DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION
MOTI DEVTI Village
AHMEDABAD District

PREPARED BY

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Prof. SinrozaParthDipakbhai

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 : MOTI DEVATI

DISTRICT:AHMEDABAD

Under

Vishwakarma Yojana: Phase-VIII

In partial fulfillment of the project offered by

GUJARATTECHNOLOGICALUNIVERSITY, CHANDKHEDA

During the academic year 2020-21.

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

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ABSTRACT

Gujarat Technological University is allotted important and prestigious project of Vishwakarma Yojana by the Government of Gujarat for the year of 2020-21. The main aim of this project is to study present status of village and techno-economic survey of villages in different district of the state in terms of collection of necessary data regarding basic amenities, several services which are adequate and inadequate, essential infrastructural facilities for the needy people and to prepare report on adequacy of the available resources with reference to population of the village and growth of the village.

The village allocated to us named as **MOTI DEVTI** which is located 42 km far from Ahmedabad. This village has main big beautiful entrance gate which increase the elegance of village among visitors. About 705 of native people of this village are engaged in agricultural activities and rest of others are doing different works outside the village.

The village has total population 3232 which is specified as 1590 female and 1642 male. The village has 594 houses and half of that houses are kuccha houses. The village has different temples which are really big and beautiful such as Ramji mandir, Mahadev mandir, Ramdevpir mandir. The village has one primary school which is very good in use and also one anganwadi is available where pupils learn subjective knowledge.

The gram panchayat building is in very poor condition and need to rebuild it as soon as possible. There is no facility available for health. The overall road network condition is very poor. The street light is also not at each and every place in village.

In this village, water supplying system is only depend on bore well. The complete water demand of people by providing water from overhead water tank. There are lack of facilities such as secondary high school, public garden, public toilet, public heath center.

To meet the demand of villagers, it is essential to provide General market, alternative health care facility, public library. There is need of cleaning pond situated in the entrance of village.

Honestly, after visiting the village we have an important ambition to design most suitable type of structures in village beyond that it would be beneficial for native people to fulfill the basic needs. By provision of attractive and useful infrastructure facilities which automatically reduce the migration ratio from village to city and to make village with full of almost basic amenities.

Key words:

- Urbanization
- Sustainable development
- Infrastructure facilities
- Smart development

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ABBREVIATIONS

SHORT NAME / SYMBOL	FULL NAME
GRDG	Global rural development grid
UDPFI	Urban and regional development plans formulations and implementation
PHC	Primary health center
CHC	Community health center
APMC	Agricultural produce market committee
MGNREGA	Mahatma Gandhi national rural employment guarantee act
NREGA	Nation rural employment guarantee act
PMGSY	Pradhanmantri gram sadak yojana
SAGY	Saansad Adarsh gram yojana
MOUD	Ministry of urban development
ICT	Information and communication technology
DAE	Department of atomic energy
BARC	Bhabha atomic research center
ULB	Urban local body
CSE	Center for science and environment

Chapter 1: Ideal village

1.1 Background

- Punsari village is located in Sabarkantha district of Gujarat in India county. The village follows the Panchayat raj system. Punsariacquired the award of being exceptional Gram Panchayat in Gujarat. In that smart village, the advanced technology education is adopted at very well level. It can be easily seen that lots of efforts have been made for empowerment of girls and increasing the safety in the village. Some of the facilities provided by way of the Panchayat which include local mineral water supply, gutter project, fitness care center, banking facility and toll-free criticism reception service.
- Punsari is very famous village even role model for others village not only in Sabarkantha district but also in every district of country India. The village is positioned at about 80 km from the national capital, Gandhinagar. Additionally a statue of Sardar Patel is established infront of the main gate. The village follows the Panchayati raj system. One interesting matter is that the name of famous village comes from the identify of one lady PuribenRabari.
- In 2010, the panchayat installed a reverse osmosis plant to ensure the availability of clean drinking water for every villagers. District panchayat has propose cost of 2,50,000/- for constructing pay and use toilet and bus stand. The village community member never does any kind of partiality between men and women and the example of that fact is the panchayat has started a bus facility called AtalExpress for women which is used for the import of milk. One more innovation makes the village very smart is that the village has installed 25 CCTVs surveillance at prime junctions of the village so the cases of robbery, other litterbugs can be spotted and punished according to crime.
- The village has adopted several ways to communicate to native public. There are 120 waterproof speakers installed through which the sarpanch inform other villagers about new schemes and also for making new announcements. In village, majority of people celebrate different kind of festivals with together. In that festivals the pre installed speakers are also used to play daily morning bhajans, prayers, shlokas and slogans of Mahatma Gandhi.

❖ Study Area Location

- Name: Punsari
- District: Sabarkantha
- Distance from Gandhinagar: 80 km
- Pin code: 383307
- Language: Gujarati, Hindi, English

- STD Code: 0277686

Fig 1.1: Map of Punsari

Fig 1.2: Satellite View of Punsari

1.2 Concept: Ideal village

1.2.1. Objectives

❖ The ideal village has following objectives:-

- Make the model village a "hub" that could attract resources for the development of other villages.
- Prevent migration from rural area to urban area
- To provide global means to local needs
- Provide easier, faster and cheaper access to urban markets for agriculture products.
- To improve social empowerment.
- Improving the literacy rate of the villagers by reducing the drop out rate
- To set up a global rural development grid(GRDG) by sharing information, ideas and solutions.
- Providing updated information and data banks to the government for better analysis and individual profiling.
- Analysis of villages on various socio economic parameters at a micro as well as macro level.
- Improving the economic conditions of the semi skilled and un skilled labors by publishing their availability status on the internet.
- Providing databases on demand to the manufacturing organizations dealing in agrobased products and implement like tractors, manures and fertilizers etc.
- Create and sustain a culture of cooperative living for inclusive and rapid development.

1.2.2 Case study of Ideal village of India/Gujarat: Punsari village:

- Punsari is a village situated in Sabarkantha district in state of Gujarat. The village has adopted the advanced education technology. In this village, first concept of improvement of village was drainage system. The village has 100% toilets and bathroom facilities which is still in use by native people. Lots of efforts made in the village for better women empowerment and significantly increase in the security of village.
- Initially many families had migrated from the punsari, the village panchayat was carrying a loss of Rs. 1,20,000/- and there were 320 family who lived below poverty line. However after 14 years, the district administration stitched up fund from various heads of the district development fund, and also started focusing on development of village with lowest administrative unit named Punsari.
- Generally, when we listen the word village the first impression comes in our mind, likewise mud houses, narrow roads, no drainage and no drinking water facilities available in normal village and also unconnected people, punsari has different story compare to other villages.
- The village has public announcement systems, CCTVs cameras to provide 24/7 security for villagers, free Wi-Fi connectivity at public gathering places and portable drinking water at affordable charges, mobile library, two primary schools with Wi-Fi connection and projector facilities, gaming zone and internet cafe for students and other basic amenities like health, education, drainage system are as per norms of urban standards.
- Every home has separate toilets in the village. The village has Primary Health Center, street light and cc roads at each and every corner of the village. For communication purpose, there are 120 water proof speakers installed which are generally used by sarpanch to inform people of new schemes and make important announcement by giving regular current news. The prayers are held every morning between 7 to 8 a.m. and in the evening between 6 to 7 p.m.
- Due to more population in village, there are four network towers andall tower frequency have range of 300 meter. Each school has CCTV camera system in coloration with Navneet Prakashan. Each school has audio and video visualization facilities. The village has personal mineral water plant.
- The village run important campaign called BHAI VANDANA program in which the sisters who do not have any brothers got enrolled. Banking facilities are provided by Sabarkantha bank and Dena bank in the village. the village has its own website WWW.PUNSARIGRAMPANCHAYAT.IN
- The committee's headquarters look like modern corporate office-on one side is conference hall where the council hold its meeting, on the others is a glass screen on which one can see four windows of live pictures beamed from CCTV cameras installed on key locations in the village.

1.2.3 The idea of a model / Smart village

- The proposed "SANSANDADARSH GRAM YOJANA" of the central government aims to involve MPs more directly in the development of model villages. By adopting a village under this initiative, an MP has the opportunity to directly benefit all sections of a village community in an integrated, efficient and participatory fashion. The following sections in this brief highlight the important objectives that a model village could achieve and covers the core features of a model village in India.
- Section 6 covers the important guideline under the new "SANSADADARSH GRAM YOJANA". It is well surveyed that 68.9% of our populations lives in rural areas (census 2011). Through the number is estimated to fall in the coming years, it is still anticipated that more than half of our population would be rural even in 2050. Despite that being several past initiative by governments at all level-central, state and local-in the past, the level of improvement has not kept pace.

Fig 1.3 Smart village

- In smart villages' excess to sustainable energy services acts as a catalyst for development enabling the provision of good education and health care, access to clean water, sanitation and nutrition, the growth of productive enterprises to boost incomes, and enhance securities, gender equality and democratic engagement.
- The idea of an "ADARSH GRAM" or model village has been explored earlier as well, most notably through the Pradhanmantri Adarsh Gram Yojana, launched by the central government in 2009-10. Thus scheme was implemented in pilot mode in 1000 villages of Assam, Bihar, Himachal Pradesh, Rajasthan and Tamil Nadu, with an allocation of Rs.10,00,000/- per village. This limit was later raise to Rs.20,00,000/- per village. The target villages under the scheme where those with more that 50% of the populations belonging to the Scheduled Castes(SCs).

1.2.4 Ancient history civil concept about Indian village/other countriesperspective about its new development

❖ **Mohenjo- daro location :-**

- Mohenjo – daro is located west of the Indus river in Larkana district, Sindh, Pakistan, in a central position between the Indus river and the Ghaggar – Hakra river. It is situated on a Pleistocene ridge in the middle of the flood plain of the Indus river valley, around 28 km from the town of Larkana.

❖ Architecture and urban infrastructure :-

- Mohenjo – daro has specific planned layout with straight line buildings which are arranged on a vast grid plan. The houses are generally made up of fired brick and other part of bricks are made up of mortar. Even rest of other construction work is filled up by sun dried mud bricks and wooden superstructure. Approximately 300 hectures are acquired by the construction of Mohenjo – daro. One survey of Oxford Handbook of cities in the World History shows that, there were around 40,000 people living in Mohenjo – daro.
- The cities is totally divided in two equal parts. One part is called as Citadel and another part is called as Lower city. The specialization of Citadel is mud – brick mound around 12 meters and it is also known as public support bath. The overall construction of Mohenjo – daro has 5000 native population and have two main assembly hall. The city is constructed with central well at the middle of the city, even though every single houses has their owe small private well.

Fig 1.4 Ancient History civil concept

Fig 1.5 View of Mohenjo Daro

❖ How to develop the ideal village :-

- Firstly, in ideal village several basic facilities should be adequate such as road connectivity, public toilets, banking facilities, 24/7 electricity availability, solid waste management, ATM, Primary Health Center, bus stand, police stand, post office, CCTV surveillance, schools and many more.

- The listed facilities should be constructed as sustainable structure as a possible and it will be more in use likewise consider in future expectations.
- The main duty of taking proper care and routine maintenance of the facilities goes to native living as well as non living people of village too.
- The village should have better health facilities especially for maternal and child health.
- The village should have better education facilities through which children get acquire higher education in term of theoretical as well as practical. Due to having enough education, children would have better luxurious lifestyle in future.
- The village should have capacity of different commercial building to fulfill the requirements of stakeholders and also beneficial to increase the overall employment ration at high level.
- The village should do daily cleaning of water tank and other water storage places, therefore there are less chancing of spreading of health related diseases.

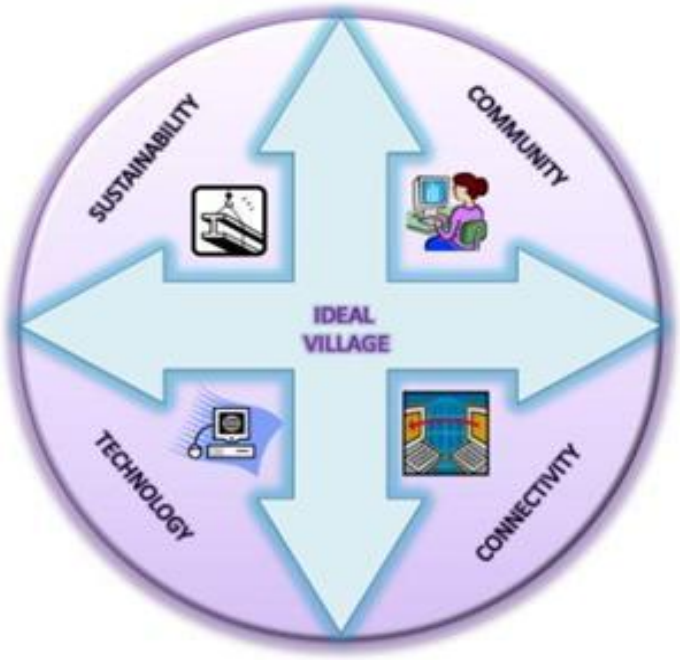

Fig 1.6 Ideal village concept

1.3 Detailed study:-

1.3.1 Physical and Demographical Growth

- The village has several education facilities such has 8 Anganwadi, 2 Primary School, 2 Secondary School, 1 Higher Secondary School and 1 mini ITI Collage.
- The whole road network is totally made of Reinforced Cement Concrete in this village.
- The village has several transportation facilities such as private vehicle, auto rickshaw and public bus which are highly used by native people.
- Generally we found the normal villages are facing problems regarding cut down power of electricity but in this specific village, 24/7 hours electricity supplied for domestic as well as other purposes.
- All the street lights of road are LED.

❖ Demographical details:-

Table 1.1 Demographical Growth

Sr. No.	Census	Population	Male	Female	Total house holds
1	2001	4,375	2,456	2,279	-
2	2011	5,100	2,653	2,447	1,109

❖ Geographical details :-

Table 1.2 Geographical Growth

Sr. No.	Description	Information/Detail
1	Area of village (approx.)	1395.65 hector
2	Agriculture land (approx.)	1015.63 hector
3	Residential area (approx.)	18.51 hector
4	Waste land (approx.)	142.06 hector
5	Other (approx.)	219.45 hector
6	Coordinates for location	23.3926° N, 73.1128° E

❖ Economic profile :-

- In this village there are three major occupation are available, which are as follow;
  1. Business
  2. Agriculture
  3. Animal bleeding

- Majority of villagers are depend of farming and it is the main source of income. If I look in to details, more than 85% people are involved in agriculture and dairy farming and part of 10% people are willing to go to Himatnagar for work.

❖ Social scenario / profile :-

- In village there is all caste people are available.
- Panchayat meeting is occurs every 1 to 2 months.
- One community hall is also available in the village.
- All people are living like as family.
- Availability of public library with daily newspaper supply.

Fig 1.7 Mobile Library

❖ Infrastructures facilities (All Types) :-

- The village has pucca 1109 houses.
- The village has post office.
- The village consist of various facilities like Bank, ATM, Public toilet, Community hall, Primary Health Center, Bus station and General market etc.

Fig 1.8 Punsari village infrastructure facilities

1.4 SWOT analysis of ideal village :-

❖ Strengths :-

- Better education system
- Availability of enough agricultural land
- Good infrastructure facilities
- Availability of profiling land
- Post office
- Primary Health Centre
- Banking faciliti

❖ Weakness :-

- Lack of necessary funding
- Recreational facilities

❖ Opportunity :-

- Well educated families
- Government schemes
- Road connectivity

❖ Threats :-

- Job insecurity
- Less women empowerment

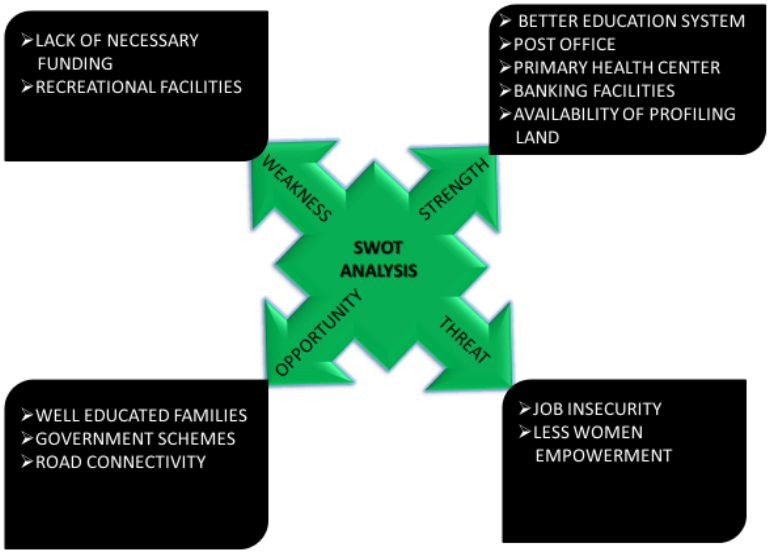

Fig 1.9 SWOT analysis

1.5 Future prospects of development of the ideal village :-

- The community of punsari village have future plan to pursue maintenance for bio gas plant and they want to implement solar street light which would be beneficial for them by saving extra electricity expenses.
- The villagers also have future plan of developing the village by inducing various technologies like rain water harvesting system which would advantageous for native people by saving rain water in rainy season and would definitely use in period of shortage of drinking water and also could be use as other different purposes likewise agricultural purpose.

1.6 Benefits of the visits of ideal village :-

- From the visit of this village we get the actual relevant and appropriate ideas of developed village.
- By visiting this village we understand the situation of real time which happen in the village.
- We definitely get assured about important idea which help us about how to develop village better than normal village.
- We deeply understand the SWOT analysis of the village.
- We can get relevant ideas regarding which types of basic amenities would be beneficial for overall growth of villagers.
- We learned different scenario which we faced while visiting and communicating with their native villagers.
- We also gain the knowledge of how to develop the village by using relevant government various schemes.
- We learned the basic facilities required for actual development of village rather than unnecessary development of irrelevant facilities.

1.7 Civil aspects required in ideal village :-

- Usually we can see that every villages have several problems such as drainage related problem, drought issues, electricity problems, water logging issues, road network connectivity issues and many more. The problems may arise due to lack proper management of different things in simple and easy ways.
- Generally there are also relevant solution which mitigate the causes of the situation which are happing in normal villages.
- According to civil, there are numerous aspect which are really likely to required in ideal village such as air pollution and its control, E-waste disposal, green building,

rehabilitation techniques, rain water harvesting system, zero energy building and many more.

- Generally, individuals of native village face water harvesting problems due to having less quantity of water compare to have vast land for farming. Not only in villages but unfortunately, the water demand is more likely higher than the supply of water from different sources such as from canal, khet talavadi, under ground sump storage, public overhead water tank and so on.
- To mitigate the issues of water problems, rain water harvesting system should be adopted in village at each and every places.
- Rainwater harvesting on roads and highways is the accumulation and storage of rainwater for reuse on site, rather then allowing it to runoff. Rainwater can be collected from roads and highways and from many places, the collected water is redirected to deep pit (well, shaft or boreholes), a reservoir with percolation, or collected from dew of fog with nets or other tools.
- Its uses include water for gardens, livestock, irrigation, domestic uses with proper treatment, indoor heating for houses etc. The harvested water can also be use as drinking water, longer term storage and for other purposes such as ground water recharge.
- The rainwater harvesting can be utilize in houses by constructing deep well and the water stored in well can be use in different uses like drinking water, washing clothes, bathing purpose and other also domestic purposes.

Chapter 2. Moti devti literature review :-

2.1 Introduction : Urban & Rural village concept

❖ Urban area :-

- An urban area has almost all kind of basic amenities to fulfill the routine need of every human being such as well educated education system, good health facilities, better financing service centers, good employment ratio.
- Moreover the people who are living in cityside have non agricultural job such as curriculum jobs.
- Generally urban areas are very developed likewise the area have good commercial centers, luxurious bungalows, long lasting roads, bridges and railways.
- Urban areas are directly connected to different major places like cities, towns and suburbs, through which the connectivity of transportbetween to different places become much more convenient and faster.
- In urbanism, the term contrast to rural areas such as villages and hamlets while in urban sociology or urban anthropology it contrasts with natural environment.

❖ Rural area :

- Usually, villages have less population compare to urban areas. The main reason behind this massive problem is that majority of people are migrating to urban areas such as mega cities due to not having proper facilities to fulfill their basic needs.
- Rural areas may developed randomly where the flora and fauna are available more for proper agricultural purposes only in particular region.
- While urban areas arrangement are more proper, preplanned and build up according to a process called as urbanization.

Fig2.1 URBAN AREA

Fig 2.2 RURAL AREA

2.2 Importance of rural development

- There are several advantages of rural development such as the scenario of migration from rural area to urban area may decrease due to implement of different activities which are really necessary in the villages.
- Individuals fail to loss the interest of living hood of city areas if the same systems and facilities may take place in the village.
- The main drawback of leaving the rural areas is due to not having proper education system in the villages, therefore parents have worry regarding the bright career for their children and they migrate to urban area to fulfill the basic requirements of education.
- However, if village has same education system like urban areas then the development of rural areas would be beneficial.

2.3Ancient Villages / Different Definition of: Rural Urban Villages

- Rural areas can be seen different to the urban areas easily. Generally rural areas have facilities like Primary Health Center, primary school.
- Moreover the overall living standard of their native people is very low and most of rural area population are living under below poverty line.
- Rural area can be defined as the particular area which have 70% populations are depends only on agricultural activities.
- Urban area can be defined as the area where majority of population are doing non agricultural job, even each and every facilities are available within doorstep of citizen.

2.4 Scenario: Rural / Urban village of India population growth

❖ Population growth of India:

- Population has been increasing day by day. For the first time since independence, the absolute increase in population is significantly more in urban area rather than rural area.
- The data analysis shows that rural area have 68.84% population while the urban area have 31.16% population.

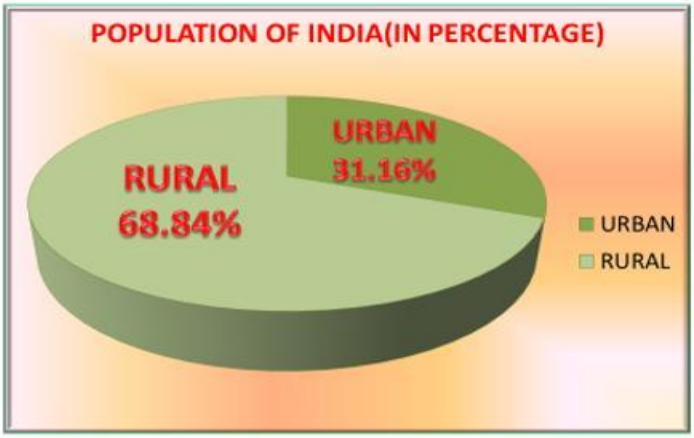

Fig 2.3 Population growth of India

- The urbanization level has been increasing significantly from 27.81% in census 2001 to 31.16% in census 2011.
- However there is clearly drastic decrease in the population od rural area likewise the decrease number are from 72.19% to 68.84%.

Table 2.1 Population of India

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

2.5 Scenario: Rural / Urban village of Gujarat population growth

- As per details from record of census 2011, Gujarat state has total population od 6,04 crores, while there are total figure of 5.07 crore population in census 2001.
- If I look into detail, the total population of Gujarat state as per census 2011 is 60,439,692 of which male are 31,491,260 and female are 28,948,432.
- While in 2001, total population was 50,671,017 in which males were 26,385,577 and females were 24,285,440.
- The total population growth in this decade was 19.28 percent while in previous decade it was 22.48 percent. The population of Gujarat forms 4.99% of India in 2011. While in 2001, the figure was 4.93%.

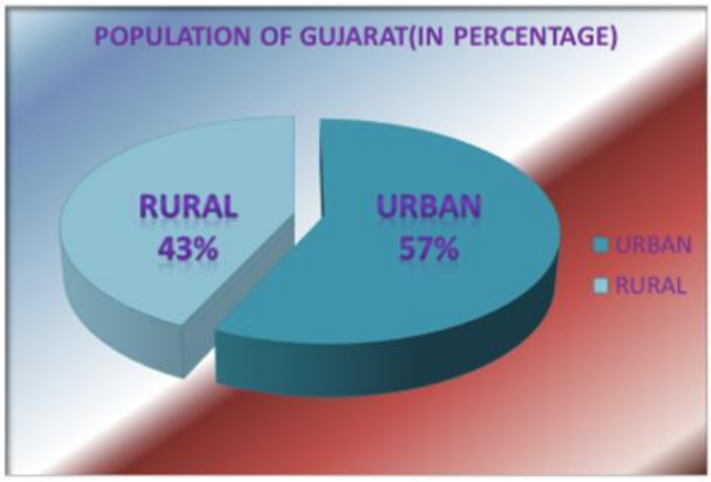

Fig 2.4 Population growth of Gujarat

Table 2.2 Population of Gujarat

Description	Rural	Urban
Population	57.14	42.60
Total population	34,649,609	25,745,083
Male population	17,799,159	13,692,101
Female population	16,895,450	12,052,982

Population growth	9.31%	36.00%
Sex ratio	949	880
Literates	21,420,840	19,672,516
Average literacy	71.71%	86.31%

2.6 Rural development issues – causes – measures

- The rural areas area facing different kind of problems and some of those seem to be unnoticeable. Generally rural area has several obstacles which make other people to migrate to urban side.
- It is clearly observe that approximately 60% to 70% are lining in rural primitive condition in India. The same situation has been increasing day by day even after completing above 70 years of independence of India.
- There are numerous obstacles behind the overall development of rural area which are given below:
  - This is particularly shown in the disparity of economic and cultural development between rural and urban areas. It is mainly done because of the dual segmentation based on the household segmentation system.
  - The native people of rural area have been migrating to urban area due to less education facilities and also lack employment to survive for routine life.
  - Still majority of villages did not have basic required technology like cooking and proper living.
  - Usually, there is lack of electricity supply every time.
  - There are also some village at where there is no transportation facilities available for convenient transport.
  - Lack of sanitation
- The main aim of rural development is to decrease the ratio of people who are living below poverty like by providing goof employment facilities.
- This has been also vocalized in the policy of the government which said: Rural poverty alleviation has been the primary concern in the economic planning and development process of the country rural development which encompasses the entire gamut of improvement in the overall quality of life in the rural areas can be achieve through eradication of poverty in ruralareas.
- The major occupation of villagers is agriculture, thus Growth of village is also depend upon development of agriculturesystem.
- By Various measures for the improvement of regional structures (land consolidation, ruralroad construction, village development) were merged and expanded strategicelements.

- To provide financial assist to develop the artisans in the rural areas, farmers and agrarian unskilled labor, small and big rural entrepreneurs to improve theireconomy.
- To provide minimum facility to rural mass in terms of drinking water, education, transport, electricity andcommunication.
- The rural development consists of different terms such as culture, society, economy, technology and health.

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

Table 2.3 Norms for villagers

Facilities	Planning Commission/UDPFI Norms
Education	
Aanganwadi	**Each or Per 2500 population**
Primary School	**Each Per 2500 population**
Secondary School	**Per 7,500 population**
Higher Secondary School	**Per 15,000 Population**
College	**Per 125,000 Population**
Tech. Training Institute	**Per 100000 Population**
Agriculture Research Centre	**Per 100000 Population**
Skill Development Centre	**Per 100000 Population**
Health Facility	
Govt./Panchyat Dispensary or Sub PHC or Health Centre	**Each Village**
PHC & CHC	**Per 20,000 population**
Child Welfare and Maternity Home	**Per 10,000 population**
Hospital	**Per 100000 Population**
Public Latrines	**1 for 50 families (if toilet is not there in home, especially for slum pockets &kutchha house)**
Transportation	
Pucca Village Approach Road	**Each village**
Bus/Auto Stand provision	**All Villages connected by PT (ST Bus or Auto)**
Drinking Water (Minimum 70 lpcd)	
Over Head Tank	**1/3 of Total Demand**
U/G Sump	**2/3 of Total Demand**
Community Hall	**Per 10000 Population**
Community hall cum Public Library	**Per 15000 Population**
Cremation Ground	**Per 20,000 population**
Post Office	**Per 10,000 population**

Gram Panchayat Building	**Each individual/group panchayat**
APMC	**Per 100000 Population**
Fire Station	**Per 100000 Population**
Public Garden	**Per village**
Police post	**Per40,000Population**

2.8 Other projects/ schemes of Gujarat/ Indian government

❖ Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA):

- Mgnrega was released on 2 February 2006 as a momentous pro-poor initiative growth. For the first time, rural communities have been given not just a development program but also a regime of rights.
- The National Rural Employment Guarantee Act,2005 (NREGA) guarantees 100 days of employment in a financial year to any rural household whose adult members are willing to do unskilled manual work.
- Before this scheme, the workers have permit to do work 100 days in year but after introducing this scheme the workers can pursue work 150 days in year and also the decent wages also increase from 182 to 202 Rs.
- If worker do not have any work in their daily routine then also government provide allocated decent wages to workers if they do not have any work.

❖ Pradhan mantriadarshgram sadak yojana:

- This scheme is a countrywide plan in India to provide good all-weather road connectivity to independent villages. This Centrally Sponsored Scheme was introduced in 2000 by the Prime Minister of India Shri Atal Bihari Vajpayee.

❖ Saansad Adarsh Gram Yojana Gram Pamchayat:

- Saansad Adarsh Gram Yojana is a rural development program have main aim to focus on the village development which consist of social-infrastructure development, socio-cultural development. The program was launched by our Prime Minister of India Narendra Modi on the birth anniversary of Jayaprakash Narayan, on 11 October, 2014.

➢ Objectives :-

- The development of model villages which are generally called as Adarsh Grams, through the innovation of existing schemes and certain new initiative to be planned for the local context, which may differ from villages to villages.

- The new creation of local model development which can be easily simulated in different villages.

Table 2.4 Government Schemes

Scheme	Sector	Provision
Central Government Health Scheme	Health	**Comprehensive medical care facilities toCentralGovernment employeesandtheir family members**
Mahatma Gandhi National Rural Employment Guarantee	Rural Wage Employment	**Legal guarantee for one Hundreddaysofemployment in every**
DeenDayalUpadhyay Gram Jyoti Yojana	Rural Power Supply	**It is a Government of India program aimed at providing 24x7 uninterrupted power supply to all homes in Rural India**
Pradhan Mantri Adarsh Gram Yojana	Model Village	**Integrated development of Schedule Caste majority villages in four states**
Rajiv Gandhi Grameen Vidyutikaran Yojana	Rural Electrification	**Programforcreationof RuralElectricity Infrastructure**
ACT		**Financial year to adult members of any rural household willing to do public work-related unskilled manual work at the statutory minimum wage ofRs.120per day in 2009 prices**

Chapter 3. Smart city / village concept idea and its visit

3.1 Introduction: Concepts, Definitions and Practices

❖ Concepts :-

- The main concept of smart village is to collect relevant community efforts and strength of native people of the villager from various streams and lastly integrate with information technology to serve essential benefits to rural area.
- Based on exploration of various disciplinary areas, there are mainly 8 factors such as policy context, technology, governance, people and community, management and organization, economy, natural environment and built infrastructure form the integrative agenda which examine that how local government are imagining the smart city/village initiatives.

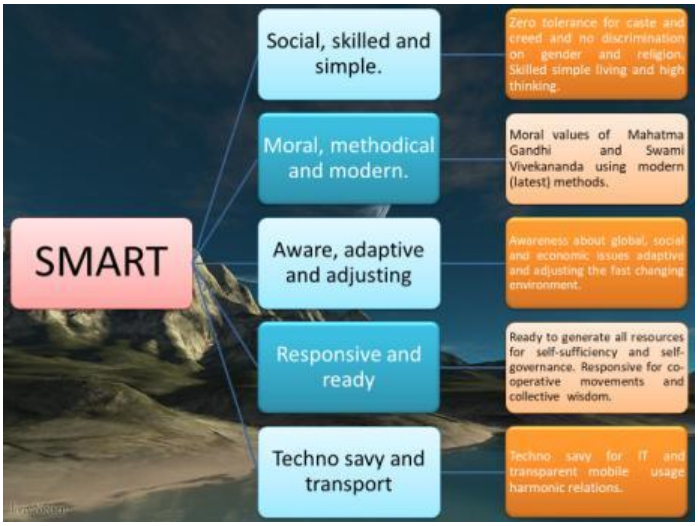

Fig 3.1 Smart city concept

❖ Definition:-

- The village has access to sustainable energy services acts as catalyst for development including better health care, access to clean water, the growth of productive enterprises to boost incomes, sanitation and nutrition, gender equality and enhanced security is termed as smart village.

❖ Practices:-

- The components taken into consideration will vary from region to region for villages which are based on the available resources and opportunities.
- Following are some generalized guidelines for the development of smart villages.

1. Economic Component: This component will include local administration and economic factors. It will cover governance models, bandwidth, mobility, cloud computing, entrepreneurship etc.
2. Environmental Component: This component will address the issues related to resources and infrastructures available at local level. It may covers cleaner

technologies, public and alternative transportation, green spaces, smart growth, climate change etc.

3. Social Component: This component may address issues related to community life, participatory democracy, social innovation, proximity services etc.

Fig 3.2 Core of Smart village

3.2 Vision-goals, standards and performance measurement indicators

Table 3.1 Different parameter and standards

Sr.No.	Parameter	Standards
1.	Electricity	• 100% households have electricity connection 24*7 supply of electricity • 100% metering of electricity supply • Tariff slabs that work towards minimizing waste
2.	Water supply	• 24 x 7 supply ofwater • 100% household with direct water supplyconnections • 135 liters of per capita supply ofwater • 100% metering of waterconnections • 100% efficiency in collection of waterrelatedCharges
3.	Health care	

		• General Hospital - 500 beds per lakhpopulation10020Family Welfare Centre for every50,000residents • Availability of telemedicine facilities to 100%residents • 30 minutes' emergency responsetime • 1 dispensary for every 15,000residents • Nursing home, child, welfare andmaternity, • center - 25 to 30 beds per lakhpopulation • Specialty Hospital - 200 beds per lakhpopulation
4.	Strom storage	• 100% coverage of road network with storm water drainage network • Aggregate number of incidents of water logging reported in a Year = 0 • 100 % rainwater harvesting
5.	Spatial planning	• 175 persons per Ha along transit corridors. • 95% of residences should have daily needs retail, parks, primary schools and recreational areas accessible within 400m walking distance. • 95% residences should have access to employment and public and institutional transport
6.	Transport	• Maximum travel time of 30 minutes in small & medium size cities and 45 minutes in metropolitan areas. • Continuous unobstructed footpath for 2 m wide oneither side of all street with Row 12 m more • Dedicated and physically segregated bicycle tracks with width of 2 m or more, one in each direction, should be provided on all streets with carriage way larger than 10 m • High quality and high frequency mass transport within 800 m (10-15-minute walking distance) of all residences in areas over 175persons / ha of built area
7.	Sewerage	

	&sanitation	• 100% households should have access to toilets • 100% schools should have separate toilets for girls • 100% households should be connected to the waste water network • 100% efficiency in the collection and treatment of waste water • 100% efficiency in the collection of sewerage network
8.	Solid management	• 100% households are covered by daily door-step Collection system • 100% collection of municipal solid waste • 100% segregation of waste at source, i.e. bio-degradable and non-degradable waste 100% recycling of solid waste

3.3 Technological option

Fig 3.3 Technological option of smart village

3.4 Road map and safeguards

- The smart city proposals are being evaluated by the Ministry of Urban Development(MOUD) shows that various number of cities and villages have proposed to be smart one in near future.

- However, before building smart cities and villages, it should be well planned and examine their co related factors which ultimately beneficial to not on government but also for live hood of society.
- Other factors also considered in the investigation likewise study of community about their education, hobbies, unique qualities and many more.
- The smart city mission has mainly two components such as area based development and pan city development. In area based development, smaller areas within the city in are accounted in the investigation of smart cities and villages mission while on the other side one main idea is directly implemented on all over the villages and cities.

3.5 Issues & Challenges

- Normally, there are many issues and challenges which involved while making any normal village or city as smart one such as funding, technology, regulation, education and job opportunity and many more.

- **Technology:-**

  - ✓ There are certain technologies required to make any village and city smarter one but adopting new technologies are very much expensive. Due to the advance technologies, it involve several borrowing money from different factors to complete the necessary demand for development of village and city. Another challenge is in the discovery of technology and the need for a medium that can bring technology users and creators together to adopt faster platforms.

- **Education and job opportunity:-**

  - ✓ The majority of villages have been facing several issues regarding education system in the village. As it is clearly seen that level of education is comparatively low in villages compare to urban areas. The education system should be changed which would directly make village part of smart one.
  - ✓ The building of smart learning environments for citizen will provide individuals more opportunities to learning easy, engaged and effective, and therefore provide wisdom into the creativity of the wholecity.Smart learning is an important support to bridge educational systems and citizen living experience.
  - ✓ These jobs will obviously be ‘smart’ and focus on skills including data analytics, programming, high-end consulting, and system and network integration. The future of a smart city is reliant on human talent and skills, making job creation one of the biggest benefits. With IT infrastructure being

the backbone of any smart city, IT professionals will certainly be in greaterdemand.

- **Government issues:-**

  - ✓ Having a set of investors, it require large number of stakeholders to deal with regular issues faced by community. In case of any cases, there is essential requirement of legal framework in the proper steps of smart city mission. Moreover, the need of relevant communication between central, state and local governments would be increase.

3.6 Smart infrastructure - Intelligent Traffic Management

- Making smart village consist several matters which should be in account while implementing any new development in the village. The main problem which is going on each and every cities and villages that is traffic problems.
- As traffic has been increasing day by day due to increase of mobility vehicles in daily routine life and also increase of population also plays significant role to cause traffic issues at everywhere.
- The smart village should be designed with the consideration of traffic and it should be reduced by implementing intelligent traffic management system which would definitely beneficial to all local people.
- Intelligent traffic management consist of different aspects such as sensor traffic lights, proper parking facilities, adequate place for parking, smart and easy regulatory equipment and many more.
- Smart infrastructure provides the foundation for all the key themes related to a smart city, including smart people, smart mobility, smart economy, smart living, smart governance and smart environment.
- Smart Information and Communications Technology (smart ICT) has the potential to transform the way we plan and manage infrastructure. New application and software are changing the face of infrastructure development sector and society as well as increasing productivity of driving safely and efficiently.
- The central characteristic that underlies most of these components is that they are connected and that they generate data, which may be used intelligently to ensure the optimal use of resources and improve performance.
- A smart system uses a feedback loop of data, which provides evidence for informed decision- making. The system can monitor, measure, analyze, communicate and act, based on information captured from sensors. Different levels of smart systems exist.

- The intelligent would collect the data of people's performance data which would analyze and help full in the new development of future designs.
- Moreover, it may collect the data and then process that data to present information to people about taking decisions. For example, the system will give relevant information of ongoing traffic and congestion of particular road on which the owner of vehicle want to travel for their comfort.
- This system is very use full as it will reduce the presence of human work in traffics issues and the work efficiency would increase safely and conveniently to serve the local people of village.
- There are examples of each level of smartness already operating, but the same principles can be applied far more widely across interconnected and complex infrastructures.

Fig 3.4 Smart infrastructure

3.7 Cyber Security

- The privacy of smart village technologies can be safe with the help of cyber security involvement in the village. As cyber security would protect the whole developed system against the international attacks and accidental threats.
- The smart village has many risks of threatening the data of old software design due to contain of legacy components in the system as well as vulnerabilities. However, to mitigate this massive cyber attacks, the invention of technology solution by adopting cyber security become necessary.
- The main object of cyber security is to serve better security postures for computers, mobiles, networks and other devices which store the data on the listed devices from cyber crimes with malicious intent.
- Cyber security is the protection of inter connected systems such as software, hardware and other data from cyber crimes.

- Cyber security in the context of smart cities is a hot topic. The objective of Smart Cities is to optimize the city in a dynamic way to offer a better quality of life to the citizens through the application of information and communication technology (ICT).
- The range of areas where cities can become smarter is extensive: it is an evolution of "Connected Cities" with the prevalence of data exchange at a larger scale.
- The main aim of introducing the cyber security is to protect each and every attacks of cybercrime and make it cyberattack free.

- **The cyber security includes :**

1. Encrypting data in storage, transit and use.
2. Defining and implementing privileges for computing resources.
3. Security networks with techniques such as a network perimeter.
4. Internal controls.
5. Securely identifying people and digital entries.
6. Running untrusted software in virtual network where it can do no harm.
7. Security by design.
8. Secure testing.
9. Secure coding.

3.8Retrofitting-redevelopment-greenfield development district cooling

❖ Retrofitting :-

- Retrofitting of any building is the process of something after it has been constructed or manufactured.
- Retrofitting of any R.C.C member is to regain the strength of that structural member which would be deteriorated and to prevent the stresses which are induced by the seismic activities like seismic waves, ground motion or soil failure due to earthquake.
- The strength deficiency of any R.C.C. building or structural member is due to poor workmanship, design error bad supervision of engineers, and also bad material which are used for that structural member.
- In smart cities there are many problem which are faced by engineers and contractors to proposed any new building or reconstruction of any old building. At that time the processes of retrofitting is used it helps in economical as well as time saving and safe process.
- Retrofitting includes addition of infill wall, Addition of shear wall, addition of steel bracing, addition of frames and buttresses, etc.

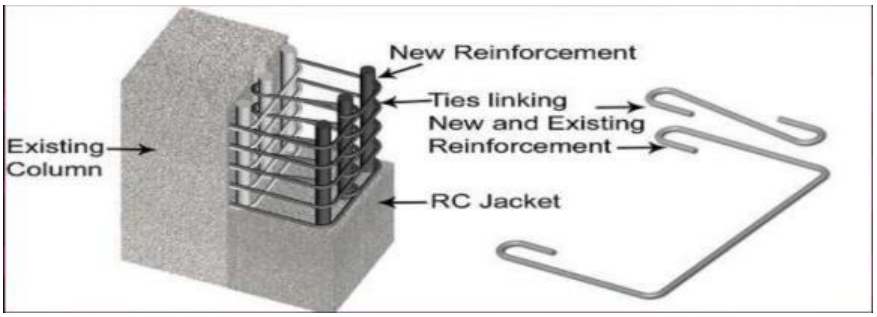

Fig 3.5 Retrofitting

❖ District heating and cooling :-

- The concept of smart village also accomplish the need water hot and cool water according the preferred weather condition. Moreover, the system should be at such level so that every individuals take benefits from the system.
- The heating system consist of main chamber in which the water is boiled with the use of different primary sources such as coal, wood, biogas, biomass and many more.
- Among the primary sources the main effective and cheapest source is solar panel through which we can get abundant heat of sun and which transferred into electricity unit production though which hot water can be formed easily.
- A heat network generates and distributes heat in the form of hot water and superheated stream using one or more generating units.
- The hot water supply system consist of long pipe established throughout the area in which the hot water would be distributed.
- The main end is connected to main chamber through which the hot water would supply according the demand of people.
- This enlarged hot water system would reduce the overall cost of individual usage and helpful to each and every native people at very low cost.
- On the other side, the cooling water system convert water from hot to cool according to the preference of people while using water at home.

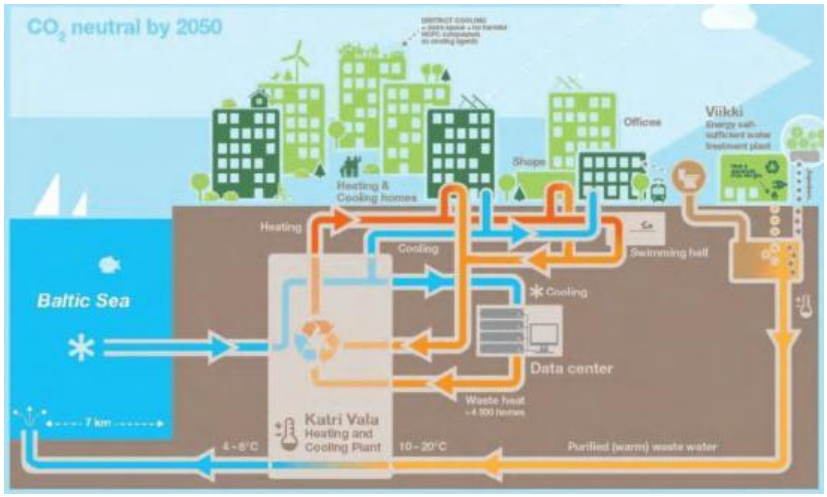

Fig 3.6 District heating and cooling

- The cool water pipeline would installed in the same manner but quite far from hot water pipeline throughout the village.
- A cooling network is a centralized system that provides chilled water to supply an air conditioning system.
- In practice, it includes chilled water production and distribution facilities to provide cooling services to all connected buildings.
- Operating as a closed circuit, the cooling network always includes two pipelines: one supplying chilled waterto users, and the other returning the water to the productionplants.
- Due to this type of new invention, villagers would get two types of water at their home without having burden of money for using two type of facilities simultaneously depending upon their choices.

3.9 Strategic options for fast development

- There is no definition of Smart city but it can be generally define as the urban area which can be developed by sustainable economic technique and high quality of life by multiple key areas like economic, environment, people living standard, mobility and government businesses.
- The smart city is that type of urban area in which electronic data which is collected by electronic data collection sensors and supply this whole information to manage resources efficiently.
- The fast development of any smart city is done by several activities liketo improvement of city (retrofitting), renewal of any

Fig 3.7 Strategic options

- city component (redevelopment) and to extend any city area (development of Greenfield) and the smart solutions are applied to cover the large area of the city.
- The basic points which are kept in mind when the city is developed as smart city and the points are the key features of smart city, how to develop city area and also Greenfield of the city, city challenges and problems and their smart solutions, etc.
- Responsibilities of smart cities:-
  - Qualitative water provision
  - Waste water treatment plant and sewage provision
  - Slum area upgradation
  - Primary education
  - Health care centers
  - Solid waste management
  - Public toilets
  - Maintenance of cremation ground
  - Public buildings like library, post office etc.
  - Banking facilities
  - Public garden and parks
  - Paid parking facilities in city core area

- Sources of finance:-
  - Property taxes
  - Advertisement taxes
  - Users taxes
  - Entertainment taxes
  - Tall taxes
  - Parking taxes
  - Public Private Partnership (PPPs)

3.10 India's urban water and sanitation challenges and role of indigenous technologies

- The technologies should be adopted to treat the waste material along with spreading awareness for achieving the target of cleanliness. There are various types of technologies which treat the waste materials.
- Moreover, there are several drawbacks for that technologies such as it might very expensive, very tricky to understand and large in size.
- However, there is one solution to mitigate the cause as indigenous technologies are very easy it understand and also very cheaper in cost even quite less space required.

- In this regard, a National workshop on Indigenous water, Wastewater and Solid Waste Treatment Technologies was organized by the Department of Atomic Energy (DAE) in January, 2015 at Gujarat Technological University (GTU) in Ahmadabad.
- The objective of the workshop was to disseminate indigenous technologies of water, wastewater and solid waste treatment developed by the Bhabha Atomic Research Centre (BARC) under "Swachh Bharat Abhiyan" and to bridge gap between the research at the research centers and the practical application of thetechnologies.

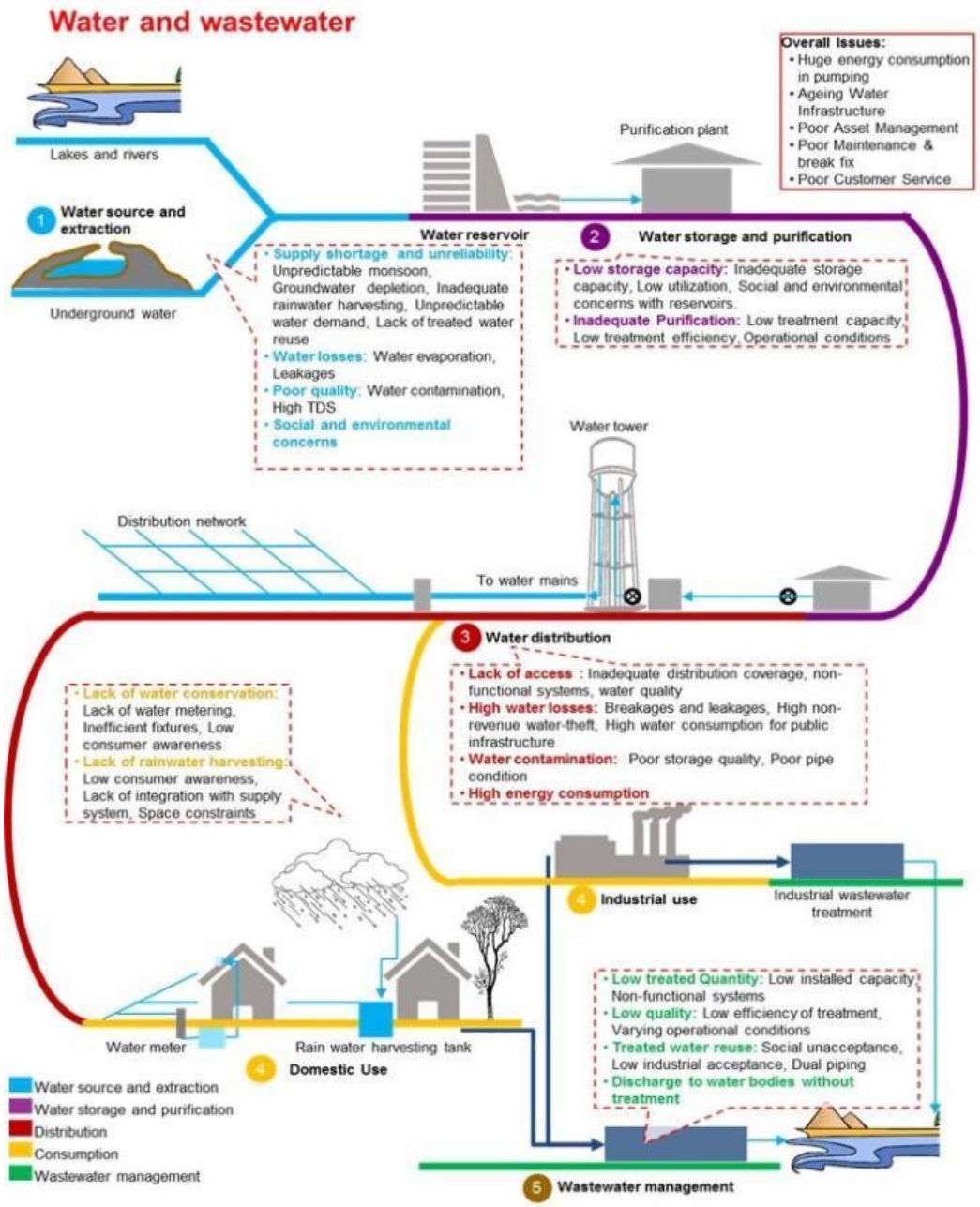

Fig 3.8Waste water management

3.11 Initiatives in village development by local self-government

- As discussed in Section 5, India's urban institutions do not have the capacity to provide adequate services at present, let alone address the requirements of accelerated urban growth in the future. Proposals relate to three types of institutions.
- According to the brief note shared by the ministry, members of parliament (MPs) from both houses will be the key drivers of this scheme with a mandate to initially adopt one village each that would be developed into Adarsh grams (model villages) by 2016.
- Developed a 35 point outcome indicator covering basic amenities, education, health, sanitation, livelihood, women empowerment, financial inclusion, food security, social security and e-governance to gauge the impact of SAGY in the GramPanchayats.
- Having moved a step ahead with the release of the draft concept note on the smart city scheme, the government is geared up to launch the SansadAdarsh Gram Yojana (SAGY) on Saturday at a function to celebrate the birth anniversary of JayaprakashNarayan.

3.12 Smart initiatives by district municipal corporation

- Majority of villages have been facing big issue that management of solid waste,this concern is not for only health problem but it become a serious issue as people resort to violent methods to protest waste being dumped in their backyard.
- But due to having concrete jungle everywhere around the city, it become quite difficult to store in particular place and dispose the waste.
- The Council has listed some of the proven examples that can be considered for tackling such a sensitiveissue. Managing solid waste is a daunting task for every urban local body (ULB) in India.
- The irony is such that out of 400 municipal corporations and councils in India, only a handful of ULBs are managing their solid waste management, while reinventing some of the age-old garbage disposal methods with a touch of new technologies.
- India's urban population growing at 3-3.5 per cent annually, the waste generated by cities is expected to increase by 5% every year.
- A survey by Delhi-based non-profit Centre for Science and Environment (CSE) attempts to find this out. In a unique method, CSE first solicited nominations from people and environmentalists on cities they think are managing their wastes well.
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- At present, the Pune Municipal Corporation (PMC) has combined an integrated approach with decentralized waste management by installing 25 bio-methane plants that produce 600 kW of electricity and compost as a by-product.

3.13Any projects contributed working by government / NGO / Other digital country concept

- The government introduces several project in the village for the overall development of village and also based on the public requirements.
- The Council has listed some of the proven examples that can be considered for tackling such a sensitiveissue. Managing solid waste is a daunting task for every urban local body (ULB) in India.
- The irony is such that out of 400 municipal corporations and councils in India, only a handful of ULBs are managing their solid waste management, while reinventing some of the age-old garbage disposal methods with a touch of new technologies.
- Smart City Framework: Turning Talk into Action At its core, a Smart City Framework is a simple decision methodology that enables both the public and private sectors to plan and implement Smart City initiatives more effectively. Most cities actually undergo this process in an intuitive way rather than in a clearly structured manner.

- Some works done by the government which are listed following :-
  1. Solid waste management
  2. Good road connectivity
  3. Health care facility
  4. Good drainage
  5. Social facilities
  6. Fire station

3.14How to implement other countries smart villages projects in Indian village context (Regarding Environment , Employment)

- To implement new innovative projects in India, it require fund for different type of aspects and also some changes required into the village to adopt new technology. By having proper fund through which villages would have several own businesses and people have chance to purse job at there, which ultimately increase the revenue of village.
- To decrease the massive effect on environment, the new developed smart technology should be implemented through which the pollution can be reduced.
- The case study of relevant village is necessary to accomplish the basic needs require in proper village for overall development of village.
- Before implementing any kind of technology or project, various factors should be checked before such as demand, supply and mane more.

Chapter 4. MOTIDEVTI VILLAGE

4.1 Introduction :-

4.1.1 Introduction of MOTIDEVTI VILLAGE

- The moti devti village is located in Sanand taluka, Ahmedabad district in state of Gujarat, India. The nearest town of moti devti is sanand which is about 6 k.m away from the village. There is beautiful village gate in the entrance of village. There is a big primary school which is very good condition. Moreover the literacy rate of village is very good around 70.28%. The bad things about village arethe gram panchayat building condition is verybad, the approach road is very bad,there is no drinking water facilities,only one hand pump is there. There is underground drainage system but not in working condition in whole village so many peopleface several problems.

Fig 4.1 Satellite view of Motidevti village

4.1.2Justification/ need of the study

Gujarat technical university is allowcated the significant and prestigious project under vishwkarma yojana in the technical year 2012/13. The basic need of study is to improve the lifestyle and provide the better facilities like water, drainage system,electricity, road network, education facilities, banking facilities etc. to the villagers. This project contains following things which will be proposed to the villagers.

- Physical infrastructure: water facility, drainage facility, road network facility etc.
- Socio cultural infrastructure: community hall, auditorium, public library, recreational facilities etc.
- Social infrastructure: school, primary health center etc.

4.1.3 Study area

- The Vishwakarma Yojana has main aim to develop all the rural villages. Therefore it become essential to get the relevant information from village to survey the better services which required to make the village just like smart village.
- Current status and technologic survey of villages which is given in terms of regular and public facilities, necessary commodities,other infrastructural amenities for the requirement of people and growth of the area with the consultation of Local revenue authorities, TDO and DDO which is classified as the future need of the villagers by keeping to mind the basicneedof community, future targeted growth of population, surrounding growth of town or Taluka placesetc.

4.1.4 Objectives of the study

- The main object of the study is to identify the village's condition and according to this the basic needs and requirement of villagers are fulfilled such as drinking water, health, road, solid waste management,drainage facilities etc.
  - Essential Sustainable Infrastructure such as Rainwater harvesting system, Biogas plant, street light amenities, eco-friendly toilet should be provided and ensure proper delivery of facilities to village dwellers.
  - Development of the villages with a rural soul and all otherfacilities.
  - To study the current growth, overall developmentofvillages.
  - By evolving strategic planning proposal in the terms of social, physical and renewable infrastructure facilities for the development of villages, channelizing urban growth and to sustainfuture.
  - Basic Socio-cultural Infrastructure – Community hall, Public library, recreation facilities must be the first priority and it should be well provided with every kind of basic facilities.

4.1.5 Scope of the study

- To provide basic amenities like drinking water, drainage system, primary health center, post office and many more.
- By providing new needy facilities that will definitely beneficial to village in near future in many ways.
- The GDP of our country will increase due to urbanization of the rural area as well as the migration rate will decrease and the employment rate will increase in rural area so the villagers do not have to find the job in nearby towns.
- From the gap analysis, overall development strategies for villagewill be proposed and planning proposals ofphysical infrastructure, Social Infrastructure and Renewable energy Source should be suggested for thevillages.
- The study will focus the development trend, intensity of growth of the village and find out the problems related to the physical development of the area and infrastructure services of the village.

- The project proposal and sustainability aspect is not considered in micro level, it is only guidingway through which each and every aspect of information and take relevant steps to develop rural area.
- Due to development of villages, there would be reduction in the migration ratio from rural area to urban area because villagers will get all kind of basic facilities which they want to acquire in urban area.

4.1.6 Methodology frame work for development of Motidevti village

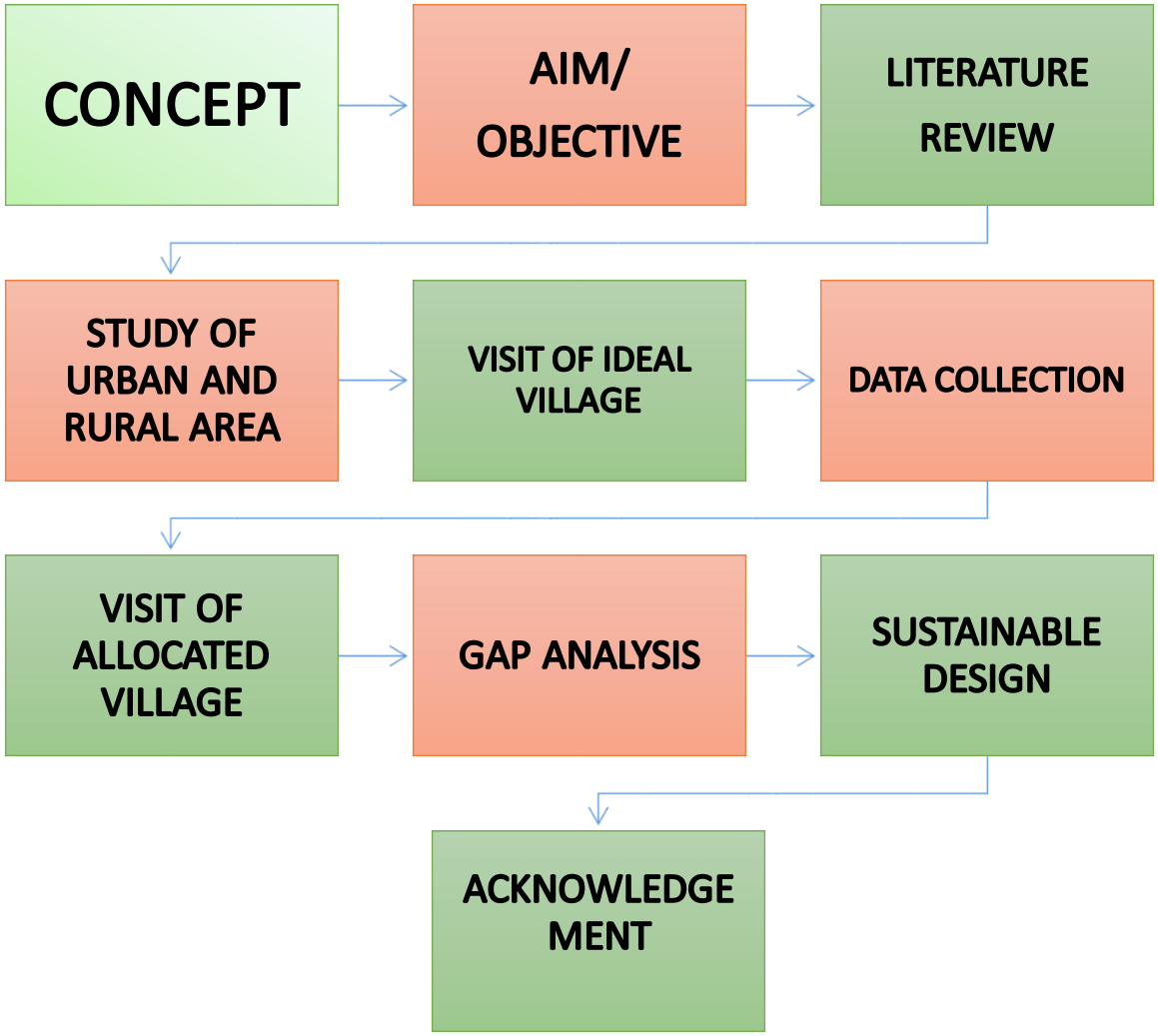

Fig 4.2 Flow chart of methodology

4.1.7 Available methodology for development of related to civil

- The village has several properties which are currently in very bad condition such as gram panchayat building, gram samajwadi, approach road.

- Gram panchayat building is available in village. However, the condition is very bad due to age of building. The reinforcement bars are easily seen in the roof and there may be damage any time if relevant precautions should not be taken properly.
- Due to not having proper safe gram panchayat building sarpanch and talati used to seat in other place and complete their regular duties.

Fig 4.3Gram panchayat building

Fig 4.4 Drainage condition

- The drainage problem also have been increase in the village as some part of village have drainage but rest of other parts does not have any drainage system so whole villagers are suffering from this massive problem.
- The approach road also in very bad condition. When we visited the village we showed that the road is almost broken at many place even the undulation may harm to physical problems such as back pain issues and also people get afraid to drive vehicles in night dur to bad condition of road because of undulation it may cause accident to road users.
- The native people of village also suffer from several basic problems such as public toilet is not available in village so people either go to farm or other places which causes pollution to others. Some people also feel hesitation when they come to this village for their own work and not having proper public toilet in village.

Fig 4.5 street road covered of mud and sand

- The inter street roads are in bad condition. Most of roads are covered by mud and sand which causes irritation to vehicle users to drive in that road and there are many chances of skid and slipping. However some area have paver block and some area have c.c. roads.

4.2 Motidevti village study area profile

4.2.1 Study area location with brief history land use details

- **Locality Name** **:** Motidevti
  City Name **:**Sanand
  District **:**Ahmadabad
  State **:**Gujarat
  Country **:**India
  Nearest town **:**Sanand 6 kms
  Area **:** 763.31 hectors
  Population **:**3232 as per 2011
  Language **:** Gujarati and Hindi, English
  Telephone Code / Std Code:02717

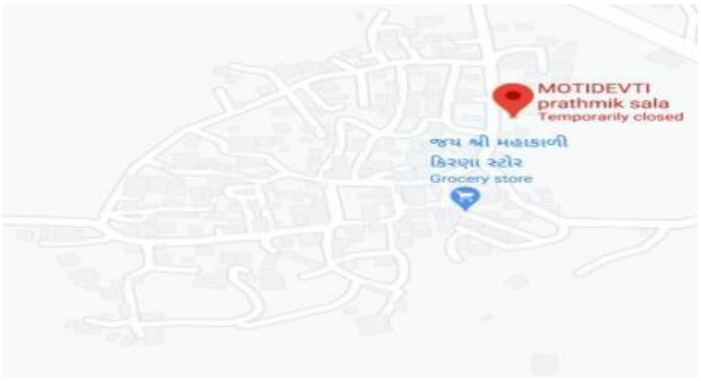

Fig 4.6 Map of Motidevti village

4.2.2 Base Location map, Land Map, Gram Tal Map

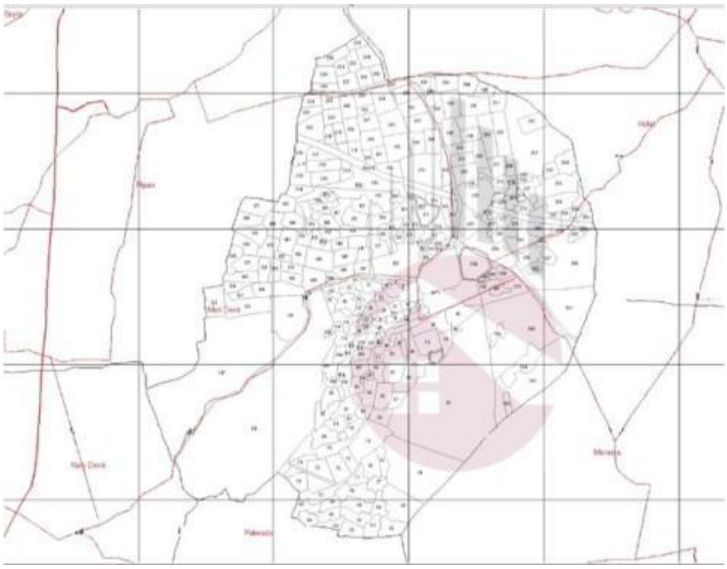

Fig 4.7 Gram tal map of Motidevti village

4.2.3 Physical and demographical growth

Table 4.1 Demographical growth

Sr No.	Census	Population	Male	Female	Household
1	2001	-	-	-	-
2	2011	3232	1590	1642	594

	TOTAL	MALE	FEMALE
POPULATION	**3232**	**1642**	**1590**
CHILD (0-6)YEAR	**631**	**319**	**312**
LITERATES	**1828(70.28%)**	**1079(81.56%)**	**749(58.61%)**
TOTAL WORKER	**1272**	**893**	**379**
MAIN WORKER	**1259**	**884**	**375**
MAIN WORKER CULTIVATOR	**191**	**178**	**13**
AGRICULTURE WORKER	**223**	**150**	**73**
OTHER WORKER	**842**	**554**	**228**
MARGINAL WORKER	**13**	**9**	**4**
NON WORKING PEOPLE	**1960**	**749**	**1211**

- Populationiscounted as 4 people per hectares.
- Sex ratio-968 female per 1000 maleas per census 2011.

Table 4.2 Geographical growth

Sr No.	Description	Information
1.	Area of village(approx.)	763.31 Hectors
2.	Agricultural area(approx.)	457.986 Hectors
3.	Residential area(approx.)	152.662 Hectors
4.	Others	152.662 Hectors
5.	Coordinates of location	22°56’25.2” N, 72°24’22.0” E

4.2.4 Economic generation profile / Banks

- In this village, there is no banking facilities available such as ATM and banks. There native people face many problems regarding banking facilities.
- There villagers have to go to other village or other places where the banking facilities are available.
- The nearest ATM and banks are available in Moraiya village and Sanasd far from 3 KM and 6 KM respectively.
- However there is essential need of banking facilities in Motidevti village.

4.2.5 Actual Problem faced by Villagers and smart solution

- After visiting to Motidevti village, we realized that many native people have been facing so many problems since a long time. We did survey about what kind of problems they are facing and we got list of problems faced by them are as follow:
  - The education is limited to Primary school.
  - Lack of drinking water facilities.
  - Bad village approach road.
  - Inadequate drainage system.
  - Inadequate solid waste management
  - There is no public toilet available.
  - There is no public building like garden, market etc.

✓ We also find relevant measures according to problems faced by villagers.

- The education facilities should be adopted at high level such as Secondary high school and private education classes.
- The drinking facilities should be fulfill as soon as possible by taking relevant steps to build appropriate water storage buildings.
- Generally, the road of village gives the first impression on visitors about the village overall developmental growth. Therefore the road networks should be well design and construction should be accounted by considering the basic requirements of roads.
- The drainage system and solid waste management system should be proper in use in each and every villages.
- The basic amenity of village is to have public toilet and that is why the toilet should be provided in the village.

- To reduce the migration ratio, government must take several steps regarding the development of village by establishing new commercial buildings such as bank, ATM, shopping mall, primary health center, post office, police station, bus station etc.

4.2.6 Social scenario -Preservation of traditions, Festivals, Cuisine

- Different cast people live in the same village by understating eachand every situations and problems faced by village. The people have different traditions according to their beliefs but the main thing is that every cast people together and enjoyed every festival which are celebrated in the village.
- The people have tendency to celebrate every festivals according to own style.
- The people celebrate Uttarayan, Republic day, Holi, Janmashtami, Independence day, Navaratri, Diwali and many more festivals.
- The place for celebrating Navaratri is very less so people feel congested while enjoying with many people.
- The major income sources of the villagers are depends only on farming and other work outside the village because there is no job opportunities available in the village.
- The main crops grown in the village are wheat and rice.
- The main cuisine of the village is normal food such as chapati, rice, dal which make them very fit and healthy.

4.2.7 Migration ratio / trends

- The main cause of migration ratio is to lack of basic facilities like primary health center, banking facilities, secondary school, restaurant and many more.
- People migrate to urban areas to achieve basic amenities for living better lifestyle and they cannot take that kind of facilities at village.
- The main measure about reducing the migration from village to urban areas is to provide same facilities which are available in the urban areas.
- Among all the reasons main reason which boost migration ratio is not having proper job opportunities and lack of primary money sources in the villages.
- The limited education level play massive role to increase the migration ratio and it can be eliminated only by providing high level of education to villagers.

4.3 Data collection of Motidevti village

4.3.1 DescribeMethodsfor data collection

❖ There are mainly two method for data collecting:

(1) Primary data collection:

(2) Secondary data collection:

(1) Primary data collection method:

- This method includes the village visit, overview of village, documentation work, study and analysis of village, meeting with honorable sarpanch, talati and wellknown people of the village who are the advisers. Basic questions were asked like village population, land details, village map etc. we also took some information about village from the villagers.

(2) Secondary data collection method:

- This method includes the detailed survey of the village. In this method some questionnaires form which are filled by village sarpanch and Talati.This form contains the basic questions like village location ,population, land details, some basic information about village. Also some paper work will be done. We also visit of village and some photograph took which indicates thevillage current condition.
- Also we did door to door survey, in this survey we asked some question to the villagers and took details about it. Due to this method we got information like drinking water problem, inadequate solid waste management, inadequate underground drainage system. There is no facilities available like primary health center, bank, ATM, police station, post-office etc.

4.3.2 Primary details of survey

- We collected different data from village like which types of facilities available in the village such as primary school, dudhderi, sevasahakari, different temples any many more.
- The villagers facing several problems regarding drinking water, solid waste management, poor drainage condition, no economic growth, no job opportunities, lack of education level and many more facilities.
- There is no primary health care center so every people of the villages have to out side the town for proper treatment.
- There is no banking facilities available so they are facing several problems related to financial such as lack of loan undertaking and other schemes of bank.

4.3.3 Average size of household

- The size of house approximately 980 sq. feet and it consist of 2 general rooms and small space as kind of balcony in front of house.

- As the talati does not have any data regarding census 2001 so we do not have any data of census 2001.
- However, as per census 2011 we have data number of 594 household in village and some of them are kuccha houses and rest of them are pucca houses.

4.3.4 Number of human being in one house

- We took details by taking door to door survey and we observed that average 4 to 5 people live in house.

4.3.5Material available locally in the village and Material Out Sourcedby the villagers

- In this village, pukka houses are made up with brick, sand, cement, stone and timber.
- However there is no availability of material in village so every materials will be outsourced near by village Sanand about 6 km.

4.3.6 Geographical detail

Table 4.3 Geographical detail

Sr No.	Description	Information
1.	Area of village(approx.)	763.31 Hectors
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4.3.7 Demographical detail

Table 4.4 Demographical detail

Sr No.	Census	Population	Male	Female	Household
1	2001	-	-	-	-
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4.3.8 Occupation detail

- The village do not have any kind of occupational facilities to purse jobs.

- Therefore villagers of Motidevti village are mainly dependent on farming but some part of villagers are doing jobs in near by town.
- Moreover, some native people have own shops so they earn money from that shops.

4.3.9 Agricultural detail

- The villagers are mainly grow wheat and rice crops to survive their basic needs and earn money by selling that crops to bazar.

4.3.10 Physical infrastructure facilities

- There is no such kind of physical infrastructure facilities which causes the high migration ratio from towns to villages.

4.3.11 Tourism development available in the village for attracting the tourist

- In this village, there are three major big temples having better condition so these places may increase the tourism and also a pond.

4.4 Infrastructural details

4.4.1 Drinking Water / Water Management Facilities

- The villagers get supply of drinking water from canal, over head tank and sump.
- The over head tank capacity is 1,50,000 liters to store and supply water to fulfill basic needs.
- The sump capacity is 50,000 liters to store water.
- However, the main problem is that the water supply from canal is insufficient and also water quality is too dirty and the taste of water is salted so villagers do not use that canal water.
- All over the water store and supply facilities are at very good level but main problem is to provide sufficient and clear tasteful water to every native people of the village is very difficult.
- So, people have only chance to fulfill their water requirements by taking water from handpump but it make vary difficult to every villagers for completing the demand of everyone.
- Due to lack of water supply, usually people store their water in numbers of pots at their home.

- Even, every people do not take water from handpump due to limited water available in well.
- The demand of water is more than the supply in the Motidevti village even though proper facilities available for water storage.
- To mitigate this problem, the water supply should be increase and routine clean up should bedone in canal.

Fig 4.8 Dirty water of canal

Fig 4.9 collecting water

- Due to lack of facilities available for supply of water to each and every doorsteps, so teenagers have to collect water for their basic need from other sources like hand pump or well.

Fig 4.10 Overhead water tank

4.4.2 Drainage Network / Sanitation Facilities

- The drainage problem also have been increase in the village as some part of village have drainage but rest of other parts does not have any drainage system so whole villagers are suffering from this massive problem.
- The drainage pipeline installed in almost 70% of village area but the man hole are broken or opened at somewhere so it may cause accident in night.
- Due to not having proper arrangement of drainage system in all over the village so sometimes it overflows and flow over roads which spread bad smell as well as pollution over the land.
- Some part of villages has drainage line in Thakor vas, Bhangi vas, in between Bhangi vas and Rabari vas.

4.4.3 Transportation & Road Network

- The approach road towards Motidevti village from main road is very bad in condition, even on visit day we got tired to cut the distance of approximately 3 km from main road due to number of undulations.
- In the village, some part of village such as Harijan vas and Prajapati vas have c.c. roads.
- The Bhangi vas and Harijan vas have roads made up of paver blocks.
- There is public as well as private transportation available in the village and people used to travel with the use of both of transportation according to availability.
- There are mainly three types transportation available such as private bus, rickshaw, jeep and GSRTC bus transportation.
- But the village does not have proper bus stand, but pick up stand available at the main road which is far from main village around 3 Km.
- Therefore, majority of people use rickshaw as mode of transportation from one destination to other destination.

Fig 4.11 Main approach road

- Some parts of village have c.c. roads but they are mainly covered with sand, garbage and mud which spread the pollution our the native community.

- The villagers are lack in discipline regarding proper management of mud and other garbage which reduce the beauty of village.
- The government also responsible for this pollution cause because they do not provide dustbin to villagers to through the garbage.
- Lack of planning creates this bad situation of every people and it may causes several disease.
- To overcome this situation, native people as well as government should take proper precaution and follow certain guideline to reduce the pollution.

Fig 4.12 Paver block

Fig 4.13 Roads cover with garbage

- The throw away culture lead several causes such as it creates hip of garbage which ultimately cover the road and reduce the width of road which result in the congestion of traffic over road.
- The people are totally depend on cattle business so they have numbers of cows and buffalos for own purposes and also for selling milk to other and create revenue from the dudh dairy.
- However, due to lack of management they create lots of mud hip at everywhere to utilize their land.

4.4.4 Housing condition

- There are two types of houses in the Motidevti village such as kuccha houses and pucca houses.
- Majority of houses are pucca and which shows the overall development of the village and visitors can easily predict about village growth.
- The number of houses in village is 594 according to census 2011.
- The average number of human beings live in one house is 5.

Fig 4.14 Pucca house

Fig 4.15 Kuccha house

4.4.5 Social infrastructure facilities , health , education , community hall,library

❖ Social infrastructure facilities :-

- There is one sevasahakarimandli which is beneficial for every native people to get loan at very low interest rate.
- There is no other physical facilities available in this village.
- The sevasahakarimandali is situated in the center of village in a well developed pucca house.
- The name of that building is written as "The motidevtisevasahakarimandal ltd." Which is registered in 08/10/1974.

Fig 4.16 Seva sahakari mandali

❖ Health facilities :-

- There is no health related facilities available in the village .
- Every villagers go to out side the town for any kind of treatments.
- The nearest primary health care center is in Sanand taluka which is 6 km far away from this town. Therefore people also feel dissatisfaction due to lack of primary health center in the village.

❖ Education facilities :-

- The education system is up to primary school but the school is excellent in condition and also become role model for there villages.

- The school is made up by private fund given by shah family.
- The school consist of classes which are full with several stationary in perfect manner and one big place is available in front of the school.
- The school have private toilet in the campus of school.
- Also there is drinking facilities available in the sump in the ground of school.
- After completing primary education, native people go to urban areas to further study in their choice and interest.

Fig 4.17 Education facilities

❖ Community facilities :-

- The village have community facilities like Gram Samajwadi in which people gather at different functions.
- The hall condition is very bad but still in working condition.
- The Gram Samajwadi need to be re constructed for surveying basic facilities to villagers which would help them to celebrate every festivals with full of excitement.
- There is no other facilities available in village such as auditorium, prayer hall, garba chowk and many more.

Fig 4.18 Gram Samajwadi

❖ Library facilities :-

- There is no such library available in village.
- The students need library in which they can study with full of concentration and make their career bright.

4.4.6Existing condition of public buildings &maintenance of existing public infrastructures

- The condition of gram panchayat building is very bad even when we visited into the building we showed that reinforcement bars are out and the building seems to be collapse any time.
- Therefore sarpanch and talati seat it the Gram Samajwadi where they feel out of fear but still the condition of Gram Samajwadi is bad so this building also need to be re constructed as soon as possible.
- There is no public toilet in the village.

Fig 4.19 Gram panchayat building

- By looking overall condition of public buildings, the maintenance of building should be done as soon as possible.
- The rest of public buildings which are not available in the village, it should be constructed with full of facilities.
- Public library should be established in the village for increasing the level of education system among children.

4.4.7 Technology mobile/ WIFI / internet usage details

- There is no WIFI available in the village.
- However, half of the population have smart phone and rest of people have keypad phone and minority of people who are illiterate those have not any kind of mobile.

- There is mobile tower of JIO in the village and most of villagers use JIO sim card for getting better network.

Fig 4.20 Mobile tower

4.4.8 Sports activity as gram panchayat

- There is no such sports activities done in village.

4.4.9 Socio-cultural facilities , public garden /park/playground /pond/ other recreation facilities

- There is no social cultural facilities available expect pond.
- There is no such extra place available to provide socio cultural facilities such as public garden, playground, park and many more.
- One big lake in situated at the end of village.
- The lake is covered with hip of garbage which cause pollution as well as decrease the interest of people to hang out near lake.

Fig 4.21 lake

4.4.10 Other facilities (E.g like foot path development-Smart toilets-Coin operated entry, self-cleansing, waterless, public building)

- Honestly, there is no other facilities like smart toilet, self-cleansing of public building in the village.
- However, there is one Thakor vas in which not only the footpath but the whole interal street is made up of paver block.
- There are some places where the paver block used as road construction. Due to paver block, there is less chances of creating mud on road and also less chances of break down the whole road.

4.4.11 Any other details

- The villagers are more conscious about birds and animals.

- Therefore, they build bird house near one temple which is constructed in 01/08/2007 and opened by beloved sarpanch of village.
- Every native people provide water, snacks, vegetable, seeds and many more thing for survival of birds.
- The individuals also have grown several trees near bird house, so there is always shadow of trees which give comfort to birds.
- There is a temple near the bird house so, every visitors take rest on the stage of village and they enjoy the scenario of birds while tacking rest.

Fig 4.22 Bird house

4.5Existing institution like - village administration – detail profile

4.5.1 Bachatmandali

- There is no any facilities like bachatmandali in this village.
- The villagers do not have any idea regarding how to save money and where to get the high interest of money. By having door to door survey, we collected the data from the native people about saving money, so majority of individuals told that we do not have any idea and facilities to save money, whatever we earn money by doing farming or by job we just use it in our daily life.

4.5.2 Dudhmandali

- There is a dudhmandali which is used by all the villagers who have their own cattle and pet animals like cows and buffalows.
- In this dudhmandali, there are two rooms in which one room is used for storage and another room is used for measuring the fat of milk by automated equipment. There are mainly 3 workers who run the mandali by doing proper works.
- We visited the mandali and get the relevant information about how the milk comes from villagers and how it distributes among people.

- Due this pet animals, the villagers have plenty of milk so they complete their house demand and they give rest of milk to dudh dairy and earn money from that.
- Due to this type of economy of villagers from dairy, they run their routine expenses and it significantly helps in buying the number of pet animals from money.
- This dudhmandali give better fat of milk so the villagers get good money from this kind of work and also it is very helpful to them.
- The chairman of the dudhmandali is quite good and he runs the dudhmandali very well in manners.

Fig 4.23 Dudhmandali

4.5.3 Mahila forum

- There is no facilities available in this village.
- Due to lack of illiteracy and knowledge, they do not run any camping such as women empowerment or mahilaudhyogsasktikaran.

4.5.4 Plantation for the air pollution

- The villagers have been doing tree plantation on environmental day and also on occasional days.
- They grow different types of tree at various places.
- Most of trees are grown in the chowk of primary school, therefore children have proper shadow of tree when they are playing and doing other outdoor activities.
- The main reason behind tree plantation is to keep environment of village as much as clean so it helps individuals to live fit and healthy.

4.5.5 Rain water harvesting - Waste water recycling

- In this village, there are three water sources :-

1. Canal
2. Overhead tank
3. Underground sump

- This three major water sources fulfill some basic water requirements of the villages by suppling water.
- The present canal water is dirty so the use of canal water is only some part of agricultural land to provide water to crops.
- The water of Motidevti village is very salty in taste so the native people have been facinf drinking water problems.
- Due to these reasons, rain water harvesting concept is proposed in the village before the some year.
- To fulfill the need of water over people, one underground sump is constructed for storing rain water in it and use it as fulfilling basic needs.
- This underground sump is situated in the primary school garden so that children can drink clean water.
- Before the rainy season come, the students and teachers clean up roof as well as sump so store water should be remain clean and drinkable.
- The rain water strike on the roof are collected in the underground sump and use that collected water for fulfilling the water requirements.
- The capacity of underground sump is 50,000 liters .

Fig 4.24 Underground sump

4.5.6 Agricultural development

- The villagers do not have idea regarding agriculture development.
- Majority of farmers of Motidevti village have been growing only rice wheat since a long time and they get high revenue from their crops.

4.5.7 Any other

- All the necessary storage building are full of demand of villages, but the main cause is to drink clean water.
- Every people do not get water at their door step so they just go there and collect water in different ways such as by hand pump, by well and many more.

Fig 4.25Collecting water from underground sump

Chapter 5. Technical Options with Case Studies

5.1 Concept (Civil)

5.1.1 Advance sustainable construction techniques / Practices and quantity surveying

❖ **What is sustainable construction?**

- The construction which made the whole environment ecological that type of construction is called sustainable construction. In other words the construction is creating healthy environment in the sans of ecological principles.
- The main key point on which the construction focused are reuse, protect nature, high quality, renew or recycle, conserve and create environment non toxic.

❖ **Aim of sustainable construction:-**

- The main aim of the construction is to reduce the industries impact on the environment and the industries are developed with sustainable construction technique.
- Not only for industries, the resident zone and buildings as well as government and public buildings are also constructed with sustainable construction so that the surrounding atmosphere will become pure and healthy.

❖ **Objectives of sustainable construction:-**

- To construct the buildings with that type of material which are available from natural resources.
- Maximum use of natural material into the building minimize hazardous material, provision of water and waste water management with sustainable techniques.
- To reduce the negative impact on environment when the building was constructed and also when the operation process of the building
- Saving water:-To reduce water usage, also reuse the water and waste water with several purification and from the precipitation.
- Saving energy:-To reduce the energy with several techniques. For an example the reduction in amount of energy which used in lighting, air conditioning, and other building operation and produce the energy which is not hazardous to the environment.
- Reduce waste:- Waste reduction is main problem which is dealt with the sustainable construction.
- To improve the health and productivity of human being with sustainable techniques which help to boost the life period.

❖ **Benefits of sustainable construction:-**

1. Improving health
2. Increase productive
3. Waste minimization and reuse and recycle of waste
4. Protect the environment
5. Better use of material
6. Better quality of life
7. Reduce energy and water usage

There are some techniques for sustainable construction which are following:-

1) Green roofs: the best idea for commercial building is green roof in this the roof top of any building is used for the plantation of flowers, plans, grass, bushes and other greenery grows material. The plant absorbs storm water or rain water and grow easily, it emits fresh and healthy air and make environment healthy and the cost of heating and cooling will reduced.
2) Solar roofs: the roof top is covering by solar panel which produce the electricity which is used during day time as well as at the night.
3) Gray water plumbing system:- gray water system is reduce the need of fresh water into the toilet . This system recycle the waste water and it use in the irrigation and toilet.
4) Construction waste management: Reduce the waste during construction of any building is more achievable for the contractors and also use the waste from material in further work.
5) Material selection: the client and engineer have to choose that type of material which do not affect the environment and green land. The material chooses from any renewable products.

❖ Sustainable construction in model villages:-

1. IDEAL VILLAGE PUNSARI:-

- The village have many sustainable facilities which should be adopted by under developed villages, The sustainable ideas are following.
- The village have all weather road with paver block and the whole drainage system is underground and cover with pukka road. There is three point outlet which dumped outside of the village into the landfill and the water will absorbed into the soil and the ground water level increased.
- In this village, the villagers are using the cattle dung which is generated in household and farms to generate electricity. There is bio-electric plant installed which produce the

electricity and whole electricity is supplied to the street light and remaining electricity is supplied to the household.

- There are about 400 LED street light which runs on solar panel so that the saving of cost of electricity for the village supply during night from the gram panchayat.

2. Allocated village Motidevti:

- In Motidevti village, the main problem which faced by the villagers is water, there is no any facilities for clean drinking water.
- There are total three sources for water.

  I. Canal
  II. Village pond
  III. Overhead tank
  IV. Underground sump

- There are many water sources in the village but the actual problem is the water of canal is very polluted and the other sources of water are very salty and not good for human and animal consumption. There is only one hand pump which is used by the whole villagers for the drinking purpose and also for the cooking purpose.
- So that we have planned to provide gray water plumbing system for the village. Due to the gray water plumbing system the waste and dirty water is recycle and the water is further used by the villagers into the irrigation purpose also for public toilet etc.
- There is a one water sump which is situated in the primary school of Motidevti village. in this sump the rain water which is collected on the roof top of the primary school is transferred with the piping connection into this sump during the rainy season. It used by the school students and teacher during working hour of the school for drinking purpose.
- This rain water harvesting is quite good but not enough for the students during the year and also it is not used by the villagers so that we proposed the idea for the rain water harvesting to each home.
- Basic component for rain water harvesting are following:
  - Rainfall
  - The catchment area on the rooftop of house at where water collected
  - Pipeline system to transfer the water from roof top to the storage tank
  - Storage tanks or storage reservoir to store water
  - An extraction device

Fig 5.1 Rain water harvesting

- RAINFALL:-
  - The main key element is rain for the rain water harvesting. The rain water harvesting is depend on region and quantity of rain in some region the rain is very heavy and in some region the rain is very low so that some data of rain into the last year is required for the rain water harvesting at huge level.

- CATCHMENT AREA:-
  - The second key point is catchment area. The catchment is that type of area on which the rainwater falls and collected and transfer through the piping system into the storage tank. The surface should be paved area like terrace or courtyard of any building or any ground area. terrace should be plastered and the material which is used to make roof top is water proof or absorb the water very less so that we can store more water into the storage tank.
- GUTTERS:-
  - The channels around the edge of slopping roof to collect and transport the water through gutters into the storage tank. The size and shape of the gutters are semi circular, circular or rectangular.
- STORAGE FACILITIS:-
  - This type of storage tank are commonly made with respect on size shape and material.The shapes are cylindrical, rectangular and square. Material used for the construction are reinforce concrete cement, ferrocement, masonry, plastic or metal sheets are commonly used. The location of the tank are commonly on the ground surface or under the surface of ground.

- **Case study: OTTAWA COMMUNITY HOUSING**

This community housing were made in 1973. This tower carried 17 storey and about 258 residential units in this tower. This tower consist of brick veneer assembly with insulation and drainage cavity.After 40 years, in 2011 old original cladding was deteriorating, withloose mortar joints, corroding shelf angles and missing blocks, and required replacement. Also the building was south facing wall provided approximately 789 square meter of wall space and is optimally oriented toward the sun so OCH decided to explore the opportunity to use solar heat to offset the building heating loads.

THE OPPORTUNITY:-

The brick cladding at Clementine Towers (1455 Clementine Ave) required replacement to address deficiencies and deterioration.And also the OCH have golden opportunity to makea structure kind of solar wall to preheat air supplied to the building's corridor ventilation system. The project reduced energy consumption and operating costs while showcasing green building practices.

THE PROCESS:-

After getting the opportunity of solar wall OCH choose a system of manufacturing in this they removed all the brick work and made concrete structure and also sealing joints was applied.The solar wall at Clementine Towers consists of a dark, perforated panel assemblywith a six-inch plenum space over insulation directly installed on the structural wall. The cladding was installed in a similar manner to conventional panelized cladding assemblies. The sun's radiant energy is absorbed and warms the building's' southfacing, dark colored panels. Exterior air is drawn in through perforations in the cladding panels and, as it is warmed by the heated cladding, the air rises through the plenum space (cavity) behind the panels. The warm air rises to the top of the plenum space and is then directed to the rooftop make-up air unit (MAU). Typically, the MAU burns natural gas to heat cold outdoor airng

the air pre-heated by the passive solar plenum reduces the amount of heating required using natural gas, thereby saving energy and costs. The solar wall passive heating system provides the greatest potential for energy savings during the spring and fall seasons, when outdoor temperatures are neither too cold nor too hot. There are also significant energy saving benefits during the winter when the exterior air is cold and the cladding is exposed to the sun. When the exterior ambient temperature rises above 15 °C, mechanical dampers

in the solar wall supply ductwork areclosed, preventing overheating of the building.

THE RESULT:-

In the 12 months prior to the solar wall retrofit, the building consumed approximately 145,000 cubic meters of natural gas per year, some of which was used by the MAU to heat air in the common areas of the building. In the 12 months after the solar wall was installed, annual natural gas consumption decreased to 115,000 cubic meters per year, saving approximately 30,000 m3of natural gas per year. This represents a 21% reduction in natural gas consumption and an estimated cost savings of approximately $11,000. These savings correspond exactly with estimates and performance modeling done using RETScreenduring the design of the project.

5.1.2 Soil liquefaction

❖ **What is soil liquefaction?**

- Soil liquefaction is define as it is a phenomenon where a saturated or partially saturated soil loses strength and stiffness in response to applied stress such as shaking during an earthquake or any other sudden changes in stress condition. In which the material behaves like a liquid.
- It is also called earthquake liquefaction.
- There are mainly two liquefaction:-

1. Flow liquefaction
2. Cyclic mobility

❖ **How does the soil liquefaction work:-**

- Generally the soil made up with the soil particles and pore holes between them which are filled with air or water. When the earthquake occurs in the water logged soil, the water filled the pore spaces and decreases the overall volume of the soil. In this process the water pressure increases between individual soil grains, due to this the soil get softened and loose its strength and its solid properties are converted into the liquid properties.

❖ **Effect of liquefaction:-**

1. Effect of liquefaction on building:-

   ➢ Buckling of piles:- pile foundation are very deep embedded into the ground because of soil support. The soil is not strong so that the pile foundation is required at thee place. When the foundation buckle due to earthquake and the structure collapse.

2. Spreading of ground:-

- Due to liquefaction soil moves in downward direction. Slopes starting from an angle 3 degree to the lateral spreading.

3. If the bridges and large buildings constructed on pile foundation may loose their support due to buckle or adjacent soil and come to rest at atilt after the earthquake shaking.
4. Also liquefaction may causes the landslides. For an example in the year of 1964, Alaska earthquake occurred due to this the liquefaction of sandy layer of soft clay causes a land slide in the mass of ground. There were approximate 75 homes destroyed and also disrupted utilities.

5. Due to liquefaction sand blows are occurred, which are also called sand boils or sand volcanoes. soil density is increased due to collapse of soil's granular structure. Due to this pressure the squeezes water out of the pores between the soil grain. Soil blows have been observed aftermath the earthquake.

❖ **Methods to reduce damage due to soil liquefaction:-**

1. By avoiding the construction on saturated soils.

   - A study of soil must be conducted before the construction for check whether the soil is durable for the construction or not.

2. To make Liquefaction-proof structural system
3. Improving soil conditions
   - To improve the soil strength and quality vibro compaction, dynamic compaction, and used and also vibro stone columns are preferable for this.

❖ **Case study:-Guwahati, India**

- Guwahati is in seismic zone V as per IS 1893, this is the most active seismic region in the world. If the magnitude of earthquake is 8 or more than 8 then Guwahati is in risk. In Guwahati, recent development have led to more construction and rise in population. On 12th June 1897 an earthquake measuring 8.1 scale that oriented in Shilong. At that time the process of soil liquefaction was started into whole Brahmaputra plain. Due to this, led flood around the plains and plateau.
- Due to this earthquake and soil liquefaction massive destruction of property and houses. After the reducing the water at some place pond and lake are made.this whole phenomenon occurs in the year of 1950.

❖ **Scenario in allocated village:-**

- There is no any major earthquake are occur in the village Moti Devti except the earthquake of 2001.
- Due to this earthquake, there were minor damage in some old houses and also there are some cracks on the road.
- Any major effect due to earthquake and soil liquefaction were not found in the village Moti Devti.
- After that some earthquake shocks are measured but they were not harmful to any structure in the village Moti Devti.

5.1.3 Sustainable Sanitation

❖ **What is sustainable sanitation?**

- Sustainable sanitation is that type of sanitation system which is designed with certain criteria for very long time.
- Sustainable sanitation system is consider the sanitation value chain from the users, excreta and waste water collection method, transportation and conveyance of waste, treatment of waste and reuse or disposal of any waste.
- The sustainable sanitation system should be technically and institutionally acceptable, economically and socially acceptable and it should be protect the human health and environment and natural resources.
- There are many sustainable sanitation system which have above aspect in mind but they fail far too due to some criteria which are not fulfill.

❖ **Purposes of sustainable sanitation :-**

- The main purpose of sustainable sanitation is to provide the healthy environment.
- The other purpose is to make city pollution free.
- To protect the natural resources and to provide safety and security to the living people at the time of defecate and urinate.

❖ **Difficulties in rural area:-**

- There is lack of drinking water
- The quality of water is quite bad
- There is no proper solid waste management and its transportation and treatment
- There is no public toilet and people use open toilet at anywhere
- There is no enough resources
- Lack of water supply to the toilets

❖ **Advantages of sustainable sanitation:-**

- Availability of water and its better supply
- Management of solid waste in better way
- Village and city became healthy
- Reduce the pollution and environment and natural resources became pollution free

❖ **Some examples of sustainable sanitation:-**

- Pit toilet should be modified with the soil composting toilet so that there is a requirement some wall reinforcement, which have shallow depth around 1 to 1.5 m and they are maintained using daily soil additions also the pits are easy to use they are periodically closed and covered with soil and also it is used in agricultural.
- To saving the cost simple urinals are used with help of separate collector system instead of the pit latrines or toilets. Also flush toilets are used with some modification so that the less water required and also the gray water is used.
- Dry toilet should be used in that type of area at where the problem of water logging. In this process the wooden box, with the plastic bucket and the toilet is on the top. There is also a sawdust. And after do your business use the sawdust to cover the matter to avoiding the foul smell. The matter should be dumped on site in fixed time period and it is use for the agricultural purposes.

❖ **Scenario in ideal village:- PUNSARI**

- The village Punsari is developed in many ways and it is one of the ideal village of our state. There is facilities of public toilet into the village and also with the proper water supply.
- There is proper solid waste management. The gram panchayat of the village Punsari have a tractor which collect the solid waste with door to door collection method.
- Also there is a mineral water plant which is used by the whole villagers and the health and hygiene of villagers became good .

❖ **Scenario in reference village:- RANCHHODPURA**

- There are two public toilet in village Ranchhodpura with proper water supply and they are clean and good in condition.
- There is a solid waste management and the solid waste is dumped into a big dig and after certain time period it was brunt.
- The quality of water which used by the villagers in drinking and cooking purpose in the village is clean and healthy.

❖ **Scenario in the allocated village:- MOTI DEVTI**

- There is no proper facilities of public toilet. There is one public toilet but it was in very bad condition and also there is no proper water supply into the toilet.
- Also there is no proper water supply for drinking purpose and cooking purpose because the water is very salty in village Motidevti.

5.1.4 Transport infrastructure / system

- India is the fastest growing country and we have to maintain its growth in well sustainable manner for improving country's overall living standard and reduce poverty.
- The current situation for the transport infrastructures are mainly roads, railways, airports and ports.

❖ **Expectation in transportation infrastructure:-**

- Improvement in transport networks.
- To increase in productivity and economic efficiency.
- To control of environment pollution and improve quality of the environment.
- To provide better facilities in transport facilities.
- Improvement of rural transport.
- Reduction In accidents and improved safety.

❖ There are many transport facilities which are present in our country:-

I. Road transportation
II. Transportation by Air
III. Transportation by Water
IV. Transportation by Pipelines

1. Road transportation:-

- Road transportation is one of the highest transportation mode in the world and also in our country India. This involves the use of vehicles (motor car, motor bike, buses, bicycle, and trucks.)
- There are many roads according to its size, functions, material and its use. Some examples are Earthen roads, moorum roads, Gravel roads, Water bound macadam road, bituminous road, cement concrete road etc.

- Our country have largest train network due to this there are many benefits like it is very cheap in travelling, safe and very comfortable for passengers about goods we transfer comparative more goods in train compare to trucks and other road transport.

2. Transportation by air:-

- Transportation by air is more expensive this is the main drawback of air transportation but air transportation is very fast and more comfortable.
- air transportation is reliable when public have transport to one country to another country also it is very useful in the case of emergency and quite speed compare to other transportation.

3. Transportation by water:-

- The water transportation is the cheapest transportation but it is time period of this transportation is very long this is one of the main drawback.
- Mainly goods transportation is done by the water transportation and also the public travel through the ships and cruise for the better experience and enjoyment.
- Eater transportation is mainly occur in ocean or sea but there are many river in our country which is used for the water transportation.

4. Transportation by pipeline:-

- There are very hazardous gases and liquids which are dangerous to transport by road and any other form of transportation in some area at that time the pipe transport is required.
- Pipeline are into land as well as under water also and transport hazardous material like gas petroleum etc.

❖ **Scenario in ideal village:- PUNSARI**

- Punsari is one of the ideal village of our state Gujarat. Which is developed in well manner in many way but now taking about the transport infrastructure about this village.
- The village have mainly road network throughout the village the roads are made up of cement concrete (C.C.) and all the roads are well maintain by their gram panchayat of punsari.
- There is no rail connectivity in the village, it is quite far from the village about 10 kms in Dhansura village.
- The main transportation of village is mainly private vehicle, buses auto-rickshaw etc.

- There is mini bus which is used for transport purpose within the village also the panchayat started bus facilities for women which is used for import of milk named Atal Express.

❖ Scenario in reference village:- RANCHHODPURA

- The village Ranchhodpura have C.C. road throughout village with paver block on the both side of road and village approach road is made with bituminous and it is very good condition.
- There are mainly private vehicles, buses and auto-rickshaw are use for transportation.
- There is no rail connectivity in the village it is quite far away from the village about 4 kms situated in Kadi.

❖ **Scenario in allocated village:- MOTIDEVTI**

- There is C.C. roads and paver blocks in some streets and earthen roads in remaining In the village Motidevti .
- Buses, auto-rickshaw and private vehicles are main Transportation of the village.

CASE STUDY:- MASS TRANSPORTATION BY BUS BETWEEN MEHSANA TO AHMEDABAD SH 41

MAIN KEY WORDS: Mass Transportation, O-D Survey

STUDY AREA:-

Study area is of about 69 km in between Mehsana to Ahmedabad city. Including many cities like kalol, Nandasan, kadi,etc. Having many industries on highway like iffco, appolo, ratnamani,etc. Main reason for using this transportation by people on large scale is for jobs, Schools, colleges, industries at Ahmedabad. Study Area containing SH41 highway. This was constructed in the starting of 2003. Road is having four lane highway and in very good condition for transportation.

PROBLEMS:-

Mass (Bus) transportation between Ahmedabad to Mehsana is being continued with some Defects. Indentify and study regarding these matter include in this topic.

- An overall lack of capacity.
- Lack of quality and choice.
- Severe traffic congestions and insufficient attraction to renew and repair vehicles.
- Curtailment of routes at the will of crew to avoid some areas.
- Overcrowding of buses.
- Rude behavior of crew.

 Dirty buses.
 Presence of bad elements on the bus.
 Worst condition of Bus station.

Methods which are used for conducting this survey:-

Origin and Destination survey:-

Origin and destination study determines the pattern of journey that people make. It is the basic study which provides the information for planning of a transportation facility or system particularly the location, design and programming of a new or improved highway public transport and parking facility. Data for Trip Generation, Trip Distribution, Model Split and Route Assignment Analysis, Becomes the Part of This study.

Roadside Interview method:-

Drivers are stopped and interviewed at roadside and data is recorded on prepared forms. The usual information required is:

(a) Type of vehicle
(b) Number of persons in vehicle ,Origin and destination of trip
(d) Purpose of trip
(e) Parking location
(f) Intermediate stops
(g) Routes travelled

Conclusion:-

Due this study and analysis how many buses are travel during early hours of day and how we can increase or decrease the buses and their route depending on the passengers and also some time we provide special buses at the job time regarding the big company.

5.1.5 Vertical Farming

- The farming of fruits, vegetables, and grain or seeds inside a building in city area or any urban centre is called vertical farming.
- In this farming the floors are designed for accommodate the crops.
- In the vertical farming heights will act as the future farm land.
- From some research the prediction of world population will reach 9 billion in the year of 2050 and 70 % people will live in urban area so that the valuable situation is that how to supply green fruits and vegetables to the city at that time the idea of vertical farming is arise.
- The vertical farming is defined as farming of vegetables, fruits grains etc. inside the building in the middle of any city or urban center.

- In the vertical farming the different floors are designed for different purposes for an example the first floor is for seeds second floor is for fruits and another floor is for fruits etc.
- The concept of supplying the vegetables and fruits in the city or urban area is not new but there are so many development with unique technique in the agricultural field so that the concept of vertical farming is useful and many countries are apply this idea into their city for an example the Mexico city.

❖ **Aim of verticalfarming:-**

- The main aim of vertical farming is to evaluate the scope of vertical farming concept in the high rise building levels in future developed urban areas
- To analysis the positive and negative features of conventional farming (green house and outdoor) and applying for vertical farming with benefits and supply the vegetables and fruits to the whole city.
- To boosts the economy of the city with new and better idea.

❖ **Confusion in mind for vertical farming:-**

- The first question is enough energy which is produce onsite is fulfill the requirement of whole building usage in different purposes.
- The second question is the vertical growth of vegetables is capable with the growth of conventionally (green house and outdoors) at the time of comparison.
- And the final question is the investors and stack holders are understand the concept of vertical farming and they believe in the new uptake technology.

❖ **Scope of vertical farming :-**

- There is no transportation cost or if the transportation is required it is quite less so that the transportation cost will reduce and the also the wetness of city because of the whole city waste brings into the farm building recycle system and the city make bacteria free and environment of city become healthy.
- Water requirement for the crop is less so that less water consumption.
- Time for growth of crops is less because of the photosynthesis of plant is done during day or night with the help of LED.

❖ **Advantages of vertical farming :-**

- The first advantage is less water consumption, maximum 70 % water is gone for modern farming. Much of this water is loss in evaporation, yes the evaporation is natural process and also the water goes out from the farm at the time of runoff and it is not use for the

drinking purpose but in the vertical farming water is used in control manner so that the waste of water is decreased and water looses are minimum.

- The vertical farming allows the maximum crops yield because the crops are grown all the time at the day and night throughout the year with help of LED in the process of photosynthesis. So the time period of grown of crops is less and also the vertical farming is not weather dependent.
- The requirement of transportation is very less or negligible because the farming of vegetables and fruits are middle of the city. The vertical farming is eco-friendly as the transportation side.
- It reduces the cost of transportation so that it will be cheaper and due to less transportation the environment became healthy and pollution free.

Fig 5.2 Vertical farming

- In the current situation many people are migrate from rural area to the urban area to fulfill the basic needs like better education to their children, better lifestyle, better living standard, employment, etc.
- Now main problem is about agricultural land. In the urban area or cities there is no agricultural land and the concept of vertical farming arise.
- The concept of vertical farming is applied into the foreign countries like in Mexico but this idea is quite impossible in undeveloped countries like India. Because India is an agricultural country and there is huge agricultural area. The vertical farming is quite possible in city are like Delhi, Mumbai, Ahmedabad, etc.
- In the village of Motidevti total area of village is 763.31 hectare and among this 457.986 hectare (around 60 % area) for agricultural so that there is no need of vertical farming in the village Motidevti and any other village area at where the agricultural land is available because vertical farming have many disadvantages like there is requirement huge building which is initially very costly and also maintain the whole building lightning because the new method is induced for the growth of vegetables and fruits with LED and solar light.

5.1.6 Corrosion mechanism, prevention &repair measures of RCC structure

- **What is corrosion?**
  - Corrosion is define as, a refine material which is naturally converted into more stable form such as its oxide, hydroxide or sulphide state this leads to deterioration of that particular material.

❖ **Causes of corrosion:-**

- Major causes of corrosion:-
  1. Nature of alloy or metal
  2. Homogeneity of the metal structure
  3. Nature of the corrosive environment
  4. Presence of other foreign matter or inclusions at the surface
  5. Other environment factor like variations in the presence of dissolved oxygen, temperature and in the velocity of movement either of the environment or system itself.

❖ **Types of corrosion:-**

1. Uniform corrosion
2. Pitting corrosion
3. Intergranular corrosion
4. Crevice corrosion
5. Stress corrosion tracking
6. Galvanic corrosion

❖ **Effect of corrosion:-**

- Due to corrosion commercial airplanes that will be possible in flight damage
- Damage to oil pipelines, this could causes a costly and very dangerous rupture which creates significant environment damage
- It damage the bridge support which causes the bridge failure
- Damages the house component due to this repairing and replacing of that component are required
- Release harmful pollutants from iron corrosion which contaminates the air.

❖ **Prevent of corrosion:-**

- Use the non corrosive metal like aluminum or stainless steel
- Use of drying agents
- The metal surface should be dry or clean
- Use coating which prevent the corrosion like oil, grease, paint or carbon fiber coating

❖ **Repairing of building:-**

➢ Some simple techniques which are used
  1. Loose concrete should be removed
  2. Remove rust over the reinforcement bars
  3. Apply bonding agent of the concrete

4. Paint the reinforcement bars with anti-corrosion paint
5. Coating system
6. Migrating corrosion inhibitors

❖ **Methodology or case study of building:-**

- First remove the concrete at where the reinforcement bars are corroded.
- Remove the rust with suitable method and make the reinforcement bar rust free.
- Now provide rust remover coating of any approved brand.
- Provide the protection coating of anti-corrosive Zn rich epoxy phenolic rebar protection system of any approved brand on the old reinforcement by brush within interval of 24 hours.
- After that provide concrete penetrating corrosion inhibitor of approved brand over the entire finished surface area.

❖ **Scenario of allocated village:- MOTIDEVTI**

- There is no any building which have required maintenance regarding like this.

5.1.7 Sewage treatment plant

❖ **What is sewage?**

- Sewage is that type of wastewater which is produce by commodity.
- It is calculate with the rate of flow or its volume.
- Sewage mainly contains gray water, black water, soaps and detergents etc.

❖ **What is Sewage Treatment?**

- Sewage treatment is process of removing containments from the waste water, which are mainly contained household sewage or industrial sewage.
- To remove the containments physical, biological and chemical process are used and the treated waste water is safe to release into the environment.

❖ **Sewage treatment plant :-**

- The waste water goes into the sewage treatment plant. If waste water directly flow on the land and it should be absorbed and ground water level increase and this is harmful and the ground water would not reusable and if waste water is flow in pond or lake the water of lake will be polluted and it is harmful to use for any purpose if there is no sewage treatment plant.
- If the sewage treatment plant is there the water will be recycled and more than enough solid materials are collected from it and recycled water is used for irrigation purpose and

it will be disposed into the environment without any problem and also the ground water level is increased.

❖ **How does sewage treatment plant works?**

➢ Sewage treatment works in three different methods. In first process waste goes through the initial process called preliminary method at where the most of the course solid particles are removed. In this process large screens are help to remove solid objects.

1. Primary treatment:-
   - When the sewage passes in the primary treatment, 60 percent of the loose solids are removed they are seen at bottom only water, grease, oil remain a float. In this phase 60 percent loose solid are removed.

2. Secondary treatment:-
   - When the waste water comes into the second phase the effluents are treated and also removed dissolve suspended biological matter. In the secondary treatment sedimentation and biological sludge are used. In this treatment there is requirement of separation process to remove the micro-organisms and supply the remaining water into the tertiary process.

3. Tertiary process:-
   - In the last and final stage of the treatment process the water goes to filter again to remove waste which was present after the process in secondary process. after that the waste water is disinfected chemically also through micro filtration and the water is released into sea water or pond.

❖ **Scenario in ideal village:-PUNSARI**

- The village Punsari has best sanitation system as well as there will be R.O. water plant for the villagers and the water is supplied throughout village in 20 liter tin.
- Also there will be public toilet and also the toilet at each and every home.
- There is a wastewater supply in the sense there are fully underground sewage system and also the maintenance and repairing work is done by the gram panchayat of Punsari.
- The cleaning of man hall by the panchayat at time to time.
- There is no any sewage treatment plant but the sewage was disposed in the pond which is quite far to the village and after some basic treatment the water is used for irrigation.

❖ **Scenario in the reference village:- RANCHHODPURA**

- The Ranchhodpura village has better sanitation system. There is no any problem related to drinking problem as well as public toilet.
- There is an underground sewage supply line which is covered with road and paver blocks.
- The waste water was dispose into the lake which is near the village without any treatment of waste water.

Fig 5.3 Deposit of sewage water

❖ **Scenario in the allocated village:- MOTIDEVTI**

- There are many problems regarding water, sewage, solid waste management etc.
- There is only one hand pump in the village which is used by whole village and also Motipura villagers are used this water into the drinking purpose.
- There is underground sewage system but the condition of the sewage is quite bad and there is some issues regarding to water flow into the sewage line because there is some chock-up and also the sewage line is open at some places.

Fig 5.4 Open man hole

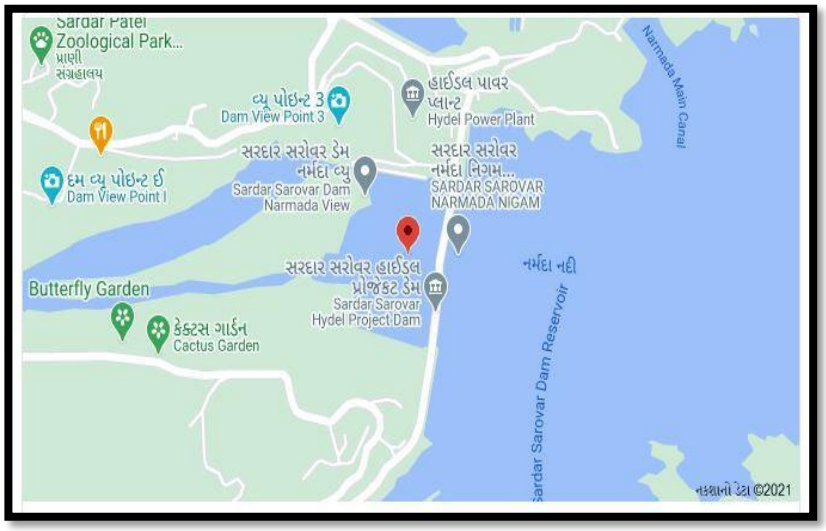
- There is no any sewage treatment plant in our village Moti Devti. The waste water is deposited into lake nearby village.

5.1.8 Case study on Sardar Sarovar Dam

➢ We find many structures which are in being construction and some of them were constructed and among them we choose the SardarSarovar Dam. This dam is constructed on Narmada river in Kevadiya near Navagam, Gujarat in India.

SardarSarovar Dam is about 100kms from Vadodara and 200 kms from Ahmedabad.

- The SSD is a concrete gravity dam constructed on Narmada river in Kevadiya. The foundation of the dam started on 5thapril 1961 by our prime minister Jawaharlal Nehru. The project took as a part of a development scheme and funded by the world bank through their international bank for reconstruction and development in 1979. The main aim of this project was to increase irrigation facilities and produce hydroelectricity, using a loan of US$ 200 million (5434 crores).



- The construction of the dam is begun in the year 1987, but he project was stalled by the supreme court of India in 1995 due to backdrop of Narmada BachaoAndolan over concerns of displacement of people. After that the project was revived in the year of 2000-01 at the lower height of 110.64 meters under direction of SC.

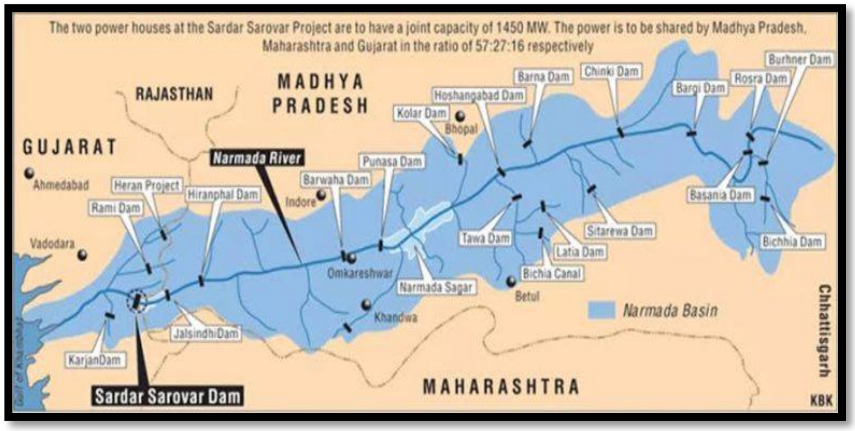


Fig 5.5 location of Sardar Sarovar Dam

❖History:-

- The plan for using the river was irrigation and power generation in the Narmada basin in the year of 1946. There were 7 projects including brunch projecting. After the investigation and initial survey, the proposed dam at Gora in the Gujarat with

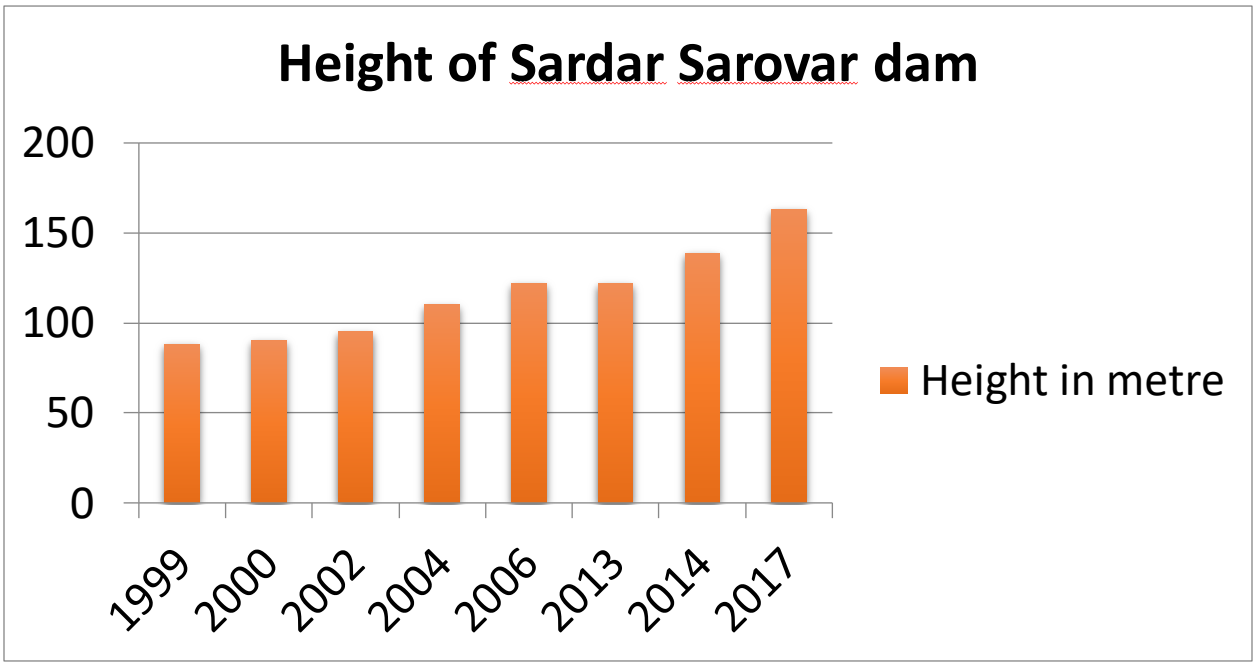
the full reservoir level (FRL) 161 ft (49.08 m) and the first foundation stone was laid by late prime minister, Pandit Jawaharlal Nehru ON 5TH APRIL 1961. After that some investigation, modernized some contour sheets from the survey of India were available, possibility of raising of the height of the dam for optimum utilization of water was considered.

- In 1964, to resolve the dispute about sharing the water of Narmada river between two governments of Gujarat and Madhya Pradesh, the government of India appointed an expert committee under chairmanship of late Dr. Khosla which recommended a higher dam with FRL 500 ft (152.44 m) in 1965. However, Govt. of M.P. was not agreeable to development of Narmada water as per **Khosla Committee** report and hence the Narmada Water Dispute Tribunal (NWDT) was constituted by the Government of India in October 1969, under the Inter State River Water Disputes Act, 1956. NWDT gave its final **award** in December 1979.
- Component of the project:-
  - Sardar Sarovar reservoir
  - Sardar Sarovar dam
  - Power
- River bed power house
- Canal head power house
- Small Hydro power projects on Narmada branch canals
- Solar power Projects on Narmada Branch Canal
- Pumping Station Projects on Narmada Branch Canals
  - Main Canal
  - Canal distribution system and irrigation water operations
  - Commanded area development

Height of the Sardar Sarovar dam:-

- In February 1999, the Supreme Court of India gave the go ahead for the dam's height to be raised to 88 m (289 ft) from the initial 80 m (260 ft).
- In October 2000 again, in a 2-to-1 majority judgment in the Supreme Court, the government was allowed to construct the dam up to 90 m (300 ft).
- In May 2002, the Narmada Control Authority approved increasing the height of the dam to 95 m (312 ft).
- In March 2004, the Authority allowed a 15 m (49 ft) height increase to 110 m (360 ft).
- In March 2006, the Narmada Control Authority gave clearance for the height of the dam to be increased from 110.64 m (363.0 ft) to 121.92 m (400.0 ft). This came after 2003 when the Supreme Court of India refused allow the height of the dam to increase again.

- In August 2013, heavy rains raised the reservoir level to 131.5 m (431 ft), which forced 7,000 villagers upstream along the Narmada River to relocate.
- On June 2014, Narmada Control Authority gave the final clearance to raise the height from 121.92 m (400.0 ft) metres to 138.68 m (455.0 ft)
- The Narmada Control Authority decided on 17 June 2017 to raise the height of the SardarSarovar Dam to its fullest height 163-meter by ordering the closure of 30 Gates.



❖ Conclusion :-

➢ SardarSarovar Dam height:

- It is the second largest gravity dam of the world and the height of the dam above deepest foundation level is 163.00 meters and top R.L. of the dam is 146.50 meters and actual height of the dam is 138.68 meters.

➢ Sardar Sarovar dam cost:-

- The total cost of Narmada project is around 47,202 crores and the actual cost of construction is 25 billion Indian rupees.

➢ Concrete required for dam:-

- The dam is 1210 meter long, 146.50 meter high and 124 meter wide as a base concrete gravity dam involving placement of about 73.20 lakh cubic meters of ‘ pre-cooled’ concrete.
- This is the second largest dam in the world in the terms of concrete used and it can lay a 22,500 kms long concrete road which can encircle the equator.

❖ About project site:

1. Location:-

1.	**State**	**Gujarat**
2.	District	Narmada
3.	Taluka	Nandod
4.	Village	Kevadia
5.	River	Narmada
6.	Longitude	73º45'E
7.	Latitude	21º50'N

2. Dam :-

1.	**Type**	**Gravity**
2.	Length of main dam	1210.02 m
3.	Top R.L. of Dam	146.50 m
4.	Maximum height above the deepest foundation level	163.00 m
5.	Highest observed flood	69385 cumecs
6.	Design flood for spillway	86944 cumecs
7.	Probable maximum flood	171100 cumecs
8.	Clear water way at crest	420.9 m
9.	Spillway capacity	86944 cumecs
10.	No. of construction sluice	10
11.	Size of construction sluice	2.10 m x 2.74 m
12.	Length of construction sluice	119.24 m
13.	Discharge capacity	268.50 cumec
14.	No. of river sluice	4
15.	Size of river sluice	2.50 m x 4.00 m
16.	Sill level	53.00 m
17.	Discharge	244 cumec

3. Power Installation:-

No.		**River bed power house**	**Canal head power house**
1.	Locaion	165 m in D/S of dam	At the toe of Vadgam Saddle dam
2.	No. of units	6	5
3.	Rated capacity of each unit	200 MW	50 MW
4.	Installed capacity	1200 MW	250 MW
5.	Type of turbine	Francis Vertical	Kaplan
6.	Type of power house	Under ground	Surface
7.	Rated speed	136.36 RPM	136.4 RPM
8.	Dia of runner	5.7 m	4.7 m

9.	Min. head race level	110.64 m	110.18 m
10.	Min. tail water level	20.80 m	92.07 m

Power allocation:- allocation in percentage

Madhya Pradesh 57

Maharashtra 27

Gujarat 16

1007 million kwh in surplus year & 856 million kwh deficit year valuing to Rs 4000 to 5000 million.

4. Cost estimate:- At price level

No.		**1986-87**	**2008-09**
1.	Cost of Unit-1 Dam & appurtenant works	619.47	3490.4
	R & R cost	316.71	4894.45
	Project debitable to sardar sarovar	83.27	545.68
	Total of unit-1	1019.45	8930.53
2.	Cost of Unit-2		
	Main canal	1588.54	5798.28
	IBPT		165.67
	Dykes		83.24
3.	Cost of Unit-3		
	Hydro civil works	236.42	930.54
	Electric Installation	743.53	1980.35
	Total of Unit-3	979.95	2910.89
4.	Group-4 Branch Canal & Distribution system	2818.1	21351.84
	Total Project Cost in Rs. crore	6406.04	21351.84

❖ **Benefits of Project:-**

➢ IRRIGATION

- The Sardar Sarovar Project will provide irrigation facilities to 18.45 lac ha. of land, covering 3112 villages of 73 talukas in 15 districts of Gujarat. It will also irrigate 2,46,000 ha. of land in the strategic desert districts of Barmer and Jallore in Rajasthan and 37,500 ha. in the tribal hilly tract of Maharashtra through lift. About 75% of the command area in Gujarat is drought prone while entire command in Rajasthan is drought prone. Assured water supply will soon make this area drought proof.

➢ DRINKING WATER SUPPLY

- A special allocation of 0.86 MAF of water has been made to provide drinking water to 173 urban centres and 9490 villages within and out-side command in Gujarat for present population of 28 million and prospective population of over 40 million by the year 2021. All the villages and urban centres of arid region of Saurashtra and Kachchh and all "no source" villages and the villages affected by salinity and fluoride in North Gujarat will be benefited. Water supply requirement of several industries will also be met from the project giving a boost to all-round production

➢ POWER

- There are two power houses viz. River Bed Power House and Canal Head Power House with an installed capacity of 1200 MW and 250 MW respectively. The power would be shared by three states - Madhya Pradesh - 57%, Maharashtra - 27% and Gujarat 16%. This will provide a useful peaking power to western grid of the country which has very limited hydel power production at present. A series of micro hydel power stations are also planned on the branch canals where convenient falls are available.

➢ FLOOD PROTECTION

- It will also provide flood protection to riverine reaches measuring 30,000 ha. covering 210 villages and Bharuch city and a population of 4.0 lac in Gujarat.

➢ WILD LIFE

- Wild life sanctuaries viz. "Shoolpaneshewar wild life sanctuary" on left Bank, Wild Ass Sanctuary in little Rann of Kachchh, Black Buck National Park at Velavadar, Great Indian Bustard Sanctuary in Kachchh, Nal Sarovar Bird Sanctuary and Alia Bet at the mouth of River will be benefited.

Chapter 6. Swachh Bharat Abhiyan (Clean India)

6.1 Swachhta needed in allocated village -Existing Situation with photograph

- The village ranking in the terms of swachhta is very bad and several factors affect to this negative situation.
- The individuals of the village are very responsible for creating pollution all over the village due to not have proper techniques in their life.
- On the visit day, we saw that lots of garbage including mud, plastic bags, papers, food and also other non biodegradable garbage on the road.
- We observed that major part of garbage is spread over road and on side footpath due to improper management of village.
- Also so many native villagers are very careless about this bad pollution as there just throw the garbage at any where in their owe prefer manner.
- The village's each and every corner is partially filled up with the garbage and also it causes air as well as land pollution among native people.
- Beyond the villagers side, the government also responsible for this worst situation as they did not provide enough dustbins in the village even the garbage collecting vehicle also comes rarely in the village.
- To eliminate the bad scenario of the village, several steps should be taken by villagers as well as by government.
- We also noticed that people throw their rubbish infront of their houses.
- By taking door to door survey we find the main causes of this situation such as they are unable to use proper dustbins for throwing garbage, also they are less understand for the sever effects of the garbage on their life.
- On the other side, the lack of drainage facilities in the village also cause pollution on the land and it has sever effect on the life.
- There are some parts of village in which drainage lines are in use but half of the villagers are facing same problem of drainage.
- Majority of villagers are totally depend on the cattle and that is the main influence factor of creating garbage at each and every corner of village as the hip of mud can easily seen at every corner of village.

Fig 6.1Garbage in well

- Due to not having any particular place for this garbage collection, the native ones have no other chance to mitigate the mud problems so they just throw in front of their houses and we causes health related problems among villagers.

6.2 Guidelines - Implementation in allocated village with Photograph

- The main aim of Swachh Bharat Abhiyan is to accelerate the efforts to achieve universal sanitation coverage and to put focus on safe sanitation, the honorable Prime Minister of India launched the Swachh Bharat Mission on 2nd October, 2014.
- The rural sanitation program in India was introduced in 1954 as a part of 1st five year plan of Government of India.
- The guideline of SBA and the provision hereunder are applicable with the effect from 2nd October 2014.

❖ Objectives :-

- Bringing out the awareness in the life of rural areas, by promoting the cleanliness, hygiene and eliminating open defecation.
- Motivate Panchayati raj and others communities to adopt sustainable sanitation facilities and practices through health education and awareness creation.
- Accelerate sanitation coverage allover the rural areas to gain the vision of SBA by 2nd October.
- Encourage cost effective and appropriate technologies for ecologically safe and convenient sanitation facilities.
- Create significant positive impact on gender and promote social inclusion by improving sanitation especially in marginalized communities.

❖ Implementation :-

- The villagers are less adequate to contribute themselves in terms of increasing the swachhata in village because the village have not any kind of proper waste collection

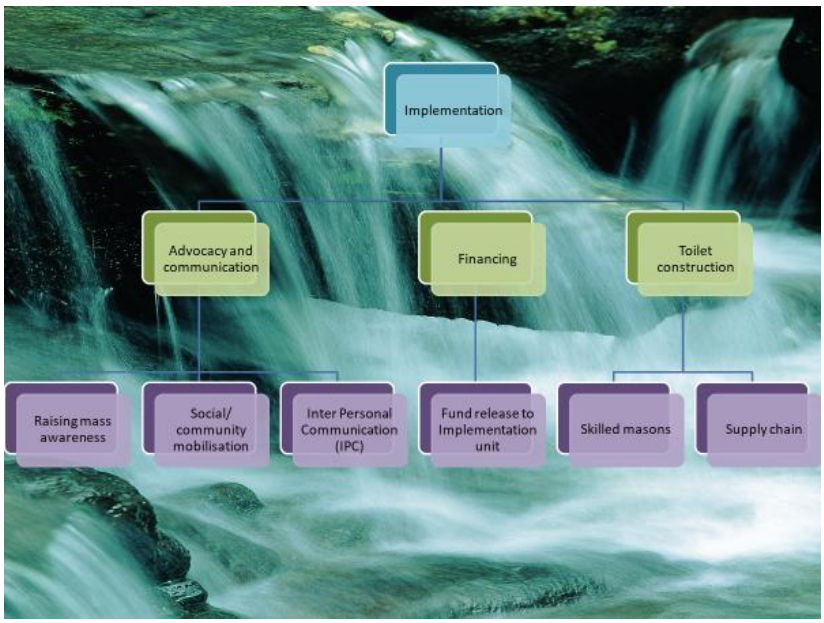
equipment.

- We asked sarpanch about the SBA guideline and implementation followed in the Motidevti village.
- The garbage collecting vehicle comes in the village twice a week which significantly affect the cause of pollution over land.
- The less education among native people also may cause this kind of waste pollution in the village.
- We saw that numbers of hip of garbage spread over the road and side footpath which reduce the length of road for smooth traffic movement as well as it creates bad smell and pollution in the village.
- The government also implement several corelated steps to bring out the overall awareness and mitigate the main problem of land pollution in villages.
- They give various steps according to the guideline provided such as mission objectives, mission strategy, mission components.

❖ Mission strategy :-

- The implementation of SBA has overall budget of Rs. 62,009/- which it totally based on the unit per capita costs for various essential components.
- The allocated fund is proposed to be generated through various sources of fund which are shown in below;

1. Corporate Social Responsibilities
2. Land Leveraging
3. Private Sector Participation
4. User charges
5. Innovative revenue streams
6. Additional Resources from State Government/ULB
7. Beneficiary share
8. External assistance
9. Swachh Bharat Kosh
10. Market borrowings



❖ Mission Objective:-

- To effect behavioral change regarding healthy sanitation practices
- Generate awareness about sanitation and its linkage with public health
- Capacity

Fig 6.2 Implementation chart

- Augmentation for ULBs to create an enabling environment for private sector participation in Capex (capital expenditure) and Opex (operation and maintenance).
- Elimination of open defecation
- Eradication of Manual Scavenging
- Modern and Scientific Municipal Solid Waste Management

❖ Mission Components :-

- Household toilets, including conversion of insanitary latrines into pour-flush latrines
- Community toilets,
- Public toilets and urinals
- Solid waste management
- IEC & Public Awareness
- Capacity building and Administrative & Office Expenses(A&OE)

6.3 Activities Done by Students for allocated village with Photograph

- We met several native people and also sarpanch for spreading the awareness of Swachh Bharat Abhiyan and how to contribute ourselves to decrease the land pollution by taking simple and easy steps by villagers.
- We taught them the main basic guideline regarding the swachhata in village and its advantages on their lives.

- We gave them basic information and easy steps to mitigate the problem easily even we did discussion to individuals about the benefits of swachhata and why it necessary for living a healthy lifestyle.
- We gave various suggestions to villagers which are written as below :
  - Avoid plastic bags
  - Keep paper bags with yourself whenever you go for shopping
  - Avoid spreading garbage at anywhere
  - Use dustbin for proper garbage collection
  - Do not throw any kind of wrappers, paper, plastic stuff, can etc at any at place
  - Spread as much as awareness regarding cleanliness of village among other people
- Due to Covid-19, Sarpanch and other community member were not interested to give us proper equipment for cleaning the places as they had worries regarding spreding of corona virus and may we caught of this virus and we were very afraid of corona virus so we did not pursue any kind of cleaning activity in the village. We regret for this inconvenience caused by us.

Chapter 7. Village condition due to Covid-19

7.1 Taken steps in allocated village related to existing situation withphotograph

- The sarpanch of Motidevti village is very much honest and down to earth person. He did several activities in the village to save the village from corona virus.
- We asked several questionnaires about which steps taken from your as well as individuals side and he gave all the kind of information which is necessary at basic level to save village by taking proper precautions.
- The whole village was spread out with the help of sanitizer periodically once a two month at each and every corner of village.
- They distributed several masks to every native people of village as part of serving humanity services to every villagers.
- They spread awareness regarding Covid-19 about which types of self precaution should take to overcome this massive problems.

Fig 7.1 Sanitizer spray in village

7.2 Activities done by students for allocated village with Photograph

- We took several precaution while visit the Motidevti village. We did visit by wearing mask and sanitizing our body after few hours repetitively.
- We gave several suggestion regarding how to fight corona virus by taking appropriate precaution to live healthy lifestyle.

Fig 7.2 Visit of dudh dairy by taking proper precautions

- We spread awareness about social distancing, wearing mask, maximum repetitively use of sanitizer in day to day life.
- We visited several places such as dudh dairy, temple, door to door survey by wearing mask and collected relevant data.
- We felt very happy about hearing not one single positive Covid-19 case in village because of proper self care and dedication of villagers to make village free from Covid-19 village which definitely good manner of native people.

7.3 Any other steps taken by the students / villagers

- The villagers play essential role towards reducing the risk of corona virus over the Motidevti village by spreading awareness massage to every people.
- They stop meeting in public places without any kind of work, even they just meet to each other only if there is an emergency work while keeping social distancing between each other.
- They restricted many festivals as it helps very much to reduce the spread out of corona virus from one community to other one.
- Initially we also took the visit very seriously as Covid-19 is almost everywhere but after collecting data of Covid-19 positive cases in the village and we got negative result of our question.
- Even though we wear mask while visiting different places and meeting to others and just keep social distancing while asking our questionnaires.

Chapter 8. Sustainable Design Planning Proposal (Prototype Design)

8.1 Design proposals

8.1.1 Sustainable Design

❖ **Public toilet :-**

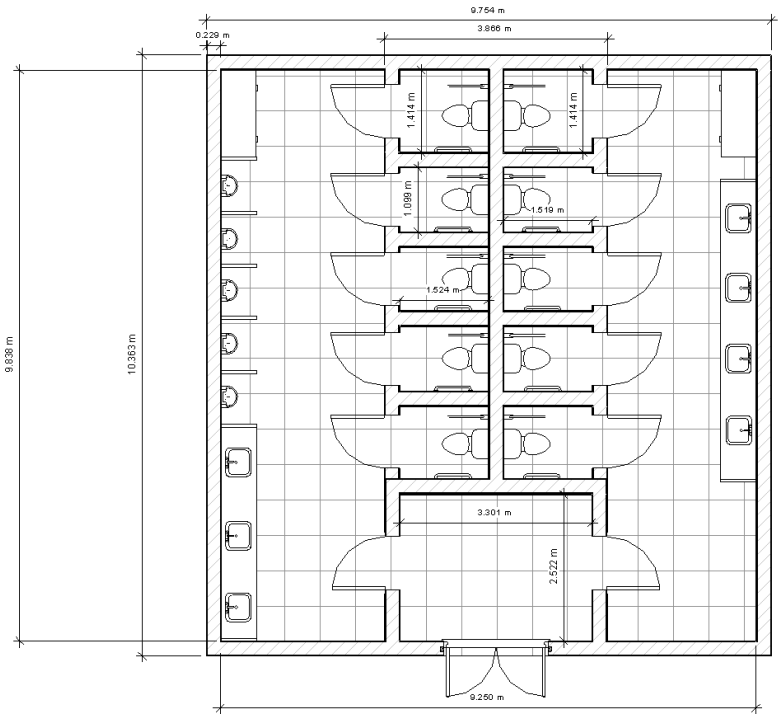


Fig 8.1 Plan layout of public toilet

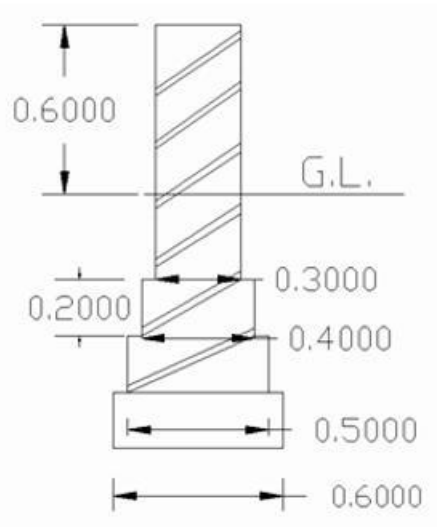


Fig 8.2 Section view of foundation

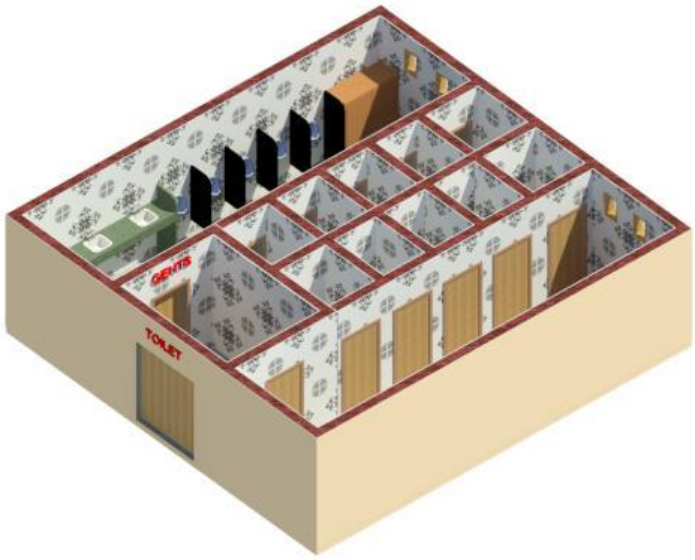


Fig 8.3 3D inside view of public toilet

❖ Measurement sheet :-

Table 8.1 Measurement sheet

Sr. no.	Item description	No.	Length (m)	Width (m)	Height (m)	Quantity (Cu m)
	Total length =2(9.75-(2*0.3))+2(10.35-(2*0.3))=37.8m					
1.	**Excavation for foundation**	1	37.8	0.9	1.2	**40.824**
2.	**P.C.C work in foundation**	1	37.8	0.9	0.3	**10.206**
3.	**Brick work in foundation up to plinth**					
	Step:-1	1	37.8	0.6	0.2	**4.536**
	Step:-2	1	37.8	0.5	0.2	**3.78**
	Step:-3	1	37.8	0.4	0.2	**3.024**
	Up to G.L.	1	37.8	0.3	0.3	**3.402**
						Total = 14.742Cu.m
4.	**Sand filling in foundation and P.L.**					
	40.824-(10.206+4.536+3.78+3.024)					**19.278**
5.	**Brick work in super structure**					
	B.W. in S.S (O.W.)	1	37.8	0.3	3	**34.02**
	Door	1	1.81	0.3	2.21	**1.20**
	Window (Ventilation)	4	1.81	0.3	0.61	**0.30**

	Lintel					
	Door	1	2	0.3	0.15	**0.09**
	Ventilation window	4	0.6	0.3	0.15	**0.108**
	B.W. in S.S(Partition wall)	2	10.05	0.15	3	**9.045**
		5	3.87	0.15	3	**8.0325**
	Deduction					
	Door	12	0.91	0.23	2.13	**5.35**
	Lintel					
	Door	12	1.1	0.15	0.15	**2.97**
	Total = (34.02+13.468)-(1.20+0.30+0.09+0.108+3.489+2.97)					**47.335**
5.	**R.C.C.**					
	Slab	2	9.754	10.363	0.1	**20.22**
6.	**Plaster**					
	(15mm thick outside plaster)					
	External wall =(2*9.75)+(2*10.35)	1	40.2	-	4	**160.8**
	Deduction					
	Door	1	1.81	-	2.21	**4.00**
	Window	4	0.41	-	0.61	**1.00**
	Total length of plaster in outer side = (160.8-4-1)	1				**155.8**
	(12 mm thick outside plaster)					
	Total length of plaster in internal side	1	129.78	-	2.9	**376.304**
	Ceiling	1	9.75	-	9.75	**89.2125**
	Deduction					
	Door	24	0.91	-	2.13	**46.52**
		1	1.81	-	2.21	**4.00**
	Windows	4	0.41	-	0.61	**1.00**
	Total = (376.304+89.2125-46.52-4-1)					**414**

❖ Abstract sheet :-

Table 8.2 Abstract sheet

Sr. no.	Particular items	Quantity	Rate	Per	Amount
1.	Excavation for foundation	40.800	85	Cu.m	**3468**
2.	P.C.C work in foundation	10.206	3200	Cu.m	**32659.2**
3.	Brickwork in foundation up to plinth	14.74	3200	Cu.m	**47168**
4.	Brickwork for super structure	47.3635	3500	Cu.m	**165772.25**
5.	R.C.C work for slab & lintels	20.18	8800	Cu.m	**177584**
6.	Plaster	569.8	150	Sq. m	**85470**
					Total = 512121.45

❖ Explanation:-

(1) P.C.C. (1:4:8) in foundation :-

For 10.206 m^3 wet concrete 12.75 m^3 dry concrete required

Here 1:4:8 = 13

Cement = (1/13*12.75) = 0.98 m^3

No. of cement bag = 0.98/0.035 = 28 bags

Sand = (4/13*12.75) = 3.92 m^3

Aggregate = (8/13*12.75) = 7.84 m^3

(2) Brick bat C.C. in foundation (1.4.8) :-

In brick bat cement the volume of brick bat required will be equal to the total volume of cement

14.74 m^2 of concrete 14.74 m^3 of brick bat required prop = 1.4.8

Volume of sand is one half of the volume of brick bat

Volume of sand required = 7.37 m^3

Volume of sand is one forth of the volume of sand = ¼(7.37) = 1.8425/0.035 = 52.64 = 53 bags

(3) For first class brickwork in C.M. 1.6 in superstructure :-

i. For 1 m^3 of brick work……. 500 bricks are required

47.3635 m^3 of brick work……(?) = 23681.75 No of bricks

Add 1% waste = 23918.56 = 23920 No. of bricks are required

ii. For 1 m^3 of brick work……. 0.33 m^3 mortar required

Proportion = 1.6. = 7

Cement = (1/7*0.33*47.3635) = 2.23/0.035 = 63.79 = 64 bags

Sand = (6/7*0.33*47.3635) = 13.39 m^3

(4) Plaster :- 15mm outer C.M. = 1:3 :-

Area of plaster 155.8 m^2

Volume of wet mortar = 155.8*0.015 = 2.337 m^3

Add 30% for uneven surface and joint filling = 2.337*1.30 = 3.038 m^3

Add 25% more for dry mortar = 3.0381*1.25 = 3.797 = 3.80 m^3

Mortar proportion = 1:3 = 4

Cement = (1/4*3.80) = 0.95/0.035 = 27.14 = 28 bags

Sand = (3/4*3.80) = 2.85 m^3

(5) 12 mm thick plaster internal wall 1:4 :-

Area of plaster = 414 m^2 thickness = 12 mm

Volume of wet concrete = 414*0.012 = 4.968 m^3

Add 30% for filling joint and uneven surface = 4.968*1.30 = 6.4584 m^3

Add 25% = 6.4584*1.25 = 8.073 m^3

Mortar proportion = 1:4 = 5

Cement = (1/5*8.073) = 1.6146/0.035= 46 bags

Sand = (4/5*8.073) = 6.4584 m^3

(6) For RCC slab and lintel :-

i. For 1 m^3 wet concrete = 1.25 m^3 dry concrete

1 m^3……1.25 m^3

20.18 m^3……. (?) = 25.23 m^3

Proportion 1:1.5:3 = 5.5 m^3

Cement = (1/5*25.23) = 4.58/0.035 = 131 bags

Sand = (1.5/5.5*25.23) = 6.88 m^3

Aggregate = (3/5.5*25.23) = 13.76 m^3

ii. Assume 1% steel of wet volume of concrete

Volume of steel = (1/100)*20.18 = 0.2028 m^3

Density of steel = 7850 Kg/m^3

Mass = 0.2018*7850 = 1584.13 Kg

For 100 Kg of steel binding wire = 1 Kg

For 1584 Kg of steel binding wire = 16 Kg required

8.1.2 Physical design (Civil)

❖ Bus stand :-

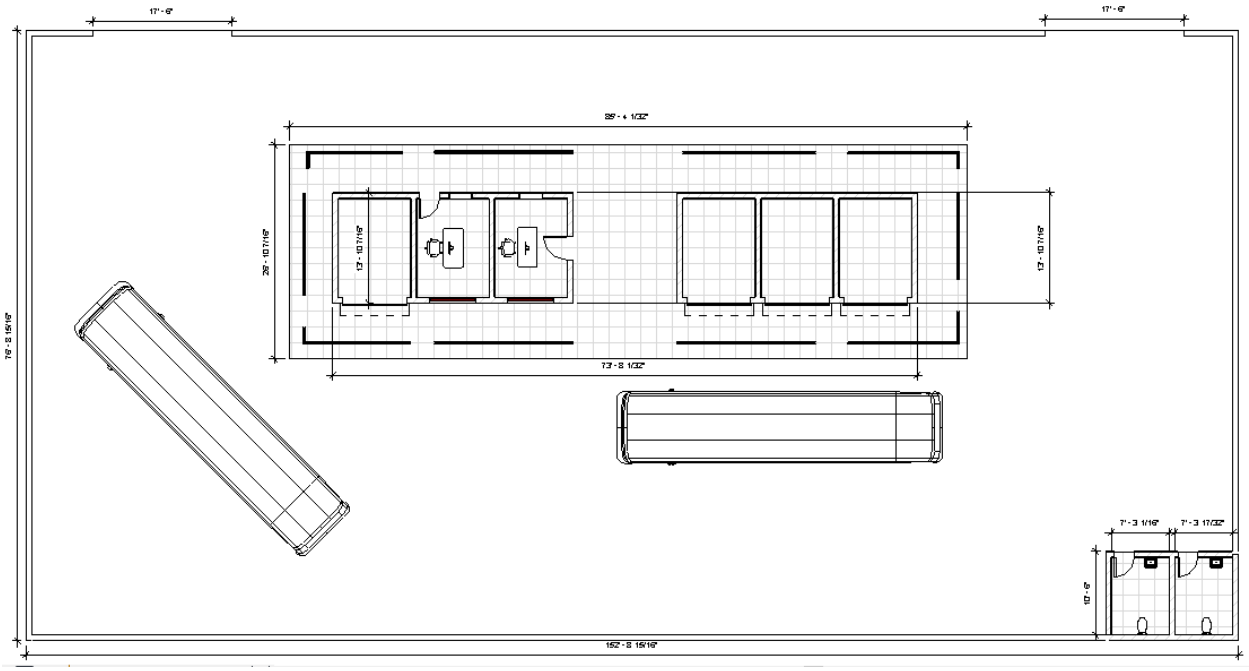


Fig 8.4 Plan layout of bus stand

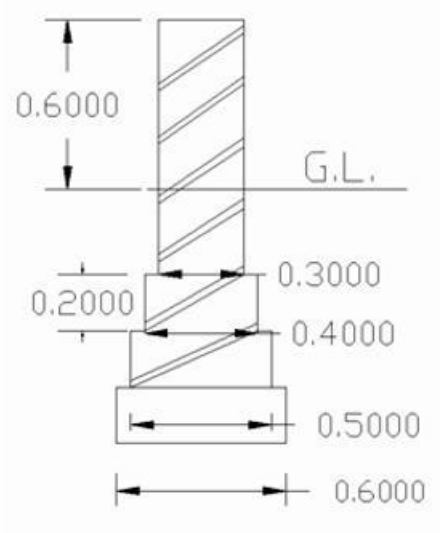


Fig 8.5 Section view of foundation

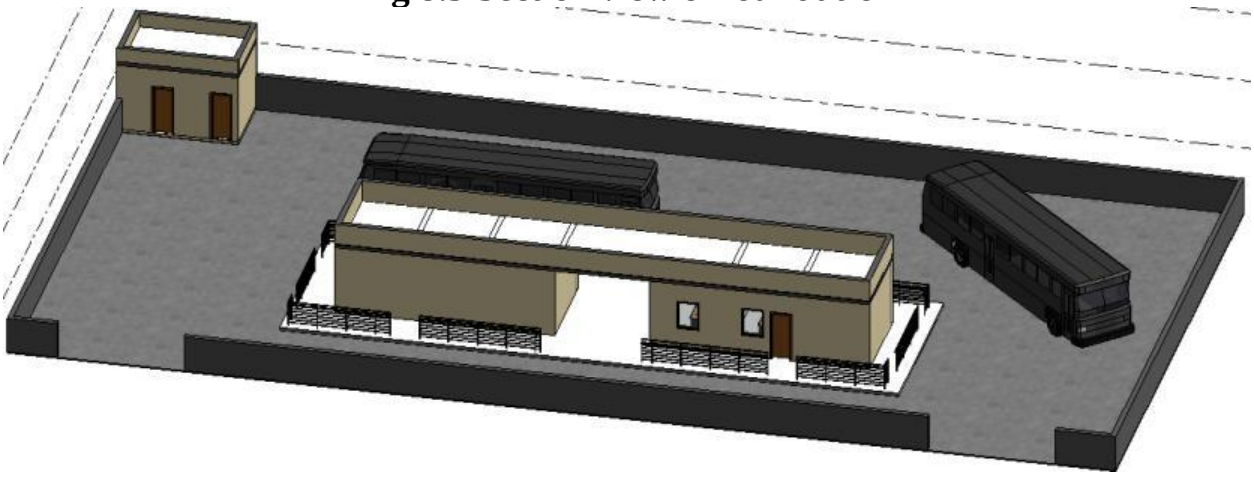


Fig 8.6 3D view of bus stand

❖ **Measurement sheet :-**

Table 8.3 Measurement sheet

Sr. No.	Description of items	No.	Length (m)	Width (m)	Height (m)	Total quantities (Cum)
	Total length					60.8
1.	**Excavation in Foundation**	1	60.8	0.9	1.2	65.664
2.	**P.C.C in Foundation**	1	60.8	0.9	0.3	16.416
3.	**Brickwork up to plinth**					
	Step:-1	1	60.8	0.6	0.2	7.296

	Step:-2	1	60.8	0.5	0.2	6.08
	Step:-3	1	60.8	0.4	0.2	4.864
	Up to G.L.	1	60.8	0.3	0.3	5.472
	Total					**23.712**
4.	**Brick work for super structure**					
	Outer wall	1	60.8	0.3	4	72.96
	Deduction					
	Door	2	0.91	0.3	2.21	1.21
		4	2.44	0.3	2.21	6.47
	Window	2	1.55	0.3	0.64	0.595
	Lintel					
	Door	2	1	0.3	0.15	0.09
		4	2.5	0.3	0.15	0.45
	Window	2	1.7	0.3	0.15	0.153
	Total					**63.992**
5.	**R.C.C.**					
	Slab	1	22	4	0.1	8.8
		1	26	8	0.1	20.8
6.	**Plaster**					
	12mm thick plaster	1	60.8	-	4	243.2
	Ceiling	2	9	4	-	72
	Deduction					
	Door	2	0.91	-	2.21	4.022
		4	2.44	-	2.21	21.57
	Window	2	1.55	-	0.64	1.984
	Total					**287.624**
7.	**(15mm thick outside plaster)**	1	60.8	-	4	243.2
	Deduction					
	Door	2	0.91	-	2.21	4.022
		4	2.44	-	2.21	21.57
	Window	2	1.55	-	0.64	1.984
	Total					**215.624**
	For compound wall					
	Total length					**137.6**
8.	**Excavation**	1	137.6	0.9	1.2	**148.60**
9.	**P.C.C.**	1	137.6	0.9	0.3	**37.152**
10.	**Brickwork in foundation**					
	Step – 1	1	137.6	0.6	0.2	16.512
	Step – 2	1	137.6	0.5	0.2	13.76

	Step – 3	1	137.6	0.4	0.2	11.008
	Up to G.L	1	137.6	0.3	0.3	8.256
	Total					**49.536**
11.	**Brickwork in super structure**	1	137.6	0.3	1.5	61.92
	Deduction	2	5.3	0.3	1.5	4.17
	Total					**57.15**
12.	**Plaster (15 mm)**	2	137.6	-	1.5	412.8
	Deduction	4	5.3	-	1.5	31.8
	Total					**381**

❖ Abstract sheet :-

Table 8.4 Abstract sheet

Sr. no.	Particular items	Quantity	Rate	Per	Amount
1.	Excavation for foundation	214.264	85	Cu. m	**18212.44**
2.	P.C.C work in foundation	53.568	3200	Cu. m	**171417.6**
3.	Brickwork in foundation up to plinth	73.248	3200	Cu. m	**234393.6**
4.	Brickwork for super structure	121.142	3500	Cu. m	**423997**
5.	R.C.C work for slab & lintels	29.6	8800	Cu. m	**260480**
6.	Plaster	864.248	150	Sq. m	**129637.2**
					Total = 1238137.84

❖ Explanation :-

(1) P.C.C. (1:4:8) in foundation:-

For 53.461 m^3 wet concrete 81.423 m^3 dry concret required
Here 1:4:8 = 13
cement = (1/13*81.423) = 6.26/0.035 = 179 bags
sand = (4/13*81.423) = 25.05 m^3
aggregate = (8/13*81.423) = 50.11 m^3

(2) Brick bat cement concrete in foundation (1:4:8)

In brick bat cement concrete foundation the volume of brick bat required will be equal to the total volume of concrete.
73.248 m^3 of concrete 73.248 m^3 of brick bat required
proportion = 1:4:8
volume of sand is one half of the volume of brick bat
volume of sand = 36.624 m^3
volume of cement is 1/4 of the sand
= (1/4)*36.624 = 9.156/0.035 = 262 bags

(3) For first class brick work in C.M. 1:6 in super structure

i. For 1 m^3 of brick work 500 bricks are required
121.142 m^3, 60571 numbers of bricks required
add 1 % waste = 61176 numbers of bricks are required

ii. For 1 m^3 0.33 m^3 mortar required

prop = 1: 6 = 7
cement = (1/7)*0.33*121.142 = 5.71/0.035 = 164 bags
sand = (6/7)*0.33*121.142 = 34.26 m^3

(4) Plaster, 15 mm outer C:M = 1:3

Area of plaster = 596.624 m^2
volume of wet mortar = 596.624*0.015 = 8.95
Add 30 % for uneven surface and joint filling
= 8.95*1.30 = 11.63
Add 25% more for dry mortar
= 11.63*1.25 = 14.54 m^3
mortar proportion = 1:3 = 4
cement = (1/4)*14.54 = 3.63/0.035 = 104 bags
sand = (3/4)*14.54 = 10.905 m^3

(5) 12 mm thick plaster internal wall with 1:4 proportion

Area of plaster = 287.624 m^2
Volume of wet concrete = 287.624*0.012 = 3.45 m^3
Add 30% forfilling joints
= 3.45*1.30 = 4.49 m^3
Add 25% for dry concrete
= 4.49*1.25 = 5.61 m^3
Mortar proportion = 1:4 = 5
Cement = (1/5)*5.61 = 1.12/0.035 = 32 bags
Sand = (4/5)*5.61 = 4.49 m^3

(6) For R.C.C. slab

i. For 1 m^3 wet concrete 1.52 m^3 dry concrete required
for 1 m^3-----> 1.52 m^3
for 29.6 m^3---->44.99 m^3
proportation = 1:1.5:3 = 5.5
cement = (1/5.5)*44.99 = 8.18/0.035 = 234 bags
sand = (1.5/5.5)*44.99 = 12.27 m^3
aggregate = (3/5.5)*44.99 = 24.54 m^3

ii. Assume 1% steel of wet volume of concrete

volume of steel = (1/100)*29.6 = 0.296 m^3
density of steel = 7850 kg/m^3
mass = 0.296*7850 = 2323.6 kg
for 2323.6 kg ---->24 kg binding wire are required

8.1.3 Social design (Civil)

- **Post office :-**

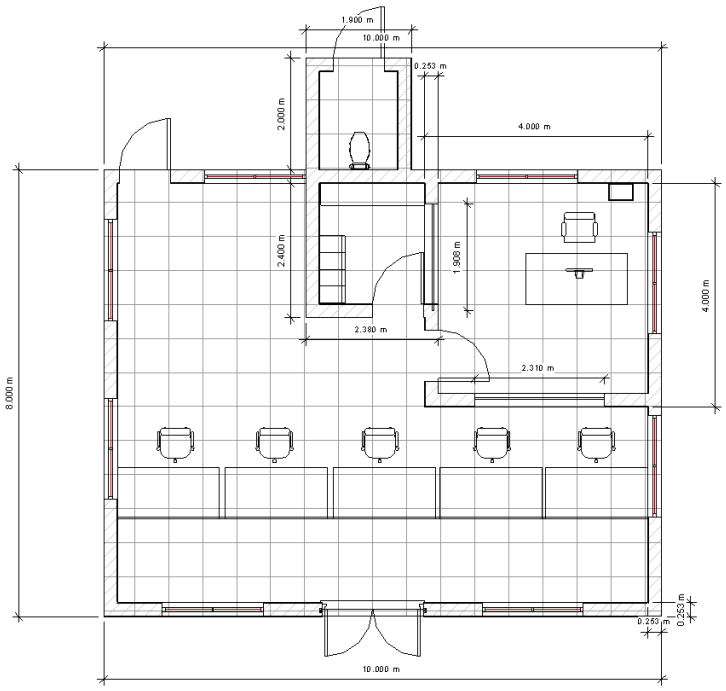


Fig 8.7Plan layout of post office

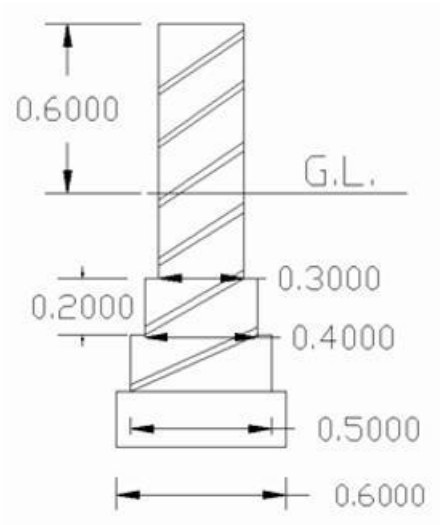


Fig 8.8 Section view of foundation

Fig 8.9 3D inside view of post office

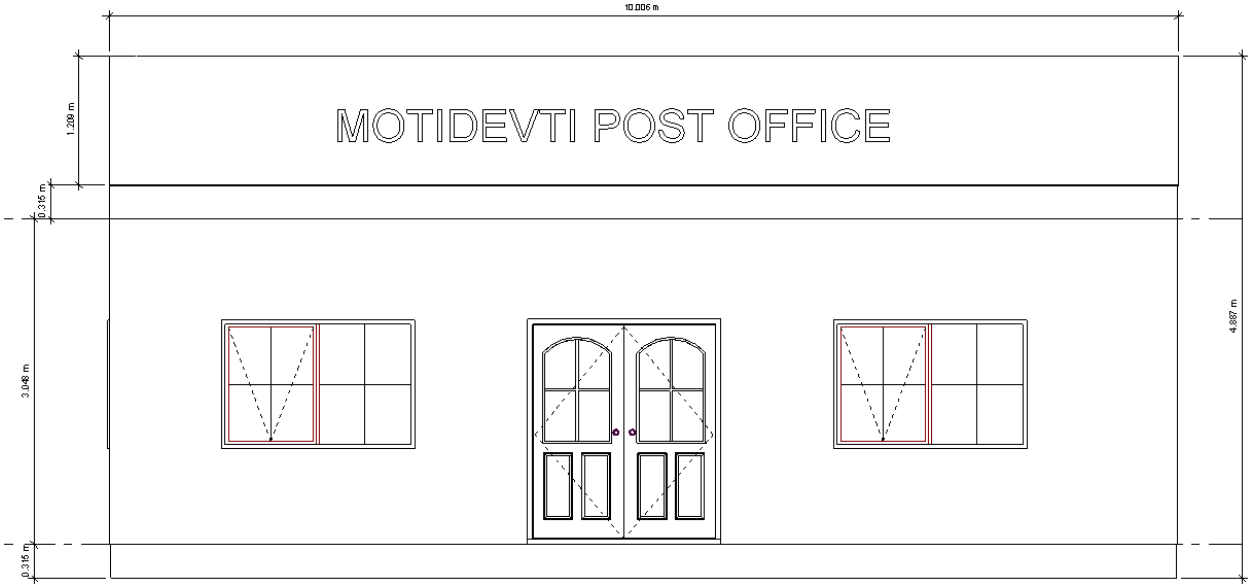


Fig 8.10Elevation of post office

❖ **Measurement sheet :-**

Table 8.5 Measurement sheet

Sr. no.	Item description	No.	Length (m)	Width (m)	Height (m)	Quantity (Cu.m)
	Total length					**51.18**
1.	**Excavation for foundation**	1	51.18	0.9	1.2	**55.27**
2.	**P.C.C work in foundation**	1	51.18	0.9	0.3	**13.82**
3.	**Brick work in foundation up to plinth**					
	Step:-1	1	51.18	0.6	0.2	**6.141**

	Step:-2	1	51.18	0.5	0.2	**5.118**
	Step:-3	1	51.18	0.4	0.2	**4.09**
	UP to G.L.	1	51.18	0.3	0.3	**4.60**
						Total = 19.949Cu.m
4.	**Brick work for Super structure**	1	51.18	0.3	3	**46.062**
	Deduction					
	Door	1	1.81	0.3	2.1	1.14
		4	0.91	0.3	2.1	2.29
	Window	8	1.81	0.3	1.2	5.21
	Curtain wall	1	2.31	0.3	1.2	0.83
		1	1.79	0.3	1.2	0.64
	Total					**35.95**
4.	**12 mm thick inside plaster**					
	Total length					**71.36**
	Outer wall	1	71.36	-	3	**214.08**
	Ceiling	1	10	8	-	**80**
		1	2	1.9	-	**3.8**
	Deduction:					
	Door	1	1.81	-	2.1	**3.801**
		4	0.91	-	2.1	**7.644**
	Curtain wall	1	1.79	-	1.20	**2.148**
		1	2.31	-	1.20	**2.77**
	Window	8	1.81	-	1.20	**17.376**
	Total					**264.141**
5.	**RCC**					
	Slab	2	10	8	0.1	**16**
		2	2	1.9	0.1	**0.76**
	Total					**16.76**
6.	**15 mm thick plaster**					
	External wall	1	40	-	3	**120**
	Deduction					
	Door	1	1.81	-	2.1	**3.801**
		2	0.91	-	2.1	**3.822**
	Window	8	1.81	-	1.20	**17.38**
	Total					**94.997**

❖ Abstract sheet :-

Table 8.6 Abstract sheet

Sr. no.	Particular items	Quantity	Rate	Per	Amount
1.	Excavation for foundation	55.27	85	Cu. m	**4697.95**
2.	P.C.C work in foundation	13.82	3200	Cu. m	**44224**
3.	Brickwork in foundation up to plinth	19.949	3200	Cu. m	**63836.8**
4.	Brickwork for super structure	35.95	3500	Cu. m	**125825**
5.	R.C.C work for slab & lintels	16.76	8800	Cu. m	**147488**
6.	Plaster	94.997	150	Sq. m	**14249.55**
					Total = 400321.3

❖ Explanation:-

(1) P.C.C. (1:4:8) in foundation :-

For 13.82 m^3 wet concrete 21 m^3 dry concrete required

Here 1:4:8 = 13

Cement = (1/13*21) = 1.62 m^3

No. of cement bag = 1.62/0.035 = 47 bags

Sand = (4/13*21) = 6.46 m^3

Aggregate = (8/13*21) = 12.92 m^3

(2) **Brick bat C.C. in foundation (1.4.8) :-**

In brick bat cement the volume of brick bat required will be equal to the total volume of cement

19.949 m^2 of concrete 19.949 m^3 of brick bat required prop = 1.4.8

Volume of sand is one half of the volume of brick bat

Volume of sand required = 9.97 m^3

Volume of sand is one forth of the volume of sand = ¼(9.97) = 2.49/0.035 = 71.246 = 72 bags

(3) **For first class brickwork in C.M. 1.6 in superstructure :-**

i. For 1 m^3 of brick work……. 500 bricks are required

35.95 m^3 of brick work……(?) = 17975 No of bricks

Add 1% waste = 18155 No. of bricks are required

ii. For 1 m^3 of brick work……. 0.33 m^3 mortar required

Proportion = 1.6. = 7

Cement = (1/7*0.33*35.95) = 1.79/0.035 = 49 bags

Sand = (6/7*0.33*35.95) = 10.16 m^3

(4) **Plaster :- 15mm outer C.M. = 1:3 :-**

Area of plaster 94.997 m^2

Volume of wet mortar = 94.997*0.015 = 1.42 m^3

Add 30% for uneven surface and joint filling = 1.42*1.30 = 1.85 m^3

Add 25% more for dry mortar = 1.42*1.25= 2.31 m^3

Mortar proportion = 1:3 = 4

Cement = (1/4*2.31) = 0.58/0.035 = 17 bags

Sand = (3/4*2.31) = 1.73 m^3

(5) 12 mm thick plaster internal wall 1:4 :-

Area of plaster = 269.06 m^2 thickness = 12 mm

Volume of wet concrete = 269.06*0.012 = 3.23 m^3

Add 30% for filling joint and uneven surface = 3.23*1.30 = 4.20 m^3

Add 25% = 4.20*1.25 = 5.25 m^3

Mortar proportion = 1:4 = 5

Cement = (1/5*5.25) = 1.0.5/0.035= 30 bags

Sand = (4/5*5.25) = 4.2 m^3

(6) **For RCC slab and lintel :-**

iii. For 1 m^3 wet concrete = 1.52 m^3 dry concrete

1 m^3……1.52 m^3

16.76 m^3……. (?) = 25.47 m^3

Proportion 1:1.5:3 = 5.5 m^3

Cement = (1/5*25.47) = 4.63/0.035 = 133 bags

Sand = (1.5/5.5*25.47) = 6.95 m^3

Aggregate = (3/5.5*25.47) = 13.90 m^3

iv. Assume 1% steel of wet volume of concrete

Volume of steel = (1/100)*16.76 = 0.1676 m^3

Density of steel = 7850 Kg/m^3

Mass = 0.1676*7850 = 1315.66 Kg

For 100 Kg of steel binding wire = 1 Kg

For 1316 Kg of steel binding wire = 14 Kg required

8.1.4 Socio-Cultural design (Civil)

❖ **Garba chowk cum auditorium :-**

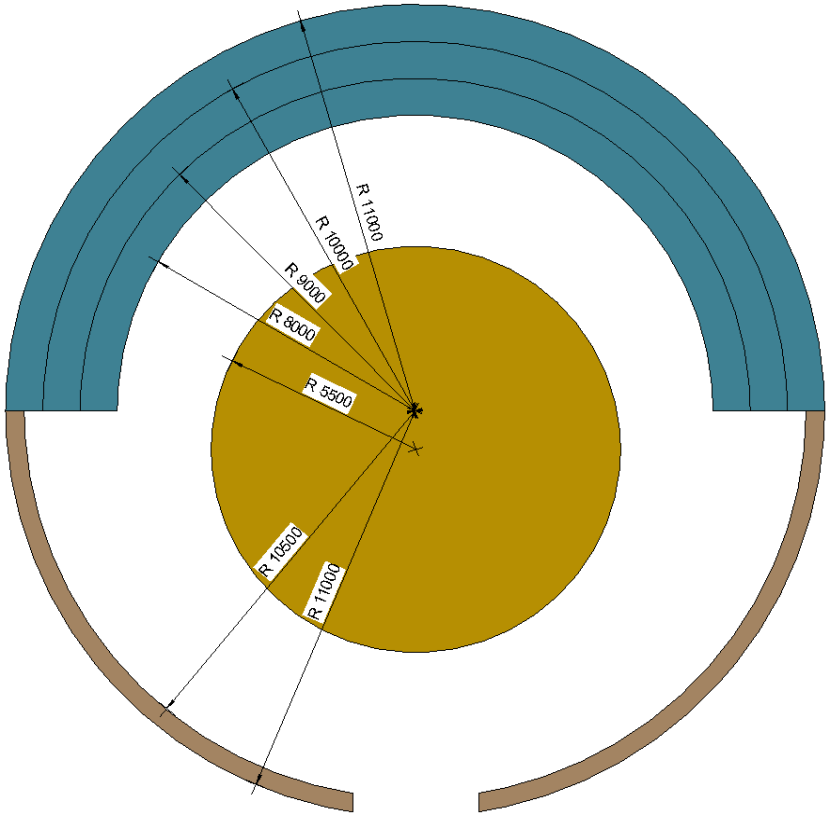


Fig 8.11 Plan layout of garba chowk cum auditorium

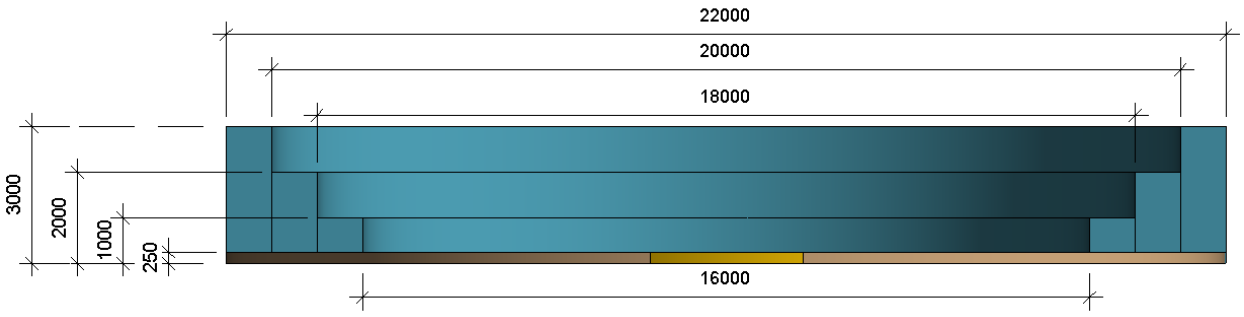


Fig 8.12 Elevation of garba chowk cum auditorium

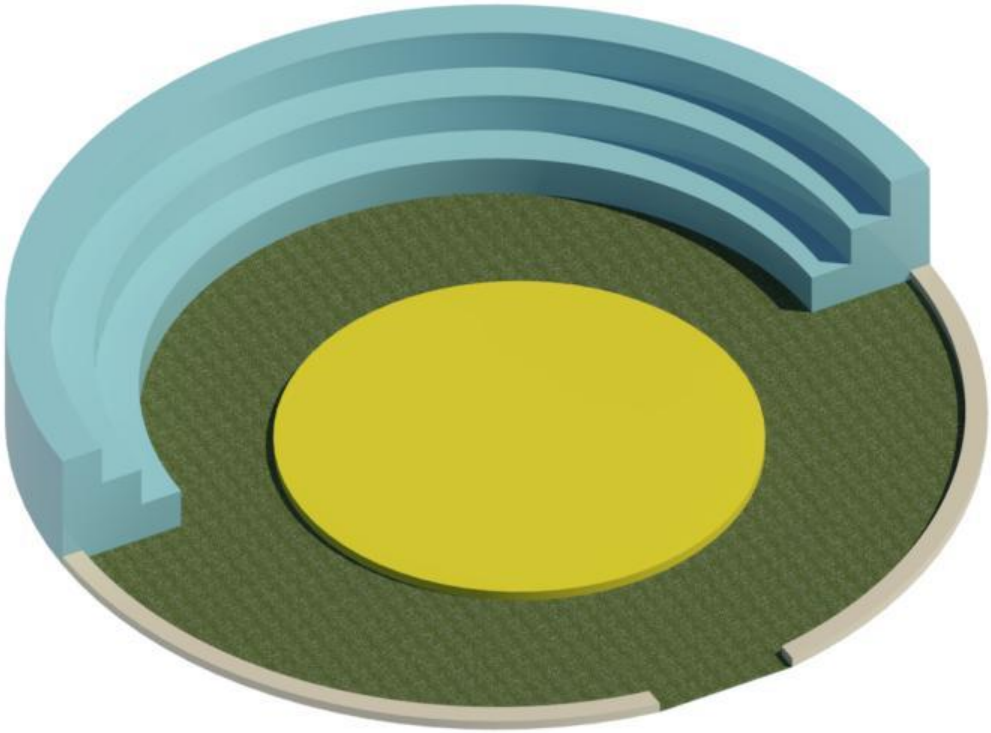


Fig 8.13 3D view of garba chowk cum auditorium

❖ Measurement sheet :-

- **Here,**
  h = 1m
  R = 11m
  r1 = 5.5m
  r2 = 8m
  r3 = 9m
  r4 = 10m
  r5 = 10.5m

Total area of semicircle = $V = = \pi R^2/2 = 189.97 m^2$

Volume for step 1:

V1= **Total volume – Volume of inner semicircle**

= **(** $\pi R^2/2 - \pi r1^2/2$) x h

= **(** 189.97–47.49) x 1

= **142.48 m^3**

Volume for step 2:

V1= **Total volume – Volume of inner semicircle**

= **(**$\pi R^2/2 - \pi r4^2/2$) x h

= (189.97 – 127.17) x 1

= **62.8 m^3**

Volume for step 3:

V1= **Total volume – Volume of inner semicircle**

= **(** $\pi R^2/2 - \pi r5^2/2$) x h

= (189.97 – 157) x 1

= **32.97 m^3**

Volume for stage: h = 0.25 m

V = **Total volume** = $\pi R^2 h \setminus 2$

= **47.49 m^3**

❖ Abstract sheet :-

Table 8.7 Abstract sheet

Sr. No.	Particular	Quantity	Rate ₹	Per	Amount ₹
1	**PCC**	**285.74**	**3200**	**m^3**	**914368**

8.1.5 Smart Village Design (Civil)

❖ Prayer hall cum meditation center

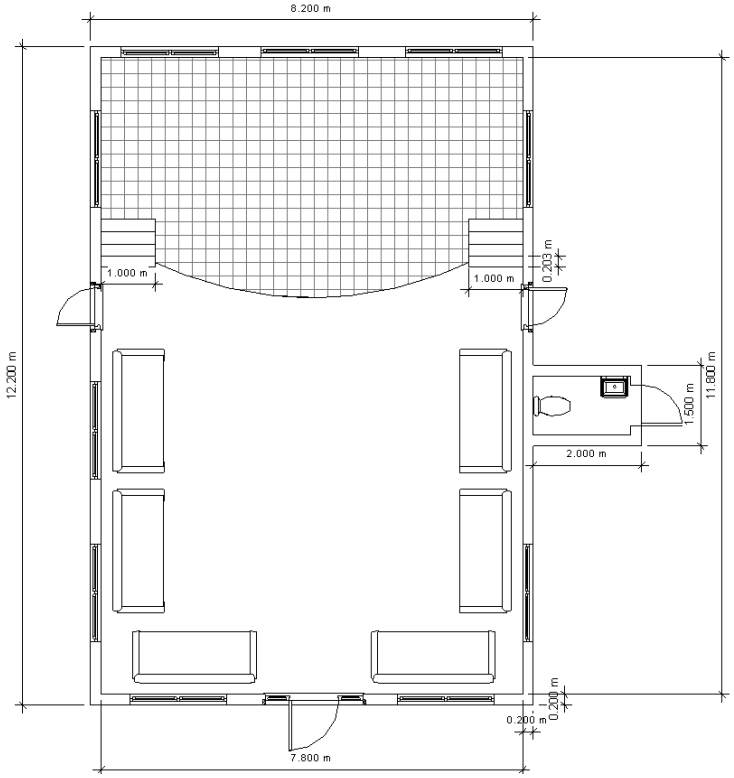


Fig 8.14Planlayout of prayer hall cum meditation center

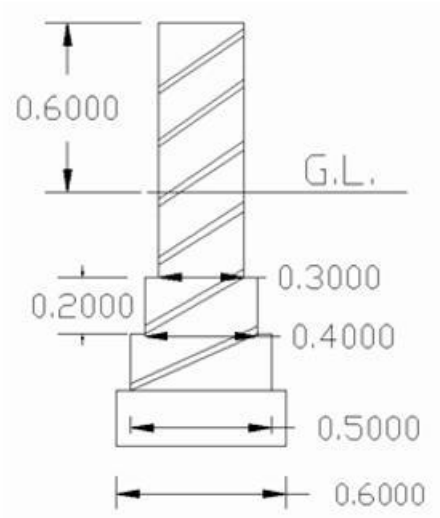


Fig 8.15 Section view of foundation

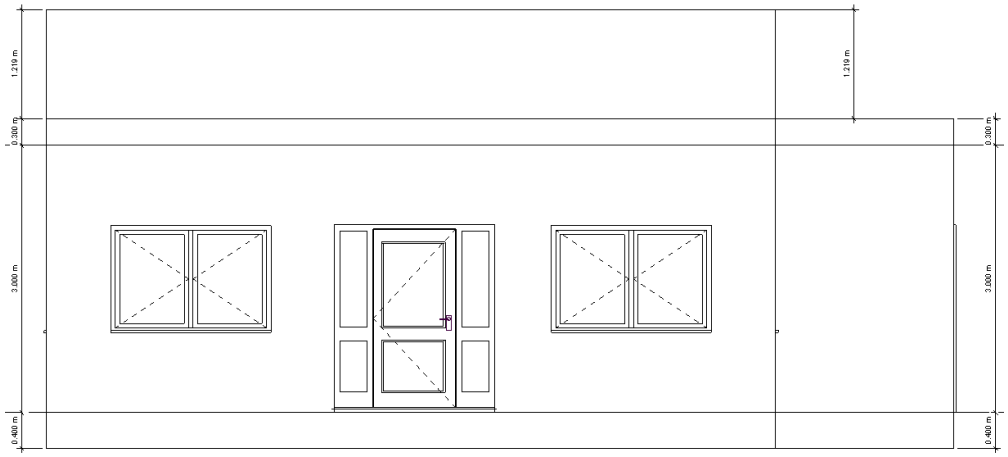


Fig 8.16Elevation of prayer hall cum meditation center

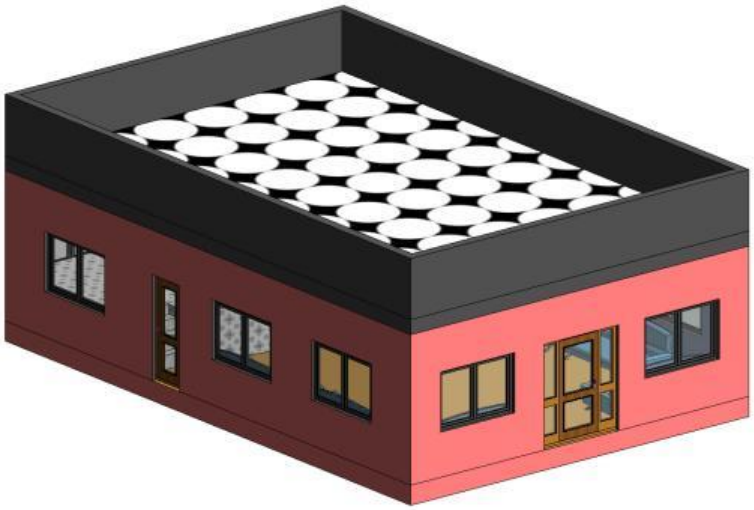


Fig 8.17 3D outside view prayer hall cum meditation center

❖ **Measurement sheet :-**

Table 8.8 Measurement sheet

	Itemdescription	No.	Length (m)	Width (m)	Height (m)	Quantity(Cu.m)
1.	Excavationforfoundation	1	42.2	0.9	1.2	**45.576**
2.	P.C.C work in foundation	1	42.2	0.9	0.3	**11.394**
3.	Brick work in foundation up to plinth					

	Step:-1	1	42.2	0.6	0.2	**5.064**
	Step:-2	1	42.2	0.5	0.2	**4.22**
	Step:-3	1	42.2	0.4	0.2	**3.376**
	Up to G.L.	1	42.2	0.3	0.3	**3.798**
						Total= 16.458 Cu. m
4.	Brickworkfor superstructure					
	Outerwall	1	42.20	0.3	3	**37.98**
		1	42.20	0.15	1	**6.33**
	Deduction:					
	Door	1	1.81	0.3	2.11	**1.145**
		3	0.81	0.3	2.11	**1.538**
	Window	11	1.80	0.3	1.20	**7.128**
	Total					**9.811**
	Deduction of Lintel					
	Door	1	2	0.3	0.15	**0.09**
		3	1	0.3	0.15	**0.135**
	window	11	2	0.3	0.15	**0.99**
	Total					**33.284**
5.	RCC					
	Slab	2	12.20	8.20	0.1	**20.008**
		2	2	1.5	0.1	**0.6**
	Total					**20.608**
6.	Plaster					
	Externalwall	1	42.2	-	4	**168.8**
	Deduction					
	Door	1	1.81	-	2.11	**3.82**
		3	0.91	-	2.11	**5.76**
	Window	11	1.80	-	1.20	**23.76**
						135.46
7.	Plaster					
	Internal wall	1	42.2	-	3	**126.6**
		1	42.2	-	1	**42.2**
	Add celling	1	12.2	8.2	-	**100.04**
		1	2	1.5	-	**3**
	Deduction					
	Door	1	1.81	-	2.11	**3.82**
		3	0.91	-	2.11	**5.76**
	Window	11	1.80	-	1.20	**23.76**
	Total					**238.5**

❖ Abstract sheet :-

Table 8.9 Abstract sheet

Sr. no.	Particular items	Quantity	Rate	Per	Amount
1.	Excavation for foundation	45.576	85	Cu. m	**3873.96**
2.	P.C.C work in foundation	11.394	3200	Cu. m	**36460.8**
3.	Brickwork in foundation up to plinth	16.458	3200	Cu. m	**52665.6**
4.	Brickwork for super structure	33.284	3500	Cu. m	**116494**
5.	R.C.C work for slab & lintels	20.608	8800	Cu. m	**181350.4**
6.	Plaster	238.5	150	Sq. m	**35775**
					Total = 426619.66

❖ Explanation :-

1. **P.C.C. (1:4:8) in foundation:-**
   For 11.394 m^3 wet concrete 17.32 m^3 dry concrete required
   Here proportion = 1:4:8 = 13
   Cement = (1/13)*17.32 = 1.33/0.035 = 38 bags
   Sand = (4/13)*17.32 = 5.33 m^3
   Aggregate = (8/13)*17.32 = 10.66 m^3
2. **Brick bat cement concrete in foundation (1:4:8)**
   In brick bat cement concrete foundation the volume of brick bat will equal to the total volume of concrete
   16.4548m^3 of concrete, 16.4548m^3 of brick bat required
   Proportion = 1:4:8
   In brick bat foundation volume of sand is one half of the volume of brick bat
   Volume of sand = (1/2)*16.458 = 8.229 m^3
   Volume of cement is ¼ of the volume of sand
   Volume of cement = (1/4)*8.229 = 2.057/0.035 = 59 bags
3. **For first class brick work in super structure with C.M. 1:6**
   i. For 1 m^3 of brick work 500 bricks are required
      33.284 m^3, 16642 numbers of bricks are required
      Add 1% of waste = 167 numbers
      Total bricks = 16810 numbers
   ii. For 1 m^3 0.33 m^3 mortar required
      Proportion = 1:6
      Cement = (1/7)*0.33*33.284 = 1.57/0.035 = 45 bags
      Sand = (6/7)*0.33*33.284 = 9.42 m^3
4. **15 mm outer wall plaster with C.M. 1:3**
   Area of plaster 135.46 m^2
   Volume of plaster = 135.46*0.015 = 2.0319 m^3
   Add 30% for uneven surface and filling joints
   = 2.0319*1.30 = 2.64 m^3

Add 25% more for dry concrete
= 2.64*1.25 = 3.3 m^3
Mortar proportion = 1:3 = 4
Cement = (1/4)*3.3 = 0.825/0.035 = 24 bags
Sand = (3/4)*3.3 = 2.475 m^3

5. **12 mm imner wall plaster with C.M. 1:4**
   Area of plaster = 238.5 m^2
   Volume of plaster = 238.5*0.012 = 2.862 m^3
   Add 30% for uneven surface and filling joints
   = 2.862*1.30 = 3.72 m^3
   Add 25% mor for dry concrete
   = 3.72*1.25 = 4.65 m^3
   Mortar proportion = 1:4 = 5
   Cement = (1/5)*4.65 = 0.93/0.035 = 27 bags
   Sand = (4/5)*4.65 = 3.72 m^3
6. **For R.C.C. slab**
   i. For 1 m^3 wet concrete 1.52 m^3 of dry concrete required
      1 m^3→1.52 m^3
      20.608 m^3 → 31.32 m^3
      Proportion = 1:1.5:3 = 5.5
      Cement = (1/5.5)*31.32 = 5.69/0.035 = 163 bags
      Sand = (1.5/5.5)*31.32 = 8.54 m^3
      Aggregate = (3/5.5)*31.32 = 17.08 m^3
   ii. Assume 1% of steel of volume of wet concrete
      Volume of steel = (1/100)*20.608 = 0.2061 m^3
      Density f steel = 7850 kg/m^3
      Mass of steel = 0.2061*7850 = 1617.89 kg
      For 100 kg of steel 1 kg of binding wire are required
      1617.89 kg of steel 17 kg of binding wire are required

8.1.6 Heritage Village Design (Civil)

❖ **Chabutaro :-**

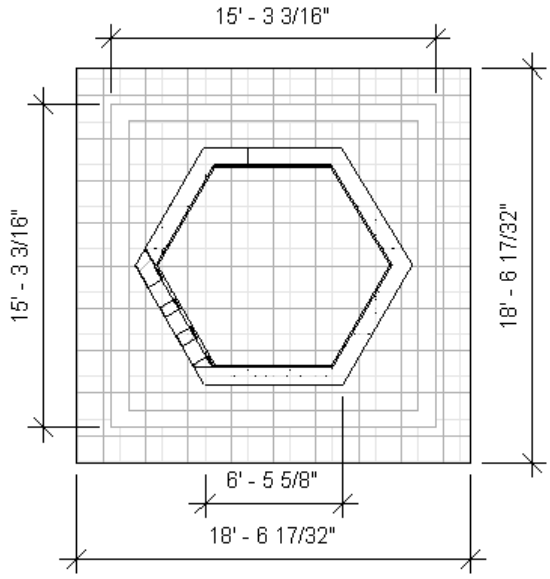


Fig 8.18 Plan layout of Chabutaro

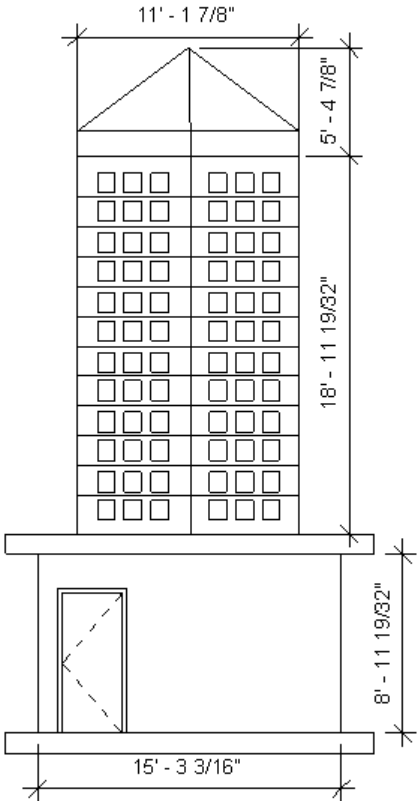


Fig 8.19 Elevation of Chabutaro

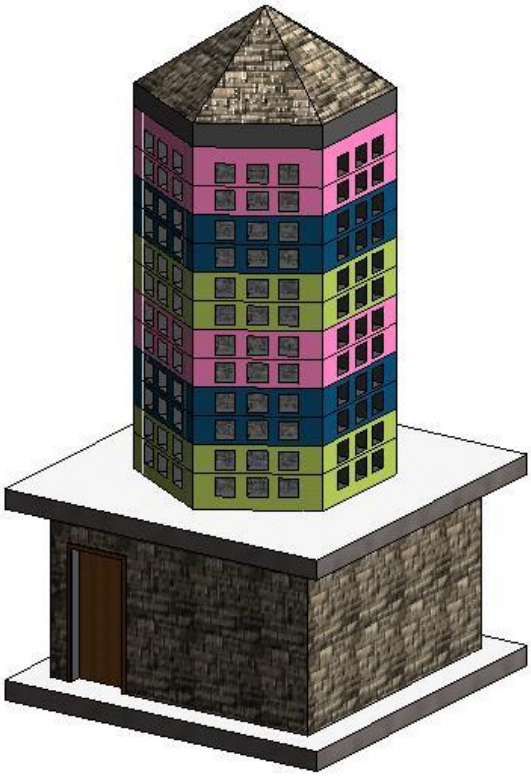


Fig 8.20 3D View of Chabutaro

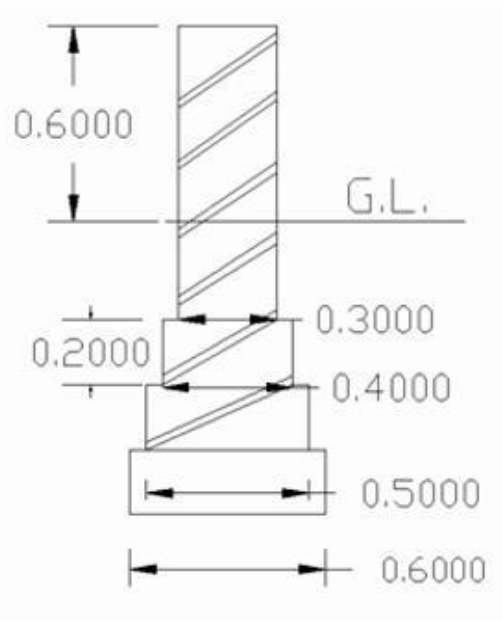


Fig 8.21 Section view of Chabutaro

❖ Measurement sheet :-

❖ Table 8.10 Measurement sheet

SrNo.	Itemdescription	No.	Length	Width	Height	Quantity
	Totallength= 15.2 m					
1.	**Excavation in foundation**	1	15.2	0.9	1.2	16.416
2.	**P.C.C.**	1	15.2	0.9	0.3	4.104
3.	**BrickfoundationuptoG.L.**					
	Step-1	1	15.2	0.6	0.2	1.824
	Step-2	1	15.2	0.5	0.2	1.52
	Step-3	1	15.2	0.4	0.2	1.22
	UptoG.L.	1	15.2	0.3	0.3	1.37
	Total					5.934
4.	**Brickwork for super structure**					
	Outer wall	1	15.2	0.3	3	13.68
	Bottom to dome	6	2	0.3	5.80	20.88
	Deduction					
	Door	1	0.91	0.3	2.21	0.603
	Lintel (door)	1	1	0.3	0.15	0.045
	Hollow space	216	0.3	0.3	0.3	5.832
	Total					28.08
5.	**12 mm plaster**					
	Internal wall	1	16.4	-	3	49.2
	Add celling	1	4.40	4.40	-	19.36
	Deduction					
	Door	1	0.91	-	2.21	2.011
	Total					66.549

❖ Calculations:-

(1) RCC:-

- **RCCofslab:-**
  Areaofslab= l*b =5.00*5.00 = 25.00m2

Total area of slab = 2*25.00 =
50.00 m^2
Volume of both slab = 5.00m^3

- **RCC oftopdome:-**
  HereL=2.65m
  Areaofdome=πRl=π(2.30)(2.65)=19.148m2
  Volumeofdome=πRhl=π(2.3)(2.65)(0.35)
  =6.70m3

Total RCC=11.70m3

Plaster :-

- **Plasterofinside&outsidedome=2** πRl=38.296m2

Plaster of outer wall = (4*4.40*3)-(0.91*2.21)=50.7889 m^2

Plaster for bottom to dome = (6*2*5.80) = 69.6 m^2

Total plaster = 158.6849 m^2

❖ **Explanation :-**

1. **P.C.C. (1:4:8) in foundation**
   For 4.104 m^3 wet concrete 6.238 m^3 dry concrete required
   Proportion = 1:4:8 =13
   Cement = (1/13)*6.238 = 0.4798/0.035 = 14 bags
   Sand = (4/13)*6.238 = 1.9194 m^3
   Aggregate = (8/13)*6.238 = 3.84 m^3
2. **Brick bat cement concrete in foundation with (1:4:8)**
   In brick bat cement concrete the volume of brick bat will be equal of volume of concrete
   For 5.934 $m^3$of concrete, 5.934 m^3 of brick bat required
   In brick bat foundation the volume of sand is one half of the volume of brick bat
   = (1/2)*5.934 =2.967 m^3
   Volume of cement is one forth of the volume of sand
   = (1/4)*2.967 = 0.74/0.035 = 22 bags
3. **For first class brick work in super structure with C.M. 1:6**
   iii. For 1 m^3 of brick work 500 bricks are required
   28.08 m^3, 14040 numbers of bricks are required
   Add 1% of waste = 141 numbers
   Total bricks = 14181 numbers
   iv. For 1 m^3 0.33 m^3 mortar required
   Proportion = 1:6
   Cement = (1/7)*0.33*28.08 = 1.32/0.035 = 38 bags
   Sand = (6/7)*0.33*28.08 = 7.94 m^3
4. **15 mm plaster with C.M. 1:3**
   Area of plaster = 158.6849 m^2

Volume of mortar = 158.6849*0.015 = 2.38 m^3
Add 30% for filling joint and uneven surface
= 2.38*1.30 = 3.094 m^3
Add 25% more for dry concrete
= 3.094*1.25 = 3.868 m^3
Mortar proportion = 1:3 = 4
Cement = (1/4)*3.868 = 0.97/0.035 = 28 bags
Sand = (3/4)*3.868 = 2.901 m^3

5. **For R.C.C slab**
   i. For 1 m^3 wet concrete 1.52 m^3 dry concrete required
   1 m^3 → 1.52 m^3
   11.70 m^3 → 17.78 m^3
   Proportion = 1:1.5:3 = 5.5
   Cement = (1/5.5)*17.78 = 3.23/0.035 = 93 bags
   Sand = (1.5/5.5)*17.78 = 4.85 m^3
   Aggregate = (3/5.5)*17.78 = 9.70 m^3
   ii. Assume 1% of steel of volume of wet concrete
   Volume of steel = (1/100)*11.70 = 0.1170 m^3
   Density of steel = 7850 kg/m^3
   Mass of steel = 7850*0.1170 = 918.45 kg
   For 100 kg of steel 1 kg of binding wire are required
   918.45 kg of steel 10 kg of binding wire are required
6. **12 mm imner wall plaster with C.M. 1:4**
   Area of plaster = 66.549 m^2
   Volume of plaster = 66.549*0.012 = 0.798 m^3
   Add 30% for uneven surface and filling joints
   = 0.798*1.30 = 1.038 m^3
   Add 25% mor for dry concrete
   = 1.038*1.25 = 1.298 m^3
   Mortar proportion = 1:4 = 5
   Cement = (1/5)*1.298 = 0.259/0.035 = 8 bags
   Sand = (4/5)*1.298 = 1.0384 m^3

❖ Abstract sheet:-

Table 8.11 Abstract sheet

Sr.no.	Particular items	Quantity	Rate	Per	Amount
1.	Excavation for foundation	16.416	85	Cu. m	**13959.36**
2.	P.C.C work in foundation	4.104	3200	Cu. m	**13132.8**
3.	Brickwork in foundation up to plinth	5.934	3200	Cu. m	**18988.8**
4.	Brickwork for super structure	28.08	3200	Cu. m	**89856**
5.	R.C.C work for slab & lintels	11.70	8800	Cu. m	**102960**
6.	Plaster	225.23	150	Sq. m	**33785.085**
					Total = 272682.045

8.2Reason for students recommending this design

- After visiting the village, we saw that villagers are facing many problems regarding basic facilities such as public toilet, post office, drinking facilities, prayer hall, education facilities and many more.
- To mitigate these issues, we made several plan to design and estimate the approximate value of building which would be required in village as a positive development.
- Moreover, migration ratio from village side to city side has been increasing day by day due to some reasons such as low level education, below poverty line life style, lack educated people, unemployment and many more.
- There is no public toilet for individuals and that people are facing major issue regarding toilet, so we made one public toilet design in the report to fulfill the requirement of people.
- Also livelihood of village are much more excited for playing garba in festivals but they are facing problem regarding proper place for placing and enjoying garba. Therefore we just made the design of garba chowk cum auditorium so they can use both kind of facilities from one place.
- There is no post office available in the village and also near by town so, people of Motidevti village have to go Sanand for post office work. To support their problem, we thought about building post office in the village can help not only the native village people but also surrounding villagers to use post office for their needy uses.

8.3About designs Suggestions / Benefit of the villagers

- There are many benefits of the design to villagers and other community also. By implementing different necessary services such as auditorium, meditation center, post office, bus stand would serve different purpose of works as per the requirement of villagers.
- Currently, due to lac of facilities available in the village, villagers have to work out side the village for long distance to complete their own tasks but due to invention of new facilities it will be easy for villagers to accomplish the works according to there preference with their convenient time.
- The benefits not only for people but also national migration ration from village to city side would definitely decrease due to innovation of same king of facilities as same as city at their doorstep.
- By implementing different facilities, people have chance to do job in newly establishes facilities and it will boost the local economy of workers so they do not need to purse jobs outside the village.

Chapter 9: Proposing designs for future development of the village for the PART-II design

Table 9.1 Proposed designs for PART II

Sr. No.	Village name	Discipline	Part-II
1.	Moti devti	Civil	Public library
			Gram Panchayat building
			Bank
			Cyber café
			Aanganwadi
			Entrance Gate

- We did visit to Motidevti village and we found various things which needed to be changed to make the village smart one.
- So we made different designs in the PART I report such as public toilet, bus stand, auditorium cum community hall, post office, garba chawk, chabutaro.
- But we wanted to make the village extra ordinary from the other villages so we proposed some extra designs for PART II.
- We made plan to make some designs for betterment of village such as public library, gram panchayat building, bank, cyber café, aanganwadi, entrance gate.
- At the end of first session village team visit the whole village and saw the condition of the village.
- Also took in mind some points which were help to create the whole project theme, design which are proposed in village.
- Also took some photographs of village condition like road network, houses condition, solid waste management, sewage system, water distribution network, condition of public building etc.
- After that we proposed some designed according to the village condition and requirement of native people and sarpanch.
- The designed were physical design (bus stand), sustainable design (public toilet), social design (post office), socio-cultural design (garba chowk), smart village design (prayer hall).
- After proposing the design the villagers and sarpanch told their problems according to design and we change and finalized our designed.

Chapter 10 : Conclusion of the entire village

- Vishwakarma yojana project is initiated by Government of Gujarat as a pilot project which is allotted to Gujarat Technological University. the Motidevti village is given by GTU to us for making which smarter one.
- We visited the allocated Motidevti village 3 times and did communication with their local people, Talati, Sarpanch, and many more. We collected the relevant information from the every individuals about the facilities available in the village and which kind of problem they are facing right now.
- We did door to door survey and collected the data and details about the village. We took several photographs of exciting condition of the village.
- The overall project consist of different scop, objectives, planning, necessary steps taken by villagers as well as us, design proposal and annexures.
- The annexures consist of three different villages such as ideal village, smart village and allocated village.
- At the end of project we put the gap analysis which is very much important for us because it give us the overall necessary details require for the overall development of Motidevtivillageby comparing the village with smart village.
- We planned five unique design for the Motidevti village for fulfilling their basic needs and amenities.
- The five design names are as under :

1. Public toilet
2. Bus stand
3. Garba chowk cum auditorium
4. Prayer hall cum meditation center
5. Post office
6. Chabutaro

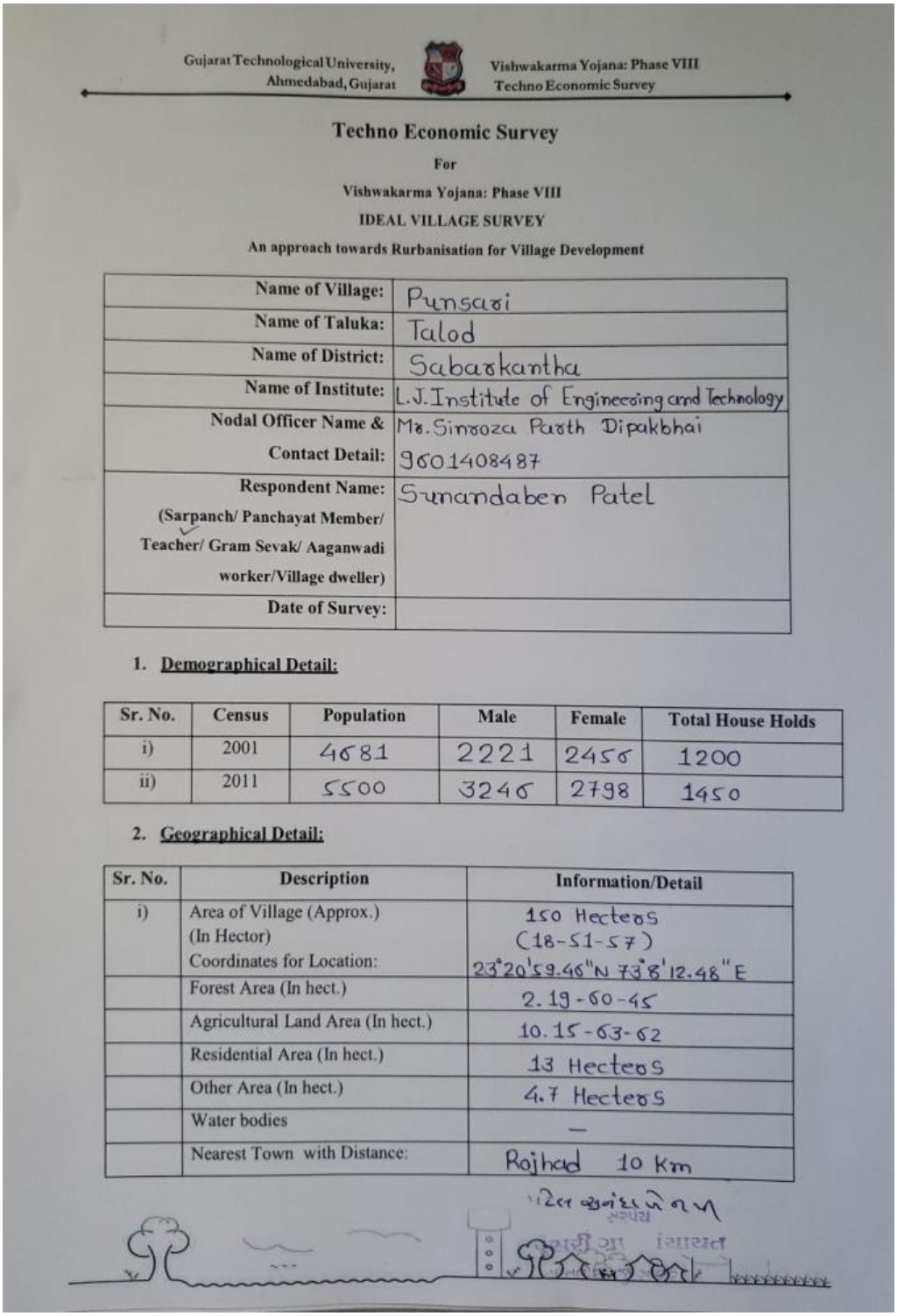
Fig 10.1 Details collected from sarpanch and other villagers

Chapter 11. References refereed for this project

- www.wikipedia.com
- www.onefivenine.com
- http://www.vyojana.gtu.ac.in
- www.googlemaps.com
- www.censusindia.gov.in
- www.harappa.com
- nationalgeographic.org
- pmgsy.nic.in
- Professional Practices & Valuation book by R.P.Rethaliya

Chapter 12. Annexures attachment

12.1 Ideal village:-



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

For

Vishwakarma Yojana: Phase VIII

IDEAL VILLAGE SURVEY

An approach towards Rurbanisation for Village Development

Name of Village:	Punsari
Name of Taluka:	Talod
Name of District:	Sabarkantha
Name of Institute:	L.J. Institute of Engineering and Technology
Nodal Officer Name & Contact Detail:	Ms. Sirooza Parth Dipakbhai 9601408487
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Sunandaben Patel
Date of Survey:	

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	4681	2221	2456	1200
ii)	2011	5500	3246	2798	1450

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	150 Hectors (18-51-57) 23°20'59.46"N 73°8'12.48"E
	Forest Area (In hect.)	2.19-60-45
	Agricultural Land Area (In hect.)	10.15-63-62
	Residential Area (In hect.)	13 Hectors
	Other Area (In hect.)	4.7 Hectors
	Water bodies	—
	Nearest Town with Distance:	Rajhad 10 Km

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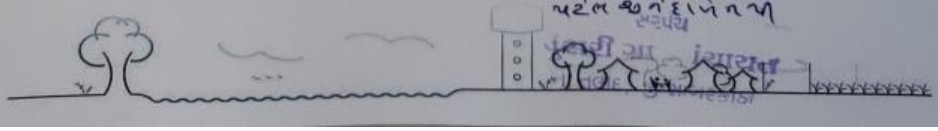
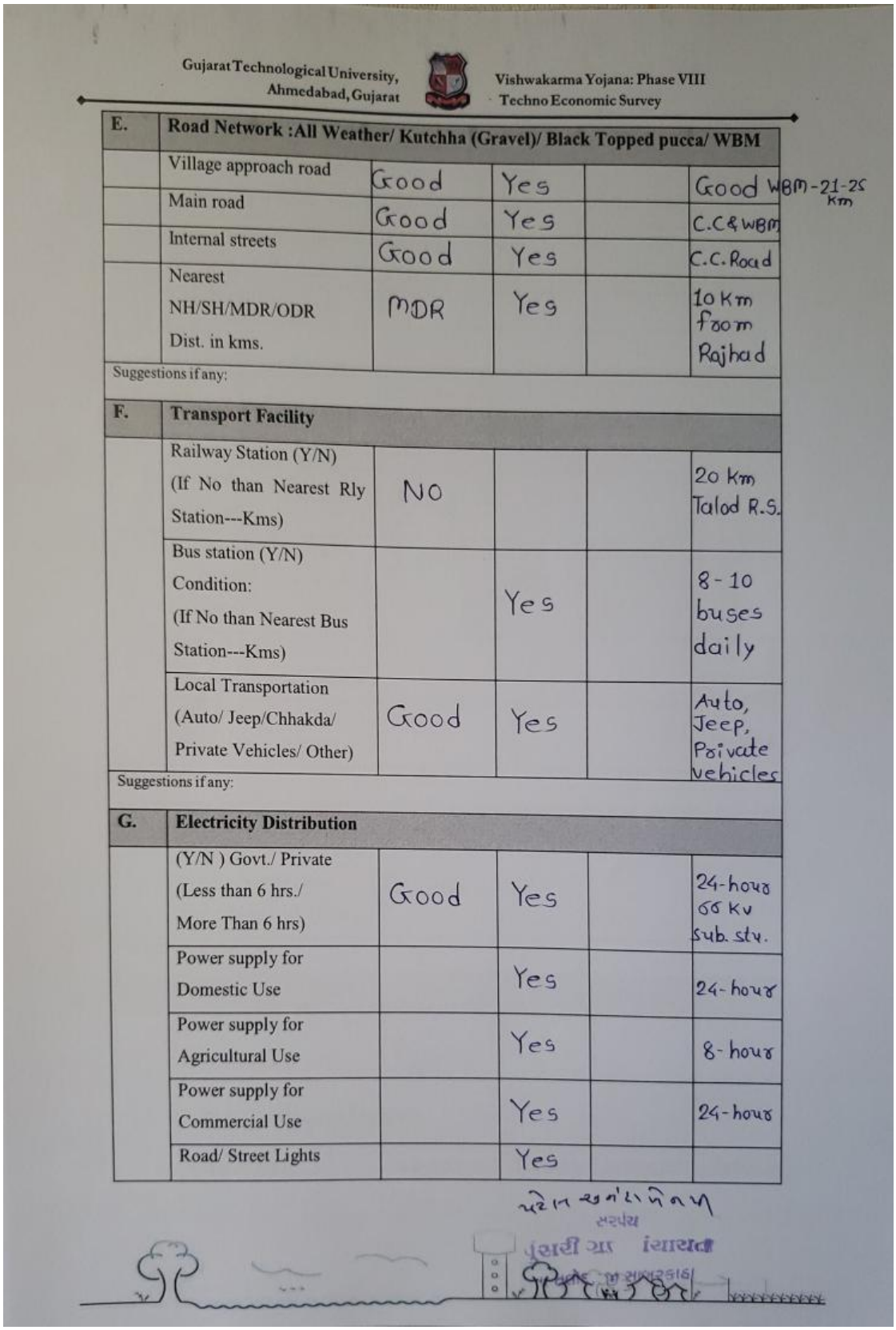
3. **Occupational Details:**

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

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	Tubewell (4 Nos.)	Yes		Well = 13 Nos Bore = 12 Nos Handpump = 3 Nos.
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	70,000L		
	Underground Sump	Capacity:			
Suggestions if any:	Restoration is required				
C.	**Drainage Facility**				
	Available (Yes/ No)		Yes		Available whole village
Suggestions if any:					
D.	**Type of Drainage**				
	Closed/ Open		Yes		Close
	If Open than Pucca / Kutchcha		-		
	Whether drain water is discharged directly in to Water bodies/ Sewer plants		Yes		
Suggestions if any:					





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E.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Good	Yes		Good WBM-21-25 Km
	Main road	Good	Yes		C.C & WBM
	Internal streets	Good	Yes		C.C. Road
	Nearest NH/SH/MDR/ODR Dist. in kms.	MDR	Yes		10 Km from Rajhad
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	NO			20 Km Talod R.S.
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)		Yes		8-10 buses daily
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Good	Yes		Auto, Jeep, Private vehicles
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Good	Yes		24-hour 66 Kv sub. stn.
	Power supply for Domestic Use		Yes		24-hour
	Power supply for Agricultural Use		Yes		8-hour
	Power supply for Commercial Use		Yes		24-hour
	Road/ Street Lights		Yes		

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	Electrification in Government Buildings/ Schools/ Hospitals		Yes		Good
	Renewable Energy Source Facilities (Y/ N)	Solar Panel	Yes		
	LED Facilities		Yes		
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	8 - Nos.	Yes		Good
	Location Condition	Good			
	Community Toilet (With bath/ without bath facilities)		No		
	Solid & liquid waste Disposal system available	Yes			Dump 2 kms far Foom village
	Any facility for Waste collection from road	Yes			Dustbin
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	Borewell			
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	100% Pucca houses			

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks

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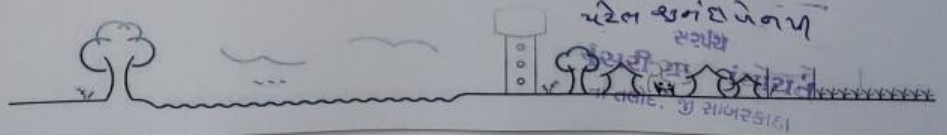
K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	24-hour	✓		well maintained
	Private Clinic/Private Hospital/ Nursing Home		✓		Reasonable rate
	If any of the above Facility is not available in village than approx. distance from village: 20....kms.				
Suggestions if any:					

L.	**Education Facilities:**				
	Aaganwadi/ Play group	8-Nos.	Yes		Good
	Primary School	2-Nos.	Yes		350 student
	Secondary school	9-12 Std	Yes		650 student
	Higher sec. School				well maintained
	ITI college/ vocational Training Center	Good	Yes		Skill dev. center
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	No			20 Kms Talod 12 kms dhansura 20 kms Modasa
	If any of the above Facility is not available in village than approx. distance from village: 12...kms. Dhansura				
Suggestions if any:					

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



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	Condition:	Good			
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	Mobile Van Good	Yes		
	Public Garden Location: Condition:		Yes		
	Village Pond Location: Condition:	1 No.	Yes		
	Recreation Center Location: Condition:			No	
	Cinema/ Video Hall Location: Condition:			No	
	Assembly Polling Station Location: Condition:	Good	Yes		
	Birth & Death Registration Office Location: Condition:		Yes		

If any of the above Facility is not available in village than approx. distance from village: ..10...**kms.** Rajhad

Suggestions if any:

N.	Other Facilities				
	Post-office	Good	Yes		
	Telecommunication Network/ STD booth		Yes		

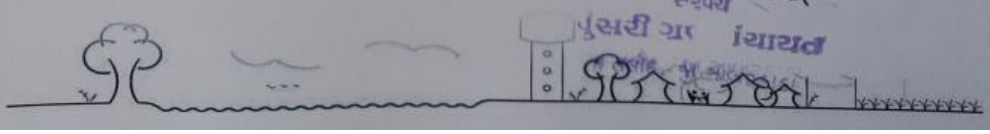
	General Market		Yes		
	Shops (Public Distribution System)		Yes		
	Panchayat Building	Good	Yes		
	Pharmacy/Medical Shop	2 Nos.	Yes		
	Bank & ATM Facility	1 No.	Yes		
	Agriculture Co-operative Society	2 Nos	Yes		
	Milk Co-operative Soc.	1 No.	Yes		
	Small Scale Industries			No	
	Internet Cafes/ Common Service Center/Wi Fi	Face Wi-fi	Yes		
	Other Facility				
Suggestions if any:					

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

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
O.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	Bio electric Plant			Electricity from solid waste (75 lacks)
P.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	Good	Yes		
Q.	Any Other				

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	Yes (Through online source)



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Recent Projects going on for Development of Village	No.
Any NGO working for village development	3-4 Nos. (NGO) on PPP buses

8. **Additional Information/ Requirement:**

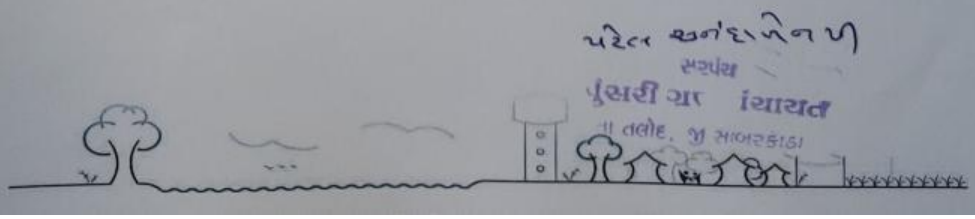
Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities(School Building, Health Center, Panchayat Building, Public Toilets & any other)	Fumigates everyday (All public building)	
2.	Additional Information/ Requirement		
3.	Cleaning and Fogging	Monthly	

9. **Smart Village Proposal Design**

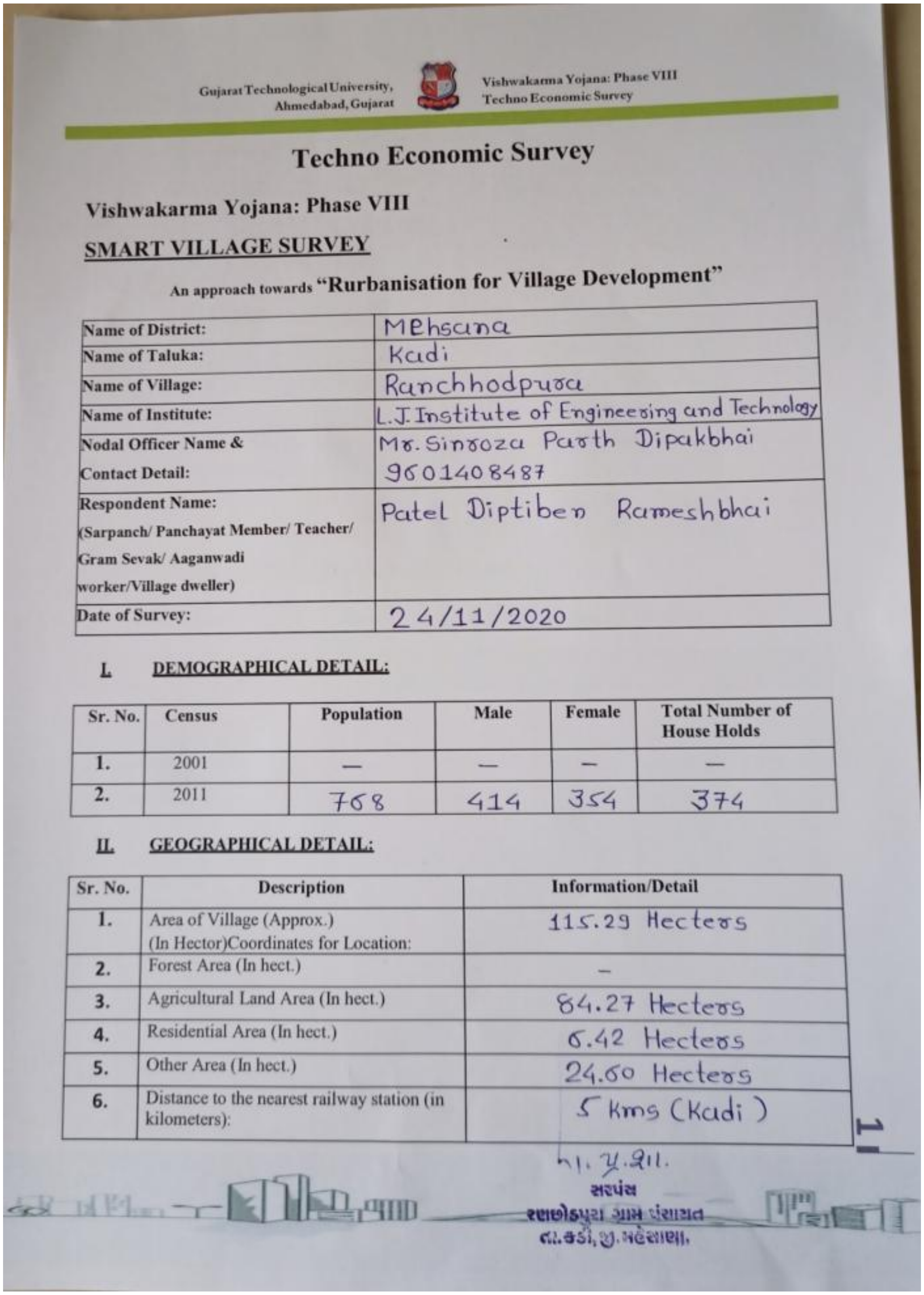
Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Is their any thing for the village enhancement possible?	Yes, maintenance of bio-electric plant	

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 Smart village:-



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SMART VILLAGE SURVEY

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

Name of District:	Mehsana
Name of Taluka:	Kadi
Name of Village:	Ranchhodpura
Name of Institute:	L.J. Institute of Engineering and Technology
Nodal Officer Name & Contact Detail:	Mr. Sinroza Parth Dipakbhai 9601408487
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Patel Diptiben Rameshbhai
Date of Survey:	24/11/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	—	—	—	—
2.	2011	768	414	354	374

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	115.29 Hecters
2.	Forest Area (In hect.)	–
3.	Agricultural Land Area (In hect.)	84.27 Hecters
4.	Residential Area (In hect.)	6.42 Hecters
5.	Other Area (In hect.)	24.60 Hecters
6.	Distance to the nearest railway station (in kilometers):	5 Kms (Kadi)

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7.	Name of Nearest Town with Distance:	KADI (5 Kms)
8.	Distance to the nearest bus station (in kilometers):	300 m (In village)
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. Farming 2. Cattle bussiness 3. Working outside
Major crops grown in the village:	1. Cotton 2. Wheat 3. Rice

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		✓		Good in Condition
2.	**DUG WELL** Protected Well Un Protected Well			✓	
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring			✓	
	Rainwater Tanker Truck Cart With Small Tank				
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump Other(Specify)**Lake/ Pond**			✓	

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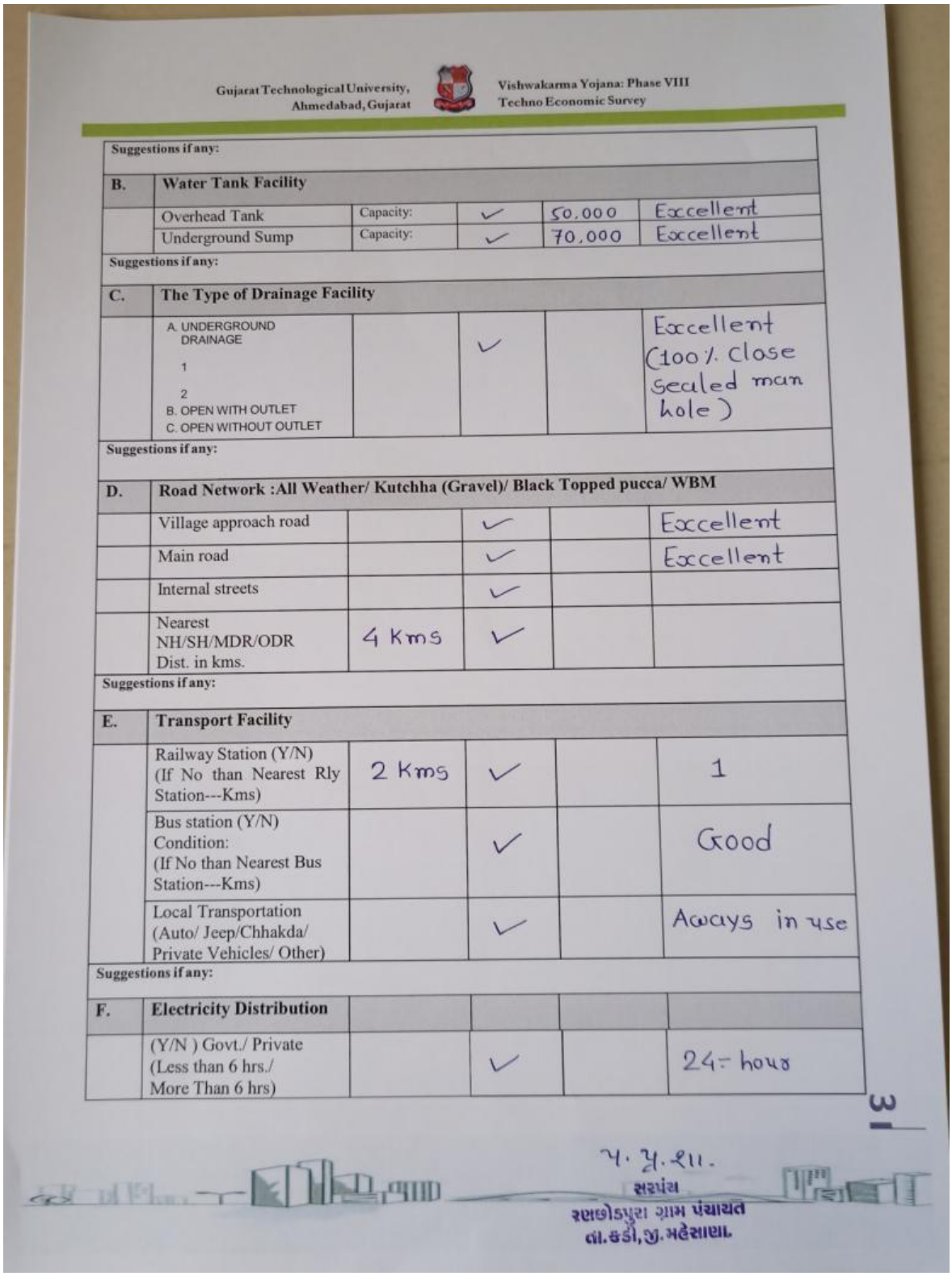

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Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	✓	50,000	Excellent
	Underground Sump	Capacity:	✓	70,000	Excellent
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET		✓		Excellent (100% close sealed man hole)
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road		✓		Excellent
	Main road		✓		Excellent
	Internal streets		✓		
	Nearest NH/SH/MDR/ODR Dist. in kms.	4 Kms	✓		
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	2 Kms	✓		1
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)		✓		Good
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)		✓		Aways in use
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)		✓		24 hour

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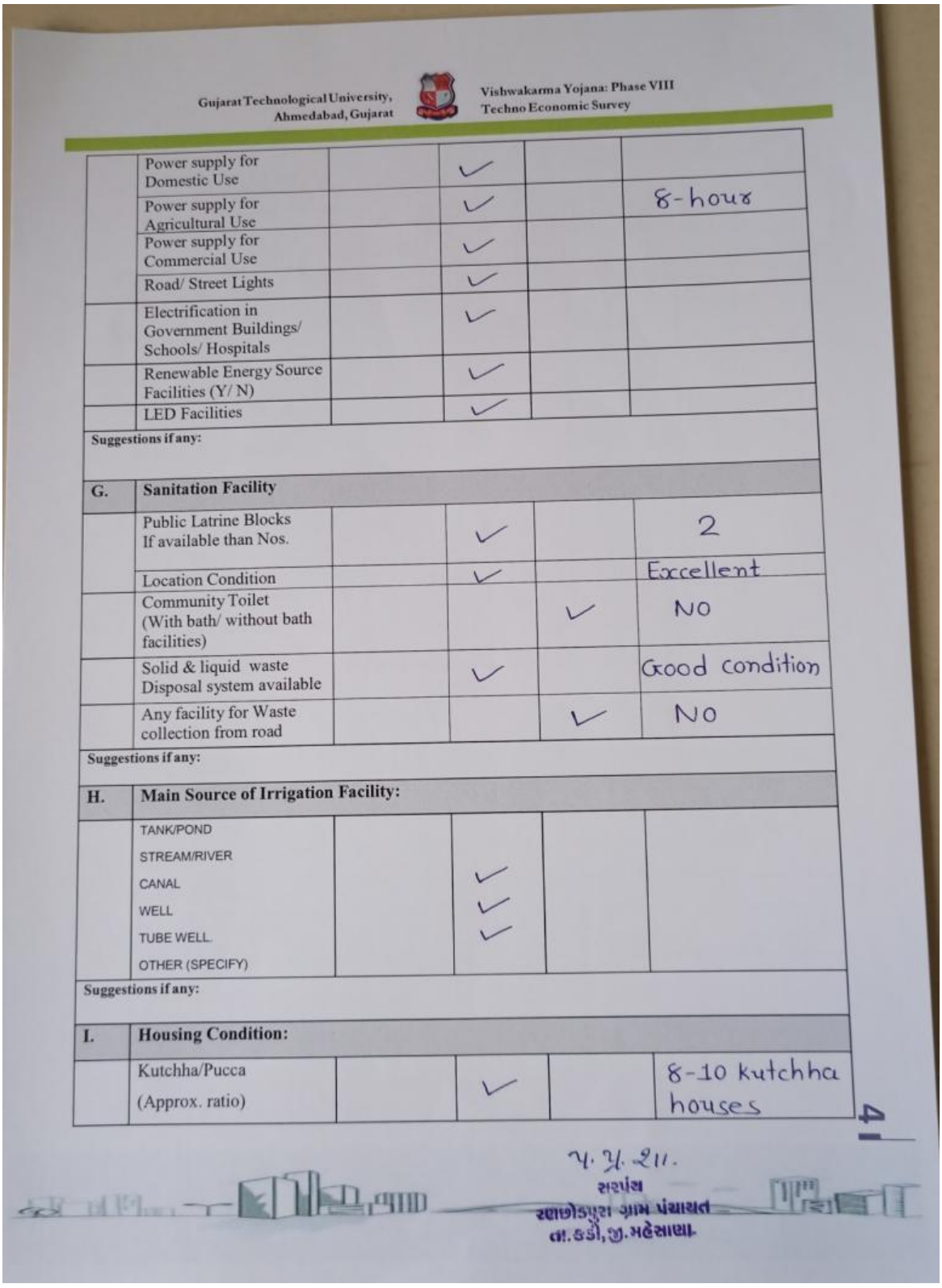

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	Power supply for Domestic Use		✓		
	Power supply for Agricultural Use		✓		8-hour
	Power supply for Commercial Use		✓		
	Road/ Street Lights		✓		
	Electrification in Government Buildings/ Schools/ Hospitals		✓		
	Renewable Energy Source Facilities (Y/ N)		✓		
	LED Facilities		✓		
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.		✓		2
	Location Condition		✓		Excellent
	Community Toilet (With bath/ without bath facilities)			✓	No
	Solid & liquid waste Disposal system available		✓		Good condition
	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)				
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)		✓		8-10 kutchha houses

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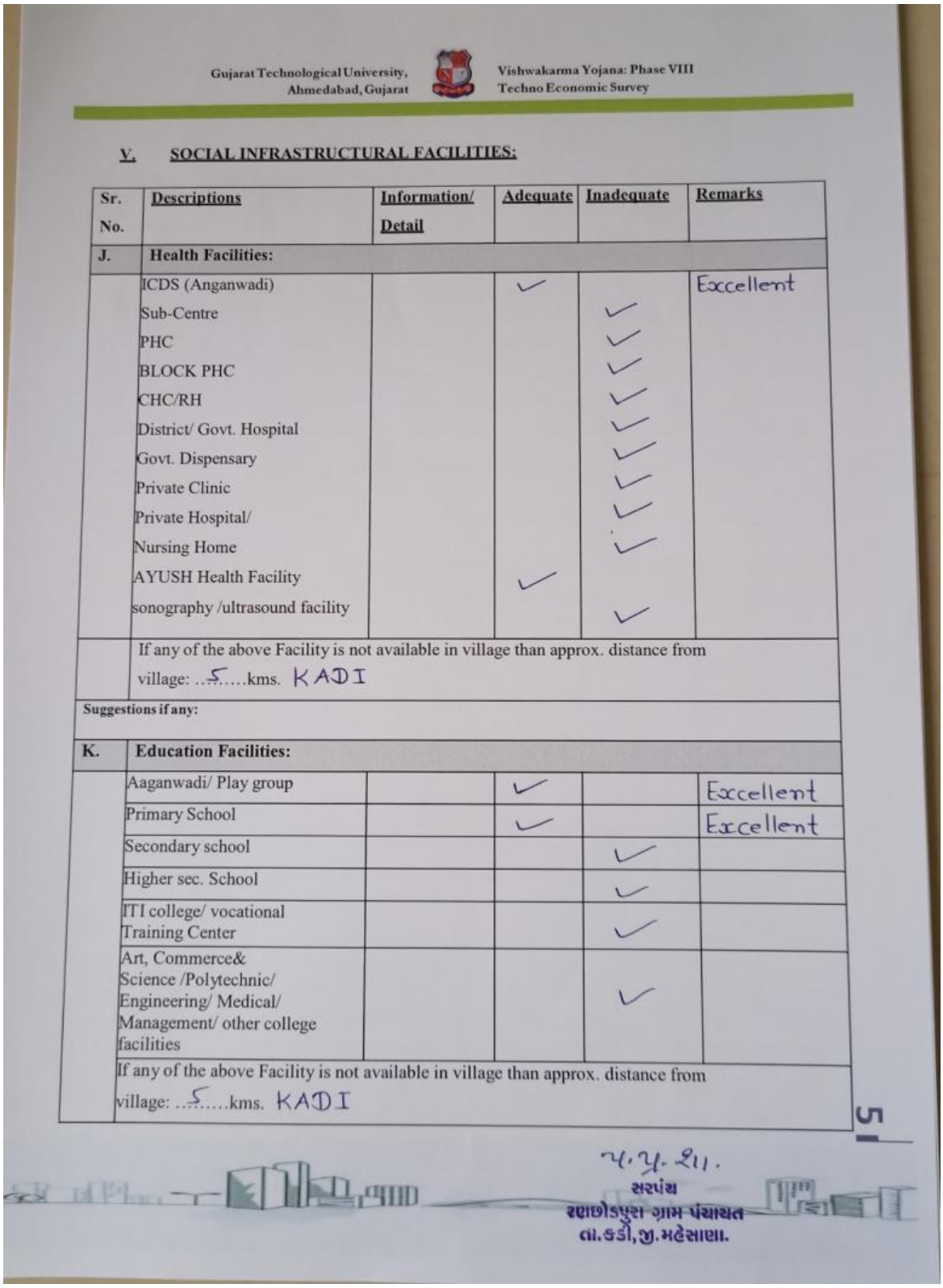

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V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)		✓		Excellent
	Sub-Centre			✓	
	PHC			✓	
	BLOCK PHC			✓	
	CHC/RH			✓	
	District/ Govt. Hospital			✓	
	Govt. Dispensary			✓	
	Private Clinic			✓	
	Private Hospital/			✓	
	Nursing Home			✓	
	AYUSH Health Facility		✓		
	sonography /ultrasound facility			✓	
	If any of the above Facility is not available in village than approx. distance from village: ..5.....kms. KADI				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group		✓		Excellent
	Primary School		✓		Excellent
	Secondary school			✓	
	Higher sec. School			✓	
	ITI college/ vocational Training Center			✓	
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities			✓	
	If any of the above Facility is not available in village than approx. distance from village: ..5.....kms. KADI				

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Suggestions if any:

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

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

Suggestions if any:

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

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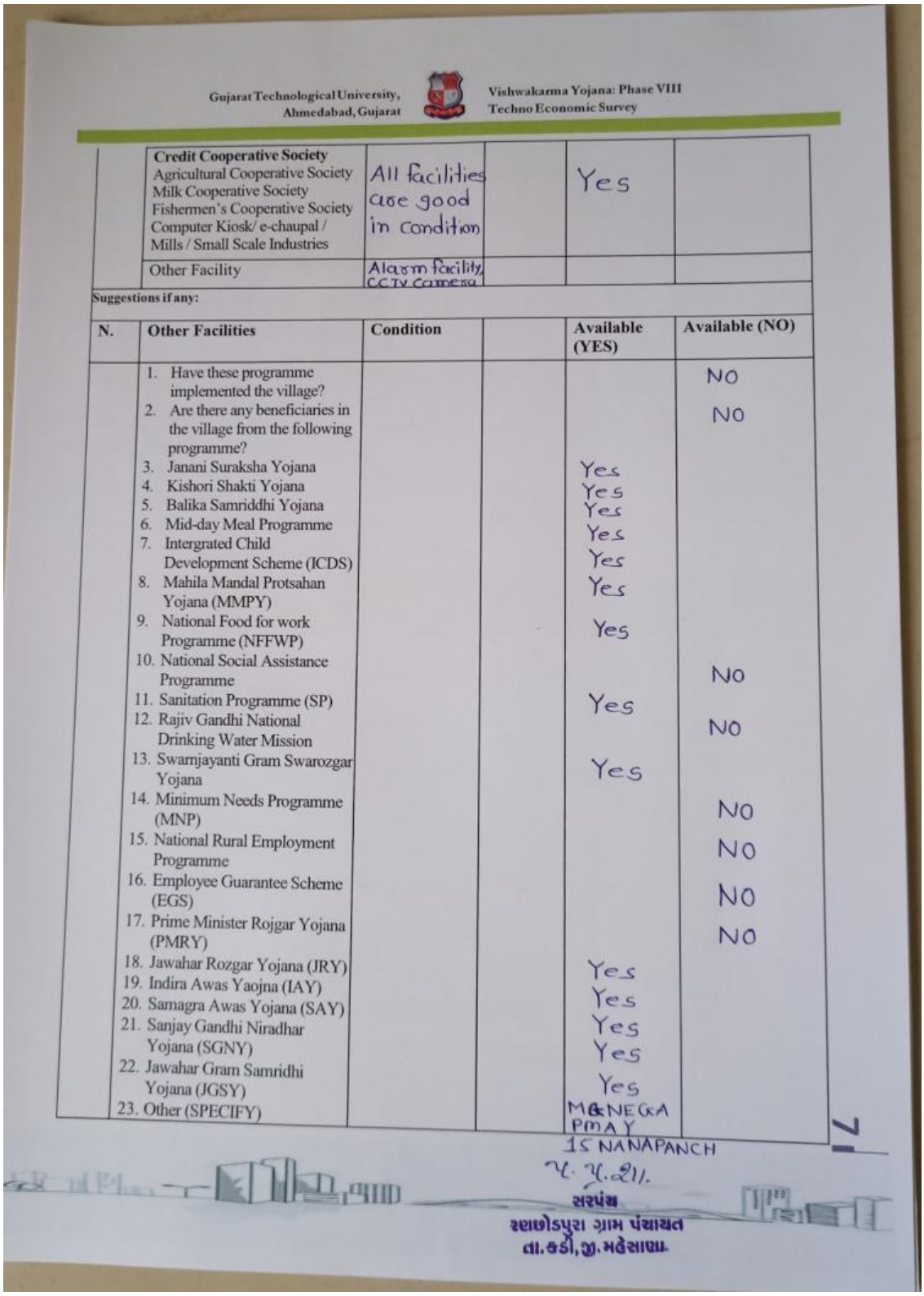

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	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries	All facilities are good in condition		Yes	
	Other Facility	Alarm facility, CCTV camera			

Suggestions if any:

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

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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	Good	✓		
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	Good	– ✓ –		
3.	Any Other		Solid waste management		

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy		✓		
2.	Recent Projects going on for Development of Village			✓	
3.	Any NGO working for village development		✓		ONGC For drainage work (8 lakh)
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)	2001 (70-80% Damage) Gokudiyu gam Sumras yojna	✓ ✓ ✓		

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

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1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other	Excellent ✓ ✓ Excellent Excellent	Moderate Need to construct
2.	Additional Information/ Requirement	PHC need to construct	
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	2-3 times 3-4 times	

IX. Smart Village / Heritage Details

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?	E-Gram facility	Excellent

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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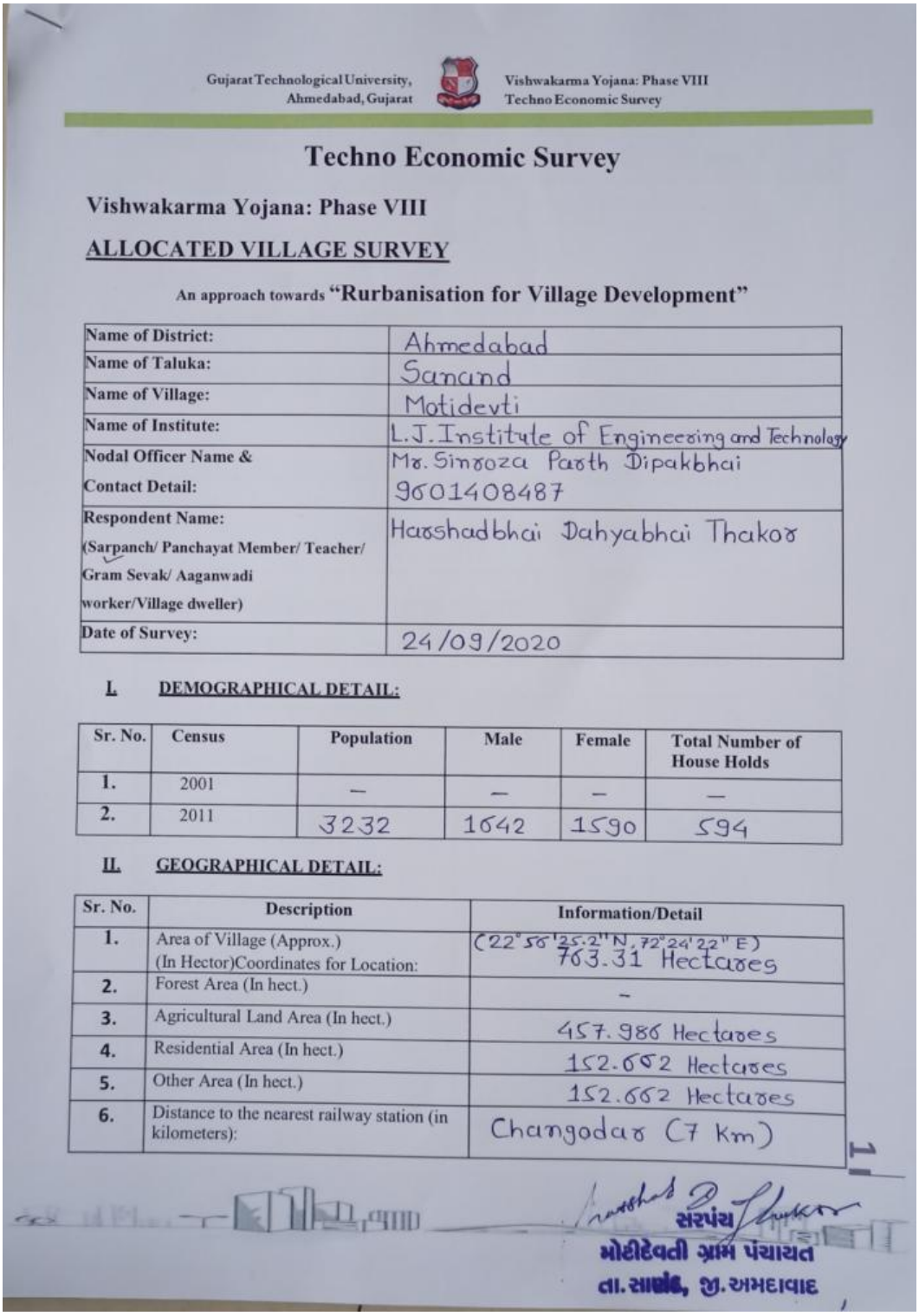
12.3 Allocated village:-



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ALLOCATED VILLAGE SURVEY

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

Name of District:	Ahmedabad
Name of Taluka:	Sanand
Name of Village:	Motidevti
Name of Institute:	L.J. Institute of Engineering and Technology
Nodal Officer Name & Contact Detail:	Mr. Sinroza Parth Dipakbhai 9601408487
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Harshadbhai Dahyabhai Thakor
Date of Survey:	24/09/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	–	–	–	–
2.	2011	3232	1642	1590	594

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	(22°56'25.2"N, 72°24'22"E) 763.31 Hectares
2.	Forest Area (In hect.)	–
3.	Agricultural Land Area (In hect.)	457.986 Hectares
4.	Residential Area (In hect.)	152.662 Hectares
5.	Other Area (In hect.)	152.662 Hectares
6.	Distance to the nearest railway station (in kilometers):	Changodar (7 Km)

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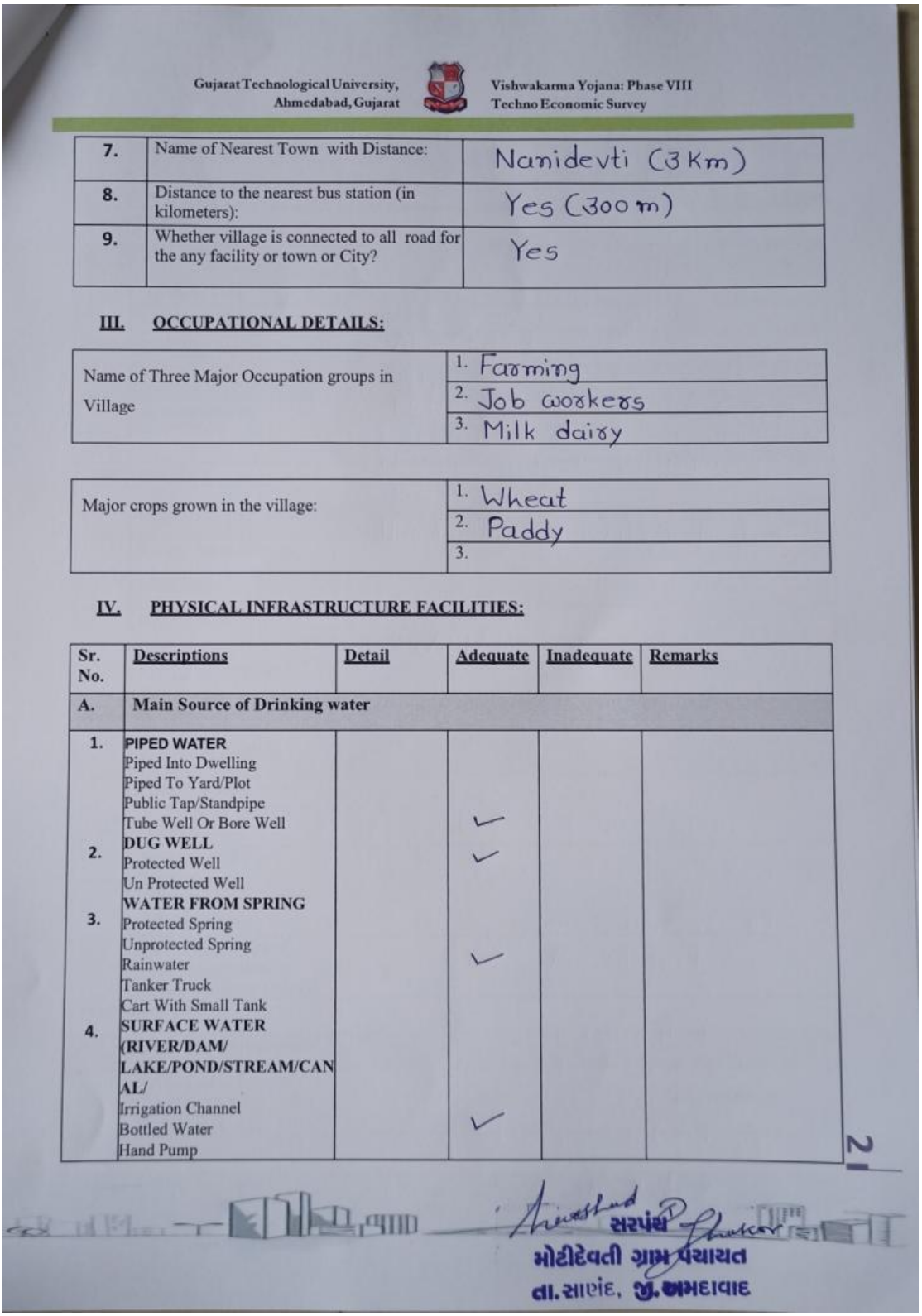

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7.	Name of Nearest Town with Distance:	Nanidevti (3 Km)
8.	Distance to the nearest bus station (in kilometers):	Yes (300 m)
9.	Whether village is connected to all road for the any facility or town or City?	Yes

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1. Farming 2. Job workers 3. Milk dairy

Major crops grown in the village:	1. Wheat 2. Paddy 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		✓		
2.	**DUG WELL** Protected Well Un Protected Well		✓		
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring				
	Rainwater Tanker Truck Cart With Small Tank		✓		
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump		✓		

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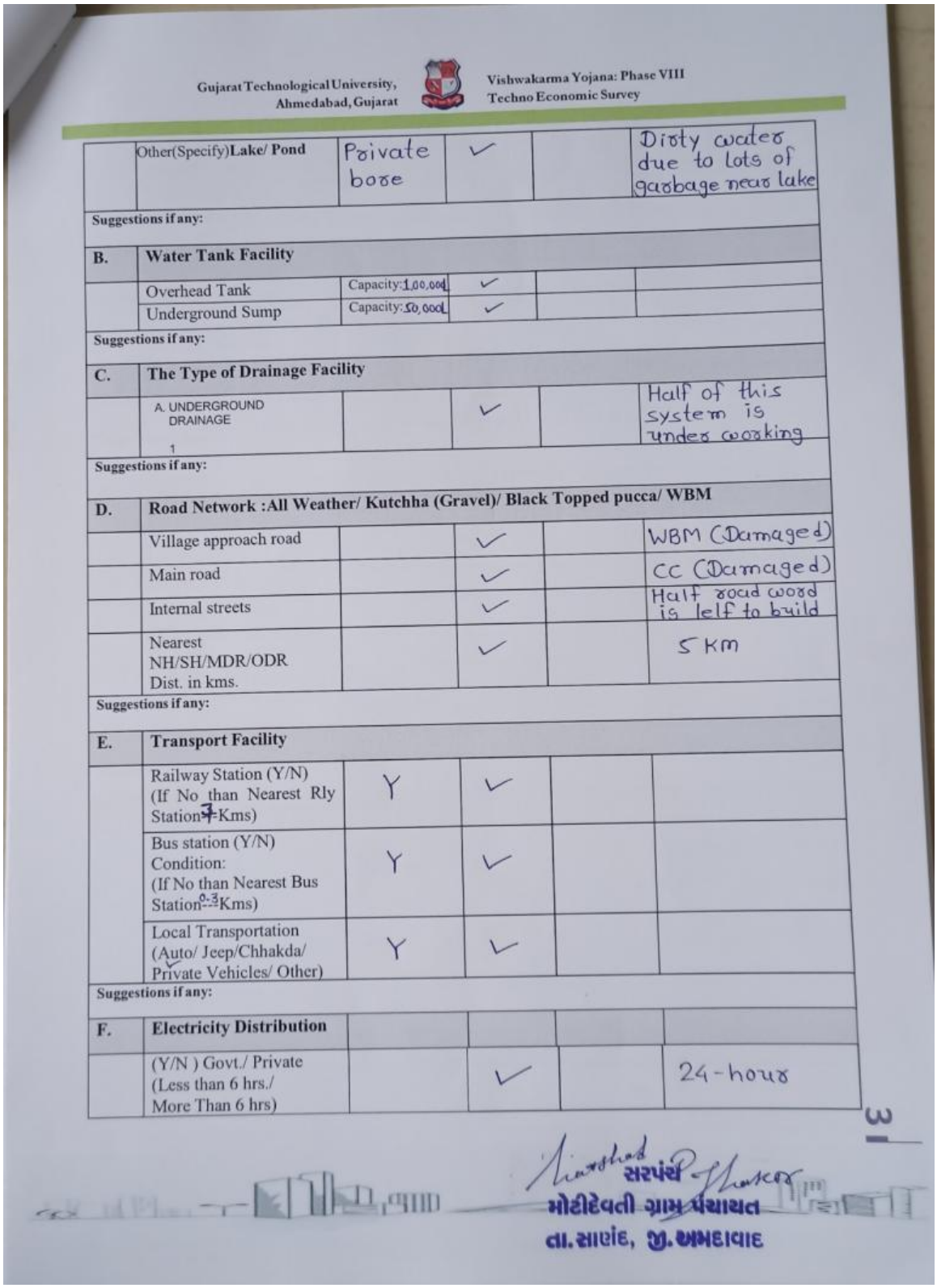

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	Other(Specify)**Lake/ Pond**	Private bore	✓		Dirty water due to lots of garbage near lake
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:1,00,000L	✓		
	Underground Sump	Capacity:50,000L	✓		
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1		✓		Half of this system is under working
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road		✓		WBM (Damaged)
	Main road		✓		CC (Damaged)
	Internal streets		✓		Half road word is left to build
	Nearest NH/SH/MDR/ODR Dist. in kms.		✓		5 KM
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station 3 Kms)	Y	✓		
	Bus station (Y/N) Condition: (If No than Nearest Bus Station 0.3 Kms)	Y	✓		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Y	✓		
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)		✓		24-hour

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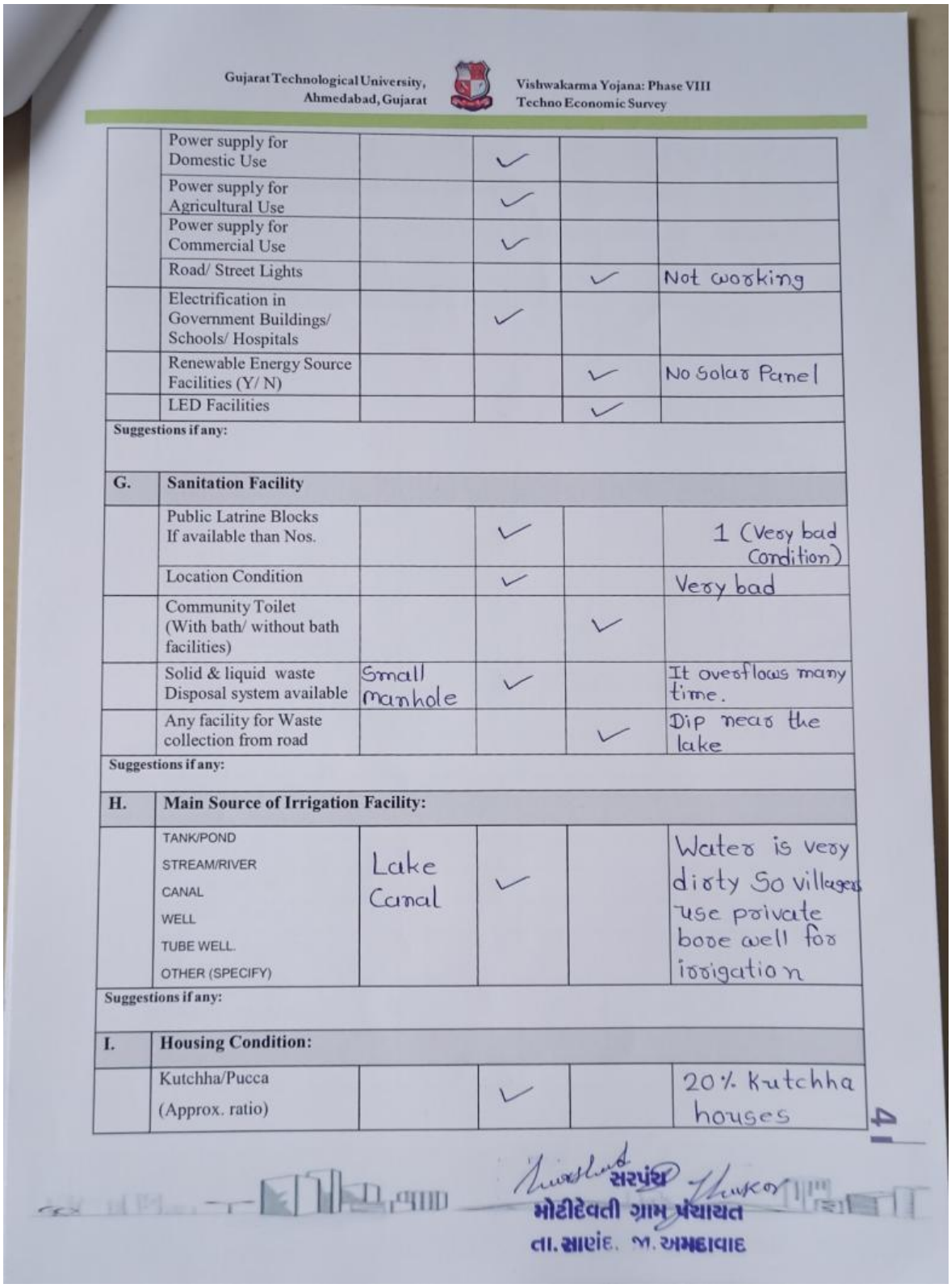

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	Power supply for Domestic Use		✓		
	Power supply for Agricultural Use		✓		
	Power supply for Commercial Use		✓		
	Road/ Street Lights			✓	Not working
	Electrification in Government Buildings/ Schools/ Hospitals		✓		
	Renewable Energy Source Facilities (Y/ N)			✓	No Solar Panel
	LED Facilities			✓	
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.		✓		1 (Very bad Condition)
	Location Condition		✓		Very bad
	Community Toilet (With bath/ without bath facilities)			✓	
	Solid & liquid waste Disposal system available	Small manhole	✓		It overflows many time.
	Any facility for Waste collection from road			✓	Dip near the lake
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL. OTHER (SPECIFY)	Lake Canal	✓		Water is very dirty So villagers use private bore well for irrigation
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)		✓		20% Kutchha houses

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V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)		✓	✓	Good Condition
	Sub-Centre			✓	Health officers come twice a month
	PHC			✓	
	BLOCK PHC			✓	→ No poivate/ public hospital
	CHC/RH			✓	
	District/ Govt. Hospital			✓	
	Govt. Dispensary			✓	→ No nursing home
	Private Clinic			✓	
	Private Hospital/			✓	
	Nursing Home			✓	
	AYUSH Health Facility			✓	→ No AYUSH
	sonography /ultrasound facility			✓	→ No sonography facility
	If any of the above Facility is not available in village than approx. distance from village: ..7.....kms. (Sanand)				
	Suggestions if any:				
K.	**Education Facilities:**				
	Aaganwadi/ Play group		✓		Good Condition
	Primary School		✓		Exccellent
	Secondary school			✓	
	Higher sec. School			✓	
	ITI college/ vocational Training Center			✓	
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities			✓	

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	If any of the above Facility is not available in village than approx. distance from village: ...7....kms. (Sanand)
Suggestions if any:	

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

If any of the above Facility is not available in village than approx. distance from village: ...7....kms. Sanand

Suggestions if any:

M.	Other Facilities	Condition	Location	Available (YES)	Available (NO)
	Post-office				NO
	Telecommunication Network/ STD booth				No
	General Market				No
	Shops (Public Distribution System)	Moderate	In village	Yes	
	Panchayat Building	Very bad		Yes	
	Pharmacy/Medical Shop				NO
	Bank & ATM Facility				NO
	Agriculture Co-operative Society				NO
	Milk Co-operative Soc.	Good		Yes	
	Small Scale Industries		6 Kms	Yes	
	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	Excellent	In village	Yes	
	Other Facility	Shop factory		Yes	
Suggestions if any:					

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

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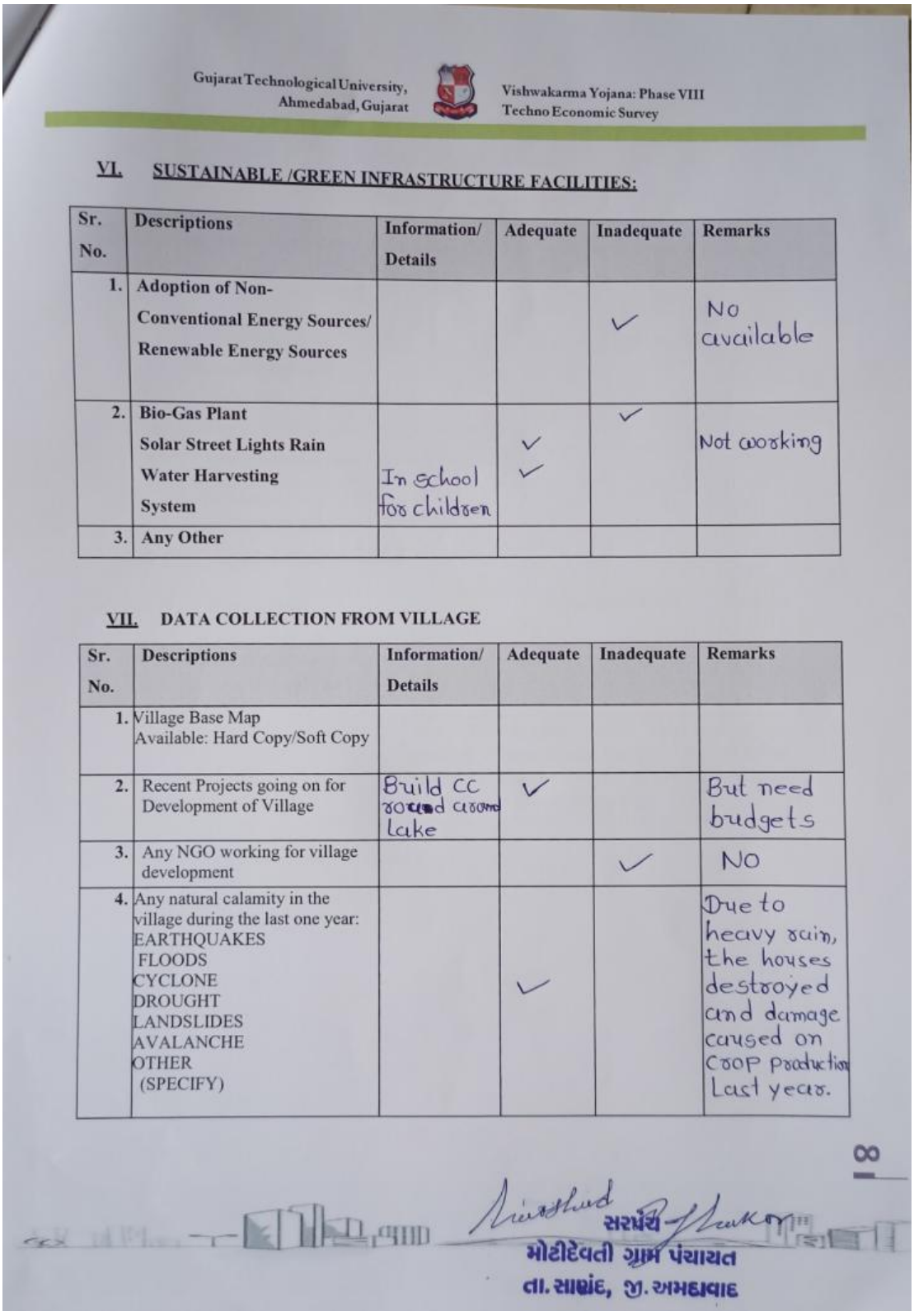

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VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources			✓	No available
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	In school for children	✓ ✓	✓	Not working
3.	Any Other				

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy				
2.	Recent Projects going on for Development of Village	Build CC road around lake	✓		But need budgets
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)		✓		Due to heavy rain, the houses destroyed and damage caused on crop production Last year.

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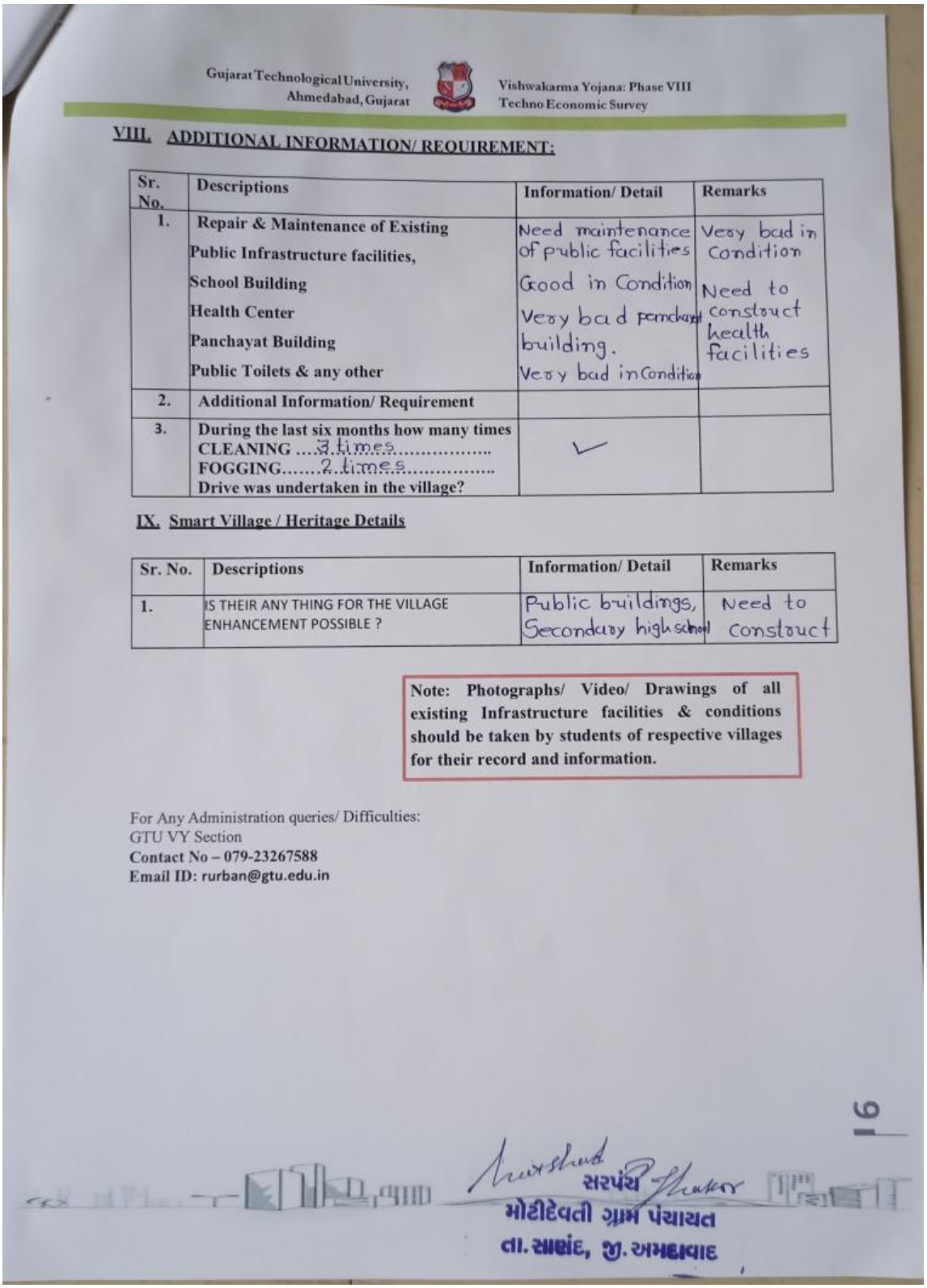

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VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other	Need maintenance of public facilities Good in Condition Very bad panchayat building. Very bad in Condition	Very bad in Condition Need to construct health facilities
2.	Additional Information/ Requirement		
3.	During the last six months how many times CLEANING ....3 times..... FOGGING.....2 times..... 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 ?	Public buildings, Secondary high school	Need to construct

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 :-

VILLAGE GAP Analysis					
Village Facilities	**Planning Commission/UDPFI Norms**	**Village Name:**	MOTI DEVTI		
		Population:			3232
		Existing	**Required as per Norms**	**Smart Vilage / Cities / Heritage Future Projection Design**	**Gap**
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	**YES(1)**		YES(1)	**NA**
Primary School	Each Per 2500 population	YES(1)		YES(1)	
Secondary School	Per 7,500 population	**NA**		**NA**	**NA**
Higher Secondary School	Per 15,000 Population	**NA**		**NA**	**NA**
College	Per 125,000 Population	**NA**		**NA**	**NA**
Tech. Training Institute	Per 100000 Population	**NA**		**NA**	**NA**
Agriculture Research Centre	Per 100000 Population	**NA**		**NA**	**NA**
Skill Development Center	Per 100000 Population	**NA**		**NA**	**NA**
Health Facility		**NA**			**NA**
Govt/Panchyat Dispensary or Sub PHC or Health Centre	Each Village	**NA**		**NA**	**NA**
Primary Health & Child Health Center	Per 20,000 population	**NA**		**NA**	**NA**
Child Welfare and Maternity Home	Per 10,000 population	**NA**		**NA**	**NA**
Multispeciality Hospital	Per 100000 Population	**NA**		**NA**	**NA**
Public Latrines	1 for 50 families (if toilet is not there in home, specially for slum pockets & kutcha house)	**NA**		**YES(2)**	**-2**
Physical Infrastructure Facilities					
Transportation		**Adequate / Inadequate**			
Pucca Village Approach Road	Each village	NO		YES	
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)	NO		YES	

Drinking Water (Minimum 70 lpcd)		Adequate / Inadequate			
Over Head Tank	1/3 of Total Demand	YES		YES	
U/G Sump	2/3 of Total Demand	YES		YES	
Drainage Network - Open		Adequate / Inadequate			
Drainage Network - Cover		YES		YES	
Waste Management System		Adequate / Inadequate			

Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	YES(1)		YES(1)	**NA**
community hall and Public Library	Per 15000 Population	NA		YES(1)	**-1**
Cremation Ground	Per 20,000 population	YES(1)		YES(1)	**NA**
Post Office	Per 10,000 population	NA		NA	**NA**
Gram Panchayat Building	Each individual/group panchayat	YES(1)		YES(1)	**NA**
APMC	Per 100000 Population	NA		NA	**NA**
Fire Station	Per 100000 Population	NA		NA	**NA**
Public Garden	Per village	NA		YES(1)	**-1**
Police post	Per 40,000Population	NA		NA	**NA**
Shopping Mall					
Electrical Design					
Electricity Network		Adequate / Inadequate			
		YES		YES	
Any Smart Village Facility					
Technology				WI-FI	
				CCTV	
				PARK	
				DUDH UTPADAK MANDALI	
				SEVA SAHKARI MANDALI	
				COMMUNITY HALL(FOR 2000 POPULATION)	
				BIG COW STABLE	

12.5 Drawings :-

❖ Public toilet :-

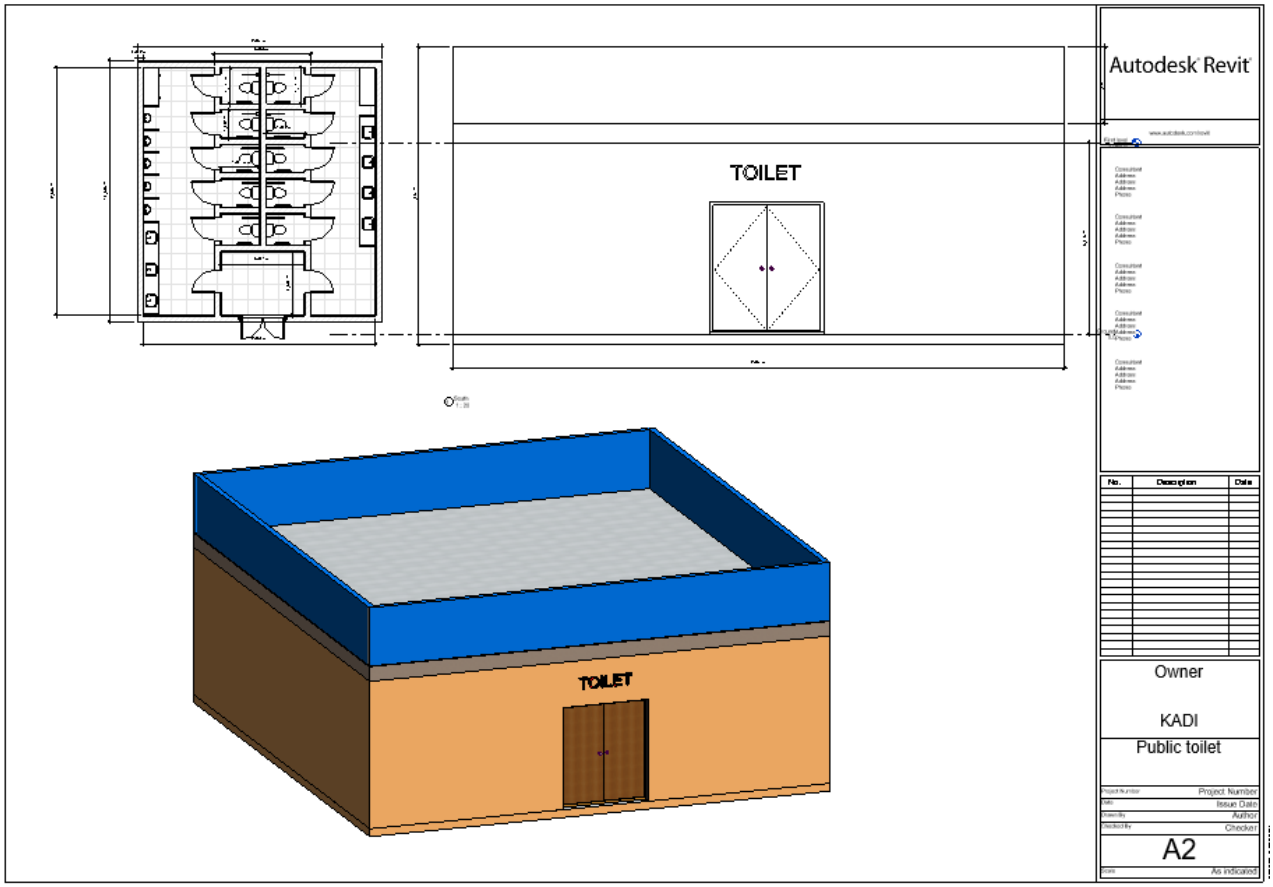


Fig 12.1 Public toilet sheet

❖ Bus stand :-

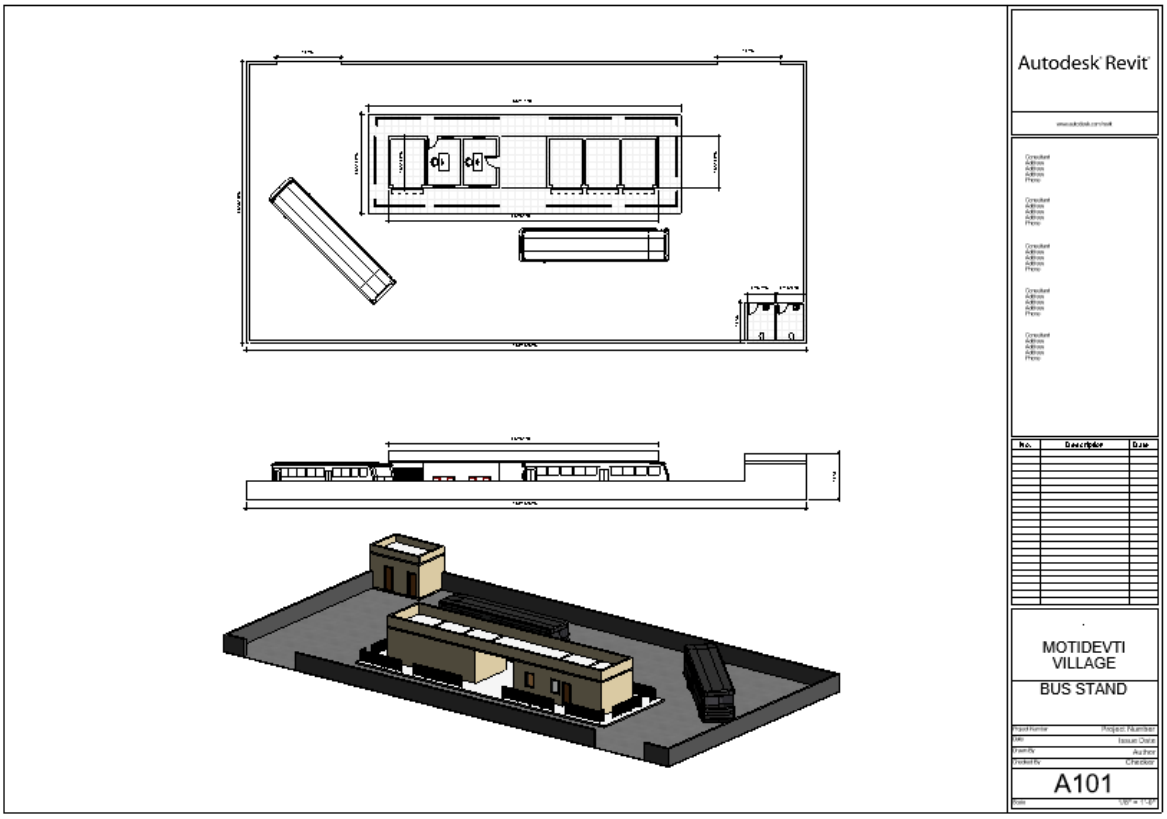


Fig 12.2 Bus stand sheet

❖ Post office :-

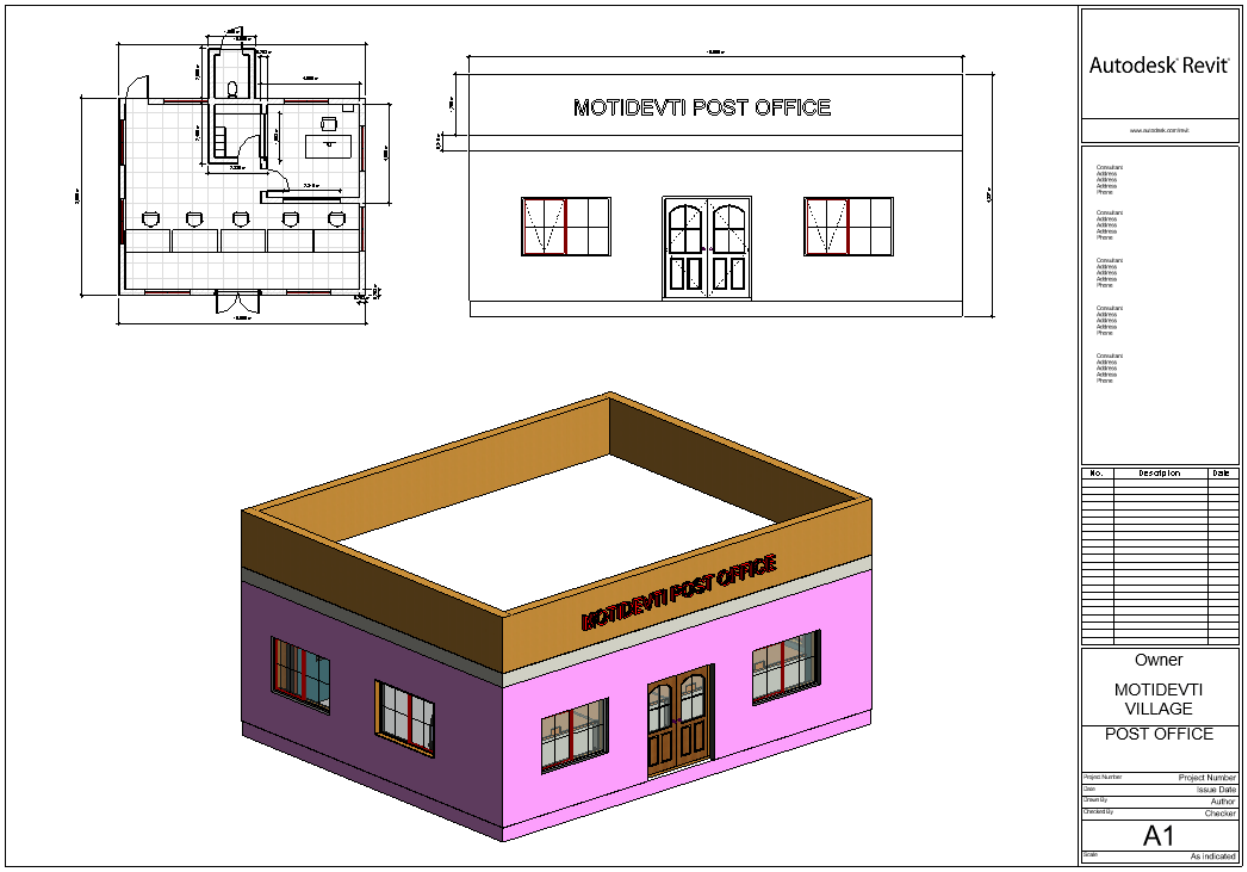


Fig 12.3 Post office sheet

❖ Garba chowk cum auditorium:-

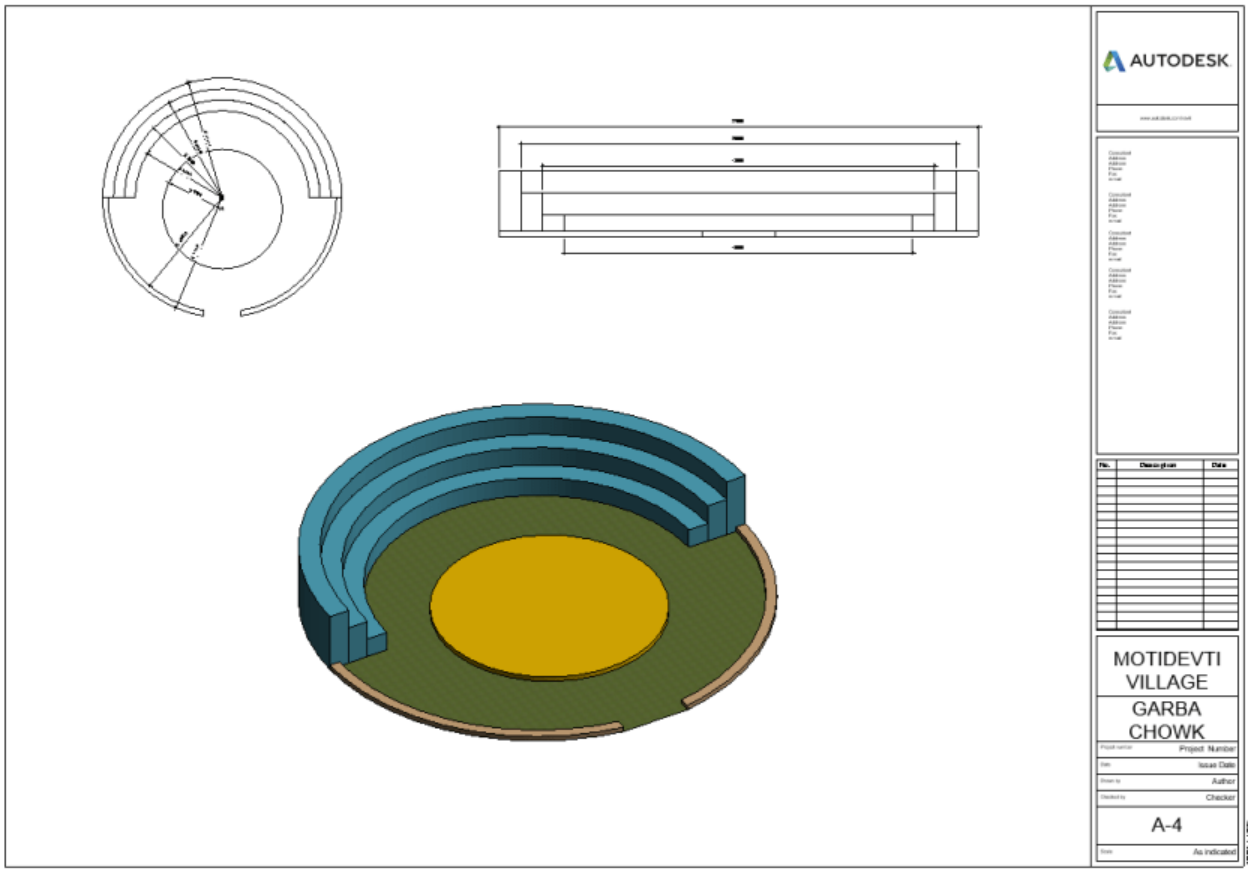


Fig 12.4 Garba chowk sheet

❖ Prayer hall cum meditation center :-

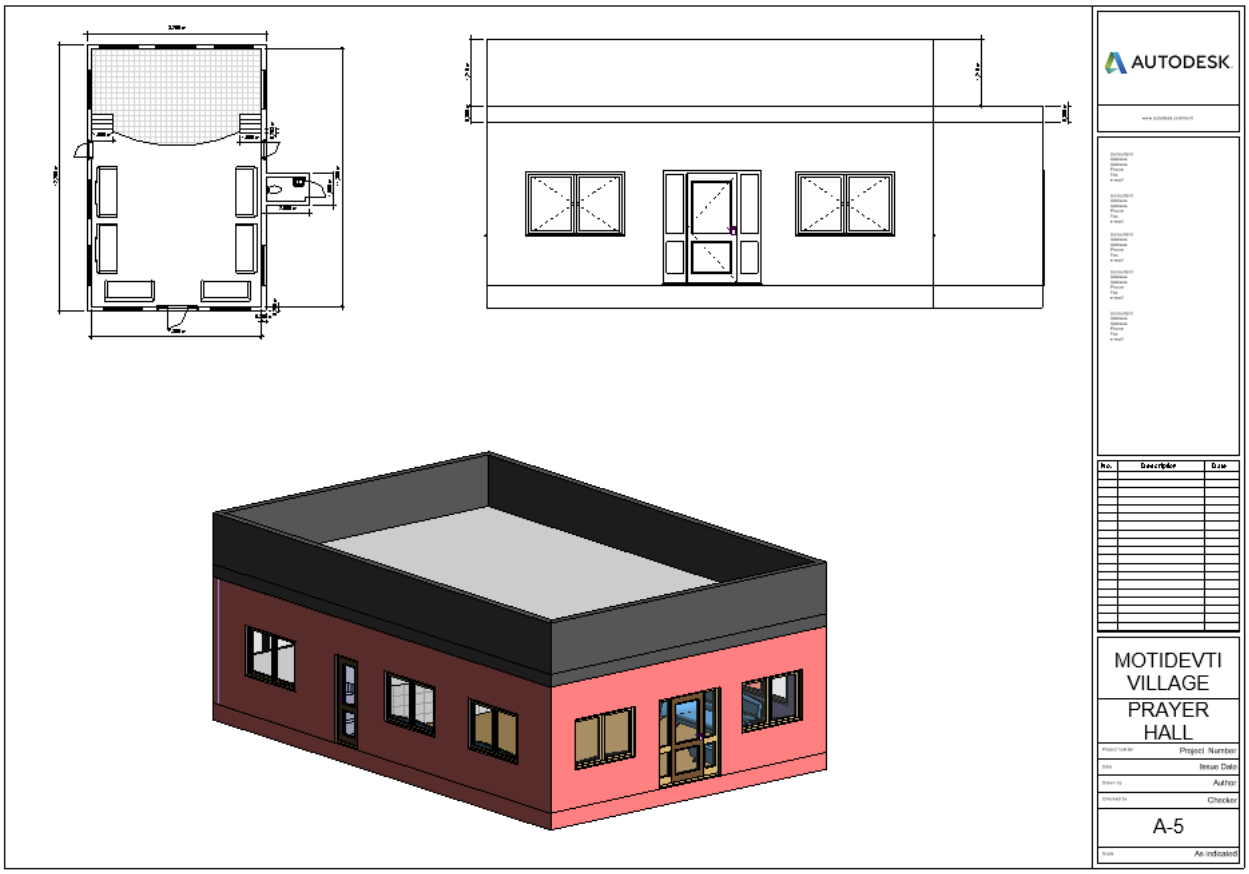


Fig 12.5 Prayer hall sheet

❖ Chabutaro :-

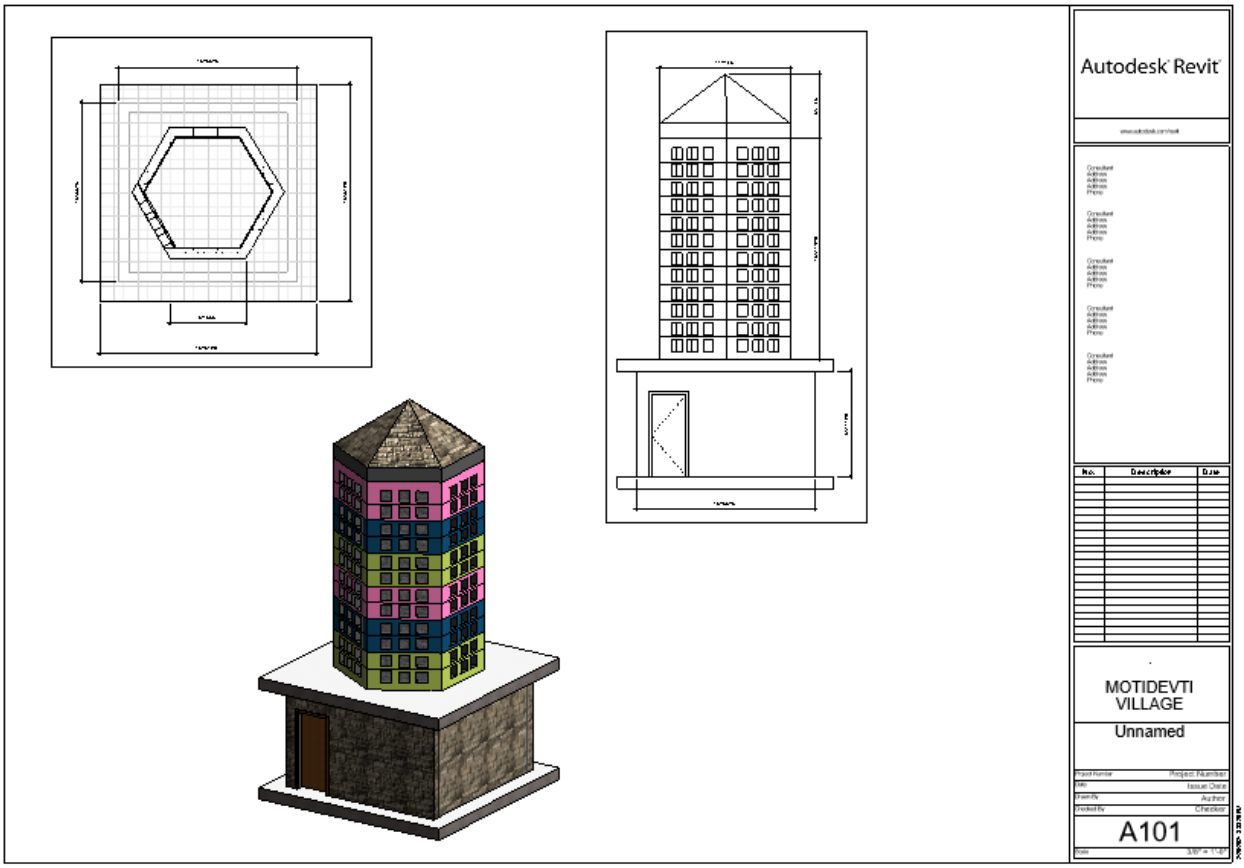


Fig 12.6 Chabutaro sheet

12.6 Summary of good photographs in table format (village visits, ideal, smart Village or any other)

❖ **Motidevti village :-**

Fig 12.7 Motidevti village photos

❖ Smart village RANCHHODPURA :-

Fig 12.8 Ranchhodpura (Smart) village photos

12.7 Village interaction with sarpanch report with the photograph

A report on interactive presentation (Vishwakarma Yojna phase-viii)
At Moti devti village, Ahmedabad district
30/09/20

As per the circular of GTU guideline . the committee member of vishwakarma yojana informed all the terms and condition of vishwakarma yojana for the implementation in village which are allocated us. on 24/09/2020 a village team of Motidevti visited the village and met the sarpanch and described their review and whole project theme of the vishwakarma yojana and also said which type of benefit were got to the village Motidevti.

At the end of first session village team visit the whole village and saw the condition of the village and also took in mind some points which were help to create the whole project theme, design which are proposed in village and also took some photographs of village condition like road network, houses condition, solid waste management, sewage system, water distribution network, condition of public building etc.

After that we proposed some designed according to the village condition and requirement of native people and sarpanch. The designed were physical design (bus stand), sustainable design (public toilet), social design (post office), socio-cultural design (garba chowk), smart village design (prayer hall). After proposing the design the villagers and sarpanch told their problems according to design and we change and finalized our designed which were following.

Our proposed designed:

1. Public toilet
2. Bus stand
3. Post office
4. Garba chowk cum auditorium
5. Prayer hall cum meditation hall

Our proposed designed was large in scale as compare to picture. Our project and design were check by our nodal officer.

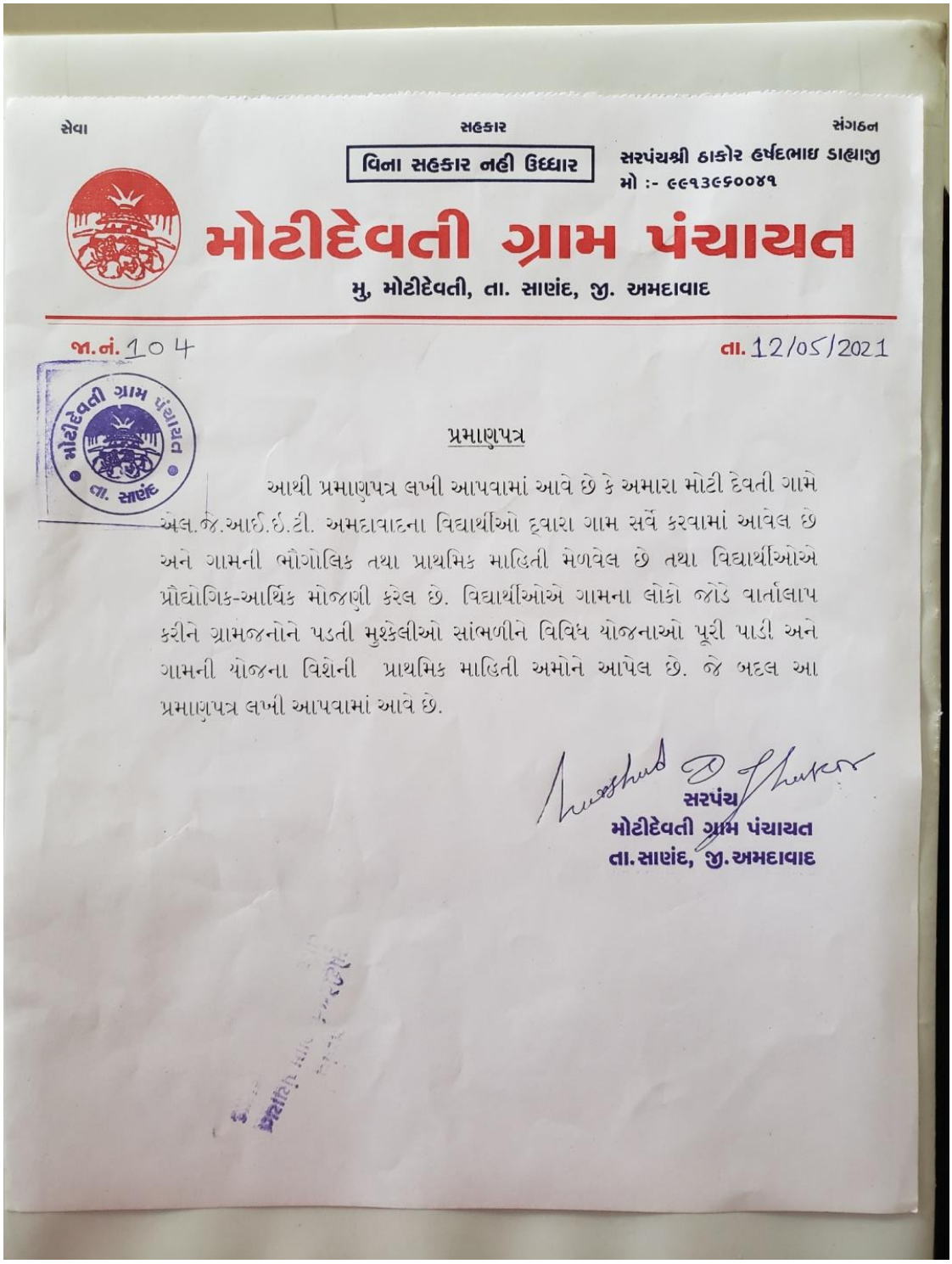
We thankful to Vishwakarma team to gave us the opportunity to do this prestigious work of development of rural area. Also we thankful to our village sarpanch Mr. HarshadbhaiDahyabhaiThakor, talati Mr. SandipbhaiGamara, gram sevakAnandbhai and villagers supporting and helping us.

Fig 12.9 Photograph with Sarpanch

12.8 Summary details of all the villages' designs in table form

Sr. No.	Village name	Discipline	Part-I	Part-II
1.	Moti devti	Civil	Public Toilet	Public library
			Bus-stand	Gram Panchayat building
			Post Office	Bank
			Step Auditorium cum Garba chowk	Cyber café
			Prayer hall cum medition center	Aanganwadi
			Chabutaro	Entrance Gate
2.	Navapura	Civil	Bio gas plant	Public health center
			Panchayat Building	Post office
			Bank	Public Toilet
			Small library	Mini Market
			Learning hub and smart play center	Public Garden
			Obelisk	R-O water plant
3.	Kolat	civil	Septic tank	Sport Area
			Vegetable market	Maternity home
			Public health center	Cremation center
			Community hall	Recreation park
			Common Service Center	Smart sanitation System
			Temple	Kolat lake

12.9 Sarpanch Letter giving information about the village development



સેવા સહકાર સંગઠન

વિના સહકાર નહી ઉધ્ધાર

સરપંચશ્રી ઠાકોર હર્ષદભાઇ ડાહ્યાજી
મો :- ૯૯૧૩૯૬૦૦૪૧

મોટીદેવતી ગ્રામ પંચાયત

મુ, મોટીદેવતી, તા. સાણંદ, જી. અમદાવાદ

જા.નં. 104 તા. 12/05/2021

મોટીદેવતી ગ્રામ પંચાયત તા. સાણંદ

પ્રમાણપત્ર

આથી પ્રમાણપત્ર લખી આપવામાં આવે છે કે અમારા મોટી દેવતી ગામે એલ.જે.આઈ.ઈ.ટી. અમદાવાદના વિદ્યાર્થીઓ દ્વારા ગામ સર્વે કરવામાં આવેલ છે અને ગામની ભૌગોલિક તથા પ્રાથમિક માહિતી મેળવેલ છે તથા વિદ્યાર્થીઓએ પ્રૌદ્યોગિક-આર્થિક મોજણી કરેલ છે. વિદ્યાર્થીઓએ ગામના લોકો જોડે વાર્તાલાપ કરીને ગ્રામજનોને પડતી મુશ્કેલીઓ સાંભળીને વિવિધ યોજનાઓ પૂરી પાડી અને ગામની યોજના વિશેની પ્રાથમિક માહિતી અમોને આપેલ છે. જે બદલ આ પ્રમાણપત્ર લખી આપવામાં આવે છે.

સરપંચ
મોટીદેવતી ગ્રામ પંચાયત
તા.સાણંદ, જી.અમદાવાદ

Chapter 13 Design proposals

13.1 Design proposals

13.1.1 Civil design 1 (Anganwadi)

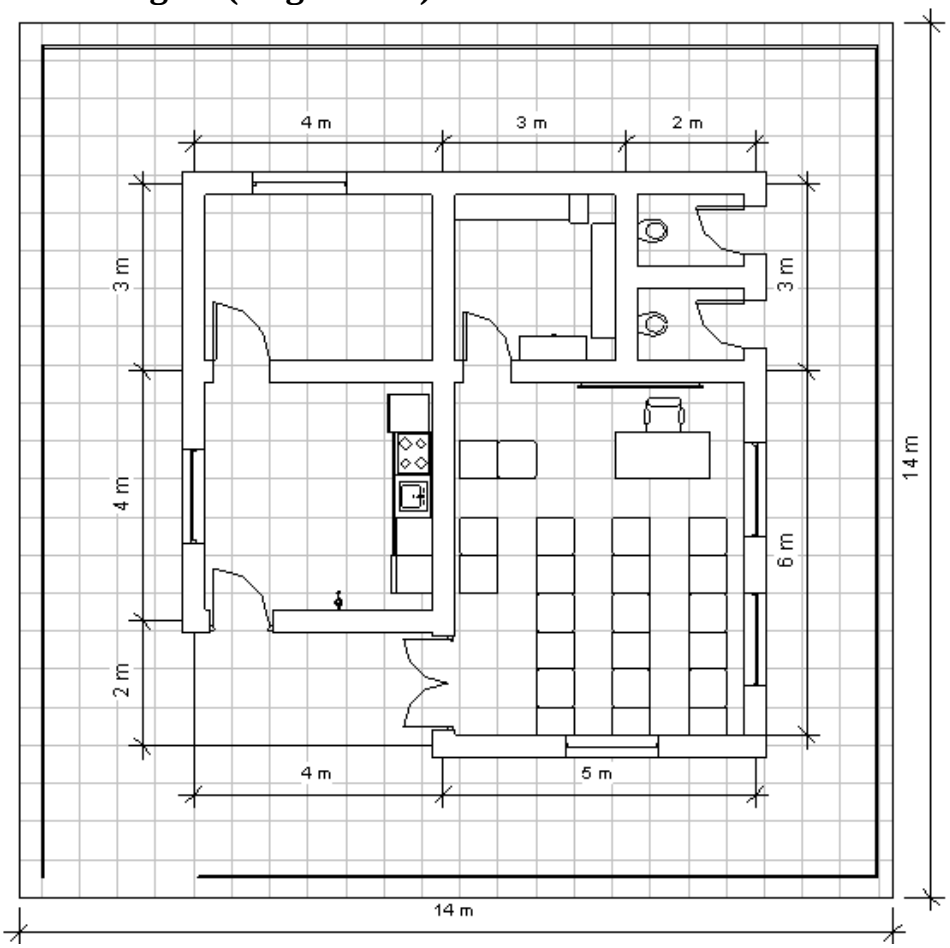


Fig 13.1 Plan of Anganwadi

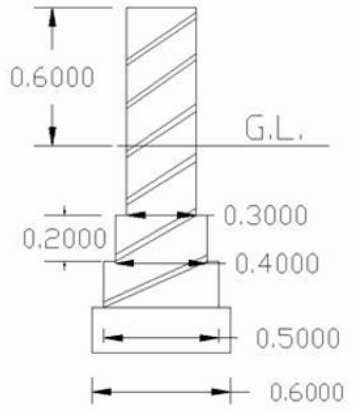


Fig 13.2 Section view of foundation

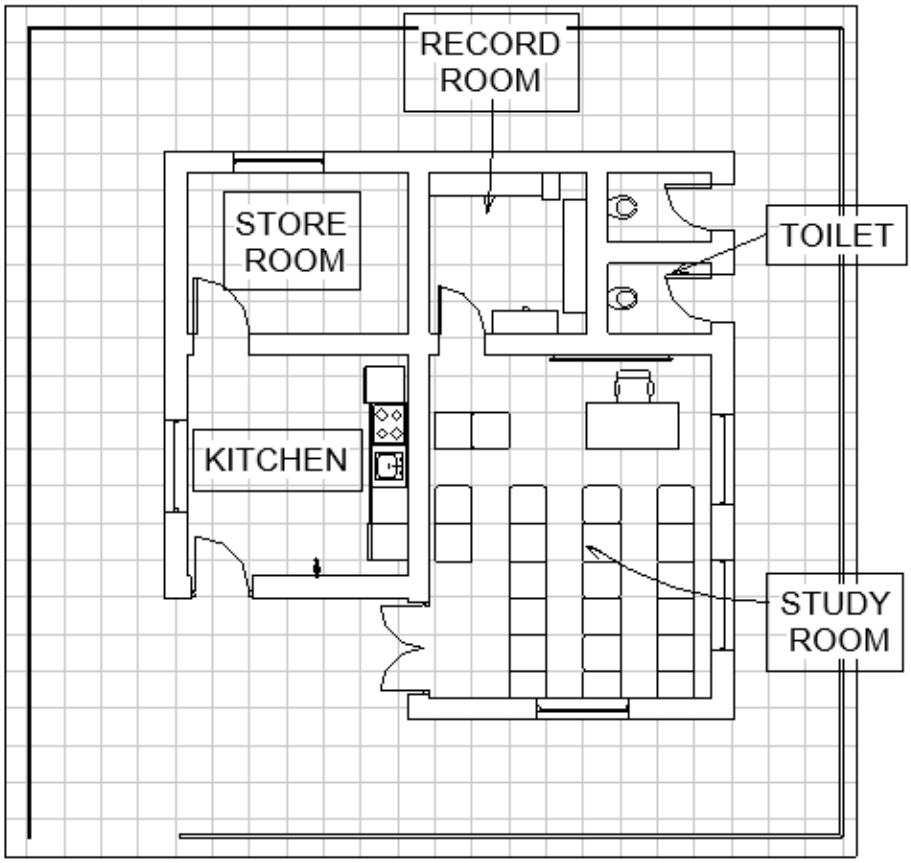


Fig 13.3 Name tag of Anganvadi

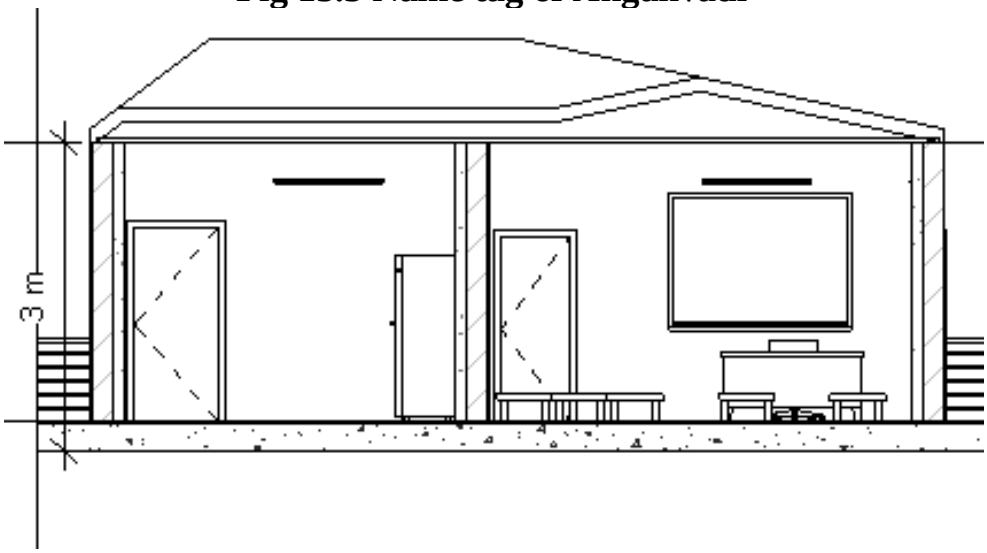


Fig 13.4 Section view of Anganwadi

Fig 13.5 3D view of Anganwadi

❖ **Measurement sheet :-**

Table 13.1 Measurement sheet

Sr. no.	Item description	No.	Length (m)	Width (m)	Height (m)	Quantity (Cu.m)
	Total length		43			
1.	**Excavation for foundation**	1	43	0.9	1.2	**46.44**
2.	**P.C.C work in foundation**	1	43	0.9	0.3	**11.61**
3.	**Brick work in foundation up to plinth**					
	Step:-1	1	43	0.6	0.2	**5.16**
	Step:-2	1	43	0.5	0.2	**4.3**
	Step:-3	1	43	0.4	0.2	**3.44**
	UP to G.L.	1	43	0.3	0.3	**3.87**
						Total = 16.77 Cu.m
4.	**Brick work for Super structure**	1	57	0.3	3	**51.3**
	Deduction					
	Door	1	2	0.3	2.1	**1.26**
		5	1	0.3	2.1	**3.15**
	Window	5	1.2	0.3	1.5	**2.7**
	Lintel					
	Door	1	2.1	0.3	0.15	**0.0945**
		5	1.1	0.3	0.15	**0.2475**

	Window	5	1.3	0.3	0.15	**0.29**
	Total					**43.56**
4.	**12 mm thick inside plaster**					
	Total length					
	Inner wall	1	78	-	3	**234.9**
	Ceiling	1	7	4	-	**28**
			5	9		**45**
	Deduction:					
	Door	1	2	-	2.1	**4.2**
		5	1	-	2.1	**10.5**
	Window	5	1.5	-	1.5	**11.25**
	Total					**281.95**
5.	**RCC**					
	Slab	1	7	4	0.1	**2.8**
		1	5	9	0.1	**4.5**
		1	14	14	0.1	**19.6**
	Total					**26.9**
6.	**15 mm thick plaster**					
	External wall	1	36	-	3	**108**
	Deduction					
	DOOR	1	2	-	2.1	**4.2**
		3	1	-	2.1	**6.3**
	Window	6	1.2	-	1.5	**10.8**
	Total					**86.7**

❖ Abstract sheet :-

Table 13.2 Abstract sheet

Sr. no.	Particular items	Quantity	Rate	Per	Amount
1.	Excavation for foundation	46.44	85	Cu. m	**3947.4**
2.	P.C.C work in foundation	11.61	3200	Cu. m	**37152**
3.	Brickwork in foundation up to plinth	16.77	3200	Cu. m	**53664**
4.	Brickwork for super structure	43.56	3500	Cu. m	**152460**
5.	R.C.C work for slab & lintels	26.9	8800	Cu. m	**236720**
6.	Plaster	368.65	150	Sq. m	**55297.5**
					Total =539240.9

❖ Explanation:-

(1) P.C.C. (1:4:8) in foundation :-

For 11.61 m^3 wet concrete 17.65 m^3 dry concrete required
Here 1:4:8 = 13
Cement = (1/13*17.65) = 1.36 m^3
No. of cement bag = 1.36/0.035 = 39 bags
Sand = (4/13*17.65) = 5.43 m^3
Aggregate = (8/13*17.65) = 10.86 m^3

(2) **Brick bat C.C. in foundation (1.4.8) :-**

In brick bat cement the volume of brick bat required will be equal to the total volume of cement
16.77 m^2 of concrete 16.77 m^3 of brick bat required prop = 1.4.8
Volume of sand is one half of the volume of brick bat
Volume of sand required = 8.38 m^3
Volume of sand is one forth of the volume of sand = ¼(8.38) = 2.09/0.035 = 59.89= 60 bags

(3) **For first class brickwork in C.M. 1.6 in superstructure :-**

i. For 1 m^3 of brick work……. 500 bricks are required
43.56 m^3 of brick work…….(?) = 21780 No of bricks
Add 1% waste = 22000 No. of bricks are required

ii. For 1 m^3 of brick work……. 0.33 m^3 mortar required
Proportion = 1.6. = 7
Cement = (1/7*0.33*43.56) = 2.05/0.035 = 59 bags
Sand = (6/7*0.33*43.56) = 12.32 m^3

(4) **Plaster :- 15mm outer C.M. = 1:3 :-**

Area of plaster 86.7 m^2
Volume of wet mortar = 86.7*0.015 = 1.3 m^3
Add 30% for uneven surface and joint filling = 1.3*1.30 = 1.69 m^3
Add 25% more for dry mortar = 1.69*1.25= 2.11 m^3
Mortar proportion = 1:3 = 4
Cement = (1/4*2.11) = 0.53/0.035 = 15 bags
Sand = (3/4*2.11) = 1.58 m^3

(5) 12 mm thick plaster internal wall 1:4 :-

Area of plaster = 281.95 m^2 thickness = 12 mm
Volume of wet concrete = 281.95*0.012 = 3.38 m^3
Add 30% for filling joint and uneven surface = 3.38*1.30 = 4.40 m^3
Add 25% = 4.40*1.25 = 5.50 m^3
Mortar proportion = 1:4 = 5
Cement = (1/5*5.50) = 1.1/0.035= 32 bags

Sand = (4/5*5.50) = 4.40 m^3

(6) **For RCC slab and lintel :-**

i. For 1 m^3 wet concrete = 1.52 m^3 dry concrete

1 m^3……1.52 m^3

26.9 m^3……. (?) = 40.88 m^3

Proportion 1:1.5:3 = 5.5 m^3

Cement = (1/5.5*40.88) = 7.43/0.035 = 212 bags

Sand = (1.5/5.5*40.88) = 11.14 m^3

Aggregate = (3/5.5*40.88) = 22.30 m^3

ii. Assume 1% steel of wet volume of concrete

Volume of steel = (1/100)*26.9 = 0.269 m^3

Density of steel = 7850 Kg/m^3

Mass = 0.269*7850 = 2111.65 Kg

For 100 Kg of steel binding wire = 1 Kg

For 2111.65 Kg of steel binding wire = 22 Kg required

13.1.2 Civil design 2 (Bank)

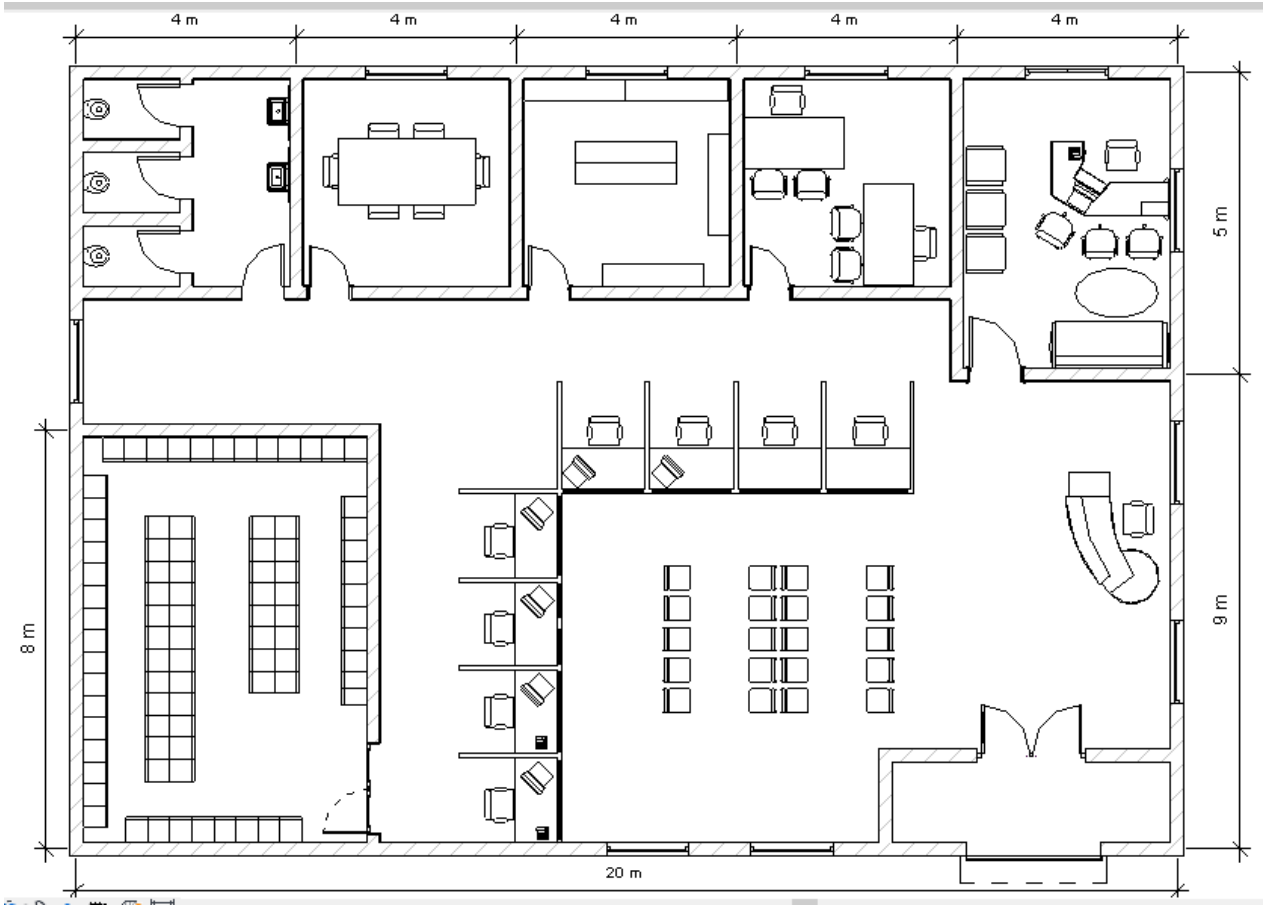


Fig 13.6 Plan of Bank

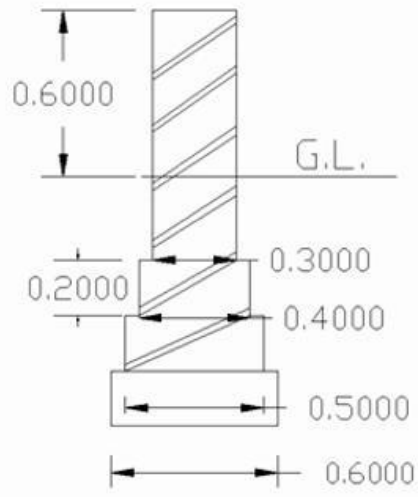


Fig 13.7 Section view of foundation

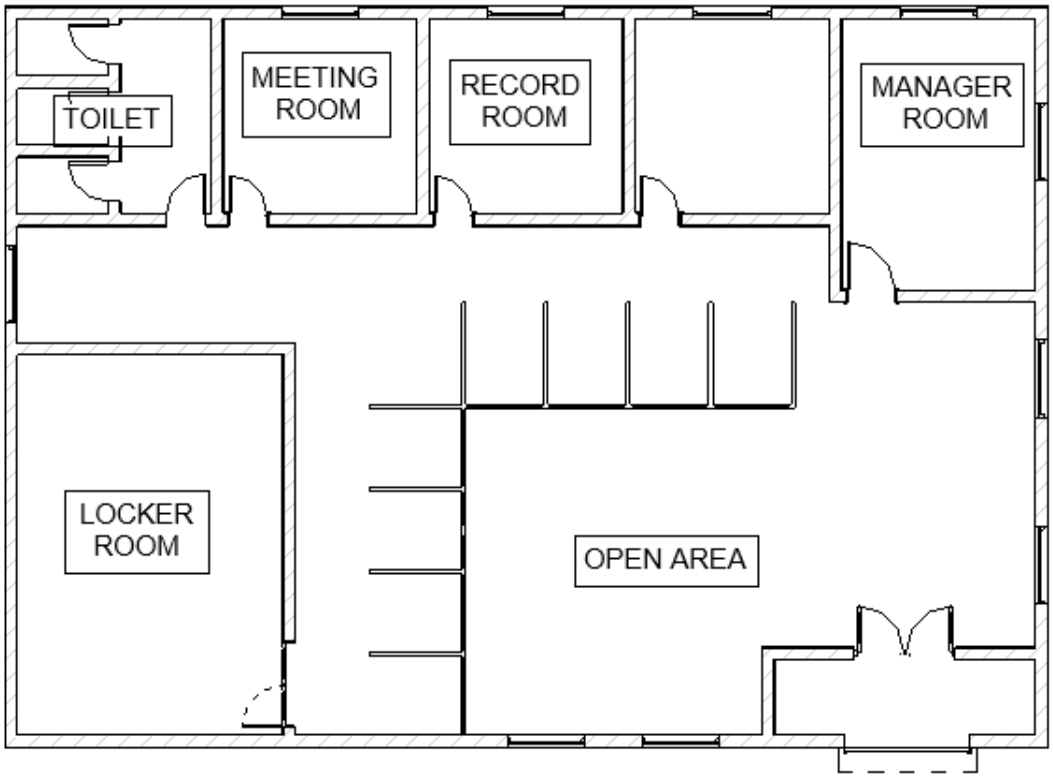


Fig 13.8 Name tag of Bank

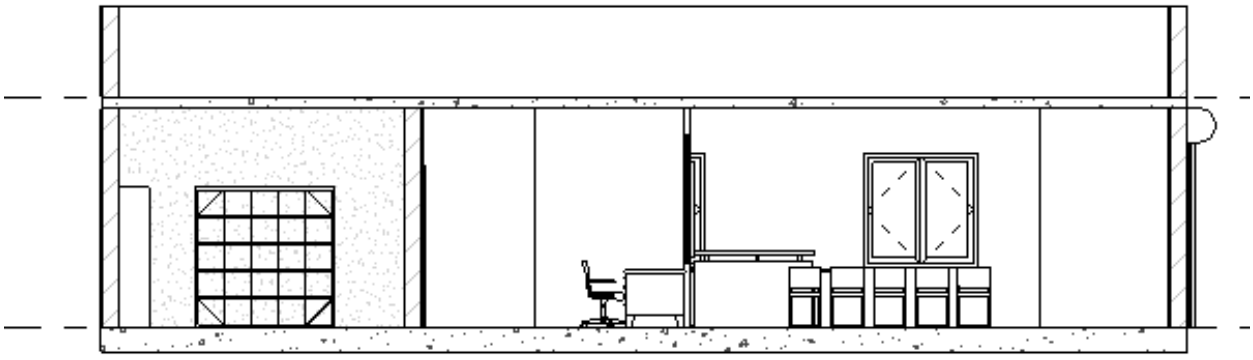


Fig 13.9 Section view of Bank

Fig 13.10 3D view of Bank

❖ **Measurement sheet :-**

Table 13.3 Measurement sheet

Sr. no.	Item description	No.	Length (m)	Width (m)	Height (m)	Quantity (Cu.m)
	Total length		68			
1.	**Excavation for foundation**	1	68	0.9	1.2	**73.44**
2.	**P.C.C work in foundation**	1	68	0.9	0.3	**18.36**
3.	**Brick work in foundation up to plinth**					
	Step:-1	1	68	0.6	0.2	**8.16**
	Step:-2	1	68	0.5	0.2	**6.8**
	Step:-3	1	68	0.4	0.2	**5.44**
	UP to G.L.	1	68	0.3	0.3	**6.12**
						Total = 26.52Cu.m
4.	**Brick work for Super structure**	1	133	0.3	3	119.7
	Deduction					

	Door	3	2	0.3	2.1	3.78
		8	1	0.3	2.1	5.04
	Window	10	1.5	0.3	1.5	6.75
	Lintel					
	Door	3	2.1	0.3	0.15	0.28
		8	1.1	0.3	0.15	0.4
	Window	10	1.6	0.3	0.15	0.72
	Total					**102.73**
4.	**12 mm thick inside plaster**					
	Total length					
	Inner wall	1	190	-	3	**570**
	Ceiling	1	20	14	-	**280**
	Deduction:					
	Door	3	2	-	2.1	**12.6**
		8	1	-	2.1	**16.8**
	Window	10	1.5	-	1.5	**22.5**
	Total					**798.1**
5.	**RCC**					
	Slab	2	20	14	0.1	**56**
	Total					**56**
6.	**15 mm thick plaster**					
	External wall	1	68	-	4	**272**
	Deduction					
	Door	1	2	-	2.1	**4.2**
	Window	10	1.5	-	1.5	**22.5**
	Total					**245.3**

❖ Abstract sheet :-

Table 13.4 Abstract sheet

Sr. no.	Particular items	Quantity	Rate	Per	Amount
1.	Excavation for foundation	73.44	85	Cu. m	**6242.4**
2.	P.C.C work in foundation	18.36	3200	Cu. m	**58752**

3.	Brickwork in foundation up to plinth	26.52	3200	Cu. m	**84864**
4.	Brickwork for super structure	102.73	3500	Cu. m	**359555**
5.	R.C.C work for slab & lintels	56	8800	Cu. m	**492800**
6.	Plaster	1043.4	150	Sq. m	**156510**
					Total = 1158723.4

❖ Explanation:-

(1) P.C.C. (1:4:8) in foundation :-

For 18.36 m^3 wet concrete 27.91 m^3 dry concrete required

Here 1:4:8 = 13

Cement = (1/13*27.91) = 2.15 m^3

No. of cement bag = 2.15/0.035 = 62 bags

Sand = (4/13*27.91) = 8.59 m^3

Aggregate = (8/13*27.91) = 17.18 m^3

(2) **Brick bat C.C. in foundation (1.4.8) :-**

In brick bat cement the volume of brick bat required will be equal to the total volume of cement

26.52 m^2 of concrete 26.52 m^3 of brick bat required prop = 1.4.8

Volume of sand is one half of the volume of brick bat

Volume of sand required = 13.26 m^3

Volume of sand is one forth of the volume of sand = ¼(13.26) = 3.32/0.035 = 94.8= 95 bags

(3) **For first class brickwork in C.M. 1.6 in superstructure :-**

i. For 1 m^3 of brick work……. 500 bricks are required

102.73 m^3 of brick work……(?) = 51365 No of bricks

Add 1% waste = 51880 No. of bricks are required

ii. For 1 m^3 of brick work……. 0.33 m^3 mortar required

Proportion = 1.6. = 7

Cement = (1/7*0.33*102.73) = 4.84/0.035 = 139 bags

Sand = (6/7*0.33*102.73) = 29.05 m^3

(4) **Plaster :- 15mm outer C.M. = 1:3 :-**

Area of plaster 245.3 m^2

Volume of wet mortar = 245.3*0.015 = 3.68 m^3

Add 30% for uneven surface and joint filling = 3.68*1.30 = 4.78 m^3

Add 25% more for dry mortar = 4.78*1.25= 5.98 m^3

Mortar proportion = 1:3 = 4

Cement = (1/4*5.98) = 1.49/0.035 = 42 bags

Sand = (3/4*5.98) = 4.48 m^3

(5) 12 mm thick plaster internal wall 1:4 :-

Area of plaster = 798.1 m^2 thickness = 12 mm
Volume of wet concrete = 798.1*0.012 = 9.57 m^3
Add 30% for filling joint and uneven surface = 9.57*1.30 = 12.441 m^3
Add 25% = 12.441*1.25 = 15.55 m^3
Mortar proportion = 1:4 = 5
Cement = (1/5*15.55) = 3.11/0.035= 88 bags
Sand = (4/5*15.55) = 12.44 m^3

(6) **For RCC slab and lintel :-**

i. For 1 m^3 wet concrete = 1.52 m^3 dry concrete
1 m^3……1.52 m^3
56 m^3……. (?) = 85.12 m^3
Proportion 1:1.5:3 = 5.5 m^3
Cement = (1/5.5*85.12) = 15.47/0.035 = 442 bags
Sand = (1.5/5.5*85.12) = 6.94 m^3
Aggregate = (3/5.5*85.12) = 13.89 m^3

ii. Assume 1% steel of wet volume of concrete
Volume of steel = (1/100)*56 = 0.56 m^3
Density of steel = 7850 Kg/m^3
Mass = 0.56*7850 = 4396 Kg
For 100 Kg of steel binding wire = 1 Kg

For 4396 Kg of steel binding wire = 44 Kg required

13.1.3 Civil design 3 (Cyber cafe)

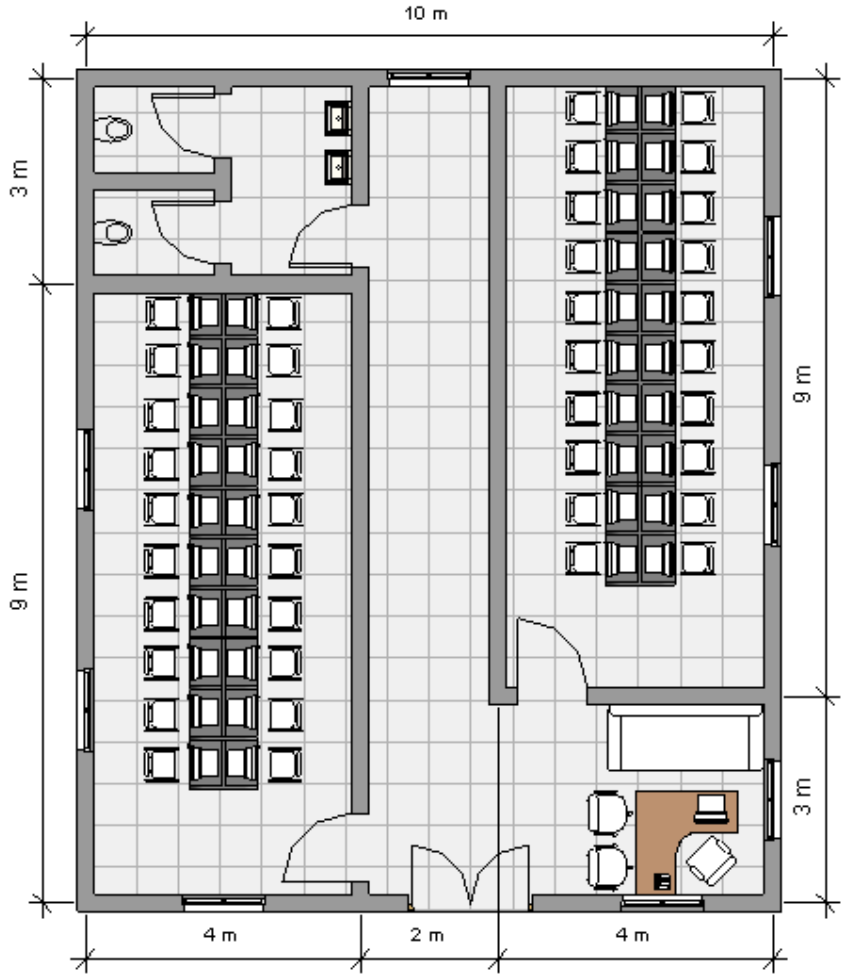


Fig 13.11 Plan of cyber café

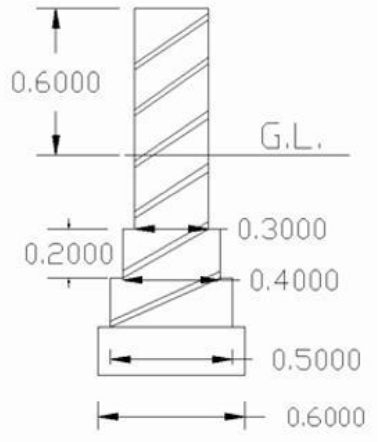


Fig 13.12 Section view of foundation

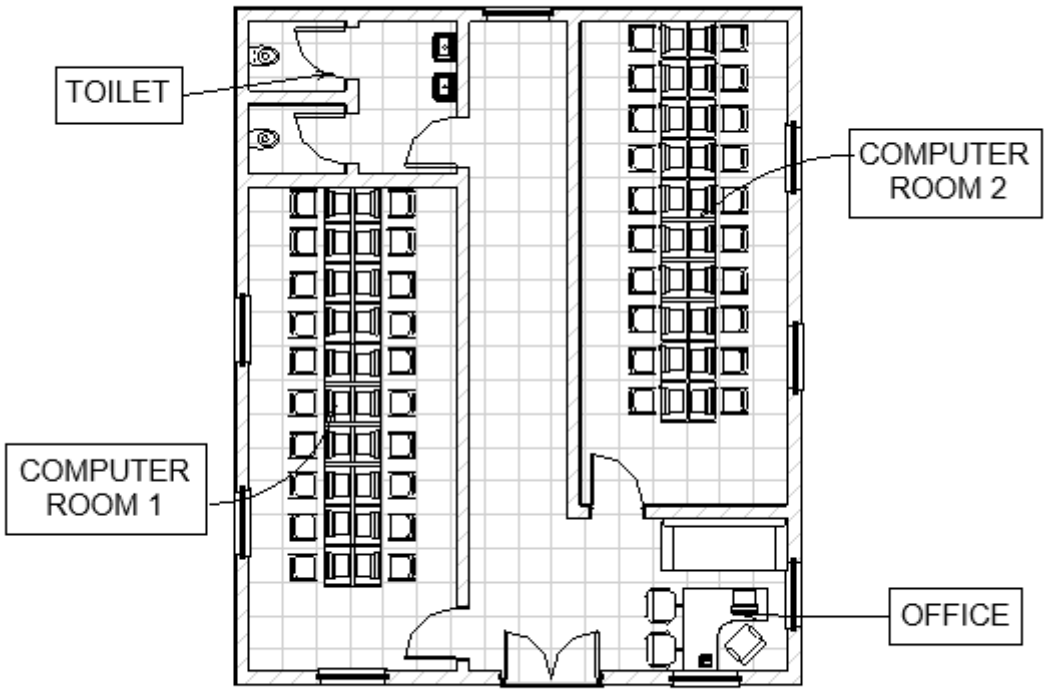


Fig 13.13 Name tag of cyber café

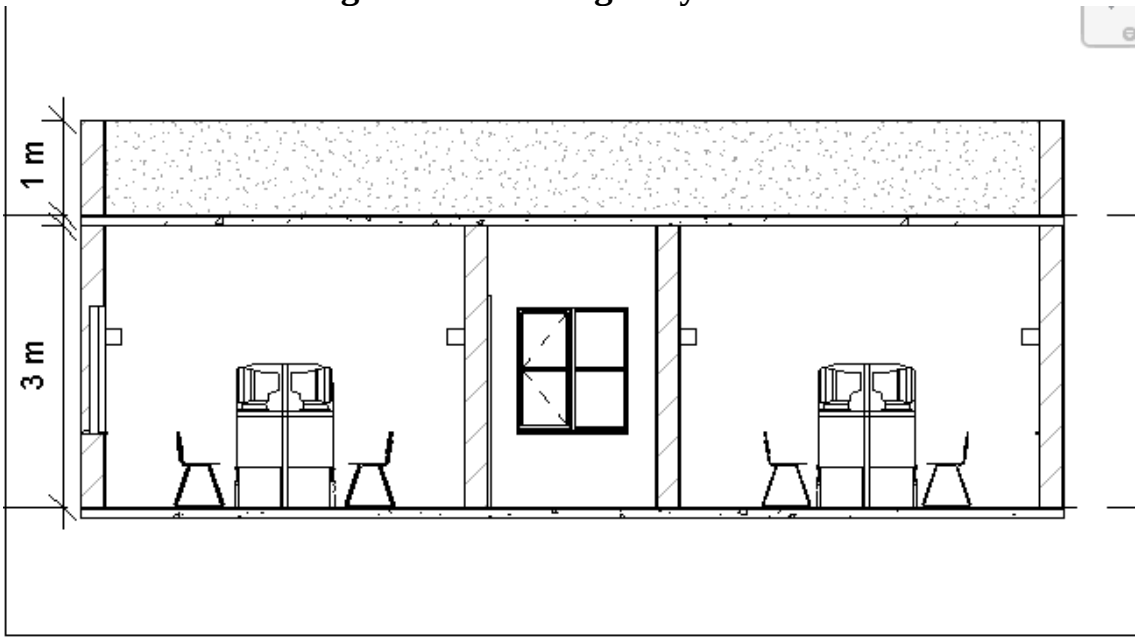


Fig 13.14 Section view of cyber café

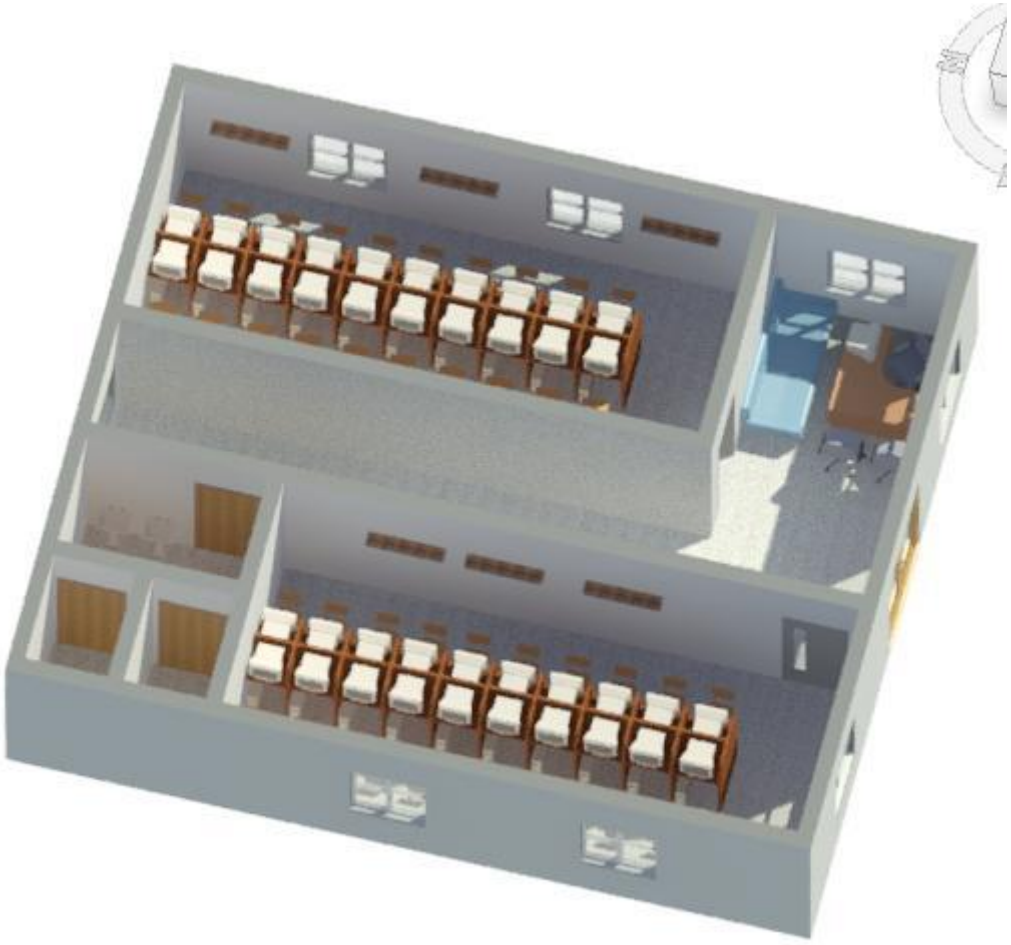


Fig 13.15 3D view of cyber café

❖ **Measurement sheet :-**

Table 13.5 Measurement sheet

Sr. no.	Item description	No.	Length (m)	Width (m)	Height (m)	Quantity (Cu.m)
	Total length		68			
1.	**Excavation for foundation**	1	68	0.9	1.2	**73.44**
2.	**P.C.C work in foundation**	1	68	0.9	0.3	**18.36**
3.	**Brick work in foundation up to plinth**					
	Step:-1	1	68	0.6	0.2	**8.16**
	Step:-2	1	68	0.5	0.2	**6.8**
	Step:-3	1	68	0.4	0.2	**5.44**
	UP to G.L.	1	68	0.3	0.3	**6.12**

						Total = 26.52 Cu.m
4.	**Brick work for Super structure**	1	78	0.3	3	**70.2**
	Deduction					
	Door	1	2	0.3	2.1	**1.26**
		5	1	0.3	2.1	**3.15**
	Window	8	1.2	0.3	1.35	**3.89**
	Lintel					
	Door	1	2.1	0.3	0.15	**0.10**
		5	1.1	0.3	0.15	**0.25**
	Window	8	1.2	0.3	0.15	**0.43**
	Total					**61.12**
4.	**12 mm thick inside plaster**					
	Total length					
	Inner wall	1	112	-	3	**336**
	Ceiling	1	12	10	-	**120**
	Deduction:					
	Door	1	2	-	2.1	**4.2**
		5	1	-	2.1	**10.5**
	Window	8	1.2	-	1.35	**12.96**
	Total					**428.34**
5.	**RCC**					
	Slab	2	12	10	0.1	**24**
	Total					**24**
6.	**15 mm thick plaster**					
	External wall	1	44	-	4	**176**
	Deduction					
	Door	1	2	-	2.1	**4.2**
	Window	8	1.2	-	1.35	**12.96**
	Total					**158.84**

❖ Abstract sheet :-

Table 13.6 Abstract sheet

Sr. no.	Particular items	Quantity	Rate	Per	Amount
1.	Excavation for foundation	73.44	85	Cu. m	**6242.4**
2.	P.C.C work in foundation	18.36	3200	Cu. m	**58752**

3.	Brickwork in foundation up to plinth	26.52	3200	Cu. m	**84864**
4.	Brickwork for super structure	61.12	3500	Cu. m	**213920**
5.	R.C.C work for slab & lintels	24	8800	Cu. m	**211200**
6.	Plaster	587.18	150	Sq. m	**88077**
					Total = 663055.4

❖ Explanation:-

(1) P.C.C. (1:4:8) in foundation :-

For 18.36 m^3 wet concrete 27.90 m^3 dry concrete required

Here 1:4:8 = 13

Cement = (1/13*27.90) = 2.15 m^3

No. of cement bag = 2.15/0.035 = 62 bags

Sand = (4/13*27.90) = 8.58 m^3

Aggregate = (8/13*27.90) = 17.17 m^3

(2) **Brick bat C.C. in foundation (1.4.8) :-**

In brick bat cement the volume of brick bat required will be equal to the total volume of cement

26.52 m^2 of concrete 26.52 m^3 of brick bat required prop = 1.4.8

Volume of sand is one half of the volume of brick bat

Volume of sand required = 13.26 m^3

Volume of sand is one forth of the volume of sand = ¼(13.26) = 3.315/0.035 = 94.71= 95 bags

(3) **For first class brickwork in C.M. 1.6 in superstructure :-**

i. For 1 m^3 of brick work……. 500 bricks are required

61.12 m^3 of brick work……(?) = 30560 No of bricks

Add 1% waste = 30865 No. of bricks are required

ii. For 1 m^3 of brick work……. 0.33 m^3 mortar required

Proportion = 1.6. = 7

Cement = (1/7*0.33*61.12) = 2.88/0.035 = 82 bags

Sand = (6/7*0.33*61.12) = 17.29 m^3

(4) **Plaster :- 15mm outer C.M. = 1:3 :-**

Area of plaster 158.84 m^2

Volume of wet mortar = 158.84*0.015 = 2.38 m^3

Add 30% for uneven surface and joint filling = 2.38*1.30 = 3.10 m^3

Add 25% more for dry mortar = 3.10*1.25= 3.87 m^3

Mortar proportion = 1:3 = 4

Cement = (1/4*3.87) = 0.9675/0.035 = 28 bags

Sand = (3/4*3.87) = 2.90 m^3

(5) 12 mm thick plaster internal wall 1:4 :-

Area of plaster = 428.34 m^2 thickness = 12 mm

Volume of wet concrete = 428.34*0.012 = 5.14 m^3

Add 30% for filling joint and uneven surface = 5.14*1.30 = 6.68 m^3

Add 25% = 6.68*1.25 = 8.35 m^3

Mortar proportion = 1:4 = 5

Cement = (1/5*8.35) = 1.67/0.035= 48 bags

Sand = (4/5*8.35) = 6.68 m^3

(6) **For RCC slab and lintel :-**

i. For 1 m^3 wet concrete = 1.52 m^3 dry concrete

1 m^3……1.52 m^3

24 m^3……. (?) = 36.48 m^3

Proportion 1:1.5:3 = 5.5 m^3

Cement = (1/5.5*36.48) = 6.63/0.035 = 189.50 bags

Sand = (1.5/5.5*36.48) = 9.95 m^3

Aggregate = (3/5.5*36.48) = 19.90 m^3

ii. Assume 1% steel of wet volume of concrete

Volume of steel = (1/100)*24 = 0.24 m^3

Density of steel = 7850 Kg/m^3

Mass = 0.24*7850 = 1884 Kg

For 100 Kg of steel binding wire = 1 Kg

For 1884 Kg of steel binding wire = 19 Kg required

13.1.4 Civil design 4 (Gram panchayat)

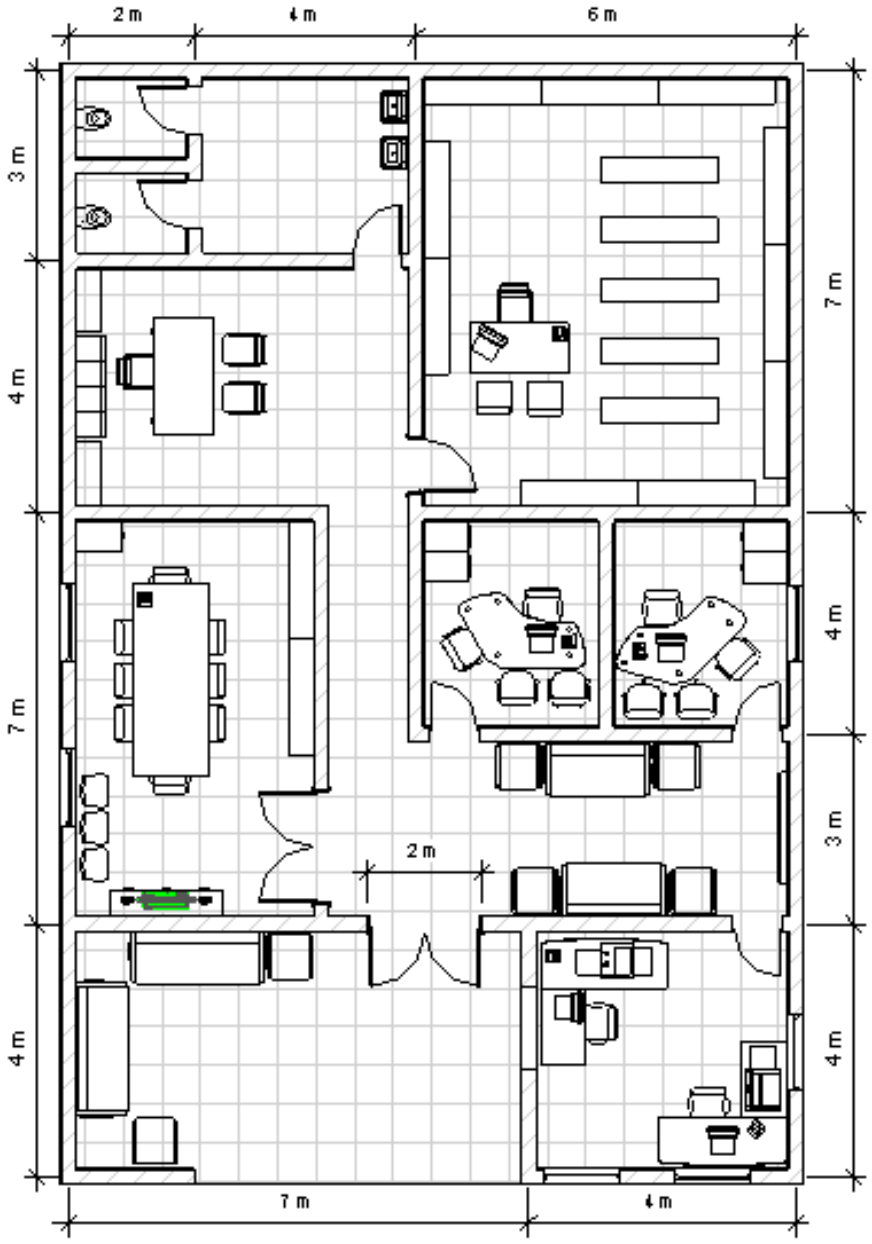


Fig 13.16 Plan of Gram panchayat

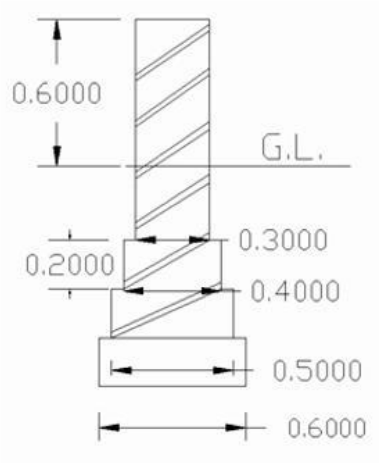


Fig 13.17 Section view of foundation

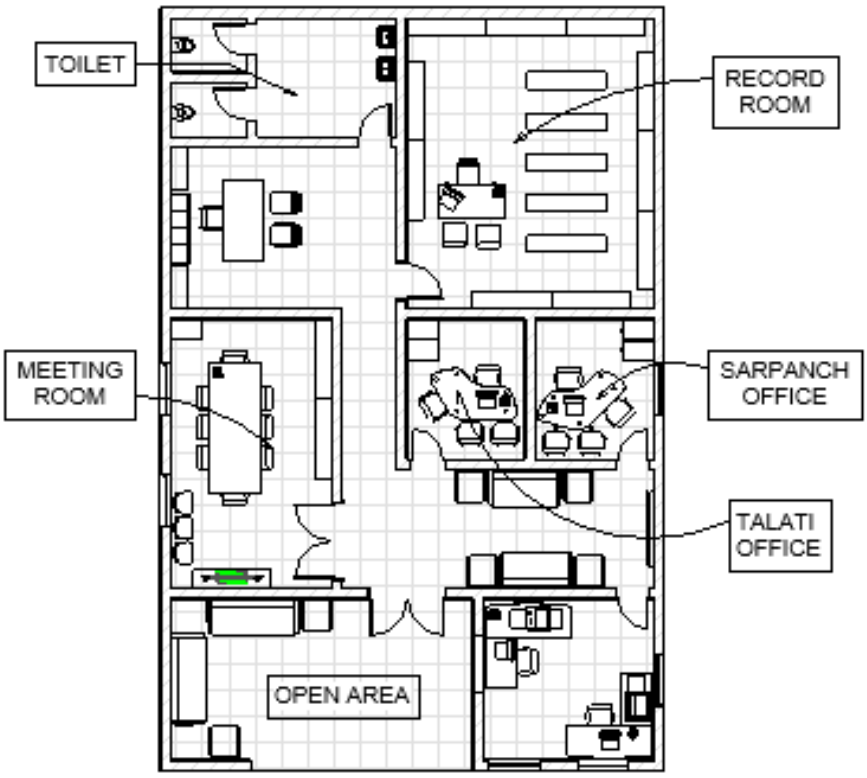


Fig 13.18 Name tag of Gram panchayat

Fig 13.19 3D view of Gram panchayat

❖ **Measurement sheet :-**

Table 13.7 Measurement sheet

Sr. no.	Item description	No.	Length (m)	Width (m)	Height (m)	Quantity (Cu.m)
	Total length		66			
1.	**Excavation for foundation**	1	66	0.9	1.2	**71.28**
2.	**P.C.C work in foundation**	1	66	0.9	0.3	**17.82**
3.	**Brick work in foundation up to plinth**					
	Step:-1	1	66	0.6	0.2	**7.92**

	Step:-2	1	66	0.5	0.2	**6.6**
	Step:-3	1	66	0.4	0.2	**5.28**
	UP to G.L.	1	66	0.3	0.3	**5.94**
						Total = 25.74 Cu.m
4.	**Brick work for Super structure**	1	119	0.3	3	**107.1**
	Deduction					
	Door	2	2	0.3	2.1	**2.52**
		7	1	0.3	2.1	**4.41**
	Window	6	1.2	0.3	1.5	**3.24**
	Lintel					
	Door	2	2.1	0.3	0.15	**0.189**
		7	1.1	0.3	0.15	**0.347**
	Window	6	1.3	0.3	0.15	**0.351**
	Total					**96.043**
4.	**12 mm thick inside plaster**					
	Total length					
	Inner wall	1	184	-	3	**552**
	Ceiling	1	12	18	-	**216**
	Deduction:					
	Door	2	2	-	2.1	**8.4**
		7	1	-	2.1	**14.7**
	Window	6	1.5	-	1.5	**13.5**
	Total					**731.4**
5.	**RCC**					
	Slab	2	12	18	0.1	**43.2**
	Total					**43.2**
6.	**15 mm thick plaster**					
	External wall	1	54	-	4	**216**
	Deduction					
	Window	6	1.2	-	1.5	**10.8**
	Total					**205.2**

❖ Abstract sheet :-

Table 13.8 Abstract sheet

Sr. no.	Particular items	Quantity	Rate	Per	Amount
1.	Excavation for foundation	71.28	85	Cu. m	**6058.8**
2.	P.C.C work in foundation	17.82	3200	Cu. m	**57024**
3.	Brickwork in foundation up to plinth	25.74	3200	Cu. m	**82368**
4.	Brickwork for super structure	96.043	3500	Cu. m	**336150**
5.	R.C.C work for slab & lintels	43.2	8800	Cu. m	**380160**
6.	Plaster	936.6	150	Sq. m	**140490**
					Total = 1002250.8

❖ Explanation:-

(1) P.C.C. (1:4:8) in foundation :-

For 17.82 m^3 wet concrete 27.08 m^3 dry concrete required

Here 1:4:8 = 13

Cement = (1/13*27.08) = 2.08 m^3

No. of cement bag = 2.08/0.035 = 60 bags

Sand = (4/13*27.08) = 8.33 m^3

Aggregate = (8/13*27.08) = 16.66 m^3

(2) **Brick bat C.C. in foundation (1.4.8) :-**

In brick bat cement the volume of brick bat required will be equal to the total volume of cement

25.74 m^2 of concrete 25.74 m^3 of brick bat required prop = 1.4.8

Volume of sand is one half of the volume of brick bat

Volume of sand required = 12.87 m^3

Volume of sand is one forth of the volume of sand = ¼(12.87) = 3.21/0.035 = 91.92= 92 bags

(3) **For first class brickwork in C.M. 1.6 in superstructure :-**

i. For 1 m^3 of brick work……. 500 bricks are required

96.043 m^3 of brick work……(?) = 48022 No of bricks

Add 1% waste = 48500 No. of bricks are required

ii. For 1 m^3 of brick work……. 0.33 m^3 mortar required

Proportion = 1.6. = 7

Cement = (1/7*0.33*96.043) = 4.52/0.035 = 130 bags

Sand = (6/7*0.33*96.043) = 27.16 m^3

(4) **Plaster :- 15mm outer C.M. = 1:3 :-**

Area of plaster 205.2 m^2

Volume of wet mortar = 205.2*0.015 = 3.078 m^3

Add 30% for uneven surface and joint filling = 3.078*1.30 = 4.00 m^3

Add 25% more for dry mortar = 4.00*1.25= 5 m^3

Mortar proportion = 1:3 = 4

Cement = (1/4*5.00) = 1.25/0.035 = 36 bags

Sand = (3/4*5.98) = 3.75 m^3

(5) 12 mm thick plaster internal wall 1:4 :-

Area of plaster = 731.4 m^2 thickness = 12 mm

Volume of wet concrete = 731.4*0.012 = 8.77 m^3

Add 30% for filling joint and uneven surface = 8.77*1.30 = 11.41 m^3

Add 25% = 11.41*1.25 = 14.26 m^3

Mortar proportion = 1:4 = 5

Cement = (1/5*14.26) = 2.85/0.035= 82 bags

Sand = (4/5*14.26) = 11.04 m^3

(6) **For RCC slab and lintel :-**

i. For 1 m^3 wet concrete = 1.52 m^3 dry concrete

1 m^3……1.52 m^3

43.2 m^3……. (?) = 65.66 m^3

Proportion 1:1.5:3 = 5.5 m^3

Cement = (1/5.5*65.66) = 11.93/0.035 = 341 bags

Sand = (1.5/5.5*65.66) = 17.90 m^3

Aggregate = (3/5.5*65.66) = 35.81 m^3

ii. Assume 1% steel of wet volume of concrete

Volume of steel = (1/100)*43.2 = 0.432 m^3

Density of steel = 7850 Kg/m^3

Mass = 0.432*7850 = 3391.2 Kg

For 100 Kg of steel binding wire = 1 Kg

For 3391.2 Kg of steel binding wire = 34 Kg required

13.1.5 Civil design 5 (Library)

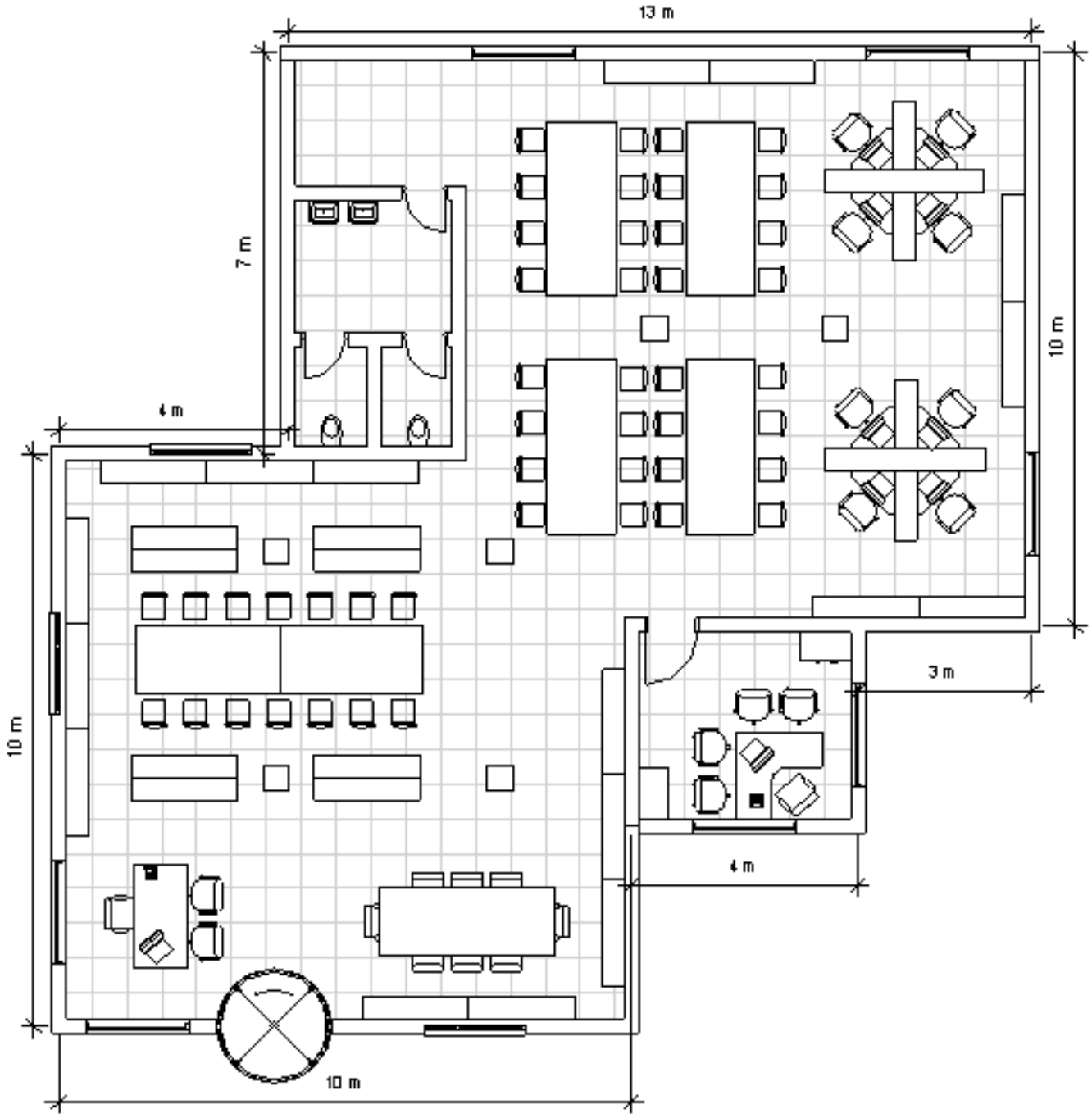


Fig 13.20 plan of library

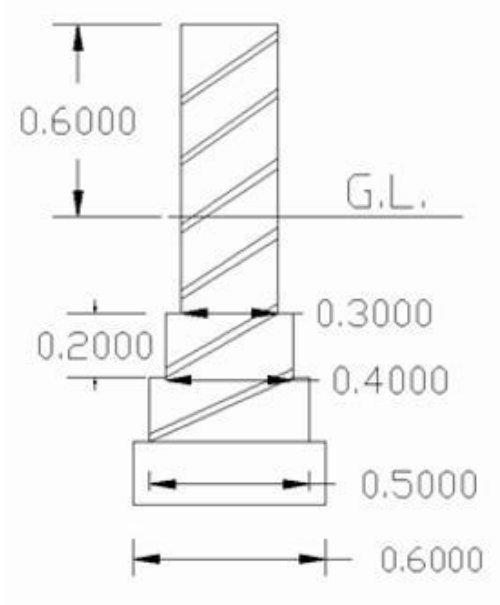


Fig 13.21 Section view of foundation

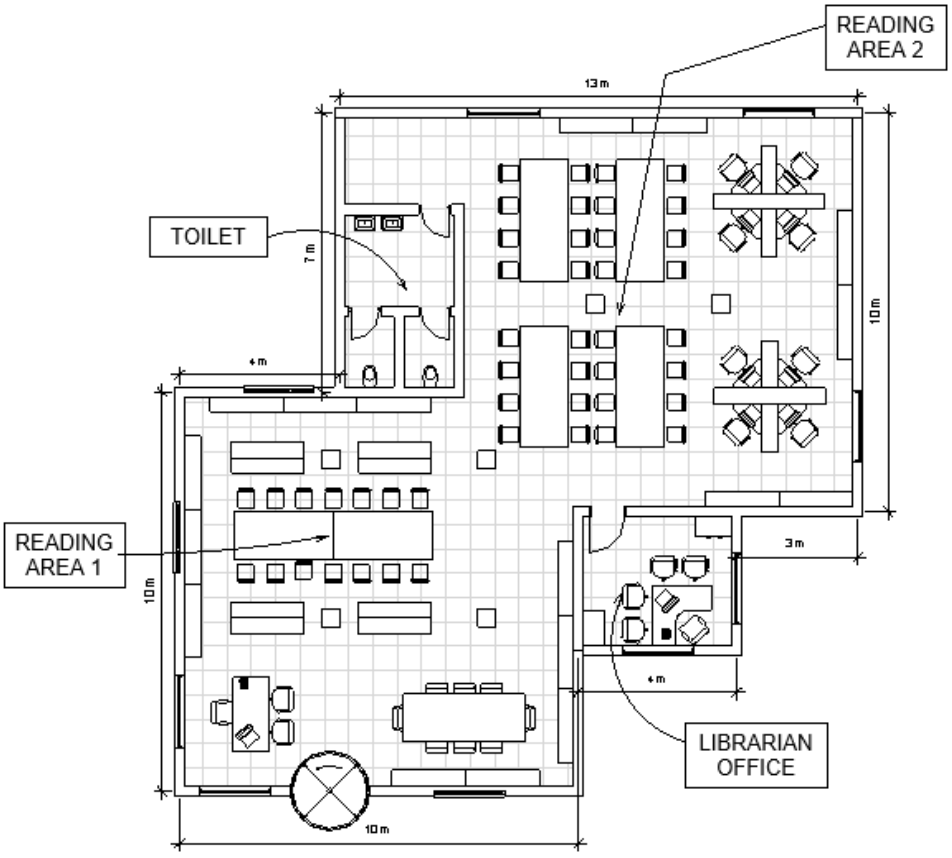


Fig 13.22 Name tag of library

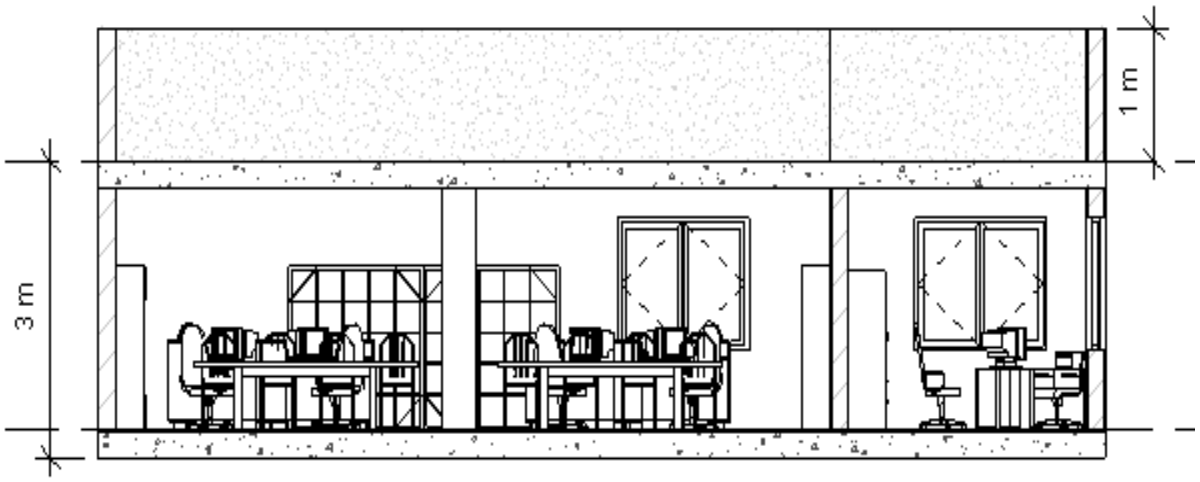


Fig 13.23 Section view of library

Fig 13.24 3D view of library

❖ Measurement sheet :-

Table 13.9 Measurement sheet

Sr. no.	Item description	No.	Length (m)	Width (m)	Height (m)	Quantity (Cu.m)
	Total length		79			
1.	**Excavation for foundation**	1	79	0.9	1.2	**85.32**
2.	**P.C.C work in foundation**	1	79	0.9	0.3	**21.33**
3.	**Brick work in foundation up to plinth**					
	Step:-1	1	79	0.6	0.2	**9.48**
	Step:-2	1	79	0.5	0.2	**7.9**
	Step:-3	1	79	0.4	0.2	**6.32**
	UP to G.L.	1	79	0.3	0.3	**7.11**
						Total = 30.81 Cu.m
4.	**Brick work for Super structure**	1	92	0.3	3	**82.8**
	Deduction					
	Door	1	2	0.3	2.1	1.26
		4	1	0.3	2.1	2.52
	Window	7	1.8	0.3	1.5	5.67
		3	1.77	0.3	0.75	1.19
	Lintel					
	Door	1	2.1	0.3	0.15	0.0945
		4	1.1	0.3	0.15	0.198
	Window	7	2.0	0.3	0.15	0.63
		3	2.0	0.3	0.15	0.27
	Total					**70.96**
4.	**12 mm thick inside plaster**					
	Total length					
	Inner wall	1	109	-	3	**327**
	Ceiling	1	13	10	-	**130**
		1	4	4	-	**16**
		1	7	6	-	**42**
		1	10	4	-	**40**
	Deduction:					
	Door	1	2	0.3	2.1	**1.26**
		4	1	0.3	2.1	**2.52**
	Window	7	1.8	0.3	1.5	**5.67**

		3	1.77	0.3	0.75	**1.19**
	Glass panel	5	2	2	0.1	**2**
	Total					**542.36**
5.	**RCC**					
	Slab	2	13	10	0.1	**26**
		2	4	4	0.1	**3.2**
		2	7	6	0.1	**8.4**
		2	10	4	0.1	**8**
	Column	6	0.5	0.5	3	**4.5**
	Deduction:					
	Glass panel	5	2	2	0.1	**2**
	Total					**48.1**
6.	**15 mm thick plaster**					
	External wall	1	68	-	4	**272**
	Deduction					
	Door	1	2	-	2.1	**4.2**
	Window	7	1.8	-	1.5	**18.9**
		3	1.77	-	0.75	**3.98**
	Total					**244.92**

❖ Abstract sheet :-

Table 13.10 Abstract sheet

Sr. no.	Particular items	Quantity	Rate	Per	Amount
1.	Excavation for foundation	85.32	85	Cu. m	**7252.2**
2.	P.C.C work in foundation	21.33	3200	Cu. m	**68256**
3.	Brickwork in foundation up to plinth	30.81	3200	Cu. m	**98592**
4.	Brickwork for super structure	70.96	3500	Cu. m	**248360**
5.	R.C.C work for slab & lintels	48.1	8800	Cu. m	**423280**
6.	Plaster	787.28	150	Sq. m	**118092**
					Total =963832.2

❖ Explanation:-

(1) P.C.C. (1:4:8) in foundation :-

For 21.33 m^3 wet concrete 32.42 m^3 dry concrete required

Here 1:4:8 = 13
Cement = (1/13*32.42) = 2.49 m^3
No. of cement bag = 2.49/0.035 = 71 bags
Sand = (4/13*32.42) = 9.97 m^3
Aggregate = (8/13*32.42) = 19.95 m^3

(2) **Brick bat C.C. in foundation (1.4.8) :-**

In brick bat cement the volume of brick bat required will be equal to the total volume of cement
30.81 m^2 of concrete 30.81 m^3 of brick bat required prop = 1.4.8
Volume of sand is one half of the volume of brick bat
Volume of sand required = 15.40 m^3
Volume of sand is one forth of the volume of sand = ¼(15.40) = 3.85/0.035 = 110 bags

(3) **For first class brickwork in C.M. 1.6 in superstructure :-**

i. For 1 m^3 of brick work……. 500 bricks are required
70.96 m^3 of brick work……(?) = 35480 No of bricks
Add 1% waste = 35850 No. of bricks are required

ii. For 1 m^3 of brick work……. 0.33 m^3 mortar required
Proportion = 1.6. = 7
Cement = (1/7*0.33*70.96) = 3.34/0.035 = 96 bags
Sand = (6/7*0.33*70.96) = 20.07 m^3

(4) **Plaster :- 15mm outer C.M. = 1:3 :-**

Area of plaster 244.92 m^2
Volume of wet mortar = 244.92*0.015 = 3.67 m^3
Add 30% for uneven surface and joint filling = 3.67*1.30 = 4.78 m^3
Add 25% more for dry mortar = 4.78*1.25= 5.97 m^3
Mortar proportion = 1:3 = 4
Cement = (1/4*5.97) = 1.49/0.035 = 43 bags
Sand = (3/4*5.97) = 4.47 m^3

(5) 12 mm thick plaster internal wall 1:4 :-

Area of plaster = 542.36 m^2 thickness = 12 mm
Volume of wet concrete = 542.36*0.012 = 6.51 m^3
Add 30% for filling joint and uneven surface = 6.51*1.30 = 8.46 m^3
Add 25% = 8.46*1.25 = 10.58 m^3
Mortar proportion = 1:4 = 5
Cement = (1/5*10.58) = 2.11/0.035= 61 bags
Sand = (4/5*10.58) = 8.46 m^3

(6) **For RCC slab and lintel :-**

i. For 1 m^3 wet concrete = 1.52 m^3 dry concrete
   1 m^3……1.52 m^3
   48.1 m^3……. (?) = 73.112 m^3
   Proportion 1:1.5:3 = 5.5 m^3
   Cement = (1/5.5*73.112) = 13.29/0.035 = 380 bags
   Sand = (1.5/5.5*73.112) = 19.94 m^3
   Aggregate = (3/5.5*73.112) = 39.88 m^3

ii. Assume 1% steel of wet volume of concrete
   Volume of steel = (1/100)*48.1 = 0.481 m^3
   Density of steel = 7850 Kg/m^3
   Mass = 0.481*7850 = 3775.85 Kg
   For 100 Kg of steel binding wire = 1 Kg

For 3775.85 Kg of steel binding wire = 38 Kg required

13.1.6 Civil design 6 (Gate)

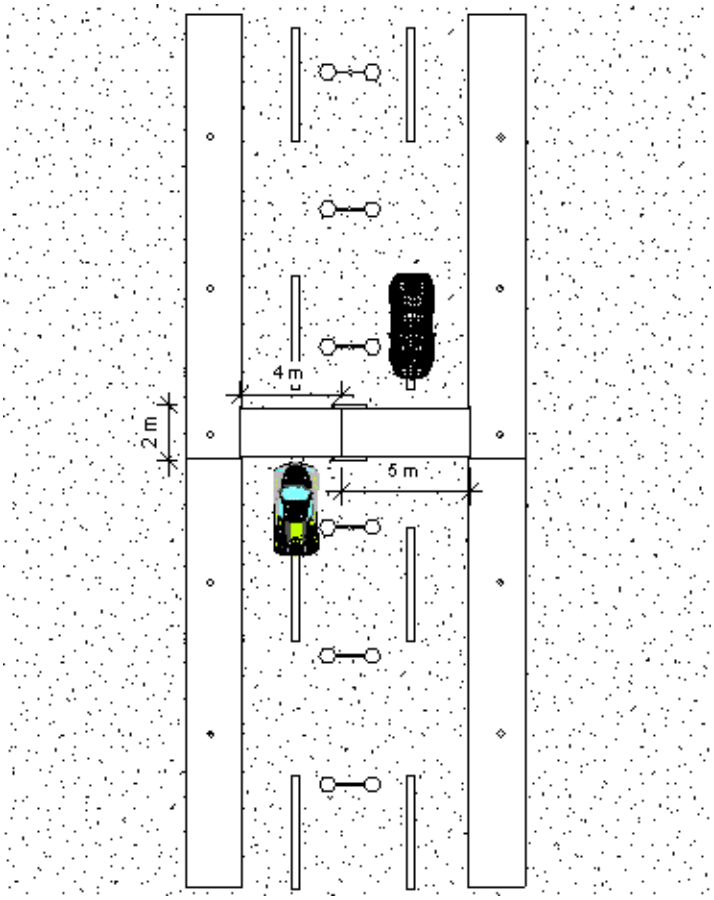


Fig 13.25 Plan of gate

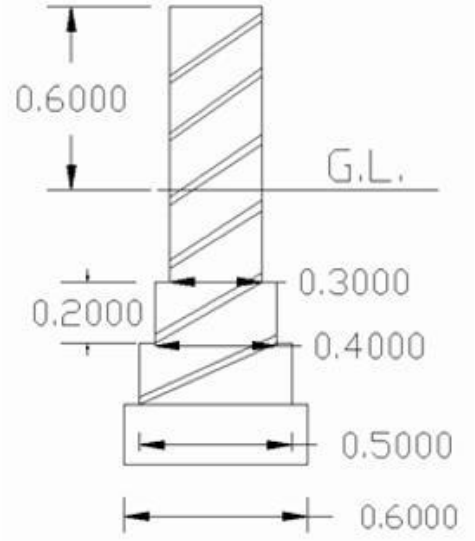


Fig 13.26 Section of foundation

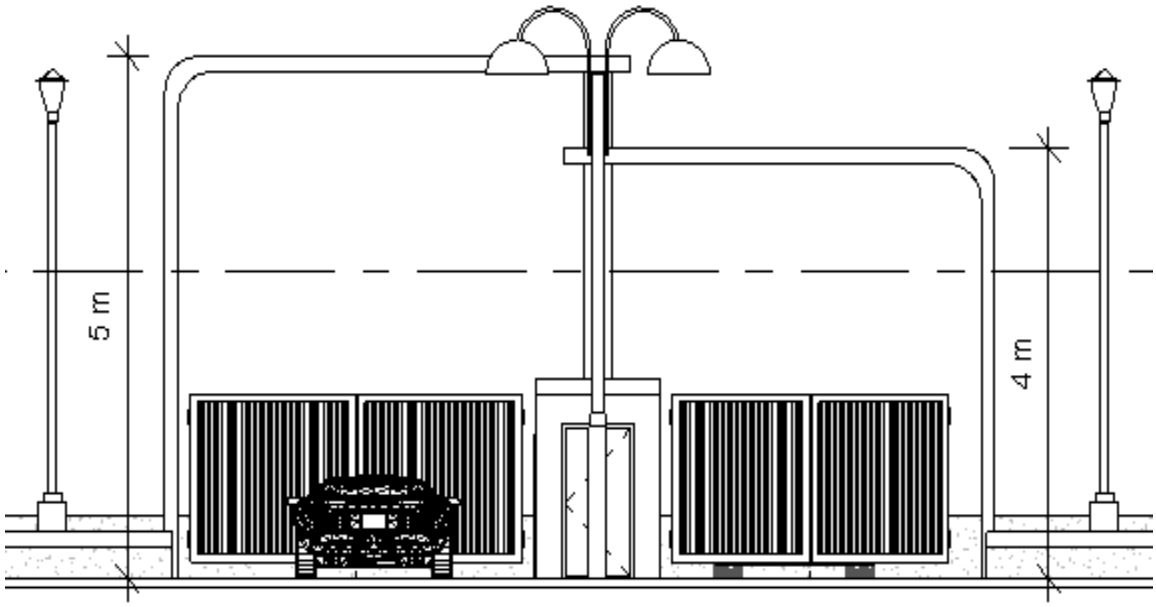


Fig 13.27 Section of gate

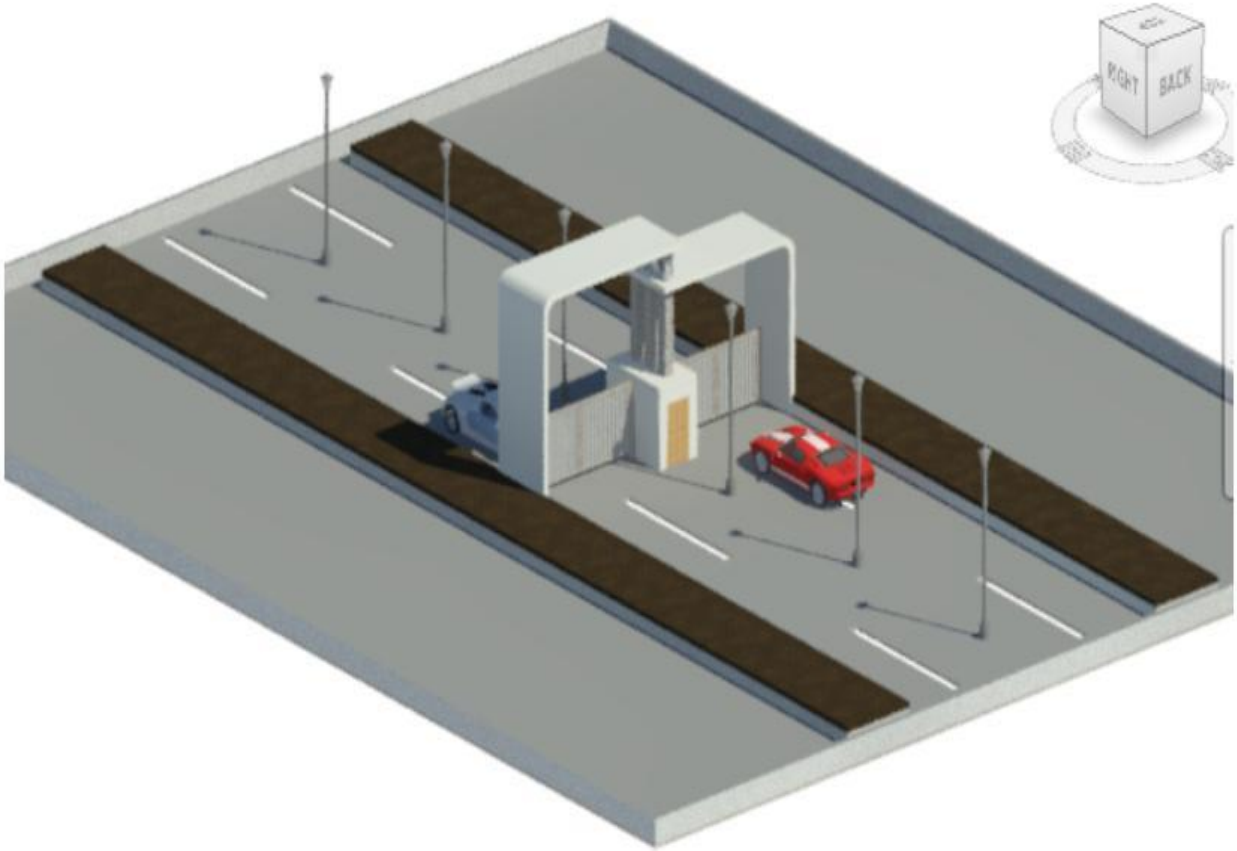


Fig 13.28 3D view of gate

❖ Measurement sheet :-

Table 13.11 Measurement sheet

Sr. no.	Item description	No.	Length (m)	Width (m)	Height (m)	Quantity (Cu.m)
	Total length		6.6			
1.	**Excavation for foundation**	1	6.6	0.9	1.2	**7.128**
2.	**P.C.C work in foundation**	1	6.6	0.9	0.3	**1.782**
3.	**Brick work in foundation up to plinth**					
	Step:-1	1	6.6	0.6	0.2	**0.792**
	Step:-2	1	6.6	0.5	0.2	**0.66**
	Step:-3	1	6.6	0.4	0.2	**0.528**
	UP to G.L.	1	6.6	0.3	0.3	**0.594**
						Total = 2.574 Cu.m
4.	**Brick work for Super structure**	1	6.6	0.3	1.8	**3.564**
	Deduction					
	Door	1	1	0.3	1.5	0.45
	Window	1	0.6	0.3	1.2	0.216
	Lintel					
	Door	1	1.1	0.3	0.15	0.495
	Window	1	0.7	0.3	0.15	0.0315
	Total					**2.37**
4.	**12 mm thick inside plaster**					
	Total length					
	Inner wall	1	6.6	-	1.8	**11.88**
	Ceiling	1	1.2	2.1	-	**2.52**
	Deduction:					
	Door	1	1	-	1.5	**1.5**
	Window	1	0.6	-	1.2	**0.72**
	Total					**12.18**
5.	**RCC**					
	Slab	2	1.2	2.1	0.1	**0.504**
		1	0.15	2.0	5.2	**1.56**
		1	5.2	2.0	0.15	**1.56**
		1	4.3	2.0	0.15	**1.29**
		1	0.15	2.0	4.8	**1.44**

	Column	3	0.3	0.3	3.0	**0.81**
	Total					**7.164**
6.	**15 mm thick plaster**					
	External wall	1	6.6	-	1.8	**11.88**
	Slab	1	1.2	2.1	-	**2.52**
		1	-	2.0	5.2	**10.4**
		1	5.2	2.0	-	**10.4**
		1	4.3	2.0	-	**8.6**
		1	-	2.0	4.8	**9.6**
	Column	3	0.3	-	3	**2.7**
	Deduction					
	Door	1	2	-	2.1	**4.2**
						2.25
	Window	1	1.5	-	1.5	
	Total					**49.65**

❖ Abstract sheet :-

Table 13.12 Abstract sheet

Sr. no.	Particular items	Quantity	Rate	Per	Amount
1.	Excavation for foundation	7.128	85	Cu. m	**605.88**
2.	P.C.C work in foundation	1.782	3200	Cu. m	**5702.4**
3.	Brickwork in foundation up to plinth	2.574	3200	Cu. m	**8236.8**
4.	Brickwork for super structure	2.37	3500	Cu. m	**8295**
5.	R.C.C work for slab & lintels	7.164	8800	Cu. M	**63043.2**
6.	Plaster	61.83	150	Sq. m	**9274.5**
					Total = 95157.78

❖ Explanation:-

(1) P.C.C. (1:4:8) in foundation :-

For 11.61 m^3 wet concrete 17.65 m^3 dry concrete required

Here 1:4:8 = 13

Cement = (1/13*17.65) = 1.36 m^3

No. of cement bag = 1.36/0.035 = 39 bags

Sand = (4/13*17.65) = 5.43 m^3

Aggregate = (8/13*17.65) = 10.86 m^3

(2) **Brick bat C.C. in foundation (1.4.8) :-**

In brick bat cement the volume of brick bat required will be equal to the total volume of cement

16.77 m^2 of concrete 16.77 m^3 of brick bat required prop = 1.4.8

Volume of sand is one half of the volume of brick bat

Volume of sand required = 8.38 m^3

Volume of sand is one forth of the volume of sand = ¼(8.38) = 2.09/0.035 = 59.89= 60 bags

(3) **For first class brickwork in C.M. 1.6 in superstructure :-**

i. For 1 m^3 of brick work……. 500 bricks are required

43.56 m^3 of brick work……(?) = 21780 No of bricks

Add 1% waste = 22000 No. of bricks are required

ii. For 1 m^3 of brick work……. 0.33 m^3 mortar required

Proportion = 1.6. = 7

Cement = (1/7*0.33*43.56) = 2.05/0.035 = 59 bags

Sand = (6/7*0.33*43.56) = 12.32 m^3

(4) **Plaster :- 15mm outer C.M. = 1:3 :-**

Area of plaster 86.7 m^2

Volume of wet mortar = 86.7*0.015 = 1.3 m^3

Add 30% for uneven surface and joint filling = 1.3*1.30 = 1.69 m^3

Add 25% more for dry mortar = 1.69*1.25= 2.11 m^3

Mortar proportion = 1:3 = 4

Cement = (1/4*2.11) = 0.53/0.035 = 15 bags

Sand = (3/4*2.11) = 1.58 m^3

(5) 12 mm thick plaster internal wall 1:4 :-

Area of plaster = 281.95 m^2 thickness = 12 mm

Volume of wet concrete = 281.95*0.012 = 3.38 m^3

Add 30% for filling joint and uneven surface = 3.38*1.30 = 4.40 m^3

Add 25% = 4.40*1.25 = 5.50 m^3

Mortar proportion = 1:4 = 5

Cement = (1/5*5.50) = 1.1/0.035= 32 bags

Sand = (4/5*5.50) = 4.40 m^3

(6) **For RCC slab and lintel :-**

i. For 1 m^3 wet concrete = 1.52 m^3 dry concrete

1 m^3……1.52 m^3

26.9 m^3……. (?) = 40.88 m^3

Proportion 1:1.5:3 = 5.5 m^3

Cement = (1/5.5*40.88) = 7.43/0.035 = 212 bags

Sand = (1.5/5.5*40.88) = 11.14 m^3
Aggregate = (3/5.5*40.88) = 22.30 m^3

ii. Assume 1% steel of wet volume of concrete
Volume of steel = (1/100)*26.9 = 0.269 m^3
Density of steel = 7850 Kg/m^3
Mass = 0.269*7850 = 2111.65 Kg
For 100 Kg of steel binding wire = 1 Kg
For 2111.65 Kg of steel binding wire = 22 Kg required

13.2Reason for Students Recommending this Design

- After visiting the village, we saw that villagers are facing many problems regarding basic facilities such as public toilet, post office, drinking facilities, prayer hall, education facilities and many more.
- To mitigate these issues, we made several plan to design and estimate the approximate value of building which would be required in village as a positive development.
- Moreover, migration ratio from village side to city side has been increasing day by day due to some reasons such as low level education, below poverty line life style, lack educated people, unemployment and many more.
- There is no public toilet for individuals and that people are facing major issue regarding toilet, so we made one public toilet design in the report to fulfill the requirement of people.
- Also livelihood of village are much more excited for playing garba in festivals but they are facing problem regarding proper place for placing and enjoying garba. Therefore we just made the design of garba chowk cum auditorium so they can use both kind of facilities from one place.
- There is no post office available in the village and also near by town so, people of Motidevti village have to go Sanand for post office work. To support their problem, we thought about building post office in the village can help not only the native village people but also surrounding villagers to use post office for their needy uses.

13.3About designs Suggestions / Benefit of the villagers

- There are many benefits of the design to villagers and other community also. By implementing different necessary services such as auditorium, meditation center, post office, bus stand would serve different purpose of works as per the requirement of villagers.

- Currently, due to lac of facilities available in the village, villagers have to work out side the village for long distance to complete their own tasks but due to invention of new facilities it will be easy for villagers to accomplish the works according to there preference with their convenient time.
- The benefits not only for people but also national migration ration from village to city side would definitely decrease due to innovation of same king of facilities as same as city at their doorstep.
- By implementing different facilities, people have chance to do job in newly establishes facilities and it will boost the local economy of workers so they do not need to purse jobs outside the village.

Chapter 14.Technical Options with Case Studies

14.1.1. Advanced Earthquake Resistant:-

What is earthquake?

- Earthquake is the shaking of earth and also in other word the release of energy due to movement of tectonic plates.

Advance earthquake analysis method:-
There are some methods which are used to analysis of earthquake :_

- Equivalent Static Analysis
- Response Spectrum Analysis
- Linear Dynamic Analysis
- Nonlinear Static Analysis
- Nonlinear Dynamic Analysis

Example:-
The Japan has faced many earthquake attacks and some of them were very high and there were many problem which were faced by the native people and also government. Due to this the government have implemented with some new techniques and ideas. Some of their ideas which are following :

1) Earthquake resistance building:-
    - In Japan, some regularity of earthquakes, all houses are made up with the idea of earthquake resistance which are withstand some level of tremor. In Japan, Law is passed by the government to make earthquake resistance building. This law applies in some other building like schools and office buildings. It is said that 87% of buildings in Tokyo are able to withstand earthquake.
2) Phone updates:-
    - In Japan, every smart phone is installed with an earthquake and tsunami emergency alert system. In this system, triggered around five to ten seconds prior to the impending the disasters, it means to give users time to quickly seek protection if necessary. The system give alert like this in Japanese language “jishin desu! Jishin desu! (this is an earthquake) until the earthquake stops.
3) Immediate TV coverage:-
    - In Japan, if the earthquake hits, aal the Japan’s TV channel immediately switch to official earthquake coverage ensuring that the population is well informed how to stay safe. The coverage delivers information on earthquake.

4) Earthquake survival kits:-

- Each and every households have prepare an earthquake kit which consists with first aid equipment, bottled water, food rations, gloves, face mask, insulation sheets, survival tools like torches and even radios that broadcast regular updates.

5) Earthquake memorial museum:-
   - This is the best idea which is used by Japan government. They built a museum and learn from the past events. In 1995, the city of Kobe was struck by the completely devastating great Hanshin Awaji earthquake, in this 5000 people are dead destroyed tens of thousands of home. After the rebuilding of city the Kobe also constructed the Kobe earthquake memorial museum.

14.1.2 Seismic retrofitting of buildings:-

What is seismic retrofitting?

- Seismic retrofitting is the technique in which the modification of existing structure to make them more resistance against seismic activities, soil failure due to earthquake or ground motion.

Need of Seismic retrofitting technique for concrete structures:-

- To reduce the losses and hazard from non structural elements
- To ensure the safety of building, machinery, inventory, employees etc.
- For the structure improvement to reduce the seismic hazard
- Important building are more strengthened for an example hospitals and schools also some government buildings and offices.

There some techniques for seismic retrofitting:-

1. External post tensioning
2. Base isolators
3. Supplementary dampers
4. Tuned mass dampers
5. Slosh tank
6. Active control system
7. Adhoc addition of structure control
8. Exterior reinforcement of building
9. Exterior concrete column

The problems are faced by the structural engineers:-

- All the method are depends on some parameter like type of structures, material condition amount of damage, need of retrofitting etc. due to this the effectiveness and lack of standard varies a lot with each and every method.

Aim of retrofitting:-

- To modify and upgrade the lateral strength of structure
- Increase the ductility of any structure

Classification of the retrofitting techniques:-

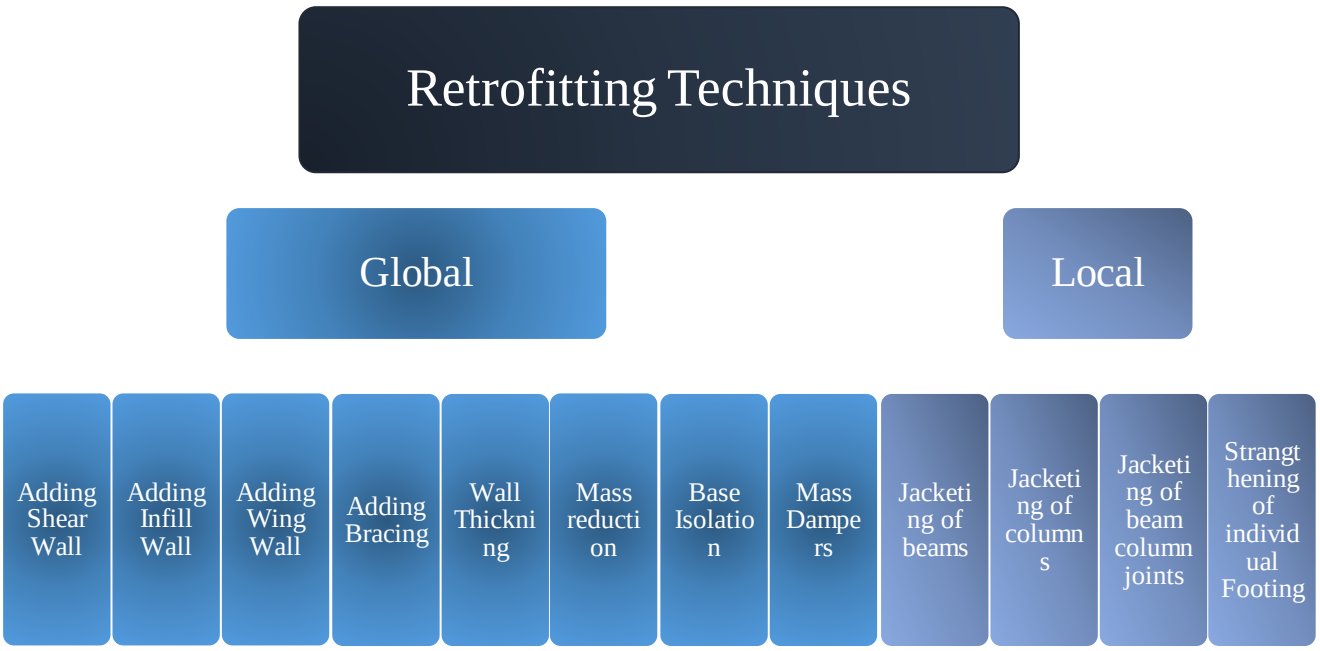


Fig 14.1 Retrofitting Techniques

Bridge retrofitting techniques are following:-

1. Expansion rockers
2. Deck rigidity
3. Hot rivets
4. Viaducts
5. Fill and overpass
6. Lattice girders, beams, and ties

Residential retrofitting methods:-

1. Reinforced and un reinforced masonry
2. Wood frame structure

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

- A many year ago the construction industries are repeatedly criticized for being inefficient and slow to innovate.
- The basic methods are changed at the roman times, but the application of innovation is quite far to make this proper in this field.
- In this field plenty of factors are intersect to do any site work for an example every site has singular prototype, also the construction work are located in different places, and also involves the constant movement of personal and machinery. In addition, the weather and other factor can prevent the application of previous experience effectively.
- Nowadays construction work are became easy due to several techniques and also some machinery.

❖ The adoption of advance construction technology requires on appropriate design, commitment from the whole project team, suitable procurement strategies, good quality control, appropriate training and careful commissioning.

❖ Advance construction technology are commonly described as following:-

1. 3D printing
2. Materials
3. Cladding system
4. Building information modeling
5. Computer aided design
6. Computer aided manufacturing
7. Smart technology
8. GPS controlled equipments
9. Research and development
10. Substructure works
11. Water engineering
12. Robotics

❖ Some advance mix proportion and materials are as following:-

1. Durable concrete
2. High performance concrete
3. Self compacting concrete(SCC)
4. The use of mineral admixtures
5. High volume fly ash concrete(HVFA)
6. Ground granulated blast furnace slag(GGBFS)
7. Fly ash
8. Condensed silica fume (CFA)
9. Ternary blends
10. Reinforcement
11. Ternary blended cements
12. Photo-catalytic cement

13. Corrosion inhibiters for reinforced concrete
14. Coarse aggregates for concrete
15. Recycled aggregates
16. Light weight aggregates
17. Advanced composite reinforcement
18. Application of Nano technology

14.1.4 Engineering Aspects of Soil mechanics - Environmental Impact Assessment

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

Such an assessment allows problems to be foreseen, so that the design and planning of the projects is modified to reduce any negative effects. It is now fashionable to build green buildings which have a positive effect on the environment.There is historical precedent for the now mandatory Environmental Impact Assessments (EIA). Past efforts by governments have resulted in bans on activities that caused noxious odors, garbage dumps were positioned at places far away from habitation, and commercial activities were restricted to town centers.

- **Objectives of Environmental Impact Assessment**
  - The objective of an EIA is to predict the environmental impact project would have on all aspects of the environment. Once this is done, a study has to be made to see if the impacts can be reduced in any way. The project has then to be modified to suit the local environment and all predictions and likely options presented to decision makers for final decisions.
  - You can gain a better understanding of EIA by understanding how any typical project can affect the environment of a particular area. Take for example the building of a new road in a city.
  - The alignment of the road may require that certain lands have to be leveled or new embankments created. Cutting of the land and the new embankments would affect the geography of the area and probably upset its drainage pattern. This would require re-planning existing methods of treating the run-off and could cause existing watercourses to be modified. The new road may require the removal of existing green cover and this could affect the living conditions in that area. The traffic going through that area can cause pollution problems from

vehicles which also includes an increase in sound pollution. The emissions from the vehicles can affect already existing atmospheric pollutants which in turn could affect human health, animal health and affect greenery in the area. The road may affect existing structures in the area which may have to be removed and can cause changes in the economic wellbeing of the persons who are using those structures.

- A positive impact of the new road may mean a reduction in traffic congestion, its positive effect on pollution, and the economic advantage of these two aspects.For any environmental impact assessment, complete data on all these aspects as they are at present has to be made so that any changes can be reasonably judged to existing standards required for good living. The deterioration or increase in these living standards has then to be highlighted by the EIA before any final decision on the project can be undertaken.

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

- A sewerage or sewer system collects wastewater. Sanitary sewers were designed and built to carry wastewater from domestic, industrial and commercial sources. Gravity is used to convey the wastewater wherever possible.
- Thus, it is not surprising that natural storm water drainage is usually used. The principle of using gravity as the driving force for conveying wastewater in a sewerage system should be applied wherever possible, because this will minimize the cost of pumping.
- Sewerage systems can be mainly classified into combined sewerage and separate sewerage. Combined sewerage carries both storm water and wastewater, while separate sewerage carries storm water or wastewater separately. Recent trends have been for the development of separate sewerage systems.
- The main reason for this is that storm water is generally less polluted than wastewater, and that treatment of combined wastewater and storm water is difficult during heavy rainfalls, resulting in untreated overflows.
- In practice, there is usually ingress of storm water into wastewater sewerage pipes, because of unsealed pipe joints, and unintentional or illegal connections of rainwater run-off. Conversely, there may be unintentional or illegal wastewater connections to storm water sewerage.
- In many developing countries, more than 70% of industrial wastes are dumped untreated into waters where they pollute the usable water supply. In many countries, the responsibility for industrial wastewater treatment falls back on ordinary taxpayers.
- In the absence of a user pays system for pollution control, large volumes of contaminated industrial wastewater end up in municipal sewage treatment plant , which are expensive to construct, operate and maintain.

CHAPTER 15. Smart and/or Sustainable features of Chapter 8 & 13 designs, Impact on society.

Table 15.1 Smart and sustainable features

DESIGNS	PERIOD OF IMPLEMENT	ESTIMATION (RS)	Benefits
Public Toilet	Immediately	**512121.45**	Villagers will use public toilet at doorstep.
Bus-stand	Within 6 months	**1238137.84**	People will enjoy public transport.
Post Office	Within 2 years	**400321.3**	People won't need to go outside for sending post.
Step Auditorium cum Garba chowk	Within 3 years	**914368**	People will have chance to be social with peer ones.
Prayer hall cum medition center	Long term(4-5 years)	**426619.66**	Elder people will spend quality time by doing prayer.
Chabutaro	Long term(3-4 years)	**272682.045**	People can feed birds by providing food and water.
Public library	Within 1 year	**963832.2**	Youth will be more intelligent by reading different books at public library.
Gram Panchayat building	Immediately	**1002250.8**	It will enhance the overall image of village.
Bank	Within 2 years	**1158723.4**	People will feel safe by putting their money into bank.
Cyber café	Within 4 years	**663055.4**	Youngsters will learn computer related work.
Aanganwadi	Within 6 months	**539240.9**	Children will be happy by having own aanganwadi.
Entrance Gate	Within 2 years	**95157.78**	It will catch the attention of visitors.

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	Farming, Jobs, Labours
2	What are the chances of employment in village?	Yes	Farming, labours
3	What are the special technical facilities in village?	NO	
4	Is any debt on village dwellers?	Yes	Co-operative
5	Are village people getting agricultural help?	Yes	Government
6	Is women health awareness Program organized in village?	Yes	Inside (Sarpanch)
7	Are women having opportunity to work and income?	Yes	Farming, labours
8	Child girl education is appreciated in village?	Yes	
9	Facility of vaccination to child is available in village?	Yes	Anganwadi
10	Are village people aware about child vaccination and done to each and every child as per norms?	Yes	
11	Women help line number information is provided to village people?	Yes	
12	Is water scarcity in village? How many days per year?	Yes	Sometime (1-2 days)
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.	Yes	Blind, walking Disability
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?	NO	
20	Life Living standard of girls and women is appreciated and uplifted in village?	Yes	

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

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

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Chapter 17.Irrigation / agriculture activities and agro industry, alternate techniques and solution

What is irrigation?

- Irrigation is the process of applying water artificially to the crops to fulfill their requirement.
- Nutrients may also be provided to the crops through irrigation.
- There are various sources to fulfill the process of irrigation which are following:-
  - Wells
  - Ponds
  - Lakes
  - Canals
  - Tube-wells
  - Dams

Types of irrigation:-

1. Surface irrigation
2. Localized irrigation
3. Drip irrigation
4. Sub irrigation
5. Sprinkler irrigation
6. Manual irrigation
7. Centre pivot irrigation

Methods of irrigation:-

1. Traditional method
2. Modern method
   I. Sprinkler system
      - In this system sprinklers water over the crop and helps in an even distribution of water. This method is useful at were scarcity of water faced.

   II. Drip irrigation
      - In this method the water supplies drop by drop at root zone of the crop and wastage of water is very less like negligible.

Agricultural process:-

- Soil preparation
- Sowing
- Manuring
- Irrigation
- Weeding
- Harvesting
- Storage

Some alternative irrigation solutions:-

- We have to choose sprinkler or drip irrigation method to save the water
- We have to choose the crop type which have required less water and also less period of irrigation.
- Choosing better and convenient method for irrigation.
- In some area there is a problem of water logging, in that type of area they should use the ground water for the irrigation purpose so that the level of ground water will decrease and the problem of water logging should be avoided.

- Preparation of land is main component in irrigation and also use proper technique in the sowing of seeds in the farm some of methods are following:-

I. Furrow method
II. Counter farming
III. Zigzag method
IV. Free-Flooding method
V. Basin flooding
VI. Border strip method

Chapter 18. Social activities – any activates planned by students

Fig 18.1 spreading awareness

- We met many people and spread awareness regarding Covid-19. We gave the information regarding how to prevent our selves by taking small precautionary steps such as wear mask, social distancing, sanitizing etc.
- We did door to door visit and talked with local villagers regarding the pandemic situation.
- The villagers were very disappointed due to implementation of lockdown all over India. Therefore, their businesses were completely shut down and they didn't have any other financial lead to overcome their financial losses.
- Therefore, we gave me alternative ways to run business by seating at home and we reduced the stress level of villagers by giving moral support.
- We also arranged some entertainment activities through which children played a lot and they were very happy even their parents felt very happy by watching their children while playing different games.
- We arranged entertainment activities by keeping in mind about corona virus so, we gave proper instruction to keep social distances and wear mask appropriately and all of the villagers including children were following our instructions easily.

Chapter 19.Motidevti village SAGY questionnaire survey form with the sarpanch signature

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: Motidevti Gram Panchayat: Motidevti Ward No. -

Block: - District: Ahmedabad

State: Gujarat L S Constituency: 60 - Sanand

1. Family Identity and Size

Name of Head of Household	THAKOR DHAYAJI GHELAJI							Male/ Female	4/3
SECC Survey ID:	1	Family Size	7	Over 18	7	6 to 18	-	Under 6	-

2. Category & Entitlement Details (Tick as appropriate)

Social Category[1]	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	N
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]
THAKOR HARSHADBHAI D.	45	M	N	2	4	Y	Y	0
THAKOR HANSHRAJ KUMAR H.	23	M	N	2	6	Y	Y	0
THAKOR KANTABEN D.	60	F	N	2	4	Y	Y	0
THAKOR VISHVANATH H.	21	M	N	1	7	Y	Y	0

3. Children from 6 years and up to 18 years

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

4. Children below 6 years

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

[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)

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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	—	✓
Children	—	—

9. House & Homestead Data

Own House: Yes / No	No. of Rooms: 3
Type: Kutcha / Semi Pucca / Pucca	
Toilet: Private / Community / Open Defecation	
Drainage linked to House: Covered / Open / None	
Waste Collection System	Door Step / Common Point / No Collection System
Homestead Land: Yes / No	Kitchen Garden : Yes / No
Compost Pit: Individual/ Group/ None	Biogas Plant: Individual/ Group/ None

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

Source of Water		Distance
Piped Water at Home	Yes / No	1
Community Water Tap	Yes / No	1
Hand Pump (Public / Private)	Yes / No	0.5
Open Well(Public / Private)	Yes / No	0.5
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	1373.958	2. Cultivable Area	763.31
3. Irrigated Area	457.986	4. Uncultivable Area	152.662

13. Principal Occupations in the Household

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

14. Migration Status
Does any member of the household migrate for Work: Yes / No. If Yes Entire Year / Seasonal (5)
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
Wheat	Kg	30
Paddy	Kg	45
Rice	Kg	60

17. Livestock Numbers

Cows: 40	Bullocks: 3	Calves: —
Female Buffalo: 10	Male Buffalo: 25	Buffalo Calves: —
Goats/ Sheep: —	Poultry/ Ducks: —	Pigs: —
Any other: Type _____		No. _____
Shelter for Livestock: Pucca / Kutcha / None		
Average Daily Production of Milk(Litres): _____		

18. What games do Children Play
Cricket, Hide and Sick

19. Do children play musical instrument (mention)
No

Schedule Filled By:
Principal Respondent:
Date of Survey:

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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: Motidevti

b. Block: –

c. District: Ahmedabad

d. State: Gujarat

e. Lok Sabha Constituency: 60 - Sanand

f. Number of Wards in the Gram Panchayat: –

g. Number of Villages in the Gram Panchayat: 1

h. Names of Villages: Motidevti

Demographic Information

Number of Households 594 Total Population 3232 Male 1590 Female 1642

SC HHs – ST HHs – OBC HHs – Other HHs –

I. Access to Infrastructure / Facilities / Services

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
a.	ANM/ Health Sub Centre	N	5 Km
b.	Nearest Primary Health Centre (PHC)	N	Sanand (7 Km)
c.	Nearest Community Health Centre (CHC)	N	Sanand (7 Km)
d.	Nearest Post Office	N	Sanand (7 Km)
e.	Nearest Bank Branch (Any)	N	Sanand (7 Km)
f.	Nearest Bank with CBS Facility	–	–
g.	Nearest ATM	N	Sanand (7 Km)
h.	Nearest Primary School	Y	Inside
i.	Nearest Middle School	N	Sanand (7 Km)
j.	Nearest Secondary School	N	Sanand (7 Km)
k.	Nearest Higher Secondary School / +2 College	N	Sanand (7 Km)
l.	Nearest Graduate College	N	Sanand (7 Km)
m	Nearest ITI / Polytechnic Centre	N	Sanand (7 Km)
n	Kisan Seva Kendra	Y	Inside

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તા.સાણંદ, જી.અમદાવાદ

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	Y	Inside
p	Nearest Agro Service Centre	N	Sanand (7 Km)
p	MSP based Government Procurement Centre	N	Sanand (7 Km)
q	Milk Cooperative /Collection Centre	Y	Inside
r	Veterinary Care Centre	N	Sanand (7 Km)
s	Ayurveda Centre	N	–
t	E – Seva Kendra	N	–
u	Bus Stop	Y	Inside
v	Railway Station	N	Sanand (7 Km)
w	Library	N	Sanand (7 Km)
x	Common Service Centre	N	Sanand (7 Km)

IV. Sports Facilities in the Gram Panchayat

a. Number of Play Grounds in the GP: Total No Public – Private –

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

V. Education, ICDS

a. Number of Angan Wadi Centres: 1

b. Number of villages without Angan Wadi Centres N

Names of such villages: –

c. Schools (Number)

Primary Private: – Primary Govt.: 1

Middle Private: – Middle Govt.: –

Secondary Private: – Secondary Govt.: –

Higher Secondary Private: – Higher Secondary Govt: –

VI. Public Distribution System

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

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

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	768.31	d.	Pasture / Grazing Land	–	g.	Check Dam	–
b.	Irrigated Land	457.980	e.	Forests/ Plantations	–	h.	Wells/Bore Wells	1
c.	Un-irrigated Land	152.662	f.	Other Common Land	152.662	i	Tanks /Ponds	1

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

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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)	60
b)	Number of Households receiving pension (old age, widow, disability)	50
c)	Number of eligible Households who are not receiving pension	10
d)	Number of Households eligible for Ration Card	594
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	80
l)	Number of landless households	–
m)	Number of IAY beneficiaries	30
n)	Number of FRA[2] beneficiaries	10
o)	Number of Community Sanitary Complexes	1
p)	Number of Households headed by single women	3
q)	Number of Households headed by physically handicapped persons	3
r)	Total number of Persons with Disability in the village	15
s)	Number of SHGs	2
t)	Number of active SHGs	1
u)	Number of SHG Federations	–
v)	Number of Youth Clubs	–
w)	Number of Bharat Nirman Volunteers	–

Name and Signature of Surveyor and Respondent'

PATEL MEET J. PATEL ABHIT R. Surveyor	सरपंच मोटीदेवती ग्राम पंचायत ता.साणंद, जि.अमदावाद PRI Respondent (Preferably Gram Panchayat Chairperson)	सलाटी कम मंत्री मोटीदेवती ग्राम पंचायत ता. साणंद Other preferably senior most Government official in the Gram Panchayat)	08/05/2021 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: Motidevti

b. Ward Number: -

c. Gram Panchayat: Motidevti

d. Block: -

e. District: Ahmedabad

f. State: Gujarat

g. Lok Sabha Constituency: 60 - Sanand

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

i. Names of Habitations / Hamlets: —

Demographic Information

Number of Households 594 Total Population 3232 Male 1590 Female 1642

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

II. Access to Infrastructure/Amenities etc.

i.	Access to Infrastructure / Facilities / Services	Located in the Village Yes (Y)/No(N)	If located elsewhere (N), distance in kms from the village
a.	Nearest Primary School	Y	Inside
b.	Nearest Middle School	N	Sanand (7 Km)
c.	Nearest Secondary School	N	Sanand (7 Km)
d.	Kisan Seva Kendra	Y	Inside
e.	Milk Cooperative /Collection Centre	Y	Inside
g.	Health Sub Centre	N	Sanand (7 Km)
h.	Bank	N	Sanand (7 Km)
i.	ATM	N	Sanand (7 Km)
j.	Bus Stop	Y	Inside
k.	Railway Station	N	Sanand (7 Km)

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

1

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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	N	Sanand (7 Km)
m	Common Service Centre	N	Sanand (7 Km)
n	Veterinary Care Centre	N	Sanand (7 Km)

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: ALL - 1

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: -

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

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

iv. Coverage of Habitations under Waste Management System

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

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

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

If 3 mention the name of the habitations not covered: Some area have open drains

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

If 3 mention the name of the habitations not covered: 1

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

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

If 3 mention the name of the habitations not covered: 1

vi. Sports Facilities in the Village

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

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

vii. Education, ICDS

a. Number of Anganwadi Centres: 1

c. Schools (Number)

Primary Private: - Primary Govt.: 1

Middle Private: - Middle Govt.: -

Secondary Private: - Secondary Govt.: -

Higher Secondary Private: - Higher Secondary Govt: -

2

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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	763.31	d.	Pasture / Grazing Land	–	g.	Check Dam	–
b.	Irrigated Land	457.986	e.	Forests/ Plnatations	–	h.	Wells/Bore Wells	1
c.	Un-irrigated Land	152.662	f.	Other Common Land	152.662	I	Tanks /Ponds	1

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	80
5	Number of landless households	–
6	Number of IAY beneficiaries	30
7	Number of FRA beneficiaries	10
8	Number of common sanitation complexes	1
9	Number of SHGs	2
10	Number of active SHGs	1
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'

PATEL MEET J. PATEL ABHIT R. Surveyor	સરપંચ મોટીદેવતી ગ્રામ પંચાયત તા.સાણંદ, જી.અમદાવાદ PRI Respondent (Preferably a ward member from a ward that is fully or partially covered under the Village)	તલાટી કમ મંત્રી મોટીદેવતી ગ્રામ પંચાયત તા. સાણંદ Official Functionary (Preferably seniormost Government official in the Gram Panchayat)	08/05/2021 Date of Survey

Chapter 20 :TDO-DDO-Collector email sending Soft copy attachment

Gmail

Meet Patel <160320106067.cl.meet.patel@gmail.com>

Development scenario of Motidevti village, Ahmedabad

Meet Patel <160320106067.cl.meet.patel@gmail.com> 21 June 2021 at 14:51
To: tdo-ahd@gujarat.gov.in, ddo-ahd@gujarat.gov.in
Cc: rurban@gtu.edu.in, parth.sinroza@ljinstitutes.edu.in

Respected Sir/Madam

We are the students of L.J. Institute of Engineering & Technology,Ahmedabad affiliated to Gujarat Technological University-GTU. GTU has been assigned to VishwakarmaYojanaa-VY in which students survey various village and ***Designs various amenities To Deliver*** it **to** them making them ideal for living better life as per requirements & village problemstatements.

As a part of Vishwakarma Yojana's guidelines, we have been asked to inform all the respectedofficers about the our project in which we will shortly notify about **Motidevti** Village profile of issues for development and our design work for them which is as below.

Village : Motidevti		Population: **3232**(As of Census 2011) Population: **3350**(At Present)
Key Issue	**Remark**	**Design Given**
Toilet	Almost 90% have household toilet , under SBA toilet was needed.	· Public Toilet
CommunityPlace	Grampanchayat faces difficulties in conducting gramsabha, village does not have any place for gatherings or for celebration.	· Prayer hall cum medition center
Bus stand	Lack of bus stand facility so local people have to catch bus from bus station by walking 7 km to sanand.	· Bus stand
Water Scarcity	Water stored in privet sump and water tank but the condition of water is very dirty. The water present in the canal is totally blackish colour and harmful to drink and also for other uses.	· Road Network with side drains tosave storm water · Rain Water Harvesting system · Lake Modification
Internal Road Network	Overall road network system is poor even during rainy season, all roads are full of mud and it becomes quite tough to walk on road.	· Paver block · Road network with cc road
Post office	There is lack of post office facility so they need to send post by reaching to Sanand.	· Post office
Recreational Area	People donot have any garden or recreation center for spending their quality time with their near and dear ones.	· Step Auditorium cum Garba chowk
Identification	Village comes within the premises of other village but it was seen that village direction	· Entrance Gate

	holdings were not proper which can cause difficulty in finding	
Gram panchayat building	The condition of Gram panchayat building is extremely poor therefore it needs to be re constructed.	Gram panchayat building

DESIGNS	PERIOD OF IMPLEMENT	ESTIMATION (RS)
Public Toilet	Immediately	**512121.45**
Bus-stand	Within 6 months	**1238137.84**
Post Office	Within 2 years	**400321.3**
Step Auditorium cum Garba chowk	Within 3 years	**914368**
Prayer hall cum medition center	Long term(4-5 years)	**426619.66**
Chabutaro	Long term(3-4 years)	**272682.045**
Public library	Within 1 year	**963832.2**
Gram Panchayat building	Immediately	**1002250.8**
Bank	Within 2 years	**1158723.4**
Cyber café	Within 4 years	**663055.4**
Aanganwadi	Within 6 months	**539240.9**
Entrance Gate	Within 2 years	**95157.78**

- **Please find here with attached,**

1. Detailed Project Report Of Motidevti Village

Best Regards,

Meet Patel & Abhit Patel
U.G.,Civil Engineering
L.J.Institute of Engineering & Technology, Ahmedabad
Gujarat Technological University
Mail:meetjbpatel@gmail.com
Mail: abhitpatel9451@gmail.com

Moti Devti_LJIET-Ahmedabad_DPR_VY(Phase-8).pdf
11642K

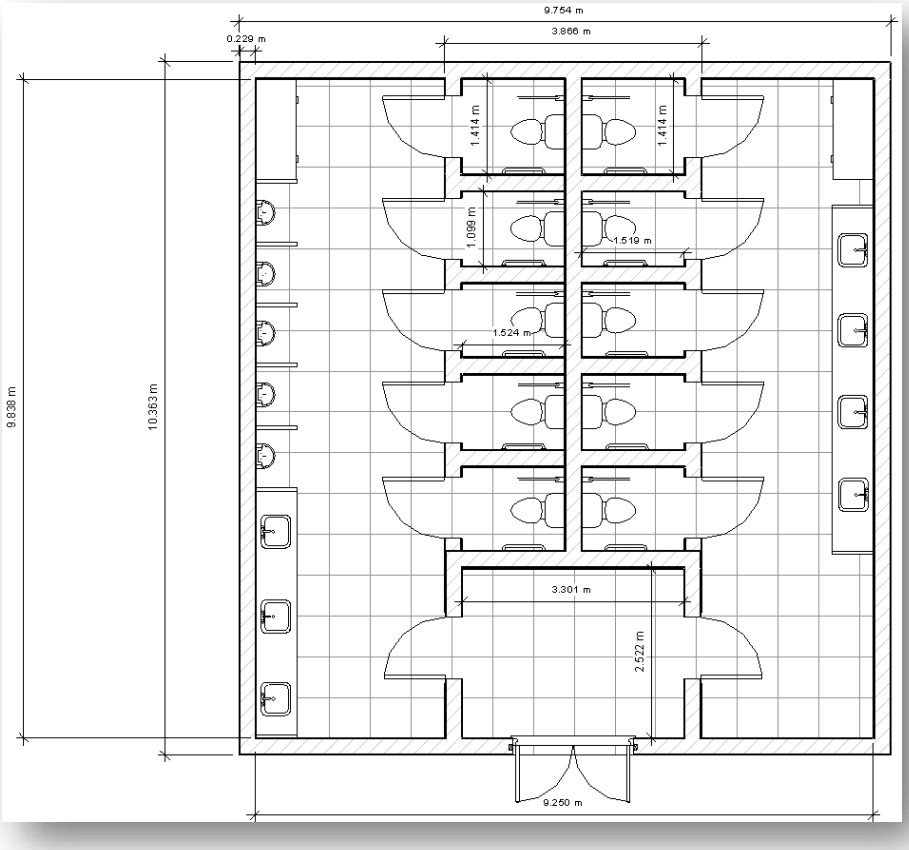
Chapter 21 : Comprehensive reports for the entire village

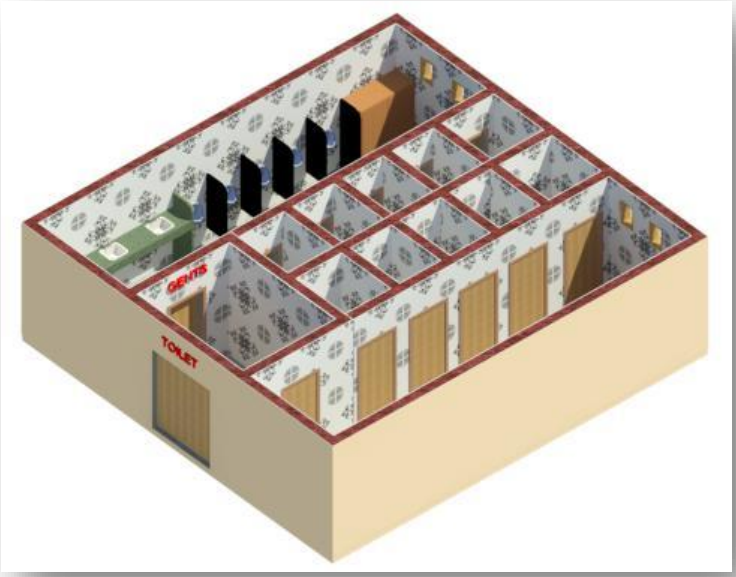
Concept :-

- India is the developing country. There are many maga cities in India which gives us proud moment and fill like European country. Now in Gujarat in the year of 2013/14 our government announce that to make village smart so that the government proposed the final year project in engineering as visshwakarma yojna.
- In this project the civil and electrical engineers students are participated and survey the whole village and collect the several basic data and information of village also interact the native people and village sarpanch and talati for collecting data abot the village and after that we have to proposed the design which fulfil the necessary of the village people and useful for them.
- We proposed the following design:-

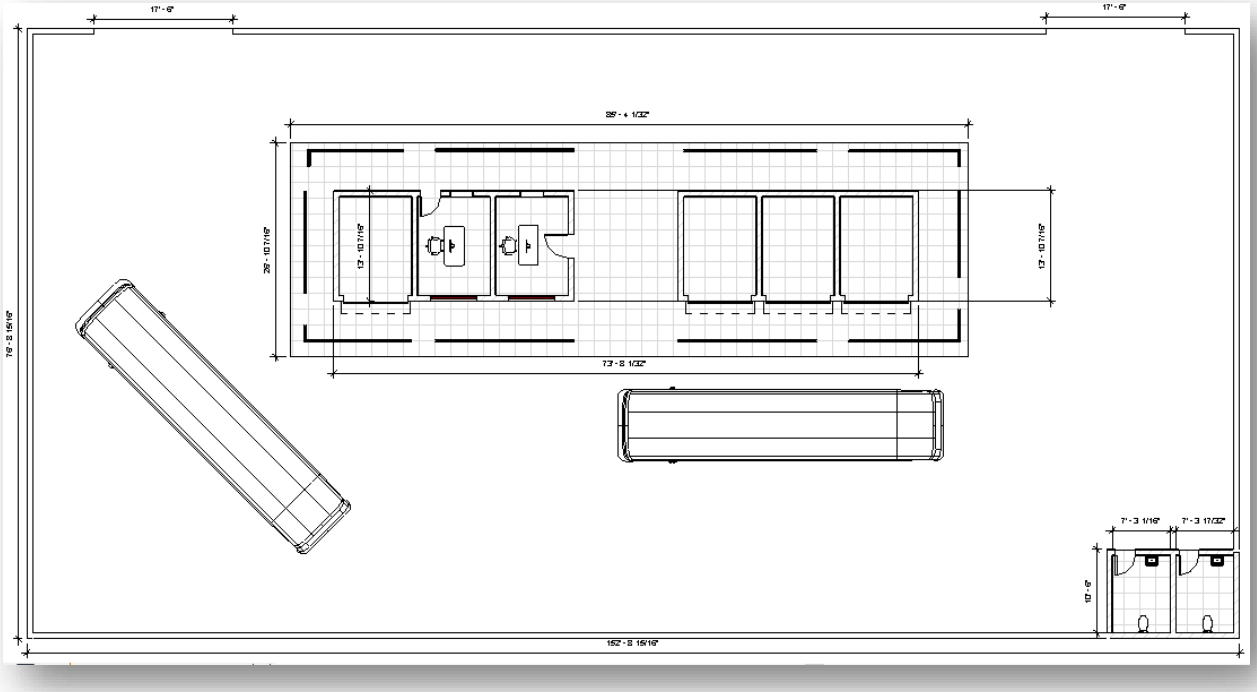
1. Public Toilet
2. Bus Stand
3. Post Office
4. Garba Chowk
5. Meditation Hall
6. Chabutaro
7. Anganwadi
8. Bank
9. Cyber Cafe
10. Public Library
11. Village Gate
12. Gram Panchayat

- Some of them photographs are following

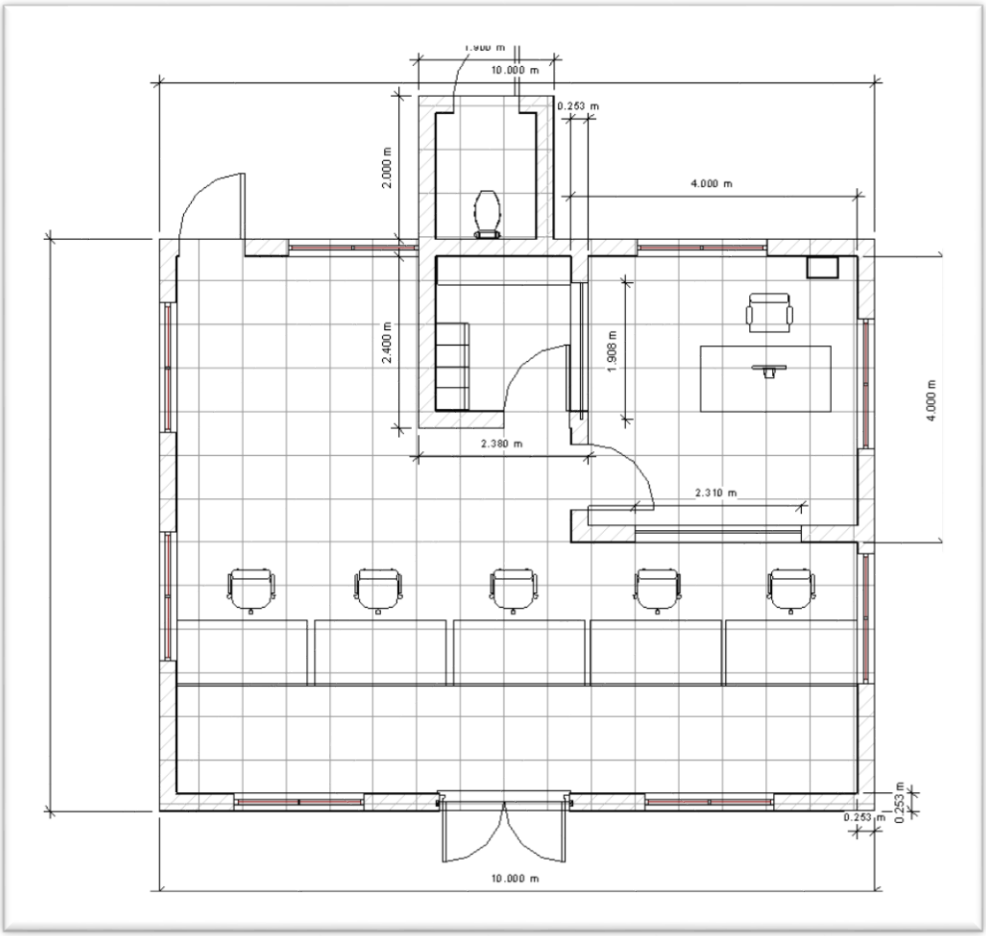




PUBLIC TOILET



BUS STAND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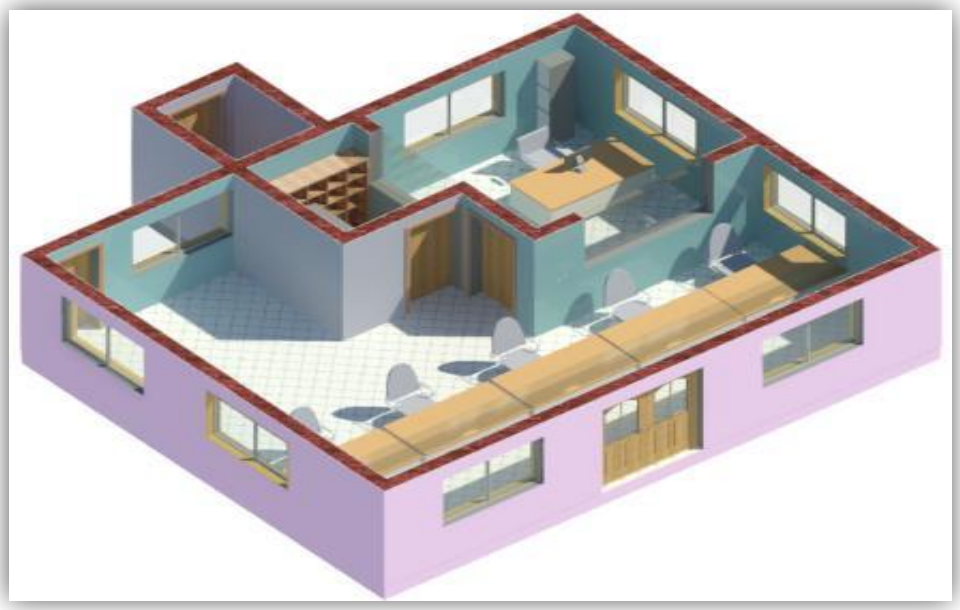
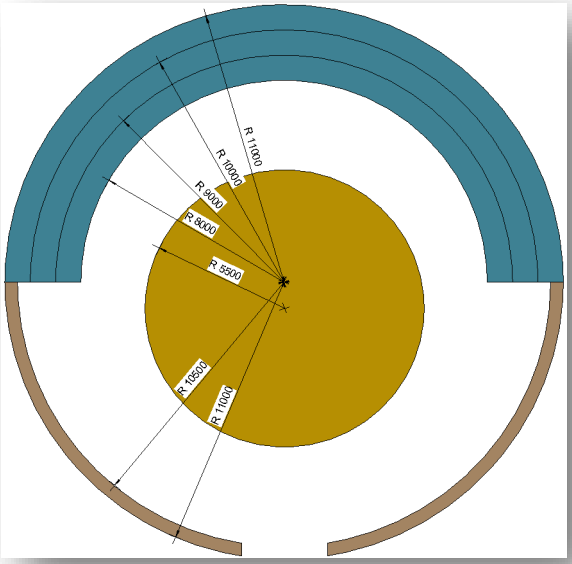
4.000 m
2.400 m
1.908 m
4.000 m
2.380 m
2.310 m
0.253 m
0.253 m
10.000 m



POST OFFICE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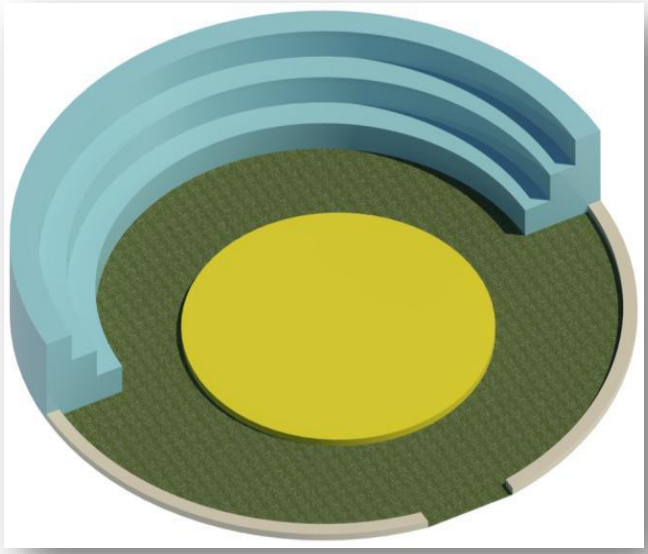
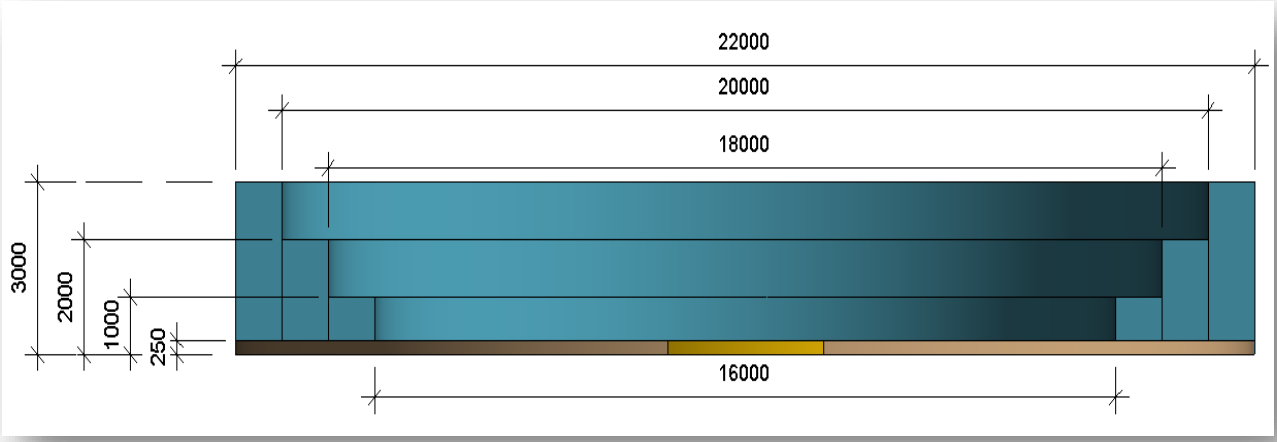
R 10000
R 9000
R 8000
R 5500
R 10500
R 11000

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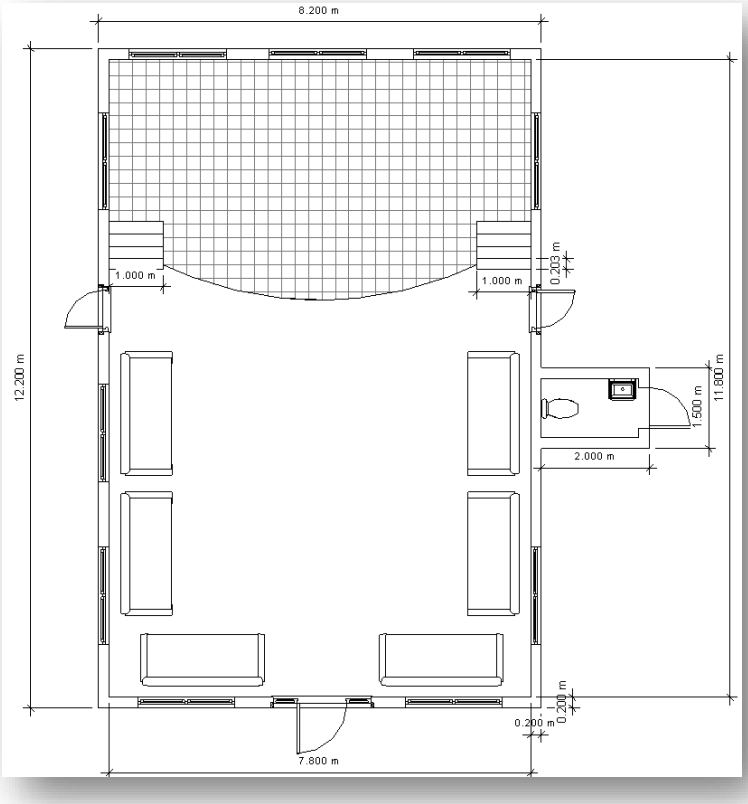
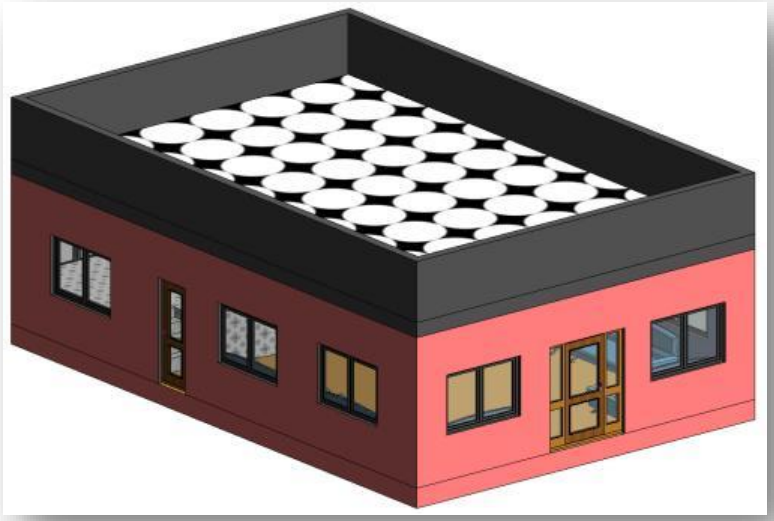
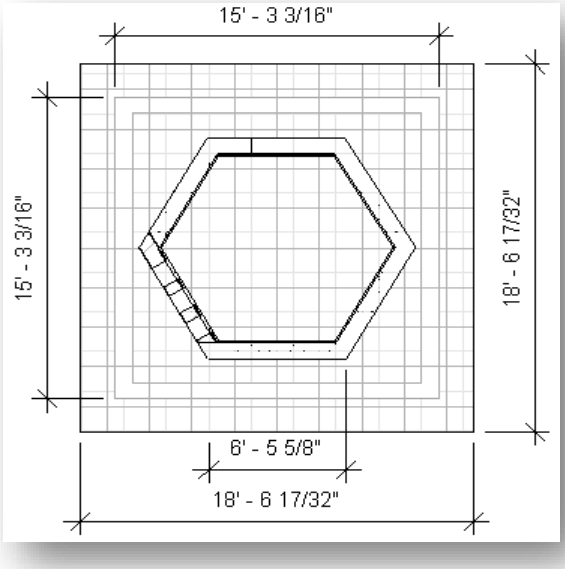
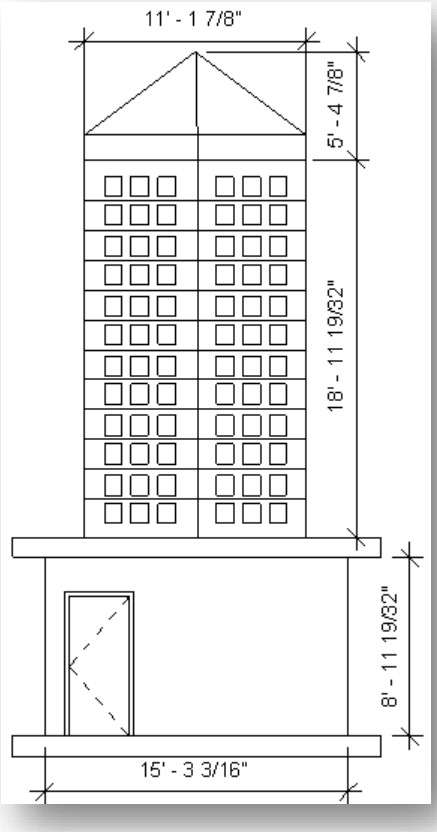
GARBA CHOWK

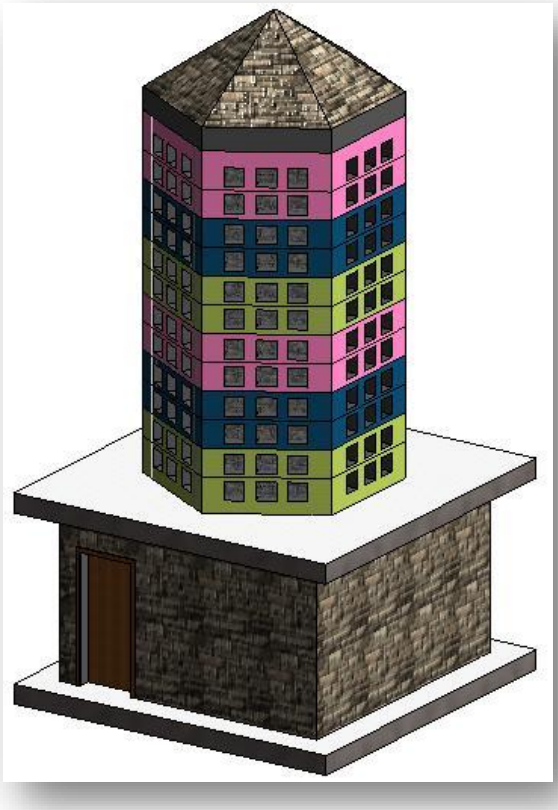




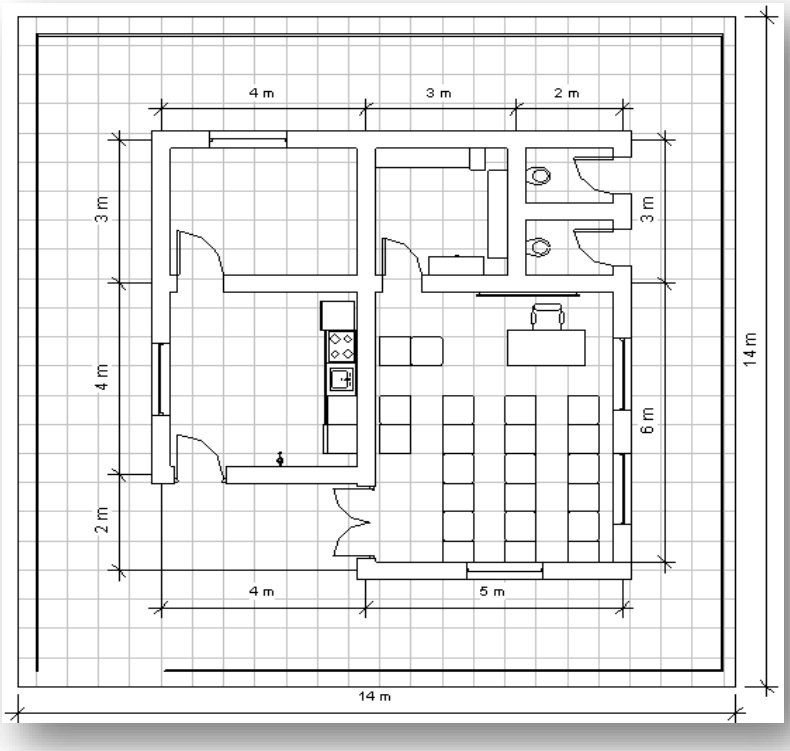
MEDITATION HALL


15' - 3 3/16"
15' - 3 3/16"
18' - 6 17/32"
6' - 5 5/8"
18' - 6 17/32"

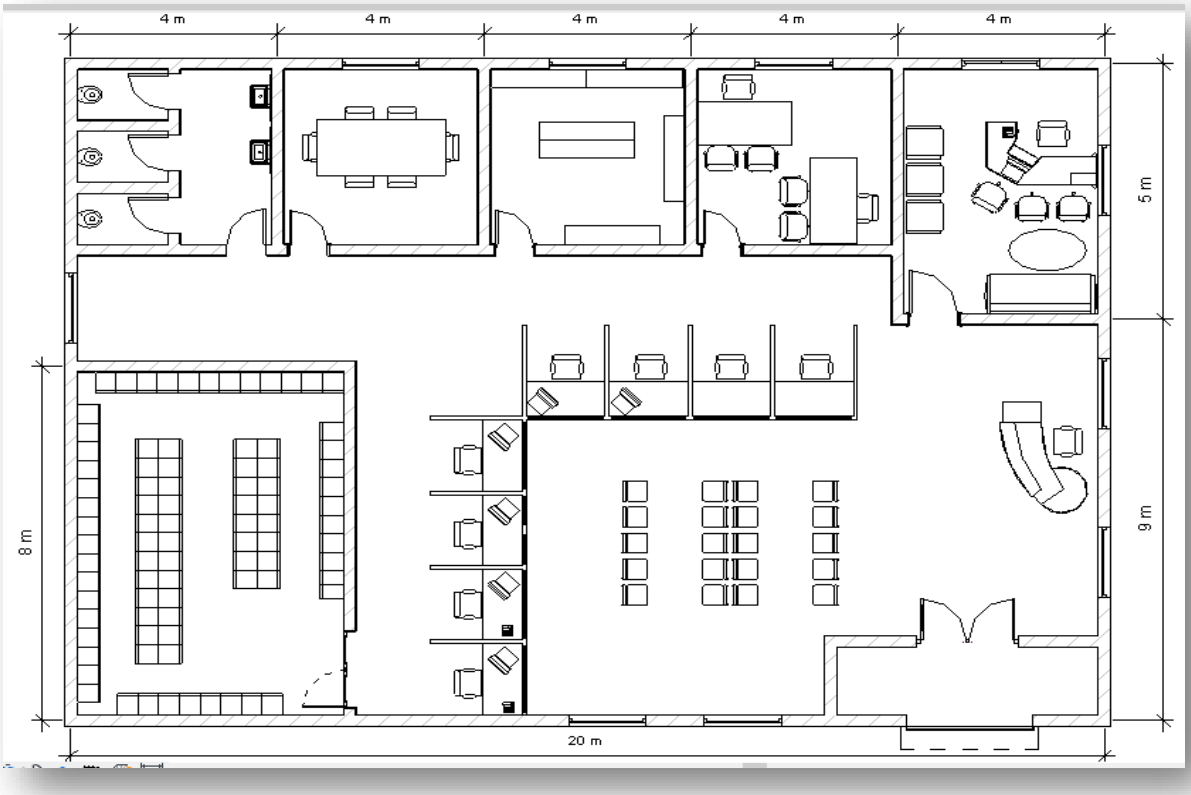

11' - 1 7/8"
5' - 4 7/8"
18' - 11 19/32"
8' - 11 19/32"
15' - 3 3/16"



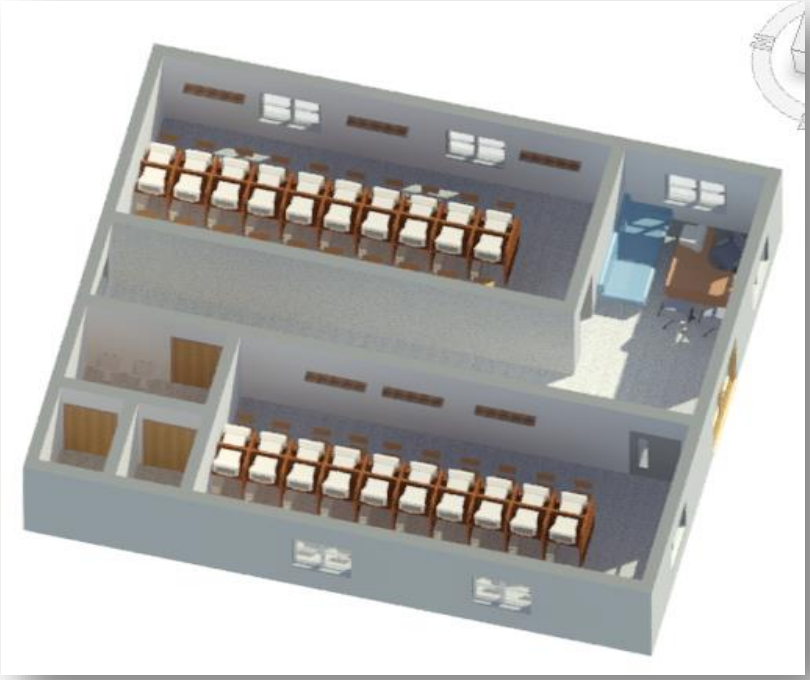
CHABUTARO

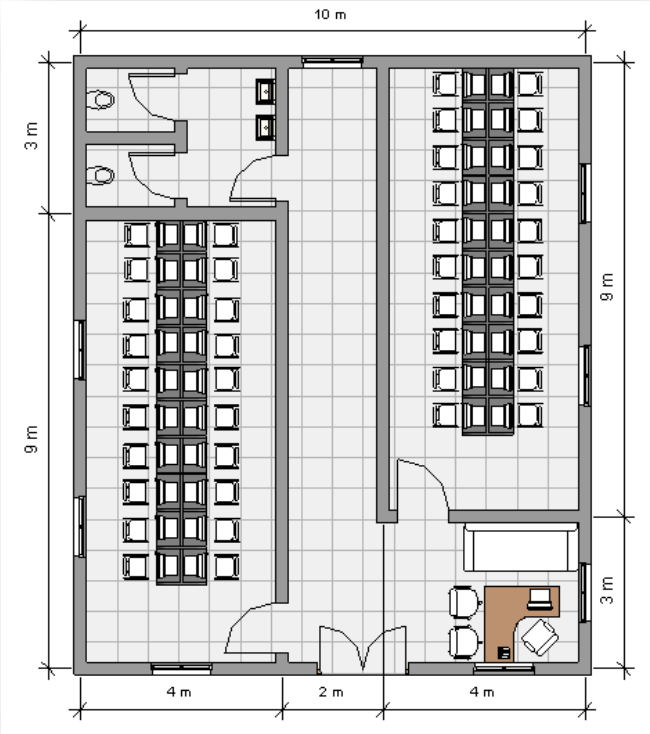


ANGANWADI

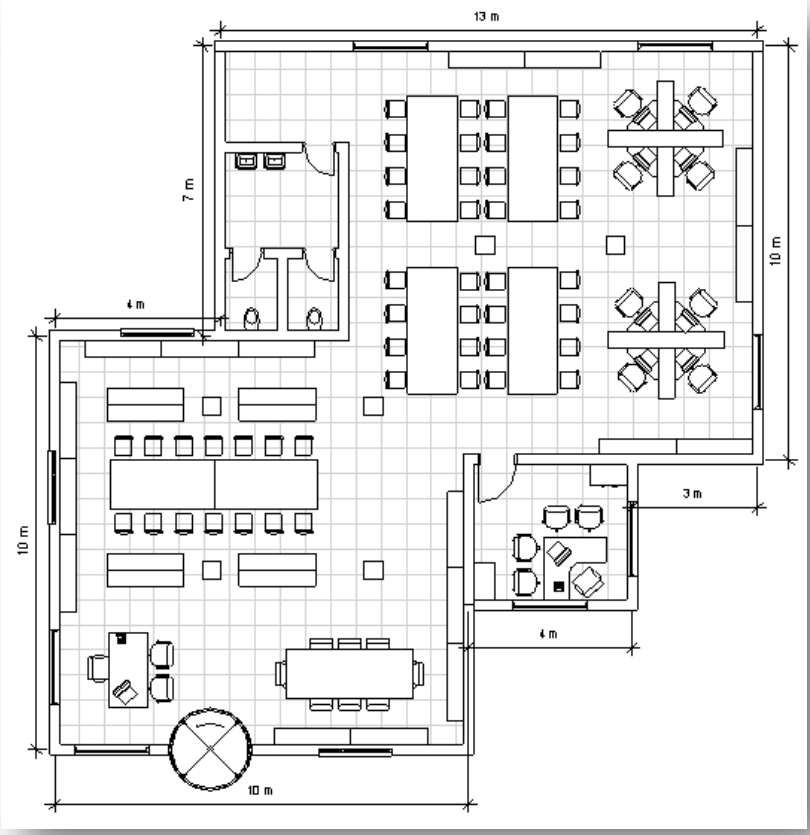


BANK

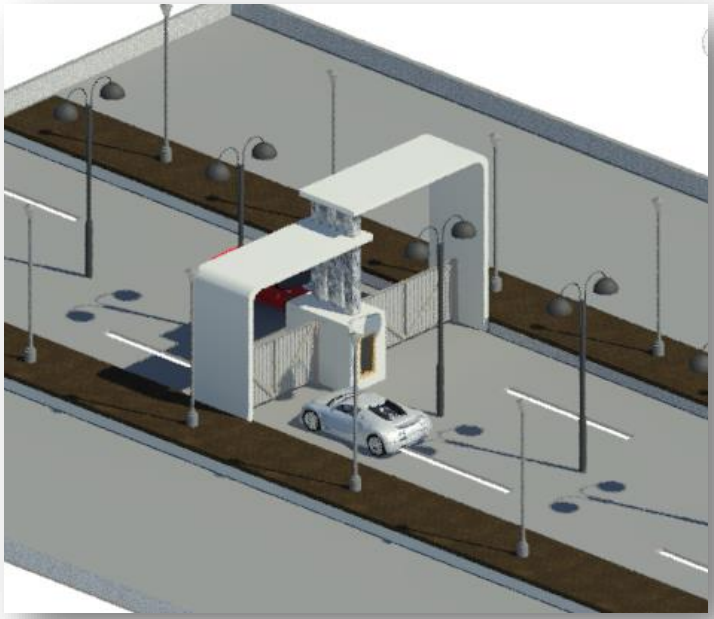




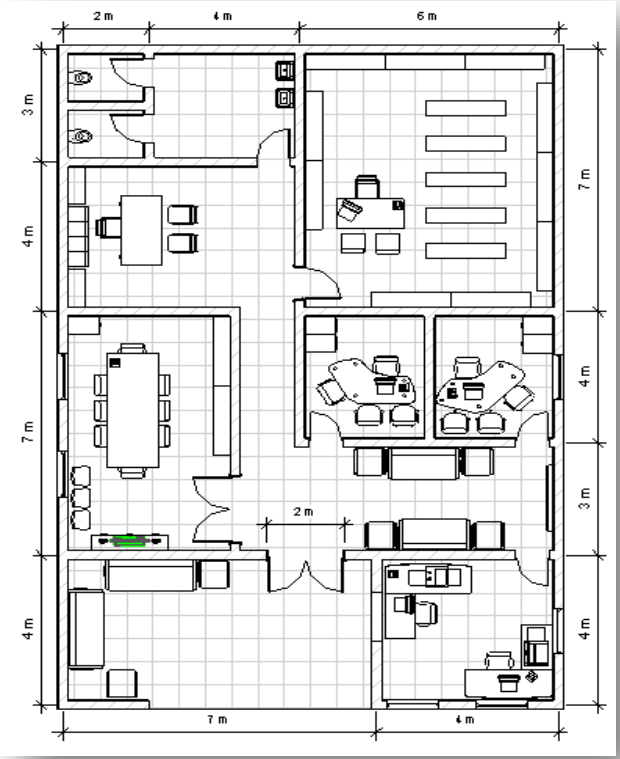
CYBER CAFE

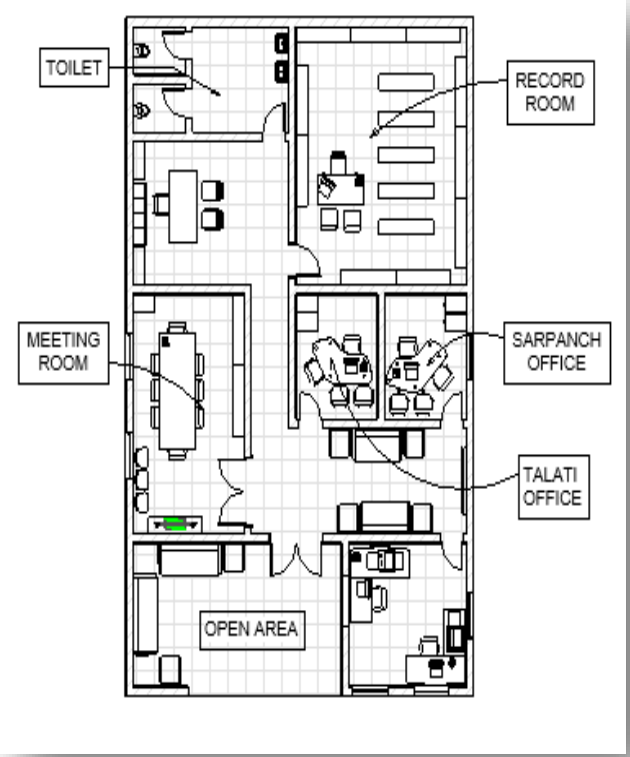


LIBRARY



VILLAGE GATE





GRAM PANCHAYAT