DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION
MODAJ Village

KHEDA District

PREPARED BY

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COLLEGE NAME

Adani Institute Of Infrastructure Engineering

NODAL OFFICERS NAME

Prof. Uzair Shaikh
Dr. Subhnarayan Sahoo

COLLEGE LOGO

YEAR: 2020-21

GUJARAT TECHNOLOGICAL UNIVERSITY
Chandkheda, Ahmedabad – 382424 Gujarat

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ON

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CERTIFICATE

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

Detail Project Report for,

VILLAGE MODAJ

DISTRICT KHEDA

Under

Vishwakarma Yojana: Phase-VIII

in partial fulfillment of the project offered by

GUJARAT TECHNOLOGICAL UNIVERSITY, CHANDKHEDA

during the academic year 2020-21.

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

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Date of Report Submission:	
Principal Name and Signature:	**Dr. V.M Patel**
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Internal(Evaluator) Guide Name andSignature:	**Dr. Subhnarayan Sahoo**
College Name:	**Adani Institute Of Infrastructure Engineering**
College Stamp:	

ABSTRACT

In our nation enormous number of individuals actually lives in towns, subsequently improvement of towns plays a significant function being developed of the nation. Vishwakarma Yojana pointis to create town with 'rustic soul' and 'metropolitan conveniences'. This Yojana is essentially to create rustic regions with affordable expense. Guide to our vision task will be to such an extent that we will discover issues looked by residents, discover arrangements and afterward short out arrangements which has higher effectiveness, longer toughness alongside conservative expense and most recent innovations. The town is having school which gives quality information to understudies, dairy is arranged in town which encourages town people to sell milk of their steers, town doesn't have any social framework like public latrines or network corridor which should be made and solid posts is set to help transmission line in town.

The plan will be proposed which is financially savvy and give a superior answer for theadvancement of the Modaj town. The plan is given by placing at the top of the priority list about what locals need and for the financial improvement of the town. The plan given is from most recent advances accessible in Indian market. The town is having its driving and slacking sidesyet by defeating the issues such that country soul is kept up, this town is having that chance of turning into an ideal town.

In part 1 on the basis of survey data, which we have collected from Modaj village and interaction with villagers, Sarpanch and Talati, we have finalized some designs for the further development of the village as, Village Pond, ATM, Village entrance gate, Rest Room and Public Toilets and Bus Stop. By introducing above mentioned amenities all the facilities can be made available to villagers which may reduce the migration. This will sustain the culture of cooperative living. Socioeconomic development will occur giving a sense of livelihood to the dwellers yet maintaining the essence of a village. And in part 2 we have decided some designs for future scope of the village development as, Rain water harvesting, Bank, Public garden, Solid waste management, Skill development center and Solar street lights and dustbins.

KEYWORDS: Rurbanization, Infrastructure facilities, Awarness of Health,Socioeconomic development,Sustainability, Rural Development, Public toilet development etc.

ACKNOWLEDGEMENT

We are highly indented to **Gujarat Technological University**, Ahmedabad for providingus 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.

We express our sincere thanks to **Commissionerate of Technical Education, Gujarat State** for appreciating and acknowledging our work.

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

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

An act of gratitude is expressed to our internal guide / Evaluator / Nodal Officer,
Mr. UZAIR SHAIKH from college **ADANI INSTITUTE OF INFRASTRUCTURE ENGINEERING** for their invaluable guidance, constant inspiration and active involvement in our project work.

We are also thankful to all the experts who provided us their valuable guidance duringthe 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.

We are also thankful to **Ms. Darshana Chauhan, Vishwakarmrma Yojana**, for all support during our work. We therefore, take this opportunity for this Project workexpressing our deep gratitude and sincere thanks for her cooperation to produce this project work in the present form.

Above all we would like to thank our Parents, family members and Friends for their encouragement and support rendered in completion of the present this work.

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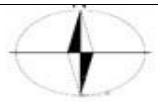
ABBREVIATIONS

SHORT NAME/ SYMBOL	FULL NAME
	North sign
°E	East
°N	North
Km	Kilometer
ATM	Automated Teller Machine
Sq. Mt	Square Meter

CHAPTER 1

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

1.1Background and study area location

Figure 1 Hathijan Entrance

Hathijan is a village panchayat located in the Gandhinagar district of Gujarat state, India. The latitude 23.0972094 and longitude 72.8744401 are the geocoordinate of the Hathijan. Gandhinagar is the state capital for Hathijan village. It is located around 33.7 kilometer away from Hathijan.. The other nearest state capital from Hathijan is Gandhinagar and its distance is 223.9 KM. The other surrouning state capitals Daman 297.7 KM., Raipur 348.2 KM., Mumbai 460.1 KM. The native language of Hathijan is Gujarati and communication.

1.1.1 Study area location:

Most of the village people speak Gujarati. Hathijan people use Gujarati language for Hathijan is located at latitude 23.0972094 and longitude 72.8744401. Hathijan village is located in the UTC 5.30 time zone and it follows Indian standard time(IST). Hathijan sun rise time varies 39 minutes from IST.

1.2 Concept: Ideal village

Figure 2 India

Figure 2 Gujarat

1.2.1 Objectives

- An ideal Indian village will be so constructed as to lend itself to perfect sanitation. It will have cottages with sufficient light and ventilation built of a material obtainable within a radius of five miles of it. The cottages will have courtyards enabling householders to plantvegetables for domestic use and to house their cattle.
- The village lanes and streets will be free of all avoidable dust. It will have wells accordingto its needs and accessible to all. It will have houses of worship for all, also a common meeting place, a village common for grazing its cattle, a co-operative dairy, primary and secondary schools in which industrial education will be the central fact, and it will have Panchayats for settling disputes. It will produce its own grains, vegetables and fruit, and itsown Khadi.

1.2.2 Idea of smart village

- Abstract 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.

1.2.3 Other Countries Perspective

- Other countries perspective also play a significant role in the development of the village. As we know that most of the villagers are having a mindset of studying and employing inother cities due to the lack of proper employment in the village.
- This is a limited idea of the right village. In the present case its houses they remain what they are with little progress. Under appropriate and intelligent circumstances
- leadership, local people can double the village income as it differs from individual income.
- In the valleys of India endless resources not for commercial purposes in all conditions but
- indeed for the purpose of place in almost all cases. The greatest tribulation is without hopethe reluctance of the local people to improve their share.

- The problem with starting a local worker which will solve its pollution. It is one of the most neglected issues facing workers and that undermines physical well-being and disease. Gandhiji says “When an employee he became a voluntary Banker, he would first collect the night soil and turn it over manure and sweeping on rural roads. You will tell people how and where to do it perform daily tasks and talk to them about the importance of good hygiene and serious injury caused by its neglect. The employee will continue to do the work even if the locals are listening to him or not.

1.2.4 Ancient History of Civil/ Electrical Conceptabout Indian Village

- After having a talk with the talati and the villagerswe got to know that a few years back, hathijan wasalso one of a kind of a regular village. The villagersused to face the common problems like drinking water facilities, electricity, roads and other such common problems.

Figure 3Hathijan Municipal Corporation

- But slowly and gradually things started to change and not only the development authority of the village was responsible for the change but the villagers also played a very important role in the development of the village.

Table 1 HATIJAN CENSUS DETAIL

Number of Households	1791
Population	8214
Male Population	4267 (51.95%)
Female Population	3947 (48.05%)
Children Population	1144
Sex-ratio	925
Literacy	68.48%
Male Literacy	75.44%
Female Literacy	60.96%
Scheduled Tribes (ST) %	9.47%
Scheduled Caste (SC) %	6.51%

1.3 Detail study of ideal village

1.3.1 Work profile

The sex-ratio of Hathijan village is around 925 compared to 919 which is average of Gujarat state. The literacy rate of Hathijan village is 68.48% out of which 75.44% males are literate and 60.96% females are literate. There are 6.51% Scheduled Caste (SC) and 9.47% Scheduled Tribe (ST) of total population in Hathijan village.

1.3.2 Agriculture

1. Cotton and Pearl millet/bajra, jowar are agriculture commodities grow in this village. 6-8 hours agricultural power supply in summer and 7 hours agricultural power supply in winter is available in this village. Total irrigated area in this village is 975 hectares from Boreholes/Tube wells 975 hectares is theSource of irrigation.

Figure 4 Hathijan Agriculture

1.3.3 Schools and Colleges

- As the population of the village is quite less, therefore only a single primary school is present in the village.
- There are no collages in the village, but there are some of the collages nearby this village:
- C.H.M Shah Collage.
- Sahajanand collage of nursing.

- "Moreover, students can learn benefits of co-operation and co-curriculum activities from rural government schools.This social inclusion will help to lessen the divide between educational qualities. It will develop friendship and bonding among the students".

1.3.4 Gram Panchayat

- Hathijan gram panchayat is situated almost at the centre of the village, but as we can see inthe image it is in a deteriorated condition.
- At the time of village visit the gram panchayat was closed, so we were unable to collect the techno-economic survey.

Figure 6 Gram Panchayat

1.3.5 Sanitation

- A public toilet is provided at the entrance of the village.
- The public toilet was in a good condition and clean both from outside and inside.
- Although inside the village there were only few public toilets which were in good condition.

Figure 7 Public Toilet

1.3.6 Roads and Network

- In the whole village there are more than 120 internal roads and were all in a good condition.
- Macadam roads were practiced in the village.
- It is situated neat the state highway 03 so no village approach roads are required.
- Although in some of the places in the village (low lying areas) repair of roads are required as the rainwater gets stored on the road.

Figure 8 Internal Streets

1.3.7 Public Places

- There were quite a few restaurants situated at the verge of the village. Some of the popular once are – Bagh one, Najranu, Shyam village.
- Also there arepopular temple of hindus – Gayatri mata mandir, Swaminarayanvidhyadham and many more.

Figure 9 Masjid

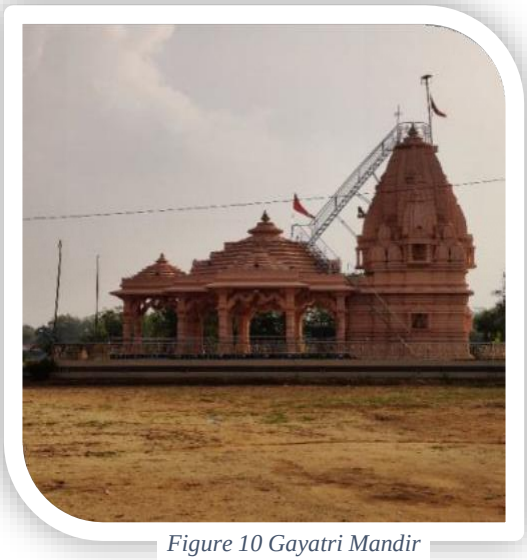


Figure 10 Gayatri Mandir

1.3.8 Government Health care centres

- Pasunj, Sub centre Pasunj, near RAMAPIR temple.
- Vahelal, Primary Health centre Vahelel, Opp. Gram panchayat.
- Vahelel, sub centre vahelal

1.4 SWOT Analysis of Ideal Village

1.4.2 Strength:

- The village is situated near the state highway which makes it easy for the villagers to travel and even supply goods to other villages.
- Some of the authentic restaurants are present near the village which attracts the people from different places to visit the village as well.
- The village is dedicated in resolving some of the major problems faced by the villagers such as - drainage network, sewage treatment, etc.
- Municipal water service is provided in the whole village.

1.4.3 Weakness:

- Agriculture is not practiced in the village, which indirectly affects the ecomony of the village.

- Electricity is also a major problem faced by the villagers, after asking a few villagers theysaid that regular electricity is not provided.
- The garbage of the village is just dumped in the nearby barren land, which affects the healthof the villagers.

1.4.4 Opportunities:

- The village can use solar panels in the main buildings such as gram panchayat and public places as well and gradually increase the usage.
- There is a lake nearby the village where the whole drainage is dumped, but instead they should provide a STP for the lake revival, and that lake could be used for holy practices such as Chatt puja.

1.4.5 Threats:

- There are too many apartments in the village near the entrance.
- Uncontrolled development and reluctant zoning ordinance enforcement is the biggest set of concerns.

Figure 11 Public toilet

1.5 Future Prospects of the Hathijan village

- Encourage movement to return to their home villagesand avoid further immigration from local villages.
- Tourism and culture can be a great source of employment for thr villagers.
- Villages experience cultural and economic growth and restoration.
- Villages become ‘smart,’ with better internet speed and connectivity.
- Villages become more attractive to foreign and local investors.

1.6 Benefits of visit of Hathijan village

- After having visited the village we got a whole overview of the path for the developmentof the village. We talked with the talati on how they began the development and sustainable growth.
- Here is the place where various individuals meet up and trade their societies and customs while finding out with regards to the nearby societies and customs

1.7 Civil Aspects of Hathijan Village

Figure 12 Doodh Mandli

- Hathijan village lacks with the number of primary schools.
- The Hathijan villages does not have a public Wifi service.
- Rain water Harvesting and Solar powered streetlights should be implemented in the village.
- The villagers do not use any Renewable sourcesof energy as Gozaria village does not have any Renewable resources.
- By giving expertise advancement focuses to the adolescent
- Panchayat ought to likewise zero in empowering the young to arrangement the independentwork units.
- Water gathering, Ground water re-energize and improvement of town tanks/lakes are likewise tasks to be sought after.

We have noticed the equilibrium of business, private and sporting area use in the Jarod town yet according to the criticism which were given by locals a few offices are inadequate in the town from common angles and these are, Gas Pipelines, Biogas Plant, Cold Storage Area, Rain Water Harvesting, Solar Street Lights, Public WiFi Connection, Fire Station , and etc.

1.8 Electrical Aspects of Hathijan Village

- Electrical power supply in Hathijan village is not continous.
- Irrigation system with solar panel should be implemented and solar street lights should be installed for regularly maintenance of electrical equipment is required as one pole gets damaged than the supply of whole village can be disturbed.
- It is seen that in some building of the village electrical wiring is not proper and modern methods are not adapted so, proper electrical wiring should be carried so the wires can beprotected from dust particles, moisture and any exterior problem also it will give good appearance of the building.
- Other than that power saving equipment should be used though their initial cost is high buttheir running cost is low such as led lights equipment with inverter also it should be well maintained. This reduces overall electricity consumption of house.

CHAPTER: 2
LITERATURE REVIEW OF MODAJ VILLAGE

2.1 INTRODUCTION :Rural and Urban village Concept

RURAL

- For the most part, a provincial zone is a topographical territory that is situated external theurban communities or towns. Regular country regions have low populace thickness and little settlements. Rustic regions are otherwise called 'open country' or 'town'.
- Farming is boss wellspring of occupation alongside stoneware, cabin ventures and so forthas per arranging commission the town with most extreme 15000 populace is considered ascountry.
- 'Panchayat' is power to take choices in such zones.

URBAN

According to the statistics of India – 2011, the meaning of metropolitan territory is as per the following:

1. The spot which has district, enterprise, cantonment board or advised town zone council, and so on.

2. The spot which fulfills the accompanying rules:

- Minimum populace of 5000
- At least 75% of male principle working populace occupied with nonagricultural interests
- Density of populace of in any event 400 people for every sq. km.

2.2 IMPORTANCE OF RURAL DEVELOPMENT

Provincial advancement is essential not just for an over-whelming lion's share of the populace living in towns however the advancement of country exercises is fundamental to quicken the movement of generally monetary advancement of the nation. Country advancement has expected more noteworthy significance in India today than in the previous period during the time spent the improvement of the nation. It is a methodology bundle trying to accomplish upgraded rustic creation and efficiency, more prominent financial value, and goal, balance in social and monetaryturn of events. The essential assignment is to moderate the yearning of around 70% of the

provisional populace, giving sufficient and nutritious food.

At that point follow a satisfactory arrangement of garments and footwear, a perfect house in a spotless climate, clinical consideration, recreational office, schooling, transport and correspondence.

2.3 DIFFERENT DEFINITION OF: RURAL AND URBAN VILLAGE

The word rurban (rural+urban) alludes to a geographic region/scene which have the financial qualities and ways of life of a metropolitan region while holding its basic provincial zone highlights. The metropolitan agglomeration/endless suburbia and development of rurban regions are a world-wide wonders.

Rurbanisation may be due to either urban expansion or rural migration. This change is made possible through urban – rural interactions, including accumulation of capital /remittances and exposure to western /modern ideas and lifestyles that eventually build new mindsets.

2.4 Rural / Urban village of India population Growth

Table 2 Growth rate of population in (%)

	2001	2011	DIFFERENCE
INDIA	**102.9**	**121.2**	**18.1**
RURAL	**74.3**	**83.3**	**9.0**
URBAN	**28.6**	**37.6**	**9.1**

	1991-2001	2001-2011	Difference
INDIA	**21.5**	**17.6**	**-3.9**
RURAL	**18.1**	**12.2**	**-5.9**
URBAN	**31.5**	**31.8**	**+0.3**

The slowing down of the overall growth rate of population is due to the sharp decline in the growth rate in rural areas, while the growth rate in urban areas remains almost the same.

Table 3 Difference in growth of urban and rural area

	1991-2001	2001-2011	Difference
EAG (Empowered action group)	**25.0**	**20.9**	**-4.1**
Rural	**23.5**	**18.7**	**-4.8**
Urban	**31.6**	**29.9**	**-1.7**
NON EAG	**18.9**	**15.0**	**-3.7**
Rural	**13.2**	**5.7**	**-7.5**
Urban	**31.5**	**32.7**	**+1.2**

Though the growth rate of population in rural areas of EAG States is nearly 3 times that in rural areas in non EAG States, it is for the first time that significant fall of growth rate is seen in the rural areas of EAG States

Source: https://censusindia.gov.in/2011-prov-results/paper2/data_files/india/Rural_urban_2011.pdf

TABLE 4 LITERACY RATE

	2001	**2011**	**Difference**
Overall			
India	64.8	74.0	+9.2
Rural	58.7	68.9	+10.2
Urban	79.9	85.0	+5.1

- The improvement in literacy rate in rural area is two times that in urban areas
- The rural urban literacy gap which was 21.2 percentage points in 2001, has come down to 16.1 percentage points in 2011

POPULATION HIGHLIGHTS

- Out of the total of 1210.2 million population in India, the size of Rural population is 833.1 million(or 68.84% of the Total Population)
- Urban population 377.1 million (or 31.16%)
- During 2001 – 2011 the population of the country increased by 181.4 million
- Increase in Rural areas: 90.4 million
- Increase in Urban areas: 91.0 million

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

Gujarat Urban Population as per Census 2011:

Out of absolute populace 42.60% individuals live in metropolitan Gujarat. All out figures of populace are 25,745,083 of which 13,692,101 are guys and 12,052,982 are females. Normal proficiency rate in metropolitan Gujarat is 86.31% in which guys were 90.98% and females were 70.26%.

Gujarat Rural Population as per Census 2011:

In rural Gujarat males were 17,799,159 and females were 16,895,450. The population growth was57.40%. Average literacy rate in rural Gujarat is 71.71% of which 81.61% are males and 57.78% are females.

Table 5 Gujarat population census

Population	2001	2011
Male	26,385,577	31,491,260
Female	24,285,440	28,498,432
Total	50,671,017	60,439,692

Source : http://censusgujarat.gov.in/

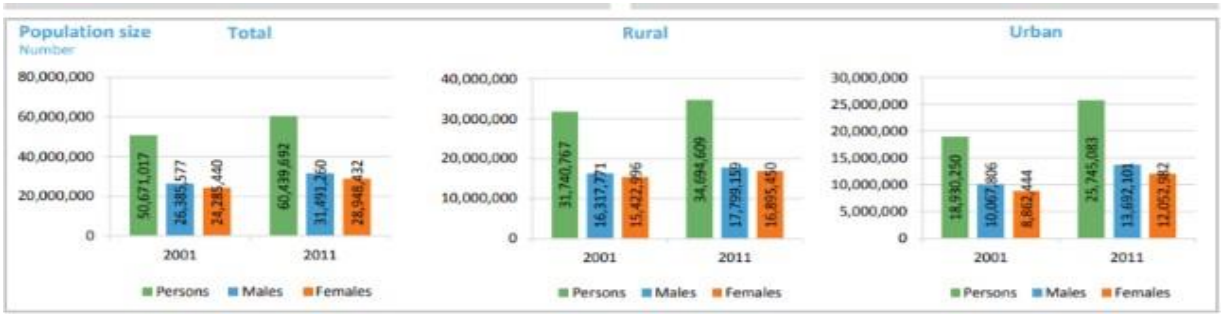


Figure 13 Rural Population Census

2.6 Rural Development Issues - Concerns – Measures

- The basic aim of the paper is to analyze the conditions of rural economy and studythe issues and challenges of the villages.
- Mass population of India in villages.
- Uneducated, Backward, Lack of infrastructure, Lack of connectivity, Lack of awareness, Poverty and Lack of development and business.

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

2.7.1 Physical Infrastructure Design:

Actual Infrastructure offices describe to in general water interest, waste offices, disinfection offices, transportation organization, accessibility of power (for homegrown, business, farming, andso on), strong waste administration. Under actual foundation offices the lacking office discoveredwas network corridor.

2.7.2 Social Infrastructure Design:

Social foundation is a subset of framework obliging administrations of wellbeing and schooling. The offices like 'keen sterilization' goes under such plan, here the word savvy' manages nearby condition and adaptable to evolving climate. Advantages of such smart disinfections resemble eliminates spread of illnesses, get away from contamination of water, the treated the soil human excreta can be utilized in manures and this can fill cultivating soil with supplements and this will likewise lessen the need of purchasing mechanical composts.

2.7.3 Socio-Culture Design

This incorporates advancement of society, culture and framework. The office creates society by making basic lobby, public library, public nursery, film corridor, get together surveying birth and passing enrollment office and so on.

2.8 Schemes by Gujarat Government

Following are the projects/schemes by Govt. Sector:

1. Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
2. National Rural Livelihood
3. Pradhan Mantri Gram Sadak Yojana

4. Training to Rural Youth for Self-Employment (TRYSEM)
5. Antyodaya Anna Yojana (AAY)
6. Aam Aadmi Bima Yojana

Overview of above points are explained below-

1. Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA):

MGNREGA Launched on second February 2006 as a groundbreaking activity towards supportive of helpless development. Unexpectedly, rustic networks have been given an advancement program as well as a system of rights. The National Rural Employment Guarantee Act 2005 (NREGA) ensures 100 days of work in a monetary year to any country family whose grown-up individuals are happy to accomplish incompetent manual work. This work ensure additionally serves different targets: creating beneficial resources and abilities accordingly boosting the rustic economy, securing the climate, enabling country ladies, diminishing provincial metropolitan movement and encouraging social value, among others. The Act offers an occasion to reinforce our vote based cycles by entrusting standard function to Panchayats at all levels in its execution and guarantees straightforwardness through contribution of network at arranging and observing stages.

2. Pradhan Mantri Gram Sadak Yojana:

At first this was completely financed by local government however after some time changes were made and it is presently supported in a proportion of 60:40 between local government and state government. The point is to give street office to provincial zones. Dined by Ministry of Rural Development.

3. National Rural Livelihood:

This mission is intended to enable the ladies self- improvement gathering model across the country. Under this plan govt. gives credit up to 3 lakh rupee at pace of 7% which could be brought down to 4% on opportune reimbursement.

4. Training to Rural Youth for Self-Employment (TRYSEM):

The aim is to provide technical and business expertise to rural BPL people who are in age group of 18-35. Later on this scheme was merged with Swarn Jayanti Swarojgar Yojana.

5. Aam Aadmi Bima Yojana:

Under this Yojana one individual from the family is covered. The premium of Rs.200 per individual per annum is shared by state and local government.

2.8 ANCIENT/EXISTING ELECTRICAL CONCEPT STUDY AS A LITERATURE REVIEW FOR VILLAGE DEVELOPMENT

2.8.1 Concept: Energy Audit

What is an Energy Audit?

- Effective energy the executives program intended to improve the energy proficiency and decrease the energy working expenses of an office.
- Detailed assessment of How an office utilizes energy? What the office paysfor that energy? It is a suggested program for changes in working practices orenergy burning-through hardware that will cost adequately get a good deal onenergy bills.
- Collection of information about an office's activity and about its past record of service bills.
- Analysed Data to discover the office utilizes, squanders energy, diminish energy costs.

2.8.2 Types: Energy Audit And its significance.

1. Walk-Through Audit (WTA): Includes stroll through investigation of an office to recognize support, operational or insufficient hardware issues and furthermore to distinguish regions that need further assessment. After effectsof a Walk-Through Audit incorporate a distinguishing proof of energy savingfreedoms a subjective examination of the execution of energy saving measures an assessment of its potential energy saving.
2. Energy Diagnosis: Includes performing monetary computations gadgets to distinguish real energy utilization and Losses utilizing a few metering gadgets.The consequences of an Energy Diagnosis incorporate an energy balance (energy utilizes breakdown) rundown of energy proficiency measures got from execution or building office. Monetary examination for every one of therecognized measures.
3. Investment Grade Audit (IGA): Includes nitty gritty record of energy use, quantitative investigation of the execution with nitty gritty speculations and operational and upkeep costs an examination of the speculation model. The consequences of an Investment Grade Audit incorporate the genuine energy

   Interest and an energy balance. Review recommends various energy saving measures, including the computation of energy reserve funds and the speculation expected to complete them. This review proposes packagedmeasures, with a financing plan just as execution and investment funds confirmation plans.

4. A home energy review helps individual mortgage holders discover their private utilization and energy stream. A review is helpful to decide spaces of your home where there is energy misfortune and by distinguishing where influence utilization might be checked to procure reserve funds.

2.8.3 Performing Energy Audit in various Public structure of towns

Sr. No	Reason	Yes	No
1	Reduce Energy Cost	Yes	
2	Reduce Production Cost		No
3	Reduce Energy Consumption	Yes	
4	Reduce Green House Gas Emission	Yes	
5	Reduce Other Emission (SOX, NOX)		No
6	Improve Overall Environmental Performance		No
7	Improve Product Quality		No
8	Improve Reputation/ Recognition	Yes	
9	Improve Compliance with Corporate Environmental Target		No
10	Improve Staff Safety& Health		No
11	Improve Compliance with Regulations		No

2.8.4 Different Techniques to save energy in provincial regions

Fixing and protecting windows, entryways and breaks is a major advance.

Checking air channels, unblocking A/C vents supplanting brilliant lights with CFLsmoving up to Energy Star apparatuses, and turning everything off when it's not beingused. Utilize environmentally friendly power sources likes sunlight based energy, wind energy, hydro energy, biomass energy, and so on

2.8.4.1 Cooking

When cooking Using electric gear use pots and container that are appropriately estimated to "fit" the burners. Utilizing a little container on a huge burner squandersenergy and can be a wellbeing

risk. Continuously cook with covers on yourcontainer, as this keeps the warmth inside and speeds up cooking time.

A microwave is an energy proficient option in contrast to an ordinary broiler. It prepares food all the more rapidly and utilizations 70-80% less power than a traditional stove.

Utilize a toaster, electric skillet, popcorn popper or moderate cooker for specific positions, instead of the electric reach top, since these little machines utilize less energy.

Utilize cold water while working your food/garbage removal. Cold water saves energy and cements oil so it will travel through the drainpipes simpler.

2.8.4.2 Home Cooling

Entire house fans can be introduced in the storage room or roof to get outside air through the house – typically around evening time when it's cooler. it can limit cooling use.

The area of a climate control system has a great deal to do with how productive it will be. In the event that you have a decision, find your unit on the north, east or thebest-concealed side of your home. In the event that the unit is presented to coordinatedaylight, it needs to work a lot harder and utilize more energy to cool your home.

Fend growth off for the climate control system since it blocks vents and decreases the unit's capacity to deplete air. For roof fans, run the fans and the climate control system simultaneously, yet set the forced air system a couple of degrees higher, to 80 or 81 degrees.

2.8.4.3 Home Heating

Keep curtains and shades on south-bound windows open during the warming seasonto permit daylight to enter your home. Close them around evening time to diminishthe chill you may feel from cold windows.

Keep chimney dampers shut when they aren't required will ascend the smokestack and break when the chimney isn't being utilized. Chimneys with glass entryways aregenerally effective. Set your indoor regulator to the least open to setting. Keep the temperature genuinely consistent, as incessant changes will utilize more energy.

2.8.4.4 Lighting

Lights add a ton of warmth to the room 99% of a light's energy use is changed overto warm, 1% to light. Utilize just as much light as you need. Exploit mirrored light by setting convenient installations

close to light shaded dividers or different surfaces.Supplant radiant lights in high use regions with smaller glaring lights. Minimal bright light bulbs are more costly, however utilize something like 70% less energy and last up to multiple times longer.

Consider utilizing lighting coordinated at a particular region rather than overhead orgeneral lighting, which may light unused spaces of the room. Restricting lighting just to regions where it is required, investment funds in the expense of bulbs and energy can be made.

2.8.4.5 Farming

Decreasing homestead energy costs is figuring out where you use energy in your activity by energy Audit Which analyze existing energy utilization and decide openings for reserve funds through energy proficiency enhancements and hardwareupdates.

Homestead energy number crunchers are another arrangement of apparatuses to appraise energy utilization and ascertain the expense of different energycontributions on your ranch.

2.8.5 Various accepted procedures as for energy the board in provincial regions

Different accepted procedures as for energy the board in provincial regions.

- Switch off the superfluous streetlamp.
- Switch off the superfluous lights and other electric hardware in home.
- Use star evaluated (energy saver) contraptions.
- Use guarantee link so transmission misfortune will be diminishes.
- Use LED lights for lighting reason since it is more energy proficient.
- Rating of engines and generator isn't more than prerequisite so load utilization islesson so it will assist with saving energy.
- Further, the quantum of electricity that can be traded under cross border trade for electricity in Indian Power Exchanges shall be prescribed from time to time by the Designated Authority.
- Cross border trade of electricity can be extended to other categories of contracts based on review by Ministry of Power in consultation with CERC.
- Transmission systems developed for cross border trade would normally be part of the integrated transmission system on the Indian side

CHAPTER: 3
SMART VILLAGES CONCEPT IDEA AND ITS VISITS

3.1 Introduction:

3.1.1 Concept about Smart Village:

Brilliant Village is an idea embraced by public, state and nearby legislatures of India, as an activity zeroed in on comprehensive country advancement, gotten from Mahatma Gandhi's vision of Adarsh Gram (Ideal Village) and Swaraj (Self Reliance).

3.1.2 Definition of a Smart Village

Smart Villages are communities in rural areas that use innovative solutions to improve theirresilience, building on local strengths and opportunities.

3.2 Vision-Goals, Standards and Performance Measurement Indicators

3.2.1 Vision:

The Vision Statement is derived from Mahatma Gandhi's concept of rural development whichrevolves around creating model villages for transforming 'swaraj' into 'su-raj'. The Vision Statement is emanated from his own words:

"Reconstruct the villages of India so that it may be as easy for any-one to live in them as it issupposed to be in the cities".

3.2.2 Three Specific Objectives:

1. To build up a meaning of Smart Villages.
2. To plan the current difficulties and potential to support advancement in EU country territories.
3. To recognize functional answers for defeat difficulties and to improve the circumstancein towns.

3.3 Technological Options

1. Enhanced Use of Smart Phones and Optical Fibre technology for Internet Techniques.
2. Smart Agriculture
3. Online Library and E-Education
4. Smart and Efficient Public Transport System

5. Smart Sewage Management System and Sanitation
6. Renewable Energy Sources and Solar Energy
7. Latest and Affordable Medical Facilities

This all are our views about adopting technologies for a smart village.

3.4 Road Map and Safeguards

Study the Community: Before choosing to construct a shrewd city, first we need to know why.

- This should be possible by characterizing the advantages of quite an activity. Study the Community to know the Citizens, the business' necessities – know the residents and the Community's interesting characteristics, for example, the age of the residents, their schooling, leisure activities and attractions of the city.
- Develop a Smart City Policy: Develop an arrangement to drive the activities, where jobs, Duties, goal, and objectives, can be characterized.
- Engage the Citizens: This should be possible by drawing in the residents using eGovernment activities, open information, sport occasions, and so on.

3.5 Smart Infrastructure

- Smart Buildings
- Smart Mobility
- Smart Energy
- Smart Waste Management
- Smart Health Care
- Adequate Water Supply
- Assured Electricity Supply
- Sustainable Environment
- Good Governance
- Security of Citizens

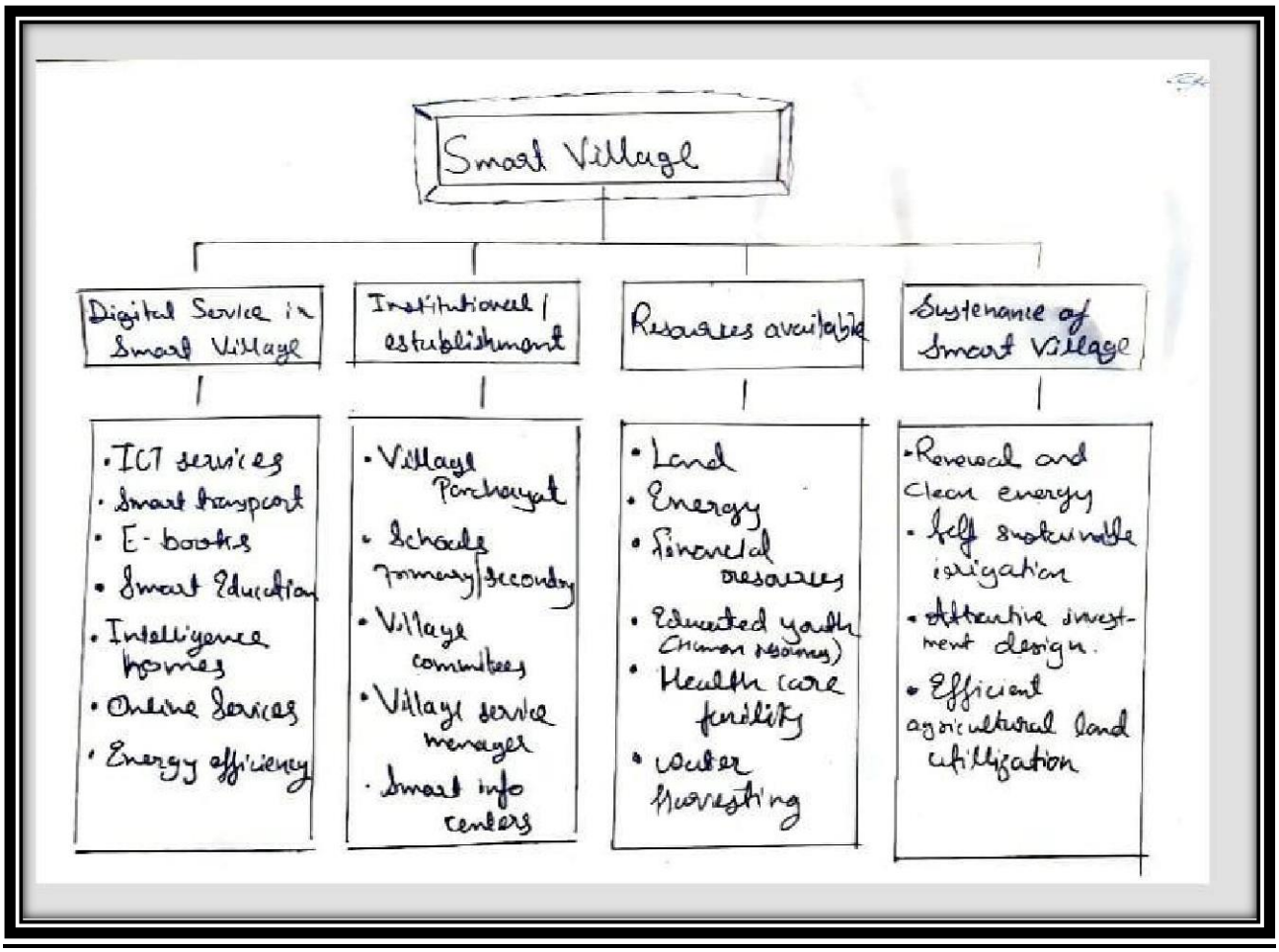


Figure 15 SMART VILLAGE SURVEY

It is viewed as that savvy innovation for these shrewd towns is as yet in the precommercial or sometimes the theoretical stage. Also, since the innovation is in the pre-adult or reasonable stage,it creates vulnerabilities seeing rate of profitability all things considered. This additionally brings about misgiving of a long compensation period, and speculators are reluctant to contribute, which adds to monetary vulnerabilities for brilliant innovation activities.

3.6 Strategic Options for Fast Development

3.6.1 Adequate technology solutions through an agile methodology:

- Builds on partner commitment, not predefined measures
- Creates keen arrangements rather than definite documentation
- Development is driven by ceaselessly evaluated partner needs instead of a formerlyarranged guide

- Prepares the network for the progressions

3.6.2 The community has come together to reverse the negative trend:

- Development of network administrations
- Tourist attractions, administrations and convenience
- Innovative older consideration
- "Future Weaving Workshop" - Settlement uphold
- Regional collaboration and improvement of human limit
- Creation of a shrewd town/region to improve the personal satisfaction
- To help to configuration savvy extends and open chances
- To share warning administrations to actualize savvy advancement systems
- To encourage the trading of encounters and best practices, and networks participation
- To decrease regulatory unpredictability to the base

3.6.3 An Integrated task:

- The shrewd town depends on the nearby requirements and objectives of the populace
- Access to data and information is expected to configuration brilliant arrangements
- Smart advancements influence nearby HR and furthermore have foundation parts
- Due to the quick advancement of innovation, it is important to actualize enhancements quick

3.6.4 Our Suggestion:

- Simple, simple to-get to help, custom fitted to the size of the settlement and its degree of improvement.
- An all in one resource answer for incorporated advancement dependent on EU level guidelines.
- Creating a "New Space" warning organization to give data and information expected to arranging.
- Creating a perplexing improvement program dependent on lithe venture the executive's strategy.

3.7 Initiatives in village development by local self-government

Function of Local self- Government:-

All metropolitan demonstrations in India accommodate capacities, forces and duties to be completed by the civil government. These are separated into two classifications: compulsory and optional.

Compulsory –

- Supply of wholesome and healthy water
- Construction and support of public roads
- Lighting and watering of public roads
- Cleaning of public roads, spots and sewers
- Regulation of hostile, risky or unpalatable exchanges and purposes for living or practices
- Maintenance or backing of public clinics
- Establishment and upkeep of elementary schools
- Registration of births and passing.
- Removing hindrances and projections in open roads, spans and different spots
- Naming roads and numbering houses
- Maintenance of law and public request

Optional:

- Laying out of zones
- Securing or evacuation of risky structures or places
- Construction and support of public parks, gardens, libraries, historical centers, rest houses, outcast homes, shelters and salvage homes for ladies
- Public structures
- Planting of trees and support of streets
- Housing for low pay gatherings
- Conducting reviews
- Organizing public gatherings, public shows, public diversion
- Provision of transport offices with the district
- Promotion of government assistance of civil workers

3.8 Smart Initiatives by District Municipal Corporation

3.8.1 Maintenance and backing to public emergency clinics of town

- Establishment and support of elementary school
- Planting and ordinary watering of trees
- Construction and upkeep of public library, garden, rest house, network lobby, sports focus,and so on
- Organizing public presentation
- Organizing public diversion
- Removing obstacles and projections in open roads and different spots

3.9 How to implement other countries smart villages projects in Indian village context

The dominant part individuals in Germany live in provincial zones (63.3%), in this way applying keen technique for rustic improvement is in accordance with nation's overall advancement objectives. The idea is about Digital Village. The principal goal of venture is to energize advancement, coordinated effort of nearby enterprises, economical and moderate arrangements. The town is additionally associated with rapid broadband organization.

We can actualize this in India in such ways like we can put together different projects for attentionto individuals with most recent advancements that can gives quick and reasonable answers for their issues with respect to agribusiness or dairy, and so forth We can likewise give them broadband organization association with the goal that their information can be saved in cloud and even digitalization is executed in town.

3.10 Civil Concept

This are our concept from civil point of view:

- Smart Infrastructure
- Smart Agriculture
- Smart Connectivity
- Smart Security
- Smart Education
- Social Infrastructure

3.11 Electrical Concept

This are our concepts from electrical point of view:

- Free from power outage.
- Secondary/Backup wellspring of power for significant structures.
- The transmitters on the electric posts should be appropriately protected and associated. Allthe houses should have solar panels so reliability of electricity is improved and overall load on power plants is reduce.
- They should be accessible to the equipment with good power rating which are useful in our day to day life.
- Underground transmission system should be adapted for better appearance and to avoid short circuit of line by tree which is usually seen in overhead transmission line.

CHAPTER: 4
ABOUT MODAJ VILLAGE

4.1 Introduction

4.1.1 Introduction about village detail

- Modaj is a Village in Mehmedabad Taluka in Kheda District of Gujarat State, India. It is located 19 KM towards North from District headquarters Kheda. 2 Km from 49 Km fromState capital Gandhinagar.
- Village is located on the bank of River Vatrak.

Figure 16 Modaj signboard

4.1.2 Need of study

•To develop rural areas in terms of whole in terms of culture, society, economy, technology and health.

•To develop living standard of rural mass.

•To develop rural youth, students and women.

•To develop and empower human resource of rural area in terms of their psychology, skill, knowledge, attitude and their other abilities.

•To solve the problems face by the rural mass for their development.

•To develop infrastructure facilities of rural area.

•To provide basic facilities in terms of drinking water, education, transport, electricity, sanitation, and communication.

•To develop rural institution like panchayat, cooperative, post, banking and credit.

•To restore uncultivated land, provide irrigation facilities and motivating farmers to adopt improved seed, fertilizer, package of practices of crop cultivation and soil conservation methods.

•To develop entertainment and recreational facility for rural mass.

•To provide rural marketing facilities.

Figure 17 Modaj village

Figure 18 Village visit

•To minimize gap between urban and rural in terms of facilities availed.

•For the sustainable development of rural area.

Figure 19 Agriculture

4.1.3 Study Area

Our main study area is the developing the new system of sewage treatment solution and the social infrastructure, like – public toilets, library, cyber cafe and renovation of the gram panchayat and other public buildings. As we know that social infrastructure is very important for improving the standard of living of the villagers and their economic conditions by providing the necessary amenities without disturbing the rural soul of the village.

4.1.4 Objectives of study

To reduce the migration of people from villages to cities.

To provide all the basic amenities in the village for their sustainable development.

To educate villagers regarding the future prospects of the village.

4.2 Modaj Village Study Area Profile

4.2.1 Study Area location

- **Locality Name :** Modaj (**Taluka Name** : Mehmedabad)

  District:Kheda**State** :

  Gujarat
- The total geographical area of the village is 1274.75 hectares.
- Modaj is a village panchayat located in the Kheda district of Gujarat state, India. The latitude 22.8734015 and longitude 72.7865518 are the geocoordinate of the Modaj. Gandhinagar is the state capital for Modaj village. It is located around 50.1 kilometeraway from Modaj.. The other nearest state capital from Modaj is Gandhinagar and itsdistance is 212.0 KM. The other surrounding state capitals are Daman 272.8 KM., Raipur 374.6 KM., Mumbai 435.2 KM.
- Modaj‘s nearest town/city/important place is Mahemdavad located at the distance of 5.1 kilometer. Surrounding town/city/TP/CT from Modaj are as follows.

Table *6* Nearby villages Distance

Mahemdavad		**5.1 KM.**
	Mahudha	16.9 KM.
Kheda		17.4 KM.
	Nadiad	20.3 KM.
Lambha		22.5 KM.

4.2.2 Base Location Map/ Gram Tal Map

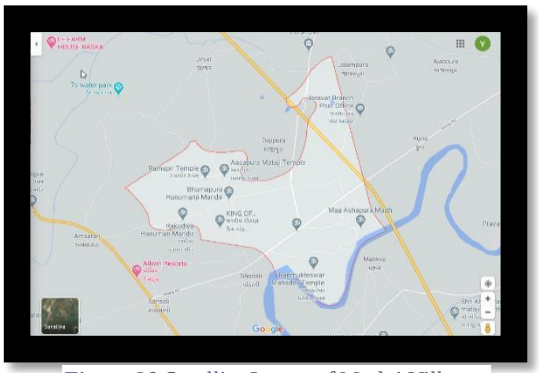


Figure 20 Satellite Image of Modaj Village

4.2.3 Physical and Demographical Growth

Table 7 Modaj census details

Census Parameter	Census Data (2011)
Total Population	15745
Total No of Houses	3043
Female Population %	50.9 % (8019)
Total Literacy rate %	71.5 % (11263)
Female Literacy rate	31.8 % (5002)
Scheduled Tribes Population %	0.0 % (7)
Scheduled Caste Population %	1.6 % (245)
Working Population %	51.2 %
Child(0 -6) Population by 2011	1936
Girl Child(0 -6) Population % by 2011	47.2 % (914)

Source - https://www.census2011.co.in/data/village/517453-modaj-gujarat.html

4.2.4 Economic Generation Profile

Figure 21 Jvar crops

- The economy of the modaj village is mainly dependenton two modes i.e. Agriculture and Personal businesses.
- Also, there is a gaushala in the village where they daily provide the milk to the Amul factories.
- **Agriculture** is the main occupation of the villagers.Some of the commonly grown crops are rice, wheat,jwar.
- Although, there were quite a few grocery stores and medical stores in the village.

Figure 22 Dudh Mandli Modaj

4.2.5 ActualProblems Faced by Villagers

- After asking a fewlocals we got to know thatduring rainy season the internal roads of the villages are Full of wet sand which makes it quite difficult for thevillagers to pass by.

- Also after having a discussion with the sarpanch and talati of the village they demanded for a children play area in the village.
- We also went to the girl school of the village and met the principal of the village and we got to know that there is no proper library in the village or the schools.
- In the public buildings like gram panchayat, post office the roof was in a bad condition which could worst the case in the rains.
- Electricity and mobile networks were not a major issue but the villagers said atleast once in a year during rainy season thereis a blackout.

Figure 23 Wheat crops

- There are 2 overhead tanks in the village and both of them are deteriorated but no repairand maintenance is done in the past few years.

- Another major problem is the burning of the garbage in the village. There is no specific garbage disposal plan in the village.

Figure 24 Grocery Store

4.3 Data Collection

4.3.1 Methods of Data Collection

Due to the Covid situation the data collection was a hectic task forus.

Telephonic conversation:

- Due to Covid 19 and initial lockdown it was difficult to visit the village hence limited datawas collected by the telephonic conversation with the Talati. Then, we also had a conversation with the clerk (Rambhai) about the technical and economical details.

Questions with the villagers and locals:

- We also met the villagers and discussed with them aboutthe problems they are facing in their day to day life. Andwhat are they expecting in the village to change in the future.
- We also asked the villagers for the reason behind their migration from the village and what changes in the village can lower the rate of migration.

Figure 23 Toilets

Past Records and Documents:

- On our 2nd visit to the village we got the necessary technical and past census information from the talatiand the clerk.

Figure 24 Internal roads

- Some of the images of the same are –

Figure 28 Burning of Garbage

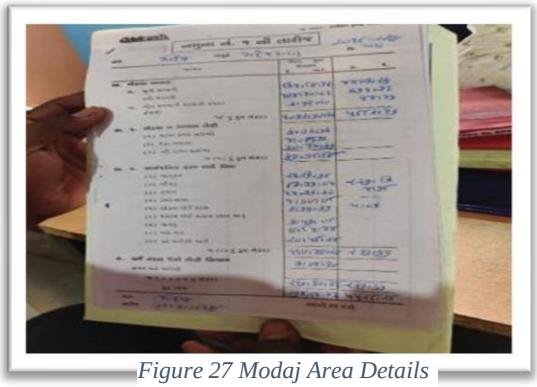


Figure 27 Modaj Area Details

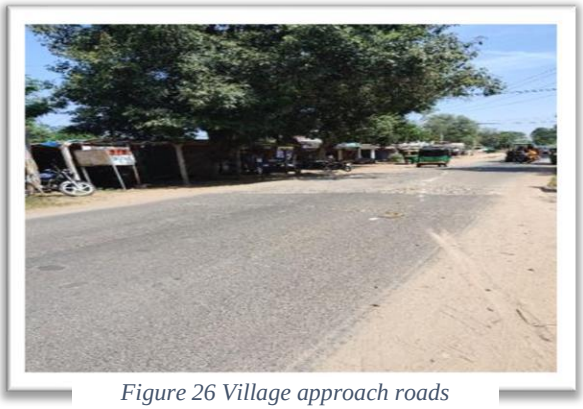


Figure 26 Village approach roads

Figure 25 Modaj primary school

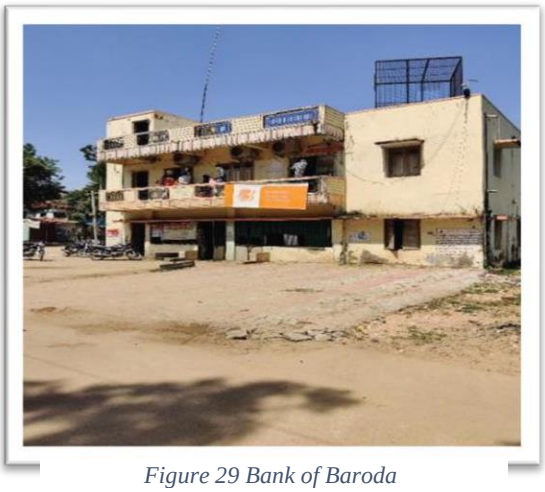


Figure 29 Bank of Baroda

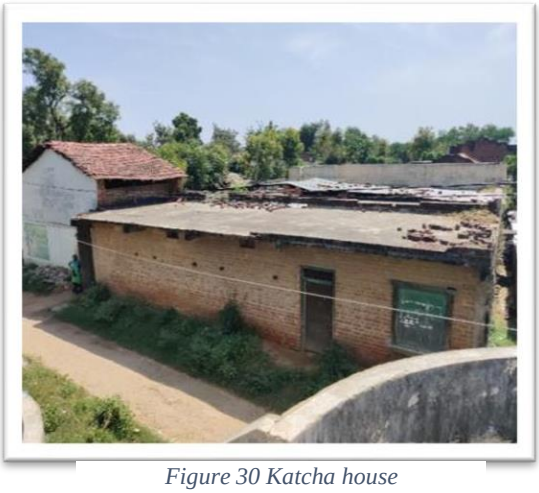


Figure 30 Katcha house

4.3.2 Primary details of the survey

- On our 1st visit to the village, because of the Covid situation we simplycollected the data by observing the village and major public buildings.
- We captured the images of the current situation of the village facilities andamenities.
- We also got some of the information from the telephonic conversations.
- Then on our further visits we met the sarpanch and talati of the village and discussed about our project and got the necessary information from the questionnaire.

4.3.3 Average size of the house

- The total geographical area of the village is 1274.75 hectares. Modaj has apopulation of about 15745 (census 2011). There are about 3043 houses inthe village. We didn't got a satisfactory answer but around 2-3 bhk houseswith a separate toilet outside the house system is practiced in the village.

4.3.4 Number of Human being in one house

- In Modaj village population of children with age 0-6 is 1936 which makes up 12.30 % of total population of village. Average Sex Ratio of Modaj village is 1038 which is higher than Gujarat state average of 919. Child Sex Ratio for the Modaj as per census is 894, higher than Gujarat average of 890

Figure 31 Houses in Modaj

Material available locally in the village and material out sourced by thevillagers

In this village, Agriculture is the main occupation of the majority of the villagers. Cropslike jowar, bajra, wheat are the commonly growncrops in the village.

- Also, there are few grocery stores, furniture

stores and other stores in the village but thematerials are imported from the cities or the nearby villages.

Cow milk is also out sourced by the villagersto the Amul factories and there is a separate“Doodh Mandli” who handles the supply of milk.

4.3.5 Geographical Detail

Modaj is a large village located in Mehmedabad Taluka of Kheda district, Gujarat with total 3043 families residing.

- It is situated 9km away from sub-district headquarter Mehmedabad and 25km away from district headquarter Nadiad. As per 2009 status.

4.3.6 Demographical detail

- Modaj is a large village located in Mehmedabad Taluka of Kheda district, Gujarat with total 3043 families residing. The Modaj village has population of 15745 of which 7726 aremaleswhile 8019 are females as per Population Census 2011.
- In Modaj village population of children with age 0-6 is 1936 which makes up 12.30 % of total population of village. Average Sex Ratio of Modaj village is 1038 which is higher than Gujarat state average of 919. Child Sex Ratio for the Modaj as per census is 894, higher than Gujarat average of 890.
- Modaj village has higher literacy rate compared to Gujarat. In 2011, literacy rate of Modajvillage was 81.56 % compared to 78.03 % of Gujarat. In Modaj Male literacy stands at 93.39 % while female literacy rate was 70.40 %.
- As per constitution of India and Panchyati Raaj Act, Modaj village is administrated by Sarpanch (Head of Village) who is elected representative of village.

Table 8 DEMOGRAPHICAL DATA

Population	15745
Population density	498 per km^2
Growth of Population	19.2%
Sex Ratio	919
Working Population	51.2 %
Literacy Rate	71.5 %

4.3.7 Occupational Detail

- **Agriculture** is the main occupation of the villagers. Some of the commonly grown crops are rice, wheat,jwar.
- Also, there is a gaushala in the village where they daily provide the milk to the Amul factories.
- Although, there were quite a few grocery stores and medical stores in the village.

Figure 32 Agriculture

4.3.8 Agriculture Details

- The three mainly grown crops are jawar, wheat andrice.
- State finds a place in the top 3 of the productivity of bajra, mustard, tobacco and many more.

Figure 33 Seeds sowing

4.3.9 Tourism development available in village

- There is not any tourism spot in the village but nearbythe village there is a hanuman mandir which is very famous i.e BHUMAPURA HANUMAN MANDIR which is a holy place for the Hindus.
- Also, about 25-30 kms from the village there is place named "DAKOR" which is yet another tourist place, and a lot of people from all over the country visit the place for its historic significance.

Figure 34 Agriculture

4.4 Infrastructure Details

4.4.1 Drinking Water

- Safe and readily available water is important for public health, whether it is used for drinking, domestic use, food production or recreational purposes. Improved water supply and sanitation, and better management of waterresources, can boost countries' economic growth andcan contribute greatly to poverty reduction.
- There is a public drinking water facility provided in the village which is free of cost but at the time we visited the village it was closed and in a very bad condition

Figure 35 Drinking water facility

4.4.2 Sanitation Facilities

- The Central Rural Sanitation Programme, which was started in 1986, was one of India'sfirst efforts to provide safe sanitation in rural areas.

- Providing sanitation to people requires attention to the entire system, not just focusing on technical aspects such as the toilet, or the wastewater treatmentplant.
- Sanitation plays a very important role in the overall health of the village. But we were quite disappointed with the existing facilities.

4.4.3 Transportation and Road Network

- Village approach roads and the internal roads of the villages were used by the buses and other private vehicles for their transportation within and outside thevillage.
- On our last visit, there was a repair work going on the approach roads.

Figure 37 Roads Repair work

- Though the approach roads are in a quite good condition but the internal roads were deteriorated and pot holes in some places.

4.4.4 Housing Condition

The total geographical area of the village is 1274.75 hectares. Modaj has a population of about 15745(census 2011). There are about 3043 houses in the village. We didn't get a satisfactory answer but around 2-3 bhk houses with a separatetoilet outside the house system is practiced in the village.

Figure 38 Housing details

4.4.5 Social Infrastructure

- Some of the public buildings like – Petrol Pumps, PostOffice, Hospitals, etc. are the major social infrastructures of the villages.
- Social Infrastructure is a subset of the infrastructure sector and typically includes assets that accommodate social services.

Figure 39 Bus station

4.4.6 Electrical Concept

4.4.6.1 Renewable Energy Source Particularly forvillages

Wind Power

Figure 40 Medical Dispensary shop

India is the breeze of superpower with an introduced wind power limit of 1,167 MW and has created around 5 billion units of power and took care of into the public lattice up until now. In advancement are wind asset appraisal program, wind checking, wind planning covering 800 stations in 24 states with 193 breeze observing stations in activity. Taking all things together 13 conditions of India have a net capability of around 45,000 MW.

Figure 41 Petrol Pumps

It's main Advantages are:

- Wind power is cost-effective.
- Wind creates jobs.
- It's a clean fuel source. ...
- Wind is a domestic source of energy. ...
- It's sustainable. ...
- Wind turbines can be built on existing farms or ranches
- Costs on fills are completely wiped out as it utilizes sun oriented energy.
- Saves time as cook need not to be available during cooking.

- Durable and easy to work with.
- Environmental Friendly

Agriculture Purpose

Water system offices in town assume a significant function in economy and advancement of town. The apportioned town is having acceptable (ordinary) office for water system however we can improve it to next level.

The thought is transformer is associated with sun powered plant going from 25KWp to 500KWp in community, public or private possession. The PV plant will take care of capacity to siphons utilized for water system. In the event that overflow power is accessible that force can be offered to framework and landowners/ranchers can get pay.

Electricity Facilities

The allocated Modaj village has total 14 step down transformers through which load is supplied all over the village and also 51 street light all over village.

In addition to improved education, rural electrification also allows for greater efficiency and productivity. Businesses will be able to keep their doors open for longer and generate additional revenues.

Renewable energy based mini grids are less dependent on larger-scale infrastructure and can be implemented faster and cheaper

The following technologies are used extensively:

- Photovoltaics
- Wind mechanical water pumps
- Small wind electric

- There are two key lessons to highlight. First, there is a need for committed political leadership, backed by institutions with the capacity and mandate to deliver electrification.

CHAPTER:5
TECHNICAL OPTIONS

5.1 CONCEPT (CIVIL)

5.1.1 SEWAGE TREATMENT PLANT AND LAKE REVIVAL

Case Study

The Rajokri Water Body Revitalisation Project

Up until 2017 the Rajokri water body used to be a grimy and turbid lake took care of by sewage from the close by shanties. It has now changed into 9,446 square meters of redeveloped public space, with a water assemblage of 2,000 square meters which is currently taken care of with treated effluents which, at a previous date, were its essential poisons.

Key Statistics of the waterbody revitalization project –

- Total area of the water body – 9,446 sq.m

- Water area – 2,000 sq.m
- Technology used for revitalisation - Scientific wetland system with activated bio-digestion.
- Design capacity - 600 kilolitres (kl) per day.
- Place-making through the creation of landscaped areas i.e. areas for public gatherings.

The work for revitalisation has been split into two packages/works – 1. Construction of a wetland system.

2. Landscape, civil, electrical and horticulture work including maintenance for a period of 5 years.

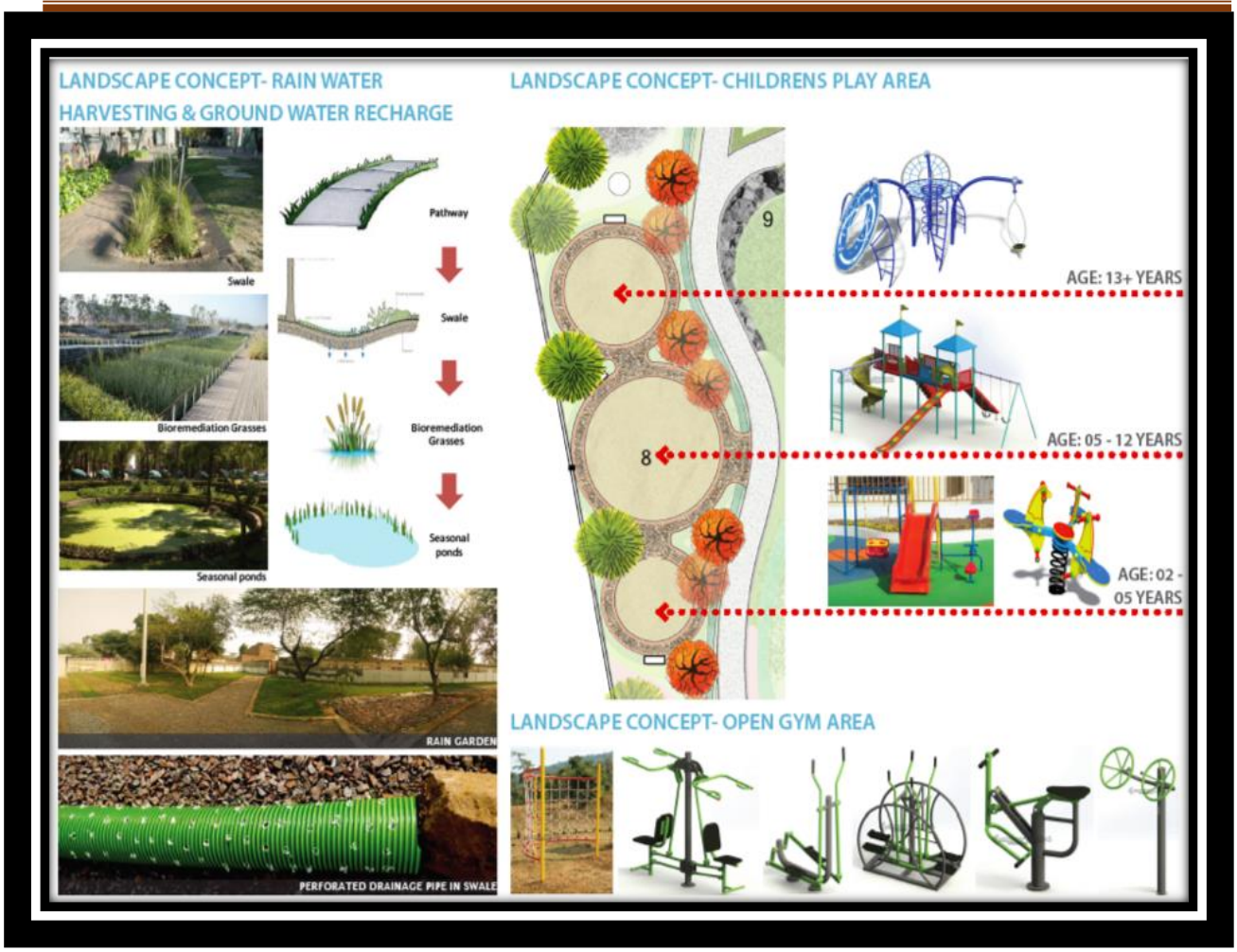


Figure : Proposed scheme, existing situation and implemented final product.

Features of the new water body include the following:

- Central waterbody with purified water and 2 MG capacity;
- Amphitheatre that doubles up as Chhath Ghat (an ancient Hindu Vedic festival historically native to the Indian subcontinent) for public gatherings;
- Green play areas with open gym and swings;
- Gravel based walking pathways that also double up as rainwater harvesting channels;
- Constructed wetland.

Construction of the wetland system and measurement sheet

1. 1. Sedimentation tank - Six partitions with five baffle walls with alternate slots at top and bottom having a capacity of 760 kl. Length: 38m, breadth: 5m, Depth: 4m;

2. 2. Wetland system
3. - Length: 34.8 - 25.8m, Width: 10.11m, Depth: 2.0 to 2.6m;
4. - No. of chambers: 15;
5. - Filler stone aggregate of nominal size of 200 to 300mm over a depth of 77cm, 100mm over a depth of 38cm, 80mm over a depth of 115cm;
6. 3. Plants on wetland - Umbrella Piperes and Canna Indica;
7. 4. Five manholes for sewage collection;
8. 5. 200mm sewage collection pipe;
9. 6. Tender Cost - INR 7,719,499 (ca. USD 108,500).

Landscape, Civil, Electrical ,Costing and Horticulture work including maintenance for a period of 5 years.

1. 1. Cost wise split of various components involved:
2. - Civil Work - INR 7,353,000 (ca. USD 103,500)
3. - Mechanical & Electrical Work - INR 373,000 (ca. USD 5,200)
4. - Planting Work - INR 1,065,000 (ca. USD 15,000)
5. - Maintenance Work - INR 1,315,000 (ca. USD 18,500)
6. 2. Two high mast lights of 16m height;
7. 3. Two 1.5 HP water pumps for lifting water from sedimentation tank to the wetland system, operated by solar energy;
8. 4. 5 HP submersible pump for feeding the sprinkler system;
9. 5. 3,400 sq.m of grassing area.

What is the Innovation?

The project utilizes a scientific wetland system with active bio digesters (SWAB), as opposed to the standard approach of chemical treatment.

The use of wetlands and mechanised aeration systems moves away from Delhi's Jal Boards policy to isolate a water body by concretising the base and using chemicals to treat water. The wetland ecosystem includes plants such as typha latifolia and spider lily, a layer of gravel which filters water, and has a biofilm on it to process pollutants. The gravel system also immobilises heavy metals.

Constructed wetlands are effective in treating organic matter, nitrogen, phosphorus, decreasing the concentrations of trace metals and organic chemicals (Kadlec and Knight 1996). The submerged aquatic macrophytes have very thin cuticles and therefore, readily take up metals from water through the entire surface. Macrophytes possess extraordinary ability to survive the adverse conditions of pollution and possess high colonization rate that are virtual tools of excellence for phytoremediation.

Further they redistribute metals from sediments to water, finally accumulate in the plant tissues, accelerate biogeochemical processes and hence maintain homoeostasis.

How does the system work?

Step 1 - Raw sewage from all channels tapped to meet at common inlet. Water quality at input level is BOD 150, TDS 2,214

Step 2 - Sewage fed into underground sedimentation tank and bio-digester: Solid components broken down and decomposed, big particles are then removed. BOD is 75.

Step 3 - Solar pumps push output to artificial wetland: 2.5m deep gravel with hormonally treated plants absorb toxins. BOD is 20.

Step 4 - Treated water passes along slope of grassland to waterbody. Carbon and sand filters reduce BOD/TDS level to below 10/10.

However, in the last few years, The Delhi government has been able to follow a steady path of improvement through various lake rejuvenation efforts spearheaded by the DJB, Irrigation and Flood Control Department (IFCD) and several citizen groups. And one the pioneering projects that set the ball of positive transformation rolling was the Rajokri Lake project.

Notwithstanding, under all the rottenness was a repository of potential, something that a group including DJB's specialized counsel Ankit Srivastava and draftsman Mriganka Saxena imagined. Under their direction, the DJB alongside IFCD began the change of the Rajokri lake into Delhi's very first decentralized sewage framework.

"Delhi has around 600 water bodies and the possible objective is to resuscitate every one of them. Notwithstanding, there was no model of comprehensive recovery that we could follow. In this way, all things considered, we made an in-house group to deal with making our own model most appropriate for the city's condition, and that is the way the Rajokri project was begun as a pilot in 2017," says Ankit, who is an alum of IIT Bombay, in ecological science and designing.

MODAJ POND DETAILS

- The pond is situated near the forest area of the village.All the waste water of a specific phase of the village directly enters the pond. After asking a few locals, theysaid that no cleaning of the pond is done due to whichanimals like snake and other are found in the lake. Also, insects are also seen in the rainy seasons.
- A man hole is provided at one end of the pond, as thewater level of the pond rises upto a certain limit the water enters in the drainage pipe and that water is directly mixed with the other pipe lines and finally enters the dry lake.

Figure 42 MODAJ POND TO BR RENOVATED

- ❖ So, our plan is to provide a practical solution to the problem. That is why we have chosen the Rajokri casestudy as our ideal solution as because the budget is quite less than the regular sewage treatment plant. Andadditionally we are providing a proposal for a children play area and an open gym.
- Although we won't be imitating the whole case study but we are working on the necessary innovations that can be made without interfering the budget of the proposal plan.

Figure 43 GARBAGE SEEN IN MODAJ POND

5.1.2 Soil Liquefaction

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

In soil mechanics, the term "liquefied" was first used by Allen Hazen in reference to the 1918 failure of the Calaveras Dam in California. He described the mechanism of flow liquefaction of the embankment dam as: If the pressure of the water in the pores is great enough to carry all the load, it will have the effect of holding the particles apart and of producing a condition that is practically equivalent to that of quicksand the initial movement of some part of the material mightresult in accumulating pressure, first on one point, and then on another, successively, as the earlypoints of concentration were liquefied.

Type of soil causes liquefaction: Poorly drained fine-grained soils such as sandy, silty, and gravelly soils are the most susceptible to liquefaction.

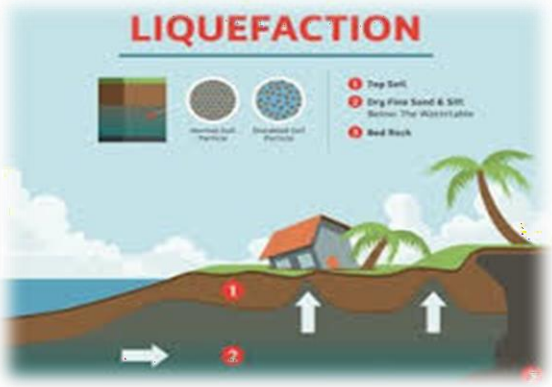


Figure 44 Soil Liquifaction effects

Figure 45 Soil Liquifaction

5.1.3 Sustainable Sanitation

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

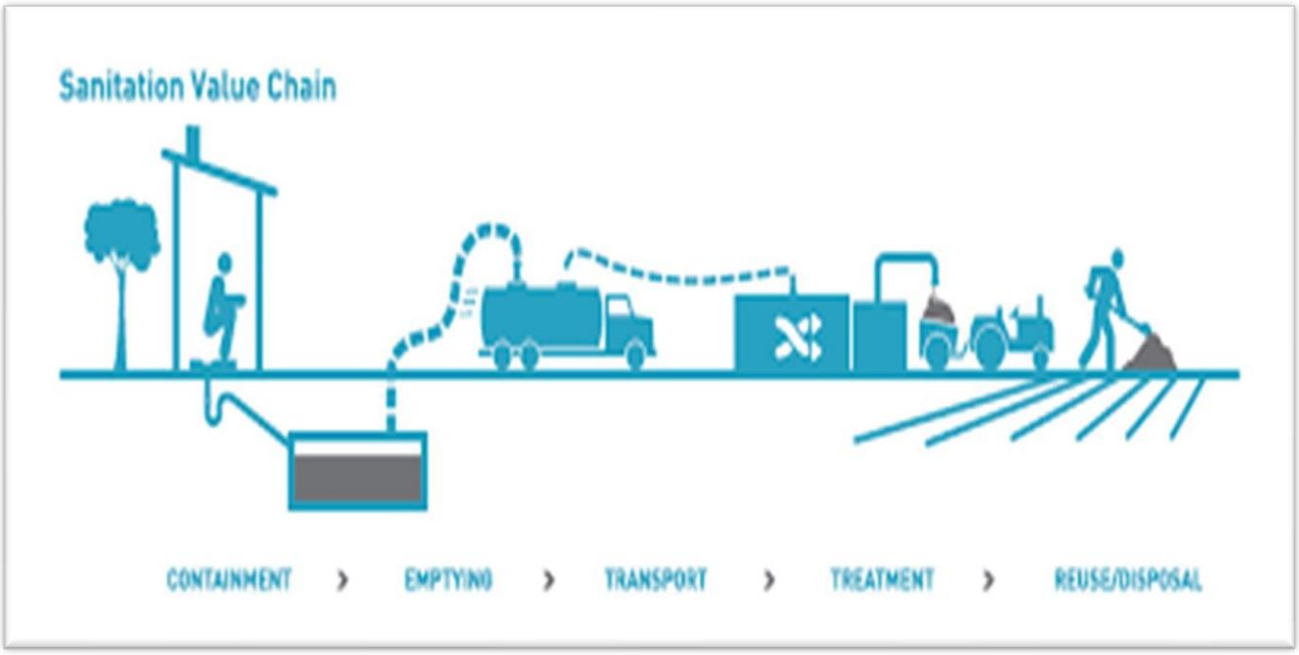


Figure 46 Sanitation Value chain

5.1.4 Transport Infrastructure / system

Transport infrastructure consists of the fixed installations necessary for transport and includes roads, railways, airways, waterways, and terminals. Transport is vital to the well-functioning of economic activities and a key to ensuring social well-being and cohesion of populations. Transportensures everyday mobility of people and is crucial to the production and distribution of goods. Adequate infrastructure is a fundamental precondition for transport systems. In their endeavour tofacilitate transport, however, decision-makers in governments and international organizations facedifficult challenges. These include the existence of physical barriers or hindrances, such as insufficient or inadequate transport infrastructures, bottlenecks and missing links, as well as lack of funds to remove them. Solving these problems is not an easy task. It requires action on the partof the governments concerned, actions that are coordinated with other governments at internationallevel.

Figure 47 Transport Infrastructure / system

5.2 ELECTRICAL

5.2.1 Biomass energy

In a direct combustion system, biomass is burned in a combustor or furnace to generate hot gas, which is fed into a boiler to generate steam, which is expanded through a steam turbine or steam engine to produce mechanical or electrical energy. As biomass is often used in villages for agriculture purposes it will be easy for them to use it.

Most electricity generated from biomass is **produced by direct combustion**. Biomass is burned in a boiler to produce high-pressure steam. This steam flows over a series of turbine blades, causing them to rotate. The rotation of the turbine drives a generator, producing electricity.

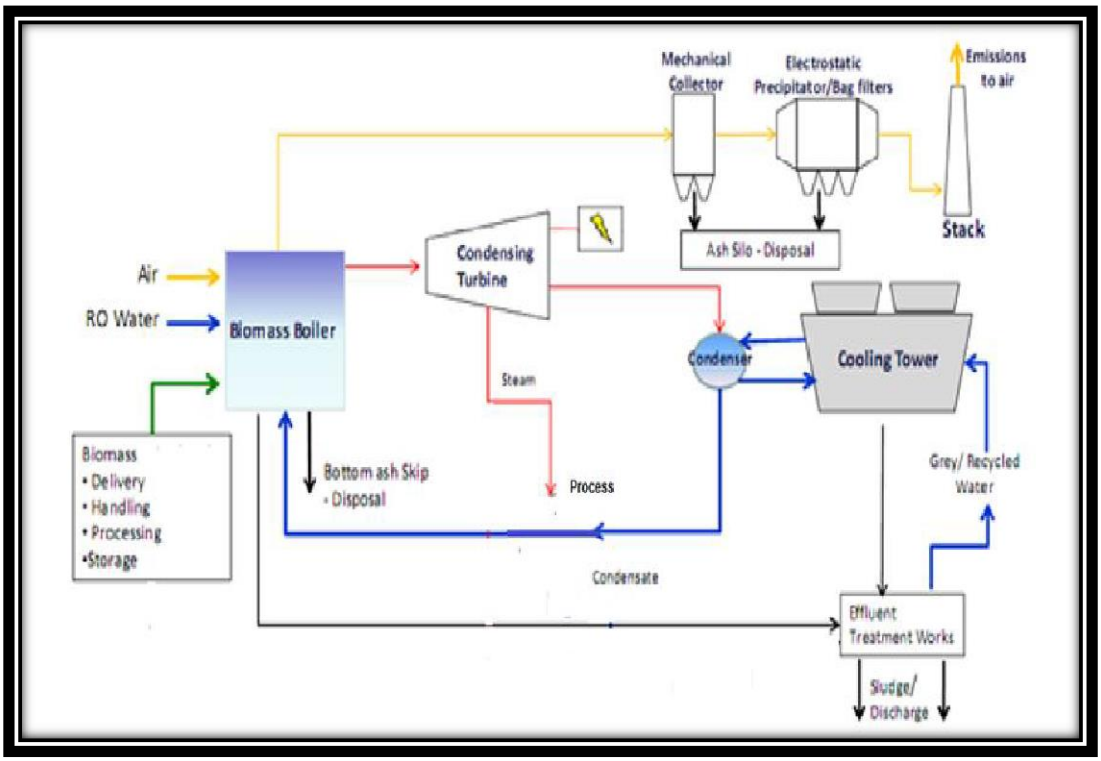


Figure 48 FLOWCHART EXPLAINING ELECTRICAL DESIGN -1

A biomass power plant can be installed in the village as its initial cost is not much and fuel which will be used for generating electricity that is biomass will be available in village itself. As it is simple to operate and maintenance is also quite easy.

5.2.2 Other renewable resources

Such as wind energy.

- Wind energy:

Wind energy can be used to generate electricity by installing wind mills in the farm so by the flow of wind the blades rotates and turbine which is connected with it also rotates. The turbine is connected with generator and hence electricity is produced. In many villages as per the measurement of average wind flow wind farm are installed and by doing this nearby villages are benefited.

Application such as wind turbine, wind blades are mounted on the top of the pole and height of the pole depends upon the wind flow measurement of that particular area.

Figure 49 WIND ENERGY

5.2.3 Solar energy

Solar power is energy from the sun that is converted into thermal or electrical energy. Solar energy is the cleanest and most abundant renewable energy source available. There are various methods to use solar energy which are mentioned below,

1. Solar power plant:

Typically, the working of a solar power plant comprises a bank of solar panels receiving sun's energy which is converted into DC electric power by photovoltaic (PV) effect produced by the PV cells in the panels. This DC electric power is fed to a battery which stores the energy. This DC power is converted to AC power by means of an inverter and the AC output of the inverter feeds the mains from where various applications draw electricpower.

Solar energy is energy derived from sunlight. Whether you realize it or not, the sun already powers our planet, providing the necessary energy to keep our environment and population growing.Solar energy can be used to provide heat, light, and other electricity-dependent needs in homes and buildings.

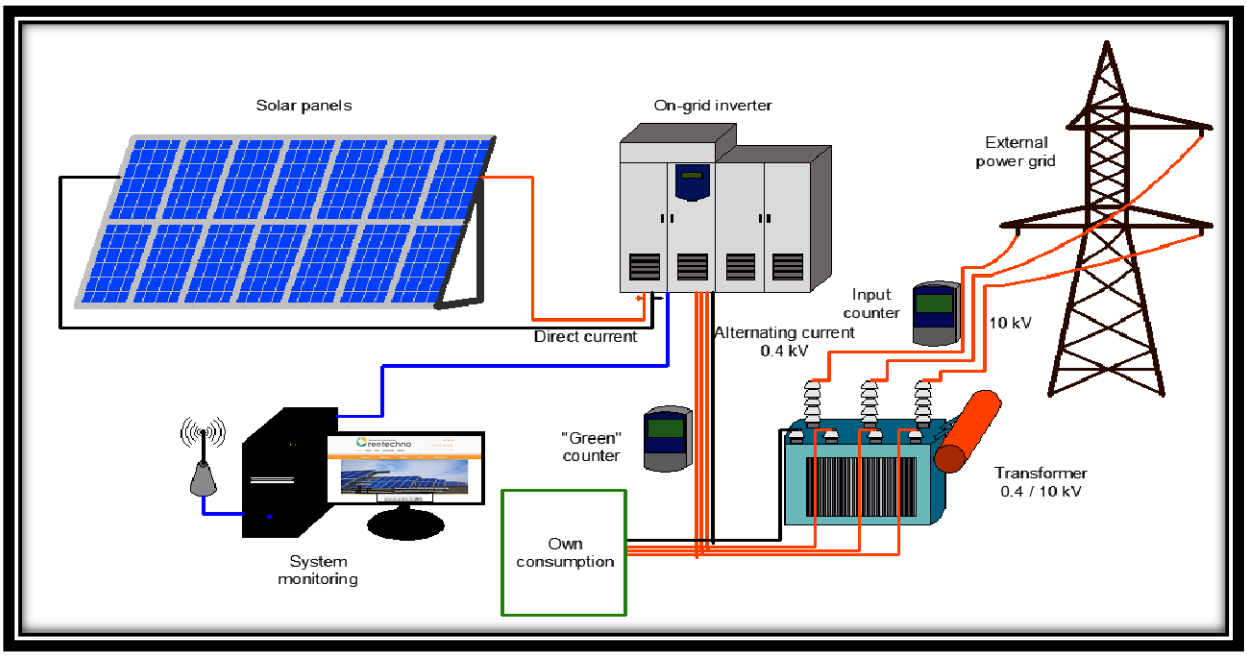


Figure 50 METHODOLOGY EXPLAINED FOR SOLAR POWER PLANT

❖ Solar street lights

Solar panels are mounted on the top of street lights so it can be operated in very low cost and this will reduce the problem of blackout in the village which use to happen when streetlights are operated by transmission line or grid.

1. Solar panel mounted on home for domestic purpose use:

Nowadays governments are providing subsidies for those who install solar panels in their terrace so electricity generated can be used by people of that house and if electricity generation is more than the use of that particular house than it is transmitted to the grid andthat amount is reduce from the actual bill. By install panels in each house will be very useful for the people of village as they cut off of electricity will not be a major issue.

5.2.4 Programmable load shedding

Programmable load shedding is a time management system. A circuit that is reliable to take over the manual task of switch ON/OFF the electrical device with respect to time. It uses Real Time Clock (RTC) interfaced to a microcontroller of 8051 families. Whilethe set time is equal to real time the microcontroller give command to corresponding relay to turn it ON andthen turn OFF as per the program. Multiple ON/OFF times entry is biggest advantage with this. A matrix keypad is placed to adjust or enter the time.

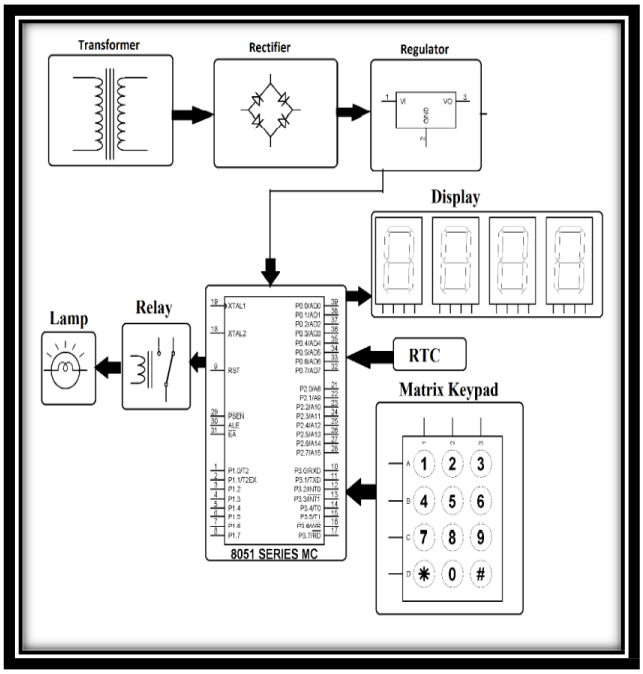


Figure 51 CIRCUIT INDICATING PROGRAMMABLE LOAD SHEDDING

The undertaking is a programmed load activity framework that controls load activity, various quantities of times as per modified guidance. The undertaking kills the manual ON/OFF exchanging of burden.

A continuous clock (RTC) is utilized to follow the time and naturally switch ON/OFF the heap. This undertaking is needed for load shedding time the board which is utilized when the power request surpasses the inventory and there comes a requirement for physically turning ON/OFF the electrical gadgets as expected. Consequently this framework kills the manual activity via naturally turning the heap ON/OFF. A lattice keypad is interfaced with the microcontroller from where the predefined time is contribution to the microcontroller. At the point when this information time equivalents to the ongoing, in light of the orders the microcontroller starts that specific hand-off to turn ON/OFF the heap. The time is shown on a seven portion show.

The force supply gives the fundamental voltage levels that are needed for the inside tasks of the Programmable Logic Controller. Furthermore, it might give capacity to the I/O modules. The force supply can be a different unit or incorporated into the processor segment. It takes the approaching voltage (regularly 120 VAC or 240 VAC) and changes the voltage as required (ordinarily 5 VDC to 32 VDC).

The force supply should give consistent yield voltage liberated from transient voltage spikes and other electrical clamor. The force supply additionally charges an inside battery in the Programmable Logic Controller to forestall cognitive decline when outer force is taken out.

The working existence of lithium batteries, which are ordinarily utilized as force supplies for Programmable Logic Controllers, is from 3 years to 5 years.

CHAPTER 6
SWATCH BHARAT ABHIYAN

6.1 Swatchhta needed in allocated village:

- The town has no open latrines. Which is essential need and furthermore a significantadvance of Swatchh Bharat Mission.
- The family squanders should be unloaded in a legitimate manner at an appropriate spotand if conceivable it can likewise be utilized for natural composts.
- There is one lake in town which is exceptionally messy and loaded with green growthwhich should be cleaned and even the way towards that lake was covered loaded withsquander.
- The town has dustbins at some spot yet the loss from the dustbins should be taken on standard stretches which is missing and because of which locals than toss squander otherthan dustbins.

As we visit the town from the outset look it looks so spotless and cleaned yet subsequent to investigating we arrived at resolution that countless spots are in awful condition. Not all spots are taken consideration with watch for a model the panchayat building is so perfect however then again the outdated close the panchayat building was in very condition individuals used to toss their trash in it's ground and it was so Dilapidated.

Figure 52 Garbage Burning

Above Image of lake which is full of garbage is been polluted mainly upto 90% by the holy things which our people of india throws in lake or river.
Here by we are going to implement pot (a big pot)in which people can throw there holy thigs instead in lake and mean while village committee can throw it further outside village zone after refining it by this there lake will be good and will help them further.

This problem is being going to be implement soon by village sarpanch and talalti.

Figure 53 Lake Bankside

Figure 54 Garbage Gathered

6.2 Guidelines which should be implemented

- The strong waste administration contains numerous cycles to lead in decreasing the lossfrom the environmental factors. It comprises of waste assortment, shipping, preparing, reusing or unloading of squanders.
- Decrease in trashes can be accomplished by playing out this administration task carefully.It all should begin from family unit level, because of this further there will be programmed decrease in waste creation on network level.
- Public mindfulness is must insofar as individuals are unaware about the significance of disinfection and neatness all the exertion of the public authority doesn't make a difference, After a few time it will back to zero.

CHAPTER 7

7.1 Village Condition due to Covid-19

Steps taken in Modaj village:

- During Lockdown villagers have strictly followed government norms and they have evenput wooden barricades to stop outsiders from entering village.
- The farmers of village who was doing farming of vegetables have given to other villagersat reasonable cost or even for free.
- Few villagers have made cotton masks and sold it to villagers at reasonable cost.
- The villagers who use smartphones have installed Arogya Setu application on their device.
- Even after unlock people has maintained social distancing
- Circles were made in front of shops/vegetable market/dairy, etc. to follow social distancing rule in queue.

Villagers who have other lungs related problem or old age have maintained strict rules and stayed in their houses until necessary.

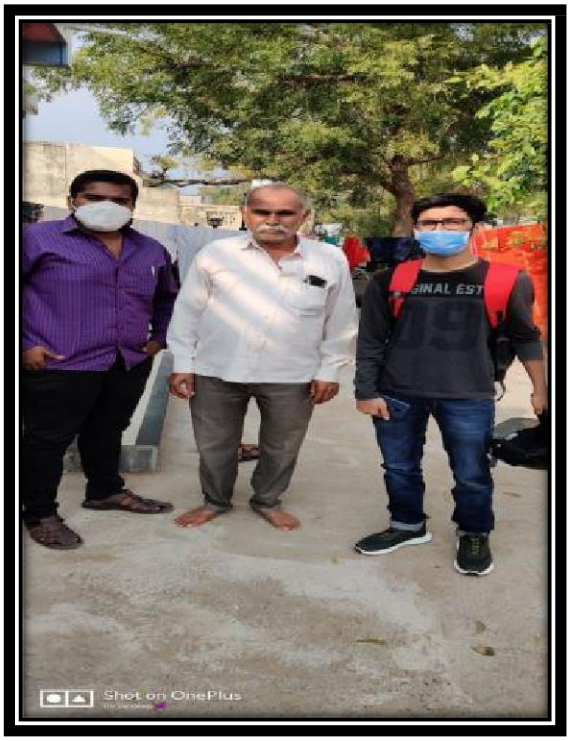


Figure 55 Photo with Sarpanch

7.2 Steps taken down by villagers and Talati

During association with the Talati, he disclosed to us that isolate spot and home isolate office were carried out during the lockdown. In the COVID-19 circumstance cleaning, hazing and sanitizing were done in the town.

7.3 Some of the Government initiatives during lockdown

Regarding COVID 19 pandemic, Ministry of Panchayati Raj, Government of India right up front cooperation with State Governments has taken different drives. Close discussion and direction of the State just as District specialists is being kept up to guarantee that lock down conditions are not disregarded and standards of social separating are circumspectly followed to contain the spread of the infection. India has overwhelmed Brazil and become the second-most exceedingly awful influenced country on the planet by the Covid pandemic, with in excess of 4 million cases. Coronavirus had for the most part stayed in India's urban communities, yet the illness is presently spreading to provincial India – a territory with more than 850 million individuals and far more awful medical care. The justification this shift seems, by all accounts, to be transient specialists who have been getting back to their towns since lockdown was facilitated toward the finish of June. The clinical reaction to stop the spread also, treat those contaminated has been deficient, as indicated by media reports. With one prepared specialist for each 1,497 individuals, against the World Health Organization suggested one for every 1,000, and public wellbeing consumption for 2018 at only 1.3% of GDP, India faces a difficult task in managing the pandemic. While 66% of India's populace lives in country regions, there are very nearly multipletimes as numerous wellbeing laborers per individual in urban areas. Most rustic networks dependon undeveloped wellbeing laborers. More than 66% of these rustic wellbeing suppliers have no conventional clinical preparing, however stay the as it were alternative of clinical help for the majority of the rustic population.

As all situation was in very very control with Talati, Sachin Patel and Sarpanch, Juvansinh Chauhan.

CHAPTER 8

Sustainable Design Planning Proposal (Prototype Design) - Part- I (Scenario / Existing Situation / Proposed Design in Auto cad / Recapitulation Sheet / Measurement Sheet / Abstract Sheet / Sustainability of Proposal / Any other software):

CIVIL DESIGN-8.1 MODAJ VILLAGE GATE

MODAJ VILLAGE GATE

Current Scenario in Modaj:

There is no any gate or entrance status in Modaj. Any new comer can't identify village without asking any local or google map.

So, we decided to propose an efficient and good quality Entrance Gate.

- There is no any gate in village so there is difficulty in finding out of modaj village.
- We had proposed for village gate in modaj village at the entrance of village.
- It gives a very good impression if there is a good village gate naming that village and also the person gets to know that he has entered in the village area.
- So, basically we are providing brick pillars in circular shape and a curvature at the center of the structure which gives a good aesthetic view of the gate.

  In the cost estimation we have not mentioned the land cost of the decided location as on asking the sarpanch and the talati they were unable to give us the approximate land cost and they said itkeeps on fluctuating.

Their PLAN ,ELEVATION ,SECTION and 3-D view are given below upon that one can know what is going to be done by us in future and can know our possible perspective of seeing and building of village gate.

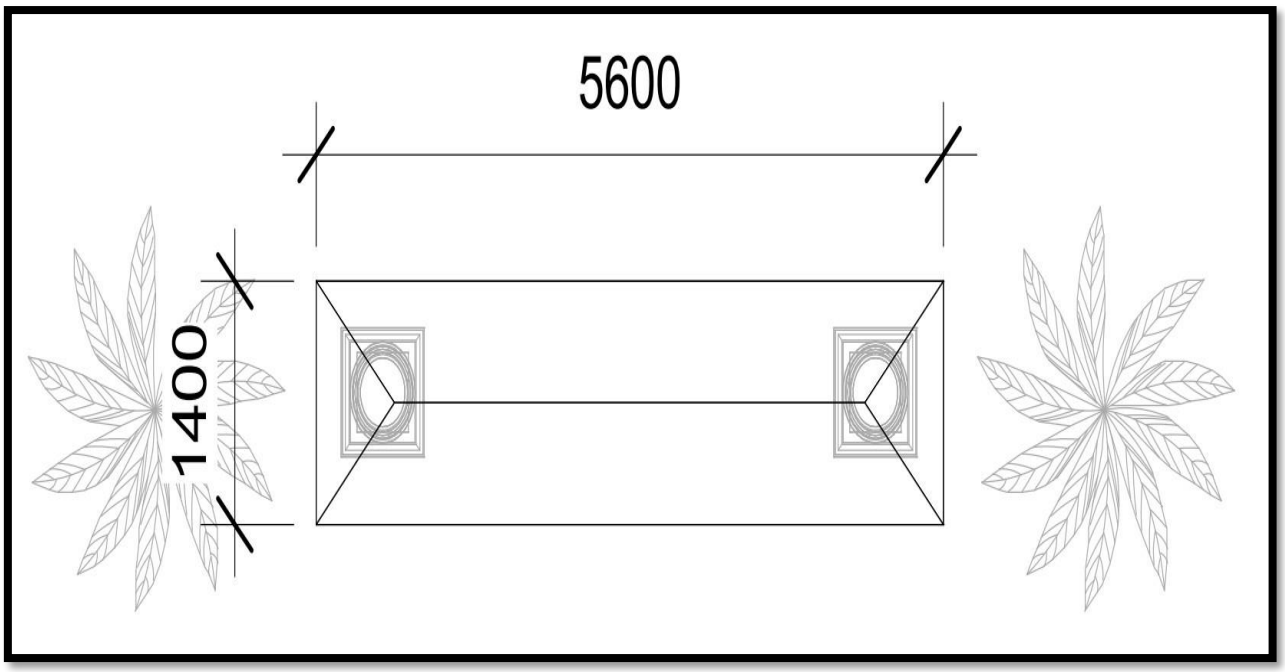


Figure 56 MODAJ GATE PLAN

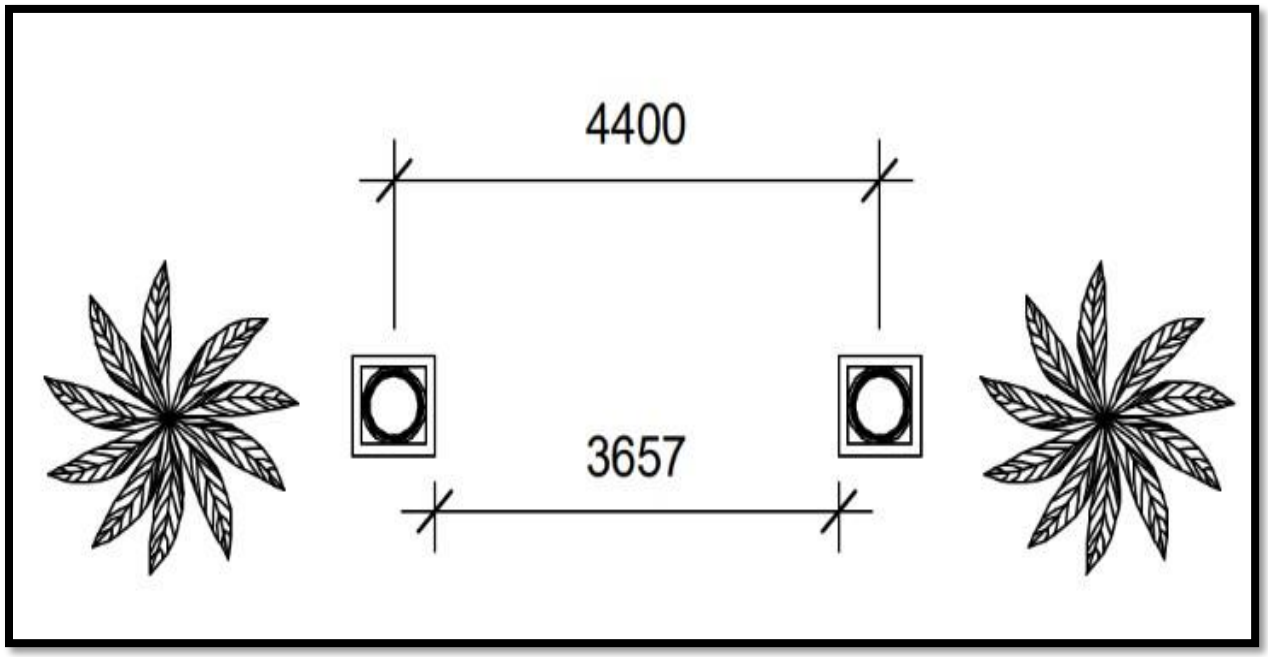


Figure 57 MODAJ GATE ELEVATION

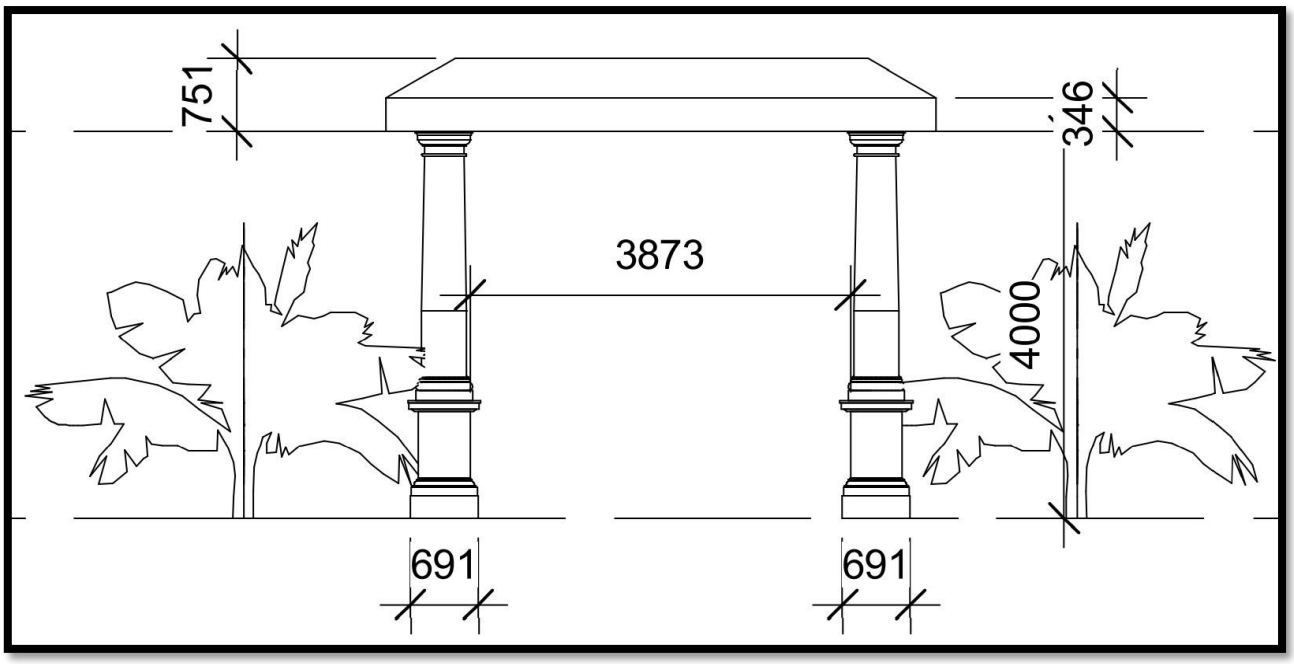


Figure 58 MODAJ GATE SECTION

Figure 59 3-D VIEW OF VILLAGE GATE

SR. NO	DESCRIPTION	QUANTITY	LENGTH	BREADTH	HEIGHT	PER	RATE	AMOUNT
1.	BRICK PILLARS	2	----	0.6	5	m^2	3500	21,000
2.	RECTANGULAR STONE	1	4.9	1.9	0.54	m^3	2800	74,076
3.	FOOTING	2	1	1	1.2	m^3	4623	12,000
4.	EXCAVATION	1	1	1	1.4	m^3	350	980
5.	PCC WORK	1	1	1	0.2	m^3	3500	1400
								1,09,456

Table 9 COST ESTIMATION FOR MODAJ VILLAGE GATE

CIVIL DESIGN-8.2 BANK NEEDED IN MODAJ VILLAGE

As on now there are only two banks in village one is B.O.B Bank of Baroda and another one is S.B.I and it is between population of thirteen thousand people so as we surveyed 3-4 times in village we had seen huge rush and crowds in banks so after talking with sarpanch,talati we are now going to propose a Bank in Modaj village.

About location we had decided to keep bank at centre of village as many of them can visit that and have a ease to visit it.

For modaj village we had put design including PLAN of the bank SECTION , ELEVATION and 3-D VIEW of Bank.

So our following designs which we are going to propose for our bank are as follows:

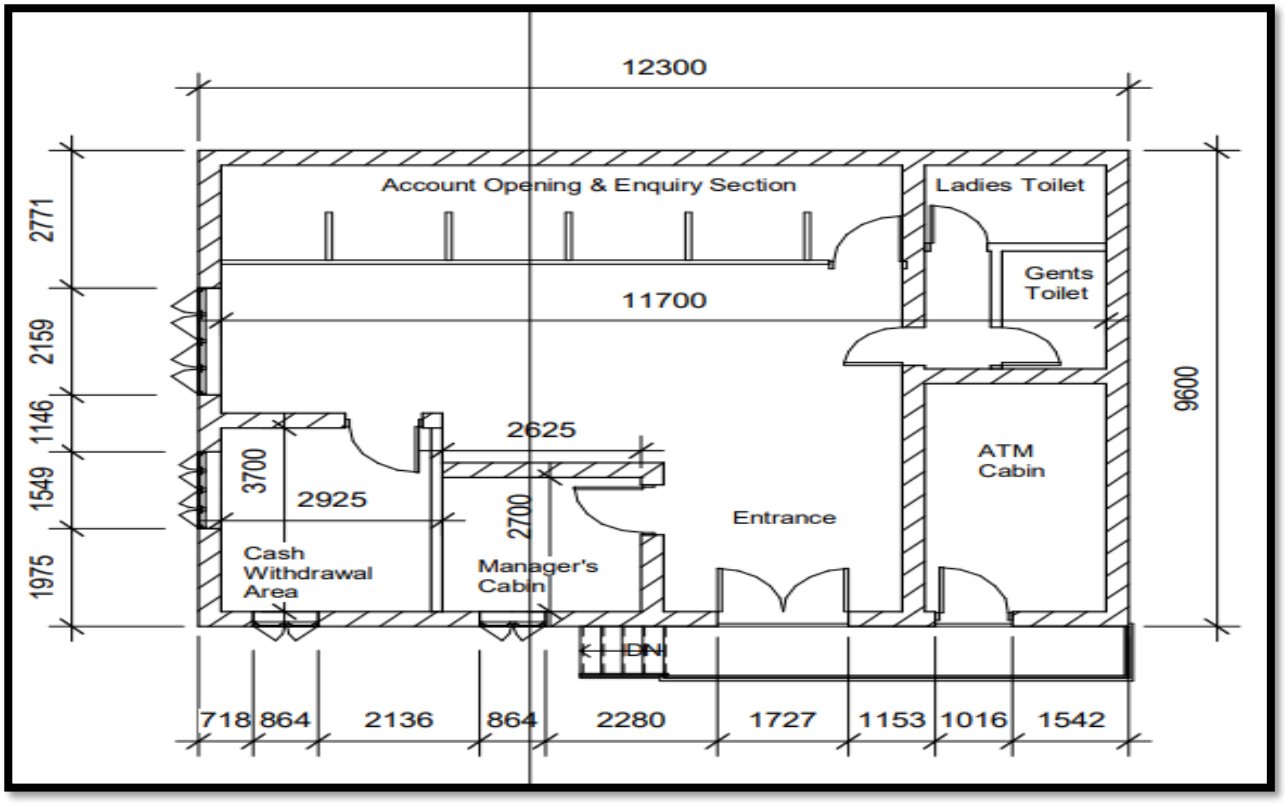


Figure 60 PLAN FOR MODAJ VILLAGE BANK

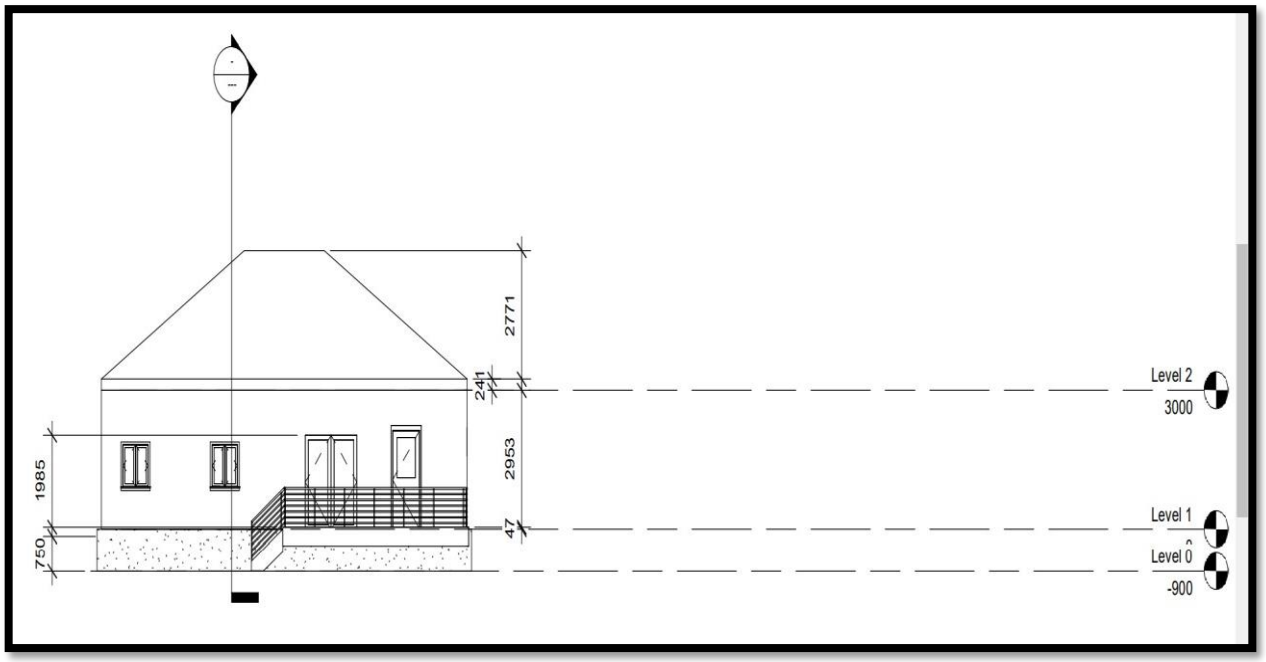


Figure 61 ELEVATION OF MODAJ VILLAGE BANK

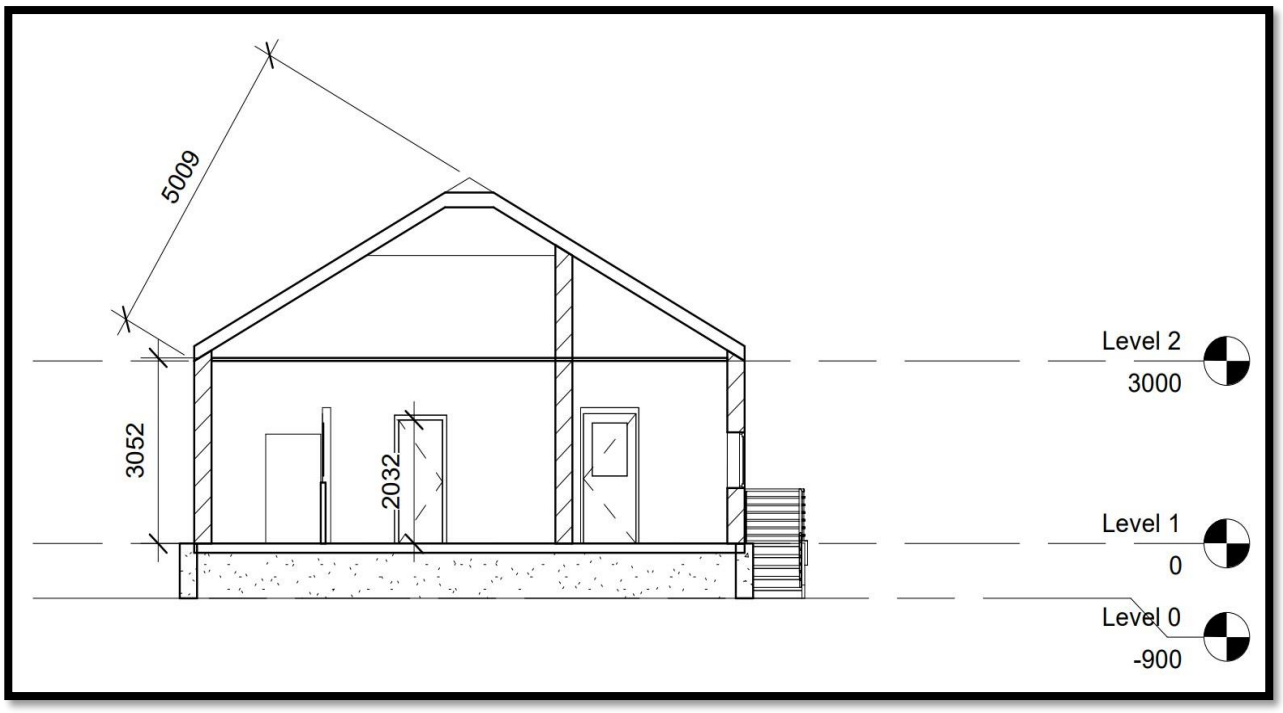


Figure 62 SECTION FOR MODAJ VILLAGE BANK

Figure 63 3-D VIEW FOR MODAJ VILLAGE BANK

SR NO	Description	o.s	Length	width	height	Quantity	Rate	Amount
1.	EXCAVATION	1	12.3	9.6	0.75	**88.56**	**350**	**30,996**
2.	PCC WORK	1	12.3	9.6	0.4	**47.23**	3500	**165,312**
3.	WALL WORK-1	2	12.3	0.3	2.9	**21.402**	125	**2675**
4.	WALL WORK-2	3	9.6	0.3	2.9	**25.056**	125	**3132**
5.	WALL WORK-3	3	2.6	0.3	2.9	**6.786**	125	**848.25**
6.	WALL WORK-4	1	3.7	0.15	2.9	**1.609**	97.5	**156.25**
8.	SLAB	1	12.3	9.6	0.15	**17.712**	180	**3188.16**
9.	PLASTERING		12.3	0.015	2.9	**118**	65	**7675.2**
10.	PAINTING WORK		12.3	---	2.9	---	40	**14044**
11.	FURNITURE WORK		---	---	---	----		**40,000**
								2,68,026

Table 10 COST ESTIMATION FOR MODAJ VILLAGE BANK

CIVIL DESIGN -8.3 GUEST HOUSE

As per 2011 census data there was 15745 of population living there and approx. now onwards there is population of 30,000 and village is spreaded total in 10.75 Ha of area. So, we are proposing for a rest room there.

- People coming from outside don't have any place to do settle for sometime.
- Present situation is they all stay in schools and other public buildings.
- Because of high population in this village there are many visitors we can see regularly. We had designed Rest room on taking consideration of village.

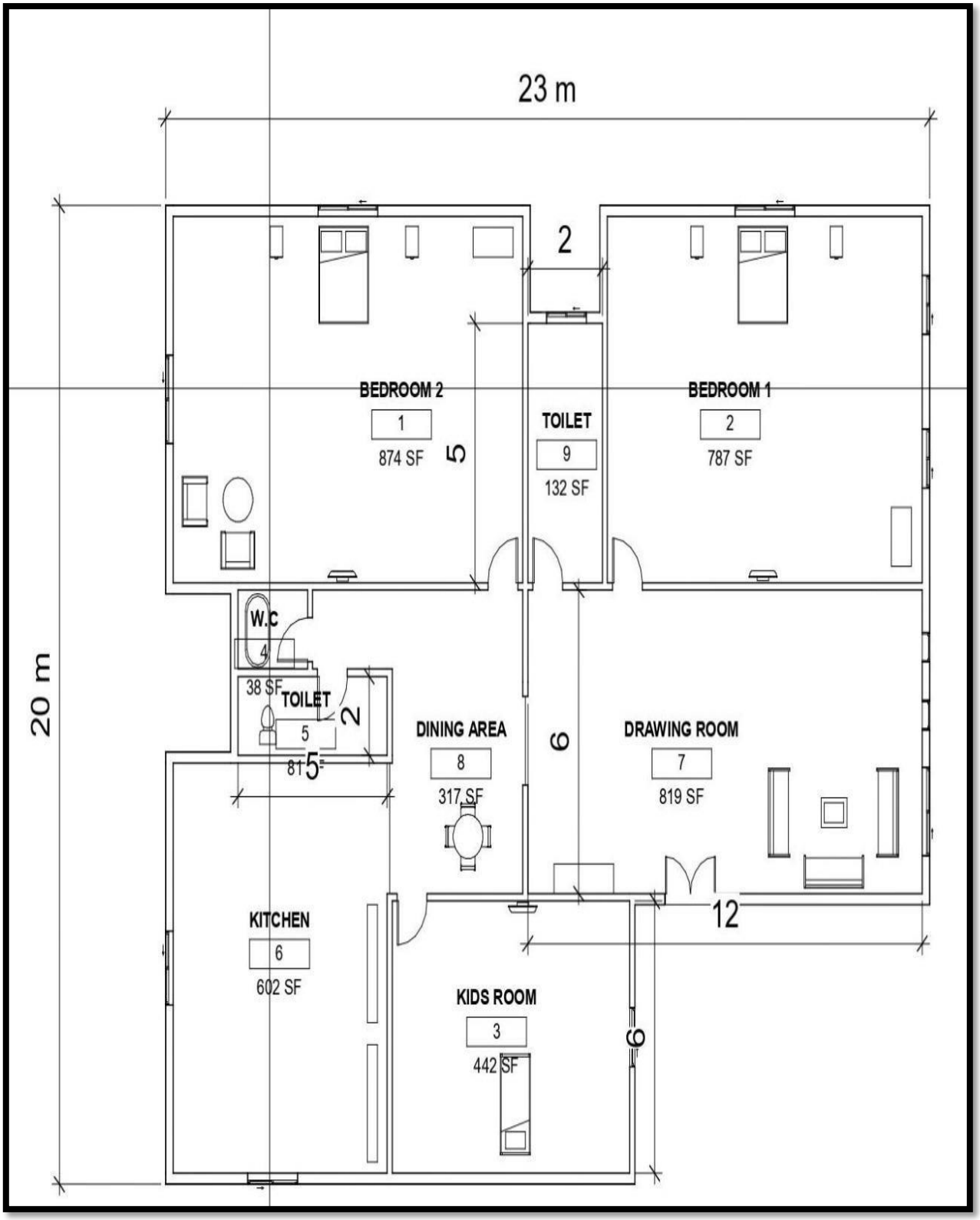


Figure 64 PLAN FOR GUEST HOUSE IN MODAJ VILLAGE

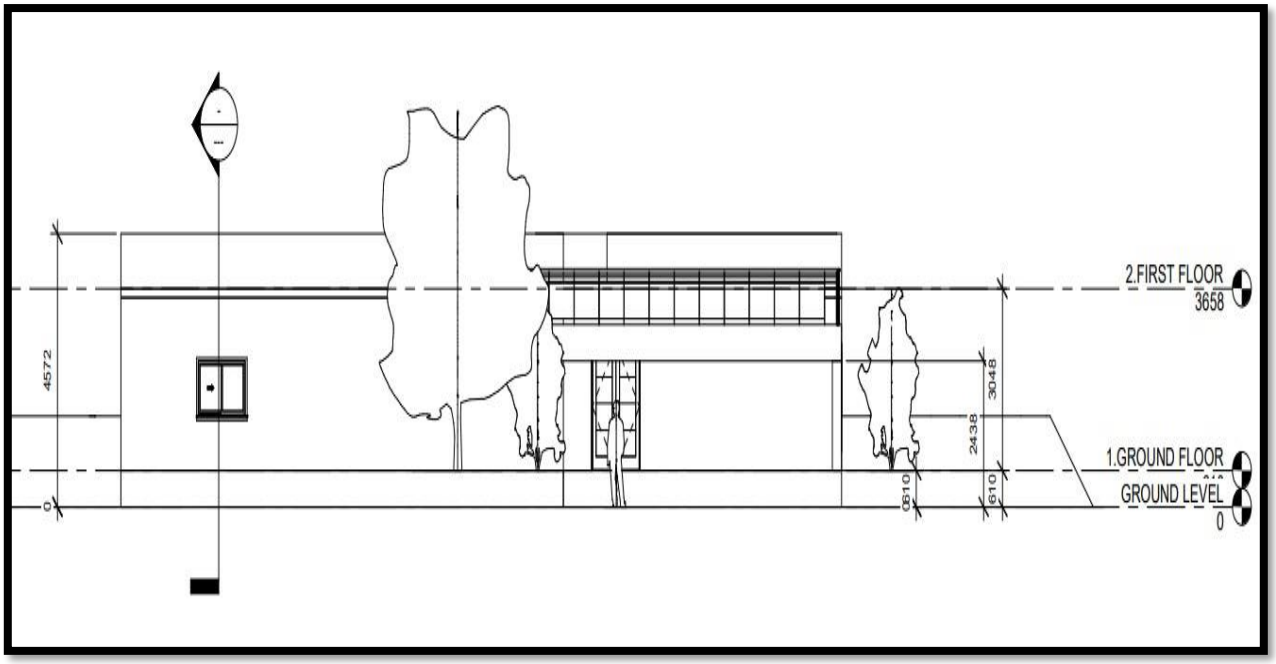


Figure 65 ELEVATION FOR GUEST ROOM

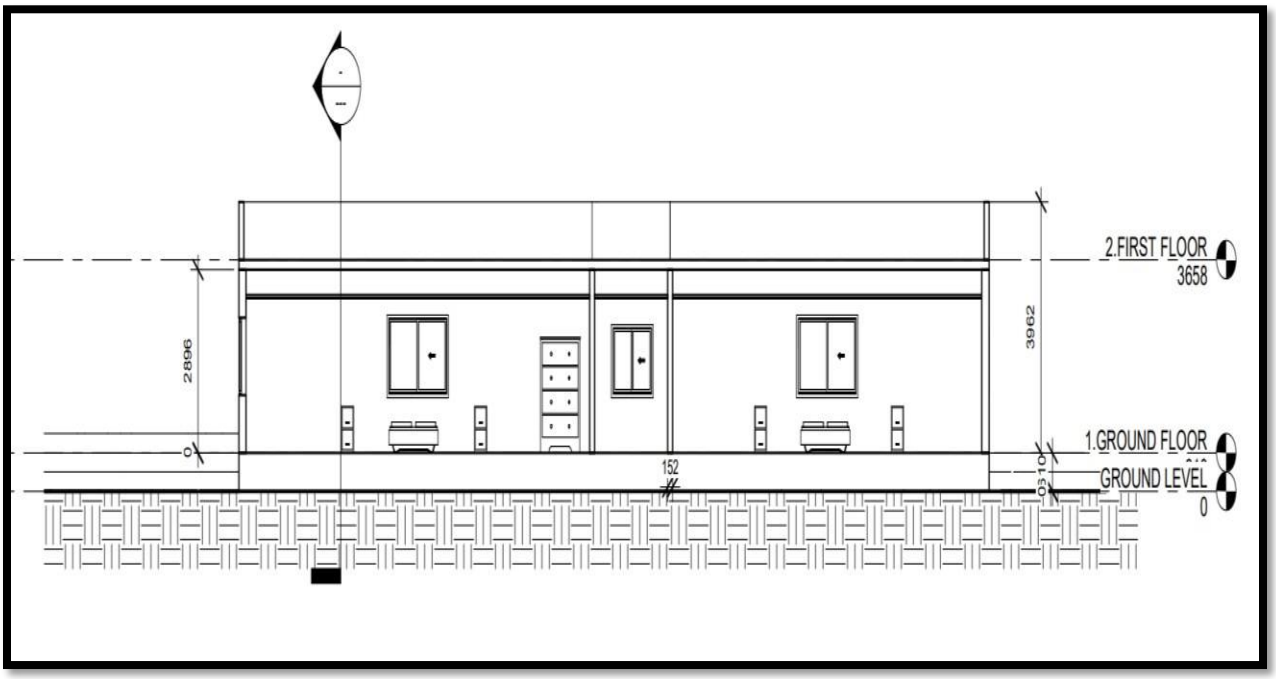


Figure 66 SECTION FOR GUEST HOUSE

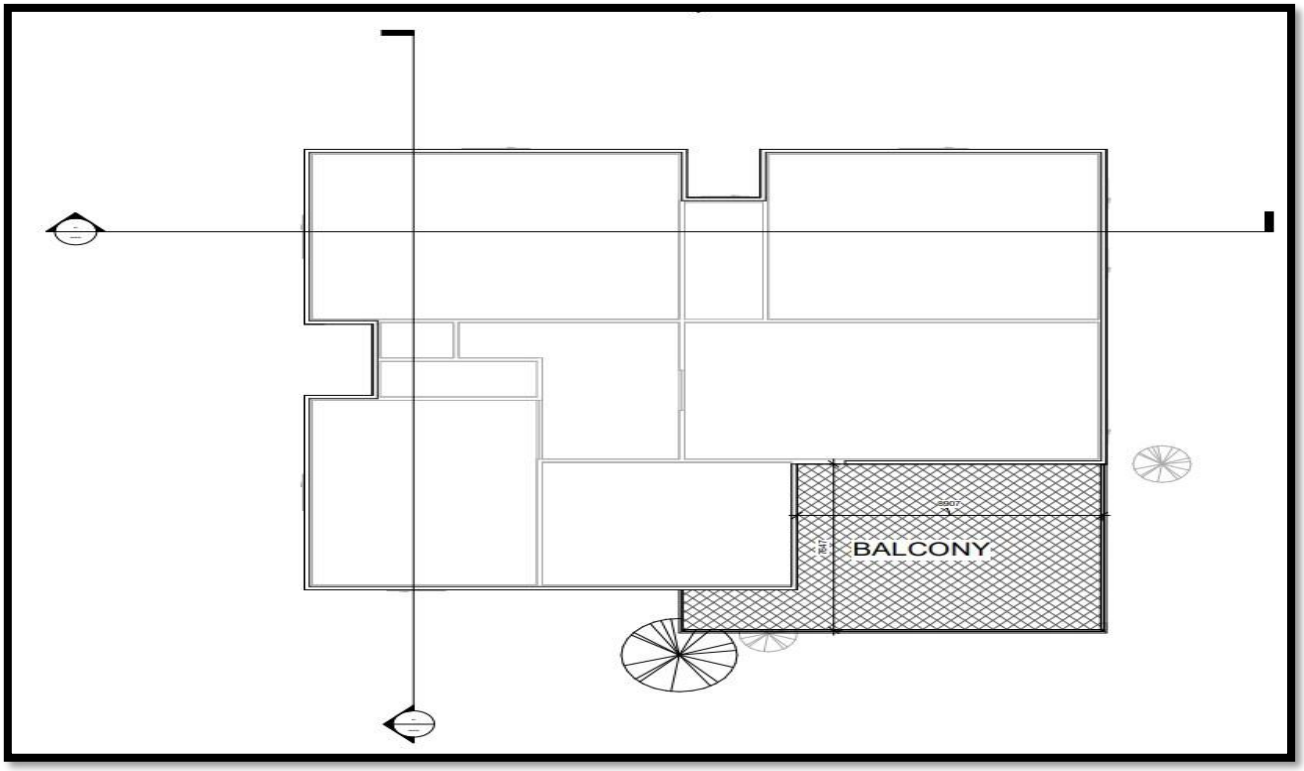


Figure 67 PLAN OF FIRST FLOOR

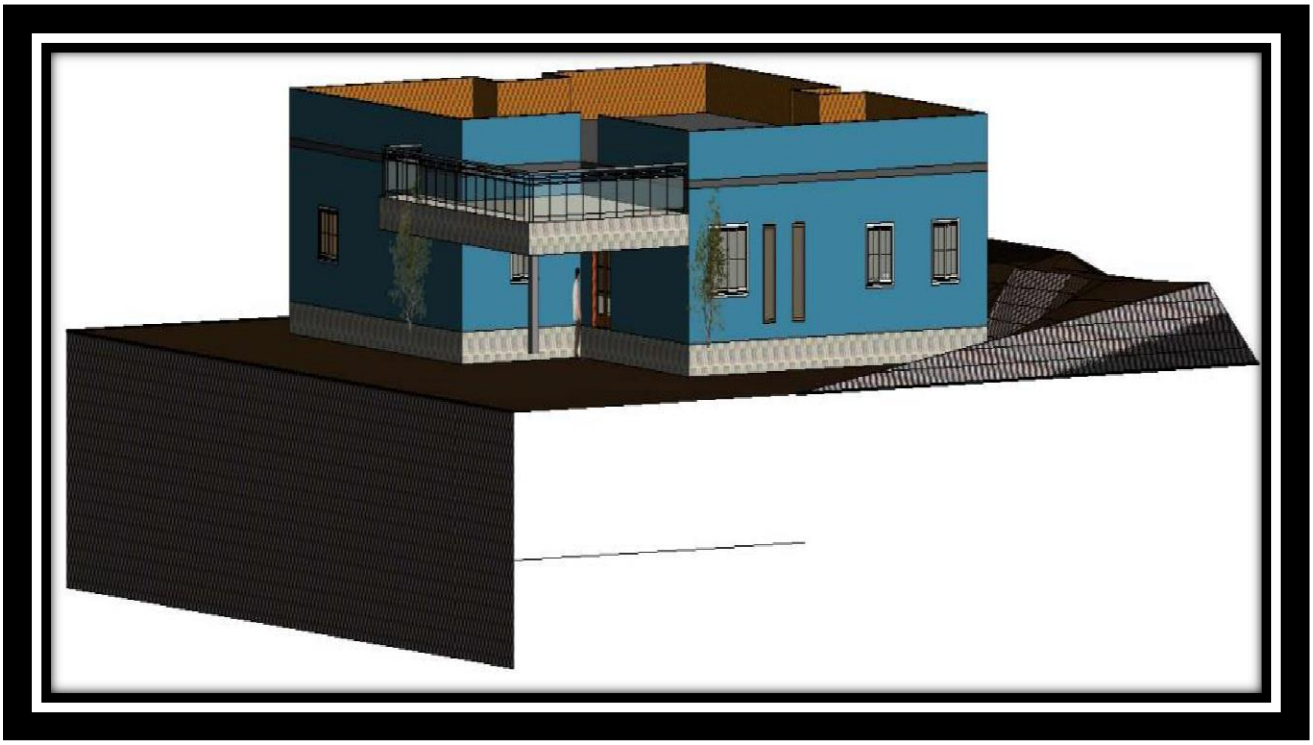


Figure 68 3-D VIEW OF PROPOSED GUEST HOUSE

SR NO	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	QUANTITY	PER	RATE	AMOUNT
1.	EXCAVATION	1	21.3	17.2	0.6	219.816	m^3	350	76935
2.	PCC WORK	1	21.3	17.2	0.2	73.27	m^3	3500	2,56,445
3.	WALL WORK-1	3	21.3	0.2	2.9	37.062	m^3	125	4632.75
4.	WALL WORK-2	1	7.27	0.2	2.9	2.52	m^3	97.5	411.11
5.	WALL WORK-3	3	17.2	0.2	2.9	29.928		125	3741
6.	WALL WORK-4	1	7.5	0.2	2.9	4.35		97.5	424.125
7.	WALL WORK-5	2	3.8	0.15	2.9	3.306		97.5	322.335
8.	SLAB	1	21.3	17.2	0.15	54.954		180	9891.72
5.	PLASTERING		21.3	0.015	2.9	0.9265	m^2	65	602.25
6.	PAINTING WORK		21.3	---	2.9	---	ft^2	40	14044
7.	FURNITURE WORK		----	---	---	---	---		50000
								Total	**4,17.447**

Table 11 COST EVALUATION FOR GUEST HOUSE

CIVIL DESIGN 8.4 PUBLIC TOILET

Current Scenario in Modaj:

There are no public toilets in village as on name of public toilet school toilets are being used no doubt that cleanliness for toilets are maintained. So, we are going to propose two public toilets for village as per existing population.

- In Modaj, there is not a single public toilet all they do is they use school toilets for fulfilling their purpose.
- Seeing this problems we had surveyed and decided to put two public toilets first inside the village and second one at the starting of village to maintain swattchh Bharat Abhiyan mission by our Prime Minister Shri Narendra Modi.
- This toilets are been designed looking upon the current scenario and latest designs.

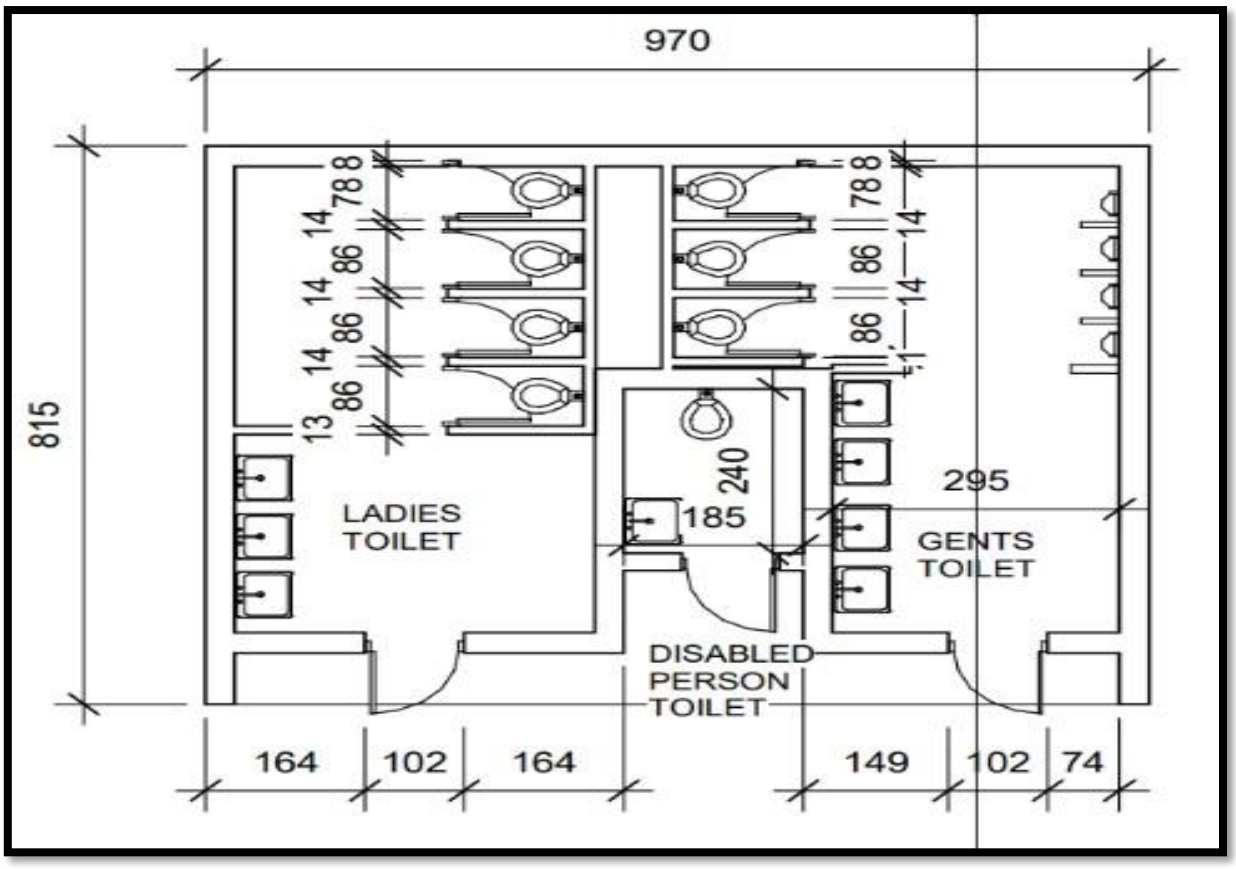


Figure 69 PLAN FOR PUBLIC TOILET

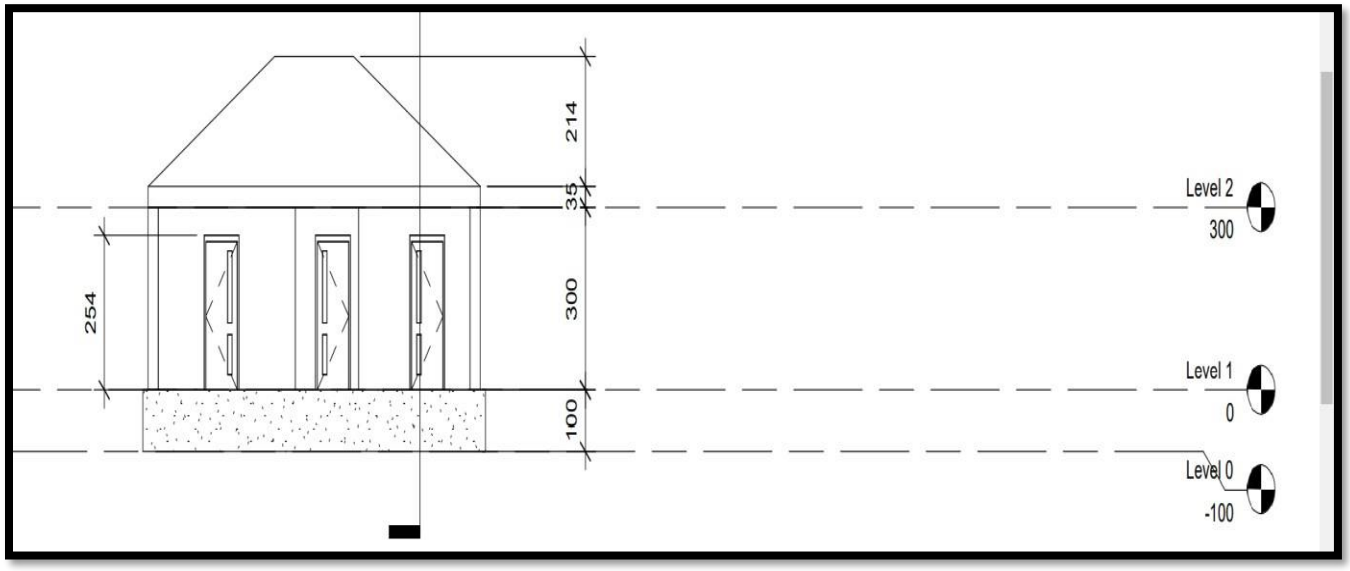


Figure 70 ELEVATION FOR PUBLIC TOILET IN MODAJ VILLAGE

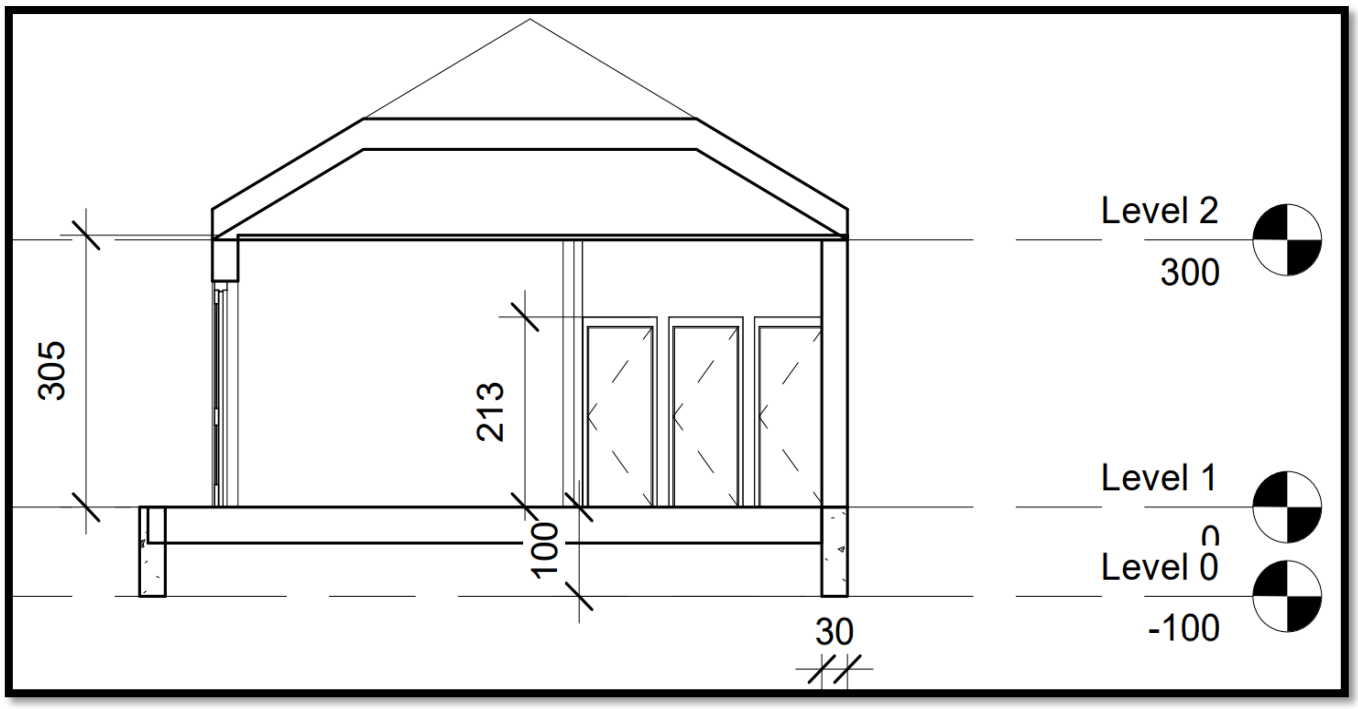


Figure 71 SECTION FOR MODAJ VILLAGE PUBLIC TOILET

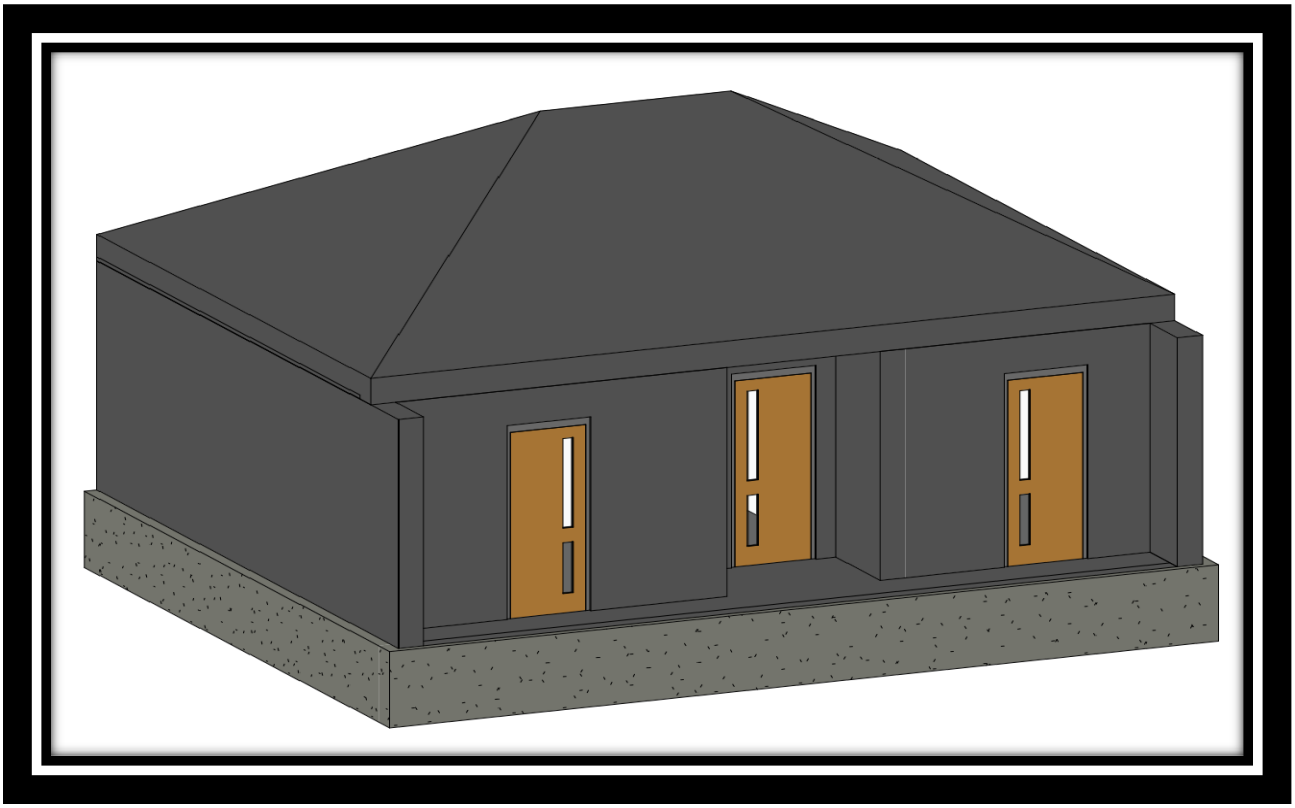


Figure 72 3-D DESIGN FOR PROPOSED PUBLIC TOILET IN MODAJ VILLAGE

Table 12 COST EVALUATION FOR PUBLIC TOILET

SR NO	DESCRIPTION	NO	LENGTH	WIDTH	HEIGHT	QUANTITY	RATE	PER	AMOUNT
1.	EXCAVATION	1	9.7	8.5	0.75	61.8375	350	m^2	21,643
2.	PCC WORK	1	9.5	8.3	0.2	15.77	3500	m^2	55,195
3.	FLOORING	1	9.7	8.5	0.15	12.36	3980	m^2	49,222
4.	WALL 1	2	9.7	0.3	3	17.46	125	m^2	2182.2
5	WALL 2	2	8.15	0.3	3	14.67	125	m^2	1833.75
6.	WALL 3	1	2.4	0.3	3	2.16	115	m^2	248.4
7.	WALL 4	1	1.8	0.3	3	1.62	115	m^2	186.3
8.	SLAB	1	9.7	8.5	0.15	12.367	180	sq.ft.	2226.15
9.	ROOF	1	9.7	8.5	2.14	176.443	150	sq.ft.	25,000
7.	DRAINAGE AND PLUMBING WORK		---	---	---	---	---	---	38000
8.	COMMODES, CERAMICS AND STEEL PRODUCTS		---	---	---	---	---	---	35000
									2,30,735

CIVIL DESIGN-8.5 PROPOSAL FOR GRAM PANCHAYAT

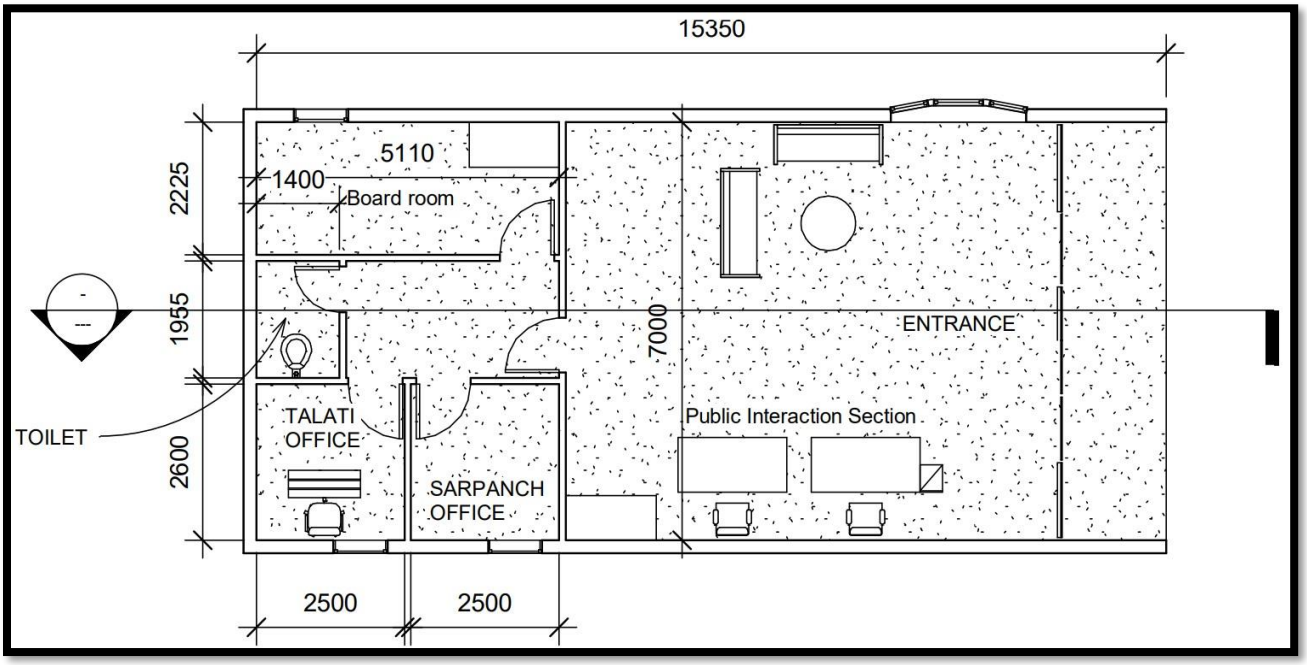


Figure 73 PLAN FOR GRAM PANCHAYAT

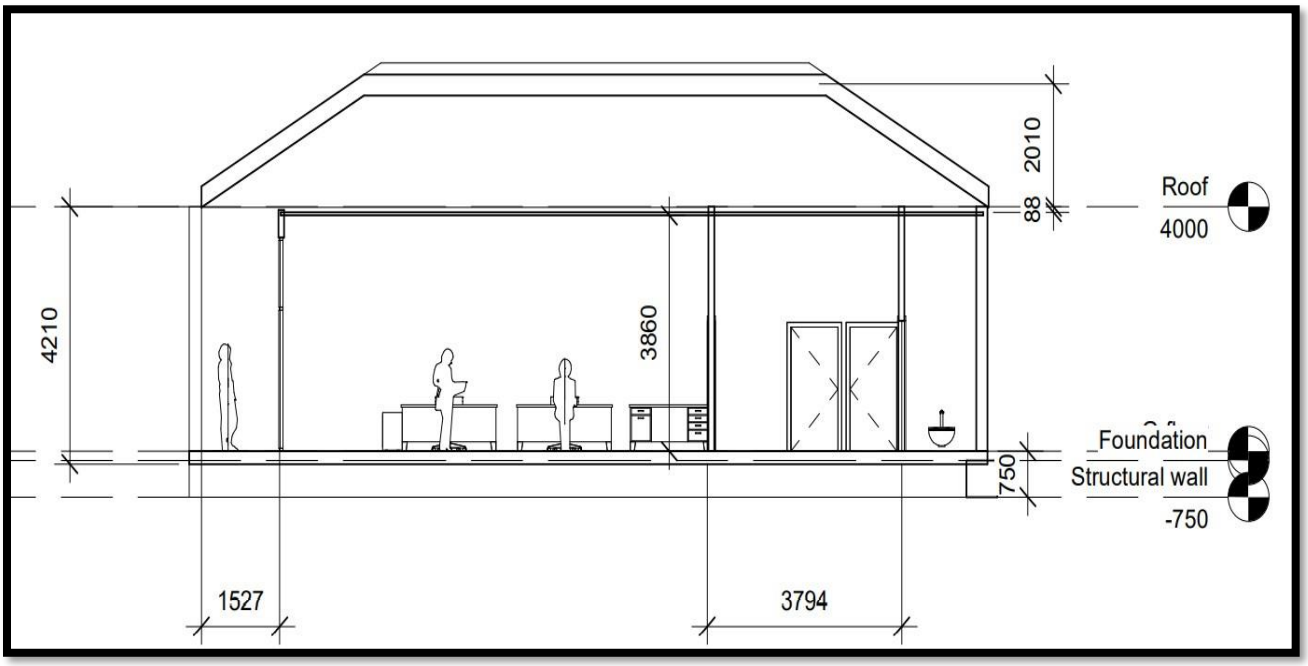


Figure 74 SECTION FOR GRAM PANCHAYAT

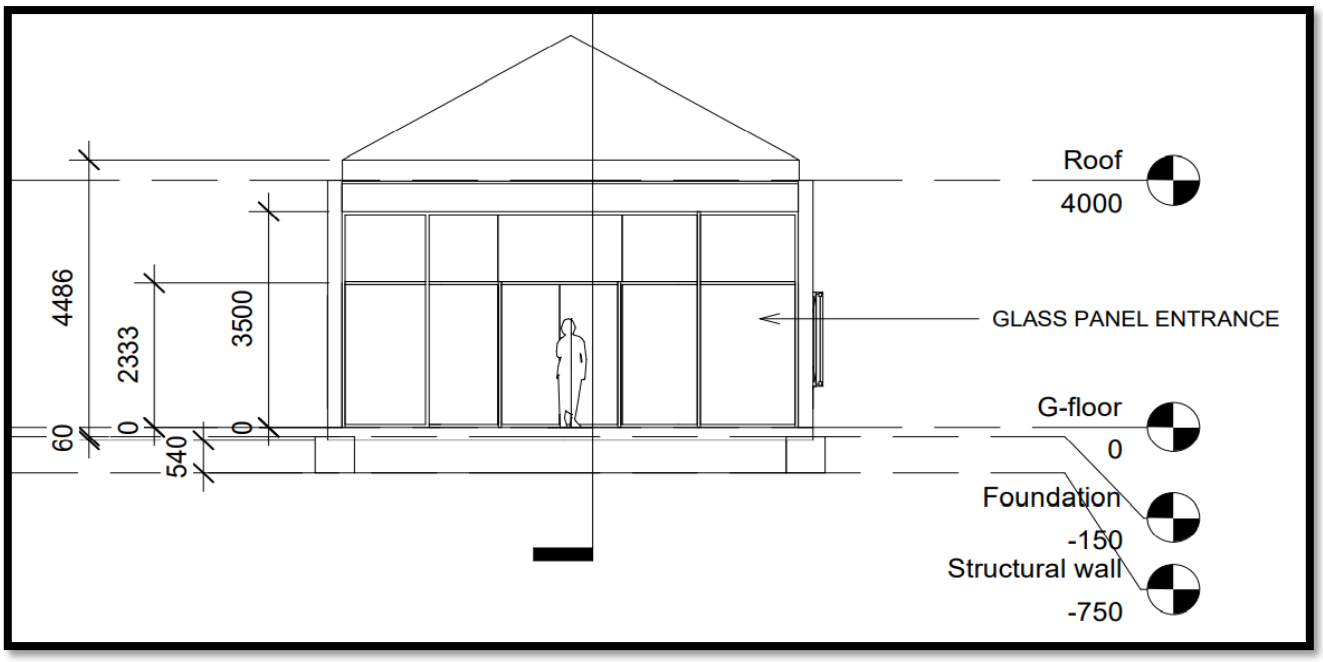


Figure 75 ELEVATION FOR GRAM PANCHAYAT

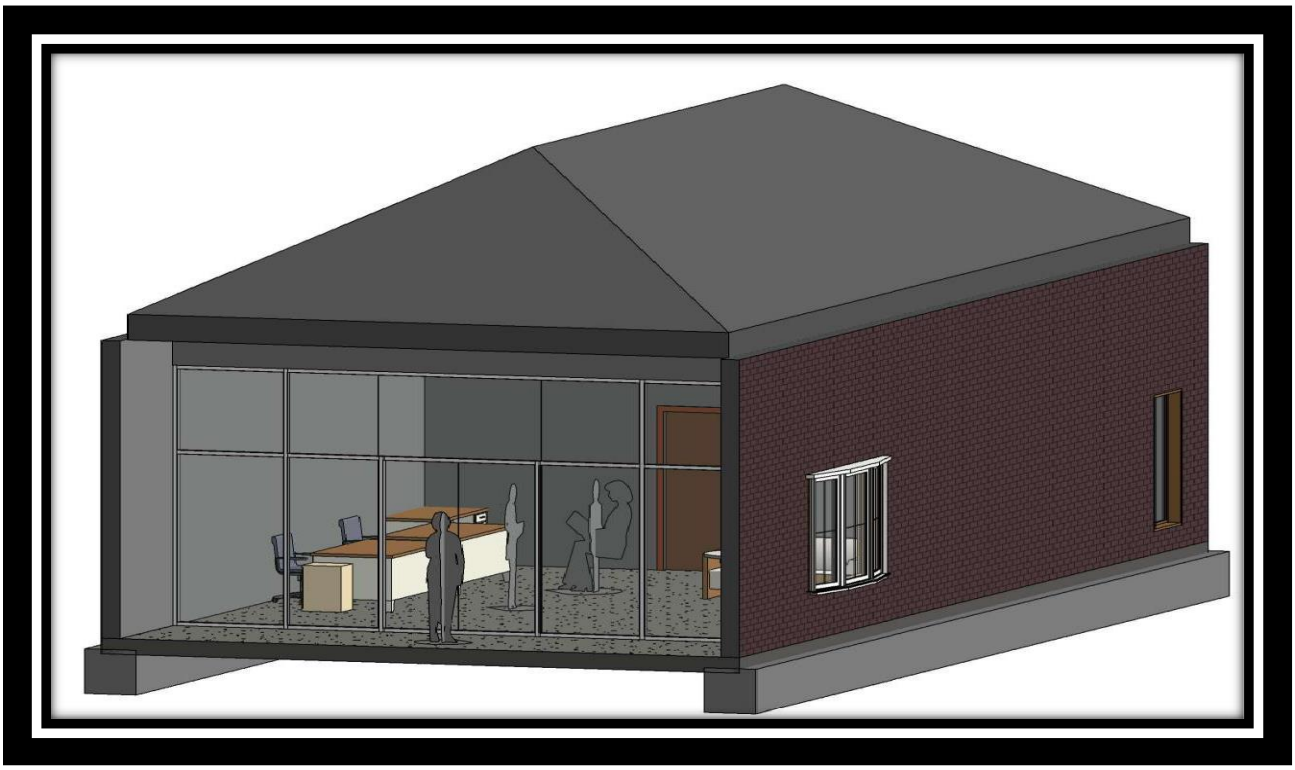


Figure 76 3-D VIEW FOR PROPOSED GRAM PANCHAYAT

SR. NO	Description	Length(m)	Width (m)	Height(m)	Count (Nos.)	Total Quantity(m^3)
1	ROOF	15.35	6.78	0.15	1	**15.61**
2	EXTERIO RWALL	15.42	0.228 6	3.5	2	**23.63**
3	FLOOR	15.42	6.7	0.15	1	**15.49**
5	DOOR	1.8796	-	2.1336	5	-
6	CURTAIN WALL	6.7	-	3	1	-
7	PCC	15.35	1.2	0.4	1	**7.368**
8	BASICWALL: 00.30	15	1.2	0.4	1	**3.6**
9	BASICWALL:0 .40	15	1.6	0.4	1	**4.8**
10	BASIC WALL:GENER IC-0.50	15	2	0.4	1	**6**
11	EXCAVATION	15.35	1.2	1.5	4	**110.5**

Table 13 ABSTRACT SHEET FOR GRAM PANCHAYAT

Table 14 COST EVALUATION FOR GRAM PANCHAYAT

SR NO.	Description	Quantity(m^3)	rate	per	Amount
1	WALL	23.63	4590	Ft^2	**108461**
2	DOOR	-	5*6000	-	**30000**
3	WINDOW	-	4*2400	-	**9600**
4	ROOF	15.61	3500	m^3	**54635**
5	FLOOR	15.49	3500	m^2	**54215**
6	EXCAVATION	110	350	m^3	**37000**
7	PCC	7.368	3500	m^3	**28770**
8	BASIC WALL:00 .30	3.6	90	Ft^2	**11520**
9	BASICWALL:0.4 0	4.8	90	Ft^2	**11520**
10	BASIC WALL:GENERI C-0.50	6	90	Ft^2	**11520**

			GRAND TOTAL	**356327**

CIVIL DESIGN -8.6 CREMATORIUM COMPLEX FOR MODAJ VILLAGE

There are two crematorium complexes which exists in village and after surveying and interactionswith villagers there is a need of crematorium complex.

After talking with sarpanch and talati of modaj village and discussing with them we have kept our view infront of them and they have accepted our views on crematorium complexes.

Here are our proposed design with PLAN , SECTION ,ELEVATION and 3-D VIEW of designs:

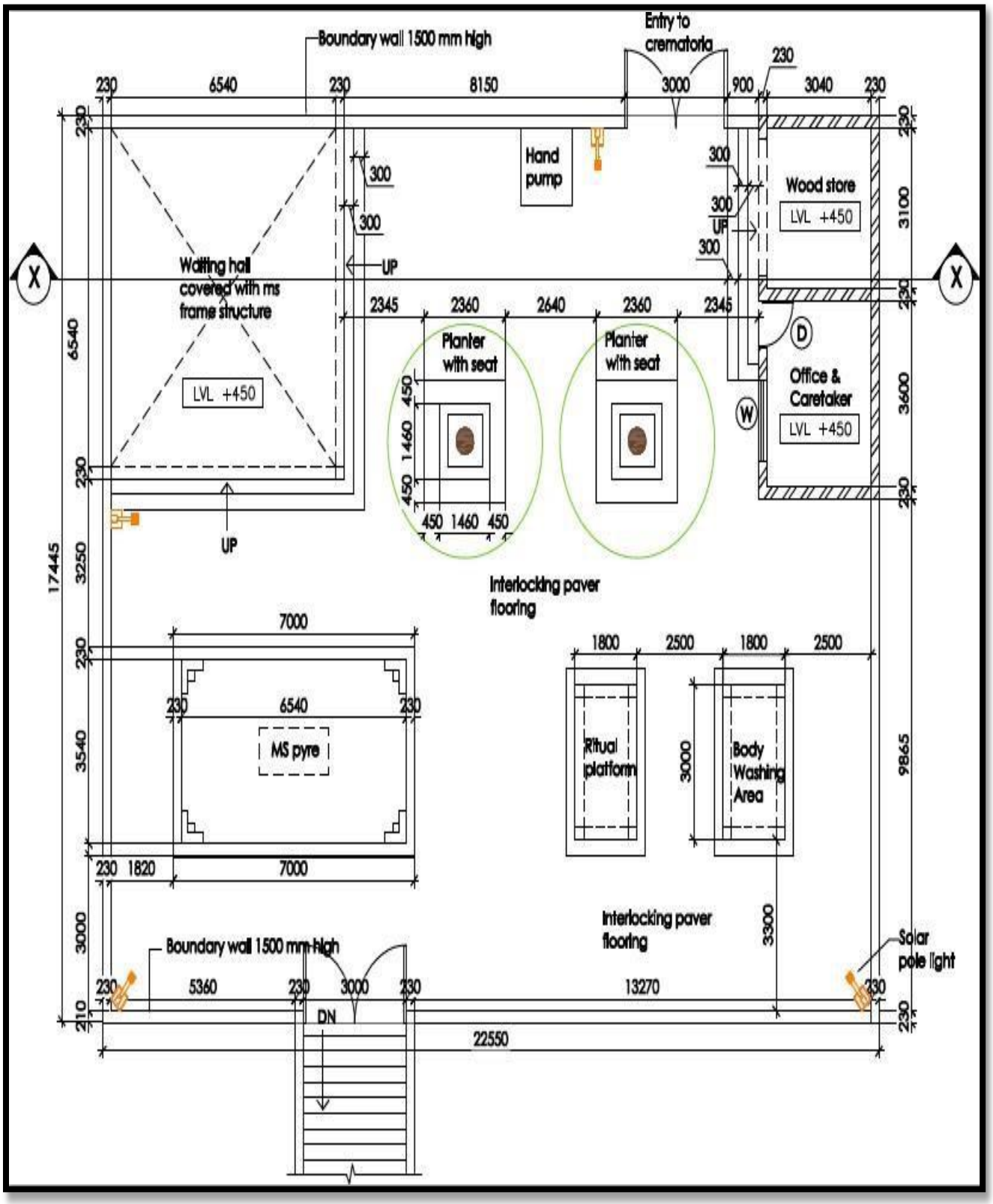


Figure 77 PLAN FOR CREMETORIAL COMPLEX

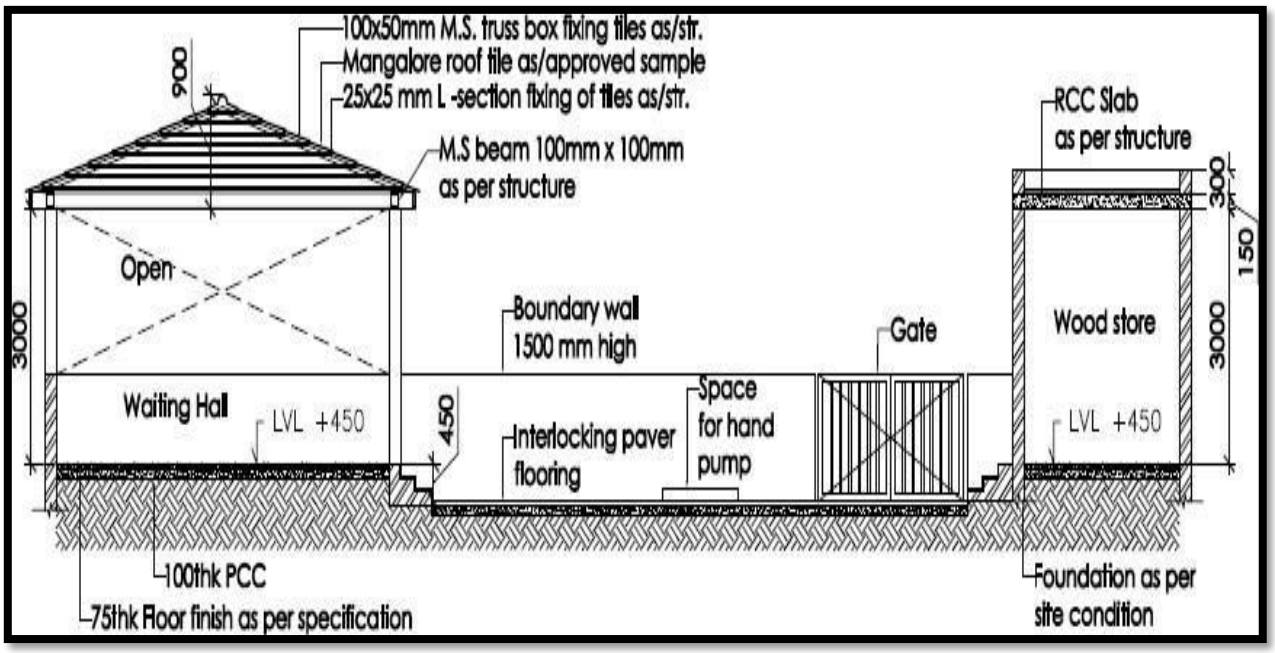


Figure 78 SECTIONAL ELEVATION OF CREMETORIAL COMPLEXTable 15 COST

EVALUATION FOR CREMATORIUM COMPLEX

SR NO'	COMPONENTS	APPROX' SIZE	COST
1	PLANTER	2.36 X 2.36	25,350
2	RITUAL PLATFORM	1.80 X 3.0	29,184
3	BODY WASHING AREA	1.80 X 3.0	29,185
4	CARE TAKER ROOM	3.6 X 3.04	2,12,000
5	WOOD STORE	3.1 X 3.04	1,80,500
6	WAITING HALL	6.54 X 6.54	3,03,627
7	COMPOUND WALL	PER mt LENGTH	4,952
8	PAVER BLOCKS	PER sq LENGTH	622
			7,85,420

Electrical design 1:

Wireless Industrial device remote control using RF base multichannel:

In today's competitive market, Industries are facing the growing demands for improving process efficiencies, comply with environmental regulations, and meet corporate financial objectives. Given the increasing age of many industrial systems and the dynamic industrial manufacturing market, intelligent and low-cost industrial automation systems are required to improve the productivity and efficiency of such systems. Traditionally, industrial automation systems are realized through wired communications. However, the wired automation systems requireexpensive communication cables to be installed and regularly maintained, and thus, they are notwidely implemented in industrial plants because of their high cost. Therefore, there is an urgentneed for cost-effective wireless automation systems that enable significant savings by optimizing the management of industrial systems.

The aim of the system is to provide a cost effective solution that will provide controlling of home or industrial appliances remotely and will also enable security against intrusion in the absence of owner. In this technique there is no limitation of controlling of devices not to switching but also to vary the speed of fan or controlling speed of AC or DC motors in industries. In this project implementation, only one remote can control up to 9999 devices and three Dimmers, it may be AC or DC Motors of 230 V. These dimmers speed can be separately vary and controls two dc motorsin bidirectional speed that is in forward or revere directions also.

This provides high speed and more flexibility. It has multiple ports so connection and control of multiple devices is possible. Its practical implementation is very easy and RF module range is very high so it can control long range easily. This system can be used for industrial based automation systems, also used in small scale industries or used in offices or for Home appliances. This can also be used in Security, Data Networking, Relay controlled devices and Robotics manufacturing systems.

Main controlling components:

1. Main Microcontroller Module
2. Dimmer Controller Module

3. Liquid Crystal Display Module
4. 12V DC Motor Module
5. Triac Switching Module

1. Main Microcontroller module:

The main board contains ARM7, the main board controller consists of 64 Pins and the crystal frequency is 12MHz for specific baud rate i.e. 9600 Bps. The ARM7 board is not directly connected to RF receiver module dueto voltage difference of receiver i.e. it works on 5V and ARM7 board or its Port works on only 3.3V so we used opto-coupler and transistor based circuit for voltage level shifting.

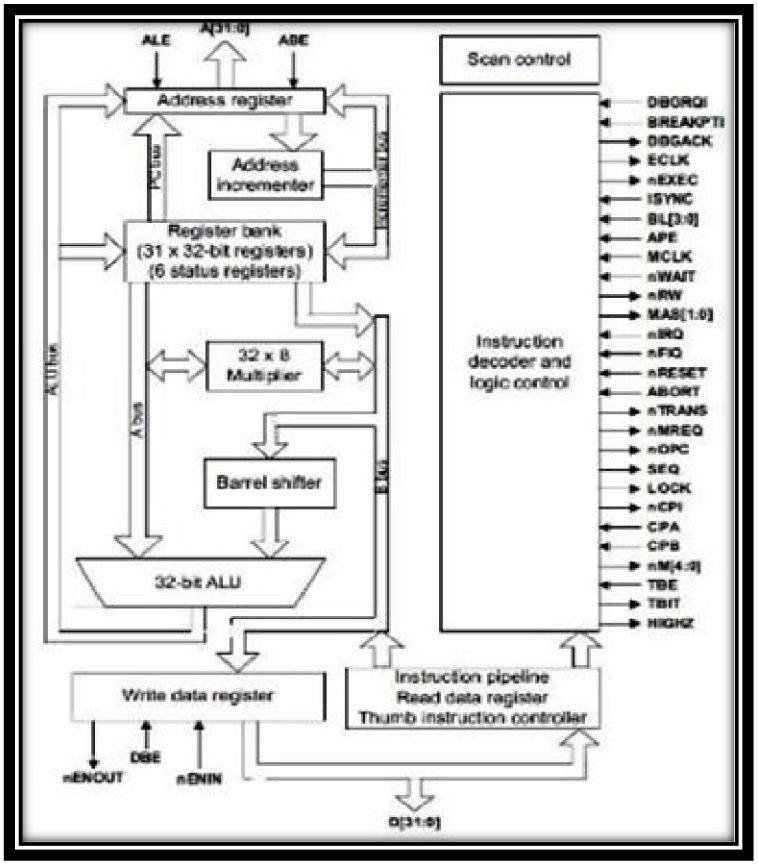


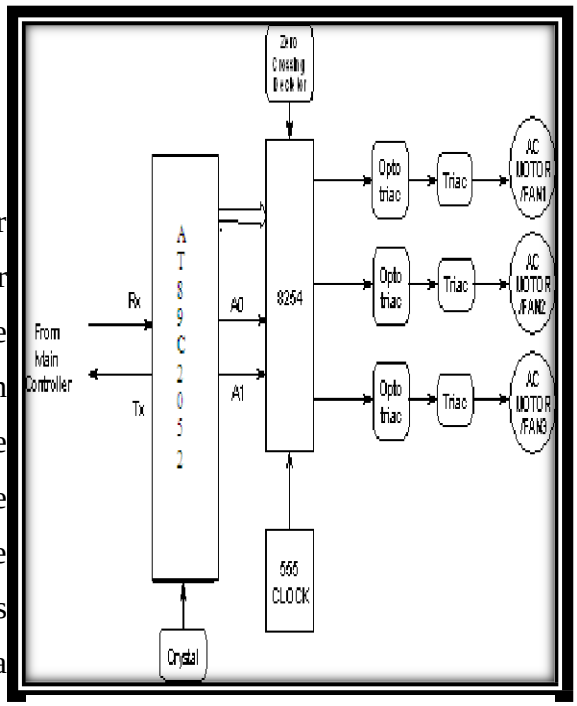
Figure 79 MAIN CONTROLER MODULE CIRCUIT

(Figure: Block diagram of ARM7 board)

Dimmer board controller is connected to Tx & Rx pin for serial data communication. In this controller, there is no need of port initialization for I/P Or O/p. It receives the data from RF modules in Four BIT and controlling other microcontrollers in specific serial BAUD rate and switching the triac devices that is in only ON/OFF state.

For the purpose of ventilation or gate controlling or automation of industrial devices the D.C. motor is used. The motor driver Circuit is connected to the ARM7 board of controller and controlling command is given from main controller, first it selects which motor to run & then controls it in both directions i.e. forward or reverse directions.

2. Dimmer Controller Module:



The dimmer controller board controls FANs or an AC/DC motor.

This board consists of AT89C2052 controller and 8254 for controlling TRIAC and 555 astable circuit is used for generating frequency for 8254 chip. These chips have three outputs for Triac triggering. Each channel and mode selection is on pin A0 and A1, and pin data bus and read / write pin are connected to AT89C2052 microcontroller andall gate pins are connected to zero crossing circuit. The o/p is connected to the opto triac i.e. moc 3021 for isolated circuit. Serial port is connected to the main board controller for data communication.

3. Liquid Crystal Display Module

There are various different controlling sections so it can be displayed on Liquid Crystal Display (LCD) Display. Whenever we select mode, it show entering mode and controlling value. LCDs can add a lot to your application in terms of providing a useful interface for the user, debugging an application or just giving it a "professional" look. The most common type of LCDcontroller is the Hitatchi 44780 which provides a relatively simple interface between a processor and an LCD.

Figure 81 L.C.D DISPLAY

4. DC motor module

In DC Motor Module, ULN2003A is used for driving 12V DC relay. The ULN2003 is a high voltage, high current Darlington arrays each containing seven open collector Darlington pairs with common emitters. Each channel rated at500mA and can withstand peak currents of 600mA. Suppression diodes are included for inductive load driving and the inputs are pinned opposite the outputs to simplify board lay out .

In this chip there are seven channels but we use donly four channels for four relays for controllingtwo DC motors. For first motor, first relay is for ON/OFF motor and combination of first and second relay is used for forward or reverse directions. Similarly, for second motor, third relay is for ON/OFF motor and combination of third and fourth relay is used for forward or reverse directions.

5. Traic Switching module

The triac switching module is used to switching ON/OFF of the controller as they are quite reliable, flexible and inexpensive remote lighting control system. The hardware and software design are presented. The experimental results have shown that this wireless technology is suitable for wireless control in home lighting and proved that the new wireless network has a more vast range of prospects in home automation and industrial control. When we select this mode, data fromARM7 board is send to serial to parallel converter and it triggers the Triac to switch the output devices i.e. makes it ON/OFF. For isolation purpose opto triac is used between serial to parallel converter and Triacs. In this way, we are going to connect up to 9999 devices.

- **RF Remote Control**

Radio frequency has traditionally been used toremotely control barriers, automatic gates & doors, industrial access control systems and motorized gates & doors by utilizing hand held transmitters and remote receivers.

1. RF Transmitter module

- Transmitter Range: 500m
- Supply Power: DC 12V Battery
- Operating Current: 15-40mA
- Frequency: 433MHz

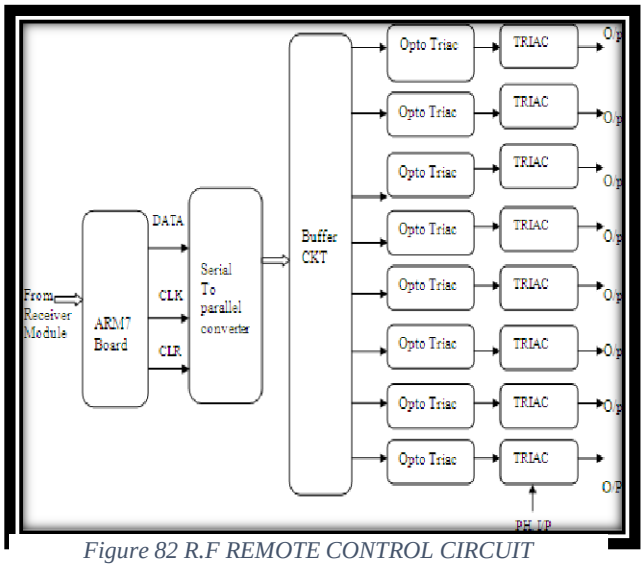


Figure 82 R.F REMOTE CONTROL CIRCUIT

2.RF receiver module

- Operating Voltage: 5 V DC
- Operating Current: 5 mA
- Receiving Sensitivity: -103 dbm
- OperatingFrequency:315MHz/433MHz selectable
- Transfer Rate: 4.8K
- Modulation
- Output: TTL

Table 16 Cost analysis based on controlling 5 devices

Component	Unit cost	Quantity	Total cost
ARM7 microcontroller	2450	5	12,250
Dimmer board	700	5	3500
LCD display	200	5	1000
DC motor module	800	5	4000
TraFFic switching module	450	5	2250
RF transmitter module	400	5	2000
RF receiver module	400	5	2000
		GRAND TOTAL	**27,000**

Electrical design 2:
High speed protection based programmable current relay.

Numerical relays or Digital relays are the latest development in the area of protective relays. The distinction between digital and numerical relay rests on points of fine technical detail, and is rarely found in areas other than protection. They can be viewed as natural developments of digital relays as a result of advances in technology. Typically, they use a specialized digital signal processor (DSP) as the computational hardware, together with the associated software tools. These relays acquire the sequential samples of the ac quantities in numeric (digital) data form through the data acquisition system and process the data numerically using an algorithm to calculate the fault discriminates and make trip decisions. The digital protective relay, or numeric relay, is a protective relay that uses a microprocessor to analyze power system voltages, currents or other process quantities for the purpose of detection of faults in an industrial process system. These convert voltage and currents to digital form and process the resulting measurements using a microprocessor. The digital relay can emulate functions of many discrete electromechanical relaysin one device, simplifying protection design and maintenance. Each digital relay can run self-testroutines to confirm its readiness and alarm if a fault is detected. Numeric relays can also provide functions such as communications (SCADA) interface, monitoring of contact inputs, metering, waveform analysis, and other useful features. Digital relays can, for example, store two sets of protection parameters, which allow the behavior of the relay to be changed during maintenance of attached equipment. Digital relays also can provide protection strategies impossible to synthesize with electromechanical relays, and offer benefits in self-testing and communication tosupervisory control systems. A microprocessor by itself cannot perform a given task, but must beprogrammed and connected to a set of additional system devices such as microprocessor which acts as CPU, memory and input/output devices interconnected for the purpose of performing somewell-defined task called microcomputer or microprocessor-based system as shown in figure. The single chip microcomputer is called “microcontroller”. The interconnection of different components, which is a primary concern in the design of a microprocessor- based system, must take into account the nature and timing of the signals that appear at the interfaces between components. The overall task of connecting I/O devices and microprocessor is termed as “interfacing”.

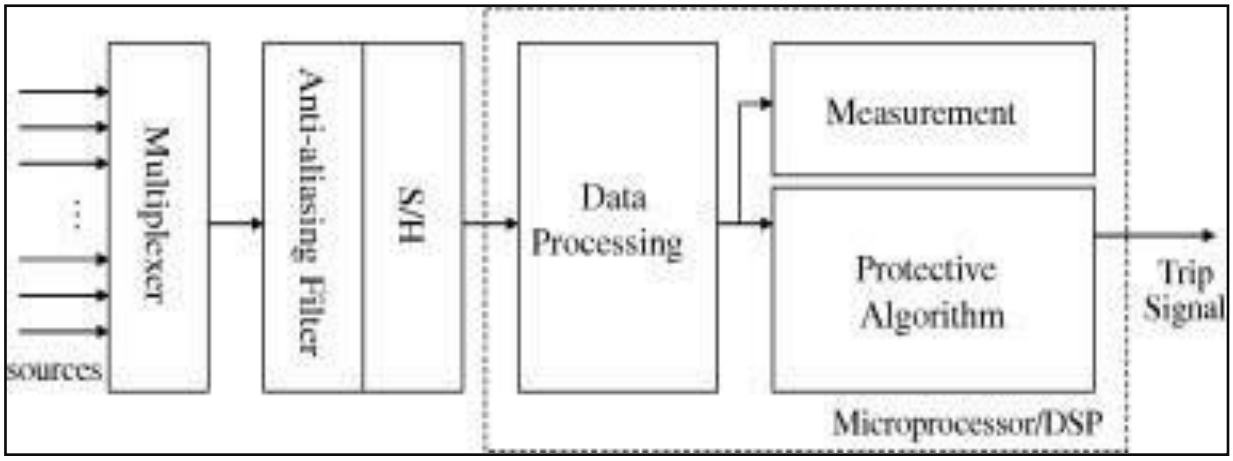


Figure 83 BLOCK DIAGRAM FOR MICROPROCESSOR BASED RELAY

- Problems formulation

Electrical power system protection is required for protection of both village people or user and the equipment from the fault, hence electrical power system is not allowed to operate without any protection devices installed. Power system fault is defined as undesirable condition that occurs in the power system. These undesirable conditions such as short circuit, current leakage, ground short, over current and over voltage. The functional security of the power grid depends upon the successful operation of thousands of relays that may be used in protective scheme for preventing the power system from cascading failures. The failure of one relay of the protective scheme to operate as intended may imbalance the stability of the entire power grid and hence it may lead thewhole system to blackout. In fact, major power system failures during a transient disturbance are more likely to be caused by unnecessary protective relay tripping rather than by the failure of a relay to take action. In other words, the performance of protective relay or system is very importantto be known especially in smart power grid. In other words, the performance of protection systemis measured by several criteria including reliability, selectivity, speed of operation, etc. Reliability has two aspects: dependability and security. Dependability is known as the degree of certainty thata relay system will operate correctly when there is a fault on the system. Security is the degree ofcertainty that a relay will operate unnecessary even when there is no fault on the system.

Normally, villages have protective equipment or there is no up gradation in their protective device. Mostly usage of fuse is more for the protection of household equipment and electromechanical or static relay are used which have several disadvantages therefore use of

programmable relay is adapted more and should also be implemented in rural areas to improve their safety.

Components of Microprocessor based/programmable over current relay

An over current relay is the simplest form of protective relay which operates when the current in any circuit exceeds a certain predetermined value, i.e. the pick-up value. It is extensively used for the protection of distribution lines, industrial motors and equipment. Using a multiplexer, the microprocessor can sense the fault currents of a number of circuits. If the fault current in any circuit exceeds the pick-up value, the microprocessor sends a tripping signal to the circuit breaker of the faulty circuit. As the microprocessor accepts signals in voltage form, the current signal derived from the current transformer is converted into a proportional voltage signal using a current to voltage converter. The ac voltage proportional to the load current is converted into dc using a precision rectifier. Thus, the microprocessor accepts dc voltage proportional to load current. The schematic block diagram of the relay is shown in figure. The microprocessor accepts signal in digital form. Therefore analog signals must be converted into digital form before feeding them to the microprocessor for processing. Both voltage and current are analog quantities. As the microprocessor accepts only voltage signal in digital form, the current signal is first converted into proportional voltage signal and then the voltage signal is converted into digital form for applyingto the microprocessor. AnA/D converter is used to convert analog signals into digital forms. If more than one analog quantity is to be converted into digital form by using only one A/D converter,analog multiplexers are used to select any one analog quantity at a time for A/D conversion. The output of the rectifier is fed to the multiplexer. The microcomputer sends a command to switch onthe desired channel of the multiplexer to obtain the rectified voltage proportional to the current ina particular circuit. The output of the multiplexer is fed to A/D converter to obtain the signal in digital form. The A/D converter ADC0800 has been used for this purpose. The microcomputer sends a signal to the ADC for starting the conversion. The microcomputer reads the end of conversion signal to examine whether the conversion is over or not. As soon as the conversion is over, the microcomputer reads the current signal in digital form and then compares it with the pick-up value. For time-varying voltages such as ac voltage, a sample and hold circuit is used to keep the desired instantaneous voltage constant during conversion period. Components are listed below:

- Microcontroller
- Multiplexer
- Analog to Digital converter
- Rectifier
- I to V converter

Figure 84 CIRCUIT EXPLAINING RELAY PROCESS

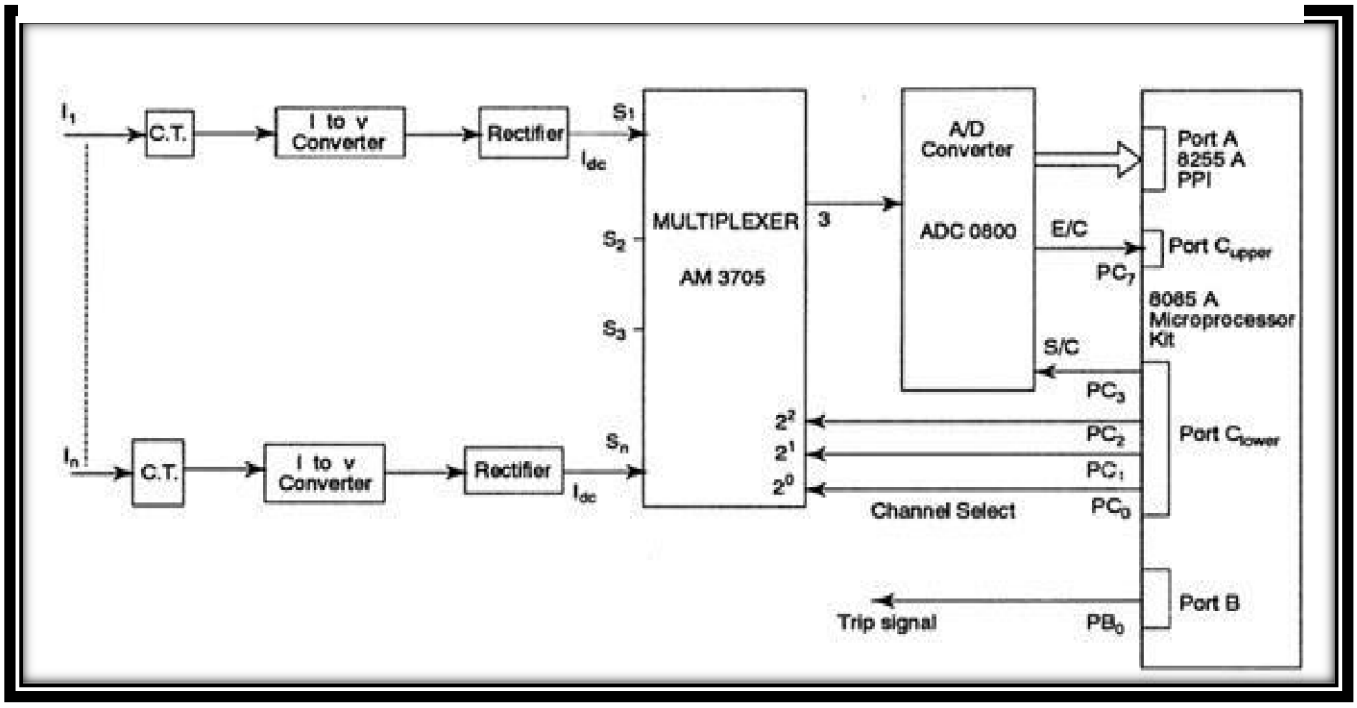


Table 17 Cost analysis for one relay is shown but in when it is used numbers of relays are used:

Component	Unit cost	Quantity	Total cost
Microcontroller	300	1	300
Multiplexer	780	1	780
A/D converter	2500	1	2500
Rectifier	350	2	700
I to V converter	3500	2	7000
CT	1200	2	2400
		GRAND TOTAL	**13680**

ELECTRICAL DESIGN-3

Central Control unit for Irrigation water Pumps Construction

This undertaking points in giving a client friendly, reliable and computerized water siphoning framework for illiterates. Now a days innovation is running with time, it totally busy with way of life of human beings. Even however there is such a significance for innovation in our normal life there are even individuals whose ways of life are far to this notable term technology. So it's our duty to plan not many dependable frameworks which can be even productively utilized by them. This base thought brought forth the venture development of focal control unit for water system water siphon regulator for illetrates and this task points in bringing the robotization innovation into lives of the illetrates.

Automation is the most frequently spelled term in the field of electronics. The hunger for automation brought many revolutions in the existing technologies. One among the technologies which had greater developments is RF communications. The result of this is the RFID cards which transmit a unique identification number. This number transmitted by the RFID can be read with the help of a RF reader.

Here the automation process is done through the wireless RF technology. The RFID reader at the central control unit decodes the RFID tag of that particular user and fed this information as inputto the microcontroller unit. The microcontroller transmits the information wirelessly through RF transmitter, to the RF receiver of the users exact water pump connected to the microcontroller. The microcontroller takes the responsibility of controlling the water pump using relay.

In our project we make use of three microcontrollers two are dedicated at the two water pumps and the other with the user at the central control unit. The design of this system is very much sensitive and should be handled with utmost care because the microcontroller is a 5 volts device and it is employed to monitor the house hold power consumption per day where it should be interfaced with a 240 volts energy meter. So every small parameter should be given high importance while designing the interfacing circuit between the controller and the water pump.

The major advantage of this device is, it can be operated by the illiterates and the status of the motor can also be known by a simple LED indication more over the device is very economical and can be brought available to the common man.

ADVANTAGES TO USER:-

1. User friendly interfacing.
2. Controls high voltage water pumps.
3. Identification of water pumps through RFID technology.
4. Wireless control of remote water pump using RF technology.
5. Feedback generated with the help of LED indicator.
6. Highly sensitive.

LOCATION:-

1. Utilized for irrigation purpose.
2. For house hold automations.

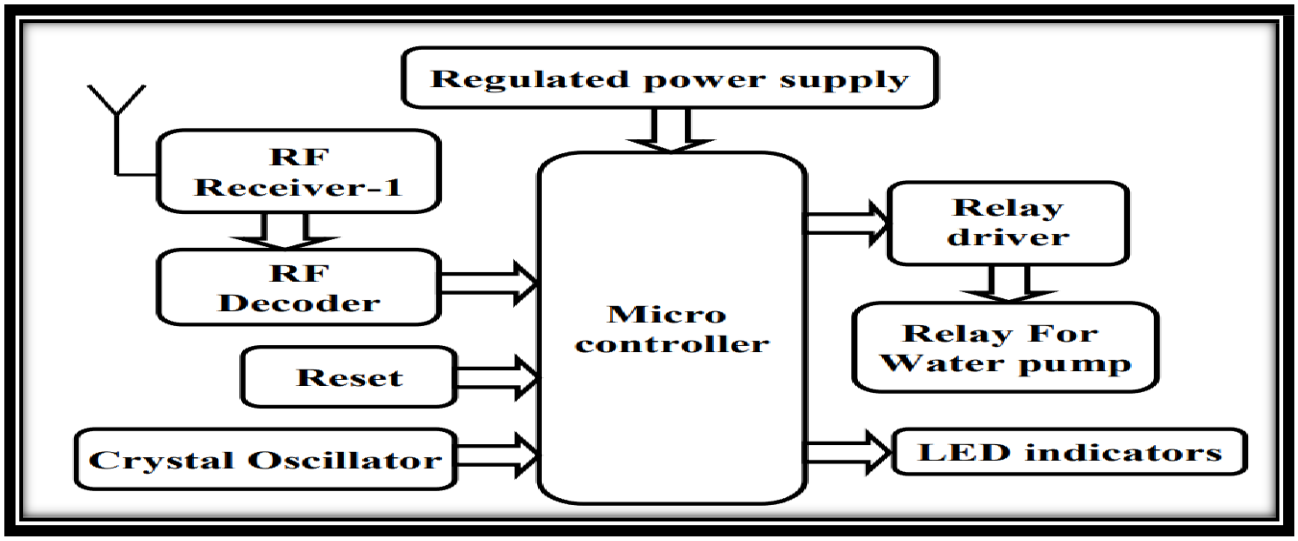


Figure 85 Construction of central control unit for Irrigation water pumps-1

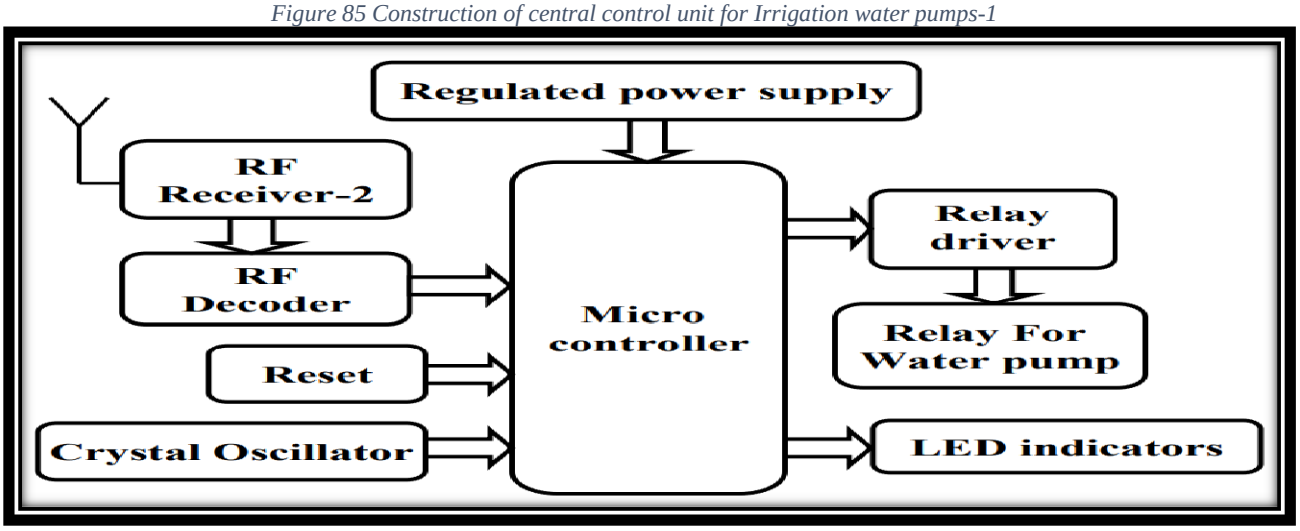


Figure 86 Construction of central control unit for Irrigation water pumps-2

Table 18 Costing for Central Control unit for Irrigation water Pumps Construction

COMPONENT	UNIT COST	QUANTITY	TOTAL COST
LED indicators	120	20	**2400**
Crystal oscillator	400	8	**3200**
Control buttons	1240	6	**7440**
LCD with driver	4440	4	**17,760**
RF transmitter and RF receivers	100	16	**1600**
Microcontrollers	299	14	**4186**
		GRAND TOTAL	**36,586**

CHAPTER: 9
Proposing Designs for Future Development of the Village for Part IIDesign

1. Public Garden:

In the Modaj village there is no any recreational area existing. So that for the better living standard and entertainment purpose we have proposed one design of public garden as recreational area in the village.

2. Automatic Intelligent Street Light which work on vehicle movement:

This design helps to detect the movement of a vehicle on highways or roads to turn ON the lights when the vehicle is ahead of the lights, and to turn OFF the glowing light when the vehicle passes away from the lights. By using this project we can conserve the energy.

3. Bus Stop

There is major need of repair of existing bus stop so for that we are proposing the design for a new and an efficient bus stop.

4. Super Market

There is a need of super market in village because there should be only one place to buy and takeof groceries because in existing time there are many places were they can open markets and that create lot of pollution and garbage and we think that if there would one place people can come atone place to buy and people in market can also keep market clean.

5. Modaj Pond in village:

There is a pond which is very bad condition in village we want to renovate that pond and also want to make something that attract that place.

6. Chabutra

Chabutra is needed inn village beneath Village main trees where people can sit, enjoy and can shadow with natural cold air.

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

- The intention of Vishwakarma Yojana is to raise the way of life of the country zones to itsspecific degree up to the degree of an ideal town circumstance.
- It is a successful government plan to build up the rustic zones under efficient expense with great functionality and effectiveness during its utilization. The undertaking will in generalimprove the physical, social just as socio-social parts of the town by executing and ad libbing different foundations concerning lesser or least impediment to its country realness.

- The primary point is to create town with a "rustic soul" yet with all metropolitan conveniences that a city may have. This task gives "Plan TO DELIVERY" answers for improvement of towns in "RURBAN" zones.
- Particularly in our allocated village, we are eyeing towards providing the basic necessitiesto the villagers by improving the existing infrastructure and spreading awareness among the village regarding eco- friendly development.

- While visiting the ideal village we started comparing it with our allocated village that is modaj and Hathijan is the ideal village, we found that modaj lacks at socio infrastructure compare to Hathijan village.
- Hence by visiting ideal village we get certain good ideas that can be applied on our allocated village additionally some requirements were also observed during the visit of smart village.
- Various problems were observed during the visit of allocated village such as broken streetpole and street lights the infrastructure is not well maintained and has old design and the new projects were delayed,
- By implementing the proposed design many day to day life problems can be resolved andthe village people will not migrate to city. In addition it will result in development of villageand make it more prosperous.
- The Modaj village mainly lacking at the socio-infrastructure as there are no community hall, parks or any other recreational area present.

CHAPTER 11

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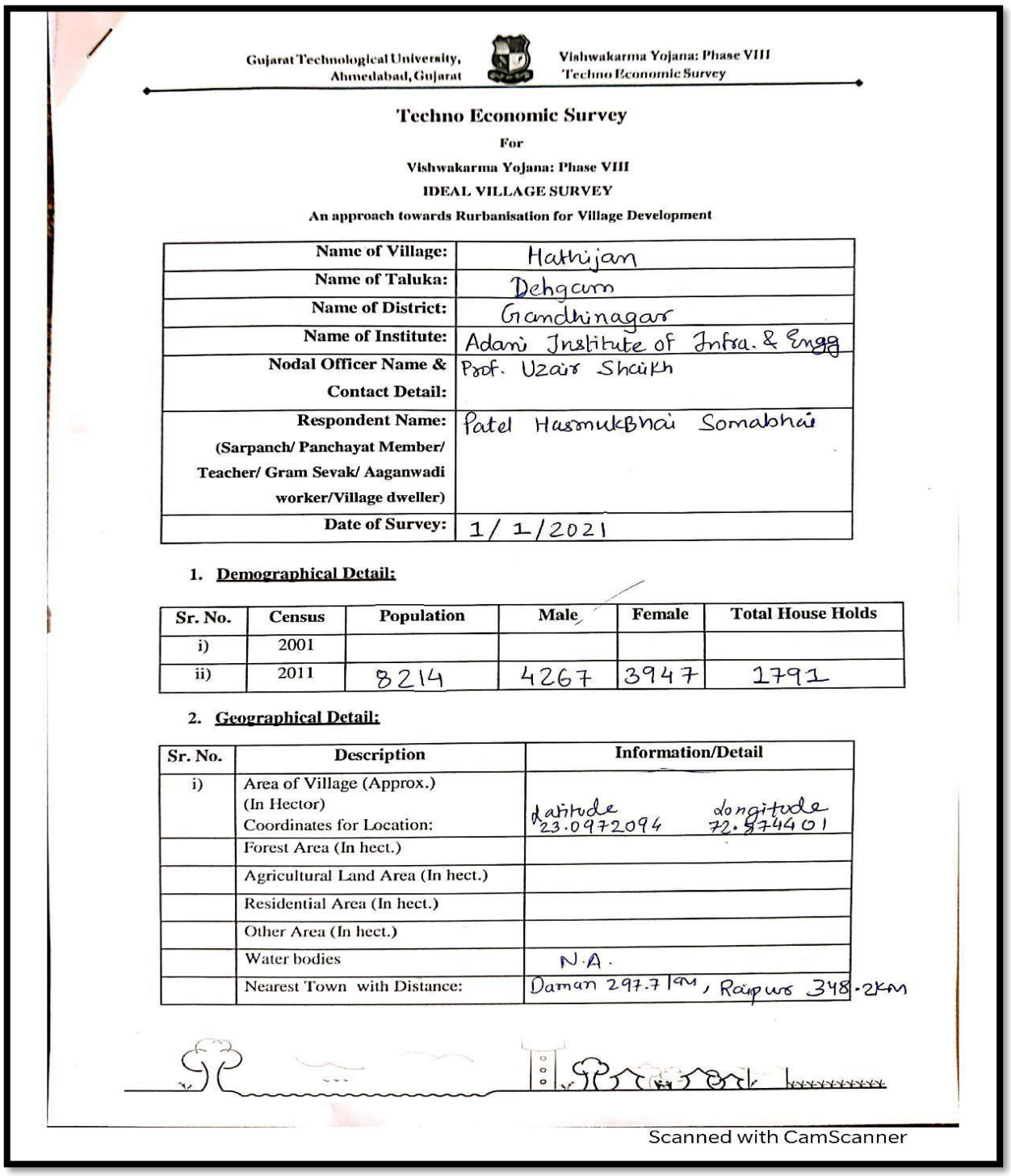
CHAPTER 12

ANNEXURE ATTACHMENT

12.1 Survey form of Ideal Village Scanned copy attachment



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

For

Vishwakarma Yojana: Phase VIII

IDEAL VILLAGE SURVEY

An approach towards Rurbanisation for Village Development

Name of Village:	Hathijan
Name of Taluka:	Dehgam
Name of District:	Gandhinagar
Name of Institute:	Adani Institute of Infra. & Engg
Nodal Officer Name & Contact Detail:	Prof. Uzair Shaikh
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Patel HasmukBhai Somabhai
Date of Survey:	1/1/2021

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001				
ii)	2011	8214	4267	3947	1791

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	Latitude 23.0972094 Longitude 72.5744 01
	Forest Area (In hect.)	
	Agricultural Land Area (In hect.)	
	Residential Area (In hect.)	
	Other Area (In hect.)	
	Water bodies	N.A.
	Nearest Town with Distance:	Daman 297.7 KM, Raipur 348.2 KM

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3. Occupational Details:

Name of Three Major Occupation groups in Village	1. Agriculture 2. Government jobs 3. Private businesses

4. Physical Infrastructure Facilities:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
	• Tap Water (Treated/ Untreated)	Yes	✓		
	• RO Water	No			
	• Well (Covered/ Uncovered)	Yes		✓	
	• Hand pumps	Yes	✓		
	• Tube well/ Borehole	Yes	✓		
	• River/ Canal/ Spring/ Lake/ Pond	Yes	✓		
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: Max. 2.3/ac	✓		
	Underground Sump	Capacity: Max. 1.5/ac	✓		
Suggestions if any:					
C.	**Drainage Facility**				
	Available (Yes/ No)	Yes	✓		
Suggestions if any:					
D.	**Type of Drainage**				
	Closed/ Open	Closed	✓		—
	If Open than Pucca / Kutchcha	—			—
	Whether drain water is discharged directly in to Water bodies/ Sewer plants	Yes	✓		—
Suggestions if any:					

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E.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	W.B.M	✓		—
	Main road	RCC	✓		—
	Internal streets	Pavers/W.B.M	✓		—
	Nearest NH/SH/MDR/ODR Dist. in kms.	SH- (1Km)	✓		—
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No (Gandhinagar Railway Station)		✓	
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes	✓		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	(Auto/ private vehicles)	✓		—
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	MGVCL (Almost 24 hrs)	✓		
	Power supply for Domestic Use	Yes	✓		—
	Power supply for Agricultural Use	Yes	✓		—
	Power supply for Commercial Use	Yes	✓		—
	Road/ Street Lights	Yes	✓		—

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	Electrification in Government Buildings/ Schools/ Hospitals	Yes	✓		—
	Renewable Energy Source Facilities (Y/ N)	No			—
	LED Facilities	No			—
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Yes (3)	✓		—
	Location Condition	1-Outside village 2, Inside (good)			
	Community Toilet (With bath/ without bath facilities)	No			—
	Solid & liquid waste Disposal system available	No			—
	Any facility for Waste collection from road	Door to door garbage collection	✓		—
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	Water tank, Well, Tube well etc	✓		—
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	60% - Pucca 40% - Kutcha	—		—

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks

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

L.	**Education Facilities:**				
	Aaganwadi/ Play group	Yes	✓		
	Primary School	Yes	✓		
	Secondary school	Yes	✓		
	Higher sec. School	Yes	✓		
	ITI college/ vocational Training Center	No			—
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	No			—
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					

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

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

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	General Market	Yes	✓		
	Shops (Public Distribution System)	Yes	✓		
	Panchayat Building	Yes	✓		
	Pharmacy/Medical Shop	Yes	✓		
	Bank & ATM Facility	Yes	✓		
	Agriculture Co-operative Society	Yes	✓		
	Milk Co-operative Soc.	Yes	✓		
	Small Scale Industries	No			
	Internet Cafes/ Common Service Center/Wi Fi	No			
	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	No No No No			
Q.	Any Other	—			

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	Not available in panchayat office

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Recent Projects going on for Development of Village	Not any
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 Toilet & Gram Panchayat requires maintenance. Else is in good condi.	—
2.	Additional Information/ Requirement	Not Any	—

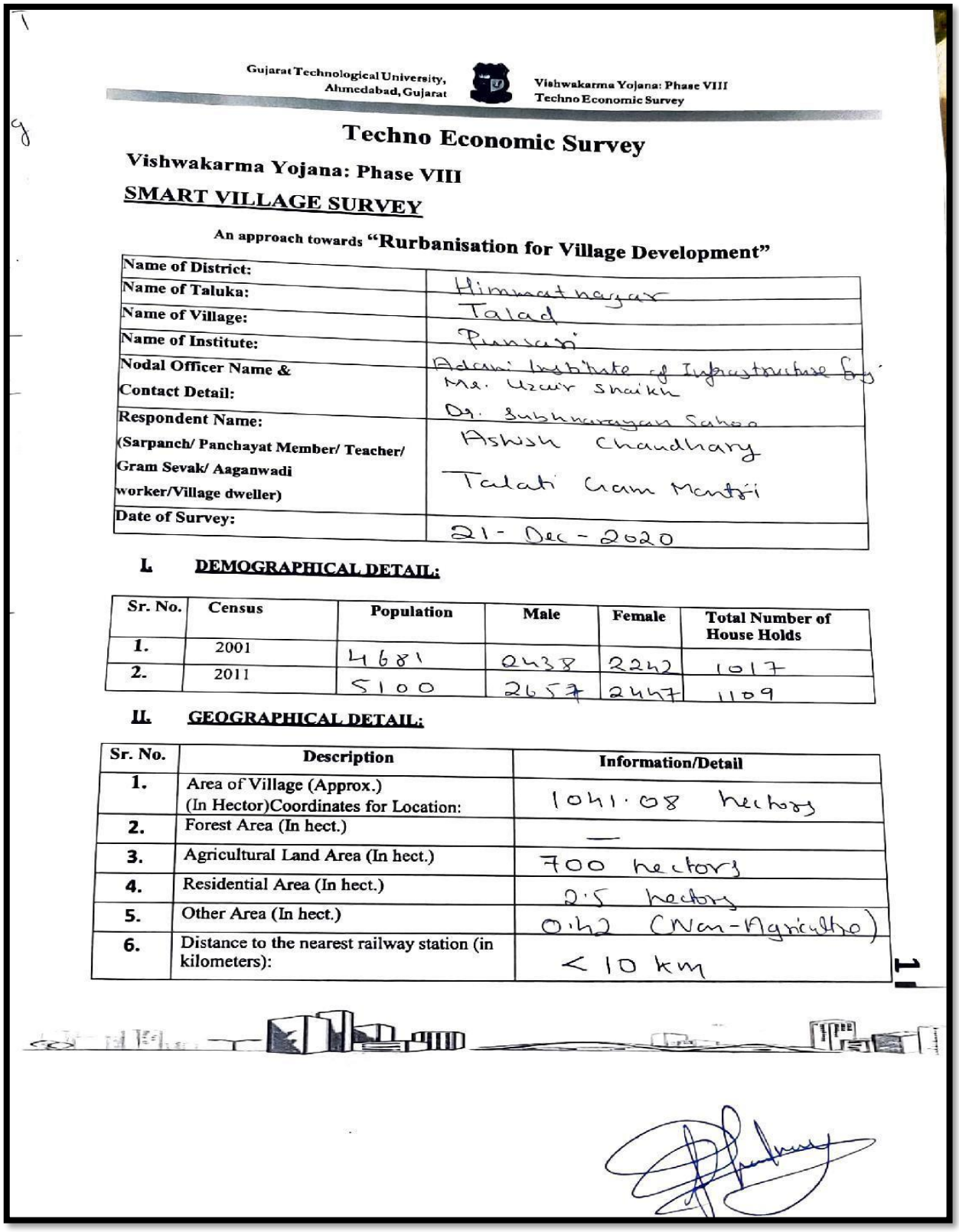
9. **Smart Village Proposal Design**

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Usage of Renewable Energy resource in village		

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

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

12.2 Survey form of Smart Village Scanned copy attachment



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

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

Name of District:	Himmatnagar
Name of Taluka:	Talad
Name of Village:	Punsari
Name of Institute:	Adani Institute of Infrastructure &
Nodal Officer Name & Contact Detail:	Mr. Uzair Shaikh Dr. Subhnarayan Sahoo
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Ashish Chaudhary Talati cum Mantri
Date of Survey:	21-Dec-2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	4681	2438	2242	1017
2.	2011	5100	2657	2447	1109

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1041.08 hectors
2.	Forest Area (In hect.)	—
3.	Agricultural Land Area (In hect.)	700 hectors
4.	Residential Area (In hect.)	2.5 hectors
5.	Other Area (In hect.)	0.42 (Non-Agriculture)
6.	Distance to the nearest railway station (in kilometers):	< 10 km

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7.	Name of Nearest Town with Distance:	24 km, taluk
8.	Distance to the nearest bus station (in kilometers):	Village itself has
9.	Whether village is connected to all road for the any facility or town or City?	Yes

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1.	Farming
	2.	Milk Production
	3.	Jobs / business
Major crops grown in the village:	1.	Bajra
	2.	Wheat
	3.	Groundnut

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

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

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	Power supply for Domestic Use	✓	✓		
	Power supply for Agricultural Use	✓	✓		
	Power supply for Commercial Use	✓	✓		
	Road/ Street Lights	✓	✓		
	Electrification in Government Buildings/ Schools/ Hospitals	✓	✓		
	Renewable Energy Source Facilities (Y/ N)	✓	✓		
	LED Facilities	✓	✓		

Suggestions if any:

G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Y			
	Location Condition	Good			
	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)				

Suggestions if any:

I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	10:90			

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Techno Economic Survey

	Power supply for Domestic Use	✓	✓		
	Power supply for Agricultural Use	✓	✓		
	Power supply for Commercial Use	✓	✓		
	Road/ Street Lights	✓	✓		
	Electrification in Government Buildings/ Schools/ Hospitals	✓	✓		
	Renewable Energy Source Facilities (Y/ N)	✓	✓		
	LED Facilities	✓	✓		

Suggestions if any:

G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Y			
	Location Condition	good			
	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)				

Suggestions if any:

I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	10:90			

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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	Yes	✓		
	CHC/RH	Yes	✓		
	District/ Govt. Hospital	Yes	✓		
	Govt. Dispensary	Yes	✓		
	Private Clinic	Yes	✓		
	Private Hospital/	No	–		
	Nursing Home	Yes	✓		
	AYUSH Health Facility	Yes	✓		
	sonography /ultrasound facility	Yes	✓		
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
	Suggestions if any:				
K.	**Education Facilities:**				
	Aaganwadi/ Play group	Yes	✓		
	Primary School	Yes	✓		
	Secondary school	Yes	✓		
	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: .....kms.				

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Suggestions if any:

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

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

Suggestions if any:

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

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

Suggestions if any:

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

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VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy	Yes Soft copy	✓		
2.	Recent Projects going on for Development of Village	Smart pickup stand			
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

8

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

IX. Smart Village / Heritage Details

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

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

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

12.3 Survey form of Allocated Village Scanned copy attachment

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Techno Economic Survey

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

An approach towards "Rurbanisation for Village Development"

Name of District:	Kheda
Name of Taluka:	Mehmdabad
Name of Village:	Modaj
Name of Institute:	Adani Institute of Infrastructure
Nodal Officer Name & Contact Detail:	Prof. Uzair Shaikh
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Niruba Juvansinh Chauhan, Chauhan Derusinh)
Date of Survey:	14/12/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	15745	7872	8014	3043

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	2200 hectares
2.	Forest Area (In hect.)	834795 hectares
3.	Agricultural Land Area (In hect.)	
4.	Residential Area (In hect.)	211334 hectares
5.	Other Area (In hect.)	
6.	Distance to the nearest railway station (in kilometers):	Nenpur railway station (8.29 Km)

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7.	Name of Nearest Town with Distance:	Mehmdabad (9 kms)
8.	Distance to the nearest bus station (in kilometers):	Mokwa Sardiya bus station (2.4km)
9.	Whether village is connected to all road for the any facility or town or City?	Yes, the village is directly connected to the state highway

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1. Agriculture 2. Private Jobs (Teachers, Poli 3. Businesses

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

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
1.	**PIPED WATER** Piped Into Dwelling Piped To Yard/Plot Public Tap/Standpipe Tube Well Or Bore Well	Borewell (22)			
2.	**DUG WELL** Protected Well Un Protected Well				
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring Rainwater Tanker Truck Cart With Small Tank				
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump				

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	Other(Specify) Lake/ Pond				

Suggestions if any:

B.	Water Tank Facility				
	Overhead Tank	Capacity:	NO		
	Underground Sump	Capacity:	YES		

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	2	✓		
	Main road	3	✓		
	Internal streets	More than 150	✓		
	Nearest NH/SH/MDR/ODR Dist. in kms.	State highway 3 (2 Kms)	Yes		

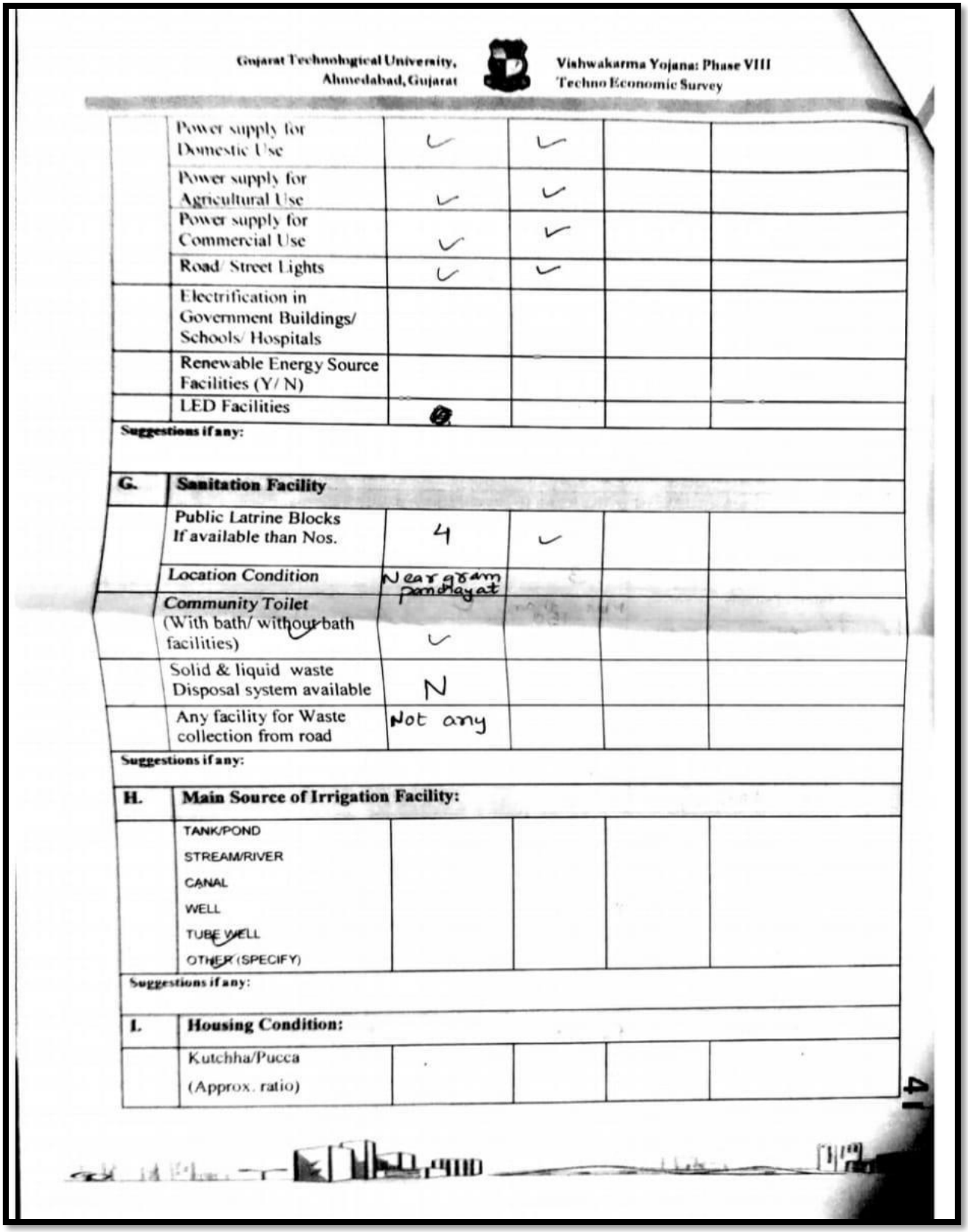
Suggestions if any:

E.	Transport Facility				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	N			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Y	Own bus station		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Private vehicles			

Suggestions if any:

F.	Electricity Distribution				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Private (MGVCL pvt. Ltd.)			

3



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	Power supply for Domestic Use	✓	✓		
	Power supply for Agricultural Use	✓	✓		
	Power supply for Commercial Use	✓	✓		
	Road/ Street Lights	✓	✓		
	Electrification in Government Buildings/ Schools/ Hospitals				
	Renewable Energy Source Facilities (Y/ N)				
	LED Facilities				

Suggestions if any:

G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	4	✓		
	Location Condition	Near gram pandhayat			
	Community Toilet (With bath/ without bath facilities)	✓			
	Solid & liquid waste Disposal system available	N			
	Any facility for Waste collection from road	Not any			

Suggestions if any:

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

Suggestions if any:

I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)				

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V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)				
	Sub-Centre				
	PHC				
	BLOCK PHC				
	CHC/RH				
	District/ Govt. Hospital				
	Govt. Dispensary	Prathmik Arogya Kendra			
	Private Clinic				
	Private Hospital/ Nursing Home				
	AYUSH Health Facility				
	sonography /ultrasound facility				
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	12			
	Primary School	7			
	Secondary school	1			
	Higher sec. School				
	ITI college/ vocational Training Center	Not Any			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	Not Any			

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

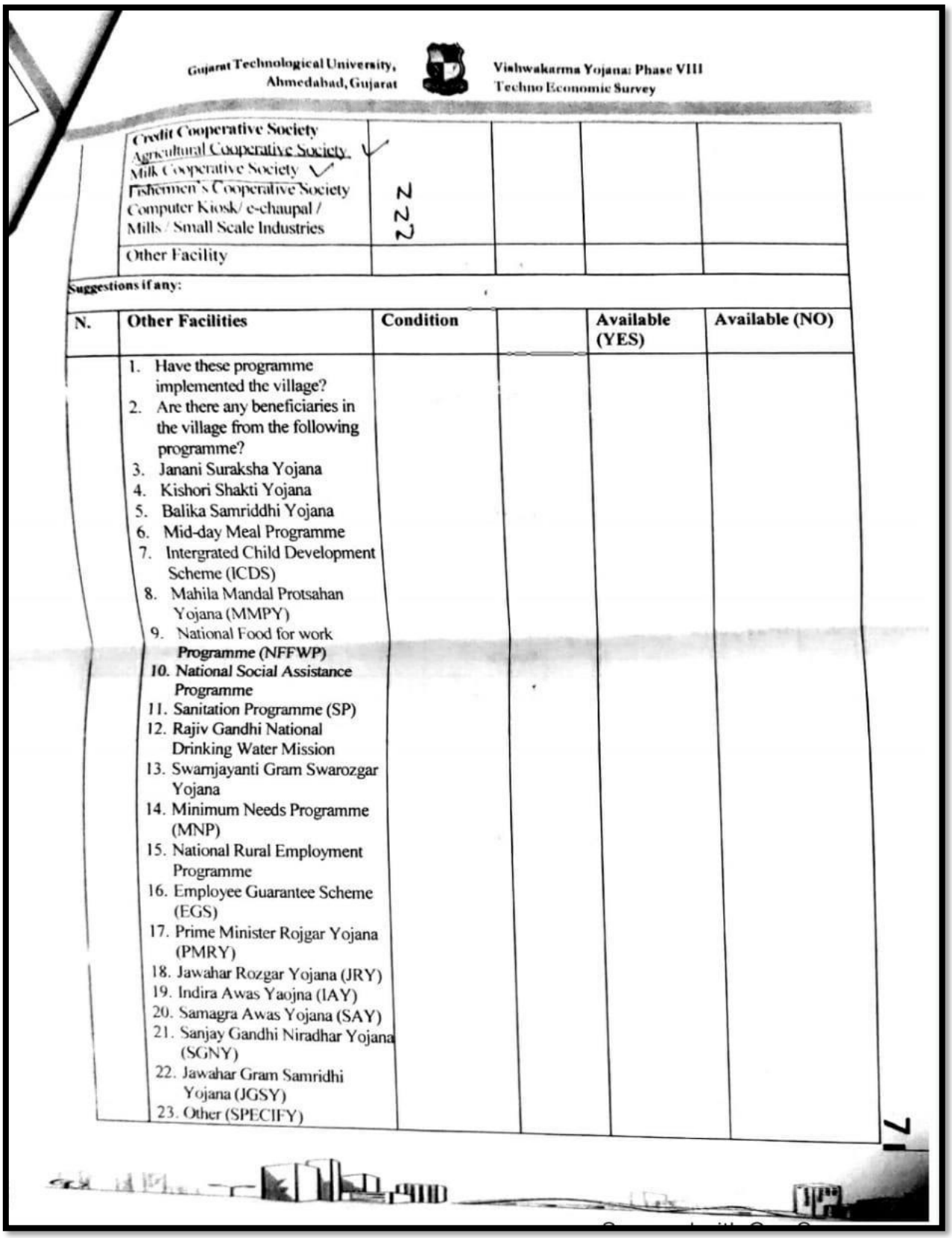
Suggestions if any:

L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)	It is in a bad condition with lack of amenities	Modaj		
	Public Library (With daily newspaper supply: Y/N)	N			
	Public Garden	N			
	Village Pond	Bad condition	Modaj		
	Recreation Center	N			
	Cinema/ Video Hall	N			
	Assembly Polling Station	N			
	Birth & Death Registration Office				

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

Suggestions if any:

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



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Credit Cooperative Society Agricultural Cooperative Society ✓ Milk Cooperative Society ✓ Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries	222			
Other Facility				

Suggestions if any:

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

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VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

VII. DATA COLLECTION FROM VILLAGE

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

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VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other	The primary school and a few anganwadi require internal maintenance.	
2.	Additional Information/ Requirement	N	
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	Twice a year cleaning is done	

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

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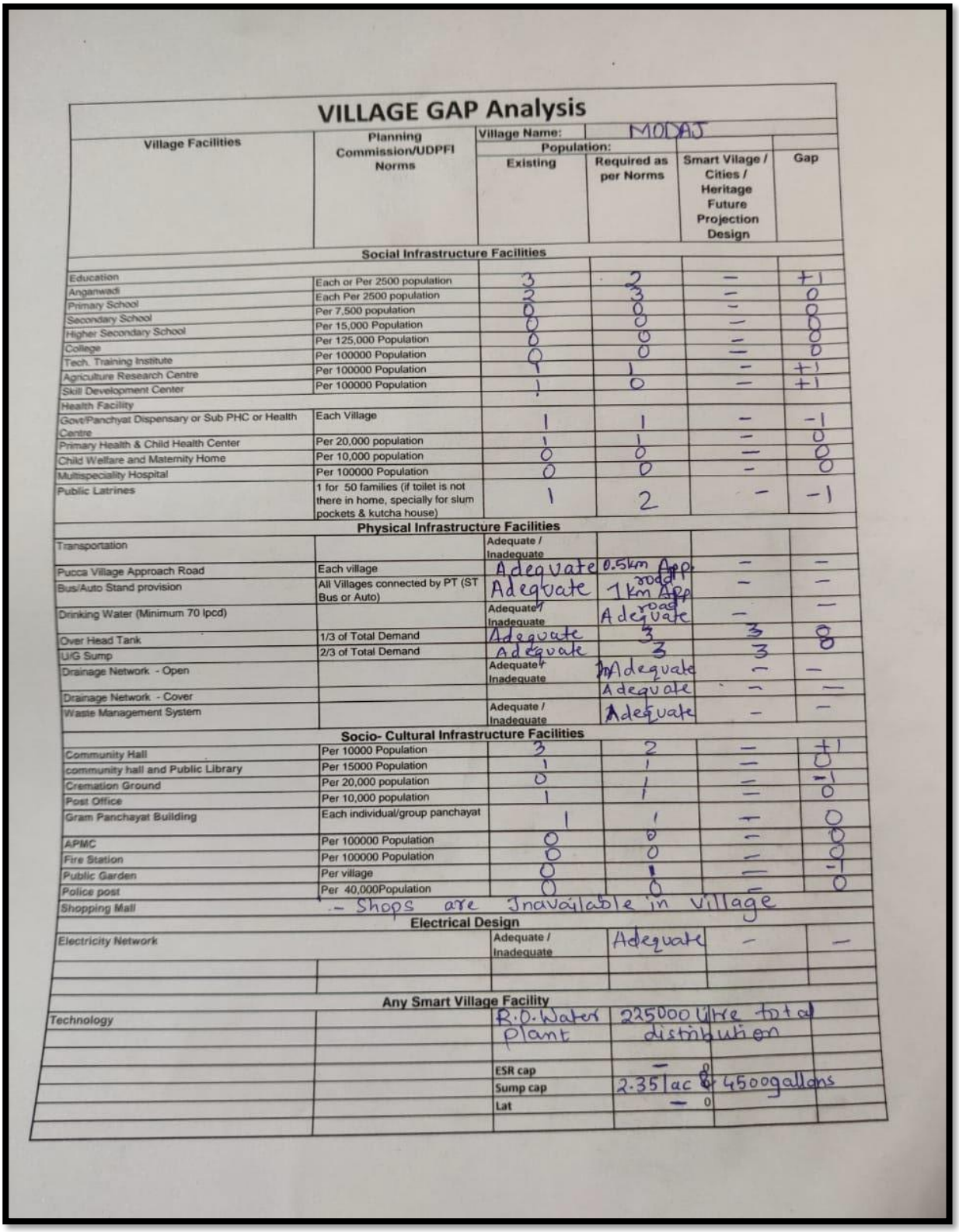
12.4 Survey form of Allocated Village Scanned copy attachment

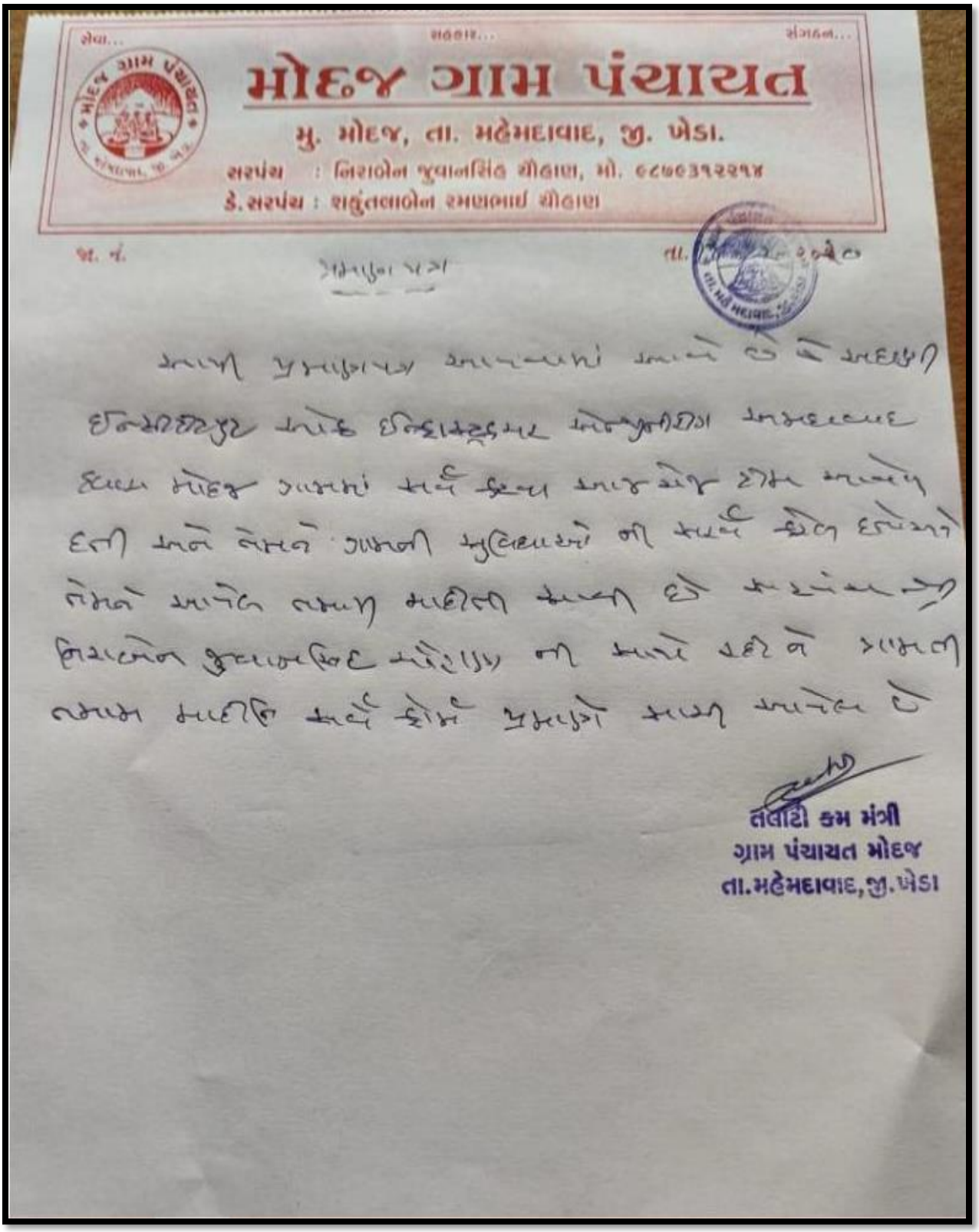


VILLAGE GAP Analysis

Village Name: MODAJ

Village Facilities	Planning Commission/UDPFI Norms	Population: Existing	Required as per Norms	Smart Vilage / Cities / Heritage Future Projection Design	Gap
Social Infrastructure Facilities					
Education	Each or Per 2500 population	3	3	–	+1
Anganwadi	Each Per 2500 population	3	3	–	0
Primary School	Per 7,500 population	0	0	–	0
Secondary School	Per 15,000 Population	0	0	–	0
Higher Secondary School	Per 125,000 Population	0	0	–	0
College	Per 100000 Population	0	0	–	0
Tech. Training Institute	Per 100000 Population	1	1	–	+1
Agriculture Research Centre	Per 100000 Population	1	0	–	+1
Skill Development Center					
Health Facility					
Govt/Panchyat Dispensary or Sub PHC or Health Centre	Each Village	1	1	–	-1
Primary Health & Child Health Center	Per 20,000 population	1	1	–	0
Child Welfare and Maternity Home	Per 10,000 population	0	0	–	0
Multispeciality Hospital	Per 100000 Population	0	0	–	0
Public Latrines	1 for 50 families (if toilet is not there in home, specially for slum pockets & kutcha house)	1	2	–	-1
Physical Infrastructure Facilities					
Transportation		Adequate / Inadequate			
Pucca Village Approach Road	Each village	Adequate	0.5km App.	–	–
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)	Adequate	1km App.	–	–
Drinking Water (Minimum 70 lpcd)		Adequate / Inadequate	Adequate	–	–
Over Head Tank	1/3 of Total Demand	Adequate	3	3	0
U/G Sump	2/3 of Total Demand	Adequate	3	3	0
Drainage Network - Open		Adequate / Inadequate	Adequate	–	–
Drainage Network - Cover			Adequate	–	–
Waste Management System		Adequate / Inadequate	Adequate	–	–
Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	3	2	–	+1
community hall and Public Library	Per 15000 Population	1	1	–	0
Cremation Ground	Per 20,000 population	0	1	–	-1
Post Office	Per 10,000 population	1	1	–	0
Gram Panchayat Building	Each individual/group panchayat	1	1	–	0
APMC	Per 100000 Population	0	0	–	0
Fire Station	Per 100000 Population	0	0	–	0
Public Garden	Per village	0	1	–	-1
Police post	Per 40,000Population	0	0	–	0
Shopping Mall	- Shops are Inavailable in village				
Electrical Design					
Electricity Network		Adequate / Inadequate	Adequate	–	–
Any Smart Village Facility					
Technology		R.O. Water Plant	225000 Litre total distribution		
		ESR cap	–		
		Sump cap	2.35 ac & 4500gallons		
		Lat	– 0		

12.5 MODAJ GRAM PANCHAYAT LETTER HEAD



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

SR.NO	VILLAGE NAME	DISCIPLINE	PART -1	PART-2
1.	**MODAJ**	**CIVIL**	BANK	PUBLIC GARDEN
		CIVIL	CREMATORIAL COMPLEX	ARTIFICIAL POND
		CIVIL	GRAM PANCHAYAT	BUS STOP
		CIVIL	VILLAGE GATE	PUBLIC LIBRARY
		CIVIL	PUBLIC TOILET	CHABUTRA
		CIVIL	REST ROOM/GUEST HOUSE	CYBER CAFE
		ELECTRICAL	CENTRAL CONTROL UNIT FOR IRRIGATION WATER PUMP CONSTRUCTION	SMART WATER LEVEL INDICATOR
		ELECTRICAL	WIRELESS INDUSTRIAL DEVICE CONTROL SYSTEM USING R.F	SOLAR WATER HEATER
		ELECTRICAL	HIG SPEED PROTECTION BASED PROGRAMMABLE CURRENT RELAY	AUTOMATIC STREET LIGHT WITH VEHICLE MOVEMENT
2.	**NARDIPUR**	**CIVIL**	WATER TANK	FOUNTAIN
		CIVIL	AANGANWADI	ANIMAL HOUSE
		CIVIL	BUS STOP	BOUNDARY WALL WITH GATE
		CIVIL	YOUTH CLUB	LIBRARY

		CIVIL	CHOWK	COMMUNITY HEALTH CENTER
		CIVIL	PUBLIC LAVOTARY	GARBA CHOWK
		ELECTRICAL	POWER THIEF IDENTIFICATION	GAS LEAKAGE DETECTION
		ELECTRICAL	AUTOMATIC WATER LEVEL CONTROLLER AND INDICATOR	AUTOMATIC LED EMERGENCY LIGHT
		ELECTRICAL	LOAD CONTROLLED SYSTEM (DUAL TONED)	THREE PHASE
3.	**BALVA**	**CIVIL**	COMMUNITY HALL	CYBER CAFE
		CIVIL	PUBLIC TOILET	DEVELOPMENT CENTER
		CIVIL	PUBLIC PARKING	SHOPPING MALL
		CIVIL	SHOPPING AREA	LIBRARY
		CIVIL	A.T.M	RECREATIONAL CENTER
		CIVIL	STEEL GATE	BUS STOP
		ELECTRICAL	SOLAR AUTOMATIC GATE	BEACON FLASHER
		ELECTRICAL	LATTICE STEEL TOWER	ARDUINO BASED LIQUID VENDING MACHINE
		ELECTRICAL	SOLAR STREET LIGHTS IN PARKING AREA	BLOWN FUSE INDICATOR

12.7 Summary of Good Photographs in Table Format (village visits, Ideal, Smart Village or any other)

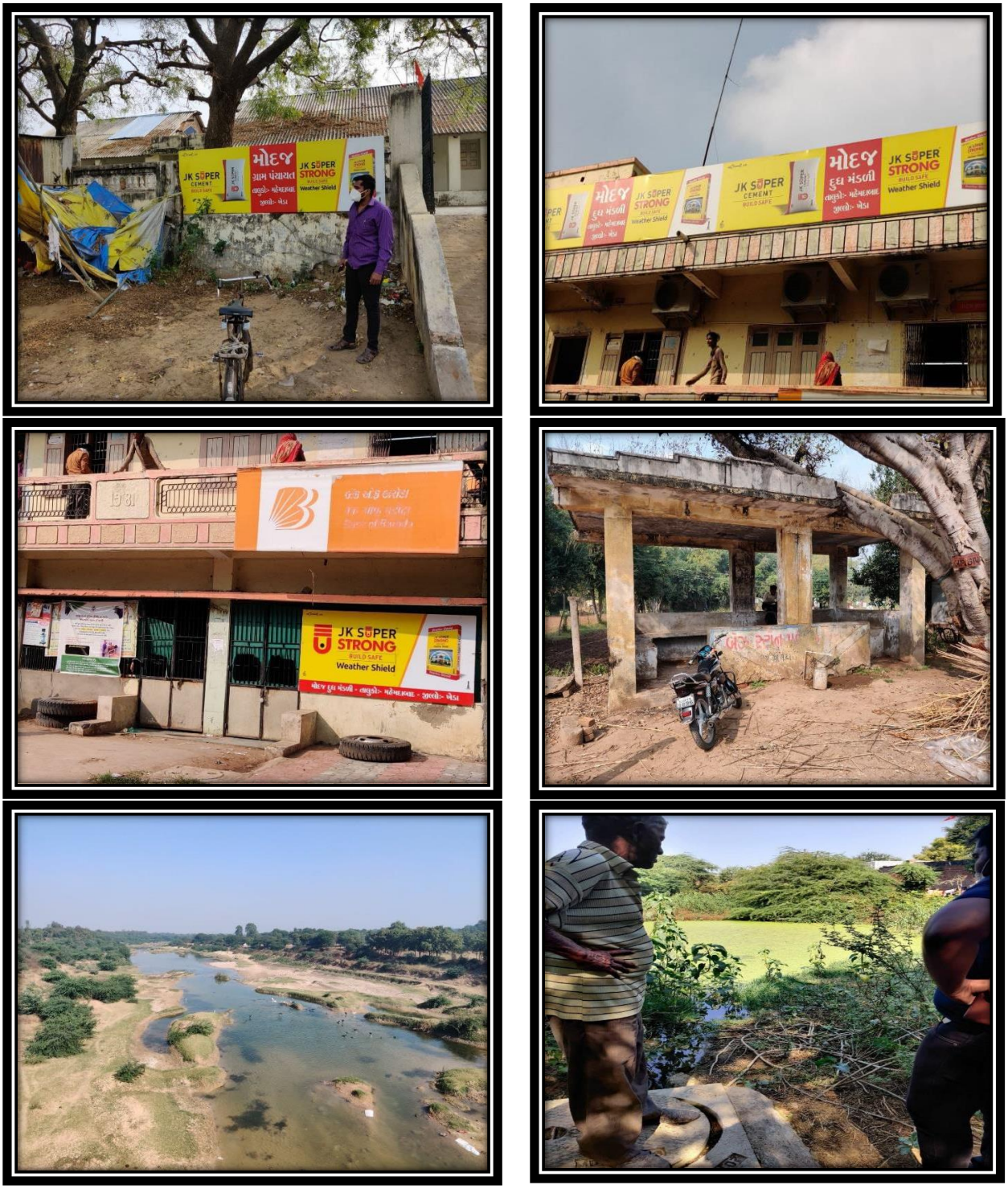


Figure 87 Modaj Village Visit's Summaries

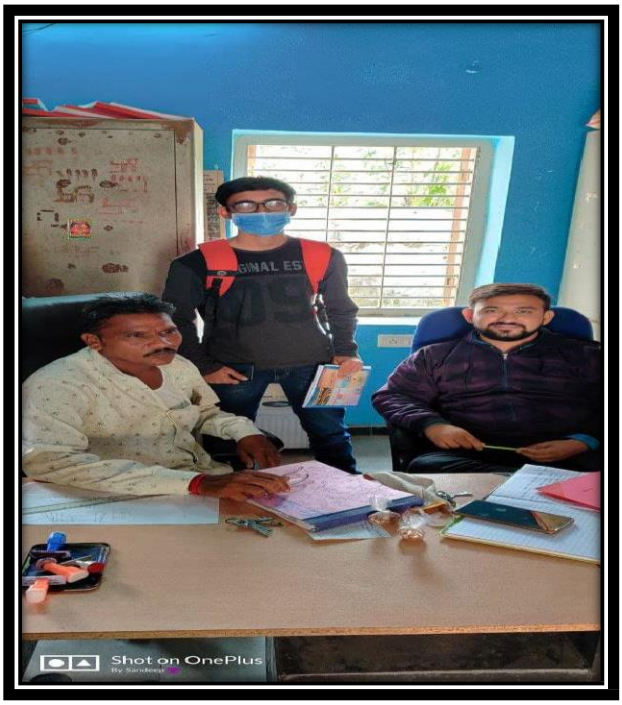


Figure 88 Talati of modaj Village

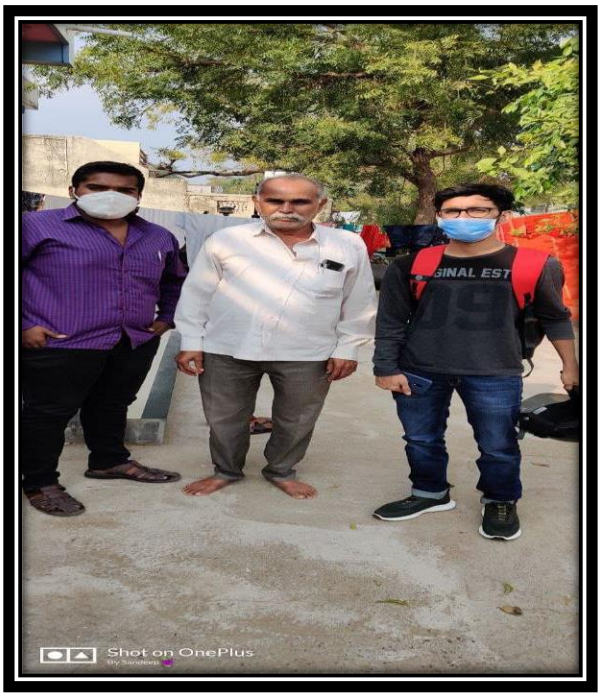


Figure 89 Sarpanchi of Modaj Village

Figure 90 Some pictures of Hatijan Village

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 Designs Proposals

13.1.1 Civil Design-1 CYBERCAFE

A cybercafe is a type of business where computers are provided for accessing the internet, playing games, chatting with friends or doing other computer-related tasks. In most cases, accessto the computer and internet is charged based on time.

Ease of use; Availability internet and for the people who can know about the internet.

In the Modaj village there is no any cybercafe existing in the village. From the feedbacks which were given by the villagers we have decided to design a cybercafe as a smart village design for the main purpose of internet availability at any time for any person in the village.

Their PLAN ,ELEVATION ,SECTION and 3-D view are given below upon that one can know what is going to be done by us in future and can know our possible perspective of seeing and building of Cyber Cafe.

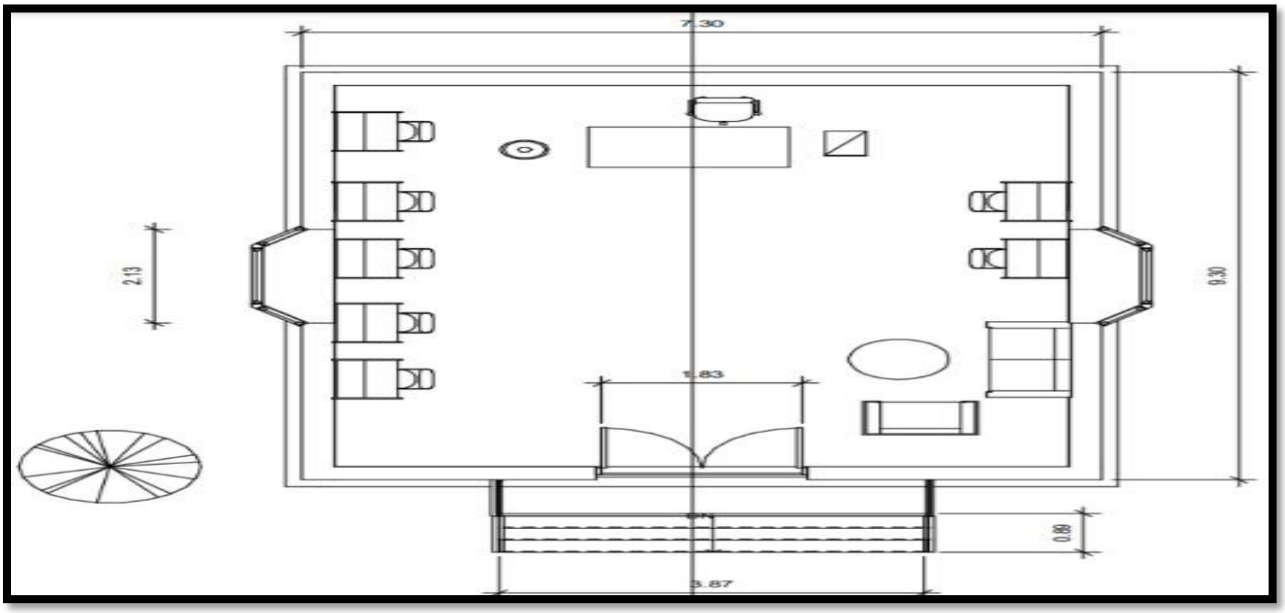


Figure 89 PLAN FOR CYBERCAFE

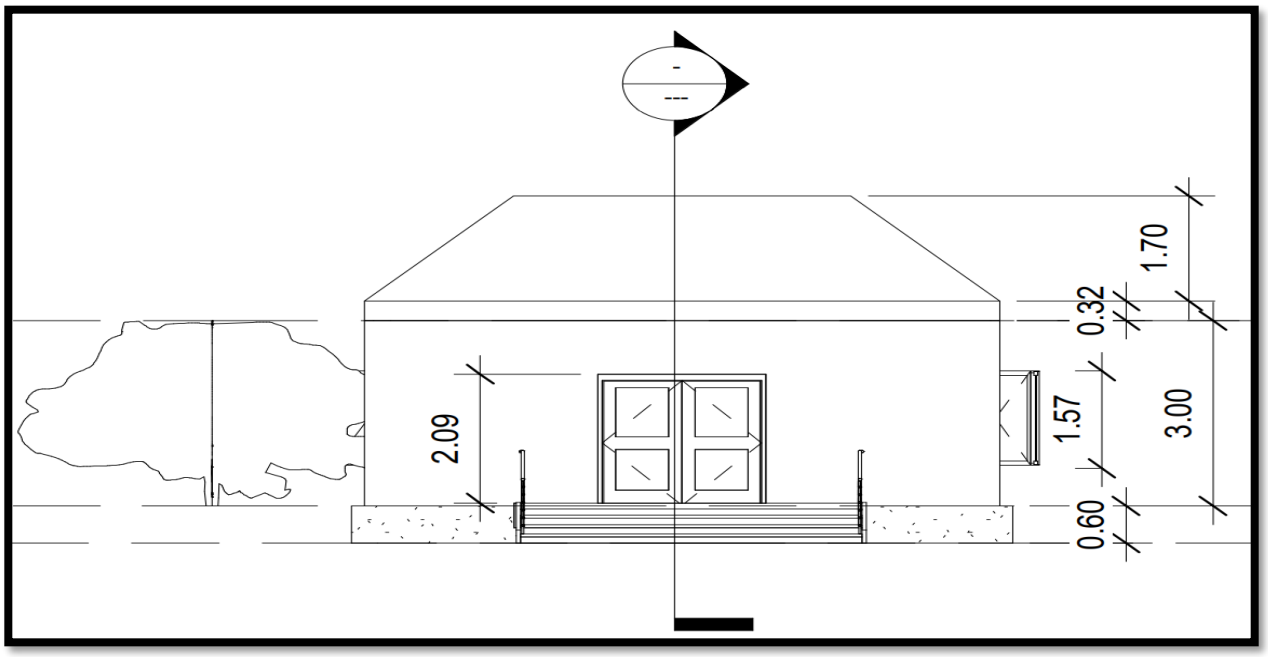


Figure 90 Elevation of CyberCafe

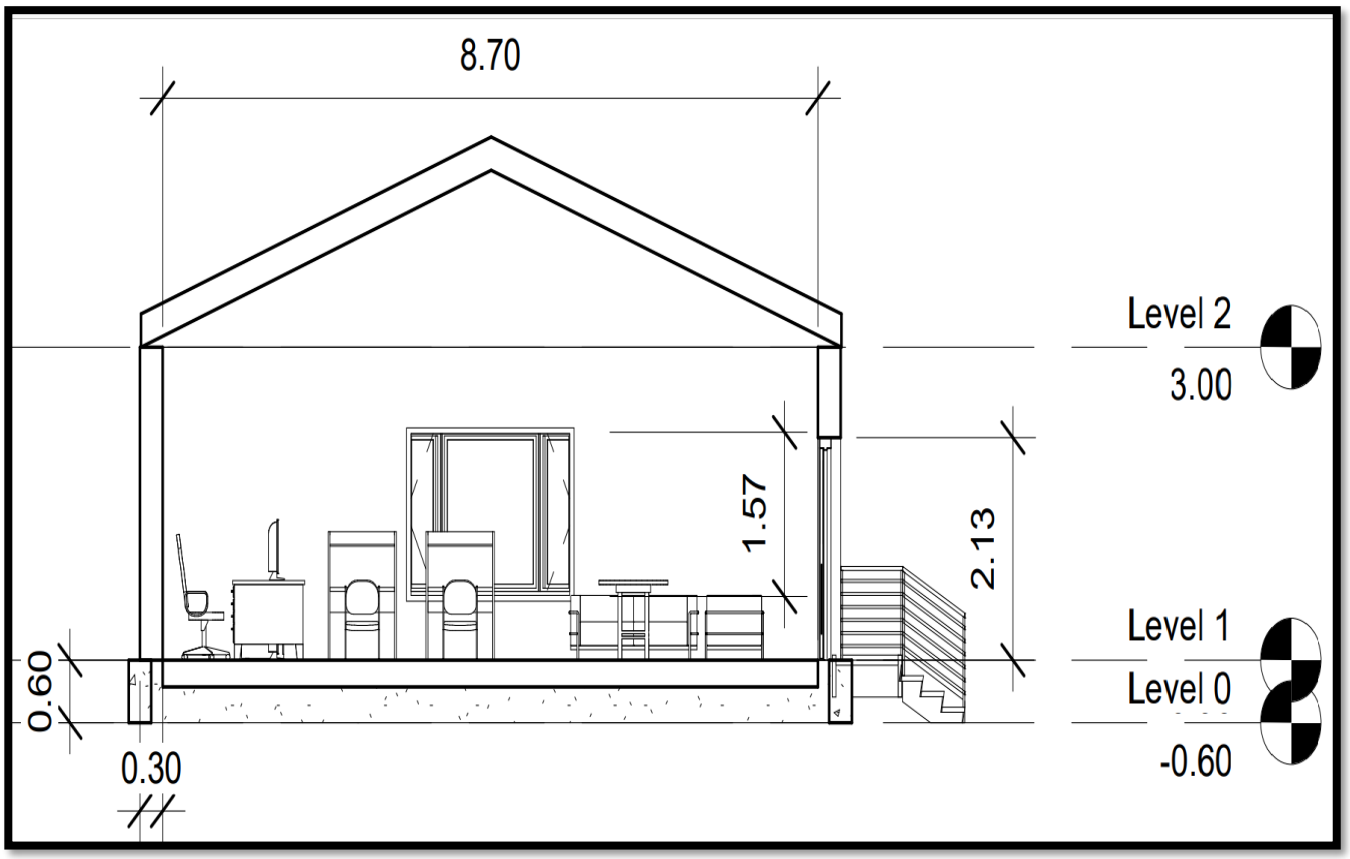


Figure 91 Section for CyberCafe

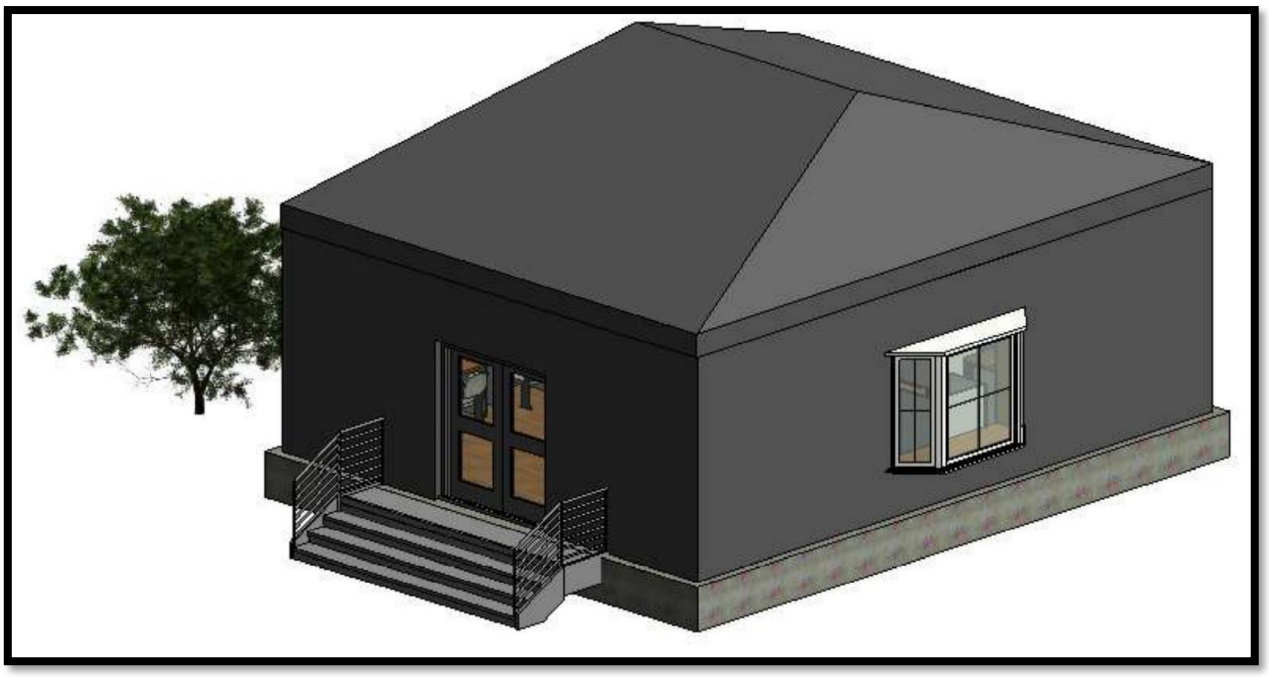


Figure 92 3-D Design for CyberCafe

Table 19 Valuation for CyberCafe

SR. NO	Description(m)	Length(m)	Width(m)	Height (m)	Quantity	Rate	Amount
1.	BASIC WALL: GENERIC - 9" 2	9.5	7.3	5.3	368m^3	755	2,77,840
2.	CURTAIN WALL	----------	----------	--------	----------	------	4500
3.	DOOR-EXTERIOR	----------	----------	---------	----------	----	6000
4.	AUS SGL GLASS FRAMED	----------	----------	--------	----------	-----	5000
5.	BASIC ROOF: GENERIC - 1	9.5	7.3	0.5	34.8m^3	3500	1,22,000
6.	FLOOR: GENERIC - 1	9.5	7.3	0.5	34.8m^3	420	14620
7.	PCC	9.5	7.3	0.5	34.8m^3	250	9000
8.	EXCAVATION	9.5	7.3	1.2	83.2m^3	220	18350
							4,60,000

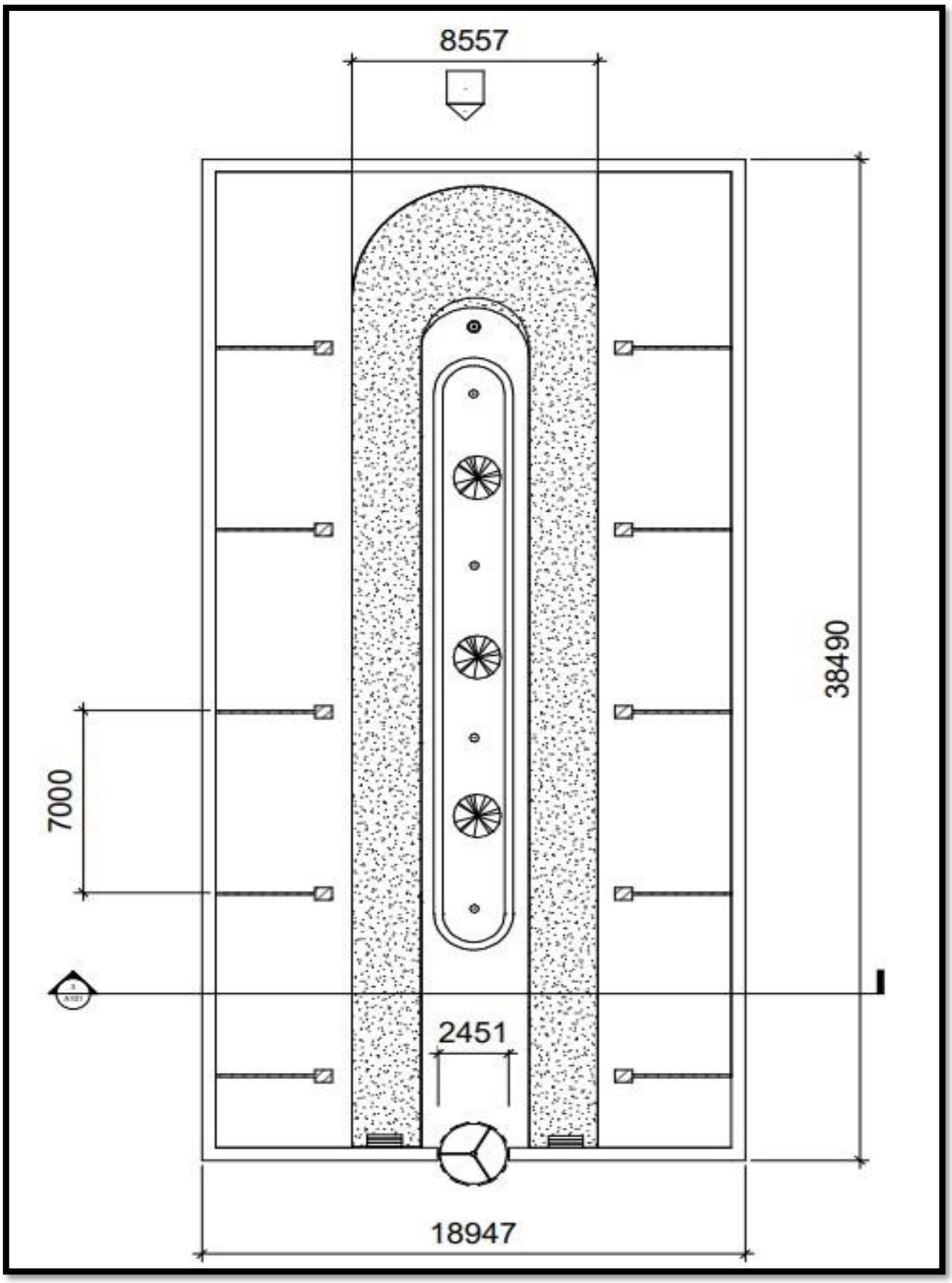
13.1.2 CIVIL DESIGN 2 SUPER MARKET

A supermarket is a self-service shop offering a wide variety of food, beverages and household products, organized into sections. It is larger and has a wider selection than earlier grocery stores, but is smaller and more limited in the range of merchandise than a hypermarket or big-box market.

Supermarket - a large self-service grocery store selling groceries and dairy products and household goods food market, grocery, grocery store, market - a marketplace where groceries aresold; "the grocery store included a meat market" hypermarket - a huge supermarket. A self- service retail market selling especially for the foods and household merchandise; something resembling a supermarket especially in the variety or volume of its goods or services.

Ease of use :- Availability of more grocery and food products ;etc.

Existing Situation :- In the Modaj village there is no any self-service shop and having variety in it. So we have designed a Supermarket as socio-cultural design or structure of the village. Supermarket is a self-service shop offering a wide variety of food, beverages, and household products, organized into sections. It is larger and has a wider selection than earlier grocery stores.


8557
38490
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2451
18947

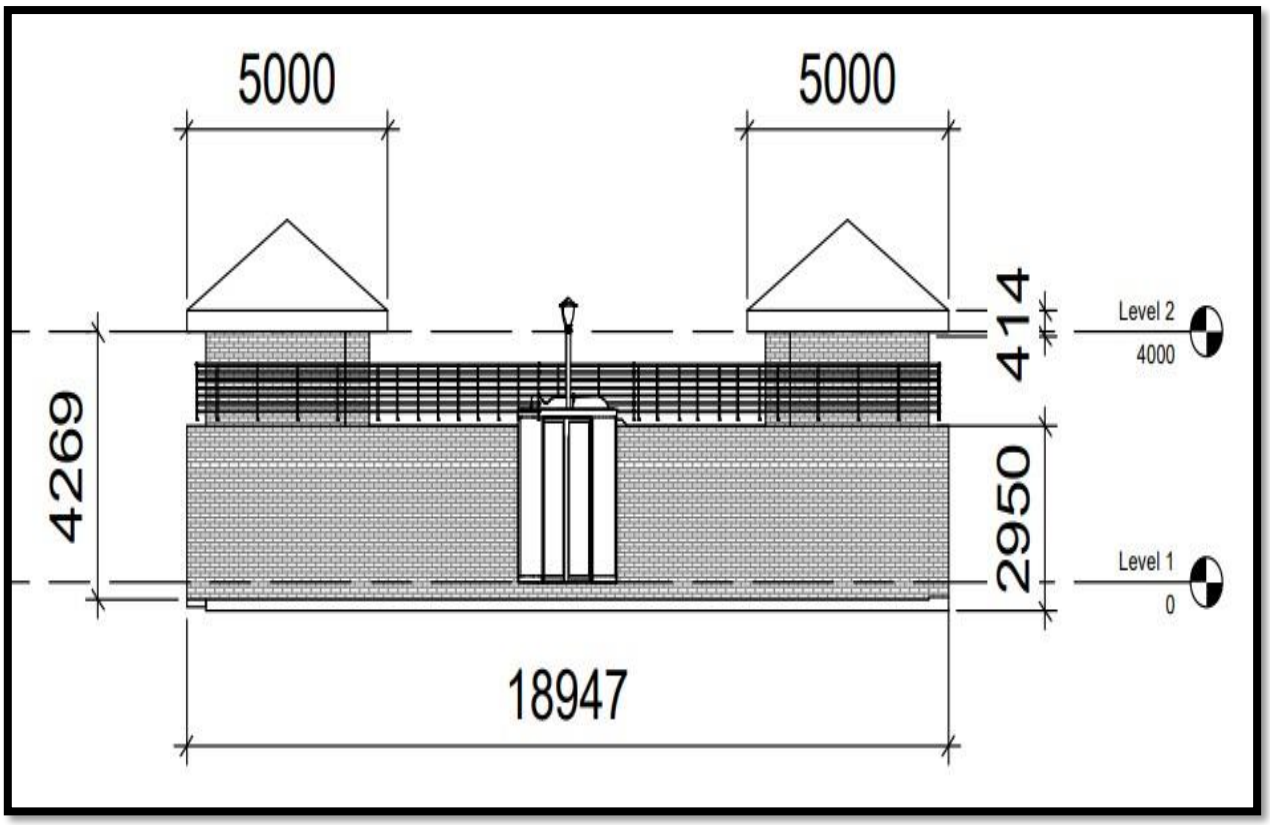


Figure 93 Elevation for Super Market

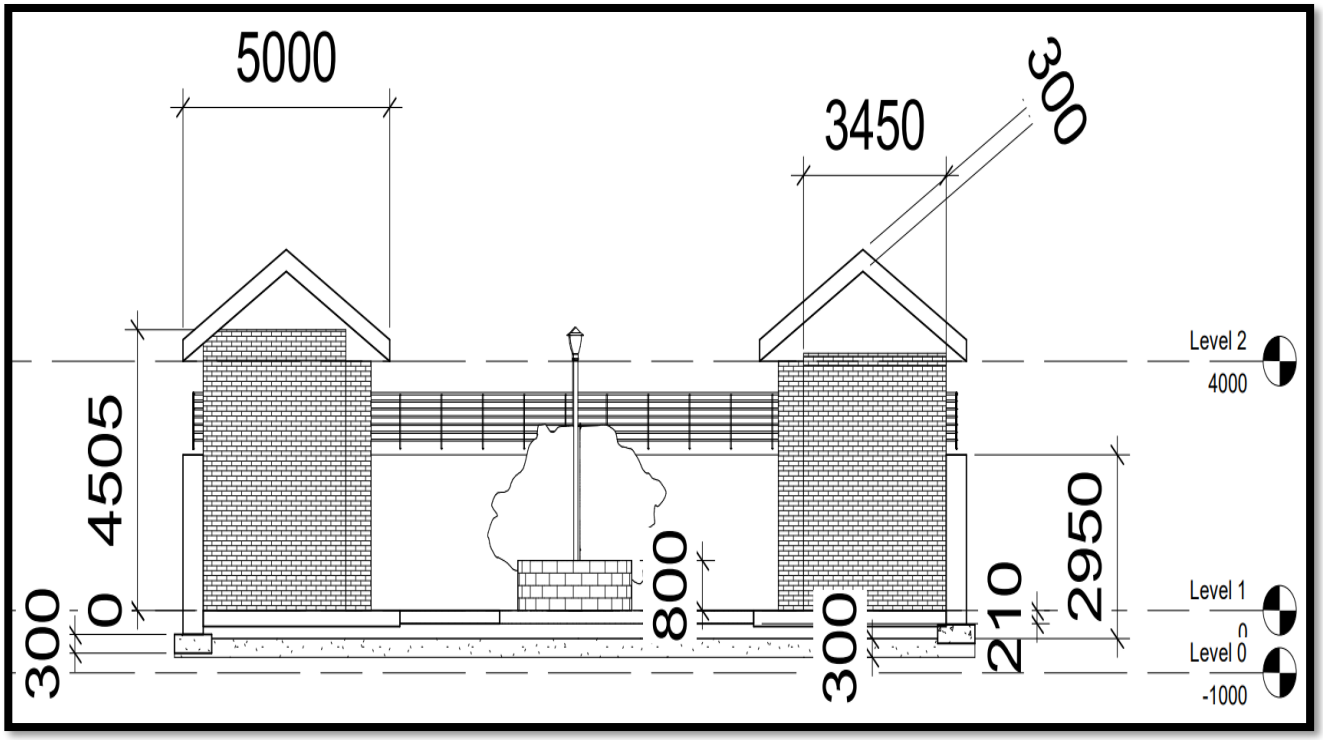


Figure 94 Section for Super Market

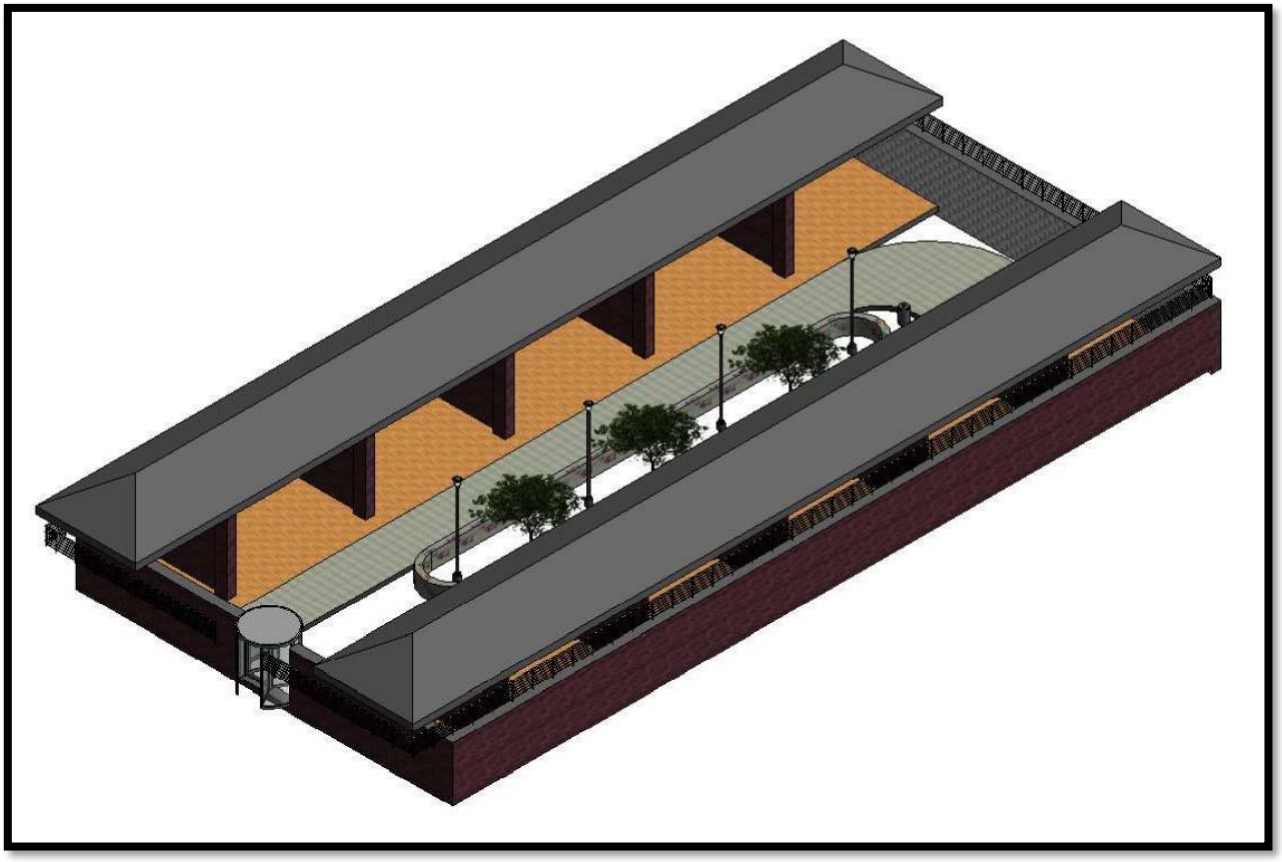


Figure 95 3-D Design for Super Market

Table 20 VALUATION FOR SUPERMARKET

SR. NO	Description(m)	Length(m)	Width(m)	Height (m)	Quantity	Rate	AMOUNT
1.	WALL	38.5	19	3	2194M^3	10800/100 Sq.ft	3,30,000
2.	DOOR						15000
3.	WINDOW				14	2200	30,800
4.	ROOF	38.5	19	0.3	220	3500	1,69,000
5.	FLOOR	38.5	19	0.3	220	225	49500
6.	PCC	38.5	19	0.5	366	540	97,000
7.	EXCAVATION	38.5	19	1	732	220	1,60,900
							8,52,250

Civil Design 13.1.3 LIBRARY

While the whole world is advancing and transitioning to digital, most of the rural Indiais still struggling to have schools and libraries.

In many parts of the country, community libraries are functioning in rural areas, and government libraries exist in many district headquarters.

However, commute to these common libraries by children is challenging.

Hence, in order to maximize the use of resources, it is important to plan a library in eachschool.

Library enables a child to attain great wisdom at almost free of cost.

Library and book reading not only improves reading habits but also a child's imagination.

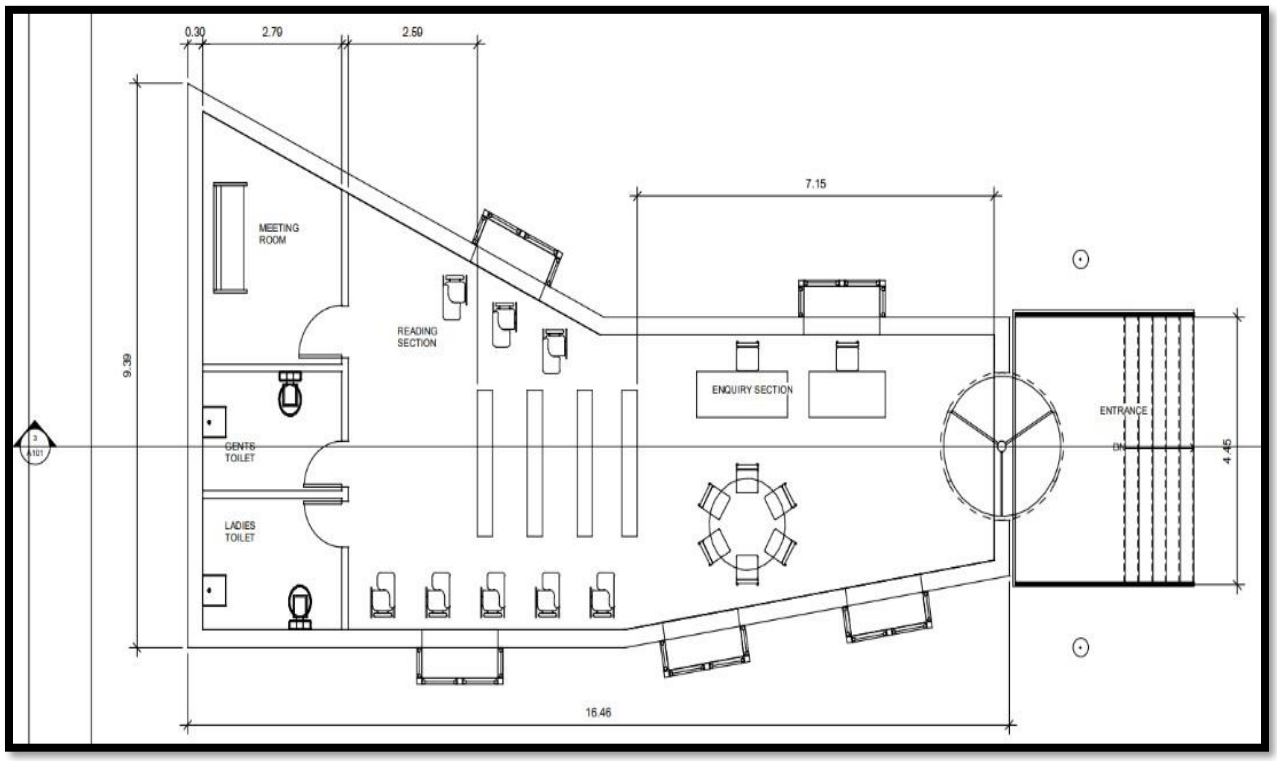


Figure 96 PLAN FOR LIIBRARY

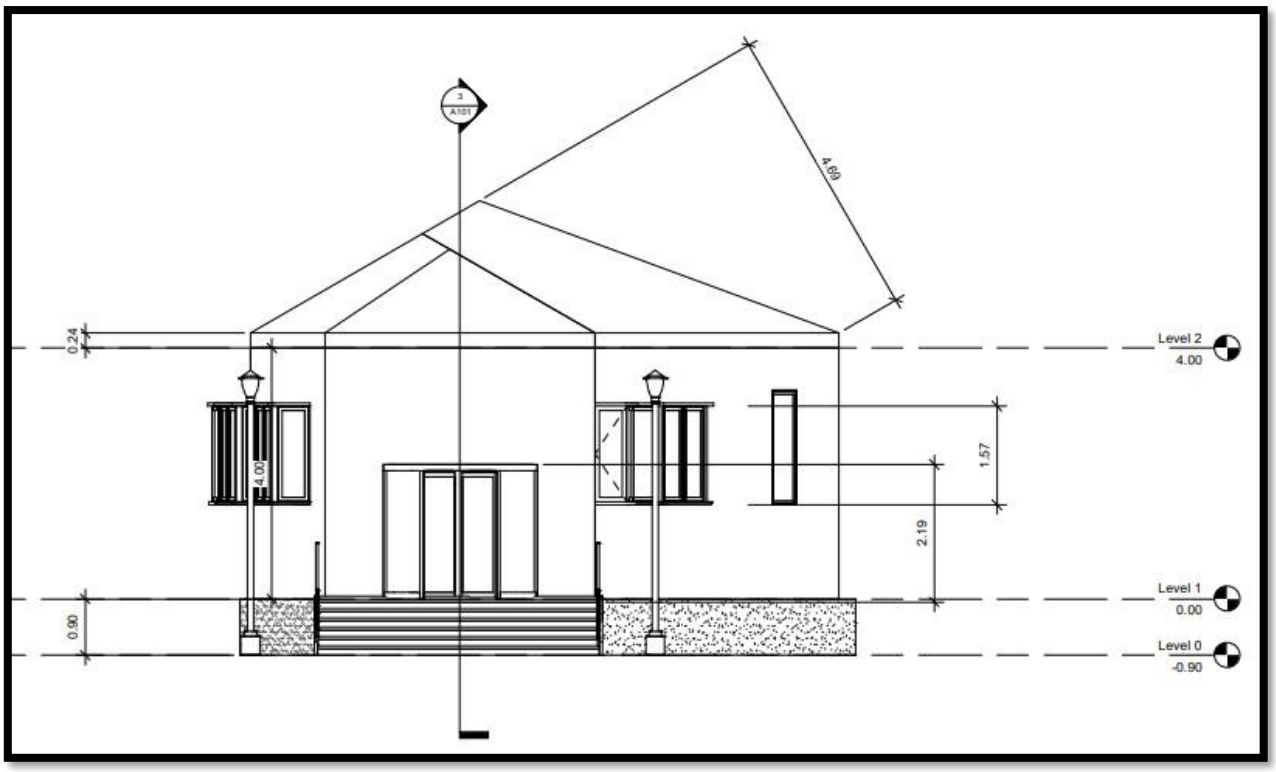


Figure 97 Elevation oof Library

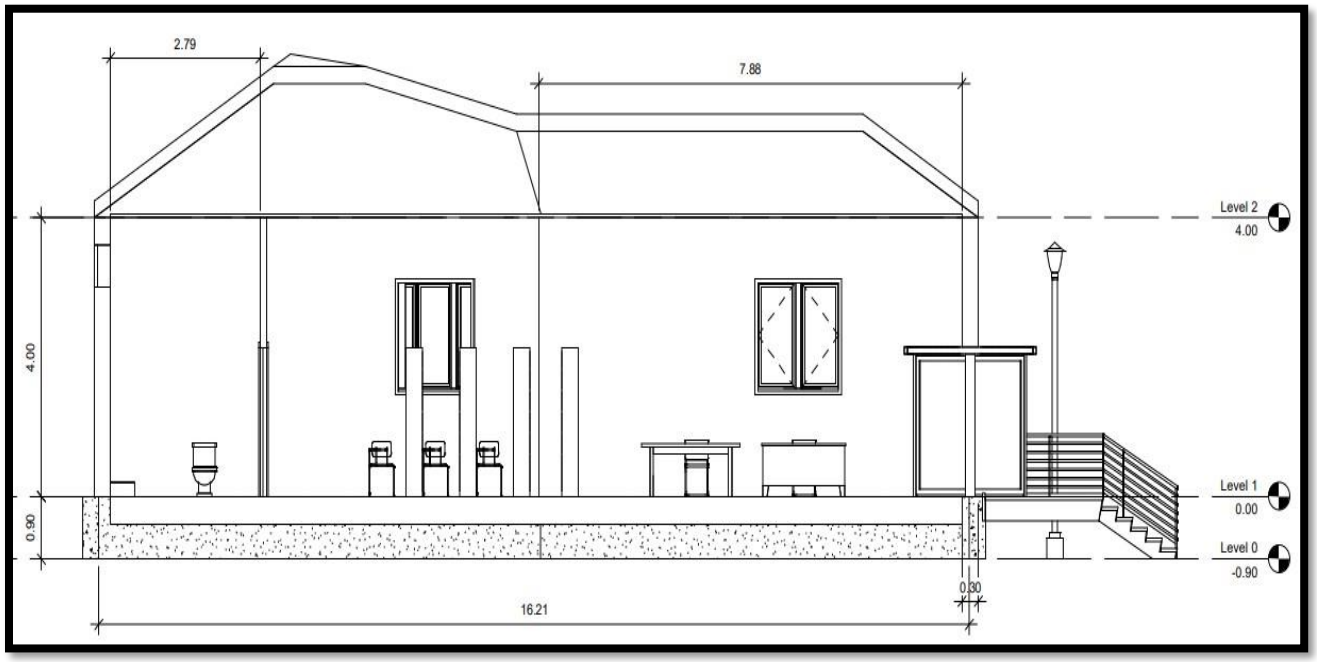


Figure 98 Section for Library

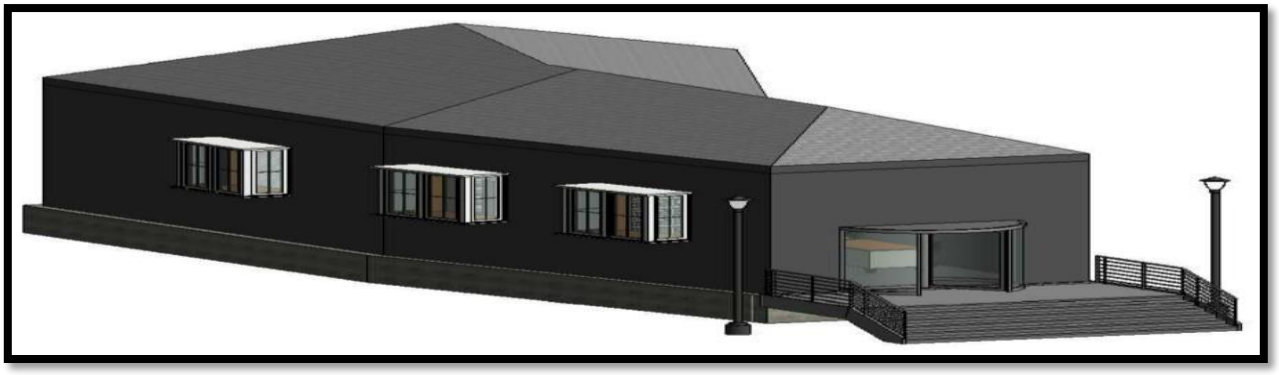


Figure 99 3D VIEW FOR LIBRARY

Table 21 Valuation for Library

SR NO	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	QUANTITY	PER	RATE	AMOUNT
1.	EXCAVATION	1	16.46	9.39	0.6	92.735	m^3	350	32,457
2.	PCC WORK	1	16.46	9.39	0.2	30.911	m^3	3500	1,08,191
3.	WALL WORK-1	2	16.46	0.3	3	29.628	m^3	125	3703.5
4.	WALL WORK-2	1	9.39	0.3	3	8.451	m^3	97.5	823.972
5.	WALL WORK-3	1	4.45	0.3	3	4.005	m^3	125	500.625
6.	WALL WORK-4	1	2.79	0.15	3	1.255	m^3	97.5	424.125
7.	WALL WORK-5	1	9.39	0.15	3	4.2255		97.5	322.335
8.	SLAB	1	16.46	9.39	0.15	23.183		180	4173.10
5.	PLASTERING		16.46	0.015	3	0.7407	m^2	65	50.15
6.	PAINTING WORK		16.46	---	2.9	47.734	ft^2	40	1909.36
7.	FURNITURE WORK		----	---	---	---	---		50,000
8.	ROOF	1	17	10	0.15	25.5		150	3825
9.	STAIRCASE	5	4.45	0.15	0.90	3.00375		3000	10,000
10.	STAIR SLAB	1	4.45	2.35	0.2	2.0915		180	400
								Total	**2,50,000**

13.1.4 CIVIL DESIGN -4 CAFETERIA

We want to propose a cafeteria in modaj village because there are various advantages of it i.e we want a nature rear view from cafeteria and it will e a different aspects for various peoples.

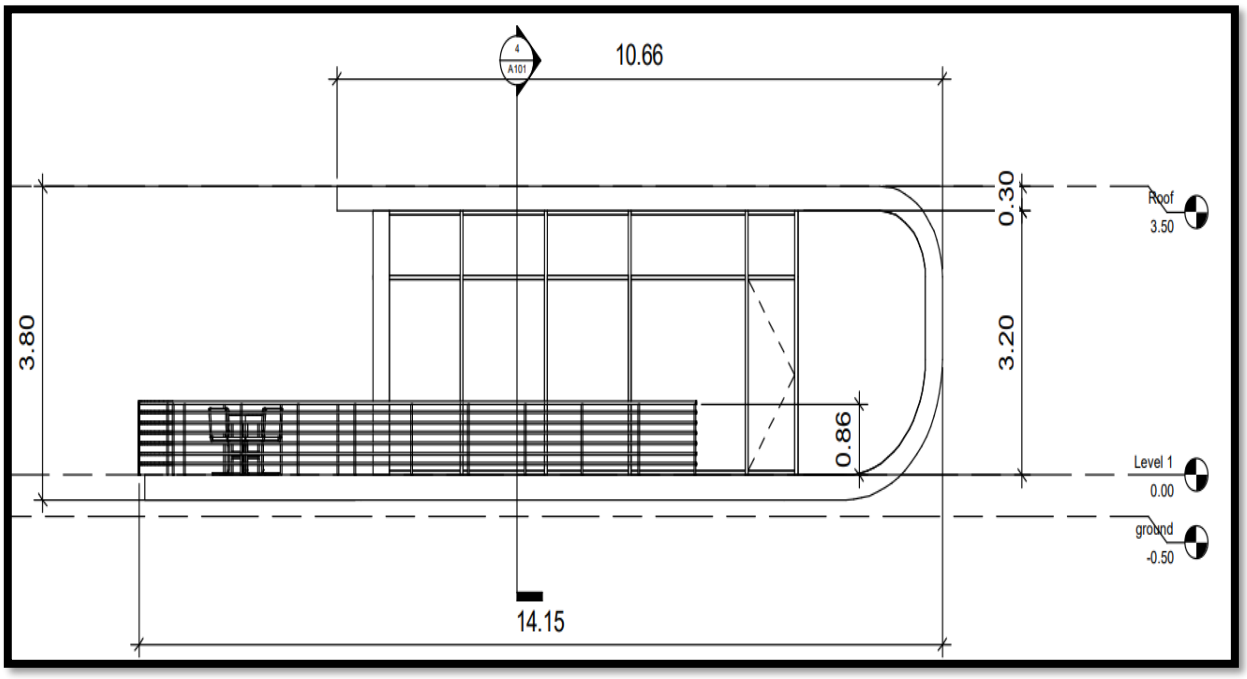


Figure 1 Elevation for Cafeteria

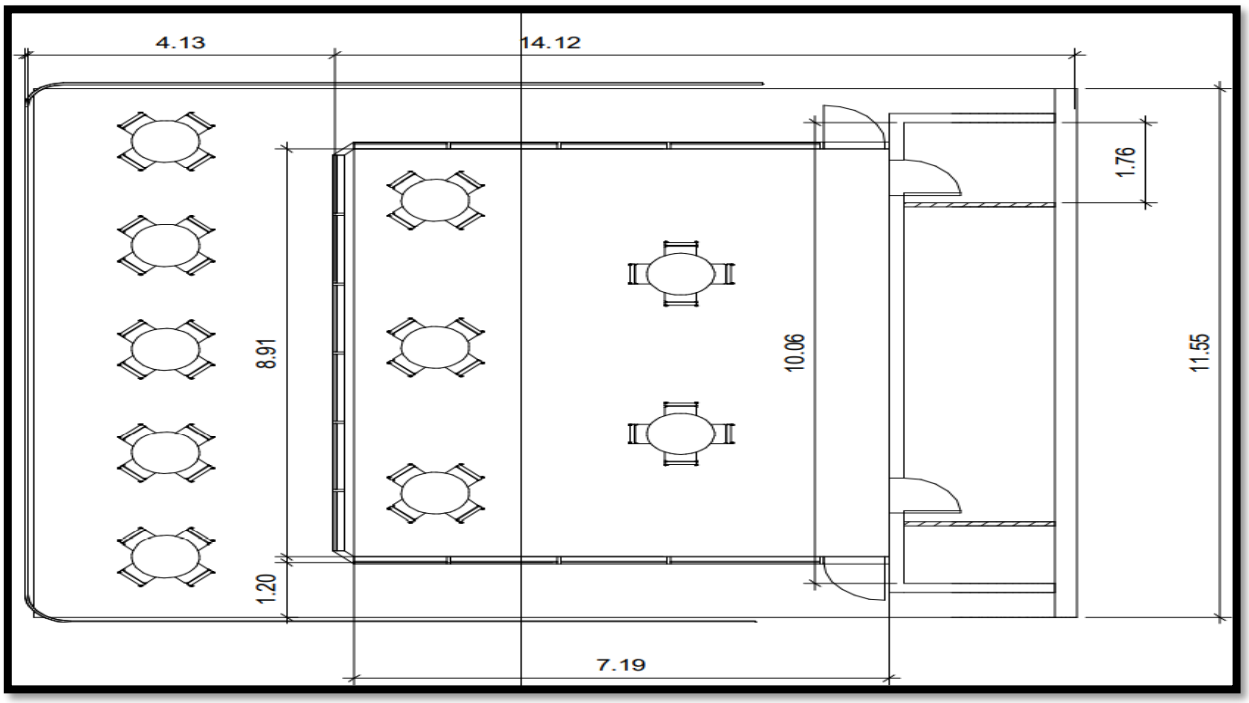


Figure 2 plan for CAFETERIA

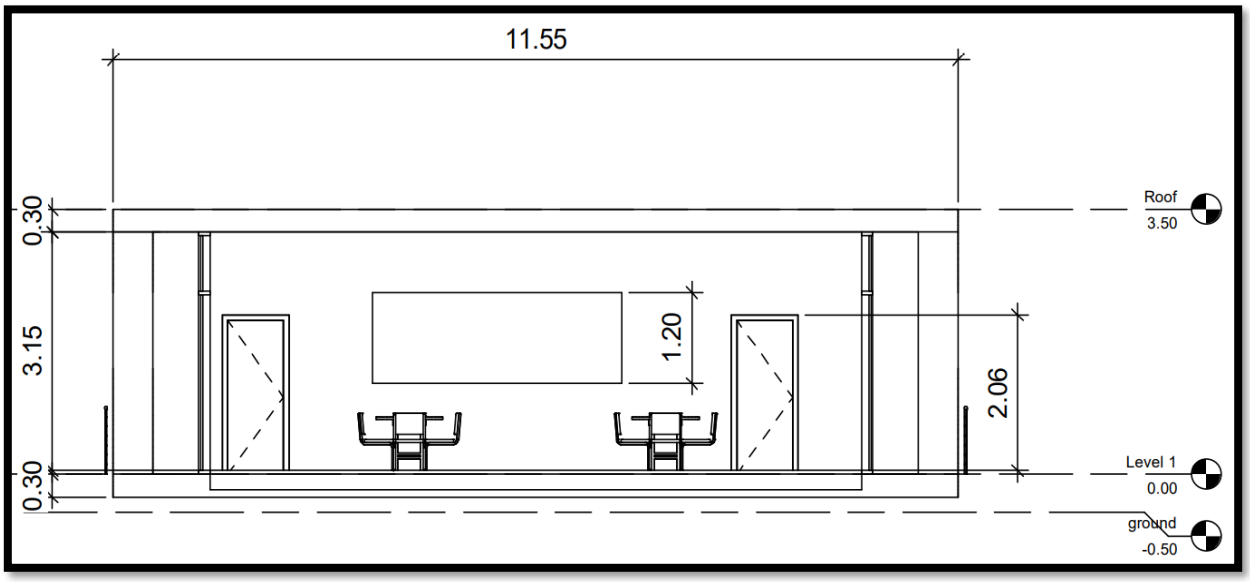


Figure 3 SECTION FOR CAFETERIA

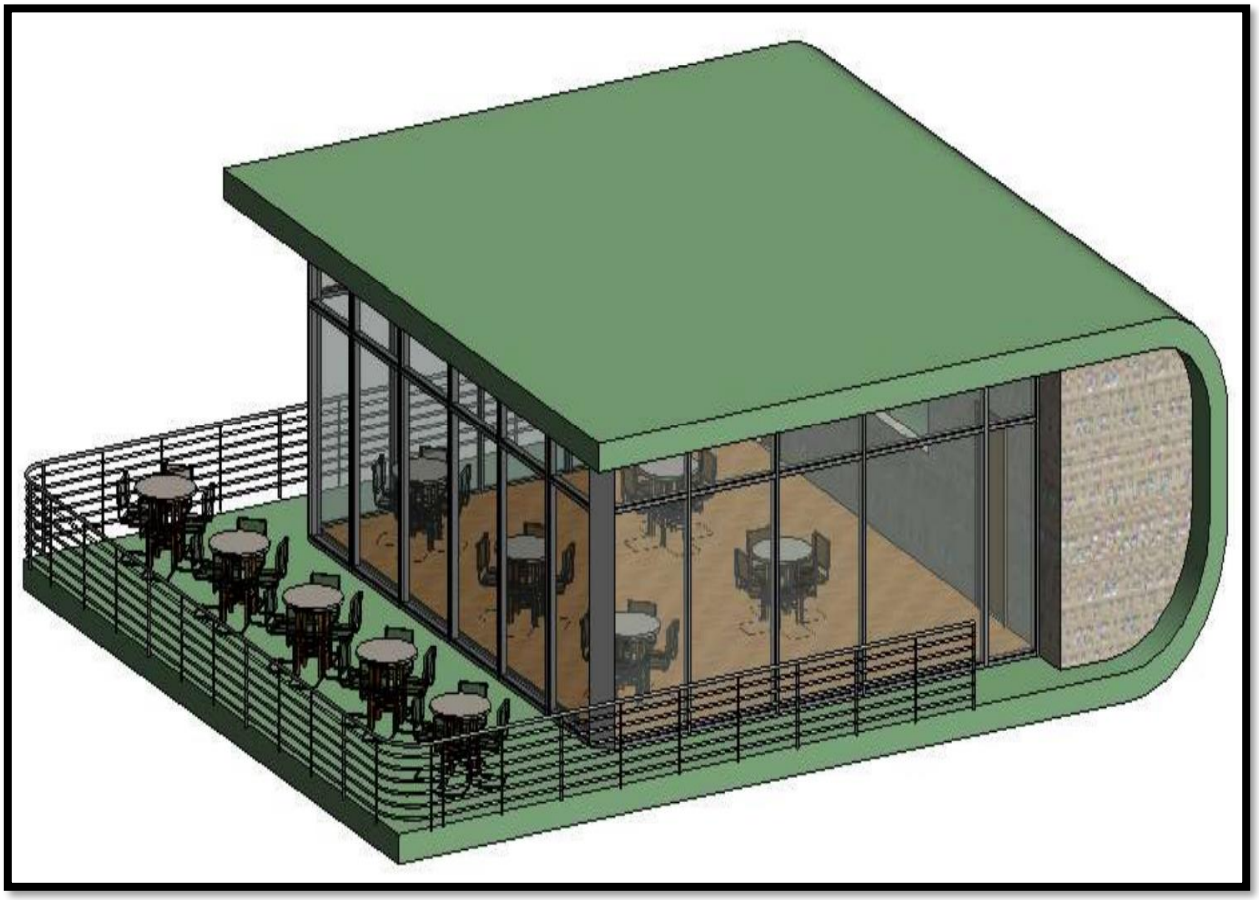


Figure 4 3-D VIEW FOR CAFETERIA

Table 1 COSTING for CAFETERIA

S R . N O	Description	o. s	Length	width	H	Quantity	Rate	Amount
1.	EXCAVATION	1	14.12	11.55	0.75	**122.314**	**350**	**42,810**
2.	PCC WORK	1	14.12	11.55	0.4	**65.23**	3500	**2,28,305**
3.	WALL WORK-1	2	8.19	0.3	3.2	**15.7248**	125	**2000**
4.	WALL WORK-2	2	11.55	0.3	3.2	**22.176**	125	**2772**
5.	WALL WORK-3	2	2.5	0.2	3.2	**3.2**	125	**400**
6.	RAILING	1	23	---	0.86	**19.78**	1500	**30,000**
8.	CEILING	1	10.06	9.19	0.15	**13.867**	180	**2500.18**
9.	PLASTERING	4	10.06	0.015	2.9	**0.437**	65	**108.44**
10.	PAINTING WORK	4	10.06	---	3.2	---	40	**14044**
11.	FURNITURE WORK		---	---	---	----		**40,000**
								3,62,939

13.1.5 CIVIL DESIGN -5 PUBLIC GARDEN

There are various advantages of public garden that you can't turn your back i.e Village people will get new exposure, childrens can play safely as gardens are designed considering safety of childrens.

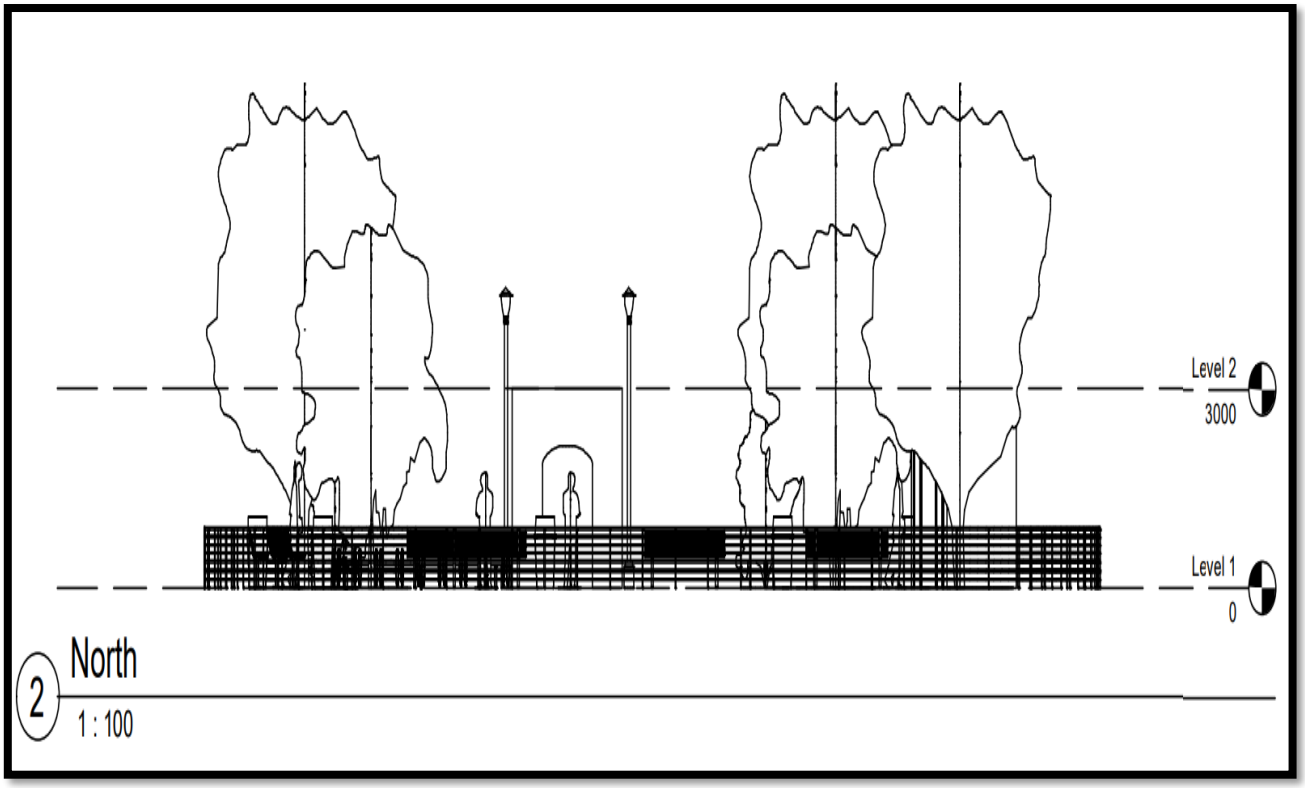


Figure 5 ELEVATION FOR PUBLIC GARDEN

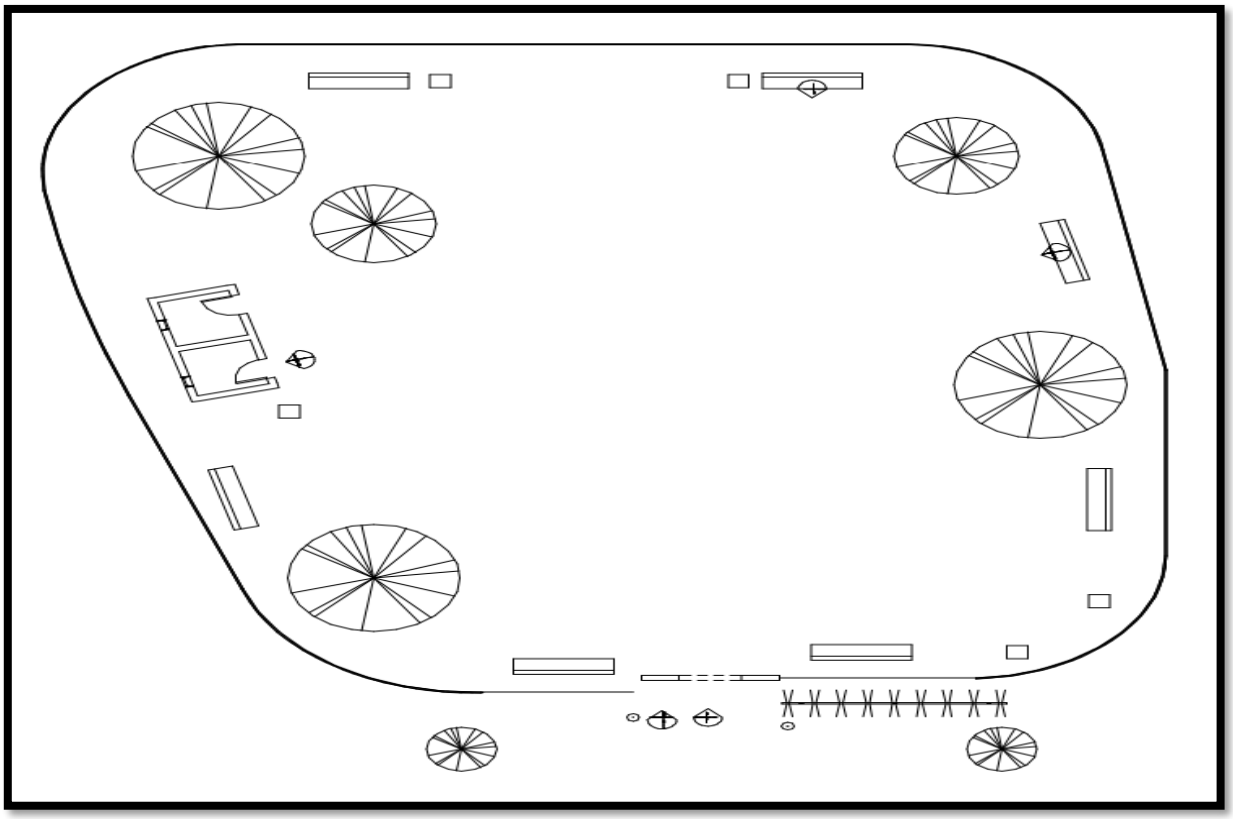


Figure 6 PLAN FOR PUBLIC GARDEN

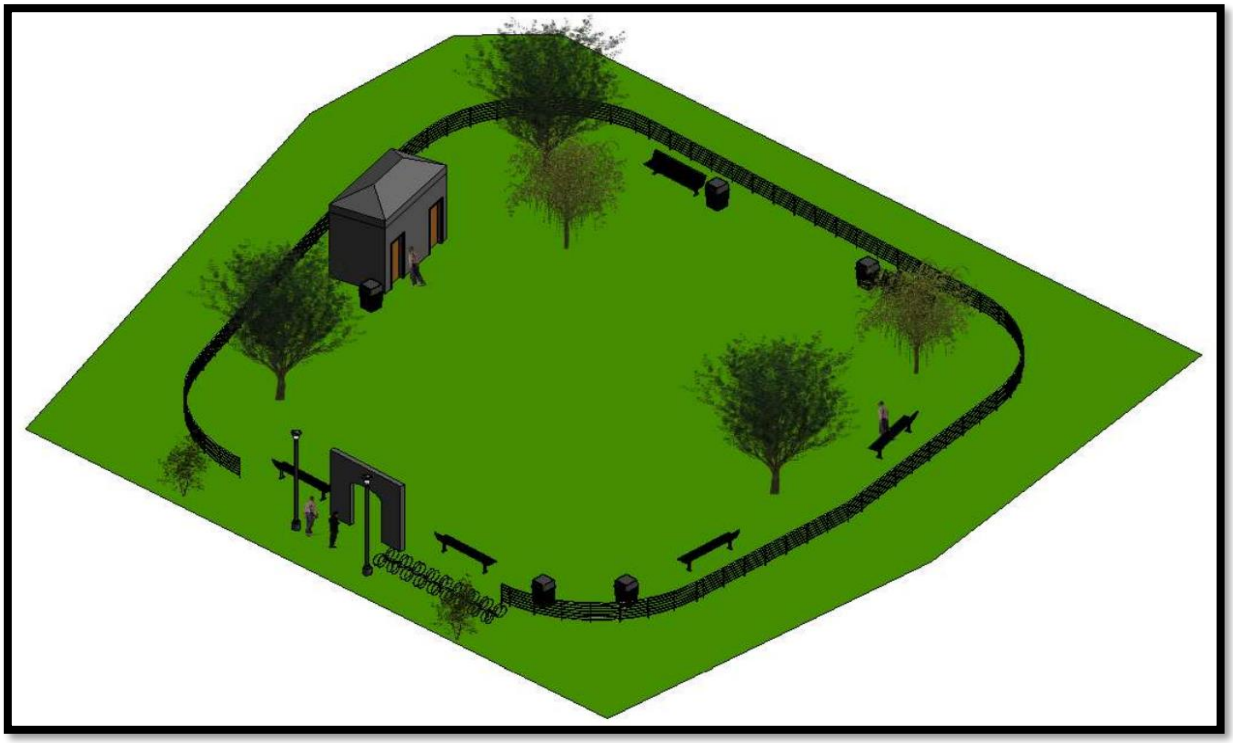


Figure 7 3-D VIEW FOR PUBLIC GARDEN

Table 2 Costing for Public garden

SR. NO	DESCRIPTION	NO.S	LENGTH	BREADTH	HEIGHT	PER	QUANTIY	RATE	AMOUNT
1.	ENTRANCE GATE	1	4	0.6	5	m^2	12	500	6000
2.	LINING	1	24.4	25.6	0.54	m^3	337.30	100	33,730
3.	STONE LAYER	1	24.4	25.6	0.3	m^3	187.392	150	28,000
4.	EXCAVATION	1	24.4	25.6	1	m^3	624.64	350	2,18,000
5.	RAILING	1	24	25	0.45	m^3	270	500	1,00,000
6.	TOILET (APPROX.)	1	---	---	----	--	----	----	50,000
									1,09,456

13.1.6 CIVIL DESIGN -6 BUS STOP

Above we have given in detail condition of bus stop and it urgently needs renovation because by seeing that bus stop impression for village and also people come in trouble.

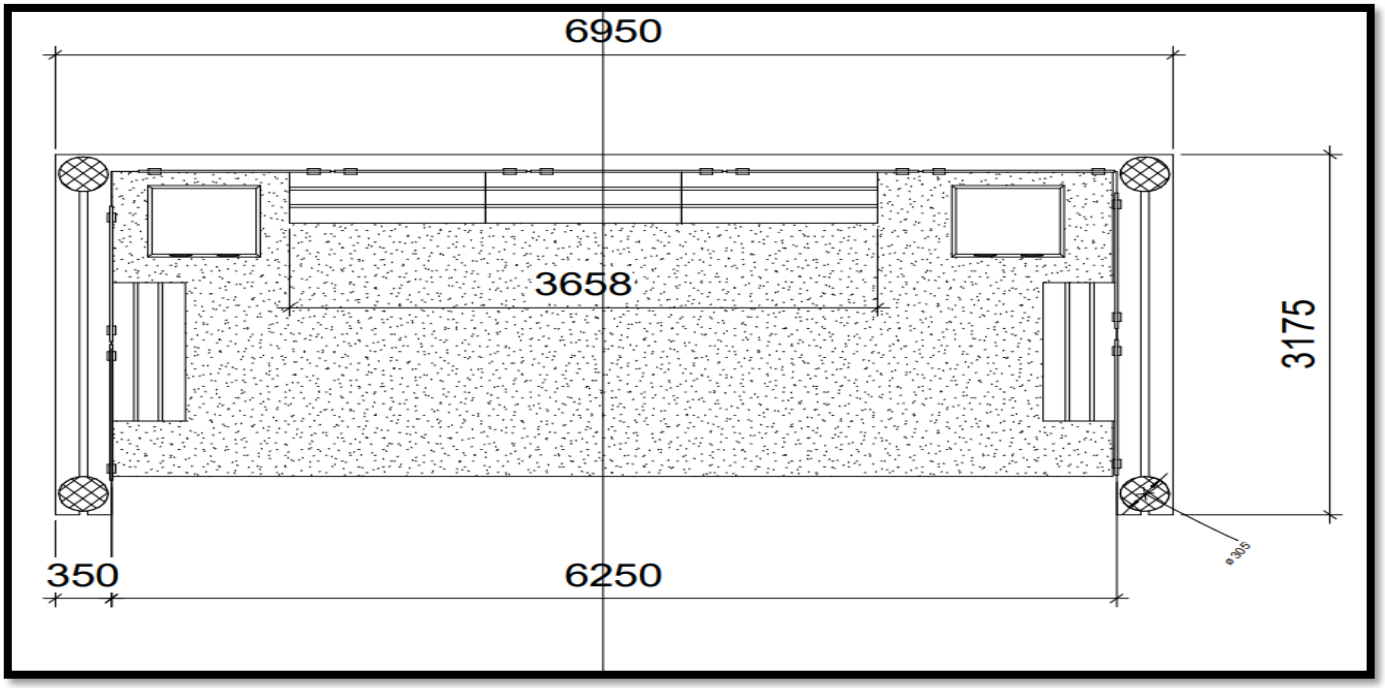


Figure 8 PLAN FOR BUS STOP

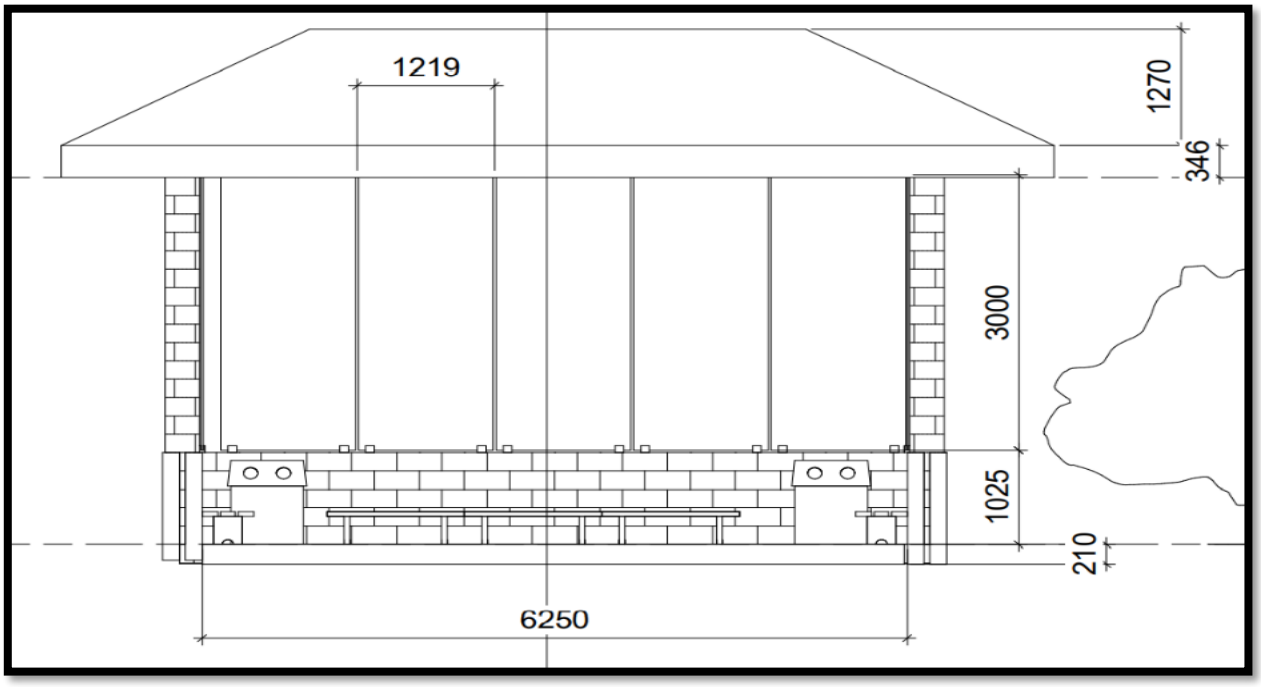


Figure 9 ELEVATION FOR BUS STOP

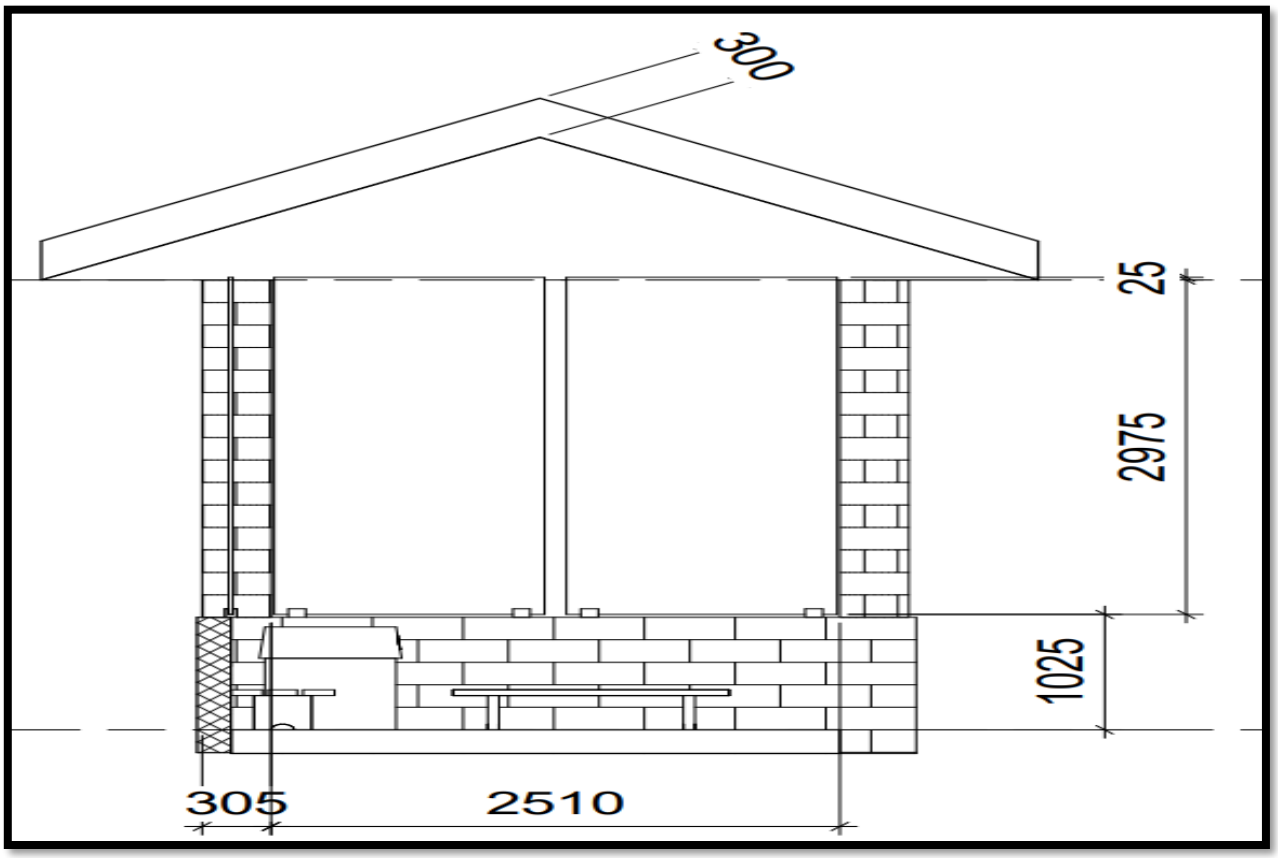


Figure 10 SECTION FOR BUS STOP

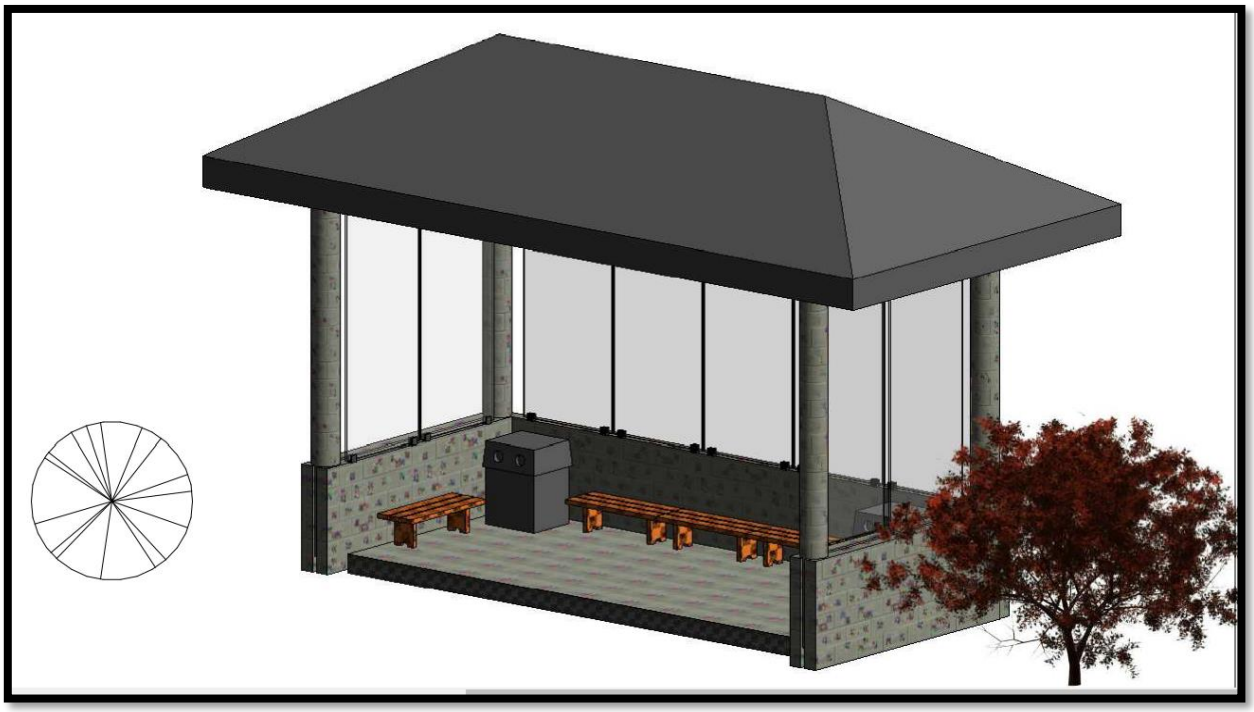


Figure 11 3-D VIEW FOR BUS STOP

Table 3 COSTING OF BUS STOP

SR NO	DESCRIPTION	LENGTH (m)	WIDTH (m)	HEIGHT (m)	QUANTITY	RATE	PER	AMOUNT
1.	PCC WORK	0.3	0.3	0.2	4	3350	m^2	20,000
2.	FLOORING	4	2	0.25	2	3980	m^2	23,000
3.	WALLS	2.6	0.3	3	2.34	6000	sq.ft	14,040
3.	ROOFING COST (R.C.C)	4.2	2.2	0.25	2.31	---	Kg	1,25,000
4.	VARIABLE COST	---	---	---	----	---	---	1,00,000
								2,28,040

13.1.7 Electrical Design 1:
Underground Cable Fault Distance Locator:

Most of the transmission lines are laid using the overhead line method, but now-a-days underground cable is widely used for safety and to develop the smart city. Underground cable installations are costly as compared to overhead cable, but are more reliable and also the life of underground cables is more as compared to overhead lines. Fault detection in underground cable is difficult as compared to overhead line cable. Underground cable is not affected by adverse conditions like a storm, rainfall, snowfall and varying in temperature. When the fault occurs in the underground cable its detection becomes difficult, so in this project we are going to find the location of the fault and which type of fault occurred.

13.1.7.1 Fault location methods

Fault location methods can be classified as

Online method**:** This method utilizes & process the sampled voltages& current to determine the fault point .Online methods for underground cable are less than overhead lines.

Offline method: In this method special instrument is used to test out service of cable in the field. There are two offline methods as following

Tracer method**:** In this method fault point is detected by walking on the cable lines. Fault point isindicated from audible signal or electromagnetic signal. It is used to pinpoint fault location very accurately. Example:1) Tracing current method 2) Sheath coil method.

Terminal method**:** It is a technique used to detect fault location of cable from one or both ends without tracing. This method use to locate general area of fault, to expedite tracing on buried cable.

Example:1) Murray loop method 2)Impulse current method.

13.1.7.2 Types of Faults

A fault in a cable can be classified into different types such as

Short Circuit Fault: when two or more conductor of the same cable in contact with each other ,then this is called a short circuit fault. It is impossible to detect visually without taking the cableapart. A short circuit fault occurs when the individual insulation of the cables is damaged.

Short circuit fault can be categorized in two types

Symmetrical fault: Three-phase fault is called symmetrical fault. In this all three phases are shortcircuited.

Unsymmetrical fault: In this fault magnitude of current is not equal & not displaced by 120degree.

13.1.7.3 METHODOLOGY

Here, 1K ohm set of resistors are used to represent the power cable (R – Y - B). DC voltage is fed at one end. When there is no fault in any phases, LCD will display as NF (No fault) because at that time, no voltage across any register of the cable. During NF – Fault switch will be open so no current will flow. Here, according to different voltages of R – Y – B phases, we have decided as1 km, 2 km 3 km and 4 km. Particular ranges are clearly defined in the programming so once its detect that range, it will be display that particular range in kilometer by using Arduino. Finally same information sends to user by using GSM SIM.

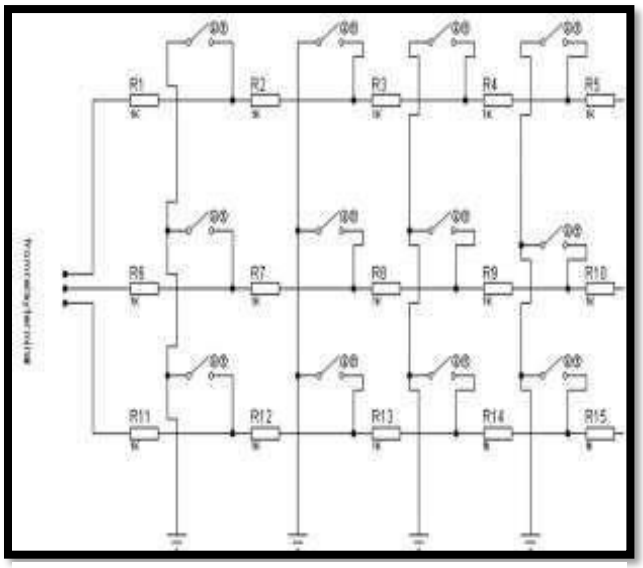


Figure 101 Circuit Diagram of Y-B power cable connection

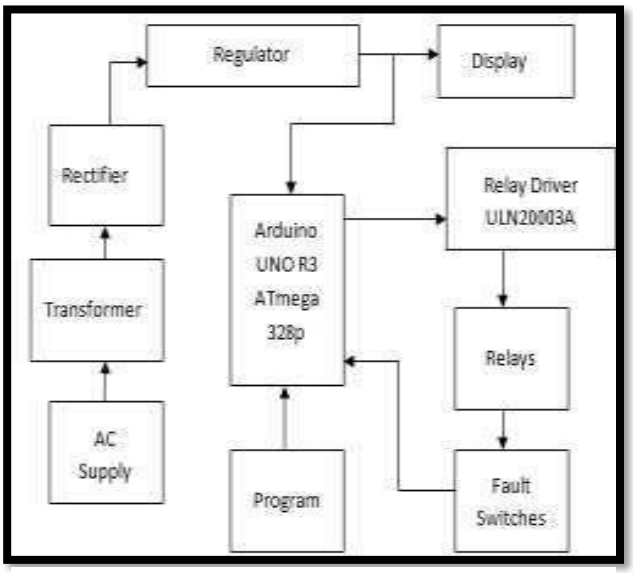


Figure 100 Circuit Diagram of system

CALCULATION

5V DC is given to register R1.Register R6 – R10 – R14 is connected to R, Y and B phase Relay respectively. Voltage across any Power Cable Register = 0V because Fault switch = OFF .Now to find voltage across any register, when Fault switch = ON ;For Example: 2 km Fault switch of Y phase = ON = Connected We have to apply Voltage Divider Rule;***V11 = (R11/ (R1+ R2+ R3+ R10+ R11))x Vs V11 = (1K/ (1K + 1K + 1K + 1K + 1K))x5V11 = 1*** Volt Where Supply Voltage = Vs = 5Similarly we can find the voltage across any register. Voltage will keep on decreases when the kilometer increases. In this project we are designing to achieve monitoring of underground cable and to provide information about detected fault. Ex:- Over voltage, under voltage, short circuit and open circuit conditions will be monitored by respective sensors. Figure shows the block diagram of fault detection in underground cable. The 230V supply is first stepped down to 12V AC using a step-down transformer. This is then converted to DC using full wave rectifier. The AC ripples is filtered out by using a capacitor and given to the input pin of this regulator. At output pin of this regulator we get a constant 5v DC which is used for Arduino and other ICs in this project. If any fault occurs that will be detected by the Arduino and convert the analog to digital value and interfacing stage i.e. buffer, driver and relay unit. Buffer is used for temporary storage, driver is used to drive the relay and relay for switching. Controller analyses the received signal and activates the GSM modules to send information to concern person. Controller as well activates the alerting system via interfacing stage. In the transmitting section, the corresponding voltage drop is fed into the controller which is inbuilt in Arduino.

This is consists of a 16bit and 32bit Analog to Digital converter. The 16bit Analog to digital converter converts the voltage into digital signal which is received from the fault switches and bank of resistors. The controller makes necessary calculations regarding the fault location. This data is then transmitted to the receiving section. The transceiver is interfaced with the display, the display shows the status of the cable at each phase. Also the distance of the cable at particularphase is displayed. The corresponding changes in the voltage and current help us to determine the type of fault in the cable. The data's are displayed using Arduino coding.

Component	Unit cost in Rs.	Quantity	Total cost in Rs.
Step down transformer	8000	1	8000
Full wave rectifier	1850	1	1850
Capacitor	350	1	350
Voltage Regulator	950	1	950
Arduino UNO	990	1	990
Protective Relays	1500	1	1500
Relay drivers	500	1	500
Fault switches	1000	1	1000
LCD display	250	1	250
			15,390

Table 22 COST ANALYSIS

13.1.8 Electrical Design 2:

DTMF based dam water gates controlling system:

The aim of this project is to provide an efficient solution for monitoring and control of dam water with automatic gate control. This system also enables the remote monitoring and control based on DTMF technology. Automated sensors and remote communication aims at building a highly automated irrigation system making use of sensors like water level indicators, gate status monitoring sensor, gate health sensor and feedback generating system etc. The objective of this project is fulfilled by employing a water sensor for water level indication, gate position monitoring and control system, and remote communicating modem and water sensor based gate health detector. The sensors altogether form the input module of the project. The project makes use of a microcontroller, which acts as a central controlling unit. This module is capable of communicating with the input and the output modules. The output module is formed by the motors used for closing and opening of gates and also the DTMF. The micro controller reads the sensor inputs continuously. The major ambition of this system is to remotely operate the gateways and automatically receive the feedback in overflow situations. The device consists of a mobile phone for which the maintainers have to make a call to close the gate of the dam and vice versa.

13.1.8.1 The advantages of this project are:

- Earlier detection of disaster.
- Remote controlling of the dam gates.
- Timer enabled water level indication.

- Monitoring can be done from anywhere in the world.

13.1.8.2 This project provides us knowledge on the following aspects:

- Interfacing Motors with Microcontroller.
- Operating depends on DTMF tones.
- Reading the input from the water sensors.
- Interfacing visual and audible alarm systems.

13.1.8.3 The major components of this design are:

1. Regulated power supply.
2. Microcontroller.
3. DTMF with interfacing circuit.
4. Motor drivers.
5. Gate controlling motors.
6. Water level sensors.
7. Buzzers.
8. LED indicators.

1. Regulated power supply:

Power supply regulation is the ability of a power supply to maintain an output voltage within a specified tolerance as referenced to changing conditions of input voltage and/or load. Most electronic equipment is powered from DC voltage derived from the unregulated AC mains voltage.

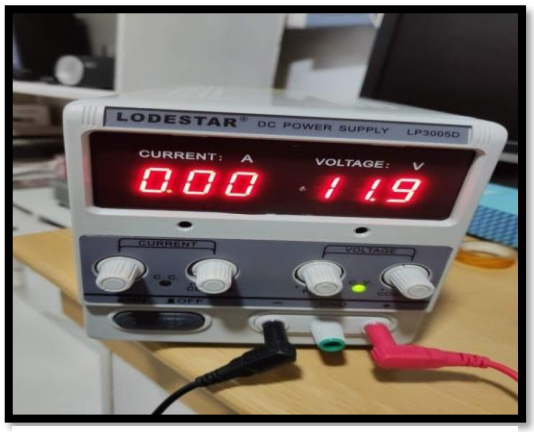


Figure 102 REGULATED POWER SUPPLY

2. Microcontroller: Microcontroller is a compact integrated circuit designed to govern a specific operation in An embedded system. A typical microcontroller includes a processor, memory and input/output (I/O) peripherals on a single chip. Sometimes referred to as an embedded controller or microcontroller unit (MCU), microcontrollers are found in vehicles, robots, office machines, medical devices, mobile radio transceivers, vending machines and home appliances, among other devices. They are essentially simple miniature personal computers (PCs) designed to control small features of a larger component, without a complex front-end operating system (OS).

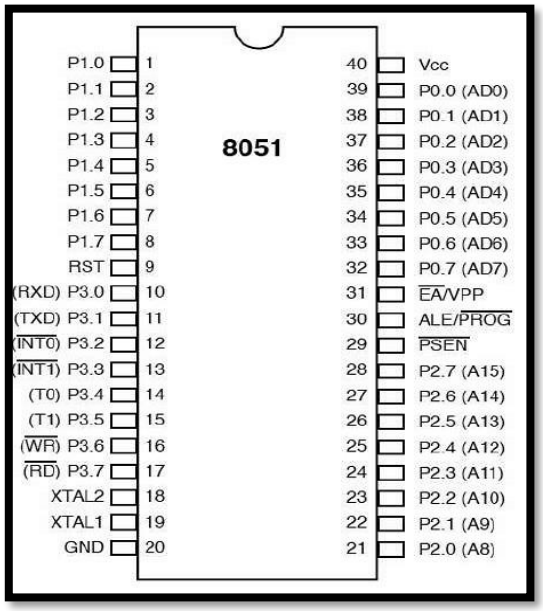


Figure 103 MICROCONTROLLER 8051

3. DTMF with interfacing circuit: DTMF (Dual Tone Multi-Frequency) is a telecommunication signaling technique that uses a mixture of two pure tones (pure sine waves). It is used in phones to generate dial tones. MT8870 is a DTMF helps decode the key pressed. It gives a 4-bit digital output that can be processed to identify the key pressed. The DTMF decoder circuit mostly used in mobile communications system which recognizes the sequence of DTMF tones from the standard keypad of the mobile phone.

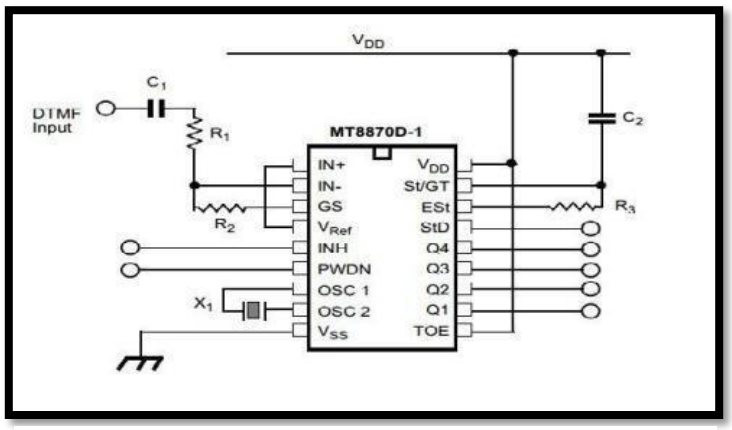


Figure 104 DTMF WITH CIRCUIT

4. Motor drivers: Motor drivers act as an interface between the motors and the control circuits. Motor require high amount of current whereas the controller circuit works on low current signals. So the function of motor drivers is to take a low-current control signal and then turn it into a higher-current signal that can drive a motor.

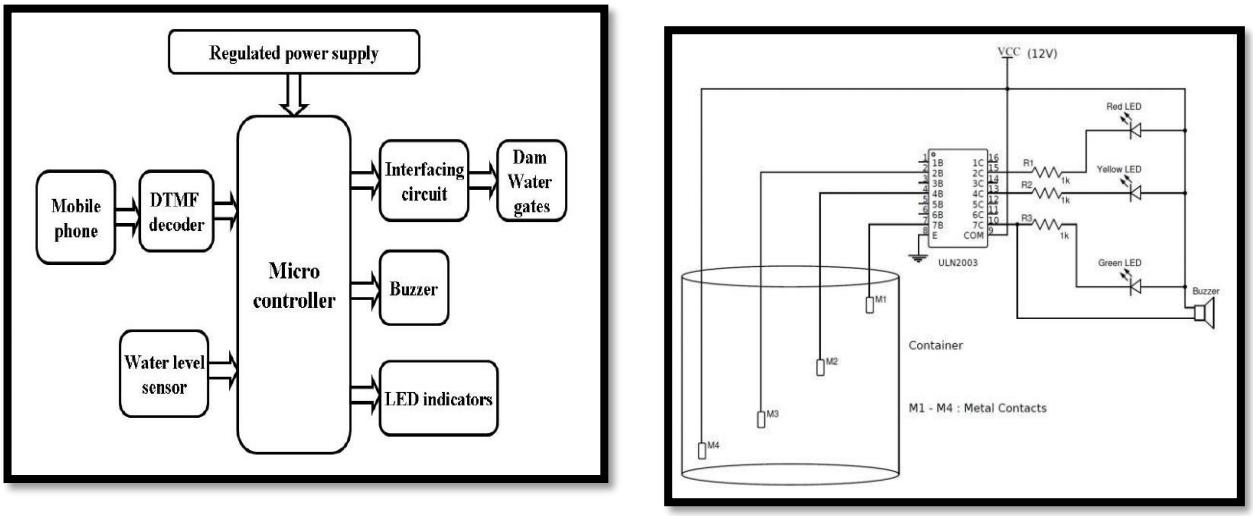


Figure 105 MOTOR DRIVER

5. Gate controlling motors: This system consists of a set of sensors connected to a stepper motor through an 8-bit microcontroller (AT89S52). The water level is detected based onthe feedback from the mechanism used. Based on this data, the level of dam gate can be controlled using a stepper motor via personal computer.
6. Water level sensors: Water level indicators work by using sensor probes to indicate water levels in a storage tank. These probes send information back to the control panelto trigger an alarm or indicator. As mentioned above, the control panel can be programmed to automatically turn on your pump to refill the water again.

7. Buzzers: A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or

Figure 108 BUZZER

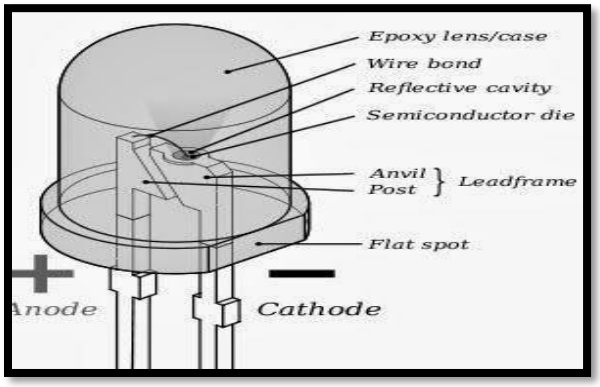


Figure 107 LIGHT EMITTING DIODE

8. LED indicators: A light-emitting diode (**LED**) is a semiconductor device that emits light when an electric current is passed through it. Light is produced when **the** particles that carry **the** current (known as electrons and holes) combine together within **the** semiconductor material. Regulated Power Supply:

13.1.8.4 Block diagram:

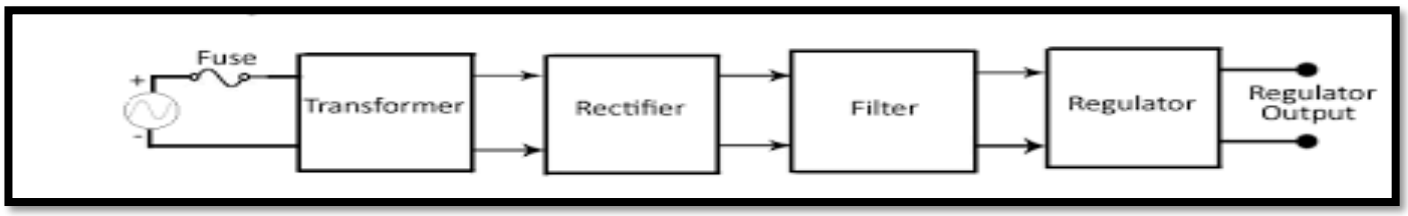


Figure 109 REGULATED POWER SUPPLY

Component	Unit cost in Rs.	Quantity	Total cost in Rs.
Regulated power supply	4500	1	4500
Microcontroller 8051	949	1	949
DTMF with interfacing circuit	250	1	250
Motor drivers	499	2	998
Gate controlling motors	6750	2	13500
Water level sensors	1299	2	2598
Buzzer	149	2	298
LED indicators	191	4	764
			23857

13.1.9 Electrical design 3: Wireless data acquisition system for energy tapping identifier:

The project aims in designing an instrument for identifying the energy tapping directly from the grid system. Energy stealing directly from the main line is the major problem in our country, especially in rural areas lot of energy is tampered and our Electricity department doesn't have any appropriate instrument to detect exactly where the energy is looted. Therefore this project work is taken up for the benefit of state Electricity Department.

The concept involved in the system is to measure the current flowing in the energy transmission line at sensitive areas, sensitive area is defined as where the transmission lines are passing very near to a village or passing over an agriculture field and people are tapping energy to run the pump sets. At these areas the current is measured with two CT's (Current transformers), these CT's are arranged at either side of the sensitive area, in series with phase. Now the current flowing through the CT primary is converted into digital and is fed to microcontroller. The controller displays the current in amps, since two CT's current is to be measured; two different systems are designed with two microcontroller units. One unit, which is supposed to be installed at starting point of particular zone, can be called as master unit. The other unit can be installed at other end of that particular zone, the current flowing through this unit Ct is transmitted in digital form. The master unit receives this data and displayed in LCD, the remote data acquired through Zigbee network is compared with master CT output and difference is displayed in separated row.The current flowing through both the CT's is almost equal, line loss is considered, whenever the energy is tapped between the two CT's, more current is passed through first CT, and the system is programmed such that when the difference is more than3-4% approximately, system energizes the alarm automatically.

13.1.9.1 The main objectives of the project are:

- Automatic identification of energy tapping.
- Usage of wireless ZIGBEE technology.

13.1.9.2 The project provides the following learning's:

- Zigbee technology.
- Interfacing Zigbee module to Microcontroller.
- Working of current transformer.
- Embedded C programming.
- PCB designing.

13.1.9.3 The main components of this project are:

- PIC Micro controller
- Regulated power supply (RPS)
- Crystal oscillator
- LCD Display
- Current transformer
- Wireless Zigbee Transceiver.
- LED indicators

1. PIC Micro controller: PIC microcontrollers (Programmable Interface Controllers) are electronic circuits that can be programmed to carry out a vast range of tasks. They can be programmed to be timers or to control a production line and much more.

2. Regulated power supply: A regulated power supply converts unregulated AC (Alternating Current) to a constant DC (Direct Current). A regulated power supply is used to ensure that the output remains constant even if the input changes. A regulated DC power supply is also known

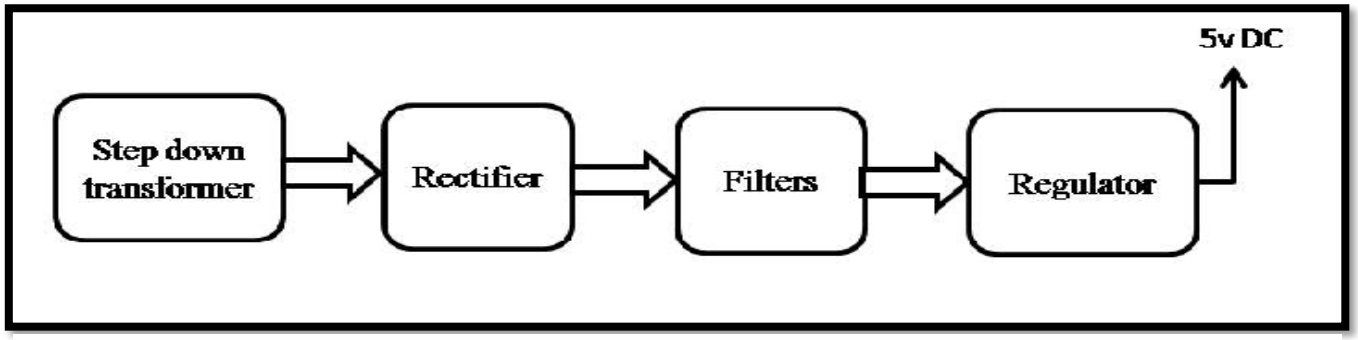
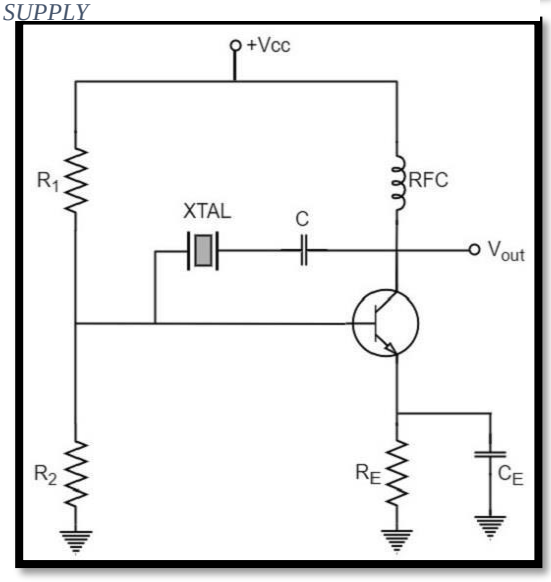


Figure 110 REGULATED POWER SUPPLY

as a linear power supply; it is an embedded circuit and consists of various blocks.

3. Crystal oscillator: Crystal oscillators operate on the principle of inverse piezoelectric effect in which an alternating voltage applied across the crystal surfaces causes it to vibrate at its natural frequency. It is these vibrations which eventually get converted into oscillations. A crystal oscillator is an electronic oscillator circuit that is used for the mechanical resonance of a vibrating crystal of piezoelectric material. It will create an electrical signal with a given frequency



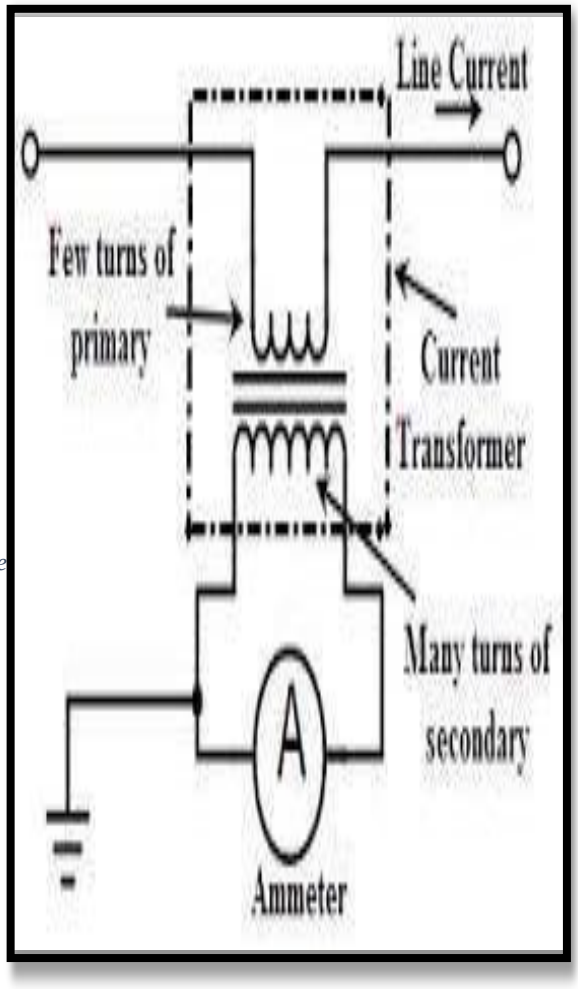
4. LCD display:A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals combined with polarizer. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in color or monochrome.

Figure 111 CRYSTAL OSCILLATOR

Figure 112 L.C.D DISPLAY

5. Current transformer: A current transformer is a device that is used for the transformation of current from a higher value into a proportionate current to a lower value. It transforms the high voltage current into the low voltage current due to which the heavy current flows through the transmission line is safely monitored by the ammeter.

6. Wireless Zigbee Transceiver: Zigbee is a low-cost, low-power, wireless mesh network standard targetedat battery-powered devices in wireless control and monitoring applications. Zigbee delivers low-latency communication. Zigbee chips are typicallyintegrated with radios and with microcontrollers. Zigbee is a wireless technology developed as an open global standard to address the unique needs of low-cost, low- power wireless IoT networks. The protocol allowsdevices to communicate in a variety of network topologies and can have battery life lasting several years.



Figure

7. LED indicators: **LED Indicators** are used as indicating, warning, accidental signals and other signals of instrument circuits in the areas of electric power.

8. Voltage transformer: The **Voltage Transformer** can be thought of as an electrical component rather than an electronic component. A transformer basically is very simple static (or stationary) electro-magnetic passive electrical device that works on the principle of Faraday's law of induction by converting electrical energy

13.1.9.4 System block diagram

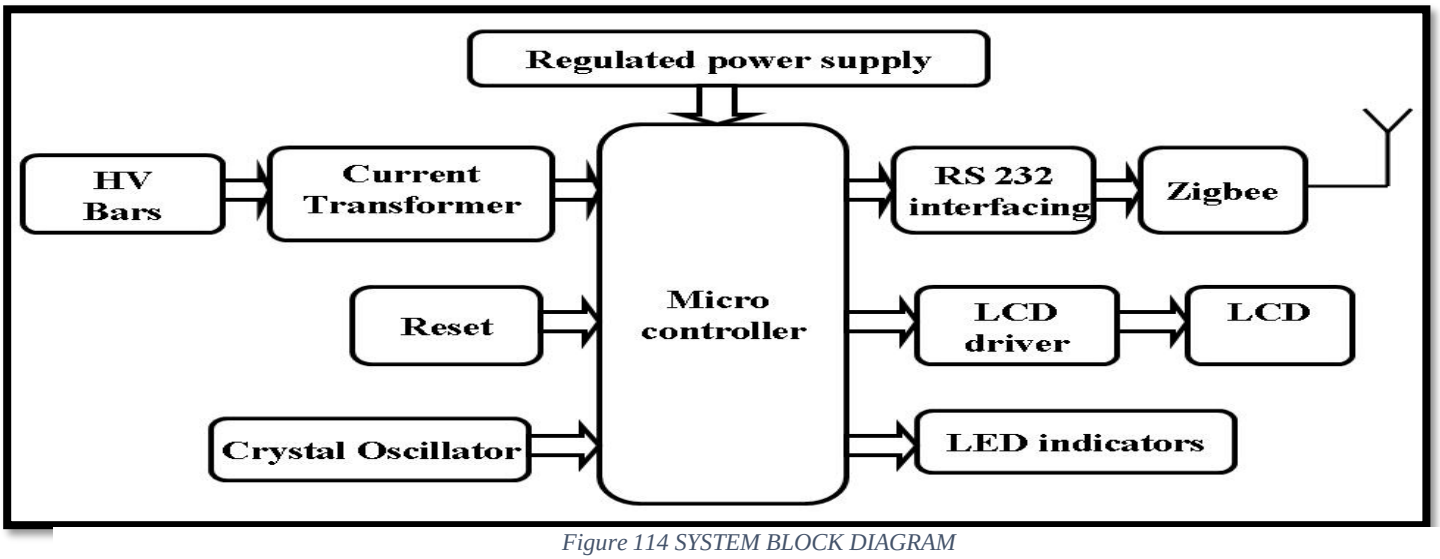


Figure 114 SYSTEM BLOCK DIAGRAM

Component	Unit cost in Rs.	Quantity	Total cost in Rs.
PIC Microcontroller	999	2	1998
DC regulated power supply	4500	2	9000
Crystal oscillator	50	2	100
LCD display	289	2	578
Current Transformer	651	2	1302
Wireless Zigbee Transceiver	750	2	1500
LED indicators	40	4	160
			14,638

Table 23 COST ANALYSIS FOR ELE DESIGN -3

13.2 Reasons For students Recommending this Designs

All the Designs which are given by us, main reason is for villagers is ease of living for them.

- Ease of Living.
- To maintain proper infrastructure of Village.
- To educate them.

- For saving their times which they can utilize for different functions.
- For reducing pollution and make village more attractive.
- To improve their standard of living.
- To help children's to improve their carriers.
- We had given design for Cafeteria is because we want village to be more popular and make it center of attraction towards village as our village lies beside Highway and also wanted to put it for nature lovers.
- Design for library is given for firstly, there are no any library there and also we want to people to be educated there because without education there is no progress.
- Design for Cybercafe is given for people there who are not familiar with computers and want to start learning can start using computers in Cybercafe and while browsing they will get knowledge about going on world and can take part
- Design of supermarket is given for people who were keeping and taking lorry here and there can get together at one place and it will make everything easy for buyers and sellersboth.
- We have given design for Bus stop because at present Bus stop their need renovation andit is of according old designs and now as we are progressing we need bus stop in new model.
- We had also given design for public garden where people can get sit together and will be very beautiful and there is need for new design public garden so they can get familiar with cities and town.

13.3 About designs Suggestions/Benefit for the villagers

1.PUBLIC GARDEN

- It is proposed in village for health related activities can done.
- For spreading awareness in Village.
- They are the sources of recreation, as well as education and research opportunities.

2.CAFETERIA

- It is proposed for making village as a center of attraction and introducing a new conceptfor the village
- To bring people to get in touch with nature.
- It will be a great income for villagers as there will be very much people coming on visit.
    - People can get relaxed after being between nature.

3.BUS STOP

- There is Bus Stop there which urgently wants renovation and because it is at starting ofvillage it gives a bad impression about village.
- Renovated Bus Stop according to modern design will be made which gives village good aesthetic.

4.LIBRARY

- There is no library in village so it will be a new initiative for village.
- It will help students for growing their carrier
    - There will be lot development in hobbies of people and etc

5.SUPER MARKET

- It will reduce traffic in village where people stand here and there for buying or selling ofitems.
- They can collect rent from super market and can increase revenue in village fund.
    - As all the sellers will stand at one place public will be benefited for their price.

6.CYBERCAFE

- As today's world is full of online activities there is much need of computers so we had proposed cybercafe in favour of modaj village.
- By this, villagers can go through computers and can make their life easier.
- They can also learn computers and can do their business online
- If they will learn about computers and when they will be use their computers in theirdaily life and then no need to come to society which this yojana wants, they will be known in Indian community.

7.UNDERGROUND CABLE FAULT DIDTANCE LOCATOR:

- Underground cable is not affected by atmospheric conditions such as rainfall, storm etc.and it also gives smart look to the village.

- It is unaffected by outer source and power supply is reliable so chances of blackout is reduced in village.
- Fault distance locator helps to find the fault in a limited time and further fault is solved so continuity is maintained and problem of villagers are overcome.

8. DTMF BASED DAM WATER GATES CONTROLLING SYSTEM:

- As dam are helpful to villagers for agriculture purpose and also it is permanent solutionof water while this design detect faults earlier so there is enough time to overcome the fault.
- It helps in remote controlling of gates and is easy to operate so a villager with a basic training can operate it.
- Due to excessive rainfall water in dam is overflowed that can affect the dam as well as village for this design provides a time enabled water level indicator.

9. WIRELESS DATA ACQUISSITION SYSTEM FOR ENERGY TAPPING IDENTIFIER:

- Energy stealing is a major issue in rural areas where a person steals electricity throughtapping and due to this there is loss of energy in the grid and a genuine customer bill isincreased than its usage, this design can overcome this problem.
- This design helps to find the tapper in rural areas by monitoring from the main grid and villager who has proper connection is able to use amount of electricity for which he pays.
- Nowadays this system is adapted more as it is capable of solving the problems in villagesand villagers.

CHAPTER 14

TECHNICAL OPTION WITH CASE STUDIES

14.1 Civil Engineering

14.1.1 Advanced Earthquake Resistant

Introduction

Whenever there is an earthquake related disaster in the news with collapsed buildings &other structure all over the place, one may think that earthquake resistant design(EQRD) of structure are still in dark age. Thus we desperately need advanced earthquake resistant design to make structure less vulnerable to earthquake even for large earthquake.

Seismology is the branch of Geophysics concerned with the study and analysis of Earthquakes and the science of energy propagation through the Earth's crust. Engineering Seismology is concerned with the solution of engineering problems connected with the Earthquakes. Seismology is extremely important because:

- Study of earthquakes gives us important clues about the earth's interior.
- Understanding earthquakes allows us to minimize the damage and loss of life.

What is an earthquake?

- An earthquake is the vibration of Earth produced by the rapid release of accumulatedenergy in elastically strained rocks.
- Energy released radiates in all directions from its source, the focus.
- Energy propagates in the form of seismic waves.
- Sensitive instruments around the world record the event.

What causes an Earthquake?

Movement of Tectonic Plates

Earth is divided into sections called Tectonic plates that float on the fluid-like interior of the Earth. Earthquakes are usually caused by sudden movement of earth plates

Rupture of rocks along a fault
Faults are localized areas of weakness in the surface of the Earth, sometimes the plate boundary itself.

How Earthquake Causes Damage?

- The severe shaking produced by seismic waves can damage or destroy building & bridge, topple utility poles & fracture gas and water mains.
- S wave can put stress on building to tear them apart. Also trigger landslide or avalanches.

Construction Methods

- Base-isolation are designed in buildings. It is a building designed to reduce amount of energy that reaches the building during earthquake.
- Flexible joints and automatic shut off valves can be installed.

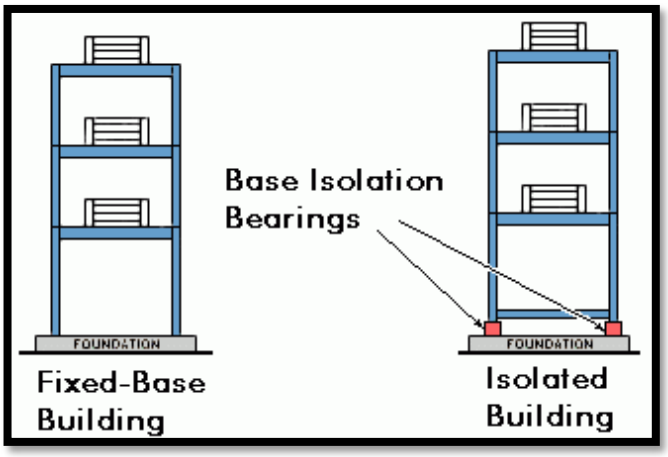


Figure 115 Constructions method

Base Isolation Method

- A base isolated structure is supported by a series of bearing pads which are placed betweenthe building and the building's foundation.

- A variety of different types of base isolation bearing pads have now been developed. The bearing is very stiff and strong in the vertical direction, but flexible in the horizontal

Protecting Against Earthquake Damage

- Prepare a Seismic Risk Map for the globe which identifies rock types, liquefaction potential, landslide potential.
- Extensive geologic surveying has to be done to identify all active faults, including hiddenfaults.
- Earthquake Resistant Design of Structures
- Enact building codes to design and build earthquake-resistant structures in high seismic risk areas. wood, steel and reinforced concrete are preferred as they tend to move with theshaking ground (unreinforced concrete and heavy masonry tend to move independently and in opposition to the shaking, battering one another until the structure collapses)

Earthquake resistant expansion joint (ERJ)

Engineered Structure

Buildings need to be designed and constructed as per the building by laws to withstand ground shaking. Architectural and engineering inputs need to be put together to improve building design and construction practices. The soil type needs to be analyzed before construction.

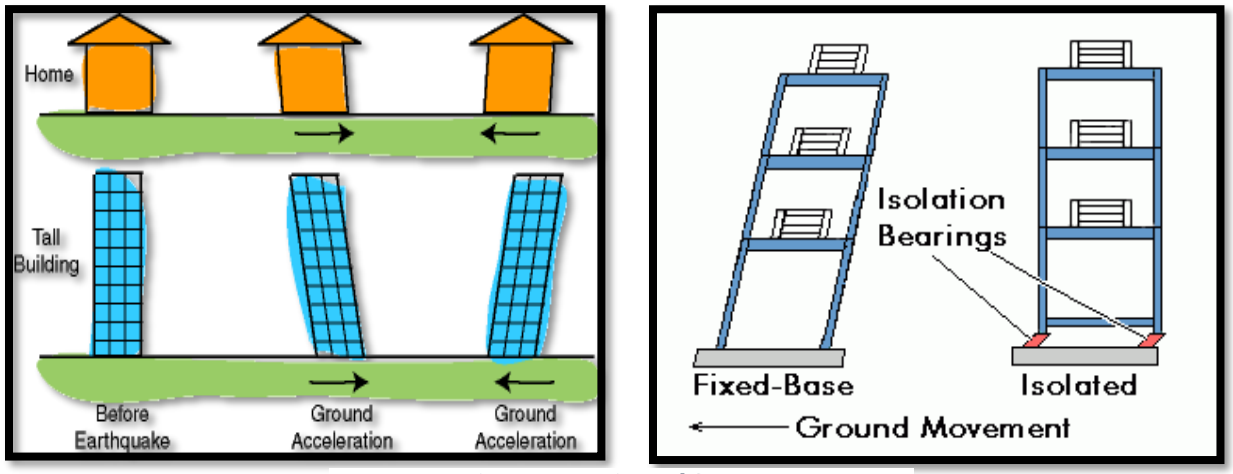


Figure 116 Engineered Structure

Earthquake Generated Forces

To get a basic idea of how base isolation works, examine.

This shows an earthquake acting on both a base-isolated building and a conventional, fixed- base**,** building. As a result of an earthquake, the ground beneath each building begins to move. In Figure, it is shown moving to the left. Each building responds with movement which tends toward the right.

The building undergoes displacement towards the right. The building's displacement in the direction opposite the ground motion is actually due to inertia**.**
The inertial forces acting on a building are the most important of all those generated during an earthquake. It is important to know that the inertial forces which the building undergoes are proportional to the building's acceleration during ground motion.

It is also important to realize that buildings don't actually shift in only one direction. Because of the complex nature of earthquake ground motion, the building actually tends to vibrate back and forth in varying directions.

SOFTWARE USED FOR DESIGNING THE BUILDING

- We have used STAAD Pro V8i Software for designing the structure.

What is STAAD Pro??

- STAAD Pro stands for Structural Analysis and Designing Program. This Software is most used Software for civil Engineering designing.
- STAAD Pro is a structural design oriented program with a user interactive interface which allows for the user working on it extremely easy.
- It can be used for modelling, designing and analyzing various structures and structural configurations.
- It is extremely useful for buildings and other such structures insignificant of their uses varying from residential to commercial to hospitals to offices. This software can be used for all kinds of buildings of various architectural drawings under a plethora ofloads.

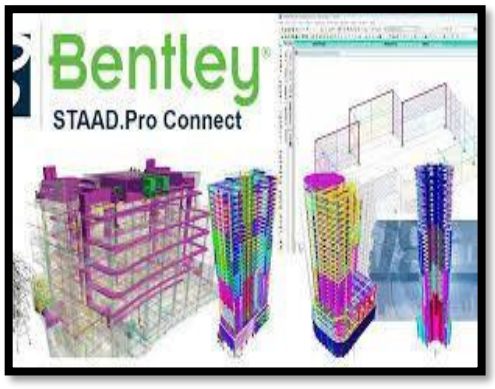


Figure 117 Staad Pro Designs

- Other than buildings, it is also useful for bridges to some extent and also foundation design and analysis. Shear wall is another feature incorporated into it for design facilitation. Steel buildings and connections can also be designed and successfully rendered to view the real-life resembling images for detailed clarity.

How can STAAD Pro help us?

- STAAD Pro software enables structural engineers to automate their undertakings byevacuating the repetitive and lengthy procedures of the manual methods.
- STAAD Pro happens to be a structural analysis software that accompanies an adaptable modelling environment, advanced features, and smooth data collaboration. It is the world's numerous structural analysis and design software that backs Indian and every single global code.
- STAAD Pro design software gives options to structural engineers to dissect and designfor all intents and any sort of structures. Departments in construction companies, proprietor/administrators, structural engineering firms and government offices etc. and offshore platform designers make use of this software broadly.
- STAAD Pro enables structural engineers to dissect and outline for all intents and purposes any sort of structure, auxiliary specialists, divisions in development

organizations, proprietor/administrators, and government offices, and seaward stagefashioners' utilization this product broadly.

Limitations:

- Not for brick masonry work.
- Does not show the amount of material used.
- Not for costing and estimating.
- Require proper skill for typical designs.
- And few other.

Benefits of STAAD Pro:

- Faster method of designing the structure.
- Does not involve any manual calculation.
- Suitable for almost all types of material for designing i. e. Concrete, Steel, Aluminiumetc.
- Shows accuracy in results i.e. Shear Force, Bending moment diagram for each and every beam and column of the structure. That you were doing manually.
- Shows result for Number of reinforcement used longitudinal, Shear reinforcement.
- Helps you to make improvement in structure, section, dimensions.
- You can design structure for any type of load i. e. Dead load, Live load, wind load, snowload, area load, floor load etc.
- You can design simple beam to sky scraper and analyze whether it will fail at appliedload or pass.
- You can import designs from auto CAD to STAAD Pro.
- Easy to learn.
-

STAAD Pro BUILDING DESIGN OF EARTHQUAKE RESISTANT BUILDING

Structure Type: SPACE FRAME

Number of Nodes	80	Highest Node	80
Number of Elements	160	Highest Beam	160

Number of Basic Load Cases	-2
Number of Combination Load Cases	27

Type	L/C	Name
Primary	1	EQ +X
Primary	2	EQ -X
Primary	3	EQ +Z

Primary	4	EQ -Z

Materials

Table 24 Material for Earthquake resistant building

Material	Name	E (KN/mm^2)	□	Density (kg/m^3)	□ (/°C)
1	STEEL	205.000	0.300	7.83E+3	12E-6
2	STAINLESSSTEEL	197.930	0.300	7.83E+3	18E-6
3	ALUMINUM	68.948	0.330	2.71E+3	23E-6
4	CONCRETE	21.718	0.170	2.41E+3	5E-6

Primary Load Cases

Table 25 Primary Load cases in Staad

Number	Name	Type
1	EQ +X	Seismic
2	EQ -X	Seismic
3	EQ +Z	Seismic
4	EQ -Z	Seismic
5	DL	Dead
6	LL	Live

Combination Load Cases

Table 26 Combination load causes in Staad

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
7	GENERATED INDIAN CODE GENRAL_S	5	DL	1.50
		6	LL	1.50
8	GENERATED INDIAN CODE GENRAL_S	5	DL	1.20
		6	LL	1.20
9	GENERATED INDIAN CODE GENRAL_S	5	DL	1.20
		6	LL	1.20
		1	EQ +X	1.20
10	GENERATED INDIAN CODE GENRAL_S	5	DL	1.20
		6	LL	1.20

		2	EQ -X	1.20
11	GENERATED INDIAN CODE	5	DL	1.20

	GENRAL_S			
		6	LL	1.20
		3	EQ +Z	1.20
12	GENERATED INDIAN CODEGENRAL_S	5	DL	1.20
		6	LL	1.20
		4	EQ -Z	1.20
13	GENERATED INDIAN CODEGENRAL_S	5	DL	1.20
		6	LL	1.20
		1	EQ +X	-1.20
14	GENERATED INDIAN CODEGENRAL_S	5	DL	1.20
		6	LL	1.20
		2	EQ -X	-1.20
15	GENERATED INDIAN CODEGENRAL_S	5	DL	1.20
		6	LL	1.20
		3	EQ +Z	-1.20
16	GENERATED INDIAN CODEGENRAL_S	5	DL	1.20
		6	LL	1.20
		4	EQ -Z	-1.20
17	GENERATED INDIAN CODEGENRAL_S	5	DL	1.50
18	GENERATED INDIAN CODEGENRAL_S	5	DL	1.50
		1	EQ +X	1.50
19	GENERATED INDIAN CODEGENRAL_S	5	DL	1.50
		2	EQ -X	1.50
20	GENERATED INDIAN CODEGENRAL_S	5	DL	1.50
		3	EQ +Z	1.50
21	GENERATED INDIAN CODEGENRAL_S	5	DL	1.50
		4	EQ -Z	1.50
22	GENERATED INDIAN CODEGENRAL_S	5	DL	1.50
		1	EQ +X	-1.50
23	GENERATED INDIAN CODEGENRAL_S	5	DL	1.50
		2	EQ -X	-1.50
24	GENERATED INDIAN	5	DL	1.50

	CODE			

	GENRAL_S			
		3	EQ +Z	-1.50
25	GENERATED INDIAN CODE GENRAL_S	5	DL	1.50
		4	EQ -Z	-1.50
26	GENERATED INDIAN CODE GENRAL_S	5	DL	0.90
		1	EQ +X	1.50
27	GENERATED INDIAN CODE GENRAL_S	5	DL	0.90
28	GENERATED INDIAN CODE GENRAL_S	5	DL	0.90
		3	EQ +Z	1.50
29	GENERATED INDIAN CODE GENRAL_S	5	DL	0.90
		4	EQ -Z	1.50
30	GENERATED INDIAN CODE GENRAL_S	5	DL	0.90
		1	EQ +X	-1.50
31	GENERATED INDIAN CODE GENRAL_S	5	DL	0.90
		2	EQ -X	-1.50
32	GENERATED INDIAN CODE GENRAL_S	5	DL	0.90
		3	EQ +Z	-1.50
33	GENERATED INDIAN CODE GENRAL_S	5	DL	0.90
		4	EQ -Z	-1.50

Statics Check Results

Table 27 Static check result done in Staad.

L/C		**FX** (kN)	**FY** (kN)	**FZ** (kN)	**MX** (kNm)	**MY** (kNm)	**MZ** (kNm)
1:EQ +X	Loads	42.081	0.000	0.000	0.000	57.719	-130.226
1:EQ +X	Reactions	-42.081	-0.000	0.000	0.000	-57.719	130.226
	Difference	0.000	-0.000	0.000	0.000	-0.000	0.000
2:EQ -X	Loads	-42.081	0.000	0.000	0.000	-57.719	130.226

2:EQ -X	Reactions	42.081	0.000	-0.000	-0.000	57.719	-130.226
	Difference	-0.000	0.000	-0.000	-0.000	0.000	-0.000
3:EQ +Z	Loads	0.000	0.000	42.081	130.226	-57.719	0.000

3:EQ +Z	Reactions	-0.000	-0.000	-42.081	-130.226	57.719	-0.000
	Difference	-0.000	-0.000	-0.000	-0.000	0.000	-0.000
4:EQ -Z	Loads	0.000	0.000	-42.081	-130.226	57.719	0.000
4:EQ -Z	Reactions	0.000	0.000	42.081	130.226	-57.719	0.000
	Difference	0.000	0.000	0.000	0.000	-0.000	0.000
5:DL	Loads	0.000	-1.03E+3	0.000	1.42E+3	0.000	-1.42E+3
5:DL	Reactions	-0.000	1.03E+3	0.000	-1.42E+3	0.000	1.42E+3
	Difference	-0.000	0.000	0.000	0.000	0.000	-0.000
6:LL	Loads	0.000	-15.050	0.000	20.643	0.000	-20.643
6:LL	Reactions	-0.000	15.050	-0.000	-20.643	-0.000	20.643
	Difference	-0.000	-0.000	-0.000	-0.000	-0.000	0.000

Beam Maximum Forces by Section Property

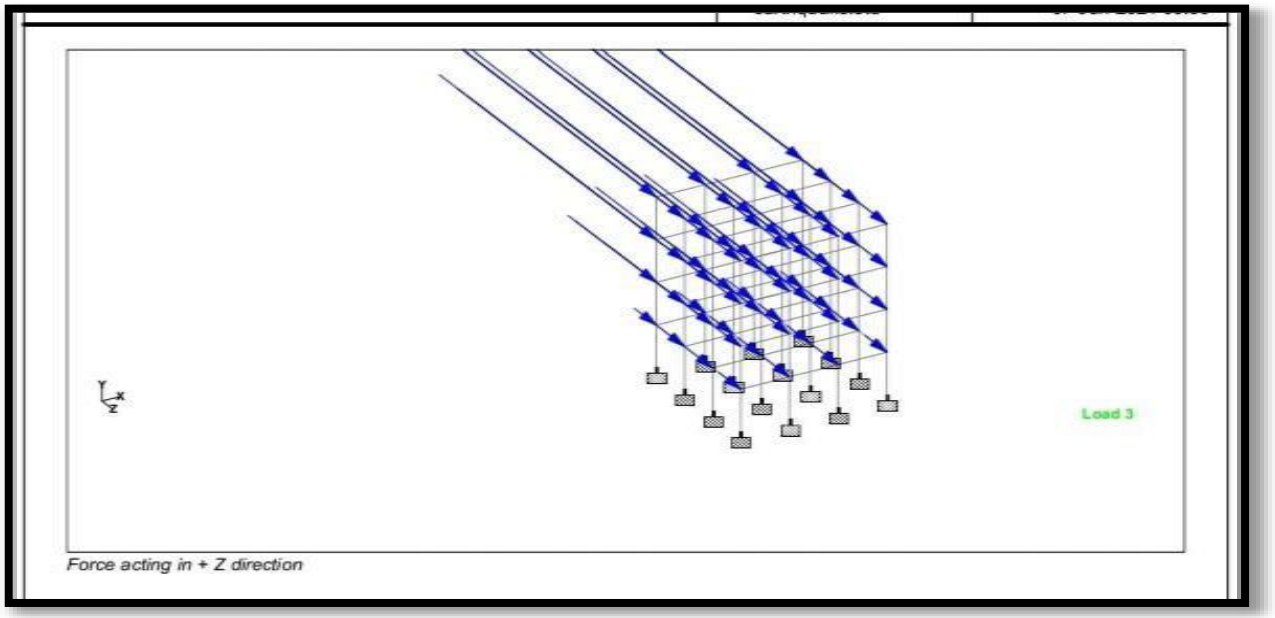


Table 28 Beam Maximum Forces by Section Property in Staad.

Section		Axial	Shear		Torsion	Bending	
		Max Fx (kN)	Max Fy (kN)	Max Fz (kN)	Max Mx (kNm)	Max My (kNm)	Max Mz (kNm)
Rect 0.30x0.23	Max +ve	115.374	14.432	4.924	0.136	2.311	3.842
	Max -ve	-9.622	-14.432	-4.924	-0.136	-2.311	-2.529

Section Properties

Table 29 Section Properties in Staad.

Prop	Section	Area (cm^2)	Iyy (cm^4)	Izz (cm^4)	J (cm^4)	Material
1	Rect 0.35x0.30	1.05E+3	78.8E+3	107E+3	153E+3	CONCRETE
2	Rect 0.30x0.23	690.000	30.4E+3	51.8E+3	64.6E+3	CONCRETE

Figure 118 Force acting in Y-Direction

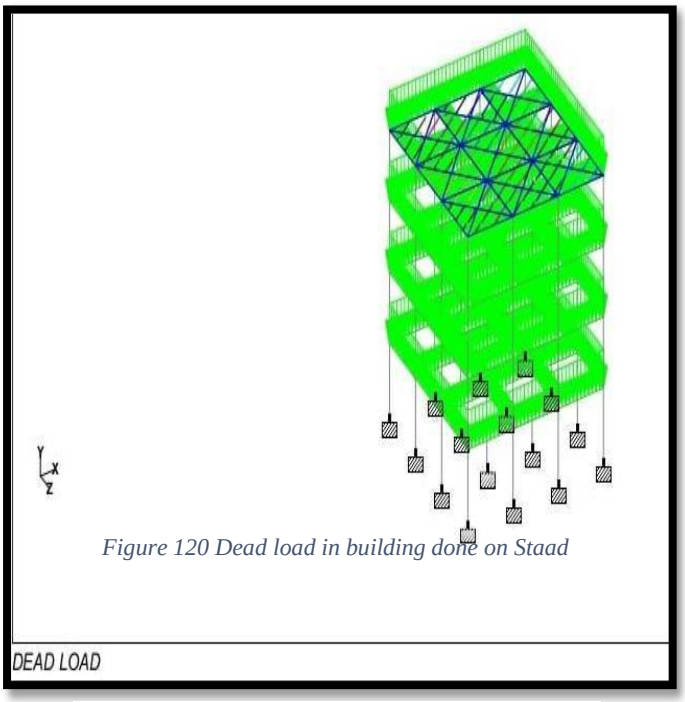


Figure 120 Dead load in building done on Staad

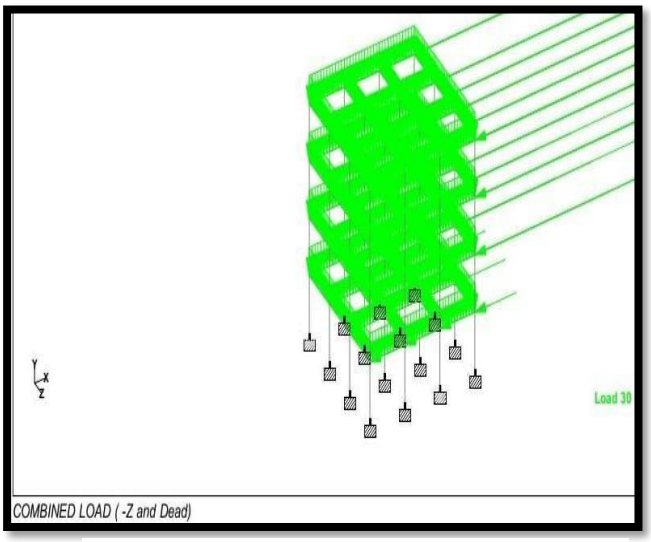


Figure 121 Combined load in building done on Staad

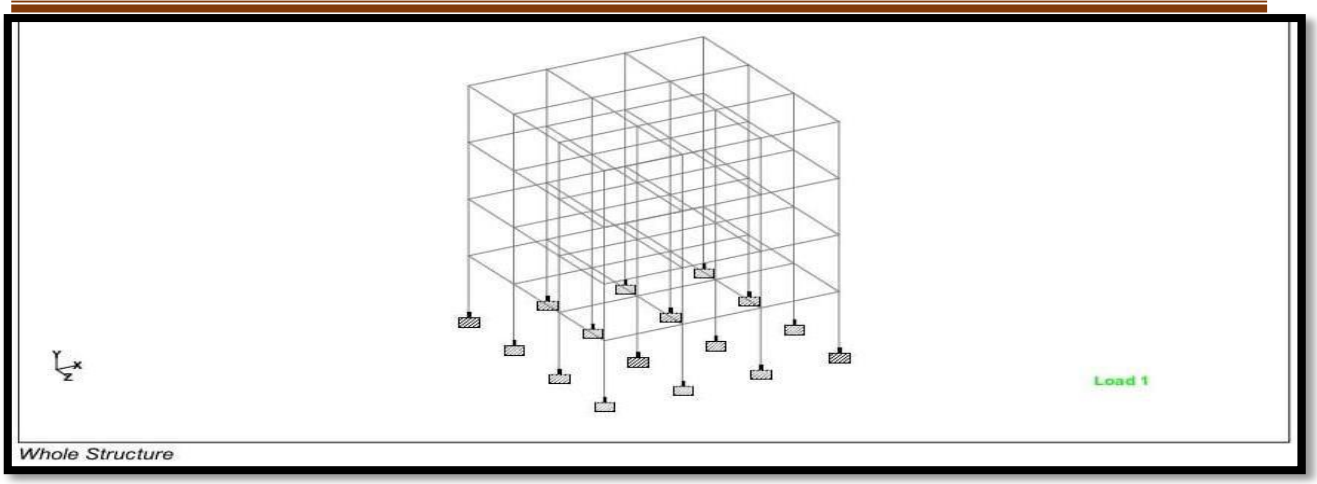


Figure 122 Whole structure load on Staad pro

SHEAR WALL DESIGN

- The use of shear walls as an earthquake resistant design is becoming dominant in seismic zones. For a structural engineer, the number one priority, when designing a building, is safety. Designing walls to resist lateral loads is part of ensuring safety of a structure.
- Generally, they are structural members, which its proper positioning at different locationsin a building, from top level to foundation level, will ensure the building resists lateral loads.
- Shear walls offer resistance to wind load and seismic load by transferring all the forces tothe foundation
- They provide the stiffness and strength of a building and resists lateral forces by transferring all the forces, caused by the lateral load, to the foundation of the building. They can be used as lateral load resisting systems and also retrofitting of structures.

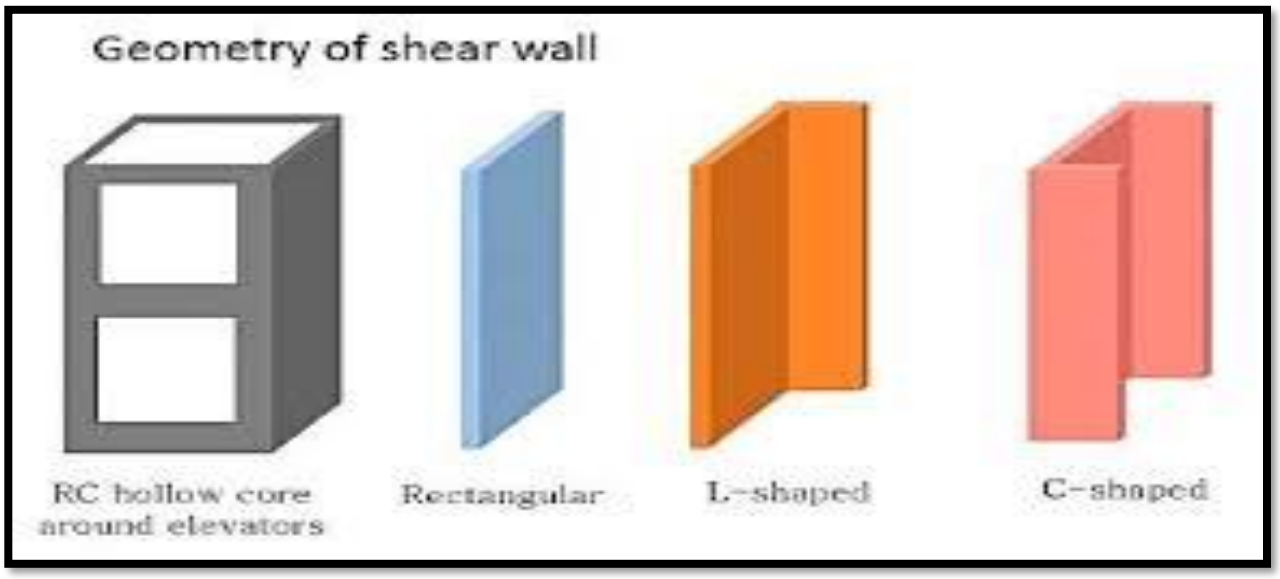


Figure 12 GEOMETRY OF SHEAR WALL

The positioning of shear walls in advantageous positions in the building, can form an efficient lateral force resisting system by reducing lateral displacements under wind loads and seismic loads.

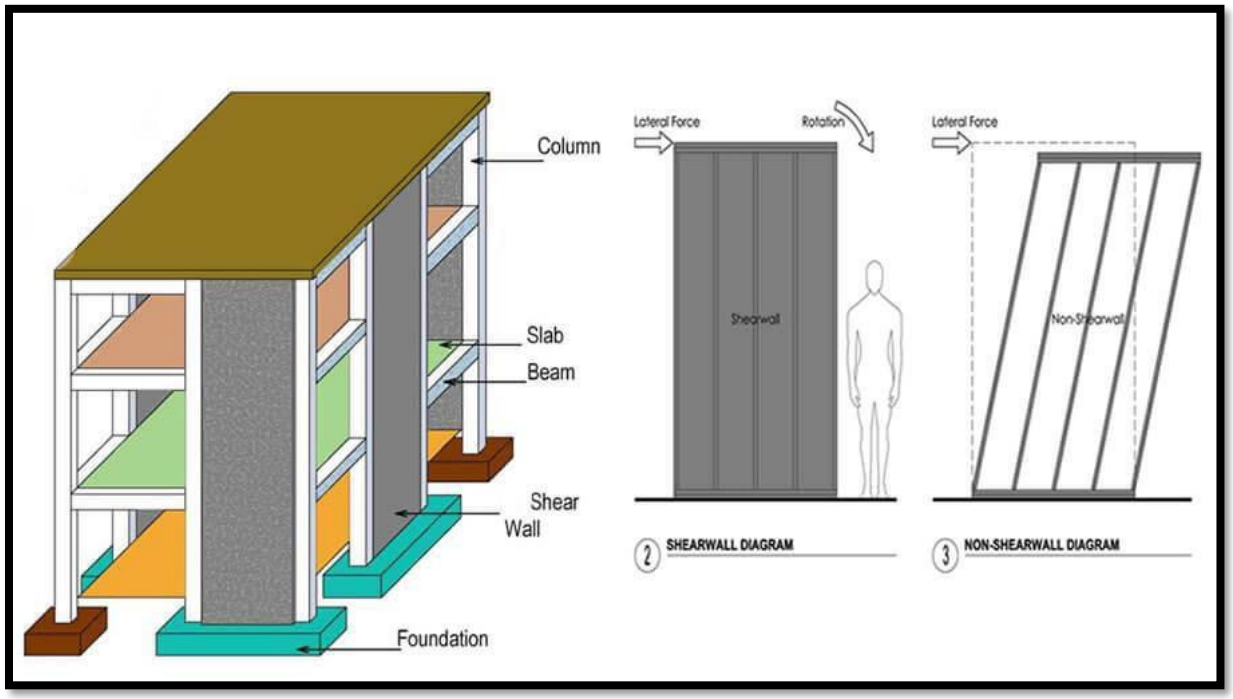


Figure 123 Shear wall design in earthquake resistant building

STAAD PRO DESIGN OF SHEAR WALL

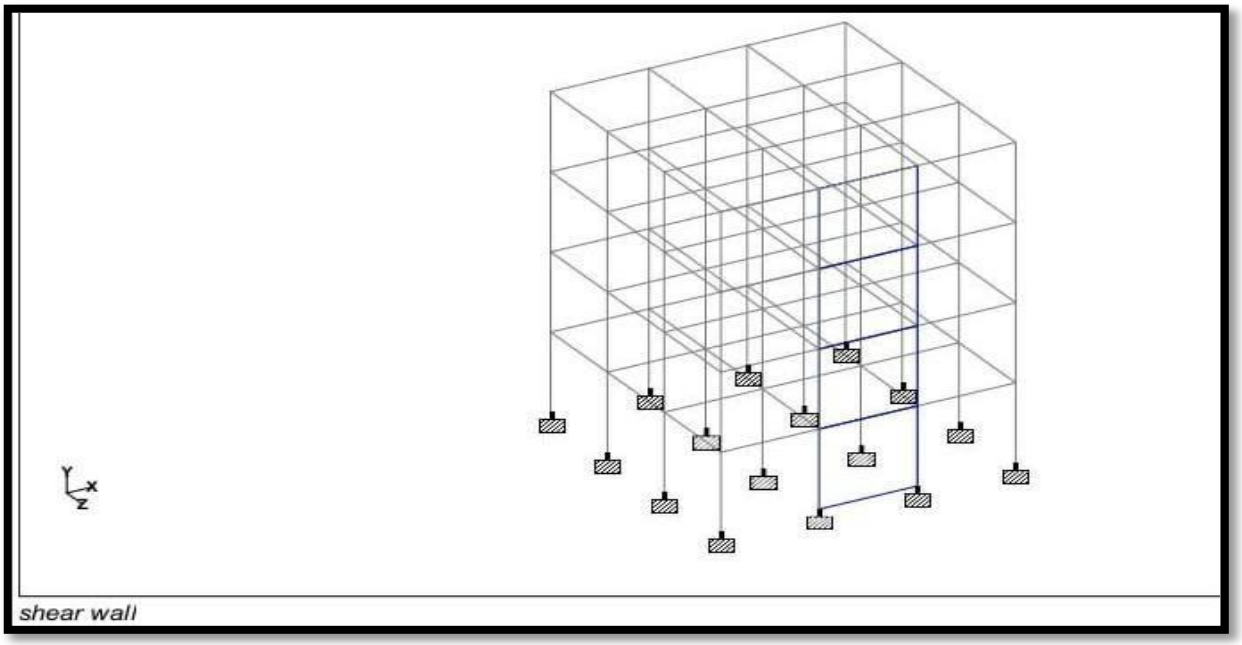


Figure 124 Analysis done in STAAD PRO DESIGN OF SHEAR WALL

CONSTRUCTION COST ESTIMATE

Table 31 Building construction materials quantity taken

Building Construction Materials				
Sr.No.	**Material**	**Qty**	**Rate(Rupees)**	**Amount**
1	Cement in Bags	3400	350	11,90,000.00
2	Steel in Kg	21250	55	11,68,750.00
3	Sand in Cu.ft.	10200	60	6,12,000.00
4	Gravel in Cu. ft.	11475	60	6,88,500.00
5	Bricks in Nos.	62220	5.5	3,42,210.00
6	Tiles in Sq. ft.	5950	70	4,16,500.00
7	Color in Liters	1020	212	2,16,240.00
			Total Cost	**₹ 46,34,200.00**

14.1.2 Seismic Retrofitting Of Building

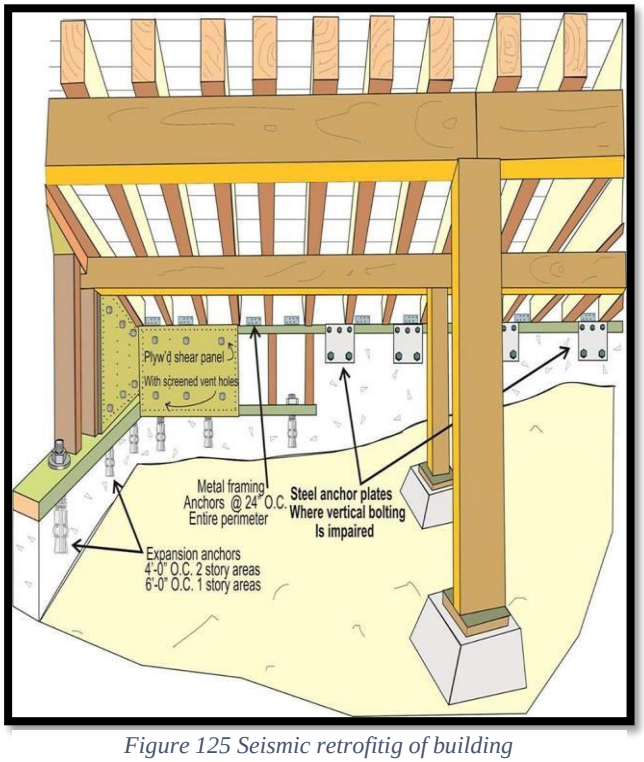


Figure 125 Seismic retrofitig of building

It's Function is To improve the effectiveness and capability of either the seismically insufficient weak structures or tremor harmed structures. Considering the blended and complex seismic reactions of retrofitted structures, heterogeneous nature of various developments along with the strain subordinate versatile properties of different materials hamper to bring a complete avocation of the use of insightful investigations. A sound subjective premise of exploratory investigations or the experience of retrofitted structures during future tremor will precisely pass judgment and uncover the accomplishment of retrofitted structures.

Since we have a significant deficiency of involvement and trial information on the conduct and reaction of retrofitted structures, the contextual investigations introduced here depend on the experience got by the others. By chance, two significant quakes of March 14 and September 19, 1979 hit an enormous number of built up substantial structures in Mexico. Some of them were retrofitted whose adequacy came to be really decided by the reoccurrence of a tremor in the same district in 1985. Comparative experience has been at first acquired from Turkey tremor, 1988 in which countless structures were harmed and retrofitted. This end up being a decent learning opportunity about the conduct of the retrofitted structures. A couple of accessible contextual investigations introduced in this part fill in as great occurrences for a superior comprehension of customary retrofitted plans. A portion of the investigations alluded here depend on advance mechanical gadgets like base seclusion and supplemental dampers. The data as to, adequacy, test consequences of the scientific or exploratory suggestions depend on the examinations and experience got by singular creators as communicated in the distributed work.

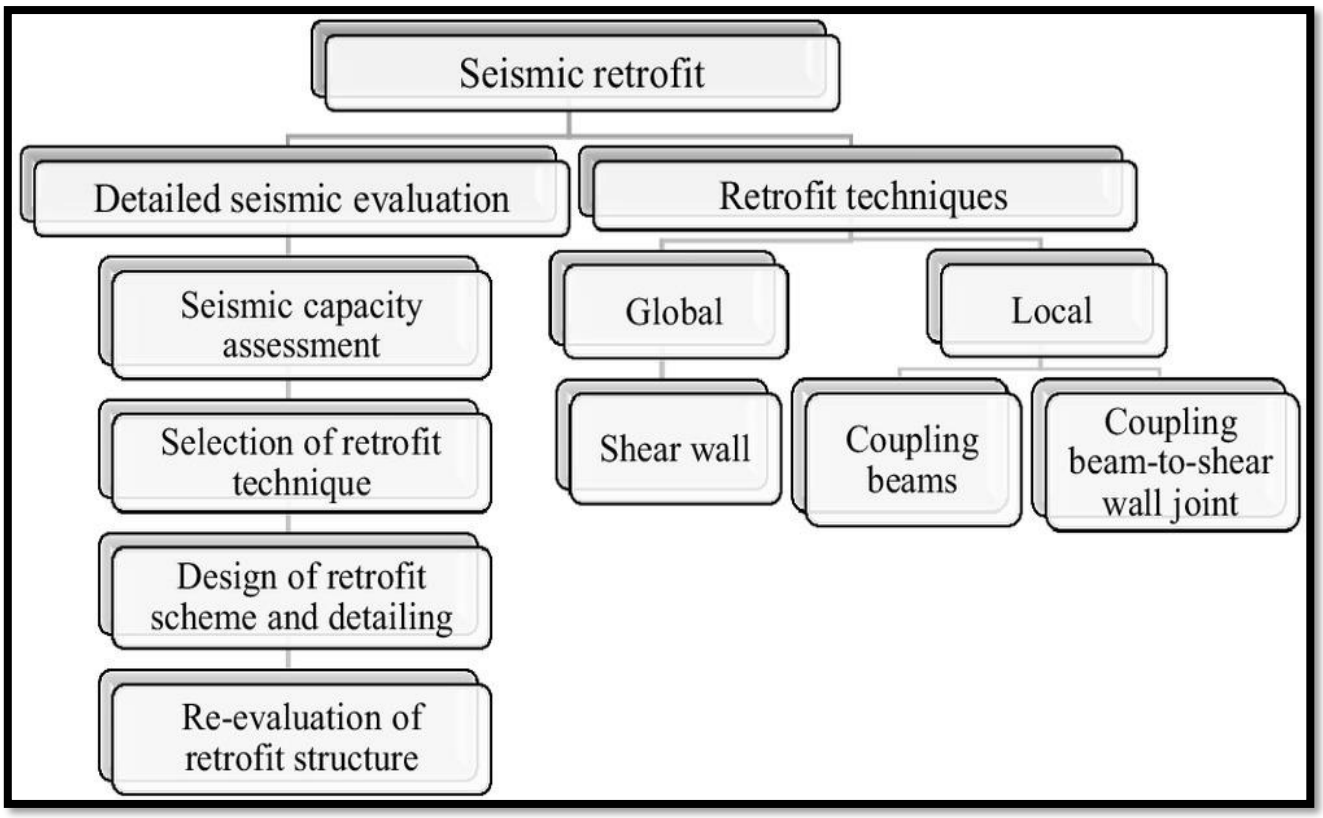


Figure 126 Flowchart explaination of Seismic retrofitting in building

Methods for seismic retrofitting of building

1. Visit to the real site with all documentation of structures ought to be made and every single underlying measurement and subtleties ought to be confirmed. On the off chance that fundamental, support must be minded chosen components by rebar finder with some non-damaging testing (NDT) and by stripping substantial cover. Establishments ought to be assessed by unearthing channels at a couple outside footings.
2. An extraordinary examination must be made with respect to the current cement quality bytaking 1-3 center examples from each building and taking bounce back hammer readings on countless underlying components aligned with the center test outcomes.
3. Inspection of each primary and compositional component for harm ought to be done and the noticed harm grade (none, light, moderate or substantial) on the primary and structural plans ought to be appropriately checked.

4. Three-dimensional straight flexible model of the current structure ought to be arranged and exposed to code determined vertical and horizontal burdens. The modulus of versatility on concrete is to be diminished as per material test results.
5. The strategy for transitory shoring of harmed components in structures ought to be suggested. The harmed constructions ought to be shored for vertical burdens also, prepared for 25% of the assessed horizontal loads and considering the live loads that will exist during development. The most ordinarily utilized components have been lumber components, steel components, and rounded platform
6. The clasping of longitudinal support, crack of ties and pounding of concrete is frequently seen in segments of harmed assembling. Around there, the unique calculation of segments is recuperated by the utilization of pressure driven jacks.
7. The seismic retrofit system for the structure subsequent to thinking about all angles oughtto be suggested.
8. The updated assembling is dissected under code determined stacking and its consistence with the code is checked.
9. For chose structures, limit range technique is utilized to survey the seismic execution of the retrofitted assembling.

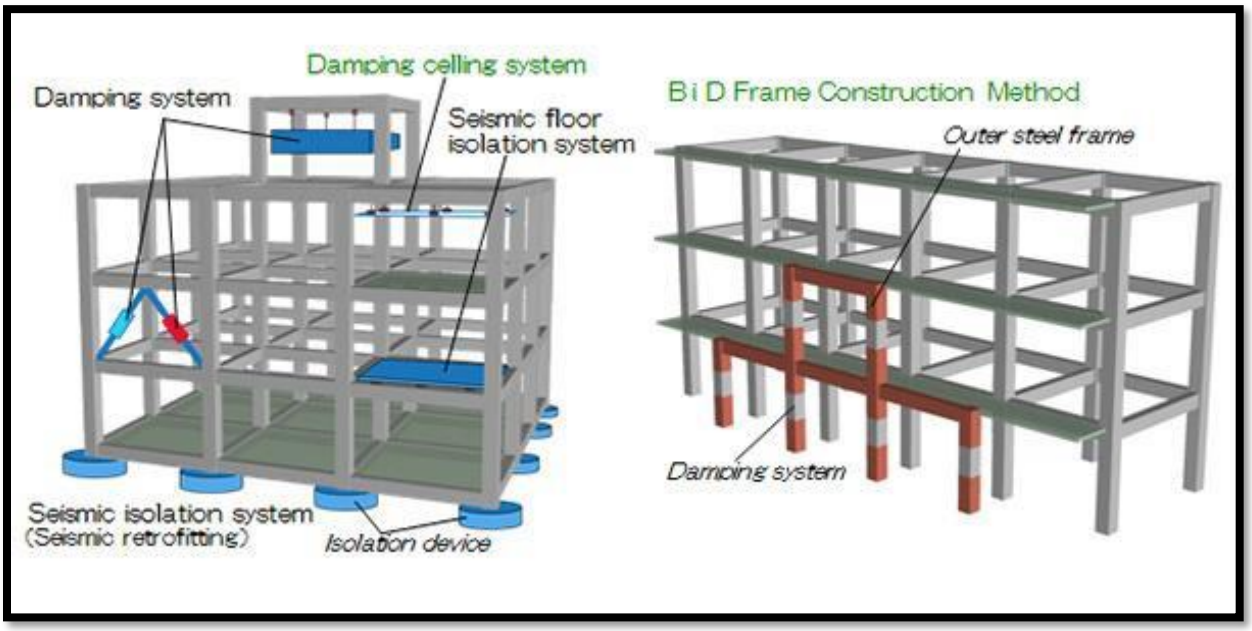


Figure 127 Picture explaination for seismic retrofitting of building

TECHNIQUES FOR RETROFITTING FOR DIFFERENT PROBLEMS:

1. Seismic Retrofitting of Building with *Jacketing and Shear Walls-*

Minor breaks - Repaired by infusing epoxy saps

Buckled longitudinal support, broken ties, and squashed cement – Replacement of new support welded with the current bars and new moreover shut ties were set, concrete with low shrinkage properties were set

Figure 128 Repair and rehabilitation of Beam

Severely harmed sections nearby added dividers – Retrofitted with encasing in concrete with suitable longitudinal and cross over support, existing surface ought to be chipped and cleaned of all free materials. The surface was soaked before the new concrete was set.

Other sections – Retrofitted with wire network and a front of 50mm of shotcrete

Damaged substantial divider added after 1979 quake – Obliterated and supplanted with new substantial dividers with 200mm in thickness

Wall with slight harm – fixed by infusing epoxy gums and by expanding their thickness to 200mm.

Foundation – The establishment network was encased to license the port to the new longitudinal

support. Also, the network was associated with the holding dividers situated around the edge to guarantee solid conduct.

Figure 129 Repair and rehabilitation ofColumn

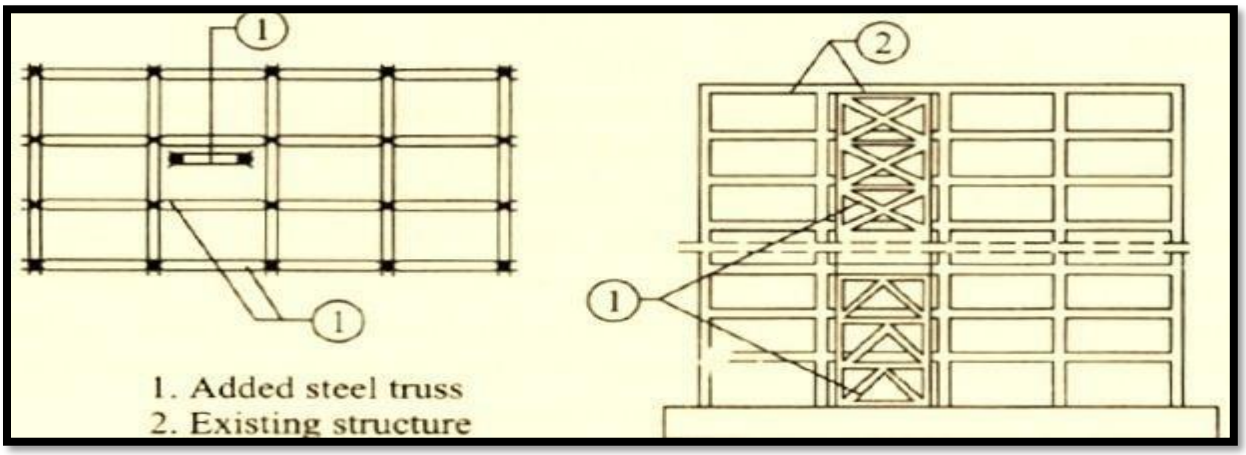
2. Seismic Retrofitting of Building with *Steel Bracing and Shear Wall-*

Cracked beams and columns – repaired with epoxy injection.

Insertion of new infill reinforced concrete shear walls in N-S direction.

NOTE :- The columns of the frames and diagonal bracing at the first level were fabricated steel boxes. The other bracing members were made from 2 channels placed toe-to-toe with gusset plate between them. New footing and piles were placed under the columns of the new frames andwere attached to the original foundation to ensure monolithic action. A wide section of the floor slab was strengthened at each location where the new steel frame was attached to existing structure.

Figure 130 Seismic Retrofitting of Building with Steel Bracing and Shear Wall



3. Seismic Retrofitting of Building with *Steel Bracing-*

- Diagonal steel bracing are added to the central bay of frames in the transverse direction.
- Insertion of new reinforced concrete infill walls of 4 cm thickness to all bays of the exterior longitudinal frames.

4. Seismic Retrofitting of Building by *Complete Jacketing of Frames*

Concrete Jacketing - Both beams and columns

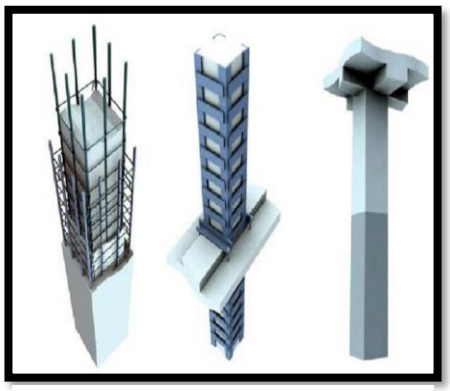


Figure 131 Concrete Jacketing

5. Seismic Retrofitting of Building with *RC Shear Walls and*

Jacketing of Columns

- Infilling of appropriate frame bays by in-situ reinforced concrete shear walls with proper anchorage to the existing frame designed for these shear walls
- Damaged columns or columns lacking required vertical load carrying capacity are jacketed. Where feasible, use of composite reinforced polymer fabric is recommended.

6. Seismic Retrofitting of a Soft Storey Building *Retrofitted by Adding RC Frames.*

- Adding of reinforced concrete frames over the existing column in the ground floor along axes
- Adding two concrete shear walls from first level to the upper storey were placed in axes.
- The existing masonry walls were retrofitted using wire mesh and 30mm of mortar
  - The cover of the existing columns was removed to permit the continuity of the new longitudinal reinforcement. The dimensions of the existing columns were increased.
  - The monolithic behaviour between the new frames and the floor system was provided by eliminating part of the floor system so that the new reinforcement of the frame was cast together with slab.
  - **Foundation** – The foundation grid was encased to permit the anchorage to the new longitudinal reinforcement.

7. Seismic Retrofitting of Building by *Steel Bracing and Infill Walls.*

- Although there is no significant damage but the owner of the building decided to retrofitit for future events and to eliminate the damage in nonstructural elements
- Steel bracing in transverse direction. Bracing consists of angle sections welded together forming a box section
- Infilled masonry walls were reinforced to stiffen the structure in the longitudinal direction. Wire mesh and shotcrete were used to strengthen the walls.

8. Effect of Shear Wall Location on Response of Retrofitted Reinforced Concrete Building

- Addition of concrete shear wall.
- Two alternative locations of shear walls considered.
- Adding of shear wall in external frame and in internal frame.

9. Seismic Retrofitting of Building by *Seismic Base Isolation.*

- Seismic isolation chosen over conventional strengthening techniques to maintain the historic fabric of the building
- The isolation system comprises 145 lead-rubber bearings, 230 high-damping rubber bearings and 42 sliders.
- Installation of the isolators required strengthening of basement walls and columns, and the provision of floor diaphragms.
- The retrofit involves re-piling the building with lead rubber bearings and rubber bearing in the supports, as well as cutting a seismic gap in the 500mm thick concrete wall.
- The strengthening of foundation walls below NZ parliament House and location of isolators.

10. Seismic Rehabilitation of a Soft-Storey Building *by Viscous Damper*.

- Steel moment frames with fluid viscous dampers (VDs) at the ground floor. The steel moment frames were designed to provide stiffness, strength, and redundancy to the existing lightly reinforced concrete columns. VDs were provided to control drift at the first floor and to keep steel moment frames in the elastic range. VDs were attached to thetop of the steel Chevron Braces and were strategically located to meet the above requirements.

14.1.3 Advance Practices in Construction field in Modern material, Technique and Equipment's.

All of those progressions in development procedures and furthermore with the interest of end clients for the shrewd structures we as constructors and fashioners are should acquaint something new and keen with satisfy their requests and needs. Brilliant constructions and material advances

are a device for sharing the information on how different structure materials can altogether build creation and benefit utilizing progressed correspondence, coordinated effort and the board innovations. The paper gives an outline of the sorts of materials accessible giving another knowledge into inventive strategies and methods that will be accessible, and open new entryways for progression and improvement in the development business. The new materials talked about in this paper present a little part of the alternatives that are accessible for use by industry.

To see all how and about of super performing development materials we should consider materials as indicated by their utilization from very root to tip. By that way we can undoubtedly close and derive about the application, execution and practicality of that specific development material. Components of development where these shrewd materials and strategies will be carried out:

High Performance Concrete

Figure 132 Composition of High PerformanceConcrete

Lafarge has developed a whole new family of concretes called Ductal. These concretes have high compressive and flexural strength, and their special characteristics enable the achievement of outstanding architectural feats. Ductal concrete incorporates strengthening fibers and opens the horizon to ultra-high performance due to its special composition which provides it with outstanding strength, six to eight times greater than traditional concrete (under compression).“Fiber-reinforced” means that it contains metal fibers which make it a ductile material. Highly resistant to bending, its great flexural strength means it can withstand significant transformations without breaking. Ductal also comes with organic fibers for applications with less load and for advanced architectural applications.

Light Transmitting Concrete

Figure 133 Example for Light Transmitting Concrete

The days of dull, grey concrete could be about to end. A Hungarian architect has combined the world's most popular building material with optical fiber from Schott to create a new type of concrete that transmits light. A wall made of "LitraCon" allegedly has the strength of traditional concrete but thanks to an embedded array of glass fibers candisplay a view of the outside world, such as the silhouette ofa tree, for example. "Thousands of optical glass fibers forma matrix and run parallel to each other between the two main surfaces of every block," explained its inventor Áron Losonczi. "Shadows on the lighter side will appear with sharp outlines on the darker one. Even the colors remain the same. This special effect creates the general impression that the thickness and weight of a concrete wall will disappear." The hope is that the new material will transform the interior appearance of concrete buildings by making them feel light and airy rather than dark and heavy.

3. Pervious Concrete

Pervious pavement is a cement-based concrete product that has a porous structure which allows rainwater to pass directly through the pavement and into the soil naturally. This porosity is achieved without compromising the strength, durability, or integrity of the concrete structure itself. The pavement is comprised of a special blend of Portland cement, coarse aggregate rock and water. Once dried, the pavement has a porous texture that allows water to drain through it atthe rate of 8 to 12 gallons per minute per square foot. Tests conclude that a square foot of Bahia sod drains at the rate of 2 1/2 to 3 gallons per minute. According to the manufacturer, this rapid flow-through ratio inspired the phrase "the pavement that drinks water".

4. Aerated Concrete

It was discovered in 1914 in Sweden that adding aluminum powder to cement, lime, water, and finely ground sand caused the mixture to expand dramatically. The Swedes allowed this “foamed” concrete to harden in a mold, and then they cured it in a pressurized steam chamber-- an autoclave. Autoclaved aerated concrete is produced by about 200 plants in 35 countries and is used extensively in residential, commercial, and industrial buildings. At a density of roughly one-fifth that of conventional concrete and a compressive strength of about one-tenth, AAC is used in load-bearing walls only in low-rise buildings. In high-rises, AAC is used in partition and curtain walls.

Figure 134 Floating Concrete

Floating Concrete

By replacing sand and gravel with tiny polymeric spheres, University of Washington materials scientists have created a concrete stronger than traditional concrete but so light it floats in water. The team won the regional American Society of Civil Engineers Concrete Canoe Competition last year.

Foamed Alluminium

“Light-as-air, stronger-than-steel materials are just beginning to shape our world. Foamed aluminum first emerged from the lab in the frame of a 1998 Karman concept car. Ten times stronger than traditional aluminum at just one tenth the weight, the material allows a more fuel- efficient vehicle. Its isotropic cellular structure helps the frame absorb shock and serves as an insulating firewall between the engine and the rest of the car. The foaming process can also be applied to steel, lead, tin, and zinc. The product is a high strength, extremely light weight materialthat possesses high durability, excellent finish and lasting value. The foam comes in an assortment of densities and sizes up to five feet wide and up to fifty feet long. It has numerous applications including architectural, automotive, marine, military, aviation, transportation, electronics, appliances, and signage.

Aerogel

Aerogel or "Air glass" is a transparent material that looks like glass, insulates better than mineral wool and is more heat resistant than aluminum. The material has many interesting properties and possible applications such as insulation in windows and solar collectors, windows in firewalls, a component in air-conditioning equipment, etc. Aerogel is molded, giving the possibility of getting different shapes: cylinders, cubes, plates of varying thickness etc. Chemically, Aerogel is composed of quartz and a great deal of air, making it fragile. The grains of quartz are small compared to the wavelength of light, giving Aerogel good transparency properties. At around 750°C (1380°F), it starts to shrink and slowly collapses to a piece of ordinary quartz. Aerogel can be cut with a band saw and holes can be drilled with ametal drill. It should be noted that Aerogel is non-flammable and non-toxic.

Tension Fabric Structure

"Transform it's" provocative tension fabric structures are appropriate for use in entertainment venues, special events, exhibits & trade shows, or anywhere that fabric architecture is appropriate. Made of nylon spandex, the structures offer a viable surface for any type of projection or lighting display, including front and rear projected video. It is also possible to print on the fabric via silk-screening or dye sublimation digital printing.

Figure 135 Tension Fabric Structure

10. Other Super Performing Multi Purposed Material:

1. **Geoweb**: Cellular confinement system for vertical vegetation for green walls.

2. **Aero Formed Aluminum**: Tightly corrugated aluminum sheets as in bamboo mats.
3. **Flexible Framing Track**: For flexible outlining and fencing. A fence framed in metallic frame.
4. **3D Molded Plywood**: Fast manufacturing furniture.
5. **Corrugated Glass**: For inside esthetics and thermal insulation.
6. **Braille Tiles:** Exclusively for people with weak eye sight or completely blind when it comes to universal design. Some Repurposed Materials and techniques.
7. **Rubber Sidewalks:** Sidewalks or walkways made using used tires and hard boarding sheets.
8. **Strawboard:** Made from agro waste mainly.
9. **Bagasse Boards**: Boards made of material left from sugarcane after extracting juice.
10. **Natural Fiber Insulation**: Insulation panels made out of used cloths.
11. **Frit**: Fine powdered glass from waste with ceramics remolded for reuse.
12. **Acousti-cell**: Boards made for acoustics from rubber shredding.
13. **Plasphalt:** Plastic blended with asphalt on roads for waste management.
14. **Fly-Ash Concrete:** Using Fly-ash residue as strengthening material with cement.

Advanced Construction Techniques

- The structure development movement, particularly the private and business complex is profoundly work escalated with next to no motorization. Roughly 35% of the all out development cost is spent on work.
- The workers have their impediments and may neglect to meet as far as possible. The nature of workmanship, as well, varies from one individual to another. Thus, quality norms can't be kept up. Wastage of material is extensively high as it is dealt with and used physically.
- The target of the development associations ought to be 'speed and economy'. This can't be accomplished with work situated progressed development procedures.
- Just contemplating and embracing present day modern procedures and hardware is the arrangement. By this, one can save material, decrease work costs, and speed up work, prompting the economy in development.

- In spite of the fact that the extent of the subject is tremendous, in this part we will talk about just the high level methods to be utilized in cutting edge development procedures exercises.

Advanced Construction Equipment

Present day Construction types of gear assume an imperative part in the development business where business destinations are stringently time and edge driven. The cutting edge development gear is extremely quick and dependable with great control measures installed into them as they have advanced throughout the long term.

Appropriate use of these gear helps in the economy, quality, security, speed and opportune finishing of the venture. It enhances the utilization of material, labor, account, and the lack of gifted and proficient work and simultaneously keeps an immediate check over the qualityestimates that are being utilized.

CLASSIFICATION OF ADVANCED EQUIPMENTS

Various equipment involved in construction works are-

1. Excavating Equipment
   i) Power Shovel
   ii) Hoe
   iii) Dragline
2. Hauling Equipment
3. Earth-moving Equipment
4. Hoisting Equipment
   a) Mobile Cranes
   b) Tower Cranes
   c) Crawler Mounted Cranes
   d) Passenger Hoist
   e) Builders Hoist
2. Dredging Equipment

3. Conveying Equipment
4. Compacting Equipment
5. Pumping Equipment
6. Pile Driving Equipment
7. Material Testing Equipment
8. Drilling Equipment
9. Aggregate, concrete and HMA (Hot Mix Asphalt) production Equipment.

Power Shovel– It is a bucket-equipped machine, usually electrically powered, used for digging, loading fragmented rock or earth and for extract ion of minerals. Main parts includes the track system, cables, rack, stick, boom foot-pin, saddle block, boom, boom point sheaves, bucket and cabin.

Figure 136 Power Shovel

Hoe– It is also known as back shovel or pull shovel. It is used to excavate beneath the natural surface on which it rests. It is used for works like excavating trenches, digging pits for basements, and it is also used for grading works which needs precision in case of control of depths. Here the basic parts include boom, jack boom, boom foot drum, boom sheave, stick sheave, bucket, bucket sheave and stick.

Dragline– It is so named as its prominent operation involves dragging the bucket against the material to be dug. It consists of long light crane boom where the bucket is loosely attached to the boom through cables. They are useful for digging below its track level and effective while handling softer materials. Here the basic parts include boom, hoist cable, drag cable, hoist chain, bucket and drag chain. It has long reaches and also used for excavating canals and then depositing on embankments without use of hauling units.

Figure 137 Dragline

Hauling Equipment– The equipment used for transporting material are known as hauling equipment or haulers. They may be operated on railways or roadways which involve operations like carriage and disposal of earth materials, haulage of big construction equipment and transportation of building materials. It is also classified as dump trucks and dumpers.

Figure 138 Earth Moving Equipment

Earth Moving Equipment-These equipment include excavators, loaders, motor graders, trenchers, backhoes and bulldozers. They are used to shift large amounts of dig foundations ,landscape areas and dirt.

Mobile Cranes– Such type of cranes is mounted on mobile units which is either of wheel type or crawler type. Truck cranes are such having high mobility whereas the crawler mounted cranes move quite slowly. Crawler mounted cranes can move on rough terrain.

Tower Cranes– These cranes are derrick crane mounted on a steel tower. They are used for industrial and high-rise residential buildings especially for assembly of industrial plants consisting of steel structures. Such cranes resemble truss structures which are made by weldingof steel bars and channel sections. Basic parts include carriage, slewing platform, jibs and tower with operator's cabin.

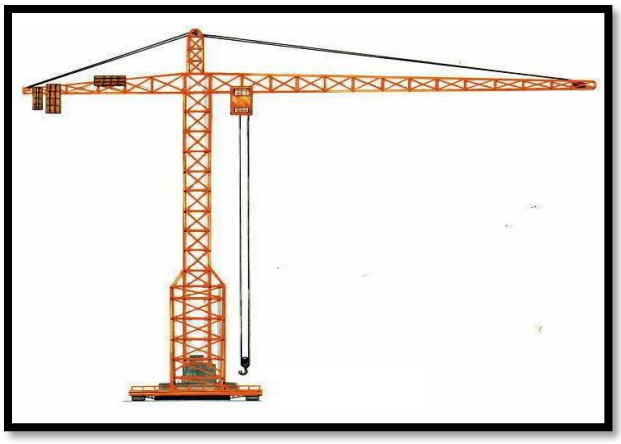


Figure 139 Tower Cranes

Crawler Mounted Cranes– These are the cranes which are placed on a set of rugged tracks that provides movement and stability for carrying heavy crane equipment. These crawler cranes are suitable for the rough surface area. Even though these cranes have no outriggers, they can operate lifts with minimal setup. Also, in addition to that they can move around easily. Crawler cranes can move around even with a heavy load.

HMA Production Equipment– HMA is produced in a plant that takes into account the proportions, blends, heats aggregate and asphalt to produce an HMA. These are of two basic types .i.e.the batch plant, and the drum plant. Batch plants leads to production of HMA in individual batches while drum plants leads to production of HMA in a continuous operation.

Pile Driving Equipment– Such equipment units involve lifting the piles from ground while taking in position to a specified depth. Here driving is accomplished by hammer on pile top. Equipment are so designed so as to remain economic while driving. Major pile driving equipment includes pile driving rigs and pile driving hammers.

Pumping Equipment– Pumping equipment are used to remove water from a volume of liquid, solid material or soil. Pumps remove liquid from a volume of liquid. They can be used for keeping water out of foundations, pits, tunnels, and other excavations and many more.

Dredging Equipment– The choice of the dredging equipment for executing a dredging operation depends on conditions such as the weather, accessibility to the site and wave conditions, anchoring conditions, required accuracy and many more. They can dig hydraulically or mechanically. Hydraulic digging involves using of working of a water flow which is erosivein nature. It is mostly done in cohesionless soils such as silt, sand and gravel. Whereas mechanical digging by teeth or cutting edges of dredging equipment or knives is applicable to cohesive soils.

14.1.4 Engineering aspects of soil mechanics-Environmental Impact Assessment

In the field of structural designing, virtually all undertakings are based on to, or into, the ground. Regardless of whether the undertaking is a design, a street, a passage, or an extension, the idea of the dirt at that area is vital to the structural designer. Geotechnical designing is the term given to the part of designing that is worried about viewpoints relating to the ground. Soil mechanics isthe subject inside this branch that takes a gander at the conduct of soils in structural designing.

Geotechnical engineers are not by any means the only experts inspired by the ground; soil physicists, horticultural designers, ranchers and landscapers all look into the kinds of soil with which they are working. These laborers, nonetheless, concern themselves generally with the natural dirt found at the dirt surface. Interestingly, geotechnical engineers are chiefly intriguedby the designing soils found underneath the dirt. It is the designing properties and conduct of these dirt which are their concern. In the field of structural designing, virtually all tasks are basedon to, or into, the ground. Regardless of whether the undertaking is a design, a street, a passage, or a scaffold, the idea of the dirt at that area is vital to the structural specialist. Geotechnical designing is the term given to the part of designing that is worried about viewpoints relating to the ground. Soil mechanics is the subject inside this branch that takes a gander at the conduct of soils in structural designing.
An appraisal of seven current and additionally future natural is-sues in Geotechnical Engineering has been introduced, including the:

(1) long haul execution of existing waste control systems,
(2) Acknowledgment of elective obstructions and boundary frameworks.
(3) Need for creative hindrances and obstruction frameworks.
(4) Rise of new types of waste.
(5) expanding significance of organic cycles
(6) part of demonstrating, and
(7) need for reliable phrasing concerning proficient character

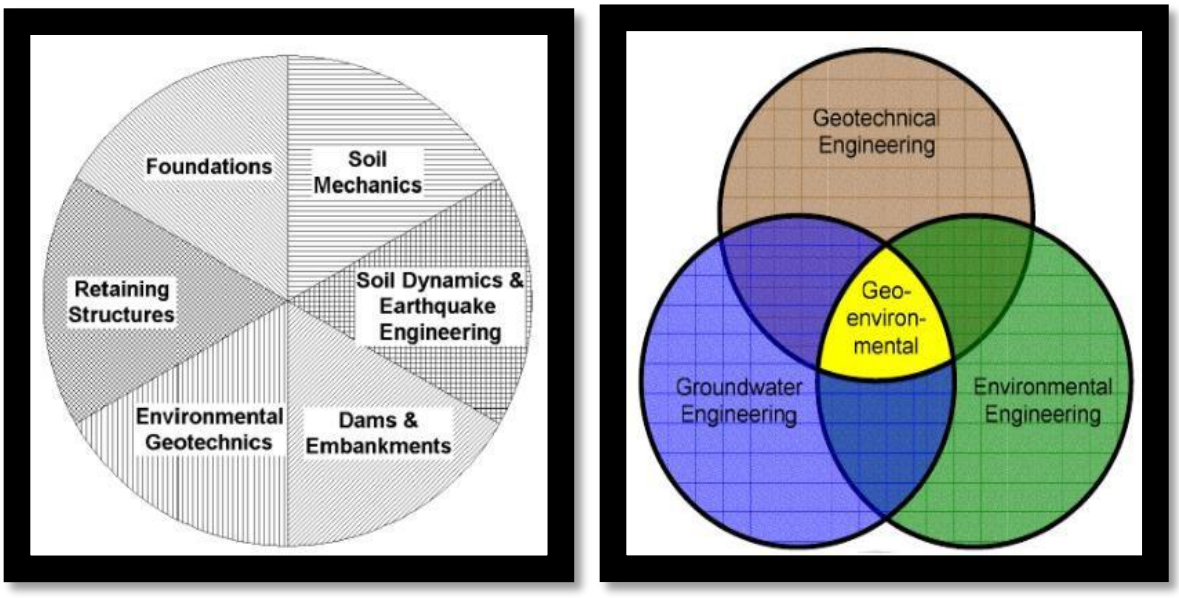
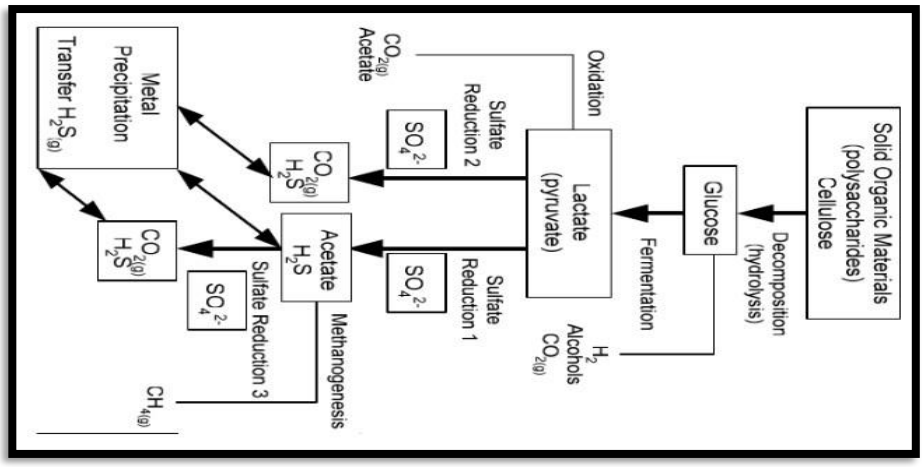


Figure 140 Engineering aspects of soil mechanics-Environmental Impact Assessment

To ensure human wellbeing and the climate, geo- specialized designers should manage the issue of the destiny and versatility of a few potential arising waste structures that either as of late have been recognized or are normal in the close future. Three such waste structures were recognized, including antibiotics utilized for development advancementin animals (steers, pigs, poultry, sheep), prions coming about because of the removal of creature bodies contaminated with creature sent illnesses, forexample, contagious spongiform encephalopathies(TSEs), in squander control facilities, and nano waste coming about as results of thedeveloping nanotechnology industry.

The capacity of models to precisely anticipate fieldexecution of designed frameworks has been and



will keep on being an issue confronting geotechnical engineers. This issue is especially impor tant when managing natural issues since models regularly are utilized as an apparatus to anticipate the future effects and resulting hazard from designing exercises identified with ecological assurance, like new garbage removal offices and existing wellsprings of pollution (e.g., squander dumps and heaps, accidental substance spills, and so on) The consequences of such forecasts might be needed for administrative acknowledgment of a picked approach and, thus, are regularly profoundly examined because of the potential for detrimental impacts on human wellbeing and the climate.

The objective of risk assessment to decide the danger to groundwater.

Other oceanic frameworks and biological systems through release of substances from a landfill. Hazard evaluation can be considered as an apparatus that records for vulnerabilities in a reasonable way. Comparable to debased land and contamination control, it tends to be applied to both the relocation of gases, the development of leachate from a landfill or the draining of pollutants from a defiled site. Dangers are determined as an element of the likelihood of the disappointment of the framework and the misfortune coming about because of antagonistic effects on the climate and human wellbeing.

Ecological guidelines are influenced by various variables, which incorporate neighborhood impression of hazard (cost/advantage just as financial issues that change significantly even inside created nations).

Subsequently, the field is very different.

Squander the executives ought to be founded on a natural geotechnical approach. A lot of waste are produced from industry and human movement. The progressive system in administration is squander minimisation, legitimate treatment, reuse/reusing and energy recuperation. Common assets ought to be safeguarded and the requirement for landfill limited.

Re-use of waste examples of potential use of the following waste materials:

One utilization of concrete considered was to immobilize poisonous synthetics in squander. Notwithstanding, it was as of late uncovered that Portland concrete may have a danger of

draining of six-valent chromium (Cr6+). Filtering tests for the concrete settled soils were done to explain the degree of pollution hazard. That from Cr+6 leachate was critical, confining the sort of soils that can be treated by this technique.

The presentation of a liner framework is straightforwardly influenced by the limit conditions. The most well-known situation for new landfills is dissemination with positive shift in weather conditions, where the compacted dirt liner is put over the water table. Dispersion with negative shift in weather conditions is the best regulation framework yet it isn't constantly utilized, because of reasonable issues of consistent dewatering. There are numerous mathematical answers for the advective dispersive-responsive condition to portray the conduct of control frameworks.

Conclusion:

This survey of ongoing advancements in natural geotechnics has zeroed in on squander the board, re- utilization of waste and remediation of dirtied soils. Specialists' duties are talked about with respect to creating appropriate waste administration innovation for a superior climate and the approach of tidying up debased locales to keep away from serious ecological danger.

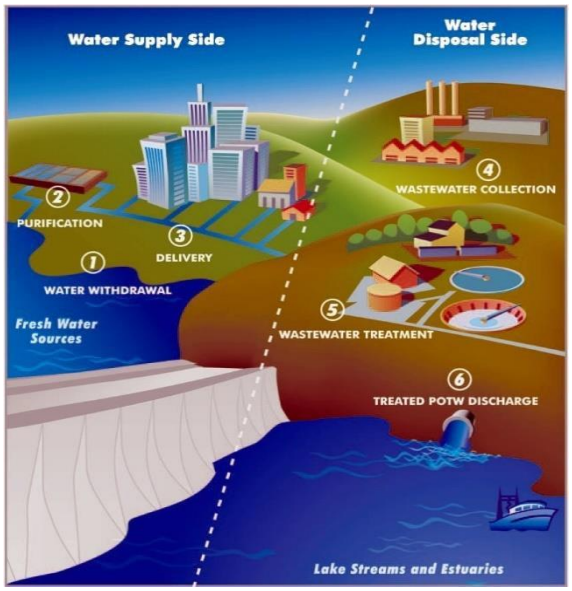


Figure 141 The objective of risk assessment todecide the danger to groundwater

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

INTRODUCTION

Water shortage and water contamination are critical issues in this day and age. One of the approaches to decrease the effect of water shortage and contamination is to extend water and wastewater reuse. The expanding shortage of water on the planet alongside quick populace expansion in metropolitan regions leads to worry about proper water the board rehearses. With regards to patterns in metropolitan turn of events, wastewater treatment merits more prominent accentuation. Right now, there is a developing consciousness of the effect of sewage defilement

on waterways and lakes. As needs be, wastewater treatment is currently accepting more not worthy consideration from the World Bank and government administrative bodies.

In a creating metropolitan culture, the wastewater age for the most part midpoints 30-70 cubic meters for each individual each year. In a city of 1,000,000 individuals, the wastewater produced would be adequate to inundate around 1500-3500 hectare. This metropolitan scourge should be handled biologically as a result of such countless major problems that are tormenting our waste administration measure:

- New migrants to urban areas have low salaries and can't manage metropolitan conveniences like garbage removal and sterile capacities;
- In agricultural nations, roughly 300 million metropolitan occupants have no admittance to sterilization;
- Around 66% of the populace in the creating scene has no sterile methods for arranging excreta and a much more prominent number need satisfactory methods for discarding absolute waste water;
- It is regularly an adequate practice to release untreated sewage straightforwardly into the waterways.

To accomplish biological wastewater treatment, a "shut circle treatment framework" is suggested. Many present day frameworks utilize a "removal based direct framework." Thecustomary direct treatment frameworks should be changed into the recurrent treatment to advance the preservation of water and supplement assets. Utilizing natural waste supplement cycles, from "place of-age" to "point-of production," shuts the asset circle and gives a superior way to deal with the board of important wastewater assets.

- High environmental quality,
- High yields in food and fiber,
- Good quality/high efficiency production, and
- Full utilization of wastes.

ISSUE EXPLAINATION ABOUT SEWERAGE

Issues concerning water disinfection originate from the ascent in metropolitan relocation furthermore, the act of releasing untreated wastewater. The uncontrolled development in metropolitan regions has made arranging and extension of water and sewage frameworks very troublesome and costly to do. Moreover, a large number of those moving to the city have low livelihoods, making it hard to pay for any water framework overhauls.

Another explanation numerous treatment frameworks in agricultural nations are impractical and ineffective is that they were essentially duplicated from Western treatment frameworks without thinking about the suitability of the innovation for the way of life, land, and environment. Frequently, neighborhood engineers instructed in Western advancement programs upheld the decision of the improper frameworks. A considerable lot of the carried out establishments were subsequently deserted because of the significant expense of running the wastewater Treatment framework and fixes. Then again, traditional frameworks may even be mechanically lacking to deal with the privately delivered sewage. For instance, in contrast with the US and Europe, homegrown wastewater in bone-dry regions, for example, the Middle East is up to multiple times more moved in the measure of oxygen request per volume of sewage.

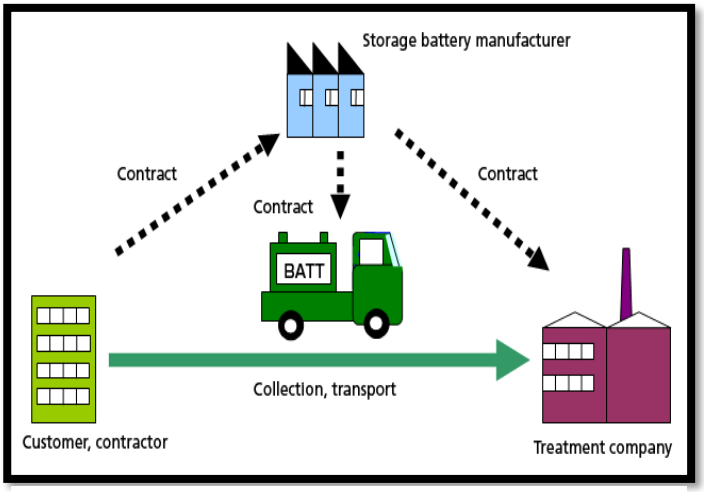


Figure 142 Example for Practical Treatment and Reuse of Wastewater

Practical Treatment and Reuse of Wastewater

The uncontrolled removal to the climate of civil, modern and farming fluid, strong, and vaporous squanders comprises perhaps the most genuine dangers to the supportability of human civilization by tainting the water, land, furthermore, air and by adding to an Earth-wide temperature boost. With expanding populace and financial development, treatment and safe removal of wastewater is vital for protect general wellbeing and lessen grievous levels of natural corruption. Moreover,

sufficient wastewater the board is likewise needed for forestalling defilement of water bodies with the end goal of saving the wellsprings of clean water.

Powerful wastewater the executives is grounded in created nations yet, is as yet restricted in non-industrial nations. In most agricultural nations, numerous individuals need admittance to water and disinfection administrations. Assortment and movement of wastewater out of metropolitan areas isn't yet an assistance gave to all the populace, and sufficient treatment is given uniquely to a little bit of the gathered wastewater. In ghettos and peri-metropolitan regions all through the world, it is basic to see crude wastewater streaming in the roads. The lacking water and sterilization administration is the primary driver of infections in agricultural nations.

Out of these cycles, different mixes can be set up. Blends can likewise incorporate some other basic cycles like Sand Filtration and Dissolved Air Floatation (DAF), which are not viewed as proper cycles fundamentally however are truth be told fitting cycles. One fascinating consolidated interaction is the age of effluents appropriate for reuse in water system dependenton pretreatment by one of the referenced unit measures followed by an adjustment supply.

Procedures for Implementing New Treatment Technology

Various countries have the issue of a limit water disparity. This ungainliness in water demand versus supply is relied upon essentially to the respectably disproportionate movement of precipitation, high temperatures, extended solicitations for water system, what's more, the impacts of the movement business. To relieve water insufficiencies, veritable idea should be given to wastewater recuperation and reuse. Recuperated wastewater can be used for different options including provincial irrigation. A wastewater treatment architect should play out a fitting peril assessment before executing the reuse of wastewater. Authentic thought about the prosperity risks and quality limits ought to be a piece of the examination. Source point checks rather than end of line courses of action are crucial. Source-point measures require wide current pre-treatment interventions, noticing and control undertakings, and inspirations for the neighborhood not dispose of any terrible matter into the sewers.

CONCLUSION

To effectively carry out the procedures for wastewater reuse, it is crucially fundamental for institutional and policymaking abilities to be improved, public attention to related issues to be expanded, and suitable monetary instruments to be made. To summarize:

a) Water shortage and water contamination represent a basic test in numerous agricultural nations;

b) In metropolitan regions, it is getting hard for the specialists to oversee water supply and wastewater;

c) Strategies for wastewater reuse can effectively improve metropolitan water the executives.

14.2 Electrical Engineering

14.2.1 Design of Power electronics converter:

14.2.1.1 What do you mean by power electronic converter?

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.

14.2.1.2 Types of Power electronics converter:

There are mainly six types and they are as followed:

1. Diode Rectifier
2. AC to DC Converter (Controlled Rectifier)
3. DC to DC Converter (DC Chopper)
4. AC to AC Converter (AC voltage regulator)
5. DC to AC Converter (Inverter)
6. Static Switches

1. Diode rectifier:

A single-phase diode rectifier converts an AC voltage at the input to a DC voltage at the output. The power flow in the circuit is unidirectional, i.e., from the AC input to the DC output only. This is a full bridge rectifier since it has two pairs of diodes.

2. AC to DC Converter (Controlled Rectifier)

AC-DC converters are electrical circuits that transform alternating current (AC) input into direct current (DC) output. They are used in power electronic applications where the power input a 50 Hz or 60 Hz sine-wave AC voltage that requires power conversion for a DC output.

Controlled rectifier can be classified in two ways:

- Single phase controlled rectifier
- Three phase controlled rectifier

3. DC to DC Converter (DC Chopper):

A DC-DC converter is a power electronics device that accepts a DC input voltage and also provides a DC output voltage. The output voltage of DC to DC converter can be greater than the input voltage or vice versa. The converter output voltages are used to match the power supply required to the loads. The connection and disconnection of power supply to the load can be controlled using a switch in the simple DC to DC converter circuit. DC to DC converter circuits consists of a transistor or diode switch, energy storage devices like inductors or capacitors and these converters are generally used as linear voltage regulators or switched mode voltage regulators. DC to DC converters are used to provide DC regulated power supply, constant DC power supply to the electrical and electronics project circuits.

DC chopper can be classified in two ways:

- Buck converter
- Boost converter
- Buck Boost converter

4. AC to AC Converter (AC voltage regulator):

AC to AC converters is used for converting the AC waveforms with one particular frequency and magnitude to AC waveform with another frequency at another magnitude. This conversion is mainly required in case of speed controlling of machines, for low frequency and variable voltage magnitude applications as well. We know that there are different types of loads that work with

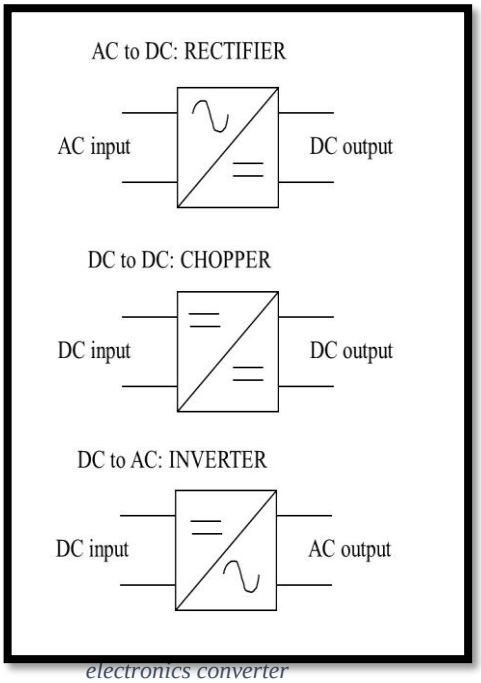
different types of POWER SUPPLIES like single-phase, three-phase supply, and the supplies can be differentiated based on the voltage and frequency range also.

5. DC to AC Converter (Inverter):

The circuit which convert DC power into AC power at desired output voltage and frequency are called as Inverters. Normally the DC source is a battery or output of the controlled rectifier. AC output voltage is built by using SCR as switches. DC to AC converters is mainly designed for changing a DC power supply to an AC power supply. Here, DC power supply is comparatively stable as well as positive voltage source whereas AC oscillates approximately a0V base stage, typically in a sinusoidal or square or mode.

6. Static Switches:

A switch having no moving part called as a staticswitch. Power semiconductor devices which can be turned on and off within a few microseconds can be used as fast acting static switches. Static switches can be also used for latching, current and voltage detection, a time delay circuit, transducers etc.



electronics converter

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

What is soft starter?
Soft starters provide all the same functionality as a starter but they allow us to protect the motor from high spikes and voltage that may cause damage to our motor. They do this by preventing that large inrush current to our motor by limiting the voltage and current upon startup. It allows us to slowly ramp up the speed of the motor which causes less wear and tear. It is used only upon startup however depending upon the model we can see them used in the shutdown process of a motor.

Advantage:

- It allows the motor to ramp up slowly to reduce the inrush current to our motor because

Of this it saves an operating cost.

- It allows us to increase the longevity of our motor because we are not putting somuch torque and wear and tear on that motor upon startup.

Disadvantage:

- It is more expensive than a starter.
- It does not give full motor speed control.

14.2.2.2 Operating Principle of Soft Starter for Single Phase Induction Motor:

Soft starter is a device which is used to run or start induction motor smoothly. But now the question is. How the soft starter makes the induction motor to start smoothly. Soft starter applies controlled voltage to induction motor. By applying gradually increasing voltage from low tohigh. As I mentioned earlier motor draws high current at the start than its rated capacity. So the voltage applied to the induction motor increases gradually from low to high value so that motor can draw small current at the start according to applied voltage. Because at low voltage motor will draw low current and at higher voltage motor draws high current. So this gradual increase involtage stops the motor to withdraw inrush current and helps the induction motor to startsmoothly. This is also known as smooth start of induction motor.

14.2.2.3 Circuit diagram of soft starter for single phase induction motor:

Circuit diagram of soft starter for single phase induction motor using pic microcontroller is given.

In above circuit diagram, lamp is used as load instead of induction motor. Because induction

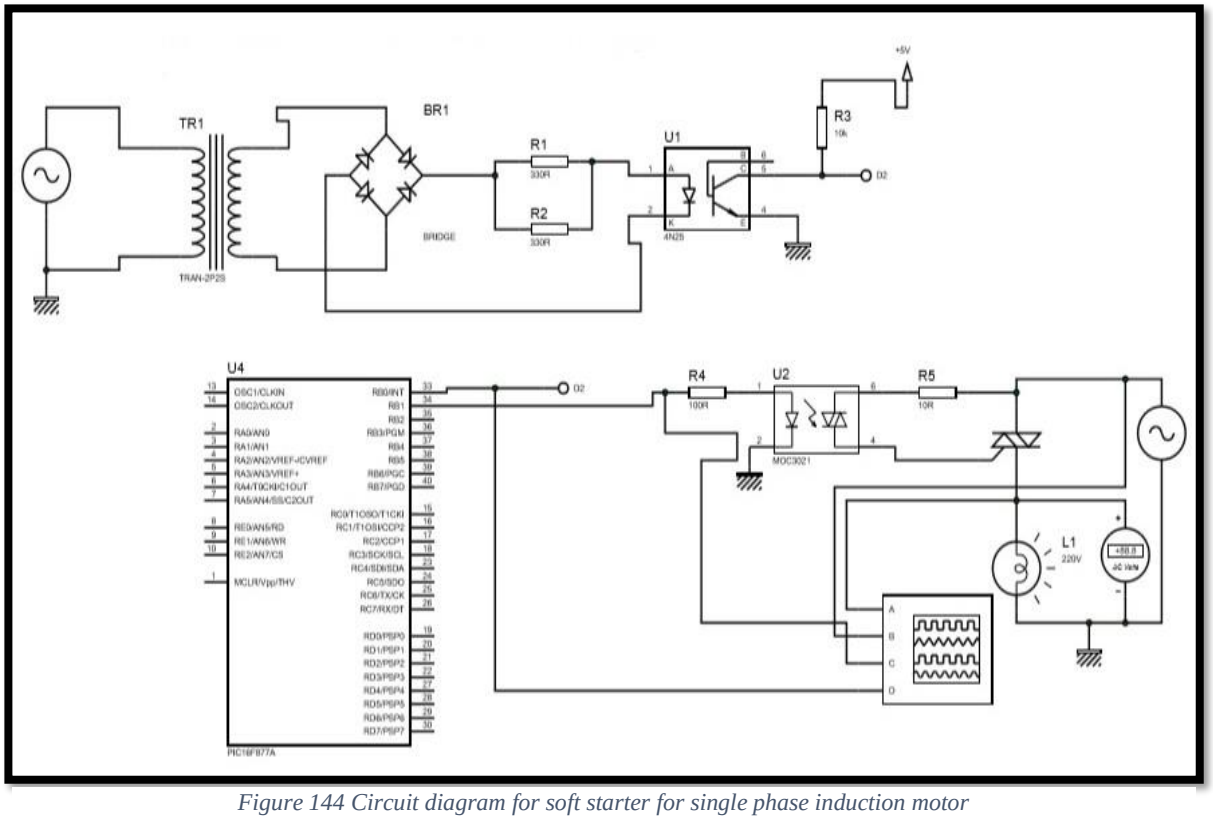


Figure 144 Circuit diagram for soft starter for single phase induction motor

motor is not available in Proteus. Because we just want to check the functionality of voltage change gradually at the start from low to high value.

So AC voltmeter is also connected parallel to lamp to check change in voltage. Oscilloscope shows the operating range of firing angle from maximum to minimum. For more details about the working of this soft starter project using pic microcontroller.

14.2.2.4 Major components in Soft starter for single phase induction motor:

- **Zero crossing detector circuit:** This circuit is used to detect zero crossing signal of ac power supply. Because firing angle which is used to control thyristor operating angle is triggered at every zero crossing.
- **PIC microcontroller:** PIC16F877A microcontroller senses zero crossing and generates triggering pulse at specified firing angle. In soft starter, firing angle will be maximum at the start, because we want minimum voltage at the start. After that firing angle will be

decreased gradually, so that voltage also increases gradually.

- **Thyristor or Two back to back Silicon controlled rectifiers:** Thyristor is used as aswitch.
- **Optoisolator:** It is used to provide isolation between pic microcontroller and high sidevoltage operating circuit.

14.2.2.5 Cost analysis of electronic soft starter for single phase induction motor:

Table 33 Cost analysis of electronic soft starter for single phase induction motor:

Component	Unit cost in Rs.	Quantity	Total cost in Rs.
PIC microcontroller	799	1	799
Transformer	1599	1	1599
Voltage Regulator	1300	1	1300
Rectifier	3900	1	3900
Zero crossing detector	50	1	50
Two back to back SCR	100	2	200
Opto isolator	165	1	165
60W Bulb	220	1	220
			8233

14.2.2.6 Operating Principle of Soft Starter for Three Phase Induction Motor:

A soft starter provides reduced voltage to stator windings of three phase induction motor by controlling the acceleration of an electric motor. A three phase induction motor is a self-starting motor and electromagnetic torque is produced due to an interaction between revolving magnetic field around rotor and rotor current. Initially during starting, a rated voltage is applied which causes high current to flow through stator windings. Now this high current is greater than the rated current which can cause heating of the stator windings and eventually damaging the insulation applied on stator windings. To avoid the problem of high starting current, there is a need of motor starters in an electric motor.

The motor can be started in three ways. Firstly by applying full load voltage i.e. direct on line starting. Secondly, by applying voltage gradually using star-delta starter and soft starter. Thirdly,by applying part winding starting i.e. autotransformer starter.

A soft starter provides reduced voltage and hence reduced torque on electric motor. A soft starter comprises of solid state devices like thyristors. The supply voltage to the motor is controlled by power semiconductor devices like thyristors. In a three phase induction motor, the torque is proportional to the square of the starting current which in turn, is proportional to the applied voltage. The starter works on the principle described above. Therefore, the torque and the currentcan be controlled by applying the reduced voltage at the time of starting of an motor.

14.2.2.7 Circuit diagram of soft starter for three phase induction motor:

The circuit diagram of soft-starting of three phase IM is shown in figure. The circuit diagram comprises of voltage regulator, zero crossing detector, bridge rectifier, 4N25 opt-Isolator, At mega 328P microcontroller and TRIAC circuit. TRIAC circuit performs the role of soft starter in each phase of three phase induction motor. TRIAC circuit basically consists of two anti parallel SCRs connected back to back. This soft starter is used to give soft starring to Induction motor.

A 12 V DC regulated supply is obtained with the help of step-down transformer and bridge circuit. The step down transformer converts 230V to 12V ac supply and then it is fed to bridge circuit. The bridge circuit in turn converts ac supply to dc supply. This dc supply is given to regulator IC to get positive 12V dc regulated supply. The main part of the circuit is zero crossing detector circuit which is made up of four diodes connected to form bridge rectifier circuit and output of bridge rectifier is fed to 4N25 Optoisolator. Then output of 4N25 Optoisolator is applied to interrupt pin of At mega 328P. Whenever the input AC waveform crosses the zero reference point, a high pulse signal triggered from 4N25 Optoisolator is given to interrupt pin of Atmega 328P. When At mega 328P receives high signal from interrupt pin, it interrupts Atmega 328P by providing high signal on interrupt pin and then it initiates delay counter from that point and hence it provides triggering pulse to gate signal of TRIAC through MOC3021 Optoisolator.

Initially, the program provides maximum time delay to reduce the power supplied to motor and gradually decreases the delay to zero value and therefore provides full power to the motor. The capacitors are used in above circuit diagram to provide voltage regulation. The cathodes of SCRsin TRIAC circuit are connected to load terminals of induction motor.

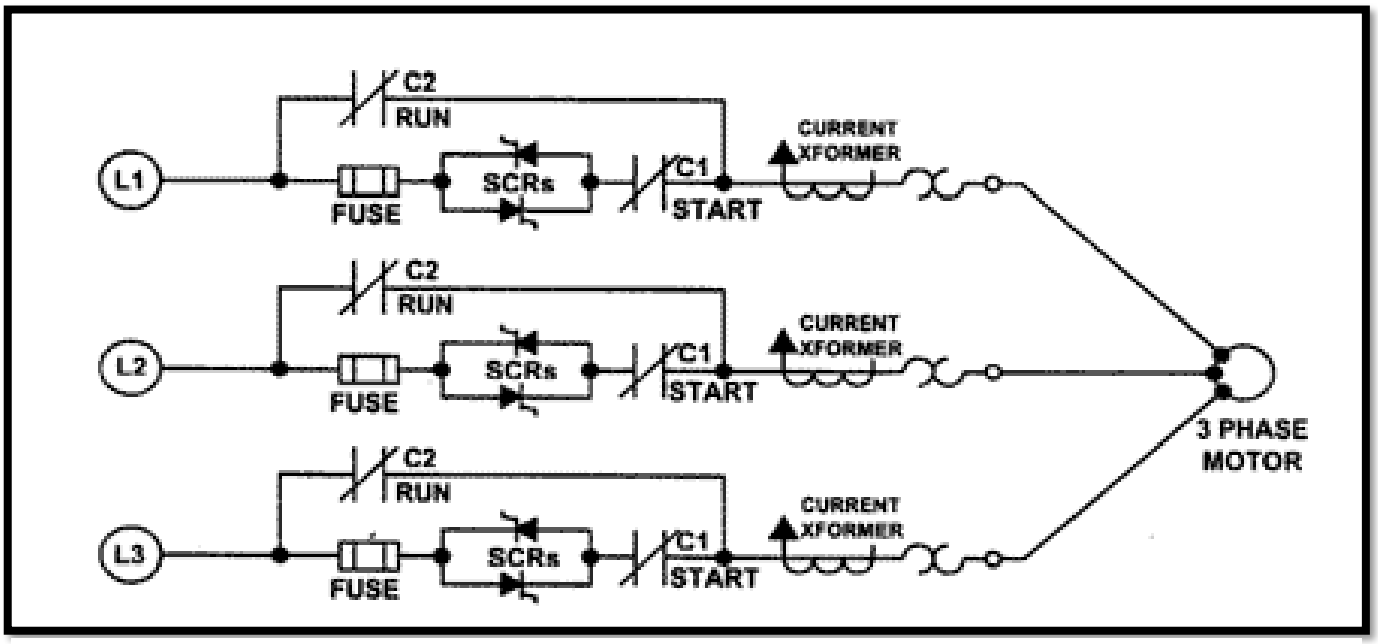


Figure 145 Line diagram of soft starter for three phase induction motor

14.2.2.8 Cost analysis of electronic soft starter for three phase induction motor:

Table 34 Cost analysis of electronic soft starter for three phase induction motor:

Components	Rating of component	Unit cost inRs.	Quantity	Total cost in Rs.
Transformer	220-240/12V	270	3	810
Diode	IN4007	10	12	120
Opto isolator	4N25	165	2	330
Arduino	ATMEGA328P	3490	1	3490
LCD display	16*2	289	1	289
Voltage regulator	7805	1249	1	1249
Capacitor	470uF	50	1	50

TRIAC	BT136	259	3	777
Toggle switch	-	25	1	25
Resistance	120 Ω	2	3	6
	330 Ω	5	4	20
	1000 Ω	52	3	156
	3.3k Ω	138	2	276
	10k Ω	180	2	360
Bulb	60 W	220	3	660
				8618

14.2.3 Advance Wireless Power Transfer

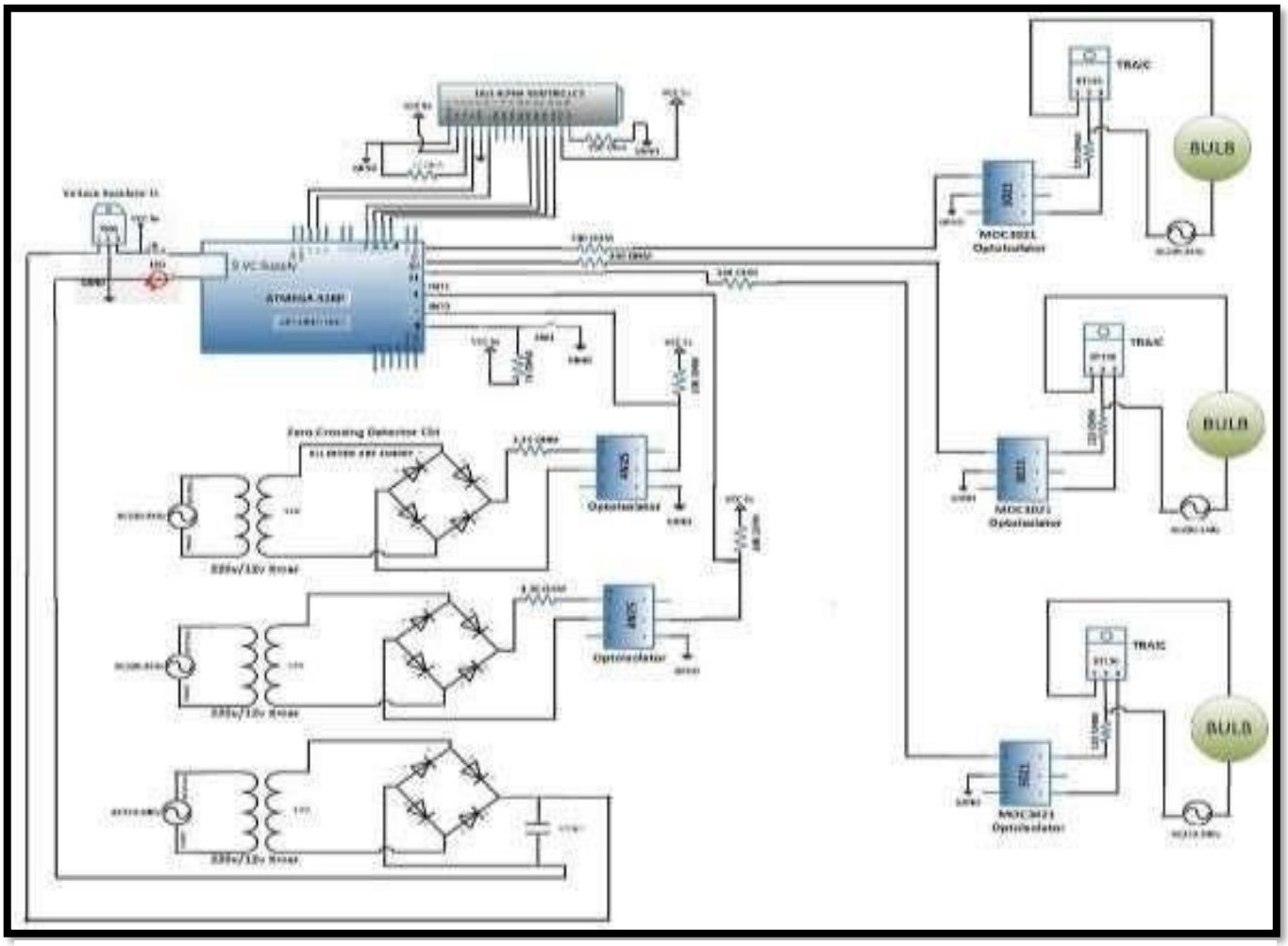


Figure 146 Circuit diagram of soft starter for three phase induction motor

The Transfer of electrical power in reliable and efficient way is always challenging for the designers and engineers. Presently all electrical power from the generating stations to the distribution station is transferred by the uses of wires and underground cables. One of the major issues in these types of systems is the losses due to resistance of the material. Generally the percentage of loss of power during the transmission and distribution is 26%.

In modern technology the use of portable device has increased such as mobile robots and electric vehicle. Mobility is the main concern of these equipment i.e. they are not connected to the main source of power.

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

14.2.3.1 Types of Wireless Power Transfer Method

1. Inductive coupling:

This type of WPT is simply based on inductive coupling between two coils. This is a type of near field technique measuring with appliance near the source. It is generally based on the principle ofmutual induction, where two coils are placed vicinity to each other and there is no physical connection between these two coils. The simplest example is transformer where the transfer of energytakes place due to electromagnetic coupling. Each

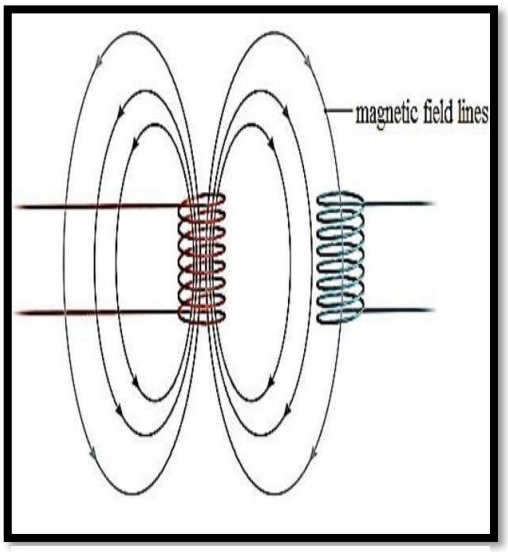


Figure 147 Inductive coupling:

of these coils connected without wires and it has been an important and popular technology to transfer power witl and reliability. Based on this technology there are various application device has been already made including electric brush and charging pad for cell phones or

laptop. But this kind of method also has some limitation i.e. the range can be very less upto few cm and separation distance is very less than the coil diameter.

2.**Magnetic Resonance Coupling WPT:**

This is also one of the important method for transferring power based on near field technique. It generally overcomes the disadvantage of up to some extent which arises in non- resonant inductive coupling. This type of coupling used the concept of resonance.At resonance we know that natural frequency and excitation frequency are same. This leads to the maximum amplitude, that means a maximum amount of energy is transferred

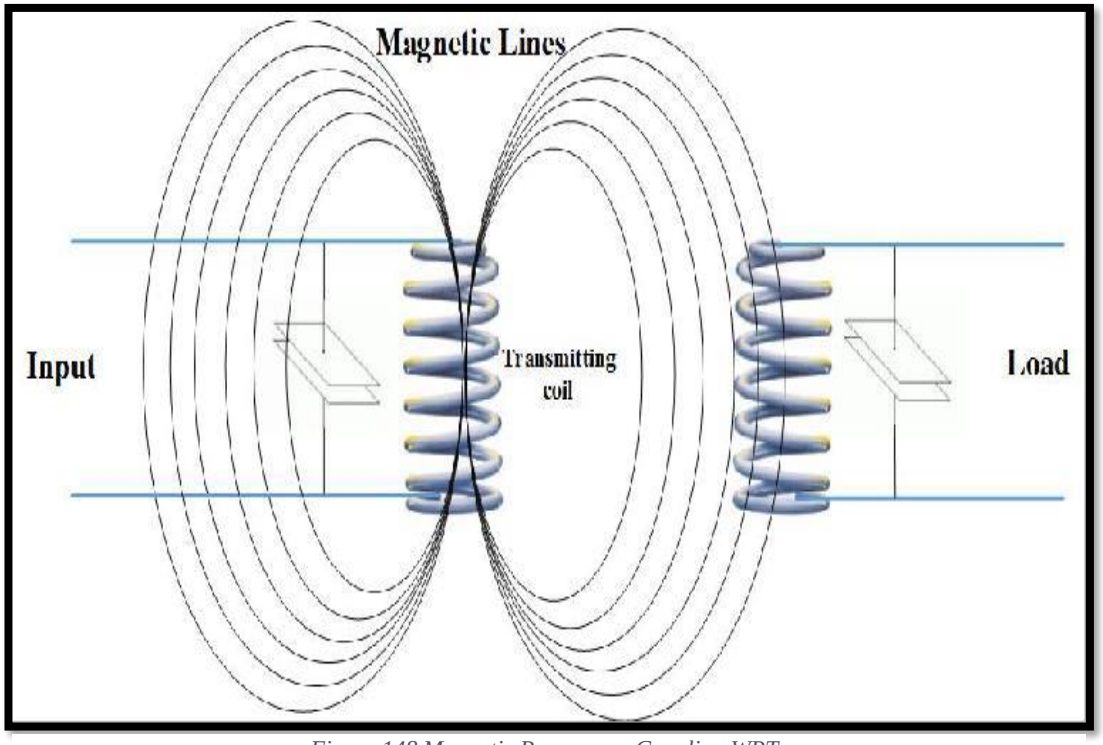


Figure 148 Magnetic Resonance Coupling WPT:

between two coils. Here the receiver and transmitter coils are tuned to be at sameresonant frequency .This allow us to transfer significant amount of power by increasing distance between coils. These type of system are used for building mid range power transfer. Mid range can be specified by distance upto 10 times the diameter of the transmitting coil. Magnetic resonance coupling have several advantage such as efficiencyincreases with decrease in the radiation and power loss and range can be increase upto some meter and it is directional. The mainly disadvantage is that selection of resonance

frequency which tunes with the natural frequency and it cannot be used for long range application.

14.2.3.2 Functional Block Diagram of Wireless Power Transfer:

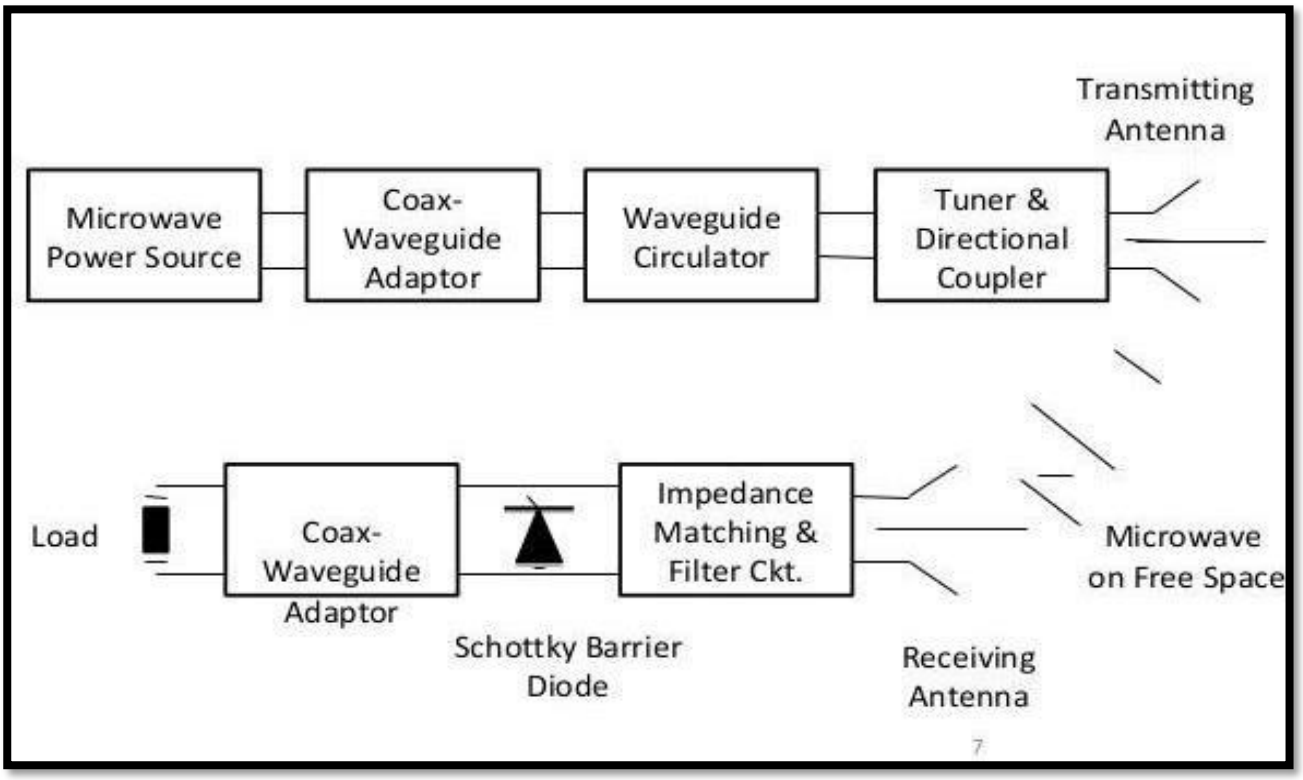


Figure 149 Functional Block Diagram of Wireless Power Transfer:

14.2.3.3 Advantages and Disadvantages of Wireless Power Transfer:

Advantages:

- It gives the human comfort as there is no chording or wiring problem, so mobility is easier.
- There is no problem of power failure and extensive heating.
- Cost of overall system decreases due to no uses of wires.
- Overall efficiency increases due to decrease in the power loss.
- It offers no corrosion as there is no exposure to the atmosphere which is Ecofriendly.

- It offers ranges of power levels and separation distance between coils.
- It offers convenient, reliability, high efficiency, low cost at the same time.

Disadvantages:

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

14.2.4 Industrial Temperature Controller

14.2.4.1 Meaning of Temperature control system:

- **Temperature:** This is the degree of hotness or coldness of a body or an environment.
- **Control System**: A control system is a device or set of devices that manage, command, direct or regulate the behavior of other devices or systems. Thus we can literally say that a Temperature Control System is a device or set of devices that manage, command, direct or regulate the behavior of other devices or systems in order to influence the degree of hotness or coldness of a body or an environment.

14.2.4.2 Its concept:

To increase the production of an industry, smooth control of temperature is the key function.5 Different industry has its own individual temperature requirement for specific role. Conventionally, industrial temperature measurement instrument thermometer is used to measure the temperature. After observing temperature reading, operator controls temperature manually. Sometimes controlling is not appropriate because of time consuming human operated control of cooling device and heating device. As a result, efficiency of temperature control fails andproduction is hampered in industries. Besides that, thermostat is used to select temperature whichis not efficient because of erosion of metal and losing to strength of metal for successive using.

Consequently, analog system loses its own linearity function since it is mechanically designed temperature control device. The temperature can be controlled more efficiently using interface between temperature sensors LM35 which produce linear voltage signal with rising temperature and microcontroller which takes response fraction of millisecond to response. Microcontroller takes signal from temperature sensor and compare with pre-set value of temperature then take decision when heating device or cooling device would be turned on and the duration of maintained temperature in system. A buzzer is turned on when unexpected or large temperatureis found in the system can be cause to damage industry. Figure 1 shows block diagram of total system.

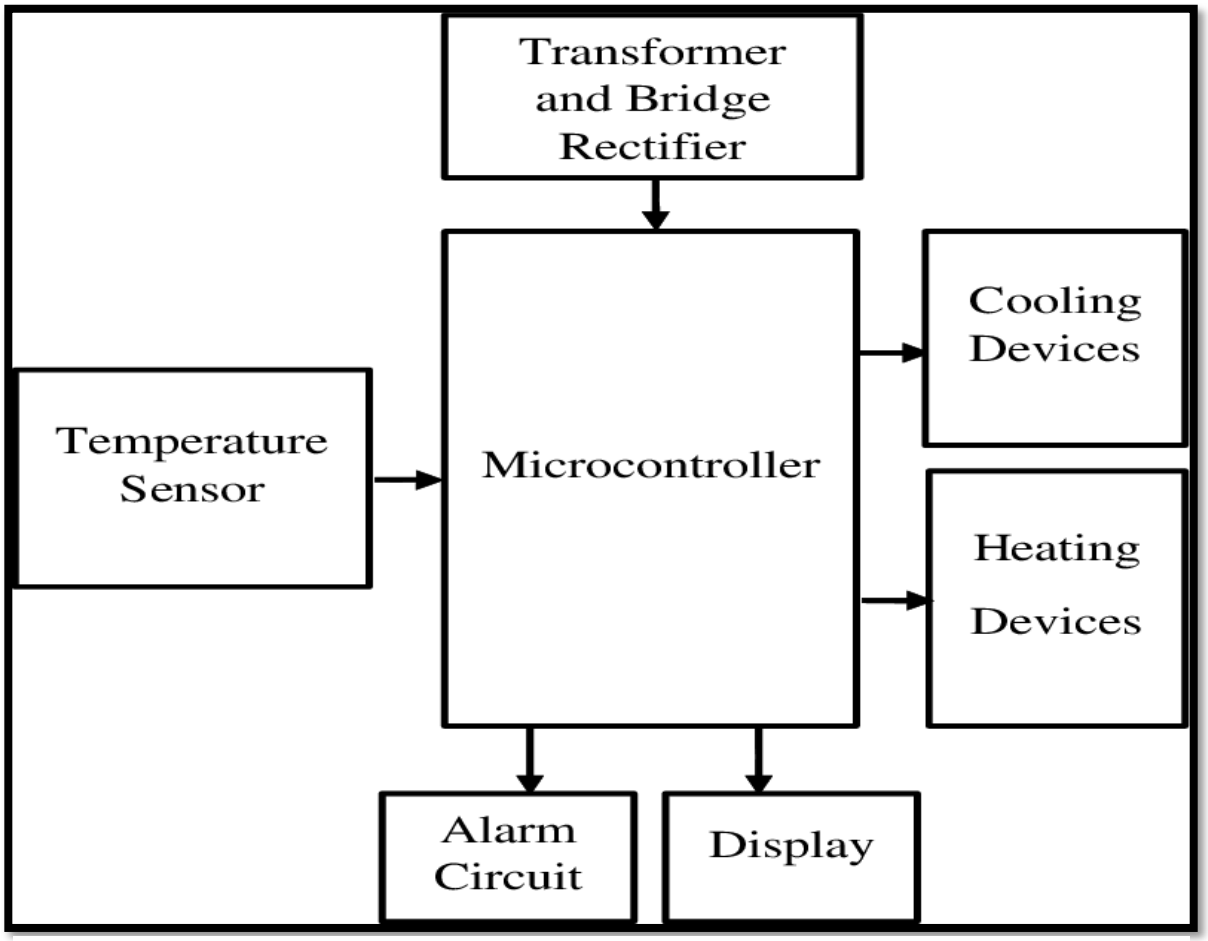


Figure 150 Block diagram for Temperature control system

14.2.4.3 Design of Temperature control circuits:

A 220 V AC supply is stepped down to 18V by using potential transformer (TR1). Transformer (TR1) is connected with a bridge rectifier (BR1) to create pulse- setting DC where a capacitor (C1) is used to produce smooth DC. A heater coil (L1) is directly connected to power supply through relay (RL1), when relay "ON" heater would produce heat. Figure 3 shows the complete circuit diagram of industrial temperature control system.

Two voltage regulators of 7412 and 7405 are used to get fixed DC voltages for different partof the circuit where U3 (7412) provides 12V and U4 (7405) provides 5V. Furthermore, capacitor C2 and C3 are used to filter output signal in case of presence of any oscillation into the provided DC voltage. The Buzzer (BUZ1) is connected with 12V DC voltage supplyfrom U3 and the relays RL1 and RL2 are also connected with 12V DC voltage supply from relays RL1 and RL2. The display (LCD1), microcontroller (U1), set point (RV1) and

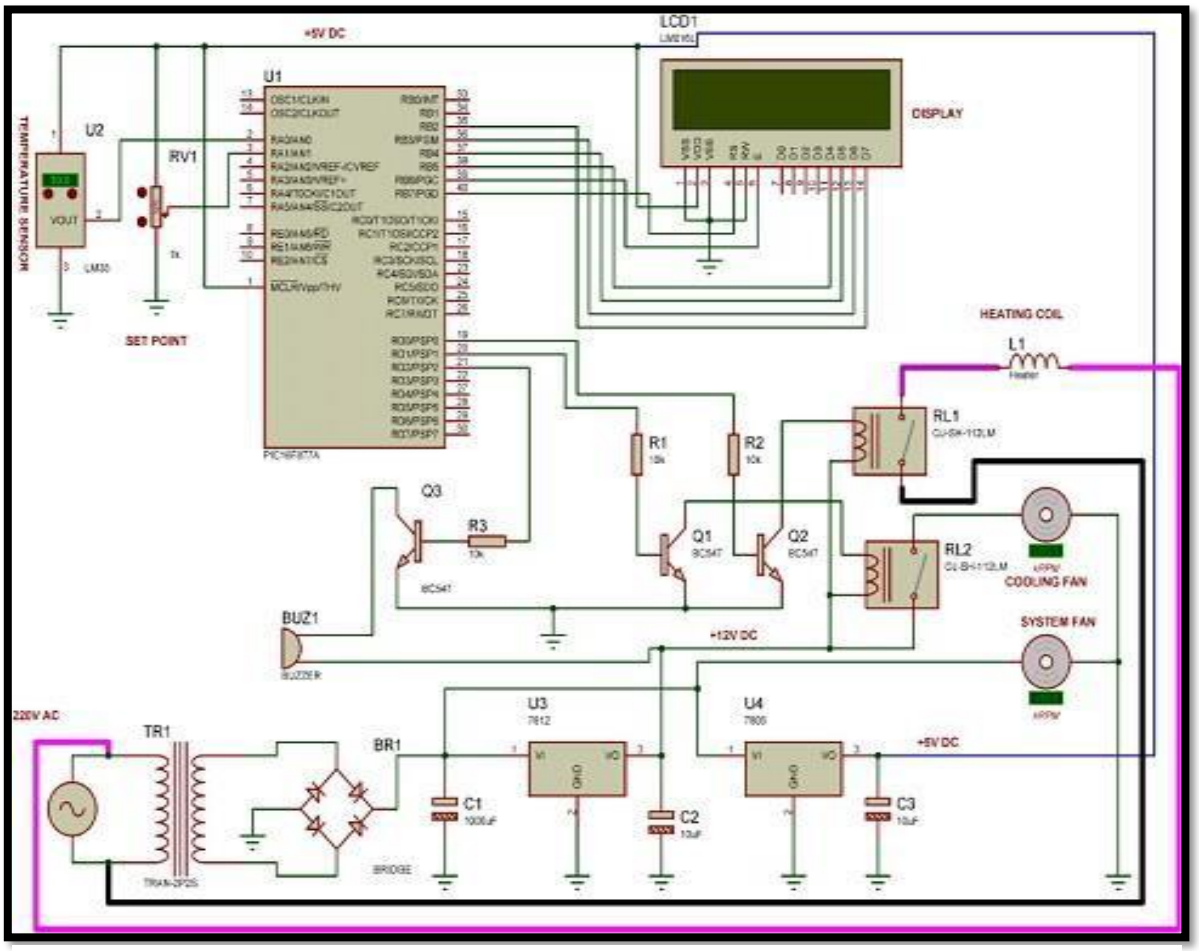


Figure 151 Circuit diagram for industrial temperaature control system

temperature sensor (U3) are connected with 5V voltage DC voltage supply. In temperature controller there are two fans, one is system fan or circulating fan and another is cooling fan which are indicated in Figure 3. System fan is directly connected with 18V and cooling fan isconnected with RL2. When power is supplied to system fan is turned on whereas cooling fan iscontrolled by the relay (RL2). Microcontroller is connected directly with sensor (U2), set point (RV1) and display (LCD1). Microcontroller is also connected with Buzzer (BUZ1), relay (RL1) and relay (RL2) through a switching device (BJT) and a resistor. Common emitter configuration of transistor (Q1, Q2 and Q3) works as a switching device.

14.2.5 Accident Alerts in Modern Traffic Signal Control System – Camera Surveillance System:

14.2.5.1 Introduction to Accident Alert System:

Accident alert system main aim is to rescuing people in accidents. Vehicle tracking system main aim is to give security to all vehicles. This is improved security systems for vehicles. The latest like GPS are highly useful nowadays, this system enables the owner to observe and track his vehicle and find out vehicle movement and its past activities of vehicle.

This new technology, popularly called vehicle Tracking Systems which created many wonders in the security of the vehicle. This hardware is fitted on to the vehicle in such a manner that it is not visible to anyone who is inside or outside of the vehicle. Thus it is used as a covert unit which continuously or by any interrupt to the system, sends the location data to the monitoring unit.

When the vehicle is stolen, the location data from tracking system can be used to find the location and can be informed to police for further action. Some Vehicle tracking System can even detect unauthorized movements of the vehicle and then alert the owner. This gives an edge over other pieces of technology for the same purpose.

This accident alert system in it detects the accident and the location of the accident occurred and sends GPS coordinates to the specified mobile, computer etc.

14.2.5.2 Features of Accident Alert System:

This system is based on new technology, its main purpose is to detect an accident and alert to the control room, so the victim can find some help. It can detect accidents the intensity of the

accident without any visual contact from control room. If this system is inserted in every vehicle then it is easy to understand how many vehicles are involved in a particular accident and how intense is it. So that the help from control room will be according to the control room. The present board designed has both vehicle tracking and accident alert systems, which make it more valuable and useful. This board alerts us from theft and on accident detection also. This device detects fire accidents also by placing fire detector in one of the interrupt pins.

14.2.5.3 Block diagram of Accident Alert System and Vehicle Tracking System:

This is the block diagram of vehicle tracking and accident alert system. This shows the overall view of the vehicle tracking and accident alert system circuit. The blocks connected here areLCD display, GPS, GSM, Shock Sensor, Power supply, fire detector.

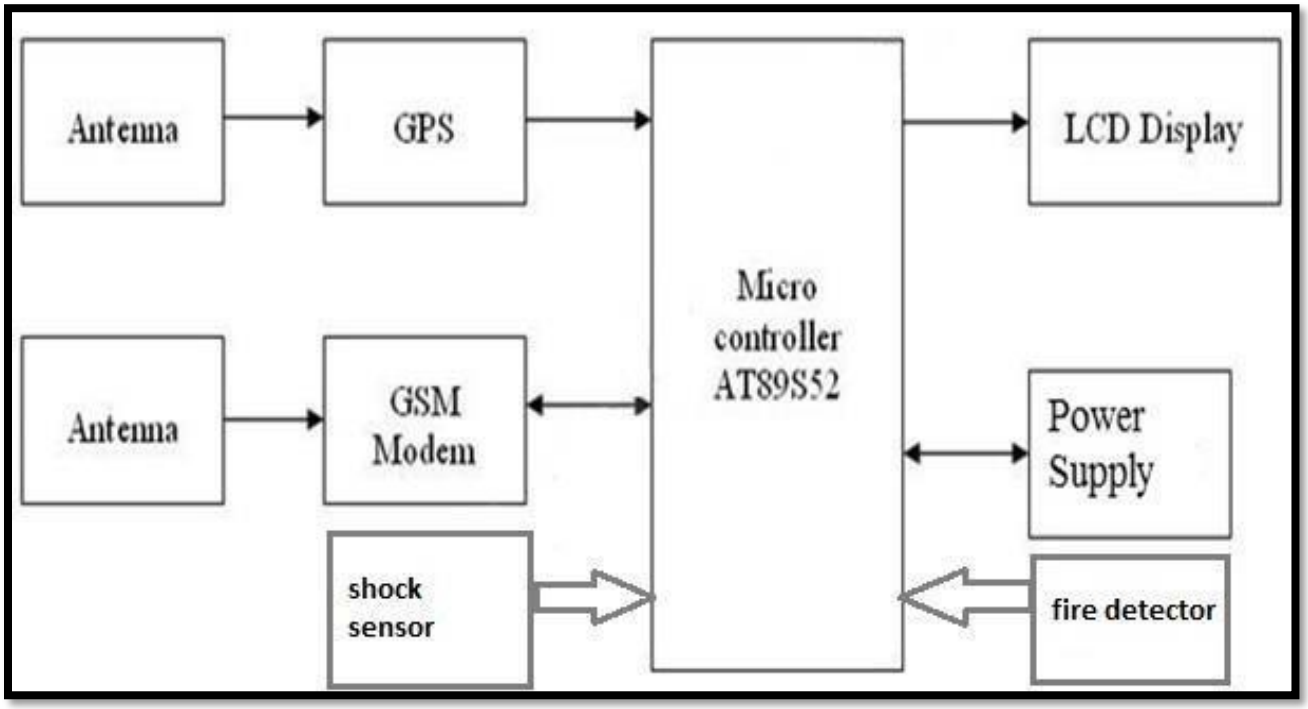


Figure 152 Block diagram of Accident Alert System and Vehicle Tracking System

14.2.5.5 Hardware used in system:

For designing this hardware many types of devices are used to make it perfectly working. All the devices are purchased from different manufacturers. These components are solderedon a soldering board. The following list of hardware are required for this system.

- GSM
- GPS
- SHOCK SENSOR
- MICRO CONTROLLER AT89S52
- MAX232
- RS232
- LCD DISPLAY
- POWER SUPPLY
- FIRE DETECTOR
- SWITCH
- CRYSTAL OSCILLATOR
- LM7805
- W10M BRIDGE RECTIFIER
- LED
- RESET BUTTON

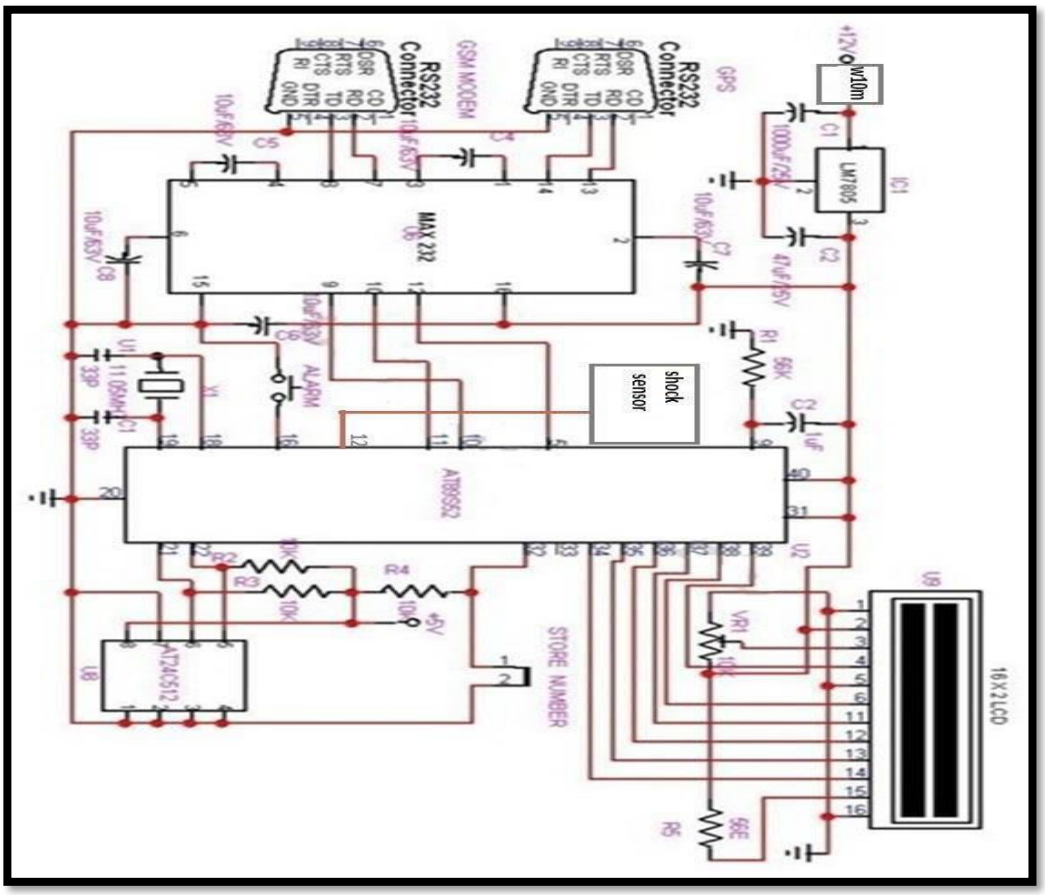


Figure 153 Internal circuit diagram of the system

14.2.5.6 Working of Accident Alert System:

Accident in the sense it could be collision of two vehicles or fire accident inside the vehicle. These shock sensors are attached to the car on all sides of the vehicle and they all are connected to the OR gate OR gate is used because to detect at least one sensor is high .the output from the or gate is connected to the interrupt pin of microcontroller and whenever this pin 12 is high the micro controller sends the message about the accident.

14.2.5.7 Applications:

- Commercial fleet operators are by far the largest users of vehicle tracking systems. These systems are used for operational functions such as routing, security, dispatch and collecting on-board information.
- These are also used for fire detector in large vehicles like train, bus etc. because the vehiclelike train contains large number of people and the sending alert of fire accident can savemany lives.
- The applications for this project are in military, navigation, automobiles, aircrafts, fleet management, remote monitoring, remote control, security systems, tele services, etc.
- Fleet monitoring
- Vehicle scheduling
- Route monitoring
- Driver monitoring
- Accident analysis
- Geo-fencing geo-coding

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).

1. Sustainable Features of Public garden:

- We will be providing smart toilets inside the garden which allows the visitors to use when necessary. The roof of the toilet will have solar plates so as to generate renewableenergy for the usage.
- As it will be a corporation property, so any kind of entry charges will not be taken from citizens.
- Sprinklers will be provided at regular intervals inside the garden for maintenance of the grass & trees. This will reduce the indirect cost for the maintenance in the long run.
- Even at the entrance, solar street lamps will be provided.
- Dustbins will be provided at regular intervals to maintain the cleanliness of the area.
- We haven't discussed about the smart environmental monitoring system with the sarpanch and Talati, but this system can be useful to maintain the shelf life of the plantsand to monitor the soil condition, moisture, etc.
- Benches will be provided at the inner circumference of the garden for old age peoples.
- Rental Cycles will be provided outside the garden, which will be beneficial for environment as well as the citizens.

2. Sustainable Features of Super Market:

- Our supermarket design is quite conventional, but is widely used all over the globe.
- This market will make a common junction for all the vendors to sell their items/products which will help them decide the price for the commodities.
- The design is such that a walkway starts as we enter the market and different units are divided according to the products so that it will be convenient for the visitors.
- Solar Lights are provided at the mid-section of the walkway.
- There will be a common billing section which will maintain the decorum.

3. Sustainable Features of Public Library:

- As we have mentioned in the report, there are no libraries in the village currently, so we decided to provide one with all the necessary amenities.
- We have design the exterior of the library with a good aesthetic appeal, which will encourage the students to learn and grow.
- Inside the library all the sanitary facilities are provided for the visitors, along with a meeting room where there can be group discussions as well as important seminars.
- Enough seating areas are provided with tables for efficiency of the work.
- Outside the library two solar light poles are provided.

- At the entrance, a circular glazed door is provided which increases the aesthetic appearance of the structure.
- Windows are provided at regular intervals to maintain the ventilation.

4. Sustainable Features of Cyber Café:

- A Cyber cafe is a type of business where computers are provided for accessing the internet, playing games, chatting with friends or doing other computer-related tasks.
- This place will be provided with a Wi- fi Connection so that the users can learn how to operate a computer and the internet based software.
- Solar energy will be used for the electric usage of the cyber café, as a government initiative regarding the maximum usage of renewable energy.
- Glass panel doors will be provided at the entrance.
- Latest Computers shall be provided for the development of village students.
- A wooden flooring will be provided for the aesthetic appearance of the café.

5. Sustainable Features of Cafeteria

- The cafeteria will have some smart features like the rooftop solar, automated light management software.
- This can also be the next business hub in the village.
- Curtain walls are provided at the boundary of the inner sitting area of the cafeteria alongwith the railing at the outer area.
- Maple wood flooring will be provided in the cafeteria for the convenience and the aesthetic.
- Circular tables along with chairs are provided both at the outer as well as the inner portion of the cafeteria.
- Rooms are also provided at the backside of the café for the inventory storage and management.
- Fully centralized air condition system will be provided.

6. Sustainable Features of Bus stand

- As we have mentioned in the report that there is only a single bus stand in the whole village, which is also not in a good condition so we decided to provide a bus stand nearthe entrance of the village.
- Glass panels are provided at the mid portion of the bus stand for the convenience of the passengers so that they can see the bus arriving from distance and can get prepared.
- An R.C.C roof is provided for the better design.
- Some benches along with waste disposals are provided at the bus stand as to maintain the cleanliness.

- Bus stops will also have a vending machine, a public telephone, a cell-phone charging outlet.
- Each bus stop will have in the roof top a selection of local plants that will provide homeand food for various bird species to invite them back to the city. There will also be information about birds, native plants, and the environment.
- Maps will be attached at the bus stops for the route selection of the passengers.
- G.P.S will also be enabled at the bus stop so as to get the current location of the buses.

7. Sustainable Features of Bank

- As mentioned in our report, there is only one bank in the village which causes chaos outside and inconvenience to both the employees and the villagers.
- An A.T.M is also provided beside the bank for easy cash withdrawal.
- Inside the bank, toilets are also provided for both men and women working.
- Rooftop Solar panels will be provided for usage of the electricity.
- Different sections are divided in the bank based on the service a customer needs which saves the time of the customer and the bank employees.
- Centralized air condition system is provided in the bank.
- Proper seating arrangement are provided along with the tables for the purpose of form filling and cheque filling.
- Manager's cabin is designed in such a way that he can monitor the employees.
- Windows are provided for the proper ventilation of the area.

8. Sustainable Features of Public Toilet

- The whole public toilet is divided into three different sections for men, women, and disabled peoples.
- Public toilet includes wash basins and dryers for the convenience.
- Ventilators are provided for the fresh air movement.
- Smart toilets are the type of water efficient toilets. This smart toilets use less water compared to the other standard toilets and also have options for full flush and eco-flush.With the dual flush option and the less water to flush the toilet, these toilets are water saving toilets. Some of the smart toilets use siphonic and as well as vacuum to enhance the flushing and reduce the water usage.
- Dustbins will also be provided for waste disposal.
- GARV Toilets provides a complete public sanitation solution that can be monitored on areal-time basis through technology and maintained regularly.
- These portable toilet units are made up of stainless steel and each & every equipment is welded or fitted with hidden nuts and bolts making it secured against any rugged use/vandalism.

9. Sustainable Features of Village Gate

- The most important reason for providing the gate is to get an idea of the entrance of the village and it also displays the development in the village.
- The design of the gate is quite simple and conventional keeping the village in mind andthe budget of the panchayat.
- Material used for construction will be R.C.C.
- A Map of the village will be provided at the entrance for the convenience of the visitors.

10. Sustainable Features of Guest House

- Solar panels will be provided at the roof for better electricity usage.
- LED lights will be used for installing in the rooms respectively.
- Installing an automated thermostat can do wonders for the energy efficiency of your home. There are new advances in smart home technology that enables occupancy detection and subsequent adjustment of your home's temperature.
- Planting a selection of native plants can improve the aesthetic qualities of your home and supply you with supplementary organic goods.
- Rain water harvesting technology will be implemented in the house.
- Good quality doors and windows are provided at regular intervals.

11. Sustainable Features of Crematorium

- We have designed the crematorium with a wood store and a caretaker office inside the whole area.
- A waiting hall is also provided with an M.S. truss and Mangalore tile roofing.
- A hand pump along with the body washing area and ritual platform is also designed.
- An interlocking paver flooring is provided in the whole premises.
- A boundary wall of 1500mm height is provided.
- 4. Nos. Solar light poles, 1
- Enough seating areas are provided at the pyre.
- 2 Nos. Chabutra siting under tree.
- Area: 400 square meters for single pyre complex.
- We have designed it in such a way that least manpower will be required for the maintenance.

12. Sustainable Features of Gram Panchayat

- The existing condition of gram panchayat requires a lot of repair and rehabilitation so we decided to keep this design.

- We have provided solar panels at the roofs for the encouragement among the villagers regarding the renewable energy usage.
- Curtain wall is provided at the entrance of the panchayat along with pentagonal windows which will give a good aesthetic appearance to the whole structure.
- Two cabins are provided for the talati and sarpanch respectively with the necessary furniture systems like the storage, chairs, table.
- An attached toilet is provided inside the gram panchayat.
- A meeting room is also provided which can also act as a waiting area for the office.
- Air conditions will be provided in each of the rooms with LED lighting.

13. Sustainable Features of Wireless Industrial device remote control using RF base multichannel:

- It helps to solve the growing demands for improving process in the industry.
- Efficiency of the industrial system is improved by using automation system; basically industrial automation system is used through wired connections.
- But use of wired connected industrial automation system has very high cost due to the fiber cable used for transmission, so wireless remote control of industrial device is used as its cost is quite low.
- By adapting this design controlling of industrial device is very easy and one can control itfrom monitor and same design can also be applicable for home automation system andfor security purpose.

14. Sustainable Features of High Speed protection based programmable current relay:

- Generally, static relays are used as protective device in houses and in substation but nowadays programmable/numerical relays are highly adapted and used for protection purpose, this relays are latest development.
- Their operation is very fast and the controlling system also gives data regarding the source of fault.
- They are programmed in such a way that are reset automatically and operates at specify time set by the programmer.
- These relays are highly used in industries for protection of large equipment and it can also be used for protection of household equipment. Initially there cost is high but their running cost is low.

15. Sustainable Features of Central Control unit for Irrigation water pumps construction:

- Normally, at any house or industry or in agriculture water pumps are used, but our design gives computerized water siphoning framework.
- By this the person without any knowledge can control and operate the water pump from

controlling unit following some basic operating guidelines.

- Its maintenance cost is low, it saves time of individual as one does not have to monitor pump at site, and t is reliable.
- This simple technology can reduce lot of work and saves time of farmer while irrigation process.

16. Sustainable Features of Underground Cable Fault Distance Locator:

- Nowadays underground transmission lines are widely used for safety purpose and to develop smart city or village.
- When fault occurs in underground transmission line location of the fault is major issuefor that fault distance locator is used.
- Its initial cost is nominal and it is more reliable.
- By this design exact location of the fault can be located by sending sample voltages and currents.

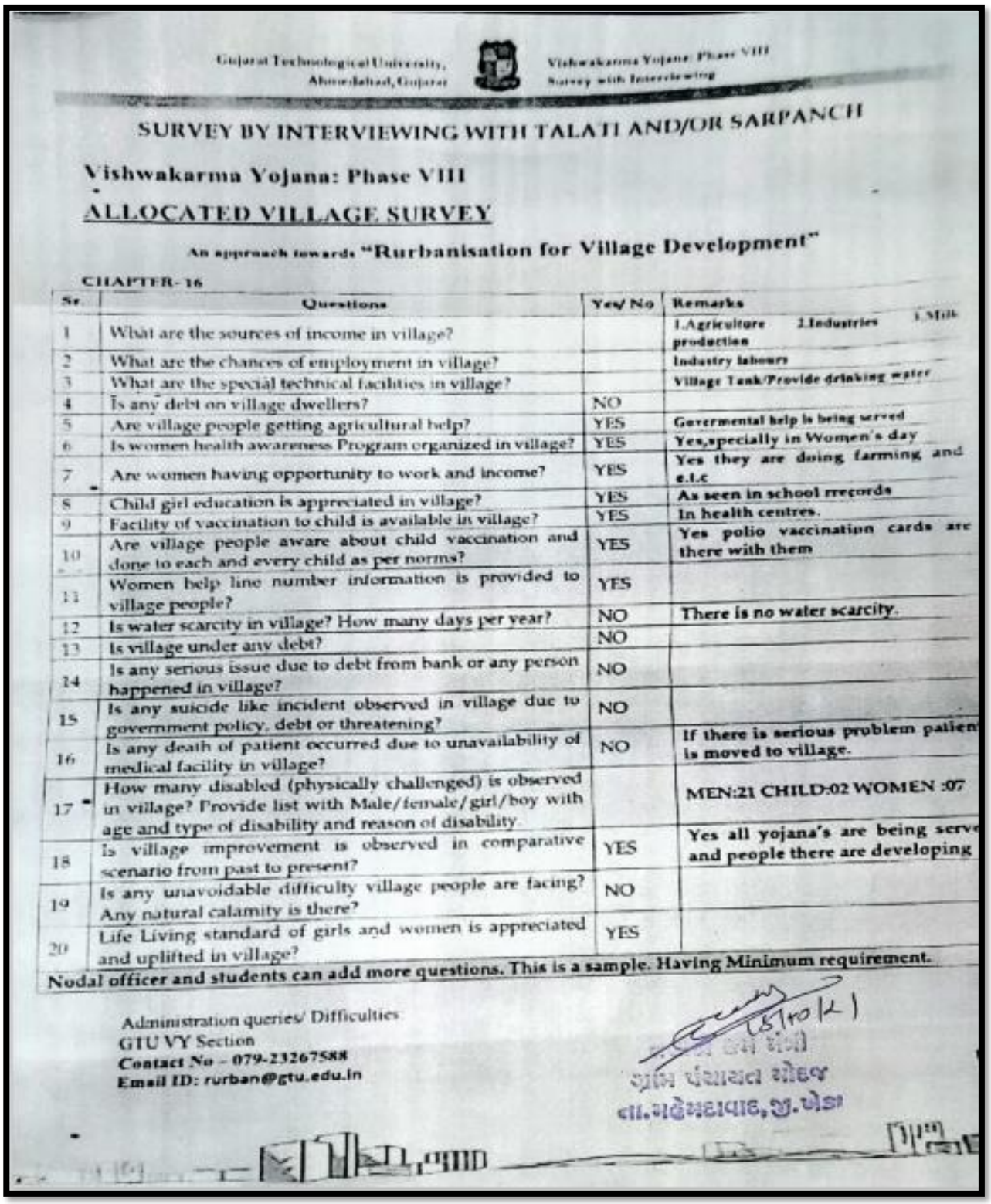
17. Sustainable Features of DTMF based Water Gates Controlling System:

- In monsoon season there is problem regarding overflow of dam due to excessive rainfall or dam gates are opened due to mistake of the operator, this design gives solution to such problem.
- The design gives efficient solution to for monitoring and controlling of dam water gates with automatic control using DTMF technology.
- Main features of design are water level indicators gate positioning and controlling systemand remote communication modem with this person with basic knowledge can operate and maintain the control of dam water gates.
- Monitoring can be done from anywhere and anytime so causality can be detected easily and can be prevented. Due to this villages near the dam are saved from disaster.

18. Sustainable Features of Wireless Data Acquisition System for Energy Tapping Identifier:

- Energy stealing directly from the main line is major problem in rural areas this design gives solution to this problem. By the help of this design one can directly identify the energy tapper directly from the grid.
- Villagers with proper connection are affected by this problem as their bill is increased if tapper steals it from their line or the electricity department has to face loss and the tapper cannot be identified.
- Main feature of this design is to save electricity and those who want to use it have to pay for it so no one has to face loss.
- This design contains two CTs and one A/D converter so system cost is low and more effective.

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?		1.Agriculture 2.Industries 3.Milk production
2	What are the chances of employment in village?		Industry labours
3	What are the special technical facilities in village?		Village Tank/Provide drinking water
4	Is any debt on village dwellers?	NO	
5	Are village people getting agricultural help?	YES	Governmental help is being served
6	Is women health awareness Program organized in village?	YES	Yes,specially in Women's day
7	Are women having opportunity to work and income?	YES	Yes they are doing farming and e.t.c
8	Child girl education is appreciated in village?	YES	As seen in school rrecords
9	Facility of vaccination to child is available in village?	YES	In health centres.
10	Are village people aware about child vaccination and done to each and every child as per norms?	YES	Yes polio vaccination cards are there with them
11	Women help line number information is provided to village people?	YES	
12	Is water scarcity in village? How many days per year?	NO	There is no water scarcity.
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	If there is serious problem patien is moved to village.
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		MEN:21 CHILD:02 WOMEN :07
18	Is village improvement is observed in comparative scenario from past to present?	YES	Yes all yojana's are being serv and people there are developing
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

ગ્રામ પંચાયત ઓફિસ
તા.સાણંદ,જી.અમદાવાદ

CHAPTER 17

Irrigation / Agriculture Activities and Agro Industry, Alternate TechnicsAnd Solution.

Present situation in village


Figure 154 SOME OF THE IRRIGATION ACTIVITIES

❖ **Irrigation Activities, Alternate Techniques and Solution**

Figure 155 Sprikler irrigation

1. Sprinkler irrigation- Sprinkler Irrigation is a technique for applying water system water which is like precipitation. Water is dispersed through an arrangement of lines ordinarily by siphoning. It is then splashed into the air and flooded whole soil surface through shower heads so it separates into little water drops which tumble to the ground.

Sprinklers give effective inclusion to little to huge regions and are reasonable for use on a wide range of properties. It is likewise versatile to virtually all irrigable soils since sprinklers are accessible in a wide scope of release limit.

Figure 156 Canal irrigation

2. Canal irrigation- A water system waterway or parallel is built to pass on water from the cause of supply to at least one farms.

All channels, laterals, and related constructions are arranged as a basic piece of a complete framework intended to work with characteristic asset protection on a ranch or gathering offarms.

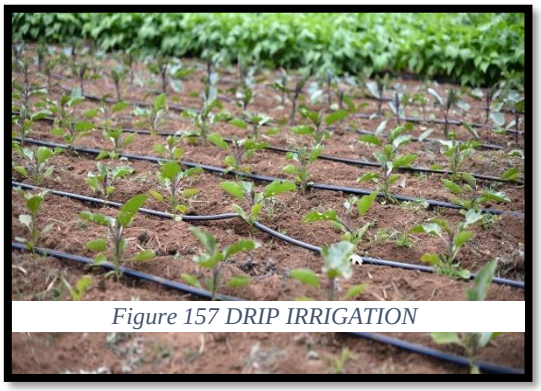


Figure 157 DRIP IRRIGATION

3. Drip irrigation- Drip water system (some of the time called stream water system) works by applying water gradually, straightforwardly to the dirt, bloop, bleep, bloop, bleep. The high productivity of drip water system results from two essential variables. The first is that the water douses into the

dirt before it can dissipate or run off. The second is that the water is just applied where it is required, (at the plant's foundations) instead of showered all over the place. While dribble frameworks are basicand pretty lenient of blunders in plan and establishment, there are a few rules that whenever followed, will make for a vastly improved trickle framework. The reason for this instructional exercise is todirect you toward materials and techniques that will expand the advantages of your new drip framework, while controlling you away from some normal confusions and practices that can raiseyour trouble.

4. Furrow irrigation:

Furrow water system is fit to the developing of tree crops. In the beginning phases of tree planting, one wrinkle close by the tree line might be adequate yet as the trees foster then at least two wrinkles can be builtto give adequate water. Now and again an uncommon crisscross framework is utilized to improve the spread of water.

Figure 158 Furrow irrigation:

Furrow water system, regularly referenced in writing, is an exceptional kind of wrinkle water system,utilized for broadcast crops. Layerings are little slopes

squeezed into the dirt surface. The use of this strategyis restricted and is excluded from this manual.

5. Center Pivot irrigation

As the name suggests, center pivots irrigate in a circular pattern around a central pivot point. Pivots are capable of applying water, fertilizer, chemicals, and herbicides. This versatility can improve the efficiency of irrigation practicesby using a single piece of machinery to perform several functions.

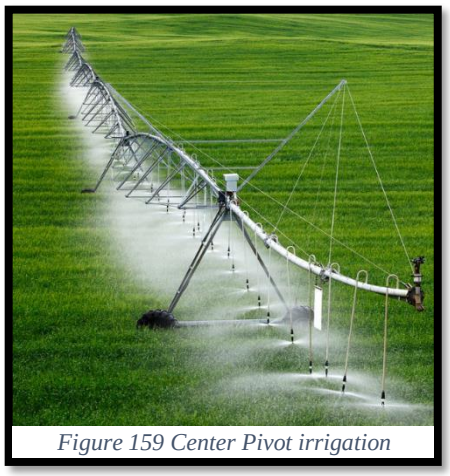


Figure 159 Center Pivot irrigation

Most center pivot machines are electrically powered, using either a generator or a public power source. Pivots use both 120 and 480 volts of alternating current (VAC) to operate. 120 VAC is used as the control circuit, powering the safety circuit, the forward and reverse movement of the pivot, and, more precisely, the movement of the Last Regular Drive Unit (LRDU). The 480 VAC is the power circuit and supplies the needed energy for the drive units to move.

CHAPTER 18 SOCIAL PROGRAM

Figure 13 Pictures replicating distribution of healthy foods to kids of village

Awarness program for kids below 12 years addicted to packet foods ,explaining and cons of eating packet foods and meanwhile distributing them healthy foods.

Our schoolchildren are progressively becoming overweight or stout. Without a trace of a solidified report, certain irregular studies led in various pieces of India over the previous decade propose that 2.9-14.3 percent youngsters in the nation could be fat and 1.5 24% overweight. The issue has especially expected a general wellbeing worry in metropolitan regions. A recent report by Jehangir Hospital in Pune and UCL Institute of Child Health, London, shows that 30% of kids living in metropolitan regions are hefty or overweight. In a recent report distributed in the Indian Journal of Public Health wellbeing specialists in Gujarat say 33% of kids examining in rich schools of Rajkot are fat or overweight.

Youth corpulence involves genuine concern since kids who are overweight or stout grow up to be overweight or fat grown-ups, says Aanuja Agarwala, dietician at the All India Institute of Medical Sciences in Delhi. In addition, kid hood stoutness is additionally a precursor of metabolic disorder, poor actual wellbeing, respiratory issues and non-communi link illnesses (NCDs) like hypertension and glucose narrow mindedness (type-II diabetes). NCDs regularly happen further down the road. Till thirty years prior, they were not a paeditrician's anxiety. Yet, they are currently starting to show up among kids, says Rekha Harish, head of pediatrics office, Govern ment Medical College, Jammu.

What could be the justification behind this new flood in corpulence and NCDs among kids? Specialists like Seema Gulati, boss undertaking official (sustenance) at the Diabetes Founda tion of India, say unreasonable utilization of food high in salt, sugar and fat is the primary guilty party for corpulence and NCDs among youngsters. Does this mean our youngsters have quit eating right? Has their way of life gone through an ocean change in ongoing many years? To get this, the Center for Science and Environment, Delhi-based examination and promotion association, as of late directed a web-based review, Know Your Diet (knowyourdiet.org). More than 13,200 youngsters in the age gathering of 9-17 from 300 schools the nation over partook in the review and gave data identified with their day by day propensities. Around 90% of them were from metropolitan regions.

The outcomes show that 93% of the kids eat bundled food and 68 percent devour bundled sugar-improved beve seethes more than one time each week; 53% burn-through these items to some extent one time per day. While 56% of the kids burn-through bundled sweet items like chocolates and frozen yogurts over two times every week, 53% devour bundled pungent food like chips and noodles and 49 percent bundled sugar-improved refreshments like soda pops and bundled juices going on like this. Right around 27% of the schoolchildren burn-through items produced by inexpensive food outlets, like burger and pizza, more than one time each week. Such food sources may not be bundled in the severe sense yet are ultra handled and high in fat, salt or sugar (HFSS)

Lastly, me and my colleagues discussed on issue with some of the ladies in village about not to burn garbage instead can collect it all and do land filling far away from village.Also,gathered with with talati and sarpanch of village and shared ideas of inviting companies to village so that they’ll establish plants there and unemployment rate would be reduced more.

CHAPTER 19 SANSAD ADARSH GRAM YOJANA (SAGY SURVEY)

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionn...

Village: MODAJ Gram Panchayat: MODAJ Ward No. 59-49

Block: Mehmdabad District: KHEDA

State: GUJARAT L S Constituency: Mehmdabad

1. Family Identity and Size

Name of Head of Household	Mansingh bhai Solanki							(Male) Female	M
SECC Survey ID:		Family Size	5	Over 18	4	6 to 18	1	Under 6	0

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]
Neema ben M. Solanki	47	F	–	2	3	Y	Y	0
Dhavalbhai Solanki	28	M	–	2	6	Y	Y	0
Darshansinh M. Solanki	25	M	–	1	7	Y	Y	0
Gritika M. Solanki	18	F	–					

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
Gritika M. Solanki	18	F	N	1	5	School	12th	Y

4. Children below 6 years

Name	Age	Sex M/F/ O	Disability Yes/No	Going to School (Y/N)	Going to AWC Y/N	De-worming Done	Fully 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)

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

5. Hand washing

	Always		Sometimes		Never
After use of Toilet	Soap ✓	Other	Soap	Other	
Before Eating	Soap	Other	(Soap)	Other	

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

7. Do members take Regular Physical Exercise

	Yoga	Games	Other Exercises
Adults	Yes / ~~No~~	Yes / ~~No~~	Yes / ~~No~~
Children	Yes / ~~No~~	Yes / ~~No~~	Yes / ~~No~~

8. Consumption of Tobacco

	Smoking	Chewing
Adults	✓	✓
Children	—	—

9. House & Homestead Data

Own House: Yes / ~~No~~	No. of Rooms: 4
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	350m
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	34	2. Cultivable Area	34
3. Irrigated Area	34	4. Uncultivable Area	0

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
Wheat	Quintal	80-90
Bajra	Quintal	50-55

17. Livestock Numbers

Cows: 12	Bullocks: 2	Calves: 3
Female Buffalo: 12	Male Buffalo: 4	Buffalo Calves: 2
Goats/ Sheep:	Poultry/ Ducks:	Pigs:
Any other: Type		No.
Shelter for Livestock: Pucca / Kutcha / None		
Average Daily Production of Milk(Litres):		

18. What games do Children Play
Cricket

19. Do children play musical instrument (mention)
flute, Dholak

Schedule Filled By:
Principal Respondent:
Date of Survey:

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

I. Basic Information

a. Gram Panchayat: Madaj

b. Block: _____

c. District: Kheda

d. State: Gujarat

e. Lok Sabha Constituency: Mehmdabad

f. Number of Wards in the Gram Panchayat: 39-49

g. Number of Villages in the Gram Panchayat: 3

h. Names of Villages:

Demographic Information

Number of Households 900-1000 Total Population 13800 Male 8000 Female 6000

SC HHs _____ ST HHs _____ OBC HHs _____ Other HHs _____

I. Access to Infrastructure / Facilities / Services

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
a.	ANM/ Health Sub Centre	Y	
b.	Nearest Primary Health Centre (PHC)	Y	
c.	Nearest Community Health Centre (CHC)	Y	
d.	Nearest Post Office	Y	
e.	Nearest Bank Branch (Any)	Y	
f.	Nearest Bank with CBS Facility	Y	
g.	Nearest ATM	Y	
h.	Nearest Primary School	Y	
i.	Nearest Middle School	Y	
j.	Nearest Secondary School	Y	
k.	Nearest Higher Secondary School / +2 College	Y	
l.	Nearest Graduate College	N	28 Km
m	Nearest ITI / Polytechnic Centre	N	04 Km
n	Kisan Seva Kendra	Y	

1

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
o	Agriculture Credit Cooperative Society	N	
p	Nearest Agro Service Centre	N	
p	MSP based Government Procurement Centre	Y	
q	Milk Cooperative /Collection Centre	Y	
r	Veterinary Care Centre	N	9 km
s	Ayurveda Centre	Y	
t	E – Seva Kendra	Y	
u	Bus Stop	Y	
v	Railway Station	N	50-55 km
w	Library	N	14 km
x	Common Service Centre	Y	

IV. Sports Facilities in the Gram Panchayat

a. Number of Play Grounds in the GP: Total 0 Public 0 Private 0

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

V. Education, ICDS

a. Number of Angan Wadi Centres: 1

b. Number of villages without Angan Wadi Centres 0

Names of such villages: _____

c. Schools (Number)

Primary Private: 3 Primary Govt.: 3

Middle Private: 0 Middle Govt.: 3

Secondary Private: 0 Secondary Govt.: 1

Higher Secondary Private: 0 Higher Secondary Govt: 0

VI. Public Distribution System

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

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

VII. Coverage of Villages under different Facilities & Services

	Parameter	Villages Status[1]	Names of Villages Covered	Names of Villages not Covered
a.	Piped Water Supply Coverage to Villages	Covered 3 / Not Covered 0	Modaj, Nenpur, Raska	
b.	Hand Pump Coverage in Villages:	Covered 3 / Not Covered 0	Modaj, Nenpur, Raska	
c.	Coverage under Covered Drains:	Covered 3 / Not Covered 0	Modaj, Nenpur, Raska	
d.	Coverage under Open Drains:	Covered 0 / Not Covered 0	Modaj, Nenpur, Raska	
e.	Villages with Household Electricity Connection (Numbers)	Connected 3 / Not Connected 0	Modaj, Nenpur, Raska	

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	62	d.	Pasture / Grazing Land	3	g.	Check Dam	0
b.	Irrigated Land	–	e.	Forests/ Plantations	0	h.	Wells/Bore Wells	14
c.	Un-irrigated Land		f.	Other Common Land	0	i	Tanks /Ponds	3

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

3

Sansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

IX. Parameters relating to Households & Institutions

		Number
a)	Number of eligible Households for pension (old age, widow, disability)	
b)	Number of Households receiving pension (old age, widow, disability)	
c)	Number of eligible Households who are not receiving pension	
d)	Number of Households eligible for Ration Card	
e)	Number of eligible HHs having ration cards	
f)	Number of households covered under RSBY (Rashtriya Swasthya Bima Yojana)	
g)	Number of HHs covered under AABY (Aam Aadmi Bima Yojana)	
h)	Number of active Job Card holders under MGNREGA	
i)	Number of Job Card holders who completed 100 days of work during 2013-14	
j)	Number of shops selling alcohol	
k)	Number of BPL families	
l)	Number of landless households	
m)	Number of IAY beneficiaries	
n)	Number of FRA[2] beneficiaries	
o)	Number of Community Sanitary Complexes	
p)	Number of Households headed by single women	
q)	Number of Households headed by physically handicapped persons	
r)	Total number of Persons with Disability in the village	
s)	Number of SHGs	
t)	Number of active SHGs	
u)	Number of SHG Federations	
v)	Number of Youth Clubs	
w)	Number of Bharat Nirman Volunteers	

Name and Signature of Surveyor and Respondent'

Surveyor	PRI Respondent (Preferably Gram Panchayat Chairperson)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	Date of Survey

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

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: Madaj

b. Ward Number: 39-49

c. Gram Panchayat: Madaj

d. Block: _____

e. District: Mehmedabad

f. State: Gujarat

g. Lok Sabha Constituency: Mehmedabad

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

i. Names of Habitations / Hamlets:

Demographic Information

Number of Households_____ Total Population_____ Male _____ Female _____

SC HHs_____ ST HHs_____ OBC HHs_____ Other HHs_____

II. Access to Infrastructure/Amenities etc.

i.	Access to Infrastructure / Facilities / Services	Located in the Village Yes (Y)/No(N)	If located elsewhere (N), distance in kms from the village
a.	Nearest Primary School	Y	
b.	Nearest Middle School	Y	
c.	Nearest Secondary School	Y	
d.	Kisan Seva Kendra	Y	
e.	Milk Cooperative /Collection Centre	Y	
g.	Health Sub Centre	Y	
h.	Bank	Y	
i.	ATM	Y	
j.	Bus Stop	Y	
k.	Railway Station	N	50 KM

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

1

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

i.	Access to Infrastructure / Facilities / Services	Located in the Village Yes (Y)/No(N)	If located elsewhere (N), distance in kms from the village
l	Library	N	14
m	Common Service Centre	Y	
n	Veterinary Care Centre	N	

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: 1

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: 1

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

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

iv. Coverage of Habitations under Waste Management System

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

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

b. Coverage under Open Drains: 2 *(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)* 2

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: 1

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

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

vi. Sports Facilities in the Village

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

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

vii. Education, ICDS

a. Number of Anganwadi Centres: 1

c. Schools (Number)

Primary Private: 0 Primary Govt.: 3

Middle Private: 0 Middle Govt.: 3

Secondary Private: 0 Secondary Govt.: 1

Higher Secondary Private: 0 Higher Secondary Govt: 0

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	62	d.	Pasture / Grazing Land	3	g.	Check Dam	
b.	Irrigated Land		e.	Forests/ Plnatations		h.	Wells/Bore Wells	14
c.	Un-irrigated Land		f.	Other Common Land		I	Tanks /Ponds	3

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

Name and Signature of Surveyor and Respondent'

Surveyor	PRI Respondent (Preferably a ward member from a ward that is fully or partially covered under the Village)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	Date of Survey

3

CHAPTER 20
TDO-DDO-COLLECTOR EMAIL SENDING SOFT COPY ATTACHMENT IN THE REPORT

Gujarat Technological University

Vishwakarma Yojana <rurban@gtu.edu.in>

Development scenario of Modaj village, Mehmadabad, Ahmedabad.

Yash Prakash Shrimali <yashshrimali.cie17@gmail.com>
To: ddo-khe@gujarat.gov.in
Cc: VishwakarmaYojana <rurban@gtu.edu.in>

Respected Sir/Madam,

We are the students of Adani Institute of Infrastructure & Engineering, Ahmedabad affiliated to Gujarat Technological University-GTU. GTU has been assigned to Vishwakarma Yojanaa-VY in which students survey various village and design various amenities to deliver it to them making them ideal for living better life as per requirements & village problem statements.

As a part of Vishwakarma Yojana's guidelines, we have been asked to inform all the respected officers about the our project in which we will shortly notify about Modaj Village profile of issues for development and our design work for them which is as below.

Village : Modaj		**Population: 15745(As of Census 2011)**
Key Issue	**Remark**	**Design Given**
Water Distribution system	Water distribution network in the village is based on the motor channels that supply the water throughout the village, but there are fixed timings for it which does not fulfill the capacity of village. Canal is there for irrigation water. Water can't be bored due to salinity of ground water.	· **Water Storage capacity** · **Rain Water Harvesting system** · **Root Zone Tech. to convert waste water into irrigation water** · **Pond Revival plan in the village**
Internal Road Network	During rainy season it gets muddy as well as safety of integrated village is at risk due to no availability of street network. A lot of internal roads in the village are kutcha road which requires modification.	· **Road network with cc road** · **Well paved roads**
Solid Waste Management	Open waste disposal can be seen everywhere in the village. Also, there is not any waste collection systems from the house of the villagers which indirectly results in waste burning	· **Waste utilization through composting** · **Cow dung can also be used for producing renewable energy.**
Toilet	Almost 90% have household toilet , but there are no common toilets in public places	· **Public Toilet**
Health Care	The villagers have to travel a lot of distance from the village for checkup and treatment.	· **PHC**
Recreational Area	Currently only Village does not have any recreational place, so we have provided a public library and a cyber café which will enhance the villagers creativity.	· **Public Garden** · **Public Library** · **Cyber café**

Gram Panchayat	Grampanchayat faces difficulties in conducting gramsabha, village does not have any place for gatherings or for celebration.	· **Gram Panchayat**
Identification	Village comes within the premises of other village but it was seen that village direction holdings were not proper which can cause difficulty in finding village	· **Entrance Gate**

Sr.No	Design Name	Period (Months)	Amount Expenditure	Benefit
1	Public Garden	4-5	Rs.1,09,000	Recreational Area
2	Public Toilet	3-4	Rs.2,30,000	Sanitation
3	Public Library	6-7	Rs.2,50,000	Knowledge and Creativity
4	Cyber café	3	Rs.9,52,823	Internet Exposure and Online learnings
5	Entrance Gate	1	Rs.1,09,000	Aesthetics And Heritage
6	Bus stand	1	Rs.2,28,000	For better passenger experience
7	Supermarket	4	Rs.8,52,256	To establish a common platform for buying various household items
8	Cafeteria	3-4	Rs.3,62,000	For business meetings
9	Gram Panchayat	7	Rs.3,56,781	To organize events and meetings
10	Guest House	6-7	Rs.4,17,447	A province for the guests and the visitors for a living.
11	Bank with A.T.M	6-7	Rs.2,70,000	This will immensely help the villagers for their withdrawals and queries as they will not have to stand in queue for their chance.
12	Crematorium	5	Rs.7,85,420	Currently in the village there is only a single crematorium. So, this will be a great design as of villagers need.

Please find here with attached,

1. Detailed Project Report of Modaj Village

Best Regards,
Yash Shrimali & Sandeep Mishra
U.G.,Civil & Infrastructure Engineering
Adani Institute of Infrastructure and Engineering
. Gujarat Technological University
Mail: yashshrimali.cie17@gmail.com

Mail: **sandeepmishra.cie17@gmail.com**

Gmail

Sandeep Mishra <sandeepmishra.cie17@gmail.com>

Vishwakarma Yojana (Modaj Village)

Yash Shrimali <yashshrimali.cie17@gmail.com> Wed, Oct 13, 2021 at 12:43 PM
To: ddo-khe@gujarat.gov.in
Cc: Sandeep Mishra <sandeepmishra.cie17@gmail.com>, Poojan Trivedi <poojantrivedi.ele18d@gmail.com>, Uzair Shaikh <uzairshaikh.aiie@gmail.com>, Vishwakarma Yojana <rurban@gtu.edu.in>

Respected Sir,

I Yash Shrimali have completed my B.E. program from Adani Institute of infrastructure & Engineering and my final year project is based on the Vishwakarma yojana in which we have surveyed a village named MODAJ which comes under Kheda District.

We have proposed 12 designs which we felt were required and necessary for the sustainable development of the village. We have attached a PDF file for your reference in which all the details and benefits of the design are mentioned.

My team members are :

1. Sandeep Mishra
2. Poojan Trivedi

Hoping for your kind response

Yours faithfully,

Yash Shrimali.

9265402871

ANNEXURE-IX-FORMAT-TDO-DDO-Collector -Development scenario of Modaj village ,Kheda[380]-converted.pdf
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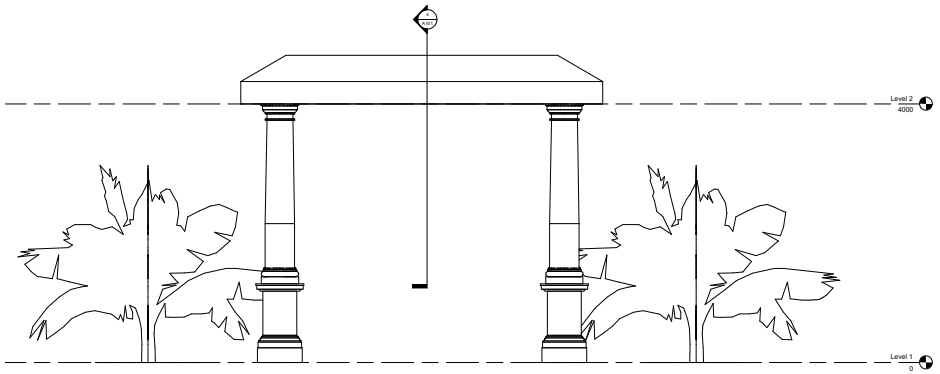
CHAPTER 21

Comprehensive report for the entire village

- The intention of Vishwakarma yojana is to raise the way of life of the country zones to its specific degree up to the degree of an ideal town circumstance.
- It is a successful government plan to build up the rustic zones under efficient expense with great functionality and effectiveness during its utilization. The undertaking will in general improve the physical, social just as socio-social parts of the town by executing and ad libbing different foundations concerning lesser or least impediment to its country realness.
- The primary point is to create town with a "rustic soul" yet with all metropolitan conveniences that a city may have. This task gives "Plan TO DELIVERY" answers for improvement of towns in "RURBAN" zones.
- Particularly in our allocated village, we are eyeing towards providing the basic necessities to the villagers by improving the existing infrastructure and spreading awareness among the village regarding eco- friendly development.
- While visiting the ideal village we started comparing it with our allocated village that is modaj and Hathijan is the ideal village, we found that modaj lacks at socio infrastructure compare to Hathijan village.
- Hence by visiting ideal village we get certain good ideas that can be applied on our allocated village additionally some requirements were also observed during the visit of smart village.
- Various problems were observed during the visit of allocated village such as broken street pole and street lights the infrastructure is not well maintained and has old design and the new projects were delayed,
- By implementing the proposed design many day to day life problems can be resolved and the village people will not migrate to city. In addition it will result in development of village and make it more prosperous.
- The Modaj village mainly lacking at the socio-infrastructure as there are no community hall, parks or any other recreational area present.
- In the part II of our project, we faced many challenges regarding the finalization of our design from the village authority and the gram panchayat members. Although, the members were quite humble to us for their suggestion in our project.
- We also figured the exact location of our projects in the village keeping all the different aspects in mind.
- Also in the part II of the report we have given an advanced earthquake resistant building design along with all the load calculations (Dead load, Live load, Wind load, Combination load)We have also provided the design of shear wall for the building which helps the structure to resist the seismic load on the structure, along with all the position of the shear wall both on the outer and inner side of the building.

- All the designs in the report are prepared in the REVIT 2018 version software as it gives a better work efficiency and excellent 3D visuals.
- Through this whole project we got to know that how to work on the field and provide sustainable designs for the village accordingly, we also faced some challenges which improved our thinking capability.
- This project gave us an exposure to what is required on field and implement the knowledge that we gained during our studies.
- In villages no renewable energy sources was used till now and the people are not that much aware from electric energy conservation and advantages of renewable sources. Need to be aware people from both and also aware from the other government's schemes and subsidy related to it so, villagers are start using renewable energy sources and save electricity.
- We have also focused on providing rooftop solar panels in the most of the public buildings of the village as the government is providing subsidies over the usage of renewable energy and that will indirectly motivate the villagers to adopt it.
- Under this scheme, the villages of "Rurban" area will be adopted by the engineering colleges under the Gujarat Technological University. The Engineering colleges would study the identified villages and make the recommendations on the application of technology to achieve integrated and comprehensive development, through project preparation and management.
- The support of the community can also foster improved implementation opportunities.
- Rain water harvesting system has been suggested and planned for all the Public Buildings in Phase-I & Phase- II.
- Village approach road and internal road for better Transport conditions of villages has been recommended.
- Socio cultural facilities like Community hall, play grounds, Parks, Library, Garden, Eco parks, Beautification of pond(water can be stored in monsoon), Natural water sources beautification and others have been suggested and planned for some villages.
- Eco sanitation, Biogas Plant, waste to energy models can be implemented in villages for sustainable development.
- Maximum participation from NGO, Public Private Partnership authorities and other need to be identified for development process.
- Identified Electricity network problems & Energy audit have been performed for various public buildings and solutions given with various nonconventional energy sources.



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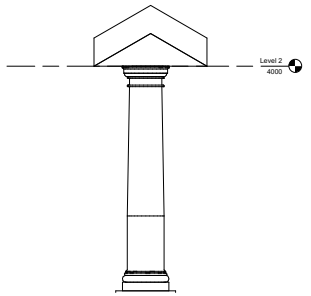

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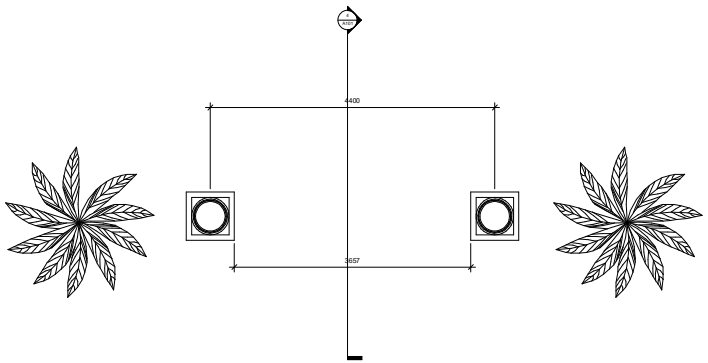

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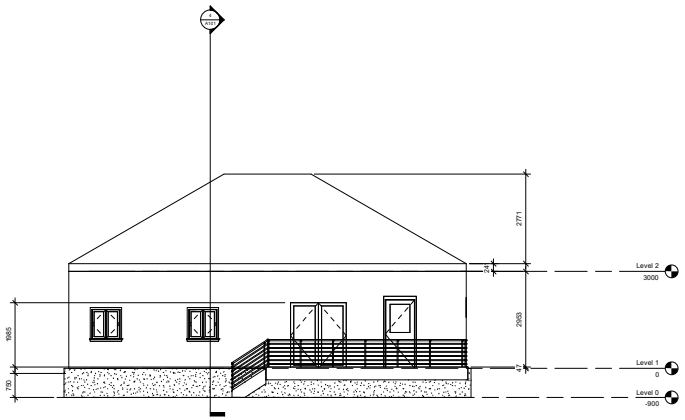

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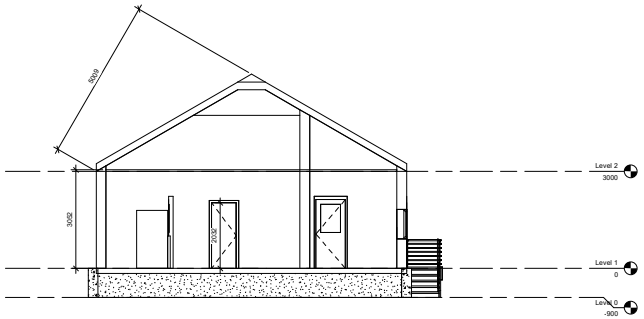

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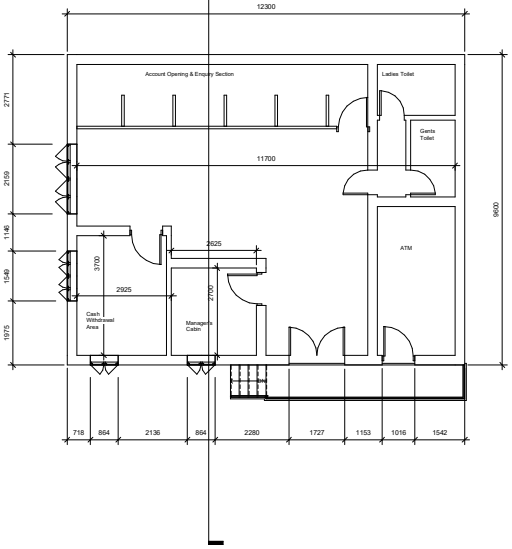

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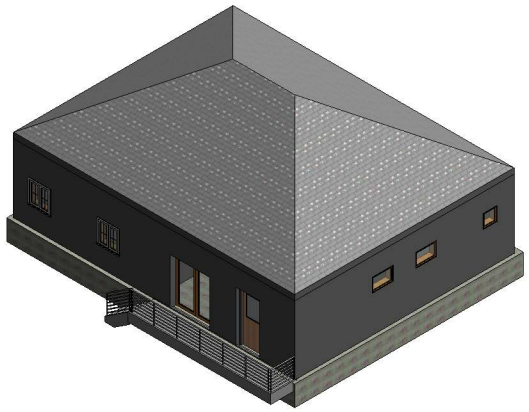

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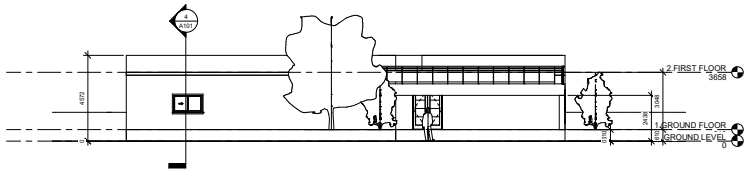

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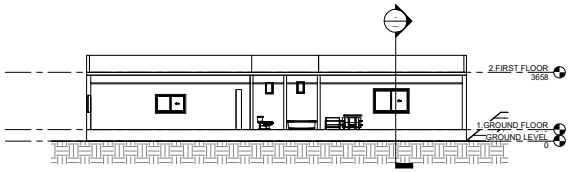

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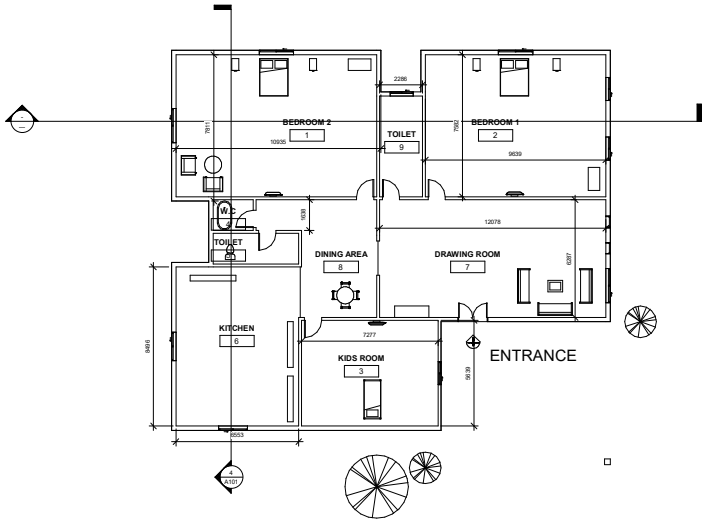

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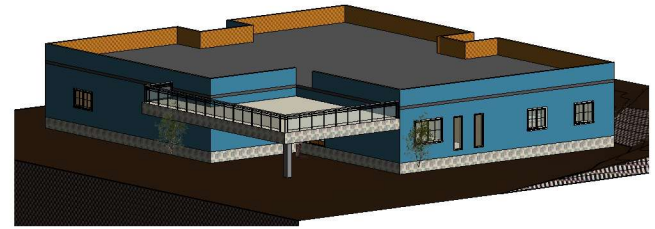

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Owner

Project Name

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Project Number	Project Number
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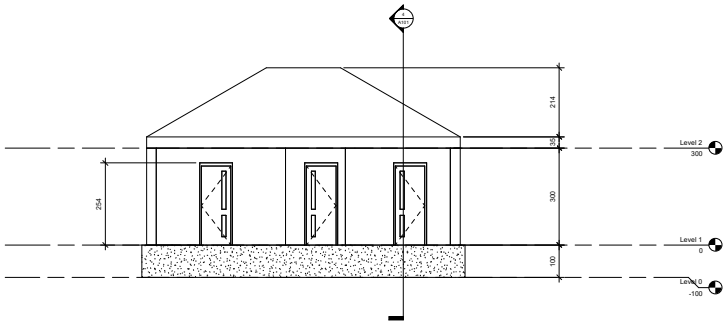
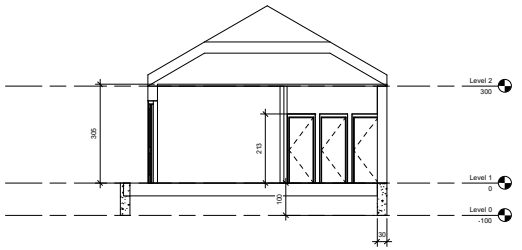


3 South
1 : 50



4 Section 1
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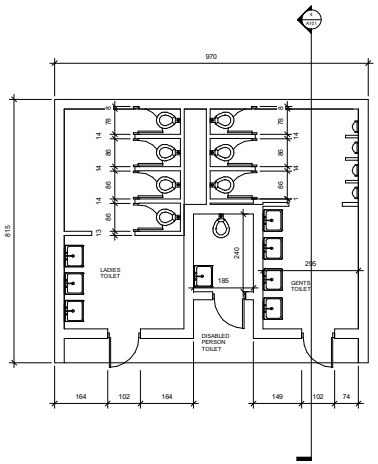

1 Level 1
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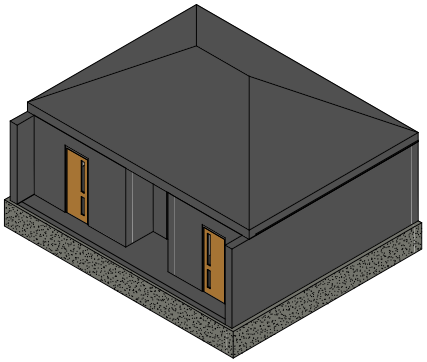

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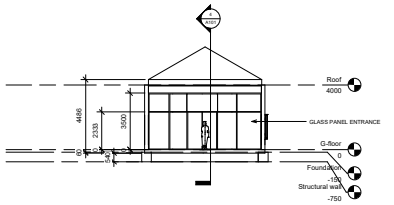

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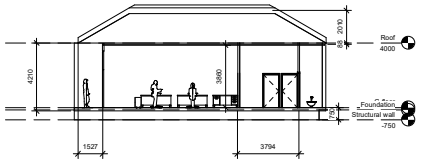

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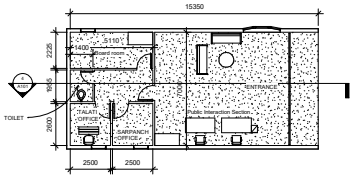

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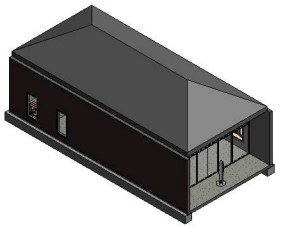

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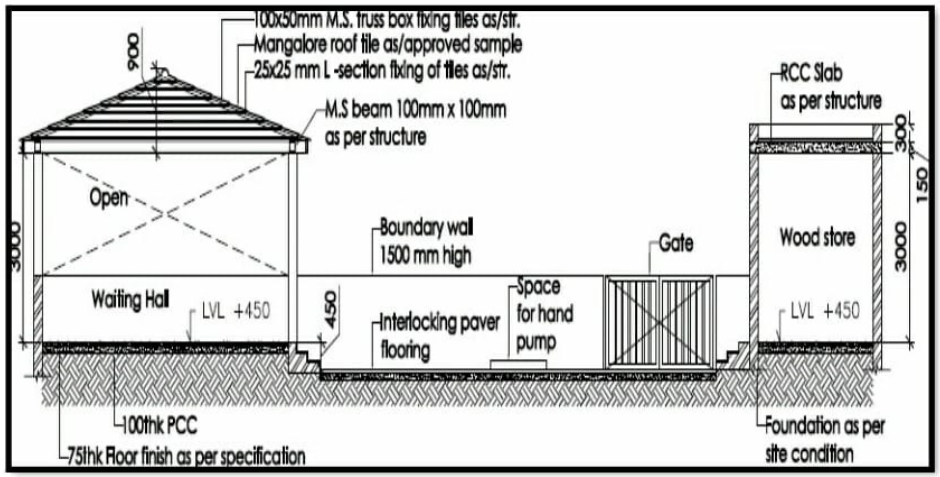

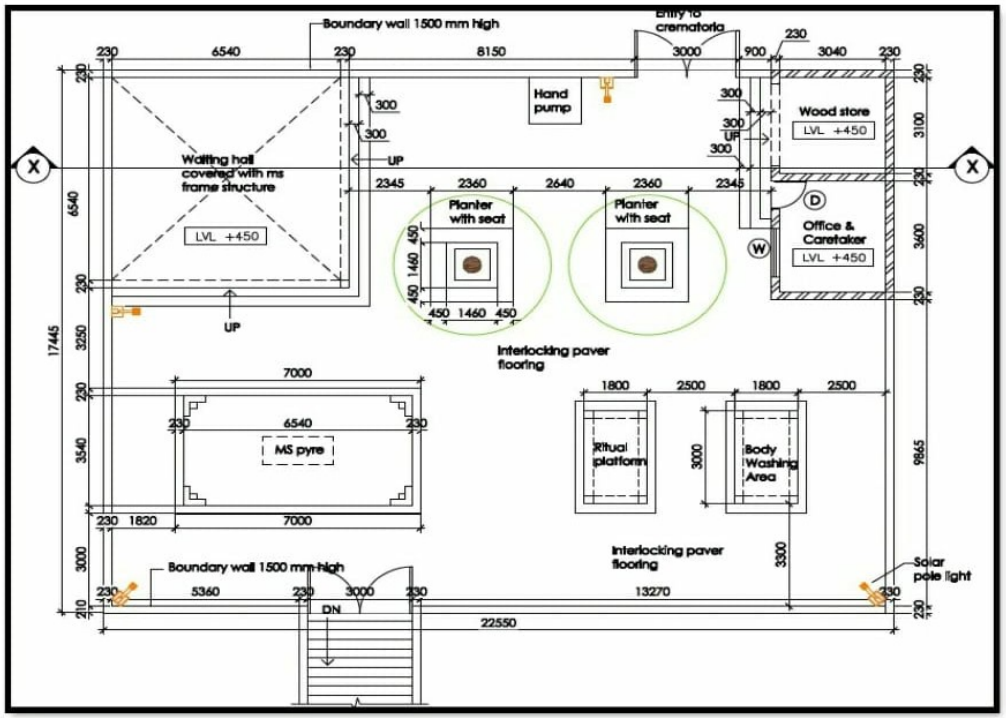

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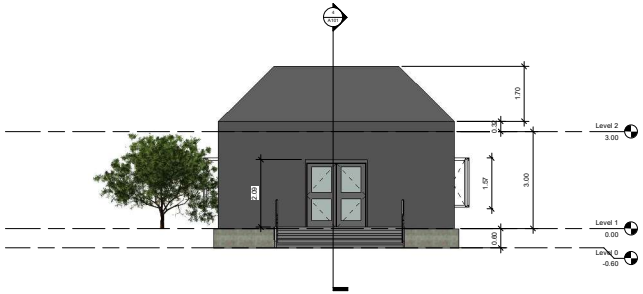

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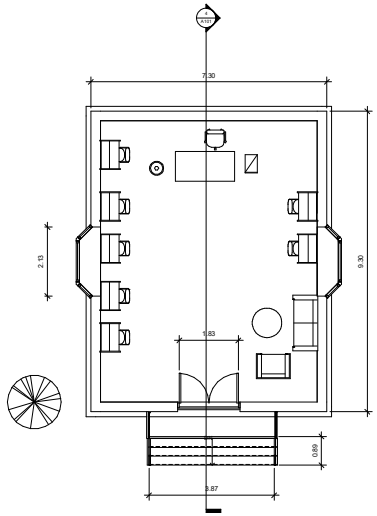

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4 Section 1
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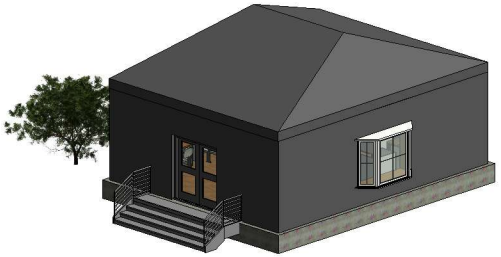

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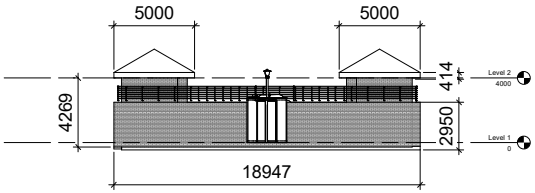

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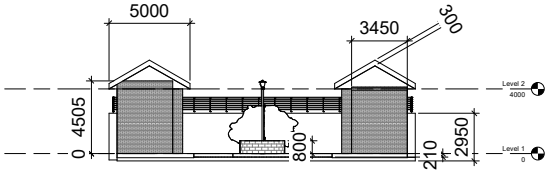

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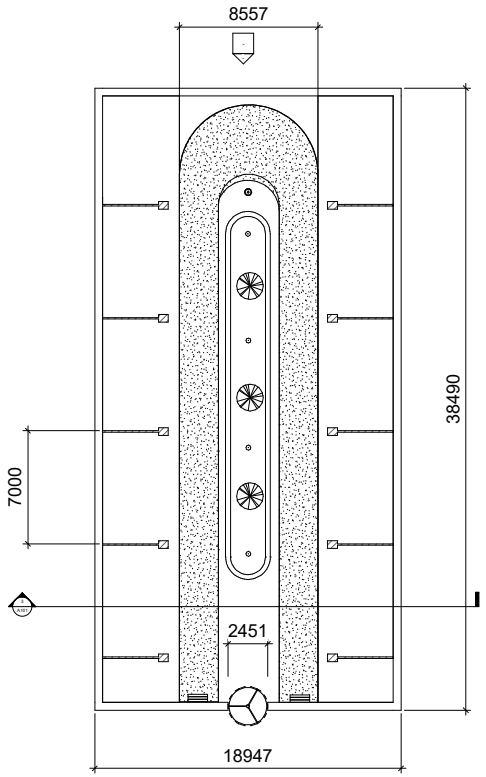

1 Level 1
1 : 100

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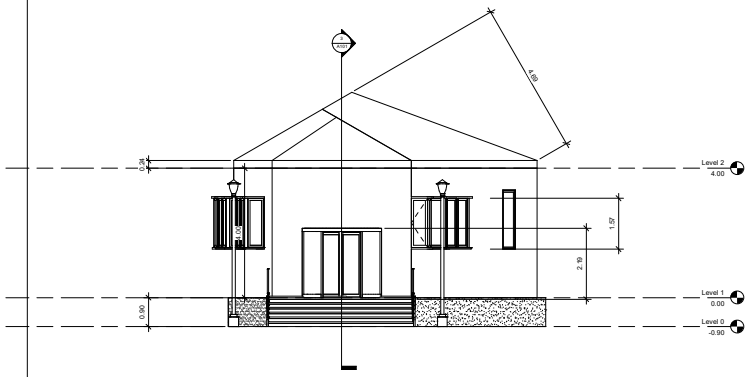

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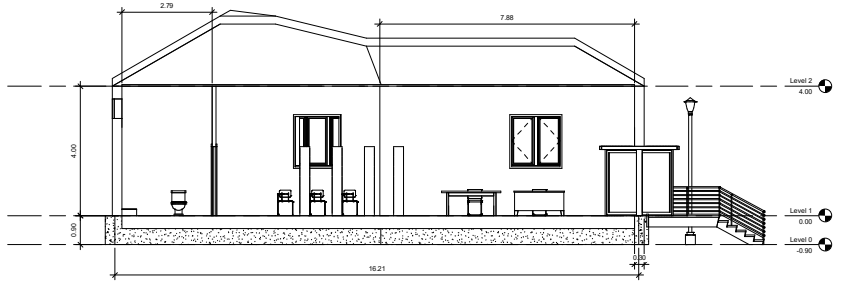
1 : 50



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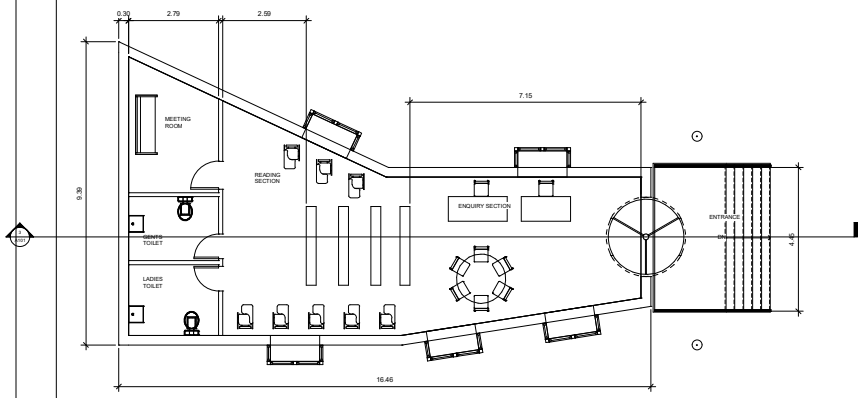

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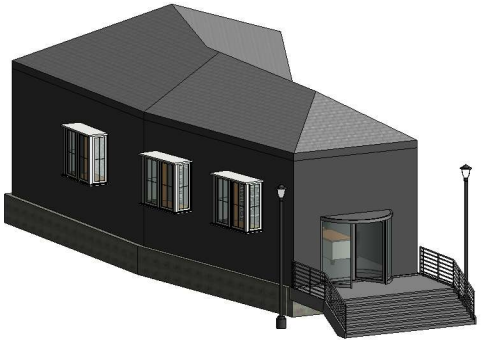

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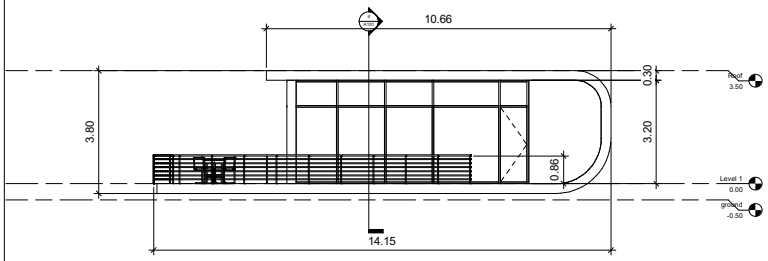

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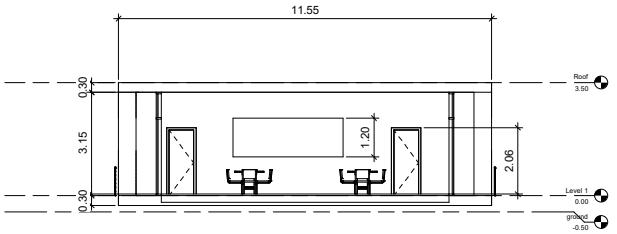

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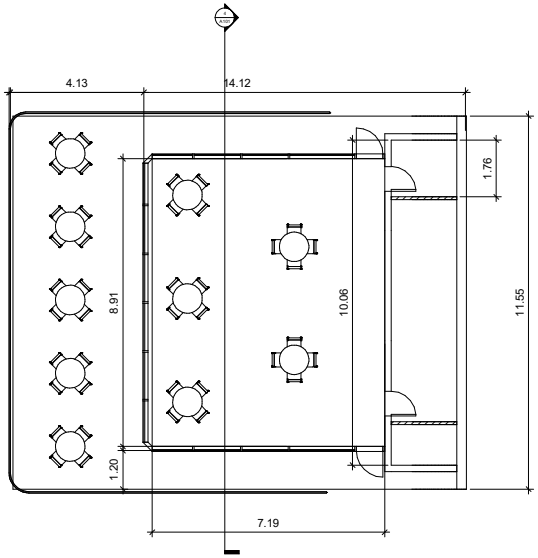

1 Level 1
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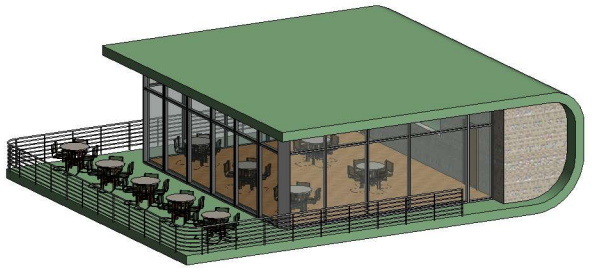

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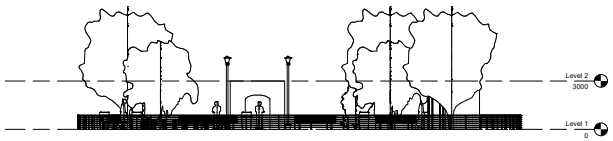

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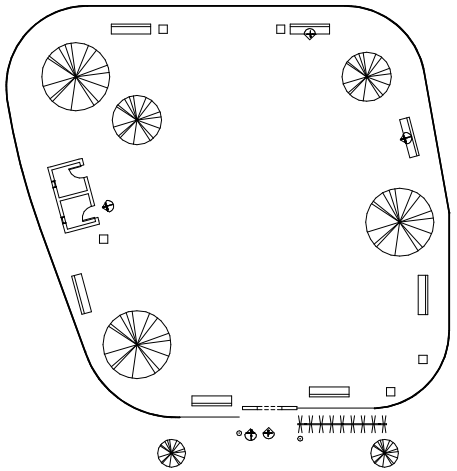

1 Level 1
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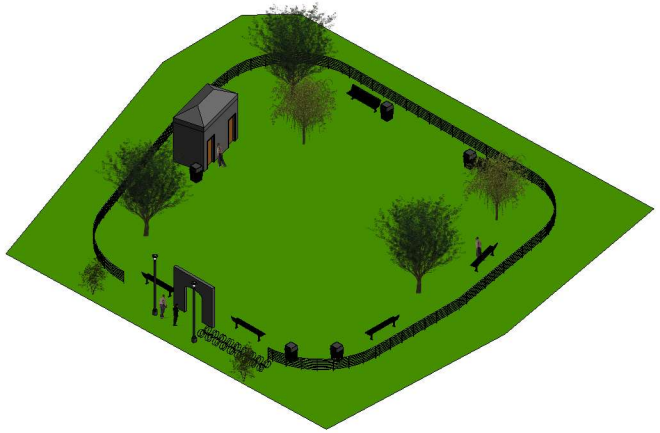

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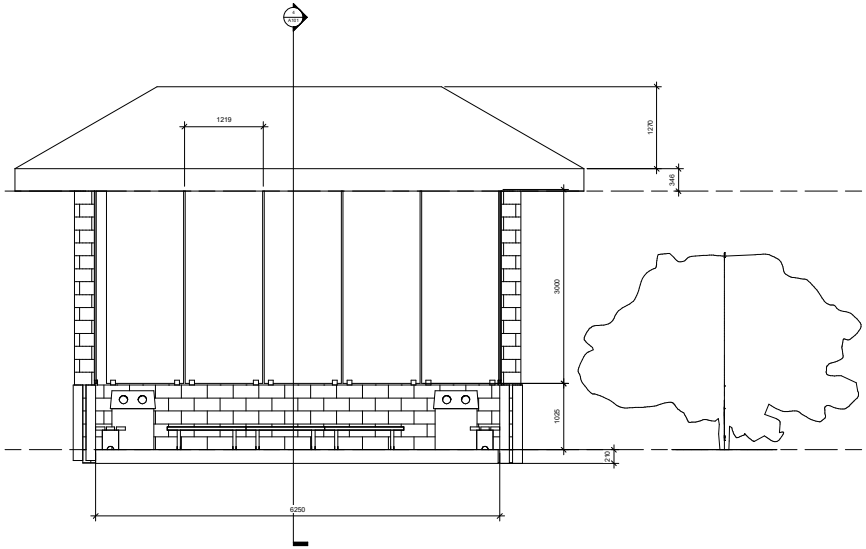

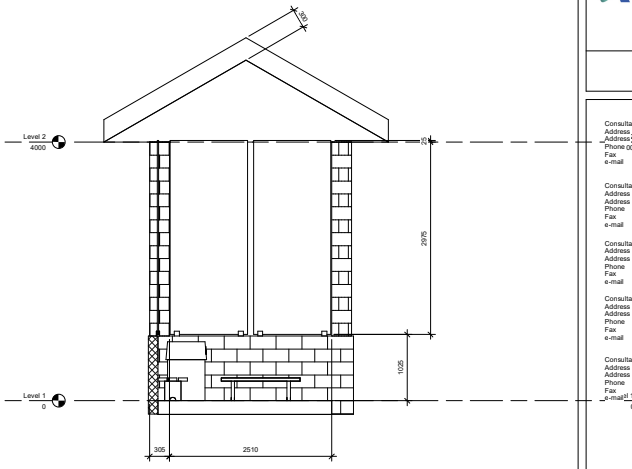

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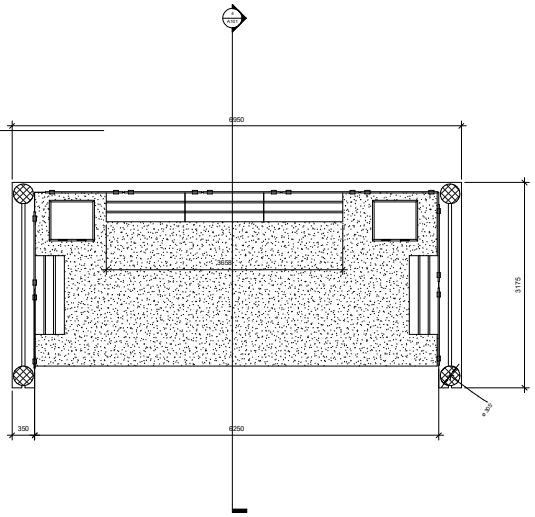

3 South
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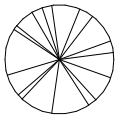

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