DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION

Bhilvan Village

Patan District

PREPARED BY

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
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COLLEGE NAME:

GOVERNMENT ENGINEERING COLLAGE KATPUR,PATAN

NODAL OFFICERS NAME:

Dr.M.I.Balya

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 Engineering successfully submitted

Detail Project Report for,
VILLAGE: BHILVAN
DISTRICT: PATAN

Under

Vishwakarma Yojana: Phase-VIII

In partial fulfillment of the project offered by

GUJARAT TECHNOLOGICAL UNIVERSITY, CHANDKHEDA

During the academic year 2020-21.

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

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ABSTRACT

The Government of Gujarat has launched Vishwakarma Yojana for development of villages by identifying the requirements of villages. Under this scheme, the villages are surveyed and this project was identified and selected for implementation. Rurbanization is to bring peace of mind to the villagers by providing them the basic amenities required and still keeping the village's oulintact. We will give planning proposal of Physical Infrastructure, Social Infrastructure & Socio-Cultural Infrastructure facilities with method of giving Redesigning, Reimaging, Repair & maintenance, and Sustainable planning for basic need of village like government buildings, schools, health facilities, water supply and sanitation, waste disposal management system, electricity, road networks, irrigation facilities, community hall, Bio gas plant, drainage System , rainwater harvesting system, Solar energy utilization and other non-conversation energy sources utilization etc. So this help to provide better solution for the available problems in rural area like drinking water, Drainage facility, road network, etc.

In vishwakarma yojana: phase-VIII we selected Bhilvan village for our project. Bhilvan is a village situated in Patan Block of Patan district in Gujarat. Situated in rural region of Patan district of Gujarat, it is one of the 139 villages of Patan Block of Patan district. As per the government records, the village code of Bhilvan is 508815. The village has 828 houses. According to Census 2011, Bhilvan's population is 4701. Out of this, 2395 are males while the females count 2306 here. The number of employed person of Bhilvan village is 1503 however 3198 are un-employed. And out of 1503 working individual 567 peoples are entirely dependent on agriculture.

We visited Bhilvan village and met with sarpanch shri Ashif Usman Badalpura. Here we inquired about the facilities available in the village like road, water supply, electricity etc. They were very helpful and they give us detailed information. We also inquired about the need of the village and they discuss about the future development need of the village and also give us information regarding various projects going under the various scheme of the government of Gujarat.

Key Words: **List out existing facilities, Gap analysis, Data collection, Making Rurbnization by redesigning. Ideal Village Surveys, Techno-Economic Survey of Village, Reimagination, Repair & Maintaining, Sustainable Planning, Give Economical Design planning proposal.**

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

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

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

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ABBREVIATIONS

SHORT NAME / SYMBOL	FULL NAME
Gov.	Government
PHC	Public Health Center
DDO	District Development Officer
TDO	Taluka Development Officer
CNG	Compressed Natural Gas
PMEGM	Prime Minister's Employment Generation programme
PMAY	Pradhan Mantri Awas Yojana
PMMY	Pradhan Mantri Mudra Yojana
MANREGA	Mahatma Gandhi National Rural Employment Guarantee Act

1. Ideal village visit from District of Gujarat State

For better understating the needs of village and to learn the work already done in some of the ideal villages, site visits are planned for the students by the institute in which a representative of the village explain the way of working, difficulties and solution to develop infrastructure facilities in their village with the scopes and future plans.

For on experience of Adarsh Gram and amenities available at the this village, 2 students working in Vishwakarma yojana from Gec-patan visited award-winning village Punsari, dist. Sabarkantha. The village has received several awards from government of Gujarat and India like best Gram Panchayat award and Nirmal Gram Puraskar. Village showcases development of rural area with vision and mission of gram panchayat.

On 5th Aug 2020, We Visited Village Name “Punsari. Punsari Village Located At Sabarkantha District In Gujarat. The Sarpanch Of Punsari Village Name Is Himansu Patel. The Village Follows The Panchayat Raj System. Many Advanced Technology Used For Various Purpose In This Village.

Many Facilities Developed In This Village And That Makes This Village As “Ideal Village”. Various Facilities Like Hospitals, Schools, Post Office, Banks, Panchayat Office , Water Tank, Bank, Atm, Etc.

Fig 1 village punsari

1.1 Background & Study Area Location

Punsari Village is Located at sabarkantha District In State Gujarat.It Is Located From 80 Km From Capital Of Gujarat.

The population of punsari village is 5500 as per 2011 census of Gov. of India. Punsari is a village located in Sabarkantha district in the state of Gujarat, India. Punsari is considered as India's smartest village. The village is located at about 80km from the state capital, Gandhinagar. Punsari is 20km from Parvati Hills. Parvati Hills is the largest table top land of India. The village follows the Panchayati raj system. The village extent is about 65 km.

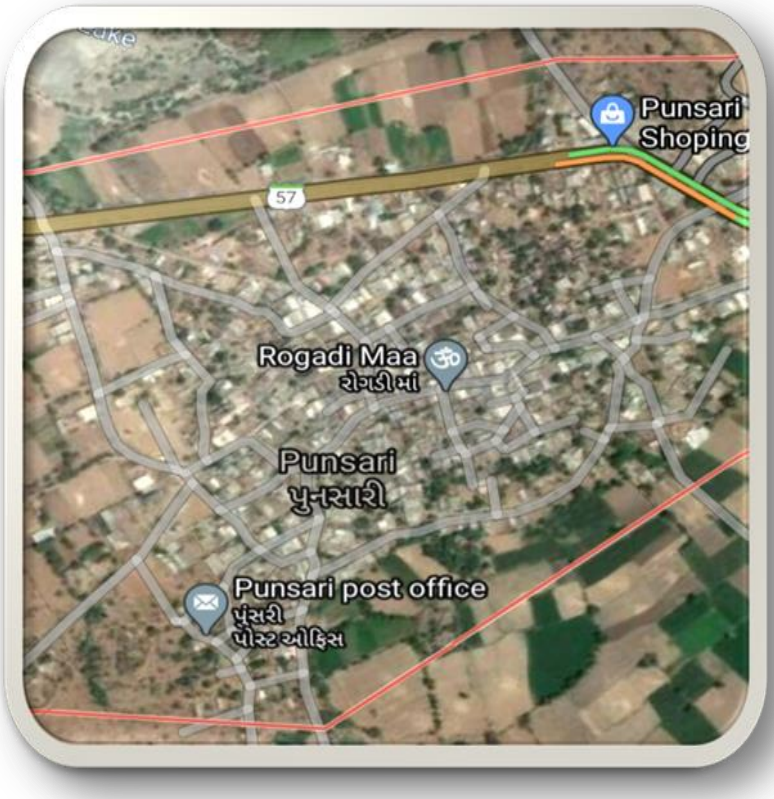


Fig 1.1.1 Punsari Village Map

The land in use of agriculture is 6 hectares. The main non farming activity is dairy in this village. The village has undergone a transformation under the panchayat. There has been use of new and advanced technology in education. This village has wi-fi connection for all people. Efforts have been made for the empowerment of women and increasing security in the village.

Fig 1.1.2 Punsari Gujarat

1.2 Concept: Ideal Village, Normal Village

❖ **Ideal village**

The People of an ideal village should be honest and hard-working. They should possess qualities like tolerance to every faith and religion, brotherhood and unity. They should live like a large family and help one another in the hour of need. They should have a sense of discipline and a spirit of service before self.

Smart Villages is a relatively new concept within the realm of EU policy making. The emerging concept of Smart Villages refers to rural areas and communities which build on their existing strengths and assets as well as on developing new opportunities.

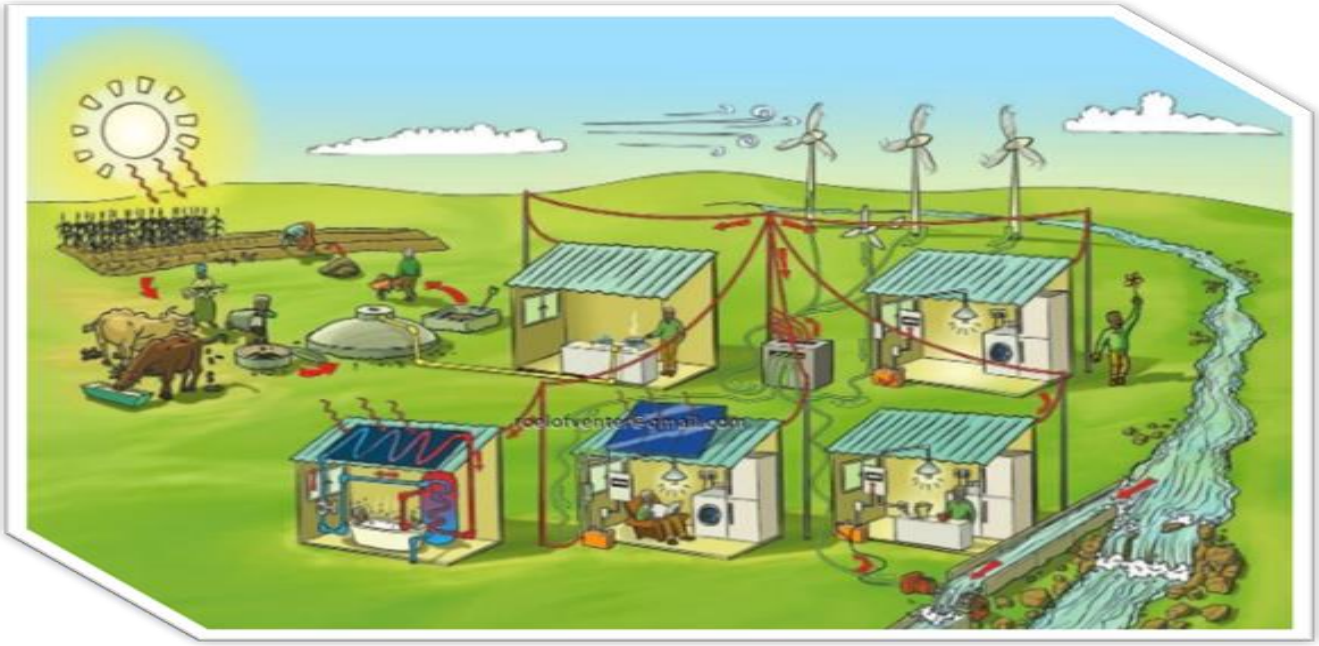


Fig 1.2.1 ideal Village

❖ **Normal village**

Around 70% of the State's population is living in rural areas. People in rural areas should have the same quality of life as is enjoyed by people living in sub urban and urban areas. On account of poverty, unemployment, poor and inadequate infrastructural facility has caused migration of the rural people to urban. Hence, created slum in this region consequently social and economic tension has resulted urban areas. Hence, rural Development which is concerned with economic growth and social justice, improvement in the living standard of the rural people by providing adequate and quality social services and minimum basic needs becomes essential.

The present strategy of rural development mainly focuses on provision of basic amenities and infrastructure facilities through innovative program of wage and self-employment. For economic improvement of local people the above goals will be achieved by various program being implemented creating partnership with communities, non-governmental organizations, community based organizations, institutions.

The Government's policy and program have laid emphasis on poverty, generation of employment and income opportunities and provision of infrastructure and basic facilities to meet the needs of rural poor.

Fig 1.2.2 Normal village

1.2.1 Objectives

• The main aim of the project is to provide urban amenities in rural areas and maintaining the rural soul.

• To provide basic infrastructure facilities like transportation facilities, primary health care facilities, government sectors like ATM facilities, post offices etc.

• To facilitate enough power supply system for whole village.

• To retrofit and renovate the primary school facilities with smart technology.

• To provide biogas plant facility due to lots of milk production in the village and to utilize the bio product as fertilizers and electricity generation.

• This project will help in developing villages in sustainable.

• In future we design about solar resources for energy purpose, rain water harvesting system, village hall, repair and maintance existing public building, public toilet, post office, solar street light etc…

1.2.2 Live Case studies of ideal village of Gujarat

The village is located about 82 kilometers north-east of Ahmedabad, the largest city of Gujarat, a state in the western region of India. Punsari falls within Sabarkantha district. The nearest railway station is 10 kilometers away. Name of the village is pronounced as "Punsari" by its people. According to last (2011) census of India, it has increased to 5500. About 98% of the population is engaged agriculture or dairy activities. Gujarati is the Local Language here. Punsari Gram Panchayat was established in 1955. However, it is mainly in last five years that the Panchayat work received significant attention and acclaim. Punsari's Panchayat has planned and implemented multiple projects for the complete transformation of the village. Effective functioning of these projects collectively has made Punsari a success story and a role model for others to follow.

The village administration has been bestowed with several awards in recognition of its exemplary achievements But Punsari was not always a model village. Like many villages in India, it did not have proper roads. Shortage of safe drinking water was an acute problem. Electricity was available only occasionally. Street lights were non-existent. The sewage disposal system was ineffective. Sanitation was poor. To make matters worse, the gram panchayat did not have sufficient funds to bring in significant changes. The transformation from just another-underdeveloped-village to the role model village of the country was gradual. A serious exploration of this exceptional achievement brings out the positive role of rural leadership in this transformation.

Punsari is a model village today. On 20th October, 2006, Mr. Himanshu Patel was elected as village Sarpanch of Gram Panchayat with a margin of 300 votes. Since his election, Mr. Patel worked relentlessly on effective utilization of a host of welfare schemes sanctioned by state and central government, coupled with judicious management of available resources. Sustained efforts by the Sarpanch started showing results in the village. In 2011, Mr. Patel was re-elected with a higher margin of 1100 votes. In his second term, he continued his efforts to fulfill his vision of "Rurban" village. He described his vision as: "a village with a rural soul and amenities of a city".

Fell of smart village

Different points of the village are now connected through clean and well-maintained concrete roads. Streetlights are operational through solar power. Scarcity of electricity has become a thing of the past as Punsari has 24-hours power supply through a 66 KV power sub-station located in the village itself. This was developed through funds from Jyotigram Yojana. The village now has a proper sanitation and underground drainage system. Every house in the village has its own lavatory, which is remarkable compared to most other villages of India. The village community is prosperous and aspirational. Cars, motorcycles, LED TVs, Split A/Cs, refrigerators, smart phones are a common sight in the village. "Atal Express", a bus service for villagers was funded through central government scheme Swarnimjayanti Gram Swarojgar Yojana. This service has been especially useful for women carrying milk to the collection center at Sabarkantha. The bus service has become one of the most used modes of transport within the village. Students are entitled to free transport as part of this facility. Sarpanch Himanshu Patel proudly describes the development at the village. Recalling one of his interactions with a state minister, he said: "The minister felt that I was boasting and exaggerating about the amenities in the village to him. He decided to pay a visit to the village to see the reality. No preparations were required to prove my point. I just called on the system installed in the panchayat office and informed the villagers about our arrival in 15 minutes. Around 500 villagers had gathered to welcome us."

1.2.3 The Idea of a Smart Village

- The idea of smart village comes through " PRADHAN MANTRI AADARSH GRAM YOJANA". It was lounched by centeral government by 2009.
- The scheme was implemented in pilot mode in 1000 villages of assam, bihar, himachal pradesh, rajasthan ,tamil nadu .
- In this scheme all 100 villages allocation rs 10 lakha per village.
- Himachal pradesh launched a mukyamantri adarsh gram yojana similar lines in 2011,with alloction rs 10 lakh per village.
- Smart village refers to a concept developed in rural area that provides solutions to problems occurred and improves the qulity of life.
- Smart village concept emerged due to some diferent charateristics between rural and urban areas.

FIg 1.2.3.1 smart village concept

1.2.4 Ancient History Civil concept about Indian Village perspctive about village and its new develpoment

Mahatma Gandhi is often quoted as having said: “Real India lives in its villages.” The fact that in the early decades of the 20th century, India’s urban segment constituted only 11 per cent of the total population gave strength to his argument. It was the villages in which 89 per cent of the population lived. That made India an agricultural country.

The development of Village India, for Gandhi, was the development of India. Illiteracy, ignorance, and poverty characterized the vast population of rural India. Gandhi organized mass movements to draw attention to the problems of the rural people, and also to involve the peasants in the freedom struggle. Social scientists also became interested in studying rural problems, particularly the deteriorating rural economy.

The growing rural discontent also worried the British Government. It felt the need to investigate the actually existing conditions. S.J. Patel, in his book Agricultural Laborers in Modern India and Pakistan, talks about the growth of village studies: With the end of the First World War, the beginnings of an agrarian crisis was accompanied by the entry of peasants into the political arena, as exemplified during the Champaran and Kaira campaigns led by Gandhiji. As a result, the cultivator of the soil began to attract consid-erable attention from students of Indian society. G. Keatings and Harold Mann in Bombay, Gilbert Slater in Madras, and E.V. Lucas in the Punjab initiated intensive studies of particular villages and general agricultural problems.

The results of these investigations evoked great interest and stressed the necessity for still further study. Economists and social anthropologists later joined the movement of village studies. In the 1950s, several studies of individual villages were undertaken. In 1955, four major publica-tions came out, three of which were anthologies of articles written by social anthropologists/sociologists on the villages studied by them, and the fourth one was a full-length monograph – the very first and by an Indian social scientist.

The Mahabharata talks of different types of settlements, for example, ghosh or brij (cattle farm), palli (small hutments), gram, kharvata or pattan, and, puri, nagar. The villages were linked with one another, culturally, socially and administratively.

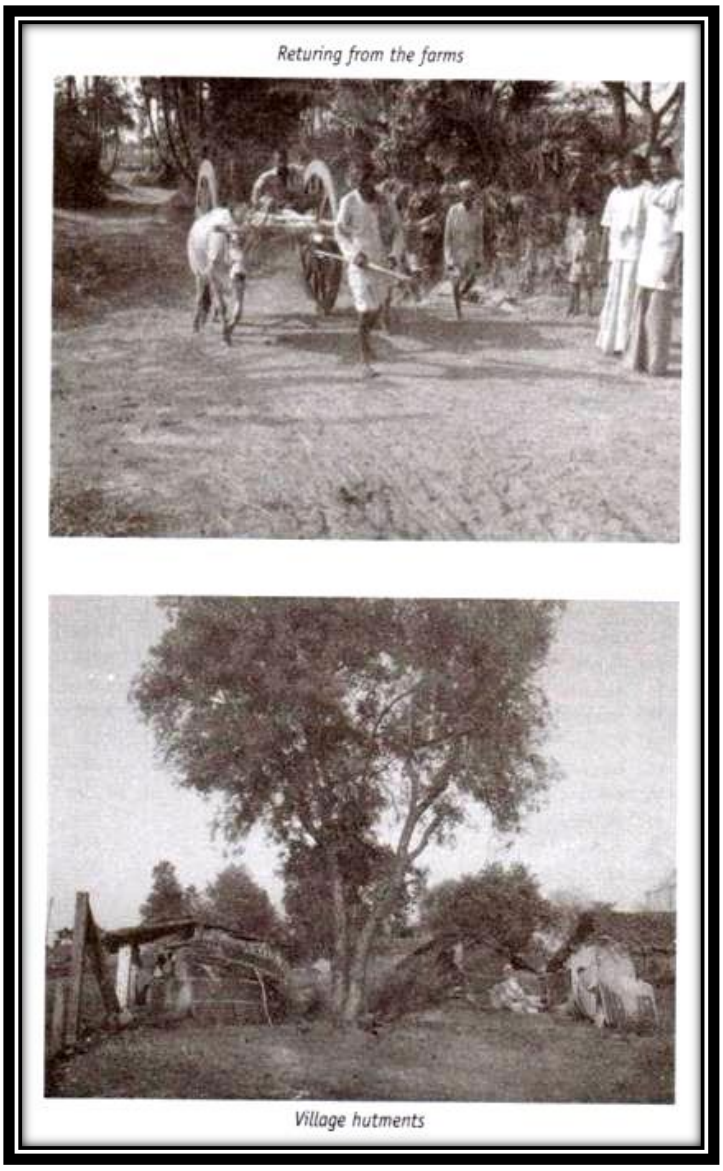


Fig 1.2.4.1 acient india village 1

Villages in Ancient India:

There is sufficient evidence to suggest that the village was one of the important settlements in ancient India. The Rig Veda talks about the gram to which various families owed their allegiance. Valmiki's Ramayana talks of two types of villages – the ghosh and the gram. The ghosh was smaller than the gram and was also known as vraja. Both types of villages had their officials, called the mahattar. There is also a reference to a senior official called gramani or gramik.

The administrator of ten villages was called dashi; of 20 villages, vinshati; of 100 villages, shati, and of over 1,000 villages, sahasra gramadhipati. This is a clear indication of the interlink-ages between the villages. Kautilya's Arthashastra suggests that river, hill, forests, ditches, tanks, bunds or trees demarcated village boundaries. He prescribed that villages should be situated at distances of one or two krosha (in Rajasthan, it is spelt as koss, which is the equiv-alent of two miles or 3.219 km) from each other so that in times of need, one village could go to the help of the other.

Fig 1.2.4.2 ancient India village 2

1.3 Detail study

A. PHYSICAL FACILITIES

1. Road Facilities

.

Village road should be connected nearest city and major district road so villagers could easily reach nearest city. Roads have many types like national highway, state highway, major district road, minor district road, village road etc…

Fig 1.3.1 village road

2 . Electricity

The electricity should be supplied 24 hour. The village should good facilities of electricity. Electricity also available for agricultural purpose. Various crops of field are depended on regular water supply and water supply is depended on electricity.

Fig 1.3.2 Village Electricity

B. SOCIAL FACILITY

3. Food

Villager grows food for all people of country. They provide us fresh and healthy food. There are various types of village crops like weath, bajara, sugar cone, cotton, Etc…

Fig 1.3.3 Food

4. Drinking Water

Smart village should have good supply of drinking water. Water is necessity for human. There is enough tube well in the smart village.

Fig 1.3.4 Water

5. Agriculture Facility

Smart village has small market for sell their crop at same palace so that transportation costs of farmers are reduced. Various farming technology machine should available for farmers in smart village.

Fig 1.3.5 farmer

6. Education Facility

Smart village has primary school, high school and craft school. Infrasture of school building has good and suitable as per Gov. Guide line. Proper education makes increment of rural power so that education facility is most important factor of smart village.

Fig 1.3.6 School

7. Hospital Facility

Smart village should have good hospital facility and it has medical store too. Animal hospital is also necessary for smart village.

Fig 1.3.7 Hospital

1.4 SWOT analysis of ideal village

- SWOT means strength, weakness, opportunities and threats. It is use full for the analysis of field strength, weakness, opportunity and threats which you are face in the field. To analysis SWOT to reduce the threats, weakness and increase the strength and apportumity available for you.

  It involves specifying the objective of the business venture or project and identifying the internal and external factors that are favorable and unfavorable to achieving that objective. SWOT analysis provides a framework for visioning by helping the planners to identify and priorities the organization‟s GOALS and to further identifies the strategies of achieving them. SWOT analysis is a technique to analyze the Strengths, Weakness, Opportunity and Threats of a decision, problem ad place etc.

  In community development or urban planning SWOT is often used at community meeting to structure conversations about projects carrying out this analysis often illuminates what needs to be done and puts problems in to prospective. A tool that identifies the Strengths, Weaknesses, Opportunities and Threats of an organization. Specifically, SWOT is a basic, straightforward model that assesses what an organization can and cannot do as well as its potential opportunities and threats. The method of SWOT analysis is to take the information from an environmental analysis and separate it into internal (strengths and weaknesses) and external issues (opportunities and threats).

1. Village strengths

- Collective Strengths and unity of the villagers
- Better natural resource base
- Organized men and women groups/ institutions in the village
- Availability of enough agricultural lands

2. WEAKNESS

- Communication gap between government and villagers
- Poor health facilities

3. OPPORTUNITIES

- Development of wastelands, abandon lands and other village lands
- Development of cash crops and horticulture in the village
- Soil improvement by different institutions
- Use of modern techniques in agriculture, new cropping pattern

4. THREATS

- Crop damage by wild animals
- Low rain fall and dry season for crops
- Lack of funds and technical knowledge in agricultural fields

1.5 Future prospects of Development of the Ideal village

A. Sustainnable Development:

- Housing
- Capacity Building Of Stake Holders
- Live Hood
- Drinking Water
- Sanitation
- Good Enviromental
- Smart Education
- Better Health

Fig 1.5.1 Sustainable Devlopment Goals

B. Community Involvement:

- Village Devlopment Planning
- Monitoring Government Fund Utilization
- Influsing Personal And Commuinity Behivior
- Tack Care About Public Places

Fig 1.5.2 Community Involvement

C. Technology:

- Land Record Modernization
- Insurance
- Pension
- Space Technology In The Aid Of Farmer
- Remote Sensing For Resource Mapping
- Irrigation Method For Farmers

Fig 1.5.3 Technology

D. Connectivity:

- Easy and Cheap Transportation
- Digital Connectivity
- Mobile Connectivity
- Physical Connectivity to Town
- Financial Connectivity
- Power Connectivity

Fig 1.5.4 Connectivity

1.6 Benefits of the visits of Ideal village

❖ Services required for smart village

1. Food security.
2. Democratic engagement
   - Good governance,
   - Social development.
3. Health welfare
   - Environmental development
   - Personal development.
4. Education - Basic knowledge for awareness.

Requirement Of Smart Village

1. Smart security.
2. Efficient public transportation system.
3. Improving sanitation conditions
4. Solid and liquid waste management.
5. Rain harvesting
6. Safe drinking water facilities.
7. Use of renewable energy.
8. Energy conservation.
9. Grievance redresser.
10. Strengthening CBOs.
11. Functional bank account.
12. Facilities regarding to the agriculture.
13. Latest& affordable medical facilities.
14. E-governance.
15. Use of modern technologies for improvement of locality.
16. Improvement on women empowerment.
17. Educational facilities.

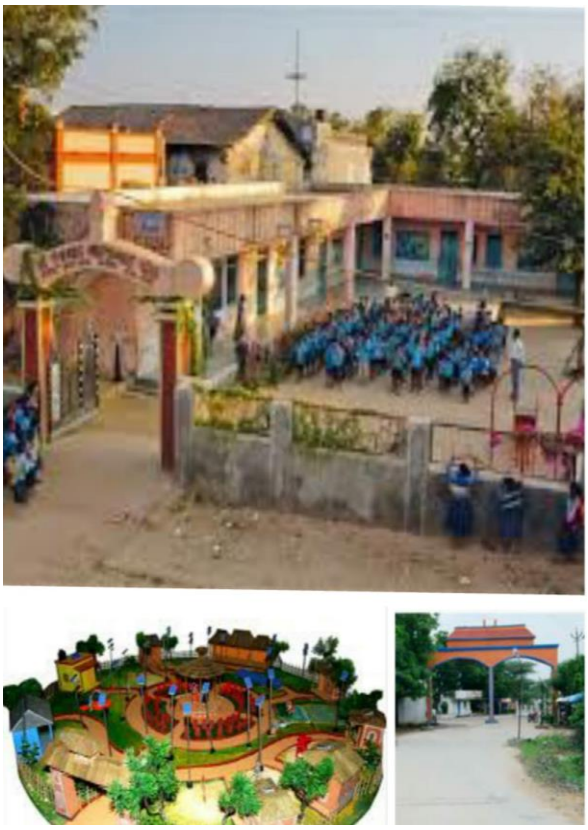


Fig 1.6.1 Ideal village visit

❖ BENEFITS

1. Locally produced and locally consumed energy:

In villages if the mountains, hilly area are present then use of solar energy & wind energy then energy is produce in that village itself & use for development of village.

2. Creation of job:

Generally village people migrate from village to city for purpose of job. If village becomes smart so all the job requirements are fulfills & people not migrate from one place to another.

3. Contribution to global environment:

The system can reduce reliance on fossil fuels &contribute to reduction of greenhouse gases such as carbon dioxide .Energy consumption Optimization 25-30% average energy saving.

4. For farmer e-learning etc. facility that will be able to ask there Quarries online.

5. **New technologies in education**

1.7 Civil aspects required in Ideal village

Smart city was an adaptive city, possessing high capacity to react; the key was on the adaptation and learning capacity, in which the citizens as the main roles in reacting, listening and receiving learning itself, this learning must be done within groups .Smart city concept was operated in complex urban area, combined several complex infrastructures, human behavior, technology, social structure and politic as well as economy .Smart city was more than digital city as it was able to connect the capital city physically with its social and develop the services and infrastructures of a better city by combining IT and politic vision to clear program for the city improvement and its services .

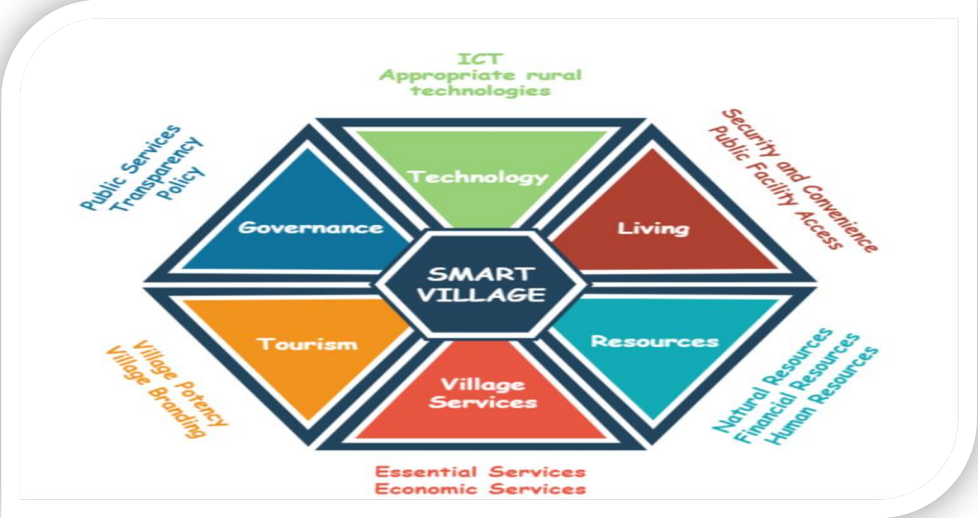


Fig 1.7.1 Proposed Smart Village Model

Proposed Smart Village Model

The proposed smart village model was analyzed based on 30 selected journals and village regulations.

The smart village model consisted of six dimensions:

1) Governance,
2) Technology,
3) Resources,
4) Village Service,
5) Living,
6) Tourism.

2. Ideal village Literature Review

2.1 Introduction: Urban & Rural village concept

Rural: All the areas which are not characterized as urban area is called rural area. In which the populations very low compared to urban areas. Mainly they depend on agricultural activities. According to census 2011, there are 6, 40,867 villages in India. The area where more than 75% of male populations associated with agricultural activity is known as rural area.

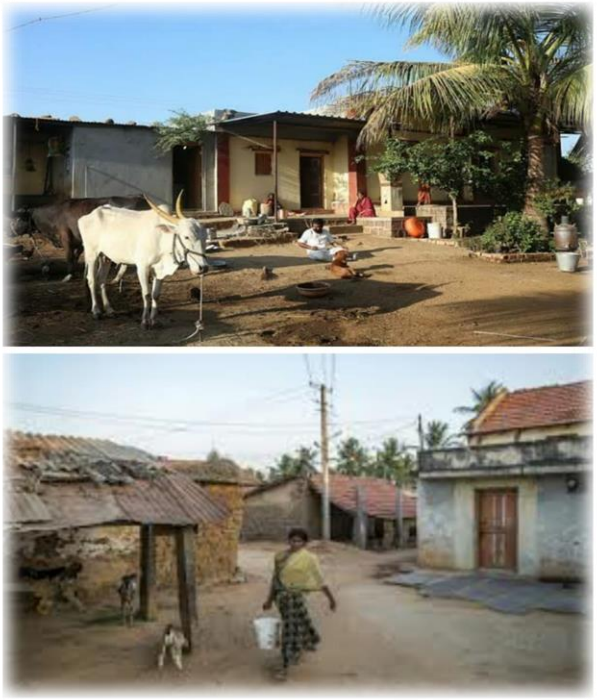


Fig 2.1.1 rural area

Urban: urban is that area where the population density is more and new facilities are provided to the people. Urban area is the region surrounding a city. Most of inhabitants of urban areas have non-agricultural jobs. Urban areas have municipality, corporation, and cantonment board or notified town area committees. According to census 2011, there are 7,935 towns, 4,041 statutory town and 3,894 census towns.

Fig 2.1.2 urban area

2.2 Importance of the rural development

An important step in the right direction was the February 2005 amendment to the Municipalities Ordinance which obligates the appointment of an environmental committee in each local authority, responsible for activities in areas that relate to the environment and sustainable development. To facilitate the move of local authorities in Israel toward sustainability, the Ministry of Environmental Protection has formulated 10 Principles for a Sustainable Local Authority. The ten principles, accompanied by concrete suggestions for action, are meant to expedite the transition from vision to action. These are the first steps in the transformation of a local authority into a sustainable local authority. Of course, such a transformation will only be successful if based on a consensus-building process in which all local stakeholders come together to formulate a joint vision and action plan.

Implementation of the following ten principles laid the foundation for the comprehensive process toward local sustainability.

1. Rational management of natural resources (water, sewage, land, energy)
2. Public participation in decision making and municipal action
3. Protection and enhancement of open spaces
4. Development of transport systems which are environmental and accessible to all
5. Minimization of the volume of municipal waste
6. Promotion of the local economy
7. Adoption of a policy of environmental and social justice
8. Advancement of environmental/social education and education for health
9. Environmental management of the municipality and its institutions
10. Advancement of partnerships to advance the environment

2.3 Different Definition of: Rural Urban Villages

RURAL AREA: Rural areas are also known as 'Countryside' or a 'village' in India. It has a very low density of population in rural area people practice agriculture for their livelihood. Town with a maximum population of 15,000 is considered rural in nature.

RURBANISATION: Developing village with a rural soul but with all urban amenities that a city may have. Rurbanisation generally refers to the process of improving the quality of daily life and economic wellbeing of people living in relatively isolated and less populated areas like small village

Rurbanization is a slow low-key change and growth process. The changes do not appear dramatic or significant to start with the slow speed of change can be steady or uneven.

2.4 Scenario: Rural / Urban village of India population Growth

Urban is that area where the population density is more and new facilities are provided to the people Urban area is the region surrounding a city. Most of inhabitants of urban areas have non-agricultural jobs. Urban areas have municipality, corporation, and cantonment board or notified town area committees. According to census 2011, there are 7,935 towns, 4,041 statutory town and 3,894 census towns.

Rural: All the areas which are not characterized as urban area is called rural area. In which the populations very low compared to urban areas. Mainly they depend on agricultural activities. According to census 2011, there are 6, 40,867 villages in India. The area where more than 75% of male populations associated with agricultural activity is known as rural area.

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

As per census of India is to release of provisional population totals-rural urban distribution.

Table 2.5.1 population of rural urban area as per census 2001 and 2011

	2001	**2011**	**difference**
India	102.9	121	18.1
Rural	74.3	83.3	9
Urban	28.6	37.7	9.1

Literacy rates (%)

Table 2.5.2 Literacy rates in rural and urban as per census 2001 and 2011

	2001	2011	difference
India	**64.8**	**74**	**+9.2**
Rural	**58.7**	**68.9**	**+10.2**
Urban	**79.9**	**85**	**+5.1**

For the Census of India 2011, the definition of urban area is as follows:

1. All places with a municipality, corporation, and cantonment board or notified

2. All other places which satisfy the following criteria:

- A minimum population of 5,000.
- At least 75% of the male main working population engaged in Non- agricultural.
- A density of population of at least 400 persons per sq km.

Table 2.5.3 literacy rates in rural and urban area as per the male and female

	2001	2011	Difference
A. Male			
India	75.3	82.1	+6.8
Rural	70.7	78.6	+7.9
Urban	86.3	89.7	+3.4
B. Female			
India	53.7	65.5	+11.8
Rural	46.1	58.8	+12.7
Urban	72.9	79.9	+7.0

2.6 Rural Development Issues - Concerns – Measures

Problems and challenges are integral to the existence of the individuals as well as the communities. In rural areas, individuals and communities are experiencing number of problems and challenges, which are proving to be major impediments within the course of meeting livelihoods opportunities. The major problems are, poverty, illiteracy, unemployment, homelessness and crime and violence. The individuals get effected by either one or more of these problems, which are having unfavorable consequences within their overall quality of lives. Poverty is characterized by lack of resources, when the individuals do not possess adequate financial resources; they are unable to fulfill their needs and requirements.

The prevalence of illiteracy is common among rural individuals, apart from poverty, there are number of causes, leading to illiteracy. Lack of literacy skills, education and awareness leads to an increase in unemployment. Homelessness among rural individuals takes place due to unaffordable housing, when they lose property, wealth and housing due to the occurrence of natural calamities and disasters and so forth. Prevalence of crime and violence is common in households as well as in other places, such as, schools, market places and so forth.

❖ **Poverty**

India comprises of one-thirds of the poverty stricken individuals. Indian poverty is primarily rural. In rural communities, landless laborers and casual workers are the individuals, who are residing in the conditions of poverty. The individuals, who are required to experience unfavorable effects as a result of poverty are, scheduled castes, scheduled tribes, the families, in which women are the heads, elderly individuals and children. The conditions of poverty among rural communities are characterized by lack of financial resources, land, assets, property and other resources. Due to lack of these resources, the individuals experience problems in sustaining their livelihoods in an appropriate manner. The vast majority of the poverty stricken individuals is employed in the agriculture sector, farming practices, and other activities, such as, animal husbandry, fisheries and so forth.

❖ **Causes of Poverty**

The major causes of poverty in rural communities have been stated as follows:

- Unemployment

Unemployment is the condition, when the individuals are not engaged in any work or occupation, either within their homes or outside the home. This is apparent that individuals get engaged in employment opportunities to generate income. Therefore, when they are unemployed, they would not be able to generate a source of income and as a result would experience poverty. When the individuals are unemployed and do not possess sufficient financial resources to meet the living requirements of their families, then there is prevalence of the conditions of poverty among them.

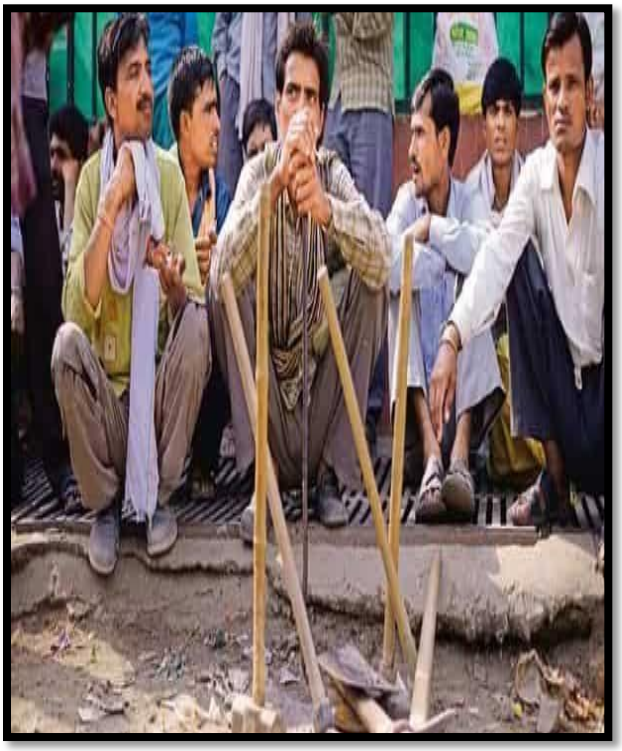


Fig 2.6.1 unemployment

- Participation in Minority Jobs

The agriculture and farming practices are regarded as the major occupations of the individuals in rural communities. Apart from these, they are engaged in activities, such as, fisheries, animal husbandry, production and manufacturing of handicrafts, and so forth. These jobs are regarded as minority jobs, which do not generate much income. In some cases, they are even required to wait for the season, when the demand for their products would be high and they would market their produce. Throughout the year, they are making use of materials to manufacture their products and have to experience poverty.

Fig 2.6.2 minority jobs

- Illiteracy and Unawareness

When the individuals do not possess the basic literacy skills of reading, writing and arithmetic and are unaware of certain aspects, particularly the ones, which are required to sustain better livelihoods, then they experience poverty. When the individuals are illiterate and unaware, then they would experience barriers in even marketing their products. Hence, when they are unable to get engaged in any occupation, due to illiteracy and unawareness, then they ultimately experience poverty.

Fig 2.6.3 literacy

- Occurrence of Natural Calamities and Disasters

The occurrence of natural calamities and disasters, such as, earthquakes, floods, draughts, Tsunamis are detrimental to the lives of the individuals to a great extent. As a consequence, the individuals experience immense loss of life, wealth and property. Therefore, when they experience natural calamities and disasters, then loss of wealth and property causes poverty.

Fig 2.6.4 natural disaster

- Inadequate Financial Management

Rural individuals mostly are illiterate and unaware. They do not possess adequate knowledge in terms of effective management of finances. In some cases, they do not make savings and investments and spend the available monetary resources on things, which are not necessary. Hence, when they do not make savings or investments in meaningful schemes, then they experience scarcity of funds, at the time of need. Hence, inadequate financial management leads to prevalence of poverty.

- Large Families

In rural communities, individuals mostly have large families. When the individuals are engaged in the agriculture sector or farming practices, or in other occupations, then their income is not sufficient to meet the needs and requirements of all family members, hence, when they experience scarcity of funds, then they are unable to meet the needs and requirements of all family members and have to experience poverty.

Fig 2.6.5 large families

- Borrowing Loans

When the rural individuals borrow loans from the moneylenders, and when they are unable to repay the loans, then they may end up as being bonded laborers. The bonded laborers usually are required to work long hours and get either very less pay or no pay at all. When they work hard, just for the purpose of repaying the loans, then they are unable to generate income to sustain the living conditions of themselves and their families. The ultimate outcome is poverty.

- Health Care Needs

The rural individuals, belonging to all age groups and backgrounds pay adequate attention towards their health conditions. The elderly individuals are required to make visits to health care centers on a regular basis to get their check-ups done. But in the case of severe health problems and illnesses, individuals are even required to make visits to urban areas. When the individuals spend their savings on medical treatment, then they do experience financial constraints in meeting other requirements. Hence, taking care of health care needs may use financial resources, thus giving rise to poverty.

- Migration

The rural individuals in most cases possess the viewpoint that in urban communities, they would be able to access better livelihoods opportunities. When the poverty-stricken and underprivileged individuals migrate to urban communities, then they experience poverty. They do not possess adequate resources to obtain housing accommodation and are homeless; they do not possess the skills to get engaged in any occupation or activity, hence, experience problems and difficulties within the course of generating a source of income.

Fig 2.6.6 migration

- Participation in Other Activities

The participation in other activities by the poverty stricken individuals may augment the conditions of poverty, especially when they incur losses. In rural areas, apart from agriculture and allied activities, individuals are engaged in the production of handicrafts, food items and so forth. Hence, when they make investments in the purchase of materials and in the implementation of production processes and do not incur much sales, then they experience losses. On the other hand, when the cost price is higher than the selling price, then they experience losses and are unable to bring about improvements in their living conditions.

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

Holistic and accelerated development of compact areas around a potential growth center in a Gram Panchayat through Public Private Partnership (PPP) framework for providing livelihood opportunities and urban amenities to improve the quality of life in rural areas.

A huge amount of migration of people is observed from rural areas to the urban areas to improve their quality of life. People generally have tended to move permanently to the urban areas instead of daily to and from visits for various urban facilities. Migration mainly occurs due to lack of basic facilities like drainage facilities, water facilities, proper health facilities and most important lack of source of income. Development of rural areas is accidently ignored in the race of developing urban areas. The motive of this project is to suggest development of the rural areas not only by the means of infrastructure but also increasing its economic growth.

AIM AND OBJECTIVES

To carry techno economic survey of the village;

- to carry intensive studies of different components in consultation with the authority and residents;
- to analyze data to be obtained from various departments related to the development process;
- to develop some means for economic development of the village;
- to design proposal for infrastructural facilities as appropriate.

2.8 Projects / Schemes of Gujarat Government

Indian Government Has Lots Of Schemes For Rural Development:

- PMGSY
- PMAY
- MGNREGA

1. PMGSY

•Full name of PMGSY is “pradhan mantri gram sadak yojana”.

• The Pradhan Mantri Gram Sadak Yojana (PMGSY), was launched by the Govt. of India to provide connectivity to unconnected Habitations as part of a poverty reduction strategy. Govt. of India is endeavoring to set high and uniform technical and management standards and facilitating policy development and planning at State level in order to ensure sustainable management of the rural roads network.

Fig 2.8.1 Village Road Construction (Pmgcy)

2. PMAY

• Full name of IAY is “PRADHANMANTRI AWAS YOJANA”.

• Pradhan Mantri Gramin Awaas Yojana, previously Indira Awaas Yojana, is a social welfare programme, created by the Indian Government, to provide housing for the rural poor in India.

• It was launched in 2015.

• Launched by Prime Minister modi. And this yojana works under “ministry of rural development of India.

Fig 2.8.2 Houses of Pmay Scheme

3. MGNREGA

•Full name of this scheme is "MAHATMA GANDHI NATIONAL RURALEMPLOYMENT GUARANTEE ACT"

•This yojana launched at 2nd Feb 2006.

•Mahatma Gandhi Employment Guarantee Act 2005, is an Indian labour law and social security measure that aims to guarantee the 'right to work'.

Fig 2.8.3 Houses Of mgnrega Scheme

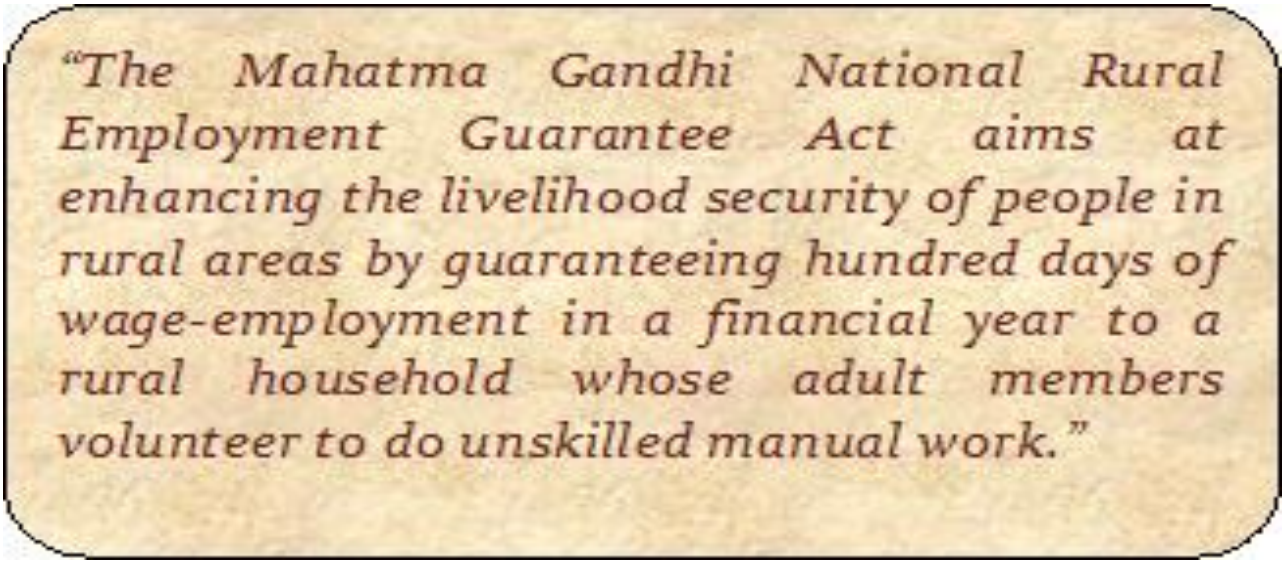


Fig 2.8.4 Mgnrega Yojana

3. Smart Village Concept Idea and its Visit

- The idea of smart village comes through " PRADHAN MANTRI AADARSH GRAM YOJANA". It was lounched by centeral government by 2009.
- The scheme was implemented in pilot mode in 1000 villages of assam, bihar, himachal pradesh ,rajasthan ,tamil nadu .
- In this scheme all 100 villages allocation rs 10 lakha per village .
- Himachal pradesh launched a mukyamantri adarsh gram yojana similar lines in 2011,with alloction rs 10 lakh per village.

3.1 Introduction: Concepts, Definitions and Practices

On 5th Aug 2020, We Visited Village Name "Punsari". Punsari Village Located At Sabarkantha District In Gujarat. The Surpanch Of Punsari Village Name Is Himansu Patel. The Village Follows The Panchyti Raj Ssystem. Many Advanced Technology Used For Various Purpose In This Village.

Many Facilites Devloped In This Village And That Makes This Village As " Ideal Village". Various Facilites Like Hospitals, Schools, Post Office, Banks, Panchyat Office , Water Tank, Bank, Atm ,Etc….

The population of punsari village is 5500 as per 2011 cencus of gov of india. Punsari is a village located in Sabarkantha district in the state of Gujarat, India. Punsari is considered as India's smartest village. The village is located at about 80km from the state capital, Gandhinagar. Punsari is 20km from Parvati Hills. Parvati Hills is the largest table top land of India. The village follows the Panchayati raj system. The village extent is about 65 km .

The land in use of agriculture is 6 hectares. The main non farming activity is dairy in this village. The village has undergone a transformation under the panchayat. There has been use of new and advanced technology in education. This village has wi-fi connection for all people. Efforts have been made for the empowerment of women and increasing security in the village.

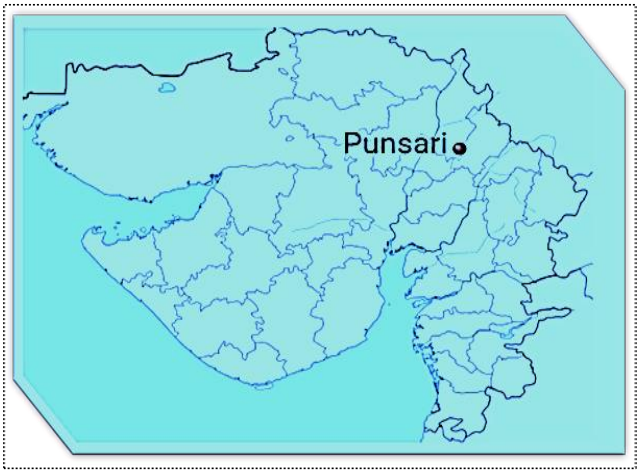


Fig 3.1.1 Punsari Gujarat

3.2 Vision-Goals, Standards and Performance Measurement Indicators

After successfully serving for two terms as village headman, Himanshu Patel stepped down from the post since this time it was reserved for a female candidate. He now wants to focus on preparing a team of young local level leaders who are not only from his own state but from across the country. He has already networked with a thousand such young village headmen from different corners of India, cutting across party ideologies. The aim of such a group is to share experiences of rural development among themselves. Nonetheless, what is important to note here is that Himanshu Patel does not intend to replicate the model of Punsari in other parts of the country. He rather believes that every village should be a unique example rooted in its own ecology and environment. He has been appointed programme officer to overlook the implementation of Nandgram project which is based on a PPP model. Vedanta Company is contributing 1000 crore rupees under its CSR initiative. The proposed programme focuses on nutrition of infants and children and fights against under- and malnutrition in India.

3.3 Technological Options

Punsari stands out in this regard as it has constructed a reverse osmosis plant and since then provided house-to-house piped connections to supply chlorinated water. It also has its own 66 KVA substation for electricity generation and 100 per cent coverage of all streets with LED streetlights. A public address system with 120 waterproof speakers for announcing information and spreading messages has been another striking feature of this village. The village headperson uses this public announcement system to share what he thinks, plans, and is doing at the gram Panchayat. The entire village has been put under CC TV surveillance, which has helped to bring down crime rate to almost zero per cent. Each household has a personalized lavatory and the whole village has a well-designed drainage and storm water disposal system.

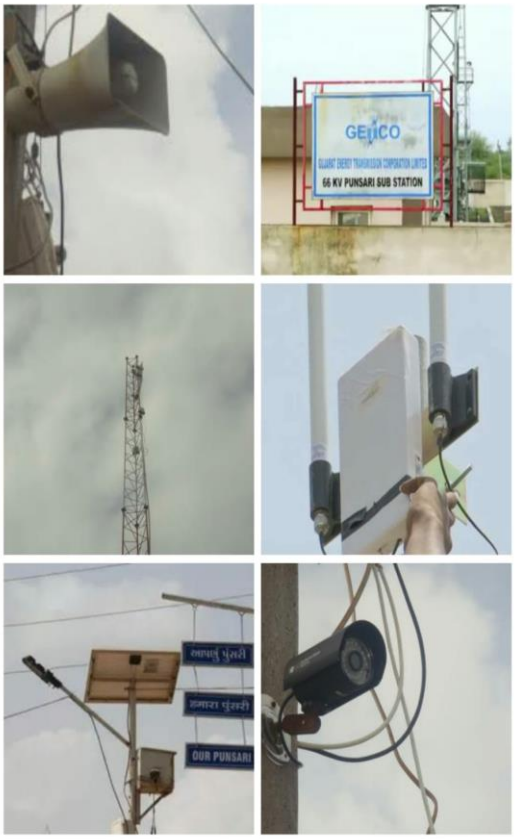


Fig 3.3.1 technology

Atal Express is a free bus service available for commutation to all the villagers. Punsari is the first fully Wi-Fi-covered village in India. There are also plans to do GIS mapping for the better imlamentation of many government schemes. Some of the popular national banks and their ATM centres are now available as well.

Education. Education for all and free for all is the mantra this village has aspired to adopt. Punsari has five primary schools and four secondary schools. The class rooms in these schools are fully equipped with CCTV cameras, LED screens used for teaching, mineral water plants, separate toilets for girls and boys, computer labs, and well-stocked libraries. MidMeals programme of the central government has been successfully implemented. Availability of these basic amenities within the premises of schools has also helped to reduce the dropout rate to zero.

3.4 Road Map and Safe Guards

To promote the development of sustainable, productive and resilient cities and communication is main goal of road map.

Road map served as a guide book, bridge builder, value creator, platform etc.

Provide connectivity to unconnected Habitations as part of a poverty reduction strategy.

Roads have many types like national highway, state highway, major district road, minor district road, village road etc…

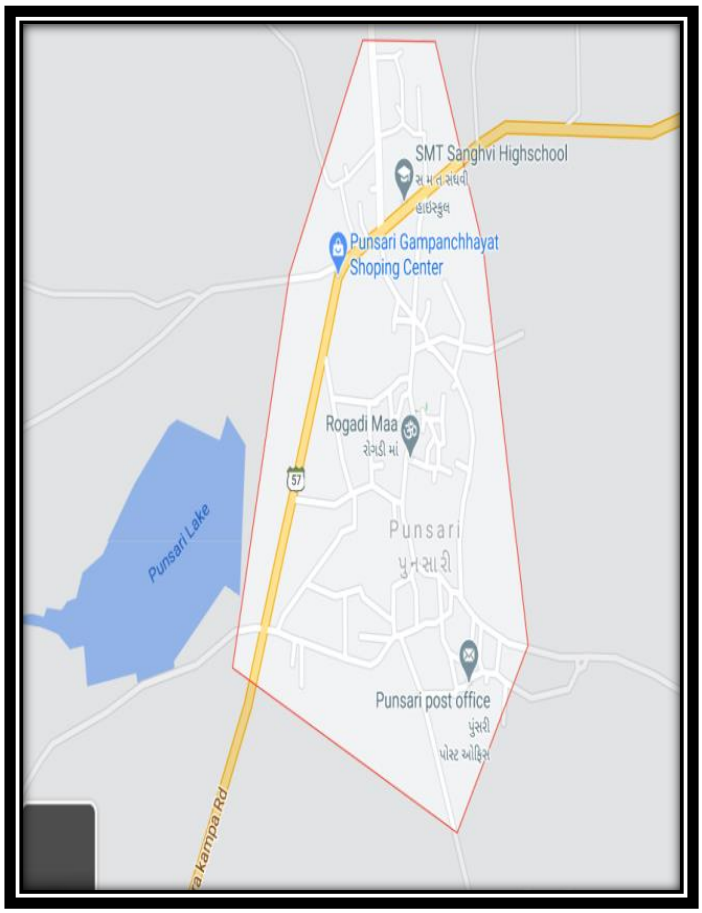


Fig 3.4.1 punsari village road map

3.5 Issues & Challenges

A model village is not necessarily an ideal village. An ideal village in is the one that has been able to transcend social inequalities, reduce subordination of women, develop true community spirit, and work tirelessly to respect and recognize constitutional values. Villages in India are notorious for the caste divide, communal tensions, social injustices, and, at times, instances of violence. Punsari has performed exceptionally well in providing basic amenities, reducing inequalities among different social groups, and improving some major social indicators of development. However, it has yet to accomplish its goal of becoming an ideal village where every citizen hailing from different socio-economic background has a voice and choice.

It also exposes the way rural democratic institutions are actually working in India (2006). Another important fault line found in this village is that the Gram Sabha (village assembly) meetings are not conducted on regular basis. Article 243(b) defines the Gram Sabha as "a body consisting of persons registered in the electoral rolls relating to a village comprised within the area of the Panchayat at the village level". Gram Sabha is an integral part of the Gandhian concept of village Swaraj (rural self-government). The objective of Gram Sabha is to enable each and every voter in a village to participate in decision-making at the local level. It is a constitutional body consisting of all persons registered in the electoral rolls of the village Panchayat. It provides a political forum to people in the village where they can meet and discuss their common problems, and consequently, understand the needs and aspirations of the community. Thus, the Gram Sabha is expected to be an epitome of participatory, deliberative, and direct democracy. It is the body that should provide valuable inputs to the Gram Panchayat to lead local government effectively.

The Gram Sabha is also to act as a watchdog in the interest of village communities by monitoring the functioning of the Gram Panchayat. However, the effectiveness of Gram Sabha has been marred by issues like social exclusion, dangerous information gap, political apathy on part of villagers, dependency syndrome, and political culture of patronage. Furthermore, stresses low participation in Gram Sabha meetings and irregular and informal ways of its conduct as some of the major concerns at the grass roots. These field observations gleaned from the model village Punsari help us understand the fact that the physical development of a village does not necessarily promise change in its social environment. The argues that unless a village is able to transcend social inequalities and develop social cohesion, a model village is far away from being an ideal village.

3.6 Smart Infrastructure - Intelligent Traffic Management

Punsari village is Gujarat's first hi tech village. The sarpanch himansu patel works hard for development of village. Punsari village has all facilities like city. It has own power generation park. City bus facility also available in this village.

The sarpanch of this village himansu patel awarded from narendra modi and president of India for made punsari high-tech village.

Fig 3.6.1 Arial view

Fig3.6.2 BAL Vatika

Fig 3.6.3 village road

Fig 3.6.4 solar penal on canal

Fig 3.6.5 Waste Collection

Fig 3.6.6 gram panchayat

Fig 3.6.7 solar street light of village

Fig 3.6.8 Industrial Area

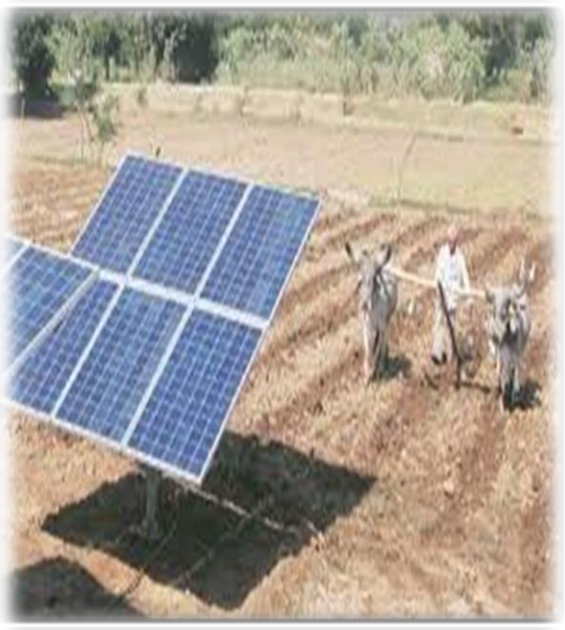


Fig 3.6.9 Solar Penal At Village

Fig 3.6.10 Primary School Classroom

Fig 3.6.11 Village Bus

Fig 3.6.12 State Bank of Village

Fig 3.6.13 Solid Waste Collection

Fig 3.6.14 Awarded Village

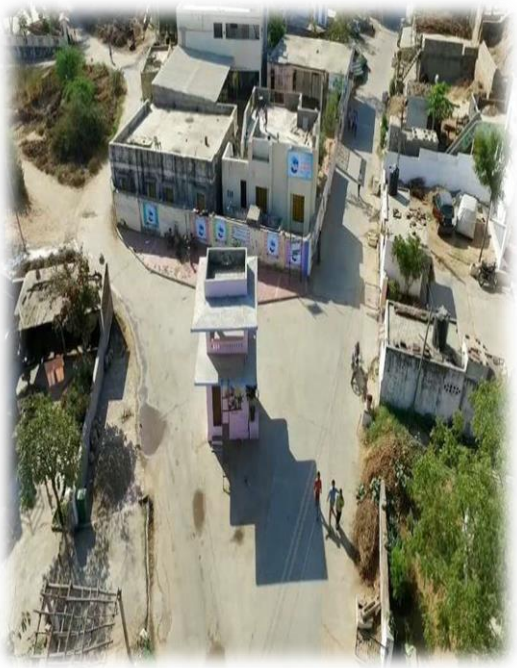


Fig 3.6.15 Well Design of Village

Fig 3.6.16 information Board

3.7 Cyber Security or any other concept as per the smart village

- ❖ Implement of security by CCTV protection and link with internet and government cyber security department.
- ❖ Provide government live help center among villages of a tehsil.
- ❖ Organize seminar of giving information about computer technology and its merits demerits.

3.8 Retrofitting- Redevelopment- Greenfield Development District Cooling

❖ District Cooling:-

- District heating is the most widespread of the two types of district energy; heating and cooling. To transport heat efficiently, the district heating distribution infrastructure comprises a network of insulated pipes, delivering heat in the form of hot water, from the generation site to the end user.
- Networks can measure from a few hundred meters to covering entire large cities. End users range from residential buildings to offices and industrial facilities. The network's coverage can easily be extended by laying more pipes, often in combination of adding more points of generation

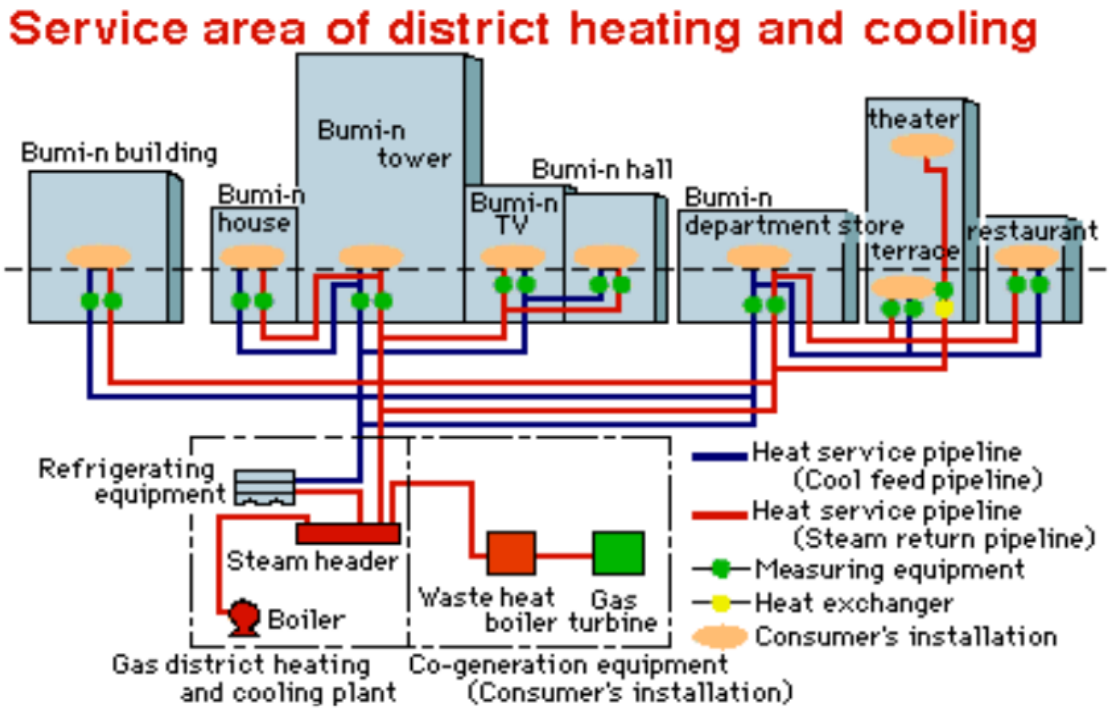


Fig 3.8.1 district cooling and heating diagram

❖ District Heating :-

- The district cooling system in Stockholm was implemented on a larger scale during the 1990's.
- It is based on the same distribution principle as district heating, and can be generated by different fuel sources and techniques. Free water cooling is a common technique, using sea or lake water in order to cool the water in the system.
- Heat pumps, generating heating and cooling, as well as cooling machines can also be used. Another way is to use the heat energy from the district heating in cooling sorption machines.

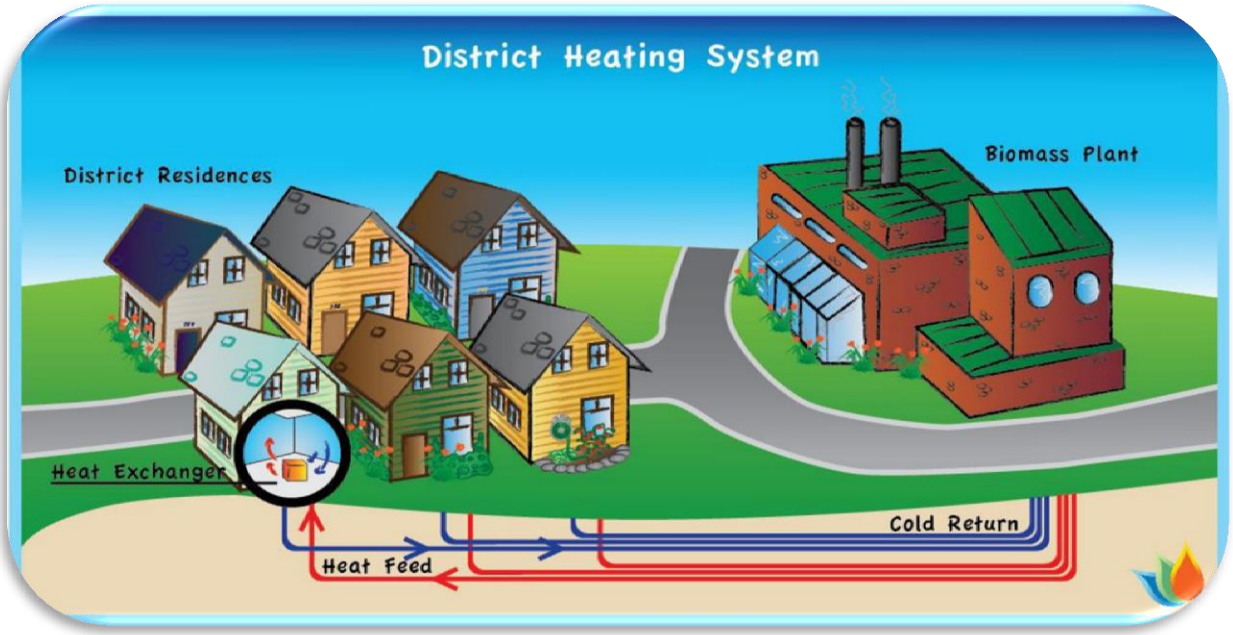


Fig 3.8.2 district heating system

3.9 Strategic Options for Fast Development

- Mission Based Approach: The Smart Village program will converge with these missions in achieving the common objectives of smart village development.
- Capacity Development and Empowerment at individual, group and institutional level To help ensure the demand, delivery, reach and use of quality services
- Social and Behavior Change: To address social and behavior change at community and individual levels:
- Good Governance for this the concerned institutions need to be functionally.
- Partnership and Collaborations program with trust, NGO and private companies to all over development of villages.

- Technology, Communication & Innovation: To achieve the 'Smart Village' status, the community, individually and collectively, will be empowered to take smart decisions using technologies, communication and innovations
- Best Practices and Knowledge Management: Introduction of innovations, new ideas and best practices of self-management is the key feature as well as an important strategy of the program.

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

1. Poor quality of drinking water.
2. Insufficient quantity of water.
3. Poor facility of irrigation.
4. Irregularity of precipitation period.

3.11 Initiatives in village development by local self-government

1. Social workers.
2. Development by NGO.
3. Trust base organizations.

3.12 Smart Initiatives by District Municipal Corporation

1. Solid waste management.
2. Selvedge water disposal.
3. Effective road transportation.
4. Maintained street light facilities.
5. Agriculture awakening center.

3.13 Any Projects contributed working by Government / NGO / Other Digital Country concept

1. PMGSY

• The Pradhan Mantri Gram Sadak Yojana (PMGSY) was launched by the Govt. of India to provide connectivity to unconnected Habitations as part of a poverty reduction strategy. Govt. of India is endeavoring to set high and uniform technical and management standards and facilitating policy development and planning at State level in order to ensure sustainable management of the rural roads network.

2. PMAY

• Pradhan Mantri Garmin Awas Yojana, previously Indira Awaas Yojana, is a social welfare programme, created by the Indian Government, to provide housing for the rural poor in India.

3. MGNREGA

- This yojana launched at 2nd Feb 2006.
- Mahatma Gandhi Employment Guarantee Act 2005 is an Indian labour law and social security measure that aims to guarantee the 'right to work'.

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

➢ the meaning of the word ‘environment’ is the surrounding of an organism. It is define as the condition of air, water, land, and other things surrounding us.

➢ by definition, environmental factors affect large groups that share common living or working spaces.

➢ Thus, they are key candidates as explanatory factors for health differences across geographic areas, such as countries.

➢ Indeed, a major motivation for the research on environmental determinants of health has been the repeated observation that many health outcomes are spatially patterned.

Ecological factor of Environment:-

1. Biotic factor:-These include all living organism that interact with each other and their living environment. For example, pant animal, bird micro-organism.

2. A biotic factor:-These include all living organism that interact with each other and their non-living environment. Also called physical environment. For example light, water, air etc.

3. Topographic factor:-

➢ Mountains, plains

➢ Lack, Ocean, River

➢ Forest

➢ Desert

4. Climate factor:-

➢ Light, Temperature

➢ Humidity, rainfall

4. About Bhilvan Village

4.1 Introduction

India's 70% population lives in villages. More than 80% of these villages are in the plain or the ocean plateau. The average villages has 250-300 households, and occupies an area of 4sq per km. people in rular area s should have same quality of life as is enjoyed by people living in sub urban or urban area. vishwakarma yojana main motto has development of rural areas. Rural development which is concerned with economic growth and social justice, improvement in the living standard of the rural people by providing adequate and quality social services and minimum basic needs becomes essential. The present project deals with the same.

The ideas, connections and activities in cities often generate the solutions to the problems they create. Vishwakarma yojana provide "design to delivery" solutions to the problems of villages in "Rurban" areas.

It is one of the strategies to reduce urban city pressure and lower the migration rate by developing village with a rural soul" but with all urban amenities that a city may have. In this project the students meet the relevant citizens of village and survey the existing facilities. Then design of the sustainable infrastructure which is to be modified is carried out for the village. This includes implementation of engineering skills to prepare detailed project reports for village as a part of the final year project work. By this project certain experiences recreates a real work and need of application of an individual technical knowledge on any existing problems Based on survey we tried to give design of basic facilities to fulfill their needs. By providing these basic facilities to village for reduce urban city pressure and decrease migrations rate, which is ultimate aim of Vishwakarma Yojana.

During our project, first we visited Bhilvan village and met with sarpanch shri Ashif Usman Badalpura. We inquired about the facilities available in the village like road, water supply, electricity etc. We also inquired about the need of the village and they discuss about the future development need of the village and also give us information regarding various projects going under the various scheme of the government of Gujarat. After collecting data from panchayat office we visited various part of the village and collected information regarding the facilities and also access the need for future expansion.

After the meeting with sarpanch we visited whole village. First we saw bus station; bus station is located at 1 km from village. It is useless condition. Then we entered village. Village is 1 km inside

from main highway. At the main chock of village “bhilvan milk dairy” located. Village has good hospital facilities and also animal health center. Bhilvan village has two tower water tanks but one is not running condition. Village has two schools 1. Bhilvan kanya school , 2. Bhilvan primary school. After visited village we identified some problems like bus station which is in very poor condition. We also found the primary school building which is not in good condition and required to renovate with smart technology. Street road is not available. Bank is not available. Atm machine is not available. Etc…

4.1.1 Introduction About Bhilvan Village details

- Bhilvan Village Is Located At Rural Region Of Patan, District Of Gujarat.
- According To Census 2011, Bhilvan Population Is 4701.
- Out Of 4701, The Males Are 2395 And The Female Is 2306.
- Bhilvan Village Has 646 Children’s In the Age of Group 0-6 Year.
- Literacy Rate in Bhilvan Village Is 76%.
- 1503 Person of Bhilvan Village Is Employed.
- 3198 Person Of Bhilvan Village Is UN Employed.
- Out Of 1503 Employed Person 567 Persons Are Entirely Depended On Agriculture.
- “Asif Usman Badalpura” Is the Sarpanch of the Bhilvan Village.
- Bhilvan Village Is 19 Km Away From Patan City.
- The Village Coad of Bhilvan Is 508815.
- The Total Geo Graphical Area of Bhilvan Village Is 523.06 Hector.
- The Main Occupation of Bhilvan Villagers Is Dairy, Second Is Farming.

Creation of infrastructure connectivity, civic and social infrastructure along with Provision of alterative.

• Basic physical infrastructure - Water Supply, Transport, Sewerage and Solid Waste.

• Management should be the priority focus and be provided Basic Social infrastructure - Health and Education facilities should be provided and ensure proper delivery of Facilities to village dwellers.

• Promote integrated development of rural areas with provision of quality housing better connectivity, employment opportunities and supporting physical and social infrastructure.

• Reduce migration from rural to urban areas due to lack of basic services and enough economic activities rural areas.

• Internal roads within village settlement, Efficient Mass Transportation systems to improve Connectivity between urban and rural are as Public transport system.

4.1.2 Need of the study

To provide basic requirements of people in the village and the development of village .for this purpose the information of village is collected. Information's like water facilities, drainage facilities, transport facilities, education facilities, bank, community hall, and other amenities. For provide this facilities to villages it is necessary to need of study.

4.1.3 Study Area (Broadly define)

Study area mainly includes the study of the village Bhilvan which is located in Patan, taluka in Patan district of Gujarat state. It is about 19 km from Patan. The Vishwakarma Yojana is aimed to Rurban development of the village. For that purpose study area is decided for taking detail information of the village. The study area includes education, health and safety, drainage, transportation facilities, social life etc. Education includes various facilities like Aganwadi, Primary School, Secondary School, Higher Secondary School, College etc. Medical Facility includes study of Gov. / Panchayat, Dispensary, Health Centre, PHC & CHC, Child Welfare and Maternity Home, Hospital etc.

This study area mainly includes study of Bhilvan village. Bhilvan is located at taluka- Patan, District-Patan, State – Gujarat.

- Bhilvan village is 19 km from patan city.
- Bhilvan to capital of state Gandhinagar is 126km.
- Bhilvan village has lower literacy rate compare to Gujarat state.
- Bhilvan village sex ratio of male or female is 40: 60.
- Bhilvan village is very famous for its cattle farm business.
- Bhilvan village villagers average income between 10k to 15k.
- Out Of 4701, The Males Are 2395 And The Female Is 2306.
- Bhilvan Village Has 646 Children's In the Age of Group 0-6 Year.
- Literacy Rate In Bhilvan Village Is 76%.

4.1.4 Objectives of the study

- The main aim of the project is to provide urban amenities in rural areas and maintaining the rural soul.
- To provide basic infrastructure facilities like transportation facilities, primary health care facilities, government sectors like ATM facilities, post offices etc.
- To facilitate enough power supply system for whole village.
- To retrofit and renovate the primary school facilities with smart technology.
- To provide biogas plant facility due to lots of milk production in the village and to utilize the bio product as fertilizers and electricity generation.
- This project will help in developing villages in sustainable.
- In future we design about solar resources for energy purpose, rain water harvesting system, village hall, repair and maintance existing public building, public toilet, post office, solar street light etc…

4.1.5 Scope of the Study

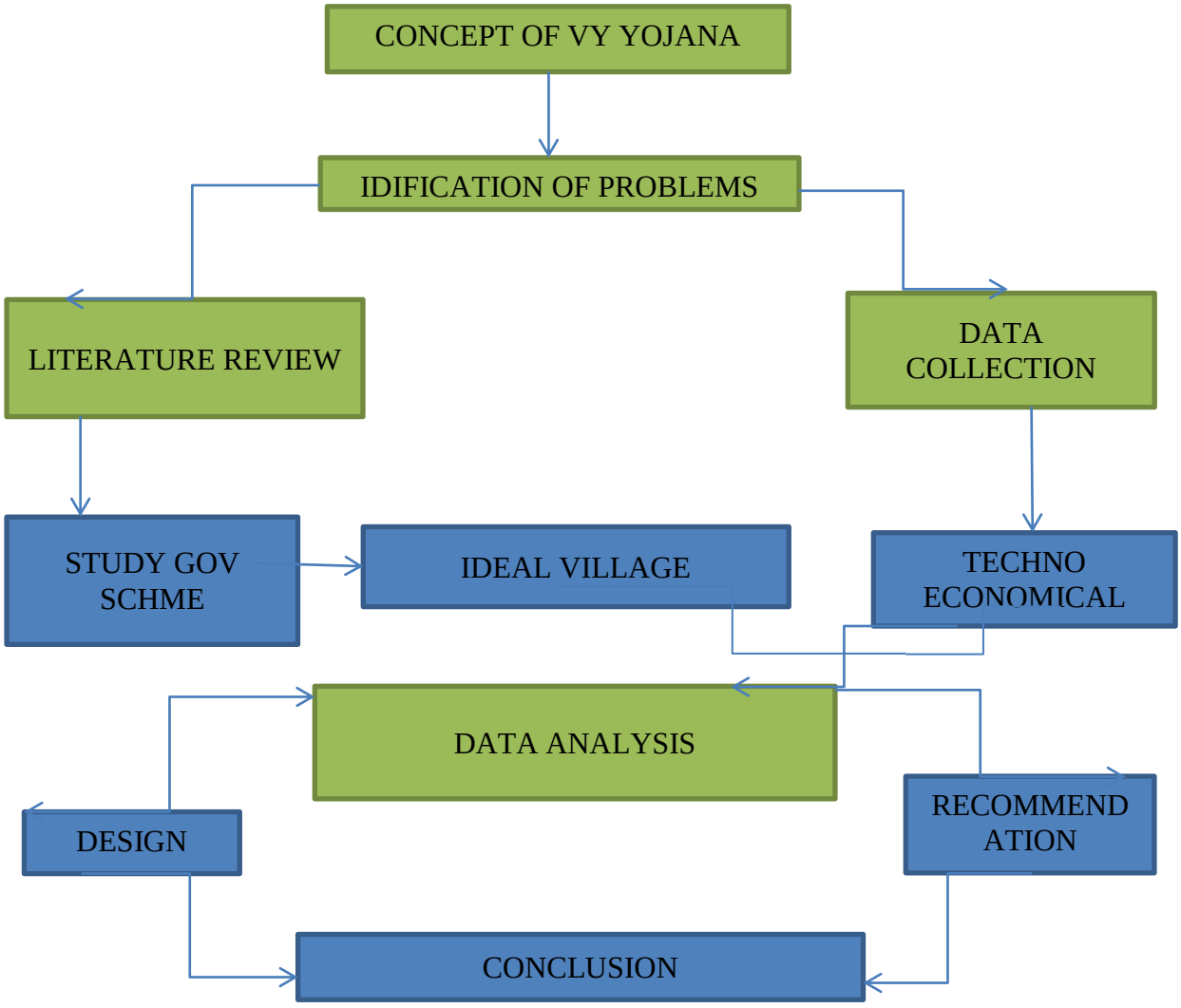
- The study will focus the development trend, intensity of growth of the village, and find out the problems related to the physical development of the area and infrastructure services of the village. Project proposal and sustainability aspect not consider in micro level, it is only guide way. The study focused to only village Bhilvan.
- Irrigation facility, Street light, Waste management system, Batter road system, to provide portable toilet in village.

4.1.6 Methodology Frame Work for development of your village

First, we studied what are the various goals and different objectives and aspect of Vishwakarma Yojana and studied various basic definitions related to the project like rural area, urban area, urbanization etc.

• After this we contacted our village (Bhilvan) sarpanch, talati, mantri and different gram panchayat members. Than after we frequently visited the Bhilvan village for the purpose of collecting various data related to various facilities and amenities and survey of different aspects related to physical infrastructural, social facilities.

• Gap analysis is done based on data collected through survey of village. And various suggestions are made by us on development of village. And based on this suggestion we will design proposed facilities in the village according to the need and population of that village.



4.1.6 Methodology

4.1.7 Available Methodology for development of related to civil

Following objects are available related civil:

- Data of ideal village (techno form of Bhilvan village)
- Data of smart village (techno form of Bhilvan village)
- SWOT analysis of ideal village
- Outline MAP of Bhilvan village
- Gov. guideline regarding village development
- Swatch Bharat Abhiyan guidelines by Gov.
- GAP analysis of village
- Vaccination against covide situation.

4.2 Bhilvan village Study Area Profile

4.2.1 Study Area Location with brief History land use details

Bhilvan Village Held at India's One of the State Gujarat. As per census 2011 information the village has population is 4701. Bhilvan village located at Patan taluka of Patan district in Gujarat state. It is 17 km away from Patan city. Geographical area of Bhilvan village is 523.06 hectors. It has 2395 number of male person and 2306 number of female person.

4.2.2 Base Location map, Land Map, Gram Tal Map

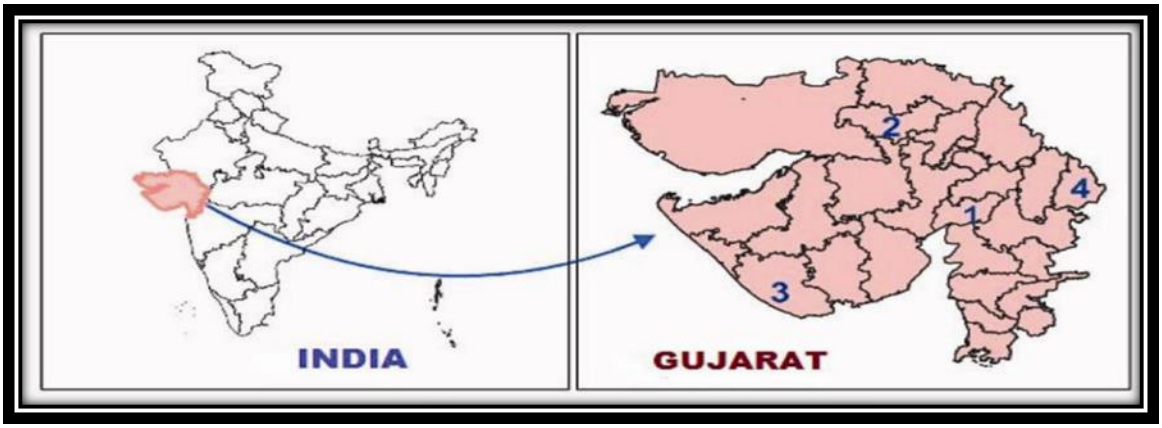


Fig 4.2.2.1 India Gujarat Map

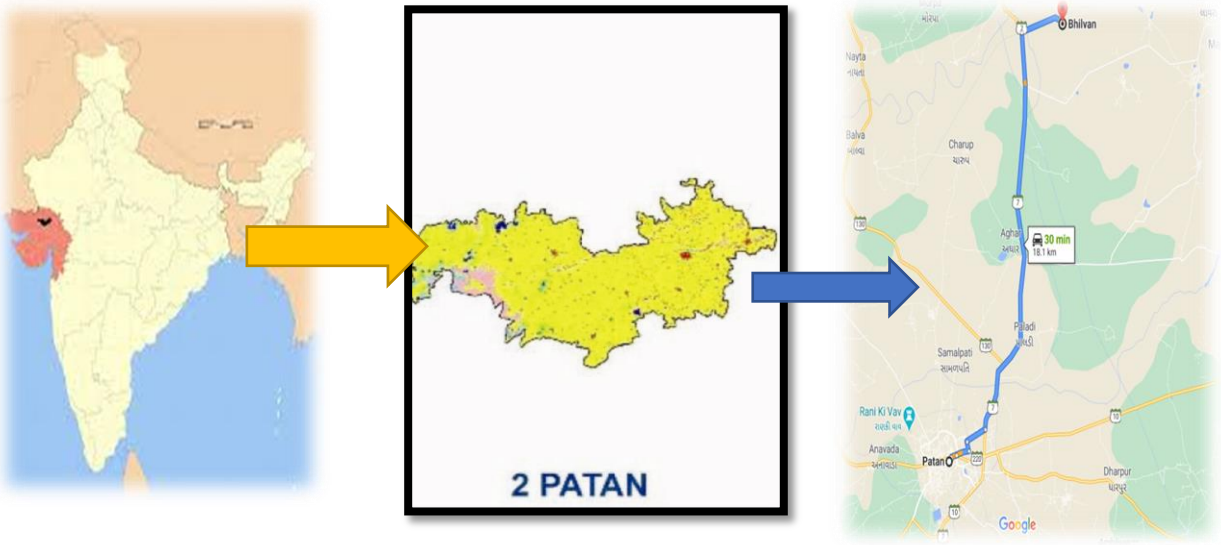


Fig 4.2.2.2 Bhilvan village located in India

Fig 4.2.2.3 Bhilvan satellite Map

4.2.3 Physical & Demographical Growth

The population of Bhilvan village is 4701 as per 2011 census of government of India. Bhilvan is a village located in Patan district in the state of Gujarat, India. Bhilvan is total number of households 828. The village is located at about 17km from the Patan city. The village follows the Panchayati raj system. The village extent is about 523.06 hector.

The land in use of agriculture is 6 hectares. The main non farming activity is dairy in this village. The village has undergone a transformation under the panchayat.

4.2.4 Economic generation profile

Bhilvan village has main occupation is cattle farming and farming. It produces 3000 liters milk per day and it is good source for nearest city Patan.

Villagers have main income from cattle farming. Village has known for its buffalo's because the milk capacity of it is high compare to other, so high demand of buffaloes of bhilvan village.

Village has not any bank or Atm machine and it is too necessary for villagers.

Nearest Atm machine is in village vadu and it is 5 km from Bhilvan village.

4.2.5 Actual Problem faced by Villagers and smart solution

Bus Station Is Located 1 Km Away From Village. Bus Station Is Use Less Condition. Bus Station Is Suitable Inside The Village So That Villagers Easily Use It.

Fig 4.2.5.1 Bhilvan bus stop

Village Has 40 To 50 Village Street But Only 5-6 Streets Has Street Road. Other Street Have Not Street Road.

Fig 4.2.5.2 Street

Village Has Not Good Electricity Facility. The Electricity Load of Village Is High because Every Second House Use Ac, Refrigerator, Washing Machine Etc. Heavy Loaded Equipment

Fig 4.2.5.3 D.P

Fig 4.2.5.4 Water Tank in Useless Condition

4.2.5.5 School

Fig 4.2.5.6 Lack View 1

Fig 4.2.5.7 Lack View 2

4.2.6 Social scenario -Preservation of traditions, Festivals, Cuisine

Bhilvan village has majority of Muslim community so it has many masjid which has good architectural design. Like noor masjid, markaz masjid..

Fig 4.2.6.1 Noor Masjid 1

Fig 4.2.6.2 Noor Masjid 2

Fig 4.2.6.3 Markaz Masjid

4.2.7 Migration Reasons

Migration is a way to move from one place to another in order to live and work. Movement of people from their home to another city, state or country for a job, shelter or some other reasons is called migration. Migration from rural areas to urban areas has increased in past few years in India.

Nowadays, many people decide to migrate to have a better life. Employment opportunities are the most common reason due to which people migrate. Except this, lack of opportunities, better education, construction of dams, globalization, natural disaster (flood and drought) and sometimes crop failure forced villagers to migrate to cities.

Positive Impact	Negative Impact
Unemployment is reduced and people get better job opportunities	The loss of a person from rural areas, impact on the level rural areas.
Migration helps in improving the quality of life of people.	The influx of workers in urban areas increases competition for the job, houses, school facilities etc.
It helps to improve social life of people as they learn about new culture, customs, and languages which help to improve brotherhood among people.	Having large population puts too much pressure on natural resources, amenities and services.
Migration of skilled workers leads to a greater economic growth of the region.	It is difficult for a villager to survive in urban areas because in urban areas there is no natural environment and pure air. They have to pay for each and everything.

4.3. Data Collection Bhilvan village

4.3.1 Describe Methods for data collection

Methods for data collection:-

❖ **Types of Surveys:-**

- Surveys are classified according to their focus and scope (census and sample surveys) or according to the time frame for data collection (longitudinal and cross-sectional surveys). A survey that covers the entire population of interest is referred to as a census. In research, however the population is used to refer to the entire group of individuals to whom the findings of a study apply. The researcher defines the specific population of interest.

❖ **Different method for data collection given below:-**

- Interviews
- Questionnaires and Surveys.
- Observations
- Focus Groups.
- Ethnographies, Oral History, and Case Studies.
- Documents and Records.

4.3.2 Primary details of survey details

For the Techno- economic survey, first of all we gone to the Sarpanch of respective village Mr. Asif Usman Badalpura at the meeting with him we gave details about Vishwakarma Yojana and get permission for the do work related to survey in village Bhilvan. With his co-ordination and his help we got all data and information related to village Bhilvan.

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

Bhilvan village has 90% pacca house and 10% kaccha house. Pacca house has 2BHK.

4.3.4 No of Human being in One House

Min 5 member in one house and max 12 member in one house. Total number of village houses is 828.

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

Which Material used locally:-

➢ Coarse aggregate,

➢ Fine aggregate,

➢ Wood,

➢ Reinforcement,

➢ Cement,

➢ Water,

➢ Bricks etc..,

Out Sourced Material:-

➢ Reinforcement,

➢ Plastic cover.

4.3.6 Geographical Detail

Bhilvan Village Located At 1 Km Inside From (MDR) Major District Road. It Has Nearest Town Patan. Bhilvan Is 17 Km Away From Patan City. It has population 4701.Area of Bhilvan village is 523.06 hector. Total no of house 828. Nearest town is Patan. The Village Coad Of Bhilvan Is 508815.The Main Occupation of Bhilvan Villagers Is Dairy, Second Is Farming. Asif Usman Badalpura" Is The Sarpanch Of The Bhilvan Village. Literacy Rate In Bhilvan Village Is 76%.

4.3.7 Demographical Detail

Population	Male	2395
	Famale	2306
	Total	4701
	No Of House	828

4.3.8 Occupational Detail - Occupation wise Details

Major Occupation	Farming
	Cattle farm
	Farm Labour
	Milk Products
	Dairy

4.3.9 Agricultural Details

Three crop periods in one year, agricultural labour total is 400.total agricultural area is 6 hector.

4.3.10 Physical Infrastructure Facilities

(A) Water Facility

Description	Num Of Facilites
Water Tank	2
Lake	1
Bore We	1
River	0
Water Tank For Animal	2

(B) Transportation Facility

Bus Station	Yes
Railway Station	No
Private Transportaion	Yes

(C) Education Institute

Primary School	Yes
Secondary School(Boys)	No
Secondary School (Girls)	Yes
Aganvadi	Yes
Collage	No

(D) Health Facility

Primary Health Center	Yes
Medical Shop	Yes
Venetary Hospital	Yes
Emergency Ward	No

(E) Other Facility

Bank	No
Post Office	Yes
Milk Dairy	Yes
Market	Yes
Agro Center	No
Libarary	No
Lpg Gas Center	Yes
Garden	No

4.4 Infrastructure Details

4.4.1 Drinking Water Facilities

Tube well is main source of drinking water.

➢ Two overhead tanks are available in the village.

1lakh liter rounded overhead tank.

Other is not in working condition

➢ Underground sump is not available in the village. In this village sump is required.

Fig 6.8.1 Water Tank

4.4.2 Drainage Network / Sanitation Facilities

Drainage facility is available 100% in the village.

Underground drainage lines 80%

Open drainage 20%

4.4.3 Transportation & Road Network

Village Approach Road:-

1. Bhilvan to Patan road is very good condition.
2. Bhilvan to Deesa road is good condition.

Main Road:-

1. Main Road of Bhilvan village is good condition but internal road is weak condition.

Main road is in good condition but its width is too short. It is single lane road so villagers want to it double lane road.

Fig 4.4.3.1 main road

Fig 4.4.3.2 internal street during block work

Fig 4.4.3.3 internal street with block

4.4.4 Housing condition

In this village we survey that condition of houses is 90 % Pacca houses and 10 % kachha.

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

1. Hospital

Fig 4.4.5.1 Bhilvan Primary Health Center

Fig 4.4.5.2 Animal Health Center

Fig 4.4.5.3 Animal Health Center

2. Education Facility

Fig 4.4.5.4 School 1

Fig 4.4.5.5 School 2

Fig 4.4.5.6 Girls Secondary School

Fig 4.4.5.7 School 3

3. Aganwadi

Fig 4.4.5.8 Aganwadi

Fig 4.4.5.9 inside the Aganwadi

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

1. Existing Condition of Public Buildings:-

➢ The building is in condition typical for buildings of this age.

➢ Structure is essentially sound with isolated areas that require attention. Caulking and sealant requires replacement throughout the building exterior.

2. Maintenance of existing Public Infrastructures:-

➢ Other facility provided is of the drinking water facility and gram Panchayat building which is being totally obsolete.

➢ In this village also maintains for the bus stand, public toilet should be provide and primary school facilities etc. in existing public facilities are need in this village.

4.4.7 Technology Mobile/ WIFI / Internet Usage Details

All people 100 % use personal mobile and internet, but in this village are not any WIFI facilities available.

4.4.8 Sports Activity as Gram Panchayat

➢ Not any sports Activity available in Gram Panchayat.

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

Socio-cultural Facilities likes Community hall, Public Library, Public garden, Recreation center, Assembly Polling, Birth& Death, etc.

Fig 4.4.9.1 Markaz masjid

Fig 4.4.9.2 Lack View 3

4.4.10 Other Facilities

Post Office:-

➢ Govt. post office building is required.

General Market:-

➢ General Market is not available in this village.

Panchayat building:-

➢ Panchayat building is available in this village.

Bank Facility:-

➢ There is no bank available in village

4.4.11 Any other details

➢ No more details

4.5 Existing Institution like - Village Administration – Detail Profile

4.5.1 Bachat Mandali

This type of facility is not available in Bhilvan village.

4.5.2 Dudh Mandali

Fig 4.5.2 Dudh Mandali

4.5.3 Mahila forum

This type of facility is not available in Bhilvan village.

4.5.4 Plantation for the Air Pollution

Fig 4.5.4 Plantation for the Air Pollution

4.5.5 Agricultural Development

Fig 4.5.5 cattle farm

5. Technical Options with Case Studies

5.1 Civil Concepts

5.1.1 The Ideal school

In our opinion, in an Ideal Country, children should start going to the first form of education at the age of 3, because this is the age when they become aware of what happens around them and it helps their development. This first form of education is called DREAMLAND.

At the age of 6, children take their FIRST STEPS and explore the world of knowledge. These are the years when they learn what they like and what topics they would like to study more in the future.

When children turn 10, they become students of a MIDDLE SCHOOL. Students should be able to choose their favourite subjects and make their own schedule.

Between 14 and 18 years old, children choose the path they would like to follow in the future and they study their favourite subjects at HIGH SCHOOL. This way, when they turn 18 and they go to COLLEGE, they are already prepared to be specialised in their field of interest.

At 22/24, when they finish COLLEGE, young people are already prepared for their careers, they have enough field / lab / office experience (due to their practical classes) to be hired immediately and do the type of work that they are best at and the happiest about.

Fig 5.1.1.1 school building 1

So that, The SCHOOL BUILDINGS should be large enough to host popular courses and to allow students to have their own lockers. They should not have white walls. There should also be a large gym and a huge library full of books.

The CLASSROOMS should be well supplied, and there should be a computer for every student and teacher, therefore the smart board could be optional. The DESKS could form a CIRCLE (as the ideal shape of a classroom). Since the students have permanent access to a computer, they do not need to look at the board any more – the teacher could simply use the PC to show them the materials. There should be around 15 STUDENTS in each class: not too few, since this way they are able to listen to more different opinions, and not too many, since the teachers should be able to check the students' work faster.

Fig 5.1.1.2 ideal classroom

The Perfect School Campus: The Importance of Having a Good School Infrastructure

The location of a school has an enormous significance, and it should be set up in a suitable atmosphere. It should be far away from the noises and the polluting atmosphere where the child can easily absorb what is being taught in school. The ambience should be calm, spacious with good amenities and utilities in a visually appealing landscape. The school should have enough lighting, useful facilities such as libraries, toilets, playground, sinks, multipurpose rooms, work areas, lockers, storage spaces, teachers, administration, etc.

Fig 5.1.1.3 school building 2

Some of the things you need to look into while selecting a good school for your child. These are key elements that comprise of a school's infrastructure:

School Building

Classrooms

Library

Importance of a Good School Infrastructure

The impact of infrastructure on educational quality

Attendance and completion of education

Teacher motivation.

Fig 5.1.1.4 ideal school

School Building:

The building should be spacious, well planned with good architectural features. There should be good ventilation in all the classrooms along with facilities like fans, lights, benches, chairs, backboard, etc. There should also be facilities such as laboratories, art and crafts workshops, multimedia room, school office, theatre and many more.

Classrooms:

The backbone of any school's infrastructure is the classroom. There should be adequate classrooms and it should look pleasant with good painting and decorations. The front wall should have an appropriate blackboard. The wall should have built in cupboards for keeping books and others important things.

Library:

It plays an important part in the learning process of the school as it's a counterpart of the schools infrastructure. It should be located in a place where it's quiet and calm with a soothing ambience for the students to concentrate better.

Importance of a Good School Infrastructure:

A good school infrastructure with good spaces makes it a good place for the children to study. The impact of educational spaces on the students set out to identify empirical well-being of students in schools. It makes it interesting and gets the children motivated to come to school, this in turn improve the attendance and interest of students in learning. Thus, it's important for schools to have good infrastructure to improve the performance of the students and improving the school's system. A good

school infrastructure is important, but at the same time, it should also have emphasis on a child friendly ambience, and activity and value based learning.

What makes a good school building?

A good school is driven by its educational vision and ethos. The role of school buildings, whether new or partly refurbished, can facilitate this vision. In school design there are many common parts, teaching spaces, staff spaces, and large spaces. However one size does not fit all. The school building needs to function, eliminating challenges such as cramped spaces, lack of natural light, and bad acoustics. What's more, school buildings should relate to their surrounding community, each offering its unique set of challenges and opportunities.

5.1.2 Prefabricated Material

Prefabricated building materials are used for buildings that are manufactured off-site and shipped later to assemble at the final location same of the commonly used prefabricated building materials are aluminum steel, wood, fiberglass and concrete.

Prefabricated metal buildings use galvanized Steel and galvalume as the chief materials for building. Galvalume is a form of Steel coated with aluminum Zinc. This is to protect the building against corrosion rust and fire. It also provides a sturdy and protective covering to the prefabricated building. Almost all the components of a metal building such as beams, frames, columns, walls & roofs are made of steel.

Fig 5.1.2.1 Prefabricated building construction

Most prefabricated military buildings use steel or aluminum frames. Prefabricated, building materials used for small prefabricated buildings are steel, wood, fiberglass. Plastic or aluminum materials. These materials are cheaper than regular brick and concrete buildings. Materials like steel, fiberglass, wood and aluminum are used as prefabricated building materials for sports buildings. These materials provide flexibility and are preferred for making structures and accessories like stands and seats for stadium and gyms.

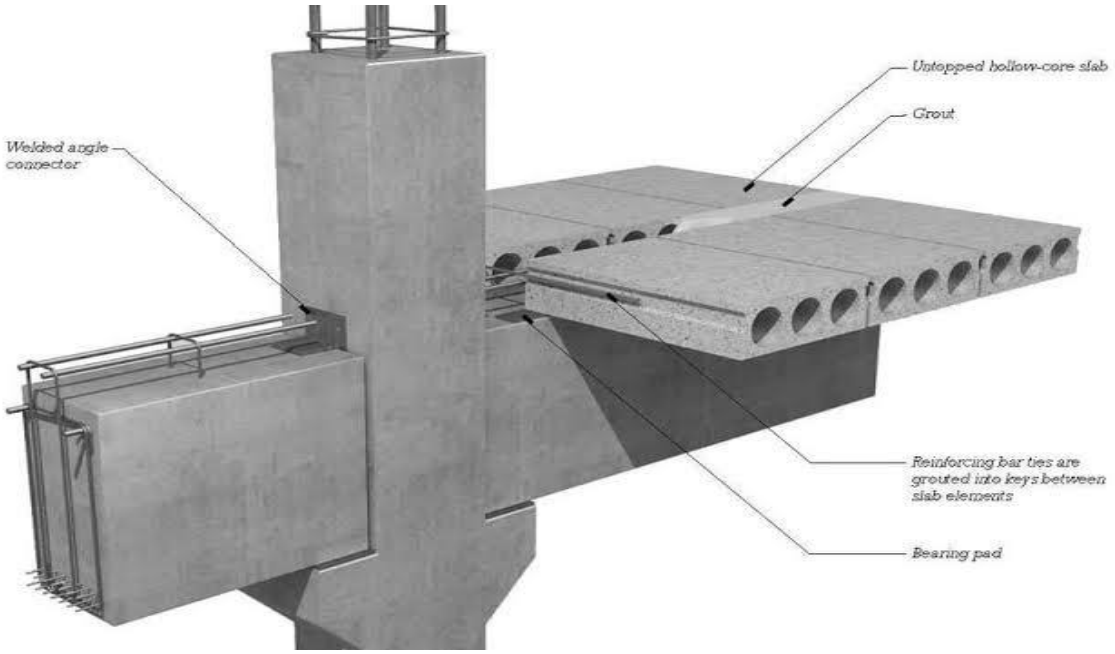


Fig 5.1.2.2 Prefabricated structure

Precast structure Installation

The following steps to be followed to erect the precast structure:

1. Planning for precast installation
2. Installation process.
3. Installation using Big canopy
4. Installation construction Management.
5. Mishandling of precast panels.
6. Common defects in precast panels.
7. Precast failures.

Fig 5.1.2.3 Prefabricated house

Site Access and storage:

Check for site accessibility and precast panels delivery to site especially low bed trailers. Check whether adequate space for temporary storage before installation and ground conditions firm ground & leveled) Uneven ground will cause overstress & crack panels.

5.1.3 Hollow concrete Structure

Hollow concrete blocks are substitutes for conventional bricks and stones in building construction. They are lighter than bricks, easier to place and also confer economics in foundation cost and consumption of cement. In comparison to conventional bricks, they offer the advantages of uniform quality, faster speed of construction, lower labour involvement and longer durability. In view of these advantages, hollow concrete blocks are being increasingly used in construction activities.

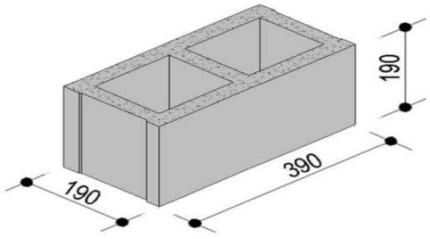


Fig 5.1.3.1 Hollow concrete brick 1

STRUCTURAL ADVANTAGES

In this construction system, structurally, each wall and slab behaves as a shear wall and a diaphragm respectively, reducing the vulnerability of disastrous damage to the Structure / building during the natural hazards.

Due to the uniform distribution of reinforcement in both vertical and horizontal directions, through each masonry element, increased tensile resistance and ductile behavior of elements could be achieved. Hence, this construction system can safely resist lateral or cyclic loading, when compared to other conventional masonry construction systems. This construction system has also been proved to offer better resistance under dynamic loading, when compared to other conventional systems of construction.

Fig 5.1.3.2 Hollow concrete brick 2

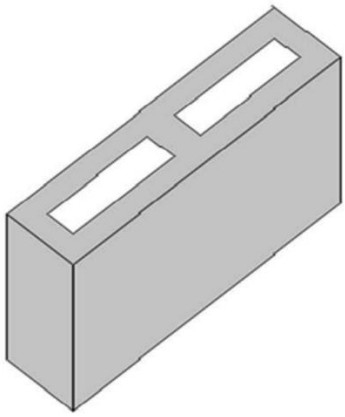


Fig 5.1.3.3 Hollow concrete brick 3

Constructional advantages

- No additional formwork or any special construction machinery is required for reinforcing the hollow block masonry.
- Only semi-skilled labour is required for this type of construction.

- It is a faster and easier construction system, when compared to the other conventional construction systems.
- It is also found to be a cost-effective disaster resistant construction system, as explained in the next section.
- This construction system provides better acoustic and thermal insulation for the building.
- This system is durable and maintenance free.
- Reduction in Dead Load
- Reduced Air Conducting Load: - Approx.50% saving.
- No salt peter or leaching: - Reduction in maintenance.
- Increased carpet area: - Due to smaller in size.
- Faster construction: - Easy to work with bigger in size.
- Assured Quality: - Fully automatic block plant.
- Better sound absorption: - Being hollow in nature.
- Reduced thickness of plaster: - Due to size accuracy & less cement consumption due to fewer joints.
- Load bearing walls: - Due to higher strength of blocks.
- Recommended for earth quake resistance.
- Less water absorption:- Approx. 3 to 4%
- Environmental Eco-Friendly
- Reduce in total cost of project: - Being less dead load of walls.

The standard sizes of hollow concrete blocks are:

Hollow blocks with two cavities in each block

(a) 400mm x 200mm x 200mm

(b) 400mm x 200mm x 150mm

(c) 400mm x 200mm x 100mm

Half Blocks

(d) 200mm x 200mm x 200mm

(e) 200mm x 200mm x 150mm

(f) 200mm x 200mm x 100mm

5.1.4 Corrosion Mechanism, Prevention & Repair Measures of RCC Structure

The durability of concrete structures is influenced by various factors, for example, ecological presentation, electrochemical responses, mechanical stacking, affect harm and others. Of all of these, consumption of the fortification is likely the primary driver for the disintegration of steel strengthen cement RC structures.

Fig 5.1.4.1 Effect of corrosion in reinforcement

To accomplish this, singular research bundles were recognized from the above expansive four approaches for repair, substitution and recovery. These were

1) Patch repairs and nascent anodes,

2) Impressed Current Cathodic Protection,

3) Galvanic Cathodic Protection,

4) Hydrophobic medications.

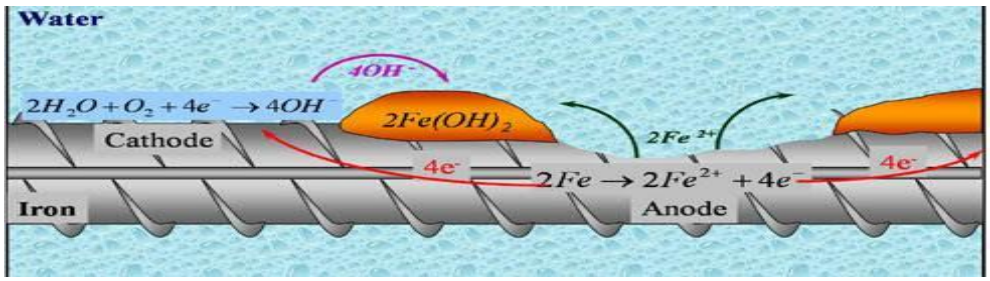


Fig 5.1.4.2 Corrosion of material

Fig 5.1.4.3 Repairing corrosion damage material

The determination of the above research bundles depended on over a wide span of time use by the development industry to repair, renovate and restore RC structures.

Their commitments might be comprehensively arranged as,

I) Investigations on how particular medications and materials perform,

ii) Investigations on the viability of existing techniques for estimations and creating options,

iii) Changes to the current hypothesis of consumption commencement and capture furthermore

iv) Changes to administration system methodologies.

5.1.5 Soil Liquefaction

Liquefaction is a phenomenon in which the strength and stiffness of a soil is reduced by earthquake shaking or other rapid loading. Liquefaction and related phenomena have been responsible for tremendous amounts of damage in historical earthquakes around the world.

Local soil conditions have a significant effect on damage to structures caused by earthquakes. During an earthquake, different kinds of soil conduct generated seismic waves in different ways and their effect on structures depends on the characteristics of the foundation soil. Many earthquakes, such as those that occurred in Japan in 1964 (Niigata) and in 1995 (Kobe), emphasized the impact and the possibility of the soil liquefaction. Liquefaction is one of the most dramatic phenomena and causes of damage to structures during the earthquake.

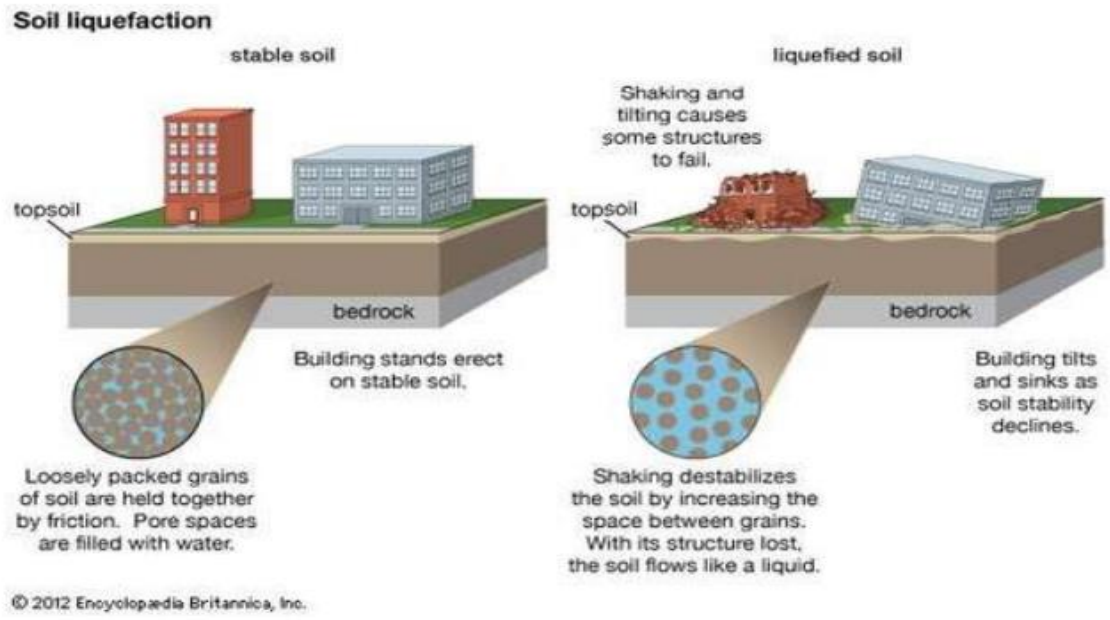


Fig 5.1.5.1 soil liquefaction

Liquefaction occurs in saturated soils, that is, soils in which the space between individual particles is completely filled with water. This water exerts a pressure on the soil particles that influences how tightly the particles themselves are pressed together. Prior to an earthquake, the water pressure is relatively low. However, earthquake shaking can cause the water pressure to increase to the point where the soil particles can readily move with respect to each other.

Earthquake shaking often triggers this increase in water pressure, but construction related activities such as blasting can also cause an increase in water pressure.

Fig 5.1.5.2 building collapse

Liquefied soil also exerts higher pressure on retaining walls, which can cause them to tilt or slide. This movement can cause settlement of the retained soil and destruction of structures on the ground surface.

The soil particles begin to move freely in the water and the soil behaves like thick liquid. Description of liquefaction occurrence: Certain materials have a tendency to decrease the volume or compactness during the deposition of any type of load (static or dynamic). Since the earthquake load is cyclic and fast, the soil has no possibility of draining the water in the pores and there is an increase in the pore pressure (Picture below).

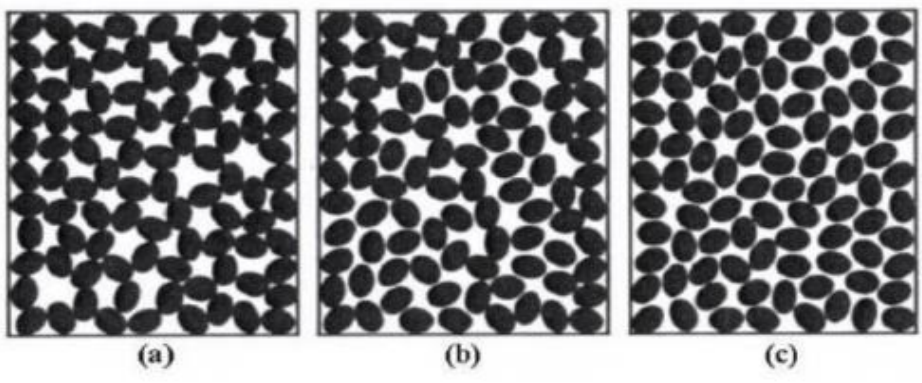


Fig 5.1.5.3soil behaves

Determining the liquefaction potential

In order to estimate the occurrence of liquefaction at a location during a strong earthquake, it is Necessary to investigate the location and make a geotechnical report that should contain the Following data:

-Position of the location

-Granulometric composition of the soil on location

-Soil compaction on location

-The degree of saturation with water

-Seismic activity zone of location

-Existing data on previous occurrences of liquefaction on location

Structure protection measures in case of liquefaction Prevention of consequences of liquefaction on existing structures can be executed in several ways:

– avoiding the construction of structures on the soil susceptible to liquefaction process

– adjusting the structure foundations to the type of soil susceptible to liquefaction

– improving or replacing the soil susceptible to liquefaction before construction of the structure

Fig 5.1.5.4 structure failure due to soil liquefaction

5.1.6 Advance Sustainable construction techniques

1 Technique for Sustainable Building Construction

The three largest construction projects underway in the Twin Cities all have a recycling rate of more than 90%, one of which is the new Viking Stadium. Pictured here is part of that project, the demolition of the old Metronome. -A quieter part of the sustainability story is the evolution in construction techniques and materials acquisition that can reduce waste, energy and various inefficiencies at building sites.

Fig 5.1.6.1 collapse stadium

Here five techniques that are having the greatest impact on sustainable building construction.

1. Prefabricating Materials in Controlled Environments Constructing as much of a structure in a controlled environment as possible has improved the quality of buildings and resulted in less trash, says Spencer Finest, principal of Minneapolis-based Greiner Construction.

2. Construction Waste Management reducing waste is becoming more achievable for contractors as haulers have grown more sophisticated in recent years. Where jobsites once had trash bins for different types of waste, they now need just one, in many cases, because haulers use pickers to separate materials.

3. Managing the Site for Improved Environment Storm water pollution prevention has become a “big deal” to municipalities and the state and federal government, says Smoczyk at Kraus-Anderson.

4. Lean Manufacturing to Reduce Energy McGough’s Brenteson says his company encourages rethinking construction approaches through lean thinking.

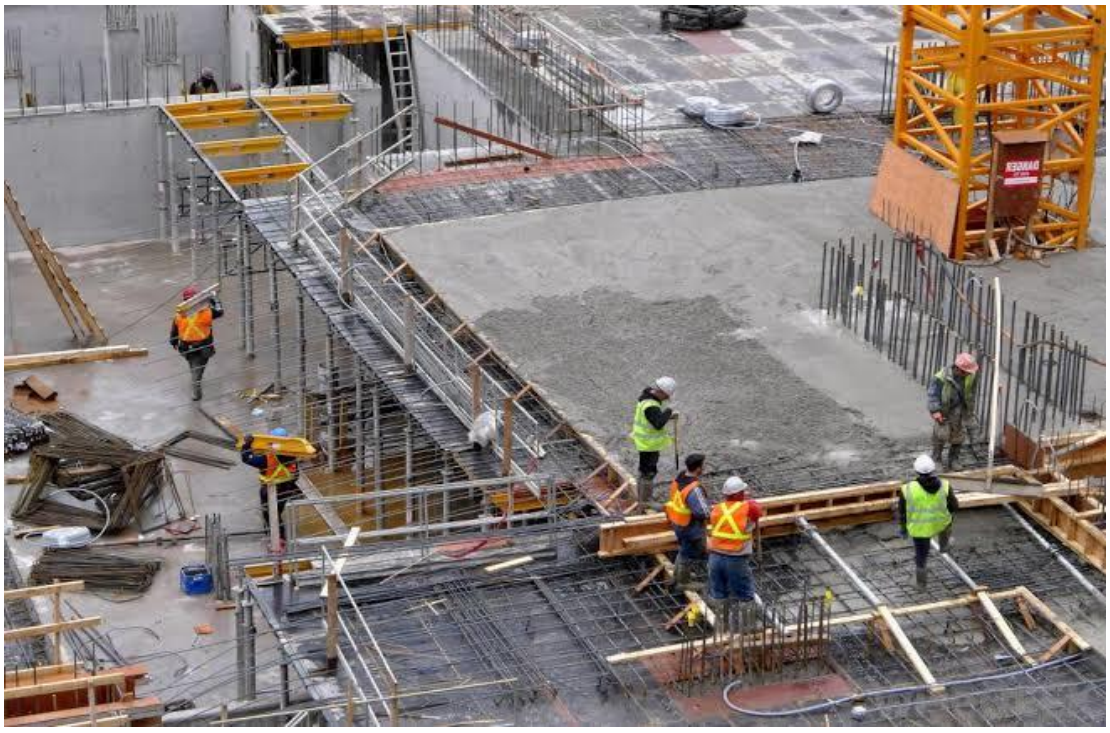


Fig 5.1.6.2 Sustainable construction

1. IoT Integrated Automated Building Systems

The Internet of Things (IoT) gives facility managers access to data that they did not previously have access to. These small connected sensors can integrate with automated building systems to improve the sustainability of operations.

2. Synthetic Roof Underlayment

The underlayment on roofs is typically asphalt-based, which breaks down relatively quickly. Replacing this layer is necessary to keep moisture out of the building's interior. Synthetic roof underlayment offers an alternative that weighs less and holds up to the wear and tear of an exterior environment.

3. Green Roofs

Another innovation for the top of commercial properties comes from green roofs. Grass, plants, flowers, bushes and other greenery grows on the roofing material. Storm water is absorbed into the soil and managed more easily than with a bare roof.

4. Grid Hybrid System

Renewable energy sources provide a sustainable way for organizations to power their commercial properties, but many grid systems lack storage to power facilities during times of low solar availability.

5. Passive Solar

Another way to leverage a sustainable solar energy source is to construct the building based on the passive solar concept. The facility's location and design maximize solar energy for heating during winter, while reducing its impact during warmer months.

6. Greywater Plumbing Systems

Greywater reduce the facility's need for fresh water, as everything except for toilet streams can be processed for reuse. The most common uses for this water include irrigation and supplying toilets with water.

7. Electro chromic Glass

Electro chromic glass can shift from clear to opaque based on external stimuli such as an electrical current or UV rays. It eliminates the need for shades and other window treatments, while adapting to current conditions passively.

8. Solar Thermal Cladding

Solar thermal cladding is a passive solar building method designed specifically to hold heat during the winter. The sun's energy is stored within this material and passed through to the building for heat retention purposes.

9. Structural 3D Printing

Creating and moving building materials to the job site can have heavy environmental costs. As structure 3D printing begins moving forward, it becomes easier to cut down on shipping costs or reduce the weight of components.

10. Self-healing Concrete

This material is in its early stages, but once it's commercially viable it opens up many sustainable possibilities. Everything from roads to walkways can benefit from concrete that heals itself. Road crews would no longer need to shut down busy streets and highway lanes to address potholes and cracks.

5.1.7 Transport Infrastructure

The economic role of transport infrastructure the impact on growth of investment in transport infrastructure varies in the different stages of a country's economic development. In low-income countries, investment in basic infrastructure provision can make a very large difference in access to education, jobs and services. As incomes rise, better transport services are needed to support the growth of business activities, exports and value creation, and the focus for infrastructure investment shifts to supporting these sectors of the economy.

Fig 5.1.7.1 Transport infrastructure

Transport infrastructure consists of the fixed installations necessary for transport and includes road, railways, airways, waterways, and terminals.

Types of transport system:

1 Road

2 Rails

3 Pedestrian

4 Urban waterways

5 Subway systems

6 Bridges and fly-overs

7 Terminals

7.1 Airports

7.2 Train station

7.3 Metro station

7.4 Bus terminal

7.5 Freight terminal

7.6 Sea port

8 Traffic intersections

9 Related subjects

10 Footnotes and references

Fig 5.1.7.2 Transport system

1 Road

A road is a paved surface to facilitate the movement of people or goods with road transport means, such as as automobiles, bicycles, buses, vans or trucks. Roads in itself are not an interesting security target, but blocking a road will cause problems with the traffic flow and reachability of certain parts of the city or area.

2 Rails

Rails are the infrastructure for rail transport. A rail road which connects two locations is also called a rail line. As for roads, rails on itself are not an interesting security target, but blocking a railroad will cause large problems with the rail transport.

3 Pedestrian

Delineated bicycle and pedestrian paths at roundabouts in The Netherlands Pedestrian paths or sidewalks, curbs, pavements, footpaths or platforms are paths alongside a road designated for pedestrians.

4 Urban waterways

Inter and intra urban transport over waterways such as canals, rivers or other waterways forms a smaller although still important aspect of the urban transport system

5 Subway systems

A rapid transit, underground, subway, elevated railway, metro or metropolitan railway system is an electric passenger railway in an urban area with a high capacity and frequency, and grade separation from other traffic. Rapid transit systems are typically located either in underground tunnels or on elevated rails above street level.

6 Bridges and fly-overs

A bridge is a structure built to span physical obstacles such as a body of water, valley, or road, for the purpose of providing passage over the obstacle.

7 Terminals

A terminal is any location where freight and passengers originates, terminates, or is handled in the transportation process. Terminals are central and intermediate locations in the movements of passengers and freight.

Fig 5.1.7.3 terminals

7.1 Airports

An airport is a location where aircraft such as fixed-wing aircraft, helicopters, and blimps take off and land. Aircraft may be stored or maintained at an airport.

7.2 Train station

A train station, also called a railroad station or railway station and often shortened to just station, is a railway facility where trains regularly stop to load or unload passengers or freight.

7.3 Metro station

A metro station or subway station is a railway station for a rapid transit system, often known by names such as "metro", "underground" and "subway".

7.4 Bus terminal

A bus terminus is a designated place where a bus or coach starts or ends its scheduled route.

7.5 Sea port

A sea port is a location on a coast or shore containing one or more harbors where ships can dock and transfer people or cargo to or from land.

5.1.8 Rain water harvesting

Rainwater harvesting is the simple process or technology used to conserve Rainwater by collecting, storing, conveying and purifying of Rainwater that runs off from rooftops, parks, roads, open grounds, etc. for later use.

Rainwater harvesting systems consists of the following components:

1: Catchment- Used to collect and store the captured Rainwater.

2: Conveyance system – It is used to transport the harvested water from the catchment to the recharge zone.

3: Flush- It is used to flush out the first spell of rain.

4: Filter – Used for filtering the collected Rainwater and remove pollutants.

5: Tanks and the recharge structures: Used to store the filtered water which is ready to use.

The process of rainwater harvesting involves the collection and the storage of rainwater with the help of artificially designed systems that run off naturally or man-made catchment areas like- the rooftop compounds, rock surface, hill slopes, artificially repaired impervious or semi-pervious land surface.

Several factors play a vital role in the amount of water harvested. Some of these factors are:

1: The quantum of runoff

2: Features of the catchments

3: Impact on the environment

4: Availability of the technology

5: The capacity of the storage tanks

6: Types of the roof, its slope and its materials

7: The frequency, quantity and the quality of the rainfall

8: The speed and ease with which the Rainwater penetrates through the subsoil to recharge the groundwater.

Fig 5.1.8 Rain water harvesting

Advantages of Rainwater Harvesting

- Less cost.
- Helps in reducing the water bill.
- Decreases the demand for water.
- Reduces the need for imported water.
- Promotes both water and energy conservation.
- Improves the quality and quantity of groundwater.

● Does not require a filtration system for landscape irrigation.

● This technology is relatively simple, easy to install and operate.

● It reduces soil erosion, storm water runoff, flooding, and pollution of surface water with fertilizers, pesticides, metals and other sediments.

● It is an excellent source of water for landscape irrigation with no chemicals and dissolved salts and free from all minerals.

Disadvantages of Rainwater Harvesting

In addition to the great advantages, the rainwater harvesting system has a few disadvantages like unpredictable rainfall, unavailability of the proper storage system, etc.

● Regular Maintenance is required.

● Requires some technical skills for installation.

● Limited and no rainfall can limit the supply of Rainwater.

● If not installed correctly, it may attract mosquitoes and other waterborne diseases.

● One of the significant drawbacks of the rainwater harvesting system is storage limits.

5.1.9 Sewage treatment plant

Sewage treatment processes

The processes at a sewage treatment works are relatively simple, and mostly mimic natural processes. Not all treatment works use all the treatment stages — some plants provide only preliminary and primary treatment, and tertiary treatment is relatively rare.

Preliminary treatment*:* this is the mechanical removal of coarse and fine solid material. the sewage passes through screens, which trap pieces of wood, rags, wire, etc. the extracted material is usually buried, but it may be burned.

Primary treatment*:* the sewage then flows slowly through grit tanks, where particles of sand or grit settle out. Fine particles still remain suspended in the sewage, so it is passed to large primary sedimentation tanks where most of the remaining particles settle out to form sludge. Primary treatment removes about 60-70% of suspended solids (table 5.1.9).

Table 5.1.9 The percentage removal (cumulative, from initial state) of constituents or characteristics of sewage after successive stages of treatment (not including sludge).

Constituent	**Primary**	**Secondary**	**Tertiary**
suspended solids	60-70	80-95	90-95
BOD	20-40	70-90	>95
phosphorus	10-30	20-40	85-97
nitrogen	10-20	20-40	20-40
E. coli bacteria	60-90	90-99	>99
viruses	30-70	90-99	>99
cadmium and zinc	5-20	20-40	40-60
copper, lead and chromium	40-60	70-90	80-89

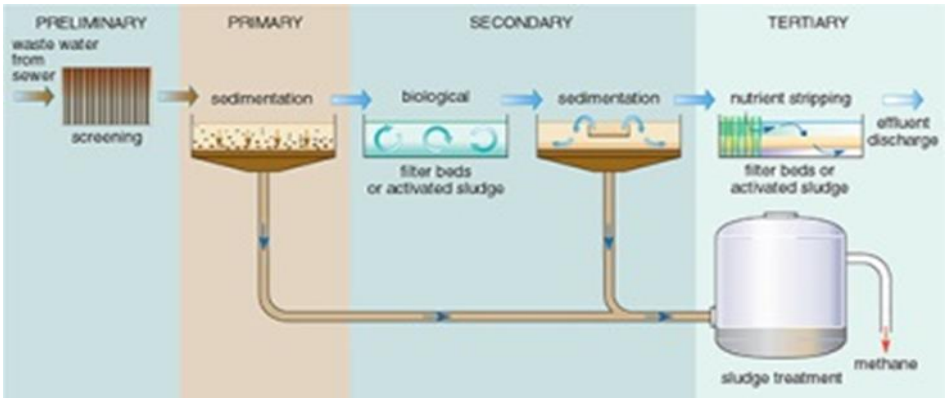


Fig 5.1.9.1 Filter beds

Filter beds: The liquid is sprayed slowly over beds of broken stones, gravel, coke or plastic (Figure below, which provide a large surface area for oxidation, and the micro-organisms (mainly bacteria) living within the filter bed break down the organic matter. The liquid that collects at the base of the filter bed contains some waste products from the filter organisms. These are separated from the

effluent in secondary sedimentation tanks, producing more sludge. Filter beds need very little supervision, but take up a lot of land.

Fig 5.1.9.2 Filter beds at a waste water treatment plant

Activated sludge: A sludge containing bacteria and other organisms is mixed with the liquid, and the whole mixture is agitated by paddles or has compressed air bubbles through it, to keep it well oxygenated. This process lasts about 10 hours, after which the mixture flows to sedimentation tanks where the sludge settles out from the effluent. Secondary treatment in addition to primary treatment removes about 70-90% of the BOD in the sewage, so the effluent is usually sufficiently purified to be discharged to a river, lake or the sea.

Tertiary treatment:

Primary and secondary treatment removes only 20-40% of the phosphorus and nitrogen, and about half of the toxic compounds. If it is necessary to reduce plant nutrients or toxic compounds beyond these levels tertiary treatment is required, but this is very expensive and not commonly used. Various types of tertiary treatment exist, e.g. nutrient stripping, disinfection by UV light or filter membranes. Where land area is available, allowing the effluent to flow through constructed ponds or lagoons is another option.

Sludge disposal:

What to do with the remaining sludge is more of a problem. Sludge is a nasty smelling, thick liquid, about 96% water, and sewage treatment plants have to dispose of vast quantities of it — a large plant will produce over a thousand tons each day.

Farmland:

Sludge disposal on agricultural land is useful as a fertilizer and soil conditioner and it is a more convenient method of sludge disposal for sewage works that are not on the coast. Tankers are used to transport the large volumes of sludge to farms. The UK disposes of much of its sludge by this method.

Landfill:

Not all sludge is suitable for farmland. For example, sludge containing toxic waste cannot be spread on fields. Instead it is dumped in natural or artificial depressions in the ground or in trenches, where it dries and decomposes slowly (and may cause unpleasant smells), and covered with a layer of soil.

Incineration:

Sludge may be dried and incinerated, leaving an inert ash. This is often the most expensive option.

5.1.10 Vertical Farming

Vertical farming is the practice of growing plants indoors under fully controlled environmental conditions in many stacked layers, using artificial lighting instead of relying on the sun. By tuning the growing environment to the exact needs of the plant and using soil-free growing techniques, vertical farming can achieve yields hundreds of times higher than conventional agriculture, 365 days a year and without requiring pesticides.

- Growing methods
- LEDs and lighting
- Environmental controls
- Sensors
- Automation
- Container farming

The report considers the economics of vertical farming in comparison to conventional agriculture and identifies opportunities for players in the industry and the wider value chain.

Fig 5.1.10 vertical farming

5.1.11 Sustainable Sanitation

The main objective of a sanitation system is to protect and promote human health by providing a clean environment and breaking the cycle of disease.

To qualify as sustainable sanitation, a sanitation system has to be economically viable, socially acceptable, technically and institutionally appropriate, and protect the environment and natural resources.

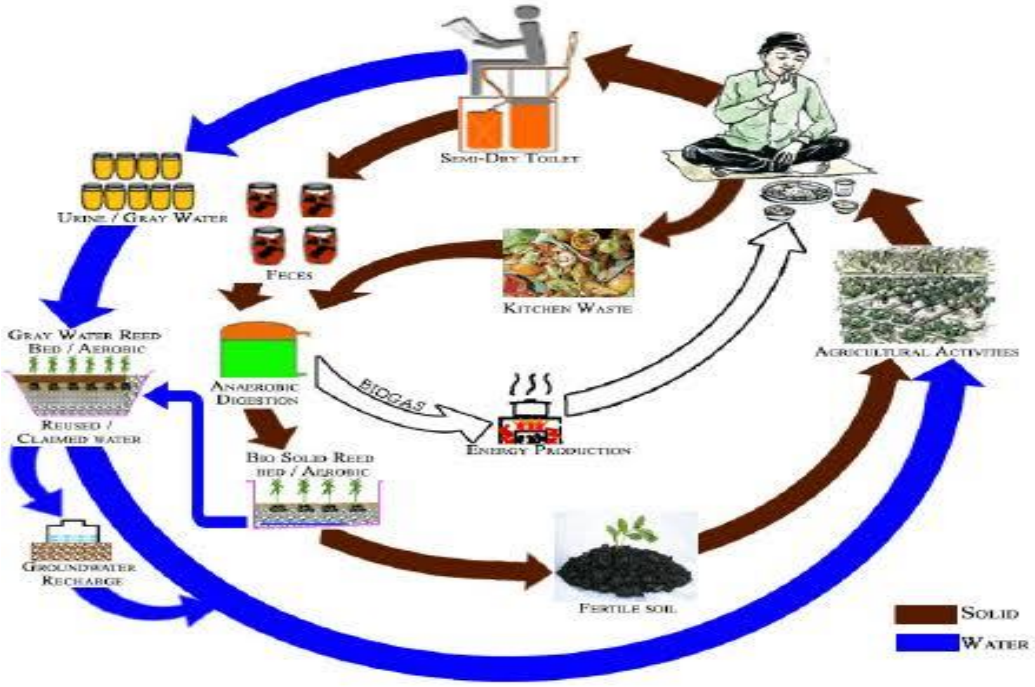


Fig 5.1.11.1 sustainable sanitation 1

Sustain believes that the following sustainability dimensions should all be considered in the design or upgrade of a sanitation system.

Technological sustainability

Technology should be a prime pillar while designing a sanitation system. Socioeconomic and demographic matrix should be prepared at a micro-level prior to the design of the sanitation system. Availability and type of land, availability of water, density of population, social and economic status of the community should be the prime factor and appropriate technological solution should be applied to design community or geography specific toilets. Technological sustainability should be determined by trained engineers.

Behavioral sustainability

Behavioral sustainability such as training the soft skills to the mass to strengthen capacity building and understanding of the interaction between the cultural, biological, physical, and social environmental factors. Programs should be focused on training communities to use the toilet and sensitize the people on the need to keep their surrounding dirt free. There is a strong need to create awareness among the population.

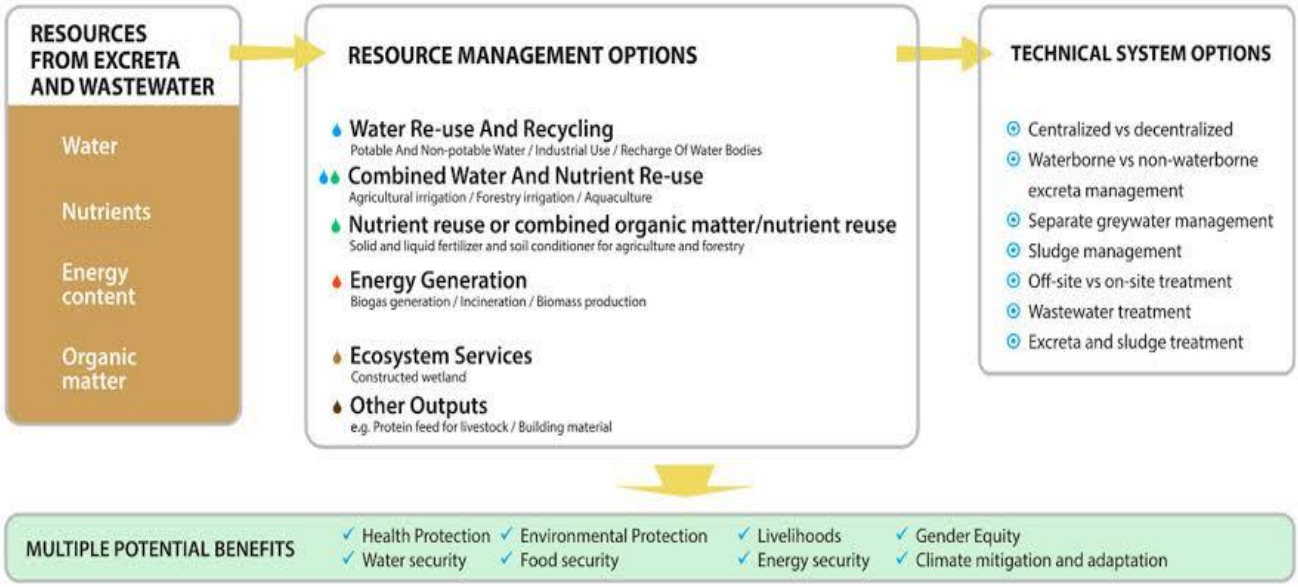


Fig 5.1.11.2 sustainable sanitation 2

Sustainability in program delivery

A robust and innovative program can additionally be proven as failed due to poor delivery mechanism, implementation, and lack of monitoring system. The Government should focus on creating a strong and sustainable mechanism and policy for delivering the plans, funds, and ideas at the grassroots level. There should be focused monitoring of the implementation backed by a penalty and incentive schemes that will encourage the channel to deliver and implement the program in a much more effective and scheduled manner.

Sustainable community toilet

Following are some of the important income generating activities that may formulate sustainable framework for community toilets in the slum:

- Pay and use system meets the demand of the community and is an economically viable income generating activity

- Monthly membership systems should offer some discounts/perks to the user and at the same time should provide a guaranteed user for the month
- Sanitary shop and multi-utility stores near toilet complexes, where fast-moving products and services such as mobile recharge, snacks, and tea will be available
- Making candles, cards, and handicraft training session for women.
- It may be a good idea to convert the urines/excreta into fertilizer and compost, and sell it exclusively to the people of the elite class who maintain huge greeneries at their home.

5.1.12 BIO-GAS PLANT

A biogas plant is where biogas is produced by fermenting biomass. The substrate used for the production of this methane-containing gas usually consists of energy crops such as corn, or waste materials such as manure or food waste. This also allows the biogas to rise more easily. Biogas is produced by microorganisms, such as methanogens and sulfate-reducing bacteria, performing anaerobic respiration. Biogas can refer to gas produced naturally or industrially.

In soil, methane is produced in anaerobic zones environments by methanogens, but is mostly consumed in aerobic zones by methanotrophs. Methane emissions result when the balance favors methanogens. Wetland soils are the main natural source of methane. Other sources include oceans, forest soils, termites, and wild ruminants The purpose of industrial biogas production is the collection of bio methane, usually for fuel. Industrial biogas is produced either;

 As landfill gas (LFG), which is produced by the breakdown of biodegradable waste inside a landfill due to chemical reactions and microbes.

 As digested gas, produced inside an anaerobic digester.

A biogas plant is the name often given to an anaerobic digester that treats farm wastes or energy crops. It can be produced using anaerobic digesters. These plants can be fed with energy crops such as maize silage or biodegradable wastes including sewage sludge and food waste. During the process, the micro-organisms transform biomass waste into biogas and digestate. Higher quantities of biogas can be produced when the wastewater is co-digested with other residuals from the dairy industry, sugar industry, or brewery industry.

For example, while mixing 90% of wastewater from beer factory with 10% cow whey, the production of biogas was increased by 2.5 times compared to the biogas produced by wastewater from the brewery only.

There are two key processes: mesophilic and thermophilic digestion which is dependent on temperature. In experimental work at University of Alaska Fairbanks, a 1000-litre digester using psychrophiles harvested from "mud from a frozen lake in Alaska" has produced 200–300 liters of methane per day, about 20%–30% of the output from digesters in warmer climates.

High levels of methane are produced when manure is stored under anaerobic conditions. During storage and when manure has been applied to the land, nitrous oxide is also produced as a byproduct of the denitrification process. Nitrous oxide (N2O) is 320 times more aggressive as a greenhouse gas than carbon dioxide and methane 25 times more than carbon dioxide By converting cow manure into methane biogas via near indigestion, the millions of cattle in the United States would be able to produce 100 billion kilowatt hours of electricity, enough to power millions of homes across the United States. In fact, one cow can produce enough manure in one day to generate 3 kilowatt hours of electricity; only 2.4 kilowatt hours of electricity are needed to power a single 100-watt light bulb for one day. Furthermore, by converting cattle manure into methane biogas instead of letting it decompose, global warming gases could be reduced by 99 million metric tons or 4%.

Fig 5.1.12 bio gas plant

Types of biogas

• Fixed Dome Biogas Plant

• Floating Drum Plant

• Low-Cost Polyethylene Tube Digester

• Balloon Plants

• Horizontal Plant

• Earth-pit Plant

• Ferro-cement Plant

• Cylindrical biogas plant

5.1.13 solid waste management

Solid waste management is a term that is used to refer to the process of collecting and treating solid wastes. It also offers solutions for recycling items that do not belong to garbage or trash. As long as people have been living in settlements and residential areas, garbage or solid waste has been an issue.

Solid waste consists of organic and inorganic waste materials produced by households, Commercial and institutional establishments that have no-economic value to the owner.

The inorganic wastes are of two types:

• Recyclable

• Non-recyclable

Fig 5.1.13.1 solid waste

Methods of Solid Waste Disposal and Management:

1) Solid Waste Open Burning
2) Sea dumping process
3) Solid wastes sanitary landfills
4) Incineration method
5) Composting process
6) Disposal by Ploughing into the fields
7) Disposal by hog feeding
8) Salvaging procedure
9) Biological digestion

Fig 5.1.13.2 six R

1. Solid Waste Open Burning

Solid waste open burning is not the perfect method in the present scenario.

2. Sea Dumping Process

This sea dumping process can be carried out only in coastal cities. This is very costly procedure and not environment friendly.

3. Solid wastes sanitary landfills

Solid wastes sanitary landfills process is simple, clean and effective. In this procedure, layers are compressed with some mechanical equipment and covered with earth, leveled, and compacted. A deep trench of 3 to 5 m is excavated and micro-organisms act on the organic matter and degrade them.

4. Incineration method

Incineration method is suitable for combustible refuse. High operation costs and construction are involved in this procedure. This method would be suited in crowded cities where sites for land filling are not available.

5. Composting process

Composting process is similar to sanitary land-filling and it is popular in developing countries. Decomposable organic matter is separated and composted in this procedure. Yields are stable end products and good soil conditioners. They can be used as a base for fertilizers.

Two methods have been used in this process:

a) Open Window Composting

b) Mechanical Composting

6. Disposal by Ploughing into the fields

Disposal by Ploughing into the fields are not commonly used. These disposals are not environment friendly in general.

7. Disposal by hog feeding

Disposal by hog feeding is not general procedure in India. Garbage disposal into sewers including BOD and TSS increases by 20-30%. Refuse is ground well in grinders and then fed into sewers.

8. Salvaging procedure

Materials such as metal, paper, glass, rags, certain types of plastic and so on can be salvaged, recycled, and reused.

9. Biological digestion

Biodegradable wastes are converted to compost and recycling can be done whenever possible. Hazardous wastes can be disposed using suitable methods.

Solid waste disposal and management includes planning, administrative, financial, engineering and legal functions. It is typically the job of the generator, subject to local, national and even international authorities.

Fig 5.1.13.3 solid waste management

5.1.14 greenhouse building

Greenhouse, also called glasshouse, building designed for the protection of tender or out-of-season plants against excessive cold or heat. In the 17th century, greenhouses were ordinary brick or timber shelters with a normal proportion of window space and some means of heating.

Many commercial glass greenhouses or hothouses are high tech production facilities for vegetables, flowers or fruits. The glass greenhouses are filled with equipment including screening installations, heating, cooling, lighting, and may be controlled by a computer to optimize conditions for plant growth. Different techniques are then used to evaluate optimality degrees and comfort ratio of greenhouses, such as air temperature, relative humidity and vapor-pressure deficit, in order to reduce production risk prior to cultivation of a specific crop.

Fig 5.1.14.1 green house

Greenhouses allow for greater control over the growing environment of plants. Depending upon the technical specification of a greenhouse, key factors which may be controlled include temperature, levels of light and shade, irrigation, fertilizer application, and atmospheric humidity. Greenhouses may be used to overcome shortcomings in the growing qualities of a piece of land, such as a short growing season or poor light levels, and they can thereby improve food production in marginal environments. Shade houses are used specifically to provide shade in hot, dry climates.

Fig 5.1.14.2 green house building

6. Swatchh Bharat Abhiyan (Clean India)

6.1 Swatchh needed in allocated village -Existing Situation

To accelerate the efforts to achieve universal sanitation coverage and to put the focus on sanitation, the Prime Minister of India had launched the Swatchh Bharat Mission on 2nd October 2014. Under the mission, all villages, Gram Panchayat, Districts, States and Union Territories in India declared themselves "open-defecation free" (ODF) by 2 October 2019, the 150th birth anniversary of Mahatma Gandhi, by constructing over 100 million toilets in rural India. To ensure that the open defecation free behaviors are sustained, no one is left behind, and that solid and liquid waste management facilities are accessible, the Mission is moving towards the next Phase II of SBMG i.e. ODF-Plus. ODF Plus activities under Phase II of Swatchh Bharat Mission (Grameen) will reinforce ODF behaviors and focus on providing interventions for the safe management of solid and liquid waste in villages.

Strategic Technology options for Swatchh Bharat Abhiyan (SBA) (Clean India) with photograph:-

• The focus of the Strategy is to move towards a ‘Swatchh Bharat’ by providing flexibility to State Governments, as Sanitation is a state subject, to decide on their implementation policy and mechanisms, taking into account State specific requirements.

• This is focused to enable States to develop an Implementation Framework that can utilize the provisions under the Mission effectively and maximize the impact of the interventions.

• The Government of India’s role would be to complement the efforts of the State Governments through the focused programmer being given the status of a Mission, recognizing its dire need for the country.

• It is suggested that Implementation Framework of each State be prepared with a road map of activities covering the 3 important phases necessary for the Programmer:

1. Planning Phase
2. Implementation Phase
3. Sustainability Phase

Planning Phase:-

1. Annual implementation plan

- GP identification
- 1. Financial resource planning

  2. Open defection elimination plan
- Design implementation approach

  3. Human resource forecasting
- Staff recruitment
- training

Implementation Phase:-

1. Advocacy and communication

- mass awareness raising
- social mobilization
- ipc/iec

  2. Financing
- fund release to implementation unit

  3. Toilet construction
- skilled masons
- supply chain

Sustainability Phase:-

.1. Hygiene promotion

- VHSNC,SHGs, MHM
- Schools,anganwadis,health

  2. Follow up
- Hand holding community for sustainability

  3. Monitoring and evaluation
- Spot checks
- Third party evaluations

Fig 6.1.1 Swatchh bharat Abhiyan 1

Fig 6.1.2 Sanitation

6.2 Guidelines - Implementation in allocated village with Photograph

A schematic representation of the SBM Programmer Implementation Diagram is represented below as an illustrative model.

• In the context of the various interventions identified in the Implementation Framework, certain approaches can be considered.

• Implementation of SBM is proposed with 'District's the base unit, with the goal of creating ODF GPs.

• The District Collectors/Magistrates/CEOs of Zillah Panchayat are expected to lead the Mission themselves, so as to facilitate district wide planning of the Mission and optimum utilization of resources.

• A project proposal shall be prepared by the District, scrutinized and consolidated by the State Government into a State Plan.

• The State plans shall provide details of the IEC, BCC, Triggering exercise, Capacity building, Implementation, Financial support and Monitoring activities planned in each district, consolidated for all Gram Panchayat.

• The District-wise plans will have Gram Panchayat wise details. The State Project Implementation Plans currently prepared by States on a perspective basis shall be revised based on the Baseline data and the revised norms of the SBM.

Fig 6.2 Swatchh Bharat Abhiyan

7. Village condition due to Covid-19

7.1 Taken steps in allocated village related to existing situation:

- People of Bhilvan village blocked border of entrance gate.
- Gram panchayat sanitize whole village.
- All the villagers were following the government rules.
- Bhilvan village has banned to entry from other state in covide situation.

There are 9 patients detected positive in covid-19 of Bhilvan village. With respect to COVID 19 pandemic, Ministry of Panchayati Raj, Government of India in close collaboration with State Governments has taken various initiatives. Close consultation and guidance of the State as well as District authorities is being maintained to ensure that lock down conditions are not violated and norms of social distancing are scrupulously followed to contain the spread of the disease.

Administrative measures

On March 18, the government issued guidelines specifying preventive measures to be taken in all government offices and employees. Recommendations include:

- avoiding face-to-face meetings and non-essential travel,
- closure of gyms and yoga centres in the Secretariat,
- home quarantine for officials exhibiting any symptoms, and
- Mandatory leave to be given to such persons going on quarantine.

Essential goods and services

On March 20, a committee was formed by the government for daily monitoring of the Availability, supplies, and manufacturing of medicines, masks, and sanitizers. On March 21, a Khas Kharid Committee was set up to ensure procurement of necessary medicines, equipment, and human resources during emergencies, bypassing existing purchase guidelines, if necessary.

Between March 21 and March 22, the government announced a partial lockdown and released a list of essential services and businesses that were allowed to operate till March 25 in the cities of Ahmedabad, Surat, Vadodara, Rajkot, Kutch and Gandhinagar. These include:

- Government and municipal departments,
- shops selling essential goods,
- Various medical facilities such as hospitals, clinics, and pharmacies,
- Public utilities,

- railways and transportation facilities,
- media, telecom, IT services,
- banks and insurance firms.

The government also invited NGOs to collaborate in the fight against COVID-19, by arranging for the supply of masks, sanitizers, and infrared thermometers, and running awareness campaigns.

During the lockdown

On March 23, the state government extended and expanded the partial lockdown announced in select cities to the entire state. The lockdown was to be in place from March 23 to March 31. In addition to the exemptions announced in the partial lockdown orders, services such as (i) cattle feeding and veterinary services, (ii) stock broking, (iii) postal and courier services, and (iv) operation of industries where workers are available on site, were permitted. The state-wide lockdown has been followed by a nation-wide lockdown since March 25. This has been further extended until May 17.

7.2 Activities Done by Students for allocated village Clean with Photograph

While meet with sarpanch took all safety guideline from government, we wear mask on our face and sanitize our hand regularly.

Fig 7.2 meeting with safety

7.3 Any other steps taken by the students

- All safety measures were taken by us while visiting the allocated village.
- Mask was always on the face.
- Regularly sanitize our hands.
- Kept social distance.

8. Sustainable Design Planning Proposal (Prototype Design) Part- I

8.1 Design Proposals

In the Part-I of Vishwakarma Yojana Phase-VIII we have selected design of bus stop, primary school, post office, Aganwadi, auditorium hall, entry gate.

8.1.1 Sustainable Design (Civil)

Post office

Post office is very important facility for villagers but Bhilvan village has no post office so we design sustainable design for village post office.

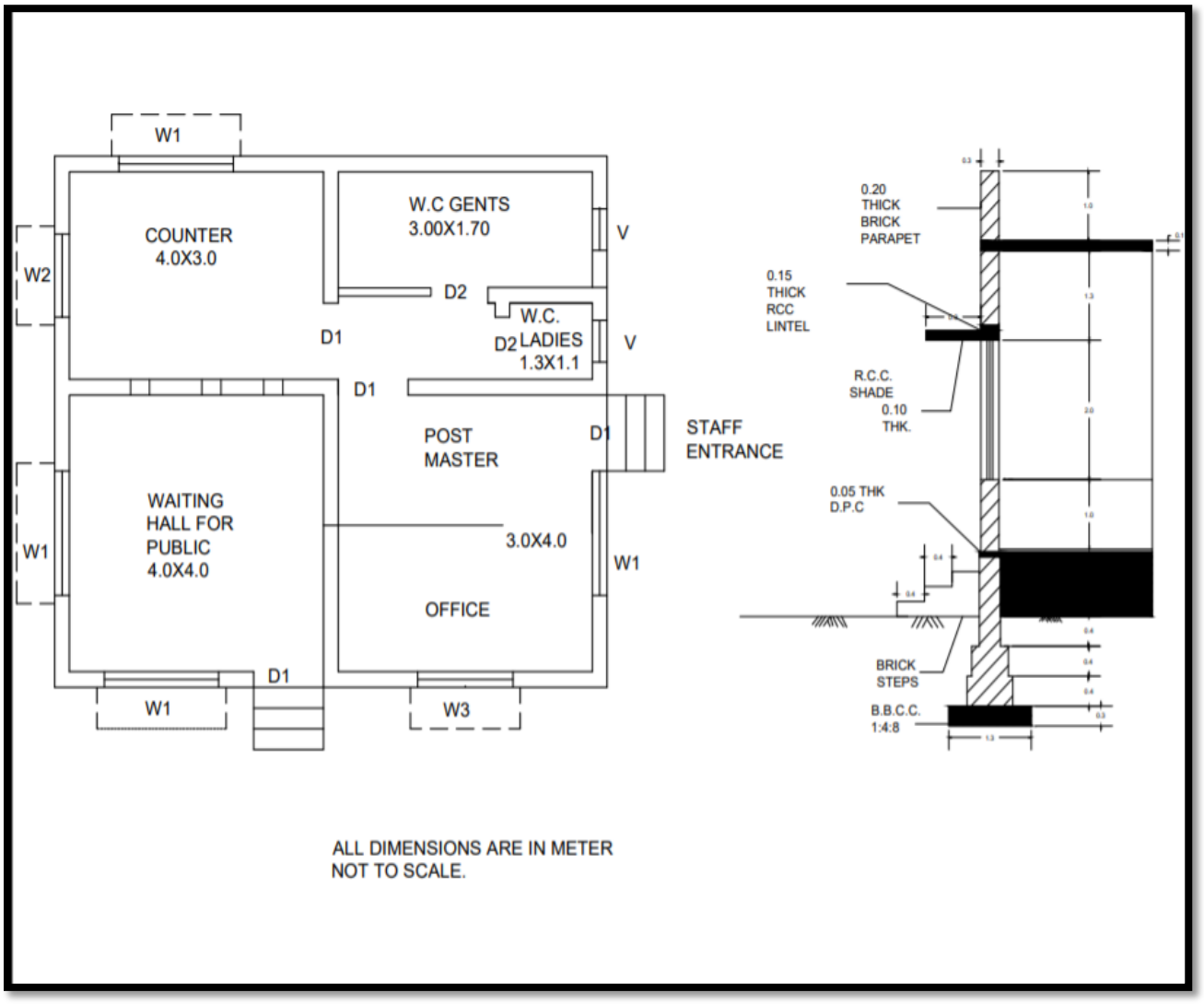


Fig 8.1.1 2d plan of post office

Estimation of post office building:-

For estimation we use centerline method.

There are 10 junctions of the walls.

So, net center – line length

= total canter line length – [½ * width * no. of junctions]

Total center line length

= 3*[4+0.2+3+0.2] horizontal walls

+ 3*[3 +0.2 + 4+ 0.2] vertical walls

+1*[3+2] between G w/c and L w/c

+ 1*[1.1 +0.2] infant of L w/c

=22.2+22.2+3.2+1.3

=48.9m

Table 8.1.1.1 measurement sheet

Item no.	Item description	No.	Length L m	Breadth B m	Height H m	quantity
1	**Earth work in excavation for foundation:** Total center line length =48.9m No. of junctions =10 S0, L = 48.9-1\2 * 0.90 *10 = 44.4 m	1	44.4	0.9	1.10	43.96m^3
2	**Brick masonry up to plinth level in C.M 1:6**					
	First step: L = 48.9-1/2*0.5*10 **=46.40m**	1	46.4	0.5	0.3	6.96
	second step: L = 48.9-1/2*0.4*10 **=446.9m**	1	46.9	0.4	0.3	5.63
	Third step: L = 48.9 -1/2 *0.3*10					

	= 47.4m	1	47.4	0.3	0.85	12.08
	Steps:					
	First step:	1	1.1	0.9	0.15	0.15
	Second step:	1	1.1	0.6	0.15	0.10
	Third step:	1	1.1	0.3	0.15	0.05
	For steps L = D1 = 1.1 m					24.97m^3
3	**Brick masonry above plinth up to slab level in C.M 1:6**					
	L= 48.9 – ½*0.2* 10					
	= 47.9 m	1	47.9	0.2	3.0	28.74m^3
	Deduction for door					- 5.57 m^3
	Deduction for Intel					- 0.646 m^3
						22.52m^3
4	Smooth plaster inside the rooms and callings in cm 1:3					238.39m^3
						-19.01 m^3
						219.37 m^3
5	Brick bat cement concrete [1:4:8] for foundation	1	44.4	0.9	0.2	7.99m^3

Table 8.1.1.2 abstract sheet

N0.	Item	quantity	rate	per	Total amount
1	Earth work in excavation for foundation:	43.96m^3	85	m^3	1,156
2	Brick masonry up to plinth level in C.M 1:6	24.97m^3	3450	m^3	86,146.5
3	Brick masonry above plinth up to slab level in C.M 1:6	22.52m^3	3321	m^3	74,788.92
4	Smooth plaster inside the rooms and callings in cm 1:3	219.37 m^3	130	m^2	28,518.1
5	Brick bat cement concrete [1:4:8] for foundation	7.99m^3	2604	m^3	20,805.96

Total item amount =211,415.48

Add water charges (1.5%) =3,171.232

Contractor's profit (10%) =21,141.548

Contingencies charges (5%) =10,570.774

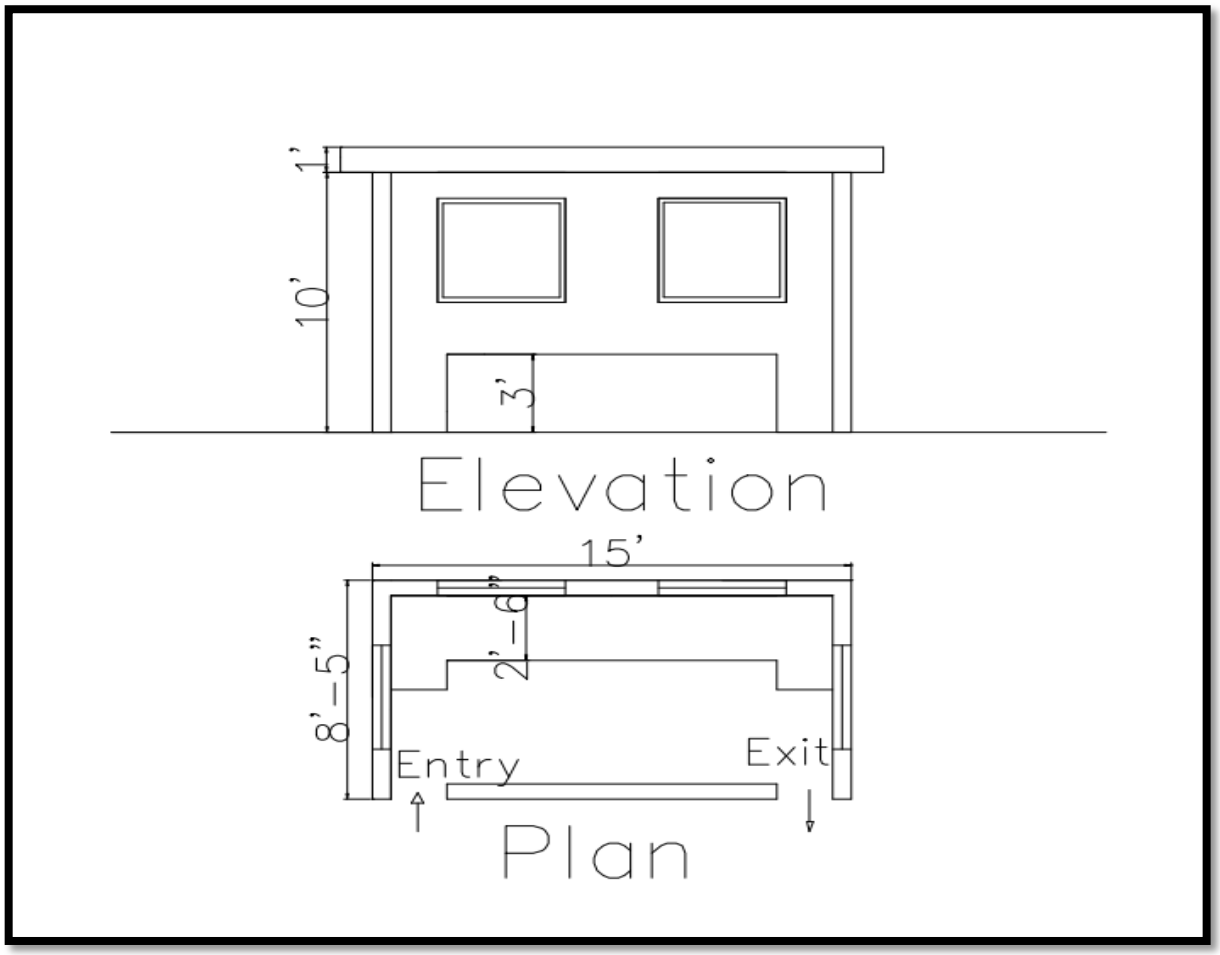
Total granted amount = 2,46,299.034

Fig 8.1.1.1 post office front view

8.1.2 Physical design (Civil)

BUS STATION:

- Bhilvan village has bus station outr side of village so that villagers are not use that bus stop.
- Buses come inside to village but into the villge no have bus stop
- So we design small suitabel bus stop for bhilvan village.



ID	ITEAM	SIZE
w	window	4'x4'

ITEM	Nos.	L	B	H/D	QUANTITY	RATE Rs.	MONEY Rs.
RCC Columns	4	0.22	0.22	3.64	1.602 m^3	13,000	83,304
RCC SLAB		3.96	4.57	0.1	1.8097 m^3	14,000	25336
MASONARY IN SUPER STRUCTURE		10.04	0.22	2.94	3.64 m^3	3500	
REDUCE							
WINDOW	4	1.21	0.2	1.21	1.171 m^3		
					1.93	3500	6755
PCC AT PLINTH		3.96	4.57	0.1	1.81 m^3	4800	8686
BOTH SIDE PLASTER		4.57 3.96 x 2	- -	3.04 3.04	13.89 24.076		
REDUCE							
WINDOW	2	1.22	-	1.22	2.44		
					35.52 m^2	130	4617
CEILING PLASTER		3.96	4.57		18.09 m^2	140	2532
			TOTAL =				1,31,230 Rs.

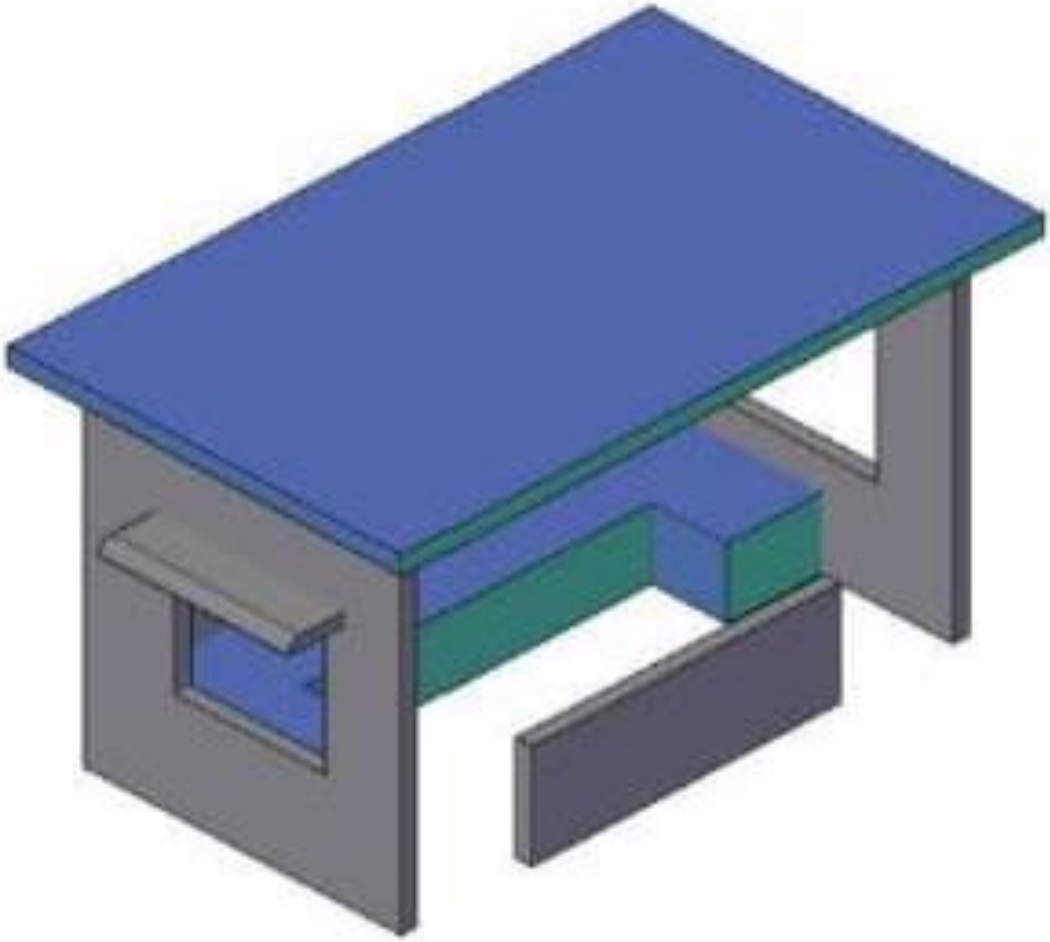
Tabel 8.1.2 abstract and quantity sheet

Add 1.5% water charges = 1,31,230 x 0.015 =1968Rs.

Add 10% contractor's profit = 1,31,230 x 0.10 =13123Rs.

Grand Total = 146,321Rs

- This Is 2d Plan Of Bus Station.
- Public Of Village Around 5000 So This Small Bus Station Is Suitable.
- The Width Of The Bus Stopn Is 15’=4.572m
- Length Of Bus Stop 8’5”=3.963m
- Height Of Bus Stop Is 10’=3.048m.



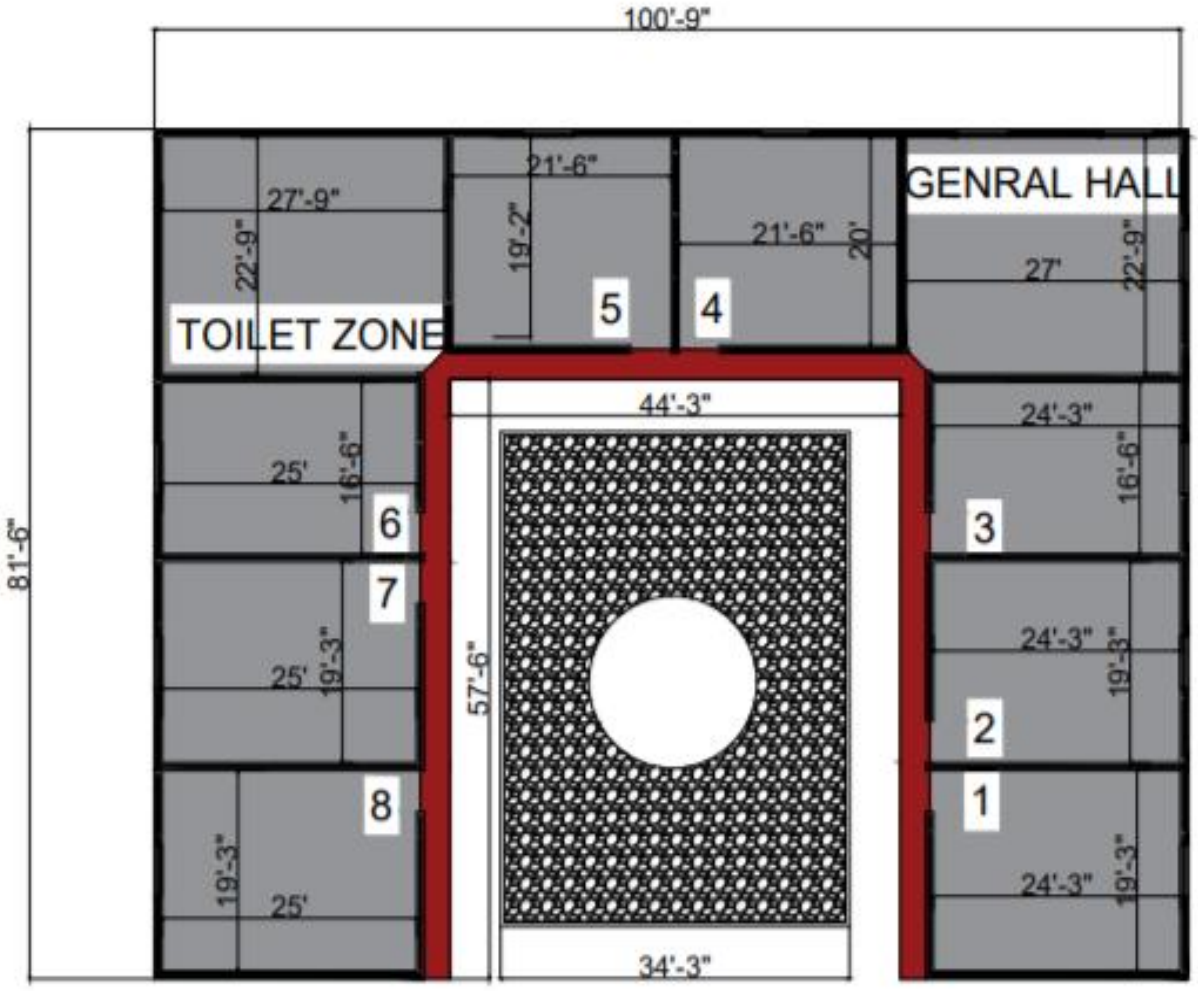
3d Model Of Bus Station

 This is simple design for bus stop of bhilvan village.

8.1.3 Social design (Civil)

PRIMARY SCHOOL:

- Bhilvan village has 1 old primary school. it has very poor condition.
- Villagers want new school building bcz of safty.
- Old school building was built in beafore the independent india.
- So we design suitabel primary school for bhilvan village.



Plan Of School Building

Fig 8.1.3.1 Front side elevation of school building

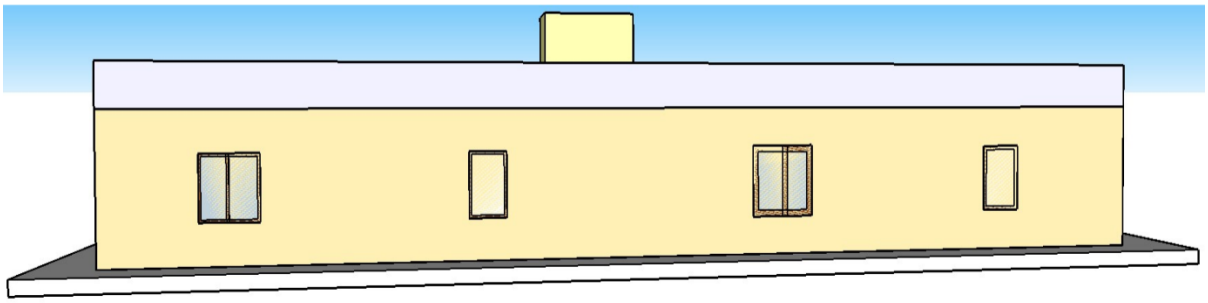


Fig 8.1.3.2 side elevation of school building

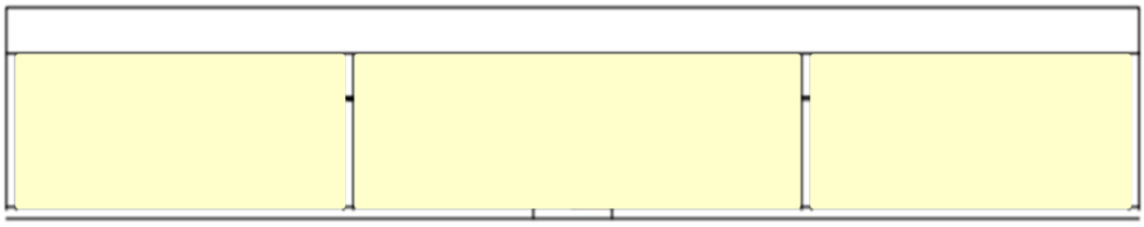


Fig 8.1.3.3 Back Side Elevation Of School Building

- School has eight class rooms.
- General room for staff members.
- Toilet at the corner side.

❖ **Approximate Esimate For School Building.**

- As Per Current Plinth total area is=8100 m^2 sq
- *Rate as per current

Tabel 8.1.3 abstract and quantity sheet

material	**Percentage from plinth level**	**Total cost**
1. Steel	24.6%	17,93,340
2. Cement	16.3%	11,88,270
3. Aggrigate	17.4%	5,39,460
4. Sand	12.3%	8,96,670
5. Brick	4.4%	3,20,760
6. Fitting		
i) Plumbing	5.5%	
ii) Electric	6.8%	
iii) Window	3%	
iv) Doors	3.4%	
v) Sanitary	4.1%	
Total Fitting	22.8%	16,62,120
7. Finishing Finishing		
i. Paint	4.1%	
ii. Tiels	8%	
Total Finishing	12.1%	8,82,090
8. Labour	30%	21,87,000
Total Cost		= 72,90,000/-

8.1.4 socio-cultural design (civil)

AUDITORIUM HALL:

- Auditorium hall is basic need of smart village.
- In smart village concept one place where people get to gather and any function celebration of villager's auditorium hall is very use full.
- In this hall one changing room, gents and ladies toilet, performance stage, public sitting area held.

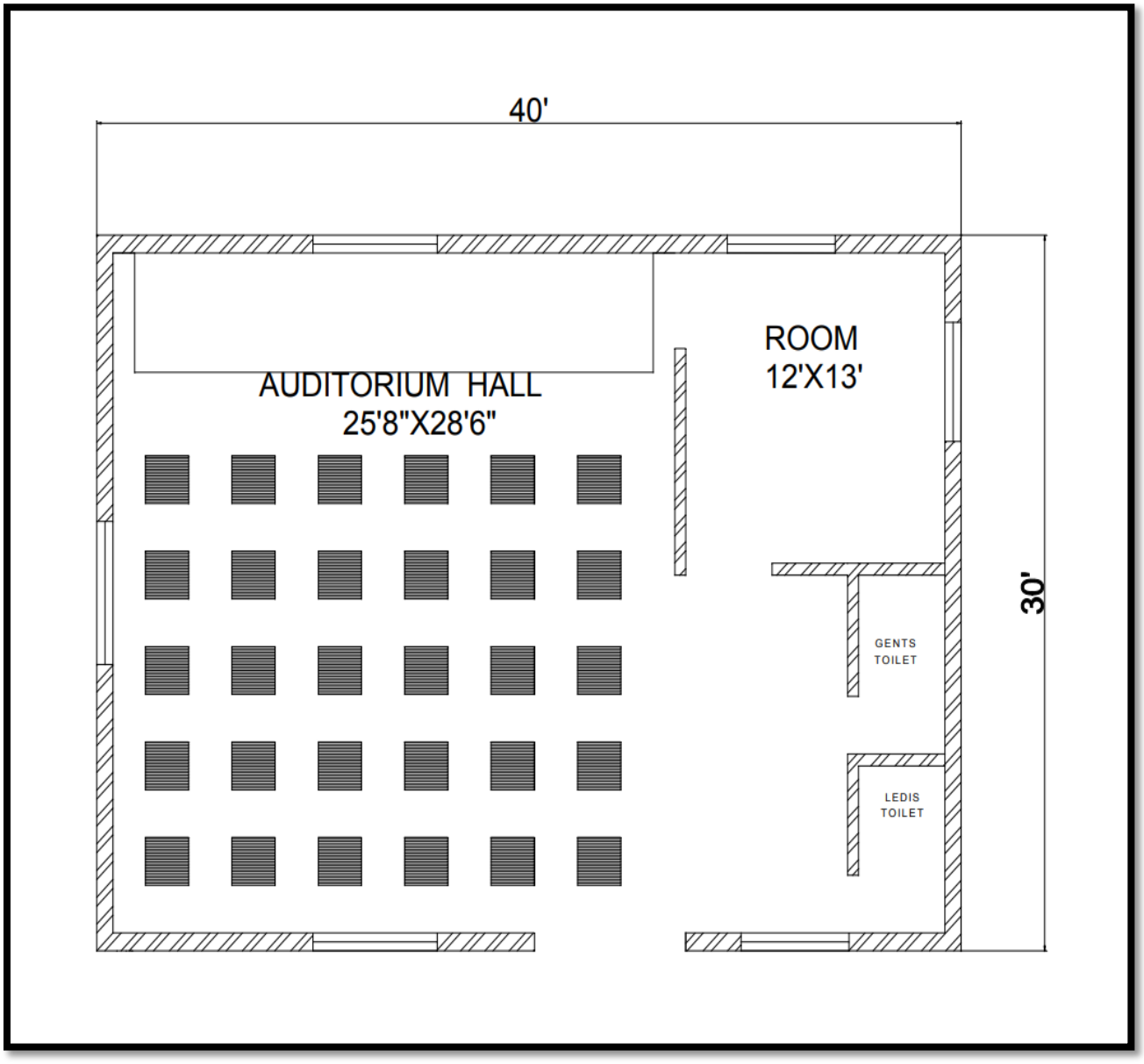


Fig 8.1.4.1 plan of auditorium hall

- Bhilvan village has no other auditorium hall so we design it for village.
- Auditorium hall has one dressing room.
- Dimension of auditorium room is 40'x30' and hall is 25'8"x28'6".
- It is useful for school function and other social functions.
- It is placed at the near panchayat house.
- It is actually need of village.

Calculation for auditorium

Total Center Line = {(8.9154*2) + (11.9634*2) + 3.8862 + 4.991}

= 49.8348m (With 2 Junctions)

Table 8.1.4(a) Measurement Sheet for Community Hall

Sr. no.	Item Description	No.	Length (m)	Breadth (m)	Height (m)	Quantity
1.	Earth work in Excavation L = 49.8348 – (0.5*0.9*2)	**1**	48.935	0.9	0.3	13.212m^3
2.	PCC (1:3:6) in Foundation	**1**	48.935	0.9	0.3	13.212m^3
3.	First class brickwork up to plinth (1:6) L = 48.935 – (0.5*0.2*2)	**1**	48.706	0.2286	0.6096	6.787m^3
4.	First class brickwork above the plinth up to first floor	**1**	48.706	0.2286	3.048	33.937m^3
Door & Window deduction						
	D	**1**	**1.22**	**0.2**	**2.1**	**2.675**
	D1	**2**	**0.91**	**0.2**	**2.1**	**0.7644**
	W	**1**	**1.524**	**0.2**	**1.4**	**0.4267**
	W1	**5**	**0.9**	**0.2**	**1.4**	**1.26**
						=2.9635m3
Net Quantity = 33.937 – 2.9635						
						=30.9735m3

Table 8.1.4(b) Abstract sheet quantities

Sr. no	Particulars	Quantity m3	Per 10 m^3	Total Amount Rs.
	Excavation for foundation	**13.212**	**800**	**10570**
	Cement concrete 1:4:8 in foundation	**13.212**	**3500**	**46242**
	Brick bat cement in foundation (1:4:8)	**6.787**	**30000**	**203610**
	First class brickwork in C.M. 1:6 in Superstructure (up to First Floor)	**30.9735**	**75000**	**2323012.5**
Net Amount of Cost up to First Floor Level				**25,83,435/-**

Fig 8.1.4.2 front view of auditorium hall

Fig 8.1.4.3 side view of auditorium hall

Fig 8.1.4.4 in- side view of auditorium hall 1

Fig 8.1.4.5 in- side view of auditorium hall 2

8.1.5 Smart village design (civil)

ANGANWADI:

- Bhilvan village has total 4 Aganwadi but 1 Aganwadi has not own building it is on rent.
- So, we design Aganwadi for village and this Aganwadi is on smart village concept.
- It has one kitchen and toilet.
- Elevation of Aganwadi is based on smart village.

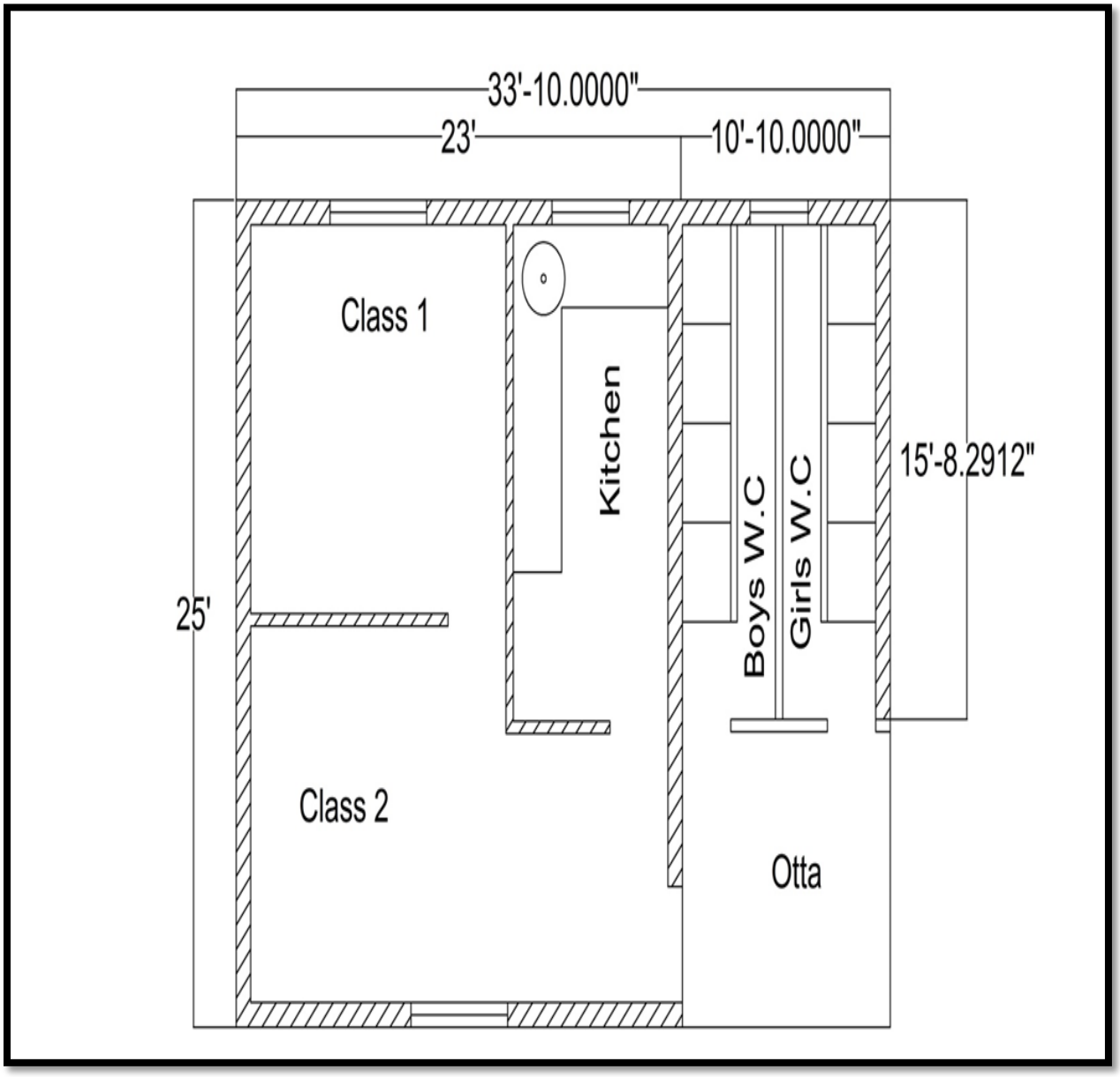


Fig 8.1.5.1 Aganwadi plan

Calculation for Aganwadi

Total Centre Line = {(2*7.3914) +10.0584+4.572+3.048+6.7818}

= 39.243m (With 2 Junctions)

Table 8.1.5(a) Measurement Sheet for Aganwadi

Sr. no	Item Description	No.	Length (m)	Breadth (m)	Height (m)	Quantity
1	Earth work in Excavation L = 39.243 – (0.5*0.9*2)	1	38.348	0.9	0.3	10.354 m^3
2	PCC (1:3:6) in Foundation	1	38.348	0.9	0.3	10.354 m^3
3	First class brickwork up to plinth (1:6) L = 38.348 – (0.5*0.2*2)	1	38.114	0.2286	0.6069	5.311 m^3
4	First class brickwork above the plinth up to first floor	1	38.114	0.2286	3.048	26.57 m^3
Door & Window deduction						
	D	1	1.22	0.2	2.1	0.5124
	D1	1	0.91	0.2	2.1	0.3822
	W	5	1.22	0.2	1.4	1.708
						=2.6026m3
Net Quantity						=23.97m3

Table 8.1.5(b) Abstract sheet quantities

Sr. no	Particulars	Quality m^3	Per 10 m^3	Total Amount Rs.
	Excavation for foundation	10.354	800	8,283
	Cement concrete 1:4:8 in foundation	10.354	3500	36239
	Brick bat cement in foundation (1:4:8)	5.371	30000	161130

	First class brickwork in C.M. 1:6 in Superstructure (up to First Floor)	23.97	75000	1797750
Net Amount of Cost up to First Floor Level				20,03,357/-

Fig 8.1.5.2 Aganwadi 3d plan

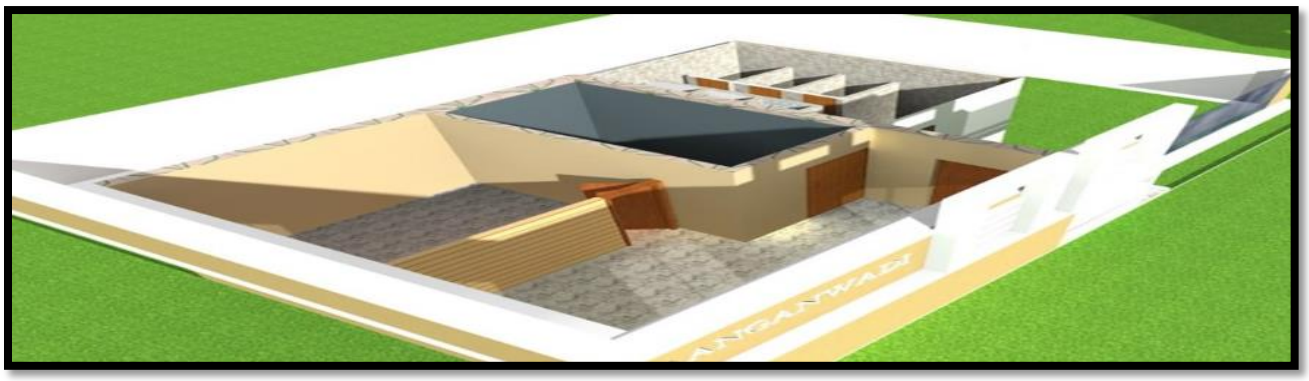


Fig 8.1.5.3 Aganwadi inside view

8.1.6 Heritage village design (civil)

ENTRANCE GATE:

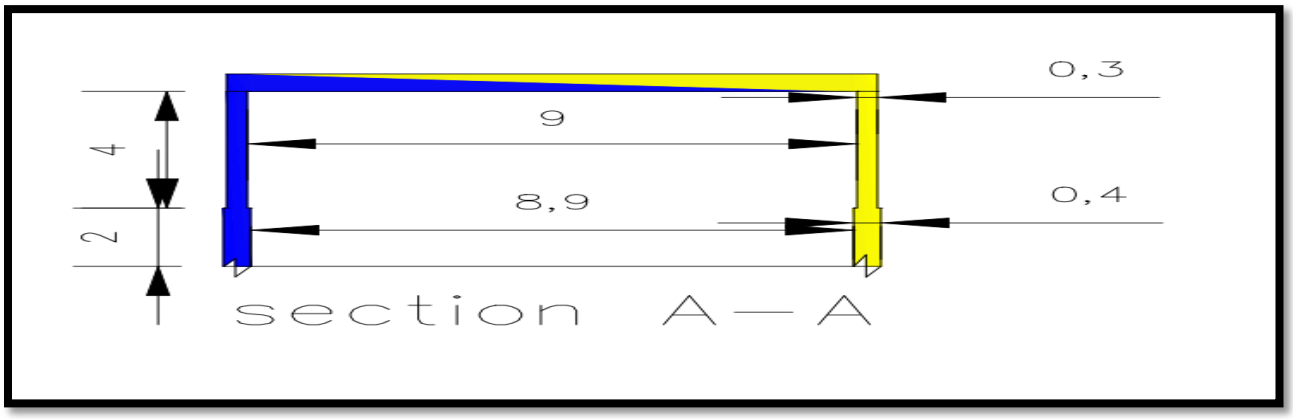


Fig 8.1.6.1 entrance gate plan section A-A

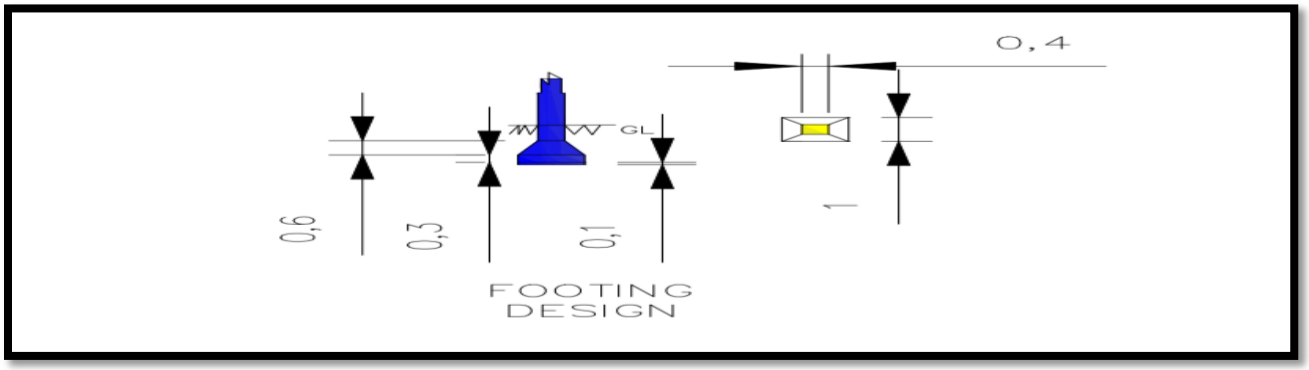


Fig 8.1.6.2 entrance gate footing plan

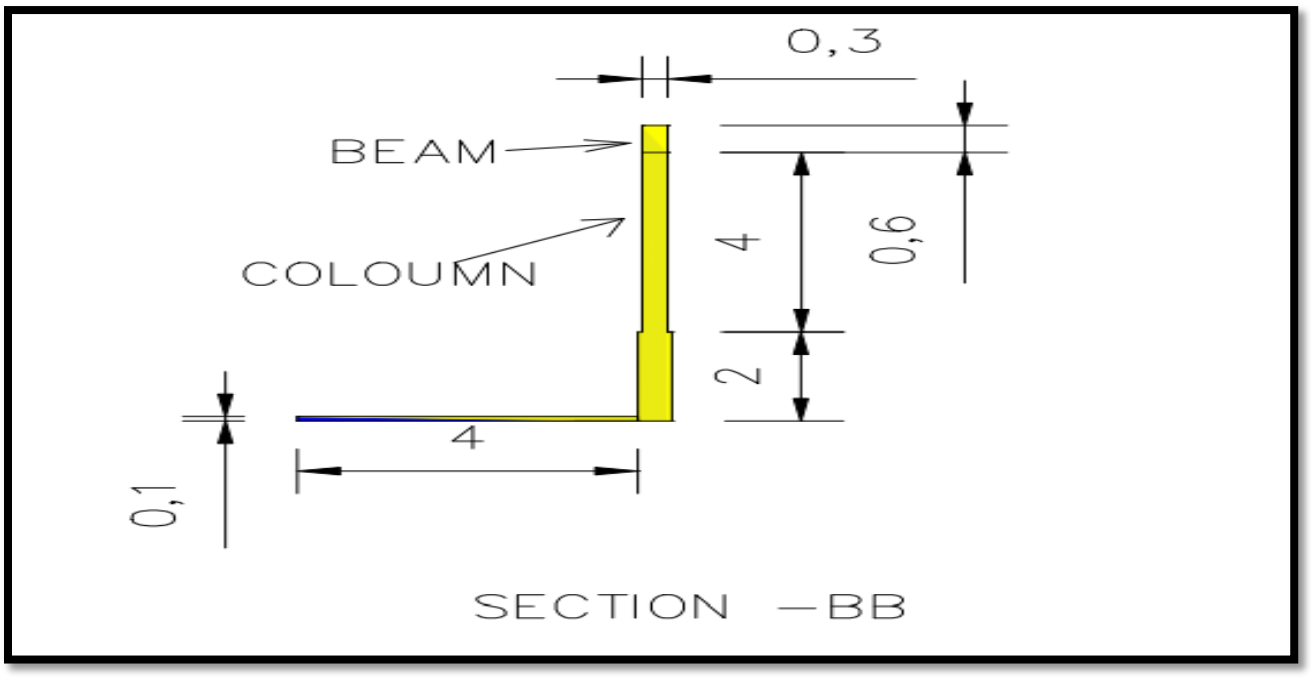


Fig 8.1.6.3 entrance gate plan section B-B

Entry gate Calculation:

Table 8.1.6 Measurement Sheet for entrance gate and Abstract sheet quantities

Sr. no	Particulars	no	L	B	H	total	Grand total
	Beam						
1.	R.C.C work 1:2:4						
	L=9.6m	1	9.6	0.3	0.6	1.728m3	1.728m3
2.	Form work for beam						
							14.58m3
3.	P.C.C. 1 : 4 : 8						
		1	1	1	0.1	0.1m3	0.1m3
4.	R.C.C. 1 :2 : 4						
	A) Footing without slope	1	1	1	0.3	0.3m3	
	B) Footing with slope						

	Vol. of sloping portion = 0.312					0.312m3	
	C) Part of column below GL	1				0.64m3	
	D) Column 0.4*0.4 m above GL	1				0.32m3	
	E) Column 0.3*0.3 m above GL	1				0.36m3	
							1.356m3
5.	Steel for column and footing						
	vertical bars of column 12 Dia. – 6 Nos.						
	L=4.2m	6	4.2	@	0.89	22.42kg	
	Dowel bars : 16 Dia. – 6 Nos.						
	L = 3.86 m						
	Lap length in compression = 24 Dia.	6	3.86	@	1.58	36.59kg	
	Lateral ties for column						
	L = 1.10 m						
	Nos. of ties = 7.22/0.15 = 48 Nos.	48	1.10	@	0.22	11.61kg	
	Footing bars : 12 Dia. – 10cm c/c Both ways.						
	L = 1.12						
	No. of bars = 10 Nos	10*2	1.12	@	0.89	19.93kg	
Net Quantity :87.95 kg							
6.	Formwork for column						

	and footing				
	Column above plinth	4	0.3	4	4.8m3
	Column below plinth	4	0.4	2.4	3.84m3
	H = 2 +0.4 = 2.4 m				
	Sloping part of footing :				
	A= 1.88 $m3$				1.88
					10.52m3

Abstract sheet for Entry Gate

No.	Item	Qty	Rate.	Per	Amount Rs.
	Beam				
1.	R.C. C. 1 : 2 : 4	1.728 m3	9000	1m3	15552
2.	Formwork for beam	45.58m3	120	1m3	5470
3.	Total quantity of steel in kg	204.05kg	50	1m3	10203
	Total amount				31225
	Column & Footing				
4.	Excavation for foundation	1.4m3	90	1m3	126
5.	Filling of foundation trench	0.624m3	55	1m3	34.32
6.	P.C.C. 1 : 4 : 8	0.1m3	2600	1m3	260
7.	R.C.C. 1: 2 : 4	1.35m3	9000	1m3	12150
8.	Column footing bars in kg	87.95kg	50	1kg	4375
9.	Column footing formwork	10.52m3	120	1m3	1262
	Total amount				18207

Total amount =Total 2 Nos. column and footing + beam

= (2* 18207) + 31225 = 67639

Fig 8.1.6.1 entrance gate

8.2 Reason for Students Recommending this Design

- For bus stop, it is spotted outside from village so villagers can't use it and it also not in working condition.so we design bus stop inside the village.
- For primary school, it is very bed condition and the building old from last 70 year and not proper facilities provide in this building. Villagers also want to rebuild their school.
- For bio-gas plant, Bhilvan village has many cattle farms so it is suitable for bio gas plant.

8.3 Benefit of the villagers

➢ The various benefits of new development or design by students are as bellow…

1) To Meet the Population Amenities.

2) To Design Eco-Sanitation System for Public Toilet to Reduce the Cost of the Construction and Meet the Government Tender Requirement.

3) The Developed new Panchayat Building to Meet the Future Requirement and Safety Instant.

4) To Increase the Communication and Skill.

5) The Developed of Social Infrastructure to Increase the Skill of the Peoples or Students.

6) To Design or Established new Technology for the Anganwadies like Theater or Online Teaching through new Story about India.

7) To Separate the Offices for Gram Panchayat Members in GP.

8) Give the New Facilities which are Recommendation by the Government Officers.

9) To Design Mobile Toilets in the Village to Meet Public Amenities every day and Big Festival.

10) To Reduce the Cost Land area Uses and Increase the Land Values.

11) To Increase the Skill and Knowledge about the Culture by Developing Community Hall.

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

1. Elevated water tank

Bhilvan village has two water tank but one of them is not working condition so we will decided to design suitable water tank for drinking water and other purpose.

2. Library

Bhilvan village has not library facility so we will design library for village. It has two reading room, one book cases room and small cabin for librarian.

3. Bank

In now a days bank facility is must needed for villagers and bank facility gives good financial growth of village. One smart village has must bank facility so we will design bank facility for Bhilvan village.

4. Gym

In this covide situation many villages affected so good health is weapon for fight all disease. For good health gym is best option so we will decide to design gym for village.

5. Rainwater harvesting

In smart village concept wastage of rain water is not preferable because value of water in rural area is high so we will decided to design rain water harvesting model for Bhilvan village.

6. Bio gas plant

Bhilvan village has many cattle farm so bio gas plant is good option for generate gas from wastage of cattle farm. So we will decided to design bio gas plant modal for part-2 design.

10. Conclusion of the Entire Village Activities of the Project

The vishwakarma Yojana given all the design which is implemented in the Bhilvan village to developed the rural area to urban area. We visit the village and meet the sarpanch and talati of the village and discuss about the infrastructure facilities available in village and other details about village. We list out the problems which villagers are facing in day to day life. Than we analysis the data collected and the list of problems and finding out the suitable mode of the solution for the particular problem.

The main objective is "All the Village Developing with Rural Solution but the all Smart Urban Facilities may have". To remember this objective to developed smart village facilities in suitable manner and reduce the migration and pollution in environment.

The Smart Villages have suitable energy resources or services for development to provision of good education, health facilities, clean water, sanitation and nutrition, to increase the productive enterprise to boost the income or wealth, security, generate equalities in both sides and many all types of infrastructures. This all the facilities provide in the rural village to develop or carry it to urban cities. To use the Smart village (Ideal village) in reference to developed all the villages in the India. To provide best infrastructure facilities in the village to promote the overall income wealth and economy in the areas. This main objective to carries Vishwakarma Yojana: to developed the entire village in one by one in the nearest cities to more away.

From the take good decision to develop the Good Economic Profile, Good Employment Solution from smart village examples.

The main aim is to implement the project to provide all the facilities in both sides rural & urban to decrease the migration. The rural sector will under developed in which there are many employments promote from the agriculture areas and also boost to all peoples to livelihoods in good or attempt infrastructure.

11. References refereed for this project

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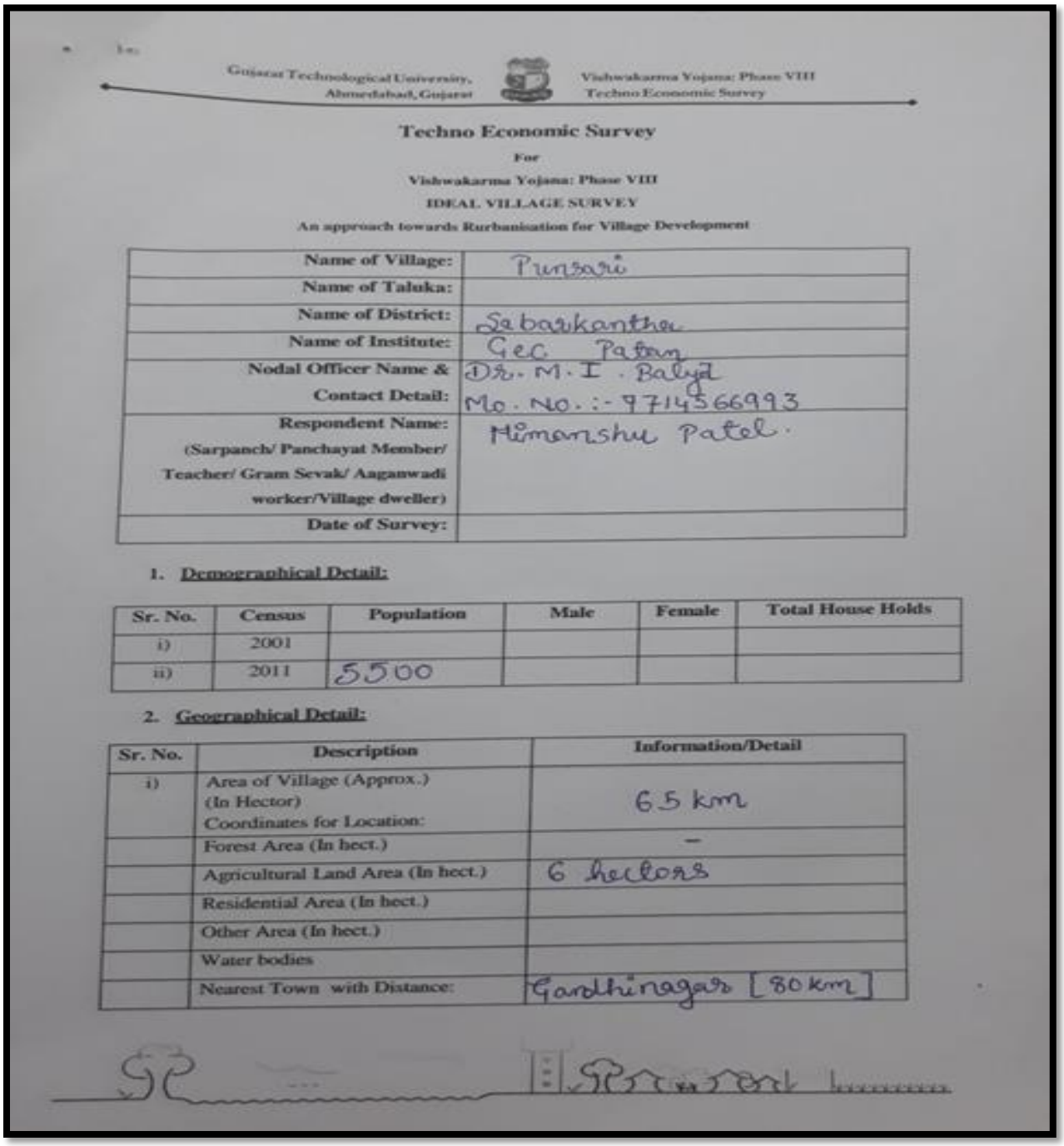
- http://www.onefivenine.com/india/villages/Patan/Patan/Bhilvan
- https://www.google.co.in/search?source
- https://villageinfo.in/gujarat/sabarkantha/punsari.html
- https://www.google.co.in/maps/place/Bhilvan,+Gujarat/
- https://www.nationalgeographic.org/encyclopedia/rural-area
- https://www.nationalgeographic.org/encyclopedia/urban-area

12. Annexure attachment

12.1 Survey form of ideal Village Scanned copy attachment in the report for Part-I Survey form of ideal Village Original copy attachment in the report for Part-II



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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

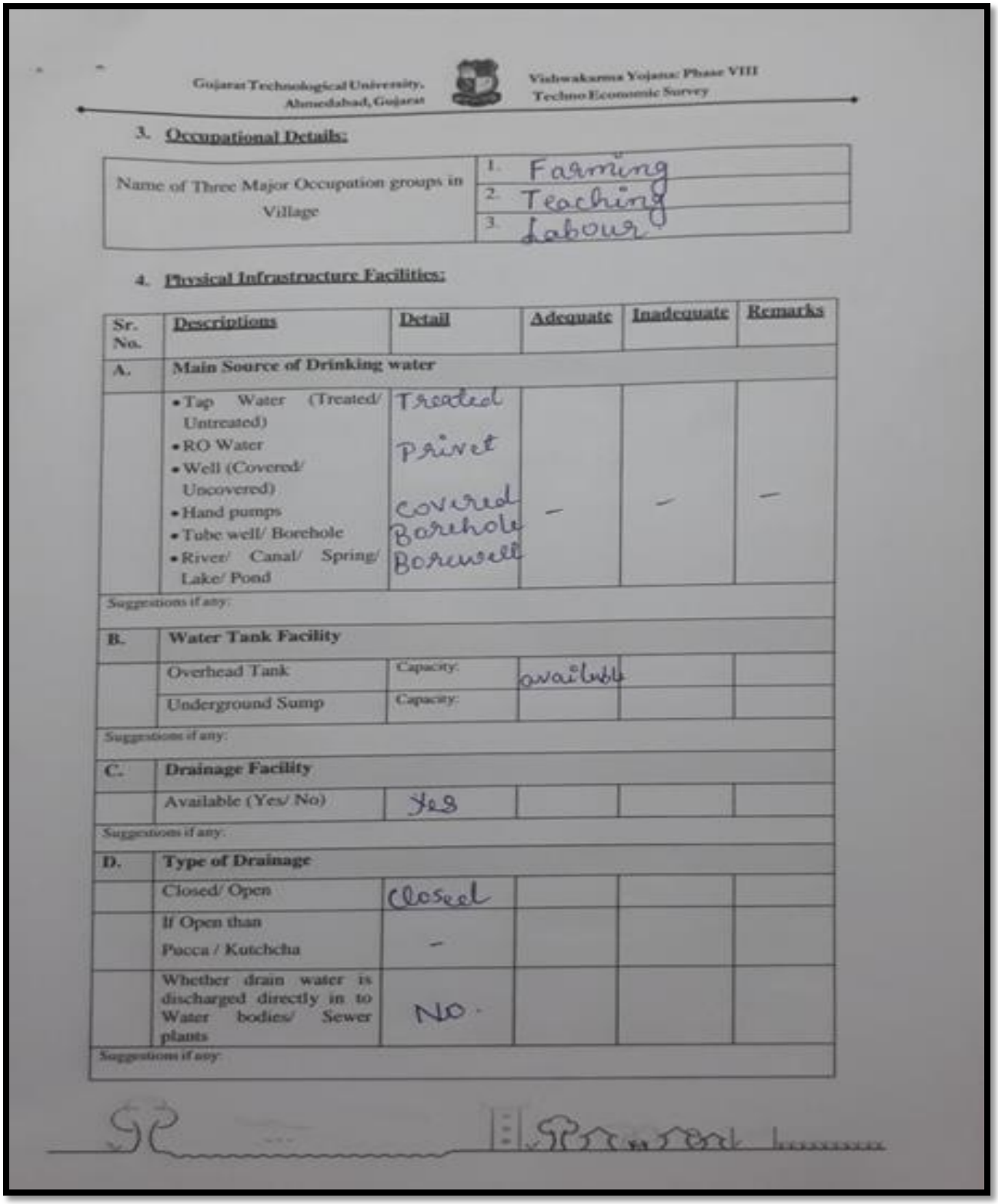
Name of Village:	Punsari
Name of Taluka:	
Name of District:	Sabarkantha
Name of Institute:	GEC Patan
Nodal Officer Name & Contact Detail:	Dr. M. I. Baluch Mo. No.:- 9714566993
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Himanshu Patel.
Date of Survey:	

1. Demographical Detail:

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001				
ii)	2011	5500			

2. Geographical Detail:

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	6.5 km
	Forest Area (In hect.)	-
	Agricultural Land Area (In hect.)	6 hectors
	Residential Area (In hect.)	
	Other Area (In hect.)	
	Water bodies	
	Nearest Town with Distance:	Gandhinagar [80 km]



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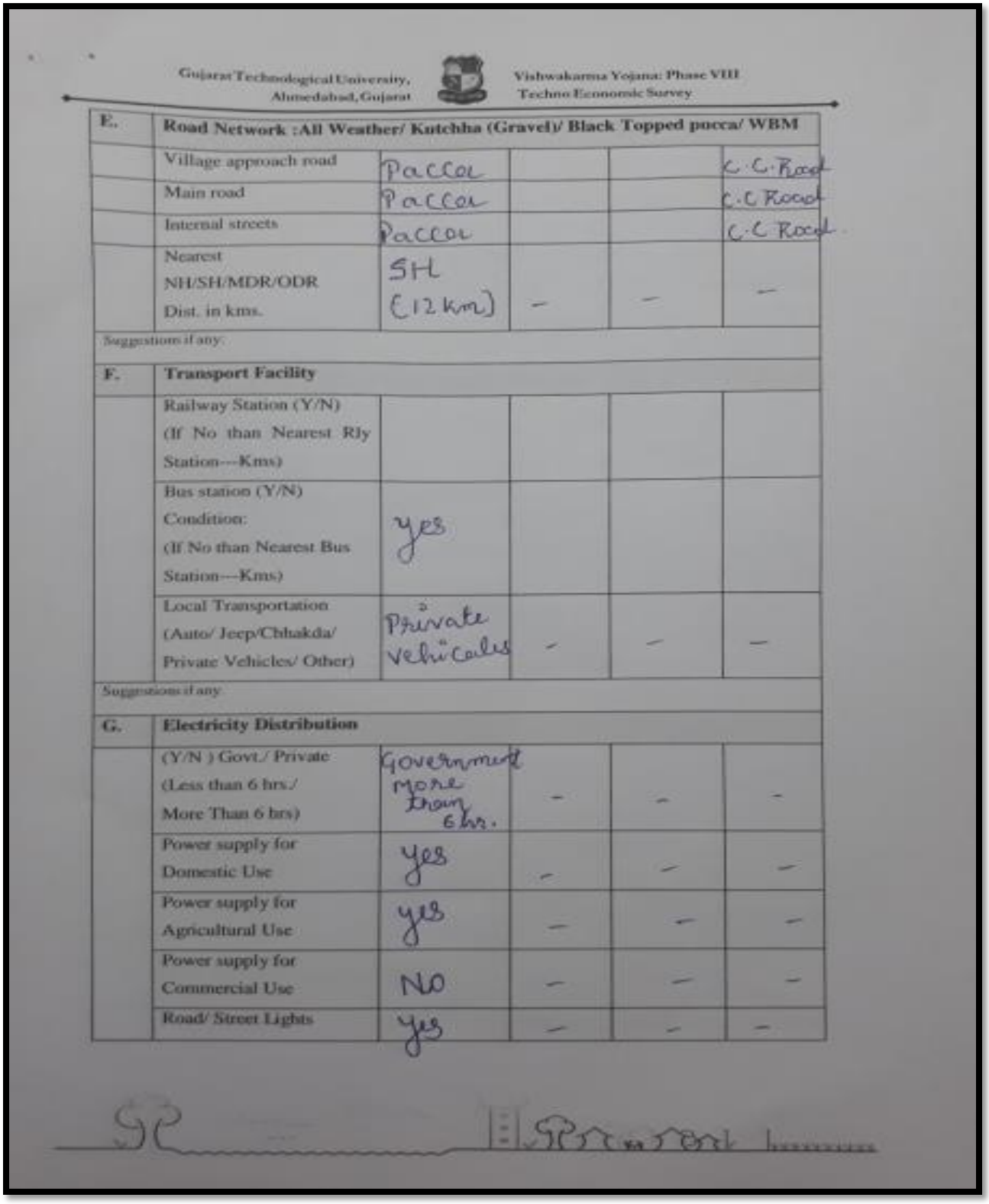
Techno Economic Survey

3. **Occupational Details:**

Name of Three Major Occupation groups in Village	1. Farming 2. Teaching 3. Labour

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



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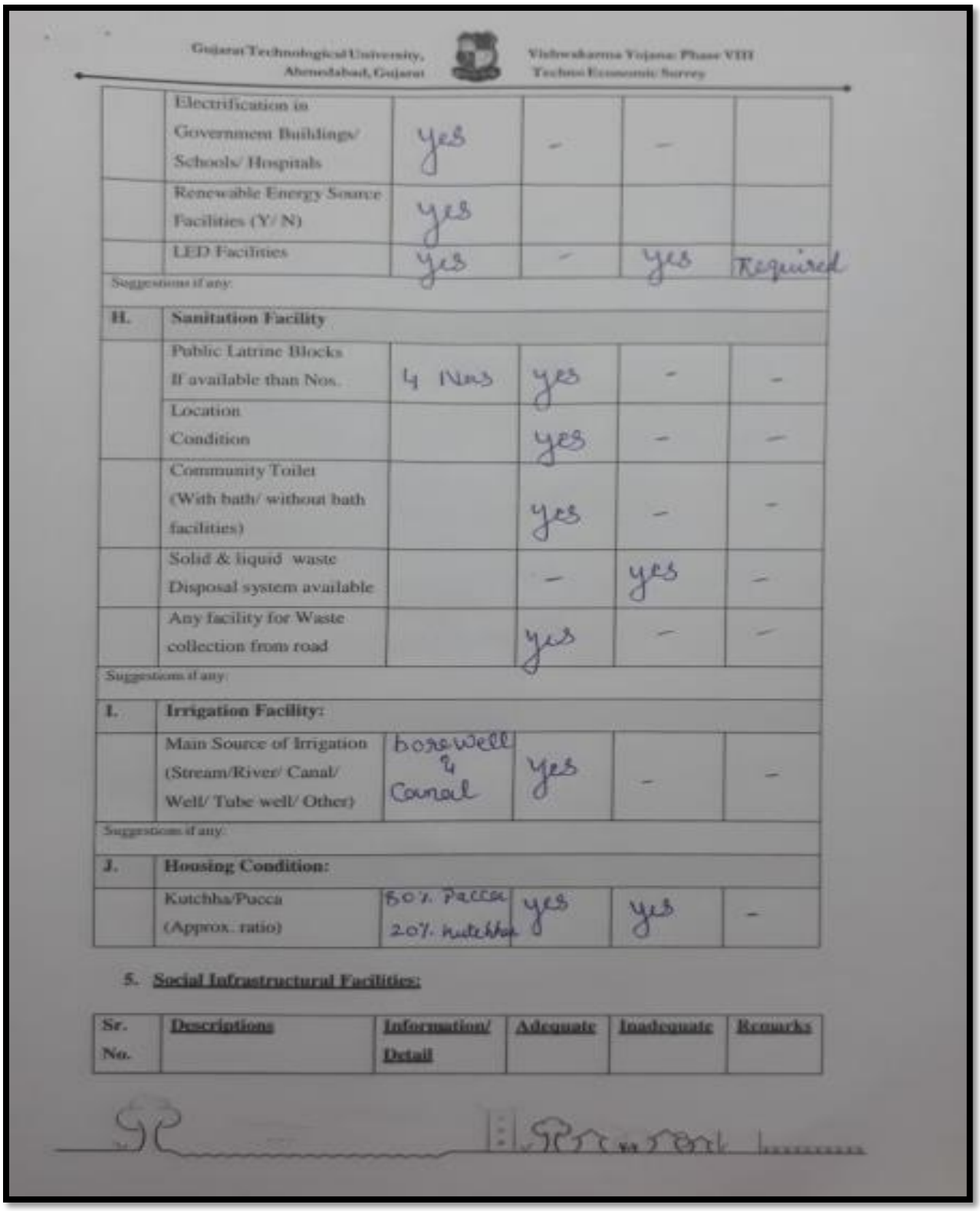
E.	Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM				
	Village approach road	Paccar			C.C. Road
	Main road	Paccar			C.C Road
	Internal streets	Paccar			C.C Road
	Nearest NH/SH/MDR/ODR Dist. in kms.	SH (12 km)	-	-	-
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)				
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	yes			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Private vehicales	-	-	-
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Government more than 6 hr.	-	-	-
	Power supply for Domestic Use	yes	-	-	-
	Power supply for Agricultural Use	yes	-	-	-
	Power supply for Commercial Use	NO	-	-	-
	Road/ Street Lights	yes	-	-	-



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Techno Economic Survey

	Electrification in Government Buildings/ Schools/ Hospitals	Yes	-	-	
	Renewable Energy Source Facilities (Y/ N)	Yes			
	LED Facilities	Yes	-	Yes	Required

Suggestions if any:

H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	4 Nos	yes	-	-
	Location Condition		yes	-	-
	Community Toilet (With bath/ without bath facilities)		yes	-	-
	Solid & liquid waste Disposal system available		-	yes	-
	Any facility for Waste collection from road		yes	-	-

Suggestions if any:

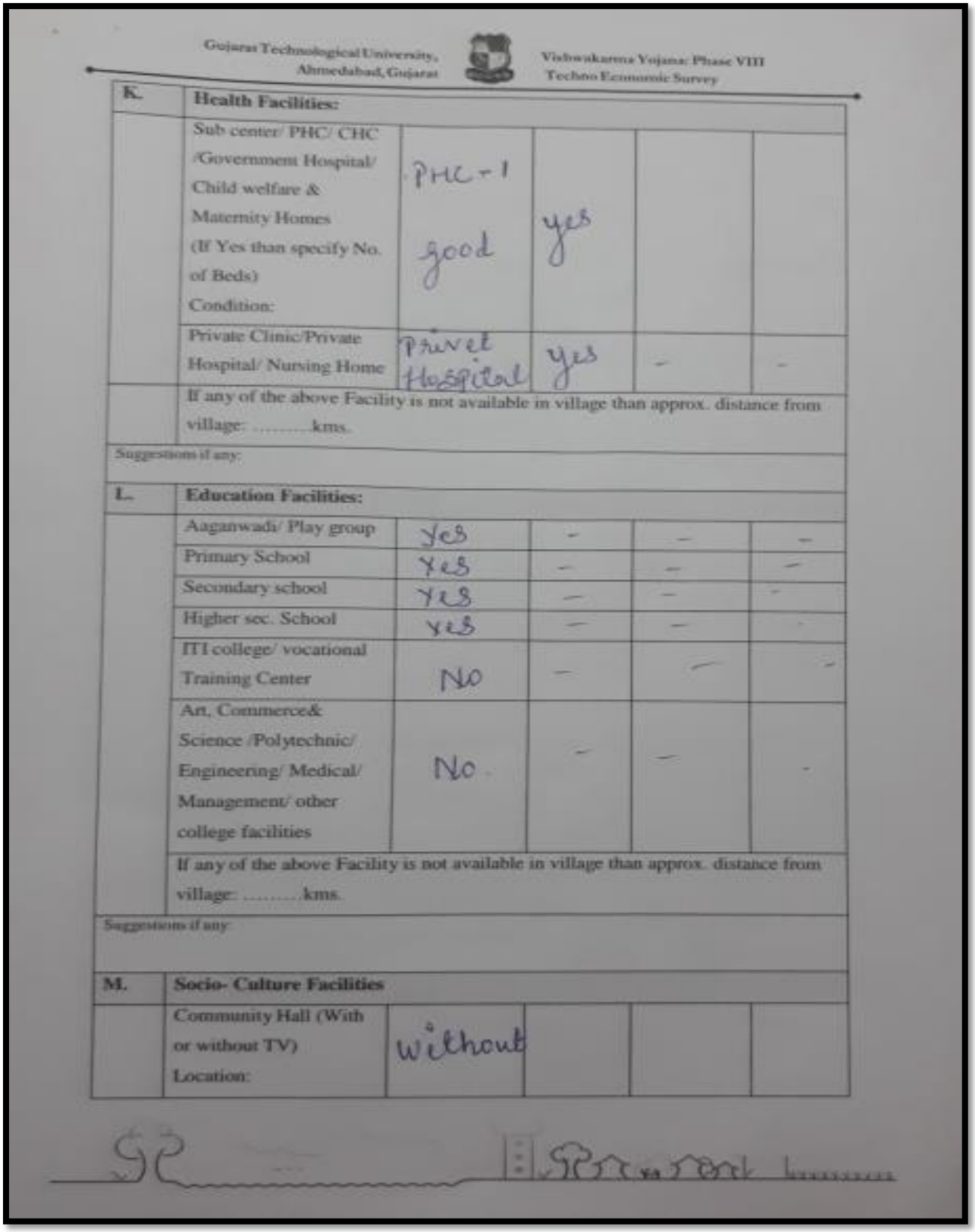
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	borewell & Canal	yes	-	-

Suggestions if any:

J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	80% Pacca 20% kutchha	yes	yes	-

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks



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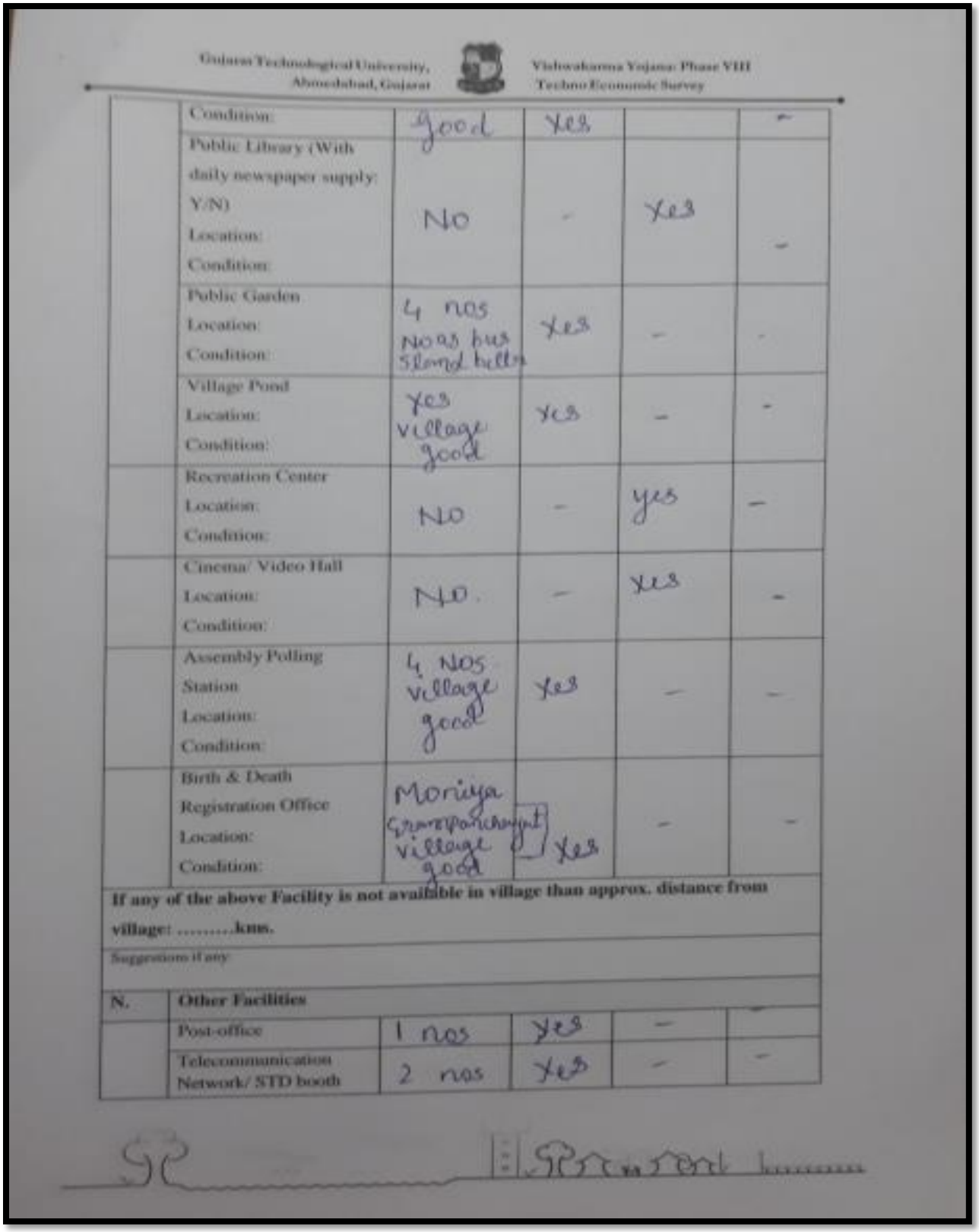
K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	PHC-1 good	yes		
	Private Clinic/Private Hospital/ Nursing Home	Privet Hospital	yes	-	-
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					
L.	**Education Facilities:**				
	Aaganwadi/ Play group	Yes	-	-	-
	Primary School	Yes	-	-	-
	Secondary school	Yes	-	-	-
	Higher sec. School	Yes	-	-	-
	ITI college/ vocational Training Center	No	-	-	-
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	No	-	-	-
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					
M.	**Socio- Culture Facilities**				
	Community Hall (With or without TV) Location:	Without			



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	Condition:	good	Yes		-
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	No	-	Yes	-
	Public Garden Location: Condition:	4 nos Nos bus stand hello	Yes	-	-
	Village Pond Location: Condition:	Yes village good	Yes	-	-
	Recreation Center Location: Condition:	NO	-	yes	-
	Cinema/ Video Hall Location: Condition:	NO.	-	Yes	-
	Assembly Polling Station Location: Condition:	4 NOS village good	Yes	-	-
	Birth & Death Registration Office Location: Condition:	Moriya Grampanchayat village good	Yes	-	-

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

Suggestions if any

N.	Other Facilities				
	Post-office	1 nos	Yes	-	-
	Telecommunication Network/ STD booth	2 nos	Yes	-	-

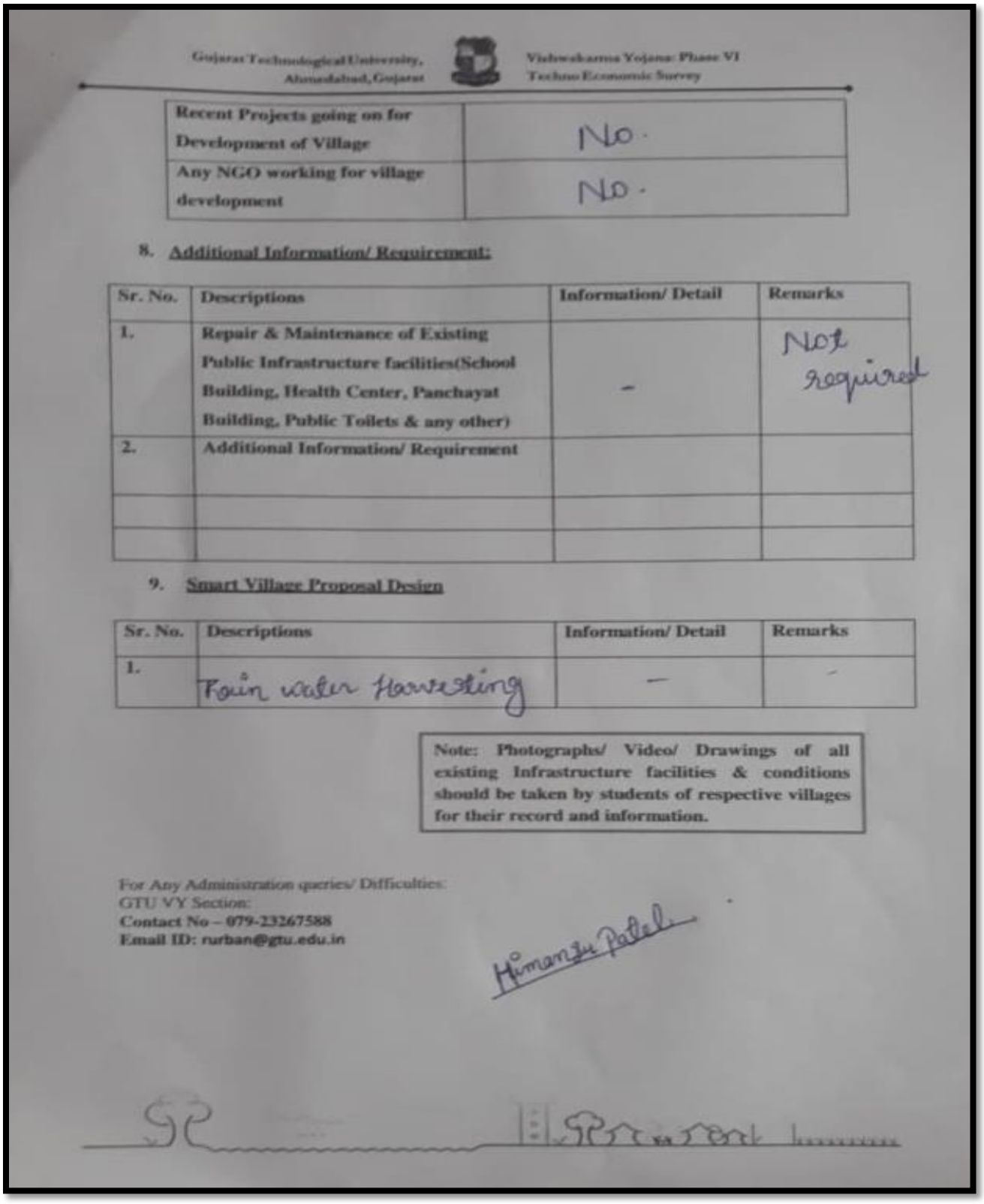
	General Market	Shop			
	Shops (Public Distribution System)	Shops [yes]			
	Panchayat Building	yes			
	Pharmacy/Medical Shop	yes			
	Bank & ATM Facility	NO			
	Agriculture Co-operative Society	yes			
	Milk Co-operative Soc.	yes			
	Small Scale Industries	NO			
	Internet Cafes/ Common Service Center/Wi Fi	wifi			
	Other Facility				
Suggestions if any:					

6. Sustainable /Green Infrastructure Facilities:

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

7. Data Collection From Village

Village Base Map Available: Hard Copy/Soft Copy	yes



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Vishwakarma Yojana: Phase VI
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Recent Projects going on for Development of Village	No.
Any NGO working for village development	No.

8. Additional Information/ Requirement:

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities(School Building, Health Center, Panchayat Building, Public Toilets & any other)	-	Not required
2.	Additional Information/ Requirement		

9. Smart Village Proposal Design

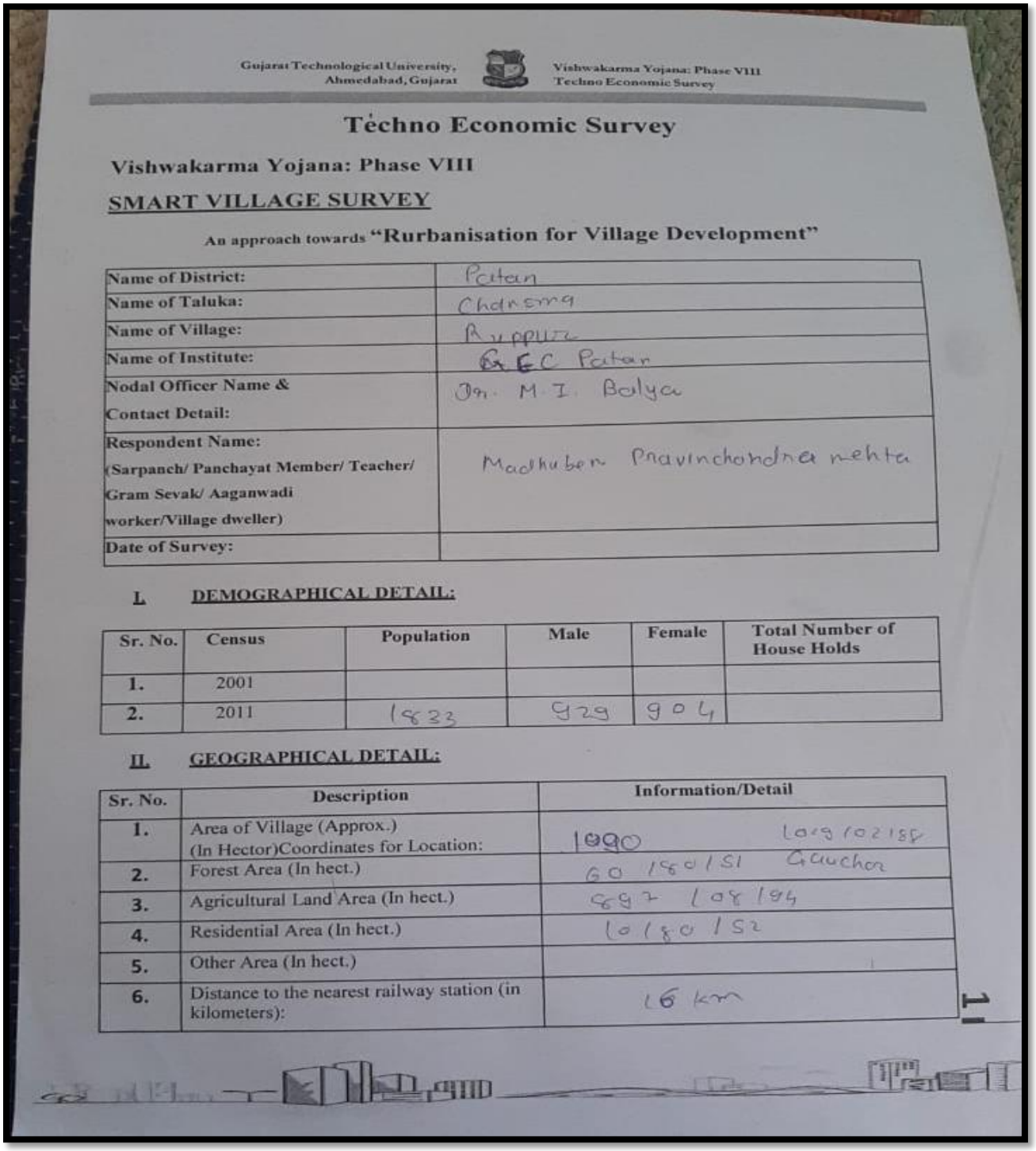
Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Rain water Harvesting	-	-

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: ruban@gtu.edu.in

Himanshu Patel

12.2 Survey form of smart Village Scanned copy attachment in the report for Part-I Survey form of smart Village Original copy attachment in the report for Part-II



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Vishwakarma Yojana: Phase VIII
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Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

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

Name of District:	Patan
Name of Taluka:	Chanasma
Name of Village:	Bhilvan
Name of Institute:	GEC Patan
Nodal Officer Name & Contact Detail:	Dr. M. I. Balya
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Madhuben Pravinchandra mehta
Date of Survey:	

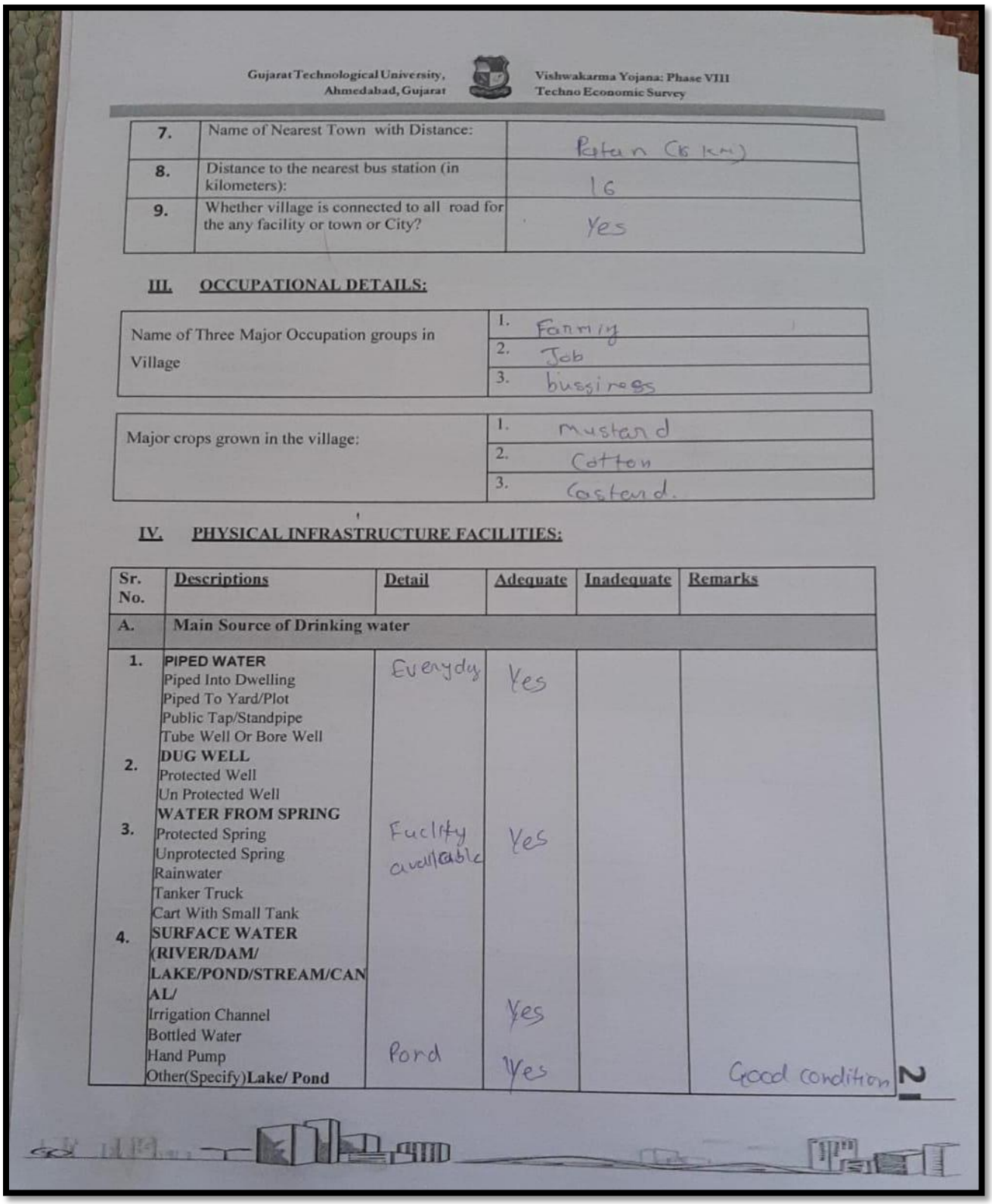
I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	1833	929	904	

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1090 Lat 23 10 21 55
2.	Forest Area (In hect.)	60 180 151 Gauchar
3.	Agricultural Land Area (In hect.)	897 108 194
4.	Residential Area (In hect.)	101 80 152
5.	Other Area (In hect.)	
6.	Distance to the nearest railway station (in kilometers):	16 km

1



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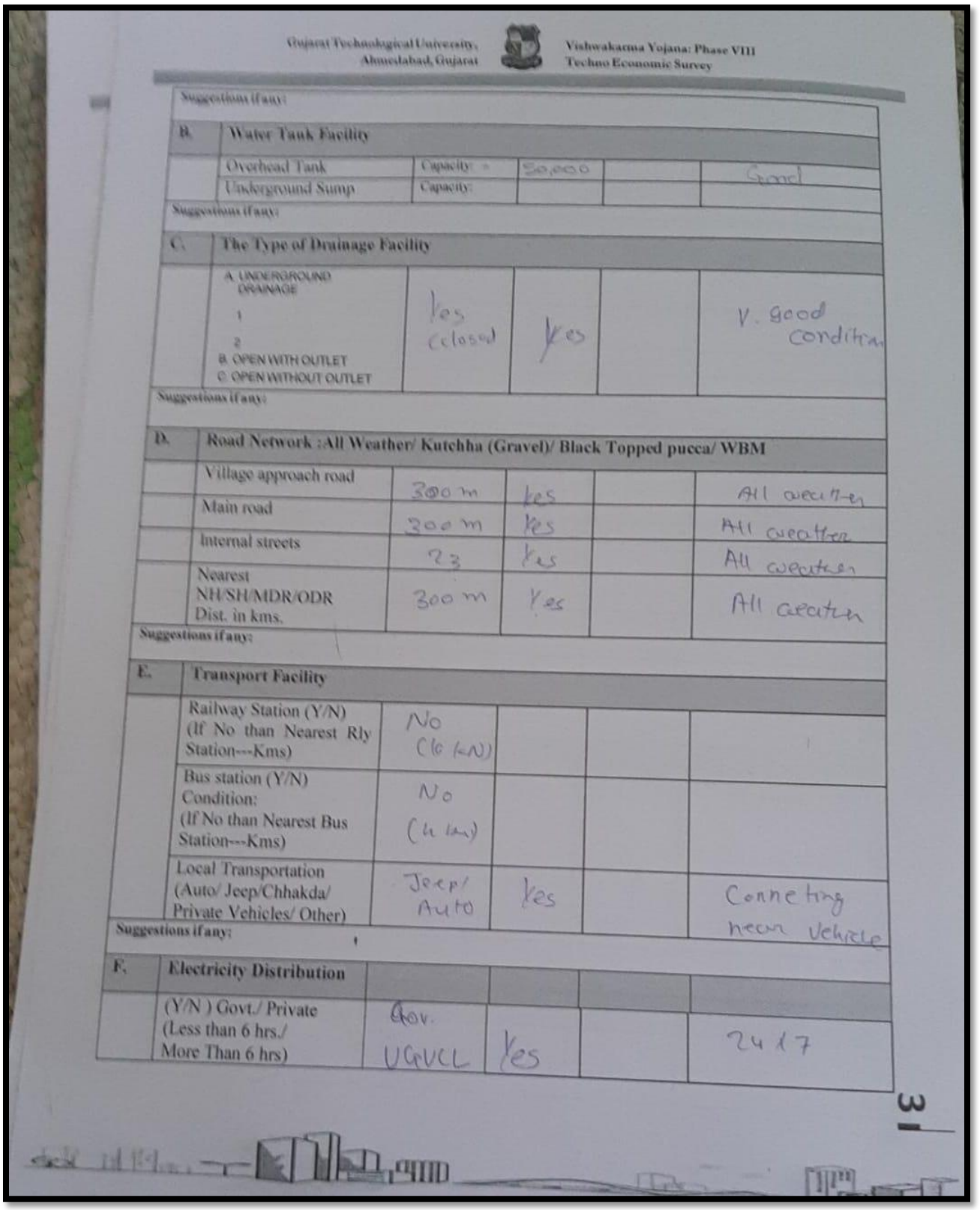
7.	Name of Nearest Town with Distance:	Patan (15 km)
8.	Distance to the nearest bus station (in kilometers):	16
9.	Whether village is connected to all road for the any facility or town or City?	Yes

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1. Farming 2. Job 3. bussiness
Major crops grown in the village:	1. mustard 2. Cotton 3. Castard.

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



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Suggestions if any:

B.	Water Tank Facility				
	Overhead Tank	Capacity: -	50,000		Good
	Underground Sump	Capacity:			

Suggestions if any:

C.	The Type of Drainage Facility				
	A. UNDERGROUND DRAINAGE 1 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET	Yes (closed)	Yes		V. Good condition

Suggestions if any:

D.	Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM				
	Village approach road	300 m	Yes		All weather
	Main road	300 m	Yes		All weather
	Internal streets	23	Yes		All weather
	Nearest NH/SH/MDR/ODR Dist. in kms.	300 m	Yes		All weather

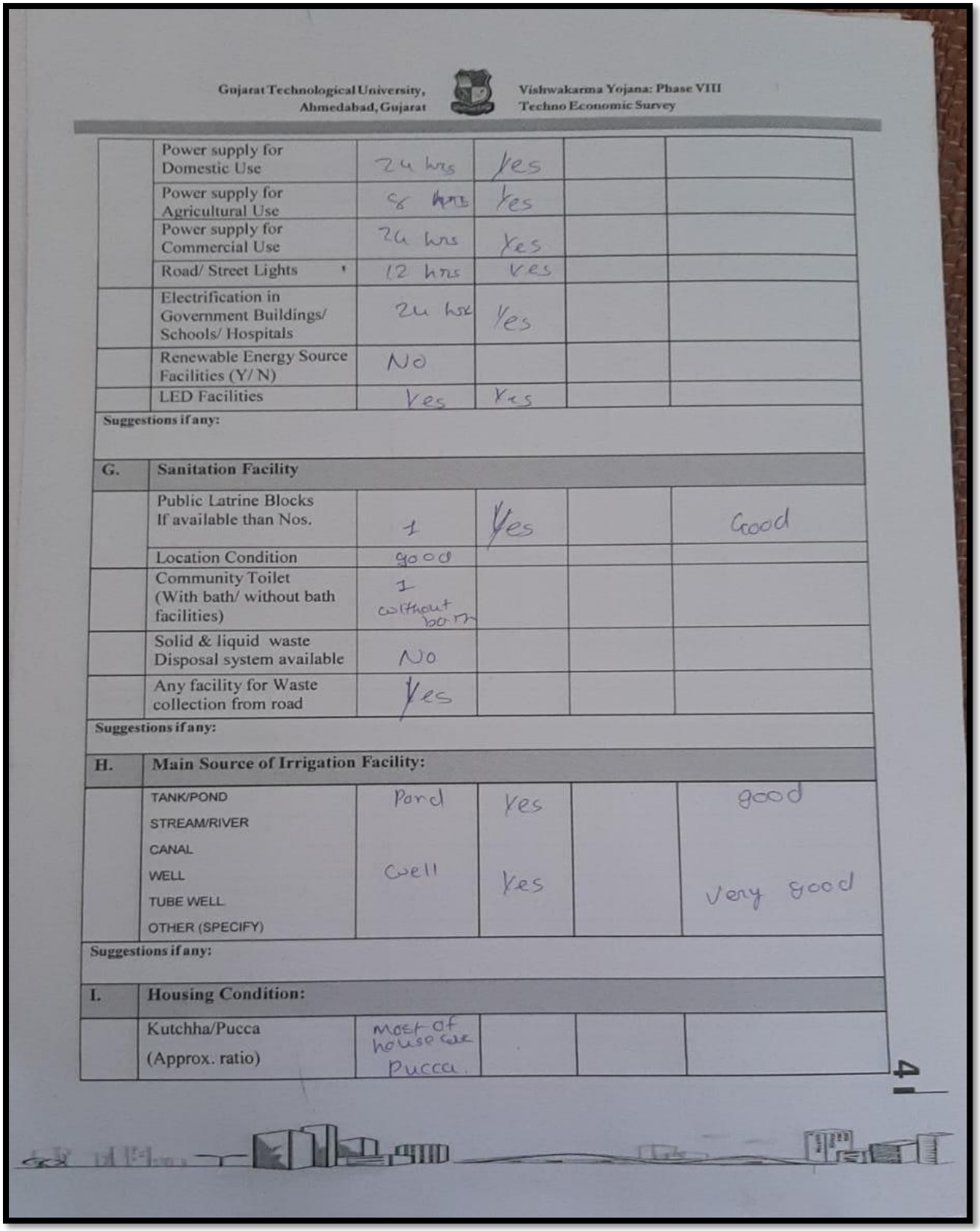
Suggestions if any:

E.	Transport Facility				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No (10 KM)			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	No (4 km)			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Jeep/ Auto	Yes		Connecting near Vehicle

Suggestions if any:

F.	Electricity Distribution				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Gov. UGVCL	Yes		24 x 7

31



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	Power supply for Domestic Use	24 hrs	Yes		
	Power supply for Agricultural Use	8 hrs	Yes		
	Power supply for Commercial Use	24 hrs	Yes		
	Road/ Street Lights	12 hrs	Yes		
	Electrification in Government Buildings/ Schools/ Hospitals	24 hrs	Yes		
	Renewable Energy Source Facilities (Y/ N)	No			
	LED Facilities	Yes	Yes		

Suggestions if any:

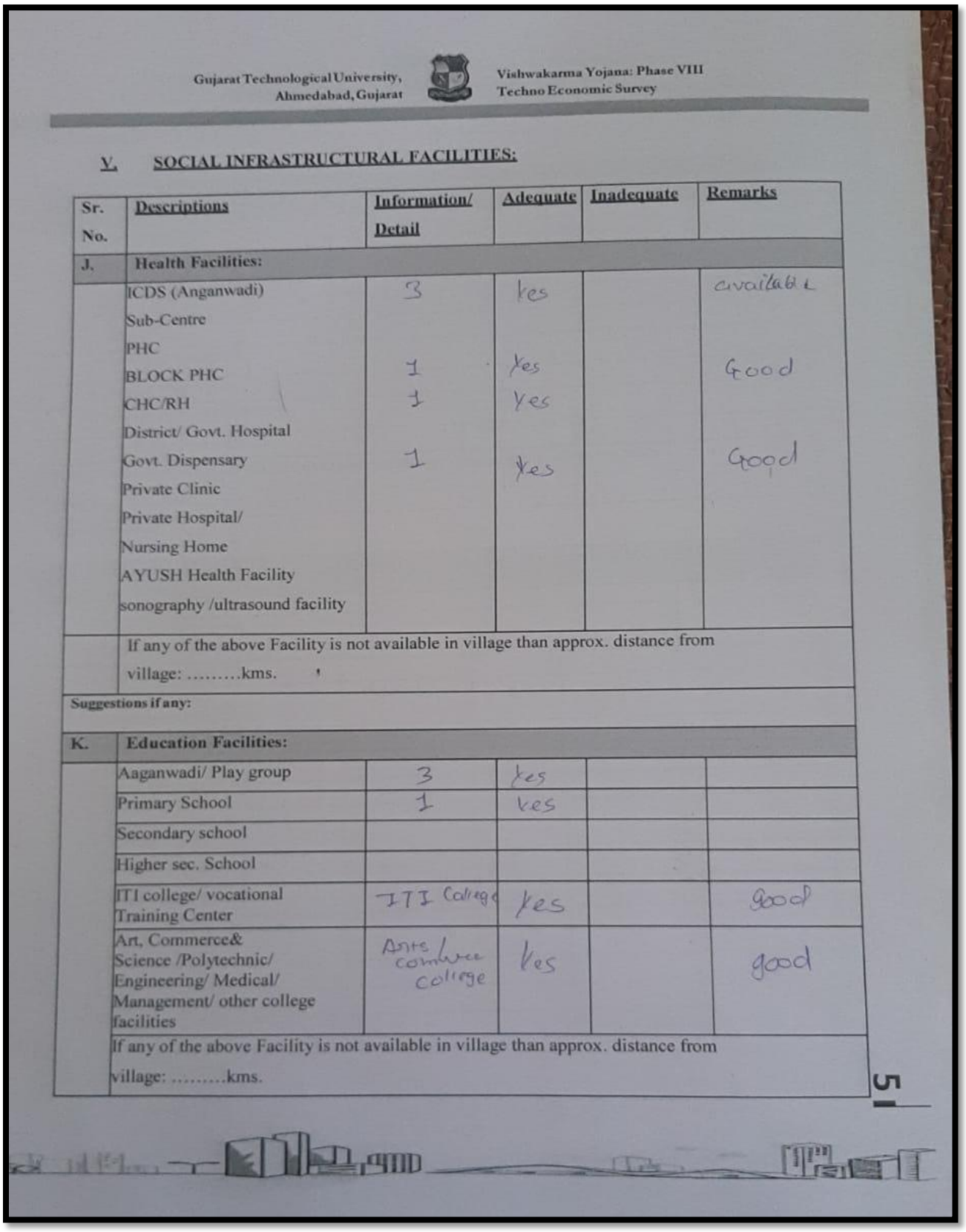
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	1	Yes		Good
	Location Condition	good			
	Community Toilet (With bath/ without bath facilities)	1 without bath			
	Solid & liquid waste Disposal system available	No			
	Any facility for Waste collection from road	Yes			

Suggestions if any:

H.	**Main Source of Irrigation Facility:**				
	TANK/POND	Pond	Yes		good
	STREAM/RIVER				
	CANAL				
	WELL	Well	Yes		Very good
	TUBE WELL				
	OTHER (SPECIFY)				

Suggestions if any:

I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Most of house are Pucca.			



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

V. SOCIAL INFRASTRUCTURAL FACILITIES:

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

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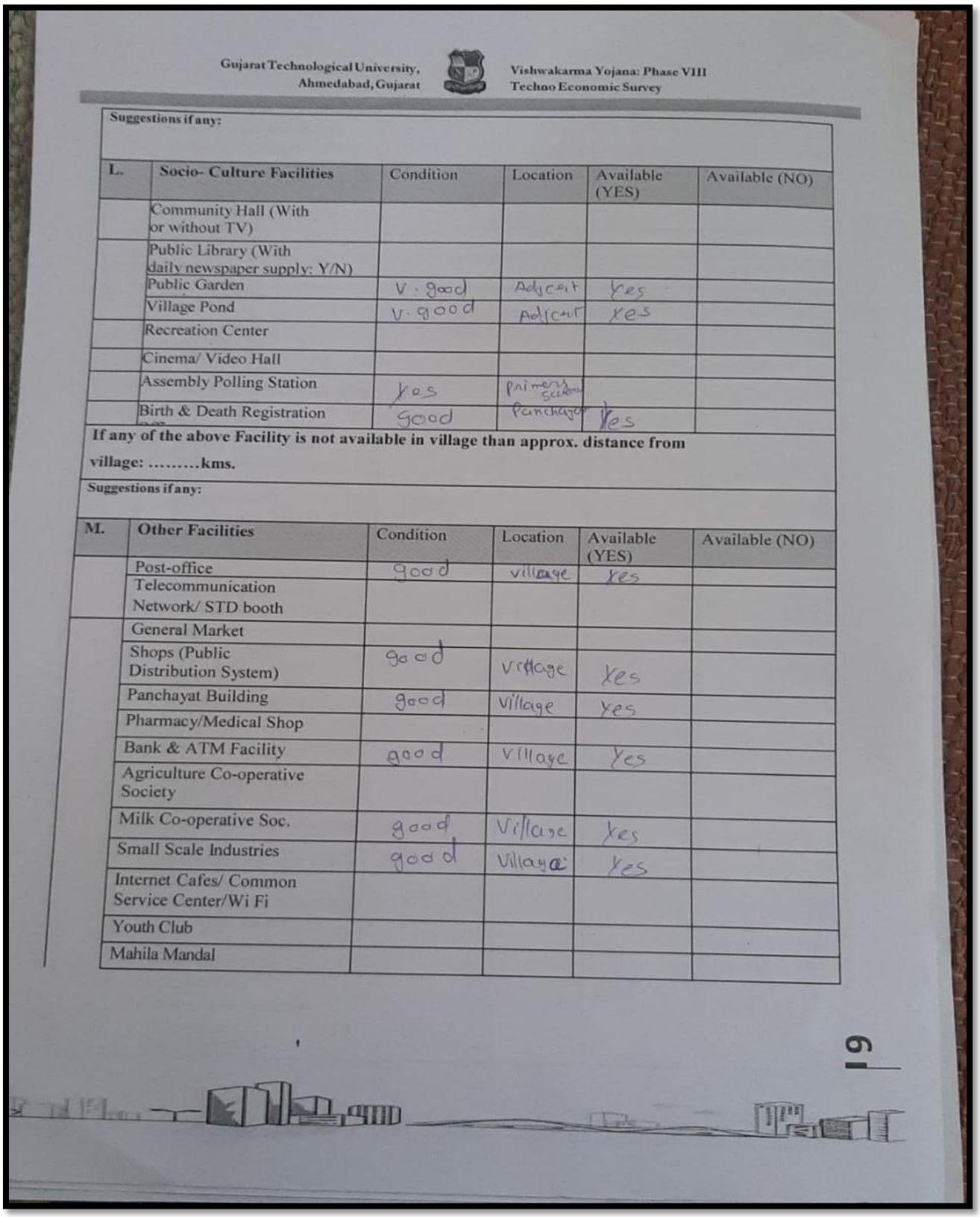

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Suggestions if any:

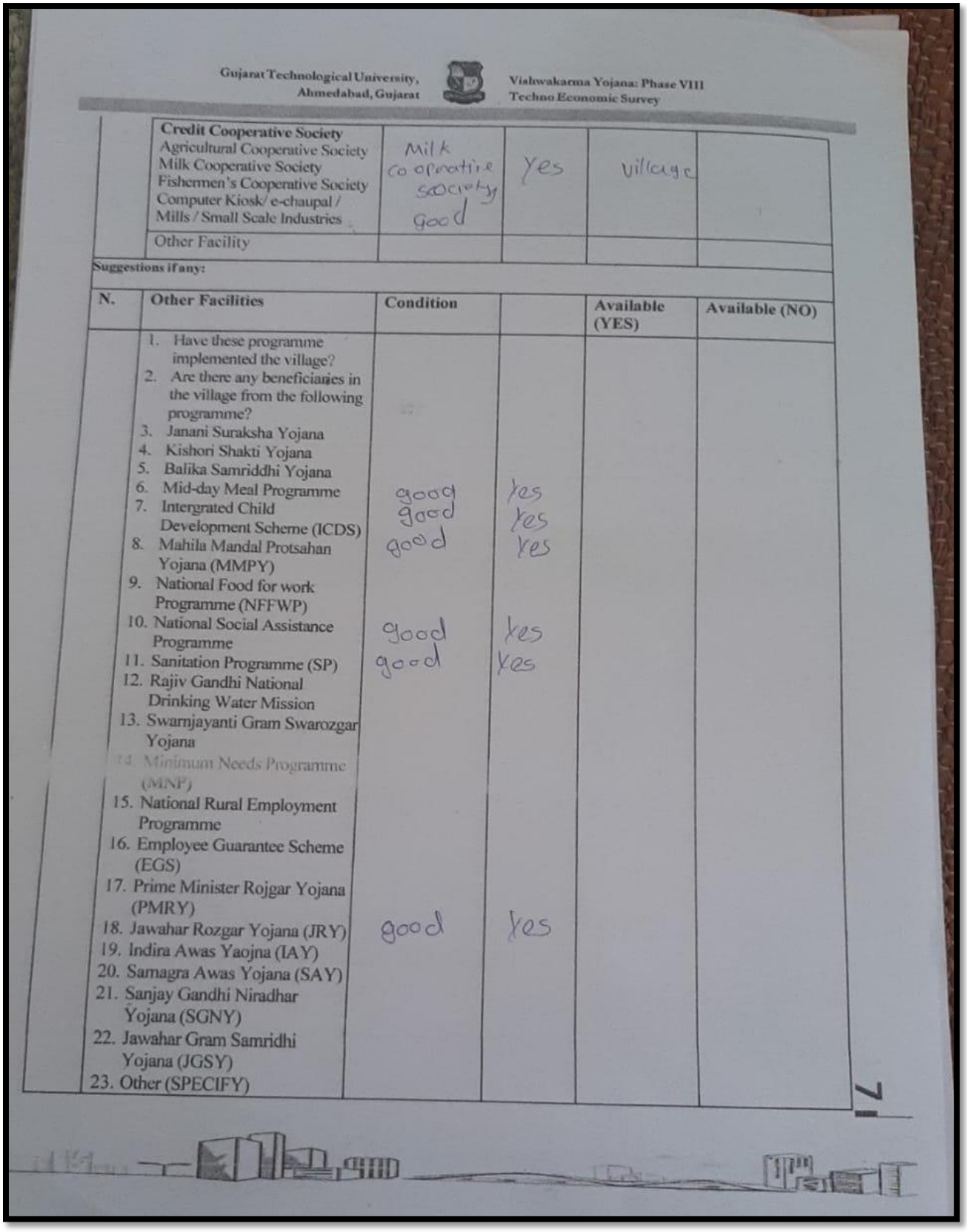
L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)				
	Public Library (With daily newspaper supply: Y/N)				
	Public Garden	V. good	Adjcait	Yes	
	Village Pond	V. good	Adjcait	Yes	
	Recreation Center				
	Cinema/ Video Hall				
	Assembly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

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

Suggestions if any:

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

19



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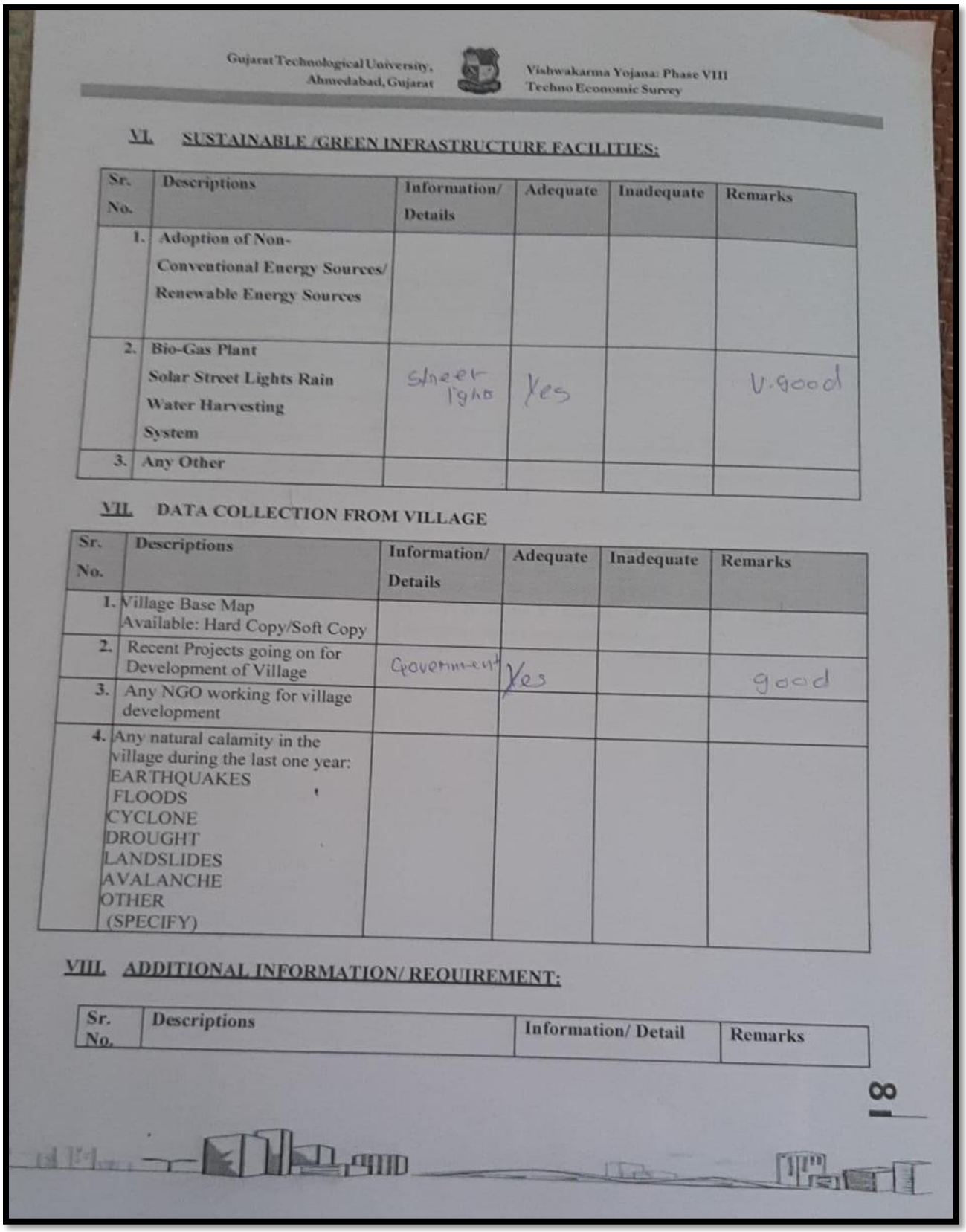
	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries	Milk cooperative society good	yes	village	
	Other Facility				

Suggestions if any:

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

17



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Techno Economic Survey

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

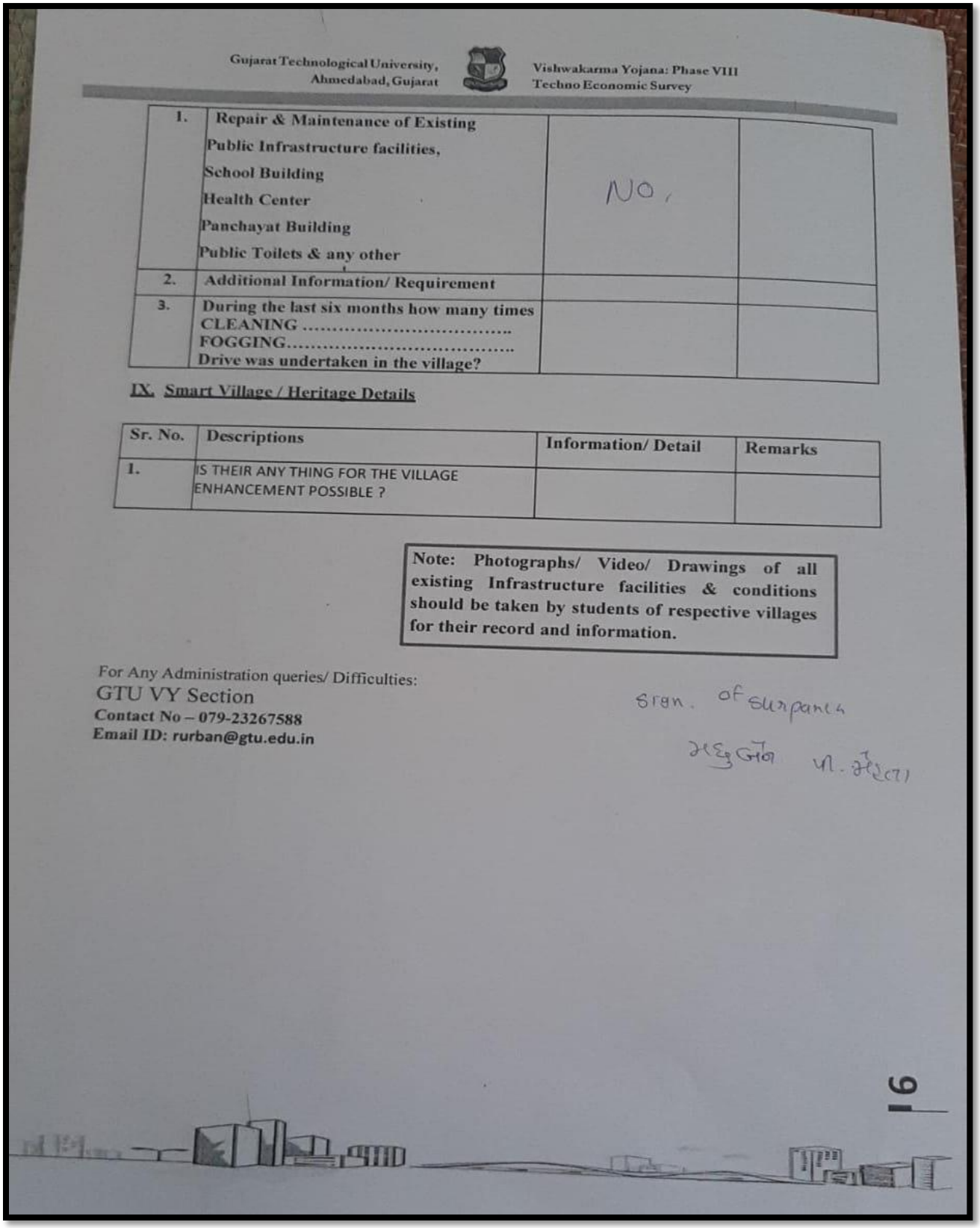
VII. DATA COLLECTION FROM VILLAGE

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	Government	Yes		good
3.	Any NGO working for village development				
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)				

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

8



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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

IX. Smart Village / Heritage Details

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

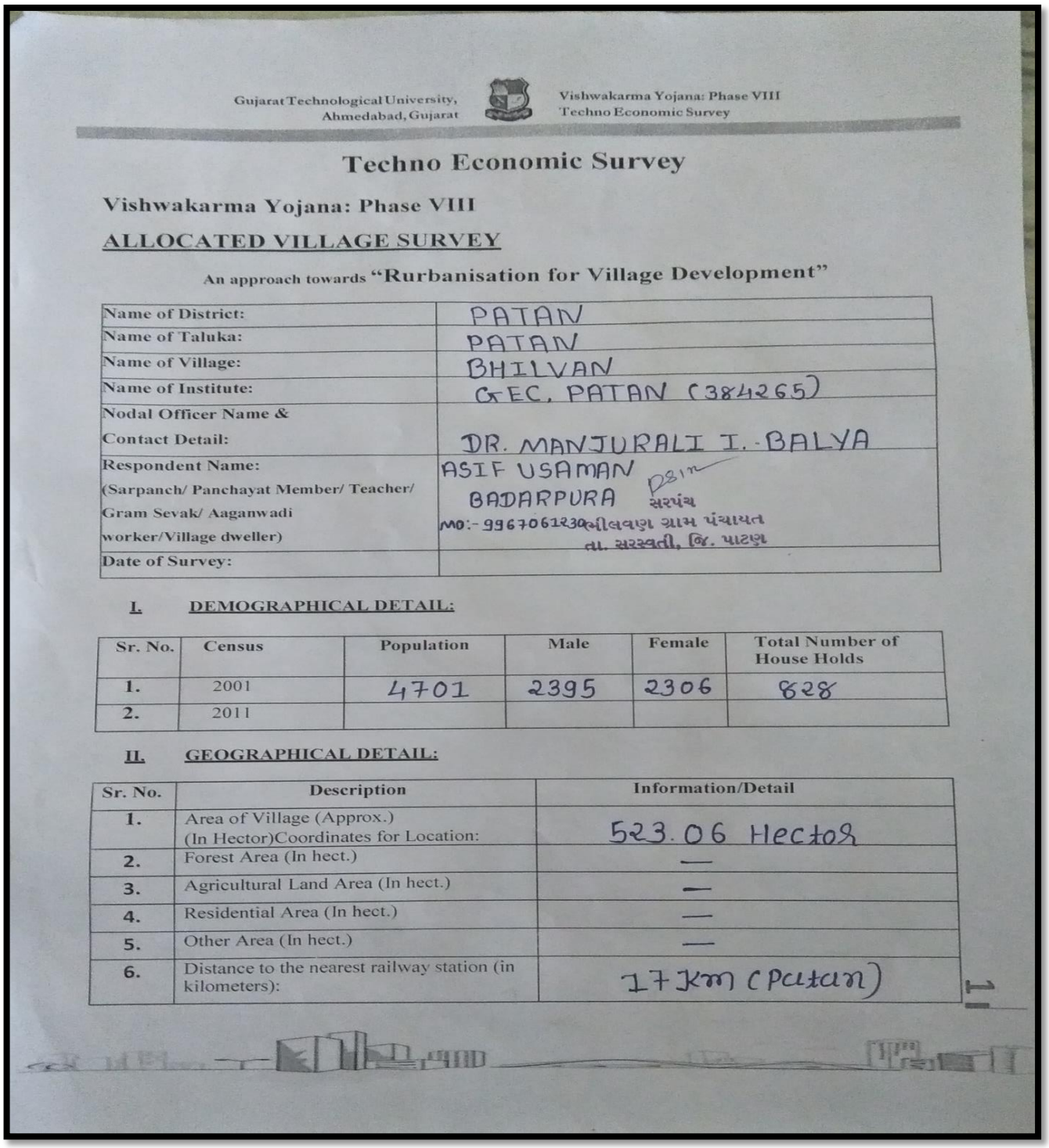
Note: Photographs/ Video/ Drawings of all existing Infrastructure facilities & conditions should be taken by students of respective villages for their record and information.

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

Sran. of Surpanch

16

12.3 Survey form of Allocated Village Scanned copy attachment in the report for Part-I Survey form of Allocated Village Original copy attachment in the report for Part-II



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Vishwakarma Yojana: Phase VIII
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Techno Economic Survey

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

An approach towards "Rurbanisation for Village Development"

Name of District:	PATAN
Name of Taluka:	PATAN
Name of Village:	BHILVAN
Name of Institute:	GEC. PATAN (384265)
Nodal Officer Name & Contact Detail:	DR. MANJURALI I. BALYA
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	ASIF USAMAN BADARPURA સરપંચ MO:- 9967061230 ભીલવણ ગ્રામ પંચાયત તા. સરસ્વતી, જિ. પાટણ
Date of Survey:	

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	4701	2395	2306	828
2.	2011				

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	523.06 Hector
2.	Forest Area (In hect.)	—
3.	Agricultural Land Area (In hect.)	—
4.	Residential Area (In hect.)	—
5.	Other Area (In hect.)	—
6.	Distance to the nearest railway station (in kilometers):	17 Km (Patan)

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7.	Name of Nearest Town with Distance:	17 Km (Patan)
8.	Distance to the nearest bus station (in kilometers):	1 Km
9.	Whether village is connected to all road for the any facility or town or City?	Yes

III. OCCUPATIONAL DETAILS:

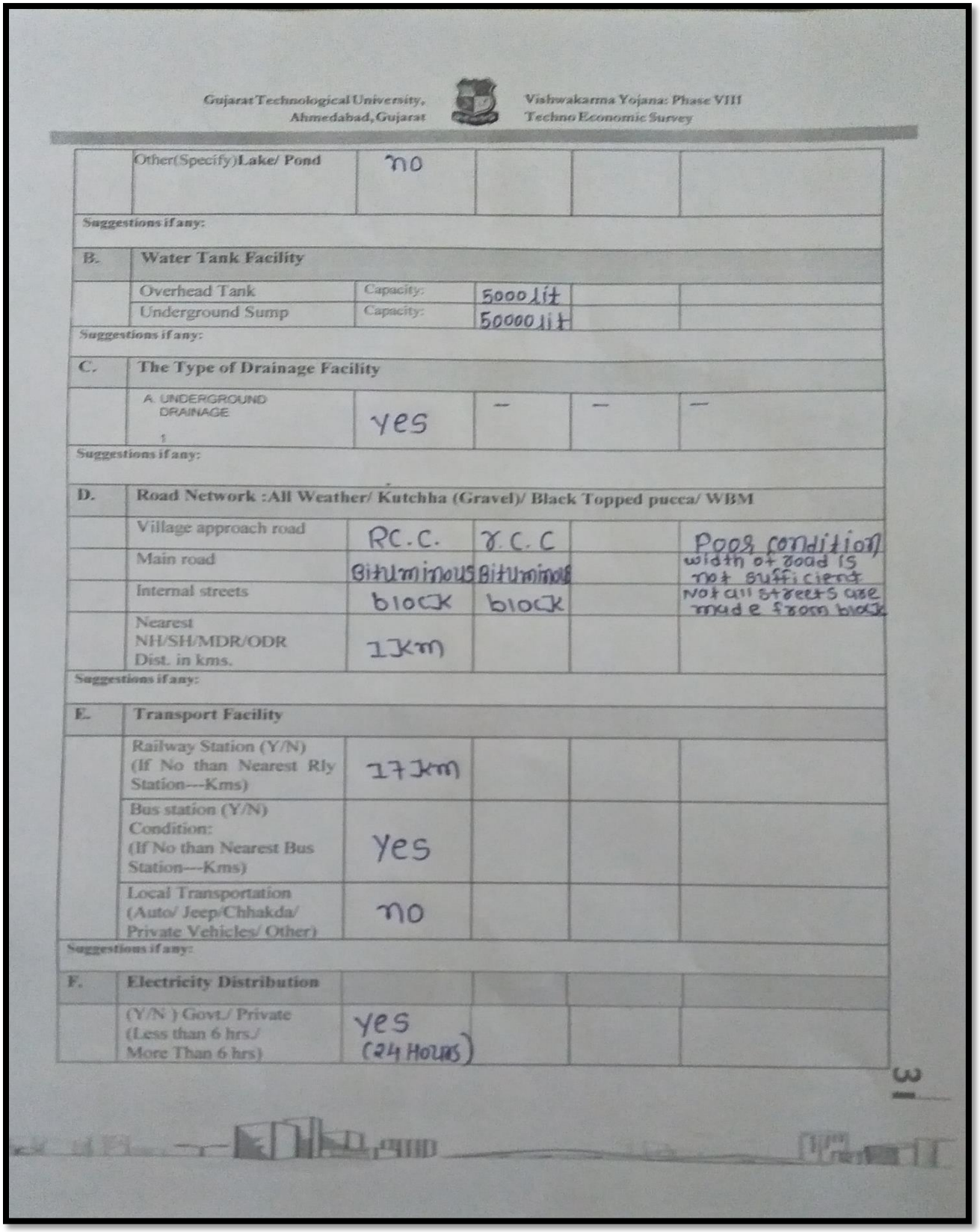
Name of Three Major Occupation groups in Village	1.	Tabelo
	2.	farmer
	3.	dairy

Major crops grown in the village:	1.	wealth
	2.	bajari
	3.	cotten

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				

21



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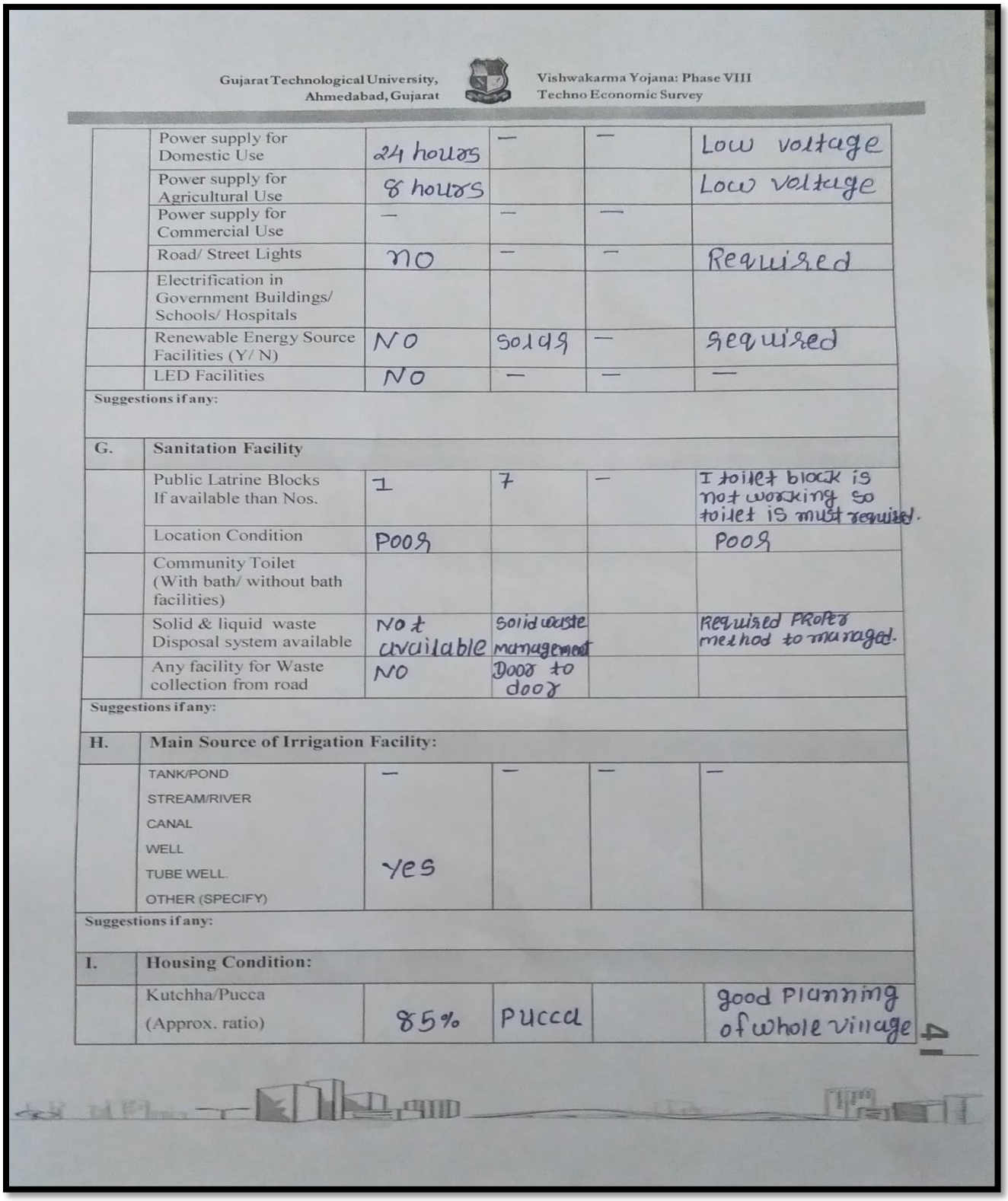
	Other(Specify)Lake/ Pond	no			
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	5000 lit		
	Underground Sump	Capacity:	50000 lit		
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE	yes	–	–	–
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	RC.C.	R.C.C		Poor condition
	Main road	Bituminous	Bituminous		width of road is not sufficient
	Internal streets	block	block		Not all streets are made from block
	Nearest NH/SH/MDR/ODR Dist. in kms.	1Km			
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	17Km			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	yes			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	no			
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	yes (24 Hours)			



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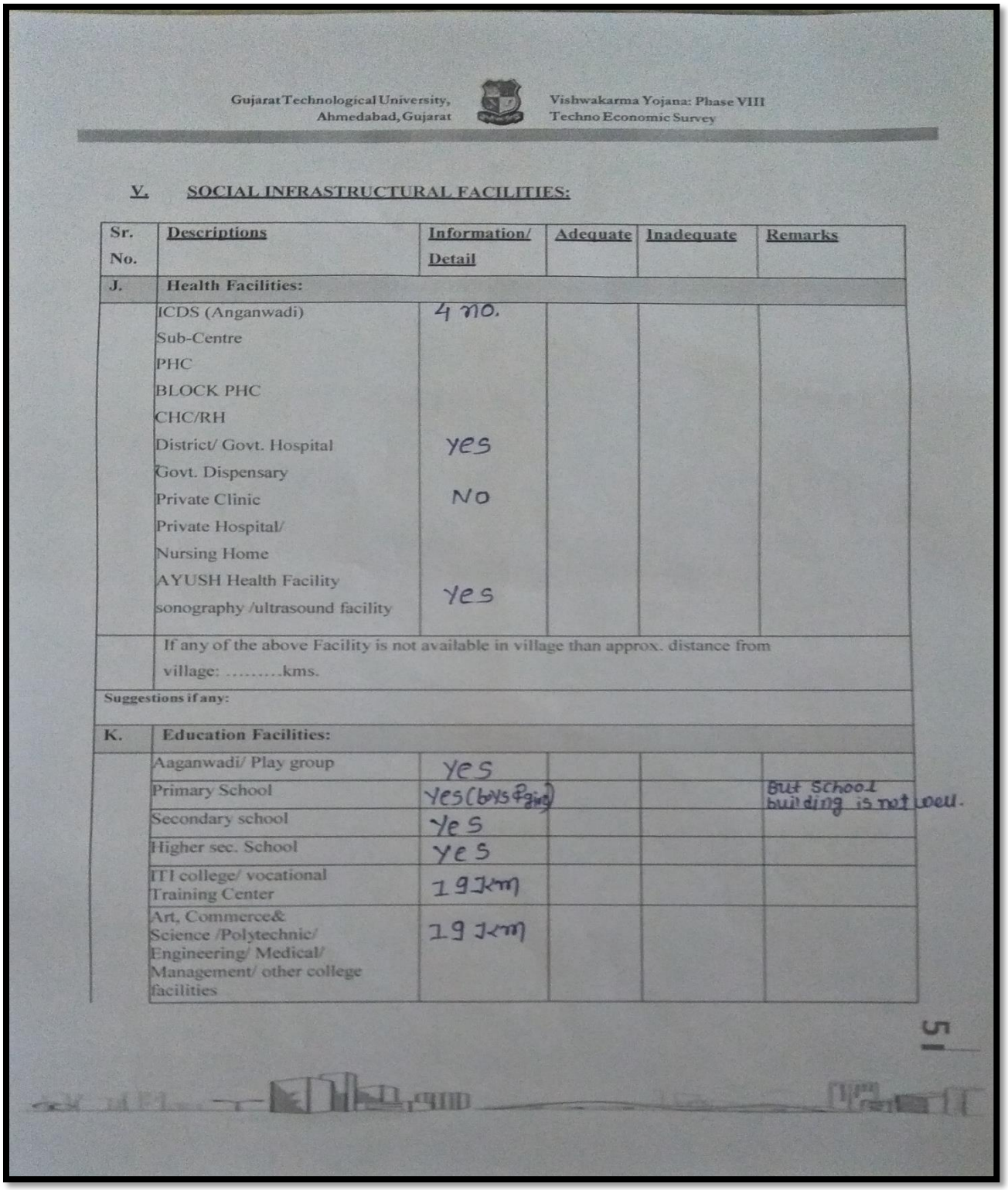
	Power supply for Domestic Use	24 hours	—	—	Low voltage
	Power supply for Agricultural Use	8 hours			Low voltage
	Power supply for Commercial Use	—	—	—	
	Road/ Street Lights	no	—	—	Required
	Electrification in Government Buildings/ Schools/ Hospitals				
	Renewable Energy Source Facilities (Y/ N)	NO	Solar	—	required
	LED Facilities	NO	—	—	—
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	1	7	—	1 toilet block is not working so toilet is must required.
	Location Condition	Poor			Poor
	Community Toilet (With bath/ without bath facilities)				
	Solid & liquid waste Disposal system available	Not available	Solid waste management		Required Proper method to managed.
	Any facility for Waste collection from road	NO	Door to door		
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL OTHER (SPECIFY)	— yes	—	—	—
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	85%	Pucca		good Planning of whole village



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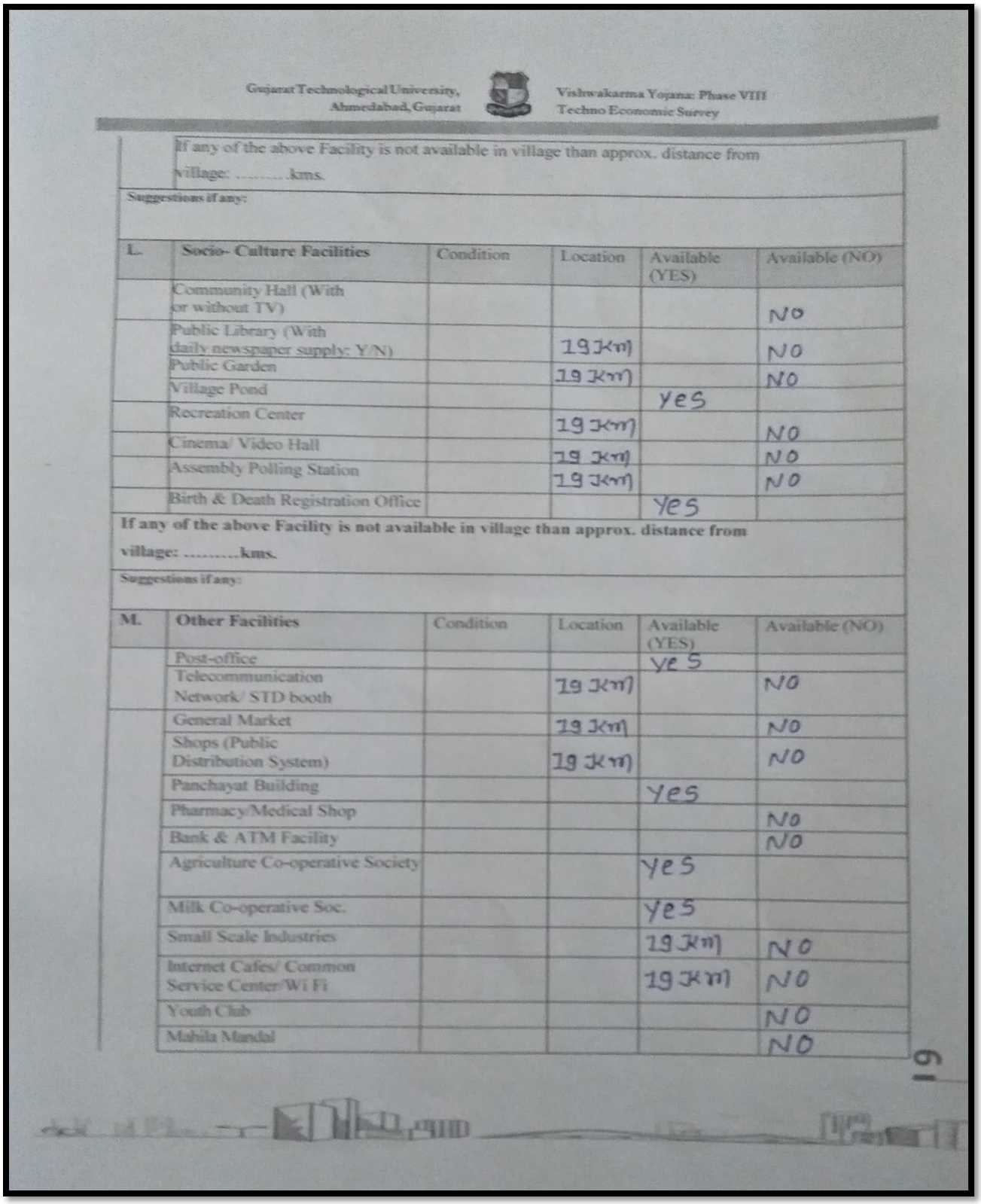
Vishwakarma Yojana: Phase VIII
Techno Economic Survey

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	4 no.			
	Sub-Centre				
	PHC				
	BLOCK PHC				
	CHC/RH				
	District/ Govt. Hospital	yes			
	Govt. Dispensary				
	Private Clinic	No			
	Private Hospital/ Nursing Home				
	AYUSH Health Facility				
	sonography /ultrasound facility	yes			
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	yes			
	Primary School	Yes (boys & girls)			But school building is not well.
	Secondary school	Yes			
	Higher sec. School	Yes			
	ITI college/ vocational Training Center	19 km			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	19 km			

5



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

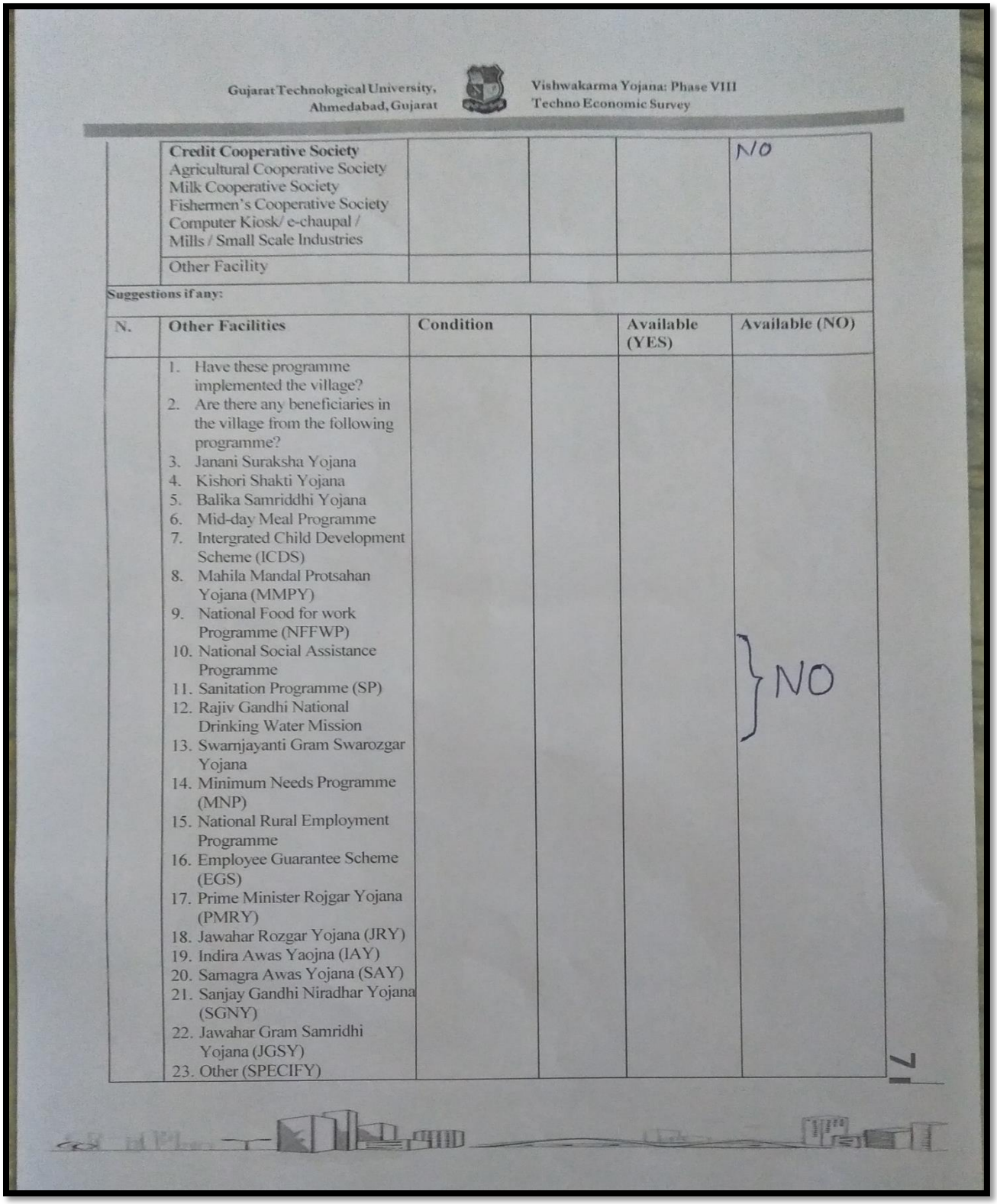
Suggestions if any:

L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)				NO
	Public Library (With daily newspaper supply: Y/N)		19 Km		NO
	Public Garden		19 Km		NO
	Village Pond			yes	
	Recreation Center		19 Km		NO
	Cinema/ Video Hall		19 Km		NO
	Assembly Polling Station		19 Km		NO
	Birth & Death Registration Office			Yes	

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

Suggestions if any:

M.	Other Facilities	Condition	Location	Available (YES)	Available (NO)
	Post-office			Yes	
	Telecommunication Network/ STD booth		19 Km		NO
	General Market		19 Km		NO
	Shops (Public Distribution System)		19 Km		NO
	Panchayat Building			Yes	
	Pharmacy/Medical Shop				NO
	Bank & ATM Facility				NO
	Agriculture Co-operative Society			Yes	
	Milk Co-operative Soc.			Yes	
	Small Scale Industries			19 Km	NO
	Internet Cafes/ Common Service Center/Wi Fi			19 Km	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				NO
	Other Facility				

Suggestions if any:

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

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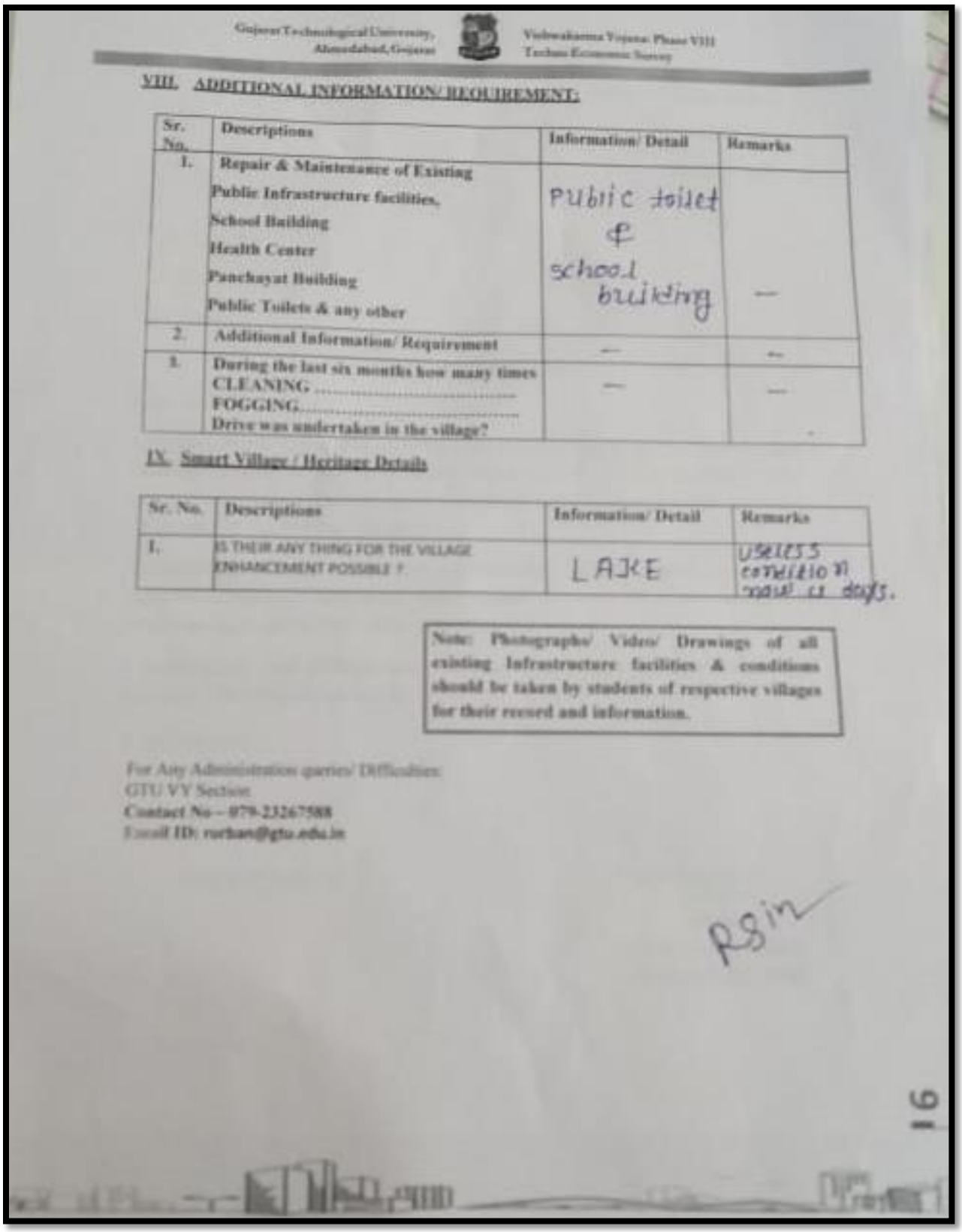
VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	Solar energy	—	—	—
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	Bio-gas Plant	—	—	—
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	—	—	—	MAP AS PER ABOVE MENTION
2.	Recent Projects going on for Development of Village				
3.	Any NGO working for village development				
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)				

8



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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	Pubic toilet & school building	—
2.	Additional Information/ Requirement	—	—
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	—	—

IX. Smart Village / Heritage Details

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?	LAKE	USELESS CONDITION NOW IT DAYS.

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

RSin

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12.4 Gap Analysis of the Allocated Village

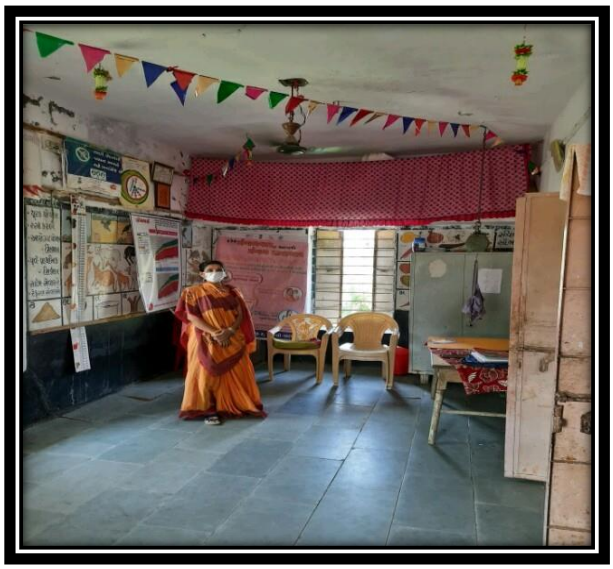
Table 12.4 gap analysis

Facilites	Bhilvan		
	Population =4701		
	Existing	**required**	**Gap**
Education			
Anganwadi	3	4	1
Primary School	1	2	1
Secondary School	1	1	0
Higher Secondary School	0	1	1
Collage	1	1	1
Medical Facility			
Government hospital	0	1	0
Medical shop	1	0	0
PHC & CHC	0	1	1
Transportation			
Bus Station	1	2	1
Railway station	0	0	0
Auto stop	1	1	0
Approch road	1	1	0
Water facilites			
Over head tank	1	2	1
Other facilites			
Public Toilet	2	0	2
gym	0	1	1
Libarary	0	1	1
Police Station	0	1	1
Bio Gas Plant	0	1	1
dairy	1	1	0
bank	0	1	1
Community hall	0	1	1

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

No.	village	Design part 1	Design part 2
1.	Bhilvan	1. post office 2. bus stop 3. primary school 4.anganwadi 5.entrance gate 6. auditorium	1. elevated water tank 2. bio gas plant 3. gym 4. bank 5. library 6. rain water harvesting
2.	kungher	1. dwelling house 2. open window composite structure 3. bio gas plant 4. pipe culvert 5. Atm centre 6. stone pitching on lack boundary	1. approach road 2. elevated water tank 3. public toilet 4. chabutara 5.approch road 6. community hall
3.	vamiya	1. bio gas plant 2. public toilet 3. community hall cum booth 4. U/G sump 5. heritage : chabutro 6. school sanitary complex	1. solid waste management 2. bus station 3. post office 4. dwelling house 5. paver block 6. public garden
4.	aghar	1. bio gas plant 2. road 3. public toilet 4. dairy 5. agro-centre 6. medical shop	1. chabutara 2. post office 3. library 4. drainage system 5. house design 6.heiger secondary school

12.6 Summary of Good Photographs in Table Format



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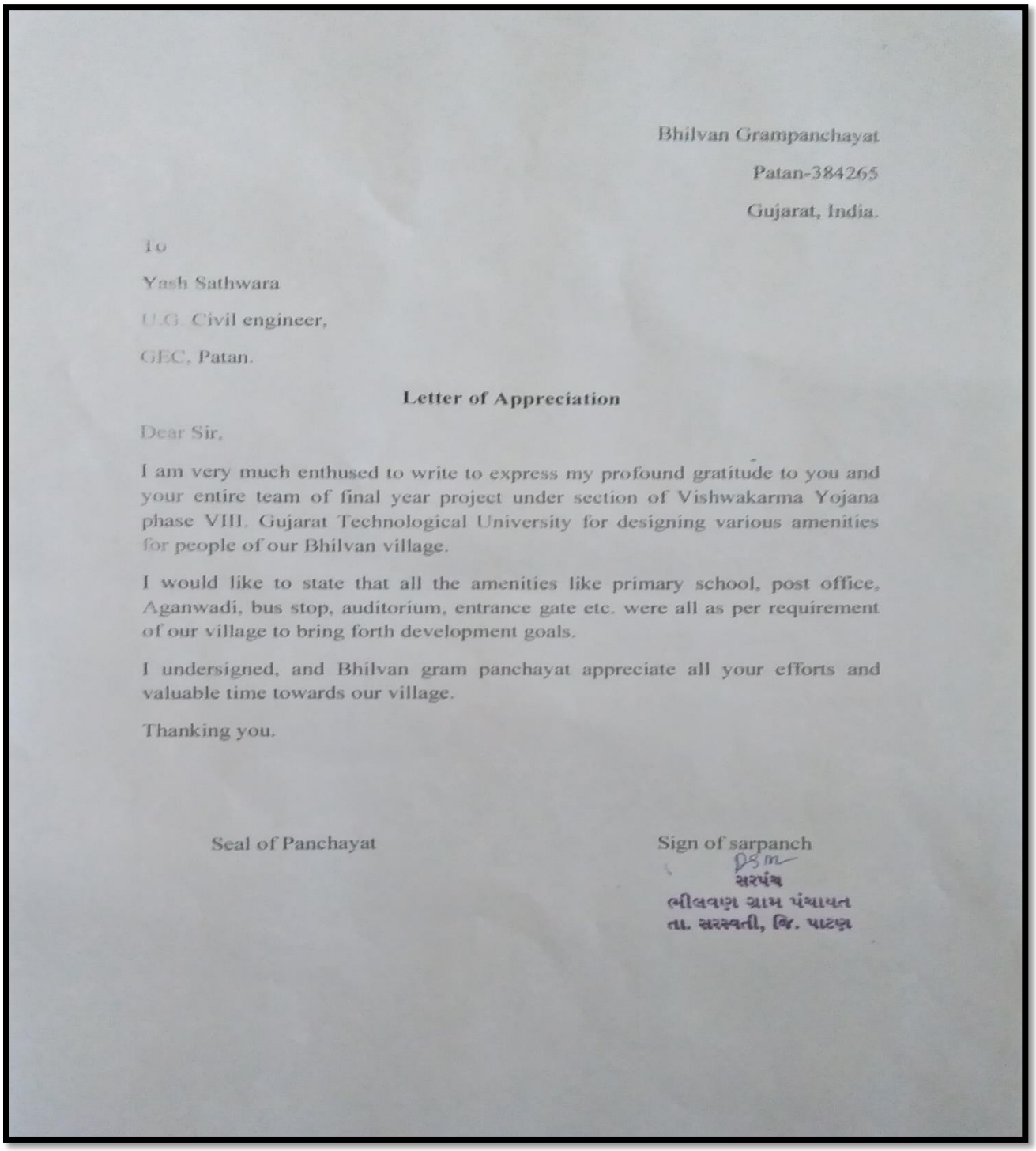
12.7 Village Interaction with sarpanch Report with the photograph

Fig 12.7.1 Meeting with sarpanch 1

Fig 12.7.2 Meeting with sarpanch 2

12.8 sarpanch letter giving information about the village devlopment.



Bhilvan Grampanchayat

Patan-384265

Gujarat, India.

To

Yash Sathwara

U.G. Civil engineer,

GEC, Patan.

Letter of Appreciation

Dear Sir,

I am very much enthused to write to express my profound gratitude to you and your entire team of final year project under section of Vishwakarma Yojana phase VIII, Gujarat Technological University for designing various amenities for people of our Bhilvan village.

I would like to state that all the amenities like primary school, post office, Aganwadi, bus stop, auditorium, entrance gate etc. were all as per requirement of our village to bring forth development goals.

I undersigned, and Bhilvan gram panchayat appreciate all your efforts and valuable time towards our village.

Thanking you.

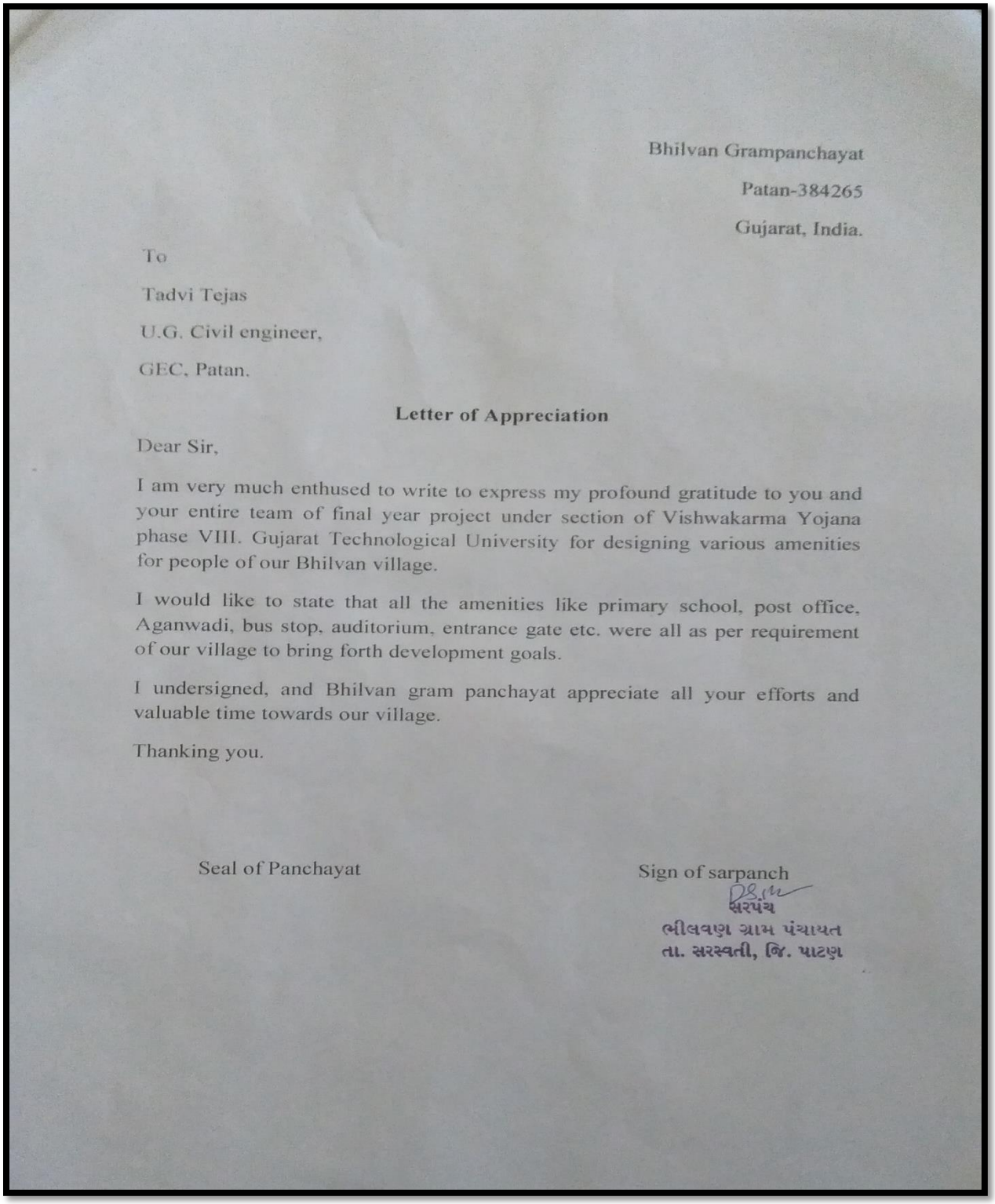
Seal of Panchayat

Sign of sarpanch

સરપંચ

ભીલવણ ગ્રામ પંચાયત

તા. સરસ્વતી, જિ. પાટણ



Bhilvan Grampanchayat

Patan-384265

Gujarat, India.

To

Tadvi Tejas

U.G. Civil engineer,

GEC, Patan.

Letter of Appreciation

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Thanking you.

Seal of Panchayat

Sign of sarpanch

સરપંચ

ભીલવણ ગ્રામ પંચાયત

તા. સરસ્વતી, જિ. પાટણ

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

13.1 Design Proposals

In the Part-II of Vishwakarma Yojana Phase-VIII we have selected design of bank, rainwater harvesting, library, gym, bio-gas plant, elevated water tank.

13.1.1 Civil Design 1

LIBARARY :

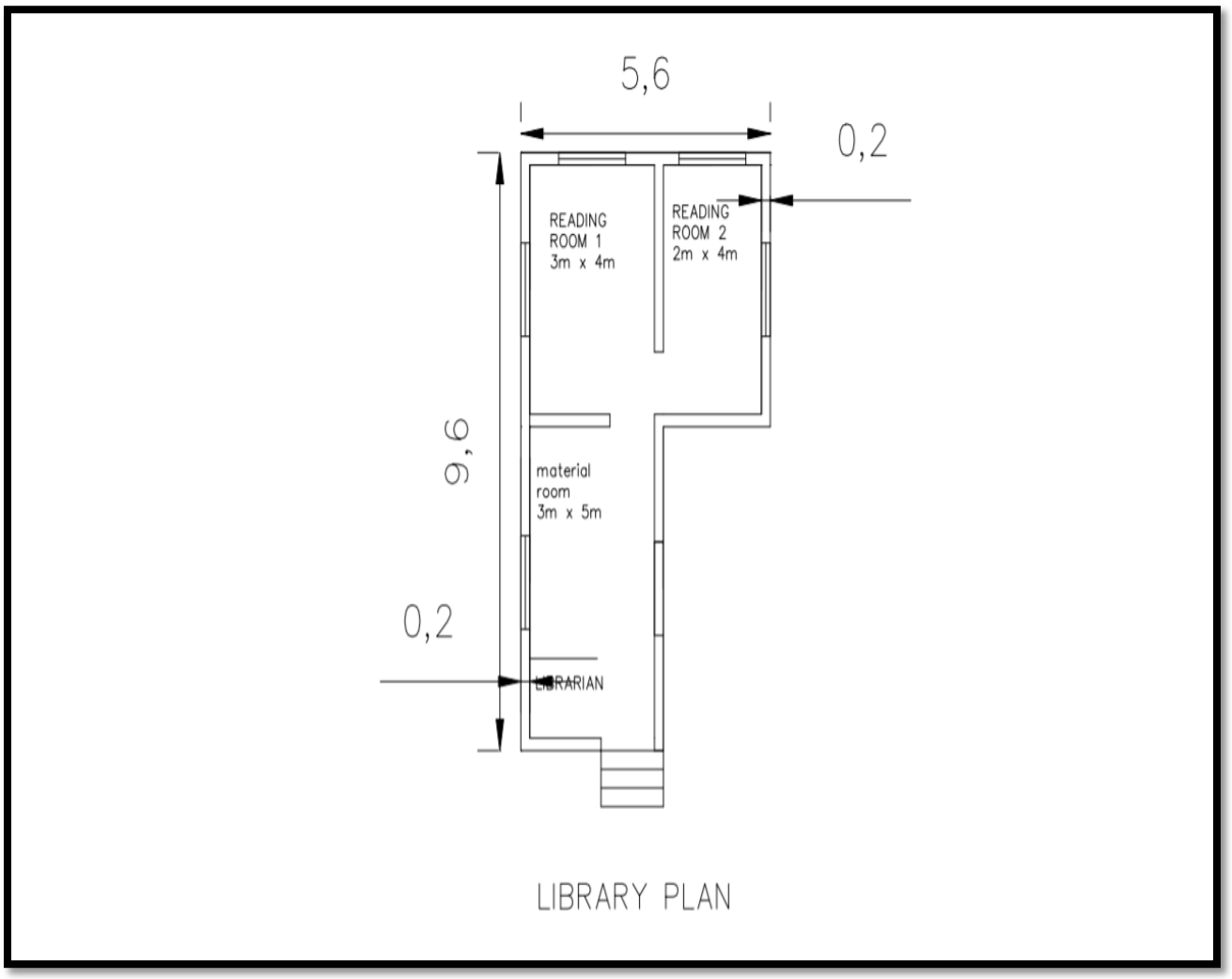


Fig 13.1.1.1 library plan

Estimation of library building:-

For estimation we use Long wall & short wall method.

Calculation:
Long wall & short wall method

Table 13.1.1.1 measurement sheet

Item No.	Item description	no	Length L m	Breadth B m	Height H m	quantity
1.	Excavation for foundation in ordinary soil Long walls:(vertical) L=(5+0.2+4+0.1+0.1)+2 X 0.40 = 10.2m H=0.4+0.4+0.4+0.2=1.4m	2	10.2	0.8	1.4	22.85
	Long walls:(right sides) L=(4+0.1+0.1) +2 x 0.40 =5.0m	1	5	0.8	1.4	5.60
	Short walls: L= (3+0.2) -2x0.4 = 2.4m	3	2.4	0.8	1.4	8.06
	Short walls: L = (2+0.2) – 2 x 0.4 = 1.4m	2	1.4	0.8	1.4	3.14
						39.79m3
2.	Brick bat cement concrete in foundation (1:3:6).					
	Long walls:(vertical)	2	10.2	0.8	0.4	6.53
	Short walls:(right sides)	1	5	0.8	0.4	1.6
	Short walls:	3	2.4	0.8	0.4	2.3
	Short walls:	2	1.4	0.8	0.4	0.90

						11.33m3
3.	Brick masonry in foundation and plinth					
	Long walls					
	First step:L= 10.2-2x0.15	2	9.9	0.5	0.4	3.96
	= 9.9m					
	Second step:L= 9.9-2x0.5	2	9.8	0.4	0.4	3.14
	=9.8m					
	Third step:L = 9.8-2x0.05	2	9.7	0.3	0.75	4.36
	=9.7m					
	H= 0.2+0.6-0.05=0.75m					
	Long walls:					
	First step:L=5- 2x 0.15	1	4.7	0.5	0.4	0.94
	=4.7m					
	Second step:L= 4.7-2 x 0.05	1	4.6	0.4	0.4	0.74
	=4.6m					
	Third step:L =4.6-2x0.05	1	4.5	0.3	0.75	1.01
	=4.5					
	Short walls					
	First step:L= 2.4+2x0.15					
	= 2.7m	2	9.9	0.5	0.4	3.96
	Second step:L= 2.7+2x0.05					
	=2.8m	2	9.8	0.4	0.4	3.14
	Third step:L = 2.8+2x0.05					
	=2.9m	2	9.7	0.3	0.75	4.36

	Short walls:					
	First step:L=1.4+2x0.15	2	1.7	0.5	0.4	0.68
	=1.7m					
	Second step:L= 1.7 + 2x 0.05	2	1.8	0.4	0.4	0.58
	=1.8m					
	Third step:L =1.8+2 x 0.05	2	1.9	0.3	0.75	0.85
	=1.9m					
		Total quantity				21.18m3
4.	**Smooth plaster on inside walls and ceiling (1:3)**					
	Walls	2	5	-	3	30
		2	3	-	3	18
	ceiling	1	5	3	-	15
						63m3
5.	**Rcc for slab**	1	4.4	5.6	1	24.64m3
		1	3.4	5.2	1	17.68m3
						42.32m3

Table 13.1.1.2Abstract sheet quantities

Sr No.	particulars	Quantity Per m3	Rate	Per	Total amount Rs.
1.	Excavation for foundation in ordinary soil Long walls:	39.79m3	80	m3	3183.2

2.	Brick bat cement concrete in foundation (1:3:6).	11.33m3	3000	m3	33990
3.	Brick masonry in foundation and plinth	21.18m3	3200	m3	67776
4.	Smooth plaster on inside walls and ceiling (1:3)	63m3	150	m3	9450
5.	r.c.c for slab	42.32m3	6000	m3	259920
Net amount of cost up to first floor level					3,74,319/-

Fig 13.1.1.2 library design 1

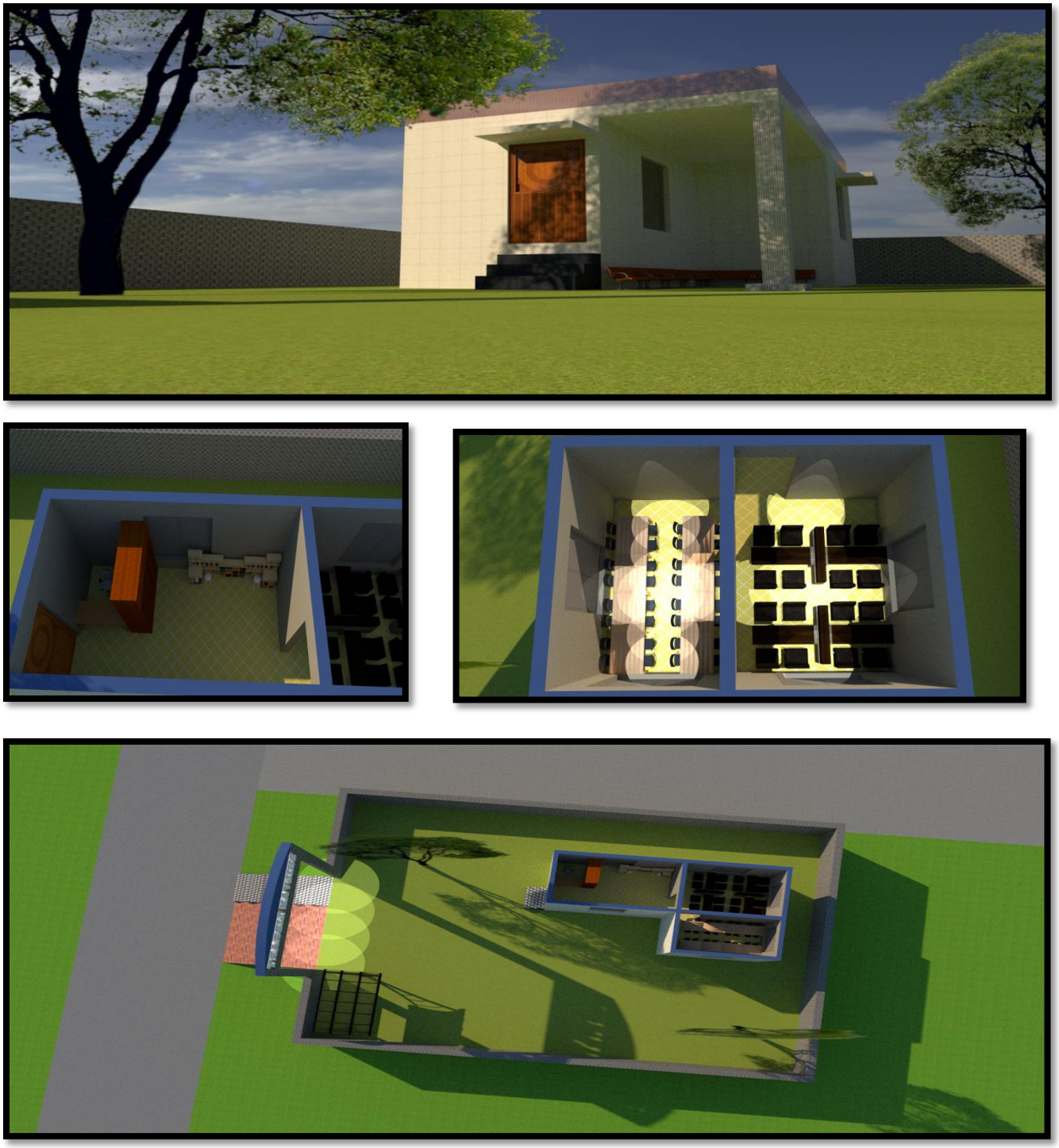


Fig 13.1.1.3 library design 2

13.1.2 Civil Design 2

GYM :

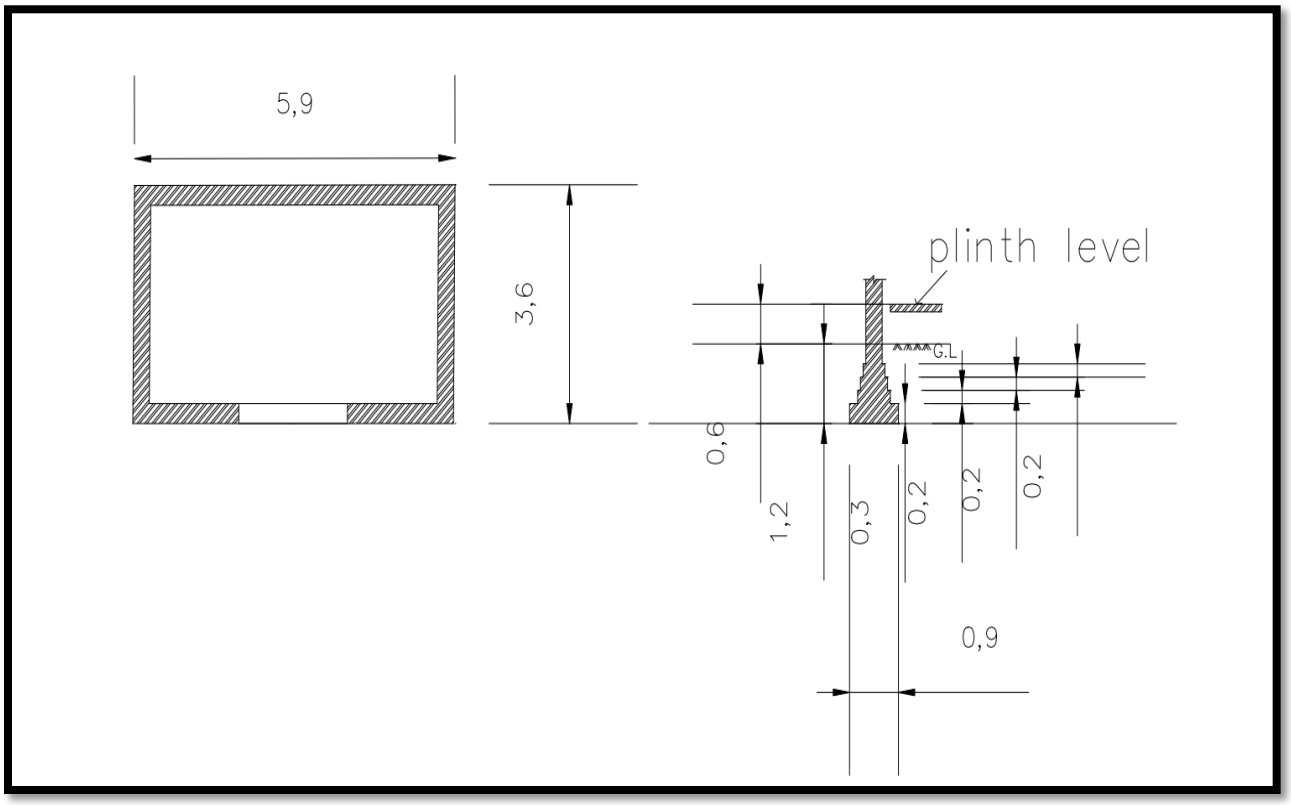


Fig 13.1.2.1 gym plan

Estimation of gym building:-

Long wall & short wall method

Table 13.1.2.1 measurement sheet

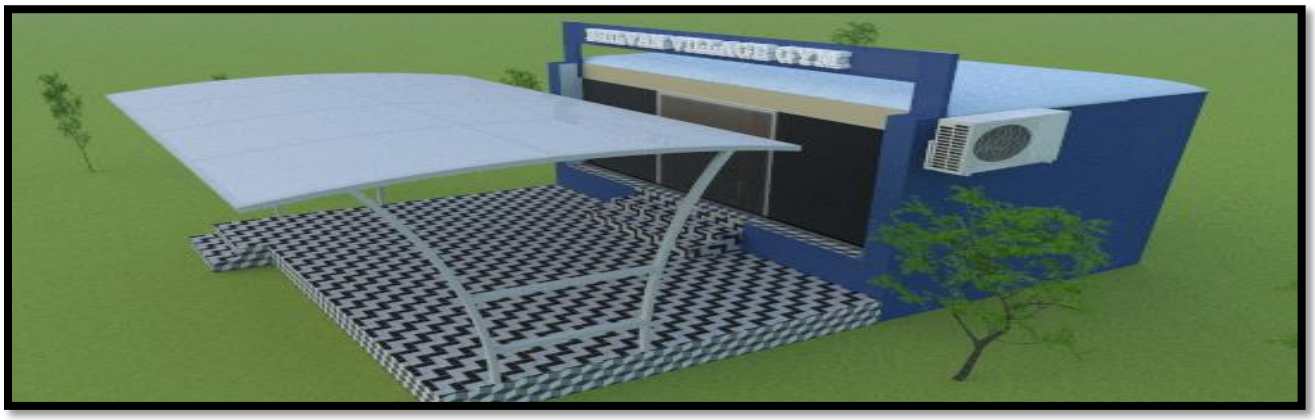
Item No.	Item description	no	Length L m	Breadth B m	Height H m	quantity
1.	Excavation for foundation in ordinary soil Long walls: L=3+2+(2x0.3)+(2x0.45) = 6.5m H=1.2m Short walls: L=3-2x0.45 =2.1m	2 2	6.5 2.1	0.9 0.9	1.2 1.2	14.04 4.536 18.57m3

2.	P.C.C (1:4:8) in foundation Long walls: Short walls:	 2 2	 6.5 2.1	 0.9 0.9	 0.3 0.3	 3.51 1.134
						4.64m3
3.	Brick masonry in foundation and plinth **Long walls** First step:L= 6.5-2x0.15 = 6.2m Second step:L= 6.2-2x0.05 =6.1 m Third step:L = 6.1-2x0.05 =6.0m Fourth step:L=6.0 -2x0.05 =5.9m H= 0.6+0.3=0.9m **short walls** First step:L=2.1+0.3 =2.4m Second step:L= 2.4+2x0.05 =2.5m Third step:L =2.5+2x0.05 =2.6m Fourth step:L=2.6+2x0.05 =2.7m	 2 2 2 2 2 2 2 2	 6.2 6.1 6.0 5.9 2.4 2.5 2.6 2.7	 0.6 0.5 0.4 0.3 0.6 0.5 0.4 0.3	 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.9	 1.49 1.22 0.96 3.19 0.576 0.5 0.416 1.458
						9.81m3

Table 13.1.2.2 Abstract sheet quantities

Sr No.	particulars	Quantity Per m3	Rate	Per	Total amount Rs.
1.	Excavation for foundation in ordinary soil Long walls:	18.57m3	80	m3	1485.6
2.	P.C.C (1:4:8) in foundation	4.64m3	3000	m3	13920
3.	Brick masonry in foundation and plinth	9.81m3	3200	m3	31392

4.	r.c.c for slab	21.24m3	6000	m3	127440
Net amount of cost up to first floor level					1,74,237/-



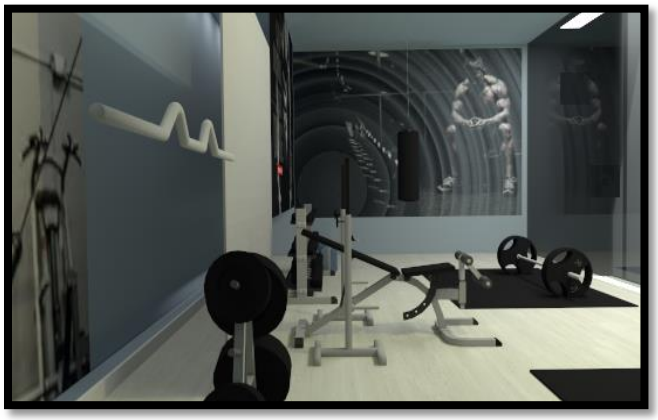


Fig 13.1.2.2 gym design

13.1.3 Civil Design 3

BANK :

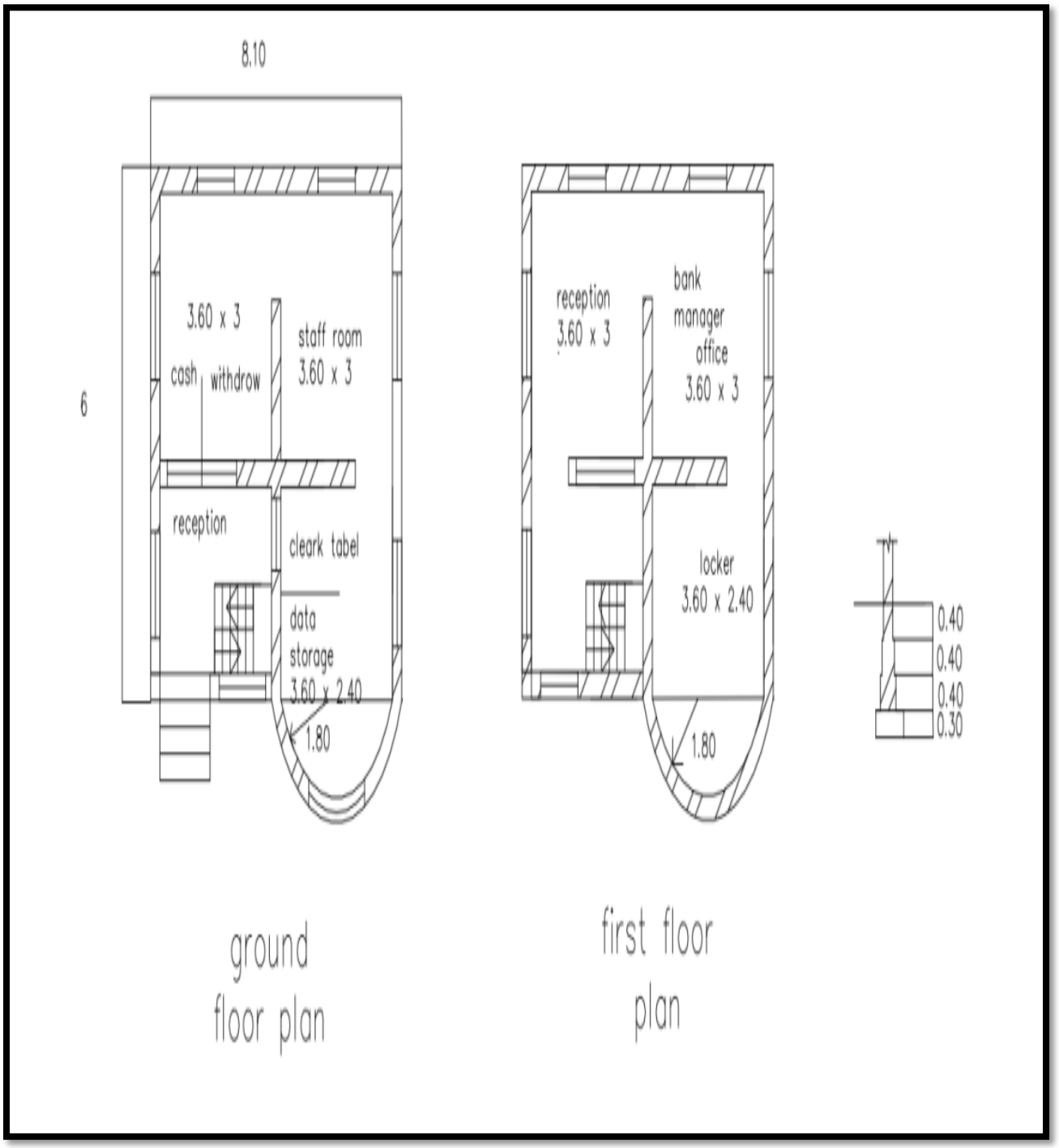


Fig 13.1.3.1 bank plan

Estimation of bank building:-

Centre line method.

There are 10 junctions of the walls

So, net centre – line length

= total centre line length – (1/2 x width x no. of junctions)

Total centre line length = 3x (4+0.2+3+0.2) horizontal walls + 3x(3+0.2+4+0.2) vertical walls + 1x (3+0.2) between ledis w.c and gents w.c + 1x(1.1+0.2) inform of w/c

= 22.2+22.2+3.2+1.3

=48.9m

Table 13.1.3.1 measurement sheet

Item no.	Item description	no	Length L m	Breadth B m	Height H m	quantity
1.	Earthwork in excavation for foundation: Total center line length= 48.9m No of junctions=10 L= 48.9-1/2x0.90x10 = 44.4m	1	44.4	0.9	1.10	43.96m3
2.	Brick bat cement concrete(1:4:8) for foundation	1	44.4	0.9	0.2	7.99m3
3.	Brick masonry up to plinth in c.m 1:6 First step:L = 48.9-1/2x0.5x10 = 46.40m Second step: L = 48.9-1/2x0.4x10 =46.9m Third step:L= 48.9-1/2x0.3x10 = 47.4 Steps: First step: Second step: Third step: For steps L = D1=1.1m	1 1 1 1 1 1	46.4 46.9 47.4 1.1 1.1 1.1	0.5 0.4 0.3 0.9 0.6 0.3	0.3 0.3 0.85 0.15 0.15 0.15	6.96 5.63 12.08 0.15 0.15 0.15 24.97m3
4.	Brick masonry above plinth up to					

	slab level in C.M 1:6. L=48.9-1/2x0.2x10 =47.9m Deductions for doors/windows Deductions for lintels	1	47.9	0.2	3.0	28.74m3 - 5.57m3 -0.646m3
5.	Smooth plaster inside the rooms and cellings in c.m 1:3.					238.39m3
					Total	519.48m3
					Add first floor quantity	475.52m3
					Net quantity	995m3

Table 13.1.2.2 Abstract sheet quantities

Sr No.	particulars	Quantity Per m3	Rate	Per	Total amount Rs.
1.	Earthwork in excavation for foundation:	43.96m3	180	m3	7913/-
2.	Brick bat cement concrete(1:4:8) for foundation	7.99m3x2	3500	m3	55930
3.	Brick masonary up to plinth in c.m 1:6	24.97m3x2	4000	m3	199760
4.	Brick masonry above plinth up to slab level in C.M 1:6.	28.74m3x2	4000	m3	229920/-
5.	Smooth plaster inside the rooms and callings in c.m 1:3.	238.39m3x2	300	m3	143034\-
				Total cost	6,36,557\-
				Add charge 5%	31,828/-
				Profit 10%	63,656/-
				Net amount	7,32,141/-

Fig 13.1.3.2 bank design

13.1.4 Civil Design 4

WATER TANK :

Capacity of tank 4.5 laces litre. M-30 concrete and Fe 415 steel.

Following components of water tank:

(1) Top spherical dome

(2) Top ring beam

(3) Cylindrical wall

(4) Base slab

(5) Bottom ring beam

Solutions:

Dimensions:

Capacity of tank = 4.5 laces liter

$=450\ m^3$

Assume diameter of tank D = 12 m

$\therefore$ Volume = $\frac{\pi}{4}\times D^2\times H$

$450 = \frac{\pi}{4}\times 12^2\times H$

$\therefore$ H = 3.97 m say H = 4.0m

Let us assume diameter of bottom ring beam = 0.75 D = 0.75×12

= 9 m

Final dimensions are

Diameter of tank, D = 12 m

Height of tank, H = 4 m

Diameter of bottom ring beam = 9 m

Let us assume ring beam is supported on six equally spaced columns

(1) Design of top Dome:

Assume $h_1 = 0.2D$

$= 0.2\times 12$

$= 2.4$ m

$(2R - h_1)\times h_1 = \frac{D}{2}\times\frac{D}{2}$

$(2\times R-2.4)\times 2.4=6\times 6$

$\therefore$ R = 8.7 m

$\sin\theta = \frac{6}{8.7}$

$\therefore \theta = 43.60°$

$\therefore \cos\theta = 0.724$

Assume thickness of dome 100 mm.

Self-weight of dome = $0.10 \times 25 = 2.5$ kN/m^2

Live load (assume) = 1.5 kN/m^2

w = 4.0 kN/m^2

Meridional force,

$T_1 = \frac{wR}{1+cos\theta}$

$= \frac{4\times 8.7}{1+\cos 43.60°}$

= 20.18 kN/m

$\therefore$ Meridional stress = $\frac{20.18\times 10^3}{100\times 1000}$ = 0.202 N/mm^2

Permissible stress in concrete in direct

Compression for M 30 concrete,

= 8 N/mm^2 ……. Safe

Hoop force,

$T_2 = wR [\cos\theta - \frac{1}{1+cos\theta}]$

$= 4\times 8.7 [0.724 - \frac{1}{1+0.724}]$

= 5.0 kN/m

$\therefore$ Hoop stress = $\frac{5\times 10^3}{100\times 1000}$

= 0.05 < 8 N/mm^2 …… safe.

Provide minimum reinforcement @ 0.24 %

$\therefore A_{st} = \frac{0.24}{100}\times 1000\times 100$

= 240 mm^2

$\therefore$ Provide 8 mm ϕ @ 200 mm c/c in radial and circumference dimension.

(2) Design of Top ring beam :

D = 12 m

Meridional thrust per metre length of beam at base,

T_1 = 20.18 kN/m

Horizontal component of T_1

$=T_1\cos\theta$

$=20.18 \cos 43.60°$

w =14.61 kN/m

∴ Total hoop tension in ring beam

$= w\cdot\frac{D}{2}$

$= 14.61\times\frac{12}{2}$

= 87.66 kN

Steel required for hoop tension, Permissible stress in steel = 130 N/m^2

$= \frac{87.66\times10^3}{130}$

A_{st} = 674.30 mm^2

Provide 6 nos. – 12 mm dia. Bars

Let width of beam = 250 mm

Transformed area of section, σ_{cbc} = 10 N/mm^2

$A_T = A_g + (m – 1) A_{st}$ m = modular ratio

$= b \cdot D + (m – 1) A_{st}$ $=\frac{280}{3\sigma_{cbc}} = \frac{280}{3\times8.10}$

$= 250D + (9.33 – 1) \times 678$ = 9.33

$= 250D + 5647.74$ IS : 456 - 2000, P, 80

Tensile stress in concrete < 1.5 N/mm^2

∴ $\frac{87.66\times10^3}{250D+5647.74} \leq 1.5$

$211.16\times10^3 \leq 375D + 8471.61$

87.66 mm < D

∴ Provide depth of beam = 300 mm

∴ Size of top ring beam is 250 mm × 300 mm

Provide minimum shear reinforcement.

Use 8 mm ϕ - 2 legged vertical stirrups.

$\therefore \quad A_{st} = 2\times\frac{\pi}{4}\times 8^2$

$= 100.53 \text{ mm}^2$

$\therefore S_F = \frac{0.87\, f_y \cdot A_y}{0.4b}$

$= \frac{0.87\times 415\times 100.53}{0.4\times 250}$

$= 362.96$ mm

Spacing limits (1) 0.75D = 0.75 × 300 = 225 mm

(2) 300 mm

∴ Provide 8 mm ϕ strrups @ 225 mm c/c.

(3) Design of tank wall :

Depth of water in tank = H = 4 m.

Dia. of tank = D = 12 m

Maximum hoop tension at base of wall due to water pressure.

$T = \frac{\gamma_w \cdot H \cdot D}{2}$

$= \frac{10\times H\times 12}{2}$

$= 60 \text{ H kN/m}$

$A_{st} = \frac{T}{130} = \frac{60H}{130}\times 10^3$

$= 461.54 \text{ H mm}^2$

Horizontal reinforcement :

The reinforcement required and provided at various depths from top is tabulated below

Depth from top (H) m	Area required A_{st} (mm^2) (461.54H)	Area on each face, mm^2 (230.76H)	Reinforcement provided on each face (horizontal)
1.	461.54	230.76	8 ϕ @ 210 mm c/c (A_{st} = 239 mm^2)
2.	923.0	461.54	10 ϕ @ 170 mm c/c

			(A_{st} = 462 mm^2)
3.	1384.62	692.31	10 ϕ @ 110 mm c/c (A_{st} = 714 mm^2)
4.	1846.16	923.0	12 ϕ @ 120 mm c/c (A_{st} = 942 mm^2)

Maximum hoop tension at base, at H = 4 m

T = 60H kN per metre length

= 60 × 4

= 240 kN

$A_T = A_g + (m - 1) A_{st}$

= 1000t + (9.33 – 1) × (2 × 942) b = 1 m = 1000m

= 1000t + 15693.72 modular ratio, m = 9.33

∴ Tensile stress in concre < 1.5 N/mm^2

∴ $\frac{240\times10^3}{1000t+15693.72} \leq 1.5$

$240 \times 10^3 \leq 1500t + 23540.58$

∴ $144.30 \leq t$

∴ Provide t = 200 mm thick wall at base and reduce it to 150 mm at top.

∴ Average thickness = 175 mm

Vertical reinforcement :

Bottom $\frac{H}{3}$ height of wall is designed as a cantilever.

∴ h = $\frac{H}{3} = \frac{4}{3}$ = 1.333m

Cantilever moment,

M = $\frac{\gamma_{w \cdot H \cdot h^2}}{6}$

= $\frac{10 \times 4 \times (1.333)^2}{6}$

= 11.84 kN.m

For M 30 concrete and Fe 415 steel.

σ_{abc} = 10 N/mm^2 $A_{st} = \frac{M}{\sigma_{st} \cdot j \cdot d}$

σ_{st} = 130 N/mm^2

m = 9.33

d = 175 – 50 = 125 mm

$k = \frac{m \cdot \sigma_{cbc}}{m \cdot \sigma_{cbc} + \sigma_{st}}$

$= \frac{9.33 \times 10}{9.33 \times 10 + 130} = 0.418$

$J = 1 - \frac{k}{3} = 1 - \frac{0.418}{3} = 0.861$

$= \frac{11.84 \times 10^6}{130 \times 0.861 \times 125}$

= 846.24 mm^2

Minimum steel required in vertical direction

$A_{st\ min} = \frac{0.24}{100} \times 1000 \times 175 = 420$ mm^2

∴ Provide 10 mm ϕ @ 150 mm c/c (524 mm^2) in vertical direction up to 1.3 m height on inner face.

Curtail alternate bars above 1.3 m height.

On outer face provide 10mm ϕ @ 300 mm c/c in vertical direction.

(4) Base slab :

Total load from dome = $T_1 \sin\theta \times 2\pi \times \frac{D}{2}$

$= 20.18 \sin 43.60° \times 2\pi \times \frac{12}{2}$

= 524.64 kN

Weight of ring beam = (0.25 × 0.30) × π × 12 × 25

= 70.68 kN

Weight of wall = 0.175 × (4 – 0.3) × π × 12.175 × 25

= 619.15 kN

Total weight = 524.64 + 70.68 + 619.25

= 1214.47 kN ……. Total load on edge of slab.

Total weight of water = $(\frac{\pi}{4} \times D^2 \times H) \cdot \gamma_w$

$= (\frac{\pi}{4} \times 12^2 \times 4) \times 10$

= 4523.90 kN

Assume slab thickness,

t = $\frac{D}{35} = \frac{12}{35}$ = 0.342 m say 350 mm

∴ Self weight of slab = 0.35 × 25

= 8.75 kN/m^2

Slab diameter = 12 + 2 × 0.2 = 12.4 m

∴ Total weight of slab = ($\frac{\pi}{4}$ × 12 · 4^2) × 8.75

= 1056.67 kN

Finishing load = ($\frac{\pi}{4}$ × 12^2) × 0.6 Assume finishing load = 0.6 kN/m^2

= 67.85 kN

∴ Load on slab = 4523.90 + 1056.67 + 67.85

= 5648.42 kN

∴ Total upward force from ring beam

= 1214.47 + 5648.42

= 6863 kN

1 Circular slab simply supported at outer periphery by walls and subjected to water pressure plus self-weight of slab.

2 Circular slab simply supported at outer periphery by walls and subjected to upward ring load.

For case I loading :

$M_r = \frac{3}{16} q (a^2 – r^2)$

$M_\theta = \frac{3}{16} q a^2 - \frac{qr^2}{16}$

q = uniformly distributed downward load

$= \frac{5648.42}{\frac{\pi}{4}\times(12.2)^2}$ = 48.32 kN/m^2

a = radius of base slab

$= \frac{12.2}{2}$

= 6.1 ,

r = radial distance where moment is required

M_r and M_θ at critical point are calculated as under :

r in metre	0	2.25	4.5
	6.1		
M_r (kN.m)	337.12	291.25	153.65
	0		
M_θ (kN.m)	337.12	321.83	275.96
	224.73		

For Case 2 loading :

b = radius of ring beam

$= \frac{q}{2}$ = 4.5 m

For r ≤ 4.5 m

$M_r = M_\theta = \frac{W}{8\pi}$ [$2\log \frac{a}{b} + 1 - (\frac{b}{a})^2$]

For r > 4.5 m

$M_r = \frac{W}{8\pi}$ [$2\log \frac{a}{r} - (\frac{b}{a})^2 + (\frac{b}{r})^2$]

$M_\theta = \frac{W}{8\pi}$ [$2\log \frac{a}{r} - (\frac{b}{r})^2 + 2 - (\frac{b}{a})^2$]

a = 6.1 m

b = 4.5 m

Total upward ring load, W = 6863 kN

Since W is acting upward, moments are taken as – Ve.

r in metre	0	2.25	4.5	6.1
M_r (kN.m)	- 196.62	-196.62	-196.62	0
M_θ (kN.m)	- 196.62	-196.62	-196.62	-240.10

Net moment in the slab are calculated as below :

r in metre	0	2.25	4.5	6.1
M_r (kN.m)	140.5	94.63	-42.97	0
M_θ (kN.m)	140.5	125.21	79.34	-24.2

∴ Design moment = 140.5 kN.m

Now, $Q = \frac{1}{2} \times 10 \times 0.418 \times 0.861$

$= 1.80$

$\therefore \quad 140.5 \times 10^6 = 1.80 \times 1000 \times d^2$

$\therefore \quad d = 279.38$ mm

$\therefore$ Provide $d = 300$ mm

$\therefore \quad t = 300 + 50$

$= 350$ mm.

$A_{st} = \frac{M}{\sigma \cdot j \cdot d}$

$= \frac{140.5 \times 10^6}{130 \times 0.861 \times 300}$

$= 4184.16$ mm^2

$\therefore$ Provide 25 mm ϕ bars @ 110 mm c/c

This steel is required in the middle at bottom of slab as moment M_r up to 2.25 m radius is sagging. This steel may be provided in the form of square mesh of size 7.0 m × 7.0 m with 25 mm ϕ bars @ 110 mm c/c both ways.

AC ring beam M_r is – Ve. i.e$_{+y}$ hogging

$\therefore \quad A_n = \frac{42.97 \times 10^6}{130 \times 0.861 \times 300} = 1280$ mm^2

$\therefore$ Provide 16 mm ϕ @ 150 mm c/c at ring beam over top face. Extend these bars up to edge on outside and 1.5 m inside, in radial direction.

At ring beam $M_\theta = 79.34$ kN.m (+ Ve)

$\therefore \quad A_n = \frac{79.34 \times 10^6}{130 \times 0.861 \times 300} = 2362.78$ mm^2

$\therefore$ Provide 20 mm ϕ @ 130 mm c/c at bottom in circumferential direction 1.0 m inside of ring beam and 1.0 m outside of ring beam.

Nominal steel @ 0.24% $= \frac{0.24}{100} \times 1000 \times 350$

$= 840$ mm^2

Provide 12 mm ϕ bars @ 260 mm c/c both ways as nominal steel at other surfaces.

(5) Design of bottom ring beam :

Radius of bottom ring beam , $b = 4.5$ m

Total load on ring beam = 6863 kN

$\therefore$ Load on beam per metre length = $\frac{6863}{\pi \times 9.0}$ = 242.72 kN/m

The beam is curved in plan.

Let us assume it is supported on 6 equally spaced columns.

The beam will be subjected to torsion.

Let, width of beam is 350 mm.

Taking depth approximately $\frac{1}{15}$ of diameter = $\frac{1}{15} \times 9$ = 0.6 m

Self weight of beam = (0.35 × 0.6) × 25

= 5.25 kN/m say 6 kN/m

$\therefore$ Total load on ring beam = 242.72 + 6

= 248.72 kN/m

w ≅ 249 kN/m

n = no. of columns = 6

$\therefore$ $2\theta = \frac{360°}{6}$ $\therefore$ $\theta = 30° = \frac{\pi}{6}$

At support, $\phi = 0°$

Maximum shear = $F_\phi = w \cdot R\ (\theta - \phi)$

$= 249 \times 4.5 \times (\frac{\pi}{6} - 6)$

= 586.70 kN

At support, $\phi = 0°$

Bending moment,

$M_\theta = wR^2 (\theta \cdot \sin\phi + \theta \cot\theta \cdot \cos\phi - 1)$

$= 249 \times 4.5^2 (\frac{\pi}{6} \times 0 + \frac{\pi}{6} \cot 30° \cos 0° - 1)$

= - 469.43 kN.m

OR by coefficient,

$M_\theta = C_1 \cdot wR^2 (2\theta)$

$= 0.089 \times 249 \times 4.5^2 (\frac{\pi}{3})$

= 469.94 kN.m

Mid span moment, $\phi = \theta = 30° = \frac{\pi}{6}$

$M = wR^2 (\theta \sin\phi + \theta \cot\theta \cdot \cos\phi - 1)$

$= 249 \times 4.5^2 \left(\frac{\pi}{6} \times \sin 30° + \frac{\pi}{6} \cot 30° \cos 30° - 1\right)$

$= 249 \times 4.5^2 (0.04719)$

$= 237.94$ kN/m

OR by coefficients

$M_\theta = C_2 \cdot wR^2 (2\theta)$

$= 0.045 \times 249 \times 4.5^2 \left(\frac{\pi}{3}\right)$

$= 237.61$ kN.m

Maximum torsional moment,

$T_\phi = wR^2 [\theta \cos\phi - \theta \cot \theta \sin \phi - (\theta - \phi)]$

For n = 6 columns $\phi_{max} = 12.75°$

$\therefore T_\phi = 249 \times 4.5^2 \left[\frac{\pi}{6} \cos 12.75° - \frac{\pi}{6} \cot 30° \sin 12.75° - (30° - 12.75°)\frac{1}{30}\right]$

$= 249 \times 4.5^2 [0.5106 - 0.200 - 0.3010]$

$= 249 \times 4.5^2 [9.6 \times 10^{-3}]$

$= 48.40$ kN.m

OR by coefficients

$T_\phi = C_3 wR^2 (2\theta)$

$= 0.009 \times 249 \times 4.5^2 \left(\frac{\pi}{3}\right)$

$= 47.52$ kN.m

Now, let us design the beam by limit state method, as a doubly R. C.

At support, $M_W = 1.5 \times 469.43 = 704.15$ kN.m

$V_u = 1.5 \times 586.70 = 880$ kN

$T_u = 0$

Assumed size of beam is 350 mm × 600 mm.

Let effective cover = 50 mm

$\therefore d = 600 - 50 = 550$ mm

$d = 50$ mm

$\therefore \frac{d}{d} = \frac{50}{550} = 0.09 \cong 0.10$

$\frac{M_W}{hf^2} = \frac{704.15 \times 10^6}{350 \times 550^2} = 6.65$

$\therefore P_r = 2.205\ \%$

$P_v = 0.822\ \%$

$\therefore A_u = \frac{2.205}{100} \times 350 \times 550 = 4244.62\ mm^2$

$\therefore$ Provide 7 Nos – 28 ϕ bars as a tension steel at top near support.

$A_M = \frac{0.822}{100} \times 350 \times 550 = 1582.35\ mm^2$

$\therefore$ Provide 6 nos. – 20 ϕ bars as a compression steel at bottom near support.

At mid span M = 237.94 kN.m

$\therefore \quad M_u = 1.5 \times 237.94$

$= 356.91$ kN.m

This moment is almost half of that at support.

$M_{u\,lim} = 0.138\ f_{ck}\ bd^2$

$= 0.138 \times 30 \times 350 \times 550^2$

$= 438.32 \times 10^6$ N.mm

$= 438.32$ kN.m

Here, $M_u = 356.91$ kN.m $< M_{u\,lim} = 438.32$ kN.m

$\therefore$ At mid span, design the beam as singly R.C beam.

$\therefore \frac{M_u}{bd^2} = \frac{356.91 \times 10^6}{350 \times 550^2} = 3.37$

$\therefore P_1 = 1.105\ \%$

$\therefore A_u = \frac{1.105}{100} \times 350 \times 550$

$= 2127.12\ mm^2$

$\therefore$ Provide 5 Nos. - 25 mm ϕ bars at bottom at mid span

Provide 2 - 12 mm ϕ at top at anchor bars.

Check for torsion :

At $\phi_{max} = 12.75° = 0.2225$ radians.

It's distance from support $= R \cdot \phi$

$= 4.5 \times 0.2225$

$= 1.0$ m

Torsion moment = T = 48.40 kN.m

$\therefore$ T_u = 1.5 × 48.40

= 72.6 kN.m

M_e = M + M_1 at ϕ_{max} = 12.75°,

$$= M + \frac{M_1 \left(1 + \frac{D}{b} \right)}{1.7}$$

$$\therefore M_e = 0 + \frac{72.6 \left(1 + \frac{600}{500} \right)}{1.7}$$

= 115.92 kN.m

$\therefore$ Factored M_e = 1.5 × 115.92

= 173.88 kN.m < 356.91 kN.m

Therefore reinforcement provided at centre 5 – 25 mm ϕ bars are sufficient at base.

Shear reinforcement :

Maximum shear at support

V = 586.70 kN

$\therefore$ V = 1.5 × 586.70

= 880 kN

$$\therefore \tau_v = \frac{V_u}{bd} = \frac{880 \times 10^3}{350 \times 550} = 4.57 \text{ N/mm}^2$$

But 4.57 N/mm^2 > 3.5 N/mm^2

$\therefore$ Increase the section as 400 mm × 800 mm

$$\therefore \tau_v = \frac{880 \times 10^3}{400 \times 750} = 2.93 \text{ N/mm}^2$$

At support P_r = 2.205 %

τ_e = 0.87 N/mm^2

$\therefore$ $V = V_u - \tau_v \cdot bd$

$= 880 \times 10^3 - 0.87 \times 400 \times 750$

= 619000 N.

Using 10 mm ϕ - 4 legged vertical stirrups

$$\therefore A = 4 \times \frac{\pi}{4} \times 10^2 = 314.15 \text{ mm}^2$$

$$\therefore S = \frac{0.87 \times 415 \times 314.15 \times 750}{619000}$$

= 137.42 mm

∴ Provide 10 mm ϕ - 4 legged vertical stirrups @ 135 mm c/c.

Side face reinforcement :

As the depth is more than 450 mm, side face reinforcement is required.

A = $\frac{0.1}{100}$×400×750

= 300 mm^2

It is distributed equally on two faces.

∴ Provide 2 – 12 mm ϕ bars on each face as side face reinforcement.

(A = 4 × $\frac{\pi}{4}$ × 12^2 = 453 mm^2)

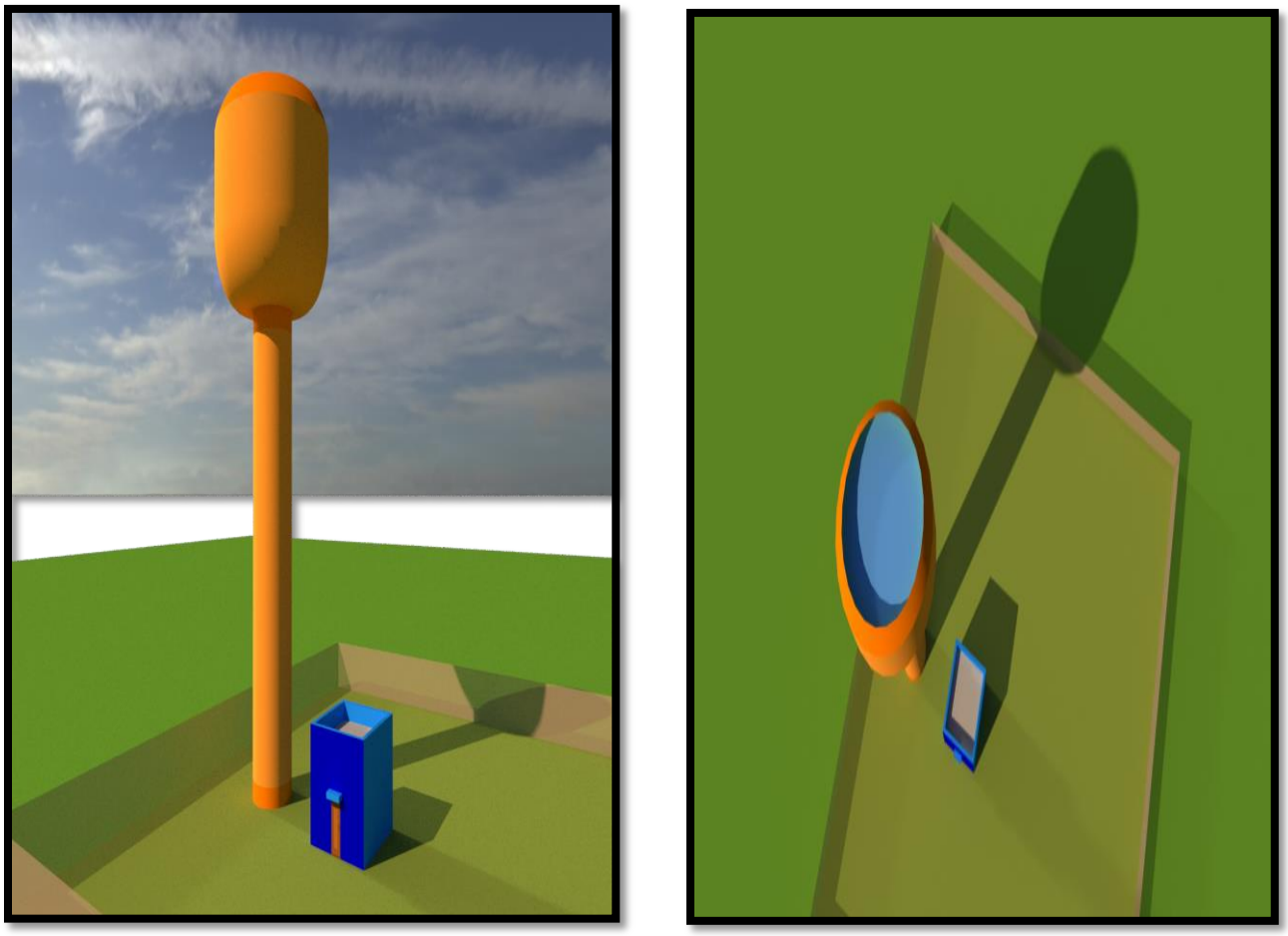


Fig 13.1.4.1 elevated water tank design

13.1.5 Civil Design 5

RAINWATER HARVESTING :

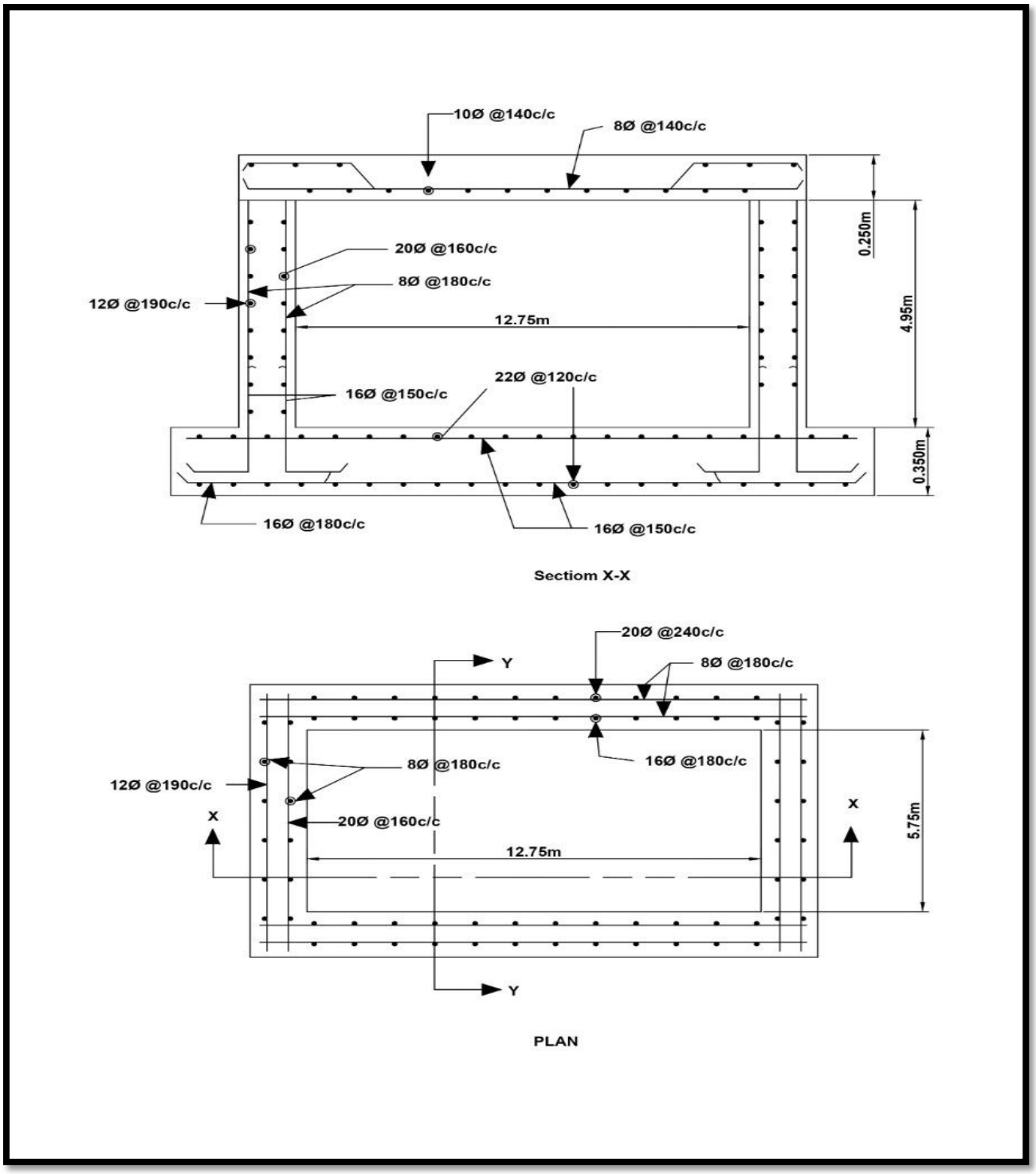


Fig 13.1.5.1 rain water harvesting tank plan

design of rainwater harvesting tank:-

- Size of water tank =2.35m x 4.75m x 5.75m
- Φ =30
- Ysat = 18 KN/cm³
- Fe =415
- M30 grade
- Unit weight of water =9.8 kN/m³

❖ L/B = 12.35/4.75 =2.6 > 2

As the L/B ratio is greater than 2,the long wall will be designed as cantilever

1) **Design constant :-** σcbc = 10, σst = 130 KN/ m³

M = 280/3 σcbc =280/3x10 = 9.33

K =m . σcbc/(m σcbc + σst)

J = 1-k/3 = 1-0.418/3 = 0.861

Q = 1/2x σcbc k.j = 1/2 x10x0.418x0.86 = 1.80

2) DESIGN OF LONG WALLS:

a) tank is empty with pressure of saturated soil from outside

$Pa = k_a \cdot \gamma' \cdot H + \gamma w \cdot H$

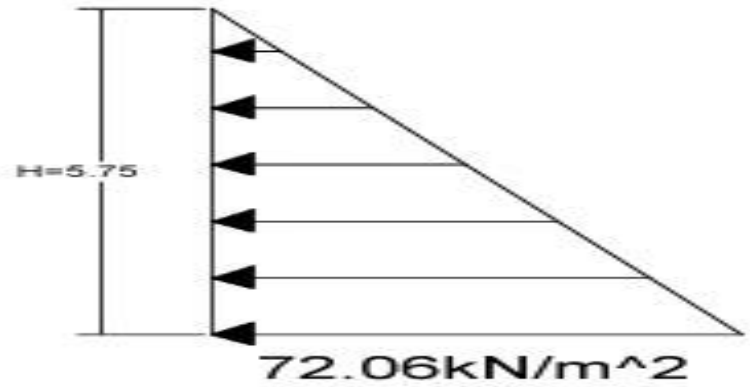
Ka = 1-sinØ / 1+sinØ =1/3

Y' = ysat –yw = 18 – 9.8 = 8.2 KN/m²

Pa = (1/3 x 8.2 x 5.75) + (9.8 x5.75) = 72.066 kN / m³

Cantilever maximum B.M at the base of wall

M = (1/2 x72.06 x 5.75) x1/3 x5.75 = 397.08 kN .m



$M = Q.\ bd^2 = 3.97.08 \times 10\text{^}6 = 1.80 \times 1000 \times d^2$

$d = 469.68$

provide $d = 500$

$D = 500 + 35 = 535mm$

$Ast = m/(\sigma st + jd)$

$= 379.08 \times 10\text{^}6 / (130 \times 0.861 \times 500)$

$= 7095.15\ mm^2$

Provide 16 mmΦ @ 80mm c/c remote face ($Ast = 2513\ mm^2$)

Since B.M is proportional to $h1^3$

$Ast1 / Ast = h1^3 / H^3$

$h1 = H \times (Ast1/Ast)\ \text{^}⅓$

if $Ast1 = ½\ Ast$ (i.e so % of the being curtailed)

$h1 = H\ (½)\ \text{^}⅓ = 5.75\ (½)\text{^}⅓ = 4.57\ m$

i.e $5.75 - 4.57 = 1.18$ m from base

$12Φ = 12 \times 16 = 192$ mm

Curtail 50 % bars at a height equal to 3

$= 1.18 + 0.19 = 1.37m$ say km from base `

❖ Direct tension in long wall

$P = Yw\ (H - h)$ $h = 1m$ (fix)

$= 9.8 \times (5.75 - 1)$

$= 46.55\ kN/m^2$

$TL = P \times B/2 = 46.55 \times 4.57 / 2 = 110.5\ kN$

$Ast = (110 \times 10^3) / 130 = 850$

3) Design of short wall

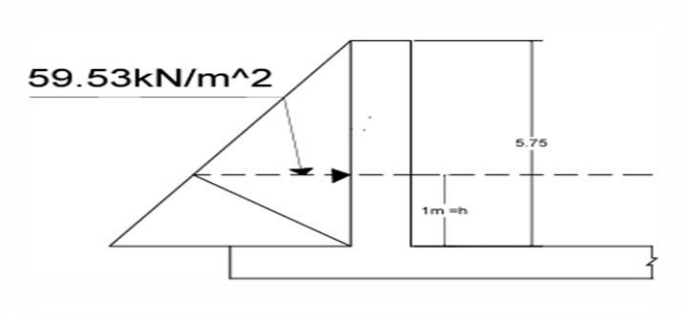
a) tank is empty with pressure of saturated soil from outside

I. Top portion :

($h = H/4 = 5.75 / 4 = 1.43\ m^3$)

$Pa = k_a \cdot \gamma' \cdot (H - h) + \gamma w \cdot (H - h)$

$= ⅓ \times 8.2\ (5.75 - 1) + 9.8\ (5.75 - 1)$



=12.98 +46.55 = 59.53 kN/ m²

Moment at support = Pa B² /12

Mf = (59.53 x 4.75 ²)/12 = 111.92 kN/m²

Moment at center = Pa B² /16

Mf = (59.53 x 4.75 ²)/16 = 83.94 kN · m

St at support = (111.92 x 10^6) / (130x 0.861 x 500)

= 1999 mm²

Provide 20 mm Φ @ 150 mm c/c

(Ast = 2094mm²)

At mid span Ast = (83.94 x 10^6) /(136 x0.861 x500) = 1499 mm²

Provide 20 mm Φ @ 160 mm c/c

(Ast = 1590mm²)

II. Bottom Portion of 1m height

Pa = 72.66 kN/m²

M = (½ x72.66 x 1) x (4 /5.75) x 1

= 25.06 kN m

Ast = m / σst · j · d

= (25.06 x 10^6) / (130 x 0.861 x 500)

= 447 mm²

Pti = 0.24 %

Ast = (0.24 / 100) x 1000 x 535 = 1284 mm²

Provide 16mm Φ @ 150mm c/c

(Ast = 1340 mm)

b) Tank is full with water and no earth fill outside

I) **Top portion** :

(h= H/4 =4.75/4 = 1.19)

P = Yw (H-h)

=9.8 x(4.75-1.19) = 34.88 kN/m²

Moment at support m1 = (34.88 x 4.75²) /12

=65.58 kN.m

Moment at centre =PB² /16

= (34.88 x4.75²) /16

49.18 kN.m

Ts = Yw (H- h) x 1

=34.88

X =d –230/2 = 500- 230/2 = 385 mm

Modified moment at support =65.58 – 34.88 x0.385

= 52.15 kN.m

Modified moment at center = 49.18 – 34.88 x 0.385

= 35.75

Ast1 for moment support = (52.15 x10^6) / (130 x0.86 x500)

= 931.83 mm²

Ast2 for direct tension = 34.88 x 10³ /130 = 268 mm²

Ast2 = 931.83 +268 = 1199.83 mm²

Provide 16mmΦ @160 mm c/c

(Ast2 =1257)

Ast1 for moment = (35.75 x 10^6) / (130 x 0.861 x 500)

=638.79

Ast2 for direct tension

Ast = 638.79 + 268

=906.79

Provide 12mm Φ@ 110 mm c/c

(1028 t)

ii) **Bottom portion of 1m height**

P =56.35

M = (½ x56.35 x1) x⅓ x1

= 9.39 kN.m

Ast = (9.36 x 10^6) / (130x 0.861 x500)

=167.78

Provide 12mm Φ@ 400mm c/c

(Ast =283)

4) Design of top slab

Assume D =250mm

d = 250 – 25 -5 = 220 mm

total load = 625 kN /m³

factored load = .5 x 6.25 =9.24 kN/m³

short span 4750 + 220 = 4950

4750 + 500 = 5250

dx = 0.009 & dy = 0.051

mx = 0.99 x 0.940 x 0.497²

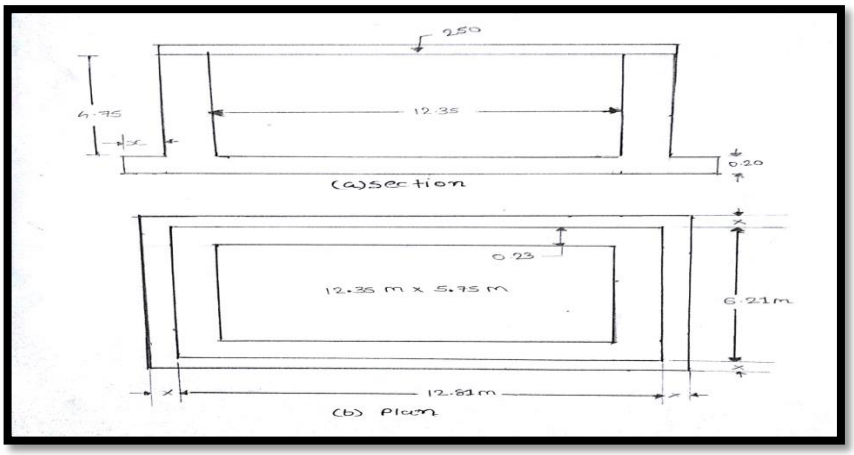
=230 = 23 kN/m

Md /bd² = (23 x10^6)/ (57.50 x 123.5²) =0.2622

Pt = 0.690%

Ast = (0.690/100) x 1000 x 215 1483.5 mm²

Provide 10mm Φ@ 140 c/c(Ast =1539 mm²)



5) Design of bottom slab

Assume thickness = 0.20m

H = 4.75 +0.2 =4.95

Upward assume when sundiy soil

= yw . H = 9.8 X 4.95 = 48.51 kN/m

❖ Downward forces

Weight of top slab

= (12.81x5.21 0 x0.250 x 25

= 417.12 kN

Weight of long wall

= 2x (12.81 x 0.23 x 5.75) x 25

=847.06 kN

Weight of long wall

= 2 (4.75 x 0.23 x 5.75) x25

=314.09

Weight of bottom slab

=(12.81+ 2x) x (5.21 +2x) x 0.2x 1.5

$=108.12x^2 + 12x^2 + 200.12$

Weight of soil on projection

yH = 18 x 5.75 = 103.5

= [2 (12.81 +2x) x + (5.21 x X) 2] 103.5

$=[25.62x + 4x^2 +10.42x]103.5$

$= 414x^2 + 3730.14 x$

Total downward force =

$417.12 + 847.06 + 314.09 + (108.12x +12x^2 200.1) +(414x^2 3730.14x)$

$= 1778.39 +3838.26x +426 x^2$ ……(1)

Uplift force on bottom of slab

Pressure = Yw H

= 9.8 x 5.95

= 58.31

Uplift force = [(12.81 + 2x) (5.21 + 2x)] x 58.31

=[$4x^2 + 36.64x + 66.74$) 58.31

=($233.24x^2 + 2101.49x$ 3891.60) ……(2)

Eluting upward and downward forces

$426x^2 + 3838.26 + 1778.39 = 233.24x^2 + 2101.49x + 3891.60$

$= 426x^2 - 233.24x^2 + 3838.26x - 2101.49x + 1778.39 - 3891.60 = 0$

$= x^2(192.76) + (1736.77)x - 2154.8 = 0$

$X = 1.10$

Self-weight of directly get transferred to soil . Hence upward pressure to be considered to B.M calculation is

= 58.31 – 0.2 x 25

=53.31 kN/m²

Earth pressure at the base of wall

= ka . Y' .H + Yw .H

=⅓ x 8.2 x5.75 x 9.8 x5.75

= 15.716 +56.35

Pa = 72.066

Reaction on wall

=½ x 72.06 x5.75

=207.17

Acting at ⅓x 5.75 +0.2 = 2.11 on form bottom of slab

Cantilever non at base of wall

= 53.31 x (1.10^2 /2) x 207.17 x 2.11 -103.5 x (1.10^2/2)

= 32.252 + 432.12 -62.61

= 406.762 .

❖ **B.M at center of slab**

= weight of 1m long + ½ weight of roof slab

= (0.23 x 5.75 x 25) + ½(5.75 x 2 x0.23) x 0.215 x 25

= 33.66 x 3.10 x 5.375

= 49.72 kN/m length

M = 53.31 x (1.5 + 0.23 + 1.10)² / 2 +207.17 x2.11 – 103.5 x 1.10 x (1.5 +0.23 +0.3)-49.72 (1.5 + 0.115)

= 213.47 +437.12 -231.11 – 80.297

=339.18 kN.m

P = Yw H

= 9.8 x 5.75 = 56.35 kN .m

Water pressure at base

½ x 56.35 x 5.75

=162 kN

B.M at the center of slab

= 53.31 x (1.5 +0.23 +1.0)² /2 -162 x 2.11-103.5 x 1.10 x (1.5 +0.23 +0.3)

=213 .47 -314 .82 -231.11

= -332.49 kN.m

Thickness of slab require

M = Q bd²

406 .76 x 10^6 = 1.80 x1000 xd²

d = 500mm

D =500 + 35 = 535 mm

Ast = (406 .76 x 10^6) /130 x 0.861 x 500 = 7268 mm²]

Provide 22 mm Φ@ 50 mm c/c(Ast = 7603)

❖ **Distribution steel**

t = 535

pt = 0.24

Ast = (0.24 /100) x 1000 x 535 = 1284 mm²

Ast fan each face = 1284 / 2 = 642 mm²

Provide 16 mm Φ@ 50 mm c/c

(Ast= 1340)

Table 13.1.5.1 Abstract sheet quantities

ITEM NO.	Description of items	Qty	Units	Rate	Amount
1	Excavation for foundation up to 1.5 m depth including sorting out and stacking of useful materials and disposing of the excavated stuff up to 50m lead (B) Dence or Hard Soil	169.48	CUM	100	16948
2	Excavation for foundation for Depth 1.5 to 3.0 m depth including sorting out and stacking of useful materials and disposing of the excavated stuff up to 50m lead (D) Soft Rock Not Required Blasting	169.48	CUM	175	29659
3	Excavation for foundation for Depth 3.0 to 5.0 m depth including sorting out and stacking of useful materials and disposing of the excavated stuff up to 50m lead (F) Hard Rock	169.48	CUM	350	59318
4	Providing and Laying cement Concrete 1:3:6 machine cut metal 40mm nominal size P.C.C. Work	14.5275	CUM	2500	36318.75
5	Providing and Laying cement Concrete 1:2:4 machine cut metal 20mm nominal size (A) Raft at foundation	16.97	CUM	4000	67880
6	Providing and Laying cement Concrete M - 200 RCC work with curing etc. Completed including (B) R.C.C. Wall	9.11	CUM	5250	47827.5
7	Providing and Laying cement Concrete M - 200 RCC work with curing etc. Completed including (D) R.C.C. Slab	13.16	CUM	5500	72380

8	Providing & Laying reinforcement for R.C.C work including bending binding and placing to TMT bar IS 1786/FE 415	4500	KG	60	270000
9	Supplying and Fixing C.I Manhole Cover 60X60 Cm Size etc…	4	NOS	1599	6396
10	Supplying and Fixing C.I Foot rests in tank etc…	8	NOS	100	800
			Total Amount>>>>>		607527.25
			Add Charge 5% >>>>>>		30376.36
			Profit at cont.10%>>>>		60752.65
			Net Amount>>>>>>		698656.26

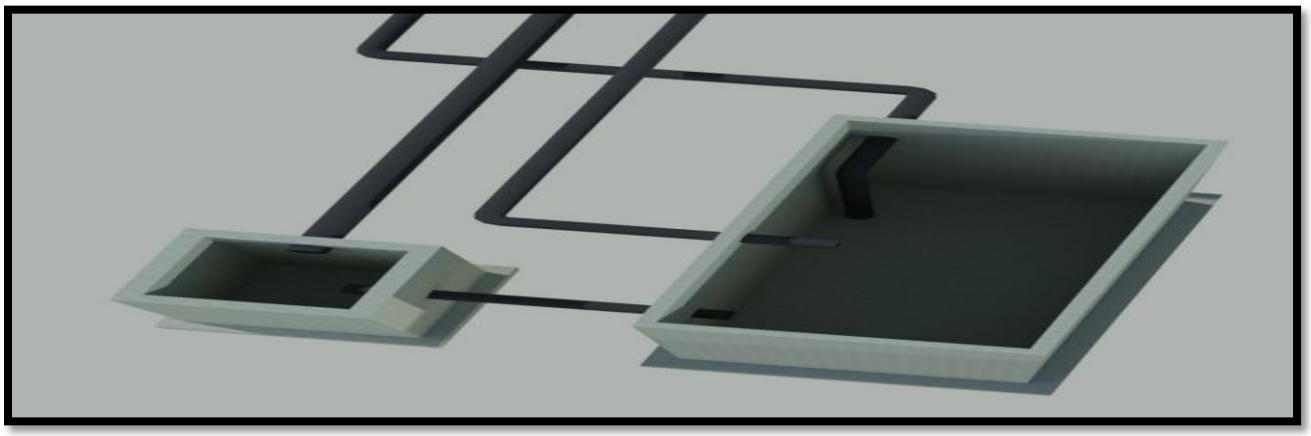


Fig 13.1.5.2 rain water harvesting design

13.1.6 Civil Design 6

Bio-Gas Plant

Biogas is a mixture of different gases produced by the breakdown of organic matter in the absence of oxygen.

Biogas can be produced from raw materials such as agricultural waste, manure, municipal waste, plant material, sewage green waste or food waste.

A biogas plant is one of the plants for renewable energy sources. It transforms the rural village into a clean village and provides gas as an energy source and gives fertilizer at the end.

In Bhilvan, most villagers are dependent on the agriculture side. So, we will be gone with renewable energy for economic growth and effective use of that energy in an easy way.

Types of biogas

- Fixed Dome Biogas Plant
- Floating Drum Plant
- Low-Cost Polyethylene Tube Digester
- Balloon Plants
- Horizontal Plant
- Earth-pit Plant
- Ferro-cement Plant
- Cylindrical biogas plant

BASIC THINGS:

Total numbers of animals in village = 2000

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

So, total per day dung = 2000 * 10.5 =21000 Kg. /day

DESIGN OF DIGESTER:

Assume retention period (RT) = 70 days.

Assume mixing proportion of solid and water is 1:2.

Now total amount of slurry per day (Sd) = Total per day dung + Water amount

= 21000 + (2*21000) = 63000 Kg. /day = 63000 Lit. /day

= 63.0 m3 / day Digester volume (Vd) = Sd * RT = 63.0 * 70

= 4410 m3

Assume cylinder shaped biogas plant.

Provide total 6 numbers of units in different areas, so digester volume becomes for one unit

= 4410 ÷ 6 =735 m3 So provide

= 750 m3

Total digester volume (Vd)

= π r2 h

= 750

= π r2 (h = 8 m)

So, dimensions of digester are h=8 m

R= 5.5

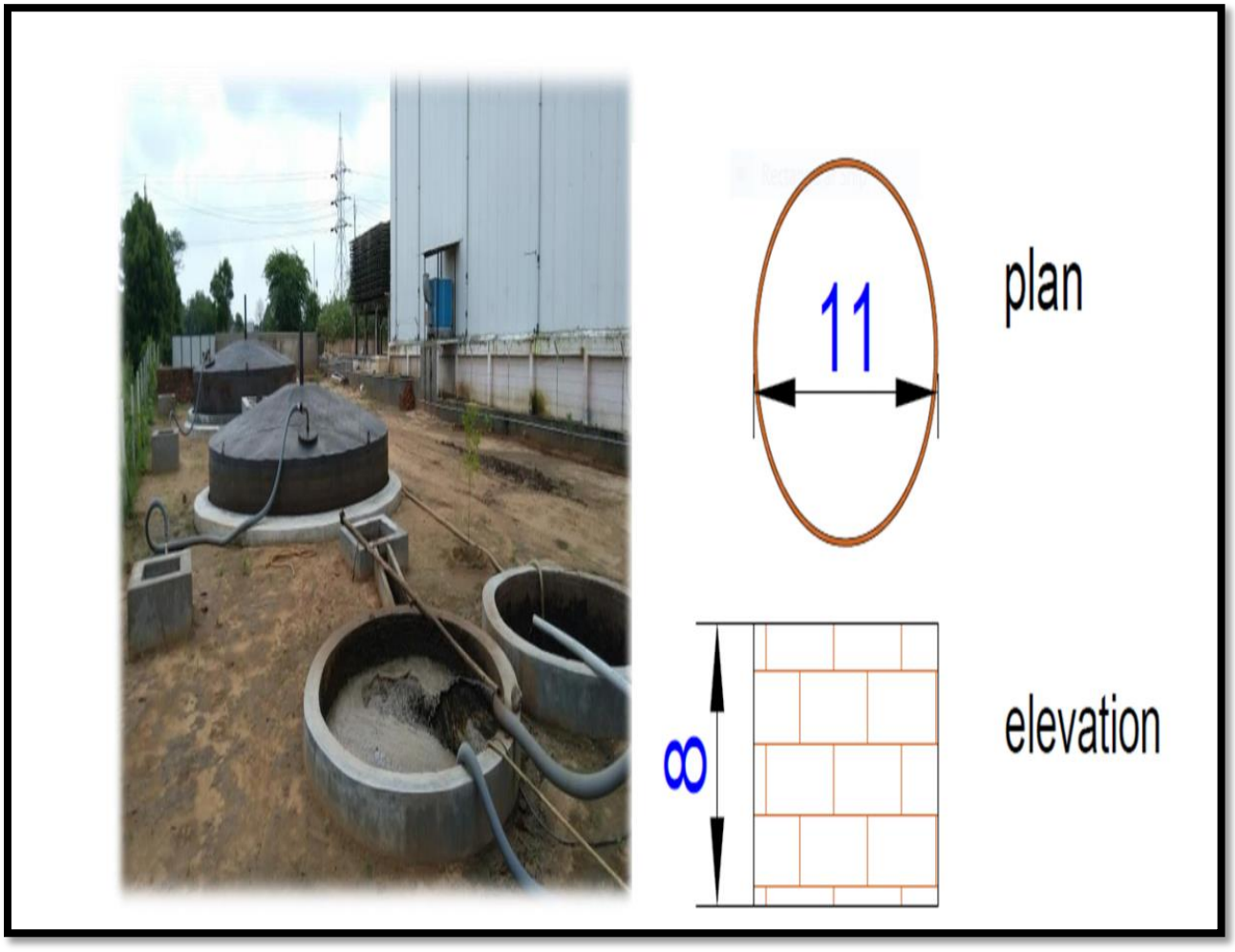


Fig 13.1.6.1 bio gas plant design

13.2 Reason for Students Recommending this Design

- For elevated water tank, Bhilvan village has two water tank and one has not working condition.so that we design water tank for village.
- For library, Bhilvan village has not facility of library so we design suitable library for Bhilvan village.
- Rainwater harvesting, water is very important resource for human. Bhilvan village has facing problem shortage of water so we design rain water harvesting system.

13.3 About designs Suggestions / Benefit of the villagers

- The various benefits of new development or design by students are as below…

1) To provide library facility for students so that they encourage their knowledge.

2) To provide elevated water tank for drinking water purpose.

3) Develop rainwater harvesting system for collect rain water for various purpose.

4) To Increase the Communication and Skill.

14. Technical Options with Case Studies

14.1 Civil Engineering

14.1.1 Advanced Earthquake Resistant

Earthquake resistant design of buildings depends upon providing the building with strength, stiffness and inelastic deformation capacity which are great enough to withstand a given level of earthquake-generated force. This is generally accomplished through the selection of an appropriate structural configuration and the careful detailing of structural members, such as beams and columns, and the connections between them.

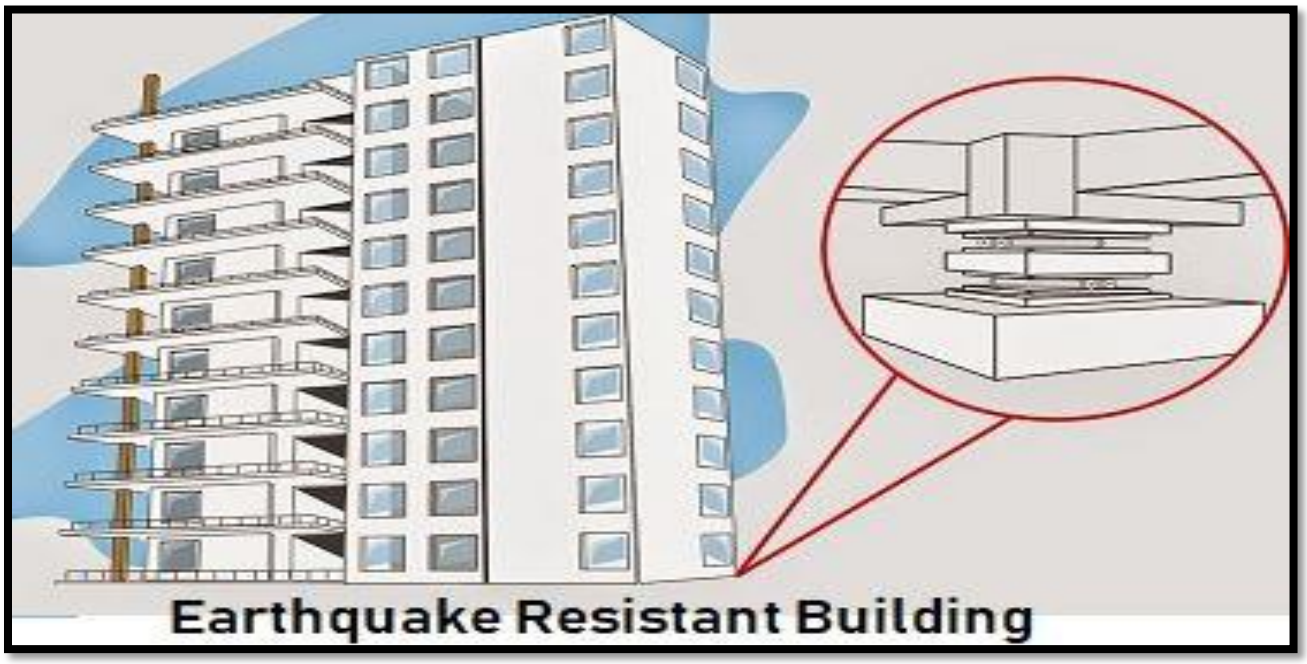


Fig 14.1.1.1 earthquake resistant building

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

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

1. Base Isolation
2. Energy Dissipation Devices

Base Isolation

A base isolated structure is supported by a series of bearing pads which are placed between the building and the building's foundation. A variety of different types of base isolation bearing pads have now been developed. The bearing is very stiff and strong in the vertical direction, but flexible in the horizontal direction.

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

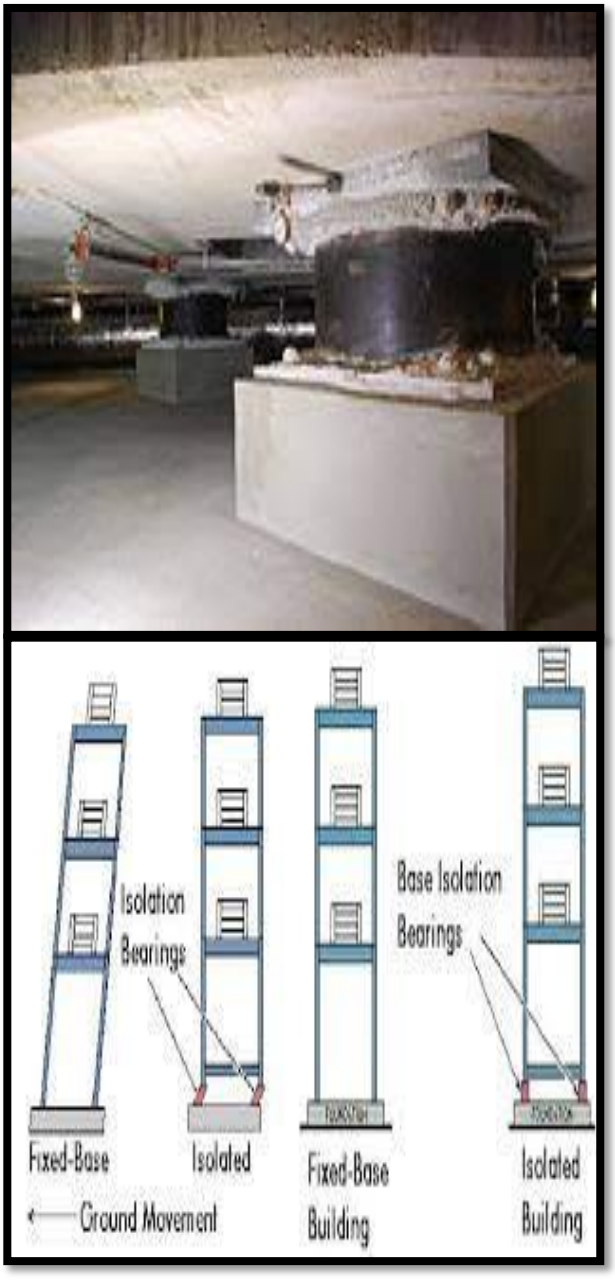


Fig 14.1.1.2 base isolation

Energy Dissipation Devices

the second of the major new techniques for improving the earthquake resistance of buildings also relies upon damping and energy dissipation, but it greatly extends the damping and energy dissipation provided by lead-rubber bearings. As we've said, a certain amount of vibration energy is transferred to the building by earthquake ground motion. Buildings themselves do possess an inherent ability to dissipate, or damp, this energy. However, the capacity of buildings to dissipate energy before they begin to suffer deformation and damage is quite limited.

The building will dissipate energy either by undergoing large scale movement or sustaining increased internal strains in elements such as the building's columns and beams. Both of these eventually result in varying degrees of damage. So, by equipping a building with additional devices which have high damping capacity, we can greatly decrease the seismic energy entering the building, and thus decrease building damage.

Fig 14.1.1.3 Energy Dissipation Devices

14.1.2 Seismic Retrofitting of Buildings

Retrofitting is the process of addition of new features to older buildings, heritage structures, bridges etc. Retrofitting reduces the vulnerability of damage of an existing structure during a near future seismic activity. Retrofit in structures is done to increase the survivability functionality.

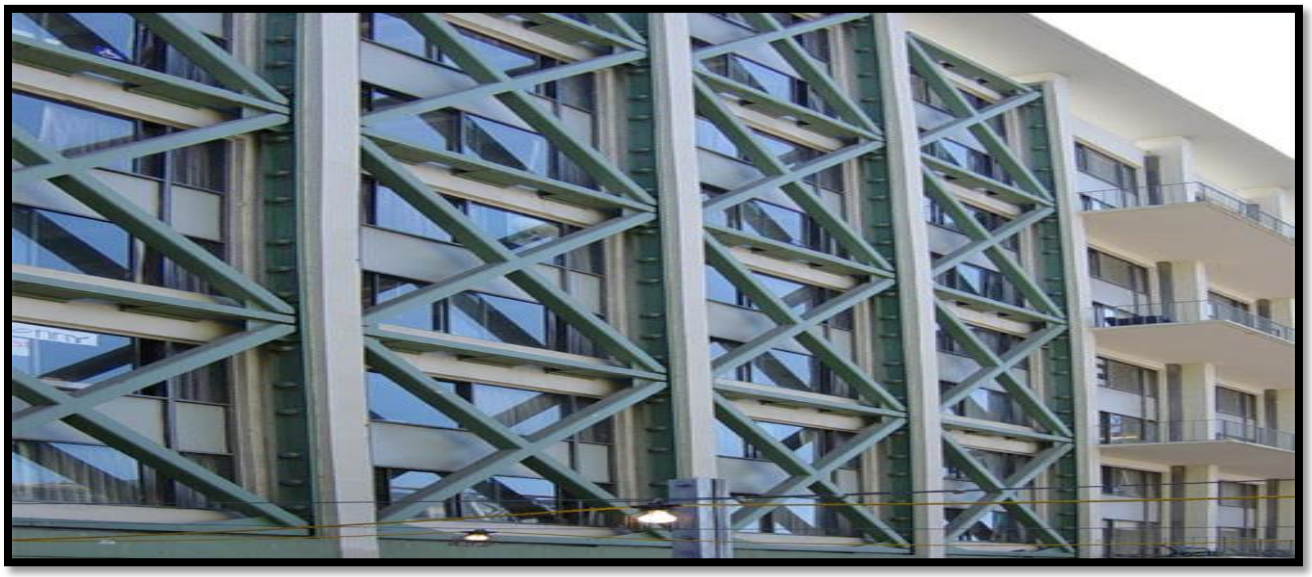


Fig 14.1.2.1 Seismic Retrofitting of Building 1

Seismic retrofitting of vulnerable structures is critical to reducing risk. It is important for protecting the lives and assets of building occupants and the continuity of their work. If you live or work in retrofitted structures, you're less likely to be injured during an earthquake.

Seismic retrofitting is the process of strengthening a home so that it is more resilient to damage in earthquakes. This process often involves strengthening weak connections such as those found at or near the foundation or roof.

Fig 14.1.2.2 Seismic Retrofitting of Building 2

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

The Indian advanced construction techniques industry is experiencing a period of fast growth. Aiming to overcome the housing problem, it also has to face the dual challenge of fulfilling the needs of the client and maintain the quality standards.

At the same time, the up-gradation of technology through the adoption of new techniques has become necessary to survive in a tough competitive environment.

The traditional methods of construction are inadequate in executing the work speedily with economy and quality. The construction industry in India must switch over to advanced construction techniques to achieve its goal in "minimum time with maximum efficiency".

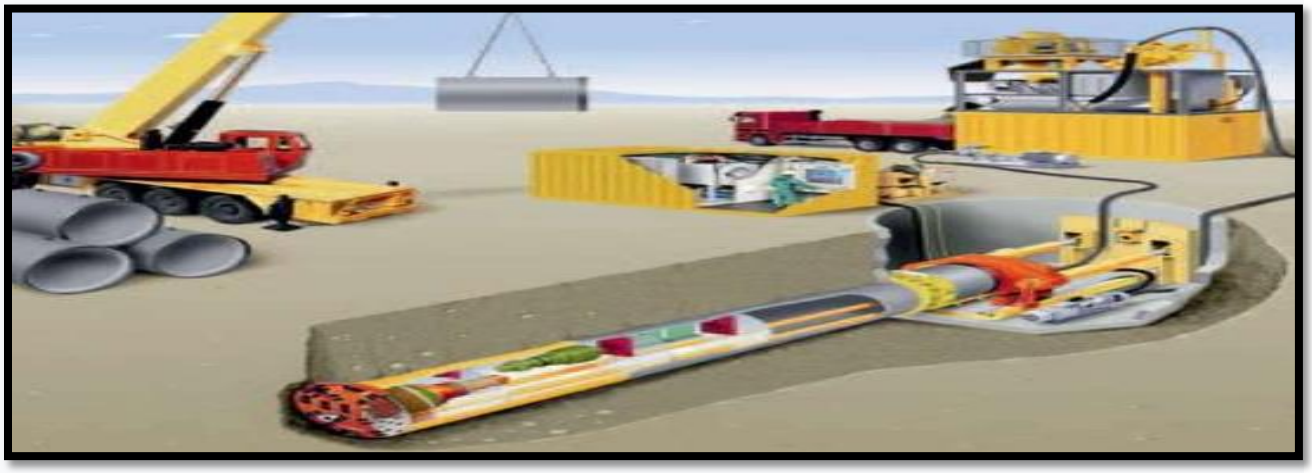


Fig 14.1.3.1 Advance Construction Technique

Advanced Construction Techniques – Necessity

1. The building construction activity, especially the residential and commercial complex is highly labour intensive with very little mechanization. Approximately 35% of the total construction cost is spent on labour.
2. The laborers have their limitations and may fail to meet the time limits. The quality of workmanship, too, differs from person to person. Hence, quality standards cannot be maintained. Wastage of material is considerably high as it is handled and utilized manually.
3. The objective of the construction organizations should be 'speed and economy'. This cannot be achieved with labour oriented advanced construction techniques.

4. Only studying and adopting modern industrial techniques and equipment is the solution. By this, one can save material, reduce labour expenses, and increase the speed of work, leading to the economy in construction.
5. Though the scope of the subject is vast, in this chapter we shall discuss only the advanced techniques to be used in advanced construction techniques activities.

Equipment Used For Small and Medium Construction Work

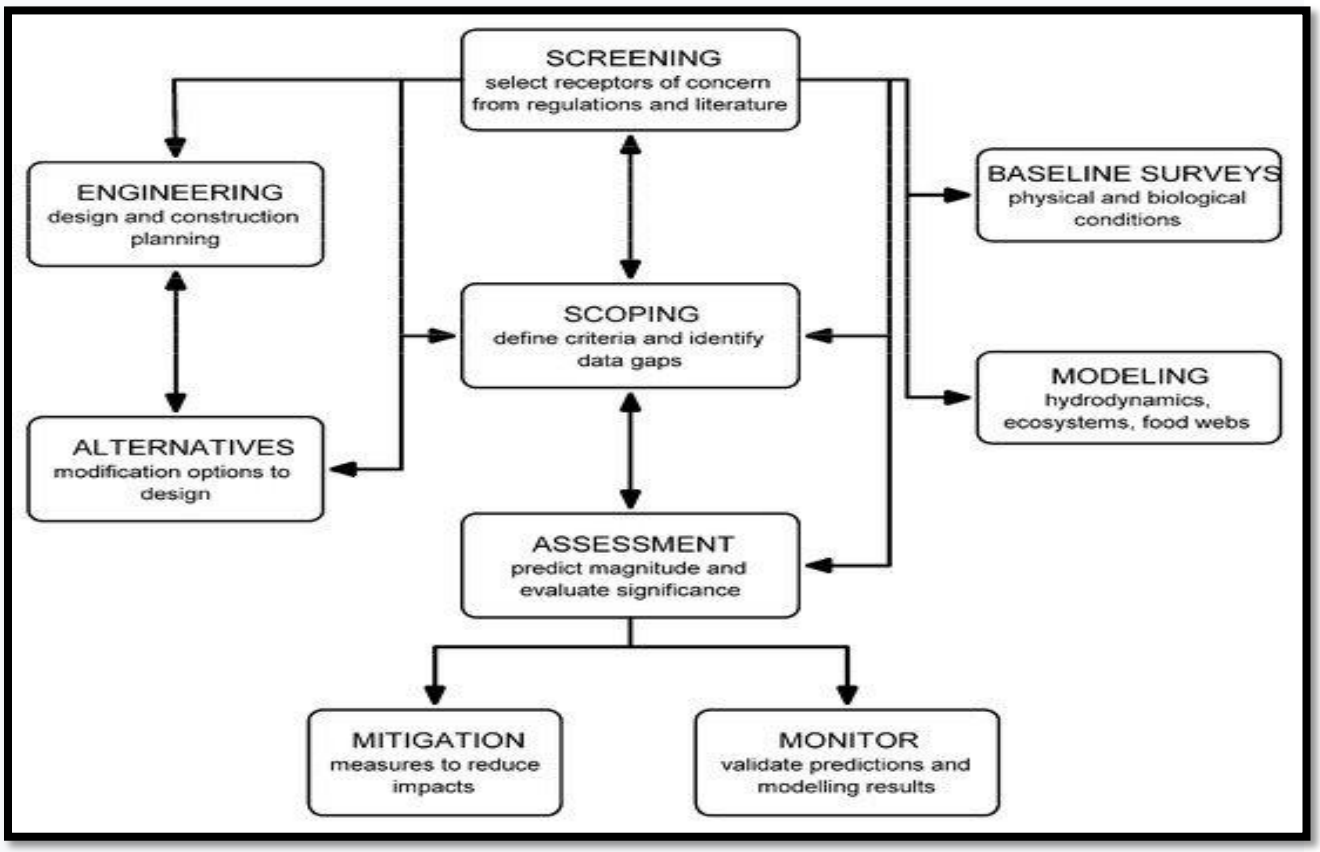
The equipment with proven utility in building construction may be as listed below

- Chain and pulley block.
- Grouting pumps.
- Sprayers for painting work.
- Tile cutters.
- Portable hand drilling machines.
- Horizontal trolleys, wheelbarrows.
- Pumps.
- Vibrators for compaction of concrete, surface vibrators.
- Auto ramming concrete block machine.
- Sand washing machine.
- Vertical lifts, hoists, winches.
- M.S. tubular scaffolding and formwork.
- Concrete mixers.
- Cranes.
- Earth excavators.

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

Sanitation, wastewater and sustainability Few areas of investment today have as much to offer the global shift towards sustainable development as sanitation and wastewater management.1 Gaps in access to decent, functioning sanitation are clear markers of inequality and disadvantage. Unsafe management of excreta and wastewater expose populations to disease, and degrade ecosystems and the services they provide. At the same time, there is growing recognition that societies can no longer afford to squander the water, nutrients, organic matter and energy contained in sanitation and other wastewater and organic waste streams. These resources can, and should, be safely recovered and

productively reused. In fact, the vision of resource efficient, circular economies is unachievable without radical change in how we manage wastewater, excreta and other biomass waste. This book discusses how this radical change might take shape. It distils some of the latest thinking and experiences on how to make sanitation and wastewater management more sustainable; and on how they can contribute to broader societal sustainability. In particular, it focuses on the idea of sanitation and wastewater management as resource management functions: as ways of keeping valuable resources available for productive uses that support human wellbeing and broader sustainability. To put the scale of the opportunity into perspective, globally we produce an estimated 9.5 million m3 of human excreta2 and 900 million m3 of municipal wastewater every day (Mateo-Sagasta et al. 2015). This waste contains enough nutrients to replace 25 per cent of the nitrogen currently used to fertilize agricultural land in the form of synthetic fertilizers, and 15 per cent of the phosphorus, along with enough water to irrigate 15 per cent of all the currently irrigated farmland in the world (some 40 million hectares; Mateo-Sagasta et al. 2015). At the city scale, the wastewater (including excreta) from a city of 10 million people contains enough recoverable plant nutrients to fertilize about 500,000 hectares of farmland – which in turn could produce about 1.5 million tons of crops.

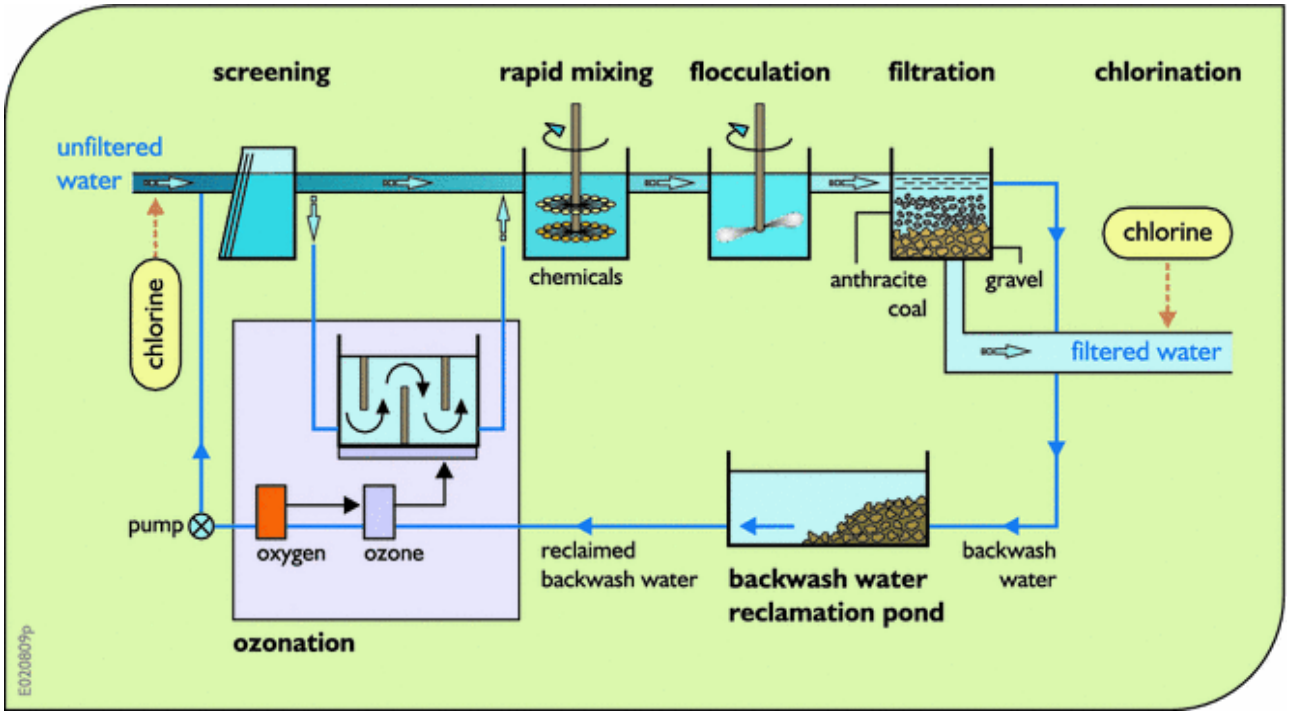


Fig 14.1.5.1 waste water filtration plant

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

Sr No.	Design Name	Period	Amount Expenditure	Benefit
1	Post Office	Immediately	2,46,299/-	In This Village For Speed Post And Other
2	BUS STATION	Immediately	1,46,321/-	Waiting For The Bus And Other
3	PRIMARY SCHOOL	Long Term (3-5 Years)	72,90,000/-	School Building Provide With All Smart School Facility
4	AUDITORIUM HALL:	Within 1 Year	25,83,435/-	Villagers Get Facility Of Auditorium Hall.
5	ANGANWADI:	Immediately	20,03,357/-	Skill Development Of Children.
6	ENTRANCE GATE:	Immediately	67,639/-	For Warm Welcome In Village
7	LIBARARY	Within 1 Year	3,74,319/-	For Good Reading Atmosphere For Students
8	GYM :	Immediately	1,74,237/-	For Good Health Purpose
9	BANK :	Within 1 Year	7,32,414/-	For Transection Purpose
10	WATER TANK :	Within 1 Year	----	For Drinking Purpose
11	Rainwater Harvesting	Within 1 Year	6,98,656/-	Collect Water For Various Purpose
12	Bio Gas Plant	Within 1 Year	------	For Gas Production

16. Survey by Interviewing With Talati 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	Agriculture
2	What are the chances of employment in village?	Yes	Agriculture side
3	What are the special technical facilities in village?	No	Recent technology use by farmer
4	Is any debt on village dwellers?	No	
5	Are village people getting agricultural help?	Yes	
6	Is women health awareness Program organized in village?	Yes	
7	Are women having opportunity to work and income?	Yes	
8	Child girl education is appreciated in village?	Yes	
9	Facility of vaccination to child is available in village?	Yes	
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?	No	
13	Is village under any debt?	No	
14	Is any serious issue due to debt from bank or any person happened in village?	No	
15	Is any suicide like incident observed in village due to government policy, debt or threatening?	No	
16	Is any death of patient occurred due to unavailability of medical facility in village?	No	
17	How many disabled (physically challenged) is observed in village? Provide list with Male/female/girl/boy with age and type of disability and reason of disability.	No	
18	Is village improvement is observed in comparative scenario from past to present?	Yes	Agriculture, electricity
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?	No	Housing condition is very pooor

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

Sign of sarpanch

17. Irrigation Activates and Agro Industry, Alternate Technics and Solution.

Bhilvan village Total area is 523.06 hectare. Wheat, cattle seed and cotton seed are agriculture commodities grow in this village. 8 hours agricultural power supply in summer and 8 hours agricultural power supply in winter is available in this village.

Fig 17.1 sprinkler irrigation

Alternate techniques and solutions:

- High yielding varieties of seeds can be used.
- Chemical fertilizers can applied.
- Irrigation has been improved by utilizing properly both ground water and surface water resources of the State.
- Cold storage, logistics and improved infrastructure can be developed

Different types of irrigation systems can be used for agriculture like

- Surface irrigation
- Drip irrigation
- Sprinkler irrigation
- Center pivot irrigation
- Lateral move irrigation
- Sub-irrigation
- Manual irrigation

18. Social Activities – Any Activates Planned By Students

Due to covide pandemic we can't do more social activities in Bhilvan village. We are insist to have precaution to covide and also promote villagers of Bhilvan village about covide awareness.

- Give awareness about covid-19.
- Insist villagers to wear mask.
- Teach steps of hand wash to villagers.
- Give awareness about social distance.
- Inform villagers to use packing things after sanitation is done.
- Insist villagers to drink pure and hot water.
- Insist for Covide vaccination.

Fig 18.1 vaccination

19. BHILVAN VILLAGE SAGY Questionnaire Survey form with the Sarpanch Signature

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: Bhilvan Gram Panchayat: Bhilvan Ward No._

Block: Patan District: Patan State: Gujarat L S Constituency:

1. Family Identity and Size

Name of Head of Household	Sabbir bhai							Male/ Female	M
SECC Survey ID:		Family Size	4	Over 18	4	6 to 18	-	Under 6	-

2. Category & Entitlement Details (Tick as appropriate)

Social Category[1]	open	Life Insurance	1. All Adults 2. Some Adults 3. None ●	AABY	1. Yes 2. No●	Kisan Credit Card	Yes
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	No

PDS (If NFSA is not implemented)	Annapurna	Antyodaya	BPL	APL	Is any woman in the family member of an SHG? Yes
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]
Sabbir bhai	45	M	N	2	10	Y	Y	0
Fatima ben	40	F	N	2	8	Y	Y	0
Salman	21	M	N	1	12	Y	Y	0
Sabina	19	F	N	1	11	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
Aryan	15	M	N	1	8	Y	8	Y

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 Immunised Y/N	Mother's Age at the time of Child's Birth
-	-	-	-	-	-	-	-	-

[1] *Marital Status: Not Married – 1, Married – 2, Widowed – 3, Divorced/Separated – 4*

[2] *Level of Education: Not Literate – 01, Literate – 02, Completed Class 5 - 03, Class 8th – 04, Class 10th-05, Class 12th-06, ITI Diploma07, Graduate-08, Post Graduate/Professional – 09 (write the highest level applicable)*

[3] No Pension – 0, Old Age Pension – 1, Widow Pension – 2, Disability Pension – 3, Other Pension – 4 (mention)

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

5. Hand washing

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

6. Use of Mosquito Net
Children: - Adults: Yes

7. Do members take Regular Physical Exercise

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

8. Consumption of Tobacco

	Smoking	Chewing
Adults	-	-
Children	-	-

9. House & Homestead Data

Own House: Yes	No. of Rooms: 4
Type: Pucca	
Toilet: Private	
Drainage linked to House: Open	
Waste Collection System	Door Step
Homestead Land: No	Kitchen Garden : No
Compost Pit: None	Biogas Plant: None

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

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

11. Source of Lighting and Power

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

12. Landholding (Acres)

1. Total		2. Cultivable Area	
3. Irrigated Area		4. Uncultivable Area	

13. Principal Occupations in the Household

Livelihood	**Tick if applicable**
Farming on own Land	•
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)	
Other Trade & Business (mention)	

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

15. Agriculture Inputs

Do you use Chemical Fertilisers	Yes
Do you use Chemical Insecticides	Yes
Do you use Chemical Weedicide	Yes
Do you have Soil Health Card	Yes
Irrigation: Canal	
Drip or Sprinkler Irrigation: Drip /Sprinkler	

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

Name	**Unit**	**Quantity**
Wheat	kg	2000
Cattle seed	kg	2000

17. Livestock Numbers

Cows: 7	Bullocks: 2	Calves:
Female Buffalo: -	Male Buffalo: -	Buffalo Calves: -
Goats/ Sheep:	Poultry/ Ducks:	Pigs:
Any other: Type _____		No._____
Shelter for Livestock: Kutcha		
Average Daily Production of Milk(Litres): 20		

18. What games do Children Play

19. Do children play musical instrument (mention)

Schedule Filled By:
Principal Respondent:
Date of Survey:

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

I. Basic Information

a. Gram Panchayat: Bhilvan

b. Block: Bhilvan

c. District: Patan

d. State: Gujarat

e. Lok Sabha Constituency: Patan

f. Number of Wards in the Gram Panchayat:

g. Number of Villages in the Gram Panchayat: _

h. Names of Villages:

Demographic Information

Number of Households : 828	Total Population: 4701	Male :2395	Female : 2306
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	7 KM
b.	Nearest Primary Health Centre (PHC)	Y	
c.	Nearest Community Health Centre (CHC)	Y	
d.	Nearest Post Office	Y	
e.	Nearest Bank Branch (Any)	Y	
f.	Nearest Bank with CBS Facility	Y	
g.	Nearest ATM	N	7 KM
h.	Nearest Primary School	Y	
i.	Nearest Middle School	Y	
j.	Nearest Secondary School	Y	
k.	Nearest Higher Secondary School / +2 College	N	17 KM
l.	Nearest Graduate College	N	17 KM
m	Nearest ITI / Polytechnic Centre	N	17 KM
n	Kisan Seva Kendra	N	17 KM

1

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
o	Agriculture Credit Cooperative Society	N	17 km
p	Nearest Agro Service Centre	N	17km
p	MSP based Government Procurement Centre	N	17 km
q	Milk Cooperative /Collection Centre	Y	
r	Veterinary Care Centre	N	17 km
s	Ayurveda Centre	Y	
t	E – Seva Kendra	N	17 km
u	Bus Stop	Y	
v	Railway Station	N	17 km
w	Library	Y	
x	Common Service Centre	N	17 km

IV. Sports Facilities in the Gram Panchayat

a. Number of Play Grounds in the GP: Total : 1 Public : 1 Private

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

V. Education, ICDS

a. Number of Angan Wadi Centres: 4

b. Number of villages without Angan Wadi Centres

Names of such villages:

c. Schools (Number)

Primary Private: 0 Primary Govt.: 1

Middle Private: 0 Middle Govt.: 0

Secondary Private: 0 Secondary Govt.: 1

Higher Secondary Private: 0 Higher Secondary Govt: 0

VI. Public Distribution System

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

2

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

VIII. Land and Irrigation

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

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

3

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

IX. Parameters relating to Households & Institutions

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

Name and Signature of Surveyor and Respondent'

Surveyor	PRI Respondent (Preferably Gram Panchayat Chairperson)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	Date of Survey

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

4

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: bhilvan

b. Ward Number:

c. Gram Panchayat: bhilvan

d. Block: bhilvan

e. District: Patan

f. State: Gujarat

g. Lok Sabha Constituency: Patan

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

i. Names of Habitations / Hamlets:

Demographic Information

Number of Households 828	Total Population 4701	Male 2395	Female 2306
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	
b.	Nearest Middle School	Y	
c.	Nearest Secondary School	Y	
d.	Kisan Seva Kendra	N	17 km
e.	Milk Cooperative /Collection Centre	Y	
g.	Health Sub Centre	N	7 km
h.	Bank	Y	
i.	ATM	N	7 km
j.	Bus Stop	Y	
k.	Railway Station	N	17 km

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

1

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

i.	Access to Infrastructure / Facilities / Services	Located in the Village Yes (Y)/No(N)	If located elsewhere (N), distance in kms from the village
l	Library	Y	
m	Common Service Centre	N	7 km
n	Veterinary Care Centre	N	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: None

iii. Drinking Water Facilities
a. Piped Water Supply Coverage to Habitations: None *(1-All 2-None 3-Some)*
If 3 mention the name of the habitations not covered:_

b. Hand Pump Coverage in Habitations:_ Some *(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: Some *(1-All 2-None 3-Some)*
If 3 mention the name of the habitations not covered:

b. Coverage under Open Drains: Some *(1-All 2-None 3-Some)*
If 3 mention the name of the habitations not covered:_

c. Coverage under Doorstep Waste Collection: *(1-All 2-None 3-Some)*
If 3 mention the name of the habitations not covered:

v. Coverage of Habitations under Electrification
a. Coverage under Household Connections: Some *(1-All 2-None 3-Some)*
If 3 mention the name of the habitations not covered:

b. Coverage under Street Lighting: All *(1-All 2-None 3-Some)*
If 3 mention the name of the habitations not covered:

vi. Sports Facilities in the Village
a. Number of Play Grounds in the Village (minimum size 200 square meters): 1
b. Mini Stadium : No Yes(Y) /No (N)

vii. Education, ICDS
a. Number of Anganwadi Centres: 1
c. Schools (Number)
Primary Private:0 Primary Govt.: 1
Middle Private: 0 Middle Govt.: 1
Secondary Private:0 Secondary Govt.: 1
Higher Secondary Private: 0 Higher Secondary Govt: 1

2

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

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

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

Name and Signature of Surveyor and Respondent'

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

Sign of sarpanch
DS m
સરપંચ
ભિલવાણ ગ્રામ પંચાયત
તા. સરસ્વતી, જિ. પાટણ

3

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

6/22/2021 Gmail - (no subject)

Gmail YASH SATHWARA <yashsathwara7748@gmail.com>

(no subject)
1 message

YASH SATHWARA <yashsathwara7748@gmail.com> Tue, Jun 22, 2021 at 11:02 PM
To: ddo-pat@gujarat.gov.in, collector-pat@gujarat.gov.in
Cc: manjuralimomin1@gmail.com, principalgecpatan@gmail.com, rurban@gtu.edu.in

Respected Sir,

As a part of PMMS subject we had given the project under scheme of Vishwakarma Yojana phase VIII. Under this project we had allotted Bhilvan village of Patan district. Under this project we had visited the village to study existing infrastructure and to propose new amenity.

In Vishwakarma Yojana Phase VIII, we had assigned the village Bhilvan for survey. We visited the village and met the Sarpanch and Talati of the village and discussed about the infrastructure facilities available in village and other details about village. We had collected the data from the villages and proposed twelve new designs such as post office, bus station, primary school, bio-gas plant, water tank, bank, gym etc. to fulfill the requirement of existing population. The proposed designs are as under:

Sr No.	Design Name	Period	Amount Expenditure	Benefit
1	Post Office	Immediately	2,46,299/-	In This Village For Speed Post And Other
2	BUS STATION	Immediately	1,46,321/-	Waiting For The Bus And Other
3	PRIMARY SCHOOL	Long Term (3-5 Years)	72,90,000/-	School Building Provide With All Smart School Facility
4	AUDITORIUM HALL:	Within 1 Year	25,83,435/-	Villagers Get Facility Of Auditorium Hall.
5	ANGANWADI:	Immediately	20,03,357/-	Skill Development Of Children.
6	ENTRANCE GATE:	Immediately	67,639/-	For Warm Welcome In Village
7	LIBARARY	Within 1 Year	3,74,319/-	For Good Reading Atmosphere For Students
8	GYM :	Immediately	1,74,237/-	For Good Health Purpose
9	BANK :	Within 1 Year	7,32,414/-	For Transection Purpose
10	WATER TANK :	Within 1 Year	----	For Drinking Purpose
11	Rainwater Harvesting	Within 1 Year	6,98,656/-	Collect Water For Various Purpose
12	Bio Gas Plant	Within 1 Year	------	For Gas Production

So, this is for your kind information…
Please find the attached detailed Project Report of Bhilvan Village…

21. Comprehensive report for the entire village

In Vishwakarma Yojana Phase-8 we will find rural current issues and problems, listing out existing amenities and give best economical solution. We will give planning proposal of Physical Infrastructure, Social Infrastructure & Socio-Cultural Infrastructure facilities with method of giving Redesigning, Reimaging, Repair & maintenance, and Sustainable planning for basic need of village like government buildings, schools, health facilities, water supply and sanitation, waste disposal management system, electricity, road networks, irrigation facilities, community hall, Bio gas plant, drainage System, rainwater harvesting system, Solar energy utilization and other non-conversation energy sources utilization etc..

Our allocated Village is Bhilvan. It is located in Patan Taluka in Patan District of Gujarat State, India. It is 17 km towards from District headquarters Patan. In this phase of Vishwakarma Yojana, we had assigned the village Bhilvan for survey. First we contacted the Sarpanch by phone and fixed the Date for the visit of the village Bhilvan. On decided date we visited the village and met the Sarpanch and Talati of the village. We gathered information about demography of the village and discussed about the infrastructure facilities available in village. There we recorded the data in the given form. We have collected the data from the village. To collect the data we visited some part of the village. There we met some residents of the village. As it was high time of the on-going pandemics, we met limited people with due care for covid protocols and tried to collect maximum details regarding existing infrastructure and perceived need by the residents. Based on our observations, and as suggested by the Sarpanch and talati and as represented by the people we proposed six new design such as post office, bus stop, primary school, Aganwadi, entrance gate and auditorium hall for part I and other new six design such as elevated water tank, bio gas plant, gym, bank, library and rainwater harvesting for part II to fulfil the requirement of existing population.