**DETAIL PROJECT REPORT**

# VISHWAKARMA YOJNA: VIII

## AN APPROACH TOWARDS RURBANISATION

## RAJGARI Village

## SURAT District

**PREPARED BY**


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**C.K. Pithawala College of Engineering and Technology**

**Nodal officers**
**Dr. Boski P. Chauhan**
**(Civil Department)**
**Prof. Hetal H. Jivanramjiwala**
**(Electrical Department)**


# YEAR: 2020-21

**GUJARAT TECHNOLOGICAL UNIVERSITY**
**Chandkheda, Ahmedabad – 382424 Gujarat**

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**ON**

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**Year:2020-21**

**Gujarat Technological University,**
**Chandkheda, Ahmedabad – 382424 Gujarat**

# CERTIFICATE

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

**Detail Project Report for,**
**VILLAGE RAJGARI**
**DISTRICT SURAT**

**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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| | |
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| **Internal (Evaluator) Guide Name and Signature:** | **Prof. Hiral B. Patel** |
| **Internal (Evaluator) Guide Name and Signature:** | **Prof. Samarth Gemlawala** |
| **College Name:** | **C.K. Pithawala College of Engineering & Tech.** |
| **College stamp:** | |

# ABSTRACT

The government of Gujarat has launched the project name Vishwakarma Yojana (scheme) for development of villages by identifying the requirement of villages. Under this scheme, the villages are surveyed and this project was identified and selected for implementation. Rurbanisation is to bring peace of mind to the villagers by providing the, the basic amenities required and still keeping the village soul intact. The project gives one new idea for village development of rural village. With the help of this yojana the migration of the people from rural to urban will be diminished by providing the basic amenities to the people which have availed them in urban. Rajgari is a village placed in Chorasi tehsil of Surat district in Gujarat. Positioned in rural region of Surat district of Gujarat, it is Situated 25km away from the sub-district headquarter Chorasi and 25Km away from district headquarter Surat. As per 2009 stats, Rajgari village is also a gram panchayat. The total geographical area of village is 350.83 hectares. Rajgari has a total population of 1300 peoples. There are about 318 houses in Rajgari village. Surat is nearest town to Rajgari which is approximately 25 Km away. The village possess the basic facility like primary education and drinking water but lack in higher educational facilities, public toilet, health facilities, sustainable infrastructure, and some physical infrastructure. Such lack in facility is becoming major concern for migration of villager toward the nearby city. We have provided 9 design including rain water harvesting, common service center, police outpost, public toilet, public dispensary, solar field, automatic watering plant, smoke detector system, temperature control system to full fill the basic facility, decrease the migration rate and rurbanize the village. Future scope of village development is the provision of proper drainage system, solid waste collection and its treatment proper and even distribution of irrigation water for the crop, beautification of lake, etc.the village had received the basic facilities under corporate responsibility fund such as water tank and community hall has been built under the CSR scheme. Providing the village with the facilities that have been lacking in the village by the proposal of the design under Vishwakarma Yojana.

**Key Words:** Vishwakarma Yojana, Infrastructure, Survey and Design.

# ACKNOWLEDGEMENT

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

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# Abbreviation

| SHORT NAME / SYMBOL | FULL NAME |
|---|---|
| Wi-Fi | Wireless Fidelity |
| DGVCL | Dakshin Gujrat Vij Company |
| GEB | Gujrat Electricity Board |
| Ppm | Parts per million |
| Km | Kilometre |
| DDO | District Development Officer |
| TDO | Taluka Development Officer |
| RCC | Reinforced cement concrete |
| SBA | Swachh Bharat Abhiyan |
| PMJDY | Pradhan Mantri Gram Sadak Yojana |
| MMS | Moisture monitoring system |
| SqM | Square metre |
| CuM | Cubic metre |

# CHAPTER 1: IDEAL VILLAGE VISIT

## 1.1 Background and study area location

Baben village which is located about 34 Km from Surat city, typifies development/. Here villagers enjoy all the facilities that one living in the city enjoys. The 2 Km road from Bardoli to Baben gives a commuter the feeling of passing through a highway this is because the village road is 12 meter wide and is well lit with street lights. This road has not been constructed with government money but the fund for it was raised through various indigenous schemes by the villagers. The contribution from the real estate developers who come to develop the land and houses in the village and use that money to develop basic amenities for the resident of the village, the above information was provided to us by the Baben gram panchayat sarpanch **BHAVESH N. PATEL.**

Baben village got the best gram panchayat of the year award in 2011 from the state government. Baben village is a bench mark for the development of other villages in India. The Baben village had received ***SWARNIM GRAM AWARD*** in the year 2012 and a cash prize of Rs 45000000/-. It had also received many such awards from the year 2007-2016.

Baben is a village panchayat located in Surat district of Gujarat state, India. The latitude 21.1378786 and longitude 73.0966019 are the geo-coordinate of the Baben. Gandhinagar is the state capital for Baben village. It is located around 24502 Kilometer away from Baben.

Baben is the village has demography of 15610 population with 8642 male and 6968 females with 5278 total households.

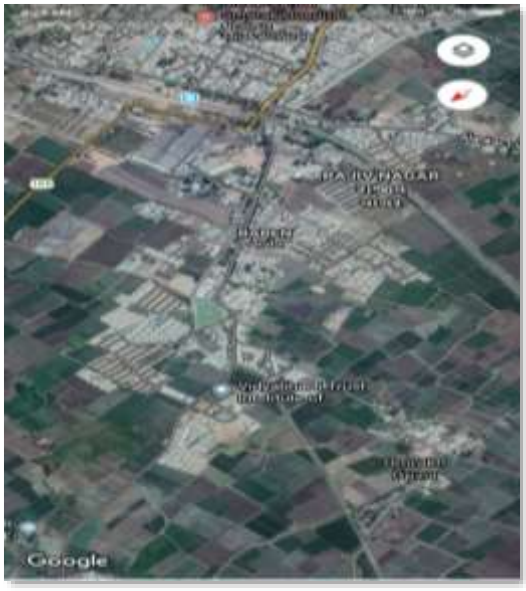


Fig.1 Map of Baben


Fig.2 Location of Baben

## 1.2 Concept of ideal village

### 1.2.1 Objectives of ideal village

An ideal village is been considered to prevent distress migration from rural to urban areas, which is a common phenomenon in India's villages due to lack of opportunities and facilities that guarantee a decent standard of living. Make the ideal village a "hub" that could attract resources for the development of other villages on its vicinity. Provide easier, faster and cheaper access to urban markets for agriculture produce or other marketable commodities produced I such villages. Contributes towards social empowerment by engaging all sections of the community in the task of village development. Create and sustain a culture of cooperative living for inclusive and rapid development.

### 1.2.2 Live Case studies of ideal village of India

**Ankapoor, Telangana**
Ankapoor is located in the Nizamabad district in the state of Telangana. Ankapoor has been globally recognized as a "Model Agricultural village" for its global achievement in introducing modern technologies in agriculture while ensuring the participation of all section of the village community, particularly women. Organizations like the Indian council for agricultural research (ICAR), international rice research institute (IRRI), Manila and international crops research institute for the semi-arid tropics (ICRISAT) have formally commended the development in agriculture in the village.

Some of the important features of the agricultural model of Ankapoor include:

- Peasant association of the village coordinates various agriculture intervention.
- The decision-making process is inclusive and based on consensus building.
- Women have a dominant role in the utilization and supervision of labor.
- Focus on new sources of income, such as commercial cultivation of seeds, scientific crop rotation techniques.
- Sustainable agriculture with greater use of farmyard manure and lesser use of chemical fertilizer.
- Village market yard facilitate the sale of agricultural produce with minimal wastage.

### 1.2.3 Idea of a model/smart village

68.9% of our population lives in rural areas (census 2011). Though number is expected to fall in the coming years, it is still estimated that half of our population would be rural even in 2050. Despite there been several past initiatives by government at all level- central, state and local. In the past, the level of improvement has not kept pace with the rising aspiration among Indians. The below table shows the data related to the growth of rural and urban population. And further describe the development needed for such large number of growths and necessity facilities that have been provided for the fulfillment of the basic requirement of such large population.

**Table 1 Urban- Rural Comparison**

| Sector | Parameter | Urban | Rural |
|---|---|---|---|
| **Expenditure poverty** | %people below poverty line (2011-12) | 27.2% | 31.3% |
| **Education** | Literacy rate-2011 | 85% | 68.9% |
| **Health** | Infant mortality rate | 28 | 46 |

One reason for the failure of rural development schemes has been the lack of holistic focus on the village as a unit. Separate flagship scheme targeting different sectors such as health (NRHM), education (SSA) and livelihood (MGNREGA) have been launched in the past, but met with limited success. The 'Model village' concept could address these challenges comprehensively. It can address resources deficit in each of these sectors, with adequate focus of the special need of every village.

### 1.2.4 Ancient History Civil concept about Indian Village

### Kashmiri mountainous villages earthquake resistance wall (Dhajji wall)

In the ancient language of carpet weavers, the old Persian word for 'Dhajji' was used to describe patchwork quilts. Because of its apparent similarity the same name was used in the traditional architectural art of the Kashmir mountains. The construction of the Dhajji is made up of very small light frames separated by stone stumbling blocks. During the 7.6 magnitude earthquake in October 2005, the traditional Dhajji houses showed remarkable resilience to earthquakes while half a million buildings, many of which were made of modern building materials, collapsed.

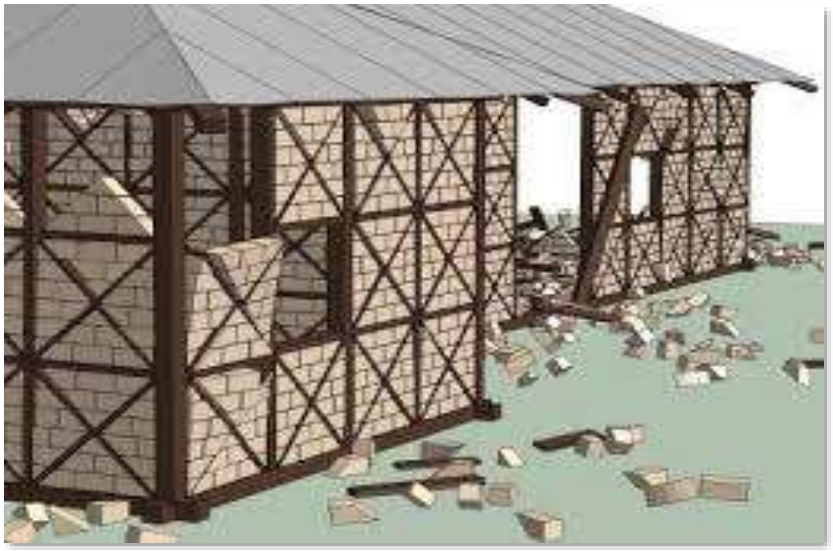

Fig.3 Dhajji Wall

In this construction system, the walls are made of timber frames within-fills of light thin panels made by close packaging of mud mortar, stone and ballast. In case of an earthquake, the small panels distribute the energy evenly.

## 1.3 Detail study

### Social scenario

Another essential facility for any village is Social infrastructure facility which leads to overall development of the village and growth of the villagers and supplementary the growth of the nation. Baben is a village having all the social infrastructure facilities such as schools, colleges, primary health care centers, recreation zones, etc. There are 12 Aaganwadi, 2 primary schools, a college (Engineering college) and a PHC. The above structures can accommodate nearly 6000-7000 students which plays an important role in economic and social development of an individual, village and a country. As these above parameters are considered for the growth of any place, Baben possess these all amenities so it is known as developed village and help other village to have a feeling to be developed.

### Physical and Demographical Growth

An area is considered to be developed when there is improvement in the living standard of the individuals of the villages, availability of transport facilities, education and health care are secured. Baben is the village which possesses utmost things that are needed to be provide as the evidence of the development.

Below mention things are the evidence of the development: -

- Main road and society streets are facilitated with bituminous and R.C.C roads. The roads are facilitated with the sign boards, markings and signals for proper functioning of the vehicular traffic.
- The village is facilitated with more than 40 cameras for providing security to the individual of the village.
- Pure drinking water for morning and evening peak hours is also provided door to door with the help of 6 overhead tanks which range from 40000L-80000L which are cleaned at regular interval to maintain hygienic condition.
- Along with facility of pure drinking water the facility for the removal of wastewater is also provided. Drainage network for the whole town is constructed from door to door and is connected to the main sewage line at Bardoli taluka.
- The garbage collection is also provided to door to door with the help of 3 collecting vans and is given to the Bardoli nagarpalika for disposal and treatment.
- 5 public toilets are also constructed with the help of government grant and by the funds collected from the local resident which had led the people to leave a better life than before.
- 24 hours electricity supply is also provided to the resident of the village by the GEB.

Fig.4 Entrance Gate of Baben Village

Fig.5 Water Tank

Fig.6 Water Tank

Fig.7 Tricycle Waste Collecting Vehicle

Fig.8 Public Toilet

Fig.9 Community Centre

Fig.10 Aaganwadi


Fig.11 24 X 7 Atm Service

Fig.12 Public Health Centre

Fig.13 Camera Monitoring

## Economic Profile

The economic status of Baben gram panchayat is much better as compared to other villages or rural towns. Baben panchayat collect around 2.5 crore rupees as various taxes and funds from the private as well as government sectors. The various sources of income are housing tax, income tax, water tax, electricity tax, fare tax, etc.

**Table 2 Various Taxes Collected by Baben Panchayat**

| Sr No. | Particular | Amount (Rs) |
|---|---|---|
| 1 | HOUSING TAX | 33,65,820 |
| 2 | JILLA PANCHAYAT TAX | 3,66,582 |
| 3 | ELECTRICITY TAX | 85,900 |
| 4 | WATER TAX | 3,00,400 |
| 5 | INCOME TAX EC | 38,85,260 |
| 6 | INCOME TAX RC | 85,400 |
| 7 | CLEANING TAX | 3,50,600 |
| 8 | SALES TAX | 5,15,660 |

## Infrastructure Facility

Similarly, as social infrastructure socio-cultural infrastructure facilities are also essential for any village to compete with the urban area and any village must have all the above-mentioned facilities so that the residents of village or panchayat may not get forced to migrate to the urban areas. Baben is a village that is also provided with the amenities such as playground, library, recreation area. A project named ***AVADH LAKE CITY*** has led the development of the village to a greater extent which is located at the central part of the village.

## 1.4 SWOT Analysis of Ideal Village

- **Strength**
  - Lake site
  - Local business
  - School and colleges
  - Ponds and sidewalks
  - Excellent water quality
  - Easy access to highway
  - Parking facilities
  - Police / fire

- Cleanliness and proper garbage collection facilities
- Proper separation between industrial and residential zone
- Proper sewage disposal facilities
- Proper R.C.C road
- Malls and proper commercial area are provided

➢ **Weakness**

- No facility of club for adults and seniors

➢ **Opportunities**

- Entertainment parks
- Construction of public library
- Redevelopment of vacant land
- Construction of movie theatre
- Private investment has a better scope
- Opportunities for local business

➢ **Threats**

- High commercial rents
- Accident due to rough driving by college student
- Algae in ponds
- Situated near industrial area (KHAND UDHYOG) will cause pollution in village

## 1.5 Future prospects of the ideal village

Baben can be a hub of education and recreation area as it has been developing a new recreational infrastructure project namely ***AVADH LAKE CITY*** which will welcome many more opportunities for the villagers and outsider to invest in business and get growth out of it. From above perspective the main cause of migration from rural to urban is unemployment rate that will be curbed. The above data shows that the unemployment rate of rural India as compare to the urban India is less. Therefore, if there is development provided by the government at the rural India level than there will be multiple opportunities to the people of rural India to engage in rather than they are engage in agriculture only. The unemployment rate in India (rural-urban) 2020-21 are as follows, Urban (7.0%) and Rural (6.2%).

Fig.14 Baben Sugar Factory


Fig.15 Pharmacy College

## 1.6 Benefits of the visit

**Purpose:** To study about the village and collect the information about different amenities that had been provided in village such as drainage system, garbage collection, sewage disposal, etc. and infrastructural facilities of the 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 development. As the visit for the ideal village is allowed it is providing necessary information to the civil engineering student as well to electrical engineering student. In the branch of civil engineering, we can understand about the actual development that a rural area needs to satisfy its basics infrastructure facilities and to compete with the urban area and can implement these techniques and facilities for the development of the villages which actually needs development and can implement same of the other villages for the development which are allotted to us in Vishwakarma Yojana phase- IV as our final year project.
As we visited our selected ideal village we came to known about the process and methodologies it took to Reurbanized itself and the time taken to complete this above action. The Reurbanization of a village will lead to curb the migration from the rural area and urban area. The sarpanch of Baben gram panchayat SHRI. BHAVESH N. PATEL Gave us brief idea about the methods, techniques, strategies that must be used for the development of any village. As Baben has developed a lot during the year 2001 to 2016 we got a good knowledge related to rural development and general infrastructure facilities to be provided in village. Baben can be considered as a benchmark for the development of other villages.

## 1.7 Civil Concept / Method / Usages in The Ideal Village

All the work of the village development is carried out 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. Civil engineering projects are increasingly complex and are associated with situation where robust decisions are required to be taken.


Fig.16 Avadh Lake City

Fig.17 Statue of Sardar Patel

# CHAPTER 2: LITERATURE REVIEW

## 2.1 Introduction: Urban and Rural

### Urban area

Urban areas are a densely populated area built on the need for hourly infrastructure. According to the census of India 2011, the term "urban agglomeration" is defined as an integrated urban area consisting of a core town together with its "outgrowths".
The census of India 2011, defines urban areas as follows:

- All the places with a municipality, corporation, cantonment board or notified town area committee.
- All other paces which satisfy the following criteria:
  1. A minimum population of 5,000.
  2. At least 75% of the male main working population engaged in non-agricultural activities.
  3. A density of population if at least 400 people per sq.km.

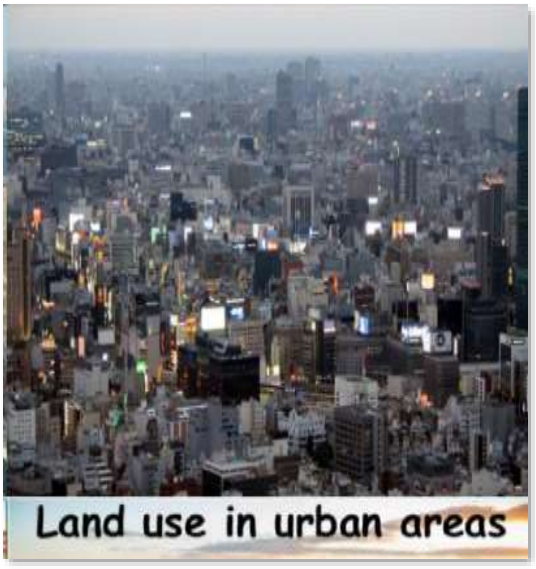


Fig.18 View of Urban Area

### Rural area

According to the planning commission, "a town with a maximum population of 15000 is considers rural in nature. In such villages the governing body is the "panchayat" that looks after the infrastructure well-being of all the villagers"

Rural areas are also known as the 'village' in India. The basic source of revenue and for a household is majorly agriculture. These areas contribute to a large share of India GDP by means of agriculture.
The national sample survey organization (NSSO) defines "rural" as follows:

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

Fig.19 View of Rural Area

## 2.2 Importance of the Rural development

Poverty means the condition where the people basic need is food, shelter, and clothing are not meet. Poverty can be reducing by providing basic facilities to the citizen like:

a) **Education**- Every child must go to school so that children get basic knowledge of life and earn the money. Facilities in education mean teacher, books, schools, etc.
b) **Health-** ill health of a person wills directly effect on working. If his health remains improper than he will not able to work directly and will not be able to get money for survivor.
c) **Employment-** Greater the employment lesser will be the poverty

Various government schemes proposed to eradicate poverty:
Deen Dayal Antodaya Yojana – National Rural Livelihood Mission, Mahatma Gandhi National Employment Guarantee Scheme, National Social Assistance Scheme, Pradhan Mantri Awas Yojana, Public Distribution System, Rashtriya Swasthya Bima Yojana

## 2.3 Ancient Villages / Different Definition of: Rural Area / Villages

Area with low facilities and fewer primary amenities are provided e.g., Water supply, drainage, infrastructure facilities etc. in ancient era the rural area is also known as an area in which a major income source is from agriculture, animal husbandry, poultry farming.
There were also known as the place where from a source of illiteracy has been origin and gender discrimination and castism has been taken birth. As there is a great saying from the legendary freedom fighter MAHATMA GANDHI that **"THE TRUE INDIA LIVES IN RURAL INDIA"**

## 2.4 Scenario: Rural / Urban village of India population Growth

**Table 3 Growth Rate of Population (In Crore)**

| | 1991-2001 | 2001-2011 | DIFFERENCE |
|---|---|---|---|
| **Population in India** | 21.5 | 17.6 | -3.9 |
| **Rural** | 18.1 | 12.2 | -4.19 |
| **Urban** | 31.5 | 31.8 | +0.3 |

## 2.5 Scenario: Rural / Urban India and Gujarat as per Census 2011 (Population growth)

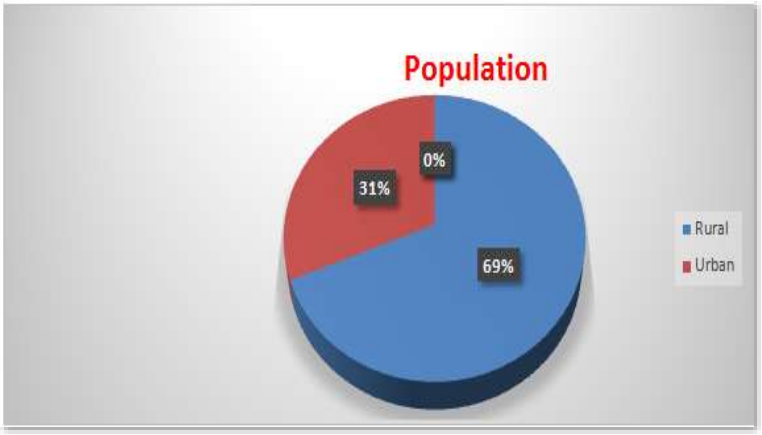


Fig.20 Population Growth (Pie Chart)

For the first time since independence, population growth has been greater in urban areas than 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 72.19% to 68.84%

## 2.6 Rural Development Issues

## Concerns

1. **Poverty**
    - Causes of poverty
        - Unemployment
        - Participation in minority jobs
        - Illiteracy and unawareness
        - Occurrence of natural calamities and disasters
        - Inadequate financial management
        - Borrowing loans
        - Large families
        - Health care needs
        - Migration
        - Participation in other activities
2. **Illiteracy**
    - Causes of illiteracy
        - Lack of financial resources
        - Parental illiteracy
        - Lack of educational facilities
        - Lack teaching-learning methods
        - Lack of interest in studies
        - Transportation problem
        - Shortage of teachers
        - Engagement in employment opportunities
        - Child labor
3. **Unemployment**
    - Causes of unemployment
        - Increased education expectation
        - Lack of basics literacy skills
        - Family and household responsibility
        - Decent work deficit
        - Lack of information
        - Health problems and illness
        - Temporary contracts
        - Skill mismatch
        - Lack of training for work
        - Social restrain upon women

## Measures

Rural development is a national necessity and there are the following steps:

- To develop basic infrastructure like schools, hospitals etc.
- To develop the road and transportation facilities.

- To develop or to provide proper electrification to rural areas.
- To improve or to develop the overall living quality of rural population.
- To provide proper security and facilities provided to urban area.
- To provide crime free and dispute free environment.
- To provide proper fund and finance for the rural development scheme.
- To develop and empower human resource of rural area in terms of their psychology, skill, knowledge, attitude and other abilities.

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

Good governance project is the very important factor for the effective project-based organization key elements in project governance is to address hoe decision rights and accountabilities are disseminated and assigned between the project team and executive.
Governance is the process of decision making and the process by which the decision is being implemented. Component of good governance project:

**Participatory** – it is very key element and need to be inform and organized.

**Effective and efficient** – good governance should process and institution produce result which meet the needs of the stakeholder while making the best use of the resources at their disposal.

**Responsive** – good governance requires that the institution and processes try to serve all stakeholders in a timely manner.

**Follow a rule of law** – good governance requires a legal framework which should be implemented impartially.

### Urban cluster gram panchayat

The ‘Rurban cluster’ can be a group of spatial cities with an estimated population of 25000 to 50000 coastal and coastal areas and with a population of 5000 to 15000 in desert, hilly or tribal areas. Ideally, a collection of villages will follow units of gram panchayat and will be within one block / tehsil for ease of handling

.

### Non-Tribal

For selection of Non-Tribal cluster, the ministry would provide a list of leading sub districts to each state, within which the cluster could be identified. The following are the parameter for ministry for the selection of sub district.

- Decadal growth in rural population.
- Decadal growth in non-farm work force participation.
- Presence of economic cluster.
- Presence the places of tourism and pilgrimage significance.

### Tribal

For identification of tribal clusters, the ministry would select the leading sub districts falling within the top 100 tribal districts of the country, based on the scheduled tribes’ population. The following are the parameter for the selection of sub districts

- Decadal growth in tribal population.

- Current tribal literacy rate.
- Decadal growth in non-farm work force participation.
- Decadal growth in rural population.
- Presence of economic cluster.

## Sansad Adarsh Gram Yojana Gram Panchayat (SAGY)

SAGY a rural development program broadly focusing upon the development ibn the villages which includes social development, cultural development and spread motivation among the people on social mobilization of the village community. The programme was launched by ***PRIME MINISTER OF INDIA, NARENDRA MODI*** on the birth anniversary of ***JAYPRAKASH NARAYAN*** on ***11 OCTOBER 2014.***

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

Most households in rural developing countries do not have access to modern energy supply. Household level biogas energy was considered as an option but failed due to lack of sufficient resource for its installation and operation. A community energy system can be an option, but most studies focused on off-grid electricity. This energy system cannot be a realistic option particularly for cooking demand. An efficient and suitable system matching local resource and demand expectation needs to be developed which this study focuses on assessing. Biogas and solar energy technologies are viable to establish such kind of system since they can be a realistic option particularly for cooking demand. An efficient and suitable system matching local resources and demand expectation needs to be developed which this study focuses on assessing. Biogas and solar energy technologies are viable to establish such kind of a system since they can be converted to different forms of energy. Therefore, this study aims to determine efficient biogas and solar energy production and utilization options for small scale village energy application in rural Ethiopia.

## Methods:

The efficiencies of the production and utilization options are determined based on the system configurations involving resource, conversion, and utilization combination models. We used local resources, data, and relevant literature information for the system analysis.

## Results:

The analysis shows that most energy is needed in the form of heat for cooking and a smaller part in the form of electricity (about 10%). The community waste stream converted to biogas will be enough for cooking, but not enough biogas is left to produce enough electricity. Co-digesting altogether provides biogas that can meet only about 75% of the electricity demand. Concentrated solar cookers can be an alternative for cooking in areas where installation of biogas is not possible. About 2-m2size solar concentrator is sufficient to meet each household's cooking energy demand. The lighting and appliance energy demand can be met with photovoltaic (PV) energy produced with reasonably sized panels. However, the use of electrical energy for cooking produced with PV cannot be an economic option with the available technologies.

## Conclusions:

The community energy system involving anaerobic co-digestion (biogas) and/or solar energy technologies is viable to meet the demand when efficient production and conversion is made based on specific local resource supply and demand.

## 2.9 Other Projects / Schemes of Gujarat / Indian Government

## Scheme by government sector:

The nine schemes of rural development in India which organized by government are as follows: 20-point program, integrate rural development program (IRDP), training rural youth for self-employment, food for work program, national rural employment program, rural landless employment guarantee program (RLEGP), jawahar rozgar yojana (JRY), antodaya Yojana, MGNREGA.

## Some other scheme:

Pradhan mantra Adarsh gram sadak Yojana (PMAGSY), bharat nirman yojana, Indira awas Yojana, Jawaharlal Nehru national urban renewal mission (JNNURM), rajiv awas Yojana, national rural health mission, national rural livelihood mission, national food security scheme.

## Scheme by private sector:

The nine companies that are finally short listed are in the area of infrastructure development with strong rural and community mobilization experience either directly or through their consortium partners. These companies include big names like:

- Jindal steel & power ltd.
- IL&FS limited
- Infrastructure Kerala limited
- Marg ltd.
- Buldana urban cooperative society ltd.

Mainly two schemes provided by private sector are

- Providing Urban Amenities in Rural Areas (PURA)
- Rurban Mission

# CHAPTER 3: SMART CITIES AND VILLAGE CONCEPT AS PER YOUR AND IT'S VISIT

## 3.1 Introduction: Concepts, Definitions and Practices

### Concepts:

The main smart villages concepts are to provide maximum facility with sustainable development, which act as the catalyst for the development. It's also important to provide the good quality of education and access to clean drinking water with that it is also important to increase production of good and income, security, gender equality and democratic engagement also play an important role in smart villages.

**GIFT (Gujarat international finance tech city) aims at providing transportation network which ensures accessibility, easy& fast mobility and zero road accidental deaths. This would be achieved by:**

Using multimodal mix transport system (MRTS/LRTS/BRTS, etc.) for both interregional states and intra city. Using walk to walk concept as part of urban planning with a nodal split of 10:90 between private and public transport. Use of electric personnel rapid transport system within the city. In future, city will be linked with Ahmedabad BRTS, operated by Ahmedabad Janmarg Ltd.

### Definition:

A city well performing in a forward looking way in economy, people, governance, mobility, environment, and living, built on the smart combination of endowment and activities of self-decisive, independent and aware citizens. A city that monitors and integrates condition of all of its critical infrastructures, including roads, bridges, subways, rails, airports, etc.

### Practices (civil)

Practices of smart village in allocated village

#### Transportation practice

The benchmark set for smart village in transportation sector is that "maximum travel time of 30 minutes in small & medium size cities and 45 minutes in metropolitan area" therefore the village which is allocated is just 40 to 45 min to the Surat city.

#### Water supply facilities practice

As per bench mark water should be supply for 24 hours. But the allocated village was trying to supply the water to the benchmark but it was reaching to 6 hours supply only.

#### Electricity practices

E bench marks say that electricity supply should be provided for 24 hours and it should be 100% metered. Allocated village has done it very efficiently by providing 24 hours supply and around 95% meter. And have availability of high-tension line passing through near village and are provided with the proper maintenance of the electricity services and they had made complete efforts for implementation of 24 hours electricity development plan.

## 3.2 Vision-Goals

### Vision:

- Homes for all.
- Skill and village enterprise development with bank and market linkages gave more flexible access to youth.
- Provide solid/liquid waste management system.
- Prevent all maternal deaths.
- Zero school drop outs of boys and girls.
- Malnutrition fee.
- No child marriages.
- Every villager has three bank account.
- Tree plantation program.
- Functional water harvesting and conservative structure.
- Functional information center, computer lab.

### Goal:

- Smart building- security camera, fire safety, electricity management.
- Smart dairy- removes supervision and monitoring in open fields and barns.
- Smart farming- satellite data for farm activities.
- Smart agriculture- smart equipment for crop production.
- Smart weather and irrigation- weather forecast, water level in dams.
- Smart health care- smart beds and equipment to monitor patient.

### Standard and performance measurement indicators.

The maturity of the smart city and the simulation model is designed to capture the key elements of the city's transformation journey into a smart city. A smart city with a high level of community and citizen engagement, with its business appeal and efficient and sustainable urban performance. The model allows the city to quickly assess its strengths and weaknesses in five areas of magnitude related to the city's intelligence and to set clear goals for how it wishes to transform in the next two to five years.

## 3.3 Technological Option

### Technological option for smart cities:

People are increasingly migrating from rural to urban areas by 2050 about 86% of the people in developed countries and 64% of people in the developing countries are expected to live in cities. Because cities will absorb future population growth, it is crucial to use resource more efficiently. How will smart cities ideology will make the urbanization process as smooth as possible.

1. **Smart energy:**
   The Smart energy system will monitor and control energy consumption to effectively manage and conserve energy. Cisco estimates that knowledgeable cities can improve their performance by 30% within 20 years. By using renewable energy sources, managing the

water supply and having a waste management system in place, cities can reduce pollution and use less energy.

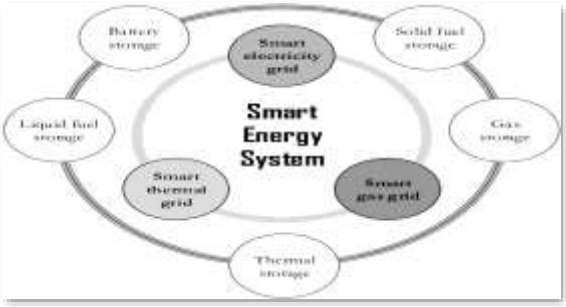


Fig.21 Smart Energy Diagram

2. **Smart mobility:**
Smart mobility endeavors to find more sustainable conveyance options. Deloitte reported than an average American stuck about 34 hours in traffic every year. With rapidly growing cities, new transportation solution needs to be developed to keep mobility dynamic.

Fig.22 Smart Mobility

3. **Smart infrastructure**
Infrastructure creates the fundamental for all smart solution by using new technology to convert raw data into information, urban and regional development can be planed and designed to the future demand. Also, existing system can be improved by analyzing data from sensor, traffic patterns and tracking system.


Fig.23 Smart Infrastructures

## 3.4 Road map and safe guards

A smart city roadmap consists of four/three major components. Study the public; before determining to build a smart city, first we want to know why. This can be done by defining the benefits of such an initiative. Study the community to know the citizens; the business needs- know the citizen and the community unique qualities, such as the age of the citizens, their education, hobbies, and attraction of the city.
Develop a smart city policy: develop a policy to drive the initiative, where roles, responsibilities, objective and goals can be defined. Create plans and policies on how the goals will be attained.
Engage the citizens: this can be done by engaging the citizen through the use of e-governance initiative, open data, sport event, etc.

## 3.5 Issues & challenges

## Urban water and sanitation challenges

More than 90%of the urban inhabitants has access to drinking water, and more than 60% of the inhabitants has access to basic sanitation. However, access to dependable, sustainable and reasonably priced water supply and sanitation service is lagging behind. Are the services reliable? No Indian city obtains piped water 24 hours a day, 7 days a week. Piped water is never supplied for more than a few hours per day, irrespective of the quantity available. Raw sewage often runoffs into open drains. Are the Amenities Technically and Financially Sustainable? Less than 50% urban inhabitants have access to piped water. Poor decision-making and financial self-sufficiency, limited answerability, weak cost recovery, perverse incentives and limited capacity has led to poor amenities to customers across the country. Urban India is at the lowest of most international measures of performance.

## Role of Indigenous technologies

The BARC is playing a pivotal role in the development of technologies. Some of these technologies are as follows:

## Environment friendly Plasma technologies:

Solid waste dumping spots or landfill sites need extra amount of land which is not available in urban areas. Incineration of solid waste pollutes the environment if the incinerators are not designed or operated properly. Thermal Plasma Technology is in an ideal world suited for waste treatment. By plasma technology Hazardous & toxic compounds are broken down to elemental constituents at high temperatures; Inorganic materials are converted to vitrified Mass; and Carbon-based materials are Paralyzed or Gasified, transformed to flue gases (H2 & CO) & Minor hydrocarbon gases when operated at low temperature (500 – 600OC). Disposal of carcass is also being thought of using plasma paralysis.

## Unique Multi Stage Biological Treatment Solution:

Multi Stage Biological Treatment Solution (MSBT) can be applied on existing STP which is not able to process Sewage to optimal effectiveness. MSBT can be implemented as a modular or container on the banks of rivers on Drains/Naas which discharge waste water to the river. It can also be fixed in small urban societies and housing complex for better water management. Benefits of MSBT are: No Surplus of Organic Sludge, No Odor problem, drastic reduction of Electrical Power usage which minimizes operating costs, no need for return sludge pumping (minimizing electromechanical component which ultimately reduces operating cost).

## Indigenous water purification technologies:

This technology can improve the quality of drinking water in small towns and cities. Uses Pressure-Based Membrane Processes. This is suitable for all volume units e.g.; they can vary from a home level unit or a community unit to a larger level. Water purification technology uses nuclear energy and solar energy as well.

## Radiation Hygienization of Municipal Sewage Sludge:

Sewage is wastewater that is produced indoors and contains a lot of human waste. It contains 99.9% water and is about 0.1%. Solid waste disposal environment is natural and is disposed of in wastewater plants leading to sewage as a product. In the process of dry Radiation Hygienization sludge produced by STP's is purified using radiation technology using a standard Gamma Dose of 10 kgs. Such radiation plants operate in India to produce medicinal products

## Refuse Derived Fuel: An Evolving Processing Technology in MSWM:

Refuse Derived Fuel (RDF) is a processed form of Municipal Solid Waste (MSW) and it can be an auxiliary to coal energy. The process of translation of garbage into fuel pellets involves primarily Drying, Separation of fire-resistant, Size reduction and Pelletisation. Jobs for teachers will also be increased has the Teacher to Student ratio will also increase. Like Teachers, health is also a crucial issue. Other jobs like infrastructure and urban planner and also small-scale jobs like sweepers and many other labour-oriented jobs will also be created.

## 3.6 Smart Infrastructure - Intelligent Traffic Management

- In modern times, the number of vehicles has increased dramatically, but in contrast, the capacity of our roads and transportation systems has not improved and as a result, they are failing to cope with this increase in the number of vehicles.
- As a result, traffic congestion, road accidents, and pollution levels are just some of the common denominators in our new cities.
- With the advent of the Internet of Things and its operations in Smart Cities, it created a complete platform to deal with road-related problems, leading to the establishment of Intelligent Traffic Management Systems (ITMS).

- Smart vehicle control system that lays its foundation for Cloud computing, Internet of Things and Data Analytics.
- This system helps to solve many of the challenges facing traffic management authorities, in terms of predicting the right route, reducing waiting times, traffic congestion, travel costs and the amount of air pollution.
- The program aims to use machine learning algorithms to predict major routes based on traffic stimulus patterns, vehicle classification, accident occurrence and rainfall levels.
- Finally, the system comes up with the idea of a green passage, where emergency services are allowed to travel without dealing with any type of traffic congestion.

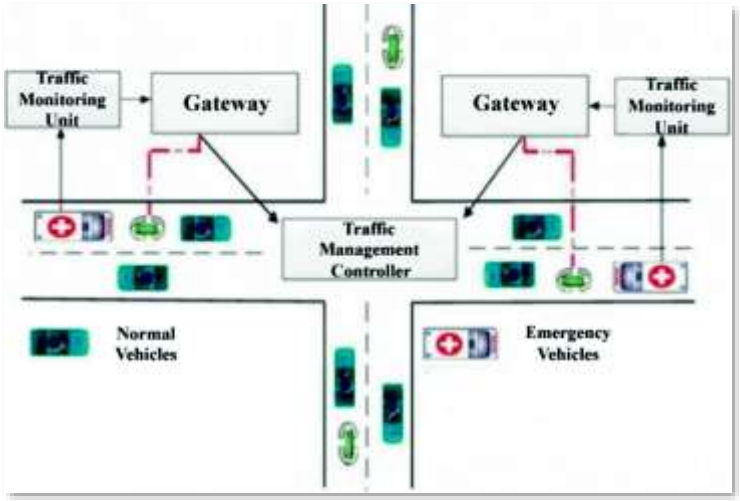


Fig.24 Intelligent Traffic Management

## 3.7 Cyber Security

Cyber security in the context of Smart Cities is a hot topic. The goal of Smart Cities is to grow the city in a flexible way to provide a better life for its citizens through information and communication technology (ICT). The range of areas where cities can be more sophisticated: is the emergence of ―Connected cities‖ and the spread of data exchange on a large scale. The increase in data exchange controls many services and assets leading to more automation in the city. With several critical services connected, the need for cyber security surges to protect data exchange, privacy and the health and safety of citizens. However, there is currently no standard or standardized model for this data exchange. This leads IPT operators, municipalities, policy makers and manufacturers, solution providers and vendors to find specific low-cost solutions and different needs. As cyber security is paramount in Digital India and the Smart City Concept note highlights an intelligent grid that will be able to withstand cyber-attacks, the National Cord Liaison Center is established by the Government of India. Also, the National Cyber Safety and Security Standards have been implemented with a view to protecting the country from current threats on the Internet, conducting research to understand the nature of cyber threats and cybercrime by assisting a common platform where experts will provide effective solutions to complex and alarming social issues. for cyber security.

New strategies and processes are being developed to address and prevent the growing complexity of Global Cyber threats facing countries around the world. The 2013 National Safety Policy has been released with an umbrella framework for viding guidance on cyberspace-related safety

activities, by the Department of Information Technology (DeitY). The Working Group on Information Technology established under the Planning Commission has also published a 12-year plan for IT development in India with a roadmap for cyber security, outlining six key issues that will focus on cyber security including: Enabling the Legal Framework; Security, Compliance and Verification Policy; R&D security Incident - Warning and early response; Safety awareness, skills development and training, and Partnerships.

## 3.8 Retrofitting- Redevelopment- Greenfield Development District Cooling

## Retrofitting

The reorganization of building-related structures, including the renovation, maintenance and strengthening of the building, is not only a requirement for construction and management in urban areas, but also an emerging problem for building engineers in the property management sector. Retrofitting is defined as the process of transforming existing buildings such as buildings, bridges, heritage buildings to make them more resistant to earthquake activity and other natural disasters.

## Redevelopment

Redevelopment is the process to convert the existing obsolete structure to the new and upgraded structure.

## District Cooling and Heating

District energy allows whole towns and city areas to be supplied with heating and cooling energy, and power, via underground energy distribution systems. Connection to a district energy network removes the need for boilers, chilies and plant rooms and a range of fossil and renewable fuel-based generating plant can be used to supply the system.

## 3.9 Strategic Options for Fast Development

**Major programs in agriculture**

- National agricultural development program
- Accelerated irrigation benefit program
- Fertilizer subsidy
- Bank loans, free electricity

**Major program to improve employment**

- Public distribution system
- Mahatma Gandhi national rural employment

**Guarantee scheme**

- National food security bill

**Major program and partnerships to improve nutrition security**

- Mid-day meal scheme
- Integrated child development scheme (ICDS)
- Senior citizens
- The nutritional program for adolescent girls
- Emergency feeding program

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

More than 90% of urban folks have access to drinking water, and more than 60% of the inhabitants has basic sanitation. However, access to dependable, sustainable, and affordable water and sanitation services is lagging behind. Are Services Consistent? No Indian city has access to piped water 24 hours a day, seven days a week. Tap water is never distributed for more than a few hours a day, regardless of the amount available. Raw sewage often overflows into open ditches. Are Services Technically and Financial Sustainable? Less than 50% of urban people have access to piped water. Non-Revenue Water (NRW: due to leakages, illegal connections, inadequacies and charges, etc.) Largely, approximately 40-70% of the water is still distributed.

## 3.11 Initiatives in village development by local self - government

Government operations can be divided into National, State and Local. Local autonomous governments are those bodies accountable for the management of a place or small civic such as a place, city or town. These bodies are appointed by the Government to represent the local civic, which increases its revenue slightly through local taxes and other measures. Local Government can be divided into different categories such as Corporations, Cities, Municipalities and Panchayat Town on a people-based basis. The management system has three levels: district, block and district. Panchayat functions at the village level. The Panchayat of India is a local body that works for the welfare of the village. Build from 7 to 31 members. However, it may have more than 31 members but not less than 7. Panchayat is a form of Indian political structure that includes five neighboring villages known as panch. The main managerial units in Panchayat glorify gram panchayats. The members of the Panchayat are known as the "panch", taking decisions about conflicts between rural and rural people. According to the Indian constitution, the Panchayat has the authority to act as an independent body. Panchayat has played a key role in the management of rural areas in India.

The Local Self Government is authorized to discharge certain compulsory functions like;

- Supplying safe and clean drinking water,
- Imparting and maintaining proper drainage and sewage systems,
- Pro viding public street lighting,
- To keep up sanitation and hygiene of public places.

## 3.12 Smart initiatives district municipal corporation

Objectives for an advanced & modern Solid Waste Management

- To provide a system of storage of waste and separation of recyclable waste at source.
- To improve system of primary collection of waste.

- To provide more efficient system of day-to-day cleaning, conventionally and mechanically.
- To provide system to eliminate practices of throwing garbage on the road causing nuisance & health threat.
- To modernize the system of civic waste storage & harmonize the system of primary collection as well as transportation of waste.
- To eliminate manual management of waste and open transportation vehicles.
- To improve the system of transportation of waste by ensuring "handling waste only once".
- To construct four more semi close body transfer station to strengthen the existing primary collection-transportation and secondary conveyance system.
- To reduce quantity of waste going to landfill site by adopting suitable technology.
- To Land to be acquired for another landfill disposal site.
- To derive income from the processing of waste.
- To ensure safe discarding of waste including bio-medical wastes.
- To do institutional strengthening.
- To have public involvement.

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

### Government projects

Name of Authority - National Highways Authority of India (NHAI)
Name of Contractor - Unique Construction
Project Name - Road up gradation (Kamrej-Chalthan) Project
Project Brief - The project envisions six laning of Kamrej-Chalthan section from 248.10 km to 264.35 km of NH-8 with long term curative measures for four black spots on Kamrej Bharuch section of NH-8.
Sector - Transportation
Sub-Sector - Roads and bridge
Project Status - Pre-construction Phase

### NGO list

Vatsalyapuram Orphanage NGO, Nature club, Janki jivdaya charitable trust, Bhansali trust, Lions club og surat north, Shri goverdhan trust, Disable welfare Trust of India, etc.

### Digital country concept

**Digital India** is a campaign launched by the Government of India with the aim of safeguarding that Government services are available electronically to citizens through improved online infrastructure and by escalating Internet connectivity or by making the country more economically empowered in the technology sector. This program includes programs to connect rural areas through fast internet networks. Digital India has three key elements: building a secure and stable digital infrastructure, delivering digital government services, and digital numeracy, launched on July 1, 2015 by Indian Prime Minister Narendra Modi, empowering and helping other key Government Schemes in India, such as India, Barat Net, Make Start-up India and Stand-up, industrial corridors, Bhararatmala, Sagarmala. As of 31 December 2018, India has 130 crore (1.3 billion) people, 123 crore (1.23 billion) Aadhaar digital biometric ID Identities, 121 crore (1.21

billion) mobile phones, 44.6 crore smart phones (446 million), 56 crore (560 million) internet users from 481 million people (35% of the world's population) in December 2017, and 51 percent growth in e-commerce.

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

After the government led by Prime Minister Narendra Modi at the institute announced its plans to develop 100 cities, various countries have been compiling a list to help India achieve its goal. While 98 cities have so far been shortlisted for development, two more names will be announced later. Of those, 20 cities selected for 2015-16 will be funded in the first round.

**The nations that have promised their support to make Indian cities smart:**
Singapore has expressed its interest in helping India achieve its ambitious dream of developing all 100 smart cities. It offered to help develop Amravati, the new capital of Andhra Pradesh as a smart city. The country is also looking to revitalize engineering and improve the transport sector and rehabilitate the old Indian city. Canada has offered to help provide solutions to housing problems by providing multi-storey housing units. Japan has signed an agreement with India to develop Varanasi as a smart city. Germany has also registered with India to develop Bhubaneswar (Odisha), Kochi (Kerala) and Coimbatore (Tamil Nadu). The US 'United States Trade and Development Agency (USTDA) has signed an agreement to develop Visakhapatnam (Andhra Pradesh), Allahabad (UP) and Ajmer (Rajasthan) as smart cities. Spain has proposed cooperation with India in building smart cities. Spain's Barcelona Regional Agency has expressed interest in exchanging technology with India. France has announced that two billion euros have been invested in India to develop three cities - Chandigarh, Puducherry and Nagpur - as smart cities. The UAE is committed to investing in the Smart City Project of India. A MoU has been signed between FICCI and the Federation of UAE on industrial relations and unity between India and the UAE. China has expressed interest in developing Pune as a smart city. $ 2.5 billion will be invested in city solutions and security projects. Sweden, Israel, the Netherlands, the United Kingdom and Hong Kong have also shown interest in investing in India in developing smart cities. The British High Commission has expressed interest in the city of Belgavi and recommended that improve the day-to-day supply of drinking water in the city. Italy has shown interest in the concept of a smart city and decided to invest $ 1.2trillion over the next 20 years in its plans. Italian companies will contribute to the construction and technology of smart cities, with services ranging from consultation to infrastructure construction itself.

## 3.15 Electrical concept

Smart villages are a steady supply of electricity and access to clean and efficient cooking equipment. Manufacturing industries and high-energy resources will often be found in the valleys provided by the national grid if they are close enough or - in many remote communities - to local mini-grids driven by renewable energy sources, perhaps in the form of a hybrid with diesel generators in some cases. The more scattered communities around these valleys will use pico-power and stand-alone systems to provide basic levels of power supply until distribution networks are available.

# CHAPTER 4: ABOUT RAJGARI VILLAGE

## 4.1 Introduction – Rajgari

Area located in rural region of Surat district of Gujarat. According to the administrative records, the village code of Rajgari 524173. The village has 318 household. According to census 2011, Rajgari's population is 1300. Out of this, 716 are males whereas the females count 584 here. This village has 124 kids in the age group of 0-6 years. Rajgari is a village in Chorasi taluka in Surat district of Gujarat state, India. The native language of Rajgari is Gujarati and most of the villagers speaks Guajarati. Rajgari people use Guajarati language for communication. Rajgari village is located in the UTC +5.30 time zones and it follows Indian standard time (IST).

## 4.1.2 Justification/ need of the study

By this Vishwakarma Yojana project, government wants technical solution of the problem of village at the engineering point of view. In this project, the common problems of village are solved by the engineering student. The basic need of rural development program has been alleviation of poverty and unemployment through creation of basic social and economic infrastructure, provision of training of rural unemployed youth and providing employment to marginal farmers/ laborers to discourage seasonal and permanent migration to urban areas. Through various government departments are involved in various infrastructural development works, a holistic view and modern solutions (aesthetic, vastushastra, etc.) can be provided by new engineers under Vishwakarma Yojana. Study of villages is done by the students with this view. 54% of India's population is below 25 years and most of them in rural areas with very little employment opportunities. Literacy is the major problem in rural development program.
Everyone wants to go to the cities, so that rural people remain as ignores part by the policy makers also. Privatization concept is useful for rural development buy, government not paying much attention to this aspect. To reduce this migration in this area focus is essential.

## 4.1.3 Study area

Rajgari is a village in a Chorasi taluka in Surat district of Gujarat state, India. The native language of Rajgari is gujarati and most of the village people speak gujarati. Rajgari people use gujarati language for communication. Rajgari village is located in UTC +5.30 time zone and it follows Indian standard time (IST). Area located in rural region of Surat district of Gujarat. According to the administrative records, the village code is 524173. Its geographical co-ordinates 21.1862° N, 72.6447° E. the other nearest state capital from Rajgari is Surat and its distance are 22 KM. total area of village is 350.83 hectares.


Fig.25 Map of Rajgari

### 4.1.4 Objectives of the study

To fulfill common requirement like drinking water, drainage system, transport system, improve living standard of people. To manage growth through good planning and appropriate development controls, reduce migration rural to urban areas due to lack of basic services and sufficient economics activities in rural areas. Electricity connection like street lighting that is energy efficient and eco-friendly. Health and education facilities should be provided and ensure proper delivery of facilities to village dwellers. Repairs & maintenance of existing public building like gram panchayat, public library, school buildings & others.

### 4.1.5 Scope of the study

Rural development aims at improving rural people livelihood in an equitable and sustainable manner, both socially and environmentally, through better access to assets and services, and control over productive capital that enable them to improve their livelihood on a sustainable and equitable basis. Design, develop and provide more efficient and sustainable electricity in rural area for providing better connection of electricity in rural areas by utilizing each resources maximum which comes with developing and using sustainable and economic planning and designing.

### 4.1.6 Methodology framework for development of your village

**Collection of data**

- Population data (as per census)
- Literacy or illiteracy
- Socio economic status
- Family composition

**Household information**

- Occupation data
- Basic amenities
- Family composition
- Facility of water

**Solid waste management**

- Amount of waste generated
- Method of collection
- Disposal of solid waste

**Transportation data**

- Number of main roads
- Number of approach road
- Types of road

Fig.26 Village Road

## 4.1.7 Available Methodology for development related to Civil

The existing structures available in the villages that help us in deciding the designs

- Water tank
- Roadways
- Gram panchayat
- Community hall
- Canal
- School
- Aaganwadi
- Post office
- Underground water tank
- Cricket ground

## 4.2 Study Area Profile

### 4.2.1 Study Area Location with brief History land use details

Rajgari is a village in a Chorasi taluka in Surat district of Gujarat state, India. The native language of Rajgari is gujarati and most of the village people speak gujarati. Rajgari people use gujarati language for communication. Rajgari village is located in UTC +5.30 time zone and it follows Indian standard time (IST). Area located in rural region of Surat district of Gujarat. According to the administrative records, the village code is 524173. Its geographical co-ordinates 21.1862° N, 72.6447° E. the other nearest state capital from Rajgari is Surat and its distance are 22 KM. total area of village is 350.83 hectares

### 4.2.2 Base Location map, Land Map, Gram Tal Map

Refer figure number 25 i.e., map of Rajgari

### 4.2.3 Physical & demographical growth

Rajgari is a small size village located in Chorasi of Surat district, Gujarat with total 318 family residing. The Rajgari village has population of 1300 out of which 716 are males and 584 are females as per census of India 2011. In village population of children with age 0-6 is 124. Rajgari village has high literacy level rate compared to Gujarat. Rajgari village male literacy stands at 96.01% while female literacy rate stands at 87.24%.

**Table 4 Demographic Details of Rajgari Village**

| Particulars | Total | Male | Female |
|---|---|---|---|
| **Total No. of Houses** | 318 | - | - |
| **Population** | 1,300 | 716 | 584 |
| **Child (0-6)** | 124 | 65 | 59 |
| **Schedule Caste** | 5 | 2 | 3 |
| **Schedule Tribe** | 4 | 2 | 2 |
| **Literacy** | 92.09 % | 96.01 % | 87.24 % |

### 4.2.4 Economic generation profile / Banks

There was only one bank has been established and that also from the help of CSR fund. The main professions of the villagers are farming and animal husbandry.

### 4.2.5 Actual problem faced by villagers and smart solution

Due to lack of infrastructure facilities like public dispensary, police choky, common service center, public toilet, and garbage collection mechanism. People are migrating from their village to other

cities. By providing the above-mentioned infrastructure facilities there will be minimization of the problem of the villagers.

**Social scenario**

In social infrastructure there is good delivery of education through primary schools and Aaganwadi but there is lack of health facilities in the village.

**Educational facilities**
Aaganwadi for free education of the children
Primary school – 1 to 8 standards only
Higher secondary schools – Not available
College – Not available

**Health facilities**
Primary health center was **not** provided under Ayushman Bharat scheme

## 4.2.6 Social scenario -Preservation of traditions, Festivals, Cuisine

**Tradition**
Marriage songs, Nachnu (folk dance)

**Festival**
All the Hindu festival

**Cuisine**
Dhokla, Bhadku, Bafanu

## 4.2.7 Migration Reasons / Trends

Due to lack of infrastructure facilities like, health services, sustainable development programs and economic facilities, people are not getting work in village and due to insufficient educational facilities people are migrating from village to other cities.

## 4.3 Data Collection

## 4.3.1 Method for data collection

- Direct communication
- Government websites
- Communication with the villages
- Views of sarpanch
- Data from Talati
- Self-observation

### 4.3.2 Primary survey details

- No health care center
- Primary school – No.1 standards 1 to 8
- Water tank – both elevated and underground water tank
- Aaganwadi – No.2
- Community hall – without TV
- Post office
- Panchayat office

### 4.3.3 Average size of the House - approx. 4

Geo-Tagging of House – There is no geo tagging is done in our village.

### 4.3.4 No of Human being in One House - average 4

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

Material available locally -wood, Cow dung.
Out Sourced Material - cement, RCC

### 4.3.6 Geographical detail

Rajgari is a village in a Chorasi taluka in Surat district of Gujarat state, India. The native language of Rajgari is gujarati and most of the village people speak gujarati. Rajgari people use gujarati language for communication. Rajgari village is located in UTC +5.30 time zone and it follows Indian standard time (IST). Area located in rural region of Surat district of Gujarat. According to the administrative records, the village code is 524173. Its geographical co-ordinates 21.1862° N, 72.6447° E. the other nearest state capital from Rajgari is Surat and its distance are 22 KM. total area of village is 350.83 hectares

.

### 4.3.7 Demographical Detail - Cast Wise Population Details

Rajgari is a small size village located in Chorasi of Surat district, Gujarat with total 318 family residing. The Rajgari village has population of 1300 out of which 716 are males and 584 are females as per census of India 2011. In village population of children with age 0-6 is 124. Rajgari village has high literacy level rate compared to Gujarat. Rajgari village male literacy stands at 96.01% while female literacy rate stands at 87.24%.

**Caste Wise Population Details**

The caste wise population available in the village are 5 & 4 schedule caste and schedule tribes respectively

### 4.3.8 Occupational Detail - Occupation wise Details / Majority business –farmers, animal husbandry, aquaculture.

**4.3.9 Agricultural Details / Organic Farming / Fishery –** fenugreek (methi), green garlic, promphet, prawns.

**4.3.10 Physical Infrastructure Facilities - Manufacturing HUB / Ware Houses –** As a village is under red line there are no industrial infra like ware house, etc.

**4.3.11 Tourism development available in the village for attracting the tourist –** There is tourism spot in nearby village like beach and water park but not in our village.

## 4.4 Infrastructure details

**4.4.1 Drinking Water / Water Management Facilities -** only domestic water supply through overhead water tank and underground water tank.

**4.4.2 Drainage Network / Sanitation Facilities -** underground drainage provided.

**4.4.3 Transportation & Road Network -** village roads, main road, internal streets.

**4.4.4 Housing condition -** Village have quite good houses made mostly pukka house and rarely any kuccha house.

**4.4.5 Social Infrastructure facilities, Health, Education, Community Hall, Library**

**Table 5 Infrastructural Details**

| Infrastructure facilities | Details |
|---|---|
| **Health** | 0 PHC |
| **Education** | 1 Primary school & play group |
| **Community Hall** | 1 without Television |
| **Library** | No |
| **Aaganwadi** | 2 |
| **Water tank** | 3 |

**4.4.6 Existing Condition of Public Building & Maintenance of existing Public-** The condition of post office and panchayat building both were in good condition.

**4.4.7 Technology mobile / WIFI/ Internet usage details –** Available due to proximity to the industrial zone and harbor.

**4.4.8 Sports Activity as Gram Panchayat –** As a sport infra by gram panchayat there is no infra but as a private there are volley ball court and lots of cricket ground.

**4.4.9 Socio-Cultural Facilities, Public Garden /Park/Playground /Pond/ Other Recreation Facilities -** community hall renovated recently, chab chabba chab water fun park, cricket ground.

**4.4.10 Other Facilities –** Apart from above given facility there is no extra facility available in the village.

**4.4.11 Any other details –** Apart from above given facility there is no extra detail available.

## 4.5 Electrical Concept

### 4.5.1 Renewable energy source planning particularly for villages

There is no renewable energy source available in village.

### 4.5.2 Irrigation Facilities

Rice, vegetables & wheat are agriculture commodities grow in this village. Villagers depend on pond and rainwater for irrigation.

### 4.5.3 Electricity Facilities

Village has the 24*7 electricity in the all the houses of the village, and electricity is provided by the GEB.

## 4.6 Existing Institution like - Village Administration – Detail Profile

**4.6.1 Bachat Mandali –** Such a concept not yet touched the village.

**4.6.2 Dudh Mandali –** Such a concept not yet touched the village.

**4.6.3 Mahila forum –** Such a concept not yet touched the village.

**4.6.4 Plantation for the Air Pollution –** These kinds of activities done by some social group like swadhaya parivar.

**4.6.5 Rain Water Harvesting –** As this is not yet developed in village so fulfill that entire design is dedicated in chapter 8.

**4.6.6 Agricultural Development -** people are using traditional methods for the agricultural purpose. Increase in productivity of crops but rate of increase.

**4.6.7 Any Other –** Above given information are what is available there is no other institution in village.

Fig.27 Aaganwadi

Fig.28 Elevated Water Tank

Fig.29 Community Hall


Fig.30 Underground Water Tank

Fig.31 Well

Fig.32 Primary School

Fig.33 Gram Panchayat Office

# CHAPTER 5: TECHNICAL OPTIONS WITH CASE STUDIES

## 5.1 Concept (civil)

### 5.1.1 Advance Sustainable construction techniques / Practices and Quantity Surveying

### Cool Roofs

Cool roofs are one of the sustainable green design technologies that aim at reflecting heat and sunlight away. It helps in keeping homes and buildings at the standard room temperatures by lowering heat absorption and thermal emittance. The cool roof design makes use of reflective paints and special tiles that absorb less heat and reflect most of the solar radiation by reducing temperatures as much as 50 degrees Celsius during summer. Cool roofs also help minimize the dependence on air conditioning and, in turn, reduce energy use, which leads to decreased cumulative greenhouse gas emissions from power plants.

### 5.1.2 Soil Liquefaction

Liquefaction is a phenomenon in which the strength and stiffness of a soil is reduced by earthquake shaking or other rapid loading. Liquefaction and related phenomena have been responsible for tremendous amounts of damage in historical earthquakes around the world. Liquefaction occurs in saturated soils, that is, soils in which the space between individual particles is completely filled with water. This water exerts a pressure on the soil particles that influences how tightly the particles themselves are pressed together. Prior to an earthquake, the water pressure is relatively low. However, earthquake shaking can cause the water pressure to increase to the point where the soil particles can readily move with respect to each other. When liquefaction occurs, the strength of the soil decreases and, the ability of a soil deposit to support foundations for buildings and bridges is reduced.

### 5.1.3 Sustainable Sanitation

Sustainable sanitation aims at overcoming these drawbacks. It is not a certain technology, but an approach with certain underlying principles. There are a number of technologies (see for instance sanitation systems) that can be used to make sanitation and wastewater management more sustainable. The term “sustainable sanitation” in principle denominates the same as ecological sanitation, though the latter has a stronger focus on source separation. The first and foremost principle is probably the one to recognize that excreta and wastewater are not a waste, but a valuable resource that can be reused and recycled. This is actually — to speak in a simplified way — the very basis of sustainability: to use resources wisely and without impairing the possibilities of future generations to meet their own needs. To summarize, sustainable sanitation is a simple approach: the most basic principle is that it considers wastewater and excreta not as a waste, but as a resource, that sanitation has to be socially acceptable and should be as economically viable as possible. There is no “one-fits-all” approach, much rather, the most adequate solution has to be

found from case to case, considering climatic conditions, water availability, agricultural practices, socio-cultural preferences, affordability, safety, and technical prerequisites — just to name a few.


Fig.34 Sustainable Sanitation

### 5.1.4 Transport Infrastructure / System

Transport infrastructure is one of the most important factors for a country's progress. Although India has a large and diverse transport sector with its own share of challenges, they can be overcome by energy-efficient technologies and customer-focused approach. One cannot overemphasize the importance of transportation than call it the 'lifeline' of a nation. It has been proven by so many instances how transport infrastructure has added speed and efficiency to a country's progress. Good physical connectivity in the urban and rural areas is essential for economic growth. India, the seventh largest nation with over a billion population, has one of the largest transport sectors. But not one without its own set of challenges but some of the big challenges the Metro faces are capacity increase, improved reliability in the system and delivering a more customer-focused approach. It is not just about modernizing stations, track and introducing new trains to the Metro; it is also about how intelligently and efficiently the system.

### 5.1.5 Vertical Farming

In direct cultivation, crops are grown indoors, under artificial conditions of light and heat.
Plants are grown indoors, under artificial conditions of light and heat. It aims for high productivity in small areas. It uses groundless methods such as hydroponics, aquaponics and aeroponics. Direct farming uses more water and pesticides than traditional farming methods. Being indoors, the plants do not adhere to certain seasons and therefore provide high yields throughout the year. Lettuce, tomatoes and green vegetables can be produced in this process.
Japan was one of the first pioneers in direct agriculture. It holds the largest share in the global vertical farming market. In Japan, vertical farming is born out of necessity where traditional farming loses its face due to aging and migration. Spread is one of the most lucrative companies

in direct farming. Every year it produces about 11 million heads of lettuce from its Kyoto factory. About 30,000 lettuce heads are produced daily at the factory, under artificial conditions and with little human intervention. The machines transfer lettuce to areas with good light, temperature and humidity at all stages of growth.
The soil that grows without soil or pesticides will eventually be collected by workers.
Now, countries like Denmark and the USA are also taking direct farming.

Fig.35 Vertical Farming

## 5.1.6 Corrosion Mechanism, Prevention & Repair Measures of RCC Structure

Corrosion is a natural process that occurs when the steel rebar within reinforced concrete structures rusts. In scientific terms, concrete corrosion is defined as the "destruction of metal by chemical, electrochemical, and electrolytic reactions within its environment." It typically forms as the concrete ages. Exposure of reinforced concrete to chloride ions is the primary cause of premature corrosion of steel reinforcement. The intrusion of chloride ions, present in deicing salts and seawater, into reinforced concrete can cause steel corrosion if oxygen and moisture are also available to sustain the reaction. Corrosion of reinforcing steel and other embedded metals is the leading cause of deterioration in concrete. When steel corrodes, the resulting rust occupies a greater volume than the steel. This expansion creates tensile stresses in the concrete, which can eventually cause cracking, delamination, and spelling. Here are some methods for controlling the corrosion of reinforced concrete. An effective corrosion control system should extend the time to corrosion initiation or, reduce the corrosion rate of embedded steel, or do both. Some of the traditional measures used to combat the corrosion of reinforced concrete are: Cathodic protection; Corrosion inhibitor admixtures; and Anti-corrosion coating**.**

### 5.1.7 Sewage treatment plant

Essentially, a sewage treatment plant operates by circulating air to encourage the growth of bacteria to break down sewage. The goal being to deliver much cleaner, more environmentally friendly effluent. It involves a similar process to a typical septic tank but has some key differences. Sewage treatment plants, depending on their size, can treat the waste of commercial properties or a number of domestic dwellings. he first thought for anyone planning a new development should be getting connected to mains sewers. They are typically the most cost-effective and reliable method of dealing with your wastewater. However, getting a mains sewer connection isn't always possible. In some scenarios, the distance from the nearest sewer or the layout of the land can make it impossible to have your property serviced by a mains sewer. That's where sewage treatment plants and other alternatives come in. The operation of a sewage treatment plant means that you can have one installed almost anywhere, as long as you have an electrical connection

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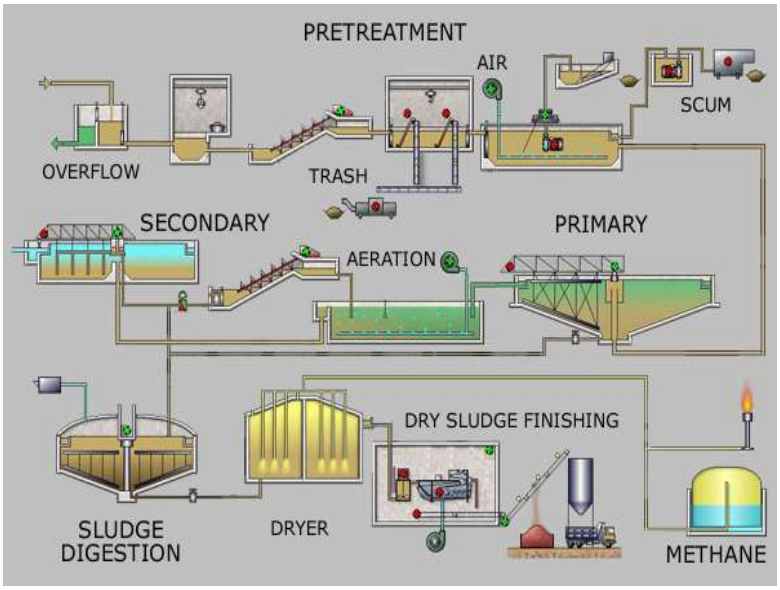


Fig.36 Sewage Treatment Plant

## 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**.**

### 5.2.2 Railway Security System using IOT:

Railway has been playing an important role of public transportation from 19'th century, in this a steam locomotive began to be run. From that moment, the railway was regarded as a core method to transport population moving along the determinant paths within and between metropolitan cities. The basic technology of the railway has been so far progressed and enables a high-speed railway system which satisfies the public demand on traveling a long distance. The railway possesses the inherent characteristics of huge capacity and energy efficiency, and those merits motivate the governments of many countries to encourage and support the railway for public interest. The governments take into account the railway vital once they establish transport policies. One of the important problems for railway operators is maintenance of their railway systems.

### 5.2.3 Management through Energy Harvesting Concept:

Energy harvesting from environmental vibrations has seen an increase in interest during the past years as part of the generally growing awareness for alternative energy sources. Next to the typical electro mechanical methods, ferro electric devices have proven to be very effective in harvesting energy for low power devices as often found in portable electronics, sensor-controlled and condition monitoring systems due to the wide usable frequency range, and adaptability.

### 5.2.4 Moisture Monitoring System:

Soil moisture monitoring is usually done by observation performed by researchers in the agricultural area. Obviously, it takes a long time, especially in view of the decline in soil moisture. This practice does not work well especially if you check the soil moisture content of the plants in it. We therefore need a solution to improve performance over time and to help monitor soil moisture conditions. Our proposed soil moisture monitoring system uses Librium Wasp mote as a microcontroller. The process of sending data from the sensor to the Internet network and then to the knowledgeable server took about 10-15 seconds. This is influenced by the process of capturing data on the board and the delay when the sensor is connected to an available network. The results of the system test showed that the system could work best if researchers wanted to monitor soil moisture levels, at which point the researchers simply set the humidity level that required the application process to be maintained. If the moisture content of the soil is equal to or less than the point set in the system, the system will give immediate notice.

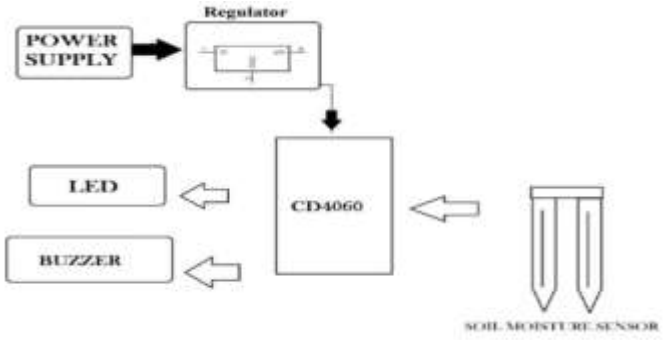


Fig.37 Block Diagram of Moisture Monitoring System

**Estimated cost:**

USB cable Arduino (A to B): -24/-
Arduino UNO R3: -354/-
Soil moisture sensor: -106/-Jumper cable male-female (pack of 10): -18/-
Jumper cable female-female (pack of 10): -18/-
Jumper cable male-male (pack of 10): -18/-
Power adapter 9-volt 1 amp: -165/-

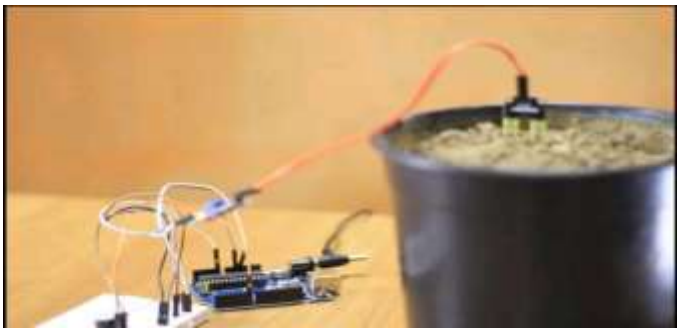

Fig.38 Working Model of Moisture Monitoring System

## 5.2.5 Home Automation using IOT/ Any other methodology:

'Internet of Things' is an umbrella term used for all technologies that enable the connection of a device to the Internet. Such systems depend on the collection of data. The data is then used for monitoring, controlling and transferring information to other devices via the internet. This allows specific actions to be automatically activated whenever certain situations arise. In a simple example, consider a smart kettle. The kettle can be programmed. to automatically turn off once it reaches a specific temperature. It might also send a notification to the user on the same.

## 5.2.6 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.

## 5.2.7 Electrical Parameters Measurements:

The measurement of electrical quantities is an essential part of almost any measurement. It can be realized as a measurement, whose results indicate directly a value of measured electric quantities, such as voltage, current, resistance, etc., or a measurement, where measurement of electrical quantities is only an internal function of an electronic measurement system measuring any other physical quantity.

# CHAPTER 6: SWATCHH BHARAT ABHIYAN (CLEAN INDIA)

## 6.1 Which type of swachhata needed in your village?

### Adequate structure for the disposal of human excreta

All household are provided with the in-house sanitation but village lack of public toilet

## 6.2 Guidelines for the process of the implementation in your village

### Following the guidelines can be followed:

- Initially, an awareness campaign can encourage beneficiaries to come forward on their own. This should be taken at ULB level and followed by acceptance of a simple application, which must be confirmed within 7 days and approved at ULB level.
- ULBs are expected to conduct a door-to-door survey. In doing so they will also look at the details of the Census 2011 or another recent research.
- A door-to-door survey, all hard-working households will be identified as well as the ULB's need to host a family toilet or community plan for each identified family / family group.

### Financial pattern and financial process

- The first installment will be issued upon receipt and adoption of a proposal containing a conceptual strategy for state sanitation as provided in Annexure IV.
- For Public Toilet projects and Strong Waste Management Projects, sufficient funding will be allocated in accordance with the Government's proposal for SWM and Public Toilet projects. It will be ensured that the funds do not remain statistical.
- For the IEC, in the exercise of power and financial constraints, the appropriate percentages (a) and (b) above will be added to the initial installment.
- States will contribute a minimum of 25% of funds to all sectors to match 75% of the Middle East. This will be 10% in the case of the Northeast and special sections of the United States.
- The following installments will be issued based on certificates of use of previous grants, physical and financial progress and other indicators

## 6.3 Actual Activity Done by Students for making your village Clean

- Survey has been done and found that there is no door-to-door garbage collection system or centralized garbage tank.
- Design has been chosen entirely subjected to this topic naming sarvajanik sauch griha i.e., public toilet which our village is lacking.
- Decision have been taken to do some sweeping campaign but due to pandemic it is no allowed by the official.

# CHAPTER 7: VILLAGE CONDITION DUE TO COVID 19

## 7.1 Taken steps in allocated village related to existing situation

**Followed lockdown rules as per defined by the government**

- People frequently sanitize their household and wear mask
- Sarpanch has made strict rules for the villagers
- COVID 19 testing van (**DHANVANTRI RATH**) has been arranged frequently for door-to-door testing of the villagers
- The mass gathering was not allowed in the village
- People of the village themselves were spreading awareness regarding the COVID 19

## 7.2 Activities done by student for allocated village

- Followed the social distancing norms and wear mask in whole survey of the village
- Contacted sarpanch before visiting village and ask about the condition of the village regarding COVID 19
- Provided sanitizer to the people before making interaction
- Mask were provided by the sarpanch to us

## 7.3 Any other steps taken by the student/villager

- As the village is surveyed, we came to know that there was lack of health facilities so as the student of Vishwakarma Yojana we have dedicated the designs by looking the situation of pandemic.
- The design has been provided of public dispensary under the scheme of jan aushadhi Yojana. So that during pandemic it will be easy for villager to access medicine and also it will help during any vaccination program

Fig.39 Picture with Sarpanch Wearing Mask

# CHAPTER 8: SUSTAINABLE DESIGN PLANNING PROPOSAL

## 8.1 Design proposal

The design proposed under the Vishwakarma phase 8 by the group that has been allocated the village name Rajgari are prescribed in the table number _. The following design are proposed by doing the survey in the allocated village and by analyzing the requirement of the villagers. Some design are provided for the security and safety purpose such as police outpost, providing sanitation facilities by recommending public toilet, fulfillment of basic requirement of water by providing public tap water, keeping in mind the government agenda for governance at the door step of the people the design that is proposed to fulfill this agenda is common service center, as sustainable development is the future of the upcoming time the retrospective design of rain water harvesting has been proposed, and last but not least health which is the frontline requirement of the good governance has been provided in the village as the design of public dispensary.

**Table 6 Design Proposal**

| Sr no. | Village | Design |
|---|---|---|
| 1 | Rajgari | Common Service Centre |
| 2 | | Public Dispensary |
| 3 | | Public Tap Water |
| 4 | | Police Station |
| 5 | | Public Toilet |
| 6 | | Rain Water Harvesting |
| 7 | | Automatic Plant Watering System |
| 8 | | Smoke Detector System |
| 9 | | Temperature Control System |

### 8.1.1 Sustainable Design – RAIN WATER HARVESTING

This village is in high need of a sustainable design to fulfill that we have found out that this village won't have any rain water harvesting system. So, to support that this design is entirely dedicated. This design work out in two-part storage tank and sand filter design which will make entire rain water harvesting system apart from piping and other thing.

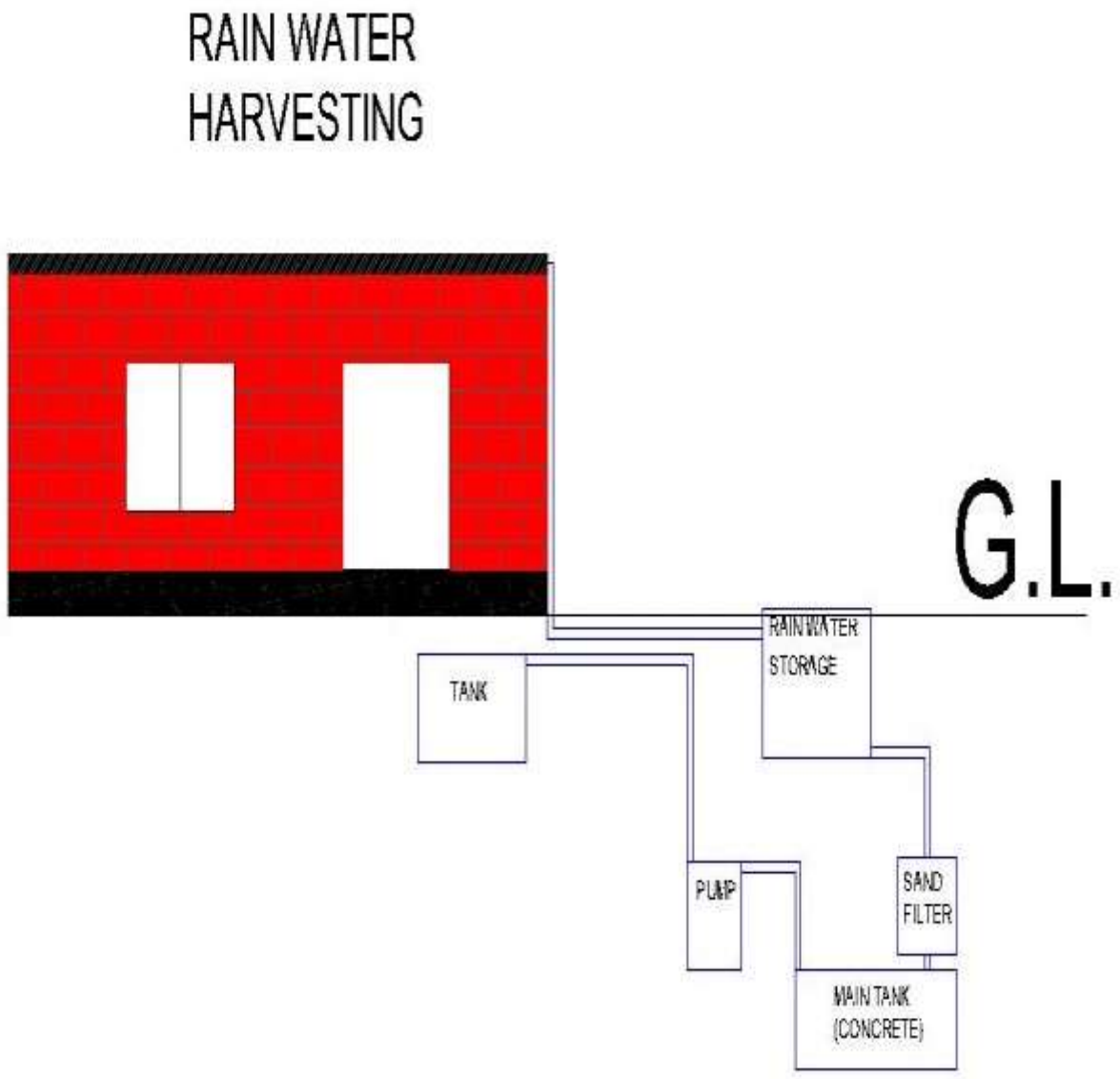


Fig.40 Rain Water Harvesting

**Storage tank**

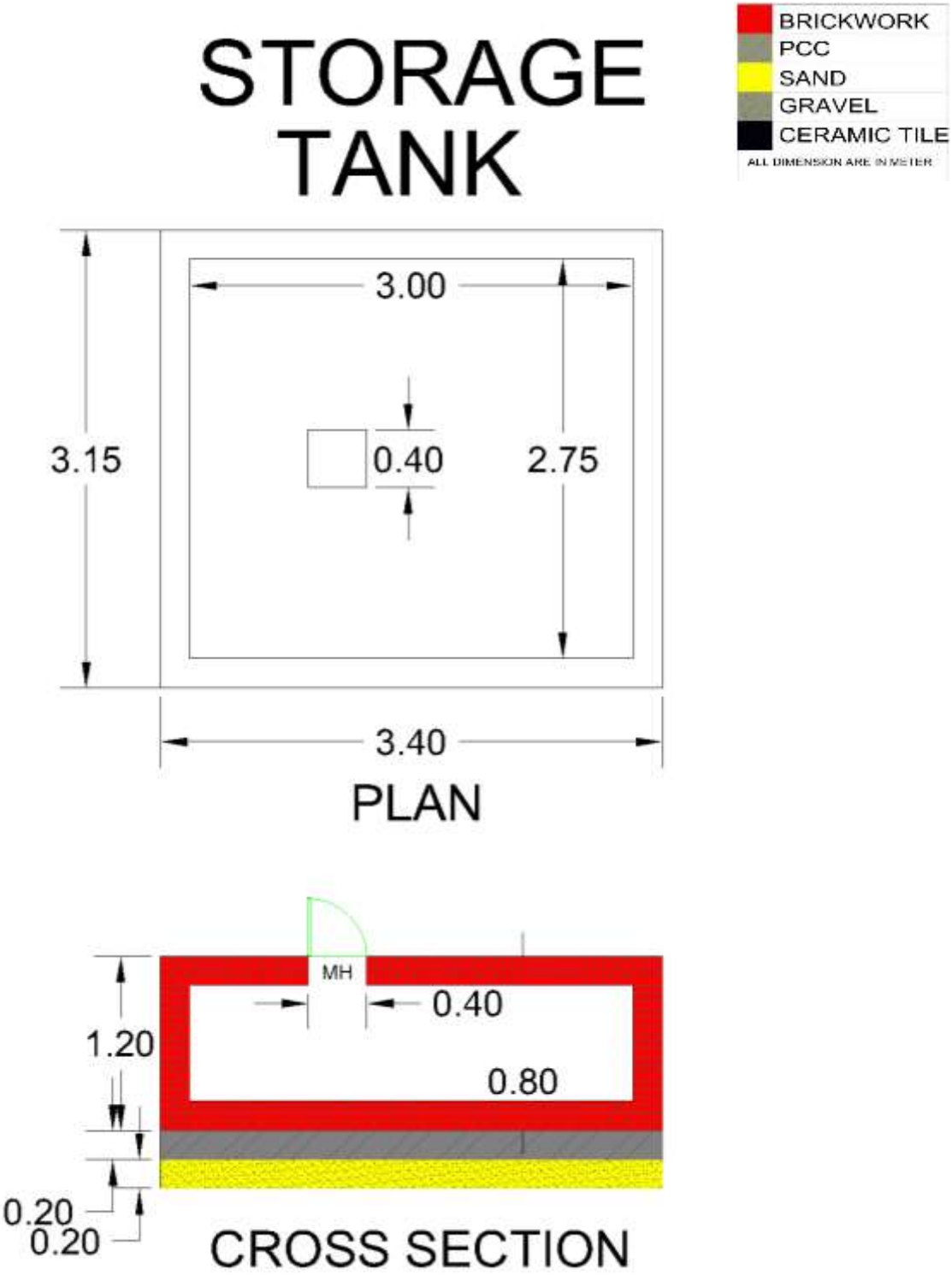


Fig.41 Plan and Cross Section of The Storage Tank

Estimation of storage tank

**Table 7 Estimation of Storage Tank**

| SlNo | Description | Quantity | Unit | Rate (RS) | Amount (RS) |
|---|---|---|---|---|---|
| **EARTH WORKS** | | | | | |
| 1 | EARTH WORKS EXCAVATION | 16.07 | Cu.M | 102.00 | 1639.14 |
| 2 | EARTH WORKS FILLING FOUNDATION USING SAND | 2.14 | Cu.M | 769.00 | 1645.66 |
| 3 | EARTH WORKS FILLING PLINTH USING EARTH FROM SITE | 1.07 | Cu.M | 49.00 | 52.43 |
| | | | | | 3337.23 |
| **PCC** | | | | | |
| 4 | PCC FOUNDATION 1:3:6 | 2.14 | Cu.M | 2,873.00 | 6148.22 |
| | | | | | 6148.22 |
| **BRICK WORKS** | | | | | |
| 5 | BRICK WORKS CM 1:2 | 4.57 | Cu.M | 2,500.00 | 11425.00 |
| | | | | | 11425.00 |
| **FLOOR AND WALL FINISHES** | | | | | |
| 6 | FLOOR FINISHING CERAMIC TILES | 8.25 | Sq.M | 600.00 | 4950.00 |
| 7 | SKIRTING CERAMIC TILES IN SqM | 11.50 | Sq.M | 300.00 | 3450.00 |
| | | | | | 8400.00 |
| **DOORS AND WINDOWS** | | | | | |
| 8 | SHUTTERS ALUMINIUM GLAZED | 0.16 | Sq.M | 149.00 | 23.84 |
| | | | | | 23.84 |
| **PLASTERING AND POINTING** | | | | | |
| 9 | PLASTERING BASEMENT CM 1:2 12MM | 1.36 | Sq.M | 109.00 | 148.24 |
| 10 | PLASTERING WALLS CM 1:2 12 MM | 25.80 | Sq.M | 104.00 | 2683.20 |
| | | | | | 2831.44 |
| Total | | | | | 32165.73 |
| **Net Amount** | | | | | 32166 |

**Sand filter**

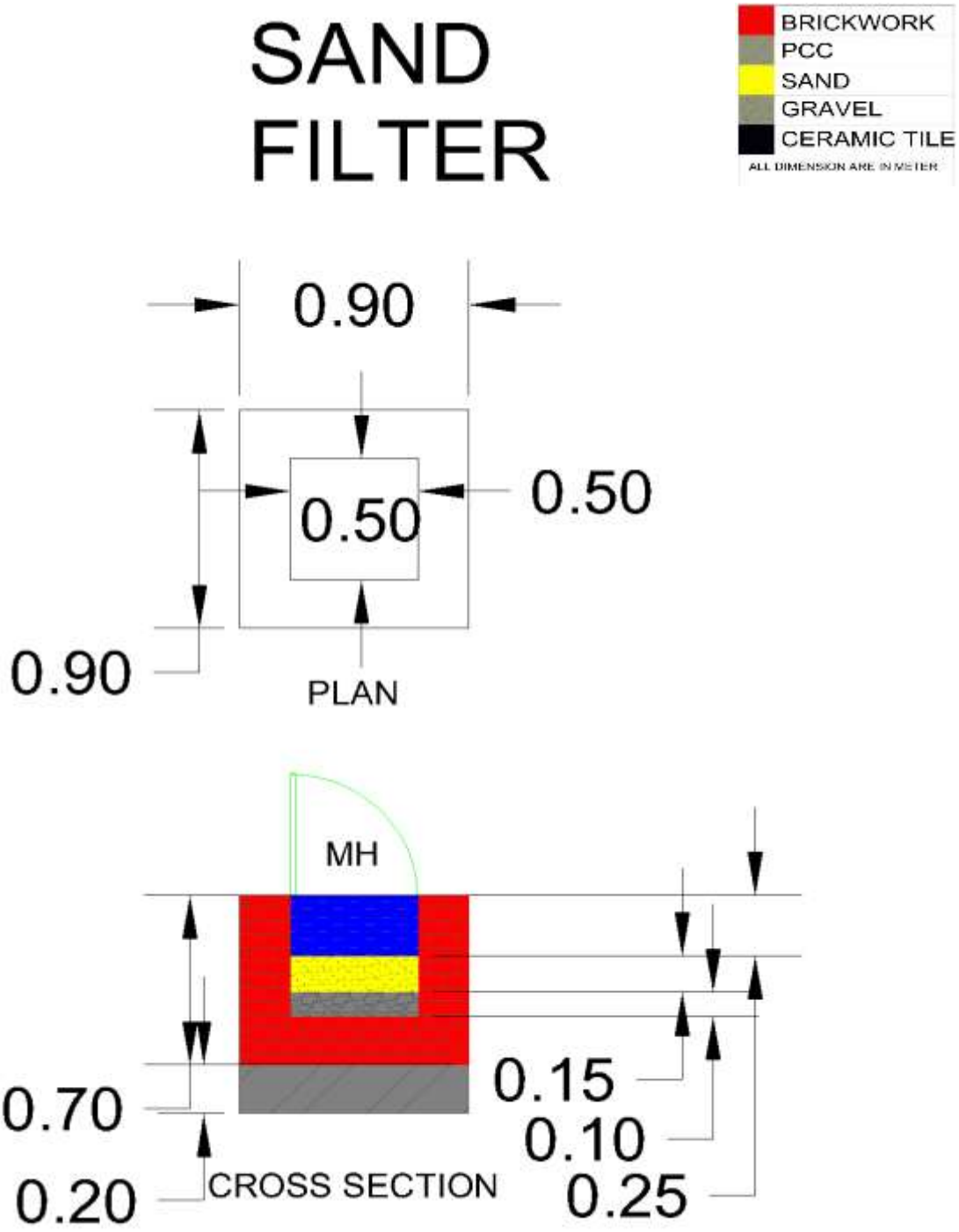


Fig.42 Plan and Cross Section of The Sand Filter

Estimation of sand filter

**Table 8 Estimation of Sand Filter**

| SlNo | Description | Quantity | Unit | Rate (RS) | Amount (RS) |
|---|---|---|---|---|---|
| **EARTH WORKS** | | | | | |
| 1 | EARTH WORKS EXCAVATION | 0.16 | Cu.M | 102.00 | 16.32 |
| 2 | EARTH WORKS FILLING PLINTH USING SAND | 0.06 | Cu.M | 769.00 | 46.14 |
| | | | | | 62.46 |
| **PCC** | | | | | |
| 3 | PCC FOUNDATION 1:3:6 | 0.16 | Cu.M | 2,873.00 | 459.68 |
| | | | | | 459.68 |
| **BRICK WORKS** | | | | | |
| 4 | BRICK WORKS CM 1:2 | 0.39 | Cu.M | 2,500.00 | 975.00 |
| | | | | | 975.00 |
| **FLOOR AND WALL FINISHES** | | | | | |
| 5 | FLOOR FINISHING CERAMIC TILES | 0.25 | Sq.M | 600.00 | 150.00 |
| 6 | SKIRTING CERAMIC TILES IN SqM | 1.00 | Sq.M | 300.00 | 300.00 |
| | | | | | 450.00 |
| **DOORS AND WINDOWS** | | | | | |
| 7 | SHUTTERS ALUMINIUM GLAZED | 0.25 | Sq.M | 149.00 | 37.25 |
| | | | | | 37.25 |
| **PLASTERING AND POINTING** | | | | | |
| 8 | PLASTERING WALLS EXT. CM 1:5 12 MM | 1.80 | Sq.M | 90.00 | 162.00 |
| | | | | | 162.00 |
| **PAINTING** | | | | | |
| 9 | PAINTING WALLS EXT. DISTEMPER | 1.80 | Sq.M | 46.00 | 82.80 |
| | | | | | 82.80 |
| **Total** | | | | | 2229.19 |
| **Net Amount** | | | | | 2229 |

### 8.1.2 Physical design – PUBLIC TAP WATER

As a village there is concept of Panghat where anyone can drink water and fill for their household need so in that thought this design make this concept revive in modern way.

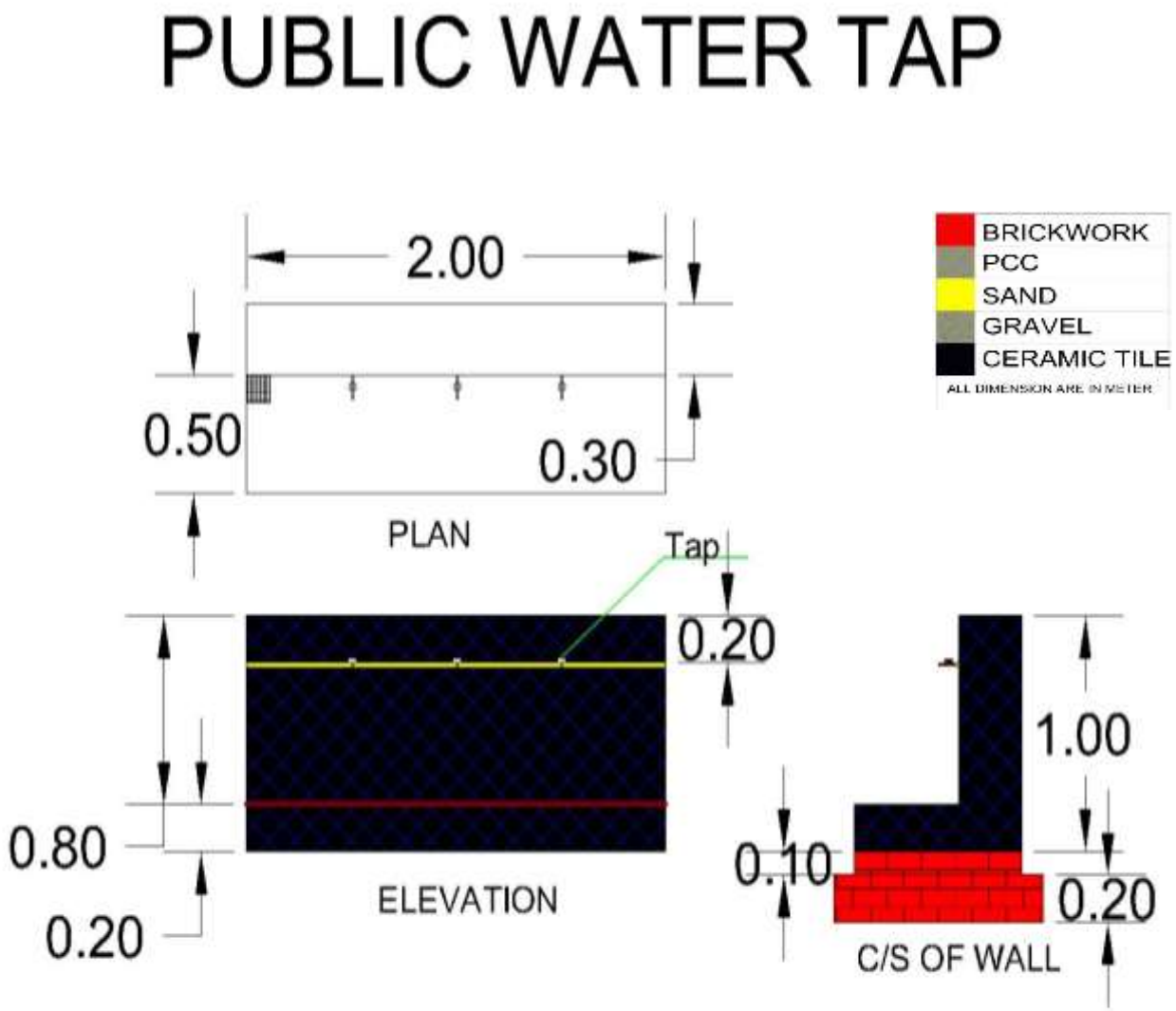


Fig.43 Plan, Elevation & Cross Section of Public Tap Water

Estimation for Public Tap Water

**Table 9 Estimation of Public Tap Water**

| SlNo | Description | Quantity | Unit | Rate (RS) | Amount (RS) |
|---|---|---|---|---|---|
| **BRICK WORKS** | | | | | |
| 1 | BRICK WORKS BASEMENT CM 1:3 | 0.88 | Cu.M | 2,470.00 | 2173.60 |
| 2 | BRICK WORKS CM 1:2 | 0.48 | Cu.M | 2,500.00 | 1200.00 |
| | | | | | **3373.60** |
| **FLOOR AND WALL FINISHES** | | | | | |
| 3 | WALL FINISHING CERAMIC TILES | 6.40 | Sq.M | 300.00 | 1920.00 |
| | | | | | **1920.00** |
| **PLUMBING** | | | | | |
| 4 | PL PVC 20MM DIA PIPE | 5.00 | M | 20.00 | 100.00 |
| 5 | TAP | 3.00 | 1 | 200.00 | 600.00 |
| | | | | | **700.00** |
| **Total** | | | | | 5993.6 |
| **Net Amount** | | | | | 5994 |

### 8.1.3 Social design – POLICE OUTPOST

As concept of social design to protect the society from anti-social aspect this design done much full filling task. As this village is near the much populate industrialized zone where people are from other part of the country to protect village from any conflict of interest this design is much useful.

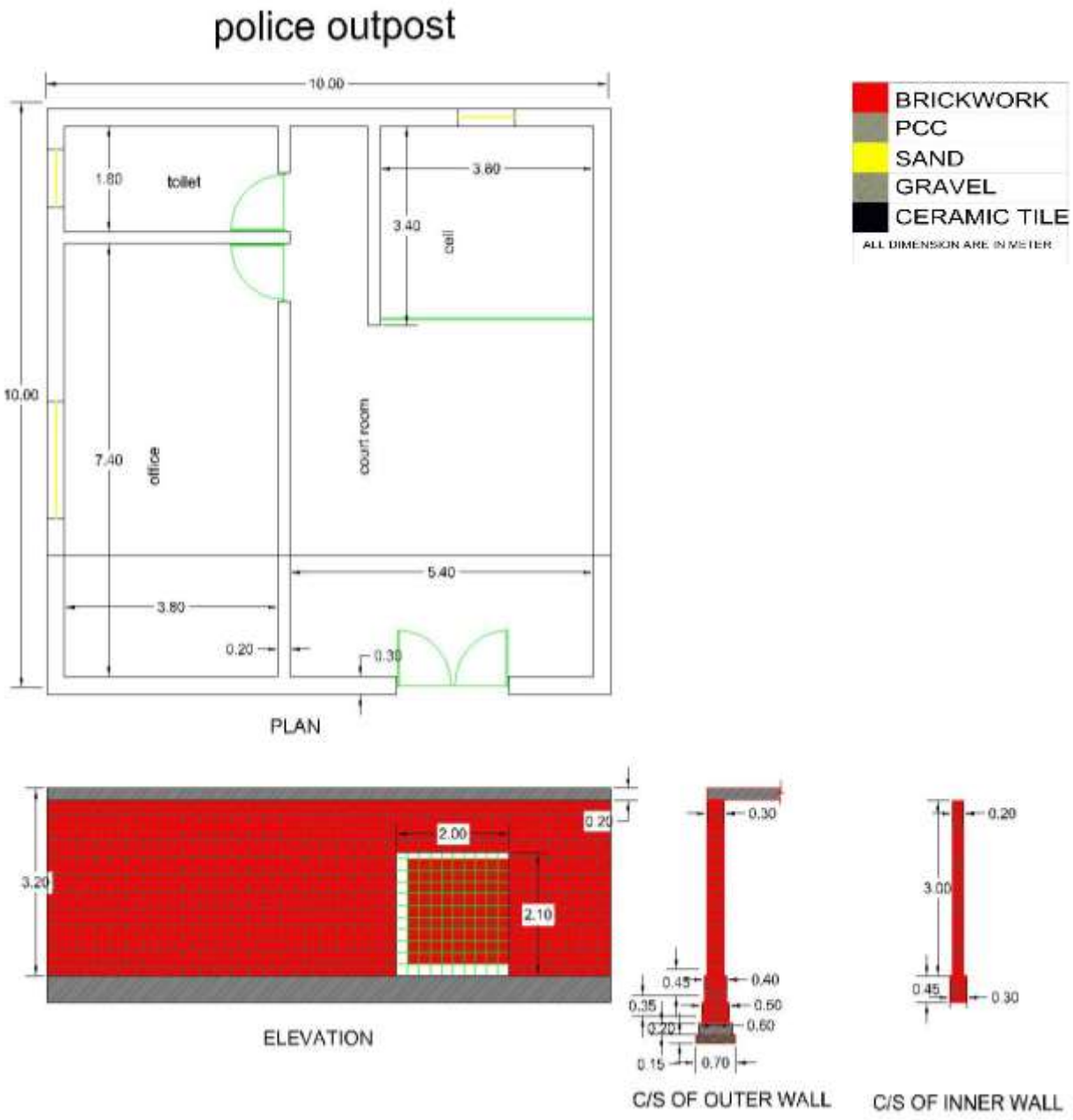


Fig.44 Plan, Elevation & Cross Section of Police Outpost

Estimation of police outpost

**Table 10 Estimation Of Police Outpost**

| SlNo | Description | Quantity | Unit | Rate (RS) | Amount (RS) |
|---|---|---|---|---|---|
| **EARTH WORKS** | | | | | |
| 1 | EARTH WORKS EXCAVATION | 19.01 | Cu.M | 102.00 | 1939.02 |
| 2 | EARTH WORKS FILLING FOUNDATION USING SAND | 4.66 | Cu.M | 769.00 | 3583.54 |
| 3 | EARTH WORKS FILLING PLINTH USING SAND | 37.19 | Cu.M | 769.00 | 28599.11 |
| 4 | ANTI TERMITE TREATMENT | 86.66 | Sq.M | 200.00 | 17332.00 |
| | | | | | 51453.67 |
| **PCC** | | | | | |
| 5 | PCC FOUNDATION 1:3:6 | 4.66 | Cu.M | 2,873.00 | 13388.18 |
| 6 | DAMP PROOF COURSE 1:2:4 | 19.54 | Sq.M | 110.00 | 2149.40 |
| 7 | PCC FLOORING 1:2:4 CuM | 8.66 | Cu.M | 3,233.00 | 27997.78 |
| | | | | | 43535.36 |
| **RCC** | | | | | |
| 8 | RCC ROOF SLABS M15 | 20.00 | Cu.M | 3,625.00 | 72500.00 |
| | | | | | 72500.00 |
| **FORM WORKS** | | | | | |
| 9 | FORM WORK RCC | 104.00 | Sq.M | 150.00 | 15600.00 |
| | | | | | 15600.00 |
| **BRICK WORKS** | | | | | |
| 10 | BRICK WORKS SOLING IN FOUNDATION | 27.16 | Cu.M | 130.00 | 3530.80 |
| 11 | BRICK WORKS FOUNDATION CM 1:3 | 6.79 | Cu.M | 2,470.00 | 16771.30 |
| 12 | BRICK WORKS BASEMENT CM 1:3 | 9.22 | Cu.M | 2,470.00 | 22773.40 |
| 13 | BRICK WORKS CM 1:2 | 46.63 | Cu.M | 2,500.00 | 116575.00 |
| 14 | BRICK WORKS CM 1:4 | 46.63 | Cu.M | 2,388.00 | 111352.44 |
| | | | | | 271002.94 |

| | | | | | |
|---|---|---|---|---|---|
| **FLOOR AND WALL FINISHES** | | | | | |
| 15 | FLOOR FINISHING CERAMIC TILES | 86.66 | Sq.M | 600.00 | 51996.00 |
| 16 | WALL FINISHING CERAMIC TILES | 109.40 | Sq.M | 300.00 | 32820.00 |
| 17 | SKIRTING CERAMIC TILES IN SqM | 12.15 | Sq.M | 300.00 | 3645.00 |
| | | | | | 88461.00 |
| **DOORS AND WINDOWS** | | | | | |
| 18 | FRAMES CONCRETE | 0.21 | Cu.M | 3,233.00 | 678.93 |
| 19 | SHUTTERS SYNTHETIC PANELLED | 10.49 | Sq.M | 800.00 | 8392.00 |
| 20 | GRILLE FOR WINDOWS 12 KG/SqM | 3.31 | Sq.M | 360.00 | 1191.60 |
| 21 | WINDOWS | 4.05 | Sq.M | 2,780.00 | 11259.00 |
| | | | | | 21521.53 |
| **PLASTERING AND POINTING** | | | | | |
| 22 | PLASTERING BASEMENT CM 1:2 12MM | 49.86 | Sq.M | 109.00 | 5434.74 |
| 23 | PLASTERING WALLS CM 1:2 12 MM | -12.03 | Sq.M | 104.00 | -1251.12 |
| 24 | PLASTERING CEILINGS AND SLABS CM 1:2 | 186.66 | Sq.M | 83.00 | 15492.78 |
| 25 | PLASTERING ROOF TOP CM 1:2 12 MM | 100.00 | Sq.M | 109.00 | 10900.00 |
| | | | | | 30576.40 |
| **PAINTING** | | | | | |
| 26 | PAINTING WALLS DISTEMPER | -12.03 | Sq.M | 46.00 | -553.38 |
| 27 | PAINTING CEILINGS AND SLABS DISTEMPER | 186.66 | Sq.M | 46.00 | 8586.36 |
| 28 | PAINTING ROOFTOPS DISTEMPER | 100.00 | Sq.M | 46.00 | 4600.00 |
| | | | | | 12632.98 |
| **PLUMBING** | | | | | |
| 29 | PL CLOSET INDIAN | 2.00 | Nos | 600.00 | 1200.00 |
| 30 | PL WASH BASIN | 1.00 | Nos | 500.00 | 500.00 |
| | | | | | 1700.00 |
| Total | | | | | 608983.88 |
| **Net Amount** | | | | | 608984 |

### 8.1.4 Socio-Cultural design – SARVAJANIK SAUCH GRIHA

As social cultural design nowadays, our country is going through a great social and cultural change of making India open defection free to fulfill that this design provided the public toilet that fulfill that interest much better way and what our village is lacking in.

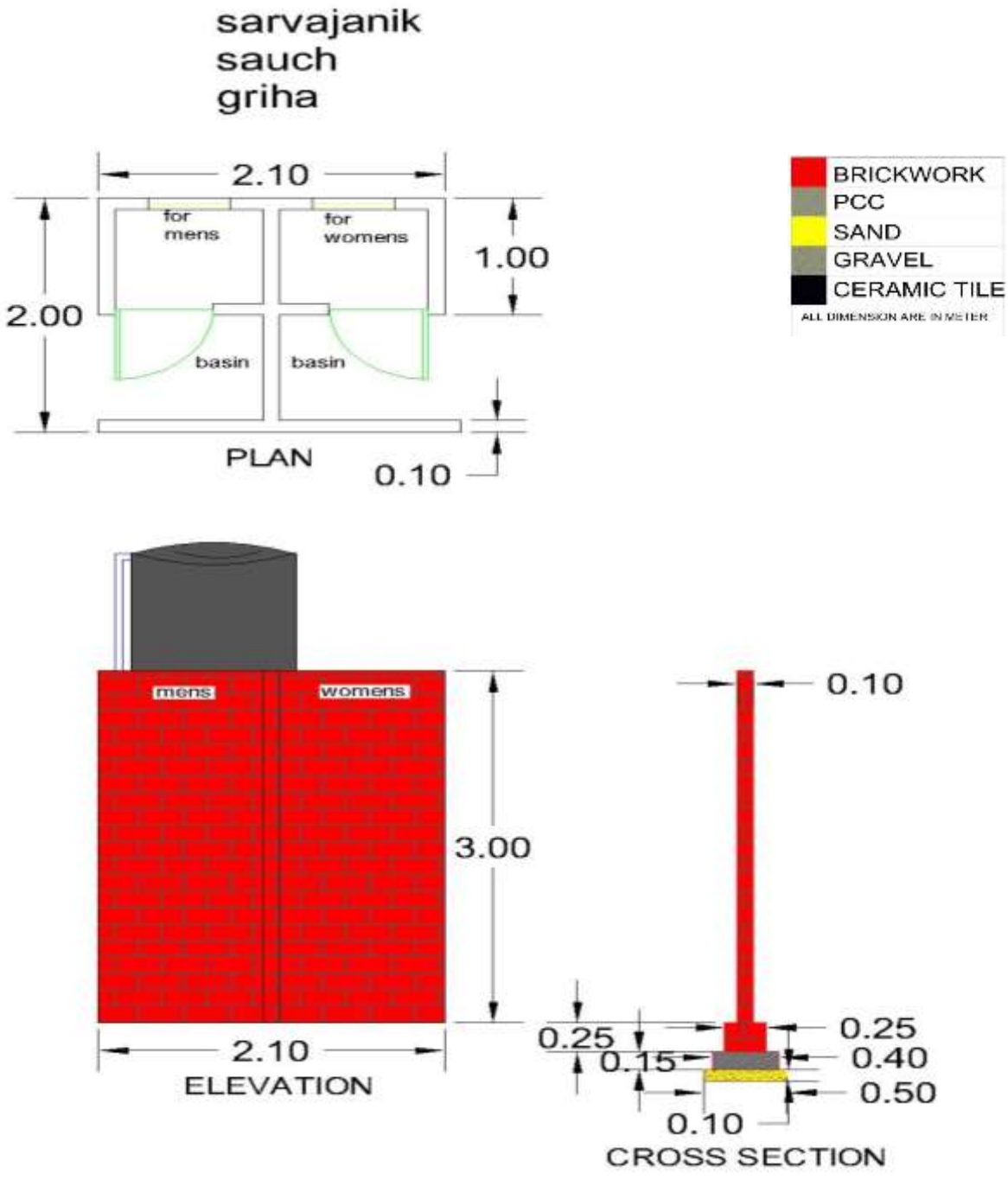


Fig.45 Plan, Elevation & Cross Section of Public Toilet

Estimation of sarvajanik sauch griha

**Table 11 Estimation of Sarvajanik Sauch Griha**

| SlNo | Description | Quantity | Unit | Rate (RS) | Amount (RS) |
|---|---|---|---|---|---|
| **EARTH WORKS** | | | | | |
| 1 | EARTH WORKS EXCAVATION | 1.98 | Cu.M | 102.00 | 201.96 |
| 2 | EARTH WORKS FILLING FOUNDATION USING SAND | 0.49 | Cu.M | 769.00 | 376.81 |
| 3 | ANTI TERMITE TREATMENT | 1.44 | Sq.M | 200.00 | 288.00 |
| | | | | | 866.77 |
| **PCC** | | | | | |
| 4 | PCC FOUNDATION 1:3:6 | 0.49 | Cu.M | 2,873.00 | 1407.77 |
| 5 | DAMP PROOF COURSE 1:2:4 | 1.98 | Sq.M | 110.00 | 217.80 |
| 6 | PCC FLOORING 1:2:4 CuM | 0.14 | Cu.M | 3,233.00 | 452.62 |
| | | | | | 2078.19 |
| **BRICK WORKS** | | | | | |
| 7 | BRICK WORKS FOUNDATION CM 1:4 | 0.53 | Cu.M | 2,408.00 | 1276.24 |
| 8 | BRICK WORKS CM 1:2 | 2.30 | Cu.M | 2,500.00 | 5750.00 |
| | | | | | 7026.24 |
| **FLOOR AND WALL FINISHES** | | | | | |
| 9 | FLOOR FINISHING CERAMIC TILES | 1.44 | Sq.M | 600.00 | 864.00 |
| 10 | WALL FINISHING CERAMIC TILES | 5.80 | Sq.M | 300.00 | 1740.00 |
| 11 | SKIRTING CERAMIC TILES IN SqM | 1.36 | Sq.M | 300.00 | 408.00 |
| | | | | | 3012.00 |
| **DOORS AND WINDOWS** | | | | | |
| 12 | FRAMES CONCRETE | 0.09 | Cu.M | 3,233.00 | 290.97 |

| | | | | | |
|---|---|---|---|---|---|
| 13 | SHUTTERS SYNTHETIC PANELLED | 2.45 | Sq.M | 800.00 | 1960.00 |
| 14 | DOORS | 2.52 | Sq.M | 2,780.00 | 7005.60 |
| 15 | WINDOWS | 0.60 | Sq.M | 2,780.00 | 1668.00 |
| | | | | | 10924.57 |
| **PLASTERING AND POINTING** | | | | | |
| 16 | PLASTERING WALLS CM 1:2 12 MM | 49.08 | Sq.M | 104.00 | 5104.32 |
| | | | | | 5104.32 |
| **PAINTING** | | | | | |
| 17 | PAINTING WALLS DISTEMPER | 49.08 | Sq.M | 46.00 | 2257.68 |
| | | | | | 2257.68 |
| **PLUMBING** | | | | | |
| | | | | | |
| 18 | PL CLOSET INDIAN | 2.00 | Nos | 600.00 | 1200.00 |
| 19 | PL WASH BASIN | 2.00 | Nos | 500.00 | 1000.00 |
| | | | | | 2200.00 |
| **ROOFING** | | | | | |
| 20 | ROOFING AC SHEETS 6MM | 4.20 | Sq.M | 206.00 | 865.20 |
| | | | | | 865.20 |
| Total | | | | | 34334.97 |
| **Net Amount** | | | | | 34335 |

## 8.1.5 Smart Village Design – COMMON SERVICE CENTRE

As smart design to full fill the requirement of digitalization and digital connectivity of the villager common service center work as bridge as many elder populations lacks in digital knowhow. This design work to provide basic digital facilities like online government services access, Aadhar card, PAN card, online crop registration, getting access to government document of personal interest, etc. This service is nowadays more of interest as people are used to travel to the nearby cybercafe to access that to without qualified personnel.

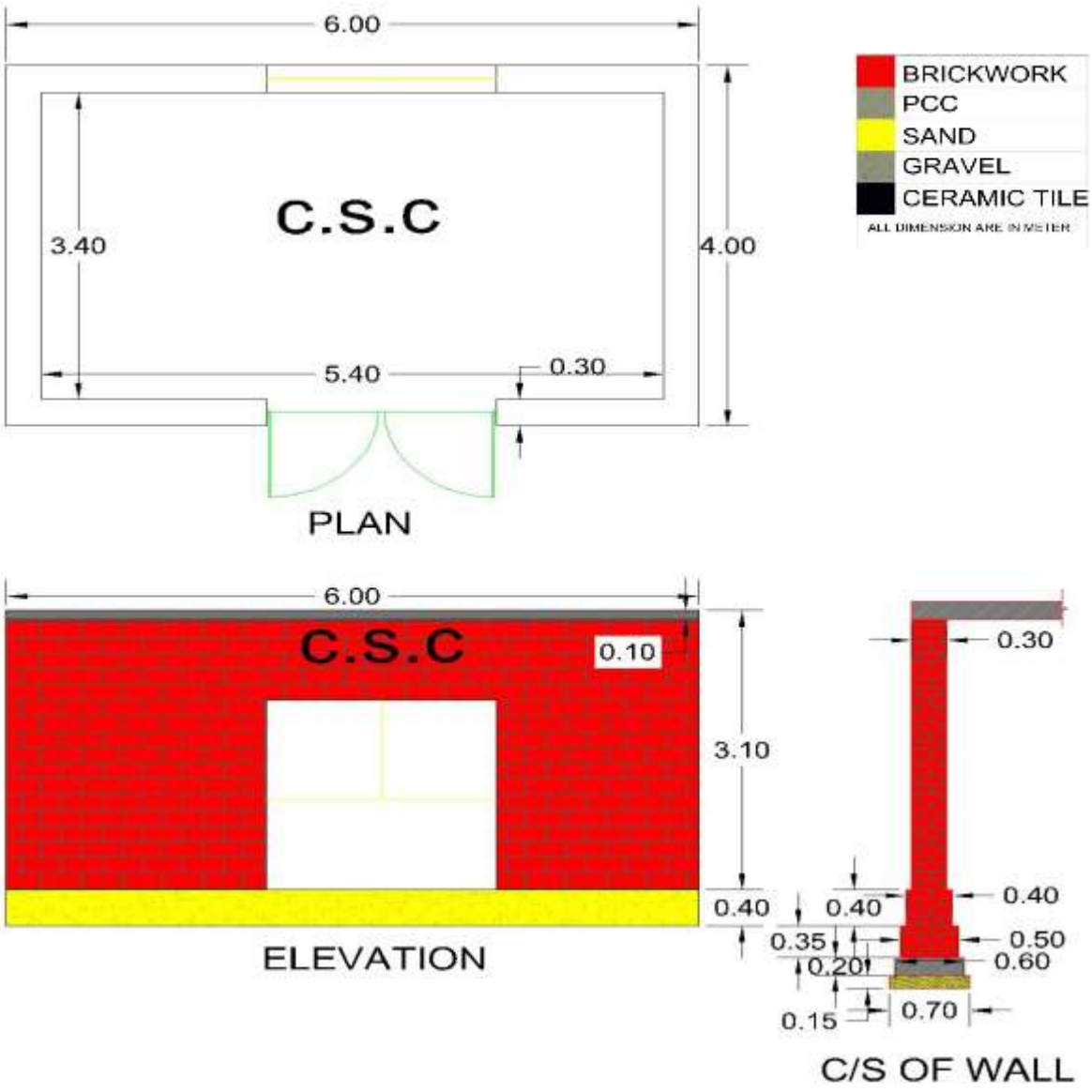


Fig.46 Plan, Elevation & Cross Section of Common Service Centre

Estimation of common service center

**Table 12 Estimation of common service center**

| SlNo | Description | Quantity | Unit | Rate (RS) | Amount (RS) |
|---|---|---|---|---|---|
| **EARTH WORKS** | | | | | |
| 1 | EARTH WORKS EXCAVATION | 9.87 | Cu.M | 102.00 | 1006.74 |
| 2 | EARTH WORKS FILLING FOUNDATION USING SAND | 2.26 | Cu.M | 769.00 | 1737.94 |
| 3 | EARTH WORKS FILLING PLINTH USING SAND | 7.00 | Cu.M | 769.00 | 5383.00 |
| 4 | ANTI TERMITE TREATMENT | 18.36 | Sq.M | 200.00 | 3672.00 |
| | | | | | 11799.68 |
| **PCC** | | | | | |
| 5 | PCC FOUNDATION 1:3:6 | 2.26 | Cu.M | 2,873.00 | 6492.98 |
| 6 | DAMP PROOF COURSE 1:2:4 | 6.92 | Sq.M | 110.00 | 761.20 |
| 7 | PCC FLOORING 1:2:4 | 1.84 | Cu.M | 3,233.00 | 5948.72 |
| | | | | | 13202.90 |
| **RCC** | | | | | |
| 8 | RCC ROOF SLABS M15 | 2.40 | Cu.M | 3,625.00 | 8700.00 |
| | | | | | 8700.00 |
| **FORM WORKS** | | | | | |
| 9 | FORM WORK RCC | 24.80 | Sq.M | 150.00 | 3720.00 |
| | | | | | 3720.00 |
| **BRICK WORKS** | | | | | |
| 10 | BRICK WORKS FOUNDATION CM 1:3 | 3.29 | Cu.M | 2,470.00 | 8126.30 |
| 11 | BRICK WORKS BASEMENT CM 1:3 | 3.01 | Cu.M | 2,470.00 | 7434.70 |
| 12 | BRICK WORKS CM 1:2 | 14.76 | Cu.M | 2,500.00 | 36900.00 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | 52461.00 |
| **FLOOR AND WALL FINISHES** | | | | | |
| 13 | FLOOR FINISHING CERAMIC TILES | 18.36 | Sq.M | 600.00 | 11016.00 |
| 14 | WALL FINISHING CERAMIC TILES | 24.00 | Sq.M | 300.00 | 7200.00 |
| 15 | SKIRTING CERAMIC TILES IN SqM | 1.76 | Sq.M | 300.00 | 528.00 |
| | | | | | 18744.00 |
| **DOORS AND WINDOWS** | | | | | |
| 16 | FRAMES CONCRETE | 0.12 | Cu.M | 3,233.00 | 387.96 |
| 17 | SHUTTERS ALUMINIUM GLAZED | 3.90 | Sq.M | 149.00 | 581.10 |
| 18 | SHUTTERS SYNTHETIC PANELLED | 2.49 | Sq.M | 800.00 | 1992.00 |
| 19 | GRILLE FOR WINDOWS 12 KG/SqM | 2.49 | Sq.M | 360.00 | 896.40 |
| | | | | | 3857.46 |
| **PLASTERING AND POINTING** | | | | | |
| 20 | PLASTERING BASEMENT CM 1:2 12MM | 15.04 | Sq.M | 109.00 | 1639.36 |
| 21 | PLASTERING WALLS CM 1:2 12 MM | 105.60 | Sq.M | 104.00 | 10982.40 |
| 22 | PLASTERING CEILINGS AND SLABS CM | 42.36 | Sq.M | 83.00 | 3515.88 |
| 23 | PLASTERING ROOF TOP CM 1:2 12 MM | 24.00 | Sq.M | 109.00 | 2616.00 |
| | | | | | 18753.64 |
| **PAINTING** | | | | | |
| 24 | PAINTING BASEMENT WHITE CEMENT | 15.04 | Sq.M | 31.00 | 466.24 |
| 25 | PAINTING WALLS DISTEMPER | 105.60 | Sq.M | 46.00 | 4857.60 |
| 26 | PAINTING CEILINGS AND SLABS DISTEMPER: | 42.36 | Sq.M | 46.00 | 1948.56 |
| | | | | | 7272.40 |
| Total | | | | | 138511.08 |
| **Net Amount** | | | | | 138511.00 |

### 8.1.6 Heritage Village Design – PUBLIC DISPENSARY

As heritage design this design fulfill the major aspect of universal medical requirement of people by providing the public dispensary with pharmacist to provide basic medicine like allopathy as well as Ayurvedic as rural India more trust on ancient methodology of treatment. This design will also fulfill the gap of a public health center as per government norm this villages population lack in criteria to have public or sub health center.

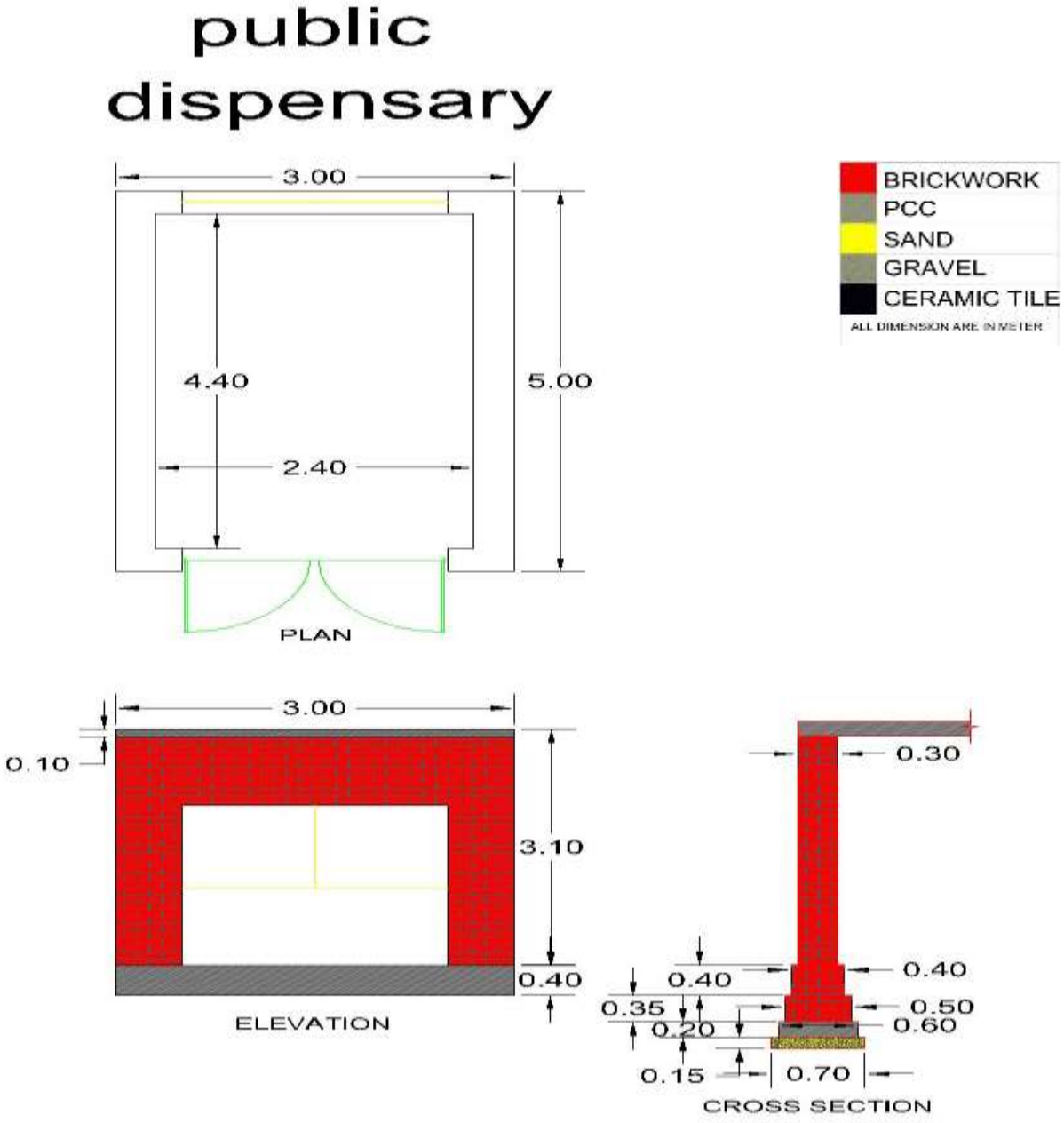


Fig.47 Plan, Elevation & Cross Section of Public Dispensary

Estimation for public dispensary

**Table 13 Estimation for Public Dispensary**

| SlNo | Description | Quantity | Unit | Rate | Amount |
|---|---|---|---|---|---|
| **EARTH WORKS** | | | | | |
| 1 | EARTH WORKS EXCAVATION | 7.25 | Cu.M | 102.00 | 739.50 |
| 2 | EARTH WORKS FILLING FOUNDATION USING SAND | 1.78 | Cu.M | 769.00 | 1368.82 |
| 3 | EARTH WORKS FILLING PLINTH USING SAND | 3.96 | Cu.M | 769.00 | 3045.24 |
| 4 | ANTI TERMITE TREATMENT | 10.56 | Sq.M | 200.00 | 2112.00 |
| | | | | | 7265.56 |
| **PCC** | | | | | |
| 5 | PCC FOUNDATION 1:3:6 | 1.78 | Cu.M | 2,873.00 | 5113.94 |
| 6 | DAMP PROOF COURSE 1:2:4 | 5.32 | Sq.M | 110.00 | 585.20 |
| 7 | PCC FLOORING 1:2:4 CuM | 1.06 | Cu.M | 3,233.00 | 3426.98 |
| | | | | | 9126.12 |
| **RCC** | | | | | |
| 8 | RCC ROOF SLABS M15. | 1.50 | Cu.M | 3,625.00 | 5437.50 |
| | | | | | 5437.50 |
| **FORM WORKS** | | | | | |
| 9 | FORM WORK RCC | 15.60 | Sq.M | 150.00 | 2340.00 |
| | | | | | 2340.00 |
| **BRICK WORKS** | | | | | |
| 10 | BRICK WORKS FOUNDATION CM 1:3 | 2.59 | Cu.M | 2,470.00 | 6397.30 |
| 11 | BRICK WORKS BASEMENT CM 1:3 | 2.37 | Cu.M | 2,470.00 | 5853.90 |

| | | | | | |
|---|---|---|---|---|---|
| 12 | BRICK WORKS CM 1:2 | 10.92 | Cu.M | 2,500.00 | 27300.00 |
| | | | | | 39551.20 |
| **FLOOR AND WALL FINISHES** | | | | | |
| 13 | FLOOR FINISHING CERAMIC TILES | 10.56 | Sq.M | 600.00 | 6336.00 |
| 14 | WALL FINISHING CERAMIC TILES | 15.00 | Sq.M | 300.00 | 4500.00 |
| 15 | SKIRTING CERAMIC TILES IN M | 13.60 | m | 18.00 | 244.80 |
| | | | | | 11080.80 |
| **DOORS AND WINDOWS** | | | | | |
| 16 | FRAMES CONCRETE | 0.12 | Cu.M | 3,233.00 | 387.96 |
| 17 | SHUTTERS METAL ROLLING | 4.66 | Sq.M | 1,000.00 | 4660.00 |
| 18 | SHUTTERS SYNTHETIC PANELLED | 2.49 | Sq.M | 800.00 | 1992.00 |
| 19 | GRILLE FOR WINDOWS 16 KG/SqM | 2.49 | Sq.M | 480.00 | 1195.20 |
| | | | | | 8235.16 |
| **PLASTERING AND POINTING** | | | | | |
| 20 | PLASTERING BASEMENT CM 1:2 12MM | 11.84 | Sq.M | 109.00 | 1290.56 |
| 21 | PLASTERING WALLS CM 1:2 12 MM | 80.80 | Sq.M | 104.00 | 8403.20 |
| 22 | PLASTERING CEILINGS AND SLABS CM 1:2 | 25.56 | Sq.M | 83.00 | 2121.48 |
| 23 | PLASTERING ROOF TOP CM 1:2 12 MM | 15.00 | Sq.M | 109.00 | 1635.00 |
| | | | | | 13450.24 |
| **PAINTING** | | | | | |
| 24 | PAINTING METAL ENAMEL | 10.00 | Sq.M | 64.00 | 640.00 |
| 25 | PAINTING BASEMENT WHITE CEMENT | 11.84 | Sq.M | 31.00 | 367.04 |
| 26 | PAINTING WALLS DISTEMPER | 80.80 | Sq.M | 46.00 | 3716.80 |

| | | | | | |
|---|---|---|---|---|---|
| 27 | PAINTING CEILINGS AND SLABS DISTEMPER | 25.56 | Sq.M | 46.00 | 1175.76 |
| | | | | | 5899.60 |
| **Total** | | | | | 102386.18 |
| **Net Amount** | | | | | 102386 |

## 8.1.7 Electrical Design 1 - AUTOMATIC PLANT WATERING SYSETM

In this project an automation of farm irrigation and soil moisture control by Arduino using soil moisture sensor and L293D module. This automatic irrigation system senses the moisture content of the soil and automatically switches the pump when the power is on. A proper usage of irrigation system is very necessary because the main reason is the shortage of land reserved water due to lack of rain, spontaneous use of water as a result large amounts of water goes waste. For this reason, we use this automatic plant watering and soil moisture monitoring system and this system is very useful in all climatic conditions. India is the agriculture-based country. Our most of peoples are completely depended on the agricultural harvesting. Agriculture is a source of employment of majority Indians and has great impact on the economy of the country. In dry areas or in case of lacking rainfall, irrigation becomes difficult. So, it needs to be automated for proper watering a plant and handled remotely by farmer. When soil goes dry pump will start watering. The aim of the implementation is to reduce water use and automatic irrigation can be used for save time and low power monitor device. The aim of the implementation this project was to demonstrate that the automatic plant irrigation can be used to reduce water use, and save your time.
An automatic plant watering system using Arduino microcontroller UNO R3 is programmed such that it gives the interrupt signals to the motor via the motor driver module. Soil sensor is connected to the A0 pin to the Arduino board which senses the moisture content present in the soil. Whenever the soil moisture content values go down, the sensor senses the humidity change, giving signal to the microcontroller so that the pump (motor) can be activated. This concept can be used for automatic plant watering system. The circuit comprises an Arduino UNO board, a soil moisture sensor, a 5V motor pump, a Motor driver L293D (IC1), motor driver IC to run the water pump. You can power the Arduino board using a 5V to 9V wall wart or plugin adaptor or solar panel. You need a separate 5V to 9v battery for the pump motor.

## Block diagram:

There are two functional components in this project. They are the moisture sensors module and the motor driver for motor pump. Thus, the Arduino Board is programmed using the Arduino IDE software. The function of the moisture sensor is to sense the temperature content present in the soil, and also it measures moisture level in the soil. The motor driver interrupts the signal to, water pump supplies water to the plants. This project uses microcontroller Arduino Uno board to controls the motor and monitor soil moisture. Follow the schematic to connect the Arduino to the motor driver, and the driver to the water pump. The motor can be driven by a 5-volt battery, we can also supply power from external source or from Arduino board. The Arduino Board is programmed using the Arduino IDE software.

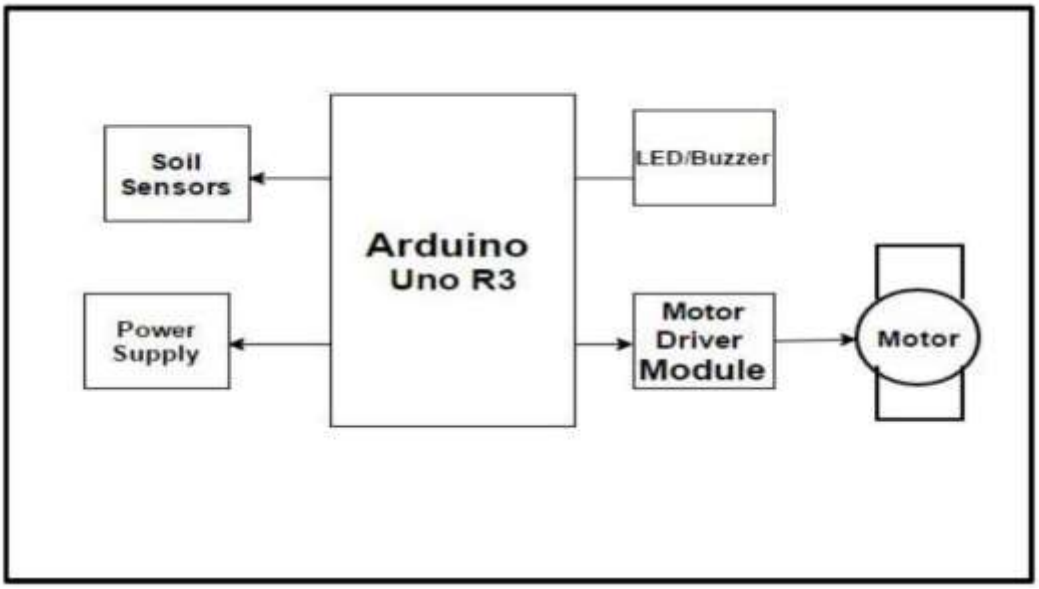


Fig.48 Working Model of Automatic Plant Watering System

## Components & requirements:

## Arduino:

In figure 2 it is showing an Arduino board is an open-source platform used for building electronics projects. Arduino is a programmable circuit's board which we can write a program based on your projects. Arduino program will be uploading with IDE (Integrated Development Environment) software that runs on your computer, it is used to write and upload computer code to the Arduino physical board. Arduino language is merely a set of C/C++ functions that can be called from your code.


Fig.49 Arduino Uno R3 board


Fig.50 Relay

## Relay:

In figure 3, shows are a relay is an electrically operated switch. Several relays use a magnet to automatically operate a switch, however alternative in operation principles are used, like solid state relays. Relays are used wherever it's necessary to regulate a circuit by a separate low-power signal, or wherever many circuits should be controlled by one signal. The essential relays were handling in long distance communicate circuits as amplifiers, they unbroken the signal coming back in from one circuit and re-transmitted it on another circuit.

## Soil Sensors:

In figure 4, Soil moisture sensors measure the humidity of water content in soil. Since the direct hydrometric measuring of free-soil wetness needs removing, drying, and coefficient of a sample, soil wetness sensors live the meter water content indirectly by victimization another property of the soil, like electrical phenomenon, nonconductor constant, or interaction with neutrons, as a proxy for the wetness content.

Fig.51 Soil moisture sensor

Fig.52 Motor driver module

## Motor Driver L293D:

In figure: 4, L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that we can control more than two DC motor with a single L293D IC at same time.

## Motor 5v:

An AC motor is an electrical motor driven by Associate in alternating current (AC). In figure: 5, The AC motor normally consists of two basic components, an outdoor stationary stator coil having coils furnished with AC to supply a rotating flux, and an indoor rotor connected to the output shaft manufacturing a second rotating flux. The rotor flux could also be made by permanent magnets, reluctance striking, or DC or AC electrical windings.

Fig.53 Motor pump

Fig.54 Transistors

Fig.55 Resistors

## Transistor:

The 2N2222 may be a common NPN bipolar semiconductor device; bipolar junction transistors (BJT) used for general purpose low-power amplifying or switch applications. It is designed for low to medium current, low amplifying current, low power, medium voltage, and might operate at moderately high speeds. It had been originally created within the TO-18 metal.

## Resistor:

Here in figure 7, it is an electrical device may be a passive two-terminal electrical part that implements resistance as a circuit component. In electronic circuits, resistors unit of measurement accustomed reduce current flow, alter signal levels, to divide voltages, bias active components, and terminate transmission lines, among completely different uses.

## Pipe:

Here it is used as a water channel, and pipe has been used for watering plant.

## Circuit diagram:

Here In this figure: 7 soil moisture sensors are connected to Arduino A0 pin for analog input, so we can get temperature content present in soil. Vcc pin is connected through 5V Arduino pin; GND pin is representing ground to connect all components. D7 is known as a digital pin, so it connected with transistors to amplifying low power. Motor driver module VCC pin connected through D13 pin of Arduino board, based on temperature monitor it pass the current to the motor pump, D7 pin is used for Ground. We can write values as output. D7 connected through resistors 1k and same connection goes through transistors for low amplifying current. In transistor has three pin which we called as Emitter, base and collector.

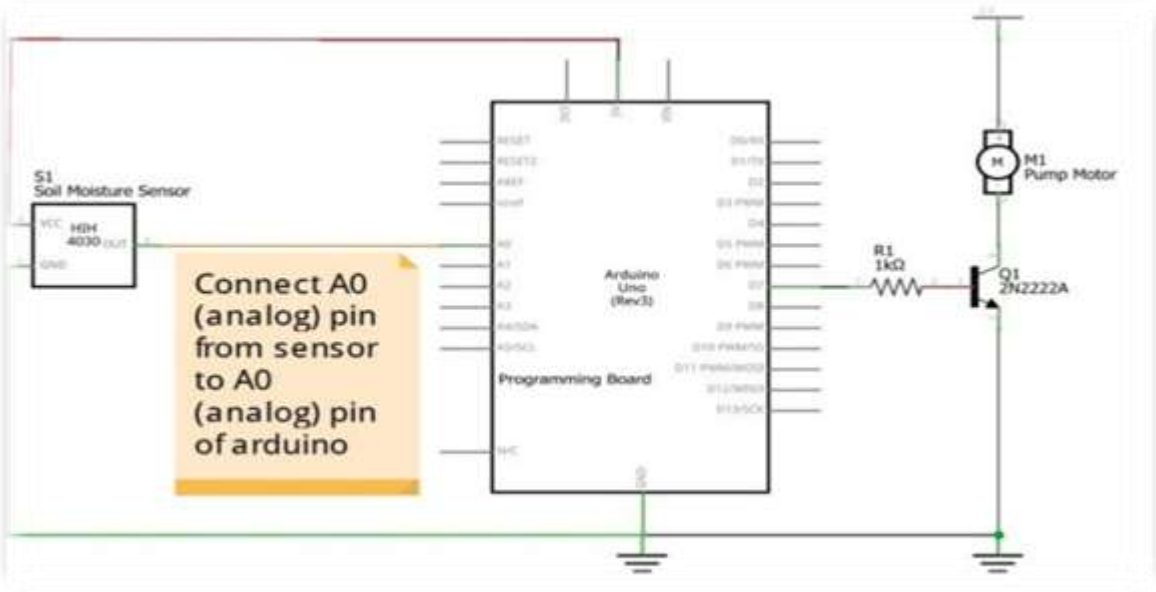


Fig.56 Architecture Diagram

## Advantages:

Low power consumption
Global range
Easy to operate
Flexible to run at specific intervals

## Disadvantages:

Communication delays
Not work in remote areas
Undetectable internal problems in motor

## Estimated cost:

1.Arduino Uno R3 board: -265/-
2.Relay: -700/-
3.Soil sensor: -55/-
4.Motor driver L293D: -299/-
5.Motor 5V: -95/-
6.Transistor: -350/-
7.Resistor: -150/-

## 8.1.8 Electrical Design 2 – SMOKE DETECTOR SYSTEM

A smoke detector is a device that detects smoke, typically as an indicator of fire. Commercial, industrial, and mass residential devices issue a signal to a fire alarm system, while household detectors, known as smoke alarms, generally issue a local audible or visual alarm from the detector itself.

There are two main kinds of smoke detectors. Such as-

Photoelectric smoke detectors and

Ionization smoke detectors.

Photoelectric sensors generate a beam of light focused on a light-sensitive cell, enclosed in the alarm. If the light beam is interrupted from smoke entering the detector, the alarm goes off. Ionization sensors work by having a small piece of radioactive material create an electric current between two plates. If smoke or hot air enters the chamber, the reaction is changed and the current is disrupted, causing the alarm to go off. Photoelectric smoke detectors work best with slow, smoky fires and ionization detectors work best with quick, hot fires.

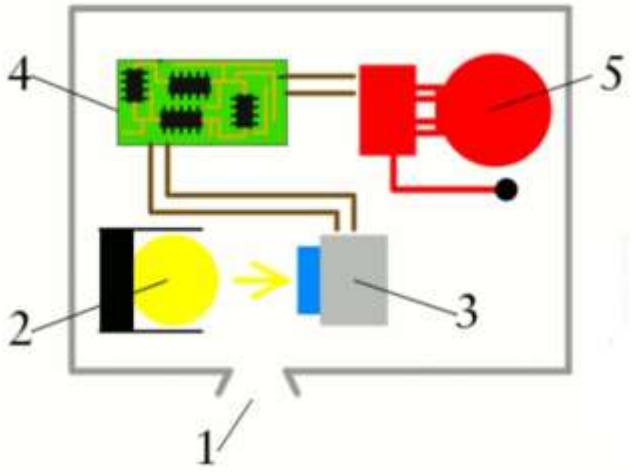


Fig.57 Block Diagram of Smoke Detector System

There are two quite different kinds of smoke detectors. One is a kind of electronic eye; the other's a sort of electronic nose. The eye type of detector is more properly called an optical smoke detector (or photocell smoke detector) and it works a bit like Tom Cruise in Mission Impossible. Remember the scene when Tom dangles from the ceiling trying to avoid all those light-detecting burglar beams? An optical smoke detector is just like that inside. The detector must be screwed to your ceiling because that's where smoke heads for when something starts to burn. Fire generates hot gases and because these are less dense (thinner—or weigh less per unit of volume) than ordinary air they rise upward, swirling tiny smoke particles up too. An invisible, infrared light beam, similar to the ones that Tom Cruise dodged, shoots across the chamber from a light-emitting diode or LED (2) to a photocell (3). The photocell is an electronic light detector that generates electricity for as long as light falls on it. Normally, when there is no smoke about, the light beam shoots constantly between the LED and the detector. An electronic circuit (4) detects that all is well and nothing happens. The alarm (5) remains silent. But if a fire breaks out, smoke enters the chamber (6) and interrupts the beam (7). Because no light is falling on the photocell, it does not generate an electric

current anymore. The circuit spots this straight away (8), realizes something's amiss, and triggers the shrill and nasty alarm (9) that wakes you up and saves your life.

## Light dependent Resistor:

LDRs or Light Dependent Resistors are very useful especially in light/dark sensor circuits. Normally the resistance of an LDR is very high, sometimes as high as 1000 000 ohms, but when they are illuminated with light resistance drops dramatically. The animation opposite shows that when the torch is turned on, the resistance of the LDR falls, allowing current to pass through it. Circuit Wizard software has been used to display, the range of values of a ORP12, LDR. When a light level of 1000 lux (bright light) is directed towards it, the resistance is 400(ohms). When a light level of 10 lux (very low light level) is directed towards it, the resistance has risen dramatically to 10.43M (10430000 ohms).

Fig.58 Light Dependent Resistor

## Light sensor circuit:

When the light level is low the resistance of the LDR is high. This prevents current from flowing to the base of the transistors. Consequently, the LED does not light. However, when light shines onto the LDR its resistance falls and current flows into the base of the first transistor and then the second transistor. The LED lights. The preset resistor can be turned up or down to increase or decrease resistance, in this way it can make the circuit more or less sensitive.

## 3-Terminal 1A positive voltage regulators:

The LM78XX series of three-terminal positive regulators are available in the TO-220/D-PAK package and with several fixed output voltages, making them useful in a wide range of applications. Each type employs internal current limiting, thermal shut-down and safe area protection, making it essentially indestructible. If adequate heat sinking is provided, they can Deliver over 1A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents. these devices can be used with external components to obtain adjustable voltages and currents.

## 7809 IC:

7809 is a voltage regulator integrated circuit (IC) which is widely used in electronic circuits. Voltage regulator circuit can be manually built using parts available in the market but it will take a lot of time to assemble those parts on a PCB. Secondly, the cost of those parts is almost equal to the price of 7809 itself so professionals usually prefer to use 7809 IC instead of making a voltage

regulator circuit from scratch. Before you start using 7809, you will need to know about the pin structure of IC 7809. Apparently, it looks like a transistor. It has three pins. For a better understanding, I have given an image of 7809 bellow. Please take a look. You can easily see the V in and V out pins as well as the ground pin. It is really easy to use 7809 for voltage regulation purposes. It is wise to use two .1uF capacitors on both input and output sides to filter any ripple or distortion in voltage but it is not necessary. In the image, you can see that 12V are being supplied on the input side of 7809 but the output side of 7809 is outputting Regulated 9V. As long as the input voltage remains above 9V, output voltage of 7809 will remain smooth and regulated. Please note that input voltage of 7809 can be up to 23V but under my experience, it is wise to avoid input over 15V. 7809 is claimed to output 9V and almost 1.5A Current but again, I have experienced that we should not put a load over 9V and 1A on it. Since we are using it in power supply, the transfer of power will result in heat output. We will need to use a heat sink with 7809 otherwise this heat can damage it. It is advised to use a 1A fuse on the output side of 7809 and a 1.5A fuse on the input side of 7809 to avoid damage in case of short circuit.

## Transistor BC547:

BC547 is an NPN bi-polar junction transistor. A transistor, stands for transfer of resistance, is commonly used to amplify current. A small current at its base controls a larger current at collector & emitter terminals. BC547 is mainly used for amplification and switching purposes. It has a maximum current gain of 800. Its equivalent transistors are BC548 and BC549. The transistor terminals require a fixed DC voltage to operate in the desired region of its characteristic curves. This is known as the biasing. For amplification applications, the transistor is biased such that it is partly on for all input conditions. The input signal at base is amplified and taken at the emitter. BC547 is used in common emitter configuration for amplifiers. The voltage divider is the commonly used biasing mode. For switching applications, transistor is biased so that it remains fully on if there is a signal at its base. In the absence of base signal, it gets completely off.

## Advantages:

Avoid smoke inhalation. The most important reason is perhaps the only one you really need. Early detection. The earlier is a fire is detected, the faster it will be that firefighters will respond. Insurance discounts. This can save you money on your house insurance. Easy & affordable.

## Estimated cost:

Light dependent resistor: -48/-
Light sensor circuit: -95/-
7809 IC: -200/-
Transistor BC547: -120/-

### 8.1.9 Electrical Design 3 – TEMPERATURE CONTROL SYSTEM

A Temperature Controlled System is a type of control system that automatically controls the temperature of an object or an area. We commonly use temperature control systems in Air conditioners, Refrigerator, Geysers, etc. where the temperature is automatically adjusted as per the input settings. In order to implement a temperature control system, we need a temperature sensor, a controller, and a cooling system. In this project, we have implemented a simple Temperature control system using simple components. The aim of this project is to automatically turn on or off the fan by detecting the surrounding temperature. The hardware requirements for this simple temperature control system are: LM35, L293D, LM358, a fan and a few passive components (Resistors).

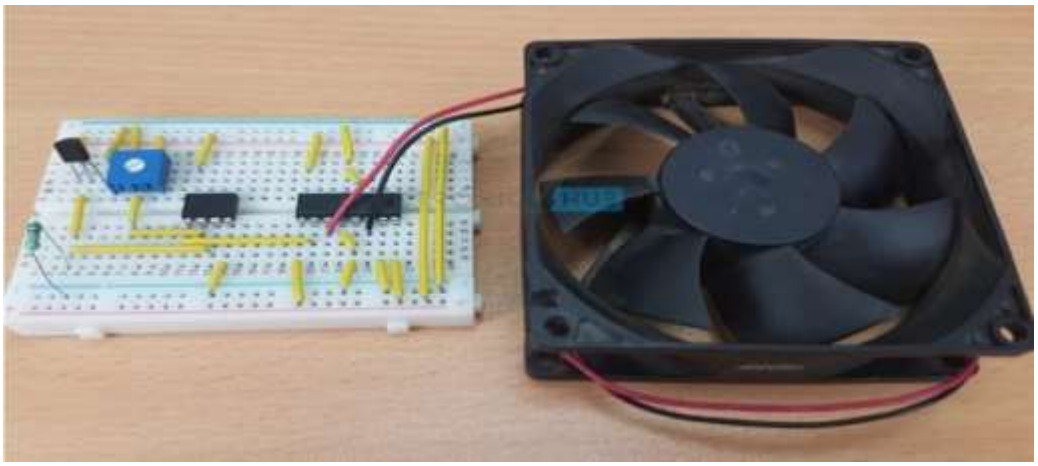

Fig.59 Working Model of Temperature Control System

### Circuit diagram:

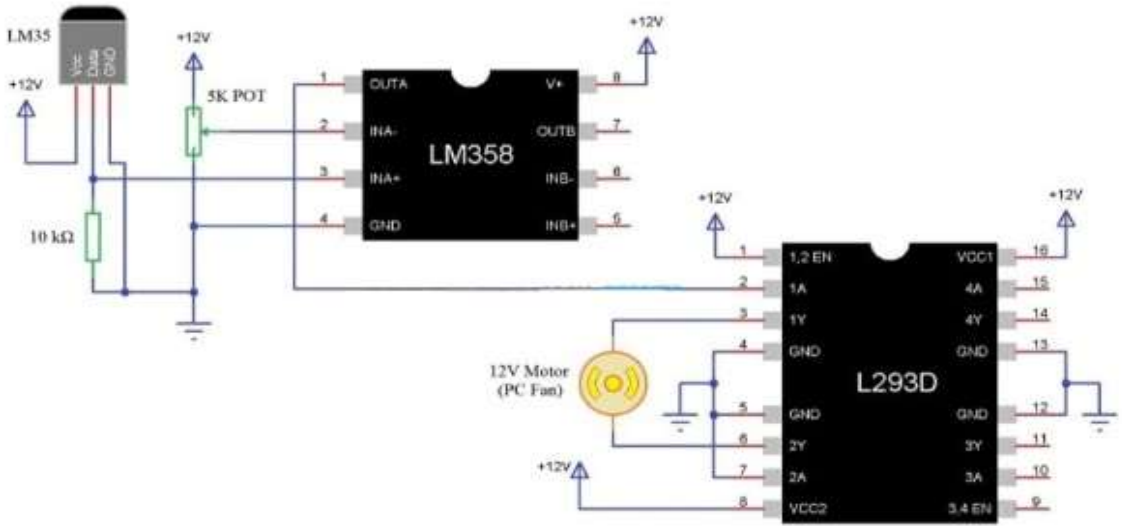


Fig.60 Circuit Diagram of Temperature Control System

The working of the Temperature Control System project can be explained easily by comparing it with a closed loop control system. A closed loop control system consists of an input, a control device, output and feedback. The input is typically a sensor that continuously monitors the test parameter. Here, the input is the LM35 Temperature Sensor and the parameter we are interested in measuring is the Temperature. The data from the input is given to a control device or system. This control device will actuate the output according to the input signals. In our project, LM358 Op – Amp is controller and it acts as a comparator. If the temperature is more than the desired temperature, we need to activate the fan. So, we need to adjust the Potentiometer such that if the temperature increases above a value, the output from the Op – Amp should be HIGH. This HIGH output from the Op – Amp is given to the Motor Driver, which along with the Fan, forms the output part of the Control System. Since the other drive input of the motor driver is already connected to GND, whenever the output from the Op – Amp is HIGH, the Input to the L293D is HIGH and the Fan starts rotating. This will cool down the surroundings and this phenomenon acts as the feedback in the control system. If the temperature decreases, the LM35 senses it and signals the Op – Amp to turn off the Fan. This will cool down the surroundings and this phenomenon acts as the feedback in the control system. If the temperature decreases, the LM35 senses it and signals the Op – Amp to turn off the Fan.

## Components:

1 x LM35 Temperature Sensor
1 x LM358 Op – Amp
1 x L293D Motor Driver IC
1 x 12V DC Fan
1 x 10 KΩ Resistor (1/4 Watt)
1 x 5 KΩ Potentiometer
1 x Breadboard
Connecting Wires
12V Power Supply

## LM35 Temperature Sensor:

LM35 is a Celsius scale temperature sensor device with its output directly proportional to the temperature. LM35 can measure temperatures in the range of $-55^0$C to $+150^0$C.In this project, we are using LM35 Temperature Sensor to measure the temperature of its surroundings and send the corresponding voltage values to the controller (Op – Amp).

## LM358 Op-Amp:

LM358 is an Operational Amplifier (Op – Amp) IC which consists of two independent Op – Amps. LM358 has a wide range of applications like filters, LED or Lamp Drivers, pulse generator, voltage-controlled oscillator (VCO), amplifier, etc. In this project, we are using the LM358 Op – Amp IC in its comparator mode. Even though LM358 has two Op – Amps, we are going to use only one. Hence, other Op – Amp ICs like LM741 (Single Op – Amp) or LM324 (Quadruple Op – Amps) can also be used. L293D Motor Driver IC: L293D is a Motor Driver IC which can drive

two motors at a time with individual inputs as it has a dual H – Bridge Driver. In this project, we are going to drive a 12V PC Fan with this motor driver IC.

## LM35 has 3 pins:

VCC, Data and GND. Connect the VCC and GND to 12V and GND respectively and form a voltage divider with data pin and a 10 KΩ Resistor. The output of the voltage divider is given to the non – inverting input (Pin 3) of the Op – Amp (LM358). A 5 KΩ Potentiometer is connected to the inverting input (Pin 2) of the Op – Amp. Pins 8 and 4 are connected to 12V supply and GND. The output of the Op – Amp i.e., Pin 1 is connected to the 1A Pin (Pin 3), which is the first driver input of the Motor Driver IC L293D. The second driver input of L293D (2A – Pin 7) is connected to GND. Pins 1, 8 and 16 (Enable 1, VCC2 and VCC2) are connected to 12V supply and Pins 4, 5, 12 and 13 are connected to GND. Motor (12V PC Fan) is connected between Pins 3 and 6 (1Y and 2Y).

## Advantages:

The project implements a closed loop type control system for automatically adjusting the temperature. Closed loop type control system is more efficient than an open loop system as the output is continuously monitored as feedback

## Estimated cost:

LM35 Temperature Sensor: -350/-
LM358 Op-Amp: -250/-
L293D Motor Driver IC: -135/-
10 KOhm Resistor: -450/-
45 KOhm Potentiometer: -199/-
Breadboard: -330/-
Connecting wires: -683/-
12v Power Supply: -72/piece

## 8.2 Reason for Students Recommending this Design

### 1. Sustainable design – Rain Water Harvesting

This design was proposed by us because there were 3 water tank structure but There was no conservative method used in the village to conserve the water that Was drained of due to negligence of the villagers. So, we decided to propose the Design if rain water harvesting method as the sustainable development is the key Element to reach the milestone of the environment conservation.

## 2. Physical design – Public Tap Water

The term physical design itself suggest to provide usefulness to unused element, our proposed design will help the to convert the unuseful of the space of the village in the beneficial requirement of the villagers.

## 3. Social design – Police Outpost

Security is been the major concern of the people at any place and police is the basic amenities that has to be provided the government to each and every citizen of the country, so in our proposed design we have provided some basic structure that has to be constructed to avoid the nuisance in future development and safeguards the residence of the villages

## 4. Socio-cultural design – Sarvajanik Sauch Griha

Sanitation is the remedies of many disease, nut in our allocated village there were no public toilet have been provided due to which there would be a risk of open defecation that have been condemned by the citizen and the government and many effective steps had been taken to implement it. So, it is our duty to provide our allocated village the sarvajanik sauch griha (public toilet).

## 5. Smart village design – Common Service Center

As the pandemic has been on the rise, it is imperative for the government to provide the basic government services to the door step of the citizen to avoid the mass gathering and having the safe environment around them.

## 6. Village heritage design – Public dispensary

As we surveyed in our Rajgari village there was no basic health facilities have been provided not even a basic PHC. But PHC can be made available to the village that have the population more than 10000 and SHC in the village have more than population of 2000, so we decided to provide the public dispensary in the village under the scheme of government of India namely **pradhan mantra jan aaushadi Yojana** in which the basic medicine along with the India's ancient medicinal concept AYURVEDA can be provided.

## 7. Electrical Design 1 - Automatic Plant Watering System

- This system provides precise coverage, eliminating concerns of over or underwatering your lawn.
- An Automatic plant watering system will save water & time.

- In additional to reducing the cost of your water bills and keeping your lawn healthy, the right automated irrigation system can help increase the value of your home, as well as save you time.

### 8. Electrical Design 2 – Smoke Detector System

- Initiate automatic fire control & suppression systems & to sound alarm.
- Summon organized assistance to initiate or assist in fire control activities.
- Supervise fire control & suppression system to assure operational status in maintained initiate auxiliary functions involving environment, utility & process controls.

### 9. Electrical Design 3 – Temperature Control System

- Eliminate human error that can occur with attempting to control temperatures manually.
- Temperature regulation controls allow homeowners to take control of the geyser, refrigerator, etc.
- Saves energy and limits excessive use.

## 8.3 About designs Suggestions / Benefit of the villagers

As our village does not consist a basic health facility therefore, it is our duty to provide our village a basic facility. As health is concern the hygiene is the major concern among the village that it lacks in terms of garbage collection and garbage disposal, sanitation which is the major cause of disease among the village can be avoid by providing the public toilet (sarvajanik sauch griha). Security of the life is the fundamental right of any citizen of any country therefore, our village lack of the basic facility of police outpost.

# CHAPTER 9: FUTURE DEVELOPMENT OF THE VILLAGE (FOR THE PART-II DESIGN)

After the multiple visit and interaction with various people of the village and by the means of deliberation we decided to provide the infrastructure in the village are as follows:

- Bus stand
- Secondary school
- Cremation center
- Door to door waste collection center
- Recreation area (parks and public garden)
- Waste water treatment plant
- Agriculture produces procurement market
- Self-propelled doorbell watcher
- Wireless medical monitoring system
- Automatic light dim dip controller

# CHAPTER 10: CONCLUSION (ENTIRE VILLAGE PROJECT)

After taking the idea from the smart and ideal village (Kamrej and Baben respectively) and making SWOT analysis of both the village, we have provided the basic infrastructure in our allocated village namely Rajgari. By keeping in the mind, the positive and negative of the smart and ideal village. we provided us the initial torque to solve the existing problem of our Rajgari village. We observed in our village that some of the basic facilities such as sufficient drinking water supply was made available to the villagers by the means of water tank but the irony that lies in the village that with the sufficient drinking water supply there was not enough sanitation available in the village such as community toilet and no door-to-door garbage collection facility was provided. By realizing the above problem, we by the way of co-operative approach among the group, and having research we decided to propose some design as per the requirement of our village.

- Public toilet
- Police outpost
- Common service center (csc)
- Rain water harvesting
- Solar field
- Public dispensary
- Automatic plant watering system
- Smoke detection system
- Temperature control system

Our utmost aim in Vishwakarma Yojana is to make our Rajgari village self-sufficient and sustainable village. And converting it into the smart village.

# CHAPTER 11: REFERENCES REFEREED FOR THIS PROJECT


- Intelligent Traffic Management System for Smart Cities by Anirup Khanna, Rohit Goyal, Manju Verma & Deepika Joshi
- A Review on Retrofitting by Sumit Bhardwaj & Sabbir Ahammed Belali
- Estimating and Costing by S.C. Rangwala
- Building Construction by Dr. B.C. Punamia
- http://www.world-housing.net/wp-content/uploads/2011/08/Dhajji_English.pdf
- https://www.devalt.org/images/L2_ProjectPdfs/Construction_manual_forartisans_and_Masons_wet_and_hilly_areas_Artisans_constructionmanual.pdf?Oid=51#:~:text=Dhajji%20construction%20is%20a%20traditional,panels%20distribute%20the%20energy%20evenly.
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- https://en.m.wikipedia.org/wiki/Zigbee
- https://smartvillage.gujarat.gov.in/down/guideline_sv_en.pdf
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- https://www.suratmunicipal.gov.in/Departments/SolidWasteManagementHome

# 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

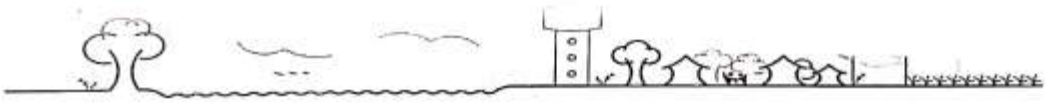
| | |
|---|---|
| Name of Village: | Baben |
| Name of Taluka: | Bardoli |
| Name of District: | Surat |
| Name of Institute: | C.K. Pithawala College, Surat |
| Nodal Officer Name & Contact Detail: | Dr. Babki P. Chauhan 9898865266 |
| Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller) | સરપંચ, ગ્રામ પંચાયત બાબેન તા. બારડોલી, જી. સુરત. |
| Date of Survey: | 08-10-2020 |

1. **Demographical Detail:**

| Sr. No. | Census | Population | Male | Female | Total House Holds |
|---|---|---|---|---|---|
| i) | 2001 | 8377 | 4576 | 3801 | 1599 |
| ii) | 2011 | 15610 | 8642 | 6968 | 5078 |

2. **Geographical Detail:**

| Sr. No. | Description | Information/Detail |
|---|---|---|
| i) | Area of Village (Approx.) (In Hector) Coordinates for Location: | 466 hect. |
| | Forest Area (In hect.) | — |
| | Agricultural Land Area (In hect.) | 282 hect. |
| | Residential Area (In hect.) | 140 hect. |
| | Other Area (In hect.) | 41 hect. |
| | Water bodies | — |
| | Nearest Town with Distance: | Bardoli, 1Km |



### 3. Occupational Details:

| | | |
|---|---|---|
| Name of Three Major Occupation groups in Village | 1. | Farmer |
| | 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)<br>• RO Water<br>• Well (Covered/ Uncovered)<br>• Hand pumps<br>• Tube well/ Borehole<br>• River/ Canal/ Spring/ Lake/ Pond | NO<br><br>Borehole<br>yes | —<br><br>—<br>yes | —<br><br>—<br>— | —<br><br>—<br>1 lake |
| Suggestions if any: | | | | | |
| B. | **Water Tank Facility** | | | | |
| | Overhead Tank | Capacity: | 40,000 | 80,000 Lit | 6 No. |
| | Underground Sump | Capacity: | — | — | |
| Suggestions if any: | | | | | |
| C. | **Drainage Facility** | | | | |
| | Available (Yes/ No) | yes | yes | — | under-ground |
| Suggestions if any: | | | | | |
| D. | **Type of Drainage** | | | | |
| | Closed/ Open | | | | |
| | If Open than Pucca / Kutchcha | | | | |
| | Whether drain water is discharged directly in to Water bodies/ Sewer plants | | | | |
| Suggestions if any: | | | | | |

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| E. | Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM | | | | |
|---|---|---|---|---|---|
| | Village approach road | All weather | – | – | All weather |
| | Main road | Yes | – | – | All weather |
| | Internal streets | Yes | – | – | All weather |
| | Nearest NH/SH/MDR/ODR Dist. in kms. | Yes | – | – | NH-53 5 Km |
| Suggestions if any: | | | | | |

| F. | Transport Facility | | | | |
|---|---|---|---|---|---|
| | Railway Station (Y/N) (If No than Nearest Rly Station---Kms) | Yes | – | – | 3 Km Bardoli |
| | Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms) | Yes | – | – | Babem |
| | Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other) | Yes | – | – | Auto/ Private vehicle |
| Suggestions if any: | | | | | |

| G. | Electricity Distribution | | | | |
|---|---|---|---|---|---|
| | (Y/N ) Govt./ Private (Less than 6 hrs./ More Than 6 hrs) | Yes | – | – | Govt. 24 Hrs DGVCL |
| | Power supply for Domestic Use | Yes | – | – | 24 Hours |
| | Power supply for Agricultural Use | Yes | – | – | Fixed hours |
| | Power supply for Commercial Use | Yes | – | – | 24 hours |
| | Road/ Street Lights | Yes | – | – | – |

| | | | | | |
|---|---|---|---|---|---|
| | 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 | - | - | 8 Nos |
| | Location Condition | Good | - | - | - |
| | Community Toilet (With bath/ without bath facilities) | Yes | - | - | with bath |
| | Solid & liquid waste Disposal system available | NO | - | - | - |
| | Any facility for Waste collection from road | Yes | - | - | 4 vehicles |
| Suggestions if any: | | | | | |
| **I.** | **Irrigation Facility:** | | | | |
| | Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other) | Yes | - | - | Private borewell & From canal |
| Suggestions if any: | | | | | |
| **J.** | **Housing Condition:** | | | | |
| | Kutchha/Pucca (Approx. ratio) | PUCCA | - | - | Minor houses are kuccha |

5. **Social Infrastructural Facilities:**

| Sr. No. | Descriptions | Information/ Detail | Adequate | Inadequate | Remarks |
|---|---|---|---|---|---|

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| K. | Health Facilities: | | | | |
|---|---|---|---|---|---|
| | Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition: | Yes | — | — | Sub-centre PHC |
| | Private Clinic/Private Hospital/ Nursing Home | Yes | — | — | Private clinics Hospital |
| | 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 | Yes | — | 12 Nos. |
| | Primary School | Yes | Yes | — | 2 |
| | Secondary school | Yes | Yes | — | 1 |
| | Higher sec. School | Yes | Yes | — | 1 |
| | ITI college/ vocational Training Center | — | — | — | — |
| | Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities | Yes | Yes | | 1 Engineering |
| | 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 — | Yes — | — — | — — |

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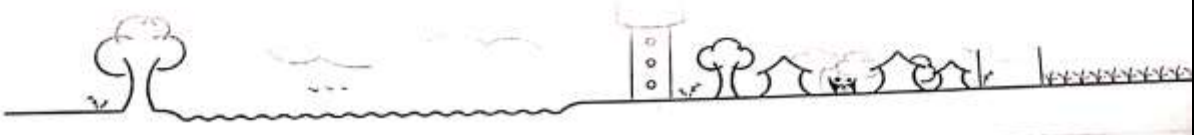
| | | | | | |
|---|---|---|---|---|---|
| | Condition: | Good | | | |
| | Public Library (With daily newspaper supply: Y/N) | Yes | Yes | – | – |
| | Location: | – | – | – | – |
| | Condition: | Good | – | – | – |
| | Public Garden | Yes | – | – | – |
| | Location: | 2 Nos | – | – | – |
| | Condition: | Good | – | – | – |
| | Village Pond | Yes | – | – | – |
| | Location: | 1 Nos | – | – | – |
| | Condition: | Good | – | – | – |
| | Recreation Center | Yes | – | – | – |
| | Location: | 4 | – | – | – |
| | Condition: | Good | – | – | – |
| | Cinema/ Video Hall | | | | |
| | Location: | – | – | – | – |
| | Condition: | | | | |
| | Assembly Polling Station | | | | |
| | Location: | – | – | – | – |
| | Condition: | | | | |
| | Birth & Death Registration Office | Panchayat | Yes | – | – |
| | Location: | – | – | – | – |
| | Condition: | Good | – | – | – |

**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 | Yes | 1 | – | Good |
| | Telecommunication Network/ STD booth | – | – | – | – |



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

| | | | | |
|---|---|---|---|---|
| General Market | Small | Yes | – | – |
| Shops (Public Distribution System) | – | – | – | – |
| Panchayat Building | Yes | 1 NO. | – | Good |
| Pharmacy/Medical Shop | Yes | 2 - 3 | – | Good |
| Bank & ATM Facility | Yes | 3 - 4 | – | Good |
| Agriculture Co-operative Society | Yes | 1 NO. | – | Good |
| Milk Co-operative Soc. | – | – | – | – |
| Small Scale Industries | – | – | – | – |
| Internet Cafes/ Common Service Center/Wi Fi | – | – | – | – |
| Other Facility | NO | – | – | – |

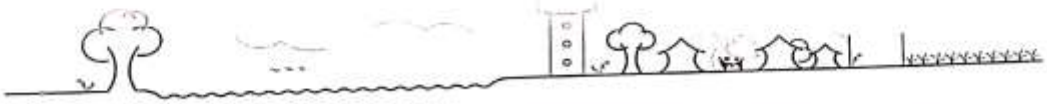
Suggestions if any:

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

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

7. **Data Collection From Village**

| | |
|---|---|
| Village Base Map Available: Hard Copy/Soft Copy | Yes. |



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VI
Techno Economic Survey

| | |
|---|---|
| Recent Projects going on for Development of Village | Yes (Road construction) |
| Any NGO working for village development | No |

8. Additional Information/ Requirement:

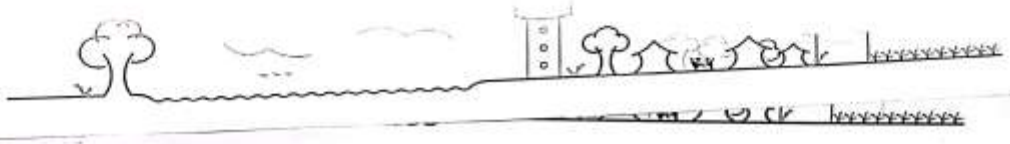
| Sr. No. | Descriptions | Information/ Detail | Remarks |
|---|---|---|---|
| 1. | Repair & Maintenance of Existing Public Infrastructure facilities(School Building, Health Center, Panchayat Building, Public Toilets & any other) | | |
| 2. | Additional Information/ Requirement | All Facilities available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

9. Smart Village Proposal Design

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

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

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



## 12.2 Survey form of Smart Village

Gujarat Technological University, Ahmedabad, Gujarat

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:** | Surat |
| **Name of Taluka:** | Kamrej |
| **Name of Village:** | Kamrej |
| **Name of Institute:** | C.K. Pithawala College, Surat. |
| **Nodal Officer Name & Contact Detail:** | Dr. Borki P. Chauhan 9898865266 |
| **Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)** | સરપંચ ગ્રામ પંચાયત કામરેજ તા. કામરેજ, જિ. સુરત |
| **Date of Survey:** | 08-10-2020. |

### I. DEMOGRAPHICAL DETAIL:

| Sr. No. | Census | Population | Male | Female | Total Number of House Holds |
|---|---|---|---|---|---|
| 1. | 2001 | 12,746 | 7265 | 5481 | 2556 |
| 2. | 2011 | 16078 | 8327 | 7751 | 3969 |

### II. GEOGRAPHICAL DETAIL:

| Sr. No. | Description | Information/Detail |
|---|---|---|
| 1. | Area of Village (Approx.) (In Hector)Coordinates for Location: | 406 hect. |
| 2. | Forest Area (In hect.) | — |
| 3. | Agricultural Land Area (In hect.) | 262 hect. |
| 4. | Residential Area (In hect.) | 140 hect. |
| 5. | Other Area (In hect.) | 41 hect. |
| 6. | Distance to the nearest railway station (in kilometers): | 18 km (Surat) |

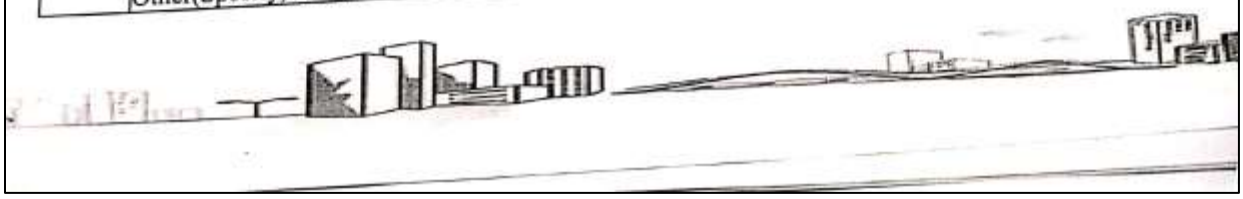
| | | |
|---|---|---|
| 7. | Name of Nearest Town with Distance: | 20Km (Surat) |
| 8. | Distance to the nearest bus station (in kilometers): | 0Km |
| 9. | Whether village is connected to all road for the any facility or town or City? | Yes. |

## III. OCCUPATIONAL DETAILS:

| | | |
|---|---|---|
| Name of Three Major Occupation groups in Village | 1. | Farming |
| | 2. | Business |
| | 3. | Job |
| Major crops grown in the village: | 1. | Sugarcane |
| | 2. | Banana |
| | 3. | Cotton |

## IV. PHYSICAL INFRASTRUCTURE FACILITIES:

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



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Suggestions if any:

| B. | Water Tank Facility | | | | |
|---|---|---|---|---|---|
| | Overhead Tank | Capacity: | 5000 | MLD | 15 Nos. |
| | Underground Sump | Capacity: | | | |

Suggestions if any:

| C. | The Type of Drainage Facility | | | | |
|---|---|---|---|---|---|
| | A. UNDERGROUND DRAINAGE<br>1<br>2<br>B. OPEN WITH OUTLET<br>C. OPEN WITHOUT OUTLET | Yes | | | |

Suggestions if any:

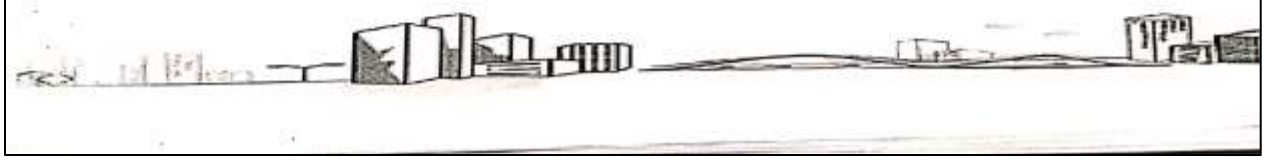
| D. | Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM | | | | |
|---|---|---|---|---|---|
| | Village approach road | Yes | | | Kutchha |
| | Main road | Yes | | | All weather |
| | Internal streets | Yes | | | WBM |
| | Nearest NH/SH/MDR/ODR Dist. in kms. | NH (1.5 Km) | SH (2.6 Km) | MDR (300m) | ODR (3.5 km) |

Suggestions if any:

| E. | 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:

| F. | Electricity Distribution | | | | |
|---|---|---|---|---|---|
| | (Y/N ) Govt./ Private (Less than 6 hrs./ More Than 6 hrs) | Yes | | | > 6 hrs. |



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

| | | | | | |
|---|---|---|---|---|---|
| | Power supply for Domestic Use | Yes | | | > 6 hrs |
| | Power supply for Agricultural Use | Yes | | | > 6 hrs |
| | Power supply for Commercial Use | Yes | | | > 6 hrs |
| | Road/ Street Lights | Yes | | | > 6 hrs |
| | Electrification in Government Buildings/ Schools/ Hospitals | Yes | | | > 6 hrs |
| | Renewable Energy Source Facilities (Y/ N) | NO | | | |
| | LED Facilities | Yes | | | |

**Suggestions if any:**

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

**Suggestions if any:**

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

**Suggestions if any:**

| I. | **Housing Condition:** | | | | |
|---|---|---|---|---|---|
| | Kutchha/Pucca (Approx. ratio) | 60/70 | | | |

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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) | No. 1 | | | |
| | Sub-Centre | | | | |
| | PHC | No. 1 | | | YES (SUB-BLOCK PHC) |
| | BLOCK PHC | | | | — |
| | CHC/RH | No. 1 | | | — |
| | District/ Govt. Hospital | | | | — |
| | Govt. Dispensary | | | | — |
| | Private Clinic | No. 10 | | | ✓ |
| | Private Hospital/ | | | | ✓ |
| | Nursing Home | | | | — |
| | AYUSH Health Facility | | | | — |
| | sonography /ultrasound facility | | | | — |
| | If any of the above Facility is not available in village than approx. distance from village: 2.0....kms. | | | | |
| | **Suggestions if any:** | | | | |
| K. | **Education Facilities:** | | | | |
| | Aaganwadi/ Play group | No. 10 | | | Yes |
| | Primary School | No. 3 | | | Yes |
| | Secondary school | No. 5 | | | yes |
| | Higher sec. School | | | | |
| | ITI college/ vocational Training Center | | | | |
| | Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities | No. 1 | | | SIDDHARTH LAW COLLEGE |
| | If any of the above Facility is not available in village than approx. distance from village: 20....kms. | | | | |

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Suggestions if any:

| L. | Socio- Culture Facilities | Condition | Location | Available (YES) | Available (NO) |
|---|---|---|---|---|---|
| | Community Hall (With or without TV) | without TV | | Yes | |
| | Public Library (With daily newspaper supply: Y/N) | Good | | Yes | |
| | Public Garden | 2 No. | | Yes | |
| | Village Pond | | | | |
| | Recreation Center | 4 No. | | Yes. | |
| | 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 | Good | | Yes | |
| | Telecommunication Network/ STD booth | | | | NO |
| | General Market | | | | NO |
| | Shops (Public Distribution System) | | | | |
| | Panchayat Building | Good | | Yes | |
| | Pharmacy/Medical Shop | | | | NO |
| | Bank & ATM Facility | | | Yes | |
| | Agriculture Co-operative Society | | | | NO |
| | Milk Co-operative Soc. | Good | | Yes | |
| | Small Scale Industries | | | | NO |
| | Internet Cafes/ Common Service Center/Wi Fi | | | | NO |
| | Youth Club | | | | NO |
| | Mahila Mandal | Good | | Yes. | |

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

Suggestions if any:

| N. | Other Facilities | Condition | | Available (YES) | Available (NO) |
|---|---|---|---|---|---|
| | 1. Have these programme implemented the village? | yes | | | |
| | 2. Are there any beneficiaries in the village from the following programme? | yes | | | |
| | 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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Techno Economic Survey

## VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

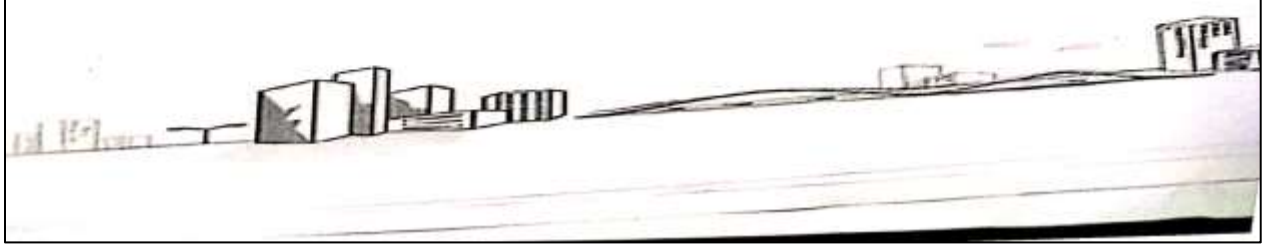
| Sr. No. | Descriptions | Information/ Details | Adequate | Inadequate | Remarks |
|---|---|---|---|---|---|
| 1. | Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources | Yes | ✓ | – | – |
| 2. | Bio-Gas Plant<br>Solar Street Lights<br>Rain Water Harvesting System | Yes<br>Yes | ✓ | – | – |
| 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 | Soft copy | – | – | – |
| 2. | Recent Projects going on for Development of Village | | | | Road construction |
| 3. | Any NGO working for village development | – | – | – | – |
| 4. | Any natural calamity in the village during the last one year:<br>EARTHQUAKES<br>FLOODS<br>CYCLONE<br>DROUGHT<br>LANDSLIDES<br>AVALANCHE<br>OTHER<br>(SPECIFY) | NO | – | – | – |

## VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

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



| | | | |
|---|---|---|---|
| 1. | Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other | — | — |
| 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 ? | Sustainable development | Yes. |

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

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



## 12.3 Survey form of Allocated Village

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

# Techno Economic Survey

## Vishwakarma Yojana: Phase VIII

## ALLOCATED VILLAGE SURVEY

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

| | |
|---|---|
| **Name of District:** | Surat |
| **Name of Taluka:** | chorasi |
| **Name of Village:** | Rajgari |
| **Name of Institute:** | C.K Pithawala college of Engineering |
| **Nodal Officer Name & Contact Detail:** | Dr. Borki P. chauhan 9898865266 |
| **Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)** | શ્રીમતી જી.પટેલ સરપંચ ગ્રામ પંચાયત રાજગરી તા. ચોર્યાસી શ્રીમતી હેમાબેન હેમરાજભાઈ પટેલ |
| **Date of Survey:** | 31/10/20 |

### I. DEMOGRAPHICAL DETAIL:

| Sr. No. | Census | Population | Male | Female | Total Number of House Holds |
|---|---|---|---|---|---|
| 1. | 2001 | | | | |
| 2. | 2011 | 1300 | 716 | 584 | 318 |

### II. GEOGRAPHICAL DETAIL:

| Sr. No. | Description | Information/Detail |
|---|---|---|
| 1. | Area of Village (Approx.) (In Hector)Coordinates for Location: | 350.83 hectares |
| 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): | Surat (22 km) |

| | | |
|---|---|---|
| 7. | Name of Nearest Town with Distance: | Surat (22 Km) |
| 8. | Distance to the nearest bus station (in kilometers): | Adajan Bus Stop (20 Km) |
| 9. | Whether village is connected to all road for the any facility or town or City? | Yes |

## III. OCCUPATIONAL DETAILS:

| | | |
|---|---|---|
| Name of Three Major Occupation groups in Village | 1. | Farming |
| | 2. | Animal husbandary |
| | 3. | Aquaculture |

| | | |
|---|---|---|
| Major crops grown in the village: | 1. | Fenugreek (Methi) |
| | 2. | Green Garlic |
| | 3. | |

## IV. PHYSICAL INFRASTRUCTURE FACILITIES:

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

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| | | | | | |
|---|---|---|---|---|---|
| | Other(Specify)Lake/ Pond | | | | |

Suggestions if any:

| B. | Water Tank Facility | | | | |
|---|---|---|---|---|---|
| | Overhead Tank | Capacity: | 25,000-50,000L | | No. 2 |
| | Underground Sump | Capacity: | 2 Lac. | liters | No. 1 |

Suggestions if any:

| C. | The Type of Drainage Facility | | | | |
|---|---|---|---|---|---|
| | A. UNDERGROUND DRAINAGE 1 | Yes | | | |

Suggestions if any:

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

Suggestions if any:

| E. | Transport Facility | | | | |
|---|---|---|---|---|---|
| | Railway Station (Y/N) (If No than Nearest Rly Station---Kms) | No | 22 km | | |
| | Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms) | No | 20 Km | | |
| | Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other) | Yes | | | |

Suggestions if any:

| F. | Electricity Distribution | | | | |
|---|---|---|---|---|---|
| | (Y/N ) Govt./ Private (Less than 6 hrs./ More Than 6 hrs) | Yes | | | > 6 hrs |

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

| | | | | | |
|---|---|---|---|---|---|
| | Power supply for Domestic Use | Yes | | | > 6 hrs |
| | Power supply for Agricultural Use | Yes | | | > 6 hrs |
| | Power supply for Commercial Use | Yes | | | > 6 hrs |
| | Road/ Street Lights | Yes | | | > 6 hrs |
| | Electrification in Government Buildings/ Schools/ Hospitals | Yes | | | > 6 hrs |
| | Renewable Energy Source Facilities (Y/ N) | Yes | | | Solar street light |
| | LED Facilities | Yes | | | |

**Suggestions if any:**

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

**Suggestions if any:**

| H. | Main Source of Irrigation Facility: | | | | |
|---|---|---|---|---|---|
| | TANK/POND<br>STREAM/RIVER<br>CANAL<br>WELL<br>TUBE WELL.<br>OTHER (SPECIFY) | ✓ | | | |

**Suggestions if any:**

| I. | Housing Condition: | | | | |
|---|---|---|---|---|---|
| | Kutchha/Pucca (Approx. ratio) | 30/70 | | | |

## V. SOCIAL INFRASTRUCTURAL FACILITIES:

| Sr. No. | Descriptions | Information/ Detail | Adequate | Inadequate | Remarks |
|---|---|---|---|---|---|
| J. | **Health Facilities:** | | | | |
| | ICDS (Anganwadi) | NO - 2 | | | — |
| | Sub-Centre | | | | — |
| | PHC | | | | — |
| | BLOCK PHC | | | | — |
| | CHC/RH | | | | — |
| | District/ Govt. Hospital | | | | — |
| | Govt. Dispensary | | | | — |
| | Private Clinic | | | | — |
| | Private Hospital/ | | | | — |
| | Nursing Home | | | | — |
| | AYUSH Health Facility | | | | — |
| | sonography /ultrasound facility | | | | — |
| | If any of the above Facility is not available in village than approx. distance from village: ..10....kms. | | | | |
| **Suggestions if any:** | | | | | |
| K. | **Education Facilities:** | | | | |
| | Aaganwadi/ Play group | NO · 2 | | | Yes |
| | Primary School | NO · 1 | | | Yes |
| | Secondary school | | | | |
| | Higher sec. School | | | | |
| | ITI college/ vocational Training Center | | | | |
| | Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities | | | | |

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If any of the above Facility is not available in village than approx. distance from village: 1.0....kms.

Suggestions if any:

| L. | Socio- Culture Facilities | Condition | Location | Available (YES) | Available (NO) |
|---|---|---|---|---|---|
| | Community Hall (With or without TV) | without TV | | yes | |
| | Public Library (With daily newspaper supply: Y/N) | | | NO | |
| | Public Garden | | | NO | |
| | Village Pond | | | | |
| | Recreation Center | | | NO | |
| | 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 | Good | | yes | |
| | Telecommunication Network/ STD booth | | | | NO |
| | General Market | | | | NO |
| | Shops (Public Distribution System) | | | | |
| | Panchayat Building | Good | | yes | |
| | Pharmacy/Medical Shop | | | | NO |
| | Bank & ATM Facility | | | | NO |
| | Agriculture Co-operative Society | | | | NO |
| | Milk Co-operative Soc. | | | | NO |
| | Small Scale Industries | | | yes | |
| | Internet Cafes/ Common Service Center/Wi Fi | | | | NO |
| | Youth Club | | | | No |
| | Mahila Mandal | | | | No |

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

Suggestions if any:

| N. | Other Facilities | Condition | | Available (YES) | Available (NO) |
|---|---|---|---|---|---|
| | 1. Have these programme implemented the village? | Yes | | | |
| | 2. Are there any beneficiaries in the village from the following programme? | Yes | | | |
| | 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 | — | — | — | — |
| 2. | Bio-Gas Plant Solar Street Lights Rain Water Harvesting System | — | — | — | — |
| 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 | Soft copy | | | |
| 2. | Recent Projects going on for Development of Village | | | | water tank construction |
| 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) | — | — | — | — |

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## VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

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

## IX. Smart Village / Heritage Details

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

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

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

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## 12.4 Gap Analysis of the Allocated Village

### Table 14 Village Gap Analysis

| VILLAGE GAP Analysis | | | | | |
|---|---|---|---|---|---|
| **Village Facilities** | **Planning Commission/UDPFI Norms** | **Village Name:** | Rajgari | | |
| | | **Population:** | 1,300 | | |
| | | **Existing** | **Required as per Norms** | **Smart Village / Cities / Heritage Future Projection Design** | **Gap** |
| **Social Infrastructure Facilities** | | | | | |
| **Education** | | | | | |
| Anganwadi | Each or Per 2500 population | 2 | 1 | | 0 |
| Primary School | Each Per 2500 population | 2 | 1 | | 0 |
| Secondary School | Per 7,500 population | 0 | 0 | | 0 |
| Higher Secondary School | Per 15,000 Population | 0 | 0 | | 0 |
| College | Per 125,000 Population | 0 | 0 | | 0 |
| Tech. Training Institute | Per 100000 Population | 0 | 0 | | 0 |
| Agriculture Research Centre | Per 100000 Population | 0 | 0 | | 0 |
| Skill Development Center | Per 100000 Population | 0 | 0 | | 0 |
| **Health Facility** | | | | | |
| Govt/Panchayat Dispensary or Sub PHC or Health Centre | Each Village | 0 | 1 | | 1 |
| Primary Health & Child Health Center | Per 20,000 population | 0 | 0 | | 0 |
| Child Welfare and Maternity Home | Per 10,000 population | 0 | 0 | | 0 |
| Multispeciality Hospital | Per 100000 Population | 0 | 0 | | 0 |
| **Public Latrines** | 1 for 50 families (if toilet is not there in home, especially for slum pockets & kutcha house) | 0 | 1 | | 1 |
| **Physical Infrastructure Facilities** | | | | | |
| Transportation | | **Adequate / Inadequate** | | Inadequate | |
| Pucca Village Approach Road | Each village | | | Adequate | |
| Bus/Auto Stand provision | All Villages connected by PT (ST Bus or Auto) | | | Inadequate | |
| Drinking Water (Minimum 70 lpcd) | | **Adequate / Inadequate** | | Adequate | |
| Over Head Tank | 1/3 of Total Demand | 2 | | Adequate | |
| U/G Sump | 2/3 of Total Demand | | | Adequate | |
| Drainage Network – Open | | **Adequate / Inadequate** | | inadequate | |
| Drainage Network – Cover | | | | inadequate | |
| Waste Management System | | **Adequate / Inadequate** | | inadequate | |
| **Socio- Cultural Infrastructure Facilities** | | | | | |
| **Community Hall** | Per 10000 Population | 1 | 0 | | 0 |
| **community hall and Public Library** | Per 15000 Population | 0 | 0 | | 0 |
| **Cremation Ground** | Per 20,000 population | 0 | 0 | | 0 |
| **Post Office** | Per 10,000 population | 1 | 1 | | 0 |
| **Gram Panchayat Building** | Each individual/group panchayat | 1 | 1 | | 0 |
| **APMC** | Per 100000 Population | 0 | 0 | | 0 |
| **Fire Station** | Per 100000 Population | 0 | 0 | | 0 |
| **Public Garden** | Per village | 0 | 1 | | 1 |
| **Police post** | Per 40,000Population | 0 | 0 | | 0 |
| **Shopping Mall** | 0 | | | | |
| **Electrical Design** | | | | | |
| **Electricity Network** | | **Adequate / Inadequate** | | Adequate | |
| | | | | | |
| | | | | | |
| **Any Smart Village Facility** | | | | | |
| **Technology** | No | | | | |
| | | | | | |
| | | | | | |
| | | **ESR cap** | 0 | | |
| | | **Sump cap** | 0 | | |
| | | **Lat** | 0 | | |

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

**Table 15 Village Summary**

| Sr. no | Village | Description | Design Proposal |
|---|---|---|---|
| 1 | Rajgari | Civil | Sarvananik Sauch Griha |
| | | | Public Dispensary |
| | | | Police Outpost |
| | | | Solar Field |
| | | | Csc Centre |
| | | | Rain Water Harvesting |
| | | Electrical | Automatic Plant Watering System |
| | | | Temperature Control System |
| | | | Smoke Detector System |
| 2 | Tenarang | Civil | Library |
| | | | Public latrine |
| | | | Clinic |
| | | | Lake Beautification |
| | | | Bank |
| | | | Vertical Farming |
| | | Electrical | Hybrid Street Light |
| | | | Solar Powered Charger |
| | | | Replacement of Light Source |
| 3 | Kunkni | Civil | Anganwadi |
| | | | Clinic |
| | | | Sprinkler Irrigation |
| | | | Solid Waste Disposal |
| | | | Water Tank |
| | | | Sewage Treatment Plant |
| | | Electrical | Smart Power Theft Detection system |
| | | | Short circuit protection |
| | | | Vertical axis wind turbine |
| 4 | Narthan | Civil | Public Latrine Block |
| | | | Public Health Centre |
| | | | Community Hall |
| | | | Rain Water Harvesting |
| | | | General Market |
| | | | Entrance Gate |
| | | Electrical | Auto Electronic School Bell |
| | | | Automated Night Lighting System |
| | | | Solar Powered Battery Charging with Reverse |

## 12.6 Summary of Good Photographs


Fig.61 Team Co-Operation

## 12.7 Village Interaction with Sarpanch Report with the Photograph

We interacted with sarpanch from the various means of communication including mobile phone and physical interaction. The sarpanch provided us various information related to the village such as occupational details (farming, animal husbandry, aquaculture) of his village people, various agriculture commodities (fenugreek, green garlic) and provided us instruction regarding the COVID 19 status of the village and what facilities were provided to the villagers by the government and how co-operative approach help them to curb the pandemic effect. And also provided basic information about physical infrastructure available in the village. Hence, due to sarpanch support we were able to complete village visit and survey smoothly.

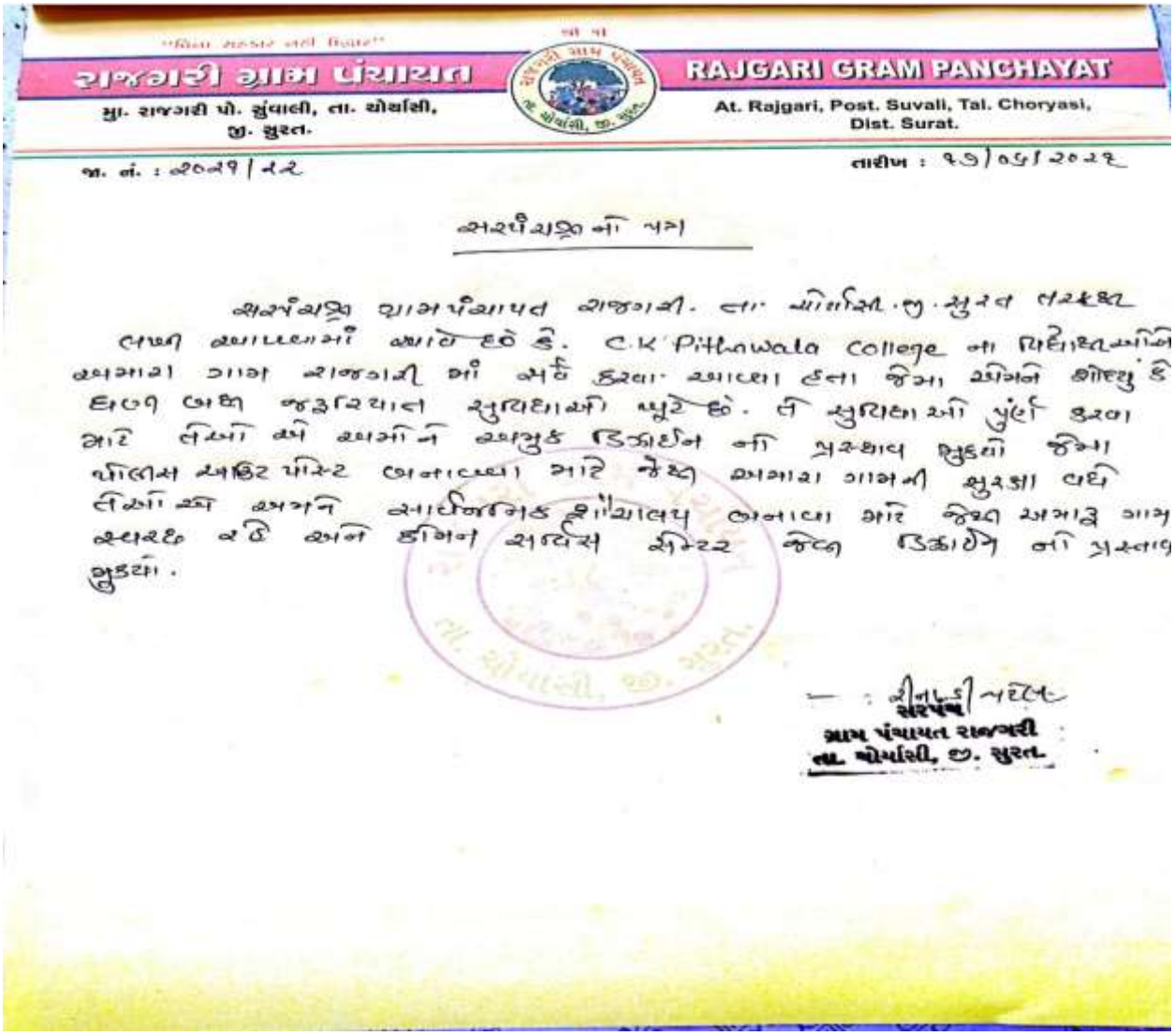

Fig.62 Picture With Sarpanch

## 12.8 Link for AutoCAD and Estimator

**AutoCAD**
We have used AutoCAD software to prepare the design and here is the link below to access that design
https://drive.google.com/drive/folders/1TqkMUjKJe_x4jdTUpDXxk0jhODRGhQje?usp=sharing

**Estimator 2.0**
We have used Estimator 2.0 software for the calculation of design and here is the link below to access the estimation report
https://drive.google.com/drive/folders/1f-xuXWk_kUFQy99qMo6g7Yq-B9_rbnQZ?usp=sharing

## 12.9 Sarpanch's Letter



રાજગારી ગ્રામ પંચાયત
મુ. રાજગારી પો. સુંવાલી, તા. ચોર્યાસી, જી. સુરત.

RAJGARI GRAM PANCHAYAT
At. Rajgari, Post. Suvali, Tal. Choryasi, Dist. Surat.

જા. નં. : ૨૦૨૧/૨૨ તારીખ : ૧૩/૦૬/૨૦૨૨

સરપંચશ્રી નો પત્ર

સરપંચશ્રી ગ્રામપંચાયત રાજગારી. તા. ચોર્યાસી. જી. સુરત તરફથી

લખી જણાવવામાં આવે છે કે. C.K. Pithawala College ના વિદ્યાર્થીઓને અમારા ગામ રાજગારી માં સર્વે કરવા આવ્યા હતા જેમા એમને જોવ્યું કે અહી બધી જરૂરિયાત સુવિધાથી પૂરે છે. તે સુવિધા ઓ પુર્ણ કરવા માટે તેમણે એ અમોને અમુક ડિઝાઈન ની પ્રરુથાવ મુકયો જેમા પોલીસ આઉટ પોસ્ટ બનાવવા માટે જેથી અમારા ગામની સુરક્ષા વધે તેમણે એ અમને આર્યુવેદિક દવાખાનું બનાવા માટે જેથી અમારૂ ગામ સ્વસ્થ રહે અને કોમન સર્વિસ સેન્ટર જેવા ડિઝાઈન નો પ્રસ્તાવ મુકયો.

— : શ્રીનામ :
સરપંચ
ગ્રામ પંચાયત રાજગારી
તા. ચોર્યાસી, જી. સુરત.

# Chapter 13: From the Chapter- 9 Future Designs of The Aspects

## 13.1 Design Proposal

### 13.1.1 Bus Stand

The main aim behind recommendation of this design is that to bring prosperity to any region and geographic area the connectivity of that region play an important role. In past we have seen many cities has flourished due to its natural harbor or its location near any major road. So, keeping that in mind this design has been recommended. For an ease there is surat sitilink last bus stop 1-2 km away from village so to connect this village that route can be easily extended without increasing pressure on the existing resource.

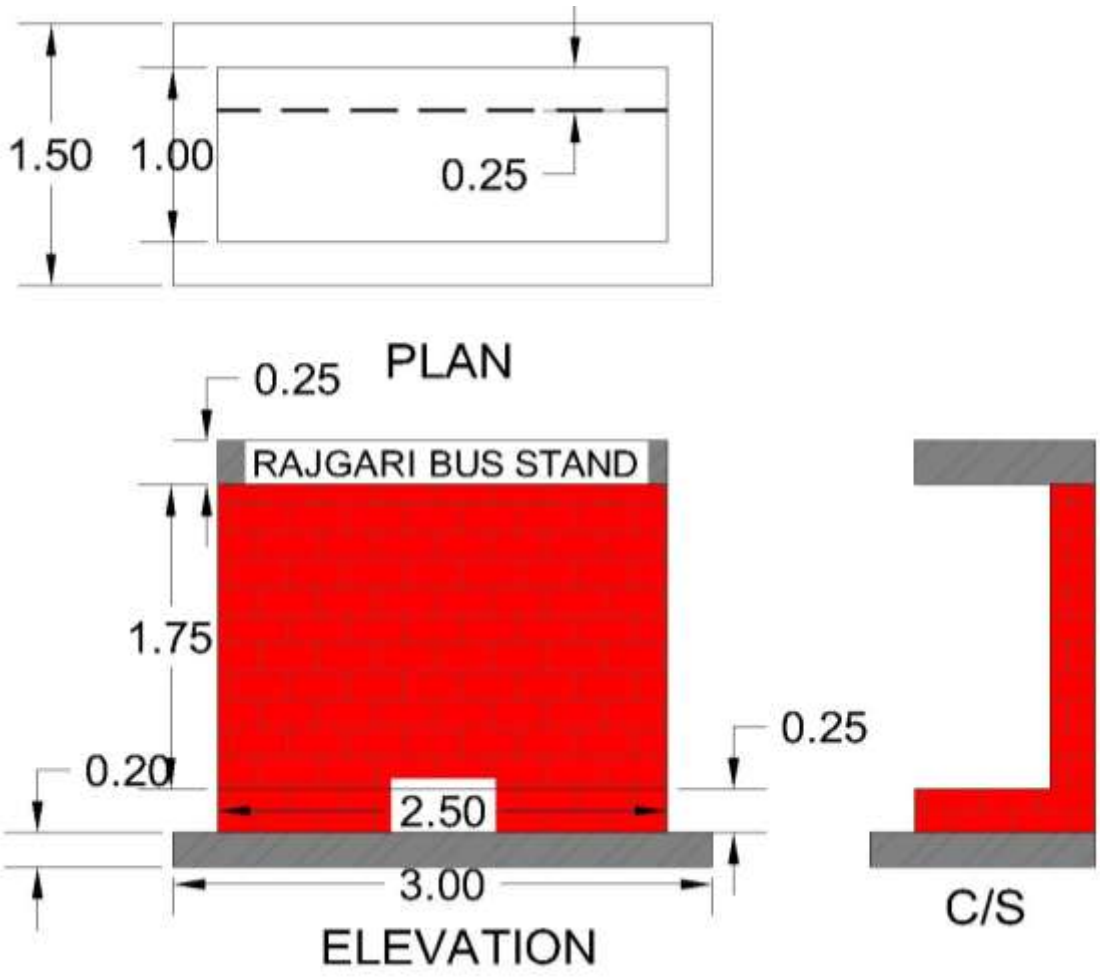



Fig.63 Plan, Elevation and Cross Section of Bus Stand

**Table 16 Estimation of Bus Stand**

| SlNo | Description | Quantity | Unit | Rate | Amount (RS) |
|---|---|---|---|---|---|
| | **CELLAR** | | | | |
| | **EARTH WORKS** | | | | |
| **1** | **EARTH WORKS EXCAVATION:** | 0.90 | Cu.M | 102.00 | 91.80 |
| | | | | | **91.80** |
| | **PCC** | | | | |
| **2** | **PCC FOUNDATION 1:3:6:** | 0.90 | Cu.M | 2,873.00 | 2585.70 |
| | | | | | **2585.70** |
| | | | | | |
| **3** | **RCC SUN SHADES M15:** | 0.62 | Cu.M | 3,625.00 | 2247.50 |
| | | | | | **2247.50** |
| | **BRICK WORKS** | | | | |
| **4** | **BRICK WORKS FOUNDATION CM 1:3:** | 0.63 | Cu.M | 2,470.00 | 1556.10 |
| **5** | **BRICK WORKS CM 1:3:** | 1.09 | Cu.M | 2,490.00 | 2714.10 |
| | | | | | **4270.20** |
| | **FLOOR AND WALL FINISHES** | | | | |
| | | | | | |
| **6** | **FLOOR FINISHING RED OXIDE:** | 2.50 | Sq.M | 212.00 | 530.00 |
| | **530.00** | | | | |
| | **PLASTERING AND POINTING** | | | | |
| **7** | **PLASTERING WALLS CM 1:2 12 MM:** | 8.75 | Sq.M | 104.00 | 910.00 |
| | | | | | **910.00** |
| | **PAINTING** | | | | |
| **8** | **PAINTING WALLS DISTEMPER:** | 8.75 | Sq.M | 46.00 | 402.50 |
| | | | | | **402.50** |
| **Total for CELLAR** | | | | | **11037.70** |
| **Total** | | | | | **11037.70** |
| **Net Amount** | | | | | **11038.00** |

### 13.1.2 Chabutra

The main aim behind the recommendation of this design is that to preserve and revive the village cultural heritage. In past it is use to have panchayat as well to feed the birds. This is use to be the focal point of the social life of the village where villager can gather up and can socialize. It is the symbol of harmony between human to human and human to nature. To revive this vanishing and old cultural heritage this design is recommended.

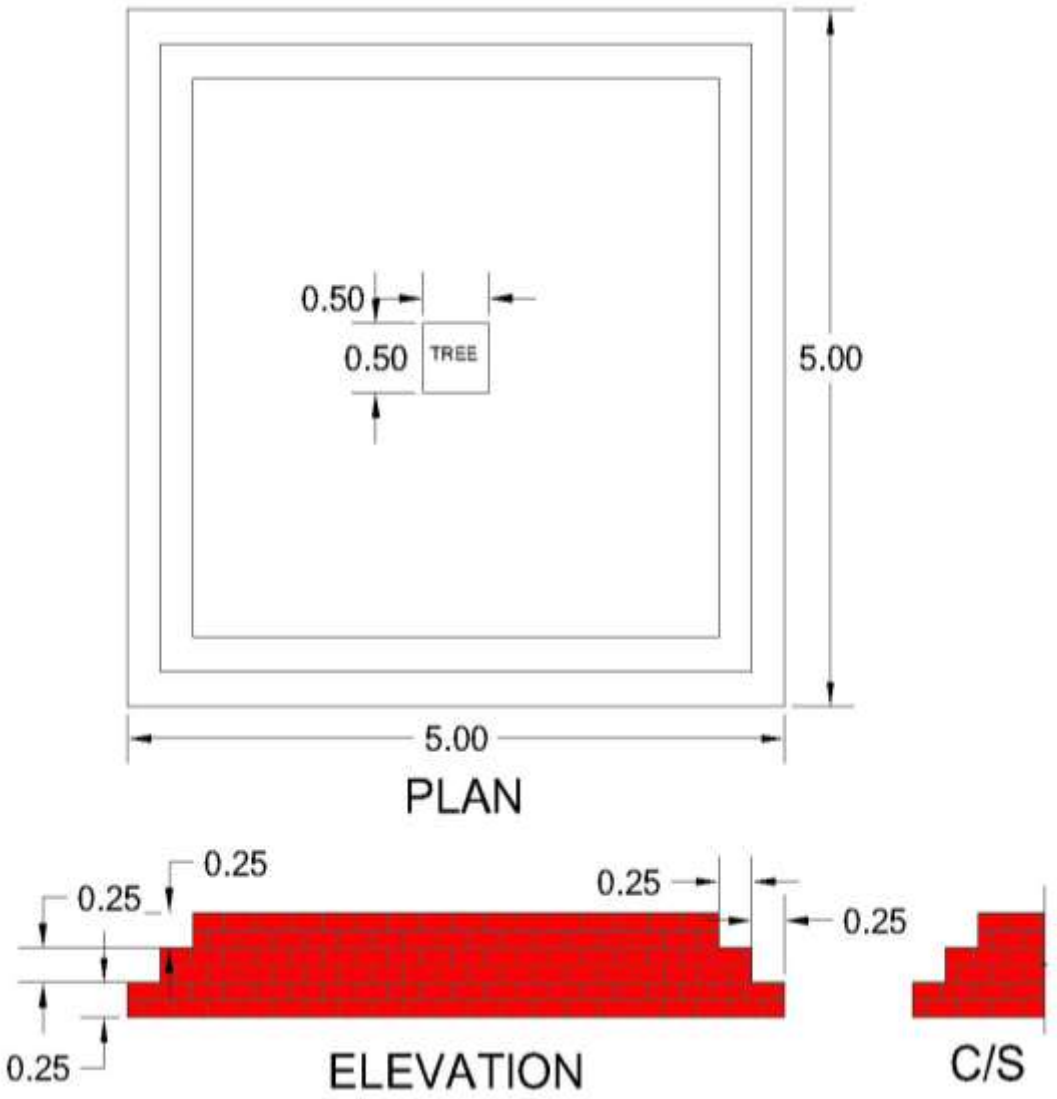



Fig.64 Plan, Elevation and Cross Section of Chabutra

**Table 17 Estimation of Chabutra**

| SINO | Description | Quantity | Unit | Rate | Amount (RS) |
|---|---|---|---|---|---|
| | **CELLAR** | | | | |
| | **BRICK WORKS** | | | | |
| **1** | **BRICK WORKS FOUNDATION CM 1:3:** | 6.25 | Cu.M | 2,470.00 | 15437.50 |
| **2** | **BRICK WORKS BASEMENT CM 1:3:** | 9.06 | Cu.M | 2,470.00 | 22378.20 |
| | | | | | **37815.70** |
| | **FLOOR AND WALL FINISHES** | | | | |
| **3** | **FLOOR FINISHING RED OXIDE:** | 16.00 | Sq.M | 212.00 | 3392.00 |
| | | | | | **3392.00** |
| **Total for CELLAR** | | | | | **41207.70** |
| **Total** | | | | | **41207.70** |
| **Net Amount** | | | | | **41208.00** |

### 13.1.3 Pravesh Dwar

This reason behind recommendation of this design is that during the first visit the biggest difficulty was faced is to recognize the village be in the village as there is no demarcation and sign to show that and village is also covered with the dense canopy of trees. This cause the village to be unnoticeable by the administration and the people that result into lack of development and create underdeveloped socio-economic pocket. Since ancient time gate play an important role in Indian culture all the ceremonies and rites are starting from the gate and it is considered to be source of prosperity and well-being so they used to draw swastika in the front of gate. So, it became necessary to provide gate.

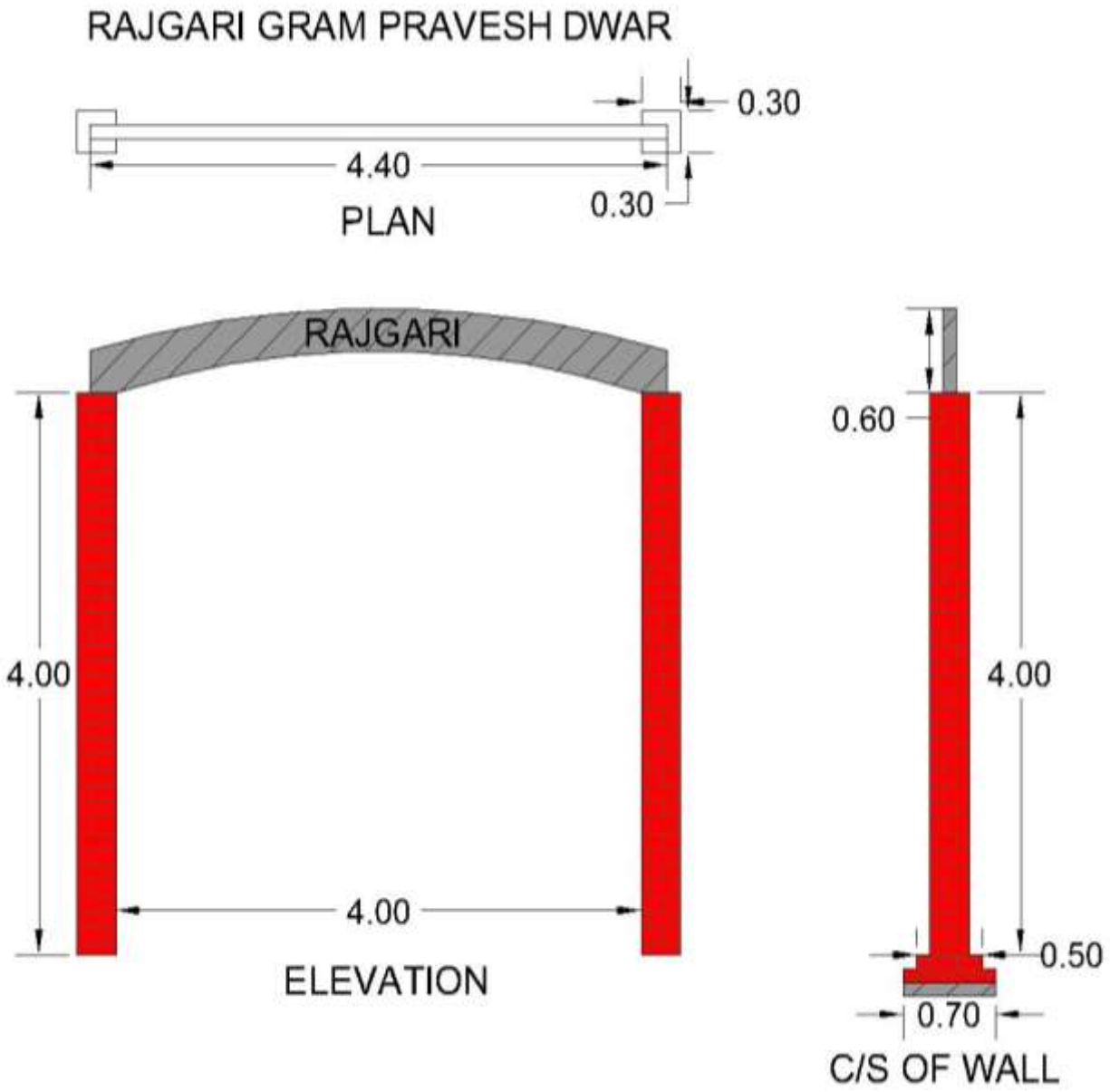



Fig.65 Plan, Elevation and Cross section of Pravesh Dwar

**Table 18 Estimation of Pravesh Dwar**

| SlNo | Description | Quantity | Unit | Rate | Amount (RS) |
|---|---|---|---|---|---|
| | **GROUND FLOOR** | | | | |
| | **EARTH WORKS** | | | | |
| **1** | **EARTH WORKS EXCAVATION:** | 0.25 | Cu.M | 102.00 | 25.50 |
| | | | | | **25.50** |
| | **PCC** | | | | |
| **2** | **PCC FOUNDATION 1:3:6:** | 0.10 | Cu.M | 2,873.00 | 287.30 |
| | | | | | **287.30** |
| | | | | | |
| **3** | **RCC BEAMS M15:** | 0.13 | Cu.M | 3,738.00 | 485.94 |
| | | | | | **485.94** |
| | **BRICK WORKS** | | | | |
| **4** | **BRICK WORKS FOUNDATION CM 1:3:** | 0.10 | Cu.M | 2,470.00 | 247.00 |
| **5** | **BRICK WORKS BASEMENT CM 1:3:** | 0.05 | Cu.M | 2,470.00 | 123.50 |
| | | | | | |
| **6** | **BRICK WORKS CM 1:2:** | 0.59 | Cu.M | 2,500.00 | 1475.00 |
| | | | | | **1845.50** |
| | **FLOOR AND WALL FINISHES** | | | | |
| **7** | **WALL FINISHING MARBLE SLABS:** | 2.55 | Sq.M | 900.00 | 2295.00 |
| | | | | | **2295.00** |
| **Total for GROUND FLOOR** | | | | | **4939.24** |
| **Total** | | | | | **4939.24** |
| **Net Amount** | | | | | **4939.00** |

### 13.1.4 Public Distribution System Shop

The reason for recommendation of this design is that our village is coastal village that causing there agriculture less productive than comparison to the village in other area of surat like Bardoli, Kamrej, Kadodara, etc. so this village is low-income village and many people are ration card holder and dependent on subsidized grain to bring ration shop at their door step this design is recommended.

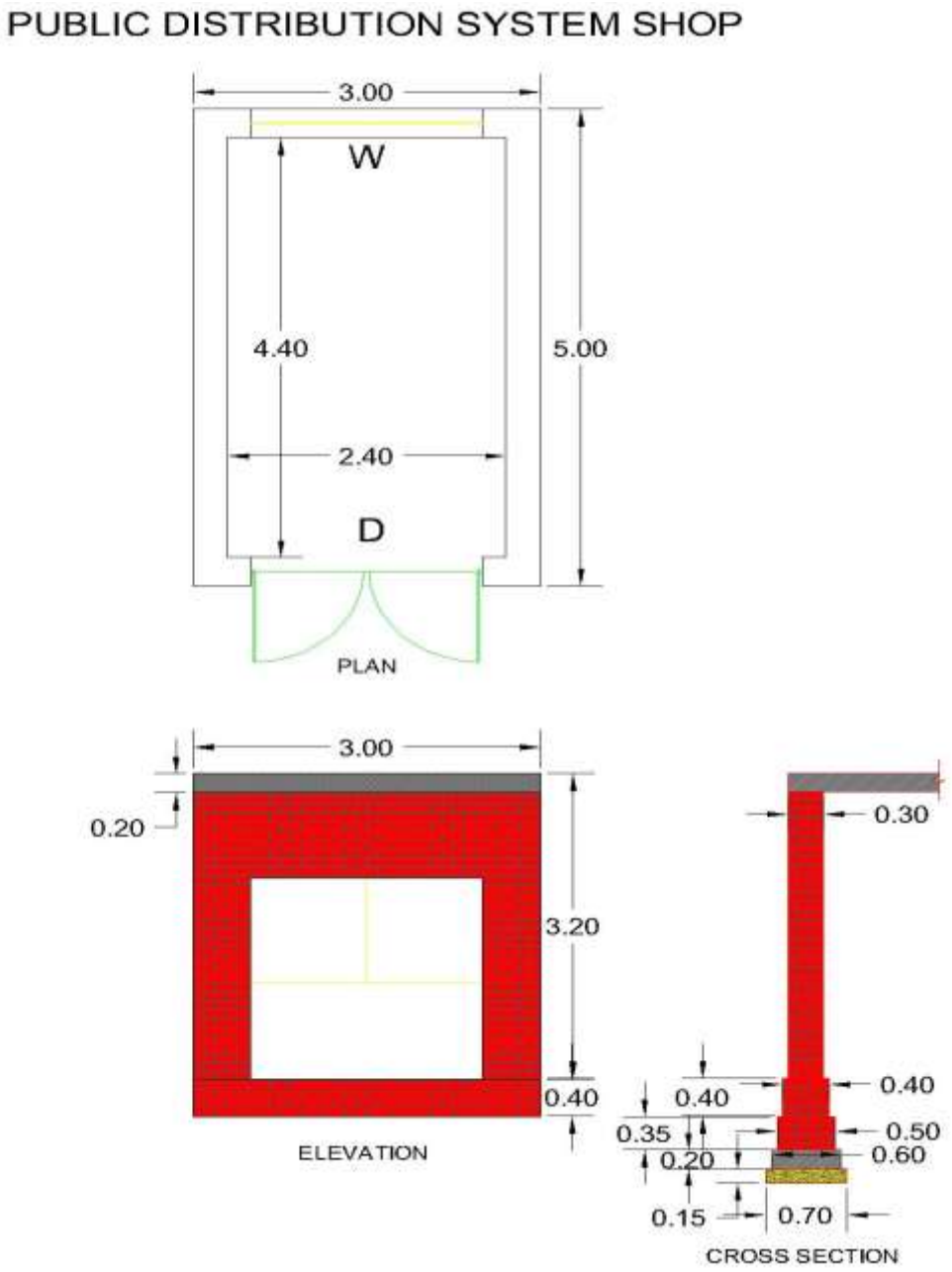



Fig.66 Plan, Elevation and Cross section of PDS Shop

## Table 19 Estimation of Public Distribution System Shop

| SINO | Description | Quantity | Unit | Rate | Amount (RS) |
|---|---|---|---|---|---|
| | **CELLAR** | | | | |
| | **EARTH WORKS** | | | | |
| **1** | **EARTH WORKS EXCAVATION:** | 28.22 | Cu.M | 102.00 | 2878.44 |
| **2** | **EARTH WORKS FILLING FOUNDATION USING SAND:** | 6.91 | Cu.M | 769.00 | 5313.79 |
| | | | | | **8192.23** |
| | **PCC** | | | | |
| **3** | **PCC FOUNDATION 1:3:6:** | 6.91 | Cu.M | 2,873.00 | 19852.43 |
| **4** | **DAMP PROOF COURSE 1:2:4:** | 23.04 | Sq.M | 110.00 | 2534.40 |
| | | | | | **22386.83** |
| | | | | | |
| **5** | **RCC ROOF SLABS M15** | 3.00 | Cu.M | 3,625.00 | 10875.00 |
| | | | | | **10875.00** |
| | **BRICK WORKS** | | | | |
| **6** | **BRICK WORKS FOUNDATION CM 1:3:** | 10.08 | Cu.M | 2,470.00 | 24897.60 |
| | | | | | |
| **7** | **BRICK WORKS BASEMENT CM 1:3:** | 9.22 | Cu.M | 2,470.00 | 22773.40 |
| **8** | **BRICK WORKS CM 1:3:** | 49.98 | Cu.M | 2,490.00 | 124450.20 |
| | | | | | **172121.20** |
| | **FLOOR AND WALL FINISHES** | | | | |
| **9** | **FLOOR FINISHING CERAMIC TILES:** | 10.56 | Sq.M | 600.00 | 6336.00 |
| **10** | **WALL FINISHING CERAMIC TILES:** | 40.80 | Sq.M | 300.00 | 12240.00 |
| | | | | | **18576.00** |
| | **DOORS AND WINDOWS** | | | | |
| **11** | **FRAMES CONCRETE:** | 0.08 | Cu.M | 3,233.00 | 258.64 |
| **12** | **SHUTTERS METAL ROLLING:** | 5.61 | Sq.M | 1,000.00 | 5610.00 |
| | | | | | **5868.64** |
| | **PLASTERING AND POINTING** | | | | |
| **13** | **PLASTERING WALLS CM 1:2 12 MM:** | 339.40 | Sq.M | 104.00 | 35297.60 |
| **14** | **PLASTERING ROOF TOP CM 1:2 12 MM:** | 15.00 | Sq.M | 109.00 | 1635.00 |
| | | | | | **36932.60** |
| | **PAINTING** | | | | |
| **15** | **PAINTING CEILINGS AND SLABS DISTEMPER:** | 15.00 | Sq.M | 46.00 | 690.00 |
| **16** | **PAINTING WALLS EXT. DISTEMPER:** | 48.00 | Sq.M | 46.00 | 2208.00 |
| | | | | | **2898.00** |
| **Total for CELLAR** | | | | | **277850.50** |
| **Total** | | | | | **277850.50** |
| **Net Amount** | | | | | **277851.00** |

### 13.1.5 Swimming Pool

The main reason behind recommendation of this design is that to fulfill physical educational, skill development as well as recreational aspect. As skill of swimming is major skill that human should know which is much ignored in india this skill is also help in villager participation in marine industry and merchant navy which will bring employment in village. And also, now a days due to global warming cyclone is become frequent in Arabian sea which is causing costal flooding in low lying area this skill will become very helpful at that time not just villager but for other also during time of natural calamity.

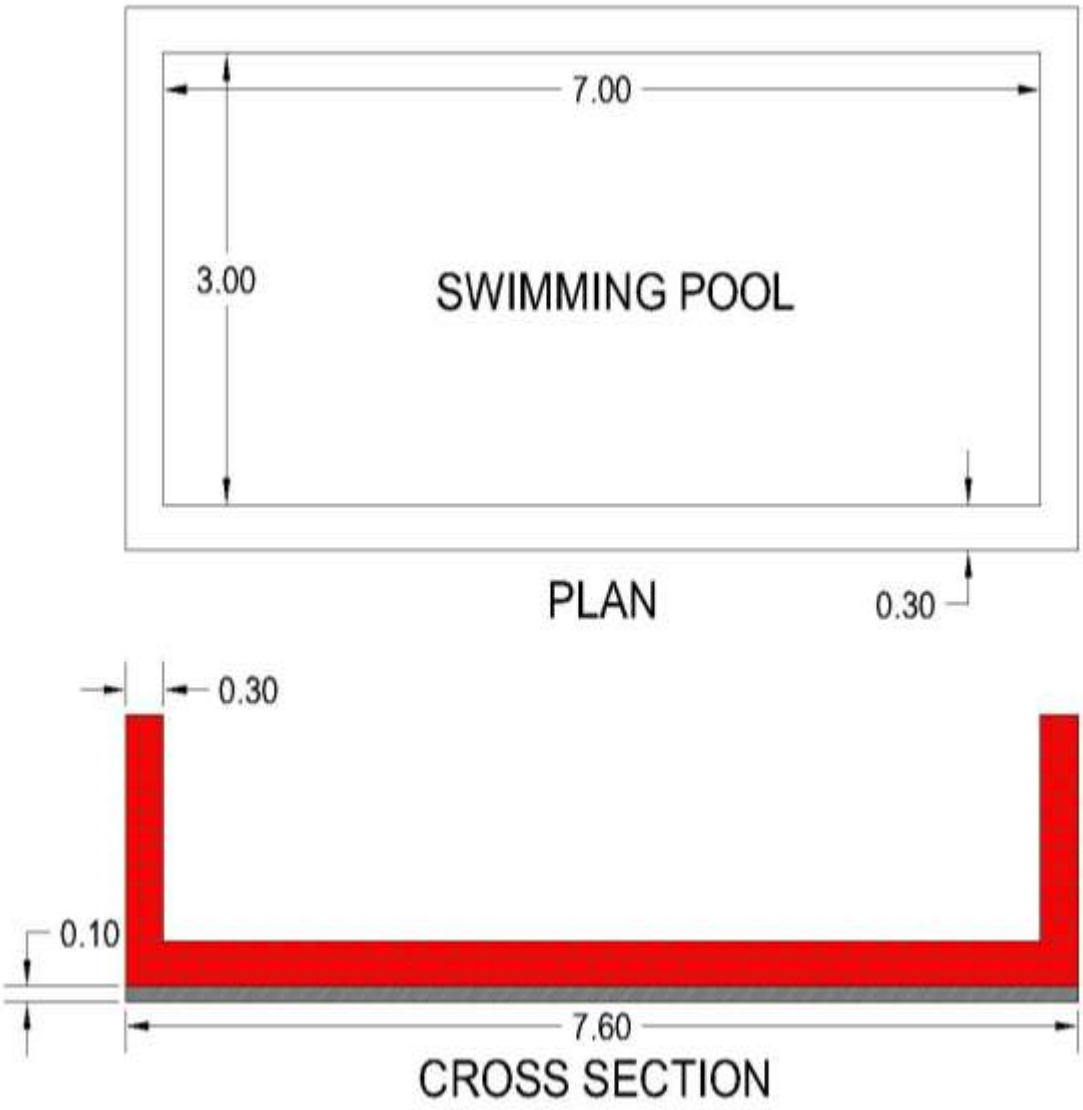



Fig.67 Plan and Cross section of Swimming Pool

**Table 20 Estimation of Swimming Pool**

| SINO | Description | Quantity | Unit | Rate | Amount (RS) |
|---|---|---|---|---|---|
| | **CELLAR** | | | | |
| | **EARTH WORKS** | | | | |
| **1** | **EARTH WORKS EXCAVATION:** | 51.98 | Cu.M | 102.00 | 5301.96 |
| | | | | | **5301.96** |
| | **PCC** | | | | |
| **2** | **PCC FOUNDATION 1:3:6:** | 2.74 | Cu.M | 2,873.00 | 7872.02 |
| | | | | | **7872.02** |
| | **BRICK WORKS** | | | | |
| **3** | **BRICK WORKS FOUNDATION CM 1:3:** | 8.21 | Cu.M | 2,470.00 | 20278.70 |
| **4** | **BRICK WORKS CM 1:3:** | 9.54 | Cu.M | 2,490.00 | 23754.60 |
| | | | | | **44033.30** |
| | **FLOOR AND WALL FINISHES** | | | | |
| **5** | **FLOOR FINISHING CERAMIC TILES:** | 21.00 | Sq.M | 600.00 | 12600.00 |
| **6** | **WALL FINISHING CERAMIC TILES:** | 30.00 | Sq.M | 300.00 | 9000.00 |
| | | | | | **21600.00** |
| **Total for CELLAR** | | | | | **78807.28** |
| **Total** | | | | | **78807.28** |

### 13.1.6 Door to Door Waste Collection System

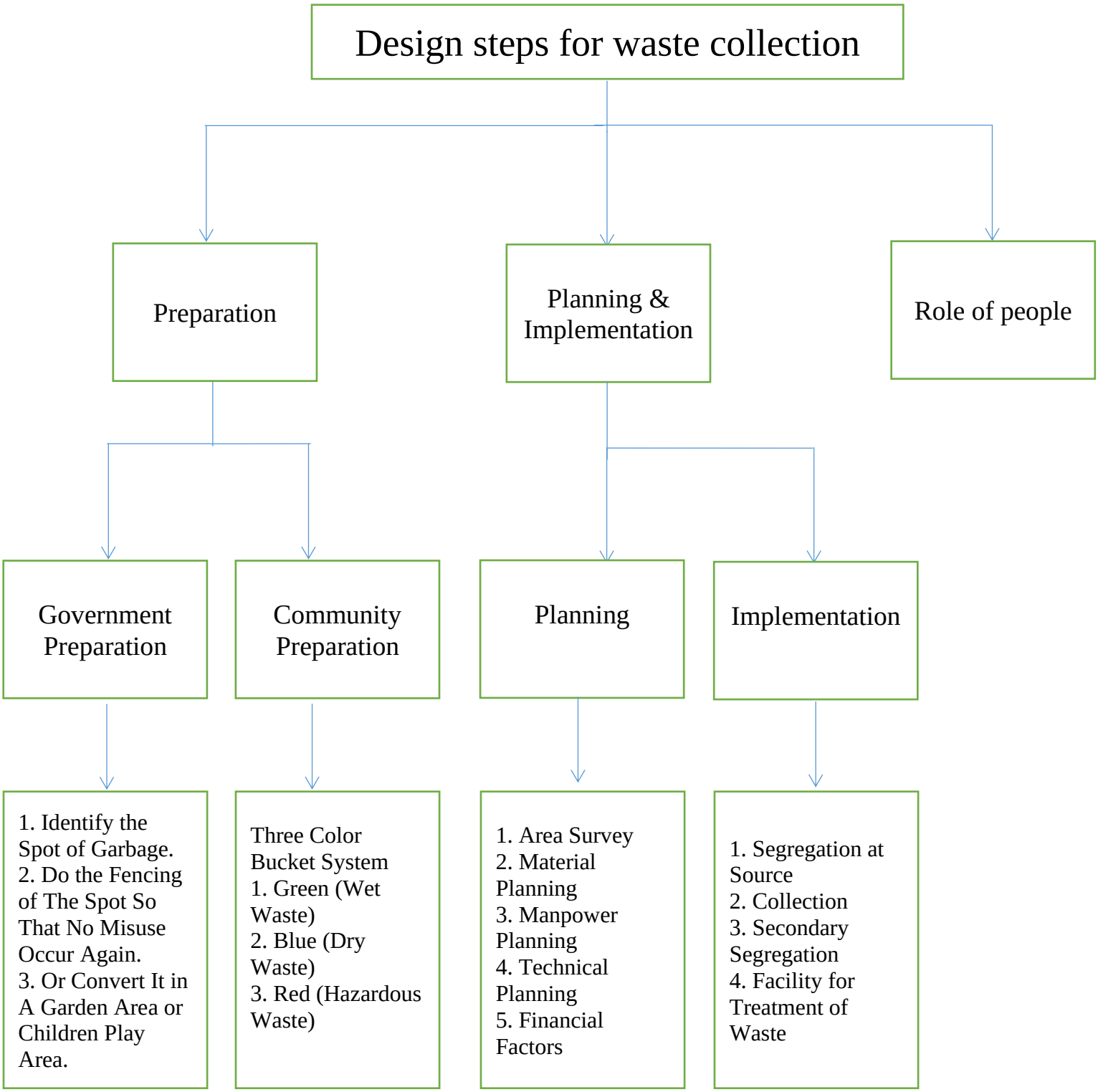



Fig.68 Solid Waste Management Flow chart

Domestic waste generated in rural areas of India is increasingly becoming a major concern. Although solid waste generated in rural areas is largely natural and decaying, it becomes one of the biggest problems facing humans. Without an effective garbage collection and disposal system at the Panchayat level it is unreasonable to place the responsibility on individual families, or to blame them carelessly. Strict waste management measures are,

- Preparation
- Planning and Implementation
- Role of people

**Preparation:**

Government preparation:

Preparations include Panchayat management and a Gram Sabha meeting to discuss what it means to have a clean home and how each family can work together. Identify unfamiliar areas: Often street corners and vacant land between houses are at risk of being ‘unexplained dump yards. The whole house is silent about the garbage dump. There are three things to do in such areas. (a) First, find those famous places / spots; (b) the bulk of the waste in such areas must be transferred to certain dumping sites; and (c) fencing can be done to prevent future misuse, or if it is a common country, add other plants or tree trunks to grow. If funds are available enter the children's swing to play there. Keep that place inhabited, it should not be seen as empty.

Community preparation:

Each household should be provided with three buckets - Green, Blue and Red. (a) A green bucket for the disposal of kitchen waste, leftovers and other liquid waste; (b) A blue bucket is designed to store dry waste; and (c) a red bucket for storing hazardous waste such as batteries; fused bulbs etc. For a list of wet / dry waste / hazardous waste see box - (Pollution Phase). Wet waste in green buckets will be collected daily in the morning (or morning and evening) as determined by Gram Panchayat. Gathering twice a day (morning and evening) makes managing easier. It is then that the waste is still fresh and has not yet begun to emit odor, effective separation is easier than handling standing and decomposing waste. Dry waste will be collected separately, and hazardous waste will be collected from homes once a month, for example, on the fifth day of each month. The potential for hazardous waste to be increased is very high.

**Table 21 Segregation of Waste**

| Wet waste (Green) | Dry waste (Blue) | Hazardous waste (Red) |
|---|---|---|
| Vegetable peels | Soap covers / packets | Broken glass |
| Fruit peels | Empty shampoo bottles | Razors |

| | | |
|---|---|---|
| Rotten vegetable and fruits | Plastic / polythene covers | Pieces of old wires, old charges, pen-drives |
| Coconut shell | Milk cover | Children's diaper |
| Eggshell | Doormat | Electronic items |
| Hair | Wrappers | Expired pesticides |
| Garden scrub | Moth cloth | Blades |
| Floor sweep | Empty containers | Toxic rejects |
| Coconut fiber | Newspaper | Medical related Cotton, tissues |
| Used / dry flower | Cardboard | Empty cans of lubricants for cars and bike |
| Spoiled spices | Stationary | |
| | Metal tins / cans | |
| | Small tubes | |
| | Aluminum foil | |
| | Old brooms | |
| | Old cushions, napkins | |
| | Metal pieces | |
| | Leather, rubber | |

**Planning:**

Planning consists of spatial research, material planning, staff planning, financial planning and technical planning.

Spatial survey: estimates of type, type, and quantity of waste generated by a different class of people viz. homes, tea tables, restaurants, wedding halls, vegetable market, fish market, bus stand, temples, and schools, etc. are needed so we can plan for collection, transportation, and energy needs. For families, the average waste produced can be limited. However, with regard to other stakeholders such as restaurants and markets, site visits may be required to assess the waste they make on a daily basis.

Operating Plans: Tri-cycles or (solar) garbage-powered garbage trucks (one vehicle with two waste collectors per 150 families, for example), uniforms and gears (jacket, gloves, cap, water bottle, first aid kit) for staff, separation. a shed, a yard of wet manure, a storage room for dry rubbish, tools and equipment.

Power Planning: SWM is a hard work. We need two employees in 150 homes. That means that for every garbage truck two workers can be sent, who can help. They can work together in 150 homes every day. They can cover 150 HH in the morning (7.00 - 10.00 am) and 150 HH in the evening (4.00 - 7.00 pm). Two hours can be spent on a second split in a shed - one hour in the morning and one hour in the evening. Experiences from others areas that poor and impoverished women are trained in this profession. Those already involved in the selection of fabrics are recruited and trained. Selection and training are important because the wrong choices will require frequent appointments.

Technical Planning: This is about the preparation and treatment of collected waste. This guide does not recommend comprehensive treatment. It suggests making a simple window compost and wet litter, and if possible, go for vermicomposting. Dry waste can be classified and what can be sold as recycling can be sold to retailers selling recycled / recycled waste from time to time. Some may be sent to a garbage dump.

Financial Planning: This includes two types of costs. (a) Cost to set up the facility, and (b) operating costs to meet recurring monthly expenses. The main costs are related to asset planning, and operating costs apply to staff points and technical planning. Financial planning must definitely include a budget plan. A budget is a statement of income and expenditure. In other words, this is a potential expenditure, as well as the revenue that the GP will receive for the proposed SWM project. This is the most important exercise that Panchayat staff should do before getting into 'real action'. This will indicate the costs that may be incurred, and what sources of revenue are available to cover the costs so that the business can be financially viable.

**Implementation:**

Source segregation: Families should have sufficient knowledge of the potential non-biological bias. As we have written to prepare the community for Step - 1 itself, in this section we assume that members of the public know how to participate and how to contribute. First, the main separation occurs in the source, i.e., the home itself. Properly covered, it will withstand a great deal of adverse conditions. Besides, it is an unpleasant task to put wet garbage over eight to 12 hours old, which has already begun to rot. Families keep kitchen refusal in Green Bin.

Collection: Sanitation workers indicate their arrival by blowing a whistle. The Green Bin is poured into a room designed for it in the third round. Liquid waste is collected daily in the morning from 7 - 11 am, or in the evening from 4.30 - 6.30pm. During the collection, sanitation workers continue to sensitize the public on what should be kept in the Green Bin, and what should go into the Blue bin, what are the hazards, and how to dispose of them.

Second segregation: The three rounds reach the partition shed where the garbage falls into the second division. In the second division, the sanitation workers filter (select and select) the 'recycling' from the acquired company. Disposals in this process are not recyclable, which, along with hazardous waste, has reached a 'waste disposal site'.

Waste Management and Treatment Center: Build 2 meters of compost by 3 x 5 meters of one meter in one brick building. It can be above ground level. It doesn't need to be folded. There should be a

roof (tile) over them considering the rainy days. This means that both yards make compost under one roof. One yard of compost can be used for 60 - 75 days. When it is almost full in two months, cover it with sand, and start using the second one. By the time the second one is filled, the garbage dumped in the first yard has turned into compost and is ready to go into the field. The two holes can be used alternately as in a two-hole toilet. We do not force vermicomposting to consider the work and additional staff needed to maintain it. GPs can opt for vermin compost if they are able to manage time, additional staff (staff).

All that may be required is:

(i) a waste disposal once in ten days however;
(ii) pest and fly control methods for breeding; and
(iii) odor control. Making compost in Windrow is very easy.

Recyclable items can be filtered and stored separately for sale to discard retailers. When large volumes accumulate, they can be sold. Arrangements can be made for residual retailers to visit the site once every two months or more. Collection of service fees from all households is critical to cover operating costs. The Sanitation Manager (or Secretary of the Panchayat) must take on the responsibility of staying at a designated Cash Counter in the GP Office, at least four hours daily to collect money for service at home (connecting drinking water at home, handling solid waste, rent, etc.). People usually visit the office and pay, as long as the system is in place, and when members of the public are sure that the GP Office is open from 12.00 noon until 2.00 pm; and from 5.00 pm to 7.00 pm. If this is not the case, people are inclined to misjudge the program, and they do not want to pay, citing a 'closed GP office' as a reason.

**The role of the people involved:**

Family responsibility: Each household will separate the waste into liquid waste (kitchen waste - GREEN) and dry waste (BULL), and Hazardous Waste (RED), and place it in a bin provided specifically for each purpose. This is called the basic division, which will be the responsibility of the residents. The basis for success or otherwise in this endeavor is at this stage.

**Role of SWM workers**

- The sanitation workers shall collect waste primarily segregated at the households.
- after reaching the segregation shed, the worker feed all the red bin waste to the incubators.
- Then they turn to handle wet waste: they do a secondary segregation of the wet waste to make sure that it doesn't get mixed with any other type of waste.
- Before the wet waste goes into compositing or gasification plant, the workers do the necessary chopping and crushing of the waste.
- Then the worker does segregation of dry waste. The main task here is to segregate different materials like plastic and metal. Then the workers put aside the recyclables.
- It would be workers responsibilities to take out manure time to time and maintain cleanliness

**Role of SWM supervisor**

- Educate and train workers of their tasks.
- Oversee worker activities and household activities.
- Resolve conflicts between workers and households.

**Table 22 Estimation of waste collection process in Rajgari**

| Expenditure items | Amount (RS) |
|---|---|
| Sanitation workers' salary (Rs. 8000*4 workers cover 150 household in the morning and 150 in the evening) | 32000 |
| Supervisor's salary | 10000 |
| Consumable bleaching powder | 300 |
| Repair and maintenance | 1000 |
| Total | 43300 |

## 13.1.7 Automatic Light- DIM and DIP Control

The number of vehicles on our roads is burgeoning day by day. This is turn forced almost all this vehicle manufactures to think about the extra safety instruments and electronic controls to attach with these products for giving the users a safety derived in all road conditions through a mass flow traffics. if asked, one should always mention that the right driving is very cumbersome due to the dazzling light problems and the frequent dipping of head lights by manual means that often cause fatigue to the driver particularly at the time of peak traffic. So naturally to get rid of this perennial problem, an automatic mechanism has to come up to dip and dim the headlamp automatically whenever required. For keeping a motor vehicle under perfect control and reins of the driver, different types of control and accessories are provided in an automobile around the driver seat, on the dash board and at the driver, different foot board. Simply, an automatic dimmer and dipper is a unit, which can automatically judge when the head light beam needs to be lowered, and which dip the headlamp from which the beam to a dipped beam. As the dipper unit is well connected to the lighting system of the vehicle, we have to look short into discussing the wiring diagram or the construction of automatic dimmer and dipper.

**Light Dependent Resistor:**

A photoresistor or light-dependent resistor (LDR) or photocell is a light-controlled variable resistor. The resistance of a photo resistor decreases with increasing incident light intensity; in other words, it exhibits photoconductivity. A photo resistor can be applied in light-sensitive detector circuits, and light- and dark-activated switching circuits. A photo resistor is made of a high resistance semiconductor. In the dark, a photo resistor can have a resistance as high as a few mega ohms (MΩ), while in the light, a photo resistor can have a resistance as low as a few hundred ohms. If incident light on a photo resistor exceeds a certain frequency, photons absorbed by the semiconductor give bound electrons enough energy to jump into the conduction band. Moreover, unique photo resistors may react substantially differently to photons within certain wavelength bands. A photoelectric device can be either intrinsic or extrinsic. An intrinsic semiconductor has

its own charge carriers and is not an efficient semiconductor, for example, silicon. In intrinsic devices the only available electrons are in the valence band, and hence the photon must have enough energy to excite the electron across the entire bandgap. Extrinsic devices have impurities, also called dopants, added whose ground state energy is closer to the conduction band; since the electrons do not have as far to jump, lower energy photons are sufficient to trigger the device.

**Comparator:**

A comparator is a circuit that accepts two voltages, v1 and v2 and outputs zero volts if or outputs a positive voltage level if. Comparators can be built from operational amplifiers. Remember that the gain of the op-amp is extremely large, somewhere on the order of. So, if the difference between the two input voltages is around 1 volt, would we expect an output voltage of one million volts? Obviously, this can't happen. The large gain of the op-amp is only valid over a small range of input voltages. If the output voltage becomes larger than the supply voltages for the op-amp, then the output will saturate or clip at that level. This means that uncompensated op-amps output voltage as a function of its input voltage will appear. The implication inherent is that an uncompensated op-amp can be used to compare two voltages. The two inputs to the circuit are analogy voltages. But if the input voltage difference is only a few millivolts, then the output will be one of two voltages, pegged at one of the two power supply voltages. In other words, the output will be binary in nature and we can use these binary voltages as a way of testing whether or not one voltage is greater than another.

**Driver Circuit:**

In electronics, a driver is an electrical circuit or other electronic component used to control another circuit or component, such as a high-power transistor, liquid crystal display (LCD), and numerous others. They are usually used to regulate current flowing through a circuit or is used to control the other factors such as other components, some devices in the circuit. The term is often used, for example, for a specialized integrated circuit that controls high-power switches in switched-mode power converters. An amplifier can also be considered a driver for loudspeakers, or a constant voltage circuit that keeps an attached component operating within a broad range of input voltages. Typically, the driver stage(s) of a circuit requires different characteristics to other circuit stages. For example, in a transistor power amplifier, typically the driver circuit requires current gain, often the ability to discharge the following transistor bases rapidly, and low output impedance to avoid or minimize distortion.

**Relay:**

A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts. The coil current can be on or off so relays have two switch positions and they are double throw (changeover) switches. Relays allow one circuit to switch a second circuit which can be completely separate from the first. For example, a low voltage battery circuit can use a relay to switch a 230V AC mains circuit. There is no electrical connection inside the relay between the two circuits; the link is magnetic and mechanical. The coil of a relay passes a relatively large current, typically 30mA for a 12V relay, but it can be as much as 100mA for relays designed to operate from lower voltages. Most ICs

(chips) cannot provide this current and a transistor is usually used to amplify the small IC current to the larger value required for the relay coil. The maximum output current for the popular 555 timer IC is 200mA so these devices can supply relay coils directly without amplification. Relays are usually SPDT or DPDT but they can have many more sets of switch contacts, for example relays with 4 sets of changeover contacts are readily available. Most relays are designed for PCB mounting but you can solder wires directly to the pins providing you take care to avoid melting the plastic case of the relay.

**Circuit Diagram**

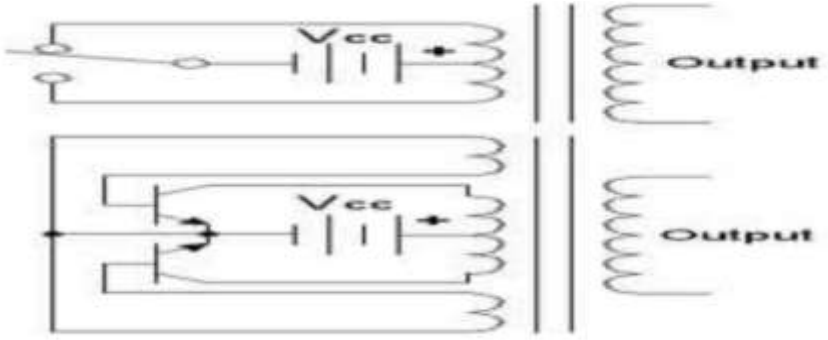



Fig.69 Circuit Diagram

In one simple inverter circuit, DC power is connected to a transformer through the centre tap of the primary winding. A switch is rapidly switched back and forth to allow current to flow back to the DC source following two alternate paths through one end of the primary winding and then the other. The alternation of the direction of current in the primary winding of the transformer produces alternating current (AC) in the secondary circuit. The electromechanical version of the switching device includes two stationary contacts and a spring supported moving contact. The spring holds the movable contact against one of the stationary contacts and an electromagnet pulls the movable contact to the opposite stationary contact. The current in the electromagnet is interrupted by the action of the switch so that the switch continually switches rapidly back and forth. This type of electromechanical inverter switch, called a vibrator or buzzer, was once used in vacuum tube automobile radios. A similar mechanism has been used in door bells, buzzers and tattoo guns. As they became available from early 1970s, transistors and various other types of semiconductor switches have been incorporated into inverter circuit designs.

**Output Waveforms:**

The switch in the simple inverter described above produces a square voltage waveform as opposed to the sinusoidal waveform that is the usual waveform of an AC power supply. Using Fourier analysis, periodic waveforms are represented as the sum of an infinite series of sine waves. The sine wave that has the same frequency as the original waveform is called the fundamental component. The other sine waves, called harmonics that are included in the series have frequencies that are integral multiples of the fundamental frequency. The quality of the inverter output waveform can be expressed by using the Fourier analysis data to calculate the total harmonic distortion (THD). The total harmonic distortion is the square root of the sum of the squares of the harmonic voltages divided by the fundamental voltage:

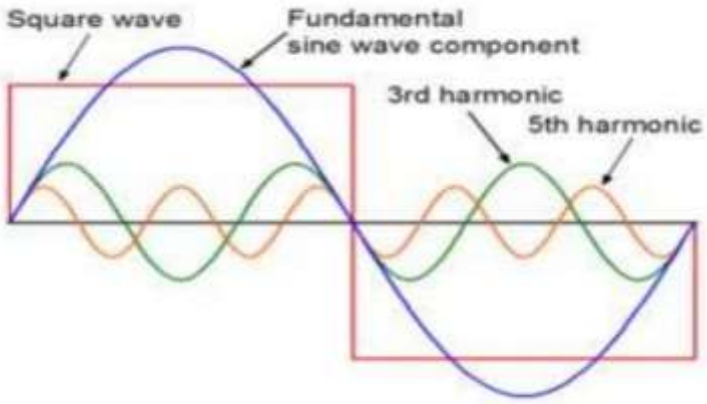



Fig.70 Output Waveforms

**Rectifier and Inverter Pulse Numbers:**

Rectifier circuits are often classified by the number of current pulses that flow to the DC side of the rectifier per cycle of AC input voltage. A single-phase halfwave rectifier is a one-pulse circuit and a single-phase full-wave rectifier is a two-pulse circuit. A three-phase half-wave rectifier is a three-pulse circuit and a three-phase full-wave rectifier is a six-pulse circuit.[6] With three-phase rectifiers, two or more rectifiers are sometimes connected in series or parallel to obtain higher voltage or current ratings. The rectifier inputs are supplied from special transformers that provide phase shifted outputs. The associated rectifier circuits are 12-pulse rectifiers, 18-pulse rectifiers and so on.

**Power supply:**

The ac voltage, typically 220V.is connected to a transformer, which steps that ac voltage down to the level of the desired dc output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation. A regulator circuit removes the ripples and also remains the same dc value even if the input dc voltage varies, or the load connected to the output dc voltage changes. This voltage regulation is usually obtained using one of the popular voltage regulator IC units.

**Bridge Rectifier:**

When four diodes are connected as shown in figure, the circuit is called as bridge rectifier. The input to the circuit is applied to the diagonally opposite corners of the network, and the output is taken from the remaining two corners.

**IC Voltage Regulators:**

Voltage regulators comprise a class of widely used ICs. Regulator IC units contain the circuitry for reference source, comparator amplifier, control device, and overload protection all in a single IC. IC units provide regulation of either a fixed positive voltage, a fixed negative voltage, or an adjustably set voltage. The regulators can be selected for operation with load currents from hundreds of mill amperes to tens of amperes, corresponding to power ratings from mill watts to tens of watts. A fixed three-terminal voltage regulator has an unregulated dc input voltage, Vi, applied to one input terminal, a regulated dc output voltage, Vo, from a second terminal, with the third terminal connected to ground.

**Advantages:**

High reliability, good performance, less expensive, low power consumption.

**Estimated cost:**

Thus, it serves not only as an automatic dimmer but also saves the driver the effort of changing the headlights from high beam to low beam," says Avinashi. It will cost about Rs 1,500 to install this device.

**Applications:**

This type of system called Automatic Dim and Dipper is used to control the intensity of the Head light automatically using the Dim Dip Controller. By knowing the opposite vehicle light intensity value, the brightness of the light is varied. This system is accurate, reliable and it is easy to operate also.

## 13.1.8 Over Speed Indication and Accident Prevention System Using IOT

Road transport has become most important mode of transportation in India. India faces the highest number of accidents in the world. This becomes more dangerous in populated regions like schools and hospitals. In school areas speed breakers are provided to reduce the speed of vehicle's, but the drivers do this manually. Many times, due to driver's fault speed is not controlled. This process can be automated by using governor. Nowadays no of vehicles have been increased and traditional systems of traffic controlling. In the developing countries we have seen a lot of crimes happening at bridges and highways. The criminals easily get escaped from the crime zone and victims lose their valuable assets including cars, jewellery etc. Although the presence of police, sometimes it gets difficult to them to identify the right vehicle and stop it for the checking. Most of the cases those vehicles pass the toll booth area by giving toll amount and no one can identify the criminal. To avoid those problems, we have introduced over speed indication system. This system will not let the criminals pass the toll booth area even after paying the toll amount. Thus, the crime rates at highways can be reduced. The overall system is user friendly, fast responsive and convent for the developing countries. As the data of each vehicle owner should be recorded in the database previously, so when any information of that vehicle owner is needed by the authority or police it can be easily found from the database to ease the investigation process.

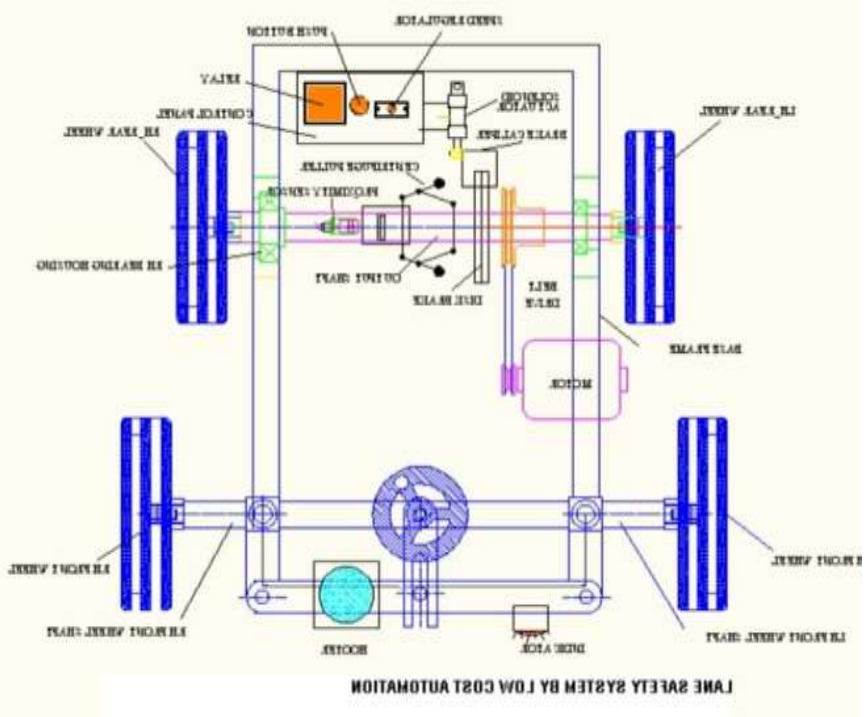


Fig.71 System Construction

System starts with motor start-up. Motor speed is controlled by electronic speed regulator, as speed increases the dead weight of the centrifuge governor fly's out making the probe to slide back. At over speed level the resultant gap between probe of the slider and the proximity sensor exceeds the permissible limit which makes the relay to operate and consequently the following actions take place.

**Construction:**

**Chassis or Frame: -**

The chassis or frame is fabricated structure that carries the entire system, rear wheel shaft is the driver shaft, that carries the reduction pulley driven by motor using an open belt drive. The end carries the steering mechanism in form of Ackerman steering with the central steering wheel controls the steering angle using the slotted lever arrangement.

**Motor: -**

Motor is the prime mover, it is single phase AC motor 50 watt, 0 to 6000 rpm variable speed. Motor speed is regulated using electronic speed regulator

**Over speed Sensing mechanism: -**

The over speed sensing mechanism is a mechanical linkage based on the bob-weight type centrifugal governor, only that is used to vary the proximal distance between the probe and the sensor which is inductive type.

**Electronic Proximity sensor: -**

The electronic proximity sensor is mounted on the sheet metal panel on the base frame by means of an Z shaped clamp. The proximity sensor as the name suggests senses the proximity of the indexer buttons which acts as stops, such that when they come in front of the proximity sensor the table the relay is operated to stop the table motion. The proximity sensor is connected to the electronic relay and the power source. Sensor type: Inductive type proximity sensor Size: M18

**Braking Mechanism: -**

The braking mechanism uses a Disk brake and brake calliper arrangement. The Disk brake is used with the view to maximize the braking and ensure safety. The brake calliper is actuated electrically using a solenoid, with electromagnetic operation.

**Over speed indicator audio speaker: -**

This is the indication by alarm system, the audio speaker gives audio message after over-speed occurs there by alarming the driver.

**Advantages:**

Save energy using automatic control systems, less cost to communicate, less power to automate.

**Estimated cost:**

Chassis or Frame-3260/piece
Motor-130 Rs
Electronic proximity sensor-Rs.200 to 300
Breaking mechanism-Rs 3000
Over speed indicator audio speaker-Rs 2,099

**Application:**

This over speed indication and automatic accident avoiding system senses the opposite vehicle by the proximity detector and stops both engines and applies auto braking thus preventing the accident this system is used to read and control the data from the vehicle.

## 13.1.9 Wireless Mobile Charger Circuit using Inductive Coupling

There is a basic law in thermodynamics; the law of conservation of energy, which states that energy may neither be created nor destroyed just can be transformed. Nature is an expert using this physics fundamental law favouring life and evolution of species all around the planet, it can be said that

we are accustomed to live under this law that we do not pay attention to its existence and how it influences our lives. Nowadays, there are some daily life applications that could use an energy transport form without cables, some of them could be:

1. Medical implants. The advance in biomedical science has allowed creating biomedical Implants like: pacemakers, cochlear implants, subcutaneous drug supplier, among others

.

2. Charge mobile devices, electrical cars, and unmanned aircraft, to name a few.

3. Home appliances like irons, vacuum cleaners, televisions, etc.

Fig.72 Inductive Wireless Charging Pad

For better comprehension theories related to Magnetic Resonant Coupling, quality factor and optimization techniques for wireless power transfer systems are presented here along with the working principles and constructions of various components. Magnetic coupling is an old and well understood method in the field of wireless power transfer. But as the magnetic field decay very quickly, magnetic field is effective only at a very short distance. By applying resonance with in magnetic coupling the power transfer at a greater distance can be obtained. For near field wireless power transfer, Magnetic resonant coupling can be the most effective method than any other method available. The block diagram for the whole experiment is shown below. It is consisting of an AC source, rectifier, oscillator, transmitter, secondary sources and load coil. It is observed that the voltage of 220V is connected to the transformer. The transformer is then connected to the transmitter circuit as a source of supply.

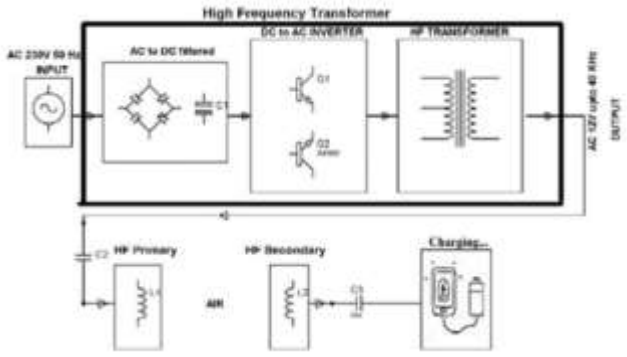



Fig.73 Block Diagram

William C. Brown has designed, developed a unit and demonstrated to show how power can be transferred through free space by microwaves. In the transmission side, the microwave power source generates microwave power and the output power is controlled by electronic control circuits.

**Inductive or Magnetic Coupling:**

Inductive or Magnetic coupling works on the principle of electromagnetism. Transferring energy between wires through magnetic fields is inductive coupling. If a portion of the magnetic flux established by one circuit interlinks with the second circuit, then two circuits are coupled magnetically and the energy may be transferred from one circuit to another circuit. This energy transfer is performed by the transfer of the magnetic field which is common to the both circuits.

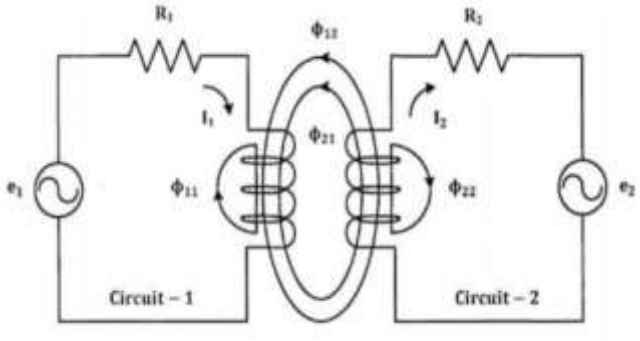



Fig.74 Magnetic Coupling with Four Component Fluxes

**Implementation:**

This project has mainly two sections, wireless power transmitter & a wireless power receiver sections. The Transmitter section of wireless charger circuit consists of a DC power source, oscillator and a transmitter coil. A constant DC voltage is provided by a DC power source, and this DC signal is the input to the oscillator circuit. This oscillator converts this DC voltage to a high frequency AC power, and is supplied to the transmitting coil. Due to this high frequency AC current, the transmitter coil energizes, and generates an alternating magnetic field in the coil.

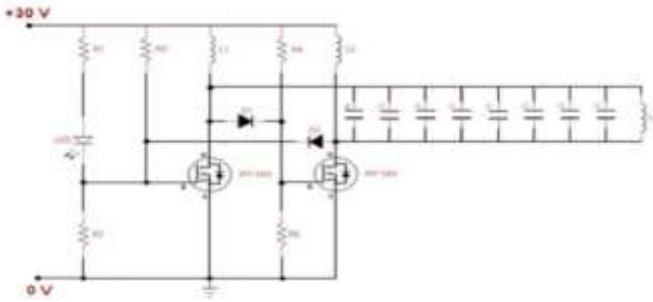


Fig.75 Transmitter Circuit

**Hardware Components:**

**High Frequency Transformer**

The transformer is one of the simplest of electrical devices. Its basic design, materials, and principles have changed little over the last one hundred years, yet transformer designs and materials continue to be improved. Transformers are essential in high voltage power transmission providing an economical means of transmitting power over large distances. The simplicity, reliability, and economy of conversion of voltages by transformers was the principal factor in the selection of alternating current power transmission in the "War of Currents" in the late 1880's. In electronic circuitry, new methods of circuit design have replaced some of the applications of transformers, but electronic technology has also developed new transformer designs and applications. Transformers come in a range of sizes from a thumbnail sized coupling transformer hidden inside a stage microphone to giga watt units used to interconnect large portions of national power grids, all operating with the same basic principles and with many similarities in their parts.

**Litz wire**

Litz Wire is a type of cable used in electronics to carry alternating current. The wire is designed to reduce the skin effect and proximity effect losses in conductors used at frequencies up to about 1 MHz It consists of many thin wire strands, individually insulated and twisted or woven together; following one of several carefully prescribed patterns often involving several levels (groups of twisted wires are twisted together, etc.). This winding pattern equalizes the proportion of the overall length over which each strand is at the outside of the conductor. The term Litz wire originates from Eisendrath, German for braided/ stranded wire or woven wire.

**Resistors**

A resistor is a component of an electrical circuit that resists the flow of electrical current. A resistor has two terminals across which electricity must pass, and is designed to drop the voltage of the current as it flows from one terminal to the next. A resistor is primarily used to create and maintain a known safe current within an electrical component.

**Diode**

A diode is a specialized electronic component with two electrodes called the anode and the cathode. Most diodes are made with semiconductor materials such as silicon, germanium, or selenium. Some diodes are comprised of metal electrodes in a chamber evacuated or filled with a pure elemental gas at low pressure. Diodes can be used as rectifiers, signal limiters, voltage regulators, switches, signal modulators, signal mixers, signal demodulators, and oscillators.

**Capacitor**

A capacitor is a passive two-terminal electrical component used to store energy in an electric field. The forms of practical capacitors vary widely, but all contain at least two electrical conductors

separated by a dielectric. Capacitors are used as parts of electrical systems, for example, and consist of metal foils separated by a layer of insulating film.

**Light Emitting Diode**

A Light-Emitting Diode (LED) in essence is a PN junction solid-state semiconductor diode that emits light when a current is applied though the device. By scientific definition, it is a solid-state device that controls current without the deficiency of having heated filaments. White LEDs ordinarily need 3.6 Volts of Direct Current (DC) and use approximately 30 milliamps (mA) of current and has a power dissipation of approximately 100 milliwatts (mow). The positive power is connected to one side of the LED semiconductor through the anode and a whisker and the other side of the semiconductor is attached to the top of the anvil or the negative power lead (cathode). It is the chemical composition or makeup of the LED semiconductor that determines the colour of the light that the LED produces as well as the intensity level.

**Advantages:**

WPT system completely reduces existing high-tension power transmission cables, substations and towers between the consumers and generating station. The cost of the distribution and transmission become less. The cost of the electrical energy to the consumers also reduces. The power could be transmitted to places to which the wired transmission is not possible.

**Estimated cost:**

High Frequency Transformer-200/piece
Litz wire-2000/kilogram ,5/meter
Resistor-200 Rs
Diode-100 Rs
Capacitor-100/piece
Light Emitting Diode-200 Rs

**Applications:**

The largest application of the WPT is the production of power by placing satellites with giant solar arrays in Geosynchronous Earth Orbit and transmitting the power as microwaves to the earth known as Solar Power Satellites (SPS). WPT is used in moving targets like fuel-free electric vehicles, fuel- free airplanes, fuel-free rockets and moving robots. The other applications of WPT are Wireless power source or Ubiquitous Power Source, RF Power Adaptive Rectifying Circuits and Wireless sensors.

## 13.2 Reason for Students Recommending this Design

### 1. Bus Stand

The main aim behind recommendation of this design is that to bring prosperity to any region and geographic area the connectivity of that region play an important role. In past we have seen many

cities has flourished due to its natural harbor or its location near any major road. So, keeping that in mind this design has been recommended. For an ease there is surat sitilink last bus stop 1-2 km away from village so to connect this village that route can be easily extended without increasing pressure on the existing resource.

## 2. Chabutra

The main aim behind the recommendation of this design is that to preserve and revive the village cultural heritage. In past it is use to have panchayat as well to feed the birds. This is use to be the focal point of the social life of the village where villager can gather up and can socialize. It is the symbol of harmony between human to human and human to nature. To revive this vanishing and old cultural heritage this design is recommended.

## 3. Pravesh Dwar

This reason behind recommendation of this design is that during the first visit the biggest difficulty was faced is to recognize the village be in the village as there is no demarcation and sign to show that and village is also covered with the dense canopy of trees. This cause the village to be unnoticeable by the administration and the people that result into lack of development and create underdeveloped socio-economic pocket. Since ancient time gate play an important role in Indian culture all the ceremonies and rites are starting from the gate and it is considered to be source of prosperity and well-being so they used to draw swastika in the front of gate. So, it became necessary to provide gate.

## 4. Public Distribution System Shop

The reason for recommendation of this design is that our village is coastal village that causing there agriculture less productive than comparison to the village in other area of surat like Bardoli, Kamrej, Kadodara, etc. so this village is low-income village and many people are ration card holder and dependent on subsidized grain to bring ration shop at their door step this design is recommended.

## 5. Swimming Pool

The main reason behind recommendation of this design is that to fulfill physical educational, skill development as well as recreational aspect. As skill of swimming is major skill that human should know which is much ignored in india this skill is also help in villager participation in marine industry and merchant navy which will bring employment in village. And also, now a days due to global warming cyclone is become frequent in Arabian sea which is causing coastal flooding in low lying area this skill will become very helpful at that time not just villager but for other also during time of natural calamity.

## 6. Door to Door Waste Collection System

The main reason behind the recommendation of this design is to tackle basic sanitation problem in which this village is lagging that is to provide solid waste management system. As of now villager used to throw a garbage at different point in the village which was picked up by the tractor trailer which was causing spread of waste due to wind and by the stray animals to prevent this and to maintain cleanliness this design is recommended as well as generate employment.

### 7. Automatic Light: DIM and DIP Control

The driver should actually turn down the bright lights immediately to avoid glare to the other person which is not happening. Hence, is the idea for the design and development of a prototype circuit called the automatic headlight dim-dip circuit. It gives the driver to use high beam light when required.

### 8. Over Speed Indication and Accident Prevention System Using IOT

The system is used to monitor speed of vehicle and to avoid the accidents by using governor and proximity sensor. Key Words: IOT, GPS, Governor, Proximity sensor, speed of vehicle. Road transport has become most important mode of transportation in India.

### 9. Wireless Mobile Charger Circuit using Inductive Coupling

The goal of this project Wireless power transmission mobile charger circuit using inductive coupling is to charge a low power device using wireless power transmission. This is done using charging a resonant coil from AC and then transmitting subsequent power to the resistive load.

## 13.3 About designs Suggestions / Benefit of the villagers

As our village lack in basic sanitation facility of solid waste management it become our utmost priority to take care of that. With a good entrance leave Prescence of that location in peoples and authorities mind which will eventually help full to highlight that location in the mind of policy maker and developers while planning. Costal villager must know the skill of swimming that's why it swimming pool is the basic sort of for costal village as well it provides extracurricular activity. While the advent of digitalization people is lacking normal human to human which is the basic of village commune to revive and preserve that old aspect of village chabutra play a significant role for socialization as oxygen for life. As this village have significant ration card holder it become more important to provide ration store at their door step and also as per national data in availing subsidized grain significant population are elderly. Connectivity is the basis for the development of any civilization to keep in that mind bus connectivity can fulfill that requirement so bus stand is provided by keeping in mind present route of bus service without creating burden on present resource.

# Chapter 14: Technical Options with Case Studies

## 14.1 Civil Engineering

### 14.1.1 Advanced Earthquake Resistant

Earthquake-resistant structures are structures designed to protect buildings from earthquakes. Although no structure is completely immune to earthquake damage, the purpose of earthquake-resistant construction is to construct better-moving structures during earthquakes than their regular counterparts. According to building codes, earthquake-resistant structures are designed to withstand the greatest seismic potential in their area. From the previous earthquake to provide the necessary performance of the earthquake threat in the area of interest. This is from properly measuring the structure to strong and ductile enough to survive an earthquake with acceptable damage. The typical method of building earthquake buildings depends on giving the building the strength, durability and strength of DE elastic deformation sufficient to withstand a certain amount of force generated by earthquakes. This is usually achieved by choosing the appropriate building layout and the detailed installation of building elements, such as beams and columns, and the interaction between them. But the most advanced means of earthquake resistance are not to strengthen the structure, but to reduce the force produced by the earthquake.

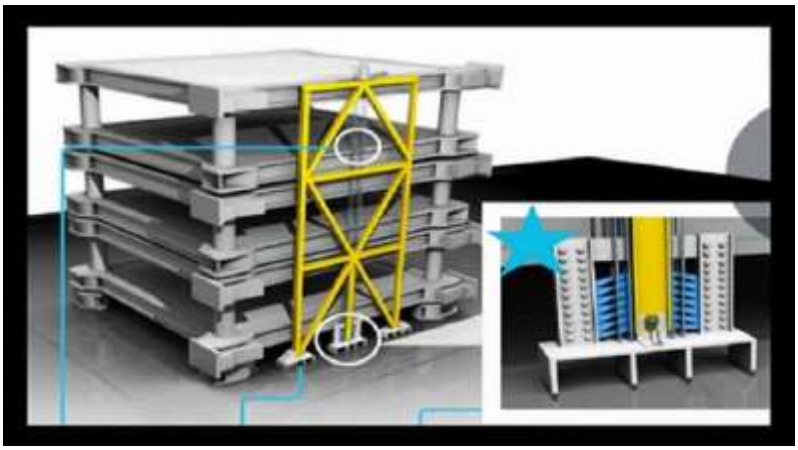


Fig.76 Advance Earthquake Resistance

Among the most important strategies for designing and building earthquake resistance are:

1 The base isolation
2 Energy dissipation devices

**The base isolation**
The structure away from the foundation is supported by a series of bearing packs placed between the building and the building foundation. A variety of different types of automatic separation pipes have now been made. The load is very hard and strong on the straight side, but flexible on the horizontal side. For a basic idea of how the base function works, check out Figure. This shows the

earthquake that works on both the demolished buildings and the general, built structure. As a result of the earthquake, the ground beneath each building begins to shake. In Figure, shown to the left. Each building responds with movement to the right. The building is moved to the right. The movement of a building in the opposite direction of the earth's motion is actually due to inertia. The most powerful energy building in a building is the most important that is produced during an earthquake. It is important to know that the non-building capacity of a building is equal to the speed of the building during the movement of the earth. It is also important to note that buildings do not actually move in one direction. Due to the complexity of the earthquake, the structure tends to vibrate back and forth in a variety of ways. In contrast, although it moves the space again, the far-flung structure retains its original, rectangular shape. It is lead rubber bearings that support the structure and are disabled. The independent structure itself avoids deformation and damage, which means that the weak forces acting on the independent structure are reduced. Examination and observation of independent structures in earthquakes has been shown to reduce the acceleration of buildings to 1/4 of the speed of solid-built structures, where each building has a percentage of gravity. As we have seen above, the inertial force increases, and decreases, in proportion as the acceleration increases or decreases. The acceleration is slower because the basic partitioning system increases the vibration time of the building, the time it takes for the structure to move back and forth and back again. In general, buildings with longer vibrations tend to reduce speed, while those with shorter periods tend to increase or increase speed. Finally, as it is very flexible, rubber separation bearings do no damage. But the leading plug in the middle of our model gets to experience the same flexibility as the rubber. Still, it produces heat.

**Energy dissipation device**

The second major innovation strategy is to improve the resistance of buildings to earthquakes and to rely on mitigation and energy dissipation, but it greatly increases energy depletion and energy supply provided by rubber bands. As mentioned, a certain amount of vibration energy is transferred to a building by ground motion. The buildings themselves have the natural ability to dissipate, or water, this energy. However, the energy dissipation of buildings before they start to deteriorate and damage is reduced. The structure will release energy whether it is moving too much or retaining internal constraints on objects such as pillars and pillars of the building. Both of these factors eventually lead to different injuries. Therefore, by equipping the building with additional water-repellent devices, we can significantly reduce the magnitude of earthquakes entering the building, thereby minimizing damage to the structure. Similarly, a number of energy-efficient devices have been used and are now being incorporated into real buildings. Power dissipation devices are also called power reduction devices. A large number of advanced water-repellent devices can be divided into three broad categories: Friction Dampers: these use split force to dissipate Metallic Dampers: use metal transformers inside Viscoelastic Dampers: use controlled hardening cuts Dampers: use forced movement (decoration) of liquid inside the dampen.

**Construction method**

- Base-isolation built into buildings. It is a structure designed to reduce the amount of energy that reaches a building during an earthquake.
- Flexible joints and automatic shut-off valves can be installed.
- Preventing Earthquake Damage Prepare an Earthquake Risk Map identifying the types of rocks, liquid strength, groundwater potential.

- Extensive spatial testing should be performed to detect all active errors, including hidden errors.
- Earthquake-resistant design Create building codes to design and construct earthquake-resistant structures in areas with high earthquake risk.
- wood, steel and reinforced concrete are popular as they tend to move with moving earth.

**Guidelines for earthquake resistant building**

In addition to the basic seismic code 1893 the BIS (Bureau of Indian Standards) has published other seismic design codes for seismic structures (IS-13828 1993)

- Horizontal bands should be provided at plinth, lintel and roof levels as per code
- Provide vertical reinforcement in key areas such as corners, internal and external wall sections as per code.
- The extent of the mud should be the same as the individual codes specified for the various earthquake zones.
- Unusual situations should be avoided in both formal and informal planning. • Quality assurance and efficiency must be guaranteed at all costs without compromise. In RCC enclosures (IS-13920)
- In RCC enclosures the separate bond space should be kept close as per code. * Bond hooks should be 135 degrees instead of 90 degrees for better tying.
- The layout of the lateral relationship in the columns should be as per the code and should continue in combination.

## 14.1.2 Seismic Retrofitting of Buildings

Earthquakes built at risk of earthquakes are a major current political issue and social significance. Most of the Italian building stock is at risk of an earthquake action even if it is available areas that have long been considered high risk for earthquakes. Thirty years ago, moderately until a major earthquake occurred in Italy over a period of 5 to 10 years. Such events clearly show the file of the vulnerability of construction stocks in particular and the fully developed environment. Earthquakes The danger in areas where the quake occurred is long overdue. similar incidents that occurred in the past. It is therefore legitimate to question why earthquakes at risk of earthquakes exist when people are institutions knew about the dangers of earthquakes. Several factors may have contributed to the formation of a situation. These are associated with historical events, blurred memory, greed, avarice, poverty and ignorance. Among the historical events that are particularly relevant are wars, epidemics, and potential natural disasters limit, significantly, the country's existing resources. In such cases there is a tendency building with substandard materials and without paying close attention to good construction and safety techniques marks. A similar situation arose in Italy and Japan after World War II and similar conflicts conditions have happened many times in Italy in the past. In that case it might be memory loss occurs and past memories are easily erased. In Italy commercial profits often come from poor employment and employment rather than making the best use of production materials. Poor state of poor-quality control and acceptance of objects also fall into this framework, which often results in papers without large numbers. The limited tendency to spend money sometimes confirms that the owner chooses a low-quality product to save resources for immediate needs. Among the causes arising from ignorance may be both insufficient knowledge of earthquakes accidents and construction errors due to insufficient knowledge of the earthquake problem; and failure to a model appropriate

for the structural response to an earthquake event. While much progress has been made in recent years by the research community in addressing with the above problems, it has become more difficult to transfer results to seismic engineering professionalism and status can only deteriorate in the near future. Recent changes in engineering studies are leading to a general decline in basic knowledge and practical skills of our engineering graduates. The final cause of the risk is linked to maintenance a situation; obviously if construction is not always taken care of, especially as it happens with cars, mechanical buildings building materials can withstand local and global degradation with significant loss of resistance of the structural members of all buildings and structures. Also, changes in service conditions, which are usually made illegally, can lead to major changes in the behavior of the building which has led to the reduction of the file Format response in expected loading conditions. On the basis of what has been presented so far, it is not surprising that in places it is known to exist depending on the risk of earthquake it is not uncommon to find buildings at risk of earthquake. These the structures need to be redesigned to allow them to withstand the effects of the earthquake the expected movement in the intended location. In the following sections some of the processes used for testing earthquake resistance and the vulnerability of reinforced concrete structures will be explained once traditional and innovative land reform techniques. This paper ends with a description of the earthquake reconstruction of two certified concrete buildings in the village of Solarino, near Syracuse, Sicily. The buildings belong to the Institute Autonomo Case Popolari (IACP) Of Syracuse. As will be clear from the arguments the purpose of this paper is not to discuss in depth the state the art of earthquake recovery, but rather to give an overview. The purpose is also to focus on a few specific procedures that can improve the quality of an earthquake monitoring system the vulnerability of existing reinforced concrete buildings and the collapse of an earthquake using new strategies such as basic separation and energy dissipation.

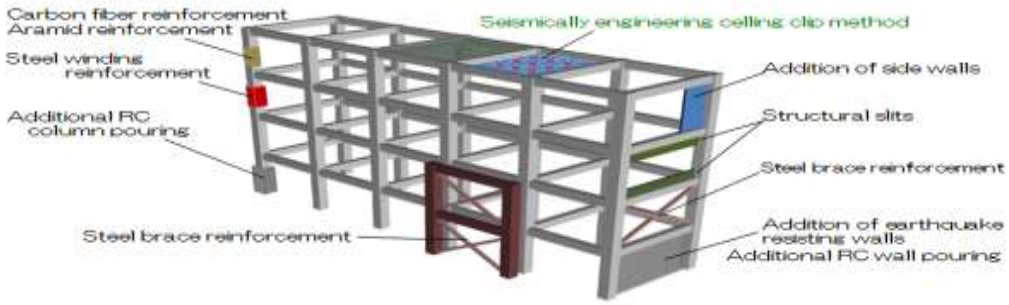



Fig.77 Seismic Retrofitting of Building

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

The construction industry has been repeatedly criticized for inefficient and slow innovation. There has been no major change in the basic methods of construction, technology and technology since Roman times. But the application of innovations in the construction industry does not go straight ahead. Each construction project is different, each site is a single design, construction work is in different locations and involves the constant movement of staff and machinery. In addition, weather and other factors may prevent the previous experience from being used effectively. The term 'advanced construction technology' includes extensive advanced technologies and practices

that describe the latest developments in materials technology, design processes, quantitative surveying, facility management, services, architectural analysis and design and maintenance studies. The application of advanced construction technology increases quality, efficiency, safety, stability and value for money. However, there is often a conflict between traditional industry methods and innovative new methods, and this often leads to a relatively slow rate of technology transfer in the industry. Adopting advanced construction technology requires appropriate design, commitment from the entire project team, appropriate procurement strategy, good quality control, proper training and careful initiation. Advanced production methods are commonly (among many others) described as modern forms:

- Materials.
- 3D printing.
- Building information modeling (BIM).
- Cladding systems.
- Computer aided design and computer aided manufacturing (CAD/CAM).
- Computer numerical control.
- Construction Innovation Hub.
- Construction plant.
- Modern methods of construction.
- Modular construction.
- Offsite manufacturing.
- Prefabrication and preassembly.
- Research and development.

### 14.1.4 Engineering Aspects of Soil mechanics - Environmental Impact Assessment

The Environmental Impact Assessment (EIA) is a process of assessing the environmental impact of a proposed project or development, taking into account the beneficial and negative interrelated socio-economic, cultural and human-health impacts. UNEP defines the Environmental Impact Assessment (EIA) as a tool used to identify the environmental, social and economic implications of a project before making a decision. It aims to assess environmental impacts at an early stage in project planning and design, find ways and means to mitigate adverse impacts, design projects tailored to the local environment, and present suggestions and options to decision makers. Environmental Impact Assessment in India is legally supported by the Environmental Protection Act, 1986, which contains various provisions on EIA methodology and policy.

**EIA process**

The EIA contains the steps described below. However, the EIA process is cyclical with interactions between different phases.

- **Screening:** The project plan is displayed for the level, location and development of the investment and if the project requires legal approval.

- **Scope:** The potential impacts of the project, the area of impact, the mitigation opportunities and the need for monitoring.

- **Baseline data collection:** Baseline data is the environmental condition of the area being studied.

- **Impact Prediction:** There is a need to anticipate positive and negative, reversible and irreversible and temporary and permanent effects that reflect a better understanding of the project through the appraisal agency.

- **Mitigation Measures and EIA Reports**: The EIA report should contain measures or measures to prevent, mitigate, or approve the effects, or the level of compensation for environmental damage or harm.

- **Public Hearing:** Upon completion of the EIA report, the public and environmental groups living near the project site may be informed and contacted.

- **Decision Making:** The Impact Assessment Authority liaises with the project in-charge with experts to make a final decision based on the EIA and EMP (Environmental Management Plan).

- **Environmental Management Plan Monitoring and Implementation:** Oversees the various stages of project implementation.

- **Alternative Assessment, Relief Measures Delimitation and Environmental Impact Assessment Report:** For each project, potential options should be identified and environmental characteristics should be compared. Options should include both project location and process technology. After reviewing the options, a mitigation plan for the chosen option should be prepared and replaced with the Environmental Management Plan (EMP) to guide the proposal towards environmental improvement.

- **Risk Assessment:** Inventory analysis and risk probability and indicators are also part of EIA processes.

### 14.1.5 Water Supply-Sewerage System-Waste Water- Sustainable development techniques

An important part of the environmental damage caused by the planet is caused by discharge of wastewater that can be treated or treated poorly. Contaminated water for industry, cities, and agriculture they contain many different types of impurities such as decay and decay matter, solid solids, rotate, nutrients, heavy metals, pesticides, germs, etc. All of these they endanger the environment and human health, so selected treatments should be adapted to their environment to better facilitate their removal. In addition to efficiency, the water is polluted Treatment options must be sustainable, not only from an environmental point of view, but also economically and morally. As a result, no technological reliance should be made less developed countries or

communities. Therefore, this Special Issue is facing development in various aspects of wastewater management include various aspects of water management such as development of mathematical models, application of life cycle strategies, or testing efficient use of wastewater treatment systems. Thirteen articles were accepted covering some of suitable fields for wastewater treatment: activated sludge, nanoparticle treatment, synthetic swamps, hydroelectric power, nutrient regeneration, friendly magic, and reversing osmosis.

The current state of the planet's environment also requires water management systems, like any other human activity, they are preserved, but what does it mean to be sustainable? Many times, we think only with regard to natural sustainability and forget that sustainability, as understood by The United Nations, in its 17 goals of Sustainable Development, is much more than that, because it includes economic and moral and social issues such as gender equality or poverty eradication in all forms of water treatment including a variety of different types, ranging from physiological methods such as melting of air or membrane techniques in chemical methods such as advanced oxidation techniques and a variety of biological methods Within this latter group, less expensive, more widespread, or natural alternatives such as ports, built-up wetlands, drip filters, or bidiscs have made remarkable progress.

## 14.2 Electrical Concept

### 14.2.1 Design of Power Electronics converter

Power electronic converters have been developed for several tenths of years with many types of applications. One of the major applications is the drive of electrical machines mainly used in the beginning for industrial applications, and now propagated in many household appliances. The beginning of the renewable energy story had a moderate influence on the power electronic converters market. Indeed, in the old small wind turbines, the mechanical power was converted to electrical power thanks to induction machines directly connected to the grid. Very quickly, the power of the wind turbine increased and more rules were imposed, for example, voltage ride-through capability, injection of reactive power. The connection of wind turbines with power electronic converters became compulsory also to optimize the aerodynamic power conversion. At the same time, photovoltaic energy started also to grow with an obvious mandatory direct current (DC)/alternating current (AC) conversion, which requires a power electronic interfacing. Beside renewables, the development of many projects of high-voltage direct current (HVDC) links also increases the impact of power converters on the grid.

The influence of power electronic converters in the grid cannot be neglected anymore; also, many studies confirm the good behaviour of the new grids comprising a high rate of these new devices. Moreover, it is likely that the type of connection currently used will not be sufficient in the future. Indeed, the power electronic converters are connected to the grid as current injectors (i.e., they are controlled based on the grid-following concept). It assumes that the grid is strong enough to behave as a voltage source at the point of common coupling of the converter. However, with the increase of these power electronic converters, this becomes less true. It is likely that some converters will need to switch from current source mode to a voltage source mode. This is the concept of grid-forming control. The general idea of this chapter is to start from the fundamental concepts of active power management in the grid with a voltage source to propose a classification of different types

of controls for power electronic converters based on fundamental thinking. Some general ideas are first recalled for the grid-following converter, but more focus is made on the grid-forming control. This approach is valid for the two main topologies found on the grid: Two-level voltage source converter (VSC) and modular multilevel converters (MMC).

### 14.2.2 Electronic Soft Starter for 1/3 Phase Induction Motor for Agriculture

The ac motor starters are increasingly becoming popular due to its controlled soft-starting capability. The ac motor starter provides limited starting current and hence conventional electromagnetic line starters and reduced-voltage starters are replaced with ac motor starters. Thyristor-based soft starters have many desirable properties and provide a viable solution to starting problems in three phase induction motors. These power semiconductor-based starters are cheap, simple, and reliable and occupies less volume. The power density of these soft starters is also very high. A three-phase induction motor produces electromagnetic torque on its shaft but initial switching instants of all three phases to the supply produces pulsations on the electromechanical torque when it is controlled by a direct- online starter. These severe pulsations in electromagnetic torque might cause shocks to the shaft and hence to the driven equipment. These pulsations might damage mechanical system components, such as shafts, couplings and gears etc. The electromagnetic torque pulsations also cause long term effects on various mechanical system components if the strength of materials is exceeded which might lead to fatigue also. The reduced voltage starting by soft starters eliminates stress from the electrical supply and it also reduces the possibility of voltage dip and brown out conditions. Soft and smooth starters provide smooth acceleration of rotor of three phase induction motor. Reduced voltage starting reduces high amount of starting torque applied on the shaft and therefore eliminates the shock on the driven load. An instantaneous high amount of starting torque can cause a jolt on the conveyor which can damage products, pump cavitation's and water hammer in pipes. Therefore, a soft starter ramps up the voltage applied to the motor from the initial voltage to the full voltage. The voltage is initially kept low to avoid sudden jerks during the start. The voltage and torque increase gradually so that the induction motor starts to accelerate. This ramp up voltage provides sufficient torque for the load to accelerate gradually and hence mechanical and electrical shocks are minimised from the system, the voltage supplied to stator windings are adjustable and it has ramp characteristics.

### 14.2.3 Advanced Wireless Power Transfer System

The Transfer of electrical power in reliable and efficient way is always challenging for the designers and engineers. Presently all electrical power from the generating stations to the distribution station is transferred by the uses of wires and underground cables. One of the major issues in these types of systems is the losses due to resistance of the material. Generally, the percentage of loss of power during the transmission and distribution is 26%. In modern technology the use of portable device has increased such as mobile robots and electric vehicle. Mobility is the main concern of these equipment i.e.; they are not connected to the main source of power. All these problems are the main motivation for researchers. Nikola Tesla was the first who introduce the concept of wireless power transfer. But this technology from the time of Tesla is underdeveloped due to lack of funding and technology. But research from past few years has always going on and recent development has been observed in the field. Wireless power transfer

can be achieved by several methods (discussed later). Here we discussed few methods such as induction coupling, resonating coupling, LASER technology for electrical power transfer.

Fig.78 Wardenclyffe Tower

**Inductive Coupling**:

This type of WPT is simply based on inductive coupling between two coils. This is a type of near field technique measuring with appliance near the source. It is generally based on the principle of mutual induction, where two coils are placed vicinity to each other and there is no physical connection between these two coils. The simplest example is transformer where the transfer of energy takes place due to electromagnetic coupling. Each of these coils connected without wires and it has been an important and popular technology to transfer power without wires because of its simplicity and reliability. Based on this technology there are various application device has been already made including electric brush and charging pad for cell phones or laptop. But this kind of method also have some limitation i.e., the range can be very less up to few cm and separation distance is very less than the coil diameter.

**Magnetic Resonance Coupling WPT**:

This is also one of the important methods for transferring power based on near field technique. It generally overcome the disadvantage of up to some extent which arise in non- resonant inductive coupling. This type of coupling used the concept of resonance. At resonance we know that natural frequency and excitation frequency are same. This leads to the maximum amplitude, that means a maximum amount of energy is transferred between two coils. Here the receiver and transmitter coils are tuned to be at same resonant frequency.

**Microwave WPT:**

This is one of the types of far-field technique of WPT which have range up to KM, with power transfer up to MW. This method uses microwave frequency ranging from 1GHZ to 1000GHZ generated from the microwave generator. First the microwave is generated by microwave generator which pass through the coax-waveguide adapter to the waveguide circulator. Then a tuner and directional coupler are used to separate wave according to their propagation direction. Then they are transmitted through antenna. At the receiver terminal, a receiver antenna receives which pass through a low pass filter to finally produce DC power. Based on microwave WPT system the present application is solar power satellite. Advantages of microwave WPT are that it

is used for several KM range with transferring high amount of power. Disadvantage are generally that the radiation effect to human beings from the microwave electromagnetic radiation.

**LASER WPT:**

This is also one of the types of far- field technique, where the power is transmitted through LASER beams. For power transmission firstly the electrical energy is converted to high LASER beams and at receiving side, these LASER beams are converted to electricity by using photo voltaic cells. This type of WPT has several disadvantages i.e., why it is not used for electrical power transmission because LASER beams can easily harm human being if they cut LASER beam path. Therefore, these are generally used for military weapon development and space research.

**Block diagram:**

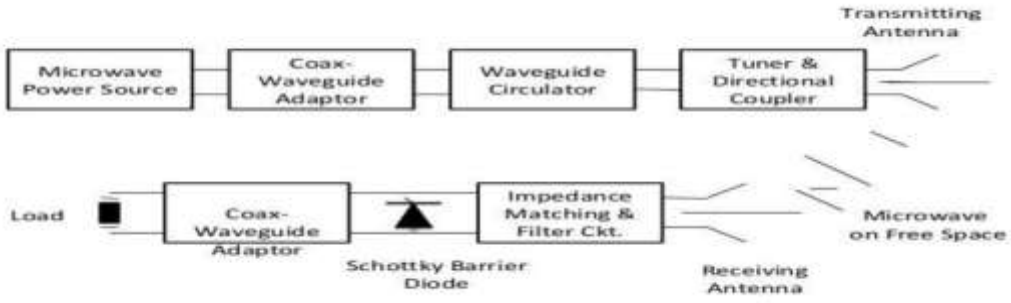



Fig.79 Functional Block Diagram of WPT

**Application:**

- Medical device
- Electrical vehicles
- Solar power satellite

**Advantages:**

- It gives the human comfort as there is no chording or wiring problem, so mobility is easier.
- There is no problem of power failure and extensive heating.
- Cost of overall system decreases due to no uses of wires.
- Overall efficiency increases due to decrease in the power loss.
- It offers no corrosion as there is no exposure to the atmosphere which is Eco-friendly.
- It offers ranges of power levels and separation distance between coils.
- It offers convenient, reliability, high efficiency, low cost at the same time.

**Disadvantages:**

- WPT methods uses the electromagnetic radiation for power transfer and the main effect of electromagnetic wave is its biological impact which harms human beings and animal.
- Biological impact of inductive coupling and resonance coupling is far less than compared to microwave power transmission technique.
- There is also a limitation of separation distance and power capacity.
- Interference of microwave with other communication system.
- Initial cost is very high for implementing WPT system.

**Estimated cost:**
Microwave power source: 14,376/-
Coax-waveguide adapter:20,463/-
Waveguide Circulator:1,124/-
Tuner and directional coupler:309/-
Schottky barrier diode:39/-
Impedance matching and filter ckt:5,850/-

### 14.2.4 Industrial Temperature Controller

An entirely new generation of highly dynamic temperature control systems by JULABO. The new PRESTO® systems are designed for precise temperature control as well as rapid temperature changes, making them ideal for reactor vessels, material stress tests, or temperature simulations. These instruments cover a working temperature of -92 to +250 °C with high cooling and heating capacity. Highly efficient components give these instruments the ability to compensate for exothermic and endothermic reactions with extraordinary speed. Permanent internal monitoring and self-lubricating pumps contribute to the new PRESTO®'s long service life. The integrated 5.7-inch colour industrial-grade touch panel is one of the identifying characteristics of the new PRESTO®. It gives the user a clear and well-organized view of important information while greatly improving user-friendliness. Once in operation, the new PRESTO® units are whisper quiet and barely audible in a laboratory. The new PRESTO® units are extremely robust and work reliably even if the ambient temperature climbs as high as +40 °C. Multiple interfaces permit remote control of the PRESTO® across networks and in superordinated control systems. Closed side panels without ventilation slits reduces to a minimum the amount of space needed to operate.

### 14.2.5 Accident Alerts in Modern Traffic Signal Control System -Camera Surveillance System

Our lives became easier with the Quick accretion of technology and infrastructure. The advent of technology has also risen the traffic hazards and the road accident take place repeatedly which causes massive loss of life and property because of the poor emergency facilities. Recently, intelligent transportation systems (ITS) have emerged as an efficient way of improving interpretation of transportation systems and enhancing travel safety. Accident detection systems are one of the most effective (ITS) tools. The accident detected system which based on Global Positioning System (GPS) and Global System for Mobile communication (GSM) can be accomplish though one or several sensors, the system can gather the information and coordinates of accident spot then send this data to the rescues services center over a network link in shortest time, it represented as an instance helping system. In this review paper, we proposed an intelligent system that composed of a GPS receiver, Vibration sensor, GSM Modem and integrated with Vehicular AD-Hoc Network (VANET). The employ of (VANET) by enhanced Ad hoc On-Demand Distance Vector protocol (AODV) helps these services in finding the optimum route to the emergency message. The use of GSM, GPS, and VANET technologies allows the system to track vehicle and provides the most instant and accurate information about the vehicle accident spot.

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

**Observation and Brief write up**

- Various infrastructure facilities which we observed in Rajgari village are as below: -
  - Physical Infrastructure Facilities:

    Houses, Communication, Electricity, Drainage Line, Road Network, Water supply system etc.
  - Social Infrastructure Facilities:
    Aaganwadi
  - Socio-Cultural Infrastructure Facilities:
    Panchayat bhavan, Community hall
  - Sustainable Infrastructure Facilities:
    Solar Street Light
  - Repair & Maintenance of Existing building:
    The Provision shall apply to the Repair, Alteration, and change of occupancy, addition and relocation of existing building and is to be maintained also.

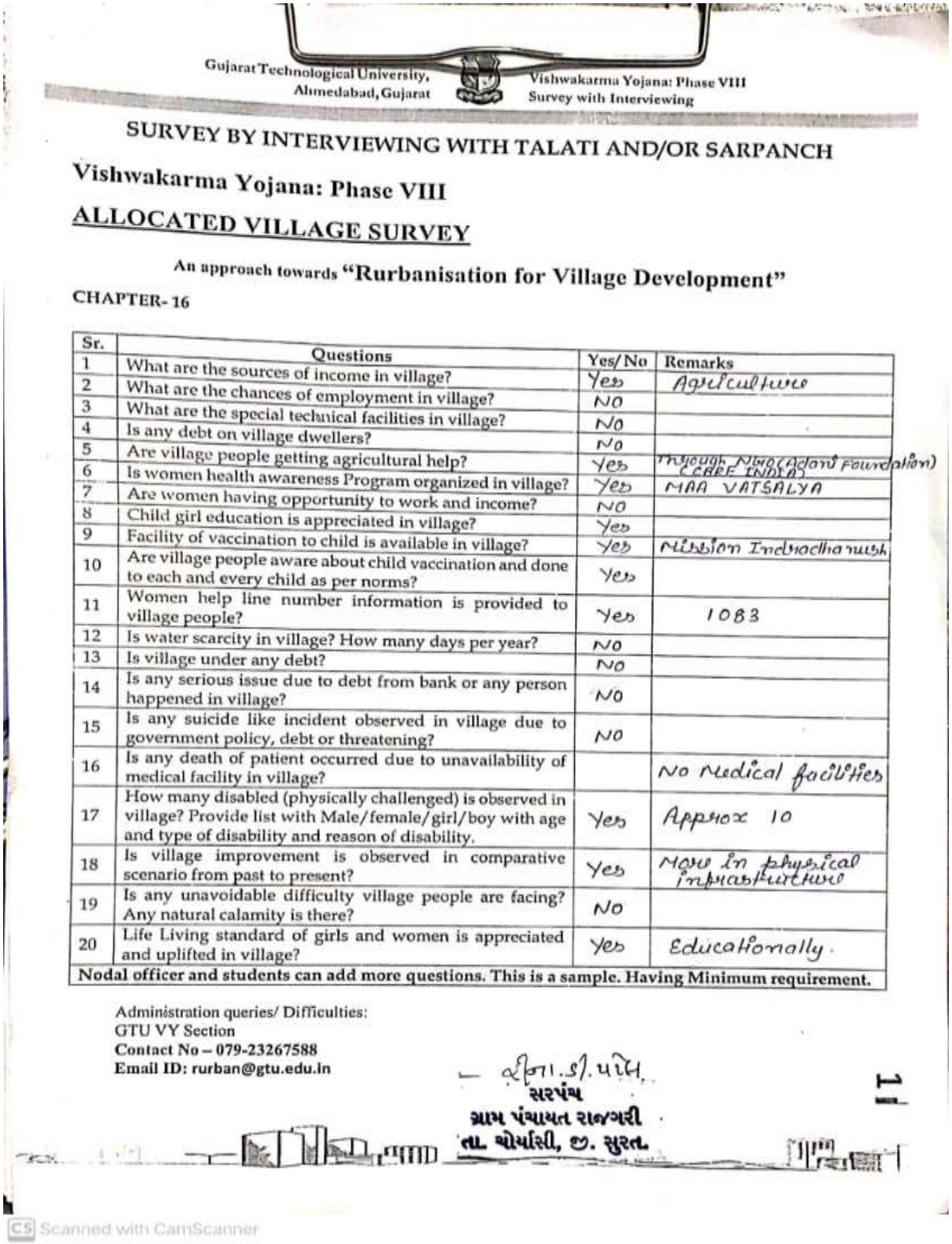
**Also, we observed in Rajgari village are,**
Nowadays villagers are facing the problem due to Covid-19. We observed that villagers are using fertilizer randomly sometime fertilizer and pesticides are creating bad effect on the crops. Women need to be grown up their self. All farmers do not know about the latest technology of farming they done farm based on old technology. There was not basic facility of PHC. They also don't have a common waste collection mechanism. They also lack the facility of high school.

How can be improved with small changes, Period –
a) Immediately, b) Within 1 year and, c) Long term (3-5 years) along with cost estimation:

| Sr. No | Design Name | Period | Amount Expenditure (Rs) | Benefits |
|---|---|---|---|---|
| **1.** | Rain water harvesting | 1-1.5 years | Rs.34,395/- | To provide water conservation technique to the villagers and remove water scarcity |

| | | | | |
|---|---|---|---|---|
| **2.** | Public tap water | Within 6 months | Rs.5,994/- | To provide drinking water facility to the visitors and the villagers too. |
| **3.** | Police outpost | Within 6 month-1 year | Rs.6,08,984/- | They can get security in all the dimension and also safety from any type of conflict. |
| **4.** | Sarvajanik sauch griha | Within 6 months | Rs.34,335/- | Sanitation is a foremost safeguard requirement from the disease, so there will be fulfillment of swatch bharat abhiyaan |
| **5.** | Common service center | 1-1.5 years | Rs.1,38,511/- | Governance at door step is the foremost agenda of the government and to increase the ease of living of the villagers |
| **6.** | Public dispensary | Within 1 year | Rs.1,02,386/- | Providing health safety to the villagers will automatically will bring social and economic development of the villagers |
| **7.** | Bus stand | Within 1 year | Rs.11,038 /- | To provide connectivity to the villagers in the main city area and to bring easy transport to their village |
| **8.** | Pravesh dwar | Within 6 months | Rs.4939/- | Easy to recognize for visitors and improve aesthetic view of village |
| **9.** | Chabutra | 2 years | Rs.41,207/- | It provides an opportunity to improve human-animal relationship and also curbed the wastage of grains. |
| **10.** | Swimming pool | 1.5-2 years | Rs.80,000 /- | To provide an educational with addition of sporting activity to the villagers. |
| **11.** | Public distribution system | Within 6 months | Rs.2,77,851/- | To provide the essentials for living of the villagers in the village only. |
| **12.** | Waste collection system | Within 6 months | Rs.3,88,777/- | Easy to recognize for visitors and improve aesthetic view of village. |

# Chapter 16: Survey by Interviewing with Talati and/or Sarpanch



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Survey with Interviewing

**SURVEY BY INTERVIEWING WITH TALATI AND/OR SARPANCH**

**Vishwakarma Yojana: Phase VIII**

**ALLOCATED VILLAGE SURVEY**

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

**CHAPTER- 16**

| Sr. | Questions | Yes/No | Remarks |
|---|---|---|---|
| 1 | What are the sources of income in village? | Yes | Agriculture |
| 2 | What are the chances of employment in village? | No | |
| 3 | What are the special technical facilities in village? | No | |
| 4 | Is any debt on village dwellers? | No | |
| 5 | Are village people getting agricultural help? | Yes | Through NGO (Adani Foundation) CARE INDIA |
| 6 | Is women health awareness Program organized in village? | Yes | MAA VATSALYA |
| 7 | Are women having opportunity to work and income? | No | |
| 8 | Child girl education is appreciated in village? | Yes | |
| 9 | Facility of vaccination to child is available in village? | Yes | Mission Indradhanush |
| 10 | Are village people aware about child vaccination and done to each and every child as per norms? | Yes | |
| 11 | Women help line number information is provided to village people? | Yes | 1083 |
| 12 | Is water scarcity in village? How many days per year? | No | |
| 13 | Is village under any debt? | No | |
| 14 | Is any serious issue due to debt from bank or any person happened in village? | No | |
| 15 | Is any suicide like incident observed in village due to government policy, debt or threatening? | No | |
| 16 | Is any death of patient occurred due to unavailability of medical facility in village? | | No Medical facilities |
| 17 | How many disabled (physically challenged) is observed in village? Provide list with Male/female/girl/boy with age and type of disability and reason of disability. | Yes | Approx 10 |
| 18 | Is village improvement is observed in comparative scenario from past to present? | Yes | More in physical infrastructure |
| 19 | Is any unavoidable difficulty village people are facing? Any natural calamity is there? | No | |
| 20 | Life Living standard of girls and women is appreciated and uplifted in village? | Yes | Educationally |

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

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

વિ.કા.ડી.પટેલ
સરપંચ
ગ્રામ પંચાયત રાજગરી
તા. ચોર્યાસી, જી. સુરત.

Scanned with CamScanner

# Chapter 17 Irrigation / Agriculture Activites And Agro Industry, Alternate Technics and Solution

Based primarily on nature of land, climatic characteristics and available irrigational facilities, the farmers in India practice different types of farming.

1. **Subsistence farming**
   Most of the farmers in the country farm by farming. It is characterized by minimal and dispersed land management and the use of early tools. As farmers suffer, they do not use fertilizers and the variety of fruits that are best harvested in their fields to the extent that they have to. Utilities such as electricity and irrigation are often not available to them.
   Features of Subsistence Farming:
   - The whole family works on a farm
   - Most of the work is done by hand
   - The farms are small
   - Traditional farming methods are followed
   - Yields are not very high
   - Most of the crop is consumed by a family with very small family remnants.

2. **Shifting agriculture**
   In this type of agriculture, first of all a piece of forest land is cleared by felling trees and burning of trunks and branches. After the land is cleared, crops are grown for two to three years and then the land is abandoned as the fertility of the soil decreases. The farmers then move to new areas and the process is repeated. Dry paddy, maize, millets and vegetables are the crops commonly grown in this type of farming.
   This practice is known by different name in different regions of India like:

   - Jhum in Assam,
   - Ponam in Kerala,
   - Podu in Andhra Pradesh and Odisha and
   - Bewar masha penda and Bera in various parts of Madhya Pradesh.

3. **Plantation agriculture**
   Cultivation to plant trees or shrubs. Introduced by the British in the 19th century. One cultivation of rubber, tea, coffee, cocoa, spices, coconut and fruit juices such as apples, grapes, oranges, etc. It has great potential and requires good management skills, technical knowledge, sophisticated equipment, fertilizer, irrigation, and transportation facilities. Cultivated agriculture for agricultural purposes for export. Most agricultural crops have a life cycle of more than two years. Natural rubber, coconut, palm oil, tea, cocoa, and coffee are all plant products and take years to ripen, but after that they produce longer. Planting is kept in tropical areas, that is, on both sides of the equator. Plants are found on all continents in tropical climates. Some fields such as tea, coffee and rubber have a repair factory on or near the farm. This type of farming has developed in the hilly areas of northeastern India, sub-Himalayan West Bengal and Nilgiri, Annamalai and Cardamom hill in central India.

4. **Intensive Agriculture**
   In areas where irrigation has occurred, farmers use fertilizers and pesticides on a large scale. They also brought their land under a variety of high-yielding seeds. They have done mechanized agriculture by introducing machinery in various farming processes. Also known as industrial agriculture, it is characterized by low consumption and high consumption of inputs such as the capital and workers in each part of the world. This is in contrast to traditional agriculture where input per unit area is lower. The Intensive Agricultural Development Program (IADP) was the first major test of the Indian government in the agricultural sector and was also known as the "package program" as it was based on the package process. The program was launched in 1961 after the Community Development Program lost its sheen. The main philosophy was to provide seed and fertilizer loans to farmers.

5. **Dry faming**
   Dry farming or dryland farming can be defined as the practice of planting crops without irrigation in areas with an annual rainfall of 750 mm - 500 mm or less. Photography and Moisture Preservation Effective Use of Existing Moisture Soil Conservation Installation Cost Management Agriculture in Dryland is subject to high diversity in sown areas, yield and production. This variation is the result of climatic disturbances.

6. **Mixed or multiple agriculture**
   Mixed farming refers to the planting of crops and the raising of animals at the same time. Multiple farming is used to show the practice of planting two or more crops together. In such a case, many plants are planted with different stages of growth. This practice is followed by areas with good rainfall or irrigation resources.

7. **Crop rotation**
   This refers to growing of number of Crops one after the other in a fixed rotation to maintain the fertility of the soil. The rotation of crops may be complete in a year in some of the areas while it may involve more than one year's time is others.
   - Pulses or any leguminous crop is grown after the cereal crops.
   - Legumes have the ability of fixing nitrogen to the soil.
   - Highly fertilizer intensive crops like sugarcane or tobacco are rotated with cereal crops.
   - The selection of crops for rotation depends upon the local soil conditions and the experience and the understanding of the farmers.

8. **Terrace cultivation**
   - The hill and mountain slopes are cut to form terraces and the land is used in the same way as in permanent agriculture.
   - Since the availability of flat land is limited terraces are made to provide small patch of level land.
   - Soil erosion is also checked due to terrace formation on hill slopes.

# Chapter 18: Social Activities- awareness campaign

The group has conducted an awareness camp related to the current scenario going on in the country i.e., covid-19 vaccination drive. The group had explained the benefits and the procedure to avail the vaccination and the safeguard measures that should be keep in mind by the individual of the villages. Here are some images of interaction of the group with the people of the village.

Fig.80 Spreading Awareness Regarding COVID Vaccine

# Chapter 19: SAGY Questionnaire Survey form with the Sarpanch Signature

**SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire**

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

**I. Basic Information**

a. Village: Rajgari

b. Ward Number: 4

c. Gram Panchayat: Rajgari

d. Block: charyasi

e. District: Surat

f. State: Gujarat

g. Lok Sabha Constituency: Navsari

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

i. Names of Habitations / Hamlets:

**Demographic Information**

Number of Households 318 Total Population 1300 Male 716 Female 584

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

**II. Access to Infrastructure/Amenities etc.**

| i. | Access to Infrastructure / Facilities / Services | Located in the Village Yes (Y)/No(N) | If located elsewhere (N), distance in kms from the village |
|---|---|---|---|
| a. | Nearest Primary School | Yes | 100 m |
| b. | Nearest Middle School | NO | 3 KM |
| c. | Nearest Secondary School | NO | 3 KM |
| d. | Kisan Seva Kendra | NO | — |
| e. | Milk Cooperative /Collection Centre | NO | — |
| g. | Health Sub Centre | NO | Suvali (2 KM) |
| h. | Bank | NO | 3 KM |
| i. | ATM | NO | 3 KM |
| j. | Bus Stop | NO | 1 KM |
| k. | Railway Station | NO | 2 KM |

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

1

## SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

| i. | Access to Infrastructure / Facilities / Services | Located in the Village Yes (Y)/No(N) | If located elsewhere (N), distance in kms from the village |
|---|---|---|---|
| l | Library | NO | — |
| m | Common Service Centre | NO | 20 KM |
| n | Veterinary Care Centre | NO | — |

**ii.** Road Connectivity

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

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

**iii. Drinking Water Facilities**

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

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

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

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

**iv. Coverage of Habitations under Waste Management System**

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

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

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

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

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

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

**v. Coverage of Habitations under Electrification**

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

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

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

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

**vi. Sports Facilities in the Village**

a.Number of Play Grounds in the Village (minimum size 200 square meters): 10

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

**vii. Education, ICDS**

a. Number of Anganwadi Centres: 2

c. Schools (Number)

Primary Private: — Primary Govt.: 1

Middle Private: — Middle Govt.: —

Secondary Private: — Secondary Govt.: —

Higher Secondary Private: — Higher Secondary Govt: —

2

## SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

| viii. Land Category | | Area in Acres | | Land Category | Area in Acres | | Irrigation Structure | No. |
|---|---|---|---|---|---|---|---|---|
| a. | Cultivable Land | — | d. | Pasture / Grazing Land | — | g. | Check Dam | — |
| b. | Irrigated Land | — | e. | Forests/ Plnatations | — | h. | Wells/Bore Wells | 100 |
| c. | Un-irrigated Land | — | f. | Other Common Land | — | I | Tanks /Ponds | 2 |

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

**Name and Signature of Surveyor and Respondent'**

| | | | |
|---|---|---|---|
| Siddish Nochil<br>Siddish.<br>Surveyor | — ડી.ના.ડી.પટેલ<br>સરપંચ<br>ગ્રામ પંચાયત રાજગરી<br>તા. ચોર્યાસી, જી. સુરત.<br>PRI Respondent (Preferably a ward member from a ward that is fully or partially covered under the Village) | તલાટી કમ મંત્રી<br>ગ્રામ પંચાયત રાજગરી<br>Official (Preferably seniormost Government official in the Gram Panchayat) | 25-3-21<br>Date of Survey |

## SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: Rajgari Gram Panchayat: Rajgari Ward No. 4

Block: Charyasi District: Surat

State: Gujarat L S Constituency: Navsari

**1. Family Identity and Size**

| Name of Head of Household | Nilesh kumar Bhagvatibhai Patel | | | | | | | Male/ Female | M |
|---|---|---|---|---|---|---|---|---|---|
| SECC Survey ID: | | Family Size | 5 | Over 18 | 4 | 6 to 18 | - | Under 6 | 1 |

**2. Category & Entitlement Details** (Tick as appropriate)

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

**2. Adults (above 18 years)**

| Name | Age | Sex M/F/O | Disability Status Y/N | Marital Status[3] | Education Status[4] | Adhaar Card (Y/ N) | Bank A/C (Y/N) | Social Security Pension[5] |
|---|---|---|---|---|---|---|---|---|
| Parvati Ben Patel | 49 | F | NO | widow | Std-3 | Y | Y | Yes |
| Arjun kumar Patel | 28 | M | NO | unmarried | Std-8 | Y | Y | NO |
| Payal ben Patel | 26 | F | NO | Married | Std-12 | Y | Y | NO |
| Nilesh bhai Patel | 32 | M | NO | Married | Std-10 | Y | Y | NO |

**3. Children from 6 years and up to 18 years**

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

**4. Children below 6 years**

| Name | Age | Sex M/F/O | Disability Yes/No | Going to School (Y/N) | Going to AWC Y/N | De-worming Done | Fully Immu-nised Y/N | Mother's Age at the time of Child's Birth |
|---|---|---|---|---|---|---|---|---|
| Riyansh Nileshbhai Patel | 3 | M | NO | NO | NO | Yes | Yes | 23 |
| | | | | | | | | |
| | | | | | | | | |

[1] Scheduled Caste 1, Scheduled Tribe 2, Other Backward Castes 3, Other 4

[2] Enter the BPL Survey round being used in the Gram Panchayat for identification of BPL Families (e.g. 1997/2002/2011)

[3] Marital Status: Not Married – 1, Married – 2, Widowed – 3, Divorced/Separated – 4

[4] Level of Education: Not Literate – 01, Literate – 02, Completed Class 5 - 03, Class 8th – 04, Class 10th-05, Class 12th-06, ITI Diploma-07, Graduate-08, Post Graduate/Professional – 09 (write the highest level applicable)

[5] No Pension – 0, Old Age Pension – 1, Widow Pension – 2, Disability Pension – 3, Other Pension – 4 (mention)

# SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

**5. Hand washing**

| | Always | | Sometimes | | Never |
|---|---|---|---|---|---|
| After use of Toilet | Soap ✓ | Other | Soap | Other | |
| Before Eating | Soap ✓ | Other | Soap | Other | |

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

**7. Do members take Regular Physical Exercise**

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

**8. Consumption of Tobacco**

| | Smoking | Chewing |
|---|---|---|
| Adults | NO | NO |
| Children | NO | N |

**9. House & Homestead Data**

| | |
|---|---|
| Own House: Yes / No | No. of Rooms: 1 bhk |
| Type: Kutcha / Semi Pucca / Pucca | |
| Toilet: Private / Community / Open Defecation | |
| Drainage linked to House: Covered / Open / None | |
| Waste Collection System | Door Step / Common Point / No Collection System |
| Homestead Land: Yes / No | Kitchen Garden : Yes / No |
| Compost Pit: Individual/ Group/ None | Biogas Plant: Individual/ Group/ None |

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

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

**11. Source of Lighting and Power**

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

**12. Landholding (Acres)**

| | | | |
|---|---|---|---|
| 1. Total | 3 | 2. Cultivable Area | 3 |
| 3. Irrigated Area | No | 4. Uncultivable Area | No |

**13. Principal Occupations in the Household**

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

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

**15. Agriculture Inputs**

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

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

| Name | Unit | Quantity |
|---|---|---|
| Chuvar | Kg | 20 Kg |
| | | |
| | | |

**17. Livestock Numbers**

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

**18. What games do Children Play**
Cricket, Volleyball

**19. Do children play musical instrument** (mention)
NO

Schedule Filled By: Siddish Nochil
Principal Respondent: Nileshkumar Patel
Date of Survey: 25-3-21

## Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

### I. Basic Information

a. Gram Panchayat: Rajgari
b. Block: chorasi
c. District: Surat
d. State: Gujarat
e. Lok Sabha Constituency: Navsari
f. Number of Wards in the Gram Panchayat: 8
g. Number of Villages in the Gram Panchayat: 1
h. Names of Villages: Rajgari

**Demographic Information**

Number of Households 318 Total Population 1300 Male 716 Female 584

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

### I. Access to Infrastructure / Facilities / Services

| | Infrastructure Facilities / Services | Located within the GP Yes (Y)/No (N) | If located elsewhere (N), distance from the GP office |
|---|---|---|---|
| a. | ANM/ Health Sub Centre | NO | |
| b. | Nearest Primary Health Centre (PHC) | NO | Suvali (2 Km) |
| c. | Nearest Community Health Centre (CHC) | NO | |
| d. | Nearest Post Office | Yes | 200 m |
| e. | Nearest Bank Branch (Any) | NO | 3 KM |
| f. | Nearest Bank with CBS Facility | NO | 3 KM |
| g. | Nearest ATM | NO | 3 KM |
| h. | Nearest Primary School | Yes | 100 m |
| i. | Nearest Middle School | NO | 3 KM |
| j. | Nearest Secondary School | NO | 3 KM |
| k. | Nearest Higher Secondary School / +2 College | NO | 20 KM |
| l. | Nearest Graduate College | NO | 20 KM |
| m | Nearest ITI / Polytechnic Centre | NO | 3 KM |
| n | Kisan Seva Kendra | NO | — |

1

## Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

| | Infrastructure Facilities / Services | Located within the GP Yes (Y) No (N) | If located elsewhere (N), distance from the GP office |
|---|---|---|---|
| o | Agriculture Credit Cooperative Society | NO | – |
| p | Nearest Agro Service Centre | NO | – |
| p | MSP based Government Procurement Centre | NO | – |
| q | Milk Cooperative /Collection Centre | Yes | – |
| r | Veterinary Care Centre | NO | – |
| s | Ayurveda Centre | NO | – |
| t | E – Seva Kendra | Yes | – |
| u | Bus Stop | NO | 1 KM |
| v | Railway Station | NO | 20 KM |
| w | Library | NO | – |
| x | Common Service Centre | NO | 20 KM |

**IV. Sports Facilities in the Gram Panchayat**

a. Number of Play Grounds in the GP: Total 10 Public – Private 10

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

**V. Education, ICDS**

a. Number of Angan Wadi Centres: 2

b. Number of villages without Angan Wadi Centres –

Names of such villages: _____

c. Schools (Number)

Primary Private: – Primary Govt.: 1

Middle Private: – Middle Govt.: –

Secondary Private: – Secondary Govt.: –

Higher Secondary Private: – Higher Secondary Govt: –

**VI. Public Distribution System**

| | Item | Private Contractor | Women's SHG | Gram Panchayat | Cooperative | Other (Mention) | Location in GP (mention Location) | If outside GP, Location & distance from GP HQrs) |
|---|---|---|---|---|---|---|---|---|
| a. | Cereal (Rice/ Wheat/ Millets) | Pvt | NO | – | – | – | NO | 2 KM |
| b. | Kerosene | – | – | – | – | – | – | – |
| c. | Other (mention) | – | – | – | – | – | – | – |

## Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

**VII. Coverage of Villages under different Facilities & Services**

| | Parameter | Villages Status[1] | Names of Villages Covered | Names of Villages not Covered |
|---|---|---|---|---|
| a. | Piped Water Supply Coverage to Villages | Covered ✓ / Not Covered | Rajgari | |
| b. | Hand Pump Coverage in Villages: | Covered / Not Covered ✓ | | Rajgari |
| c. | Coverage under Covered Drains: | Covered ✓ / Not Covered | Rajgari | |
| d. | Coverage under Open Drains: | Covered / Not Covered ✓ | | Rajgari |
| e. | Villages with Household Electricity Connection (Numbers) | Connected ✓ / Not Connected | Rajgari | |

**VIII. Land and Irrigation**

| | Private Land | Area in Acres | | Common Land | Area in Acres | | Irrigation Structure | No. |
|---|---|---|---|---|---|---|---|---|
| a. | Cultivable Land | — | d. | Pasture / Grazing Land | — | g. | Check Dam | — |
| b. | Irrigated Land | — | e. | Forests/ Plantations | — | h. | Wells/Bore Wells | 100 |
| c. | Un-irrigated Land | — | f. | Other Common Land | — | i | Tanks /Ponds | 2 |

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

## Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

IX. Parameters relating to Households & Institutions

| | | Number |
|---|---|---|
| a) | Number of eligible Households for pension (old age, widow, disability) | – |
| b) | Number of Households receiving pension (old age, widow, disability) | – |
| c) | Number of eligible Households who are not receiving pension | – |
| d) | Number of Households eligible for Ration Card | 318 |
| e) | Number of eligible HHs having ration cards | 318 |
| f) | Number of households covered under RSBY (Rashtriya Swasthya Bima Yojana) | – |
| g) | Number of HHs covered under AABY (Aam Aadmi Bima Yojana) | – |
| h) | Number of active Job Card holders under MGNREGA | – |
| i) | Number of Job Card holders who completed 100 days of work during 2013-14 | – |
| j) | Number of shops selling alcohol | NO |
| k) | Number of BPL families | 100 |
| l) | Number of landless households | – |
| m) | Number of IAY beneficiaries | 10 |
| n) | Number of FRA[2] beneficiaries | – |
| o) | Number of Community Sanitary Complexes | – |
| p) | Number of Households headed by single women | – |
| q) | Number of Households headed by physically handicapped persons | 120 |
| r) | Total number of Persons with Disability in the village | 10 |
| s) | Number of SHGs | 2 |
| t) | Number of active SHGs | 2 |
| u) | Number of SHG Federations | 2 |
| v) | Number of Youth Clubs | – |
| w) | Number of Bharat Nirman Volunteers | – |

**Name and Signature of Surveyor and Respondent'**

| | | | |
|---|---|---|---|
| Siddish Nochi Siddish. | – કીના.કી.પટેલ સરપંચ | તલાટી કમ મંત્રી ગ્રામ પંચાયત રાજગરી | 25-3-21 |
| Surveyor | PRI Respondent (Preferably Gram Panchayat Chairperson) ગ્રામ પંચાયત રાજગરી તા. ચોર્યાસી, જી. સુરત. | Official Respondent (Preferably senior most Government official in the Gram Panchayat) તા. ચોર્યાસી, જી. સુરત. | Date of Survey |

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

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

Gmail

Rathi Yash <yrpk21@gmail.com>

**Development scenario of Rajgari village, Chorasi, Surat.**

**Rathi Yash** <yrpk21@gmail.com> 29 May 2021 at 13:06
Draft To: ddo-sur@gujarat.gov.in, collector-sur@gujarat.gov.in, tdo-chorasi@gujarat.gov.in
Cc: rurban@gtu.edu.in

Respected Sir/Madam

We are the students of C.K. Pithawala College of Engineering &Technology, Vesu, Surat affiliated with Gujarat Technological University-GTU. GTU has been assigned to Vishwakarma Yojana-VY in which students survey the various villages and Design various amenities To Deliver them to them, making them ideal for living a better life as per requirements & village problem statements.

As a part of Vishwakarma Yojana's guidelines, we have been asked to inform all the respected officers about our project in which we will shortly notify about Rajgari Village's profile of issues for development and our final Report is also attached below & our design work for them in that:

**DPR RAJGARI.pdf**
5072K

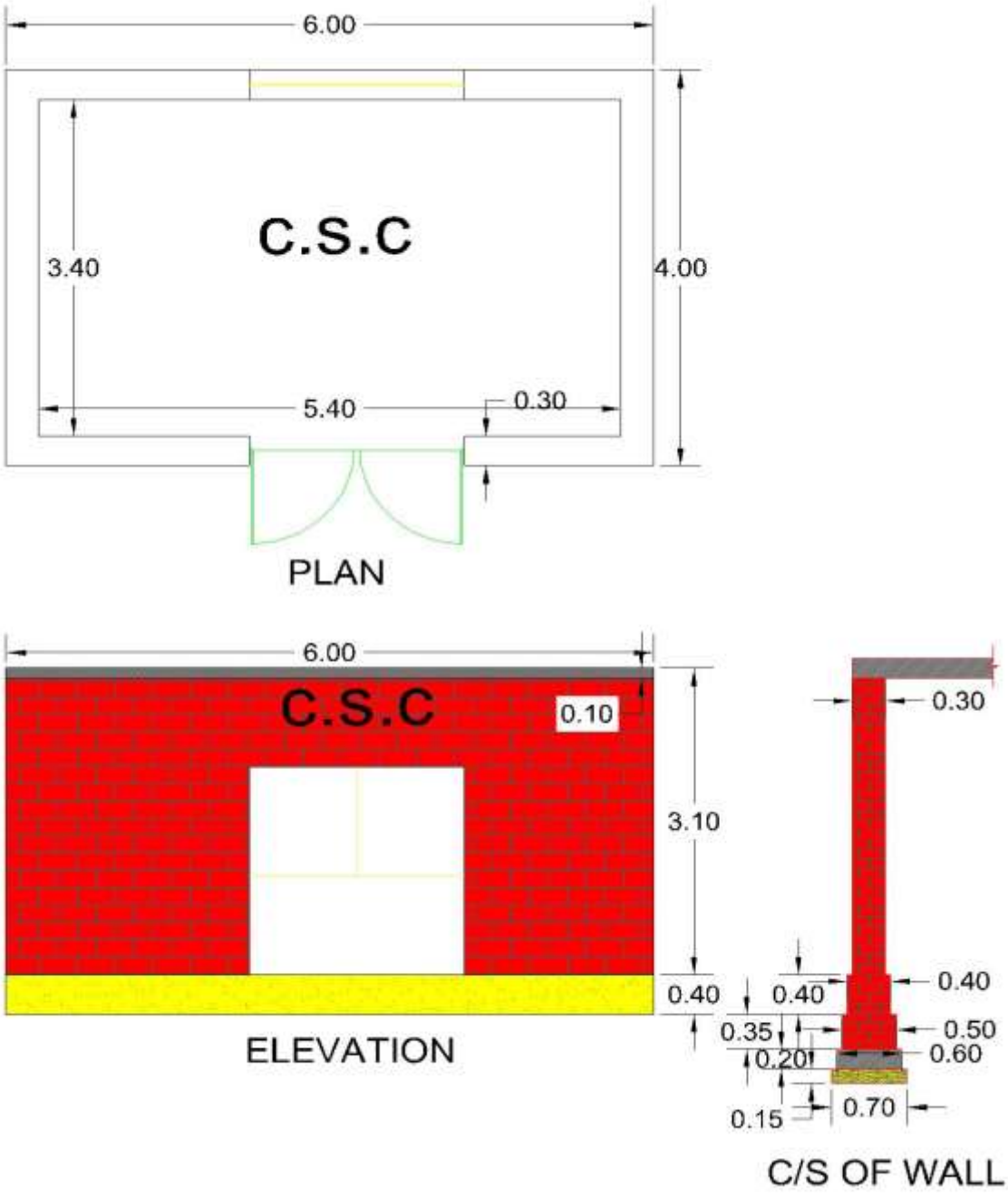
Fig.81 Soft Copy of Mail to TDO DDO and Collector

# Chapter 21: Comprehensive report for the entire village

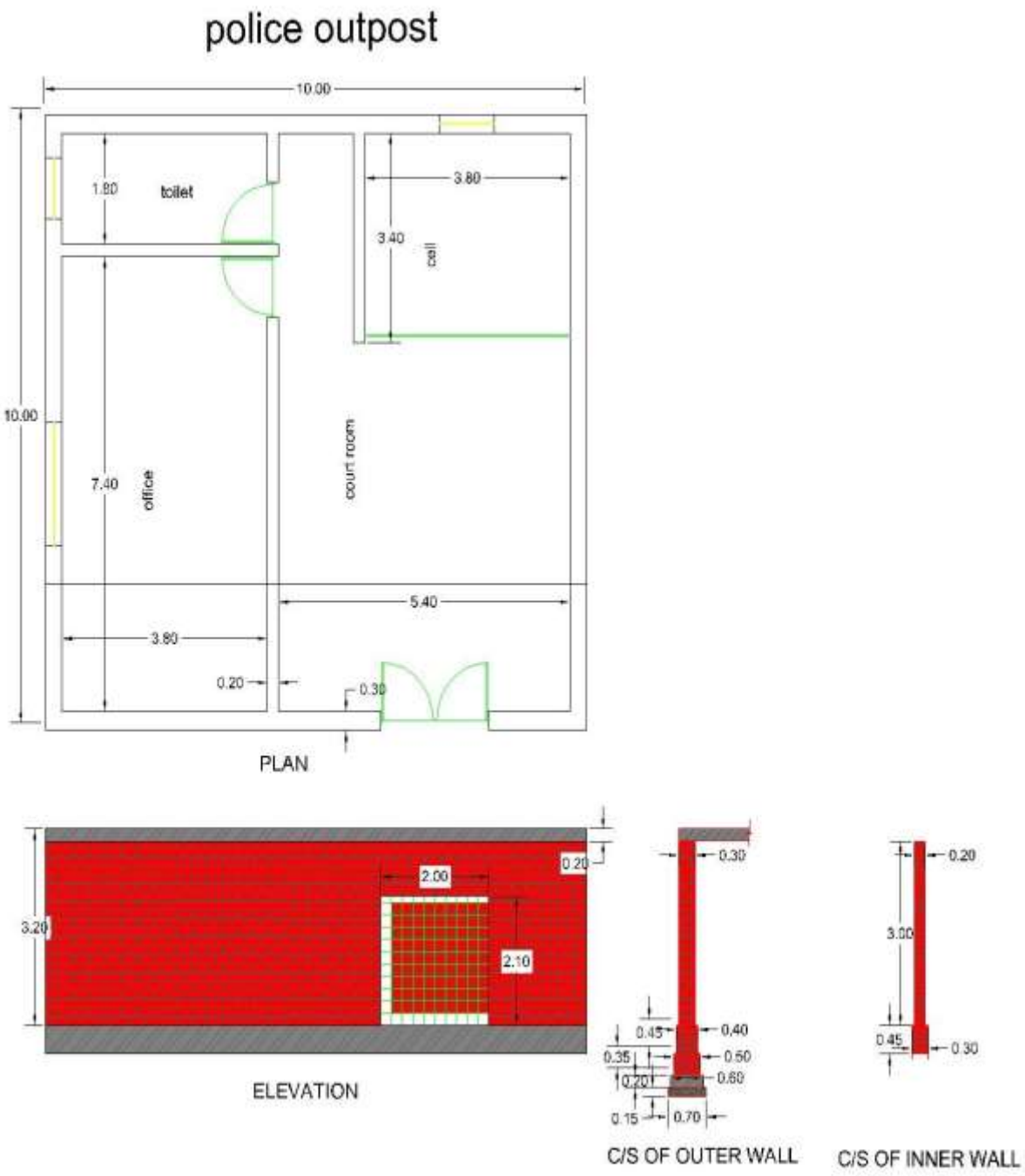
## Concept

Vishwakarma Yojana is provides special scheme for development of village by GTU and Government of Gujarat in which students work together and collect data and information regards village development with the help of gram panchayat and stake holders. Village have some basic facilities like drinking water, drainage system, pucca road, and other facilities like primary school, primary health center, community hall, library, public latrine block, are sufficient so that village can develop. So, we will give proposal regarding sustainable energy sources and solution related to infrastructure problems. Efforts have been made in this project work to identify and plan some of the below facilities for sustainable development of village and to meet need of future population. Vishwakarma Yojana is one of the initiatives towards Rurbanisation that is village development by the government of Gujarat, which was allotted as a real time situation type project provides to GTU.

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

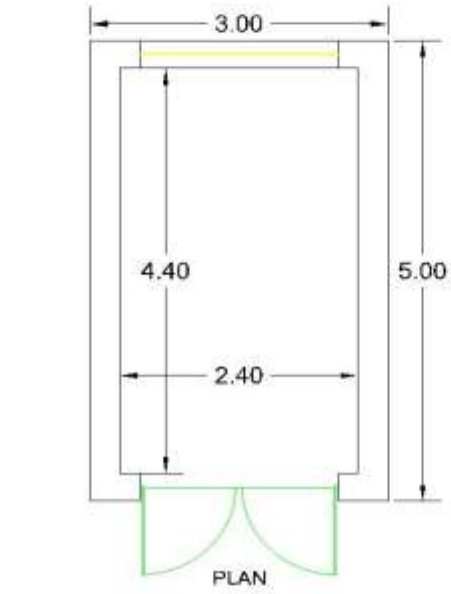


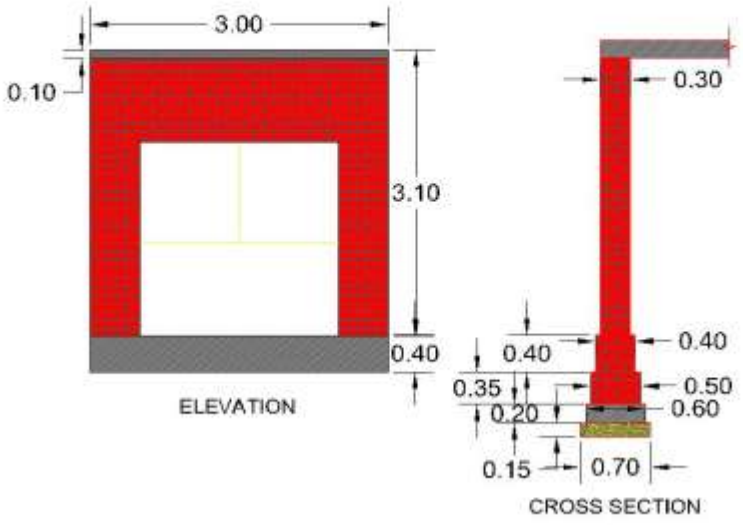

**Design civil:** Common Service Centre
**Village:** Rajgari **District:** Surat




**Design civil:** Police Outpost
**Village:** Rajgari **District:** Surat

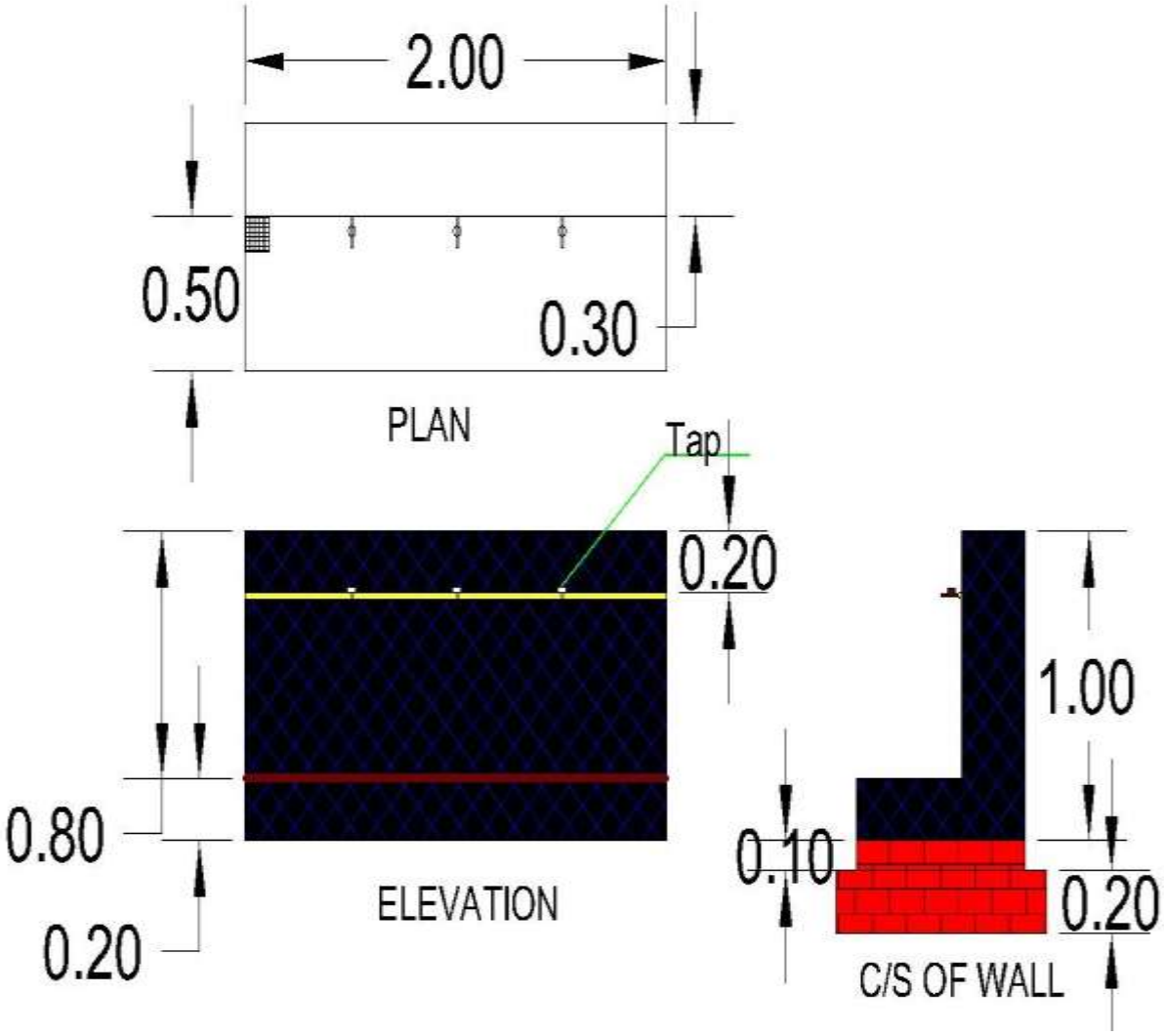
public
dispensary



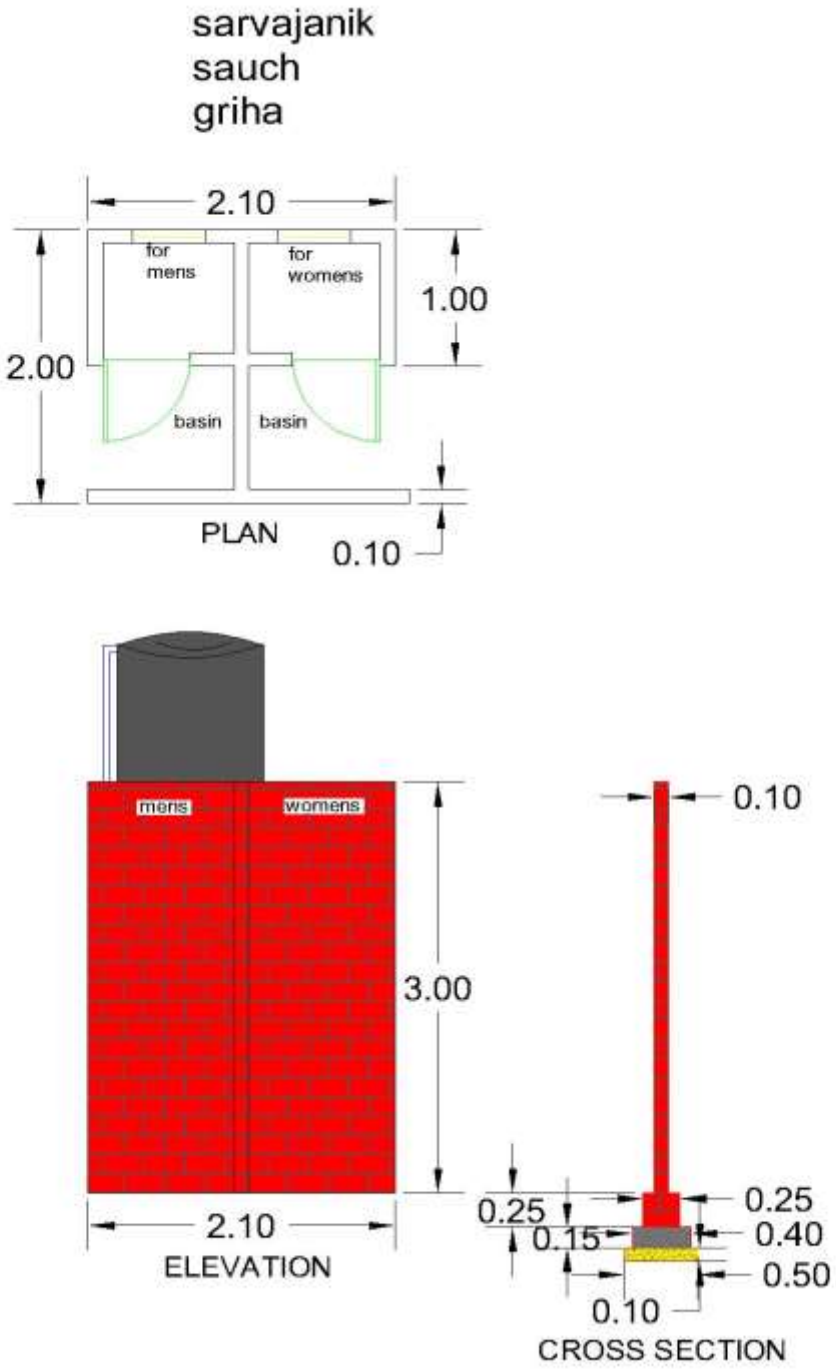




**Design civil:** Public Dispensary
**Village:** Rajgari **District:** Surat

# PUBLIC WATER TAP

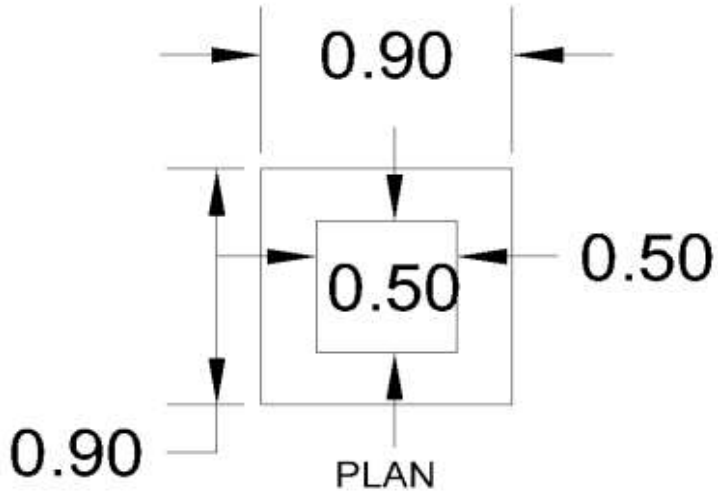


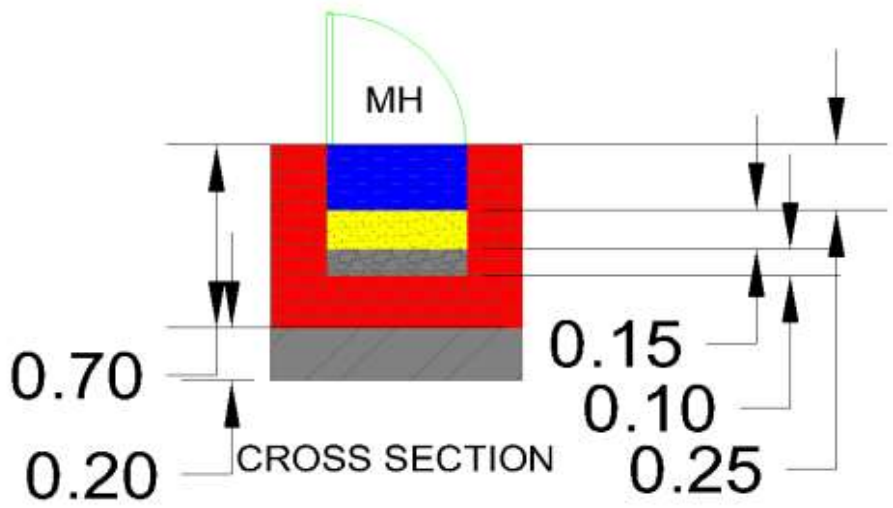

**Design civil:** Public Water Tap
**Village:** Rajgari **District:** Surat




**Design civil:** Sarvajanik Sauch Griha
**Village:** Rajgari **District:** Surat

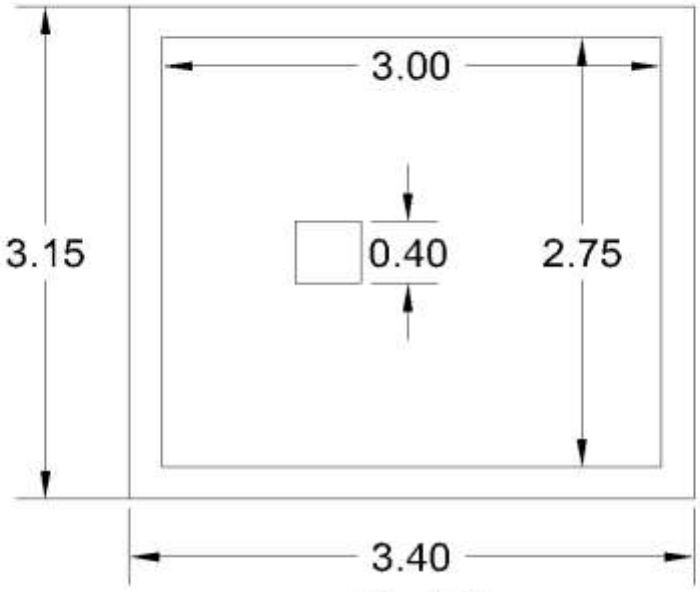
# SAND FILTER



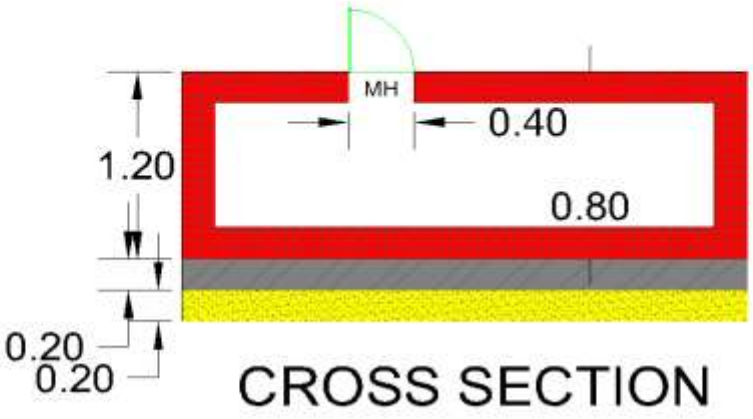




**Design civil:** Sand Filter
**Village:** Rajgari **District:** Surat

# STORAGE TANK

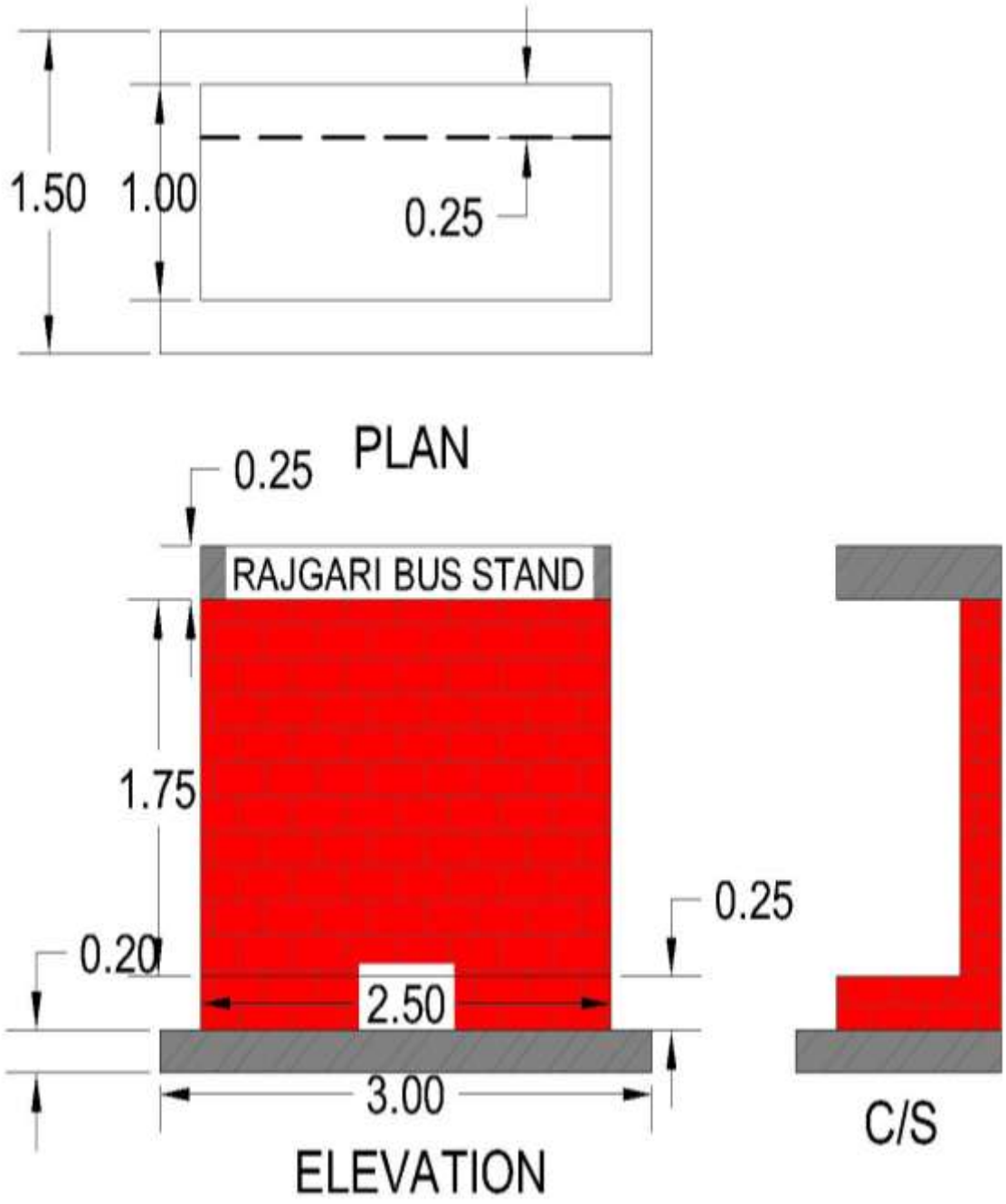



PLAN

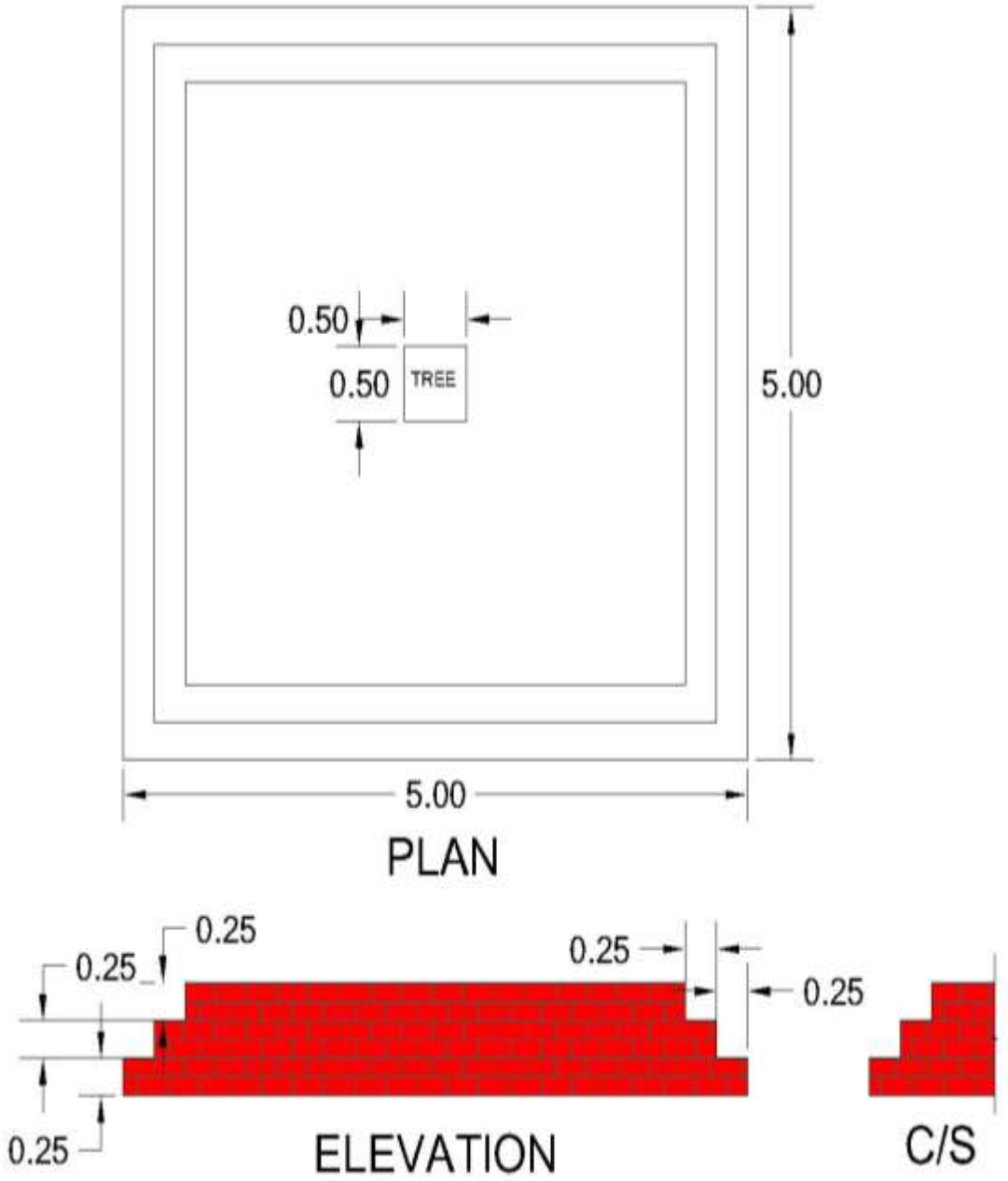



CROSS SECTION

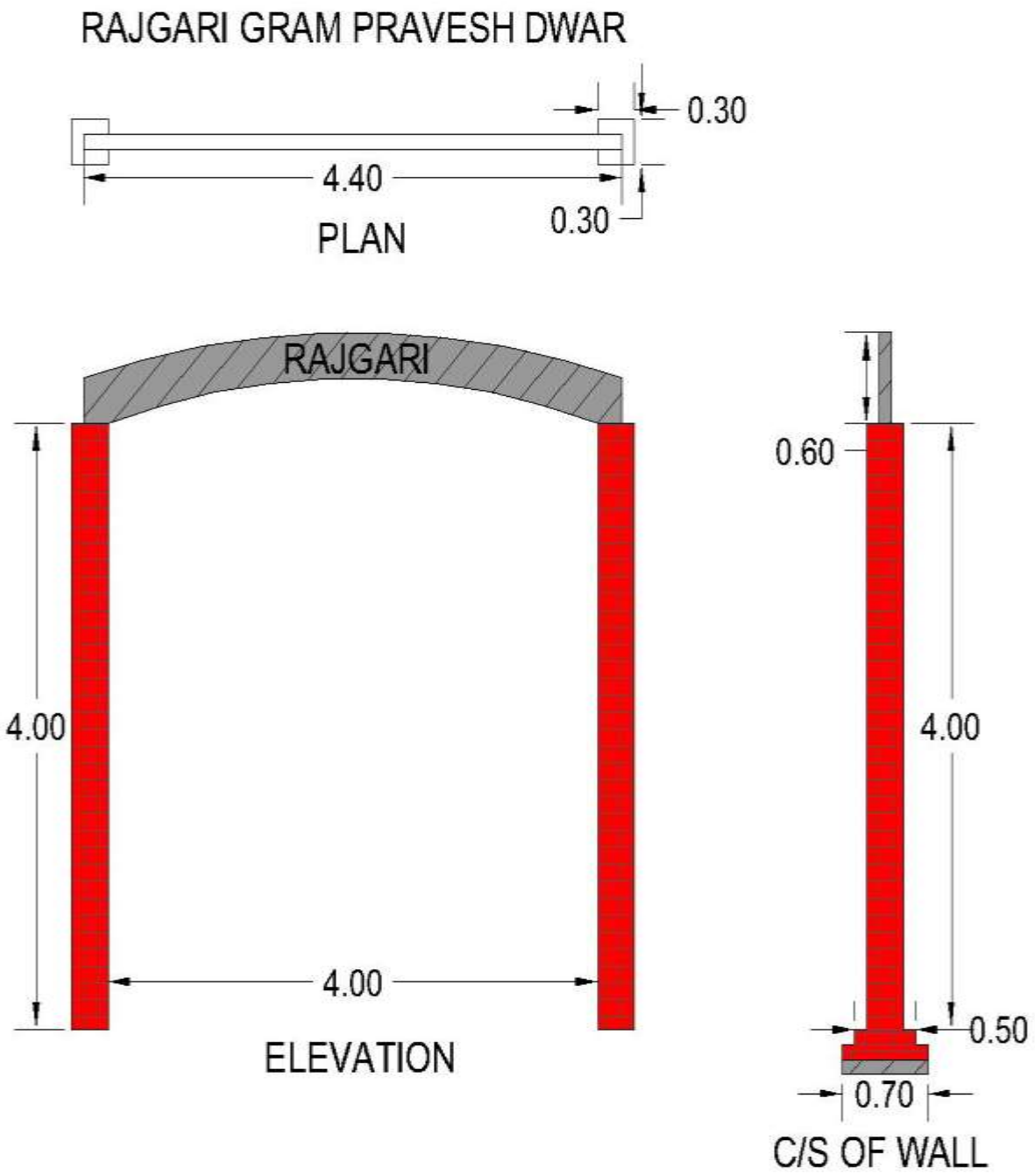
**Design civil:** Storage Tank
**Village:** Rajgari **District:** Surat




**Design civil:** Rajgari Bus Stand
**Village:** Rajgari **District:** Surat

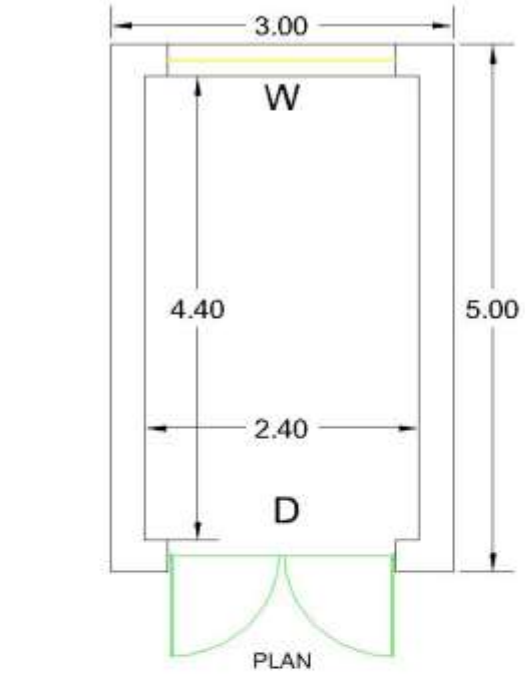


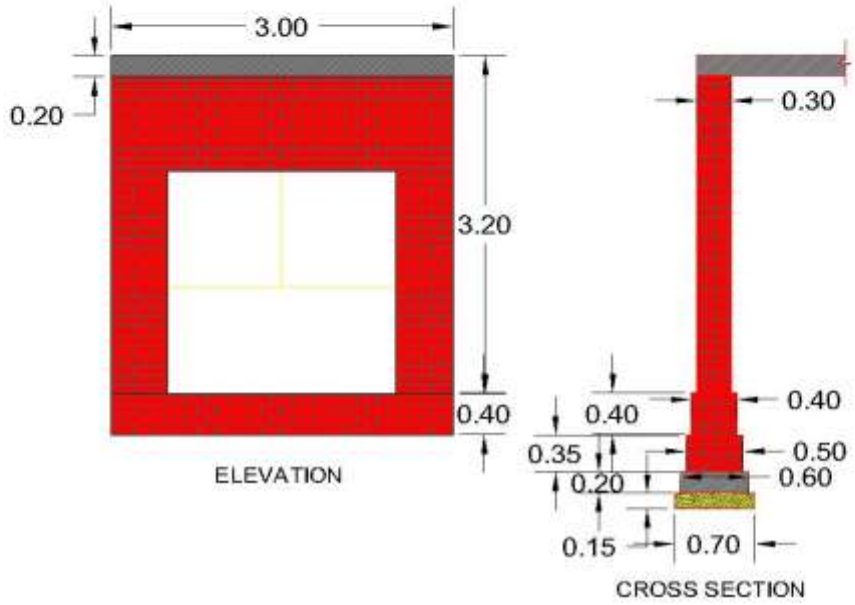

**Design civil:** Chabutra
**Village:** Rajgari **District:** Surat



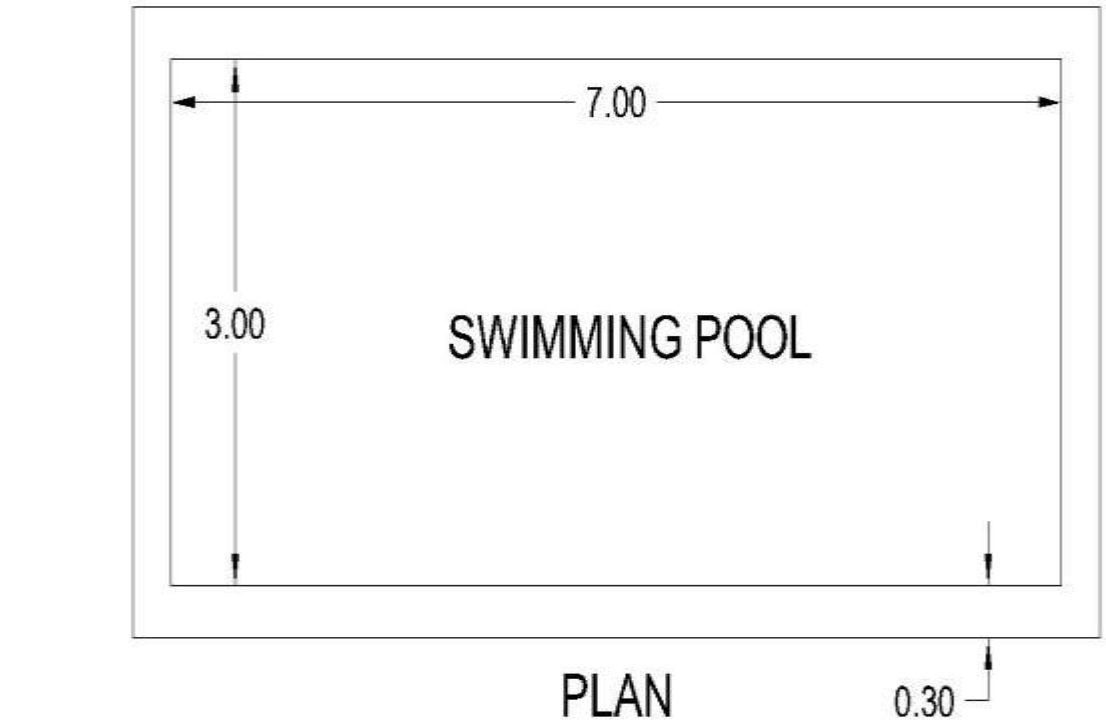

**Design civil:** Pravesh Dwar
**Village:** Rajgari **District:** Surat

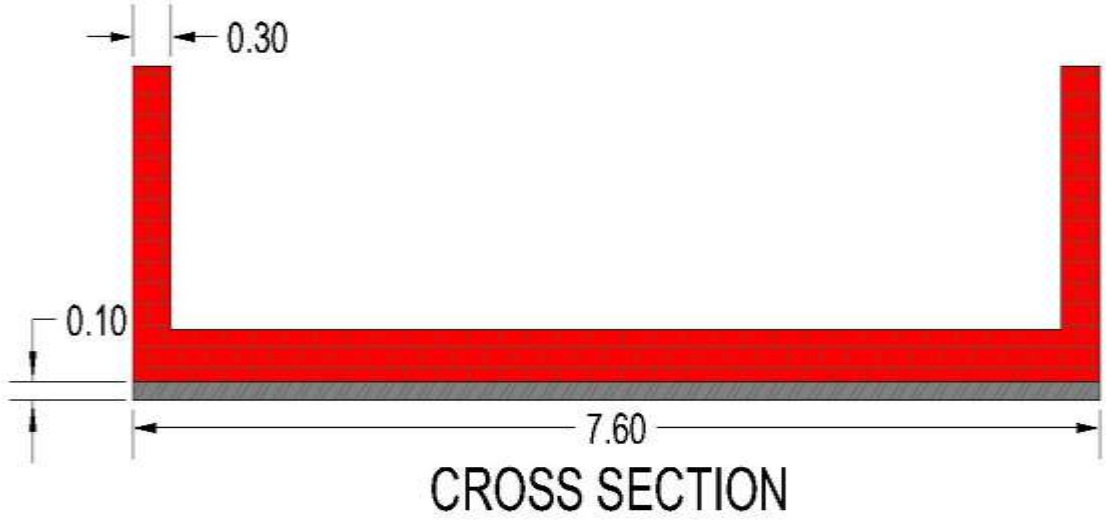
PUBLIC DISTRIBUTION SYSTEM SHOP




**Design civil:** Public distribution System Shop
**Village:** Rajgari **District:** Surat




**Design civil:** Swimming Pool
**Village:** Rajgari **District:** Surat


**Design civil:** door to door waste collection System
**Village:** Rajgari **District:** Surat

# Nodal Officer's Statement

By providing this required facility to village, development and growth of village can be possible. So ultimately migration rate and urban city pressure can be reduced and livelihood of village dweller will increase

All the design which is given as above are very helpful for future development of village and village people for their enhancement and prosperity. I admire these students to do work related to civil engineering people and hope these works is help to improve and understand their skills and make it even batter. I am sure they got deep knowledge about development of village and various infrastructure facility design of village. Lastly, we all enjoyed the informational as well as practical journey of civil engineering work.

**Nodal Officer**

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**Civil Engineering Department**
**C. K. Pithawala College of Engineering & Technology**

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