DETAILED PROJECT REPORT

VISHWAKARMA YOJNA PROJECT: VIII

AN APPROACH TOWARDS RURBANISATION

VILLAGE :- KHODIYAR

DISTRICT :- AHMEDABAD

PREPARED BY:-

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L.D COLLEGE OF ENGINEERING

AHMEDABAD

NODAL OFFICER

PROF. UTKARSH. P. NIGAM

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YEAR: 2020-21

GUJARAT TECHNOLOGICAL UNIVERSITY

Chandkheda, Ahmedabad – 382424 Gujarat

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CERTIFICATE

This is to certify that the following students of Degree/Diploma Engineering successfully submitted

Detailed Project Report For,

VILLAGE :- KHODIYAR

DISTRICT :- AHMEDABAD

Under

Vishwakarma Yojna: Phase- VIII

Is Partial fulfillment of the Project offered by

GUJARAT TECHNOLOGICAL UNIVERSITY, CHANKHEDA

During Academic Year 2020-2021

This Project Work has been carried out by them under our supervision and guidance.

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
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Date and Report Submission:-	15/12/2020
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Internal Guide Name and Signature:-	
College Name:-	L.D College of Engineering
College Stamp:-	

ABSTRACT

Vishwakarma Yojana Project and how you do your vision project:

We are currently working on Vishwakarma Yojana Project Phase VIII – An Approach towards Rurbanisation and we are very glad to work with Gujarat Technological University for Sustainabe Development of the villages which are very in under- Developed condition and we see our vision project as an opportunity to give our best for this project as an National Duty.

About Your Village Description:

We have selected KHODIYAR Village in Daskroi Tehsil in Ahmedabad District. The Village is 18 Kms far from Ahmedabad District. . According to census 2011 information, the location code or village code of khodiyar village is 511631. Ahmedabad district is both district and sub-district headquarters of khodiyar village..

About Existing Village Condition:

As per 2009 stats, khodiyar village is also a gram panchayat. The village is in still under-developed condition. The village is still deprived of many basic facilities that have became a primary facilities which must be present in any of the villages of India. The infrastructural facilities of the villages are not upto level and so we decided to carry out Vishwakarma Yojana Project in this Village.

About Your Proposed Design Your View for Village Development:

We have proposed 6 Civil Designs for this Village in this semester and we are going to Propose another 6 Civil Designs in the next semester for the sustainable development of the villages. We will be trying our best to propose the best designs for the village Structurally and economically.

About future scope of the village development:

To accomplish the 'Smart Village' status, the community, individually and collectively, will be empowered to take smart decisions using smart technologies and with the support of smart manpower and by managing to be self-sufficient.

Key Words: Emerging India, Information and Communication Technology, Smart Villages

ACKNOWLEDGEMENT

We are highly indented to **Gujarat Technological University**, Ahmedabad for providing us such opportunity to work under Vishwakarma Yojana to get real work experience and applying our technical knowledge in the development of Villages.

We wish to express our deep sense of gratitude to **Prof.(Dr.) Navin Sheth, Hon'ble Vice Chancellor, Gujarat Technological University-Ahmedabad**, for his encouragement and giving us the wonderful project.

We also express our gratitude to **Dr. K.N.Kher, Registrar, Gujarat Technological University-Ahmedabad** for giving us complete support.

We express our sincere thanks to **Commissionerate of Technical Education, Gujarat State** for appreciating and acknowledging our work.

We express our sincere thanks to **DDO, TDO, Sarpanch, Talati and staff members of Ahmadabad** District for providing us with requisite data whenever we approached them. Especially our thanks are to all villagers and stake holders for their support during Survey.

We are also thankful to our Prof.(Dr.) **R.K.Gajjar** Principal, faculties of our colleges for their encouragement and support to complete this project work.

An act of gratitude is expressed to our internal guide / Evaluator / Nodal Officer, Dr./Mr./Mrs **Utkarsh.P.Nigam** from college **L.D College of Engineering** for their invaluable guidance, constant inspiration and active involvement in our project work.

We are also thankful to all the experts who provided us their valuable guidance during the work. We express our sincere thanks to, **Dr. Jayesh Deshkar, Hon'ble Director of Vishwakarma Yojana project and Principal, V.V.P Engineering College and Core Committee member of Vishwakarma Yojana project Prof(Dr.)Jigar Sevalia**, Professor, SCET, Surat, **Prof.K.L.Timani**, Associate Professor,VGEC, **Prof.Rena Shukla**, Associate Professor, LD Engineering College, **Prof.Y.B.Bhavsar**, Associate Professor,VGEC, Prof.Jagruti Shah, Assistant Professor, BVM Engineering College for providing us technical knowledge of this project work.

We are also thankful to **Ms. Darshana Chauhan, Vishwakarmrma Yojana**, for all support during our work. We therefore, take this opportunity for this Project work expressing our deep gratitude and sincere thanks for her cooperation to produce this project work in the present form.

Above all we would like to thank our Parents, family members and Friends for their encouragement and support rendered in completion of the present this work.

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ABBREVIATIONS

SHORT NAME / SYMBOL	FULL NAME
MoRTH	Ministry of Road Transport and Highway
MoRD	Ministry of Rural Development
RCC	Reinforced Cement Concrete
PCC	Plain Cement Concrete
BM	Brick Masonry
CPWD	Central Public Work Department
IRC	Indian Road Congress
MS	Mild Steel
CI	Cast Iron

CHAPTER 1:

IDEAL VILLAGE VISIT-PUNSARI

1.1 BACKGROUND & AND STUDY AREA LOCATION

Introduction:-

- An ideal Indian village will be so constructed as to lend itself to perfect sanitation. It will have cottages with sufficient light and ventilation built of a material obtainable within a radius of five miles of it. The cottages will have courtyards enabling householders to plant vegetables for domestic use and to house their cattle. The village lanes and streets will be free of all avoidable dust. It will have wells according to its needs and accessible to all. It will have houses of worship for all, also a common meeting place, a village common for grazing its cattle, a co-operative dairy, primary and secondary schools in which industrial education will be the central fact, and it will have Panchayats for settling disputes. It will produce its own grains, vegetables and fruit, and its own Khadi. This is roughly my idea of a model village.

Background:-

- Vishwakarma Yojana is government project for developing various villages. Vishwakarma Yojana is one of the approaches towards Rurbanization to solve issues of Urbanization In this project various details of villages like demographical details, geographical details, occupational details, physical infrastructure facilities, social infrastructure facility etc. various data are collected. And it tries to develop facilities as possible as best. Its main purpose is making village as model or ideal village with maximum facilities.

Study area location:-

- Punsari is a village located in Sabarkantha district in the state of Gujarat, India. The village is located at about 80 km from the state capital, Gandhinagar. Punsari is 20km from Parvati Hills. Parvati Hills is the largest table top land of India

VILLAGE	PUNSARI
TALUKO	Bayad
DISTRICT	SABARKANTHA
STATE	GUJARAT
LANGUAGE	GUJARATI, HINDI, ENGLISH
TIME ZONE	IST (UTC+5:30)
PINECODE	383307

Table 1.1: General Information Of Punsari Village

Punsari is a village in Sabarkantha district in the state of Gujarat,India. Punsari is considered as India's smartest Village. The village is located at about 80 Km from the state of capital, Gandhinagar. Punsari is 20 km from Parvati Hills. Parvati Hills is the largest table top land Of India.

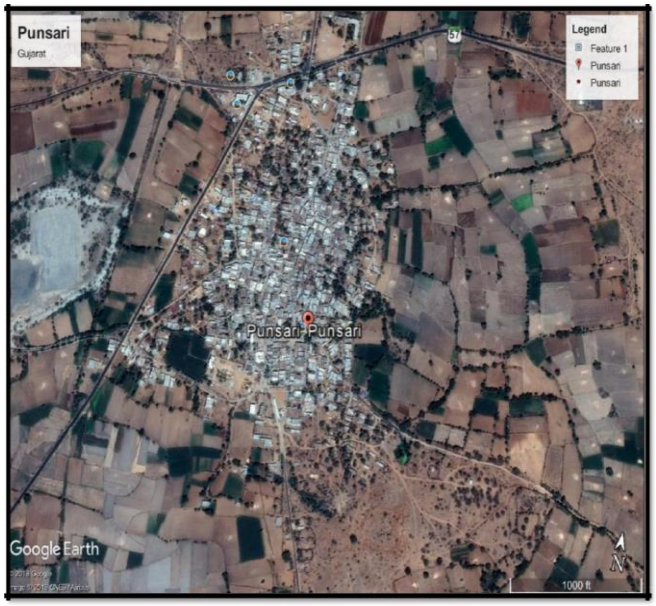


Fig 1.1 : Location of Ideal Village

1.2 Concept of ideal village and normal village :-

- An model village has good system of sanitation and drainage. Because filth and rubbish of the village should be regularly removed away into the compost pits. An ideal village has very good drain system so that the dirty water of the village is properly drained away.

Basic Infra-structures:-

- Besides the people, an ideal village should have the following basic infra-structures:

Houses:-

The houses should be neat and clean. They should be well-ventilated to allow free flow of light and air. There should be good arrangement for proper sanitation and drainage system.

Good Connectivity:-

Good connectivity is one of the most essential requirements of an ideal village. The village should be well-connected to other parts of the country by roads and also by rails, if possible. The streets and lanes of the village should also be well maintained so that people can easily commute from one part to another.

Sufficient sources of potable water:-

An ideal village should have good supply of clean drinking water. There should be enough wells, tube-wells and even submersibles to meet the needs of the villagers. It would help everyone get good drinking water. There should also be separate ponds for villagers to take bath and to get water for their cattle.

Proper sanitation and drainage facilities:-

An ideal village should have good system of sanitation and drainage so that dirty water and waste can be easily drained out. It would help the village keep clean and free from many diseases caused by filthy water. It would also save the villagers from water-logging during the rainy season.

Pasture land for cattle:-

Almost every villager living in a village keeps cattle. There should be enough pasture land for grazing of their cattle. Generally, it should be within the village, at a distance from the houses or just outside the village.

Food and fodder:-

The villagers grow food and vegetables not only for themselves but also for the urban people. They also grow fodder for their cattle. They also produce dairy, poultry and other products for their own consumption as well as for supply to urban areas. There should be proper arrangements in the village itself to provide them with good seeds and all assistance related to their produces.

Wholesale market within the village:-

Most of the people living in villages are farmers by profession. They grow food crops, cash crops and fodders in their fields. While they consume the food crops for themselves and the fodder for their cattle, the cash crops the other surplus products are sold in the market to meet their other requirements. There should be provision for wholesale market in the village itself so that the villagers can sell their surplus products there at reasonable rates and get good return. This would save them from the hands of the middle men and bring prosperity.

Cottage Industries:-

An ideal village should have well-established small cottage industries so that the artisans and small farmers can utilize their skills and extra time to produce articles necessary for day to day use and earn a handsome profit by selling them in the market.

Healthcare Centres and hospitals:-

Besides food, the other most important aspect of human life is health. An ideal village should have proper facilities taking care of the health of the villagers as well as of their cattle and poultry. There should be one-two healthcare centres depending upon the population of the village. A small hospital also adds to the quality of such a village. Besides health centres for the villagers, veterinary dispensaries should also be there to take care of their live-stock.

Educational facilities:-

An ideal village should have proper arrangements of education for the children. There should be Primary schools and High schools so that the little children need not go out of the village for education. Primary education should be free and compulsory for every child up to a certain age.There should also be soft skills training centres and preferably an adult education centre for the elders who want to get education. Playground for children and a meeting place for elders should also be part of an ideal village.

People:-

People of an ideal village are very neat and clean. They have a sense of discipline and collaboration. They have a spirit of service and let go.

Conclusion:-

An ideal village makes all possible provision for development of her people. It is our main duty that we should develop every village of India to much higher level. The idea of an ideal village will certainly help us in discharge our duty.

1.2.1 OBJECTIVES

- Create and sustain a culture of cooperative living for inclusive and rapid development.
- Development of socio culture facilities like community hall, public library, recreational activities and repairing of existing amenities Repair & maintenance of Existing Public Buildings like Gram Panchayat, Public Library, School Buildings, Health Center, Public Toilet Block & Other.
- Internal roads within village settlement, Efficient Mass Transportation systems to improve connectivity between urban and rural areas, Public transportation facilities that need to be developed like bus stops, transport depot etc.
- Promote integrated development of rural areas with provision of quality housing, better connectivity, employment opportunities and supporting physical and social infrastructure.

1.2.2 EXAMPLE/LIVE CASE STUDY

1.2.1.1 Dharnai in Bihar:-

Once struggling to get basic electricity like most villages in India, Dharnai has now changed its fate and become the first village in India to completely run on solar power. Residents of Dharnai had been using diesel-based generators and hazardous fuel like cow dung to meet the electricity requirement for decades, which were both costly and unhealthy. Since the launch of Greenpeace's solar-powered 100 kilowatt micro-grid in 2014, quality electricity is being provided to more than 2,400 people living in this village in Jehanabad district.

Fig 1.2: Dharnai Village, Bihar

1.2.1.2 Ramchandrapur, Telangana:-

The first village in Telangana region to win the Nirmal Puraskar in 2004-05, Ramchandrapur came into focus a decade ago when the villagers pledged to donate their eyes for the visually challenged. Among its many achievements, all the houses in the village have smokeless chullahs and toilets with tap-water facilities. It is the first village in the state to construct a sub-surface dyke on the nearby river and solve drinking water problems by constructing two over-head tanks in each house. Ramchandrapur had shown the way to other villages on how to utilise government schemes and take up developmental works. The village does not have drainage system and all the water generated from each house is diverted to the plants, which were planted by the villagers in each house.

1.2.3 THE IDEA OF A MODEL/SMART VILLAGE

The smart village is made by providing dumping area facilities, covered drainage system, sewer line, drinking water treatment plant, 24 hours electricity, proper village road, bank and ATM facilities, bio gas plants, rain water harvesting, canal water for agriculture purpose and proper town planning.

1.2.4 ANCIENT HISTORY CIVIL CONCEPT ABOUT INDIAN VILLAGE/OTHER COUNTRIES PERSPECTIVE ABOUT VILLAGE AND ITS NEW DEVELOPMENT

The Best example of ancient civil engineering concept is seen in mohenjo daro town planning:-

- The Indus Valley held cities and towns that shared unique building strategies throughout their survival in history. The people of the civilisation were extremely intelligent and advanced for their time, learning quickly the uses of different building materials and tools, and the best structural layouts for the towns. Homes and public buildings seemed almost luxurious for their time, having a sophisticated plumbing setup and being multi-levelled.

- Housing in the Valley was adequate and architecturally simple, yet outstanding. From one to two to three storeys, whether in the lower or higher part of town, houses contained these following features. Every household had continuous access to clean water from nearby wells and drainage facilities, including plumbing. The Indus Valley civilisation is thought to be the first with an urban sanitation system, again very advanced for their time. There was a bathing room, and sometimes individual rooms for each person. All houses in a town were identical, and built together in courtyards. Connecting upper levels to lower levels were sets of brick stairs or sometimes ladders. The majority of houses were spacious and had flat roofs; however in poorer regions some houses had no roof at all and were exposed to all the weather.

- The sewers were brick-lined and found under the streets of the town. Mohenjo-Daro had the best sewerage system, which has remained intact for us to analyse today. The pipes were made of baked clay and ran all the way to the houses, taking waste from the bathrooms to the sewers. The sewers drained into nearby rivers.

- The Indus Civilization spanned much of what is now Pakistan and North India, extending westwards to the Iranian border, south to Gujarat in India and northwards to an outpost in Bactria, with major urban centers at Harappa, Mohenjo-daro, Lothal, Kalibangan, Dholavira and Rakhigarhi. Mohenjo-daro was the most advanced city of its time, with remarkably sophisticated civil engineering and urban planning.

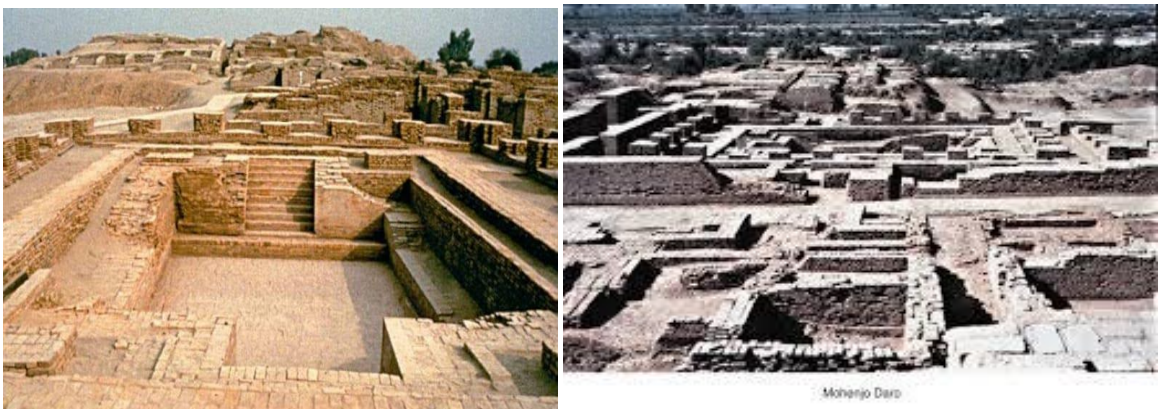


Fig 1.3: Mohen-jo Daro Village

1.3 DETAIL STUDY(SOCIO ECONOMIC,PHYSICAL,DEMOGRAPHIC AND INFRASTRUCTURE DETAILS) OF IDEAL VILLAGE

Physical and Demographic Detail :-

- Punsari is a village located in Sabarkantha district in the state of Gujarat, India. The village is located at about 80 km from the state capital, Gandhinagar.
- Punsari is considered as India's smartest village. There has been use of new and advanced technology in education. This village has Wi-Fi connection for all people. Effort have been made for the empowerment of women and increasing security in the village. Some of the facility provide by the panchayat including local mineral water supply, sewer & drainage project, CCTV camera in village healthcare centre, Mini bus provide for import of milk, banking facilities and toll-free complaint reception service.
- The village follows the Panchayati raj system he village has undergone a transformation under the panchayat. There has been use of new and advanced technology in education. Efforts have been made for the empowerment of women and increasing security in the village. Some of the facilities provided by the panchayat include local mineral water supply,

sewer & drainage project, a healthcare centre, banking facilities and toll-free complaint reception service. Consequently, Punsari received the award of being the best Gram Panchayat in Gujarat. The village's model has been appreciated by delegates from Nairobi and they are keen to replicate this in Kenyan villages.

➢ Basic information:-

Country	India
State	Gujarat
District	Sabarkantha
Government	
Type	Panchayati Raj
Body	Gram Panchayat
Population (2011)	
Total	5,500
Languages	
Official	Hindi, English, Gujarati
Time zone	IST (UTC+5:30)
PIN	383307
Website	www.punsarigrampanchayat.in

Table 1.2: Basic Information of Punsari Village

Name of three major occupation groups in village	Farming	50%
	Dairy	35%
	Business	15%

Table 1.3: Occupational Details

Demographics:-

- The population of Punsari was 4681 as per 2001 census of India Which has increased to 5500 in 2011.
- As of June 2012, the population is 6000.

Infrastructure facilities:-

- Look and Feel of A Modern Village. Different points of the village are now connected through clean and well-maintained concrete roads. Streetlights are operational through solar

power. Scarcity of electricity has become a thing of the past as Punsari has 24-hours power supply through a 66 KV power sub-station located in the village itself. This was developed through funds from Jyotigram Yojana.

- The village now has a proper sanitation and underground drainage system. Every house in the village has its own lavatory, which is remarkable compared to most other villages of India.
- The village community is prosperous and aspirational. Cars, motorcycles, LED TVs, Split A/Cs, refrigerators, smart phones are a common sight in the village.
- "Atal Express", a bus service for villagers was funded through central government scheme Swarnimjayanti Gram Swarojgar Yojana.12 This service has been especially useful for women carrying milk to the collection center at Sambharkanta. The bus service has become one of the most used modes of transport within the village. Students are entitled to free transport as part of this facility.

Healthcare:

- Punsari has a primary healthcare center (PHC) which is operational on 24/7 basis. Two qualified doctors are on duty throughout. This center has a separate maternity ward as well. ASHA workers are actively engaged in the center and the entire village. They organize seminars and discussions to spread increased awareness about health and hygiene related matters. The center has its own transport system. Over the years the rate of institutional delivery and immunization of newborn babies have gone up to 100%. The expectant mothers are given monetary aid and encouraged to attend the vaccination camps.
- Villagers are covered under a group insurance scheme for life and medical cover. Each villager between the ages of 18 to 60 years is insured for an accidental cover of 1 lakh and a mediclaim cover of 25,000. The farmers are insured against any accident under a scheme by RSBY. They get an insurance of 1.2-2 lakh in selected hospitals for treatment in case of an accident. The Below Poverty Line (BPL) population of Punsari is also benefited under the Mukhyamantri Amrutam Yojna launched in 2012.
- Punsari has eight well equipped anganwadi17 centres (crèches). All these centres have well-maintained infrastructure. Inhabitants of Punsari make best use of these centres. Facilities provided through these centres have minimized cases of malnourishment and sickness among child to almost zero level.

Drinking Water:

- Availability of clean drinking water used to be a crucial problem in the village. The village wells had high levels of salt which caused health issues. Punsari has worked towards advancement in provision of clean drinking water in the village through five bore wells, four hand pumps and house to house piped connections to distribute chlorinated water. Since 2010, the panchayat installed its own reverse osmosis plant producing mineral water to

ensure the supply of clean drinking water to the villagers. This plant has been set up under PPP (public-private partnership) business model. The water is supplied to all the households at nominal charges of rs 4/20 liters. BPL families get it free of cost. The private partner also supplies this mineral water to other villages. During weddings and other ceremonies, water tankers are arranged by the panchayat. Drinking water taps are available for all villagers across the village. There are 73 wells which exist in the village and nearby areas which are recharged regularly.

Wi-Fi Connectivity:

- Punsari was completely connected to Wi-Fi in 2006. It is accessible throughout the village through Reliance's data usage plans, so every user has a unique username and password that allows access to the CCTV recordings, mobile library, complaint registrations, etc. This Wi-Fi connection is maintained by volunteers, and electrical engineers with the panchayat.

Education:

- There are five primary schools (up to standard V) in Punsari and one secondary school (up to standard VIII). Schools have well equipped computer labs and libraries. Students' lockers were installed in classrooms. As a result, children don't have to walk to school and back home with heavy bags. In addition, buses are provided to transport the children to and from school. The village panchayat also has a scholarship scheme for students from economically weak backgrounds.
- One of the schools in the village has been developed as a model school. It has projectors and computers for teaching. The focus of all the schools is on activity-based learning.

Fig 1.4:- Primary School in Punsari

Fig 1.5: Sub-Station

Fig 1.6: Camera Surveillance

Fig 1.7: Waste Collection

Fig 1.8: Speaker in the Village

Fig 1.9: Bus Transport

Fig 1.10: Solar Street Light

Fig 1.11: Elevated Water Tank

Fig 1.12: Punsari Bus Stand

Fig 1.13: Clinic in Punsari

Fig 1.14: Aanganwadi in Punsari

1.4 SWOT ANALYSIS OF IDEAL VILLAGE

Strength:-

- Government yojna are effectievely work in village
- Transportation facilities
- Sanitation facilities
- Proper drainage facilities
- Camera surveillance
- Panchayat Body and Member ready to village developing work
- Finacal Institution are available, Bank,Milk Co.Oparative mandali

Weakness:-

- Conventional method of agricultural system
- No facilities for higher secondary education
- Lack of maintainace of some existing facilities

Opportunities:-

- Skill Development Centre
- Woman empowerment
- Educational awareness
- Agriculture

Threats:-

- Lack of awareness for village development in public

1.5 FUTURE PROSPECTS OF DEVELOPMENT OF THE IDEAL VILLAGE

For future prospect, the village Punsari can use more advanced technologies for Dairy prospect and for other Agreculture also.They can also provide biogas plant in the village.They can Provide the solar system for a whole village.

1.6 BENEFITS OF THE VISITS OF IDEAL VILLAGE

- Can able to know different types of the facilities infrastructure likes Physical social; social cultural sustainable and repair and maintain ace related and also know about the basic facilities about the village
- We get experience of communication with village peoples
- We get knowledge regarding various government yojna relate to village development.
- We had seen much kind of new technologies which can be used in village that are being used in the urban area.

1.7 CIVIL CONCEPT REQUIRED IN IDEAL VILLAGE/SMART VILLAGE

Ideal/ Smart villages will be connected to towns and cities through information and communication technologies (ICT) enabled by access to energy. Such technologies will enhance education and health services by providing links to the world‘s knowledge base and opportunities for distance learning, as well as supporting initiatives in m-health (mobile health, also known as telemedicine). Connectivity will also open up participation in governance processes at local, regional and national levels.

There are many areas within the ideal villages vision that will be sharpened and refined through a series of workshops to be held around the world under the current Ideal Villages Initiative. With the immense potential benefits that it can bring to rural communities, is not just aspirational but can be realised with the engagement and wholehearted commitment of all stakeholders, from the inventors of new energy-provision technologies to indispensable village leaders as role models.

Smart/ Ideal villages can capture many of the benefits of urban living while retaining valued aspects of rural life and ensuring balanced development at the national level. This enables villagers to attain healthy and fulfilling lives, achieve their development potential, earn a viable living and be connected to the wider world.

CHAPTER 2:

LITERATURE REVIEW

2.1 INTRODUCTION : URBAN & RURAL VILLAGE CONCEPT

Urban:-

- An urban area is an area where many people live and work close together. The population density is higher than in the surrounding area. It is where buildings are close together. Urban is the opposite of rural, where farm lands and nature are. Urban areas are usually cities and towns. Most of the work available in urban areas is factory and office work. agricultural work is rare because buildings are close together and there is no space for farm lands.

Rural:-

- Rural development is the process of improving the quality of life and economic well-being of people living in rural areas, often relatively isolated and sparsely populated areas. Rural development has traditionally centered on the exploitation of land-intensive natural resources such as agriculture and forestry.

2.2 IMPORTANCE OF THE RURAL DEVELOPMENT

- The main objective of the rural development programme is to raise the economic and social level of the rural people.
- Rural development implies both the economic betterment of people as well as greater social transformation.
- In Rural village life is simple and relaxed and rural area environment is direct contact with nature
- rural development is approaches for multi-purpose, which include the activities related to agriculture, animal husbandry, co-operation, irrigation, village and small-scale industries, health care and sanitation, housing, transport and communication, welfare of women and children and rural employment
- Rural Development refers to the process of improving or uplifting the living conditions of the people living in rural areas.
- The people of India live mostly in rural areas (villages). Therefore, it is in the heart of the villages that the nation lives. Indeed, “the soul of India is in the toil of the rural areas”. The welfare of India depends upon the prosperity of the villages.

Fig 2.1:- Urban Scenario

Fig 2.2 :- Rural Scenario

2.3 ANCIENT VILLAGES/ DIFFERENT DEFINITION OF: RURAL URBAN VILLAGES

- **United states development of agriculture** defines rural areas as any area other than a city or town that has a population of greater than 50,000 inhabitants and the urbanized areas contiguous and adjacent to such town or a city.

- **National geographic society** defines A rural area is an open swath of land that has few homes or other buildings and not very many people.

- **United states census** defines rural areas as comprising open country and settlements with fewer than 2500 residents areas designated as rural can have population densities as high as 999 per square mile as 1 person per square mile.

2.4 SCENARIO: RURAL/ URBAN VILLAGE OF INDIA POPULATION GROWTH

Growth rate of population

	2001	2011	DIFFERENCE
INDIA	21.5	17.6	-3.9
RURAL	18.1	12.2	-5.9
URBAN	31.5	31.8	+0.3

Table 2.1: Growth Rate of Population(%)

Sex Ratio of India

	2001	2011	Difference
Overall			
India	**933**	**940**	**+7**
Rural	**946**	**947**	**+1**
Urban	**900**	**926**	**+26**
0-6 years			
India	**927**	**914**	**-13**
Rural	**934**	**919**	**-15**
Urban	**906**	**902**	**-04**

Table 2.2: Sex Ratio of India

Literacy Rates (in %)

	2001	2011	Difference
Overall			
India	64.8	74.0	+9.2
Rural	58.7	68.9	+10.2
Urban	79.9	85.0	+5.1

Table 2.3: Literacy Rate(%)

Gujarat Data as per census

Description	2011	2001
Population	60,439,692	50,671,017
Male	31,491,260	26,385,577
Female	28,948,432	24,285,440
Percentage of total Population	4.99%	4.93%
Sex Ratio	919	920
Child Sex Ratio	890	883
Population Growth	19.28%	22.48%
Density/km2	308	258
Density/mi2	798	669
Area(Km^2)	196,244	196,024
Area mi2	75,770	75,685
Total Child Population (0-6 Age)	7,777,262	7,532,404
Male Population (0-6 Age)	4,115,384	4,000,148
Female Population (0-6 Age)	3,661,878	3,532,256
Literacy	78.03 %	69.14 %

Male Literacy	85.75 %	79.66 %
Female Literacy	69.68 %	57.80 %
Total Literate	41,093,358	29,827,750

Table 2.4: Gujarat Data As Per Cencus

2.5 SCENARIO: RURAL/ URBAN VILLAGE OF GUJARAT AS PER CENSUS 2011 AND LATEST

- The total figure of population living in urban areas is 25,745,083 of which 13,692,101 are males and while remaining 12,052,982 are females. The urban population in the last 10 years has increased by 42.60 percent.
- Sex Ratio in urban regions of Gujarat was 880 females per 1000 males. For child (0-6) sex ratio the figure for urban region stood at 852 girls per 1000 boys.
- Total Children (0-6 age) living in urban areas of Gujarat were 2,952,359. Of total population in urban region, 11.47 % were children (0-6).
- Average Literacy rate in Gujarat for Urban regions was 86.31 percent in which males were 90.98% literate while female literacy stood at 70.26%.

Description	Rural	Urban
Population (%)	57.40 %	42.60 %
Total Population	34,694,609	25,745,083
Male Population	17,799,159	13,692,101
Female Population	16,895,450	12,052,982
Population Growth	9.31 %	36.00 %
Sex Ratio	949	880
Literates	21,420,842	19,672,516
Average Literacy	71.71%	86.31%
Male Literacy	81.61 %	90.98 %
Female Literacy	57.78 %	70.26 %

Table 2.5: Population Growth

2.6 RURAL DEVELOPMENT-CONCERNS-MEASURES

Infrastructure related Issues

- Lack of Hospitals
- Education Institute
- Water supply
- Transportation
- Improper Electricity Facility

Agriculture related Issues

- Lack of advance technology
- Poor marketing
- Lack of Machinary

People Related

- Poverty
- Lack of awareness
- Lack of Education

Economic

- Maintainance cost
- High cost of input

Various Measures for Rural Development:-

- To provide minimum facility to rural mass in terms of drinking water, education, transport, electricity and communication.
- To develop rural institutions like Panchayat, cooperatives, post, banking
- To develop rural industries through the development of handicrafts, small scaled industries, village industries, rural crafts, cottage industries and other related economic operations in the rural sector.
- Give Free Education to youth of Rural areas
- Promote non-agricultural industries such as mining, service industries, construction and commerce, in a sustainable manner, as a source of employment and income for rural populations.
- To develop living slandered of rural mass.
- Improve access to reliable and affordable energy services, including renewable and alternative sources of energy for sustainable rural development.
- Take help from Government Yojana
- To develop rural area as whole in terms of culture, society, economy, technology and health.

2.7 Various infrastructure guidelines with the Norms for Villages for the provisions of different infrastructure facilities:

According to UDPFI norms:

- PHC or Health Centre: According to URDPFI norms, per village one PHC or Health centre is required, so the provision of one PHC should be there.
- Public Toilet Block: We recommended providing public toilet in village. According to URDPFI norms there should be one public toilet per 50 families.
- Community Hall: According to URDPFI norms, one Community hall is required per village, so the provision of one PHC should be there.
- U/G Sump: According to URDPFI norms, two U/G sumps of 12000L and 10000L capacity tanks is required.
- Secondary School: According to URDPFI norms per 7500 population, one secondary school is required.

2.8 Ancient / Existing Electrical concept study as a Literature Review for village development:

A Survey of related studies was undertaken by the researcher to get an insight into the work that has already been in the field of this investigation in the context of related industry. An attempt is made in this chapter to review the existing literature on the subject of research. The available literature related to the present research work studied by the researcher is divided into the following subcategories:-

- Power sector reforms in Gujarat.
- Recent issues & challenges of Indian power sector
- Approaches of performance measurement
- Summary and research gaps
- KPIs for a power distribution utility
- KPI approach of performance measurement
- Prior studies on power sector
- Power sector scenario in India

2.9 Other Projects / Schemes of Gujarat / Indian Government:

1. **Indira Awas Yojana:**
   It is one of the six components of Bharat Nirman Yojana. It was introduced in 1985-86. It aims to help built or upgrade the households of people living under BPL.

2. **Pradhan Mantri Gram Sinchai Yojana :**
   It is a national mission to improve farm productivity and ensure better utilization of the resources in the country.
3. **Bharat Nirman Yojana:**
   It was launched in 2005 for building infrastructure and basic amenities in rural areas. It comprises of six components rural housing, irrigation, drinking water, rural roads, electrification.
4. **Jawaharlal Nehru National Urban Renewal Mission (JNNURM):**
   It was launched on 3rd December, 2005. The main objective of this scheme was fast track development of cities across the country. It was focused especially on developing efficient urban infrastructure service delivery mechanism, community participation and accountability of urban local bodies and other agencies towards citizen.
5. **Pradhan Mantri Adarsh Gram Sadak Yojana (PMAGSY):**
   It focuses on integrated development of 100 villages with a 50 per cent population of SCs.
6. **Sardar Patel Awash Yojana:**
   Sardar Patel Awash Yojana for land less agricultural laborer's and village artisan living Below Poverty line in rural areas of the State.The poor has right to live new life and turn to new culture.
7. **Rajiv Awas Yojana (RAY):**
   This programme was announced in June 2009 with an objective to make the country slum-free.
8. **Panchvati Yojana:**
   It aims at welfare of Rural people of state to devlope the park and village with necessary and implements of joy and amusment are easily available People may spend their time leisurely in the late evening and the women can spend their time peacefully with their children.
   It aims to build such places where senior citizens of the village may sit peacefully and may ponder over the matters.
9. **E-Gram Yojana :**
   To make the various tasks of the panchayat modern, simple, organized, time- bound, rapid, error free, transparent through the implementation of Information Technology. To provide E-Services to rural folk which are comparable to those availed by urban people.

CHAPTER 3:

SMART VILLAGE CONCEPT IDEA AND ITS VISIT

3.1 INTRODUCTION: CONCEPT, DEFINITIONS AND PRACTISES

- Smart village means all the necessaries facilities is developed in the village and no need to moves in city for any kind of requirement.
- It's a village that have all the necessary conditions to live in community, respecting the environment, traditions, education, respecting the people and its values, and where every person is really involved in the local improvement of the social aspects.
- The level of progress of climate smart agriculture was examined, its ideas were employed to develop a framework for smart village development. This is essential because most agricultural activites are maximized in the rural communities, more so, its development can influence the increasing rural-urban migration. Also of importance is the tailoring of this framework towards sustainabilityThe level of progress of climate smart agriculture was examined, its ideas were employed to develop a framework for smart village development. This is essential because most agricultural activites are maximized in the rural communities, more so, its development can influence the increasing rural-urban migration. Also of importance is the tailoring of this framework towards sustainability.

3.2 VISION-GOALS, STANDARDS AND PERFORMANCE MEASUREMENT INDICATORS

- To Accomplish the smart village status, The community, individually and connectively , will be empowerd to take smart decisions using smart technologies and with the support of smart manpower and by managing to be self-sufficient.
- Gram Panchayat is required to have a vision to make the village a Smart Village. Therefore, besides infrastructural development, a Gram Panchayat must have a target to make the village-life self-sufficient, socially harmonious and healthy. Gram Panchayat must work with a vision to provide equal opportunities to the youth, women, farmers, artisans, backward and deprived people.

Standards:

- In India 60% of population lives in its villages. The youth from villages have been migrating to cities in search of work as there are no or less opportunities for employment in villages. They leave a good quality life of village for a poor quality of life in cities. This leads to slums

& poor hygienic conditions of life for them in cities. We need to stop this migration from villages to cities.

Smart Cities Performance Measurement Indicators:

- Availability of ATM, Banks, post offices etc.
- Hygienic drinking water and R.O. system.
- primary health care 27 X 7.
- Smart primary and secondary education.
- Common places like community hall, marriage hall, theater etc.
- Provision of Rainwater harvesting system.
- Proper sanitation & Drainage, disposal of rainwater.
- Solar energy plant to preserve electricity
- Medaled road and streets.
- Uses of renewable sources like biogas, solar etc.
- Connectivity through internet, Wi-Fi.
- Smart fire-fighting system.

3.3 TECHNOLOGICAL OPTIONS

- Smart transportation
- Smart water supply
- Smart health care
- Smart waste management
- Smart building
- Smart energy
- Smart public services

3.4 ROAD MAP AND SAFE GUARDS

- A smart city is defined as a city that engages its citizens and connects its infrastructure electronically. A roadmap is a strategic plan that defines a goal or desired outcome and includes the major steps or milestones needed to reach it.
- The first step in establishing a road map for a smart city is to know why there is a need for a smart city initiative. This can be done by studying the city‘s demographics, including the residents who are the principal stakeholders in the city. People love to live in cities that are convenient, liveable, vibrant, and connected, so they can get anywhere whenever they want. Knowing the ages of the citizens, their educational background, their hobbies, the city attractions, the businesses, and the resources of the community are all key steps in getting to know the community and why there is a need to build a smart city-Geographic Information System (GIS) tools can be used to achieve this step. GIS is an essential economic development tool that many cities use for planning, analyses, and building lively

communities that attract businesses and residents; furthermore, people expect and demand their governments to provide a wide range of services. The government and the citizens' relationship is a supply and demand type of a relationship; the more services the citizens demand, the more services the government is obligated to deliver-as long as the citizens are willing to pay of course.

3.5 ISSUES AND CHALLENGES

- The Smart Cities Mission requires smart people who actively contribute in governance and improvements. Citizen contribution is much more than a official participation in governance. Smart people involve themselves in the definition of the Smart City, decisions on organizing Smart Solutions, implementing reforms, doing more with less and mistake during applying and designing post-project structures to make the Smart City developments sustainable. The participation of smart people will be enabled by the SPV through increasing use of ICT, especially mobile-based tools.
- States and ULBs will play a key supportive role in the development of Smart Cities. Smart leadership and vision at this level and ability to act decisively will be important factors determining the success of the Mission
- Understanding the concepts of retrofitting, redevelopment and Greenfield development by the policy makers, implementers and other stakeholders at different levels will require capacity assistance.
- There are certain technologies that are a part of the project and it is expensive to use them Because of the advancement.
- For the development of smart city, there is a dual need of building it on two layers i.e.) infrastructure and technology. With infrastructure being the underlying layer and technology being the top layer . It was reported in a survey that, almost 50% urban areas do not have water supply connections. Sewage is also a big problem and solving these issues in important before moving on to the technology layer.
- For a smart city, the main focus is on the reliability of utility services including water, electricity and broadband services. There needs to be a constant 24X7 supply grid electricity. However, looking at the existing demand and supply, this is quite challenging although not impossible. Thus, in order to overcome this hurdle, the cities need to shift towards renewable sources and need to focus on green buildings to reduce the need for electricity.

3.6 SMART INFRASTRUCTURE-INTELLIGENT TRAFFIC MANAGEMENT

- Smart Information and Communications Technology (smart ICT) has the potential to transform the way we plan and manage infrastructure. New developments in computer hardware, new applications and software are changing the face of the infrastructure sector, and society more generally; driving greater efficiency, increasing productivity, and greatly simplifying construction processes and life-of-asset maintenance.

Smart transport:

- Transport network improvements are likely to be made more efficient by the application of smart ICT capabilities. Urban transport networks, public transport, and freight transport networks all stand to benefit from new technologies and processes like BIM, the IoT and machine learning.
- ICT and the Internet of Things (IoT) empowers us to infuse intelligence into our entire transportation system by instrumenting it with sensors, meters, appliances, cameras, smart phones, biometric devices- giving us the ability to measure, sense and see the exact condition of everything. Instrumentation is about sensing what is happening right now, whether it is the temperature of a train wheel bearing, the location of a misplaced suitcase, metal fatigue in a bridge. At the same time, sophisticated analytic systems can detect patterns and relationships and enable continuous decision making in near-real time. We can better plan routes and schedules, reduce congestion and optimise vehicles, equipment and facilities to expand capacity. These new traffic systems can improve drivers' commutes, give better information to city planners, increase the productivity of businesses and raise citizens' quality of life.

Smart Energy:

- Smart energy grids will play an important role in both urban and regional areas in a variety of ways.
- There are obviously a lot of benefits from smart meters and that sort of smart grid technology that go to the utilities and the distributors in being able to manage that. From a consumer perspective, there are advantages, if you are using that sort of distributed generation – if you are using solar power and, hopefully, with storage, as that starts to become more common. Being able to have information about when you are using electricity and to maximise the power that you are generating from your own solar panels means that there are opportunities to reduce costs, in that you will obviously want to try to push more of our energy use into the middle of the day when you are producing power from your solar panels and rely less on the grid at night when you are paying for power from the grid.

Smart waste management:

- Waste generation is increasing at a rate faster than that of urbanization.18 Cities are increasingly finding it difficult to source, separate and use different kinds of waste that can potentially be returned to a consumer life cycle. Waste management typically includes the monitoring, collection, transport, processing, recycling and disposal of waste. Smart waste management systems reduce waste and categorize the type of waste at the source, and develop methods for the proper handling of waste. Such systems may be used to convert waste into a resource and create closed-loop economies. Their primary benefits are in improving the efficiency of waste collection, pick up, separation, reuse and recycling.
- One of the primary inefficiencies of waste management is the inability to predict when waste is to be picked up; trucks are often sent to collect waste when bins are not full. Sensors, connectivity and the Internet of Things offer ways to mitigate additional costs arising from such inefficiency. Smart waste management systems enable the movement of different kinds of waste to be monitored, and technology may be leveraged to better understand and manage the flow of waste from source to disposal. Such projects are currently being piloted in Santander, Spain and Sharjah, United Arab Emirates.

Smart Building :

- Building information modelling (BIM) is a powerful new ICT tool that can achieve efficiencies in construction. According to many of the submitters to this inquiry, BIM brings the construction industry into the digital age.
- The simplest definition of BIM is 'a digital representation of the physical and functional characteristics of a building'. BIMcan provide a shared knowledge resource or single source of truth for all of the parties to a particular construction project.

3.7 CYBER SECURITY OR ANY CONCEPT

- Cyber security in the context of Smart Cities is a hot topic. The objective of Smart Cities is to optimize the city in a dynamic way to offer a better quality of life to the citizens through the application of information and communication technology (ICT).
- Smart Cities Cyber security and Privacy examines the latest research developments and their outcomes for safe, secure, and trusting smart cities residents.Smart cities improve the quality of life of citizens in their energy and water usage, healthcare, environmental impact, transportation needs, and many other critical city services. Recent advances in hardware and software have fueled the rapid growth and deployment of ubiquitous connectivity between a city's physical and cyber components. This connectivity however also opens up many security vulnerabilities that must be mitigated.
- Smart Cities Cyber security and Privacy helps researchers, engineers, and city planners develop adaptive, robust, scalable, and reliable security and privacy smart city applications that can mitigate the negative implications associated with cyber-attacks and potential privacy invasion. It provides insights into networking and security architectures, designs, and models for the secure operation of smart city applications.

3.8 RETROFITTING-REDEVELOPMENT-GREENFIELD DEVELOPMENT DISTRICT COOLING

Retrofitting – Redevelopment:

- Green building retrofits deliver proven results with minimal cost. Today's leading building owners have actively engaged green building retrofits as the key to future models of sustainability. More than narrow vertical products, horizontal platform approaches have driven investment in bundles of technology that interoperate to deliver deeper efficiencies with a comprehensive approach**.**
- Here are the some retrofit methods that can guide the way to sustainable building practices.

Green Roof:

Fig 3.1: Pictures of Green Roofing

- Green roofs represent specialized roofing systems that support vegetation growth (e.g., grass, plants, flowers, bushes and other greenery) on rooftops. Numerous benefits can result from implementing green roof technology in an urban area.
- For example, a green roof can reduce site level storm water runoff, lower a building's cooling/heating energy demand, and reduce the urban heat island effect from the building. Extensive green roof systems have gained in popularity because they are lightweight, low cost and low maintenance. Green roofs easily check the "Green" box of building sustainability.

Real-Time Visibility to Energy Consumption:

- Energy efficiency represents a well-known principle that forms the foundation of any green building proposition. Too many existing buildings provide little to no visibility into the real-time energy consumption of different areas of a building. In today's climate where real-time products and services represent the norm, managing energy consumption retroactively based on a monthly utility bill seems preposterous. The entire CRE industry believes in energy efficiency; they simply lack the tools to execute.
- Internet of Things (IoT) retrofits routinely deliver real-time insights into energy consumption both at the whole-building level and at a tenant or equipment level. IoT retrofits can roll out incrementally at a fraction of the costs of upgrading existing infrastructures.
- Without question, energy efficiency programs should go beyond the main utility meter. Submetering delivers the needed granular insight. Even if your building has a Building Automation System (BAS), you still aren't in the clear. Most existing buildings have a BAS that cannot deliver real-time visibility to utility submetering data. Even more problematic is gaining anytime, anywhere access to that data via your mobile device. Cloud-based IoT solutions can deliver real-time visibility to everyone in your organization, regardless of their location on-premises or off-site.

Water Efficiency:

- Water efficiency represents another foundational principle to green buildings. Geographic areas facing acute water shortages make this a non-negotiable issue. Managing end-use water consumption can take a variety of forms.
- Cooling towers represent one of the largest consumers of water in a commercial/industrial building. Any green initiative that takes water efficiency into account should monitor and optimize the operation of the cooling tower. An example usage profile can be calculated as follows based on the Chiller tonnage.

CYCLES OF CONCENTRATION						
Chiller Tonnage (Nameplate)	**3**	**4**	**5**	**6**	**7**	**8**
100	5,480	4,930	4,660	4,380	4,380	4,110
200	10,960	9,860	9,320	8,770	8,490	8,490
400	21,920	19,730	18,360	17,530	17,260	16,710
500	27,400	24,380	23,010	21,920	21,370	21,100
600	33,150	29,320	27,400	26,580	25,750	25,210
800	44,110	39,180	36,710	35,340	34,250	33,700
1000	55,070	49,040	46,030	44,110	42,740	41,920
1500	82,740	73,420	68,770	66,030	64,380	63,010
2000	110,140	97,810	91,780	88,220	85,480	83,840
2500	137,810	122,470	114,790	110,140	107,120	104,930
3000	165,210	146,850	137,810	132,330	128,490	126,030
3500	192,880	171,510	160,550	154,250	149,860	146,850
4000	220,270	195,890	183,560	176,160	171,510	167,950
5000	275,340	245,480	229,590	220,270	214,250	209,860

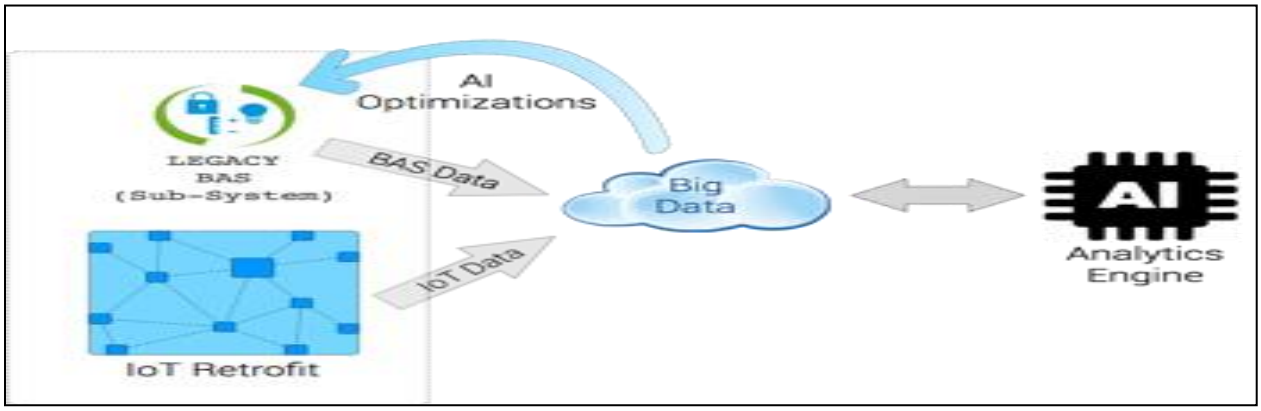
Table 3.1 :Example of Daily Cooling Tower Water Use at Full Load (Gallons Per Day)

- As illustrated, the daily water usage can range into hundreds of thousands of gallons. Without real-time visibility into the operation of the cooling tower (e.g., blowdown, system leaks, and drift), how else can a building claim that green building practices have been incorporated Low-cost IoT retrofits can provide needed insights through asset digitization of the cooling tower and chiller to achieve true water efficiency.

Virtual Building Automation System (BAS):

- Many existing buildings do not have a BAS. Buildings that do have a BAS often face expensive upgrade paths to modernize its obsolete functionality. For example, a BAS may not have the benefit of occupancy data from the building, an array of temperature/humidity sensors scattered throughout a particular zone, peak demand program alerts, etc.

- IoT solves this data problem. Retrofit IoT sensors capture additional data relevant to the HVAC controls. This IoT data would supplement existing data extracted from the BAS itself using industry standard protocols such as BACnet.



- The cloud aggregates the IoT data and BAS data into Big Data. An Artificial Intelligence (AI) Analytics Engine would then process the Big Data to produce automated intelligent controls. AI optimizations would then be fed back to the legacy BAS to supersede the HVAC programming. The cloud would transmit HVAC commands (e.g., changing of temperature setpoints) to the on-site BAS for execution.
- This architecture implements a type of virtual BAS that overlays a software application layer on top of an on-site BAS sub-system. The biggest benefit Transforming your legacy on-site BAS into a cloud-based BAS that provides real-time analytics for building optimization. As compared to a BAS upgrade, a low-cost BAS retrofits provide the easiest path to a sustainable future.

Greenfield Development District Cooling:

- District cooling provides chilled water for indoor cooling purposes to industrial, commercial and residential buildings through a closed loop pipe network.
- Functionally and technically, it is similar to district heating.
- A district cooling system can reach an efficiency rate typically 5 or even 10 times higher than a traditional cooling system.
- The cold water used in a district cooling system can come from free sources such as sea water, or it can be produced from sources like waste heat with the use of steam turbine-driven or absorption chillers or electric chillers.
- District cooling delivers chilled water to offices, shopping malls, apartments and other kinds of buildings that need indoor cooling. through the district cooling network, the cooling plant pumps chilled supply water to buildings. The chilled water is fed into the individual buildings' own cooling systems through a heat exchanger.
- When the water has cooled the building, it returns to the cooling plant at a higher temperature where it is chilled again and redistributed in a closed loop. The cold water used in a district cooling system can come from free sources such as sea water, or it can be

produced from sources like waste heat with the use of steam turbine-driven or absorption chillers or electric chillers.

3.9 STRATEGIC OPTIONS FOR FAST DEVELOPMENT

- Greenfield development will introduce most of the Smart Solutions in a previously vacant area (more than 250 acres) using innovative planning, plan financing and plan implementation tools (e.g. land pooling/ land reconstitution) with provision for affordable housing, especially for the poor. One well known example is the GIFT City in Gujarat.
- The smart city proposal of each short listed city is expected to encapsulate either retrofitting or redevelopment or green filed development model, or a mix there of and apian city future with smart solution.
- The use of pilot projects and open sensor data can play a pivotal role in ensuring high returns for Smart City initiatives
- Redevelopment will affect a replacement of the existing built-up environment and enable cocreation of a new layout with enhanced infrastructure using mixed land use and increased density.

3.10 India's Urban Water and Sanitation Challenges and Role of Indigenous Technologies

Water Challenge:

- Distribution challenges, such as water loss due to theft, pilferage, leaky pipes and faulty meter readings, result in unequal and unregulated distribution of water. In New Delhi, for example, water distribution loss was reported to be about 40% as per a study. In Mumbai, where most residents get only 2-5 hours of water supply per day, the non-revenue water loss is about 27% of the overall water supply. This strains the municipal body‘s budget and impacts the improvement of distribution infrastructure. Factors such as difficult terrain and legal issues over buildings also affect water supply to many parts.
- The daily water supply rate in the developing countries is very low compared to the industrial world. In India, it ranges from 16 to 300 liters/day depending on the locality and the economic strata.
- One of the main reasons is the high rate of water losses from the distribution system. Demographic, social and economic developments are the factors which increase pressure on water resources.
- According to a 2017 report, 630 million people in the South East Asian countries, including India, use faecescontaminated drinking water source, becoming susceptible to a range of diseases. Industrial waste is also a major cause for water contamination, particularly antibiotic ingredients released into rivers and soils by pharma companies.
- The government of India has launched Swajal scheme to ensure there is a steady supply of clean drinking water in rural areas. These remote rural areas usually receive contaminated and harsh water which, on consumption, has led to many illnesses.
- This Swajal scheme was launched by the government for sustained water supply in rural areas. 90 per cent of this project is funded by the government and 10 per cent is funded by

the beneficiary communities. The management of this operation is managed by local villagers and hundreds of technicians will be trained under this scheme to maintain and operate the units. All the villages will get water supplied through fitted pipes. This will ensure that the water is not contaminated. The maintenance of these pipes will be taken care of by the technicians.

Sanitation Challenges:

- India needs to liberated itself from this unbecoming distinction and join the ranks of developed nations who have implemented urban planning and sanitation on an equal footing and reaped spectacular results in the form of highly evolved cities that are not only clean, resilient and environment-friendly, but they also provide a healthy habitat for the residents.
- One of the major challenges for the government is to elevate India to the international levels of urban sanitation that is found in developed counties
- As a step towards this, India along with other member states of the UN committed to the new global goals for sustainable development, which included target to ensure everyone, everywhere, has access to basic toilets by 2030.

3.11 INITIATIVES IN VILLAGE DEVELOPMENT BY LOCAL SELF-GOVERNMENT

- Local bodies are institutions of the local self governance, which look after the administration of an area or small community such as villages, towns, or cities. The Local bodies in India are broadly classified into two categories. The local bodies constituted for local planning, development and administration in the rural areas are referred as Rural Local Bodies (Panchayats) and the local bodies, which are constituted for local planning, development and administration in the urban areas are referred as Urban Local Bodies (Municipalities).
- The Panchayati raj system with elected body at the village, Talukas and district levels
- The modern system is based imparts on traditional Panchayati governance, in part on the vision of mahatma Gandhi and in part by the work of various committees to harmonize the highly centralized in Indian governmental administration with a degree of local autonomy the result was intended to create greater participation in local government by people and more effective implementation of rural development programs.

3.12 SMART INITIATIVES BY DISTRICT MUNICIPAL CORPORATION

- Recycling Process for non-biodegradable waste to recover commercially valuable materials (e.g. plastic, paper, metal and e-waste recycling)
- Waste to Energy: Recovering energy before final disposal of waste.
- Water treatment plant procees for treatment of sewerage water.
- Processing organic waste to recover compost(e.g. windrow composting, invessel composting, vermi composting)

3.13 ANY PROJECTS CONTRIBUTED WORKING BY GOVERNMENT/NGO/OTHER DIGITAL COUNTRY CONCEPT

3.12.1 Government Contribution:-

a) Reorienting education towards sustainable development:

- Education is critical for promoting sustainable development and improving the capacity of the people to address the environment and development issue.
- Basic education provides underpinning for any environment and development education, the latter needs to be incorporated as essential part of learning.
- It is critical for achieving ethical awareness, values and attitudes, skills and behavior consistent with sustainable development and for effective public participations in decision making.
- To achieve the accessibility of environment education, linked to social education from the primary school age through adulthood to all groups of people.

(b) Increasing public awareness:

- Public awareness should be recognized as a process by which human beings and societies can teach their fullest potential.
- Small scale enterprise promotion through social media.
- Education empowerment and access to information through smart phones.
- By making Motivational Videos. Promoting training programs.
- Government with the help of non-government authorities can arrange various trainings to aware the people.
- Implement various schemes and projects in accordance with policies.

3.14 HOW TO IMPLEMENT OTHER COUNTRIES SMART VILLAGE PROJECTS IN INDIAN VILLAGE CONTEXT

As is the trend with urban India, consumers in the rural regions are also expected to embrace online purchases over time and drive consumption digitally. The rural regions are already well covered by basic telecommunication services and are now witnessing increasing penetration of computers and smart phones. Taking advantage of these developments, online portals are being viewed as key channels for companies trying to enter and establish themselves in the rural market. The Internet has become a cost-effective means for a company looking to overcome geographical barriers and broaden its reach. Market research firm Nielsen expects India‘s rural FMCG market to reach a size of US$ 100 billion by 2025. Another report by McKinsey Global Institute forecasts the annual real income per household in rural India to rise to 3.6 per cent

2025, from 2.8 per cent in the last 20 years.

3.15 ELECTRICAL CONCEPT

Alternative sources of energy are being pursued in the world today, as the accessibility of fossil fuels and other non-renewable resources are declining. Solar energy offers a promising solution to this search as it is a less polluting energy resource and can easily be converted into electricity through the usage of photovoltaic systems. It is a clean, pollution free and renewable energy source. Model approaches for a renewable energy supply have been developed and demonstrated to meet the energy requirements of rural people, while raising economic productivity contributing to a sustainable improvement in living conditions in rural areas. These also provide inputs for further rural energy interventions and they reduce carbon emissions by focusing on technologies not based on fossil fuels. Providing access to electricity in rural areas of India is a major challenge. The fuel is generally of meagre quality, and energy is used inefficiently; the power supply is unreliable and access to it limited, with about 500 million people in rural areas still unable to benefit from modern energy services. This not only has an adverse effect on economic productivity; more importantly, it also affects people's quality of life and is having a strong impact on the environment. The unsustainable use of locally sourced biomass and an increasing dependence on fossil fuels are causing environmental degradation at local (land degradation), regional (air, water and soil pollution) and global levels (greenhouse gas – GHG emissions contributing to climate change).At the same time, locally based measures that use renewable energies to secure the rural power supply are opening up new opportunities for economic productivity while also reducing GHG emissions and local pollution. The purpose of the Rural Energy Supply Models (RESM) is to provide a qualified tool as a guide for governments, business, experts and financing organizations. It is intended to help bridge remaining knowledge gaps on suitable models for energy supply in rural areas.

CHAPTER NO 4 :

ABOUT KHODIYAR

4.1 Introduction

4.2 < Khodiyar > Study Area Profile

4.3 Data Collection< Khodiyar >

4.4 Infrastructure Details

4.5 Existing Institutions like - Village Administration – Detail Profile

4.1 INTRODUCTION

4.1.1 INTRODUCTION ABOUT <KHODIYAR> VILLAGE

Khodiyar Village is located in Daskroi Tehsil of Ahmedabad District in Gujarat, India. According to Census 2011 information the location code or village code of Khodiyar village is 511631. The Ahmedabad is both the District and Sub-District Headquarters of Khodiyar Village. As per 2009 Stasts, Khodiyar village is also a gram panchayat.

The total geographical area of the village is 413.39 hectares. Khodiyar has a population of 3327 people. there are about 60 houses in Khodiyar village. As per 2019 stats, Khodiyar villages comes under Ghatlodia assembly and Gandhinagar parliamentary constituency. Ahmedabad is nearest town to Khodiyar which is approximately 17 km away.

4.1.2 JUSTIFICATION/NEED OF THE STUDY

The Government of Gujarat has launched Vishwakarma Yojana (scheme) for development of villages by identifying the requirements of villages. Under this scheme, the villages are surveyed and this project was identified and selected for implementation. Rurbanisation is to bring peace of mind to the villagers by providing them the basic amenities required and still keeping the village soul intact. This project gives one new idea for Development of rural villages. Also gives procedure how they fulfill requirement of the villages. Now a day people are moving from rural to urban area due to lack of basic amenities

With the help of this Yojana we can bring awareness about the thing which are not available at rural areas. So this help to provide better solution for the available problems in rural area like drinking water, Drainage facility road network, etc. Khodiyar village is in Daskroi taluka of Ahmedabad district. In Khodiyar village people are engaged with the agriculture and Business activity. In this village some educated people went to Ahmedabad for work and some people go for labours work and for other purpose. The main source of water is bore wall and in the village.

For the survey of villager we collect some basic data about village like population of the village, political background of village, Area of Village. Then we will Compare village Facilities with Ideal and smartvillage.

In Khodiyar village Based on gap analysis and condition of existing facilities based on the interviews, we have proposed design and estimation of some required designs. The details have been expressed in details in the report.

4.1.3 Study Area

Khodiyar Village is located in the Daskroi tehsil/taluka of Ahmedabad district in Gujarat. The total geographical area of the village Khodiyar is 413.39 Heactares. The pincode of the village is 382421. The population of the Village is 3327. The total number of the households in the village is 620.

As per 2019 stats, Khodiyar villages comes under Ghatlodia assembly and Gandhinagar parliamentary constituency. Ahmedabad is nearest town to Khodiyar which is approximately 17 km away.

Map of the Khodiyar Village:-

Land Map:-

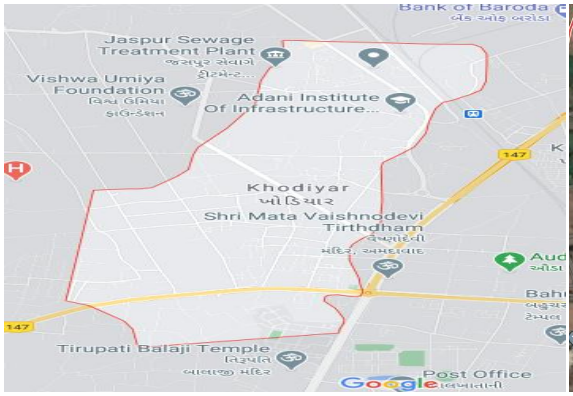


Fig 4.1: Land Map of Khodiyar

Satellite Map:-

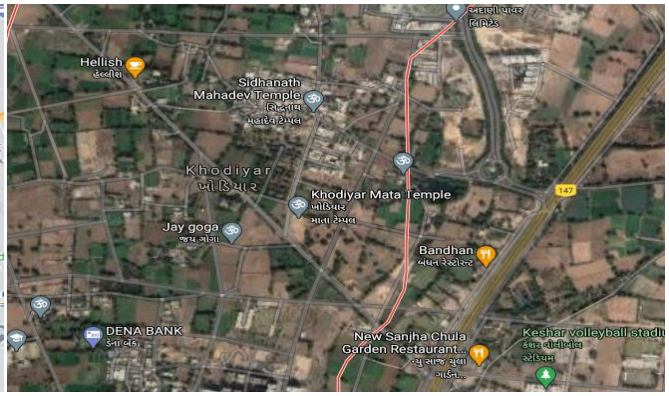


Fig 4.2: Satellite Map of Khodiyar

Fig 4.3: Gram Tal Map of Khodiyar

Gtu allocated one village to us of Gujarat for surveying which is the Khodiyar village of Ahmedabad district. This is our study area & we have to find problem related to structure and general amenities in village. Khodiyar is 17 km away from Ahmedabad.

4.1.4 OBJECTIVES OF THE STUDY

Aim:-

To design and develop the various components of the Khodiyar Village Ahmedabad based on the Socio- Economic Analysis.

Objectives:-

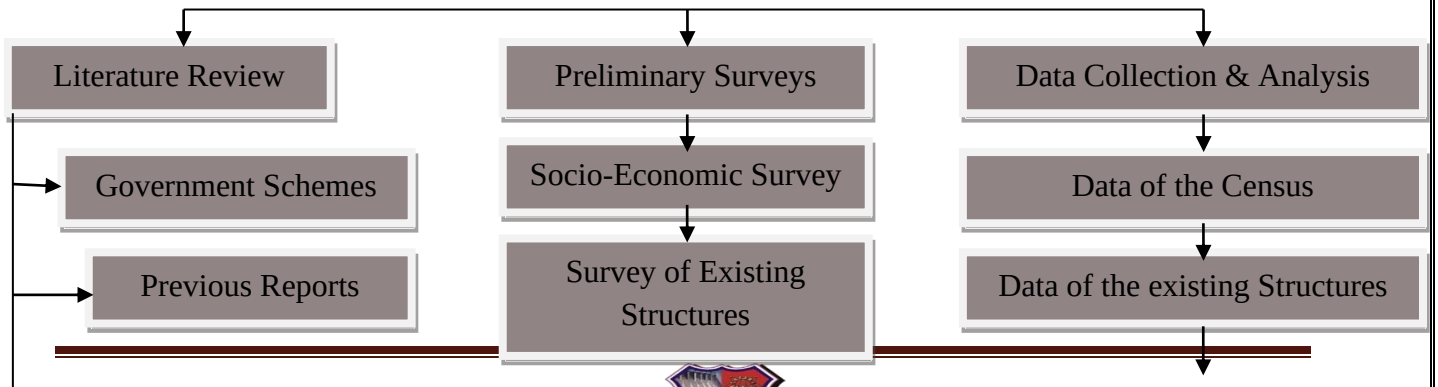
1. To analyze the existing conditions of village
2. To find out the problems of problems of people living in khandheri village.
3. To analyse existing social and physical amenities, public buildings as well as infrastructure
4. To collect socio-economic data through techno-economic survey.
5. To find public requirement in village

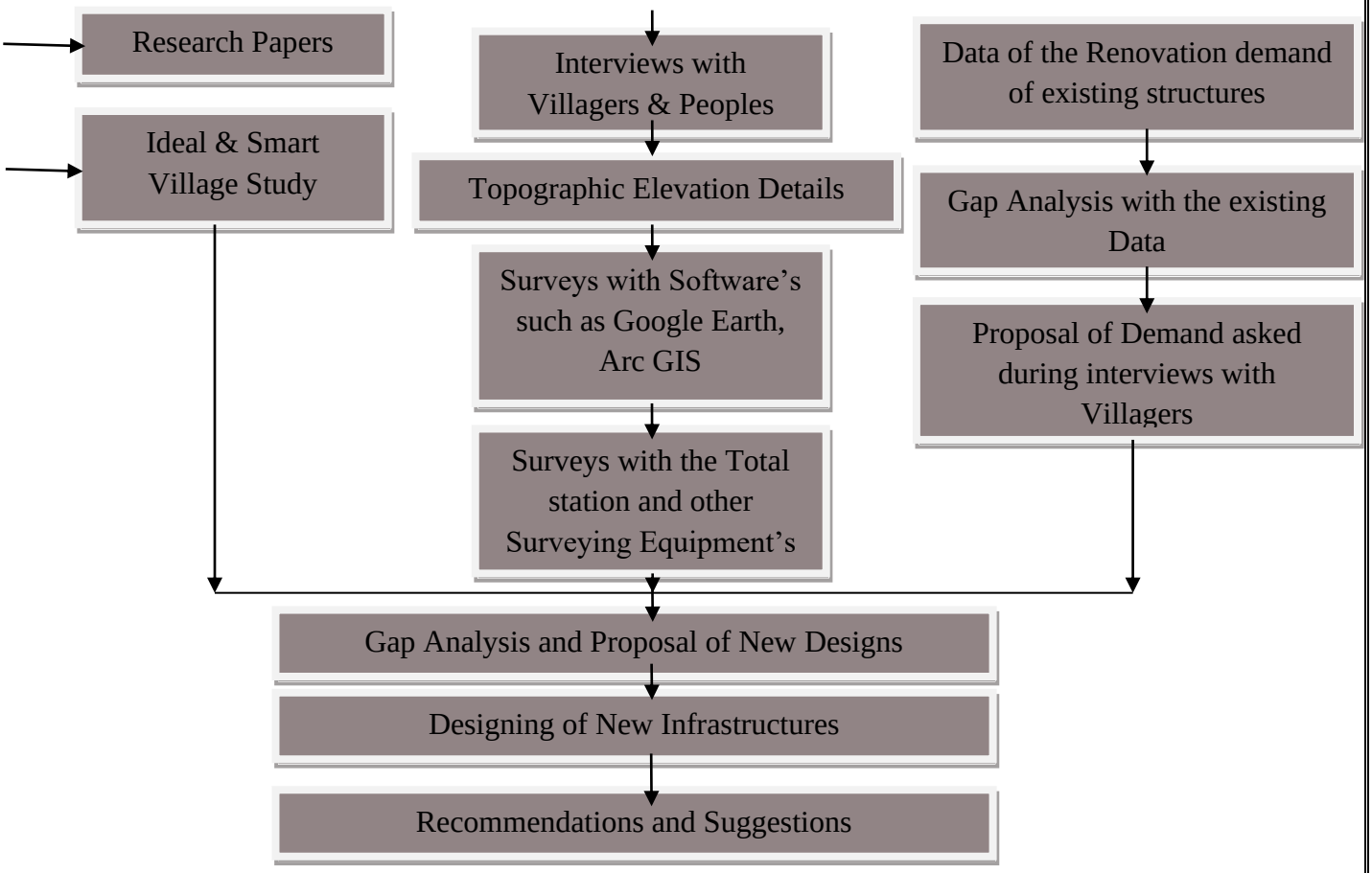
4.1.5 SCOPE OF THE STUDY

1. Provide safe and affordable water facilities and sanitation.
2. To perform safe and Economical socio-economical surveys.
3. To solve water scarcity and other problem for rural area.
4. Design a networs and infrastructures which is economical and easy to develop.
5. Creation of artificial ground water recharge system and other facilities.
6. Provide aesthetic and hygienic environment for human.
7. Collection and storage of rain water and other data as well.
8. Improve the living standard of rural population towards rurbanisation.

4.1.6 METHODOLOGY FRAME WORK FOR DEVELOPMENT OF YOUR VILLAGE

The methodology Developed has been explained below which includes the proposed planning as well. The flow chart below shows the detailed methodology.





4.1.7 AVAILABLE METHODOLOGY FOR DEVELOPMEN OF RELATED TO CIVIL

- Concept of Various type of method for Transportation
- Various type method for Drainage System
- Various type method for Roads
- Housing condition, Heath Facilities, Education Facilities, Technology Mobile/ WIFI / Internet Usage Details
- Drinking Water, Drainage Network, Sanitation Facilities: Waste Management Facilities
- Different Concept of the Solid / Liquid type of Waste Management

4.2 <KHODIYAR STUDY AREA PROFILE

4.2.1 STUDY AREA LOCATION WITH BRIEF HISTORY LAND USE DETAILS

According to Census 2011 information the of Khodiyar village is near Ahmedabad. Khodiyar village is located in Daskroi of Ahmedabad district in Gujarat, India. It is located 17 km away from Ahmedabad. Khodiyar village is gram panchayat. Nearest village is Lapkaman, Lilapur and Muthiya.

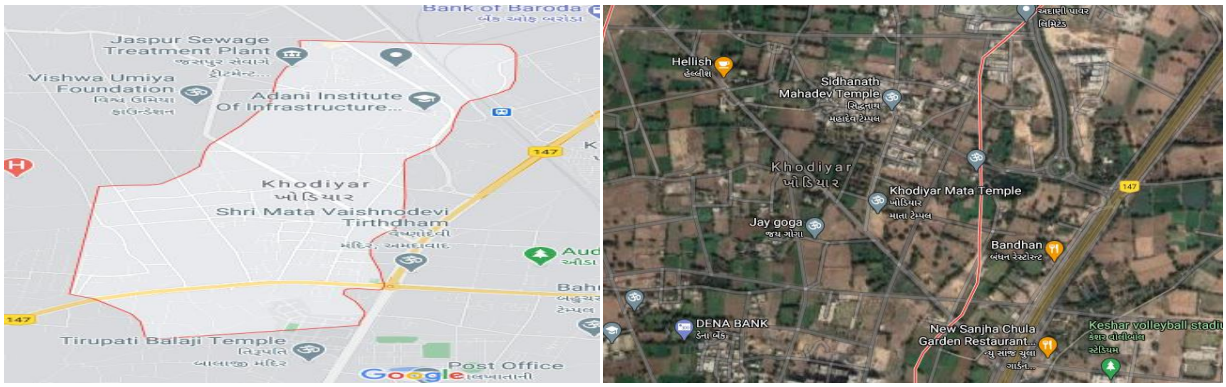
BRIEF HISTORY:-

Khodiyar Village, with population of 3327 is located in Daskroi Taluka of Ahmedabad district in the state Gujarat in India. Total geographical area of Khandheri village is 413.39 Hectares. Population density of the village is 80 persons per km2.Nearest railway station is Khodiyar which is within the village. Nearest town of the village is Ahmedabad and distance from Khodiyar village to Ahmedabad is 17 km. The village has its own post office and the pin code of Khodiyar village is 382421. The village comes under Khodiyar panchayat. District head quarter of the village is Ahmedabad t which is 17 km away. 0.41 square kilometer (1%) of the total village's area is covered by forest.

4.2.2 BASE LOCATION MAP, LAND MAP, GRAM TAL MAP

Map of the Khodiyar Village:-

Land Map:- **Satellite/Location Map:-**



4.2.3 PHYSICAL AND DEMOGRAPHICAL GROWTH

Road Network:-

- Connect with the main highway(Sarkhej-Gandhinagar Highway)
- Some road in the village is pucca roads(CC Roads) and some are still in bad condition.

Housing Conditions:-

- 70% houses in the villages are in good condition or we can say they are pucca houses.

- Remaining houses in the village are still in the bas condition(Kucha house).

Transportation Facilities:-

- The village is connected with main road, GSRTC, and most of any vehicle is available for transportation facilities.
- Nearest railway station is within Khodiyar.

Table 4.1: Population according to Census 2011

4.2.4 ECONOMIC GENERATION PROFILE/BANKS

The number of working person of Khodiyar village is approximately 950 while 600 are un-employed. And out of 950 employed individual 400 individuals are completely dependent on cultivation.

4.2.5 ACTUAL PROBLEM FACED BY VILLAGERS AND SMART SOLUTION

Following were the main problems of the villagers when we interacted with them. The problems were:-

1. There was not any facility of public toilet in the village. The toilet facility was only provided per house wise but was not provided in the village.
2. There was also not any facility of medical store in the village
3. The students in the village was also deprived of library
4. While interaction we also got to know that there was not a single public park in the village for children and old ones.

So as an smart solution we came out with the design of the various infrastructures that was demand of the villagers due to which their problems could be solved.

4.2.6 SOCIAL SCENARIO –PRESERVATION OF TRADITIONS, FESTIVALS, CUISINES

Particulars	Total	Male	Female
No of Houses	620	-	-
Population	3327	1667	1660
Child(0-10)	345	195	150
Scheduled Castes	702	357	348
Scheduled Tribes	231	120	111
Literacy	62%	72%	54%

Table 4.2: Socio-Scenario of Khodiyar

It was found that all the people of this village are not very much connected with today‘s technology environment rather than their main major working area. The major crops produced in the village are cotton and Groundnut. The major population is get income through the farming and there are no other job opportunities. The education is limited to secondary school.There is lack of technical skill in the people. Festivals are mainly related toGujarati culture and same goes with cuisines.

4.2.7 MIGRATION REASONS/TRENDS

Employment:-

People migrate in large number from rural to urban areas in search of employment. The agricultural base of rural areas does not provide employment to all the people living there. Even the small-scale and cottage industries of the villages fail to provide employment to the entire rural folk. Contrary to this, urban areas provide vast scope for employment in industries, trade, transport and services. About 8.8 per cent of migrants migrated for employment in 1991.

Education:-

Rural areas, by and large, lack educational facilities, especially those of higher education and rural people must migrate to the urban centers for this purpose. Many of them settle down in the cities for earning a livelihood after completing their education.

Lack of Security:-

Political disturbances and interethnic conflicts drive people away from their homes. Large number of people has migrated out of Jammu and Kashmir and Assam during the last few years due to disturbed conditions there.

4.3 DATA COLLECTION <KHODIYAR>

4.3.1 DESCRIBE METHODS FOR DATA COLLECTION

Data collection related to village is the most important first step for development of anyvillage. Without data we cannot identify what is the future requirement for developmentof village. The following data was collected by various means like: Office record of concerned office department like- R&B Department, Talati office etc. Interaction with Sarpanch, Upsarpanch, villagers etc. Visit to different parts of village.

Method for Collection:

- House hold for population
- Occupational survey
- Transportation survey
- Educational survey
- Techno economic survey

4.3.2 PRIMARY DETAILS OF SURVEY

In the primary survey we collected the details about population of khodiyarvillage, sex ratio, literacy rate of village & various general problems of thevillagers by interacting with them and enquiring about the problems faced bythem in daily life. They were asked to suggest the possible and desirablesolutions for these problems as well as other infrastructural facilities they would like to have in their village.

Following questions were asked to the different age group and status of village people:

- Do you have enough water supplies?

- Which type of irrigation facility you are using? Is it enough?
- Are you comfortable with your Road network facility?
- What are your Sources of economy?
- Which type of medical facility is available?
- What is your primary need?
- Which type of facility you want first?
- Where you dispose your waste? Are comfortable with available

4.3.3AVERAGE SIZE OF THE HOUSE – GEO TAGGING OF HOUSE

Average size of the house as per general survey is reported as 20ft. x 15 ft. (6.1 m by 4.5 m). The most of the houses were masonry and concrete build. The impact of Ahmedabad is seen in the vicinity as main economic city center is located nearby. There is about 950 houses out of which 850 are residing.

4.3.4 NO OF HUMAN BEING IN ONE HOUSE

As per the information given by Sarpanch and our survey there are average 5 to 6 persons per household in village

4.3.5 MATERIAL AVAILABLE LOCALLY IN THE VILLAGE AND MATERIAL OUT SOURCED BY THE VILLAGERS

Materials as cement brick, aggregate, sand are locally used for construction purpose.

Rarely available material lint district which are necessarily for daily use go has to brought from nearby area.

4.3.6 GEOGRAPHICAL DETAIL

Khodiyar is a village situated in Daskroi Block of Ahmedabad district in Gujarat. Located in rural region of Ahmedabad district of Gujarat, it is one of the 56 villages of Daskroi Block of Ahmedabad district. According to the administration records, the village code of Khodiyar is 511631 . The village has approx 450 families.

Locality Name:- Khodiyar
City Name:- Ahmedabad
District:- Ahmedabad
State:- Gujarat
Language:- Gujarati and Hindi
Time Zone:- : IST (UTC+5:30)
Elevation from ground level:- 35 meters above sea level
Pin Code:- 382421
Post Office Name:- Khodiyar
STD/Telephone Code:- 02717

Fig 4.4: Entrance of Khodiyar

4.3.7 DEMOGRAPHICAL DETAIL – CAST WISE POPULATION DETAILS/ WHICH ID PROOF USING BY VILLAGERS

Category	Population
Total	3327
Male	1667
Female	1660

Particulars	Total	Male	Female
No of Houses	620	-	-
Population	3327	1667	1660
Child(0-10)	345	195	150
Scheduled Castes	702	357	348
Scheduled Tribes	231	120	111

Generally Villagers of Khodiyar Village use Aadhar card and Pan Card as their identity proof.

4.3.8 OCCUPATIONAL DETAIL

There is not any exact number for the people that are engrossed in different field but one thing for sure is that the most of people in the village has been associated in the fields like farming, poultry farming, etc.

In this village 80 to 85 % people connected with agriculture activities it‘s the villages main source of income. But village has the milk production business so that‘s a income of source too there are approx. 5 to 10 % people are connected with milk production and other aredoing labor work for money.

4.3.9 AGRICULTURAL DETAIL

Category	Area

Area of Village	413.39 hectares
Forest Area	-
Agricultural Area	200 hectares

Table 4.3: Agricultural Detail of Khodiyar

Main source of income in this village is farming. Farmers use drip irrigation system to do farming. The main agriculture product is groundnut, cotton

4.3.10 PHYSICAL INFRASTRUCTURE FACILITIES

- The primary well spring of drinking water is tap water.
- Town has one tube wells; the water supply to the town is dealt with.
- Town has additionally an overhead tank. It has additionally decent seepage office, the waste is of shut seepage and the deplete water is specifically release dint the water assortments of town.
- There is bituminous town approach Road. The fundamental street and inner street of town are of bituminous and RCC individually.
- Transport station with great condition is additionally accessible into the town. 24-hour power supply is given into the town to private utilization. Street and road light are of LED lights. But some street not available of streetlight.

4.3.10 TOURISM DEPARTMANT AVAILABLE IN THE VILLAGE FOR ATTRACTING TOURISTS

There is no any tourist spot in the village through which any tourist can get attracted.

Hence Khodiyar is the simple village where the people reside since many years

4.4 INFRASTRUCTURAL DETAILS

4.4.1 DRINKING WATER FACILITIES

There is Municipality supply in the Khodiyar village through narmada water supply scheme. There is also various sources of the water like tube wells and bore well. Most of the houses in the village have their own bore well. There is a facility of an Overhead Tank in the Khodiyar from which water is supplied to every houses.

4.4.2 DRAINAGE NETWORK/ SANITATION FACILITIES

Underground drainage facilities are available in all areas of the khodiyar village. Waste water is disposed without any treatment and Drainage Storm water facility is not available in village; due to that clogging of rain water on road is problem in monsoon.

4.4.3 TRANSPORTATION AND ROAD NETWORK

Almost half roads of the village is pucca roads where some are kacha and some are bituminous roads. The road joining to SG Highway is RCC Pavement road. We are going to propose the design of RCC Pavement road in the village area.

4.4.4 HOUSING CONDITION

In the village housing conditions is found to be quite good. Masonry and Concrete materials are widely used for the house construction. Some houses are still are made up of use of conventional materials like stone, wood etc.

4.4.5 SOCIAL INFRASTRUCTURE FACILITIES

SOCIAL-CULTURAL FACILITIES:-

Sr No	Particulars	Facilities/Information
1	Community hall (without TV)	1
2	Public library	Not available
3	Public garden	Not available
4	Village pond	2
5	Recreational center	Not available
6	Birth & death registration office	1

Table 4.4 : Socio-Cultural Facilities

HEALTH FACILITIES:-

Sr No	Particulars	Nos
1	Sub health center	1
2	Govt. hospital	At Ahmedabad(6-7 kms away)
3	Private Clinic	-
4	Surgical doctor	-
5	Medical Shop	1
6	Ambulance facilities (108)	1

Table 4.5 : Health Facilities

EDUCATION FACILITIES:-

Description	Existing Facility
Aanganwadi	Only 1 aanganwadi in village
Primary School	1
Higher Secondary School	At Ahmedabad(10 km away)

Table 4.6: Education Facilities

Fig 4.5: Primary School in Khodiyar

Fig 4.6 : Gram Panchayat of Khodiyar

Fig 4.7: Chowk in Khodiyar

Fig 4.8: Over Head Water tank

Fig 4.9: Urban Sub-Health Centre in Khodiyar

Fig 4.10: Road Condition in Village

Fig 4.11: House condition in Village

4.4.6 EXISTING CONDITION OF PUBLIC BUILDINGS & MAINTENANCE OF EXISTING PUBLIC INFRASRTUCTURES

EXISTING FACILITIES:-

Sr No	Particulars	Condition
1	Gram Panchayat	Not that much good
2	Post Office	Needs Renovation
3	Bus Station	Not available
4	Sub heath center	Bad Condition
5	Primary school	Very Good Gondition
6	Secondary and higher secondary school	Not available

Table 4.7: Existing Facilities of Khodiyar

Maintenance of gram panchyat and sub health center is not upto level. The maintenance of primary school is done nicely.

Fig 4.12: Temple in Khodiyar

4.4.7 TECHNOLOGY MOBILE/ WIFI/ INTERNET USAGAE DETAILS

There is one smart-phone present in almost all the houses in the village so we can say that the village is not deprived new technology arriving in our world. There is not so usage or we can say nill usage of wifi in the village as there is no wifi tower available in the village. As the village is near the SG Highway they have good internet facility in their area

4.4.8 SPORTS ACTIVITY AS GRAM PANCHAYAT

Yearly one-time sport competition is held into the schools for the students.

4.4.9 SOCIO-CULTIRAL ACTIVITY

SOCIAL-CULTURAL FACILITIES:-

Sr No	Particulars	Facilities/Information
1	Community hall (without TV)	1
2	Public library	Not available
3	Public garden	Not available
4	Village pond	2
5	Recreational center	Not available
6	Birth & death registration office	1

Table 4.8: Social-Cultural Facilities of Khodiyar

There was not provision of public park in the village so we have gave the design of public park for the village**.**

Fig 4.13: Barren Land on which we have proposed design of Public Garden

4.4.10 OTHER FACILITIES

No Any Other Facilities in the village.

4.4.11 ANY OTHER DETAILS

Any sort of extraordinary offices other than previously mentioned isn't accessible into the village.

4.6 EXISTING INSTITUTION

4.6.1 BACHAT MANDLI

There is no specific Bachat Mandli in the village. Banks are present in the village where people can save or withdraw the money.

4.6.2 DUDH MANDLI

There is a Dudh Mandli in the village in which the people associated with the milk and its product business are joined in it. There is also some 2 Dairy in the village.

4.6.3 MAHILA FORUM

There are various rights and reserved honours for the ladies in the era of local self-government in the villages. The women empowerment schemes are observed in the villages as well.

4.6.4 PLANTATION FOR AIR POLLUTION

Various activity are held in every year for tree plantation in the village and also students in the school take part in the plantation every year.

4.6.5 RAIN WATER HARVESTING WASTE WATER RECYLING

Water is, undoubtedly, the top natural resource you need for your home use. It‘s glamorous to

possess a stockpile of guns, gold, and jeweler, but without water, life might prove to be unbearable. Water shortages are sometimes inevitable, and so if you‘re not prepared for the eventuality, you might find yourself between a rock and a hard place. The best and cheapest alternative to the traditional water supply systems is rainwater harvesting. However, to be able to harvest rainwater, you‘ll need to install a rainwater harvesting system.

We all take water for granted. It is one of those natural resources that most people do not put a lot of thought into, but in order to continue enjoying that free supply of water for many more years, changes must be made. Rainwater harvesting is the process of collection of rainwater from surfaces on which rain falls, filtering it and storing it for multiple uses. Rainwater harvesting puts the supply of water back to normal levels. It is the collection and storage of water from surfaces that rain has fallen upon.

Rainwater harvesting is an innovative technique utilized to harvest rainwater from roofs and other above surfaces to be stored for later use. Rain harvested water can be used for garden and crop irrigation, watering livestock, laundry, and flushing toilets. However, you cannot use harvested rainwater for showering, bathroom sink or kitchen use because it‘s not really fit for consumption.

In a normal scenario the rainwater is collected from roof buildings and then stored inside of a special tank. Rainwater harvesting systems are designed after assessing site conditions that include rainfall pattern, incident rainfall, subsurface strata and their storage characteristics. Rainwater harvesting is popular all across the world, although in countries that are very dry, such as Australia, it is even more popular.

4.6.6 AGRICULTURAL DEVELOPMENT

The term _Green Revolution‘ refers to a sustained and continuous increase in agricultural productivity or a yield per acre take-off in traditional agriculture.

The stress is on intensive rather than extensive cultivation so as to raise productivity per hectare. It signifies a shift to the agricultural production function and the consequent increase in land productivity, i.e., yield per hectare.

All rural extension work takes place within a process of development, and cannot be considered as an isolated activity. Extension programme and projects and extension agents are part of the development of rural societies. It is, therefore, important to understand the term *development*, and to see how its interpretation can affect the course of rural extension work.

The term development does not refer to one single phenomenon or activity nor does it mean a general process of social change. All societies, rural and urban, are changing all the time. This change affects, for example, the society's norms and values, its institutions, its methods of production, the attitudes of its people and the way in which it distributes its resources. A rural society's people, customs and practices are never static but are continually evolving into new and different forms. There are different theories which seek to explain this process of social change (as evolution, as cultural adaptation or even as the resolution of conflicting interests) and examples of each explanation can be found in different parts of the world.

4.6.7 ANY OTHER

National Rural Employment Programme, Prime Minister Rojgar Yojana(PMRY),Balika Samridhdhi Yojana.

CHAPTER 5:

5.1 TECHNICAL OPTIONS WITH CASE STUDIES

5.1.1 Advance Sustainable construction techniques / Practices and Quantity Surveying

Introduction:-

Sustainable construction is the practice of creating a healthy environment that's based on ecological principles. According to Professor Charles J. Kibert, sustainable construction focuses on six principles: "conserve, reuse, recycle/renew, protect nature, create non-toxic and high quality."

The goal is to reduce the industry's impact on the environment by utilizing sustainable development practices, employing energy efficiency, and taking advantage of green technology.

Although many different business sectors are doing what they can to be more sustainable, the construction sector is unique because it has the chance to significantly affect the way these practices are applied. This is because of the large amounts of materials and energy that the industry uses.

Importance of advance construction techniques:-

Whether it's the price tag for the materials, the training that goes behind it, or resistance to adapting to new methods (why fix if it ain't broke as the old saying goes), there is some pushback on green construction.

Despite that pushback, however, more owners and developers, both public and private, are turning to a greener and more sustainable form of construction. Especially since the effects of climate change can already be felt across the globe.

Sustainability is important for a variety of reasons, including a better quality of life and environmental quality. In order to have thriving and healthy communities, we need to have clean air, natural resources, and a non-toxic environment, and the construction industry can lead the way for greener projects.

5.1.2Soil Liquefaction

Soil liquefaction, also called earthquake liquefaction , ground failure or loss of strength that causes otherwise solid soil to behave temporarily as a viscous liquid. The phenomenon occurs in water-saturated unconsolidated soils affected by seismic waves (secondary waves), which cause ground vibrations during earthquakes. Although earthquake shock is the best known cause of liquefaction, certain construction practices, including blasting and soil compaction and vibroflotation (which uses a vibrating probe to change the grain structure of the surrounding soil), produce this phenomenon intentionally. Poorly drained fine-grained soils such as sandy, silty, and gravelly soils are the most susceptible to liquefaction.

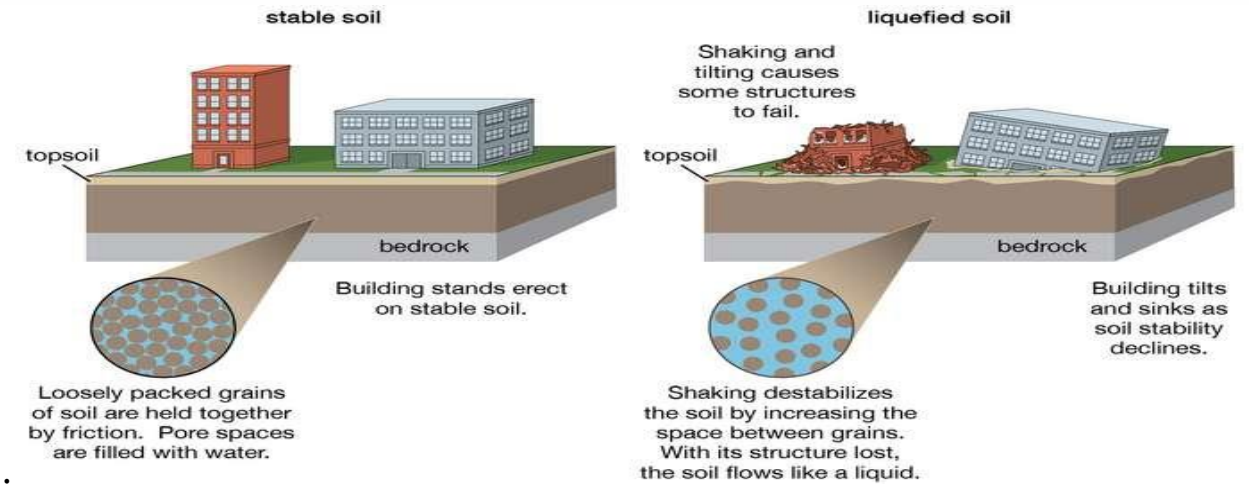


Fig 5.1: Soil Liquefaction Mechanism

One of the most severe episodes of liquefaction in modern times occurred in China during the Tangshan earthquake of 1976. Some scientists estimate that an area of more than 2,400 sq km (about 925 sq miles) was subjected to severe liquefaction, which contributed to the extensive damage that took place in the southern part of the city. The liquefaction of the soft lake sediment upon which central Mexico City was built amplified the effects of the 1985 earthquake, the epicentre of which was located hundreds of miles away. In addition, the liquefaction of the ground beneath the Mission and Market districts in San Francisco during the 190 earthquake caused several structures to pitch and collapse. These districts were built on poorly filled reclaimed wetlands and shallow-water areas.

Liquefaction may also contribute to sand blows, which are also known as sand boils or sand volcanoes. Sand blows often accompany the liquefaction of sandy or silty soil. With the collapse of the soil's granular structure, the density of the soil increases. This increased pressure squeezes the water out of the pore spaces between the soil grains and expels wet sand from the ground. Sand blows have been observed in the aftermath of several earthquakes, including the New Madrid earthquakes of 1811–12, the Tangshan earthquake of 1976, the San Francisco–Oakland earthquake of 1989, and the Christchurch earthquakes of 2010–11.

5.1.3 Sustainable Sanitation

Sustainable sanitation aims at overcoming these drawbacks. It is not a certain technology, but an approach with certain underlying principles. There are a number of technologies (see for instance sanitation systems) that can be used to make sanitation and wastewater management more sustainable. The term "sustainable sanitation" in principle denominates the same as ecological sanitation, though the latter has a stronger focus on source separation.

The first and foremost principle is probably the one to recognise that excreta and wastewater are not a waste, but a valuable resource that can be reused and recycled. This is actually to speak in a simplified way the very basis of sustainability: to use resources wisely and without impairing the possibilities of future generations to meet their own needs.

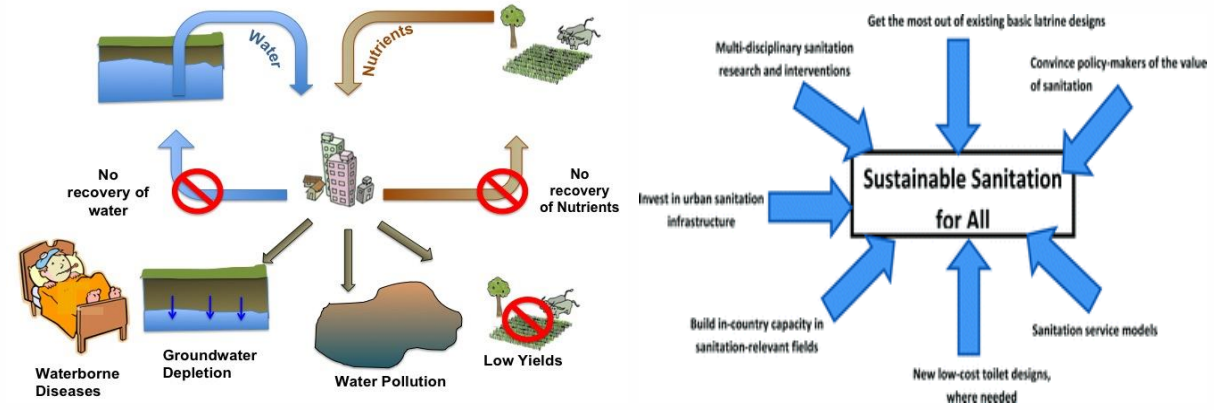


Fig 5.2 : Sustainable Sanitation

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. In order to be sustainable a sanitation system has to be not only economically viable, socially acceptable, and technically and institutionally appropriate, but it should also protect the environment and the natural resources. According to the Sustainable Sanitation Alliance, when improving an existing and/or designing a new sanitation system, sustainability criteria related to the following aspects should be considered:

Environment and natural resources

Environment and natural resources aspects involve the required energy, water and other natural resources for construction, operation and maintenance of the system, as well as the potential emissions to the environment resulting from use. It also includes the degree of recycling and reuse of excreta practiced and the effects of these, for example reusing the wastewater, returning nutrients and organic material to agriculture, and the protecting of other non-renewable resources, for example through the production of renewable energy (e.g. biogas or fuel wood).

Technology and operation

Technology and operation aspects incorporate the functionality and the ease with which the system can be constructed, operated and monitored using the available human resources (e.g. the local community, technical team of the local utility etc.). It also concerns the suitability to achieve an efficient substance flow management from a technical point of view. Furthermore, it

evaluates the robustness of the system, its vulnerability towards disasters, and the flexibility and adaptability of its technical elements to the existing infrastructure, to demographic and socio-economic developments and climate change.

Finance and economics

Financial and economic issues relate to the capacity of households and communities to pay for sanitation, including the construction, maintenance and depreciation of the system. Besides the evaluation of investment, operation and maintenance costs, the topic also takes into account the economic benefits that can be obtained in "productive" sanitation systems, including benefits from the production of the recyclables (soil conditioner, fertiliser, energy and reclaimed water), employment creation, increased productivity through improved health and the reduction of environmental and public health costs.

Socio-cultural and institutional aspects

Socio-cultural and institutional aspects take into account the socio-cultural acceptance and appropriateness of the system, convenience, system perceptions, gender issues and impacts on human dignity, the contribution to subsistence economies and food security, and legal and institutional aspects.

5.1.4 Transport Infrastructure / system

Sustainable transport and the environment protection including green vehicles/ Urban transport, land use development, spatial and transport planning/ Bicycling, bike, bike-sharing systems, cycling mobility/ Human factor in transport systems/ Intelligent Mobility: emerging technologies to enable the smarter movement of people and goods/Airport landside: access roads, parking facilities, terminal facilities, aircraft apron and the adjacent taxiway/ Transportation policy, planning and design, modelling and decision making/ Transport economics, finance and pricing issues, optimization problems, equity appraisal/ Road safety impact assessments, road safety audits, the management of road network safety and safety inspections/ Tunnels and underground structures: preventing incidents-accidents mitigating their effects for both people and goods/ Traffic flow characteristics, traffic control devices, work zone traffic control, highway capacity and quality of service/ Track-vehicle interactions in railway systems, capacity analysis of railway networks/ Risk assessment and safety in air and railway transport, reliability aspects/ Maritime transport and inland waterways transport research/ Intermodal freight transport: terminals and logistics.

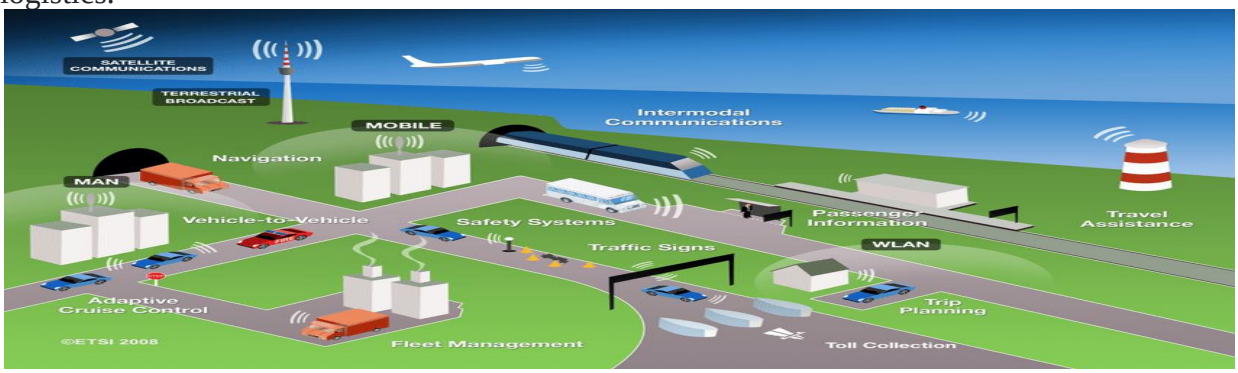


Fig 5.3 : Transport Infrastructure System

5.1.5 VERTICAL FARMING

INTRODUCTION:-

In 1915, Gilbert Ellis Bailey coined the term "Vertical farming" and wrote a book titled "Vertical Farming". In the early 1930s, William Frederick Gerick pioneered hydroponics at the University of California at Berkley. In the 1980s, Ake Olsson a Swedish ecological farmers, invented a spiral-shaped rail system for growing plants and suggested vertical farming as a means for producing vegetables in cities. Using advanced greenhouse technology such as hydroponics and aeroponics, the vertical farm could theoretically produce fish, poultry, fruit and vegetables (Despommier, 2010). His concept was to grow the food in urban areas itself utilizing less distance and saving the time in bringing the food produced in rural areas to the cities. He intended in growing food within urban environments and thus have fresher foods available faster and at lower costs.

Why vertical farming?

Vertical farming could enable food production in an efficient and sustainable manner, save water and energy, enhance the economy, reduce pollution, provide new employment opportunities, restore ecosystems, and provide access to healthy food. In a controlled environment, crops will be less subject to the infestation, the nutrient cycle, crop rotation, polluted water runoff, pesticides and dust (Touliatos et al., 2016). Vertical farms also utilize advanced technologies and intensive farming methods that can exponentially increase production. Researchers have been optimizing indoor farming by calibrating, tuning and adjusting a wide-range of variables including light intensity, light color, space temperature, crop and root, CO2 contents, soil, water, and air humidity (Padmavathy et al., 2016). In addition, vertical farming provides an opportunity to support the local economy. Abandoned urban buildings can be converted into vertical farms to provide healthy food in neighborhoods where fresh produce is scarce.

Advantages of vertical farming:-

- The first and the major advantage of vertical farming is producing extremely high yields per available land or area.
- Producing the food throughout the year without the risk of vagaries of nature of nature like floods, heavy rains, uneven rains, hail and snowfall, drought, dry spells, extreme high temperatures, cold waves, epidemics of pest and diseases, etc.
- It reduces the cost over transporting loads of food grains from rural area to ϖ urban areas and reduce the spoilage occurring there in.
- Fossil fuel consumption in transporting the farm produce to cities from village places is also reduced to a greater extent.
- Vertical farming uses 70 to 95 % less water compared to traditional farming 90% less or no soil is needed in vertical farming and thereby no pest and diseases infestations.

- Pesticide free or organic food is produced as there is no use of pesticides.

Disadvantages of vertical farming:-

- Initial huge cost for establishing the vertical farming system is the major problem.
- It will include the cost erecting the structures along with its automation like computerized and monitoring systems, remote control systems, programmable LED lighting systems, climate control system, etc.
- Huge energy cost as growing plant is entirely with artificial lights.
- The excess nutrients used in vertical farming may interfere and contaminate the main urban water system if not taken care of.
- LED lighting systems emit heat though small amount will create problem of maintaining the temperatures especially in summer months and may overload the air conditioning systems which will again incur high energy cost.

5.1.6 Corrosion Mechanism, Prevention & Repair Measures of RCC Structure

Steel corrosion is the main cause of deterioration of reinforced concrete (RC) structures. We provide an up-to-date review on corrosion mechanisms and recent advances in electrical methods for corrosion monitoring. When assessing corrosion mechanism, the inherent heterogeneity of RC structures and the significant effect of environmental factors remain major issues in data interpretations. The steel surface condition and local inhomogeneities at the steel–concrete interface appear to have an important effect on corrosion initiation. Considering uniform corrosion in atmospherically exposed RC structures, the two main influencing factors of the corrosion process are the water content and the pore structure at the steel–concrete interface. However, irrespective of the depassivation mechanism, i.e. carbonation or chloride-induced corrosion, non-uniform corrosion is expected to be the main process for RC structures due to local variations in environmental exposure or the presence of interconnected rebars with different properties. Future studies may then be focused on their effect on macrocell corrosion to gain further insights in the corrosion mechanisms of RC structures.

Concerning corrosion monitoring using electrical methods, the half-cell potential technique with potential mapping is accurate for locating areas with a high corrosion risk. Recent developments in the measurement of concrete resistivity have shown that the use of electrical resistivity tomography allows to consider appropriately the inherent heterogeneity of concrete and provides more insights on transport phenomena (e.g. water and salts ingress) in the material. Nevertheless, during the corrosion propagation stage, the polarization resistance remains the most important parameter to be determined as it provides quantitative information of the corrosion rate. If conventional three-electrode configuration methods can supply an accurate determination in the case of uniform corrosion, they often fail in the case of macrocell corrosion in field experiments.

Recent advances have shown that a four-electrode configuration without any connection to the rebar can rather be used for the non-destructive testing and evaluation of corrosion. If studies are still required to quantify the corrosion rate, this method appears sensitive to localized corrosion and thus more suitable to field investigations. Finally, the coupling of numerical simulations with complementary electrical and other non-destructive testing methods is essential for consolidating the results to provide a better diagnosis of the service life of RC structures.

Fig 5.4 : Corrosion in the Steel

Corrosion control by inhibitors:-

A corrosion inhibitor is either liquid or powder chemical additive that reduce the rate of metal wastage on mixing to a corrosive aqueous condition. In ideal condition, corrosion inhibitor prevents corrosion in reinforced steel without adversely affecting properties of concrete. Inhibitors are uniformly distributed throughout the concrete matrix hence protecting the entire steel surface.

Corrosion inhibitor may include materials which mitigate reinforcement corrosion by one of the following mechanisms: (i) Oxidation by passivation of the surface; (ii) Formation of barrier layers; (iii) Influencing the environment in contact with the metal.

Following are the requirements for effective corrosion inhibitor:-

• The solubility should be such that rapid saturation of the corroding surface occurs without being readily leached out.

• The molecules should possess strong electron acceptor or donor properties or both.

• Induce polarization of the respective electrodes at relatively low current values.

• Be compatible with the intended system so that adverse side effects are not produced.

Inhibitors can be used by adding in concrete or applying externally on existing structures, the former type comes under the category of Corrosion Inhibitor Admixtures (CIA), CIA can mainly be classified as, anodic, cathodic or mixed organic inhibators.

5.1.7 Sewage Treatment Plant

Essentially, a sewage treatment plant operates by circulating air to encourage the growth of bacteria to break down sewage. The goal being to deliver much cleaner, more environmentally friendly effluent. It involves a similar process to a typical septic tank but has some key differences. Sewage treatment plants, depending on their size, can treat the waste of commercial properties or a number of domestic dwellings.

What Are The Stages of Sewage Treatment?

The general construction of a sewage treatment plant doesn't differ too drastically from that of a septic tank. Just as with a septic tank, sewage flows from the property being serviced into the first chamber of the sewage treatment plant. Here, the water sits until grease, oil and scum have floated to the top and solids have settled on the bottom of the tank.

Once the process of separation has taken place, the liquid travels into a second chamber which is where sewage treatment plants differ from septic tanks. This chamber is fitted with an air pump that circulates air around the chamber to encourage the growth of aerobic bacteria. This bacteria helps to break down the contaminants in the water, effectively cleaning it.

The final stage of a sewage treatment plant is one last settlement tank. This final tank allows the very last solids that may remain to sink to the bottom of the tank before the effluent is discharged into a soak away or watercourse.

Once the treatment process has been completed and the wastewater has been treated as thoroughly as possible, it can be discharged into the environment. This is another key area where sewage treatment plants differ from sewage treatment plants. Whereas you must discharge effluent from a septic tank into a soakaway for further treatment in the ground, subject to an Environment Agency Consent to Discharge, you can discharge your effluent into local water sources straight from your treatment plant. This is because of the vastly improved effluent quality that the treatment process produces.

Why Are Sewage Treatment Plants Required?

The first thought for anyone planning a new development should be getting connected to mains sewers. They are typically the most cost-effective and reliable method of dealing with your wastewater. However, getting a mains sewer connection isn't always possible. In some scenarios, the distance from the nearest sewer or the layout of the land can make it impossible to have your property serviced by a mains sewer. That's where sewage treatment plants and other alternatives come in. The operation of a sewage treatment plant means that you can have one installed almost anywhere, as long as you have an electrical connection.

Do Sewage Treatment Plants Still Need Emptying?

The purpose of a sewage treatment plant is to treat the wastewater as thoroughly as practically possible – and, even though such plants can often deal with more waste than a septic tank, they will still need emptying from time to time. Over time, sludge can also build up in the system, so

it's important that a treatment plant is regularly maintained at least once a year or as you are advised by the installer.

Advantages of a sewage treatment plant

- Reliable and unlikely to encounter problems with only regular maintenance
- Can be installed even on challenging or compact sites
- Cost-effective over time, with only installation, power and maintenance to pay.

Disadvantages of a sewage treatment plant

- The plant needs a constant supply of electricity to run
- Will require professional maintenance annually, and in the unlikely event of problems
- Design and installation of the system needs to be undertaken professionally

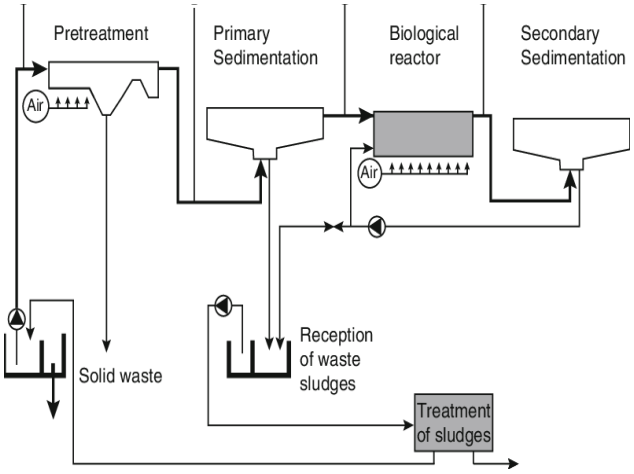


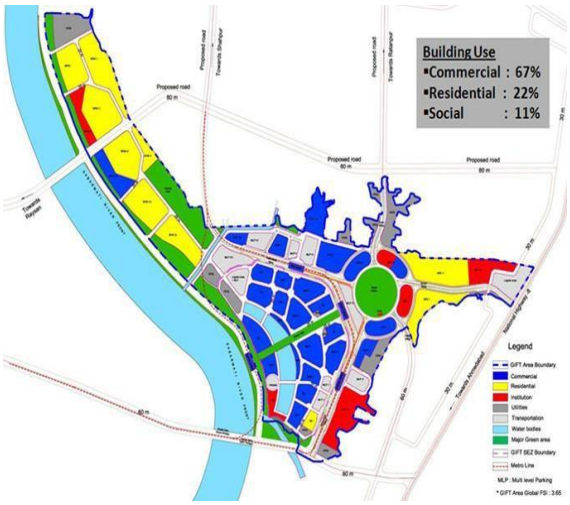
Fig 5.5 : Sewage Treatment Process

Fig 5.6 : Sewage Treatment Plant

Case Study on Gift City

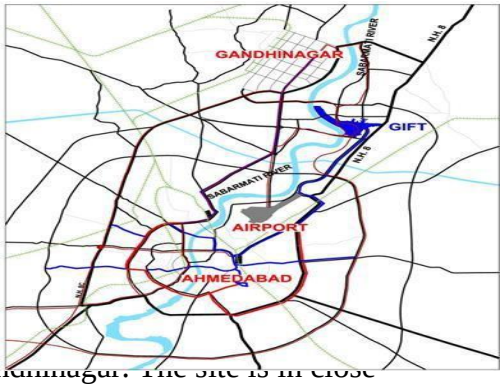
Transport Infrastructure/System

Abstract:
Gujarat International Finance Tec-City Company Limited (GIFTCL) is developing a financial Central Business District (CBD) namely GIFT City between Ahmedabad and Gandhinagar as a global financial and IT services hub, a first of its kind in India. GIFT City is being developed as a high quality commercial zone along with an ideal blend of residential and social facilities that optimise land and real estate values with global connectivity and generation next infrastructure.



GIFT City transport master plan aims at a transit oriented development based on walk to work approach, pedestrian friendly infrastructure with zero fatal accidents, easy and fast mobility with minimum conflicts and efficient public transport systems which reduce the per capita energy basket. In accordance with the GIFT City transport vision, the transport infrastructure has been planned to cater to the daily demand as well as that of the peak hour and Multi Level Parking (MLP) lots have been proposed at suitable locations in the GIFT city. To enhance the mobility and safety in GIFT city, various smart transport applications like advanced traveller information system, security and surveillance system, intelligent parking management system, parking guiding system, automatic vehicle location and tracking, real time travel response etc are planned. GIFT City transport master plan addresses the needs of all users of GIFT City, thereby it can be called as "User-Centred Smart Transport System" and its makes it possible for all GIFT City users to enjoy a world class life style in this vibrant global city. GIFT City smart transport planning parameters and design details are elaborated in this paper.

1. Introduction



Gujarat International Finance Tec-City (GIFT), a Global Financial and IT/ITES Hub in the State of Gujarat, a first of its kind smart city in India, is being developed by Gujarat International Finance-Tec City Company Limited (GIFTCL), a Joint Venture of Gujarat Urban Development Company Ltd. (GUDCL) and Infrastructure Leasing & Financial Services (IL&FS). GIFT is strategically located between Ahmedabad and Gandhinagar at a distance of about 12 kms from Sardar Vallabhbhai Patel International Airport and 8 kms from Gandhinagar. The site is in close proximity to the National Highway (NH-48). The location of GIFT City is shown in Figure.

GIFT City is being developed as a high quality commercial zone along with an ideal blend of residential and social facilities that optimise land and real estate values with global connectivity and generation next infrastructure. GIFT City is expected to be above or at par to all other international financial districts in terms of scale, scope, finest quality of infrastructure and life. GIFT City will encompass an area of 358 Ha (886 acres) with a total Built-up area ("BUA") of around 62 mn sft developed in three phases as Domestic Tariff Area (DTA) and Special Economic Zone (SEZ). The predominant land use is Commercial 67%; Residential 22% and Social 11%. The GIFT City master plan is presented in Figure.

2. Transport philosophy

GIFT City aims at a transit oriented development based on walk to work approach, pedestrian friendly infrastructure with zero fatal accidents, easy and fast mobility with minimum conflicts and efficient public transport systems which reduce the per capita energy basket. In accordance to the various activities envisaged for GIFT, the mandate is not only to provide connectivity, but also to cater to the daily demand as well as that of the peak hour with an objective to achieve higher share of public transport. The transport infrastructure in GIFT City has been planned to achieve this objective. Multi Level Parking (MLP) lots have been proposed at strategic locations in the GIFT City. To enhance the mobility in the GIFT City, various facilities such as underpasses, elevated covered walkways with travellators have been planned for pedestrian comfort and safety. Activity nodes have been integrated with the pedestrian network to enhance the walking experience. The public transport system is being integrated effectively connecting Ahmedabad and Gandhinagar.

3. Travel demand estimation

3.1 Daily trips

GIFT would act as a catalyst for development in its hinterland. The primary employment in GIFT is expected to give rise to equal number of secondary employment. The SEZ is expected to have an international clientele, and hence offices will be operating in multiple shifts. A second shift of work is considered in the processing area of the SEZ. 50% of the employment, primary and secondary, of the SEZ processing area is assumed to constitute in the second shift. The total number of trips generated due to office activity in the SEZ and non SEZ (DTA) areas are considered as incoming and outgoing trips.

3.2 Peak hour trips

Trips due to office use are considered in the peak hour as office is the predominant landuse of GIFT. Since there are two shifts, the peak hour occurs in the overlap between the general and the second shifts. This is the duration when the general shift is ending, and the second shift is about to start. The number of trips in the peak hour is considered as one-way trips of the primary jobs of the general and second shifts. Secondary jobs are considered to occur in the off peak hours. It is easily appreciated that the peak direction of travel is that of the trips due to primary employment in general shift. Since there are a number of offices of varying kinds, it is assumed that the total number of trips due to primary employment in the general shift would occur in two

hours. For sake of convenience, the number of trips in the peak period is spread equally over two hours.

3.3Modal split

The vision of GIFT is to provide a robust and efficient public transport system in such a way that the modal split of the trips is 90:10 in favour of public transport. However, the present share of public transport in the modal split experienced in most Indian urban centres is in between 40-70%. Initiatives to boost public transit are undertaken nowadays. Appreciating the fact that it would take some time for people to shift from their personalized modes to public transport, a buffer is incorporated in the design of transport infrastructure. Keeping in view the 90:10 modal split, public transport is envisaged to cater to 90% of the trips. The share of private vehicles is designed as 25%, instead of 10%, so that a buffer is inbuilt into the system.

4. Public transport

GIFT would not only attract people from the nearby urban centres, Ahmedabad and Gandhinagar, but also encourage development in the nearby areas. Therefore, it is crucial to consider the development of the surrounding region of GIFT in design of transport infrastructure. Connectivity to the hinterland is considered while designing the public transport system for the city. Three corridors of Mass Rapid Transit (MRT) are planned to pass through the GIFT. These are essentially two MRT corridors, referred to as the West Corridor and the East Corridor. The West corridor branches out into two and rejoins near the north-west and south-west entry points. Thus, public transport connectivity is provided for the future realization of the skyline of tall buildings. The MRT stations (Refer Figure 3) are placed in maximum walking distance of 500m reach to the destinations. Bus Rapid Transit (BRT) system has also been proposed. Until MRT is operational, this would act as the medium of public transport connectivity. The bus stops are placed based on demand near major attraction points, such that they are located within 500m walking distance from the embarking/ disembarking points.

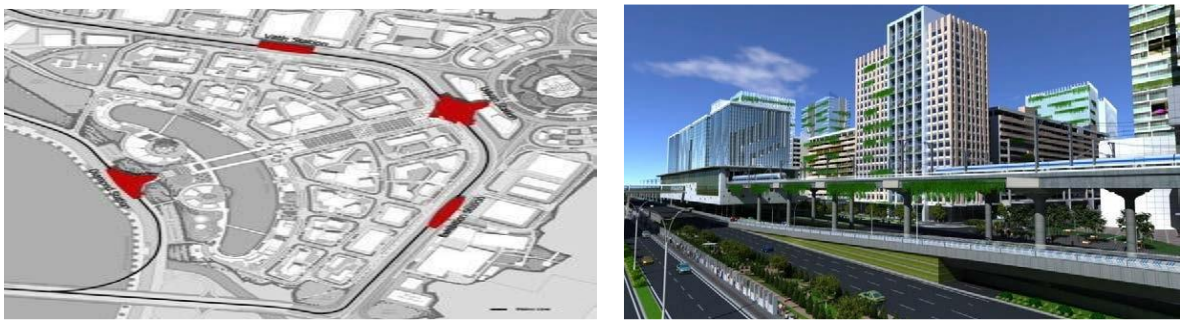


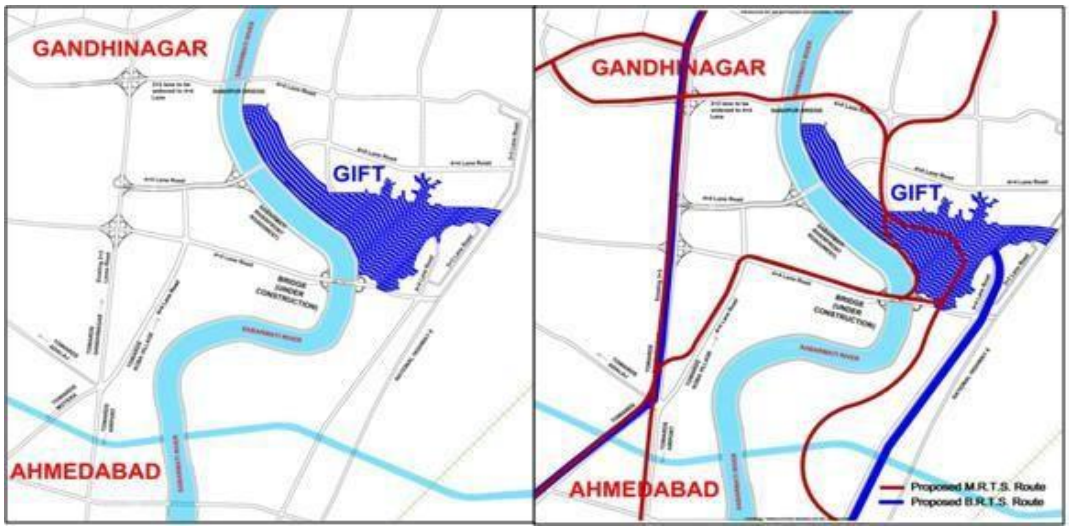
Fig 5.7: Proposed metro station in GIFT City

To achieve the envisaged public transport share of 90%, it is very essentialto have a convenient and reliable public transportation system to GIFT City from the nascent stages

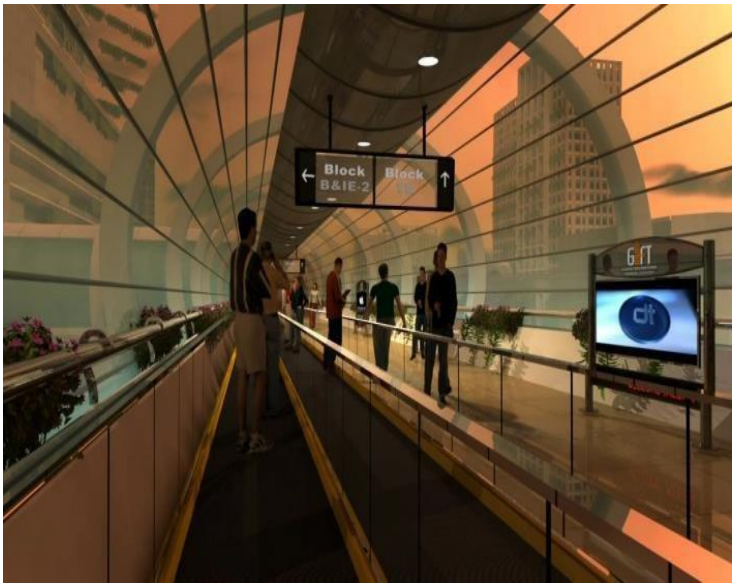
itself. At present there is no public transport facility to GIFT City either from Ahmedabad or Gandhinagar and the proposed MRT & BRT operations to GIFT City may take some more time, considering GIFT City transport vision and realistic prevailing scenario, GIFT City started its own air-conditioned bus service from Ahmedabad(end point connected to the existitng BRTstation at Visat, Ahmedabad).

5. External connectivity

The influence area of GIFT City includes Ahmedabad, Gandhinagar and the surrounding Districts of Kalol, Saiz,Sanand, Mehmedabad and Dehgam. GIFT City will act as a catalyst for all round development in the entire region. The major road network in the influence area includes National Highway 48 (NH-48) on the East, Ahmedabad-Gandhinagar Highway on the west passing through PDPU circle and Koba circle. Connectivity is proposed from all the sides in the form of bridges and major road corridors, apart from these, river front roads are proposed on either side of the Sabarmati River and are represented in below figure.



6 Internal Transport



The principle behind design of movement within the GIFT City is to have dedicated corridors for vehicular movement, and movement in the internal areas would be mainly pedestrian with a provision for movement of emergency vehicles when required. There are five major entry points to GIFT Project, connected to the regional road network. The arterial transport corridor comprises of dual 4-lane main arterial road with dual 2-lane sub-arterial roads on either side. The five roads converge into a roundabout, which is designed to effectively handle the total traffic volume entering from all directions. The radius of the rotary is designed at 200m. The length of the shortest section of the roundabout is 150m. Six lanes have been provided for carrying mixed traffic which enables to handle 8000 PCU/hour.

The other components of internal transport infrastructure include flyovers and underpasses for maintaining a conflict free movement within the GIFT City. Large green corridor is designed within the rotary consisting of 32 acre area for various social activities includes golf course, club etc. For the movement of pedestrian's between the central roundabout and the adjoining packages, pedestrian underpasses are planned. In the SEZ area, the network would be mainly for pedestrian movement and interspersed nodes that connect to the buildings in the enclave with elevated walkway and travelator connectivity.

7. Pedestrian facilities

Pedestrian walkways will be developed keeping in mind pedestrian safety and comfort. Street furniture will be included and activity centres introduced at nodes for making walking a safe and comfortable experience. Shady trees and comfortable ergonomic seating arrangements will be made. Level differences will be minimized for comfort of the elderly.

The material suggested for pedestrian pathways is grass pavers which are not only comfortable to walk on, but also strong enough to carry the load of emergency vehicles such as fire tenders. In course of time when subsequent phases of development come into place, and demand of pedestrian infrastructure increases and hence, it has been envisaged to construct elevated walkways from major transport nodes such as MRT stations and multi level car parks for direct connection into buildings. These walkways will be covered and

could even be air conditioned for complete pedestrian comfort. Walkability influence area around each MRT station is presented in Figure above.

8 Streetscape

As GIFT City is proposed to be highly dense with commercial development, in the planning stage itself, sufficient buffer is left for making provision of taxi bay, bus stop, free flow of pedestrian movement including drop off and pick up from the respective buildings. By considering these, buffer 22 m is left from the edge of the carriageway to the building footprint. This area will also facilitates to lay the various utility infrastructures such as water, irrigation, automated waste collection, power, ICT corridors.

Fig 5.8 : Streertscape Images

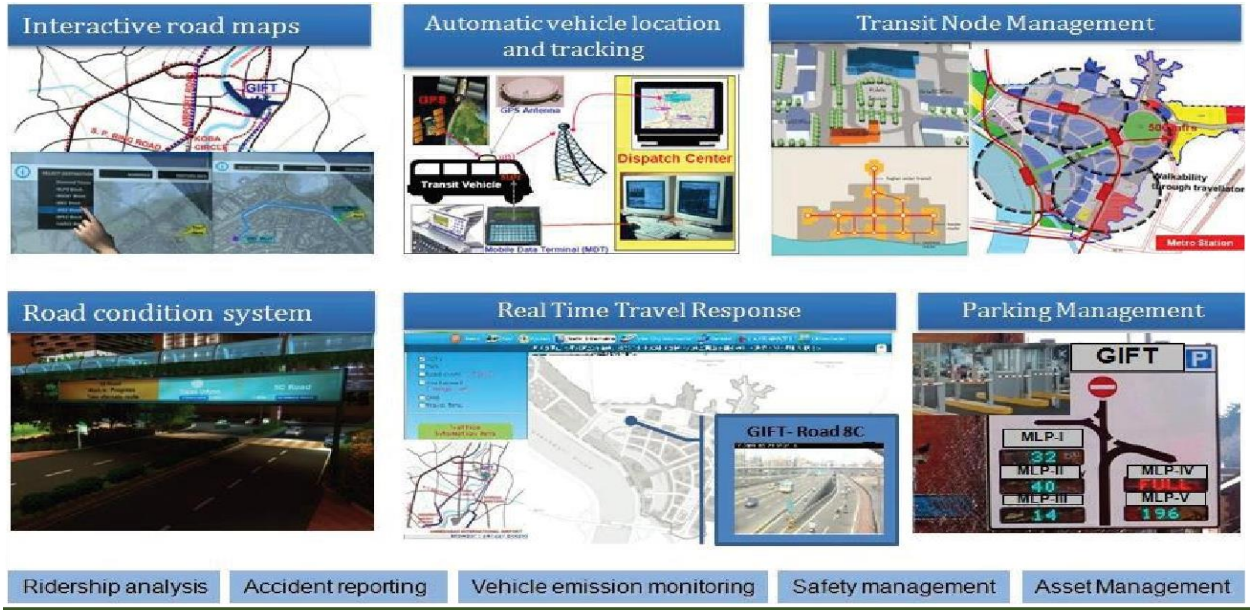
9 Signage System

As GIFT City aims at high share of public transport, transit oriented development (walk to work approach) and pedestrianised oriented internal movement etc., the need for good signage to make these activities easier becomes more and more apparent. Considering these aspirations GIFT City developed GIFT City Signage System to "provide a clear visual language and graphic standards that can be universally understood, encourage walking and transit usage by offering quality multi-modal information, and provide consistent information across a broad range of environments in the city at par with best national and international standards." Armed with a novel design approach, which stressed on a seamless integration of information and user experience, the project focused on factors like progressive disclosure, predictability, importance of landmarks, human ergonomics – all lending it a unique touch. The system gives the information in a progressive manner, not just letting the user know the orientation through maps and distance with respect to time, but also with an indication, a physical reference, a pre-view to where the user's next step can lead, or simply put, a nudge furtherin the right direction. As a part of phase 1, few sign posts as per GIFT City signage system are erected on site and the same are presented in Figure below.

Fig 5.9 : Images of Signage System

10 Smart Transportation System

GIFT City, proposed smart transportation system improve transport outcomes such as transport safety, transport productivity, travel reliability, informed travel choices, environmental performance and network operation resilience. Due to the proposed development in GIFT City, the interest in smart transport comes from the problems caused by traffic congestion and a synergy of new information technology for simulation, real-time control, and communications networks.



From smart transport consideration it would include advanced traveller information system for communicating the information through variable message signs etc; security and surveillance system; intelligent parking management system to operating the parking areas; advanced public transport system to operate the MRT and BRT by sharing the information with the end users. The gambit of smart transport also includes automatic vehicle location and tracking, real time travel response etc.

All the required provisions to facilitate smart transport applications in GIFT City are considered in the planning stage and itself and incorporated in the design stage forsuccessful implementation of smart transport system in the GIFT City. Illustrative

example of proposed GIFT City smart transport system is shown in figure 10. As a part of phase wise smart transportation implementation GIFT City installed GPRS based real time vehicle trackers in all GIFT City vehicles.

The installation of these trackers resulted in better planning and fleet management and helping in speed checks of vehicles, accurate location, deviations in the journey paths(if any) etc. Glimpse of one such vehicle tracking application implemented in public transport is presented in figure above.

11 Parking Philosophy

One of the most commonly faced problem in urban metros is parking. GIFT City has incorporated sufficient provisions in the GIFT City master plan and its development control regulations (DCR) so that there won't be any parking problems in the GIFT City.

As a part of GIFT City master plan, MLPs have been proposed at strategic locations (refer figure 12) so that there won't be any parking issues. As per the GIFT City DCR, parking requirement for different land uses are estimated by considering the parking norms. In addition to this, 10% for visitor and 20% for two wheeler parking need to be provided. The total requirement of parking as perDCR for all phases is approximately 1,50,000 Equivalent Car Spaces (ECS) out of which approximately 65,000 ECS need to accommodate in different common parking areasdesignated in the Master Plan.

Multi level parking

As mentioned in the previous sections, GIFT City project is developing in a phased manner so development of required transport infrastructure also is being developed in the same manner. As a part of phase1 infrastructure development GIFT City is developing an MLP with a capacity of approximately 5400 Equivalent Car Spaces (ECS). Parking Guidance System (PGS) and Parking Management Systems (PMS) are also part of the proposed MLP development.

Parking guidance systems

Parking guidance systems basically, to assist drivers in efficiently locating available parking

spaces, and hence minimising risk of associated delays within the car park and on the upstream road network. PGS shall monitor the parking spaces in real-time using ultrasonic sensors. Driveway sensors shall be installed in the main entrance to count the vehicle in real-time until the time it gets a parking. The sensor shall be ultra slim so that it will not affect the height limitations of the parking &Ultra flat no angle loosing visibility LED indications at entrances, ramps, crossings & parking places and shall provide a far view of clear parking spaces at least 60 meters. Visibility of LED lights can be adjusted thru the software installed on PC. The proposed PGS, system configuration and real time application images are shown in figure below.

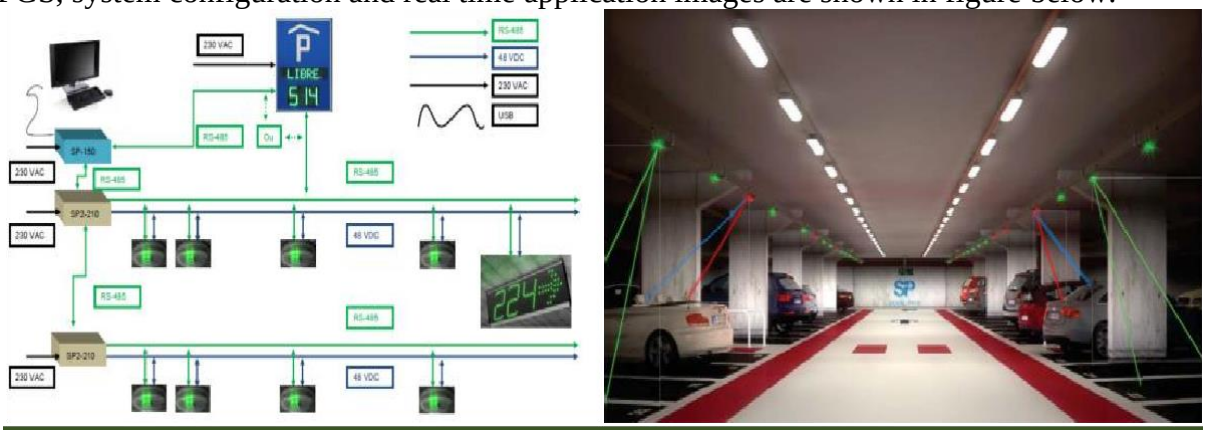


Fig 5.10 : Parking Guidance System

Parking management system

Parking Management System (PMS), mainly consists of access and revenue controls to assist operators in efficiently managing entry, exit and payment for use of the car park facility, by minimising both customer inconvenience and cost of fare recovery. Parking Management System comprises of gate entry barriers, long range RFID reader, entry station, exit station, cash terminal, handheld unit, pay on foot systems, central management station etc. The glimpses of the proposed units are presented in figures below.

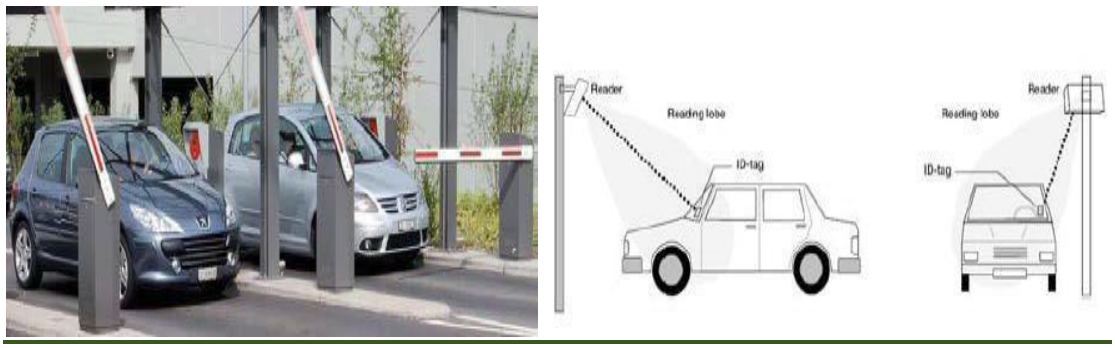


Fig 5.11 : Parking Management System

12 Conclusion

GIFT City in based on Transit Oriented Development approach where metro stations are strategically located at the center of high-density commercial development with progressively lower-density development spreading outward from the center.

GIFT City transport plan envisages a modal split of 10:90 between private and public transport. However the system has been designed as 25%, private instead of 10%, so that a buffer is inbuilt into the system. To meet the envisaged public transport share and considering the prevailing conditions GIFT started its own public transport facility.

Its proposed to develop MLPs with total capacity of 50,000 ECS in GIFT. People coming by private vehicles can walk to their destinations after leaving their vehicles in these MLPs which are located strategically near the entry points on either side of the road.

Proposed smart transportation applications in GIFT City improve transport outcomes such as transport safety, transport productivity, travel reliability, informed travel choices, environmental performance and network operation resilience

GIFT City transport master plan addresses the needs of all users of GIFT City, thereby it can be called as "User- Centred Smart Transport System" and its makes it possible for all GIFT City usersto enjoy a world class life style in this vibrant Global City.

CHAPTER 6:

SWATCH BHARAT ABHIYAN

6.1 SWATCHA NEEDED IN ALLOCATED VILLAGE

Swachh Bharat Mission was initiated by Prime Minister Narendra Modi on October 2, 2014, when he resolved to bring about an Open Defecation Free (ODF) India by October 2, 2019.

The task ahead was not just to build toilets, but to bring about the requisite behavioral change among the community towards open defecation.

Given the stipulated timeframe as Zila Swachh Bharat Perak (#ZSBP) various measures, activities, system and processes were implemented in districts Agra and Kanpur Nagar of Uttar Pradesh to achieve the desired results.

In sense of cleanliness the khodiyar village require sounder strategic plan for making village swatch. At present there is no plan or strategy for waste management. Due to this reasons the present outlook of khodiyar village is not very good according to swatchta, on the roads of khodiyar village you can see the scattered waste, this scattered waste invite mosquitoes, fly and many other small insect and due to this disease like malaria and dengue spread it. so in khodiyar village there is an need to implement daily cleanliness program and which includes cleaning of road, collecting of waste from every house, disposal of waste regularly, cutting of unnecessary grass.

6.2 GUIDELINES – IMPLEMENTATION IN ALLOCATED VILLAGE

Village administration processes the Clean India Mission guidelines for cleaning within the villages.

Guidelines with the process of Implementation:

Seven methods have been identified as an initiatives.

1. Motivation of the people for the clean India mission.
2. Slogans and Poster preparations and distribution within the villages.
3. Door to door awareness programs and seminars by students to be done in the 8thsemester.
4. Village administrative officials will be given some suggestions for the improvement of the Clean-India Mission.
5. Persons from the NGO‘s will be met and will be given some suggestions.
6. Village is going through the policies of the Clean India Mission of Government of India and also of the State Government.
7. Village female and girls will be motivated through programs organised by the Sarpanch.

6.3ACTIVITIES DONE BY THE STUDENTS

1. Preparation of the monitoring plan forcleaning.
   Students have carefully identified the policies and discussed it with the sarpanch and officials. Students suggested about **"Regular Monitoring of the cleaning of villages atleast one in the week".**

2. Door to door meetings of the students within thevillages.

Fig 6.1 : Swatchata in Village

CHAPTER 7:

VILLAGE CONDITION DUE TO COVID-19

7.1 TAKEN STEPS IN ALLOCATED VILLAGE

As we know the whole world is facing Covid-19 Pandemic and so does the India and the every single part of India. Khodiyar village has taken some precautionary steps to deal with this pandemic.

1. They have made rule to put on the mask compulsory whenever any person goes out of his home.
2. Banners and templates are sticked in the villages so that people may be aware of the precautionary steps.
3. They are sanitizing the places like gram panchyat, primary school, sub health center every week.

7.2 ACTIVITIES DONE BY THE STUDENTS

We as a student have taken care when we visited the village. When we interacted with the villagers, we gave information and importance of mask and washing hands to deal with this virus. Also when we were interacting with the villagers or sarpanch we have maintained social distancing to avoid spreadness of the virus.

7.3 ANY OTHER STEPS TAKEN BY THE STUDENTS

We tried to not gather group of people when we were interacting with them as for safety purpose and also we gathered information from sarpanch what are the steps taken by the village to deal with this pandemic.

Fig 7.1 : Interaction with Villagers with Proper Social Distancing and having Mask on Face.

CHAPTER 8:

SUSTAINABLE DESIGN PLANNING PROPOSAL

(PROTOTYPE DESIGN)-PART-I

8.1 DESIGN PROPOSALS

We have made following designs for Khodiyar village for Part-1 as per requirements of the villagers.

1. Design of Library
2. Design of Post office
3. Design of Clinic with Medical Store.
4. Design of Public Toilet
5. Design of Public Park
6. Design of Bio-Gas Plant

A design proposal is used by a freelance designer, design agency, or other design business. It's sent out to prospective design clients to provide details on design and branding work. A design project proposal needs to be crisp and professional since it represents the business that sends it out. It also needs to be consistent with the organization's own branding.

Planning: Successful projects begin with diligent planning. The design process starts with an initial meeting to discuss the vision, logistics, and final project outcomes with the key decision makers and the creative experts on the commercial general contractor team. This should be a collaborative process that explores options and directions that ultimately lead to an amazing finished product. Together, the team will walk through architectural, physical and economic requirements of the project as well as code requirements.

Design Development: Design development then kicks off with experienced design professionals creating architectural, structural, and engineering drawings, as needed. These designs should detail specifications of the project from the ground up, oftentimes with artist renderings. The designs should also include detailed descriptions and mockups.

Financials: Financial models and budgeting should also be a key component in the pre- construction and design phase. Conceptual estimates are often created throughout the pre- construction phase and as a design is refined realistic cost estimates are updated.

Need of Above Design Planning Proposal

1 Socio Cultural Design- Public Library

Need:- As per talk with the villagers, the students of the village were deprived of library where they can read various books and gain some knowledge and also they can get the peaceful place to read so we proposed the design of library**.**

2 Physical Design – Post Office

Need:- There is Post office in the village but the current condition of post office is critical and also the space is conjested in the present structure so we proposed the design of Post office for better serviceability and have wider space.

3 Smart Village Design – Clinic with medical store

Need:- There is no any private clinic in the village. As per norms there should be atleast one clinic in the village. So we proposed the design of clinic with attached medical store in the village.

4 Social Design – Public Toilet

Need:- There was no public latrine block or public toilet in the village. So there is no any facilities of sanitation for outsiders of the village. So we proposed the design of Public Toilet in the village.

Socio-Cultural Design

1. DESIGN OF LIBRARY

FIG 8.1 : ELEVATION OF LIBRARY

Fig 8.2 :SECTION OF LIBRARY

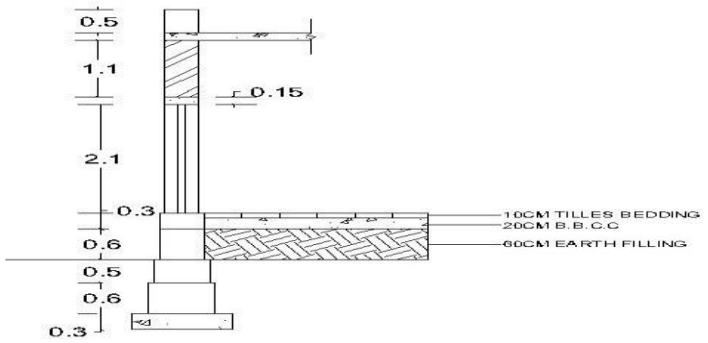
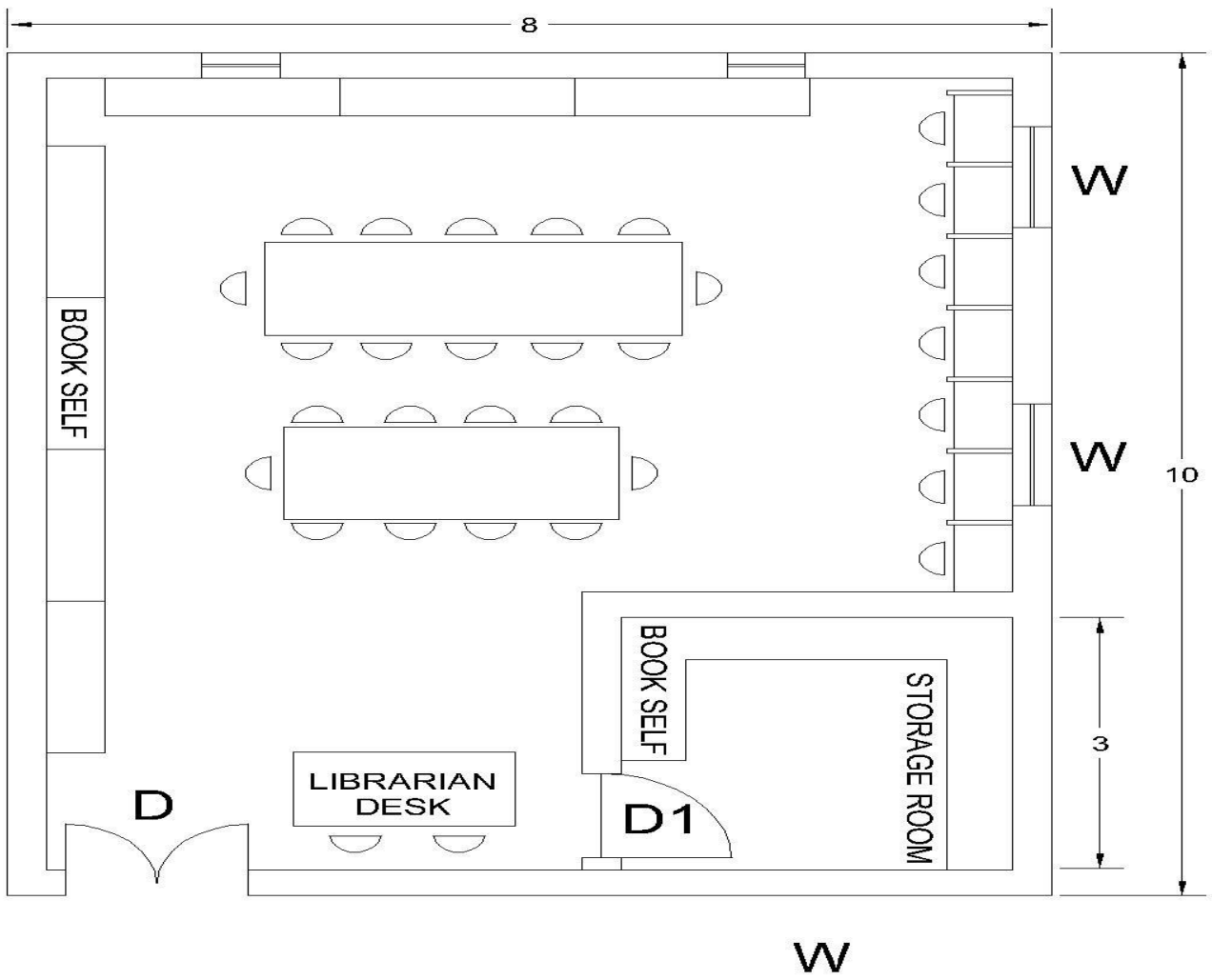


FIG 8.3 : DETAILED PLAN OF LIBRARY



CONSTRUCTION WORK OF AN LIBRARY AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

MEASUREMENT SHEET

ITEM	DESCRIPTION	NO	LENGTH	B/W	H/D	QUANTITY	UNITS
1.	**Excavation for**	1	40.5	0.9	1.4	51.03	Cu.m
	Foundation						
2.	**P.C.C work in foudation**	1	40.5	0.9	0.3	10.94	Cu.m
	L= 40.5 m						
	Total Quantity					10.94	Cu.m
3.{I}	**Brick Masonary Work for**						
	Foundation steps						
	1st Step:-	-	40.8	0.6	0.6	14.69	Cu.m
	L= 40.8 m						
	2nd Step:-	-	40.9	0.5	0.5	10.225	Cu.m
	L= 40.9 m						
	3rd Step:-	-	41.0	0.4	0.9	14.76	Cu.m
	L= 41.0 m						
	Total Masonary Work:-					39.675	Cu.m
{ii}	**Brick Masonary Work**						
	for steps:-						
	1st step:-	1	1.2	0.9	0.3	0.324	Sq.m.
	2st step:-	1	1.2	0.6	0.3	0.216	Sq.m.
	3st step:-	1	1.2	0.3	0.3	0.108	Sq.m.

4.	**Earthfilling**	1	3	3	0.6	5.4	Cu.m
		1	4.1	3.3	0.6	8.118	Cu.m
		1	7.4	6.1	0.6	27.084	Cu.m
	Total Earthfilling					40.602	Cu.m
5.	**DPC Work**	-	41.0	0.4	-	16.4	Sq.m
6.	**Brick masonary work**						
	In super structure						
	Wall(300 mm)	-	41.1	0.3	3.35	41.3055	Cu.m
	L= 41.1 m						
	Deduction for doors and						
	Windows:-						
	Door – D	1	1.4	0.3	2.1	0.882	Cu.m
	Door = D1	1	1	0.3	2.1	0.63	Cu.m
	Window – W	2	1.2	0.3	1.4	1.008	Cu.m
	Window – W1	2	0.6	0.3	0.6	0.216	Cu.m
	Total deduction for doors					2.736	Cu.m
	and windows						
	Deduction for Lintel:-						
	Door – D	1	1.7	0.3	0.15	0.0765	Cu.m
	Door = D1	1	1.3	0.3	0.15	0.0585	Cu.m
	Window – W	2	1.5	0.3	0.15	0.135	Cu.m
	Window – W1	2	0.9	0.3	0.15	0.081	Cu.m
	Total deduction for lintel					0.351	Cu.m
	Total Brick Work in S.S					38.2185	Cu.m
7.	**Flooring:-**						
	Sitting room	-	7.4	6.1	-	45.14	Sq.m
	Storage room	-	3	3	-	9.0	Sq.m
	Lobby	-	4.1	3.3	-	13.53	Sq.m

	Addition of doors:-						
	Door -D	1	1.4	0.3	-	0.42	Sq.m
	Door –D1	1	1	0.3	-	0.3	Sq.m
	Total Flooring Work					68.39	Sq.m

8.	**Brickwork in Parapet**						
	Wall						
	Perpherical Length	-	34.8	0.3	0.5	5.22	Cu.m
	L= 34.8 m						
	Total work in parapet wall					5.22	Cu.m
	Net Quantity of Brick					43.4385	Cu.m
	Work in S.S						
	38.2185 + 5.22						
9.	**RCC Work**						
(i)	**Slab**	-	8	10	0.12	9.6	Cu.m
	L= 8 m						
	B= 10m						
(ii)	**Chajja**						
	Door - D	1	1.7	0.6	0.15	0.153	Cu.m
	Window - W	2	1.5	0.6	0.15	0.135	Cu.m
	Window – W1	2	0.9	0.6	0.15	0.081	Cu.m
	Total RCC Work in Chajja					0.369	Cu.m
(iii)	**Lintel**						
	Door – D	1	1.7	0.3	0.15	0.0765	Cu.m
	Door = D1	1	1.3	0.3	0.15	0.0585	Cu.m
	Window – W	2	1.5	0.3	0.15	0.135	Cu.m

	Window – W1	2	0.9	0.3	0.15	0.081	Cu.m
	Total RCC Work in lintel					0.351	Cu.m
	Total RCC Work:-					10.32	Cu.m
10.	**Inside Plaster**						
(i)	Sitting Room	2	7.4	-	3.35	49.58	Sq.m
		2	6.1	-	3.35	40.87	Sq.m
	Storage Room	2	3	-	3.35	20.1	Sq.m
		2	3	-	3.35	20.1	Sq.m
	Lobby	1	4.1	-	3.35	13.735	Sq.m
		2	3.6	-	3.35	24.12	Sq.m
(ii)	Deduction for Doors and						
	Windows:-						
	Door - D	1/2	1.4	-	2.1	1.47	Sq.m
	Door - D1	2/2	1	-	2.1	2.1	Sq.m
	Window – W 2NO	1/2	1.2	-	1.4	1.68	Sq.m
	Total Deduction for Doors					5.25	Sq.m
	and Windows						
(iii)	Addition for Ceiling:-						
	Sitting Room	-	7.4	6.1	-	45.14	Sq.m
	Lobby	-	4.1	3.3	-	13.53	Sq.m
	Storage Room	-	3	3	-	9	Sq.m
	Total Addition for Ceiling					67.67	Sq.m
	Total Inside Plaster					230.925	Sq.m
11.	**External Plaster**						

	Short Wall	2	8	-	4.75	76	Sq.m
	Long Wall	2	10	-	4.75	95	Sq.m
	Deduction for Doors						
	And Windows						
	Door - D	1/2	1.4	-	2.1	1.47	Sq.m
	Window - W 2NO	1/2	1.2	-	1.4	1.68	Sq.m
	Total External Plaster					167.85	Sq.m
	Total Plaster Work(I + E)					398.775	Sq.m

12.	**Whitewash**					398.775	Sq.m
	As per inside and outside						
	plaster						
13.	**Painting**					398.775	Sq.m
	As per inside and outside						
	plaster						
14.	**Skirting Work**	2	7.4	-	-	14.8	R Mt
		2	9.4	-	-	18.8	R Mt
		4	3	-	-	12	R Mt
	Total Skirting Work					45.6	R Mt

CONSTRUCTION WORK OF AN LIBRARY AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

ABSTRACT SHEET

Sr	Description	Quantity	Rate	Per	Amount
1.	Excavation Work	51.03	160	Cu.m	8164.8
2.	P.C.C	10.94	3000	Cu.m	32820
3.	Brickwork in	39.675	3200	Cu.m	126960
	Foundation				
4.	Brickwork in	38.2185	3500	Cu.m	133764.75
	Superstructure				
5.	Earthfilling	40.602	700	Cu.m	28421.4
6.	Plastering	398.775	150	Sq.m	59816.25
7.	Flooring	68.39	900	Sq.m	61551
8.	RCC Slabs	9.6	4900	Cu.m	47040
9.	Painting	398.775	25	Sq.m	9969.375
	Total Rupees				5,08,507.575
	Contiguous Charges (5% Rupees)				25425.37
	10% Contractor Charges				50850.75
	2% Water Charges				10170.15
	Total Amount Rupees				5,94,953.845
	Round Off To Rupees				6,00,000 Rs

Physical Design

2. DESIGN OF POST OFFICE

FIG 8.4 : DETAILED PLAN OF POST OFFICE

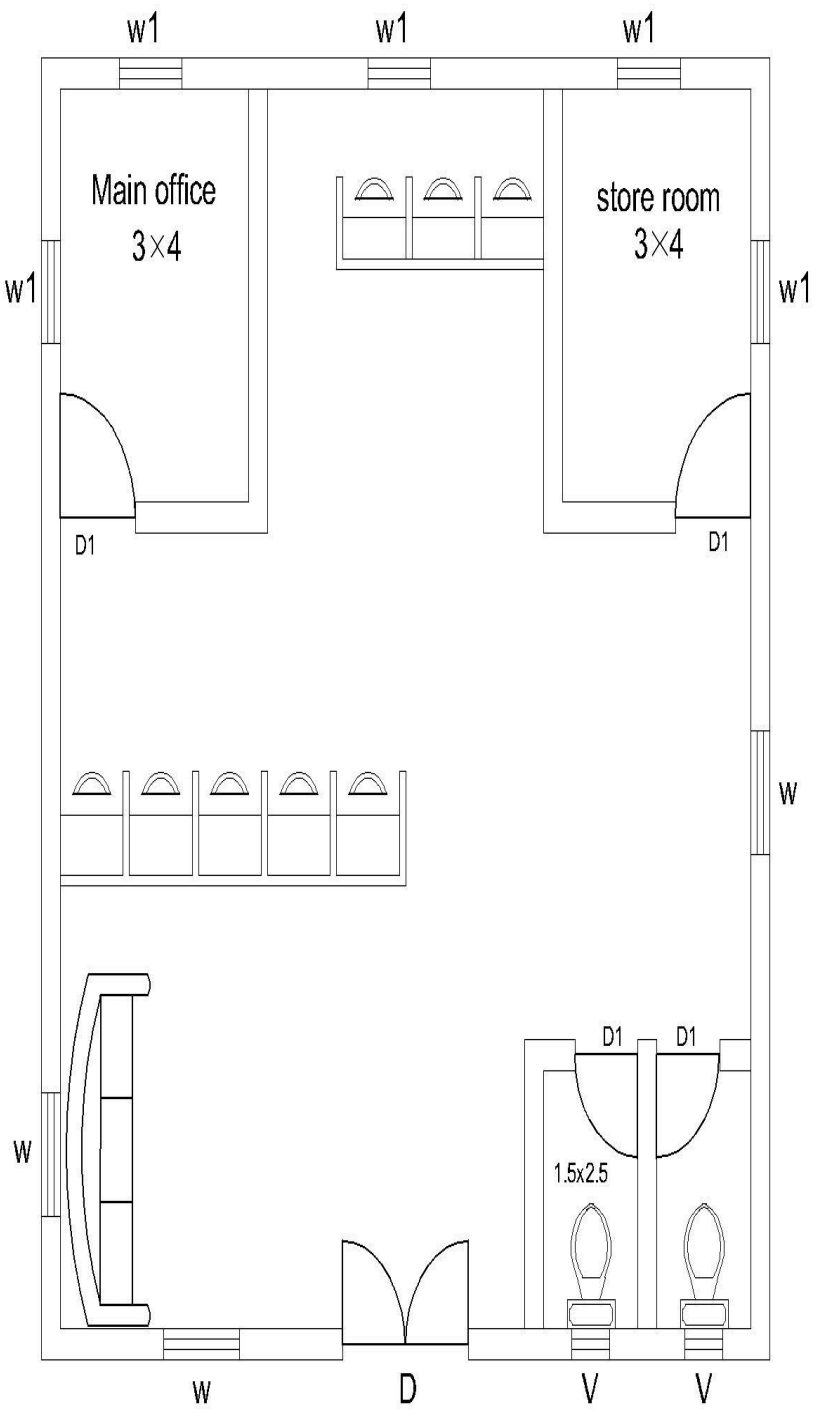
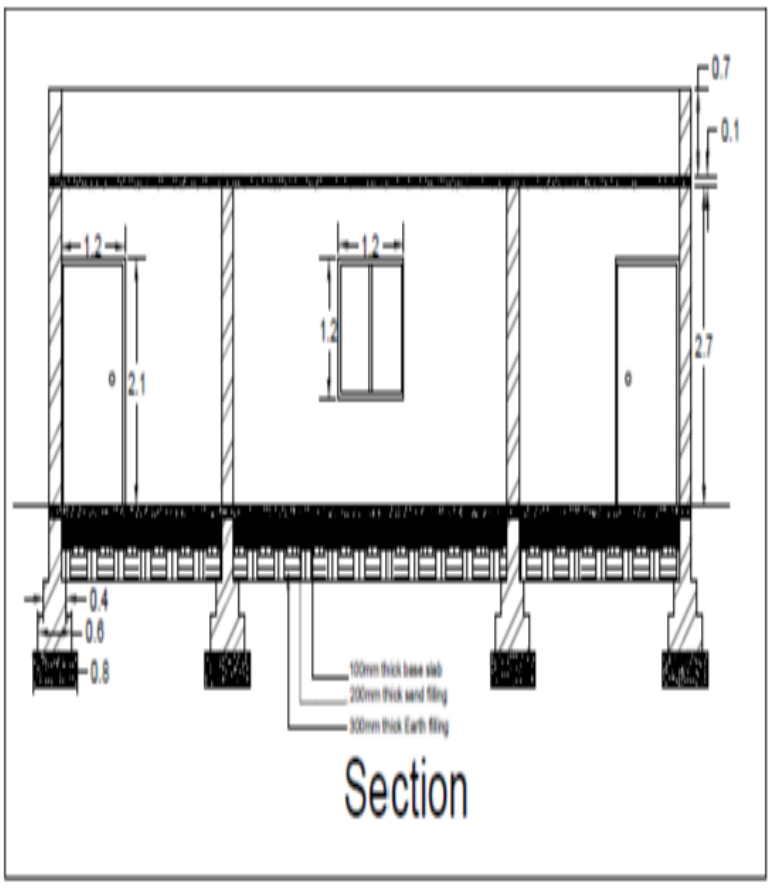


FIG 8.5: SECTION OF POST OFFICE



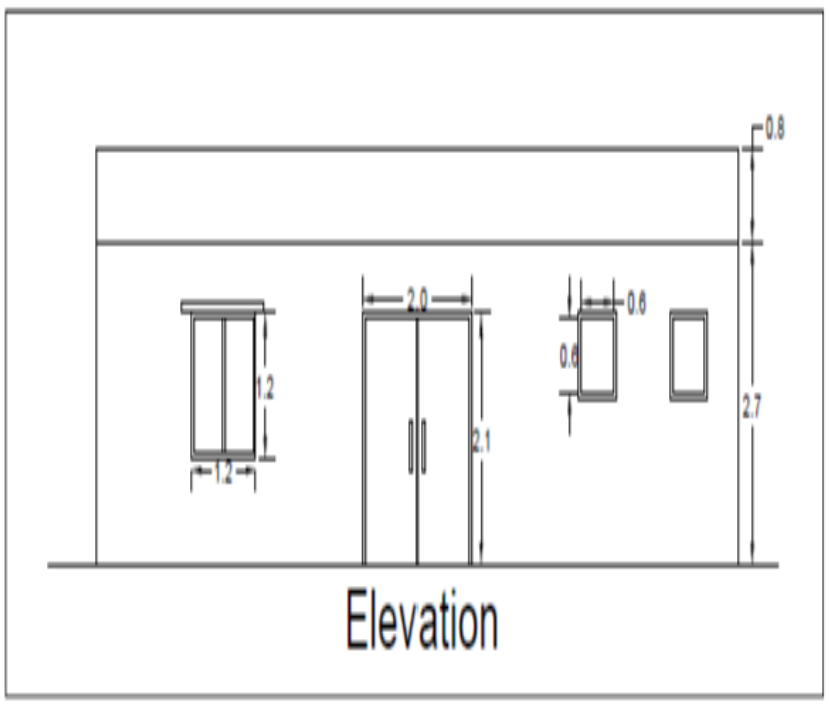


FIG 8.6 : ELEVATION OF POST OFFICE

CONSTRUCTION WORK OF AN POST OFFICE
AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

MEASUREMENT SHEET

ITEM	DESCRIPTION	NO	LENGTH	W/B	H/D	QUANTITY	UNITS
1.	**Excavation for**	1	68.4	0.8	0.9	49.248	Cu.m
	Foundation						
	L= 68.4 m						
	Total Quantity					49.248	Cu.m
2.	**P.C.C in Foundation**						
	L= 68.4 m	1	68.4	0.8	0.3	16.416	Cu.m
	Total Quantity					16.416	Cu.m
3.	**Brickwork upto Plinth**						
	1st step :-		69.2	0.6	0.3	12.456	Cu,m
	L = 69.2 m						
	2nd Step:-		70	0.4	0.3	8.4	Cu.m
	L = 70 m						
	3rd Step:-		70.8	0.2	1.2	16.992	Cu.m
	L = 70.8 m						
	Total Brickwork upto					37.848	Cu.m
	Plinth						
4.	**Brickwork In S.S**						
	200 mm Walls						
	L = 70.8 m		70.8	0.2	2.7	38.23	Cu.m

	Parapet Wall	1	12	0.2	0.7	1.68	Cu.m
		1	11.6	0.2	0.7	1.624	Cu.m
	Total Brickwork in Parapet					3.304	Cu.m
	Wall						
	Total Brickwork in S.S					41.534	Cu.m
	Deduction for Doors						
	and Windows:-						
	Door - D	1	2	2.1	0.2	0.84	Cu.m
	Door – D1	2	1.2	2.1	0.2	1.008	Cu.m
	Door – D2	2	1	2.1	0.2	0.84	Cu.m
	Window – W	4	1.2	1.2	0.2	1.152	Cu.m
	Window – W1	4	1	1.2	0.2	0.96	Cu.m
	Ventilator	2	0.6	0.6	0.2	0.144	Cu.m
	Net Brickwork in S.S					36.59	Cu.m
5.	**Internal Plaster**						
	Ceiling	-	12	11	-	132	Sq.m
	Main Wall	2	12	-	2.7	64.8	Sq.m
		2	11	-	2.7	59.4	Sq.m
	Main Office + Store Room	2	4	-	2.7	21.6	Sq.m
		2	3	-	2.7	16.2	Sq.m
	Outside Main Room	2	4.3	-	2.7	23.22	Sq.m
	Wall	2	3.3	-	2.7	17.82	Sq.m

	Toilet Wall	2	2.5	-	2.7	13.5	Sq.m
		1	3.3	-	2.7	8.91	Sq.m
	Outside Toilet Wall	1	2.8	-	2.7	7.56	Sq.m
		1	3.6	-	2.7	9.72	Sq.m
	Total Inside Plaster Work					374.73	Sq.m
	Deduction For Doors and						
	Windows						
	Door – D 1NOs	1/2	2	-	2.1	2.1	Sq.m

	Door – D1 2NOs	1	1.2	-	2.1	5.04	Sq.m
	Door – D2 2NOs	1	1	-	2.1	4.2	Sq.m
	Window – W 4NOs	1/2	1.2	-	1.2	2.88	Sq.m
	Window – W1 4NOs	1/2	1	-	1.2	2.4	Sq.m
	Net Inside Plaster					358.11	Sq.m
6.	Outside Plaster						
	Long Wall	2	12.6	-	3.5	88.2	Sq.m
	Short Wall	2	11.6	-	3.5	81.2	Sq.m
	Total Outside Plaster					169.4	Sq.m
	Deduction for Doors and						
	Windows						
	Door – D 1NOs	1/2	2	-	2.1	2.1	Sq.m
	Window – W1 4 NOs	1	1.2	-	1.2	2.88	Sq.m
	Window – W1 4 NOs	1	1	-	1.2	2.4	Sq.m

	Total Deduction					7.38	Sq.m
	Net Outside Plater Work					162.02	Sq.m
	Total Plaster Work(I + E)					520.13	Sq.m
7.	**RCC Slab**						
	L = 11.6	-	11.6	12.6	0.12	17.5392	Cu.m
	B = 12.6						
8.	**Painting**						
	As per Calculation in Plaster					520.13	Cu.m

CONSTRUCTION WORK OF A POST OFFICE AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

ABSTRACT SHEET

Sr	Description	Quantity	Rate	Per	Amount
1.	Excavation Work	49.248	160	Cu.m	7879.68
2.	P.C.C	16.416	3000	Cu.m	49248
3.	Brickwork upto	37.848	3200	Cu.m	121113.6
	Plinth				
4.	Brickwork in	36.59	3500	Cu.m	128065
	Superstructure				
5.	Plastering	520.13	150	Sq.m	78019.5
6.	RCC Slabs	17.5392	4900	Cu.m	85942.08
7.	Painting	520.13	25	Sq.m	13003.25

	Total Rupees	483270.51
	Contiguous Charges (5% Rupees)	24163.5255
	10% Contractor Charges	48327.051
	2% Water Charges	9665.41
	Total Amount Rupees	565426.5
	Round Off To Rupees	5,70,000 RS

Smart Village Design

3. DESIGN OF CLINIC WITH MEDICAL STORE

Fig 8.7 : Plan of Clinic With Medical Store

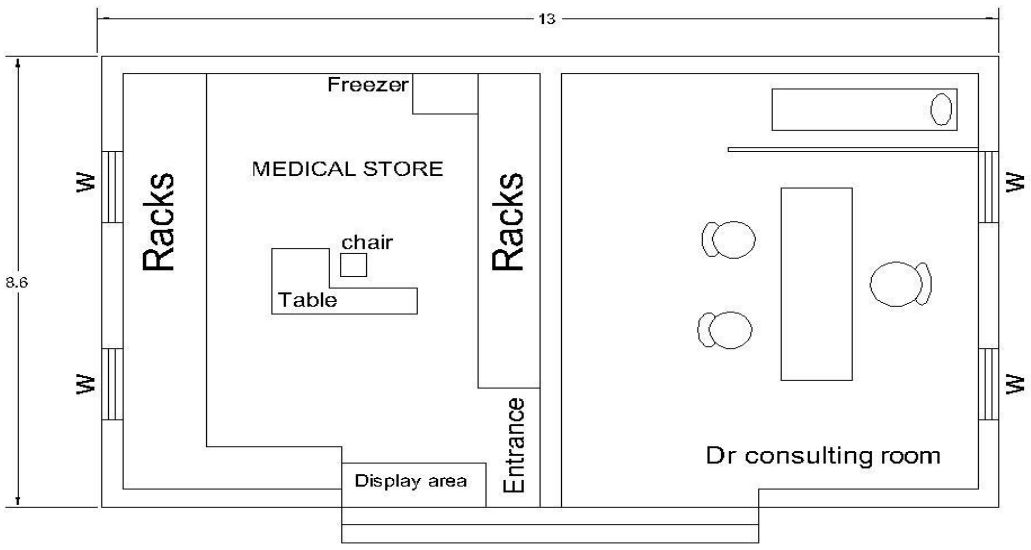


Fig8.8: Section of Clinic with Medical Store

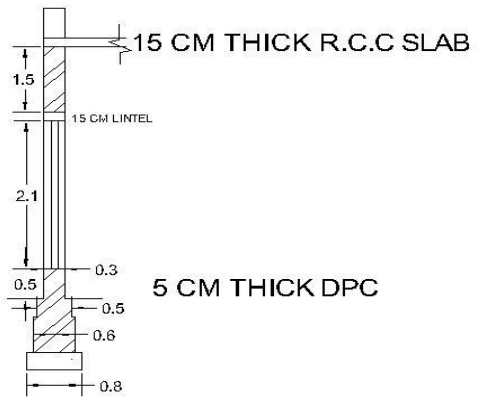
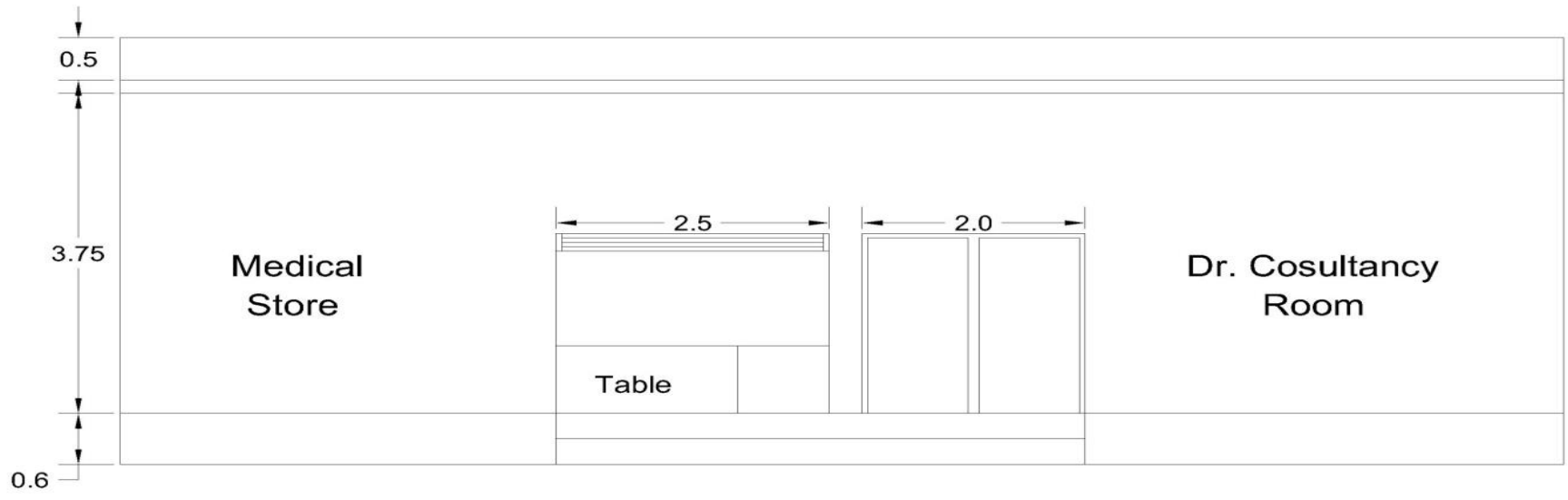


Fig 8.9 : Elevation of Clinic with Medical Store



CONSTRUCTION WORK OF A CLINIC WITH MEDICAL STORE AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

MEASUREMENT SHEET

ITEM	DESCRIPTION	NO	LENGTH	B/W	H/D	QUANTITY	UNITS
1.	**Excavation for**						
	Foundation						
	L = 50.3m	-	50.3	0.8	1.2	47.52	Cu.m
2.	**P.C.C Work in**						
	Foundation						
	L = 49.5m	-	49.5	0.8	0.3	11.88	Cu.m
3.	**Brick Masonary**						
	Upto Plinth						
	1st Step:-						
	L = 49.7 m	-	49.7	0.6	0.6	17.89	Cu.m
	2nd Step:-						
	L = 49.8 m	-	49.8	0.5	0.3	7.47	Cu.m
	3rd Step:-						
	L = 50 m	-	50	0.3	0.45	6.75	Cu.m
	For Steps:-						
	1st Step:-	1	4.3	0.6	0.25	0.645	Cu.m
	2nd Step:-	1	4.3	0.3	0.25	0.323	Cu.m
	Total Brickwork					33.078	Cu.m
	Upto Plinth						
4.	**Earthfilling**						
	Earthfilling in Plinth	-	12	8	0.45	43.2	Cu.m

5.	**D.P.C Work**						
	0.05 m Thick D.P.C	-	50	0.3	-	15	Sq.m
	L = 50m						
6.	**Brick Work in S.S**						
	300 mm wall						
	L = 50m	-	50	0.3	3.75	56.25	Cu.m
	Deduction For Doors						
	And Windows						
	Door D	1	2	0.3	2.1	1.26	Cu.m
	Window W	4	1.2	0.3	1.6	2.304	Cu.m
	Shutter S	1	2.5	0.3	2.1	1.575	Cu.m
	Total Deduction of					5.139	Cu.m
	Doors and Windows						
	Brickwork in						
	Parapet:-						
	Long Wall(o-o):-	2	13	0.3	0.5	3.9	Cu.m
	Short Wall(I-I):-	2	8	0.3	0.5	2.4	Cu.m
	Total Brickwork					6.3	Cu.m
	In Paratpet						
	Total Brick Work					58.85	Cu.m
	In S.S						
7.	**Lintel Work**						
	Total Lintel Work	4	1.5	0.3	0.15	0.27	Cu.m
8.	**Internal Plaster**						

	Ceiling:-	2	6	8	-	96	Cu.m
	Wall:-						
	Medical Store	2	6	3.75	-	45	Cu.m
	Clinic	2	8	3.75	-	60	Cu.m
	Deduction for						
	Doors and Windows						
	Shutter S 1 NOS	1	2.5	-	2.1	5.25	Sq.m
	Window W 4 NOS	1/2	1.2	-	1.6	3.84	Sq.m
	Door 1 NOS	1	2	-	2.1	4.2	Sq.m
	Total Deduction of					13.24	Sq.m
	Doors and Windows						
	Total Internal Plaster					196.71	Sq.m
9.	**External Plaster**						
	Long Wall:-	2	13	-	4.9	127.04	Sq.m
	Short Wall:-	2	8.6	-	4.9	84.28	Sq.m
	Deduction for						
	Doors and Windows						
	Shutter S 2 NOS	1	1.2	-	1.6	3.84	Sq.m
	Window W 4 NOS	1/2	2.35	-	2.5	5.875	Sq.m
	Door 1 NOS	1	2	-	2.1	4.2	Sq.m
	Total External					198.39	Sq.m
	Plaster						
	Total Plaster Work					395.1	Sq.m
	(Internal + External)						
10.	**Whitewash**						
	As per calculation					395.1	Sq.m
	Of Total Plaster						

11.	**Flooring Work**						
	Room:-	2	6	8	-	96	Sq.m
	Shutter Seal:-	2	2.35	0.3	-	1.41	Sq.m
	Stairs:-	2	4.3	-	0.25	2.15	Sq.m
	Total Flooring Work					99.56	Sq.m
12.	**Skirting**						
	Skirting Work:-						
	Long Wall:-	2	13	-	-	26	R mt
	Short Wall	2	8.6	-	-	17.2	R mt
13.	**R.C.C For Slab**						
	Total R.C.C work	-	13	8.6	0.15	16.77	Cu.m
	For Slab						

CONSTRUCTION WORK OF A CLINIC WITH MEDICAL STORE AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

ABSTRACT SHEET

Sr	Description	Quantity	Rate	Per	Amount
1.	Excavation Work	47.52	160	Cu.m	7603.2
2.	P.C.C	11.88	3000	Cu.m	35640
3.	Brickwork Upto	33.078	3200	Cu.m	10584.6
	Plinth				
4.	Brickwork in	58.85	3500	Cu.m	205975
	Superstructure				
5.	Earthfilling	43.2	700	Cu.m	30240
6.	Plastering	395.1	150	Sq.m	59265
7.	Flooring	99.56	900	Sq.m	89604
8.	RCC Work	16.77	4900	Cu.m	82173
9.	Painting	395.1	25	Sq.m	9877.5

	Total Rupees	5,30,962.3 Rs
	Contiguous Charges (5% Rupees)	26548.115 Rs
	10% Contractor Charges	53,096.2 Rs
	2% Water Charges	10619.246 Rs
	Total Amount Rupees	6,21,225.861 Rs
	Round Off To Rupees	6,25,000 Rs

Socio-Cultural Design

4. DESIGN OF PUBLIC TOILET

FIG 8.10 : DETAILED PLAN OF PUBLIC TOILET

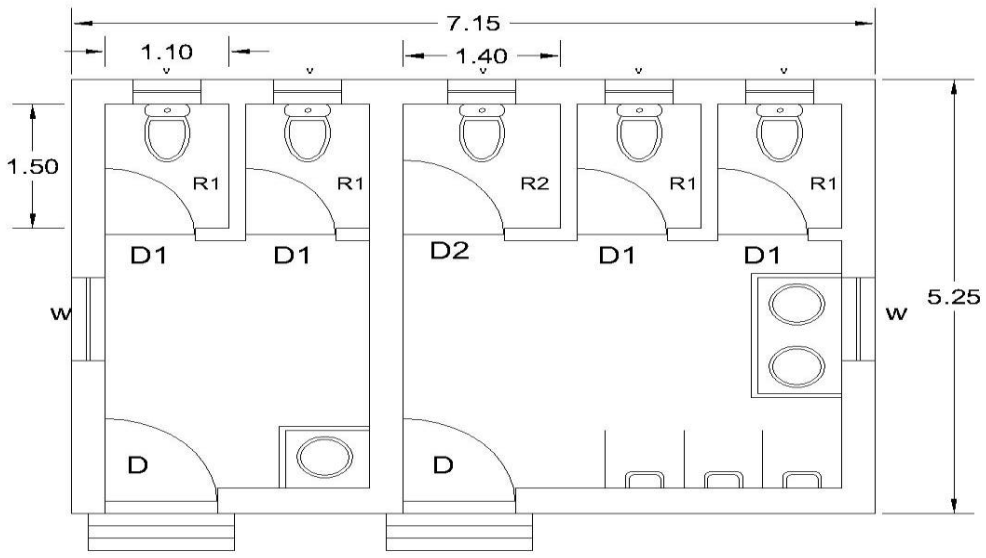
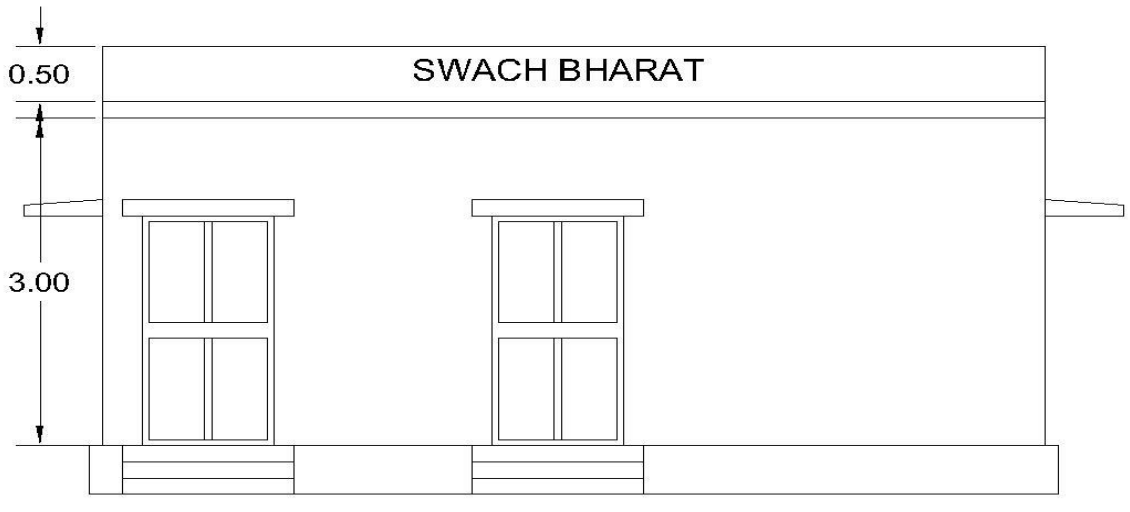
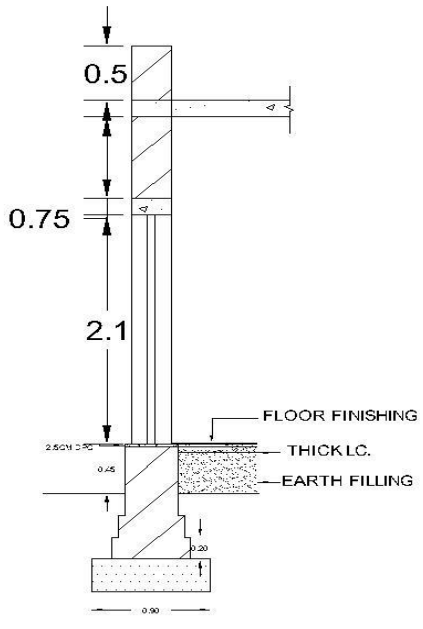


FIG 8.11 :ELEVATION OF TOILET

FIG 8.12: SECTION OF TOILET





CONSTRUCTION WORK OF A PUBLIC TOILET AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

MEASUREMENT SHEET

ITEM	DESCRIPTION	NO	LENGTH	B/W	H/D	QUANTITY	UNITS
1.	**Excavation in**						
	Foundation						
	L = 27.65 m	-	27.65	0.9	0.9	22.396	Cu.m
2.	**P.C.C Work in**						
	Foundation						
	Total P.C.C Work						
	L = 27.65 m	-	27.65	0.9	0.3	7.46	Cu.m
3.	**Brickwork Upto**						
	Plinth						
	Foundation Steps:-						
	1st Step:-						
	L = 27.95 m	-	27.95	0.6	0.2	3.354	Cu.m
	2nd Step:-						
	L = 28.05 m	-	28.05	0.5	0.2	2.805	Cu.m
	3rd Step:-						
	L = 28.15 m	-	28.15	0.4	0.65	7.319	Cu.m
	For Masonary Steps:-						
	1st Step:-	2	1.3	0.9	0.15	0.351	Cu.m
	2nd Step:-	2	1.3	0.6	0.15	0.234	Cu.m
	3rd Step:-	2	1.3	0.3	0.15	0.117	Cu.m
	Total Brickwork					14.18	Cu.m
	Upto Plinth						
4.	**D.P.C Work**						

	Total DPC Work	-	28.15	0.4	-	11.26	Sq.m
5.	**Brick Work In S.S**						
	300 mm Walls						
	L = 28.25 m	-	28.25	0.3	3	25.425	Cu.m
	Deduction For Doors						
	And Windows:-						
	Door D	2	1	0.3	2.1	1.26	Cu.m
	Door D1	4	0.8	0.3	2.1	2.016	Cu.m
	Door D2	1	0.9	0.3	2.1	0.567	Cu.m
	Window W	2	1	0.3	1.2	0.72	Cu.m
	Ventilator V	5	0.6	0.3	0.6	0.54	Cu.m
	Total Deduction of					5.103	Cu.m
	Doors and Windows						
	Deduction Of Lintel:-						
	Door D	2	1.3	0.3	0.15	0.117	Cu.m
	Window W	2	1.3	0.3	0.15	0.117	Cu.m
	Ventilator V	5	0.9	0.3	0.15	0.2015	Cu.m
	Total Deduction of					0.4365	Cu.m
	Lintel						
	Brick Work In						
	Parapet Wall:-						
	Long Wall(o-o)	2	7.15	0.3	0.5	2.145	Cu.m
	Short Wall(I-I)	2	4.95	0.3	0.5	1.485	Cu.m
	Total Brickwork in					3.63	Cu.m
	Parapet Wall						
	Total Brick Work					23.5155	Cu.m

	In S.S						
6.	**Earthfilling**						
	Gents Room:-	-	3.9	4.65	0.45	8.16075	Cu.m
	Ladies Room:-	-	2.35	4.65	0.45	4.917375	Cu.m
	Total Earthfilling					13.078125	Cu.m
7.	**Internal Plaster**						
	Work						
	Gents Room:-						
	Long Wall	2	4.65	-	3	27.9	Sq.m
	Short Wall	2	3.9	-	3	23.4	Sq.m
	Ceiling	1	3.9	4.65	-	18.135	Sq.m
	Ladies Room:-						
	Long Wall	2	4.65	-	3	27.9	Sq.m
	Short Wall	2	2.35	-	3	10.92	Sq.m
	Total Internal Plaster					122.3625	Sq.m
	Deduction of Doors						
	And Windows:-						
	Door D 2 NOs	1/2	1	-	2.1	2.1	Sq.m
	Window W 2 NOs	1/2	1	-	1.2	1.2	Sq.m
	Total Deduction					3.3	Sq.m
	Net Internal Plaster					119	Sq.m
8.	**External Plaster**						
	Work						
	Long Wall:-	2	7.15	-	3.65	52.195	Sq.m

	Short wall:-	2	5.25	-	3.65	38.325	Sq.m
	Total Deduction					3.3	Sq.m
	Net External Work					87.22	Sq.m
	Total Plaster Work					206.22	Sq.m
	(Internal + External)						
9.	**Whitewash**						
	As per Total Plaster					206.22	Sq.m
	Work						
10.	**Flooring Work**						
	For Open Space:-	1	3.9	3	-	11.7	Sq.m
		1	2.35	3	-	7.05	Sq.m
	For Toilet:-	4	1.1	1.5	-	6.6	Sq.m
		1	1.4	1.5	-	2.1	Sq.m
	For Door Seal:-						
	Door D	2	1	0.3	-	0.6	Sq.m
	Door D1	4	0.8	0.3	-	0.96	Sq.m
	Door D2	1	0.9	0.3	-	0.27	Sq.m
	Total Flooring Work					29.28	Sq.m
11.	**R.C.C Work**						
	Total Work for	-	7.15	5.25	0.15	5.63	Cu.m
	R.C.C Slab						
	Lintel Work					0.4365	Cu.m
	Total R.C.C Work					6.0665	Cu.m

CONSTRUCTION WORK OF A PUBLIC TOILET AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

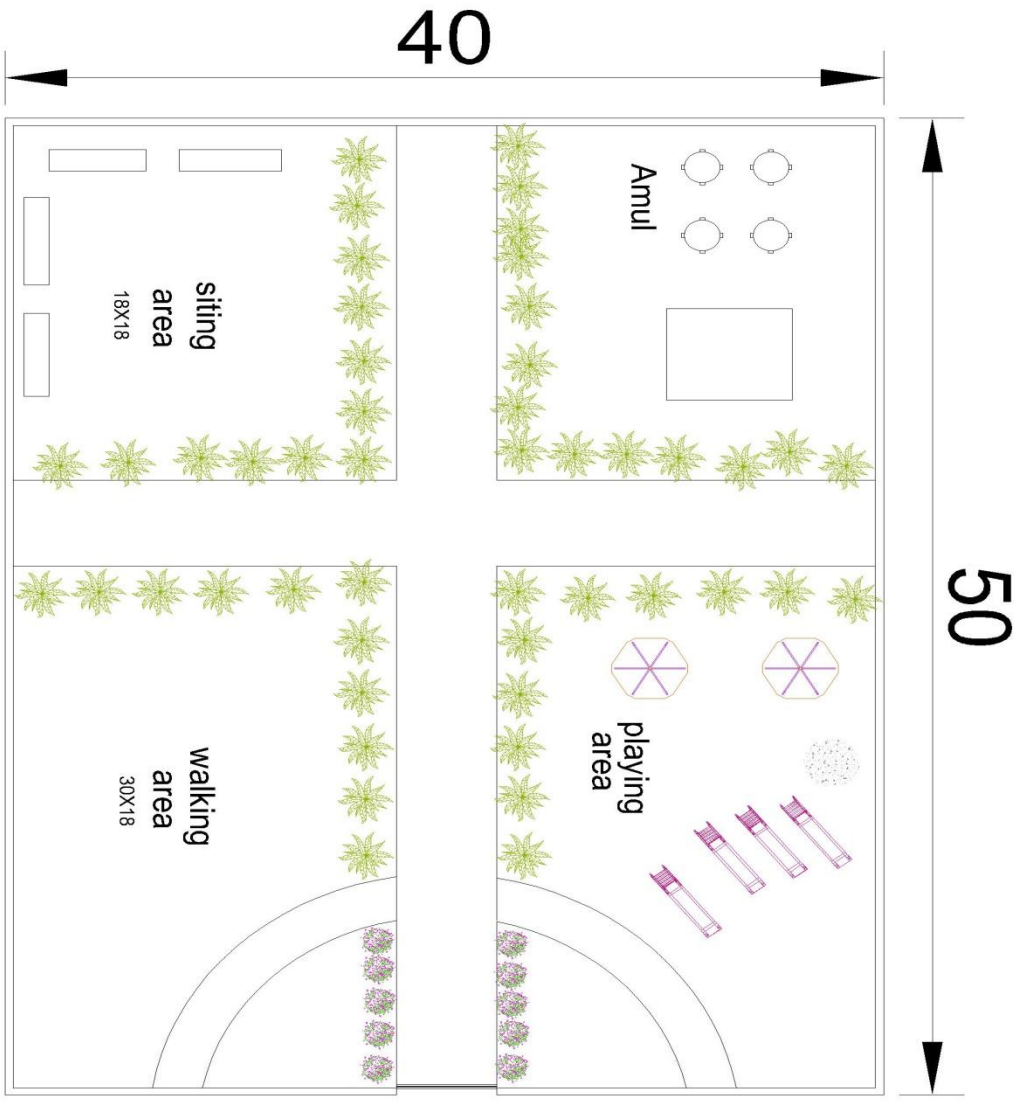
ABSTRACT SHEET

Sr	Description	Quantity	Rate	Per	Amount
1.	Excavation Work	22.396	160	Cu.m	3583.36
2.	P.C.C	7.46	3000	Cu.m	22380
3.	Brickwork Upto	14.18	3200	Cu.m	45376
	Plinth				
4.	Brickwork in	23.5155	3500	Cu.m	82304.5
	Superstructure				
5.	Earthfilling	13.078125	700	Cu.m	9154.6875
6.	Plastering	206.22	150	Sq.m	30933
7.	Flooring	29.28	900	Sq.m	26352
8.	RCC Work	6.0665	4900	Cu.m	29725.85
9.	Painting	206.22	25	Sq.m	5155.5
10.	Gully Trap (150*100 mm)	5	64	NOS	320
11.	Urinal	3	500	NOS	1500
12.	W/C Pan	5	350	NOS	1750
13.	Wash Basin	3	1150	NOS	3450
14.	Elbow	3	20	NOS	60
15.	PVC Pipe	18	400	NOS	7200

	Total Rupees	2,69,244.8975
	Contiguous Charges (5% Rupees)	13,462.24
	10% Contractor Charges	26,924.48
	2% Water Charges	5,384.89
	Total Amount Rupees	315016.52 Rs
	Round Off To Rupees	3,15,000 Rs

5. DESIGN OF PUBLIC PARK

FIG 8.13 : PLAN OF PUBLIC PARK



CONSTRUCTION WORK OF A PUBLIC PARK AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

MEASUREMENT SHEET

ITEM	DESCRIPTION	NO	LENGTH	B/W	H/D	QUANTITY	UNITS
1.	Excavation for						
	Foundation						
	L=180 m	1	180	0.3	1.3	70.2	Cu.m.
2.	P.C.C. work in						
	Wall						
	L=221.2m	1	221.2	0.3	0.3	16.2	Cu.m.
3.	Brick Masonary						
	In S.S						
	L=180m	1	180	0.3	1.5	81	Cu.m.
4.	Steel Railing	1	180	-	0.5	90	Sq.m
5.	Plaster	1	180	0.2	-	36	Sq.m
6.	Land Scaping	1	40	50	-	2000	Sq.m

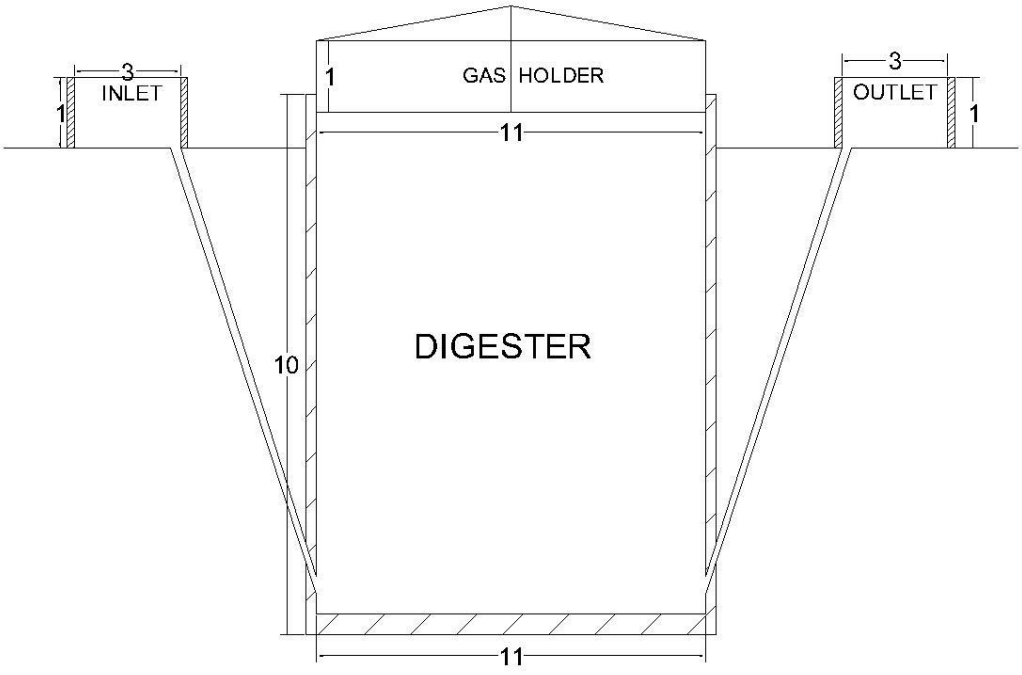
CONSTRUCTION WORK OF A PUBLIC PARK AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

ABSTRACT SHEET

Sr.	Item description	Quantity	Rate	Per	Amount
1.	Excavation work	70	155	Cu.m.	10850
2.	P C.C	16.2	3000	Cu.m.	48600
3.	Masonary	81	3500	Cu.m.	283500
4.	Steel Railing	90	150	Sq.m.	13500
5.	Plaster	36	150	Sq.m.	5400
6.	Land Scaping	2000	215	Sq.m.	430000
	Total Rupees				791850 Rs
	Contiguous Charges (5% Rupees)				39592.5 Rs
	10% Contractor Charges				79185 Rs
	2% Water Charges				15837 Rs
	Total Amount Rupees				926464.5
	Round Off To Rupees				930000 Rs

6. DESIGN OF BIO-GAS PLANT

FIG 8.14 : ELEVATION OF PLANT



Design Of Bio Gas Plant:-

- Bio gas plant is one of the plants for renewable energy sources. It transforms rural village in to clean village and provide gas as energy source and gives fertilizer at end.
- Day to day operation
- Daily 5000 - 5500 kg cow dung is fed into the plant. The amount of cow dung fed varies with number of cattle present (500/animal/day). Poultry waste and kitchen waste can also be added if it is available.
- Equal amount of water is added in the inlet tank, mixed (manually), and let in the digester. Water is procured manually from nearby wells (Maximum 50 feet away).
- The gas collected in the dome after digestion is used as and when required. The usability of gas depends on its pressure inside the dome.
- The output slurry is dried and used as manure in beneficiary's own farms.
  Initial cost of the plant

BASIC THINGS:-

- Total numbers of animals in village = 400
- As per standard data assume per day dung of animal=10.5 Kg.
- So total per day dung = 400 * 10.5 =4200 Kg. /day

DESIGN OF DIGESTER:-

- Assume retention period (RT) = 70 days.
- Assume mixing proportion of solid and water is 1:2.
- Now total amount of slurry per day (Sd) = Total per day dung + Water amount
  - 4200 + (2*4200)
  - 12600 Kg. / day
  - 12.6 m3 / day
- Digester volume (Vd) = Sd x RT
  - =12.6 x 70
  - =882 m3
- Assume cylinder shaped biogas plant.

- Provide total one numbers of units in different areas
- So, digester volume becomes for one unit = 882/1

- 882 m3
- So, provide = 880 m3

- Total digester volume (Vd) = π r2 h

- 880 = π x r2 x10 (assume h=10m) So dimensions of digester are H = 10 m

- R = 5.5 m

DESIGN OF GAS HOLDER:-

- Assume digester temperature= 26-28 ˚C

- Now from following fig find Gd by taking RT=70 days Specific gas production Gd = 37 Lit. / Kg. / day

- Daily gas production G = Gd * Feed volume

- 37 * 42
- 155400 Lit.

- 155.4 m3

- Now assume gas holder capacity = 60

- Gas holder volume = Daily gas production X Capacity of holder

- =155.4 X 0.6
- =93.24 m^3

- So, take Gas holder volume = 94 m^3

- Now for 1 unit provide volume of holder of each unit = 94/1

- =94 m^3

- Take It = 94 m3Provide cylinder shaped holder; so…

- Volume = π x r2 x h

- 94 = 3.14 x r2 x h (assume h=1m)
- R = 5.5 m

Design of Inlets and Outlets:-

- Total volume of slurry mixes per unit = 12.6/1
  = 12.6 m^3 / day
- Assume two-time filling operation in plant.
- So, take total volume of slurry = 12.6 ÷ 2 = 6.3 m3/ day
- Take it = 7 m3/ day Provide rectangular tank…
- Total volume for one time mixing of slury= L x B x H
  = L x B x 1 (assume H=1m)
- Dimension of inlet are L=3
  m,B = 3 m, H = 1 m
- Here 7 m3 / day required < 9 m3 / day provided.
- **Hence ok**
- Provide same size for outlet tank also.

8.2 REASONS FOR STUDENTS RECOMMENDING THIS DESIGN

Following are the points due to which we have recommended this design for the village.

1. There was no provision of government or private library where the students of village can study in peaceful environment so we proposed design of library.
2. There was no medical store in the village. Medicines were only obtained in the public sub health center. Other than that there was not a single source from where people of village can get the medicine whenever they want.
3. The condition of post office was in bad condition and so we have proposed the design of post office
4. There was no provision of public toilet in the village. The toilet were only in the individual house only but there was no public toilet in the village so we proposed the design of public toilet
5. Also there were many barren land in the village which were not taken care of and was not used by the villagers. So we thought to design public park on that land so that the land can be used for better purpose of the village.

8.3 DESIGNS SUGGESTIONS/BENEFITS OF THE VILLAGE

Villagers shall be highly benefitized with the scheme. The mentioned points summarized the benefits availed by the villagers.

- The basic need or we can say suggestion from the villagers was to build a public toilet to increase cleanliness in the village so by the public toilet they can have benefit of using them and maintaining swatcha in the village.
- Social gathering and roaming is also required. For that the parks and public gardens are been proposed to be constructed.

CHAPTER 9:

PROPOSING DESIGNS FOR FUTURE DEVELOPMENT OF THE VILLAGE FOR PART-II DESIGN

Need of Above Design Planning Proposal

1 Socio Cultural Design- Public Library

Need:- As per talk with the villagers, the students of the village were deprived of library where they can read various books and gain some knowledge and also they can get the peaceful place to read so we proposed the design of library**.**

2 Physical Design – Post Office

Need:- There is Post office in the village but the current condition of post office is critical and also the space is conjested in the present structure so we proposed the design of Post office for better serviceability and have wider space.

3 Smart Village Design – Clinic with medical store

Need:- There is no any private clinic in the village. As per norms there should be atleast one clinic in the village. So we proposed the design of clinic with attached medical store in the village.

4 Social Design – Public Toilet

Need:- There was no public latrine block or public toilet in the village. So there is no any facilities of sanitation for outsiders of the village. So we proposed the design of Public Toilet in the village.

In the next semester we are going to design following infrastructure facility for the village

1. Design of Community Centre

   There was no any place in the village where social gathering can be done by the village at the time of any festivals or some event in the village and so we have proposed the design of community centre so that they can perform the social activities and functions in it.

   At current situation the villagers are facing problem as they cannot perform any social gatherings in the village and so they told about their problem to us and so we decided to design such a gram panchayat which can withstand a large group of people.

2. Design of Gram Panchayat

The current condition of the gram panchayat is not that upto level and some changes is to be done in it and so we have proposed the design with all the infrastructure that a gram panchayat should have.

The gram panchayat is designed in such a way that the all necessary infrastructures is available in it.

3. Design of Aanganwadi

There is sufficient aanganwadi in the village and their condition is also good but they are lacking in facilities that the students and teachers are deprived of and so we have proposed the design of aanganwadi in the village.

The aanganwadi is designed in such a way that students of the village can get the modern technologies in their education system and have all the facilities that an aanganwadi have.

4. Design of Market Yard

There is no any proper place in the village where all the vegetable and other grocery items vendors meet and sell their vegetables and so to centralize this we have proposed the market yard in the village.

5. Design of Crematorium

There is only one crematorium in the village so that in this time of pandemic where the death rate is high and there is lack of crematorium due to which people of the village are facing problem in the crematorial activities of any dead person.

6. Design of Hospital

There is only one sub health centre in the village and so when we were interacting with the villagers they shared the problem of health facilities and unavailability of the doctor when they are in need and so we proposed the design of hospital.

CHAPTER 10:

CONCLUSION OF THE ENTIRE VILLAGE ACTIVITIES OF THE PROJECT

- Vishwakarma Yojana: An approach towards rurbanisation. Name Itself indicates to the motive of Vishwakarma Yojana phase - VII is to uplift the lifestyle of the rural areas to its certain extent up to the level of an ideal village situated at the nearby location of that particular jurisdiction.
- It is an effective government scheme to develop the rural areas under economical cost with good workability and efficiency during its usage. The main aim of the studies within this project was to develop a village with all urban facilities.
- Under this project, we did the survey of Khodiyar village (Taluka-Daskroi, District-Ahmedabad) through the techno economic survey during which we faced so many challenges too.
- After having the conversation with the Sarpanch, we came to know about the needs and the problems faced by the village dwellers.
- We get to know about the history and the present condition of the village and the facilities existing in the village.
- The project tends to improve the physical, social as well as socio-cultural aspects of the village by implementing and improvising various infrastructures with regards to lesser or least hindrance to its rural authenticity. With Gap Analysis, we conclude that some of different Smart Village facilities are required as basic or primary level which still lack in village.
- So, according to Gap Analysis of Khodiyar village, we observed condition of existing infrastructure facilities in village such as- Primary school, Water tank, Road network, Drainage network, etc.
- Smart Village can solve their problem itself can become a smart village example to another village too.
- On the basis of gap analysis we proposed some design such as library, post office, medical store, public toilet, public park and bio gas plant for the part I.
- We found that these designs are useful to meet the actual requirement of village and hence can transform this village into a smart village.

CHAPTER 11:

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CHAPTER 12:

ANNEXURE ATTACHMENT

12.1 Survey Form of Ideal Village

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

For

Vishwakarma Yojana: Phase VIII

IDEAL VILLAGE SURVEY

An approach towards Rurbanisation for Village Development

Name of Village:	Sabarkanthu
Name of Taluka:	Talod
Name of District:	Punsari
Name of Institute:	L.D.C.E
Nodal Officer Name & Contact Detail:	Prof. V.P. Nigam Utkarsh.nigam99@gmail.com
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aanganwadi worker/Village dweller)	Sachinbhai Member of Gram Panchayat.
Date of Survey:	28/11/2020

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001				
ii)	2011	6000	3055	2945	1500

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	1531-65-76
	Forest Area (In hect.)	-
	Agricultural Land Area (In hect.)	1015-63-62
	Residential Area (In hect.)	15-51-52
	Other Area (In hect.)	216-60-45
	Water bodies	-
	Nearest Town with Distance:	Modasa - 25 km

3. **Occupational Details:**

Name of Three Major Occupation groups in Village	1. Farming 2. Dairy 3. Jobs

4. **Physical Infrastructure Facilities:**

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
	• Tap Water (Treated/ Untreated) • RO Water • Well (Covered/ Uncovered) • Hand pumps • Tube well/ Borehole • River/ Canal/ Spring/ Lake/ Pond	- Everyday to Nos canal pond	yes yes yes		 Good Proper
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: 1 lakh lit	✓	–	
	Underground Sump	Capacity: –	–	–	
Suggestions if any:					
C.	**Drainage Facility**				
	Available (Yes/ No)	yes			
Suggestions if any:					
D.	**Type of Drainage**				
	Closed/ Open	closed	✓		
	If Open than Pucca / Kutchcha				
	Whether drain water is discharged directly in to Water bodies/ Sewer plants				
Suggestions if any:					

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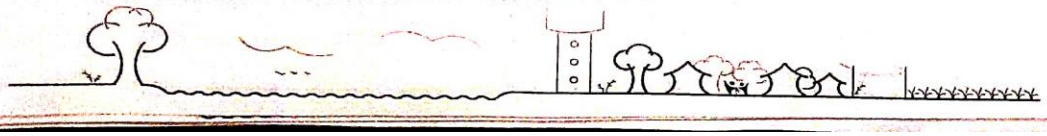
E.	Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM				
	Village approach road	3	✓	–	All weather
	Main road	2	✓	–	All weather
	Internal streets	30	✓	–	All weather
	Nearest NH/SH/MDR/ODR Dist. in kms.	7Fm	✓	–	
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No (30km) Talod	–	–	–
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	No (30km) Talod	–	–	–
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto Private Vehicles	yes	–	–
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Govt (more than 6 hrs)	yes	–	–
	Power supply for Domestic Use	yes	yes	–	–
	Power supply for Agricultural Use	yes	yes	–	–
	Power supply for Commercial Use	yes	yes	–	–
	Road/ Street Lights	yes	yes	–	Good



	Electrification in Government Buildings/ Schools/ Hospitals	Yes	Yes	-	-
	Renewable Energy Source Facilities (Y/ N)	No	yes	-	-
	LED Facilities	yes	yes	-	Good
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	2 Nos	yes	-	Good
	Location Condition	clean	-	-	
	Community Toilet (With bath/ without bath facilities)	2 Nos (with bath)	yes	-	Very good condition
	Solid & liquid waste Disposal system available	1 Nos	yes	-	-
	Any facility for Waste collection from road	-		-	-
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	canal well - Nos	yes yes	- -	Proper Good
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	< 3% Kutchha > 97% Pucca	-	-	-

5. Social Infrastructural Facilities:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks

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K.	Health Facilities:				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	1 Primary health centre Good			
	Private Clinic/Private Hospital/ Nursing Home				
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					

L.	Education Facilities:				
	Aaganwadi/ Play group	4	✓	-	Good
	Primary School	1	✓	-	Good
	Secondary school	1	✓	-	Good
	Higher sec. School	1	✓	-	Good
	ITI college/ vocational Training Center	1 - Kvic	✓	-	Good
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	-	-	-	-
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					

M.	Socio- Culture Facilities				
	Community Hall (With or without TV) Location:	Good condition	2 nos Punsori	yes	-

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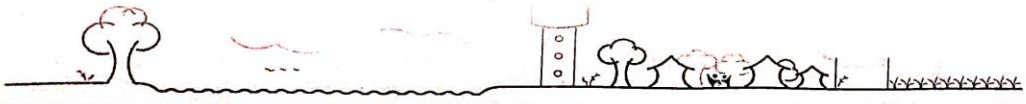
	Condition:				
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	Yes	Punsori	Yes	-
	Public Garden Location: Condition:	-	-	-	-
	Village Pond Location: Condition:	Yes	Punsori	yes	-
	Recreation Center Location: Condition:	-	-	-	-
	Cinema/ Video Hall Location: Condition:	-	-	-	-
	Assembly Polling Station Location: Condition:	-	-	-	-
	Birth & Death Registration Office Location: Condition:	Good con. Panchayat	Panchayat	yes	-
If any of the above Facility is not available in village than approx. distance from village: .....kms.					
Suggestions if any:					

N.	Other Facilities				
	Post-office	Good	Near Panchayat	✓	-
	Telecommunication Network/ STD booth	-	-	-	-



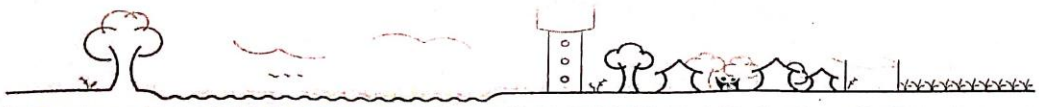
	General Market	well	-	yes	-
	Shops (Public Distribution System)	Good		✓	-
	Panchayat Building	Good		✓	-
	Pharmacy/Medical Shop	Good		✓	-
	Bank & ATM Facility	Good		✓	-
	Agriculture Co-operative Society	Good		✓	-
	Milk Co-operative Soc.	Good		✓	-
	Small Scale Industries	Good		✓	-
	Internet Cafes/ Common Service Center/Wi Fi	wifi		✓	-
	Other Facility	-	-	-	-
Suggestions if any:					

6. **Sustainable /Green Infrastructure Facilities:**

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
O.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	No	-	-	-
P.	Bio-Gas Plant	1	Yes	-	Good
	Solar Street Lights	100	yes	-	Good
	Rain Water Harvesting System	School	yes	-	Good
Q.	Any Other				

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	Available Photo



Recent Projects going on for Development of Village	-
Any NGO working for village development	No

8. Additional Information/ Requirement:

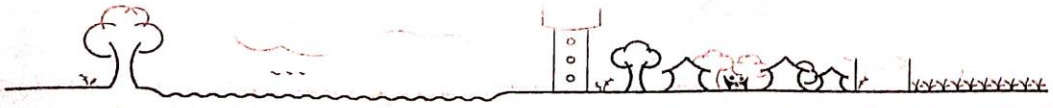
Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities(School Building, Health Center, Panchayat Building, Public Toilets & any other)	Y N N N	Tendering Project
2.	Additional Information/ Requirement	-	-
		-	-
		-	-

9. Smart Village Proposal Design

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	-	-	-

Note: Photographs/ Video/ Drawings of all existing Infrastructure facilities & conditions should be taken by students of respective villages for their record and information.

For Any Administration queries/ Difficulties:
GTU VY Section:
Contact No – 079-23267588
Email ID: rurban@gtu.edu.in



12.2 Survey Form of Smart Village

Gujarat Technological University, Ahmedabad, Gujarat

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Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

An approach towards **"Rurbanisation for Village Development"**

Name of District:	Gandhinagar
Name of Taluka:	Gandhinagar
Name of Village:	Adalaj
Name of Institute:	L.D.C.E
Nodal Officer Name & Contact Detail:	Prof. U.P. Vijgom
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Rameshbhai – Panchayat member
Date of Survey:	20/11/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	11,957	6137	5820	3000

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	2723 ha
2.	Forest Area (In hect.)	–
3.	Agricultural Land Area (In hect.)	730 ha
4.	Residential Area (In hect.)	–
5.	Other Area (In hect.)	1500 ha
6.	Distance to the nearest railway station (in kilometers):	8km

7.	Name of Nearest Town with Distance:	Ahmedabad – Kalol
8.	Distance to the nearest bus station (in kilometers):	within village.
9.	Whether village is connected to all road for the any facility or town or City?	district

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1.	Agriculture
	2.	Job
	3.	labour

Major crops grown in the village:	1.	Wheat
	2.	Juwar
	3.	Bajari

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
1.	**PIPED WATER** Piped Into Dwelling Piped To Yard/Plot Public Tap/Standpipe Tube Well Or Bore Well	Pipe water	✓	–	–
2.	**DUG WELL** Protected Well Un Protected Well	–	–	–	–
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring	–	–	–	–
	Rainwater Tanker Truck Cart With Small Tank				
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel	Narmada Canal	✓	–	–
	Bottled Water Hand Pump Other(Specify)**Lake/ Pond**				

Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	2.5 lakh	1 lakh	50,000
	Underground Sump	Capacity:	50,000		
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET	underground	✓	–	–
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	All weather	✓	–	–
	Main road	All weather	✓	–	–
	Internal streets	All weather	✓	–	–
	Nearest NH/SH/MDR/ODR Dist. in kms.	NH	✓	–	–
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	N	–	–	–
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Y	–	–	–
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	All	–	–	–
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	GEB	24 hrs	–	–

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	Power supply for Domestic Use	✓	✓	–	–
	Power supply for Agricultural Use	✓	✓	–	–
	Power supply for Commercial Use	✓	✓	–	–
	Road/ Street Lights	✓	✓	–	–
	Electrification in Government Buildings/ Schools/ Hospitals	✓	✓	–	–
	Renewable Energy Source Facilities (Y/ N)	N	–	–	–
	LED Facilities	✓	✓	–	–

Suggestions if any:

G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	2	✓	–	–
	Location Condition	Good	✓	–	–
	Community Toilet (With bath/ without bath facilities)	Yes with bath	✓	–	–
	Solid & liquid waste Disposal system available	Yes	✓	–	–
	Any facility for Waste collection from road	–	–	–	–

Suggestions if any:

H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL. OTHER (SPECIFY)	Bore hole	✓	–	–

Suggestions if any:

I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	mix Kutcha / Pucca	✓	–	–

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	✓	✓	–	–
	Sub-Centre		✓	–	–
	PHC	✓			
	BLOCK PHC	✓	✓	–	–
	CHC/RH	✓	✓	–	–
	District/ Govt. Hospital	✓	✓	–	–
	Govt. Dispensary	–	–	–	–
	Private Clinic	–	–	–	
	Private Hospital/	✓	✓	–	
	Nursing Home	–	–	–	–
	AYUSH Health Facility	–	–	–	–
	sonography /ultrasound facility	–	–	–	–
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	✓	✓	–	–
	Primary School	✓	✓	–	–
	Secondary school	✓	✓	–	–
	Higher sec. School	–	–	–	–
	ITI college/ vocational Training Center	–	–	–	–
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	–	–	–	–
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				

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Suggestions if any:

L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)	Good		Yes	
	Public Library (With daily newspaper supply: Y/N)				
	Public Garden	Good		Yes	
	Village Pond	Good		Yes	
	Recreation Center				
	Cinema/ Video Hall				
	Assembly Polling Station	Good		Yes	
	Birth & Death Registration	Good		Yes	

If any of the above Facility is not available in village than approx. distance from village: .....kms.

Suggestions if any:

M.	Other Facilities	Condition	Location	Available (YES)	Available (NO)
	Post-office	Good		Yes	
	Telecommunication Network/ STD booth				
	General Market	Good		Yes	
	Shops (Public Distribution System)	Good		Yes	
	Panchayat Building	Good		Yes	
	Pharmacy/Medical Shop	Good		Yes	
	Bank & ATM Facility	Good		Yes	
	Agriculture Co-operative Society	Good		Yes	
	Milk Co-operative Soc.	Good		Yes	
	Small Scale Industries	Good		Yes	
	Internet Cafes/ Common Service Center/Wi Fi	Good		Yes	
	Youth Club				
	Mahila Mandal	Good		Yes	

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	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries	✓ ✓			
	Other Facility				

Suggestions if any:

N.	Other Facilities	Condition		Available (YES)	Available (NO)
	1. Have these programme implemented the village?				
	2. Are there any beneficiaries in the village from the following programme?				
	3. Janani Suraksha Yojana	Good		yes	
	4. Kishori Shakti Yojana				
	5. Balika Samriddhi Yojana	Good		yes	
	6. Mid-day Meal Programme				
	7. Intergrated Child Development Scheme (ICDS)				
	8. Mahila Mandal Protsahan Yojana (MMPY)	Good		yes	
	9. National Food for work Programme (NFFWP)				
	10. National Social Assistance Programme				
	11. Sanitation Programme (SP)				
	12. Rajiv Gandhi National Drinking Water Mission				
	13. Swarnjayanti Gram Swarozgar Yojana				
	14. Minimum Needs Programme (MNP)				
	15. National Rural Employment Programme	Good		yes	
	16. Employee Guarantee Scheme (EGS)				
	17. Prime Minister Rojgar Yojana (PMRY)	Good		yes	
	18. Jawahar Rozgar Yojana (JRY)				
	19. Indira Awas Yaojna (IAY)				
	20. Samagra Awas Yojana (SAY)				
	21. Sanjay Gandhi Niradhar Yojana (SGNY)	Good		yes	
	22. Jawahar Gram Samridhi Yojana (JGSY)				
	23. Other (SPECIFY)				

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VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	No	-	-	-
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	No	-	-	-
3.	Any Other				

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy	Hard copy			
2.	Recent Projects going on for Development of Village				
3.	Any NGO working for village development	No			
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)	No			

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

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1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other	No	
2.	Additional Information/ Requirement		
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?		

IX. Smart Village / Heritage Details

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?		

સરપંચ
ખડાલજ ગ્રામ પંચાયત
તા.જિ. ગાંધીનગર.

Note: Photographs/ Video/ Drawings of all existing Infrastructure facilities & conditions should be taken by students of respective villages for their record and information.

For Any Administration queries/ Difficulties:
GTU VY Section
Contact No – 079-23267588
Email ID: rurban@gtu.edu.in

12.3 Survey Form of Allocated Village

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

An approach towards **"Rurbanisation for Village Development"**

Name of District:	Ahmedabad
Name of Taluka:	Daskroi
Name of Village:	khodiyar
Name of Institute:	L.D.C.E
Nodal Officer Name & Contact Detail:	Prof. U.P. Nigam utkarsh.nigam99@gmail.com
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Babubhai Patel - Panchayat member
Date of Survey:	10/10/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	3327	1667	1660	620

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	413.39 hectors.
2.	Forest Area (In hect.)	-
3.	Agricultural Land Area (In hect.)	200 hectors.
4.	Residential Area (In hect.)	-
5.	Other Area (In hect.)	-
6.	Distance to the nearest railway station (in kilometers):	within khodiyar

7.	Name of Nearest Town with Distance:	Bopal (10 km)
8.	Distance to the nearest bus station (in kilometers):	5 km
9.	Whether village is connected to all road for the any facility or town or City?	–

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1.	Farming
	2.	mason
	3.	Jobs

Major crops grown in the village:	1.	Groundnut
	2.	cotton
	3.	Bajra

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
1.	**PIPED WATER** Piped Into Dwelling Piped To Yard/Plot Public Tap/Standpipe Tube Well Or Bore Well	Pipe water	✓	–	–
2.	**DUG WELL** Protected Well Un Protected Well	–	–	–	–
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring	–	–	–	–
	Rainwater Tanker Truck Cart With Small Tank				
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump	Pond	–	✓	–

	Other(Specify)**Lake/ Pond**				
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: 1 lakh ltr	✓	–	–
	Underground Sump	Capacity:	–	–	–
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1	underground	✓	–	–
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	All weather	✓	–	–
	Main road	All weather	✓	–	–
	Internal streets	kutchha	–	✓	–
	Nearest NH/SH/MDR/ODR Dist. in kms.				
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	Yes (within village)	✓	–	–
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	No (Vaishnadevi mandir) 2km	–	✓	–
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	All	✓	–	–
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	more than 6hrs	✓	–	–

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	Power supply for Domestic Use	yes	✓	-	-
	Power supply for Agricultural Use	yes	✓	-	-
	Power supply for Commercial Use	yes	✓	-	-
	Road/ Street Lights	yes	✓	-	-
	Electrification in Government Buildings/ Schools/ Hospitals	yes	-	✓	-
	Renewable Energy Source Facilities (Y/ N)	No	-	-	-
	LED Facilities	No	-	-	-

Suggestions if any:

G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	No Block	✓	✓	-
	Location Condition	-	-	-	-
	Community Toilet (With bath/ without bath facilities)	No	-	-	-
	Solid & liquid waste Disposal system available	yes	-	✓	-
	Any facility for Waste collection from road	-	-	-	-

Suggestions if any:

H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL. OTHER (SPECIFY)	✓ ✓			

Suggestions if any:

I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	mix Kutcha/Pucca			

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	Yes	-	✓	-
	Sub-Centre	Yes	✓	-	-
	PHC	Yes	-	-	-
	BLOCK PHC	No	-	-	-
	CHC/RH	No	-	-	-
	District/ Govt. Hospital	No	-	-	-
	Govt. Dispensary	No	-	-	-
	Private Clinic	1 Nos	-	✓	-
	Private Hospital/	No	-	-	-
	Nursing Home	No	-	-	-
	AYUSH Health Facility	No	-	-	-
	sonography /ultrasound facility	No	-	-	-
	If any of the above Facility is not available in village than approx. distance from village: 2-3 ……kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	✓	✓	-	-
	Primary School	✓	✓	-	
	Secondary school	-	-	-	-
	Higher sec. School	-	-	-	-
	ITI college/ vocational Training Center	-	-	-	-
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	-	-	-	-

If any of the above Facility is not available in village than approx. distance from village: .....kms.

Suggestions if any:

L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)	N			
	Public Library (With daily newspaper supply: Y/N)	N			
	Public Garden	N			
	Village Pond	Y(Good)			
	Recreation Center	N			
	Cinema/ Video Hall	N			
	Assembly Polling Station	Y(Good)			
	Birth & Death Registration Office	Y (Good)			

If any of the above Facility is not available in village than approx. distance from village: 3-4...kms.

Suggestions if any:

M.	Other Facilities	Condition	Location	Available (YES)	Available (NO)
	Post-office	Good		✓	
	Telecommunication Network/ STD booth	-			
	General Market	Good		✓	
	Shops (Public Distribution System)	Good			
	Panchayat Building	Fair		✓	
	Pharmacy/Medical Shop				✓
	Bank & ATM Facility				✓
	Agriculture Co-operative Society			✓	
	Milk Co-operative Soc.			✓	
	Small Scale Industries				✓
	Internet Cafes/ Common Service Center/Wi Fi				✓
	Youth Club				✓
	Mahila Mandal			✓	

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries	-	-	-	-
	Other Facility				

Suggestions if any:

N.	Other Facilities	Condition		Available (YES)	Available (NO)
	1. Have these programme implemented the village?				
	2. Are there any beneficiaries in the village from the following programme?				
	3. Janani Suraksha Yojana	Good		yes	
	4. Kishori Shakti Yojana				
	5. Balika Samriddhi Yojana				
	6. Mid-day Meal Programme	Good		yes.	
	7. Intergrated Child Development Scheme (ICDS)				
	8. Mahila Mandal Protsahan Yojana (MMPY)				
	9. National Food for work Programme (NFFWP)				
	10. National Social Assistance Programme				
	11. Sanitation Programme (SP)				
	12. Rajiv Gandhi National Drinking Water Mission				
	13. Swarnjayanti Gram Swarozgar Yojana				
	14. Minimum Needs Programme (MNP)				
	15. National Rural Employment Programme	Good		yes.	
	16. Employee Guarantee Scheme (EGS)				
	17. Prime Minister Rojgar Yojana (PMRY)	Good		yes.	
	18. Jawahar Rozgar Yojana (JRY)				
	19. Indira Awas Yaojna (IAY)				
	20. Samagra Awas Yojana (SAY)				
	21. Sanjay Gandhi Niradhar Yojana (SGNY)				
	22. Jawahar Gram Samridhi Yojana (JGSY)				
	23. Other (SPECIFY)				

7

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	No			
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	No No No			
3.	Any Other				

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy	Hard copy			
2.	Recent Projects going on for Development of Village	Not any			
3.	Any NGO working for village development	No			
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)	No			

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other	NO	
2.	Additional Information/ Requirement	-	-
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	Very few times	-

IX. Smart Village / Heritage Details

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?		

Note: Photographs/ Video/ Drawings of all existing Infrastructure facilities & conditions should be taken by students of respective villages for their record and information.

For Any Administration queries/ Difficulties:
GTU VY Section
Contact No – 079-23267588
Email ID: rurban@gtu.edu.in

સરપંચ
ખોડિયાર ગ્રામ પંચાયત

12.4 Gap Analysis of Allocated Village

VILLAGE GAP ANALYSIS					
Village Facilities	Planning Commission/UDPFI Norms	Village Name:	KHODIYAR		
		Population: 3327			
		Existing	Required as per Norms	Smart Vilage / Cities / Heritage Future Project Design	Gap
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	1	2	-	-1
Primary School	Each Per 2500 population	1	1	-	0
Secondary School	Per 7,500 population	0	1	-	-1
Higher Secondary School	Per 15,000 Population	0	1	-	-1
College	Per 125,000 Population	0	0	-	0
Tech. Training Institute	Per 100000 Population	0	0	-	0
Agriculture Research Centre	Per 100000 Population	0	0	-	0
Skill Development Center	Per 100000 Population	0	0	-	0
Health Facility					
Govt/Panchyat Dispensary or Sub PHC or Health Centre	Each Village	1	1	-	0
Primary Health & Child Health Center	Per 20,000 population	1	1	-	0
Child Welfare and Maternity Home	Per 10,000 population	0	0	-	0
Multispeciality Hospital	Per 100000 Population	0	0	-	0
Public Latrines	1 for 50 families (if toilet is not there in home,	0	2	-	-2

	specially for slum pockets & kutcha house)				
Physical Infrastructure Facilities					
Transportation		Adequate / Inadequate			
Pucca Village Approach Road	Each village	Adequate	-	-	-
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)	Adequate	-	-	-
Drinking Water (Minimum 70 lpcd)		Adequate	-	-	-
Over Head Tank	1/3 of Total Demand	Adequate	1	-	-
U/G Sump	2/3 of Total Demand	Inadequate	1	-	-
Drainage Network - Open		Inadequate	-	-	-
Drainage Network - Cover		Adequate	-	-	-
Waste Management System		Inadequate	-	-	-
Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	0	1	-	-1
community hall and Public Library	Per 15000 Population	0	1	-	-1
Cremation Ground	Per 20,000 population	1	1	-	0
Post Office	Per 10,000 population	1	1	-	0
Gram Panchayat Building	Each individual/group panchayat	1	1	-	0
APMC	Per 100000 Population	0	0	-	0
Fire Station	Per 100000 Population	0	0	-	0
Public Garden	Per village	0	1	-	-1
Police post	Per 40,000Population	0	1	-	-1
Shopping Mall		0	0		
Electrical Design					
Electricity Network	Torrent Power	Adequate	24 hr	-	-

12.5 Summary Details of All the Villages Designs in Table form ~~as~~ Part-I and Part-II

Village	Part- I	Part –II
Magodi (Gandhinagar)	Rain water harvesting system (Civil)	
	Public Toilet Block (Civil)	
	Primary Health Center (Civil)	
	Community Hall (Civil)	
	Skill Development Centre (Civil)	
	Museum (Civil)	
	Solar Based Pumpset For Agriculture (Electrical)	
	Design Of Solar Street Light (Electrical)	
	Design of Combined solar power for the use of high power pump/motor for irrigation (Electrical)	
Ropda (Ahmedabad)	Primary Health Centre (Civil)	
	Post Office (Civil)	
	Bank (Civil)	
	Garden (Civil)	
	Bus Station (Civil)	
	Road (Civil)	
	Green Building (Electrical)	
	Application of motion sensor in building lightning installation for energy saving and reduce carbon footprint. (Electrical)	
	LPG leakage protection system (Electrical)	
Shela Gam (Ahmedabad)	ATM (Civil)	
	Community Hall (Civil)	
	Primary Health Centre (Civil)	
	Automatic plant watering system based on soil moisture using arduino (Electrical)	
	Automatic Power theft detection system (Electrical)	
	Solar Tracking system (Electrical)	
	Public Toilet (Civil)	
	Library (Civil)	

Lapkaman (Ahmedabad)	Primary Health Centre (Civil)	
	KishanSeva (Civil)	
	Post Office (Civil)	
	Smart design–design of pavement in graveyard with paver block(Civil)	
	Smart Irrigation System (Electrical)	
	Automatic solar tracking system (Electrical)	
	GSM board synchronization with agriculture pump (Electrical)	
Khodiyar (Ahmedabad)	Public Toilet (Civil)	Community Center(Civil)
	Medical Shop (Civil)	Gram Panchayat(Civil)
	Library (Civil)	Aanganwadi(Civil)
	Garden (Civil)	Market Yard (Civil)
	Post Office (Civil)	Crematorium(Civil)
	Bio Gas Plant (Civil)	Hospital(Civil)
Patosan (Banaskantha)	Primary Health Centre (Civil)	
	Solar Water Distribution System (Civil)	
	Park (Civil)	
	Library (Civil)	
	Community Hall (Civil)	
	Toilet (Civil)	

12.7 Summary of Good Photographs in Table Format (village visits, Ideal, Smart Village or any other)

IDEAL VISIT PICS

Entrance

Primary school

Aanganwadi

Chowk

Clinic

Agro Service Centre

Smart Village Pics

Gram Panchayat

Kanya Shala(School)

Bank & ATM

Sahakari Mandli

Post Office

Public Health Centre

Khodiyar Village Pics

Gram Panchayat

Primary School

Temple

Health & Wellness Centre

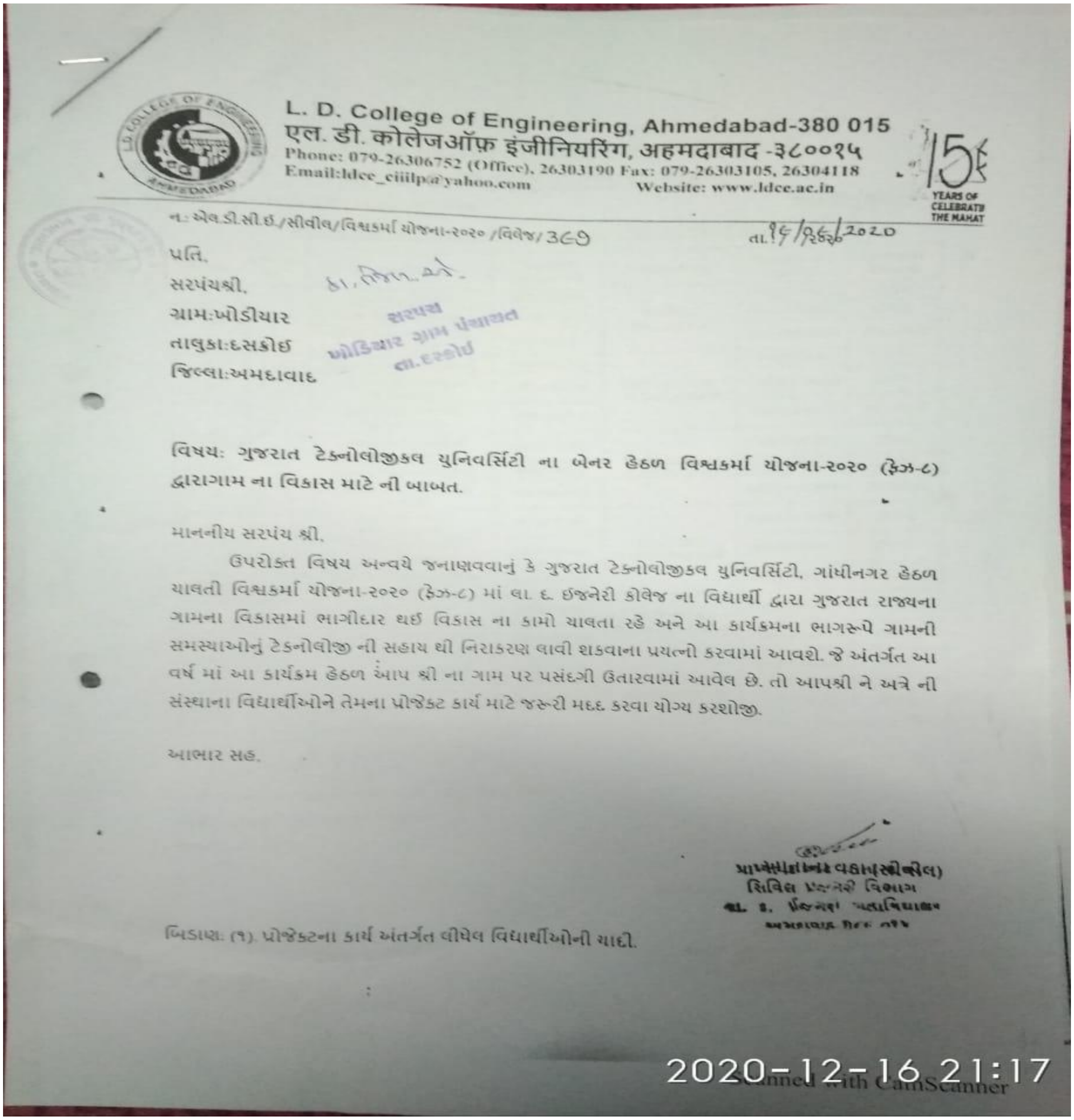
Chowk

Entrance

12.8 Village Interaction with sarpanch Report with the photograph

Fig 12.4 Village Interaction with sarpanch Report with the photograph

12.9 Sarpanch Letter giving information about the village development



L. D. College of Engineering, Ahmedabad-380 015
एल. डी. कोलेजऑफ़ इंजीनियरिंग, अहमदाबाद -३८००१५
Phone: 079-26306752 (Office), 26303190 Fax: 079-26303105, 26304118
Email:ldce_ciiilp@yahoo.com Website: www.ldce.ac.in

નં: એલ.ડી.સી.ઇ./સીવીલ/વિશ્વકર્મા યોજના-૨૦૨૦ /વિવેજ/ 369 તા.16/12/2020

પ્રતિ,
સરપંચશ્રી,
ગ્રામ:ખોડીયાર
તાલુકા:દસક્રોઇ
જિલ્લા:અમદાવાદ

વિષય: ગુજરાત ટેક્નોલોજીકલ યુનિવર્સિટી ના બેનર હેઠળ વિશ્વકર્મા યોજના-૨૦૨૦ (ફેઝ-૮) દ્વારાગામ ના વિકાસ માટે ની બાબત.

માનનીય સરપંચ શ્રી,

ઉપરોક્ત વિષય અન્વયે જનાણવવાનું કે ગુજરાત ટેક્નોલોજીકલ યુનિવર્સિટી, ગાંધીનગર હેઠળ ચાલતી વિશ્વકર્મા યોજના-૨૦૨૦ (ફેઝ-૮) માં લા. દ. ઇજનેરી કોલેજ ના વિદ્યાર્થી દ્વારા ગુજરાત રાજ્યના ગામના વિકાસમાં ભાગીદાર થઈ વિકાસ ના કામો ચાલતા રહે અને આ કાર્યક્રમના ભાગરૂપે ગામની સમસ્યાઓનું ટેકનોલોજી ની સહાય થી નિરાકરણ લાવી શકવાના પ્રયત્નો કરવામાં આવશે. જે અંતર્ગત આ વર્ષ માં આ કાર્યક્રમ હેઠળ આપ શ્રી ના ગામ પર પસંદગી ઉતારવામાં આવેલ છે. તો આપશ્રી ને અત્રે ની સંસ્થાના વિદ્યાર્થીઓને તેમના પ્રોજેક્ટ કાર્ય માટે જરૂરી મદદ કરવા યોગ્ય કરશોજી.

આભાર સહ.

બિડાણ: (૧). પ્રોજેક્ટના કાર્ય અંતર્ગત લીધેલ વિદ્યાર્થીઓની યાદી.

Fig 12.5 Sarpanch Letter giving information about the village development

PART:2

CHAPTER 13:

From the Chapter- 9 future designs of the aspects (Feasibility, Construction, Operation and maintenance of various design options in Rural Areas along with cost with AutoCAD designs / planning with any software

13.1Reasons for Students Recommending this Designs

1. Design of Community Centre

There was no any place in the village where social gathering can be done by the village at the time of any festivals or some event in the village and so we have proposed the design of community centre so that they can perform the social activities and functions in it.

2. Design of Gram Panchayat

The current condition of the gram panchayat is not that upto level and some changes is to be done in it and so we have proposed the design with all the infrastructure that a gram panchayat should have.

3. Design of Aanganwadi

There is sufficient aanganwadi in the village and their condition is also good but they are lacking in facilities that the students and teachers are deprived of and so we have proposed the design of aanganwadi in the village.

4. Design of Market Yard

There is no any proper place in the village where all the vegetable and other grocery items vendors meet and sell their vegetables and so to centralize this we have proposed the market yard in the village.

5. Design of Crematorium

There is only one crematorium in the village so that in this time of pandemic where the death rate is high and there is lack of crematorium due to which people of the village are facing problem in the crematorial activities of any dead person.

6. Design of Hospital

There is only one sub health centre in the village and so when we were interacting with the villagers they shared the problem of health facilities and unavailability of the doctor when they are in need and so we proposed the design of hospital.

1. Design of Community Center

Fig 13.1:- Detailed Plan of Community Center

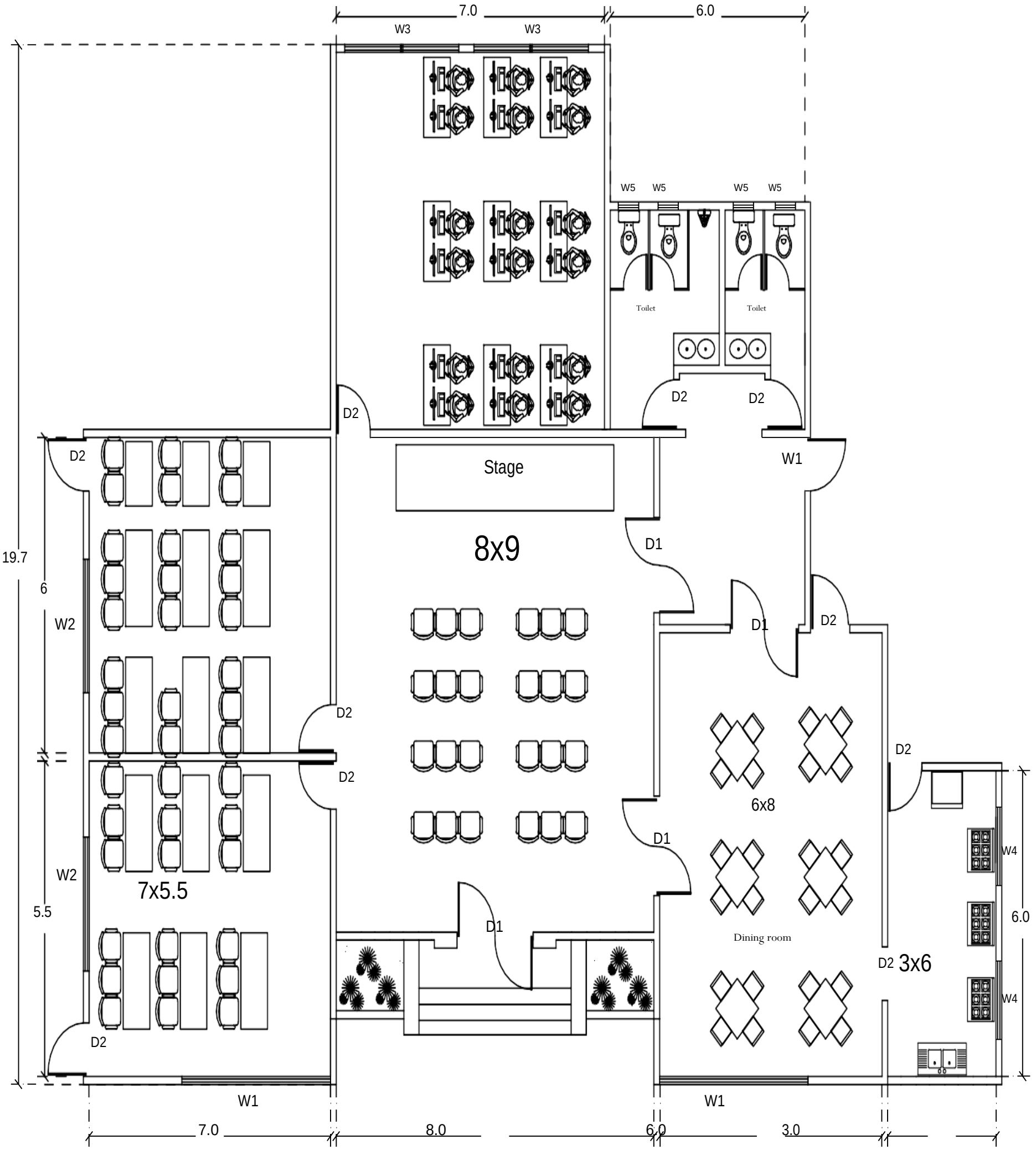


Fig 13.2:- Foundation Section of Community Center

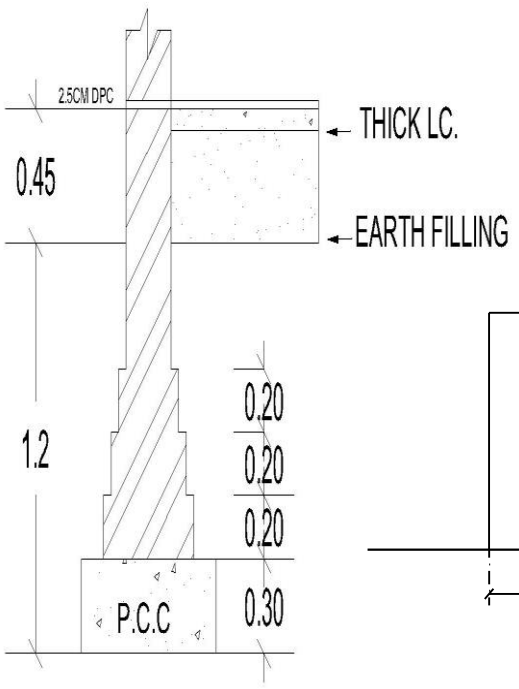
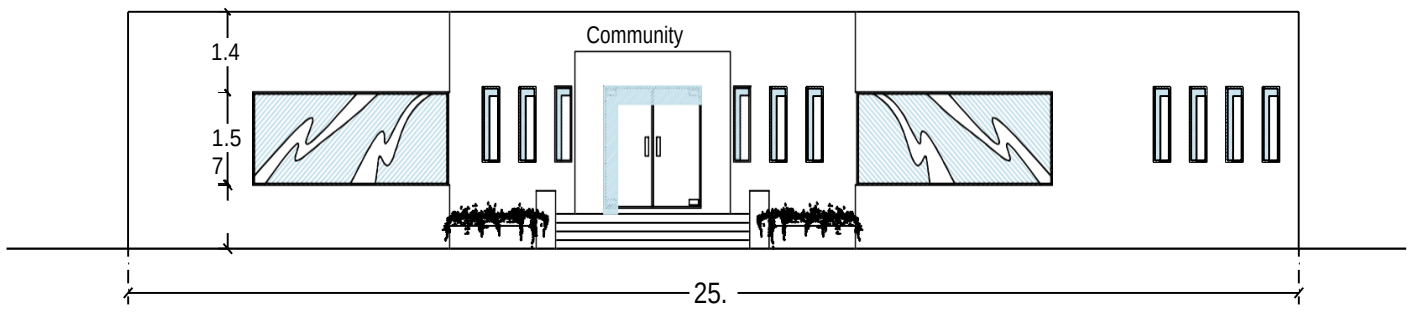


Fig13.3:- Elevation of Community Center



CONSTRUCTION WORK OF AN COMMUNITY CENTER AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

MEASUREMENT SHEET

ITEM	DESCRIPTION	NO	LENGTH	B/W	H/D	QUANTITY	UNITS
1.	**Excavation for**						
	Foundation						
	CL=120.5 m	-	120.5	0.9	1.2	130.14	Cu.m
2.	**PCC Work in Foundation**						
	L=120.5 m	-	120.5	0.9	0.3	32.535	Cu.m
3.	**Brick Masonary upto**						
	Plinth						
	1st Step:-						
	L= 122 m	-	122	0.6	0.2	14.64	Cu.m
	2nd Step:-						
	L= 122.5 m	-	122.5	0.5	0.2	12.25	Cu.m
	3rd Step:-						
	L= 123 m	-	123	0.4	0.2	9.84	Cu.m
	4th Step:-						
	L= 123.5 m	-	123.5	0.3	0.75	27.785	Cu.m
	Total Brickwork Upto					97.05	Cu.m
	Plinth						
4.	**Brickwork in Super**						
	Structure						
	All Walls of 300 mm						
	L= 123.5 m	-	123.5	0.3	4.1	151.905	Cu.m
	Deduction for doors and						
	Windows:-						

	Door – D1	4	1.9	0.3	2.1	4.788	Cu.m
	Door = D2	10	1.2	0.3	2.1	7.56	Cu.m
	Window – W1	3	4	0.3	1.6	5.76	Cu.m
	Window – W2	2	3	0.3	1.6	2.88	Cu.m
	Window – W3	2	3.4	0.3	1.6	3.264	Cu.m
	Window – W4	2	2.1	0.3	1.2	1.512	Cu.m
	Window – W5	4	0.6	0.3	0.6	0.432	Cu.m
	Total Deduction for doors					26.196	Cu.m
	and Windows:-						
	Net Brickwork in SS					125.709	Cu.m
5.	**Plastering**						
(i)	**Ceiling**						
	Stage Hall	-	8	9	-	72	Sq.m
	Training Centre(i)	-	7	5.5	-	38.5	Sq.m
	Training Centre(ii)	-	7	6	-	42	Sq.m
	Computer Room	-	7	7	-	49	Sq.m
	Dining Room	-	6	8	-	48	Sq.m
	Kitchen	-	3	6	-	18	Sq.m
	Toilet	-	6	3	-	18	Sq.m
(ii)	**Wall Plaster**						
	(i)Stage Hall						
	Long Wall	2	9	-	4.1	73.8	Sq.m
	Short Wall	2	8	-	4.1	65.6	Sq.m
	(ii)Training Centre(i)						
	Long Wall	2	7	-	4.1	57.4	Sq.m
	Short Wall	2	5.5	-	4.1	45.1	Sq.m
	(iii)Training Centre(ii)						
	Long Wall	2	7	-	4.1	57.4	Sq.m
	Short Wall	2	6	-	4.1	49.2	Sq.m

	(iv) Computer Room						
	Long Wall	2	7	-	4.1	57.4	Sq.m
	Short Wall	2	7	-	4.1	57.4	Sq.m
	(v)Dining Room						
	Long Wall	2	8	-	4.1	65.6	Sq.m
	Short Wall	2	6	-	4.1	49.2	Sq.m
	(vi)Kitchen						
	Long Wall	2	6	-	4.1	49.2	Sq.m
	Short Wall	2	3	-	4.1	24.6	Sq.m
6.	**External Plaster**						
	Long Wall	2	23	-	4.1	188.6	Sq.m
	Short Wall	2	18.5	-	4.1	151.7	Sq.m
	Total Plaster(I+E)					1277.7	Sq.m
	Deduction for Door and						
	Window for Plaster						
	Door – D1	4	1.9	-	2.1	15.96	Sq.m
	Door = D2	10	1.2	-	2.1	25.2	Sq.m
	Window – W1	3	4	-	1.6	19.2	Sq.m
	Window – W2	2	3	-	1.6	9.6	Sq.m
	Window – W3	2	3.4	-	1.6	10.88	Sq.m
	Window – W4	2	2.1	-	1.2	5.04	Sq.m
	Window – W5	4	0.6	-	0.6	1.44	Sq.m
	Total Deduction					87.32	Sq.m
	Net Plaster(I+E)					1190.38	Sq.m
7.	**Painting**						
	Same as Plastering					1190.38	Sq.m

8.	**Flooring**						
	Same as Ceiling					285.5	Sq.m
9.	**RCC Slab**						
	Stage Hall	-	8	9	0.12	8.64	Cu.m
	Training Centre(i)	-	7	5.5	0.12	4.62	Cu.m
	Training Centre(ii)	-	7	6	0.12	5.04	Cu.m
	Computer Room	-	7	7	0.12	5.88	Cu.m
	Dining Room	-	6	8	0.12	5.76	Cu.m
	Kitchen	-	3	6	0.12	2.16	Cu.m
	Toilet	-	6	3	0.12	2.16	Cu.m
	Total RCC Work					34.26	Cu.m

CONSTRUCTION WORK OF AN COMMUNITY CENTER AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

ABSTRACT SHEET

Sr	Description	Quantity	Rate	Per	Amount(Rs)
1.	Excavation Work	130.14	160	Cu.m	20822.4
2.	P.C.C	32.535	3000	Cu.m	97605
3.	Brickwork in	97.05	3200	Cu.m	310560
	Foundation				
4.	Brickwork in	125.709	3500	Cu.m	439981.5
	Superstructure				
5.	Plastering	1190.38	150	Sq.m	178557
6.	Flooring	285.5	900	Sq.m	256950
7.	RCC Slabs	34.26	4900	Cu.m	167874
8.	Painting	1190.38	25	Sq.m	29759.5
	Contiguous Charges (5% Rupees)				75105.475
	10% Contractor Charges				150210.95
	2% Water Charges				30042.19
	Total Amount Rupees				1757468.115
	Round Off To Rupees				1760000

2. Design of Gram Panchayat

Fig 13.4:- Detailed Plan of Gram Panchayat

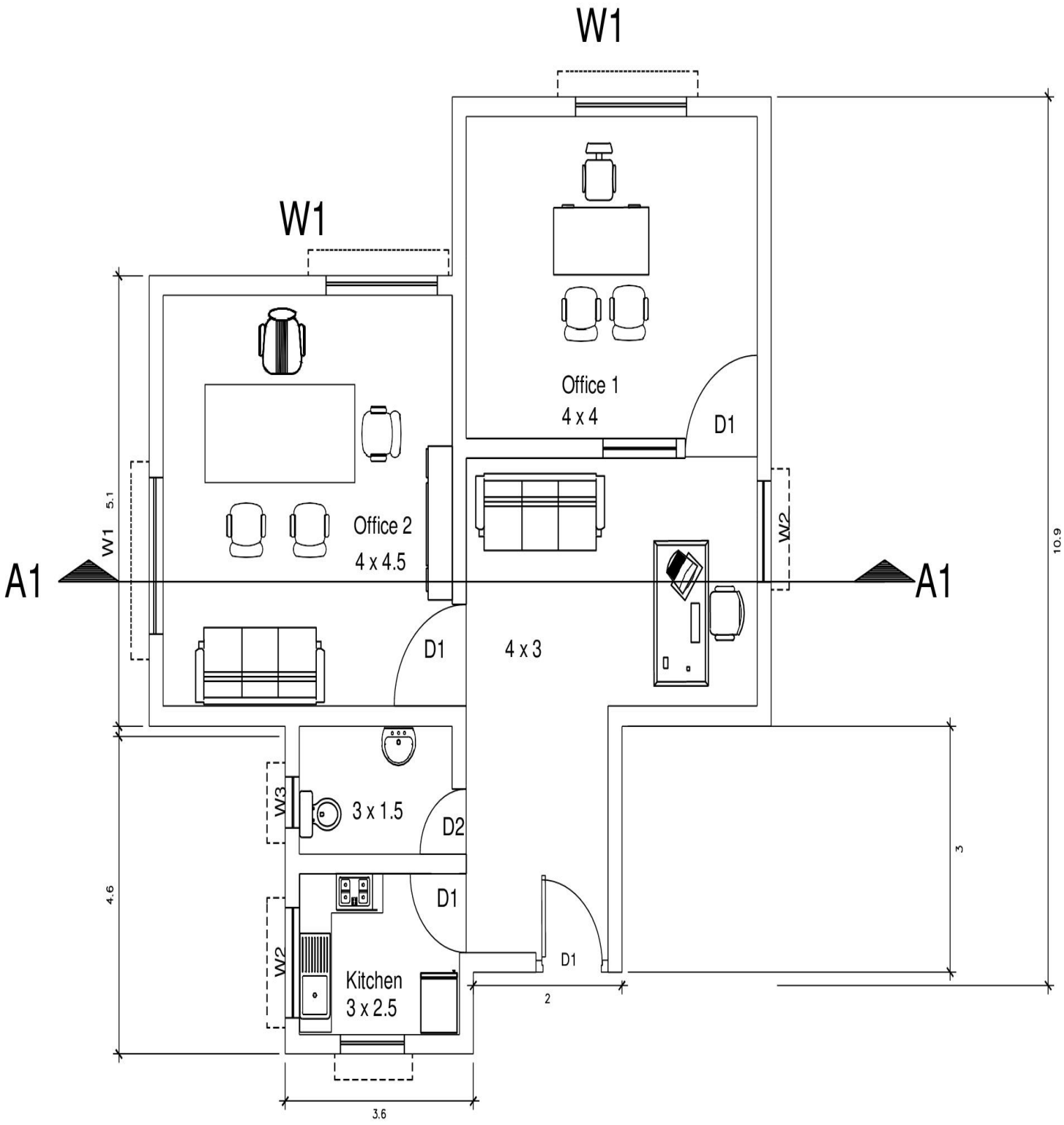


Fig13.5:-Section of Gram Panchayat

CONSTRUCTION WORK OF AN GRAM PANCHAYAT
AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

MEASUREMENT SHEET

Sr.No	Description	No	Length (m)	Breath /Width(m)	Height/Depth(m)	Quantity (m3)	Unit
1	**Excavation for**	-	57.9	0.9	1.4	74.13	m3
	Foundation						
	C.L = 62.4 m						
	L = 62.4 – 0.5*9*10						
	L= 57.9 m						
2	**PCC in Foundation**	-	57.9	0.9	0.3	15.6	m3
	L = 57.9 m						
3	**Brick Masonry upto**						
	Plinth						
	1st Step:-	-	59.4	0.6	0.2	7.128	m3
	L= 59.4 m						
	2nd Step:-	-	59.9	0.5	0.2	5.96	m3
	L= 59.9 m						
	3rd Step:-	-	60.4	0.4	0.2	4.8	m3
	L= 60.4 m						
	4th Step:-	-	60.9	0.3	0.75	13.7	m3
	L= 60.9 m						
	Total Brickwork upto					31.6	m3
	Plinth						
4	**Brickwork in Super**						
	Structure						
	All wall of 300 mm.						
	L= 60.9 m	-	60.9	0.3	3.15	57.55	m3

	Parapet Wall:-	-	60.9	0.3	0.15	2.74	m3
	Total Brickwork in SS					60.24	m3
	Deduction for Door and						
	Window:-						
	Door-D1	4	1.2	0.2	2.1	2.016	m3
	Door-D2	1	0.8	2.1	0.2	1.68	m3
	Window-W1	3	1.8	1.6	0.2	1.728	m3
	Window-W2	3	1.2	1.6	0.2	1.152	m3
	Window-W3	1	0.6	0.6	0.2	0.072	m3
	Total Deduction for					6.652	m3
	Doors and Windows						
	Net Brickwork in SS					53.58	m3
5	**Earth-Filling**						
	Office 2	1	4	4.5	0.45	8.1	m2
	Office 1	1	4	4	0.45	7.2	m2
	Passage	1	4	3	0.45	5.4	m2
	Toilet	1	3	1.5	0.45	2.025	m2
	Kitchen	1	3	2.5	0.45	3.375	m2
	Other	1	2	3	0.45	2.7	m2
	Total Earth-filling					28.8	m2
6	**Plastering**						
6.1	**Internal Plaster**						
(i)	**Ceiling**						
	Office 2	1	4	4.5	-	18	Sq.m
	Office 1	1	4	4	-	16	Sq.m
	Passage	1	4	3	-	12	Sq.m
	Toilet	1	3	1.5	-	4.5	Sq.m
	Kitchen	1	3	2.5	-	7.5	Sq.m
	Other	1	2	3	-	6	Sq.m
(ii)	**Wall Plaster**						
	(i)Office 2						
	Long wall	2	4.5	-	3.15	28.35	Sq.m

	Short wall	2	4	-	3.15	25.2	Sq.m
	(ii) Office 1						
	Long wall	2	4	-	3.15	25.2	Sq.m
	Short wall	2	4	-	3.15	25.2	Sq.m
	(iii)Passage						
	Long wall	2	4	-	3.15	25.2	Sq.m
	Short wall	2	3	-	3.15	18.9	Sq.m
	(iv) Toilet						
	Long wall	2	3	-	3.15	18.9	Sq.m
	Short wall	2	1.5	-	3.15	9.45	Sq.m
	(v) Kitchen						
	Long wall	2	3	-	3.15	18.9	Sq.m
	Short wall	2	2.5	-	3.15	15.75	Sq.m
	Total Internal Plaster					173.84	Sq.m
6.2	**External Plaster**						
	(Part 1)	1	11.9	-	3.8	45.22	Sq.m
	(Part 2)	2	4.6	-	3.8	34.96	Sq.m
	(Part 3)	1	5.1	-	3.8	19.38	Sq.m
	(Part 4)	1	4.6	-	3.8	17.48	Sq.m
	(Part 5)	1	2	-	3.8	7.6	Sq.m
	(Part 6)	1	4.6	-	3.8	17.48	Sq.m
	(Part 7)	1	2	-	3.8	7.6	Sq.m
	Total External Plaster					149.72	Sq.m
	Deduction for Door and						
	Window for plaster						
	Door-D1	3.5	1.2	-	2.1	8.82	Sq.m
	Door-D2	1	0.8	-	2.1	1.68	Sq.m
	Window-W1	1.5	1.8	-	2.1	5.67	Sq.m
	Window-W2	2	1.2	-	2.1	5.04	Sq.m
	Window-W3	0.5	0.6	-	2.1	0.63	Sq.m
	Total Deduction for					21.84	Sq.m
	Doors and Windows						
	Total Plaster(I+E)					301.72	Sq.m
	=173.84+149.72-21.84						
7	**Whitewashing**					301.72	Sq.m

	Same as Plastering						
8	**Painting**					301.72	Sq.m
	Same as Plastering						
9	**RCC Work**						
	(Part 1)	-	7.9	4.6	0.12	4.3608	Cu.m
	(Part 2)	-	3	2	0.12	0.72	Cu.m
	(Part 3)	-	3.6	4.6	0.12	1.9872	Cu.m
	(Part 4)	-	5.1	4	0.12	2.448	Cu.m
	Total RCC Work					9.516	Cu.m
10	**Flooring**					28.8	Sq.m
	Same as ceiling or Earth						
	Filling work						

CONSTRUCTION WORK OF AN GRAM PANCHAYAT AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

ABSTRACT SHEET

Sr	Description	Quantity	Rate	Per	Amount(Rs)
1.	Excavation Work	74.13	160	Cu.m	11860.8
2.	P.C.C	15.6	3000	Cu.m	46800
3.	Brickwork in	31.6	3200	Cu.m	101120
	Foundation				
4.	Brickwork in	53.58	3500	Cu.m	187530
	Superstructure				
5.	Earthfilling	28.8	700	Cu.m	20160
6.	Plastering	301.72	150	Sq.m	45258
7.	Flooring	28.8	900	Sq.m	25920
8.	RCC Slabs	9.516	4900	Cu.m	46628.4
9.	Painting	301.72	25	Sq.m	7531.25
	Total Rupees				492808.45
	Contiguous Charges (5% Rupees)				24640.4225
	10% Contractor Charges				49280.845
	2% Water Charges				9856.169
	Total Amount Rupees				576585.0415
	Round Off To Rupees				5,80,000

3. Design of Aanganwadi

Fig 13.6:- 3D View of Anganwadi

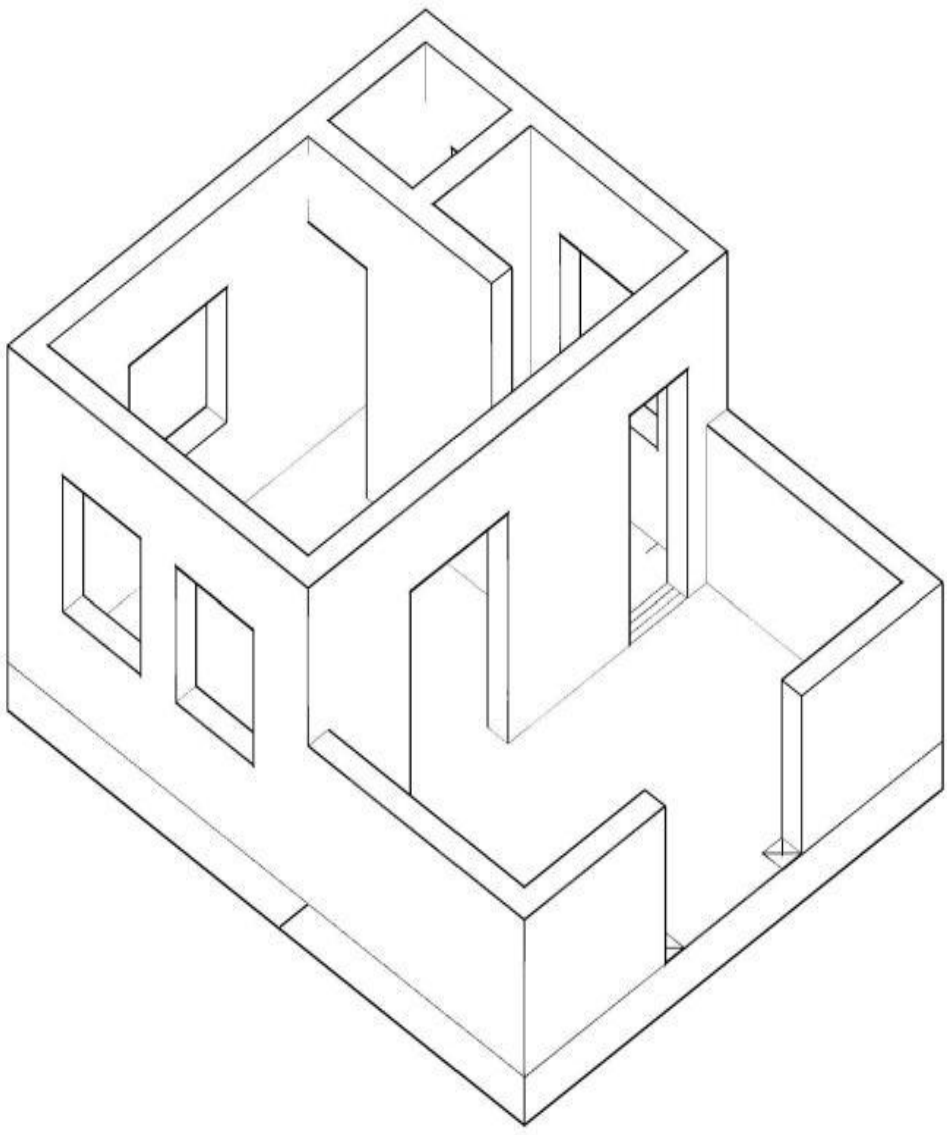
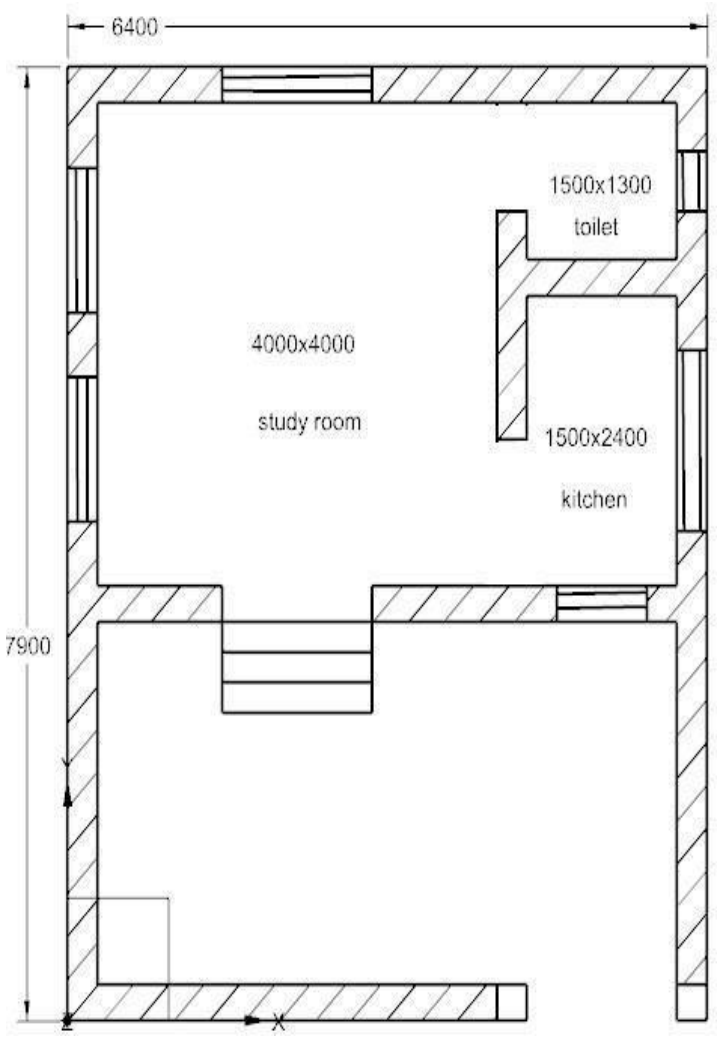


Fig 13.7:- Detailed Plan of Anganwadi



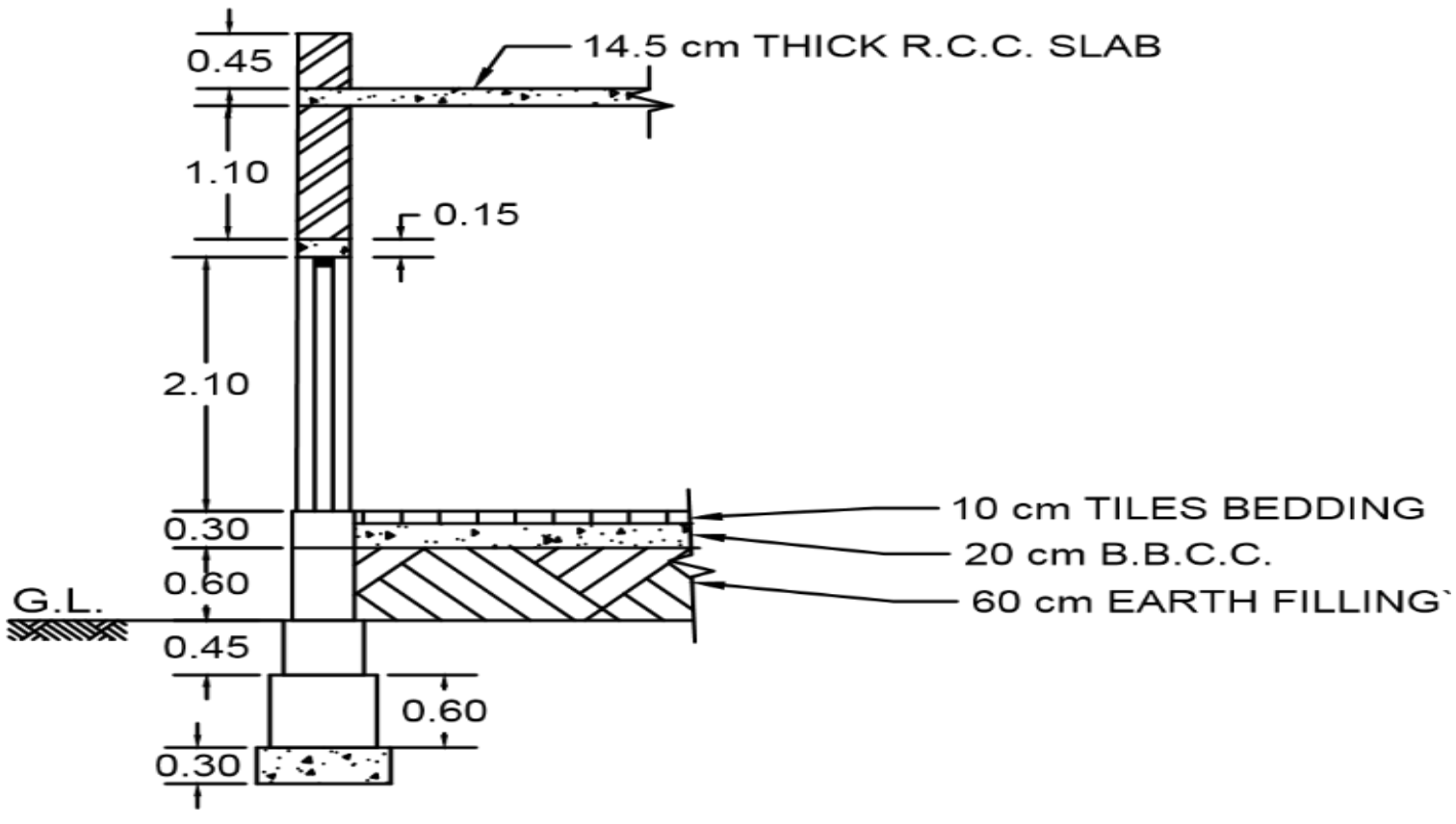


Fig 13.8:- Section of Aaganwadi

CONSTRUCTION WORK OF AN AANGANWADI AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

MEASUREMENT SHEET

Sr.No	DESCRIPTION	NO	L	B/W	H/D	QUANTIY	UNITS
ITEM NO.:- 1							
	Excavation for						
	Foundation						
	L= 49.5 m	1	49.5	0.75	1.35	50.12	Cu.m.
	TOTAL QTY					50.12	Cu.m.
ITEM NO.:- 2							
	C.C. work in foundation						
	L=49.5 m	1	32.4	0.75	0.3	11.13	Cu.m.
	TOTAL QTY					11.13	Cu.m
ITEM NO.:- 3							
	Brick masonry work in						
	Foundation						
	1st step						
	L=47.7 m	1	47.7	0.6	0.6	17.17	Cum.
	2nd step						
	L= 48.15 m	1	48.15	0.45	0.45	9.75	Cu.m.
	Total Brick masonry					26.32	Cu.m.
	work in foundation						
	Brick masonry work						
	for step						
	1st step	1	1.5	0.9	0.25	0.3375	Cu.m.
	2st step	1	1.5	0.6	0.25	0.225	Cu.m.
	3st step	1	1.5	0.3	0.25	0.1125	Cu.m

							.
	Total Brick masonry					0.675	Cu.m.
	work forstep						
ITEM NO.:- 4							
	Earth filling work						
	Study Room	1	4	4	0.45	7.2	Cu.m.
	Kitchen	1	1.5	2.4	0.45	1.62	Cu.m.
	Toilet	1	1.5	1.3	0.45	0.87	Cu.m.
					Total	9.70	Cu.m.
ITEM NO.:- 5							
	D.P.C work						
	L=49.5 m	1	49.5	0.3		14.85	Rmt
ITEM NO.:- 6							
	Brick masonry work in						
	super structure						
	L=49.5 m	1	49.5	0.3	3.35	49.74	Cu. m.
	Deduction for door &						
	Window						
	Door – D1	1	1.5	0.3	2.1	0.945	Cu.m.
	Door – D2	1	1.2	0.3	2.1	0.756	Cu.m.
	Door – D3	1	0.9	0.3	2.1	0.567	Cu.m.
	Window – W1	2	1.5	0.3	1.2	1.08	Cu.m.
	Window – W2	2	1.2	0.3	1.2	0.864	Cu.m.
	Window – W3	1	0.9	0.3	1.2	0.324	Cu.m.
	Ventilator – V	1	0.5	0.3	0.5	0.075	Cu.m.
	Deduction for lintel						
	Door – D1	1	1.5	0.3	0.15	0.0675	Cu.m.
	Door – D2	1	1.2	0.3	0.15	0.054	Cu.m.
	Door – D3	1	0.9	0.3	0.15	0.040	Cu.m.
	Window – W1	2	1.5	0.3	0.15	0.135	Cu.m.
	Window – W2	2	1.2	0.3	0.15	0.108	Cu.m.
	Window – W3	1	0.9	0.3	0.15	0.040	Cu.m.
	Ventilator – V	1	0.5	0.3	0.15	0.0225	Cu.m.
			Total Deduction			5.078	Cu.m.
	Total Brick masonry						

	Work						
	=49.74– 5.078					44.662	Cu.m.
ITEM NO.:- 7							
	Lintel work as per						
	Above					44.662	Cu.m.
ITEM NO.:- 8							
	Internal plaster work(12mmthick)						
	Study room	2	4		3.35	26.8	Sq.m.
		2	4		3.35	26.8	Sq.m.
		1	4	4		16	Sq.m.
	kitchen	2	1.5		3.35	10.05	Sq.m.
		2	2.4		3.35	16.08	Sq.m.
		1	1.5	2.4		3.6	Sq.m.
	Toilet	2	1.5		3.35	10.05	Sq.m.
		2	1.3		3.35	8.71	Sq.m.
		1	1.5	1.3		1.95	Sq.m.
					Total	120.04	Sq.m.
	Deduction In internal plaster						
	Door – D1	½ x 1	1.5		2.1	1.575	Sq.m.
	Door – D2	½ x 1	1.2		2.1	1.26	Sq.m.
	Door – D3	½ x 1	0.9		2.1	0.945	Sq.m.
	Window – W1	½ x 2	1.5		1.2	1.8	Sq.m.
	Window – W2	½ x 2	1.2		1.2	1.44	Sq.m.
	Window – W3	½ x 1	0.9		1.2	0.54	Sq.m.
	Ventilator – V	½ x 1	0.5		0.5	0.125	Sq.m.
					Total	7.685	Sq.m.
	Total internal Plaster						
	Work						
	=120.04 –7.685					112.35	Sq.m.
ITEM NO.:- 9							
	White wash as per					112.35	Sq.m.
	Above						
ITEM NO.:- 10							
	Brick masonry work	1	14.7	0.20	0.45	1.323	Cu.m.
	For parapet wall						
ITEM NO.:- 11							

	External plaster work						
	For long wall	2	4.6		4.845	44.57	Sq.m.
	For short wall	2	6.4		4.845	62.01	Sq.m.
	Inner side of parapetwall	1	14.7		0.45	6.661	Sq.m.
	Top of parapetwall	1	14.7	0.2		2.94	Sq.m.
	TOTAL					116.18	Sq.m.
	Deduction for door &						
	window						
	Door – D1	½ x 1	1.5		2.1	1.575	Sq.m.
	Window – W1	½ x 2	1.5		1.2	1.8	Sq.m.
	Window – W2	½ x 2	1.2		1.2	1.44	Sq.m.
	Window – W3	½ x 1	0.9		1.2	0.54	Sq.m.
	Ventilator – V	½ x 1	0.5		0.5	0.125	Sq.m.
					Total	5.48	Sq.m.
	Total External plaster work						
	=116.18 – 5.48					179.94	Sq.m.
ITEM NO.:- 12							
	External white wash as per above					179.94	Sq.m.
ITEM NO.:- 13							
	Flooring work						.
	Study Room	1	4.0	4.0		16.00	Sq.m.
	Kitchen	1	1.5	2.4		3.60	Sq.m.
	Toilet	1	1.5	1.3		1.95	Sq.m.
	Step:						
	Riser	2	1.5		0.15	0.45	Sq.m.
	Tread	3	1.5	0.25		1.125	Sq.m.
	Door Sill						
	Door1	1	1.5	0.3		0.45	Sq.m.
	Door2	1	1.2	0.3		0.36	Sq.m.
	Door3	1	0.9	0.3		0.27	Sq.m.
	Total Flooring work					24.20	Sq.m.
ITEM NO.:- 14							
	Skirting work						
	Study Room	2	4			8.0	Rmt
		2		4		8.0	Rmt
	Kitchen	2	1.5			3.0	Rmt
		2		2.4		4.8	Rmt

	Door1	2	1.5			3.0	Rmt
	Door2	2	1.2			2.4	Rmt
	Door3	2	0.9			1.8	Rmt
	Total Skirting work					31.00	Rmt
ITEM NO.:- 15							
	Plaster Work on Compound Wall						
	Internal plaster	2	3		1.5	9.0	Sq.m.
		1	6.1		1.5	9.15	Sq.m.
	External Plaster						
		2	3.3		1.5	9.9	Sq.m.
		1	6.4		1.5	9.6	Sq.m.
	Top of compound wall	1	9.7	0.3		2.91	Sq.m.
				Total		40.56	Sq.m.
	Deduction For Gate	1	1.5		1.5	2.25	Sq.m.
	Total Plaster on Compound Wall	40.56-2.25				38.31	Sq.m.
ITEM NO.:- 16							
	R.C.C Work for slab						
	L=4.6 m	1	4.6	6.4	0.145	1.484	Cu.m.
	B= 6.4 m						
	H= 0.145 m						

CONSTRUCTION WORK OF AN AANGANWADI AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

ABSTRACT SHEET

Sr	Description	Quantity	Rate	Per	Amount(Rs)
1.	Excavation Work	50.12	155	Cu.m.	7768.6
2.	P.C.C	11.13	3000	Cu.m.	33390
3.	Brickwork in	26.32	3200	Cu.m.	84224
	Foundation				
4.	Brickwork in	44.66	3500	Cu.m.	156310
	Superstructure				
5.	Plastering	330.6	150	Sq.m.	49590
6.	Flooring	24.20	855	Sq.m.	20691
7.	RCC Slabs	1.484	4900	Cu.m.	7271.6
8.	Whitewashing	292.29	15	Sq.m.	4384.35
9.	Painting	330.6	25	Sq.m.	8265
	Total Rupees				371894.55
	Contiguous Charges (5% Rupees)				18594.72
	10% Contractor Charges				37189.45
	2% Water Charges				7437.89
	Total Amount Rupees				435115.34
	Round Off To Rupees				436000.00

4. Design of Market Yard

Fig 13.9:- Detailed Plan of Market Yard

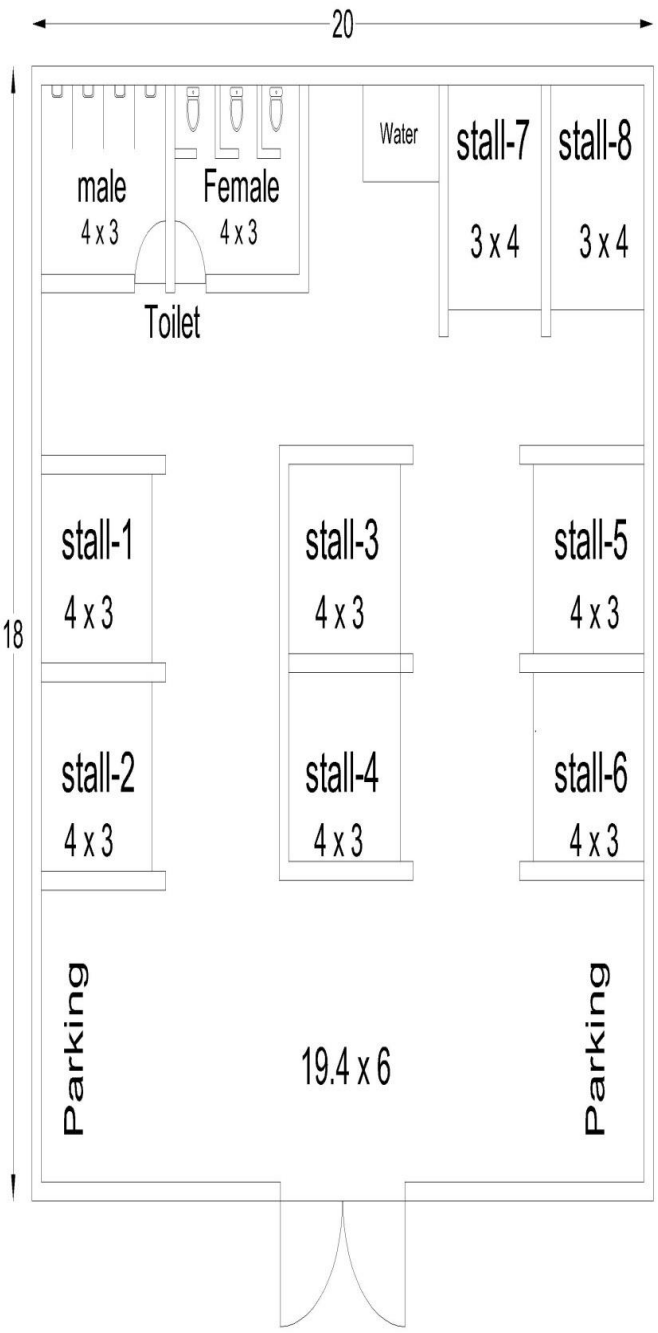
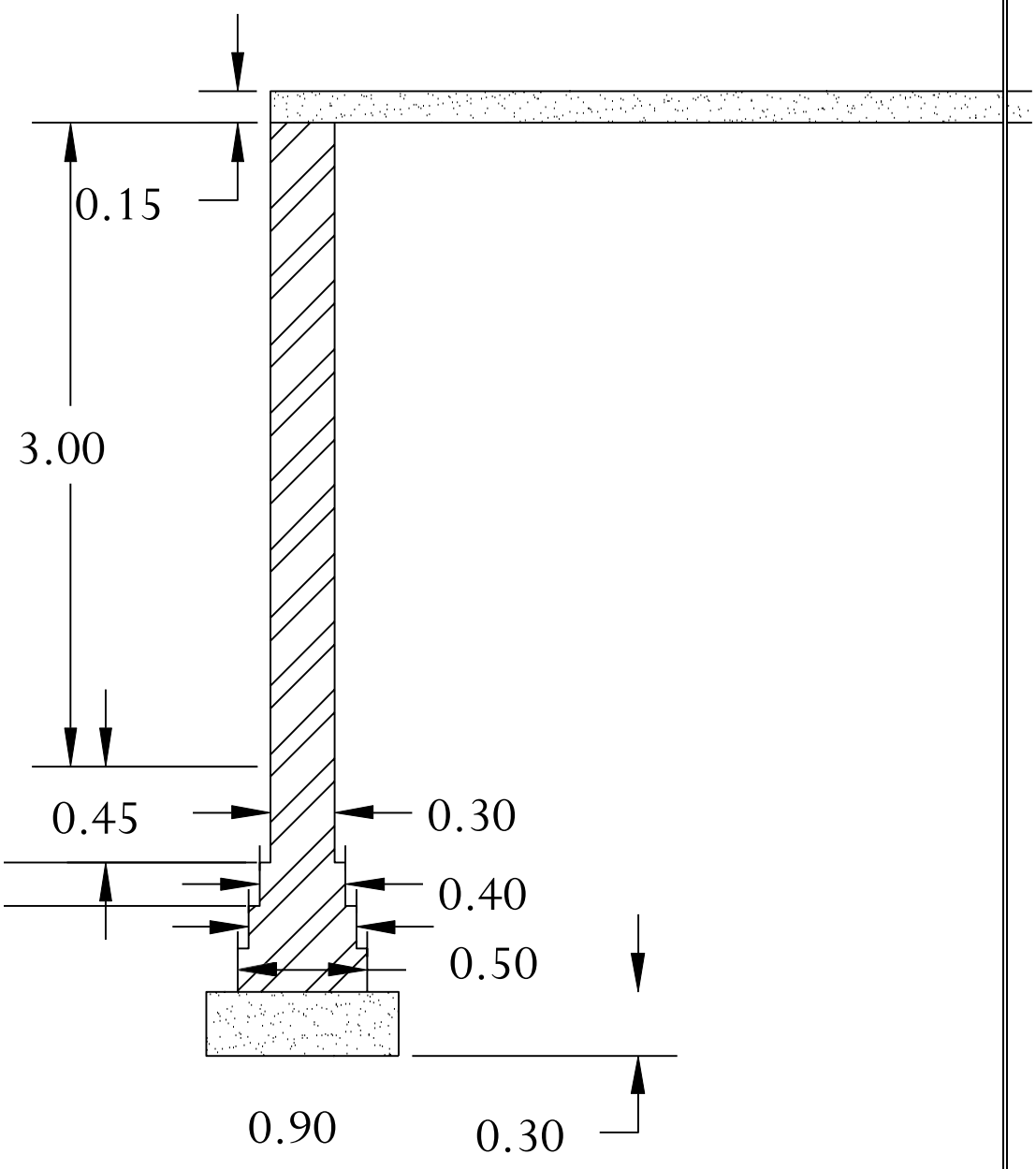


Fig 13.10 Section of Market Yard



CONSTRUCTION WORK OF AN MARKET YARD
AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

MEASUREMENT SHEET

Sr. No.	Description Of Item	Nos.	Length (m)	Breadth (m)	Height (m)	Quantity
1	**Excavation for foundation** Net center line =153.1 – ( ) = 146.8 Number of junction = 14	1	146.8	0.9	1.1	145.33 m^3
2	**PCC for foundation**	1	146.8	0.9	0.3	39.64 m^3
3	**Brick Masonry upto Plinth**					
	Step 1 (Width 0.6 m) L = 153.1 -( ) = 148.9	1	148.9	0.6	0.2	17.87 m^3
	Step 2 (Width 0.5 m) L = 153.1 -( ) = 149.6	1	149.6	0.5	0.2	14.96 m^3
	Step 3 (Width 0.4 m) L = 153.1 -( ) = 150.3	1	150.3	0.4	0.2	12.02 m^3
	Step 4 (Width 0.3 m) L = 153.1 -( ) = 151	1	151	0.3	0.2	9.06 m^3
	Step 5 (Width 0.3 m) L = 153.1 -( ) = 151	1	151	0.3	0.45	20.38 m^3
				Total Brickwork		**74.29 m^3**
4	**Sand filling up to G.L.**					
	Quantity = (Excavation – PCC-Brickwork upto GL) = (145.33 – 39.64 –53.91) =51.78	-	-	-	-	51.78 m^3
5	**Brick Masonry above plinth to slab level**					
	Compoun d wallL = 54.5 m	1	54.5	0.3	2	32.7 m^3
	Stall wall L = 102.5 m	1	102.5	0.3	3	92.25 m^3

	Deduction for ventilation	4	0.4	0.3	0.4	-0.192 m^3
	Deduction for main gate	1	3	0.3	2.1	-1.89 m^3
				Total		**122.87 m^3**
6	**Sand filling for Plinth level**					
	Total area	1	20.3	19.7	0.35	139.97 m^3
	Deduction of wallL= 69.8 m	1	69.8	0.3	0.35	-7.33 m^3
				Total		**132.64 m^3**
7	**PCC above sand filling**					
	Total area	1	20.3	19.7	0.1	39.99 m^3
	Deduction of wallL= 69.8 m	1	69.8	0.3	0.1	-2.09 m^3
				Total		**37.9 m^3**
8	**Formwork for slab**	2	5.9	-	0.17	2 m^2
		2	3.6	-	0.17	1.22 m^2
				Total		**3.22 m^2**
9	**Inside plaster**					
	Stall	8	10.5	-	3	252
	Toilet	2	16	-	3	96
	Open Space	1	99.4	-	3	298.2
	Deduction for main gate	–	3	-	3	-4.5
				Total		**641.7 m^2**
10	**Outside plaster**	1	82.4	-	3	247.2
	Deduction for main gate	–	3	-	3	-4.5
				Total		**242.7 m^2**
11	**Roof of Stall**	8	4.3	3.8	-	**130.72 m^2**

CONSTRUCTION WORK OF MARKET YARD AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

ABSTRACT SHEET

Sr. No.	Description Of Item	Quantities	Rate	Per	Amount
1	Excavation	145.33 m^3	110	m^3	15987
2	PCC	77.54m^3	965	m^3	74836
3	Sand Filling	184.42 m^3	90	m^3	16598
4	R.C.C. Work	5.89 m^3	12000	L.S.	12000
5	Brick Work	208.11 m^3	1250	m^3	260137
6	Inside Plaster	641.7 m^2	150	m^2	96255
7	Outside Plaster	242.7 m^2	250	m^2	60675
8	Roof	150 m^2	250	m^2	37500
9	Cement	682 bags	280	Bag	190960
10	Sand	108.36 m^3	900	m^3	97524
11	Aggregate	77.41 m^3	1000	m^3	77410
12	Brick	98579 nos.	4	Brick	394316
13	Steel	463 kg	5	Kg	25465
14	Binding Wire	5 kg	60	Kg	300
				TOTAL	13,59,963
Add 1.5% water charge Rs.					20,400
Add 10% contractor profits Rs.					1,36,000
Total cost					**15,16,400Rs.**

5. Design of Crematorium

Fig 13.11 Detailed Plan of Crematorium

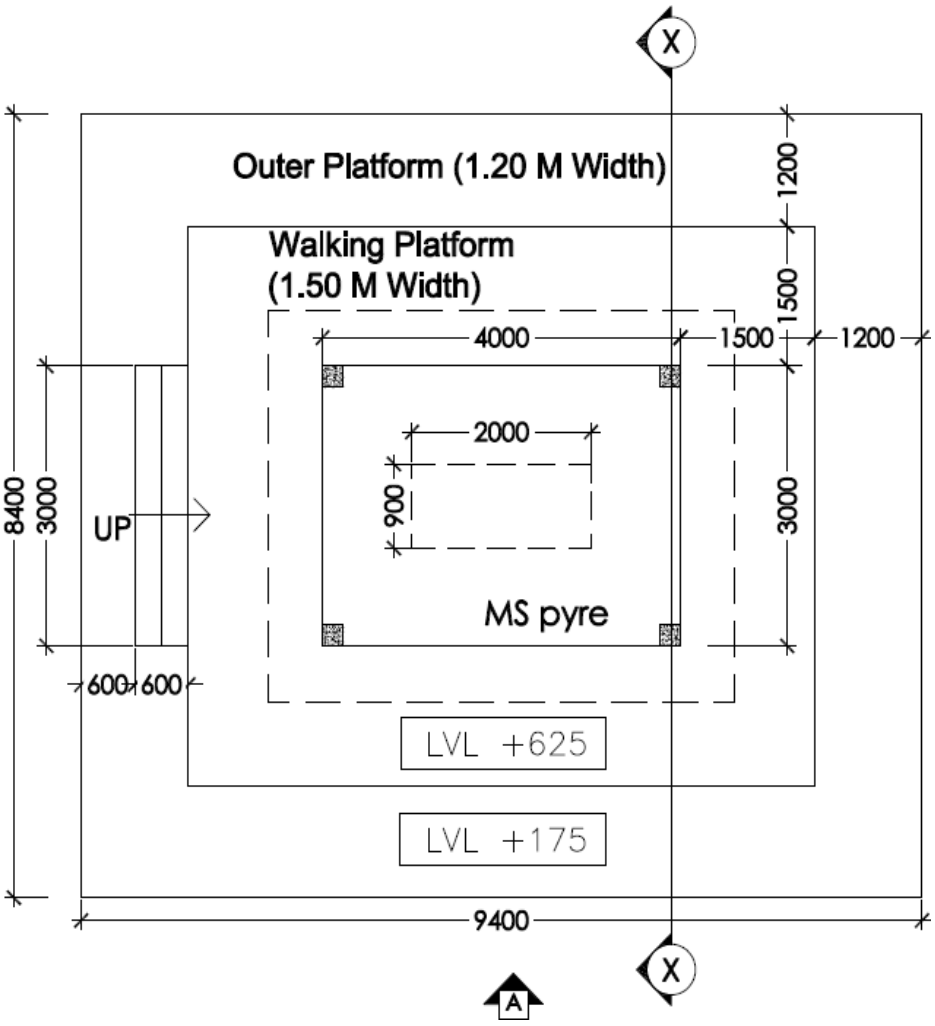


Fig 13.12 Section of Crematorium

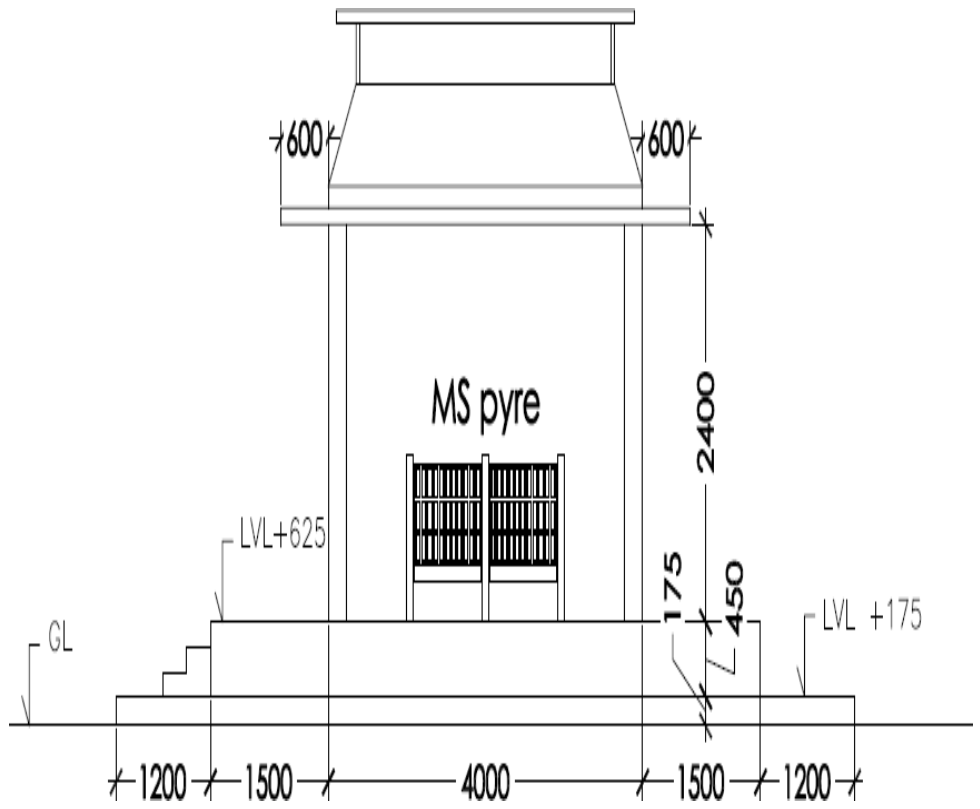
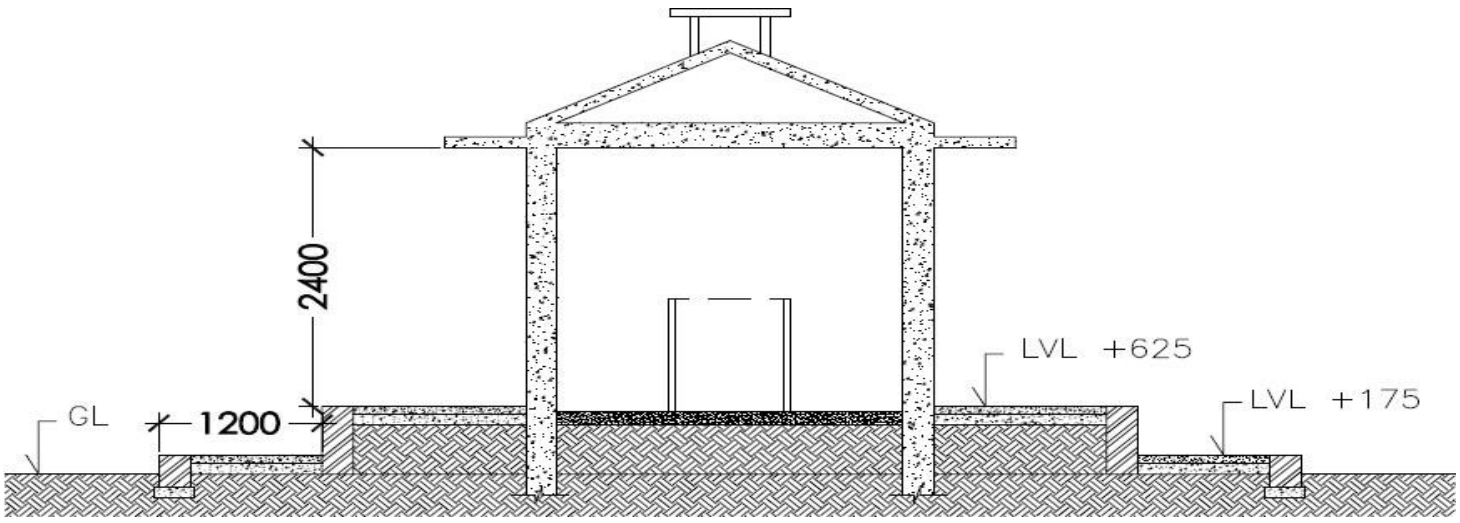


Fig 13.13 Section of Crematorium



CONSTRUCTION WORK OF AN CREMATORIUM
AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

MEASUREMENT SHEET

S. No.	DSR Ref. No.	Description ofWork	Unit	Qty.	Rate	Amount (Rs)	Remarks
1	2.8	Earth work in excavation by mechanical means (Hydraulic excavator) / manualmeans in foundationtrenches or drains (not exceeding 1.5 m in width or 10 Sqm on plan),including dressing of sides and ramming of bottoms, lift up to 1.5 m, including getting out the excavated soil anddisposal of surplus excavated soil as directed, within a lead of 50 m.					
	2.8.1	All kinds of soil.	Cum	14.52	166.4	2,416.13	1.13%
2	4.1	Providing and layingin position cement concrete of specified grade excluding the cost of centering and shuttering - All workup to plinth level :					
	4.1.8	1:4:8 (1 Cement : 4 coarse sand (zone- III) : 8 graded stone aggregate 40 mm nominal size) under footing/Floor	Cum	8.79	4478.15	39,362.94	18.45%

3	2.27	Supplying and fillingin plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	Cum	14.83	917.75	13,610.23	6.38%
4	2.25	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift up to 1.5 m.	Cum	18.88	125.75	2,374.16	1.11%
5	5.33	Providing and laying in position machine batched and machine mixed design mix M-25 grade cement concrete for reinforced cement concrete work, using cement content as per approved design mix, including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement, including admixtures in recommended proportions as per IS: 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in- charge.“(Note: - Cement content considered in this item is @ 330 kg/cum. “Excess/ less cement used as per design mix is payable/recoverable					

		separately).					
	5.33.1	All works up to plinth level	Cum	2.77	6446.45	17,856.67	8.37%
	5.33.2	All works above plinth level up to floor V level	Cum	4.12	7250.05	29,870.21	14.00%
6	5.9	Centering and shuttering including strutting, propping etc. and removal of form for all heights :					
	5.9.6	Columns, Pillars, Piers, Abutments, Posts and Struts	Sqm	30.055	467.85	14,061.23	6.59%
7	5.22	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete up to plinth level.					
	5.22.6	Thermo- Mechanically Treated bars of grade Fe-500D or more.	Kg	545.0	56.6	30,847.00	14.46%
8	6.1	Brick work with common burnt clay F.P.S. (non- modular) bricks of class designation 7.5 in foundation and plinth in:					
	6.1.2	Cement mortar 1:6 (1 cement : 6 coarse sand)	Cum	7.67	4751.65	30,847.00	14.46%
9	13.1	12 mm internal cement plaster of mix :					
	13.1.2	1:6 (1 cement: 6 fine sand)	Sqm	19.77	160.35	3,170.12	1.49%

10	13.5	15 mm cement plaster on rough side of single or half brick wall of mix:					
	13.5.2	1:6 (1 cement: 6 coarse sand)	Sqm	122.91	194.6	23,918.29	11.21%
11	13.44	Finishing walls with water proofing cement paint of required shade :					
	13.44.1	New work (Two or more coats applied @ 3.84 kg/10 Sqm)	Sqm	85.03	58.8	4,999.76	2.34%
		Total				**213,333.73**	**100%**
		Rounding off				**6,666.27**	
		Grand Total			**INR**	**220,000.00**	

- **The Cost of Crematorium is approximately Rs 2,20,000**

6. Design of Hospital

Fig 13.14 Detailed Plan of Hospital

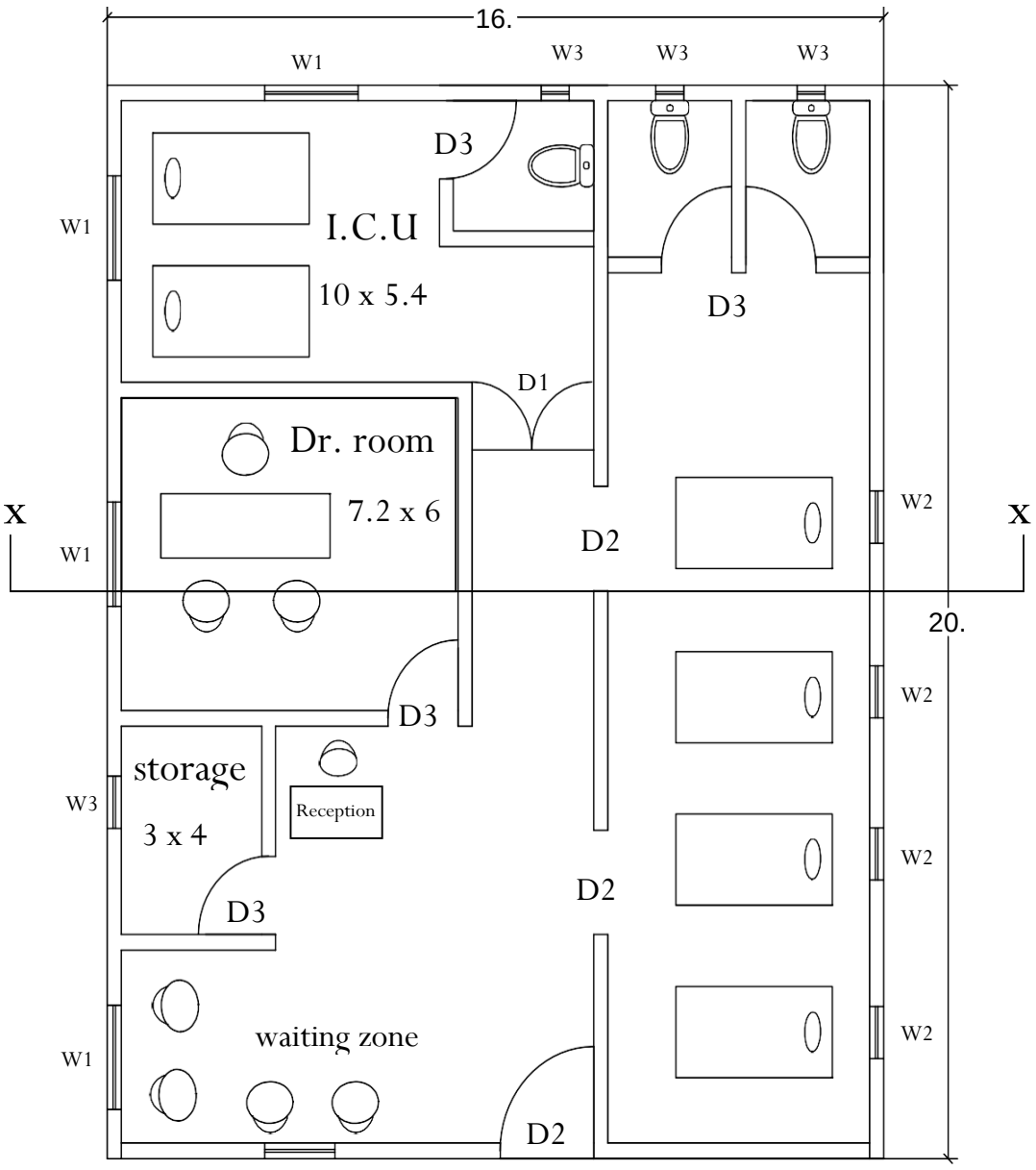


Fig 13.15 Elevation of Hospital

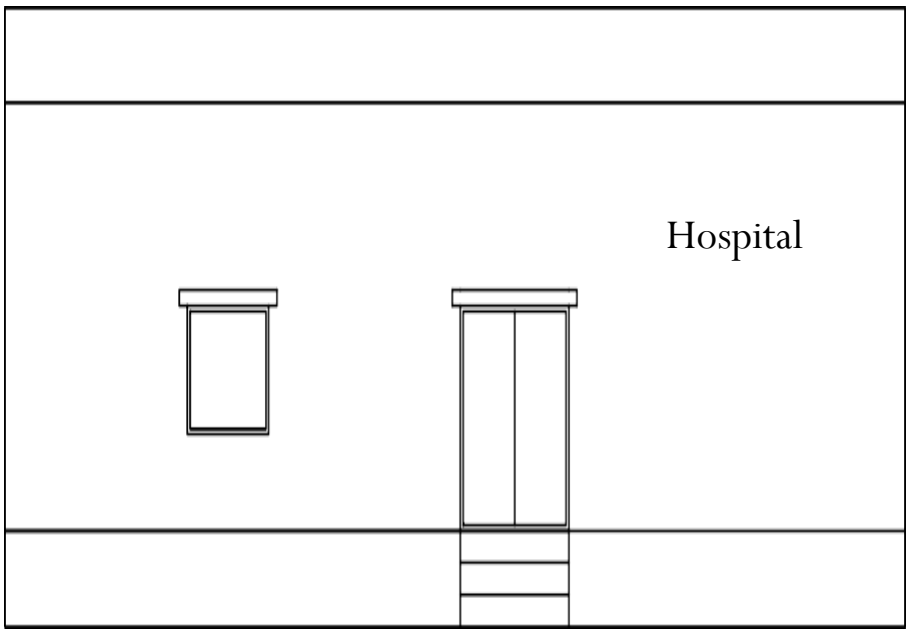
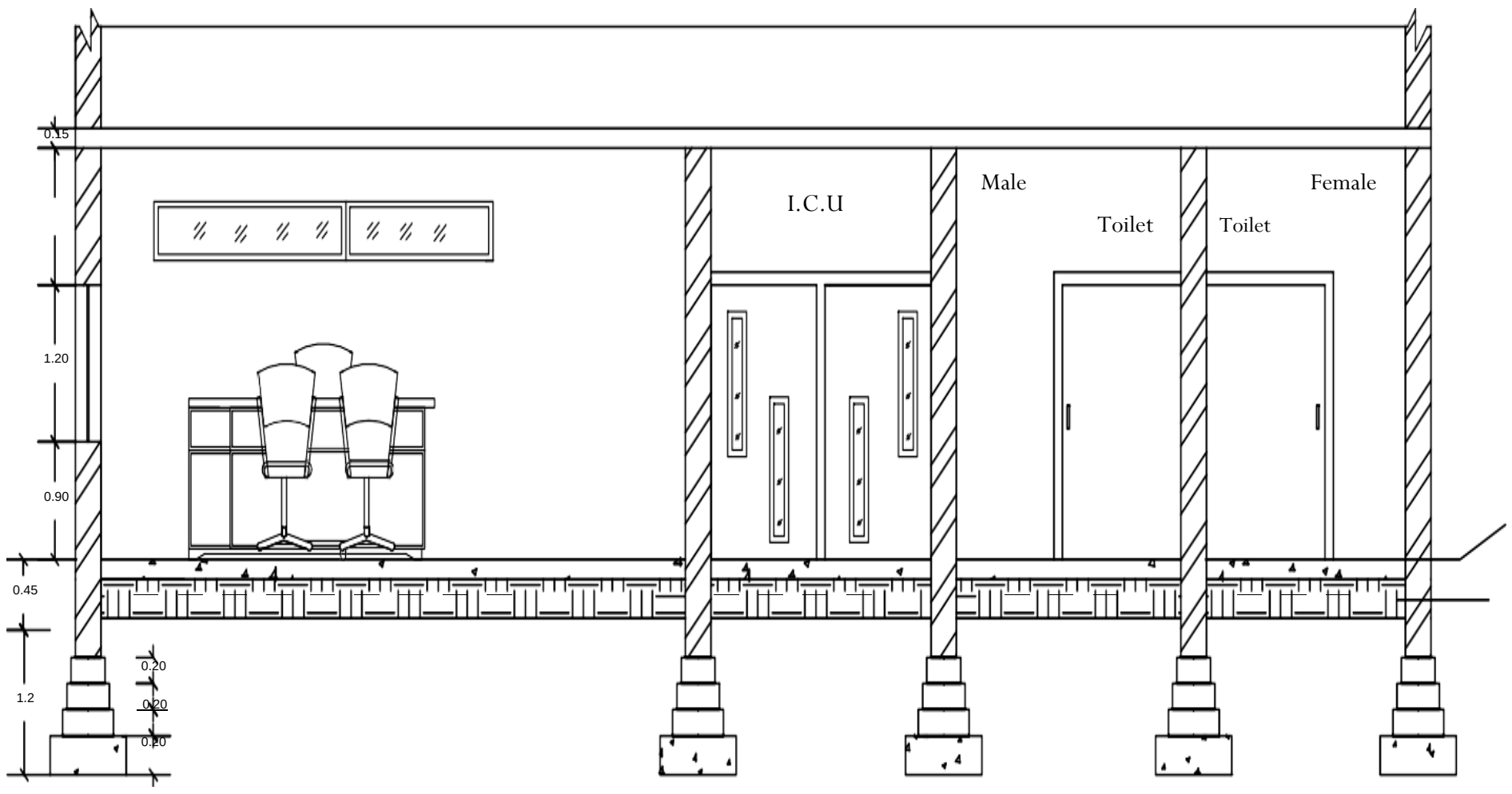


Fig 13.16 Section of Hospital



CONSTRUCTION WORK OF A HOSPITAL AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

MEASUREMENT SHEET

ITEM	DESCRIPTION	NO	LENGTH	B/W	H/D	QUANTITY	UNITS
1.	**Excavation for**						
	Foundation						
	L= 128.1 m	-	128.1	0.9	1.4	161.406	Cu.m
2.	**P.C.C work in foudation**						
	L= 128.1 m	-	128.1	0.9	0.3	34.58	Cu.m
3.	**Brick Masonary Work**						
	Upto Plinth						
	1st Step:-						
	L= 129.3 m	-	129.3	0.6	0.2	15.516	Cu.m
	2nd Step:-						
	L= 129.7 m	-	129.7	0.5	0.2	12.97	Cu.m
	3rd Step:-						
	L= 130.1 m	-	130.1	0.4	0.2	10.408	Cu.m
	4th Step:-						
	L= 130.5 m	-	130.5	0.3	0.75	29.36	Cu.m
	Total Brick Masonary					68.254	Cu.m
	Upto Plinth						
4.	**Brickwork in Super**						
	Structure						
	All Wall of 300 mm.						
	L= 130.5 m	-	130.5	0.3	3.15	123.3	Cu.m
	Deduction for doors and						
	Windows:-						

	Door – D1	1	3	0.3	2.1	1.89	Cu.m
	Door – D2	3	1.9	0.3	2.1	3.57	Cu.m
	Door = D3	3	1.2	0.3	2.1	3.8	Cu.m
	Window – W1	4	2.1	0.3	1.2	3.024	Cu.m
	Window – W2	5	1.8	0.3	1.2	3.24	Cu.m
	Window – W3	4	0.6	0.3	0.6	0.432	Cu.m
	Total Deduction for Door					17.86	Cu.m
	And Windows						
	Net Brickwork in SS					105.44	Cu.m
5.	**EarthFilling**						
	ICU	-	10	5.4	0.45	54	Cu.m
	Dr Room	-	7.2	6	0.45	43.2	Cu.m
	Waiting Room+Storage	-	10	9.2	0.45	92	Cu.m
	General Ward	-	6.3	20	0.45	126	Cu.m
	Total Earth Filling					141.84	Cu.m
6.	**Plastering**						
(i)	**Internal Plaster**						
	1. Ceiling						
	Total ceiling Work	-	16.6	20.6	-	341.96	Sq.m
	2. Wall Plaster						
	ICU						
	Long Wall	2	10	-	3.15	63	Sq.m
	Short Wall	2	5.4	-	3.15	34.02	Sq.m
	Dr Room						
	Long Wall	2	7.2	-	3.15	45.36	Sq.m
	Short Wall	2	6	-	3.15	37.8	Sq.m
	Storage						
	Long Wall	2	4	-	3.15	25.2	Sq.m
	Short Wall	2	3	-	3.15	18.9	Sq.m

	General Ward						
	Long Wall	2	20	-	3.15	126	Sq.m
	Short Wall	2	6	-	3.15	37.8	Sq.m
	Waiting Zone						
	Long Wall	2	10	-	3.15	63	Sq.m
	Short Wall	2	4	-	3.15	25.2	Sq.m
(ii)	**External Plaster**						
	Long Wall	2	20.6	-	3.15	129.78	Sq.m
	Short Wall	2	16.6	-	3.15	104.58	Sq.m
	Total Plaster(I+E)					709.84	Sq.m
	Deduction for Doors						
	And Windows						
	Door – D1	1	3	-	2.1	6.3	Sq.m
	Door – D2	3	1.9	-	2.1	11.9	Sq.m
	Door = D3	3	1.2	-	2.1	12.67	Sq.m
	Window – W1	4	2.1	-	1.2	10.08	Sq.m
	Window – W2	5	1.8	-	1.2	10.8	Sq.m
	Window – W3	4	0.6	-	0.6	1.44	Sq.m
	Total Deduction					53.19	Sq.m
	Net Plaster(I+E)					656.65	Sq.m
7.	**Flooring**						
	Same as ceiling					341.96	Sq.m
8.	**RCC Slab**						
	Total RCC Work	-	20.6	16.6	0.12	41.0352	Cu.m

CONSTRUCTION WORK OF A HOSPITAL AT KHODIYAR, TAL- DASKROI, DIST-AHMEDABAD

ABSTRACT SHEET

Sr	Description	Quantity	Rate	Per	Amount(Rs)
1.	Excavation Work	161.406	160	Cu.m	25824.96
2.	P.C.C	34.58	3000	Cu.m	103740
3.	Brickwork in	68.254	3200	Cu.m	218412.8
	Foundation				
4.	Brickwork in	105.44	3500	Cu.m	369040
	Superstructure				
5.	Earthfilling	141.84	700	Cu.m	99288
6.	Plastering	656.65	150	Sq.m	98497.5
7.	Flooring	341.96	900	Sq.m	307764
8.	RCC Slabs	41.0352	4900	Cu.m	201067.58
9.	Painting	656.65	25	Sq.m	16416.25
	Total Rupees				1440051.09
	Contiguous Charges (5% Rupees)				72002.55
	10% Contractor Charges				144005.109
	2% Water Charges				28801.02
	Total Amount Rupees				1684859.769
	Round Off To Rupees				16,85,000

CHAPTER 14:

Technical Options with Case Studies

14.1 Civil Engineering

14.1.1 Advanced Earthquake Resistant

The science of structural and **Earthquake Engineering** helps enhance the seismic flexibility of civil structures and critical infrastructure through advanced engineering and management tools. While natural forces are extremely useful to mankind, natural disasters can wreak a havoc with hurricanes, earthquakes, tsunamis posing threat to life and infrastructure worth billions of dollars.

Earthquake-resistant structures are structures designed to protect buildings from earthquakes. While no structure can be entirely immune to damage from earthquakes, the goal of earthquake-resistant construction is to erect structures that fare better during seismic activity than their conventional counterparts. According to building codes, earthquake-resistant structures are intended to withstand the largest earthquake of a certain probability that is likely to occur at their location. Currently, there are several design philosophies in earthquake engineering, making use of experimental results, computer simulations and observations from past earthquakes to offer the required performance for the seismic threat at the site of interest.

These range from appropriately sizing the structure to be strong and ductile enough to survive the shaking with an acceptable damage. The conventional approach to earthquake resistant design of buildings depends upon providing the building with strength, stiffness and inelastic deformation capacity which are great enough to withstand a given level of earthquake-generated force. This is generally accomplished through the selection of an appropriate structural configuration and the careful detailing of structural members, such as beams and columns, and the connections between them. But more advanced techniques for earthquake resistance is not to strengthen the building, but to reduce the earthquake-generated forces acting upon it.

Among the most important advanced techniques of earthquake resistant design and construction are:

1. Base Isolation
2. Energy Dissipation Devices

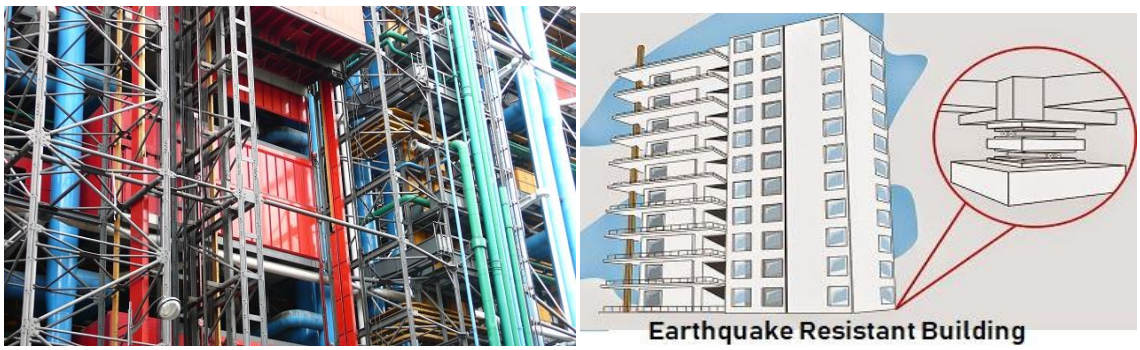


Fig 14.1 Advanced Earthquake Resistant Techniques

14.1.2 Seismic Retrofitting of Building

Seismic Retrofitting Techniques are required for concrete constructions which are vulnerable to damage and failures by seismic forces. In the past thirty years, moderate to severe earthquakes occurs around the world every year. Such events lead to damage to the concrete structures as well as failures. Thus the aim is to Focus on a few specific procedures which may improve the practice for the evaluation of seismic vulnerability of existing reinforced concrete buildings of more importance and for their seismic retrofitting by means of various innovative techniques such as base isolation and mass reduction. So Seismic Retrofitting is a collection of mitigation technique for Earthquake engineering. It is of utmost importance for historic monuments, areas prone to severe earthquakes and tall or expensive structures. **Keywords:** Retrofitting, Base Isolation, Retrofitting Techniques, Jacketing, Earthquake Resistance

Introduction to Seismic Retrofitting Techniques:

- Earthquake creates great devastation in terms of life, money and failures of structures.
- Upgrading of certain building systems (existing structures) to make them more resistant to seismic activity (earthquake resistance) is really of more importance.
- Structures can be (a) Earthquake damaged, (b) Earthquake vulnerable
- Retrofitting proves to be a better economic consideration and immediate shelter to problems rather than replacement of building.

Seismic Retrofitting of Concrete Structures:

Definition: It is the modification of existing structures to make them more resistant to seismic activity, ground motion, or soil failure due to earthquakes. The retrofit techniques are also applicable for other natural hazards such as tropical cyclones, tornadoes, and severe winds from thunderstorms.

Need for Seismic Retrofitting:

- To ensure the safety and security of a building, employees, structure functionality, machinery and inventory
- Essential to reduce hazard and losses from non-structural elements.
- predominantly concerned with structural improvement to reduce seismic hazard.
- Important buildings must be strengthened whose services are assumed to be essential just after an earthquake like hospitals.

Basic Concept of Retrofitting:

The aim is at:

- Upgradation of lateral strength of the structure
- Increase in the ductility of the structure
- Increase in strength and ductility

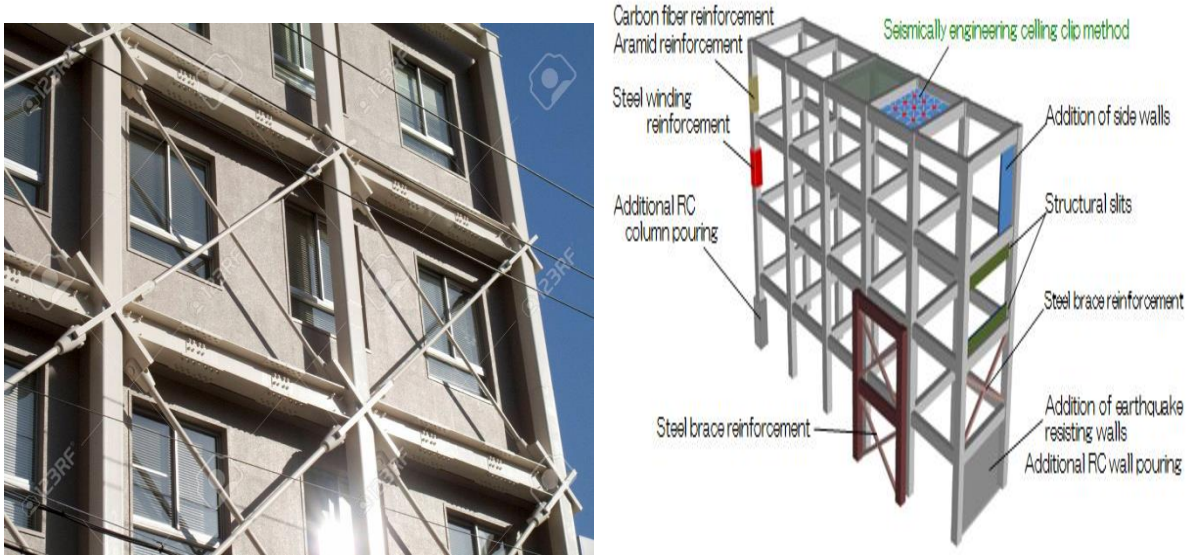


Fig 14.2 Seismic Retrofitting of Building

14.1.3 Advance Practices in Construction Field in Modern Material, Techniques and Equipment.

EQUIPMENT USED FOR SMALL AND MEDIUM CONSTRUCTION WORK

- Chain and pulley block.
- Grouting pumps.
- Sprayers for painting work.
- Tile cutters.
- Portable hand drilling machines.
- Horizontal trolleys, wheelbarrows.
- Pumps.
- Vibrators for compaction of concrete,
- surface vibrators.
- Auto ramming concrete block machine.
- Sand washing machine.
- Vertical lifts, hoists, winches.
- M.S. tubular scaffolding, and formwork.
- Concrete mixers.
- Cranes.
- Earth excavators.
- Earthmovers
- The Indian advanced construction
- techniques industry is experiencing a
- period of fast growth. Aiming to
- overcome the housing problem, it also
- has to face the dual challenge of fulfilling

- the needs of the client and maintain the
- quality standards.
- At the same time, the up-gradation of
- technology through the adoption of new
- techniques has become necessary to
- survive in a tough competitive
- environment.
- The traditional methods of construction are inadequate in executing the work speedily with
- economy and quality. The construction industry in India must switch over to advanced
- construction techniques to achieve its goal in "minimum time with maximum efficiency".

14.1.4 Engineering Aspects Of Soil mechanics - Environmental Impact Assessment

An Environmental Impact Assessment is a formal method of judging the impact that any new developmental project would have on the environment and its constituents. This can include changes that the project would create in the physical aspects of existing geography, chemical changes to the atmosphere including air and water, biological changes that affect plant, animal and human life, cultural impact of a project on the society in the area, and other socio-economic effects that the project can have.

Such an assessment allows problems to be foreseen, so that the design and planning of the projects is modified to reduce any negative effects. It is now fashionable to build green buildings which have a positive effect on the environment.

There is historical precedent for the now mandatory Environmental Impact Assessments (EIA). Past efforts by governments have resulted in bans on activities that caused noxious odors, garbage dumps were positioned at places far away from habitation, and commercial activities were restricted to town centers.

Objectives of Environmental Impact Assessment

The objective of an EIA is to predict the environmental impact project would have on all aspects of the environment. Once this is done, a study has to be made to see if the impacts can be reduced in any way. The project has then to be modified to suit the local environment and all predictions and likely options presented to decision makers for final decisions.

You can gain a better understanding of EIA by understanding how any typical project can affect the environment of a particular area. Take for example the building of a new road in a city.

14.1.5 Water Supply-Sewerage system-Waste Water- Sustainable Development Techniques

Water is one of the world's most valuable resources, yet it is under constant threat due to climate change and resulting drought, explosive population growth, and waste. One of the most promising efforts to stem the global water crisis is industrial and municipal water reclamation and reuse.

The Water Reuse Association defines reused,recycled, or reclaimed water as "water that is

used more than one time before it passes back into the natural water cycle." Thus, water recycling is the reuse of treated wastewater for beneficial purposes such as agricultural and landscape irrigation, industrial processes, toilet flushing, or replenishing a groundwater basin (referred to as groundwater recharge).

Water scarcity and water pollution are crucial issues in today's world. One of the ways to reduce the impact of water scarcity and pollution is to expand water and wastewater reuse. The increasing scarcity of water in the world along with rapid population increase in urban areas gives rise to concern about appropriate water management practices. In the context of trends in urban development, wastewater treatment deserves greater emphasis. Currently, there is a growing awareness of the impact of sewage contamination on rivers and lakes. Accordingly, wastewater treatment is now receiving greater attention from the World Bank and government regulatory bodies. Urban wastewater treatment has received less attention compared to 'water supply & treatment.' Water scarcity coupled with the bursting seams of our cities and towns have taken a toll on our health and environment. The sewage contamination of our lakes, rivers, and domestic water bodies has reached dangerous levels and is being recognized by leading organizations like the World Bank. The current urban wastewater management system is a linear treatment system that is based on disposal. The traditional system needs to be transformed into a sustainable, closed-loop urban wastewater management system that is based on the conservation of water and nutrient resources. A huge loss of life-supporting resources is the result of failed organic wastewater recovery. A wastewater management team is well equipped to create a wastewater management strategy that will result in the reduction of pathogens in surface and groundwater to improve public health.

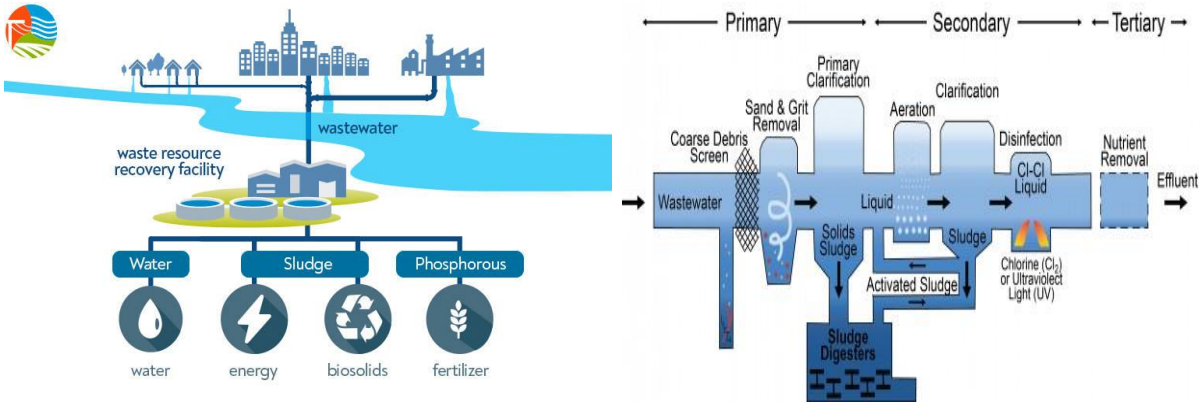
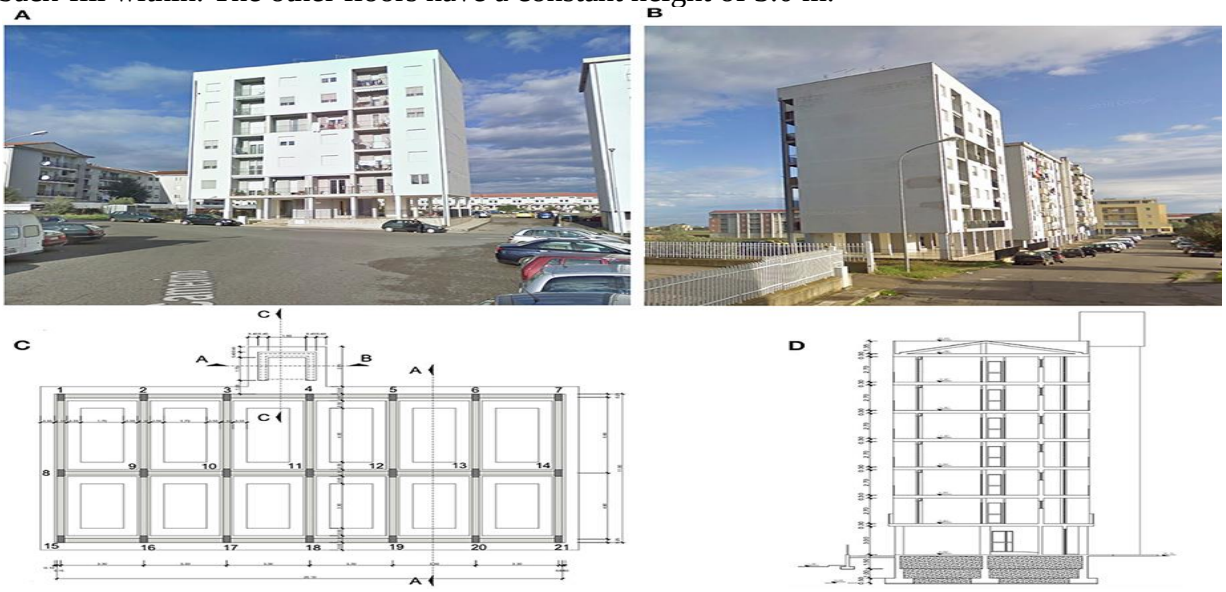


Fig 14.3 Sustainable Techniques in Water Supply System

Case Study – Seismic Retrofitting of Buildings

The chosen case study is a RC building designed in the '90s and built in Marconia, a locality of the Pisticci Municipality (Province of Matera, Italy). It was realized by ATER, which is the local company for housing of the Basilicata Region, with the aim of providing social housing to the applicants.

The building is composed by seven floors plus a two-pitch roofing system. The pilotis ground floor is used as porch, while the upper six floors are used for housing. Some image of the considered building in the "as-built" condition is reported in Figures. While a foundation plan and a transverse section are illustrated in Figures respectively. In plan the building is a simple rectangle of dimensions 20.10 × 11.0 m, reaching the maximum height measured above the ahead foundation of 21.1 m. The foundations were realized through inverted T beams strips having a total height of 1.50 m and a width of 0.50 m (the flange has dimensions 1.60 × 0.50 m). The ground floor has an height of 3.1 m, and was realized with an incoherent foundation back-fill within. The other floors have a constant height of 3.0 m.



The building has for all floors, one-way RC joists all directed along the transverse direction (Y direction), with hollowed lightening blocks. No internal RC frame along the transverse direction is present. Each floor may be reached through concrete stairs, or else with an elevator hosted within a concrete core made by vertical RC walls running throughout the total building height, and having a thickness of 20 cm. In total, 21 columns compose the 3D building frame, having the dimensions and reinforcements details summarized in Table 1. As for the beams, the principal ones supporting the joists have, at all floor levels, a section of 100 × 25 cm, while the secondary ones have a section 60 × 25 cm. The typical reinforcements, respectively, of principal and secondary beams, are depicted in Figures 2A,B, respectively.

The building was designed in according to the Italian Design Code (NTC, 1992), only for vertical loads without any detailing rule for structural ductility, by applying the allowable stress design method (also called working stress design method). Although the construction period is quite recent, the seismic action was not considered because of the considered area,

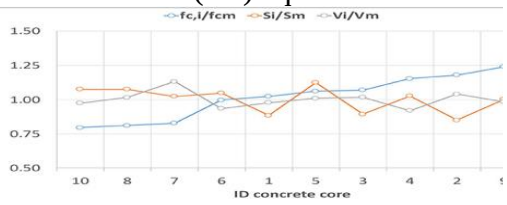
which was classified by law as not seismic. On the contrary, as it will be discussed later, by referring to current seismic classification (NTC, 2008) the site belongs to a zone having a medium-low seismic intensity.

Materials Properties

Details on the building under consideration were collected firstly from the examination of the complete original design documents, including the original certificates which are related to concrete and reinforcing steel samples tested in the laboratory, as required by the design code adopted for building design (NTC, 1992). However, *in situ* measurements and tests including extraction of concrete cores were conducted, too. The comparison between the information gathered through the tests campaign and the original documents has demonstrated that the building was realized accordingly to the project approved, without any significant difference.

Precisely, the *in situ* investigations included dimensional measures of the primary and secondary elements, pacometer investigations, visual assays of elements steel reinforcements (by locally removing the concrete cover), surveys and assays for defining the effective permanent loads. All the *in situ* inspections were planned and performed by distributing in plan and in elevation as much as possible in the investigations. More in detail: in total 10 concrete cores were extracted from the concrete core walls; 40 coupled pacometric and sclerometric tests were conducted for applying the SONREB method, demonstrating an acceptable homogeneity of concrete within the elements. It should be noted that the concrete cores were extracted from the vertical walls instead of the columns since it was decided of not disturbing these elements that showed at the base of the ground floor an evident degradation state. The results of the average compressive strength experienced in the laboratory on the 10 concrete cores are numerically reported in table, the results of non-destructive tests conducted in the same points where the core were extracted are shown. In addition, in the histogram form, the values of the concrete compressive strength ($f_{c,i}$), sclerometric rebound index (S_i) and ultrasonic velocity (V_i) are reported, each divided by the correspondent average value ($f_{c,m}$, S_m, V_m). The resulting ratios, for each point investigated, are sorted in according to the increasing ratio $f_{c,i}/f_{c,m}$. It is important to note that in the case, a really low correlation among the destructive ($f_{c,i}/f_{c,m}$) and non-destructive measures (S_i/S_m, and V_i/V_m) is observed. In conclusion, the average concrete cylindrical compressive strength resulted equal to 19.15 MPa, and is compatible with a concrete class R_{bk} = 25 MPa, that was the concrete strength used for realizing building components, as resulted in the material certificates of the original project. This value has been assumed as design value for seismic assessment of the building under consideration. As for the reinforcing steel no sample was extracted and the assumed value of the tensile strength has been the one reported in the original material certificate. It resulted in according to a reinforcing steel of class FeB44k, with a characteristic tensile strength equal to f_{yk} = 440 MPa. Therefore, the Knowledge Level (*KL*) reached, in according to the NTC (2008), resulted equal to KL3, with a Factor of Confidence (FC) equal to 1.

Id Concrete core	Level	$f_{c,i}$ (N/mm²)	S_i	V_i (m/s)
1	Ground floor	20.19	29	3,592
2	Ground floor	23.28	28	3,821
3	Ground floor	21.12	30	3,734
4	Floor 1	22.76	34	3,376
5	Floor 2	20.96	37	3,707
6	Floor 3	19.7	35	3,433
7	Floor 4	16.34	34	4,154
8	Floor 5	16.02	36	3,731
9	Floor 5	24.49	33	3,613
10	Floor 6	15.71	36	3,577
	Average value	19.75	33	3,674
	Standard dev.	3.13	3.06	217.74
	C.V.	16%	9%	6%



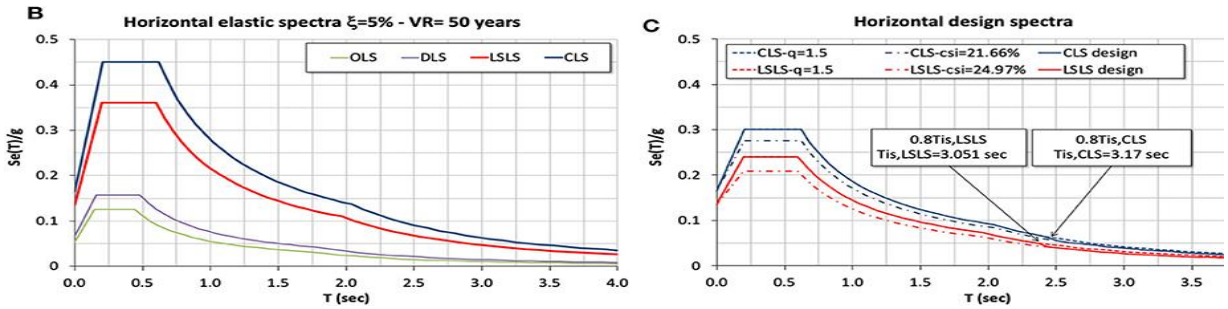
In summary, the design values for concrete and steel assumed in this study are the following:
• Concrete: $f_{cd} = f_{cm}/(\gamma_c \cdot FC) = 9.75/(1.5 \cdot FC) = 13.16\ MPa$
• Steel: $f_{yd} = f_{yk}/\gamma_s = 440/1.15 = 382\ MPa$.

Site Seismic Hazard and Response Spectra

In this section, the actual seismic hazard of the site is examined. It corresponds to the seismic hazard adopted by the Italian design Code (NTC, 2008) considered for assessing and designing the retrofit interventions later discussed. This seismic hazard remains unchanged in the current Italian design code (NTC, 2018). On the contrary, as already said, the same area was not classified as seismic zone in according to the previous Italian design codes.
Figure illustrates the site seismic hazard and the horizontal response spectra assumed in the numerical simulations when seismic action is considered. More in detail, a nominal life V_N = 50 years and coefficient of use C_U = 1 are considered, resulting in a reference period V_R of 50 years. For completeness, the seismic parameters in conditions of horizontal rigid soil (indicated as *Type A* soil) are reported for the four Limit State assumed by the reference design code (NTC, 2008), that are: Operativity Limit State (*OLS*), Damage Limit State (*DLS*), Life-Safety Limit State (*LSLS*), Collapse Limit State (*CLS*). Specifically, the following parameters are detailed (Figure 3A):
• Return period T_R;
• Maximum soil accelerations a_g in the case of rock soil;
• Maximum spectrum amplification coefficient F_0;
• Transition period T^*c in the spectrum between constant acceleration and constant velocity.

A

V_N=50 years, C_U=1, V_R=50 years					
Limit State	T_R (years)	a_g (g)	F_0	T^*_C (sec)	PGA (g)
OLS	30	0.035	2.418	0.276	0.052
DLS	50	0.043	2.454	0.313	0.064
LSLS	475	0.009	2.665	0.433	0.135
CLS	975	0.110	2.741	0.454	0.164



The horizontal elastic response spectra for the site considered are reported in (Figure 3B), by referring to a soil of *Type C*, as resulted in the case analyzed, and to a conventional viscous damping ratio ξ = 5%. While, in Figure 3C design spectra by considering the Fixed-Base (*FB*) and Base-Isolated (*BI*) structure are shown. In particular, due to the lack of detailing rules for ductility the horizontal design spectrum for *FB* model is calculated starting from the elastic one and by assuming conservatively a behavior factor q = 1.5. As for the *BI* structure, in order to properly take into account the energy dissipated by the isolating system the appropriate design spectrum is calculated as indicated by NTC (2008). Therefore, the design spectra ordinates for *LSLS* and *CLS* having a period $T \geq 0.8^* T_{is}$ (that is the range of isolating system vibration periods) are reduced through the factor η=10(5+ξeis) as function of the equivalent

viscous damping ratio ξ_{eis} due to isolation system. As known, ξ_{eis} depends on the design horizontal displacement which, in turn, is function of the considered limit state. In this case ξ_{esi} results, as it will be discussed later on, equal to 24.97% for *LSLS*, and to 21.66% for *CLS*. While, for $T < 0.8^{*}T_{is}$ the spectra ordinates are coincident with the design ones calculated with a ductility factor q = 1.5 since these ordinates regard the superstructure modes.

Numerical Investigations on "as-Built" Building (Fixed-Base Model)

The existing RC building in the fixed-base (FB) original configuration has been implemented with a FEM model within SAP 2000 software (Computers Structures Inc., 2015). In particular, an elastic model has been adopted, consisting of frame elements for the beams and columns, shells for the elevator core walls and joists. No reduction for flexural and shear stiffness of beams and columns has been considered due to the limited behavior factor assumed for the structure (NTC, 2008). Finally, the model has been fully fixed at the base.

As for the evaluation of the floor masses, they have been calculated in accordance with the following combination:

$$Gk1+Gk2+\sum j\psi 2jQkj \quad (1)$$

where G_{k1} represents the permanent structural loads, G_{k2} are the semi-permanent non-structural loads, and Q_{kj} represent the *j-th* variable load. In this case we have:

- *Housing floors:* $G_{k1}+G_{k2}$ = 6.20 kN/m^2
- *Under-roof floor:* $G_{k1}+G_{k2}$ = 3.20 kN/m^2
- *Roof:* $G_{k1}+G_{k2}$ = 3.75 kN/m^2
- *Live load:* Q_k =2.00 kN/m^2
- *Snow load:* Q_s = 0.60 kN/m^2

In all the performed analyses the horizontal seismic action effects are evaluated, together with the vertical loads, through a modal analysis with response spectra where the modal effects are combined with CQC combination rule. For taking into account the directional effects of the seismic action, the following combinations have been considered in evaluating the structural response:

$$\pm 1.00\,EX \pm 0.3EY \quad (2)$$

where the multiplier coefficients have been permutated. Moreover, the vertical component of seismic action has been neglected.

Structural Verifications

As for the structural verifications for the existing FB building, a modal linear analysis with a design spectrum for LSLS has been conducted. Due to the absence of detailing rules with respect to structural ductility, a behavior factor q = 1.5 has been considered for both verifications of ductile (flexural) and brittle (shear) mechanisms. Overall, as it was simple to expect, by applying the current design code (NTC, 2008) all the beams and columns result verified only with respect to the current vertical loads. Whereas, if one considers the seismic combinations no-one of the primary elements (columns and beams) satisfies the safety verifications. More precisely, the flexural mechanisms do not result verified neither for columns nor for beams. As proof of this, for instance in Figure 5 the columns structural verifications with respect to the design combinations including the seismic action (Equation 2) are reported. As regards the shear verifications, the transverse reinforcement amounts in beams and columns should result sufficient by considering, as indicated by NTC (2008), the secondary shear-resistant mechanisms contribution. However, it should be pointed out that the current stirrups spacing detected respected the detailing of NTC (1992), that indicated a

spacing not >0.8 the effective section depth, and therefore not >0.8·23 cm = 18.4 cm.
For completeness, Figure 6A plots for LSLS the floor shear distributions along the two principal directions, by considering separately the seismic action along the longitudinal (*EX*) and transverse direction (*EY*) direction. As a useful comparison, in the same figure the resulting shears for the *BI* model are illustrated, too. It is easy to note that, in the case of *FB* building the shear distribution is quite non-linear especially for the higher floors. While, in Figures 6B–E are reported for *DLS* interstory drifts calculated for *X* and *Y* directions, by considering the perimetral columns n. 1, 7, 15, and 21. These graphs clearly show that the response is irregular with respect to lateral actions due to important torsional effects mainly provoked by the concrete core hosting the elevator. This is proved by the fact that significant interstory drifts occur also along the direction orthogonal to the acting seismic action. In any case the maximum interstory drift does not exceed the 0.5% limit value assumed as maximum allowable for the infills masonry (NTC, 2008).

Retrofit Strategy With Isolation System at the Base (Base-Isolated Model)

Numerical investigations carried out on the FB model showed that the considered existing building did not satisfy the safety requirements with respect to the seismic actions as required by the refence design code (NTC, 2008). Mainly, all beams and columns resulted as discussed before, the critical elements unable, although the presence of core concrete hosting the elevator to resist to the seismic design actions. This aspect, however, was easily predictable since, as already described, the building was designed only with respect to the vertical loads. Therefore, due to the critical structural aspects encountered, the seismic isolation at the base as retrofit strategy was considered for considerably reducing the seismic demand. Anyway, it should be noted that the building considered had a natural propensity to this retrofit solution, owing to the high grid foundation above which seismic devices may be placed with some local and easy interventions.

In detail, the seismic retrofit intervention was realized as follows. At first, the incoherent back-fill between foundation beams was removed, and concrete columns at foundation grid intersections were created for positioning the isolation devices. Then, above the foundation plan, a grid consisting of steel frames hinged at the columns base with bolted steel joints was installed. This intervention was conducted with the aim of preventing the horizontal relative displacements among the columns at base. Finally, a cut of each singular column at base above the foundation was realized by applying a temporary bearing system with hydraulic jacks for permitting, once the required column part was removed, of installing the isolation device. In order to improve as well the bearing capacity of columns with respect to the vertical loads, preliminarily to the isolation intervention FRP wraps were applied to the columns up to the fourth floor. The seismic retrofit intervention consisted also of a bracing system, realized through two vertical elastic steel frames laterally applied along the transverse direction (i.e., Y direction, the short direction) for all the building height. The two frames were made with vertical and diagonal elements having a UPN400 section, welded each other and bolted to the existing RC frame structure. Finally, above the steel frame grid a walking floor with corrugated steel panels was mounted. As far as the concrete core hosting the elevator is concerned, it was isolated at the base above the foundation plan with a similar procedure applied for the columns. At first, a temporary bearing system with hydraulic jacks

was installed in local slots realized in the vertical walls above the existing foundation. Then, a new RC foundation plate above the isolation plan was realized, externally extended for creating a collar necessary for installation of isolation devices. Then, the cut of the walls for removing the walls between the new foundation and the exiting one was completed and the isolation devices were installed.

Dynamic Non-Linear Analyses

In order to better evaluate maximum displacement of the isolation system and the effects on the superstructure, several Non-Linear Dynamic (NLD) analyses have been conducted. The numerical model implemented consists of elastic frame and shell elements for modeling the superstructure, and of the zero-length elements for simulating the behavior of the seismic devices. In particular, a frictional behavior (rigid-plastic) is assigned (μ = 1%) to the flat-surface sliders, while the elastomeric devices are modeled as elastic with an equivalent damping ratio (ξ_H) of 10%. As for the global damping, a 5% modal damping is considered.

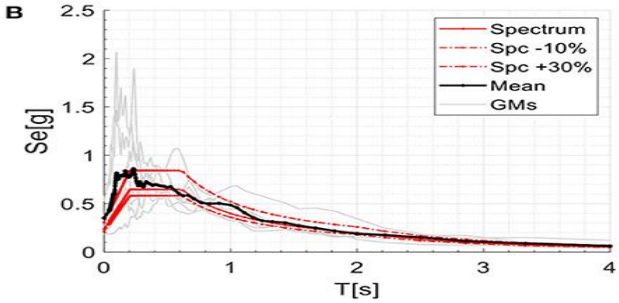
In order to perform NLD, a set of seven couples of recorded Ground Motions (GMs) have been selected according to the spectral matching criteria of the Italian Design Code (NTC, 2008). In order to properly consider the bidirectional motion the spectrum- compatibility criterion has been applied to the mean of the SRSS resultants of each couple of GMs between 0.5 and 4 s, by considering a CLS action level. In this way the spectrum compatibility has been ensured for both isolated and superstructure modes.

More precisely, the GMs have been extracted from the database SIMBAD (Smerzini et al., 2014) by using the REXEL software (Iervolino et al., 2009) and elaborated in order to verify the spectrum compatibility of the SRSS combined spectra. Due to the seismic action level considered and the wide range of periods required for spectrum compatibility, it has not been possible to select records coming from a single type of subsoil (i.e., soil Type C). However, the amplitude and shape of the reference spectra account for the soil type conditions. It is worth to note that in order to not alter the GMs characteristics and to improve the interpretability of results no scale factor has been adopted in obtaining the spectrum-compatibility. Therefore, in the analyses performed the GMs considered are unscaled, as suggested in Morelli et al. (2018). Finally, Figure 11 shows the details of each couple selected of GMs, also plotted in the form of horizontal combined spectrum with the SRSS rule. In the same figure the spectrum resulting as mean value of the SRSS combined spectra is compared with the expected one by the design code for CLS.

A

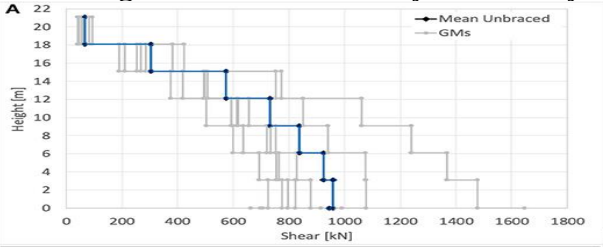
Waveform ID	Earthquake Name	Date	Mw	Fault Mechanism	R_{epi} [km]	PGA_X [m/s²]	PGA_Y [m/s²]	Site Class
IN00459	Northridge	17/01/1994	6.7	reverse	20.19	2.51	2.17	C
IN00140	Southern Iwate	13/06/2008	6.9	reverse	18.82	3.55	3.69	B
IN00388	Christchurch	13/06/2011	6	reverse	13.44	1.31	1.24	C*
IN00438	Parkfield	28/09/2004	6	strike-slip	15.23	1.39	2.24	B
IN00343	Christchurch	21/02/2011	6.2	reverse	16.52	1.78	1.38	C*
IN00463	Northridge	17/04/1994	6.7	reverse	18.59	2.73	4.65	B
IN00051	NW Off Kyushu	20/03/2005	6.6	strike-slip	25.96	2.35	2.75	C

B

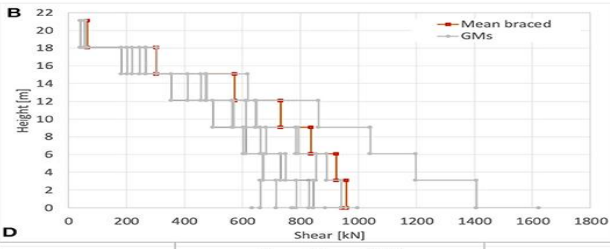


In Figure 12 the maximum floor shears occurring in the Y-direction (where steel bracing system is applied) obtained within NLD analyses are shown. Precisely, in Figure 12A and in Figure 12B both braced and unbraced configurations are considered, by reporting the maximum floor shears of each GM couple (gray solid line) and the resulting average on the seven couples (black solid line). It can be noticed that, except for one record (i.e., IN 00051) the maximum floor shears are quite similar among the different GMs. For sake of completeness, Figure 12C separately reports a comparison between the averages of maximum floor shears, also numerically summarized in Figure 12D. As it is clear to observe, the presence of the bracing system reduces at CLS the shear at higher floors up to 18%, confirming the results of linear dynamic analyses.

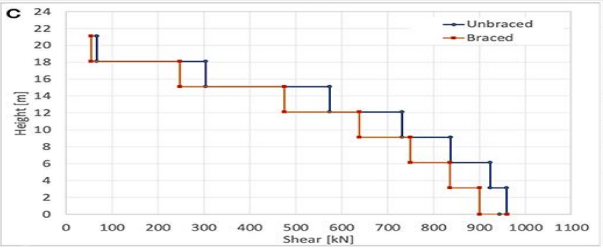
A



B



C



D

Floor	Floor Shear [kN] Unbraced	Braced	Δ[%]
7	945.1	960.3	2%
6	959.5	900.9	-6%
5	924.3	836.5	-9%
4	837.0	749.3	-10%
3	731.7	638.2	-13%
2	573.8	475.6	-17%
1	303.6	247.6	-18%
Ground floor	66.0	54.2	-18%

As for the isolation system verifications, as example in Figures 13A,B the displacements time-history of the center of mass of the isolated floor (i.e., z = 0 m) along X and Y directions for two GMs couples (i.e., IN00140 and IN00463) are reported. While, in Figure 13C the numerical values of maximum and minimum displacements obtained for each GMs couple are reported. Also, it is reported for each GMs couple the maximum displacement (in absolute value), and the combined one between with the SRSS rule, as well as the mean values of the maximum, minimum, and absolute values. It can be noticed that the average maximum displacements in absolute are 88 and 111 mm along X and Y direction, respectively. These values are in good agreement with the obtained results of linear dynamic analyses exposed

in Figure 8C. Moreover, the maximum resultant displacement calculated with the SRSS combination rule is of 129 mm, which is 1.16 times higher than maximum displacement recorded along one of the principal direction (i.e., along Y-direction in this case). This result is in good agreement with the rule discussed in Clough and Penzien (1993) and in Laguardia et al. (2019) in order to assess the maximum resultant displacement. In these studies, it is suggested to amplify the results of a monodirectional analysis by a factor of 1.12 or 1.18 by considering a ratio of earthquake ground motions spectral components of 0.85 and 1, respectively. Nevertheless, the torsional effects are not considered in the NLD analyses performed. In order to emphasize such aspect the maximum resultant displacement is plotted in Figures 13A,B with black dashed lines (symmetrically plotted on positive and negative values) together with the horizontal displacement along X and Y directions (red and blue solid lines, respectively). It can be seen that the maximum value of resultant displacement is quite similar to the maximum value along a single direction and, moreover, the resultant displacement peak occurs at the displacement peak along the same direction.

Conclusions

An application of the seismic isolation at the base of an existing RC buildings has been presented in this study. The existing building has been designed only for vertical loads since, at construction time, no seismic classification was in existence by law. While, the seismic zones upgrade due to the recent Italian seismic hazard maps classified the area with a medium-low seismic intensity.

The results of the analyses performed highlight the importance of the steel bracing system along the transverse direction in order to increase the stiffness of the superstructure with a consequent reduction of the higher vibration mode effects and, therefore, for making more uniform the seismic demand in terms of forces.

As for the non-linear dynamic analyses results, they have demonstrated that the displacement demand on seismic devices is lower than their maximum displacement capacity. However, some difference may be encountered in combining the effects of the seismic action along the two principal directions. In any case, NLD analyses demonstrate that the maximum value of resultant displacement is quite similar to the maximum value of maximum displacement along a single direction. In addition, the resultant displacement peak takes place at the displacement peak along the same direction.

CHAPTER 15:

Smart and/or Sustainable features of **Chapter 8 & 13 designs**, Impact on society (For Allocated village development, villagers happiness, comfortable and for enhancement of the village) (**With the Smart village development Concept As Per Your Idea And Village Visit, modern technology with innovation**). **with doing small changes, Period, Amount Expenditure and Benefit –** a) Immediately b) Within 1 year c) Long term (3-5 years) along with cost estimation.

b) If possible, List the sources of the funding available with the Village gram panchayat

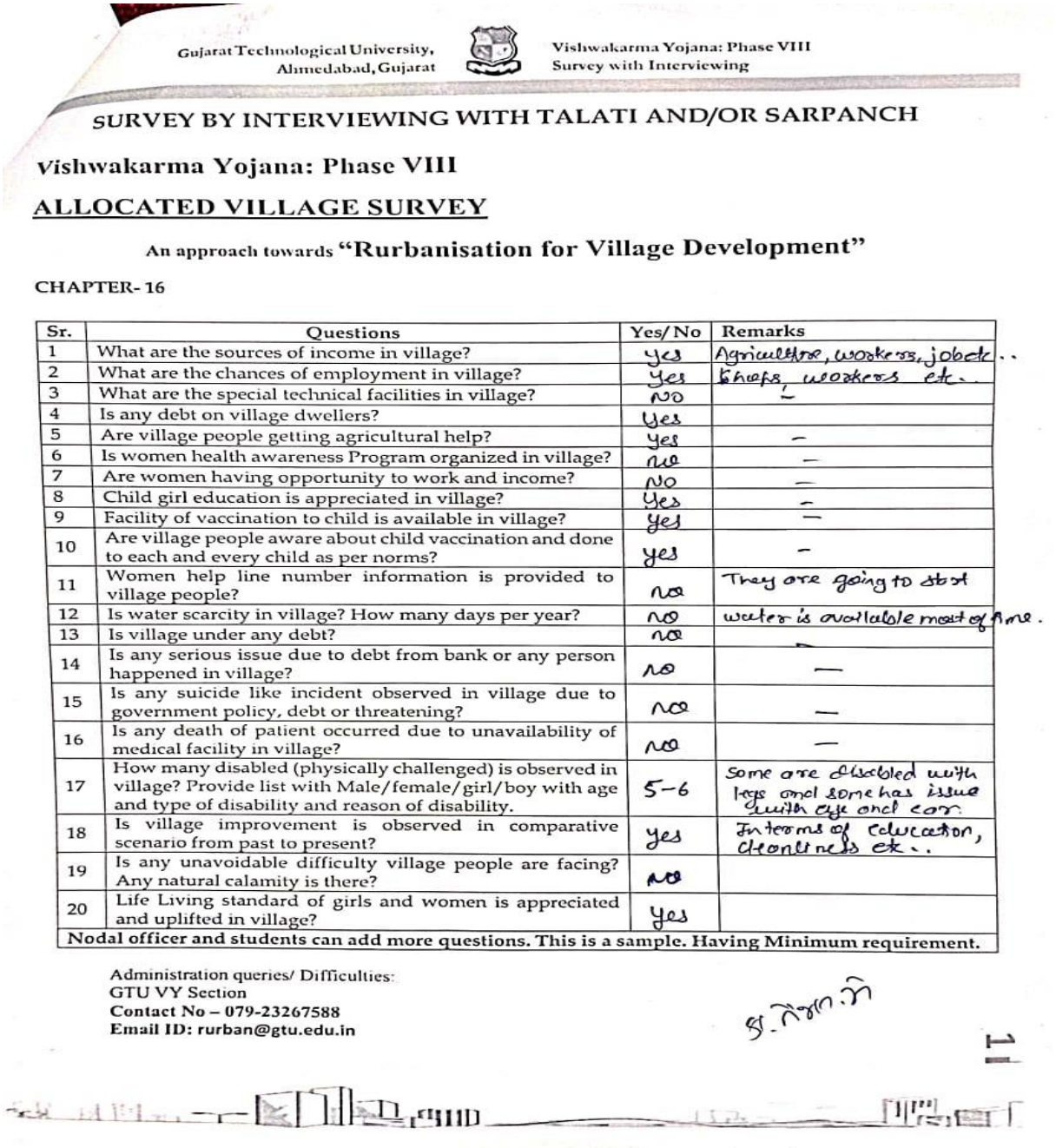
Sr No	Name	Approximate Time	Cost(Rs)
1	Library	1	6,00,000
2	Post Office	1	5,70,000
3	Clinic with Medical Store	6 Months	6,25,000
4	Public Toilet	8 Months	3,15,000
5	Public Park	1	9,30,000
6	Bio-Gas Plant	2	-
7	Community Center	2	17,60,000
8	Gram Panchayat	1.5	5,80,000
9	Aanganwadi	1.5	4,36,000
10	Market Yard	8 Months	15,16,400
11	Crematorium	1.5	2,20,000
12	Hospital	2	16,85,000

Table 15.1 Smart/Sustainable Features of Chapter 8&13

CHAPTER 16:

Survey by Interviewing with Talati/Sarpanch

Fig 16.1 Survey by Interviewing with Talati/Sarpanch



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Survey with Interviewing

SURVEY BY INTERVIEWING WITH TALATI AND/OR SARPANCH

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

An approach towards "Rurbanisation for Village Development"

CHAPTER- 16

Sr.	Questions	Yes/ No	Remarks
1	What are the sources of income in village?	Yes	Agriculture, workers, jobetc..
2	What are the chances of employment in village?	Yes	Shops, workers etc.
3	What are the special technical facilities in village?	NO	–
4	Is any debt on village dwellers?	Yes	
5	Are village people getting agricultural help?	Yes	–
6	Is women health awareness Program organized in village?	no	–
7	Are women having opportunity to work and income?	No	–
8	Child girl education is appreciated in village?	Yes	–
9	Facility of vaccination to child is available in village?	Yes	–
10	Are village people aware about child vaccination and done to each and every child as per norms?	yes	–
11	Women help line number information is provided to village people?	no	They are going to start
12	Is water scarcity in village? How many days per year?	NO	water is available most of time.
13	Is village under any debt?	no	–
14	Is any serious issue due to debt from bank or any person happened in village?	no	–
15	Is any suicide like incident observed in village due to government policy, debt or threatening?	no	–
16	Is any death of patient occurred due to unavailability of medical facility in village?	no	–
17	How many disabled (physically challenged) is observed in village? Provide list with Male/female/girl/boy with age and type of disability and reason of disability.	5-6	Some are disabled with legs and some has issue with eye and ear.
18	Is village improvement is observed in comparative scenario from past to present?	yes	In terms of education, cleanliness etc..
19	Is any unavoidable difficulty village people are facing? Any natural calamity is there?	no	
20	Life Living standard of girls and women is appreciated and uplifted in village?	Yes	

Nodal officer and students can add more questions. This is a sample. Having Minimum requirement.

Administration queries/ Difficulties:
GTU VY Section
Contact No – 079-23267588
Email ID: rurban@gtu.edu.in

CHAPTER 17:

Irrigation/Agricultural Activities and Agro Industry, Alternate Technics and Solution

Farming methods have evolved massively over the years, from basic, hand-held tools to the modern, sophisticated machinery we use today. Farmers are now embracing modernity, which has enabled them to achieve the highest potential in whichever farming activity they choose to undertake. Farming methods are increasingly becoming more refined, less manual, yields are increasing, and it's not uncommon to find beef poultry, beef cattle, and dairy cows on the same farm. But what is causing these changes? The answer is simple. Technology!

Technological advancements have permeated every industry across the world and agriculture is no exception. Nowadays, technology is significantly helping growers and farmers in several ways, including precise forecasting, data-driven decision making, and more. The changes have also resulted in a positive impact on the bottom line of most farmers and ultimately led to improved accesses to food products, at reasonable prices. Let's delve into the specific ways in which technology has revolutionised agriculture.

1 Online Resources

The proliferation of internet technology has dramatically offered farmers unprecedented access to a wealth of valuable resources and tools to make farming easier. Notably, the internet has innumerable production and planning tools to help them forecast future crops.

Additionally, the World Wide Web provides several farming forums that let them exchange ideas seek advice and participate in insightful discussions. These forums offer robust support groups that can help farmers without ever setting foot on the farm.

2 GPS

A few decades ago, the idea of tractors driving themselves on the farm was implausible. However, the entry of GPS technology has completely changed everything. GPS provides precise location information at any point near or on the earth's surface. So, farming machines integrated with GPS receivers can recognise their position within the farm.

Now, tractors equipped with GPS technology coupled with automatic steering systems are used to improve the placement of seeds on the farm, thereby reducing wastes and costs. Additionally, GPS guided drones are increasingly being used to perform tasks such as crop spraying,livestock,monitoring.

The applications of GPS are many and transcend their usage in tractors. For example, farmers can use a GPS receiver to detect preselected positions in a farm field for soil sample collection. The selected soil samples are then analysed to generate a fertility map in a geographic information system (GIS). Using the map, farmers can accurately prescribe the quantity of fertiliser required for each sampled section of the farm field. After that, the farmer can use Variable-rate technology (VRT) fertiliser applicators to distribute the precise amount of fertilisers in the area.

3 Sensors

Sensors, like GPS technology, are increasingly being used by farmers to comprehend their crops at a micro level, reduce environmental impacts, and conserve resources. Most of the sensing technologies used in precision agriculture provide critical data.

Location sensors use GPS satellites signals to ascertain longitude, latitude and altitude. To effectively triangulate a position, a farmer should have a minimum of three satellites. Optical sensors are also used in precision agriculture to aggregate and process plant colour and soil reflectance data. More precisely, they are used to determine the organic matter, moisture content.

Generally, sensors can monitor everything from soil temperature to humidity levels in grain silos. Also, they can offer very critical knowledge of soil health. And importantly, sensor technology helps farmers to use their irrigation waters more efficiently, minimising on wastage, and lowering costs.

4 Mobile devices

As technology improves every day, mobile technology also has advanced, as evidenced by the number of apps popping up. This development has significantly impacted every sphere of life.

The actual game changes have been mobile applications. They have altered the lives of farmers and agricultural field holders, for the better. Famers have access to several mobile apps that can help them to collect information on their field farms, check the weather.

With farmers getting insightful details from mobile apps, they are smoothly transitioning from handling fields to creating farm maps and facilitating the use of drones. The software behind the apps put them in the drivers' seat when managing everything from strategy formulation to tracking progress.

5 Smart farming

When all the above technologies are merged, the resulting product will be a smart farming system, often referred to as precision agriculture. Smart farming involves the implementation of contemporary Information and Communication Technologies (ICT) into agriculture, resulting in what is referred to as the Third Green Revolution. The revolution is slowly taking over the agricultural sector through the joint application of ICT solutions such as the Internet of Things (IoT), GPS, robotics, sensors and actuators, Big Data, Unmanned Aerial Vehicles UAVs.)

Using irrigation as an example, we can demonstrate how different technologies are combined to offer smart farming. Before watering the farm field, a farmer can mount a sensor on an irrigator to assess the moisture level of the soil. The information obtained is then used to vary the quantity of water required.

Farmers can use drones to assess plant health and enable them to take any corrective measures, where applicable. Similarly, smart farming techniques allow farmers to monitor the individual needs of their animals better and regulate their nutrition correspondingly, thereby

averting disease and improving their health.

Smart farming provides farmers with limitless potential to deliver a more sustainable and productive output based on field-generated data. Also, it gives farmers an added value through better and timely decision-making.

Undoubtedly, technology is significantly altering the way we live and work. The adoption of various technologies in agriculture has brought several disruptions in the industry, with specific emphasis on agricultural jobs. Increasingly, agricultural technician jobs are now on demand to cater to the needs of the changing times. Nonetheless, it is clear that technology has changed agriculture, for the better.

Fig 17.1:- New Agricultures Techniques in Agro industry

CHAPTER 18:

Social Activities- Any Activities Planned by Students

As the COVID-19 Pandemic is going on, we gave the message to the villagers about the awareness and precautions that they should take in this global pandemic to avoid to come contact with this virus.
The message we gave were like

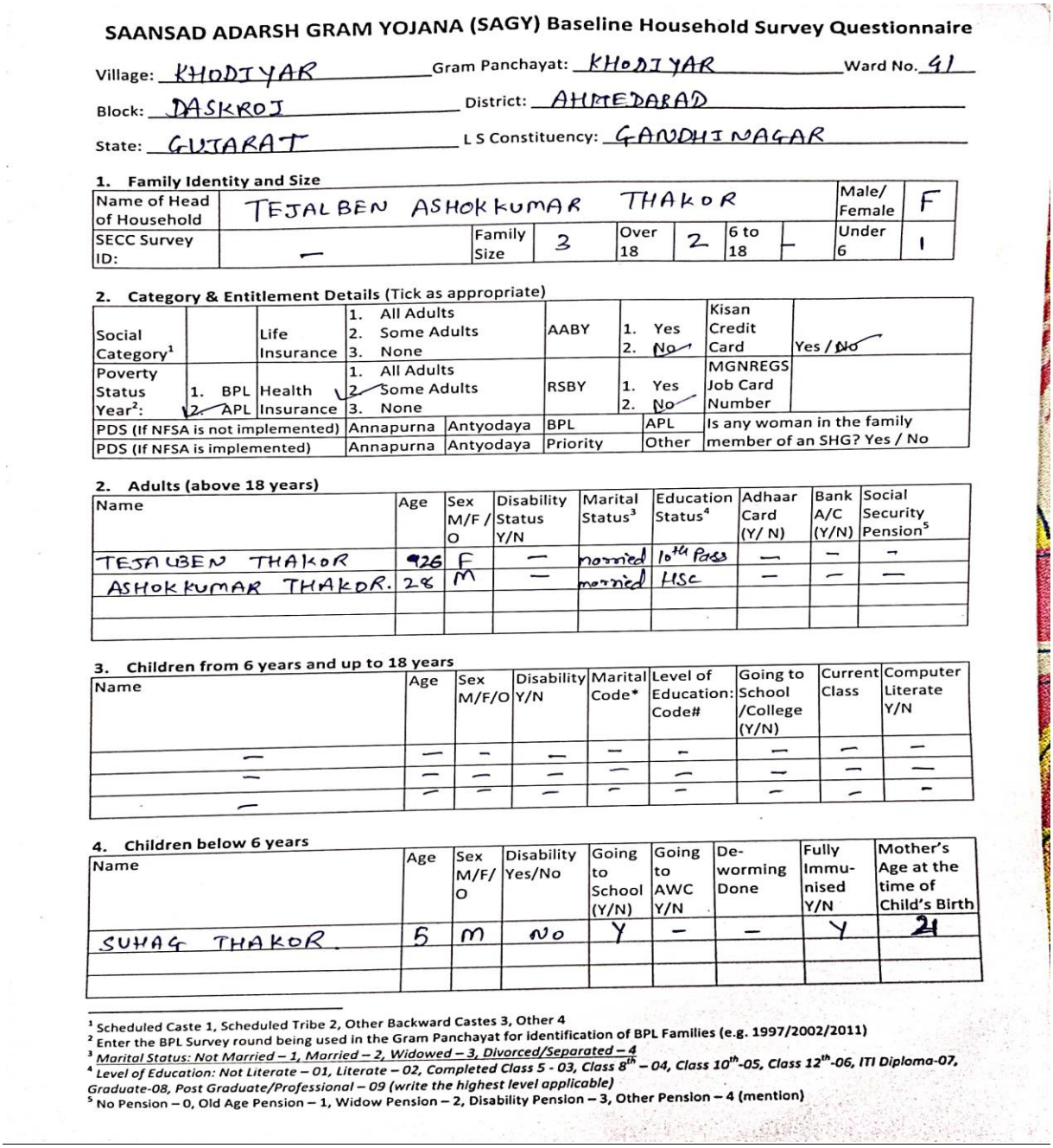
1. To proper sanitize their surroundings and keep the area clean.
2. To proper wash their hands frequently with soap or sanitizer.
3. To avoid social gatherings and keep proper social distancing whenever they meet.
4. To take covid vaccine and break this stigma of this virus.
5. To do regularly yoga and physical exercises in the village.

Fig 18.1:- Interacting with the villagers and giving proper guidance about COVID-19.

CHAPTER 19:

SAGY Questionnaire Survey form with the sarpanch signature

Fig 19.1 SAGY Questionnaire Survey form with the sarpanch signature



SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: KHODIYAR Gram Panchayat: KHODIYAR Ward No. 41

Block: DASKROI District: AHMEDABAD

State: GUJARAT L S Constituency: GANDHINAGAR

1. Family Identity and Size

Name of Head of Household	TEJALBEN ASHOKKUMAR THAKOR						Male/ Female	F
SECC Survey ID:	—	Family Size	3	Over 18	2	6 to 18	—	Under 6	1

2. Category & Entitlement Details (Tick as appropriate)

Social Category[1]		Life Insurance	1. All Adults 2. Some Adults 3. None	AABY	1. Yes 2. No	Kisan Credit Card	Yes / No
Poverty Status Year[2]:	1. BPL 2. APL	Health Insurance	1. All Adults 2. Some Adults 3. None	RSBY	1. Yes 2. No	MGNREGS Job Card Number	
PDS (If NFSA is not implemented)		Annapurna	Antyodaya	BPL	APL	Is any woman in the family member of an SHG? Yes / No	
PDS (If NFSA is implemented)		Annapurna	Antyodaya	Priority	Other		

2. Adults (above 18 years)

Name	Age	Sex M/F / O	Disability Status Y/N	Marital Status[3]	Education Status[4]	Adhaar Card (Y/ N)	Bank A/C (Y/N)	Social Security Pension[5]
TEJALBEN THAKOR	26	F	—	married	10th Pass	—	—	—
ASHOKKUMAR THAKOR.	28	M	—	married	HSC	—	—	—

3. Children from 6 years and up to 18 years

Name	Age	Sex M/F/O	Disability Y/N	Marital Code*	Level of Education: Code#	Going to School /College (Y/N)	Current Class	Computer Literate Y/N
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—

4. Children below 6 years

Name	Age	Sex M/F/ O	Disability Yes/No	Going to School (Y/N)	Going to AWC Y/N	De-worming Done	Fully Immu-nised Y/N	Mother's Age at the time of Child's Birth
SUHAG THAKOR.	5	M	No	Y	—	—	Y	21

[1] Scheduled Caste 1, Scheduled Tribe 2, Other Backward Castes 3, Other 4
[2] Enter the BPL Survey round being used in the Gram Panchayat for identification of BPL Families (e.g. 1997/2002/2011)
[3] *Marital Status: Not Married – 1, Married – 2, Widowed – 3, Divorced/Separated – 4*
[4] *Level of Education: Not Literate – 01, Literate – 02, Completed Class 5 - 03, Class 8th – 04, Class 10th-05, Class 12th-06, ITI Diploma-07, Graduate-08, Post Graduate/Professional – 09 (write the highest level applicable)*
[5] No Pension – 0, Old Age Pension – 1, Widow Pension – 2, Disability Pension – 3, Other Pension – 4 (mention)

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

5. Hand washing

	Always		Sometimes		Never
After use of Toilet	Soap	Other	Soap	Other	
Before Eating	Soap	Other	Soap	Other	

6. Use of Mosquito Net
Children: Yes / No Adults: Yes / No

7. Do members take Regular Physical Exercise

	Yoga	Games	Other Exercises
Adults	Yes / No	Yes / No	Yes / No
Children	Yes / No	Yes / No	Yes / No

8. Consumption of Tobacco

	Smoking	Chewing
Adults	Yes	Yes
Children	NO	NO

9. House & Homestead Data

Own House: Yes / No	No. of Rooms:
Type: Kutcha / Semi Pucca / Pucca	
Toilet: Private / Community / Open Defecation	
Drainage linked to House: Covered / Open / None	
Waste Collection System	Door Step / Common Point / No Collection System
Homestead Land: Yes / No	Kitchen Garden : Yes / No
Compost Pit: Individual/ Group/ None	Biogas Plant: Individual/ Group/ None

10. Source of Water (Distance from source in KMs)

Source of Water		Distance
Piped Water at Home	Yes / No	2
Community Water Tap	Yes / No	—
Hand Pump (Public / Private)	Yes / No	—
Open Well(Public / Private)	Yes / No	—
Other (mention): —		—

11. Source of Lighting and Power

Electricity Connection to Household: Yes / No
Lighting: Electricity/Kerosene/Solar Power
Mention if Any Other: _____
Cooking: LPG/Biogas/Kerosene/Wood/Electricity
Mention if Any Other: —
If cooking in Chullah: Normal/ Smokeless

12. Landholding (Acres)

1. Total	4113ha.	2. Cultivable Area	90ha
3. Irrigated Area	50ha.	4. Uncultivable Area	323ha.

13. Principal Occupations in the Household

Livelihood	Tick if applicable
Farming on own Land	✓
Sharecropping /Farming Leased Land	✓
Animal Husbandry	✓
Pisciculture	
Fishing	X
Skilled Wage Worker	X
Unskilled Wage Worker	X
Salaried Employment in Government	X
Salaried Employment - Private Sector	✓
Weaving	✓
Other Artisan(mention)	X
Other Trade & Business (mention)	✓

14. Migration Status
Does any member of the household migrate for Work: Yes / No. If Yes Entire Year / Seasonal
Does anyone below 18 years migrate for work: Y/N

15. Agriculture Inputs

Do you use Chemical Fertilisers	Yes/No
Do you use Chemical Insecticides	Yes/No
Do you use Chemical Weedicide	Yes/No
Do you have Soil Health Card	Yes/No
Irrigation: None/ Canal/ Tank/ Borewell/Other	
Drip or Sprinkler Irrigation: Drip /Sprinkler / None	

16. Agricultural Produce in a normal year (Top 3)

Name	Unit	Quantity
JUWAR	—	—
MAKAI	—	—
BAJRA		

17. Livestock Numbers

Cows: 50	Bullocks: 2	Calves: 50
Female Buffalo: 1	Male Buffalo: 1	Buffalo Calves: —
Goats/ Sheep: 30	Poultry/ Ducks: —	Pigs: —
Any other: Type —		No. —
Shelter for Livestock: Pucca / Kutcha / None		
Average Daily Production of Milk(Litres): 200		

18. What games do Children Play
cricket, indoor games, etc...

19. Do children play musical instrument (mention)
No

Schedule Filled By:
Principal Respondent:
Date of Survey:

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

(Note: Please aggregate information from village level questionnaires wherever relevant)

I. Basic Information

a. Gram Panchayat: KHODIYAR

b. Block: DASKROI

c. District: AHMEDABAD

d. State: GUJARAT

e. Lok Sabha Constituency: GANDHINAGAR.

f. Number of Wards in the Gram Panchayat: 10

g. Number of Villages in the Gram Panchayat: -

h. Names of Villages:

-

Demographic Information

Number of Households 700 Total Population 3327 Male 1667 Female 1660

SC HHs 51 ST HHs 51 OBC HHs - Other HHs -

I. Access to Infrastructure / Facilities / Services

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
a.	ANM/ Health Sub Centre	Y	-
b.	Nearest Primary Health Centre (PHC)	N	30
c.	Nearest Community Health Centre (CHC)	N	30
d.	Nearest Post Office	N	5
e.	Nearest Bank Branch (Any)	Y	-
f.	Nearest Bank with CBS Facility	N	-
g.	Nearest ATM	Y	-
h.	Nearest Primary School	Y	-
i.	Nearest Middle School	N	2
j.	Nearest Secondary School	N	2
k.	Nearest Higher Secondary School / +2 College	N	5
l.	Nearest Graduate College	N	5
m	Nearest ITI / Polytechnic Centre	N	5
n	Kisan Seva Kendra	N	-

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

(Note: Please aggregate information from village level questionnaires wherever relevant)

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
o	Agriculture Credit Cooperative Society	N	–
p	Nearest Agro Service Centre	N	–
p	MSP based Government Procurement Centre	N	–
q	Milk Cooperative /Collection Centre	N	–
r	Veterinary Care Centre	N	–
s	Ayurveda Centre	N	–
t	E – Seva Kendra	N	–
u	Bus Stop	Y	
v	Railway Station	Y	
w	Library	N	5
x	Common Service Centre	N	5

IV. Sports Facilities in the Gram Panchayat

a. Number of Play Grounds in the GP: Total 0 Public – Private –

b. Mini Stadium : No Yes(Y) /No (N) *(Playground with equipment and sitting arrangement)*

V. Education, ICDS

a. Number of Angan Wadi Centres: 2

b. Number of villages without Angan Wadi Centres –

Names of such villages: –

c. Schools (Number)

Primary Private: 1 Primary Govt.: 1

Middle Private: – Middle Govt.: –

Secondary Private: – Secondary Govt.: –

Higher Secondary Private: – Higher Secondary Govt: –

VI. Public Distribution System

	Item	Private Contractor	Women's SHG	Gram Panchayat	Cooperative	Other (Mention)	Location in GP (mention Location)	If outside GP, Location & distance from GP HQrs)
a.	Cereal (Rice/ Wheat/ Millets)	–	–	Yes	–	–	–	–
b.	Kerosene	–	–	Yes	–	–	–	–
c.	Other (mention)	–	–	–	–	–	–	–

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

(Note: Please aggregate information from village level questionnaires wherever relevant)

VII. Coverage of Villages under different Facilities & Services

	Parameter	Villages Status[1]	Names of Villages Covered	Names of Villages not Covered
a.	Piped Water Supply Coverage to Villages	Covered 100%. Not Covered –	whole village khodiyar is covered.	–
b.	Hand Pump Coverage in Villages:	Covered – Not Covered –	–	–
c.	Coverage under Covered Drains:	Covered 100%. Not Covered –	whole village khodiyar is covered	–
d.	Coverage under Open Drains:	Covered – Not Covered –	–	–
e.	Villages with Household Electricity Connection (Numbers)	Connected 100%. Not Connected –	whole village khodiyar is covered	–

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	90 ha	d.	Pasture / Grazing Land	–	g.	Check Dam	–
b.	Irrigated Land	50 ha	e.	Forests/ Plantations	–	h.	Wells/Bore Wells	4
c.	Un-irrigated Land	40 ha	f.	Other Common Land	–	i	Tanks /Ponds	3

[1] Mention the number of Villages Covered and Not Covered

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

(Note: Please aggregate information from village level questionnaires wherever relevant)

IX. Parameters relating to Households & Institutions

		Number
a)	Number of eligible Households for pension (old age, widow, disability)	15 - 20
b)	Number of Households receiving pension (old age, widow, disability)	10 - 15
c)	Number of eligible Households who are not receiving pension	0-5
d)	Number of Households eligible for Ration Card	700(all).
e)	Number of eligible HHs having ration cards	-
f)	Number of households covered under RSBY (Rashtriya Swasthya Bima Yojana)	0
g)	Number of HHs covered under AABY (Aam Aadmi Bima Yojana)	0
h)	Number of active Job Card holders under MGNREGA	-
i)	Number of Job Card holders who completed 100 days of work during 2013-14	-
j)	Number of shops selling alcohol	-
k)	Number of BPL families	213
l)	Number of landless households	50-100.
m)	Number of IAY beneficiaries	-
n)	Number of FRA[2] beneficiaries	-
o)	Number of Community Sanitary Complexes	-
p)	Number of Households headed by single women	4-5
q)	Number of Households headed by physically handicapped persons	5-6
r)	Total number of Persons with Disability in the village	5-6
s)	Number of SHGs	1
t)	Number of active SHGs	1
u)	Number of SHG Federations	-
v)	Number of Youth Clubs	-
w)	Number of Bharat Nirman Volunteers	-

Name and Signature of Surveyor and Respondent'

Akshat.		GI, Narm 25	20|6|2021
Surveyor	PRI Respondent (Preferably Gram Panchayat Chairperson)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	Date of Survey

[2] The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

This questionnaire should be filled for each of the villages in the selected Gram Panchayat[1]

I. Basic Information

a. Village: Khodiyar

b. Ward Number: 01

c. Gram Panchayat: Khodiyar

d. Block: DASKROI

e. District: AHMEDABAD

f. State: GUJARAT

g. Lok Sabha Constituency: GANDHINAGAR

h. Number of Habitations / Hamlets in the Gram Panchayat: —

i. Names of Habitations / Hamlets:

—

Demographic Information

Number of Households 700 (Approx) Total Population 3327 Male 1667 Female 1660

SC HHs 51 ST HHs 51 OBC HHs — Other HHs —

II. Access to Infrastructure/Amenities etc.

i.	Access to Infrastructure / Facilities / Services	Located in the Village Yes (Y)/No(N)	If located elsewhere (N), distance in kms from the village
a.	Nearest Primary School	Yes	—
b.	Nearest Middle School	No	2
c.	Nearest Secondary School	No	2
d.	Kisan Seva Kendra	No	—
e.	Milk Cooperative /Collection Centre	No	2
g.	Health Sub Centre	Yes	—
h.	Bank	Yes	—
i.	ATM	no	2
j.	Bus Stop	Yes	—
k.	Railway Station	Yes	—

[1] While filling this the surveyor must collect the information from the Ward Member/s and relevant government officials

1

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

i.	Access to Infrastructure / Facilities / Services	Located in the Village Yes (Y)/No(N)	If located elsewhere (N), distance in kms from the village
l	Library	No	5
m	Common Service Centre	NO	5
n	Veterinary Care Centre	No	5

ii. Road Connectivity

a. Habitations connected by All-weather Roads (1-All 2-None 3-Some)

If 3 mention the name of the habitations where not available:_____

iii. Drinking Water Facilities

a.Piped Water Supply Coverage to Habitations:_____ (1-All 2-None 3-Some)

If 3 mention the name of the habitations not covered:_____

b.Hand Pump Coverage in Habitations: _____ (1-All 2-None 3-Some)

If 3 mention the name of the habitations not covered:_____

iv. Coverage of Habitations under Waste Management System

a. Coverage under Covered Drains: _____(1-All 2-None 3-Some)

If 3 mention the name of the habitations not covered:_____

b. Coverage under Open Drains: _____(1-All 2-None 3-Some)

If 3 mention the name of the habitations not covered:_____

c. Coverage under Doorstep Waste Collection: (1-All 2-None 3-Some)

If 3 mention the name of the habitations not covered:_____

v. Coverage of Habitations under Electrification

a. Coverage under Household Connections: (1-All 2-None 3-Some)

If 3 mention the name of the habitations not covered:_____

b.Coverage under Street Lighting: All(1-All 2-None 3-Some)

If 3 mention the name of the habitations not covered: At some places, street lights are not present

vi. Sports Facilities in the Village

a.Number of Play Grounds in the Village (minimum size 200 square meters): 0 (No).

b.Mini Stadium : 0 (No) Yes(Y) /No (N)

vii. Education, ICDS

a. Number of Anganwadi Centres: 2

c. Schools (Number)

Primary Private: 1 Primary Govt.: 1

Middle Private: - Middle Govt.: -

Secondary Private: - Secondary Govt.: -

Higher Secondary Private: - Higher Secondary Govt: -

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

viii. Land Category		Area in Acres		Land Category	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	90ha	d.	Pasture / Grazing Land	–	g.	Check Dam	~~4~~
b.	Irrigated Land	50ha	e.	Forests/ Plnatations	–	h.	Wells/Bore Wells	3
c.	Un-irrigated Land	40ha	f.	Other Common Land	–	I	Tanks /Ponds	2

ix. Entitlement Related Parameters		
1	Number of active Job Card holders under MGNREGA	~~155~~ -
2	Number of active Job Card holders who have completed 100 days of work	115
3	Number of shops selling alcohol	–
4	Number of BPL families	99
5	Number of landless households	50-100
6	Number of IAY beneficiaries	–
7	Number of FRA beneficiaries	–
8	Number of common sanitation complexes	–
9	Number of SHGs	–
10	Number of active SHGs	–
11	Existence of SHG Federation in the Village (Yes / No)	–
12	Number of Youth Clubs	–
13	Number of Bharat Nirman Volunteers	–

Name and Signature of Surveyor and Respondent'

Surveyor	PRI Respondent (Preferably a ward member from a ward that is fully or partially covered under the Village)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	20|6|2021 Date of Survey

CHAPTER 20:

TDO-DDO-Collector email sending Soft Copy attachment in the report

Fig 20.1 Email Screen Shot of sending report of vishwakarma yojana to TDO DDO

8/10/2021 Gmail - Vishwakarma Project Phase-8

Gmail

Sumey Shah <sumeyshah147@gmail.com>

Vishwakarma Project Phase-8
1 message

Sumey Shah <sumeyshah147@gmail.com> 10 August 2021 at 22:44
To: collector-ahd@gujarat.gov.in
Cc: dish-ahd@gujarat.gov.in
Bcc: ddo-ahd@gujarat.gov.in, tdo-ahd@gujarat.gov.in, do-dish-ahd@gujarat.gov.in

Hello Sir/Mam,

I Sumey Shah, Student in L.D College of Engineering , Ahmedabad affiliated to Gujarat technological university & Accredited by National board of Accreditation under the guidance of Prof. Utkarsh.P.Nigam have carried the project Vishwakarma Yojana Phase 8- An approach towards Rurbanisation. GTU has allotted us very important and prestigious project of Vishwakarma Yojna (Phase-VII) by the Government of Gujarat, in which the students would study the identified villages and make recommendations to achieve integrated and comprehensive development through Technological options.

As a part of vishwakarma Yojana's guidelines, we have discussed and informed to all the respected officers about our project in which we will shortly notify about Khodiyar village of Ahmedabad district, profile of issues for development and our design work for them which are as below:

Village : Khodiyar District: Ahmedabad		**Population: 3327(according to census 2011)**
Key Issue	**Remarks**	**Designs Given**
Public Infrastructure	There was no public latrine block or public toilet in the village. So there is no any facilities of sanitation for outsiders of the village. So we proposed the design of Public Toilet in the village.	**Public Toilet**
Education	There is sufficient aanganwadi in the village and their condition is also good but they are lacking in facilities that the students and teachers are deprived of and so we have proposed the design of aanganwadi in the village and As per talk with the villagers, the students of the village were deprived of library where they can read various books and gain some knowledge and also they can get the peaceful place to read so we proposed the design of library.	**Aanganwadi, Library**
Health	There is only one sub health centre in the village and so when we were interacting with the villagers they shared the problem of health facilities and unavailability of the doctor when they are in need and so we proposed the design of hospital and There is no any private clinic in the village. As per norms there should be atleast one clinic in the village. So we proposed the design of clinic with attached medical store in the village.	**Hospital, Clinic with Medical Store**

https://mail.google.com/mail/u/0?ik=f300d80b3b&view=pt&search=all&permthid=thread-a%3Ar7741367830170641562&simpl=msg-a%3Ar773806286… 1/2

Community Place	There was no any place in the village where social gathering can be done by the village at the time of any festivals or some event in the village and so we have proposed the design of community centre so that they can perform the social activities and functions in it.	**Community Center**
Solid Waste Disposal	There was no source for treatment of solid waste generated in the village and so we have provided the design bio-gas plant.	**Bio-Gas Plant**
Sports	There was no such place where kids of village can spare their free time in playing different outdoor games and so we have designed public park.	**Public Park**

The Other Design we have provided for the betterment of the village Khodiyar are:-

Post Office, Gram Panchayat, Market Yard, Crematorium.

Also we are attaching the Combined Report of Part-1 and Part-2.

Part 1-2 Combined.pdf
20871K

CHAPTER 21:

Comprehensive report for the entire village

We are currently working on Vishwakarma Yojana Project Phase VIII – An Approach towards Rurbanisation and we are very glad to work with Gujarat Technological University for Sustainabe Development of the villages which are very in under- Developed condition and we see our vision project as an opportunity to give our best for this project as an National Duty.

We have selected KHODIYAR Village in Daskroi Tehsil in Ahmedabad District. The Village is 18 Kms far from Ahmedabad District. . According to census 2011 information, the location code or village code of khodiyar village is 511631. Ahmedabad district is both district and sub-district headquarters of khodiyar village..

As per 2009 stats, khodiyar village is also a gram panchayat. The village is in still under-developed condition. The village is still deprived of many basic facilities that have became a primary facilities which must be present in any of the villages of India.

We have made following designs for Khodiyar village for Part-1 as per requirements of the villagers.

1. Design of Library
2. Design of Post office
3. Design of Clinic with Medical Store.
4. Design of Public Toilet
5. Design of Public Park
6. Design of Bio-Gas Plant

We have proposed the following designs for the part 2 for the betterment of the village and we have also mentioned the need of the design for which they are proposed.

1. Design of Community Centre
2. Design of Gram Panchayat
3. Design of Aanganwadi
4. Design of Market Yard
5. Design of Crematorium
6. Design of Hospital

We have visited Punsari village as our ideal village and visited Punsari a few times and gathered information about it and understood how an ideal village should be.

We have visited Adalaj village as our smart village and saw all the smart facilities present in the village and try to adopt the design in our village.