DETAIL PROJECT REPORT

VISHWAKARMA YOJANA: VIII

AN APPROACH TOWARDS RURBANISATIONAN

Khambhaliya Village

Junagadh District

PREPARED BY

STUDENT NAME	BRANCH NAME	ENROLLMENT NO.
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COLLEGE NAME

OM ENGINEERING COLLEGE

NODAL OFFICERS NAME

PROF. H.M. BHIMJIANI

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

Detail Project Report for ,

VILLAGE KHAMBHALIYA

DISTRICT JUNAGADH

Under

Vishwakarma Yojana: Phase-VIII

in partial fulfillment of the project offered by

GUJARAT TECHNOLOGICAL UNIVERSITY, CHANDKHEDA

during the academic year 2020-21.

This project work has been carried out by them under our supervision and guidance.

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
Ankit Dabhi	Civil	171020106003
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Internal (Evaluator) Guide Name and Signature:	**PROF. H.M. BHIMJIANI**
College Name:	**OM ENGINEERING COLLEGE**
College Stamp:	

ABSTRACT

"Developing village with a 'rural soul' but with all urban amenities that a city may have"

Vishwakarma yojana is one of the initiatives towards Rurbanization by Government of Gujarat. Which was allotted as a real time situation type project provide to GTU. The student and faculty members meet all the citizen of a village. Survey the existing facilities. Then they re-imagine and design the whole of the infrastructure of the village. The students use their engineering skills to prepare detailed project reports for infrastructure as a part of their final year project work. By this project students are experience a real work and able apply own technical knowledge on any real problem. This entire hard work, many students visits to the village and do survey on his particular village.

Khambhaliya is a village in bhesan taluka District of Gujarat, India. This khambhaliya village is 5 km of the bhesan taluka. This village are available also gram panchayat. This village is native language of the most use of the Gujarati. This village is population as per 2011 is 3153 total population of the village it is the male of 1499 and female is 1654 is the village.

This village houses condition is good. In this village there are no public toilet. In this village panchayat and post office building condition is not good and also community hall is not in good condition.

Key Words: Rural Development
Infrastructure Facilities,
Rurbanization,
Agriculture Development,

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.

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ABBREVIATIONS

SHORT NAME/SYMBOL	FULL NAME
B	Bank
A	Anganwadi
AF	Anganwadi facilities
GP	Gram panchayat
ATP	Any Time Payment
PO	Post office
PDS	Public Distribution
NHM	National Health Mission
PDS	Public Distribution system
PMJDY	Pradhan Mantri Jan – Dhan Yojana
VDP	Village development plan
SBA	Swachh Bharat Abhiyan
MKSD	Mahila Kisan Sashaktikaran Pariyojana

MKRE	Ministry of New and Renewable Energy
MHM	Menstrual Hygeiene Management
MDWS	Ministry of Drinking Water and Sanitation
NRLM	National Rural Livelihood Mission
NABARD	National Bank for Agriculture and Rural Development
NDDB	National Daily Development Board
NFSA	National Food Security Act
NHM	National Health Mission
NIRD&PR	National Institute of Rural Development and Panchayati Raj
NLM	National Literacy Mission
NRDWP	National Rural Drinking Programme
ODF	Open Defecation Free
PB	Panchayat Building
PO	Post Office
PDS	Public Distribution System
S	School
SAGY	Sansad Adarsh Gram Yojana
SIRD	State Institute of Rural Development
SSA	Sarva Shiksha Abhiyan
SHGs	Self Help Groups
SAGJ	Sansad Adarsh Gram Yojana
SDGs	Sustainable Development Goals
SBM	Swachh Bharat Abhiyan
SOVDD	Schedule of Village Demographical detail
USPTO	US Patent Database
PHC	Primary health center

Chapter 1.

Ideal village visit from District of Gujarat State:

1.1 Background & Study Area Location

- On 22 august,2020 we visited a village name shapur. Shapur is the village located in Junagadh district in Gujarat state.
- The village follows the panchayat raj system from the 1984. The current village sarpanch name is Ms. Ilaben Fhaldu.

Fig 1.1 Map of Shapur Village

Detail	Total	Male	Female
Population	8108	4237	3871
Child (0-6)	650	328	322
Schedule Cast	722	361	361
Schedule Tribe	246	133	113

Table 1.1 Population in Shapur

❖ Study of Location:

Country	State	District	Taluka
India	Gujarat	Junagadh	Vanthali

Gram Panchayat	**Shapur**
District	Junagadh
State	Gujarat
Latitude and Longitude	21.46806 ° N & 70.3709 ° E
Area	1200 Sq. /k㎡
Population	9800
Household	1810

Table 1.2 Study of Location

1.2 Concept of Ideal Village, Normal Village

- An ideal village will be so constructed as to lead itself to perfect sanitation. It will have cottages with sufficient light and ventilation build of a material obtainable within a radius of five miles of it.
- It will have sufficient irrigation system for agriculture purpose and drainage system for domestic and industrial purpose.
- It will have primary requirement like post office, primary health center, police station, public toilet, water distribution system, primary & high secondary schools, etc.

1.2.1 Objectives of ideal village

- To increase infrastructure facility.
- To increase the occupation of the people in village.
- To increase the living standards of the people of village.
- To provide good sanitation and drainage system.
- To increase people's wealth.
- To increase transportation facility.
- To increase health security.
- To increase irrigation and drinking facilities.

1.2.2 Case Study of Ideal Village of India/ Gujarat:

- Although India does not live in its villages anymore, the rural population is still sizeable and, more importantly, it reels under the pressure of extreme poverty, pitiable basic amenities and dearth of livelihood opportunities. There is an urgent need to transform the rural landscape of India while retaining the soul of the rural life. The case of village Punsari from the Sabharkantha District of the state of Gujarat is unique as it stands out as a smart and model village. The paper argues that grassroots leadership, community participation, decentralization of powers to local bodies in rural areas, and financial support in the form

of various government schemes can bring far-reaching changes in the rural landscape of India. The paper also strongly advocates a view that there still exists a considerable gap in what we call a model village and what an ideal village should be.

1.2.3 The Ideal of Model/Smart Village

- Smart village refers to a concept developed in rural area that provides solution to problem occurred and improves the quality of life. The main problems faced by rural areas are cover poverty, low level of education, and limited access to technology. Smart village concept emerged due to some different characteristics between rural and urban areas.

1.2.4 Ancient history civil/ electrical concept about Indian village/ foreign countries perspective and its development

- We know there is a government in India at the center and state levels. But there another important system for local governance. The foundation of the present local self-government in India was laid by the Panchayati Raj system (1992).
- But the history of Panchayati Raj starts from the self-sufficient and self-governing village communities. In the time of the Rig-Veda (1700 BC), evidence suggests that self-governing village bodies called 'sabhas' existed. With the passage of time, these bodies became panchayats.

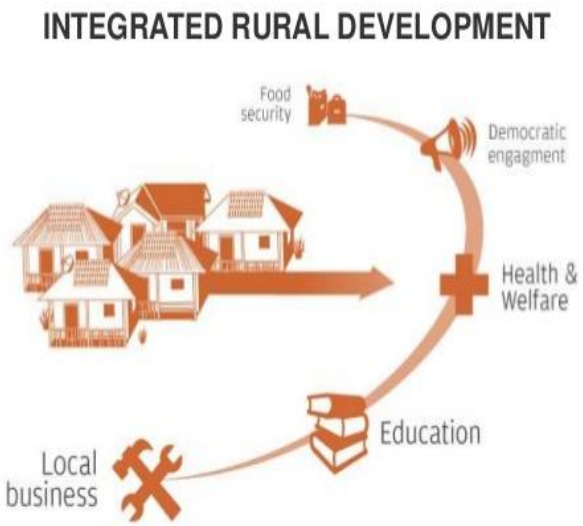

Fig 1.2.4 Fig civil concept

- Panchayats were functional institutions of grassroots governance in almost every village. They endured the rise and fall of empires in the past, to the current highly structure system.

1.3 Detail Study

1.3.1 Socio economic

- The villagers are most of the total population is depends on the agriculture activities and other source of the income is industrial and labour occupation.
- The village has railway station and bus station, it is play an important role in development of the village.
- The village is developed facilities like CCTV Camera in some place.

1.3.2 Demographical Detail

1.3.3 (a) Gram Panchayat

પરિશિષ્ટ-૩

ગ્રામ પંચાયતના અંદાજિત આવકના સાધનો

ક્ર. નં.	આવકના સાધન	૨૦૧૫-૧૬	૨૦૧૬-૧૭	૨૦૧૭-૧૮	૨૦૧૮-૧૯	૨૦૧૯-૨૦
૧	કચેરીની આવક		૨,૦૦,૦૦૦/-	૨,૨૦,૦૦૦/-	૨,૫૦,૦૦૦/-	૨,૭૦,૦૦૦/-
૨	ઓકટ્રોયની આવક					
૩	રોયલ્ટી	૩,૨૫,૦૦૦	૩૪૫૦૦૦	૩૪૫૦૦૦	૩૪૫૦૦૦	૩૪૫૦૦૦
૪	ગ્રામ પંચાયતને મળતી પ્રોત્સાહક ગ્રાન્ટ	૧૦૭૫૦	૧૦૭૫૦	૧૦૭૫૦	૧૦૭૫૦	૧૦૭૫૦
૫	ગ્રામ પંચાયતની અન્ય સ્વભંડોળની આવક					

1.3.3 Infrastructure detail

- This village has very good infrastructure.
- Shapur village has infrastructure facilities like Panchayat building, Post office, Bank/ATM, Health center, Schools, Aanganvadi, etc.

1.3.3 (b) Anganvadi

1.3.3 (c) Bank

1.4 SWOT Analysis of Ideal village

- SWOT analysis is a strategic planning technique used to help a person or organization identify strengths, weaknesses, opportunities, and threats related to business competition or project planning.

1.4 Fig SWOT

- **Strength:**
  - Better safety and security.
  - Efficient transport system.

- Batter health safety.

❖ **Weakness:**
- Damage road network.
- Damage of houses
- Weakness in education.

❖ **Opportunities:**
- Stable social structure.
- Better health safety.

❖ **Threats:**
- Have to meet new governance rules in this market.

1.5 Future prospects of Development of the Ideal village / Smart Village

- Improve village infrastructure.
- Increment of the wealth of people.
- People get properly facility in village.
- Improvement in road network.
- Provide R.O. plant for pure drinking water in village.
- Decrease the people transferring out state.
- The village people get good income.
- Visitors come here and village people get moony.

1.6 Benefits of visits Ideal village/ Smart village

- Improve the life style of the people in village.
- We know about actual village life.
- Improvement in the communication skill.
- We know about of village people problems.
- Helps to understand the do's and don't of the village activity.
- We discussed the good and bad thing about village from village people
- We saw all type of basic and primary amenities available.

1.7 Civil aspects required in Ideal village / Smart Village

- In the shapur village we observe that there is lack of civil aspects like rain water harvesting, bio-gas plant, solar street lights, storage area, medical store etc

Chapter 2.

Literature review- (Civil & Electrical Concept)

2.1 Introduction: Urban & Rural village concept

❖ **Urban:**

- Urban areas are very developed, meaning there is a density of human structures such as houses, commercial buildings, roads, bridges, and railways. "Urban area" can refer to towns, cities, and suburbs**.** An urban area includes the city itself, as well as the surrounding areas.
- In the urban area the 70 to 80 % of the total population is engaged with non-agriculture activities. The transportation and communication are well developed in the urban area.

Fig 2.1 (a) Urban Area

❖ **Rural:**

- In general, a rural area is a geographic area that is located outside towns and cities. Where the most of the total population is engaged with agriculture activities.
- Rural areas are also known as the 'countryside' or a 'village' in India. It has a very low population density.
- According to the Planning Commission, a town with a maximum population of 15,000 is considered rural in nature. In these areas the panchayat makes all the decisions. There are five people in the panchayat. The National Sample Survey Organization (NSSO) defines ‘rural’ as follows:

Fig 2.1 (b) Rural area

- An area with a population density of up to 400 per square kilometer.
- Villages with clear surveyed boundary but no municipal board.
- A minimum of 75% of male working population involved in agriculture.

2.2 Importance of the Rural development

- Rural development is a dynamic process, which is mainly concerned with the rural areas.
- This include- Agriculture growth, putting up of economic and social infrastructure, fair wages as also housing and house sites for the landless, village planning, public health, education and functional literacy, communication etc.
- Rural development is a national necessity and has considerable importance in India.

Fig 2.2 Importance of rural development

- Rural development is important not only for the majority of the population residing in a rural area but the growth of rural activities is necessary to stimulate the speed of overall economic expansion of the nation.

2.3 Ancient Villages / Different Definition of: Rural Urban Villages

- Urban areas that have a major non-agricultural activity and function as the urban settlements, concentration and distribution of government services, social services, and economic activities.
- Rural areas that have a major agricultural activity, including the management of natural resources in the region, and function as rural settlements, government services, social services, and economic activities.

2.4 Scenario: Rural / Urban village of India population Growth

Population (in Crore)

	2001	2011	Difference
India	102.9	121.0	18.1
Rural	74.3	83.3	9.0
Urban	28.6	37.7	9.1

Table 2.4 Population in Crore

- The absolute increase in population is more in urban area that in rural area.
- Rural-Urban distribution: 68.84 & 31.16%

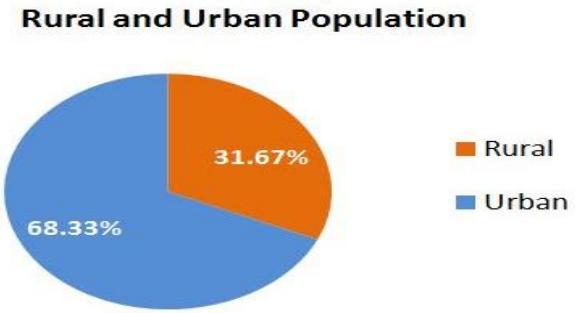

Fig 2.4 Population chart India

2.5 Scenario: Rural / Urban village of Gujarat as per Census 2011 and latest

Description	2011	2001
Approximate population	6.04 Crores	5.07 Crores
Actual population	60,439,692	50,671,017
Male	31,491,260	26,385,577
Female	28,948,432	24,285,440
Population Growth	19.28%	22.48%
Percentage of total population	4.99%	4.93%
Sex ratio	919	920
Density per square km	308	258
Density per square meter	798	669
Area per square km	196.244	196.024
Area per square meter	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 (0-60 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
Male Literate	23,474,873	17,833,273
Female Literate	17,618,485	11,994,477

Table 2.5 Population of Gujarat

❖ **Gujarat Urban population:**

➢ As per the Census 2011, the total Population of Gujarat is 6.04 Cr**.** Thus the population of Gujarat forms 4.99 percent of India in 2011. Gujarat has total population of 60,439,692 in which males were 31,491,260 while females were 28,948,432. Total area of Gujarat is 196,244 square km. Thus the population Density of Gujarat is 308 per square km which is lower than national average 382 per square km. The average sex ration is the number of females per 1000 males. As per the Census 2011, the Average Sex Ration of Gujarat is 919 which is above than national average of 943 females per 1000 males. Also the child sex ration (age less than 6 years) of Gujarat is at 890 which is lower than 918 of India. The total literacy rate of Gujarat is 78.03% which is greater than average literacy rate 72.98% of India. Also the male literacy rate is 85.75% and the female literacy rate is 69.68% in Gujarat.

❖ **Gujarat Rural population:**

➢ Total rural population of Gujarat State is 34694609 which is 57.4% of total Gujarat's population and Gujarat urban population is 25745083 about 42.6% of total population. In Gujarat State sex ratio in rural area is 949 and urban area is 880 per 1000 male persons. Gujarat Literacy % in rural area is 71.71% as compared to urban area which is 86.31%.

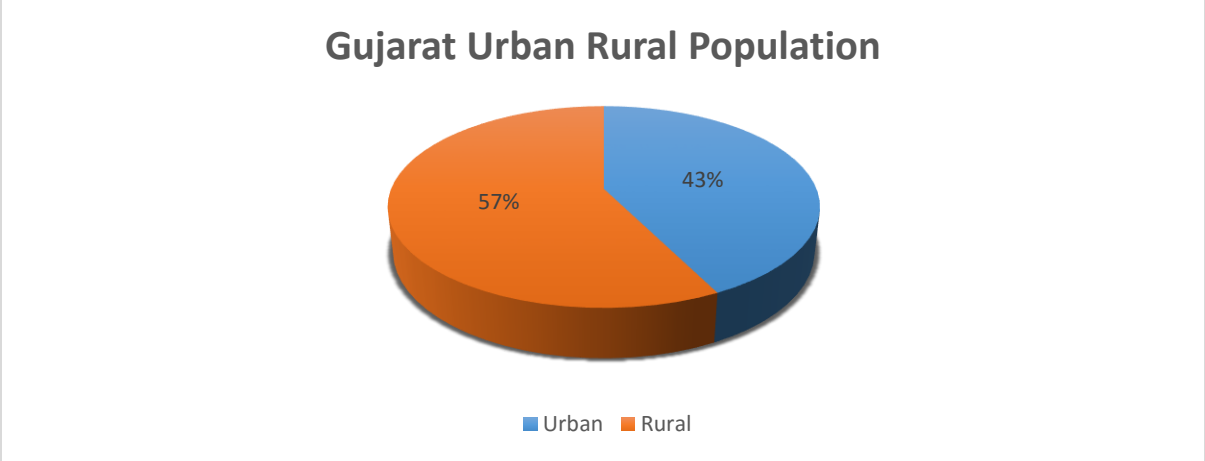

Fig 2.5 Population chart of Gujarat

2.6 Rural Development Issues - Concerns – Measures

❖ **People related issues:**

- ➢ Traditional way of thinking.
- ➢ Poor understanding.
- ➢ Low level of education to understand development efforts and new technology.
- ➢ Poor awareness.
- ➢ Low level of education**.**

❖ **Agriculture related issues:**

- Poor marketing facility.
- Unavailability of inputs.
- Lake of awareness, knowledge and skill.

❖ **Infrastructure related issues:**

- Poor infrastructure facility like: Water, Electricity, Transport, Communication, Health, etc.

- **Economic problems:**
- High cost of input.
- Unfavorable economic condition to adopt high cost technology.

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

- Rods in village
- Transportation
- Bus station in each village
- Natural resource conservation service directive
- Department directive

2.8 Other Projects / Schemes of Gujarat / Indian Government

❖ **Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS):**

- National Rural Employment Guarantee Act 2005, was launched on the 2nd Feb.2006. Now the new name of this scheme is "Mahatma Gandhi National Rural Employment Guarantee Act" (or, MGNREGA).
- This scheme is an Indian labor law and social security measure that aims to provide ‘right to work' to the people falling Below Poverty Line.
- It guarantees 100 days employment in a year to the village people.
- Fifty percent workers should be women.
- Its 90% funding is borne by the central government and 10% by the state government.

❖ **National Rural Health Mission (NRHM):**

- The National Rural Health Mission (NRHM) was launched on 12th April 2005, to provide accessible, affordable and quality health care to the rural population, especially the vulnerable groups.
- NRHM seeks to provide equitable, affordable and quality health care to the rural population, especially the vulnerable groups. Under the NRHM, the Empowered Action Group (EAG) States as well as North Eastern States, Jammu and Kashmir and Himachal Pradesh have been given special focus. The thrust of the mission is on establishing a fully functional, community owned, decentralized health delivery system with inter-sectoral convergence at all levels, to ensure simultaneous action on a wide range of determinants of health such as water, sanitation, education, nutrition, social and gender equality.
- NRHM focuses on Reproductive, Maternal, Newborn, Child Health and Adolescent (RMNCH+A) Services. The emphasis here is on strategies for improving maternal and child health through a continuum of care and the life cycle approach. It recognises the inextricable linkages between adolescent health, family planning, maternal health and child survival. Moreover, the linking of community and facility-based care and strengthening referrals between various levels of health care system to create a continuous care pathway is also to be focussed.

- **Indira Awas Yojana:**

- Indira Awas Yojana revamped as Pradhan Mantri Gramin Awaas Yojana in 2016 is a welfare program created by the Indian Government to provide housing to rural poor people in India.
- The goal of this scheme is to provide a home to all citizens until 2022. The cost of constructing the houses will be shared by the center and the state. The scheme has been implemented in rural areas throughout India, except in Delhi and Chandigarh. Houses developed under this scheme will have basic amenities such as toilet, electricity connection, drinking water connection, LPG connection etc.

Chapter 3.

Smart (Cities / Village) Concept Idea and its Visit (Civil & Electrical Concept)

3.1 Introduction: Concepts and Definitions

❖ Introduction

- 'Smart cities' is a term used to describe the use of smart technologies and data as the means to solve cities' sustainability challenges. Many cities are in the process of making themselves smart, using data and technology to improve transport, energy use, health and air quality or to drive economic growth. Others are being built to be smart from the start So this is a term that relates to the present and to the future.

❖ Concepts:

- In general, a smart city is a city that uses technology to provide services and solve city problems. A smart city does things like improve transportation and accessibility, improve social services, promote sustainability, and give its citizens a voice.
- This smart city concept of the improving the building and infrastructure quality and improving the infrastructure management (digital technology). this smart city digital like this communication, social network, mobile, internet of things etc. is the smart city.

❖ Definitions:

- A smart city is a developed urban area that creates sustainable economic development and high quality of life by excelling in multiple key areas; economy, mobility, environment, people, living, and government. - Business Dictionary

3.2 Vision-Goals, Standards and Performance Measurement Indicators

❖ Smart city Vision & Goals

- The vision of "Smart Cities" is the **urban center of the future**, made safe, secure environmentally green, and efficient because all structures--whether for power, water, transportation, etc. are designed, constructed, and maintained making use of advanced, integrated materials, sensors, electronics, and networks which are interfaced with computerized systems comprised of databases, tracking, and decision-making algorithms.

Fig 3.2 (a) Smart city Vision

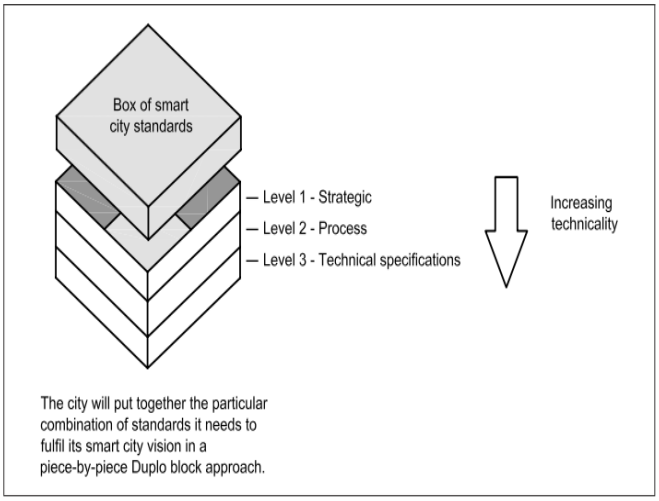

Fig 3.2 (b) Smart City Standards

❖ Smart city Standards

- **Strategic**: These are smart city standards that aim to provide guidance to city leadership and other bodies on the "process of developing a clear and effective overall smart city strategy". They include guidance in identifying priorities, how to develop a roadmap for implementation and how to effectively monitor and evaluate progress along the roadmap.

- **Process**: Standards in this category are focused on procuring and managing smart city projects – in particular those that cross both organizations and sectors. These essentially offer best practices and associated guidelines.

- **Technical**: This level covers the myriad technical specifications that are needed to actually implement Smart City products and services so that they meet the overall objectives.

❖ Smart City Performance Measurement Indicators

- Indicators for smart cities, gives cities a set of indicators for measuring their performance across a number of areas, allowing them to draw comparative lessons from other cities around the world and find innovative solutions to the challenges they face.

- Key performance indicators represent a particular value or characteristic that is measured to assess whether an organization's goals are being achieved. The main benefit of a KPI is that it collects all the data from various individuals and combines it on a main data base. But does not address the constraints involved to achieve the goals is a setback for leaders to take decision.

3.3 Technological Options

- Smart Infrastructure
- Smart energy
- Smart care
- Smart Public Service
- Smart mobility
- Smart Data

Fig 3.3 Smart Energy

3.4 Road Map and Safe Guards

- The purpose of the road map and safe guard is smart cities is development of the road map. This road map sets out the ten steps of the proposed IE' Innovation of the public sector for dealing with the challenge of the smart cities. It involves local government, private initiative and the general public.

3.5 Issues & Challenges

- The rapid growth of Indian economy has placed a stress on physical infrastructure, Social Infrastructure and Institutional Infrastructure because all these 3 major areas already suffer from a deficit. Smart city could be a possible solution to all these problems. Smart city is mainly concerned with smart governance, smart energy, smart environment, smart people, smart transportation‖, smart IT and communications, smart buildings and smart living at large. Smart is not just about technology-enabled, but also about power, water, transportation, solid waste management and sanitation.

3.6 Smart Infrastructure

- Smart city technology is literally built into the fabric of the city. For example, lighting systems can adapt to their surroundings using connected sensors, increasing or decreasing illumination according to time of day, in response to human or vehicle traffic, or in response to events or other city activities.
- Connected roads can provide information on traffic patterns and road hazards through cameras or road sensors. Data can be used to inform public transportation routes, make traffic enforcement more efficient, and help emergency vehicles get to their destination faster.

3.7 Cyber Security

- Now day all payment is going to digital and smart user use net banking sell phone and computer. This facility is good for busy people but it has a disadvantage. Some people disuse his knowledge and going work for scam and frond. So this problem is the Cyber security. It protect and ewer to scam and frond. This save our data and protect our moony. Elements of cyber security include: Application security, Information security, Network security.

3.8 Strategic Options for Fast Development

- The strategic components of area-based development in the Smart Cities Mission are city improvement (retrofitting), city renewal (redevelopment) and city extension (greenfield development) plus a Pan-city initiative in which Smart Solutions are applied covering larger parts of the city. Below are the three models of Area-based smart city development:

- Retrofitting will introduce planning in an existing built-up area to achieve smart city objectives, along with other objectives, to make the existing area more efficient and liveable. In retrofitting, an area consisting of more than 500 acres will be identified by the city in consultation with citizens. Depending on the existing level of infrastructure services in the identified area and the vision of the residents, the cities will prepare a strategy to become smart.

- Redevelopment will effect a replacement of the existing built-up environment and enable co-creation of a new layout with enhanced infrastructure using mixed land use and increased density. Redevelopment envisages an area of more than 50 acres, identified by Urban Local Bodies (ULBs) in consultation with citizens. For instance, a new layout plan of the identified area will be prepared with mixed land-use, higher FSI and high ground coverage.

- 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. Greenfield developments are required around cities in order to address the needs of the expanding population.

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

❖ Urban water and Sanitation Challenges

- Urban sanitation in India faces many challenges. Nearly 60 million people in urban areas lack access to improved sanitation arrangements, and more than two-thirds of wastewater is let out untreated into the environment, polluting land and water bodies. To respond to these environmental and public health challenges, urban India will need to address the full cycle of sanitation, i.e. universal access to toilets, with safe collection, conveyance and

treatment of human excreta. This paper outlines these concerns, and highlights the need for focusing on access to water and the full cycle of sanitation for the urban poor, as fundamental to addressing the sanitation challenge. Priorities for policy and financing for urban sanitation in India are discussed, and the paper concludes with an examination of key policy initiatives in the last decade, assessing the extent to which these priorities are gaining attention.

❖ **Role of Indigenous Technologies**

- The indigenous technology is use in smart city at any place. The technology is use in that place like a governance, Public Service, Safety and security, Environment and power consumption, Education, Health, etc.

3.10 Initiatives in village development by local self-government

❖ **Local self-government**

- Gram Panchayat
- Social workers
- Zilla Panchayat

3.11Smart Initiatives by District Municipal Corporation

Smart city Mission was launched by Prime Minister Shri Narendra Modi on 25 June, 2015. Surat city was selected among 100 cities to be developed as smart city in India due to various achievements, initiatives and all-inclusive approach. Accordingly, Surat city had submitted "Smart City Proposal".

Fig 3.11 This solid Municipal management

3.12 Any Projects contributed working by Government / NGO / Other Digital Country Concept

- Promoting use of digital tools to bring efficiency and large-scale impact among non-profit communities by recognizing NGOs that are using for mass impact
- The ENGO Challenge aspires to create an ecosystem of NGOs, which use Information Communication Technology (ICT) and digital media tools for good governance practices for the benefit of societies and communities at large. The challenge seeks to recognise, salute and honor best NGO practices using ICT in any part of the world. The objectives of the ENGO Challenge are:
- To promote and encourage best ICT practices by NGOs for community development.

- To create an ecosystem of NGOs who uses ICTs and digital media for good governance practice for community serving purpose.
- To create and build a network of NGOs into innovative ICT practices for learning, experience sharing and promoting good practices.
- To advocate the wider need for good ICT practice among NGOs as the third sector working partner hand in hand with the public and the private sectors
- To encourage bottom up NGO led local content development and population, information and community work experiences on ICT platforms through the web especially for wider access and partnership.
- Over the years, ENGO Challenge has created a database of 647 ICT for Development interventions by NGOs from eight countries in Asia and Africa. In its three editions so far, the ENGO Challenge has honored and felicitated 27 winners.

3.13 How to implement other Countries smart villages projects in Indian village context

- The emerging concept of Smart Villages refers to rural areas and communities which build on their existing strengths and assets as well as on developing new opportunities. In Smart Villages traditional and new networks and services are enhanced by means of digital, telecommunication, internet technologies, innovations and the better use of knowledge, for the benefit of inhabitants and businesses. Digital technologies and innovations may support quality of life, higher standard of living, public services for citizens, better use of resources, less impact on the environment, and new opportunities for rural value chains in terms of products and improved processes. LED street lights and solar panels.

3.14 Electrical concept (Design Ideal and Prototype model)

- No Electric Student

Chapter 4.

About Khambhaliya Village

4.1 Introduction

4.1.1 Introduction About Khambhaliya Village details

- Khambhaliya village is located in Bhesan taluka in Junagadh district of Gujarat state, India. The village is 5 km away from the Bhesan.

4.1.2 Justification/ need of the study

- The need of the study is to provide the basic requirements of people in the village and for Rurban Development of the village. For this purpose the information of the village is collected based on different categories such as Education, Water Facilities, Drainage Facilities, Transportation Facilities, Primary Health Care, Bank Facilities, Public Toilets, Community hall and other amenities.

4.1.3 Study Area

- Khambhaliya village is located near Bhesan taluka away from 5km and 32km away from the Junagadh. The Pincode of the village is 362030.
- The total population of the village is 3153 and the male is 1499 and the female is 1654 in the village.

4.1.4 Objectives of study

- To increase infrastructure in village.
- Reduce the problem face by the people of village.
- To increase economic development in village.
- To increase the transportation facility.
- To provide basic needs like, health care, clean drinking water, etc.

4.1.5 Scop of the study

- By the analyzing the present conditions we can improve the basic amenities and facilities like agriculture facilities, education facility.

- To Improve life style of villagers by helping them to develop their skill by assisting them in implementing income generating activities in close coordination and cooperation with national and international organizations.

4.1.6 Methodology Frame Work for development of your village

- The methodology for the development of the village are Techno Economic Survey, Various kind of Form, Interaction or Questionnaires with the Peoples and Government Offices and On Location contextual investigation.

4.2 Khambhaliya Study Area Profile

4.2.1 Study Area Location

- Khambhaliya is a Village in Bhesan Taluka in Junagadh District of Gujarat State, India. It is located 32 KM towards East from District headquarters Junagadh. 315 KM from State capital Gandhinagar. Khambhaliya Pin code is 362030 and postal head office is Ranpur.

4.2.2 Base Location map, Land Map, Gram Tal Map

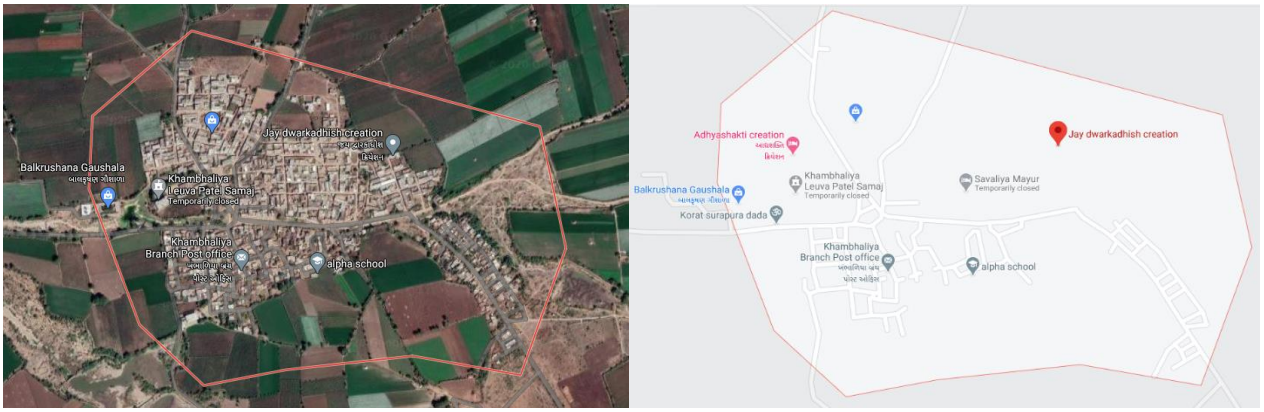

Fig 4.2.2 Khambhaliya Village Map

4.2.3 Physical & Demographical Growth

Total Population	3153
Area of village	1535.02 hectares
Irrigated area	1137.15 hectares
Non-agriculture area	18.74 hectares
Occupation detail	1. Farmer 2. Labor
Physical Infrastructure	1. Main source of drinking water is through pipe. 2. Water tank facility Overhead tank and Underground sump
Education facility	1. Primary school 2. Anganvadi
Major crops grown in village	1. Peanuts 2. Cotton

Table 4.2.3 Detail of village

4.2.4 Economic generation profile / Banks

- About the economic profile of this village, many citizen's work interest is farming and labor work. The village doesn't have any better facilities regarding infrastructure but has good electrification system which distributed 24*7 hours for domestic use and 8 hours for agricultural use.
- In Khambhaliya there is no bank facility in the village and no any online method in the village.
- The Khambhaliya main source of the income in agriculture field.

4.2.5 Actual Problem faced by Villagers and smart solution

- In the village there is no high school and the student faces many problem in education. Need to buildup high school.
- There is no bank facility in the village. it's needs bank in the village.
- In the village street light is in not good condition. Need of solar panel LED street lights.
- In the village there is no drainage facility. Need of closed drainage system to build.
- In the village there is no disposal of the waste. Provide an area for the disposal waste.

4.2.6 Social scenario

- 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, Groundnut and Castor. The major population is get income through the farming and there are no other job opportunities. The education is limited to primary school.

4.2.7 Migration Reasons / Trends

❖ **Migration reasons**

- In the village there is limited education so for the education the people migrate to the urban area for the education and after complete the education some of the people settle in the urban area.
- Employment is also reason for the migration in village.

❖ **Trends of migration**

- The facility of the cities is attract the rural people in cities.

- In the urban area many opportunity, employment, transport, industry, modem facility of life also attract rural people.

4.3. Data Collection Khambhaliya (Photograph/Graphs/Charts/Table)

Data collected are

- 3 Anganwadi
- Primary school
- Public library
- Post office
- Gram panchayat

Fig 4.3 (a) Anganwadi

Fig 4.3 (b) Primary school

Fig 4.3 (c) Post office

Fig 4.3 (c) Public library

Fig 4.3 (e) Panchayat building

4.3.1 Methods for data collection

- First we are visit the village and meet the sarpanch of the village. We discuss about the village condition and facility like, infrastructure, water supply, waste disposal, drinking water etc.
- Then we meet some people of the village and discuss about village and problem faced by them. Then we observe the village condition and see the facility of the village.

4.3.2 Primary survey details

- The entire data collected by us is displayed in the form itself. A copy of the form is shown below which refers to the type of data collected and that the details in the form cover the facilities of the entire area of the village.
- The entire data collected by us is displayed in the form itself. A copy of the form is shown below which refers to the type of data collected and that the details in the form cover the facilities of the entire area of the village.

4.3.3 Average size of the House - Geo-Tagging of House

- Some of the houses is pakka with facility and most of the houses is pakka. Few houses is kachha.

4.3.4 No of Human being in One House

- There in one house around 5 to 6 people live. And there are small family 2 to 4 people and large family 6 to 10 people living.

4.3.5 Material available locally in the village and Material Out Sourced by the villagers

❖ **Material used locally**

- The material used in the agriculture field is Organic material use as fertilizer.

❖ **Material out sourced by the villagers**

- Material of construction and fuel is not available in the village for this material is purchase out of the village market.

4.3.6 Geographical Detail

- Khambhaliya Village Gram Panchayath name is Khambhaliya. Khambhaliya is 5 km distance from Sub District Head Quarter Bhesan and it is 40 km distance from District Head Quarter Junagadh. Nearest Statutory Town is Jetpur in 17 km Distance. Khambhaliya Total area is 1535.02 hectares, Non-Agricultural area is 18.74 hectares and Total irrigated area is 1137.15 hectares.

4.3.7 Demographical Detail

- Total population of the village is 3153 and the population of the male is 1499 and female 1654. Total literacy of the village is 70.0%.

4.3.8 Occupational Detail

- The most of the people is in farming occupation.
- Least amount of people in labor occupation.

4.3.9 Agricultural Details / Organic Farming / Fishery

- More then 90% of the people is related to the farming. Peanut, cotton, wheat are grown in the agriculture. Power supply of 8 hr. in winter and 8 hr. in summer for the agriculture in the village. Total irrigated area of the village is 1137.15 hectares.

4.3.10 Manufacturing HUB / Ware Houses

- There is no facility of it.

4.3.11 Tourism development available in the village for attracting the tourist

- There is no tourism in the village.

4.4 Infrastructure Details (With Exiting Village Photograph)

4.4.1 Drinking Water / Water Management Facilities

- There is two water facility overhead tank and underground sump. Overhead tank capacity is 70,000 lit. and underground sump capacity is 2,00,000 lit.

Fig 4.4.1 Water tank

Fig 4.4.3 Internal roads

4.4.2 Drainage Network / Sanitation Facilities

- There is no Drainage and sanitation facility in the village.

4.4.3 Transportation & Road Network

- There is a local transport available like, private bus, etc.

4.4.4 Housing condition

- There is most of the houses is pucca and the few is kutcha but the most of the houses is in good condition and few of the houses is in bad condition.

4.4.5 Social Infrastructure Facilities, Health, Education, Community Hall, Library

Fig 4.4.5 (a) primary school & primary health center

Fig 4.4.5 (b) Community hall & Post office

4.4.6 Existing Condition of Public Buildings & Maintenance of existing Public Infrastructure

- Needs of maintenance of street lights.

4.4.7 Technology Mobile/ WIFI / Internet Usage Details

- No government WIFI is available in village. People use private network.

4.4.8 Sports Activity as Gram Panchayat

- There is no activity like that.

4.4.9 Socio-Cultural Facilities, Public Garden /Park/Playground /Pond/ Other Recreation Facility

- No facility like that in village.

4.4.10 Other Facilities

- No other facility.

4.4.11 Any other details

- Everything is as the above details.

4.5 Electrical Concept

4.5.1 Renewable energy source planning particularly for villages

- No Electrical student.

4.5.2 Irrigation Facilities

- No Electrical student.

4.5.3 Electricity Facilities with Area

- No Electrical student.

4.6 Existing Institution like - Village Administration – Detail Profile

4.6.1 Bachat Mandali

- There is no Bachat Mandali.

4.6.2 Dudh Mandali

- There is no Dudh Mandali.

4.6.3 Mahila forum

- There is no mahila forum.

4.6.4 Plantation for the air pollution

- In the village there were need plantation in some area.

4.6.5 Rain Water Harvesting - Waste Water Recycling

- There is not available for water Harvesting.

4.6.6 Agricultural Development

- Agriculture awareness and Technology implement is needed for Best Irrigation development.

4.6.7 Any Other

- There were no any other facility.

Chapter 5.

Technical Options with Case Studies

5.1 Concept (Civil)

5.1.1 Advance Sustainable construction techniques

- 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.

❖ **Different Types of Sustainable Construction**

- Construction techniques, resources, and building practices have evolved over the years, and with the increased interest in sustainability and energy conservation, new methods of construction that focus on sustainability have been developed. There are two things that go into sustainable construction: the materials that are used and the methods that are utilized.

- **Materials**

- One of the best ways to practice sustainability in construction is through the materials that are used. A new generation of stronger, lighter and more sustainable building materials can help solve many problems in the industry as well as push current practices to be more sustainable.

- These materials have the added benefit of protecting the environment by reducing the carbon footprint of the buildings that use these materials. They promote a cleaner Earth and a future of sustainability while also being aesthetically appealing and much more efficient.

- **Methods**

- Sustainable construction isn't just about using the newest materials; it's also about using building methods that enhance renewable and sustainable efforts. Some of these methods include:

- Cutting materials precisely in order to reduce waste

- Constructing green buildings
- Controlling waste management, such as separating and recycling waste
- Selecting sustainable and recycled materials
- Managing construction sites to improve the environment
- Conserving Energy
- Examples include treating water on-site, no smoking, recycling food containers, etc.

Fig 5.1.1 Sustainable construction Methods

❖ Benefits of Sustainable Construction

- Sustainable building isn't just good for the environment, although that is a fantastic reason to adopt sustainable practices. There are many benefits to adopting eco-friendly methods in the construction industry, such as:

- **Promotes Healthier Living**

- Construction projects that develop green buildings aren't only beneficial to the environment; they also provide many psychological benefits to the people inside them. For example, in an office building, cognitive function scores rose by 61 percent. It was also reported that employees were 44 percent better at making decisions that achieve workplace goals. In green hospital buildings, 56 percent were satisfied with the cheerfulness of the hospital after the green renovations. Plus, Seasonal Affective Disorder was reduced.

- **Reduces Waste**

- The reduction of construction waste is also a beneficial side effect in building more green buildings. By their nature, they already use fewer resources, relying on recycled and renewable materials along with more sustainable construction methods. The use of sustainable materials is also beneficial to overall human health as paint, industrial cleaning products and building materials can be dangerous for human health.

- **Promotes Sustainability**

- Sustainable construction also promotes sustainability and efficient energy use. With renewable energy construction on the rise, coupled with sustainable construction methods, more people are beginning to see the importance and efficiency of using sustainable methods. It also sends a clear message to the industry and everywhere else: sustainability is viable and important.

❖ Challenges

- Although the benefits to sustainable construction are present and obvious, transitioning isn't an overnight process. It takes time and preparation to utilize the best practices.

Training needs to be implemented in order to start practicing sustainable methods, and that takes time and money.

- Another obstacle that many companies may come across is the actual principal cost of sustainable construction. The general consensus is that sustainable construction comes at a premium and the cost is higher than what the demand actually is, despite the evidence to the contrary.
- Nevertheless, as more interest in sustainability efforts continue to rise, more construction firms are making the switch to sustainable construction, with green building activity on the rise.

❖ **Importance of Sustainable Construction**

- 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.
- 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.
- Sustainable construction is developing each and every day, with more demand for cleaner and greener spaces. As the effects of climate change increase, sustainability becomes even more important. While there are challenges, the benefits involved with sustainable construction can create a pathway to a cleaner future.

5.1.2 Soil Liquefaction

- Soil liquefaction occurs when a saturated or partially saturated soil substantially loses strength and stiffness in response to an applied stress such as shaking during an earthquake or other sudden change in stress condition, in which material that is ordinarily a solid behaves like a liquid.

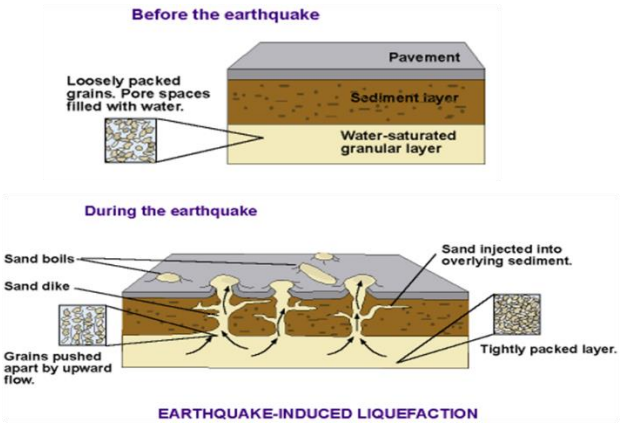

Fig 5.1.2 (a) Soil Liquefaction

Fig 5.1.2 (b) Effect of soil liquefication

- The phenomenon is most often observed in saturated, loose (low density or uncompacted), sandy soils. This is because a loose sand has a tendency to compress when a load is applied. Dense sands, by contrast, tend to expand in volume. If the soil is saturated by water, a condition that often exists when the soil is below the water table or sea level, then water fills the gaps between soil grains. In response to soil compressing, the pore water pressure increases and the water attempts to flow out from the soil to zones of low pressure (usually upward towards the ground surface). However, if the loading is rapidly applied and large enough, or is repeated many times (e.g. earthquake shaking, storm wave loading) such that the water does not flow out before the next cycle of load is applied, the water pressures may build to the extent that it exceeds the force between the grains of soil that keep them in contact.
- The effects of soil liquefaction on the built environment can be extremely damaging. Buildings whose foundations bear directly on sand which liquefies will experience a sudden loss of support, which will result in drastic and irregular settlement of the building causing structural damage, including cracking of foundations and damage to the building structure, or leaving the structure unserviceable, even without structural damage. Where a thin crust of non-liquefied soil exists between building foundation and liquefied soil, a 'punching shear' type foundation failure may occur. Irregular settlement may break underground utility lines. The upward pressure applied by the movement of liquefied soil through the crust layer can crack weak foundation slabs and enter buildings through service ducts, and may allow water to damage building contents and electrical services.

5.1.3 Sustainable Sanitation

- Sustainable sanitation is a sanitation system designed to meet certain criteria and to work well over the long-term. Sustainable sanitation systems consider the entire "sanitation value chain", from the experience of the user, excreta and wastewater collection methods, transportation or conveyance of waste, treatment, and reuse or disposal.
- The purpose of sustainable sanitation is the same as sanitation in general: to protect human health. However, "sustainable sanitation" attends to all processes of the system: This includes methods of collecting, transporting, treating and the disposal (or reuse) of waste.

❖ **Criteria**

- 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:

- **Health**

➢ Health aspects include the risk of exposure to pathogens and hazardous substances that could affect public health at all points of the sanitation system from the toilet via the collection and treatment system to the point of reuse or disposal. The topic also covers aspects such as hygiene, nutrition and the improvement of livelihood achieved by the application of a certain sanitation system, as well as downstream effects.

- **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.

5.1.4 Transport Infrastructure / system

➢ Transportation is the movement of goods and people from one place to another. In ancient times, people crafted simple boats out of logs, walked, rode animals and, later, devised wheeled vehicles to move from place to place. They used existing waterways or simple roads for transportation. Over time, people built more complex means of transportation. They learned how to harness various sources of power, such as wind, steam, and combustion, to move barges,

ships, trains, automobiles, and airplanes. These new means of transportation required people to change their environments by building transportation infrastructure. Transportation infrastructure is the underlying system of public works designed to facilitate movement.

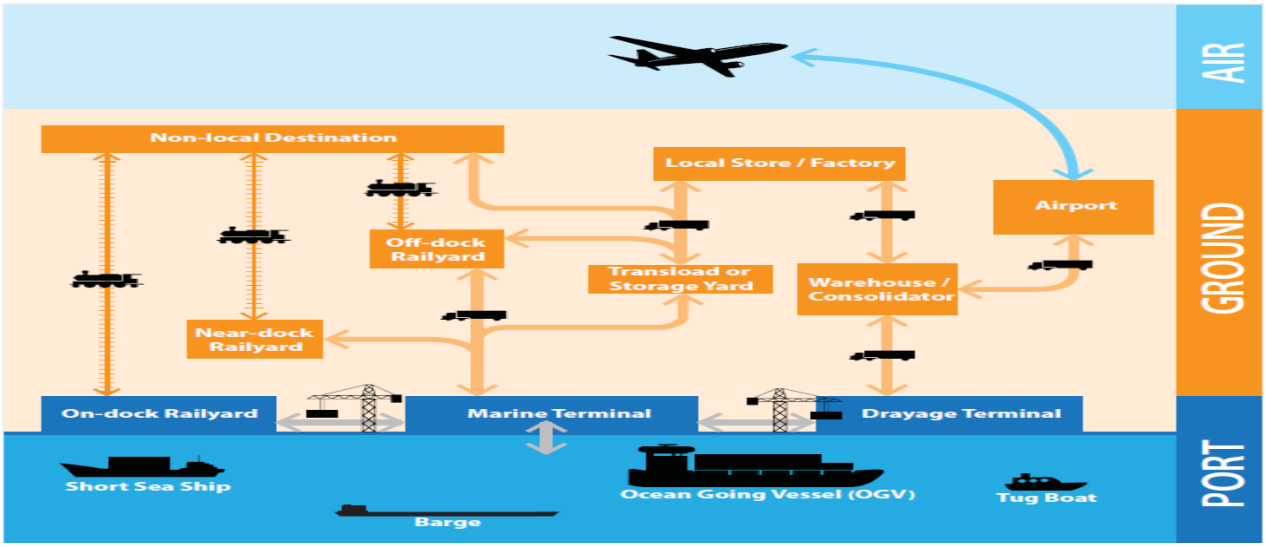

Fig 5.1.4 Transport Infrastructure

5.1.5 Vertical Farming

- Vertical farming is the practice of producing food on vertically inclined surfaces. Instead of farming vegetables and other foods on a single level, such as in a field or a greenhouse, this method produces foods in vertically stacked layers commonly integrated into other structures like a skyscraper, shipping container or repurposed warehouse.
- Using Controlled Environment Agriculture (CEA) technology, this modern idea uses indoor farming techniques. The artificial control of temperature, light, humidity, and gases makes producing foods and medicine indoor possible. In many ways, vertical farming is similar to greenhouses where metal reflectors and artificial lighting augment natural sunlight. The primary goal of vertical farming is maximizing crops output in a limited space.

Fig 5.1.5 Vertical Farming

- **Advantages:**

- It offers a plan to handle future food demands.
- Weather doesn't affect the crops.
- More organic crops can be grown.
- There is less exposure to chemicals and disease.

- **Disadvantages:**

- It could be very costly to build and economic feasibility studies haven't yet been completed.
- It would involve higher labor costs.

5.1.6 Corrosion Mechanism, Prevention & Repair Measures of RCC Structure

- Corrosion Mechanism, Prevention & Repair Measures of RCC Structure Though concrete is quite strong mechanically, it is highly susceptible to chemical attack and thus structure gets damaged and even fail unless some preventive measures are adopted to counteract this and thereby increasing the durability of structure. In the case of Reinforced concrete structure the ingress of moisture or air may lead to corrosion of steel, cracking and spalling of concrete cover thereby reducing durability of concrete structure. Repair has been suggested as the protective solution for damaged structure due to corrosion.
- The proper corrosion-protection strategy will vary from structure to structure. Some factors to be considered during the design of a structure include:
- Intended design life of the structure.
- Effects of corrosion and corrosion-induced deterioration – This includes the costs due to closure (either permanent or temporary) for repair. Bridges on major roads are more critical than bridges on local roads.
- Quality of workmanship in construction – The quality of construction entails good consolidation, proper rebar placement, sufficient concrete cover over the steel reinforcing bars, and other measures.
- Possible rehabilitation methods – The design of structures should include provisions for the possible future rehabilitation of corrosion-induced deterioration.
- Initial costs – May need to consider more than just initial costs (i.e., life-cycle costs). As the rehabilitation and replacement costs increase, corrosion-control measures become more cost-effective.
- Multiple protection strategies may be cost-effective for long-term corrosion protection. One such strategy is the use of epoxy-coated rebar in combination with a durable concrete containing corrosion inhibitors, having a low permeability, and adequate concrete cover. Silica fume and fly ash can be added to the concrete to reduce permeability and provide additional corrosion control. However, there is a need to balance the costs of the additional control measures against how much additional service life can be expected as a result of the added control measures. The additional costs can usually be justified based on a life-cycle cost analysis.

5.1.7 Sewage treatment plant

- Sewage Treatment Plant is a plant or installation setup that is used to purify contaminated substances. These substances may be solid, liquid and semi-solids. Sewage treatment is one of the treatments that a waste treatment plant works on in the oil and gas industry and in other

manufacturing industries. Treatment plants are named after their treated substances, for example

- Wastewater treatment plant – treated wastewater
- Sewage treatment plant – treated sewage
- Water treatment plant – treated water

1. Preliminary Treatment: This is the first stage of sewage treatment plant process and its main objective is the removal of coarse solids and other large materials often found in raw wastewater. Preliminary treatment operations typically include large filtering screens, grit removal and, in some cases, breaking of large objects. Excess grit cause severe pump blockages thereby affecting a range of subsequent treatment pumps. Flow measurement devices, often standing-wave flumes, are always included at the preliminary treatment stage.

2. Primary Treatment: The main purpose of this treatment is to reduce any heavy solids (organic & inorganic) that settle to the bottom by sedimentation while oil, grease & lighter solids float to the surface by skimming. The settled and floating materials are removed and the remaining liquid may be discharged or subjected to the next stage i.e. secondary treatment. Primary treatment removes about 60% of suspended solids from wastewater.

3. Secondary Treatment: The prime objective is the further treatment of the effluent from primary treatment to remove dissolved and suspended biological matter. The biological solids removed during secondary sedimentation, called secondary or biological sludge, are normally combined with primary sludge for sludge processing. Secondary treatment may require a separation process to remove the micro-organisms from the treated water prior to discharge or tertiary treatment. Secondary treatment removes more than 90% of suspended solids.

4. Tertiary/Advanced Treatment: Tertiary treatment generally follows secondary treatment and aids the removal of those wastewater constituents which cannot be removed in secondary treatment. Treated wastewater is sometimes disinfected chemically or physically (for example, by lagoons and microfiltration) prior its discharge into the receiving environment (sea, river, lake, wet lands, ground, etc.)

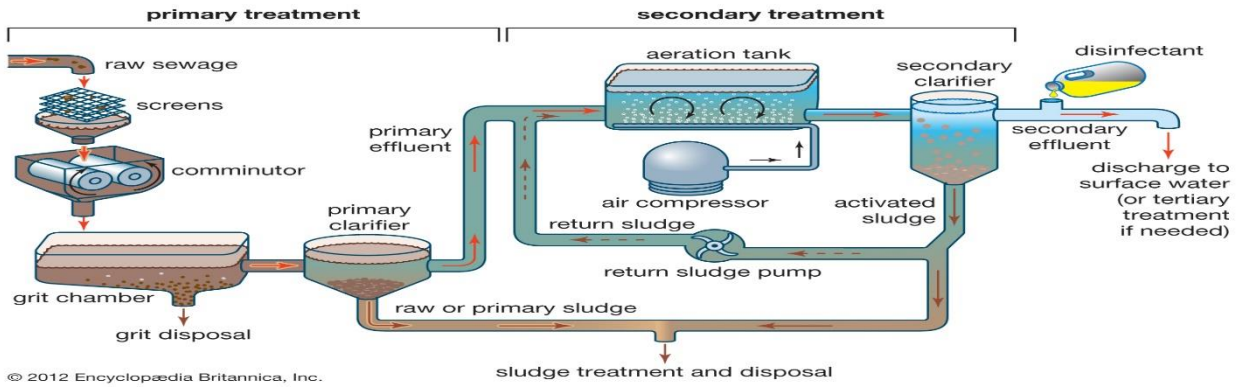

Fig 5.1.7 Sewage treatment plant

5.1.8 Technical case study on Narendra Modi STADIUM

- The Narendra Modi Stadium, commonly known as the Motera Stadium, is a cricket stadium situated inside the Sardar Vallabhbhai Patel Sports Enclave in Ahmedabad, Gujarat, India. As of 2021, it is the largest stadium in the world, with a seating capacity of 132,000 spectators. It is owned by the Gujarat Cricket Association and is a venue for Test, ODI, and T20I cricket matches.

Narendra Modi Stadium	
Full name	Narendra Modi Stadium
Former names	Motera cricket stadium Sardar patel stadium
Location	Motera, Ahmedabad, Gujarat, India
Owner	Gujarat Cricket Association
Executive suites	76
Capacity	132,000 (2020–present) 54,000 (2006–2015) 49,000 (1982–2006)
Field size	180 yards x 150 yards
Surface	Australian grass (oval)
Broke ground construction	1983 (former structure) 2017 (expansion)
Built	12 November 1983 (former structure) 24 February 2020 (post expansion)
Opened	12 November 1983 (former structure) 24 February 2020 (post expansion)
Renovated	24 February 2020
Expanded	24 February 2020
Closed	2015 (former structure)
Demolished	2015 (former structure)
Construction cost	₹800 crore (US$110 million) (reconstruction, 2017–2020)
Architect	Populous (reconstruction) Shashi Prabhu (former structure)
General contractor	Larsen & Toubro

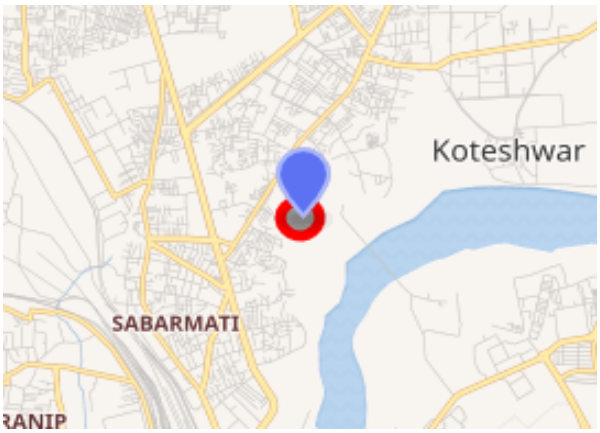

Figure 5.1.8 (a) Narendra Modi stadium

- The stadium was constructed in 1983 and was first renovated in 2006. It became the regular venue for international matches in the city. In 2015, the stadium was closed and demolished before being completely rebuilt by February 2020, with an estimated cost of ₹800 crore (US$110 million).
- Apart from cricket, the stadium has hosted several programs arranged by the Government of Gujarat. It has hosted matches during the 1987, 1996, and 2011 Cricket World Cups. As of 2021, the stadium has hosted 14 Tests, 24 ODIs, and 6 T20I match.
- On 24 February 2021, the stadium was renamed as the Narendra Modi Stadium by the Gujarat Cricket Association after the current Prime Minister of India, Narendra Modi who is also a Gujarat native and a former chief minister. It hosted its first ever pink ball Test match on 24 February 2021 between India and England.

❖ **History**

1982-2006 (Early years)

- Formerly known as the Gujarat Stadium, the ground was renamed in tribute to Sardar Vallabhbhai Patel, India's first Home Minister and Deputy Prime Minister. Before the Sardar Patel Stadium, international cricket matches in the city were played at the Ahmedabad Municipal Corporation's stadium of the same name (Sardar Patel Stadium) in the Navrangpura area. In 1982, the Government of Gujarat donated a 100-acre (400,000 m^2) stretch of land on the banks of the Sabarmati River to build a new stadium. The construction of the Sardar Patel Stadium was completed in nine months. Since then, all International cricket fixtures for the city are hosted here. In the 1984–85 Australia-India series, Sardar Patel Stadium hosted its first ODI, in which Australia defeated India.

2006–2015 (Rise to prominence)

- The stadium became a focal venue of ICC Champions Trophy in 2006 and hosted five of the 15 games played. In order to host the tournament, the stadium was renovated to add three new pitches and a new outfield. Floodlights and covered stands were introduced at the stadium as a part of the renovation program.
- The Sardar Patel Stadium has hosted games whenever India has hosted the Cricket World Cup, including the first match of the 1996 World Cup between England and New Zealand. However, while the stadium hosted only one game each in 1987 and 1996, it hosted three games in the 2011 World Cup, including the quarter-finals between Australia and India. Sachin Tendulkar became the first cricketer to score 18,000 runs in One Day Internationals. As of 19 August 2017, Sardar Patel has hosted 12 Tests, 23 ODIs and 1 T20I.

2015–2020 (Reconstruction)

- In October 2015, the stadium was demolished for reconstruction, though some media referred to it as a renovation. The total cost of reconstruction was estimated to be ₹700 crores. However, the final cost was reported at ₹800 crores. The redevelopment, originally planned to be completed in 2019, finished in February 2020.

Figure 5.1.8 (b) Stadium before Reconstuction

Work

- L&T took over the construction work of the stadium in December 2016. On 16 January 2017, the Gujarat Cricket Association oversaw the project, which formally began on the same day. The stadium was planned to be finished in 2 years and the reconstruction project was estimated to cost around ₹ 7 billion. Finishing touches were given to the stadium in February 2020 and it hosted an England-India day-night test match in 2021.
- Mumbai-based Commercial Kitchen Consultants "Span Asia" were hired to work with Populous and L&T on all the F&B Related areas such as the Concession Counters, Main Stadium Kitchens, Player Kitchens, VIP/VVIP Boxes, Corporate Boxes, Press & Media Boxes, Pantries, GCA Club and Related areas.

❖ **Stadium design and Facilities**

- The redesigned stadium occupies 63 acres of land, with three entry points compared to one in the old stadium, with a metro line at one of the entry points. It contains 76 corporate boxes that can hold 25 persons each, a 55-room clubhouse, an Olympic sized swimming pool, and four dressing rooms. A unique feature of the stadium is the LED lights on the roof instead of the usual floodlights at cricket grounds. The LED lights are installed on an

anti-bacterial, fireproof canopy with PTFE membrane that covers 30 out of 55 metres width of sitting area. The roof was done by the company Walter P Moore and was specifically designed to be lightweight and separate from the seating bowls in order to make it fairly earthquake resistant. The structure eliminates the need for pillars and gives spectators an unobstructed view of the entire field from any place in the Stadium.

- Outside of the main ground, the stadium is able to accommodate several other features, including an Olympic-sized swimming pool, an indoor cricket academy, badminton and tennis courts, a squash arena, a table tennis area, a 3D projector theater, and a clubhouse with three practice grounds and 50 rooms. The parking lot can accommodate 3,000 cars and 10,000 two-wheelers. Sardar Patel Stadium also has a huge ramp designed to facilitate the movement of around 60,000 people simultaneously. The stadium has been designed such that patrons fill the lower levels of the ground for smaller events to maintain the crowd atmosphere when not at capacity.
- It has also been planned that the stadium will be connected to the metro station by a skywalk to decrease road congestion. The skywalk is planned to be completed after September 2020, and is a part of the Motera Metro Station project rather than the stadium's.
- The total area of the stadium is equivalent to 32 olympic-size football fields put together. It is currently the only cricket stadium in the world to have four dressing rooms for the players, which makes it possible to play back to back games in the same day. It is also the only stadium in the world with 11 centre pitches on the main ground.

5.2 Concept (Electrical)

5.2.1 Programmable Load Shedding

- No Electrical student.

5.2.2 Railway Security System using IoT

- No Electrical student.

5.2.3 Management through Energy Harvesting Concept

- No Electrical student.

5.2.4 Moisture Monitoring System

- No Electrical student.

5.2.5 Home Automation using IoT / Any other methodology

- No Electrical student.

5.2.6 PC Based Electrical Load Control

- No Electrical student.

5.2.7 Electrical Parameters Measurements

- No Electrical student.

Chapter 6.

Swatchh Bharat Abhiyan (Clean India)

❖ **Swachh Bharat Abhiyan (Clean India)**

- It is a country-wide campaign initiated by the Government of India in 2014 to eliminate open defecation and improve solid waste management (SWM). Phase 1 of the mission lasted till October 2019. Phase 2 will be implemented between 2020-21 and 2024-25.
- Initiated by the Government of India, the mission aimed to achieve an "open-defecation free" (ODF) India by 2 October 2019, the 150th anniversary of the birth of Mahatma Gandhi. The objectives of the first phase of the mission also included eradication of manual scavenging, generating awareness and bringing about a behavior change regarding sanitation practices, and augmentation of capacity at the local level. The second phase of the mission aims to sustain the open defecation free status and improve the management of solid and liquid waste. The mission is aimed at progressing towards target 6.2 of the Sustainable Development Goals Number 6 established by the United Nations in 2015.
- As part of the campaign, volunteers, known as Swachhagrahis, or "Ambassadors of cleanliness", promoted indoor plumbing and community approaches to sanitation (CAS) at the village level. Other activities included national real-time monitoring and updates from non-governmental organizations (NGOs) such as The Ugly Indian, Waste Warriors, and SWaCH Pune (Solid Waste Collection and Handling).
- The government provided subsidy for construction of nearly 110 million toilets between 2014 and 2019, although many Indians especially in rural areas choose to not use them. The campaign was criticized for using coercive approaches to force people to use toilets. Many households were threatened with a loss of benefits such as access to electricity or food entitlements through the public distribution system.

6.1 Swatchhta needed in allocated village -Existing Situation with photograph

Fig 6.1 Need waste management

- In the village there is no facility related to waste management. There is no provision of garbage collection and even no authorized garbage dumping points in the village. Villagers are forced to dump the garbage at random places or to burn it in open spaces view absence of garbage dumping points which negatively impacts the hygiene and health of the peoples. We need support of government and also people support needed.

6.2 Guidelines for the process of the implementation in your village with photograph

❖ **Action for making your village Clean:**

- Avoid use of plastic bags.
- Follow government's rules and regulations.
- If someone is breaking the rule, they make aware of it.
- Spread awareness to keep our village clean.
- Keep paper bags with yourself to store wet waste and throw them in dustbin only.
- Avoid spitting on roads.

❖ **Necessity steps should be taken by government:**

- Dustbin should be kept at proper distance of road.
- Dustbin should be kept at all public places like bus-stand, railway station, gardens, etc.
- Proper public toilets are to be made and they should be maintained regularly.
- Rules should be made and action should be taken if someone breaks the rules.

6.3 Actual Activity Done by Students for making your village Clean with Photograph

- we are going to village and observe the actual condition of the village but we found out there is no any waste management in the village. The waste is throw anywhere in the place by the people of village. Then we talk about the cleanliness and its importance, it's benefits, effect and how cleanliness is play a major role in our life.

- We tell the how can the cleanliness will done by regularly clean surrounding areas and don't throw the waste anywhere around the places and the guideline for the cleanliness.

Fig 6.3 Swachhta activity

Chapter 7

Village condition due to Covid-19

Due to COVID-19 pandemic, Ministry of Panchayat, Government of India in close collaboration with state governments has taken various initiatives. The guidance for the COVID 19 are not violated and norms of social distancing are scrupulously followed to contain the spread of the disease. COVID-19 had mostly remained in India's cities, but the disease is now spreading to rural India – an area with over 850 million people and far worse healthcare. Most rural communities rely on untrained health workers. Over two-thirds of these rural health providers have no formal medical training, but remain the only option of medical support for most of the rural population.

7.1 Taken steps in allocated village related to existing situation with photograph

- **Following steps taken in village:**

- There is restriction in outdoor going, it's only allow if work is important.
- Social distancing is compulsory to follow.
- Wearing mask in public is necessary.
- People from outer city & village is necessary to quarantine for 14 days.

7.2 Activities Done by Students for allocated village Clean with Photograph

- We visited the village then get the permission of sarpanch for spreading awareness about COVID 19.
- We meet many people of village and aware about covid-19 and give the information about hygiene, sanitizer & mask how to use it and what's importance of it and wash hands properly so corona virus will not affect the our body also avoid crowded area and firstly make yourself home quarantined if you fill any COVID-19 symptom in your body.

Fig 7.2 Activity for Covid-19

7.3 Any other steps taken by the students / villagers

- No other stapes taken.

Chapter 8.
Sustainable Design Planning Proposal (Prototype Design)- Part- I (Scenario / Existing Situation / Proposed Design in Auto cad / Recapitulation Sheet / Measurement Sheet / Abstract Sheet / Sustainability of Proposal / Any other software)

8.1 Design Proposals

- In primary and techno-economic survey we collected information regarding to facilities Primary facilities, social facilities, socio-cultural facilities, educational facilities and sanitation facilities. From the collected data and observation, the information and condition of existing facilities as follows.

8.1.1 Sustainable Design (Primary school)

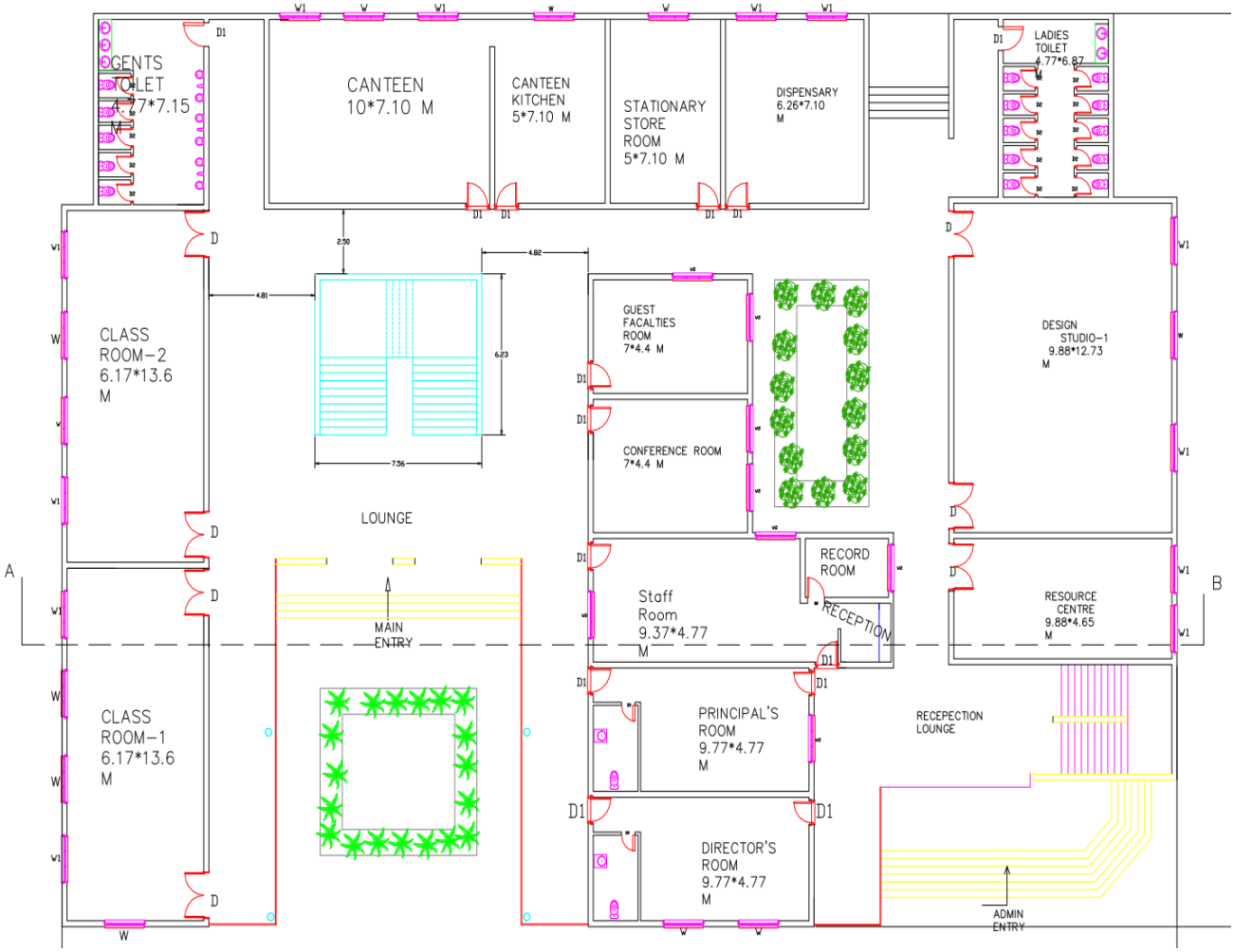

Fig 8.1.1 Ground plan of primary school

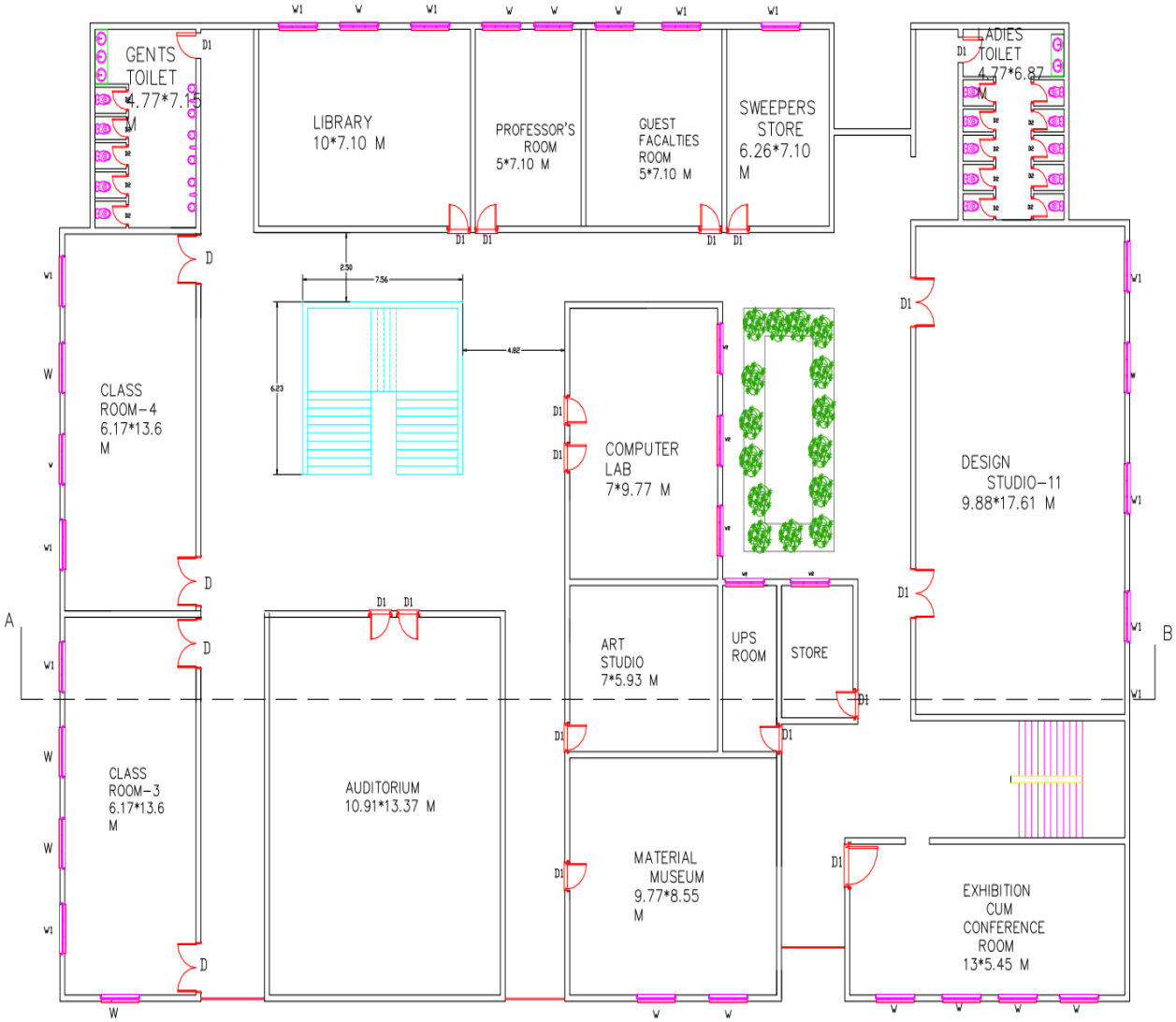

Fig 8.1.1 (a) First floor plan of primary school

Schedule of Door & Windows (Meter)	
D	1.80 x 2.10
D1	1.20 x 2.10
D2	0.90 x 2.10
W	1.80 x 1.20
W1	1.40 x 1.20
W2	1.20 x 1.20

Fig.8.1.1 (b) Elevation

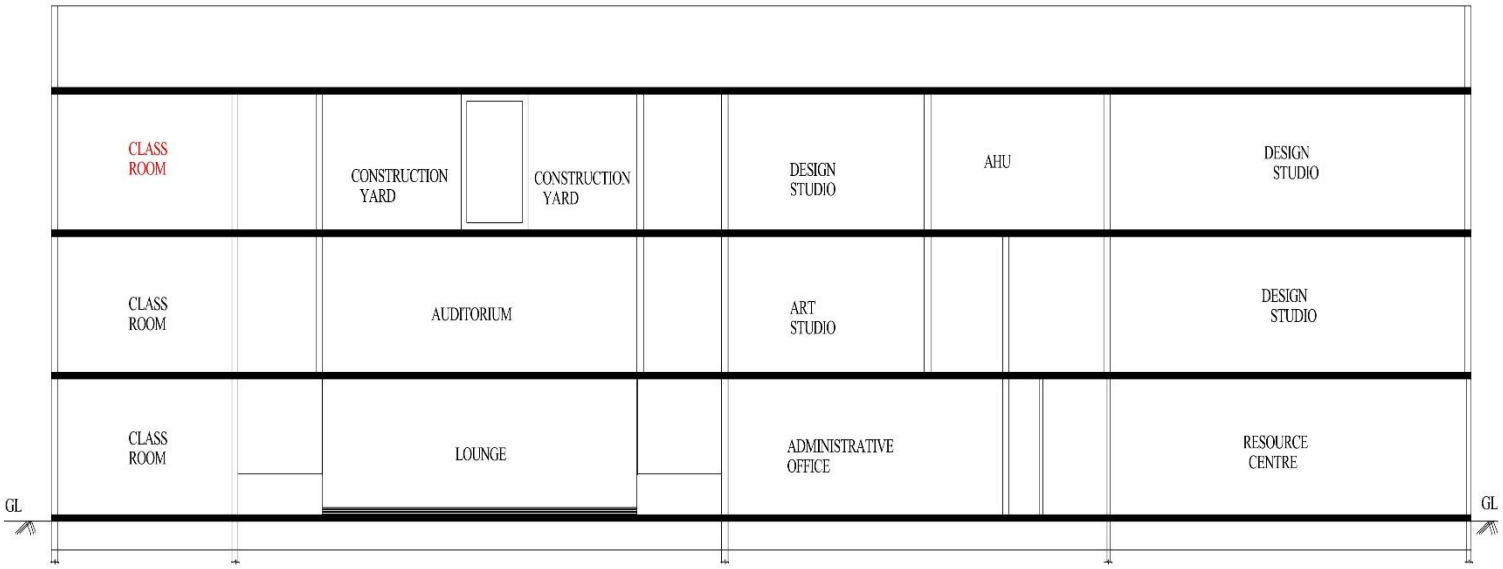

Fig.8.1.1 (c) Section

Primary school Material Estimate quantity with Cost					
Item No.	**Particulars of Items**	**Quantity**	**Rate**	**Per**	**Amount Rs.**
1	Earthwork in excavation for foundation	776.66	85.00	M^3	66016.10
2	P.C.C. work for foundation including compaction and curing	164.14	300.00	M^3	49242
3	Brick masonry in C.M.1:6 in foundation and plinth including curing, etc.	302.93	3200.00	M^3	969376
4	Brick masonry in C.M.1:6 in superstructure including curing.	10159.89	3500.00	M^3	35,559,615
5	Smooth plaster inside the room including scaffolding, racking of masonry joints, curing, and complete.	7611.66	160.00	M^2	1,217,865.6
6	R.C.C. work in slab, chajja (0.6 projection) and lintel (0.1 m bearing on wall) including reinforcement steel, centering, finishing, curing.	824.37	8800.00	M^3	7,254,456
7	Wood work for doors and windows	442.26	200.00	M^2	88,452
8	Mosaic tiles flooring work	3724.02	170.00	M^2	633083
9	Damp proof course above plinth	108.48	150.00	M^3	16272
Total					**45,854,377**

Tab. 8.1.1 Estimate and Cost of Primary school

8.1.2 Physical design (Garden)

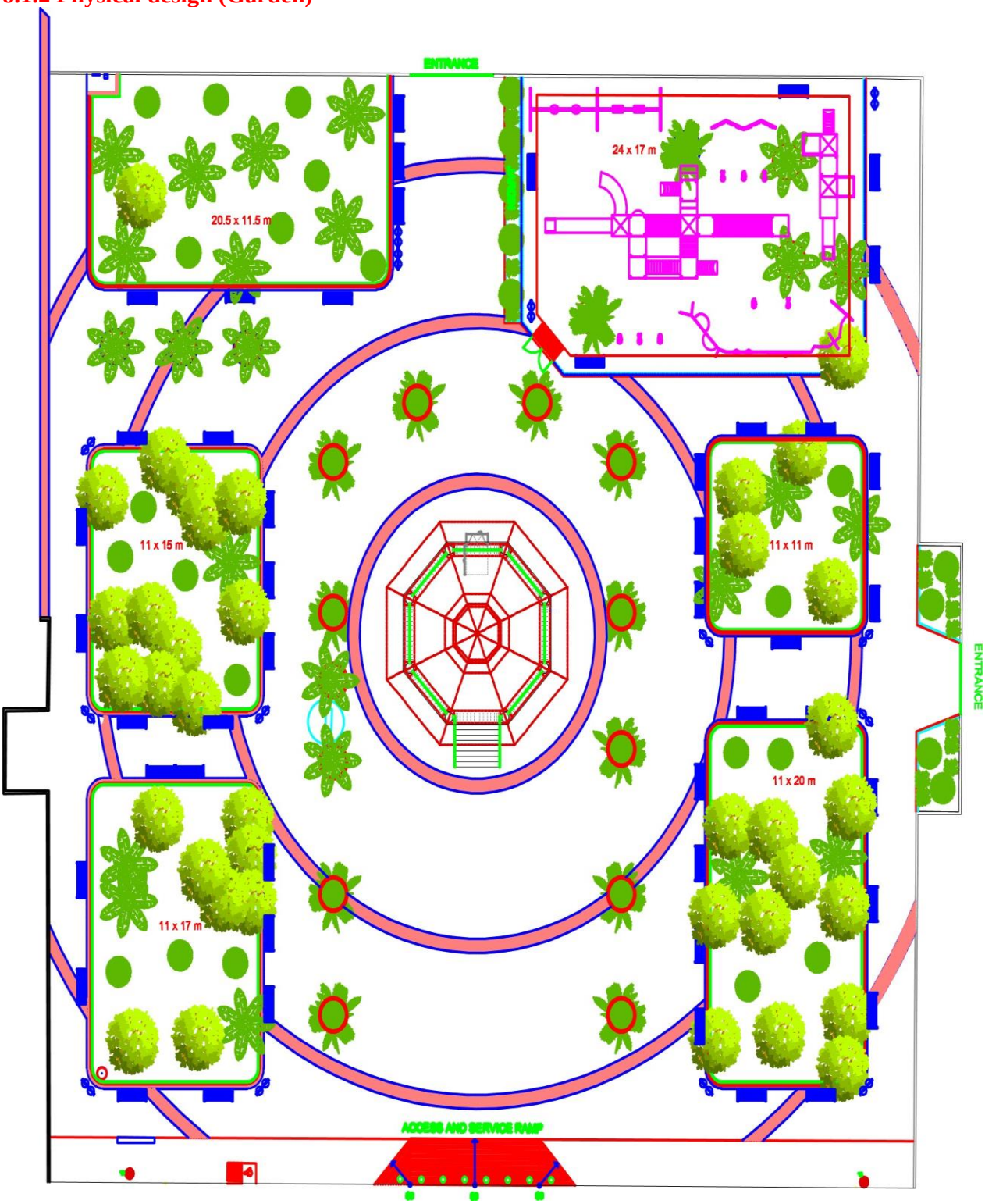

Fig 8.1.2 Garden

Garden Material Estimate quantity with Cost					
Sr. No.	**Item Description**	**Quantity**	**Rate**	**Per**	**Amount Rs.**
1	Excavation of foundation	198	745	M^3	147510
2	P.C.C. work for foundation	54	4100	M^3	221400
3	Masonry work in foundation up to plinth level	40	1300	M^3	52000
4	R.C.C. work for plinth coping	24	8800	M^3	211200
5	Masonry work in super structure.	120	1700	M^3	204000
6	Plaster work	1200	450	M^2	540000
7	Filing in garden	5880	45	M^2	264600
Total					**1640710**

Table 8.1.2 Estimate and Cost of Garden

8.1.3 Social design (Bus Stop)

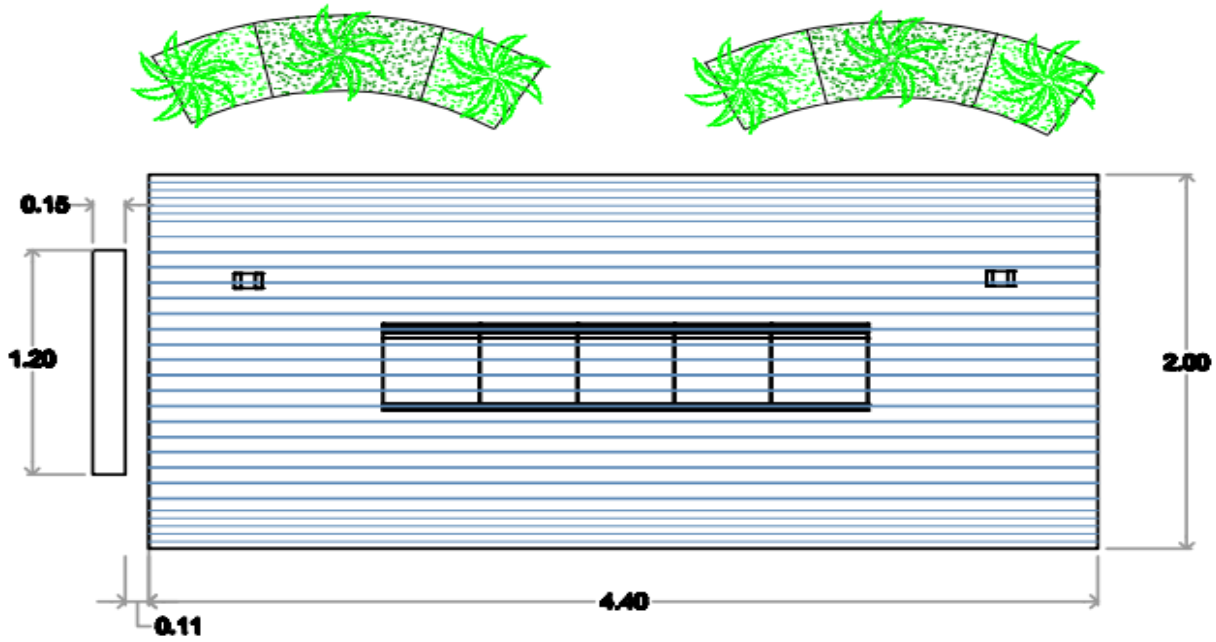

Fig.8.1.3 (a) Bus Stop Plan

Fig.8.1.3 (b) Elevation

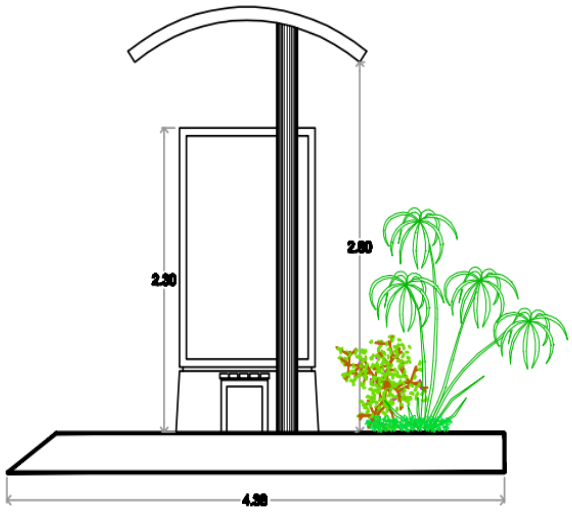

Fig.8.1.3 (c) Section

Bus Stop Material Estimate quantity with Cost					
Sr. No.	**Particulars of Items**	**Quantity**	**Rate**	**Per**	**Amount Rs.**
1	Concrete work for ground base.	10	50.00	M^3	500
2	Marble black sheet for bus time and schedule.	7	120.00	Sq. foot	840
3	Marble granite sheet for people sitting.	8	140.00	Sq. foot	1120
4	Kota stone	3	80.00	Sq. foot	240
5	Steel sheet (ISI)	15	140.00	Foot	2100
6	Cold rolled coil pipe	60	70.00	Kg.	4200
Total					**9000**
5% bhisti (450), 3% water charges (284) TOTAL					**9734**

Table 8.1.3 Estimate and Cost of Bus Stop

8.1.4 Primary Health Center

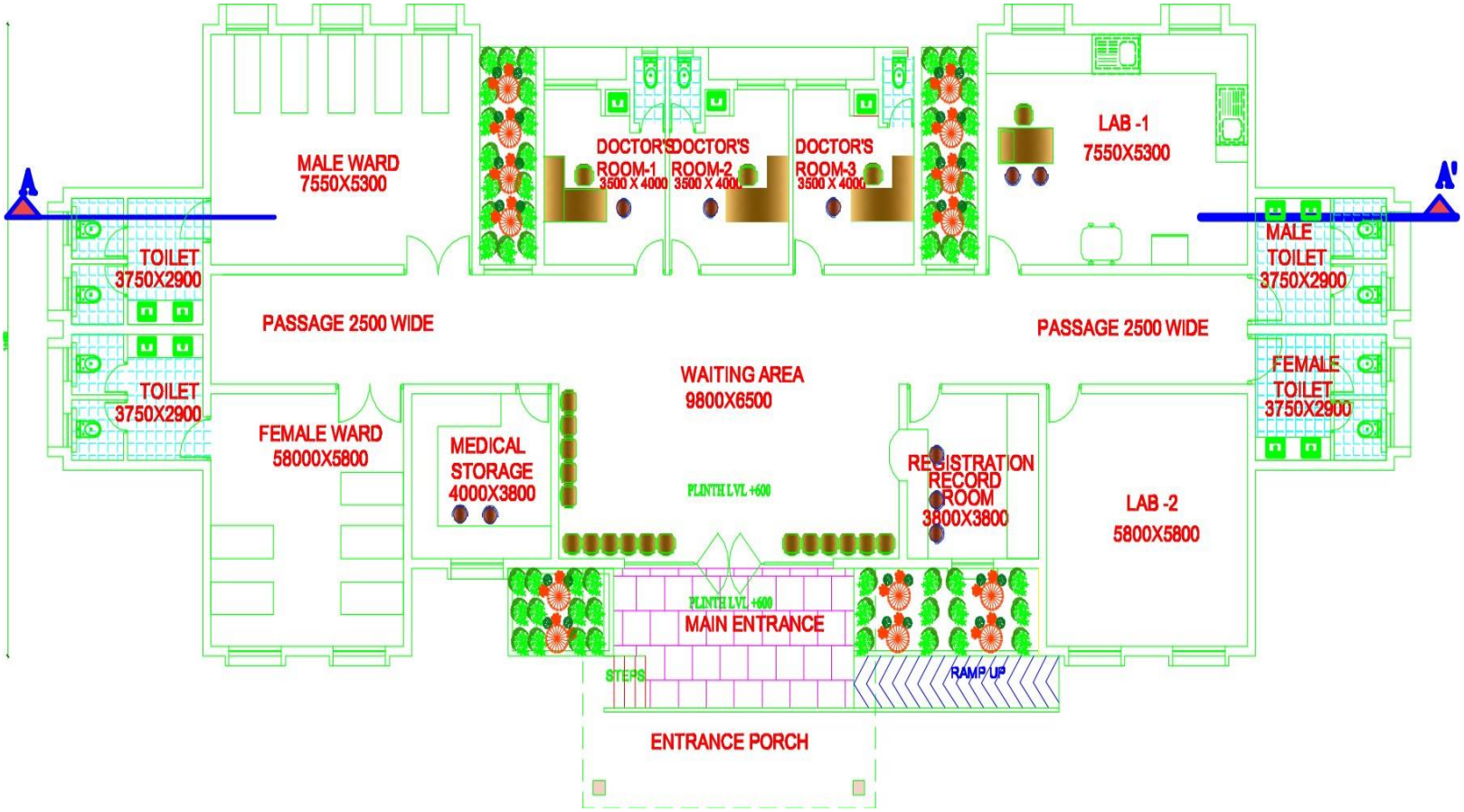

Fig. 8.1.4 (a) Primary Health Center Plan

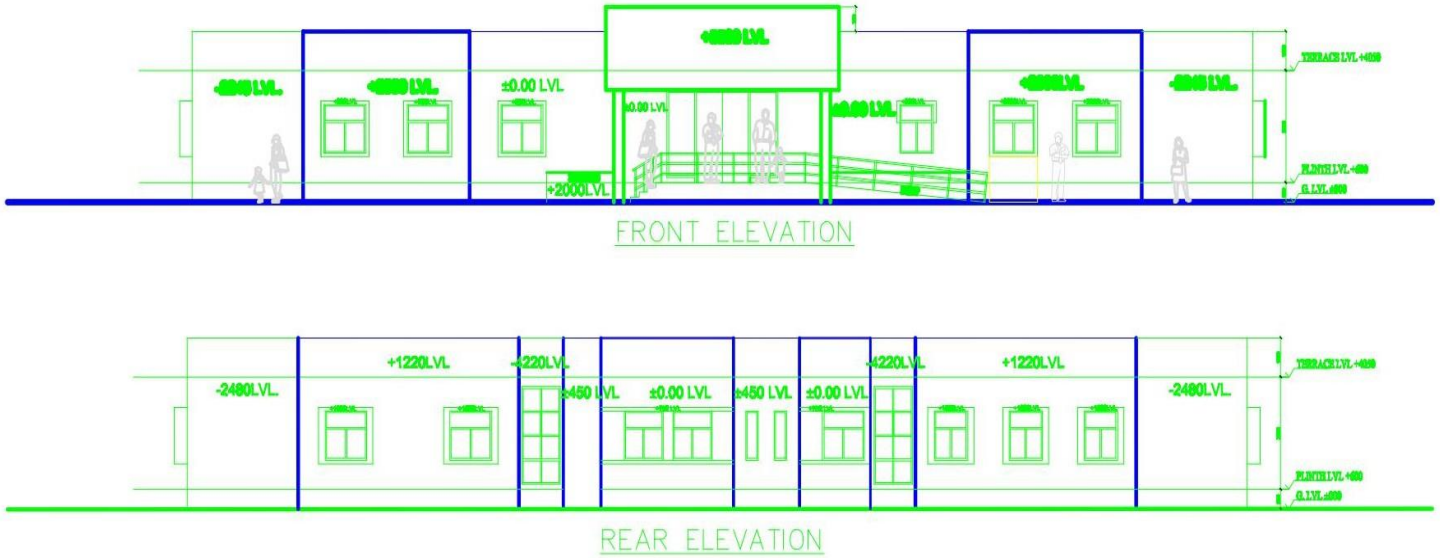

Fig.8.1.4 (b) Elevation

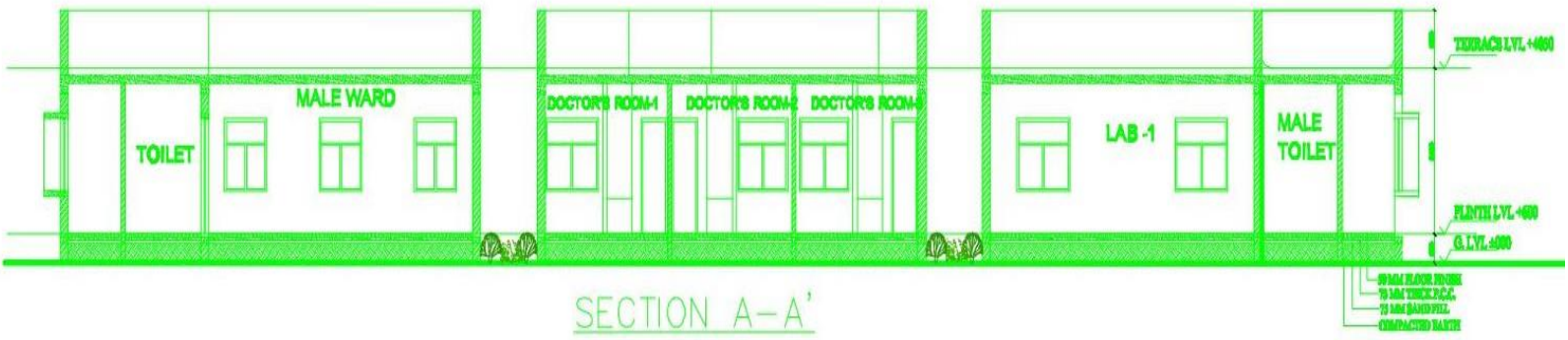

Fig.8.1.4 (c) Section

Primary Health Center Measurement Sheet						
Sr. No.	**Item description**	**No.**	**Length (m)**	**Bright (m)**	**Height (m)**	**Quantity (M^3)**
1	Earthwork in excavation for foundation	1	248.25	0.90	1.4	312.795
2	Brick bat cement concrete (1:4:8) for foundation	1	248.25	0.90	0.2	44.685
3	Brick masonry above plinth upto slab level c.m. 1:6	1	262.95	0.3	3	236.65
4	Brick masonry upto plinth in c.m. 1:6	1	248.25	0.3	0.90	67.02
5	Deduction for door and windows					
	D	1	1.80	0.3	2.10	1.13
	D1	8	1.10	0.3	2.10	5.54
	D2	4	0.90	0.3	2.10	2.26
	D3	11	0.70	0.3	2.10	4.85
	W	13	1.80	0.3	1.20	8.42
	V	11	0.60	0.3	0.60	1.18
					Total deduction	23.38
					Net quantity	213.28

Table 8.1.4 (a) Primary Health Center Measurement Sheet

Primary Health Center Abstract Sheet					
Sr. No.	**Particular of item**	**Quantity**	**Rate**	**Per**	**Amount Rs.**
1	Excavation in foundation	312.80	85	M^3	27353
2	Brick bat cement concrete (1:4:8)for foundation	44.70	2700	M^3	120690
3	Brick masonry up to plinth in c.m. 1:6	241	3200	M^3	684800
4	Brick masonry above plinth up to slab in 1:6	210.29	3500	M^3	736015
5	Smooth plaster inside the room and ceiling	1179.06	160	M^2	188649.6
6	R.C.C. work in slab, chajja and lintel	86.94	8800	M^3	765072
Total					**2522579**

Table 8.1.4 (b) Primary Health Center Abstract Sheet

8.1.5 Design for door-to-door waste collection:

SR. NO.	Description	No.	Rete Per Unit NOS.	Cost (Rs.)
Purchase Cost				
1	Waste collection tricycle	1	23000/-	23000/-
2	Public Dustbin	20	670/-	13400/-
3	Skip Container bin	2	60000/-	120000/-
Maintenance Cost (Monthly)				
4	Man required (for collection of waste)	1x30	300/-	9000/-
Total purchase cost				**156400/-**
Total maintenance cost				**9000/-**
Total initial cost				**165400/-**

Table 8.1.5 Abstract for door-to-door waste collection

- **Detail of waste collection trip**
- Timing for waste collection = 7:30 am to 11:30 am.
- Public dustbin empty everyday.
- Community container empty at every 3 alternate day.
- Total no. of house hold in village = 591 (census 2011)

$$\text{Maintenance charge from each house hold} = \frac{9000}{591}$$

$$= 15.23 \text{ say } 16$$

- **Tricycle specification**
- ✓ Material – Mild steel
- ✓ Color – Black
- ✓ No. of box – 8
- ✓ No. of well – 3

❖ **Dustbin Specification**

✓ Capacity – 240 lit.

✓ Double bin (separate for dry and liquid waste)

✓ Material – FRP

❖ **Community skip container specification**

✓ Material – steel

✓ Green color

Fig 8.1.5 (a) Community skip container

Fig 8.1.5 (b) Dustbin

8.1.6 Design of Soak pit & Septic Tank

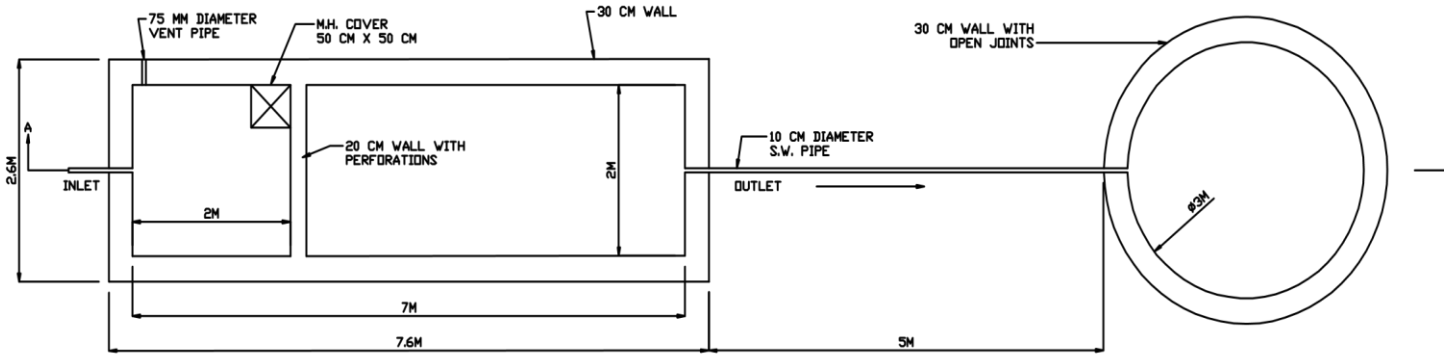

Fig 8.1.6 (a) Soak pit & Septic Tank Plan

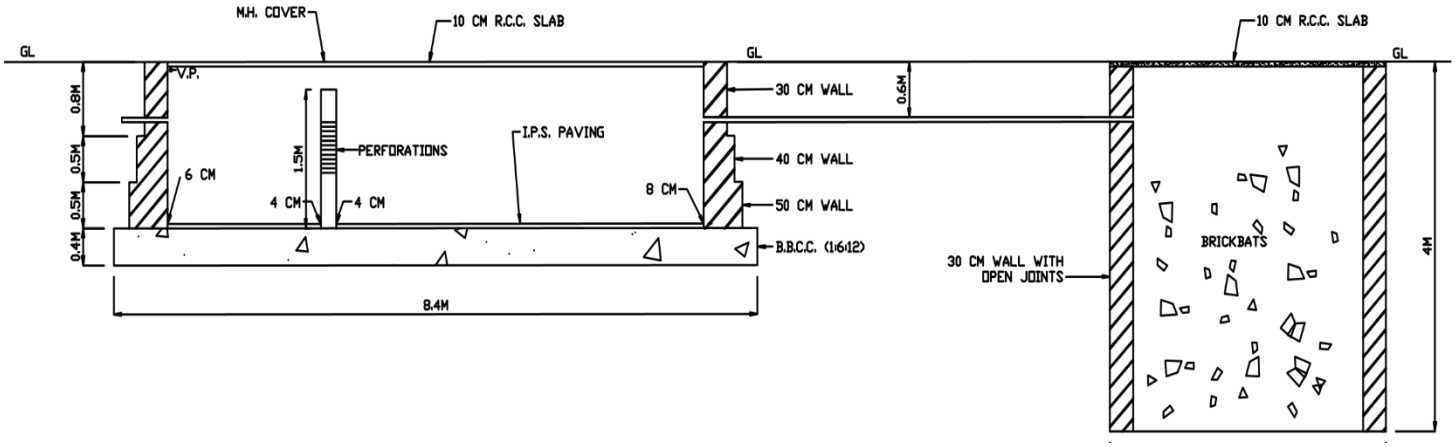

Fig 8.1.6 (b) Soak pit & Septic Tank Section

No.	Item	Quantity	Rate	Per	Amount Rs.
1	Excavation for foundation (a) Up to 1.5m depth (b) From 1.5 m to 3m depth (c) More than 3m depth	 58.11 m^3 43.26 m^3 10.18 m^3	 85 100 150	 m^3 m^3 m^3	 4939 4326 1527
2	Foundation concrete B.B.C.C. (1:6:12)	11.42 m^3	2000	m^3	22840
3	First class brick masonry in C.M. (1:6) for the wall of septic tank.	14.57 m^3	3200	m^3	46624
4	Open joints masonry of soak pit	12.73 m^3	1500	m^3	19095

5	Brick bats in soak pit	24.03 m^3	800	m^3	19224
6	RCC slab	2.97 m^3	8800	m^3	26136
7	I.P.S. at the bottom of the septic tank (a) average 5 cm thick (b) average 6 cm thick	 4.0 m^2 9.6 m^2	 250 300	 m2 m2	 1000 2880
8	12 mm thick plaster (1:4) inside the septic tank	55.81 m^2	150	m2	8372
9	C.I. steps	3 nos	300	No.	900
10	Manhole cover size 50cm x 60cm	1 no	450	No.	450
11	100 mm dia. Pipe	8 r.m.	130	r.m.	1040
12	75 mm dia. C.I. vent Pipe	12 r.m.	300	r.m.	3600
Total				**Rs.**	**162954**
Add 5% for contingencies				**Rs.**	**8148**
Grand total				**Rs.**	**171102**

Table 8.1.6 Abstract of Soak pit & Septic Tank

8.2 Recommendations of the Design

- Primary School: In the village primary school physical condition are so bad then we proposed primary school design.
- Garden: In village the garden provided for interaction of people purpose.
- Bus Stop: In the village there is no facility of bus stop so we proposed bus stop design.
- Primary Health Center: It is provided for the health safety for people of village.
- Door to Door waste collection:

8.3 About designs Suggestions / Benefit of the villagers

- In the village there is primary school is in bad condition so we provide new primary school to get batter facility for students.
- Benefit of garden is people of village is interact with each other.
- In the village if there are bus stop is available then the people get easily use the transport facility.
- Primary health center is good for the people of the village for their health care.

Chapter 9.

Proposing designs for Future Development of the Village for the PART-II Design

- In Future we will implement the new technologies to develop the facilities also try to catch the maximum economic output of a system. In the sense we will also try to give our best to complete our motto of Rurbanization.
- In the next semester we will design The Bank and ATM because we see there is no facility like this so after this it is very helpful for the villager and village economy.
- In village we saw there is no public toilet in the village it is very harmful for the village people so we provie the design of public toilet in the village it is improve the safety against the health.
- For the better health of the villagers we decide provide the design of GYM.
- Also provide the design of,

- Public Toilet
- Post office
- Medical store
- Bio-Gas Plant.

Chapter 10.

Conclusion of the Entire Village Activities of the Project

- In this semester, we completed our Literature Review and our Ideal Village Visit. From there we got an idea about how the smart village should be. Then we visited our allotted village Khambhaliya of Junagadh district.
- There we completed our Techno-Economic Survey and Smart Village Survey. After surveying we came to conclusion that there was lack of Social Culture Plant. Hence, we designed Garden and also designed Primary school and Bus Stop of the entire village.
- In this project, I am represent the advance facilities like Eco-friendly and less costing design for the easy development of the rural to urban village.
- This all the facilities provide in the rural village to develop or carry it to urban cities. To use the Smart village (Ideal village) in reference to developed all the villages in the India. To provide best infrastructure facilities in the village to promote the overall income wealth and economy in the areas. This main objective to carries Vishwakarma Yojana: to developed the entire village in one by one in the nearest cities to more away.
- The main objective is “All the Village Developing with Rural Solution but the all Smart Urban Facilities may have”. To remember this objective to developed smart village facilities in suitable manner and reduce the migration and pollution in environment.

Chapter 11.

References refereed for this project

1. http://villageinfo.in

2. http://smartvillages.org

3. www.vy.gtu.ac.in

4 www.CensusIndia.gov.in

5 www.Googlemaps.com

6 http://villagemap.in

7. www.onefivenine.com

8. www.wikipedia.com

9. General Guidelines of Vishwakarma Yojana Phase – VIII Academic B. E. Final Year Project

10.GTU Innovation Council – Guideline for Final Year B. E. Project & PMMS Activities.

11.The Google Translate – www.translate.google.com

12.To connected with the Nodal Officers to guideline for this project through the VY – VIII guidelines.

Chapter 12.
Annexure attachment

12.1 Survey form of Ideal Village Scanned copy attachment in the report for Part-I

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:	Shapur
Name of Taluka:	Vanthali
Name of District:	Junagadh
Name of Institute:	Om engineering College
Nodal Officer Name & Contact Detail:	H.M. Bhimajiani sir
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Shrimati Jaliben Dineshbhai Pujaudy (Sarpanch) Gram Panchayat Sapur
Date of Survey:	22/10/2020

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001				
ii)	2011	8108	4237	3871	1798

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	1898 Ha.
	Forest Area (In hect.)	0
	Agricultural Land Area (In hect.)	1369 Ha
	Residential Area (In hect.)	
	Other Area (In hect.)	62 Ha.
	Water bodies	0194
	Nearest Town with Distance:	Vanthali 5 km

3. Occupational Details:

Name of Three Major Occupation groups in Village	1. Industrial 20 % 2. Agriculture 70 % 3. Labour 10 %

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	Sump-1 water tank-2			
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	Yes		
	Underground Sump	Capacity:	Yes		
Suggestions if any:					
C.	**Drainage Facility**				
	Available (Yes/ No)	Yes	Yes		
Suggestions if any:					
D.	**Type of Drainage**				
	Closed/ Open	Closed	Yes		
	If Open than Pucca / Kutchcha				
	Whether drain water is discharged directly in to Water bodies/ Sewer plants	Water bodies			
Suggestions if any:					

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E.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	C.C.	Yes		
	Main road	C.C.	Yes		
	Internal streets	Block	Yes		
	Nearest NH/SH/MDR/ODR Dist. in kms.	N.H.			
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	Yes	Yes		
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes		Yes	
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Yes	Yes		
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Gov. more than 6hr	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		

	Electrification in Government Buildings/ Schools/ Hospitals	Yes	Yes		
	Renewable Energy Source Facilities (Y/ N)	No			
	LED Facilities	Yes			
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	3			
	Location Condition	Near bus stand	Good		
	Community Toilet (With bath/ without bath facilities)	No	No		
	Solid & liquid waste Disposal system available	Yes			
	Any facility for Waste collection from road	No			
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	River ajut			
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Pucca	Yes		

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:	PHC Good			
	Private Clinic/Private Hospital/ Nursing Home	Private clinic	Yes		
	If any of the above Facility is not available in village than approx. distance from village: ...5....kms.				
Suggestions if any:					

L.	**Education Facilities:**				
	Aaganwadi/ Play group	14	Yes		
	Primary School	5	Yes		
	Secondary school	1	Yes		
	Higher sec. School	2	Yes		
	ITI college/ vocational Training Center	No			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	No			
	If any of the above Facility is not available in village than approx. distance from village: ..20..kms.				
Suggestions if any:					

M.	**Socio- Culture Facilities**				
	Community Hall (With or without TV) Location:	Yes Gaurad Sabha		Yes	

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	Condition:				
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	No			
	Public Garden Location: Condition:	No			
	Village Pond Location: Condition:	No			
	Recreation Center Location: Condition:	No			
	Cinema/ Video Hall Location: Condition:	No			
	Assembly Polling Station Location: Condition:	8 Yes			
	Birth & Death Registration Office Location: Condition:	Yes near Panchayat	Yes		
If any of the above Facility is not available in village than approx. distance from village: .10..kms.					
Suggestions if any:					
N.	**Other Facilities**				
	Post-office	Yes	Yes		
	Telecommunication Network/ STD booth	Yes	Yes		

	General Market	Yes			
	Shops (Public Distribution System)	Yes			
	Panchayat Building	Yes			
	Pharmacy/Medical Shop				
	Bank & ATM Facility	Yes			
	Agriculture Co-operative Society	Yes			
	Milk Co-operative Soc.	No			
	Small Scale Industries	Yes			
	Internet Cafes/ Common Service Center/Wi Fi	No			
	Other Facility	No			
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 Solar Street Lights Rain Water Harvesting System	No			
Q.	Any Other	No			

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	

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Recent Projects going on for Development of Village	
Any NGO working for village development	

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)	Jutes - 4	
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 Scanned copy attachment in the report for Part-I

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Vishwakarma Yojana: Phase VIII Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

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

Name of District:	Junagadh
Name of Taluka:	Junagadh
Name of Village:	Choki
Name of Institute:	G.M. Engineering college
Nodal Officer Name & Contact Detail:	H.M. Bhimgirani sir
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	ભિખાભાઈ કોટડીયા (સરપંચ)
Date of Survey:	25-10-2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	3022	1528	1494	719
2.	2011	3419	1850	1569	727

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1282 hec.
2.	Forest Area (In hect.)	4.50 hec.
3.	Agricultural Land Area (In hect.)	550 hec.
4.	Residential Area (In hect.)	620 hec.
5.	Other Area (In hect.)	107.5 hec.
6.	Distance to the nearest railway station (in kilometers):	10 km

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7.	Name of Nearest Town with Distance:	Jetpur - 14 Km
8.	Distance to the nearest bus station (in kilometers):	10 Km
9.	Whether village is connected to all road for the any facility or town or City?	NH

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1.
	2.
	3.
Major crops grown in the village:	1.
	2.
	3.

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	Piped into Dwelling	Yes		
2.	**DUG WELL** Protected Well Un Protected Well	Protected well	yes		
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring				
4.	Rainwater Tanker Truck Cart With Small Tank **SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump Other(Specify)**Lake/ Pond**	Irrigation Canal Lake/ Pond	Yes.		

B.	Water Tank Facility				
	Overhead Tank	Capacity:	Yes		
	Underground Sump	Capacity:			
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET	open with outlet	Yes		
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	50% Pucca			50% Kutcha
	Main road				
	Internal streets	Kutcha			
	Nearest NH/SH/MDR/ODR Dist. in kms.	NH & MDR 10 Km			
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	yes 10 Km			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes	Yes		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Yes	Yes		
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Yes Gov. more than 6 hrs.	Yes		

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	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		
	Electrification in Government Buildings/ Schools/ Hospitals	Yes	Yes		
	Renewable Energy Source Facilities (Y/ N)			No	
	LED Facilities			No	
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Yes	Yes	1	
	Location Condition	Community			
	Community Toilet (With bath/ without bath facilities)	Yes Without bath.			
	Solid & liquid waste Disposal system available	Yes	Yes		Door to Door collect.
	Any facility for Waste collection from road	No.		No	
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL. OTHER (SPECIFY)	Tube well other	Yes		
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Pucca	Yes		50 %

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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	Anganwadi PHC Private Clinic Nursing Home			
	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	Anganwadi	Yes	3	Good condition.
	Primary School	Yes	Yes	1	
	Secondary school	Yes	Yes	1	
	Higher sec. School	No.		No.	
	ITI college/ vocational Training Center	No.			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	No.			
	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)	Yes	choki	Yes	
	Public Library (With daily newspaper supply: Y/N)	No			No
	Public Garden	Yes	choki		
	Village Pond	No			No
	Recreation Center	No			No
	Cinema/ Video Hall	No			No
	Assembly Polling Station	Yes	choki	Yes	
	Birth & Death Registration	Yes	choki	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	choki	Yes	
	Telecommunication Network/ STD booth	Good	choki	Yes	
	General Market				No
	Shops (Public Distribution System)			Yes	
	Panchayat Building	Good		Yes	
	Pharmacy/Medical Shop			Yes	
	Bank & ATM Facility	Yes		Yes	
	Agriculture Co-operative Society				
	Milk Co-operative Soc.				
	Small Scale Industries	No			No
	Internet Cafes/ Common Service Center/Wi Fi	No			No
	Youth Club				No
	Mahila Mandal			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			Yes	
	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 4. Kishori Shakti Yojana 5. Balika Samriddhi Yojana 6. Mid-day Meal Programme 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 16. Employee Guarantee Scheme (EGS) 17. Prime Minister Rojgar Yojana (PMRY) 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)			yes	

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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	Yes		
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System			No	
3.	Any Other			No	

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy	Yes	Yes		
2.	Recent Projects going on for Development of Village			No	
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

8

1.	**Repair & Maintenance of Existing Public Infrastructure facilities,** **School Building** **Health Center** **Panchayat Building** **Public Toilets & any other**	School buildings Panchayat buildings	
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 ?		

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 Scanned copy attachment in the report for Part-I

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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:	Junagadh
Name of Taluka:	Bhesan
Name of Village:	Khambaliya
Name of Institute:	Om engineering College
Nodal Officer Name & Contact Detail:	H.M. Bhimaiyani sir.
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	લુણા હિંમતભાઈ રામજીભાઈ સરપંચ ગ્રામ પંચાયત ખંભાળીયા
Date of Survey:	07/11/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	3353	1699	1654	591

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1335.02 Hector
2.	Forest Area (In hect.)	No.
3.	Agricultural Land Area (In hect.)	1137.18 Hect.
4.	Residential Area (In hect.)	
5.	Other Area (In hect.)	18.74 Hect.
6.	Distance to the nearest railway station (in kilometers):	more than 10 Km

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

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1.	Aggriculture 95 %
	2.	labar 5 %
	3.	

Major crops grown in the village:	1.	Peanut
	2.	Cotton
	3.	

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	Piped home			
2.	**DUG WELL** Protected Well Un Protected Well	Yes Unprotected			
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring	No			
	Rainwater Tanker Truck Cart With Small Tank				
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump				

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	Other(Specify)**Lake/ Pond**				
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: 70,000	1		
	Underground Sump	Capacity: 2 lakh	1		
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1	No			
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road				
	Main road				
	Internal streets	Pcc			
	Nearest NH/SH/MDR/ODR Dist. in kms.	SH - 5 to 7 km			
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	No			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Yes			
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Yes Govt 24 hrs.			

3

	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			
	Location Condition				
	Community Toilet (With bath/ without bath facilities)	No			
	Solid & liquid waste Disposal system available	No			
	Any facility for Waste collection from road	No			
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL OTHER (SPECIFY)	Well Tube well			
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	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	PHC		Yes	
	If any of the above Facility is not available in village than approx. distance from village: ...5....kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	3	Yes		
	Primary School	1		Yes	
	Secondary school	No			
	Higher sec. School	No			
	ITI college/ vocational Training Center	No			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	No			

	If any of the above Facility is not available in village than approx. distance from village: ..5.....kms. Bhesan
Suggestions if any:	

L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)	Not good		Yes	
	Public Library (With daily newspaper supply: Y/N)	Not good		Yes	
	Public Garden				No
	Village Pond				No
	Recreation Center				No
	Cinema/ Video Hall				No
	Assembly Polling Station				No
	Birth & Death Registration Office		In Panchayat	Yes	

If any of the above Facility is not available in village than approx. distance from village: ..5.....kms.

Suggestions if any:

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

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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	No			

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				
	4. Kishori Shakti Yojana				
	5. Balika Samriddhi Yojana				
	6. Mid-day Meal Programme				
	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				
	16. Employee Guarantee Scheme (EGS)				
	17. Prime Minister Rojgar Yojana (PMRY)				
	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)				

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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	No			

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy	Yes			
2.	Recent Projects going on for Development of Village	No			
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)	Floods			

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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		
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 ?		

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

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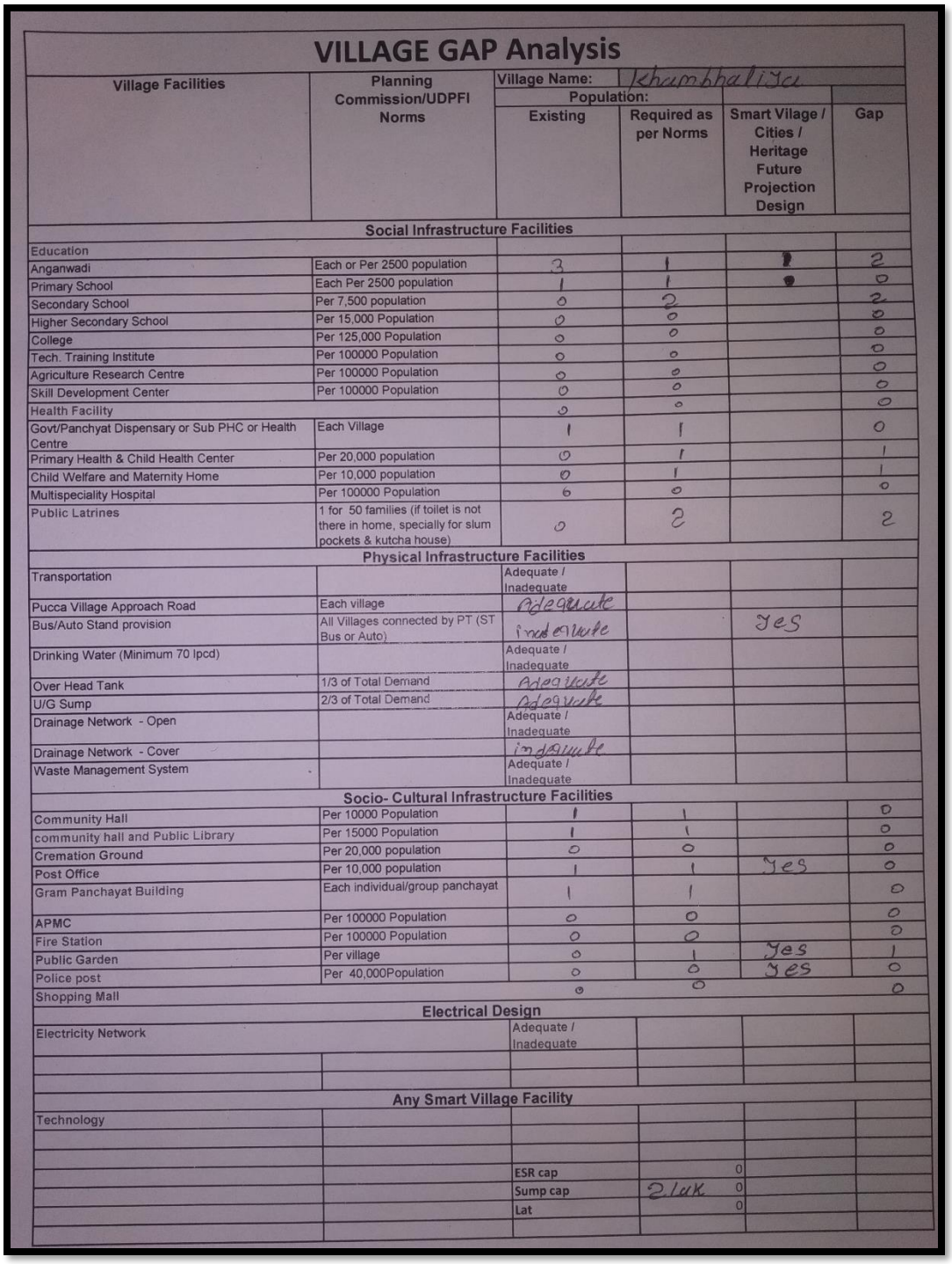
12.4 Gap Analysis of the Allocated Village



VILLAGE GAP Analysis

Village Name: Khambhaliya

Population:

Village Facilities	Planning Commission/UDPFI Norms	Existing	Required as per Norms	Smart Vilage / Cities / Heritage Future Projection Design	Gap
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	3	1	1	2
Primary School	Each Per 2500 population	1	1	1	0
Secondary School	Per 7,500 population	0	2		2
Higher Secondary School	Per 15,000 Population	0	0		0
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		0	0		0
Govt/Panchyat Dispensary or Sub PHC or Health Centre	Each Village	1	1		0
Primary Health & Child Health Center	Per 20,000 population	0	1		1
Child Welfare and Maternity Home	Per 10,000 population	0	1		1
Multispeciality Hospital	Per 100000 Population	6	0		0
Public Latrines	1 for 50 families (if toilet is not there in home, specially for slum pockets & kutcha house)	0	2		2
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)	Inadequate		Yes	
Drinking Water (Minimum 70 lpcd)		Adequate / Inadequate			
Over Head Tank	1/3 of Total Demand	Adequate			
U/G Sump	2/3 of Total Demand	Adequate			
Drainage Network - Open		Adequate / Inadequate			
Drainage Network - Cover		Inadequate			
Waste Management System		Adequate / Inadequate			
Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	1	1		0
community hall and Public Library	Per 15000 Population	1	1		0
Cremation Ground	Per 20,000 population	0	0		0
Post Office	Per 10,000 population	1	1	Yes	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	Yes	1
Police post	Per 40,000Population	0	0	Yes	0
Shopping Mall		0	0		0
Electrical Design					
Electricity Network		Adequate / Inadequate			
Any Smart Village Facility					
Technology					
		ESR cap	0		
		Sump cap	2 Lak 0		
		Lat	0		

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

Om Engineering

Sr. No.	Village Name	Discipline	Part-1	Part-2
1	Khambhaliya	Civil	Primary health center	Public toilet
			Primary school	Post office
			Garden	ATM
			Bus stop	Bank
			door to door waste collection	Medical shop
			Soak pit &Septic tank	Bio gas plant
2	Toraniya	Civil	Gram panchayat	Street light
			Road (maintenance)	Bank/ATM
			Public toilet	Post office
			Library	Street light
			Primary health center	
3	Moti Parabadi	Civil	Bus stand	Primary health center
			Public toilet	Post office
			Garden	Library
			High school	Gram panchayat
			Anganvadi	Bio gas plant
			Panchyat building	Community hall

Table 12.5 Summary Details of All the Villages Designs

12.6 Drawings (If, required, A1, A2, A3 design is not visible then Only)

- Other design creating in AutoCAD.

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

❖ **Ideal village visit**

Fig. 12.7 (a) Ideal village visit

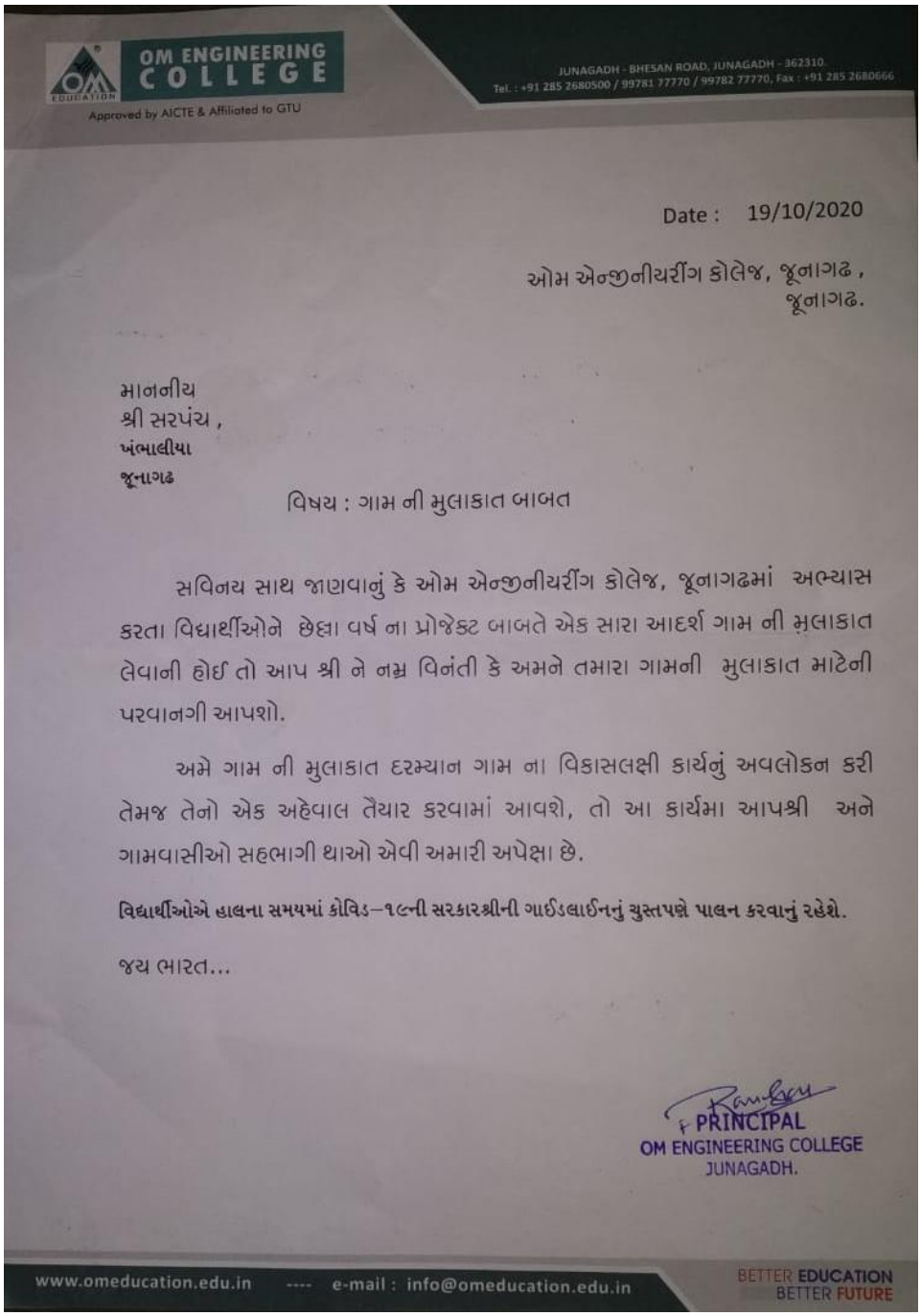
❖ **Allocated village visit**

Fig. 12.7 (b) Allocated village visit

12.8 Village Interaction with sarpanch Report with the photograph

Fig. 12.8 Village interaction

12.9 Sarpanch Letter giving information about the village development



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Date : 19/10/2020

ઓમ એન્જીનીયરીંગ કોલેજ, જૂનાગઢ ,
જૂનાગઢ.

માનનીય
શ્રી સરપંચ ,
ખંભાલીયા
જૂનાગઢ

વિષય : ગામ ની મુલાકાત બાબત

સવિનય સાથ જાણવાનું કે ઓમ એન્જીનીયરીંગ કોલેજ, જૂનાગઢમાં અભ્યાસ કરતા વિદ્યાર્થીઓને છેલ્લા વર્ષ ના પ્રોજેક્ટ બાબતે એક સારા આદર્શ ગામ ની મુલાકાત લેવાની હોઈ તો આપ શ્રી ને નમ્ર વિનંતી કે અમને તમારા ગામની મુલાકાત માટેની પરવાનગી આપશો.

અમે ગામ ની મુલાકાત દરમ્યાન ગામ ના વિકાસલક્ષી કાર્યનું અવલોકન કરી તેમજ તેનો એક અહેવાલ તૈયાર કરવામાં આવશે, તો આ કાર્યમા આપશ્રી અને ગામવાસીઓ સહભાગી થાઓ એવી અમારી અપેક્ષા છે.

વિદ્યાર્થીઓએ હાલના સમયમાં કોવિડ–૧૯ની સરકારશ્રીની ગાઈડલાઈનનું ચુસ્તપણે પાલન કરવાનું રહેશે.

જય ભારત...

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BETTER EDUCATION
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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

13.1 Design Proposals

- In this semester we provide design of Bank with ATM, Medical store, public store, post office, GYM, Bio-Gas plant.

13.1.1 Civil Design 1 (Public Toilet)

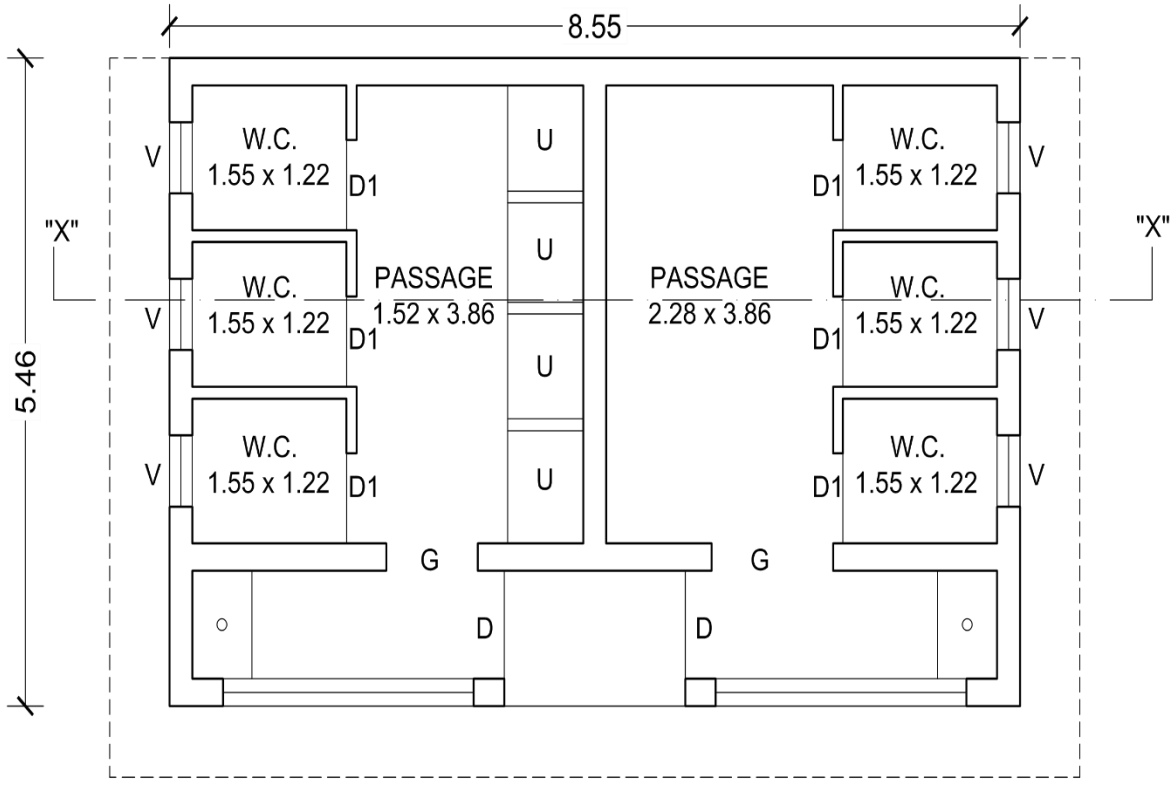
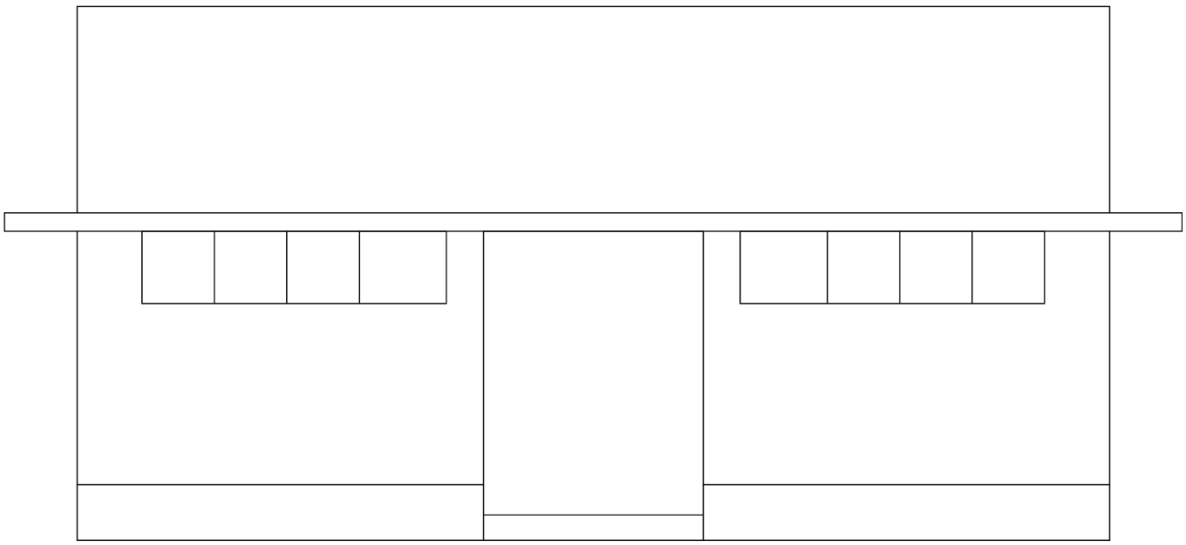


Figure 13.1.1 (a) plan of public toilet



ELEVATION

Figure 13.1.1 (b) Elevation of public toilet

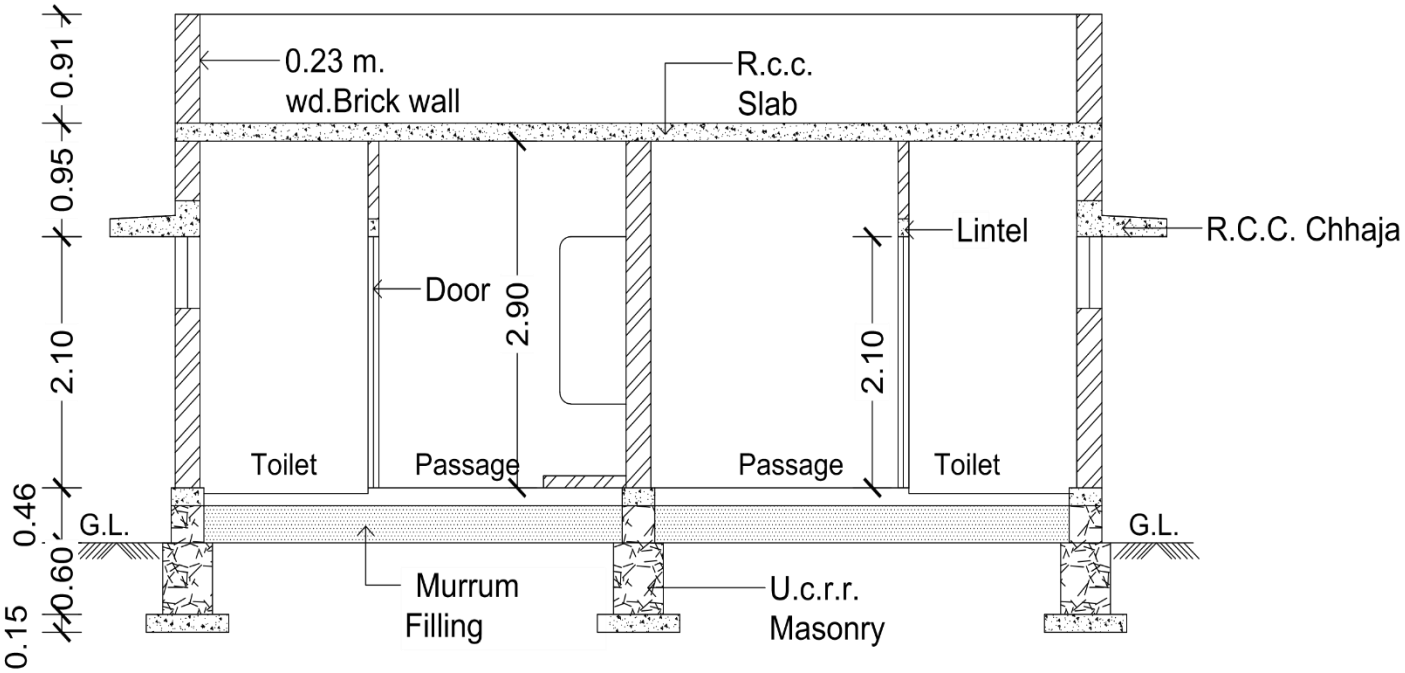


Figure 13.1.1 (c) Section of public toilet

Measurement sheet of Public Toilet						
Sr. No.	**Item description**	**No.**	**Length (m)**	**Breath (m)**	**Height (m)**	**Quantity**
1	Earth work excavation in foundation 0.30th wall	1	40.37	1.00	1.2	48.44 m^3
2	Earth work in excavation for 20th wall	1	22.27	0.90	1.2	24.05 m^3
3	P.c.c work for foundation	1	62.64	1.00	0.20	12.53 m^3
4	2cd class masonry work in foundation					
	For 0.30th wall	1	40.37	0.30	0.60	7.27 m^3
	For 0.20th wall	1	22.27	0.20	0.20	2.67 m^3
5	Dem proof course (D.P.C)	1	62.64		0.23	14.41 m^3
6	1st class brick masonry in super structure					
	For 0.30th wall	1	40.37	0.30	3.00	36.33 m^3
	For 0.20th wall	1	22.27	0.20	3.00	13.36 m^3
	Masonry work in parapet wall	1	46.57	0.10	0.85	3.95 m^3
	Deduction in door and window					
	D	2	1.20	0.30	2.10	1.51 m^3
	D1	6	1.00	0.20	2.10	2.52 m^3
	G	2	1.20	0.30	2 10	1.51 m^3
	V	6	0.60	0.30	0.60	4 53 m^3
	V1	2	1.50	0.30	0.60	0.54 m^3
7	R.c.c work					
	For slab	1	8.53	5.46	0.15	6.98 m^3
	For chajja	1	22.45	0.60	0.10	1.34 m^3
	For lintel	1	1.45	0.30	0.10	0.043 m^3
8	Steel 1% of Rcc	-	-	-	-	780 kg
9	Wood work					
	D	2	1.50		2.10	6.30 m^2
	D1	6	1.00		2.10	12.6 m^2
10	Glass, aluminium frame for ventilation					
	V	6	0.60		0.60	2.16 m^2
	V1	2	1.50		0.60	1.80 m^2

Table 13.1.1 (a) Measurement sheet of Public Toilet

Abstract sheet of Public Toilet					
Sr. No.	**Particulars of items**	**Quantity**	**Rat**	**Per**	**Amount (Rs.)**
1	Earth work excavation in foundation	72.50	85.00	m^3	6418
2	Pcc work	12.87	3000.00	m^3	38610
3	Brick masonry up to plinth	9.94	3200.00	m^3	31808
4	D.p.c	14.41	150.00	m^3	2162
5	1^{st} class brick masonry in super structure	49.69	3500.00	m^3	173915
6	Perapet wall	9.15	310.00	m^3	28365
7	Rcc work	8.36	8800.00	m^3	73568
8	Soomth plaster work inside the wall and ceiling	274.85	160.00	m^3	43976
9	Plaster work outside the wall	140.72	170.00	m^3	23922
10	Mosaic tile flooring	38.814	180.00	m^2	6986.52
11	Wood work	18.90	250.00	m^2	4725
12	Glass with aluminium frame	3.96	60.00	m^2	237.6
13	Steel	780	75.00	kg	58500
				Total	**493,193.12**

Table 13.1.2 (b) Abstract sheet of Public Toilet

13.1.2 Civil Design 2 (Post Office)

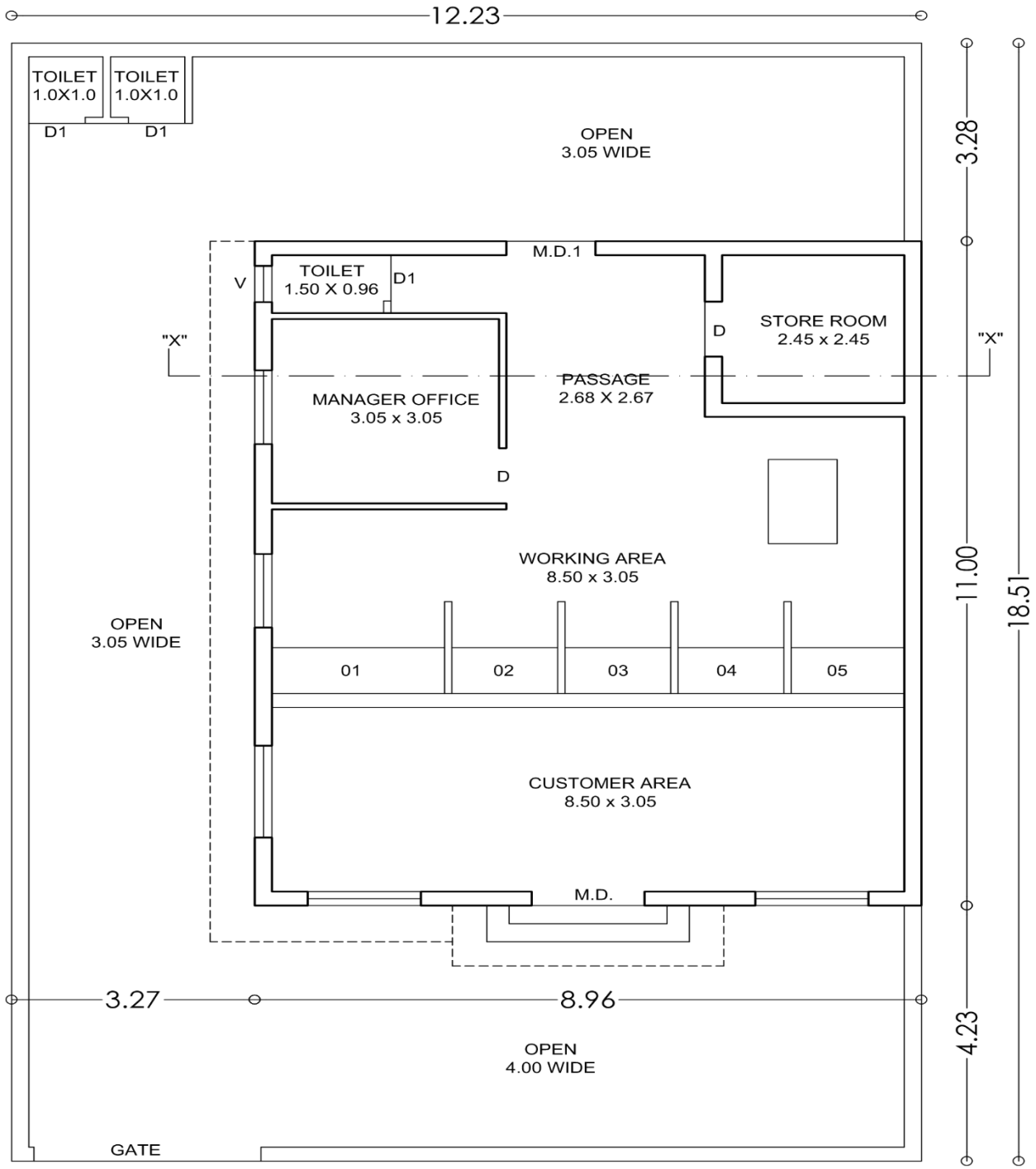


Figure 13.1.2 (a) Plan of post office

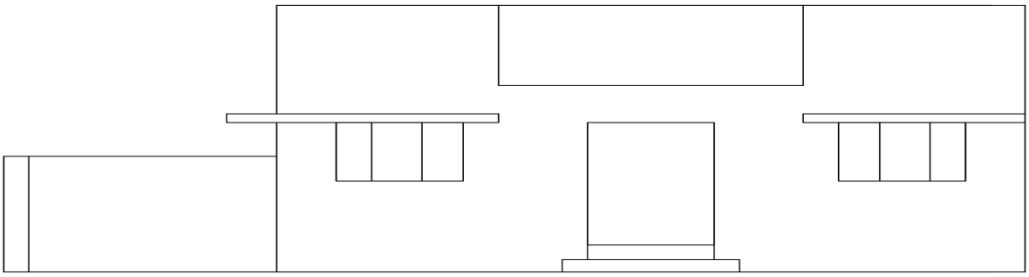


Figure 13.1.2 (b) Elevation of post office

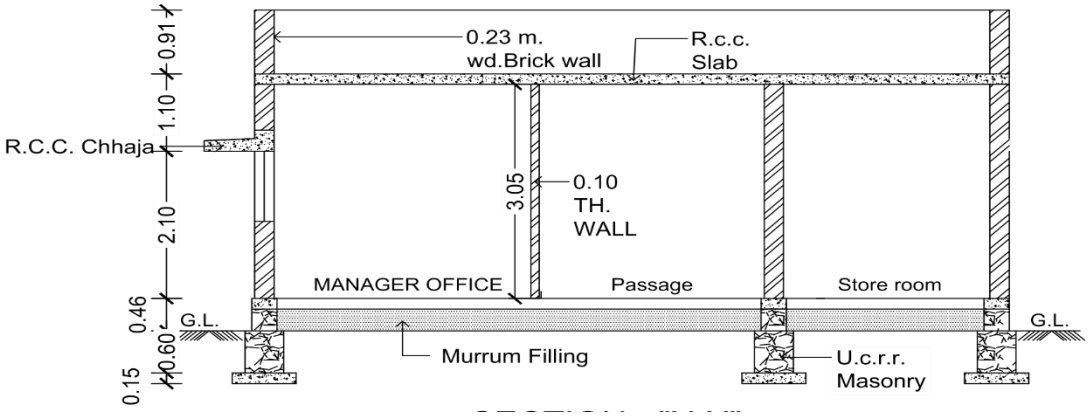


Figure 13.1.2 (c) Section of post office

Measurement Sheet of Post Office						
Sr. No	**Item Description**	**No.**	**Length (m)**	**Breath (m)**	**Height (m)**	**Quantity**
1	Earthwork in excavation for foundation	1	111.67	0.90	0.75	75.37 m³
2	Bric bat cement concrete for foundation (1:4:8)	1	111.67	0.90	0.15	15.07 m³
3	Brick masonry work in foundation	1	109.07	0.40	0.60	26.18 m³
4	R.c.c work for plinth coping	1	109.39	0.35	0.46	17.61 m³
5	Murrum filing in plinth	1	8.96	11.00	0.36	35.48 m³
6	Brick masonry work in super structure	1	93.83	0.30	3.00	84.44 m³
7	Deduction for door/window and lintel					(-) 8.08 m³
8	Brick work in compound wall	1	38.25	0.30	1.50	17.21 m³
9	R.c.c work in Slab	1	8.96	11.00	0.15	14.78 m³
10	R.c.c work in chajja	1	20.86	0.60	0.10	1.25 m³
					Total	277.31 m³

Table 13.1.2 (a) Measurement Sheet of Post Office

Abstract sheet of Post Office					
Sr. No	**Particulars of items**	**Quantity**	**Rat**	**Per**	**Amount**
1	Earth work in excavation for foundation	75.37	85.000	m^3	6406.45
2	Brick bat cement concrete work in foundation	15.07	2700.00	m^3	40689
3	Brick masonry up to in plinth	26.18	3200.00	m^3	83776
4	R.c.c work in slab, chajja, lintel and plain ciping	33.64	8800.00	m^3	296032
5	Brick masonry work in super structure	76.35	3500.00	m^3	267225
6	Soomth plaster work inside the wall and celling	338.10	160.00	m^3	54096
7	Earth filling in plinth	35.48	60.00	m^3	2128.8
8	Brick masonry work in compound wall	17.21	3400.00	m^3	58514
9	Furniture work	60	250.00	m^2	15000
10	Mosaic tile flooring work	80	180.00	m^2	14400
				Total	83826725

Table 13.1.2 (b) Abstract sheet of Post Office

13.1.3 Civil Design 3 (GYM)

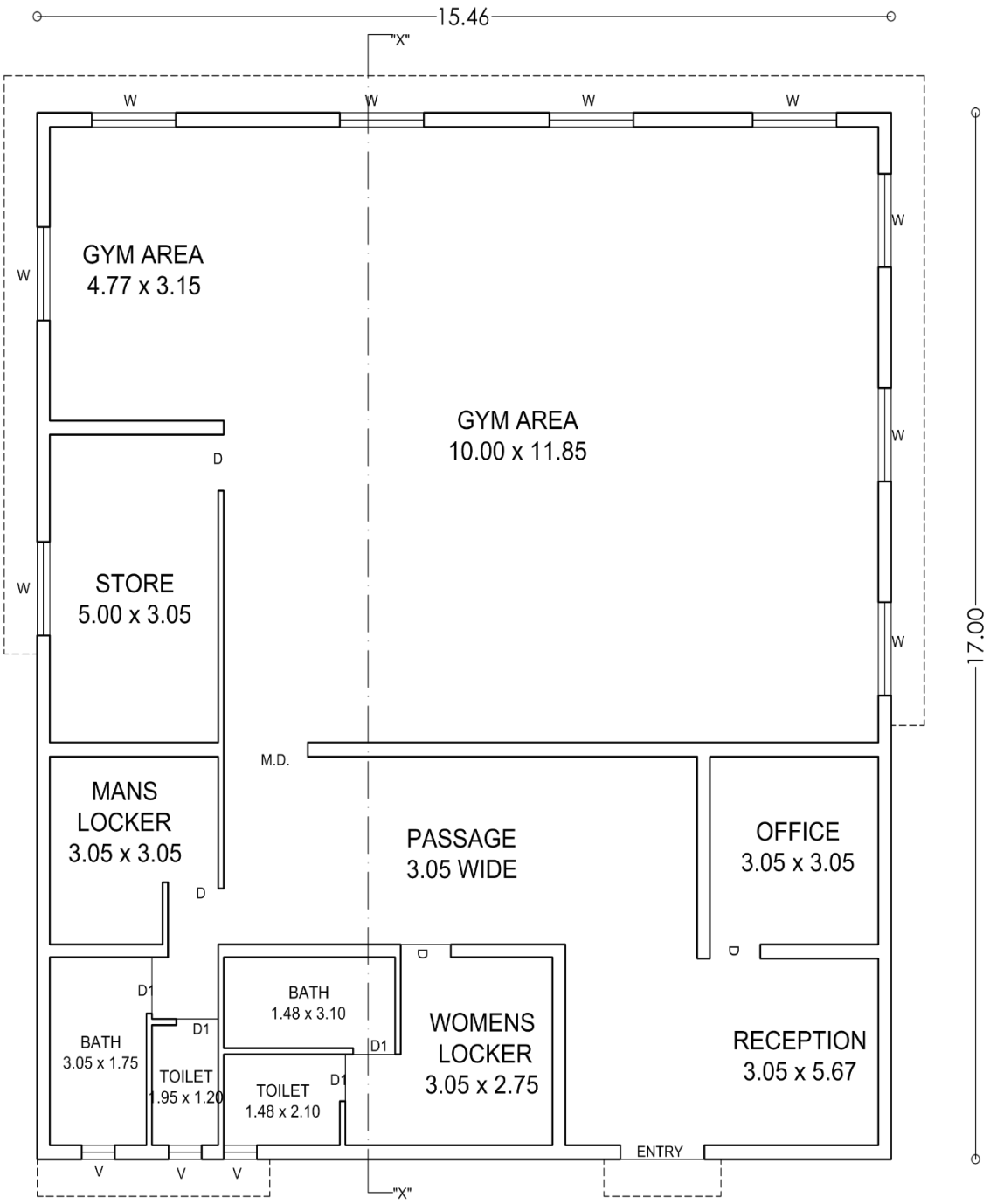


Figure 13.1.3 (a) plane of GYM

Figure 13.1.3 (b) Elevation of GYM

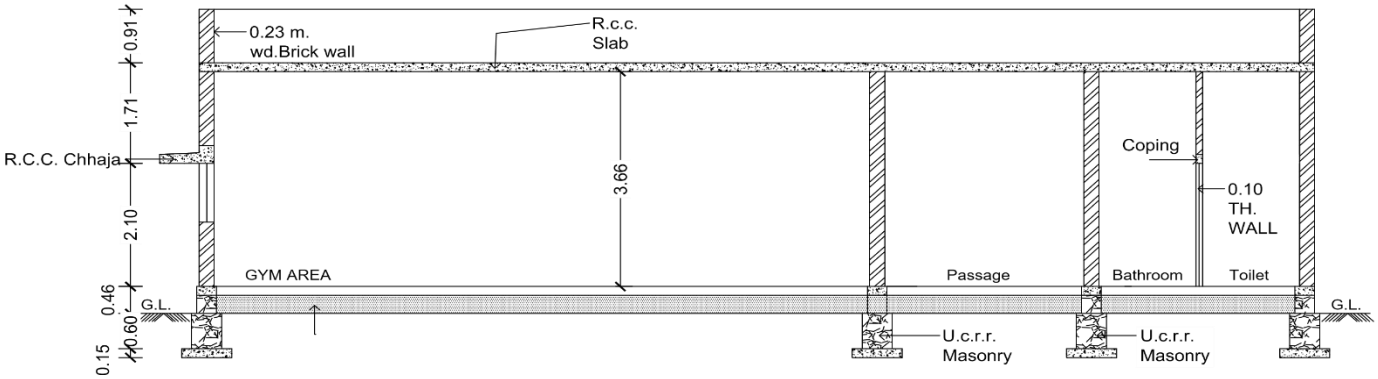


Figure 13.1.3 (c) Section of GYM

Sr. No.	ITEM DESCRIPTION	No.	L (m)	B (m)	H (m)	Quantity
1	Earthwork in excavation for foundation	1	134.79	0.90	0.75	90.983 m³
2	Brick bat cement concrete for foundation	1	134.79	0.90	0.15	18.196 m³
3	Concrete work in foundation for footing	1	134.79	0.80	0.60	64.69 m³
4	R.C.C work in plinth coping	1	134.79	0.30	0.40	16.174 m³
5	Brick masonry above plinth up to slab level in C.M 1:6	1	140.19	0.30	4.00	162.22 m³
	Deduction for door and window					
	M.D	2	1.80	0.30	2.10	2.27
	D	4	1.10	0.30	2.10	2.77
	D1	4	0.90	0.20	2.10	1.51
	W	9	1.20	0.30	1.20	3.89
	V	3	0.60	0.30	0.60	0.324
Total net quantity (162.22 – 10.764)= 151.46 m³						10.764 m³
6	R.C.C work in slab	1	17.00	15.46	0.20	52.57 m³

Table 13.1.3 (a) Measurement sheet of GYM

Abstract Sheet of GYM					
Sr. No.	**Particulars of items**	**Quantity**	**Rate**	**Per**	**Amount (Rs.)**
1	Excavation in foundation	90.983	85.00	m^3	7733.555
2	Brick bat cement concrete for foundation	18.196	2700.00	m^3	49129.2
3	Concrete work in footing & plinth coping.	80.87	8800.00	m^3	711656
4	Brick masonry above plinth up to slab level in C.M 1:6	151.46	3200.00	m^3	503872
5	Smooth plaster work inside the rooms and ceilings	762.28	160.00	m^3	121964.8
6	R.C.C work in slab, chajja and lintel	54.93	8800.00	m^3	527384
				Total	**1921739.555**

Table 13.1.3 (b) Abstract Sheet of GYM

13.1.4 Civil Design 4 (Medical Store)

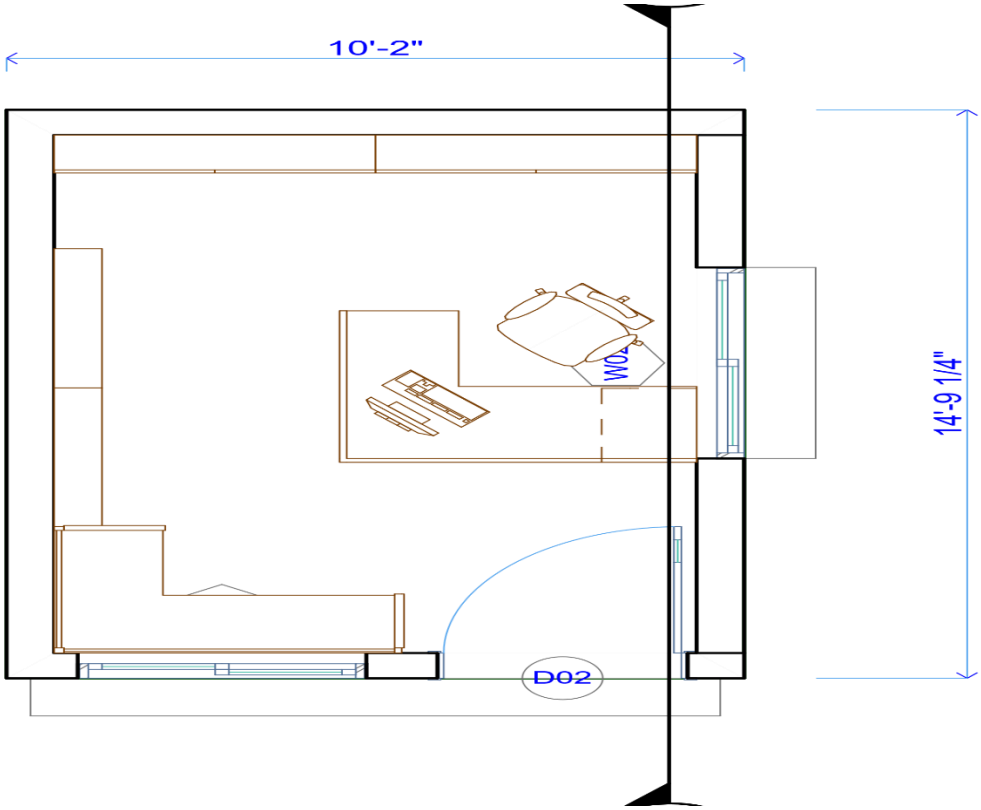


Figure 13.1.4 (a) Plan of medical store

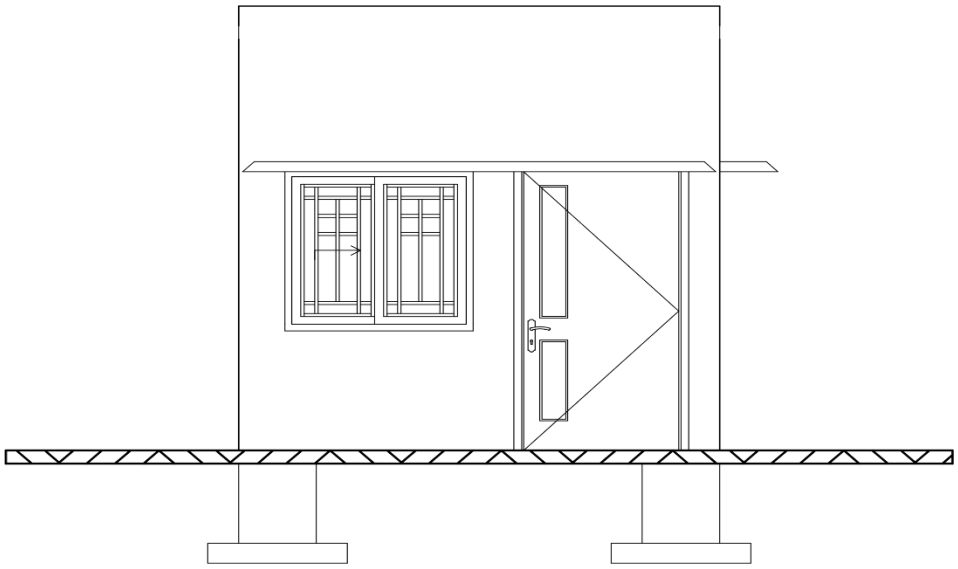


Figure 13.1.4 (b) Elevation of medical store

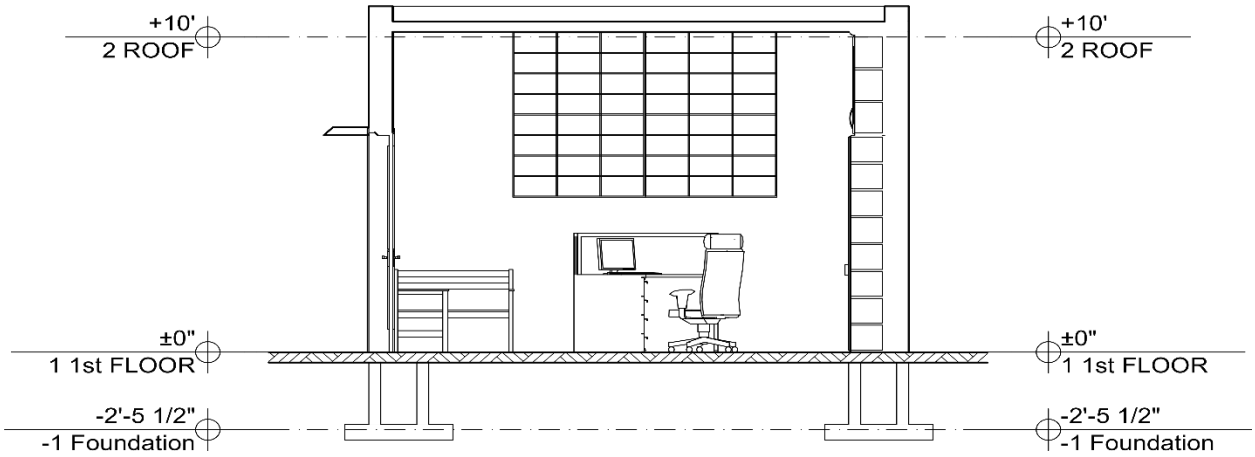


Figure 13.1.4 (c) Section of medical store

Abstract Sheet of Medical Store					
Sr. No	**Description**	**Quantity**	**Rate**	**Per**	**Amount**
1	Excavation	4.86	90.00	m^3	437.4
2	Basic wall exterior	220.48	120.00	Ft^2	26457
3	Roof work	1.80	8800.00	m^3	15840
4	Mosaic tile flooring work	9.99	180.00	m^3	1798.2
5	P.c.c work in flooring work	1.80	3000.00	m^3	5400
6	Wood work for windows and table	2.3	250.00	m^3	575
7	Glass door with aluminium frame	-	3500.00	-	3500
				Total	54007.60

Table 13.1.4 (a) Abstract Sheet of Medical Store

13.1.5 Civil Design 5 (Bank with ATM)

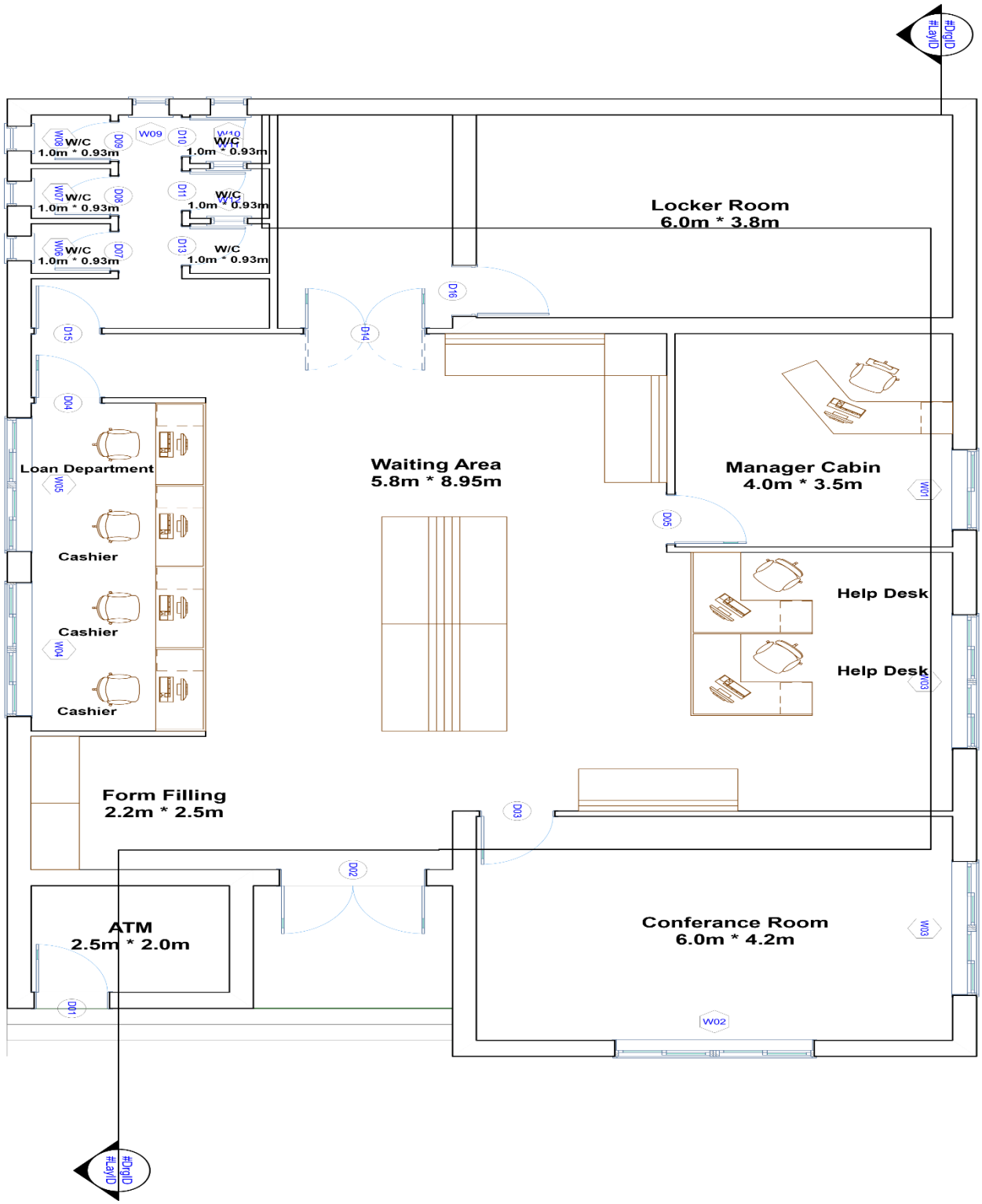


Figure 13.1.5 (a) Plan of bank with ATM

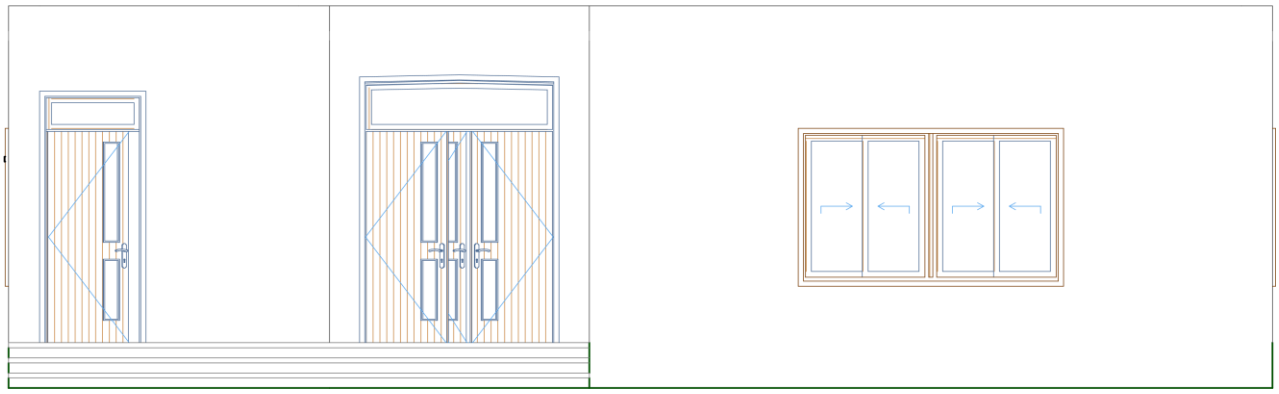


Figure 13.1.5 (b) Elevation of Bank with ATM

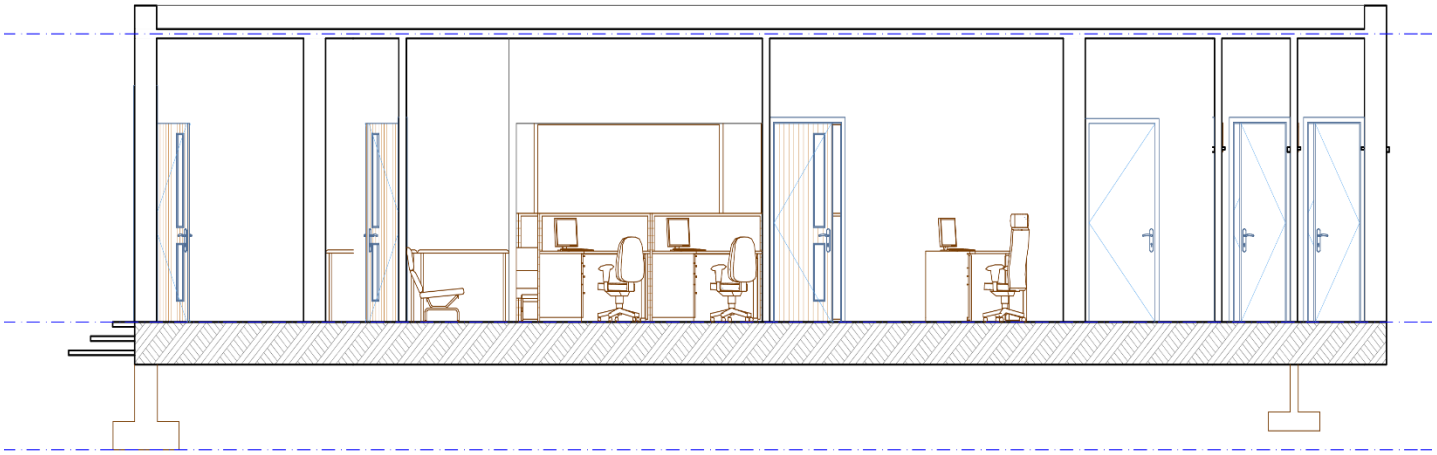


Figure 13.1.5 (C) Section of bank with ATM

ID	SIZE		MATERIAL
	WIDTH	**HEIGHT**	
W01	4'-11"	3'-11 1/4"	Wood: Mahogany Vert
W02	8'-2 1/2"	4'-11"	Wood: Mahogany Vert
W03	8'-2 1/2"	4'-11"	Wood: Mahogany Vert
W04	8'-2 1/2"	4'-11"	Wood: Mahogany Vert
W05	8'-2 1/2"	4'-11"	Wood: Mahogany Vert
W06	1'-5 3/4"	0'-11 3/4"	Metal: Aluminum
W07	1'-5 3/4"	0'-11 3/4"	Metal: Aluminum
W08	1'-5 3/4"	0'-11 3/4"	Metal: Aluminum
W09	1'-5 3/4"	0'-11 3/4"	Metal: Aluminum
W10	1'-5 3/4"	0'-11 3/4"	Metal: Aluminum
W11	1'-5 3/4"	0'-11 3/4"	Metal: Aluminum
W12	1'-5 3/4"	0'-11 3/4"	Metal: Aluminum

Sr. No.	Item Description	No.	Length (m)	Breadth (m)	Height (m)	Quantity
1	Earth work excavation in foundation					
	For 0.30	1	84.10	0.90	1.50	113.535 m^3
	For 0.20	1	35.78	0.90	1.50	48.303 m^3
2	Pcc work in foundation concrete	1	119.88	0.30	0.15	16.183 m^3
3	Brick masonry work up to plinth in c.m 1:6	1	116.28	0.30	1.20	41.860 m^3
4	Brick masonry above plinth up to slab level in c.m 1:6.	1	116.28	0.30	3.00	104.652 m^3
5	Deduction for door-windows					(-)14.237 m^3
6	Rcc work in plinth coping.	1	116.28	0.30	0.46	160.460 m^3
7	Murrum filing in plinth	1	161.72	-	0.36	58.22 m^3
8	Rcc work	1	12.2	19.3	0.15	16.046 m^3
9	Dem proof course (D.p.c)	1	116.28	0.30	0.10	3.488 m^3
10	Steel of Rcc.					
	1.5 %	-	-	-	-	1170 kg
					Total	1746.984 m^3

Table 13.1.5 (a) Measurement sheet of bank with ATM

Sr. No.	Particulars of items	Quantity	Rate	Per	Amount
1	Earth work in excavation in foundation	161.838	85.00	m^3	13756.23
2	Pcc wirk	16.183	3500.00	m^3	13757.25
3	Brick masonry work up to plinth in cm 1:6	41.860	3200.00	m^3	56630
4	Dem proof course (D.p.c)	3.488	160.00	m^3	133952
5	A1 grad brick masonry work above plinth up to slab level c.m.1:6	104.652	3500.00	m^3	558.4
6	R.c.c work	176.506	8800.00	m^3	1553288
7	Smooth plaster work inside the wall and ceiling.	479.424	180.00	m^2	86297.4
8	Murrum	58.22	90.00	m^3	5239.8
9	Mosaic tile flooring work	178..89	180.00	m^2	32200.2
10	Farnichar work	310.25	250.00	m^2	77562.5
11	Glass door with aluminium frame	6.70	3000.00	-	20100
12	Rcc steel 1.5 %	1170	75.00	kg	87750
				Total	**2433645.55**

Table 13.1.5 (b) Abstract sheet of bank with ATM

13.1.6 Bio-Gas Plant

- Bio gas plant is one of the plant for renewable energy sources. It transforms rural village in to clean village and also provide gas as energy source and gives fertilizer at end.

❖ **BASIC THINGS:**

Total numbers of animals in village = 3000

As per standard data assume per day dung of animal=10.5 Kg.

So total per day dung = 3000 * 10.5 =31500 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

= 31500 + (2*31500)

= 94500 Kg. /day

= 94500 Lit. /day

= 94.5 m3 / day

Digester volume (Vd) = Sd * RT

= 94.500 * 70

= 6615 m3

Assume cylinder shaped bio gas plant. Provide total 6 numbers of units in different areas, so digester volume becomes for one unit= 6615 ÷ 6 =1102 m3

So provide= 1100 m3

Total digester volume (Vd) = π r2 h

1100 = π r2 (h = 10 m)

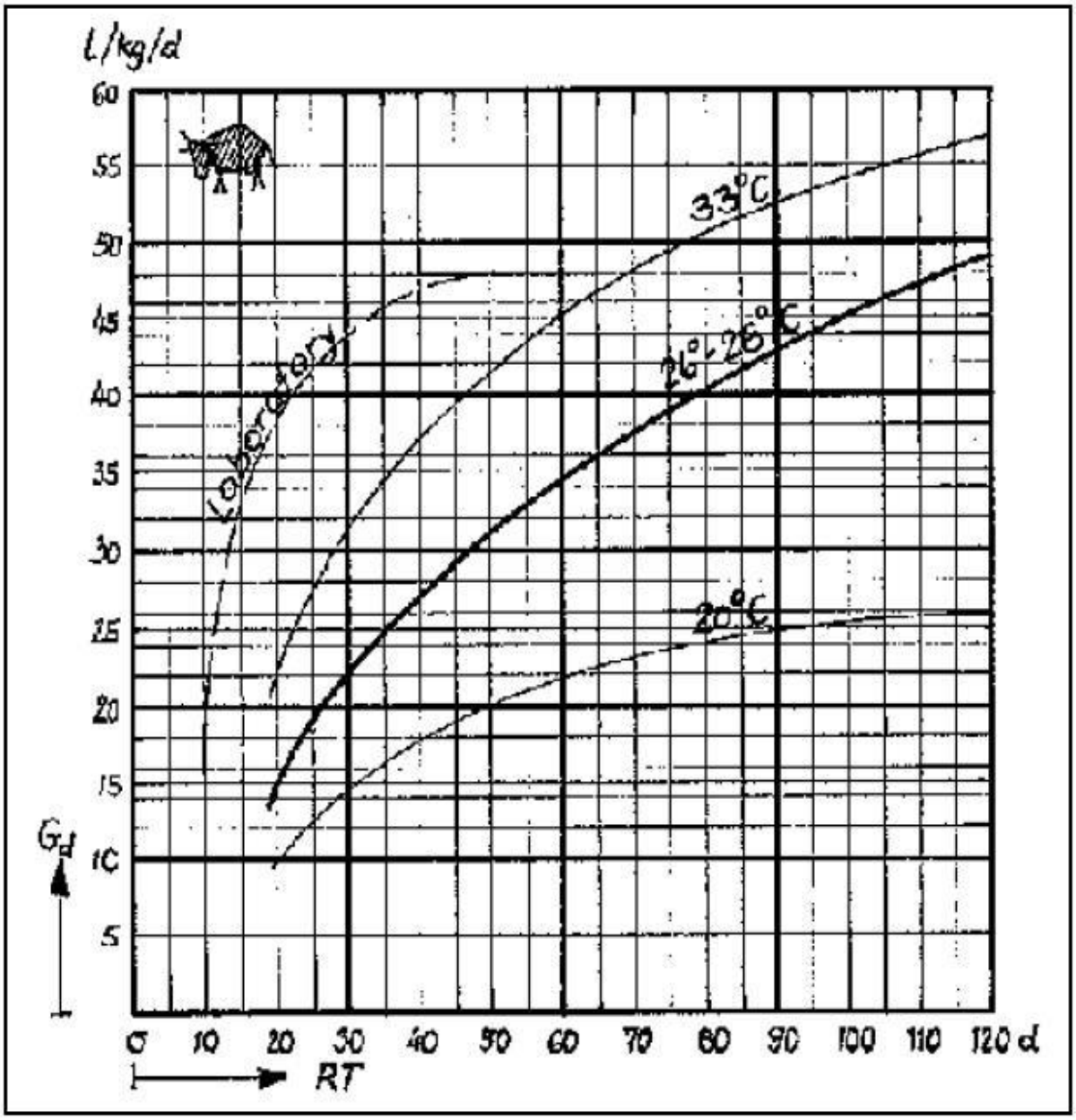
So dimensions of digester are h=10 m

R= 6 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 × 31500
=1165500 Lit.
=1165.5 m^3

Now assume gas holder capacity = 60 %

Gas holder volume = Daily gas production × Capacity of holder

= 1165.5 ×0.60
=699.3 m^3

So take Gas holder volume = 700 m^3

Now for 6 units provide volume of holder of each unit = 700 ÷ 6
= 116.66
Take it =120 m^3

Provide cylinder shaped holder; so…

Volume = $\pi r^2 h$
$120 = \pi r^2$ (h = 1 m)

So dimensions of Gas holder are H = 1 m
R = 6 m

- **DESIGN OF INLET & OUTLET:**

Total volume of slurry mix per unit = 94.50 ÷ 6 = 15.75 m3 / day

Assume two time filling operation in plant; so take total volume of slurry = 15.75 ÷ 2
= 7.87 m3 / day
Take it = 8 m3 / day

Provide rectangular tank…

So... Total volume for one time mixing of slurry = L × B × H
8 = L × B × (H=1m)

Dimension of inlet are L = 3 m
B = 3m
H = 1 m

Here 8 m3 / day required < 9 m3 / day provided.
Hence ok

Provide same size for outlet tank also.

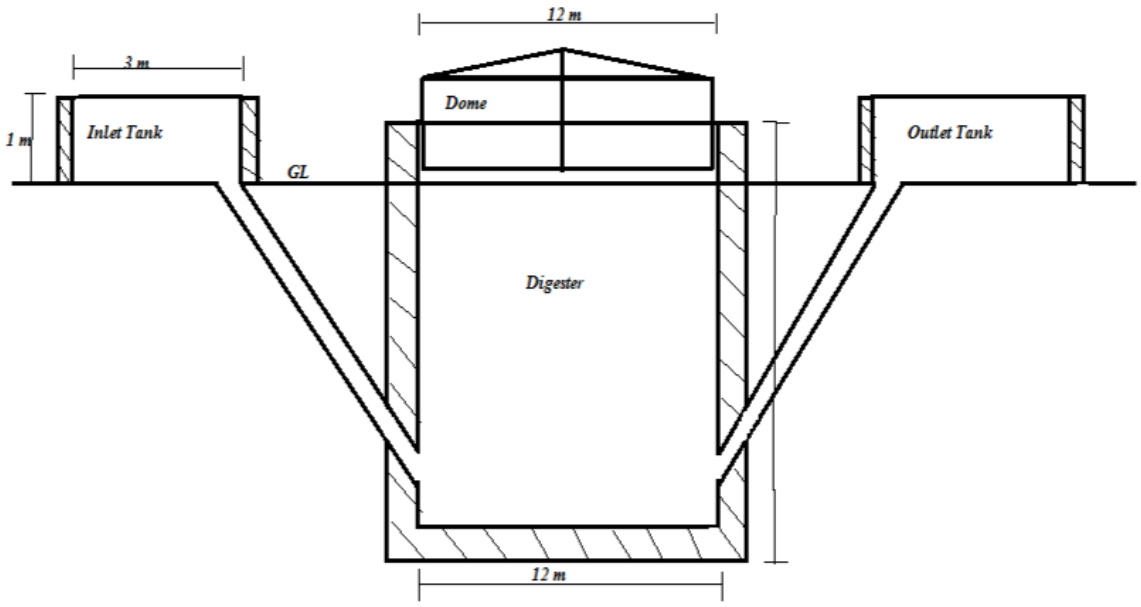


Figure 13.1.6 Bio-Gas Plant

Sr. No.	MATIRIYAL DISCRETION	QUANTITY	RATE	PER	AMOUNT
1	Cement 50 kg	30	320.00	Bag	9600
2	Waterproof cement 1kg	7	250.00	Bag	1750
3	Quarry stone dressed/Blocks	300	150.00	Pcs	45000
4	Bricks	600	28.00	Pcs	16800
5	Sand	4	1100.00	Ton	4400
6	Ballast	2	850.00	Ton	1700
7	Lime 25kg bag	3	250.00	bag	750
8	Square twisted bar-Y8/R8	9	280.00	Length	2520
9	Round bar -R6	10	750.00	Length	7500
10	Binding wire	3	288.00	Kg	864
11	Timber-2”×2”	2	625.00	m	1250
12	Timber -2”×2”	2.5	625.00	m	1562.5
13	Play wood- 3mm	2	360.00	Sheet	720
14	Nails-3”	2	150.00	Kg	300
15	Nails-2”	0.5	60.00	Kg	30
16	GI- pipe 3/4"	1	65.00	Length	65
17	Wire brush	2	40.00	Pcs	80
18	Paint brush-6”	1	343.00	Pcs	343
19	PVC pipe 4”Sanitation	100	1490.00	Length	14900
20	PVC elbow 4”-45° sanitation	1	343.00	Pcs	450
21	Total				109634.5.

13.2 Reason for Students Recommending this Design

- Public Toilet: In the village there is no facility of this and there is need of the public toilet.
- Post office: In the village post office physical condition are so bad then we proposed Post office design.
- GYM: In the village there is no facility available for workout so we proposed the GYM design.
- Medical store: In the village there is no facility for medicine so we proposed the design of medical store.
- Bank with ATM: In the village no bank and ATM service available so we proposed the design of Bank and ATM.

13.3 About design Suggestions/Benefit of the Villagers:

- In the village we provide the design of public toilet for batter hygiene and decrease in health issues.
- In village post office is in bade condition so new design is helpful for the village people.
- GYM is very beneficial for villagers to fit and batter health in the future.
- Due to medical store the easy of get medicine will help to the villagers.
- Due to bank and ATM it helps for easy payment and development in the economy for the village.

Chapter 14.
Technical Options with Case Studies

14.1 Civil Engineering

14.1.1 Advanced Earthquake Resistant

- Advanced Earthquake Resistant Techniques 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.

❖ **Base Isolation:**

- It is easiest to see this principle at work by referring directly to the most widely used of these advanced techniques, which is known as base isolation. A base isolated structure is supported by a series of bearing pads which are placed between the building and the building's foundation.
- (See Figure 1) A variety of different types of base isolation bearing pads have now been developed. For our example, we'll discuss lead–rubber bearings. These are among the frequently–used types of base isolation bearings. (See Figure 2) A lead–rubber bearing is made from layers of rubber sandwiched together with layers of steel.

- In the middle of the bearing is a solid lead 'plug.' On top and bottom, the bearing is fitted with steel plates which are used to attach the bearing to the building and foundation. The bearing is very stiff and strong in the vertical direction, but flexible in the horizontal direction.

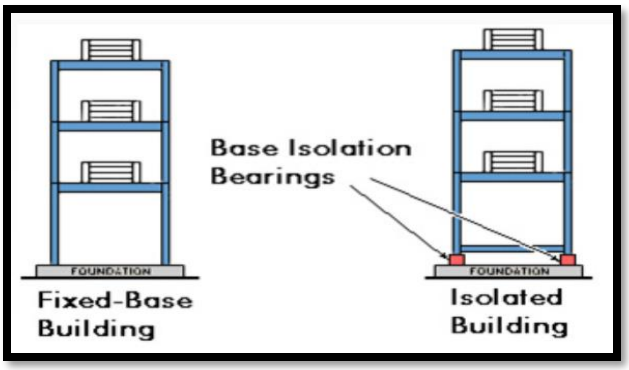


Figure 1

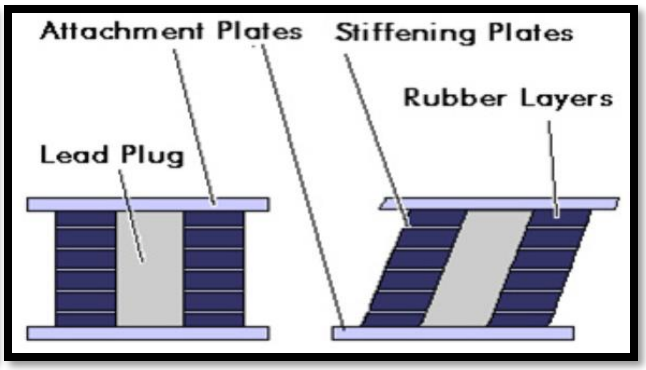


Figure 2

❖ **Earthquake Generated Forces:**

- To get a basic idea of how base isolation works, first examine Figure 3. This shows an earthquake acting on both a base isolated building and a conventional, fixed–base, building. As a result of an earthquake, the ground beneath each building begins to move. In Figure 3, it is shown moving to the left.
- Each building responds with movement which tends toward the right. We say that the building undergoes displacement towards the right. The building's displacement in the direction opposite the ground motion is actually due to inertia. The inertial forces acting on a building are the most important of all those generated during an earthquake.

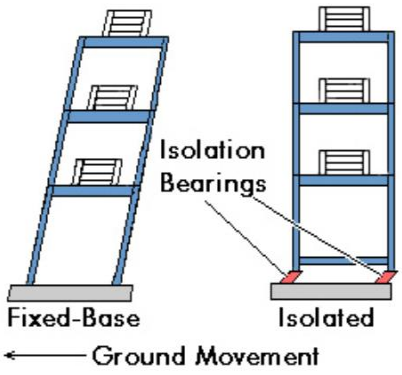


Figure 3

❖ **Energy Dissipation Devices:**

- The second of the major new techniques for improving the earthquake resistance of buildings also relies upon damping and energy dissipation, but it greatly extends the damping and energy dissipation provided by lead–rubber bearings.
- The building will dissipate energy either by undergoing large scale movement or sustaining increased internal strains in elements such as the building's columns and beams. Both of these eventually result in varying degrees of damage. So, by equipping a building with additional devices which have high damping capacity, we can greatly decrease the seismic energy entering the building, and thus decrease building damage.

- Accordingly, a wide range of energy dissipation devices have been developed and are now being installed in real buildings. Energy dissipation devices are also often called damping devices. The large number of damping devices that have been developed can be grouped into three broad categories:

- Friction Dampers– these utilize frictional forces to dissipate energy
- Metallic Dampers– utilize the deformation of metal elements within the damper
- Viscoelastic Dampers– utilize the controlled shearing of solids
- Viscous Dampers– utilized the forced movement (orificing) of fluids within the damper

❖ **Damping Devices and Bracing Systems:**

- Damping devices are usually installed as part of bracing systems. Figure 4 shows one type of damper–brace arrangement, with one end attached to a column and one end attached to a floor beam. Primarily, this arrangement provides the column with additional support.

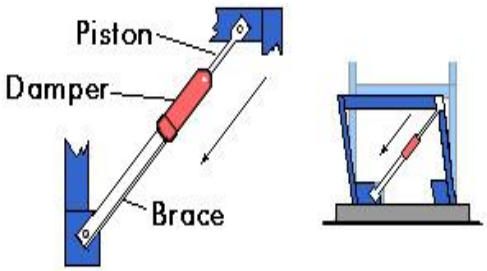


Figure 4

- Most earthquake ground motion is in a horizontal direction; so, it is a building's columns which normally undergo the most displacement relative to the motion of the ground. Figure 4 also shows the damping device installed as part of the bracing system and gives some idea of its action.

14.1.2 Seismic Retrofitting of Buildings

- Seismic retrofitting is the modification of existing structures to make them more resistant to seismic activity, ground motion, or soil failure due to earthquakes. With better understanding of seismic demand on structures and with our recent experiences with large earthquakes near urban centers, the need of seismic retrofitting is well acknowledged.
- The retrofit techniques outlined here are also applicable for other natural hazards such as tropical cyclones, tornadoes, and severe winds from thunderstorms. Whilst current practice of seismic retrofitting is predominantly concerned with structural improvements to reduce the seismic hazard of using the structures, it is similarly essential to reduce the hazards and losses from non-structural elements.
- It is also important to keep in mind that there is no such thing as an earthquake-proof structure, although seismic performance can be greatly enhanced through proper initial design or subsequent modifications.

❖ **Strategies**

- Seismic retrofit (or rehabilitation) strategies have been developed in the past few decades following the introduction of new seismic provisions and the availability of advanced materials.
- Increasing the global capacity (strengthening). This is typically done by the addition of cross braces or new structural walls.
- Reduction of the seismic demand by means of supplementary damping and/or use of base isolation systems.
- Increasing the local capacity of structural elements. This strategy recognises the inherent capacity within the existing structures, and therefore adopts a more cost-effective approach to selectively upgrade local capacity (deformation/ductility, strength or stiffness) of individual structural components.
- Selective weakening retrofit. This is a counter-intuitive strategy to change the inelastic mechanism of the structure, while recognising the inherent capacity of the structure.
- Allowing sliding connections such as passageway bridges to accommodate additional movement between seismically independent structures.
- Addition of seismic friction dampers to simultaneously add damping and a selectable amount of additional stiffness.

❖ **Objectives**

- Public safety only. The goal is to protect human life, ensuring that the structure will not collapse upon its occupants or passersby, and that the structure can be safely exited. Under severe seismic conditions the structure may be a total economic write-off, requiring tear-down and replacement.
- Structure survivability. The goal is that the structure, while remaining safe for exit, may require extensive repair (but not replacement) before it is generally useful or considered safe for occupation. This is typically the lowest level of retrofit applied to bridges.
- Structure functionality. Primary structure undamaged and the structure is undiminished in utility for its primary application. A high level of retrofit, this ensures that any required repairs are only "cosmetic" – for example, minor cracks in plaster, drywall and stucco. This is the minimum acceptable level of retrofit for hospitals.
- Structure unaffected. This level of retrofit is preferred for historic structures of high cultural significance.

❖ **Techniques**

- Common seismic retrofitting techniques fall into several categories:

❖ **External post-tensioning**

- The use of external post-tensioning for new structural systems have been developed in the past decade. An extension of the same idea for seismic retrofitting has been experimentally tested for seismic retrofit of California bridges under a Caltrans research project and for

seismic retrofit of non-ductile reinforced concrete frames. Pre-stressing can increase the capacity of structural elements such as beam, column and beam-column joints.

❖ **Base Isolation**

- Base isolation is a collection of structural elements of a building that should substantially decouple the building's structure from the shaking ground thus protecting the building's integrity and enhancing its seismic performance.
- This earthquake engineering technology, which is a kind of seismic vibration control, can be applied both to a newly designed building and to seismic upgrading of existing structures.
- Normally, excavations are made around the building and the building is separated from the foundations. Steel or reinforced concrete beams replace the connections to the foundations, while under these, the isolating pads, or base isolators, replace the material removed. While the base isolation tends to restrict transmission of the ground motion to the building, it also keeps the building positioned properly over the foundation.

❖ **Supplementary dampers**

- Supplementary dampers absorb the energy of motion and convert it to heat, thus damping resonant effects in structures that are rigidly attached to the ground. In addition to adding energy dissipation capacity to the structure, supplementary damping can reduce the displacement and acceleration demand within the structures.
- In some cases, the threat of damage does not come from the initial shock itself, but rather from the periodic resonant motion of the structure that repeated ground motion induces. In the practical sense, supplementary dampers act similarly to Shock absorbers used in automotive suspensions.

14.1.3 Advance Practices in Construction field in Modern Material, Techniques and Equipment's

- Building construction methods have experienced significant facelift in recent times with innovative technologies being harnessed optimally for improving the qualitative index of buildings.
- This has spelled considerable advantages for end users like us who can remain immune from recurrent expenses on repairs and other incidental building-related jobs. Construction lead time has also been reduced and building costs have been rationalized.

❖ **3D Volumetric Construction**

- Using this modular construction technology, 3D units are produced in controlled factory settings using needful construction and building materials.

- Finished units are transported to site in various modules, basic structural blocks or final touched up units with all amenities installed, for assembly. Blocks can be erected rapidly at site and properties of concrete like fire retardant, sound resistivity, thermal mass etc. are retained.

Fig. 14.1.3 (a) 3D Volumetric Construction

Fig. 14.1.3 (b) Precast Flat Panel Modules

❖ **Precast Flat Panel Modules**

- These are primarily wall and floor modules which are manufactured away from the actual site and then transported to site for erection. Load bearing components like decorative cladding and insulation panels can also be produced.
- Also called cross-wall construction, the technology has gained momentum due to seamless adherence to specifications and ease as well as swiftness of construction.

❖ **Pre-cast Foundation Technique**

- Foundations can be built swiftly with precast concrete units which are produced in a factory and are high on quality quotient. Strength is imparted to foundation related building construction materials through interconnected concrete piles.
- This technique allows construction work to progress even in inclement weather and minimizes excavation activity.

❖ **Insulating Concrete Formwork (ICF) Technique**

- ICF technique employs polystyrene blocks that feature twin walls and can be rapidly put together for creating building wall formwork. The formwork is then pumped in with high quality, ready mixed, factory-made concrete.
- The building construction process becomes fool-proof and the resultant structure has a high level of sound and thermal insulation

.

❖ **Thin Joint Masonry Technique**

- Utilization of this technique leads to the reduction of the quantum of mortar applied by slashing it depth from 10mm to lesser than 3mm. Consequently, mortar can be laid swiftly with enhanced productivity on the longer wall panels.

Fig. 14.1.3 (c) Pre-cast Foundation Technique

Fig. 14.1.3 (d) Insulating Concrete Formwork (ICF) Technique

Fig. 14.1.3 (e) Thin Joint Masonry Technique

❖ **Equipment**

- Construction equipment refers to heavy-duty vehicles, specially designed for executing construction tasks, most frequently ones involving earthwork operations. kindly check below the construction equipment types and construction equipment list. Construction equipment for building construction and construction machinery used in construction projects.
- They are also known as heavy machines, heavy trucks, construction equipment, engineering equipment, heavy vehicles, or heavy hydraulics.
- Proper use of appropriate equipment contributes to the Economy, Quality, Safety, Speed, and Timely completion of the Project. Construction equipment is an important part of any construction process. It is not always desirable or possible for the Contractor to own each and every type of Construction Equipment required for the Project.
- The basic operations involved in the construction of any Project are Excavation, Digging of large quantities of earth, Moving them to fairly long distances, Placement, Compacting, Leveling, Dozing, Grading, Hauling, etc. You can find below the construction equipment used in India and abroad.

14.1.4 Engineering Aspects Of Soil mechanics - Environmental Impact Assessment

- Environmental assessment (EA) is the assessment of the environmental consequences of a plan, policy, program, or actual projects prior to the decision to move forward with the proposed action.
- In this context, the term "environmental impact assessment" (EIA) is usually used when applied to actual projects by individuals or companies and the term "strategic environmental assessment" (SEA) applies to policies, plans and programmes most often proposed by organs of state.
- It is a tool of environmental management forming a part of project approval and decision-making. Environmental assessments may be governed by rules of administrative

procedure regarding public participation and documentation of decision making, and may be subject to judicial review.

- The purpose of the assessment is to ensure that decision makers consider the environmental impacts when deciding whether or not to proceed with a project.
- Soil mechanics is a discipline of civil engineering that predicts the soil performance characteristics utilizing the engineering techniques of dynamics, fluid mechanics, and other technologies.
- Soil mechanics includes the study of soil composition, strength, consolidation, and the use of hydraulic principles to deal with issues concerning sediments and other deposits.
- Soil mechanics is one of the major sciences for resolving problems related to geology and geophysical engineering. Soil mechanics studies are very important for civil engineers because based on the findings of soil mechanics studies, engineering structures are constructed.
- The type of construction, type of equipment to be used, type of foundation, support material, and many other aspects of construction works are largely affected by the soil mechanics studies.
- Basically we study about soil formation modes, physical and chemical properties of soil, dynamic loading of soils, permeability, consolidation, etc. In the subsequent sections of this article, we will discuss in detail about major aspects of soil mechanics studies.

❖ **Objectives of Environmental Impact Assessment (EIA)**

- To ensure that Environmental considerations are addressed properly and incorporated into decision making process.
- To avoid, minimize or balance the adverse significant bio-physical, social and other relevant effects of developmental projects.
- To protect the productivity and capacity of natural system and ecological processes with maintain their function.
- To promote development that is sustainable and optimize resources use and management opportunities.

❖ **Characteristics of Environmental Impact Assessment**

- Apply to all activities that have significant environmental impact and address all the impacts that are expected to be significant.
- Compare alternatives to a proposed project (including the possibility of not developing the site), management, techniques and mitigation measures.
- Clear EIS mentioning importance of impacts and their specific characteristics to experts as well as to non expert in the field.
- Public participation and stringent administrative review procedure
- Be on time so as to provide information for decision making and be enforceable.
- Including monitoring and feed back procedures.

14.1.5 Water Supply-Sewerage system -Waste Water- Sustainable development techniques

❖ Water supply

➢ A water supply network or water supply system is a system of engineered hydrologic and hydraulic components that provide water supply. A water supply system typically includes the following:

1. A drainage basin (see water purification – sources of drinking water)
2. A raw water collection point (above or below ground) where the water accumulates, such as a lake, a river, or groundwater from an underground aquifer. Raw water may be transferred using uncovered ground-level aqueducts, covered tunnels, or underground water pipes to water purification facilities.

Figure 14.1.5 (a) Water Supply

3. Water purification facilities. Treated water is transferred using water pipes (usually underground).
4. Water storage facilities such as reservoirs, water tanks, or water towers. Smaller water systems may store the water in cisterns or pressure vessels. Tall buildings may also need to store water locally in pressure vessels in order for the water to reach the upper floors.
5. Additional water pressurizing components such as pumping stations may need to be situated at the outlet of underground or aboveground reservoirs or cisterns (if gravity flow is impractical).
6. A pipe network for distribution of water to consumers (which may be private houses or industrial, commercial, or institution establishments) and other usage points (such as fire hydrants)
7. Connections to the sewers (underground pipes, or aboveground ditches in some developing countries) are generally found downstream of the water consumers, but the sewer system is considered to be a separate system, rather than part of the water supply system.

❖ Sewerage system

➢ Sewerage (or sewage system) is the infrastructure that conveys sewage or surface runoff (stormwater, meltwater, rainwater) using sewers. It encompasses components such as receiving drains, manholes, pumping stations, storm overflows, and screening chambers of the combined sewer or sanitary sewer. Sewerage ends at the entry to a sewage treatment plant or at the point of discharge into the environment. It is the system of pipes, chambers, manholes, etc. that conveys the sewage or storm water.

Figure 14.1.5 (b) Sewerage system

- In many cities, sewage (or municipal wastewater) is carried together with stormwater, in a combined sewer system, to a sewage treatment plant. In some urban areas, sewage is carried separately in sanitary sewers and runoff from streets is carried in storm drains.
- Access to these systems, for maintenance purposes, is typically through a manhole. During high precipitation periods a sewer system may experience a combined sewer overflow event or a sanitary sewer overflow event, which forces untreated sewage to flow directly to receiving waters. This can pose a serious threat to public health and the surrounding environment.
- The main part of such a system is made up of large pipes (i.e. the sewers, or "sanitary sewers") that convey the sewage from the point of production to the point of treatment or discharge.
- Types of sanitary sewer systems that all usually are gravity sewers include:

- Combined sewer
- Simplified sewerage
- Storm drain

- Sanitary sewers not relying solely on gravity include:

- Vacuum sewer
- Effluent sewer

❖ **Waste Water**

- Wastewater comes from ordinary living processes: bathing, toilet flushing, laundry, dishwashing, etc. It comes from residential and domestic sources.
- Commercial wastewater comes from non-domestic sources, such as beauty salon, taxidermy, furniture refinishing, musical instrument cleaning, or auto body repair shops. This wastewater may contain hazardous materials and requires special treatment or disposal.
- There are two main types of residential wastewater treatment:
  1. A lagoon system places wastewater in a shallow open pool. Treated effluent from the lagoon is introduced into the environment through slow evaporation
  2. A septic system places wastewater in an underground tank. Treated effluent from the tank is introduced into the environment through a drainfield.
- Wastewater is broken into two categories, depending upon the source.
  1. Gray water: Gray water is from showers, baths, whirlpool tubs, washing machines, dishwashers and sinks other than the kitchen sink.
  2. Black water: Black water is from toilets and kitchen sinks.

❖ **Sustainable development techniques**

- Sustainable development can be defined as an approach to the economic development of a country without compromising with the quality of the environment for future generations. In the name of economic development, the price of environmental damage is paid in the form of land degradation, soil erosion, air and water pollution, deforestation, etc. This damage may surpass the advantages of having more quality output of goods and services.
- Sustainable Development Goals

- To promote the kind of development that minimises environmental problems.
- To meet the needs of the existing generation without compromising with the quality of the environment for future generations.

- Achieving Sustainable Development

- It can be achieved by restricting human activities.
- Technological development should be input effective and not input utilising.
- The rate of consumption should not surpass the rate of salvation.
- For renewable resources, the rate of consumption should not surpass the rate of production of renewable substitutes.
- All types of pollution should be minimised.
- It can be achieved by sensible use of natural resources.

14.1.6 Technical Case study on Golden Gate Bridge

- The Golden Gate Bridge is a suspension bridge spanning the Golden Gate, the one-mile-wide (1.6 km) strait connecting San Francisco Bay and the Pacific Ocean. The structure links the U.S.
- city of San Francisco, California—the northern tip of the San Francisco Peninsula—to Marin County, carrying both U.S. Route 101 and California State Route 1 across the strait. It also carries pedestrian and bicycle traffic, and is designated as part of U.S. Bicycle Route 95. Being declared one of the Wonders of the Modern World by the American Society of Civil Engineers, the bridge is one of the most internationally recognized symbols of San Francisco and California. It was initially designed by engineer Joseph Strauss in 1917.

Characteristics	
Design	Suspension, art deco, truss arch & truss causeways
Material	Steel
Total Length	8,980 ft (2,737.1 m), about 1.7 mi (2.7 km)
Width	90 ft (27.4 m)
Height	746 ft (227.4 m)
Longest Span	4,200 ft (1,280.2 m), about 0.79 miles (1.28)

Clearance above	14 ft (4.3 m) at toll gates, trucks cannot pass
Clearance below	220 ft (67.1m) at hightide

History	
Architect	Irving morrow
Engineering design by	Joseph strauss, Charles ellis, Leon Solomon moisseiff
Construction start	January 5, 1933
Construction end	April 19, 1937
Opened	May 27, 1937

Statistics	
Daily traffic	110,000
Toll	Cars (southbound only) July 1, 2021 –June 30, 2022 $8.60 (Pay by plate) $8.05 (FasTrak) $6.05 (carpools during peak hours, FasTrak only)

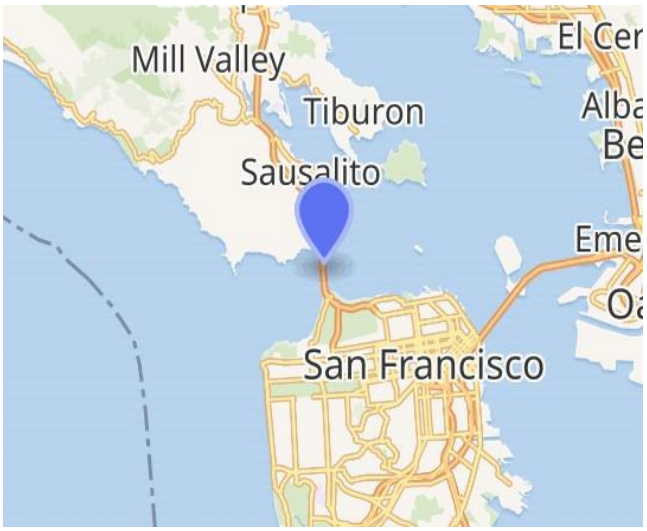


Figure 14.1.6 (a) Golden gate bridge

The Frommer's travel guide describes the Golden Gate Bridge as "possibly the most beautiful, certainly the most photographed, bridge in the world." At the time of its opening in 1937, it was both the longest and the tallest suspension bridge in the world, with a main span of 4,200 feet (1,280 m) and a total height of 746 feet (227 m).

❖ **History**

Ferry service

- Before the bridge was built, the only practical short route between San Francisco and what is now Marin County was by boat across a section of San Francisco Bay. A ferry service began as early as 1820, with a regularly scheduled service beginning in the 1840s for the purpose of transporting water to San Francisco.
- The Sausalito Land and Ferry Company service, launched in 1867, eventually became the Golden Gate Ferry Company, a Southern Pacific Railroad subsidiary, the largest ferry operation in the world by the late 1920s.
- Once for railroad passengers and customers only, Southern Pacific's automobile ferries became very profitable and important to the regional economy.
- The ferry crossing between the Hyde Street Pier in San Francisco and Sausalito Ferry Terminal in Marin County took approximately 20 minutes and cost $1.00 per vehicle, a price later reduced to compete with the new bridge.The trip from the San Francisco Ferry Building took 27 minutes.
- Many wanted to build a bridge to connect San Francisco to Marin County. San Francisco was the largest American city still served primarily by ferry boats. Because it did not have a permanent link with communities around the bay, the city's growth rate was below the national average.
- Many experts said that a bridge could not be built across the 6,700-foot (2,000-metre) strait, which had strong, swirling tides and currents, with water 372 ft (113 m) deep at the center of the channel, and frequent strong winds. Experts said that ferocious winds and blinding fogs would prevent construction and operation.

❖ **Conception**

- Although the idea of a bridge spanning the Golden Gate was not new, the proposal that eventually took hold was made in a 1916 San Francisco Bulletin article by former engineering student James Wilkins.
- San Francisco's City Engineer estimated the cost at $100 million (equivalent to $2.4 billion today), and impractical for the time. He asked bridge engineers whether it could be built for less.
- One who responded, Joseph Strauss, was an ambitious engineer and poet who had, for his graduate thesis, designed a 55-mile-long (89 km) railroad bridge across the Bering Strait.

At the time, Strauss had completed some 400 drawbridges— most of which were inland— and nothing on the scale of the new project.

- Strauss's initial drawings[17] were for a massive cantilever on each side of the strait, connected by a central suspension segment, which Strauss promised could be built for $17 million (equivalent to $404 million today).
- Local authorities agreed to proceed only on the assurance that Strauss would alter the design and accept input from several consulting project experts. A suspension-bridge design was considered the most practical, because of recent advances in metallurgy.
- Strauss spent more than a decade drumming up support in Northern California. The bridge faced opposition, including litigation, from many sources. The Department of War was concerned that the bridge would interfere with ship traffic. The US Navy feared that a ship collision or sabotage to the bridge could block the entrance to one of its main harbors. Unions demanded guarantees that local workers would be favored for construction jobs. Southern Pacific Railroad, one of the most powerful business interests in California, opposed the bridge as competition to its ferry fleet and filed a lawsuit against the project, leading to a mass boycott of the ferry service.
- In May 1924, Colonel Herbert Deakyne held the second hearing on the Bridge on behalf of the Secretary of War in a request to use federal land for construction. Deakyne, on behalf of the Secretary of War, approved the transfer of land needed for the bridge structure and leading roads to the "Bridging the Golden Gate Association" and both San Francisco County and Marin County, pending further bridge plans by Strauss. Another ally was the fledgling automobile industry, which supported the development of roads and bridges to increase demand for automobiles.
- The bridge's name was first used when the project was initially discussed in 1917 by M.M. O'Shaughnessy, city engineer of San Francisco, and Strauss. The name became official with the passage of the Golden Gate Bridge and Highway District Act by the state legislature in 1923, creating a special district to design, build and finance the bridge. San Francisco and most of the counties along the North Coast of California joined the Golden Gate Bridge District, with the exception being Humboldt County, whose residents opposed the bridge's construction and the traffic it would generate.

❖ **Design**

- Strauss was the chief engineer in charge of the overall design and construction of the bridge project. However, because he had little understanding or experience with cable-suspension designs, responsibility for much of the engineering and architecture fell on other experts. Strauss's initial design proposal (two double cantilever spans linked by a central suspension

segment) was unacceptable from a visual standpoint. The final graceful suspension design was conceived and championed by Leon Moisseiff, the engineer of the Manhattan Bridge in New York City.

- Irving Morrow, a relatively unknown residential architect, designed the overall shape of the bridge towers, the lighting scheme, and Art Deco elements, such as the tower decorations, streetlights, railing, and walkways. The famous International Orange color was Morrow's personal selection, winning out over other possibilities, including the US Navy's suggestion that it be painted with black and yellow stripes to ensure visibility by passing ships.
- Senior engineer Charles Alton Ellis, collaborating remotely with Moisseiff, was the principal engineer of the project. Moisseiff produced the basic structural design, introducing his "deflection theory" by which a thin, flexible roadway would flex in the wind, greatly reducing stress by transmitting forces via suspension cables to the bridge towers. Although the Golden Gate Bridge design has proved sound, a later Moisseiff design, the original Tacoma Narrows Bridge, collapsed in a strong windstorm soon after it was completed, because of an unexpected aeroelastic flutter. Ellis was also tasked with designing a "bridge within a bridge" in the southern abutment, to avoid the need to demolish Fort Point, a pre–Civil War masonry fortification viewed, even then, as worthy of historic preservation. He penned a graceful steel arch spanning the fort and carrying the roadway to the bridge's southern anchorage.

- Ellis was a Greek scholar and mathematician who at one time was a University of Illinois professor of engineering despite having no engineering degree. He eventually earned a degree in civil engineering from the University of Illinois prior to designing the Golden Gate Bridge and spent the last twelve years of his career as a professor at Purdue University. He became an expert in structural design, writing the standard textbook of the time. Ellis did much of the technical and theoretical work that built the bridge, but he received none of the credit in hislifetime. In November 1931, Strauss fired Ellis and replaced him with a former subordinate, Clifford Paine, ostensibly for wasting too much money sending telegrams back and forth to Moisseiff. Ellis, obsessed with the project and unable to find work elsewhere during the Depression, continued working 70 hours per week on an unpaid basis, eventually turning in ten volumes of hand calculations.

❖ **Finanace**

- The Golden Gate Bridge and Highway District, authorized by an act of the California Legislature, was incorporated in 1928 as the official entity to design, construct, and finance the Golden Gate Bridge. However, after the Wall Street Crash of 1929, the District was unable to raise the construction funds, so it lobbied for a $30 million bond measure (equivalent to $452 million today). The bonds were approved in November 1930, by votes in the counties affected by the bridge. The construction budget at the time of approval was $27 million ($418 million today). However, the District was unable to sell the bonds until 1932, when Amadeo Giannini, the founder of San Francisco–based Bank of America, agreed on behalf of his bank to buy the entire issue in order to help the local economy.

❖ **Construction**

- Construction began on January 5, 1933. The project cost more than $35 million ($523 million in 2019 dollars), and was completed ahead of schedule and $1.3 million under budget (equivalent to $24.5 million today). The Golden Gate Bridge construction project was carried out by the McClintic-Marshall Construction Co., a subsidiary of Bethlehem Steel Corporation founded by Howard H. McClintic and Charles D. Marshall, both of Lehigh University.
- Strauss remained head of the project, overseeing day-to-day construction and making some groundbreaking contributions. A graduate of the University of Cincinnati, he placed a brick from his alma mater's demolished McMicken Hall in the south anchorage before the concrete was poured. He innovated the use of movable safety netting beneath the construction site, which saved the lives of many otherwise-unprotected ironworkers. Of eleven men killed from falls during construction, ten were killed on February 17, 1937, when the bridge was near completion and the net failed under the stress of a scaffold that had fallen. The workers' platform that was attached to a rolling hanger on a track collapsed when the bolts that were connected to the track were too small and the weight was too great to bear. The platform fell into the safety net, but was too heavy and the net gave way. Two of the twelve workers survived the 200-foot (61 m) fall into the icy waters, including the 37-year-old foreman, Slim Lambert. Nineteen others who were saved by the net over the course of construction became members of the Half Way to Hell Club.

❖ **Torsional bracing retrofit**

- On December 1, 1951, a windstorm revealed swaying and rolling instabilities of the bridge, resulting in its closure.[40] In 1953 and 1954, the bridge was retrofitted with lateral and diagonal bracing that connected the lower chords of the two side trusses. This bracing stiffened the bridge deck in torsion so that it would better resist the types of twisting that had destroyed the Tacoma Narrows Bridge in 1940.

❖ **Bridge deck replacement (1982–1986)**

- The original bridge used a concrete deck. Salt carried by fog or mist reached the rebar, causing corrosion and concrete spalling. From 1982 to 1986, the original bridge deck, in 747 sections, was systematically replaced with a 40% lighter, and stronger, steel orthotropic deck panels, over 401 nights without closing the roadway completely to traffic. The roadway was also widened by two feet, resulting in outside curb lane width of 11 feet, instead of 10 feet for the inside lanes. This deck replacement was the bridge's greatest engineering project since it was built and cost over $68 million.

❖ Structural specifications

Figure 14.1.6 (b) Structural specification

- Until 1964, the Golden Gate Bridge had the longest suspension bridge main span in the world, at 4,200 feet (1,300 m). Since 1964 its main span length has been surpassed by seventeen bridges; it now has the second-longest main span in the Americas, after the Verrazzano-Narrows Bridge in New York City. The total length of the Golden Gate Bridge from abutment to abutment is 8,981 feet (2,737 m).
- The Golden Gate Bridge's clearance above high water averages 220 feet (67 m) while its towers, at 746 feet (227 m) above the water, were the world's tallest on a suspension bridge until 1993 when it was surpassed by the Mezcala Bridge, in Mexico.
- The weight of the roadway is hung from 250 pairs of vertical suspender ropes, which are attached to two main cables. The main cables pass over the two main towers and are fixed in concrete at each end. Each cable is made of 27,572 strands of wire. The total length of galvanized steel wire used to fabricate both main cables is estimated to be 80,000 miles (130,000 km). Each of the bridge's two towers has approximately 600,000 rivets.
- In the 1960s, when the Bay Area Rapid Transit system (BART) was being planned, the engineering community had conflicting opinions about the feasibility of running train tracks north to Marin County over the bridge. In June 1961, consultants hired by BART completed a study that determined the bridge's suspension section was capable of supporting service on a new lower deck. In July 1961, one of the bridge's consulting engineers, Clifford Paine, disagreed with their conclusion. In January 1962, due to more conflicting reports on feasibility, the bridge's board of directors appointed an engineering review board to analyze all the reports. The review board's report, released in April 1962, concluded that running BART on the bridge was not advisable.

❖ Usage and tourism

- The bridge is popular with pedestrians and bicyclists, and was built with walkways on either side of the six vehicle traffic lanes. Initially, they were separated from the traffic lanes by only a metal curb, but railings between the walkways and the traffic lanes were

added in 2003, primarily as a measure to prevent bicyclists from falling into the roadway. The bridge was designated as part of U.S. Bicycle Route 95 in 2021.

- The main walkway is on the eastern side, and is open for use by both pedestrians and bicycles in the morning to mid-afternoon during weekdays (5:00 a.m. to 3:30 p.m.), and to pedestrians only for the remaining daylight hours (until 6:00 p.m., or 9:00 p.m. during DST). The eastern walkway is reserved for pedestrians on weekends (5:00 a.m. to 6:00 p.m., or 9:00 p.m. during DST), and is open exclusively to bicyclists in the evening and overnight, when it is closed to pedestrians. The western walkway is open only for bicyclists and only during the hours when they are not allowed on the eastern walkway.
- Bus service across the bridge is provided by two public transportation agencies: San Francisco Muni and Golden Gate Transit. Muni offers Saturday and Sunday service on the Marin Headlands Express bus line, and Golden Gate Transit runs numerous bus lines throughout the week.
- A visitor center and gift shop, originally called the "Bridge Pavilion" (since renamed the “Golden Gate Bridge Welcome Center”), is located on the San Francisco side of the bridge, adjacent to the southeast parking lot. It opened in 2012, in time for the bridge's 75th-anniversary celebration. A cafe, outdoor exhibits, and restroom facilities are located nearby. On the Marin side of the bridge, only accessible from the northbound lanes, is the H. Dana Bower Rest Area and Vista Point,named after the first landscape architect for the California Division of Highways.

❖ Wind

- The Golden Gate Bridge was designed to safely withstand winds of up to 68 mph (109 km/h).[104] Until 2008, the bridge was closed because of weather conditions only three times: on December 1, 1951, because of gusts of 69 mph (111 km/h); on December 23, 1982, because of winds of 70 mph (113 km/h); and on December 3, 1983, because of wind gusts of 75 mph (121 km/h).
- As part of the retrofitting of the bridge and installation of the suicide barrier, starting in 2019 the railings on the west side of the pedestrian walkway were replaced with thinner, more flexible slats in order to improve the bridge's aerodynamic tolerance of high wind to 100 mph (161 km/h). Starting in June 2020, reports were received of a loud hum, heard across San Francisco and Marin County, produced by the new railing slats when a strong west wind was blowing. The sound had been predicted from wind tunnel tests, but not included in the environmental impact report; ways of ameliorating it are being considered.

❖ Seismic vulnerability and improvements

- Modern knowledge of the effect of earthquakes on structures led to a program to retrofit the Golden Gate to better resist seismic events. The proximity of the bridge to the San Andreas Fault places it at risk for a significant earthquake. Once thought to have been able to withstand any magnitude of foreseeable earthquake, the bridge was actually vulnerable

to complete structural failure (i.e., collapse) triggered by the failure of supports on the 320-foot (98 m) arch over Fort Point. A $392 million program was initiated to improve the structure's ability to withstand such an event with only minimal (repairable) damage. A custom-built electro-hydraulic synchronous lift system for construction of temporary support towers and a series of intricatelifts, transferring the loads from the existing bridge onto the temporary supports, were completed with engineers from Balfour Beatty and Enerpac, without disrupting day-to-day commuter traffic. Although the retrofit was initially planned to be completed in 2012, as of May 2017 it was expected to take several more years.

Figure 14.1.6 (c) seismic vulnerability

- The former elevated approach to the Golden Gate Bridge through the San Francisco Presidio, known as Doyle Drive, dated to 1933 and was named after Frank P. Doyle. Doyle, the president of the Exchange Bank in Santa Rosa and son of the bank's founder, was the man who, more than any other person, made it possible to build the Golden Gate Bridge. The highway carried about 91,000 vehicles each weekday between downtown San Francisco and the North Bay and points north. The road was deemed "vulnerable to earthquake damage", had a problematic 4lane design, and lacked shoulders; a San Francisco County Transportation Authority study recommended that it be replaced. Construction on the $1 billion replacement, temporarily known as the Presidio Parkway, began in December 2009. The elevated Doyle Drive was demolished on the weekend of April 27–30, 2012, and traffic used a part of the partially completed Presidio Parkway, until it was switched onto the finished Presidio Parkway on the weekend of July 9–12, 2015. As of May 2012, an official at Caltrans said there is no plan to permanently rename the portion known as Doyle Drive.

Chapter 15.

Smart and/or Sustainable features of Chapter 8 & 13 designs, Impact on society.

(For Khambhaliya village development, villagers' happiness, comfortable and for enhancement of the village)

Sr. No	Design Name	Period to Implement	Amount(Rs)	Benefit
1	**PHYSICAL INFRASRUCTURE**			
	Public Toilet	Immediately	493,193.12	Decrease health issue andimprove cleanliness in village.
	Bus Stop	Immediately	9734	Easy access of Transportation
2	**SOCIAL INNFRASTRUCTURE**			
	Design of Soak pit & Septic Tank	Within 1 year	171102	Cleanliness in village
	Post Office	Immediately	83826725	Improve in Social life
	PHC	Within 1 year	2522579	Batter health care for the village
3	**SUSTAINBLE INFRASTRUCTURE**			
	Bank With ATM	Immediately	2433645.55	Development in economy and e-banking
	Primary School	Within 1 year	45,854,377	Batter education for village
	Bio gas Plant	Within 1 year		It is very sustainable way to get energy in the village there is lot of dung so it is very economical

4	**SOICIO – CULTURE INFRASTRUCTURE**			
	Gym	Immediately	1921739.555	Improvement in health and body
	Door to Door waste collection	Immediately	165400	Cleanliness in village
	Medical Store	Immediately	54007.60	Easily access of medicine in village
5	**SMART VILLAGE DESIGN**			
	Garden	Within 1 year	1640710	Playing for village children and other activity

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

- Fourteen (14^{th}) finance commission.
- ATVT Grant (Apno Taluko Vibrant Taluko)
- MLA Grant
- Member of Parliament Grant
- MGNREGA Grant (Mahatma Gandhi National Rural Employment Guarantee Act 2005)
- NREGA (National Rural Employment Guarantee act)
- Gram Panchyat Grant

Chapter 16.
Survey By Interviewing With Talati And/Or 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	Agricultural Production
2	What are the chances of employment in village?	No	
3	What are the special technical facilities in village?	No	
4	Is any debt on village dwellers?	No	
5	Are village people getting agricultural help?	Yes	
6	Is women health awareness Program organized in village?	Yes	
7	Are women having opportunity to work and income?	Yes	
8	Child girl education is appreciated in village?	Yes	
9	Facility of vaccination to child is available in village?	Yes	In Sub-Center
10	Are village people aware about child vaccination and done to each and every child as per norms?	No	
11	Women help line number information is provided to village people?	Yes	1091 Women helpline. No. Provided
12	Is water scarcity in village? How many days per year?	No	
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.	No	
18	Is village improvement is observed in comparative scenario from past to present?	Yes	
19	Is any unavoidable difficulty village people are facing? Any natural calamity is there?	Yes	
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 / Agriculture Activites And Agro Industry, Altenate Technics And Solution

❖ Drip Irrigation

- Drip irrigation is a type of micro-irrigation system that has the potential to save water and nutrients by allowing water to drip slowly to the roots of plants, either from above the soil surface or buried below the surface.
- The goal is to place water directly into the root zone and minimize evaporation. Drip irrigation systems distribute water through a network of valves, pipes, tubing, and emitters.
- Depending on how well designed, installed, maintained, and operated it is, a drip irrigation system can be more efficient than other types of irrigation systems, such as surface irrigation or sprinkler irrigation.
- Modern drip irrigation has arguably become the world's most valued innovation in agriculture since the invention in the 1930s of the impact sprinkler, which offered the first practical alternative to surface irrigation.
- Careful study of all the relevant factors like land topography, soil, water, crop and agro-climatic conditions are needed to determine the most suitable drip irrigation system and components to be used in a specific installation.
- Drip irrigation may also use devices called micro-spray heads, which spray water in a small area, instead of dripping emitters. These are generally used on tree and vine crops with wider root zones.
- Subsurface drip irrigation (SDI) uses permanently or temporarily buried dripperline or drip tape located at or below the plant roots. It is becoming popular for row crop irrigation, especially in areas where water supplies are limited, or recycled water is used for irrigation.

Figure 17.1.1 (a) Drip Irrigation

❖ Components and operation

- Components used in drip irrigation (listed in order from water source) include:

- Pump or pressurized water source

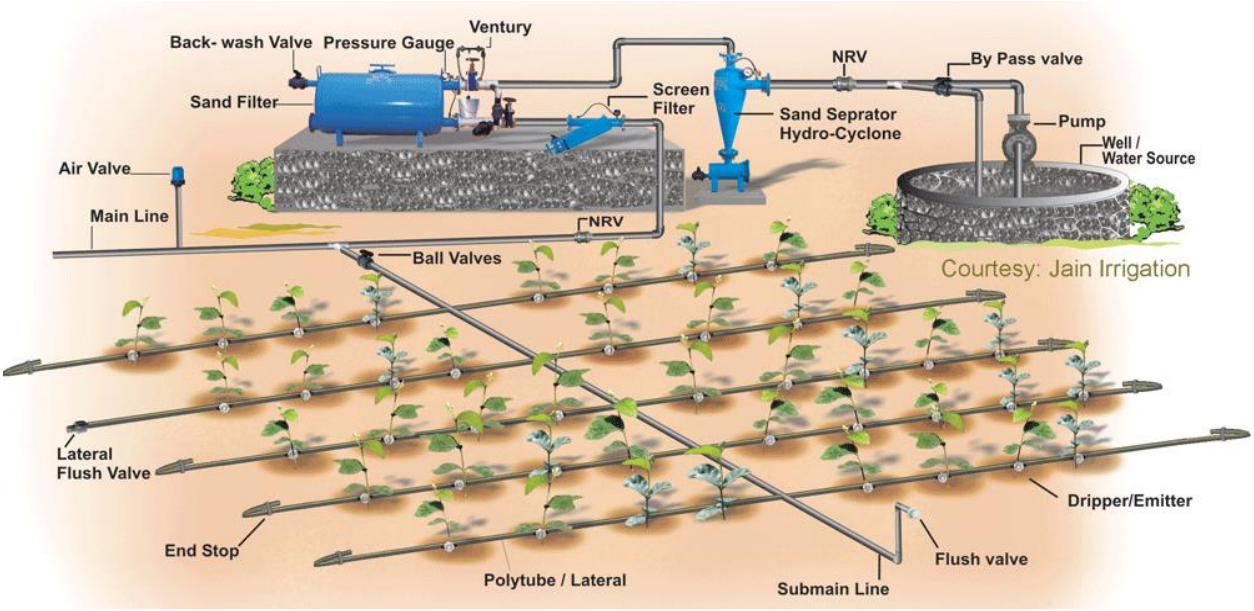


Figure 17.1.1 (b) Components and operation

- Water filter(s) or filtration systems: sand separator, Fertigation systems (Venturi injector) and chemigation equipment (optional)
- Backwash controller (Backflow prevention device)
- Pressure control valve (pressure regulator)
- Distribution lines (main larger diameter pipe, maybe secondary smaller, pipe fittings)
- Hand-operated, electronic, or hydraulic control valves and safety valves
- Smaller diameter polyethylene tube (often called "laterals")
- Poly fittings and accessories (to make connections)
- Emitting devices at plants (emitter or dripper, micro spray head, inline dripper or inline drip tube)

- In drip irrigation systems, pump and valves may be manually or automatically operated by a controller.
- Most large drip irrigation systems employ some type of filter to prevent clogging of the small emitter flow path by small waterborne particles. New technologies are now being offered that minimize clogging. Some residential systems are installed without additional filters since potable water is already filtered at the water treatment plant.
- Virtually all drip irrigation equipment manufacturers recommend that filters be employed and generally will not honor warranties unless this is done. Last line filters just before the final delivery pipe are strongly recommended in addition to any other filtration system due to fine particle settlement and accidental insertion of particles in the intermediate lines.
- Drip and subsurface drip irrigation is used almost exclusively when using recycled municipal wastewater. Regulations typically do not permit spraying water through the air that has not been fully treated to potable water standards.

- Because of the way the water is applied in a drip system, traditional surface applications of timed-release fertilizer are sometimes ineffective, so drip systems often mix liquid fertilizer with the irrigation water. This is called fertigation; fertigation and chemigation (application of pesticides and other chemicals to periodically clean out the system, such as chlorine or sulfuric acid) use chemical injectors such as diaphragm pumps, piston pumps, or aspirators.
- The chemicals may be added constantly whenever the system is irrigating or at intervals. Fertilizer savings of up to 95% are being reported from recent university field tests using drip fertigation and slow water delivery as compared to timed-release and irrigation by micro spray heads.

❖ **Advantages and disadvantages**

- The advantages of drip irrigation are:

- Fertilizer and nutrient loss is minimized due to a localized application and reduced leaching.
- Water application efficiency is high if managed correctly.
- Field leveling is not necessary.
- Fields with irregular shapes are easily accommodated.
- Recycled non-potable water can be safely used.
- Moisture within the root zone can be maintained at field capacity.
- Soil type plays a less important role in the frequency of irrigation.
- Soil erosion is lessened.
- Weed growth is lessened.
- Water distribution is highly uniform, controlled by the output of each nozzle.
- Labour cost is less than other irrigation methods.
- Variation in supply can be regulated by regulating the valves and drippers.
- Fertigation can easily be included with minimal waste of fertilizers.
- Foliage remains dry, reducing the risk of disease.
- Usually operated at lower pressure than other types of pressurized irrigation, reducing energy costs.

- The disadvantages of drip irrigation are:

- Initial cost can be more than overhead systems.
- The sun can affect the tubes used for drip irrigation, shortening their lifespan. (See Polymer degradation);
- The risks of degrading plastic affecting the soil content and food crops. With many types of plastic, when the sun degrades the plastic, causing it to become brittle, the estrogenic

chemicals (that is, chemicals replicating female hormones) which would cause the plastic to retain flexibility have been released into the surrounding environment.[16]

- If the water is not properly filtered and the equipment not properly maintained, it can result in clogging or bioclogging.
- For subsurface drip the irrigator cannot see the water that is applied. This may lead to the farmer either applying too much water (low efficiency) or an insufficient amount of water, this is particularly common for those with less experience with drip irrigation.
- Drip irrigation might be unsatisfactory if herbicides or top dressed fertilizers need sprinkler irrigation for activation.
- Drip tape causes extra cleanup costs after harvest. Users need to plan for drip tape winding, disposal, recycling or reuse.
- Waste of water, time and harvest, if not installed properly. These systems require careful study of all the relevant factors like land topography, soil, water, crop and agro-climatic conditions, and suitability of drip irrigation system and its components.
- In lighter soils subsurface drip may be unable to wet the soil surface for germination. Requires careful consideration of the installation depth.
- Most drip systems are designed for high efficiency, meaning little or no leaching fraction. Without sufficient leaching, salts applied with the irrigation water may build up in the root zone, usually at the edge of the wetting pattern. On the other hand, drip irrigation avoids the high capillary potential of traditional surface-applied irrigation, which can draw salt deposits up from deposits below.
- The PVC pipes often suffer from rodent damage, requiring replacement of the entire tube and increasing expenses.
- Drip irrigation systems cannot be used for damage control by night frosts (like in the case of sprinkler irrigation systems)

Chapter 18.

Social Activities – Any Activates Planned By Students e.g Teaching Learning activities, awareness camp, business idea for SELF HELP GROUP OR ANY OTHER

❖ **Swachh Bharat Abhiyan**

- It is a country-wide campaign initiated by the Government of India in 2014 to eliminate open defecation and improve solid waste management (SWM). Phase 1 of the mission lasted till October 2019. Phase 2 will be implemented between 2020-21 and 2024-25.
- Initiated by the Government of India, the mission aimed to achieve an "open-defecation free" (ODF) India by 2 October 2019, the 150th anniversary of the birth of Mahatma Gandhi. The objectives of the first phase of the mission also included eradication of manual scavenging, generating awareness and bringing about a behavior change regarding sanitation practices, and augmentation of capacity at the local level. The second phase of the mission aims to sustain the open defecation free status and improve the management of solid and liquid waste. The mission is aimed at progressing towards target 6.2 of the Sustainable Development Goals Number 6 established by the United Nations in 2015.
- As part of the campaign, volunteers, known as Swachhagrahis, or "Ambassadors of cleanliness", promoted indoor plumbing and community approaches to sanitation (CAS) at the village level. Other activities included national real-time monitoring and updates from non-governmental organizations (NGOs) such as The Ugly Indian, Waste Warriors, and SWaCH Pune (Solid Waste Collection and Handling).
- The government provided subsidy for construction of nearly 110 million toilets between 2014 and 2019, although many Indians especially in rural areas choose to not use them. The campaign was criticized for using coercive approaches to force people to use toilets. Many households were threatened with a loss of benefits such as access to electricity or food entitlements through the public distribution system.
- we are going to village and observe the actual condition of the village but we found out there is no any waste management in the village. The waste is throw anywhere in the place by the people of village. Then we talk about the cleanliness and its importance, it's benefits, effect and how cleanliness is play a major role in our life.
- We tell the how can the cleanliness will done by regularly clean surrounding areas and don't throw the waste anywhere around the places and the guideline for the cleanliness.

Figure 18.1.1 (a) Activity

❖ Awareness of Vaccination

- world Immunisation Week (April 24-30) is a one-week period at the end of April dedicated to raising awareness and a better understanding of how immunisation can fight against a host of diseases that are otherwise easily-contractible. These diseases, though preventable, still exist, especially in the developing world where education on basic healthcare is often lacking.
- According to the World Health Organization, though the rate of children being vaccinated has gone up, the overall targets for the eradication of diseases such as Measles, Rubella, and maternal and neonatal Tetanus have fallen behind their aimed-for schedule. Moreover, there have been several outbreaks of diseases that have vaccines to protect children and adults in areas where inhabitants are underprivileged by poverty, marginalization and conflict.
- In India, millions of children still do not have access to life-saving vaccinations. Immunisation is a cost-effective health precaution that can save adults, children and their parents' distress, heartache and money spent on healthcare services when complications arise.
- The main aim of World Immunisation Week is to raise awareness about the importance of getting the necessary vaccinations in their prescribed doses and schedule.
- Educate yourself on immunisation and speak to your physician about the necessary vaccines you and your family need. Speak to those who know about immunisation, especially people who may be underprivileged and not have access to important healthcare information. Here are some points of conversation to drive in why getting vaccinated is crucial:

- Getting immunised is a community duty as the protection against these diseases ensures that you will not pass them to others who are not immunised and perpetuate the cycle of illness.
- Focus on the importance of vaccinating children to help them avoid suffering uncomfortable and painful symptoms.
- Remind people that even seemingly harmless diseases such as Measles and Mumps can have dire long-term consequences that arise from complications, such as Pneumonia and brain inflammation (Measles), or deafness (Mumps). In some cases, complications can prove fatal.

- Talk about monetary costs of providing adequate healthcare and loss of money from having to take time off to care for a sick child in case of infection. All of which can be easily prevented by proper immunisation

Chapter 19.

Khambhaliya SAGY Questionnaire Survey form with the Sarpanch Signature (Scanned copy attachment in the soft copy report and Original copy in hardbound report)

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: Khambhaliya Gram Panchayat: Khambhaliya Ward No. ____

Block: ____ District: Junagadh

State: Gujarat L S Constituency: ____

1. Family Identity and Size

Name of Head of Household	Dinesh Bhai Shivgabhai Shiyal							Male/ Female	M
SECC Survey ID:		Family Size	6	Over 18	2	6 to 18	3	Under 6	—

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]
Dinesh Bhai Shivgabhai	45	M	N/A	Yes	10th	Yes	Y	Nil
Mamta Ben Dineshbhai	41	F	N/A	Yes	12th	Yes	Y	Nil
Vishal bhai Dineshbhai	33	M	N/A	Yes	10th	Yes	Y	Nil

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
Kaam vishal bhai Shiyal	17	M	N	N		School	10th	N
Kajal ben vishal bhai	12	F	N	N		"	7th	N
Shalonni ben vishal bhai	15	F	N	N		"	9th	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

[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	no	no
Children	no	no

9. House & Homestead Data

Own House: Yes / No	No. of Rooms: 4
Type: Kutcha / Semi Pucca / Pucca ✓	
Toilet: Private / Community / Open Defecation no	
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	Yes
Community Water Tap	Yes / No	no
Hand Pump (Public / Private)	Yes / No	yes
Open Well(Public / Private)	Yes / No	yes
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		2. Cultivable Area	
3. Irrigated Area		4. Uncultivable Area	

13. Principal Occupations in the Household

Livelihood	Tick if applicable
Farming on own Land	no
Sharecropping /Farming Leased Land	-
Animal Husbandry	2 cow
Pisciculture	-
Fishing	-
Skilled Wage Worker	-
Unskilled Wage Worker	-
Salaried Employment in Government	-
Salaried Employment - Private Sector	-
Weaving	-
Other Artisan(mention)	-
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
Peanut	1 Pocket	3 bag
Cotton	1 Pocket	3 bag

17. Livestock Numbers

Cows: 2	Bullocks:	Calves: 2
Female Buffalo: -	Male Buffalo: -	Buffalo Calves: -
Goats/ Sheep: -	Poultry/ Ducks: -	Pigs:
Any other: Type -		No. -
Shelter for Livestock: Pucca / ~~Kutcha~~ / None		
Average Daily Production of Milk(Litres): 40 Li		

18. What games do Children Play
Video Game in Mobile

19. Do children play musical instrument (mention)
no

Schedule Filled By: Ankit, Hardik.
Principal Respondent: -
Date of Survey: 21-6-21

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: Khambhaliya

b. Block: _____

c. District: Junagadh

d. State: Gujarat

e. Lok Sabha Constituency: _____

f. Number of Wards in the Gram Panchayat: _____

g. Number of Villages in the Gram Panchayat: _____

h. Names of Villages:

Khambaliya

Demographic Information

Number of Households 591 Total Population 3153 Male 1499 Female 1654

SC HHs 72 ST HHs 30 OBC HHs 1368 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	No	
b.	Nearest Primary Health Centre (PHC)	Yes	5 km
c.	Nearest Community Health Centre (CHC)	No	
d.	Nearest Post Office	Yes	1 Km
e.	Nearest Bank Branch (Any)	Yes	
f.	Nearest Bank with CBS Facility	No	
g.	Nearest ATM	No	
h.	Nearest Primary School	Yes	1 km
i.	Nearest Middle School	No	
j.	Nearest Secondary School	No	
k.	Nearest Higher Secondary School / +2 College	No	
l.	Nearest Graduate College	No	
m	Nearest ITI / Polytechnic Centre	No	
n	Kisan Seva Kendra	No	

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	No	
p	Nearest Agro Service Centre	No	
p	MSP based Government Procurement Centre	No	
q	Milk Cooperative /Collection Centre	Yes	
r	Veterinary Care Centre	No	
s	Ayurveda Centre	No	
t	E – Seva Kendra	Yes	
u	Bus Stop	Yes	
v	Railway Station	No	
w	Library	No	
x	Common Service Centre	No	

IV. Sports Facilities in the Gram Panchayat

a. Number of Play Grounds in the GP: Total __-__ 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:__3__

b. Number of villages without Angan Wadi Centres__-__

Names of such villages: __-__

c. Schools (Number)

Primary Private: ____ Primary Govt.:____

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)			No	(Khambaliya)			
b.	Kerosene			No				
c.	Other (mention)			No				

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 ✓ / Not Covered		
b.	Hand Pump Coverage in Villages:	Covered ✓ / Not Covered		
c.	Coverage under Covered Drains:	Covered / Not Covered ✓		
d.	Coverage under Open Drains:	Covered / Not Covered ✓		
e.	Villages with Household Electricity Connection (Numbers)	Connected ✓ / Not Connected		

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land		d.	Pasture / Grazing Land		g.	Check Dam	no
b.	Irrigated Land	113 7 15 Hect	e.	Forests/ Plantations	no	h.	Wells/Bore Wells	Yes
c.	Un-irrigated Land		f.	Other Common Land	18.74 Hect	i	Tanks /Ponds	Yes

[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)	
b)	Number of Households receiving pension (old age, widow, disability)	
c)	Number of eligible Households who are not receiving pension	
d)	Number of Households eligible for Ration Card	
e)	Number of eligible HHs having ration cards	
f)	Number of households covered under RSBY (Rashtriya Swasthya Bima Yojana)	
g)	Number of HHs covered under AABY (Aam Aadmi Bima Yojana)	
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	
l)	Number of landless households	
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	
q)	Number of Households headed by physically handicapped persons	
r)	Total number of Persons with Disability in the village	
s)	Number of SHGs	
t)	Number of active SHGs	
u)	Number of SHG Federations	
v)	Number of Youth Clubs	
w)	Number of Bharat Nirman Volunteers	

Name and Signature of Surveyor and Respondent'

-Ankit Dabhi -Chudasama Hardik. Surveyor	PRI Respondent (Preferably Gram Panchayat Chairperson)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	21-6-21 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: Khambhaliya

b. Ward Number: _____

c. Gram Panchayat: khambhaliya

d. Block: _____

e. District: Junagadh

f. State: Gujarat

g. Lok Sabha Constituency: _____

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

i. Names of Habitations / Hamlets:

Demographic Information

Number of Households 591 Total Population 3153 Male 1499 Female 1654

SC HHs 72 ST HHs 30 OBC HHs 368 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	
c.	Nearest Secondary School	No	
d.	Kisan Seva Kendra	No	
e.	Milk Cooperative /Collection Centre	Yes	
g.	Health Sub Centre	No	
h.	Bank	No	
i.	ATM	No	
j.	Bus Stop	Yes	
k.	Railway Station	No	

[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	Yes	
m	Common Service Centre		
n	Veterinary Care Centre		

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: None

iii. Drinking Water Facilities

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

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

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: 2 *(1-All 2-None 3-Some)*

If 3 mention the name of the habitations not covered: None

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

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

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

If 3 mention the name of the habitations not covered: 2 None

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: 1 - All

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

If 3 mention the name of the habitations not covered: 2 - Some

vi. Sports Facilities in the Village

a.Number of Play Grounds in the Village (minimum size 200 square meters): —

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

vii. Education, ICDS

a. Number of Anganwadi Centres: 3

c. Schools (Number)

Primary Private: No Primary Govt.: 1

Middle Private: No Middle Govt.: No

Secondary Private: — Secondary Govt.: —

Higher Secondary Private: No Higher Secondary Govt: No

2

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		d.	Pasture / Grazing Land		g.	Check Dam	
b.	Irrigated Land		e.	Forests/ Plnatations		h.	Wells/Bore Wells	
c.	Un-irrigated Land		f.	Other Common Land		I	Tanks /Ponds	

ix. Entitlement Related Parameters		
1	Number of active Job Card holders under MGNREGA	
2	Number of active Job Card holders who have completed 100 days of work	
3	Number of shops selling alcohol	
4	Number of BPL families	
5	Number of landless households	
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'

Ankit Dabhi Harshdik Chudasama 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)	21-6-21 Date of Survey

Chapter 20.
TDO-DDO-Collector email sending Soft copy attachment in the report

Vishwakarma Yojana phase VIII Khambhaliya village report
1 message

Ankit Dabhi <ankitdabhi946@gmail.com> Thu, 12 Aug 2021 at 12:06 pm
To: shaktigohil12@yahoo.com

Dear sir,
I am Dabhi Ankit and Chudasama Hardik student of civil engineering at om engineering college junagadh. I am sending this email with attached soft copy of khambhaliya village report, which is the part of our final year project of vishwakarma Yojana phase VIII.

Khambhaliya Final Report .pdf
15.5 MB

Vishwakarma yojna project report khambhaliya
1 message

Hardik Chudasama <hardikchudasma111@gmail.com> Sat, 25 Sep, 2021 at 10:56 AM
To: Patelbhai148@gamil.com

Dear sir,
I am Dabhi Ankit and Chudasama Hardik student of civil engineering at om engineering college junagadh. I am sending this email with attached soft copy of khambhaliya village report, which is the part of our final year project of vishwakarma Yojana phase VIII.

Chapter 21.
Comprehensive report for the entire village

- As per the guideline of Vishwakarma yojana VIII we visited Khambhaliya village is a Bhesan taluka in Junagadh district of Gujarat state, India. It is located 5 Km from Bhesan. Khambhaliya village population is 3153.

- To know or to understand the actual necessities of village and interact with Sarpanch, Talati and other village dowelled.

- Techno-economic surrey forms give much information about village by interacting with Sarpanch and Talati. But interactions with village dealers and observation of village condition are required.

- We provide Bio-gas Plant, Medical store, Public-toilet, Bank with ATM and Post office, P H C. We explained all the parameters of various design such as sustainable, physical, social, socio-culture, smart and heritage village design.

- Based on the collection of the data of the village and survey work done in both semester we have to do some improvement in the Delad village and do some repair work in the village.

- We have to provide some facilities in the village like repair and re-habitation of the existing school building etc. There is a room which is not in good condition in primary school so it needs re-construction asper the demand of villagers and review of sarpanchtalati we propose the design of the garden, medical store, bank, ATM service, PHC, Bus stop etc.

- We visited all the internal part of the village and interacted with villagers directly and ask them about the present situation of village. We conducted a techno-economic the gap analysis and provide the necessary facilities to village. We saw that as per UDPEI Norma there are some non-adequate facilities.

- Our team of VY thanked all the member of the village for their support during this work period and made than understand that the implantation of such facilities can build implantations of such facilities can build a better village and hence lead to build a strangulation.

- In the village, there are many houses which have not toilet blocks included. So that it is advisable to provide a common public toilet block in village. In Khambhaliya, there is already an existing toilet block, but it is not in well condition so people refuse to use it.

- In this time, everyone is living in high mind stress. So, there should be some amenities which are useful for the refreshment like Garden. Thus, to maintain the health and mind fresh of the villagers, we proposed the design of Garden. It will help the villagers to be fresh.

- There should be a stable design selected which can help the village to develop properly with low expense and high quality. By providing all these amenities, village will move forward in the direction of the development and by which the development of the villagers will be held.

- Proper disposal of this waste is necessary for the village. A waste is a non-functional thing, but if we utilize it properly, we can dispose it with little bit income from it. This little income can also give its big help to Gram Panchayat to develop the village.

- By implanting given design proposals, all the missing amenities can be provided which will stop the migration of rural people towards the urban area which will in turn reduce pressure on cities.

- The amenities designed under this Vishwakarma project phase viii will be helpful for better development of the village as physically as well as socially, which improves the overall lifestyle of people along with nation with preserving nature bit by bit.