DETAIL PROJECT REPORT

VISHWAKARMA YOJANA: VIII
AN APPROACH TOWARDS RURBANISATION
Shapar – Veraval Village

Rajkot District

PREPARED BY

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
Geerach Rubeena	Civil Engineering	170040106005
Lila Nirav	Civil Engineering	180043106003
Fichadiya Radhika	Electrical Engineering	170040109001

B.H.GARDI COLLEGE OF ENGINEERING & TECHNOLOGY

DR. VIMAL N. PATEL
Associate Professor & Head of Civil Engineering Department, BHGCET, Rajkot

YEAR: 2020-21

GUJARAT TECHNOLOGICAL UNIVERSITY
Chandkheda, Ahmedabad – 382424 Gujarat

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CERTIFICATE

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

Detail Project Report for,

VILLAGE Shapar - Veraval

DISTRICT Rajkot

Under

Vishwakarma Yojana: Phase-VIII

in partial fulfilment 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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College Stamp:	

ABSTRACT

Vishwakarma Yojana is one of the Gujarat government initiatives designated as a pilot project to the Government of Gujarat Rurbanization. Through the Yojana, we are getting real work experience and the ability to apply our technical knowledge and practices to a real problem. This includes hard work, extensive village visits and extensive dialogue with different stakeholders. Today the world is growing rapidly and the living standards of society are improving due to development in every field. Due to the evolution of new affordable technologies the world has become small and faster.

Shaper Veraval is one of the villages in the Rajkot district. It is 17km far from Rajkot city. Shaper Veraval is an industrial area. There are lots of things good in a village-like, water distribution, drainage facilities, 60% road are good, etc. there are many things required in a village-like library, garden, solar system, biogas plant, medical laboratory etc.

We visited our village and made a list of primary required things which is suggested to us by the Shapar – Veraval villagers. Based on a primary survey, we tried to give the design of required things and their location point. By providing these facilities to villagers, livelihood will be increased because of that development of the village can be possible. Which is the ultimate aim of the Vishwakarma Yojana.

The need for some new facilities was discovered after reviewing all the data and the current facilities still need maintenance. In our project, we have identified new development facilities such as Public Place, Common Library, Waste Management System, Solar Systems, Drainage Systems, etc. in this village.

The future contamination of our project is the growth of a village as it will become a large industrial village and enormous renewable energy using the village of Rajkot town, which will increase the jobs of the village itself and the surrounding area, and this is the successful way to increase the GDP if the village. We would try to build facilities such as roads, solid waste management, irrigation facilities, rainwater harvesting, bio-toilet, parking facilities, and so on in this future contamination.

Keywords: Rurbanization, Vishwakarama Yojana, Village Development, Ideal village Development

ACKNOWLEDGEMENT

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

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

We also express our gratitude to **Dr. K.N.Kher**, **Registrar, Gujarat Technological University-Ahmedabad** for giving us complete support.

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We are also thankful to our **Prof**. (**Dr.) Sidhharthsinh Jadeja Principal**, faculties of our colleges for their encouragement and support to complete this project work.

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We are also thankful to all the experts who provided us their valuable guidance during the work. We express our sincere thanks to, **Dr. Jayesh Deshkar, Hon'ble Director of Vishwakarma Yojana project and Principal, V.V.P Engineering College and Core Committee member of Vishwakarma Yojana project Prof (Dr.) Jigar Sevalia**, Professor, SCET, Surat, **Prof.K.L.Timani,** Associate Professor,VGEC, **Prof.Rena Shukla**, Associate Professor, LD Engineering College, **Prof.Y.B.Bhavsar,** Associate Professor,VGEC, **Prof.Jagruti Shah**, Assistant Professor, BVM Engineering College for providing us technical knowledge of this project work.

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Contents

Description Page No.

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

SHORT NAME / SYMBOL	FULL NAME
PMGSY	Pradhan Mantri Gram Sadak Yojana
PURA	Provision of Urban Amenities to Rural Areas
ICTs	Information and Communication Technologies
CNG	Compressed Natural Gas
WIFI	Wireless Fidelity
LED	Light-emitting diode
GIS	Geographic Information System
CCTV	Closed-circuit television
SCM	Supply chain management
IEEE	Institute of Electrical and Electronics Engineers
GPS	Global Positioning System
SDGs	Sustainable Development Goals
TDO	Tactical Data Officer
DDO	Drawing and Disbursing Office
ATM	automated teller machine
LAN	local area network
SEH-WSN	Solar energy harvesting wireless sensor networks
WSN	wireless sensor networks
DC	Direct current
USB	Universal Serial Bus
EHP	Enter ocytozoon hepatopenaei
SBM	Swachh Bharat Mission
GDP	Gross domestic product

CHEPTER 1

Ideal village visit- MOVIYA- The Ministry is implementing

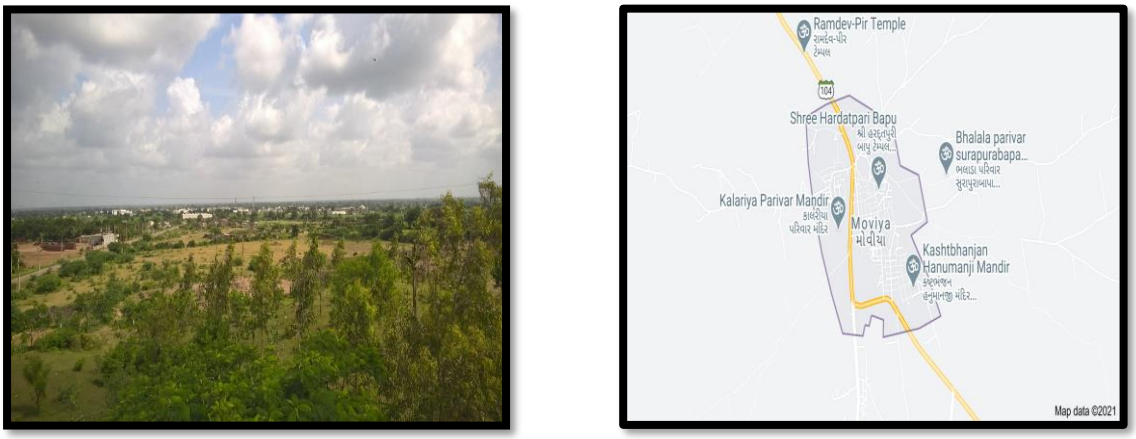


Figure 1 Top view of Moviya Village

1.1 Background & Study Area Location

- **Background**

We visited the ideal village of MOVIYA (Taluka Gondal) on September 5, 2020. The village has been following the Panchayati Raj system since the 1950s. The village underwent a transformation under the panchayat. Advanced technology has been used in education. Efforts have been made to empower women and increase protection in the village. Some of the facilities provided by the panchayat include a local gutter initiative, a health center, a banking facility.

Figure 2 Gram Pannchayat & entrance gate of moviya Village

Study area location:

- In the village Moviya, there are 5 private schools and 4 government schools.

- There is also a private arts college available.
- More than 4000 students from nearby schools and colleges The Village.
- In private schools, teaching is done by biting technology like a projector.
- There is also a Taluka School and the Weapons. It's trying to put it as a historic place.

1.2 Concept: Ideal Village

Figure 3 Schools of Moviya Village

1.2.1. Objectives:-

- To research the current development, features and growth of villages.
- Analysis of current infrastructure facilities and their management challenges in village phases.
- Providing simpler, quicker and cheaper access to urban markets for agricultural or other marketable commodities produced in such villages.
- To examine and evaluate how sustainable infrastructure, such as LED street lights, etc.
- To research the future development of the village and future scenarios.

1.2.2. Example / Live Case Studies of Ideal Village of India/Gujarat:-

- Moviya is a Gondal Taluka village in the Rajkot district of the state of Gujarat, India. It is situated 44 km south of the Rajkot District headquarters. 280 KM from Gandhinagar State Capital, The code for Moviya Pin is 360330 and the post office is Moviya .
- Moviya is surrounded by Kotda Sangani Taluka in the east, Jetpur Taluka in the south direction, Lodhika Taluka in the north direction, Vadia Taluka in the south direction.
- The nearest cities to Moviya are Rajkot, Kalavad, Upleta, Junagadh.

1.2.3. The Idea of a modal/Smart Village:-

Smart Village, as an initiative on holistic rural development, has been a term adopted by Indian national, state and local governments from Mahatma Gandhi's vision of the Adarsh Gram(Ideal Village) and Swaraj (Self-reliance). Premier Narendra Modi, in addition to Smart Cities and Digital Ind, launched Sansad Adris Gram Yojan (SAGY) or SAANJHI, Gandhi's Birthday on 2 October 2014 The key purpose of the Model Parliamentary Village Scheme is to adopt a rural village and to develop it in a model for every Member of the Parliament and Minister by 2019, according to the Sagy Guidelines. Sagy's vision is an integrated village development plan covering the personal, personal and social aspects.

1.2.4. Ancient History Civil / Electrical concept about Indian Village / other Countries Perspective about village and its new Development:-

Program to provide financial help for the electrification of those remote non-electrified census villages and non-electrified hamlets of electrified census villages where either the grid extension is not feasible or the grid is not cost-effective and is not covered by Rajiv Gandhi Grameen Vidyutikaran Yojana. Via various renewable energy sources, these villages are given basic facilities for electricity/lighting.

1.3 Detail Study (socio Economic, Physical, Demographic and infrastructure Details of ideal Village / smart village with Photograph) :-

- **Physical & Demographical Growth :-**
    - There is a sub-station of 65 KV which supplies power to the village. The goal of Sarpanch is to connect Wi-Fi to the entire village so that villagers can use unlimited internet access once they purchase the modem from the panchayat office.
    - The panchayat in this village has made efforts to provide students with the best facilities possible. E-Class and CCTV cameras are installed both in primary schools and in the village. Besides schools, 25 CCTVs are installed at the village's main junctions so that litterbugs can be spotted and punished. Auto Rixa is used for transport purposes within the village.
    - 120 waterproof speakers used by the Sarpanch to inform people about new schemes and to make important announcements are installed for communication purposes.

- Approximately 14 crores were the total estimates for this development work and the State and central governments provided support for the same work.

Table 1 Demographical Growth

Country	India
State	Gujarat
District	Rajkot
Taluka	Gondal
Location	Moviya
Population(2020/2021) est.	10,678 - 13,430
Population(2011)	11008
Males	5708
Females	5300
Households	2260

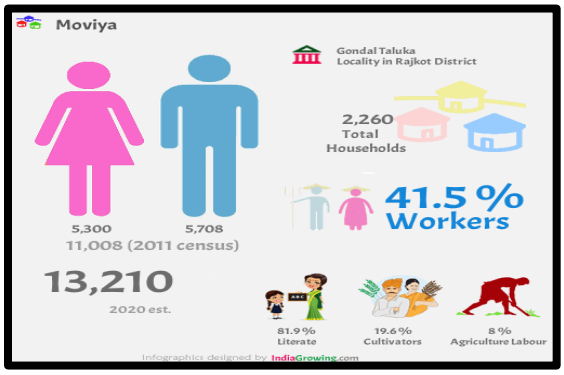


Figure 4 Demographical growth

- **Economical Profile:-**
  - Approximately 80 per cent of the people in the village are farmers. They are directly dependent on their farm.
  - PREMIUM The average annual income of farmers is between 70,000 and 80,000 rs per year.
  - They now have a good economic status due to a good average income.

Table 2 Economic profile

Worker	Total	Male	Female
Main Worker	3880	3392	488
Marginal Worker	232	119	113
Total worker	4115	3511	601

- **Social Scenario:-**.
- Social Scenario There are nearly all cast individuals available in the village.
- Patel is mostly living here; almost 80% of the total population.
- There are also migrant people living here.
- There are migrant workers living outside of the village.

Table 3 Social Scenario

Description Type	Commodities
Agricultural Commodities (First)	GROUND NUT
Manufacturers Commodities (First)	N/A
Handicrafts Commodities (First)	BULL CART
Agricultural Commodities (Second)	COTTON
Handicrafts Commodities (Second)	Nut-cracker, Sickle Km
Agricultural Commodities (Third)	PULSES
Forest Area (in Hectares)	8.1ha

Table 4 Social Scenario

Particulars	Total	Male	Female
Total No. of Houses	2,260	-	-
Population	11,008	5,708	5,300
Child (0-6)	961	558	403
Schedule Caste	726	351	375
Schedule Tribe	5	2	3
Literacy	80.80%	86.35%	74.96%

- **Infrastructures facilities :-**
  - There are 3200 houses in the village. All of them are concrete-based maid houses and have a good drainage system.
  - There is a single post office available.
  - There are also facilities available such as hospital, 1- milk sector, 2 Govt. Office support, 20 agricultural agencies, 1- animal hospital.
  - There is also 1- E dhara Kendra is available.
- **Key elements of ideal village :-**
  - Compared to Gujarat, Moviya village has a higher literacy rate. The literacy rate of Moviya village was 80.85% in 2011, compared to 78.03% in Gujarat. Male literacy stands at 89.10% in Moviya, while the rate of female literacy was 72.44%.
  - To ensure the supply of clean drinking water to the villagers, the panchayat installed a reverse osmosis plant in 2010. During marriages and other ceremonies, water tankers are arranged. For everyone, drinking water taps are available.
- **Resources :-**
  - The government is committed to providing each family in a village with at least 55 litres per capita day (LPCD) of water, the GPS should concentrate on providing individual household tap links.
  - The much-needed avenues for physical activity and leisure of people in the village are playgrounds and open-air theatres. In each village, there should be at least one playground and one open-air theatre.
  - GPS can also support animal shelters for cows and sheep. This will promote milk and sheep-rearing activities. In order to encourage small and marginal farmers to enter the department, community harvesting facilities should also be provided.

1.4 SWOT Analysis of Ideal Village/smart village

SWOT analysis provides a framework for visioning by helping the planners to identify and priorities the organization's GOALS and to further identifies the strategies of achieving them.

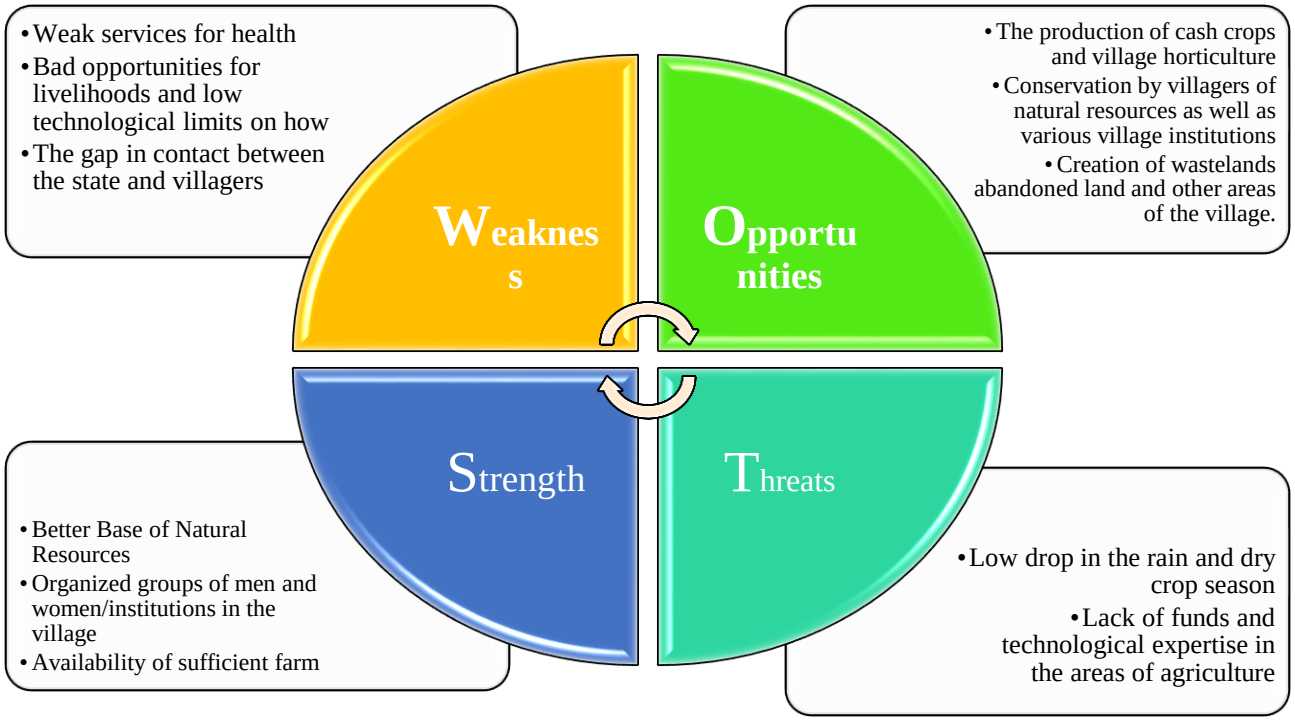


Figure 5 SWOT analysis

1.5 Future prospects:-

- Panchayat will make a playground for the kids in Moviya village.
- They are building a biogas plant.
- They will grow villages with more innovations, such as the use of groundwater storage.

1.6 Benefits of the visits :-

- We will prepare relief improvements in the village offered by GTU by visiting the village. As an ideal village, the following things should be present.
- Decent drainage
- The good economic status of a person
- Healthy housing situation
- Commercial construction should be needed.

1.7 Electrical/Civil aspect required in Ideal Village :-

- In Ideal Village there is no bio – gas plants so bio – gas plant required.
- In ideal Village somewhere road condition are not good so road need to maintain.
- Solar Street lights are required.
- There is no cinema hall in village so it's required.
- There is no sewage treatment plant in village so it's required.
- There is no rainwater harvesting is there so it's required.
- Some house condition not good so it's required.
- We know a day's Internet connection is very essential so Public Free Wi-Fi required.
- Current scenario population increase day by day so people need land more. People for their comfort they cut the tree and for butter transportation system bitumen roads made. So ground level decrease so ground water recharge methods need in the village.
- The village lanes and streets will be free of all avoidable dust.
- In ideal village So many structure, planning & management wise facilities available which are more than any other village.
- That happens because of only rubrics & rules of civil engineering conceptual fundamental studies.
- Also have transportation facility and connected to City or Town with good road.

Figure 6 Road facilities & Geographical map of Movia village

CHAPTER 2
Literature Review

2.1 Introduction: Urban & rural Village Concept :-

- The 'Design to Living' solution for the construction of villages in 'Rurban' areas would be given by Vishwakarma Yojana.
- Rural Amenities = R-Urban Town + Urban Amenities.

The creation of a village with a "rural soul," but with all of them

Urban amenities that a city may have"

- The project's aim is to provide urban services while retaining a rural soul in rural areas. This will lead to the sustainable growth of villages, reduce migration from villages and avoid urban pressure in towns.

2.2 Importance of the Rural Development :-

Rural growth is important not only for the majority of the population living in rural areas, but it is crucial to increase rural activities in order to stimulate the pace of the nation's overall economic expansion.

Rural growth pretends to be important in the country today than in the old days in the course of the nation's evolution. It is a strategy aimed at improving rural growth and productivity, promoting socio-economic equality and ambition, and achieving stability in social and economic development.

The primitive task is to reduce hunger by about 70 per cent of the rural population, to provide adequate and nutritious food. Subsequently, equal clothing and footwear equipment, a safe environment and home, medical treatment, recreational provision, schooling, transport and communication are served.

2.3 Ancient Village / Different Definition of: Rural-Urban Villages:-

- India's soul remains in its villages, with 60 per cent of the population still living in Indian villages. Indian villages have an elegant and lovely way of life. The villages are away from the busy urban life and the villages are calm, pleasant, tranquil and green in which you can breathe natural air.

- India's census considers such areas to be rural, where the population is less than 5000 and the population density is less than 400 per square kilometer. It further notes that at least 75% of males in the working population are engaged in agricultural pursuits in such areas.
- The scale of the group is very small. Agriculturalist and group size are negatively linked to each other.
- There is less intensive social mobility. The population's territorial, occupational, and other types of social mobility are less extreme. They follow the same profession, stay in the same place.
- The choice of leadership is more dependent on the individual's established personal attributes, leading to greater face-to-face interactions and more intimate awareness of the individual.

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

India, with 1,220,200,000 (1.22 billion) people is the second most populous country in the world Every year, India adds more people than any other nation in the world, and in fact the individual population of some of its states is equal to the total population of many countries. Some of the reasons for **India's rapidly growing population** are poverty, illiteracy, high fertility rate, rapid decline in death rates or mortality rates and immigration from Bangladesh and Nepal. Alarmed by its swelling population, India started taking measures to stem the growth rate quite early. In fact India by launching the National Family Planning program in 1952 became the first country in the world to have a population policy. The family planning program yielded some noticeable results, bringing down significantly the country's fertility rate.

Table 5 Population scenario of India

DESCRIPTION	2011
Approximate Population	1,21,08,54,977
Male	623, 724, 248
Female	586,469, 174
Population Growth	17.64%
Sex Ratio	940
Density/km2	382
Literacy	74.04%
Area(Km^2)	3.287 million km^2

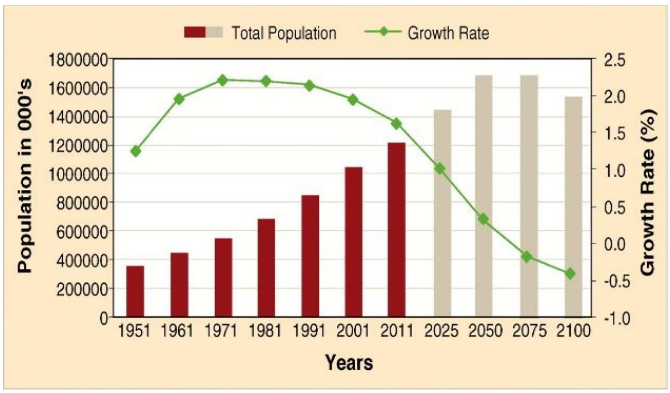


Figure 7 Population growth rate Year 1951 to 2011

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

- These are some of India's urban and rural population patterns, according to provisional data released by Census India.
- For the first time since Independence, the absolute population growth has been greater in urban areas than in rural areas.
- India's rural population: 68,84 per cent
- India Urban Population:31.16%
- The level of urbanisation grew from 27.81% in the 2001 Census to 31.16% in the 2011 Census.
- The proportion of the rural population has decreased from 72.19% to 68.84%.

Table 6 Population scenario of Gujarat

DESCRIPTION	2011	2001
Actual Population	6.04 cr.	5.07 cr.
Male	3,14,91,260	2,63,85,577
Female	2,89,48,432	2,42,85,440
Population Growth	19.28%	22.48%
Sex Ratio	919	920
Density/km2	308	258
Literacy	78.03%	69.14%
Area(Km^2)	1,96,244	1,96,024

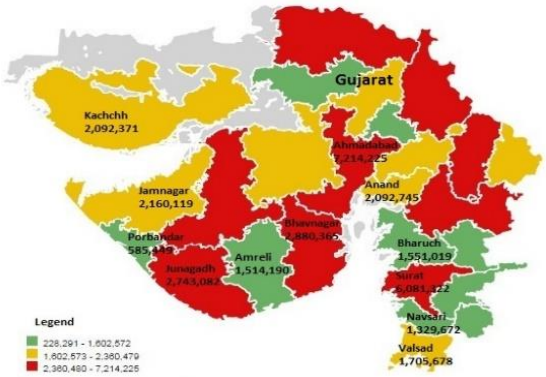


Figure 8 Gujarat Population detail

2.6 Rural Development Issues – Concerns – Measures

- **Issue of Agriculture:-**

In general, the question is how agriculture in India can be industrialized. It includes

- Increasing the level of marketing of agricultural production and operations and stabilizing agricultural product prices;
- Changing the situation of smallholder economic agriculture, achieving economies of scale in the production and activity of agricultural products;
- To ensure food security in India.

- **Issue of Rural Areas:-**

- This is especially expressed in the difference between urban and rural areas of economic and cultural growth. The dual segmentation based on the household registration method is primarily induced by this.

- **Issue of Farmers :-**

It involves raising farmers' income levels, alleviating farmer's pressures, enhancing farmer's cultural qualities, and safeguarding farmer's rights.

- **Various Measures for Rural development:-**
  - Projects / Schemes by Govt. sector
  - Projects / Schemes by Private sector
  - Other projects / Schemes.

2.7 Various infrastructure & guidelines/norms for village of the provision of different infrastructure facilities:-

Sanitation Facilities :-

- One of India's first attempts to provide safe sanitation in rural areas was the Central Rural Sanitation Program, which was introduced in 1986. The aim of this project was primarily on providing citizens with subsidies for the construction of sanitation facilities. A study conducted by the government in 1996-97 showed, however, that it was more necessary to raise awareness of sanitation as a whole rather than just to provide construction subsidies.
- Speed up the coverage of sanitation in rural areas.
- Drive people to get facilities rather than asking the government to do it (demand-led promotion).
- Emphasis on comprehensive education and awareness programmes to ensure that the need for good sanitation is recognised by citizens.
- Take the method to rural schools and nursery schools outside rural households. The emphasis was again placed on maintaining good hygiene practises here.
- Encourage technologies that are cost-effective and relevant.
- Through all the above, improve the health and quality of life in rural areas.
- In the Year 1995 Population Covered 3.6*, in the year 1998 Population Covered 8.1*, & in the Year 1999 Population Covered 9.0*.

- **Drinking-Water Facilities :-**

The provision of clean and safe drinking water has emerged as a major challenge, especially in rural areas, in the face of the rapid degradation of the quantity and quality of groundwater supplies, mainly due to overflow, waste and contamination by competing sectors and/or individuals (typically industrial units, large farmers and irresponsible urban dwellers). Drinking water is defined as an economic good by the dual phenomenon of scarcity and inefficiency of use. However, unlike the urban case, the levying of user fees for domestic water usage in rural areas in rural regions was not quite appropriate. In rural environments, the public good nature of water is more pronounced at low-income levels.

Table 7 Source of Drinking water In inhabited village in India

SOURCE	VILLAGE (%ge)
Well	69.8
Hand Pump	55.9
Tube well	21.1
Tap	18.2
Tank	14.3
River	10.0
Nala	3.6
Canal	3.5
Fountain	2.6

Figure 9 Source of Drinking water

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

The process of bringing electricity to rural and remote areas is rural electrification. Rural communities suffer huge market failures as national grids are below their electricity demand. As of 2017, the world's electricity consumed more than 1 billion people - 14% of the world's population. The electrification process usually begins in towns and municipalities and extends gradually into rural regions, but in developing countries this process often faces obstacles. Expansion of the domestic grid is costly and countries lack the resources to expand their current infrastructure. In addition, it is more difficult to amortize the cost of capital to reduce the unit cost of each hook-up in less populated regions (yielding higher per capita share of the expense). Rural communities will have the ability to take up large amounts of economic and social development when they overcome these barriers and reach national electrification.

This diagram shows the global rural electrification rate along with the 1990-2016 growth in electrification and summarizes World Bank data.

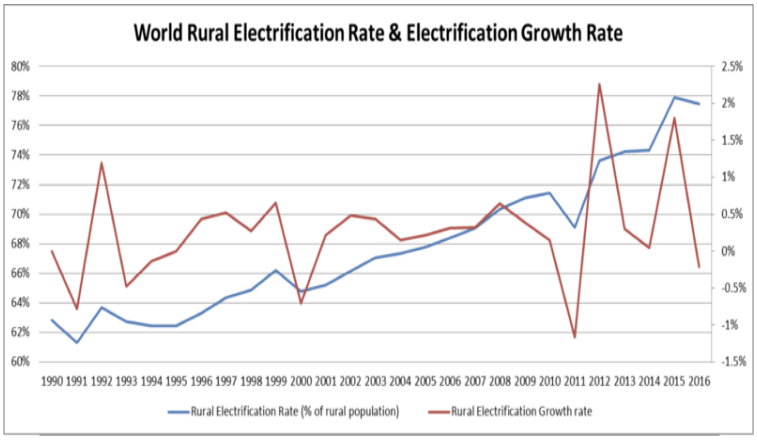


Figure 10 Chart of world rural electrification rate & Electrification growth rate

Renewable off-grid enterprises have emerged in many areas to meet the demand for electricity in rural communities. Due to their geographical location and relatively low aggregate demand, expanding the nationwide grid to rural areas is expensive and challenging. Renewable energy based mini grids are less dependent on larger-scale infrastructure and can be implemented faster and cheaper. Where an electric power distribution grid can be set up single wire earth return is often used. The following technologies are used extensively:

Photovoltaics, Wind mechanical water pumps, Small wind electric, Diesel solar hybrid power systems: especially for telecommunications worldwide. Fully commercial and the preferred option for remote telecommunications, commercially evolving for village power.

Bioenergy Micro hydro is very widely implemented in Nepal, Vietnam, and China.

Hybrid power is also widely used where a number of different technologies are combined to provide a single power source.

2.9 Other Project / Schemes of Gujarat / Indian Government:-

- The National Rural Employment Guarantee Act, 2005 (NREGA)
- the Pradhan Mantri Gram Sadak Yojna
- Sampoorna Grameen Rozgar Yojana (SGRY):-

- **Sampoorna Grameen Rozgar Yojana (SGRY):-**
- On 25 September 2001 Sampoorna Grameen Rozcar Yojana (SGRY) was introduced by a merger of the EAS and the JGSY systems (Jawahar Gram Samridhi Yojna).

- The goal was, in addition to creating sustainable Community assets in rural areas, to provide additional jobs and food security.
- The annual expenditure was Rs. 10,000, with 50 lakhs of food grain. The cash portion was 75:25 for the Center and the States. Food grains for the States/UTs were supplied free of charge.
- The workers earned minimum wages by a mixture of at least five kilograms of food grain and 25 percent of wages in cash.
- The Panchayati Raj Institutions have all three phases introduced. Each Panchayat level was a separate unit for action.

Projects / Schemes by Private sector :-

As a central sector scheme for the remaining time of the XI program, the Government of India, the Ministry of Rural Development (MoRD), has revived a scheme for 'Provision of Urban Amenities in Rurally Areas' (PURA).

MoRD intends, with aid of the Department of Economic Affairs and the Asian Development Bank, to implement the Public Private Partnership (PPP) PURA scheme between Gram Panchayat(s) and private sector partners.

The scheme provides for the combination of rural infrastructure growth with economic regeneration activities and is the first attempt to supply a basket of infrastructure and services in rural areas through PPP.

Mission: Comprehensive and accelerated development of compact areas around a potential growth center in a Gram Panchayat (or Gram Panchayats group) through the framework of the Public Private Partnership (PPP) to provide livelihood opportunities and urban amenities to enhance the standard of urban amenities life in rural areas.

Objectives: - Creating livelihood opportunities and urban services in rural areas to bridge the rural-urban gap are the key objectives of the scheme.

Planning:-

A Gram Panchayat/ cluster of geographically contiguous Gram Panchayats for a population of approximately 25,000-40,000 will be established by the private partner chosen to undertake PURA projects. Whereas the cluster will be the project area, there could be sub-projects within the cluster to cover each of the Panchayats. Alternatively, to make the project feasible, a big single Panchayat might provide critical mass individually. In the pilot stage, Gram

Panchayat(s) can be established and selected by the Private Partner, on the basis of their knowledge of the industry or previous grassroots work experience. The Private Partner shall prepare for the development/refreshment of selected infrastructure services and economic activities, after initiating a basic study, in this specified PURA sector.

- **Other projects / Schemes:**

1) Pradhan Mantri Suraksha Bima Yojana

It is open to individuals between the ages of 18 and 70 with bank accounts. It has a Rs.12 annual premium excluding service charge, which is roughly 14 percent of the premium. It will be automatically debited from the account for the number. The pay out to the nominee is 02 lakh in the event of accidental death or absolute disability, and 01 lakh in the case of partial permanent disability. In both eyes, hands or feet, complete impairment has been described as loss of use. Partial permanent disability in one eye, hand or foot has been described as loss of use. This scheme would be connected to the bank accounts opened under the Jan Dhan Yojana scheme of Pradhan Mantri. Most of these accounts initially had zero balances. By using this and similar systems, the government aims to reduce the number of such zero-balance accounts.

- **Sukanya Samriddhi Account:-**
- The scheme was initiated in Panipat, Haryana, by Prime Minister Narendra Modi on 22 January 2015. Accounts can be opened at any of the offices of India Post or a branch of some registered commercial banks. The interest rate was originally set at 9.1 percent, but interest rates were later changed to 8.6 percent for FY 2016-17.
- The account may be opened at any point between the child's birth and the time the guardian reaches 10 years of age. Per kid, only one account is allowed. For each of their children parents can open up to two accounts for (exception allowed for twins and triplets). The account can be shifted to any place in India.
- It is appropriate to deposit a minimum of Rs1,000 annually into the account. Rs 150,000 is the maximum deposit limit. A fine of Rs.50 will be imposed if the minimum deposit is not made within a year.
- After she reaches the age of 10, the girl will operate her account. For higher education purposes, the account makes a 50 percent withdrawal at the age of 18. At the age of 21, the account reaches maturity. If the account is not locked, then interest at the prevailing rate will continue to be paid. If the girl is over 18, usual closed is permitted.

CHAPTER 3
Smart (Cities/Villages) concept Idea and its visit (Civil & Electrical Concept)

3.1 Introduction: Concepts, Definitions and practices:-

Samadhiyala is a Village in Upleta Taluka in Rajkot District of Gujarat State, India. It is located 97 KM towards west from District head quarters Rajkot. 348 KM from State capital Gandhinagar Samadhiyala Pin code is 360490 and postal head office is Upleta . Samadhiyala is surrounded by Dhoraji Taluka towards East , Manavadar Taluka towards South , Kutiyana Taluka towards west , Jamkandorna Taluka towards East . Upleta, Manavadar, Junagadh, Keshod are the near by Cities to Samadhiyala.

Table 8 Samdhiyan Data

Locality Name	**Samadhiyan (સમઢીયાળા)**
Taluka Name	Upleta
District	Rajkot
State	Gujarat
Language	Gujarati and Hindi, Urdu, English, Sindhi, Bengali, Tamil, And Marathi
Time zone	IST (UTC+5:30)
Elevation / Altitude	46 meters. Above Sea level
Telephone Code / Std Code	02826
Census Parameter	Census Data
Total Population	2569
Total No of Houses	527
Female Population %	48.5 % (1245)
Total Literacy rate %	67.4 % (1731)
Female Literacy rate	29.5 % (758)
Scheduled Tribes Population %	0.0 % (0)
Scheduled Caste Population %	19.0 % (487)
Working Population %	44.1 %
Child(0 -6) Population by 2011	272
Girl Child(0 -6) Population % by 2011	44.9 % (122)

Figure 11 Samadhiyan Map

Smart Village/City Concept:-

The smart city concept integrates information and communication technology (ICT), and various physical devices connected to the IoT (Internet of things) network to optimize the efficiency of city operations and services and connect to citizens Smart city technology allows city officials to interact directly with both community and city infrastructure and to monitor what is happening in the city and how the city is evolving. ICT is used to enhance quality, performance and interactivity of urban services, to reduce costs and resource consumption and to increase contact between citizens and government.

The concept of smart village is understood by experts as integration information technology in the life of rural communities, so as to produce benefits and sustainability between information technologies with rural communities.

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

Smart Village/City Definition:

Smart city is defined as an innovative city on the use of Information and Communication Technology (ICT) and other means to improve its quality of life, efficiency of urban services, and competitiveness, as well as sustainability.

The present period of human progress is now no longer a reality and is known as the smart age.' Smartphones, smart TVs and advanced homes are being used by human beings.

The concept of the smart village" also tackled many problems, such as unplanned urbanization, village underdevelopment, economic migration, better living standards, etc.

Smart Village/City Practices:

It has already been noted that the implementation of smart concepts into regional, both rural and urban contexts has to be adapted to socio-cultural and environmental circumstances. Thus, in the cities, different issues need to be tackled than in rural areas, where the main challenge is to bridge the distances among relatively small number of people. In the context of digital transformation that is at the forefront of our interest, this means that also digitalization requires adapted concepts, business models and solutions that have to strive to generally improve the well-being of the rural population.

Figure 12 Smart Village

3.2 Vision – Goals, Standards and Performance Measurement Indicators:-

- **Vision – Goals :-**

The vision is to serve as a catalyst for the growth of education, health, clean water, sanitation and sanitation, in the intelligent village. Sustainability of the climate. The objective of the document is to create joint planning as a basis for defining the fundamental issues of the stakeholders and to make India a developed country by using engineering and technology as the means for self-sustainability. The aim is to achieve village growth and rural development.

In order to increase income and stability, the smart village's basic concept is access to renewable energy services. The rate of urban and rural growth is imbalanced. The consequence has been rural migration and the urban infrastructure has been under pressure. The key explanation for the migration of people to urban pockets is primarily the protection of jobs and a better standard of living. The idea of intelligent villages could play a key role in maintaining a balance between urban and rural development and in helping to minimise rural migration. Uncontrolled growth in urban population density while the number of urban centres, however, is still insufficient to absorb migrants from the villages. In order to increase quality of life this must be effective.

- **Standards :-**
  - Educated strategy and decision-making.
  - Evaluate the effect on the total production of a city of infrastructure projects
  - A secure foundation for use of large data and explosion of information to assist cities in building core knowledge and allow comparative analysis for urban decision making.
  - Benchmarking and organising strategic and local priorities.

- Open data and openness for attractive investment.

- **Performance Measurement Indicators :-**

  Services management., Use of ICTs to provide community services, Services of complaint, State transparency of information, Financial openness, Management, Civic engagement, Access to internet, IT services, accessibility to water, Usage of electricity, Farming, Rural society • Rural community, Education level, Services of health, job Availability, Management of waste, Security of the public, Services for Green Space, Facility for Banking, Identity of the village, Customs and culture

3.3 Technological Options:-

1) Improved use of Mobile Phones and Internet Optical Fibre Technology Methods:-

In terms of specific, India has become the second largest smartphone market. According to the Counterpoint Research Survey, smart phone users crossing 220 million users across the US market. In addition to the tablet, Alternative media for easy internet access in villages such as fibre optics. This is actually one of the most sophisticated devices. The cable network is being solely substituted. The comparatively favourable optical fibre connectivity is better than the cable network. Low cost, easy to mount, quick transfer of data and plenty of raw material available

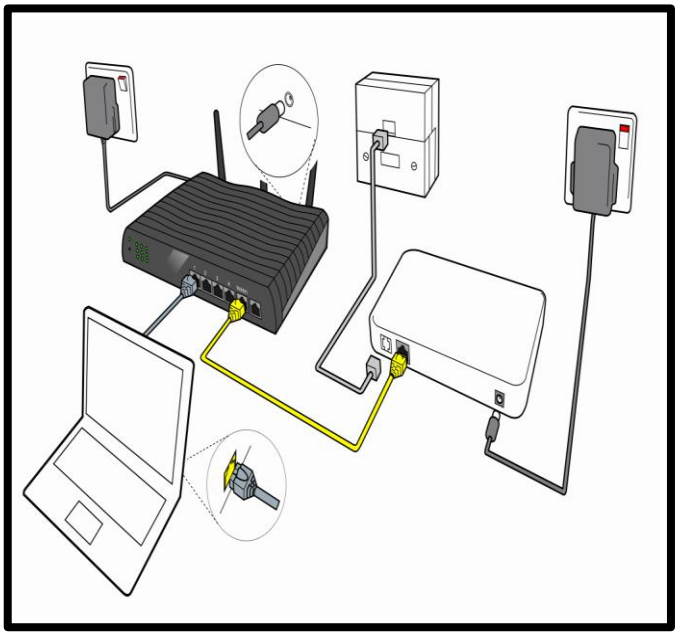


Figure 13 Improved use of Mobile Phones and Internet Optical Fiber Technology Methods

2) Educational and Online Library:-

Our next obligation to make villages smarter is to provide quality education to villagers, after providing internet facilities in villages using different advanced technology. One of the easiest ways to access data and information is through the Internet. By delivering online education in schools and universities, this technology can now be explored to a greater degree. On the internet, global digital content is available that can be reached by children in villages to make them compliant with the rest of the world

Figure 14 Educational and Online Library

3) Public transport system smart and effective:-

The main factor behind the separation of villages from the rest of the world is lack of transport facilities. In improving the situation, our government plays an important role and has already taken steps in the right direction. Although promoting the Clean and Smart Cities & Villages scheme, we must encourage the use of clean fuels for our cars, including organic fuels, ethanol and CNG. Electric and solar powered vehicles can be used in addition equally promoted. Because of its low cost, CNG in India is already a common fuel.

Figure 15 smart and effective Public transport system

4) Most recent and economic health facilities:-

Mobile vans equipped with fundamental medical installations may supplement a primary health centre and visit those areas in which there is no primary health centre or the requirements of ordinary people are not met. These carriers may be scheduled and called in cases of emergency in some regions. By - User's knowledge level, the quality of service can be increased. Many of the government schemes that economically deprived and rural people have available need knowledge.

5) Intelligent wastewater treatment and sanitation system:-

For local management authorities the management of large quantities of household waste and waste had become major headache. Dumping is also important in the town, such waste affects the health of ordinary citizens. Urgent and successful steps to tackle the issue of waste management. The scheme is required. Improvement of awareness and capacity building in hygiene diagnostics, community planning and decision-making In the growth of intelligent settlements, study of the cost-efficient and safe technologies of waste water treatment for mainstreaming of faecal sludge.

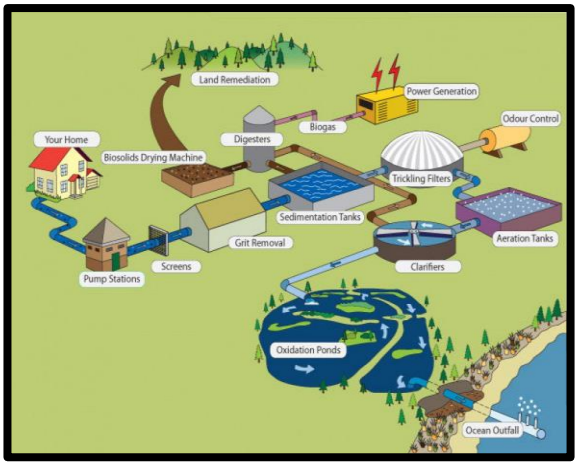


Figure 16 Intelligent wastewater treatment and sanitation system

6) Intelligent farming:-

Farming is the oldest occupation in our country, along with bread and butter, for earning daily wages, and more than half of our population depends directly on this profession. To escape both the water and energy crisis, solar powered bore wells can be installed directly in fields.

Intelligent farming is an emerging concept that refers to managing farms using modern Information and Communication Technologies to increase the quantity and quality of products while optimizing the human labor required.

Figure 17 Intelligent farming

7) Solar energy and renewable energy sources:-

Alternative, less carbon-burning energy sources must be invented and solar power sources will play an important role to resolve these global environmental implications and save our planet from the threat of global warming.

3.4 Road Map and Safe Guards:-

• The first step in creating a smart city roadmap is to know why a smart city project is required. This can be achieved by researching the population of the city, including the inhabitants of the key city actors. The GIS is a fundamental tool for economic development which many cities are using to design, evaluate and create vibrant, enterprising and resident-friendly communities.

• The second step is to create the policy that guides all initiatives in creating a clever road map for a region. The policy must describe the position of smart cities, their roles, strategies and goals.

• The third factor in the creation of a smart city roadmap includes people by using e-government and efficient governance, contributing to quality and service provision. One purpose of engaging people is to create trust and to engage them in the solution.

3.5 Issues & Challenges:-

1. **Funding:-**

Sadly, when it comes to financing, the Smart Cities initiative is not smartly privileged. The funding of the city challenge is said to be one of the biggest challenges.

2. **Lack of coordination between the centre and the state:-**

An effective project execution will only occur if cooperation between different government entities takes place. When preparing for the creation of intelligent cities, proper regulation is necessary. At the moment it is important to coordinate both horizontally and vertically.

3. **Master Plan's availability:-**

Most of India's cities have no master plans and growth plans. If we are talking about turning them into intelligent cities, this is a tragic situation. The existence of both criteria is important for carrying out and encapsulating the Smart City project as improvements are tracked and there is no other way of simplifying, enhancing and making it better and more efficient.

4. **Public engagement:-**

The lack of public knowledge of these schemes is one of the main challenges. The goal should be to engage and empower residents by means of communal initiatives that raise awareness and offer training to sustain infrastructure at village level.

5. **Fundamental facilities:-**

The administrators must first answer the residents' key needs. This include clean water, good hygiene and so on. The goal should be to improve the quality of life and then to move to other areas to be tackled.

6. **Not just housing**:-

The government can focus on creating sustainable jobs in addition to providing affordable housing.

3.6 Smart Infrastructure – Intelligent Traffic Management:-

Intelligent Traffic Management:-

An intelligent traffic management system (ITMS) is defined as an advanced application that—without embodying intelligence as such—aims to provide innovative services related to different modes of transport and traffic management. It enables users to be better informed and to make safer, more coordinated, efficient and smarter use of transport networks.

In ITMS, communication and information technologies are applied in the field of road transport, road infrastructure, vehicles, users and traffic management. ITMS provides a useful interface with other modes of transport to improve the efficiency of road transport and traffic management.

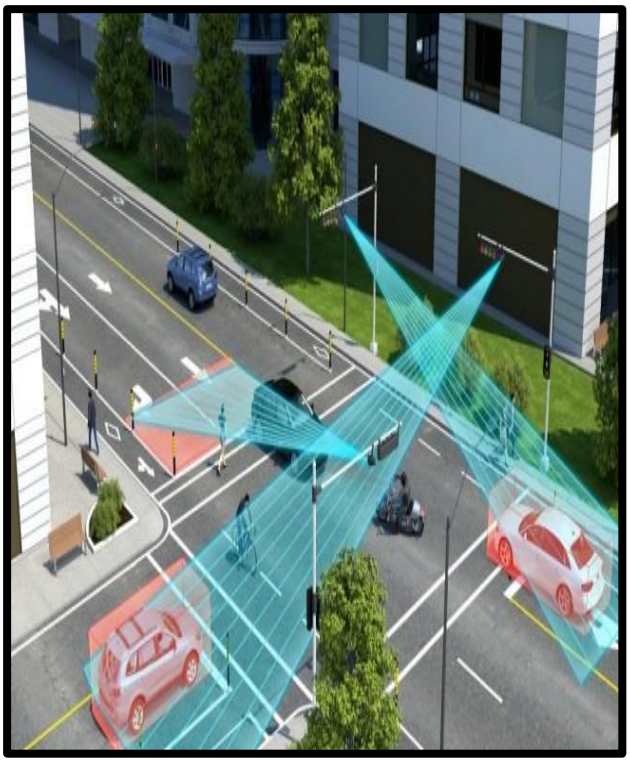


Figure 18 Intelligent Traffic Management

Smart infrastructure:-

Smart infrastructure is the basis for all main issues of the region, including intelligent citizens, intelligent mobility, the smart economy, intelligent living, intelligent governance and smart climate. The central feature of each of these components is the link and data generation that can be used intelligently to ensure that resources are used optimally and performance enhancement.

3.7 Cyber Security or any other concept as per the:-

Smart Cities are evolving throughout the world. These emerge from IT technologies that present challenges to our safety and privacy standards while providing new economic and social opportunities.

People are connected to each other by smart phones and gadgets already. Many cities are using intelligent energy metres, protection devices, and intelligent devices. Homes, vehicles, public spaces and other social networks have been completely connected to the Internet of Things. Standards develop with all these theoretically connected systems.

The "Internet of Things." They would boost the quality of life unprecedentedly. In order to benefit from this, modern integrated control, monitoring and automation systems shift urban infrastructures and services. Intelligent public and private transport links to the network from GPS to weather and traffic alerts with interconnected data.

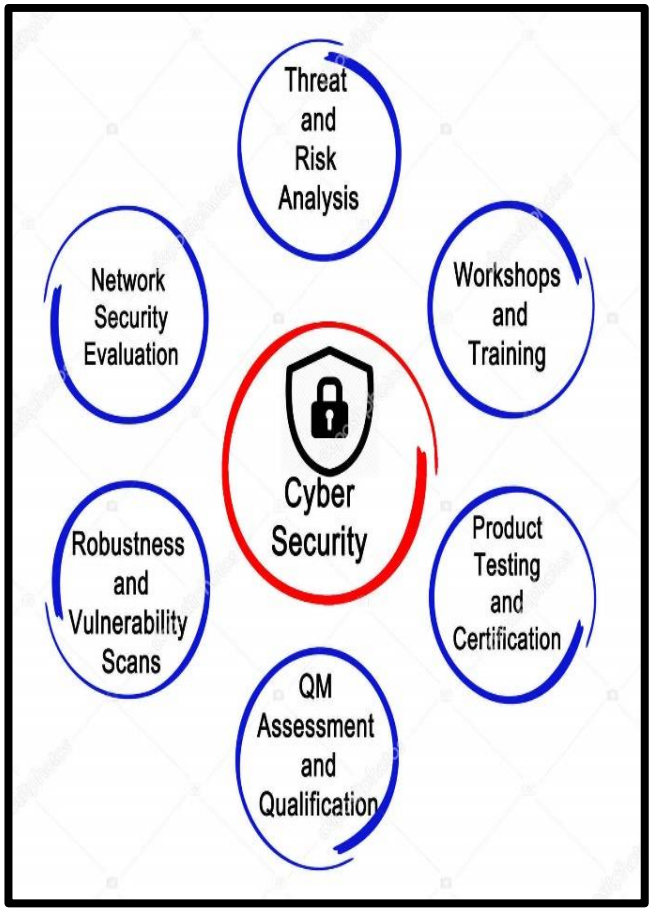


Figure 19 Different domains Cyber Security

3.8 Retrofitting – Redevelopment – Greenfield Development District Cooling:-

Retrofitting is one of the strategic elements that can help to accomplish a range of goals for intelligent cities such as making the current city more effective and more live able along with others when planning in an existing building area is initiated. In conjunction with the public, the city will usually designate an area of more than 500 acres.

Redevelopment induces massive infrastructure growth through the use of the mixed patterns of land use and at the same time rising density. If the area reaches 50 hectares, redevelopment is taken in the interests of the people. For instance, mixed land use is accomplished by planning a new layout for the area by applying high land covers.

The construction of Greenfield will use creative planning, plan funding, and plan implementation tools (e.g. land pooling/land reconstitution) for most intelligent solutions in previously vacant areas (more than 250 hectare) with the provision for affordable housing for, particularly, the poor. In order to respond to the needs of the expanding population Greenfield developments are needed in cities.

3.9 Strategic Options for Fast Development:-

- It begins with a practical plan
- Intelligent cities need comprehensive Experiments
- A clever city view should improve privacy
- Intelligent cities need intelligent data
- Build yourself when you rethink transport
- Don't play down digital safety
- Initiatives for smart cities can Complement low technology initiatives

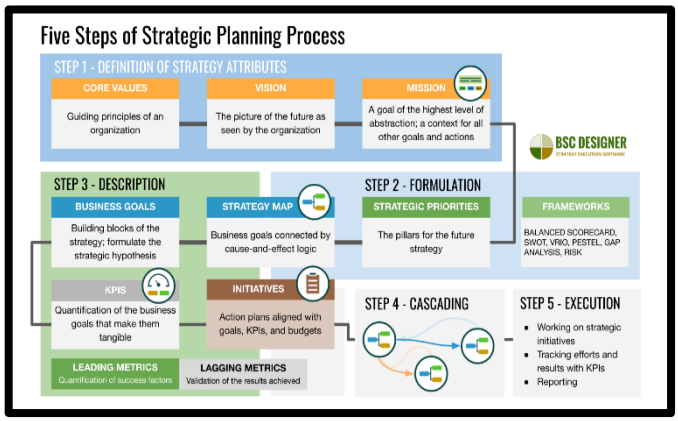


Figure 20 Strategic option for fast development

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

More than half the world's population lives for the first time in history in cities and towns. By 2050 it is predicted that this will increase to two-thirds. In urban areas in less-developed countries, population growth is the fastest; by 2050 the urban population is expected to increase from 3.9 billion today to 6.3 billion by 2050.

While in urban areas, the access rates for water and sanitation are relatively higher than rural, many regions have struggled to keep pace with planning and infrastructure. Currently, 700 million urban residents live without improved sanitation, leading to poor public health and severe Wastewater contamination, and 156 million live without improved sources of water.

More than 140,000 children under the age of five die every year from diarrhea caused by unsafe water and poor sanitation in India.

Going for open defecation is also embarrassing, smelly and dirty, and it exposes women and girls to an increased risk of fear, harassment and attack.

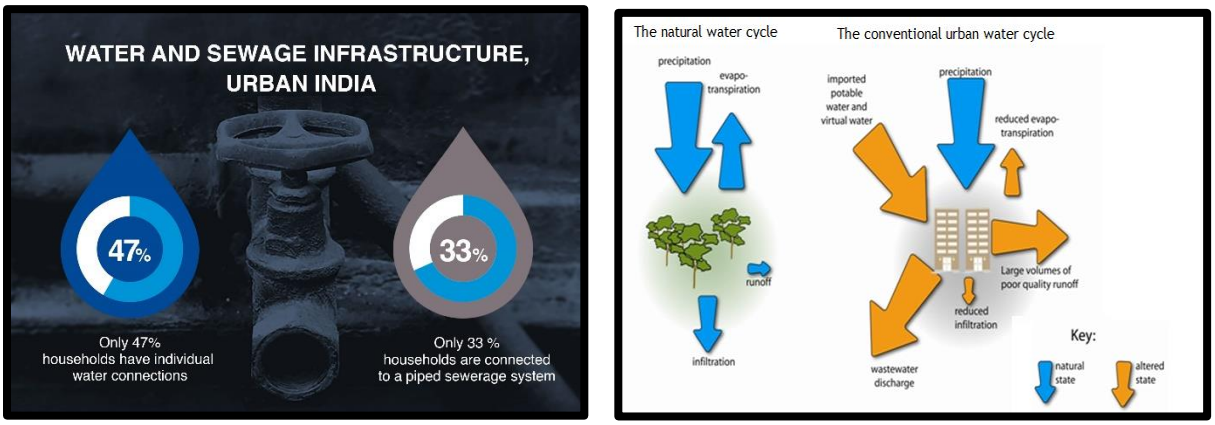


Figure 21 water & sanitation in rural area

3.11 Initiatives in Villages development by local self – government:-

- Local self-government is an organisation made up of local elected officials who administer and provide essential services for the affairs of the community.
- Importance of local self-government provide the foundations of a democratic framework to provide training grounds for the local leadership Local people are well aware of their issues and can recommend better solutions Promote self-help and volunteer service.
- Efficient agencies for implementation of development programmes, local self-government entities have arisen. Gram Sabah defines and implements development projects. The local administration has become an important part of the development of development at grassroots level through the decentralisation of power.

3.12 Smart Initiatives by District Municipal Corporation:-

On 25th June 2015 Prime Minister Shri Narendra Modiji launched the Smart City Mission. Surat City, due to numerous achievements, initiatives and inclusive approach, was selected from 100 cities to grow into a smart town in India.

• Publish and disseminate the district scheme.

• Promote the participation of Gram Panchayat in the competition

• Give Smart Village works in principle/administrative consent.

• Each month check the physical and financial performance of works..

• Send progress report to state level on a regular basis.

• Prepare and submit a state-wide annual smart village wise survey.

3.13 Any Projects contributed working by government / NGO /Other Digital Country Concept:-

The SCM, which will upgrade 100 towns and cities with affordable homes, integrated multimodal transport, open space development and preservation and waste and traffic control systems among others, was launched on 25 June 2015 by Narendra Modi.

The Government decided to provide the same contributions from the State Government and the urban local authority, each city rs. 100 crore every year for five years as part of the mission.

Instead of assigning the role to municipal companies, the project is being implemented through SPVs and is driving private investment.

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

Smart Village Initiative: A new path forward for the worldwide off-grid community and IEEE Smart Village, SDG 2030, especially Goal 7, affordable, and clean energy, are both globally involved in empowering off-grid community. SDG 2030. The first promotes access to renewable energy as a major driver for improving good education and health care systems, clean water access, sanitation, economic development, improved protection, equality between women and men, etc.

Smart Environment:-

Smart villages can be stewards of the environment aided by technologies to monitor key environmental indicators such as forest health, water quality, soil conditions and changes to the landscape. They can also reduce pressure on deforestation using efficient cook stoves to decrease the need for traditional biomass energy sources such as charcoal and wood a key driver of unsustainable forest use. Smart villages can host community-run recycling facilities ranging from those equipped to recycle wastewater and organic waste from agro-processing, to next-generation facilities for the recycling of e-waste, including energy-storage and generation technologies such as batteries and solar panels. Depending on geographical endowments, some smart villages will be able to operate as regional ecotourism hubs, an activity that can improve the welfare and

connectivity of rural and urban communities. However, the pressing need of hour is to have a Smart Village with all sorts of comprehensiveness in it.

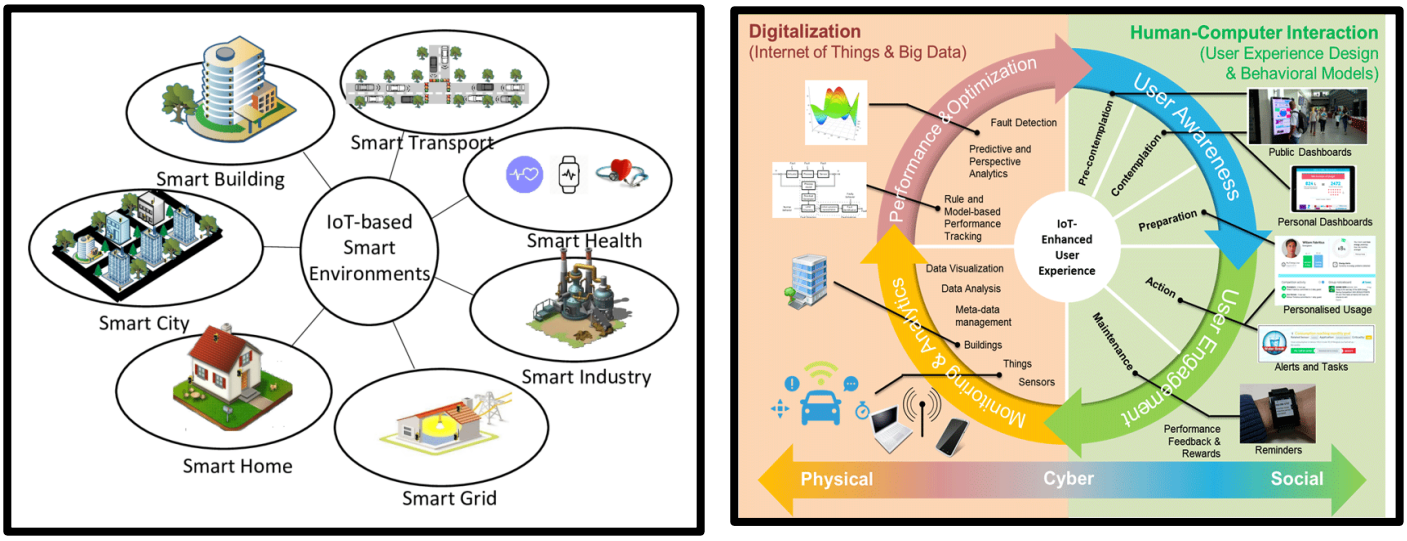


Figure 22 Smart Environment

3.15 Electrical concept (Design Ideal and prototype model)

During the last century and a half, electricity has evolved from a scientific curiosity, to a luxury for wealthy people and to a daily necessity in the developed and developing world.

Power Systems Design

Power systems distribute electrical energy. Major factors to be included in the design and analysis of these systems are: proper voltage levels, balances and quality, system capacity, reliability and redundancy, steady state and transient loads, short circuit protection (design and analysis), load flow, voltage drop, harmonics, and protective device coordination. The power systems design shall meet the local building codes, National Electrical Code (NEC), National Electrical Safety Code (NESC), and other applicable codes and standards.

Figure 23 Utility services

Electrical engineering documents applicable to power systems shall at a minimum indicate the following**:**

- Electrical legend
- System one line diagram or Riser Diagram
- Conductor capacities (sizes) and insulation type
- Protection devices and interrupting capability
- Utility Service
- Transformer
- Main and distribution panel board locations
- Circuitry of all outlets and devices
- Short circuit analysis
- Load computations
- Grounding and bonding
- Low Voltage control diagrams

Figure 24 Transformer

Incorporate energy-efficient technology

Some of today's most cutting edge systems, such as the Rexroth Indra Drive Mi integrated drive/motor systems, include a highly energy-efficient feature: bus sharing. Multiple drives are daisy-chained together and share power from the same bus; in many multi-axis machines, as some motors are accelerating up to speed (drawing power), others are decelerating (regenerating power). With bus sharing, rather than having to deliver maximum power to the accelerating motors and bleed off the decelerating motors into heat across a bleeder resistor, power is shared, so the machine's power consumption is significantly reduced.

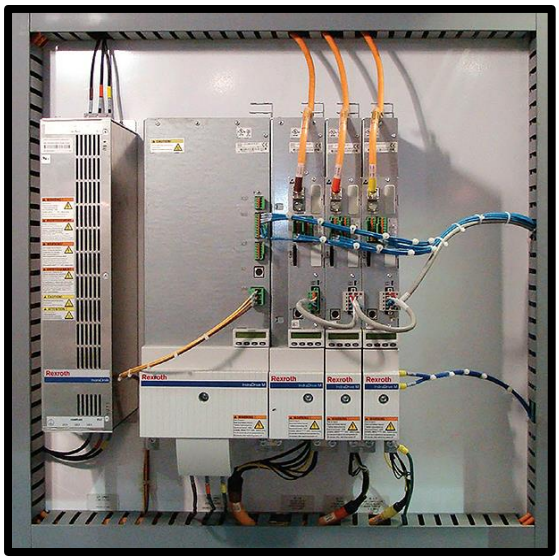


Figure 25 Regenerative-power-supplies

CHAPTER 4
About Shapar – Veraval Village :-

4.1 Introduction

4.1.1 Introduction About Shapar – Veraval Village Details :-

- Shaper Veraval is one of the villages in the Rajkot district. It is 17km far from Rajkot city.
- Pin code of shaper – veraval village is 360024and postal head office in shapar.
- Shapar - Veraval people use their Indian Rupee national currency and INR is their international currency code. By adding the Indian country dialling code +91 from abroad, Shapar - Veraval phones and mobiles can be reached. Shapar - Veraval people in everyday life adopt the dd/mm/yyyy date format.
- The native language of Shapar-veraval is Gujarati, and Gujarati is spoken by most people in the village. Shapar - Veraval individuals use the language of Gujarati for communication.

4.1.2 Study justification/ need of the study:-

- construction in villages which could be undertaken in accordance with the need of the village,
- Equipment for physical infrastructure (Water, Drainage, Road, Electricity, Solid waste Management, Storm Water Network, Telecommunication & other),
- Educational, health, sanitation, social infrastructure and cultural (Community Center, Library, recreation, other and sustainable infrastructure for an efficient growth of the villages. Electricity (Rainwater harvesting, biogas farm, eco-toilets, solar street lighting, etc.).
- "Vishwakarma Yojana" has given students in engineering a real-world forum while plying their technological skills to rural development.

4.1.3 Study Area :-

Current status and techno-economic survey of the villagers in the State district in terms of basic and public amenities, necessary services, various infrastructural facilities for people's needs and

the adequacy of the available resource for the village population and the growth of the area with the consultation of local revenue authorities, TDO and DDO on the potential need for the village population and growth of the area town or Taluka places etc.

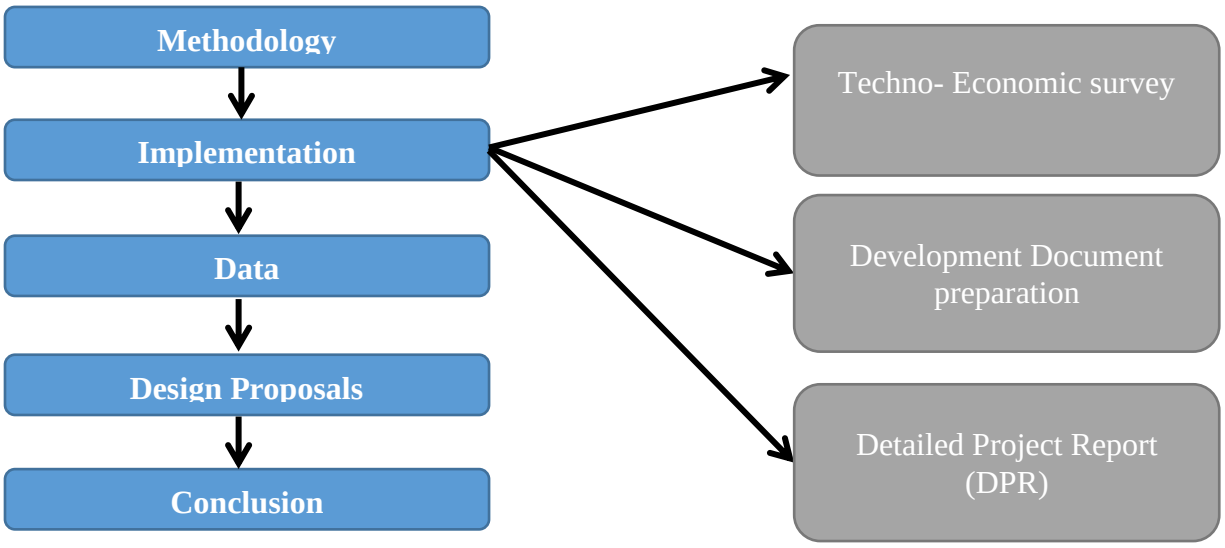
4.1.4 Objectives of the study :-

- Infrastructure development-The main pillars are connectivity, civil and social infrastructure, along with the provision of alternative livelihoods.
- Basic Physical Infrastructure – Water Supply, Transport, Sewerage and Solid Waste Management should be the priority focus and be provided.
- Basic Social Infrastructure – Health and Education facilities should be provided and ensure proper delivery of facilities to village dwellers.
- Promote integrated rural development with the provision of quality accommodation, improved connectivity, opportunities for jobs and the promotion of physical and social infrastructure.
- Reducing migration from rural to urban areas due to a shortage of social facilities and adequate rural economic activity.
- Internal roads within the settlement of the village, effective mass transit systems to enhance connectivity between urban and rural areas, public transport facilities to be built such as bus stops, transport depots, etc.
- Identification of sanitation facilities that need improvement: household link sewerage and drainage line, solid waste collection door to door & dumping facilities.
- Refurbishment of village lakes, water tanks and wells, construction of infrastructure for sustainable growth for rain water harvesting.
- Production of socio-cultural facilities such as community hall, public library, recreational activities and maintenance of current facilities.
- Repair & maintenance of Existing Public Buildings like Gram Panchayat, Public Library, School Buildings, Health Center, Public Toilet Block & Other.

4.1.5 Scope of the Study:-

- To provide a village with urban services without disturbing the village's spirit.
- Village growth would be possible due to the availability of urban services.

4.1.6 Methodology Frame work :-



Methodology-Implementation:- In the various districts of the state of Gujarat, the techno-economic survey of villages was carried out in terms of basic and public amenities and other infrastructural facilities. The project were divided into three parts:

1) Techno-economic survey of villages: Collected all essential information from village such as: Demographical detail, Geographical detail, Occupational Detail, Physical Infrastructure Facilities, Social Infrastructural Facilities, Sustainable/Green infrastructure facilities, Other data collection From village, Additional information/Requirement of the village etc.
2) Development document preparation: Planning and estimating the proposed development by evaluating the gap analysis
3) Detailed Project report (DPR): Preparation of plans for growth and an action plan.
4) Data Analysis: GAP analysis for all the selected villages were performed by comparing existing with the required facilities. Rural Planning Norms and UDPFI (Urban Development Plans, Formulation and Implementation) guidelines were taken as a reference for providing infrastructure facilities.
5) Design Proposals: As per the gap analysis the proposed development and planning Strategies have been designed as per all the regulations and norms along with the consultation of concerned Government Officials (TDO, DDO & Sarpanch). Students of all respective villages have prepared design proposals for essential infrastructure facilities, prepared ready to execute documents, Detail estimates with abstract sheet, Measurement sheets, Recapitulation Sheet and Detail Drawings.

In the designing Phase, the students have proposed various designs from the

(i) Physical infrastructure facilities (Water, Drainage, Road, Electricity & Solid- liquid waste Management)

(ii) Social infrastructure facilities (Education, Health & Sanitation facilities)

(iii)Socio-cultural facilities (Community Hall, Library, Recreation Facilities & other)

(iv)Sustainable infrastructures (Rain water harvesting, Biogas plant, Solar Street lights, Eco sanitation & other) Repair & Maintenance of public buildings for overall development of village.

4.1.7 Available methodology

4.2 Shapar – Veraval Village Study Area Profile :-

4.2.1 Study Area Location with brief history land use details:

Shapar is a Village in Kotda Sangani Taluka in Rajkot District of Gujarat State, India. It is located 17 KM towards South from District head quarters Rajkot. 19 KM from Kotda Sangani. 262 KM from State capital Gandhinagar. Shapar Pin code is 360024 and postal head office is Veraval (Shapar) .Pardi (3 KM) , Ribda (4 KM) , Pipaliya Pal (5 KM) , Virva (5 KM) , Gundasara (6 KM) are the nearby Villages to Shapar. Shapar is surrounded by Lodhika Taluka towards west , Kotda Sangani Taluka towards East , Gondal Taluka towards South , Paddhari Taluka towards North .Rajkot, Kalavad, Wankaner, Thangadh are the nearby Cities to Shapar.

Table 9 Study area profile Shapar - Veraval village

Locality Name	Shapar (**શાપર**)
Taluka Name	Kotda Sangani
District	Rajkot
State	Gujarat
Language	Gujarati and Hindi
Time zone	IST (UTC+5:30)
Elevation / Altitude	196 meters. Above Seal level
Telephone Code / Std Code	2827
Assembly constituency	Rajkot Rural assembly constituency
Assembly MLA	lakhabhai sagathiya
Lok Sabha constituency	Rajkot parliamentary constituency
Parliament MP	KUNDARIA MOHANBHAI KALYANJIBHAI
Serpanch Name	Dharmeshbhai Tilara
Pin Code	360024
Post Office Name	Veraval (Shapar).

4.2.2 Base Location Map, Land Map, Tal Map :-

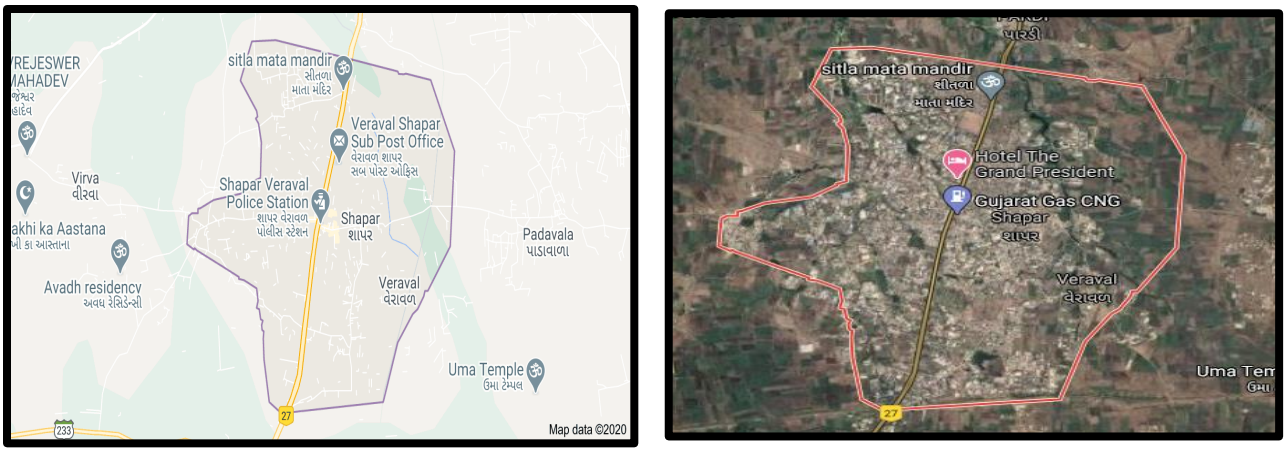


Figure 26 Satellite image of Sapar-Veraval Village

4.2.3 Physical & Demographical Growth :-

Table 10 Physical Growth

Sr. No.	Description	Information/Detail
1	Area of Village (Approx.) (In Hector) Coordinates for Location:	1551.969 ha
2	Forest Area (In hect.)	
3	Agricultural Land Area (In hect.)	
4	Residential Area (In hect.)	2 ha
5	Other Area (In hect.)	236.336
6	Water bodies	Tap, well, Hand pump ,River Water

Table 11 Demographical Growth

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	7143			
ii)	2011	9249	5430	3819	2602

4.2.4 Economical Generation profile / Banks :-

In Shapar – Veraval Village there are Banks are available and also ATM are available. There is no Agriculture bank is available. Total income 36000 to 50000 per annum per family

4.2.5 Actual Problem faced by Villagers and smart Solution :-

Raw roads increase the amount of dust in the atmosphere. So there is difficulty in breathing. No public place are there for feel relaxed. Older people have a habit to reading books, newspapers.

But there is no library. More land area is needed for the solar system. There is enough land in the villages but no information about the solar system.

4.2.6 Social Scenario – Preservation of traditions, Festivals, Cuisine :-

Drinking water services are good in the village and the state of existing public buildings is also good. There is a need for maintenance of existing roads and an underground water drainage system as well. shapar - veraval village is located in Gujarat state and they preserves all traditions and celebrates all the festivals.

4.2.7 Migration Reason / Trends :-

There are two type of migration permanent and temporary. Some people migrate permanently for better life style, for job, for business, etc., some people migrate temporarily for children higher education, for health treatment, etc.

4.3 Data Collection Shapar – Village :-

4.3.1 Describe Methods for data collection :-

For data collection we met shaper – veraval talati cum mantry and discuss various details about village and fill Techno economic survey. And also interact with villagers.

4.3.2 Primary Detail of survey :-

Character In primary survey collect some information like,

- Location of shaper – veraval Village
- Water tank detail
- Road Networks and its type
- Drainage Condition
- Electricity distribution
- Irrigation methods
- Population of village etc.,

4.3.3 Average size of Houses – Geo – Tagging of House :-

According to census 2011 and gram panchayat Detail in Shapar – Veraval village there are 9249 total peoples are there and total number of houses is 2602 are there.

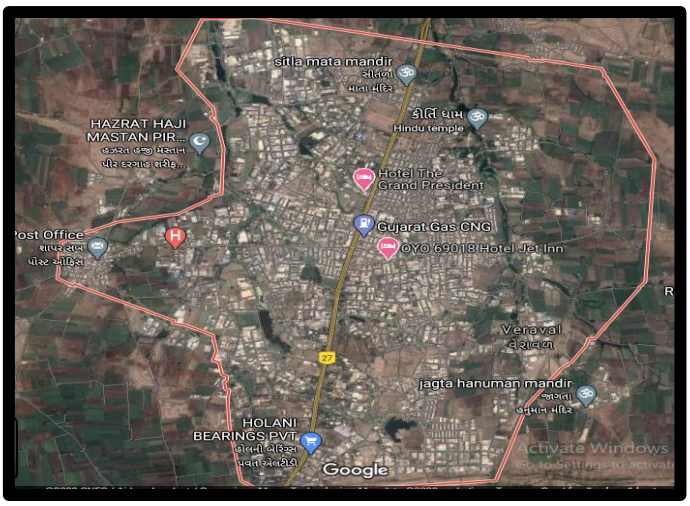


Figure 27 Average size of house and geo Tagging map of Village

4.3.4 No of Human Being in One House :-

in shapar veraval village average 4 to 5 people live in one house.

4.3.5 Material Available Locally in the village and Material out Sourced by the Village :-

Shapar – veraval village is industrial area so any industrial materials are easily available in village. other materials like Brick, aggregate, cement, etc., purchased out of the village.

4.3.6 Geographical Detail :-

Table 12 Geographical Detail

Sr. No.	Description	Information / Detail
1.	Area of Village (approx.) (in Hector) Coordinates for Location :	1551.969ha
2.	Forest Area (In Hector)	110.479Ha
3.	Agriculture area (In Hector)	
4.	Residential Area (In Hector)	
5.	Other Area (In Hector)	
6.	Distance to the nearest railway station (in Kilometers) :	6km
7.	Name of Nearest Town with Distance :	Rajkot
8.	Distance to the nearest bus station (in kilometers) :	17km
9.	Whether village is connected to all road for any facility or town or city ?	YES

4.3.7 Demographical Detail :-

Table 13 Demographical Detail

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	7143	4190	2953	2000
2.	2011	9249	5430	3819	2602

4.3.8 Occupational Detail :-

Table 14 Occupation Detail

Name of Three Group in Villages	Agriculture
	Labour work

4.3.9 Agriculture Detail :-

In shaper – veraval Village People grow Peanuts and Cotton. People use chemical fertilizer and organic fertilizer for their farming.

4.3.10 Physical Infrastructure Facilities – Manufacturing:-

Table 15 Physical Infrastructure Facilities

Sr. No.	Description	Detail
A.	Main Source Of Drinking Water	There are many sources of drinking water like, piped water from the Narmada Dam, Bore well, Dug well, Tanker truck, Hand pump, etc.
B.	Water Tank Facility	Overhead Tank is available
C.	The Type of Drainage Facility	Underground Drainage Facility available
D.	Road Network	Some Roads are kutchha some roads are made of concrete.
E.	Transport Facility	Ribada railway station is located 6 km from the village. The bus station is located 5 km from the village. Auto Riksha, Jeep, Private Vehicles are also available in the village.
F.	Electricity Distribution	Government Electricity is provided 24 hours in village. And power supply also provide in Domestic use, Agriculture use, Commercial use, Government Buildings, Schools, Hospitals, Road Street lights etc., In some private houses have Renewable Energy.
G.	Sanitation Facility	Public Toilet is available. Solid and Liquid waste disposal system is also available. Road litter is cleaned there every day.

H.	Main source of Irrigation Facility	In village main sources of irrigation are well and Tube Well.
I.	Housing Condition	In village 99 % of houses are pucca.

4.3.11 Tourism development available in the village for attracting the tourist:-

No, there is no any tourism development available in the village.4.4 Infrastructure Details :-

4.4.1 Drinking water / Water Management Facilities :-

There are many Drinking water facilities in the village. Like In houses Narmada water pipeline are available. Also people have Private Bore well. In Farm Dug well is available.

Figure 28 Water tank Facility In Shapar – Veraval Village

4.4.2 Drainage Network / Sanitation Facilities :-

Figure 29 Drainage Condition In Shapar – Veraval Village

In village Drainage Condition is good But somewhere Open Drainage systems are there.

For Sanitation, Road litter is cleaned there every day. Door to Door waste Collection system is there. But there are no Dustbin provides on road.

4.4.3 Transportation and Road Network :-

Ribda railway station is 6 km far from the village. The bus station is 5 km far from the village. Auto Rickshaw, EECO, Private Vehicles are also available in the village.

Figure 30 Bus Stop and Road Condition of Village

4.4.4 Housing Condition :-

In shaper – Verval Village Most of Houses are Pucca. Like 99% houses are pucca. And some houses and Gram Panchayat Building need to Maintenance.

4.4.5 Social Infrastructure Facilities, Health, Education, Community hall, Library :-

In Village 1 Aaganwadi are there. Also Primary Health Care (PHC) are there. District Government hospital is there. Also some private clinic is there. There are no secondary & Higher Secondary schools. 1 Community Hall is there. In village No library is there

Figure 31 Private clinic at shapar – Veraval Village

4.4.6 Existing Condition of Public Building & Maintenance of Existing Public Infrastructure :-

In Village Gram Panchayat Building need to maintenance.

Figure 32 Gram Panchayat Building and maintenance Building Village

4.4.7 Technology Mobile / WIFI / Internet Usage Details :-

Mobile users are more in the village because now a day mobile phones are necessary to communicate with each other. In gram panchayat WIFI connection is available.

4.4.8 Sports Activity as Gram Panchayat :-

No any sports activity as Gram Panchayat. but in school sports are played.

4.4.9 Social Cultural Facilities, Public Garden / Park /Play Ground /Pond/ Other Recreation Facilities :-

In Village only 1 Community hall are there without T.V. and its condition is very good. Which is located in the village. Birth and Death Registration Facilities is available in gram panchayat. There are no any Public Places and Recreation Facilities are not there.

4.4.10 Other Facilities :-

There is Post Office available in gram panchayat building. Also some banks are there in the village. General Market is also available in village. Medical shops are there in very good condition. Mahila mandal is also there.

4.4.11 Any other Details ;-

In Village Agriculture banks are not there. Many Government Schemes are provided to villagers

4.5 Electrical Concept:-

4.5.1 Renewable energy source planning particularly for villages :-

In Village any Government Renewable energy sources are not there. But in some private houses solar systems are there. Solar street lights are not there. No single Biogas plants are in village. The renewable sources of energy proposed to be put to use for improving the overall energy scenario include biomass, biogas and solar energy. Biomass can be produced from agro waste, mainly paddy in the case of this village, and can be utilized to generate electricity in a biomass plant.

4.5.2 Irrigation Facilities:-

For irrigation many source of water are there like, well, dug well, Narmada canal, bore well, etc. Farmer use chemical fertilizer and organic fertilizer for their farming. Irrigation in India includes a network of major and minor canals from Indian rivers, groundwater well based systems, tanks,

and other rainwater harvesting projects for agricultural activities. Of these groundwater system is the largest.

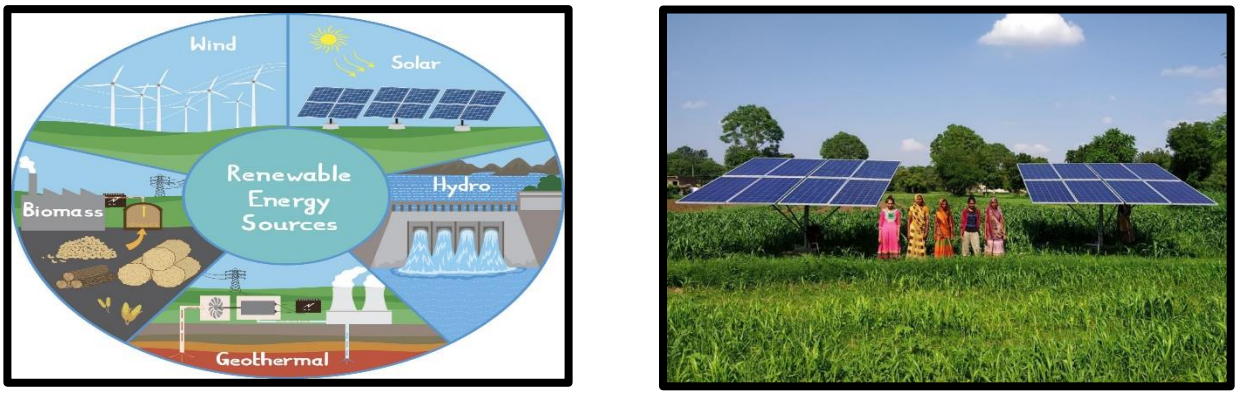


Figure 33 Renewable Energy Source

Figure 34 Irrigation Facilities

4.5.3 Electricity Facilities with Area :-

In Village Electricity provides 24 hours from PGVCL .

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

In Gram Panchayat Building Post office, Birth death registration are there. 1 aanganwadi are in the viilage.

4.6.1 Bachat Mandali :-

In Village any special Bachat Mandali are not there.

4.6.2 Dudh Mandali :-

In Village government Dudh Mandali are not there. But private Dudh Dairys are there.

4.6.3 Mahila Forum :-

In Village Mahila Mandal and Aangawadi are there. Figure number 36

4.6.4 Plantation for the Air Pollution :-

Shapar – Veraval Village is very Green. Many Private house holders have trees in their courtyard.

4.6.5 Rain water Harvesting – Waste Water Recycling :-

In Village any Rain water Harvesting system and waste water recycling system are not there. The leaves and the surface of the plant absorb these pollutants and filter them from the air through their stomates (pores). Trees are also trapping heat and reducing atmospheric greenhouse gas. It also reduces the level of ozone in the ground and adds oxygen to the air around us.

4.6.6 Agricultural Development :-

In village any special Scheme are not working in the village. And no any agriculture banks are in there. Rural development is a process integrated with economic and social objectives, which must seek to transform rural society and provide a better and more secure livelihood for rural people. Rural development, therefore, is a process of analysis, problem identification and the proposal of relevant solutions.

4.6.7 Any Other :-

In Village Private and Government Health facilities are there. Fig. 35

Figure 35 Agriculture Land

Figure 36 Mahila Forum

CHAPTER 5
Technical Options with Case Studies

5.1 Concept (Civil)

5.1.1 Advance Sustainable construction Techniques /Practice and Quantity Surveying:-

In the world of construction, many trends come and go. Some fall by the wayside in a short period of time, but others grow to become an integral part of the industry as a whole. Sustainable construction definitely falls under the latter.

Green building techniques are reshaping the industry and becoming a fundamental part of new building designs. Construction professionals are using many different eco-friendly design principles to construct new buildings and to renovate old ones.

Let's take a look at these green building techniques as well as developing trends that will define sustainable construction in the future.

1. Modular Construction Techniques to Eliminate Waste

Modular construction is a sustainable technique that builders are using to design structures faster, at a more competitive cost, and with maximum resource efficiency. Modular structures can be built within a controlled environment where wastage of resources is minimized and pollution is controlled.

For example, modular homes being built in large cities such as Sydney can be constructed offsite (in a controlled manufacturing plant) and the final product delivered to the actual location. This prevents environmental pollution and rubbish accumulation. The modular construction process is also carefully controlled for material usage, quality and reliability.

Construction technologies can be used to make modular construction even more efficient. The use of construction software allows builders to prepare accurate material estimates, design 3D images of the construction site, and coordinate activities with all stakeholders. The end result is a high-quality structure that is also environmentally friendly.

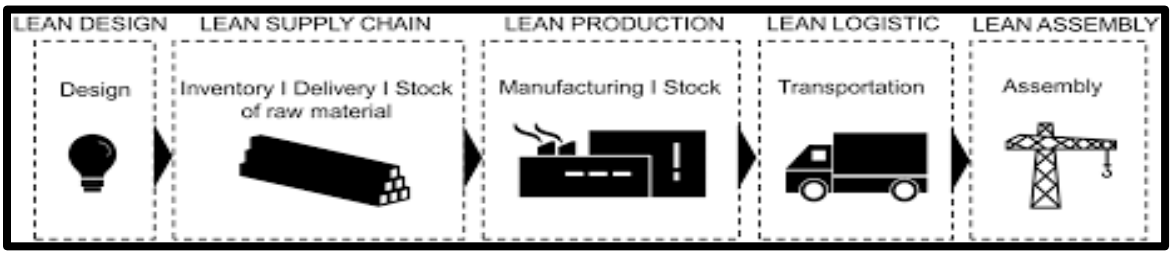


Figure 37 Modular Construction Techniques to Eliminate Waste

2. Use of Green Building Materials

Perhaps the most popular sustainable construction technique is the use of green building materials. These are materials sourced from renewable sources and are also recyclable when the building has reached its lifespan.

Green building materials are typically sourced from sustainable forests (such as timber forests). They can also be produced from innovative manufacturing processes that reduce harmful emissions to the atmosphere. Concrete and steel are two examples of materials that are now being produced via eco-

Tender tips, marketing tips, technology for builders

Figure 38 Use of Green Building Materials

3. Zero Energy Construction

Zero energy construction is an emergent trend in many different homes/buildings. The goal of a 'zero energy' structure is to produce as much energy as it consumes, having a zero net impact on the environment. Builders are incorporating zero energy techniques to design more efficient, durable and sustainable structures at a competitive cost.

Zero energy construction techniques involve a combination of the following steps:

- Using renewable energy sources (such as solar and wind) to power the building
- Efficient air ventilation systems that eliminate pollutants from the surrounding air
- Better insulation materials that minimize leaking air and noise pollution
- Using energy efficient indoor appliances
- Zero energy construction also allows buildings to put back as much energy into the grid as they use during the year.

4. Flexible Space Design to Improve Functionality

Flexible and dynamic construction is another sustainable design technique, which involves making a space functional for more than one purpose.

This dynamic design trend first started with reception areas being designed to also act as a lounge for both guests and employees. The technique is also expanding into hallways, classrooms, stairways and dining locations. Builders are trending towards designing offices to also become livable apartments, hotels to become condos, and retail spaces to double up as community centers.

By making a previously static space more useful for different functions, builders can reduce material usage and save on valuable resources.

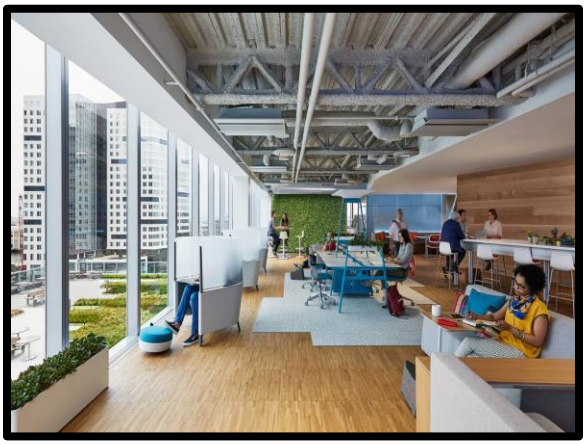


Figure 39 Flexible Space Design to Improve Functionality

Resilience and Durability

Sustainable construction also involves improving the durability and resiliency of buildings. Climate change has heightened concerns of more inclement weather events (such as flooding, bushfires and cyclones), with structures needing to be designed with resiliency at the fore.

More builders are trending towards incorporating risk mitigation steps such as insurance plans, construction technology and renewable building materials. In this way, structures can recover quickly after disaster strikes.

The eco-friendly design techniques highlighted above not only contribute to more sustainable structures; they also allow builders to save costs, increase quality and improve the efficiency of their construction processes

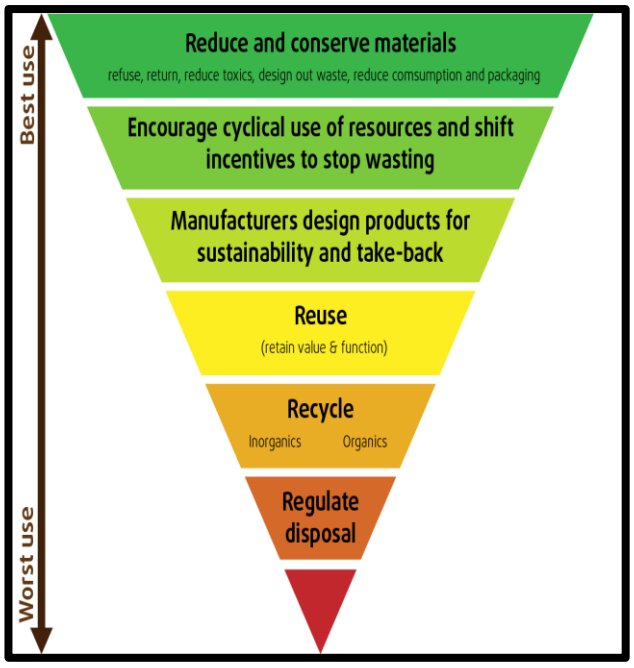


Figure 40 Resilience and Durability

5.1.2 Soil Liquefaction:-

Soil liquefaction is the phenomenon in which the stiffness and the strength of the soil are lost under the action of earthquake force or due to rapid loading conditions. Soil liquefaction occurs in a fully saturated soil.

Principle and Causes of Liquefaction

The soil in normal condition is closely packed to each other. The soil particles are closely packed due to the contact forces of each particle. This tight packing contributes to the soil strength.

When the soil is in the saturated condition, the pores and the soil are fully filled with water. These water molecules present in the soil exerts pressure on the neighboring particles. The water pressure exerted by these water molecules increases with rapid load action or earthquake forces. During liquefaction, the water pressures become high enough to counteract the gravitational pull on the soil particles.

Effects of Liquefaction

Liquefaction phenomenon can result in many effects in the soil and the structures. They are:

1. Sand Boiling

When liquefaction occurs below the surface that is fully compacted, the water pressure below the surface makes the water to break out like a bubble. These come out as boiling water. This is called as sand boiling.

2. Damage to offshore structures

Liquefaction is common in soil that is submerged. These conditions cause huge damage for the bridge construction, structures supporting submerged soil deposits.

3. Failure of Dams and Retaining Walls

The soils supporting Dams and Retaining walls undergoes liquefaction, which results in the collapse of these structures. As the structures lose the ability to control the huge water it further results in floods that are uncontrollable.

4. Surface Landslides

The failure of water carrying bodies can result in surface landslides.

5. Failure of Structures under Earthquake

Liquefaction followed by earthquake forces make the structures to lose its stability. They can either split or lean bringing complete collapse of the structure. Past earthquake records have shown a

huge failure of building structures due to liquefaction. These hazards do not provide enough time for evacuation that it results in a huge loss of life and property.

Methods of Reducing Soil Liquefaction Hazards

There are basically three methods of reducing liquefaction hazards:

1. By Avoiding Liquefaction Susceptible Soils

Construction on liquefaction susceptible soils is to be avoided. It is required to characterize the soil at a particular building site according to the various criteria available to determine the liquefaction potential of the soil in a site

2. Build Liquefaction Resistant Structures

In certain situations, the construction over a land which shows the chances of liquefaction are not avoidable. Hence, foundation structures constructed must be designed such a way to resist the effects of liquefaction. The major reasons for constructing structures over liquefiable soil are space restrictions, favorable conditions, and other reasons.

3. Improve the Soil

This involves mitigation of the liquefaction hazards by improving the strength, density and drainage characteristics of the soil. This can be done using a variety of soil improvement techniques.

Figure 41 Soil Liquefaction

5.1.3 :- Road network in India, Public and Private Partnership Financing & Case Study :-

The main objective of a sanitation system is to protect and promote human health by providing a clean environment and breaking the cycle of disease. In order to be sustainable a sanitation system has to be not only economically viable, socially acceptable, and technically and institutionally appropriate, it should also protect the environment and the natural resources.

When improving an existing and/or designing a new sanitation system, sustainability criteria related to the following aspects should be considered:

(1) Health and hygiene: includes the risk of exposure to pathogens and hazardous substances that could affect public health at all points of the sanitation system from the toilet via the collection and treatment system to the point of reuse or disposal and downstream populations

2) Environment and natural resources: involves the required energy, water and other natural resources for construction, operation and maintenance of the system, as well as the potential emissions to the environment resulting from use.

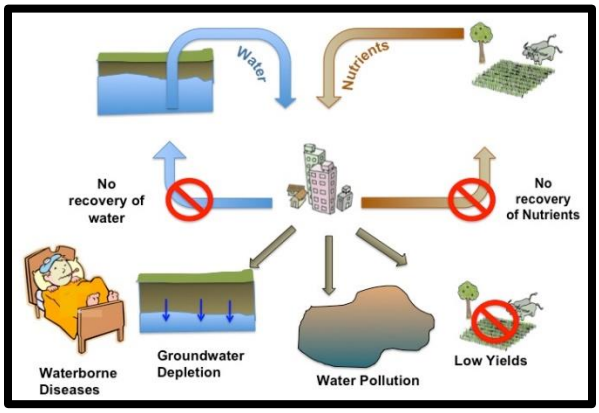
(3) Technology and operation: incorporates the functionality and the ease with which the entire system including the collection, transport, treatment and reuse and/or final disposal can be constructed, operated and monitored by the local community and/or the technical teams of the local utilities.

(4) Financial and economic issues: relate to the capacity of households and communities to pay for sanitation, including the construction, operation, maintenance and necessary reinvestments in the system. Besides the evaluation of these direct costs also direct benefits e.g. from recycled products (soil conditioner, fertiliser, energy and reclaimed water) and external costs and benefits have to be taken into account.

(5) Socio-cultural and institutional aspects: the criteria in this category evaluate the socio-cultural acceptance and appropriateness of the system, convenience, system perceptions, gender issues and impacts on human dignity, the contribution to food security, compliance with the legal framework and stable and efficient institutional settings.

How to achieve the objectives?

In order to achieve these objectives, a joint road map of sustainable sanitation related activities for the IYS was developed in the meetings of January and April 2007 by participants from more than 30 multi and bilateral organisations, NGOs and research institutions. The roadmap consists mainly of a series of thematic working groups that will jointly elaborate a range of publications on sustainable sanitation issues, will organise or contribute to international events and will contribute to develop new funding instruments as well as sustainable sanitation capacity building and program initiatives.



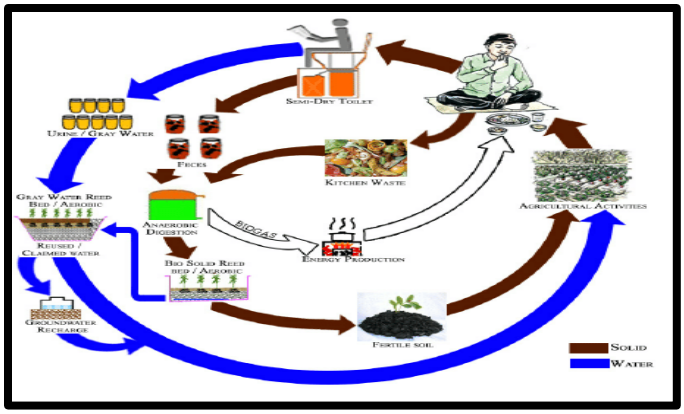


Figure 42 Road network in India

5.1.4 Transportation Infrastructure / System:-

Transportation infrastructure are foundational structure and system for transporting people and goods. Transport infrastructure consists of the fixed installations necessary for transport and includes roads, railways, airways, waterways, and terminals. Productive investment in transport infrastructure is vital for prosperity. As a middle-income economy heavily geared towards exports, investment in a high-quality transport infrastructure base has contributed significantly to the Chile's development. A fully coordinated approach to infrastructure spending, with investment driven by transport policy goals that are integrated with land-use and sectoral development objectives, must accompany Chile's transition from a middle to a high-income economy and should address the potentially negative impacts on social and territorial equality and the environment associated with this transition.

Roads :

Road such as streets, avenues and highways. Includes paved roads, unpaved roads and roads with unique surface such as cobblestone.

Railways:-

Railways including high speed rail, subways and elevated railways such as a cable car.

Walkways:-

Paths for walking such as sidewalks, trails and pedestrian zones.

Bridges & Tunnels:-

Bridges and tunnels for vehicles, trains and pedestrians.

Stations:-

Railway station and similar facilities such as bus stations.

Airports:-

Airports and related services such as air traffic control.

Air routes:-

The management of air routes and related services such as air traffic control, aeronautical meteorology, air navigation systems, air space management, air traffic flow and capacity management.

Waterways:-

Navigable waterways such as a canal.

Ports:-

Harbors where ships can dock and transfer people and/or cargo. This may include passenger facilities known as seaports.

Cycling Infrastructure:-

Infrastructure for bicycles such as bicycle highways, bike paths and bike lanes.

Living streets:-

Streets designed for multiple uses by restricting the speed of vehicles and giving pedestrians rights of way. Living streets are often designed for children, recreation and green spaces such as community garden.

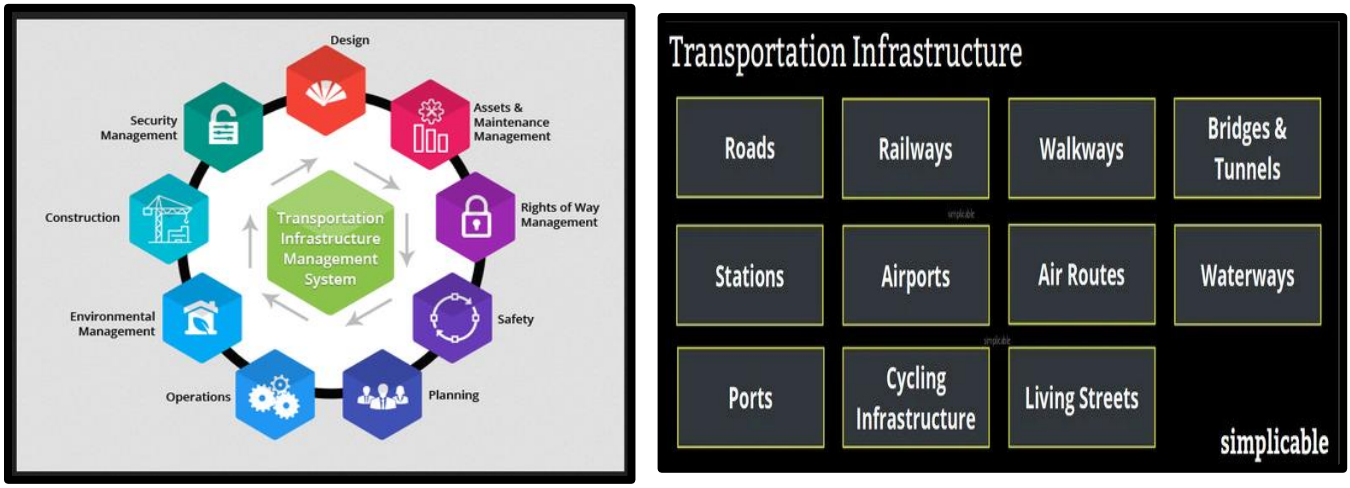


Figure 43 Transportation Infrastructure

5.1.5 Vertical Farming

(l) Field of the Invention

Vertical gardening allows gardeners to cultivate and display their flower, spice, and vegetable plants in very limited spaces or what would otherwise be untenable gardening locations.

Vertical gardens are becoming increasingly popular in peoples' homes, both in their houses and in limited outdoor areas, as people move towards urban areas and desire to grow their own food. Vertical gardens began as an experiment in 1988. Gardeners frustrated with little outdoor space could make the most of their space with a vertical garden. Today, companies sell ready-made systems and all-in-one kits for gardeners who want to have gardens in small spaces at home.

The costs and aesthetics of many existing systems lack appeal to consumers. The present invention creates a vertical gardening system that is cost-effective, has the ability to be mass-produced, and is aesthetically pleasing.

A vertical planter and gardening wall comprised of base planter blocks that are identical to each other and end blocks that are identical to each other. The blocks are stackable and interlock. The invention can be used by gardeners to cultivate and display their gardens indoors or outdoors in a restricted area.

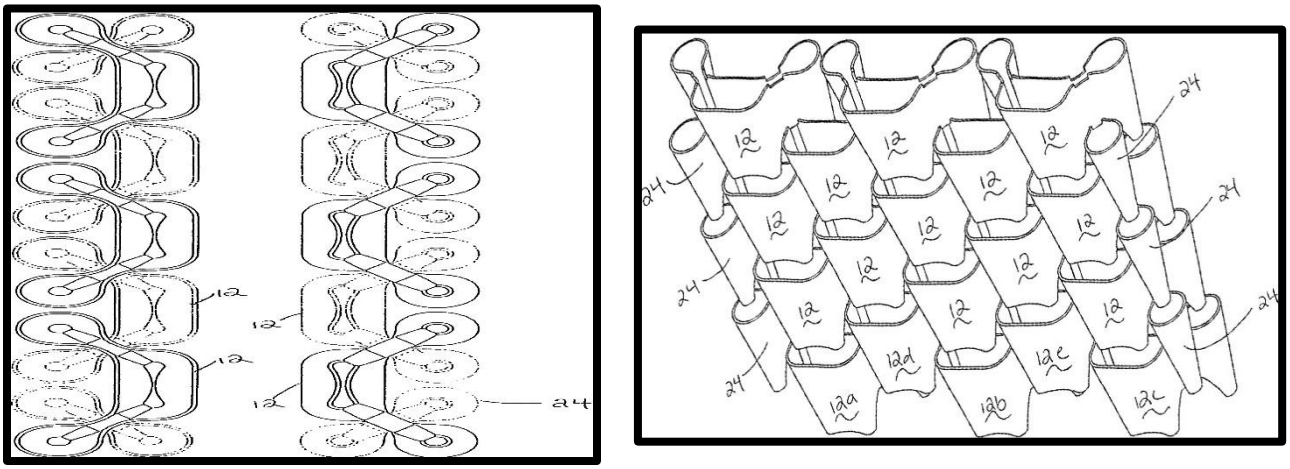


Figure 44 Vertical Farming

5.1.6 Corrosion Mechanism, prevention & repair measure of RCC structure

Corrosion Mechanism:-

Corrosion in concrete is induced by the generation of the electrochemical potentials in following ways: 1. When two different metals are present in concrete, such as steel rebar's, aluminum conduit pipes, or when significant variation exist in surface characteristics of the steel, formation of composition cell can occur. 2. Concentration cells may be formed near reinforcing steel because of the differences in the concentration of dissolved ions, such as alkalis and chlorides.

Corrosion Prevention:-

There 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.

The constant repair of reinforced concrete infrastructure results in high lifecycle costs over the structure's required service life. Overall, the shortfall of traditional corrosion preventative measures is they do not adequately prevent or counteract the development of corrosive conditions in the concrete.

As mentioned, water is one of the three required elements for corrosion to occur. Water also acts as a carrier for chloride ions, which is the leading cause of deterioration of the passive layer that would otherwise protect the rebar. Hence, the critical factor in the corrosion of steel reinforcement, as well as concrete deterioration all together, is the penetration of water and waterborne chlorides into concrete.

Corrosion Repair:-

To accomplish this, singular research bundles were recognized from the above expansive five approaches for repair, substitution and recovery. These were 1) Patch repairs and nascent anodes, 2) Impressed Current Cathodic Protection, 3) Galvanic Cathodic Protection, what's more, 4) Hydrophobic medications. The determination of the above research bundles depended on over a wide span of time use by the development industry to repair, renovate and restore RC structures.

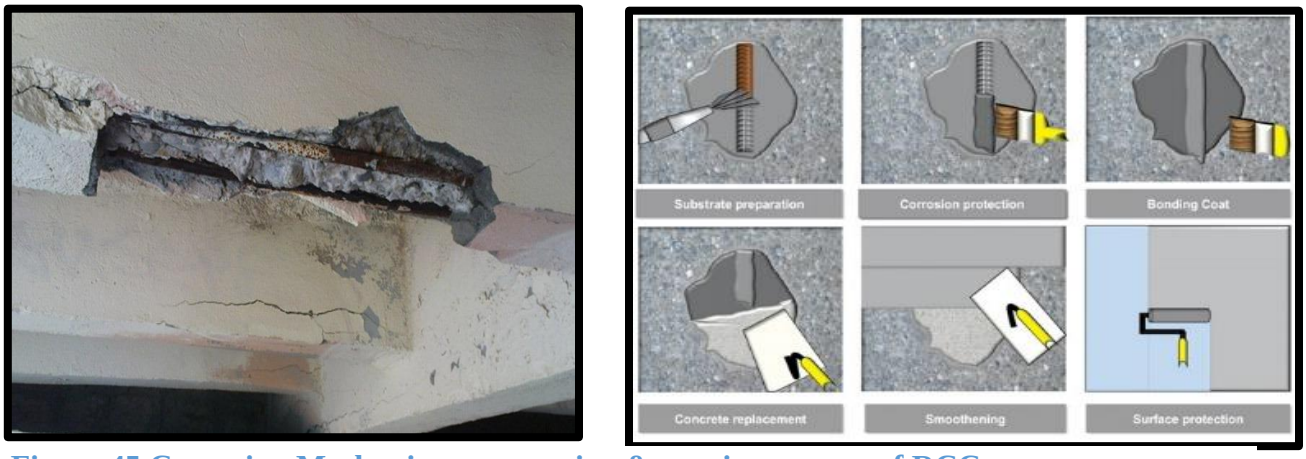


Figure 45 Corrosion Mechanism, prevention & repair measure of RCC structure

5.1.7 Sewage Treatment Plant

Kadodara is situated on NH-08 16.6 km away from Surat and 20 km away from Bardoli. Due to rapid industrialization of kadodara population is increasing day by day. Recently it has been given a status of municipality. Considering growth it has become essential to provide STP for the future requirement and in the present work effort has been made to design STP to cater the need of up to the year of 2041 of town for which population forecasting, sampling and analysis, selection of site, degree of treatment required, design of treatment unit and estimation of the cost will be under taken. The samples were collected from the various locations and samples were tested to measure various parameters like BOD,COD, TSS,TDS, pH, Chlorine content etc., The work also involve selection of treatment unit/ method based on efficiency and cost. The chlorination process will also apply to the treated water to reduce the dependency on precious ground water and to decrease the burden on environment.

1. **Introduction**

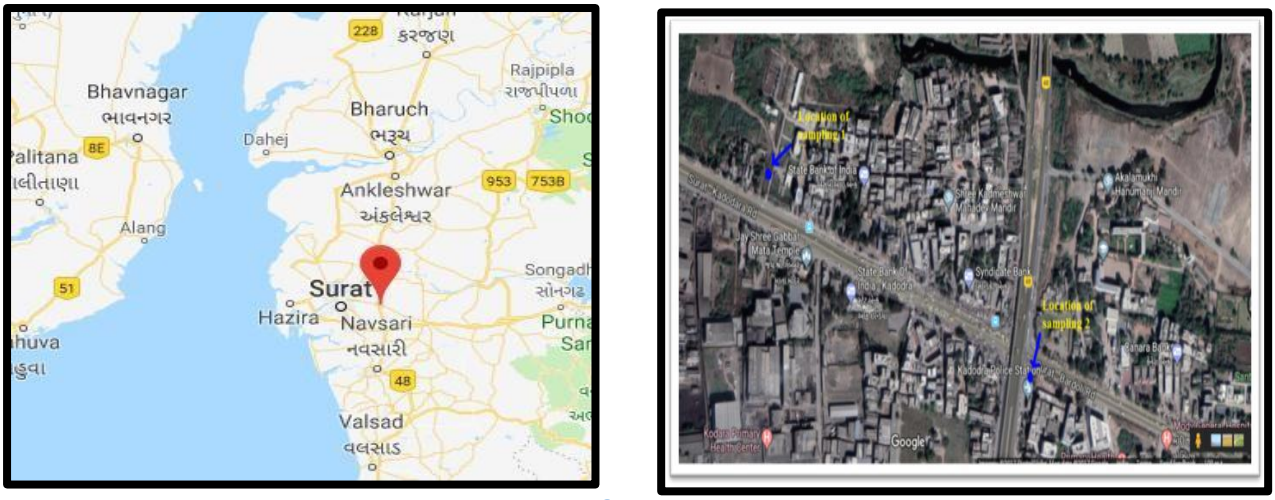


Figure 46 Location & Map of Kadodara village

Kadodara is medium town in the Surat district in the Indian state of Gujarat. Kadodara is a junction of NH 6 and NH 8 and is on the middle way on Surat-Bardoli road. Due to tremendous growth of diamond and textile business the land values are increase in Surat as well as Kadodara is just 17 km away for Surat, industry related to this business shifted to Kadodara due to better availability of transportation and availability of industrial land and sources, Because of that the growth of the industries people are migrated to Kadodara, hence population is increases day by day.

1.1 Objective

- To study demographic profile and population forecasting of study area.

- To determine quality and quantity of waste water by local habitant.
- To analyze quality of waste water by conducting different tests.
- To propose suitable method of treatment based on test results.
- To design all treatment units.
- To propose design of sewage treatment plant with detailed cost estimation.

2. Population forecasting

Table 16 Population forecasting

Forecasting Method	Population in year 2011	Population in year 2041
Arithmetic increase method	10495	61018
Incremental increase method	14819	61028
Geometric increase method	27336	192164

The larger value of population is obtained from Geometric increase method hence this method to be taken to calculate quantity of sewage generated.

2.1 Quantity Of sewage

- A/c to IS 1172:1993 for communities population greater than 1,00,000 water requirement per day taken between 150-200 lpcd
- Kadodara is also an industrial town,15% of taken lpcd(i.e 200 lpcd) is allotted to treat ETP treated waste water from some industries in special cases.
- Total requirement of water shall be 230 lpcd.
- Capacity of STP= (230×0.8×192164)/106 = 36 MLD

Table 17 Quantity of sewage

Sr. no	Criteria	Plot 218	Plot 13
1	Area of plot	60 acre	40 acre
2	Access to the site on existing road	Easily accessible	Easily accessible
3	Site outside the flooding Zone	Yes	Yes
4	Proximity of residence	More	Less than Plot 218
5	Traffic and dust pollution	No	No
6.	Topography of site	Good	Good
7.	Type of soil	Same	Same

8.	Site drain Condition	Very good	Very good
9.	Concentration of people	More	Less
10.	Proximate distance from disposal are	Very near	Very near
11.	Land acquisition	Semi Govt	Govt

4. Sampling and Testing

According to the above data plot no. 13 is suitable site for STP.

Sampling and Testing

First sample collection (monsoon)

Sample 1- From closed drainage

Sample 2- From open drainage near to the Bridge

Second sample collection (winter)

Sample 1- From closed drainage

Sample 2- From open drainage near to the Bridge

4.1 Test results

Table 18 Test results for Monsoon season

Sr. no	Parameters	Results(Monsoon)		Highest value
		Sample 1	Sample2	
1	pH	7.3	7.19	7.3
2	BOD(mg/l)	154.18	148.36	154.18
3	COD(mg/l)	360	350	360
4	TDS(mg/l)	641	764	764
5	TSS(mg/l)	250	267	267
6	Temperature (ºC)	29.5	29.7	29.7
7	Chloride(mg/l)	9.96	14.95	14.95

Table 19 Test results for Winter season

Sr .no	Parameters	Results(winter)		Highest value
		Sample 1	Sample2	
1	pH	7.2	8.03	8.03
2	BOD(mg/l)	209.4	215.27	215.27

3	COD(mg/l)	450	430	450
4	TDS(mg/l)	756	698	756
5	TSS(mg/l)	210.79	247.2	247.2
6	Temperature (ºC)	27.74	28.5	28.5
7	Chloride(mg/l)	19.93	17.44	19.93

pH, TSS, Temperature, TDS are measured by using instrument Hac.

Table 20 Final Results

Sr. no	Parameters	Limits	Results
1	pH	5.5-9	8.03
2	BOD(mg/l)	30	215.27
3	COD(mg/l)	250	360
4	TDS(mg/l)	100	764
5	TSS(mg/l)	100	267
6	Temperature (ºC)	25.7 ºC	29.7
7	Chloride(mg/l)	4 – 10 mg/l	19.93

Sewage disposal limits are obtained from GPCB manual

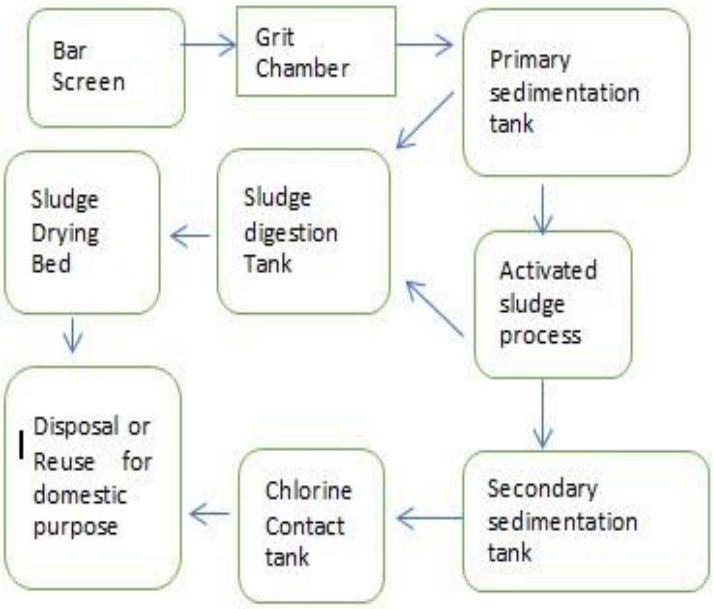


Figure 47 Methodology

5.1 Classification Of Sewage Treatment Plant Methods

PRELIMINARY SEWAGE TREATMENT

This treatment reduces the BOD of the wastewater, by about 15 to 30%. Examples of preliminary operations are:

- Screening provided for the removal of debris and rags.
- Grit chamber provided for removal for the elimination of coarse suspended matter that may cause wear or clogging of equipment.

PRIMARY SEWAGE TREATMENT

In primary treatment, a portion of the suspended solids and organic matter is removed from the wastewater. This removal is usually accomplished by physical operations such as

sedimentation in Settling Basins. The liquid effluent from primary treatment, often contains a large amount of suspended organic materials, and has a high BOD (about 60% of original). The organic solids, which are separated out in the sedimentation tanks (in primary treatment), are often stabilized by anaerobic decomposition in a digestion tank or are incinerated, The residue is used for landfills or as a soil conditioner. The principal function of primary treatment is to act as a precursor to secondary treatment.

SECONDARY SEWAGE TREATMENT

Secondary treatment involves further treatment of the effluent, coming from the primary sedimentation tank and is directed principally towards the removal of biodegradable organics and suspended solids through biological decomposition of organic matter, either under aerobic or anaerobic conditions. In these biological units, bacteria will decompose the fine organic matter, to produce a clearer effluent. The treatment reactors, in which the organic matter is decomposed (oxidized) by aerobic bacteria are known as Aerobic biological units; and may consist of:

(i)Aeration tank: The activated sludge process is the most common option in secondary treatment. Aeration in an activated sludge process is based on pumping air into a tank, which promotes the microbial growth in the wastewater. The microbes feed on the organic material, forming flocs which can easily settle out.

(ii)Secondary sedimentation tank: They are used to settle out the biological material flowing from the secondary treatment.

TERTIARY/ ADVANCED SEWAGE TREATMENT AND WASTEWATER RECLAMATION

Advanced wastewater treatment, also called tertiary treatment is defined as the level of treatment required beyond conventional secondary treatment to remove constituents of concern including nutrients, toxic compounds, and increased amounts of organic material and suspended solids and particularly to kill the pathogenic bacteria.

(i)Sludge digestion Tank: Sludge digestion is a biological process in which organic solids are decomposed into stable substances. (ii)Chlorine contact tank: To remove harmful pathogenic bacteria and make it possible for human touch.

Conclusion

- Considering the population growth, recently awarded municipality status and industrialization it is now high time to install STP for Kadodara town.

•Proposed STP design is functional, efficient, easy to operate.

A Detailed RCC design of units is prepared on the basis of which detailed estimation has been worked out of proposed STP which seems reasonable.

Table 21 Design of units

Sr. no	Unit	Dimension	No.
1	Collection chamber	Dia– 6m, d-3	1
2	Approach channel	L–2m,b0.675m, d–0.75m	2
3	Bar screen	Bar-10*50mm, space– 25mm	2
4	Grit chamber	L– 20m, b-1.5m, d-1m	2
5	Primary Sedimentation Tank	Dia– 24m, d-5.95m	2
6	Aeration Tank	L-21m, b-18.5m, d-4m	4
7	Secondary Sedimentation Tank	Dia– 24m, d-5.95m	2
8	Chlorine contact tank	Dia-18M, D-3M	1
9	Sludge digestion tank	Dia-21M, D-8M	1
10	Filter press		2

Table 22 Estimation with help of detailed RCC design

Unit	No	Quantity of steel(kg)	Formwork (m^2)	Concrete Work (m^3)
Collection chamber	1	958.42	88.61	12.73
Approach channel	2	28.93	34	3.135
Grit chamber	2	397.292	43	8.5
Primary sedimentation tank	2	21820.66	1099.69	392.69
Aeration Tank	4	29568.98	631.7	396.55
Secondary sedimentation tank	2	21820.66	1099.69	392.69
Sludge digestion tank	1	44803.98	1658.66	1202.48
Chlorine contact tank	1	5260.37	861.06	69.05

Table 23 Costing of units

Sr. no	Unit	No	Material cost(INR)

1	Collection chamber	1	3,43,076/-
2	Approach channel	2	41,432/-
3	Bar screen	2	-
4	Grit chamber	2	1,37,690/-
5	Primary Sedimentation Tank	2	65,55,690/-
6	Aeration Tank	4	1,47,52,796/-
7	Secondary Sedimentation Tank	2	65,55,690/-
8	Chlorine contact tank	1	7,35,006/-
9	Sludge digestion tank	1	85,74,993/-
10	Filter press	2	5,90,000/-

This cost includes concrete work, formwork and steel reinforcement with contractor's profit.

Total Cost = Total cost - 38,246,941/-INR

REFERENCES

Books:

1- Waste water treatment concept and design approach by G.L. karia and R.A. Christian.

2- Waste water treatment plant planning design and operation by syed R. Qasim

3- Waste water engineering treatment and reuse by Metcalf & Eddy,Inc.

4- Design of reinforced concrete structure by H.J Shah

5- Estimation and costing by B.N Dutta

IS Code:

[1] 1- IS 456-2000

2- IS 3370 (part-3)

5.2 Concept (Electrical)

5.2.1 Programmable Load Shedding

Programmable load shedding time management system is a reliable circuit that takes over the manual task of switch ON/OFF the electrical devices with respect to time. It uses real time clock (RTC) interfaced to a microcontroller of 8051 family. Multiple ON/OFF time entry is the biggest advantage with this project. Load shedding is what electrical utilities do when there is a huge demand for electricity that exceeds the supply this in a distribution system it needs to be precisely controlled for specific period of time programmable load shedding time management system is a

reliable circuit while the set time equals to the real time. Then microcontroller gives command to the corresponding relay to turn on the load and them another command to switch OFF as per the program. Multiple ON/OFF time entry to the biggest advantage with this project. A matrix keyword helps entering the time.

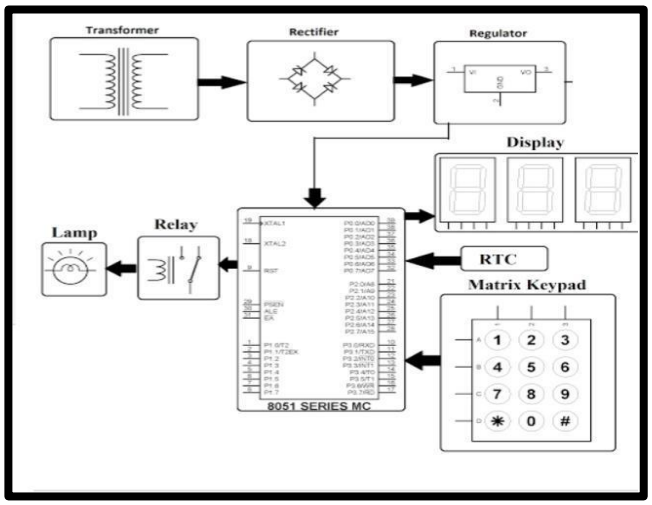


Figure 48 Circuit Diagram of Programmable load shedding

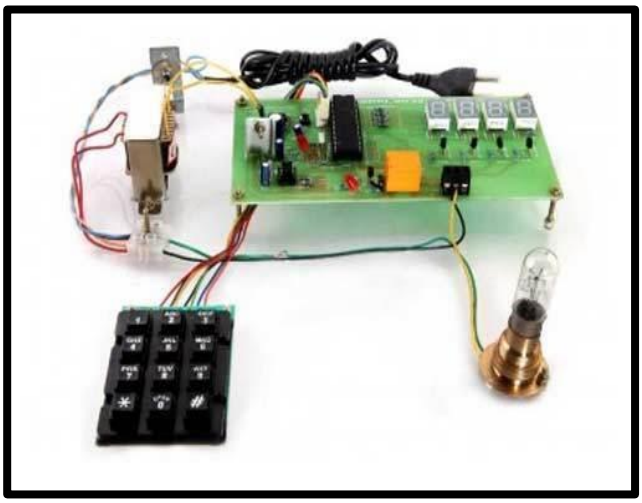


Figure 49 Hardware Component of Programmable load Shedding

System Hardwar component

Power supply, Voltage regulator (LM 7805) , Microcontroller (AT89S52), DS1307 RTC. Matrix keyword, Relay, 7 segment, BC547, Register , Capacitor.

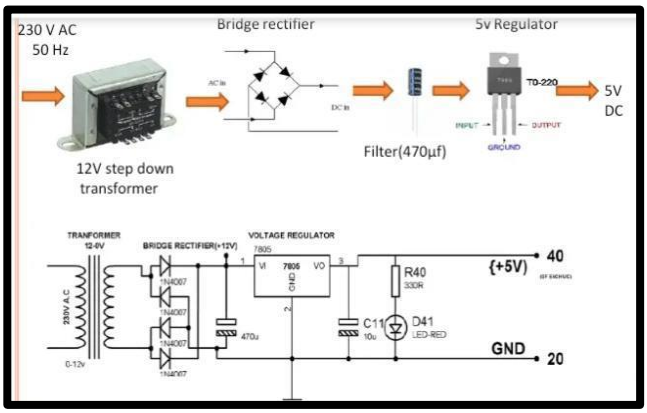


Figure 50 Internal Path of the Circuit

5.2.2 Railway Security System Using IOT

The Indian Railway has one of the largest railway networks in the world, crossing over 1, 15,000 km in distance, all over India Railway is one of the most used mean of transportation. For the railway system to operate constant monitoring and inspection of railway tracks is required. Currently railway track inspection done manually which is time taking and not accurate, due to the high chance of human error occurrence .To avoid the accidents we proposed this system which is an efficient method for railway track monitoring system.

Why use this system.

In our “Indian railway system” all the control system are done through Manpower. In this present condition we must have faced the following problem.

- Wastage of time, Wastage of energy, Difficulty for a manual operator

To overcome these problems we are going to propose a system which gives best method for prevention and safety of passengers.

- **HARDWARE-SOFTWARE REQUIREMENT**

Hardware- Raspberry Pi3 model-B, IR sensor, Ultrasonic, Sensor or GPS module.

Software– MPLAB IDE, PROTEUS

Shows the block diagram of the desired system.

There are two modules 1) **Monitoring System 2) Train System**

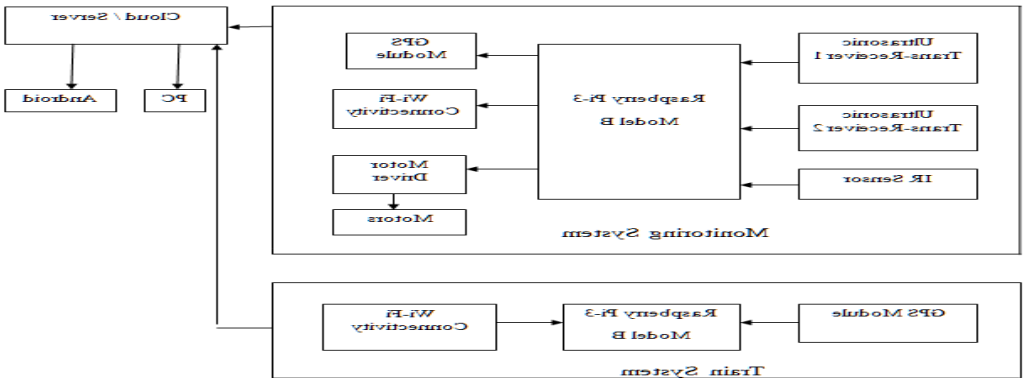


Figure 51 Diagram of Monitoring and train system

1. Monitoring System

This system is in moving position. We pass this system before the train is passed. We have to use three sensors. One IR sensor used for line follow and to detect the obstacle on the track and two ultrasonic sensors are used for measuring the perpendicular distance and according to that convey message to Raspberry Pi whether the crack or any obstacle is detected. First we set some threshold range of distance. When the distance is increased or decreased then definitely there is any obstacle or crack. There is synchronization between the monitoring system and train system, so this information of crack detection is send to train system which is implemented on railway and all the stations between the source station and destination station. GPS module is able to update location of monitoring system continually. There is also a Wi-Fi connectivity for internet access.

2 Train System

Train System is placed on the train. It consist of Raspberry pi module B, GPS module and Wi-Fi connectivity. This is in synchronization with monitoring system. When it get signal that is track is detected then will be stop.

A. Block Diagram B) Block Diagram Description at user end C) Ultrasonic Sensor (HC-SR04)

The limitations of methods in their ability to detect defects in the rail foot, especially in the side edges away from the region directly below the web and how the LRUT method provides a significant improvement for the same. Long Range Ultrasonic Testing (LRUT) technique is proposed as a complimentary inspection technique to examine the foot of rails, especially in track regions where corrosion and associated fatigue cracking is likely, such as at level crossings. LRUT technique is found to be suitable for examining inaccessible areas of railway tracks such as areas where corrosion occurs and susceptible areas of fatigue cracking.

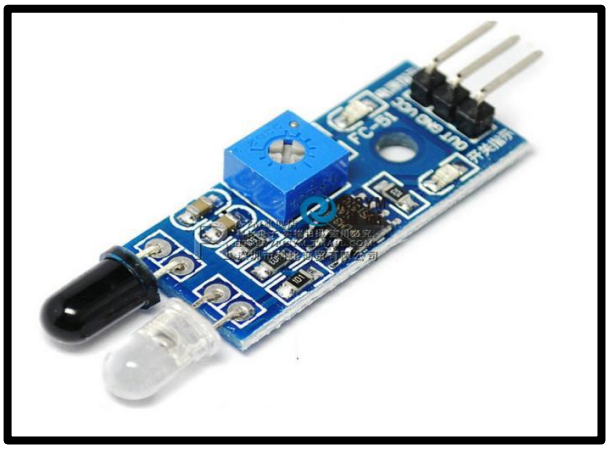


Figure 52 IR sensor HDLC4260

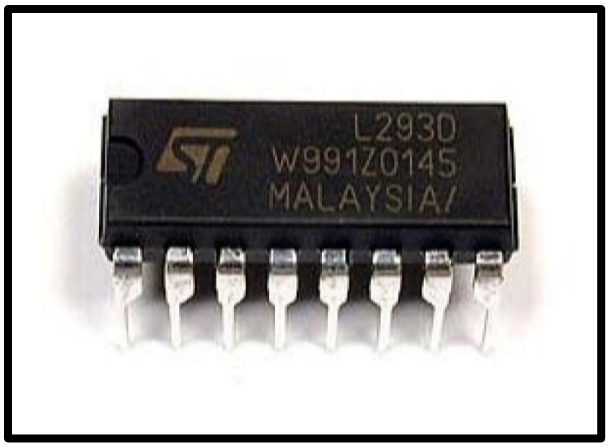


Figure 53 Motor Driver

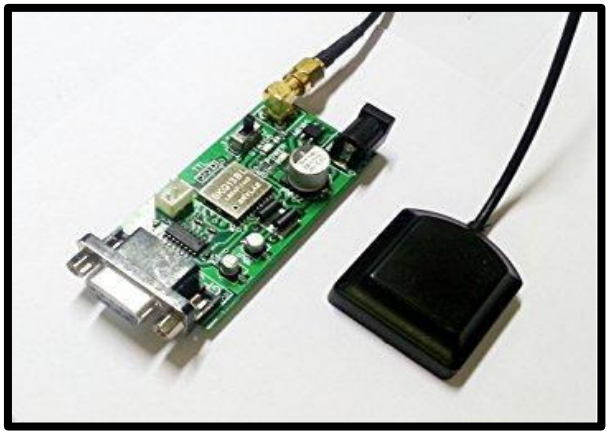


Figure 54 GPS module

Figure 55 Raspberry pi Controller using railway system

5.2.3 Management through Energy Harvesting concept:-

Wireless sensor power control and energy harvesting techniques Nodes:-

- **Introduction**

In the 21st century, due to the rise in global warming and other environmental problems, the design of an effective renewable energy harvesting system is the most significant technical challenge. For long network lifetime solar energy harvesting wireless sensor networks, the design of successful solar energy harvesting systems is important. The harvester device takes the input from solar photovoltaic energy and turns it into electrical energy in SEH-WSN nodes. This electrical energy is then used to charge the battery of the WSN node and supply the sensor node with the operating voltage. The benefit of using WSN node energy harvesting is that by going out to remote areas for volcano monitoring, glacier monitoring, forest monitoring and battlefield monitoring applications, it decreases the human efforts needed to replace the battery of hundreds or thousands of sensor nodes. Enabled WSN nodes for energy harvesting increase the overall service life of the sensor network.

- **The SEH-WSN Node Operation :-**

The SEH-WSN node's internal block diagram is shown in the figure. A DC power supply (3.6 volts, Tektronix, Inc., Beaverton, OR, USA) is supplied to the WSN node by the solar energy harvesting system. Through using solar panels, this voltage is harvested from the ambient sunlight. The solar panel directly transforms light energy into DC electrical energy. To charge the battery, the DC-DC converter controls this DC voltage. The WSN node drives the rechargeable battery.
By using the sensor measurement unit, the WSN node calculates the desired physical quantity (e.g., temperature, light, humidity and pressure). This detected data is processed by a microcontroller in the computer unit.

- **Harvesting Framework for Solar Energy :-**

The solar panel, the DC-DC converter, the refractive battery, the BMS battery charging circuit as well as the DC-DC converter control unit are all part of the simple pilot system. Two kinds of DC-DC converter methods are commonly available:
(1) Control of the pulse width (PWM) and (2) Control of the maximum power point (MPPT).

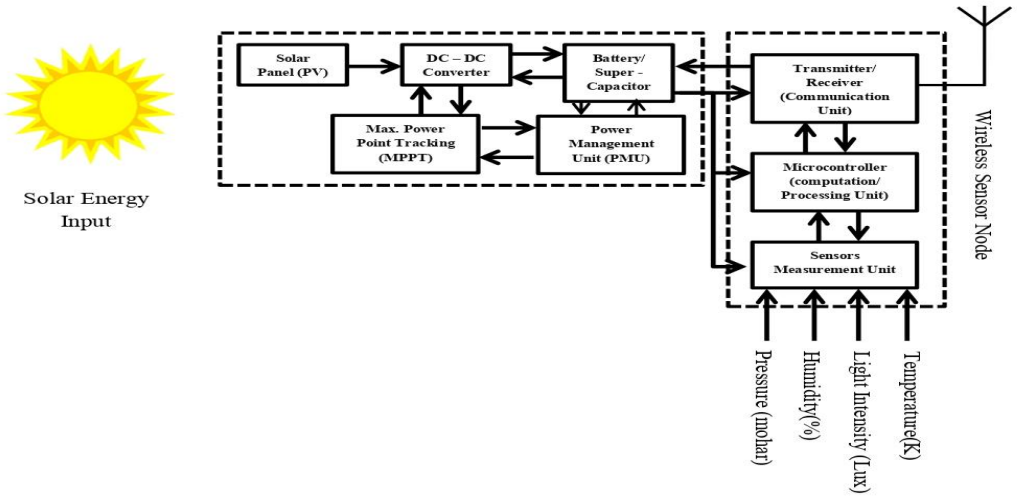


Figure 56 Block diagram of Solar Energy Harvesting Wireless Sensor Network Node (SEH-WSN)

- **Solar PV panel modeling :-**

A solar cell is a halve-conductor system that transforms light energy into electrical energy and it is also called a photovoltaic cell. When an electron-hole-pair (EHP) is produced when a photon of light energy incidents over a solar cell. This newly created EHP contributes to the electric current known as light generated current (IL).

- **DC-DC Conversion Modeling**

In the configuration of a photovoltaic system there are usually three types of DC-DC converters: buck converter, boost converter, and buck boost converter. In this context, we used a DC-DC Buck converter, as its performance is high compared to Boost and Buck-Boost. To DC-DC Buck converter is a converter of power electronics in which the output voltage is often lower than the input voltage.

- **Modeling of the MPPT technique for optimum power point monitoring :-**

In photovoltaic (Pv) solar systems, the MPPT techniques are commonly used to optimize the production of electricity from the Sun under various solar irradiation conditions. The voltage (VPV) and current (IPV) in the solar panel continuously are measured and the algorithm is determined Duty cycle quantity (D) to be fed to the DC-DC buck converter MOSFET switch.

The following algorithms are generally used in photovoltaic applications as :-

- Perturbation and Observation (P&O) technique,
- Incremental Conductance (INC) technique and
- Fraction Open Circuit Voltage (OCV).

In all types of solar energy harvester systems, the P&O technique is often used.

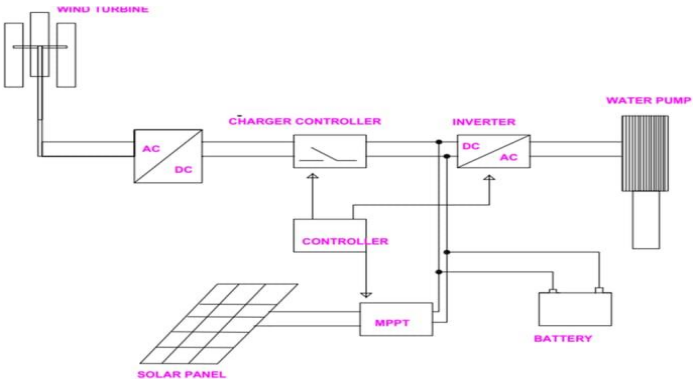


Figure 57 Harvesting Farm of solar Energy

Table 24 Harvesting Farm of solar Energy

Sr. No.	Item	Rate
1	Solar Panel	6000
2	DC Converter	300
3	PWM Controlled	4500
4	Battery	1000
5	WSN Sensor Price	4000
	Total	15800

5.2.4 Moisture Monitoring System

- The main aim of this project was to provide water to the plants or gardening automatically using
- Microcontroller (Arduino Uno). We can automatically watering the plants when we are going on vacation or don't we have to bother my neighbors, Sometimes the neighbors do too much of watering and the plants end up dying anyway.
- There are timer based devices available in India which waters the soil on set interval.
- They do not sense the soil moisture and the ambient temperature to know if the soil actually needs watering or not. Assimilation is that the artificial application of water to the land or soil It is used to assist in the growing of agricultural crops, maintenance of landscapes, and re vegetation of disturbed soils in dry areas and during periods of inadequate rainfall. When a zone comes on, the water flows through the lateral lines and ultimately finally ends up at the irrigation electrode (drip) or mechanical device heads. Working
- 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 goes down, the sensor senses the humidity change, giving signal to the microcontroller so that the pump (motor) can be activated.

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 measure 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 supplies power from external source or from Arduino board. The Arduino Board is programmed using the Arduino IDE software.

Component use in this project

Arduino uno, Motor driver

Motor 5v , Register

Transistor, Soil moisture sensor

Relay

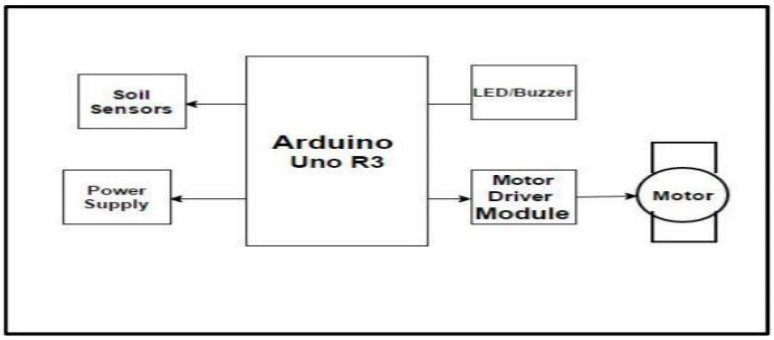


Figure 58 Block Diagram of moisture monitoring system

5.2.5 Home Automation using IOT/any other methodology

- Internet of Things (IOT) is widely used in home automation. It provides facility to have control over a wide range of home appliances and ensure securities. It also permits open access to a wide range of control of digital services the proposed system consists of an Arduino Uno board (ATmega32 IC), GSM module (SIM 300), PIR sensor, temperature sensor (LM 35), gas sensor (MQ-6), power select (7805) and web application.
- GSM module is used to establish communication between the microcontroller and the webpage developed. The design is user friendly and a safe system to control a wide varieties of home appliances, especially the aged and differently abled, and facilitates energy management.
- At home on a daily basis and activates the wide range of operations.
- The sensor parameters can be conveniently stored in the cloud. The system can be further modified to industrial automation, mobile health care, traffic management, and elderly assistance. Index Terms: GSM, Home automation, IOT, sensors.

Figure 59 GSM based Home automation System

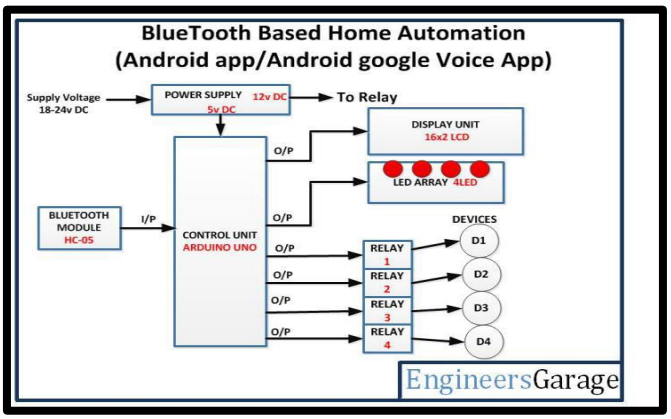


Figure 60 Block Diagram of home automation

Wireless home automation system

Advantage of IOT	Disadvantages of IOT
Save time: as it reduces human effort then it definitely save out time	Privacy
Enhance data collection	Complexity Application of IOT
Security	Health, Wearable, Traffic monitoring, Fleet management, Agriculture, Hospitality, Smart grid and energy saving, Water supply.

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

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

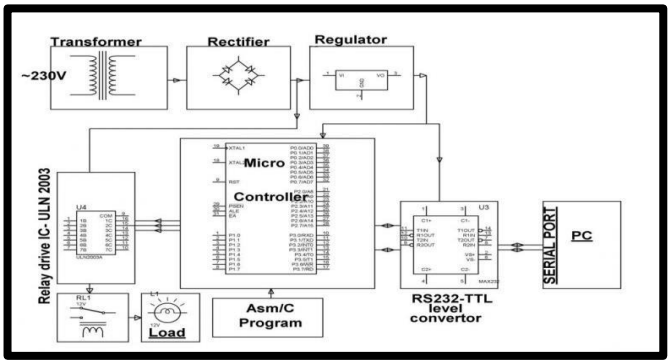


Figure 61 PC Based Electrical Load Control System

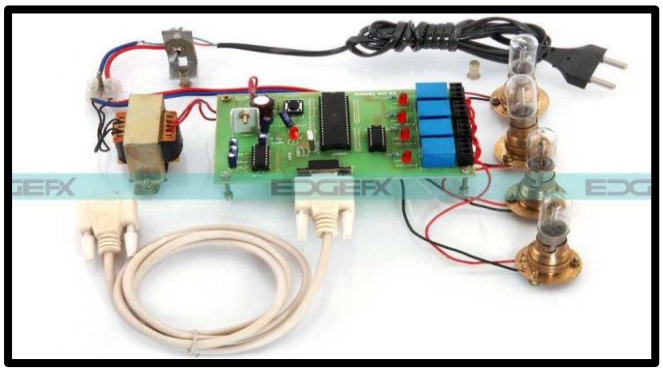


Figure 62 Block Diagram and Hardware component arrangement

Keil an ARM Company makes C compilers, macro assemblers, real-time kernels, debuggers, simulators, integrated environments, evaluation boards, and emulators for ARM7/ARM9/Cortex-M3, XC16x/C16x/ST10, 251, and 8051 MCU families.

Table 25 Estimation of Pc based Electrical Load Control

Sr. No.	Components required	Total costing
1	Microcontroller	980
2	Rectifier	200
3	Transformer	495
4	Regulator	150
5	RS232-TTL level convector	698
6	Relay driver IC	180
7	Lamp	100
	Total cost = 2,803 approx.	

5.2.7 Electrical Parameter Measurements

Measurement of electrical quantities may be done to measure electrical parameters of a system. Using transducers, physical properties such as temperature, pressure, flow, force, and many others can be converted into electrical signals, which can then be conveniently measured and recorded. The standard units of electrical measurement used for the expression of voltage, current and resistance are the Volt [V], Ampere [A] and Ohm [Ω] respectively.

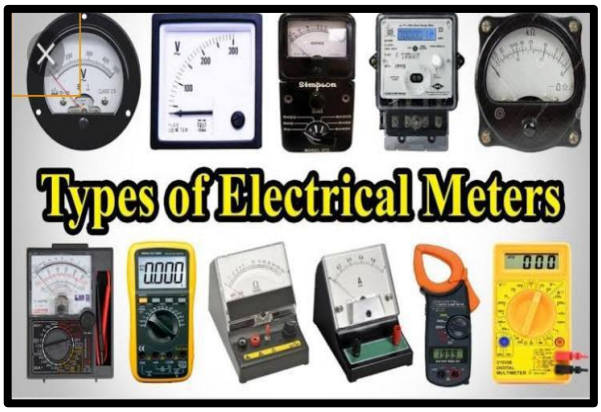


Figure 63 Types of Electrical meter

Application

Every circuit measurement electrical, quantities use this component, Testing component, Use manufacturers electrical component etc.

CHAPTER 6
Swatchh Bharat Abhiyan (Clean India)

Swachh Bharat Abhiyan (SBA) (or Swachh Bharat Mission (SBM) or Clean India Mission in English) is a campaign in India that aims to clean up the streets, roads and infrastructure of India's cities, smaller towns, and rural areas. The objectives of Swachh Bharat include eliminating open defecation through the construction of household-owned and community-owned toilets and establishing an accountable mechanism of monitoring toilet use. Run by the Government of India, the mission aims to achieve an Open-Defecation Free (ODF) India by 2 October 2019, the 150th anniversary of the birth of Mahatma Gandhi, by constructing 90 million toilets in rural India.

The Swachh Bharat Abhiyan is the most significant cleanliness campaign by the Government of India. Shri Narendra Modi led a cleanliness pledge at India Gate, which about thirty lakh government employees across the country joined. He also flagged off a walkathon at Rajpath and surprised people by joining in not just for a token few steps, but marching with the participants for a long way.

6.1 Swatchhta needed on Shapar – Veraval Village :-

In shaper – Veraval Village somewhere solid waste dump on anywhere. There is also a small lake in the village which also has garbage. There are no any solid waste management systems.

Figure 64 Existing condition of road and river

Figure 65 Existing Drainage Condition in Shapar - Veraval Village

6.2 Guideline – Implementation in allocated village with photograph

In shaper – Veraval Village door to door waste collection system are there. Roads are cleaned daily.

In all houses dustbins are there.

Here some suggestion and guideline process are given :-

- **Suggestions to make village clean :-**
  - In village do some activity or awareness program to villagers regarding Swachh bharat abhiyan like painting competition, Drama, workshops, quiz, etc.,
  - To villagers explain about cleanness, health, solid waste management, Bio-gas, eco-wise waste management system etc.,
  - The government provides 1 set of dustbins per household like blue and green. So will aware about on it. Give information about which type of waste put in which dustbin.

- **Guideline Process :-**

The key objectives of the Swatch Baharat project are as follows to achieve Swatch Bharat' by 2019:

a) To improve the overall life quality in rural areas through the promotion of cleanliness, hygiene and elimination of open defecation

(b) Accelerate the coverage of rural sanitation by 2 nd October 2019 to meet Swachh Bharat's vision

c) Urge society and Panchayati Raj institutions through awareness-raising and education on health to adopt sustainable sanitary practises and facilities

(d) Promote reliable and sufficient technology to ensure that sanitation is environmentally healthy and sustainable

e) to develop community-based hygiene programmes for general cleanliness in the rural areas with an emphasis on the science and solid waste management systems. e)

f) Substantially positive gender effect and encourage social inclusion through improved sanitation, in particular in excluded communities.

The District shall prepare a project proposal containing the specifics of Gram Panchayat and reviewing the proposal, and it shall be consolidated in the State Plan by the State Government.

The Government of India will share the State Plan (Swachh Bharat Mission Gramin - Ministry of Drinking Water and Sanitation). This Strategy would include a five-year PIP Plan and five separate annual implementation plans (AIP).

States are currently planning the State Project Implementation Plans in perspective based on the baseline data as well as the updated SBM standards (G). Every year the Ministry approves the AIP plans. The AIP of all States should also have an Annual Communications Schedule.

The State shall establish a tailored communication policy, a communication plan and materials on the basis of formative research and consultation rounds and will train Community actors to use these instruments.

6.3 Activities done by students for shapar – veraval village :-

We did Village survey, met with villagers, due to covid-19 situation schools are closed. For safety purpose we didn't do much more.

Figure 66 RCC road in shapar - veraval village

Figure 67 Street in shapar - verval village

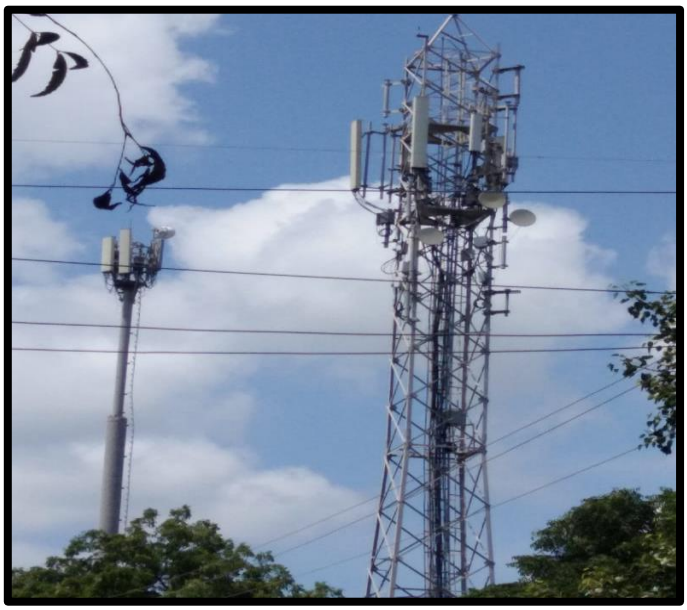


Figure 68 Electrical poll in shapar - veraval village

Figure 69 River in Shapar - Veraval Village

CHAPTER 7
Village condition due to Covid-19

- Countries around the world have undertaken a wide range of strategies to halt the spread of COVID-19 and control the economic fallout left in its wake.
- Rural areas of developing countries pose particular difficulties for developing and implementing effective responses owing to underdeveloped health infrastructure, uneven state capacity for infection control, and endemic poverty.
- the case for the critical role of local governance in coordinating pandemic response by examining how state authorities are attempting to bridge the gap between the need for rapid, vigorous response to the pandemic and local realities in three Indian states – Rajasthan, Odisha, and Kerala.
- Through a combination of interviews with mid and low-level bureaucrats and a review of policy documents, we show how the urgency of COVID-19 response has galvanized new kinds of cross-sectoral and multi-scalar interaction between administrative units involved in coordinating responses, as local governments have assumed central responsibility in the implementation of disease control and social security mechanisms.
- Evidence from Kerala in particular suggests that the state's long term investment in democratic local government and arrangements for incorporating women within grassroots state functions (through its Kudumbashree program) has built a high degree of public trust and cooperation with state actors, while local authorities embrace an ethic of care in the implementation of state responses.
- These observations, from the early months of the pandemic in South Asia, can serve as a foundation for future studies of how existing institutional arrangements and their histories pattern the long-term success of disease control and livelihood support as the pandemic proceeds. Governance, we argue, will be as important to understanding the trajectory of COVID-19 impacts and recovery as biology, demography, and economy.

7.1Taken step in Shapar – Veraval village related to existing situation :-

During village visit we noticed most of People wearing a mask. In government building, hospital, clinic, etc. social distancing Was maintained properly. Government Building, medical shop, private shops, sanitizer are available. Hospitals are also clean and they also maintain Covid-19 guidelines.

7.2 Activities done by students for shapar – veraval village :-

We did Village survey, met with villagers, due to covid-19 situation schools are closed. For safety purpose we didn't do much more. We met with Talati mantri and we were discus about existing situation in village and no COVID 19 cases are in village.

7.3 Any other steps taken by the students/villagers:-

Villagers Take care for their health. There is no any other step taken by students. In the COVID-19 situation cleaning, fogging and sanitization were done in the village.

Figure 70 Sanitizing Process in shapar - veraval village

Figure 71 Shapar - Veraval village womes made face mask

CHAPTER 8
Sustainable Design Planning Proposal (Prototype Design) – Part -I

8.1 Design proposal :-

8.1.1 Community hall :-

Community centres are public places where a group project, social services, public information and other events appear to be gathered by community members. They may sometimes be available to the entire community or a specialised group in the broader community.

In general, community centres perform the following roles (but not all).

- As an environment with different occasions and rituals for the entire group.
- As the location for public citizen meetings in different regions.
- As the place to meet people and ask for their input, support or vote from the politicians or other official leaders ("election campaigning" in democracies, other kinds of requests in non-democracies).
- As a social gathering place for community members.
- As a residence for local clubs and charitable work.
- As a place that members of the group (and often others) will rent cheaply if a private family or party is too large to live at. For eg, the non-church sections of marriages, funerals, etc.
- As a location that tells local history and transmits.
- The venue for the coordination of local non-governmental events.

In some circumstances, village halls can provide retail services to the community. Rural community buildings today have a function as a multi-purpose centre, a hub of arts and sports and provide education, health care or retail services in some cases. in some cases. Changes to the licence,

Community hall referring to the village of Shapar - Veraval.

❖ **Proposed design data**

- Community hall cum library

- Location = Near the hanuman Temple & opposite side of primary school.
- Plan area = 50.29m X 32.00m
- Direction of plan Establish = NE SW

❖ **Furniture Amenities :-**

- Security Room = 1 Table – 2 chair
- Office = 1 table – 1 main chair – 2 other chair
- Multipurpose room 1&2 = 1-table - 10 chair -1 cupboard
- Store room = 1&2&3&4 = every room
- 1 cupboard
- 1 table
- 2 chair
- Library =5-cupboard -2 table - 20 Chair
- Meeting room = 2 main chair – 15 chair – 1 Cupboard

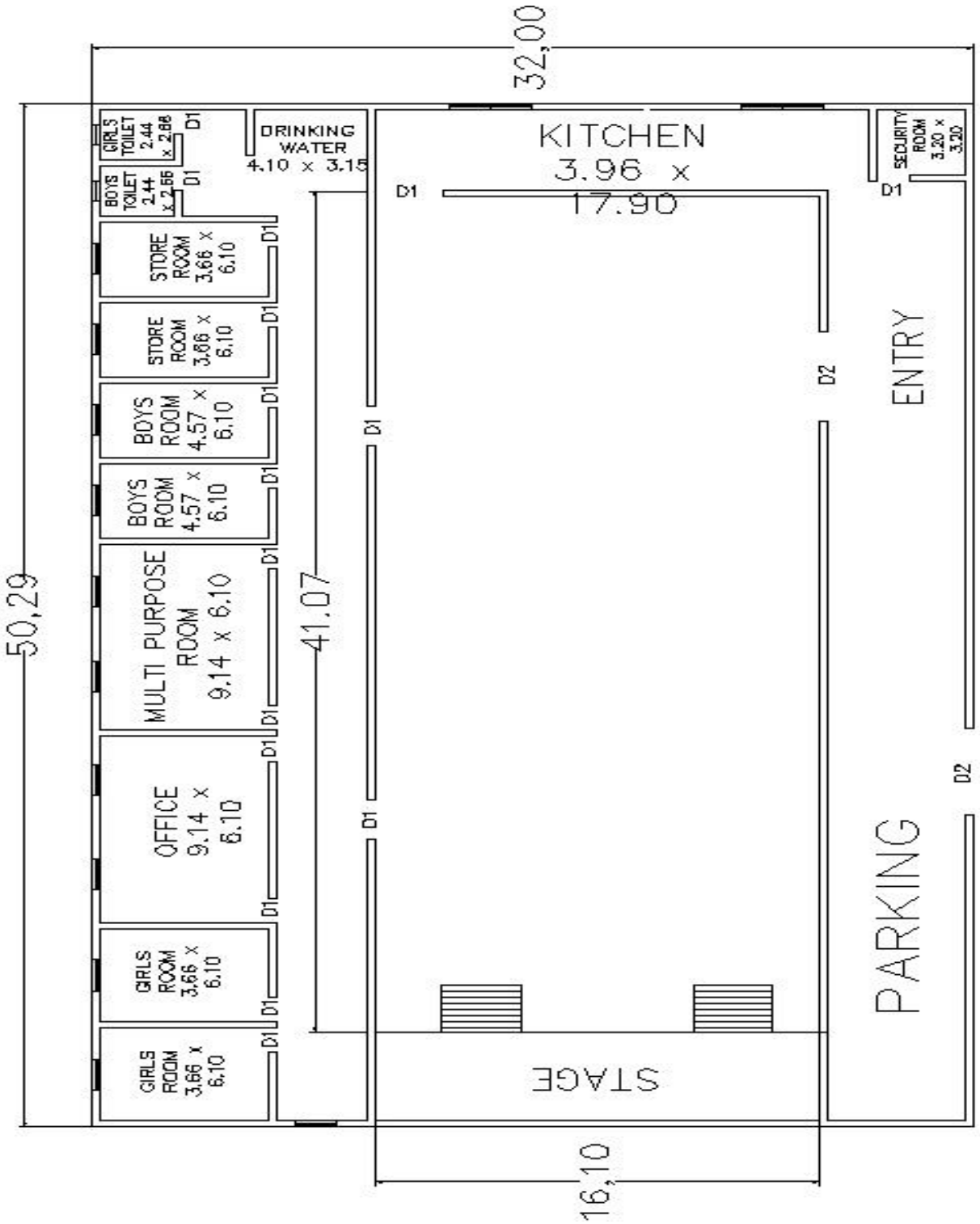


Figure 72 Plan of Community hall

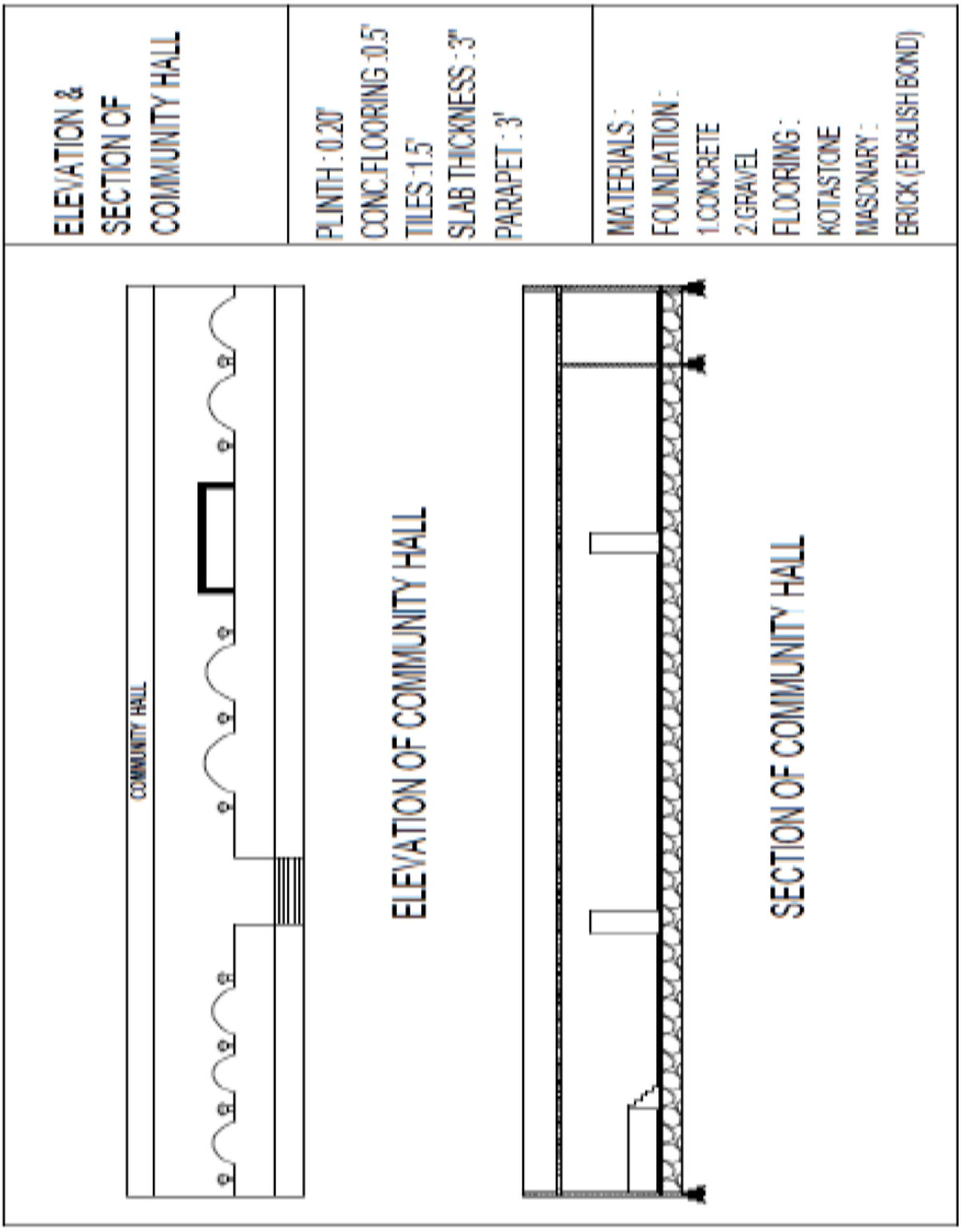


Figure 73 Elevation and Section of Community hall

Estimation Of Community Hall

Table 26 Measurement Sheet of Community hall

Sr no	Item of work	no	L (m)	B(m)	D/H (m)	Quantity	Rate Rs.	Amount Rs
1	Excavation in foundation for columns	37	0.7	0.9	0.7	16.31 m^3	205	3343.55
2	BBLC work in foundation	37	0.7	0.9	0.2	4.662	2604	12139
3	BBLC work in foundation							
	1 st footing	37	0.6	0.8	0.2	3.552		
	2 nd footing	37	0.5	0.7	0.2	2.59		
	3 rd footing	37	0.4	0.6	0.1	0.888		
						7.03 m^3	319	22481.94
4	Masonry work in super structure	1	304.6	0.2	3	182.76 m^3	3321	60676.32
5	RCC work for all columns	37	0.4	0.6	3	26.64 m^3	4937	131521.7
6	External plaster	1	152	-	3	456 m^2	130	59280
7	External plaster	1	462	-	3	1386 m^2	100	138600
8	RCC slab work	1	50	26	0.1	130 m^3	4937	641810
9	Steel work							
	In slab [(130*1)/100]*78.5=102.05 q/m^3=1025 kg						54.87	560009.5
	In column [(26.64*1)/100]*78.5 =20.91 q/m3=2091 kg						54.87	114756.6
10	Parapet wall	1	152	-	0.6	91.2 m^2	399	38388.8
						TOTAL	=	1781008
						Add 8%	=	142480
						GRAND TOTAL	=	1923488

Table 27 Beam Design

M30	Fe415(Main)	Fe415(415)
Length: 5000.0 mm	Size: 600.0mm*300.0 mm	cover: 25.0 mm

Table 28 Summary of reinforcement area(sq.mm)

SECTION	0.0	1250.0 mm	2500.0 mm	3750.0 mm	5000.0 mm
TOP REINF.	330.58 (sq.mm)	330.58 (sq.mm)	330.58 (sq.mm)	0.00 (sq.mm)	0.00 (sq.mm)
BOTTOM REINF.	0.00 (sq.mm)	0.00 (sq.mm)	330.58 (sq.mm)	330.58 (sq.mm)	330.58 (sq.mm)

Table 29 Summary of provided reinforcement area

SECTION	0.0 mm	1250.0 mm	2500.0 mm	3750.0 mm	5000.0 mm
TOP REINF.	4-12 mm 1 layer (s)	4-12 mm 1 layer (s)	4-12 mm 1 layer(s)	2-12 mm 1 layer (s)	2-12 mm 1 layer (s)
BOTTOM REINF.	2-12 mm 1 layer (s)	2-12 mm 1 layer (s)	4-12 mm 1 layer(s)	4-12 mm 1 layer (s)	4-12 mm 1 layer (s)
SHEAR REINF.	2 legged 8mm @150mm c/c	2 legged 8mm @150mm c/c	2 legged 8mm @150mm c/c	2 legged 8mm @150mm c/c	2 legged 8mm @150mm c/c

Table 30 Column Design

M30	Fe415(Main)	Fe415(sec)
Length: 2500.0 mm	cross section: 600 mm*400.0 mm	Cover: 40.0 mm

Guiding load case : 3 end joint : 43 short column

Steel area : 4076.01 sq.mm.

Concrete area : 235924.00 sq.mm

Main reinforcement : provide 24 – 16 mm dia. (2.01%, sq.mm)

So the final cost of the Community hall is 1923488 rs.

8.1.2 Common Public Place (Garden) :-

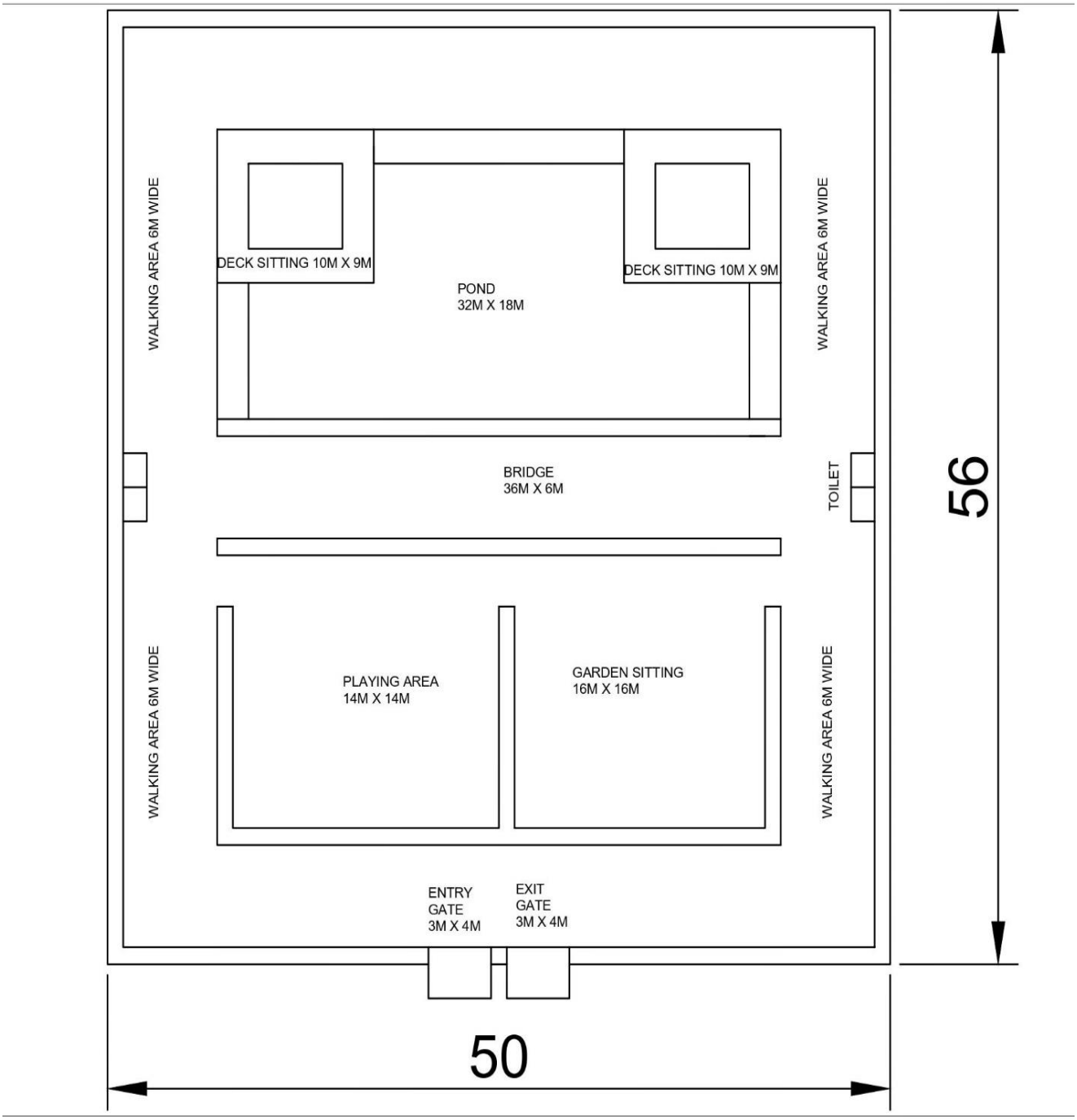


Figure 74 Design of Common Public Place (garden)

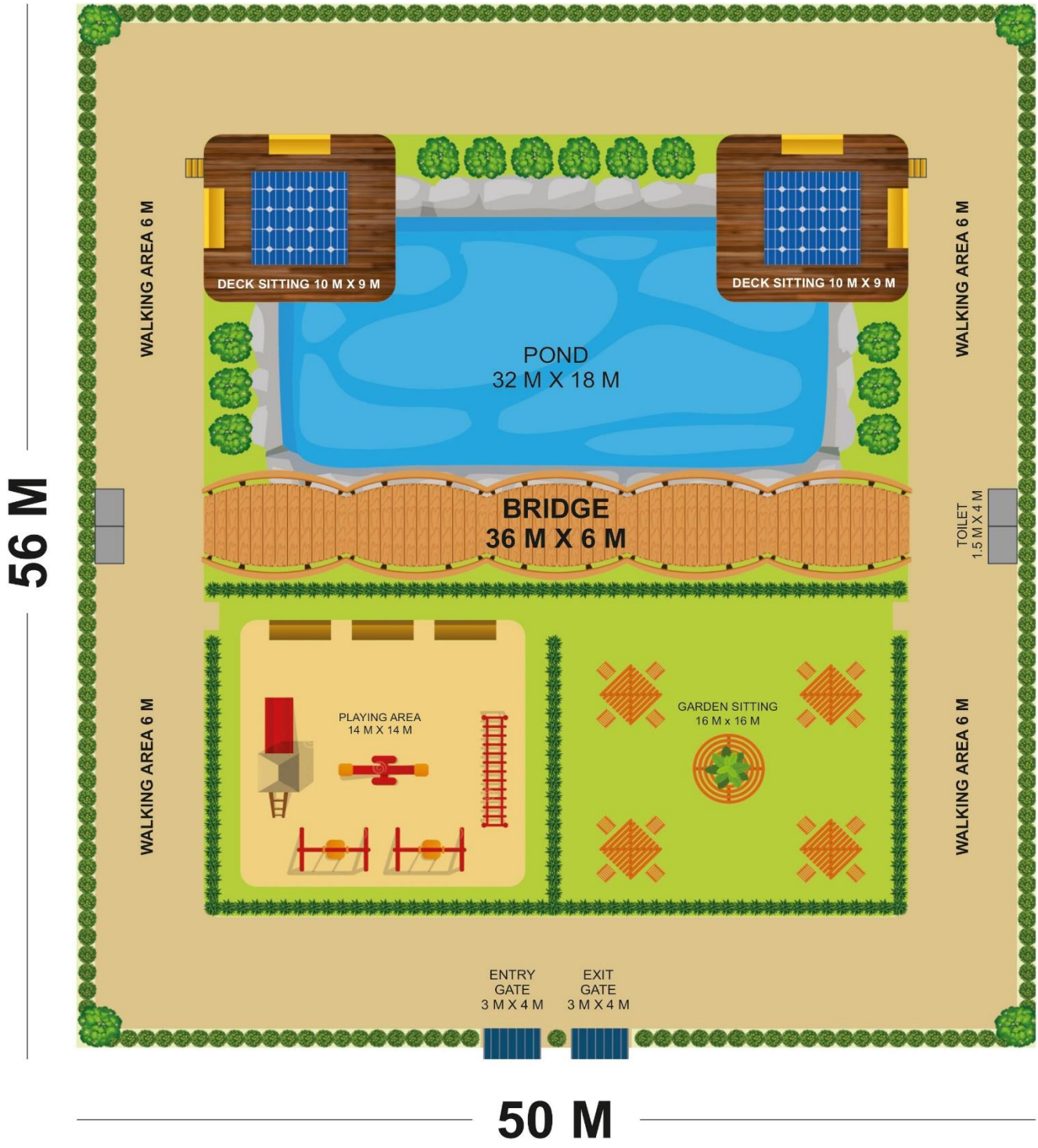


Figure 75 3D View of Common Public Place (Garden)

- **Estimation of Common Public Place (Garden) :-**

Table 31 Measurement Sheet of Common Public Place

SR.NO.	DESCRIPTION	NUMBERS	RATE RS.	AMOUNT RS.
TREES REQUIRED				
1	for corners	4	750	3000
2	border of walking area	140	30	4200
3	pond border	53	225	11925
4	playground and garden border	78	60	4680
			total=	23805/- or 25000/-
TOILET REQUIRED				
	FRP mobile toilet			
1	man's toilet	2	15000	30000
2	woman's toilet	2	15000	30000
			total=	60000/-
BRICK WORK FOR BORDER				
1	190x90x90mm for boundaries	2300	10	23000
2	Worker	4	800 per 4 days	3200
			total=	26200/-
GATE(ENTRY/EXIT)				
1	Gate	2	1170	2340
			total=	2340/-
ROCKS				
1	rocks border for pond	330feet	50	16500
2	Workers	4	1200 per for 4 days	4800
			total=	21300/-
SOIL				
1	soil required for walking area	63.6 volume	850	54060
2	soil required for playground area	3234 square feet	15	48510

3	Workers	4	400 per 2 days	1600
			total=	104170/-
RAILING				
	Bridge	236 feet	200	47200
			total=	47200/-

Table 32 Abstract Sheet of Common public Place

		Area	**Unit**	**Time**	**rate/m3**	**Total**
1	Excavation	572.6				
	by excavator	572.6	m3	10 min	350	200400/-
	by labour	572.6	m3	2 hour	300	171771/-

Table 33 Material Quantity of Common Public Place

no.	**particulars**	**quantity or number**	**Rate**	**Per**	**amount**
1	Materials				
	Cement	235	300	Bags	70500
	Sand	164	800	m3	131200
	Aggregate	328	1000	m3	328000
	Sundries				100
				total=	529800/-
2	Labour				
	Mistry	0.5	400	4 day	800
	Mason	1	300	4 day	1200
	mail coolie	7	200	4 day	5600
	female coolie	11	180	4 day	7920
	Bhisti	2.5	200	4 day	2000
	Sundries				100
				total per day=	17620/-

for 572.57 m3 concrete is required proportion 1:2:4=7

cement =1/7x573 =82m3 = 82/0.35 =235 bags

sand = 2x82 =164m3

Aggregate = 4x82 =328m3

- **Bridge**

- Area of bridge = 19.56x117.36 =2295.56 square feet
- The price of bridge per one square feet = 600/-
- Total price of bridge = 2296x600
  = 1377600/-

- **Sitting area (deck)**

- Area of deck = 2x(33x29)
  = 1914 square feet
- The price of deck per one square feet = 200/-
- Total price of both deck = 382800

- **Pond**

- Area of pond = 32x18 m
- From each corner remove a square which is 2x2 m.

The area remaining

=32x18 – (4 × 2× 2)= 560m2

Take a circle of radius 2 m, cut it into four quarter circles and place the quarter circles in the missing corners of the rectangle.

The area of a circle of radius 2 m is $\pi \times 2^2$ square feet so the area of the rectangle with rounded corners is

=560+ (π x 2^2)
= 560+ 12.57
=572.57 square meter
The total area of pond= 572.57 m2

material + labour cost RS = 547420

add 1.5% water charges RS=8200

add 10% contractor's profit RS= 5474

8.1.3 Primary Health Care Centre:-

Primary Health Centers (PHCs) are state-owned rural health facilities in India, also referred to as public health centers. They are primarily single-physician clinics, typically with small surgery facilities as well. They are part of the public health system sponsored by the government in India and are the most fundamental units of this system. There are 30045PHCs currently in India.

Functions

- Health of the mother-child, including family planning
- Supply of clean water and basic sanitation
- Prevention and control of diseases locally endemic
- Collection of critical statistics and monitoring
- Preventive education
- National health program, where needed
- Programs for referrals
- Health guide recruitment, health staff, local dais and health assistants
- Basic laboratory staff

Location

In an easily accessible place, it should be centrally located. Electricity, all weather road communication, sufficient water supply and telephone facilities should be available for the selected area. In order to prevent the duplication of human resources, another health center/SC should not be built at a location where a PHCC is already located. PHCC should be outside the collection of garbage, cattle shed, field for water logging, etc. The PHCC must have an acceptable boundary wall and gate.

Area

With the entire infrastructure available, it should be well designed. With the best possible use of natural light and ventilation, it should be well lit and ventilated. The area of the plinth will range from 375 and 450 sq. Depending on whether an OT facility is picked, meters.

Entrance with Barrier free access

Barrier-free access environment according to GOI guidelines for easy access to non-ambulant (wheel-chair, stretcher), semi-ambulant, visually impaired and elderly people. Ramp as per specification, hand-railing, proper lightning, etc. must be installed in all health facilities and retrofitted in older facilities that do not have the same. For elderly and mentally disabled patients, the doorway leading to the entrance should also have a ramp that facilitates easy access. It should also have an appropriate number of wheel chairs, stretchers, etc.

Waiting Area

- This should have adequate room and seating arrangements according to patient load for waiting clients / patients.
- Posters imparting health education should be carried on the walls.
- Booklets/leaflets in the local language may be issued for the same reason in the waiting area.
- Toilets with sufficient water supply should be required for males and females separately. There should be an acceptable number of fans, coolers, tables or chairs in the waiting room.
- The patient's waiting area should have safe drinking water available.

Wards:-

- Drinking water facilities and separate clean toilets for men and women should be available.
- The ward should be conveniently accessible from the OPD to eliminate the need for a separate ward and OPD nursing staff during OPD hours.
- The nursing station should be situated in such a way that after daily clinical timings, health workers can be conveniently accessible to the OT and labor space.
- Ward cleaning etc. should be carried out at regular intervals and at times in order not to interfere with the work during peak hours and during peak hours.
- During periods of consumption, too. Ward washing, labour room, OT, and toilets should be checked periodically.

Essential requirement

Decent accommodation for 24-hrs with all the facilities. Medical officers, nursing assistants, pharmacists, laboratory technicians and other staff should be able to provide water, electricity, etc. If for any reason the accommodation can not be provided, then the employees may be paid house rent allowance, but in that case they should stay in the vicinity of PHC so that, if necessary, they are available 24 * 7.

Boundary wall/Fencing

For safety and protection, essential Boundary Wall/Gate fencing should be provided.

Environment friendly features

The PHCC should be as environmentally sustainable and energy-efficient as possible. Rain-The harvesting of water, the use of solar energy and the use of energy-efficient bulbs/appliances should be promoted.

Other amenities

Adequate water supply and water storage facilities should be made available (over head tank) with pipe water.

Computer

For Management Information System (MIS) purposes, necessary computers with an Internet connection should be given.

Proposed design data of Primary Health Care Center

- Plan – area = 22.68m X 31.68m

Furniture Required:-

- Passage area = Every side (four side) – 2 bench
- Laboratory room = 2 bed – 1 table – 2 chair – 1 cupboard – 1 bench
- Medical room = 2 table – 4 chair – 1 bench – 2 cupboard
- Maternity room = 3 bed – 1 table – 3 chair – 6 stool – 1 cupboard – 1bench – 2 main chair
- Woman admit room = 3 bed – 1 table – 2 chair – 6 stool – 1 cupboard – 1 bench – 2 main chair
- Lady dr. room & General dr. room = every room – 1 table – 1 main chair – 3 other chair – 2 cupboard – 1 bed
- Dressing room = 2 bed – 1 table – 2 main chair – 2 chair – 4 stool – 1 cupboard – 1 bench
- Reception room = 1 table – 2 main chair – 1 cupboard

❖ **We plan our primary health center here according to the following guidelines and the possibility of village area is as below.**

Figure 76 Plan of Public Health Care Centre

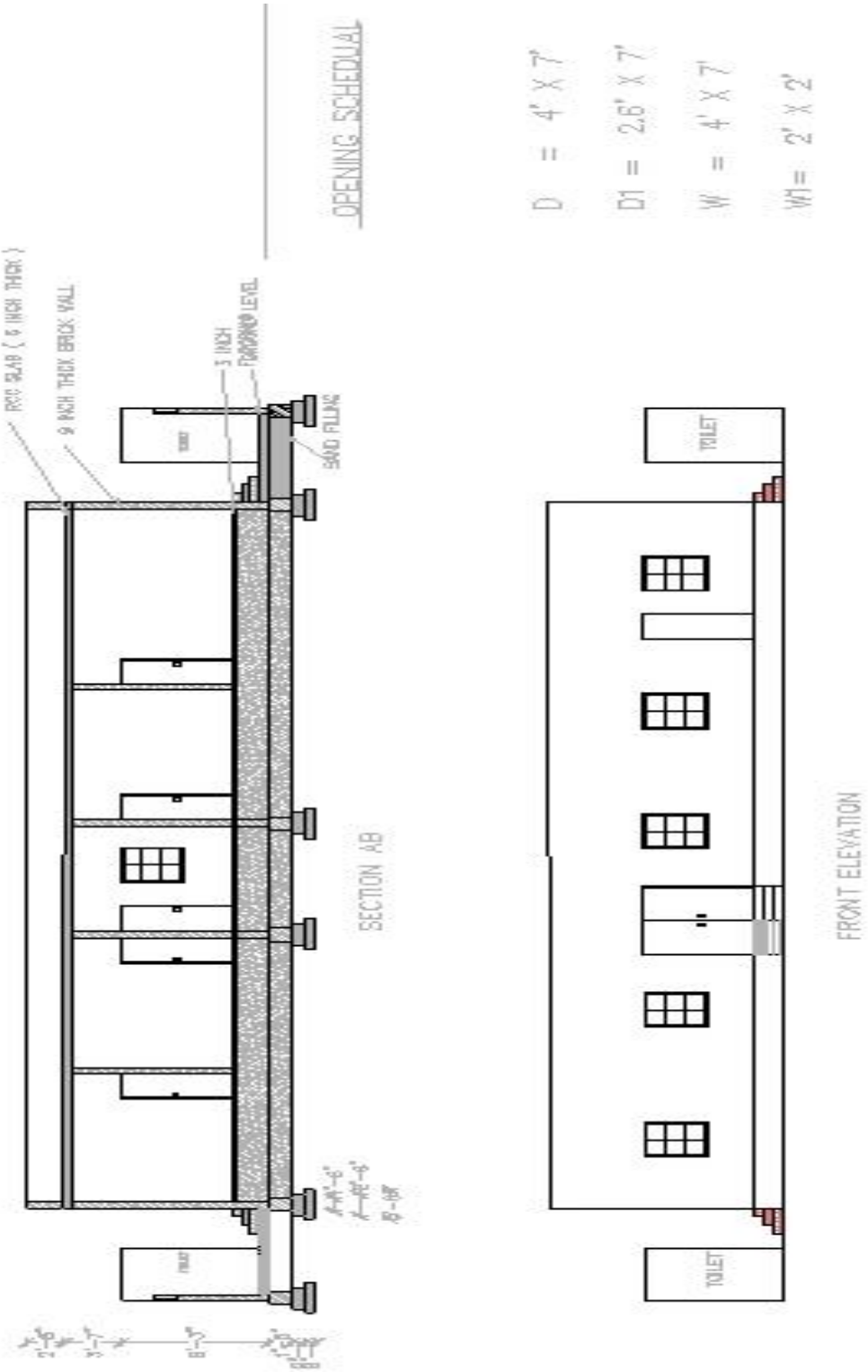


Figure 77 Elevation and Section of Public Health Care Centre

Table 34 Measurement Sheet of Public Health Care Center

SR. No.	Description	NO	L	B	H	QTY	Unit	Rate	Price
1	**Excavation**								
	wall 1 & 2	2	31.25	0.5	0.9	25.31			
	side wall 1&2	2	22.94	0.5	0.9	18.58			
	wash room	11	1.37	1.7	0.45	11.39			
						55.29	**cu.m**	85	4699.38
2	**PCC(1:4:8)**								
	wall 1 & 2	2	31.25	0.5	0.1	2.813			
	side wall 1&2	2	22.94	0.5	0.1	2.065			
	Column					0			
	wash room	11	1.37	1.7	0.1	2.53			
						7.409	**cu.m**	3000	22226.58
3	**Brickwork**								
	compound wall								
	wall 1&2	2	31.25	0.5	0.45	12.66			
		2	31.25	0.2	1.68	24.15			
	side wall					0			
	wall 1& 2	2	22.48	0.5	0.45	9.1			
		2	22.48	0.2	1.68	17.37			
	Washroom					0			
	1 to 6	8	1.68	0.2	2.82	5.69			
	wall	6	1.34	0.2	2.82	3.4			
	Deduction					0			
	Door	-6	0.76	0.2	2.1	-1.44			
	Ventilation	-6	0.6	0.2	0.6	-0.32			
						0			
	Store Room	2	4.88	0.2	2.6	5.84			
		1	4.57	0.2	2.6	2.73			
		1	4.57	0.2	2.6	1.78			
	Deduction					0			
	Door	-1	1	0.2	2.1	-0.48			
						0			
	General dr. room	2	4.57	0.2	2.6	5.47			
		1	5.06	0.2	2.6	3.03			
	Toilet	1	1.68	0.2	2.93	0.74			
		1	1.34	0.2	2.93	0.59			
	Deduction					0			

	Window	-1	1.22	0.2	1.22	-0.34			
	Ventilation	-1	6	0.2	0.6	-0.83			
	door(D)	-1	1	0.2	2.1	-0.48			
	(D1)	-1	0.76	0.2	2.1	-0.24			
						0			
	Reception Room	2	3.66	0.2	2.6	4.38			
		1	5.06	0.2	2.6	3.03			
		1	1.83	0.2	2.93	0.8			
	deduction					0			
	Door	-1	1	0.2	2.1	-0.48			
	Window	-1	1.22	0.2	1.22	-0.34			
						0			
	Lady Dr. Room	2	4.8	0.2	2.6	5.74			
		1	4.57	0.2	2.6	1.78			
	Toilet	1	1.68	0.2	2.93	0.74			
		1	1.34	0.2	2.93	0.59			
	Deduction					0			
	Window	-1	1.22	0.2	1.22	-0.34			
	Ventilation	-1	6	0.2	0.6	-0.83			
	Door (D)	-1	1	0.2	2.1	-0.48			
	(D1)	-1	0.76	0.2	2.1	-0.24			
	Gap	-1	1	0.2	2.6	-0.39			
						0			
	Maternity Room	2	6.4	0.2	2.6	7.65			
		1	4.57	0.2	2.6	2.73			
	Toilet	1	1.68	0.2	2.93	0.74			
		1	1.34	0.2	2.93	0.59			
	Deduction					0			
	Window	-1	1.22	0.2	1.22	-0.34			
	Ventilation	-1	6	0.2	0.6	-0.83			
	Door (D)	-1	1	0.2	2.1	-0.48			
	(D1)	-1	0.76	0.2	2.1	-0.24			
						0			
	Admit Room &women admit room	4	5.03	0.2	2.6	12.03			
		4	4.57	0.2	2.6	10.93			
	Toilet	2	1.68	0.2	2.93	1.48			
		2	1.34	0.2	2.93	1.18			
	Deduction					0			

	Window	-2	1.22	0.2	1.22	-0.68			
	Ventilation	-2	6	0.2	0.6	-1.66			
	Door (D)	-2	1	0.2	2.1	-0.97			
	(D1)	-2	0.76	0.2	2.1	-0.48			
						0			
	Dressing & Medical Room	4	4.8	0.2	2.6	11.48			
		2	4.57	0.2	2.6	5.47			
	Deduction					0			
	Window	-2	1.22	0.2	1.22	-0.68			
	Door (D)	-2	1	0.2	2.1	-0.97			
						0			
	Laboratory Room	2	4.8	0.2	2.6	5.74			
		1	4.57	0.2	2.6	2.73			
	Deduction					0			
	Window	-1	1.22	0.2	1.22	-0.34			
	Door (D)	-1	1	0.2	2.1	-0.48			
						0			
	Entry	1	9.83	0.2	2.6	5.88			
	Deduction					0			
	window	-2	1.22	0.2	1.22	-0.68			
	Main door	-1	2.44	0.2	2.1	-1.18			
						0			
	Near step	2	1.22	0.2	2.6	1.46			
	Deduction					0			
	Gap	-2	1.22	0.2	2.1	-1.18			
						161.25	**cu.m**	3500	564369.2
4	**plaster(15mm)**								
	toilet(1 to 6)	12	1.52		2.82	51.44			
		12	1.34		2.82	45.35			
	Deduction					0			
	Door	-3	0.76		2.1	-4.79			
	Ventilation	-3	0.6		0.6	-1.08			
						0			
	store room	2	4.42		2.93	25.9			
		2	4.57		2.93	26.78			
	Ceiling	1	4.42		4.57	20.2			
	Deduction					0			

	Door	-0.5	1		2.1	-1.05			
						0			
	general dr. room & lady dr.room					0			
	Ceiling	2	4.57		4.57	41.77			
	Wall	8	4.57		2.93	107.12			
	Toilet	4	1.65		2.93	19.34			
		4	1.34		2.93	15.7			
	Deduction					0			
	Window	-1	1.22		1.22	-1.49			
	door(D)	-1	1		2.1	-2.1			
	(D1)	-1	0.76		2.1	-1.6			
	Ventilation	-1	0.6		0.6	-0.36			
	Gap	-0.5	1		0.6	-0.3			
						0			
	Reception room					0			
	Ceiling	1	3.66		4.57	16.73			
	Wall	2	3.66		2.93	21.45			
		2	4.57		2.93	26.78			
	partition wall	2	1.83		2.93	10.72			
	Deduction					0			
	Window	-0.5	1.22		1.22	-0.74			
	Door	-0.5	1		2.1	-1.05			
						0			
	Maternity Room					0			
	Ceiling	1	6.17		4.57	28.2			
	Wall	2	6.17		2.93	36.16			
		2	4.57		2.93	26.78			
	Toilet	2	1.65		2.93	9.67			
		2	1.34		2.93	7.85			
	Deduction					0			
	Window	-0.5	1.22		1.22	-0.74			
	door(D)	-0.5	1		2.1	-1.05			
	(D1)	-0.5	0.76		2.1	-0.8			
	Ventilation	-0.5	0.6		0.6	-0.18			
						0			
	Admit & Women Admit room					0			
	Ceiling	2	4.57		4.57	41.77			

	Wall	8	4.57		2.93	107.12			
	Toilet	4	1.65		2.93	19.34			
		4	1.34		2.93	15.7			
	Deduction					0			
	Window	-1	1.22		1.22	-1.49			
	door(D)	-1	1		2.1	-2.1			
	(D1)	-1	0.76		2.1	-1.6			
	Ventilation	-1	0.6		0.6	-0.36			
						0			
	dressing, Medical& Laboratory room					0			
	Ceiling	3	4.57		4.57	62.65			
	Wall	12	4.57		2.93	160.68			
	Deduction					0			
	Window	-1.5	1.22		1.22	-2.23			
	door(D)	-1.5	1		2.1	-3.15			
						0			
	Waiting Area					0			
	Ceiling					0			
	near step	2	1.22		4.8	11.71			
	In front of entry	1	10.82		9.83	106.36			
		1	6.02		4.8	28.9			
	Wall	2	24.23		2.93	141.99			
		2	10.82		2.93	63.41			
	Deduction					0			
	Window	-1.5	1.22		1.22	-2.23			
	Door	-4.5	1		2.1	-9.45			
	main door	-0.5	2.44		2.1	-2.56			
	Gap near step	-1	1.22		2.1	-2.56			
						1252.5	**sq.mt**	140	175349.7
5	**20mm plaster**								
	Building								
	Wall	2	24.69		4.35	214.8			
		2	16.08		4.35	139.9			
	Deduction					0			
	Window	-5	1.22		1.22	-7.44			
	main door	-0.5	2.44		2.1	-2.56			
	Ventilation	-0.25	0.6		0.6	-0.09			

	Gap	-1	1.22		2.1	-2.56			
						0			
	terrace parapet					0			
	Wall	2	24.23		1.23	59.61			
		2	15.62		1.23	38.43			
						0			
	compound wall	2	107.52		2.44	524.7			
	top of c.w	1	107.52		0.23	24.73			
						0			
	Toilet					0			
	Wall	4	1.65		3.12	20.59			
		2	4.63		3.12	28.89			
	Deduction					0			
	Door	-3	0.76		2.1	-4.79			
	Ventilation	-3	0.6		0.6	-1.08			
						1033.12	**sq.mt**	207	213855.1
6	**interior paint**					**1252.5**	**sq.mt**	85	106462.3
	quantity of 15 mm plaster								
7	**exterior paint**					**1033.12**	**sq.mt**	60	61986.98
	quantity of 20 mm plaster								
8	**Rcc Lintel**								
	D	10	1.46	0.2	0.13	0.42			
	D1	11	1.06	0.2	0.15	0.26			
	main door	1	2.9	0.2	0.13	0.08			
	W	10	1.68	0.2	0.13	0.48			
	Gap	2	1.68	0.2	0.13	0.1			
						1.35	**cu.m**	5000	**6725.375**
								Total	**1155675**

PHC availability is needed in the village. It offers more convenience for individuals to provide the primary care needed. Ultimately, therefore, primary care can be conveniently given and good health treatment can be carried out.

8.1.4 Affordable Cost Toilet with Bathroom

A toilet is a sanitary installation used for human urine and waste to be collected or discarded. Various porcelain flush toilets are common in developed countries: seats are usually used in the west while porcelain flush toilets in eastern Asia are common. They are connected in most urban areas to a sewer system and to septic tanks in less constructed areas. Dry toilets such as pit latrines and toilets remain common in many developing countries, especially in rural areas. Dry toilets are usually placed in outhouses, e.g. not indoors, and are perfectly placed outside potable water and bathing water sources.

Toilets with bathroom Feature Specifications for Rural India:

- Low number of machinery,
- Lesser maintenance
- Accessible locally & easily.
- Expense Efficient
- Hygienic to the
- Convenient to the Indian theme
- Basic approach / Component Criteria.

Important characteristics

1) Provides privacy, particularly important for women and adolescent girls, for ablution.

2) In the bathroom, it provides water storage, bathing and washing facilities.

3) Promotes bathroom waste water in the kitchen garden.

4) Multifunctional composition

Combined Low – cost toilet with bath

Proposed design data

- Plan area = 2.43m * 2m
- Shokpit = 1m (round shape)
- Bucket = 2 = 1 – toilet , 1 – bathroom
- toilet sheet
- Tape = 2 (1 bath & 1 – toilet)
- Water tank = 1 – (500 litre)
- Disposal waste collect right side of toilet in shock peat in diameter
- Shock peat capacity collect human excreta 500m
- Required Water for toilet & bath for personal = 5 litre (toilet), 15 litre (bath)

We design a toilet attached bathroom here at the lowest rate possible and try to provide more facilities as modern toilet.

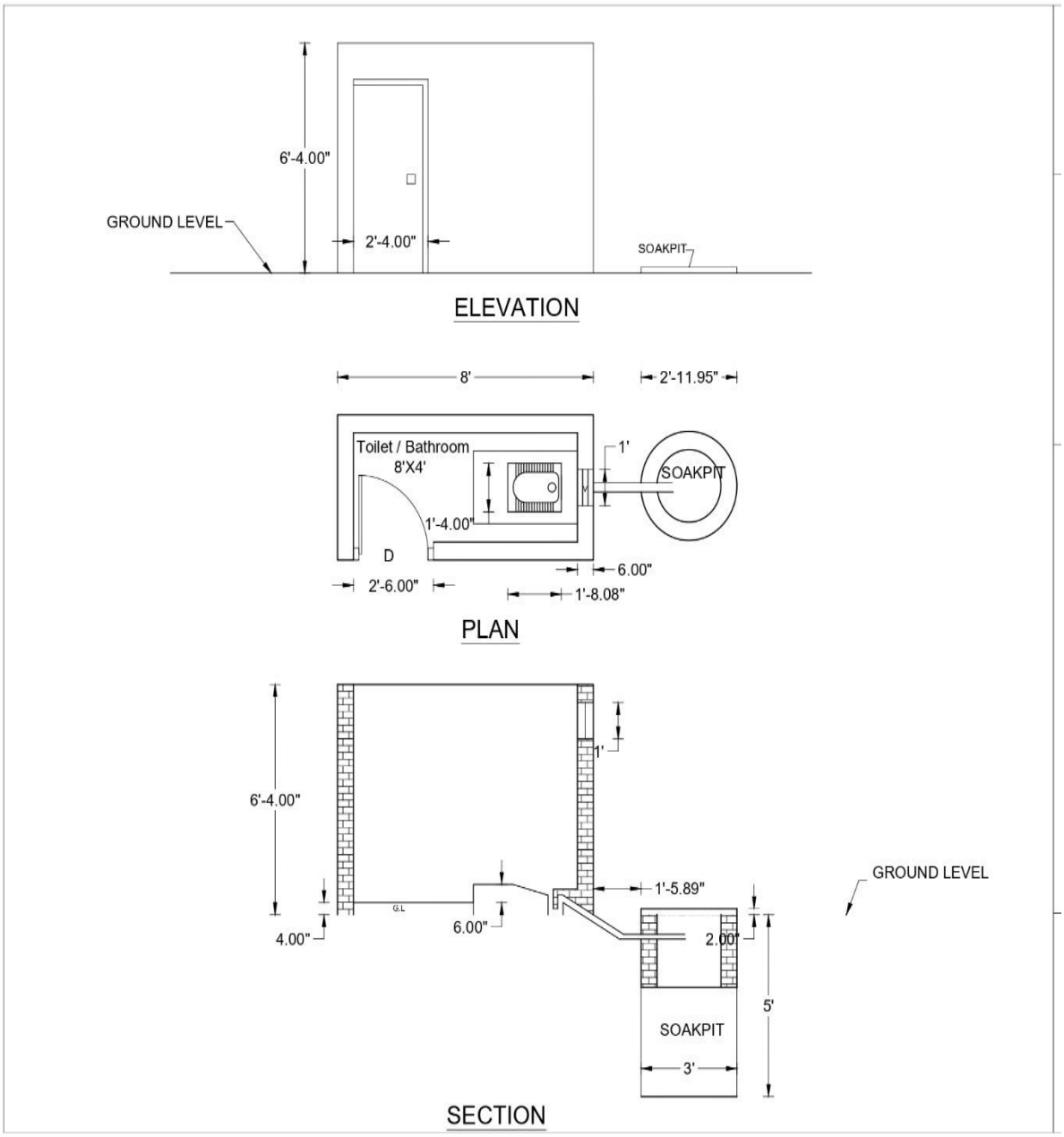


Figure 78 Plan Elevation and Section of Affordable Cost Toilet with Bathroom

Table 35 Measurement Sheet of Affordable Cost Toilet with Bathroom

Sr.No.	Detail	Quantity	Unit	Rate	Total
1	concrete block l*b*h=16*4*8	130	Per block	25	3250
2	cement beg	2	per beg	345	690
3	w/c with trap -21 inch	1	per trap	325	325
4	PVC pipe 4 inch dia.	1.5	Per meter	100	150
5	door (steel fabricate)	1	no.	900	900
6	sand 50 cub. Feet	60	Feet	50	3000
7	Asbestoses	1	no.	400	400
8	G.I. pipe	2	Meter	75	150
9	cement sheet	L.S.			500
10	labour cost	1.5	Day	500	750
11	labour cost	1.5	Day	300	450
12	Bhisti	1	Day	100	100
13	transportation cost	L.S.			500
	Total				**11,165**

So the final cost of the attached affordable cost toilet with bathroom is 11,165 rs. That is more feasible for a low-cost toilet in the village.

8.1.5 Automated teller machine (ATM)

An ATM or cash machine (in British English) is an electronic device for telecommunication, which, at any time and without the need to have direct interaction with bank employees, enables customers of financial institutions to carry out financial transactions, such as cash withdrawals, deposits, transferring money or requesting information on accounts.

ATMs are convenient, allowing consumers to perform quick self-service transactions such as deposits, cash withdrawals, bill payments, and transfers between accounts. Fees are commonly charged for cash withdrawals by the bank where the account is located, by the operator of the ATM, or by both.

- **Types of ATMs**

There are two primary types of ATMs. Basic units only allow customers to withdraw cash and receive updated account balances. The more complex machines accept deposits, facilitate line-of-credit payments and transfers, and access account information.

Analysts anticipate ATMs will become even more popular and forecast an increase in the number of ATM withdrawals. ATMs of the future are likely to be full-service terminals instead of or in addition to traditional bank tellers.

An ATM is typically made up of the following devices:

- CPU (to control the user interface and transaction devices)
- Magnetic or chip card reader (to identify the customer)
- a PIN pad for accepting and encrypting personal identification number EPP4 (similar in layout to a touch tone or calculator keypad), manufactured as part of a secure enclosure
- Secure crypto processor, generally within a secure enclosure
- Display (used by the customer for performing the transaction)
- Function key buttons (usually close to the display) or a touchscreen (used to select the various aspects of the transaction)
- Record printer (to provide the customer with a record of the transaction)
- Vault (to store the parts of the machinery requiring restricted access)
- Sensors and indicators

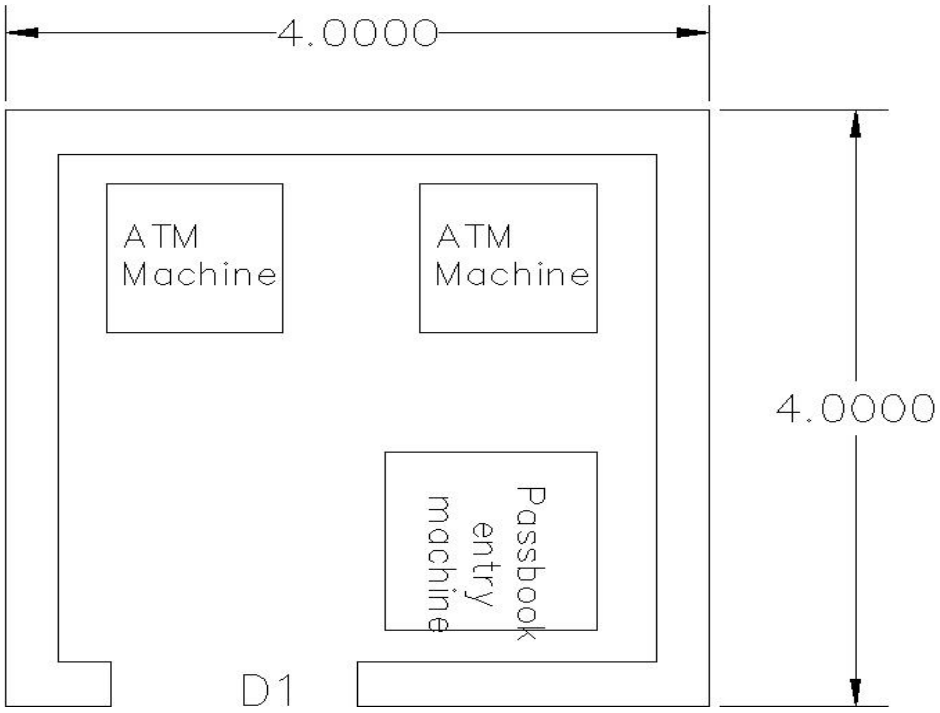


Figure 79 Plan of ATM

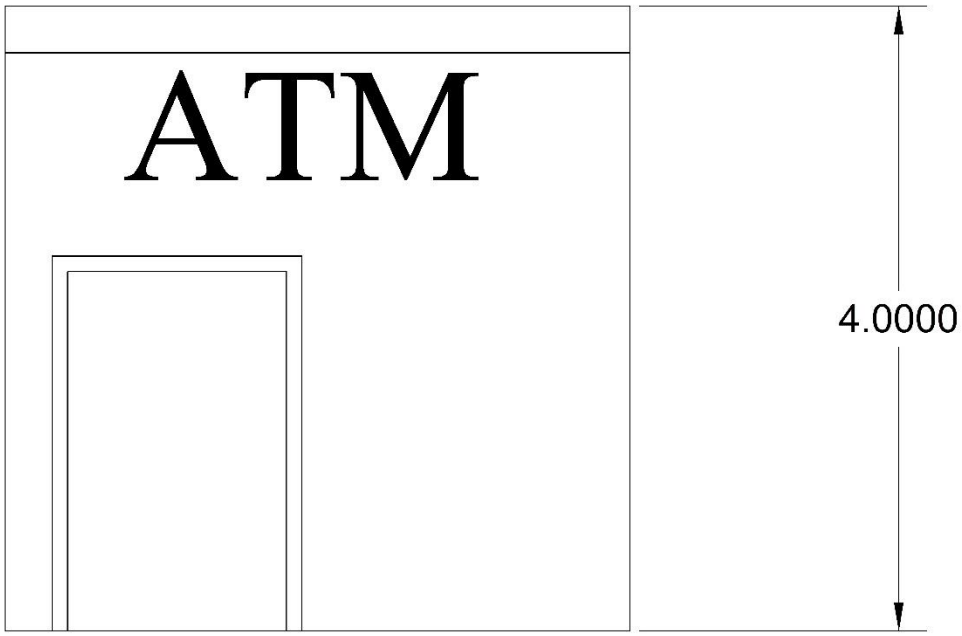


Figure 80 Elevation of ATM

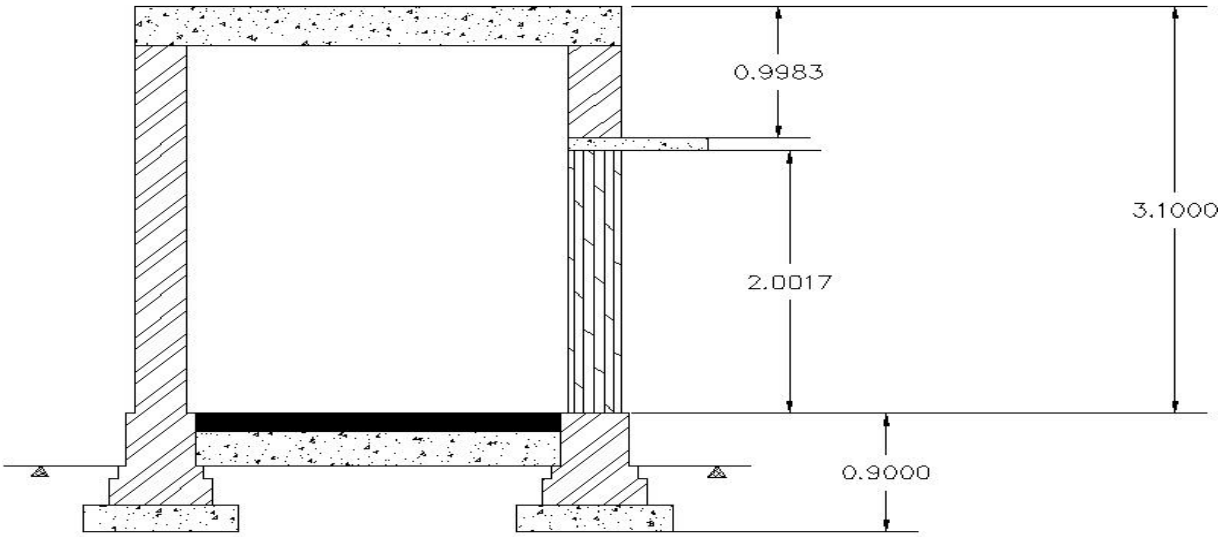


Figure 81 Section of ATM

Proposed of design

Size of ATM 4m x 4m

CENTER LINE METHOD

total L= (4x(3.4+0.15+0.15)

L=14.8M

Estimation of ATM

Table 36 Measurement sheet of ATM

Item no.	Description of item	NO. Of quantity	L	B	H	QUANTITY IN M3
1	EXCAVATION IN FOUNDATION	1	14.8	0.9	0.5	11.988
2	B.B.C.C WORK IN FOUNDATION	1	14.8	0.9	0.2	2.664
3	BRICK WORK IN FOUNDATION AND PLINTH					
	1st STEP	1	14.8	0.6	0.2	1.776
	2nd STEP	1	14.8	0.5	0.1	0.74
	3rd STEP	1	14.8	0.4	0.4	2.368
						TOTAL=4.884
4	EARTH FILLING					
	1ST FOOTING	1	14.8	0.6	0.2	1.776
	2ND FOOTING	1	14.8	0.5	0.1	0.74

	3RD FOOTING	1	14.8	0.4	0.4	2.368
						TOTAL=4.884
4	DPC. WORK	1	14.8	0.4		5.92
5	BRICK WORK IN SUPER STRUCTURE	1	14.8	0.3	3.1	13.764
6	DOOR	1	1.6	0.3	2.4	1.152
7	LINTEL	1	1.6	0.3	0.3	0.144
8	DEDUCTION OF DOOR & LINTEL					
	TOTAL BRICK WORK					13.764-1.152-0.144
	TOTAL BRICK WORK					12.468
9	R.C.C SLAB	1	4	4	0.2	3.2
10	PLASTERING WORK					
	INSIDE PLASTER	1	3.4	3.4	3.1	35.836
	OUTSIDE PLASTER	1	4	4	3.1	49.6
11	DEDUCTION DOOR IN PLASTERING					
	TOTAL INSIDE PLASTER= INSIDE PLATER-DOOR					
	TOTAL INSIDE PLASTER					35.836-1.152
	TOTAL INSIDE PLASTER=34.684M2					
	TOTAL OUTSIDE PLASTER=OUTSIDE PLASTER-DOOR+LINTEL					
	TOTAL OUTSIDE PLASTER=49.6-1.152+0.144					
	TOTAL OUTSIDE PLASTER=48.592M2					
12	PAINTING IN WALL					
	INSIDE PAINTING	1	3.4	3.4	3.1	35.836
	OUTSIDE PAINTING	1	4	4	3.1	49.6
13	DEDUCTION DOOR IN PAINTING					
	TOTAL INSIDE PAINTING= INSIDE PAINTING-DOOR					
	TOTAL INSIDE PAINTING					34.684M2
	TOTAL OUTSIDE PAINTING=OUTSIDE PAINTING-DOOR+LINTEL					
	TOTAL OUTSIDE PAINTING					48.592M2

Table 37 Costing of ATM

SR. NO.	DESCRIPTION OF ITEM	UNIT	QUANTITY	RATE	PER	ESTIMETED COST
1	excavation in foundation	m3	11.988	205/-	m3	2520/-
2	B.B.C.C. In foundation	m3	2.664	2610/-	m3	6955/-
3	brick work up to GL	m3	4.884	3200/-	M3	15630/-
4	earth filling	m3	4.884	300/-	m3	1470/-
5	brick work from GL to plinth level	m3	2.368	3000/-	m3	7110/-
6	D.P.C	m2	5.92	80/-	m2	480/-
7	brick work in super structure	m3	12.468	3500/-	m3	43640/-
8	R.C.C slab	m3	3.2	10000/-	m3	32000/-
9	12mm thick inside plaster	m2	34.684	160/-	m2	5550/-
10	20mm thick outside plaster	m2	48.592	250/-	m2	12150/-
11	flooring	m2	16	750/-	m2	12000/-
12	skirting	m	15	220/-	m	3300/-
13	paining	m2	83.276	300/-	m2	24985/-
14	door frame	m3	0.54	185/-	m3	100/-
					TOTAL=	1,67,890/-
				ADD 3% CONTIGENCIES		5040/-
			ADD 2% WORK CHARGE ESTABLISHMENT			3360/-
					TOTAL=	176300/-

So the final cost of the ATM is 176300 rs.

8.1.6 Acoustic Auditorium

Auditorium acoustics According to Literature review:

This Special Issue on the Auditorium Acoustics topic follows an international conference held in October 2018 at the new Elbphilharmonie in Hamburg. The conference was attended by about 200 delegates from all parts of the world and 83 papers were presented on a wide range of topics in auditorium acoustics. The success of the conference is that it brought together from around the world all the latest thinking on auditorium acoustics. A variety of papers considered of particular significance have been gathered in this Special Issue 'Auditorium Acoustics' in Acoustics to document this performance.

The conference also included an orchestral rehearsal at the new concert hall, leading to an insightful discussion on the relative merits of the "shoebox" and "vineyard terrace" styles of hall.

Two of the papers in this special issue include an exemplary historical history that explains the major groundbreaking work in the second half of the twentieth century in auditorium acoustics, such as that done by Beranek, Marshall, and Barron. His personal friend Jerry Hyde introduced Beranek's thinking, while Barron himself wrote research work in the 1960s, including that of Marshall and Barron.

Proposed of Design

Size of Auditorium = 24m * 12m

Chair = 200

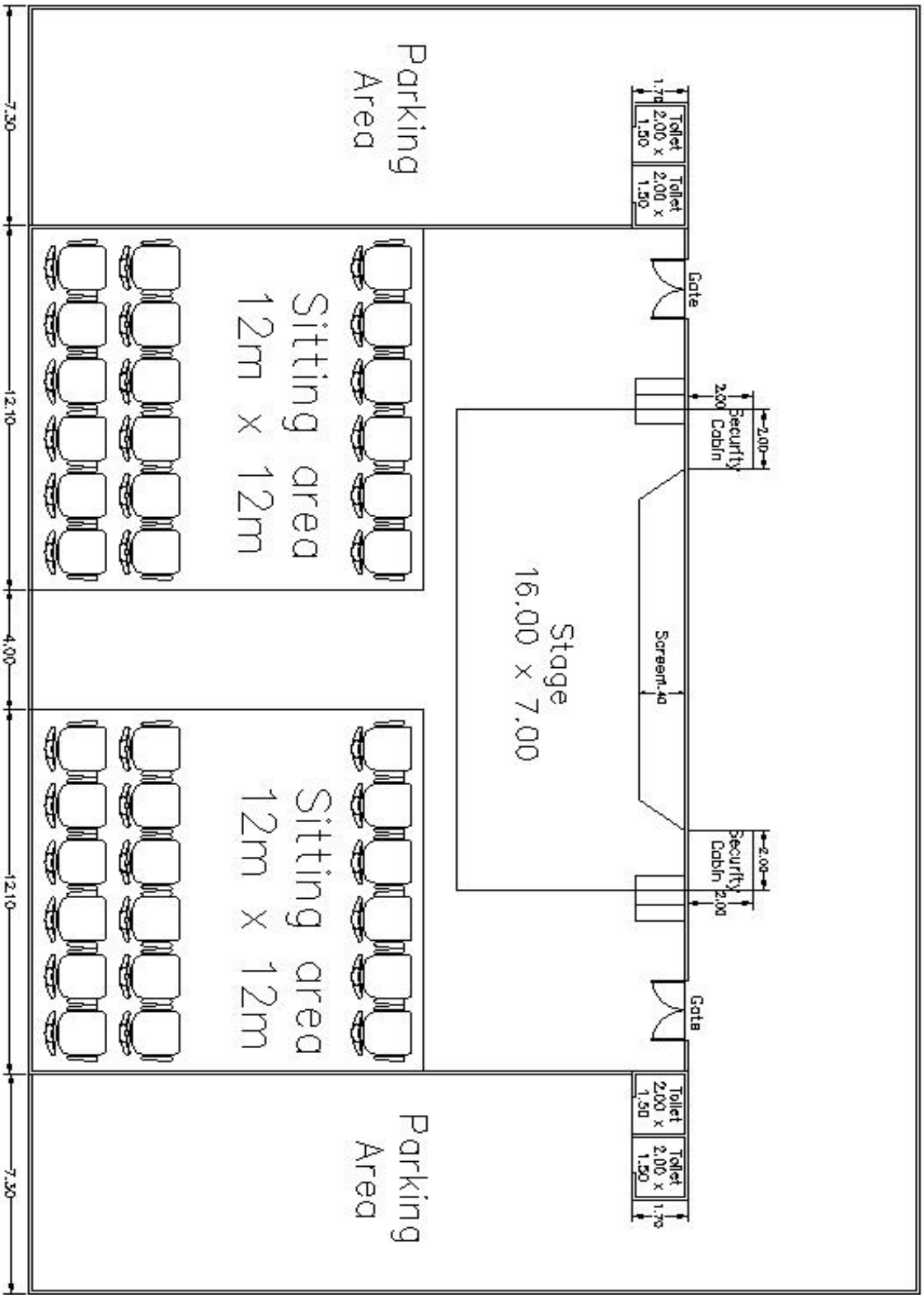


Figure 82 Design of Acoustic Auditorium

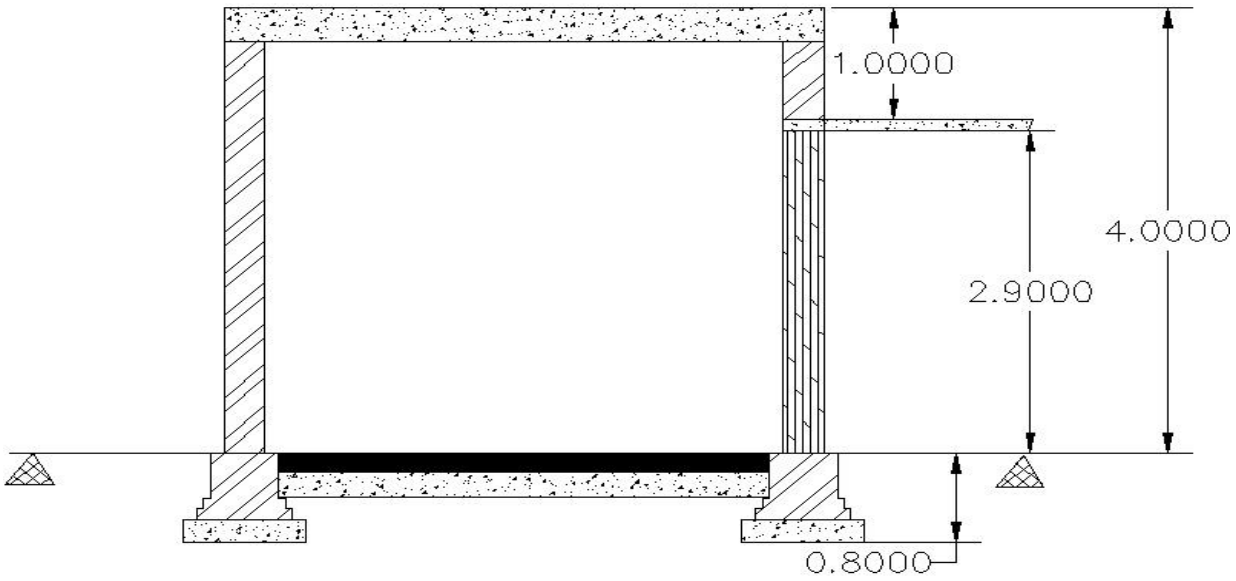


Figure 83 Section of Acoustic Auditorium

Figure 84 Elevation of Acoustic Auditorium

Table 38 Measurement sheet of Acoustic Auditorium

Sr. No.	Particulars	Nos	L	B	H	QTY	Unit	Rate	Price
1	Earthwork Excavation in Foundation	1	72	0.9	1.4	90.72	Cum	86	7802
2	C.C. (1:4:8) bed for foundation	1	72	0.90	0.30	19.44	Cum	3000	58320
3	Brick work in foundation & Plinth								
	1st Footing	1	72	0.60	0.30	12.96	Cum		
	2nd Footing	1	72	0.50	0.30	10.8			
	Plinth wall	1	72	0.40	0.60	8.64			
					Total	32.4	Cum	5300	171720
4	Brickwork in super structure	1	72	0.30	4	86.4	Cum	3530	304992
5	Deduction for Door	2	2	0.3	2.5	3	Per nos	2000	4000
					Deduction(-)	83.4			
6	Chair	400					Per nos	200	80000
7	Acoustic Form Sheet	1				83.4	Cum	1100	91740
8	Exterior Paint Quantity of 20mm Plaster	4				288	Cum	60	17280
9	Portable Toillet	4	2	1.5			Per nos	20000	80000
								Total	**8,15,854**

So the final cost of the Acoustic Auditorium is 8,15,854 Rs.

8.1.7 Solar System for Common Public Place (Garden) :-

Solar Rooftop Folding :-

Save material, Energy, Surface and money.

Folding roof is applied over infrastructure surface.

The main component in Solar Roof top system are :-

1. Solar panels
2. Inverter battery
3. Charge controller
4. Electrical wires, switch gears.

Hybrid solar system :-

Solar hybrid system has three connected load sources (solar energy, solar battery, government electricity). The solar hybrid system has both solar and solar grid features.

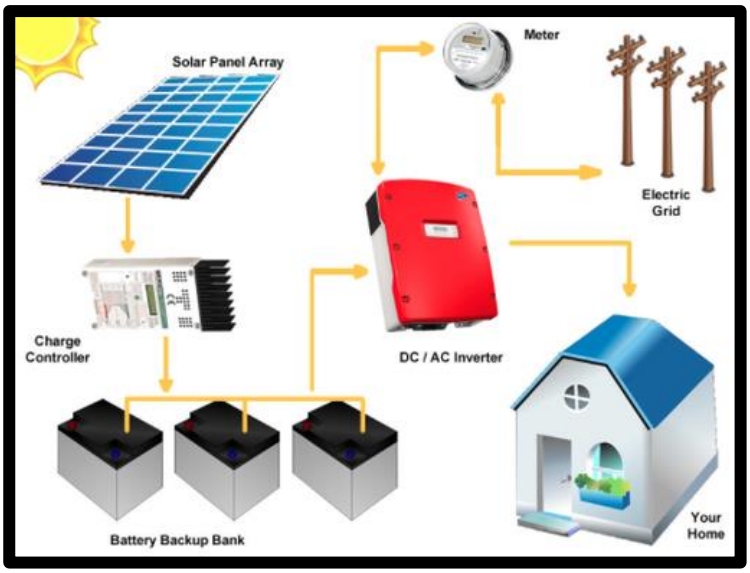


Figure 85 Power system working system diagram

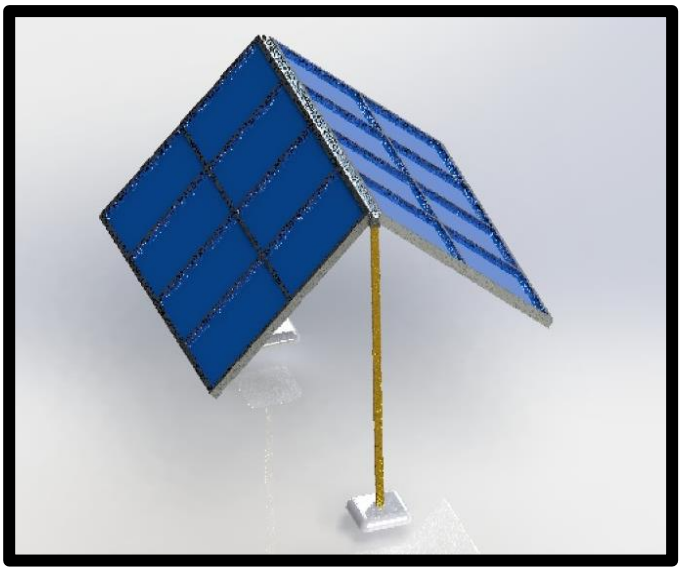


Figure 86 Solar Roof top Folding System

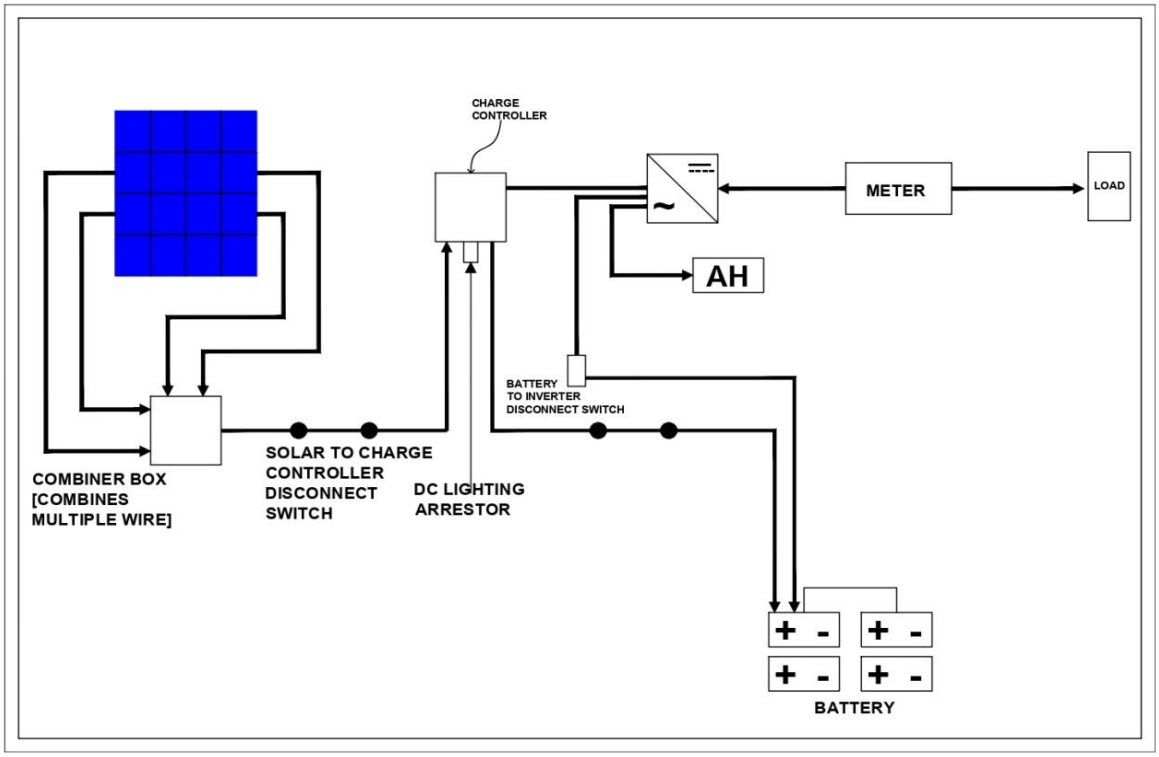


Figure 87 Wiring Diagram of solar system for common public place (Garden)

Figure 88 demo of solar system for common public placee (Garden)

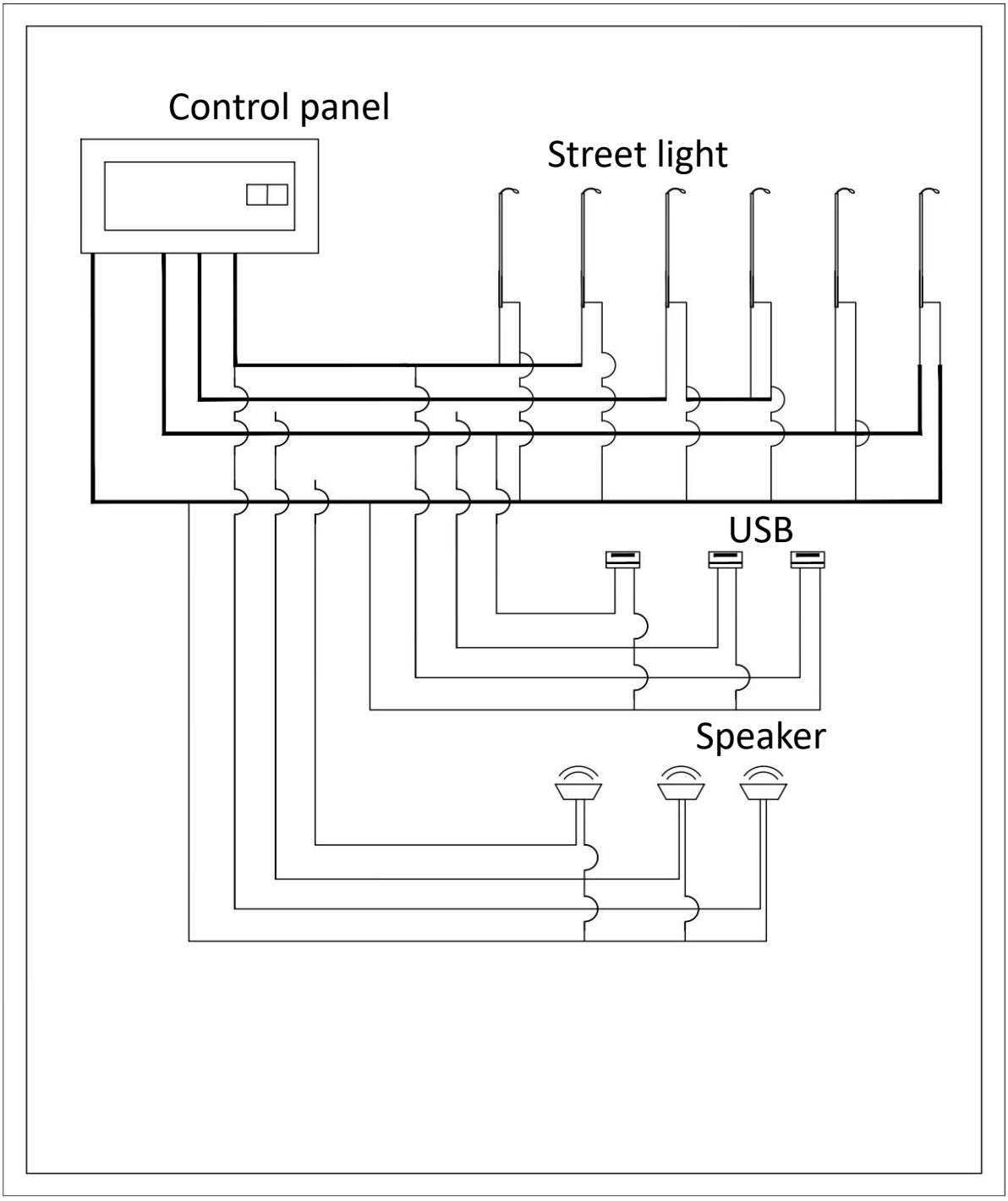


Figure 89 Street light, USB and speaker wiring Diagram of solar system for common public place (Garden)

Power Consumption:-

Table 39 Power Consumption

Sr. No.	Appliances	Nos(a)	Watt(b)	a*b	Hours (c)	a*b*c
1	Street Lights	75	75	5625	12	67,500
2	Decorative Light	8	70	560	12	6720
3	Land Scape Light	48	30	1440	12	17280
4	Speaker	4	100	400	4	1600
5	Pond shower Lights	2	100	200	8	1600
				Total = 8225		Total = 94,700

Estimation of solar system Common Public Place (Garden) :-

Table 40 Measurement Sheet of solar system common public place

Sr. No.	Item Name	Per Item	Nos	Total Amount
1	LED Lights	750	75	56,250
2	Pole Price	5000	75	375000
3	Decorative Lights	800	48	38400
4	Speakers	8000	4	32000
5	Pond Shower Lights	5000	2	10000
				Total = 5,11,650

Table 41 Hybrid 10 kW Solar System

Particulars	Description
Solar power Plant	10 Kw
Solar Panel in Watt	335 watt
Solar panel Qty	30 nos.
Hybrid Solar Inverter	10 kW
Solar battery	10 nos.
Solar Structure	10 kW
Junction Box	1 Nos
DC Cable	90 Mtr
AC Cable	60 Mtr
Space required	60 sq. mt
Solar Accessories	Fasteners, Cable Tie , Crimping Tool, Earthing Kit, Lighting Arrestor
Total Price	Rs.5,13,595(Including Installation Charges)

Average generation: 40 units per day

8.1.8 GSM based motor speed control

In this project we are going to make a DC motor control circuit whose speed and rotational direction can be set / controlled via SMS commands. By sending appropriate SMS commands to the circuit, you can control a brushed DC motor of 6V to 12V rated up to 2A. We can set 255 different levels of speed in both the directions.

Motors are more frequently used in our daily life than you might think. From irrigation / water pump motor to vibration motor in your smartphone

Electric motors did a great help to human kind and pushed us light years ahead from an era where man power decided health of an economy to an automated zero man economy, of course with a smart electronic brain. Turning ON and OFF motor is not enough for many applications; we need to precisely control the rotational speed and the direction of motors. To do this we are using a method called PWM which we will learn in detail.

For many applications we might need to start or stop / control speed of motors remotely, so we introduced GSM in the circuit so that we can control the DC motor anywhere in the world.

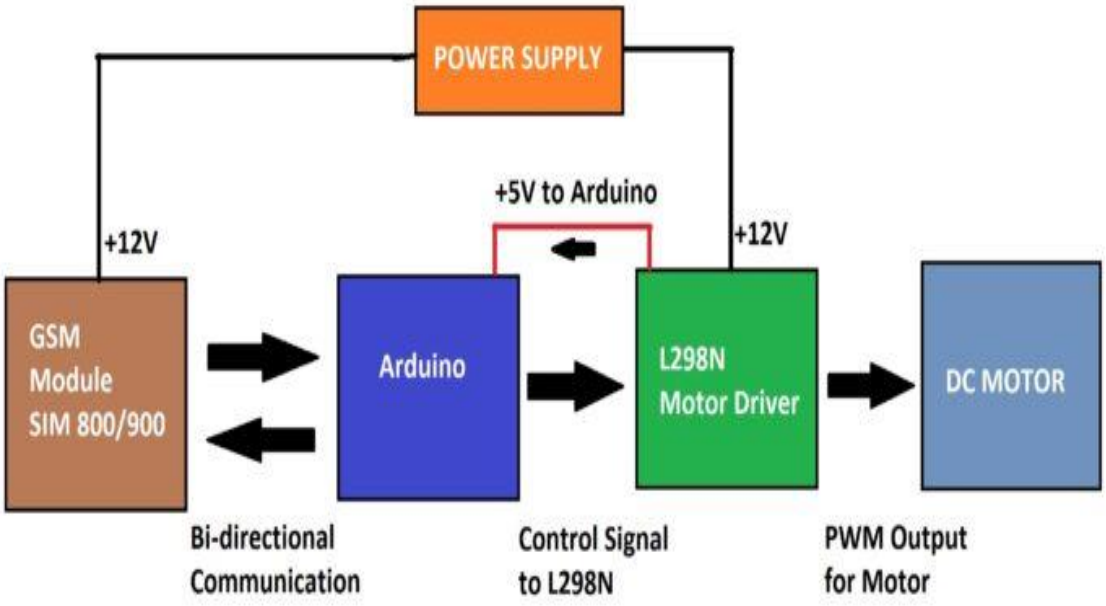


Figure 90 Block Diagram of GSM Dc Motor Speed Control

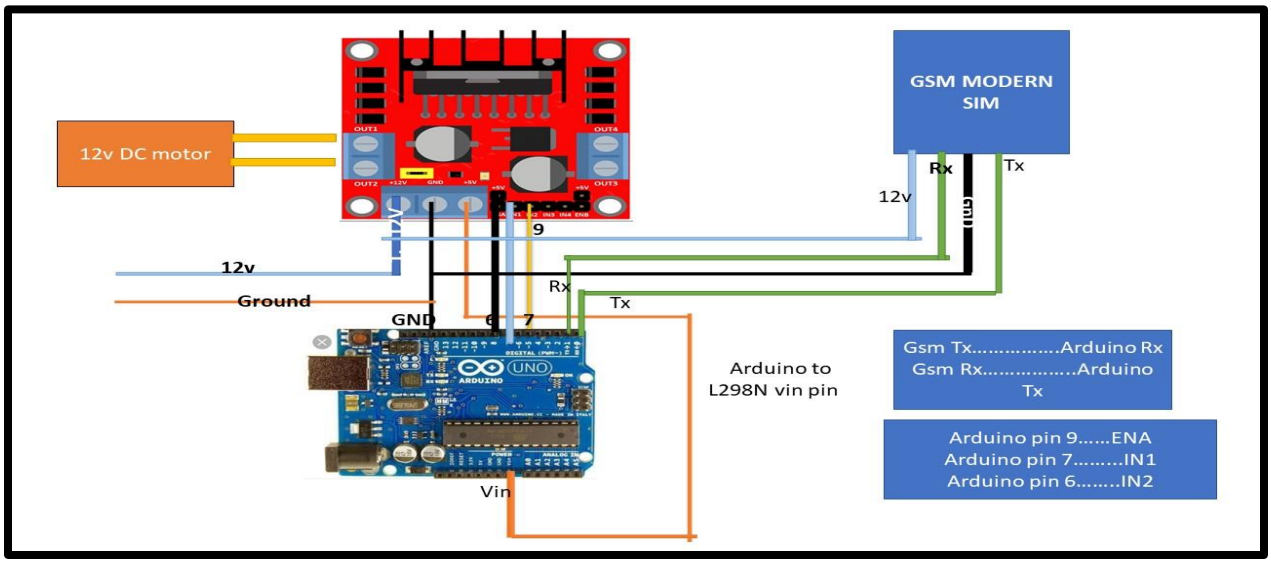


Figure 91 Circuit diagram of GSM based motor speed control

GSM based

The GSM based motor control circuit consists of a GSM modem for sending and receiving SMS, an Arduino board will interpret the received SMS command and gives out control signal to L298N DC motor driver which drives the motor at the desired speed and direction. The 12V power supply is shared by L298N driver and GSM module SIM 800 / 900. 5V for Arduino is derived from L298N driver (you can spot this on block diagram) which has built-in 5V regulator which is fed to VIN pin of Arduino.

The Tx of the GSM is connected to Rx of Arduino and Rx of the GSM is connected to Tx of Arduino. Pin #9 is the speed control pin which is connected to ENA of the L298N and pins 7 and 6 are direction control which is connected to IN1 and IN2 of L298N.

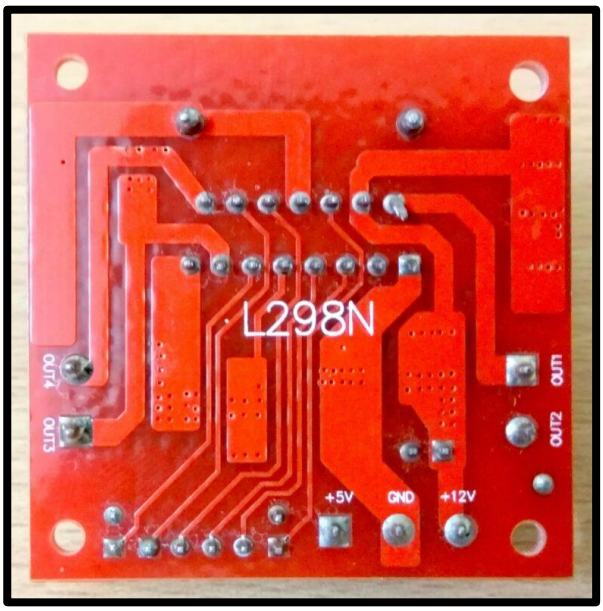


Figure 92 Back side of L298N Mortar Driver

What is L298N Module?

L298N is a dual H-bridge DC motor driver module, meaning this module can control two DC motors simultaneously, the main IC in the module has two H-bridges for controlling two DC motors independently.

It has control pins for each motor, through which we can control speed and direction of each motor independently. The L298N can operate from 6V to 12V and can control two motors of 6V to 12V. L298N module can handle motors rated up to 2A. We are going to use only one motor in this project.

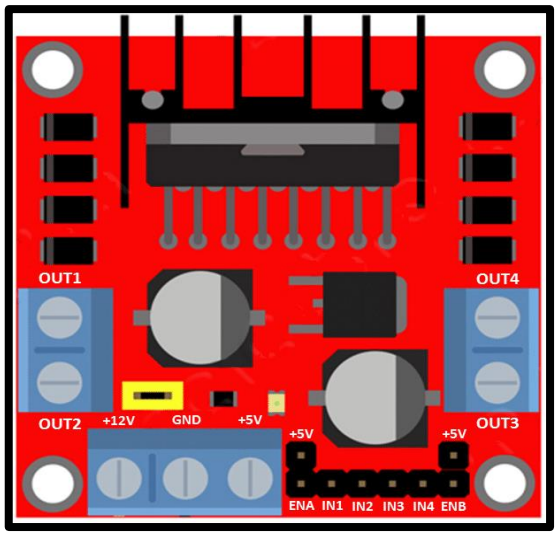


Figure 93 Front side of L298N Mortar Driver Module

Functions of each pins in L298N:

- There are two motor outputs on two sides of the module, OUT1 and OUT2 controls one motor and OUT3 and OUT4 control another motor.
- There is a +12V input, a ground and a +5V output (Yes, 5V output) terminals. We need to connect 6-12V input to +12V and GND terminals. 5V output terminal can be used to power Arduino and other 5V devices if needed.
- Beside these three terminals there are bunch of male connectors which controls the direction and speed of the motors. By connecting ENA to 5V this will enable the motor at OUT1 and OUT2 and by connecting ENA to GND, OUT1 and OUT2 will be disabled, similarly for ENB which is associated with OUT3 and OUT4.
- IN1 and IN2 are the direction control for motor at left hand side (out1, out2). By applying +Ve at IN1 and –Ve at IN2 the motor rotates in a direction, by reversing the applied signal polarity at IN1 and IN2 will reverse the rotating direction of the motor at OUT1 and OUT2.
- Similarly for IN3 and IN4 which is associated with OUT3 and OUT 4.

Arduino uno

The Arduino is most used microcontroller which is easily programmable. It has operating voltage of 5 volt, it has 14 digital input output pins of which 6 pins are PWM output and 6 analog input .it can be also provide usb connection .it work as brain of whole system. Its clock speed is of 16 MHz and also stronger RESET circuit. It contains 16 MHz

Figure 94 Ardunio uno controller

Ceramic resonator

Work as brain of whole system. Its clock speed is of 16 MHz and also stronger RESET circuit. It contains 16 MHz .

How to control the speed and direction of the motor:

Controlling the Speed:

We can control the speed of the motor by applying PWM signal to ENA or ENB depending on at which output your motors are at, at the same time we should keep the direction signal at a constant voltage and polarity. Some of you may or may not know what PWM is, so here is the brief explanation on PWM or Pulse Width Modulation and its power delivery.

PWM is a modulation technique used for delivering constant power output for loads like brushed DC motors. PWM is modulated at a constant frequency and voltage, in this circuit the frequency is 490Hz at a constant voltage you applied to L298N. In PWM we are changing the duty cycle of the frequency, that is ON and OFF time in a cycle. If we keep 50% ON and 50% OFF in a cycle to a DC motor, it will rotate half of its full speed. If we keep the duty cycle at 25% that is 25% ON and 75% OFF, the motor will rotate 25% of its maximum speed. If you keep the pulse at 100% of the time ON (the pulse will be straight line on graph) the motor will rotate at 100% of its speed.

PWM looks like this on graph:

The DC motor will average out the pulsating power in to a constant rotational motion. So by simply changing the pulse width we can control the power delivery to a DC motor thus its rotational speed.

Direction control in DC motor is very simple; by just reversing the polarity across the terminal will change rotational direction of the motor. This is done by pin 7 and 6 of the Arduino which is applied to IN1 and IN2 of L298N.

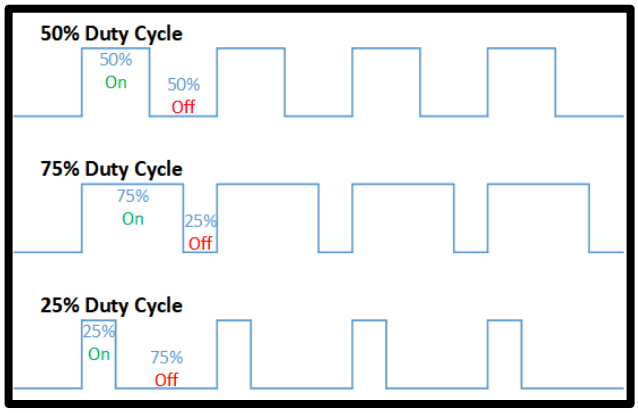


Figure 95 Pulse width modulation duty cycle

Direction Control:

Direction control in DC motor is very simple; by just reversing the polarity across the terminal will change rotational direction of the motor. This is done by pin 7 and 6 of the Arduino which is applied to IN1 and IN2 of L298N.

How to Operate this Speed Control Circuit Properly:

1. With completed hardware, upload the program code with the phone number from which you are going to send the SMS commands to the GSM modem.

2. Switch ON the circuit, within 40 seconds the GSM module would have been connected to a mobile network (with SIM inserted), the network LED on GSM modem must blink once every 3 seconds.

3. You will receive a SMS to your phone number which you entered in the code; saying – System is ready.

4. Now you can send SMS command to the SIM (phone number) which you inserted to GSM modem. Send /n200/ (say) the motor starts rotating; now try /r200/, now motor starts rotating in opposite direction.

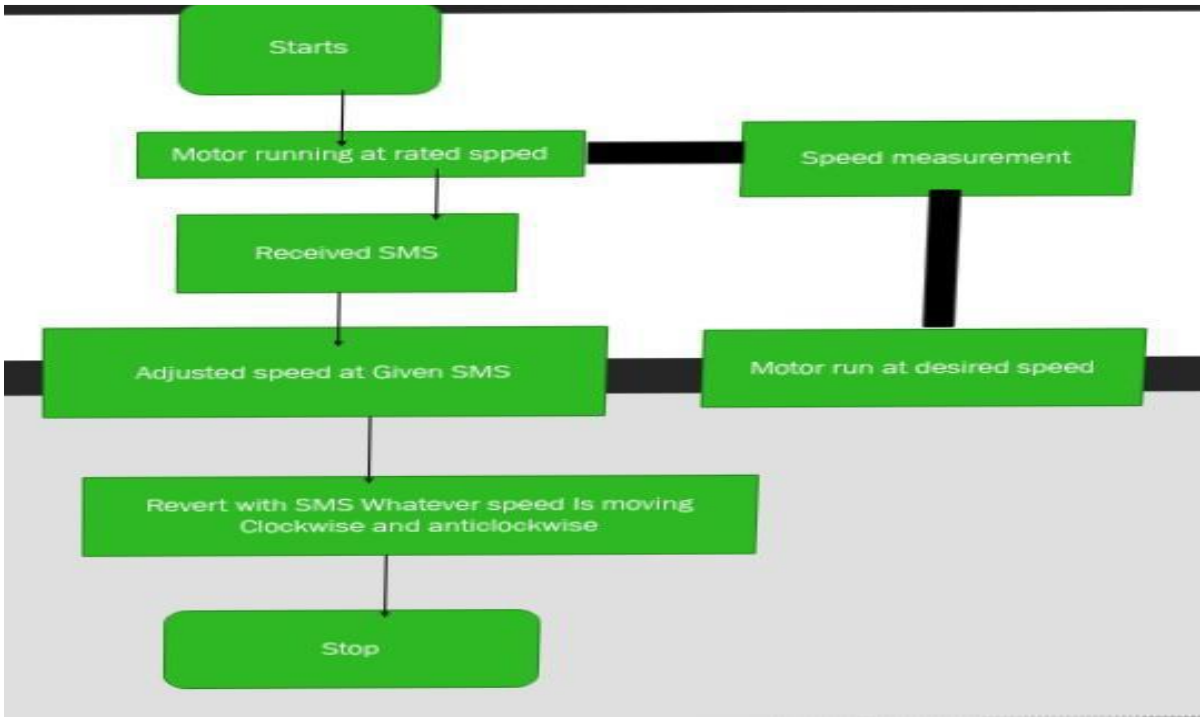


Figure 96 Flow chart of GSM based moto speed control

ADVANTAGES

1) This is ensure safety of worker in industrial place.
2) This is easy method to control the speed of DC motor.
3) it is can be operated from long distance.
4) This technology can save our time and energy.
5) it reduces the cost of wiring.

Table 42 Measurement Sheet of GSM based motor speed control

Sr. No.	Particulars	Amount Rs.
1	Arduino	500
2	Motor Driver	90
3	Motor DC	100
4	Other cost	200
	Total	900

8.1.9 Counter Visitor of an Auditorium

Power saving with Bidirectional Visitor counter

This Project is designed and presented in order to count the visitors of an auditorium. The system counts both the entering and exiting visitor of the auditorium .Depending upon the sensors interruption, the system identifies the entry and exit of the visitor .Depending on the number of people present in the hall we are going to control the lights and fans on considering the environmental aspects like temperature, light etc. If no one in the room the fans and lights are going to switched off automatically, the fan's speed is regulated according to the temperature in the room. When the projector switch get turned ON all the lights will get turned OFF but fans remains in the ON condition.

Circuit operation:

The two IR sensors are directly connected to the microcontroller pin the outputs of two sensors are applied as a high pulse and low pulse. These high and low pulses are considered as set-1 and reset-0. These conditions are checked by microcontroller as per the written code in it, if the interruption occurs in sensor 1 followed by sensor 2 results in an increment in the count value and if the interruption occur in sensor 2 followed by sensor 1 results in decrement in the count. If the count is less than one, the LED and fan circuit get turned off. There are two IR sensor namely IR sensor IN and IR sensor out for detecting the person's entry and exit movements through the door, when the person enters the room the count get incremented and the led will glow depending on the output from the LDR.The temperature sensor (DHT11) used in the project determines the temperature of the room and the microcontroller takes the input from sensor depending on the temperature value transistor drive circuit operates the dc fan. The temperature and number of counts are displayed in LCD (16*2).

This system is an effective way for the power management, automatic device control and together count, temperature and power consumption. Controlling circuit used in this project controls the devices like fans, lights etc. This system can be used to operate other devices for the effective power usage.

Advantages:

- Completely Automatic System

- No need of human intervention.
- Can work 24x7 without any problem.
- Low cost and very easy to implement.
- Power Saving

Future Scope:

- Multiple devices can be turned ON/OFF instead of just lights.
- We can check the ambient light intensity and then decide if the light needs to be turned ON or not.

Metal detector can be added for security reasons

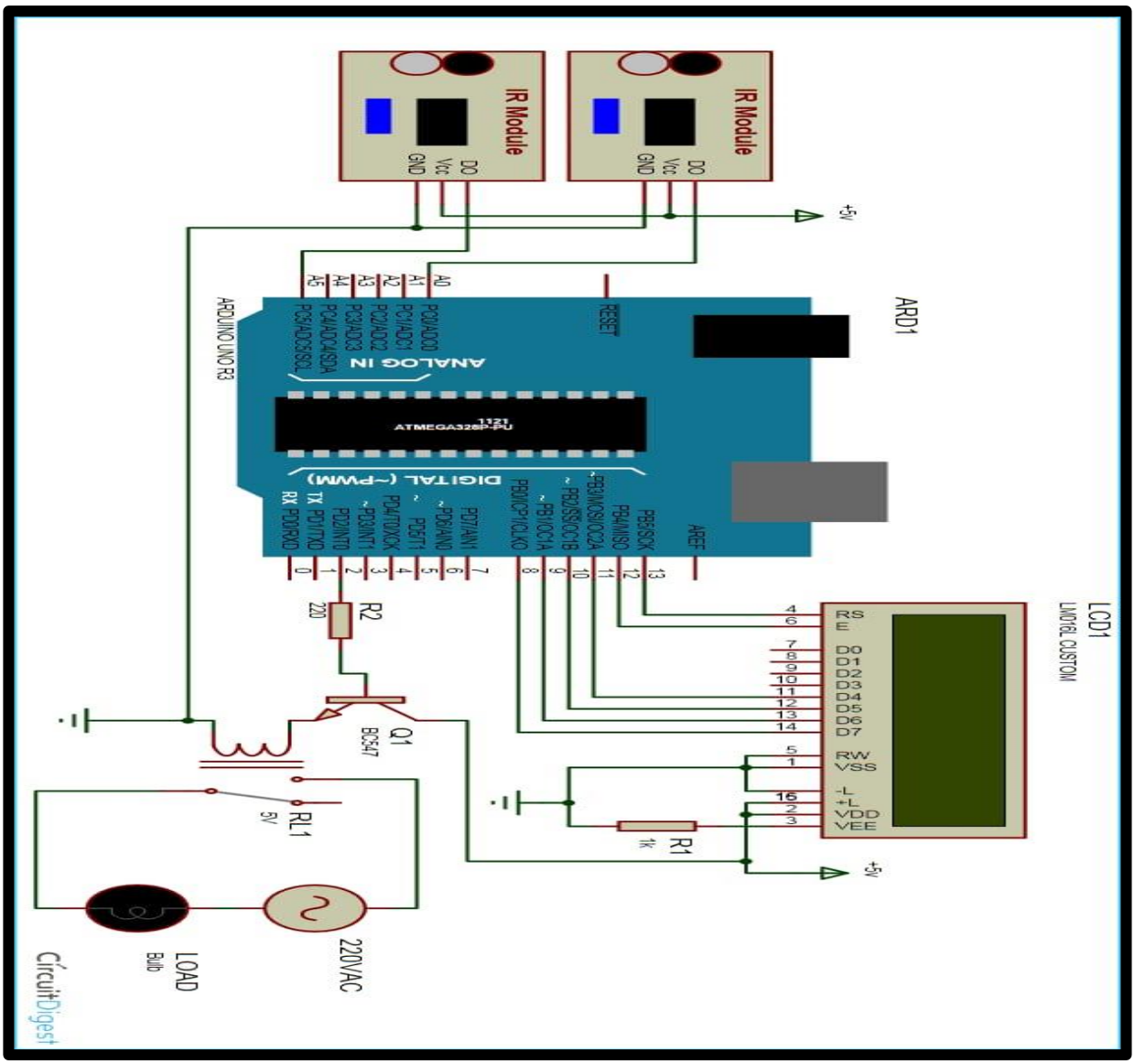


Figure 97 Circuit Diagram of Counter Visitor of an auditorium

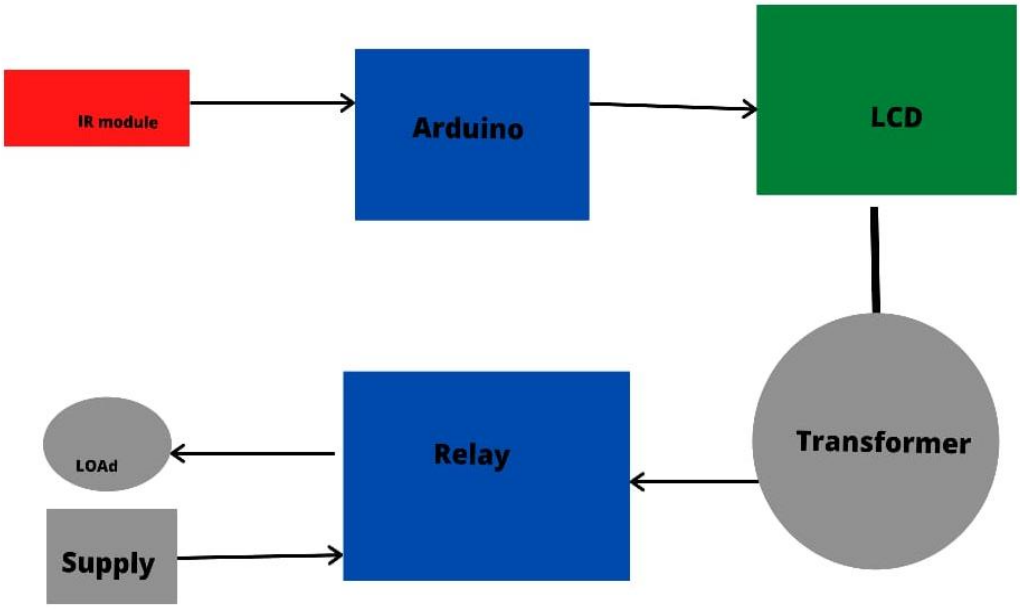


Figure 98 Flow chart of Process of Auditorium

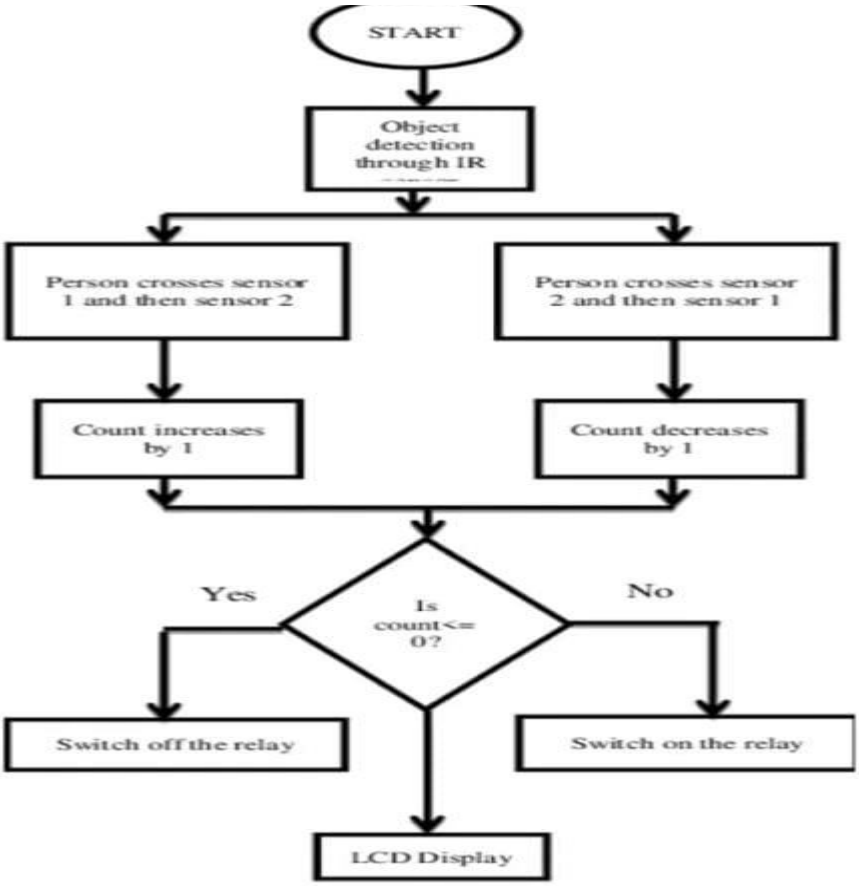


Figure 99 Flow chart of Process of Auditorium

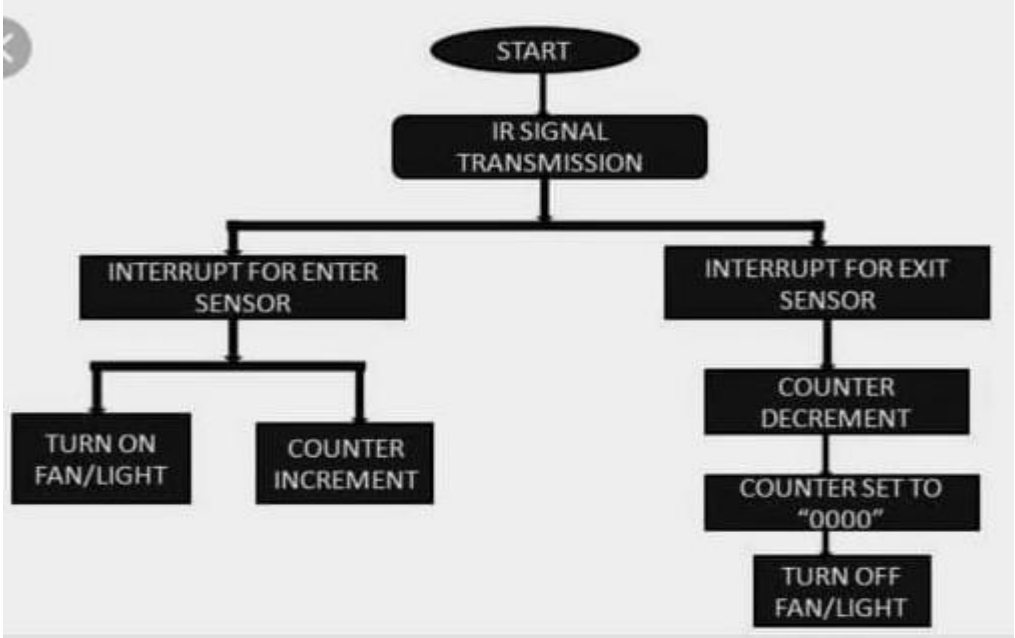


Figure 100 Flow chart of component of auditorium

Table 43 Estimation sheet of Counter Visitor of an Auditorium

Sr no.	Components use	Quantity
1	Transformer (12-0-12)	1
2	Arduino Uno	1
3	IR sensor	2
4	Resistors	2
5	Relay	1
6	Bulb	1
7	Transistor (BC547)	1

- **Costing of design**

Table 44 Measurement sheet of Counter Visitor of an Auditorium

Sr no.	Components use	Quantity	Price/pic	Total price
1	Transformer (12-0-12)	1	439	439
2	Arduino Uno	1	551	551
3	IR sensor	2	75	150
4	Resistors(220 ohm/1k)	2	42+2	88
5	Relay	1	201	201
6	Bulb	1	150	150
7	Transistor (BC547)	1	30	30
8	Other cost			500
Final cost Approximate			**2285Rs.**	

8.2 Reason for Recommending this Design:-

As per Interaction with villagers, we found there is no library for children to gain more knowledge through books.

Also we found there is no public place in village where people can go and relax and children play different games and enjoy.

In village ATM is far from the village so we design ATM.

Now a day we know Greenhouse effect is increase day by day. So we move on renewable energy.

8.3 Suggestion and Benefit of the villagers:-

Village has not good roads and also not good transportation system.

We know now day a water scarcity is occur. So we think we work on water.

We provide library so student can read on healthy and peaceful place.

Energy conservation.

1 Installation of :

Installation of solar panel.

2 Replacement of:

The old tube lights with new electronic chock tube lights. And the tube lights at the lobbies with LEDs.

3 Removal of:

Some of the tube lights of the top floors' hall.

4 Behavioural Changes:

All the electrical equipment’s should be turned OFF when they are not in use. The fans and tube lights of the classrooms and of other places should be turned OFF before leaving the room.

CHAPTER 9
Proposing design for Future Development of the Village for the PART-II Design

This study aims at developing and sustaining the village and enhancing the village.

We will work to develop the village to the best of our knowledge.

Major facilities are available in the village. So we will try to give more facilities to the villagers for their better lifestyle.

We will work on waste water treatment for future Development.

As well as we will create awareness of government schemes that can give various benefits to the villagers.

In village any solid waste management systems are not there so we will work on it.
Villagers who are not conscious of the method of rain water harvesting. so we will on it.

In village Many people have pets like cows, buffaloes, goats etc., using of there waste we will make bio-gas plant.

CHAPTER 10
Conclusion of the Entire Village Activities of the Projects

Vishwakarma Yojana: An approach towards rurbanisation. Name Itself suggests that it should provide the village with primary and obligatory facilities to which villages we visited MOVIYA, an ideal village. Ideal village conditions as village should have such facilities as primary school, health centre, well maintained water source, village cleanliness, good education facilities with the nearest city by transportation. We met sarpanch from the village of MOVIYA and he guided us to the first and main thing that needs to be done in the village.

After the visit to the ideal village, we find out what makes the village smart. The GTU (Vishwakarma Yojana) is allocated to Shapar – veraval Village for the development of the village. We went to the village which is located 17 kilometres from the city of Rajkot and interacted with the villagers and Talati cum mantry of Shapar- Veraval. Then we did techno economic surveys on the basis that we collected information on necessary things in the village and immediately had to adjust things.

The development of the village can be possible by providing essential facilities to the village. So migration from the village to the town would eventually be reduced and villagers' livelihoods would increase. That the villagers can have a safe and prosperous life. Ultimate village and population growth is the basis for country development. India is developing and GDP depends heavily on agriculture. As village growth is possible, the techniques of farming are increasing and the GDP percentage is increasing.

The people of Shapar-Veraval was less aware of renewable energy sources and of the benefits of renewable energy. People on both sides of business need to know and people should also be aware of the policies and incentives of the other governments so that villagers are willing to start using renewable resources, saving energy and using both for their own use. Comparison with intelligent data from the village and the gap analyses have been performed by detail design of certain amenities that can be fully utilised for village development.

CHAPTER 11
References Referred for this Projects

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CHAPTER 12
Annexure Attachment

12.1 Survey Form of Ideal Village Scanned Copy for Part - I :-

Gujarat Technological University, Ahmedabad, Gujarat — Vishwakarma Yojana: Phase VIII Techno Economic Survey

Techno Economic Survey

For

Vishwakarma Yojana: Phase VIII

IDEAL VILLAGE SURVEY

An approach towards Rurbanisation for Village Development

Name of Village:	Moviya
Name of Taluka:	Paddhari
Name of District:	Rajkot
Name of Institute:	B.H. Gardi College of Engg &Tech
Nodal Officer Name & Contact Detail:	Dr. Vimal N Patel
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Tadpada Rekhaben Sarpanch
Date of Survey:	5th Sep 2020

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	8000			
ii)	2011	11,888	5,705	5,300	2,260

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	6654.44 ha
	Forest Area (In hect.)	81 ha
	Agricultural Land Area (In hect.)	220.1 ha
	Residential Area (In hect.)	
	Other Area (In hect.)	
	Water bodies	
	Nearest Town with Distance:	Gondal 7 Km

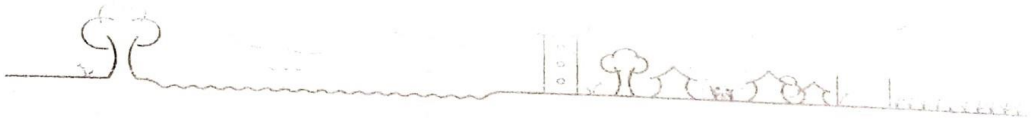
3. **Occupational Details:**

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

4. **Physical Infrastructure Facilities:**

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
	• Tap Water (Treated/ Untreated)	Treated	yes		
	• RO Water		yes		
	• Well (Covered/ Uncovered)	uncovered	yes		
	• Hand pumps		yes		
	• Tube well/ Borehole		yes		
	• River/ Canal/ Spring/ Lake/ Pond				
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	2,00,000 lit- yes	litre	
	Underground Sump	Capacity:	5,00,000 lit- yes	litre.	
Suggestions if any:					
C.	**Drainage Facility**				
	Available (Yes/ No)		yes		
Suggestions if any:					
D.	**Type of Drainage**				
	Closed/ Open	Closed	yes		
	If Open than Pucca / Kutchcha				
	Whether drain water is discharged directly in to Water bodies/ Sewer plants	directly in to water bodies			
Suggestions if any:					

E.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road		Yes		
	Main road		Yes		
	Internal streets		Yes		
	Nearest NH/SH/MDR/ODR Dist. in kms.	5-10 Km NH	Yes		
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	5-10 Km Gomta Rail way		NO	
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)		Yes		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto, Tractors	Yes		
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Govt. more than 6hrs.	Yes		
	Power supply for Domestic Use		Yes		
	Power supply for Agricultural Use		Yes		
	Power supply for Commercial Use		Yes		
	Road/ Street Lights		Yes		



	Electrification in Government Buildings/ Schools/ Hospitals		Yes		
	Renewable Energy Source Facilities (Y/ N)		Yes		
	LED Facilities		Yes		
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.		Yes		
	Location Condition				
	Community Toilet (With bath/ without bath facilities)	Without bath	Yes		
	Solid & liquid waste Disposal system available		Yes		
	Any facility for Waste collection from road		Yes		
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	Bhadar river.	Yes		
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Pucca 75%			

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks

K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	PHC, 4 medical shops	yes		
	Private Clinic/Private Hospital/ Nursing Home	private clinic private Hospital	yes		
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					
L.	**Education Facilities:**				
	Aaganwadi/ Play group	private	yes		
	Primary School	Govt & private both	yes		
	Secondary school	Govt & private both	yes		
	Higher sec. School		yes		
	ITI college/ vocational Training Center		No	NO	
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities		NO	NO	
	If any of the above Facility is not available in village than approx. distance from village: ...7.....kms.				
Suggestions if any:					
M.	**Socio- Culture Facilities**				
	Community Hall (With or without TV) Location:	without TV	yes		

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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

	General Market		yes		
	Shops (Public Distribution System)		yes		
	Panchayat Building		yes		
	Pharmacy/Medical Shop	4 Shops	yes		
	Bank & ATM Facility		yes		
	Agriculture Co-operative Society		yes		
	Milk Co-operative Soc.		yes		
	Small Scale Industries		yes		
	Internet Cafes/ Common Service Center/Wi Fi		yes		
	Other Facility	–			
Suggestions if any:					

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

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

7. Data Collection From Village

Village Base Map Available: Hard Copy/Soft Copy	

Recent Projects going on for Development of Village	No
Any NGO working for village development	No

8. Additional Information/ Requirement:

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

9. Smart Village Proposal Design

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	wastwater management system Rainwater Harvesting		

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

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

મોવિયા ગ્રામ પંચાયત

સરપચ
મોવિયા ગ્રામ પંચાયત

12.2 Survey Form of Smart Village Scanned Copy for Part - I :-

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:	Rajkot
Name of Taluka:	Rajkot - Upleta
Name of Village:	Raj Samadhiyala
Name of Institute:	B.H. Gardi College of Engg. & Tech.
Nodal Officer Name & Contact Detail:	Dr. Vimal N. Patel
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Bhavnaben Ashokbhai Vaghera
Date of Survey:	12-Sep-2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	1756	875	881	280
2.	2011	1467	732	735	325

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector) Coordinates for Location:	1089.55
2.	Forest Area (In hect.)	40.46
3.	Agricultural Land Area (In hect.)	714.70
4.	Residential Area (In hect.)	5.5061
5.	Other Area (In hect.)	325.55
6.	Distance to the nearest railway station (in kilometers):	Rajkot - 23 Km

7.	Name of Nearest Town with Distance:	Rajkot - 23 Km
8.	Distance to the nearest bus station (in kilometers):	1Km or 500m
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. Agriculture
	2.
	3.
Major crops grown in the village:	1. Cotton
	2. Segame
	3. Caston

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

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

Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:			
	Underground Sump	Capacity:	1,00,000/-		
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET	some where open & some where closed	yes		
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	All weather	yes		
	Main road	CC roads	yes		
	Internal streets	CC roads	yes		
	Nearest NH/SH/MDR/ODR Dist. in kms.	SH. Rajkot, Bhavnagar	yes		
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station ... Kms)	23 - Km Rajkot		NO	
	Bus station (Y/N) Condition: (If No than Nearest Bus Station ... Kms)	Good	yes		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto, Chhakda, private vehicle	yes		
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Govt More than 6 hours	Yes		

31

	Power supply for Domestic Use	24 hours	Yes		
	Power supply for Agricultural Use	more than 8 hours	yes		
	Power supply for Commercial Use	more than 8 hours	yes		
	Road/ Street Lights		yes		
	Electrification in Government Buildings/ Schools/ Hospitals		yes		
	Renewable Energy Source Facilities (Y/ N)	some Private houses	yes		
	LED Facilities		yes		
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	5	yes		
	Location Condition	Good			
	Community Toilet (With bath/ without bath facilities)	Community bath at Samshan	yes		
	Solid & liquid waste Disposal system available		yes		
	Any facility for Waste collection from road		yes		
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND		yes		
	STREAM/RIVER		yes		
	CANAL				
	WELL				
	TUBE WELL.		yes		
	OTHER (SPECIFY)	Check dam	yes		
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Good			

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)		yes		
	Sub-Centre		yes		
	PHC		yes		
	BLOCK PHC			No	
	CHC/RH			No	
	District/ Govt. Hospital			NO	
	Govt. Dispensary		yes		
	Private Clinic			No	(sub-Centre
	Private Hospital/			NO	
	Nursing Home			NO	
	AYUSH Health Facility			No	
	sonography /ultrasound facility			NO	
	If any of the above Facility is not available in village than approx. distance from village: ...7....kms. Sardhar				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group		yes		
	Primary School		yes		
	Secondary school		yes		
	Higher sec. School			NO	
	ITI college/ vocational Training Center	Rajkot - 23 Km		No	
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	Jamnagar 7-Km		NO	
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				

Suggestions if any:

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

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

Suggestions if any:

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

19

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries			NO	
	Other Facility				

Suggestions if any:

N.	Other Facilities	Condition		Available (YES)	Available (NO)
	1. Have these programme implemented the village?				NO
	2. Are there any beneficiaries in the village from the following programme?				
	3. Janani Suraksha Yojana			yes	
	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)			yes	
	9. National Food for work Programme (NFFWP)				
	10. National Social Assistance Programme				
	11. Sanitation Programme (SP)			yes	
	12. Rajiv Gandhi National Drinking Water Mission				
	13. Swarnjayanti Gram Swarozgar Yojana			yes	
	14. Minimum Needs Programme (MNP)				
	15. National Rural Employment Programme			yes	
	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)			yes	
	21. Sanjay Gandhi Niradhar Yojana (SGNY)				
	22. Jawahar Gram Samridhi Yojana (JGSY)				
	23. Other (SPECIFY)				

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy				
2.	Recent Projects going on for Development of Village				
3.	Any NGO working for village development			NO	
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)			NO	

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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

IX. Smart Village / Heritage Details

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?	Library, gym, renewable energy, sports academy	

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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9

12.3 Survey Form of Allocated Village Scanned Copy for Part - I :-

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

Name of District:	RAJKOT
Name of Taluka:	KOTDA SANGANI
Name of Village:	SHAPAR
Name of Institute:	B.H.GARDI COLLEGE OF ENGG & TECH
Nodal Officer Name & Contact Detail:	DR. VIMAL N. PATEL
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	P.L. VASOYA TALATI CUM MANTRI SHAPAR
Date of Survey:	19-Sep-2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	7,143			
2.	2011	9,249	5,430	3,819	2,602

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector) Coordinates for Location:	1551.969
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):	6 KM

7.	Name of Nearest Town with Distance:	
8.	Distance to the nearest bus station (in kilometers):	3 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.	GENERAL
	2.	SC
	3.	OBC

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

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

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

	Other(Specify) **Lake/ Pond**	LAKE ARE NOT USAb LE FOR ANY			
Suggestions if any:		PURPOSE			
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	YES		
	Underground Sump	Capacity:		NO	
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	CC	YES		
	Main road	CC	YES		
	Internal streets	CC	YES		
	Nearest NH/SH/MDR/ODR Dist. in kms.	CC			
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	RIBDA RAILWAY STATION	YES		6 KM
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	3 KM	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)	24 hrs	YES		

	Power supply for Domestic Use		YES		
	Power supply for Agricultural Use		YES		
	Power supply for Commercial Use		YES		
	Road/ Street Lights		YES		
	Electrification in Government Buildings/ Schools/ Hospitals		YES		
	Renewable Energy Source Facilities (Y/ N)	IN SOME PRIVATE	YES		
	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		YES		
	Any facility for Waste collection from road		YES		
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL OTHER (SPECIFY)		YES YES		
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	0.5%	YES		

41

V. SOCIAL INFRASTRUCTURAL FACILITIES:

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

If any of the above Facility is not available in village than approx. distance from village: ...4....kms.

Suggestions if any:

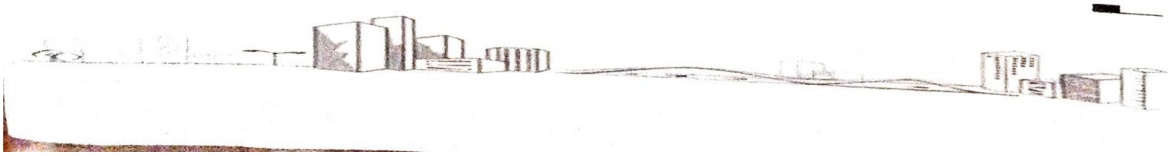
L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)	good	NEAR 2 g.p	YES	
	Public Library (With daily newspaper supply: Y/N)				NO
	Public Garden				NO
	Village Pond	NOT good		YES	
	Recreation Center				NO
	Cinema/ Video Hall				NO
	Assembly Polling Station				NO
	Birth & Death Registration Office	good	g.p	YES	

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

Suggestions if any:

M.	Other Facilities	Condition	Location	Available (YES)	Available (NO)
	Post-office	good	g.p	YES	
	Telecommunication Network/ STD booth				NO
	General Market			YES	
	Shops (Public Distribution System)			YES	
	Panchayat Building	GOOD		YES	
	Pharmacy/Medical Shop	GOOD		YES	
	Bank & ATM Facility			YES	
	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			YES	

19



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries				NO
	Other Facility				

Suggestions if any:

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

71

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources		YES		IN SOME PRIVATE HOUSE
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System			NO	
3.	Any Other				

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy				
2.	Recent Projects going on for Development of Village	WATER SUPPLY	YES		
3.	Any NGO working for village development			NO	
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)		YES	NO NO NO NO NO	

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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	requirement, ~~need~~ need	
2.	Additional Information/ Requirement	—	—
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	Daily	

IX. Smart Village / Heritage Details

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

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

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

તલાટી-કમ-મંત્રી
શાપર (વે.) ગ્રામ પંચાયત.

16

Scanned with CamScanner

12.4 Gap Analysis of the Allocated Village :-

Table 45 Gap Analysis

VILLAGE GAP Analysis					
Village Facilities	**Planning Commission/UDPFI Norms**	**Village Name:**	Shapar-Veraval Rajkot		
		Population:		19152	
		Existing	**Required as per Norms**	**Smart Village / Cities / Heritage Future Projection Design**	**Gap**
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	1	3		-2
Primary School	Each Per 2500 population	1	3		-2
Secondary School	Per 7,500 population	1	2		-1
Higher Secondary School	Per 15,000 Population	0	1		-1
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/Panchyat Dispensary or Sub PHC or Health Centre	Each Village	0	1		-1
Primary Health & Child Health Center	Per 20,000 population	0	1		-1
Child Welfare and Maternity Home	Per 10,000 population	1	1		0
Multispeciality Hospital	Per 100000 Population	0	1		-1
Public Latrines	1 for 50 families (if toilet is not there in home, specially for slum	1	1		0

	pockets & kutcha house)				
Physical Infrastructure Facilities					
Transportation		**Adequate**			
Pucca Village Approach Road	Each village	YES	NO		
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)	YES	NO		
Drinking Water (Minimum 70 lpcd)		**Adequate**			
Over Head Tank	1/3 of Total Demand	YES	NO		1
U/G Sump	2/3 of Total Demand	YES	NO		1
Drainage Network - Open		YES	YES		
Drainage Network - Cover		YES	NO		1
Waste Management System		**Adequate**			
Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	1	0		1
community hall and Public Library	Per 15000 Population	0	1		-1
Cremation Ground	Per 20,000 population	0	1		-1
Post Office	Per 10,000 population	1	0		1
Gram Panchayat Building	Each individual/group panchayat	1	0		1
APMC	Per 100000 Population	0	1		-1
Fire Station	Per 100000 Population	0	1		-1
Public Garden	Per village	0	1		-1
Police post	Per 40,000Population	0	1		-1
Shopping Mall					
Electrical Design					
Electricity Network		**Adequate**			
Any Smart Village Facility					
Technology		adequte			
		ESR cap	0		
		Sump cap	0		
		Lat	0		

12.5 Summary Details of All the Villages Design in Table form Part - I:-

Table 46 Summery of all Villages

SR.NO	VILLAGE	Department	PART I	PART II
1	Chela	Civil	Pickup stand (Bus Stand)	Public Library
			Public Toilet	Village Bank
			Health Center	Public warehouse with cold storage
			Garden	ATM
			Rain water Harvesting	Animal water pond
			R.C.C. Main Road	Vegetable Market
		Electrical	Electrical Street light	Detect Rash driving speed checker system on highway
			Irrigation System	Movement sensed automatic door opening system
			Electrical loads life cycle	Smart dustbin using Arduino, ultrasonic sensor & servo motor
2	Shapar – Veraval	Civil	Sustainable design of Garden	High School
			Sustainable design for community hall	Organic waste Controller
			ATM	Post Office
			Public Health Centre	Shelter
			Acoustic Auditorium	Bus Stand with Toilet, Cycle Stand & Stall
			Affordable cost Toilet with bathroom	Green Infrastructure Library
		Electrical	Automatic Solar Roof Top	RFID based attendance system
			Solar System for Common Public Place (Garden)	Design of GSM based taking energy meter
			GSM based motor speed control	GSM based automatic water plant system

12.6:-Drawings :-

In the list of figures, together with their page numbers, are mentioned all drawings and images in their respective chapters along with designs and their listings. And at the end of the Vishwakarma Yojana Phase VIII report, we added A3 sheets of proposed designs.

12.7 Summary of Good Photographs in Table Format :-

Figure 101 Photographs of Shapar – Veraval Village

Figure 102 Photographs of Shapar – Veraval Village

12.8 Village Interaction with sarpanch Report :-

In accordance with the circular GTU all the team of Vishwakarma Yojana were informed that they would present their work in the village to implement Vishwakarma Yojana effectively. In this guide the Shapar - Veraval village student team submitted the Shapar - Veraval village development plan in Panchayat office.

On this basis, we have searched our assigned Shapar - Veraval Village primary requirements. We have made the key list of specifications, based on the needs of the citizens of Sarpanch, Talati cum Mantri and Panchayat.

We learned about physical infrastructure problems, social infrastructure and socio-cultural facilities based on knowledge. After that we built a shared common public place, an automatic solar top roof system, a community hall cum library.

Figure 103 Interaction with Talati cum mantri

Figure 104 Team Member

We have taken various approaches and provided management strategies for such structures in the form of a project, as well as various problems they face when constructing such facilities. Sarpanch Talati cum mantri and villagers share various problems. Now, the villagers were better off with this final concept.

The growth of the village of Shapar - Veraval (Rural soul + Urban amenities) could be more beneficial in implementing this design.

Our members of VY's team truly thanks the entire community for their help during these years. They proved they can create a better village and thus build a strong nation with the introduction of such facilities. we also thanks to our nodal officer to help us in our project work.

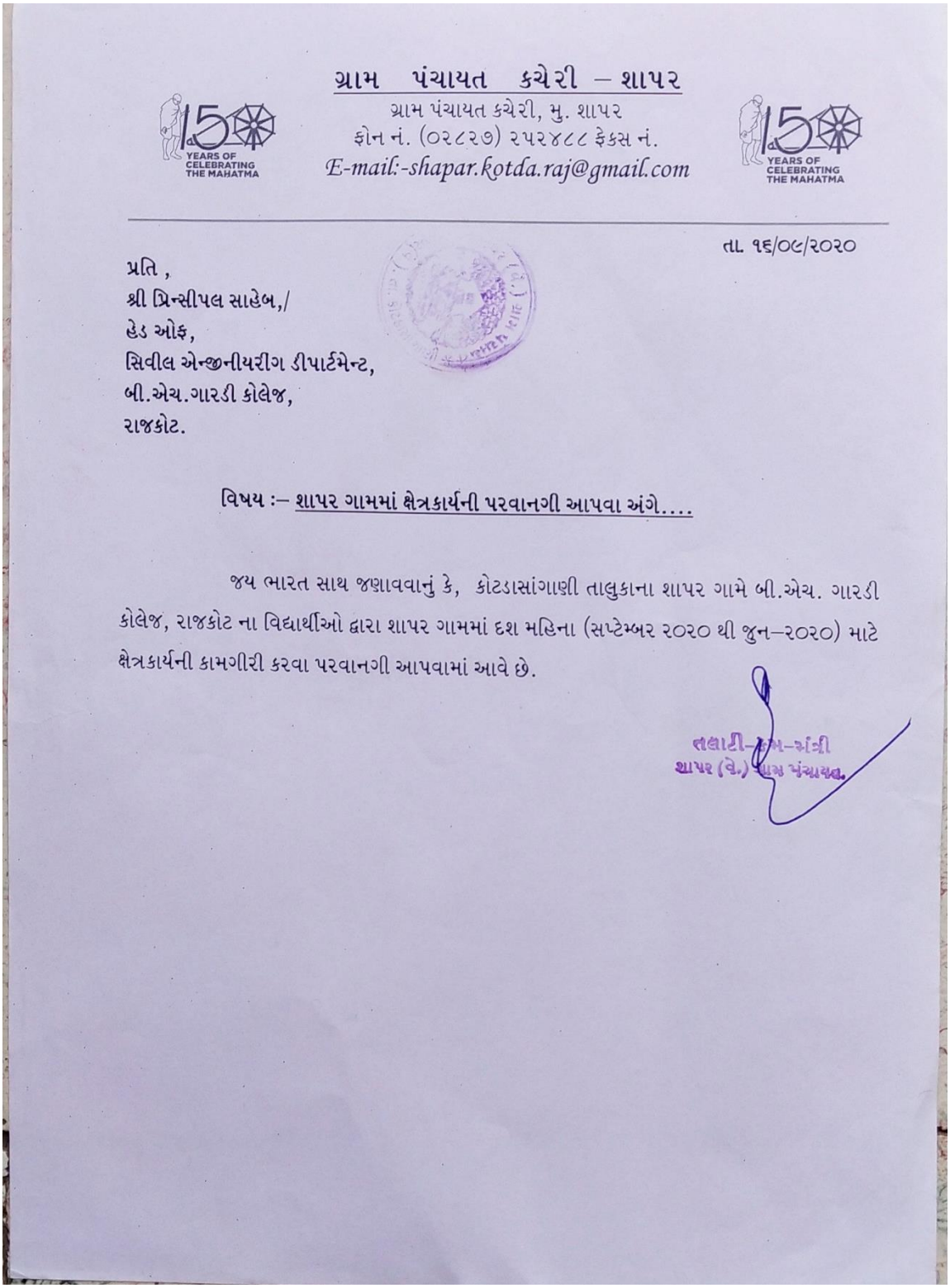
12.9 sarpanch Letter Giving information about the Village development:-

According to the Vishwakarma Yojana guideline, for the study reason, we visit Shapar - Veraval village. We met Talati cum mantra P. L. Vasoya he is a very dynamic person who provides us with knowledge and data whenever we need it. We met other staff members who also gave us good answers.

We also visit the entire inner part of the village and communicate directly with the villagers and ask them about the village's current condition. We are carrying out a techno-economic survey of the village of Shapar - Veraval. After all of this research, we performed gap analysis and equipped the village with the requisite facilities. We found that adequate facilities are available in the village according to Urban and Regional Development Plans Formulation and Implementation (URDPFI) requirements, but we found that some facilities are not there as per our visit. Like a public place, a library, etc.

We provide Community hall cum library Common Public Place, Automatic solar roof top system, paver block road construction for village as primary basis. Then in second stage we provide, Waste water management, air pollution measure and control, solid waste management etc.

Permission Latter :-



ગ્રામ પંચાયત કચેરી – શાપર

ગ્રામ પંચાયત કચેરી, મુ. શાપર
ફોન નં. (૦૨૮૨૭) ૨૫૨૪૮૮ ફેક્સ નં.
E-mail:-shapar.kotda.raj@gmail.com

તા. ૧૬/૦૯/૨૦૨૦

પ્રતિ ,
શ્રી પ્રિન્સીપલ સાહેબ,/
હેડ ઓફ,
સિવીલ એન્જીનીયરીગ ડીપાર્ટમેન્ટ,
બી.એચ.ગારડી કોલેજ,
રાજકોટ.

વિષય :– શાપર ગામમાં ક્ષેત્રકાર્યની પરવાનગી આપવા અંગે....

જય ભારત સાથ જણાવવાનું કે, કોટડાસાંગાણી તાલુકાના શાપર ગામે બી.એચ. ગારડી કોલેજ, રાજકોટ ના વિદ્યાર્થીઓ દ્વારા શાપર ગામમાં દશ મહિના (સપ્ટેમ્બર ૨૦૨૦ થી જુન–૨૦૨૦) માટે ક્ષેત્રકાર્યની કામગીરી કરવા પરવાનગી આપવામાં આવે છે.

તલાટી-કમ-મંત્રી
શાપર (વે.) ગ્રામ પંચાયત.

CHAPTER 13

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

13.1 Design Proposals

13.1.1 Design of High School

The public sector and the private sector provide education in India with control and funding from three levels: central, state and local. Education is provided by India. Free and compulsory education is a fundamental right for children between the ages of 6 and 14 under various articles of the Indonesian Constitution. In India, the ratio between public and private schools is 7:5.

India has progressed to approximately 3/4 in 2011 in terms of increasing primary school attendance and literacy in the age group of 7-10. The improved education system of India is often mentioned as one of the most important contributors to its economic development. Many progress has been attributed to various public institutions, especially in higher education and scientific research.

India has a large private school system in primary and secondary school, complementing government-run schools, with 29% of private education students between the ages of 6 and 14. Some technical schools at post-secondary level are private, too. In India, private education market had an income of 450 in 2008, but it is expected to be a market of 2400 crore.

India has a large private school system in primary and secondary school, complementing government-run schools, with 29% of private education students between the ages of 6 and 14. Some technical schools at post-secondary level are private, too. In India, private education market had an income of 450 in 2008, but it is expected to be a market of 2400 crore.

It should be made clear that while there are private schools in India, they are highly regulated as to what to teach and how to work (this must be a non-profit organization to manage any educational institution accredited) and all other operational aspects. Therefore it can be misleading to differentiate government schools and private schools.

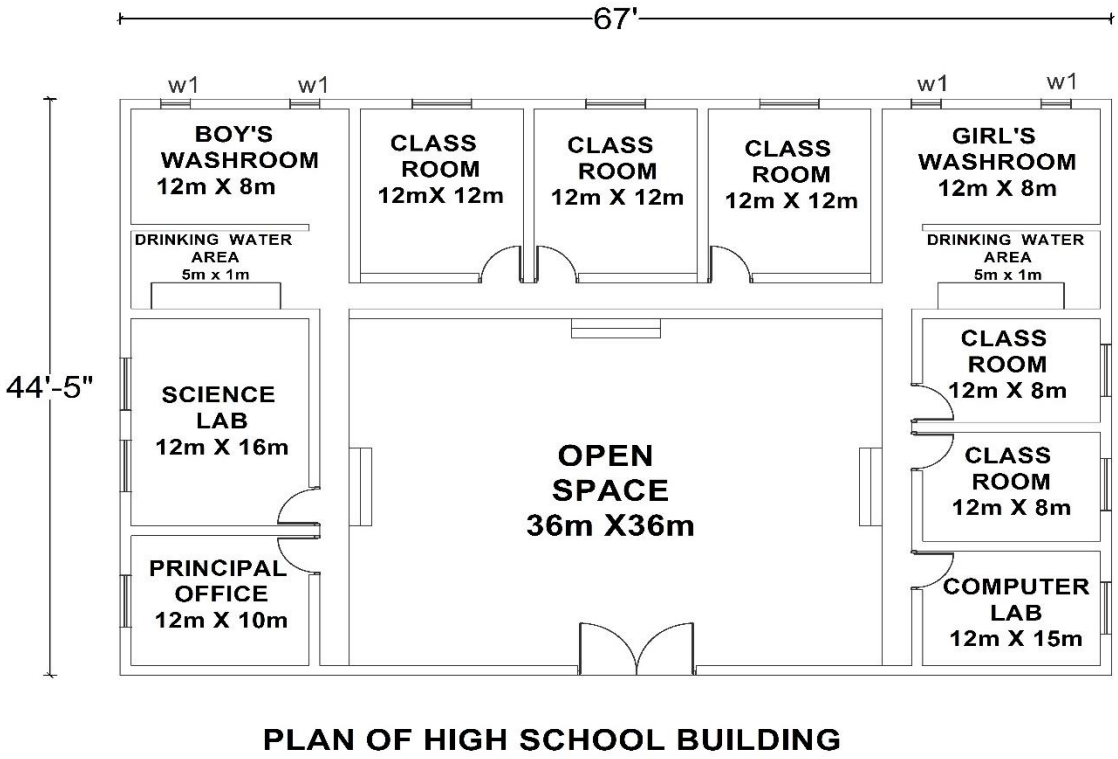


Figure 105 Plan of High School

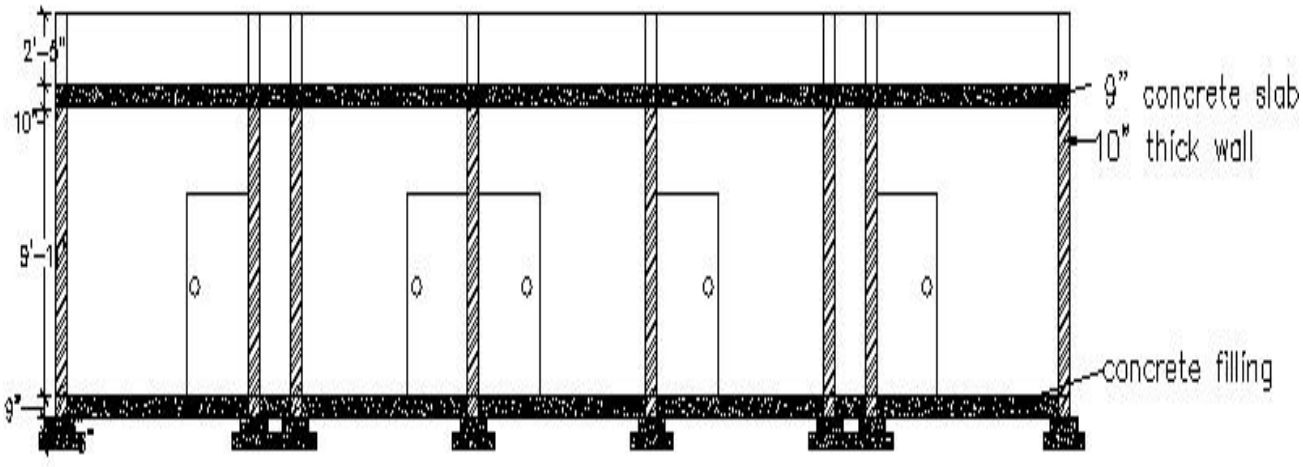


Figure 106 Section of High School

Table 47 Measurement Sheet of High School

Item No.	Description	No	L	B	H	QTY	Unit	Rate	Price
1	Excavation								
	Wall 1&2	1	60	0.450	0.900	24.30			
	Side wall 1&2	2	44	0.450	0.900	35.64			
	Class Room	17	12	0.450	0.900	82.62			
	Class 2	4	8	0.450	0.900	12.96			
	Wash Room	2	10	1.680	0.450	15.12			
						170.64	Cu.m	85	14504.4Rs
2	PCC(1:4:8)								
	Wall 1&2	1	60	0.450	0.100	2.700			
	Side wall 1&2	2	44	0.450	0.100	3.960			
	Class Room	17	12	0.450	0.100	9.180			
	Class 2	4	8	0.450	0.100	1.440			
	Wash Room	2	10	1.680	0.450	15.120			
						32.400	Cu.m	3000	97200Rs.
3	Brick Work								
	Wall 1&2	1	60	0.230	3	41.400			
	Side wall 1&2	2	44	0.230	3	30.360			
	Class Room	17	12	0.230	3	8.280			
	Class 2	4	8	0.230	3	5.520			
	Wash Room	2	10	0.230	3	6.900			
						92.46		2100	194166Rs
4	Plaster(15mm)								
	Toilet(1to6)	4	10		3	120			
	Celling	1	10		2	20			
	Celling	2	44		12	1056			
	Celling	1	24		12	288			
	Class Room 1	12	12		3	432			
	Class Room 2	9	12		3	324			
	Staff Room	4	8		3	96			
						2516		110	276760
5	20mm Plaster								
	Building								
	wall	2	44		3	264			
		1	60		3	180			
	Class 1&2	11	12		3	396		2700	1069200Rs
6	Interior Paint	Quantity of 15 mm plaster				108.90	Sq.nt	85	9256.5Rs
7	Exterior Paint	Quantity of 20 mm plaster				170.64	Sq.mt	60	10238.4Rs
8	RCC Lintel								
	Main Door	9	1	0.23	0.125	0.26			
	W	9	1.68	0.23	0.125	0.43			
						0.69	Cu.m	5000	3467.25Rs
						Total		1674793Rs.	

13.1.2 Organic Waste Controller

Introduction

Organic waste controller plant is one of the plant for renewable energy sources. It transforms rural village in to clean village and also provide gas as energy source and gives fertilizer at end. The gas produced by decomposition of organic waste is called Organic waste controller. Organic waste controller is rich with CH4 (Methane) and when bunt produces energy, which can use for heating, lighting etc. It satisfies several criteria of appropriateness - meets a basic need as cooking fuel; makes optimal use of local resources such as cow dung and other organic wastes; helps to develop indigenous growth using local skills and technologies; provides relief from drudgery; and leads to environmental improvement. Scientifically, Organic waste controller plants only either of these is possible. The realization, its undoubted potential, led to the promotion of Organic waste controller plants in a major way in the late 1970's as an answer to the growing fuel crisis. Today India has the second largest programme in the world after China.

Organic waste controller technology is one of the most appropriate options for meeting the growing energy needs of the rural areas in India. Organic waste controller is a clean and convenient fuel for cooking and lighting in the households; it can supply motive power for irrigation and small industries, and the effluent slurry, a by-product, can be used as organic manure. More importantly, Organic waste controller makes use of local resource - cattle dung - in an environmentally and economically viable manner. In addition to dung, Organic waste controller can also be produced using other organic matter like human waste. It is for these reasons that Organic waste controller has gained popularity in India and is, the largest and most prominent of all the rural renewable energy programmes implemented by the government.

Operation of ORGANIC WASTE CONTROLLER PLANT

The material to be processed is brought to the plant site every day. Two workers are needed for the operation of the plant. The important tasks to be done are:

- Transport of waste materials
- Processing the waste in mixer
- Routine operations for pre-digester and digester tanks
- Manure pits

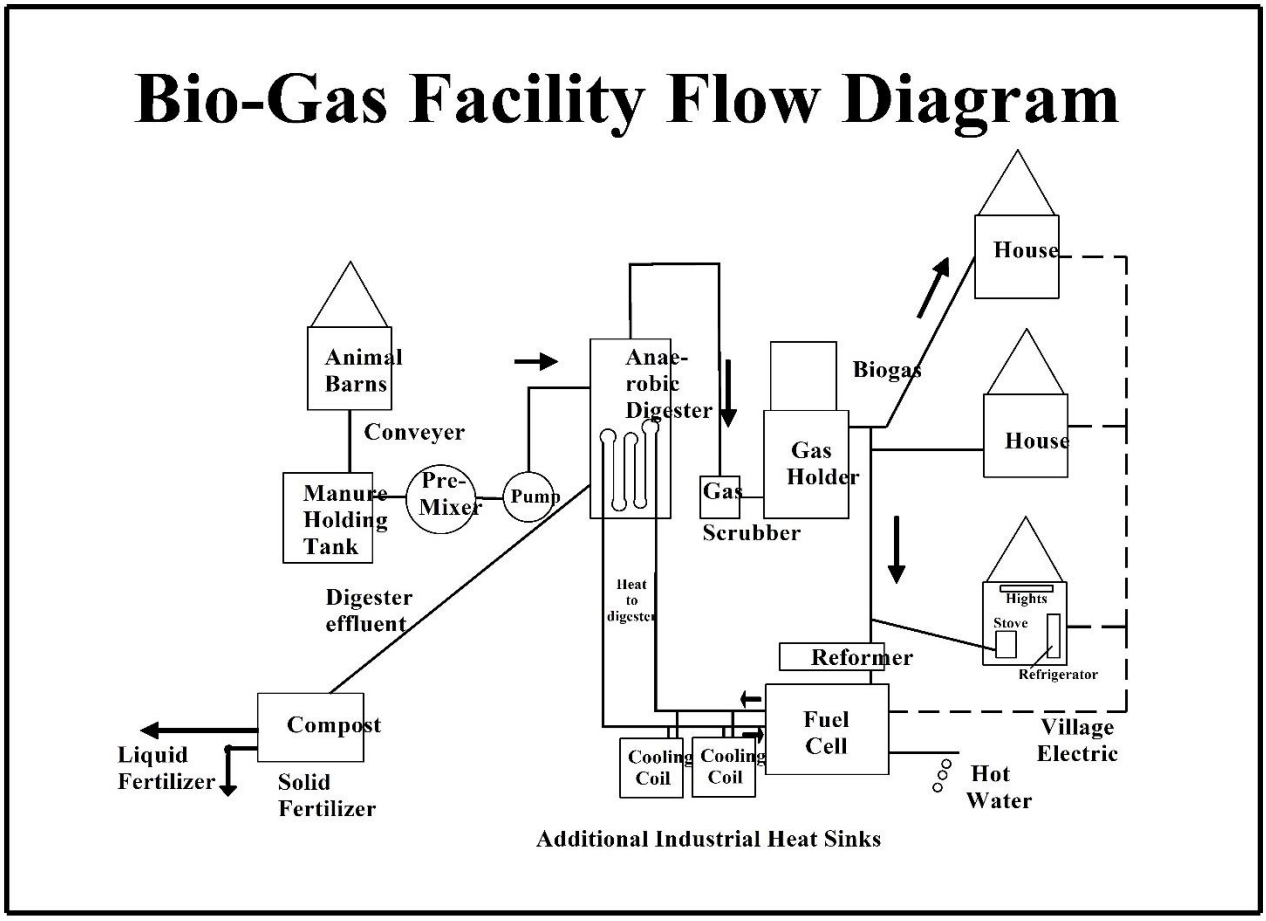


Figure 107 Bio Gas Facility Flow Diagram

Proposed design data

- Organic Waste Controller :-
- Plan Area – 20m X 20m

Tools required:-

- Numbers of Shovel required = 5
- Numbers of Bowel required= 8
- Numbers of Trowel required= 3
- Numbers of Balti required = 10
- Material and things are mandatory :-
- mud truck = 1 (1 ton capacity)
- No. of animal = 800

- Near the organic waste controller plant, size of (5m * 5m) Small Water tank construct at right side of tank.
- 8m X 8m size of storage tank available left side of organic waste collector.
- Supply of fertilize organic waste to farmer by 500rs per one tone
- Gases produce per annum = 25 tone

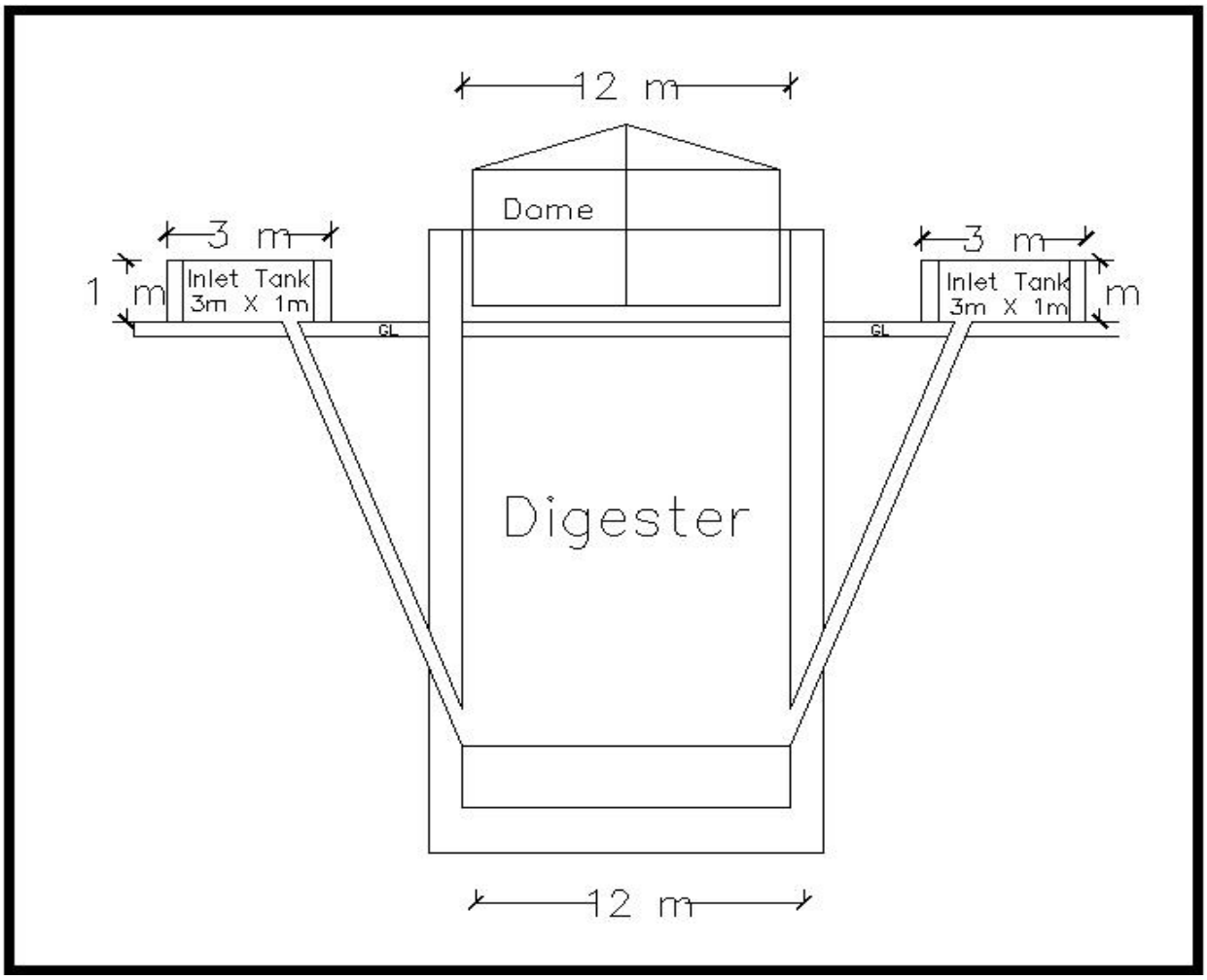


Figure 108 Plan of Organic waste Controller

Table 48 Estimation of Organic Waste Controller

Sr No.	Description	Calculation
1	Total numbers of animals in Shapar-veraval village(N)	N= 1500
2	As per standard data assume per day dung of animal(B)	B= 10.5 Kg.
3	So total per day dung(A*B)	A*B=1500*10.5=150Kg./day
4	Assume retention period (RT)	RT = 70 days.
5	Assume mixing proportion of solid and water is 1:2.	
6	Now total amount of slurry per day (Sd)	Sd = Total per day dung + Water amount 47250 = 47250 Kg. /day = 47250 Lit. /day = 47.25 m^3/day
7	Digester volume (Vd)	Vd = Sd * RT 3307.5 = 3307.5 m3
8	Assume cylinder shaped Organic waste controller plant.(Provide total 6 numbers of units in different areas, so digester volume becomes for one unit)	3307.5 ÷ 6 =551.25 m3 So provide= 555 m3
9	Total digester volume (Vd)	Vd= π r2 h 555 = π r2 (h = 10 m)
10	dimensions of digester H=10 m , R=6 m	
11	Assume digester temperature= 26-28 ˚C	
12	Specific gas production (G_d) by graph.	G_d = 37 Lit. / Kg. /day
13	Daily gas production G	G = G_d × Feed volume 582750 =582750 Lit. =582.75m^3
14	Now assume gas holder capacity = 60 %	

Table 49 Construction Cost

No	Description	Amount(Rs.)
1.	58 Ch.M. and 1number of digester (Each digester rate is 0.75 Lakhs).	**1*75000=75000**
2.	Plant cost.	4500
3.	Pipeline cost.	2300
4.	Appliance cost.	2000
5.	Pressurization system cost.	1800
6.	Vermicomposting cost.	2550
7.	Color and White washing cost.	2600
8.	Contractor profit	1950
9.	Water cost	4500
	Total cost	**97,200**

Table 50 Operating Cost

NO	Description	Amount per Month	Amount per Year
1	Semi dry slurry rupee 2/KG for ($2.5m^3$=2500KG)	2500*2=5000	12*5000=60000
2	Worker salary	1.5*1000=1500	12*1500=18000
3	Electricity and Maintenance	600	12*600=7200
4	Labor daily wage	500	12*500=6000
	Total Operating cost	**7600**	**91,200**

Total cost of Bio-gas plant =construction cost + operating cost

= 97,200+91,200

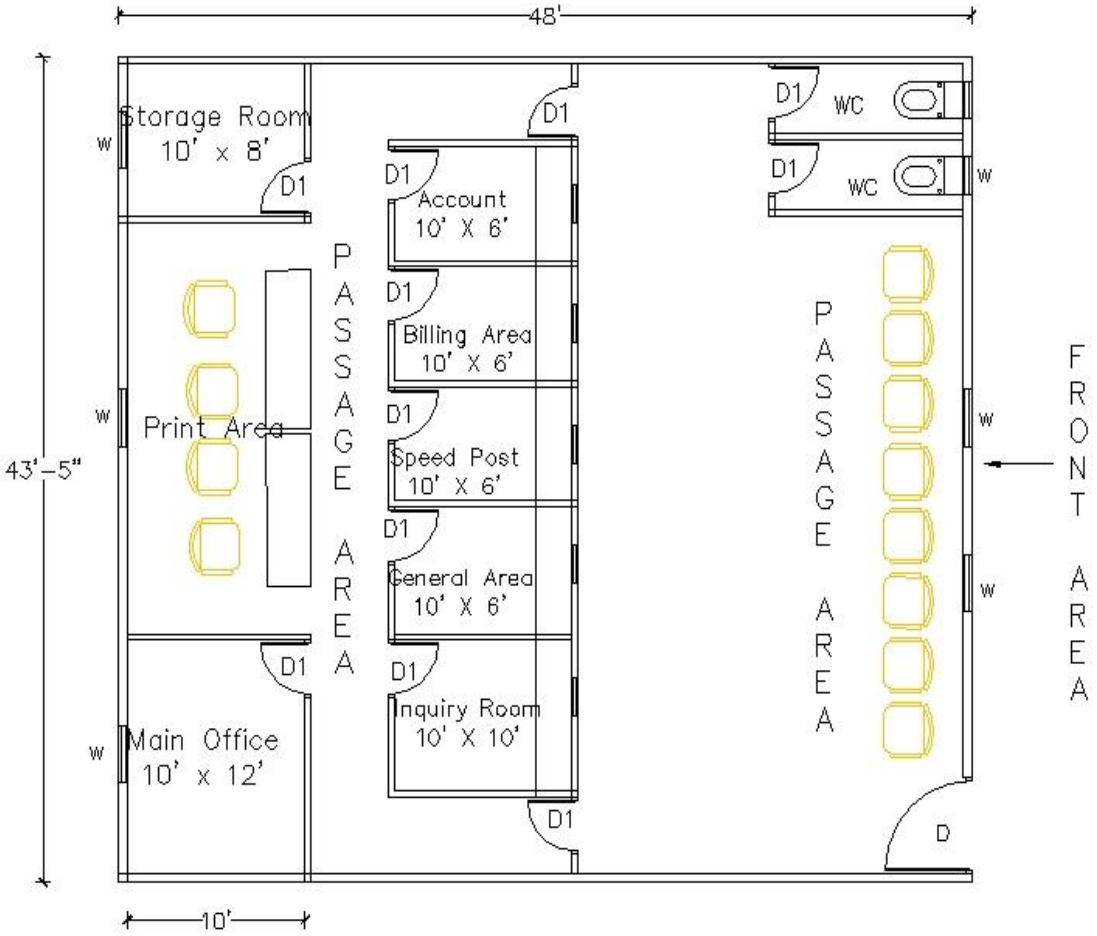
= 1,88,400 Rupee

13.1.3 Post Office

Proposed design data
Plan area = 14.63m X 13.26m

Furniture design:-

- Inquiry room = 2table – 2 main chair -4 other chair and 1 cupboard
- General Area = 1 table – 4 chair – 1 main chair -1 banch for public seating
- Speed post = 1 table – 1 main chair – 2 other chair
- Billing area & Account room = every room 1 cupboard – 1 table – 1 main chair – 2 other chair
- Storage room = 1 table – 1 cupboard – 2 chair
- Main office = 2 table – 2 main chair – 8 other chair – 1 cupboard
- Print area = 2 table – 4 chair – 1 bench
- Passage area = 8 benches for public



PLAN

Figure 109 Plan of Post Office

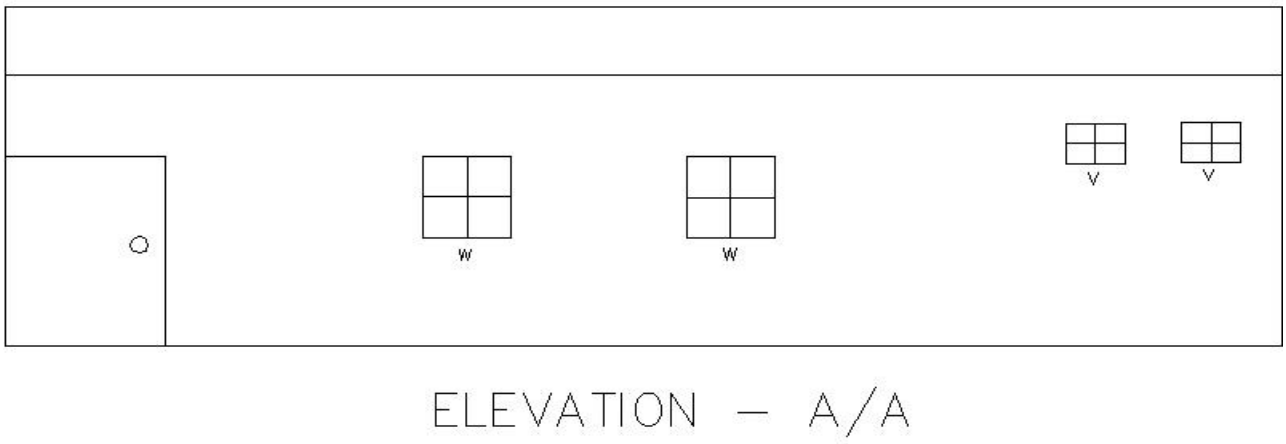


Figure 110 Elevation of Post Office

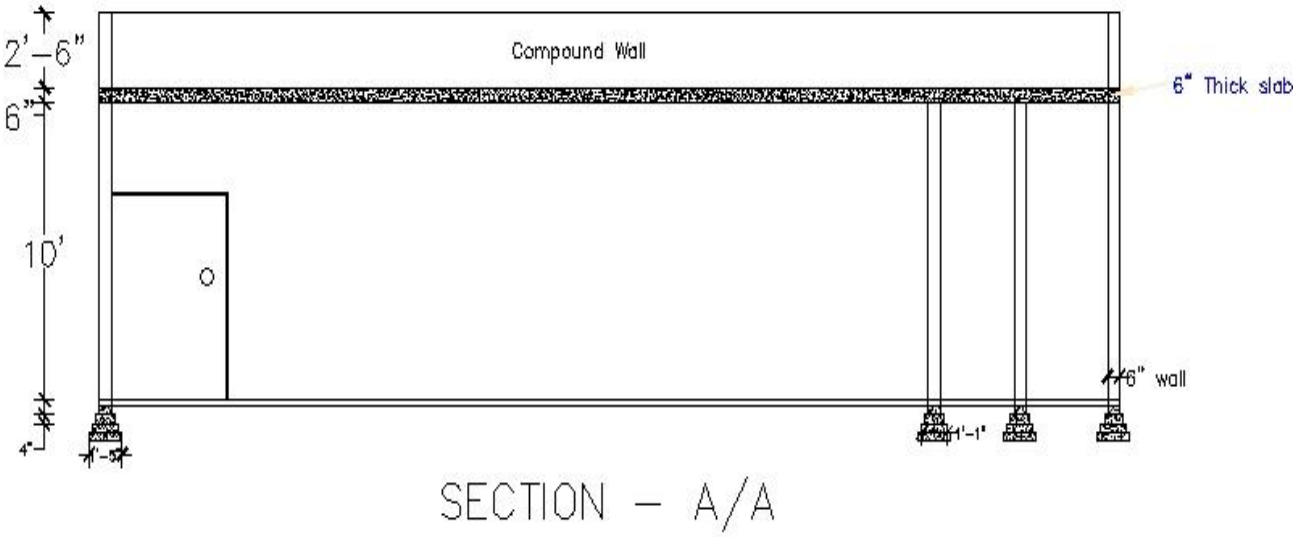


Figure 111 Section of Post Office

- **Estimate of Post Office**

Table 51 Measurement sheet of Post office

Sr No	Description	NO.	length(ft)	Breath(ft)	Height(ft)	Quantity(ft^3)	Rate (Rs./(ft^3)	Amount(Rs.)
1	Excavation in foundation							
	Long wall (horizontal) type-1	2	43'5"	2'9"	4'	206'33"	60	
	Long wall(Left) type-2	1	34'	2'9"	4'	22'63"	60	
	Long wall (Right) type-3	1	20'	2'9"	4'	15'91"	60	

	short wall type 1	2	48'	2'9"	4'	212'6"	60	
	short wall type 2	8	10'	2'9"	4'	13'8"	60	
					Total	821'45"		49287
2	P.C.C. in foundation(1:3:6)							
	long wall type 1	3	43'5"	2'9"	1'	41'24"	3000	
	Long wall type 2	1	34'	2'9"	1'	4'5"	3000	
	Long wall type 3	1	20'	2'9"	1'	3"	3000	
	Short wall type 1	4	48'	2'9"	1'	3'95"	3000	
	Short wall type 2	1	10'	2'9"	1'	2.5"	3000	
					Total	8'75"		26250
3	Brick work in foundation							
	long wall (type 1)1st step	3	43'5"	2'	6"	1'6"	3000	
	second step	3	43'2"	1'6"	6"	1'38"	3000	
	third step	3	42'9"	1'3"	6"	1'9"	3000	
	fourth step	3	42'6"	1'	3'9"	4'9"	3000	
	long wall (type2)1st step	1	34'	2'	6"	18"	3000	
	second step	1	33'9"	1'6"	6"	15"	3000	
	third step	1	33'6"	1'3"	6"	12"	3000	
	fourth step	1	33'3"	1'	3'9"	53"	3000	
	long wall (type 3)1st step	1	20'	2'	6"	18"	3000	
	second step	1	19'9"	1'6"	6"	15"	3000	
	third step	1	19'6"	1'3"	6"	12"	3000	
	fourth step	1	19'3"	1'	3'9"	53"	3000	
	short wall(type 1) 1st step	4	48'	2'	6"	20'3"	3000	
	second step	4	47'9"	1'6"	6"	17'58"	3000	
	third step	4	47'6"	1'3"	6"	13'8"	3000	
	fourth step	4	47'3"	1'	3'9"	62'33"	3000	
	short wall (type 2)1st step	1	10'	0.6	6"	1'8"	3000	
	second step	1	10'9"	0.5	6"	1'47"	3000	
	third step	1	10'6"	0.4	6"	1'44'	3000	
	fourth step	1	10'3"	0.3	3'9"	5'5"	3000	
					Total	152'88"		458640
4	Brick work in super structure in cement mortar(1:3)							
	long wall 1	3	43'5"	1'	1'	132'25"	3300	
	long wall 2	1	34'	1'	1'	14'47"	3300	
	long wall 3	1	20'	1'	1'	13'28"	3300	
	For parapet wall							
	long wall	2	43'5"	1'	2'9"	23'26"	3300	
	short wall	2	48'	1'	2'9"	22'63"	3300	
					Total	208'56"		
	deduction for door and windows							
	Main door D1	1	7'	1'	5'	5'9"	3300	

	door D2	7	7'	1'	2.6'	12'8"	3300	
	W.C. door D3	2	7'	1'	2.6'	1'83"	3300	
	outer window W1	5	3'	1'	3'	8'85"	3300	
	inner window W2	5	2'	1'	2'	3'55"	3300	
	ventilation	2	2'	1'	2'	24"	3300	
					Total	33'17"		
					Net quantity			
					Total	175'39"		578787
5	R.C.C. work in slab chajja & lintel							
	R.C.C slab	1	14.63	12.9	3"	74'34"	8500	
	R.C.C. chajja	5	1.5	0.9	3"	2'21"	8500	
	R.C.C. lintel					2'06"	8500	
					Total	78'60"		668100
6	2 cm thick kotah stone						(in $ft^{2)}$	
	office 1&2	2	16'07"	13'1"		121'32"	400	
	conference	1	15'09"	9'08"		41'80"	400	
	customer service	1	16'07"	13'1"		64'60"	400	
	storage	1	9'97"	5'11"		15'55"	400	
	print room	1	10'69"	13'38''		43'65"	400	
	post box	1	15'68"	13'2"		62'79"	400	
	open space	1	15'58"	13'2"		62'69"	400	
	door sills	8	2'9"	9"		7'08"	400	
						419'78"		167912
7	plaster(15mm)					1259'35"	150/ft^2	188902.5
8	paint cost					1259'35"	50/ft^2	62967.5
9	water cost							10000
10	over headed cost							5000
11	contractor profit cost							50000
12	reinforcement steel, centering, finishing, curing					419'78"	2000	255900
							Total cost	19,20,456 Rs.

So the final cost of the Post Office is 19,20,456Rs.

13.1.4 Shelter

STORM SHELTER. A building, structure or portion thereof, constructed in accordance with ICC 500, designated for use during a tornadoes, hurricanes, and other severe Windstorms.
SAFE ROOM. An interior room, space within a building, or entirely separate building, designed and constructed to provide near absolute life safety protection for its occupants from tornadoes or Hurricanes.
This standard applies to the design, construction, installation and inspection of storm shelters constructed for the purpose of providing protection from tornadoes ,
Hurricanes and other severe windstorms.
Storm shelters shall be constructed as either separate, detached buildings or rooms or spaces within new or existing buildings.
Design of facilities for use as emergency shelters after the storm is outside the scope of this standard.

Figure 112 Upper side of Shelter

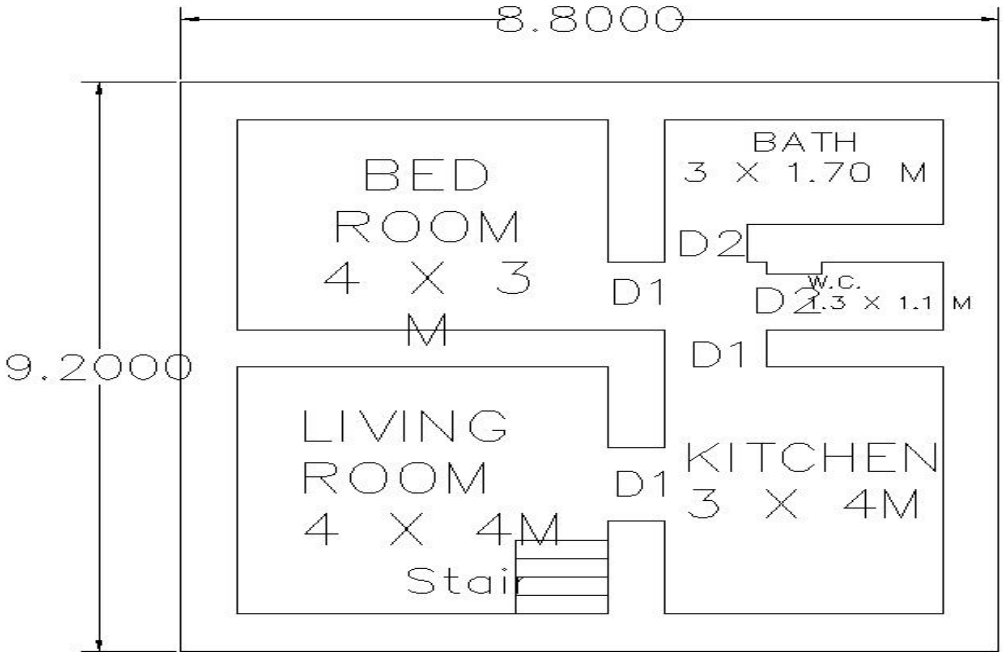


Figure 113 Plan of Shelter

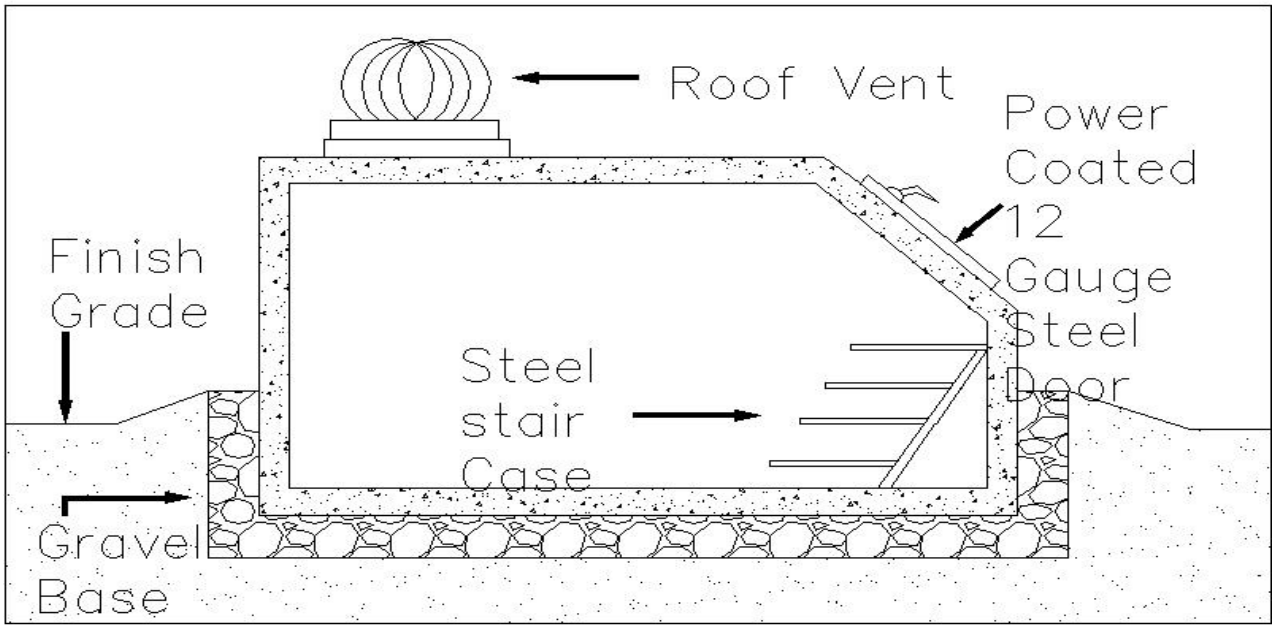


Figure 114 Section of Shelter

- **Estimation of Shelter**

Table 52 Measurement sheet of Shelter

Sr. No.	Item Description	No	Length L(m)	Breadth B(m)	Height H(m)	Quantity	Rate	Amount Rs.
1	Earthwork in Excavation for Foundation	1	44.4	0.9	1.10	43.96m^3	60/m^3	26376
2	Brick bat cement Concrete (1:4:8) for foundation							
		1	44.4	0.9	0.20	7.99 m^3	2700/m^3	21573
3	Brick Masonry up to Plinth in C.M. 1:6							
	First Step	1	46.4	0.5	0.3	6.96		
	Second step	1	46.9	0.4	0.3	5.63		
	Third step	1	47.4	0.4	0.85	12.08		
	First step	1	1.1	0.9	0.15	0.15		
	Second step	1	1.1	0.6	0.15	0.10		

	Third Step	1	1.1	0.3	0.15	0.05		
					Total	24.97m^3	3000	74910
4	Brick Masonry above Plinth up to slab level in C.M. 1:6							
		3	7.6	0.2	3	13.68		
		3	4	0.2	3	7.2		
		4	3	0.2	3	7.2		
		1	1.1	0.2	3	0.66		
					Total	**(+)28.74m^3**		
	Deduction for Doors							
	D1	3	1.1	0.2	2.1	1.39		
	D2	2	0.9	0.2	2.1	0.76		
	G1	1	1.2	0.2	2.1	0.50		
	D1	3	1.4	0.2	0.15	0.126		
	D2	2	1.2	0.2	0.15	0.072		
	G1	1	1.5	0.2	0.15	0.045		
					Total	(-)2.893		
				Net Quantity		22.52m^3	3300	74316
5	Smooth Plaster Inside the rooms and celling in c.m. 1:3					219.37m^2	100/m^2	21937
6	Water cost					L.S.		10000
7	Contractor Profit					L.S.		50000
8	Ventilator					L.S.		5000
9	Power Coated 12 gauge steel door					L.S.		5000
10	Miscellaneous Works (Electrical, Mechanical, Piping etc.)					L.S.		150000
11	Steel Stair case					L.S.		5000
						Total Cost		444112

So the final cost of the Shelter 4, 44,112 Rs.

13.1.5 Bus Stand with Toilet, Cycle stand and stalls

Proposed design data
Plan area =11.95m * 3.45 m

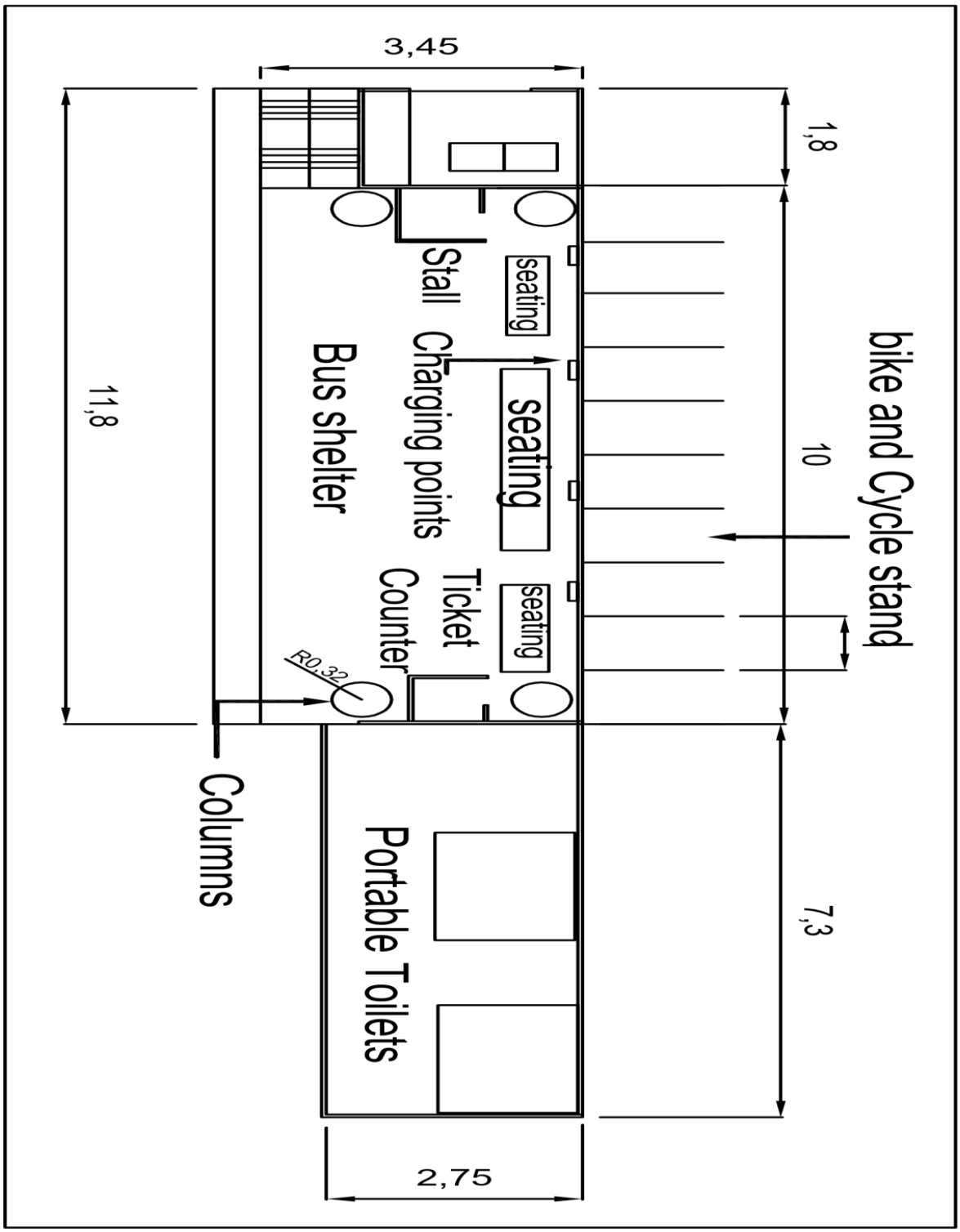


Figure 115 Plan of Bus stand

- **Estimation of Bus stand**

Table 53 Measurement sheet of Bus stand

Sr. No.	Item Description	Unit	Unit Price (Rs.)	Qty.	Amount (Rs.)
Bus Shelter & Cycle Stand					
1	SS Grade 304 Column, Rafter, Purlin, Roof sheet Polycarbonate Sheet, Frame for Advertisement Board, SS Sheet for Advertisement Board, Acrylic Sheet for Route Board, Connectors for Advertisement Board	No.	1,232,000	1	1,232,000
		Sub-Total (A)			1,232,000
Toilet Blocks					
2	Portable Toilet	No.	25000	2	50000
		Sub Total (B)			50,000
Grid- Connected Sol					
3	5KW, Single phase, Rooftop On grid Solar System	No.	285,000	1	285,000
4	Power cables, DC combiner & DC distribution box, Ear thing of Solar system	No.	45,000	1	45,000
5	Bi-directional, Import/ Export KWh Metering system	No.	20,000	1	20,000
6	AC Distribution Box	No.	40,000	1	40,000
			Sub-Total (C)		390,000
Vendor stalls					
7	Modular Prefabricated stalls	No.	250,000	1	250,000
			Sub-Total (D)		250,000
Civil Works					
8	Earthwork for Cutting, Filling and Disposal of Surplus Earth				
9.	Earth work in excavation in foundation, trenches etc. including dressing of sides and ramming of bottoms, including getting out the excavated material, refilling after laying pipe/ foundation and disposal of surplus				

	excavated material at a lead up to 50m suitable site as per direction of Engineer for following depths, below natural ground / Road top level				
a	In ordinary rock.				
b	Depth up to 1.5 m	cum	324	38	12,312
10	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibrator including curing complete as per clause 2100 of MoRT&H specification including all scaffolding, material, labor, machinery.	cum	3,550	9	31,950
a	RCC - M25	cum	4,940	24	118,560
11	Supplying, fitting and placing TMT bar reinforcement in sub structure/ superstructure at all level complete as per drawing and clause 1600 & 2200 of MoRT&H Specification including all material, labor, machinery etc.	Tone	52,800	0.2	10,560
12	Brick work with FPS bricks of class designation 75 in foundation and plinth in				
a	Cement mortar 1:4 (1 cement : 4 coarse sand)	cum	3,950	6	23,700
13	Kota stone slab flooring 25mm thick over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab including rubbing and polishing complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand)	sq.m.	1,020	80	81,600
	Sub-Total (E)				278,682
Miscellaneous					
14	Miscellaneous Works (Electrical, Mechanical, Piping etc.)	LS		1	150,000
	Sub-Total (F)				150,000
	TOTAL (A + B + C + D + E + F)				**23,50,682**

So the final Cost of the Bus Stand with Toilet, Cycle stand and stalls is 2350682 Rs.

13.1.6 Green Infrastructure Library

Proposed design data

Plan area =11.95m * 3.45 m

Furniture design:-

Net surfing area: 4 Chair – 4 table

Reception Area: - 2 Chair – 1 Table

Reading Area: - 4Chair – 2 Table

E-desk: - 4Chair – 1 Table

6 Extra Chair --- 2 Extra Table

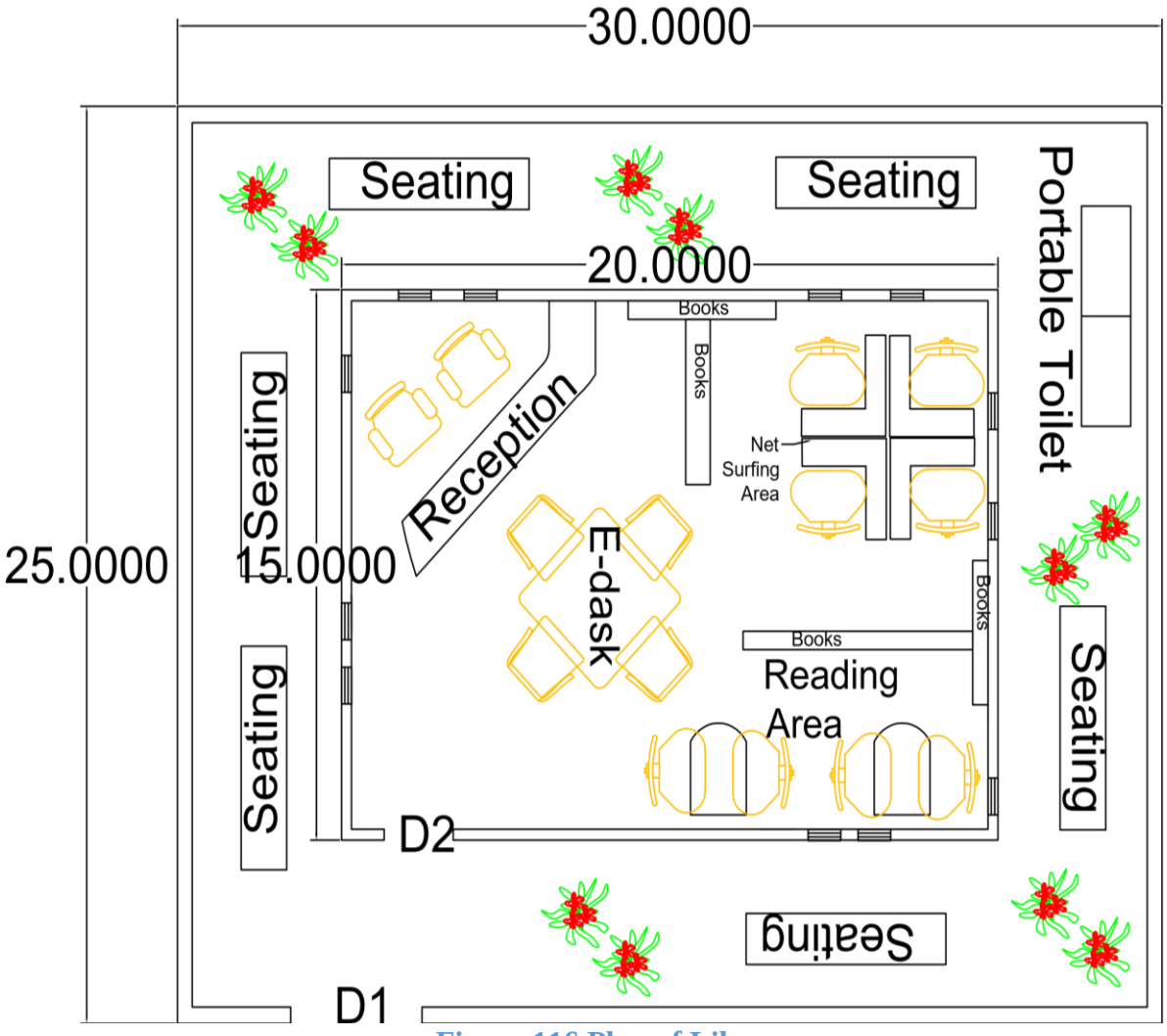


Figure 116 Plan of Library

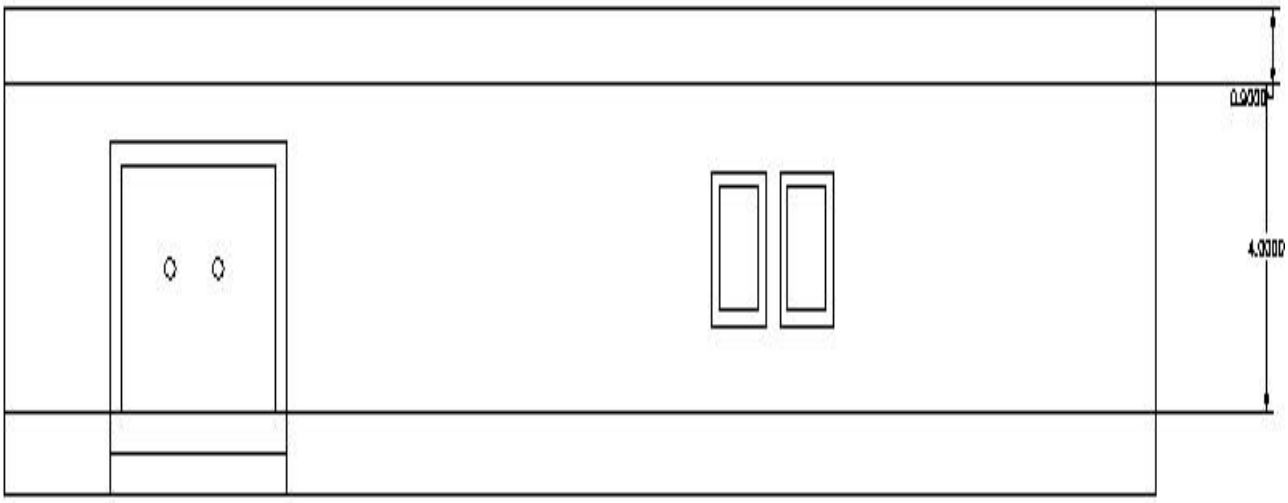


Figure 117 Elevation of Library

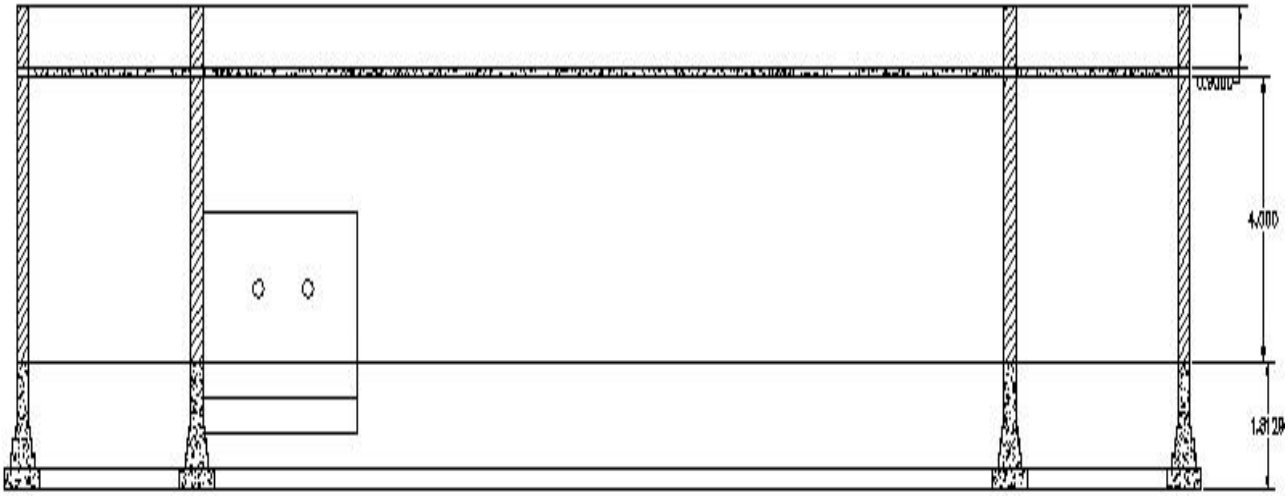


Figure 118 Section of Library

- **Estimation of Library**

Table 54 Measurement sheet of Library

Sr. No.	Particulars	No	L	B	H	Quantities
1	Excavation of Foundations	1	70.75m	0.90m	1.5m	95.51m3
2	Cement concrete in foundation	1	70.75m	0.90m	0.30m	19.10m3
3	earth filling					
	1st footing	1	70.9m	0.60m	0.20m	8.50m3
	2nd footing	1	70.95m	0.50m	0.20m	7.10m3
	3rd footing	1	71m	0.40m	0.20m	5.68m3

					total	21.28m3
4	brick work					
	brick work up to G.L.	1	70.75m	0.30m	0.60m	12.735m3
5	brick work to G.L. To plitnh	1	70.75m	0.30m	0.60m	12.735m3
6	Brick work in super structure		71.05m	0.30m	5.62m	119.79m3
7	Deductions					
	D1	1	1.10m	0.30m	4m	1.32m3
	D2	1	1.10m	0.30m	2.10m	0.693m3
	window	12	1.10m	0.30m	1m	3.96m3
					total	5.97m3
					Total	113.82m3
8	inside plastering	1	15m		20m	300m2
9	outside plastering	1	15m		20m	300m2
10	Paint					
	Wall no 1	1				95.3m2
	Wall no 2	1				71.75m2
	Wall no 3	1				95.65m2
	Wall no 4	1				71.75m2
	celling					300m2
	Total					634.25m2
11	RCC slab	1	15m	20m	0.12m	36m3
12	flooring	1	15m	20m	0.02m	6m3

Table 55 Cost of Library

SR. NO.	DESCRIPTION OF ITEM	QUANTITY	RATE	PER	Amount Rs.
1	excavation in foundation	95.51	205/-	m3	20000/-
2	B.B.C.C. In foundation	20	2610/-	m3	52200/-
3	brick work up to GL	12.735	3200/-	M3	40752/-
4	earth filling	21.28	300/-	m3	6384/-
5	brick work from GL to plinth level	12.735	3000/-	m3	38205/-
6	D.P.C	30	80/-	m2	2400/-
7	brick work in super structure	114	3500/-	m3	399000/-
8	R.C.C slab	36	10000/-	m3	360000/-
9	12mm thick inside plaster	300	160/-	m2	48000/-
10	20mm thick outside plaster	300	250/-	m2	75000/-

11	flooring	6	750/-	m2	4500/-
12	skirting	35	220/-	m	7700/-
13	paining	600	300/-	m2	18000/-
14	door frame	7.56	185/-	m3	1400/-
			TOTAL=		1073550/-
		ADD 3% CONTIGENCIES			32207/-
		ADD 2% WORK CHARGE ESTABLISHMENT			21471/-
			TOTAL=		1127228/-
15	Seating table	10	3000		30000
16	Chair	20	300		6000
17	Portable Toilet	2	25000		50000

So the final Cost of the Green Infrastructure library is 12,13,228Rs.

13.1.7 RFID based attendance system

Introduction

An RFID based Attendance System is a very interesting project which can be used in different places say in Schools to register the attendance of students and teachers, Private organizations to get rid of manual attendance process ,repented by pepper sheet and signature, researchers have proposed many technologies that included in barcode based attendance system to tabulate monthly working hours of employees and automatically calculate salary based on the number of hours registered in the office and other similar kinds of applications.

Thus, the data stored in this card is referred as the identification/attendance of the person.

RFID Based Attendance System using Arduino, RTC & LCD Display. Here Arduino UNO acts central processor for controlling all other computer to go to the notification components as input/output unit. We have used 5volt power supply to power all the components used in this project. RFID Reader module is interfaced with Arduino to read the data from RFID Card/tag. Real Time Clock (RTC) ModuleDS3231 is used to display the current time and date on the LCD as well as arriving and leaving time of the users. LCD displays every output like current date & time, information of users, no of staffs present or absent and menu options from 1to 4. Red & Green LED is used for the indication of arriving and leaving. Similarly buzzer produces sound whenever the interrupt is detected.

SYSTEM ARCHITECTURE

The module included in the proposed system architecture as Follows:

Arduino Uno Microcontroller (Atmega328), RFID Reader, RFID tags, Sim card, LCD and buzzer, Power Supply Unit, RTC module.

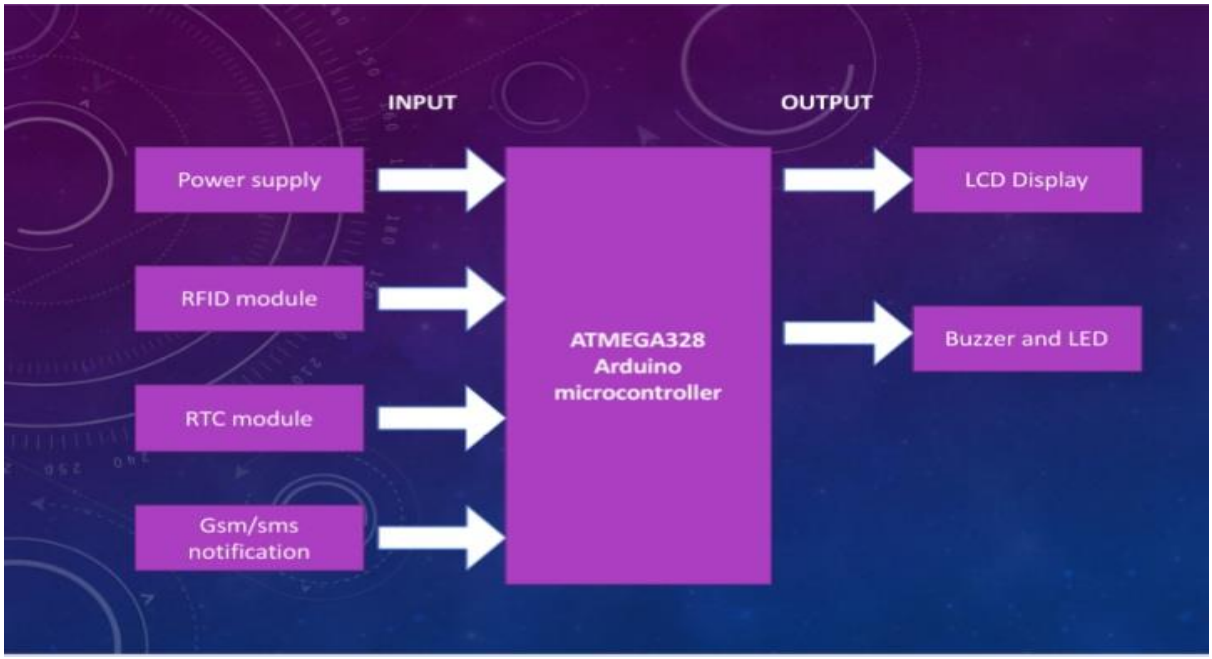


Figure 119 block diagram of RFID based attendance system

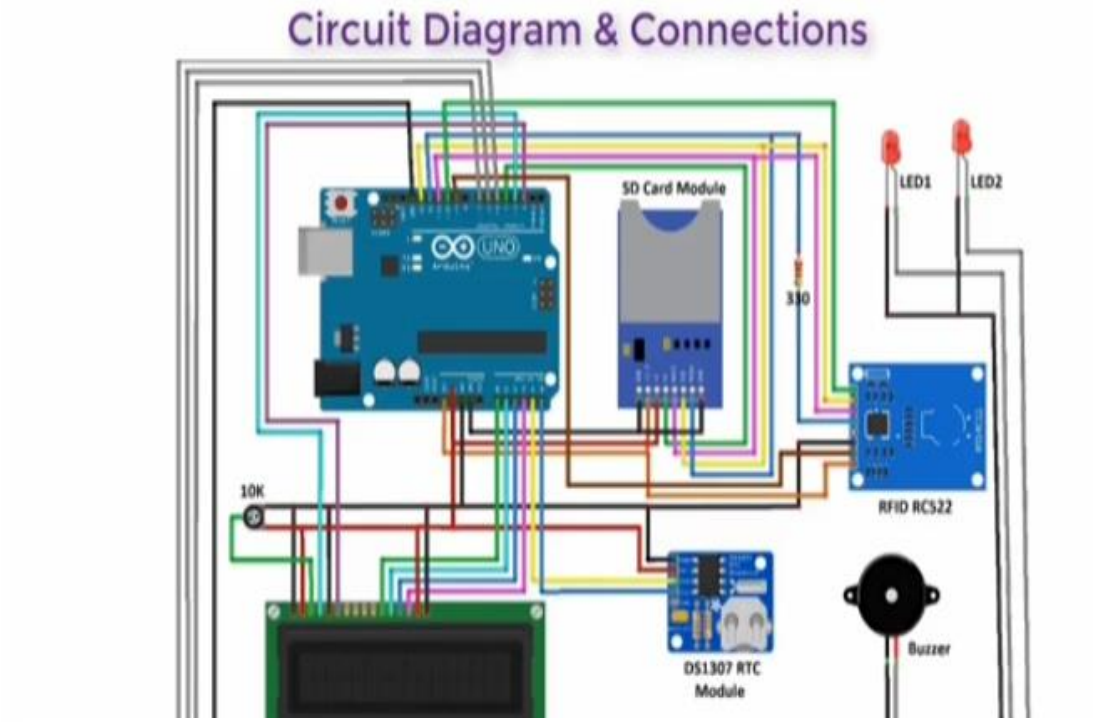


Figure 120 circuit diagram of RFID based attendance system

The Arduino Uno is open source microcontroller board based on the microchip ATmega328P microcontroller and developed by Arduino. The board is equipped with sets of digital and analogue input/output (I/O) pins that may be interfaced to various expansion boards and other circuits. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USE cable. It can be powered by the USB cable or by an external 9-vot battery, though it accepts voltages between 7 and 20 volts

RTC module (DS3231 or DS1307)

Real time clock is used to keep record off time and to display time. It is used in many digital electronics devices like computers, electronics watches, date loggers and situation where you need to keep track of time. RTC has a CMOS battery. Using DS3231 IC as the main component, several manufacturers developed DS3231 RTC Modules with all the necessary components. Almost all the modules available today consist of an additional IC, 24C32N (or something similar). This secondary IC is an EEPROM IC of 32Kb size. Since both RTC and EEPROM ICs are interfaced through I2CProtocol, you won't need any extra pins as boththese I2C Devices can act as slaves while a microcontroller acts as a master. Since RTC is all about maintaining time irrespective of the power supply, you can connect a 3V CR2032 Lithium Battery to the RTC IC to keep the clock ticking. In the DS3231 Module, there is a provision for you to connect a battery using the battery holder provided on the back

RFIR reader module

The EM-18 RFID Reader module operating at 125kHz is an inexpensive solution for yourRFID based application.

The Reader module

comes with an on-chip antenna and can be powered up with a 5V power supply. Power-up the module and connect the transmit pin of the module to receive pin of your microcontroller. Show your card within the reading distance and the card number is thrown at the output. Optionally the module can be configured for also a weight and output.

Radio Frequecy Identification Tags

The working principle of RFID card shows in figure

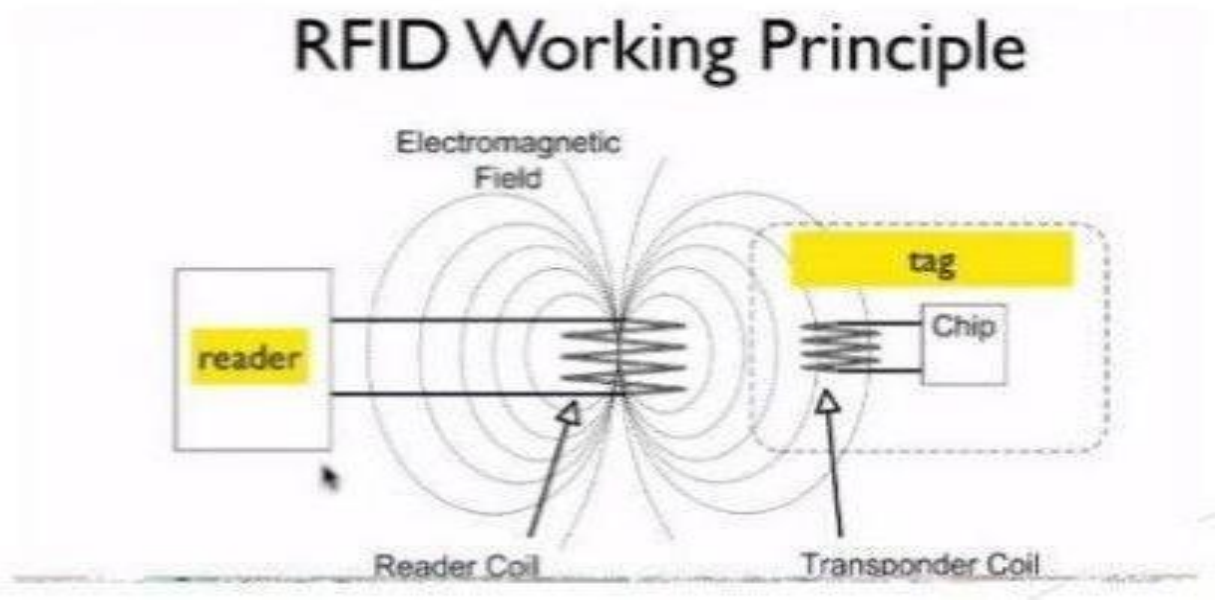


Figure 121 working principles of RFID

The working principle of RFID card shown in figure RFID tag known as a proximity integrated circuit card and it can be powered by actively or passively. RFID tags also known as transponder and one transponder consist of antenna, microchip and battery (for active tag only). The size of the chip generally depends on the antenna size. Antenna size and form is dependent on the frequency that used by the tag. Active tag contain on board power source where passive tag are inductively powered via Radio signal that generated by RFID reader. Active tag can work in absence of reader and records the sensor reading or perform their calculation. Passive tags can operate in presence of reader only. In addition to the microchip, some tags contain rewritable memory which size can varies according to the application requirement. The purpose of microchip is to store the Unique Identification (ID) of each object. This ID act as a serial number stored in the RFID memory. The range of RFID tags depends on their frequency. These frequency ranges are Low Frequency (30-500 KHz), High Frequency (10-15MHz) and Ultra High Frequency (2.4- 2.5GHz). Other performance attribute and resistance to interference determined by this frequency range.

Liquid Crystal Display

The main purpose of LCD in this proposed design is to display the information like employed code and name, welcome message that stored on the SD card when tag match with the based code. The configuration of the LCD used is 16*2.

Power Supply Unit

As shown in figure 3 the input to the proposed design supplied through the regulated supply unit that is using a voltage regulator (7805-IC). Which takes input as 9 volt battery and get output as 5 volt? So after this pure direct current voltage obtained from the regulator applied to the proposed design.

Figure shows the flow chart of the proposed system in this first RFID tag code read by the reader and decrypts it and sended its information to the controller. When the code matched with the stored information then only gate will open with audio greeting and display the employee information on the LCD that retrieved by the controller from the micro SD card. If the code not matched then door remain closed and alerts the security person through Speaker by playing the separate audio file saying entry is unauthorized. Figure show that real time RFID system Figure 1a shows that if system valid and figure 2b shows that system is not valid

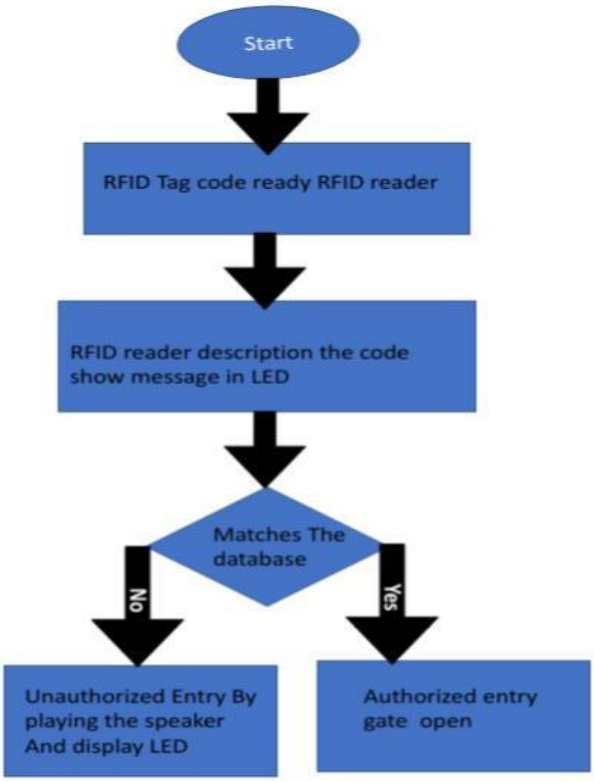


Figure 122 flow chart of design system

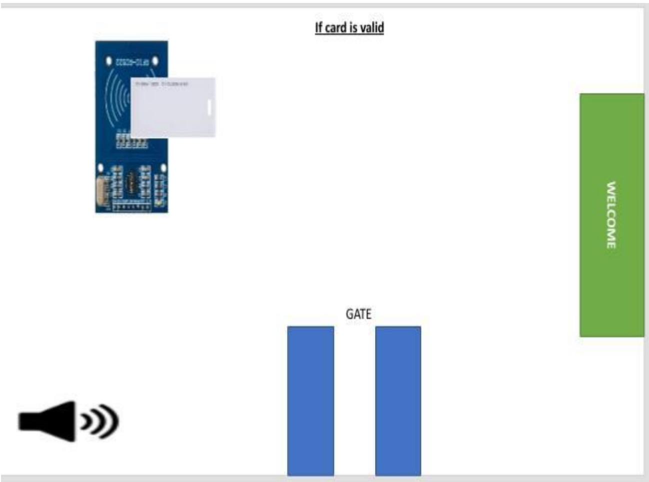


Figure 118 RFID based system if system valid

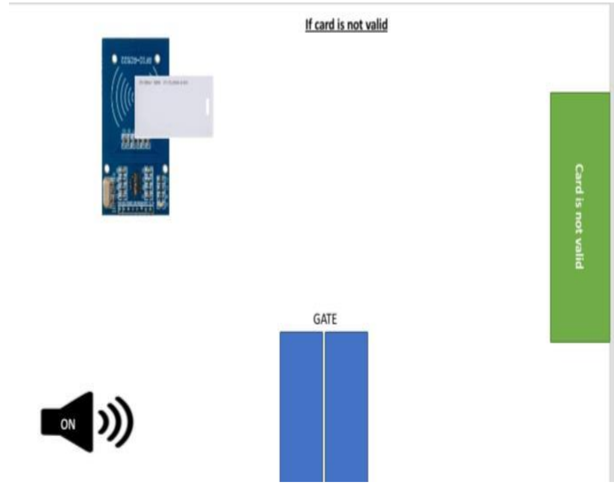


Figure 119 RFID based system if system not valid

Final Output Result

RFID Based Gate security system is able to identify the authorized entry, record it and allow them to pass through the gate and displayed the all information that linked with that code along with audio greeting. Figure 7 shows the accepted card information that read by the reader and matched with stored base code. Figure 8 shows the greeting message along with the RFID code.

```
               alid cáReady to read a PICC Card
Card UID: - 47 -  - B0 -  - 73 -  - 65 -
Accepted, Valid card
Card UID: - 47 -  - B0 -  - 73 -  - 65 -
Accepted, Valid card
Card UID: - 47 -  - B0 -  - 73 -  - 65 -
Accepted, Valid card
Card UID: - 47 -  - B0 -  - 73 -  - 65 -
Accepted, Valid card
Card UID: - 47 -  - B0 -  - 73 -  - 65 -
Accepted, Valid card
Card UID: - 47 -  - B0 -  - 73 -  - 65 -
Accepted, Valid card
Card UID: - 47 -  - B0 -  - 73 -  - 65 -
Accepted, Valid card
Card UID: - 47 -  - B0 -  - 73 -  - 65 -
Accepted, Valid card
Card UID: - 47 -  - B0 -  - 73 -  - 65 -
Accepted, Valid card
```

Figure 123 Simulation output file

```
--------------------------------
Scanned PICC's UID:
47B07365
Welcome, You shall pass
Scanned PICC's UID:
47B07365
Welcome, You shall pass
Scanned PICC's UID:
47B07365
Welcome, You shall pass
Scanned PICC's UID:
47B07365
Welcome, You shall pass
Scanned PICC's UID:
47B07365
Welcome, You shall pass
Scanned PICC's UID:
47B07365
Welcome, You shall pass
Scanned PICC's UID:
47B07365
Welcome, You shall pass
Scanned PICC's UID:
47B07365
Welcome, You shall pass
```

Figure 124 greeting simulated output file

Table 56 Estimation of RFID based attendance system

Component	**Quantity**	**Price**
Arduino Uno	1	500
RTC module	1	200
RFID reader	1	150
RFID tag	4	50
Buzzer	1	50
LCD	1	120
SD card module	1	100
Led	2	10
Total	12	1170RS

13.1.8 Design of GSM based taking energy meter

Abstract

GSM based Talking Energy meter is a new concept in the measurement of electricity consumption remotely on periodic basis and alerting user regarding power consumption, overloading & tempering through Audio Signal. This method of measurement and data collection discards the conventional method of taking the meter reading manually. Though the Talking Energy Meter display and sounds the number of electrical units consumed by the user as well as warning signal at the load center but on the other side, there is urgent need to develop a system which will transmit the units consumed by the individual user to the Power Utility Company (PUC). In this paper design of GSM based Talking Energy Meter is presented which will be able to communicate based on GSM network; for the transparency between the user and the PUC. The GSM based Talking Energy Meter (GTEM) consist of a energy meter connected with the compatible microcontroller, a display device, an audio module, GSM modem and a transmit and maintain the record of the electricity consumption data of a particular user

INTRODUCTION

Traditional meter reading for electricity consumption and billing is done by human operator by visiting one place to another. This requires more time to collect data regarding energy consumption by user and also requires more labor operator. Moreover, human operator billing are prone to error as sometime some locations are not easily accessible for reading energy consumption. Sometimes bad weather conditions also restrict labor billing job. Printed billing has tendency of losing in the mail box. Also the user with busy work schedule does not constraint on energy meter for reading power consumption. Physically disable person are also unable to get information & alert signal regarding power consumption. In order to achieve efficient meter reading, reduce billing error and operation cost, facilitate handicapped user, GSM based Talking Energy Meter (GTEM) plays a vital role to address the above mentioned problems. GTEM is an effective means of data collection that allow substantial saving through reduction of meter re-read, greater data accuracy, allow frequent reading, improved billing and customer services, more timely energy profiles and consumption trends updates, more convenient for user with busy lifestyle, highly facilitation to physically disable persons and better deployment of human resource. With advancement in digital technology, analogue electro-mechanical meter is continuously replaced by digital electronic meter. Digital energy meter offer greater convenience to implement and establish automatic meter reading system electronically. Efficiency and reliability of retrieving meter reading in the GTEM

was a major challenge. Various Automatic Meter Reading (AMR) methods & technologies using Power Line Carrier (PLC) Communications, Supervisory Control & Data Acquisition (SCADA), telephone modem, internet, Ethernet, Embedded RF Module, Wi-Fi, and Bluetooth & ZigBee were established and developed to provide & demonstrate the solutions of efficiency, reliability and effectiveness of AMR. The above mentioned method have a number of drawbacks like higher cost, short distance, interference effect in communication channel, system complexity, error prone etc. With rapid development of Global System Mobile (GSM) infrastructure, in past decade has made wireless automatic meter reading system more reliable and possible. GSM based Talking Energy Meter (GTEM) based on GSM network is presented in this paper takes advantages of available GSM infrastructure nationwide coverage in the country and the SMS cell broadcasting feature to request and retrieve individual houses and building power consumption meter reading back to the Power Utility Company(PUC) wirelessly. The Audio Module of this Automatic Meter Reading (AMR) system alerts the user reads the energy meter readings and automatically send some updates to user's mobile phone like low balance alert, cut off alert, resume alert and recharge alert. Through audio signal about power consumption, bill due dates, meter overloading and/or meter tempering. This feature facilitate in alerting the customer having busy schedule and also to physically handicapped persons.

WORKING OF TALKING ENERGY METER BASED ON MICROCONTROLLER

The threshold unit value is set for which the consumption level increase is notified to the user. And the user can change that threshold limit according to the requirement by using dome switch.

A relay switch is connected with the microcontroller and the load which is used to cut the supply if someone tries to steal the electricity. It is used as protection purpose.

Voice Module is used to give the alert when consumption of units exceeds the set limit by user.

As soon as the limit exceeds, the voice alert occur and SMS get send on registered mobile number.

Working explanation:

Here we have interfaced electricity energy meter with Arduino using the pulse LED (Calibration or Cal) of electricity Energy meter. We only need to connect tis CAL LED to Arduino through an Opt coupler IC.

Components used:

Arduino, GSM Module, 16x2 LCD, Analogue Electricity Energy Meter, Opt coupler 4n35, Resistors, POT, Connecting wires, Bulb and holder, SIM card, Power supply, Mobile Phone.

When we power up the system then it reads previous values of rupees stored in EEPROM and restores them into the variables then checks the available balance with the predefined value and take action according to them, like if available balance is greater than 15 rupees then Arduino turns On the electricity of home or office by using relay. And if balance is less than 15 rupees then Arduino sends a SMS to user phone regarding low balance alert and requesting to recharge soon. And if balance is less than 5 rupees then Arudino turns Off the electricity connection of home and sends a SMS to user's phone for 'Light Cut' alert and requesting to recharge soon. GSM module has been used to send and receive messages, you can check about GSM MODULE

Now when we need to recharge our system, we can recharge it simply by sending a SMS to the system, through our Cellphone. Like if we want to recharge by 45 bucks then we will send #45*, here # and * are prefix and suffix to the recharge amount. System receives this message and extract recharge amount and update the balance of system. And system again turns On the electricity of the house or office.

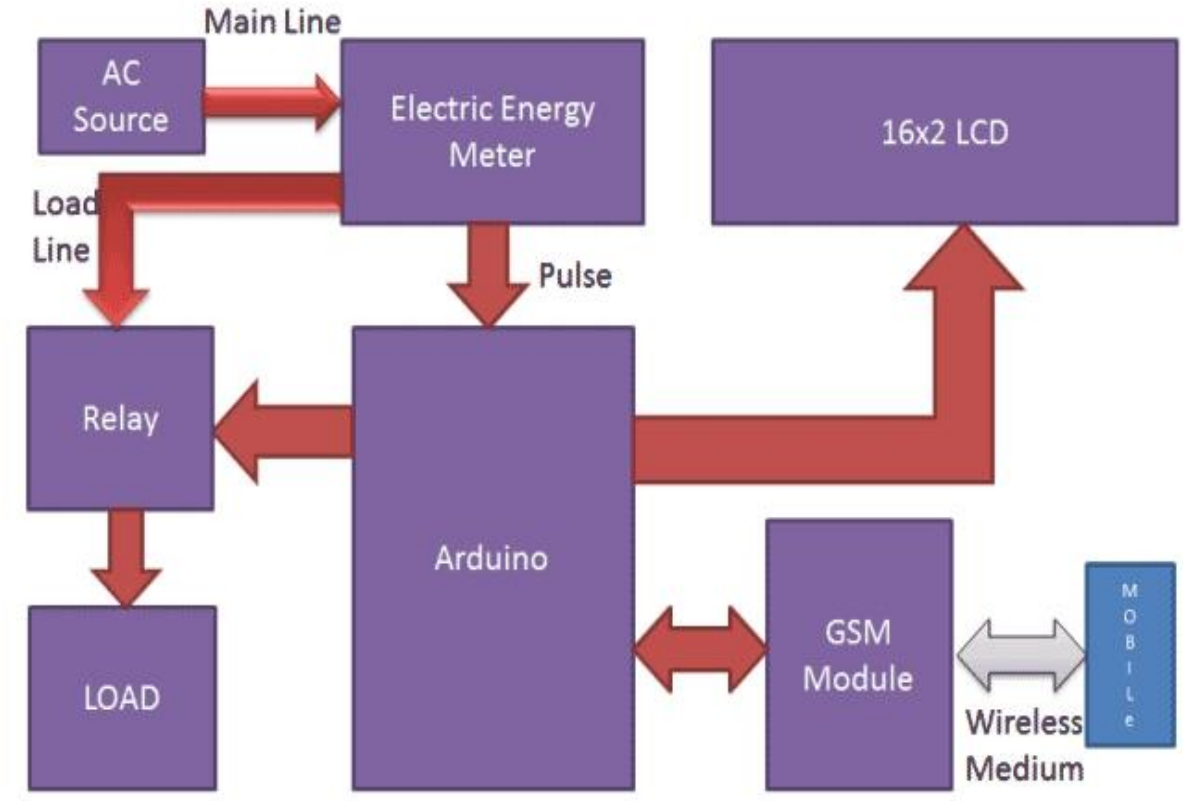


Figure 125 block diagram of GSM based taking energy meter

Circuit Description:

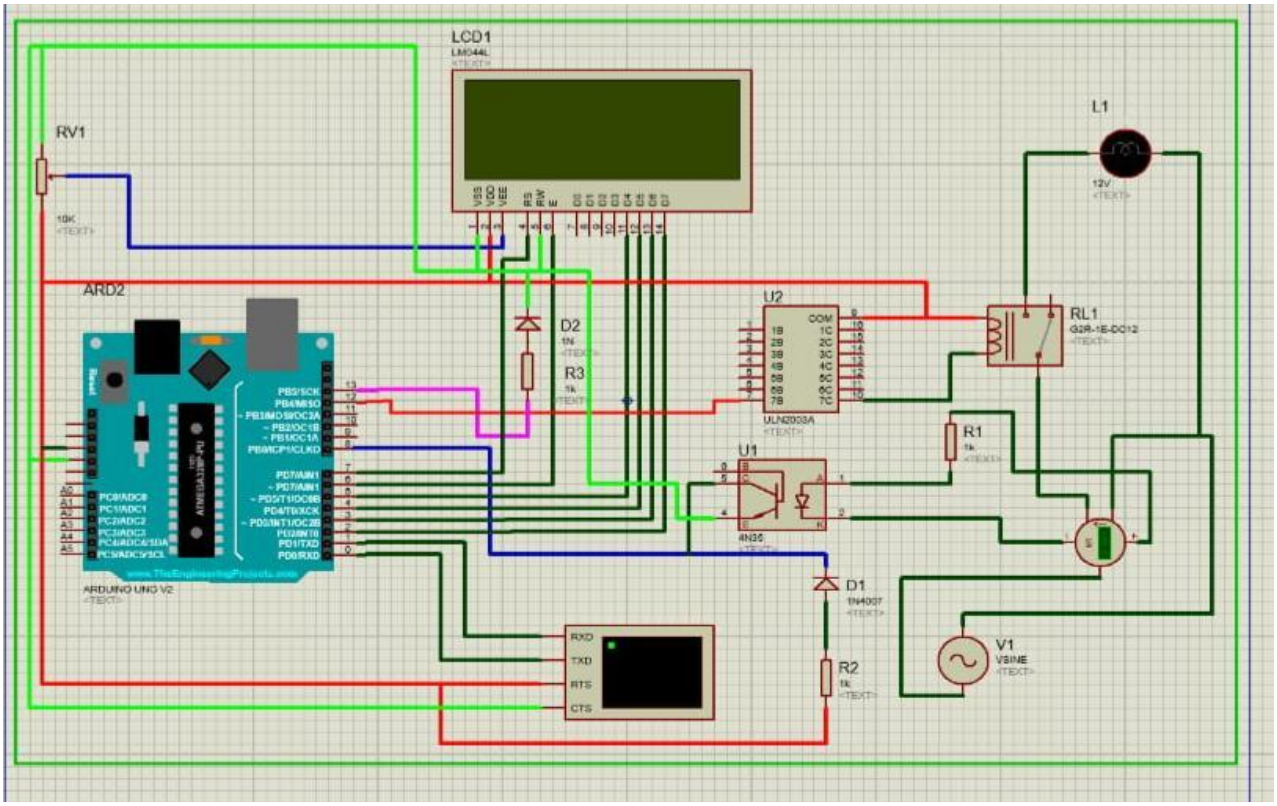


Figure 126 Circuit Diagram

Circuit connections for this Wireless Electricity Meter Reading Project, are shown in the diagram; we have used a Arduino UNO for processing all the things used in project. A liquid crystal display is used for displaying the status of Units and remaining balance. Data pins of LCD namely RS, EN, D4, D5, D6, D7 are connected to Arduino digital pin number 7, 6, 5, 4, 3, 2. And Rx and Tx pins of GSM module are directly connected to the Tx and Rx pins of Arduino respectively. And GSM module is powered by using a 12 volt adaptor. A relay is used for switching electricity connection which is connected at pin 12 of Arduino though ULN2003 relay driver.

How to Connect Energy Meter with Arduino:

First user need to buy an Analogue Electricity Energy Meter. After it user needs to open it and find the Pulse LED or Cal LED's terminals (cathode and Anode). Now solder two wires at both the terminals and take it out from the energy meter and then close energy meter and tight the screws. Now user needs to connect anode terminal of LED at pin number 1 of Opt coupler and cathode terminal to pin 2. Pin number four of optocouper should be directly connected to ground. A LED and a Pull-up resistor are connected at pin number 5 of optocoupler. And same terminal should go to the Arduino pin 8 too.

Figure 124 energy meter connection

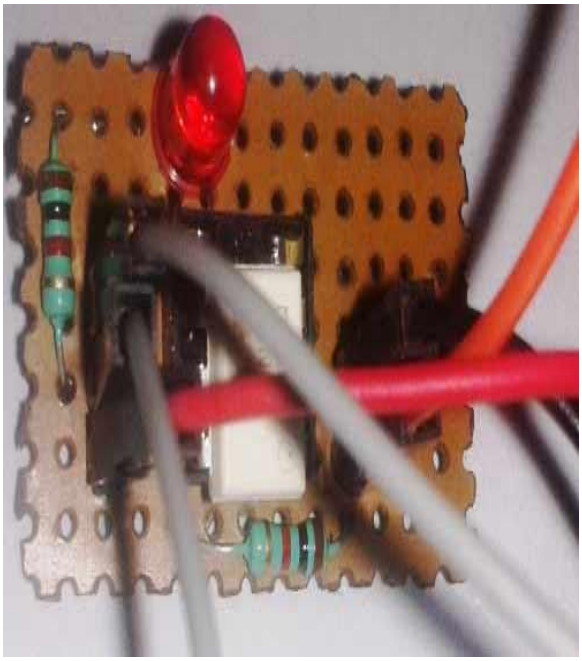


Figure 125 pull up circuit and optocouper IC circuit

Calculation of Pulses and Units:

Before proceeding for the calculations, first we have to keep in mind the pulse rate of energy meter. There are two pulse rates of energy meter first is 1600 imp/kwh and second is 3200 imp/kwh. So here we are using 3200 imp/kwh pulse rate energy meter.

So first we need to calculate the Pulses for 100watt, means how many times Pulse LED will blink in a minute, for the load of 100 watts.

Pulse= (Pluse_rate*watt*time)/ (1000*3600)

So pulses for 100 watt bulb in 60 seconds, with energy meter of 3200 imp/kwh pulse rate can be calculated as below:

Pulses=3200*100*60/1000*3600

Pulses = ~5.33 pulse per minute

Now we need to calculate Power factor of a single pulse, means how much electricity will be consumed in one pulse:

PF= watt/(hour*Pulse)

PF=100/60*5.33

PF=0.3125 watt in a single pulse

Units= PF*Total pulse/1000

Total pulses in an hour is around 5.33*60=320

Units = 0.3125*320/1000

Units = 0.1 per hour

If a 100 watt bulb is lighting for a day then it will consume

Units =0.1*24

Units = 2.4 Units

And suppose unit rate is at your region is 5 rupees per unit then

You have to pay for 2.4 Units Rs:

Rupees= 2.4*5 = 12 rupees

Advantage

High accuracy, Low cost, Reliable, No need gsm continues monitoring

Disadvantages

Billing system fails no gsm network coverage

Changes may be applicable for network use

Required fixed gsm number

Application

Energy meters are widely used in domestic areas for the measurement of electric power consumed by the customers and these energy meters are commonly used in industrial sector for controlling the electric power of various machinery according to its reading and for measurement of electric power.

Table 57 Cost estimate

Description	Quantity	Price
Arduino Uno	1	500
GS	1	325
4n35IC	1	20
Diode, resistance, wire	As per requirement	300
Lcd	1	350
ULN2003	1	15
12v relay	1	25
60w bulb	1	10
Energy Meter	1	400
Total		2000

13.1.9 GSM based automatic water plant system

INTRODUCTION

Perfect irrigation is an important feature for growing healthy crops. As India is a country where agriculture is one of the cores of economy, irrigation has to be smart and advanced. As we are stepping into a world of automation, the work load of the farmers can be reduced by formulating an automated system for maintaining a requisite supply of water. So this automated system has been devised to take care of the daily watering schedule of the crops. This system will be used for every crop with different moisture levels pre-programmed in the Arduino. Here, Arduino UNO R3 has been programmed to sense the moisture of the soil. When the moisture of the soil drops below a definite level, which is pre-defined in the Arduino, the system will be activated automatically and the plants will be watered keeping them healthy The system is also helpful in saving water, as the system supplies water to the crop or the plant concerned, when needed. GSM (Global System for Mobile Communications) executes computerized cellular conference systems. Results are sent from the system to the agricultural manufacturer. The coded instructions from the cell phone, controls the entire irrigation system

Related work

some of the systems are connected to internet which not reliable and feasible for farm that are not internet ready. the system is connected and control via internet. The sensor readings that are obtained by the microcontroller are displayed over the internet and user can only monitor and send instruction via internet.

Wireless sensor has been used in to detect the soil moisture. But, due to instability and expandability, the system has to develop two tiers working procedure which is data stream processing and the other is analyzing sensor data. Data stream processing will convert sensor data to DBMS format. While analyzing sensor data will predicts future soil moisture data based on the amount of water needed for irrigation based on predictive value and send control command to control the watering system.

WORKING PRINCEPLE

In This Plant Watering System, Soil Moisture Sensor checks the moisture level in the soil and if moisture level is low then Arduino switches On a water pump to provide water to the plant. Water pump gets automatically off when system finds enough moisture in the soil. Whenever system

switched On or off the pump, a message is sent to the user via GSM module, updating the status of water pump and soil moisture. This system is very useful in Farms, gardens, home etc. This system is completely automated and there is no need for any human intervention.

The complete system block Diagram is shown in figure.1and figure shows circuit diagram of the system.

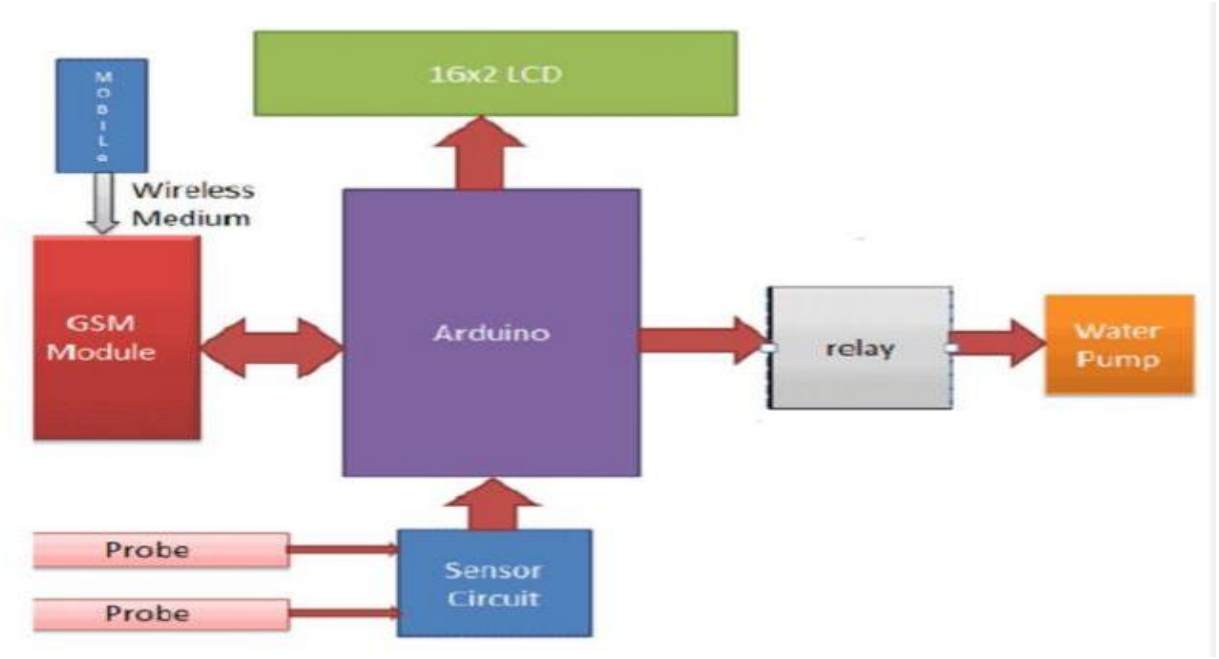


Figure 126 Working Block Diagram

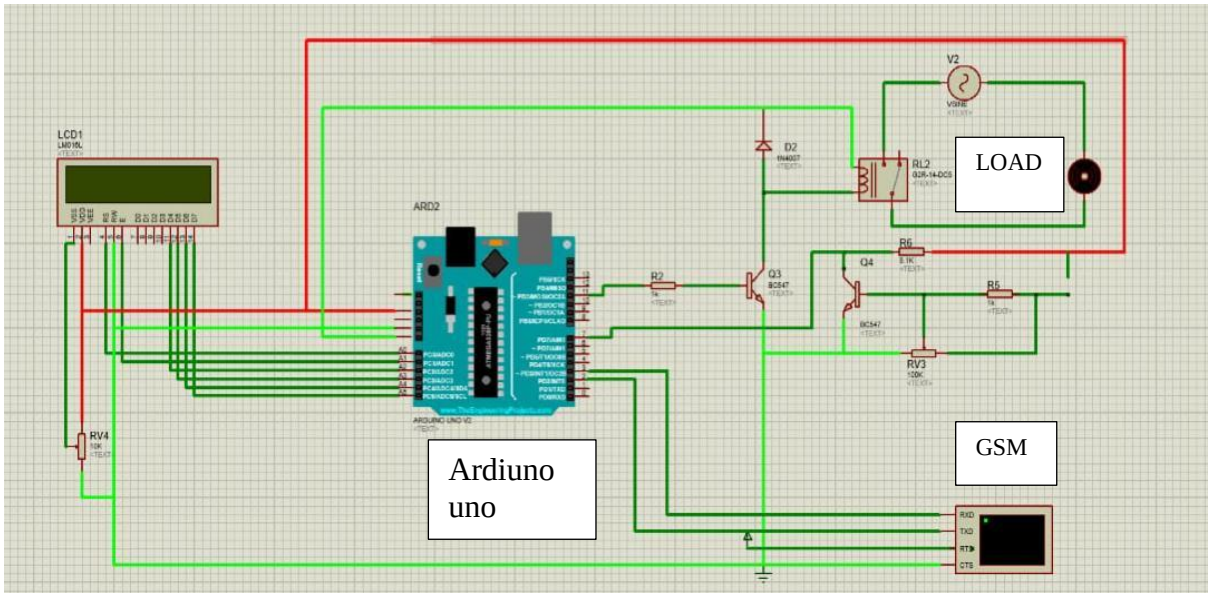


Figure 127 Circuit diagram of the games based automatic water plant system

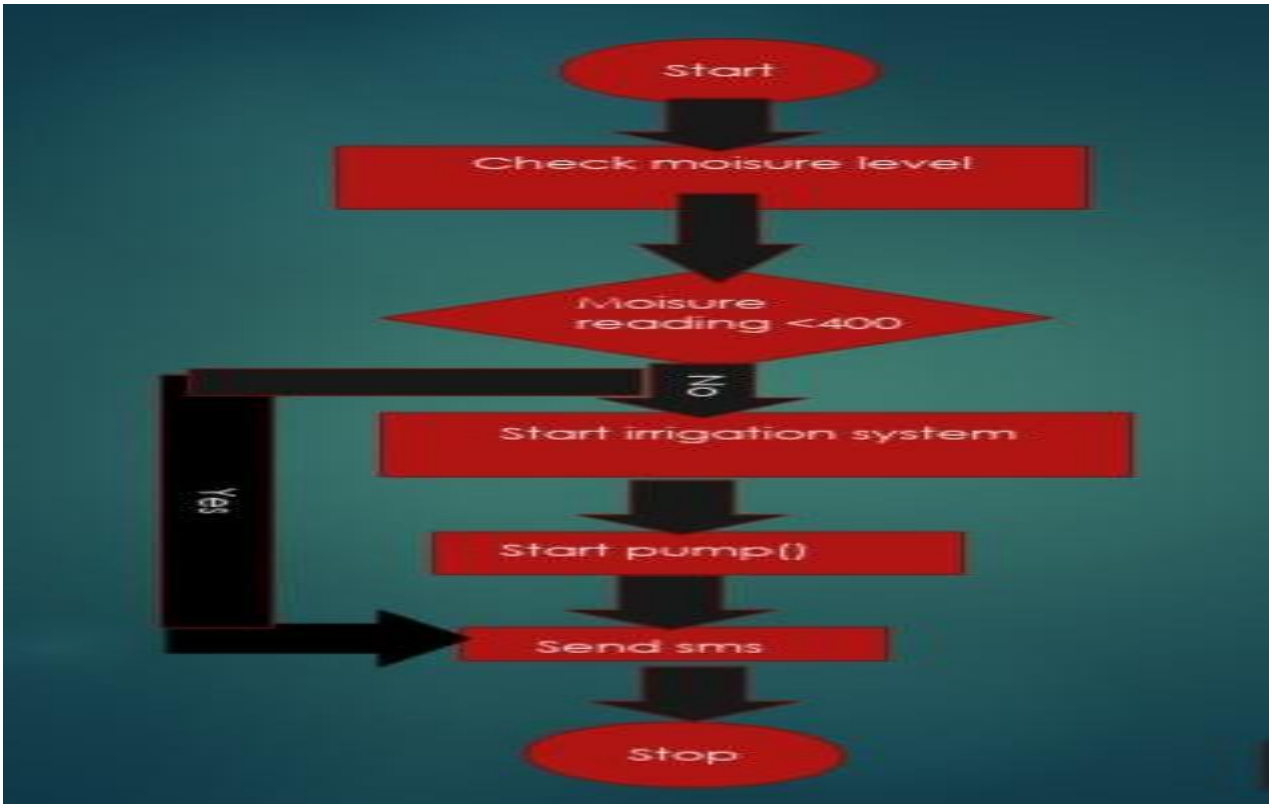


Figure 127 Flow chart of the system

Systems ARCHITECTURE

The module included in the proposed system architecture as follow

Arduino UNO, Power supply, Relay, GSM module, Water pump, Soil moisture sensor

Power Unit

Electrical power is the rate of electrons moving which generates electricity. To carry out such operations, many goods need electrical power due to the electronic era. Each circuit runs on a different voltage, some circuits run on 5V, 9V, etc. So if an ATMEGA 16bit microcontroller is used this project will use 5V and 12V, then it will require a 5V power supply as the operating voltage for ATMEGA 16 microcontroller is 5V. If a voltage greater than 5V is applied then it can damage the microcontroller. To prevent this we still use a 5V power supply for circuits with microcontrollers. Below is a dc power supply block diagram, in which four phases are shown in fig.

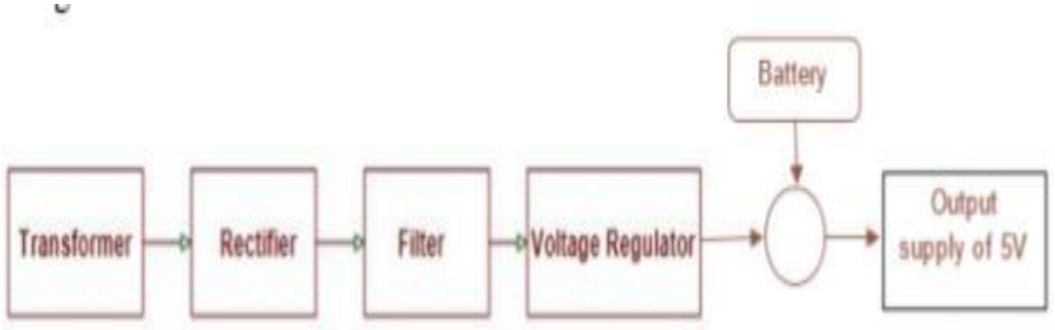


Figure 128 Power Supply Block Diagram

Arduino UNO

Arduino is a popular open-source development board for engineers and makers to develop electronics projects in an easy way. Here have analog and digital pins. It consists of both a physical programmable development board (based on AVR series of microcontrollers) and a piece of software or IDE which runs on your computer and used to write and upload the code to the microcontroller board.

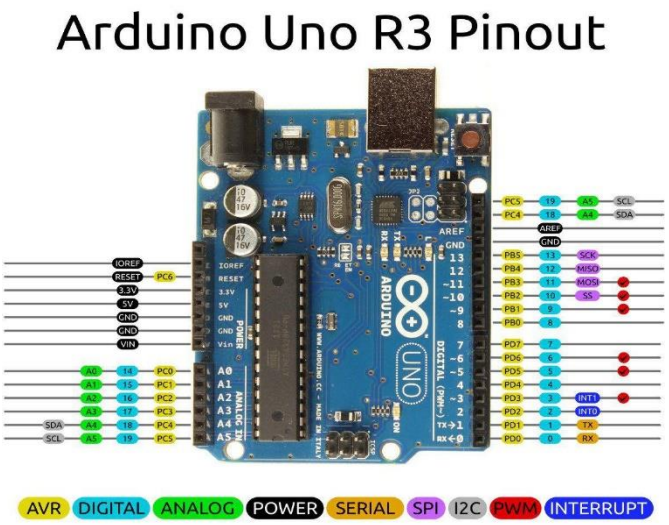


Figure 129 Arduino UNo R3 Pinout

GSM MODULE

TTL SIM 900 is a complete Quad-band GSM/GPRSGSM module is used for sending SMS to the user. Here we have used TTL SIM900 GSM module, which gives and takes TTL logic directly (user may use any GSM module). It is very sensitive to voltage rating and it is recommended to read its datasheet before use. Its operating voltage rating is 3.8v to 4.2v.

Figure 130 GSM Module

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. Its collector terminal connect with diode. BC547 is mainly used for amplification and switching purposes.

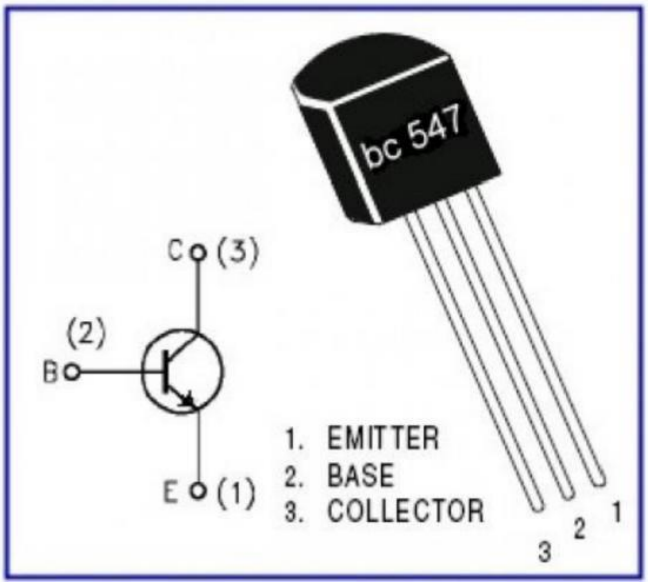


Figure 131 Transistor BC547

LCD 16X2

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices

and circuits. Here we connected 2&15 no. pin in vcc and 1,3,5,16 no. pin connect in ground. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines.

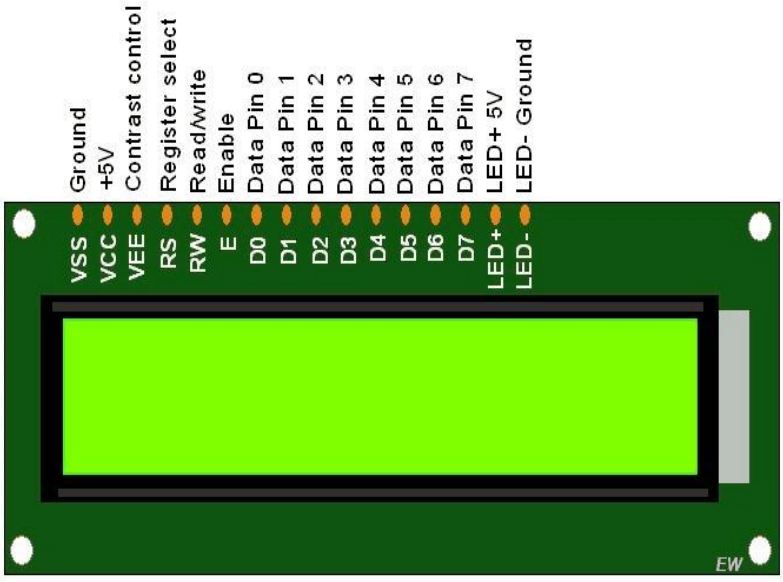


Figure 132 LCD 16X2

Table 58 LCD 16*2

Pin No.	Symbol	Level	Description
1	V_{ss}	oV	Ground
2	V_{dd}	5ov	Supply voltage for logic
3	VO	(variable)	Operating Voltage for LCD
4	RS	H/L	H-Data L- Instruction Code
5	R/W	H/L	H-Read
6	E	H,H-L	Chip Enable ssgnl
7	DB0	H/L	Data Bit 0
8	DB1	H/L	Data Bit 1
9	DB 2	H/L	Data Bit 2
10	DB3	H/L	Data Bit 3
11	DB4	H/L	Data Bit 4
12	DB	H/L	Data Bit 5
13	DB	H/L	Data Bit 6
14	DB	H/L	Data Bit 7
15	A	-	Power Supply for LED backlight(+)
16	K		Power Supply for LED backlight(-)

Moisture Sensor

Soil moisture sensors measure the volumetric water content in soil. Since the direct gravimetric measurement of free soil moisture requires removing, drying, and weighting of a sample, soil moisture sensors measure the volumetric water content indirectly by using some other property of the soil, such as electrical resistance, dielectric constant, or interaction with neutrons, as a proxy for the moisture content. Most soil moisture sensors are designed to estimate soil volumetric water content based on the dielectric constant (soil bulk permittivity) of the soil. The dielectric constant can be thought of as the soil's ability to transmit electricity. The dielectric constant of soil increases as the water content of the soil increases. The moisture has very well defined pin out the plant. The table below shows the action taken according to the level of the sensor reading, specified only for prototyping purposes.

Table 59 Sensor reading with the volume water

Sensor Reading	Condition	Volume of water
0 -200	Wet	No water Flow
300-400	Wet	No water Flow
500-600	Dry	water Flow
700-800	Dry	water Flow
900-1000	Too dry	water Flow
1000 Above	Too dry	water Flow

MOBILE PHONE SUPPORT:-
Agro mate can be operated from any mobile phone, Supports GSM, CDMA and Land line, Android application for smart phones
Devices:-
Industrial automation and process control
Software:-
Home appliances, Security alerts
Advantages:-
Low power Consumption, Global range, Easy Operate, Flexible to run at specific interval.
Disadvantages :-
Communication Delay, Not work in remote areas, Undetectable internal problem in motor.

Figure 134 Soil Moisture Sensor

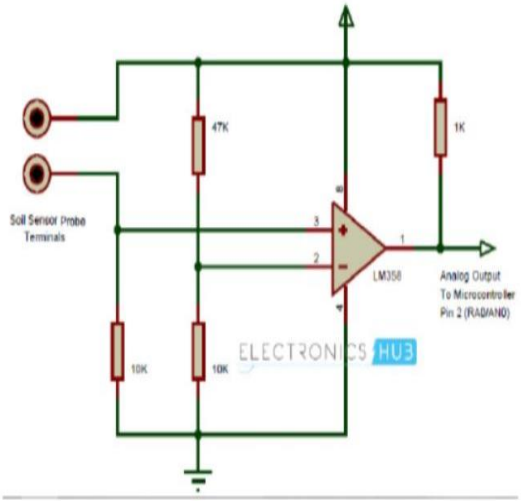


Figure 133 Circuit Diagram for Soil Moisture Sensor

REGISTER:-

Resistor is a component that resists the flow of direct or alternating electric circuit. Resistors can limit or divide the current, reduce the voltage, protect an electric circuit, or provide large amounts of heat or light. They are often color coded by three or four color bands that indicate the specific value of resistance. Resistors obey ohm's law, which

States that the current density is directly proportional to the electric field when the temperature is constant.

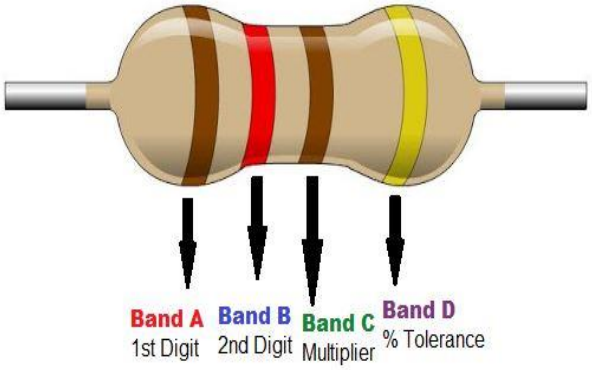


Figure 135 Register

Table 60 Measurement sheet of GSM based automatic water plant system

Description	Quantity	Price
Arduino uno	**1**	**500**
Moisure sensor	1	85
Resistor,wire	As per requirement	300
LCD	1	350
DC motor	1	300
Gsm module	1	325
BC547	2	20
Total		1600

13.2 Reason for Student Recommending this design

- Need of High school in village because there is only one primary school is there.
- As we know in village animals dungs are there that why we provide OWC.
- In village post office need to smart and repair.
- To escape natural disaster we provide shelter.
- For learning and reduce literacy we provide a library.
- In Village there is only small bus stand is there but not in good condition and people not used that's why we provide bus stand.
- Attendance needs to be taken at various places including colleges, school for students and in the industries for the login logout time of employees.
- The b automatic watering schemes include water conservation, improper irrigating elimination, easy fertilization, reduced labor costs and effective watering of plants.
- This system helps users alert them to maximum loads, power status (ON/OFF), billing status etc.

13.3 About designs Suggestions / Benefit of the villagers

High School Building:

Benefits: Rural schools are community hubs and bring people together. Rural schools encourage student participation and ownership. Rural schools serve as centers for the arts. Rural schools are catalysts for the Farm to School movement.

Organic Waste Controller Plant:

Benefits: Provides a non-polluting and renewable source of energy. Leads to improvement in the environment, and sanitation and hygiene. Household wastes and bio-wastes can be disposed of usefully and in a healthy manner. The technology is cheaper and much simpler than those for other bio-fuels, and it is ideal for small scale application.

Post Office:

Benefits: rural post office can provide communication and other services easily .It can make sure that villagers can be facilities like easily payment of light bills, money transfer, insurance policies etc. post office is first prime thing should be present in smart village. Cost of post office is highly depended on requirement facilities in village.

Bus Stand with Toilet, Cycle stand and stalls:

Benefits: The goal of bus terminals is to provide efficient, reliable service to their users. For this, information about every facility provided in terminals must be effectively distributed to the public. Reduced perceived wait time, increased terminal efficiency, increased attractiveness etc.

Green Infrastructure Library:

Benefits: it's provide a green infra structure for reading. And also provide computer with internet connection. And also have e-desk using of that villager will know advance features.

Shelter :

Benefits: it's provide for life-safety protection from hurricanes and tornadoes or other natural disaster. Having a shelter, or a safe room, built into your house can help to protect Peoples from injury or death caused by the dangerous forces of extreme winds. It can also relieve some of the anxiety created by the threat of an oncoming tornado or hurricane.

RFID Based Attendance Management System

Benefits: Convenience and Accuracy. The RFID attendance management system eliminates all the drawbacks of the manual attendance process while making the process hassle-free. Security, Easy Tracking, Real-Time Access.

Automatic water plant system

Benefit: Reduced runoff of water and nutrients: Automation can help keep fertilizer on farm by effectively reducing run off from the property. Using automatic plant irrigation system produces smaller droplets, helping to preserve nutrients and reducing runoff of water.

Voice application with Energy meter

Benefits: type of energy meter having the ability to provide output in attractive manner. The purpose of this project is to build a KWH (Kilo Watt Hour) meter that can alert the users with voice messages.

CHAPTER 14
Technical Option with Case Studies

14.1 Civil Engineering

14.1.1 Advanced Earthquake Resistance

Earthquake-resistant or seismic structures are designed to prevent earthquakes to some extent. Although no structure can be fully immune to earthquake damage, the objective of earthquake resistant construction is to build better structures than conventional ones during seismic activity.

Proposed Designed Earthquake Resistant Techniques

Combination of Triangular building designed Structure (withstand large pressure) along with cross bracing. (Two steel rods connected in the walls of the unction's are used). It is avoid the vibration and collapsing. Move less during earthquake than rectangular building (increased Resistance). Triangular frameworks are provided. Provide high performance concrete wall construction. Fundamental core delivers the torsional resistance of the building.

Strategies for Earthquake Resistant Construction

The Bureau of Indian Standards has distributing earthquake resistant construction masonry structures for earthquake design codes for 1893. (IS-13828 1993).

How to Make A Building Earthquake-Proof

1. Create a Flexible Foundation
2. Counter Forces with Damping
3. Shield Buildings from Vibrations
4. Reinforce the Building's Structure

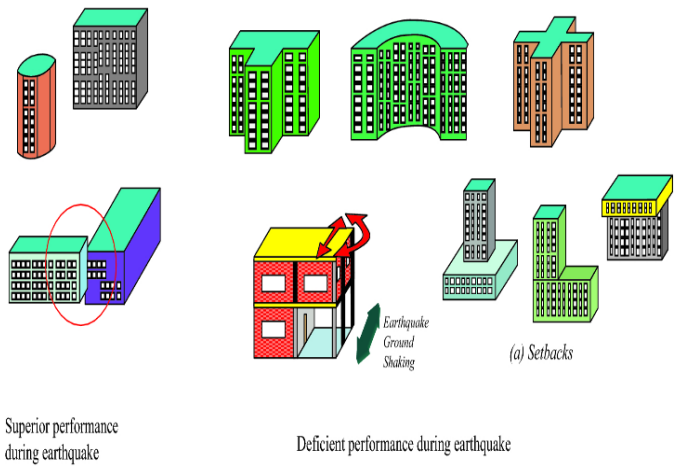


Figure 136 Deficient performance during earthquake

14.1.2 Seismic Retrofitting of Buildings

Seismic Retrofitting Techniques:

- Earthquake creates great devastation in terms of life, money and failures of structures.
- Upgrading of certain building systems (existing structures) to make them more resistant to seismic activity (earthquake resistance) is really of more importance.
- Structures can be (a) Earthquake damaged, (b) Earthquake vulnerable
- Retrofitting proves to be a better economic consideration and immediate shelter to problems rather than replacement of building.

Basic Concept of Retrofitting:

- Upgradation of lateral strength of the structure
- Increase in the ductility of the structure
- Increase in strength and ductility

Classification of Retrofitting Techniques:

1) Global

Adding Shear wall, adding in fill wall, Adding Bracing, Adding Wing wall, Wall Thickening, Wall Thickening, Base Isolation, Mass Damper

2) Local

Jacketing of Beam, Jacketing of Beam Column Joints, Jacketing of Column, Strengthening of Individual Footing.

Adding New Shear Walls:

- Frequently used for retrofitting of non-ductile reinforced concrete frame buildings.
- The added elements can be either cast? In? place or precast concrete elements.
- New elements preferably be placed at the exterior of the building.
- Not preferred in the interior of the structure to avoid interior moldings.

Figure 137 Additional Shear Wall

Adding Steel Bracings

An effective solution when large openings are required.

Potential advantages due to higher strength and stiffness, opening for natural light can be provided, amount of work is less since foundation cost may be minimized and adds much less weight to the existing structure.

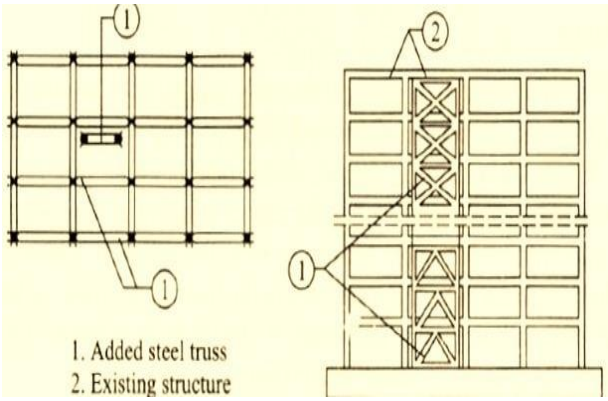


Figure 138 Adding STEEL Bracings

Base Isolation (or Seismic Isolation):

Isolation of superstructure from the foundation is known as base isolation. It is the most powerful tool for passive structural vibration control technique.

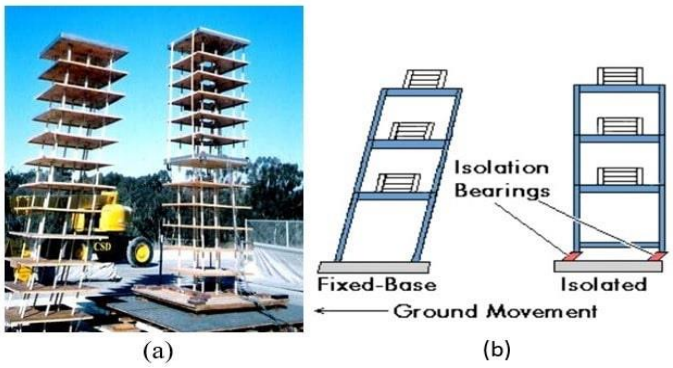


Figure 139 (a) Model under Test, (b) Diagrammatical Representation

Mass Reduction Technique of Retrofitting:

This may be achieved, for instance, by removal of one or more story's as shown in Figure. In this case it is evident that the removal of the mass will lead to a decrease in the period, which will lead to an increase in the required strength.

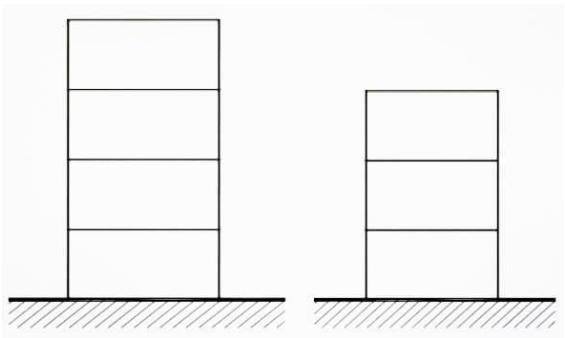


Figure 140 Seismic Retrofitting by Mass reduction (removal of Story)

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

Construction Practices:-Specifications, details and sequence of activities and construction co-ordination, Site Clearance ,Marking, Earthwork, masonry, stone masonry, Bond in masonry, concrete hollow block masonry, flooring, proof courses, construction joints, movement and expansion joints, pre cast pavements, Building foundations, basements, temporary shed, centering and shuttering, slip forms, scaffoldings, de-shuttering forms, Fabrication and erection of steel

trusses, frames, braced domes, laying brick, weather and water proof, roof finishes, acoustic and fire protection.

Modern Construction Material:-

Fly ash Brick, Bendable Concrete, Translucent Concrete, Rich lite, Sensi Tiles, Radiant Barriers, Liquid Granite, Transparent Aluminum, Carbon Nano-tubes, Carbon Fiber, Unfired Clay Brick, and Solar Panel Roofing.

Construction Techniques

The term 'advanced construction technology' covers a wide range of modern techniques and practices that encompass the latest developments in materials technology, design procedures, quantity surveying, facilities management, services, structural analysis and design, and management studies.

Precast Flat Panel System, 3D Volumetric Modules, Flat Slab Construction, Precast Cladding Panels, Concrete Wall and Floors, Twin Wall Technology, Precast Concrete Foundation

Construction Equipment

Selection of equipment for earth work - earth moving operations - types of earthwork equipment - tractors, motor graders, scrapers, front end waders, earth movers – Equipment for foundation and pile driving. Equipment for compaction, batching and mixing and concreting - Equipment for material handling and erection of structures - Equipment for dredging, trenching, tunneling,

14.1.4 Engineering Aspects of Soil mechanics - Environmental Impact Assessment

Engineering aspects of Soil Mechanics

Shear Strength of Soils, Mohr-Coulomb Failure Criterion, Direct Shear Test, Triaxle Test, Total Stress Strength Parameters, Effective Stress Strength Parameters, Pore Water Pressure Parameters, Stress-Strain Behavior of Sands.

Environmental Impact Assessment (EIA)

Environmental Impact Assessment (EIA) is a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.

The Environment Impact Assessment Process

Screening: The project plan is screened for scale of investment, location and type of development and if the project needs statutory clearance.

Scoping: The project's potential impacts, zone of impacts, mitigation possibilities and need for monitoring.

Collection of baseline data: Baseline data is the environmental status of study area.

Impact prediction: Positive and negative, reversible and irreversible and temporary and permanent impacts need to be predicted which presupposes a good understanding of the project by the assessment agency.

Mitigation measures and EIA report: The EIA report should include the actions and steps for preventing, minimizing or by passing the impacts or else the level of compensation for probable environmental damage or loss.

Public hearing: On completion of the EIA report, public and environmental groups living close to project site may be informed and consulted.

Decision making: Impact Assessment Authority along with the experts consult the project-in-charge along with consultant to take the final decision, keeping in mind EIA and EMP (Environment Management Plan).

Monitoring and implementation of environmental management plan: The various phases of implementation of the project are monitored.

Assessment of Alternatives, Delineation of Mitigation Measures and Environmental Impact **Assessment Report:** For every project, possible alternatives should be identified, and environmental attributes compared. Alternatives should cover both project location and process technologies.

What is the Purpose of EIA

- It promotes sustainable development by identifying environmentally sound practice and mitigation measures for development.
- To ensure that environmental consequences were taken into account during planning, designing, & decision making process.
- To influence how it is subsequently managed during its implementation.
- The adverse impacts could be avoided reduce.

Figure 141 Purpose of EIA

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

Sewerage system or Waste Water system

A sewerage system, or wastewater collection system, is a network of pipes, pumping stations, and appurtenances that convey sewage from its points of origin to a point of treatment and disposal.

Components and types

The main part of such a system is made up of large pipes (i.e. the sewers, or "sanitary sewers") that convey the sewage from the point of production to the point of treatment or discharge.

Types of sanitary sewer systems that all usually are gravity sewers include:

Combined sewer, Simplified sewerage, Storm drain

Sanitary sewers not relying solely on gravity include:

Vacuum sewer, Effluent sewer

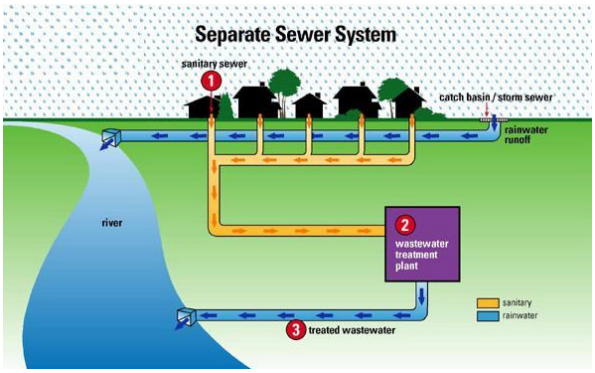


Figure 142 Separate sewer system

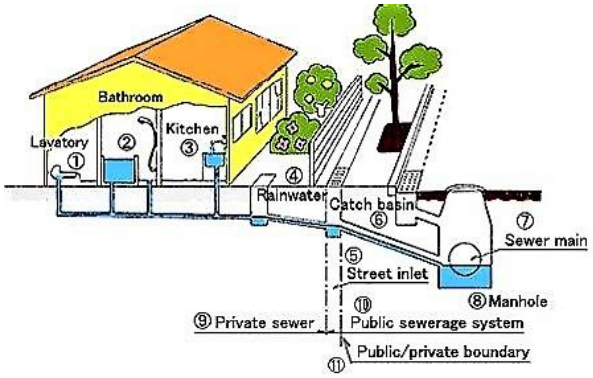


Figure 143 Combined Sewer system

What is Sustainable Development?

Sustainable development is the practice of using guidelines for environmentally responsible and energy savings to create new development projects and to maintain and retrofit older projects.

Goals of Sustainable Development

To minimize the depletion of natural resources when creating new developments.

To create a development that can be maintained and sustained without causing further harm to the environment. To provide methods for retrofitting existing developments to make them environmentally friendly facilities and projects.

Some other most important sustainable development goals set by these bodies include:

1. Eradication of poverty across the world

These organizations primarily focus on the least developed and low-income countries where poverty is rife.

2. Promotion of good health and well being

This sustainable development goal seeks to ensure good health and well-being for all at each stage of life.

3. Provision of Quality Education For All

These bodies have realized that the level of child school dropout is at an all-time high. This gap must be closed to ensure sustainable future development even as international communities work to ensure quality and equity in the education sector.

4**. Provision of Clean Water and Sanitation**

Water and sanitation are on top of the chart regarding sustainable development. They are critical to the survival of humans and the planet. This goal aims to address aspects relating to sanitation, hygiene, drinking water and the quality and sustainability of water resources across the globe.

5. Building up Strong Infrastructure, Supporting Inclusive and Sustainable Industrialization and Incubating Innovation

This goal takes into account three aspects of sustainable development: industrialization, infrastructure, and innovation. Infrastructure is vital because it offers the basic framework necessary to smooth the running of enterprise and society at large.

6. Enabling Access to Affordable and Clean Energy

Energy is the most critical resource to achieving most of the sustainable development goals. Energy plays a vital role in mitigating poverty through advancements in industrialization, education, water supply and health and fighting climate change.

7. Achieving Gender Equality

In the past few decades, gender equality and women empowerment have been agendas for most governments for long-term sustainable development.

Examples of Sustainable Development

Wind Energy

Wind energy is energy harnessed from the motion of wind using wind turbines or windmills. Wind energy is renewable, which means it’s never-ending and can be used to substitute energy at the grid. This makes it a good sustainable development practice.

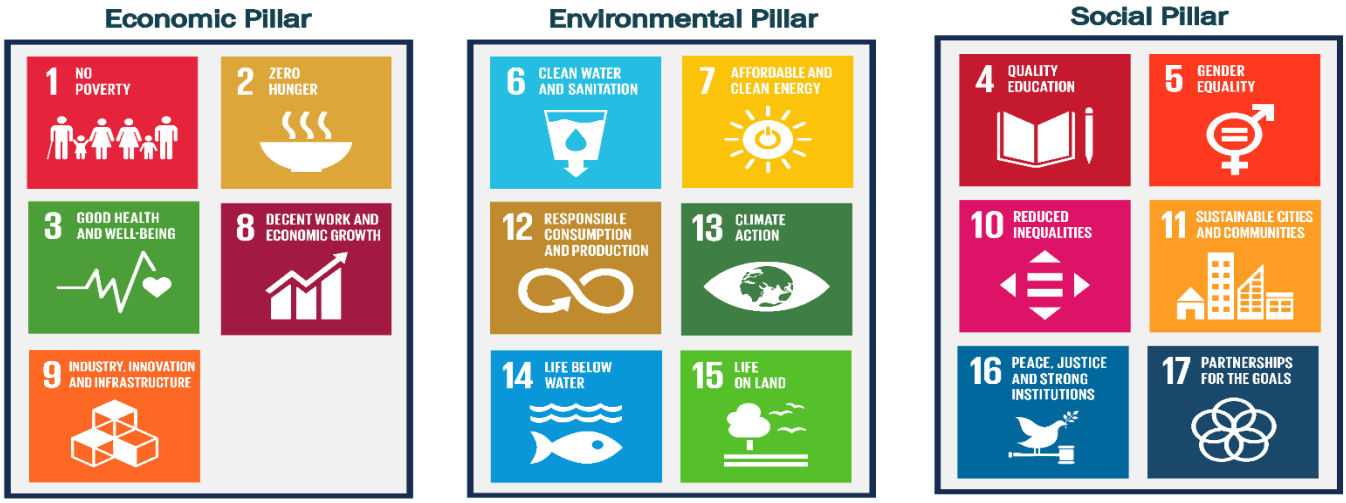
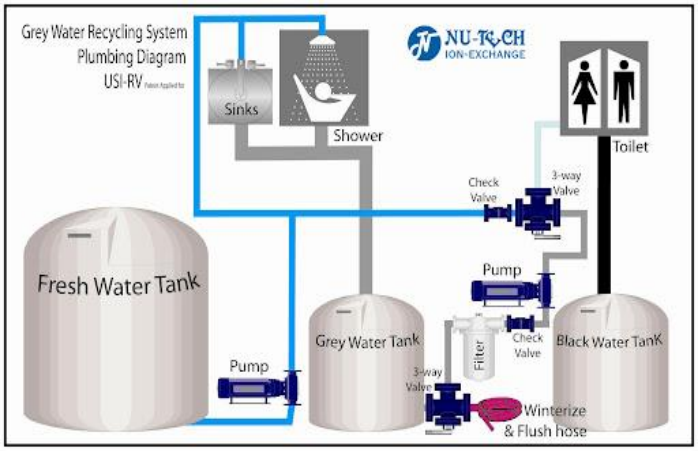


Figure 144 17 SDG'S

Abstract: The water Plays a vital Role in human life growth of each and every organ. In the 21st Century the world faces crises of fresh drinking water as a result of deterioration by next world conduit will be for water. To avoid it most of countries developed the modern techniques to utilize the reuse of waste water, in this project we define the gray water which contains sulphates, salts of Fe, AK & Ionic impurity and free from fecal matter as in pure sewage. The carbon filter is introduced between tow units of sand filter function as to settle the suspended matter & dissolved impurity of sulphates, Soap solution, and sodium are heavily attracted by carbon & is removed to reach the parameter of portable water.

Table 61 Grey water Treatment Plant Model

Table 62 Grey water Treatment Plant Prototype



The sand filter consists of particle size 0.6 to 1.2 mm and depth of 1.8 m. it removes the flocs generated in the salvage. In this system the first sand filter removes the dirt, dust settable impurity, while passed to carbon filter removes the salts and generated flocs, this water again passed into

sand filter & extrudes the flocs. The carbon filter had been extensively used all over as an economical methods treatment waste water plays a significant role in removal of taste & odor.

Table 63 Cost of Treatment Plant

Sr. No.	Item	Capacity of tank	Cost
1	Pipes	-	12000
2	Mushroom filter	1000	3500
3	Sand filter	5000	35000
4	Carbon Filter	5000	40000
5	Ozone Filter	2000	4500
6	Electric motor	-	5000
7	Back wash system	-	3000
8	Pressure gauge	3 nos	6000
9	Water Level Indicator		160-0
10	Valve	6 Nos	8000
11	Transportation	-	5000
12	Fitting cost	-	8000
13	Syntax	5000	20000
	Total Cost:-		1,48,000/rs

14.2 Electrical Engineering

14.2.1 Design of Power Electronics converter

Introduction

The design of power electronics converter circuits requires design the power and control circuits. The voltage and current harmonics that are generated by the power converters can be reduced or minimized with a proper choice of the control strategy.

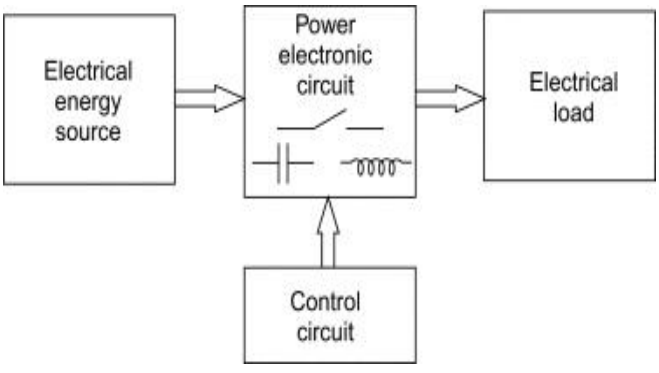


Figure 145 Power Electronic circuits concept

What is power electronics converter?

Power electronic converter uses power electronic components such as SCRs, TRIACs, IGBTs, etc. to control and convert the electric power. The main aim of the converter is to produce conditioning power with respect to a certain application.

The Power Electronic Converter can be classified into.

Diode Rectifier, AC to DC Converter (Controlled Rectifier), DC to DC Converter (DC Chopper), AC to AC Converter (AC voltage regulator), DC to AC Converter (Inverter), Static Switches.

Power electronics converter components

Figure 146 Diode

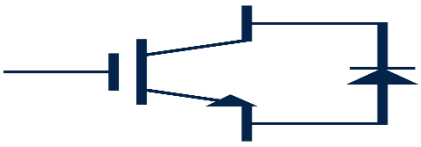


Figure 147 IGBT

Figure 148 SCR

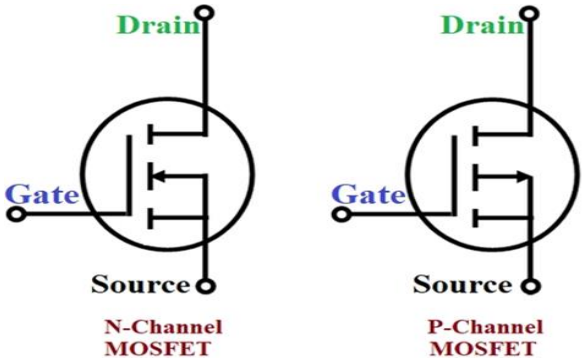


Figure 149 MOSFET

Application power electronics converter

Applications that each converter is used in. AC Voltage Controller: Lighting Control; Domestic and Industrial Heating; Speed Control of Fan, Pump or Hoist Drives, Soft Starting of Induction Motors, Static AC Switches (Temperature Control, Transformer Tap Changing, etc.)

Hear one type power electronics converter is z source inverter Z source inverter is traditional voltage source inverter and current source inverter has improved to the z source inverter.

Introduction

Z source inverter is a low cost, reliable and efficient inverter. The z source inverter provides the same features of a DC -DC booster inverter (single stage less complex &more effective) Z source inverter has the benefits of enhanced reliability.

The z source inverter has been adjustable for residential PV system because of the capability of the voltage boost and inversion is a single stage. The z source inverter reduces harmonics, electromagnetic interference noise and low common mode noise.

Block diagram of the system it contain PV array ,z source bridge inverter, filter and control circuits

The whole control circuit consists of two loops namely MPPT control loop,z source Capacitor voltage control loop and voltage -current compensation loop.

The MPPT control circuit for pv array is a realized by using incremental conductance technique which keeps it working around the maximum power point.

The z source Capacitor voltage control compensation loops utilizes a shoot through technique.

In grid connected photovoltaic system a proportional-integral-derivative (PID) control circuit is implemented with PWM generator. It modifies the control signal obtained from the comparison of MPPT and inverter output to generate PWM signal.

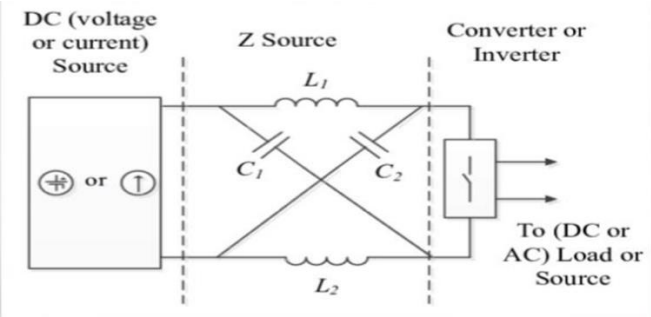


Figure 150 operation of z source inverter

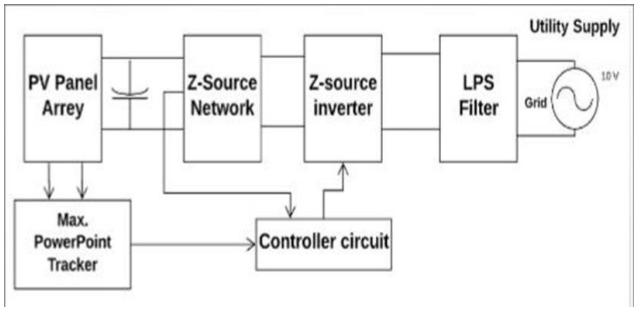


Figure 151 block diagram of the system

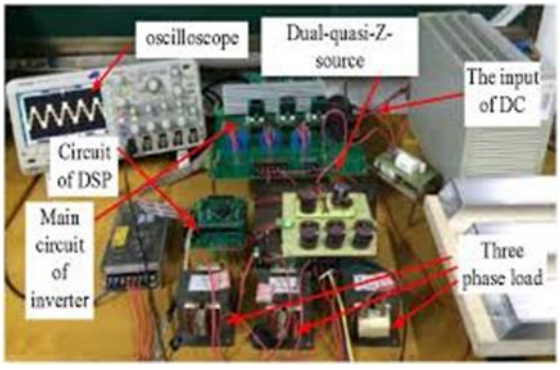


Figure 152 Model of z source inverter

Table 64 Cost of Power electronics converter

Description	Nos	Price
LC Circuit	1	500
Control circuit price	1	200
Solar panel price	1	2000
Z source inverter	1	5000
	Total	7700

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

A soft starter is any device that controls the acceleration of an electric motor using controlling the applied voltage.

An Induction motor can self-start owing to the interaction between the rotating magnetic field flux and the rotor winding flux, causing a high rotor current as torque is increased. As a result, the stator draws high current and by the time the motor reaches to full speed, a large amount of current (greater than the rated current) is drawn and this can cause heating up of the motor, eventually damaging it. To prevent this, motor starters are needed.

a soft starter is any device that reduces the torque applied to the electric motor. It generally consists of solid-state devices like thermistors to control the application of supply voltage to the motor

Water Treatment Facility

The first application will be a wastewater pump. A water treatment plant typically has a constant flow of water coming into the plant. Let's assume the demand for water exiting the plant is constant with the supply entering the plant.

Which device would be the best option?

That's right! A soft starter would be a great choice because in this application when starting the water pump there would be a large inrush of current on our motor that our soft starter could handle and gradually ramp up the pump.

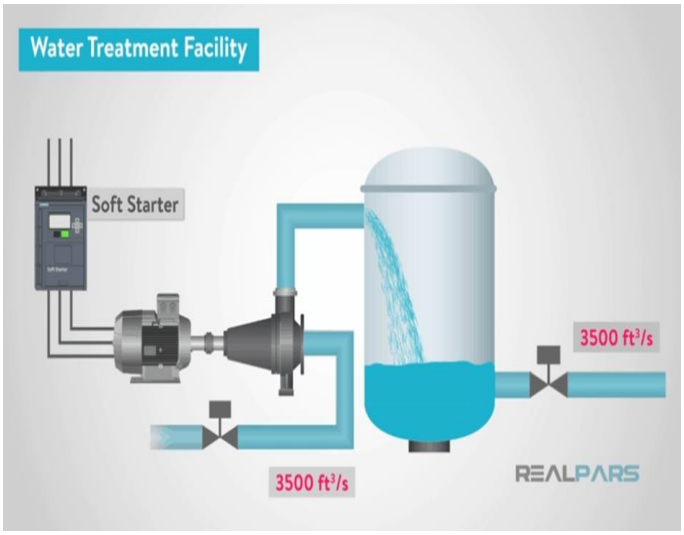


Figure 153 Water treatment facility

Cooling Fan System

The next application we will look at is a cooling fan.

In this scenario, a cooling fan will turn on when the plant air temperature hits a high-temperature set-point.

Once the set-point is reached, the cooling fan will slow down to maintain the air temperature unless it drops below a low-temperature set point, where it will shut off.

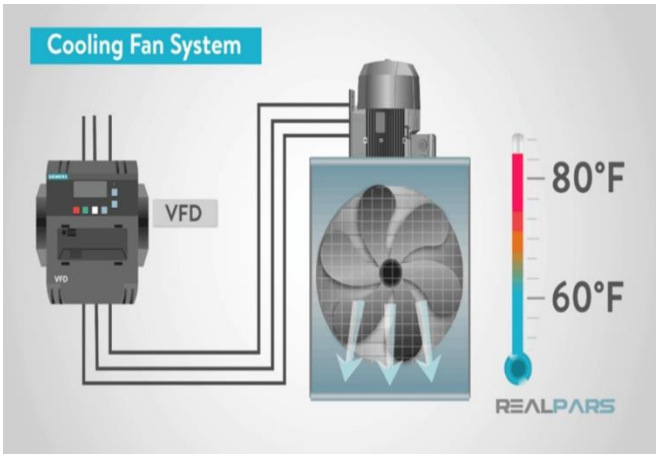


Figure 154 Cooling Fan System

14.2.3 Advanced Wireless Power Transfer System

Wireless power transfer (WPT), in its general term, has been around us for decades in applications such as telemetry, satellite communications, and radio frequency identification (RFID) tags. Most of these applications transfer low amounts of power, in the range of microwatts to milliwatts, for data transfer. For higher-power applications, from few watts to several kilowatts, over moderate distances, the WPT has recently been the focus of the industrial developments. The most common method of high power WPT is through inductive coupling that was invented by Nikola Tesla more than a century ago.

Wireless power transfer

Wireless power can be defined as the transmission of electrical energy from a power source to an electrical load without connecting wires. It is reliable, efficient, fast, low maintenance cost, and it can be used for short range or long range. The basic working principle of wireless power transfer is, two objects having similar resonant frequency and in magnetic resonance at powerfully coupled rule tends to exchange the energy, while dissipating relatively little energy to the extraneous off-resonant objects.

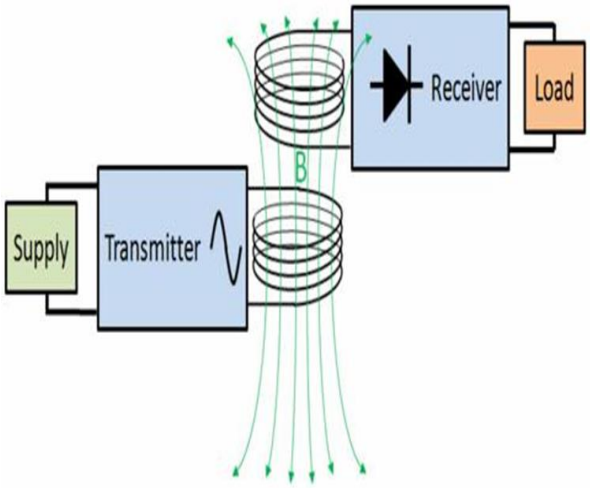


Figure 155 Wireless power transfer

Requires component wireless power transfer

Coil, Voltage regulator, Diode, Transformer.

Wireless Power Transfer Advantages

Simple design, Lower frequency operation, Low cost, Practical for short distance

Wireless Power Transfer Disadvantages

High power loss, Non-directionality, Inefficient for longer distances

Wireless Power Transfer Applications

Consumer electronics, Transport, Heating and ventilation, Industrial engineering, Model engineering.

14.2.4 Industrial Temperature Controller

As the name implies, a temperature controller is an instrument used to control temperatures, mainly without extensive operator involvement. A controller in a temperature control system will accept a temperature sensor such as a thermocouple or RTD as input and compare the actual temperature to the desired control temperature, or set point. It will then provide an output to a control element . A good example would be an application where the controller takes an input from a temperature sensor and has an output that is connected to a control element such as a heater or fan.

Temperature Control System that was ever made – The Human Body Temperature Control System. The body regulates its temperature continuously. It may increase or decrease its temperature when it finds that it is too cold or too hot. In this case, temperature is being regulated by a control system, and the control is called homeostasis. Somewhere in the brain, perhaps the Hypothalamus, the optimum temperature of the body (set point) is stored (about 37°C). That information is continuously available to some structure, we call the comparator.

The temperature controller the following items should be considered

1 Types of input temperature sensor and temperature range Ex RTD, thermocouple

2 Type of output required Ex electromechanical relay, SSR, or analog output

3 control algorithm Ex on/off, proportional or PID

4 The number and type of outputs Ex heating system, cooling system, alarm system and limit

There are three types of Controller / Control Algorithms for use in the construction and Design of most Temperature Control Systems. These include

Figure 156 PID (proportional-integral -derivation)

Figure 157 ON/OFF controller

Application of industrial temperature controller

Heat treat /oven temperature controller are used in ovens and in heat treating applications within furnaces, ceramic, Klansman, boiler, heat exchanger, Packing, Plastic, Health care, Food beverage.

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

Introduction

This project is developed for the users to have accident alerts in modern traffic system. This device can be used in highly accidents area and pin drop curves to avoid accidents It consists of two transmitters and two receivers. One transmitter is connected first (One arm of the curve) and a receiver is fixed just opposite to the transmitter. The other transmitter is connected at the same side (Other arm of the curve) and the receiver is fixed just opposite to the second transmitter. When the vehicle passes the first transmitting and receiving unit (One arm of the curve), it senses that one vehicle is crossing. When it crosses the second unit (Other arm of the curve), it also senses. The microcontroller unit calculates the speed displacement/time taken. This project is very much used in traffic controller. It is very accurate and cost effective.

Transmitter side

Radio transmitters: A radio transmitter consists of several elements that work together to generate radio waves that contain useful information such as audio, video, or digital data.

Power supply: Provides the necessary electrical power to operate the transmitter.

Oscillator: Creates alternating current at the frequency on which the transmitter will transmit. The oscillator usually generates a sine wave, which is referred to as a carrier wave.

Modulator: Adds useful information to the carrier wave. There are two main ways to add this information. The first, called amplitude modulation or AM, makes slight increases or decreases to the intensity of the carrier wave. The second, called frequency modulation or FM, makes slight increases or decreases the frequency of the carrier wave.

Amplifier: Amplifies the modulated carrier wave to increase its power. The more powerful the amplifier, the more powerful the broadcast.

Antenna: Converts the amplified signal to radio wave

Receiver side

A radio receiver A radio receiver is the opposite of a radio transmitter. It uses an antenna to capture radio waves, processes those waves to extract only those waves that are vibrating at the

desired frequency, extracts the audio signals that were added to those waves, amplifies the audio signals, and finally plays them on a speaker.

Antenna: Captures the radio waves. Typically, the antenna is simply a length of wire. When this wire is exposed to radio waves, the waves induce a very small alternating current in the antenna. o RF amplifier: A sensitive amplifier that amplifies the very weak radio frequency (RF) signal from the antenna so that the signal can be processed by the tuner.

Tuner: A circuit that can extract signals of a particular frequency from a mix of signals of different frequencies. On its own, the antenna captures radio waves of all frequencies and sends them to the RF amplifier, which dutifully amplifies them all.

Detector: Responsible for separating the audio information from the carrier wave. For AM signals, this can be done with a diode that just rectifies the alternating current signal. What's left after the diode has its way with the alternating current signal is a direct current signal that can be fed to an audio amplifier circuit. For FM signals, the detector circuit is a little more complicated.

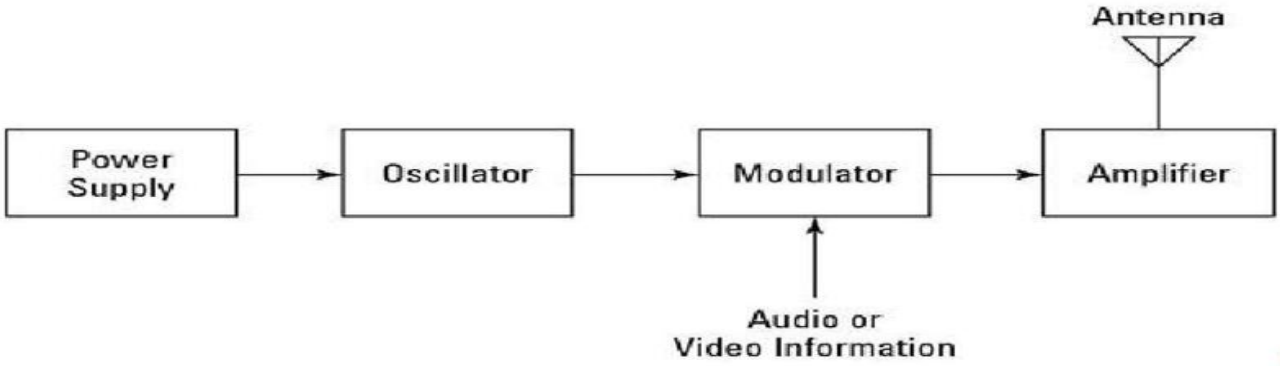


Figure 158 Transmitter side our system

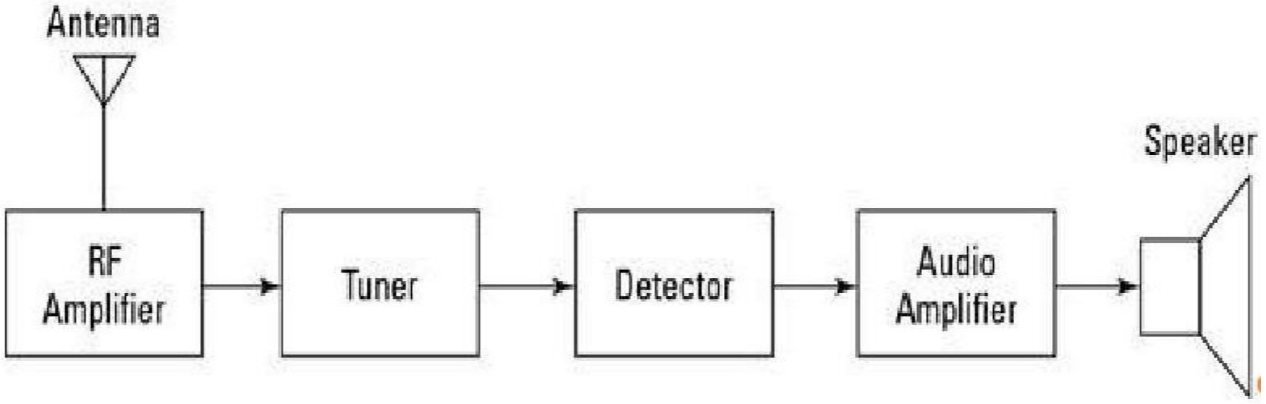


Figure 159 Receiver side our system

CHAPTER 15

Smart and/or Sustainable features of Chapter 8 & 13 designs, Impact on society.(For Allocated village development, villagers happiness, comfortable and for enhancement of the village) (With the Smart village development Concept As Per Your Idea And Village Visit, modern technology with innovation). with doing small changes, Period, Amount Expenditure and Benefit a) Immediately b) Within 1 year c) Long term (3-5 years) along with cost estimation.b) If possible, List the sources of the funding available with the Village gram panchayat

Our design make a new view of the village.

Those villagers who are not leaving in village that will be attract and come back to the village.

Community Hall: we are providing a better community hall with long life span to people make gathered.

Common Public place: There is no public place in the village so we provide a village so for relaxation people can go.

Primary Health care Centre: in village health center is far form the village for better facility we provide a PHCC.

ATM: there are no atm in village that's why we provide atm. So for any emergency when banks are closed peoples can get money.

Acoustic Auditorium: for entertainment purpose we provide a Auditorium. In village peace of environment are there so we provide acoustic so other people can't disturb.

High School: in village only one primary school are there. For better Education we provide a High school building so villager can't go outside for high school education.

Green Infrastructure Library: for reduce literacy and learn new things and people drop their phone while and read the books.

Shelter: for protect against natural disaster we provide shelter.

Solar System for Common Public Place: for energy free garden we provide Solar System for Common Public Place this system can absorb sun light and in evening provide lights.

Post office: for better courier service and also better government.

Counter Visitor of an auditorium: A people counter is an electronic device that is used to measure the number of people traversing a certain passage or entrance.

GSM based motor speed controller: GSM technology based automatic control system is designed to monitor and control speed of an Induction motor/DC motor and also performs necessary operation like start, stop, reverse the rotation etc.

GSM based tracking energy meter: These meters are used for measuring, monitoring the electric energy or electrical power by adopting a wireless communication module like GSM.

GSM based automatic water plant system: By knowing the status of moisture and temperature through GSM with the use of moisture and temperature sensors, water flow can be controlled by just sending a message from our mobile.

1) Bio Electricity plant.

- The Bio plant in Raj-Samadhiyala village at a cost of 75 lakh has been installed
- The maximum plant capacity is 123 KVA, and the operating capacity is 45 KVA.
- The raw materials of the plants are solid waste, livestock dung, agricultural waste and wood.
- AADHYA CORPORATION PVT is installed in the plant.
- All villages easily have the raw material required for the factory. This plate can be placed in every village but only Shapar-veraval village is considered here.

2) Central R.O. water cooling plant.

- The primary requirement of mankind is safe drinking water. Normally, villagers don't have RO plants in village because they find it difficult to maintain them and they need to rely on governmental sources of water, which can be healthy in case of special occasions.
- Thus in Gram Panchayat in Raj-Samadhyala, an R.O. cooling plant is being installed only for the people of Raj-Samadhiyala, to supply drinking water.
- Water is very cheap, such as 4/-Rs. And 12/-Rs.
- The company UMIYA BEVERAGE handles the plant.
- Every morning, they provide the villagers with water. Over time, they offer good service.

3) Automatic flushing system in Public toilets.

- In today's life, the urinal system cannot be flushed by most people. It creates an unpleasant environment in which people use it, especially in public places, have a bad smell.
- In some cases, the faucet cannot be shut down correctly after it has been used, which leads to waste of water.
- This causes various problems to environment.
- This reduces function and makes the block toilet more pollutant.

- We therefore suggested a 'Automatic flushing system' to maintain the existing toilet block.
- The environment near the urinal is clean and hygienic.
- It will also use less water to flush.
- It avoids unnecessary waste of water and saves water.

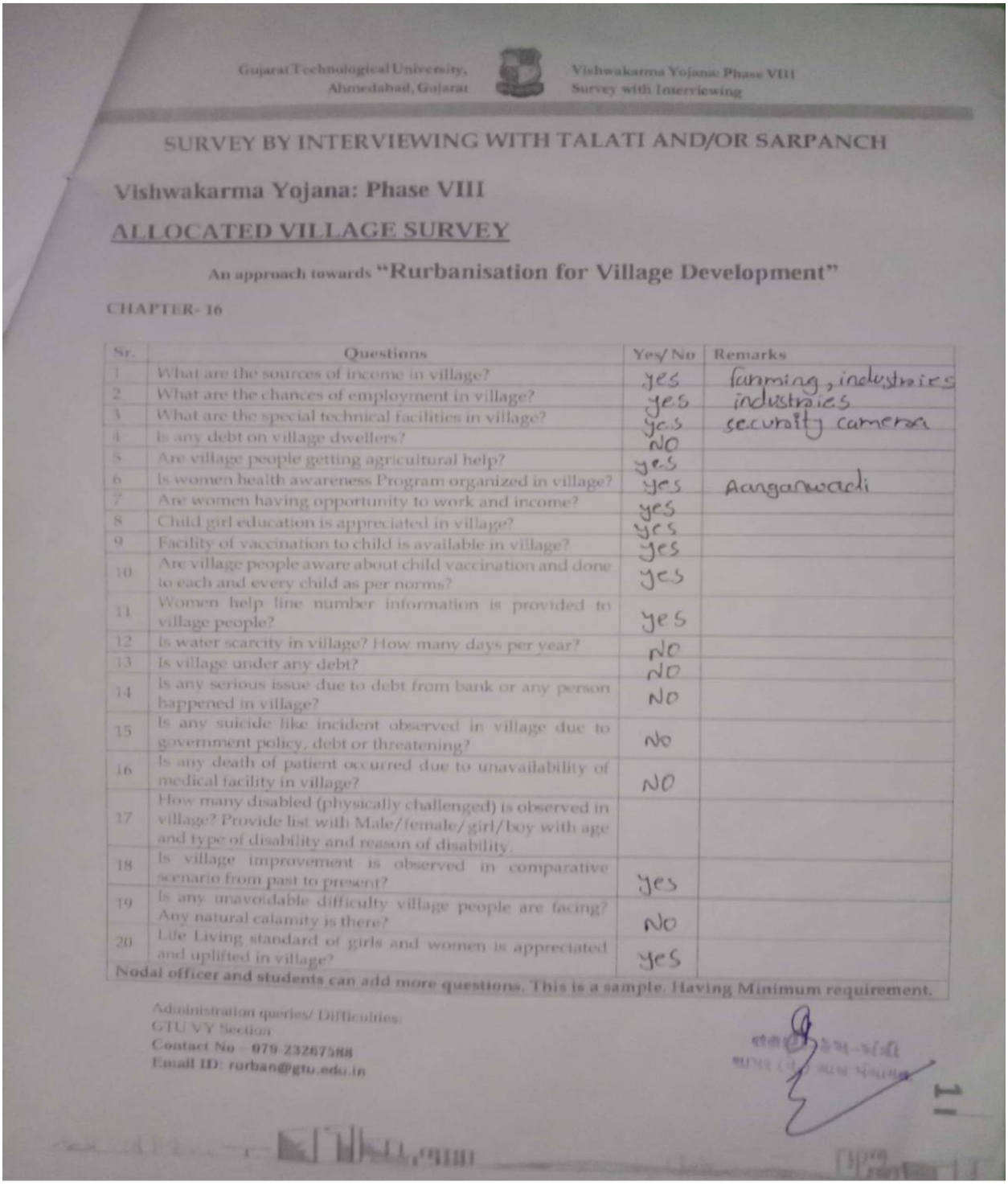
4) Zero Plastic Waste in the village

- Raj Samadhiyala‟ is the plastic free village so this rule can be applies in the Shapar-veraval village.

Table 65 Implementation & existing scenario of proposed designs

Sr. No.	Design Name	Implementation	Period	Available Fund	Expenditure
1	Community hall	0%	8 month	-N/A-	19,23,488
2	Common Public Place	0%	8 Month	-N/A-	8,08,694
3	Primary Health Care Centre	0%	3Year	-N/A-	11,55,674
4	Affordable Cost Toilet with Bathroom	0%	5month	-N/A-	11,165
5	Automated teller machine(ATM)	0%	10 month	-N/A-	1,76,300
6	Acoustic Auditorium	0%	1.5year	-N/A-	8,15,854
7	Solar System for Common Public Place	0%	12month	-N/A-	5,11,650
8	GSM based motor speed controller	0%	3month	-N/A-	900
9	Counter Visitor of an auditorium	0%	5month	-N/A-	2285
10	High School	0%	2year	-N/A-	16,74,793
11	Organic waste controller	0%	1year	-N/A-	1,88,400
12	Post Office	0%	3year	-N/A-	19,20,456
13	Shelter	0%	4year	-N/A-	4,44,112
14	Bus stand with Toiler, cycle stand and stalls	0%	5year	-N/A-	23,50,082
15	Green Infrastructure Library	0%	4year	-N/A-	
16	RFID based attendance system	0%	6month	-N/A-	1170
17`	GSM based tracking energy meter	0%	3month	-N/A-	2000
18	GSM based automatic water plant system	0%	5month	-N/A-	1600

CHAPTER 16
Survey By Interviewing With Talati And/Or Sarpanch



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Survey with Interviewing

SURVEY BY INTERVIEWING WITH TALATI AND/OR SARPANCH

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

CHAPTER- 16

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

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

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

Scanned with CamScanner

CHAPTER 17
Irrigation / Agriculture activities And Agro Industry, Alternate Technics and Solution

Irrigation supports the production of agricultural crops, preserving landscapes and revegetating disturbed soil during less than average rainy seasons in dry areas. Irrigation also has other usefulness's in crop production, such as frost protection, weed growth suppression in grains and soil consolidation prevention.

Agriculture Activates

The economic activities included in agriculture proper are (i) growing of field crops, fruits, nuts, seeds and vegetables, (ii) management of tea, coffee and rubber plantations, (iii) agricultural and horticultural services on a fee or on contract basis such as harvesting, baling and thrashing, preparation of tobacco for marketing, pest control, spraying, pruning, picking packing, and (iv) ancillary activities of cultivators such as gur making, transportation of own produce to primary markets, activities yielding rental income from farm buildings and farm machinery and interest on agricultural loans.

What is meant by agro industry?

Industries that have agricultural produce as raw materials are known as Agro-based Industries. These are consumer-based industries. Cotton, jute, silk, woolen textiles, sugar and edible oil, etc.

Importance of Agro-based industries in India

- Help in increasing industrial production.
- Provide employment to landless agricultural labor and tribal population from rural and backward areas.
- Ensure the development and stability of rural economy through diversification and reduced dependence on agriculture.
- Ensure the alleviation of poverty by providing steady sources of income and livelihood.
- Earn much required foreign exchange for the country.
- Improve the standard of living in rural areas.
- Help in reducing the extreme inequalities in the distribution of income and wealth.
- Are easy to establish.
- Support balanced growth between agriculture and industry, and Help in avoiding wastage of perishable agricultural products.

Techniques and Solutions:

High quality of seeds

Recent research shows that the access of small farmers (which cultivate about 80% of the total world's food) to high quality seeds is very limited. This is a relatively straightforward problem, because seeds of high quality are quite easy to achieve. After a farmer gets seeds, he or she can usually harvest high yield varieties by saving and replanting the seeds they harvest each season for many years to come.

Improved technology of monitoring

Farmers often do not know exactly how much water and nutrients their plants need, especially in developing countries. Today, scientists have developed sensors which can detect the water and nutrient content of a soil easily and thus make the efficient use of agricultural resources easier.

Organic Fertilizer

Continuous agriculture depletes the soils of certain cultivable nutrients. In this case, by using organic fertilizers such as animal manures, oyster shells and bone meal, farmers can re-normal nutrients securely. These substances are often more expensive than their synthetic counterparts, but for the environment they are also much better.

Pest Control Green Methods

The spraying of herbicides and conventional pesticides on plants can damage local and remote ecosystems. Resistant weeds and pests often start to develop and proliferate after prolonged periods of pesticide use. Alternative pest control methods can help avoid these problems. Biological methods for controlling populations of insects are one of the most common. These approaches include predatory species such as prayer cloaks, lady bugs, green lacewings and certain wasps that prey upon pesticides. Farmers should take special care when applying this method not to introduce species that cause more harm than good.

Strategy Irrigation

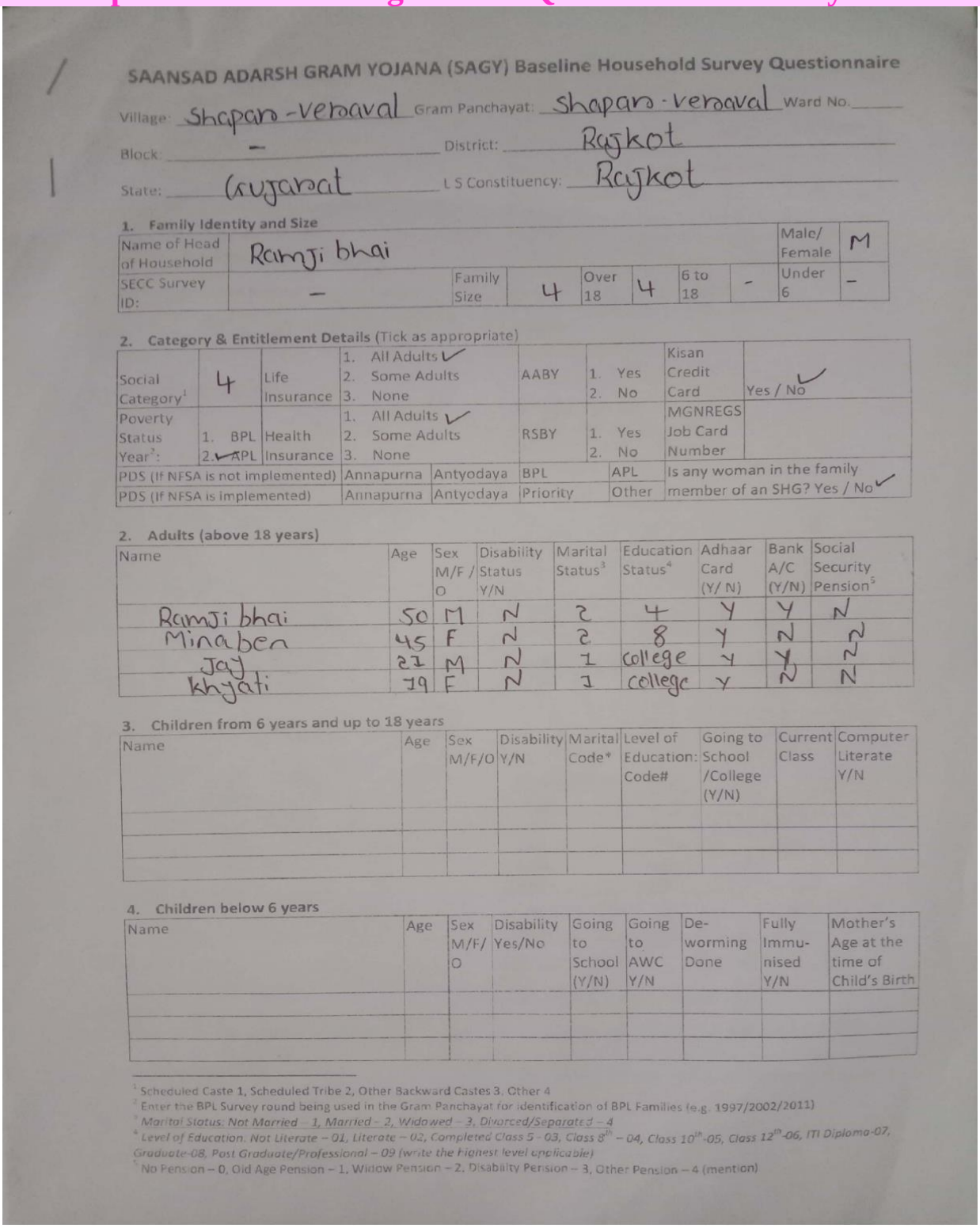
Plants must survive with water. They get all the water they need in some areas from the precipitation. This is, however, not always the case, especially in the world's drier regions. Farmers can use irrigation in such areas to maintain their soils adequately humidify.

CHAPTER 18
Social Activities – Any Activates Planned By Students e.g Teaching Learning activities, awareness camp, business idea for SELF HELP GROUP OR ANY OTHER

- As a part of social activity we have encouraged the villagers to for the development of the village by interacting more with us.
- As a first step in this programme, it is necessary to establish contact with more than one village which would help to select a village where 'Leadership' is well established. In other words, selecting a village with proper leadership is very important as the sustained follow up action and evaluation is ensured in such places.
- To start with, the NSS unit can take the help of the Block Authorities, District Panchayat Officer, District Tribal Welfare Officer, District Medical Officer, Extension Officer of Agriculture, Irrigation and Education Departments for the selection of the village.
- It is to be noted that the selected villages should be within a short distance from the College so that constant contact can easily be made.
- For Women we need to start small gruh Udhyog so women can depend and learn new things.
- Also arrange different type of awareness camps so people can aware and learn new things. Like agriculture new methods, how to use seeds and there percentages, health related camp, aware about government schemes, water harvesting, etc.
- Social and Emotional Learning (SEL) nurtures social awareness, the ability to understand and empathize with others' points of view.

Figure 160 Discuss with Sarpanch

CHAPTER 19
Shapar – Veraval Village SAGY Questionnaire Survey form



SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: Shapar-veraval Gram Panchayat: Shapar-veraval Ward No. ____

Block: – District: Rajkot

State: Gujarat L S Constituency: Rajkot

1. Family Identity and Size

Name of Head of Household	Ramji bhai							Male/ Female	M
SECC Survey ID:	–	Family Size	4	Over 18	4	6 to 18	-	Under 6	-

2. Category & Entitlement Details (Tick as appropriate)

Social Category[1]	4	Life Insurance	1. All Adults ✓ 2. Some Adults 3. None	AABY	1. Yes 2. No	Kisan Credit Card	Yes / No ✓
Poverty Status Year[2]:	1. BPL 2. ✓APL	Health Insurance	1. All Adults ✓ 2. Some Adults 3. None	RSBY	1. Yes 2. No	MGNREGS Job Card Number	
PDS (If NFSA is not implemented)	Annapurna	Antyodaya	BPL	APL	Is any woman in the family member of an SHG? Yes / No ✓		
PDS (If NFSA is implemented)	Annapurna	Antyodaya	Priority	Other			

2. Adults (above 18 years)

Name	Age	Sex M/F / O	Disability Status Y/N	Marital Status[3]	Education Status[4]	Adhaar Card (Y/ N)	Bank A/C (Y/N)	Social Security Pension[5]
Ramji bhai	50	M	N	2	4	Y	Y	N
Minaben	45	F	N	2	8	Y	N	N
Jay	21	M	N	1	college	Y	Y	N
khyati	19	F	N	1	college	Y	N	N

3. Children from 6 years and up to 18 years

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

4. Children below 6 years

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

[1] Scheduled Caste 1, Scheduled Tribe 2, Other Backward Castes 3, Other 4
[2] Enter the BPL Survey round being used in the Gram Panchayat for identification of BPL Families (e.g. 1997/2002/2011)
[3] Marital Status: Not Married – 1, Married – 2, Widowed – 3, Divorced/Separated – 4
[4] Level of Education: Not Literate – 01, Literate – 02, Completed Class 5 - 03, Class 8th – 04, Class 10th-05, Class 12th-06, ITI Diploma-07, Graduate-08, Post Graduate/Professional – 09 (write the highest level applicable)
[5] No Pension – 0, Old Age Pension – 1, Widow Pension – 2, Disability Pension – 3, Other Pension – 4 (mention)

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SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

5. Hand washing

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

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

7. Do members take Regular Physical Exercise

	Yoga	Games	Other Exercises
Adults	Yes / No ✓	Yes / No ✓	Yes / No ✓
Children	Yes / No ✓	Yes / No ✓	Yes / No ✓

8. Consumption of Tobacco

	Smoking	Chewing
Adults	–	yes
Children	–	No

9. House & Homestead Data

Own House: Yes / No	No. of Rooms: 2
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	3km
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	2 acre	2. Cultivable Area	2-acre
3. Irrigated Area		4. Uncultivable Area	

13. Principal Occupations in the Household

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

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

15. Agriculture Inputs

Do you use Chemical Fertilisers	Yes/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
–	–	–
–	–	–
–	–	–

17. Livestock Numbers

Cows: –	Bullocks: –	Calves: –
Female Buffalo: 1	Male Buffalo: 1	Buffalo Calves: –
Goats/ Sheep: –	Poultry/ Ducks: –	Pigs: –
Any other: Type _____		No. _____
Shelter for Livestock: Pucca / Kutcha ✓ / None		
Average Daily Production of Milk(Litres): 8		

18. What games do Children Play
hide & seek, cricket, etc..

19. Do children play musical instrument (mention)

Schedule Filled By:
Principal Respondent:
Date of Survey:

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Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

I. Basic Information

a. Gram Panchayat: Shapar Veraval

b. Block: -

c. District: Rajkot

d. State: Gujarat

e. Lok Sabha Constituency: Rajkot

f. Number of Wards in the Gram Panchayat: _____

g. Number of Villages in the Gram Panchayat: _____

h. Names of Villages:

Demographic Information

Number of Households 2602 Total Population 9249 Male 5430 Female 3819

SC HHs ~~NO~~ ST HHs yes 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)	yes	4km
c.	Nearest Community Health Centre (CHC)	yes	5km
d.	Nearest Post Office	yes	0 km
e.	Nearest Bank Branch (Any)	yes	3km
f.	Nearest Bank with CBS Facility	-	-
g.	Nearest ATM	yes	5km
h.	Nearest Primary School	yes	1km
i.	Nearest Middle School	yes	1km
j.	Nearest Secondary School	yes	5 km
k.	Nearest Higher Secondary School / +2 College	NO	
l.	Nearest Graduate College	NO	
m	Nearest ITI / Polytechnic Centre	NO	
n	Kisan Seva Kendra	NO	

1

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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	2km
r	Veterinary Care Centre	NO	
s	Ayurveda Centre	NO	
t	E – Seva Kendra	NO	
u	Bus Stop	yes	0km
v	Railway Station	yes	12km
w	Library	NO	
x	Common Service Centre	NO	

IV. Sports Facilities in the Gram Panchayat

a. Number of Play Grounds in the GP: Total 0 Public - Private -

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

V. Education, ICDS

a. Number of Angan Wadi Centres: 1

b. Number of villages without Angan Wadi Centres -

Names of such villages: _____

c. Schools (Number)

Primary Private: - Primary Govt.: 1

Middle Private: - Middle Govt.: 1

Secondary Private: - Secondary Govt.: 1

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)	yes	-	yes	-	-	near	-
b.	Kerosene	-	-	yes	-	-	-	-
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 90% Not Covered [illegible]	veraval	
b.	Hand Pump Coverage in Villages:	Covered 5 NO. Not Covered	veraval	
c.	Coverage under Covered Drains:	Covered 70% Not Covered	veraval	
d.	Coverage under Open Drains:	Covered 30% Not Covered	veraval	
e.	Villages with Household Electricity Connection (Numbers)	Connected 100% Not Connected	veraval	

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	1300	d.	Pasture / Grazing Land	–	g.	Check Dam	1
b.	Irrigated Land	1200	e.	Forests/ Plantations	–	h.	Wells/Bore Wells	1000
c.	Un-irrigated Land	100	f.	Other Common Land	2400	i	Tanks /Ponds	3

[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)	50
b)	Number of Households receiving pension (old age, widow, disability)	47
c)	Number of eligible Households who are not receiving pension	3
d)	Number of Households eligible for Ration Card	700
e)	Number of eligible HHs having ration cards	–
f)	Number of households covered under RSBY (Rashtriya Swasthya Bima Yojana)	–
g)	Number of HHs covered under AABY (Aam Aadmi Bima Yojana)	–
h)	Number of active Job Card holders under MGNREGA	–
i)	Number of Job Card holders who completed 100 days of work during 2013-14	–
j)	Number of shops selling alcohol	0
k)	Number of BPL families	20
l)	Number of landless households	–
m)	Number of IAY beneficiaries	30
n)	Number of FRA[2] beneficiaries	0
o)	Number of Community Sanitary Complexes	2
p)	Number of Households headed by single women	5-10
q)	Number of Households headed by physically handicapped persons	2-5
r)	Total number of Persons with Disability in the village	35
s)	Number of SHGs	0
t)	Number of active SHGs	0
u)	Number of SHG Federations	0
v)	Number of Youth Clubs	0
w)	Number of Bharat Nirman Volunteers	0

Name and Signature of Surveyor and Respondent'

Nirav Patel Surveyor	PRI Respondent (Preferably Gram Panchayat Chairperson)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	25/6/2021 Date of Survey

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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: shapar veraval
b. Ward Number: _____
c. Gram Panchayat: shapar veraval
d. Block: –
e. District: Rajkot
f. State: Gujarat
g. Lok Sabha Constituency: Rajkot
h. Number of Habitations / Hamlets in the Gram Panchayat: –

i. Names of Habitations / Hamlets:

Demographic Information

Number of Households 2602 Total Population 9249 Male 5430 Female 3819

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	2km
b.	Nearest Middle School	yes	5 ~~10~~km
c.	Nearest Secondary School	yes	5 ~~10~~km
d.	Kisan Seva Kendra	NO	
e.	Milk Cooperative /Collection Centre	yes	2km
g.	Health Sub Centre	yes	2km
h.	Bank	yes	3km
i.	ATM	yes	6 km
j.	Bus Stop	yes	1km
k.	Railway Station	NO	–

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

1

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

l.	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	
n	Veterinary Care Centre	No	

ii. Road Connectivity
a. Habitations connected by All-weather Roads (✓1-All 2-None 3-Some)
If 3 mention the name of the habitations where not available: _____

iii. Drinking Water Facilities
a.Piped Water Supply Coverage to Habitations: _____ (✓1-All 2-None 3-Some)
If 3 mention the name of the habitations not covered: _____

b.Hand Pump Coverage in Habitations: _____ (1-All 2-None ✓3-Some)
If 3 mention the name of the habitations not covered: _____

iv. Coverage of Habitations under Waste Management System
a. Coverage under Covered Drains: _____(1-All 2-None ✓3-Some)
If 3 mention the name of the habitations not covered: _____

b. Coverage under Open Drains: _____(1-All 2-None ✓3-Some)
If 3 mention the name of the habitations not covered: _____

c. Coverage under Doorstep Waste Collection: (✓1-All 2-None 3-Some)
If 3 mention the name of the habitations not covered: _____

v. Coverage of Habitations under Electrification,
a. Coverage under Household Connections: (1-All✓ 2-None 3-Some)
If 3 mention the name of the habitations not covered: _____

b.Coverage under Street Lighting: All(✓1-All 2-None 3-Some)
If 3 mention the name of the habitations not covered: _____

vi. Sports Facilities in the Village
a.Number of Play Grounds in the Village (minimum size 200 square meters): NO
b.Mini Stadium : NO Yes(Y) /No (N)

vii. Education, ICDS
a. Number of Anganwadi Centres: 1
c. Schools (Number)
Primary Private: - Primary Govt.: 1
Middle Private: - Middle Govt.: 1
Secondary Private: - Secondary Govt.: 1
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	1300	d.	Pasture / Grazing Land	-	g.	Check Dam	1
b.	Irrigated Land	1200	e.	Forests/ Plnatations	-	h.	Wells/Bore Wells	1000
c.	Un-irrigated Land	100	f.	Other Common Land	2400	I	Tanks /Ponds	3

ix. Entitlement Related Parameters		
1	Number of active Job Card holders under MGNREGA	0
2	Number of active Job Card holders who have completed 100 days of work	0
3	Number of shops selling alcohol	0
4	Number of BPL families	100
5	Number of landless households	0
6	Number of IAY beneficiaries	30
7	Number of FRA beneficiaries	0
8	Number of common sanitation complexes	2
9	Number of SHGs	0
10	Number of active SHGs	0
11	Existence of SHG Federation in the Village (Yes / No)	0
12	Number of Youth Clubs	0
13	Number of Bharat Nirman Volunteers	0

Name and Signature of Surveyor and Respondent'

Nirav Patel			25/6/2021
Surveyor	PRI Respondent (Preferably a ward member from a ward that is fully or partially covered under the Village)	Official Respondent (Preferably senior most Government official in the Gram Panchayat)	Date of Survey

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

8/20/2021 Gardi Vidyapith Mail - Development scenario of Shapar - Veraval village, Kotda Sangani, Rajkot

Geerach Rubeena <17cl007@gardividyapith.ac.in>

Development scenario of Shapar - Veraval village, Kotda Sangani, Rajkot

Geerach Rubeena <17cl007@gardividyapith.ac.in> Mon, Jun 28, 2021 at 1:49 PM
To: ddo-raj@gujarat.gov.in, collector-raj@gujarat.gov.in
Cc: rurban@gtu.edu.in
Bcc: VIMAL PATEL <vnpatel@gardividyapith.ac.in>, Radhika Fichadiya <17ee004@gardividyapith.ac.in>, Lila Nirav <17cl014@gardividyapith.ac.in>

Good Afternoon sir/ma'am
Greetings of the day

We are students of the B.H. Gardi College of Engineering and Technology, Anandpar, Rajkot. affiliated to Gujarat Technological University-GTU. GTU has been assigned to Vishwakarma Yojana - VY in which students survey various villages and Designs various amenities To Deliver them to make them ideal for living a better life as per requirements & village problem statements.
We are working under the Vishwakarma Yojana Phase VIII Project of development of the Shapar - Veraval village and as a completion of the project, we have proposed designs according to the requirement of the villagers after a techno-economic survey.
Here I have attached the final report of designs with an economic budget.
Encl:
1. Detailed Project Report of Shapar - Veraval village

Thanking you
With warm regards
Geerach Rubeena
Leela Nirav
Fichadiya Radhika
U.G. Civil Engineering
U.G. Electrical Engineering
B.H. Gardi College of Engineering and Technology, Rajkot

Vishwakarma Yojana Phase VIII Shapar - Veraval Village.pdf
15173K

Figure 161 Email to DDO - Collector in soft copy

CHAPTER 21
Comprehensive report for the entire village

Vishwakarma Yojana: An approach towards rurbanisation. Name Itself indicates to provide primary and mandatory facilities to village which cities may have starting of the project we have visited the ideal village Moviya. ideal village terms as village should have facilities like primary school building , heath center , good water supply , well managed drainage system , cleanness of the village , should be connect with nearer city by transportation system , good education facilities. We met with sarpunch of Moviya village and he guided us what are the main and primary things needed in village and must be implemented.

This era deals with modernity, living standards, technology and modern technology. We understand that the development of countries is related not only to re urban but also to villages. The villages and small towns as a "rural incubator" play a key role in rural development and offer marketing services, supplying agricultural inputs for their rural areas, for instance, fertilizer and agricultural machinery, municipal services such as education centers, health services and so on.

We get the idea and the scenario of a model village after visiting the ideal village and smart village. Up to now we think about the meaning of "the village" as low-class people, who go away with ordinary life and old thinking and technology. But a daily scenario has changed completely, Indian villages are growing. The Smart Village concept is introduced with smart cities and we are proud to say that we are one part of the concept. Because we connect to rural development concepts such as through Vishwakarma Yojana.

We saw during a visit to Idea village, that all the village's success depends on the village Sarpanch. The only person who can increase the village level in all respects is a sarpanch. So many governmental arrangement exists for towns and villages, but the Sarpanch is the only connection between these two phases.

The political issue is particularly important for rural development in India. Everybody works for himself. They just want to develop them themselves rather than the village. Villages require long-term master plan planning.

We conclude from our study that providing facilities is not just a rural development solution. All Gujarat villages now have a very good relationship with the past. However, we must concentrate on improving existing facilities. The existing facilities are not focused on villager and Gram

Panchayat. This means that the villagers are trying to discard it. Villagers are also unaware of new technologies that improve them.

It is renowned for its cleanliness of 100%. It is a perfect Gujarat village. We visit our shapar - Veraval Village after visiting these two villages. We found that the structure, facilities and village dwellers differed enormously in the local authorities (Gram Panchayat).

Villages and towns play a major role as "rural incubator" in the development of rural areas and offer marketing services, agricultural inputs, such as fertilizer and farm machinery, municipal services such as education facilities, health services, etc.

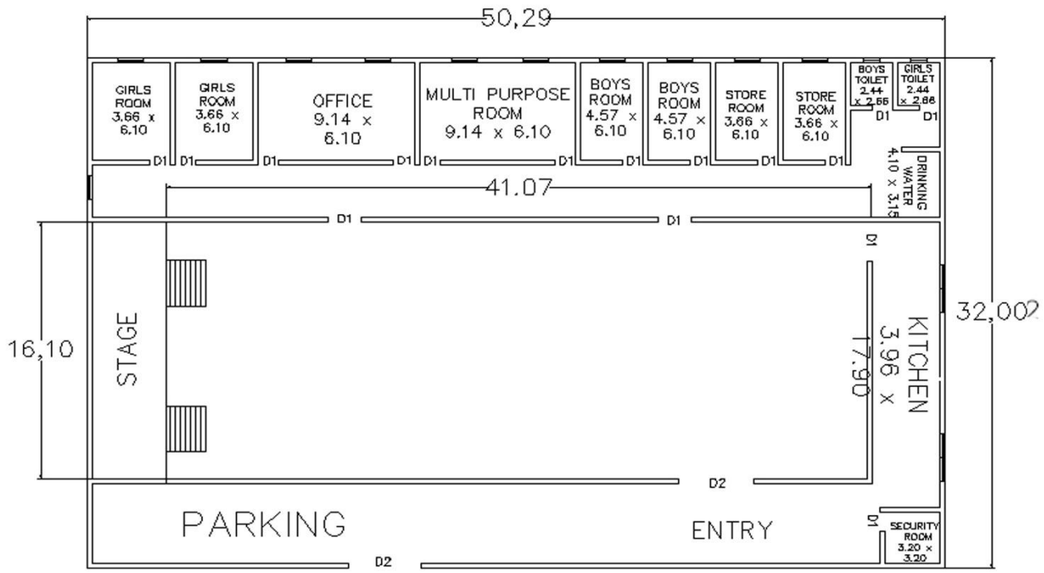
We get to the idea and scenario of a model village after visiting the Ideal Village Moviya and Smart Village Raj samadhiyala. Up to now, we think about the meaning of 'village' as poor people, leaving with ordinary life and with ancient mentality and old technologies. But now a day scenario has changed completely, Indian villages are now expanding. The Smart Village concept has been introduced with smart cities and we are proud to say we are one part of this concept. We connect with rural development concepts through Vishwakarma Yojana.

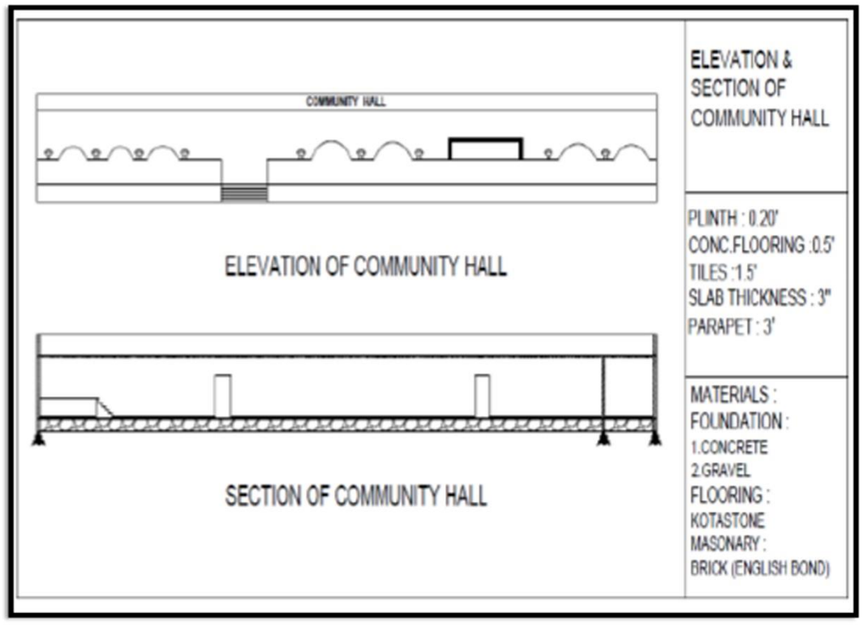
When we visited Idea village, we saw that the village's success depends on the village Sarpanch. The only person able to improve village level in all respects is a sarpanch.

So many governorates are involved in village and village arrangements, but the Sarpanch is the only connection between the two phases. With a little knowledge and group work anything that Moviya village has proved can be achieved.

Also, Rajsamadhiyala is also a village where gram panchayat are awarded the role model. Its cleanliness is known to be 100%. It's a clever Gujarat village.

We visited these two settlements and then visited our village of Shapar Veraval. We have seen the enormous difference between the local authorities (Gram Panchayat). The political issue is particularly important for rural development in India. Everybody works for himself. Instead of village they want to nurture them themselves. Villages require long-term master plan planning proposals.





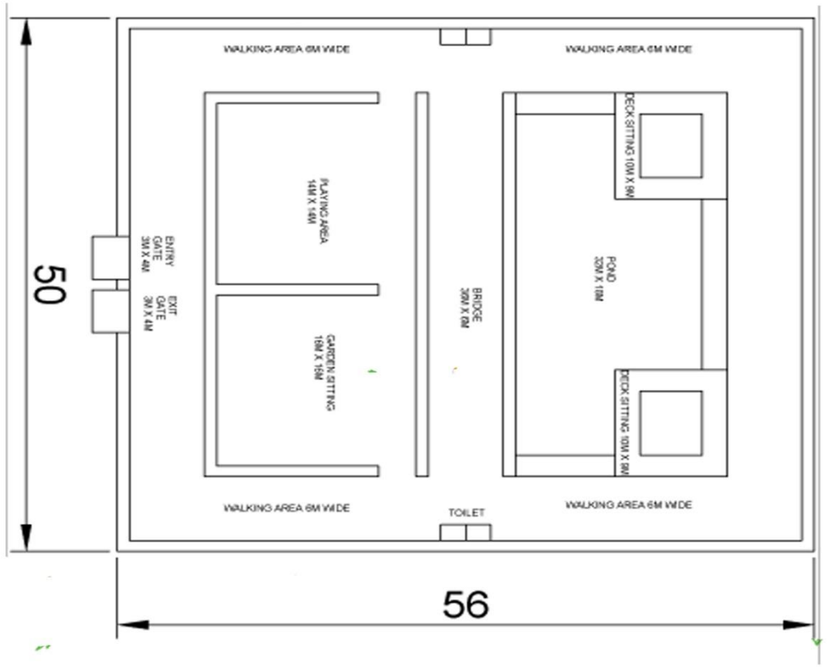
GUJRAT TECHNOLOGICAL UNIVERSITY

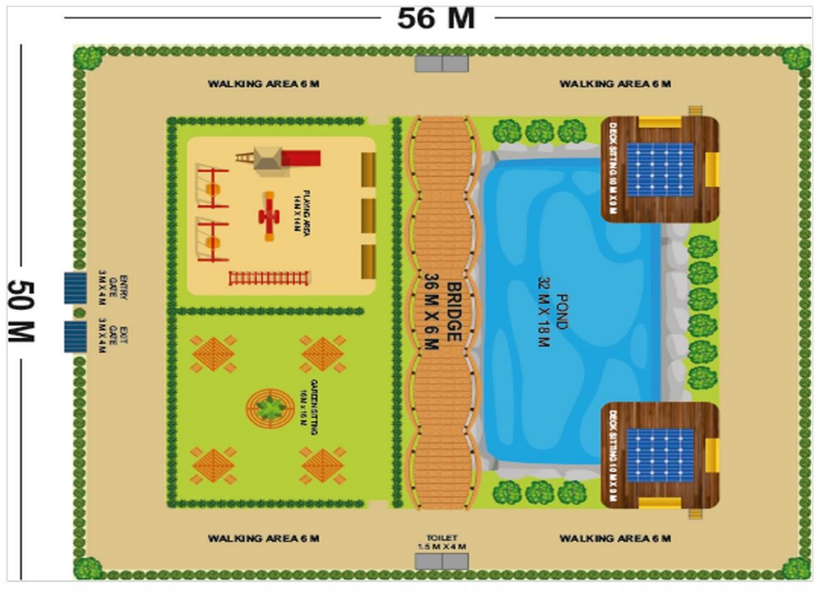
ALL DIMENSION ARE IN METER

BOYS ROOM - 4.57*6.10
OFFICE - 9.14*6.10
MULTI PURPOSE ROOM - 9.14*6.10
KITCHEN - 3.96*17.90
STAGE - 41.07*16.10

B.H.Gardi College of Engineering and Technology
Smt. T.V.Mehta Charitable Foundation

DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	1
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1





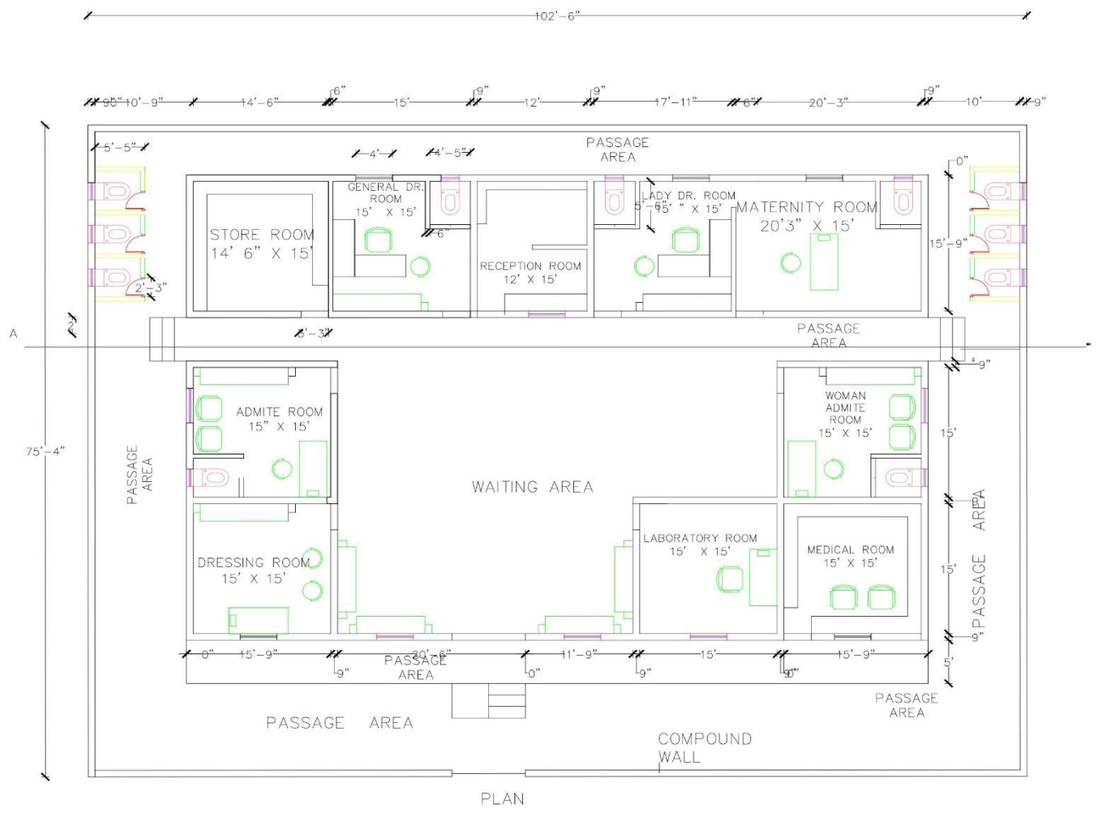
GUJRAT TECHNOLOGICAL UNIVERSITY

ALL DIMENSION ARE IN METER

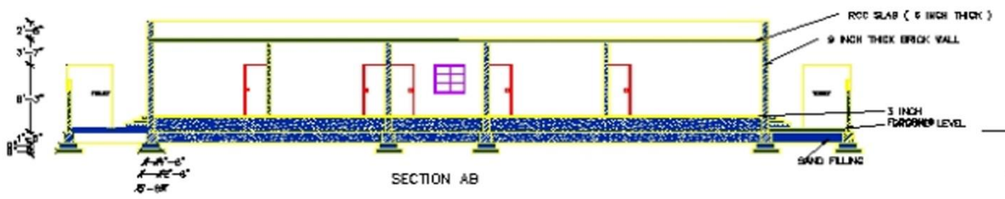
COMMON PUBLIC PLACE - 50*56
POND - 32*18
PORTABLE TOILET - 1.5*4
SITTING AREA - 10*9
PLAY GROUND - 14*14
BRIDGE - 36*6
SOLAR PANEL - 3*4

B.H.Gardi College of Engineering and Technology
Smt. T.V.Mehta Charitable Foundation

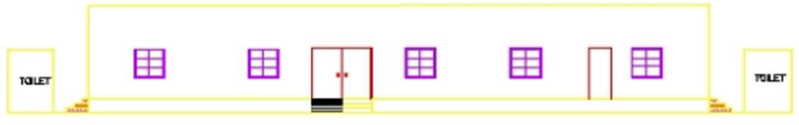
DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIA
SHEET NUMBER	2
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1



PLAN



SECTION AB



FRONT ELEVATION

OPENING SCHEDUAL

D = 4' X 7'
D1 = 2.6" X 7'
W = 4' X 7'
W1 = 2' X 2'

GUJRAT TECHNOLOGICAL UNIVERSITY

ALL DIMENSION ARE IN FEET

STORE ROOM - 14.6*15
GENERAL DR. ROOM - 15*15
RECEPTION ROOM - 12*10
LADY DOCTORE ROOM - 15*15
MATERNITY ROOM - 20.3*15
DRESSING ROOM - 10*10

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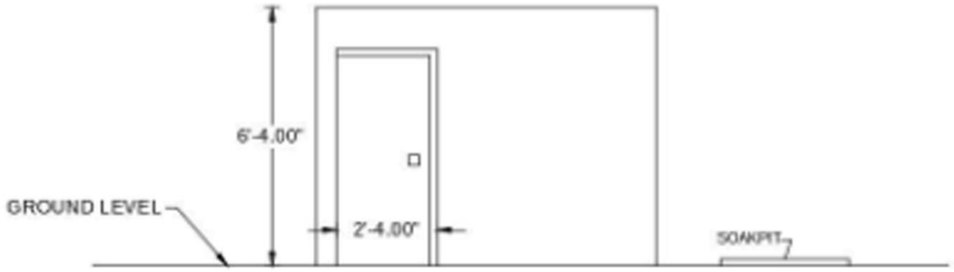
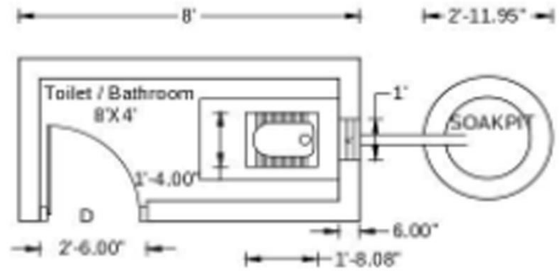
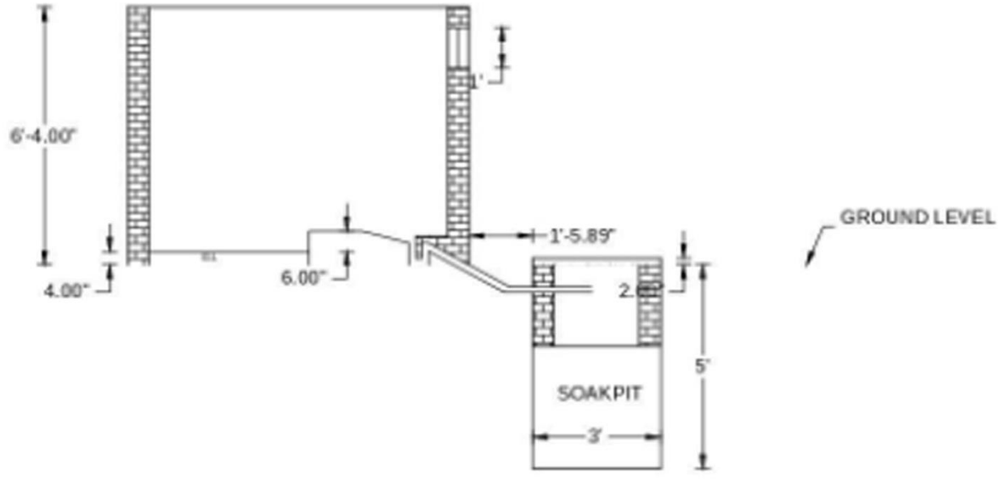
DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	3
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1



ELEVATION



PLAN



SECTION

GUJRAT TECHNOLOGICAL UNIVERSITY

ALL DIMENSION ARE IN METER

GENERAL DESIGN FOR PUBLIC

OPENING SCHEDUAL
D - 2.4*5
W - 1*1
S - 1.5RADIUS

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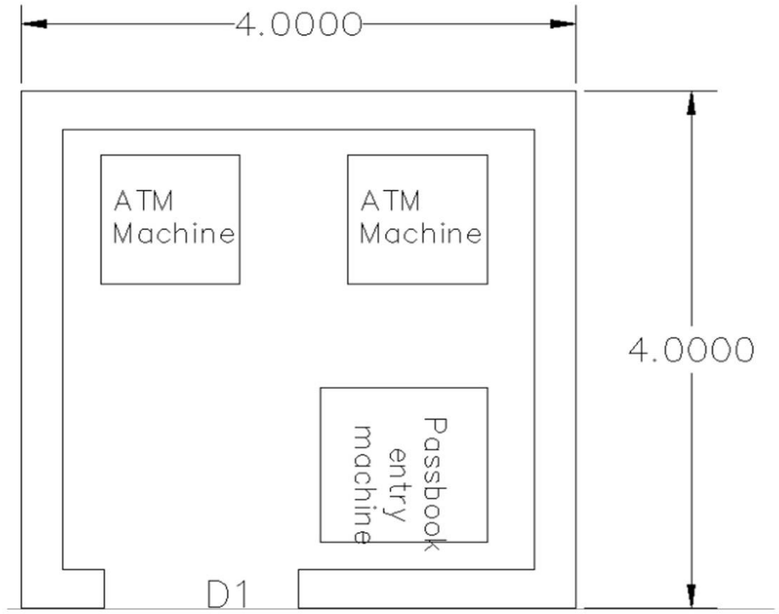
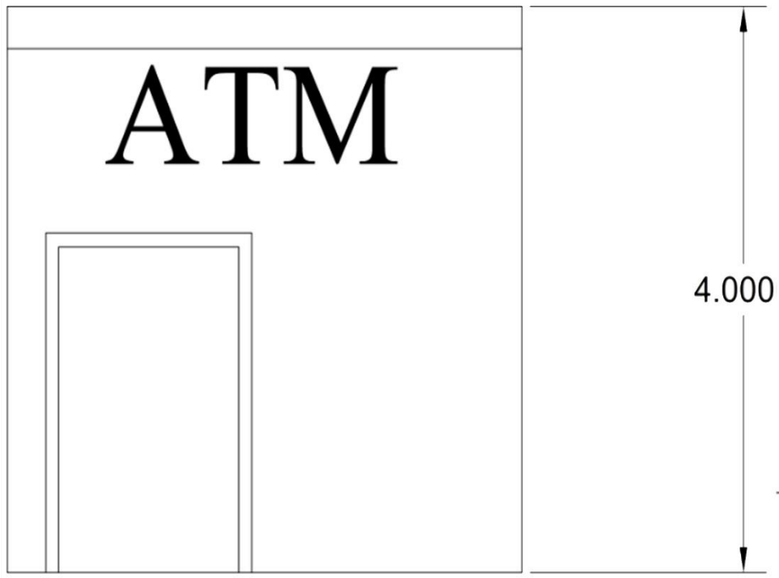
Smt. T.V.Mehta Charitable Foundation

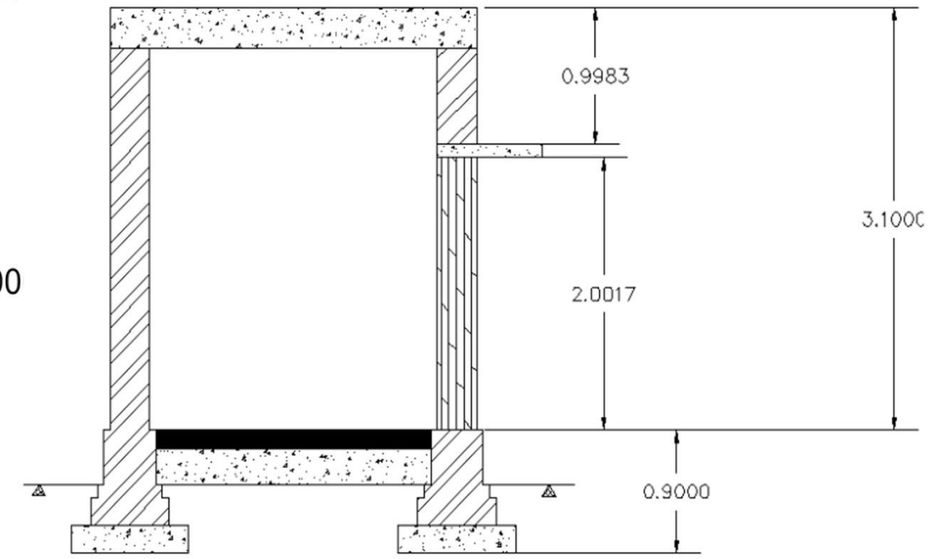
DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	4
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1



PLAN



ELEVATION



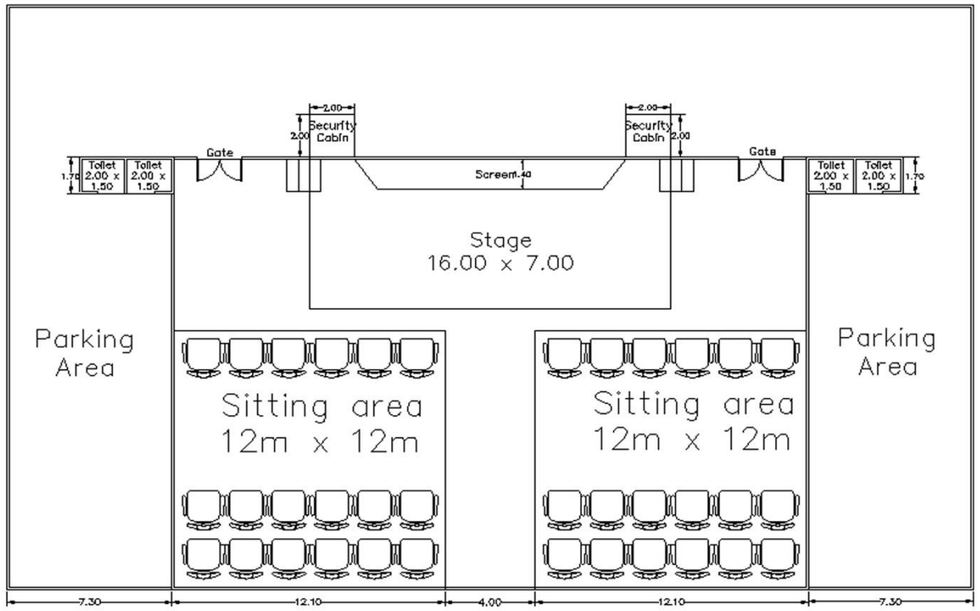
SECTION

GUJRAT TECHNOLOGICAL UNIVERSITY

ALL DIMENSION ARE IN METER
BBCC - 0.20M
FOOTING - 0.30M
GROUND LEVEL TO PLINTH LEVEL - 0.40M
STRUCTURE HEIGHT - 3.10M
DESIGN IS PREPARED ONLY FOR EDUCATIONAL PURPOSE

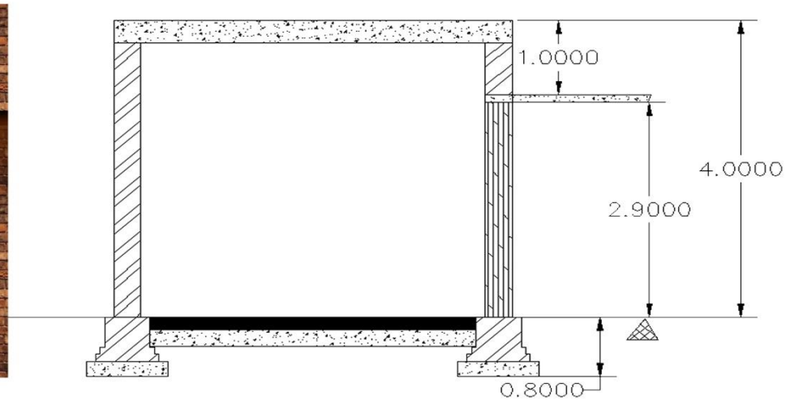
B.H.Gardi College of Engineering and Technology
Smt. T.V.Mehta Charitable Foundation

DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	5
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1



PLAN

ELEVATION



SECTION

GUJRAT TECHNOLOGICAL UNIVERSITY

ALL DIMENSION ARE IN METER

ITS USED AS AN AUDITORIUM AND THEATER TOO.

DIMENSIONS

GATE - 2METER

TOILET DOOR - 1METER

STAIRS OF STAGE - 1*0.25*0.25M

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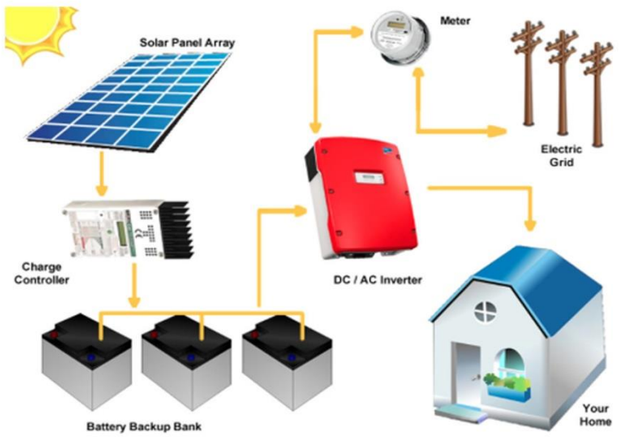
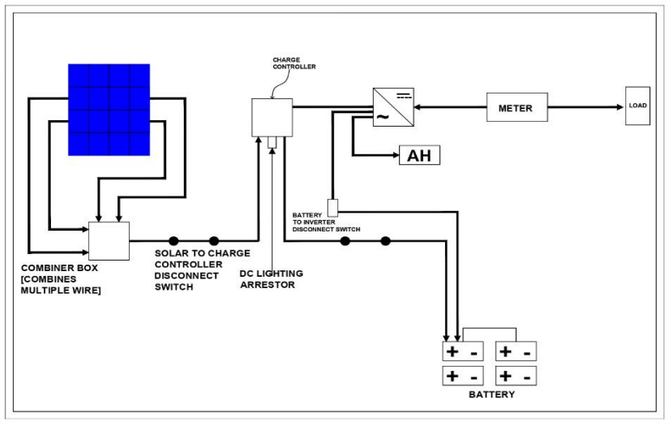
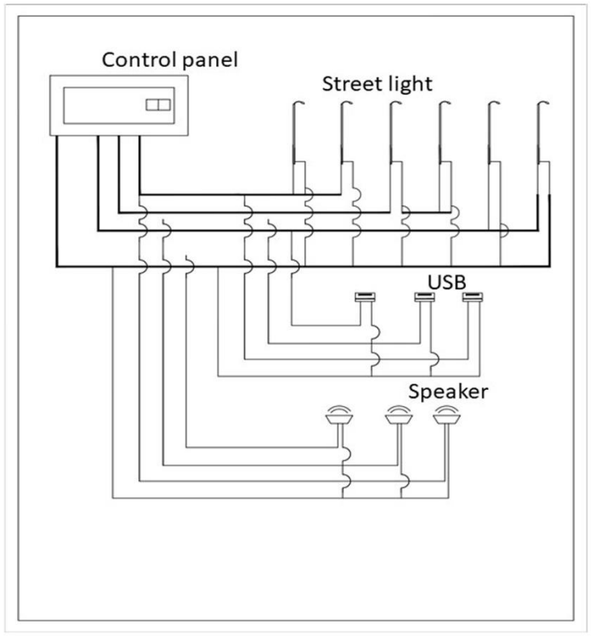
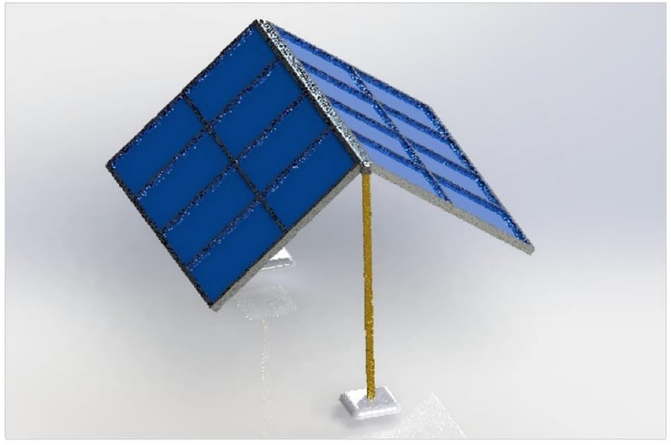
DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	6
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1









GUJRAT TECHNOLOGICAL UNIVERSITY

The main component in solar roof top system are
1. Solar panels
2. Inverte battery
3. Charge controller
4. Electrical wires, switch gears.

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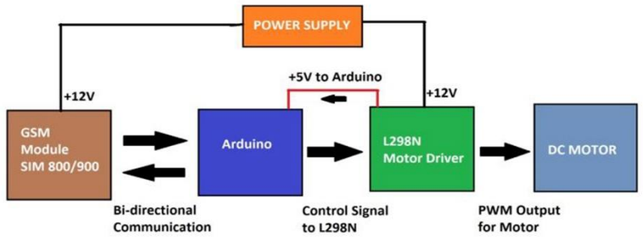
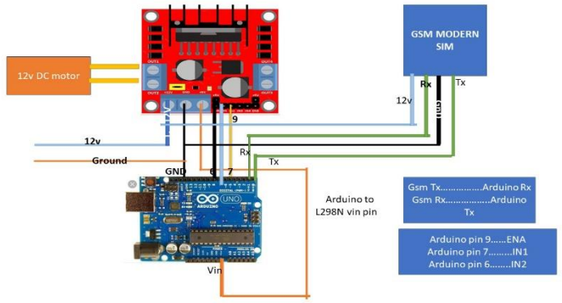
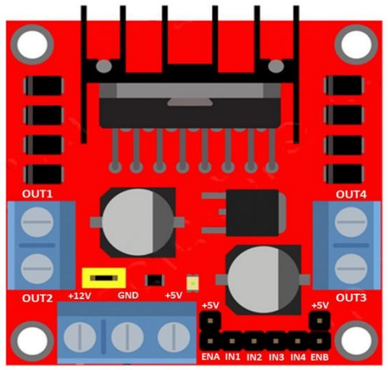
DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	1
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	-







GUJRAT TECHNOLOGICAL UNIVERSITY

Motors are more frequently used in our daily life than you might think...
Advantages
1. This is ensure safety of worker in industrial place.
2. It is can be oprated from long distance
3. It reduces the cost of wiring.

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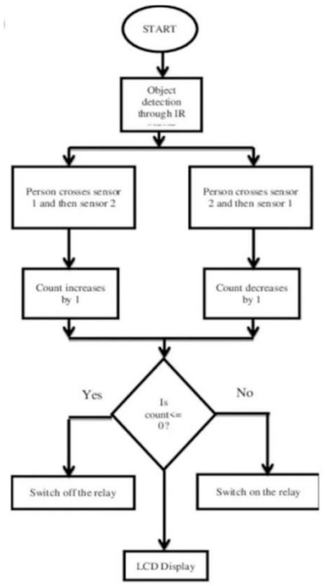
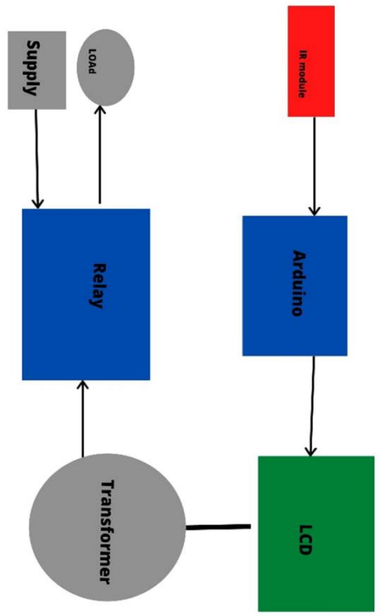
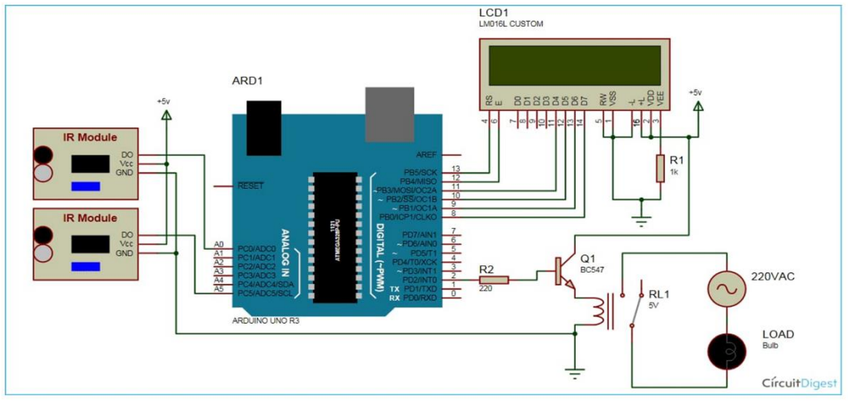
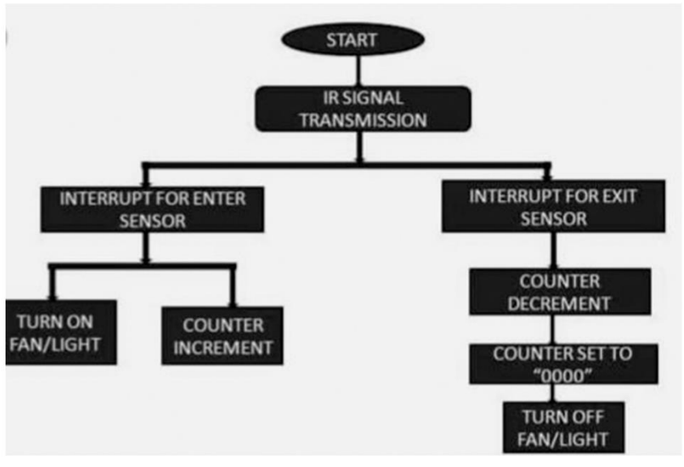
DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	2
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	-



Block diagram of bidirectional controls system







GUJRAT TECHNOLOGICAL UNIVERSITY

ALL DIMENSION ARE IN METER

COMMON PUBLIC PLACE - 50*56
POND - 32*18
PORTABLE TOILET - 1.5*4
SITTING AREA - 10*9
PLAY GROUND - 14*14
BRIDGE - 36*6
SOLAR PANEL - 3*4

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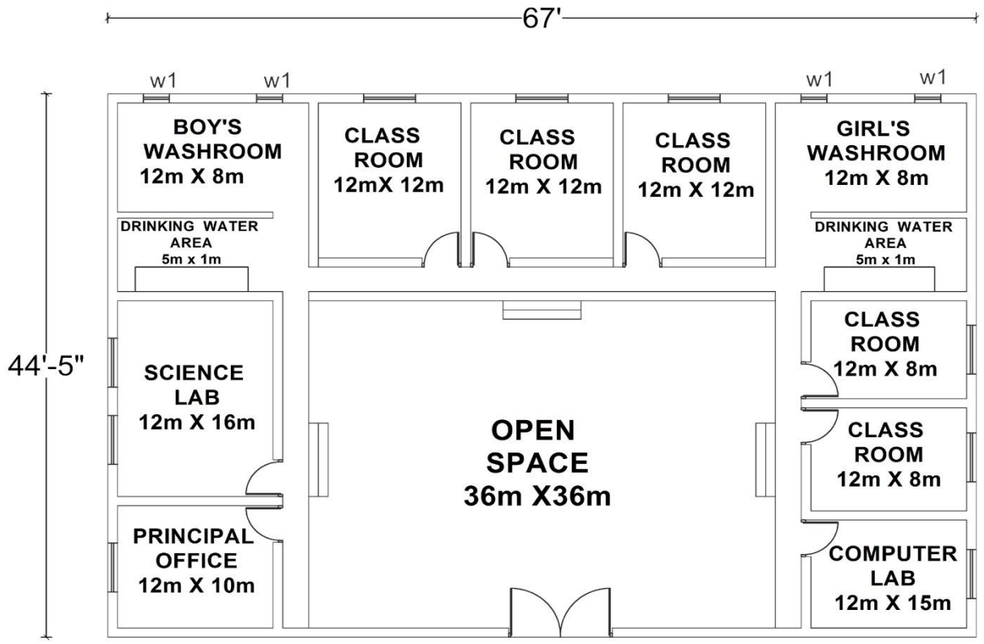
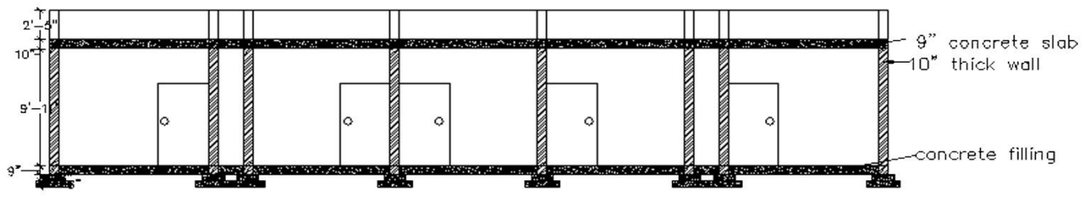
DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIA
SHEET NUMBER	2
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1



PLAN OF HIGH SCHOOL BUILDING



SECTION OF HIGH SCHOOL BUILDING

1. HIGH SCHOOL

GUJRAT TECHNOLOGICAL UNIVERSITY

ALL DIMENSION ARE IN METER
OPEN SPACE - 36m*36m
PRINCIPAL OFFICE - 12m*10m
SCIENCE LAB - 12m*16m
BOYS WASHROOM- 12m*8m
CLASS ROOM - 12m*12m
GIRLS ROOM - 12m*8m
COST - 16,74,793

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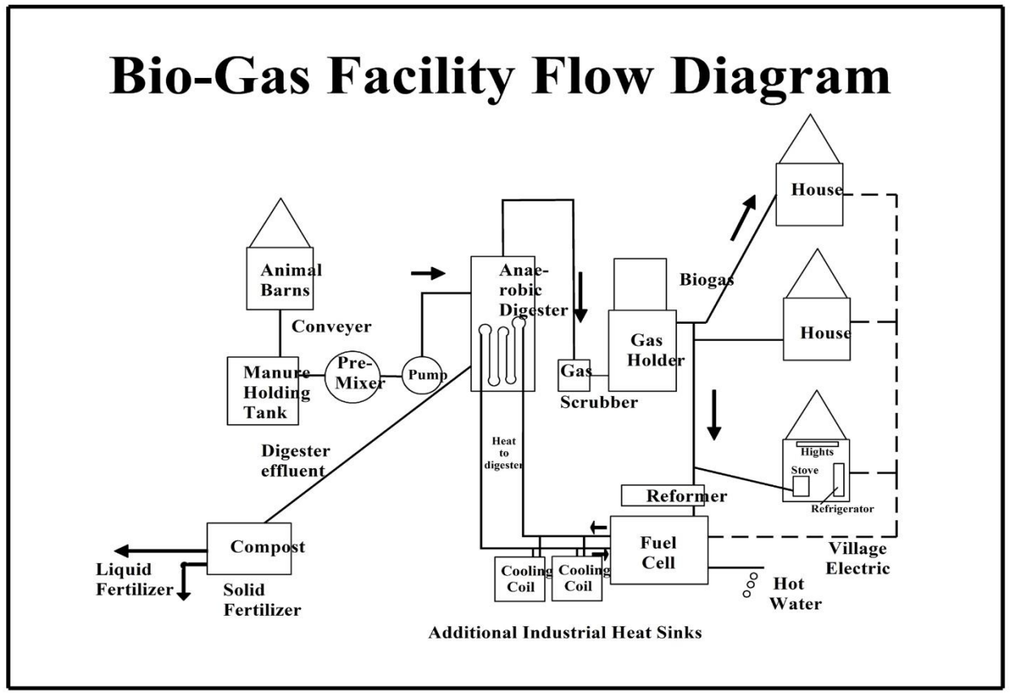
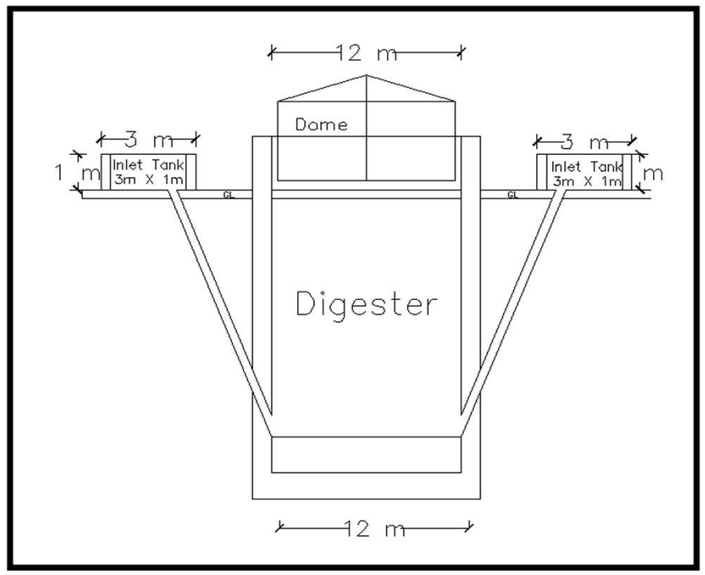
DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	1
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1





2. BIO GAS WASTE CONTROLLER

GUJRAT TECHNOLOGICAL UNIVERSITY

ALL DIMENSION ARE IN METER
COMPOST
ANIMAL BARNS
HOLDING TANKS
PRE-MIXTURE
PUMP
SCRUBER
COST - 1,88,400

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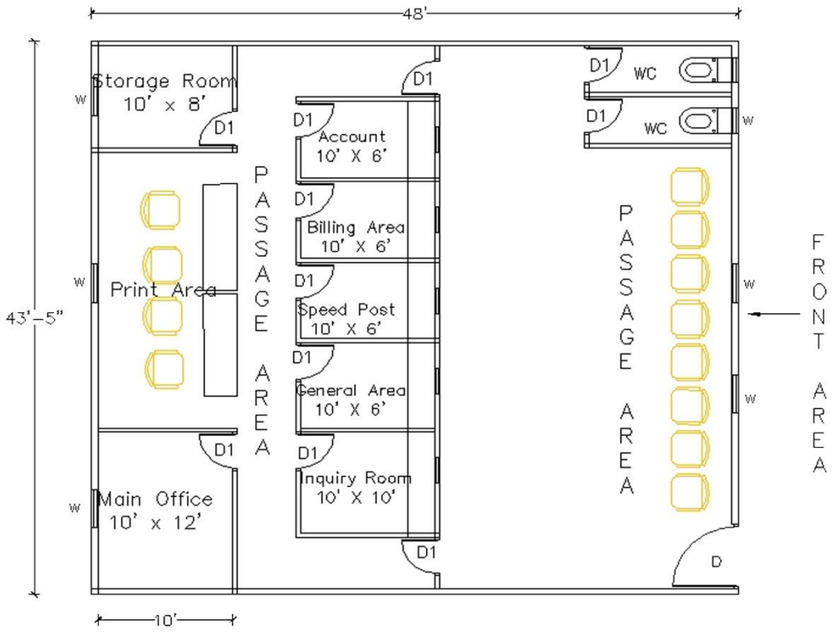
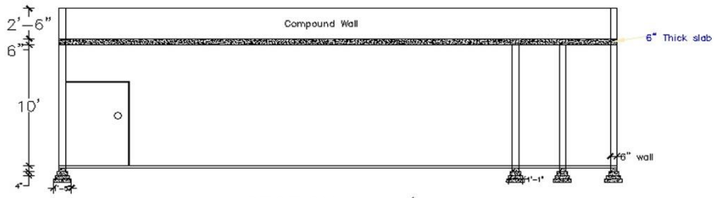
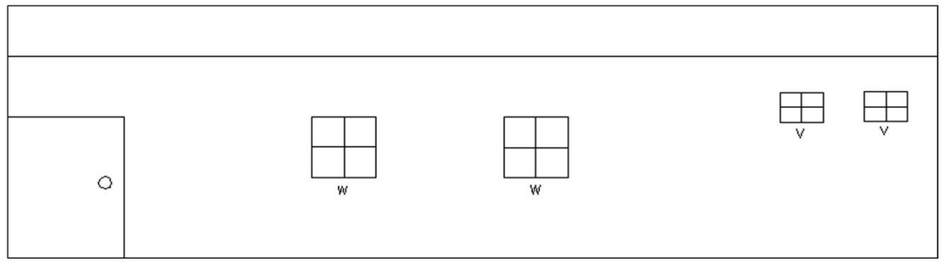
DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	2
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1



PLAN



SECTION – A/A



ELEVATION – A/A

3. POST OFFICE

GUJRAT TECHNOLOGICAL UNIVERSITY

ALL DIMENSION ARE IN METER
MAIN OFFICE - 1210m*12m
STORAGE ROOM - 10m*8m
INQUIRY ROOM - 10m*10m
GENERAL ROOM - 10m*6m
SPEED POST - 10m*6m
BILLING AREA - 10m*6m
COST - 19,20,456

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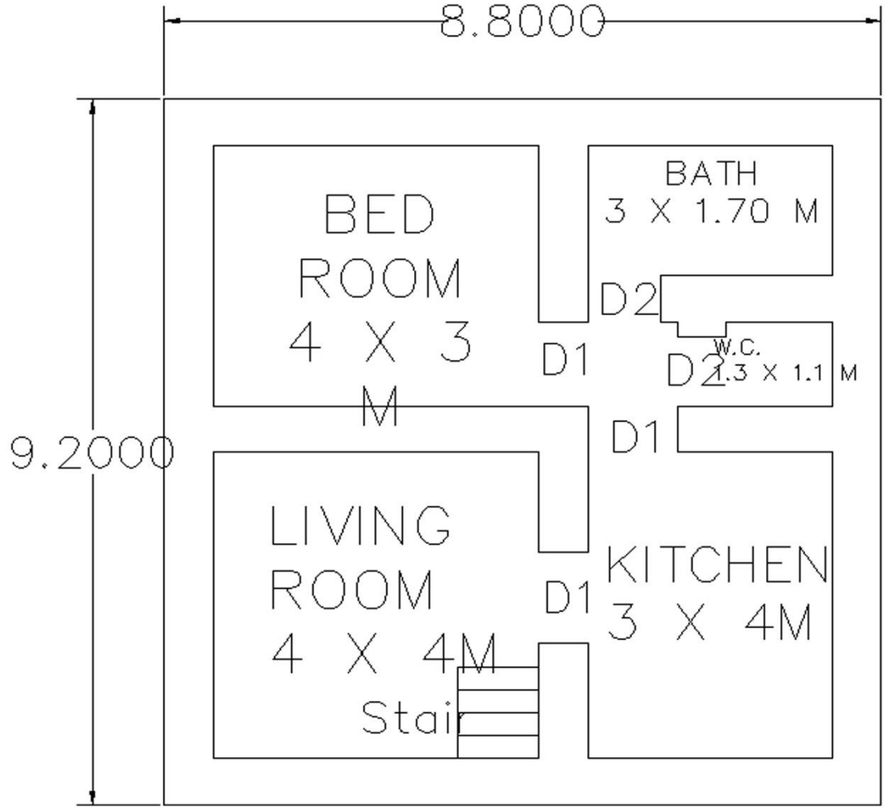
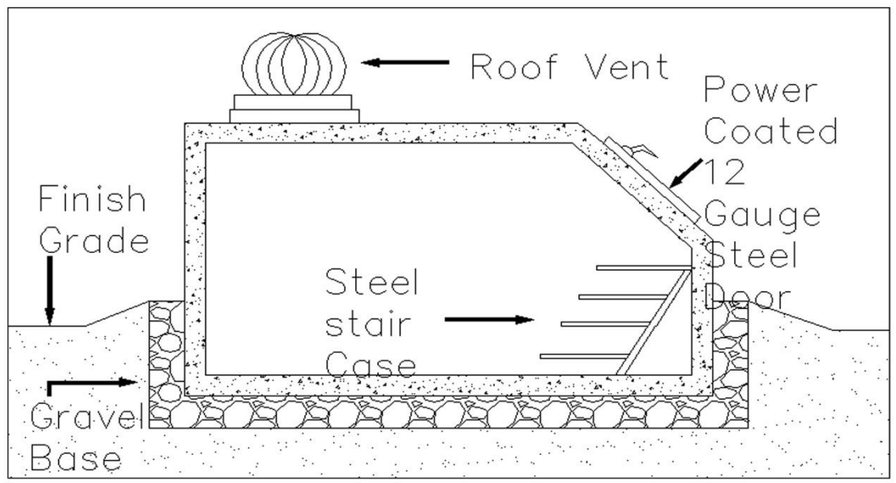
DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	3
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1





4. SHELTER

GUJRAT TECHNOLOGICAL UNIVERSITY

ALL DIMENSION ARE IN METER
BED ROOM - 4m*3m
LIVING ROOM - 4m*4m
BATH - 3m*1.70m
KITCHEN - 3m*4m
COST - 4,44,112

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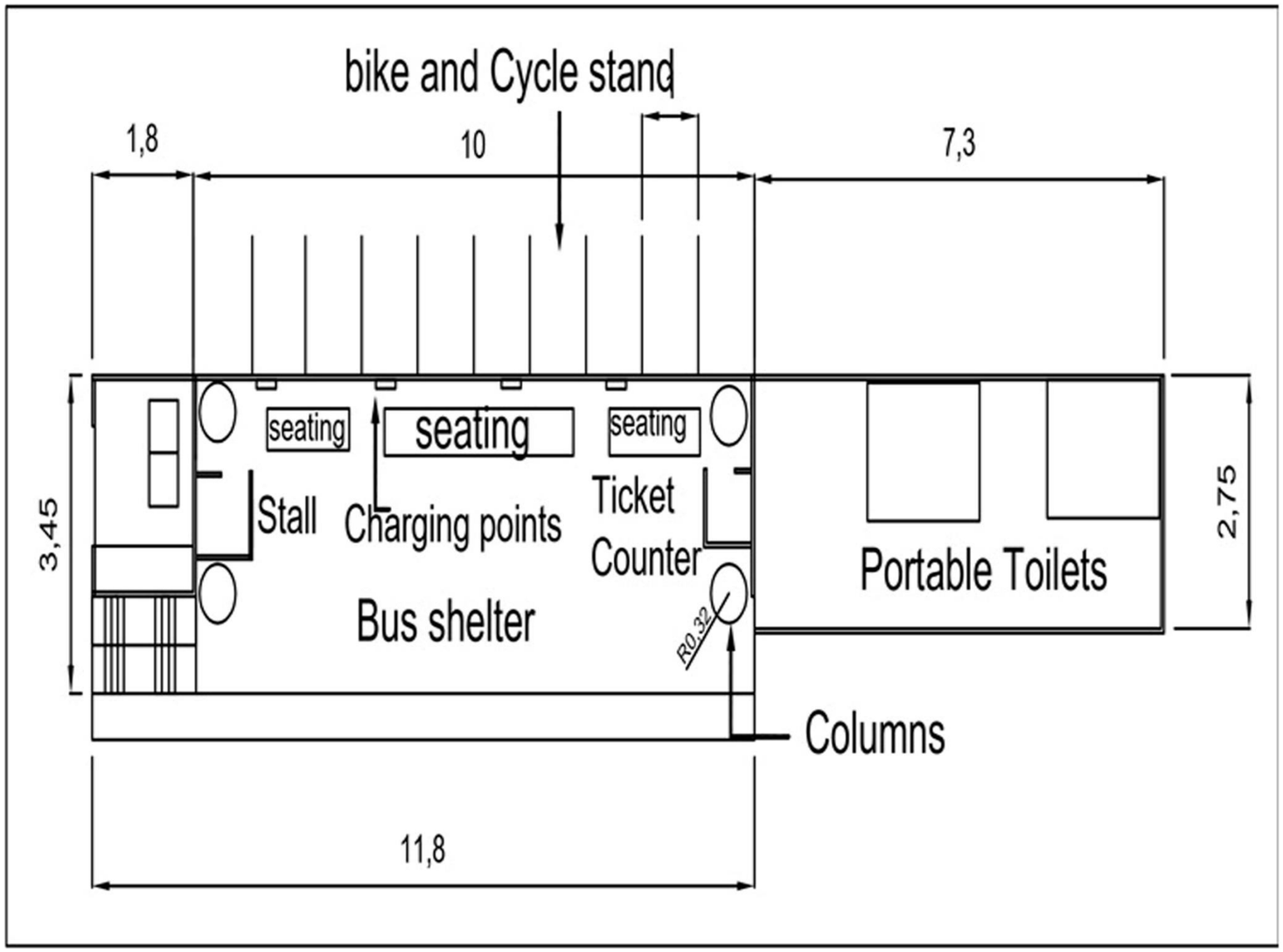
DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	4
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1



5. BUS STAND WITH TOILET, CYCLE STAND, AND STALLS

GUJRAT TECHNOLOGICAL UNIVERSITY

ALL DIMENSION ARE IN METER
BIKE AND CYCLE STAND
BUS SHELTER
PORTABLE TOILETS
TICKET COUNTER
STALL
COST - 23,50,082

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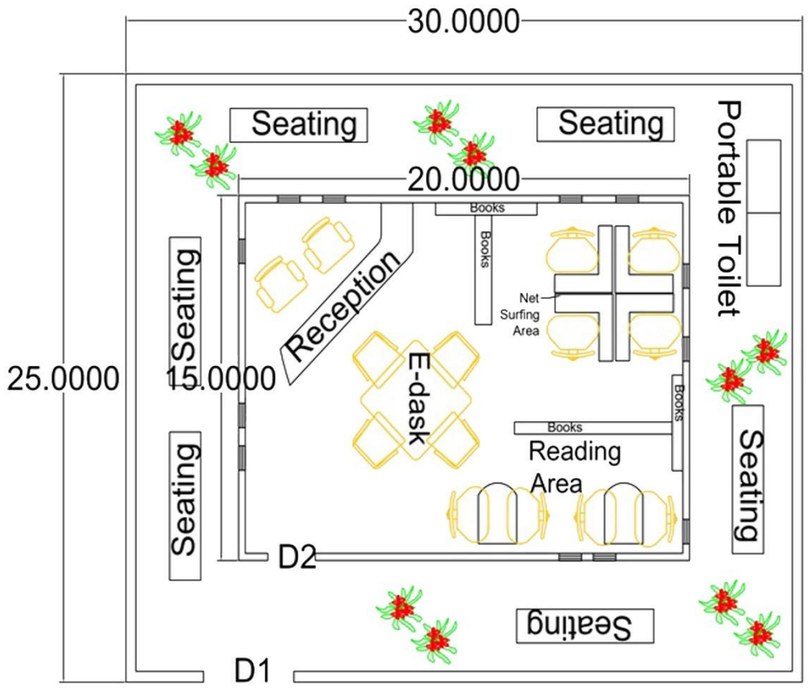
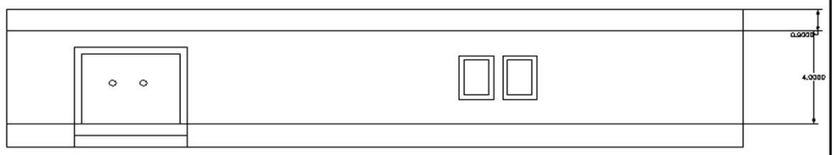
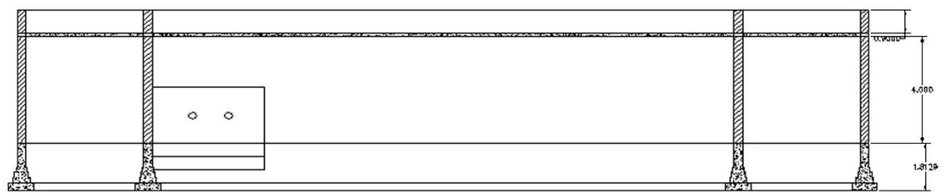
DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	5
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1



PLAN



ELEVATION



SECTION

6. GREEN INFRASTRUCTURE LIBRARY

GUJRAT TECHNOLOGICAL UNIVERSITY

ALL DIMENSION ARE IN METER
SEATING
PORTABLE TOILETS
RECEPTION
READING AREA
COST - 12,00,000

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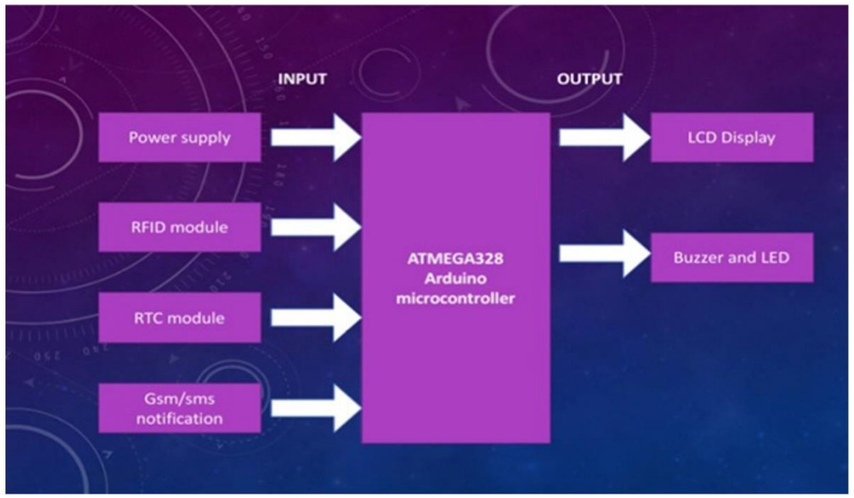
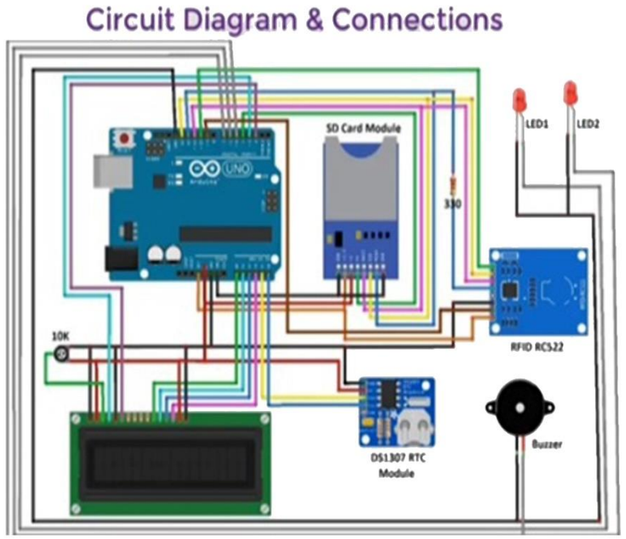
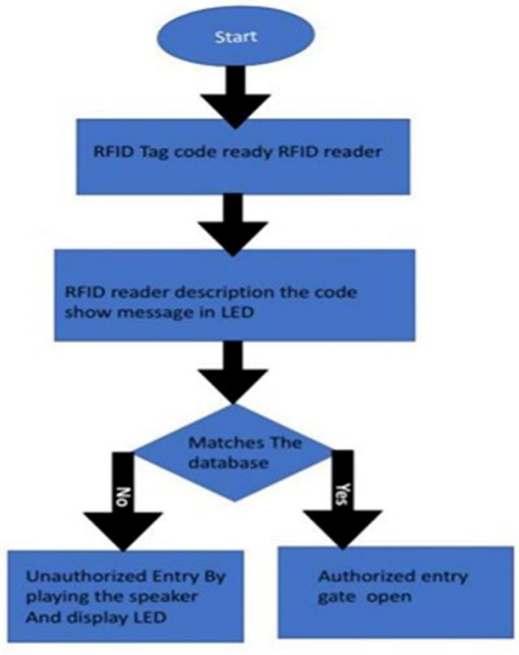
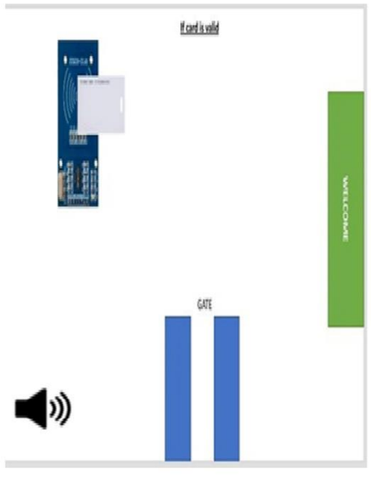
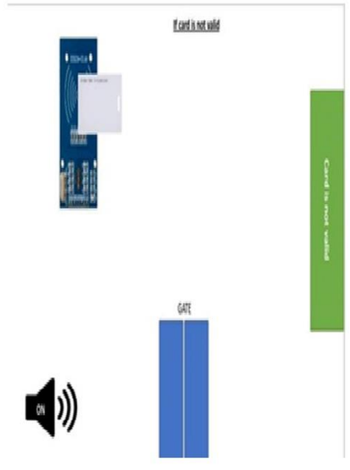
DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	6
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1











7. RFID BASED ATTENDANCE SYSTEM

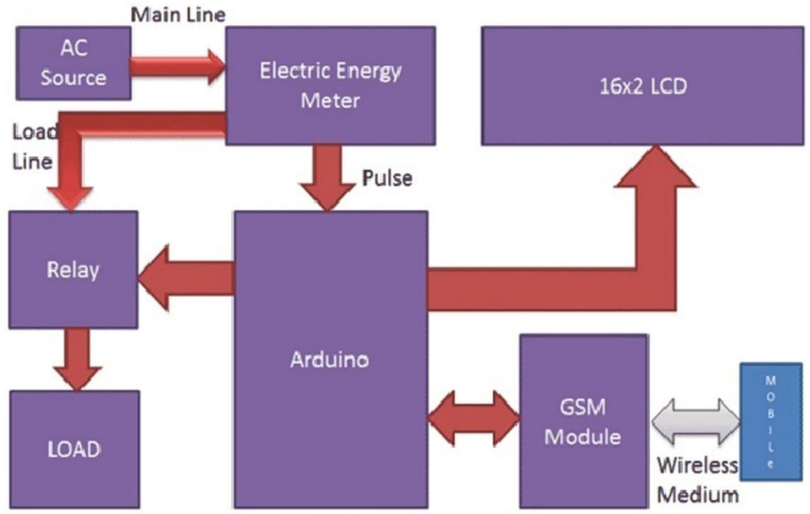
GUJRAT TECHNOLOGICAL UNIVERSITY

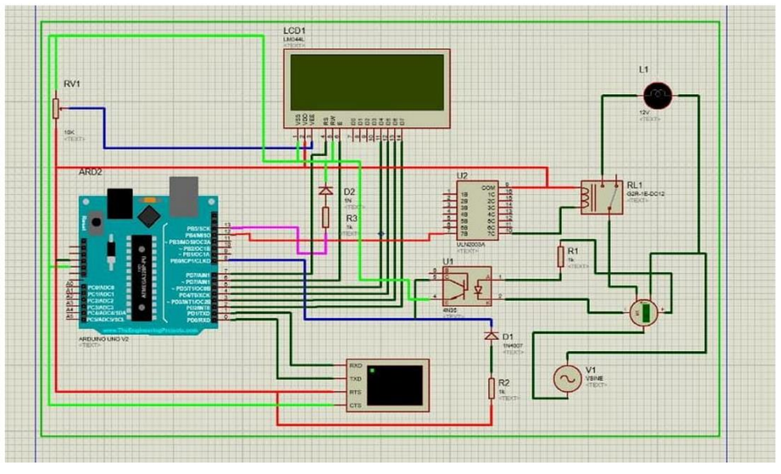
ALL DIMENSION ARE IN METER

RFID BASED ATTENDANCE SYSTEM
COST - 1170

B.H.Gardi College of Engineering and Technology
Smt. T.V.Mehta Charitable Foundation

DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	7
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1





8. GSM BASED TRACKING ENERGY METER

GUJRAT TECHNOLOGICAL UNIVERSITY

ALL DIMENSION ARE IN METER
AC SOURCE
LOAD LINE
ELECTRIC ENERGY METER
LOAD
COST- 2000

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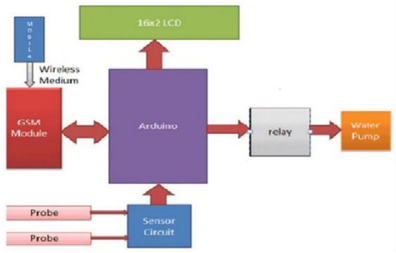
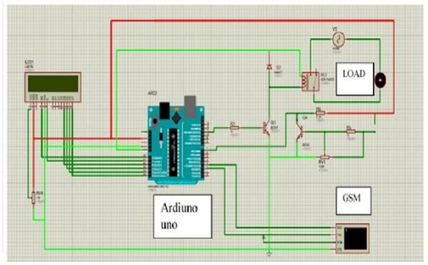
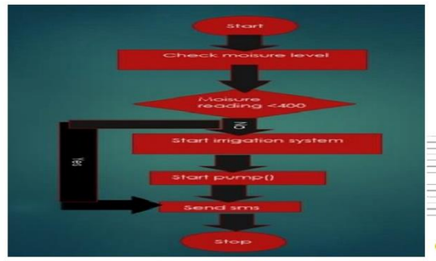
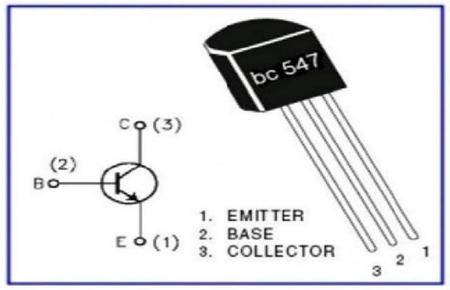
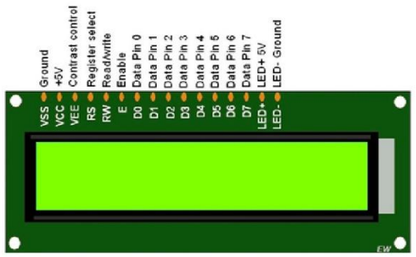
DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	8
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1

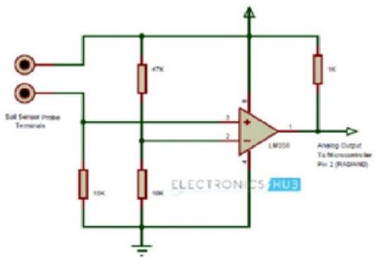


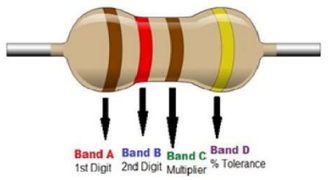












9. GSM BASED AUTOMATIC WATER PLANT SYSTEM

GUJRAT TECHNOLOGICAL UNIVERSITY

ALL DIMENSION ARE IN METER

GSM BASED AUTOMATIC WATER PLANT SYSTEM
COST- 1600

B.H.Gardi College of Engineering and Technology
Smt. T.V.Mehta Charitable Foundation

DESIGN BY	GEERACH RUBEENA LILA NIRAV FICHADIYA RADHIKA
SHEET NUMBER	9
GUIDE BY	Dr. VIMAL PATEL
VISHWAKARMA YOJANA	
SCALE	1:1