DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION

Rasnol Village
Anand District

PREPARED BY

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
Maitry Prajapati	Civil	170110106036
Pavan Patel	Civil	180113106012
Manav Prajapati	Electrical	170110109043

COLLEGE NAME: -

G.H. PATEL COLLAGE OF ENGINEERING & TECHNOLOGY

COLLEGE LOGO

Prof. Ratansharan Panchal

NODAL OFFICERS NAME

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: - RASNOL

DISTRICT:- ANAND

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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Maitry Prajapati	**Civil**	**170110106036**
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Date of Report Submission:	
Principal Name and Signature:	**Dr. Himanshu Soni**
VY-Nodal Officer Name and Signature:	
Internal (Evaluator) Guide Name and Signature:	**Prof. Ratansharan Panchal**
College Name:	**G.H. Patel College of Engineering & Technology**
College Stamp:	

ABSTRACT

In India a Home for 133 crore People is among the fastest growing economics of the world, with more than 68.84% of the total population living in the core of 7 lakh village.

These villages have a very beautiful and attractive lifestyle, free from the hustle and bustle of a city life, providing peaceful, clam, and quiet and a green environment. Today the world is grooving rapidly and living standard of society are improving due to development in each and every filed due to evolution of new affordable technologies world has become smaller and faster.

Due to lack of amenities people are moving from rural to urban area. The government of Gujarat lunched Vishwakarma yojana which is work for help and provide better solution for development of village. Under this scheme village are surveyed, from survey identifying the problem of villages and give solution of problems. By providing RURBANIZATION is done. Village are developing as urban areas.

Our project is about development of appropriate facility and suggestion for upgradation od Rasnol Village.

Rasnol Village is located in Anand district, so it is essential to develop the village under the district for the growth of state and also for the country. Population of village is 9390 and the area of village is 1186.36 hectares. Despite availability of many infrastructure facilities, the growth in population has outpaced all efforts of development so far. Slow pace development in village and pursuit of better life style has led to huge migration from village to cities.

On the basis of collected data from techno-economic survey & smart village survey, we found Gap between existing facilities and required as per norms. For sustainable development we proposed some design in village which is not existing in the village.

Keywords: - Vishwakarma Yojana, Urbanization, Rurbanization, Village development, Infrastructure, Rural development, Sustainable development.

CONTENT

LIST OF TABLES

ABBREVIATIONS

SHORT NAME / SYMBOL	FULL NAME
GIS	Geographic information system
PMGSY	Pradhan mantri gram sadak Yojna
KM	Kilometer
SAGY	Sansad Adarsh Gram Yojna

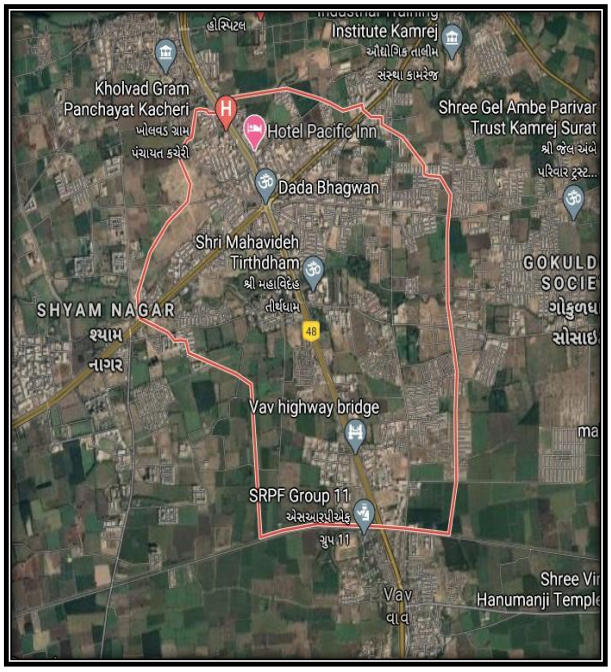
LIST OF FIGURES

Chapter 1: Ideal village visit from District of Gujarat State (Civil & Electrical Concept)

1.1 BACKGROUND & STUDY AREA LOCATION

Kamrej village is located about 20 km from Surat city, typifies development. Here villagers enjoy all the facilities that one living in the city enjoys. The 2km road from Kamrej to Surat gives a commuter the feeling of passing through a highway, therefor the village road is 12-meter-wide and its well-lit with street light. The village panchayat collect grant which is given by government and use that money on development of road construction, street lights, a lack, public toilets, drainage system, and water system for the 16078 people of Kamrej village. The village has a primary, secondary school and high secondary school and number of restaurants.

Kamrej village is located in Surat district of Gujarat state, India. The latitude 21.2695 N and longitude 72.9577 E are the geocoordinate of Kamrej. Gandhinagar is the state capital for Kamrej village. It is located around 265.7 km away from kamrej.



(Fig. 1 Map of Kamrej village)

1.2 CONCEPT OF IDEAL VILLAGE

1.2.1 Objective of Ideal Village

The Ideal village concept is a community village with self-sustaining income producing projects, independent electrification system generated from non-fuel-based device, clean water facility for drinking including water for irrigation, quality but affordable housing, school, medical facilities for human being and animals, proper sanitation system, information center, bank, police station, retail outlet for household and agriculture needs, phone facility, connection roads to nearby village and town, legal councilor.

Provide drinking water security through an integrated combination of pipe, local traditional water sources and multiple sources for alternative use. Conserve water through water resource management that includes rainwater harvesting and artificial recharge, conservation and

renovation of traditional water sources build effective community institution at the local level by supporting capacity building and empowerment. Ensure that all community groups, including women, are able to participate in the decision- making processes and benefit from program improvement and improve household and community environment with sanitation improvement and increased hygiene4 awareness in communities.

1.2.2 Case Study of Ideal Village of India / Gujarat

Urban or municipal infrastructure refers to hard infrastructure systems generally owned and operated by municipalities, such as streets, water distribution, and sewers. It may also include some of the facilities associated with soft infrastructure, such as park, public pools and libraries.

Green infrastructure is a concept that highlights the importance of the natural environment in decision about land use planning. In particular there is an emphasis on the "life support" functions provided by a network of natural ecosystems, with an emphasis on interconnectivity to support long-term sustainability. Example include clean water and healthy soil, as well as the more androcentric function such as recreation and providing shade and shelter in and around towns and cities. The concept can be extended to apply to the management of storm water at the local level through the use of natural system, or engineering systems that mimic natural systems, to treat polluted runoff.

1.2.3 The Idea of Model

1. Exposer visits are a very important training methodology as it enables the participants from a different setting to interact with learn from each other, allowing them to view practical / real life situation of successful integration of sustainable practices in the said field.
2. During this meeting border information exchanges took place between the two groups, beyond the core topic. It was observed that all the participants were enthusiastic for learning and implementing their learning's in their own village.
3. This visit was a step forward in the project as it was a real time experience for the participants on the struggle and hard work that goes into building a remarkable ideal village.

1.2.4 Ancient History Civil / Electrical Concept About Indian Village / Foreign Countries Perspective and Its Development

Punsari village is situated in sabarkantha Gujarat, Punsari is India's smartest village. The village is located 18 km away from the Gandhinagar, Punsari village has followed Panchayati raj system. The villagers used new and advance technology in education. The panchayat provided Wi-Fi system for all people of village. Punsari panchayat provide the facilities of local mineral water supply, sewer and drainage project, health care center, banking facilities, toll free complain reception service.

The village received award being the best gram panchayat of Gujarat. The village model has been appreciated by delegates from Nairobi and they are coming to replicant in the village of Kenya.

1.3 DETAIL STUDY

Socio economic

The Kamrej panchayat collect around 1.5 crore rupees as various tax funds from privet as well as government sectors the economic status of Kamrej Panchayat is Much better than others Village or rural areas. The various sources of income are housing tax water tax, cleaning charges, electricity bills, Taxes from Kamrej Factory of Sugar etc.

Various taxes collected by the gram panchayat of Kamrej

Table no.1 Various taxes collected by Kamrej village

Sr no.	Particular	Amount (Rs.)
1	Housing tax	30,65,820
2	Jilla panchayat tax	3,06,582
3	Electricity tax	82,700
4	Water tax	2,30,440
5	Cleaning tax	3,06,570
6	Income tax EC	36,64,630
7	Income tax RC	85,400
8	Sales tax	4,54,660

- **Physical, Demographic and Infrastructure Detail of Ideal Village**

Kamrej is a village facilitated with bituminous and R.C.C. roads for main village road as well as society streets. The road is facilitated with sign board, markings and signals for proper functioning of the vehicular traffic as well as pedestrian's traffic. The village is facilitated with proper street light for night travel.

Pure drinking water for morning and evening peak hours is also provided door to door with help of 6 over head water tank which range from 15000l to 25000l which are cleaned at regular intervals to maintain hygienic conditions.

Along with the facility of pure drinking water the facility for the removal of waste water is also provided. Drainage network for the whole town is constructed from door to door and is connected to main sewage line at Choryasi Taluka. Along with sewage disposal solid waste management is also given a wide importance and is collected from door to door with the help of 9 collecting vans and is given to the Surat mahanagarpalika for disposal and treatment. 5 public toilets are also constructed with the help of government grant and by fund collected from the local residents which had led the people to leave a better life than before. 24hrs electricity supply is also provided to the residents from GEB.

Education: -

They have hierarchy of education facilities from pm-primary school to college. There are 6 pre-primary schools (Aganwadi), 2-primary school, 3 schools and private college. Also, it is noted that there is 98% enrollment and only 2% dropout ratio in schools. They have banned the tobacco, cigarette and other product in the 100-meter radius of school for better health of student.

Facilities in government school:

- No. of students – 1021
- Teachers – 32
- Play ground
- Filtered drinking water
- Computer lab

(Fig 2 Gate of Kamrej village)

(Fig 3 Primary school of Kamrej Village)

(Fig 4 Sarpanch Office, Kamrej)

(Fig 5 Road of Kamrej village)

(Fig 6 Post office, Kamrej)

(Fig 7 Police Station, Kamrej)

1.4 SWOT ANALYSIS OF IDEAL VILLAGE

SWOT Analysis is a useful technique for understanding your Strengths and Weaknesses, and for identifying both the Opportunities open to you and the Threats you face.

- **Strengths**
    - Schools and colleges
    - Religious places (temples & masjid)
    - Excellent water quality
    - Easy access to highway
    - Parking Facilities
    - Police & Fire station
    - Major Source of water (Tapi river)

  - Post office
  - Hospital
  - Renewable energy sources
- **Weaknesses**
  - No facility of club for adults and seniors
  - Need to upgrade village parks and playgrounds
  - Improper solid waste management
  - Improper telecommunication network
  - No road drainage provided
- **Opportunities**
  - Opportunity for more events in parks, ponds and open space
  - Construction of public library
  - Construction of movie theatre
  - Opportunities for local business
  - Redevelopment of vacant land
  - Entertainment parks
- **Threats**
  - Algae in water tank surface
  - Accidents due to rough driving by college and high school students
  - High commercial rents

1.5 FUTURE PROSPECTS OF THE IDEAL VILLAGE:

Kamrej village can be developed as an educational and recreational hub due to development of upcoming infrastructure projects near the village and due to ITI college campus in the premises of Kamrej village. Local business and employment opportunities can also be improved with regards to increase in the physical and social development of village.

1.6 BENEFITS OF THE VISITS

Purpose

To study about the development as well as the infrastructure facilities of villages which is an ideal village and can be considered as Benchmark for the development and growth of other villages which are developing or which needs to be development.

By visiting such villages, we students of civil engineering and electrical engineering can understand about the actual development that a rural area needs to satisfy its basic infrastructure facilities and compare with urban area and can implement these techniques and facilities for the

development of other villages which actually needs development and can implement the same for the development of villages which are allocated to us as a final year project.

After visiting the village, we came to know about various facilities that can be provided in a village for Rurbanization of village and to reduce the migration of people from villages to city areas. We also came to know about the various methodologies and techniques that can be used for the development of village.

1.7 CIVIL CONCEPT / METHOD / USAGES IN THE IDEAL VILLAGE:

Civil engineering projects are increasingly complex and are associated with situations where robust decision is required to be taken. These decisions are made in different stages of civil engineering projects. For example, decision making takes place during feasibility study stage prior to design, procurement and construction stages in order to determine the viability of project undertaken by an investor.

With the help of an interdisciplinary approach to problem solving, however, many innovations are being made in an effort to bring practical, repeatable implementation to construction. Although the learning curve may be steep, the potential benefits are considerable. All the work of the village development is carried by the gram panchayat are in their presence and efforts to make their village world class and people will visit their village for their well-known facilities which are provided by gram panchayat.

Chapter 2: Literature Review

2.1 Introduction: Urban and Rural

The "Rural Area" means any place as per the "least census" which meets the following criteria,

- Area with population less than 5,000
- Density of population less than 400 per km
- More than "25% of the male working population" is engaged in agricultural works.

The definition of urban area is as follow:

1. All places with a municipality, corporation or notified town area committee, etc.
2. All other places which satisfied the following criteria:

    - Area with minimum population of 5,000
    - At least 75% of the male working population is engaged in nonagricultural activities.
    - A density of population of at least 400 persons per km^2

2.2 Importance of The Rural Development:

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

Rural development is pretended to be noticeable importance in the country today than in the olden days in the process of the evolution of the nation. It is a strategy trying to obtain improved rural creation and productivity, higher socio-economic equality, and ambition, stability in social and economic development.

The primitive task is to decrease the famine roughly about 70 percent of the rural population, implement sufficient and healthy food. Later, serve fair equipment of clothing and footwear, a clean environment and house, medical attention, recreational provision, education, transport, and communication.

2.3 Different Definition of Rural Area / Village

As urban markets saturate and companies spread their wings in search of new markets, everybody has the same question on their lips: what constitutes a "rural" market? The question to discover the real rural India still continues in great earnest. Almost every economic agency today has a definition of rural India. Here are a few definitions.

According to the planning commission, a town with a maximum population of 15000 is considered rural in nature.

The national sample survey Organization (NSSO) defines "Rural" as follow:

- An area with a population density of up to 400 per km^2
- Villages with clear surveyed boundaries but no municipal board
- 0A minimum of 75% of male working population involved in agriculture and allied activities.

2.4 Scenario: Rural / Urban India And Gujarat As Per Census 2011 (Population Growth)

DATA HIGHLIGHTS – CENSUS 2011
Table no.2 Population (in Crore**)**

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

For the first time since Independence, the increase in population is more in urban areas than that in rural areas

- Rural- Urban distribution: 68.84% and 31.16%
- Level of urbanization increased from 27.81% in 2001 census to 31.16% in 2011 census
- The proportion of rural population declined from 72.195 to 68.84%

2.5 Rural issues and Concern

The major three issues are Agriculture, Rural area and Farmers.

- **Issues of Agriculture**

In general, the issues are how to increase agriculture in India. It includes:

1. Increase the marketization level of agriculture production and operation and stabilizing the prices of agricultural products.

2. Changing the situation of smallholder economic agriculture, achieving economies of scale of agriculture production and operation
3. Guaranteeing the food security in India

- **Issues of Rural Areas**

This is particularly reflected in the disparity of economic and cultural development urban and rural areas. It is mainly caused by dual segmentation based on the household registration system.

- **Issues of Farmers**

It includes improving the income level of farmers, alleviating burdens of farmers, increasing the cultural quality of farmers, and safeguarding the right of farmers.

2.6 Various Measures for Rural Development:

For the development of rural different measures need to be taken to fulfil following objectives:

- To promote the rural economy by improving production and the employment situation and incomes of the rural population through:
- The development of new nonagricultural rural activities, such as agro industries, support services, etc., which will make higher level of productivity and competitiveness possible;
- The improvement of working, training and income condition of rural workers; and
- To promote the generation of saving and facilities a higher level of investment in the rural area.
- To help expand the access of the rural population to basic services, including, education, health care etc.

2.7 Various Infrastructure & Guideline / Norms for Village for the Provision of Different Infrastructure Facilities.

- **Water supply: -**

Delivery of safe drinking water is vital for protecting public for public health and of promoting more secure livelihoods. The traditional approach to water quality and safe management has relied on the testing of drinking water, as it leaves the treatment works or at selected points, either within the distribution system or at consumer taps. It is referred to as “end-product testing”.

Various method for water supply,

Gravity-fed water supply system in hilly areas, Dug well-based rural water supply, Borewell-based rural water supply, Ground water recharging system, Roof top rain water harvesting systems

- **Sanitation facilities: -**

Demand and supply of sanitation facilities and services should be addressed concurrently to ensure toilet adoption and sustained use and enable scale adoption and sustained use of sanitation facilities requires construction on safe toilets and their sustained use.

- **Roads: -**

The union ministry of rural development has recently issued fresh guidelines under the "Pradhan Mantri Gram Sadak Yojana" to prevent construction of poor-quality roads and streamline the bidding process throughout India. PMHSY is the largest rural road connectivity program in the world.

- **School: -**

Many small towns lack basic educational infrastructure. Most schools don't have proper toilets, electricity, and proper building with roofs. There is also lack of drinking water. The condition of government schools is also not satisfied according to many reports. There have been several cases of poisoning due to poor quality mid-day meals in government schools. Therefor, provide among the all facilities in rural schools like proper toilets, electricity and proper building and also provide good furniture which required in school.

2.8 Other Projects / Schemes

- **Projects / Schemes by Government Sector:**
  - ✓ IRDP (Integrated Rural Development Program)
  - ✓ SGSY (Swaranjayanti Gram Swarozgar Yojana)
  - ✓ NRUM (National Rurban Mission)
  - ✓ Pradhan Mantri Gram Sadak Yojana
  - ✓ Mahatma Gandhi National Rural Employment Guarantee Act-2005
  - ✓ PURA (Provision of Urban Amenities in Rural Areas)
  - ✓ JNNURM (Jawaharlal Nehru National Urban Renewal Mission)
  - ✓ JWDP (Integrated Wasteland Development Program)

- **Projects / Schemes by Private Sector:**
  - ✓ Intensive Agriculture area Program
  - ✓ Intensive Agriculture District Program
  - ✓ High Yielding Varieties Program
  - ✓ Rural Industries Projects

Chapter 3: Smart (Cities / Village) Concept As per Your Idea and its Visit (Civil & Electrical Concepts)

3.1 Concept, Definitions and Practices

the concept of smart city embraces several definitions depending on the meanings of the word “smart”. Intelligent city, knowledge city, ubiquitous city, sustainable city, digital city etc. many definitions of smart city exist but no one has been universally acknowledged yet. From literature analysis it emerges that Smart city and digital city are the most used terminologies in literature to indicated the smartness of a city.

3.2 Bench Marks – Vision – Goal, Standards and Performance Measurement Indicators

The vision of smart cities is that the smart cities are the center of the future, secure environmentally green, made safe, efficient because of all structure- whether for water, power, transportation. Are designed, construction making use of integrated materials, sensors, and network which are interfaced computerized systems of database, decision making algorithms.

Calculation of the 79 different livability indicators prescribed in the ‘livability standards in cities’ requires data on a large number of aspects of urban infrastructure, governance, municipal finances, social infrastructure, economic aspects etc. wherever such data is regularly compiled by the ULBs or other services such as DISCOMS. Water and sewerage utilities etc. it should be sources from the records of such provides.

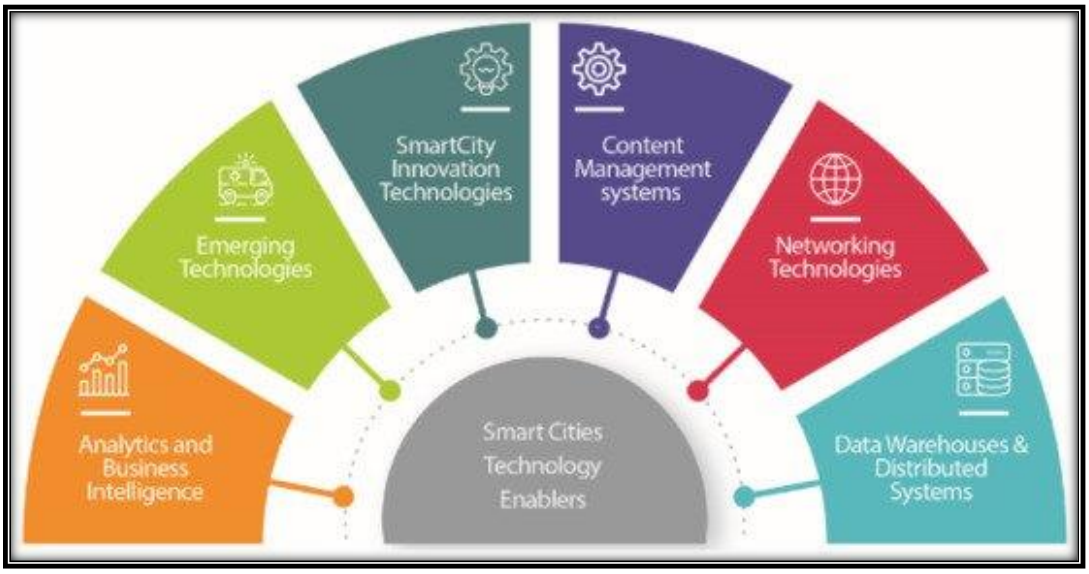
(fig.8 Vision of Smart Village**)**

3.3 Technological Options for Smart Cities:

Cities and communities across the Nation are today facing complex and persistent challenges stemming from changing populations and infrastructure. In particular, demands on city infrastructure, systems, and services are growing and changing, prompting important new needs, such as more effective use of limited space, greater walkability, and ways to support residents across all socioeconomic statuses. The need for improved resilience in the face of natural and man-made disasters adds to the challenges that cities and communities are facing. These challenges directly manifest for city residents as well. Being able to address these challenges is in and of itself difficult.

Ongoing city operations are often dependent upon the very infrastructure, services, and systems that could benefit from innovation and finding the time, energy, and resources to improve city capabilities without adversely affecting these ongoing operations is not trivial. Consider, for example, routine roadway construction projects; cities and communities must often conduct these projects during limited nighttime and weekend hours, so as to minimize disruptions for residents who rely upon the roadways to commute to and from work.

At the same time, advances in networking and information technology over the last several decades have transformed individuals' lives, rapidly altering how we live, work, and communicate. Integrating these digital technologies with physical infrastructure at the city level similarly enables innovative opportunities and solutions to the challenge's cities are facing. By working closely with cities to support this integration in ways described in this strategic plan, Federal agencies can help facilitate solutions to city challenges and catalyze the smart of the future.

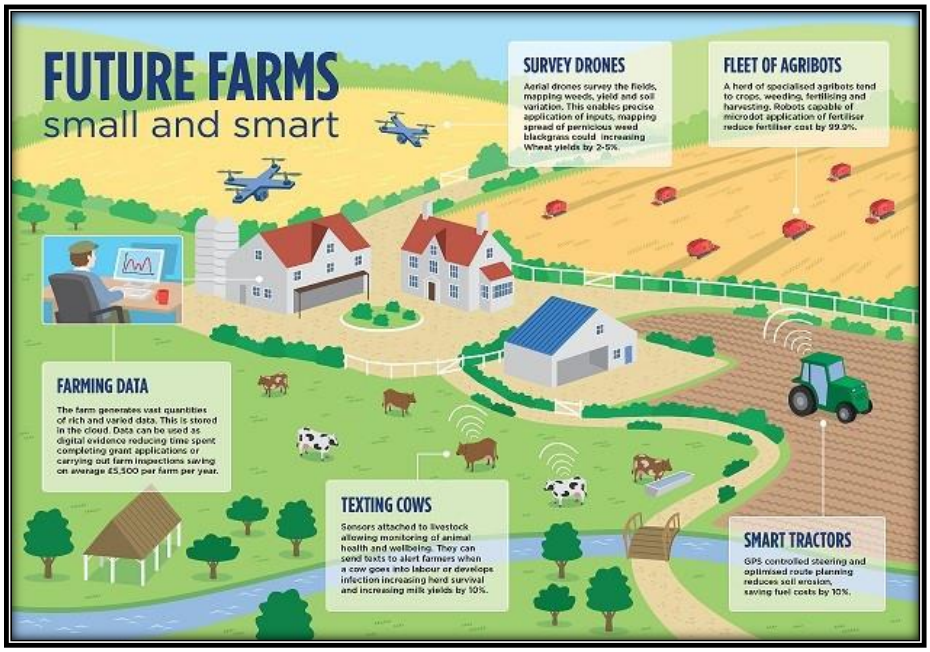


(fig 9 Technological Options for Smart Cities)

3.4 Road Map and Safe Guards

The purpose of building smart cities is to make the lives of the people safer and easier. Technology can be used as an instrument to protect lives and improve services and, furthermore, it can be used to protect Personally Identifiable Information and cities critical infrastructures, such as water treatment systems, transportation, hospitals, and power plants. Technology can be used to reduce crimes by geographically spotting areas with high crime rates, identifying specific crime patterns, and reporting it to law enforcement instantly, many of these services are achieved.

Sensors are small measurement devices that can be integrated with electronics to detect certain smells, sound, or levels of variations. Sensors can be passive or active. Passive sensors do not necessarily take action; they simply collect data, and they are used mainly to measure weather conditions, such as Ozone levels, wind speed, or the sun's ultraviolet levels. Active sensor devices, on the other hand, use electronics to process data and take action.



(fig.10 Technology used in Future Smart Village)

3.5 Issues & Challenges

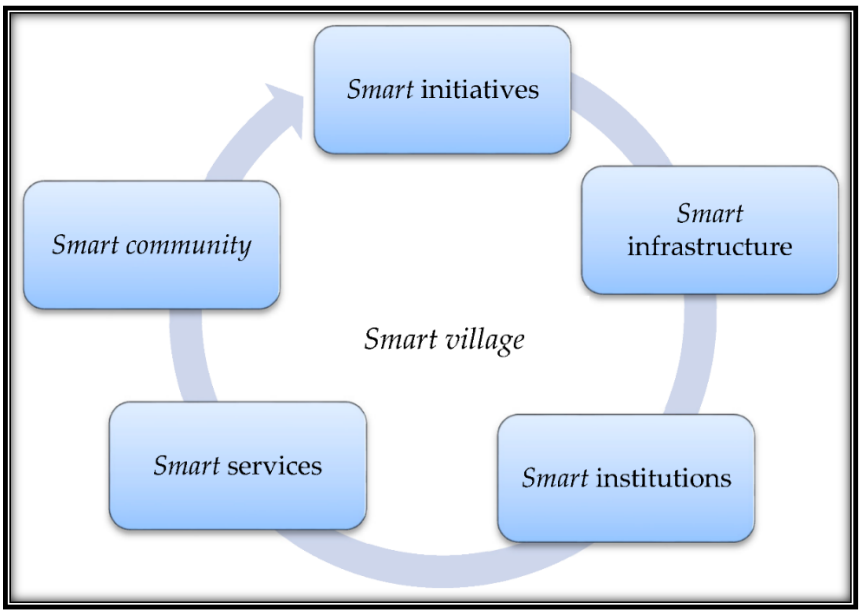
1. Retrofitting existing legacy city: infrastructure to make it smart, there are a number of issues to consider when reviewing a smart city concept. The most important is to determine the existing cities weak areas that need utmost consideration, e.g. 100-per-cent distribution of water supply and sanitation. The integration of formerly isolated legacy systems to achieve citywide efficiencies can be a significant challenge.
2. Financings of smart cities: The High-Power Expert Committee on Investment Estimates in Urban Infrastructure has assessed a per-capita investment cost of Rs 43,386 for a 20year period. Using an average figure of 1 million people in each of the 100 smart cities, the total

estimate of investment requirements for the smart city comes to Rs 7 lakh crore over 20 years. This translates into an annual requirement of Rs 35,000 crore. One needs to see how these projects will be financed as the majority of project need would move through complete private investment or through PPPs (public-private partnership).

3. Availability of city development plan: Most of our cities don't have a city development plan, which is the key to smart city planning and encapsulates and encapsulates all a city needs to improve and provide better opportunities to its citizens. Unfortunately, 70-80 % of Indian cities don't have.
4. Financial sustainability of ULBS: Most ULBS are not financially self-sustainable and tariff levels fixed by the ULBs for providing services often do not mirror the cost of supplying the same. Even if additional investments are recovered in a phased manner, inadequate cost recovery will lead to continued financial losses.
5. Technical constraints of ULBS: Most ULBS have limited technical capacity to ensure timely and cost-effective implementation and subsequent operations and maintenance owing to limited recruitment over a number of years along with inability of the ULBs to attract best of talent at market competitive compensation rates.
6. Three-tier governance: Successful implementation of smart city solutions needs effective horizontal and vertical coordination between various institutions providing various municipal amenities as well as effective coordination between local government, state government, central government, agencies on various issues related to financing and sharing of best practices and service delivery processes.
7. Providing clearances in a timely manner: For timely completion of the project, all clearances should use online processes and be cleared in a time-bound manner. A regulatory body should be set up for all utility services so that a level playing field is made available to the private sector and tariffs are set in a manner that balances financial sustainability with quality.
8. Dealing with a multivendor environment: Another major challenge in the smart city space is that software infrastructure in cities contains components supplied by different vendors. Hence, the ability to handle complex combinations of smart city solutions developed by multiple technology vendors becomes very significant.
9. Capacity building program: Building capacity for 100 smart cities is not an easy task and most ambitious projects are delayed owing to lack of quality machinery and manpower, both at the center and state levels. In terms of funds, only around 5 per cent of the central allocation may be allocated for capacity building programs that focus on training, contextual research, knowledge exchange and a rich database. Investments in capacity building programs have a multiplier effect as they help in time-bound completion of projects and in designing programs, developing faculty, building databases as well as designing tool kits and decision support systems. As all these have a lag time, capacity building needs to be strengthened right at the starting.
10. Reliability of utility services: For any smart city in the world, the focus is on reliability of utility services, whether it is water, telephone, electricity, broadband services. Smart cities should have to provide electricity 24 Hours.

3.6 Smart Infrastructure

Smart information and communication technology have the potential to transform the way we plan and manage infrastructure. New development in computer hardware, new applications and software are changing the face of the infrastructure sectors, and society more generally; driving greater efficiency, increasing productivity, and greatly simplifying construction process and life of asset maintenance.



(fig.11 Smart Infrastucture)

3.7 Cyber Security

Cyber security is the body of technologies, processes and practices designed to protect network, computers, programs and data from attack, damage or unauthorized access. In a computing context, security includes both cyber security and physical security.

Ensuring cyber security requires coordinated efforts throughout on information system.
Elements of cyber security include:

- Application security
- Network security
- Operational security
- End-user education

(fig.12 Cyber Security)

3.8 District Cooling and Heating / Green Building

District cooling system produce chilled water, steam or hot water at a central plant and then pipe that energy out to building for air conditioning. Space heating and water heating. As a result, there buildings don't require their own chiller, air conditioners, boilers or furnaces.

District cooling systems are a highly efficient way for many owners and manufacturers to effectively address each of these challenges while meeting their comfort and process cooling and heating needs.

Heat sources in use for various district heating systems include, power plants designed combined heat and power including both combustion and nuclear power plants; and simple combustion of a fossil fuel or biomass; geothermal heat; solar heat; industrial heat pumps which extract heat from, river or lake water, seawater, sewage, and waste heat from industrial processes.

(fig.13 green building)

3.9 Strategic Option for Fast Development

Smart Infrastructure involves applying this to economic infrastructure for the benefit of all stakeholders. It will allow owners and operators to get more out of what they already have, increasing capacity, efficiency and resilience and improving services.

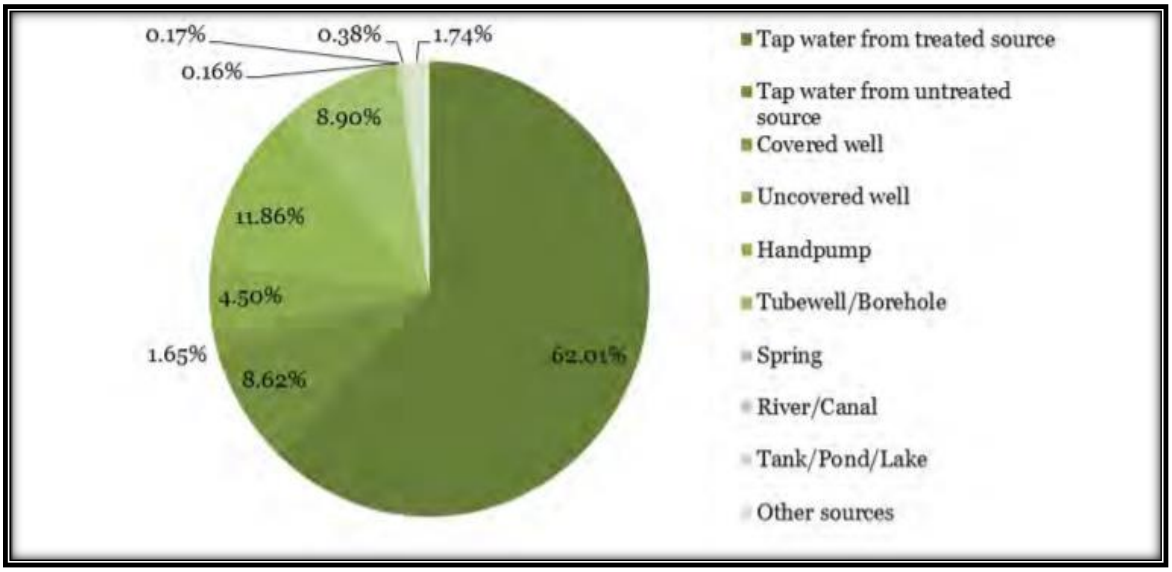
It brings better performance at lower cost. Gaining more from existing assets is the key to enhancing service provision despite constrained finance and growing resource scarcity. It will often be more cost-effective to add to the overall value of mature infrastructure via digital enhancements than by physical enhancements – physical enhancements add `more of the same', whereas digital enhancements can transform the existing as well.

Smart Infrastructure will shape a better future. Greater understanding of the performance of our infrastructure will allow new infrastructure to be designed and delivered more efficiently and to provide better whole life value.

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

More than 90% of the urban population has access to drinking water, and more than 60% of the population has access to basic sanitation. However, access to reliable, sustainable, and affordable water supply and sanitation (WSS) service is lagging behind. Are the Services Reliable? No Indian city receives piped water 24 hours a day, 7 days a week. Piped water is never distributed for more than a few hours per day, regardless of the quantity available. Raw sewage often overflows into open drains. Are the Services Technically and Financially Sustainable? Less than 50% urban population has access to piped water. The Non-Revenue Water (NRW: due to leakages, unauthorized connections, billing and collection inefficiencies, etc.) is huge, estimated between 40-70% of the water distributed.

Operations and maintenance cost recovery through user charges is hardly 30-40%. Most urban operations survive on large operating subsidies and capital grants.



(fig.14 Analysis of Water Distribution)

3.11 Initiative in Village Development by Local Self-Government

- **Rural Local Government (or Panchayat Raj Institutions)**
  - Zilla Panchayat
  - Mandal or Taluka Panchayat
  - Gram Panchayat

- **Initiation by Local People**
  - Organization program for increase literacy for peoples of village.
  - Providing enough information regarding to using of various facilities.
  - Peoples have to learn various things regarding how to keep facilities in good condition.

3.12 Smart Initiative by District Municipal Corporation

- Solid waste management.
- Selvedge water disposal.
- Effective road transportation.
- Maintaining street light facilities.
- Agriculture awakening center.

3.13 Any Projects Contributed Working by Government

- The panchayat raj system is a three-tier system with elected bodies at village, taluka and district levels.
- The modern system is based in part on traditional panchayat government, in part on the vision of mahatma Gandhi and part by the work of various committees to harmonize the highly centralized Indian government administration with a degree of local autonomy.
- The result was intended to create greater participation in local government by people and more effective implementation of rural development programs.
- Although, as of 2015, implementation in all of India is not complete the intention is for there to be a gram panchayat for each village or group of villages, a tehsil level council, and a zilla panchayat at the district level.

3.14 How to Implement Other Countries Smart Villages project in Indian Village context

Each village should have following 5 basic amenities in 5 year:

- Roads
- Electricity
- Water
- Hospitals
- Schools

Basic amenities of for smart village from other countries are:

- Schooling: smart class room can improve the quality of education by providing access to a large amount of education resources.
- Health care: improving information available on the availability, location and cost of various types of health care.
- Agriculture: provide information to farmers on the types of crops that can fetch them returns, by ensuring that there is no guilt of one product shortage of another.

Chapter 4: Introduction of Rasnol Village

4.1 Introduction

4.1.1 Introduction About Rasnol Village Details

The rurbanzation area selected for the study, planning, and designing is Rasnol Village, located in Umreth Taluka of Anand district in Gujarat, India. It is situated 14 km away from district headquarter Anand.

Rasnol is a village in Umreth taluka of Anand district in Gujarat State. Rasnol village pin code is 388335. Rasnol village total population is 9390 and number of houses are 1951. Female population is 4463 and male population is 4927.

4.1.2 Justification / need of the study

The Goal of research proposal is to present and justify the need to study a research problem and to present the practical ways in which this research should be conducted.

There are number of schemes of the Government which are being operated and run for rural development in the rural areas of the country. Evolution taken up so far for these schemes has been more or less in a piecemeal form, i.e. generally for each scheme separately. It has become difficult to get an overall picture of the development in totality in the rural areas and is difficult to assess the impact of any one particular scheme, since most of the schemes are complementary and supplementary and most of the time, they all are contributing to the impact. Hence a view has been formed to take up studies on trial basis to assess the impact of the important schemes as a whole in rural development in selected village

4.1.3 Study Area

Rasnol village is the village in Umreth taluka in Anand district of Gujarat state, India. It is located from 16 km away from the Anand and 104 km away from state capital Gandhinagar.Village has population about 9390 and no.of house is 1951, female population is 48% and male population is 52%. The total area of village is 1186.36 hectors.

4.1.4 Objective of the study

The main objective of the study undertaken is to utilize the results to provide true feedback of the present state of implementation of all development schemes in the rural areas. The observation made during the study are to inputs to help in bringing about changes in the formulation or reformulation.

- To access problems, constrains in the effective implementation.

- To know the basic requirement of village.
- To provide the basic facilities in rural area like Education, health, irrigation, electric power etc.
- To provide the impact of these various programs
- To gauge the general opinion of the people towards there schemes and programs of the government.

4.1.5 Scope of the Study

The aim of project is to develop the village with job opportunity for villagers. A team of project is finding the problem or need of a village in terms of socio – cultural or physical or social infrastructure and to design that facility with efficient engineering solution which include the design proposal and estimate cost to facilitate the require facility for the future growth of village with urban facilities.

The study will focus the development trend, intensity of growth of the village, and find out the problems related to the socio-cultural or physical development of the area, social infrastructure services, and the administrative systems of the village. The study of village gives the reason where there is need of sustainable facilities like infrastructure facilities, community hall, primary health center, post office, general market, pure drinking water, road network, schools, electricity, sanitation, library, aaganwadi, overhead tank, police station, fire station, etc. are available or not. Rural settlement engulfed in urban limits during the process of development, and also those located in the fringe areas of large cities, can be termed as urban villages.

4.1.6 Methodology Framework for Development of Your Village

To achieve the aim by passing through the objective, the study will be done in the following methodology, described as follow:

A. Literature study:

The various theories and case studies to be referred to the understanding of various issues related to the urban, to define the “Fringe villages”, to study the various issues of “Fringe villages”

B. Field Visit:

The field visit will be starts from collection of revenue maps and ‘gametal’ maps if possible, along with the map and other basic information of the study areas.

C. Primary Survey and Interview:

The primary surveys such as household surveys, questionnaire survey, to know the real status of the infrastructure services and quality of life they are living in the particular area and the major problems and issues they are facing, questionnaire survey of the real estate developers to

know the scope and trend and scope of the development and status of the market and demand of that place.

D. Data Analysis:

An analysis form is used for finding a requirement of village as per government norms. A data collected during village survey is also used for an analysis government data on paper data.

E. Issues Findings, Development of Strategy:

From the above study in the detail of the literature review, situation analysis, study of the existing institutional framework, primary and secondary data analysis and mapping the best appropriate strategy to be formulated with possible recommendation, implementation strategy and allocating the roles and responsibilities of the different local bodies which give a scope for villagers to show their ability and chances of job opportunity.

F. Final Proposal:

Strategic theme-based proposal for fridge village from analysis in the from of rurban town.

4.1.7 List of objects Available Related to Civil Methodology.

- Anganwadi
- Panchayat office
- Overhead rectangular water tank
- Primary school
- Drainage system
- Underground water system
- General store

4.2 STUDY AREA PROFILE

4.2.1 Study Area Location

Name of Village: - Rasnol
Name of Taluka: - Umreth
Name of District: - Anand
The location code or village code of Rasnol village is 516917. It is situated 16 km away from sub-district headquarter and 16 km away from district headquarter Anand.

- Primary topographical and geographical details are described below:

Table no.3 study area location

1	Nearest town and its distance	Anand- 16km
2	Temperature	29 C’
3	Annual rainfall	672mm

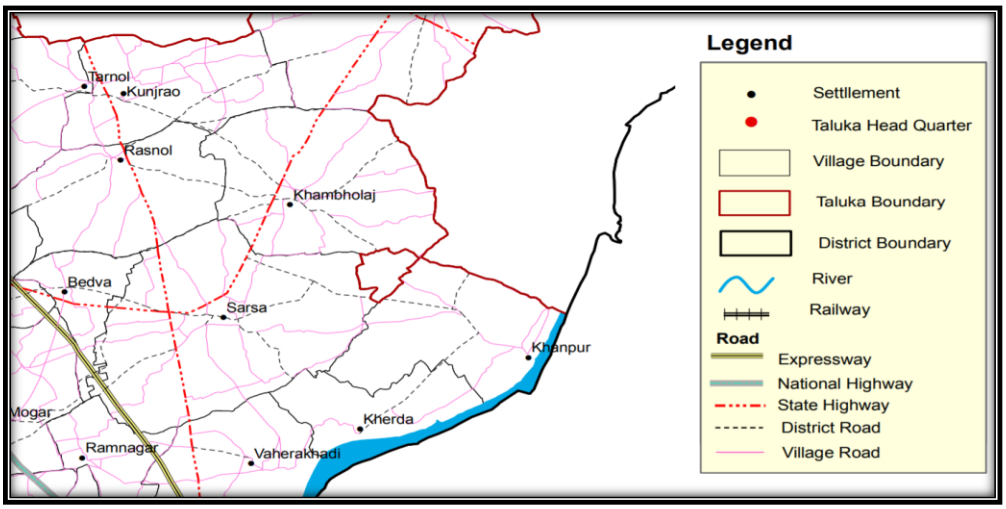
4.2.2 Base Location map, Land Map, Gram Tal Map

Base Location Map:

(fig.15 Base Location Map of Rasnol)

Rasnol village is located at Umreth Taluka in Anand District in Gujarat State, Rasnol village is 16 km away from Anand.

Land map:



(fig.16 Land Map of Rasnol Village)

Gam Tal Map:

(fig.17 Gram Tal Map of Rasnol village)

4.2.3 Physical & Demographical Growth

The facilities are essential for economic as well as social growth of any area. These facilities include proper road network, water supply, drainage etc. any village which needs to be economically development must contain the above-mentioned facilities.

Demographical growth

Table no.4 Demographical growth

Sr.no.	Population	Male	Female	Total house hold
1	9093	4927	4463	1951
2	12%	9%	5%	

4.2.4 Economic Profile / Bank

The economic status of Rasnol gram panchayat is not well as compared the ideal village like Kamrej. Rasnol panchayat collects around 14 to 15 Lakh as various taxes and funds from the various sources of income are housing tax, income tax, water tax, electricity bills, cleaning charges, taxes from the House hold. And the other development work is done in village by the Grant Which is given by the Stat government or Central Government.

There is no Bank in Rasnol Village. Villager have to Go to Umreth village which is near to Rasnol Village at the 1.9 Km Distance.

4.2.5 Social scenario – Preservation of traditions, Festival, Cuisine

Stringent rules must be passed to ensure that corrupt practices do not hamper and harass the bank loan seekers, old age and handicapped pensioners, and other recipients of bank assistance for small enterprises or other beneficiaries for other interventions.

Festivals: the village folk culture is dance including garba, dandiya, raas, tipani etc.
Traditional wear: they wear traditional cloths like chanyacholi, kediyo, kachhado, Guajarati saree etc.
Cuisine: the regular food is Gujarati thali, Indian food, the villagers prefers the vegetables to eat which is they grow in their farm.

4.2.6 Migration Reasons / Trends

In Rasnol village people are migrate because of better opportunity for jobs, business, high living standard. People are migration to Anand is one of the economic hub of Gujarat, people earn more in the city rather than village that's why people migrate from village to city

4.3 DATA COLLECTION

4.3.1 Methods for Data Collection

- By filling survey forms
- By interaction with villagers
- By interaction with sarpanch / panchayat members
- By observation the current condition of the village

4.3.2 Primary Survey Details

Primary survey details are collected by interacting with the village dwellers and questioning them about facilities available and require. They were asked to give suggestions about the work required to be carried out for the development of the village to promote rurbanization.

4.3.3 Average Size of the House

The village has no specified size of house, but the Financially Capable villagers have good constructed House and poor villagers have small size or medium size house. The Average size of house is 100 var plot per house.

4.3.4 No. of Human being in one house

As per population and house hold number the average Human being in the one House is 4. Each House has 4 persons in the house

4.3.5 Which Martial Use locally / Out Sourced Materials

The village has no specific material. All the martial which is required which has been Transported to village from the nearest town like Anand.

Which Martial Use Locally The village has no specific material. All the martial which is required which has been Transported to village from the nearest town like Anand.

4.3.6 Geographic Details

Table no.5 Geographic Details

Sr.no	Description	Information details
1	Area of village	1186.36 hectors
2	Forest area	-
3	Residential area	108.42 hectors
4	Other area	236.85 hectors
5	New area	21.52 hectors
6	Distance from nearest railway station	8km -Vadod
7	Nearest town with distance	16 km – Anand

4.3.7 Demographic Details

Table no.6 Demographic Details

Sr.no	Population	Male	Female	Total house hold
1	9390	4927	4463	1951

4.3.8 Occupational Details

Table no.7 Occupational Detail

Percentage of worker	Occupation
70%	Farming
20%	Work in farm as labor
10%	jobs

4.3.9 Agricultural Details

Table no.8 Agricultural Details

Weather	Crops name
Winter	Wheat
Summer	Bajara
Monsoon	Ground nut

4.3.10 Manufacturing Hub / Warehouse: No, manufacturing Hub

4.3.11 Tourism Cluster: No, tourism site at village.

4.4 Infrastructure Details

4.4.1. Drinking water / Water management facilities

The Rasnol village Has One R.O. Plant by which the village has provide the drinking water facilities. the village has one underground And Two Overhead water tanks by the village has provided the water for drinking.

(fig.18 water tank 1 of Rasnol)

(fig.19 water tank 2 of Rasnol)

4.4.2 Drainage network / sanitation Facilities

Rasnol village Has Under Ground drainage system and all the house hold has provided Drainage system. Village has One public Toilet.

(fig.20 public toilet of Rasnol)

4.4.3 Transportation and Road Network

Usually, the Villager use their own vehicle and Gujrat Government provide G.S.R.T.C. Bus service for transportation. The Village has no Bus stand Facilities. The village has Bituminous and R.C.C. road, network.

4.4.4 Housing condition

Village house hold has good Condition, almost villagers have good Paccca Makan (House).

(fig.21 kuccha / pucca house of Rasnol)

4.4.5 Social Infrastructure Facilities Health, Education, community hall, Library

Rasnol village has health care center, and 1 primary school but no library and no community hall

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

Some of public buildings are in good condition like panchayat office and some public building like anganwadi require maintenance of redesign.

4.4.7 Technology/ Mobile/ Wi-Fi / internet uses detail in percentage

Table No. 9 Technology/ Mobile/ Wi-Fi / internet uses detail in percentage

Technology	Percentage of users
Mobile	92%
Wi-Fi	0%
Internet	78%

4.4.8 Sports Activities as Gram Panchayat

Table no.10 Sports Activities as Gram Panchayat

Sports Activities
Cricket
Volley ball

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

No, Rasnol village has no socio-cultural facilities.

4.4.10 Other Facilities:

No other facilities.

4.4.11 Any other details:

Nil

4.5 ELECTRICAL CONCEPT

4.5.1 Renewable energy source planning particularly for villages:

In Rasnol village renewable Energy is solar energy for use as a house hold purpose and street light.

4.5.2 Irrigation Facilities:

There are no irrigation facilities for farmers. (canal, pond) Farmers irrigate their farm with the use of tube or bore well and open well.

4.5.3 Electricity Facilities with Area:

In Rasnol village there are 24-hour electricity facilities.

4.6 EXISTING INSTITUTION LIKE - VILLAGE ADMINISTRATION – DETAIL PROFILE

4.6.1 Bachat Mandali:

No Bachat mandali

4.6.2 Dudh Mandali:

No Dudh Mandali

4.6.3 Mahila Forum:

No Mahila Forum

4.6.4 Plantation for air pollution:

For reducing pollution panchayat has stated planting trees over the areas on which plantation is possible

4.6.5 Rain water Harvesting:

No use of rain water Harvesting methods in village.

4.6.6 Agriculture Development:

Rasnol Villagers use advanced technology for irrigation and plantation of crop and advanced machinery for framing.

4.6.7 Any Other:

NA

Chapter 5: Technical Options with Case Studies

5.1 CONCEPT (CIVIL)

5.1.1 Advance construction techniques

The construction industry is repeatedly criticized for being inefficient and slow to innovate. The basic method of construction, techniques and technologies have changed little since roman time

Every construction project is different, every site is a singular prototype, construction works are in different places, and involve the constant movement of personnel and machinery. The term 'advanced construction technology' covers a wide range of modern techniques and practices that encompass the latest development in materials technology, design procedures, quantity surveying, facilities management, services, structural analysis and design, and management studies.

8 Modern Building Construction Techniques,

1) 3D Volumetric Construction

Using this modular construction technology, 3D units are produced in controlled factory settings using needful construction and building materials. Finished units are transported to site in various modules, basic structural blocks or final touched up units with all amenities installed, for assembly. Blocks can be erected rapidly at site and properties of concrete like fire retardant, sound resistivity, thermal mass etc. are retained.

(fig.22 3D Volumetric Construction)

2) Precast Flat Panel Modules

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

(fig.23 Precast Flat Panel Modules)

3) Tunnel Formwork System

With this tunnel technique, construction is paced up for cellular structures of repetitive patterns through the building of monolithic walls or units in a single operation per day.Expeditious work is achieved by deploying formwork and readily mixed concrete with the convenience and agility of factory conditions. Formworks in tunnel form are stacked and used at the site with cranes.

(fig.24 Tunnel Formwork System)

4) Flat Slabbing Technology

This technique utilizes the simplicity of contemporary formwork for quickly building flat slabs to facilitate easy and swift placing of horizontal amenities and for partitioning. Maximization of pre-fabricated services occur as services can be carried out in an uninterrupted manner in zones underneath the floor slabs.

Every top-notch building Construction Company is using the same as internal layouts can be conveniently modified for accommodating alterations at a later date. Further, reinforcement needed is lesser which cuts down labour costs significantly.

5) Pre-cast Foundation Technique

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

(fig.25 Pre-cast Foundation Technique)

6) Hybrid Concrete Building Technique

This technique expedites construction turnaround time by blending the advantages of concrete pre-casting with the in-situ building. Quality improves, whereas the cost of construction plummets.Hybrid concrete structures are easy to build, competitive in nature and perform consistently.

(fig.26 Hybrid Concrete Building Technique)

7) Thin Joint Masonry Technique

Utilization of this technique leads to the reduction of the quantum of mortar applied by slashing it depth from 10mm to lesser than 3mm. Consequently, mortar can be laid swiftly with enhanced productivity on the longer wall panels.With large sized concrete blocks, higher construction efficiency along with significant cost reduction can be achieved. Within a single day,

the number of mortar courses laid is higher as curing of mortar takes place quickly without compromising on bonding strength resulting in the elimination of floating problem.

(fig.27 Thin Joint Masonry Technique)

8) Insulating Concrete Formwork (ICF) Technique

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

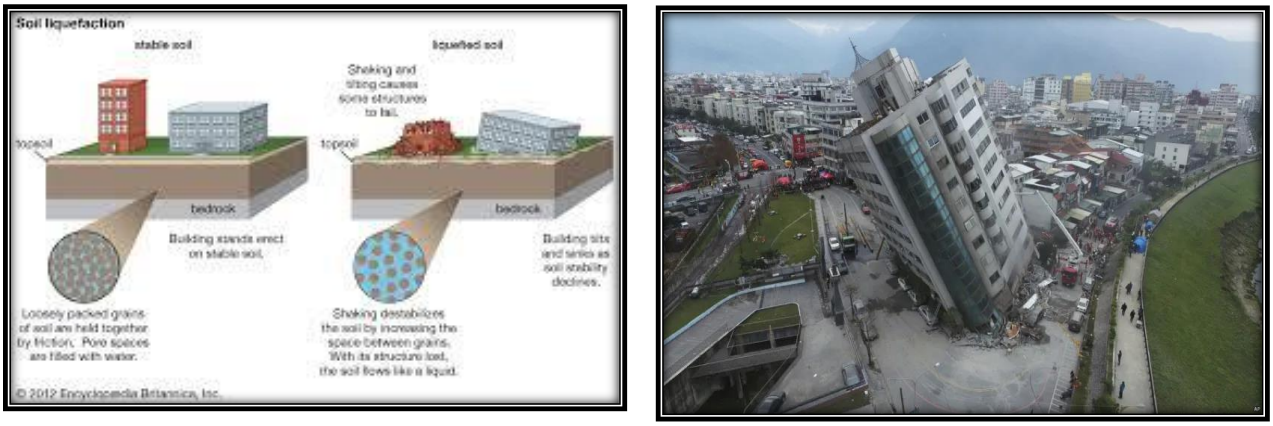
(fig.28 Insulating Concrete Formwork (ICF) Technique)

5.1.2 Soil Liquefaction

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

The phenomenon is most often observed in saturated, loose (low density or uncompacted), sandy soils. This is because a loose sand has a tendency to compress when a load is applied. Dense

sands, by contrast, tend to expand in volume or 'dilate'. If the soil is saturated by water, a condition that often exists when the soil is below the water table or sea level, then water fills the gaps between soil grains ('pore spaces'). In response to soil compressing, the pore water pressure increases and the water attempts to flow out from the soil to zones of low pressure (usually upward towards the ground surface). However, if the loading is rapidly applied and large enough, or is repeated many times (e.g. earthquake shaking, storm wave loading) such that the water does not flow out before the next cycle of load is applied, the water pressures may build to the extent that it exceeds the force (contact stresses) between the grains of soil that keep them in contact. These contacts between grains are how the weight from buildings and overlying soil layers is transferred from the ground surface to layers of soil or rock at greater depths. This loss of soil structure causes it to lose its strength (the ability to transfer shear stress), and it may be observed to flow like a liquid (hence 'liquefaction').

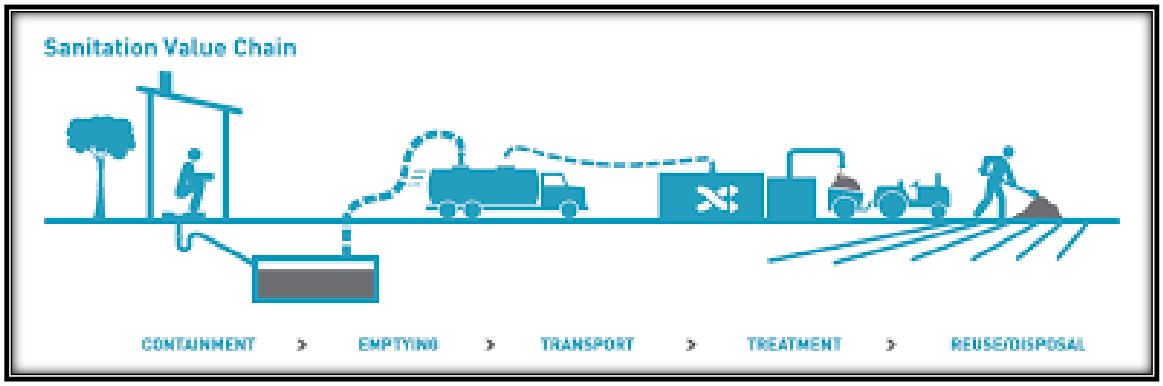


(fig.29 soil liquefaction)

5.1.3 Sustainable Sanitation

Sustainable sanitation is a system designed to meet certain criteria and to work well over the long-term. Sustainable sanitation systems consider the entire "sanitation value chain", from the experience of the user, excreta and wastewater collection methods, transportation or conveyance of waste, treatment, and reuse or disposal. The Sustainable Sanitation Alliance includes five features (or criteria) in its definition of "sustainable sanitation": Systems need to be economically and socially acceptable, technically and institutionally appropriate and protect the environment and natural resources.

Sustainable sanitation, defined with the five sustainability measures, may or may not have a focus on reuse of excreta, because the criterion of "protecting the natural resources" is only one of several that need to be aimed towards. In comparison, ecological sanitation (ecosan) has a strong focus on the reuse of waste.

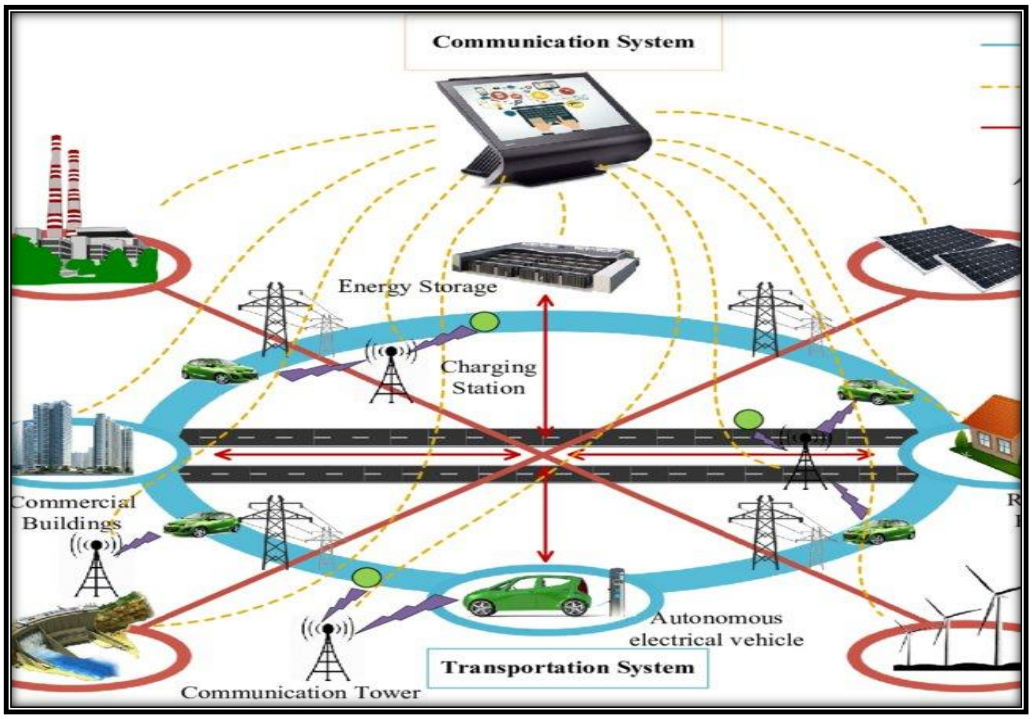


(fig.30 sustainable sanitation)

5.1.4 Transport Infrastructure / system

- WBM roads
- Bituminous roads
- Concrete roads

Intelligent transport system is an advanced application which aims to provide innovative services relating to different modes of transport and traffic management and enable users to be better informed and make safer, more coordinated, and smarter use of transport networks.



(fig.31 transport system)

5.1.5 Vertical Farming

Vertical farming is the practice of growing crops in vertically stacked layers. It often incorporates controlled-environment agriculture, which aims to optimize plant growth, and soilless farming techniques such as hydroponics, aquaponics, and aeroponics. Some common choices of structures to house vertical farming systems include buildings, shipping containers, tunnels, and abandoned mine shafts.


(fig.32 vertical farming)

5.1.6 Corrosion Mechanism, Prevention & Repair Measures of RCC Structure

Mechanism: Corrosion Mechanism, Prevention & Repair Measures of RCC Structure Though concrete is quite strong mechanically, it is highly susceptible to chemical attack and thus structure gets damaged and even fail unless some preventive measures are adopted to counteract this and thereby increasing the durability of structure. In the case of Reinforced concrete structure, the ingress of moisture or air may lead to corrosion of steel, cracking and spalling of concrete cover thereby reducing durability of concrete structure. Repair has been suggested as the protective solution for damaged structure due to corrosion.

Overall, there is very little published empirical evidence that provides insight into the durability of silane treatments and their long-term residual protection (i.e., following at least 10 years of service). Such a gap in knowledge is undesirable given the scale of infrastructure treated with hydrophobic treatments such as silanes.

Prevention: Corrosion of steel in reinforced concrete structures can be divided into four different categories, based on how they provide protection:

1) Alternative reinforcement and slab design method includes materials that electrically isolate the steel from the concrete and create a barrier for chloride ions, materials that protect steel galvanic-

ally, and materials that have significantly higher corrosion thresholds than conventional reinforcing steel. Concrete slabs have been designed without any internal reinforcement.

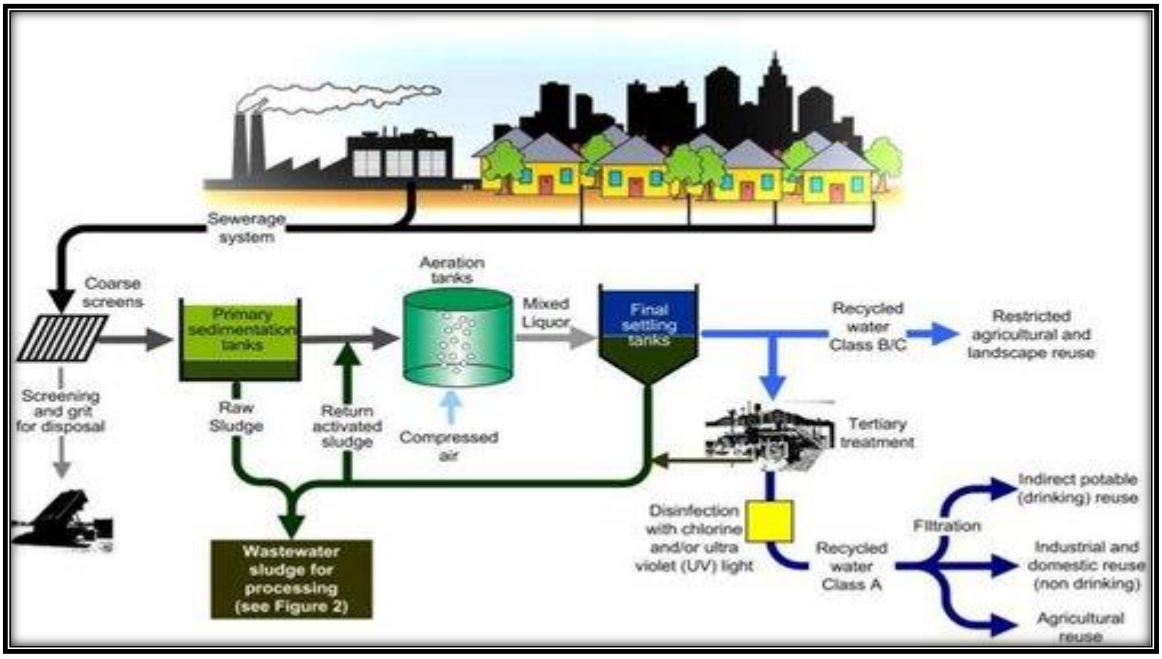
2) Barrier methods protect reinforced concrete from corrosion damage by preventing water, oxygen, and chloride ions from reaching the reinforcement and initiating corrosion.

3) Electrochemical methods use current and an external anode to protect the reinforcement, even when the chloride ion concentration is above the corrosion threshold.

4) Corrosion inhibitors offer protection by raising the threshold chloride concentration level, by reducing the permeability of the concrete, or by doing both.

5.1.7 Sewage treatment plant

Sewage treatment is the process of removing contaminants from municipal wastewater, containing mainly household sewage plus some industrial wastewater. Physical, chemical, and biological processes are used to remove contaminants and produce treated wastewater (or treated effluent) that is safe enough for release into the environment. A by-product of sewage treatment is a semi-solid waste or slurry, called sewage sludge. The sludge has to undergo further treatment before being suitable for disposal or application to land.



(fig.33 sewage treatment plant)

5.1.8 Technical Case Study On "Ahmedabad metro"

History:

In 2003, Gujarat Infrastructure Development Board carried out the study for urban transport between Gandhinagar and Ahmedabad. It also carried out the detailed project report through Delhi Metro Rail Corporation and RITES and submitted it in June 2005 and received Central Government's approval in the same year.[13][14] Following the estimated cost of ₹ 4295

crores and the study of the viability of the project, it was abandoned in 2005 to give priority to the Ahmedabad BRTS and suburban railway projects. In 2008, considering the future developments in and around Ahmedabad and Gandhinagar, the project was revived, and new corridors were designed to make the project viable. The special purpose vehicle company, Metro Link Express for Gandhinagar and Ahmedabad (MEGA) Company Ltd (now renamed GMRC), was established by Government of Gujarat on 4 February 2010 with Rs 200 crore. Later in 2014, it was decided that the Central Government will own 50% of the company.

Design: Phase-1

On 19 October 2014, Union Cabinet of India approved ₹ 10,773 Crores for the Phase–1.The Central government approved use of unused Western Railways land along the Botad-Sabarmati meter gauge line in November 2014. The original plan of Metro along Ashram Road was tweaked, and the track was moved westward. The new plan added cost of ₹ 500 crore and two more stations. It helped by fewer problems in land acquisition and less congestion on Ashram Road. In 2015 budget of Gujarat, ₹ 611 crore was further allocated for the metro. The ground breaking ceremony was held on 14 March 2015 for the construction of 6.5 km long Vastral – Apparel Park stretch of east–west corridor in presence of then Gujarat Chief Minister, Anandiben Patel. The ground-breaking ceremony for North-South Corridor was held on 17 January 2016 in presence of the then Gujarat CM Anandiben Patel. The work started in March 2016. The Indian Railways permitted the construction of north–south corridor stretch on its land in June 2016.

Japan International Co-operation Agency (JICA) agreed to fund ₹ 5968 Crores for Phase-1 of the project in November 2015 and the first trench of ₹ 4456 Crores was released in 2016.

The trial runs were carried out in February 2019 on 6.5 km long Vastral – Apparel Park section of Phase-1. The section was inaugurated on 4 March 2019 by Indian Prime Minister Narendra Modi. It opened to the public on 6 March 2019.

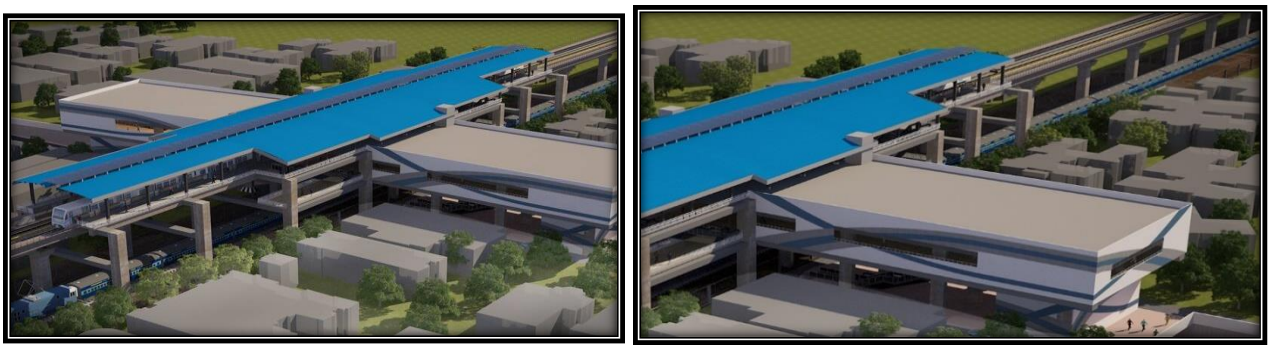
Phase-2

The Government of Gujarat gave approval for Phase-2 of project in October 2017 and revised it in October 2018. In February 2019, the Union cabinet approved the Rs 5384.17 crore second phase of the project. It will extend from Motera to Mahatma Mandir in Gandhinagar,(22.838 km) with a separate line from Gujarat National Law University (GNLU) linking Pandit Deendayal Petroleum University (PDPU) and GIFT City (5.416 km). The Phase-2 will have total 28.254 km long elevated corridor with 22 stations.

Tendering for the Phase 2 began in January 2020.On 18 January 2021, the foundation of the 28.25 km long Phase-2 connecting Ahmedabad with Gandhinagar was laid by Prime Minister modi.

Funding:

The first phase of the project costs around 10,773 crores, for which japan has extended a soft loan 6,066 crore to the Indian government through its funding agency JICA.gujarat government and central government are to each contributed 1,990 crores for the project.



(fig.34 design of Ahmedabad metro)

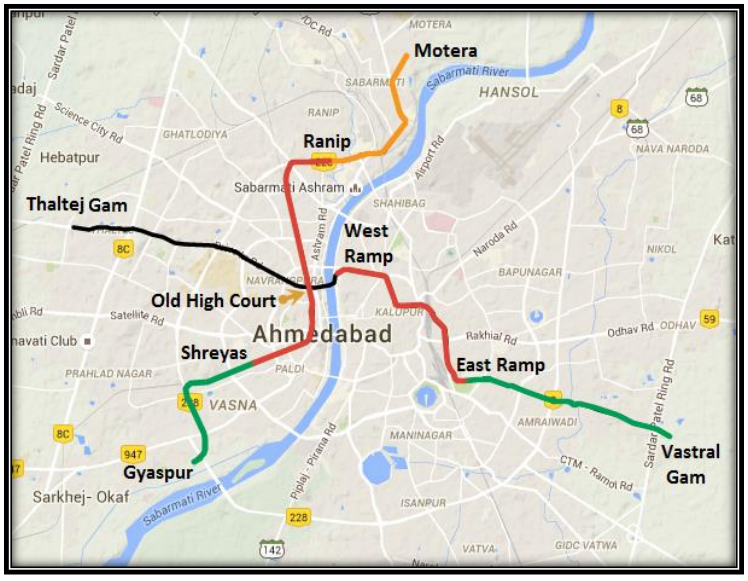
Construction:

Ahmedabad Metro is a new rapid transit system under construction between Gandhinagar and Ahmedabad in the state of Gujarat, India. The project is being developed by the Metro Link Express for Gandhinagar and Ahmedabad (MEGA), a special purpose vehicle (SPV) jointly owned by the Government of India (GoI) and the Government of Gujarat. MEGA will own and operate the project.

The final detailed project report (DPR) for the Ahmedabad Metro was prepared by the Delhi Metro Rail Corporation (DMRC) and approved in March 2015. Construction began with the ground-breaking ceremony held in March 2015 and is expected to be completed by the end of 2020. A 6.5km section of the first phase of the project between Vastral Gam Station and Apparel Park Station opened in March 2019. The foundation ceremony for the second phase was also laid on the same date. The metro project aims to meet the transport needs of the city's growing population, which has reached 8.64 million as of 2020.

(fig. 35 construction of metro)

Line routes and stations:



(fig.36 lines and routes of metro)

The total length of phase one of the Ahmedabad Metro project is 40.03km, of which 6.5km is underground and the remainder is elevated. The first phase includes two corridors and 32 stations, connecting the four sectors of Ahmedabad city.

The first phase is divided into two sections, the North-South Corridor and the East-West Corridor. The 18.87km-long North-South Corridor will have 15 stations. It will connect Motera Stadium with APMC and have stations at Sabarmati, AEC, Sabarmati Railway station, Ranip, Vadaj, Vijaynagar, Usmanpura, Old Highcourt, Gandhigram, Paldi, Shreyas, Rajivnagar and Jivraj.

The 21.16km-long East-West Corridor will have 17 stations. It will pass through Nirant Cross Road, Vastral, Rabari Colony, Amraiwadi, Apparel Park, Kankaria East, Kalupur Railway Station, Ghee Kanta, Shahpur, Old High Court, Stadium, Commerce Six Road, Gujarat University, Gurukul Road, Doordarshan Kendra and Thaltej stations, connecting Vastral Gaam to Thaltej Gaam.

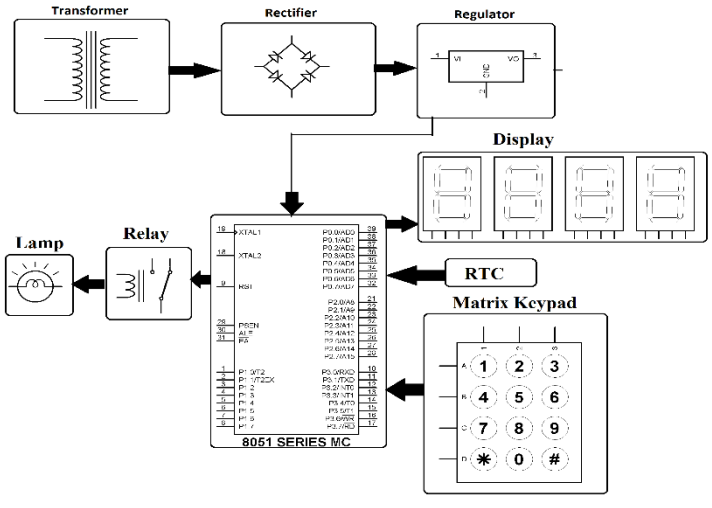
The underground section will feature four stations, while the elevated link will have 13 stations. The interchange station for the corridors will be the Old High Court station.

The 28.2km-long second phase will include two corridors and connect Mahatma Mandir, Sachivalaya, Gift City and Pandit Deendayal Petroleum University (PDPU). Corridor 1 will be 22.838km starting from Motera Stadium to Mahatma mandir, while Corridor 2 will be 5.416km starting from GNLU to GIFT City. Phase two will include a total of 24 stations.

5.2 Concept (Electrical)

5.2.1 Programmable Load Shedding

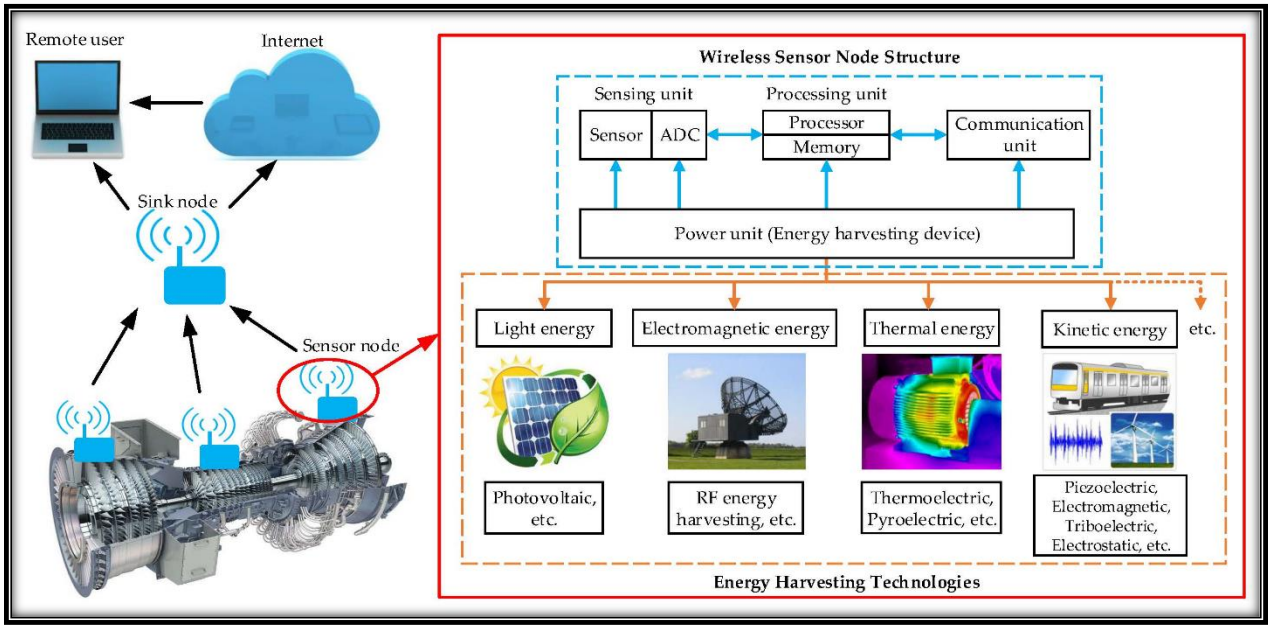
The project is an automatic load operation system that controls load operation, multiple numbers of times according to programmed instruction. The project eliminates the manual ON/OFF switching of load. A real time clock (RTC) is used to track the time and automatically switch ON/OFF the load. This project is required for load shedding time management which is used when the electricity demand exceeds the supply and there comes a need for manually switching ON/OFF the electrical devices in time. Hence this system eliminates the manual operation by automatically switching the load ON/OFF.



(fig.37 load shedding)

5.2.2 Management through Energy Harvesting Concept

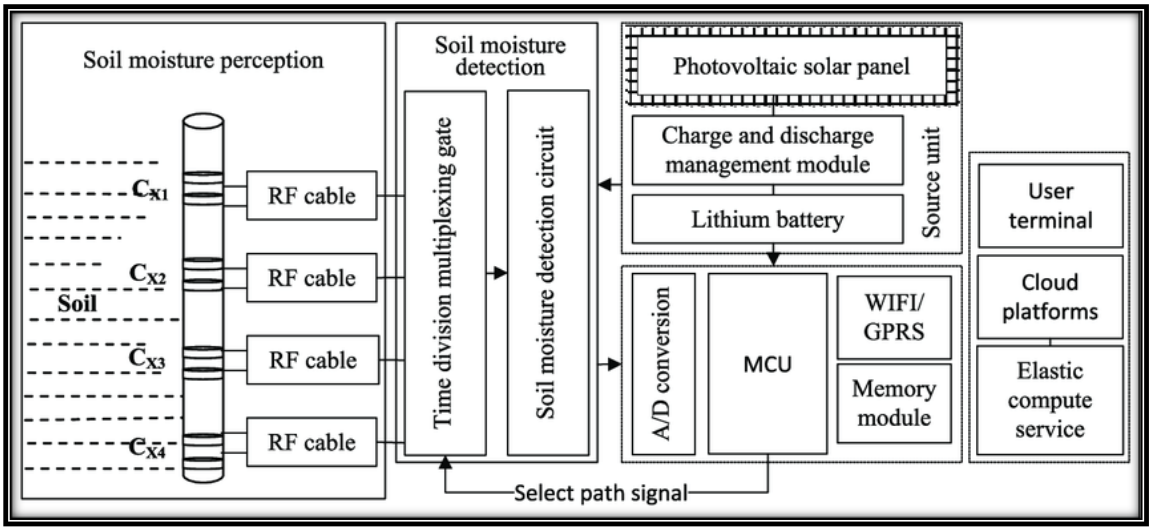
The objective of the Power Management through Energy Harvesting Concept project work has been designed and implemented in the power management through energy harvesting concept which deals with the power saving and optimization



(fig.38 energy harvesting concept)

5.2.3 Moisture Monitoring System

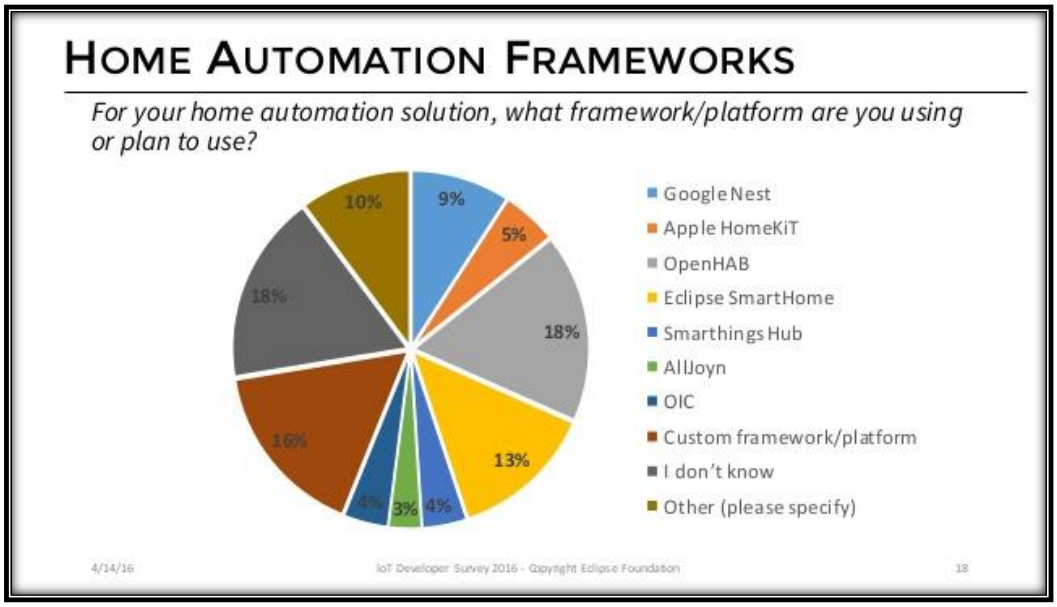
Soil moisture sensors aid good irrigation management. Good irrigation management gives better crops, uses fewer inputs, and increases profitability. Soil moisture sensors help irrigators to understand what is happening in the root zone of a crop.



(fig.39 moisture monitoring system)

5.2.4 Home Automation using IoT / Any other methodology

Home automation system using IoT that can control and automate most of the home appliances. The proposed system consists of an Arduino Uno board (ATmega32 IC), GSM module (SIM 300), PIR sensor, temperature sensor (LM 35), gas sensor (MQ-6), power select (7805) and web application.



(fig.40 home automation)

5.2.5 PC Based Electrical Load Control

Automation system is mostly depending upon the power systems in industrial, residential or commercial, which needs remote controlling and monitoring. By employing wireless technologies, it is more competent to execute a suitable technology depending upon the requirements of the proposed system like speed, cost, and distance.

For distant controlling and monitoring of different loads and by means of efficient power usage through real time power spending with the help of a PC based graphical user interface application. The progress of technology equipment is becoming simpler and easier for us. Automated systems have more benefits over manual system. PC based electrical load-controlled systems are highly reliable, precise and time conserving systems. They give number of features like rapid data storage, transfer data and data securities.

The PC based electrical load control system can be built with 8051 series Microcontroller, Level Shifter IC, DB Connector, Relays, Relay Driver, Transformer, Diodes, Capacitors, Resistors, LED, Crystal, Lamps, Keil compiler and Language: Embedded C or Assembly.

5.2.6 Electrical Parameters Measurements

Table no11 Electrical parameters measurement

Electrical parameter	Measuring unit	Symbol
Voltage	Volt	V or E
Current	Ampere	I or i
Resistance	Ohm	R or Ω
Conductance	Siemen	G or ℧
Capacitance	Farad	C
Charge	Coulomb	Q
Inductance	Henry	L or H
Power	Watts	W
Frequency	Hertz	Hz

Chapter 6: Swatchh Bharat Abhiyan (Clean India)

6.1 Swatchhta needed in allocated village

The Nirmal Bharat Abhiyan has been restructured into the Swachh Bharat Mission (Garmin). The mission aims to make India an open defecation free country in Five Years. It seeks to improve the levels of cleanliness in rural areas through Solid and Liquid Waste Management activities and making Gram Panchayats Open Defecation Free (ODF), clean and sanitized.

Village requires solid waste disposal, sanitation, liquid waste management etc.

(Fig.41 existing condition in Rasnol)

6.2 Guidelines - Implementation in allocated village

"A clean India would be the best tribute India could pay to Mahatma Gandhi on his 150-birth anniversary in 2019," said Shri Narendra Modi as he launched the Swachh Bharat Mission at Rajpath in New Delhi. On 2nd October 2014, Swachh Bharat Mission was launched throughout length and breadth of the country as a national movement. While leading the mass movement for cleanliness, the Prime Minister exhorted people to fulfill Mahatma Gandhi's dream of a clean and hygienic India. Shri Narendra Modi himself initiated the cleanliness drive at Mandir Marg Police Station. Picking up the broom to clean the dirt, making Swachh Bharat

(fig.42 Swatchh Bharat Abhiyan)

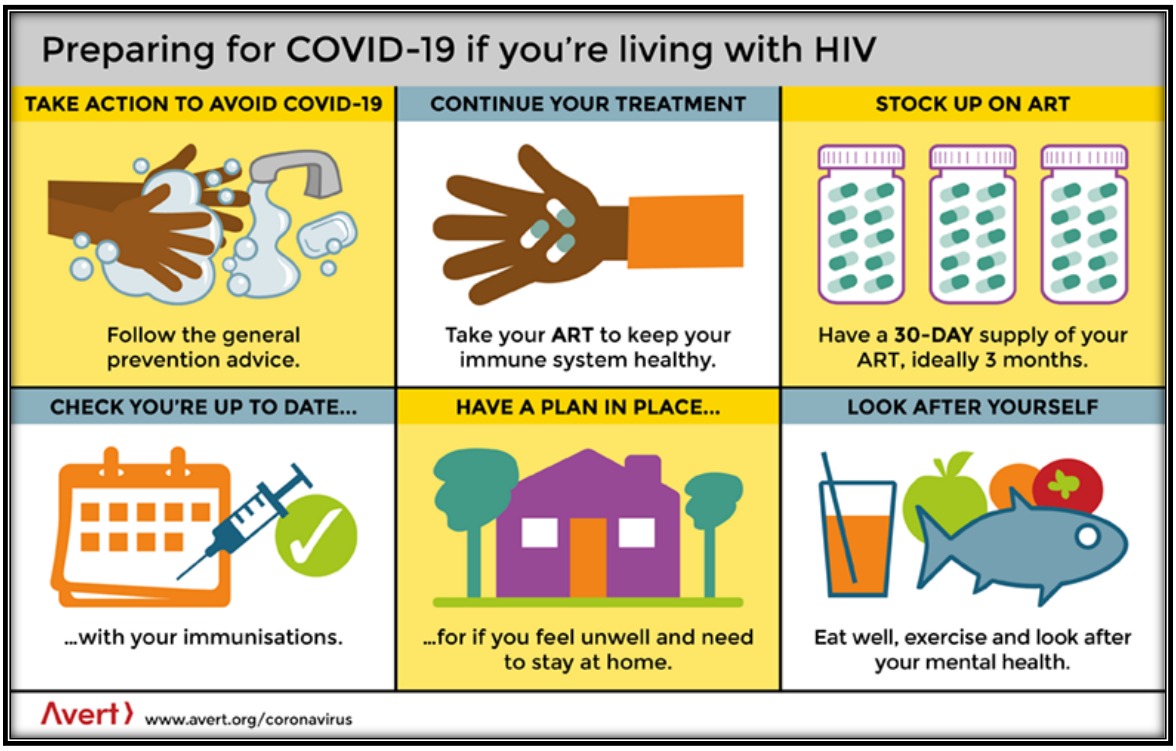
Abhiyan a mass movement across the nation, the Prime Minister said people should neither litter, nor let others litter. He gave the mantra of 'Na gandagi karenge, Na karne denge.' Shri Narendra Modi also invited nine people to join the cleanliness drive and requested each of them to draw nine more into the initiative. By inviting people to participate in the drive, the Swachhta Abhiyan has turned into a National Movement. A sense of responsibility has been evoked among the people through the Clean India Movement. With citizens now becoming active participants in cleanliness activities across the nation, the dream of a 'Clean India' once seen by Mahatma Gandhi has begun to get a shape.

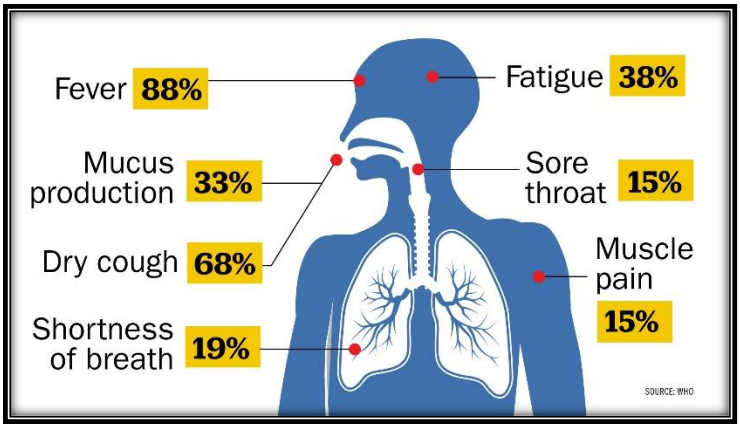
- By ensuring safe sanitation in all households, public, offices, institutions and places.
- By educating communities about safe usage of water, prevent of contamination and about hygienic habits.
- Identification of Household without toilets corrective action.
- To promotes modern agriculture and water use technologies to conserve water.
- By proper plan and implementation of water supply schemes.
- To establish local environmental safeguard measures.
- To facilitate participation of local communities in improving water and sanitation management.

6.3 Activities Done by Students for allocated village

- Student have to aware the villagers about waste and waste segregation.
- Students can help to clean their school's colleges and aware the people to don't throw the garbage on the road.
- They can give the information to people about dry and wet garbage and dispose them to separate.
- Student can aware the people and make campaigning about swatcch bhart abhiyan.

Chapter 7: Village condition due to Covid-19





(fig.43 COVID-19 situation)

Coronavirus disease 2019 (**COVID-19**) is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first case was identified in Wuhan, China in December 2019.

Common symptoms of COVID-19 include fever, cough, fatigue, breathing difficulties, and loss of smell and taste. Symptoms begin one to fourteen days after exposure to the virus. While most people have mild symptoms, some people develop acute respiratory distress syndrome (ARDS). ARDS can be precipitated by cytokine storms,multi-organ failure, septic shock, and blood clots. Longer-term damage to organs (in particular, the lungs and heart) has

been observed. There is concern about a significant number of patients who have recovered from the acute phase of the disease but continue to experience a range of effects—known as long COVID—for months afterwards. These effects include severe fatigue, memory loss and other cognitive issues, low-grade fever, muscle weakness, and breathlessness.

COVID-19 spreads via several means, primarily involving saliva and other bodily fluids and excretions. These fluids can form small droplets and aerosols, which can spread as an infected person breathes, coughs, sneezes, sings, or speaks. The virus may also spread by direct contact and it is unknown how often it spreads via fomites (contaminated surfaces). The exact route of transmission is rarely proven conclusively, but infection mainly happens when people are near each other for long enough, which is known as "close contact". It can spread as early as two days before infected persons show symptoms and from asymptomatic individuals. People remain infectious for up to ten days in moderate cases, and two weeks in severe cases. The standard diagnosis method is by real-time reverse transcription polymerase chain reaction (RRT-PCR) from a nasopharyngeal swab. Preventive measures include social distancing, quarantining, ventilation of indoor spaces, covering coughs and sneezes, hand washing, and keeping unwashed hands away from the face. The use of face masks or coverings.

7.1 Taken steps in allocated village related to existing situation

Villagers follow the covid-19 guideline which is provided by the government of Gujarat. And according to that Gram panchayat and sarpanch make a guideline for villagers to take some steps against covid-19.

- Wearing mask
- 6 feet distance (social distancing)
- Washing hand repeatedly
- Shutdown shops after 7pm

7.2 Activities Done by Students for allocated village

- We organized Covid-19 awareness camp in rasnol village. We interacted with villagers and told them regarding the danger of corona virus. We also interacted with Sarpanch and distributed nose mask and sanitizer. Corona virus is one of the pandemics which has broken the economic leg of world’s leading nation and lots of people have lost lives till date. In such situation it is very necessary to not underestimate the severity of this disease.
- Guidelines which WHO have given we tried to explain to villagers.



(fig.44 mask distribution in rasnol village)

7.3 Any other steps taken by the students / villagers

No

Chapter 8: Sustainable Design Planning Proposal (prototype Design) – part 1

8.1 Design Proposals

Table no. 12 design proposals

Sr. no	Description	Design
1	Civil	Design of Anganwadi
2	Civil	Design of Agro Storage Unit
3	Civil	Design of Milk Dairy Unit
4	Civil	Design of Community Hall
5	Civil	Design of Prathmik Arogya Kendra
6	Civil	Design of bus stand

Agro Storage Unit

The 70% population of the rasnol village is doing framing and other 20% people are doing labor working farm so, agro product is produce in big amount, but the village does not have the storage building for agro product therefore the villagers need a storage house for their agro product so they can store their agro product safely.

Bus Stand

Urban transport has increasingly played a key role in making rapidly growing cities livable and sustainable. Sensitivity to local context and scientific evaluation of available alternatives lies at the core of an efficient public transport system. At the same time, the soft aspects like access to information, experience of journey and customer satisfaction play an important role in attracting and retaining users to the system. A proactive branding and communications plan adds significantly to the system image.

Community Hall

Village has community hall with good condition but as increasing in population they want new hall with better condition and facilities.

Public Toilet

A public toilet is a room or small building with toilets (or urinals) and sinks that does not belong to a particular household. Rather, the toilet is available for use by the general public, customers, travellers, employees of a business, school pupils, prisoners etc. Public toilets are commonly separated into male and female facilities, although some are unisex, especially for small or single-occupancy public toilets. Increasingly, public toilets are accessible to people with disabilities.

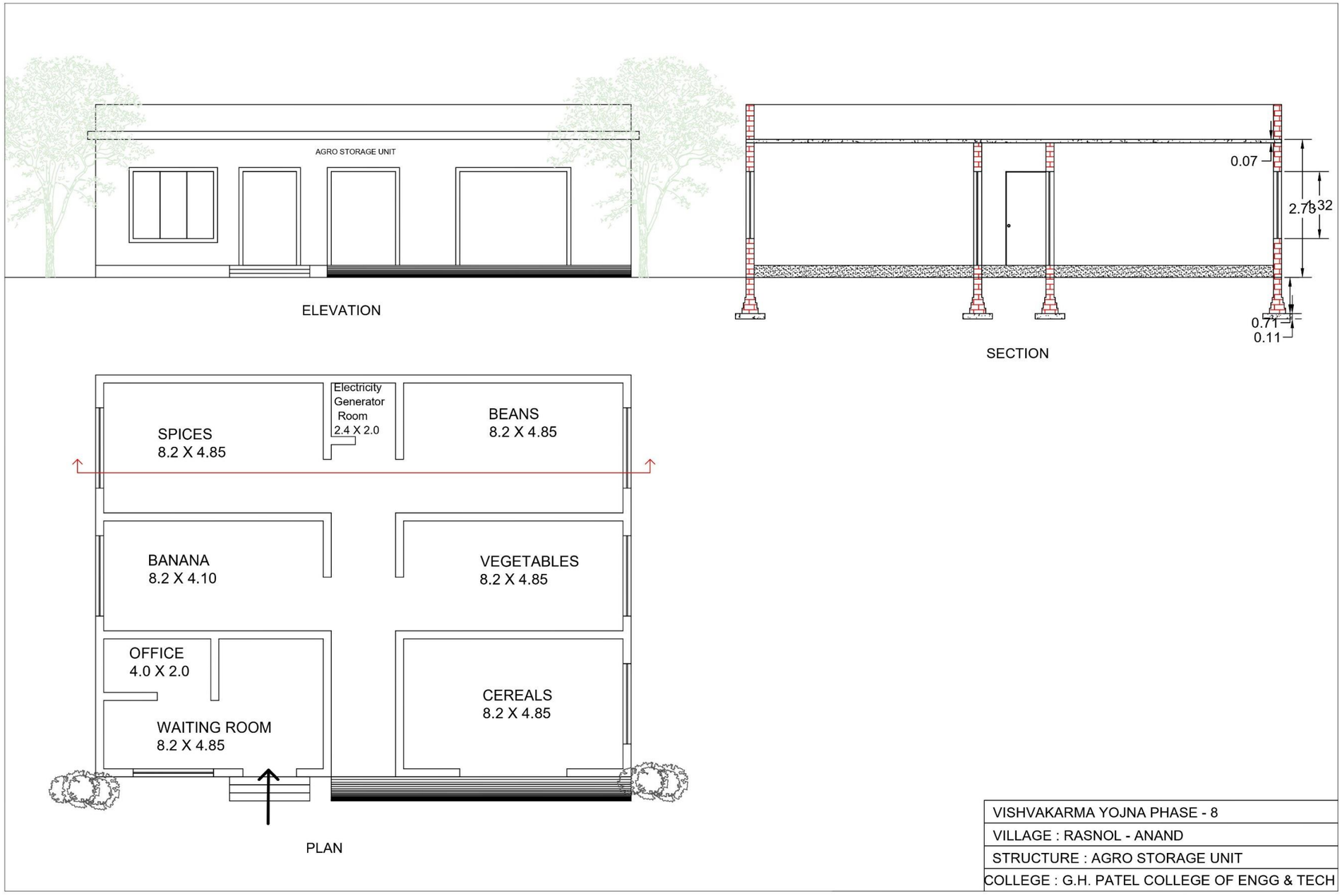
e-center

We are providing e-center in village so that villagers get ease in online booking of tickets, students can fill their exam forms, and villagers can get maximum use of wi-fi and computer. This will be a smart digital progress in rasnol village.

Bio Gas Plant

Biogas is a green energy source in form of electricity and heat for the local grid. Considerable environmental advantages – less emission of the greenhouse gases methane, CO_2 and nitrous oxide. Environmentally friendly recirculation of organic waste from industry and household.

8.1.1 Design of Agro Storage Unit



BUILDING ESTIMATE

QUANTITY SHEET

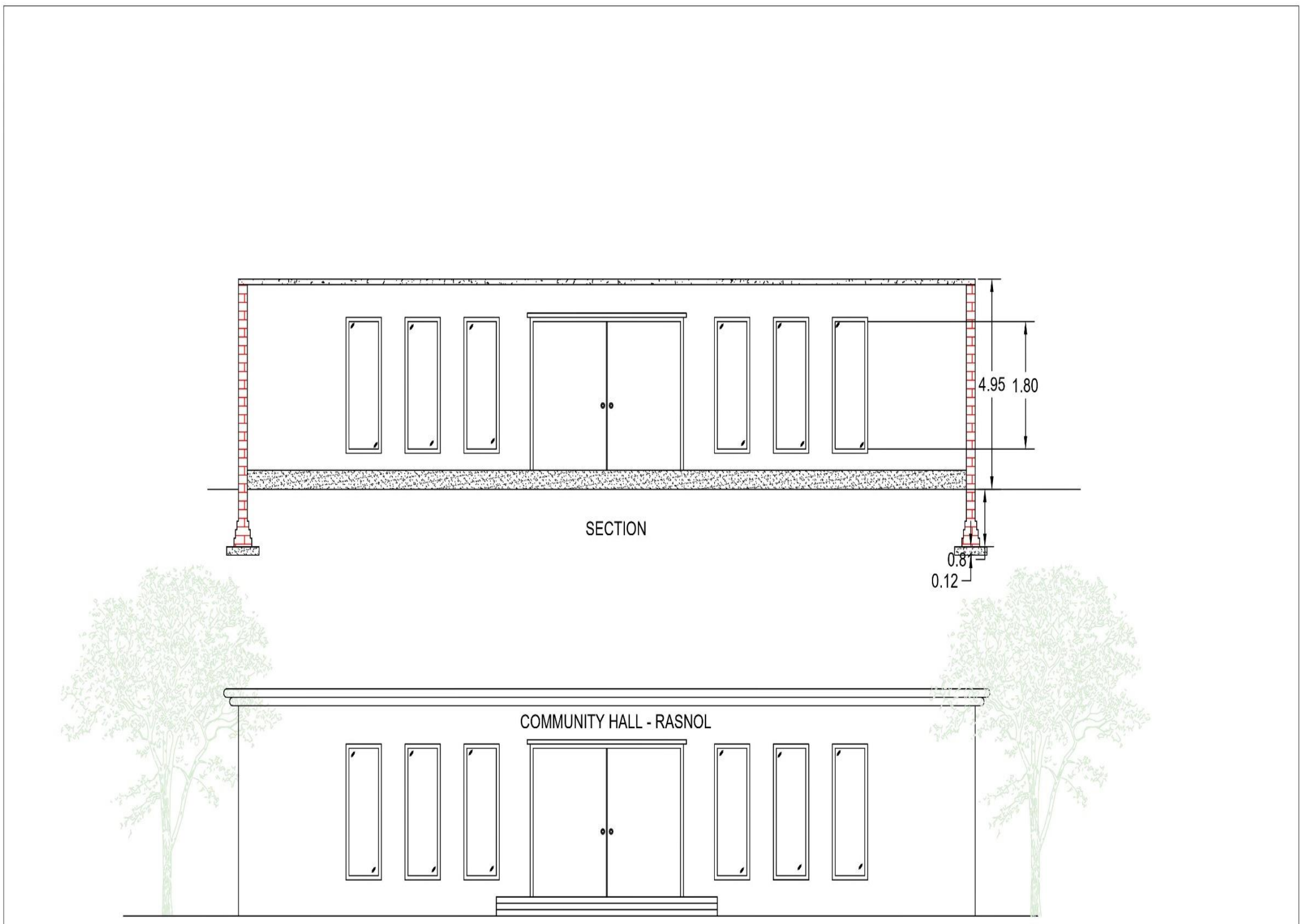
Sr. No.	Item Description	No.	Length (m)	Width (m)	Height (m)	Quantity (CU M / SQ M)
Total center line length: (4*19.7) + (4*14.7) + 4.3 + 2.3 + 2.7 = **146.9** No. of T junction = **20**						
1	**Earthwork in Excavation in Foundation**					
	Excavation for Foundation	1	137.9	0.9	1.2	148.93
				TOTAL QTY.		148.93 m^3
2	**P.C.C. in Excavation in Foundation**					
	P.C.C. For Foundation	1	137.9	0.9	0.3	37.233
				TOTAL QTY.		37.233 m^3
3	**Brick Masonry Footing**					
	1^{st} step (W=0.6)	1	140.9	0.6	0.3	25.362
	2^{nd} step (W=0.5)	1	141.9	0.5	0.3	21.255
	3^{rd} step (W=0.4)	1	142.9	0.4	0.3	17.148
				TOTAL QTY.		63.745 m^3
	Brick Masonry for Super Structure					
	(width = 0.3m)	1	143.9	0.3	4.5	194.26
				TOTAL QTY.		194.26 m^3
	Deduction for Door & Window					
	D	1	4	0.3	3.5	4.2

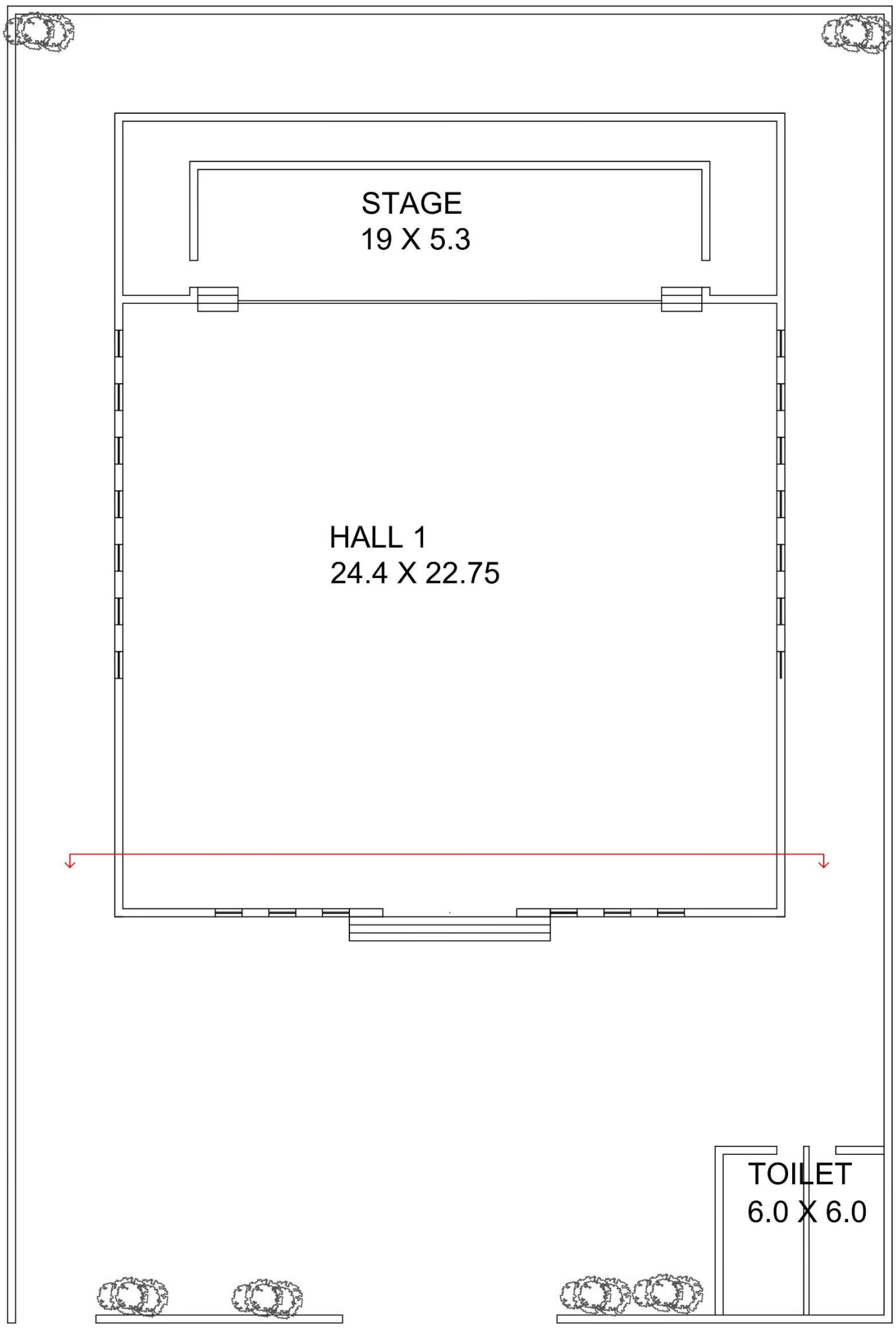
	D1	5	2	0.3	3.5	10.5
	D2	1	2.4	0.3	3.5	2.52
	D3	1	1.5	0.3	3.5	1.572
	W1	6	3	0.3	2.5	13.5
				TOTAL QTY.		32.295 m^3
				NET QTY.		161.97 M^3
7	**Outside Plaster**					
	L1	2	20	00	4.5	180
	L2	2	15	00	4.5	135
	Deduction					
	D	0.5	4	00	3.5	7
	D1	5	2	00	3.5	35
	D2	0.5	2.4	00	3.5	4.2
	D3	1	1.5	00	3.5	5.25
	W	3	3	00	2.5	22.5
8	**Inside Plaster (1:4)**					
	Wall 1	12	8.2	00	4.5	442.8
	Wall 2	8	4.85	00	4.5	174.6
	wall 3	4	4.1	00	4.5	73.8
	Passage					
	Wall 1	2	12.4	00	4.5	111.6
	Wall 2	2	2.4	00	4.5	21.6
	Electricity Generator Room					

	Wall 1	2	2.4	00	4.5	21.6
	Wall 2	2	2	00	4.5	18
	Deduction					
	D	0.5	4	00	3.5	7
	D1	5	2	00	3.5	35
	D2	0.5	2.4	00	3.5	4.2
	D3	1	1.5	00	3.5	5.25
	W1	3	3	00	2.5	22.5
				TOTAL QTY. OF PLASTER		1105.02

Abstract sheet of Agro Storage Unit					
Sr. No.	**Item Description**	**QTY**	**Rate**	**Per**	**Amount**
1	Earthwork in Excavation In Foundation	148.93	160	CU M	23828.80
2	P.C.C. For Foundation	37.233	3900	CU M	145208.70
3	Brick Masonry in Footing	63.795	6150	CU M	392339.25
4	Brick Masonry in Super Structure	161.97	6150	SQ M	996115.5
5	Plaster (1:4)	1105.05	260	SQ M	287313
6	Wooden Door	51.45	5000	SQ M	257250
7	Windows	22.5	3500	SQ M	78750
			TOTAL Rs.		1520805.25
		Add 1.5% Water Charge			22812.078
		Add 10% Co. Charge			152080.525
		Total Estimate Cost in Rs.			1695697.854

8.1.2 Design of Community Hall





PLAN

VISHVAKARMA YOJNA PHASE - 8
VILLAGE : RASNOL - ANAND
STRUCTURE : COMMUNITY HALL - RASNOL
COLLEGE : G.H. PATEL COLLEGE OF ENGG & TECH

BUILDING ESTIMATE OF COMMUNITY HALL

QUANTITY SHEET

Sr. No.	Item Description	No.	Length (m)	Width (m)	Height (m)	Quantity (CU M / SQ M)
Total center length: (3*24.7) + (2*29.7) + (2*4.7) + 19.1 = **162m** No. of T junction = 4						
1	**Excavation in Foundation**					
	Wall	1	160.2	0.9	1.2	173.016
				TOTAL QTY.		173.016 m^3
2	**P.C.C. Work in Foundation (1:4:8)**					
	Wall	1	160.2	0.9	0.3	43.25
				TOTAL QTY.		43.25 m^3
3	**Brick Work in Foundation up to Plinth**					
	1^{st} step (W= 0.6)	1	159	0.6	0.3	28.62
	2^{nd} step (W=0.5)	1	159.2	0.5	0.3	23.88
	3^{rd} step (W=0.4)	1	159.4	0.4	0.3	19.128
				TOTAL QTY.		71.628 m^3
4	**Brick Work for Super Stucture**					
	Ground Floor					
	Wall	1	159.6	0.3	4.2	201.09
	Deduction					
	D	1	5	0.3	3	4.5
	D1	2	1	0.3	3	1.8
	W	20	1	0.3	2	12
				TOTAL QTY.		182.79 m^3
5	**Outside plaster**					

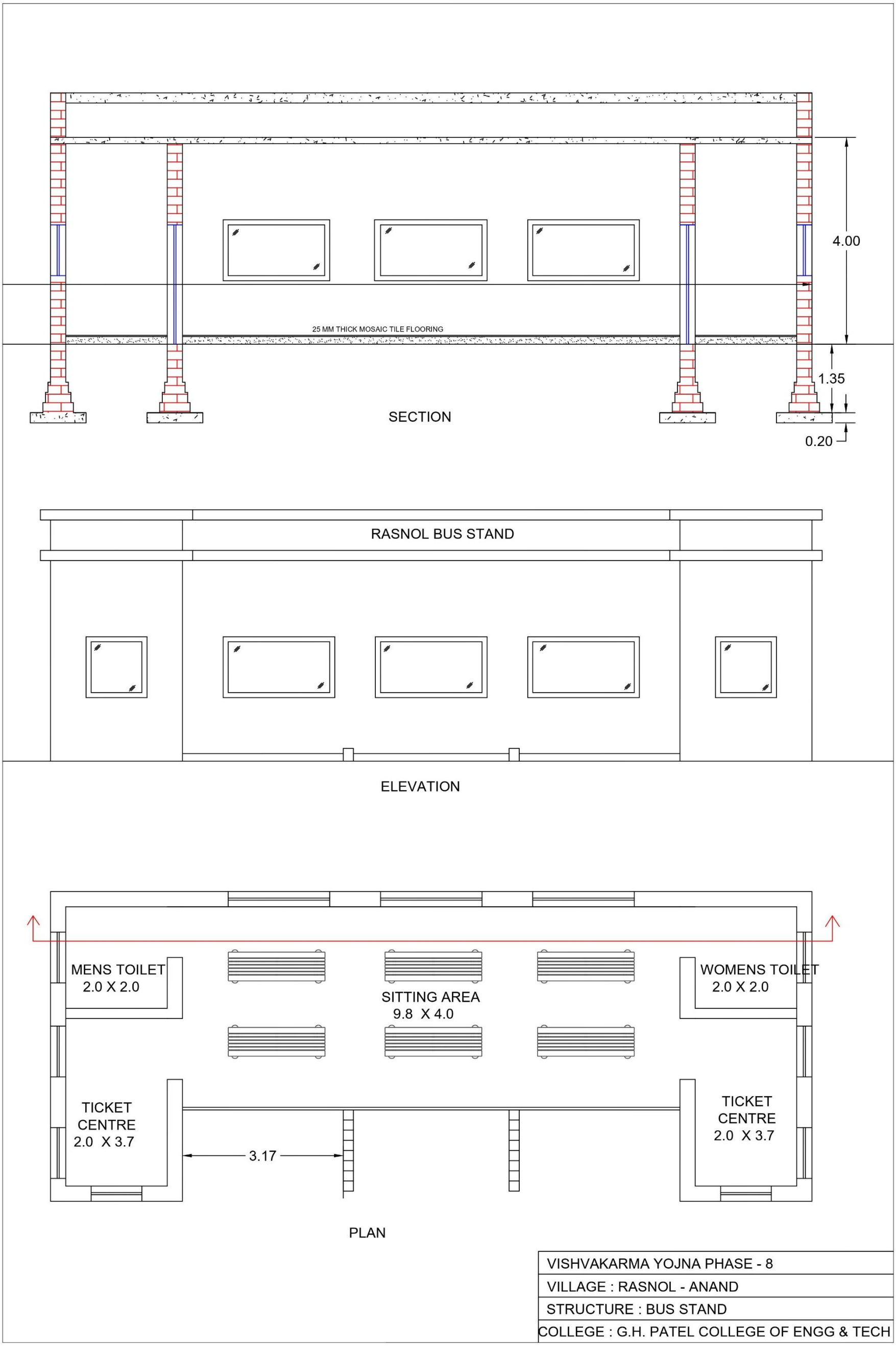
	Wall	2	30	00	5	300
	Wall 2	2	25	00	5	250
	Deduction					
	D1	0.5	5	00	3.5	-8.75
	W	10	1	00	3	-30
	Inside plaster					
	Wall	2	22.6	00	4.3	194.36
	Wall 2	2	24.4	00	4.3	209.84
	Wall (back stage)	1	24.4	00	4.3	104.92
	Side Wall (back stage)	2	6.5	00	4.3	29.95
	Side wall (back stage) 2	2	5	00	4.3	43
	Side wall stage	2	5	00	4.3	43
	Back wall stage	1	19	00	4.3	81.7
	Deduction					
	Stage	1	19	00	3.5	-66.5
	D1	0.5	5	00	3.5	-8.75
	D2	1	1	00	3.5	-3.5
	W	10	1	00	3	-30
				TOTAL QTY		1109.27 m^2

Abstract Sheet of Community Hall

Sr. No.	Item Description	QTY	Rate	Per	Amount
1	Excavation in Foundation	173.016	160	CU M	27682.56
2	P.C.C. work in Foundation	43.25	3900	CU M	167700
3	Brick masonry up to plinth	71.628	6150	CU M	440512.20
4	Brick masonry for super Structure	371.05	6150	SQ M	2281957.50
5	Plaster	1109.27	260	SQ M	288410.20
6	Wooden door	24.5	5000	SQ M	122500
	window	60	3500	SQ M	210000

			TOTAL Rs.	3538762.42
		Add 1.5% Water Charge		53081.43
		Add 10% Co. Charge		353875.242
		Total Estimate Cost in Rs.		3945720.10

8.1.3 Design of Bus Stand



BUILDING ESTIMATE OF BUS STAND

QUANTITY SHEET

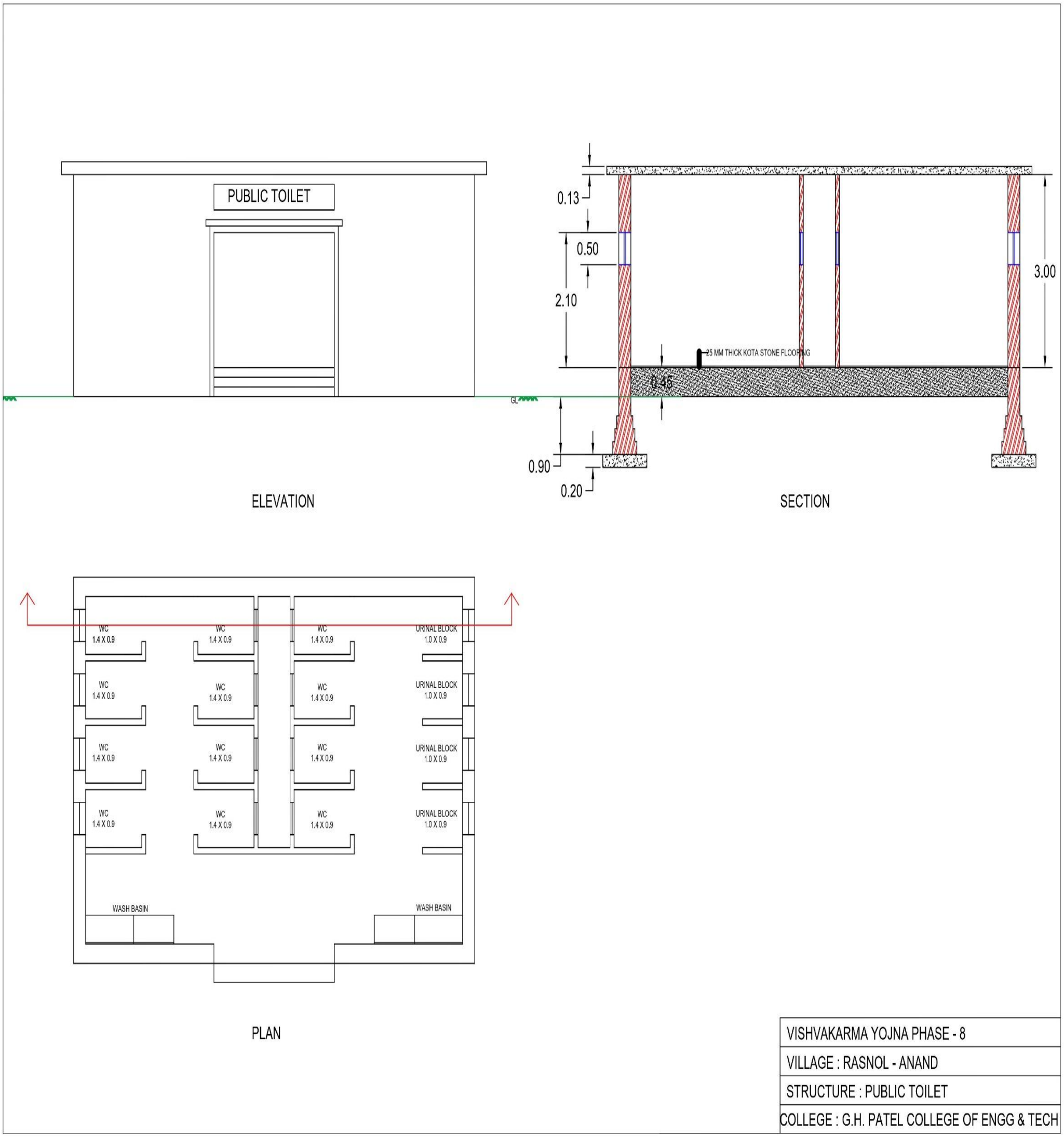
Sr. No.	Item Description	No.	Length (m)	Width (m)	Height (m)	Quantity (CU M / SQ M)
Total center length: (4*5.8) + (4*4.3) + (1*14.7) = **55.10 m** No. of T junction = 6						
1	**Excavation in Foundation**					
	Wall	1	51.8	1.1	1.35	76.923
				TOTAL QTY.		76.923 m^3
2	**P.C.C. Work in Foundation (1:4:8)**					
	Wall	1	51.8	1.1	0.2	11.936
				TOTAL QTY.		11.936 m^3
3	**Brick Work in Foundation up to Plinth**					
	1^{st} step (W= 0.6)	1	53.3	0.6	0.2	6.396
	2^{nd} step (W=0.5)	1	53.6	0.5	0.2	5.36
	3^{rd} step (W=0.4)	1	53.9	0.4	0.2	4.231
				TOTAL QTY.		15.985 m^3
4	**Brick Work for Super Stucture**					
	Ground Floor					
	Wall	1	54.1	0.3	4	64.92
	Deduction					
	D	4	1	0.3	3	-3.6
	W	6	1	0.3	1	-1.8
	W2	3	2	0.3	1	-1.8
	V	2	1	0.3	0.6	-0.36
				TOTAL QTY.		57.36 m^3
5	**Outside plaster**					
	Wall	1	32.2	00	4	128.8

	Deduction					
	W	6	1	0.3	1	-1.8
	W2	3	2	0.3	1	-1.8
	V	2	1	0.3	0.6	-0.36
	Inside plaster					
	Ticket center	2	2	3.7	4	59.2
	Toilet	2	2	2	4	32
	Back wall	1	9.8	00	4	39.2
	Side wall	2	5.8	00	4	46.4
	Deduction					
	D	4	1	0.3	3	-3.6
	W2	3	2	0.3	1	-1.8
	V	2	1	0.3	0.6	-0.36
				TOTAL QTY		295.88 m^2

Abstract Sheet of Bus Stand

Sr. No.	Item Description	QTY	Rate	Per	Amount
1	Excavation in Foundation	76.923	160	CU M	12307.68
2	P.C.C. work in Foundation	11.936	3900	CU M	46550.4
3	Brick masonry up to plinth	15.98	6150	CU M	105468
4	Brick masonry for super Structure	57.36	6150	SQ M	378576
5	Plaster	295.88	260	SQ M	76928.8
6	Wooden door	12	5000	SQ M	60000
7	window	7.2	3500	SQ M	25200
			TOTAL Rs.		705030.88
		Add 1.5% Water Charge			8460.37
		Add 10% Co. Charge			70503.88
		Total Estimate Cost in Rs.			783995.13

8.1.4 Design of Public Toilet



BUILDING ESTIMATE OF PUBLIC TOILET

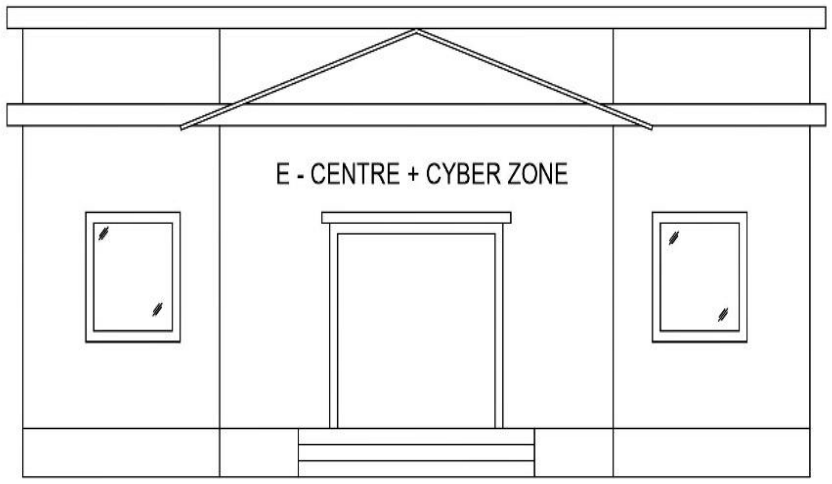
QUANTITY SHEET

Sr. No.	Item Description	No.	Length (m)	Width (m)	Height (m)	Quantity (CU M / SQ M)
Total center length: (2*9.7) + (2*5.7) = 30.8 **m** No. of T junction = 0						
1	**Excavation in Foundation**					
	Wall	1	30.8	1.1	1.35	45.738
				TOTAL QTY.		45.738 m^3
2	**P.C.C. Work in Foundation (1:4:8)**					
	Wall	1	30.8	1.1	0.2	6.776
				TOTAL QTY.		6.776 m^3
3	**Brick Work in Foundation up to Plinth**					
	1st step (W= 0.6)	1	30.8	0.6	0.2	3.696
	2nd step (W=0.5)	1	30.8	0.5	0.2	3.08
	3rd step (W=0.4)	1	30.8	0.4	0.2	2.464
				TOTAL QTY.		9.24 m^3
4	**Brick Work for Super Stucture**					
	Ground Floor					
	Wall	1	30.8	0.3	3	27.72
	Deduction					
	D	1	3	0.3	2.1	-1.89
	V	8	0.5	0.3	0.5	-0.6
				TOTAL QTY.		25.23m^3
5	**Outside plaster**					
	Wall	1	32	00	3.45	110.4
	Deduction					

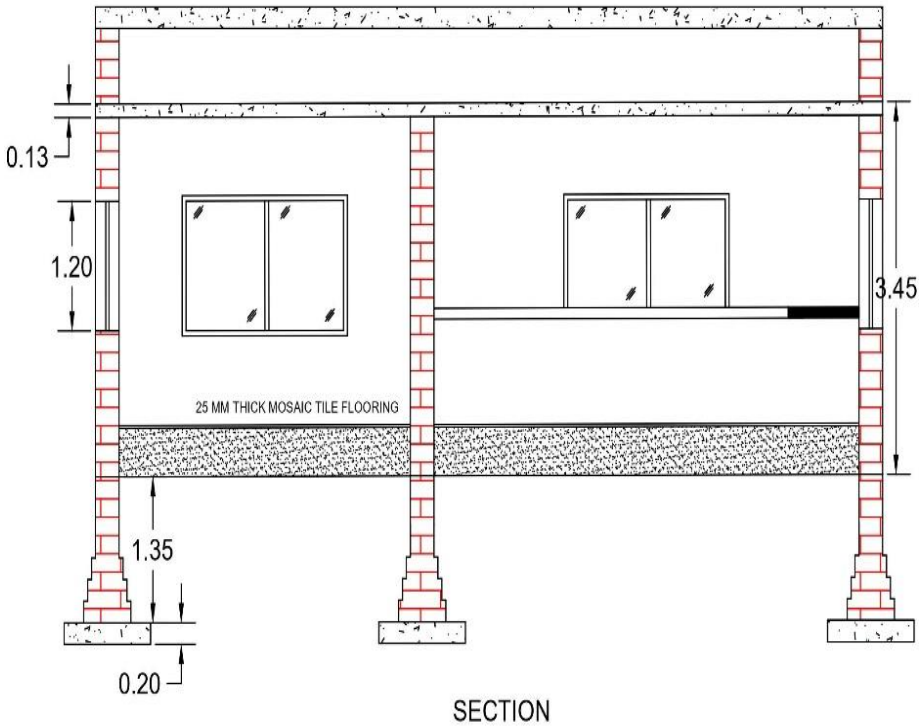
	D	0.5	3	00	2.1	-3.15
	V	4	0.5	00	0.5	-1
	Inside plaster					
	Wall	1	29.6	00	3.45	102.12
	Deduction					
	D	0.5	3	00	2.1	-3.15
	V	4	0.5	00	0.5	-1
				TOTAL QTY		204.22 m^2

Abstract Sheet of Public Toilet					
Sr. No.	**Item Description**	**QTY**	**Rate**	**Per**	**Amount**
1	Excavation in Foundation	45.738	160	CU M	7318.08
2	P.C.C. work in Foundation	6.776	3900	CU M	26426.4
3	Brick masonry up to plinth	9.24	6150	CU M	56826
4	Brick masonry for super Structure	25.23	6150	SQ M	166518
5	Plaster	204.2	260	SQ M	61260
6	Partition material (Approx)				50000
7	Window	2	3500	SQ M	7000
			TOTAL Rs.		375348.48
		Add 1.5% Water Charge			5630.227
		Add 10% Co. Charge			37534.84
		Total Estimate Cost in Rs.			418513.54

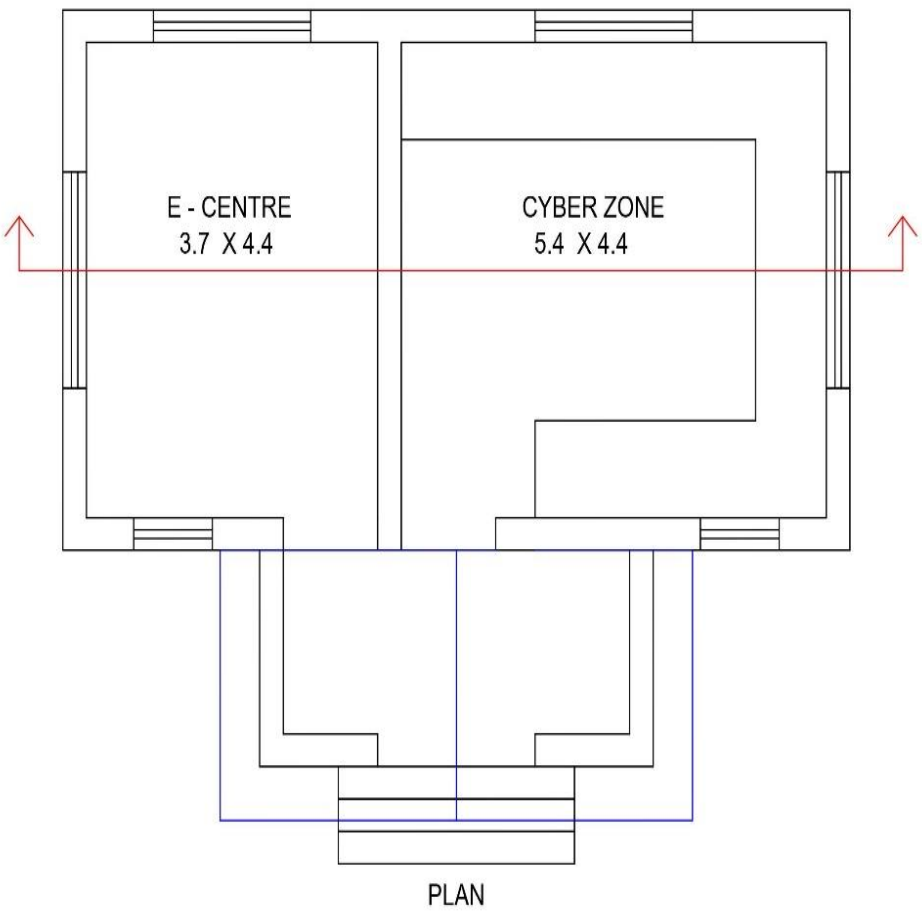
8.1.5 Design of e-center



ELEVATION



SECTION



PLAN

VISHVAKARMA YOJNA PHASE - 8
VILLAGE : RASNOL - ANAND
STRUCTURE : E - CENTRE
COLLEGE : G.H. PATEL COLLEGE OF ENGG & TECH

BUILDING ESTIMATE OF E-CENTRE

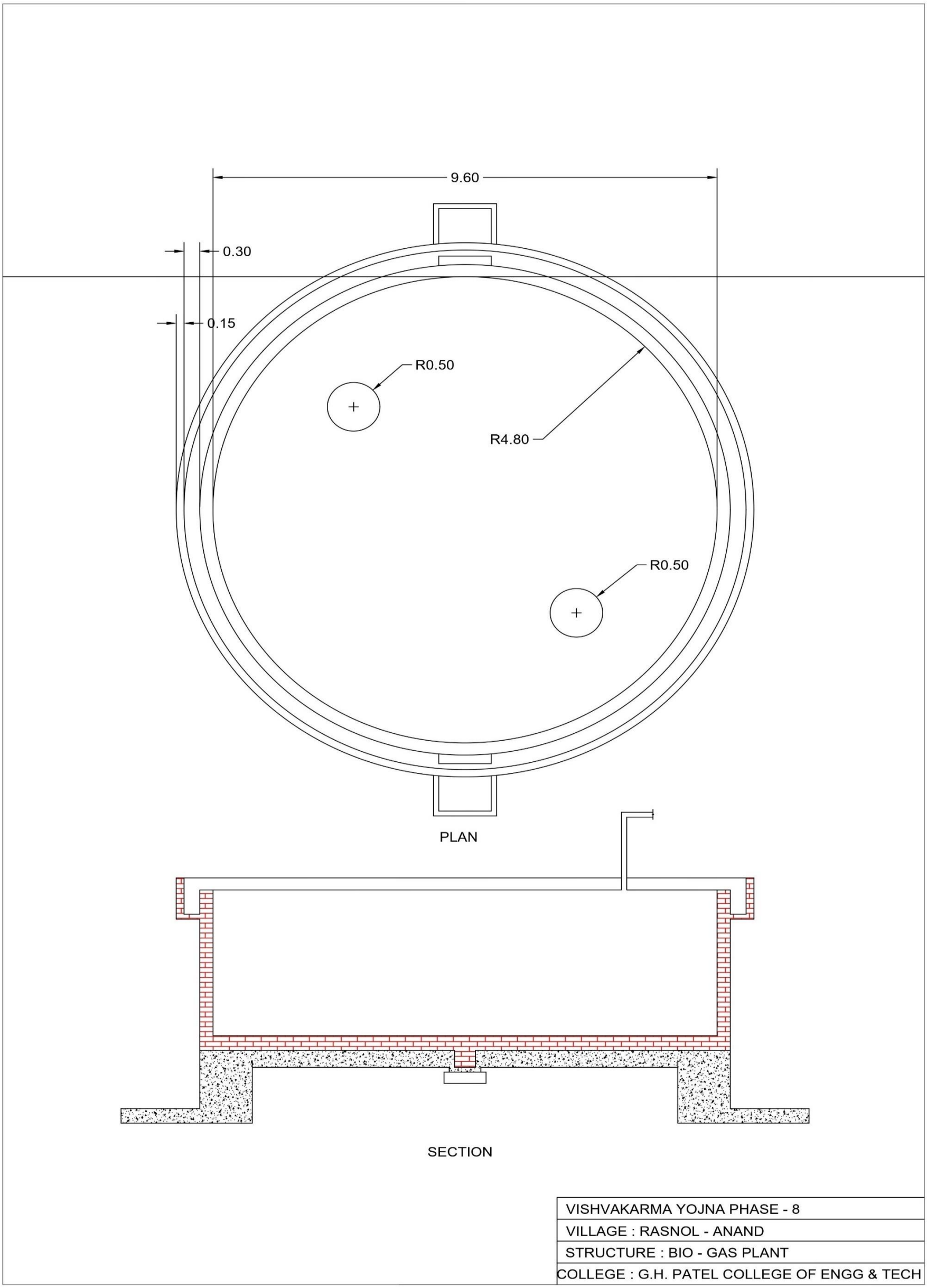
QUANTITY SHEET

Sr. No.	Item Description	No.	Length (m)	Width (m)	Height (m)	Quantity (CU M / SQ M)
Total center length: (2*9.7) + (3*4.7) + (2*2) + 4.7 = **42.2 m** No. of T junction = 4						
1	**Excavation in Foundation**					
	Wall	1	42.2	1.1	1.35	62.667
				TOTAL QTY.		62.667 m^3
2	**P.C.C. Work in Foundation (1:4:8)**					
	Wall	1	42.2	1.1	0.2	9.284
				TOTAL QTY.		9.284 m^3
3	**Brick Work in Foundation up to Plinth**					
	1^{st} step (W= 0.6)	1	41	0.6	0.2	4.92
	2^{nd} step (W=0.5)	1	41.2	0.5	0.2	4.12
	3^{rd} step (W=0.4)	1	41.4	0.4	0.2	3.312
				TOTAL QTY.		12.352m^3
4	**Brick Work for Super Stucture**					
	Wall	1	41.6	0.3	3	37.44
	Deduction					
	D	1	2	0.3	2.1	-1.26
	D1	2	1.2	0.3	2.1	-1.512
	W	4	2	0.3	1	-2.4
	W1	2	1	0.3	1	-0.6
				TOTAL QTY.		31.668m3
5	**Outside plaster**					
	Wall	1	34	00	3.45	117.4
	Deduction					
	D	0.5	2	00	2.1	-2.1

	W	2	2	00	1	-4
	W1	1	1	00	1	-1
	Inside plaster					
	E Centre	2	3.7	4.4	3	97.68
	Cyber Zone	2	5.4	4.4	3	142.56
	Front	2	4.4	1.7	3	44.88
	Deduction					
	D	0.5	2	00	2.1	-2.1
	D1	2	1.2	00	2.1	-5.04
	W	2	2	00	1	-4
	W1	1	1	00	1	-1
				TOTAL QTY		383.28 m^2

Abstract Sheet of e-Centre					
Sr. No.	**Item Description**	**QTY**	**Rate**	**Per**	**Amount**
1	Excavation in Foundation	62.667	160	CU M	10026.72
2	P.C.C. work in Foundation	9.284	3900	CU M	362076
3	Brick masonry up to plinth	12.352	6150	CU M	75964.8
4	Brick masonry for super Structure	31.668	6150	SQ M	194758.2
5	Plaster	383.28	260	SQ M	99652.8
6	Door	7.12	3900	SQ M	27768
7	Window	10	3500	SQ M	35000
			TOTAL Rs.		805246.52
		Add 1.5% Water Charge			12078.68
		Add 10% Co. Charge			80524.652
		Total Estimate Cost in Rs.			897849.86

8.1.6 Design of Bio-gas Plant



BUILDING ESTIMATE OF BIO-GAS PLANT

QUANTITY SHEET

Sr. No.	Item Description	No.	Length (m)	Width (m)	Height (m)	Quantity (CU M / SQ M)
1	Excavation	1	33.284	2.550	1.880	159.56
2	Rubble Soling					
	Below Foundation	1	33.284	2.550	0.230	19.52
	Below Grade Slab	1	70.846		0.230	16.29
				TOTAL QTY.		35.81
3	PCC					
	Below Foundation	1	33.284	2.550	0.150	12.73
	Below Grade Slab	1	70.846		0.150	10.62
				TOTAL QTY.		23.35
4	RCC					
	Raft	1	33.284	2.250	0.300	22.46
	Wall	1	33.284	0.250	4.200	34.94
	Grade Slab	1	70.846		0.500	35.42
	Top Slab	1	70.846		0.200	14.16
				TOTAL QTY.		107.00
5	Plaster	1	33.284		4.200	139.79
6	External Plaster	1	33.284		3.700	123.15
7	Manhole Cover	2				2.00
8	100mm Dia Pipe	1	100.00			100.00
9	Miscellaneous Connections	1				1.00

Abstract Sheet of Bio-Gas Plant

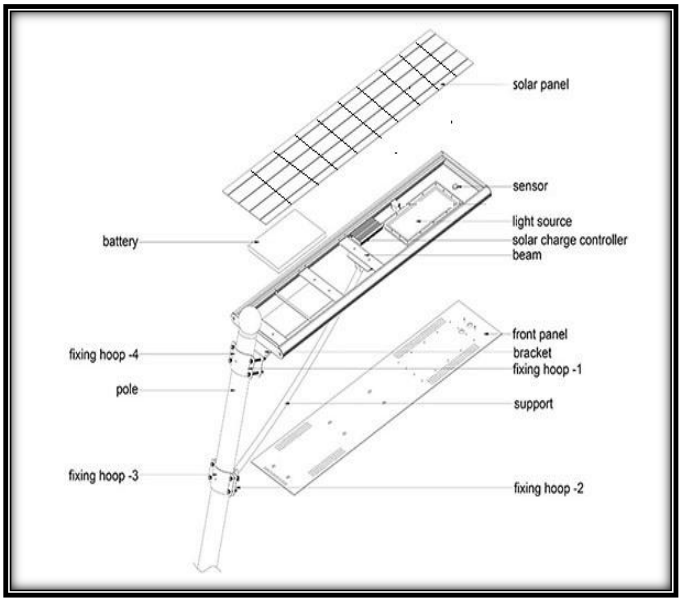
Sr. No.	Item Description	QTY	Rate	Per	Amount
1	Excavation	159.56	352.45	CuM	56,238.15

2	Rubble Soling	35.82	4,000.00	CuM	143,262.81
3	PCC	23.36	5,789.60	CuM	135,233.87
4	RCC	107.01	9,763.80	Cum	1,044,797.14
5	Internal Plaster	139.79	254.25	CuM	35,542.32
6	External Plaster	123.15	416.55	CuM	51,298.47
7	Manhole Cover	2.00	5,000.00	Nos	10,000.00
8	100mm Dia Pipe	100.00	950.00	Rmt	95,000.00
9	Miscellaneous Connections	1.00	25,000.00	LS	25,000.00
			Total Amount		1,596,372.76
			Contingency 3%		47,891.18
			Total Estimate Cost in Rs.		1,644,263.95

8.1.7 Design of Solar Street Light

All in one solar street light

New Integrated Solar led Street Light is an extremely versatile and robust solar parking lot light, it is perfect for all kind of weather conditions. This compact solar powered street light provides extra lighting easily in no time. Installation is straightforward; only 4 bolts need to be tightened onto a pole. The unit can also be wall mounted. No trenching or connection to the electric grid is needed. The all-in-one LED solar street light is perfect for retrofitting old electric powered fixture or new installations. In this put solar panel, solar light, and battery all in one box. Show in below figure.



(fig.45 Solar Light)

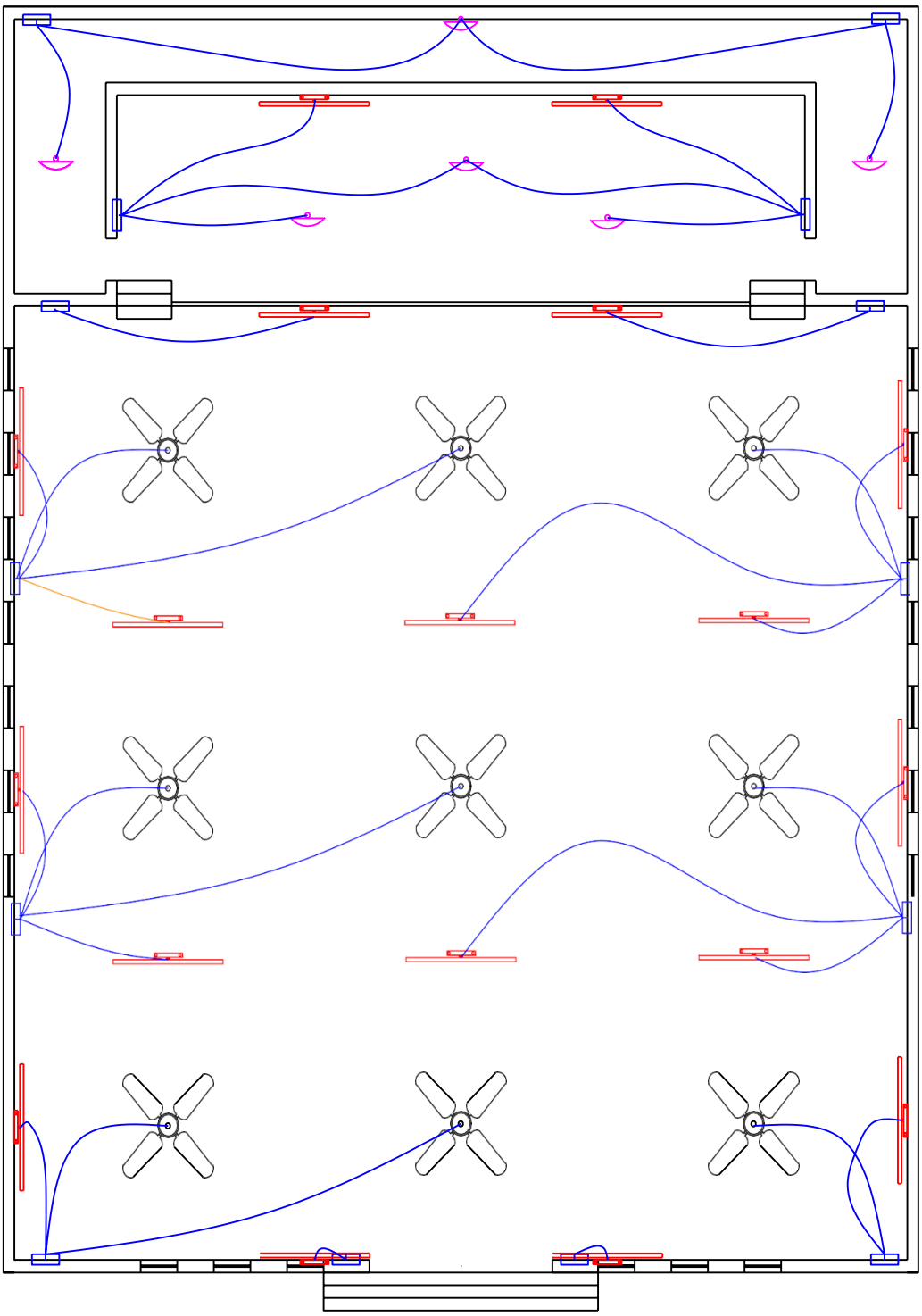
- This design is to put high efficiency monocrystalline silicon solar panel, LED lamps, long life Lithium battery and controller all in one box.
- without any cable, very easy for shipment, installation and maintenance.
- In this solar light there are sensor fitted in light. in night light automatic on. & in day light automatic off with help of sensor.
- Use of sensor -Light on/off controlled by automatic daylight sensing or hour present, no running or maintenance cost.
- All-in-one type has motion sensor to avoid wastage of energy.

❖ **Estimate Cost of All-In-One Solar Street Light**

Sr. No	Item description	Rate in Rs
1	All in one (Solar panel, solar light, and battery)	5500
2	Pole (7-8Meter)	3000
3	labour charge & other	1200
	Total estimate cost in Rs	**9700**

SPECIFICATION		
Model No		GMT- 20
Integrated Solar Street light		**20W**
Solar panel High Efficiency monocrystalline silicon	Max power	50-60W/20V
	Lifetime	25Years
Battery	Type	Lion / Lifepo4
	Lifetime	2years / 5years
LED Lamp	Max power	20W (1w x 20led)
	led chip brand	Bridgelux with high brightness
	lumen (LM)	2600-3000
	Lifetime	50000Hours
	Viewing Angle	120°
Charge time	by sun	6 - 7 Hours
Working Time	Bright Mode	6+6 Hours
	Dim Mode	12 Hours
Colour temperature	range(k)	6000 - 6500k
Mounting height	range (m)	7-8m
Lamps material of main	Aluminum Alloy	
Back Up	*2 - 3 Day*	
warranty period	1years	

8.1.8 Electrical Design of Community Hall



Electrical cost of community hall: -

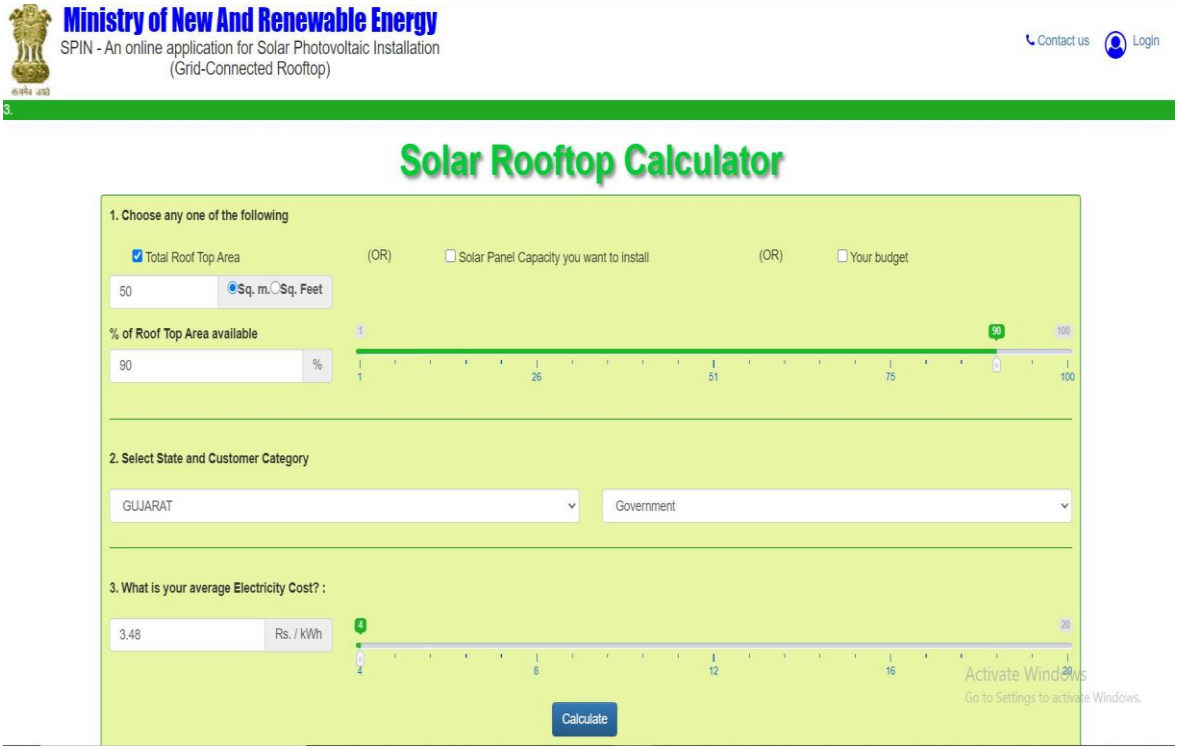
Electrical accessories estimate: -

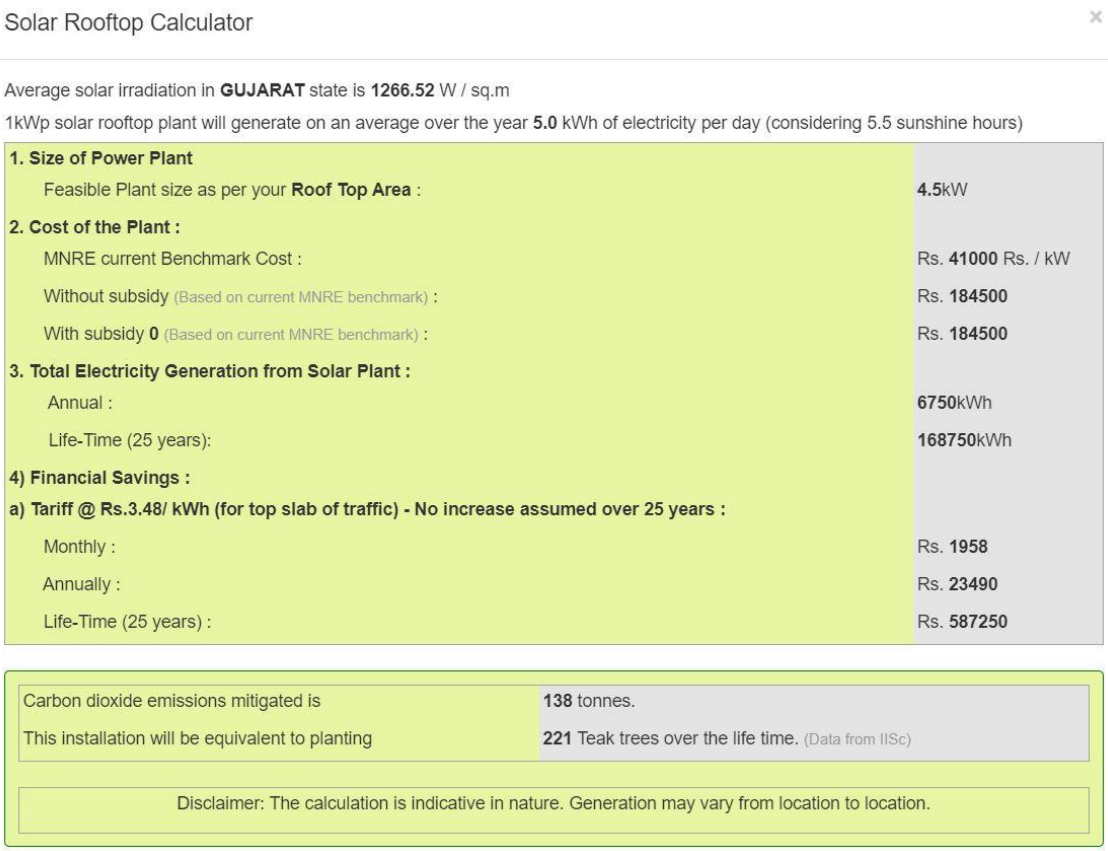
Sr. no	Place	Item Description	No of Use	Each Cost	Total cost Rs
1`	Hall + Stage	LED Tube light	11	550	6050
2	Hall + stage	Fan	8	1500	12,000
3	Stage	50W Flood Light	2	1100	2200
4	Toilet	LED Bulb	2	80	160
				Total Rs	20,410

Electrical wiring & labour cost: -

Sr. no	Name	Labour cost	Number	Cost	
1	One point price (underground wiring)	150	23	3450	
2	For one LED tube light & bulb	50	13	650	
3	For one fan	100	8	800	
3	For one flood light	50	2	100	
4	For extra plug point	150	15	2250	
			Total Rs.	**7250**	

8.1.9 Estimate of Solar Root Top at Public Toilet: -





(fig. 46 solar rooftop at public toilet)

Total roof top area around = 50 sq. Meter

We provide 9 LED tube light and 2 Exhaust fans
LED tube light = 9*20W= 180 watt
Exhaust fan =2*55W=110 watt

LED tube light kwh/day = 0.24
For 9 LED tube light = 2.16 kwh/day
=64.8 kwh/month

Exhaust fan kwh/day=0.60
For 2 Exhaust=1.32kwh/day
=39.6kwh/month

Total electricity consumption = 2.16+1.32 =3.48 unit/day
= 39.6+64.8=104.4 unit/day

So, size of solar panel is 4.5kw
Cost of the plant =1,84,500 Rs
Solar panel installation cost around = 30,800 Rs

8.2 Recommendations of The Design

- Anganwadi - Child Development Services program to combat child hunger and malnutrition.
- Agro storage unit - to store a greater number of goods on temporary basis.
- Milk dairy unit - multi-purpose farm that is concerned with the harvesting of milk.
- Community hall - to provide location where members of a community tend to gather for group activities, social support, public information, and other purposes.
- Prathmik Arogya kendra - to provide preliminary health service to villagers.
- Primary school - to provide primary academic facility in village.
- Lake development - to improve lake condition.
- Bus stops - to provide good transportation facility.

8.3 Suggestions / Benefits of The Villagers

Villagers gives us suggestions that they require bus stop, public garden, lake development, partmik Arogya kendra, community hall, well-constructed road etc. Which help full for villagers.

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

After completion of visit & data collection the project carried out in the current semester by the group members which includes the design of a sustainable facilities. Future scope would be study over other different urban amenities that would be sustainable in rural areas.

Table no 13. Part II design

Sr. No.	Design
1	Drinking water facilities
2	Burial ground
3	Animal shelter
4	Bank with ATM service
5	Front gate
6	Dust bin

Chapter 10: Conclusion of the Entire Village Activities of the Project

For India's economy to be strong, the rural economy needs to grow. Rural areas are still plagued by problems of malnourishment, illiteracy, unemployment and lack of basic infrastructure like schools, hospitals, sanitation, etc. Our villages need to grow in tandem with cities and standard of life has to improve there for inclusive growth to happen. If rural India is poor, India is poor.

While we have latest services and products available in our cities now, villagers are still coping with age old products.

1. While we have international fully air-conditioned schools in our cities, the schools in villages still don't have benches and chairs, leave alone computers. We have a huge shortage of teachers in rural areas, and the school dropout rate is huge.

2. In cities, we have wide roads, flyovers and underpasses while many villages still don't have proper roads. Urban-rural road links can play a vital role in rural growth.

3. Employment opportunities are hardly there in villages which forces youth to move to cities creating imbalance in the ecosystem and leaving the villages deprived.

4. While we may have numerous hospitals, nursing homes and medical facilities in cities, villages neither have health awareness nor health facilities. See the condition of major hospitals like AIIMS to know how many villagers have to flock to cities for even basic treatments.

Vishwakarma yojana aims to procure development in villages without losing essence. After all the way to uplift our country is through developing the villages. The scheme would reinforce wellbeing of people and further quality of living standard.

Chapter 11: References refereed for this project

1) B.N. DATTA (2017) Stimtion publisher “Estimation and costing book”

2) G.B. Deshpandey, J.P. Nayak (2014) Nirali prakasan “Quantity surveying book”

3) National Building Code of India (2016)

4) S.S. Bhavikatt, M.V. Chltawadagi (2014) I.K. International Pvt. Ltd. “Building planning and drawing”

5) The Hindu news (15 October 2013) “The 15 must have basic amenities in Villages.”

- **Web Sites: -**

o www.Sciencedirect.com

o www.smartvillage.gujrat.gov.in

o https://www.census2011.co.in/

o Gujrat Village Directory @ VList.in- India

o Swachhbharat.mygov.in

o https://bis.gov.in

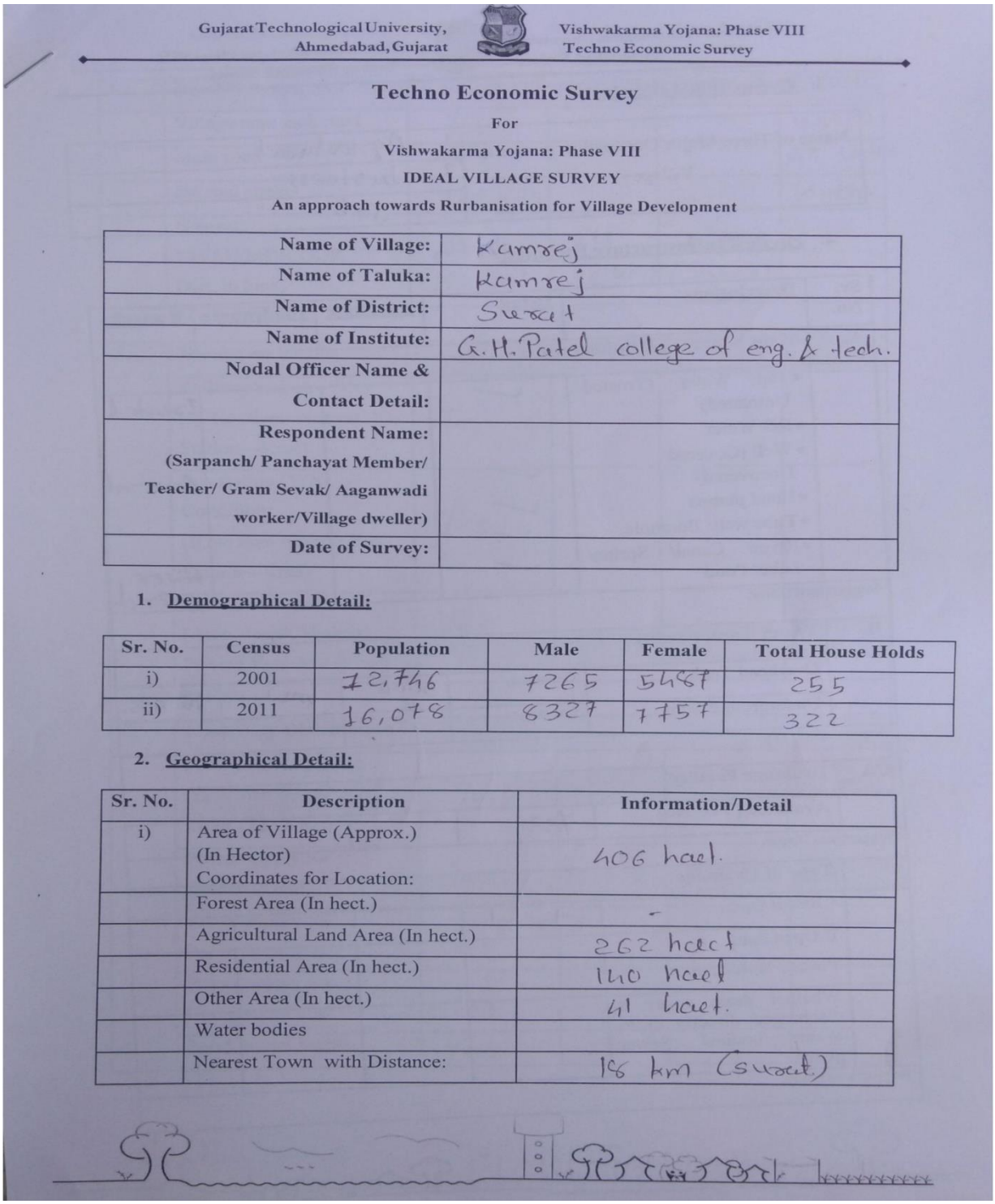
o developments-every-small-town-needs/story/239305.html

o rehabilitation/maintenance/

o www.onefivenine.com/india/villages/vansva

Chapter 12: Annexure attachment

12.1 Survey form of Ideal Village



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

For

Vishwakarma Yojana: Phase VIII

IDEAL VILLAGE SURVEY

An approach towards Rurbanisation for Village Development

Name of Village:	Kamrej
Name of Taluka:	Kamrej
Name of District:	Surat
Name of Institute:	G.H. Patel college of eng. & tech.
Nodal Officer Name & Contact Detail:	
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	
Date of Survey:	

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	12,746	7265	5481	255
ii)	2011	16,078	8327	7757	322

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	406 hect.
	Forest Area (In hect.)	-
	Agricultural Land Area (In hect.)	262 hect
	Residential Area (In hect.)	110 hect
	Other Area (In hect.)	41 hect.
	Water bodies	
	Nearest Town with Distance:	16 km (Surat)

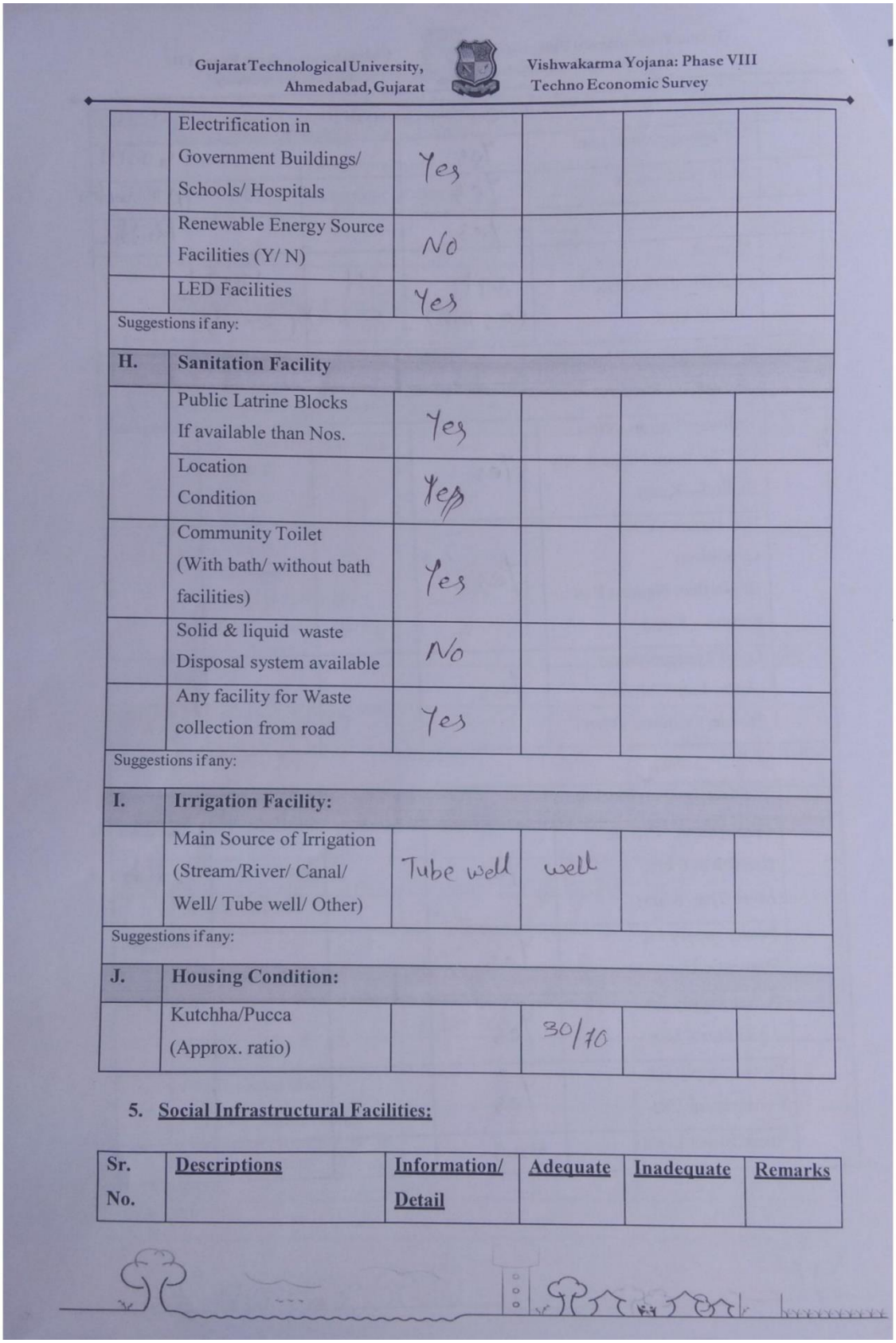
3. Occupational Details:

Name of Three Major Occupation groups in Village	1. Agricultural
	2. business
	3. Job

4. Physical Infrastructure Facilities:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
	• Tap Water (Treated/ Untreated)	✓			Treated
	• RO Water				
	• Well (Covered/ Uncovered)	✓			Covered
	• Hand pumps	✓			
	• Tube well/ Borehole	✓			
	• River/ Canal/ Spring/ Lake/ Pond	✓			River Pond
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	5000	mw	15 nos.
	Underground Sump	Capacity:			
Suggestions if any:					
C.	**Drainage Facility**				
	Available (Yes/ No)	Yes.			
Suggestions if any:					
D.	**Type of Drainage**				
	Closed/ Open	closed			
	If Open than Pucca / Kutchcha				
	Whether drain water is discharged directly in to Water bodies/ Sewer plants				
Suggestions if any:					

E.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Yes			WBM
	Main road	Yes			All weather
	Internal streets	Yes			Kutcha
	Nearest NH/SH/MDR/ODR Dist. in kms.	NH (2.5 KM)	SH (26 km)	MDR (300m)	
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	Yes			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Yes			
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Yes			>6 hrs
	Power supply for Domestic Use	Yes			
	Power supply for Agricultural Use	Yes			
	Power supply for Commercial Use	Yes			
	Road/ Street Lights	Yes			



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

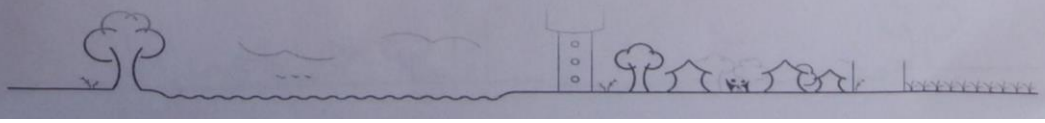
	Electrification in Government Buildings/ Schools/ Hospitals	Yes			
	Renewable Energy Source Facilities (Y/ N)	No			
	LED Facilities	Yes			
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Yes			
	Location Condition	Yes			
	Community Toilet (With bath/ without bath facilities)	Yes			
	Solid & liquid waste Disposal system available	No			
	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)	Tube well	well		
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)		30/10		

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks

K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	PHC Goverment Hospital			
	Private Clinic/Private Hospital/ Nursing Home	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	9		
	Primary School	Yes	3		
	Secondary school	Yes	5		
	Higher sec. School				
	ITI college/ vocational Training Center				
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	Yes	1		Siddharth arts & law college
	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:	Yes	with T.V.		

	Condition:	Good			
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	Yes			
	Public Garden Location: Condition:	Yes	Good	2 Nos.	
	Village Pond Location: Condition:				
	Recreation Center Location: Condition:	Yes	4 Nos		
	Cinema/ Video Hall Location: Condition:	Yes	900 m		
	Assembly Polling Station Location: Condition:				
	Birth & Death Registration Office Location: Condition:				
If any of the above Facility is not available in village than approx. distance from village: .....kms.					
Suggestions if any:					
N.	**Other Facilities**				
	Post-office	Good	Pin:- 394180		
	Telecommunication Network/ STD booth	Yes	Good		



	General Market	Yes			
	Shops (Public Distribution System)	Yes			
	Panchayat Building	Yes			
	Pharmacy/Medical Shop	Yes			
	Bank & ATM Facility	Yes			
	Agriculture Co-operative Society				
	Milk Co-operative Soc.	Yes			
	Small Scale Industries				
	Internet Cafes/ Common Service Center/Wi Fi				
	Other Facility	Women Development Cell			
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	Yes			
P.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	Solar, Street lights, Bio gas,			
Q.	Any Other				

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	

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Recent Projects going on for Development of Village	Road construction & drainage.
Any NGO working for village development	

8. Additional Information/ Requirement:

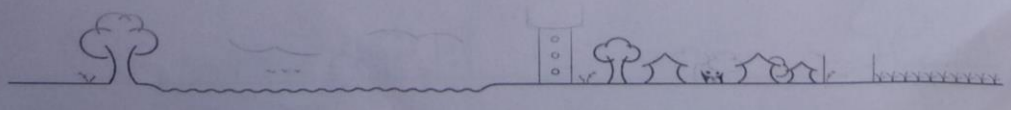
Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities(School Building, Health Center, Panchayat Building, Public Toilets & any other)		
2.	Additional Information/ Requirement		

9. Smart Village Proposal Design

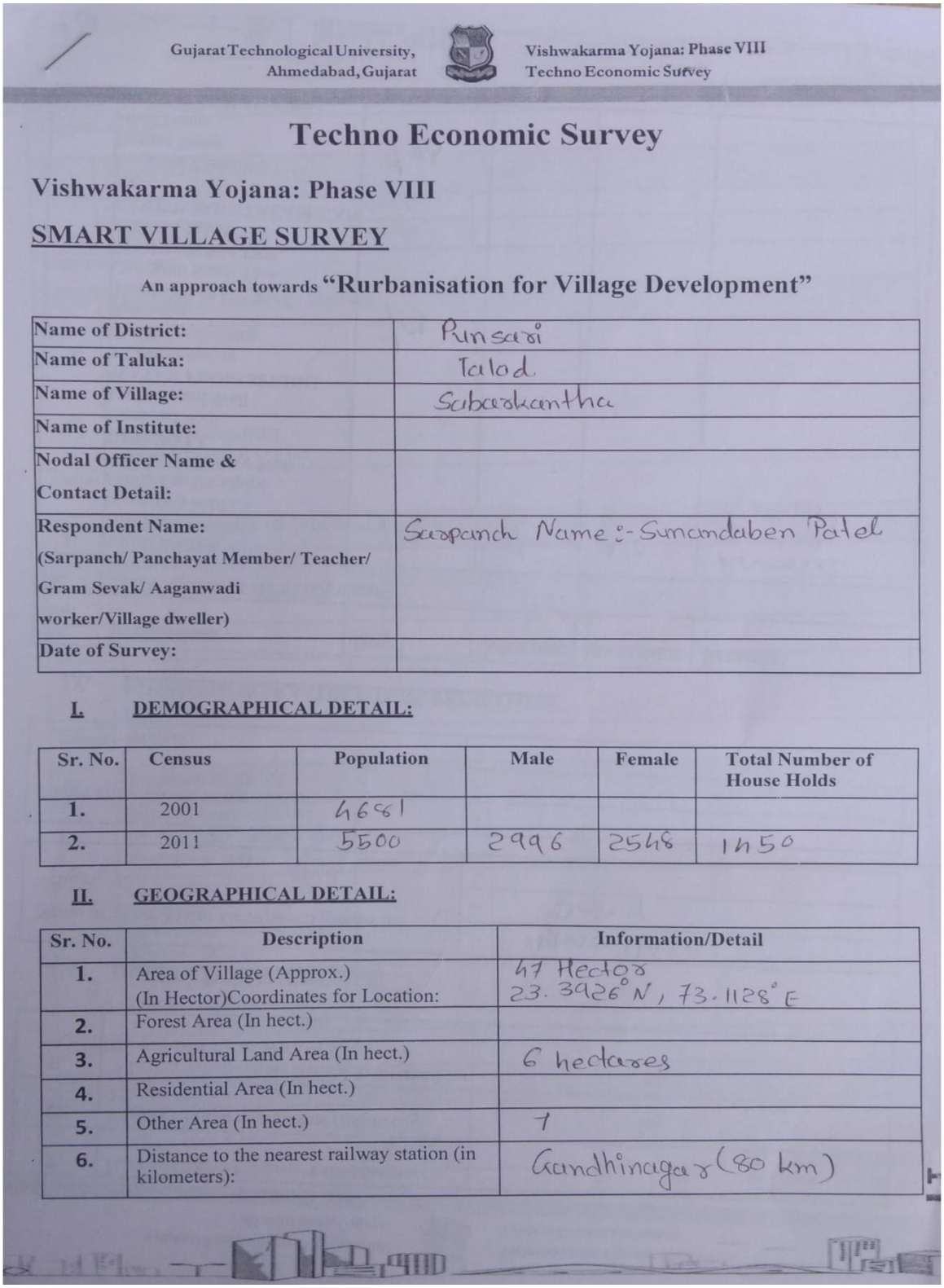
Sr. No.	Descriptions	Information/ Detail	Remarks
1.			

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

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



12.2 Survey form of Smart Village



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

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

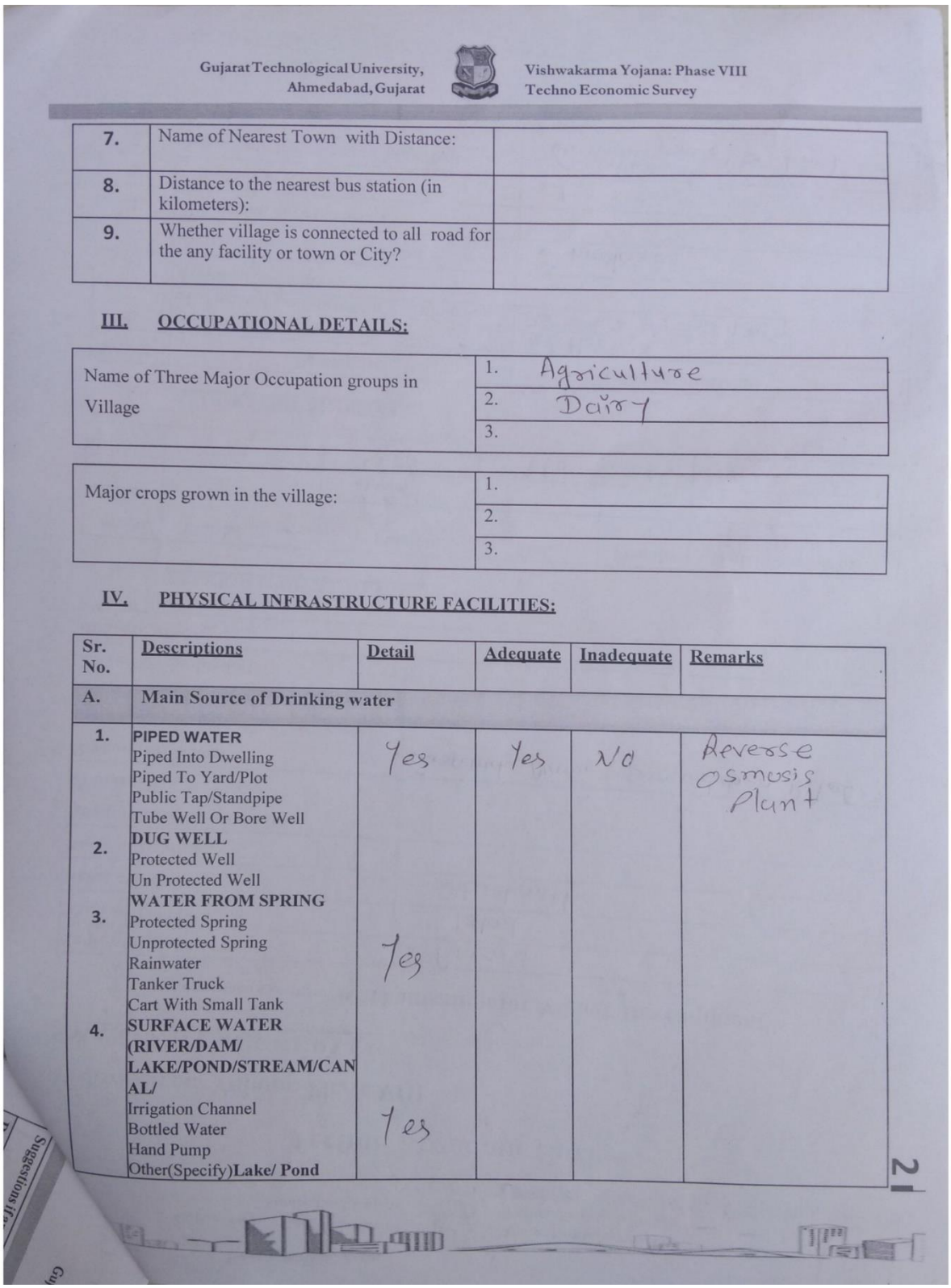
Name of District:	Punsari
Name of Taluka:	Talod
Name of Village:	Sabarkantha
Name of Institute:	
Nodal Officer Name & Contact Detail:	
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Sarpanch Name :- Sumandaben Patel
Date of Survey:	

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	4681			
2.	2011	5500	2996	2548	1450

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	47 Hectors 23.3926° N, 73.1128° E
2.	Forest Area (In hect.)	
3.	Agricultural Land Area (In hect.)	6 hectares
4.	Residential Area (In hect.)	
5.	Other Area (In hect.)	1
6.	Distance to the nearest railway station (in kilometers):	Gandhinagar (80 km)



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

III. OCCUPATIONAL DETAILS:

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

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

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

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

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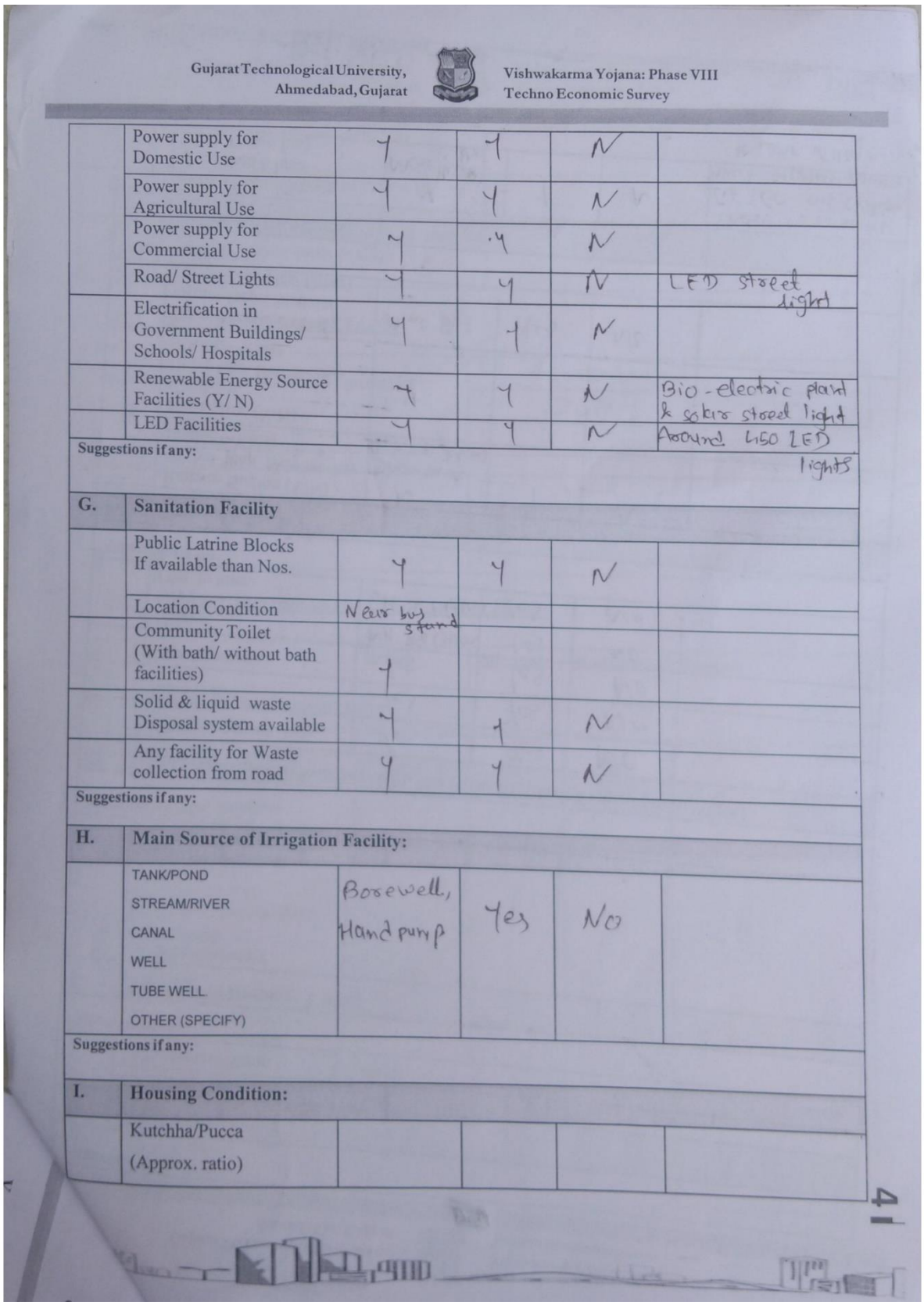
Suggestions if any:						
B.	**Water Tank Facility**					
	Overhead Tank	Capacity:				
	Underground Sump	Capacity:				
Suggestions if any:						
C.	**The Type of Drainage Facility**					
	A. UNDERGROUND DRAINAGE 1 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET					
Suggestions if any:						
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**					
	Village approach road	Yes	Yes	NO		
	Main road	Yes	Yes	NO		
	Internal streets	Yes	Yes	NO		
	Nearest NH/SH/MDR/ODR Dist. in kms.	NH 48 (31km) SH 57 (0km)	Yes Yes	NO NO		
Suggestions if any:						
E.	**Transport Facility**					
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	N (Dhamsuara Railway Station)	Y	N		
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Y				
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Mini Bus	Yes	NO		
Suggestions if any:						
F.	**Electricity Distribution**					
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Y More than 6 Hrs.	1	N	There is 66 kV GETCO sub-station that supplies power to the village.	



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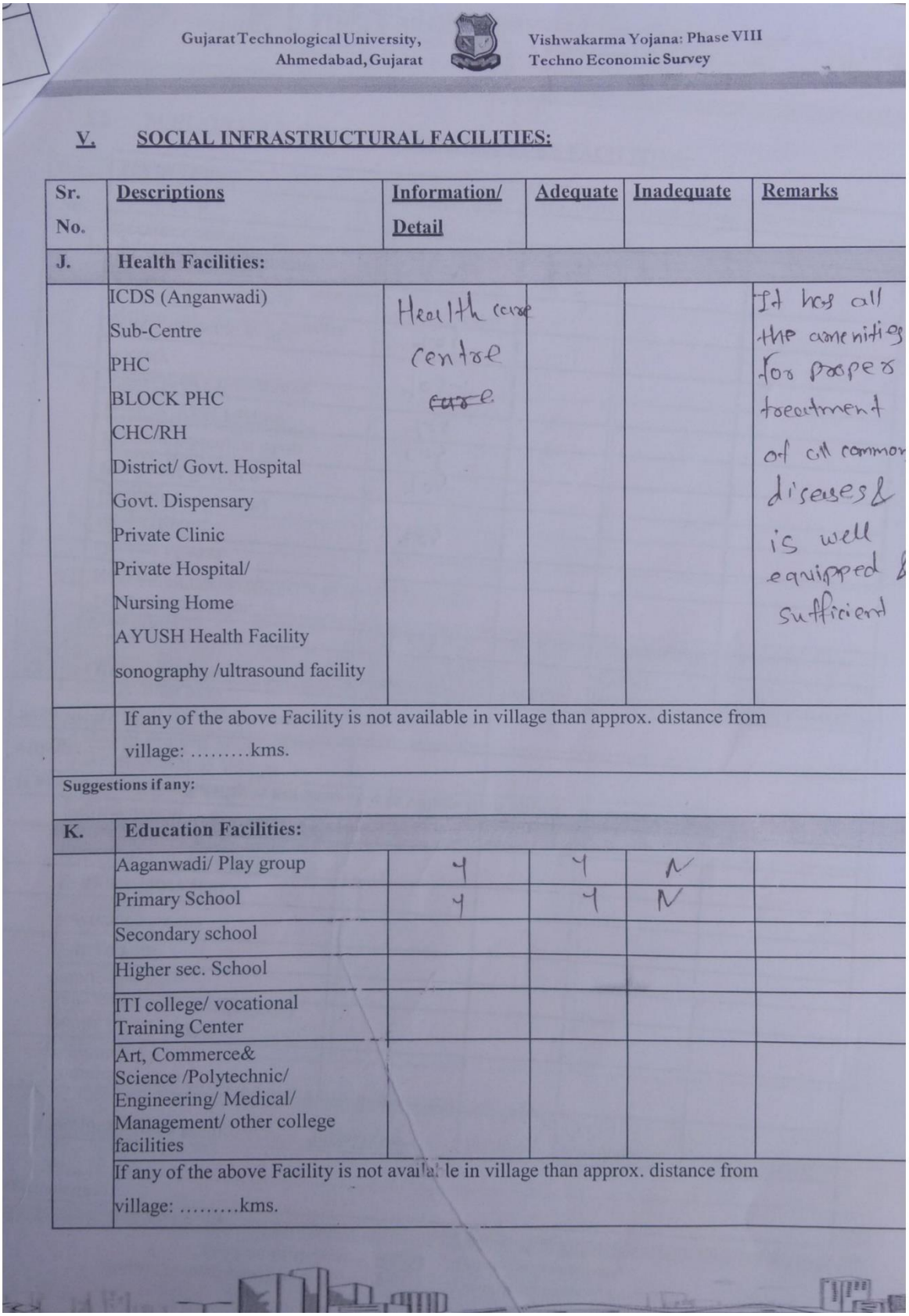
Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Power supply for Domestic Use	Y	Y	N	
	Power supply for Agricultural Use	Y	Y	N	
	Power supply for Commercial Use	Y	Y	N	
	Road/ Street Lights	Y	Y	N	LED street light
	Electrification in Government Buildings/ Schools/ Hospitals	Y	Y	N	
	Renewable Energy Source Facilities (Y/ N)	Y	Y	N	Bio-electric plant & solar street light
	LED Facilities	Y	Y	N	Around 450 LED lights
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Y	Y	N	
	Location Condition	Near bus stand			
	Community Toilet (With bath/ without bath facilities)	Y			
	Solid & liquid waste Disposal system available	Y	Y	N	
	Any facility for Waste collection from road	Y	Y	N	
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL OTHER (SPECIFY)	Borewell, Hand pump	Yes	No	
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)				



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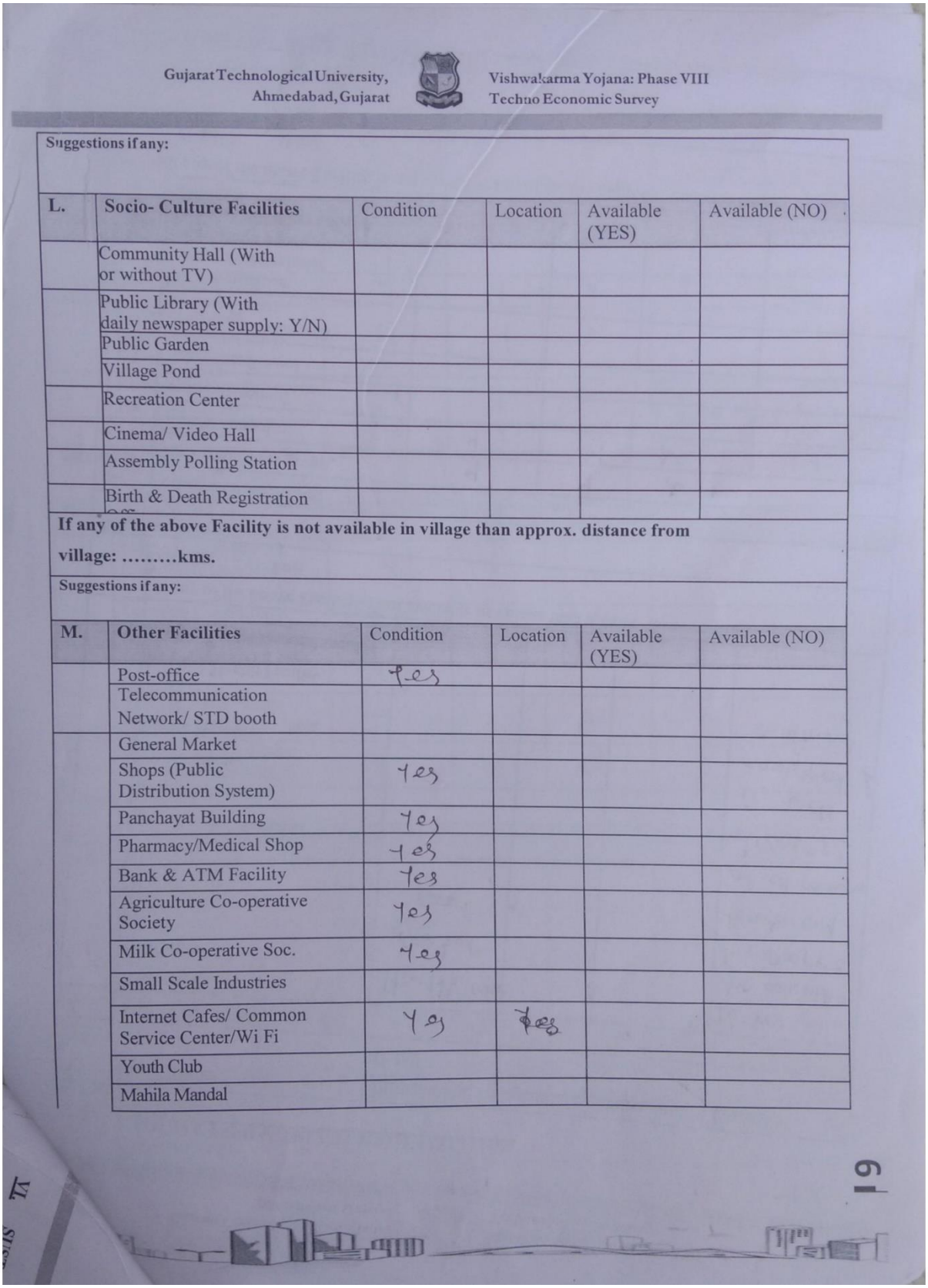
Vishwakarma Yojana: Phase VIII
Techno Economic Survey

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi) Sub-Centre PHC BLOCK PHC CHC/RH District/ Govt. Hospital Govt. Dispensary Private Clinic Private Hospital/ Nursing Home AYUSH Health Facility sonography /ultrasound facility	Health care centre ~~care~~			It has all the amenities for proper treatment of all common diseases & is well equipped & sufficient
	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	Y	Y	N	
	Primary School	Y	Y	N	
	Secondary school				
	Higher sec. School				
	ITI college/ vocational Training Center				
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities				
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				



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Vishwakarma Yojana: Phase VIII
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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				
	Village Pond				
	Recreation Center				
	Cinema/ Video Hall				
	Assembly Polling Station				
	Birth & Death Registration				
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				
	General Market				
	Shops (Public Distribution System)	Yes			
	Panchayat Building	Yes			
	Pharmacy/Medical Shop	Yes			
	Bank & ATM Facility	Yes			
	Agriculture Co-operative Society	Yes			
	Milk Co-operative Soc.	Yes			
	Small Scale Industries				
	Internet Cafes/ Common Service Center/Wi Fi	Yes	Yes		
	Youth Club				
	Mahila Mandal				

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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 Panels, Bio-electric plants	Yes		
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	Yes Yes	Yes Yes		
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		Yes		
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)				

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

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

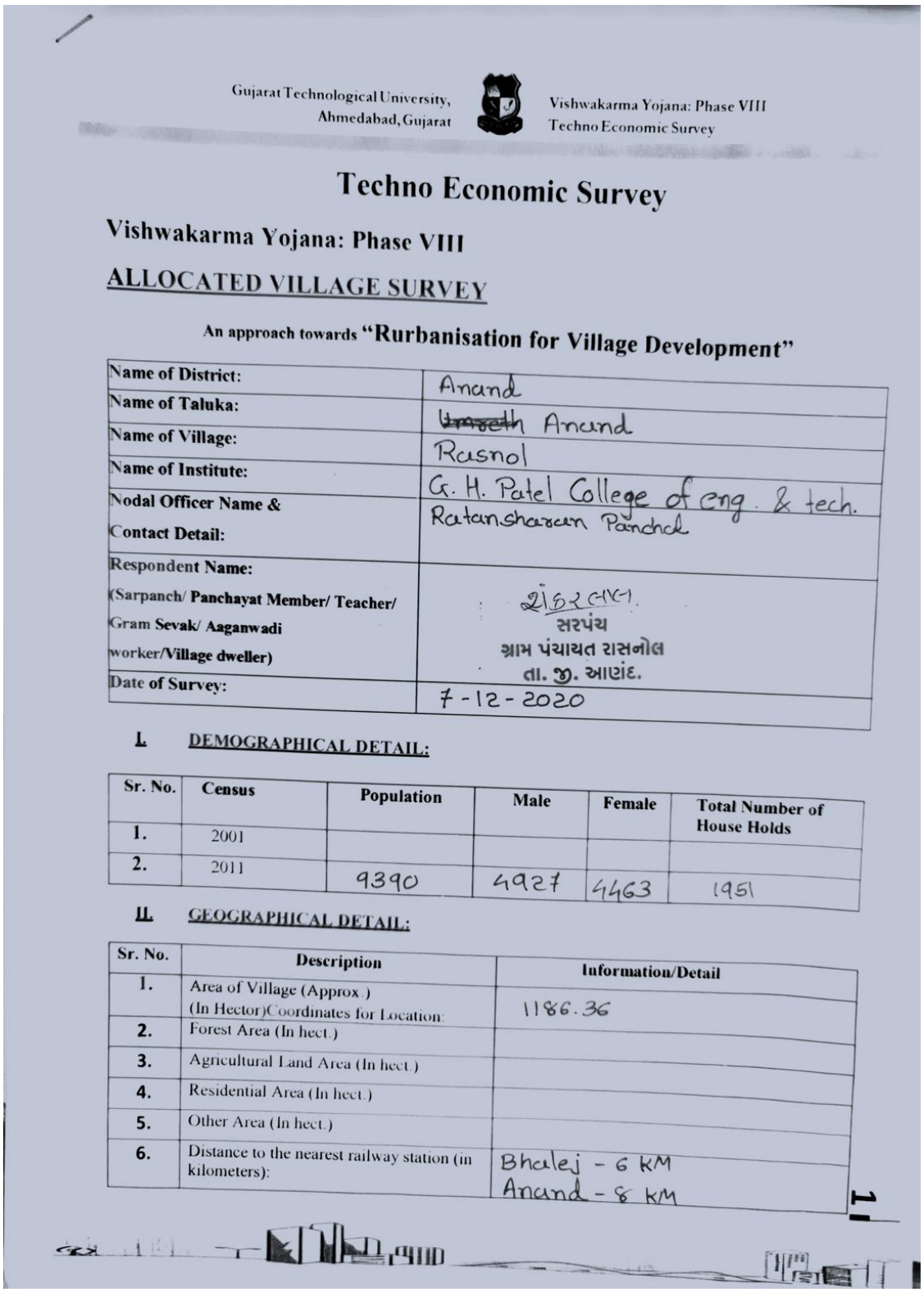
IX. Smart Village / Heritage Details

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

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

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

12.3 Survey form of Allocated Village



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

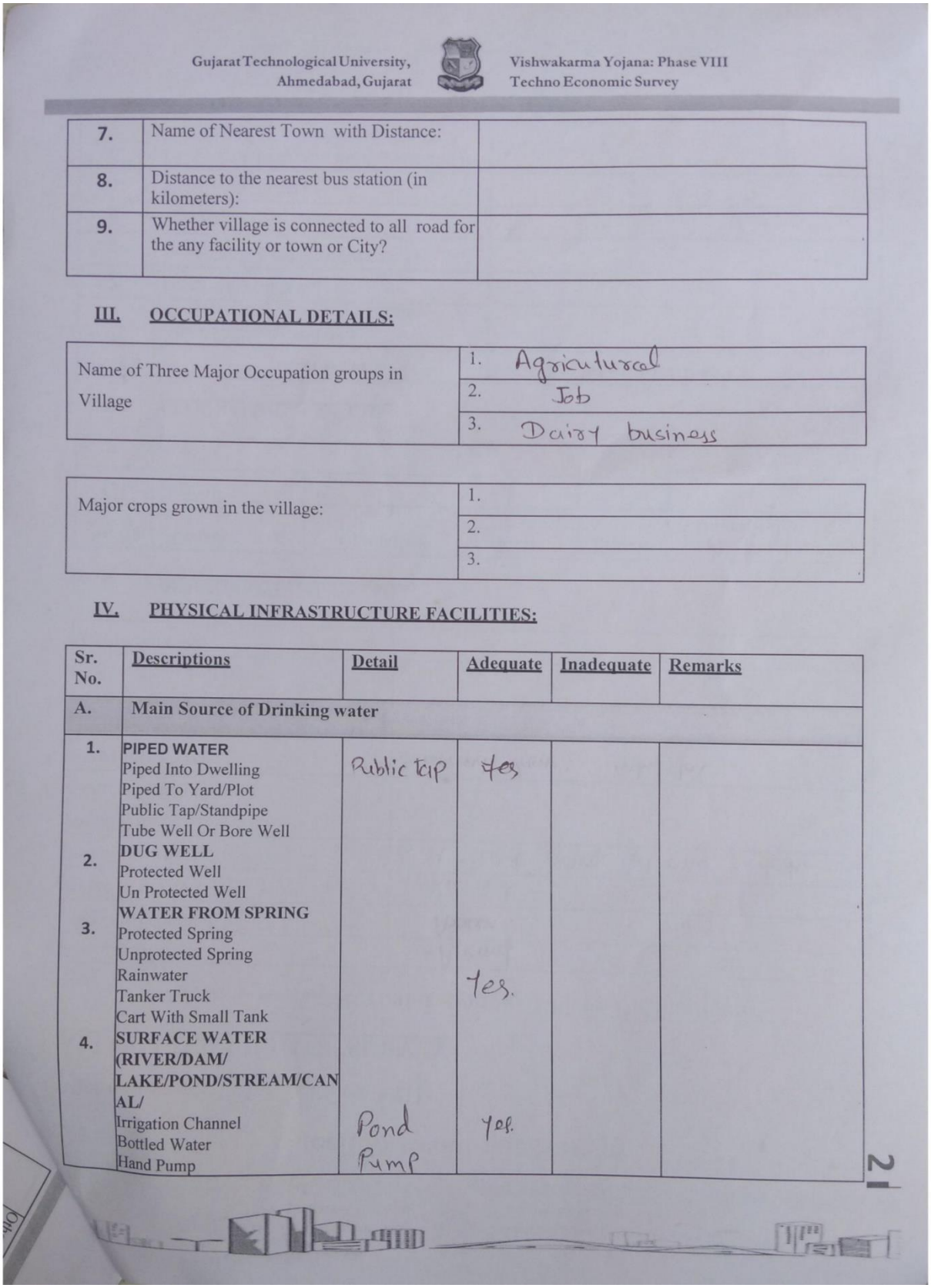
Name of District:	Anand
Name of Taluka:	~~Umreth~~ Anand
Name of Village:	Rasnol
Name of Institute:	G. H. Patel College of eng. & tech.
Nodal Officer Name & Contact Detail:	Ratan sharan Pandhal
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	સરપંચ ગ્રામ પંચાયત રાસનોલ તા. જી. આણંદ.
Date of Survey:	7-12-2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	9390	4927	4463	1951

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1186.36
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):	Bhalej - 6 KM Anand - 8 KM



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

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1.	Agricultural
	2.	Job
	3.	Dairy business

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

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

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

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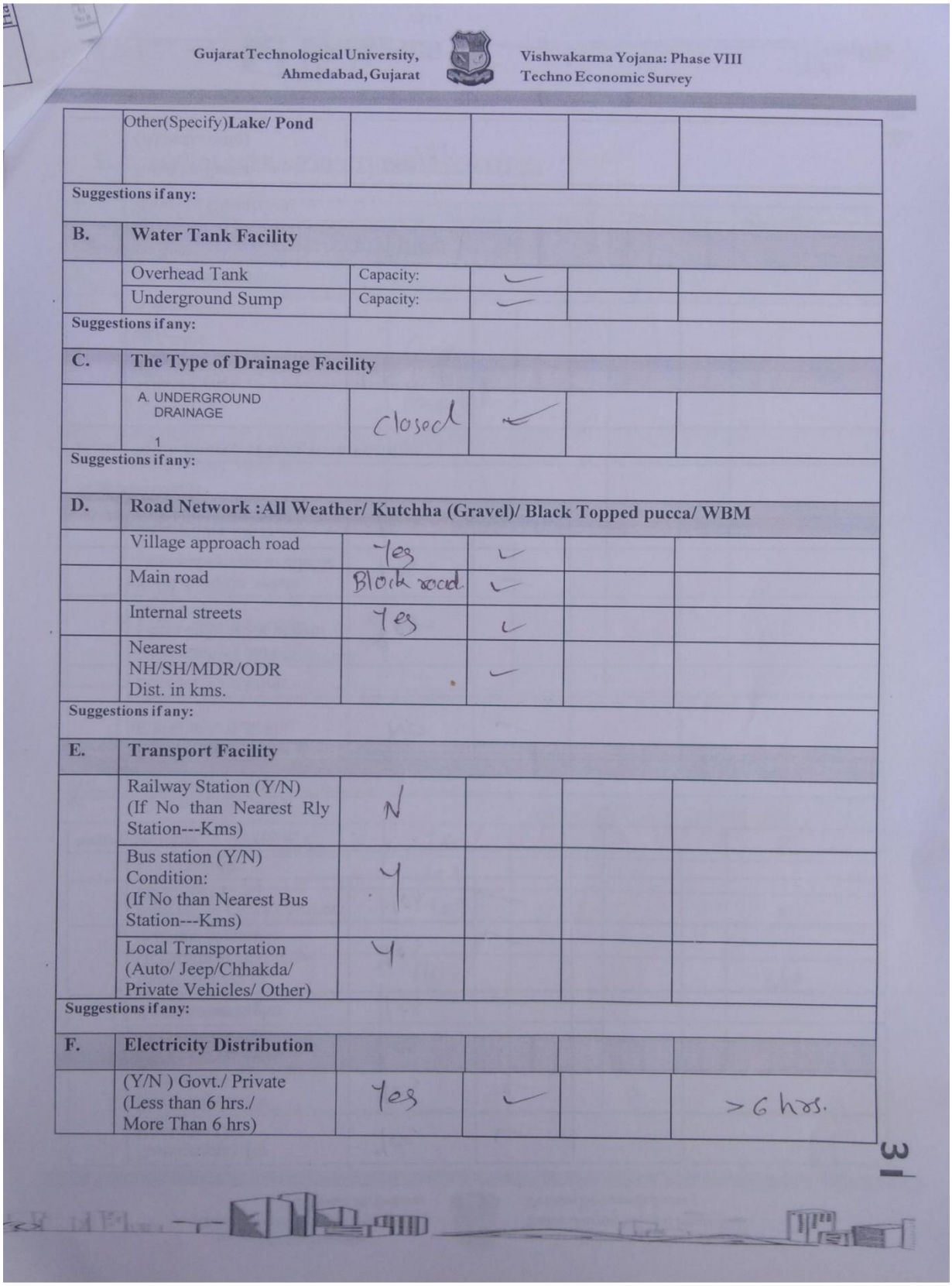

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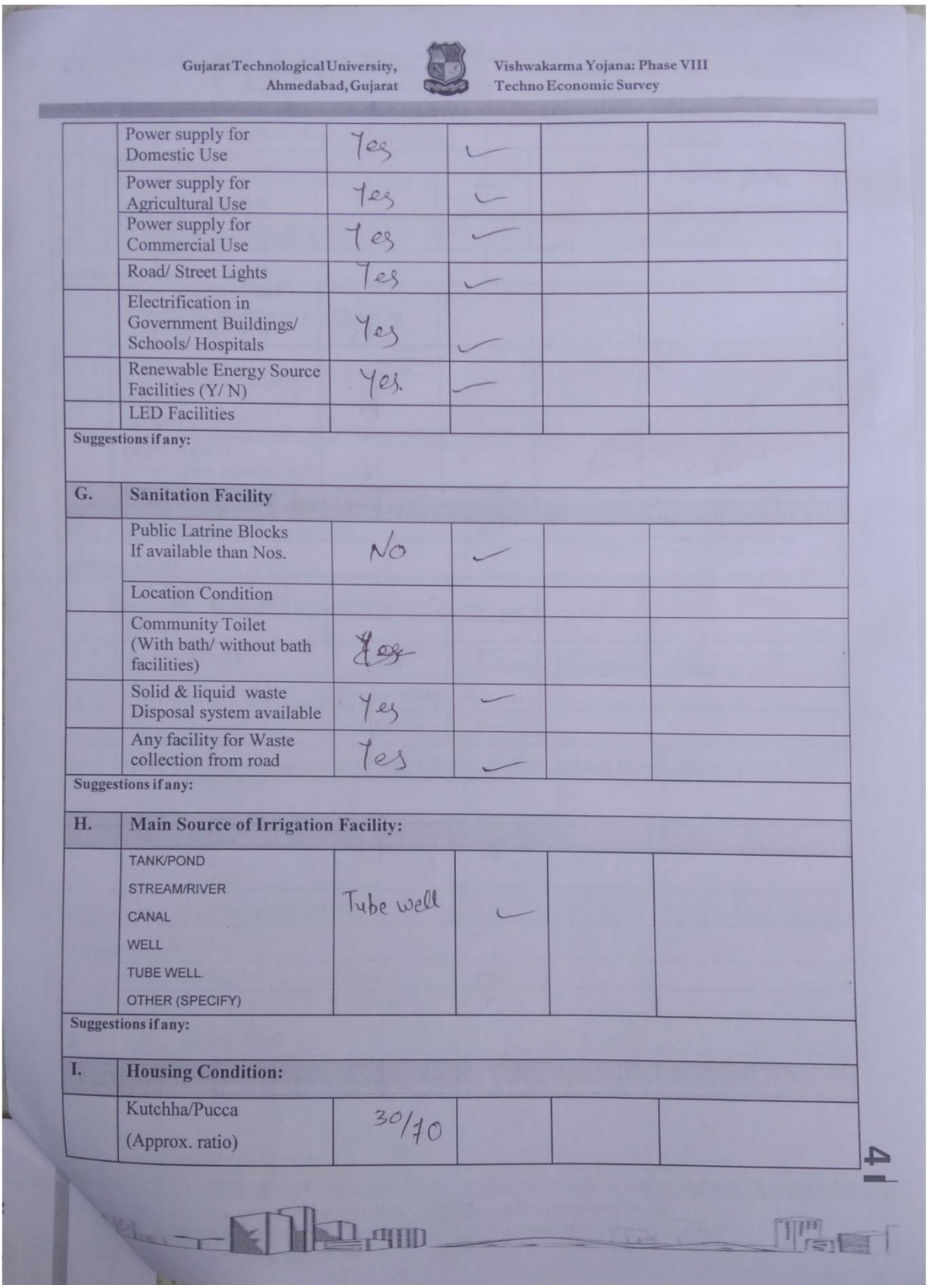
Techno Economic Survey

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

3



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Power supply for Domestic Use	Yes	✓		
	Power supply for Agricultural Use	Yes	✓		
	Power supply for Commercial Use	Yes	✓		
	Road/ Street Lights	Yes	✓		
	Electrification in Government Buildings/ Schools/ Hospitals	Yes	✓		
	Renewable Energy Source Facilities (Y/ N)	Yes.	✓		
	LED Facilities				
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	No	✓		
	Location Condition				
	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:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL OTHER (SPECIFY)	Tube well	✓		
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	30/70			

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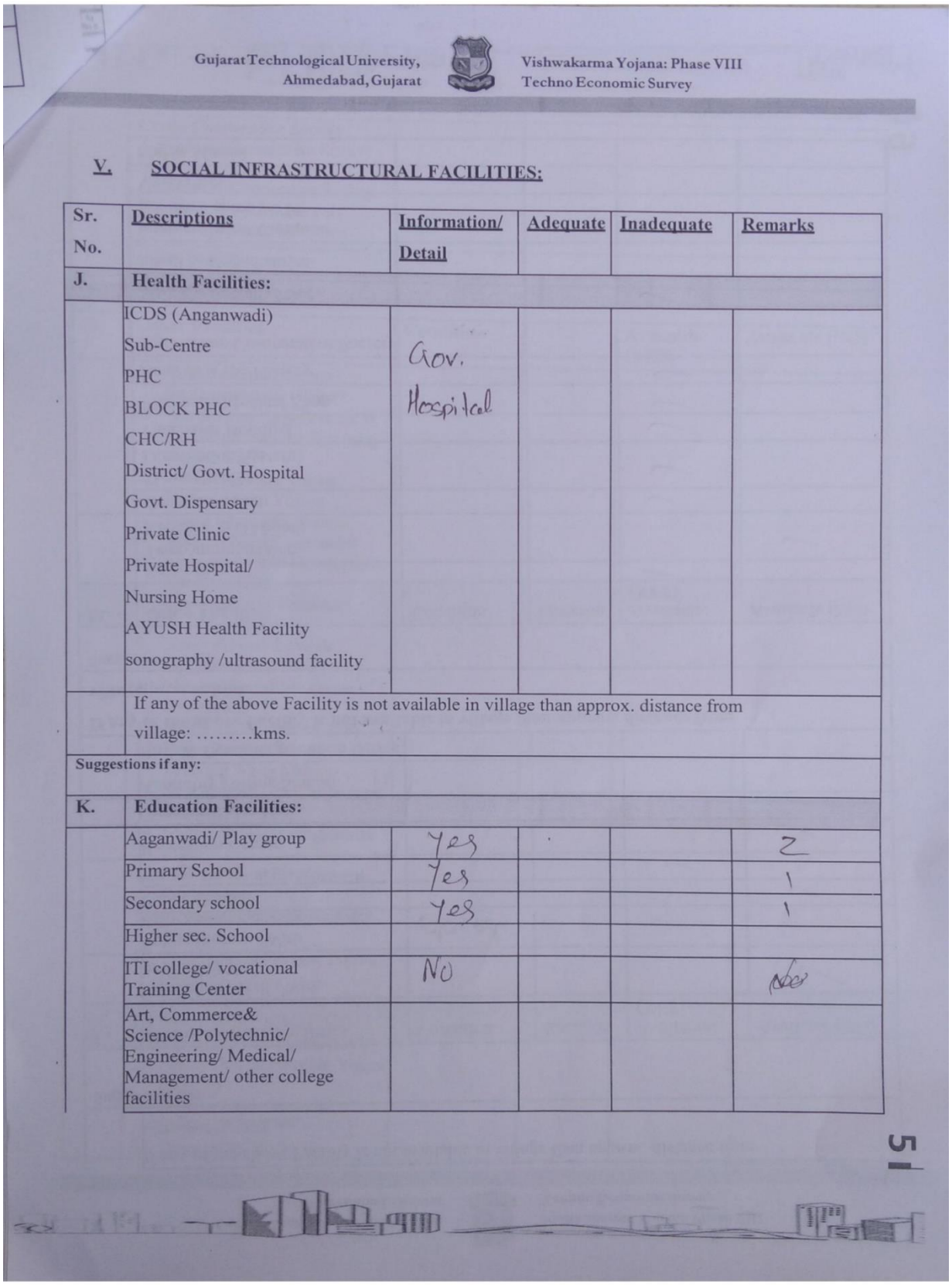

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi) Sub-Centre PHC BLOCK PHC CHC/RH District/ Govt. Hospital Govt. Dispensary Private Clinic Private Hospital/ Nursing Home AYUSH Health Facility sonography /ultrasound facility	Gov. Hospital			
	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			2
	Primary School	Yes			1
	Secondary school	Yes			1
	Higher sec. School				
	ITI college/ vocational Training Center	No			No
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities				

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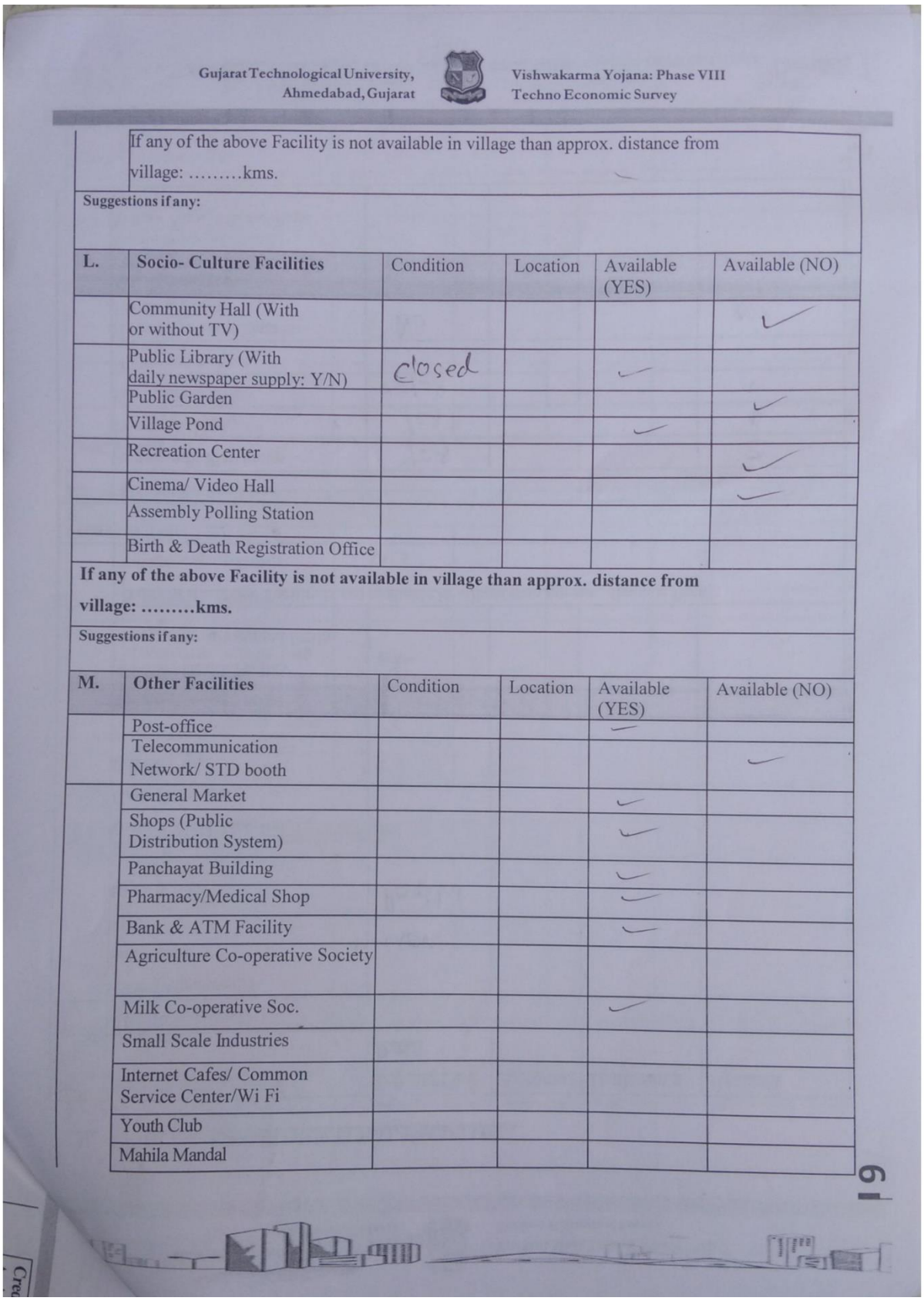

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Vishwakarma Yojana: Phase VIII
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	If any of the above Facility is not available in village than approx. distance from village: .....kms.
Suggestions if any:	

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

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			✓	
	Telecommunication Network/ STD booth				✓
	General Market			✓	
	Shops (Public Distribution System)			✓	
	Panchayat Building			✓	
	Pharmacy/Medical Shop			✓	
	Bank & ATM Facility			✓	
	Agriculture Co-operative Society				
	Milk Co-operative Soc.			✓	
	Small Scale Industries				
	Internet Cafes/ Common Service Center/Wi Fi				
	Youth Club				
	Mahila Mandal				

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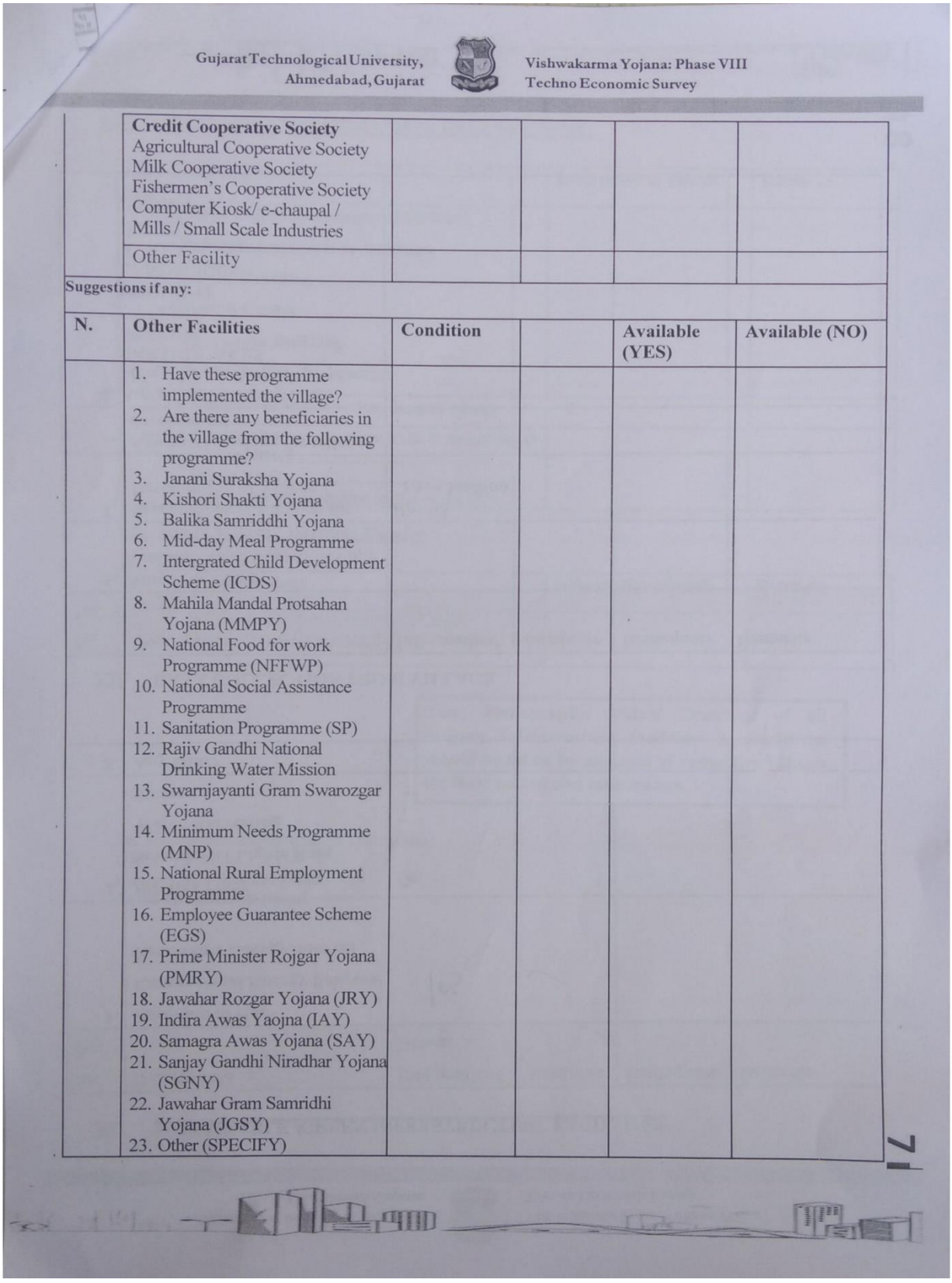

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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

Suggestions if any:

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

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VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	Yes	✓		
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	Ge			
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	Road constouction			
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
1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other		
2.	Additional Information/ Requirement		
3.	During the last six months how many times CLEANING …….. FOGGING…….. Drive was undertaken in the village?		

IX. Smart Village / Heritage Details

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

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

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

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12.4 Gap Analysis of the Allocated Village

Village facilities	Planning commission/UDPFI norms	Village name: **Rasnol**			
		Population: 9390			
		Existing	**Required**	**Smart village / cities future projection design**	**Gap**
Education					
Anganwadi	Each or per 2500 population	2	2		0
Primary school	Per 2500 population	1	1		0
Secondary school	Per 7500 population	1			
Higher secondary school	Per 15000 population	0			
College	Per 125000 population	0			
Tech. training institute	Per 100000 population	0			
Agriculture research center	Per 100000 population	0			
Skill development center	Per 100000 population	0			
Health facility					
Govt/panchayat dispensary or sub PHC or health center	Each village	1	1		0
Primary health & child health center	Per 20000 population	0			
Child welfare & maternity center	Per 10000 population	0			
Multispecialty hospital	Per 100000 population	0			
Public latrines	1 for 50 families (if toilet is not there in home, especially for slum pockets & kutcha house)	0			
Physical infrastructure facilities					
Transportation		Adequate / Inadequate			
Pucca village approach road	Each village	Adequate			

Bus/auto stand provision	All villages connected by PT (ST Bus or Auto)	Adequate			
Drinking water (min. 70 lpcd)		Adequate / Inadequate			
Overhead tank	1/3 of total demand				
U/G sump	2/3 of total demand				
Drainage network		Adequate / Inadequate			
Open					
Cover					
Waste management system		Inadequate			
Socio cultural infrastructure					
Community hall	Per 10000 population	NO	Required		
public library	Per 15000 population	YES	Required		
Cremation ground	Per 20000 population	YES	Not Required		
Post office	Per 10000 population	1	Adequate		
Gram panchayat building	Each individual / group panchayat	1	Inadequate		
APMC	Per 100000 population	0	Inadequate		
Fire station	Per 100000 population	NO	Not Required		
Public garden	Per village	NO	Required		
Police post	Per 40000 population	YES	Not Required		

12.5 Summary of all the villages in the table form as part-1 and part-2

G..H PATELCOLLEGE OF ENGINEERING AND TECHNOLOGHY			
NO.	**Village name**	**Part 1**	**Part 2**
1	Rasnol	Community hall	Drinking water facilities
		Public toilet	Burial ground
		Agro storage unit	Animal shelter
		Biogas plant	Bank with ATM service
		e-center	Front gate
		Bus stand	Dust bin
		Solar Streetlight	CCTV cameras
		Solar rooftop at public toilet	Design of transformer
		Electrical plan of community hall	Electricity distribution planning
2	Valasan	Public garden	
		Pubic health center	
		Public toilet	
		Rain water harvesting system	
		Anganwadi	
		Community hall	
		Solar street light	
		CCTV installation	
		Solar rooftop on public building	
3	Hadgood	ATM	Drinking water facilities
		Public Toilet	Public garden
		Road side waste management	Bank service
		Internet zone and library	Animal shelter
		Entrance gate	Rain water harvesting system
		Solar rooftop system for Govt. buildings, school/colleges, hoapitals	Citizen service center
		E-gram center	
		Primary health center	Water treatment plant
		Bus stand	Public garden
		Market place	Cybercafe

4	Tarnol	Public library	Post office
		Indoor games	Rain water harvesting
		Public toilet	Gram panchayat
		Solar street light	
		Solar rooftop at primary health center	
		Solar rooftop at bus stand	

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

All the images and drawings are attached in the chapter along with design.

12.7 Summary of Good Photographs

Ideal Village:

(Gate of Kamrej village)

(Sarpanch Office, Kamrej)

(Primary school of Kamrej Village)

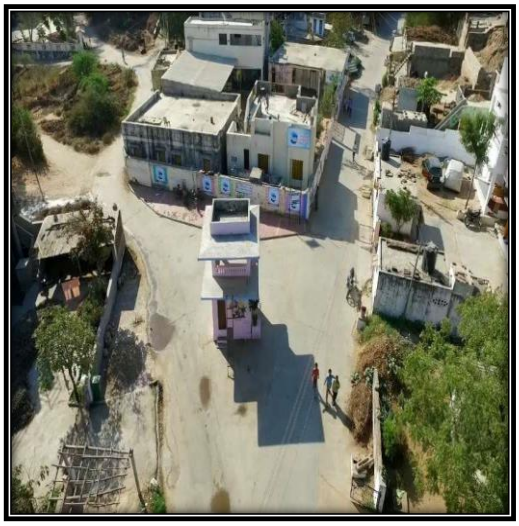
(Road of Kamrej village)

(water tank of kamrej Village)

(Post office of Kamrej Village)

Smart Village:

(Gate of Punsari Village**)**



(Bank in Punsari Village**)**

(Street of Punsari village**)**

(Gram Punchayet, Punsari)

Allocated Village, Rasnol:

(Temple, Rasnol village)

(church, Rasnol village)

(Kuccha Makan, Rasnol)

(Street of Rasnol village)

(Primary boy's school, Rasnol)