DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION
NANI-BHATLAV Village
SURAT District

PREPARED BY

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NODAL OFFICERS

YEAR: 2020-21

GUJARAT TECHNOLOGICAL UNIVERSITY
Chandkheda, Ahmedabad – 382424 Gujarat

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Gujarat Technological University,
Chandkheda, Ahmedabad – 382424 Gujarat

CERTIFICATE

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

Detail Project Report for ,
VILLAGE NANI-BHATLAV
DISTRICT SURAT

Under

Vishwakarma Yojana: Phase-VIII

in partial fulfillment of the project offered by

GUJARAT TECHNOLOGICAL UNIVERSITY, CHANDKHEDA

during the academic year 2020-21.
This project work has been carried out by them under our supervision and guidance.

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ABSTRACT

The strength of my country lies in the hut of the poor ;in villages; in youth.... i believe in their strength and hence i believe in the future of our country..- ***Narendra modi***

Vishwakarma yojana is one of the great initiatives towards rurbanisation by government of Gujarat, which was allotted as a real-time situation type project provides to GTU.. The student uses their engineering skills to prepare detailed project report for the infrastructure as a part of their final year project. Rurbanisation is to bring peace of mind to the villagers by providing them the basic amenities required and still keeping the village soul intact. With the help of this yojana we can bring awareness about the thing which is not available at rural areas. Now a day people are moving from rural to urban area due to lack of basic amenities. So, this help to provide better solution for the available problems in rural area like drinking water, drainage facilities, road network.

The given village is NANI BHATLAV village. NANI BHATLAV village is located at 52 km from Surat and 11 km from Bardoli. Bardoli is nearest town of NANI BHATLAV village. The local language is Gujarat. The KHARI river pass near the between the NANI BHATLAV and kanbha village. Total population of the village is 1067 as per census 2011. Main occupation of the NANI BHATLAV village is farming. while other occupation is dairy and labour work. Village has gram panchayat building and bus stand. The village elevated reservoir and sump for water storage. There is 24*7 electricity supply for residential use and 8 hours for agricultural use.

There are many facilities which lack in NANI BHATLAV village like health centers, proper roads, disposal of drainage water, solid waste management plant, and recreational centers. There are no facilities for the public toilet.

The intersaction and techno-economic survey of NANI BHATLAV village that we have done in terms of basic services, public facilities, other infrastructural facilities for the need of the people and to prepare a report on the predictable socio-economic growth of area with the discussion of TDO, DDO, and sarpanch will helpful in providing better facilities and services in village

Hereby, we are proposing designs for Plastic block, Skill Development center, Health center Grocery Shop, Garden, Primary School

Key Words: - Primary Health Centre, Community Hall, Post office, Developed village, Urbanization, physical infrastructure

ACKNOWLEDGEMENT

We are extremely obliged and thankful to **Gujarat Technological University**, Ahmedabad for providing us a golden opportunity to work under Vishwakarma Yojana to get real work experience and applying our technical knowledge in the development of Villages.

We express our great 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 Surat** 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.)PYUSH JAIN 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, **ASSIST. PROF. MR. SANDIP MISTRY, ASSIST. PROF. MR. ASHISH A. PATEL from college S.N.P.I.T. & R.C.,UMRAKH** 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 during the work. We express our sincere thanks to, **Dr. Jayesh Deshkar, Hon'ble Director of Vishwakarma Yojana project and Principal, V.V.P Engineering College and Core Committee member of Vishwakarma Yojana project Prof(Dr.)Jigar Sevalia**, Professor, SCET, Surat, **Prof.K.L.Timani,** Associate Professor,VGEC, **Prof.Rena Shukla**, Associate Professor, LD Engineering College, **Prof.Y.B.Bhavsar,** Associate Professor,VGEC, **Prof.Jagruti Shah**, Assistant Professor, BVM Engineering College for providing us technical knowledge of this project work.

We are also thankful to **Ms. Darshana Chauhan, Vishwakarmrma Yojana**, for all support during our work and guiding us to give our best of the best possible in our work. We therefore, take this opportunity for this Project work expressing our deep gratitude and sincere thankfulness for her cooperation and support to produce this project work in the present form.Above all we would like to thank the almighty god and our Parents, family members and Friends for their encouragement and soothing support rendered in completion of the present work and making us that efficient to present our work in front of you all.

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ABBREVIATIONS

SHORT NAME / SYMBOL	FULL NAME
PURA	Provision of Urban Amenities in Rural
PHC	Public health center
TDO	Taluka Developer Officer
DDO	District Developer Officer
NGO	Non-government Organization
PPP	Public Privet Partnership
DRDA	District Rural Development Agency
MNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
NRUM	National Rurban Mission
RCC	Reinforced Cement Concrete
G.L	Ground Level
P.L	Plinth Level
CM	Cement Mortar
PHC	Primary Health Centre
ATM	Automated Teller Machine
AGRSARI	Academy of Grass Road Studies and Research of India
CCTV	Closed Circuit Television
TRC	Tax Residency Certificate
PUC	Pollution Under Control
RO	Reverse Osmosis
LED	Light Emitting Diode
WBM	Water Bound Macadam
RCC	Reinforced Cement Concrete
IIT	Indian Institute of Technology
SWOT	Strength, Weakness, Opportunities, Threats
NSSO	National Sample Survey Organization
SC	Scheduled Caste
ST	Scheduled Tribe
UDPFI	Urban Development Plans, Formations and Implementations

CHAPTER 1

IDEAL VILLAGE -RAYAM (civil concept)

Introduction:

1.1 Background:

Rayam is a Village in Bardoli Taluka in Surat District of Gujarat State, India. It is located 38 KM towards East fromDistrict headquarters Surat. 2 KM from. 275 KM from State capital Gandhinagar
Rayam Pin code is 394355 and postal head office is Varad. Sankri (1 KM), Khoj (2 KM), Ruwa (2 KM), Rajpura Lumbha (2 KM), Varad (2 KM) are the nearby Villages to Rayam. Rayam is surrounded by Palsana Taluka towards west, Valod Taluka towards South, Kamrej Taluka towards west, Mandvi Taluka towards North. Vyara, Navsari, Surat, Songadh are the nearby Cities to Rayam.

Fig;1.1 (map of village- Rayam)

Study area location:

Locality : Rayam (રાયમ)
Taluka : Bardoli
District : Surat
State : Gujarat
Language **:** Gujarati and Sindhi, Hindi, Marvadi,english, Marathi,
Time zone: IST (UTC+5:30)
Telephone Code / Std Code: 02622

1.2 Concept: Ideal village, Normal Village:

1.2.1 Objectives of smart village:

- Create a healthy and environmentally sustainable community.
- Encourage the provision of local business services within the village.
- Encourage slow and sustainable development that maintains the village‘s rural and historic character and identity.
- Improve pedestrian and traffic safety within the village.
- Cooperate on planning and future development in consideration of the village as a whole.
- Increase economic development.
- Improve connectivity for all modes of transportation.
- Create a central hub for the community that includes community facilities and services.

1.2.2 EXAMPLE /LIVE CASE STUDY OF IDEAL VILLAGE OF INDIA / GUJARAT:

Based on Census 2011 information the location code is 510668. Rayam village is located in Surat district in Gujarat, India. It is situated 22km away from Bardoli.

Table 1. Rayam village detail

Gram panchayat	Rayam
District	Surat
State	Gujarat
Pin code	394955
Population	1619(census 2011)
Household	354
Nearest town	Bardoli

1.2.3 The Idea of Model/Smart Village:

What is smart village?

In smart village access sustainable energy services acts as a catalyst for development enabling the provision of good education and health care, access to clean water, sanitation and nutrition, the growth of productive enterprise to boost income and enhanced security Fig:1.2 Key elements of modelvillage

Local Business:

- Farming
- Agriculture labour work
- Shops

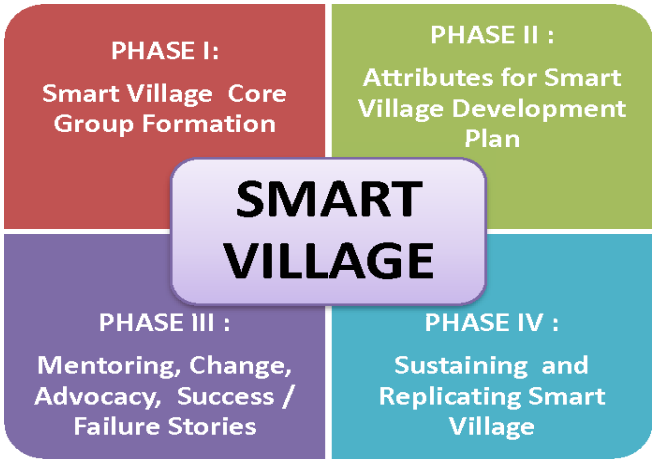
Education:

- Aanganwadi
- Primary School
- Secondary School

Higher Secondary School

Health and Welfare:

- Government Hospital
- Private Hospital



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

Villages in Ancient India:

There is sufficient evidence to suggest that the village was one of the important settlements in ancient India. The Rig Veda talks about the gram to which various families owed their allegiance. Valmiki ‘s Ramayana talks of two types of villages – the Ghosh and the gram.

The Ghosh was smaller than the gram and was also known as vraja, or brij (signifying a cattle farm). Both types of villages had their officials, called the mahattar. There is also a reference to a senior official called gramani or gramik. The Mahabharata talks of different types of settlements, for example, ghosh or brij (cattle farm), palli (small hutments), gram (villages around the forts or durgs), kharvata or pattan (towns), and pur, puri, nagar.

The villages were linked with one another, culturally, socially and administratively. The administrator of ten villages was called dashi; of 20 villages, vinshati; of 100 villages, shati, and of over 1,000 villages, sahasra gramadhipati. This is a clear indication of the interlink-ages between the villages. Kautilya's .Arthashastra suggests that river, hill, forests, ditches, tanks, bundsor trees demarcated village boundaries.

He prescribed that villages should be situated at distances of one or two krosha (in Rajasthan, it is spelt as koss, which is the equivalent of two miles or 3.219 km) from each other so that in timesof need, one village could go to the help of the other.

1.3 Detail study of Ideal village/ Smart village with photograph:

Physical & Demographical growth:

According to Census 2011 information the location code of Rayam village is 524290. Rayam village is located in Surat district in Gujarat, India. It is located 16km away from Bardoli, which is sub-district of Rayam village. The geographical area of village is 343.18 hectares. Rayam has a total population of 1619 peoples. There are about 354 houses in Rayam village.

Table 2 GENERAL INFORMATION OF RAYAM

Total population	1619
No. of Male voters	837
No. of Female voters	782

Economic profile: Table:3:economic profile

Farming	70%
Animal Husbandry	20%
Framing work	10%

Occupation details:

1. Agriculture
2. Animal Husbandry
3. Agriculture labour Workers.
4. Own small business.

Social Scenario: We have found that all villagers of this Rayam village are much connect with today technology, environment and working area and production of agricultural food.they have pretty much developed housing as 100% of the houses are pucca house and the connecting road as well internal road are of bitumen or of conceret blocks.

Fig 1.3 cricket ground

Fig:1.4high school

Fig:1.5water tank

fig1.6:primary school

Fig: 1.8PHC centre

fig:1.7 panchayat office

Fig 1.9: aaganvadi

Fig1.10: temple

Fig1.11:66kv power plant

fig;1.12Mahadev temple

fig: 1.13shankri mandir(BAPS)

fig:1.14 shankri mandir(BAPS)

fig:1.15 Open channel

Fig:1.16 comunnity hall

Key element of ideal village (Rayam):

1. Rayam has proper drainage systems.
2. R.C.C roads
3. Water distributions system
4. Street light
5. Sanitation facilities
6. RO Plant

Resources:

Village is mainly depending on agriculture activities. Sufficient water source is canal, tube well and rain water for cultivation of crop. Hospital, garden, pond also be there.

1.4 Swot analysis of ideal village / Smart village:

Strength	Weaknesses	Opportunities	Threats
Bank facilities with ATM's	No recreational area or public garden	Improving in waste management	Lack of awareness of villagers about cleaning
Good road network	No Community hall	Woman empowerment	Lack of funding
Good water supply system	No public latrines	Mall and Small-scale industries	No water sources other than canal
Primary health centre	No library	To make a wifi enabled village	

1.5 Future prospects of Development of the Ideal village / Smart Village :

- Converting the village with the Wi-Fi facility.
- Segregation of waste i.e. Plastic and other garbage is going to be planned for the effective waste management.
- A mechanism to use sewage water for plantation.
- Pond development and redesigning of public garden.

- Reduce the Illiteracy rate.
- Opening Skill Development Centers.
- Increase Source for high wages.
- To provide an infrastructure facility like, water harvesting system, Different types of renewable energy source, Water conservation system.
- In this village also maintains for the bus stand, public toilet should be provide and drainage facilities etc. in existing public facilities are need in this village.

1.6 Benefits of visits of Ideal village / Smart Village:

- We discussed the good and bad thing about village from village people.
- We saw all type of basic and primary amenities available.
- To know the strength and weakness of village.
- Know about a behaviour of different village people.
- Get a such surveyor experience in illiterate people.
- We see some different type of little requirements of village.

1.7 Electrical / Civil aspects required in Ideal village / Smart Village:

The scope of basic amenities include safe drinking **water**, sanitation, housing, all weather road to village, electrification, fuel, connectivity, healthcare centre, school, playground and recreational facilities and many more.

Smart villages capture many of the benefits of urban living while retaining valued aspects of rural life and ensuring balanced development at the national level. This enables villagers to attainhealthy and fulfilling lives, achieve their development potential, earn a viable living and be connected to the wider world, giving them a real choice between the traditional route of migrationto a city, or life in a smart village

Basic amenities are linked to qualitative and developed human living and the modern State has to ensure this out of public finance through dedicated institutional arrangement. But this process has not produced the desired result, especially for the deserving majority of the poor

CHAPTER 2

LITERATURE REVIEW – (CIVIL & ELECTRICAL CONCEPT)

2.1 Introduction: Urban & Rural village concept

Urban:

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

Rural:

All the areas which are not characterized as urban area is called rural area. In which the population is very low compared to urban areas. Mainly they depend on agricultural activities.
According to census 2011, there are 6, 40,867 villages in India. The area where more than 75% of male population is associated with agricultural activity is known as rural area.Rural areas are also known as the 'countryside' or a 'village' in India. It has a very low population density. In rural areas, agriculture is the chief source of livelihood along with fishing, cottage industries, pottery etc. According to the Planning Commission, a town with a maximum population of 15,000 is considered rural in nature. In these areas the panchayatmakes all the decisions

2.2 Importance of the rural development

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

- The objective of the national rurban mission is to stimulate local economic development, enhance basic services and create well planned rurban clusters.
- Bridging the rural-urban divide-via: economic technology and those related to facilities and services.
- Aims at finding ways to improve rural lives with participation of rural people themselves, so as to meet the required needs of rural communities.
- The process of improving the quality of life and economic well-being of people living in rural areas often relatively isolated and sparsely populated areas.
- Stimulating local economic development with emphasis on reduction of poverty and unemployment in rural areas.

2.3 Ancient village / different definitions of rural areas village

The Census Bureau defines rural as "any population, housing, or territory NOT in an urban area". Its definition of rural is closely tied to its urban definition. Rural areas have low population density and large amount of undeveloped land. Agricultural activities are more in rural areas. Rural areas are large and isolated areas of and open country with low population density.

Rural areas can be said as comprising open country and settlements with fewer than 2500 residents areas designated as rural can have population densities as high as 999 per square mile as 1 person per square mile.

United states development of agriculture (2002 form bill) defines rural areas as any area other than a city or town that has a population of greater than 50,000 inhabitants and the urbanized areas contiguous and adjacent to such town or a city.

National geographic society defines A rural area is an open swath of land that has few homes or other buildings and not very many people

2.4 Scenario: Rural / Urban village of India population Growth

Rural/urban India & Gujarat as per census 2011 Agenda of census of India is to release of provisional population totals-Rural urban distribution. Population of Rural and Urban area (in crore).

TABLE 4:Growth rate of population in %(AS PER CENSUS 2001 AND 2011)

	2001	2011	Difference
India	21.5	17.6	-3.9
Rural	18.1	12.2	-5.9
Urban	31.5	31.8	+0.3

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

TABLE 5: Growth rates in rural and urban areas in Gujarat(AS PER CENSUS 2001 AND 2011)

Details	Rural	Urban
Population	34,670,817	25,712,811
Decadal Population Growth	2,930,050	6,782,561
Percentage to Total Population	13.49%	10.96%

2.6 Rural Development Issues - Concerns – Measures

Rural development is the national necessity and it has following issues and concerns:

Poverty : India comprises of one-thirds of the poverty stricken individuals. Indian poverty is primarily rural. In rural communities, landless labourers and casual workers are the individuals, who are residing in the conditions of poverty. The conditions of poverty among rural communities are characterised by lack of financial resources, land, assets, property and other resources. Due to lack of these resources, the individuals experience problems in sustaining their livelihoods in an appropriate manner.

Illiteracy: Illiteracy is referred to the inability of the individuals to identify, interpret, understand, create, communicate, and compute, using printed and written materials, associated with the varying context. In 1930, the U.S. Bureau of Census defined the personas an illiterate, who is unable to read and write in any languageIlliteracy is a social issue that is prevalent among rural individuals, especially belonging to deprived, marginalized and socio-economically backward sections of the society.

Transportation Problems: In rural areas, mostly schools are located at a distance from home. When the students experience problems in transferring to schools, then they are unable to pursue academic goals. It has been researched upon that girls normally experience problems in transferring to schools and are depended upon their familymembers. In the case of transportation problems, parents are vested with the responsibilityof taking their children to school and bringing them back home

Child Labour :In India, there has been prevalence of child labour. The individuals, belonging to deprived, marginalized and socio-economically backward sections of the society are the ones, who mostly encourage their children to get engaged in various formsof labour practices, thus depriving them from acquisition of education

Unemployment :Unemployment is referred to as the state, when individuals are not engaged in any form of work or occupation or task, primarily to generate a source of income. When the individuals are jobless and idle, then they are stated to be unemployed.In rural communities, the problem of unemployment is severe among the individuals. When they are unemployed, they experience number of problems and challenges, which are regarded as major barriers within the course of attainment of better livelihoods opportunities

Homelessness: Homelessness in rural India is a relatively hidden and an unknownphenomenon. This phenomenon is comprehensive and is continuing to grow with the increase in the country's population. Homelessness is a condition, when the individuals do not have any form of shelter or housing accommodation. Homeless individuals are residing in temporary shelters, pavilions, on the roadside or within homes of friends or relatives. It is regarded as one of the major problems that individuals experience within the course of acquisition of better livelihoods opportunities.

Rural development and it's following measures:

- Development of infrastructure

There is a lack of infrastructure in rural area. Infrastructure development like electricity, irrigation, credit, marketing, transport facilities, etc., needs to be addressed. Infrastructure plays big role as the development can be widely measure by infrastructural development.

- Increase in employment within or around village.

The employment plays a vital role in the development as it can be backbone of getting out of poverty and having a concrete economy. Even though the employment in village seems hard , as even many suffer unemployment in urban areas as well but the villagers can have major chance , by the development of small scale or large scale industries nearby.

- Reduction of poverty

The reduction of poverty is important because rural areas have the maximum poverty. Around 30% of the population is below the poverty line; this figure reduced to 21.92% in 2012.
There is a serious need of taking steps for the alleviation of poverty.

- Development of health facilities.

Rural areas lack proper health facilities. Better health facilities are necessary for physical growth of individuals. The basic healthcare facility is very poor in Indian village due to somecorrupted government and overburden of work on healthcare supply employee.

- Development of productive resources

Productive resources of each locality need to be developed to enhance employment opportunities.It will help in diversification of production activities with a view of finding an alternative means other than crop cultivation to sustain life.

- Development of human resources.

There is a need to improve the quality of human resources in rural areas. It can be done by improving the literacy rate (especially female literacy), skill development, industrial training,

- Emphasizing development of skill development centre

Around 15,000 villages across the country have not yet established skill development centres under the Antyodaya Scheme, a report by the Rural Development Ministry revealed.so the basics says that by having a skilled individual, he/she can be employed.so development of skill development center should be emphasize

2.7 VARIOUS INFRASTRUCTURE GUIDELINES WITH THE NORMS FOR VILLAGES FOR THE PROVISIONS OF DIFFERENT INFRASTRUCTURE FACILITIES:

Educational Facilities: The education nuture the newbies and their upbrining gives our country the youth we want and youth we need.There are Primary schools, High schools and craft schools in an ideal village. Primary education is free and compulsory. Educational Facilities: There are Primary schools, High schools and craft schools in an ideal village. Primary education is free and compulsory.

Agriculture and Industry: People of an ideal village are good farmers and good artisans. They grow food crops, commercial crops and oil-seeds. They take up improved method of farming. They do all kinds of home industry including spinning and weaving.

Electricity: The government has electrified over 7,000 villages in 2015-16 which stands 37 per cent higher than the previous three years.But this may not necessarily mean that all houses in the villages have access to electricity. This is because it takes time to set up the infrastructure such as transformers and power lines needed to distribute the electricity to every house. According to a study, the delay in actual electrification ranged from two years (in the case of Jharkhand and Bihar, which saw a recent wave of electrification) to more than 25 years in Odisha and about 15 years in the case Madhya Pradesh and Uttar Pradesh.

Roads & connectivity: There is a positive relationship between connectivity and development in smaller towns and villages in India.With better roads and highways, there can be a better flow of business, trade and communication that will eventually enhance growth.
Mountainous areas and remote villages are cut off from the network of roads, which need to be connected. The government has allocated thousands of crores for building a strong transport network that can link different cities and small towns with regional hubs.
However, several projects across the country have seen slow progress over the years severely impacting the economic progress of the small towns.India has had a bad history of bridges collapsing in both rural and urban areas, endangering people's lives because of weak construction. In the Gujarat town of Junagadh, earlier this year, another bridge had collapsed due to poor

materials that were used in its construction. In many villages with rivers, bridges are very crucial for children and workers to travel to school or adults for their work site.These bridges cut out a long distance and time for it.

Sewerage and Drainage:The drainage system for any city/village is governed mainly by natural course and topography. The discharge is calculated that guides the requirements for provision of additional drain as well as up gradation of existing drains. The treatment of sewerage is essential to provide hygienic conditions. The sewerage is estimated at the rate of 80% of the water supply demand. The large & metro cities shall be provided with regular sewerage treatment facilities at zonal/city level. The newly developed areas shall have community level septic tanks based on economic & environmental considerations. .The squatter settlements may be provided with a facility of 1 toilet for 4 to 5 families based on the concept of low cost and low water consumption. Comment - In case of developing cities the Treatment plant shall be planned with possible future expansion including biogas plant, energy conservation &environment considerations.

Healthcare facilities: The number of hospitals and medical dispensaries need to be pumped up in rural India. The government hospitals in most parts of the country are not up to the mark and medicines not readily available. According to a study, rural public health facilities have a hard time ensuring a regular presence of medical professionals, trained doctors and pharmacists.In addition, there is a high level of absenteeism of those already employed

Waste management system: If Prime Minister Narendra Modi's Clean India Campaign has to succeed, then the small towns of India will need an efficient waste management system.This is a key infrastructure required to improve sanitation and prevent outbreak of diseases. At present, wastes from households are mostly disposed in city outskirts by municipalities. There is an urgent need to set up recycling facilities as a lot of times the waste often ends up in rivers polluting them. Also, drainage facilities are a major problem with most towns getting flooded during the monsoons.

Housing: The housing conditions in rural India have not improved much. According to Census 2011, as much as 20.7 percent of the total 206 million (or 20.6 crore) occupied rural houses are with thatched roofs. These houses are not safe for living, highly vulnerable to rainfall, wind blow, fire and many other accidents. Some of the government interventions, such as, Indira Awas Yojana (IAY), operation of corpus funds like Rural Infrastructure Development Fund (RIDF) by the National Bank for Agriculture and Rural Development (NABARD) and Rural Housing Fund by the National Housing Bank, aim at promoting rural housing in the country. However, a lot more needs to be done to provide better housing facilities to the rural population.

Water Supply: Among the 122 countries that are ranked in quality of portable water, India falls at 120, despite having 4 per cent of the world's water resources. There is inadequate piped water supply across rural India and the houses that receive water are mostly untreated. During years of bad monsoon, crops suffer because of the lack of irrigation facilities. By 2017, the government aims to bring piped water supply to at least 50 per cent of rural households.

Sanitation Facilities: Open defecation is a major issue in rural and semi-rural India despite the many governmental schemes and awareness programmes. According to an United Nations report in 2010, out of a total of 2.5 billion people worldwide that defecate openly, 665 million belong to India.And what is more alarming is the fact that some 88 per cent of diarrhea deaths worldwide are attributable to unsafe water, inadequate sanitation and poor hygiene. "Improving access to safe drinking water, adequate sanitation and promoting good hygiene are key components in preventing diarrhea," the report said

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

Introduction:

Rural electrification is the process of bringing electrical power to rural and remote areas. Rural communities are suffering from colossal market failures as the national grids fall short of their demand for electricity. As of 2017, over 1 billion people worldwide lack household electric power – 14% of the global population. Electrification typically begins in cities and towns and gradually extends to rural areas; however, this process often runs into obstacles in developing nations. Expanding the national grid is expensive and countries consistently lack the capital to grow their current infrastructure. Additionally, amortizing capital costs to reduce the unit cost of each hook-up is harder to do in lightly populated areas (yielding higher per capita share of the expense). If countries are able to overcome these obstacles and reach nationwide electrification, rural communities will be able to reap considerable amounts of economic and social development.

Education:

Access to electricity facilitates sustainable economic and social growth. First, through an increase in educational achievement. Students who were previously forced to study when the sun was shining are now able to study by the light of LEDs early in the morning or late into the night. In Kenya for example, interviews with school teachers revealed that access to light has allowed for extra hours of teaching earlier and later in the day to cover material not adequately reviewed during normal hours. Additionally, schools with access to electricity are able to recruit higher quality teachers and have seen improvements on test scores and graduation rates, raising the human capital entering the labor force in the future

Productivity and efficiency:

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. Farmers will have access to streamlined modern techniques such as irrigation, crop processing, and food preservation. In 2014, rural communities in India gained more than US$21 million from increased economic activity driven by recent additions of electricity

Job creation:

When expanding the electrical grid, there is a demand for thousands of jobs ranging from business development to construction. Projects to spread electricity create a wealth of job opportunities and help to alleviate poverty. For example, India set a target of 175GW of clean energy to be installed by 2022 to increase electrification throughout the country. An estimated 300,000 jobs will need to be created in order to reach these lofty goals.

Healthcare improvements:

The availability of electricity can drastically increase the quality of healthcare provided. Improved lighting increases the time patients can come and get treatment. Refrigerators can be used to conserve incredibly valuable vaccines and blood. Sterilization measures will be improved and the implementation of high-tech machines such as x-rays or ultrasound scanners can provide doctors and nurses the tools they need to perform. In Diara Rhashalpool, a cluster of villages on the river Ganges, 140 households are without power. The locals are forced to travel 2–3 hours across the river for treatment or access to vaccines. With access to electricity, treatment would be far more accessible to the local population.
Additional benefits:

- Reduce isolation and marginalization through telephone lines and Television.
- Improve safety with the implementation of street lighting, lit road signs.
- Reduce expenses on expensive fossil fuel lamps i.e., kerosene.

2.9 Other Projects / Schemes of Gujarat / Indian Government

1. **Training to Rural Youth for Self-Employment (TRYSEM)**
   This centrally sponsored programme was started on august 15, 1979.The main target of this scheme was to provide technical and business expertise to rural BPL people who are in the age group of 18-35.This programme has been merged with Swarn Jayanti Gram Swarojgar Yojna on April1, 1999.

2. **Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS):**
   National Rural Employment Guarantee Act 2005, was launched on the 2nd Feb.2006. Nowthe new name of this scheme is "Mahatma Gandhi National Rural Employment GuaranteeAct" (or, MGNREGA).This scheme is an Indian labour law and social security measure that aims to provide ‘right to work' to the people falling Below Poverty Line.It guarantees100 days employment in a year to the village people.Fifty percent workers should be women.Its 90% funding is borne by the central government and 10% by the state government.

3. Antyodaya Anna Yojna (AAY):

The scheme was launched by the Prime Minister Atal Bihari Bajpayi on the 25 December 2000.The scheme provides food grains to around 2 cr. Below Poverty Line (BPL) families at a very subsidized rate.Total 35 kgs of food grains is provided to a family. Rice is provided at the rate of Rs. 3/kg and wheat at 2 Rs.2/kg.

4. Pradhan Mantri Gram Sadak Yojna:

Initially it was 100% centrally funded scheme, launched on the December 25, 2000.After the recommendation of 14th finance commission report now expenditure will be shared by the centre and state at ratio of 60:40.The main aim of this scheme is to provide all weather road connectivity to the rural areas whose population is more than 500 persons and in terms of hilly areas it is 250 persons.This scheme is launched by the Ministry of Rural Development.

5. Kisan Suryoday Yojana

This scheme is a very beneficial scheme for the farmers of the state of Gujarat. Now the farmers of Gujarat will not have the problem of water for irrigation. Under Gujarat Kisan Suryoday Yojana, farmers of the state will be able to irrigate their fields by obtaining three phase electricity for irrigation during the day. Which will benefit them greatly. The Gujarat state government has allocated a budget of Rs 3,500 crore to set up infrastructure under the scheme by2023. If the farmers of the state want to take advantage of this scheme, then they should

6. Namo E-Tablet Yojana 2021

Through the implementation of the scheme, free tablets will be provided to the students of colleges. The tablets will be provided with a subsidized price of 1000 rupees because the Government wants to implement the new avenues of modern education in our country by providing good quality technical products to the students so that they can touch heights. This willprove to be a very helpful scheme for all of the students because of the availability of tablets in only rupees thousand.

7. Gujarat Vidhva Sahay Yojana 2021

Through the implementations of the Gujarat vidhva Pension Sahay Scheme, the financial funds will be provided to all of the widows of the Gujarat state. The importance of this scheme is that it will provide financial funds to all of the widows who want to provide for their family but they are not able to provide because of lack of education or because they belong to below the poverty line group. The incentive will be provided to all of the Widows so that they have a healthy lifestyle in the near future and they can also carry forward their child's education.

CHAPTER 3

3. SMART CITIES/ VILLAGE CONCEPT AS PER YOUR IDEA AND ITS VISIT

3.1 Introduction: Concepts, Definitions and Practices

- The 'smart village' is a model in which, energy access acts as a catalyst for a range of development outcomes. If managed correctly, technology 'leapfrogging' could lead to rapid improvements in healthcare, nutrition, education, and economic security. Villagers could thus have the opportunity to capture many of the benefits of urban life while retainingvalued aspects of rural life, and ensuring balanced development at a national level.
- In Smart Villages access to sustainable energy services acts as a catalyst for Development

– enabling the provision of good education and healthcare, access to clean water, sanitation and nutrition, the growth of productive enterprises to boost Incomes, and enhancedsecurity, gender equality and democratic engagement.

- REQUIREMENT OF SMART VILLAGE

1. Smart security.
2. Efficient public transportation system.
3. Improving sanitation conditions
4. Solid and liquid waste management.
5. Rain harvesting /Rain water drainage system.
6. Safe drinking water facilities.
7. Use of renewable energy

3.2 Vision-Goals, Standards and Performance Measurement Indicators:

Vision:

The vision of smart village is that modern energy access can act as catalyst for developmentin education , health , productive enterprise , clean water , sanitation , environmental sustainabilityand participatory democracy which helps to support further improvement in access to energy .

Standards:

- Smart security.
- Efficient public transportation system.
- Improving sanitation conditions
- Solid and liquid waste management.
- Rain harvesting /Rain water drainage system.
- Safe drinking water facilities

PMI(Performance Measurement Indicators):

Following are the measurement that indicates the performance of the smart village

- Economic factors in the local territory
- Social factors in local territory
- cultural activities
- industries
- Service basket

3.3. Technological Options:

•Smart teaching:

Smart education is now a typical feature in education emerging from information communications technologies and the constant introduction of new technologies into institutional learning. The smart classroom aims users to develop skills, adapt, and use technologies in a learning context that produces elevated learning outcomes which leads to big data. The internet of things is a new technology in which objects equipped with sensors, actuators, and processors communicate with each other to serve a meaningful purpose.

•Smart transportation:

Smart mobility refers to using modes of transportation alongside or even instead of owning a gas-powered vehicle. This can take on many different forms, including ride-sharing, car-sharing, public transportation, walking, biking, and more

•Smart societies:

The smart society is the sum of smart cities and much more.In the smart society, digital methods and technologies are taking advantage of all the available data, to creation new solutions to known and future challenges in relation to life, work of citizens in all the parts of a country.

•Smart public services:

A smart city contains is a municipality that uses information and communication technologies to increase operational efficiency, share information with the public and improve both the quality of government services and citizen welfare

• Smart health care

SmartCare is a fully integrated electronic health record system to provide continuity. of care and a clinical management information system at the facility and district level. It is a key component in 'one National M&E system'. smater

3.4 Road Map and Safe Guards:

Smart Maps are designed so that users can quickly and intuitively interact with them despite having virtually no training, ensuring that information reaches the widest possible audience. Smart Maps are built to update quickly and correctly as cities change and evolve.A smart city roadmap consists of four/three (the first is an initial check) major component.

- Study the Community: Before deciding to build a smart city, first we need to know why.This can be done by defining the benefits of such an initiative. Study the community to know the Citizens, the business's needs – know the citizens and the community's unique qualities, such as the age of the citizens, their education, hobbies, and attractions of the
- Develop a Smart City Policy: Develop a policy to drive the initiatives, where roles, responsibilities, objective, and goals, can be defined. Create plans and strategies on how the goals will be achieved.
- Engage the Citizens: This can be done by engaging the citizens through the use of e government initiatives, open data, sport events, etc.

  Smart Maps are designed so that users can quickly and intuitively interact with them despite having virtually no training, ensuring that information reaches the widest possibleaudience. Smart Maps are built to update quickly and correctly as cities change and evolve.

3.5 Issues & Challenges:

Issues faced by cities:
Budget limitation:

There is a huge issue of budget constraints, which essentially has limited innovative thinking and created obstacles for many other initiatives.The budget constraints have created many hindrances for a lot of smart initiatives that if properly nurtured could be more cost- effective and efficient

Smart Technology:

It is considered that smart technology for these smart villages is still in the precommercial or in some cases the conceptual stage. And since the technology is in the pre-mature or conceptual stage, it generates uncertainties regarding return on investment as far as financial parameters are

concerned. This also results in apprehension of a long payback period, and investors are unwilling to invest, which contributes to financial uncertainties for smart technology initiatives

Lack of Knowledge:

The other challenges related to smart village initiatives in India is the lack of knowledge of the people using modern technology. The citizens' experience of these smart technology initiatives has largely not been good for several reasons, one of which is due to the paucity of knowledge ofthe common people as to how to use modern digital technologies, Internet and other modern technology, and also the fact that there are very few people, especially in rural areas of India, as with other parts of the developing world, who know how to efficiently use and apply modern digital technologies, such as "smart meters" (Bracknell Forest Homes).

Issues such as data privacy and security and political interferences also do not help to overcome the issue.

Challenges faced by cities

- Ensuring that all members of the community benefit from technological improvements
- Providing first and last-mile service for transit users
- Combining and streamlining payment systems, including for those without smartphones
- Integrating the sharing economy into a suite of mobility options
- Enhancing trip planning services to help users make efficient choices
- Determining the current state of travel conditions
- Facilitating the movement of goods into and within a city
- Coordinating data collection and analysis across systems
- Reducing inefficiency in parking systems and payment
- Limiting the impacts of climate change and reducing carbon emissions
- Improving traffic signal operations
- Increasing avenues to partners & adapting to new business models

3.6 Smart infrastructure- Intelligent Traffic Management:

One of the key components in smart cities of the future is the use of Advanced Traffic Management Systems (ATMS) and Advanced Traveler Information Systems (ATIS) for efficient management and control of traffic flows. The purpose of the ATMS/ATIS is to improve the overall traffic system performance, e.g. reducing emissions, noise and travel times

The **Advanced Traffic Management System** (ATMS) field is a primary subfield within the Intelligent Transportation System (ITS) domain. The ATMS view is a top-down management perspective that integrates technology primarily to improve the flow of vehicle traffic and improve safety. Real-time traffic data from cameras, speed sensors, etc. flows into a Transportation Management Center (TMC) where it is integrated and processed (e.g. for incident detection), and may result in actions taken (e.g. traffic routing) with the goal of improving traffic flow. The National ITS Architecture defines the following primary goals and metrics for ITS:

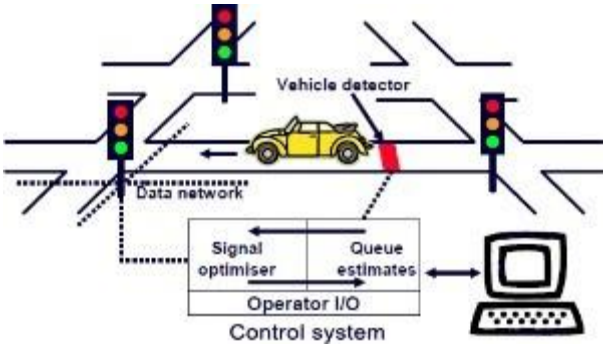
Its functional areas:

- Real-time traffic monitoring
- Dynamic message sign monitoring and co
- Incident monitoring
- Traffic camera monitoring and control
- Active Traffic Management (ATM)
- Chain control
- Ramp meter monitoring and control
- Arterial management
- Traffic signal monitoring and control
- Automated warning systems
- Road Weather Information System (RWIS
- Highway advisory radio
- Urban Traffic Management and Control

fig- 3.1 ATMS

The Urban Traffic Management Control or UTMC programme is the main initiative in the UK for the development of a more open approach to intelligent transportation system . Originating as a Government research programme, the initiative is now managed by a community forum, the UTMC Development Group, which represents both local transport authorities and the systems industry.

fig- 3.2 traffic control



UTMC systems are designed to allow the different applications used within modern traffic management systems to communicate and shareinformation with each other. This allows previously disparate data from multiple sources such as Automatic Number Plate Recognition cameras, variable message sign (VMS), car parks, traffic signals, air quality monitoring stations and meteorological data, to be amalgamated into a central console or database. The idea behind UTMC is to maximise road network potential to create a more robust and intelligent system that can be used to meet current and future management requirements.

3.7 Cyber security :

A successful cybersecurity approach has multiple layers of protection spread across the computers,networks, programs, or data that one intends to keepsafe. In an organization, the people, processes, and technology must all complement one another to create an effective defense from cyber-attacks. A unified threat management system can

automate integrations across select Cisco Security products and accelerate key security operations functions: detection, investigation, and remediation.

As several critical services become interconnected, the need for cyber security surges to protect data exchanges, privacy as well as the health and safety of citizens. However, there is currently no harmonized guideline or standard to model these data exchanges. This leads IPT operators, municipalities, policy makers as well as manufacturers, solution providers and vendors to adopt specific solutions with low scalability and disparate requirements.

CHALLENGES OF CYBER SECURITY

Cyber Security is becoming a severe issue for individuals, enterprises, and governments alike. In a world where everything is on the internet, from cute kitten videos and our travel diaries to our credit card information, ensuring that our data remains safe is one of the biggest challenges of Cyber Security**.**

Lack of uniformity in devices used for internet access:

With varying income groups in India, not everyone can afford expensive phones. In the US, Apple has over 44% market share. However, in India the iPhones with their higher security norms are used by less than 1% of mobile users.

Lack of national level architecture for Cybersecurity –

Critical infrastructure is owned by private sector, and the armed forces have their own firefighting agencies. However there is no national security architecture that unifies the efforts of all these agencies to be able to assess the nature of any threat and tackle them effectively.

Lack of awareness –

As there is no National regulatory policy in place for cybersecurity there is a lack of awareness at both company level as well as individual level. Domestic netizens can protect and be protected from the cyber attacks only if there is a guided and supervised legal framework

Ransomware – All of the above could be used to hold a city to ransom. Hackers, or hacktivists, use these to compromise a process or release confidential data unless certain demands are met. Paying a ransom would set a dangerous precedent.

SMART CITY SECURITY SOLUTIONS:

- While it may seem like there are an endless amount of problems withsmart cities there are solutions out there and ways to improve on them. Onesuch solution is the hardening of any systems network is virtually importantto be it being successful. It doesn't matter ifwe are talking about softwareor hardware hardening any form of it is vital to keeping a smart city secure.
- One of the best things to do with solving smart city security issues is to doconstant penetration testing. Constant penetration testing is vital to keep anysmart city up and operational. Smart cities are always evolving and beingupdated in some form. So it is essential to make sure that you are constantlytesting the network for new holes and ways

to access it should be a first lineof defense in preventing threats and attacks. Penetrationtesting is only one partof improve security measure.

- Another issue to be considered is securing the ports. Some cities offer free Wi-Fi, which results in a large amount of traffic traveling going in and outof ports on a network every day. As a result of this port security can be a vitalpart as well in hardening and protectingyour network. With port security, it isnecessary to go through and find out which ones arebeing used for basictraffic and others are being left open but are of no use. Investing in a portscanner that can scan ports and packets on a network is an excellent way tosolve the issue of ports and securing your smart city.
- Furthermore, one of the most important steps in protecting a smart city byways of improving security is hardware and software firewalls. Determiningthe type of traffic thatis being allowed to pass through the firewall is one ofthe most important ways to defend the network from potential attack that can take place. A firewall is key to any network butin terms of a smart cityand the security, a firewall is vital to the daily functions
- Another solution that we have come up with is a variation of public Wi-Fi usage policy. Currently some cities are freely offering Wi-Fi to the mass public. Routers ae being placed on corners of the streets and the Wi-Fi is being used by the public. While this is a great idea, we believe this could solve multiple problems in one shot. By offering a smallpaid Wi-Fi service, we could reduce the overall traffic on the network by a large amount

3.8 Retrofitting- Redevelopment- Greenfield Development District Cooling:

Retrofitting fig:3.3 retrofitting

An area consisting of more than 500 acres will be identified by the city in consultation with citizens. Redevelopment will affect a replacement of the existing built-up environment and enable co-creation of a new layout with enhanced infrastructure using mixed land use and increased density.

Air condition from Hammond services, In the Southeast, air conditioners are almost crucial pieces of equipment for home comfort. However, it can be difficult to find the right air

conditioner for your home, one that will provide enough cool air in the summer to cool your home without driving your energy costs through the roof. We can help! At Hammond Services, we can help you choose the perfect air conditioner for your home, install it professionally, and even maintain/repair it in the years ahead.

Greenfield development is a term often used for land that has not been used before for any human activity like agriculture or real estate development. Greenfield Land is generally land where there is no development of any kind

When it comes down to selecting a new air conditioner for your home, there are a few things you should consider. First of all is efficiency. By choosing an

energy efficient model, you can be sure your money is being well spent and is not being thrown away with inefficiencies. Get the most bang for your buck with an air conditioner that wo not cost a fortune to run. Reliability You Can Count on as a Carrier Factory Authorized Dealer, our commitment to quality products you can count on is clear. We are confident when we say that with the proper maintenance, you can count on our air conditioners to operate efficiently for years to come. If you are having trouble choosing an air conditioner for your home, contact us today – we can help you weigh your options!

District Cooling:

District cooling system (DCS) distributes thermal energy in the form of chilled water from a central source to multiple buildings through a network of underground pipes for use in space cooling. The cooling or heat rejection is usually provided from a central cooling plant, thus eliminating the need for separate systems in individual buildings.District cooling system is known as District heating system when used for heating in colder countries. District cooling or heating systems are widely used across the globe.

DCS consists of three primary components

1. The central cooling plant.
2. The chilled distribution network.
3. The consumer system or energy transfer station.

The central plant generates chilled water with compressor drive chillers or absorption chillers. Large size centrifugal chillers with higher efficiency are usually installed to take advantage of the economies of scale. Apart from energy efficient chillers, the central plant consists of chilled water pumps, cooling towers with condenser water pumps, thermal energy storage tank, electrical power distribution system and control system for centralized automation and control ofequipment.

Fig:3.4 overview

The distribution network consists of pre-insulated chilled water supply and return pipes. These pipes are either buried or in underground trenches.The consumer system or energy transfer system (ETS) consists of heat exchangers, tertiary circulation pump, chilled water piping in buildings, AHUs and the air distribution system. The heat exchangers exchange thermal energy between DCS chilled water and building chilled water.GIFT City has been developed on 886 acres of land with a total built up area of 62 million square feet, and includes commercial buildings, residential buildings, social buildings such as hotel, club and malls, and a hospital. The overall area is divided into three zones based on functionality.

The estimated air conditioning load requirement for these developments will be about 270,000 TR, which requires electrical power demand of 240 MW for the air conditioning load only, considering each building with its own plant.A feasibility study was carried out between various available systems, and District cooling system (DCS) was finalized considering the following salient advantages:

High efficiency system – lower energy consumption,

High diversity,

Better reliability,

Lower space requirement at buildinglevel,

Reduced noise and vibration at buildinglevel,

Lower operating and maintenance cost for the centralized facility,

Lower electrical demand for individual building.

fig:3.5 plan of GIFT

Each plant has been designed with chilled water based stratified thermal energy storage tank, which can be charged during off-peak period and discharged during peak period, thu and also reducing the electrical demand to 135 MW only. Thus, electrical demand reduction from 240 MW to 135 MW has been achieved with the help of District cooling system. In line with electrical power requirement, makeup water would also reduce.

Based on the above study, GIFT City is proposed to be served with three DCS plants of equal capacity (60,000 TR each). Each plant is proposed to be interconnected through chilled water piping laid in the utility tunnel for improving redundancy. Figure 4 shows the master plan of GIFT City with DCS plant location.

The chilled water generated at DCS plant will be circulated to each building through chilled water pipes. These pipes are laid in the specially constructed underground utility tunnel. This tunnel houses all city level utilities. It provides huge benefits for installation, operation and maintenance of all systems. Figure 5 shows a view of the utility tunnel.

3.8.1 Financing Smart Cities Development:

- User charges
- Government and pvt.organisation support
- Parking fees

- Small busssiness
- Advertisement tax, Entertainment tax, Profession tax, Telecom, gas, power and water.

3.9 Strategic options for fast development:

The fast development is only possible in terms of infrastructure or socio-culture, is by boosting the economical aspect of the city. The generalize form of growth of society can be obtained by follow:

- Virtual plan or ideology:

The main aim of creating a full filling smart village should be clear and a virtual, realistic plan should be created that give general idea and route of the final goal

- Experimentation:

More we experiment, more we learn. The knowledge can be full filled and given full justice by taking more chances and getting what is best for the development

- Start small:

The budget constrain remains the same problem in every aspect of the development, so the generalized idea should be implemented on low scale. So the budget constrain makes no issue

- Privatization:

The privatization is a key to remove unemployment from rural or urban areas. Privatization give employment and directly effect the per capita income and increase growth of the development. Privatization also increases the work efficiency and quality of work to be done

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

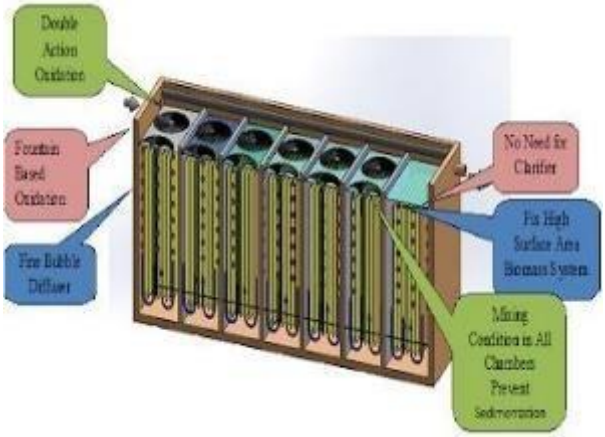
Swachh Bharat Abhiyan was launched by Honorable Prime Minister of India on 2nd October 2015, which caught attention of everybody not only in India, but also in the world. The government has taken various steps to create awareness among the masses for keeping the area surrounding them neat and clean. Government is also paying special attention for cleaning of rivers, railway stations, tourist destinations and other public places.

To achieve the target of cleanliness, the technologies to treat the waste material should also be developed along with creating awareness. There are many technologies that are used to treat waste material. They are usually very costly, very complex to be understood and viable only for large size units. At the same time, indigenous technologies are low cost capital and easy to use and they can also be used by different size units.

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

Indigenous water purification technologies: fig:3.6 water purification

These technologies can improve the drinking water quality of smaller villages as well as larger cities. It uses the Pressure Driven Membrane Processes. These are suitable for all capacity unitse.g. they are adaptable from household level unit or community level unit to large scale unit. Water purification technologies make use of the nuclear energy and solar energy also.



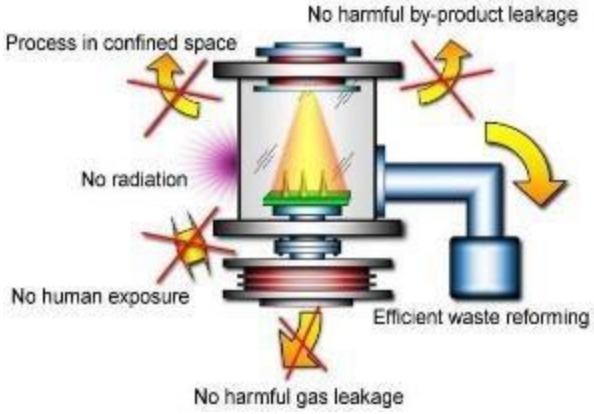
Environment friendly Plasma technologies:

Solid waste dumping sites or landfill sites need more amount of land which is not available in urban areas. Incineration of solid waste pollutes the environment if the incinerators are not designed or operated properly. Thermal Plasma Technology is ideally suited for waste treatment. By plasma technology Hazardous & toxic compounds are broken down to elemental constituents at high temperatures; Inorganic materials are converted to Vitrified Mass; and Organic materials are Pyrolysed or Gasified, converted to flue gases (H2 & CO) & Lower hydrocarbon gases when operated at low temperature (500 – 600OC). Disposal of carcass is also being thought of using plasma pyrolysis.

Unique Multi Stage Biological Treatment Solution:

fig:3.7 MSTB

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



The BARC UF Membrane Technology for Domestic Water Purifiers:

Water filters manufactured by Isroli based on membrane based water Purification Technology has been developed by BARC. Benefits of BARC Polysulfone Membrane are high tech 0.02micron or 20nm, simple form factor, rugged

(life of more than 1 year) and low maintenance (about Rs. 500 per year). It is very easy to use and very low-cost solution for the water contamination.

Radiation Hygienization of Municipal Sewage Sludge:

The Sewage is the waste water generated from domestic premises and consists mainly of human waste. It typically contains 99.9% water and about 0.1% solid. The solid waste in sewage is typically organic in nature and is broken down in the sewage treatment plants resulting in sewage sludge as a byproduct. In Radiation Hygienization process dry sludge generated at STP„s is hygienized using radiation technology using standard Gamma facility at a Dose of 10 kGs. Such radiation plants are operating in India for sterilizing medical products.

3.11 Initiatives in village development by local self-government:

first, the reform of policies and regulations that now inhibit development initiatives by the people; and second, more efficient resource management and the building of institutional capacity. Resource Management and Institutional Development. As discussed in Section 5, India's urban institutions do not have the capacity to provide adequate services at present, let alone address the requirements of accelerated urban growth in the future. Proposals relate to three types of institutions coordinated programming. Improved personnel incentives will be needed to permit therecruitment and retention of qualified staff as will skills training programs. Resource constraints, however, preclude simply expanding local government under current practices in proportion to urban growth.

Financial Systems

Constraints on government budgets and the rigidities of the present system of intergovernmental transfers prevent an adequate response of traditional arrangements to the challenge of urbanization. A new and more decentralized system of public and private financial intermediaries will be required. The establishment of the NHB represents an important step: an apex institution that will stimulate the creation of a network of mortgage financing. The NCU also calls for the creation of Urban Infrastructure Development banks to permit local governments to borrow for infrastructure.

Non-Governmental Organizations

Given the size of the job and the difficulty governmental agencies have in dealing directly in some aspects of the development of urban areas (eg, stimulating informal sector enterprise and provision of shelter) there is a recognition of the need for new and expanded NGOs to assist in facilitating the urbanization process.

3.12 Smart initiatives by Surat Municipal Corporation:

Surat Smart City focuses on development of a particular area that creates sustainable economic development and high quality of life by smart interventions. It is envisaged that the area under consideration will transform into a well-planned urban space with sustainable and rationally incremental economic development and activity.Smart initiatives can be followed by:-

In Water management:

- Up-gradation of existing water supply system to 24 x 7 water supply in the proposed area.
- Smart Metering – for meter reading/ billing remotely

- Zero Liquid Discharge WTP – Recycling of backwash water received during treatment process in Water treatment plant.
- Rain water recharging – to uplift the existing ground water table in the area.
- "Water Conservation" through IEC Activities – For Awareness in Citizens.In

sewerage treatment:

- Up-gradation and augmentation of two existing Sewage treatment plants in the proposedarea.
- Recycling & treatment of secondary sewage water through Tertiary treatment plant forreuse by nearby industries for Industrial use.
- Remodelling and restructuring of existing 5.5 km creek passing through proposed area – Beautification of both sides of Creek by construction of footpath, cycling track, plantation etc.
- Rain water recharging by storm water pipes.

In renewable energy:

- Proposed increase in the existing capacity of Wind, Biogas and Solar energy resources as follows: Wind Energy – 2.1 MW , Biogas plant for organic waste ,Solar Energy – 1 MW
- LED Street lighting and Smart monitoring system in the proposed area- Automatic On-Off of Streetlights through auto sensors.

In Town Planning & Development

- Smart Parking (Mechanized)
- Skywalk (Travelator)
- Incubation/Start up centre
- Affordable Housing

3.13 Any Projects contributed working by Government / NGO / Other DigitalCountry concept:

Under the Pradhan Mantri Awas Yojana –

Gramin or Housing for All, the world's largest housing programming for the rural poor, India aims to build 30 million houses for the rural poor for 2022 – which means building five million houses every year in rural areas. Financial assistance is provided for construction of the houses. UNDP is committed to working closely with the government to help upscale ruralhousing for India's poor.In partnership with the Ministry of Rural Development, UNDP, through the Governance & Accelerated Livelihoods project, helps promote affordable

housing for the rural poor. Proposed more than 100 housing designs, approved by the state governments and vetted by a central agency.

This yojna have given a good shelter to the needy and some basic changes in the structural design can immensely improve the quality standard of the people seeking help. Integration ofdrinking water, sanitation and domestic energy requirements into the housing typologies is underway The main features and benefits of PMAY Gramin are:

- It promotes housing facilities in all rural areas in India except Delhi and Chandigarh.
- The main objective of this scheme is to assist the applicants in constructing a pucca house.
- This scheme aims to construct 4 crore houses for the rural poor by 2022.
- The budget for this scheme is ₹ 81,975 crore

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

In city there are different opportunities to employ smart technologies whereas these are limited in villages. However, one can employ such technologies to improve several aspects of rural life. Some examples are,

Schooling – smart class rooms can improve the quality of education by providing accessto a large amount of educational resources.

Health care – improving information available on the availability, location and cost ofvarious types of health care.

Agriculture – provide information to farmers on the types of crop that can fetch themreturns, by ensuring that there is no glut of one product and shortage of another.

The above are some examples. There are also services that can be provided at village level, like Wi-Fi hot spots should be made available to citizens on a chargeable basis. With broadband connectivity made available, the entire village will have more accountable citizens, accountable governance, accountable business and service delivery mechanisms—thus making it smart.

We need to start with mapping of public institutions and offices, local businesses and organizations. We need to connect schools, colleges, sub-health centres, hospitals, Anganwadis, panchayats, markets, micro-enterprises, NGOs, self-help groups, libraries and other public spaces to the panchayat level intranet-cum-database.

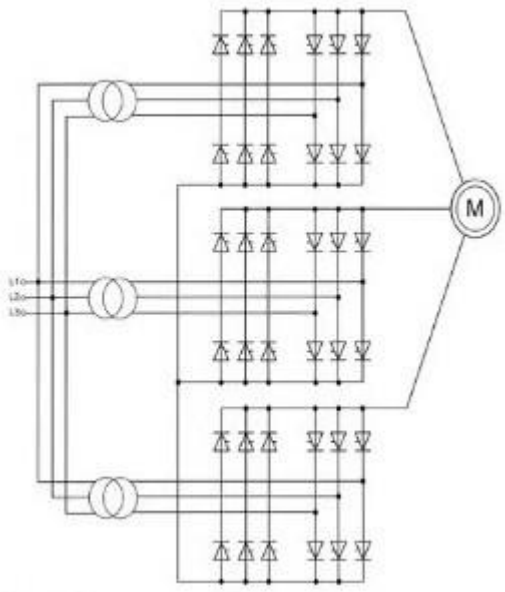
3.15 Electrical concept (Design Ideal and Prototype model):

Idea Reality offer an effective combination of electronic design and industrial/product design ensuring that your product is designed in harmony with both constraints. Too often these disciplines are separated and lead to inferior products. Furthermore, we believe that the our electronic product design experience and network of electronics suppliers & mass production factories means that your project will reach production faster and to a higher standard.

3.15.1 Diagram Of cyclocteronver

What is Cycloconverter

A cyclocteronver (also known as a cycloinverter or CCV) converts a constant voltage, constant frequency AC waveform to another AC waveform of a different frequency. A cycloconverter achieves this through synthesizing the output waveform from segments of the AC supply (without an intermediate DC link).



The main forms of electrical energy commonly available are constant DC (Direct Current) and constant AC (Alternating Current). Often though, we need to swap between AC and DC, change the frequency, or swap from constant to variable power. For these conversion purposes, several converters like inverters, rectifiers,dc choppers and cycloconverters are employed. The cycloconverters can in fact transfer AC power of a fixed frequency to the AC power of a different frequency

The cycloconverter converts AC to AC whilst changing only the frequency. Hence it is also known as a frequency changer. Normally, the output frequency is less than the input frequency. There are no DC stages in between this conversion process. The implementation of the control circuit is complicated due to a large number of SCRs . Microcontroller or DSP or microprocessor is used in control circuits.

Types of Cycloconverters

There are two main types of cycloconverters:

1. Blocking mode Cycloconverters
2. Circulating current Cycloconverters

CHAPTER 4: About Nani-Bhatlav village

4.1 Introduction

4.1.1 Introduction about Nani-Bhatlav village:

GTU allocated one village to us of Gujarat for surveying which is the Nani Bhatlav in Surat district. This is our study area to find problem related to structure and general amenities. Nani Bhatlav village is located at 49 km from Surat and 16 km from Bardoli. Surat is nearest town of Nani Bhatlav village. The local language is Guajarati. The Vedavathi river pass near the between the Nani Bhatlav and Utara village. Total population of the village is 1067 as per census 2011. Main occupation of the Nani Bhatlav is farming. 80% people of Nani Bhatlav depend on farming while 10% people are doing dairy and milk production and remaining 10% people are in labor work. Literacy rate of Nani Bhatlav is 66.7%.

Basic infrastructure like primary school, aganwadi, panchyat office, sub center, drinking water supply network, etc. are available.

4.1.2 Justification/need of study:

- The Vishwakarma yojna have the main aim is to get the main on-site problem faced by the villages and thereby from the view of a civil engineer.The hurdels faced by the villagers that are solved by the civil engineers by their prospective
- The students allocated as engineers and the Faculty Members as a guide meet all the stakeholders of the villages to conduct survey on the existing features. After that, engineers re-think upon the present facilities and according to that they give the new designs for the needs.
- Though various government sectors are involved in different infrastructural works, a holistic view and modern remedies can be provided by new engineers under Vishwakarma Yojana. The scrutinizing of villages is done by the students with this view.
- It is an program that leads the villages towards Rurbanization, held by the Government of Gujarat handed over to the prime developers of GTU that are students.

4.1.3 Study area:

GTU allocated one village to us of Gujarat for surveying which is the NANI BHATLAV near Surat district. Nani Bhatlav is a Village in Bardoli Taluka in Surat District of Gujarat State, India. It is located 47 KM towards East from District headquarters Surat. 7 KM from. 276 KM from State capital Gandhinagar. Nani Bhatlav Pin code is 394340 and postal head office is Madhi. Junvani, Bhensudla, Surali, Madhi, Vadhvaniya are the nearby Villages to Nani Bhatlav.Nani Bhatlav is surrounded by Valod Taluka towards South, Mandvi Taluka towards North, Vyara Taluka towards South, Mahuva Taluka towards South. Vyara, Songadh, Navsari, Surat are the nearby Cities to Nani Bhatlav.

4.1.4 Objective of the study:

- The study will focus the development trend, intensity of growth of the village, and find out the problems related to the Socio- Cultural or physical development of the area, social infrastructure services, and the administrative systems of the village.
- These include agricultural growth, putting up of economic and social infrastructure, fair wages as also housing and house sites for the landless, village planning, public health, education and function literacy, communication.
- The other objective is to give the village the taste of urban area in its own way, that suits the way of living of the villagers and giving them best possible way from the view of an civil engineer.

4.1.5 Scope of study:

Infrastructure:

- To provide connectivity, civil and social infrastructure with provision of alternativeEconomy generation is the key pillars that the concept.

Basic Physical Infrastructure:

Physical infrastructure refers to the basic infrastructure that a human society needs. That shows the basic development of the area and country itself . Basic infrastructure includes basic amenities like water supply ,good roads, drainage facility and housing.

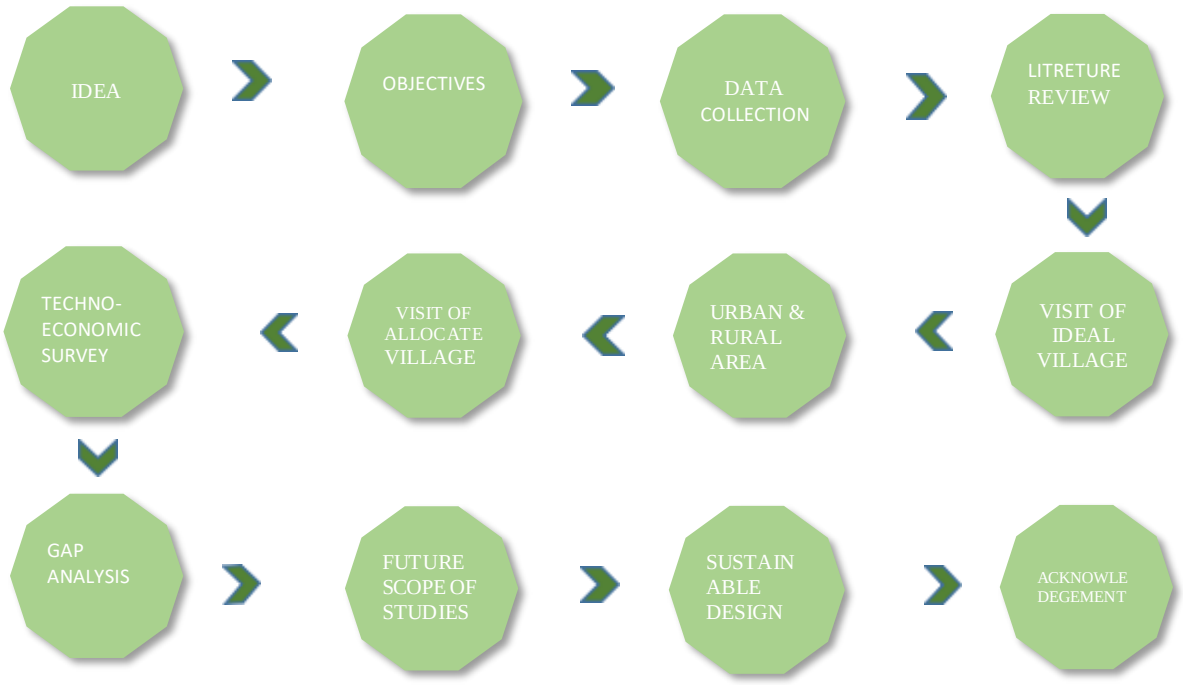
- To provide Water Supply, Transport, Sewerage and Solid Waste Management should be the priority on it. To provide internal roads within village
- Efficient Transportation systems to improve connectivity between urban and rural areas, Public transportation facilities that need to be developed like bus stops, transport depot etc.

Basic Social Infrastructure:

Social infrastructure with its positive externalities has a significant role in the economic development of a country. It is empirically proven and widely recognized that education and health impact the growth of an economy

- To provide Health care and Educational facilities and ensure proper delivery of facilitiesto village houses.
- Promote development of rural areas with provision of quality housing, better connectivity, employment opportunities and supporting physical and social infrastructure.
- To reduce migration from rural to urban areas due to lack of basic services.

4.1.6 Methodology Frame Work for development of your village



4.1.7 Available Methodology for development of related to Civil/Electrical

Methodology adopted for village planning will have to be different from urban planning:

- Holding Exploratory meeting with Panchayat for briefing about the project, defining aim and objectives, scope, value addition to village, planning & development, process methodology tobe followed for implementation and consent for going ahead with the project.
- Calling meeting of Gram Sabha involving all residents for explaining the project, understanding their vision, its benefits, role of residents, understanding the problems, identifying needs and priorities, promoting participatory mechanism, sourcing suggestions and obtaining approval of the residents
- Carrying out a socio-economic and demographic survey asking for priorities of development/infrastructure/ skill up-gradation, improving opportunities for employment.
- Creating a physical map of the village defining; location/conditions of houses community buildings, public buildings sewerage, roads, storm/waste water drainage, network street lights(if any) etc

- Preparing inventory of problems, deficiency in infrastructure, amenities, additional facilities needed etc existing employment opportunities

- Making projections/forecast for next 10 years for population, need for housing, employment, skill up-gradation and other infrastructure, services etc Preparing Draft Master/Development Plan of Village based on studies made, analysis carried out, vision and priorities defined, problems identified, understanding needs/ requirements of village, projections made for development / amenities / services/employment and rough estimates / cost of development

- Sharing the Draft Master/ Development Plan with Panchayat for approval in principle for placing before the Gram Sabha.

- The significance of strategic planning in any business organization cannot be exaggerated. Majority of top performing companies have identified the role of strategic planning for long term growth and continued existence of their business organization. Most of the managers have observed that through defining the mission of their organization, they are better able to give it direction and focus its activities.

- Planning is major process for organization's success because without proper planning, there may be confusion and unethical practices can occur. Currently, researchers are more interested to study strategic management. stated that there is a positive correlation between strategic management and organizational performance in some Nigeria banks in his study.

- This special issue aims at providing recent developments about the decision making in the field of civil engineering. This field is vast and plays an important role in the life of modern society. A very large number of decisions must be made in the life cycle of constructed objects. The decisions will be required in the time span starting from conceptualisation of these objects and covering design, construction, occupation, and decommissioning. Methods of DM can facilitate making these decisions in formal and not fully formal, partially intuitive way. The present special issue provides numerous examples on how can this be done.

- Construction methodology refers to the planned method of construction, taking into account all contractual and legal requirements, construction constraints, risks, and opportunities. Methodology includes the temporary and permanent works and the services required to complete the construction works.

- Medium buildings are light to medium weight commercial or industrial buildings up to three levels above ground which utilise commercial or industrial materials, construction techniques, and services.

4.2 Nani-Bhatlav Study Area Profile:

4.2.1 Study area location with brief History land use details:

Nani Bhatlav village is located at 49 km from Surat and 16 km from Bardoli. Surat is nearest town of Nani Bhatlav village.By the occupation the man occupation still remains the agriculture and the dairy.but for the growth and development different small business and other employment sources.Nani Bhatlav village is situated in Surat district. The village is waiting for industrial development,education, drinking water and roads are the main concerns of this village. Young generation is attracted towards mobile, laptop and computer technology these days. Medical and health servicesmust be improved. There is a profound requirement of the drainage system over the whole village.

Table .6. NANI BHATLAV

Village Name	NANI BHATLAV
Taluka	Bardoli
District	Surat
State	Gujarat
Language	Gujarati
Time Zone	IST(UTC+5:30)

4.2.2 Base Location map, Land Map, Gram Tal Map (Map with all existing facilities) & Study area land use detail.

Study area land use detail

Table 7 detail of study area

Name of village	Nani Bhatlav
District	Surat
Taluka	Bardoli
Total Geographical Area	190.25 hectares
Area Under Forest	0
Agricultural Land	140 hectares
Barren & Uncultivable Land	9 hectares
Permanent Pastures and Grazing Land	2 hectares
Residential Area	6 hectares
Area use for Irrigation	0
Cultivable Waste Land	0
Recreational Area	negligible
Area Irrigated by Other (Lift Irrigation)	0

Fig. 4.1 satellite view of village

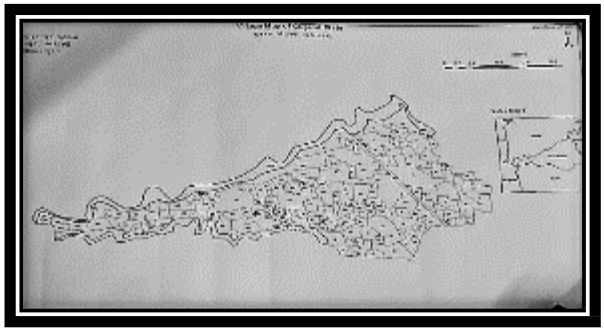


fig.4.2: land map of Nani Bhatlav

fig 4.3 map of nani bhatalav

4.2.3 Physical & demographical growth:

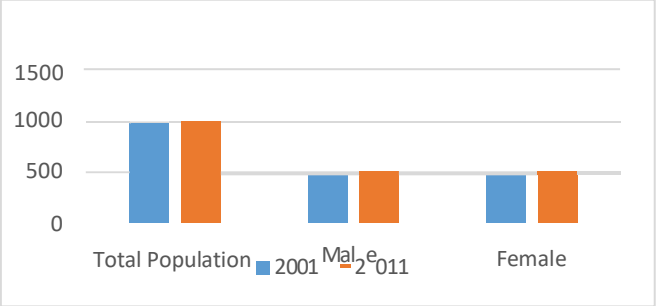
Table .8 Demographic data of Nani Bhatlav village

Census Parameter	Census Data
Total Population	1067
Total No of Houses	231
Female Population %	51.0 % (544)
Total Literacy rate %	66.7 % (712)
Female Literacy rate	29.9 % (319)
Scheduled Tribes Population %	96.2 % (1026)
Scheduled Caste Population %	0.0 % (0)
Working Population %	46.9 %
Child (0 -6) Population by 2011	109
Girl Child(0 -6) Population % by 2011	63.3 % (69)

Physical Growth

- Primary school (Nos. 1)
- Anganwadi (Nos. 2)
- Bus Water tanks
- Pucca roads with inter village connectivity

Fig .4.4(Demographic growth of Nani Bhatlav)



4.2.4 Economic generation profile.

About the economic profile of thisvillage,the main source of the economy circulation is farming. About 80% of the population is indulged with farming and about 10% migrstes to urban area or near by cities for the industries or employment. Remaining 10% of the population is attached with animal husbandry

4.2.5 Actual problem faced by villagers and smart solution:

By the interaction with the villagers and the sarpanch itself we came across some real problems faced by the villagers. First and most concerned problem was the long distance travelling for getting the secondary or higher education. The villager's kids have to travel or migrate to near by city or town for the higher education. Second problem that was encountered was the lack of drainage facility, the villagers use (khaad kuva) for the human waste. The other problem was the lack of employment, they don't have the basic skills required in the modern world. So, for these problems we have given designs for a building for as of a skill development centre.

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

The social scenario is pretty much along the opposite side of the materialistic world. The major population in Nani bhatlav is Hindu so almost every festivals & their celebration takes place in the village. The other religion people celebrate along with them. The main diet and cuisine they follow is rice , wheat , fish and chicken. Each region of the state has a distinctive flavor associated with its local food. Some of the famous Gujarati delicacies include dhokla, fafda, khandvi, dhal dhokli, Undhiyu, handvo, Ganthia, dal Wada, khakhra, and Thepla still comes in their diet.

The traditions are not largely in practice in this time but the rituals for some their cultural activity still takes palce. They still have the out side world touch and the way of celebration is slightly changed.

4.2.7 To know the reason of migration/trends of migration/Problem and potential of migration:

- For employment factor .
- For good quality higher education
- For good health care facility
- For unavailability of basic facility(post),(library)
- For better way of living life

4.2.8 Study area land use details:

Agricultural land use: - 70%

Residential land use: - 20%

Infrastructure: - 10%

4.3 Data collection Nani-Bhatlav:

Data collection related to village is the most important first step for development of any village. Without data we cannot identify what is the future requirement for development of village. The following data was collected by various means like: Office record of concerned office department like- R&B Department, Talati office etc. Interaction with Sarpanch, Deputy sarpanch, villagers etc. Visit to different parts of village

4.3.1 Describe Method for Collection:

Fig4.5:kaccha house

Method that was followed by us in order :

- Questionnaires: Villages related questions were asked to Sarpanch/Talati in order to get the correct Information.
- Interview: Interaction with local peoples of the villages to attain history and present condition of the village and main problem faced by them.
- Observation: for gaining data, observation by own leads to better gathering of information about the village saesthetics.
- Case Studies: While acquiring specifics case studies of different villages helps in securing best stats of allocated village.
- Techno-economic survey of village: Collected all essential information from village such as: Household data, Occupational detail, Water facilities, Drainage facilities, Sanitation availability, Storm water network, Solid waste Management facilities, Electricity and other necessary data.

4.3.2 Primary details of survey:

Nani Bhatlav village is located at 49 km from Surat and 16 km from Bardoli. Surat is nearest town of Nani Bhatlav village.Nani Bhatlav village is situated in Surat district

Primary survey was conducted to identify the various general problems of the villagers by interacting with them and enquiring about the problems faced by them in daily life. They were asked to suggest the possible and desirable solutions for these problems as well as other infrastructural facilities they would like to have in their village.

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

As per the sarpanch and our survey there are average 5 x 11.5 m2 household in village.The housing is in both ways in this village as pucca house and kachha house.

4.3.4 No of human being in one house:

As per the sarpanch and our survey there are average 4 persons per household in village.

fig4.6:pucca house

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

There are no locally material available like standard bricks, aggregates, concrete and reinforcements as no villager have economical freedom for starting up bussiness. So, this material is brought from nearest city for construction of the houses.. In this village kachha houses are more than the pucca houses.By the approximation the pucca houses were about 60% while 40% still there are kachha houses

4.3.6 Geographical Detail:

Table:9

Locality Name	Nani Bhatlav
District	Bardoli
State	Gujarat
Language	Gujarati and Sindhi, Hindi,
Std Code:	02622
Area (In hect.)	190.25
Government	Panchayat

4.3.7 Demographical Detail - Cast Wise Population Details / Which ID proof using by villagers:

Table:- 10 Demographical Detail

Particular	total	Male	Female
Population	1067	523	544
Child (0-6)	109	40	69
Literacy	712	393	319

Villagers uses the general ID proof as Aadhaar card or voter id

4.3.8 Occupational Detail - Occupation wise Details / Majority business:

In Nani bhatlav around 75 to 80 % people are connected with agriculture activities, it's the villages main source of income. But village has the milk production business
so that's an income of source too there are approx. 10 to 15 % peopleare connected with milk production and other are doing labor work for farms and for the agriculture for money like.

4.3.9 Agriculture Detail/ Organic Farming / Fishery

Major source of income in this village is farming. Farmers use drip irrigation system or flood irrigation to do farming. The main agriculture product is sugarcane, rice and some seasonal vegetables 142.69-hectare area covered in the agriculture activity out of 190.25hectare.

4.3.10 Manufacturing hub:

There is Milk dairy(dudh mandali). There are some production of cow dung cake for different uses.elseway there are no other manufacturing hub present in the village.

fig4.7 overhead water tank

4.3.11 Tourism Cluster

No tourism in this village. As it is a underdeveloped and no attension sekking location is present.

4.4 Infrastructure Details:-

4.4.1 Drinking water:

For drinking Purpose ground water tank, tube well and tap water available. Some people also use hand pump for water purpose. There are over headed water tank is available in village for drinkingpurpose.

fig4.8: bitumen road

4.4.2 Drainage facility:

No drainage system available. Hence we have given proposed design for a good drainage system.

4.4.3 Transportation &network:

Main road of village is in good condition and all main roads are of black topped. The width of main road is 3m. Road maintenance is required in some areas of village. The internal street roads are also 90% of R.C.C. But buses are easily not available at the entrance of village.Other transport facilities like Auto, chhakda and private vehicles are also available. There is no railway station near the Nani-Bhatlav village.

4.4.4 Housing condition:

In the Nani-Bhatlav village, the condition of house is good.About 60% of the house are pucca house while remaining 40% are still kachha house.

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

There is no social infrastructure facilities, community hall, library.There is primaryschool and anganwadi

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

In nani bhatlav public building like gram panchyat, school, anganwadi, post office condition is not well so necessary maintenance is required.
As by the panchayat office and post office need high maintainence, while primary school just need low maintenece .

4.4.7 Technology Mobile/ WIFI / Internet Usage Details

In the Nani-Bhatlav village, there are only 70% people are using smart mobile and internet. Rest of them uses a dialphone.

4.4.8 Sports Activity as Gram Panchayat :

There is no Any Sport Activity done by Gram Panchayat .But some sport activity is conducted by the primary school.

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

There is no availability of any recreational facilities nor any socio-cultural facility like public library, public garden, and cinema hall etc. inside the village so Socio-cultural Facility is required. There is only one playground. Village pond is not available.

Fig4.9: Panchayat office

4.4.10 Other Facilities

There are three bank available in Nani-Bhatlav. One grocery shop is available in the village. Primary school and secondary school, three water tanks for drinking purpose are available in village.Village needs sewage treatment plant, public library , community hall.

4.5 Electrical Concept:

4.5.1 Renewable energy source planning particularly for villages

Concept of Smart villages is a global modern approach for off-grid communities. Vision behind this concept is to assist the policy makers, donors and socio-economic planner for rural electrification worldwide, with special focus on Asian and African countries. Smart villages concept is engaged in efforts to combat the real barriers to energy access in villages, particularlyin developing countries with technological, financial and educational methodology

4.5.2 Irrigation Facilities

Irrigation is the process of applying controlled amounts of water to plants at needed intervals. Irrigation helps to grow agricultural crops, maintain landscapes, and revegetate disturbed soils in dry areas and during periods of less than average rainfall. Irrigation also has other uses in crop production, including frost protection, suppressing weed growth in grain fields and preventing soil consolidation. In contrast, agriculture that relies only on direct rainfall is referred to as rain- fed

4.5.3. Electricity Facilities with Area:

Electrical Services is composed of three units: Electrical, Electronic Low Voltage, and High Voltage. The Electrical Unit maintains secondary voltage power distribution systems, performing such utility functions as: installation of new electrical circuits; maintenance and repair of building switchboards; repair of indoor and outdoor lighting systems;

4.5.4 Electrical things available in village

1 Street light
Street light are available in the village in limited quantities and work from 7:00pm to 6:30am.
2 Solar panels
Few houses are equipped with solar water heaters and few houses are equipped
With solar panels that generate electricity.
3 Agriculture motor
Some of the farms have motors to pump water from the canal.
Some of the farms have motors to pump water from the artificial pond.
4 PVC insulator strip on cable
Very few houses have PVC insulator strips coated electric cables that helps to prevent from electric socks and prevent the electric cable from the direct contact of moisture.

4.6 Existing Institution like - Village Administration – Detail Profile:

4.6.4 Bachat Mandali

There is no Bachat Mandali

fig 4.10:dudh mandali

4.6.5 Dudh Mandali

There is a Dudh Mandali.

4.6.6 Mahila forum:

There is no Mahila forum

4.6.7 Plantation for the Air Pollution:

There is no Plantation yet.

4.6.8 Rain Water Harvesting - Waste Water Recycling:

There is no rain water harvesting.

4.6.9 Agricultural Development:

There is not that major Agricultural Development in nani bhatalav.The villagers uses same old techniques for agriculture. But as Major source of income in this village is farming. Farmers use drip irrigation system or flood irrigation to do farming. The main agriculture product is sugarcane, rice and some seasonal vegetables .142.69-hectare area covered in the agriculture activity out of

4.6.10 Any Other infrastructure:

Fig4.11 post office

fig 4.12intersection

fig 4.13village board

Fig4.14 school compound

fig4.15 primary school

fig 4.16over head tank

fig4.17 5000 lit tank

Fig4.18 well & intersection

Fig 4.20milk centre

fig 4.21flag hosting area

fig4.22 kuccha house

Fig4.23 pucca house

fig4.25 pucca house

Fig4.26 government office

CHAPTER 5 Technical Options with Case Studies

5.1 Concept (Civil)

5.1.1 Advance construction techniques / Practices and Quantity Surveying:

Advancement of construction techniques have immensely developed in past decades. This procedure enrolls 3D printing, Materials, Building information modeling, Cladding systems, block houses, modular construction, off site manufacturing prefabrication and preassembly. and many more. The term 'advanced construction technology' covers a wide range of modern techniques and practices that encompass.

The latest developments in materials technology, design procedures, quantity surveying, facilities management, services, structural analysis and design, and management studies.

Cladding system:

The term 'cladding‟ refers to components that are attached to the primary structure of a building to form non-structural, external surfaces. This is as opposed to buildings in which the external surfaces are formed by structural elements, such as masonry walls, or applied surfaces such as render. Cladding is often prefabricated in panels that are attached to the structural frame of the building, and some cladding systems can be purchased 'off the shelf'.

Whilst cladding is generally attached to the structure of the building, it typically does not contribute to its stability. However, cladding does play a structural role, transferring wind loads, impact loads, snow loads and its own self-weight back to the structural framework.

Modular buildings:

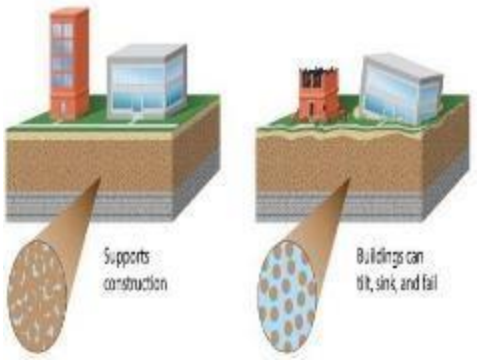
Modular buildings or referred to as volumetric construction, are buildings made up of components manufactured on assemblylines in factories then assembled on site in a variety of arrangements.

Buildings can be constructed using modular 'parts' such as walls, frames, doors,ceilings, and windows, or a number of 'complete' prefabricated modular building units.

Modular building became popular after the Sec ond World War when there was a need for the rapid construction of buildings (in particular dwellings) to replace bomb-damaged buildings and to accommodate returning troops. They were initially well-received, but as they often remained in use well beyond their design life (for example, 'temporary' classrooms,some of which are still in use), and were sometimes aesthetically less attractive that traditional buildings, they fell out of favour.

5.1.2. Soil Liquefaction

fig 5.1 soil liquefication



Soil liquefaction, also called earthquake liquefaction, ground failure or loss of strength that causes otherwise solid soil to behave temporarily as a viscous liquid. Soil liquefaction only occurs when a saturated or partially saturated soil 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 might result in accumulating pressure, first on one point, and then on another, successively, as the early points of concentration were liquefied.

Liquefaction may also contribute to sand blows, which are also known as sand boils or sand volcanoes. Sand blows often accompany the liquefaction of sandy or silty soil. With the collapse of the soil's granular structure, the density of the soil increases. This increased pressure squeezes the water out of the pore spaces between the soil grains and expels wet sand from the ground.

5.1.3 Sustainable Sanitation:

The main objective of a sanitation system is to protect and promote human health by providing a clean environment and breaking the cycle of disease. To qualify as sustainable sanitation, a sanitation system has to be economically viable, socially acceptable, technically and institutionally appropriate, and protect the environment and natural resources.

Most sanitation systems have been designed with these aspects in mind, but they fail far too often because some of the criteria are not met. In fact, there is probably no system which is absolutely sustainable. The concept of sustainability is more of a direction than a state to reach. Nevertheless, it is crucial that sanitation systems are evaluated carefully with regard to all dimensions of sustainability.

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 (SuSanA) 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: to protect 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.

Principles for planning and implementing sustainable sanitation systems:

- Human dignity, quality of life and environmental security at household level should be at the centre of any sanitation approach.
- In line with good governance principles, decision making should involve participation of all stakeholders, especially the consumers and providers of services.
- Waste should be considered a resource, and its management should be holistic and form part of integrated water resources, nutrient flow and waste management processes.
- The domain in which environmental sanitation problems are resolved should be kept to the minimum practicable size (household, neighborhood, community, town, district, catchments, city).

5.1.4 Transport Infrastructure / system:

Transport is vital to the well-functioning of economic activities and a key to ensuring social well-being and cohesion of populations. Transport ensures everyday mobility of people and is crucial to the production and distribution of goods. Adequate infrastructure is a fundamental precondition for transport systems.

If we have to put up a transportation infrastructure in generalize form we have about five of the transportation ways, that are; roads, railways, airways, waterways, and terminals.

Roads:

Road Transport is considered to be one of the most cost effective and preferred mode of transport, both for freight and passengers, keeping in view its level of. imagepenetration into populated areas. Thus, it is vital for economic development and social integration of the country. Easy availability, adaptability to individual needs and the cost savings are some of the factors which go in favour of road transport. Road transport also acts as a feeder service to railway,shipping and air traffic.

Roads types:

Earthen Roads:Earthen roads are laid with soil. They are cheaper of all types of roads. This type of road is provided for less traffic areas and or for countryside areas. Good drainage system should be required which reflects good performance for longer period.

Gravel Roads: Gravel roads are also low-quality roads but they are good when compared to earthen roads. Compacted mixture of gravel and earth is used as pavement material in this case.

Murrum Roads:Murrum is a matter obtained from the disintegration of igneous rocks by weathering agencies. This is used to make roads called as murrum roads.

Kankar Roads:Kankar is nothing but impure form of lime stone. Kankar roads are provided where lime is available in good quantity. These are also low quality and performance wise they are similar to gravel and murrum roads.

WBM Roads:Water Bound Macadam (WBM) roads contain crushed stone aggregate in its base course. The aggregates are spread on the surface and these are rolled after sprinkling water.WBM roads provide better performance compared to earthen, gravel, murrum and kankar roads.

Bituminous Roads: Bituminous roads are very popular roads around the world. They are most used roads in the world. They are low in cost and good for driving conditions. They are flexible and thickness of bituminous roads depends upon the sub-grade soil conditions.

Concrete Roads: Cement concrete is used to construct the pavements in case of concrete roads. These are very popular and costlier than all other types of roads. They are not flexible so, they require less maintenance. Concrete roads are suitable for high traffic areas. Concrete roads are laid with joints and time of construction is more.

Railway transportation:

Rail transport is also known as train transport. It is a means of transport, on vehicles which run on tracks . It is one of the most important, commonly used and very cost effective modes of commuting and goods carriage over long, as well as, short distances. Since this system runs on metal rails and wheels, it has an inherent benefit of lesser frictional resistance which helps attach more load in terms of wagons or carriages. This system is known as a train. Usually, trains are powered by an engine locomotive running on electricity or on diesel. Complex signaling systems are utilised if there are multiple route networks. Rail transport is also one of the fastest modes of land transport.

Advantages:

1. Dependable:

The greatest advantage of the railway transport is that it is the most dependable mode of transport as it is the least affected by weather conditions such as rains, fog etc. compared to other modes of transport.

2. Better Organised:

The rail transport is better organised than any other form of transport. It has fixed routes and schedules. Its service is more certain, uniform and regular as compared to other modes of transport.

3. High Speed over Long Distances:

Its speed over long distances is more than any other mode of transport, except airways. Thus, it is the best choice for long distance traffic.

4. Suitable for Bulky and Heavy Goods:

Railway transport is economical, quicker and best suited for carrying heavy and bulky goods over long distances.

5. Cheaper Transport:

It is a cheaper mode of transport as compared to other modes of transport. Most of the working expenses of railways are in the nature of fixed costs. Every increase in the railway traffic is followed by a decrease in the average cost. Rail transport is economical in the use of labour also as one driver and one guard are sufficient to carry much more load than the motor transport.

6. Safety:

Railway is the safest form of transport. The chances of accidents and breakdowns of railways are minimum as compared to other modes of transport. Moreover, the traffic can be protected from the exposure to sun, rains, snow etc.

Disadvantages:

1. Huge Capital Outlay:

The railway requires is large investment of capital. The cost of construction, maintenance and overhead expenses are very high as compared to other modes of transport. Moreover, the investments are specific and immobile. In case the traffic is not sufficient, the investments may mean wastage of huge resources.

2. Lack of Flexibility:

Another disadvantage of railway transport is its inflexibility. Its routes and timings cannot be adjusted to individual requirements.

3. Lack of Door to Door Service:

Rail transport cannot provide door to door service as it is tied to a particular track. Intermediate loading or unloading involves greater cost, more wear and tear and wastage of time.

4. Booking Formalities:

It involves much time and labour in booking and taking delivery of goods through railways as compared to motor transport.

5. Under-utilised Capacity:

The railway must have full load for its ideal and economic operation. As it has a very large carrying capacity, under-utilisation of its capacity, in most of the regions, is a great financial problem and loss to the economy.

Water transportation: Waterways are an important mode of transport for both passenger and cargo traffic in India. It is the cheapest means of transport and is most suitable for carrying heavy and bulky material. It is a fuel-efficient and eco-friendly mode of transport. The water

transport is of two types– (a) inland waterways, and (b) oceanic waterways. Inland waterways are s the chief mode of transport before the advent of railways. Oceanic routes play an important role in the transport sector of India's economy.

Advantages:

1. Less Maintenance Cost:

Maintenance cost in rail and road transport is quite high but maintenance cost of water transport is quite less.

2. Cheap:

The transport channel is quite cheap as compared rail and road Transport.

3. Useful for Bulky Goods:

Heavy and bulky goods can be transported easily at little cost through water transport.

4. Useful During Natural Calamities:

During natural calamities like flood and rains, when rail and road transport is disrupted, relief operations can be operated through water transport.

5. Helpful in Defence:

Development of shipping is essential for the defence of the country also. It is also called second line of defence.

7. Important for Foreign Trade:
8. Water transport plays important role in foreign trade. India's foreign trade is mainly dependent on water transport.

Disadvantages of Water Transport:

1. Slow Speed:

It is a slow means of transport. Failure of monsoon results into fall in the water level of rivers making navigation difficult.

2. More Risky:

Water transport is more risky as compared to other means because there is always danger of sinking ships or boats.

Fig 5.2 vertical farming

5.1.5 **Vertical Farming**:

Vertical farming is the practice of growing crops in vertically stacked layers. The concept of vertical farming was proposed in 1999 by Dickson Despommier, a professor of Public and Environmental Health at Columbia University.

What Vertical Farming means:

Vertical farming is the practice of producing food on vertically inclined surfaces.Instead of farming vegetables and other foods on a single level, such as in a field or a greenhouse, this method produces foods in vertically stacked layers commonly integrated into other structures like a skyscraper, shipping container or repurposed warehouse.The primary goal of vertical farming is maximizing crops output in a limited space.

How Vertical Farming Works

There are four critical areas in understanding how vertical farming works: 1. Physical layout, 2. Lighting, 3. Growing medium, and 4. Sustainability features.

Firstly, the primary goal of vertical farming is producing more foods per square meter. To accomplish this goal, crops are cultivated in stacked layers in a tower life structure.

Secondly, a perfect combination of natural and artificial lights is used to maintain the perfect light level in the room. Technologies such as rotating beds are used to improve lighting efficiency.

Thirdly, instead of soil, aeroponic, aquaponic or hydroponic growing mediums are used. Peat moss or coconut husks and similar non-soil mediums are very common in vertical farming. Finally, the vertical farming method uses various sustainability features to offset the energy cost of farming. In fact, vertical farming uses 95% less water.

Scope of vertical farming:

Vertical farming has a great scope in India, But there are challenges like acceptance of vertical farming by the Indian farming community.

Vertical farming is definitely a solution to critical problems in Indian agriculture like lack of supply or oversupply of farm produce, over-use of pesticides, over-use of fertilizers, deteriorating soils, and even the unemployability.

Indian farmers are facing various problems like lack of electricity supply throughout the day, assurance of minimum support prices, no control over market glut, water scarcity, etc. The initial huge cost of infrastructure for a large-scale farm is a major hurdle for implementing vertical farming in India.

Vertical farming in India has to face other challenges like public awareness, inclusiveness of the farming community, technical know-how, cost incurred in managing and mainlining the vertical farm systems, and also its economic viability.

vertical farming cost in India:

India is a viable market due to population growth which is growing at a very fast rate So it is the right time to produce hydroponically grown food within India. This customer market includes retail and hotel, and fast-food chains, railway catering, foreign food service companies, NGOs, and defense establishments. Hydroponics is a lucrative opportunity to deploy in India. These are the following estimated cost of purchasing a vertical farm in India:

If the land is already owned for setting-up a vertical farm, then capital costs per acre every 5 years are Rs 30.5 lakhs.Operational costs, for example, tomatoes as the example crop, in 1 acre per year are Rs 9 lakhs but the revenue can be on an average around 33.5 lakhs.

If the land is independently owned the profit potential of 15 lakhs per year is slightly less than if it were leased, averaging around 16.5 lakhs per year.But it is important to note that in the first year, 80% depreciation is available under the Indian Income Tax Act to the buyer. 75% of bank financing is available through agriculture loans and a 20% subsidy from the National HorticultureBoard (NHB).

Advantages:

It offers a plan to handle future food demands

It allows crops to grow year-round

It uses significantly less water

Weather doesn't affect the crops

More organic crops can be grown

There is less exposure to chemicals and disease

Disadvantages:

It could be very costly to build and economic feasibility studies haven't yet been completed.

Pollination would be very difficult and costly

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

Corrosion Mechanism: The corrosion of steel reinforcement in concrete is complex, but basically it is an electrochemical reaction similar to that of a simple battery. The composition of mild steel varies along its length and potential anodic (more negatively charged) and cathodic (positively charged) sites can be set up at various points.

Valuable assets of a country are created through construction. Construction plays a vital role in economic development. It is a forerunner activity and hallmark of development process of any nation.figure shows the way steel got corroded by moisture.

Steel reinforcement which is used in RCC, though on one side complements the concrete for its weakness in tension (tensile stress), it also impairs the durability and longevity of concrete, due to its proneness to corrosion.

Repairs and rehabilitation of concrete structures, which of late has become an activity comparable to construction itself worldwide, is mostly because deterioration of concrete due to corrosion of embedded steel.

Causes of Corrosion of Steel Reinforcement in Concrete:

fig 5.3 water proofing spray

Corrosion of steel in concrete is an electrochemical process. The electrochemical potentials to form the corrosion cells may be generated in two ways:

(a) Composition cells may be formed when two dissimilar metals are embedded in concrete, such as steel rebars and aluminum conduit pipes, or when significant variations exist in surface characteristics of the steel.

(b) Concentration cells may be formed due to differences in concentration of dissolved ions near steel, such as alkalies, chlorides, and oxygen.

The differences in electrochemical potential can arise from differences in the environment of the concrete. Electrochemical cells form also due to a variation in salt concentration in the pore water or due to a non-uniform access to oxygen.

methods to prevent corrosion:

There are some methods for controlling the corrosion of reinforced concrete. An effectivecorrosion control system should extend the time to corrosion initiation or, reduce the corrosion rate of embedded steel, or do both.

Cathodic protection;

Corrosion inhibitor admixtures; and

Anti-corrosion coating.

Waterproofing strategies

Concrete is a hard material with a network of openings such as capillaries, pores, cracks, and micro-cracks. Water can pass through unprotected concrete, acting as a carrier for aggressive chemicals like chloride, which will corrode reinforced steel rebar.

With the exception of mechanical damage, all the adverse influence on durability in concrete involves the transport of fluids through the concrete.[viii] Water permeability determines the rate of deterioration, which means if the concrete is protected against the ingress of water, the durability of the structure will increase and in the end the service life. As a result, reducing the permeability of the concrete is key. Unfortunately, as with the protection of reinforced concrete, traditional measures are not living up to expectations.

Integral crystalline waterproofing admixture:

A permeability-reducing admixture suitable for hydrostatic conditions (PRAH) such as integral crystalline waterproofing (ICW) admixture is included with the concrete mix at batching or

directly to the ready-mix truck. Instead of adding the installation of a sheet membrane or the application of a fluid membrane, an ICW eliminates that need by becoming part of the concrete mixture. The ICW admixture is effective in reducing concrete's permeability without costly materials, labor or time required to install the external methods.

The features of an ICW admixture provide many unique benefits to concrete enhancing the durability for the properties of concrete that have historically resulted in poor durability. Through the use of crystalline technology, the ICW admixture reduces the penetration of water and water-borne chemicals through three primary mechanisms:crystallization and lowering the permeability of the concrete;reducing the size and quantity of cracks in the concrete; andself-sealing cracks and micro-cracks that form later in the life of a structure.

5.1.7 Sewage treatment plant:

The Sewage treatment is the process of removing contaminants from many different location as wastewater and household sewage water,etc. It includes physical, biological and sometimes chemical processes to remove pollutants. Its aim is to produce an environmentally safe sewage water, called effluent, and a solid waste, called sludge or biosolids, suitable for disposal or reuse. Reuse is often for agricultural purposes, but more recently, sludge is being used as a fuel source.

Water from the mains, used by manufacturing, farming, houses (toilets, baths, showers, kitchens, sinks), hospitals, commercial and industrial sites, is reduced in quality as a result of the introduction of contaminating constituents. Organic wastes, suspended solids, bacteria, nitrates, and phosphates are pollutants that must be removed.

Fig 5.4 sewage treatment plant

To make wastewater acceptable for reuse or for returning to theenvironment, the concentration of contaminants must be reduced to a safe level, usually a standard set by the Environment Agency.Sewage can be treated close to where it is created (in septic tanks and their associated drainfields or sewage treatment plants), or collected and transported via a network of pipes and pump stations to amunicipal treatment plant. The former system is gaining popularity for many new ECO towns, as 60% of the cost of mains sewerage is in the pipework to transport it to a central location and it is not sustainable. It is called 'Decentralisation' of sewage treatment systemsThe job of designing and constructing sewage works falls to environmental engineers. They use a variety of engineered and natural systems to meet the required treatment level, using physical, chemical,

biological, and sludge treatment methods. The result is cleaned sewage water and sludge, both of which should be suitable for discharge or reuse back into the environment. Sludge, however, is often inadvertently contaminated with many toxic organic and inorganic compounds and diseases and the debate is raging over the safety issues. Some pathogens, for example, 'Prion' diseases (CJD or 'Mad Cow Disease is a Prion disease) cannot be destroyed by the treatment process.

The features of wastewater treatment systems are determined by:

The nature of the municipal and industrial wastes that are conveyed to them by the sewers.The amount of treatment required to keep the quality of the receiving streams and rivers.Discharges from treatment plants are usually diluted in rivers, lakes, or estuaries. They also may, after sterilisation, be used for certain types of irrigation (such as golf courses), transported to lagoons where they are evaporated, or discharged through underground outfalls into the sea. However, sewage water outflows from treatment works must meet effluent standards set by the Environment Agency to avoid polluting the waters that receive them.

Sewage treatment plant processes fall into two basic types:

Anaerobic Sewage Treatment

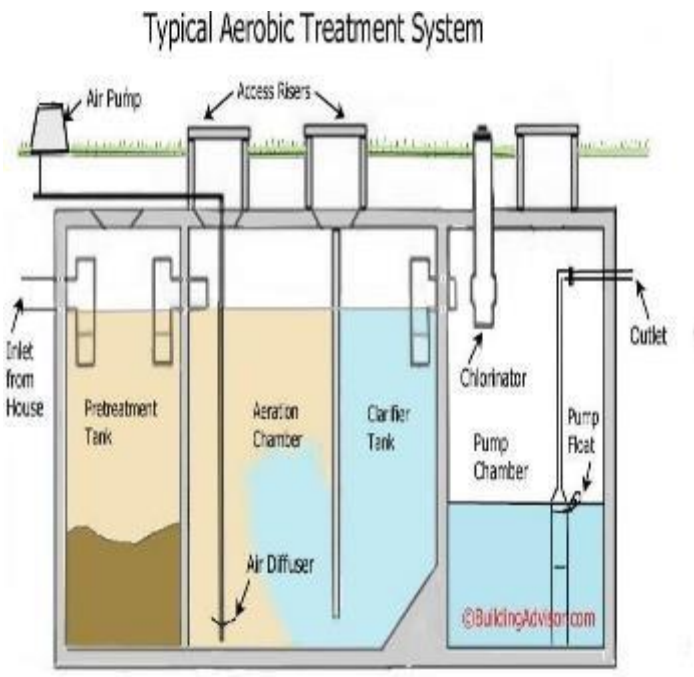
fig5.5 Anaerobic Sewage Treatment

Sewage is partly decomposed by anerobic bacteria in a tank without the introduction of air, containing oxygen. This leads to a reduction of Organic Matter into Methane, Hydrogen Sulphide, Carbon Dioxide etc. It is widely used to treat wastewater sludge and organic waste because it provides volume and mass reduction of the input material to a large extent.. The methane produced by large-scale municipal anerobic sludge treatment is currently being examined for use in homes and industry, for heating purposes. Septic tanks are an example of an anerobic process, but the amount of methane produced by a septic tank (it is only the SLUDGE at the bottom that produces methane) serving less than 100 people is miniscule. In addition to this, septic tank effluent still contains about 70% of the original pollutants and the process smells very badly, due to the Hydrogen Sulphide, if not vented correctly. The effluent produced by this process is highly polluting and cannot be discharged to any watercourse. It must be discharged into the

Aerobic layer of the soil (within the top metre of the ground) for the aerobic soil bacteria to continue the sewage treatment via the aerobic process below.

Aerobic Sewage Treatment

fig 5.6 Aerobic Sewage Treatment



In this process, aerobic bacteria digest the pollutants. To establish an aerobic bacterial colony you must provide air for the bacteria to breathe. In a sewage treatment plant, air is continuously supplied to the Biozone either by direct Surface Aeration using Impellers propelled by pumps which whisk the surface of the liquid with air, or by Submerged Diffused Aeration using blowers for air supply through bubble diffusers at the bottom of the tank. (The most modern aerobic sewage systems use natural air currents and do not require electricity, though these are only used for small scale sewage systems at the moment. Once again, the general public leads the way!) Aerobic conditions lead to an aerobic bacterial colony being established. These achieve almost complete oxidation and digestion of organic matter and organic pollutants to Carbon Dioxide, Water and Nitrogen, thus eliminating the odour and pollution problem above. The effluent produced by this process is non-polluting and can be discharged to a watercourse

Conventional sewage water treatment involves either two or three stages, called primary, secondary and tertiary treatment. Before these treatments, preliminary removal of rags, cloths, sanitary items, etc. is also carried out at municipal sewage works.

Primary Treatment

This is usually Anerobic. First, the solids are separated from the sewage. They settle out at the base of a primary settlement tank. The sludge is continuously being reduced in volume by the anerobic process, resulting in a vastly reduced total mass when compared to the original volume entering the system.The primary settlement tank has the sludge removed when it is about 30% ofthe tank volume.

Secondary Treatment

This is Aerobic. The liquid from the Primary treatment contains dissolved and particulate biological matter. This is progressively converted into clean water by using indigenous, water-borne aerobic micro-organisms and bacteria which digest the pollutants. In most cases, this effluent is clean enough for discharge directly to rivers.

Tertiary Treatment

In some cases, the effluent resulting from secondary treatment is not clean enough for discharge. This may be because the stream it is being discharged into is very sensitive, has rare plants and animals or is already polluted by someone's septic tank. The Environment Agency may then require a very high standard of treatment with a view to the new discharge being CLEANER thanthe water in the stream and to, in effect, 'Clean it up a bit'. It is usually either Phosphorous or Ammoniacal Nitrogen or both that the E.A. want reduced. Tertiary treatment involves this process.If Phosphorous is the culprit, then a continuous dosing system to remove it is the tertiary treatment.If Ammoniacal Nitrogen is the problem, then the sewage treatment plant process must involve a nitrifying and then de-nitrification stage to convert the ammoniacal nitrogen to Nitrogen gas that harmlessly enters the atmosphere.

5.1.8 Technical Case "Study on Sardar Patel Stadium"

The Sardar Patel Stadium, commonly known as Motera Stadium to avoid confusion with another stadium of the same name, is a cricket stadium in Ahmedabad, Gujarat, India. As of 2020, it is the largest cricket stadium in the world and the second largest stadium overall, with a seating capacity of 110,000 spectators.It is owned by the Gujarat Cricket Association and is a venue for Test, ODI, and T20I cricket matches.

The stadium was constructed in 1983 and was first renovated in 2006.It became the regular venue for international matches in the city. In 2015, the stadium was closed and demolished before being completely rebuilt by February 2020, with an estimated cost of ₹800 crore (US$110 million

History

1982–2006 -

fig5.7 Namo stadium design

Formerly known as the Gujarat Stadium, the ground was renamed in tribute to Sardar Vallabhbhai Patel,[citation needed] India's first Home Minister and Deputy Prime Minister. Before the Sardar Patel Stadium, international cricket matches in the city were played at the Ahmedabad Municipal Corporation's stadium of the same name (Sardar Patel Stadium) in the Navrangpura area. In 1982, the Government of Gujarat donated a 100-acre (400,000 m2) stretch of land on the banks of the Sabarmati River to build a new stadium. The construction of the Sardar Patel Stadium was

completed in nine months.Since then, all International cricket fixtures for the city are hosted here. In the 1984-85 Australia-India series, Sardar Patel Stadium hosted its first ODI

2015–2020 (Reconstruction) –

US President Donald Trump and Indian Prime Minister Narendra Modi at the Sardar Patel Stadium, 24 February 2020.

In October 2015, the stadium was demolished for reconstruction, though some media referred to it as a renovation. The total cost of reconstruction was estimated to be ₹700 crores.[citation needed] However, the final cost was reported at ₹800 crores. The redevelopment, originally planned to be completed in 2019, finished in February 2020.

Conception

fig 5.8 before and after

The idea to build the new stadium was allegedly proposed by Narendra Modi, the president ofthe Gujarat Cricket Association and the Chief Minister of Gujarat atthe time. Shortly before Modimoved to Delhi after becoming the Prime Minister of India, there were discussions about minor upgrades to the stadium and development of the structure at the pavilion end. Modi asked the officials to build a new larger stadium instead ofminor renovation work when he learned about the Melbourne Cricket Ground.

Bids

After starting demolition work at the end of 2015, the Gujarat Cricket Association issued a request for tender on 1 January 2016 in The Times of India and The Indian Express. Nine bidders showed interest and purchased the tender documents, out of which three submitted Technical and Financial bids on time; they were the Shapoorji Pallonji Group, Nagarjuna Construction Company, and Larsen & Toubro. A Tender Commercial Committee (TCC) of nine experts was formed to evaluate tenders. Additionally, STUP Consultants was appointed as the Project Management Consultant to evaluate proposals and technical details of each bid working with the TCC.

Each of the three bidders presented their designs, models, and technical details of their concepts & designs. Because of the sheer size and complexity of the project, the bidders were evaluated on multiple parameters like efficiency, resources, the time frame of completion, ease of implementation, etc. The bidders were ranked and weighted on all of the parameters.

Table no. 11 Bids Submitted for Sardar Patel's Reconstruction

Bidder	Bid	Evaluation	Notes
Larsen & Toubro	₹677.19 crore (US$95 million)	Lowest-1 (L1)	Winning bid. Financially lowest and technically ranked first.
Shapoorji Pallonji & Co. Ltd.	₹847.88 crore (US$120 million)	Lowest-2 (L2)	
Nagarjuna Construction Co. Ltd.	₹1,065 crore (US$150 million)	Highest (L3)	

- In the end, L&T was finalized as the Principal Contractor to build and design the stadium.

Fig 5.9 during construction

Work

L&T took over the construction work of the stadium in December 2016.On 16 January 2017, the Gujarat Cricket Association oversaw the project, which formally began on the same day. The stadium was planned to be finished in 2 years and the reconstruction project was estimated to cost around ₹ 7 billion.Finishing touches were given to the stadium in February 2020 and it is expected to host an England-India day-night test match by 2021.

Mumbai-based Commercial Kitchen Consultants "Span Asia" were hired to work with Populous and L&T on all the F&B Related areas such as the Concession Counters, Main Stadium Kitchens, Player Kitchens, VIP/VVIP Boxes, Corporate Boxes, Press & Media Boxes, Pantries, GCA Club and Related areas.

Stadium Design

fig 5.10 after construction

The redesigned stadium occupies 63 acres of land, with three entry points compared to one in the old stadium, with a metro line at one of the entry points. It contains 76 corporate boxes that can hold 25 persons each,a 55-room clubhouse, an Olympic sized swimming pool,and four dressing rooms. A unique feature of the stadium is the LED lights on the roof instead of the usual floodlights at cricket grounds. The LED lights are installed on an anti-bacterial, fireproof canopy with PTFE membrane that covers 30 out of 55 metres width of sitting area. The roof was done by the company Walter P Moore and was specifically designed to be lightweight and separate from the seating bowls in order to make it fairly earthquake resistant.The structure eliminates the need for pillars and gives spectators an unobstructed view of the entire field from any place in thestadium.

Outside of the main ground, the stadium is able to accommodate several other features, including an Olympic-sized swimming pool, an indoor cricket academy, badminton and tennis courts, a squash arena, a table tennis area, a 3D projector theater, and a clubhouse with three practice grounds and 50 rooms.The parking lot can accommodate 3,000 cars and 10,000 two-wheelers. Sardar Patel Stadium also has a huge ramp designed to facilitate the movement of around 60,000 people simultaneously. The stadium has been designed such that patrons fill the lower levels of the ground for smaller events to maintain the crowd atmosphere when not at capacity.

It has also been planned that the stadium will be connected to the metro station by a skywalk to decrease road congestion. The skywalk is planned to be completed after September 2020, and is a part of the Motera Metro Station project rather than the stadium's.

Major events

fig 5.11:namaste trump event

Namaste Trump-The stadium was the venue of the Namaste Trump event and hosted US President Donald Trump and Indian Prime minister Narendra Modi on 24 February 2020.The event mirrored the "Howdy Modi" event held in Houston, Texas. The main event at the stadium was organised in the afternoon and was the highlight of the President's visit to India. The event served as a platform for the US President and Indian Prime Minister to display their friendly relationship with each other. While initial reports suggested that Trump would inaugurate the Motera Stadium, it was later disregarded as "speculation and assumption".

5.2 Concept (Electrical)

5.2.1 ProgrammableLoadShedding

(I) Definition

Programmable load shedding time management system is a reliable & effective load shedding technique that takes over the manual task of switch ON/OFF the electrical supply with respect to time.

(II) Explanation

In today's world, there is a continuous need for automatic appliances with the increase in standard of living; there is a sense of urgency for developing circuits that would ease the complexity of life. The project is designed to operate an electrical load multiple number of times as per the program. It overcomes the difficulties of switching the load ON/OFF manually. This proposed hasan inbuilt real time clock (RTC) to keep tracking the time and thus to switch ON/OFF the load accodingly. Load shedding is what electric utilities do when there is a huge demand for electricity that exceeds the supply. Thus in a distribution system it needs to be precisely controlled for specific period of time. Programmable load shedding time management system is a reliable circuit that takes over the manual task of switch ON/OFF the electrical devices with respect to time. It uses real time clock (RTC) interfaced to a microcontroller of 8051 family. While the set time equals tothe real time, then microcontroller gives command to the corresponding relay to turn ON the loadand then another command to switch OFF as per the program. Multiple ON/OFF time entry is thebiggest advantage with this project.

Programmable load shedding time management system is uses real time clock (RTC) interfaced to a microcontroller of 8051 family. Multiple ON/OFF time entry is the biggest advantage with this project. the set time equals to the real time, then microcontroller gives command to the corresponding relay to turn ON the load and then another command to switch OFF as per the program. Multiple ON/OFF time entry is the biggest advantage with this project.

The project is an automatic load operation system that controls load operation, multiple numbers of times according to programmed instruction. The project eliminates the manual ON/OFF switching of load. A real time clock (RTC) is used to track the time and automatically

switch ON/OFF the load. This project is required for load shedding time management which is used when the electricity demand exceeds the supply and there comes a need for manually switching ON/OFF the electrical devices in time.

Hence this system eliminates the manual operation by automatically switching the load ON/OFF. A matrix keypad is interfaced with the microcontroller from where the specified time isinput to the microcontroller. When this input time equals to the real time, based on the commands the microcontroller initiates that particular relay to switch ON/OFF the load. The time is displayedon a seven segment display.

(III) Block Diagram

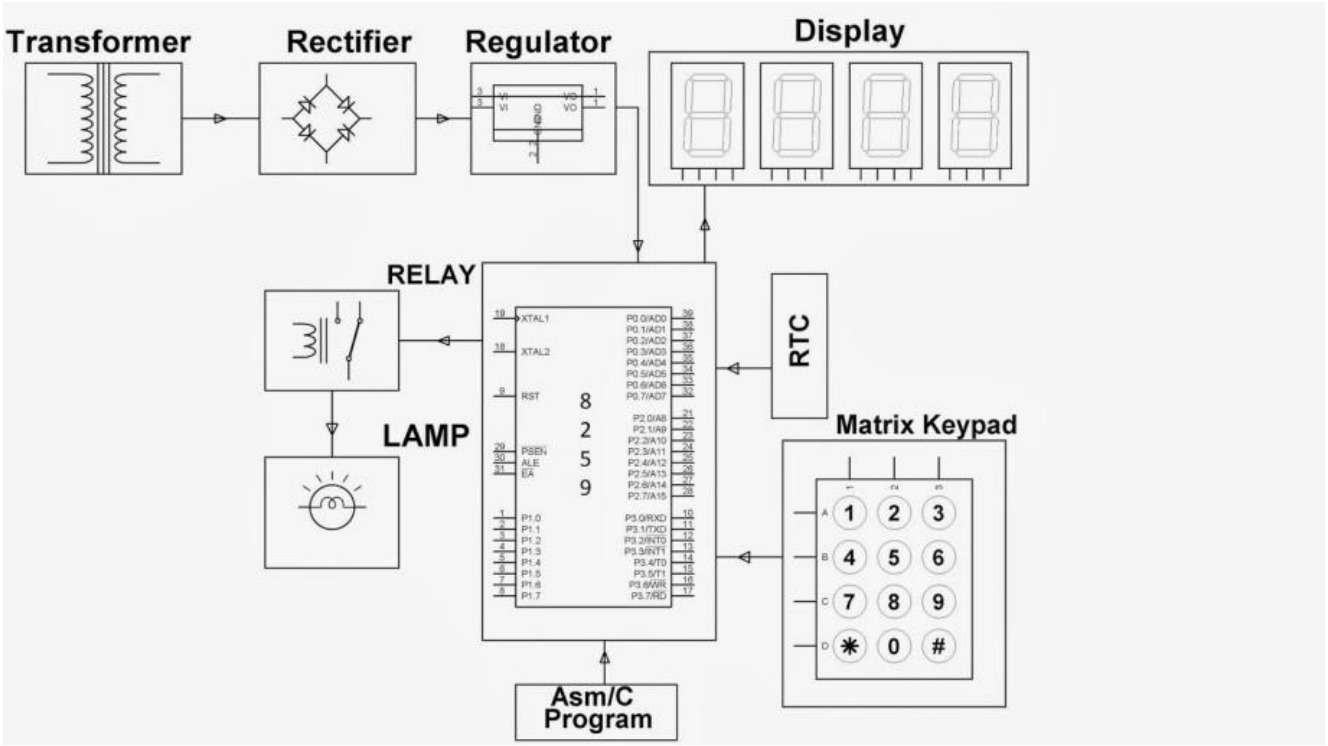


Fig. 1 Programmable Load Shedding

(IV) Circuit Diagram

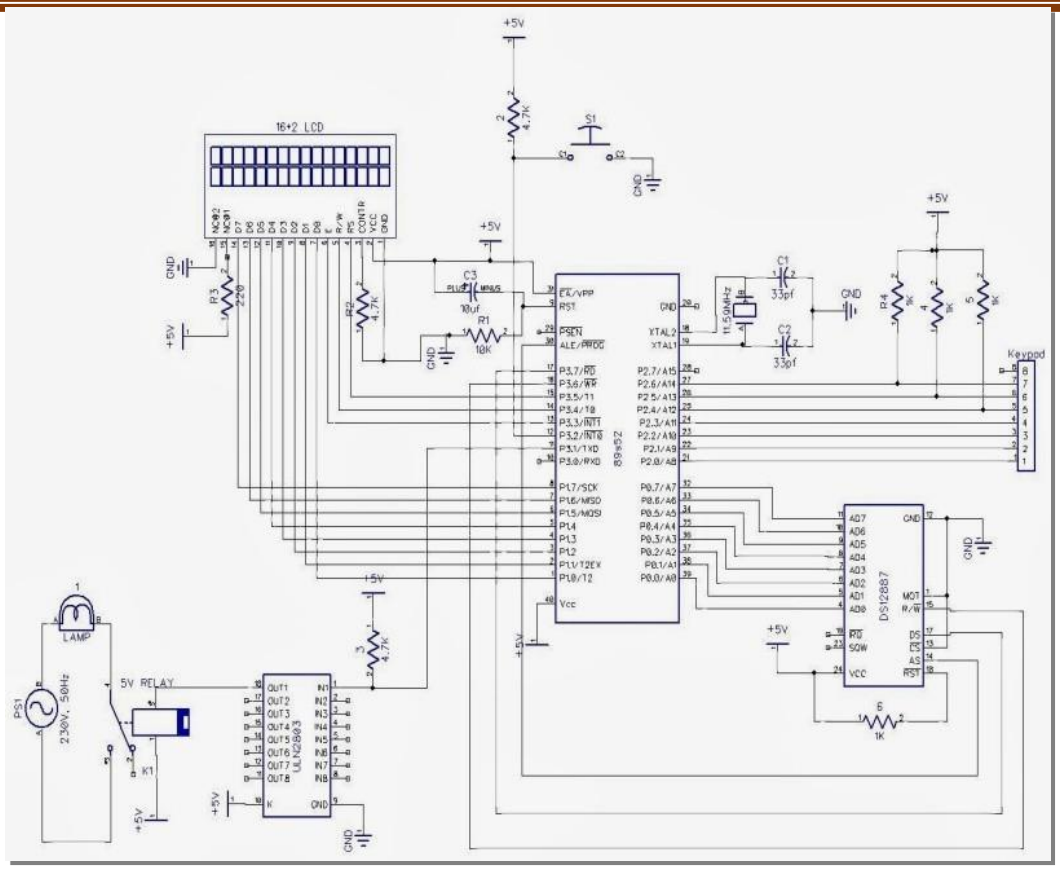


Fig. 2
Circuit Diagram of Programmable Load Shedding

(v) Cost

Table no. 12 Total cost

Device	**Cost**
Transformer	150/-
Rectifier	25/-
Lamp	65/-
8259 microcontroller	700/-
Ascm/c	800/-
Matrix keypad	315/-
Regulator	250/-
Display	490/-
Relay	470/-
Total	3265/-

There are no easy ways for tackling this problem, but the main concern is regarding its feasibility for the fluctuating environmental conditions. In this paper, we are proposing an IoT based

5.2.2.RailwaySecuritySystemusing IoT:

(I) Definition

In a railway security system using IOT , a motion detection sensor which detects the motion of the object which performs skin detection and then sends the image to the railway server using IOT.

(II) Explanation

Railways is considered as one of the widely spread mode of transportation all over the globe. Nowadays there is an enormous increase in road and railway traffic. This rapid growth has given rise to more and more accidents at the level crossings. This is a serious concern for both railway and road traffic users.

This real time information is sent to database server with the help of Wi-Fi module through Internet of Things (IoT). With the help of GSM module, we send the intrusion detection information to the concerned train driver, station master and control room for efficient monitoring.Even with greatest of ideas to avoid railway accidents, many trains accidents still happen worldwide. This paper shares an idea on how to avoid train collision by using an automated controlincorporated in the trains. In this proposed paper we have implemented ideas such as pre-crashingusing RFID sensor, ultrasonic sensor in-order to choose an array of commands which would runas per the conditional algorithm created in the microcontroller. We would also have a EPM tocontrol the speed of the motor to lessen speed. This system will be more efficient since it was fullyautomated and also it was cost effective.

We wanted to be apart of our surrounding with some change and advancement so that it canbring the better life of the middle class and lower class people to travel in high security and advanced locomotion's .the train is one and only most widely used transportation, and not only forthis they are used for goods transportation also .Indian railways are not able to facility the customerproperly due to crowded amount of people. Statistics show that the leading cause of death by injuryin railways traffic accidents(two train collision each other). There are number of causes for whichan accident can occur, some of them are; lack of training for driving or less experienced, use of mobile phone while driving, unskilled drivers, driving while intoxicated, bad railway tack condition, overloading in tain and negligence traffic management.

In this survey paper, we briefly review selected railway accidents detection techniques and propose a solution. Rear end crashes occur mainly due to obstacle and crack in tracks. Accordingto recent statistics, a major percentage of train accidents happen due to not proper surveillance ofrailway track. In Feb. a train was travelling in the forest range of Bihar state were five elephant were hit

the railway. The existing system in semi automated railways accidents are occurring at frequently, consideration this in mind we want to bring some change and make it effective so that it becomes a compulsory and law for practice. Once the implementation of smart train with lot of new technology many ideas have been proposed for essential advancement in developing system meant for better travelling livihood.

A system based on vision and video processing has been proposed that could employ a camera to take video images and extract features for finding the obstacle and behavior of obstaclearound and draw conclusion to avoid accidents. Live camera that analyze the images from the video to recognize obstacle and sends an alert if it detect a automated engine breaking using EPMmodule The main objective of this study is to provide frameworks on the development of smart train automation method that can avoided collision risk vehicles, detect their relative distance andspeed and therefore inform the driver about a probable accident. The system we proposed will prevent collision of any form of accident in the railways system.

5.2.3 Management through Energy Harvesting Concept:

(I) Definition

Wireless Sensor Networks, (WSNs) are large networks composed of small sensor nodes, withlimited computer resources capable for gathering, data processing and communicating.

(II) Explanation

In recent years, great advances in understanding the opportunities for nonlinear vibration energy harvesting systems have been achieved giving attention to either the structural or electrical subsystems. Yet, a notable disconnect appears in the knowledge on optimal means to integrate nonlinear energy harvesting structures with effective nonlinear rectifying and power management circuits for practical applications. Motivated to fill this knowledge gap, this research employs impedance principles to investigate power optimization strategies for a nonlinear vibration energy harvester interfaced with a bridge rectifier and a buck-boost converter.

The frequency and amplitude dependence of the internal impedance of the harvester structure challenges the conventional impedance matching concepts. Instead, a system-level optimization strategy is established and validated through simulations and experiments. Through careful studies, the means to optimize the electrical power with partial information of the electrical load is revealed and verified in comparison to the full analysis. These results suggest that future study and implementation of optimal nonlinear energy harvesting systems may find effective

guidance through power flow concepts built on linear theories despite the presence of nonlinearities in structures and circuits.

Collections of tiny, inexpensive wireless sensor nodes (modules), organized in clusters and networks deployed over a geographical area, capable to integrate continuous and unobtrusive measurement, computing and wireless communication, have attracted much attention during the last decade in forming the concept of smart spaces. One of the many challenges associated with sensing multiple parameters from the environment, by using wireless sensor networks, is to how to transmit data and power the sensors. Batteries provide the most obvious power source of sensor nodes. In spite of the fact that battery technology is mature, extensively commercialized, and completely self-contained, even for relatively large battery capacity and moderate communication traffic requirements, the mean time to replacement or recharging is only two or three years. For deployment with hundreds of sensors, this means that a battery will need a replacement every few days, what represents an unsuitable rate for many applications. Several solutions to the power problem exist, such as reducing power consumption to the point where batteries can elongate the sensor module's lifetime.

Another solution is energy harvesting–EH (or energy that is extracting energy from ambient sources. Common energy ambient sources for energy harvesting include mechanical energy resulting from vibration, stress and strain; thermal energy from furnaces and other heating sources; solar energy from all forms of light sources, ranging from lighting to the sun; electromagnetic energy that is captured via inductors, coils and transformers: wind and fluid energy resulting from air and liquid flow; human energy which depend of human movement by foot, human skin and blood; and chemical energy from naturally recurring or biological processes.

This solution assumes that the wireless sensor node completely alone, can capture and accumulates energy as it becomes available. In most cases, these energy sources provide energyin very small packets that have previously been difficult to capture and use. Because of that,capturing, accumulating, and storing of small packets of electrical energy requires high energyefficiency. The harvesting circuit must stay in active mode permanently, to be ready to captureharvestable energy whenever it becomes available, and to be capable to provide an output as theapplication requires. The power consumption of the harvester has to be very small so that theenergy consumed by this circuit iSs much smaller than the energy provided by the ambient sources.The second key component of the harvester is its high energy retention, i.e. the capability tostore

circuits must have extremely high energy retention, due to the infrequency of the energy capture activity. Low harvesting activity levels mean that it may be many hours before enough energy has been stored by the energy harvesting circuit to trigger some activities of SNs, such for example data transmission, sensing data, collecting data, etc.. The energy harvesting circuit must also economize the stored energy in order to provide correct operation for the intended application.

This article starts from the fact that WSNs are ideally suited for long-lived applications deployed at large densities for low cost. The article discusses some promising techniques and research directions for alleviating the energy problem in wireless sensor node, including power management, energy aware sensing and environmental energy harvesting. Its aim is to point to some global viewpoint, concerning power reduction and energy harvesting problems, as useful design concepts for sensor node designers with order to provide long lived sensor networks. The remainder of the article is structured as follows. Section II concentrates on sensor node system architecture. The workload profile of the sensor node is briefly discussed in Section III. Section IV deals with power management techniques currently implemented in sensor nodes.

(III) Block Diagram

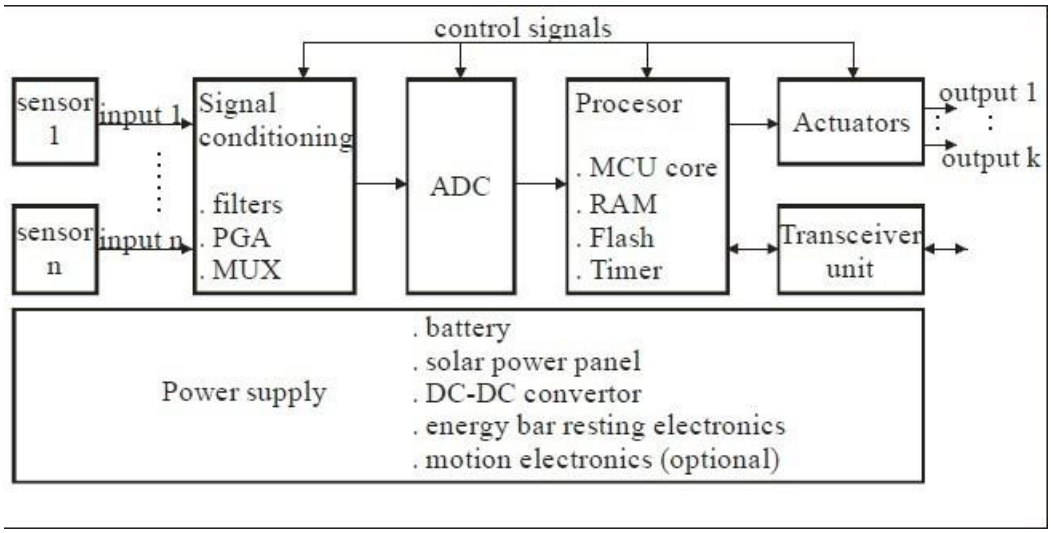


Fig. 3 Block Diagram of Management through Energy Harvesting Concept

(IV) Graph

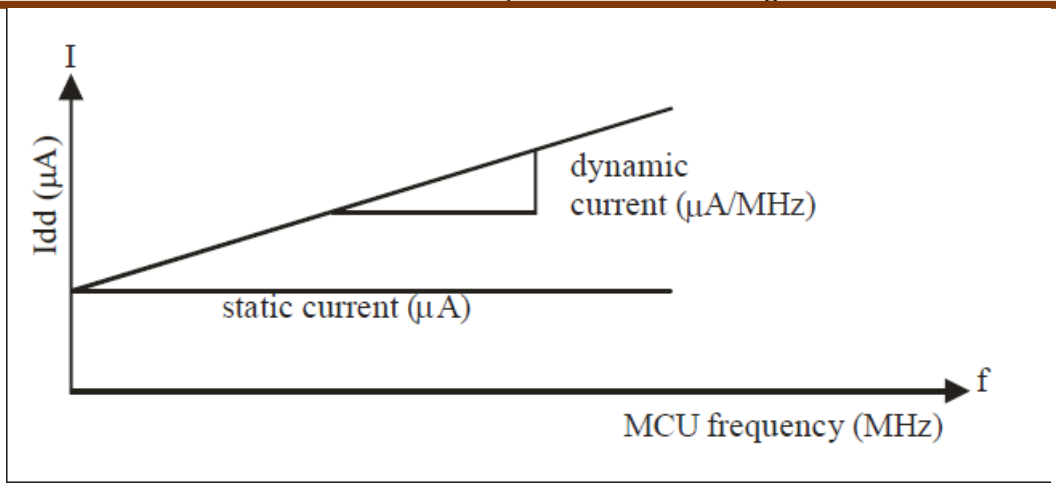


Fig. 4 Graph of Management through Energy Harvesting Concept

5.2.4 Moisture Monitoring System:

(I) Definition

The soil moisture sensor (SMS) is a sensor connected to an irrigation system controller that measures soil moisture content in the active root zone before each scheduled irrigation event and bypasses the cycle if soil moisture is above a user- defined set point.

(II) Explanation

The efficient irrigation management practices based on the monitoring of the moisture in thesoil provide a great benefit for the appropriate amount of water applied in the fields. This paper presents design and development of a soil moisture sensor and a response monitoring system. Theprobes used in this sensor are made of nickel which is an anti-corrosive and robust material for usein agricultural related applications.

The response monitoring system measure the moisture of the soil, compare it with the desired values given by the user and generate alert if soil moisture goes below desired value. It helps in problems related to growing of crops in which irrigation is required at irregular interval. It is also helpful in monitoring of soil moisture in golf fields. I. INTRODUCTION India is a developing nation with a very large population. Due to increasing population, the basic need such as food and water is increasing day by day.

Thus there is a need of saving these resources and utilize them in an efficient manner. Sincewater is one of the most important elements in our daily life, thus we must use efficient ways to utilize water and save it for future generations. One of method is efficient irrigation management practices for fields. Irrigation water management practices could greatly benefit by the knowledge

of moisture in the soil. To determine the soil moisture we have designed and developed a nickel probes based soil moisture sensor and a response monitoring system. By knowing the moisture value, we can estimate when to water and how much to water the fields so that there is no over-watering or wilting of crops. These practices will increase crop yield, improve quality of crops, conserve water resources, save energy, and decrease fertilizer supplies.

The soil moisture monitoring system can realize the continuous monitoring of soil moisture for a long time. The user can flexible arrange the soil moisture sensor according to the monitoringneeds; the sensor can also be arranged at different depths to measure the soil moisture situation inthe profit. The system also provides additional expansion capacity to increase the corresponding sensor according to monitoring requirements, monitoring soil temperature, soil conductivity, soil PH value, groundwater level, groundwater quality as well as air temperature, air humidity, light intensity, wind speed, wind direction, rainfall and other information, so as to meet the system function upgrade needs.

The soil moisture status of each monitoring point in time and accurately, which provides important basic information for disaster reduction and drought resistance, fertilization and irrigation.

Planting a tree in an environment where the seed or the plant would not get water adequatelythrough natural sources like rain or ground water in its initial phases has been always a matter of concern for tree planters. This is where an autonomous moisture monitor for plants system can help.

The system timely monitors the moisture level of the soil. If at the time of monitoring it comes to know that the moisture level of the soil is lower than recommended then it will raise an audio visual alert. This alert is then received by the care taker of the plant. When the care taker waters the plant the alarm goes off and the monitoring cycle continues.

In this system we use a timer IC to time the monitoring process. A moisture level sensor is used to detect the moisture level of the soil. An LED is used to give visual alarm and a Buzzer is used to give audio alarm to the care taker of the plant. Thus in this project with the help of a simple combinational circuit and a sensor we can help save a plant by maintaining the moisture level of the soil of the plant, thus keeping the plant healthy.

(III) Blok Diagram

Fig. 5 Block Diagram of Web Server

(A) Web Server

(B) General architecture

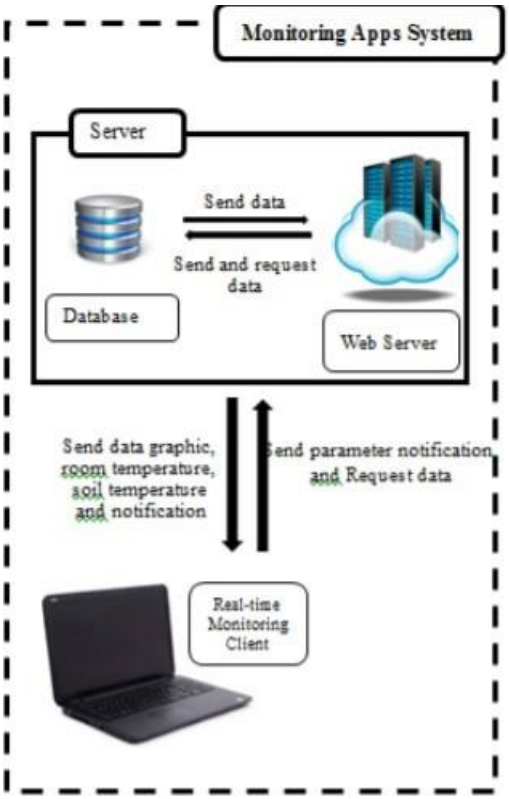


Fig. 6 Block Diagram of General architecture

5.2.5 Home Automation using IoT/Any other methodology

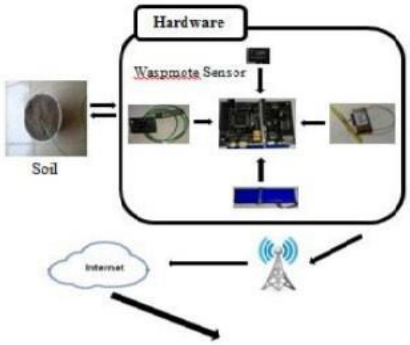
(I) Definition

The Internet of Things, commonly known as IoT, refers to any device that's connected to the Internet that isn't normally;for example, a smart light bulb that you can turn on and off viaan app. All home automation devices are IoT devices, which can be automated to trigger one another.

(II) Explanation

Home automation has become more and more popular in recent years. It aims at helping people manage the home appliances freely and build an autonomous environment in home. The aim of this project is the home automation with full security and controlling the home appliances using wireless communication as Wi-Fi. We design this smart home system with the implementation of related software and hardware. To assure security the PIR and vibration sensorsare used to detect the motion and vibration to prevent from theft. It alerts the people by buzzer andstarts to record it through HD spy camera.

Emergency Backup Protection Design Will Helpful To Residents. In Any Circumstances The Power Of Distribution Company Will Not Arrive Then At That Time This Backup Protection Will Use. This Backup Protection Can Run The Water Motor, Street Light, Panchayat House And School. Therefore The Instant Use Of Work Will Not Stop.



ESP8266 is used because the arduino has the advantages of ease understandability and easily modifiable. The arduino board is specially designed circuit board for programming and prototyping with ATMEL microcontroller. The microcontroller used in this arduino is ATmega 328 which is in-built in arduino board and the coding are done in java script.

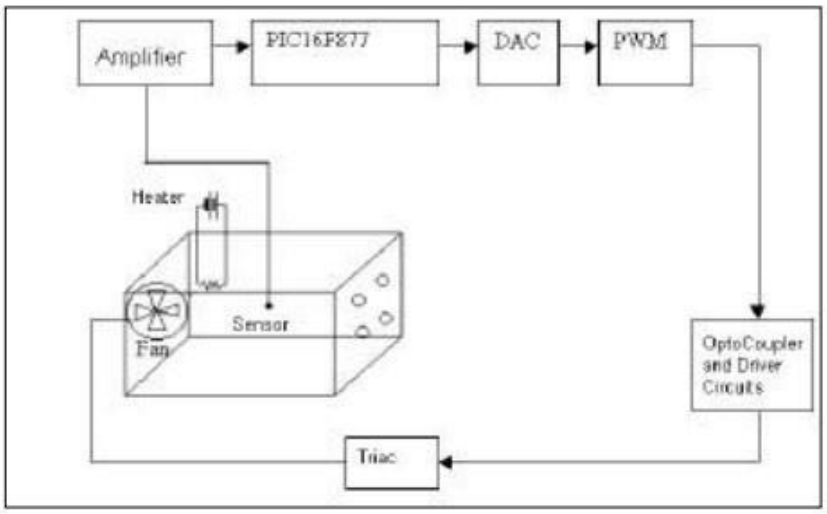
The IoT based home automation consist of several smart devices for different applications of lighting, security, home entertainment etc. All these devices are integrated over a common network established by gateway and connected in a mesh network. This means that it gives users the flexibility to operate one sensor based followed by the action of the other. For e.g. you can schedule to trigger the living room lights as soon as the door/windows sensor of your main door triggers after 7pm in the evening.

Thus all the sensors within a common network can perform cross-talk via the main controller unit. As shown in the figure, some of the smart sensors in home automation acts as sensor hubs. These are basically the signal repeaters of signal bouncers which that are located in the midway between the hub installation location and the sensors that are at a distant location. For such long distances, these sensor hubs play an important role to allow easy transmission of signals to sensorsthat are far away from the main controller but in closer proximity to the sensor hub. The commonlyused sensor hubs in IoT based Home Automation system are Smart Plugs.

Home automation is providing home safety for dwellers. It automatically turn lights on in closets, stairways, and other dark places. Thus accidentally tripping or running into thing is decreased. Everywhere environmental issues are raised before introducing any technology. In thisregard home automation provides a better solution. Devices included in home automation consumeless power. Besides, it saves energy. Thus home automation technology is so far environmentallysuitable. Moreover, the technology keeps mind in peace. In most cases, guardians face problems and always they keep tensioning for the safety of their children staying in home.

In home automation system internet access is used to control from far away. For years, internet is used only for surfing pages, searching information and downloading software and otherthings. Advancement of technology is forcing to make interaction internet with machineries and devices. In home automation system comfort and security of houses have been enhanced. Besides,people are concerning over costs. In offices, a division of people are employed only to make supervision of some manual means typed work. Home automation is replacing those arrangements.For this, cost is highly reduced. Besides, for manual labour engaged to control appliances waste energy in cases.

It is seen that appliances continue to run though people are not present in their respective places. For this energy cannot stop consuming. If this happens for a long time then there have possibility to misuse energy in a huge amount. To overcome this obstacle home automation is encouraged to apply. Home automation does that challenging work. That's why; home automationis presented as energy efficient. In recent years home automation is gaining much popularity. The trend is also in favor of using home automation technology. If we look around residences, malls, offices, use of home automation systems will draw attention.



(III) Block Diagram

Fig. 7 Block Diagram of Temperature control of the existing system

5.2.6 PC Based Electrical Load Control:

(I) Definition

For distant controlling and monitoring of different loads and by means of efficient power usage through real time power spending with the help of a PC based electrical load control.

(II) Explanation

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

For distant controlling and monitoring of different loads and by means of efficient power usage through real time power spending with the help of a PC based graphical user interface application. The progress of technology equipments is becoming simpler and easier for us. Automated systems have more benefits over manual system.

PC based electrical load controlled systems are highly reliable, precise and time conserving systems. They give number of features like rapid data storage, transfer data and data securities. For distant controlling and monitoring of different loads and by means of efficient power usage through real time power spending with the help of a PC based graphical user interface application.

The progress of technology equipments is becoming simpler and easier for us. Automated systems have more benefits over manual system. PC based electrical load controlled systems are highly reliable, precise and time conserving systems. They give number of features like rapid datastorage, transfer data and data securities.

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

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

Compilers are programs used to convert a High Level Language to object code. Desktop compilers produce an output object code for the underlying microprocessor, but not for other microprocessors.

Workin of Project :-

The main goal of this project is to control the electrical load through a PC (personal computer). For example, lighting in the theatre can be controlled form the PC for superior stage

At present, they are physically controlled which makes it complex to organize the lighting with the particular scene. By employing this system, one can manage the electrical load ON/OFFby just being seated at one place using a PC. The main goal of this project is to control the electricalload through a PC (personal computer). For example, lighting in the theatre can be controlled formthe PC for superior stage management.

(III) Block Diagram

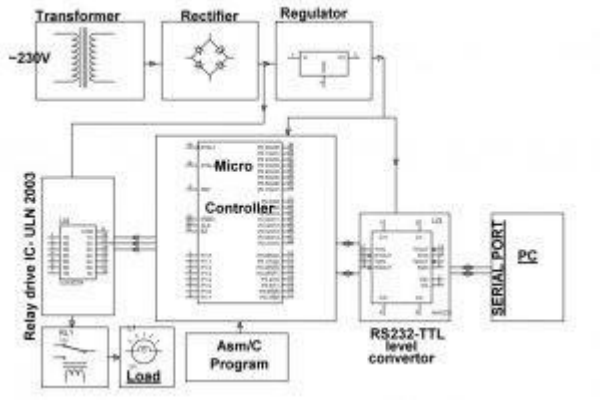


Fig. 8 Block Diagram of PC Based Electrical Load Control System Block Diagram

5.2.7 Electrical Parameters Measurements:

(I) Definition

Electrical parameters measurements are the methods, devices and calculations used to measure electrical quantities. Measurement of electrical quantities may be done to measure electrical parameters of a system.

(II) Explanation

Electrical Parameter	Measuring Unit	Symbol
Voltage	Volt	V or E
Current	Ampere	I or i
Resistance	Ohm	R or Ω
Conductance	Siemen	G or ℧

Table No. 1

The standard units of electrical measurement used for the expression of voltage, current and resistance are the Volt [V], Ampere [A] and Ohm [Ω] respectively.

These electrical units of measurement are based on the International (metric) System, also known as the SI System with other commonly used electrical units being derived from SI base units.

Sometimes in electrical or electronic circuits and systems it is necessary to use multiples orsub-multiples (fractions) of these standard electrical measuring units when the quantities being measured are very large or very small.

Multiples and Sub-multiples :-

There is a huge range of values encountered in electrical and electronic engineering betweena maximum value and a minimum value of a standard electrical unit. For example, resistance canbe lower than 0.01Ω or higher than 1,000,000Ω. By using multiples and submultiple's of the standard unit we can avoid having to write too many zero's to define the position of the decimal point. The table below gives their names and abbreviations.

Prefix	Symbol	Multiplier	PowerofTen
Terra	T	1,000,000,000,000	10^{12}
Giga	G	1,000,000,000	10^{9}
Mega	M	1,000,000	10^{6}
Kilo	K	1,000	10^{3}
None	None	1	10^{0}
Centi	C	1/100	10^{-2}
Milli	M	1/1,000	10^{-3}
Micro	µ	1/1,000,000	10^{-6}
Nano	N	1/1,000,000,000	10^{-9}
Pico	P	1/1,000,000,000,000	10^{-12}

Table No. 2

So to display the units or multiples of units for either Resistance, Current or Voltage wewould use as an example:

- 1kV = 1 kilo-volt – which is equal to 1,000 Volts.

Likewise, if we needed to convert kilo-hertz into mega-hertz we would need to divide by one thousand. A much simpler and quicker method would be to move the decimal point either leftor right depending upon whether you need to multiply or divide.

- 1mA = 1 milli-amp – which is equal to one thousandths (1/1000) of an Ampere.
- 47kΩ = 47 kilo-ohms – which is equal to 47 thousand Ohms.
- 100uF = 100 micro-farads – which is equal to 100 millionths (100/1,000,000) of a Farad.
- 1kW = 1 kilo-watt – which is equal to 1,000 Watts.
- 1MHz = 1 mega-hertz – which is equal to one million Hertz.

To convert from one prefix to another it is necessary to either multiply or divide by the difference between the two values. For example, convert 1MHz into kHz.

Well we know from above that 1MHz is equal to one million (1,000,000) hertz and that 1kHzis equal to one thousand (1,000) hertz, so one 1MHz is one thousand times bigger than 1kHz. Then to convert Mega-hertz into Kilo-hertz we need to multiply mega-hertz by one thousand, as 1MHzis equal to 1000 kHz.

Likewise, if we needed to convert kilo-hertz into mega-hertz we would need to divide by one thousand. A much simpler and quicker method would be to move the decimal point either leftor right depending upon whether you need to multiply or divide.

As well as the "Standard" electrical units of measure shown above, other units are also usedin electrical engineering to denote other values and quantities such as:

- Wh – The Watt-Hour, The amount of electrical energy consumed by a circuit over a period of time. Eg, a light bulb consumes one hundred watts of electrical power for one hour. It is commonlyused in the form of: Wh (watt-hours), kWh (Kilowatt-hour) which is 1,000 watt-hours or MWh (Megawatt-hour) which is 1,000,000 watt-hours.
- dB – The Decibel, The decibel is a one tenth unit of the Bel (symbol B) and is used to represent gain either in voltage, current or power. It is a logarithmic unit expressed in dB and is commonly used to represent the ratio of input to output in amplifier, audio circuits or loudspeaker systems.

  For example, the dB ratio of an input voltage (V_{IN}) to an output voltage (V_{OUT}) is expressed as $20\log_{10}$ (Vout/Vin). The value in dB can be either positive (20dB) representing gain or negative (-20dB) representing loss with unity, ie input = output expressed as 0dB.
- θ – Phase Angle, The Phase Angle is the difference in degrees between the voltage waveform and the current waveform having the same periodic time. It is a time difference or time shift and

CHAPTER: 6
SWACHH BHARAT ABHIYAN (CLEAN INDIA)

6.1 Swatchhta needed in allocated village -Existing Situation with photograph

Swachh Bharat Abhiyan

fig6.1 solid waste lump

Swachh Bharat Mission is a mass movement for cleanliness launched on 2nd October 2014 by the Prime Minister of India. The Swachhta Abhiyan has turned into a National Movement with citizens now becoming activeparticipants in cleanliness activities across thenation. The dream of a, Clean India "once seen by Mahatma Gandhi is being realized with millions of people across the country joining the cleanliness initiatives of the government departments, NGOs and local community centers to make India clean as a part of this Jan Andolan".Geo-spatial Technology for Swachh BharatAbhiyan

A novel initiative to contribute in the Swachh Bharat Abhiyaan using the Geo-spatial Technology (GST) was taken up jointly Dehradun. This initiative was supported by Nagar Nigam, Dehradun (local authorities). Indian Institute of Remote Sensing (IIRS), a Unit of ISRO, coordinated this programme in collaboration with the following institutions

6.2 Guidelines for the process of the implementation in your village with photograph:

- Safe sanitation means promotion of safe disposal of human excreta, right use of toilet and avoiding open defecation as well as management of solid and liquid waste
- To achieve "Swachh Bharat" by 2019, the main objectives of the SBM are to Bring aboutan improvement in the general quality of life in the rural areas, by promoting cleanliness,hygiene and eliminating open defecation, , Motivate communities and Panchayati Raj Institutions to adopt sustainable sanitation . practices and facilities through awareness creation and health education. Encourage cost effective and appropriate technologies for ecologically safe and sustainable sanitation

- Develop, wherever required, community managed sanitation systems focusingscientific Solid & Liquid Waste Management systems for overall cleanliness in the ruralareas Create significant positive impact on gender and promote social inclusion by improving sanitation especially in marginalized communities.
- Sanitation technologies: While it has been found that twin pit pour flush toilet technologyis the most responsive technical option in most geographies, an illustrative list of technology options, with cost implications will be provided to meet the user preferences and location-specific needs.
- Swachhagrahis: There is a need for a dedicated, trained and properly incentivized sanitation workforce at the village level. An army of 'foot soldiers' or 'Swachhagrahis',earlier known as 'Swachhata Doots' could be developed and engaged through existing arrangements like Panchayati Raj Institutions, Co-operatives, ASHAs, Anganwadi workers, specifically for the purpose
- Availability of water: Conjoint programmes may be prioritized at the District 8 and GP levels under SBM and the National Rural Drinking Water Programme (NRDWP), to maximize the availability of water in villages which is an important factor for sustainingsanitation facilities created. Rural School Sanitation focusing on separate toilets for girlsand boys remains a major intervention which shall be implemented under the programmes of the Department of School Education. Water will be provided inside the toilets for both boys and girls.

6.3 Activities Done by Students for allocated village with Photograph:

- While traveling doesn't throw any wrapper, paper or any dry waste on road. Keep it inyourbag or pocket (as it is a dry waste you can keep them in your bag/pocket).
- Keep paper bags with yourself to store wet waste and throw them in dustbin only.
- Spitting on roads (as it can be the reason of viral disease).
- Avoid chewing Pan-Masala, Gutka and Tobacco.
- Avoid use of plastic bag.
- Follow government's rules and regulations.
- If someone is breaking the rule then make them aware of it.
- Stop your friends if they are making such mistakes.
- Spread awareness to keep our village clean.

Education start-ups can also partner with other schools for spreading awareness among the adults in rural areas. If the elderly populace of villages does not comprehend the value of education, they won't allow their children to study

CHAPTER: 7

VILLAGE CONDITION DUE TO COVID-19:

The The stigmatization of those infected or suspected to have COVID-19 is likely to result in unreported cases. And, indeed, some reports suggest that this is taking place. This means the situation can only get worse for COVID-19 victims and is undermining efforts to mitigate the pandemic

COVID-19 had mostly remained in India's cities, but the disease is now spreading to rural India – an area with over 850 million people and far worse healthcare. The reason for this shift appears to be migrant workers who have been returning to their villages since lockdown was eased at the end of June. The medical response to stop the spread and treat those infected has been inadequate, according to media reports. With one trained doctor for every 1,497 people, against the World Health Organization recommended one per 1,000, and public health expenditure for 2018 at just 1.3% of GDP, India faces an uphill struggle in dealing with the pandemic. While two-thirds of India's population lives in rural areas, there are almost four times as many health workers per person in cities. Most rural communities rely on untrained health workers. Over two-thirds of these rural health providers have no formal medical training, but remain the only option of medical support for most of the rural population.

The stigmatization of those infected or suspected to have COVID-19 is likely to result in unreported cases. And, indeed, some reports suggest that this is taking place. This means the situation can only get worse for COVID-19 victims and is undermining efforts to mitigate the pandemic. In the long term, it threatens India's recovery and progress, with the potential for many people to become debilitated with illness and economic hardship

7.1 Taken steps in allocated village related to existing situation withphotograph

The nation-wide lockdown imposed in India from March 25 to May 31, 2020 following the breakout of the Covid-19 pandemic affected rural India in diverse ways. This was only to beexpected given the great variation in production systems and socio-economic conditionsin villages across agro-ecological zones. Fig 7.1 interaction with sarpanch with mask

Even as India has reached a new level in Covid-19 with over one lakh positive cases, there is no clear idea yet on the incidence of the disease in the rural areas. Irrespective of any such incidence, rural areas have also come to bear a major brunt of the lockdown imposed sinceMarch 25.Proactive measures are needed on thepart of the government and civil society to safeguard rural populations from the economic fallout of this pandemic. These could include:

1. Continuing the supply chain of midday meals and Anganwadi meals, and delivering them to thefamilies' doorsteps, so that children and pregnant mothers get at least one meal a day.

2. Supplying free ration to rural households through the public distribution system.

3.Supporting rural households with 30-50 days' worth of labour wages, from the MGNREGA

4.Leveraging the SHG network and ASHA workers to disseminate IEC material.

5. Extending Village Organizations (VOs) to provide soft loans to households that lose wage days and/or incur COVID-19-related health expenses—State Rural Livelihood Missions may consider extending the use of the Vulnerability Reduction Fund (VRF) to the VOs for this purpose.

6. Rescheduling bank loan repayment cycles for SHGs and individual agricultural debtors.The current crisis is one which we are not fully equipped for, nor know enough about. Preparing and empowering the rural population would go a long way in this fight.

7.2 Activities Done by Students for allocated village Clean with Photograph:

We provide awareness, safety measures and precautions regarding COVID-19. We provide awareness, safety measures and precautions regarding COVID-19.we have gone through different task and have done few objectives aand process for make our village cleaner and beautiful.

Providing midday meals and Anganwadi meals, and delivering them to thefamilies' doorsteps, so that children andpregnant mothers get at least one meal a day.

Supporting rural households with 30-50 days' worth of labour wages, from the MGNREGALeveraging the SHG network and ASHA workers to disseminate IEC material.

In a parliamentary democracy, the bedrock of this approach is the willingness of the people to cooperate, accept responsibility and have confidence in the system. These three pillars, in turn, are anchored in the trust citizens have in the government machinery delivering public services. India's pandemic response has made it clear how feeble such trust really is.

7.3 any other steps taken by the students / villagers:

Villagers took each and every precautions and safety measures regarding COVID-1 Villagers took eachand every precautions and safety measures regarding COVID-1. The current crisis is one which we are not fully equipped for, nor know enough about. As the situation was really critical as we consider as thecurrent covid situation .For our and the villagers safety from thecovid we have taken some basic care to get the maximum safety from the coivd itself . we have always taken into consideration of hand gloves ,mask and sanitaizer . during the interaction with any vilagers or village sarpanch we make sure everyoneof us have our mask and hand gloves on and insist the villagers or the village sarpanch.some good enoughdistance of about 5 feet was maintained for our best safety.

CHAPTER: 8
SUSTAINABLE DESIGN PLANNING PROPOSAL

8.1.1 Public toilet:

In our village NANI BHATLAV, The Public toilet facilities is not available. The villagers are gone for a toilet in open space area and agriculture area also. So, dinginess is spread in village and due to dinginess diseases are also spread in people. So, we are design the public toilet for neat and clean village.

Single entrance/exit plans work satisfactorily provided the path of the users do not cross each other and the main entrance is wide enough. Dispensing with the main entrance door to the public toilet not only helps to improve the ventilation within the toilet but also minimizes hand contact for hygiene reasons (See Illustration 2). The main entrance shall preferably have no door, and the cubicles, urinals and mirrors shall be away from the line of sight from the main entrance.

For example, the door can be replaced by offset entrance maze which blocks the view yet allows easier, hands-free access.

For installation of main entrance without doors, there are several screening arrangements showing the visibility from outside in each case. Consideration should be given to the positioning of the mirrors and to the gaps created by the hinges. For example, the access entrance to male public toilets should not open directly to the urinal area. Avoid entrances opening onto a wall surface with the mirror reflecting the urinals. Public toilets should be designed to minimize hand contact as far as possible for hygienic reasons. Electronic products for toilets such as flush valves and faucets require minimum maintenance but offer enhanced operations that promote sanitation and perceived cleanliness because of hands-free operation.

Location of accessible toilets should not be too remote from the main traffic area to avoid long travel distance. It should be easily accessible for those with urgency for the users. Directional signs leading to such toilets should meet the requirements specified in Building and Construction Authority's (BCA) Code on Accessibility in the Built Environment.

Clear signage should be designated for each gender of required public toilet facilities. The location of the signs should be near the entrance to each toilet facility and clearly displayed at noticeable locations in main traffic passageways to direct the public to the toilets. Signage should indicate the distance or time.

We use the plastic block in brick wall to reduce the amount of the design and also give more life the structure.

Use the plastic block in brick wall.

Materials:

- Plastic waste
- Fly ash
- Recycled plastic
- Rock dust
- Ceramic dust
- Coarse aggregate

Advantages:

- Available at a cheaper rate
- Environment friendly
- The solution to plastic waste generation
- Can be used in small villages

Size:

- 9*4*3”

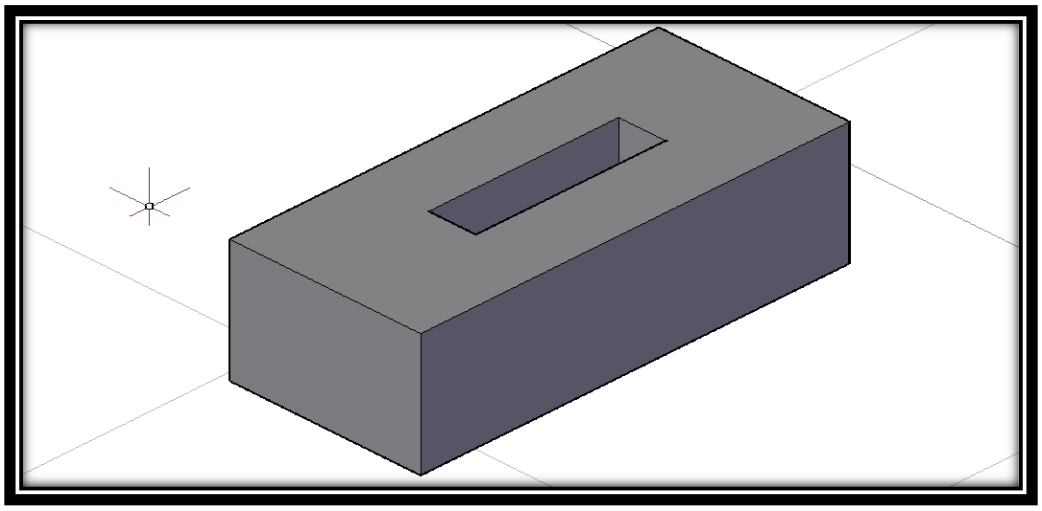
Developer:

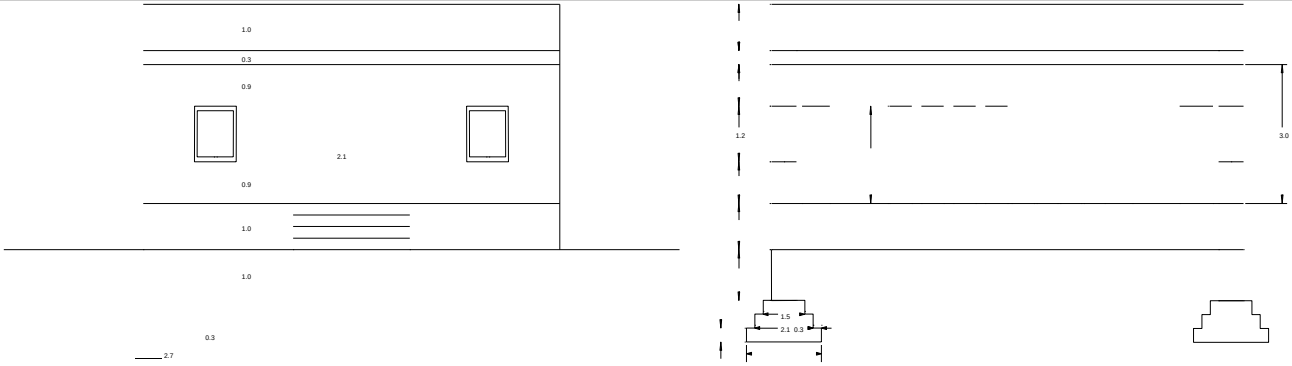
- Addin Infra Limited, Ahmedabad

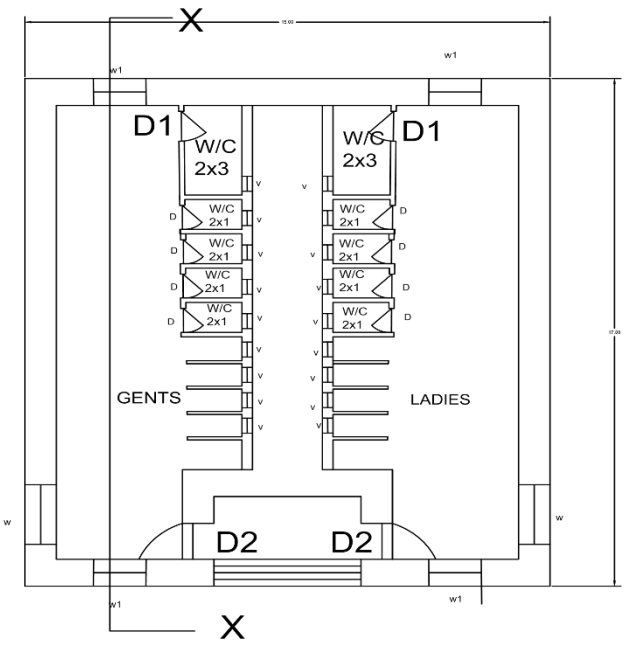
Price:

- Rs. 45/box

Fig8.1 plastic block 3D model







DESIGN NO.	**PUBLIC TOILET**
PREPARED BY	**JOSHI NIRMIT PANCHOLI RIMPLE**
PROJECT NAME	**VISHWAKARMA YOJANA PHASE VIII RANASAR, GANDHINAGAR**
INSTITUTE	**S.N.P.I.T. & R.C., UMRAKH**
UNIVERSITY	**GUJARAT TECHNOLOGICAL UNIVERSITY**

Fig8.2 3D Model of Public Toilet

Measurement Sheet of skill development center						
Sr. No	**DESCRIPTION**	**NO.**	**L**	**B**	**H**	**QUANTY**
	Total Centre line =4x10.4+4x11.9 =89.2m No. Of T-junction=16					
1.	Excavation for foundation up to 1.5 depth					
	(numberofteajunction×width÷2)					
	=89.2-(16×0.9÷2) = 82m	1	82	0.9	0.9	66.42m^3
	For steps:					
	L=1.2+0.15=1.5m	1	1.5	0.6	0.15	0.135m^3
					Total	66.55m^3
2.	Providing and laying PCC (1:4:8) for foundation	1	82	0.9	0.3	22.14m3
	Steps	1	1.5	0.9	0.15	0.236m^3
					Total	22.376m^3
3.	First class brick masonry C:M(1:6) for foundation					
	Step:-1(60cm)					
	L=84.4m	1	84.4	0.6	0.3	15.192m^3
	Step:-2(50cm)					
	L=85.2m	1	85.2	0.5	0.3	12.78m^3
					Total	27.97m^3
4.	Back filling in foundation					
	=66.42-27.97=38.45m3				Total	38.45m3
5.	First class brick masonry G.L to P. L					
	L=86m	1	86	0.4	0.575	19.78m3
	Step1.	1	1.2	0.3	0.15	0.054
	Step2.	1	1.2	0.3	0.30	0.108
	Step3.	1	1.2	0.3	0.45	0.162
					Total	20.104m3
6.	DPC(2.5cmthick)	1	86	0.4		34.4m2
	Deduction:					
	D	1	1.2	0.4		0.48
	D1	5	0.9	0.4		1.8
					Total	2.28m2
	(a)W	8	0.9	0.3	1.2	2.592
	(5)ventilation	1	0.6	0.3	0.6	0.108

				Net total		67.923m^3
7.	Half brick partition wall in C:M (1:6)					
	PLW	1	1		3	3
	PSW	1	2		3	6
	For toilet					
	Lw	1	2		3	6
	Sw	1	2		3	6
	Deduction:					
	O	1	0.5		2.1	1.05
	D3	1	0.75		2.1	1.575
				Net total		18.375m^3
8.	Providing and laying RCC(1:2:4) for slab, lintel, chhajja					
	(1) Lintel L=86.8m	1	86.8	0.3	0.15	3.906
	(2) Chhajja					
	(a)W	8	1.2	0.6	0.1	0.576
	(3)RCC slab	1	12.2	10.7	0.1	13.054
					Total	17.608m^3
9.	Providing mild steel reinforcement in RCC work					
	Quantity=1%ofvolumeofconcrete					
	=17.608×78.54=1382kg					
					Total	1382kg
10.	12cmthickplaster					
	(A)Internal plaster					
	(1)ceiling					
	Beutiparlar class	1	4	4		16
	Computer class	1	4	4		16
	Tailoring class	1	3.5	4		14
m	Spoken English class	1	3.5	4		14
	Passage	1	2	8.3		16.6
	Open space	1	3.5	3		10.5
	Office	1	4	3		12
	Reception and water room	1	2	3		6
	Wall					
	Beutiparlar class	4	4		3	48
	Computer class	4	4		3	48
	Tailoring class	2	3.5		3	21

		2	4		3	24
	Spoken English class	2	3.5		3	21
		2	4		3	24
	Passage	1	1.5		3	4.5
		1	11.6		3	34.8
		1	8.6		3	25.8
		1	3.5		3	25.8
	Office	2	4		3	24
		2	3		3	12
	Reception and water room	2	2		3	12
					Total	429.5m2
11	External plaster up to parapet					
	Lw	2	12.2	0.2		4.88
	Sw	2	10.3	0.2		4.12
	Parapet inside					
	Lw	2	11.8		0.9	21.24
	Sw	2	10.3		0.9	18.54
	Chajja (window)					
	Face	8	1.2		0.1	0.96
	Side	2x8	0.6		0.1	0.96
	Top	8	0.6		0.1	5.76
	Bottom	8	0.6		0.1	5.76
					Total	272.9m2
	Deduction					
	D	1	1.2		2.1	2.52
	D1	5	0.9		2.1	9.45
	D2	1	0.75		2.1	1.575
	W	8	0.9		1.2	8.64
	V	1	0.6		0.6	0.36
	O	1	0.5		2.1	1.05
					Total	23.595m2
				Net total		678.805m2
12.	5cmthickmosictilesflooring					
	Beutiparlar class	1	4	4		16
	Computer class	1	4	4		16
	Tailoring class	1	3.5	4		14
	Spoken English class	1	3.5	4		14
	Passage	1	2	6.6		13.2

	Open space	1	3.5	3		10.5
	Office	1	4	3		12
	Reception and water room	1	2	2		4
					Total	99.7m2
13.	10cmBBLC(1:2:4)					
	Beutiparlar class	1	3.9	3.9	0.1	1.521
	Computer class	1	3.9	3.9	0.1	1.521
	Tailoring class	1	3.4	3.9	0.1	1.326
	Spoken English class	1	3.4	3.9	0.1	1.326
	Passage	1	1.9	8.5	0.1	1.615
	Open space	1	3.4	2.9	0.1	0.986
	Office	1	3.9	2.9	0.1	1.131
	Reception and water room	1	1.9	2.9	0.1	0.551
					Total	9.977m3
14.	Sand filling/murum					
	Beutiparlar class	1	3.9	3.9	0.45	6.84
	Computer class	1	3.9	3.9	0.45	6.84
	Tailoring class	1	3.4	3.9	0.45	5.967
	Spoken English class	1	3.4	3.9	0.45	5.967
	Passage	1	1.9	8.5	0.45	7.267
	Open space	1	3.4	2.9	0.45	5.08
	Office	1	3.9	2.9	0.45	2.47
	Reception and water room	1	1.9	2.9	0.45	4.437
					Total	44.868m3
15.	Providing and laying skirting of mosaic tiles					
	Beutiparlar class	4	4			16
	Computer class	4	4			16
	Tailoring class	2	3.5			7
		2	4			8
	Spoken English class	2	3.5			7
		2	4			8
	Passage	2	11.2			22.4
	Office	2	4			8
		2	3			6
	Reception and water room	4	2			8
	Deduction					
	D	1	1.2			1.2
	D1	5	0.9			4.5

	D2	1	0.75			0.75
	O	1	0.5			0.5
					Total	99.45m

ABSTRACT SHEET					
Sr.no	**Description**	**Quantity**	**Rate**	**Per**	**Amount (Rs)**
1	Excavation for foundation up to 1.5m depth in ordinary soil	27.391cu .m	85	M^3	2328.23
2	Providing and lying PCC for foundation	5.334cu. m	1500	M^3	8001
3	2^{nd} class brick masonry CM(1:6) for				
	Foundation	11.898cu .m	1600	M^3	19036.8
4	Backfilling in foundation	14.737cu ,m	50	M^3	736.85
5	1^{st} class brick masonry from G.L to P.L	8.767cu. m	1600	M^3	14027.2
6	Providing and lying DPC	12.45sq. m	150	M^2	1867.5
7	1^{st} class brick masonry CM(1:6) for				
	Super structure	29.709cu .m	1500	M^3	44563.5
8	Half brick partition wall CM(1:3)	45.87sq. m	750	M^2	34,402.5
9	Providing and lying RCC (1:2:4)	9.102cu. m	2500	M^3	22755
10	Providing mild steel reinforcement for				
	RCC work	714.50kg	35	KG	25007.5
11	12mm thick cement plaster	313.56sq. m	150	M^2	47034
12	5cm thick mosaic tiles floor	35.745sq. m	200	M^2	7149
13	10cm thick BBLC(1:2:4)	3.302cu. m	1000	M^3	3302
14	Sand filling/murrum filling	14.85cu. m	50	M^3	742.5

15	Providing and lying white glazed tiles at				
	Toilet floor	16.8sq.m	200	M^2	3360
		Total			2,34,313.58
		3%contingency			7,029.40
		2% work charge establishment			4,686.27
		Total			2,46,029.25
		10% contractor profit			24,602.92
		GRAND TOTAL			2,70,632.17

8.1.2 Sustainable Design (Rain Water Harvesting):

Water is our most precious natural resource and something that most of us take for granted. We are now increasingly becoming aware of the water to our survival and its limited supply.

The Harvesting of rainwater simply involves the collection of water from on surfaces which rain falls, and subsequently storing this water for later use. Normally water is collected from the roofs of the buildings and stored in rainwater tanks.

Importance:

- By capturing water directly, we can significantly reduce our reliance on water storage dams. This places less stress on these dams and can potentially reduce the need to expand these dams or build new ones.
- Collecting and using your own water can also significantly reduce your water bills.
- By capturing water, the flow of storm water is also reduced and this minimizes the likelihood of overloading the storm water systems in our neighborhoods

.

Components of Rainwater Harvesting System

Cachments.

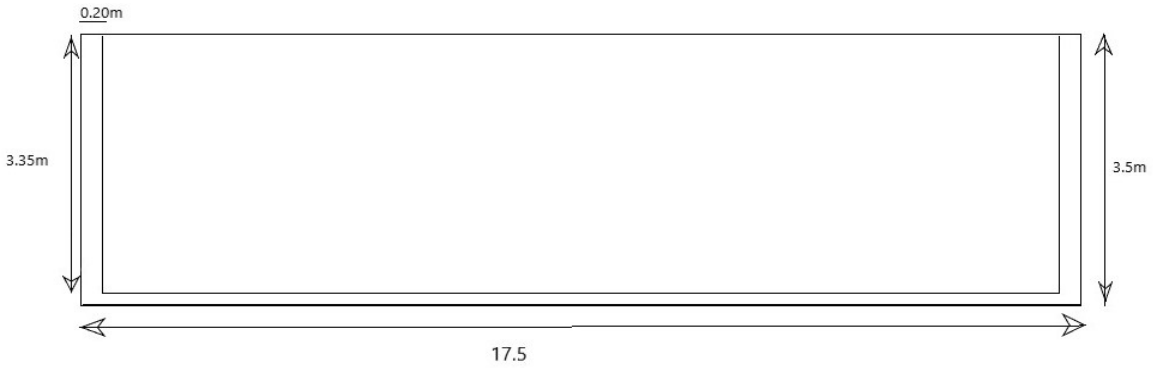
Coarse mesh.

Gutters.

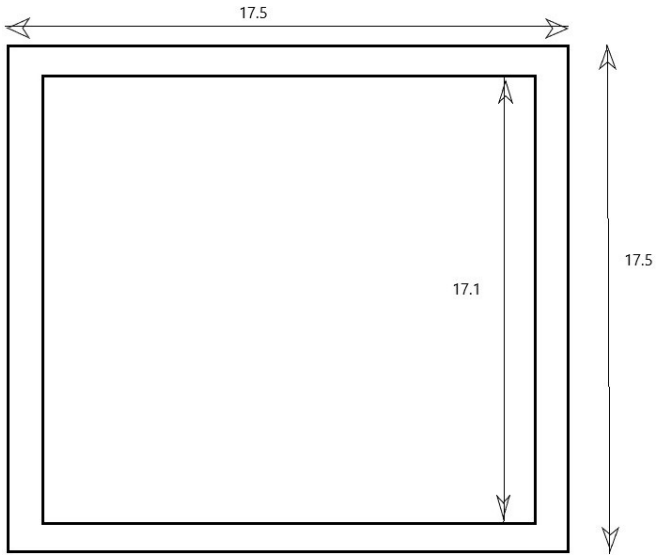
Conduits. First flush.Filters.

Storage tanks and.

Recharge structures.

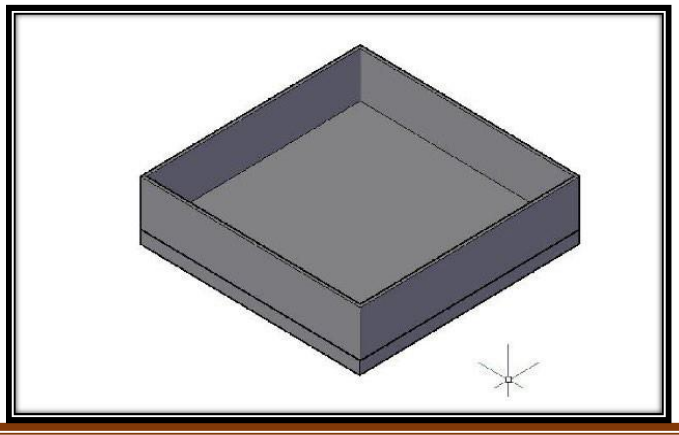


SECTION



PLAN

DESIGN	**WATER TANK**
PREPARED BY	**JOSHI NIRMIT PANCHOLI RIMPLE**
PROJECT NAME	**VISHWAKARMA YOJANA PHASE VIII RANASAR, GANDHINAGAR**
INSTITUTE	**S.N.P.I.T. & R.C., UMRAKH**
UNIVERSITY	**GUJARAT TECHNOLOGICAL UNIVERSITY**



Catchment Area (A) = 85 x 30 = 2550 ft2 = 273.21 m2Average Annual Rainfall = 1.15 m
Average rate of Rainfall = 625 mm/hrRunoff co-efficient = 0.85

Step: 1
he maximum amount of rainfall that can be harvested potentially = 337.21 x 0.85 x 1.15
= 231.87 cum.

Step: 2
From IS: 15797: 2008,
Table no: 1, Interpolating the value of the value of water availability = 232 cum.

Step: 3
Calculation of Downpours:
No. of Downpours = Roof drainage area /Max. roof drainage area served per downpour
= 237.21 /53
= 4.47 = 5
Step: 4
Diameter of gutter and width of G.I. sheet.Rainfall Intensity = 60 mm/hr
From IS: 15797: 2008, table-3 [Cl. 6.1(b)]
By interpolating the values, D
= 125.44 mm = 125.50 mmB
= 219.89 mm = 225 mm

Therefore, providing 5 inch diameter of gutter and 9 inch width of the G.I. Sheet.Step: 5
Estimating the size of Conveyance Pipe.
From table A-4, Guidelines for Rain Water Harvesting System handbook by Canada Authority
By interpolating the values, we got 5 inches for pipes.

Step: 6
Estimating the size of the required system.
V = t x n x q | from IS: 15797: 2008, cl. 6.
Where, V = Volume of tank, in litres
t = Length of Dry season, days
n = number of peoples using that tank
q = Consumption in litres per capita per dayV = 245 x 292 x 135 = 9657900 litres = 9658 m3
We have to design for 1000 m3 of water.
We are providing underground rectangular tank of size 17.5 m x 17.5 m x 3.5 mConsidering free board = 150 mm
Water Depth = 3.5 – 0.15 = 3.35 m

Volume = 17.1 m x 17.1m x 3.35 m = 979.573 m3 = 979573.5 liters

Measurement Sheet							
Sr. No.	Particular	No	L	B	H	Quantity	Total Quantity
1.	Excavation for Foundation for depth more than 3.3m including sorting out and stacking of useful material and disposing off the excavated stuff upto 50 m lead	1	17.5	17.5	3.5	1071.8 m^3	1071.8 m^3
2.	Providing and laying Cement Concrete 1:3:6 (1 cement : 3 coarse sand : 6 stone aggregate 40 mm nominal size) and curing complete excluding cost of formwork in foundation	1	17.5	17.5	0.10	30.625 m^3	30.625 m^3
3.	Providing and laying controlled cement concrete M15 for curing complete excluding the cost of formwork & reinforcement including curing Walls Slabs	 4 2	 17.5 17.5	 3.5 17.5	0.10 0.10	 24.50 m^3 61.25 m^3	85.75 m^3
4.	Deduction of Manholes from the top slab	2	0.60	0.60	0.10	0.072 m^3	61.25-0.072 =61.178 m^3
5.	Providing H.Y.S.D bar reinforcement for R.C.C work including bending binding and placing in position	85.67 m^3	@	70 Kg/ m^3		6000 Kg	6000 Kg

ABSTRACTSHEET					
Sr. no	Description	Quantity	Rate	Per	Amount (Rs)
1.	For Excavation of foundation	1071.8	124.00	Cum	132903.20
2.	Providing and laying P.C.C (1:3:6) excluding cost of formwork	30.625	2932.00	Cum	89792.50
3.	Providing and laying controlled cement concrete M15 for the walls excluding cost of reinforcement	24.50	4077.00	Cum	99886.50
4.	Providing and laying concrete and finishing smooth curing including	61.25	5927.00	Cum	363028.75

	the cost of formwork but excluding the cost of reinforcement in R.C.C slab				
5.	Reinforcement	6000	40.00	Kg	24000.00
				Total Rs.	709613.95
				Say Rs.	709614.00

8.1.3 Social-cultural Design (PUBLIC HEALTH CENTRE):

Use the Plastic blocks in walls.

Materials:
- Plastic waste
- Fly ash
- Recycled plastic
- Rock dust
- Ceramic dust
- Coarse aggregate

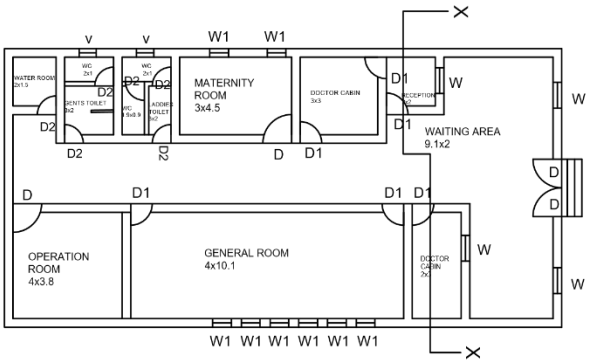
Advantages:
- Available at a cheaper rate
- Environment friendly
- The solution to plastic waste generation
- Can be used in small villages

Size:
- 9*4*3”

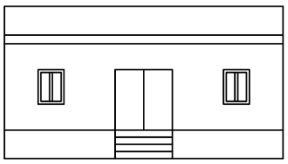
Developer:
- Addin Infra Limited, Ahmedabad

Price:
- Rs. 45/box

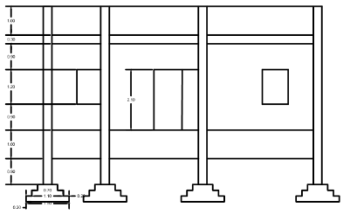
Public Health Center



PLAN



ELEVATION



SECTION X-X

DESIGN NO.3	Public Health Centre with Plastic block	
Preparaed By	NIRMIT JOSHI PANCHOLI RIMPLE	Sheet No.3
PROJECT NAME	VISHWAKARAMA YOJANA PHASE VIII RANASAR, GANDHINAGAR	
INSTITUTE NAME	S.N.P.I.T&R.C., UMRAKH	
UNIVERSITY NAME	GUJARAT TECHNOLOGICAL UNIVERSITY	

Fig 8.7 3D Modal of Public Health Center

Measurement Sheet of skill development center						
Sr. No	DESCRIPTION	NO	L	B	H	QUANTY
	Total Centre line=4x10.4+4x11.9= 89.2m No. Of T-junction=16					
1.	Excavation for foundation up to 1.5 depth					
	Length=total centerline-(numberofteajunction×width÷2)					
	=89.2-(16×0.9÷2)=82	1	82	0.9	0.9	66.42m3
	For steps:-					
	L=1.2+0.15=1.5m	1	1.5	0.6	0.15	0.135m3
				Total		66.55m3
2.	Providing and laying PCC(1:4:8) for foundation	1	82	0.9	0.3	22.14m^3
	Steps	1	1.5	0.9	0.15	0.236m3
				Total		22.376m^3
3.	First class brick masonry C:M(1:6) for foundation					
	Step:-1(60cm)					
	L=84.4m	1	84.4	0.6	0.3	15.192m^3
	Step:-2(50cm)					
	L=85.2m	1	85.2	0.5	0.3	12.78m^3
				Total		27.97m^3
4.	Back filling in foundation					
	=66.42-27.97=38.45m^3			Total		38.45m^3
5.	First class brick masonary G.L to P.L					
	L=86m	1	86	0.4	0.575	19.78m^3
	Step1.	1	1.2	0.3	0.15	0.054
	Step2.	1	1.2	0.3	0.30	0.108
	Step3.	1	1.2	0.3	0.45	0.162
				Total		20.104m^3
6.	DPC(2.5cmthick)	1	86	0.4		34.4m^2
	Deduction:-					
	D	1	1.2	0.4		0.48
	D1	5	0.9	0.4		1.8
				Total		2.28m2
				Net total		32.12m^2
7.	First class brick masonary for					

	superstructure					
	L=86.8m	1	86.8	0.3	3	78.12m^3
	Deduction					
	(1)Lintel	1	86.8	0.3	0.15	3.906
	(2)Door					
	(a)D	1	1.2	0.3	2.1	0.756
	(b)D1	5	0.9	0.3	2.1	2.835
	(a)W	8	0.9	0.3	1.2	2.592
	(5)ventilation	1	0.6	0.3	0.6	0.108
				Net total		67.923m^3
8.	Half brick partition wall in C:M (1:6)					
	PLW	1	1		3	3
	PSW	1	2		3	6
	For toilet					
	Lw	1	2		3	6
	Sw	1	2		3	6
	Deduction:-					
	O	1	0.5		2.1	1.05
	D3	1	0.75		2.1	1.575
				Net total		18.375m^3
9.	Providing and laying RCC (1:2:4) for slab, lintel, chhajja					
	(1)Lintel L=86.8m	1	86.8	0.3	0.15	3.906
	(2)Chhajja					
	(a)W	8	1.2	0.6	0.1	0.576
	(3)RCC slab	1	12.2	10.7	0.1	13.054
				Total		17.608m^3
10.	Providing mild steel reinforcement in RCC work					
	Quantity=1%ofvolumeofconcrete					
	=17.608×78.54=1382kg					
				Total		1382kg
11.	12cmthickplaster					
	(A)Internal plaster					
	(1)ceiling					
	Beutiparlar class	1	4	4		16
	Computer class	1	4	4		16
	Tailoring class	1	3.5	4		14
	Spoken English class	1	3.5	4		14
	Passage	1	2	8.3		16.6
	Open space	1	3.5	3		10.5

	Office	1	4	3		12
	Reception and water room	1	2	3		6
	Wall					
	Beutiparlar class	4	4		3	48
	Computer class	4	4		3	48
	Tailoring class	2	3.5		3	21
		2	4		3	24
	Spoken English class	2	3.5		3	21
		2	4		3	24
	Passage	1	1.5		3	4.5
		1	11.6		3	34.8
		1	8.6		3	25.8
		1	3.5		3	25.8
	Office	2	4		3	24
		2	3		3	12
	Reception and water room	2	2		3	12
				Total		429.5m2
11	External plaster up to parapet					
	Lw	2	12.2	0.2		4.88
	Sw	2	10.3	0.2		4.12
	Parapet inside					
	Lw	2	11.8		0.9	21.24
	Sw	2	10.3		0.9	18.54
	Chajja (window)					
	Face	8	1.2		0.1	0.96
	Side	2x8	0.6		0.1	0.96
	Top	8	0.6		0.1	5.76
	Bottom	8	0.6		0.1	5.76
				Total		272.9m2
	Deduction					
	D	1	1.2		2.1	2.52
	D1	5	0.9		2.1	9.45
	D2	1	0.75		2.1	1.575
	W	8	0.9		1.2	8.64
	V	1	0.6		0.6	0.36
	O	1	0.5		2.1	1.05
				Total		23.595m2
				Net total		678.805 m^2
12.	5cmthickmosictilesflooring					
	Beutiparlar class	1	4	4		16
	Computer class	1	4	4		16
	Tailoring class	1	3.5	4		14
	Spoken English class	1	3.5	4		14

	Passage	1	2	6.6		13.2
	Open space	1	3.5	3		10.5
	Office	1	4	3		12
	Reception and water room	1	2	2		4
				Total		99.7m2
13.	10cmBBLC(1:2:4)					
	Beautiparlour class	1	3.9	3.9	0.1	1.521
	Computer class	1	3.9	3.9	0.1	1.521
	Tailoring class	1	3.4	3.9	0.1	1.326
	Spoken English class	1	3.4	3.9	0.1	1.326
	Passage	1	1.9	8.5	0.1	1.615
	Open space	1	3.4	2.9	0.1	0.986
	Office	1	3.9	2.9	0.1	1.131
	Reception and water room	1	1.9	2.9	0.1	0.551
				Total		9.977m3
14.	Sand filling/murum					
	Beautiparlour class	1	3.9	3.9	0.45	6.84
	Computer class	1	3.9	3.9	0.45	6.84
	Tailoring class	1	3.4	3.9	0.45	5.967
	Spoken English class	1	3.4	3.9	0.45	5.967
	Passage	1	1.9	8.5	0.45	7.267
	Open space	1	3.4	2.9	0.45	5.08
	Office	1	3.9	2.9	0.45	2.47
	Reception and water room	1	1.9	2.9	0.45	4.437
				Total		44.868m3
15.	Providing and laying skirting of mosaic tiles					
	Beutiparlar class	4	4			16
	Computer class	4	4			16
	Tailoring class	2	3.5			7
		2	4			8
	Spoken English class	2	3.5			7
		2	4			8
	Passage	2	11.2			22.4
	Office	2	4			8
		2	3			6
	Reception and water room	4	2			8
	Deduction					
	D	1	1.2			1.2
	D1	5	0.9			4.5
	D2	1	0.75			0.75
	O	1	0.5			0.5
				Total		99.45m

ABSTRACTSHEET					
Sr. no	Description	Quantity	Rate	Per	Amount (Rs)
1	Excavation for foundation up to 1.5m depth in ordinary soil	99.279	85	M^3	8438.72
2	Providing and lying PCC for foundation	33.28	1500	M^3	49920
3	1st class brick masonry CM(1:6) for Foundation	42.33	1600	M^3	67728
4	Back filling in foundation	56.81	50	M^3	2840.7
5	1stclassbrickmasonryfromG.LtoP.L	30.43	1600	M^3	48689.6
6	Providing and lying DPC	47.14	150	M^2	7071
7	1stclassbrickmasonryCM(1:6)for				
	Superstructure	101.37	1500	M^3	152055
8	Half brick partition wall CM(1:3)	13.6	750	M^2	10200
9	Providing and lying RCC(1:2:4)	25.26	2500	M^3	63150
10	Providing mild steel reinforcement for				
	RCC work	1984	35	KG	69440
11	12mmthickcementplaster	1002.96	150	M^2	150444
12	5cmthickmosaictilesfloor	144.3	200	M^2	28860
13	10cmthickBBLC(1:2:4)	14.329	1000	M^3	14329
14	Sand filling/murrumfilling	64.47	50	M^3	3223.5
15	Providing and lying white glazed tiles				
	W.C	38.57	200	M^2	7714
16.	Providing and laying skirting of mosaic tiles	149.7	250	M	37425
		Total			7,21,528.52
		3% contingency			21,645.85
		2% work charge establishment:			14,430.57
		Total			7,57,604.94
		10%contractor profit			75,760.49
		GRAND TOTAL			8,33,365.43

8.1.4 Social-cultural Design (Grocery shop):

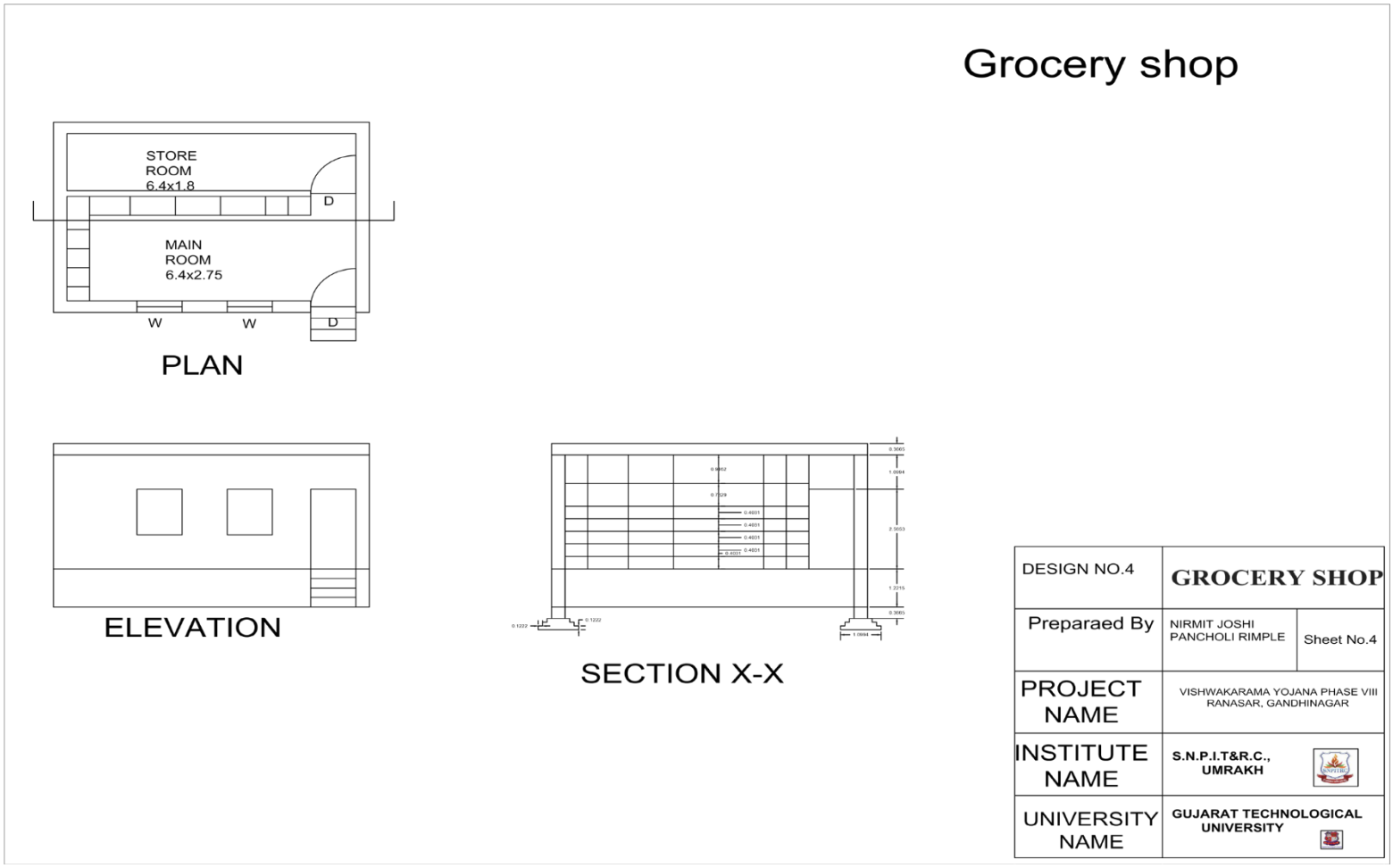


Fig 8.8 3D Model of Grocery shop

Measurement Sheet of public health center						
Sr. No	DESCRIPTION	No	L	B	H	QUANTITY
1	Center line=(6.7*3)+(5*2)=30.1m T-junction=3					
2	Excavation in foundation					
	L=C.L.-width/2*no of junction =30.1-(0.9/2)*3=24.7m	1	24.7	0.9	0.6	13.3m^3
3	P.C.C.(1:2:4) IN FOUNDATION L=30.1-(0.9/2)*3=24.3m	1	24.7	0.9	0.2	4.4M^3
4	Brick work in foundation					
	1)Step-1 (0.9m)L=30.1-(0.9/2)*3=28.7m	1	28.7	0.9	0.1	25.83m^3
	2)Step-2 (0.7m)L=30.1-(0.7/2)*3=29.05m	1	29.05	0.7	0.1	20.34m^3
	3)Step-3 (0.5m)L=30.1-(0.5/2)*3=29.35m	1	29.35	0.5	0.1	14.67m^3
					Total	60.84m^3
5	Earth filling in plinth level					
	1)Main room(6.4*1.8)	1	6.4	1.8	1	11.52m^3
	2)Store room(6.4*2.75)	1	6.4	2.75	1	17.6m^3
					Total	29.12m^3
6	No. of tiles					
	Tiles is 0.25*0.25 m					
	1)Main room=(6.4*1.8)/(0.25*0.25)=184.32m					
7	Brick masonry in super structure					
	L=30.1-(0.3/2)*3=29.65m	1	29.65	0.3	3	26.69m^3
	Deduction for Door & Window					
	D(1*2.1)	2	1	0.3	2.1	1.26m^3
	W(1*1.4)	2	1	0.3	1.4	0.84m^3
					Total	2.10m^3
	Actual quantity of Brick masonry in super structure					24.59m^3
8	Providing and laying RCC(1:2:4) for slab, lintel, Chhajja					
	(1)Lintel L=24.3m	1	24.3	0.3	0.1	0.729m^3

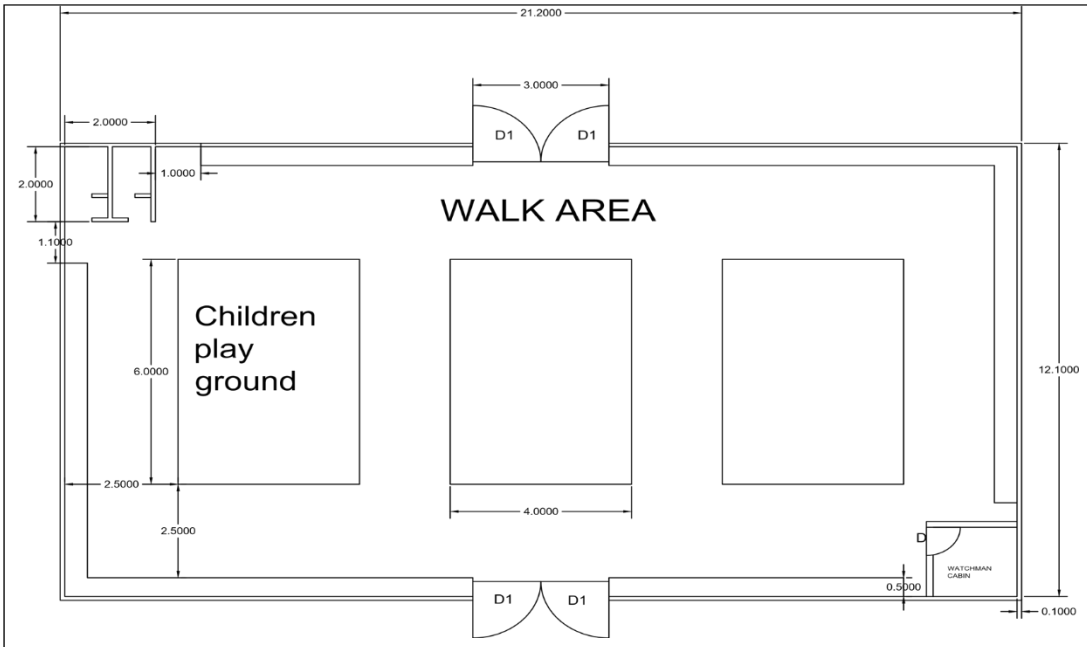
	(2)Chhajja					
	(a)W	2	1	0.3	1.4	0.84m^3
	(b)D	2	1	0.3	2.1	1.26m^3
	(3)RCC slab	1	7	5	0.1	3.5m^3
					Total	6.33m^3
9	Providing mild steel reinforcement in RCC work					
	Quantity=1%ofvolumeofconcrete					
	=6.33×78.54=459.19kg				Total: -	459.19kg
10	12cmthickplaster					
	(A)Internal plaster					
	(1)ceiling					
	Main Room	1	6.4	2.75		17.6
	Store room	1	6.4	1.8		11.25m
					Total	28.85m^3

ABSTRACTSHEET					
Sr. no	description	Quantity	Rate	Per	Amount (Rs)
1	Excavationforfoundationupto1.5mdepthi nordinarysoil	13.3	85	M^3	1130.5
2	Providing and lying PCC for foundation	4.4	1500	M^3	6600
3	1st class brick masonry CM(1:6) for				
	Foundation	60.84	1600	M^3	97344
4	Earth filling in foundation	29.12	50	M^3	1456
5	No. of tiles	30.43	1600	M^3	48688
6	Brick masonry in super structure	24.59	1500	M^3	36885
7	Providing and lying RCC(1:2:4)	6.33	2500	M^3	15825
10	Providing mild steel reinforcement for				
	RCC work	459.19	35	KG	16071.65
11	12mmthickcementplaster	28.85	150	M^2	4327.5
				Total=	228327.65
				3% contingency	6849.83
				2% work charge establishment:	4566.55

				Total =	239744.03
				10%contractor profit :-	23974.4
				GRAND TOTAL=	263718.4363

8.1.5 Socio-Cultural Design (DESIGN OF GARDEN):

Plan of Garden



NAME	SIZE
D	0.75X2.1
D1	1.5X1.5

DESIGN NO.	**GARDEN**
PREPARED BY	**JOSHI NIRMIT PANCHOLI RIMPLE**
PROJECT NAME	**VISHWAKARMA YOJANA PHASE VIII GANDHINAGAR**
INSTITUTE	**S.N.P.I.T. & R.C., UMRAKH**
UNIVERSITY	**GUJARAT TECHNOLOGICAL UNIVERSITY**

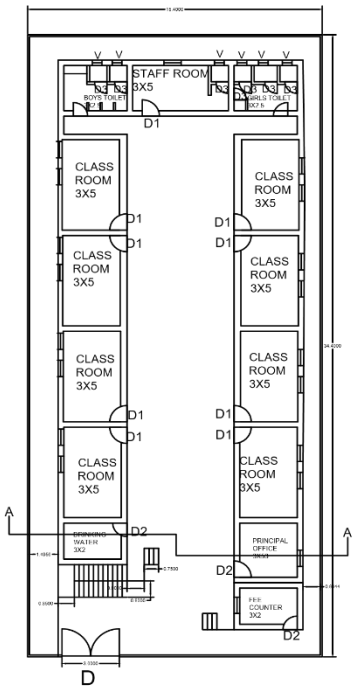
Measurement Sheet of GARDEN						
SR. NO	DESCRIPTION	NO.	L	B	H	QUANTITY
1.	Tatal area of garden for foundation , walling, gardening, soil filling, watering,etc.	1	12.20	21.20		2783.98 sq.ft.
	21.20 X 12.20 = 258.64 m^2 = 2783.98sq.ft.					
2.	Area of paver blocks in garden	1				7330 nos.
	(2.5 X 20 X 2) + (2 X 6 X 4) – (2.1 X 2.1) + (0.5 X 2 X 1) + (0.3 X 3 X 2)					
	= 146.39 m^2 = 1575.73 sq.ft.					
	One block size = 0.2 X 0.1 = 0.02 m^2 = 0.215 sq.ft.					
	No. of blocks = 1575.73 / 0.215 = 7328.97 = 7330 nos.					
3.	Partition wall up to 2 m height					
	SW	2	12		2	48
	LW	2	18.2		2	72.8
	21.20 – 3 = 18.2					
	TOILET WALL					
	Vertical wall	2	2.1		2.5	10.5
	Horizontal wall	1	1.5		2.5	3.75
					Total :-	135.05 m^2
4.	RCC slab for toilet	1	2.2	2.2	0.1	0.484 m^3
5.	Providing mild steel reinforcement for RCC work including binding and bending and placing position					

	Quantity = 1 % of volume of concrete					
	= 0.484 X 78.54 = 38.01 = 38 kg					38 kg

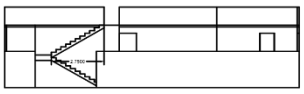
ABSTRACT SHEET					
SR. NO	DESCRIPTION	QUANTITY	RATE	PER	AMOUNT(RS)
1.	Running foot rate includes foundation, walling, gardening, soil filling, watering, etc.	2783.98 sq.ft.	300	Sq.ft.	835194
2.	Benches (FRP garden benches)	4 nos.	6500	Bench	26000
3.	Double seesaw (iron yellow, orange double seesaw)	1 nos.	8000	Piece	8000
4.	Slides (FRP wave slide yellow)	1 nos.	27000	Set	27000
5.	Paver blocks (garden paver block for landscaping-grey colour)	7330 nos.	25	block	183250
6.	Half brick Partition wall (1:3)	135.05 m^2	1500	M^2	202575
7.	RCC slab for toilet (1:2:4)	0.484 m^3	2500	M^3	1210
8.	Providing mild steel reinforcement for RCC work	38 kg	45	Kg	1710
		TOTAL :-			1284939
		3 % CONTINGENCY :-			38548.17

		2 % WORKCHARGE ESTABLISHMENT :-	25698.78
		TOTAL :-	1349185.95
		10 % CONTRACTOR PROFIT :-	134918.595
		GRAND TOTAL :-	1484104.545

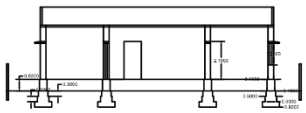
8.1.6 Physical Design (DESIGN OF PRIMARY SCHOOL):



PLAN



ELEVATION



SECTION A-A

PRIMARY SCHOOL

NAME	SIZE	QUANTITY
D	1.2X2.1	2
D1	0.9X2.1	9
D2	0.75X2.1	5
D3	0.65X2.1	2
W	0.9X1.2	7
V	0.5X0.5	6

DESIGN NO.6	**PRIMARY SCHOOL**	
Preparaed By	NIRMIT JOSHI PANCHOLI RIMPLE	Sheet No.6
PROJECT NAME	VISHWAKARAMA YOJANA PHASE VIII RANASAR, GANDHINAGAR	
INSTITUTE NAME	**S.N.P.I.T&R.C., UMRAKH**	
UNIVERSITY NAME	**GUJARAT TECHNOLOGICAL UNIVERSITY**	

Measurement Sheet of primary school						
SR. NO	DESCRIPTION	NO.	L	B	H	QUANTITY
	SCHOOL BUILDING TOTAL CENTRE LINE = (27..6 X 2) + (30.9 X 2) + (11.9 X 2) + (13 X 3.3) = 183.7					
	NO. OF T JUNCTION = 30					
1.	Excavation for foundation up to 1.5 m depth					
	L = 187.7 – (30 X 0.9 / 2) = 170.2 m	1	170.2	0.9	0.9	137.86 m^3
	For boundary wall					
	LW	2	34.4	0.2	0.5	6.88
	SW	2	15.2	0.2	0.5	3.04
					Total :	147.78 m^3
2.	Providing and laying PCC (1:4:8) for foundation	1	170.2	0.9	0.3	45.954 m^3
3.	First class brick masonry CM (1:6) for foundation					
	Step : 1 – 60 cm					
	= 183.7 – (30 X 0.6 / 2) = 174.7 m	1	174.7	0.6	0.3	31.446
	Step : 2 – 50 cm					
	= 183.7 – (30 X 0.5 / 2) = 176.2 m	1	176.2	0.5	0.3	26.43
					Total :	57.88 m^3
4.	Back filling in foundation					
	= 137.86 – 31.446 – 26.43 = 79.98 m^3					79.98 m^3
5.	First class brick masonry GL to PL					
	= 183.7 – (30 X 0.4 / 2) = 177.7 m	1	177.7	0.4	0.575	40.87
	Steps :-					
	1	2	0.9	0.25	0.15	0.0675
	2	2	0.9	0.25	0.3	0.135
	3	2	0.9	0.25	0.45	0.2025
					Total :	41.275 m^3
6.	DPC (2.5 cm thick)	1	177.7	0.4		71.08
	Deduction of door					
	D1	9	0.9	0.4		3.24
	D2	5	0.75	0.4		1.5

					Total :	66.34 m^2
7.	First class brick masonry for super structure					
	= 183.7 – (30 X 0.3 / 2) = 179.2 m	1	179.2	0.3	3	161.28 m^3
	Deduction :-					
	Lintel	1	179.2	0.3	0.15	8.064
	Door					
	D1	9	0.9	0.3	2.1	5.103
	D2	5	0.75	0.3	2.1	2.36
	Window					
	W	19	0.9	0.3	1..2	6.156
	Ventilation					
	V	6	0.5	0.3	0.5	0.45
					Total :	139.147 m^3
8.	Half brick partition wall in CM (1:6)					
	Boundary wall :-					
	LW	2	34.4		2	137.6
	SW	2	15.2		2	60.8
	Toilet :-					
	LW1	6	0.9		3	16.2
	LW2 = 0.9 + 0.1 = 1	7	1		3	21
	SW = 0.6 + 0.1 = 0.7	1	0.7		3	2.1
	Deduction :-					
	D3	7	0.65		2.1	9.56
					Total :-	228.14 m^2
9.	Providing and laying RCC (1:2:4)					
	Lintel	1	179.2	0.3	0.15	8.064
	Chhajja					
	W = 0.9 + 0.15 + 0.15 = 1.2	19	1.2	0.45	0.1	1.026
	RCC slab					
	LW1	1	27.9	4.5	0.1	12.56
	LW2	1	31.2	4.5	0.1	14.04
	SW	1	4	3.2	0.1	1.28
	Staircase					
	(1) 22 X 0.5 X 0.15 X 0.25 X 0.9 = 0.37					0.37
	(2) 3.16 X 0.15 X 0.9 = 0.43					0.43
	(3) 3.52 X 0.15 X 0.9 = 0.47					0.47
	(4) 0.85 X 2 X 0.25 X 0.9 = 0.38					0.38
					Total :	38.62 m^3
10.	Providing mild steel reinforcement for					

	RCC work including binding and bending and placing in position					
	Quantity = 1% of volume of concrete					
	= 38.62 X 78.54 = 3033.21 kg = 3034 kg				Total :	3034 kg
11.	12 mm thick plaster					
	(A) internal plaster					
	(a) ceiling					
	(i) drinking water room	1	2	3		6
	(ii) principal office	1	3	3		9
	(iii) fees counter	1	2	3		6
	(iv) class room	8	5	3		120
	(v) staff room	1	2.5	5		12.5
	(vi) toilet	2	2.5	3		15
	(vii) passage					
	1	2	3.3	1		6.6
	2	1	3.2	0.9		2.88
	3	1	24.8	0.9		22.32
	4	1	28.1	0.9		25.29
	(b) wall					
	(i) drinking water room					
	LW	2	3		3	18
	SW	2	2		3	12
	(ii) principal office					
	LW	4	3		3	36
	(iii) fees counter					
	LW	2	3		3	18
	SW	2	2		3	12
	(iv) class room					
	LW	2	3		3	18
	SW	2	5		3	30
	(v) staff room					
	LW	2	5		3	30
	SW	2	2.5		3	15
	(vi) toilet					
	LW	4	3		3	36
	SW	4	2.5		3	30
	(vii) passage					
	1	1	11.6		3	34.8
	2	2	3.3		3	19.8
	(B) external wall					
	Wall up to parapet top:-					
	LW1	2	27.9		4.5	251.1
	LW2	2	31.2		4.5	280.8
	SW	2	12.2		4.5	109.8
	Parapet top :-					

	LW1	2	27.9	0.2		11.16
	LW2	2	31.2	0.2		12.48
	SW1	2	11.8	0.2		4.72
	Parapet inside :-					
	LW1	2	27.5		0.9	49.5
	LW2	2	30.8		0.9	55.44
	SW1	2	11.8		0.9	21.24
	Chhajja :-					
	W	19	1.2	0.45		10.26
	Chhajja front :-					
	W	19	1.2		0.1	2.28
	Chhajja side :-					
	W	38		0.45	0.1	38.045
	Boundary wall :-					
	LW	4	34.4		2	275.2
	SW	4	15.4		2	123.2
	DEDUCTION :-					
	Door :-					
	D	2	1.5		2.1	6.3
	D1	9	0.9		2.1	17.01
	D2	5	0.75		2.1	7.875
	D3	7	0.65		2.1	9.555
	Window :-					
	W	19	0.9		1.2	20.52
					Total	1719.605 m^2
12.	5 cm thick mosaic tiles flooring :-					
	(i) drinking water room	1	3	2		6
	(ii) principal office	1	3	3		9
	(iii) fees counter	1	3	2		6
	(iv) class room	8	3	5		120
	(v) staff room	1	5	2.5		12.5
	(vi) toilet	2	3	2.5		15
	(vii) passage					
	1	1	24.8	0.9		22.32
	2	1	28.1	0.9		25.29
	3	1	3.6	1		3.6
	4	1	3.2	0.9		2.88
					Total :	222.59 m^2
13.	10 cm BBLC (1:2:4)					
	(i) drinking water room	1	2.9	1.9	0.1	0.551
	(ii) principal office	1	2.9	2.9	0.1	0.841
	(iii) fees counter	1	2.9	1.9	0.1	0.551
	(iv) class room	8	2.9	4.9	0.1	11.368
	(v) staff room	1	4.9	2.4	0.1	1.176
	(vi) toilet	2	2.9	2.4	01	1.392
	(vii) passage					
	1	1	24.7	0.8	0.1	1.976

	2	1	28	0.8	0.1	2.24
	3	1	3.5	0.9	0.1	0.315
	4	1	3.1	0.8	0.1	0.248
					Total :	20.658 m^3
14.	Sand filling / murrum					
	(i) drinking water room	1	2.9	1.9	0.45	2.48
	(ii) principal office	1	2.9	2.9	0.45	3.78
	(iii) fees counter	1	2.9	1.9	0.45	2.48
	(iv) class room	8	2.9	4.9	0.45	51.16
	(v) staff room	1	4.9	2.4	0.45	5.29
	(vi) toilet	2	2.9	2.4	0.45	6.26
	(vii) passage					
	1	1	24.7	0.8	0.45	8.89
	2	1	28	0.8	0.45	10.08
	3	1	3.5	0.9	0.45	1.42
	4	1	3.1	0.8	0.45	1.12
					Total	92.96 m^3
15.	Providing and laying white glazed tiles WC					
	WC:-					
	(i) floor	7	0.9	0.9		5.67
	(ii) wall	7 X 4 =28	0.9		2.1	52.92
	Deduction :-					
	D3	7	0.65		2.1	9.56
					Total	49.03 m^2
16.	Providing and laying skirting of mosaic tiles					
	(i) drinking water room					
	LW	2	3			6
	SW	2	2			4
	(ii) principal office					
	LW	4	3			12
	(iii) fees counter					
	LW	2	3			6
	SW	2	2			4
	(iv) class room					
	LW	16	3			48
	SW	16	5			80
	(v) staff room					
	LW	2	5			10
	SW	2	2.5			5
	(vi) toilet					

	LW	2	3			6
	SW	2	2.5			5
	(vii) passage					
	1	1	24.8			24.8
	2	1	28.1			28.1
	3	4	3.6			14.4
	4	1	5			5
	DEDUCTION :-					
	Door :-					
	D1	9	0.9			8.1
	D2	5	0.75			3.75
	D3	7	0.65			4.55
					Total :	241.9 m
17.	Providing paver blocks					
	Area = (2 X 1.5 X 34.2) + (2 X1.5 X 12.2) + (3.2 X 28.7) = 231.04 m^2 =2486.89 sq.ft.					
	One block area = 0.02 m^2 = 0.215 sq.ft.					
	No. of blocks = 2486.89 / 0.215 = 11566.93					
	= say 11567 nos.				Total :	11567 nos.

ABSTRACT SHEET					
SR. NO	DESCRIPTION	QUANTITY	RATE	PER	AMOUNT(RS)
1.	Excavation for foundation up to 1.5 m depth	147.78 m^3	100	m	14778
2.	Providing and laying PCC (1:4:8) for foundation	45.954 m^3	1500	m	68931
3.	First class brick masonry CM (1:6) for foundation	57.88 m^3	1600	m	92608
4.	Back filling in foundation	79.98 m^3	70	m	5598.6
5.	First class brick masonry GL to PL	41.275 m^3	1600	m	66040
6.	DPC (2.5 cm thick)	66.34 m^2	200	m	13268
7.	First class brick masonry for super structure	139.147 m^3	1500	m	208720.5
8.	Half brick partition wall in CM	228.14 m^2	1500	m	342210

	(1:6)				
9.	Providing and laying RCC (1:2:4)	38.62 m^3	2500	m	96550
10.	Providing mild steel reinforcement for RCC work including binding and bending and placing in position	3034 kg	45	Kg	136530
11.	12 mm thick plaster	1719.605 m^2	150	m	257940.75
12.	5 cm thick mosaic tiles flooring	222.59 m^2	200	m	44518
13.	10 cm BBLC (1:2:4)	20.658 m^3	1000	m	20658
14.	Sand filling / murrum	92.96 m^3	60	m	5577.6
15.	Providing and laying white glazed tiles WC	49.03 m^2	200	m	9806
16.	Providing and laying skirting of mosaic tiles	241.9 m	250	M	60475
17.	Providing paver blocks	11567 nos.	25	Block	289175
		TOTAL :-			1733384.45
		3 % CONTIGENCY :-			52001.53
		2 % WORKCHARGE ESTABLISHMENT :-			34667.69
		TOTAL :-			1820053.67
		10 % CONTRACTOR PROFIT :-			182005.37
		GRAND TOTAL :-			2002059.04

8.1.7 Electrical Design 1 (Earthing Product):

FIG :8.9 Earthing

Objective:-

Earthing is carried out to achieve the Following;

To Save Human Life From Danger of Shock Death in Case it comes in Contact with Change

To Maintain the Line Voltage Constant.

To Protect Large Building From Atmosphere Lightning.

To Protect all Machine Fed from O.H. Line From Atmosphere Lightning.

Scope of Study:-

Most commonly earthing is used for safety purpose. Earthing protects the personnel from short-circuit current. It also provides easiest path to the flow of short-circuits current even after the failure of insulation. It protects from high voltage surges and lighting discharge. So by the use of earthing we can save human life, machinery, houses or buildings etc. Earthing can also protect over voltage. So eathing is necessary for each and every house or building.In this village there is less number of earthing in the houses, so tries to improve it for the safety of all.

Methodology:-

passes to the earth which has zero potential. So it protects the system and equipment from damage. Earthing can be done by electrically connecting respective parts in the installation to some systemof electrical conductors or electrodes placed near the soil or below ground level. Earthing mat orelectrode under the ground level have flat iron riser through which all the non-current carryingmetallic parts of the equipment are connected.

When the faults occurs the fault current from equipment flows through the earthing system to the earth and thereby protect the equipment from the fault current. At the time of fault, the earth met conductors rise to the voltage which is equal to the resistance of the earth mat multiplied by a ground fault.

MAIN earthling terminal or bar:

- Main earthling bar is to be provided at point of service entrance or main distribution room, andas described in the Specification or shown on the Drawings. Connect all earthing conductors, protective conductors and bonding conductors to the main earthing bar.
- Provide 2 insulated main earthling conductors, I at each end of the bar, connected via testing jointsto the earth electrode at 2 separate earth pits. Conductor is to be sized to carry maximumearth fault current of system at point of application with final conductor temperature not exceeding 160 deg.C (320 deg. F) for at least 5 seconds. Main earthing conductors are to be minimum 120 mm2 or as otherwise required by the particular Section of the Specification. Main earthing bar shall be positioned at an accessible location within the electrical room and clearly labeled.
- The main earth bar shall be in the form of a ring or rings of bare conductors surrounding or withinan area in which items to be earthed are located. Where 2 or more rings are installed, they shall be interconnected by at least two conductors, which shall be widely separated.
- Testing joints (test links) are to be provided, in an accessible position, on each main earthing conductor, between earthling terminal or bar and earth electrode.

Scope of Study

Most commonly earthing is used for safety purpose. Earthing protects the personnel from short-circuit current. It also provides easiest path to the flow of short-circuits current even after the failure of insulation. It protects from high voltage surges and lighting discharge. So by the useof earthing we can savehuman life, machinery, houses or buildings etc. Earthing can also protect over voltage. So eathing is necessary for each and every house or building.

Earthling or conductors:

1.Protective conductors are not to be formed by conduit, trucking, ducting or the like.

1. Continuity of Protective Conductors: Series connection of protective conductor from one pieceofequipment to another is not permitted. Extraneous and exposed conductive parts of

equipment are not to be used as protective conductors, but are to be connected by bolted clamptype connectors and/or brazing to continuous protective conductors which are to be insulated by molded materials. Conductor sheaths shall be of yellow-green colored PVC to meet the requirements of BS 6004 or IEC 60502-1 Grade ST1 with a minimum thickness of 1.5 mm.

2. Bare strip conductors only shall be used for earth electrodes or voltage control meshes.
3. Conductors buried in the ground shall normally be laid at a depth of 1000 mm below the underground power cables in an excavated trench. The backfill in the vicinity of the conductorshall be free of stones and the whole backfill shall be well consolidated. All conductors not buried in the ground shall be straightened immediately prior to installation and supported clearof the adjacent surface.
4. Earth Fault Loop Impedance: For final circuits supplying socket outlets, earth fault impedanceat every socket outlet is to be such that disconnection of protective device on over-current occurs within 0.4 seconds. For final circuits supplying only fixed equipment, earth fault loop impedance at every point of utilization is to be such that disconnection occurs within 5 seconds.Use appropriate tables and present same for approval by the Engineer.

Cost of material used:

Table 8.1: Cost of material for earthing	
Material	**Cost**
Earth electrode	Rs. 600
Coal	Rs. 30
Salt	Rs. 60
	Total cost: Rs. 690

There are approximate 231 houses in the allocated Nanibhatlav village. There are approximately70 houses which have proper earthling facility. There is 161 houses left without earthling facility. So total cost of this is as following:There is 161 houses left without earthling facility. So total cost of this is as following:

Table: Total cost of earthling	
Used earth electrode	**Cost**
161 * 690	= Rs. 1,11,090

- The main earth bar shall be in the form of a ring or rings of bare conductors surrounding or within an area in which items to be earthed are located. Where 2 or more rings are installed, they shall be interconnected by at least two conductors, which shall be widely separated.
- Testing joints (test links) are to be provided, in an accessible position, on each main earthing conductor, between earthling terminal or bar and earth electrode.

Fig 8.10 house withoutearthing

fig8.11 house withoutearthing

-

- The above photo are of my allocated village.
- In my allocated village most of people don't have earthingfacilities in
- Due to not having the earthing facilities the risk of being affected by currentincreases in the residents.
- Without an earthing connection the safety switches will not workand an electricalfault could cause a house.
- The earthing should be done for not being affected by the current.

8.1.6. Benefits of Earthing after providing to people

- Ensure the safety of electrical appliances and devices from theexcessive amountof electrical current.
- Helps in the flow of electric current directly inside the ground.
- It Protects building breakdown from the lightning.
- earthing helps in the protection of overvoltage, stabilization of voltage.
- Keep the electric appliance safe from the damage.
- Earthing prevents injury damage and death caused by electric current.
- Earthing Keeps the voltage constant in the healthy phase.

Calculation of different types of earthing:-

(A)Earthing Resistance & No of Rod for Isolated Earth Pit (Without Buried Earthing Strip):The Earth Resistance of Single Rod or Pipe electrode is calculated as per BS 7430:

R=ρ/2×3.14xL (loge (8xL/d)-1)

Where ρ=Resistivity of Soil (Ω Meter),L=Length of Electrode (Meter), D=Diameter of Electrode (Meter) Example:

Calculate Isolated Earthing Rod Resistance. The Earthing Rod is 4 Meter Long and having 12.2mm Diameter, Soil Resistivity 500 Ω Meter.

R=500/ (2×3.14×4) x (Loge (8×4/0.0125)-1) =156.19 Ω.

The Earth Resistance of Single Rod or Pipe electrode is calculated as per IS 3040:

Factors for parallel electrodes in line (BS 7430)

Table 8.3: Factors for parallel electrodes

Number of electrodes (*n*)	**Factor (λ)**
1.0	2
1.66	3
2.15	4
2.54	5
2.87	6

- For electrodes equally spaced around a hollow square, e.g. around the perimeter of a building, the equations given above are used with a value of λ taken from following Table.
- For three rods placed in an equilateral triangle, or in an L formation, a value of λ = 1.66
- For Hollow Square Total Number of Electrode (N) = (4n-1). Fig 8.3 earthing design
- The rule of thumb is that rods in parallel should be spaced at least twice their length toutilize the full benefit of the additional rods.
- If the separation of the electrodes is much larger than their lengths and only a few electrodes are in parallel, then the resultant earth resistance can be calculated using theordinary equation for resistances in parallel.

may be assumed.

Factors for electrodes in a hollow square (BS 7430)

Number of electrodes (*n*)	**Factor (λ)**
2	2.71
3	4.51
4	5.48
5	6.13
6	6.63
7	7.03
8	7.36
9	7.65
10	7.09
12	8.03
14	8.06
16	8.09
18	9.02
20	9.04

Table 8.4: Factors for electrode in Hollow Square

Earth Fault Loop Impedance: For final circuits supplying socket outlets, earth fault impedanceat every socket outlet is to be such that disconnection of protective device on over-current occurs within 0.4 seconds

Provide 2 insulated main earthling conductors, I at each end of the bar, connected via testing joints to the earth electrode at 2 separate earth pits. Conductor is to be sized to carry maximumearth fault current of system at point of application with final conductor temperature not exceeding 160 deg. C (320 deg. F) for at least 5 seconds. Main earthing conductors are to be minimum 120 mm2 or as otherwise required by the particular Section of the Specification. Main earthing bar shall be positioned at an accessible location within the electrical room and clearly labeled.

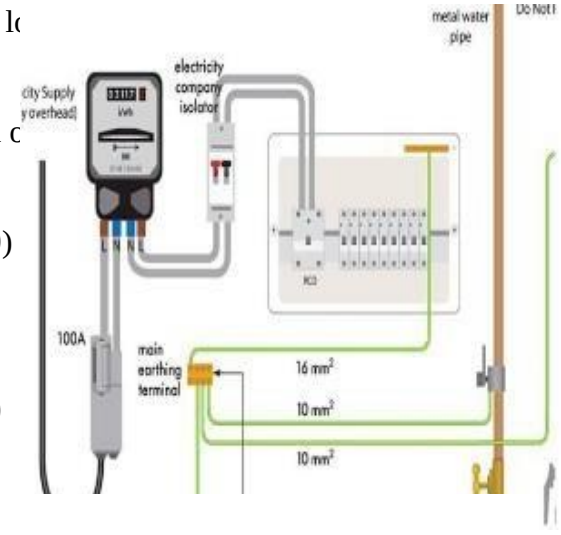
- The Resistance of Original Earthing Rod will be l

  Rod, 60% for third Rod,66% for forth Rod
- Now Calculate Total Resistance of Earthing Rod c
- a=500/(2×3.14x136x4)=0.146
- Ra (Parallel in Line) =136.23x (1+10×0.146/200)

  =1.67 Ω.
- If Earthing Rod is connected in Hollow Square

  than Rod in Each side of Square is 200=(4n-1)

  so n=49 No.



- Number of Earthing Pipe required= 50000/838 =59.66 Say 60 No's.
- Total Number of Earthing Pipe required = 60 No's.

- **Benefits of Earthing after providing to people:-**
- Ensure the safety of electrical appliances and devices from the excessive amount

Helps in the flow of electric current directly inside the ground.

Earthing helps in the protection of overvoltage, stabilization of voltage.

Implementing in The Village :-

According to our project profile we are implementing Earthing in Government Primary School.(I)
Calculation of Earthing in Government Primary School Table 8.5: Calculation of Earthing

Material	Cost
Earthing Plat	2300 /-
Charcoal 200 gm	100 /-
Salt 200 gm	20 /-
Cable 1.5 mm (15 per meter)	180 /- (12 meter)
Labor and Wire Man Cost	300 /-
Total Cost	2900-

8.1.8 the electric appliance Electrical Design 2 MCB (Miniature Circuit Breaker):

Objective:-

Primarily Designed to Protect Cables and Lines against Overload (Thermal) and Short Circuit (electromagnetic). They Care For protecting this Electrical Equipments against excessive Temperature Rises and Destruction in the event of a short circuit Basic function it to detect a Fault Condition and by Interrupting Continuity to Immediately Discontinues Electrical Flow.

Scope of Study :-

Most commonly MCB may be used as an alternative of fuse where the fault rating of MCB is high. It is designed to protect against overloading and short-circuiting. Modern day wiring regulations require that very rapid operation is achieved in the event of an earth fault to minimize the dangers from electrocution. MCB is also useful in measurement device. It protects against over/high voltages.So by means of such benefits of MCB the villages people have try to use MCBs.

Design Proposal :-

What is MCB?

Circuit breakers are safety accessories for house hold applications.MCB: Miniature circuit breaker.

MCB is an adjustable circuit breaker that has an electro-MCB works on either the bi-metallic or by magnetic trip coil. Both methods work by deflecting thelatch attached to stop the flow of current. While bimetallic piece gets heated, the magnetic coil usesthe magnetic flux and deflects the latch to open the circuit.

However MCB is an easy solution and alternative to fuses to control the sudden surge of charges inthe circuit.

Uses of MCB

MCB is vital for the efficient functioning and maintaining the safety of the electric machines. Thus MCB finds use in most of the electrical appliances, be it for domestic usage or industrial purposes.

The multitude of electric connections at home like lights, heater, and fans require MCB to constantly check and protect the connection Industries function predominantly with a lot of machines and also has a large initial current load. In this case, MCB plays a crucial role in preventing the sudden gush of electric charges through a circuit, thereby increasing the shelf life of the devices by protecting from damage.

(III) Realign the metal coil

Although both the fuse and circuit breakers serve the same purpose, the mechanism of action is different. A fuse consists of a metal that melts when excess current flows and breaks the circuit. Once the fuse melts, it has to be replaced with a new one.

Thus replacing fuses every time it melts is a tedious process. Circuit breakers are an alternative to this troublesome process. They are easy to handle as the circuit breaks if the current flow reaches unsafe levels but can be turned on after the system comes in control.

Although electricians are better at deciding the type of MCB to be installed, it is good to know and understand a wide variety of concepts, especially about the things used in day-to-day life. Effective installation of miniature circuit breakers can ensure safety and protection of all the electrical systems across households and industries. Make sure you use a FINILOX MCB for improving the overall

8.2.5 Design Calculation

Cost of material used

Table: 8.3 Cost of material MCB	
Material	**Cost**
External casing	Rs. 70
Contact	Rs. 40
Knob	Rs. 200
Bi-metallic strip	Rs. 130
Solenoid	Rs. 70
Arc chutes	Rs. 5
	Total cost: Rs. 515

So total cost of this is as following:

Used earth electrode	**Cost**
178 * 515	= Rs. 91,670

There are approximate 231 houses in the allocated Nani bhatlav village. There are approximately 53 houses which have proper earthling facility. There is 178 houses left without earthling facility.

Calculation of MCB

Design Distribution Box of one House and Calculation of Size of branch Circuit MCB as following Load Detail. Power Supply is 430V (P-P), 230 (P-N), 50Hz. Consider Demand Factor 0.6 for Non Continuous Load& 1 for Continuous Load for Each Equipment.

- Branch Circuit-1: 4 No of 1Phase, 40W, Lamp of Non Continues Load + 2 No's of 1Ph, 60W, Fan of Non Continues Load.
- Branch Circuit-**2**: 2 No of 1Ph, 200W, Computer of Non Continues Load.
- Branch Circuit-3: 1 No of 1Ph, 200W, Freeze of Continues Load.
- Branch Circuit-4: 8 No of 1Ph, 40W, Lamp of Non Continues Load + 2 No's of 1Ph 60W, Fan of NonContinues Load.
- Branch Circuit-5: 4 No of 1Ph , 40W, Lamp of Non Continues Load + 1 No's of 1Ph 60W, Fan of NonContinues Load.+ 1 No's of 1Ph 150W, TV of Continues Load
- Branch Circuit-6: 1 No of 1P , 1.7KW, Geyser of Non Continues Load.

Table No 8.8 Fault Current

Class of MCB

Type of Load	Class	Sensitivity
Lighting	B Class	IΔn:30ma
Heater	B Class	IΔn:30ma
Drive	C Class	IΔn:100ma
A.C	C Class	IΔn:30ma
Motor	C Class	IΔn:100ma
Ballast	C Class	IΔn:30ma
Induction Load	C Class	IΔn:100ma
Transforme r	D Class	IΔn:100ma

Table No 8.9 Class of MCB

Size of MCB

Current (Amp)	Lighting Load MCB (Amp)	Heating/Cooling/Motor-Pump Load MCB (Amp)
1.0 to 4.0	6	16
6.0	10	16
10.0	16	16
16.0	20	20
20.0	25	25
25.0	32	32
32.0	40	40
40.0	45	45
45.0	50	50
50.0	63	63
63.0	80	80
80.0	100	100
100.0	125	125
125.0	225	225
225.0	600	600
600.0	800	800
800.0	1600	1600
1600.0	2000	2000
2000.0	3000	3000

Table No 8.10 Size of MCB

Calculation:

Size of MCB for Branch Circuit-1

- Load Current of Lamp= (No X Watt X Demand Factor)/Volt =(4X40X0.6)/230=0.40Amp
- Load Current of Fan= (No X Watt X Demand Factor)/Volt =(2X60X0.6)/230=0.31Amp
- Branch Circuit-1 Current as per NEC = Non Continues Load+125% Continues Load
- Branch Circuit-1 Current as per NEC =(0.4+0.31)+125%(0) =0.73Amp
- Type of Load=Lighting Type
- Class of MCB=B Class
- Size of MCB=6 Amp
- No of Pole of MCB=Single Pole

Size of MCB for Branch Circuit-2

- Load Current of Computer = (No X Watt X Demand Factor)/Volt =(2X200X0.6)/230=1.04Amp
- Branch Circuit-2 Current as per NEC = Non Continues Load+125% Continues Load
- Branch Circuit-2 Current as per NEC =(1.04)+125%(0) =1.04Amp
- Type of Load=Lighting Type
- Class of MCB=B Class
- Size of MCB=6 Amp
- Breaking Capacity: 6KA
- No of Pole of MCB=Single Pole

Size of MCB for Branch Circuit-3

- Load Current of Freeze= (No X Watt X Demand Factor)/Volt =(1X200X0.6)/230=0.87Amp
- Branch Circuit-3 Current as per NEC = Non Continues Load+125% Continues Load
- Branch Circuit-3 Current as per NEC =(0.87)+125%(0) =0.87Amp
- Type of Load=Lighting Type
- Class of MCB=B Class
- Size of MCB=6 Amp
- Breaking Capacity: 6KA
- No of Pole of MCB=Single Pole

Size of MCB for Branch Circuit-4

- Load Current of Lamp= (No X Watt X Demand Factor)/Volt =(8X40X0.6)/230=0.83Amp
- Load Current of Fan= (No X Watt X Demand Factor)/Volt =(2X60X0.6)/230=0.31Amp
- Branch Circuit-4 Current as per NEC = Non Continues Load+125% Continues Load
- Branch Circuit-4 Current as per NEC =(0.83+0.31)+125%(0) =1.15Amp
- Type of Loa**d**=Lighting Type
- Class of MCB=B Class
- Size of MCB=6 Amp
- Breaking Capacity: 6KA
- No of Pole of MCB=Single Pole

Size of MCB for Branch Circuit-5

- Load Current of Lamp= (No X Watt X Demand Factor)/Volt =(4X40X0.6)/230=0.42Amp
- Load Current of Fan= (No X Watt X Demand Factor)/Volt =(1X60X0.6)/230=0.16Amp
- Load Current of TV = (No X Watt X Demand Factor)/Volt =(1X150X1)/230=0.65Amp
- Branch Circuit-5 Current as per NEC = Non Continues Load+125% Continues Load
- Branch Circuit-5 Current as per NEC =(0.42+0.16)+125%(0.65) =0.57+0.82=1.39Amp
- Type of Load=Lighting Type
- Class of MCB=B Class
- Size of MCB=6 Amp
- Breaking Capacity: 6KA
- No of Pole of MCB=Single Pole

Size of MCB for Branch Circuit-6

- Load Current of Geyser= (No X Watt X Demand Factor)/Volt =(1X1700X0.6)/230=4.43Amp
- Branch Circuit-6 Current as per NEC = Non Continues Load+125% Continues Load
- Branch Circuit-6 Current as per NEC =(4.43)+125%(0) =4.43Amp
- Type of Load=Heating & Cooling Type
- Class of MCB=C Class
- Size of MCB=16 Amp

No of Pole of MCB=Single Pole

Size of MCB for Branch Circuit-7

- Class of MCB=C Class
- Size of MCB=16 Amp
- Breaking Capacity: 6KA
- No of Pole of MCB=Single Pole

Size of MCB for Branch Circuit-8

- Load Current of Motor-Pump = (No X Watt X Demand Factor)/(1.732XVolt) =(1X746X0.6)/(1.732X430)=0.60Amp
- Branch Circuit-8 Current as per NEC =Non Continues Load+125% Continues Load
- Branch Circuit-8 Current as per NEC =(0.60)+125%(0) =0.60Amp
- Type of Load=Motor-Pump Type
- Class of MCB=C Class
- Size of MCB=16 Amp
- Breaking Capacity: 10KA
- No of Pole of MCB= Three Pole

- The above photo is of my allocated village.
- In my allocated village, most of people don't have MCB facility in their homes.
- If there is no MCB and the power supply from distribution company suddenly increase then the electric device of the house will be burn or get spoil.

- MCB immediately detect any abnormality and switch off the electric circuit automatically.
- MCB prevents any permanent damage to electric appliances and human beings.
- In my allocated village, most of the houses are made of wood and row dunging and if the power increase then the chances of catching fire is more, therefore MCBmust require.

Implementing in The Village :-

According to our project profile we are implementing MCB in Panchayat Ghar.

(I) Different Price of MCB

Company Name	Price
Benlo (16 A)	192 /-
Havells	175 /-
Orient	180 /-
ABB	352 /-
Finolex	181 /-

Table 8.11: Different Price of MCB

8.2.5. Benefits of MCB after providing to people

- After Providing the MCB, if the supplied power by distribution company increase thenthe MCBtripped itself and prevent electric device from being damaged.
- Because of MCB tripped itself, the more power is going to stop and the chance ofcatching fireare reduced.
- Best advantage of an MCB is that it ensure equal distribution of electrical energy acrossall thedevices.
- MCB is reusable and hence has less maintenance and replacement cost.
- MCB is more sensitive to current than Fuse
- In case of MCB, the faulty zone of electrical circuit can be easily identified
- With MCB, it is very simple to resume the supply
- Handling MCB is electrically safer than handling a Fuse. In case of MCB
- MCB is reusable and hence has less maintenance and replacement cost

8.1.9 Electrical Design 3(TIME SWITCH SPECIFICATION):

•Certain consumer services are required to operate on a pre-determined controlled time sequence basis.

• As this involves the switching on and off of various components or sections of circuit, switches automatically operated by timing mechanisms are necessary.

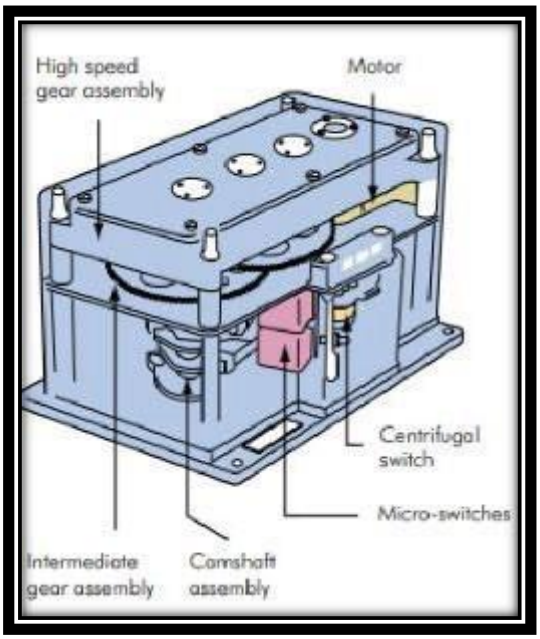


Fig8.11: Time switch

• The principal of time switch operation varies, but in general it is based on the one in which a contact assembly is actuated by a cam, driven at constant speed by a speed controlled electric motor.

•In some specialized consumer services, switches which operate on a thermal principle are used. In these the contact assembly is operated by the distortion of a thermal element when the latter has been carrying a designed current for a predetermined period.

• The diagram of a motor driven time switch unit is shown in fig. EL 4.9. It is designed to actuate relays which, in turn, control the supply of alternating current to the heating elements of a power unit de-icing system.

Signals to the relays are given in repeated time cycles which can be of short or long duration corresponding respectively to ‘fast’ and ‘slow’ selections made on the appropriate system control switch

8.3.7 Benefit of Time Switch after providing to people:-

You don’t have to get up to switch on the light and you can carry on with what you are doing without interruption.

Using time switches to operate them can result in significant convenience and energy and cost savings, while also making your home safer and more secure.

Cost of material used

Table 8.5 Material cost of time switch	
Material	**Cost**
Contactor $AgSnO_2$	Rs. 20
Various types on lamps as per Req. Sodium, Halogen discharge	Rs. 700
Resistance	Rs. 70
Touch control key	Rs. 120
Protection case	Rs. 300
	Total cost: 1210

Current Situation Regarding Time Switch:-

- There is no use of time switch in my allocated village.
- The Water tank is turned on with the help of a manual switch.
- Because of this manual system the motor runs even after the tank filled with the water. It is wastage of water and electricity.
- If we put the time switch, it will continue for certain of time period it saves both water and electricity.

- **Implementing in The Village :-**
  According to our project profile we are implementing Time Switch at Motor of Water Tank.

Different Price of Time Switch
Table 8.13: Price of Time Switch

Company Name	Price
L&T	2200 /-
Havells	3009 /-
Magnus	1299/-

CHAPTER: 9

FUTURE DEVELOPMENT OF THE VILLAGE

After the completion of first part of the Vishwakarma yojana and giving our best in giving the designs , we still think that there are many things that lacks and could havebeen more better than thepresent condition. Our aim is to work according to the new upcoming town planning scheme inNanibhatlav village. Based on these plans, our next target will be to provide regular maintenance ,which helps in sustaining the structure for longer duration. Also, due to lack in maintenance, villagers avoidconsuming it and which make the structures obsolete.

so for the future development of the Nanibhatlav ,we would like to give:

- Pharmacy

  The availability of the medicinal support of so less so that the villagers have to nearest pharmacy that is around 14 km far , by the inclusion of a pharmacy it will help the villagers drastically.

- overhead tank

  As by the increase in population that results into more usage of the resources, the water tank they currently have place scarcity for the people in the water usage. Existing water tanks are unable to fulfil the demand of water supply for the villagers.

- Drainage system

  The villagers still uses the old methods (khaad kuva) for the excreta-human waste. And as these old method have hundreds bad effect on human health and society . A good drainage system is must.

- Physical and mental fitness club

  Physical fitness that is gymnasium and mental fitness is to be done by yoga Sana. A proper fitness center needs to be provided for the well-being.

But apart from this , we need to emphasize them with getting more use from the renewableenergy sources, even government helping out personnel for getting solar panels

Internal road quality can be improved to provide better transportation facilities.

CHAPTER: 10

CONCLUSIONS

The main aim and vison of Vishwakarma Yojana is to uplift the lifestyle of the rural areas by giving them the basic amenities and to its certain extent up to the level of an ideal village. It is an exceptional and beneficial government scheme to develop the rural areas under conserved economical cost with good future aspects, workability and efficiency during its usage. The project intends to improve the physical, social as well as socio-cultural aspects of the village by implementing and providing various infrastructures with regards to lesser or least hindrance to its rural authenticity.

This will help in developing Smart villages with them having the necessary amenities that can bring the joy and uplift their way of living life and thus developing villages in sustainable manner, reduce migration from villages. This should lead to some rethinking about the meaning of efficiency beyond the usual conceptions of economic or technical efficiency. Indeed, employment expansion is at least as important as growth in productivity. In a sense, both represent the utilization of labor as a resource. Why, then, does thinking about efficiency focus on one and neglect the other It is important to reflect on this question The answer, which calls for change in both economics and politics, could make a real difference.

By improving the structural things that will surely makes their life more enjoyable and making them feel to improve it gradually. People of village migrate from rural to urban for better education, to get employment, to live standard life. To reduce the migration of people from rural to urban by providing all the general facilities in the villages like primary-secondary education, public health center, skill development center. Infrastructure facilities should be encouraging the people of the rural village to get sufficient livelihood and improve their standard of living.

Success in development of a village only can be achieved, if Sarpanch of that village wants to nourish it and the people supports him/her with all their hearts. Government of India has provided many schemes/programs among the nation for the village and the villagers, but Sarpanch works as a bridge between Government and the villagers. All this can be fulfilled, by having little awareness and helpful working group in the village, perfect example is Punsari village. Also, it was awarded as smartest village.

We had a desire for us as well as for the villagers that “Alone we do so little, together we do far much more” with this sentence, we have come so far and hope that we could complete all our wished projects within time. We faced problems in different but we have gathered our courage, self as well as team-motivation to complete the work on time with giving our best for the progress of the report.

CHAPTER: 11

REFERENCE

https://sdgs.un.org/

https://www.indianmirror.com/

https://gujaratindia.gov.in/

Indian Village Directory | villageinfo.in

India .All states, Districts,Villages,Schools,Colleges,Maps,Pin Codes of India (onefivenine.com)

Wikipedia

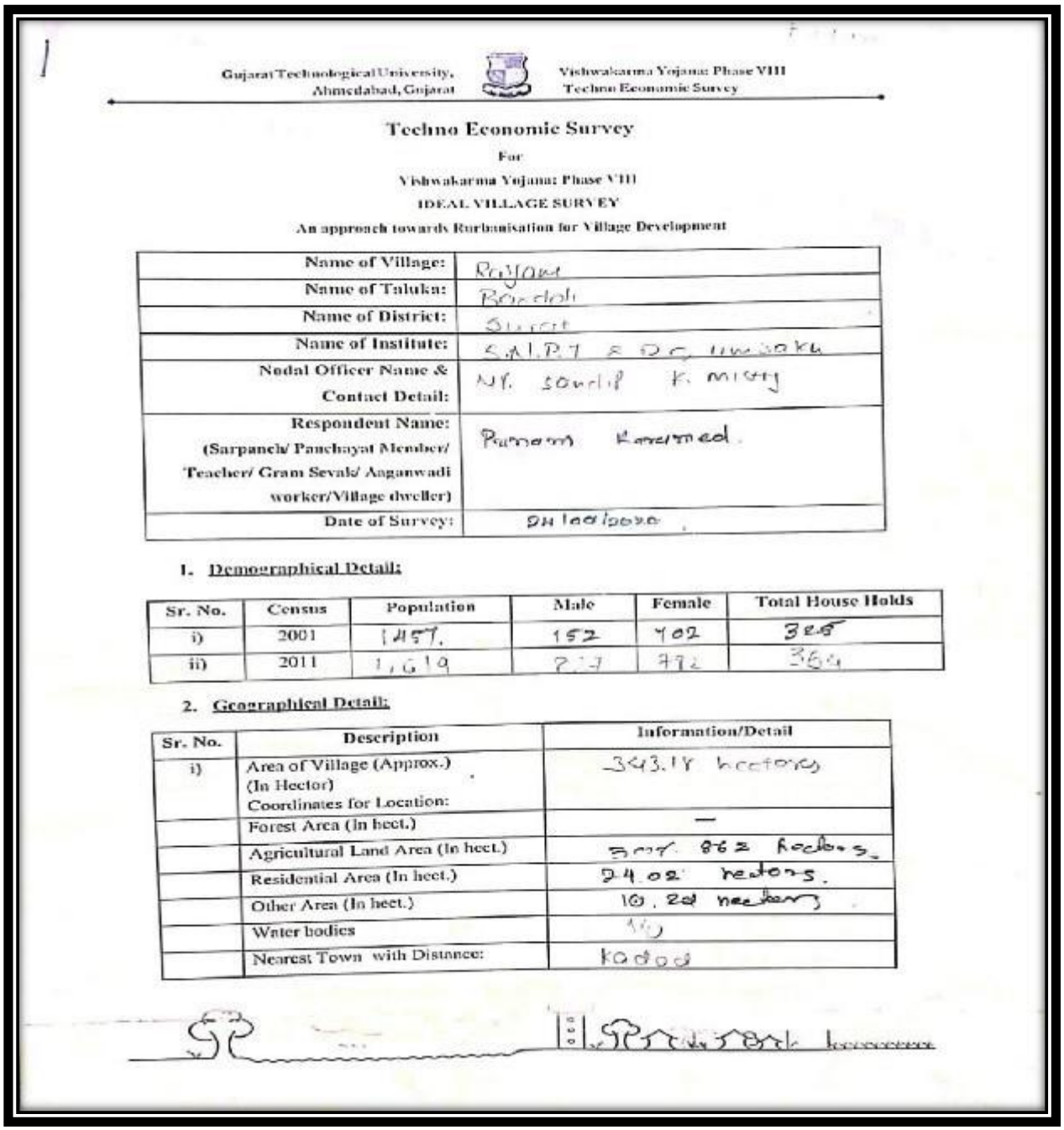
Google Earth

GTU VYOJANA | Home

CHAPTER 12:

ANNEXURE

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



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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:	Rayam
Name of Taluka:	Bardoli
Name of District:	Surat
Name of Institute:	S.N.P.T & R.C. Umarkh
Nodal Officer Name & Contact Detail:	M.P. Sondip K. Mistry
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Anganwadi worker/Village dweller)	Punam Kanubhai
Date of Survey:	24/10/2020

1. Demographical Detail:

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	1457	752	702	328
ii)	2011	1,619	847	772	364

2. Geographical Detail:

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	343.18 hectors
	Forest Area (In hect.)	—
	Agricultural Land Area (In hect.)	307.862 hectors.
	Residential Area (In hect.)	24.02 hectors.
	Other Area (In hect.)	10.20 hectors
	Water bodies	Nil
	Nearest Town with Distance:	Kadod

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3. Occupational Details:

Name of Three Major Occupation groups in Village	1. [illegible]
	2. [illegible]
	3. Agricultural work

4. Physical Infrastructure Facilities:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
✓	• Tap Water (Treated/ Untreated)	[illegible]			
✓	• RO Water	[illegible]			
	• Well (Covered/ Uncovered)				
✓	• Hand pumps	Available			
	• Tube well/ Borehole				
	• River/ Canal/ Spring/ Lake/ Pond	River			
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	[illegible]	30,000	
	Underground Sump	Capacity:	/	/	
Suggestions if any:					
C.	**Drainage Facility**				
	Available (Yes/ No)	Yes, [illegible]			
Suggestions if any:					
D.	**Type of Drainage**				
	Closed/ Open				
	If Open than Pucca / Kutchcha				
	Whether drain water is discharged directly in to Water bodies/ Sewer plants	Joint			
Suggestions if any:					

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E.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Kodad - Bardoli			
	Main road	WBM			
	Internal streets	All Weather - Cement conc.			
	Nearest NH/SH/MDR/ODR Dist. in kms.	Next to Village			
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	Bardoli - 6KM Amboli - 2 KM			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	In the Village			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto			
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Govt 8 hrs			
	Power supply for Domestic Use	24 hrs			
	Power supply for Agricultural Use	8 hrs			
	Power supply for Commercial Use	24 hrs			
	Road/ Street Lights	AV			

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	Electrification in Government Buildings/ Schools/ Hospitals	Yes - Full.			
	Renewable Energy Source Facilities (Y/ N)	Solar Street Light			
	LED Facilities	Yes.			
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	None			
	Location Condition	—			
	Community Toilet (With bath/ without bath facilities)	—			
	Solid & liquid waste Disposal system available	Yes			
	Any facility for Waste collection from road	Locally - one - Gov.			
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)				
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Pakko - 360			

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:	5 beds Normal			
	Private Clinic/ Private Hospital/ Nursing Home	Near by VJ			
	If any of the above Facility is not available in village than approx. distance from village: 1.....kms.				
Suggestions if any:					

L.	Education Facilities:				
	Aaganwadi/ Play group	2-3			
	Primary School	1			
	Secondary school	1			
	Higher sec. School	1			
	ITI college/ vocational Training Center	/			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	/			
	If any of the above Facility is not available in village than approx. distance from village: 2.....kms.				
Suggestions if any:					

M.	Socio- Culture Facilities				
	Community Hall (With or without TV) Location:	Not available			

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	Condition:	Not-usable			
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	None			
	Public Garden Location: Condition:	Yes- local within village Good			
	Village Pond Location: Condition:	In Jhaggad			
	Recreation Center Location: Condition:	Ground			
	Cinema/ Video Hall Location: Condition:	None			
	Assembly Polling Station Location: Condition:	In Prim School for Lok Sabha			
	Birth & Death Registration Office Location: Condition:	Village Office			

If any of the above Facility is not available in village than approx. distance from village: ..0.....kms.

Suggestions if any:

N.	Other Facilities				
	Post-office	Yes			
	Telecommunication Network/ STD booth	None			

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General Market	Yes-mall			
Shops (Public Distribution System)	Yes			
Panchayat Building	yes			
Pharmacy/Medical Shop	None -	bardoli		
Bank & ATM Facility	2 bank	bardoli/surat	-2	ATM
Agriculture Co-operative Society	2			
Milk Co-operative Soc.	1			
Small Scale Industries	tailoring center		- 2 (25/30)	
Internet Cafes/ Common Service Center/Wi Fi	–			
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	solar plant na		Put	
P.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	–			
Q.	Any Other				

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	

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Techno Economic Survey

Recent Projects going on for Development of Village	Nil
Any NGO working for village development	Nil

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)	Need to repair to school etc.	
2.	Additional Information/ Requirement	Drinking water	
		Water Tank	

9. Smart Village Proposal Design

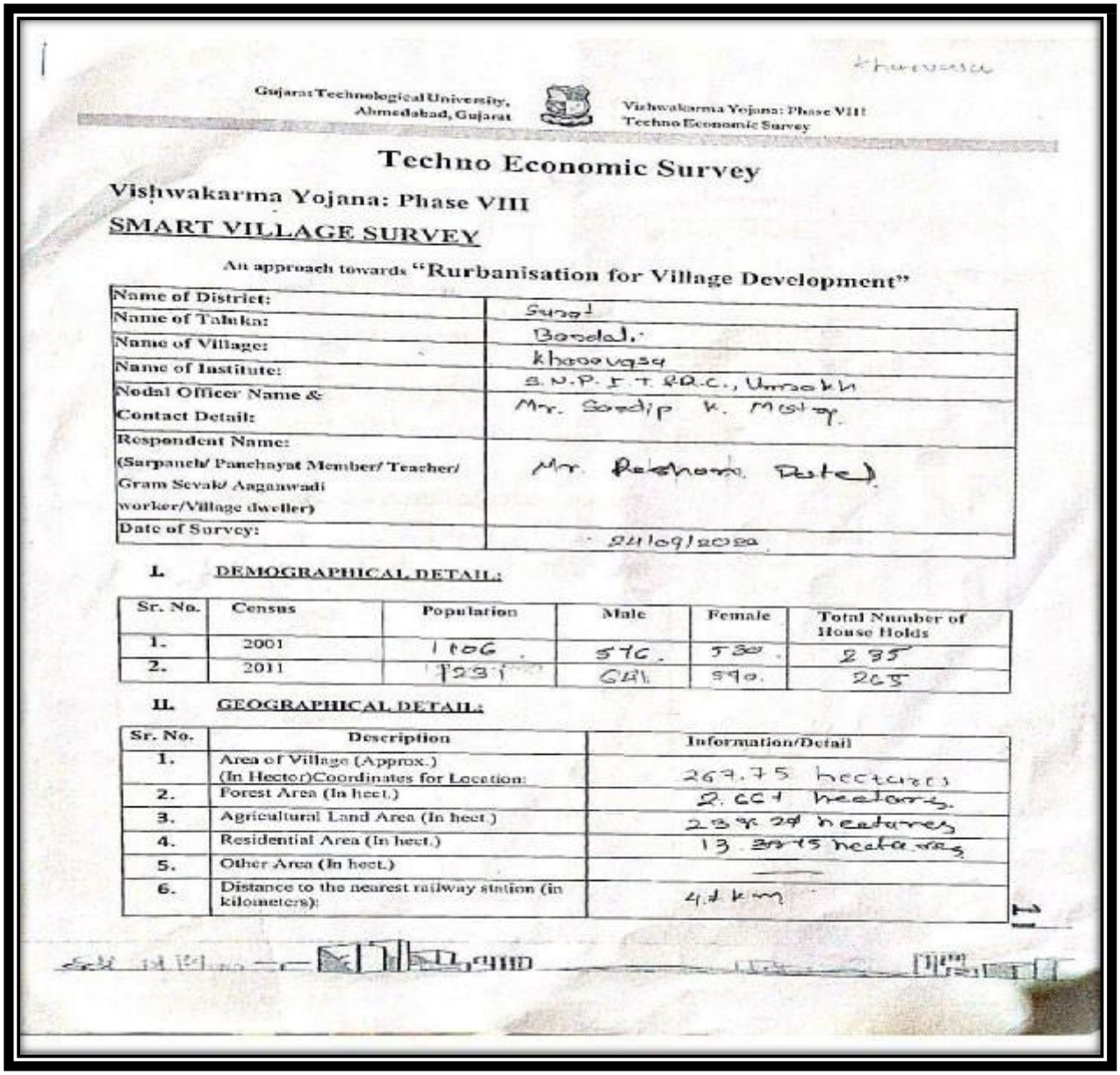
Sr. No.	Descriptions	Information/ Detail	Remarks
1.			

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

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

તલાટી-કમ-મંત્રી
સરપંચશ્રી
ગ્રામ પંચાયત નાનમ
તા. બારડોલી, જિ. સુરત

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



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Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

An approach towards "Rurbanisation for Village Development"

Name of District:	Surat
Name of Taluka:	Bardoli.
Name of Village:	Kharvasa
Name of Institute:	S.N.P.I.T. & R.C., Umrakh
Nodal Officer Name & Contact Detail:	Mr. Sandip K. Mistry.
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Anganwadi worker/Village dweller)	Mr. Rakesh Patel
Date of Survey:	24/09/2019

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	1106	576	530	285
2.	2011	1291	681	590	265

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	269.75 hectares
2.	Forest Area (In hect.)	2.001 hectares.
3.	Agricultural Land Area (In hect.)	239.29 hectares
4.	Residential Area (In hect.)	13.3975 hectares
5.	Other Area (In hect.)	—
6.	Distance to the nearest railway station (in kilometers):	4.2 km

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7.	Name of Nearest Town with Distance:	4.1 Km
8.	Distance to the nearest bus station (in kilometers):	6.1 km
9.	Whether village is connected to all road for the any facility or town or City?	Bus, Rikh, etc.

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1.	farming
	2.	farm worker
	3.	—

Major crops grown in the village:	1.	કપાસ
	2.	ડાંગર.
	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				
2.	DUG WELL Protected Well Un Protected Well	no	Yes.		
3.	WATER FROM SPRING Protected Spring Unprotected Spring Rainwater Tanker Truck Cart With Small Tank	No		No.	
4.	SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/ Irrigation Channel Bottled Water Hand Pump Other(Specify)Lake/ Pond				

2

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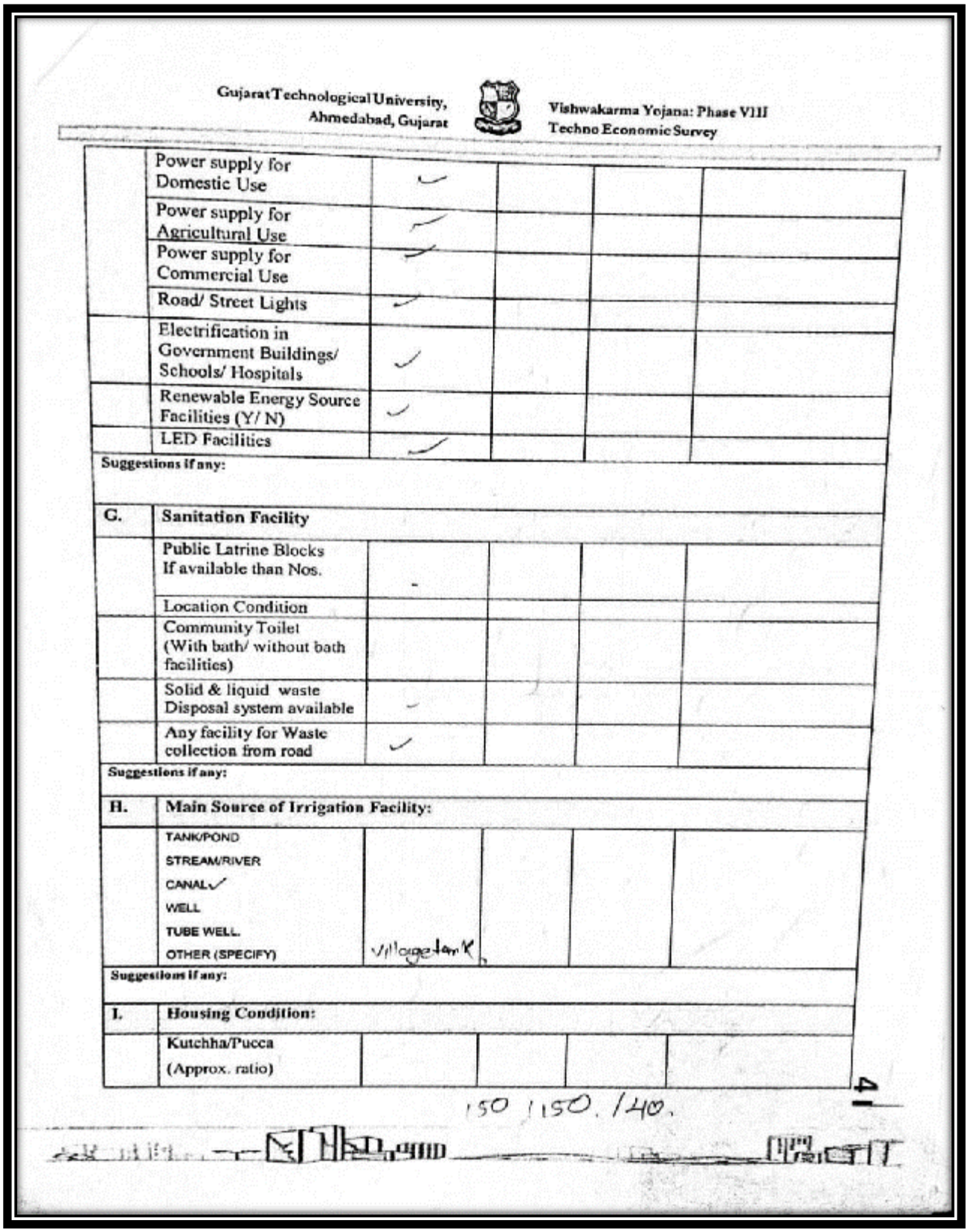
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	2Nos	1 tank / 10, Labelers.	
	Underground Sump	Capacity:			
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET	✓	Yes.		
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	2 KM.			
	Main road	1 KM			
	Internal streets	C.C. Block			
	Nearest NH/SH/MDR/ODR Dist. in kms.				
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	Bardoli			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Khatwas			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	—			
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Govt			

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.	-			
	Location Condition				
	Community Toilet (With bath/ without bath facilities)				
	Solid & liquid waste Disposal system available	✓			
	Any facility for Waste collection from road	✓			

Suggestions if any:

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

Suggestions if any:

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

150 / 150. / 140.

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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		yes		
	CHC/RH		yes		
	District/ Govt. Hospital		yes		
	Govt. Dispensary				
	Private Clinic				
	Private Hospital/ Nursing Home				
	AYUSH Health Facility				
	sonography /ultrasound facility				
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	1 no			
	Primary School	yes			
	Secondary school	1 nos			
	Higher sec. School				
	ITI college/ vocational Training Center				
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities				
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				

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Suggestions if any:

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

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

Suggestions if any:

M.	Other Facilities	Condition	Location	Available (YES)	Available (NO)
	Post-office	✓		Yes	
	Telecommunication Network/ STD booth	✓		Yes	
	General Market	✓		Yes	
	Shops (Public Distribution System)	✓		Yes	
	Panchayat Building	✓		Yes	
	Pharmacy/Medical Shop	✗			No
	Bank & ATM Facility	✓		Yes	
	Agriculture Co-operative Society	✓		Yes	
	Milk Co-operative Soc.	✓		Yes	
	Small Scale Industries	✓		Yes	
	Internet Cafes/ Common Service Center/Wi Fi	✗			No
	Youth Club	✓	1 Km	Yes	
	Mahila Mandal	✓	1 Km	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				
Other Facility				

Suggestions if any:

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

No.

Yes,
No.

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1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other		
2.	Additional Information/ Requirement		
3.	During the last six months how many times CLEANING .....2..... FOGGING.....0..... Drive was undertaken in the village?		

IX. Smart Village / Heritage Details

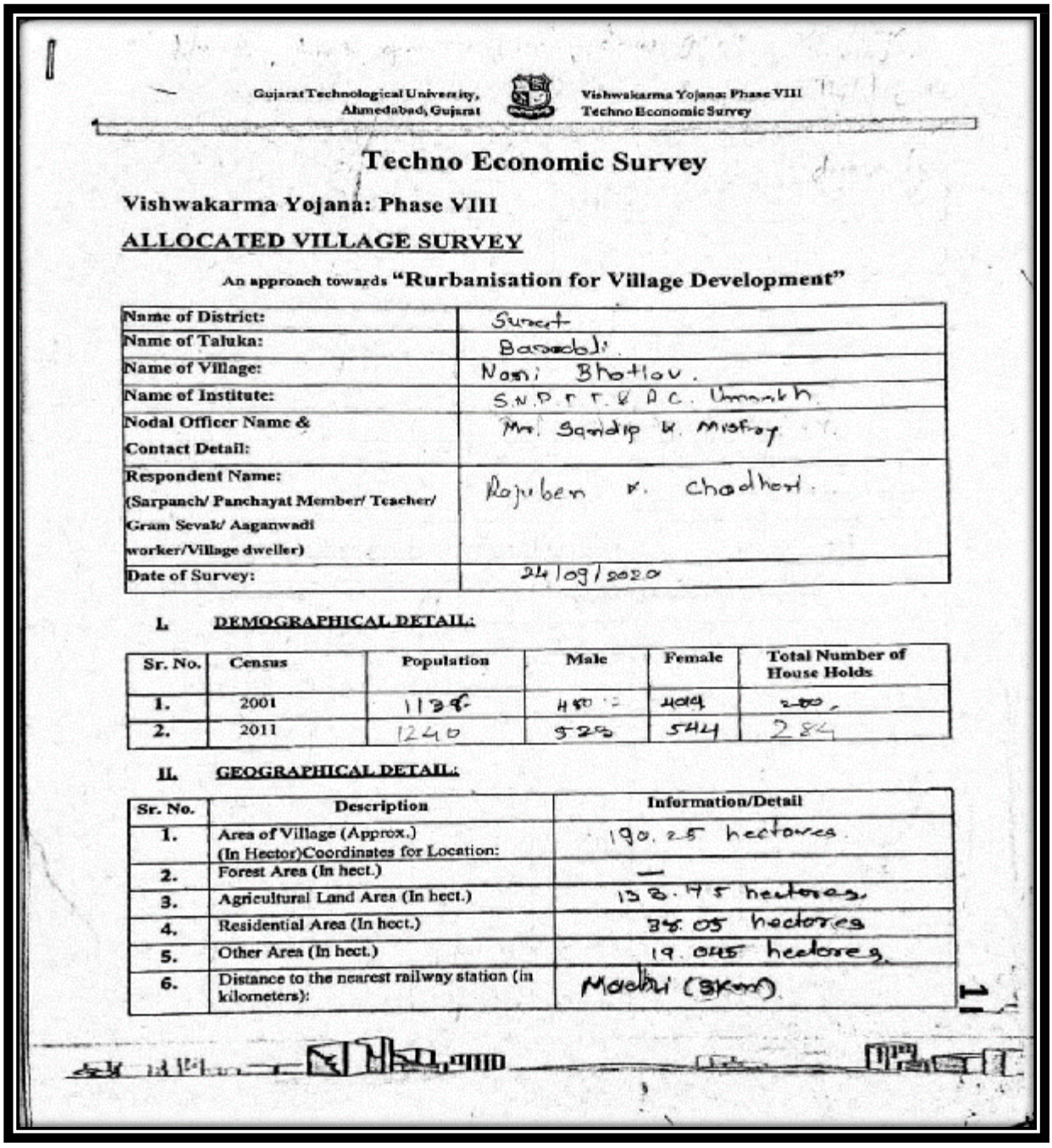
Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?		

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

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

ઉપ સરપંચ
ગ્રામ પંચાયત અરજણા
તા. બારડોલી, જિ. સુરત

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



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Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

Name of District:	Surat
Name of Taluka:	Bardoli
Name of Village:	Nani Bhatlav.
Name of Institute:	S.N.P.T.&A.C. Umarkh.
Nodal Officer Name & Contact Detail:	Mr. Sandip K. Mistry
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Rajuben K. Chadhari.
Date of Survey:	24/09/2020

I. **DEMOGRAPHICAL DETAIL:**

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	1138	480	409	200
2.	2011	1240	529	544	284

II. **GEOGRAPHICAL DETAIL:**

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	190.25 hectores.
2.	Forest Area (In hect.)	—
3.	Agricultural Land Area (In hect.)	138.745 hectores.
4.	Residential Area (In hect.)	38.05 hectores
5.	Other Area (In hect.)	19.045 hectores.
6.	Distance to the nearest railway station (in kilometers):	Madhi (3Km)

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7.	Name of Nearest Town with Distance:	Madhi
8.	Distance to the nearest bus station (in kilometers):	within village
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.	Animal husbandary
	2.	Agriculture
	3.	Load work

Major crops grown in the village:	1.	Sugar cane
	2.	danger
	3.	—

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
1.	PIPED WATER				
	Piped Into Dwelling	Yes			
	Piped To Yard/Plot				
	Public Tap/Standpipe				
	Tube Well Or Bore Well				
2.	DUG WELL				
	Protected Well				
	Un Protected Well				
3.	WATER FROM SPRING				
	Protected Spring				
	Unprotected Spring	—			
	Rainwater				
	Tanker Truck				
	Cart With Small Tank				
4.	SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/				
	Irrigation Channel	Yes -- Khadki			
	Bottled Water				
	Hand Pump	Yes — 1 to 5			

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	Other(Specify)Lake/ Pond				

Suggestions if any:

B.	Water Tank Facility				
	Overhead Tank	Capacity:	40,000 lit / 5,000 x 12		
	Underground Sump	Capacity:			

Suggestions if any:

C.	The Type of Drainage Facility				
	A. UNDERGROUND DRAINAGE 1	Nill → Khadi - Kaccha			

Suggestions if any:

D.	Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM				
	Village approach road	Sunali-Bhatlav - WDH			
	Main road	All weather			
	Internal streets	"			
	Nearest NH/SH/MDR/ODR Dist. in kms.	12 Kms -	NH (Bajipura)		

Suggestions if any:

E.	Transport Facility				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	3 KM (Madhi)			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Within	village		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Avail.			

Suggestions if any:

F.	Electricity Distribution				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	DGVCL - Juvon Jyot			

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	Power supply for Domestic Use	24hrs			
	Power supply for Agricultural Use	8 hrs →	8 ~~hrs~~ 4		
	Power supply for Commercial Use	None			
	Road/ Street Lights	Yes			
	Electrification in Government Buildings/ Schools/ Hospitals	School			
	Renewable Energy Source Facilities (Y/ N)	solar light :- 10 Nos			
	LED Facilities	Yes			

Suggestions if any:

G.	Sanitation Facility				
	Public Latrine Blocks If available than Nos.	Nil			
	Location Condition	—			
	Community Toilet (With bath/ without bath facilities)	—			
	Solid & liquid waste Disposal system available	Not avail			
	Any facility for Waste collection from road	Not avail			

Suggestions if any:

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

Suggestions if any:

I.	Housing Condition:				
	Kutchha/Pucca (Approx. ratio)	71%	71/142	respectively	

well maintained, Mainland & Kotecha

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V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	Yes - 2 Nos ✓			
	Sub-Centre				
	PHC	- None -	(Vyara) 5 KM		
	BLOCK PHC				
	CHC/RH				
	District/ Govt. Hospital	None			
	Govt. Dispensary				
	Private Clinic	None			
	Private Hospital/ Nursing Home				
	AYUSH Health Facility	None			
	sonography /ultrasound facility				
	If any of the above Facility is not available in village than approx. distance from village: ..5....kms.				
	Suggestions if any:				
K.	**Education Facilities:**				
	Aaganwadi/ Play group	✓ Yes			
	Primary School	✓ Yes	1 - 5		
	Secondary school	-	(Nos/Km) - (Vyara)		
	Higher sec. School				
	ITI college/ vocational Training Center		(Vyara)		(Vyara)
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities		(Vyara)		

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If any of the above Facility is not available in village than approx. distance from village: ...16....kms.

Suggestions if any:

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

If any of the above Facility is not available in village than approx. distance from village: ...16...kms.

Suggestions if any:

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

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	Credit Cooperative Society Agricultural Coopemative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries				None
	Other Facility				

Suggestions If any:

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

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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 light not work.			
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	No.			
3.	Any Other				

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	illage Base Map Available: Hard Copy/Soft Copy				
2.	Recent Projects going on for Development of Village				
3.	Any NGO working for village development				
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)	25% village affected			

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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	school 1., Panchayat Building	
2.	Additional Information/ Requirement		
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	1 1	

IX. Smart Village / Heritage Details

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?	gate, light public toilet bank. school.	

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

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

વાલુજીભાઈ કે ચૌધરી
સરપંચશ્રી
ગ્રામ પંચાયત, નાનીભટલાવ
તા. ઓરડોલી, જિ. સુરત.

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12.4 GAP ANALYSIS OF ALLOCATED VILLAGE

Village Facilities	Planning Commission/UD PFI Norms	Village Name:	Nani-bhatlav		
		Population: 1067			
		Existing	Required as per Norms	Smart Vilage Heritage Future Projection Design	Gap
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	2	NO	8	6
Primary School	Each Per 2500 population	1	NO	1	0
Secondary School	Per 7,500 population	0	NO	0	0
Higher Secondary School	Per 15,000 Population	0	NO	0	0
College	Per 125,000 Population	0	NO	0	0
Tech. Training Institute	Per 100000 Population	0	NO	0	0
Agriculture Research Centre	Per 100000 Population	0	NO	0	0
Skill Development Center	Per 100000 Population	0	NO	0	0
Health Facility					
Govt/Panchyat Dispensary or Sub PHC or Health	Each Village	0	YES	1	1
Primary Health & Child Health Center	Per 20,000 population	0	NO	1	1
Child Welfare and Maternity Home	Per 10,000 population	0	YES	1	1
Multispeciality Hospital	Per 100000 Population	0	NO	0	0
Public Latrines	1 for 50 families (if toilet is notthere in home, specially for slum pockets & kutcha	0	YES	0	0
Physical Infrastructure Facilities					
Transportation		**Adequate**			
Pucca Village Approach Road	Each village	YES			
Bus/Auto Stand provision	All Villages connected by PT (STBus or Auto)	YES			
Drinking Water (Minimum 70 lpcd)		**Adequate**			
Over Head Tank	1/3 of Total Demand	2	YES	3	1
U/G Sump	2/3 of Total Demand	0	YES	1	1
Drainage Network - Open		**Inadequate**	NO	0	0
Drainage Network - Cover		**Inadequate**	YES	1	1
Waste Management System		**Inadequate**	N0	0	0
Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	1	NO	1	0
community hall and Public Library	Per 15000 Population	0	YES	1	1
Cremation Ground	Per 20,000 population	0	NO	0	0
Post Office	Per 10,000 population	0	NO	1	0
Gram Panchayat Building	Each individual/group panchayat	1	NO	1	0
APMC	Per 100000 Population	0	NO	0	0
Fire Station	Per 100000 Population	0	NO	0	0
Public Garden	Per village	0	YES	1	1
Police post	Per 40,000Population	0	NO	0	0
Electrical Design					
Electricity Network		**Adequate**	NO	**Adequate**	0
Any Smart Village Facility					
Technology					
		ESR cap	0		
		Sump cap	0		

12.5 Summary of All Villages Designs

Sr. No.	Village name		Design	
			PART-1	PART-2
1	Nani-Bhatlav	Civil Engineering	Public toilet with plastic block	ATM
			Rain Water Harvesting	Village Gate
			Public Health Centre with Plastic block	Chabutaro
			Grocery shop	Panchayat Building
			Garden	Sports Club
			Primary school	Krushi Sheva Kendra
		Electrical Engineering	Earthing product	Programmable Load
			Miniature circuit breaker (MCB)	Shedding
			Time switch specification	Home Automation
2	Utara	Civil Engineering	Drainage system	Organic Composting Plant
			Bus stand	Temple
			Party plot	Bank With ATM
			Cemetery	Cheese Factory
			Public Health Centre	Banquet Hall
			Cattle house	Park
		Electrical Engineering	Underground cable	Solar Tracker with Stepper Motor Using
			CCTV camera	Microcontroller Auto Intensity Control of Street Light Electrical
			Solar Photovoltaic	Load Control System by Computer
3	Vadhava	Civil Engineering	Post office	Agriculture storage room
			Low cost Toilet	Cybercafé
			Skill development center	Funeral home
			Library	Primary shop
			Biorock Treatment plan	Milk Dairy
			Party plot with plastic block	Bank
		Electrical Engineering	Solar street light designing	Auto Irrigation System Using Soil Moisture Sensor and PIC
			Solar crop dryer	Fire Alarm
			Prepaid energy meter	Underground Cable Fault Distance Locator

12.6 Summary of Good Photographs in Table From:-

Fig 12.1milk centre

fig 12.2flag hosting area

fig 12.3kuccha house

fig 12.4pucca house

fig 12.5pucca house

fig 12.6government office

Fig12.7 post office

Fig12.8 intersection

fig12.9 village board

fig 12.10school compound

fig 12.11primary school

Fig12.12 over head tank

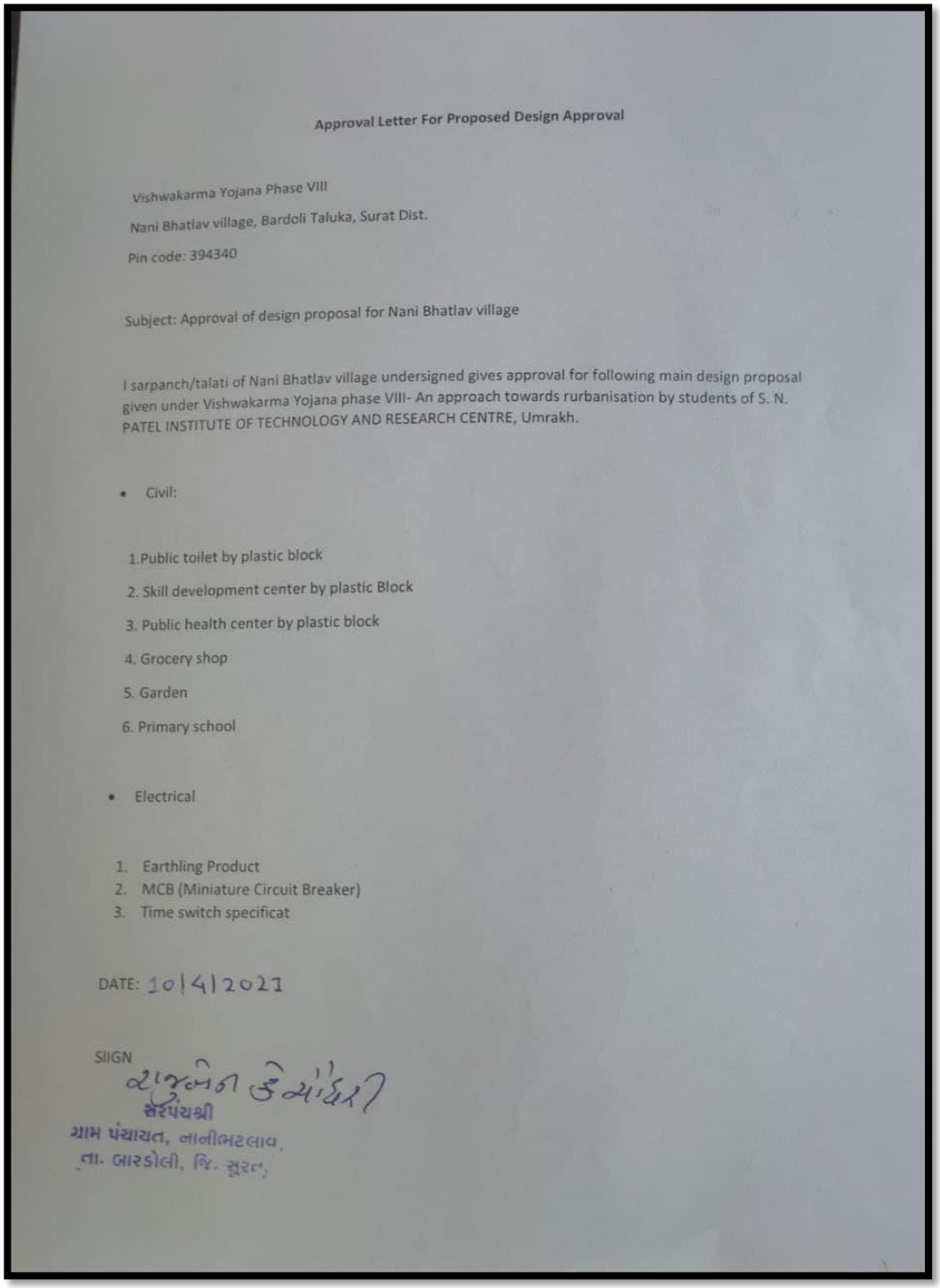
fig12.13 5000 lit tank

fig 12.14 intersection

12.7 Village Interaction Report with the photograph as a report format

Techno economic survey forms give much information about village by interacting with Talati and Sarpanch. But interaction with village dwellers and observation of village condition is required. We visited allocated village Nani-Bhatlav and also visited ideal village and Smart villageKharvasa.We met to Sarpanch Rajuben k. Chaudhari and Talati of Nai-Bhatlav village. They both are very dynamic person and gave us the detailed information and data whenever we required. Wevisited all the internal part of the village and interacted with villagers directly and ask them about the present situation of village. We conducted a Techno-economic survey of Nani-Bhatlav village.After all, we analyzed the gap analysis and provided the necessary facilities to village.

12.8 Sarpanch Letter giving information about the village development



Approval Letter For Proposed Design Approval

Vishwakarma Yojana Phase VIII

Nani Bhatlav village, Bardoli Taluka, Surat Dist.

Pin code: 394340

Subject: Approval of design proposal for Nani Bhatlav village

I sarpanch/talati of Nani Bhatlav village undersigned gives approval for following main design proposal given under Vishwakarma Yojana phase VIII- An approach towards rurbanisation by students of S. N. PATEL INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE, Umrakh.

- Civil:

1.Public toilet by plastic block

2. Skill development center by plastic Block

3. Public health center by plastic block

4. Grocery shop

5. Garden

6. Primary school

- Electrical

1. Earthling Product
2. MCB (Miniature Circuit Breaker)
3. Time switch specificat

DATE: 10/4/2021

SIIGN

સરપંચશ્રી

ગ્રામ પંચાયત, નાનીભટલાવ

તા. બારડોલી, જિ. સુરત.

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

13.1.1 Sustainable Design (Civil design 1) : ATM

Scenario :

The residents of far-flung or rural areas are unable to pay visit to branches located at distant places onaccount of resource constraints viz., time, cost and opportunity. Thus, it has become imperative for banks to reach out customers through a variety of technology driven delivery channels such as Micro ATMs, Bio-metric ATMs, Mobile ATMs, and Smart Cards etc., which are most cost effectivecompared to Brick and Mortar model. ATM has brought sea change in Indian Banking space with significant qualitative improvement in delivery of banking services and within short span the presenceof ATMs are outnumbered the physical branch network. The higher growth percentage of white-labelATM (WLA) operators is an indication of rural growth but its not limited to that. Banks have also beenexpanding in rural regions. However, the ATM industry numbers (3% growth) do not reflect that as the expansion was offset by the 10-PSU-bank merger plan, which led to closure of ATMs in urban areas.

Existing Situation in nani bhatlav :

Here we have designed the ATM for our nani bhatlav. The population of nani bhatlav village is 1067 asper 2011 census. So it is required to have one ATM in the village. The villagers have to go in bardoli for cash requirement so that we have decided and finalized the design of ATM.

Sustainability of the design :

ATM as an important tool :

Design Utilized by Illiterate/ Semi-literate users ; Under served ; Unbanked ; People living inremote area;Needs :

Basic banking facilities ; Security ; Ease of use ; A suitable and simple product ; etc.

Design brief :

Atm design to assist illiterate, semi-literate with banking; Providing services through familiar devices;Net reduction in transaction processes; Aim to help in financial inclusion policies; etc.

ATM Design :

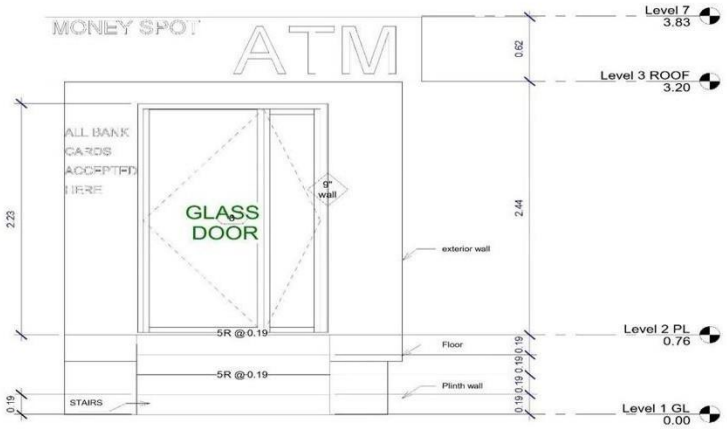
Length : 2.67m ; Width : 2.67m : Height :

3.35mCarpet area : 4.88 m^2

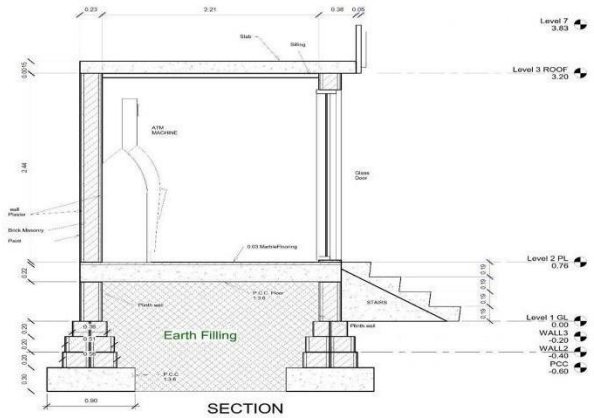
Common repair and maintenance of the structure :

For maintenance to be most effective, it should be organized through a programme of cyclical maintenance. At the most basic level this includes daily routines, and works upwards to periodic

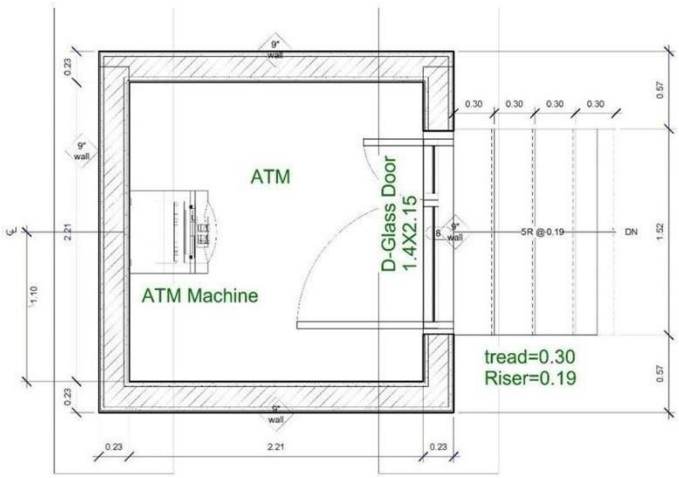
Proposed Design in Auto cad :



ELEVATION



SECTION



PLAN

DESIGN NO. 11	*ATM*	
Preparaed By	NIRMIT JOSHI PANCHOLI RIMPLE	Sheet No.11
PROJECT NAME	VISHWAKARAMA YOJANA PHASE VIII RANASAR, GANDHINAGAR	
INSTITUTE NAME	S.N.P.I.T&R.C., UMRAKH	
UNIVERSITY NAME	GUJARAT TECHNOLOGICAL UNIVERSITY	

ATM : Measurement Sheet

SR. NO	Description	Length (m)	Width (m)	Height (m)	Count (Nos.)	Total Quantity (m^3)
1	GLASS DOOR WITH ALUMINUM FRAME	1.397	0.02	2.2098	1	**1**
2	BASIC ROOF: GENERIC	2.667	2.667	0.152	1	**1.15**
3	FLOOR: 10"	2.667	2.667	0.254	1	**1.81**
4	BASIC WALL: 9" EXTERIOR	2.4384	0.2286	3		**4.68**
5	BASIC WALL: 9" EXTERIOR	1.6002	0.2286	3	1	**3.47**
6	CAST-IN-PLACE STAIR:	0.1778	1.524	0.1778	4	**0.75**
7	PCC IN FOOTING	10.22	0.90	0.4	1	**2.80**
8	BASIC WALL: 0.40	10.22	1.6	0.4	1	**1.64**
9	BASIC WALL: 00.30	10.22	1.2	0.4	1	**1.22**
10	BASIC WALL: GENERIC – 0.50	10.22	2	0.4	1	**2.04**
11	EXCAVATION	10.22	1.2	1.5	1	**18.40**

ATM : Abstract Sheet

SR NO.	Description	Quantity (m^3)	Rate	Per	Amount
1	BASIC WALL: 9" EXTERIOR 1	220.48	130	Sq.Ft	**28662**
2	BASIC WALL: 9" EXTERIOR 2	25.84	90	Sq. Ft	**2325.6**
3	GLASS DOOR WITH ALUMINUM FRAME: 1400X2150	-	3000	-	**3000**
4	BASIC ROOF: GENERIC - 12"	1.15	3500	M3	**4025**
5	FLOOR: 10"	1.81	4100	M3	**7421**
6	CAST-IN-PLACE STAIR: MONOLITHIC STAIR	-	3000		**3000**
7	EXCAVATION	1.215*4	350	M3	**1701**
8	PCC	9.32	3500	M3	**32620**
9	BASIC WALL: 00.30	4.08	90	Sq Ft	**13140**
10	BASIC WALL: 0.40	5.44	90	Sq Ft	**13140**
11	BASIC WALL: GENERIC -0.50	6.78	90	Sq Ft	**13140**
				GRAND TOTAL	**104752**

The rates of their respective works provided in the abstract sheet along with quantities are inclusiveofwater charges, contractor's profit, contingencies, utilities and labor charges.

Total cost = ₹ 104752/-

13.1.2 Heritage Village Design (Civil design 2) : Entrance gate

Scenario :

A village entrance gate as a heritage village design , a gate or gateway is a point of entryto a spacewhich is enclosed by wall Gates may prevent or control the entry or exit of individuals, or they maybe merely decorative. Other terms for gate include yett and port.The word is derived from oldNorse "gat", meaning road or path, and originally referred to the gap in the wall or fence, rather thanthe barrier which closed it. The moving partor parts of a gateway may be considered "doors", as theyare fixed at one side whilst opening and closing like one.

Existing Situation in Nani bhatlav :

In the Nani bhatlav village there is no any village entrance or front gate existing in the village. After the approval of proposed designs of village as of part 2 , Talati has appreciated our work andtold that thereis a need of the village entrance gate in Nani bhatlav . So we have designed a villageentrance gate as a heritage village design.

Sustainability of the design :

Entrance Gate as an important tool :

Design Utilized by,

People living in the village of even outsiders from nearby villages and relatives of thevillagers canuseor utilize a village entrance gate for their different uses.

Needs :

For better esthetic entrance view; Ease of use; Availability of good approach road ;etc.Design brief :

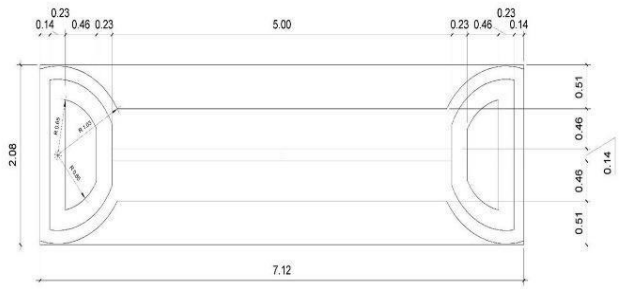
The village entrance gate design as a heritage village design is for better esthetics andlooks ofthevillage approach road.

Entrance Gate Design :

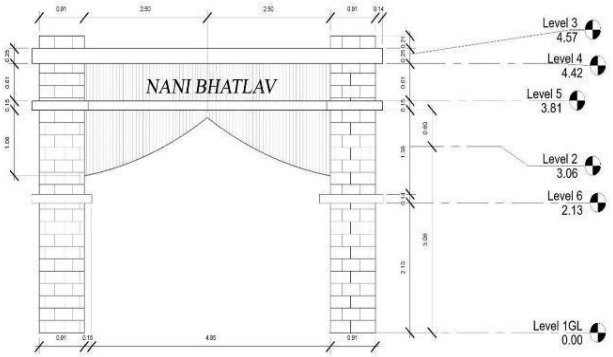
Length : 7.12m ; Width : 2m : Height :4.88m Common repair and maintenance of thestructure:

Some common repairs and maintenances are as below ; Exterior painting and plastering ; Landscaping and gardening ; Paving repairs ; Carpeting and flooring; Plumbing;Repairing cracking or leaning walls etc**.**

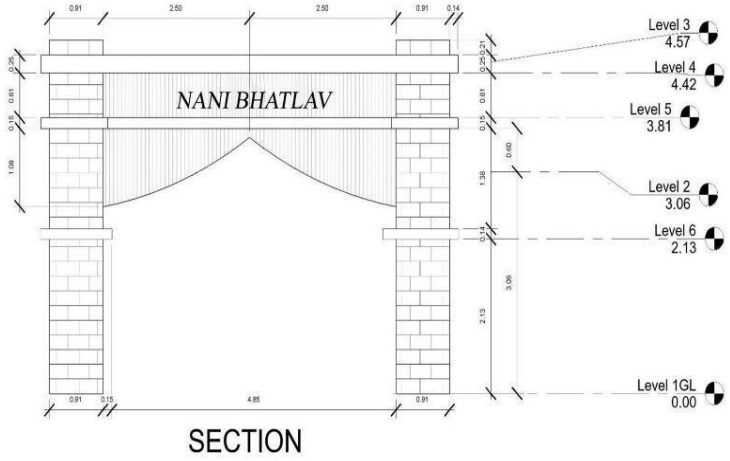
For most effective maintenance , it should be organized through a programme of cyclical maintenance.At the most basic level this includes daily routines, and works upwards to periodic programmes of weekly, monthly, semi-annual, annual, quinquennial and so on routines.



PLAN



ELEVATION



SECTION

DESIGN NO. 11	*GATE*	
Preparaed By	NIRMIT JOSHI PANCHOLI RIMPLE	Sheet No.11
PROJECT NAME	VISHWAKARAMA YOJANA PHASE VIII RANASAR, GANDHINAGAR	
INSTITUTE NAME	S.N.P.I.T&R.C., UMRAKH	
UNIVERSITY NAME	GUJARAT TECHNOLOGICAL UNIVERSITY	

Entrance Gate : Measurement Sheet

SR. NO	Description	Length (m)	Width (m)	Height (m)	Count (Nos.)	Total Quantity (m^3)
1	BASIC WALL: 9"	7.12	2.083	4.877	2	**8.66**
2	BASIC WALL: GENERIC - 6" MASONRY	1.524	0.1524	1.83	1	**1.04**
3	ROOFS 1	7.2	2.08	0.1524	1	**3.7**
4	ROOFS 2	7.2	2.08	0.1524	1	**1.42**
5	EXCAVATION	2	2	1.5m	2	**13.5**

Entrance Gate : Abstract Sheet

SR NO.	Description	Quantity (m^3)	rate	per	Amount
1	BASIC WALL: 9"	8.66	3500	Ft^2	**30310**
2	BASIC WALL: GENERIC - 6" MASONRY	1.04	130	Ft^2	**10231**
3	ROOFS 1: ROOFS 1	3.7	3500	m^3	**12950**
4	FLOOR: GENERIC - 6"	1.42	3500	m^3	**4970**
5	EXCAVATION	13.5	350	m^3	**9450**
6	PCC	1.85	3500	m^3	**12950**
7	BASIC WALL: 00.30	1.8	90	Ft^2	**9360**

8	BASIC WALL: 0.40	2.8	90	Ft^2	**9360**
9	BASIC WALL: GENERIC - 0.50	2.8	90	Ft^2	**9360**
			GRAND TOTAL		**108941**

The rates of their respective works provided in the abstract sheet along with quantities are inclusive of water charges, contractor's profit, contingencies, utilities and labor charges.

Total cost = ₹ 108941/-

13.1.2 Sustainable design 3: Panchayat building

Scenario:

As a village a good well built panchayat building is a must needed construction.The panchayat building have major use in day to day functioning of the village and the management. And it is obvious that the well built panchayat building will give a better control and organised way to manage the village and the other uses.

Existing Situation in Nani bhatlav :

Currently there is no proper panchayat building present in the nani bhatlav.The present cnsition wise the panchayat need a re construction and re design . The space for the office is significantly less . And the proper toilet system is not present.

Sustainability of the design :

Panchayat building is a must necessity for Nani bhatlav. And the design we have given satisfythe all basic requirement for a panchayat building should have.

Design Utilized by,

This design is utilised by the sarpanch of the village and different elected authorites those who manage the village .

Needs :

The needs for the panchayat building is that it can be used for execution of maintenance and construction of water resources, roads, drainage, School buildings and common property resources.Levy and collect local taxes.Execute government schemes related to employment.**Design brief :**

The design is basic and sober as that makes it more money efficient.the design consist of waiting room ,sarpanch office and tallati office.

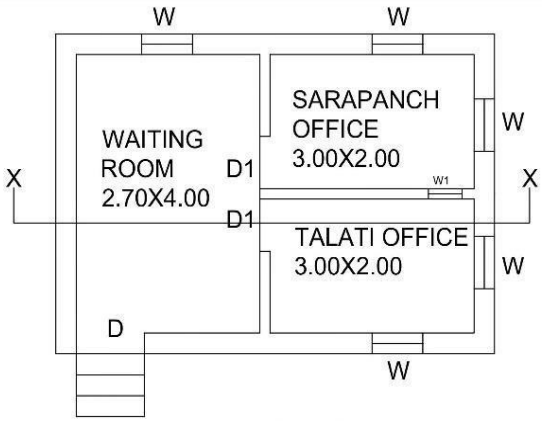
The waiting room dimension is 2.70X4.00 mt.

While the sarpanch office and tallati office have the dimension of 3.00X2.00 mt.

Common repair and maintenance of the structure :

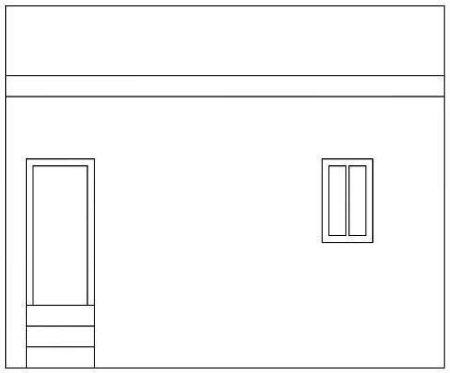
Some common repairs and maintenances are as below ; Exterior painting and plastering ; Landscaping and gardening ; Paving repairs ; Carpeting and flooring; Plumbing; Repairing cracking or leaning walls etc**.** For most effective maintenance , it should be organized through a programme of cyclical maintenance.At the most basic level this includes daily routines, and works upwards to periodic programmes of weekly, monthly, semi-annual, annual, quinquennial and so on routines.

PANCHAYAT BUILDING

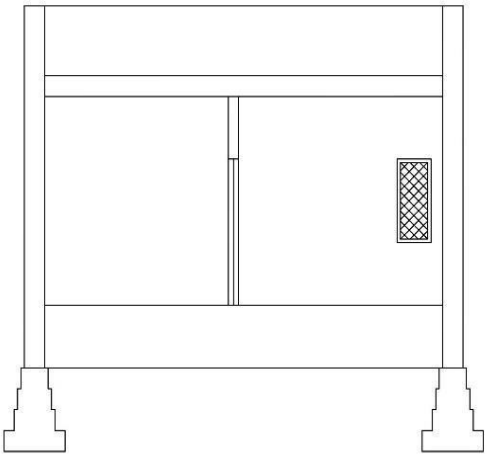


PLAN

NAME	SIZE	QUANTITY
D	1.00X2.10	1
D1	0.75X2.10	2
W	0.75X1.20	4
W1	0.50X1.20	1



ELEVATION



SECTION X-X

DESIGN NO.9	**PANCHAYAT BUILDING**	
Preparaed By	NIRMIT JOSHI PANCHOLI RIMPLE	Sheet No.9
PROJECT NAME	VISHWAKARAMA YOJANA PHASE VIII RANASAR, GANDHINAGAR	
INSTITUTE NAME	S.N.P.I.T&R.C., UMRAKH	
UNIVERSITY NAME	GUJARAT TECHNOLOGICAL UNIVERSITY	

Measurement sheet for panchayat office

Sr. no	DESCRIPTION	NO	L	B	H	QUANTITY
1	Excavation for foundation L=27.8-1.1/2*5=25.05	1	25.05	1.1	1.1	30.311m3
2	PCC L=27.8-0.9/2*5=25.55	1	25.55	0.9	0.2	4.59
3	Brick work in foundation uptoplinth					
	1st step, L=27.8-0.6/2*5=26.55	1	26.3	0.6	0.3	4.734
	2nd step,L=27.8-0.5/2*5=26.3	1	26.55	0.5	0.3	3.983
	3rd step,L=27.8-0.4/2*5=26.80	1	26.80	0.4	0.85	9.112
	Total=					17.829
4	Earthfilling work in plinth				`	
	Waiting room=2.7*4	1	2.7	4	0.55	5.94
	Sarpanch office=3*2	1	3	2	0.55	3.3
	Talati office=3*2	1	3	2	0.55	3.3
	TOTAL					12.54m3
5	DPC at plinth level L=27.8-0.4/2*5=26.8	1	26.8	0.4	_	10.72m3
6	Brickmasonary in super structure					
	For 0.3 m wall L=20-0.3/2*5=19.25	1	19.25	0.3	3	17.325m3
	For 0.15 wall L=6.75-0.15/2*5=6.375	1	6.375	0.15	3	2.069
	Total					20.194m3
	Deduction for doors and windows					
	D=1*2.10	1	1	0.3	2.10	0.63
	D1=0.752*2.10	2	0.75	0.15	2.10	0.473
	W=0.755=*2.10	5	0.75	0.3	1.2	1.35
	W1=0.50*1.20	1	0.50	0.15	1.2	0.09
	TOTAL					2.57m3
	Lintel quantity					
	D=1*2.10	1	1.3	0.3	0.15	0.059
	D1=0.75*2.10	2	1.05	0.15	0.15	0.047
	W=0.75*1.20	5	1.05	0.3	0.15	0.236

	W1=0.5*1.20	1	0.8	0.15	0.15	0.018	
	TOTAL					0.36m3	
	BRICE WORK IN SS						
	20.194-2.54-0.36=17.29m3						
7	RCC slab L=0.45+5.7=6.15 B=4+0.3=4.3 H=0.2		1	6.15	4.3	0.2	5.289m3
8	Brick masonary in parapet wall						
	H-wall,L =6.15m		1	6.15	0.3	1	1.845
	V-wall , L=4m		1	4	0.3	1	1.2
	total						3.045m3
9	Plastering work -inside With the combine of waiting room,sarpanch office and talati office-TOTAL						100.2m3
	Deduction of doors and windows						7.05
	Total work						93.15m3
10	Flooring of 5cm mosaic tiles combining,						
	waiting room		1	2.7	4	-	10.8
	sarpanch office		1	3	2	-	6
	talati office		1	3	2	-	6
	TOTAL						20.8m3

Abstract sheet for panchayat building					
SR. NO.	DESCRIPTION	QUANTITY	RATE	PER	AMOUNT
1	Excavation for foundation	30.311m3	100	M	3031.10
2	PCC laying for foundation	4.599	1500	M	6898.50
3	1st class brick for foundation	17.829	1600		28526.40
4	Earth filling for plinth	12.54	75	M	940.50
5	PCC at plinth	10.72	200	M	2144
6	Brick masonary in ss	17.29	1500	M	25935
7	Laying of rcc slab	5.289	2500	M	13222.5
8	Reinforcement for rcc	420	45	Kg	18900
9	12mm thick plaster	93.15	150	M	13972.5
10	5cm thick flooring mosaic titles	20.8	200	M	4160
		total			117730.5

		3% contingency	3531.915
		2% work charge establishment	2354.61
		total	123617.025
		10% contractor profit	12361.73
		Grand total	135978.78

The rates of their respective works provided in the abstract sheet along with quantities areinclusive ofwater charges, contractor's profit, contingencies, utilities and labor charges.

Total cost = ₹ 135978/-

13.1.3 Sustainable design 4: Chabutaro

Scenario:

The Chabutro is a structure mostly found in India. They are a tower-like structure with octagonal or pentagonal shaped enclosures at the top. In the upper enclosure are several holes, wherein birds can maketheir nests. In Gujarat these are constructed at the entrances villages, especially for use and breedingof pigeons. Inside this structure mostly pigeons reside and breed. Mostly such monuments are found in village centers or at village entrances in the Gujarat & Kutch in India. At the base of the structure a sittingplatform is usually made. The base and the surrounding area of this structure serves as a gathering placefor villagers and as a playing area for children.

Existing Situation in Nani bhatlav :

Within nani bhatlav though there are much greenery sorrunding but a chabutaro will gives an area to children to play and gives a different face of the village itself as socially and structurally.Nani bhatlavhave no chabutara in sorrunding area.

Sustainability of the design

Design Utilized by,the birds as of different types of birds that gets home to live and get drinking waterand food or grains to eat.

Needs :

There is major deception of sparrow and pegions as human has take over his enormous giants of concretejungle. As by chabutaro it will give a home to the birds to stay.

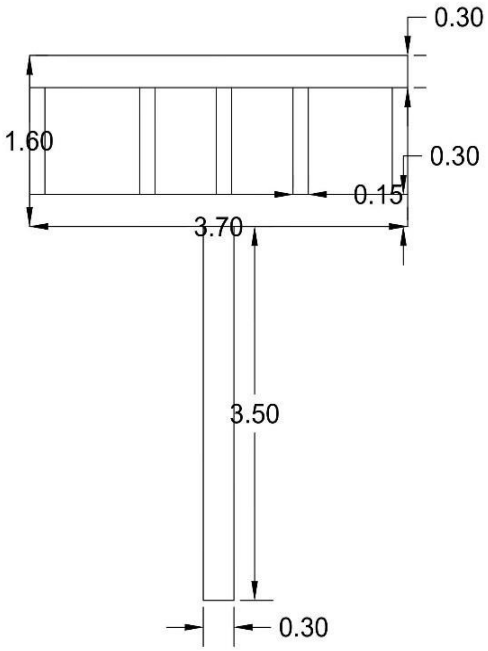
Design brief

The chabutaro is 5.1mt of height and 2 m width having a spearical shape on the top and a pole likestructurre for the support on the ground.spacing of the 0.15mt is given as an entrance for the birds.

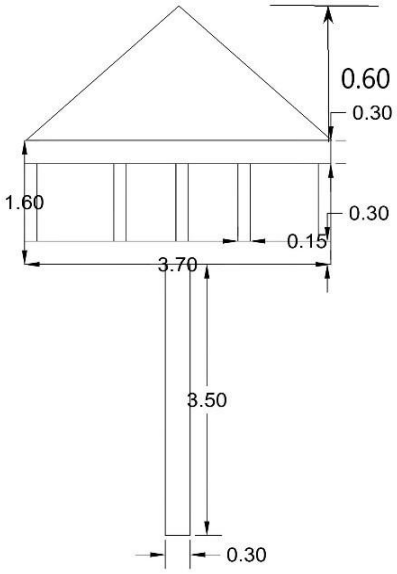
The structure: Common repair and maintenanceof the structure :

Some common repairs and maintenances are as below ; Exterior painting and plastering ; Landscapingand gardening ; Paving repairs ; Carpeting and flooring; Plumbing; Repairing cracking or leaning walls etc**.**

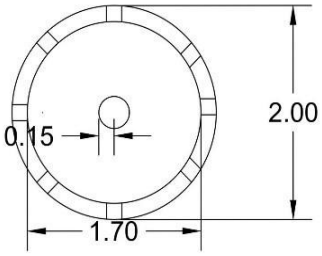
For most effective maintenance , it should be organized through a programme of cyclical maintenance.At the most basic level this includes daily routines, and works upwards to periodic programmes of weekly, monthly, semi-annual, annual, quinquennial and so on routines.



ELEVATION



SECTION



PLAN

DESIGN NO. 10	**CHABUTARA**	
Preparaed By	NIRMIT JOSHI PANCHOLI RIMPLE	Sheet No.10
PROJECT NAME	VISHWAKARAMA YOJANA PHASE VIII RANASAR, GANDHINAGAR	
INSTITUTE NAME	S.N.P.I.T&R.C., UMRAKH	
UNIVERSITY NAME	GUJARAT TECHNOLOGICAL UNIVERSITY	

Abstract sheet for chabutaro					
SR. NO.	DESCRIPTION	QUANTITY	RATE	PER	AMOUNT
1	Excavation for pile driving	0.063	1000	M	63
2	Pile installation and its quantity	247	60	Kg	14820
3	Circular type wood shade for chabutaro				
	For down side	33.82	130	Sq. ft.	4396.60
	For upper side	33.82	130	Sq. ft	4396.60
4	Wood for connecting upper side and down side	31	130	M	4030
		Grand total			27706.20

The rates of their respective works provided in the abstract sheet along withquantities areinclusive ofwater charges, contractor's profit, contingencies, utilities and labor charges.

Total cost = ₹ 27706.20/-

13.1.3 Sustainable design 5- krushi sevan Kendra

Scenario

Krushi seva kendra is the Supplier, Distributor, Wholesaler and Trader of Organic Pesticides, Bio-Pesticides, Maize Seed, Sesame Seeds, Cotton Seeds, etc. India is an agriculture economy unlike other developed countries, which are industrial economy. That means the economy of thecountry depends, to a large extent, on agriculture. Crop cultivation sustains almost two -third of the Indianpopulation.

Existing Situation in Nani bhatlav

Nani bhatlav have no such krushi seva kendra .there is one but the the farmer need to travel about51 km for that.so we thought that the a krshi seva kendra is good fr the farmers of the village.

Sustainability of the designNeeds :

The krushi seva kendra makes a difference for farmer as he gets the seed organic pesticides, Bio-Pesticides, Maize Seed, Sesame Seeds, Cotton Seeds, etc.The distance for the travel of the farmer will reduce and employment will increase

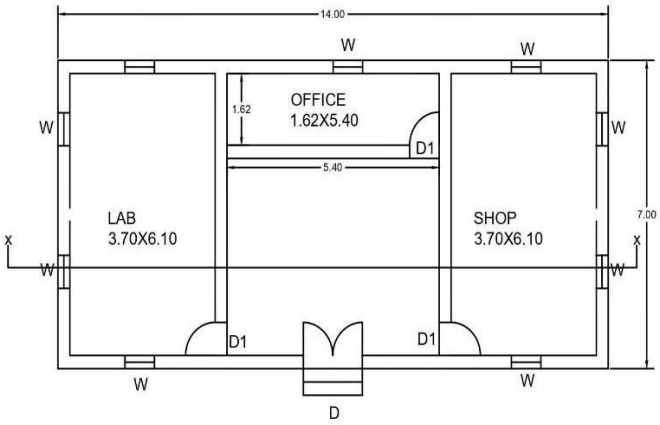
Design brief

The design of KRUSHI seva kendra consist of LAB,OFFICE and SHOP.The length of thestructure is 7m and the width of the structure is 14 m LAB has the area of 3.70*6.10 Office has the area of 1.62*5.40Shop has the area of 3.70*6.10

maintenance of the structure :

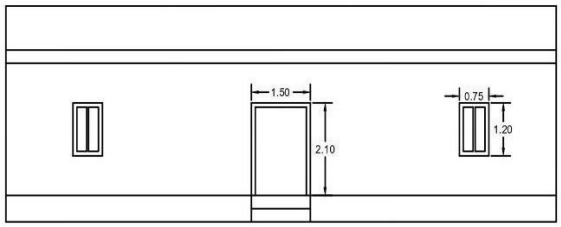
Some common repairs and maintenances are as below ; Exterior painting and plastering Landscapingand gardening ; Paving repairs ; Carpeting and flooring; Plumbing; Repairing cracking or leaning walls etc**.**

For most effective maintenance , it should be organized through a programme of cyclical maintenance.At the most basic level this includes daily routines, and works upwards to periodic

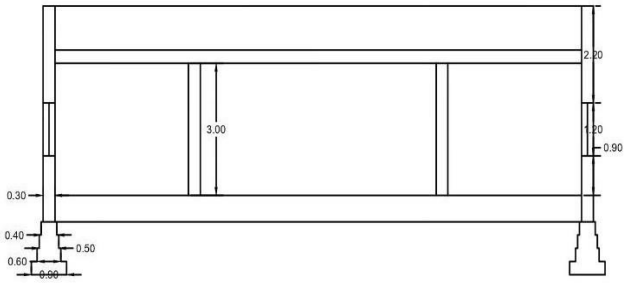


NAME	SIZE	QUANTITY
D	1.00X2.10	1
D1	0.75X2.10	3
W	0.75X1.20	9

PLAN



ELEVATION



SECTION X-X

DESIGN NO.12	KRUSHI SHEVA KENDRA
Preparaed By	NIRMIT JOSHI PANCHOLI RIMPLE Sheet No.12
PROJECT NAME	VISHWAKARMA YOJANA PHASE VIII NANABAR, GANDHINAGAR
INSTITUTE NAME	S.N.P.I.T&R.C., UMRAKH
UNIVERSITY NAME	GUJARAT TECHNOLOGICAL UNIVERSITY

SR. NO.	DESCRIPTION	NO	L	B	H	QUANTITY
1	Excavation for foundation	1	36.2	1.1	1.1	43.80
2	Pcc	1	36.8	0.9	0.2	6.624
3	Brick work in foundation upto plinth level	3	-	-	-	25.50
4	Earthfilling work in plinth for three of the space as lab,shop,office	4	-	-	-	42.113
5	Pcc at plinth level	1	38.3	0.4	-	15.32
6	Brick work in super structure	1	38.6	0.3	3	34.76
	Deduction of doors& window	13	-	-	-	4.47
	Lintel quantity	13	-	-	-	0.15
	Total brickwork in SS					30.108
7	RCC slab	1	14	6.7	0.22	20.64
8	Brick masonary in parapet	4	-	-	-	12.06
9	Wall plastering	16	-	-	-	217.32
	Deduction of door & window	-	-	-	-	9.825
	Total plastering					207.495
10	Flooring 5cm thick	4	-	-	-	76.56

Abstract sheet for krushi seva kendra					
SR. NO.	DESCRIPTION	QUANTITY	RATE	PER	AMOUNT
1	Excavation for foundation	43.808	100	M	4380.2
2	PCC laying for foundation	6.624	1500	M	9936
3	1st class brick for foundation	25.508	1600	M	40812.8
4	Earth filling for plinth	42.113	75	M	3158.475
5	PCC at plinth at 6.05m	15.32	200	M	3064
6	Brick masonary in ss	30.108	1500	M	45162
7	Laying of rcc slab	20.636	2500	M	51590
8	Reinforcement for rcc	1629.27	45	Kg	73317.12
9	12mm thick plaster	207.495	150	M	31124.25
10	5cm thick flooring mosaic titles	76.508	200	M	15313.60
		total			277858.45
		3% contingency			8335.75
		2% work charge establishment			5557.169
		total			291751.196
		10% contractor profit			29175.136
		Grand total			320926.50

13.1.4 Sustainable design 6 -Sports Club

Scenario
The sport activites are the must and can be considered as the alternative of the exercise or anyother physical training and that gies a joy to a human being and different benefits to health of individual.the sport club will enrich the village with different types of playable items and different platforms for different games.

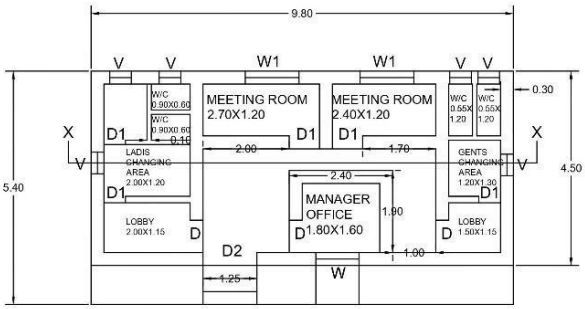
Existing Situation in Nani bhatlav ;
At current situation nanai bhatlav is getting young as new generation takes the hold.more young generation needs more area to play and can grow in that particular direction.There is currently no such area or amnetites that young genearation can play or improve there co cirrricular activity.
Sustainability of the design
Needs :An in the present situation and under government many different scheme helps poor peopleto live a better life.A new
Design brief

maintenance of the structure :

Some common repairs and maintenances are as below ; Exterior painting and plastering ; Landscaping and gardening ; Paving repairs ; Carpeting and flooring; Plumbing; Repairing cracking or leaning walls etc**.**

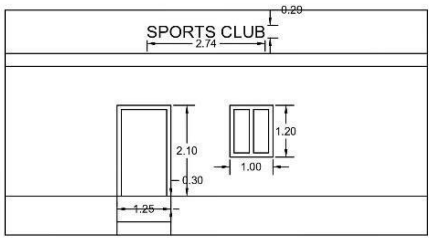
For most effective maintenance , it should be organized through a programme of cyclical maintenance.At the most basic level this includes daily routines, and works upwards to periodic programmes of weekly, monthly, semi-annual, annual, quinquennial and so on routines

SPORT CLUB

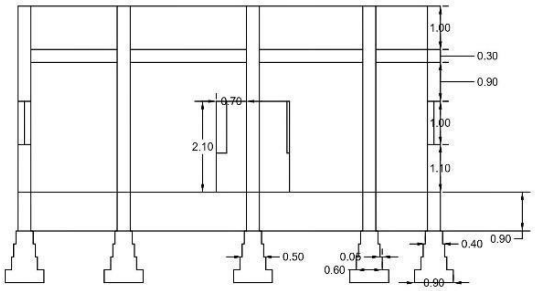


NAME	SIZE	QUANTITY
D	0.75X2.10	3
D1	0.70X2.10	3
D2	1.25X2.10	1
W	1.00X1.20	1
W1	1.25X1.20	2
V	0.50X1.00	6

PLAN



ELEVATION



ELEVATION

DESIGN NO. 11	**SPORTS CLUB**	
Preparaed By	NIRMIT JOSHI PANCHOLI RIMPLE	Sheet No.11
PROJECT NAME	VISHWAKARAMA YOJANA PHASE VIII RANASAR, GANDHINAGAR	
INSTITUTE NAME	**S.N.P.I.T&R.C., UMRAKH**	
UNIVERSITY NAME	**GUJARAT TECHNOLOGICAL UNIVERSITY**	

SR. NO.	DESCRIPTION	NO	L	B	H	QUANTITY
1	Excavation for foundation	1	47.25	1.1	1.1	57.173
2	Pcc	1	48.9	0.9	0.2	8.811
3	Brick work in foundation upto plinth level	3	-	-	-	35.211
4	Earthfilling work in plinth for three of the space as lab,shop,office	7	-	-	-	19.33
5	Pcc at plinth level	1	53.20	0.4	-	21.28
6	Brick work in super structure	-	-	-	-	48.87
	Deduction of doors& window	18	-	-	-	6.571
	Lintel quantity	12	-	-	-	0.609
	Total brickwork in SS	-	-	-	-	41.69
7	RCC slab	1	9.8	4.75	0.20	9.31
8	Brick masonary in parapet	2	-	-	-	4.185
9	Wall plastering	18	-	-	-	203.7
	Deduction of door & window	-	-	-	-	16.239
	Total plastering	-	-	-	-	187.462
10	Flooring 5cm thick	7	-	-	-	35.15

Abstract sheet for sport club

SR. NO.	DESCRIPTION	QUANTITY	RATE	PER	AMOUNT
1	Excavation for foundation	57.173	100	M	5717.3
2	PCC laying for foundation	8.811	1500	M	13216.5
3	1st class brick for foundation	35.211	1600	M	56337.6
4	Earth filling for plinth	19.33	75	M	1449.75
5	PCC at plinth at 6.05m	21.28	200	M	4256
6	Brick masonary in ss	41.69	1500	M	62535
7	Laying of rcc slab	735	45	Kg	33075
8	Reinforcement for rcc	9.31	2500	M	23275
9	12mm thick plaster	187.462	150	M	28119.3
10	5cm thick flooring mosaic titles	35.15	200	M	7030
		total			235011.45
		3% contingency			7050.344
		2% work charge establishment			4700.229
		total			246762.023
		10% contractor profit			24676.20
		Grand total			271438.225

ELECTRICAL DESIGNS

13.2.1 Smart Dustbin :-

Objective :

The Use Of Smart Dustbin Will Directly Affect To The Residents And Government Employees. The Main Goal Of Smart Dustbin Is That When A Dustbin Will Nearly Fill Then At That Time A Text Message Will Deliver To The Sarpanch OR Government Employees. Because Of That A Employees Will Come And Empty The Dustbin. Due ToThis Design A Dustbin Will Not Fully Fill And Employees Also Not Return Without Work.

Scope of Study :-

The Main Root Of Smart Dustbin Design Is Focus On People's Healthy And Improve The Atmosphere. Due To This Design Dirt Will Be Less And The Epidemic Will Spread Less.Whose Advantage To The Resident And Government Employees. Government EmployeesWill Not Have To Come For See The Dustbin Fills OR Not.

Methodology :-

The automation of the smart dustbin is achieved through the use of a power supply, Microcontrollerand ultrasonic sensor all programmed using Arduino.

Circuit diagram :-

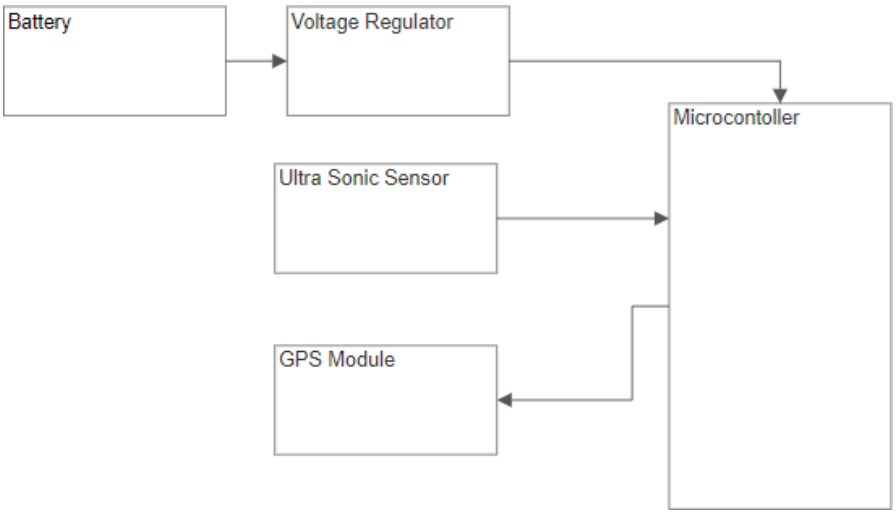
Device Use In Smart Dustbin :-

(1) ATmega 328P

(2) Ultra Sonic Sensor

(3) GPS Module Fig. 13.1 Block diagram

Explanation :-



(1) ATmega 328P

ATmega328P is a microcontroller that is manufactured by Atmel. It is a high-performance Atmel picoPower 8- bit AVR RISC-based microcontroller that combines 32KB ISP non-volatile storage with read-while-write capabilities, 1024B EEPROM, 2KB SRAM, twenty three general purpose I/O lines, thirty two general purpose operating registers, three versatile timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, a 6-channel 10-bit A/D converter (8-channels in TQFP and QFN/MLF packages), programmable watchdog timer with internal oscillator, and five software selectable power saving modes. This device operates between 1.8-5.5 volts.

(2) Ultra Sonic Sensor

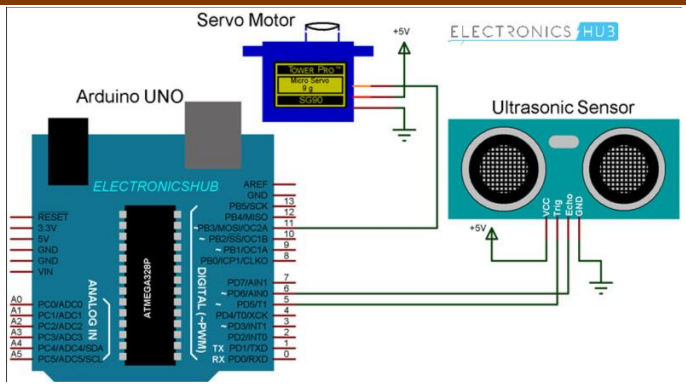
An Ultrasonic sensor is a device that measures the distance of an object with the help of sound waves. It measures distance through sending out a sound wave at a particular frequency and listening for that wave to bounce back. It is possible to measure the distance between the sensor and that object by recording the elapsed time between the sound wave being generated and the sound wave bouncing back. In other words, the sensor head emits an ultrasonic wave and receives the wave that is reflected back from the target. The distance can be calculated with the following formula: Distance = 1/2 × T × C Where T is the time between the emission and reception, and C is the speed.

(3) GPS Module

GPS modules contain tiny processors and antennas that directly receive data sent by satellites through dedicated RF frequencies. From there, it'll receive timestamp from each visible satellites, along with other pieces of data.

GPS is a system of 30+ navigation satellites circling Earth. We know where they are because they constantly send out signals. A GPS receiver in your phone listens for these signals. Once the receiver calculates its distance from four or more GPS satellites, it can figure out whereyou are.

Circuit diagram:-



Cost Of Device :-

Table no. 13.1 Cost of Device

Device	Cost
Ultra Sonic Sensor	200/-
GPS Module	1599/-
ATmega 328P	260/-
Miscellanies Cost	500/-
Total Cost	2459/-

Benefit Of Smart Dustbin After Providing to People :-

(1) The “smart bin” communicates information on fill levels and ensures collection only when the bin is full.

(2) it saves time of the employees

(3) improve street sanitation

Implementing In The Village :-

We Implementing This Design At Dustbin.

Device	Cost
Ultra Sonic Sensor	200/-
GPS Module	1599/-
ATmega 328P	260/-
Miscellanies Cost	500/-
Technician Cost	300/-
Total Cost	2759/-

Table no. 13.2 Implementing cost of device

13.2.2 ELCB

Objective :-

ELCBs Is Earth Leakage Circuit Breaker. This Is One Type Of Circuit Breaker. In My Allocated Village, There Is No Use Of ELCB. The Use Of ELCB Can ProvideA Protection To The Human Body. If Someday A Leakage Current Passes In The Electrical Equipment Body

Then Fear Of Shock OR Chance Of Fire Will Increase. ELCB Is Instantly Tripe When Leakage Current Flows Then Shock And Chance Of Fire Will Decrease.

Scope Of Study The Main Root Of Design Of ELCB Is Focus On People's Safety. It Is One Type Of Protection FromPlanting In The House.The Human Body WillSave From Shock AndIn The Village The Dung House And Wooden House Survived From Fire. This Way ELCB Focuses On The Protection Of Human Being.

Methodology

An Earth-leakage circuit breaker (ELCB) is a safety device used in electrical installationswith high Earth impedance to prevent shock. It detects small stray voltages on the metalenclosures of electrical equipment, and interrupts the circuit if a dangerous voltage is detected.

Component Use In ELCB

(1) Push Button

(2) Casing

(3) Resistor

(4) Trip coil

Explanation

What is an Earth Leakage Circuit Breaker (ELCB)?An ECLB is one kind of safety device used for installing an electrical device with high earth impedance to avoid shock. These devicesidentify small stray voltages of the electrical device on the metal enclosuresand intrude the circuit if a dangerous voltage is identified. The main purpose of the Earth leakage circuit breaker (ECLB) is tostop damage to humans & animals due to electric shock. An ELCB is a specific type of latching relay that has a structure's incoming mains power associated through its switching contacts so that the circuit breaker detaches the power in an unsafe condition. The ELCB notices fault currents of human or animal to the earth wire in the connection it guards. If ample voltage seems across the ELCB's sense coil, it will turn off the power, and remain off until manually rearrange. A voltage

ELCB Function

The main function of an Earth-leakage circuit breaker or ELCB is to prevent shock whileelectrical installations through high Earth impedance because it is a safety device. This circuit breaker identifies tiny stray voltages on top of the electrical equipment with a metalenclosure & disrupts the circuit if a hazardous voltage is identified. The main purpose of ELCBs is to avoid harm to human beings as well as animals because of electric shock.

ELCB Operation

The earth circuit is adapted when an ELCB is used; the connection to the earth rod is accepted through the earth leakage circuit breaker by linking to its two earth terminals. One goes to the fitting earth circuit protective conductor (CPC), and the other to the earthrod or another kind of earth connection. Thus the earth circuit permits through the ELCB's sense coil.

Benefit After Providing ELCB :-

(1) It is cheap and efficient.

(2) It protects animals and humans from electrical shock.

(3) In this process, when the installation has two connections to the earth, a nearby high current lightning strike will cause a voltage gradient in the soil, presenting the ELCB sense coil with enough voltage to cause it to trip.

Implementing In The Village

We Implementing This Design At Panchayat House.

Table no 13.3 Cost of device

Components	**Price**
Push Button Switch	20/-
Casing	60/-
Resistor	58/-
Tripe Coil	250/-
Latching Coil	350/-
Miscellanies	60/-
Total Cost	798/-

Table no. 13.3 Implementing cost of device

	Components	Price
	Push Button Switch	20/-
	Casing	60/-
	Resistor	58/-
	Tripe Coil	250/-
	Latching Coil	350/-
	Miscellanies	60/-
	Technician Cost	100/-
	Total Cost	898/-

13.2.3 Emergency Battery System

Objective :-

Emergency Backup Protection Design Will Helpful To Residents. In Any Circumstances The Power Of Distribution Company Will Not Arrive Then At That Time This Backup Protection Will Use. This Backup Protection Can Run The Water Motor, Street Light, Panchayat House And School. Therefore The Instant Use Of Work Will Not Stop.

Scope Of Study :-

By Emergency Backup, The Main Focus Is On The People Of Village Had Not Dis- comfortableWithout Power. If The Power Will Not Arrive From Distribution Company. Then It Fulfills AllTheRequirements Of Residents. Thus Emergency Backup Focus On Well Being Of Residents.

Methodology :-

At Time Of Blackout We Have To Use Emergency Instrument Equipment Like Water Motor, Street Light Other Electrical Equipment Of School And Panchayat House Should Work. So For This Function The Battery backup system is used. It works as DC to AC Converter. If the power supply from distribution company fails at that time with the help of inverter DC supply of battery

Device Use In Emergency Battery Backup

(1) Battery

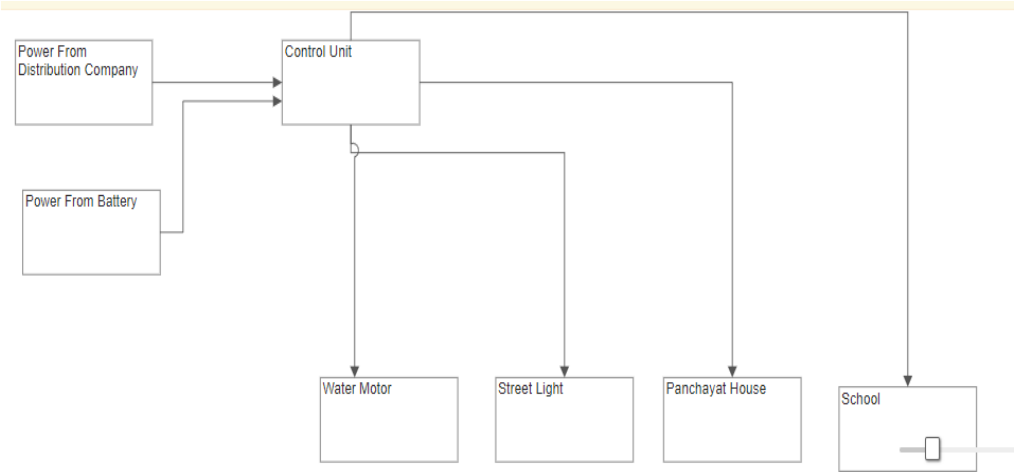
(2) Inverter

(3) Control Unit

(4) Cables

Explanation

Fig. no. 13.4 Block Diagram



(1) Power From Distribution Company : the power which come from distribution company.

(2) Power From Battery: When the power will cut off from distribution company then Power will supply from the battery.

(3) Control Unit: Inverter is used in control panel . Inverter converts dc supply to ac from battery.

Cost Of Device

Table no. 13.5 Cost of device

Component	Rating	Price
Battery	3KV	25,000/-
Inverter	200ah	90,000/-
Miscellanies	-	1000/-
Total Cost	-	1,15,000/-

Benefit After Providing Emergency Battery Backup:-

(1) It Provides Power Whenever Grid Power Is Not Arrived

(2) It Is Very Useful In Any Emergency Situation Occurs

(3) Quick And Automatic Distribution Of Power

(4) Peace Of Mind That Family and home are safe during Blackout

(5) Comfort and safety during blackouts

Implementing In The Village

We Implementing This Design At Near Panchayat Office.

Table no. 13.6 Implementing cost of device

Component	Rating	Price
Battery	3KV	25,000/-
Inverter	200ah	90,000/-
Labor Cost	-	3000/-
Miscellanies	-	1000/-
Total Cost	-	1,18,000/-

13.2 Reason for student recommending this design

(1) Smart Dustbin

- The smart dustbin delivered message of the information on fill levels and ensures collection only when the dustbin is full.
- This creative technology saves the time of the government employees or sarpanch.
- This technology improve the street sanitization and this prevents possible of epidemic.

(2) ELCB

- This tool is cheap and efficient.
- It protect animals and human being from the electrical shock and it reduces chance of the fire.

(3) Emergency Battery Backup

- It provides power whenever the power is not arrived from the distribution company.
-When any emergency situation occur, we use it in many ways so it is very beneficial and useful.
- It gives peace of mind that family and home are safe during blackout.
- it provide comfort and safety during power shutdown, blackout.

13.3 About design suggestion / Benefit of the village

(1) Smart Dustbin

When the bin full it ensures collection and also it communication information on fill levels.
-This smart bin also improves sanitization facilities of the street and as well as town.
- Last but not the least this bin saves time of the people.

(2) ELCB

As per function has two connection to the earth than a nearly high current lightning strike will cause a voltage gradient in soil and presenting the ELCB sense coil with enough voltage to cause it to trip.
-Use of ELCB is efficient and cheap.

(3) Emergency Battery Backup

- Emergency battery backup is very useful in any emergency situation.
- It gives automatic and quick response of distribution of power.
- During blackouts use of this is comfort and safe.
- It providing power when ever grid power is not available.
- During blackouts family and others can use electricity.

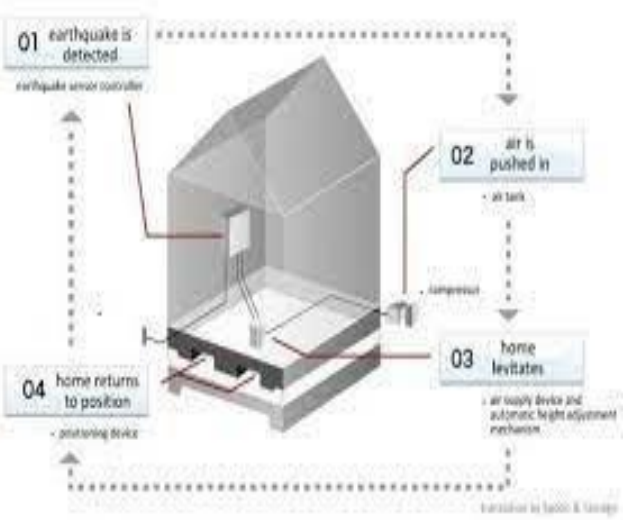
CHAPTER 14

Technical Options with Case Studies:-

14.1 Civil Engineering:-

14.1.1 Advanced Earthquake Resistant:-

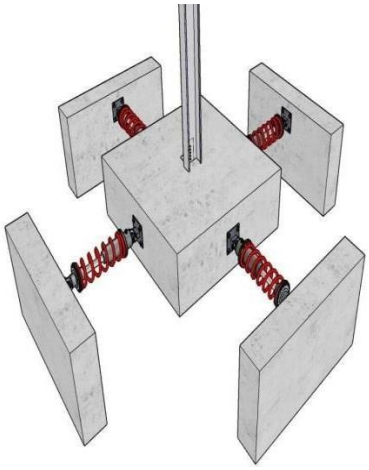
A natural calamity known as earth quake has taken the toll of million of lives throughthe age in the unrecored human history. A disturbance that causess haking of the top surface of the earth where major man made engineering structure are constructed . due to underground seismic energy transformtation the movementalong a fault plan or from volcanic activity is called earthquake.
However with the advance made in various areas of the science through coming . These range from appropriately sizing the structure to be strong and ductile enough to survive the shaking withan acceptable damage. The conventional approach to earthquake resistant design of buildings depends upon providing the building with strength, stiffness and inelastic deformation capacity which are great enough to withstand a given level of earthquake-generated force.
There are many known and practiced measures to protect against seismic threats. Let's take a look at some of the earthquake resistant techniques used bythe engineers world over to minimize the damage tostructures due to earthquakes:



Floating Foundation:

The levitating or floating foundation separates the substructure of a building from its superstructure. Oneway of doing this is by floating a building above its foundation on lead-rubber bearings that comprise a solid lead core covered in alternating layers of rubber and steel. The bearings are attachedto the building andits foundation with the help of
steel plates. So, when an earthquake occurs, the floating foundation can move without moving the structure above it.

Shock Absorption:



Similar to the shock absorbers used invehicles, buildings also makes use of this technology. This earthquake resistant technologyhelps buildings slow down and reduce the magnitude of vibratory motions. Ideally shock absorbers should be placed at each level of the building – one end attached to the beam and the other endto the column. Each comprises a piston head that moves inside a cylinder full of silicone oil. During earthquakes, the horizontal motion of building will make the piston push against the oil, transforming mechanical energy from the quake toheat.

Rocking Core-Wall:

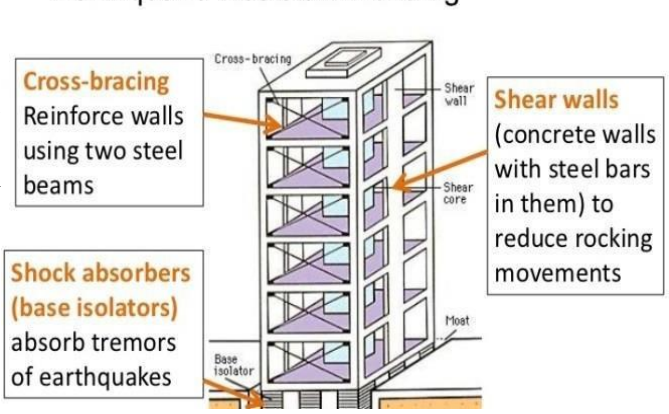
Modern high-rise buildings use this technique to improve seismic resistance at a low cost. To make thi work, a reinforced concrete core is set throughthe heartof the structure, surrounded by elevator banks. Earthquake resilience of tall and super-tallbuildings couldbe realized through rocking structures,self-centering structures, replaceable structuralmembers,etc. Inthis paper, rocking walls were introduced to a 240-meter-high tall building.

The structural system is composed of centralreinforced concrete (RC) core walls and peripheral steelreinforced concrete (SRC) frames. Three structures were analytically compared including one withtraditional walls, one with rocking walls, and one withrockingwallsand additional viscous dampers

Many modern high-rise buildings use this technique to increase seismic resistance in an affordable way. It works most effectively when used together with base isolation. For base isolation, elastometric bearings are built with alternating layers of steel and natural rubber/neoprene. The bearing thus created has low horizontal stiffness and vertical rigidity. The combination is highly effective, cost-friendly and simple to implement

Symmetry, Diaphragms And Cross-Bracing:

Generally one common criterion for seismic designs is symmetry. Seismic risks of asymmetrical designs are higher. L-Shaped, T-Shaped and split-level structures may be more visually appealing but they are also prone to torsion. Thus engineers design symmetrical
structures tokeep the forces equally distributed through the structure and limitornamental elements like cornices, cantilever projections etc.



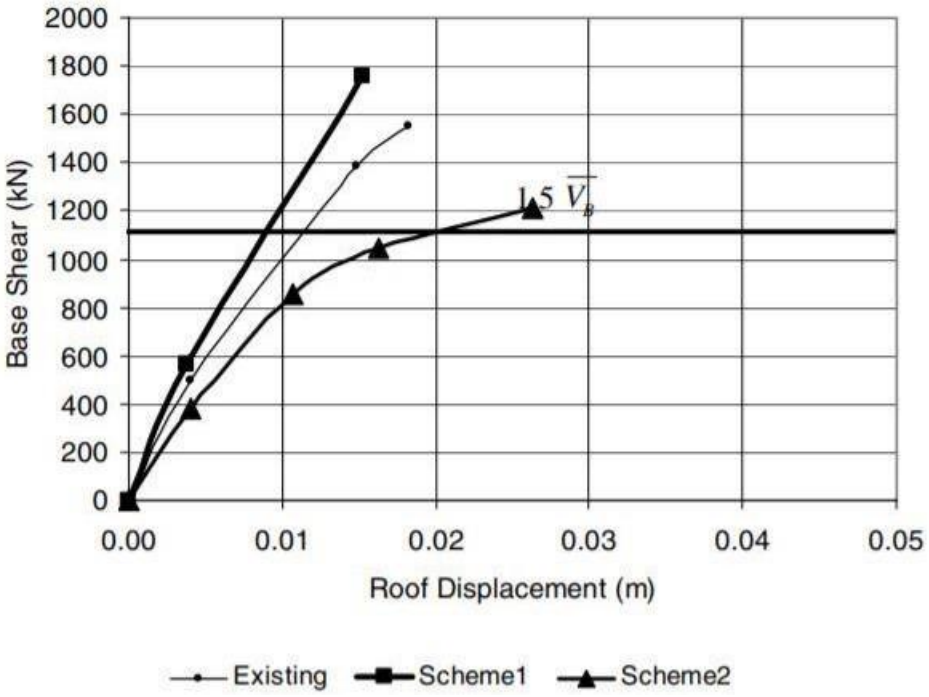
An earthquake has a significant lateral force. Seismic designing counteracts these forces in both horizontal and vertical structuralsystems. Diaphragmsare integral to horizontal structures
– such as floors of a building or roof. Engineersdesign each diaphragm on itsown deck and strengthen it horizontallyso it can distribute sideways forces with vertical structure parts.

With vertical structures, engineers haveseveral approaches. Braced frames are often used in building walls. Braced frames rely on trusses forresisting sideways motion. Cross-bracing is a technique that uses two diagonal members in an X-shape to build wall trusses and it is a popularteчnique to build earthquake resistant structures.

14.1.2 Seismic Retrofitting of Buildings:-

The earthquake at Bhuj, Gujarat, in 2001 has been a watershed event in the earthquake engineering practice in India. The code of practice for seismic analysis, IS 1893:2002 because they were built prior tothe implementation of these codes. This paper is part of a project, whose aim is to evolve methodologies to assess the seismic vulnerability of reinforced concrete (RC) three-to tenstoreyed, residential and commercial buildings, particularly those located in the urban areas of earthquake zones V, IV and III, and to propose retrofit measures for the structurally deficient buildings

RETROFIT STRATEGIES Retrofit strategies that are viable for the type of buildings considered, are grouped under local and global strategies. These groups need not be watertight and strategies falling in either group are expected. Local Retrofit Strategies Local retrofit strategies include local strengthening of beams, columns, slabs, beam-to-column or slab-tocolumn joints, walls and foundations. Local strengthening allows one or more under-strength elements or connections to resist the strength demands predicted by the analysis, without affecting the overall response of the structure. This scheme tends to be the most economical alternative when only a few of the building's elements are deficient. c. Fibre reinforced polymer sheet wrapping Concrete Jacketing Thismethod increases both strength and ductility of the columns.



But, the composite deformation of the existing and the new concrete requires adequate dowelling to the existing column. Also, the additional longitudinal bars need to be anchored to the foundation and should be continuous through the slab. Frequently, these considerations are ignored.

Steel Jacketing Steel jacketing refers to encasing the column with steel plates and filling the gap with non- shrink grout. It is a very effective method to remedy deficiencies such as inadequate shear strength and inadequate splices of longitudinal bars at critical locations But, it may be costly and its fire resistance has to be addressed.

Fibre Reinforced Polymer Sheet Wrapping

Gluing mild steel plates to beams is often used to improve the beam flexural and shear performances. The addition of steel plate is simple and rapid to apply, does not reduce the storey clear height significantly and can be applied while the structure is plates are of course prone to premature debonding FRP Wrapping Like steel plates, FRP laminates are attached to beams to increase their flexural and shear capacities. The amount of FRP attached to the soffit should be limited to retain the ductile flexural failure mode. Bonacci and Maalej listed the failure modes of beams, strengthened withFRP laminates. Use of FRP bars FRP bars can be attached to the web of a beam for shear strengthening . FRP bars can be used as tendons for external prestressing. Beam–To-Column Joint Strengthening The different methods of strengthening are as follows. Concrete Jacketing The joint canbe strengthened by placing ties through drilled holes in the beam . But the placement of such ties is difficult. Concrete Fillet Bracci et al. suggested the use of a concrete fillet at the joint to shift the

potential hinge region away from the column face to the end of the fillet. Steel Jacketing Steel jacketing helps in transferring moments and acquiring ductility through confinement of the concrete. Ghobarah et al. proposed the use of corrugated steel jackets. Steel plating is simpler as compared to steel jacketing, where plates in the form of brackets are attached to the soffits of beams and sides of the column. Wall Strengthening A concrete shear wall can be strengthened by adding new concrete with adequate boundary elements. For the composite action, dowels need to be provided between the existing and new concrete. Steel braces or strips FRP or steel sheets, externalprestressing or reinforcedgrouted core can be employed for strengthening unreinforced masonary walls. Foundation Strengthening Foundation strengthening is done by strengthening the footing as well as the soil

A CASE STUDY

The building presented in this paper is a residential, ordinary moment resisting RC framed building, located in Zone III. Figure 1 shows the typical floor plan of the building. The building is a four storeyed building. The height of the roof is 13.1 m from the ground level. Plan dimensions of the building are 20.47m ×13.29m Preliminary Evaluation The evaluation statements as given in FEMA 178 were used inthe preliminary evaluation of the building. of cutout areas is less than 50 percent of theplan.

corners are present in the building as both the projections of the structure beyond each re-entrant corner are greater than 15 percent of the corresponding plan dimensions. The beams are stronger than the columns. Reinforcement details like hook lengths, splice lengths, tie spacing in columns, joint reinforcement were not mentioned in the available drawings. The center line of the plinth beams are located 1.1m below the ground level. This increases the height of the ground storey RETROFITTING OF BUILDING From the seismic evaluation it was determined that building needs retrofit to resist the design earthquake demand. To retrofit the building a number of possible retrofitting schemes were tried. Two schemes that are economically feasible are presented here. In Scheme 1, to enhance the capacities of the columns in the ground storey (including the parts between the plinth beams and top of the footings), local retrofitting of the columns by concrete jacketing was adopted.

CONCLUDING REMARKS The paper presents a review of the existing retrofit strategies thatare applicable for multi-storeyed residential reinforced concrete buildings addressed in the project. It also presents a case study of a three storeyed building, located in an urban area in earthquake zone III. The following aspects are noteworthy from the case study.

The absence of plinth beams at the ground storey level increases the vulnerability of the ground storey columns. Although the ground storey was not a weak or soft storey as per the Code definition, it is susceptible to large drift

Inclusion of the infill walls by the equivalent strut method shows substantially high baseshear. The effect of openings in the infill walls was not considered. This effect needs to be further investigated. In a retrofit scheme, a combination of local and global retrofit strategies may be required.The appropriate scheme to be adopted is of course building specific. The case study of this building shows that a scheme which increases ductility is more effective. The inclusions of shear walls or steel braces were not investigated in this case study. The effects of the lateralloadson the soil bearing pressure and the demands on the footings are not reported.

14.1.3 Advance Practices in Construction field in Modern Material, Techniquesand Equipment's:-

Advanced construction technology:

Founded by Mexican social entrepreneur Carlos González, EcoDom transforms plastics intohouses for low-income families

Plastics production has grown exponentially since its creation. According to the study "Production, use, and fateof all plastics ever made," published in Science Advances magazinein 2017, 8.3 billion tonnes have been produced worldwide in the last 65 years – weighing the equivalent of 10,000 Eiffel Towers or 35,000 Empire State Building

The problem is that only nine percent of all plastic waste gets recycled, while the rest ends up in nature. Eight million tonnes of plastics go into the ocean every year – a figure that may rise to 500 million by 2020 if the situation does not improve.

Commodity-Analysis

Can gold touch ₹50,000 this week? In Mexico, PET consumption reaches 722,000 tonnes per year. The country ranks first in bottled water consumption worldwide, according to the Environmental Commission of the Mexican House of Representatives, and second when it comes to soft drink bottles.

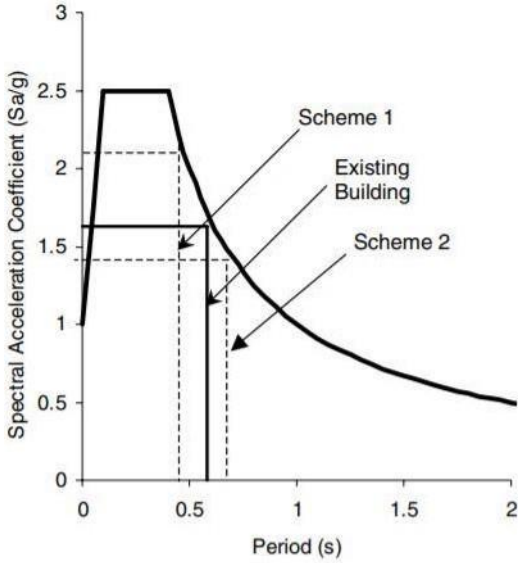
But the country has made important progress, according to the local environmental NGO Ecoce; PET collection and recycling increased from 6 to 58 percent in the last 15 years, ahead of Brazil (42 percent), Canada (40 percent) and the United States (31 percent). Norway's recycling culture leads the way with a 95 percent rate.

Growing awareness of PET environmental consequences is encouraging people to take action. Mexico's Carlos González, CEO of EcoDom, is an example. His company, based in Xicotepec de Juárez, Puebla, turns plastic waste into construction materials to build affordable housing for low-income families.

González grew up in the mountains near Puebla, one of the most disadvantaged regions in the country, surrounded by poverty, lack of access to decent housing and plastic pollution. He conceived and created his business model in 2012.

"Our goal is to deeply clean Mexico, and the world, of plastic by taking advantage of its properties' potential for construction – it doesn't biodegrade, get damp or moth- eaten," the entrepreneur explains. The company recycles mainly PET, but also high-density Polyethylene (HDPE), polypropylene and acrylonitrile butadiene styrene (ABS),

usually found in broken buckets, toys or bags. González buys the material by the kilogram from small companies, or from independent collectors with whom the company regularly works. EcoDom also organises waste pickingoperations in Puebla, where volunteers join the firm's employees to collect plastics from households or businesses.



"We select the plastics and grind them through an industrial process to turn them into flakes,which are then placed into a mould, melted and, once in a plasma state, taken to a press that applies pressure to produce the raw material for our products," González explains.

COSTING OVERALL AND THE PROCESS.

To create a wall, the company transforms around six kilograms of plastics. The whole process costs from 50 to 60 Mexican pesos, or nearly three dollars.

EcoDom generates revenue from selling plastic-derived construction materials such ascontaining walls, earthenware, mezzanines and thermic roofs; but also from building houses andselling properties to low-income families.

Roughly 10 percent of its profits are destined for social causes. With these funds, the company isable to sell partially subsidised 42 square-metre houses for 5,000 pesos (USD265) or single rooms for 1,000 pesos. Buyers are allowed to pay with work instead of money.

"Our houses cost less than others made entirely ofconcrete. One of the perks of our system is thatthe material can resist up to twice the load of traditional building materials,which speeds the construction phase and allows for savings of up to 25 percent of the total cost. Traditional building materials resist 2.5 kilos per square centimetre, whereas ours can hold up to 5.3 kilos per square centimetre," says EcoDom's CEO.

The company also started donating houses to families last year. So far, it has sold two houses anddonated five houses and three bedrooms.

Now, they are negotiating the terms of an agreement with Puebla's Cuauhtémoc University to donate five other houses.

González began this project alone, but with help from his now partner, Eily Cristell Velázquez. Today EcoDom has three more shareholders. Together, they have invested more than eight million pesos so far, and have managed to stir interest from companies inIndia, Canada, France,Brazil,

South Africa, Guatemala and the Dominican Republic. An agreement with the latter's

government is under negotiation, in a bid to tackle the massive plastic pollution problem off the coast of Santo Domingo that made headlines earlier this year.
González says he's proud of what his company has achieved and plans to enlarge its scope through a franchise model. In December, he will join the Mexican construction company Haras to build 250 houses in Puebla. EcoDom hopes to provide the necessary materials and expertise toconstruct at least half of the houses.

Building on plastic

"Our goal is to clean Mexico, and the world, of plastic by taking advantage of its properties' potential for construction: it doesn't biodegrade, get damp or moth-eaten," he explains. Thecompany recycles mainly PET, but also high-density polyethylene (HDPE), polypropylene and acrylonitrile butadiene styrene (ABS), usually found in broken buckets, toys or bags.
González buys the material by the kilogram from small companies, or from independent collectors with whom the company regularly works. EcoDom also organises waste-picking operations in Puebla, where volunteers join the firm's employees to collect plastics from households or businesses.

"We the plastics and grind them into flakes, which are then placed into a mould, melted once they are in a plasma state, they are taken to a press, which applies pressure to produce the raw material for our products," González explains.

To create a wall, the company transforms around 6 kg of plastics. The whole process costs from 50 to 60 Mexican pesos, or nearly $3.

EcoDom generates revenue from selling plastic-derived construction materials such as containing walls, earthenware, mezzanines and thermal roofs but also from building houses and selling properties to low-income families.

About 10 percent of the company's profits are allocated for social causes. With these funds, the company is able to sell partially subsidised 42 square-metre houses for 5,000 pesos ($265) or single rooms for 1,000 pesos. Buyers are allowed to pay with work instead of money.

Stronger and cheaper

"Our houses cost less than others made entirely of concrete. The material we use for our construction can resist up to twice the load of traditional building materials, which speeds up the construction phase and allows for savings of up to 25 percent of the total cost. Traditional building materials resist 2.5 kg per square centimetre, whereas ours can hold up to 5.3 kg per square centimetre," says González.

Last year, the company also
started donating houses to families. So far, it has sold two houses and donated five houses and three bedrooms. Now, it is negotiating the terms of an agreement with Puebla's Cuauhtémoc University to donate five more houses.

New markets abroad

González began this project alone, but with help from his current partner, Eily Cristell Velázquez. Today, EcoDom has three more shareholders. Together, they have invested more than eight million pesos (about $400,000), and have managed to generate interest from companies in India, Canada, France, Brazil, South Africa, Guatemala and the Dominican Republic. An agreement with the Dominican Republic government is under negotiation, in an effort to tackle the massive plastic pollution problem off the coast of Santo Domingo, which made headlines earlier this year.

14.1.4 Engineering Aspects of Soil mechanics - Environmental Impact Assessment

Soil Mechanics is the application of laws of mechanics and hydraulics to engineering problems dealing with sediments and other unconsolidated accumulations of solid particles, which are produced by the mechanical and chemical disintegration of rocks, regardless of whether or notthey contain an admixture of organic constituents.

Engineers are concerned with soil's mechanical properties: permeability, stiffness, and strength. These depend primarily on the nature of the soil grains, the current stress, the water content and unit weightBy an engineer aspect the soil mechanics gives the information about the past present and futureof the concrete jungle or the industries built or the river flowing or the agriculture of ther nationor the Environmental Impact Assessment (EIA) is a process of evaluating the likely environmentalimpacts of a proposed project or development, taking into account inter-related socio- economic, cultural and human-health impacts, both beneficial and adverse.

UNEP defines Environmental Impact Assessment (EIA) as a tool used to identify the environmental, social and economic impacts of a project prior to decision-making. It aims to predict environmental impacts at an early stage in project planning and design, find ways andmeans to reduce adverse impacts, shape projects to suit the local environment and present thepredictions and options to decision-makers.

Environment Impact Assessment in India is statutorily backed by the Environment ProtectionAct, 1986 which contains various provisions on EIA methodology and process.

History of EIA in India

The Indian experience with Environmental Impact Assessment began over 20 years back. Itstarted in 1976-77 when the Planning Commission asked the Department of Science and Technology to examine the river-valley projects from an environmental angle.

Till 1994, environmental clearance from the Central Government was an administrativedecision

and lacked legislative support.projects on the state government depending on the size/capacity of the project.The EIA Process

Screening: The project plan is screened for scale of investment, location and type ofdevelopment and if the project needs statutory clearance.Scoping: The project's potential impacts, zone of impacts, mitigation possibilities and need formonitoring.Collection of baseline data: Baseline data is the environmental status of study area.Impact prediction: Positive and negative, reversible and irreversible and temporary and permanentimpacts need to be predicted which presupposes a good understanding of the projectby the assessment agency.Mitigation measures and EIA report: The EIA report should include the actions and steps for preventing, minimizing or by passing the impacts or else the level of compensation for probableenvironmental damage or loss.
Public hearing: On completion of the EIA report, public and environmental groups living closeto project site may be informed and consulted.
Decision making: Impact Assessment Authority along with the experts consult the project-in-charge along with consultant to take the final decision, keeping in mind EIA and EMP procedures.

Conclusion:
State government has provided the environmental clearance to the project proposal and theprojct will be implemented shortly

14.1.5 Water Supply-Seweragesystem-Waste Water-Sustainable development

The traditional methods of wastewater treatment become increasingly challenged with the identification of more and more contaminants, rapid population growth, increasing industrial activities, and ever shrinking fresh water sources. Conventional process has been proven inremoving many chemical and microbial contaminants from wastewater. However, the effectiveness of these processes has become limited over the last two decades because of new challenges; increased knowledge about the consequences from water pollution and public demand for better quality water have enforced the implementation of much stricter regulations by expanding the scope of regulatedcontaminants.It will also provide effective segregation of metals, bimetallic nano particles, mixed oxides, zeolites and carbon compounds etc from the wastewater resources. With improved membranes and configurations, more efficient pumpingand energyrecovery systems will be possible. Automatic Variable filtration (AVF)Technology Automated Variable Filtration (AVF)technology is a state of the art technology used for wastewater treatment in which upward flowof influent is cleaned by downward flow of filter media. During the treatment
complete biological treatment and the retention of pathogens including viruses has become possible; treatment with membrane bioreactor produces a highly clarified effluent
that can be more easily disinfected. Thus treatment with MBR followed by RO and UV treatment is ideal for producing non-potable water.significant are to remove nutrients (nitrogen
and phosphorus) and synthetic organic compounds (SOCs) because of their signifcant impacts on public health and the environment.

The emergence of nanotechnology and the incorporation of living microorganisms in biomicroelectronic devices has revolutionized the treatment process. The best part of nanotechnology is that it can easily

lowering the maximum contaminant levels set for wastewater discharge. Among them, the most

New Technologies for Wastewater Treatment Wastewater treatment involves reduction in pollutants in process from wastewater and proper operation and maintenance of the plant to obtain the desired performance. Wastewater treatment technologies are crucial for urban water systems. Some of the new technologies being used and introduced for wastewater treatment globally to reclaim the resources: Membrane Filtration Membrane filtration is essential to the development of advanced water reclamation systems and the development of new and improved systems is expected to continue.

Micro and ultra-filtration membranes provide excellent pretreatment to remove a wide range of dissolved contaminants. Membrane bioreactor filtration technology is being extensively used for advanced treatment to produce water for reuse by the industries. With MBRs, merge with other technologies and modify, endorse and clarify any existing concept. It offers innovative approach to develop and exploit these processes in completely new ways. Nanotechnology concepts improved hydraulic conductivity. A number of new researches are being conducted for producing fabrication of membranes from nano materials for decompositiontreatment. process itself, the filter media is cleaned by the filtered influent thus there is no requirement forany additional filter media cleaning or fresh water. The AVF process comprises two sets of media filters that
Cost effective to install and low

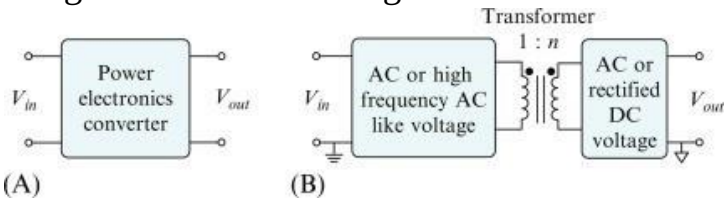
operating and maintenance costs Average reject of 5-15% Extremely low power consumption Ease of Operation & Maintenance Microbial Fuel Cells
Microbial fuel cells is a breakthrough technology where electrical energy could be extracted directly from organic matter present in the waste stream by using electron transfer to capture the energy produced by microorganisms. Microorganisms are grown as a biofilm

14.2 Electrical Engineering

14.2.1 Design of Power Electronic Converter

Diagram

Fig. no. 14.1 Block diagram



Explanation

Power electronic converters play the role of taking electrical energy from the power system and turning it into a suitable form needed by a motor. The power electronic converter may be determined according to the given power source and the driving motor.

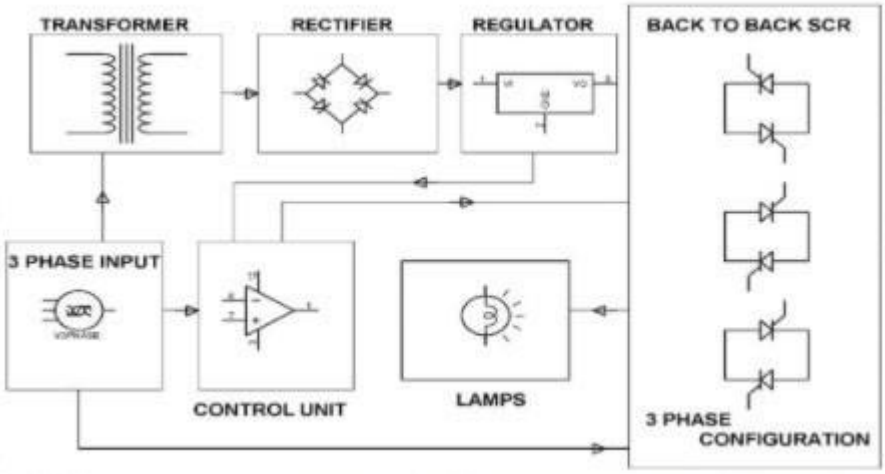
For DC drives, power electronic converters such as a controlled rectifier or a chopper can be used to adjust the DC power, which will be described in more detail in Chapter 2. In contrast, AC drives mostly use an inverter to adjust the voltage and frequency in the AC power, which will be also described in more detail in Chapter 7. In this case, a rectifier is often included to convert the AC power in the mains power system into the DC power.

These power electronic converters use power semiconductor devices such as gate turn-off (GTO) thyristor, integrated gate-commutated thyristor (IGCT), insulated gate bipolar transistor (IGBT), power metal oxide semiconductor field effect transistor (MOSFET), and power bipolar junction transistor (BJT). These switching devices are determined according to their power handling capability and their switching speed. The power handling capabilitycan be ranked in an increasing order of MOSFET, IGBT, and GTO thyristor, while the switching speed can be ranked in an increasing order of GTO thyristor, IGBT, and MOSFET. All these switching devices described above are based on the silicon (Si) semiconductor material. Recently, switching devices based on wide bandgap materials suchas silicon carbide (SiC) or gallium nitride (GaN) are being recognized as a promising futuredevice.

Power electronics converters are generally consist of only semiconductor switches and energy storage elements. Nonisolated converters are often preferred in applications that electrical isolation is not a necessity, because they are less bulky and costly, and more efficient and reliable. Fig. 1.1A shows a general layout of nonisolated power electronics converters in which the circuit do not consist of magnetic or electric isolation. On the other hand, isolated power converters often use either transformer or coupled inductor for multiplepurposes such as voltage level shifting, obtaining multiple outputs, providing galvanic isolation and ground loop avoidance. Figure illustrates a general layout of the isolated powerelectronics converters in which a transformer is employed to provide electrical isolation.

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

Diagram Fig. no. 14.2 Block diagram



Explanation

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

Now let us have a brief recall of the need for having a starter for any motor.

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

Motor starting can be in 3 ways

Applying full load voltage at intervals of time: Direct On Line Starting

Applying reduced voltage gradually: Star Delta Starter and Soft starter

Applying part winding starting: Autotransformer starter

Now let us shift our particular attention to soft starting.

In technical terms, a soft starter is any device that reduces the torque applied to the electric motor. It generally consists of solid-state devices like thyristors to control the application of supply voltage to the motor. The starter works on the fact that the torque is proportional to the square of the starting current, which in turn is proportional to the applied voltage. Thus the torque and the current can be adjusted by reducing the voltage at the time of starting the motor.

There can be two types of control using soft starter:

Open Control: A start voltage is applied with time, irrespective of the current drawn or the speed of the motor. For each phase, two SCRs are connected back to back and the SCRs are conducted initially at a delay of 180 degrees during the respective half-wave cycles (for which each SCR conducts). This delay is reduced gradually with time until the applied voltage ramps up to the full supply voltage. This is also known as Time Voltage Ramp System. This method is not relevant as it doesn't control the motor acceleration.

Components of a basic soft starter Power switches like SCRs which need to be phase controlled such that they are applied for each part of the cycle. For a 3 phase motor, two SCRs are connected back to back for each phase. The switching devices need to be rated atleast three times more than the line voltage.
Control Logic using PID controllers or Microcontrollers or any other logic to control the application of gate voltage to the SCR, i.e. to control the firing angle of SCRs to make theSCR conduct at the required part of the supply voltage cycle.
Working Example of Electronic Soft Start System for 3 phase induction motor the system consists of the following components.

Two back to back SCRs for each phase, i.e. 6 SCRs in total.
Control Logic circuitry in the form of two comparators- LM324 and LM339 to produce thelevel and the ramp voltage and an optoisolator to control the application of gate voltage to each SCR in each phase.A power supply circuitry to provide the required dc supply voltage.
Block Diagram showing Electronic Soft Start System for 3 phase Induction Motor. Block Diagram showing Electronic Soft Start System for 3 phase Induction Motor
The level voltage is generated using the comparator LM324 whose inverting terminal is fed using a fixed voltage source and the non inverting terminal is fed through a capacitor connected to the collector of an NPN transistor. The charging and discharging of the capacitor cause the output of the comparator to change accordingly and the voltage level to change from high to low. This output level voltage is applied to the non inverting terminal ofanother comparator LM339 whose inverting terminal is fed using a ramp voltage. This ramp voltage is produced using another comparator LM339 which compares the pulsating DC voltage applied at its inverting terminal to the pure DC voltage at its non inverting terminal and generates a zero voltage reference signal which is converted to a ramp signal by the charging and discharging of an electrolyte capacitor.
Components of a basic soft starter Power switches like SCRs which need to be phase controlled such that they are applied for each part of the cycle. For a 3 phase motor, two SCRs are connected back to back for each phase. The switching devices need to be rated atleast three times more than the line voltage.
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Already then, he was rather skeptical about the slow though inevitable adoption of these technologies: “I shall proceed slowly and carefully… might not have beengiven to the world for a long time yet… my best wishes for your future success.
the excitement coming…”.
Tesla’s main idea was to use our planet as a conductor in order to transmit power toany point on Earth. As a result, he conducted successful experiments at Colorado Springs, Colorado in the 1900s, where a resonant transformer made of a 200 feet mast with a copper ball on top was built (the Tesla coil). With frequency of 150 kHz
and 300 KW of input power he was able to collect “thousands of discharges” up to 50 kilometers from the source, though there are no details of how much power was collected .Furthermore, Tesla’s Wardenclyffe tower, built on Long Island, was another sophisticated construction to pursue his goal of the World Wireless System.
Unfortunately, this 154 feet high wireless power transmitter, which played a crucial rolein Tesla’s inventions, was demolished a few years later due to his debts and the US Government claims that it acted as a spy transmitter.
Brown (2011) states that the lack of technology, microwave power in particular, result-
ed in a continuous pause in development of wireless power until World War II when the first radars were made. Consequently, it boosted the point-to-point microwave transmission research. As a result, William C. Brown’s cordless helicopter was introduced in 1964, the main conceptof which was a 400W continuous power microwave transmitter delivering up to 100 W to the receiver end on the machine. Furthermore, as mentioned by Garnica et al. (2013) and Brown (2011), the idea of long-distance power transmission from space objects emerged where energy would be gathered, beamed from a solar-power satellite to Earth and then converted into electrical form. However, neither technique received any further attention in industry. The next step towards WPT was development of the RFID system in 1973 where tags were powered using induction coupling. It took three decades before the WiTricity research group introduced the real cordless electricity transfer in 2007 with a 60W bulb being powered at two meters distance. Apparently, this was the starting point for a rapidly growing and competitive industry of wireless power transfer.

Cost

Table no. 13. Total cost of device14.2.2

Device	Cost
Transformer	150/-
Rectifier	25/-
Regulator	250/-
Control unit	1500/-
Lamp	65/-
Input	35/-
SCR	125/-
Total cost	2150/-

14.2.3 Advanced Wireless Power Transfer System

Explanation

Wireless power transfer (WPT) is an important topic nowadays. Although WPT has been known for more than a century, only now has the WPT industry started its rapid growth. The number of publications on wireless power has increased by at least 1200% in the last 10 years [9,2]. Current solutions are having great success in the marketplace with diffusions of innovations from innovators to early adopters as of now. However the main focus of the current solutions is a "wow" factor which in most cases neglects convenience. Obviously, there is a need for a real-life application, for average users who are not particularly familiar with the engineering world and do not follow state of the art technologies.

The goal of the project was to evaluate and study the wireless power transfer technologies and physics behind it. The design and implementation of the wireless energy transmission system prototype and its implementation in the NextFloor innovative floor was the main plan. It was crucial for NextFloor to integrate advanced technologies into their floor system in order to make it really "smart" and innovative and wireless power transfer was one of them.

WPT is a very broad though relatively new technology – almost 80% of my references are dated later than the year 2010; hence, the scope of the project was limited to implementation of the inductive power transfer mode only. However, other types of WPT are also discussed in the thesis. The question my project was aimed to answer was simple: Are we ready to use cordless electricity in our everyday lives?

Last but not least, my utmost aims that I set in the beginning were to apply the gained knowledge in practice, assess my professional competence and development needs and learn how to work in a professional team researching a totally new technology

The development of the WPT systems started already in the late 19th century with the ideas of Nikola Tesla, who is rightfully considered an acknowledged genius in this field. Already then, he was rather skeptical about the slow though inevitable adop-

tion of these technologies: "I shall proceed slowly and carefully… might not have been given to the world for a long time yet… my best wishes for your future success. the excitement coming…".

Tesla's main idea was to use our planet as a conductor in order to transmit power to any point on Earth. As a result, he conducted successful experiments at Colorado Springs, Colorado in the 1900s, where a resonant transformer made of a 200 feet mast

with a copper ball on top was built (the Tesla coil). With frequency of 150 kHz and 300 KW of input power he was able to collect "thousands of discharges" up to 50 kilometers from the source, though there are no details of how much power was collected . Furthermore, Tesla's Wardenclyffe tower, built on Long Island, was another sophisticated construction to pursue his goal of the World Wireless System. Unfortunately, this 154 feet high wireless power transmitter, which played a crucial role in Tesla's inventions, was demolished a few years later due to his debts and the US Government claims that it acted as a spy transmitter. Brown (2011) states that the lack of technology, microwave power in particular, resulted in a continuous pause in development of wireless power until World War II when the first radars were made. Consequently, it boosted the point-to-point microwave transmission research. As a result, William C. Brown's cordless helicopter was introduced in 1964, the main concept of which was a 400W continuous power microwave transmitter delivering up to 100 W to the receiver end on the machine. Furthermore, as mentioned by Garnica et al. (2013) and Brown (2011), the idea of long-distance power transmission from space objects emerged where energy would be gathered, beamed from a solar-power satellite to Earth and then converted into electrical form. However, neither technique received any further attention in industry. The next step towards WPT was development of the RFID system in 1973 where tags were powered using induction coupling. It took three decades before the WiTricity research group introduced the real cordless electricity transfer in 2007 with a 60W bulb being powered at two meters distance. Apparently, this was the starting point for a rapidly growing and competitive industry of wireless power transfer.

14.2.4 Industrial Temperature Controller

Explanation

As the name implies, a temperature controller is an instrument used to control temperatures, mainly without extensive operator involvement. A controller in a temperature control system will accept a temperature sensor such as a thermocouple or RTD as input and compare the actual temperature to the desired control temperature, or setpoint. It will then provide an outputto a control element.

A good example would be an application where the controller takes an input from a temperature sensor and has an output that is connected to a control element such as a heater orfan. The controller is usually just one part of a temperature control system, and the whole system should Learn more about Digital Controllers.

What Are the Different Types of Process or Temperature Controllers, and How Do TheyWork?

There are three basic types of process controllers: on-off, proportional and PID. Depending upon the system to be controlled, the operator will be able to use one type or another to control the

Process.

On/Off temperature Controller

An on-off temperature controller is the simplest form of control device. The output from the device is either on or off, with no middle state. An on-off controller will switch the output only when the temperature crosses the setpoint. For heating control, the output is on when the temperature is below the setpoint, and off above setpoint.

Since the temperature crosses the setpoint to change the output state, the process temperaturewill be cycling continually, going from below setpoint to above, and back below. In cases where this cycling occurs rapidly, and to prevent damage to contactors and valves, an on-off differential, or "hysteresis," is added to the controller operations.

This differential requires that the temperature exceed setpoint by a certain amount before the output will turn off or on again. On-off differential prevents the output from "chattering" or making fast, continual switches if the cycling above and below the setpoint occurs very rapidly.

On-off control is usually used where a precise control is not necessary, in systems which cannot handle having the energy turned on and off frequently, where the mass of the system is so great that temperatures change extremely slowly, or for a temperature alarm. One special type of on-off control used for alarm is a limit controller. This controller uses a latching relay, which must be manually reset, and is used to shut down a process when a certain temperature is reached.

Proportional Control

Proportional controls are designed to eliminate the cycling associated with on-off control. A proportional controller decreases the average power supplied to the heater as the temperature approaches setpoint.

This has the effect of slowing down the heater so that it will not overshoot the setpoint, but will approach the setpoint and maintain a stable temperature. This proportioning action can be accomplished by turning the output on and off for short time intervals. This "time proportioning" varies the ratio of "on" time to "off" time to control the temperature. The proportioning action occurs within a "proportional band" around the setpoint temperature.

Outside this band, the temperature controller functions as an on-off unit, with the output either fully on (below the band) or fully off (above the band). However, within the band, the output is turned on and off in the ratio of the measurement difference from the setpoint. At the setpoint (the midpoint of the proportional band), the output on:off ratio is 1:1; that is, the on-time and off-time are equal. If the temperature is further from the setpoint, the on- and off-times vary in proportion to the temperature difference. If the temperature is below setpoint, the output will be on longer; if the temperature is too high, the output will be off longer.

PID Control

The third controller type provides proportional with integral and derivative control, or PID. This controller combines proportional control with two additional adjustments, which helps theunit automatically compensate for changes in the system.

These adjustments, integral and derivative, are expressed in time-based units; they are also referred to by their reciprocals, RESET and RATE, respectively. The proportional, integral and derivative terms must be individually adjusted or "tuned" to a particular system using trial and error. It provides the most accurate and stable control of the three controller types, and is best used in systems which have a relatively small mass, those which react quickly to changes in the energy added to the process.

In this other article, how to tune a PID controller is covered in more detail.

It is recommended in systems where the load changes often and the controller is expected to compensate automatically due to frequent changes in setpoint, the amount of energy available,or

the mass to be controlled. OMEGA offers a number of controllers that automatically tune themselves. These are known as autotune controllers.
temperature-controller-panel-cutouts-diagram

Standard Sizes
Since temperature controllers are generally mounted inside an instrument panel, the panel mustbe cut to accommodate the temperature controller. In order to provide interchangeability between temperature controllers, most temperature controllers are designed to standard DIN sizes. The most common DIN sizes are shown below.

14.2.5 Accident Alerts in Modern Traffic Signal Control System Camera SurveillanceSystem

Explanation
Nowadays the road accidents in modern urban areas are increased to uncertain level. The loss of human life due to accident is to be avoided. Traffic congestion and tidal flow are major facts that cause delay to ambulance. To bar loss of human life due to accidents we introduce a scheme called ITLS (Intelligent Traffic Light system). The main theme behind this scheme is toprovide a smooth flow for the emergency vehicles like ambulance to reach the hospitals in timeand thus minimizing the delay caused by traffic congestion. The idea behind this scheme is to implement ITLS which would control mechanically the traffic lights in the path of the ambulance. The ambulance is controlled by the control unit which furnishes adequate route to the ambulance and also controls the traffic light according to the ambulance location and thus reaching the hospital safely. The controller identifies the location of the accident spot through the sensor systems in the vehicle which determined the accident and thus the controller walks through the ambulance to the spot. This scheme is fully automated, thus it finds the accident spot, controls the traffic lights, helping to reach the hospital in time.
Nowadays Wireless Sensor Networks (WSN) has been applied in various domains like weather monitoring, military, home automation, health care monitoring, security and safety etc. or in a nut shell one can say wireless sensor network can be applied in most of the domains Traffic Signal System or traffic monitoring is a vast domain where WSN can be applied to gather information about the incoming flow of traffic, traffic load on a particular road, traffic load at particular period of time (peak hours) and in vehicle prioritization. WSN installed along a road
.
The sensor nodes that are to be deployed along the road are small in size and have low energy consumption. These sensors run on both battery power as well as solar energy. They have the capability to draw solar energy so that they can use sunlight for functioning in bright and sunny condition and the battery power for functioning at night or in cloudy or foggy condition.
Sensors used in the Wireless Sensor Network for traffic signal systems are mainly of two types:
i) Intrusive type and ii) Non-Intrusive type i) Intrusive types of sensor are kept under the road and sense the traffic waiting at the signal. This type of sensor has the same working principle as that of a metal detector. ii) Non-Intrusive types of sensor is fitted on the road. The installation of this type of sensor is easy as no cutting of road is needed to be done. Non-intrusive sensor includes acoustic sensors or video image processors to detect the presence of vehicles waiting at the traffic intersection. Although Intrusive sensors are very effective still Non-intrusive sensors are preferred over Intrusive sensors as they are cost-effective, easy to install, immune tonatural corrosion and degradation.

CHAPTER 15

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

1. Primary School

Primary school as proposed for nani bhatlav is most needed in nani bhatlav village. The designof the school gives the student teacher to get and give their best for the education field.Primary school in nani bhatlav have total of 8 class rooms and all can be equipped with the bestsmart boards and digital teaching.priamry school also have 2 separate toilet for girls and boys. The primary school have a staff room for teacher and a principle office and astore room.The school is targeted to get best education possible and best environment.

2. Garden

Public garden is comprise of the children play area and joggers track for the adults. The nesseccity for having a public garder was to have a proper area where children can play and spent some good time playing outdoor games.public garder has area of 21*19 mts.Such big area is much more use for any marriage function or other occation.this garden can bring publicto live a healthy lifestyle.

3. Grocery Shop

Grocery shop is a must in todays world. The villagers of Nani bhatlav needs to and travel 13kmto buy the necessary items for the house hold work. The design we have provided has two mainarea as a store room and a main counter side. the dimension of the store room and the main areais respectively 6.4*1.8m & 6.4*2.78m.This design proposal will reduce the travel of the villagers and save their money .grocery shop provides all home day today essential things.

4. Health center

The health center is the place every individual needs right from the birth to the death bed.The health center that we have given has all the most basic necessity that a health center needs. The design we have proposed have a maternity room , wash area for men and women, emergency operation theatre, a lobby or waiting area, reception ,store room, and a general ward. The health center should be having all the basic and needed instruments and machines forthe basic operation of a patient.

5. Rain water harvesting.

rainwater harvesting is as important and plays a vital role in conservation of water and conservation of environment .The rainwater consist of the main underground water storage tank and the piping system that includes filter and different size of the pipes. By his overall conservation can be estimated of at least 1 to 5 lakh of liters per annum

6. Public toilet

Public toilet was given by us as a design specific for the nani bhatlav because it is so crucial to have a clean and hygenic society and surrounding that will make the area cleaner more liveable and better.the toilet is divided into two parts as male and female. And gives proper justice to the population and the reqirement for it

7. Atm

we have designed the ATM for our nani bhatlav. The population of nani bhatlav village is 1067

asper 2011 census. So it is required to have one ATM in the village. The villagers have to go in bardoli for cash requirement so that we have decided and finalized the design of ATM.
Basic banking facilities ; Security , Ease of use ,A suitable and simple product Atm design to assist illiterate,semi-literate with banking Providing services through familiar devices Net reduction in transaction processes; Aim to help in financial inclusion policies; etc.the ATM that design we have proposed have the Length of 2.67m and Width 2.67m and of Height 3.35m &Carpet area 4.88m2

8. panchayat building

As a village a good well built panchayat building is a must needed construction.The panchayat building have major use in day to day functioning of the village and the management. And it is obvious that the well built panchayat building will give a better control and organised way to manage the village and the other uses. Currently there is no proper panchayat building present in the nani bhatlav.The present cnsition wise the panchayat need a re construction and re design .The space for the office is significantly less . And the proper toilet system is not presentPanchayat building is a must necessity for Nani bhatlav. And the design we have given satisfy the all basic requirement for a panchayat building should have.employment.The designis basic and sober as that makes it more money efficient.the design consist of waiting room ,sarpanch office and tallati office.The waiting room dimension is 2.70X4.00 mt.While the sarpanch office and tallati office have the dimension of 3.00X2.00 mt.

9. Village gate

A village entrance gate as a heritage village design , a gate or gateway is a point of entry to a space which is enclosed by wall Gates may prevent or control the entry or exit of individuals, or they maybe merely decorative Design Utilized by People living in the village of even outsiders from nearby villages and relatives of the villagers can useor utilize a village entrancegate for their different uses.For better esthetic entrance view,Ease of use, Availability of good approach road .The village entrance gate design as a heritage village design is for better esthetics and looks of thevillage approach road.the Entrance Gate that we have Designed havethe Length of 7.12m ,Width of 2m and Height 4.88m

10. chabutara

Within nani bhatlav though there are much greenery surrounding but a chabutaro will gives an area to children to play and gives a different face of the village itself as socially and structurally. Nani bhatlav have no chabutara in surrounding area. Sustainability of the design Utilized by, the birds as of different types of birds that gets home to live and get drinking water and food or grains to eat. Needs There is major deception of sparrow and pegions as human has take over his enormous giants of concrete jungle. As by chabutaro it will give a home to the birds to stay. Design brief The chabutaro is 5.1mt of height and 2 m width having a spherical shape on thetop and a pole like structure for the support on the ground. Spacing of the 0.15mt is given as an entrance .

11. sports club

At current situation nani bhatlav is getting young as new generation takes the hold.more young generation needs more area to play and can grow in that particular direction.There iscurrently no such area or amnetites that young genearation can play or improve there co

cirricular activity.Sustainability of the design Needs An in the present situation and under government many different scheme helps poor people to live a better life.

12. Krushi seva kendra

Nani bhatlav have no such krushi seva kendra .there is one but the farmer need to travel about 51 km for that.so we thought that the a krshi seva kendra is good for the farmers of the village. Sustainability of the design Needs The krushi seva kendra makes a difference for farmer as he gets the seed organic pesticides, Bio-Pesticides, Maize Seed, Sesame Seeds, Cotton Seeds, etc.The distance for the travel of the farmer will reduce and employment will increase .Design brief The design of KRUSHI seva kendra consist of LAB,OFFICE and SHOP.The length of the structure is 7m and the width of the structure is 14 m LAB has the area of 3.70*6.10.Office has the area of 1.62*5.40.Shop has the area of 3.70*6.10mt.

SR. NO.	NAME OF DESIGN	PERIOD	AMOUNT EXPENDITURE	BENEFIT
1	Primary school	5-6 months	20,02,059	The design of the school gives the student teacher to get and give their best for the education field. Primary school in nani bhatlav have total of 8 class rooms and all can be equipped with the best smart boards and digital teaching
2	Garden	2-8 weeks	1,48,410	Public garden is comprise of the children play area and joggers track for the adults. The nesseccity for having a public garder was to have a proper area where children can play and spent some good time playing outdoor games
3	Grocery shop	1-2months	2,63,718	.This design proposal of shop will reduce the travel of the villagers and save their money .grocery shop provides all home day today essential things.
4	Health centre	2-5months	8,33,365	The design we have proposed have a maternity room , wash area for men and women, emergency operation theatre, a lobby or waiting area, reception ,store room, and a general ward. The health center should be having all the basic and needed instruments and machines for the basic operation of a patien
5	Rainwater harvesting	5-8weeks	7,09,614	The rainwater consist of the main underground water

				storage tank and the piping system that includes filter and different size of the pipes. By his overall conservation can be estimated of at least 1 to 5 lakh of liters per annum.
6	Public toilet	5-6weeks	2,70,632	Public toilet was given by us as a design to have a clean and hygenic society and surrounding that will make the area cleaner more liveable and better.the toilet is divided into two parts as male and female. And gives proper justice to the population and the reqirement for it.
7	ATM	2-6weeks	1,04,752	The villagers have to go in bardoli for cash requirement so that we have decided and finalized the design of ATM. Basic banking facilities ; Security , Ease of use
8	Panchayat building	3-6months	1,35,978	As a village a good well built panchayat building is a must needed construction.The panchayat building have major use in day to day functioning of the village and the management. And it is obvious that the well built panchayat building will give a better control and organised way to manage the village and the other uses.
9	Village gate	1-2months	1,08,941	A village entrance gate as a heritage village design , a gate or gateway is a point of entry to a space which is enclosed by wall Gates may prevent or control the entry or exit of individuals. For better esthetic entrance view,Ease of use, Availability of good approach road
10	Chabutra	1-2weeks	27,706	As by chabutaro it will give a home to the birds to stay.

				a.Sustainability of the design Design Utilized by,the birds as of different types of birds that gets home to live and get drinking water and food or grains to eat
11	Sport club	4-5months	2,71,438	At current situation nanai bhatlav is getting young as new generation takes the hold.more young generation needs more area to play and can grow in that particular direction.There is currently no such area or amnetites that young genearation can play or improve there co cirrricular activity
12	Krushi seva kendra	5-8months	3,20,926	s The krushi seva kendra makes a difference for farmer as he gets the seed organic pesticides, Bio-Pesticides, Maize Seed, Sesame Seeds, Cotton Seeds, etc.The distance for the travel of the farmer will reduce and employment will increase

CHAPTER 16

Survey by Interviewing With Talati And /Or Sarpanch

We visited allocated village nani bhatlav and also visited ideal village and Smart village rayamand kharvasa. We met to Sarpanch rajuben k. chaudari ofNani bhatlav village.The servey wasdone on the basis of the material providedas a questionary consisting of different question that were linked with the development of village as by structural means and the social means.while during the interview with rajuben the sarpanch of nani bhatlav the Techno economic survey forms give much information about village by interacting with her. But interaction with village dwellers and observation of village condition is required.As we conducted the interview we get to know the development of the village in specifc number that gives us the clear and easy idea of the development of the village itself.

We asked her all the questionaries and co related question as of % of puucca houses in village,no of water tanks in village, etc.though the sarpanch rajubenhave given us enough time we still had some time quaries regarding the data
,and she has helped us by the everyway possible.They were very cooperative and helpful and dynamic person and gave us the detailedinformation and datawhenever we required.We visited all the internal part of the village and interacted with villagers directly and ask them about the present situation of village. We conducted a Techno-economic survey of Nnai bhatlav village. After all, we analyzed the gap analysis and provided the necessary facilities tovillage. We saw that as per UDPFI norms there are some non-adequate facilities.

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Survey with Interviewing

SURVEY BY INTERVIEWING WITH TALATI AND/OR SARPANCH

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

An approach towards "Rurbanisation for Village Development"

CHAPTER- 16

Sr.	Questions	Yes/No	Remarks
1	What are the sources of income in village?	Yes	labour work for farming
2	What are the chances of employment in village?	Yes	20%
3	What are the special technical facilities in village?	No	
4	Is any debt on village dwellers?	No.	
5	Are village people getting agricultural help?	Yes.	2000/- per 4 month
6	Is women health awareness Program organized in village?	Yes	
7	Are women having opportunity to work and income?	Yes	
8	Child girl education is appreciated in village?	Yes.	All
9	Facility of vaccination to child is available in village?	Yes.	Most of
10	Are village people aware about child vaccination and done to each and every child as per norms?	Yes	Some
11	Women help line number information is provided to village people?	Yes.	
12	Is water scarcity in village? How many days per year?	No.	
13	Is village under any debt?	No.	
14	Is any serious issue due to debt from bank or any person happened in village?	Yes.	
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?	Yes.	2 cases in last year.
17	How many disabled (physically challenged) is observed in village? Provide list with Male/female/girl/boy with age and type of disability and reason of disability.	NO	
18	Is village improvement is observed in comparative scenario from past to present?	Yes.	15%
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

Method Rural A

સરપંચ
ગ્રામ પંચાયત ઉતારા
તા. બારડોલી, જી. સુરત

CHAPTER 17

Irrigation / Agriculture Activates and Agro Industry, alternate Technics and Solution:

in agriculture, sustainability is a complex idea with many facets, including the economic ,the social as it should deal fairly with its workers and have a mutually beneficialrelationship with the surrounding community, and the environmental.

Environmental sustainability in agriculture means good stewardship of the natural systemsand resources that farms rely on. Among other things, this involves:

- Building and maintaining healthy soil
- Managing water wisely
- Minimizing air, water, and climate pollution
- Promoting biodiversity

There's a whole field of research devoted to achieving these goals:agroecology, the scienceof managing farms as ecosystems. By working with nature rather than against it, farms managed using agroecological principles can avoid damaging impacts without sacrificingproductivity or profitability.

Indoor Vertical Farming

Indoor vertical farming can increase crop yields, overcome limited land area, and even reduce farming's impact on the environment by cutting down distance traveled in the supply chain. Indoor vertical farming can be defined as the practice of growing produce stacked one above another in a closed and controlled environment. By using growing shelves mounted vertically, it significantly reduces the amount of land space needed to grow plants compared to traditional farming methods. This type of growing is often associated withcity and urban farming because of its ability to thrive in limited space. Vertical farms are unique in that some setups don't require soil for plants to grow.

Modern Greenhouses

Inrecent decades, the Greenhouse industry has been transforming from small scale facilities used primarily f research and aesthetic purposes (i.e., botanic gardens) to significantly more large-scale facilities that compete directly with land-based conventional food production. Combined, the entire global greenhouse market currently produces nearly US $350 billion in vegetables annually, ofwhich percent.

GIS-Based Agriculture

Since fields are location-based, GIS software becomes an incredibly useful tool in terms of precision farming. While using GIS software, farmers are able to map current and future changes in precipitation, temperature, crop yields, plant health, and so on. It also enables the use of GPS-based applications in-line with smart machinery to optimize fertilizer and pesticide application; given that farmers don't have to treat the entire field, but only deal with certain areas, they are able to achieve conservation of money, effort, and

Data From The Sky – Drones

With the assistance of drones farmers have an opportunity to define crop biomass, plant height, the presence of weeds, and water saturation on certain field areas with high precision. They deliver better and more accurate data with higher resolution in comparison to satellites. When they are locally operated, they provide valuable information even faster than scouts. Drones are also considered to be unrivaled aides in the battle against insects; the invasion is prevented by applying the insecticide on the hazard areas using drones, all while

Automated Farm Equipment

Automated farming equipment such as a self-driven tractor or seeder solves the problem of both time-constraints and labor shortages.

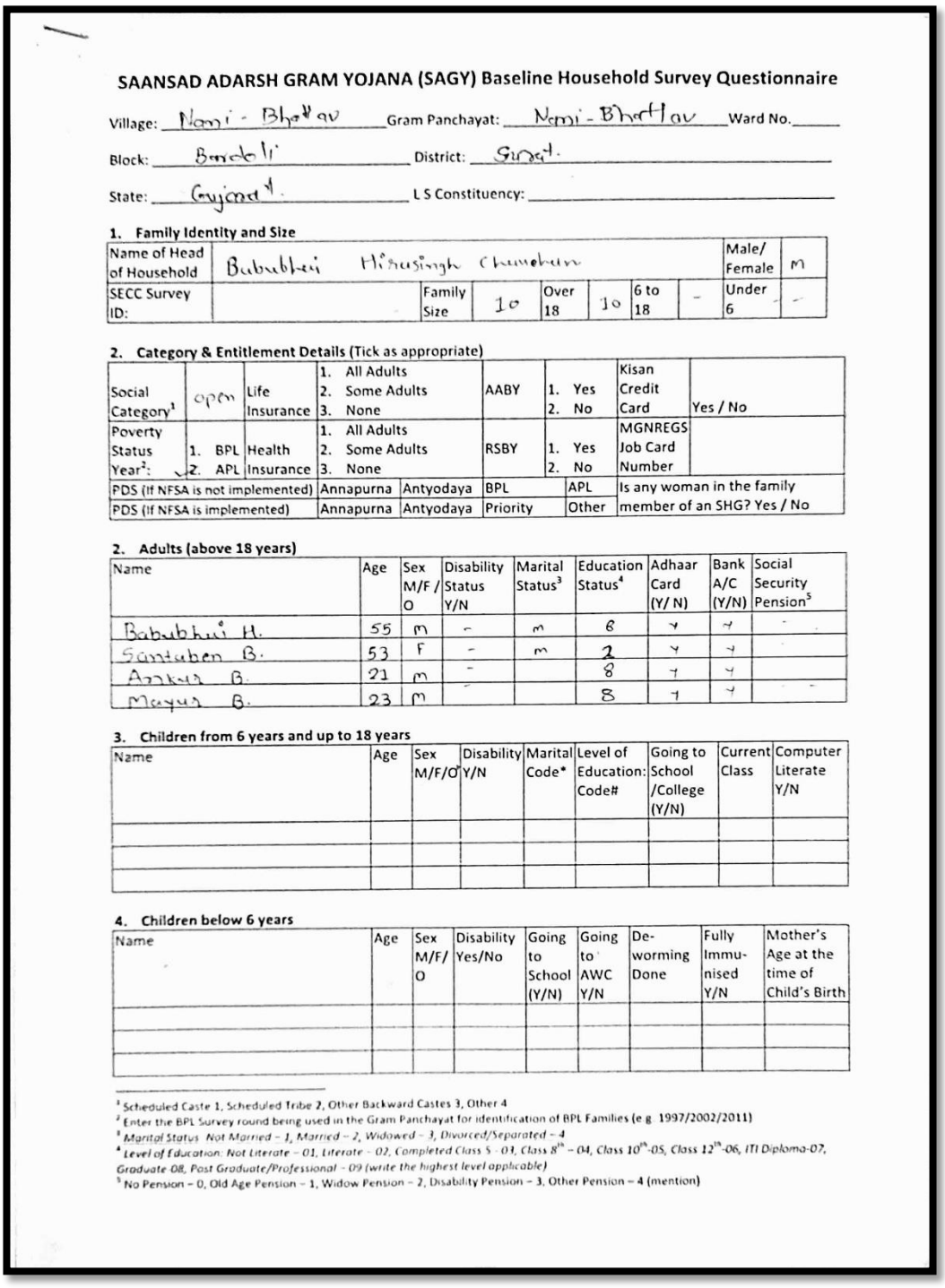
Machines like these can work round the clock tirelessly to bring higher yields in a shorter time. They are perfect for orchard management as they allow farmers to work on more important things, such as strategizing an improvement in quality for their crops instead of focusing on menial and manual lab

CHAPTER18
Social Activities – Any Activates Planned By Students

Our team had planned a social activity or our day of visit of the village, afterthe completion of our survey and interviewing the sarpanch of Nani bhatlav.we movedto about 5 to 6 houses asking for their family members and ask them to gather their friends and withing some time we had a whole bunch of young generation and adultsready to listen us. We have little time and a big message to convey, but we started and turn by turn we start giving from the scratch information of education.Why education is necessary? Why do we need to study?
Making them understand that learning and studying is not boring . we tried to maketheir parents understand the education and not sending them for child labor though there was no single child doing child labour but that message was needed toconvey.We tried to explain them different ways of learning .the session was about30 min long but even if it effects the mind of any one individual our social activityand ourmessage wins. After this activity all of them thanked us for this activity andwe feltproud for that as it was not so usual for us to deliver such raw speech to suchdeserving peoples.

CHAPTER 19

VADHAVA SAGY Questionnaire Survey form with theSarpanchSignature:



SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: Nani - Bhatlav Gram Panchayat: Nani - Bhatlav Ward No. ____

Block: Bardoli District: Surat.

State: Gujarat. L S Constituency: ____

1. Family Identity and Size

Name of Head of Household	Babubhai Hirusingh Chunekar							Male/ Female	M
SECC Survey ID:		Family Size	10	Over 18	10	6 to 18	-	Under 6	-

2. Category & Entitlement Details (Tick as appropriate)

Social Category[1]	open	Life Insurance	1. All Adults 2. Some Adults 3. None	AABY	1. Yes 2. No	Kisan Credit Card	Yes / 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]
Babubhai H.	55	m	-	m	8	Y	Y	-
Santuben B.	53	F	-	m	2	Y	Y	
Ankur B.	21	m	-		8	Y	Y	
Mayur B.	23	m	-		8	Y	Y	-

3. Children from 6 years and up to 18 years

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

4. Children below 6 years

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

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

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

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

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

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

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	
Community Water Tap	Yes / No	
Hand Pump (Public / Private)	Yes / No	
Open Well(Public / Private)	Yes / No	1.5
Other (mention):		

11. Source of Lighting and Power

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

12. Landholding (Acres)

1. Total	3 acre	2. Cultivable Area	
3. Irrigated Area	3 acre	4. Uncultivable Area	

13. Principal Occupations in the Household

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

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

15. Agriculture Inputs

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

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

Name	Unit	Quantity
Grass		

17. Livestock Numbers

Cows: 4	Bullocks:_____	Calves: _____
Female Buffalo:_____	Male Buffalo:_____	Buffalo Calves:_____
Goats/ Sheep:_____	Poultry/ Ducks:_____	Pigs:_____
Any other: Type _____		No._____
Shelter for Livestock: Pucca / Kutcha / None		
Average Daily Production of Milk(Litres): 5		

18. What games do Children Play

-

19. Do children play musical instrument (mention)

Schedule Filled By:
Principal Respondent:
Date of Survey:

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

I. Basic Information

a. Gram Panchayat: Nani - Bhatlav

b. Block: Bardoli

c. District: Surat

d. State: Gujarat

e. Lok Sabha Constituency: Bardoli

f. Number of Wards in the Gram Panchayat: 2

g. Number of Villages in the Gram Panchayat: 1

h. Names of Villages:

Demographic Information

Number of Households 284 Total Population 1240 Male 523 Female 544

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

I. Access to Infrastructure / Facilities / Services

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
a.	ANM/ Health Sub Centre	N	Vaskai - 5Km
b.	Nearest Primary Health Centre (PHC)	N	
c.	Nearest Community Health Centre (CHC)	N	Kadod - 16.5Km
d.	Nearest Post Office	N	Madhi
e.	Nearest Bank Branch (Any)	N	
f.	Nearest Bank with CBS Facility	N	Madhi
g.	Nearest ATM	N	Madhi
h.	Nearest Primary School	Y	
i.	Nearest Middle School	N	Madhi/Kadod
j.	Nearest Secondary School	N	Madhi/Kadod
k.	Nearest Higher Secondary School / +2 College	N	Madhi/Kadod
l.	Nearest Graduate College	N	Bardoli
m	Nearest ITI / Polytechnic Centre	N	Bardoli
n	Kisan Seva Kendra	N	Rajpipda

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	N	
q	Milk Cooperative /Collection Centre	Y	
r	Veterinary Care Centre	N	
s	Ayurveda Centre	N	
t	E – Seva Kendra	Y	
u	Bus Stop	Y	
v	Railway Station	N	Madhi (3km)
w	Library	N	
x	Common Service Centre	N	

IV. Sports Facilities in the Gram Panchayat

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

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

V. Education, ICDS

a. Number of Angan Wadi Centres: _____

b. Number of villages without Angan Wadi Centres 0

Names of such villages: _____

_____

c. Schools (Number)

Primary Private: 0 Primary Govt.: 1

Middle Private: 0 Middle Govt.: 0

Secondary Private: 0 Secondary Govt.: 0

Higher Secondary Private: 0 Higher Secondary Govt: 0

VI. Public Distribution System

	Item	Private Contractor	Women's SHG	Gram Panchayat	Cooperative	Other (Mention)	Location in GP (mention Location)	If outside GP, Location & distance from GP HQrs)
a.	Cereal (Rice/ Wheat/ Millets)	—	-	Yes	—	-	Bamadeh	
b.	Kerosene	—	-	No	—	-		
c.	Other (mention)	—	-	Sugar, salt	—	-	—	-

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

VII. Coverage of Villages under different Facilities & Services

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

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	1331	d.	Pasture / Grazing Land	-	g.	Check Dam	-
b.	Irrigated Land	3805	e.	Forests/ Plantations	-	h.	Wells/Bore Wells	-
c.	Un-irrigated Land	-	f.	Other Common Land	1901	i	Tanks /Ponds	-

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

3

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

IX. Parameters relating to Households & Institutions

		Number
a)	Number of eligible Households for pension (old age, widow, disability)	0
b)	Number of Households receiving pension (old age, widow, disability)	0
c)	Number of eligible Households who are not receiving pension	1284
d)	Number of Households eligible for Ration Card	-
e)	Number of eligible HHs having ration cards	1280 284
f)	Number of households covered under RSBY (Rashtriya Swasthya Bima Yojana)	0
g)	Number of HHs covered under AABY (Aam Aadmi Bima Yojana)	0
h)	Number of active Job Card holders under MGNREGA	0
i)	Number of Job Card holders who completed 100 days of work during 2013-14	0
j)	Number of shops selling alcohol	0
k)	Number of BPL families	250
l)	Number of landless households	0
m)	Number of IAY beneficiaries	0
n)	Number of FRA[2] beneficiaries	0
o)	Number of Community Sanitary Complexes	0
p)	Number of Households headed by single women	15
q)	Number of Households headed by physically handicapped persons	4
r)	Total number of Persons with Disability in the village	4
s)	Number of SHGs	0
t)	Number of active SHGs	0
u)	Number of SHG Federations	0
v)	Number of Youth Clubs	0
w)	Number of Bharat Nirman Volunteers	0

Name and Signature of Surveyor and Respondent'

Surveyor	PRI Respondent (Preferably Gram Panchayat Chairperson)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	Date of Survey
	સરપચશ્રી ગ્રામ પંચાયત, નાનીભટલાવ તા. બારડોલી, જિ. સુરત.	સભ્ય તાલુકા પંચાયત બારડોલી તા. બારડોલી, જિ. સુરત.	22/12/21

[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: Nani-Bhatlav

b. Ward Number: _____

c. Gram Panchayat: Nani-Bhatlav

d. Block: Bardoli

e. District: Surat

f. State: Gujarat

g. Lok Sabha Constituency: Bardoli

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

i. Names of Habitations / Hamlets:

Demographic Information

Number of Households 284 Total Population 1240 Male 523 Female 574

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	N	Madhi
d.	Kisan Seva Kendra	N	Madhi
e.	Milk Cooperative /Collection Centre	N	Madhi
g.	Health Sub Centre	N	Madhi
h.	Bank	N	Madhi
i.	ATM	N	Madhi
j.	Bus Stop	N	Madhi
k.	Railway Station	N	Madhi

[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	Madhi
m	Common Service Centre	N	Madhi
n	Veterinary Care Centre	N	Madhi

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: 2

iii. Drinking Water Facilities

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

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

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

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

iv. Coverage of Habitations under Waste Management System

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

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

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

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

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

If 3 mention the name of the habitations not covered: None

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: All

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

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

vi. Sports Facilities in the Village

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

b.Mini Stadium : — Yes(Y) /No (N)

vii. Education, ICDS

a. Number of Anganwadi Centres: 1

c. Schools (Number)

Primary Private: — Primary Govt.: 1

Middle Private: — Middle Govt.: —

Secondary Private: — Secondary Govt.: —

Higher Secondary Private: — Higher Secondary Govt: —

2

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

viii. Land Category		Area in Acres		Land Category	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	1394	d.	Pasture / Grazing Land	-	g.	Check Dam	-
b.	Irrigated Land	386	e.	Forests/ Plnatations	-	h.	Wells/Bore Wells	-
c.	Un-irrigated Land	-	f.	Other Common Land	1904	I	Tanks /Ponds	-

ix. Entitlement Related Parameters		
1	Number of active Job Card holders under MGNREGA	0
2	Number of active Job Card holders who have completed 100 days of work	0
3	Number of shops selling alcohol	0
4	Number of BPL families	૭
5	Number of landless households	૨૬૦
6	Number of IAY beneficiaries	૦
7	Number of FRA beneficiaries	૦
8	Number of common sanitation complexes	0
9	Number of SHGs	0
10	Number of active SHGs	0
11	Existence of SHG Federation in the Village (Yes / No)	0
12	Number of Youth Clubs	0
13	Number of Bharat Nirman Volunteers	૦.

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
	સભ્ય તાલુકા પંચાયત બારડોલી તા. બારડોલી, જિ. સુરત	સરપચશ્રી ગ્રામ પંચાયત, નાનીભટલાવ તા. બારડોલી, જિ. સુરત.	22/12/21

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CHAPTER 20
TDO-DDO-Collector email sending Soft copy attachment in the report

9/9/21, 1:42 PM SNPIT & RC College Mail - Development scenario of Nani Bhatlav village,Bardoli,Surat.

SNPIT&RC

sandip mistry <sandip.mistry@snpitrc.ac.in>

Development scenario of Nani Bhatlav village,Bardoli,Surat.
1 message

sandip mistry <sandip.mistry@snpitrc.ac.in> Thu, Sep 9, 2021 at 1:41 PM
To: tdo-bardoli@gujarat.gov.in, ddo-sur@gujarat.gov.in
Cc: Vishwakarma Yojana <rurban@gtu.edu.in>

Respected Sir/Madam

I am professor Sandip K. Mistry from S.N. Patel Institute of technology & R.C. Our B.E. final year students of Shree Sitaram Naranjibhai Patel Institute of Technology and Resreach Center,Umrakh,Baradoli,Surat affiliated to Gujarat Technological University-GTU. GTU has been assigned to Vishwakarma Yojanaa-VY in which students survey various villages and Designs 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 a sked to inform all the respected officers about our project in which we will shortly notify about **Nani bhatlav** Village profile of issues for development and our design work for them which is as below.

Village : Nani bhatlav		**Population: 1067(As of Census 2011) Population: 1350 (At Present)**
Key Issue	**Remark**	**Design Given**
Health Care	Habitats has to travel minimum 12 km for any health care aids to bardoli	Public Heath Center
Sanitation	Almost 90% have household toilet , under SBA toilet was needed.	Public Toilet
Education	The primary education is mandataory for all citizens .No school was there for primary education	Primary school
Water Scarcity	Water storage capacity o is enough but supply at the household is not enough to commence daily needs,	Rainwater Harvesting
Recreational Area	Currently only Village does not have any recreational place except for one temple near gamtal.	Garden chabutaro
Government building	Grampanchayat faces difficulties in conducting gramsabha, village does not have any place for gatherings or for celebration.	Community hall
Identification of village	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	Entrance Gate

9/9/21, 1:42 PM SNPIT & RC College Mail - Development scenario of Nani Bhatlav village,Bardoli,Surat.

Sr.No	Design Name	(Months)	Expenditure	Benefit
1	Primary school	5-6	Rs. 20,02,059	Better Education
2	Garden	1-2	Rs. 1,48,410	Recreational
3	Grocery shop	1-2	Rs.2,63,178	Economic development
4	Health Center	2-5	Rs.8,33,365	To Facilitate Good Health
5	Rainwater Harvesting	1-2	Rs. 7,09,614	Conservation of rain water and future use
6	Public Toilet	1-2	Rs.2,70,632	Sanitation
7	ATM	1	Rs.1,04,752	Liquid money availability
8	Panchayat building	6-8	Rs.1,35,978	Social development ,better management
9	Village gate	1-2	Rs.1,08,941	Aesthetics And Heritage
10	Chabutra	1	Rs.27,706	Recreational
11	Sport club	5-6	Rs.2,71,438	Gathering ,healthy lifestyle
12	Krushi seva kendra	5-7	Rs.3,20,926	For better development of famers in local area

The overall goal of our Village Development work is that people in poor rural villages have access to their most basic needs, improved education and health, and a means of sustaining their livelihoods and increasing their standard of living. More specifically, they have access to clean, safe drinking water within or near their homes. Sufficient lighting in their homes. A safe and adequate shelter that withstands the elements.

We have given our best to deliver the best of us in the development of Nani bhatlav for its structural development for its growth in every aspect.

Please find herewith attached,
1. Detailed Project Report Of **NANI BHATLAV** Village.

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Mr. Sandip K. Mistry
Assistant Professor,
Civil Engineering Department,
S.N.P.IT& R.C,Umrakh,
Bardoli.
9428380875

NANI BHATLAV_SNPITRC_VY-8_PART-2.pdf
13742K

CHAPTER 21

Comprehensive report for the entire village

The villages are the most important role in the maintaining the ratio of the balance between the modern world and the interior heart of the india.villages have created magnificent stars and given to the outer world.

Everyone loves their village as they enjoy living in that village and they also like the environment which is present in the town. The village is a very peaceful place where there is very little noise which makes a suitable environment for old people. There are issues in a village western person living in the city on another hand the people living in the village do not see things are the problem as they are the daily things for them with their to face.

They use problems in the village is that there is a lack of various services, where there is no water connection or water pipeline we drink water to the home rather than people have to walk a long distance to well of water and bring the water to the home.Also, the small children have to travel a lot to get an education as there is a very less number of schools available in and village and students from many distances come to receive training in the school.

Gandhi often expressed that most of India lives in villages and unless village life can be revitalized the nation as a whole can hardly come alive. About 70 percent of the Indian population resides in more than 627,000 villages.

The innovation and entrepreneurial imperatives – with close links to each other – are obvious and probably the most important ingredients in any society today – rich and poor – to find new opportunities and new solutions for a better life for all. Entrepreneurs exploit new ideas, solutions, innovations, and businesses in society or other ways to create value for themselves and their families. And no-where is the ‘entrepreneurial revolution’ so present than in Eastern Asia. Here the unemployment rate is already high and the young generation is growing rapidly, especially in India.

The village life is actually amazing life which is of blessings of God and has wonderful things.The village life is actually the life of those people who live far away from cities. They don'thave many facilities but there are some well-known blessings which make their life wonderful and amazing as they breathe in fresh air, eat fresh food, drink fresh milk and pure milk and live happily with each other.

In October 2011, the birth of an unidentified baby marked the seven billionth human. With more than 1.2 billion people and a world-leading national birth rate of about 50 per minute, India is more likely than any other country to have gestated Baby And given that about 70% of Indians –roughly one-tenth of humanity – live in the countryside, there’s a good chance 7B is among the new offspring in one of India’s 600,000-plus villages.

Rural India is a focal point for issues of global concern: the impacts of high population and development on natural resources; water pollution from raw sewage and pesticide runoff; soil loss and desertification due to erosion, overgrazing and deforestation.

This whole report comprehend the necessity of having the basic amenities within the village and its surrounding that enhance the living standards of the individual of the village without outweighing the effect of modernization and industrialization. As by our proposed designs of different infrastructure and amenities the villagers will not find any need to migrate to the urban area by any reason of not getting the basic necessity fulfilled.

The basic infrastructure like Primary school ,Grocery shop ,Health center ,Public toilet those design we have propose will give and fulfill the all basic necessity of any individual living in the village . the children will get primary education within the village. a grocery shop will eliminate the need of going to towns or cities to get their daily need of grocery. Health center and public toilet will help village to be clean and free from diseases and health center will be highly useful for villagers to get basic medical facility within the village. Public toilet was given by us as a design to have a clean and hygienic society and surrounding that will make the area cleaner more live able and better. The toilets divided into two parts as male and female. And gives proper justice to the population and the requirement for itThe design of the school gives the student teacher to getand give their best for the education field. Primary school in nani bhatlav have total of 8 class rooms and all can be equipped with the best
smart boards and digital teachingThis design proposal of shop will reduce the travel of the villagers and save their money .grocery shop provides all home day today essential things The design we have proposed have a maternity room , wash area for men and women, emergency operation theatre, a lobby or waiting area, reception ,store room, and a general ward. The health center should be having all the basic and needed instruments and machines for the basic operation of a patient

The village is need to developed from every aspects so Garden ,Rainwater harvesting
Village gate ,Chabutra following designs have been proposed that will help to grow village with an overall development covering development from infrastructure to aesthetic. The garden will give a proper asthetic view to the village and a place to recreational purpose, giving a place to villagers to have a sound place to relax and do physical activities. The rainwater harvesting will givie a better purpose to save water and conserve for future use.the village gate will give a representations to the village followed by the village name. chabutra is also As by chabutaro it will give a home to the birds to stay a Sustainability of the design Utilized by, the birds as of different types of birds that gets home to live and get drinking water and food or grains to eat.
SPORT CENTER For the sports center we have given this design because at current situation nani bhatlav is getting young as new generation takes the hold. More young generation needs more area to play and can grow in that particular direction. There is currently no such area or amenities that young generation can play or improve there cocurricular activity
ATM As the cash flow or liquidity of money is important and Basic banking facilities the villagers have to go in Bardoli for cash requirement so that we have decided and finalized the design of ATM.
PANCHAYAT The whole administration of the village is done at the panchayat building so As a village a good well built panchayat building is a must needed construction. The panchayat building have major use in day to day functioning of the village and the management. And it is obvious that the well built panchayat building will give a better control and organized way to manage the village and the other uses.

The overall goal of our Village Development work is that people in poor rural villages have access to their most basic needs, improved education and health, and a means of sustaining their livelihoods and increasing their standard of living. More specifically, they have access to clean, safe drinking water within or near their homes. Sufficient lighting in their homes. A safe and adequate shelter that withstands the elements.

The villages are the vital playing role in the scope of the developments as same as the urban culture plays the role in the nation development. The regional development comes within the rural area of the nation.

Even in the corona period the villages were lately affected by the corona virus were drastically affected. The major portion of the country is covered under the rural semi rural and urban areas. Due to the unawareness of the corona virus the made an high impact on the villages of all the major states.

Today, Inclusive rural development is a more specific concept than the concept of rural development of earlier, in broader terms, inclusive rural development is about improving the quality of life of all rural people. More specifically, inclusive rural development covers three different but interrelated dimensions: Economic dimension, social dimension, and Political dimension. The economic dimension encompasses providing both capacity and opportunities for the poor and low-income households, in particular, to benefit from economic growth.

For the increasing the efficiency of the people living in the villages and making their life better we have tried our best to give the design of the different infrastructure in different manners. We have given the 12 total design of different infrastructure. The design for the civil section that we have given are:-

1. Primary school
2. Garden
3.Grocery shop
4. Health centre
5. Rainwater harvesting
6. Public toilet
7. ATM
8. Panchayat building
9. Village gate
10. Chabutra
11. Sport club
12. Krushi seva kendra

For the electrical section we have proposed the other designs as:-

1. **Earthing**
2. **MCB**
3. **Time switch**
4. **Smart dustbin**
5. **ELCB**
6. **Emergency battery system**