DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION
TENARANG Village

SURAT District

PREPARED BY

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
Muskan Gheewala	Civil Engineering	170090106006
Harshit Mehta	Civil Engineering	170090106021
Priyansh Jain	Electrical Engineering	160090109042

C.K. Pithawala College of Engineering and Technology

NODAL OFFICERS NAME

Dr. Boski P. Chauhan,
Civil Engineering Department
Prof. Hetal H. Jivanramjiwala,
Electrical Engineering Department

YEAR:2020-21

GUJARAT TECHNOLOGICAL UNIVERSITY
Chandkheda,Ahmedabad– 382424 Gujarat

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Chandkheda, Ahmedabad– 382424 Gujarat

CERTIFICATE

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

Detail Project Report for,

VILLAGE: - TENARANG

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 the under our supervision and guidance.

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Dateof Report Submission:	
Principal Name and Signature:	Dr. Anish Gandhi
VY-Nodal Officer Name and Signature:	Dr. Boski P. Chauhan & Prof. Hetal H. Jivanramjiwala
Internal(Evaluator) Guide Name and Signature:	Dr. Boski P. Chauhan & Prof. Hetal H. Jivanramjiwala
College Name:	C.K. Pithawala College of Engineering and Technology
College Stamp:	

ABSTRACT

"Vishwakarma Yojana" The proposed scheme provided by the Gujarat Government to GTU students for making the development of village. Vishwakarma yojana provides the real work experience to engineering students and simultaneously apply their technical knowledge in development of the different type of infrastructure in the village. Under this yojana, the villages are surveyed and students are identifying the village which is needed to development. This plan gives the detailed development of the village by providing different facilities in unlike categories such as Physical infrastructure (Roads, water supply system, overhead water tank, storm water storage, etc.) Social Infrastructure (Health, Community Hall, primary health center, government clinic, generic medical shop, etc.) and Sustainable Infrastructure (Biogas plant, Solar Street, solar rooftop system, rainwater harvesting, etc.). This helps the urban peoples together with the rural peoples towards the nation progress. Generally, the peoples living in villages are working as a farmer in major, so their living standards are not levelized to the rural ones. So, villagers migrate to city for money purposed as well as for their own personal progress. By providing such rural amenities in the village, it will lead as a helping hand in resisting the migration. Also helps in increasing the lifestyle of the people living in the village.

The developmental work in villages that could under taken as per the need of the village in particular includes physical infrastructure facilities, social infrastructure facilities, socio- cultural facilities and sustainable infrastructures for effective development of villages. **About our village Tenarang**is a small village/hamlet in Olpadtaluka in Surat district of Gujarat state, India. It comes under Tenarangpanchayat. It is located 22 KM towards North from district headquarters Surat. 246 KM from state capital Gandhinagar.Tenarang is surrounded by Surat taluka towards South, Hansottaluka towards North, Chorasitaluka towards South, and Kamrejtaluka towards East. Surat, Ankleshwar, Navsari, Bharuch are the nearby cities to Tenarang.

Nearest railway station – more than 23 km, nearest bus station – 1.8 km away from village nearest ATM – 2.8 km away from village .About our proposed designs for village development we plan on providing public toilets, Library ,Clinic, Vertical Farming buildings, Bank and several other designs to increase the living standard of the villagers. Maximum participation from NGO, Public Private Partnership authorities and other need to be identified for development process, Involvement of stake holders from planning phase, developing new technologies for effective development, Designing of Model Urban Town, More Expert sessions and Technical skill enhancement of Students.

Our willingness is to provide proper and reliable facilities to them which will be beneficial to them in their living ways. Second thought about the enhancement of the village will be fulfilled by providing better environment, roads, new school building, Public water tap, Public toilet, garden, library, roads, drainage system, water supply system, agricultural facilities etc. This will lead to a prosperous village, where all love to live.The students of the Vishwakarma Yojana are trying their best to handover the latest facilities to village of the Gujarat in the progress mission of India.

Key Words: Realization, Development, Social Infrastructure.

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

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ABBREVIATIONS

SHORT NAME	FULL NAME
EMD	Earnest Money Deposit
EWS	Economically Weaker Section
FPC	Flat plate collector
GHG	Green House Gas
IAY	Indira Awas Yojana
KPI	Key Performance Indicator
LIG	Low Income Group
MIG	Medium Income Group
NCRM	National Centre For Research Methods
NGO	Non-Governmental Organizations
NREGA	National Rural Employment Guarantee Act
O&M	Operation And Maintenance
PMGSY	Pradhan Mantri Gram Sadak Yojana
PMAY	Pradhan Mantri Awas Yojna
PPP	Public-Private-Partnership
PURA	Provision Of Urban Amenities In Rural Areas
SAGY/SAANJI	Sansad Aarush Gram Yojana
SCP	Smart City Proposal
TDR	Transferable Development Rights
UCL	University College London
UDA	Urban Development Authority
VO	Voluntary Organizations

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

1.1 Background & Study Area Location

1.1.1 Background of the Project

The Gujarat Technological University has been allotted an important and prestigious project of Vishwakarma Yojana by the Government of Gujarat for the year 2012-13.Vishwakarma Yojana would provide “Design to Delivery” solution for development of villages in ‘Rurban’ areas. The developmental work in villages that could under taken as per the need of the village in particular includes Physical infrastructure facilities (Water, Drainage, Road, Electricity, Solid waste Management, Storm Water Network, Telecommunication & other), Social infrastructure facilities (Education, Health, Sanitation) Socio- Cultural Facilities (Community Hall, Library, Recreation Facilities & other) and Sustainable Infrastructures (Rain water harvesting, Biogas plant, Eco Toilets, Solar Street lights & other) for effective development of Villages. “**Vishwakarma Yojana**” has provided the platform for real world experience to engineering students and simultaneously apply their technical knowledge in the rural infrastructure development. From the Techno Economic survey, Students had identified the existing issues prevailing in villages and made the recommendations on the application of technology to achieve integrated and comprehensive development, through detail project report preparation and management. The approach like Vishwakarma Yojana is step towards nation development.

1.1.2 Study Area location

The village Baben is in Bardoli Taluka of Surat district in south Gujarat. The geographical location of the village is 21°0813.94" N and 73°0, 47.77’. E at an elevation of 30m from MSL Baben is the one of the villages which got ‘**Swarnim Gram (સ્વર્ણિમગામ)**’ prize out of 448 villages for creating basic facilities. The village was also selected for ‘Sampurana swachtha abhiyan’ Activities against global warming was conducted with the slogan as "War against Global Warming” They have planted 1280 trees in there village. Recreational facilities are developed like playing area, garden and panchvati in the open area. Asia's biggest sugar mill is located in Baben.

The primary occupation in the village is farming of sugarcane and paddy. Sugar cane industry was established in the year 1955 in Baben. Village and hence employment opportunities are created. Migration took place and number of industrial workers increased. Therefore second, occupation is employment in industries.

The village is situated at 2.1 km from Bardoli and 40 km from Surat city. The nearest milt, to Baben is Bardoli which is located in 1.0 km approximately. It is also well connected with NH-6 (In Surat District NH-6 passes through Hajira. Surat. Sachin. Palsana and

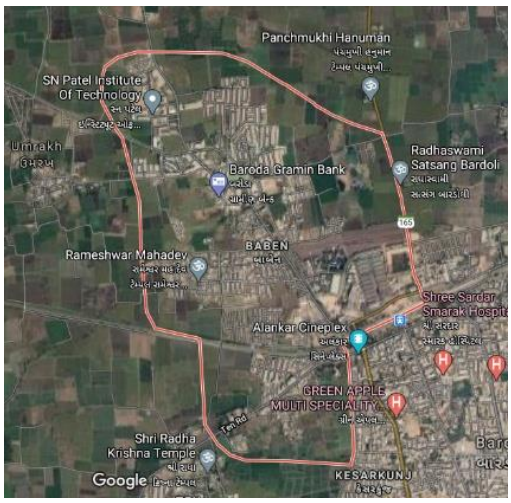


Fig 1 Arial view BABEN village

Bardoli and Mahatma Gandhi Road that connects to Bardoli. The nearest airport is Surat Airport and is at a distance of 44 km.

1.2 Concept: Ideal Village, Normal Village

1.2.1 Objective

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

Methodology-Implementation:

The techno-economic survey of villages has been conducted in different districts of the Gujarat state in terms of basic and public amenities, other infrastructural facilities. The project had been divided into three parts:

1. **Techno-economic survey of villages:** 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 Networks, Recreation facilities, Education facilities, Health Facilities, Transportation facilities, Road network, Irrigation Plan and estimate of proposed development by assessing gap analysis.
2. **Detailed Project report (DPR):** System, Use of non-conventional energy sources, Migration rate, Literacy rate and other necessary data.
3. **Development document preparation:** Preparation of development strategies and action plan.

1.2.2 Example / Live Case studies of ideal village of India/Gujarat

- **Punsari (Gujarat):**

  Punsari, located in Gujarat, puts most metros to shame. Funded by the Indian government and the village's own funding model, Punsari is no NRI-blessed zone. The village also boasts of amini-bus commute system and various other facilities.
- **Dharnai (Bihar):**

  First fully solar powered village: Dharnai, a village in Bihar, beat 30 years of darkness by developing its own solar-powered system for electricity. With the aid of Greenpeace, Dharnai declared itself an energy-independent village in July. Students no long need to limit their studies to the day time, women no longer limit themselves to stepping out in the day in this village of 2400 residents.
- **Pothanikkad (Kerala)**

  The village with 100% literacy rate: Unsurprisingly in Kerala, Pothanikkad village was the first in the country to achieve a 100%literacy rate. Not only does the village boast of city-

standard high-schools, but it also has primary schools and private schools. Guess the number of people the village has educated? Well, according to the 2001 census there are 17563 residents living in the village.

- **Mawlynnong (Meghalaya)**

  Asia's cleanest village Mawlynnong, a small village in Meghalaya, was awarded the prestigious tag of 'Cleanest Village in Asia' in 2003 by Discover India Magazine. Located at about 90 km from Shillong, the village offers a sky walk for you to take in the beauty as you explore it. According to visitors, you cannot find a single cigarette butt/plastic bag lying around there.

1.2.3 The Idea of a model/Smart Village

The idea of an "Aarush Gram" or model village has been explored earlier as well, most notably through the Pradhan mantri Aarush Gram Yojana, launched by the Central Government in 2009-10. The scheme was implemented in pilot mode in 1000 villages of Assam, Bihar, Himachal Pradesh, Rajasthan and Tamil Nadu, with an allocation of Rs 10 lakh per village. This limit was later raised to Rs 20 lakh per village. The target villages under the scheme were those with more than 50% of the population belonging to Scheduled Castes (SCs). Additionally, State governments have also taken steps in this direction. Himachal Pradesh launched a Mukai Mantri Adarsh Gram Yojana along similar lines in 2011, with the allocation of Rs 10 lakh per village.

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

The study of ancient civil, architecture, structure and culture and its combination with modern civil will lead to sparkle the modernity. Today we need to make a home not just a house. We have to accept the fact that our elders identified our DNA and present a frame work in which we can mold easily. if we want to understand science then we need to understand Indian tradition because our tradition our customs and practice is our science. Otherwise the distance measured by our ancestors and NASA's Distance won't be almost equal. "Many of the advances in the sciences that we consider today to have been made in Europe were in fact made in India centuries ago." - Grant Duffs (British Historian) "Whatever sphere of human mind you may select for your special study, whether it be language, or religion, or mythology or philosophy, whether it be laws or customs, primitive art or primitive science, everywhere you have to go to India. Whether you like it or not because some of the most valuable and most instructive materials in the history of man are treasured up in India and in India only"

1.3 Detail study (Socio economic, physical, demographic and infrastructure details) of Ideal village / Smart Village with photograph

- Basic Physical Infrastructure – Water Supply, Transport, Sewerage and Solid Waste Management should be the priority focus and be provided.
- Basic Social Infrastructure– Health and Education facilities should be provided and ensure proper delivery of facilities to village dwellers.
- Promote integrated development of rural areas with provision of quality housing, better connectivity, employment opportunities and supporting **physical and social infrastructure**.
- Reduce migration from rural to urban areas due to lack of basic services and sufficient economic activities in rural areas.

- Internal roads within village settlement, Efficient Mass Transportation systems to improve connectivity between urban and rural areas, Public transportation facilities that need to be developed like bus stops, transport depot etc.
- Identification of sanitation facilities that need improvement – sewerage and drainage line for household connection, door to door solid waste collection & dumping facilities.
- Electricity connections like street lighting that is energy efficient and eco-friendly.
- Refurbishing of village lakes, water tanks and wells, construction of rain water harvesting structures for Sustainable Development.
- Development of socio culture facilities like community hall, public library, recreational activities and repairing of existing amenities.
- Repair & maintenance of Existing Public Buildings like Gram Panchayat, Public Library, School Buildings, Health Center, and Public Toilet Block & Other.

1.3.1 Socio economic

Fig 2 Sugar Factory

Fig 3 Traffic Camera monitoring

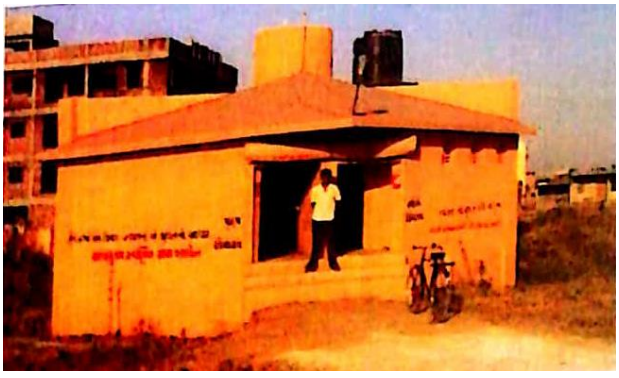


Fig 4 Sanitation Facilities

1.3.3 Infrastructure

Fig 5 Pharmacy College

Fig 6 Engineering College

1.4 SWOT analysis of Ideal village / Smart Village

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

Strengths

- Ponds and Sidewalks
- Lake Site
- Local businesses
- Schools and colleges
- Religious places (Temples/Masjid)
- Excellent water quality
- Easy access to highway

- Parking facilities
- Police / Fire

Weaknesses

- No facility of clubs for adults and seniors
- Vacant commercial complexes
- Need to upgrade village parks and playgrounds

Opportunities

- Opportunity for more events in parks, ponds and open space
- Construction of public library
- Opportunities for local business
- Redevelopment of community hall
- Cricket play ground

Threats

- Algae in ponds
- Accidents due to rough driving by college students
- High commercial rents

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

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

1.6 Benefits of the visits of Ideal village / Smart Village

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

By visiting such villages we students of civil engineering can understand about the actual development that an rural area needs to satisfy its basic infrastructure facilities and to compete with urban area and can implement these techniques and facilities for the development of other villages which actually needs development and can implement the same for the development of the villages which are allotted to us in Vishwakarma Yojana Phase-VIII as our final year project.

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

The sarpanch of Baben gram panchayat gave us a brief idea about the methods, techniques, strategies that muse be used for the development of any village and what plays an important role for the development of any village.

As Baben has developed a lot during the year 2007 to 2020 we got a good knowledge related to rural development and general infrastructure facilities to be provided in a village. Baben can also be considered as bench mark for the development of other villages.

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 area is the region surrounding a city. Most of inhabitants of urban areas have non-agricultural jobs. Urban areas have municipality, corporation, and cantonment board or notified town area committees. 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.

2.2 Importance of the rural development

Rural development is the national necessity and it has following measures:

- To develop rural area as whole in terms of culture, society, economy, technology and health.
- To develop living slandered of rural mass.
- To develop rural youths, children and women.
- To develop and empower human resource of rural area in terms of their psychology, skill, knowledge, attitude and other abilities.
- To develop infrastructure facility of rural area.
- To provide minimum facility to rural mass in terms of drinking water, education, transport, electricity and communication.
- To develop rural institutions like Panchayat, cooperatives, post, banking and credit.
- To provide financial assist to develop the artisans in the rural areas, farmers and agrarian unskilled labor, small and big rural entrepreneurs to improve their economy.
- To develop rural industries through the development of handicrafts, small scaled industries, village industries, rural crafts, cottage industries and other related economic operations in the rural sector.
- To develop agriculture, animal husbandry and other agricultural related areas.
- To restore uncultivated land, provide irrigation facilities and motivate farmers to adopt improved seed, fertilizers, package of practices of crop cultivation and soil conservation methods.

2.3 Ancient Villages / Different Definition of: Rural Urban Villages

Rural areas have low population density and large amount of undeveloped land. Agricultural activities are more in rural areas. Census rural refers to individuals living in the countryside outside centers of 1000 or more population. Rural and small town refers to individuals in towns or municipalities outside the commuting zone of larger urban centers. These individuals may disaggregated into zones according to the degree of a larger urban center. A rural area is an open swath of land that has few homes or other buildings and not many people.

2.4 Scenario: Rural / Urban village of India population Growth

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

(Both combined)

Agenda of census of India is to release of provisional population totals-Rural urban distribution. Population (in crore).

Table 1 Population of Rural and Urban areas as per census 2001 and

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

For the first in since independence, the absolute increase in population is more in urban areas that in rural areas.

Rural-Urban Distribution: 68.84% & 31.16

Level of urbanization increased from 27.81% in 2001 census to 31.16% in 2011.

Literacy rates (in %)

Table 2 Literacy Rates in Rural and Urban areas as per Census 2001 and 2011

	2001	2011	Difference
India	64.8	74.0	+9.2
Rural	587	68.9	+10.2
Urban	79.9	85.0	+5.1

.

The improvement in literacy rate in rural area is two times that in urban areas.The rural urban literacy gap which was 21.2% points in 2001, has come down to 16.1% points in2011.Literacy Rates (in %)

Table 3 Literacy Rates in Rural and Urban areas as per male - female

	2001	2011	Difference
Male			
India	75.3	82.1	+6.8
Rural	70.7	78.6	+7.9
Urban	86.3	89.7	+3.4
Female			
India	53.7	65.5	+11.8
Rural	46.1	58.8	+12.7
Urban	72.9	79.9	+7.0

Gujarat Census:

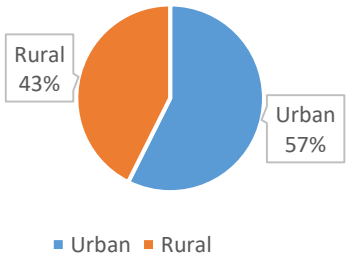


Fig 7 Rural-urban graph

2.6 Rural Development Issues - Concerns – Measures

- People are directly or indirectly dependent on agriculture and a large number of landowners have small and medium-sized landholding.
- Economy of the people living in rural areas is low.
- The price the farmers get for their produces is less in relation to the work they put in.
- People have to migrate to the urban areas due to unavailability of education.
- The other rural problems are due to the fact that since the rural people do not live in concentrated masses, the availability of specialized service to them is minimum.
- Very less people are employed in the rural areas.
- Lack of physical facilities in rural areas.
- Lack of recreation facilities.
- Farmers are not having market area for selling their goods directly to the market.

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

Table 4 Tena (Tenarang) Details

Village facilities	Planning Commission	Required as per norms
Education		
Anganwadi	Each or Per 2500 population	6
Primary School	Each Per 2500 population	6
Secondary School	Per 7,500 population	2
Higher Secondary School	Per 15,000 Population	1
College	Per 125,000 Population	1
Tech. Training Institute	Per 100000 Population	0
Agriculture Research Centre	Per 100000 Population	0
Skill Development Center	Per 100000 Population	0
Health Facility		
Govt/Panchyat Dispensary or Sub PHC or Health Centre	Each Village	1
Primary Health & Child Health Center	Per 20,000 population	1
Child Welfare and Maternity Home	Per 10,000 population	1
Multispecialty Hospital	Per 100000 Population	0
Physical Infrastructure		
Transportation		

Pucca Village Approach Road	Each village	1
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)	1
Over Head Tank	1 /3 of Total Demand	3.5 lakh liter tank
Socio- Cultural Infrastructure Facilities		
Community Hall	Per 10000 Population	1
community hall and Public Library	Per 15000 Population	1
Cremation Ground	Per 20,000 population	1
Post Office	Per 10,000 population	1
Gram Panchayat Building	Each individual/group panchayat	1
APMC	Per 100000 Population	0

2.8 Other Projects / Schemes of Gujarat / Indian Government

2.8.1 Other Projects

Following are the projects/schemes by Govt. Sector
1] Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
2] Pradhan Mantri Gram Sadak Yojana (PMGSY)
3] Indira Awas Yojana (IAY)

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

MGNREGA Launched on 2nd February 2006 as a momentous initiative towards pro-poor growth. For the first time, rural communities have been given not just a development programmer but also a regime of rights. The National Rural Employment Guarantee Act, 2005 (NREGA) guarantees 100 days of employment in a financial year to any rural household whose adult members are willing to do unskilled manual work.

This work guarantee also serve other objectives: generating productive assets and skills thereby boosting the rural economy, protecting the environment, empowering rural women, reducing rural urban migration and fostering social equity, among others. The Act offers an opportunity to strengthen our democratic processes by entrusting principle role to Panchayats at all levels in its implementation and promises transparency through involvement of community at planning and monitoring stages.

2] Pradhan Mantri Gram Sadak Yojana (PMGSY):

Pradhan Mantri Gram Sadak Yojana (PMGSY) was launched on 25th December 2000 as a fully funded Centrally Sponsored Scheme to provide all weather road connectivity in rural areas of the country.

The program envisages connecting all habitations with a population of 500 persons and above in the plain areas and 250 persons and above in hill States, the tribal and the desert areas. According to latest figures made available by the State Governments under a survey to identify Core Network as part of the PMGSY program, about 1.67 lakh Unconnected Habitations are eligible for coverage under the program. This involves construction of about 3.71 lakh km. of roads for New Connectivity and 3.68 lakh km. under up gradation. The President of India, in his address to Parliament on 25thFebruary, 2005 announced a major business plan for rebuilding rural India called Bharat Nirman.

The Finance Minister, in his Budget Speech of 28thFebruary,2005, identified Rural Roads as one of the six components of Bharat Nirman and has set a goal to provide connectivity to all habitations with a population of 1000 persons and above (500 persons and above in the case of hilly or tribal areas) with an all-weather road. A total of 59564 habitations are proposed to be provided new connectivity under Bharat Nirman. This would involve construction of 1, 46,185 km of rural roads. In addition to new connectivity, Bharat Nirman envisages up gradation/renewal of 1, 94,130 KM of existing rural roads. This comprises 60% up gradation from Government of India and 40% renewal by the State Governments.

3] **Indira Awas Yojana (IAY)**:

Housing is one of the basic requirements for human survival. For a normal citizen owning a house provides significant economic security and status in society. For a shelter less person, a house brings about a profound social change in his existence, endowing him with an identity, thus integrating him with his immediate social background

Objective

The objective of Indira Awaas Yojana is primarily to help construction of dwelling units by members of Scheduled Castes/ Schedule Tribes., freed bonded laborers and also non-SC/ST rural poor below the poverty line by providing them with grant-in-aid.

2.8.2 Schemes of Gujarat

Following are the projects/schemes running by the private sector
1] Non-Governmental Organizations (NGOs)
2] Provision of Urban Amenities in Rural Areas (PURA)

1] Non-Governmental Organization (NGOs):

The NGOs became prominent after independence, especially after 1970s. Development parishioners, government officials and foreign donors consider that NGOs by virtue of being small scale, flexible, innovative and participatory, are more successful in reaching the poor and in poverty alleviation, NGOs involved in initiating and implementing rural development program. At present30 000 NGOs working in India.

Definition of NGOs

The term NGOs is used to denote / specify those organizations which undertake voluntary action and social movements. A non-governmental organization (NGO) is a legally constituted organization created by legal persons that operates independently from any government and a term usually used by governments to refer to entities that have no government status.

In the cases in which NGOs are funded totally or partially by governments, the NGO maintains its non-governmental status by excluding government representatives from membership in the organization. The term is usually applied only to organizations that pursue some wider social aim that has political aspects, but that are not overtly political organizations such as political parties.

2] Provision of Urban Amenities in Rural Areas (PURA):

Objective of the Scheme:
The objective of the scheme is to provide urban amenities and livelihood opportunities in rural areas to bridge the rural-urban divide, thereby reducing migration from rural to urban areas.
PURA aims to achieve "holistic and accelerated development of compact areas around a potential growth center in a Panchayat (or group of Panchayats) through PPP by providing livelihood opportunities and urban amenities to improve the quality of life in rural areas."
The PURA Scheme (provision of Urban Amenities in Rural Areas) envisages rapid growth of rural India -- given enhanced connectivity and infrastructure, the rural population would be empowered and enabled to create opportunities and livelihoods for themselves on a sustainable and growing basis. The key characteristics of the scheme are:

- Simultaneous delivery of key infrastructure in villages leading to optimal use of resources Provision of funds for O&M of assets for 10 years post-construction, along with capital investment for creation of assets
- Transformation of several schemes into a single project, to be implemented as per set standards in a defined timeframe, with the requirements of each scheme being kept intact
- Combining livelihoods creation with infrastructure development
- Enforcement of standards of service delivery in rural areas almost at par with those obtaining in urban areas Enforcement of service standards through a legally binding arrangement

.

Public-Private-Partnership or PPP

Public-Private-Partnership or PPP is a mode of implementing government programs/schemes in partnership with the private sector. The term private in PPP encompasses all non-government agencies such as the corporate sector, voluntary organizations, self-help groups, partnership firms, individuals and community based organizations, PPP,

Moreover, subsumes all the objectives of the service being provided earlier by the government, and is not intended to compromise on them. Essentially, the shift in emphasis is from delivering services directly, to service management and coordination.

The roles and responsibilities of the partners may vary from sector to sector. While in some schemes/projects, the private provider may have significant involvement in regard to all aspects of implementation; in others s/he may have only minor role. **Cost-effectiveness** Since selection of the developer/ service provider depends on competition or some bench marking, the project is generally more cost effective than before.

3 Smart (Cities / Village) Concept Idea and its Visit (Civil & Electrical Concept)

3.1 Introduction: Concepts, Definitions & Practices

Smart Village is a concept adopted by national, state and local governments of India, as an initiative focused on holistic rural development, derived from Mahatma Gandhi's vision of *Aarush Gram* (Ideal Village) and *Swaraj* (Self Reliance). Prime Minister NarendraModi launched Sansad Aarush Gram Yojana (SAGY) or SAANJHI) on 2 October 2014, Gandhi's birthday, in addition to Smart Cities and Digital India, as a development programme for India. The Parliamentarian's Model Village Scheme main goal is for each Member of Parliament and Minister to adopt a rural village and develop it into a model by 2019 under the SAGY guidelines. The vision of SAGY is a integrated village development plan, encompassing *Personal*, *Human*, *Social*, and *Economic* dimensions.

Government of India, under the energetic, committed & innovative leadership of Prime Minister Narendra Modi, is working on Smart cities & Smart Villages program, which is good initiative.65% of India's population lives in its villages. The youth from villages have been migrating to cities in search of work as there are no or less opportunities for employment in villages. They leave a good quality life of village for a poor quality of life in cities. This leads to slums & poor hygienic conditions of life for them in cities. We need to stop this migration from villages to cities. For this we need to create work opportunities in villages & make villages SMART for our citizens.

People are employed in various sector as the work flow rate for the village is good. Vidhyabharti Trust, Umrakh College, Multi-specialist Hospital, Secondary schools, Clinics, the big Sugar Factory; all of which provides a lot of employment hence a lot of workforce and labourforce.

3.2 Vision – Goals, Standards and Performance Measurement Indicators

Sustainable development is generally discussed in terms of environmental considerations, but from a rural community perspective, sustainable development must address how the people of the community generate the income to maintain their rural lifestyle. In those instances where employments considered as part of sustainability discussions, it is too often thought of in static terms jobs that will last. But the reality of both modern rural and urban life is that economic conditions rapidly change, and so a discussion of sustainable employment has to be conducted in a dynamic context where different types of employment evolve as economic conditions change. While market signals alone can, in principle, provide the information and the conditions for this type of dynamic process, the argument of the paper is that the nature of rural areas makes it unlikely for markets alone to allow sustainable employment.

In this paper, we describe the ecosystem for a village and then map out an integrated design procedurefor building a smart village. We define a Smart Village as a bundle of services which are delivered to its residents and businesses in an effective and efficient manner. Dozens of services including construction, farming, electricity, heath care, water, retail, manufacturing and logistics are needed in building a smart village. Computing, communication and information technologies play a major role in design, delivery and monitoring of the services. All the techniques and technologies needed to build a smart village are available now and some of them are being used in villages in India but these are disparate, fragmented and piecemeal efforts. We recognize that the need of the hour is strategy, integrated planning and above all monitoring and execution of the activities using appropriate governance models. Our integrated design is a way forward to deal with the demographic deficit and also achieve the goals of inclusive growth. It is replicable and can be used to design and build smart villages in other parts of the World.

A Key Performance Indicator (KPI) or Performance Measurement Indicator is a measurable value that demonstrates how effectively a company is achieving key business objectives. Organizations use KPIs at multiple levels to evaluate their success at reaching targets. High-level KPIs may focus on the overall performance of the business, while low-level KPIs may focus on processes in departments such as sales, marketing, HR, support and others.
Cities must be able to measure whether or not they're becoming smarter, and the extent to which they're smart. But how? Measurement provides a basis to track progress, to make decisions and to compare cities. Terms such as 'indicators' and 'metrics' are often used interchangeably, although their meanings can differ across organizations. A key performance indicator (KPI) is a quantifiable measure that an organisation uses to assess performance on objectives. Measurements that are based on a standardised method are called metrics.
Measuring the extent to which a city is getting smarter is by no means a straightforward task. For a start, there's no standard set of smart city indicators. Even though cities often apply KPIs to measure the progress of their smart city projects – for example tonnes of CO_2 emissions per capita or the number of Wi-Fi hotspots installed – the KPIs are not comparable across all cities. Then there's the problem that it's difficult to measure direct links between some of the things you would implement as a smart city. So, while KPIs tell us about performance in specific areas, such as increased broadband connectivity, how can we know whether this improves city outcomes such as more jobs for citizens? Many projects have already started to help members deploy better smart city solutions by developing and validating KPIs and data collection procedures in collaboration with cities. They're working with numerous research institutes to ensure the best performance for smart villages.

3.3 Technological options

Technology can help by creating more accessible interfaces such as smart city dashboards, for example the London City Dashboard created by University College London (UCL), National Centre for Research methods (NCRM) and Jisc.

3.4 Road Map and Safeguards

Fig 8 Road map

Tenarang is a small Village/hamlet in OlpadTaluka in Surat District of Gujarat State, India. It comes under TenarangPanchayath. It is located 22 KM towards North from District headquarters Surat. 246 KM from State capital GandhinagarTenarang is surrounded by Surat Taluka towards South , HansotTaluka towards North , ChorasiTaluka towards South , KamrejTaluka towards East . Surat,Ankleshwar , Navsari , Bharuch are the near by Cities to Tenarang. It is near to Arabian sea. There is a chance of humidity in the weather.People are living unanimously in the locality. Everybody is aware of each other's welfare and happiness with lot of ecstasy in their hearts. A properly maintained supply of water from the lake is constantly rushing into village *ghars*. Power for the community is mostly taken care by themselves, although the street lights, or I may correct, Solar street lights are sponsored by the ONGC (Oil and Natural Gas Corp.) Hazira Plant located nearby the village in west most end of Surat. In general, it can be said that the people are happy, consciously satisfied with the life, just with a little bit of advancement.

3.5 Issues & Challenges

The village visit to Tenarang was an experience to learn. We started with asking politely easy questions to the surrounding localities. People were helpful, telling us the needed information and a bit of their own sometimes. The electrical power system of the village is poor. The line comes all the way from Masma, a village 10 kms away. Many times there is a shortage. Roads under the given circumstances are better than expectation, plainly built,narrow. It must be hard but with proper efforts the village can be well-nourished.

3.6 Smart Infrastructure – Intelligent Traffic Management

Not that it is just a village, but also it has a small lithospheric area which makes the roads smaller and houses congested. Lesser makes the need of traffic management.

Public Transportation Management:

The service is aimed towards the encouragement of public transport use amongst people. The goal can be achieved by effective automation, planning and management of public transportation with the help of real time data analysis of different routes. The information helps in knowing vehicle schedules and offering quick response to operators and dispatchers during the deviation, delay or other emergency scenarios. It also helps in ensuring the security of people engaged in public transit systems.

Route Information:

If travelers have prior information about the route best suited for their journey their travel becomes easy and comfortable, especially for a new zone. Real time information about traffic conditions, transit systems, sharp turns, stop signs, road conditions, man oeuvres and other instructions about the routes can ease travel.

Smart cities need smart transport services. Proper movement of people, goods and services accelerate the growth and development of a region. A well planned and efficiently managed transport network is a must for any society. A city's transport system acts as a lifeline for the smooth functioning of the city. In the absence of right commuting channels, life comes to a halt for people residing in urban areas. Proper means and management of transport channels defines the quality of life in modern hi-tech cities.

3.7 Cyber security or any other concept

Security is a global idea tied to safety, an assurance that a person may go about his or her life without injury to life, property or rights. Cyber security is a subset that focuses on computing systems, their data exchange channels and the information they process, the violations of which may be sanctioned under criminal law. Information security and assurance intertwine with cyber security with a focus on information processed. With computing system, the kernel of security concerns is the information handled by the system. The three general areas to be secured are:

- The "privacy" and confidentiality of the information
- The integrity and authenticity of the information and
- The availability of the information for its use and services

Further, the legal and social concepts of a citizen's "right to privacy" are entangled with the challenge of cyber security and the benefits of the Smart City. That legal/social concept of privacy addresses confidential aspects of life, control of one's own public profile and a life free of unwarranted interference. This applies to both state action and that of private parties.Within most democratic and hybrid legal regimes under common law, civil law and mixed systems there are core general principles relating to privacy and cyber privacy:

- Activities within the home have the greatest level of protection and are generally protected from intrusion by others absent reasonable grounds and, often, judicial orders of intrusion, based on law.
- Activities that extend outside the home may still be protected as to privacy but the level of protection may vary. This may depend on whether there is a "reasonable expectation of privacy," under Indian constitutional law, or a special protection out by statute for that activity.
- Activities out in public or involving third parties may have little or no protection as to privacy absent special protection out by statute for that activity.
- Activities subject to public regulation may carry lesser or no privacy protections, particularly where data collection is part of regulation or a pre-condition to state permission to use regulated services.
- Any activity data may be monitored, collected and used with the consent of the data subject, absent statutory prohibitions on use even with consent. Third parties may condition use of their services or products on consent to such data use, even where a data subject may consent without actually reading the consent document they execute.

As to "cyber privacy" the legal regime is further defined by related, analogous statues that may prohibit unauthorized access to a computer, a network and related data, unauthorized interception of, interference with or transmission of data and unauthorized data processing and analytics of a data collection.

3.8 Retrofitting- Redevelopment- Greenfield Development District Cooling

3.8.1 Retrofitting

Retrofitting is one of the strategic components which when will be introduce planning in an existing built-up area, will help us to achieve several objectives for smart city like making the existing area more efficient and livable along with others. In this method, generally an area more than 500 acres will be identified by the city in consultation with citizens. After identification and observation of the current situation of infrastructure services in the identified area and the vision of the residents, the cities will prepare a strategy to become smart. Since existing structures are largely to remain intact in this model, it is expected that more intensive infrastructure service levels and a large number of smart applications will be packed into the retrofitted smart city. Now days, one of the most commonly method used for the retrofitting for any buildings is Green retrofitting.

3.8.2 Redevelopment

Redevelopment causes the tremendous development in infrastructure by using the mixed land use patterns and also increasing the density at the same time. When the area is more than 50 acres, then for the sake of concerns of citizen's redevelopment is adopted. For example, by implementing high ground coverage, mixed land use is done by preparing new layout for the area. Vacant land represents both a significant problem and an attractive opportunity for many central cities. Vacant land and abandoned structures impose both economic and social costs on cities and the neighborhoods or districts in which they are located. On the economic side, such properties lower neighboring property values and tax revenues even as they create pressure to raise taxes to maintain service levels. Addressing the issue of vacant and abandoned land and structures, state governments play an important role as well.

3.8.3 Green field development

Greenfield development will introduce most of the Smart Solutions in a previously vacant area (more than 250 acres) using innovative planning, plan financing and plan implementation tools (e.g. land pooling/ land reconstitution) with provision for affordable housing, especially for the poor. Greenfield developments are required around cities in order to address the needs of the expanding population. From a legal perspective, the challenges in obtaining timely, effective, and affordable approvals for Greenfield residential development. One of the most important issues with Greenfield developments is to ensure that the development area can be appropriately served with infrastructure. New areas (Greenfield) will be developed around cities in order to accommodate the expanding population in urban areas.Unlike retrofitting and redevelopment, Greenfield developments could be located either within the limits of the ULB or within the limits of the local Urban Development Authority (UDA). Some of the important determining factors about Greenfield development are:

- Areas of land that have never been used for construction, areas of natural, often grassed, land.
- Nothing to demolish, and no existing issues
- Cheaper to develop
- Demand for rural/suburban housing
- Easier to comply with environmental standards

3.9 Strategic Options for Fast Development

3.9.1 Functional flexibility

- It means cities, urban forms can easily adapt (with limited Investment needs) to a redistribution of urban functions.
- A resilient urban form must have flexibility to get a third dimension without disturbing the availability and hierarchy of facilities, amenities and quality of life.
- Community re-densification initiatives not limited to policy like Transferable Development Rights (TDR), issued in addition to normal Floor Area Ratio, increases the Community Global FAR.
- Protects cultural or historical heritage, increasing the number of in-habitants, reducing per capita cost of utility distribution and increased access to utility.

3.9.2 Highly connected network

- Implies full spectrum of streets of various lengths, width and spans adapted to different speeds and to different flows. When some connections are cut, others are created to compensate for the cuts and maintain the urban system in operation.
- Social networks as well as street networks show characteristics such as a high level of clustering.
- These are complex evolved street patterns with node and its intersection with another street as a link.

3.9.3 Greening, water recycling & urban rural integration

- Water recycling and grey water use, improving runoff management and developing new/alternative water sources; storage facilities and autonomously powered water management and treatment infrastructure.
- City‘s green infrastructure reduces GHG emissions, as they are carbon sink.

3.9.4 Industrial development

Sensitive industrial development concepts constitute a significant element in this manual. What we propose is to set the stage for creative industrial development and to illustrate several success stories that can be referred to by hamlets throughout the Park in their individual efforts to attract industry. The Saint Paul Port Authority redevelops blighted, contaminated, and underutilized properties in industrial areas.

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

No Indian city is in a position to boast of a complete sewerage system, which can keep up with the sanitation and pollution challenge. In fact, most Indian cities have a massive backlog of incomplete sewage systems or systems in serious need for refurbishment and repair. The most advanced city is Bengaluru with 3610 km of sewage lines and 14 sewage treatment plants. Some of these plants do not function because of high recurring costs –electricity and chemicals and others because they do not have the sewage to treat. In most cities, only a small (estimated) proportion of sewage is transported for treatment. And if the treated sewage –transported in official drains –is allowed to be mixed with the untreated sewage –transported in unofficial and open drains –then the net result is pollution. The added problem is that the location of the hardware –the sewage treatment plant –is not designed to dispose of the treated effluent so that it actually cleans the water body. Most cities don't seem to think of this factor when they build their infrastructure for sewage. They build a sewage treatment plant where there is land. The treated sewage is then disposed of, as conveniently as possible, invariably into a drain. But as this drain collects the untreated waste of large numbers of people, the end result is pollution.

The sewage treatment system must plan for safe disposal, before it can even be planned for treatment. The following could be options:

- Discharge directly in rivers or lakes to add to water quality
- Discharge in lakes or other water-bodies designed for secondary treatment for recharge of groundwater.
- Piped to green spaces for watering.
- Channels for irrigation in agriculture.
- Reuse in industry

3.11 Initiatives in village development by local self-government

Following the assent of the President, the Panchayati Raj Act was brought into force by a government notification on April 24th, 1993 as the 73rd Constitutional Amendment which is inserted after Part VIII of the Constitution of India. Simultaneously the Nagarpalika Act on urban local government bodies was brought into force as the 74th constitutional amendment. As a consequence of the Panchayati Raj Act, the number of local self-government institutions with directly elected representatives rose to around 500 bodies at district level, 5000 at block level and 225 000 at village level.292 A district level Panchayat covers a population of approximately 1-2 million, an intermediate level Panchayat a population of approximately 80-200 000 and a Gram Panchayat comprising a village or a group of villages, a population of approximately 1500-8000, varying from state to state.

The Panchayati Raj Act, 1992 specifies:

- The constitution and composition of institutions of local self-governance at the village, intermediate and district level – The Act provides for a mandatory three tier system of local self-government institutions for states with a population above 20 million. Small states are

given the option not to have an intermediate level Panchayat. The Act provides for direct elections of Panchayat members at all levels.

- The audit of accounts of Panchayats - The Act leaves the matter entirely to the Legislature of the states
- The elections to the Panchayats - Every state should have a State Election Commission for superintendence, direction and control of the preparation of electoral rolls and for conducting elections. The Commission should consist of a State Election Commissioner appointed by the Governor.
- Its applications to certain territories, states and areas - The Act specifies that its provisions shall apply to the Union territories subject to exceptions and modifications by the President of India.
- Disqualification of membership - The Act refers to state legislation for defining criteria of disqualification of membership. The Act itself only specifies that no person should be disqualified on the ground of age if the person has attained 21 years.
- The powers, authorities and responsibilities of Panchayats - The Act refers to state legislation to endow Panchayats with adequate powers and authority "as may be necessary to enable them to function as institutions of local self-government". It mentions the preparation of plans for economic development and the implementation of development schemes including the matters listed in the 11th Schedule.
- The powers to impose taxes by, and funds of, the Panchayats - The Act mentions that the legislature of the states should pass legislation to authorize Panchayats to levy, collect and appropriate taxes, duties, tolls and fees.

3.12 Smart Initiatives by District Municipal Corporation

Smart city Mission was launched by Prime Minister Shri NarendraModi on 25 June, 2015. Surat city was selected among 100 cities to be developed as smart city in India due to various achievements, initiatives and all inclusive approach. Accordingly Surat city had submitted “Smart City Proposal” (SCP) for Surat City in the given format on 15 December, 2015 to Ministry of Urban Development, Government of India with required consent of Government of Gujarat and statutory authority of Surat Municipal Corporation. Till deadline for submission total 97 cities had submitted their smart city proposal to Government of India. As per the already given plan, 20 cities were to be selected in round-1 (current year) on merit of their submitted proposal. Government of India had constituted 3 teams with expert members of World Bank, ADB and other independent members for evaluation and marking of all the submitted smart city proposals from 97 smart cities and to select final list of top 20 cities based on marking.

Citizens Engagement is the base of four pillars of institutional, physical, social and economic infrastructure for comprehensive development as per Smart City Mission guidelines and therefore Citizens Engagement tool is extensively used to know the suggestions / feedback from citizens by various online & offline methods like – Stakeholders consultation meetings with Elected representatives, Press media, different industrial, trade & commerce associations, doctors, engineers, architects and NGOs, Ward level meetings with citizens, Essay & Drawing competition for students and citizens, Techno fair for informing citizens about possible smart solutions, Citizens Poll on myGov and SMC’s website and seminars / webinars on different subjects etc.Based on Citizens Poll for Pan City initiatives, ICT based Transport-Connectivity smart solutions are finalized in Smart City Proposal, which will be implemented in entire area of Surat city. Based on suggestions/ feedback received during Citizens Engagement, “Retrofitting” is selected out of the three options given for area development. After screening of all the possible options, area measuring 2167 acres (8.77 Sq.km) of 7 T.P. schemes in the Anjana, Umarwada,

Magob, Dumbhal&Parvat located in East & South-East zone of city is selected for retrofitting in Smart City Proposal. Present population of this area is about 5 Laces apart from about 1 Lac floating population. Significance of this area can be judged from the fact that about 10% population of city resides in the selected 3% area which contributes to about 16% of economy of city. Selected area is having many commercial and industrial units based on textile sector which acts as a catalyst for greater job opportunities.

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

The Oil and Natural Gas Corporation Limited (ONGC), a government-owned oil and gas company, has floated a 5 MW tender along with seven years of operation and maintenance (O&M) at its premises in the state of Gujarat.The last date for the submission of bids is February 11, 2020, while a pre-bid conference will be held on January 20, 2020.The projects must be installed on a lump sum turnkey basis along with seven years of operation and maintenance at ONGC Hazira in Surat, Gujarat. The contract period for this tender is 12 months.The interested bidders need to furnish ₹3.6 million as the earnest money deposit (EMD).ONGC has announced several solar tenders in the past year for captive consumption.According to Mercom's India Solar Project Tracker, Gujarat has 2.3 GW large-scale solar projects in operations. According to Mercom India Research, ONGC has 15 MW of large-scale solar projects in operation.

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

Alleviating poverty, reducing inequality and achieving economic prosperity and well-being is a global challenge, which corresponds to the United Nations Sustainable Development Goals, 1, 8 and 10. The aim of the 'Scalable Architecture for Smart Villages' project is to make a contribution to this rather daunting challenge. In proposing an approach to scalable architecture, we are aware of the many great minds that have directed their attention to this challenge and who have made significant contributions, and thus we approach it with humility. We acknowledge that those who have come before have impacted varying degrees of change in their own unique way. We would like to share our novel approach, with our focus being on the words 'smart' and 'scalable', which allow communities to customize their development trajectory. In order to achieve scale and customization in smart villages, we are formulating a new scalable framework that is guided on a philosophical level by the need for an endogenous initiative. We draw on the scholarship around the field of Participatory Action Research (PAR), but note some differences in our approach. We detail the differences between PAR and our approach further in the paper, under the section "Knowledge Gap and The Discovery Phase".

3.15 Electrical concept

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

4 About Tenarang Village

4.1 Introduction

4.1.1 Introduction about Tenarang Village details

Fig 9 Google map TENARANG

Table 5 Details

Locality Name	**:**	Tenarang (તેનારાંગ)
Taluka Name	**:**	Olpad
District	**:**	Surat
State	**:**	Gujarat
Language	**:**	Gujarati (and Sindhi, Hindi, Marvadi, English, Marathi, Telugu, And Oriya)
Time zone	**:**	IST(UTC+5:30)
Elevation / Altitude	**:**	19 meters. Above Seal level
Telephone Code	**:**	02621
Pincode	**:**	394540 (Olpad)
Sarpanch	**:**	Jayeshbhai Patel
Talati-kam-mantri	**:**	Prabhat Desai
Assembly constituency	**:**	Olpad assembly constituency
Assembly MLA	**:**	DarshanaVikramJardosh
Parliament MP	**:**	Patel MukeshbhaiZinabhai
LokSabha constituency	**:**	Surat Parliamentary Constituency

4.1.2 Justification/ need of the study

Tenarang village is very small village through it is undeveloped village. Reasons behind selecting villages are given below:

- No railway station with in 10 km. (Nearest railway station : Surat at 14-15 km)
- In Covid-19 pandemic, there is no newspaper supply!
- No public transportation after unlocking process from lockdown.
- No medical shops within 10 km.

- No hospitals with in 5 km.
- Not any child-care clinic / Maternity home within 10 km
- No renewable energy source!!

4.1.3 Study Area (Broadly define)

- According to Gandhi "An ideal Indian village will be so constructed as to lend itself to perfect sanitation. It will have cottages with sufficient light and ventilation built of a material obtainable within a radius of five miles of.
- The village lanes and streets will be free of all avoidable dust. It will have wells according to its needs and accessible to all. It will have houses of worship for all; also a common meeting place, a village common for grazing its cattle, a co-operative dairy, primary and secondary schools in which industrial education will be the central fact, and it will have panchayats for settling disputes.
- It will produce its own grains, vegetables and fruit, and its own khadi." The vision of Vishwakarma yojana is to reduce and remove the rural urban divide through infusion of urban patterns and services in rural system. .This can be achieved by considering various aspects such as Physical, Social, and Renewable infrastructural facilities .This requires study of village with respect to delivery of basic needs, to aim at Reimagining, Redesigning, Rejuvenating and strengthening the community life.
- The present study deals with recognizing the needs of the village community and providing engineering solutions mainly in the form of Physical, Social, Socio-cultural, sustainable and smart infrastructure.

4.1.4 Objectives of the study

- Upgrade the basic utilities as per urban standards.
- Provide sustainable civil designs for the village.
- Redesign.
- To analyze the current condition of village.

4.1.5 Scope of the Study

Scope of the project is to provide urban amenities in rural areas while maintaining the rural soul. This will help in developing villages in sustainable manner, reduce migration from villages and prevent the cities from the urban pressure.

4.1.6 Methodology Frame Work for development of your village

In the initial phases of project we studied various concepts related to village development and its objective and need. Then we selected BABEN Village of Surat district visited it, conducted survey and got an idea of how a village should be. Then we visited TENARANG village and performed the techno economic survey, under this social, socio economical and physical information was collected by interacting with members of panchayat and some villagers regarding the prevailing condition of village. We also asked them about some suggestions that can may prove to be useful to them. After studying and analyzing the data collected Gap analysis was performed and various design proposals and their estimate was done.

4.1.7 Available Methodology for development of related to Civil/Electrical

Crucial tasks within this methodology include periodic pre-scheduled meetings between the students and municipal leaders, separate weekly advising sessions with the industry advsior and

university advisor, and a presentation to the members of the community as their designs progressed to allow the community to voice their opinions and gain acceptance. Due to the many accomplishments and benefits that resulted from this collaborative student project, the methodology that paved the way to success can serve as a model to other institutions and government agencies interested in enhancing the undergraduate engineering technology student experience and benefiting underserved communities in need of assistance to safeguard their residents through infrastructure improvements.within this methodology include periodic pre-scheduled meetings between the students and municipal leaders, separate weekly advising sessions with the industry advsior and university advisor, and a presentation to the members of the community as their designs progressed to allow the community to voice their opinions and gain acceptance. Due to the many accomplishments and benefits that resulted from this collaborative student project, the methodology that paved the way to success can serve as a model to other institutions and government agencies interested in enhancing the undergraduate engineering technology student experience and benefiting underserved communities in need of assistance to safeguard their residents through infrastructure improvements.

4.2 Tenarang Study Area Profile

4.2.1 Study Area Location with brief History land use details

Tenarang is a small Village/hamlet in OlpadTaluka in Surat District of Gujarat State, India. It comes under TenarangPanchayat. It is located 22 KM towards North from District headquarters Surat. 246 KM from State capital Gandhinagar

Tenarang is surrounded by Surat Taluka towards South, HansotTaluka towards North, Chorasi Taluka towards South, Kamrej Taluka towards East .Surat, Ankleshwar, Navsari, Bharuch are the nearby Cities to Tenarang. It is near to Arabian Sea. There is a chance of humidity in the weather.

4.2.2 Base Location map, Land Map, Gram Tal Map

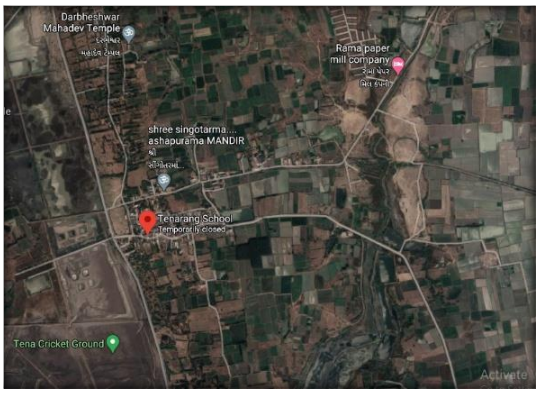


Fig 10 Tena (Tenarang) Map

Fig 11 Tena (Tenarang) Map

4.2.3 Physical & Demographical Growth

Not Growth available because of not any advance work is done!

4.2.4 Economic generation profile / Banks

No bank available in the village for that, one has to go 2-3 km outside the village.

4.2.5 Actual Problem faced by Villagers and smart solution

- Frequency of water in farming
- Network connection
- Cricket playground
- Recreational Area
- Newspaper facility
- Renewable energy source
- Irrigation
- Petrol pump
- Public transportation (covid-19 effect)

4.2.6 Social scenario -Preservation of traditions, Festivals, Cuisine

- Due to Arya club, in holi there are lots of city people come to celebrate holi in village.
- In temple, people used to celebrate festival in unity.

4.2.7 Migration Reasons / Trends

These reasons can be classified as economic, social, political or environmental: social migration - moving somewhere for a better quality of life or to be closer to family or friends.

- Push and pull factors
- Lack of services.
- Lack of safety.
- High crime.
- Crop failure.
- Drought.
- Flooding.
- Poverty.
- War.

4.3 Data Collection Tenarang Photograph/Graphs/Charts/Table)

4.3.1 Describe Methods for data collection

- Household survey (sample) to peoples of village
- Information by talati/Sarpunch

4.3.2 Primary details of survey details

Table 6 Details TENARANG

Name of Taluka:	Olpad
Name of Village:	Tenarang
Name of Institute:	C. K. Pithawala College of Engineering & Technology
Nodal Officer Name & Contact Detail:	Dr. Boski P. Chauhan& Prof. Hetal H. Jivanramjiwala
Respondent Name:	Prabhat Desai (Talati)
Date of Survey:	20/10/2020

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

4.3.4 No of Human being in One House

Table 7 Demographical Details

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	**Not available**			
2.	2011	1976	1075	901	**500 approx.**

4.3.5 Material available locally in the village and Material out Sourced by the villagers

Not any material available in the village because the people are engage doing farming as vegetables and other people busy in laborious work in Glass(5-7 km away) factory.

4.3.6 Geographical Detail

Table 8 Geographical Details

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.)	756 ha
3.	Agricultural Land Area (In hect.)	658 ha
4.	Residential Area (In hect.)	49 ha
6.	Distance to the nearest railway station (in kilometers):	Surat 23 km
7.	Name of Nearest Town with Distance:	Surat 13 km
8.	Distance to the nearest bus station (in kilometers):	Olpad / Surat
9.	Whether village is connected to all road for the any	Yes, MDR

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

Cast wise detail not available

ID proof – ADHAR CARD

4.3.8 Occupational Detail - Occupation wise Details / Majority business

In the Tenarang village, the most of the villagers are getting income from the farming about 60 % to 70 % villagers are conducted with farming, 10 % are conducted with the milk production and the remaining villagers are worked on laborious work. So, we can say that the main source of income in the village is farming.

4.3.9 Agricultural Details / Organic Farming / Fishery

The main occupation and income of source is farming. And the second resource is laborious work at glass factory. The village has approx. 658 hectares land as a agriculture land. In the village, the main crops are Rice, Wheat &Vegetable. The farmers are mostly used flood irrigation system.

4.3.10 Physical Infrastructure Facilities - Manufacturing HUB / Ware Houses

Not available in the village because there is not any kind of any club/factory.

4.3.11 Tourism development available in the village for attracting the tourist

Yes, Arya Club but not available for villagers.

4.4 Infrastructure Details (With Exiting Village Photograph)

4.4.1 Drinking Water / Water Management Facilities

The village has good & pure water for drinking. There are one overhead water tanks are in the village 5-6 no of underground sump. The main overhead water tank has a storage capacity of 50000 liters, it is enough to providing the drinking water in the village daily 2 hours supply. And it's maintained by gram panchayat. There is also availability of Public bore wells because the borewell water is salty because of new by ocean area.There is not public bore well/everyone has their own bore well. Same above as Unprotected well.

\

Fig-12 Underground tank **Fig-13 Overhead tank**

4.4.2 Drainage Network / Sanitation Facilities

Village drainage line are construct before some years. The village has not proper completed drainage network. It is approx. completed around 60-70% of total work and it is discharge in to the nearby water bodies.

4.4.3 Transportation & Road Network

There is public transport available in the village. The bus from Surat-Olpad is connected the Tenarang village but the bus stop of Tenarang village is not really developed. Tenarang village is connected to Surat city with MDR roads (around 13 km from city).And all reads of village are fully developed with black topped pucca road.

Fig-14 Road connecting From Surat city

Fig-15 Internal Streets kuchha road

Fig-16 internal Streets

Fig-17 MDR connected to Surat

4.4.4 Housing condition

There are total 500 households are in the village in which the 20 % houses are made up of the bricks and concrete, and the remaining houses are made up of clay and shades. 50 % are kacha house and 30 % are pakka house.

Fig-18 Different Housing conditions

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

Heath facility there is not any kind of Clinical facility available in the village and any kind of medical facility or medicine available in the village. The requirement of clinic in the hospital hence design of hospital given below. For hospital/medicine people have to go surat/olpad 10 km away

Education details there are 2 andanwadis and 2 schools are available in the village. There is one primary school and one is middle school. For farther studies, villagers have to in cities.

Community Hall There is community hall available in the village but in very poor condition. The maintained or repair required. As per marriage conditions, there is gram panchayat has improved hall by providing external patras as given below.

Library no library available In covid- period there is not any kind of avability of newspaper around 10 months.

Fig-19 Anganwadi no 1 (two anganwadis)

Fig-20 primary school Gate

Fig 21 Office Primary school

Fig 22 Anganwadi no 2 (two anganwadi)

Fig 23 inside school

Fig 24 With school teacher

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

- Community hall
- Dairy
- Panchayat building

Fig 25 Gram panchayat

Fig 26 Milk dairy

Fig 27 Community hall

4.4.7 Technology Mobile/ WIFI / Internet Usage Details

After the survey of village, know that about 60-70 % villagers have smartphone and they use internet. They are aware about the technology. But there is not 4G connection of internet. The network strength of village is very poor. Most of the house has a cable TV connection. There is no WIFI connection in the village.

4.4.8 Sports Activity as Gram Panchayat

No Sports activity done! Because not actually any kind of active sports group in village yet

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

Public garden/parkthere is no public garden/park is available in the village.
Playground There is no playground in the village for the sports activity.
Pond There are 1 pond in the village and it's filled by canal in the village and it is used for domestic purpose.

4.4.10 Other

Table 20 Other facility details TENARANG

Other Facilities	Condition	Location	Available (YES)	Available (NO)
Post-office		0 km	Yes	
telecommunication Network/ STD booth				**No**
General Market		13 km		**No**
Shops (Public Distribution System)			Yes	
Panchayat Building			Yes	
Pharmacy/Medical Shop		13 km		**No**
Bank & ATM Facility		4-5 km		**No**
Agriculture Co-operative Society		2 km		**No**
Milk Co-operative Soc.			Yes	
Small Scale Industries			Yes	
Internet Cafes/ Common Service Center/Wi Fi				**No**
Youth Club				**No**
MahilaMandal			Yes but inactive	
Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupa	2-5 km distance In village Glassware/ chikni			

4.5 Electrical Concept

4.5.1 Renewable energy source planning particularly for villages

There is 50% solar street lights available in the village other than not any kind of renewable energy source available in the village.

4.5.2 Irrigation Facilities

The main irrigation in the village is through canal. There is lake available in the village but villagers use it for domestic purpose. There is also well available in village at personal level also but no one use for there drinking purpose.

Fig 28 solar street light

4.5.3 Electricity Facilities with Area

Table 24 Electricity Facilities with Area

F.	Electricity Distribution			
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	GSRDC (24 hrs)	Yes	
	Power supply for Domestic Use	24 hrs		
	Power supply for Agricultural Use	24 hrs		
	Power supply for Commercial Use	24 hrs		
	Road/ Street Lights	Yes,street light		**10% solar street available**
	Electrification in Government Buildings/ Schools/ Hospitals	No hostital available		
	Renewable Energy Source Facilities (Y/ N)	no		
	LED Facilities	Yes 100%		

4.6 Existing Institution like - Village Administration – Detail Profile

4.6.1 Bachat Mandali

Not available because bachat mandli club is not available in village

4.6.2 Dudh Mandali

Yes, available But very much construction required. Very poor in Actual condition

*Mahila for un*its, **Available but not active**

Fig 29 General Shop At Village

Fig 30 Post Office

Fig 31 Tena Lake

Fig 32 Tena School

5 Technical Options with Case Studies

5.1 Concept (Civil)

5.1.1 Advance Sustainable construction techniques / Practices and Quantity Surveying

A ‘green’ building is a building that, in its design, construction or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment. Green buildings preserve precious natural resources and improve our quality of life.There are a number of features which can make a building ‘green’. These include:

This is why WorldGBC supports its member Green Building Councils and their member companies in individual countries and across regions, to pursue green buildings that are best suited to their own markets.To get involved in your own country’s transformation to green building, please contact or join your local Green Building Council.

Abstract: The idea of green building has made an enormous significance in a creating nation like INDIA. The hypothesis suggests of minimizing the wastage and the expense of development. With expansion in urbanization the normal assets were utilized as a part of ill-advised ways which drives us towards the usage of green structures and the idea helps in making ideal utilization of regular assets. The green building is an eco-friendly segment, since it depends on the essential tenet - "REDUCE, REUSE and RECYCLE". In the long run, the green structures manage the cost of an abnormal state of financial and building execution, which drives us to the advancement of future era. The point of a green building configuration is to minimize the interest on non-renewable assets, amplify the use effectiveness of these assets when being used and boost reduce, reusing and usage of renewable assets. It amplifies the utilization of effective building materials and development hones; enhances the utilization of local sources and sinks by bio-climatic design; utilizes least vitality to power itself; utilizes productive gear to meet its lighting, aerating; cooling and different needs; boosts the utilization of renewable wellsprings of vitality; uses proficient waste and water administration hones; gives agreeable and hygienic indoor working conditions. With regards to the expression "Green Buildings," we may simply characterize it as an extraordinary sort of working without knowing the subtle elements and foundation behind it. Really, Green Buildings comprise of a wide range of sorts of material and gear. Their appearances additionally vary from other typical structures. Green structures regularly incorporate measures to lessen vitality use. To expand the productivity of the building envelope (boundary amongst molded and unconditioned space), they may utilize high-proficiency windows and protection in walls, roofs, and floors.

5.1.2 Soil Liquefaction

Soil liquefaction occurs when a saturated or partially saturated soil substantially loses strength and stiffness in response to an applied stress such as shaking during an earthquake or other sudden change in stress condition, in which material that is ordinarily a solid behaves like a liquid. In soil mechanics, the term "liquefied" was first used by Allen Hazen[1] 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.

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

Although the effects of soil liquefaction have been long understood, engineers took more notice after the 1964 Niigata earthquake and 1964 Alaska earthquake. It was a major factor in the destruction in San Francisco's Marina District during the 1989 Loma Prieta earthquake, and in Port of Kobe during the 1995 Great Hanshin earthquake. More recently soil liquefaction was largely responsible for extensive damage to residential properties in the eastern suburbs and satellite townships of Christchurch, New Zealand during the 2010 Canterbury earthquake and more extensively again following the Christchurch earthquakes that followed in early and mid-2011.On 28 September 2018, an earthquake of 7.5 magnitude hit the Central Sulawesi province of Indonesia. Resulting soil liquefaction buried the suburb of Balaroa and Petobo village in 3 meters deep mud. The government of Indonesia is considering designating the two neighborhoods of Balaroa and Petobo that have been totally buried under mud, as mass graves**.**

- **Technical definitions**

The building codes in many countries require engineers to consider the effects of soil liquefaction in the design of new buildings and infrastructure such as bridges, embankment dams and retaining structures.

Soil liquefaction occurs when the effective stress (shear strength) of soil is reduced to essentially zero. This may be initiated by either monotonic loading (i.e. a single, sudden occurrence of a change in stress – examples include an increase in load on an embankment or sudden loss of toe support) or cyclic loading (i.e. repeated changes in stress condition – examples include wave loading or earthquake shaking). In both cases a soil in a saturated loose state, and one which may generate significant pore water pressure on a change in load are the most likely to liquefy. This is because loose soil has the tendency to compress when sheared, generating large excess pore water pressure as load is transferred from the soil skeleton to adjacent pore water during untrained loading. As pore water pressure rises, a progressive loss of strength of the soil occurs as effective stress is reduced. Liquefaction is more likely to occur in sandy or non-plastic silty soils, but May in rare cases occur in gravels and clays (see quick clay).

A 'flow failure' may initiate if the strength of the soil is reduced below the stresses required to maintain the equilibrium of a slope or footing of a structure. This can occur due to monotonic loading or cyclic loading, and can be sudden and catastrophic. A historical example is the Aberfan disaster. Casagrande referred to this type of phenomena as 'flow liquefaction' although a state of zero effective stress is not required for this to occur.

'Cyclic liquefaction' is the state of soil when large shear strains have accumulated in response to cyclic loading. A typical reference strain for the approximate occurrence of zero effective stress is 5% double amplitude shear strain. This is a soil test-based definition, usually

performed via cyclic triaxial, cyclic direct simple shear, or cyclic torsional shear type apparatus. These tests are performed to determine a soil's resistance to liquefaction by observing the number of cycles of loading at a particular shear stress amplitude required to induce 'fails'. Failure here is defined by the aforementioned shear strain criteria.

The term 'cyclic mobility' refers to the mechanism of progressive reduction of effective stress due to cyclic loading. This may occur in all soil types including dense soils. However, on reaching a state of zero effective stress such soils immediately dilate and regain strength. Thus, shear strains are significantly less than a true state of soil liquefaction.

5.1.3 Sustainable Sanitation

Sustainable sanitation is a sanitation system designed to meet certain criteria and to work well over the long-term. Sustainable sanitation systems consider the entire "sanitation value chain", from the experience of the user, excreta and wastewater collection methods, transportation or conveyance of waste, treatment, and reuse or disposal.The Sustainable Sanitation Alliance (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.

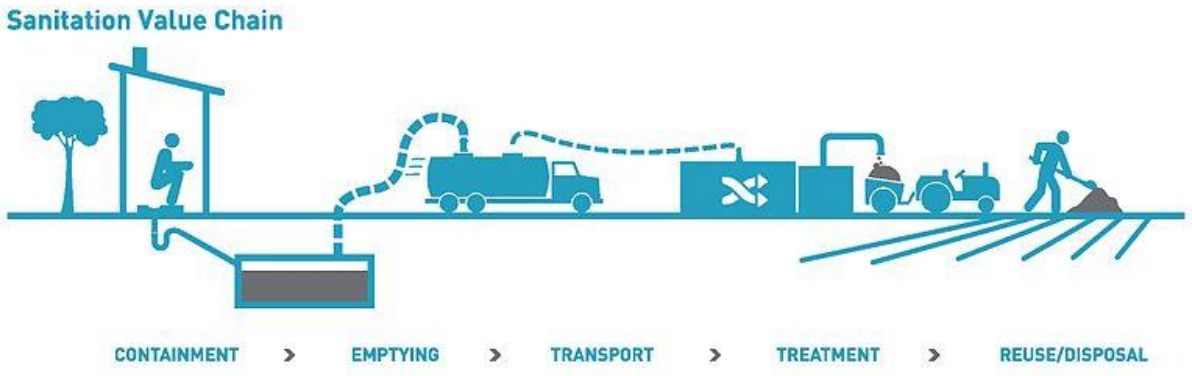


Fig 33 Sanitation Value Chain

Planning for sustainable sanitation

Most sanitation systems have been designed with the five aspects in mind, but in practice they are failing far too often because some of the criteria are not met. Since there is no one-for-all sanitation solution which fulfils the sustainability criteria, evaluation will depend on the local framework and will have to take into consideration the existing environmental, technical, socio-cultural and economic conditions.

Some basic principles to be observed when planning and implementing a sustainable sanitation system were endorsed by the members of the Water Supply and Sanitation Collaborative Council (the “Bellagio Principles for Sustainable Sanitation”) during its 5th Global Forum in November 2000:

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 resource, nutrient flow and waste management processes.
- The domain in which environmental sanitation problems are resolved should be kept to the minimum practicable size (household, community, town, district, catchment, and city).
- These planning guidelines have been revised further and are now used in various training courses for urban planners.

5.1.4 Transport Infrastructure / system

Transport infrastructure and services are fundamental public goods that affect the way societies and economies function. Local decision makers will want to take many factors into account when deciding local transport policy, but our focus is on the narrower issue of understanding the economic impact.

There are two main economic aims of transport spending. First, to reduce transport costs to businesses and commuters (for example by reducing congestion – and thus saving time – or by reducing fares). Second, and related, to stimulate the UK and local economies, for example, by raising the productivity of existing firms and workers or by attracting new firms and private sector investment. To meet these policy aims requires an understanding of whether we are spending enough and on the right things.

To help answer this question, our review summarises some of the key theories and evidence regarding the impact of transport on the economy – with a particular focus on the lessons that we can draw from the limited number of available impact evaluations.

The basic message that emerges from our review is that the economic benefits of transport infrastructure spending – particularly as a mechanism for generating local economic growth – are not as clear-cut as they might seem on face value. In turn, this raises fundamental questions about scheme appraisal and prioritisation and about the role of impact evaluation in improving decision making around transport investment. For more on this, click through to the section of filling the evidence gaps.

5.1.5 Vertical Farming

Vertical farming is the practice of growing crops in vertically stacked layers. It often incorporates controlled-environment agriculture, which aims to optimize plant growth, and soilless farming techniques such as hydroponics, aquaponics, and aeroponics. Some common choices of structures to house vertical farming systems include buildings, shipping containers, tunnels, and abandoned mine shafts. As of 2020, there is the equivalent of about 30 ha (74 acres) of operational vertical farmland in the world. The modern concept of vertical farming was proposed in 1999 by Dickson Despoiler, professor of Public and Environmental Health at Columbia University. Despoiler and his students came up with a design of a skyscraper farm that could feed 50,000 people. Although the design has not yet been built, it successfully popularized the idea of vertical farming. Current applications of vertical farming's coupled with other state-of-the-art technologies, such as specialized LED lights, have resulted in over 10 times the crop yield than would receive through traditional farming methods.

The main advantage of utilizing vertical farming technologies is the increased crop yield that comes with a smaller unit area of land requirement. The increased ability to cultivate a larger

variety of crops at once because crops do not share the same plots of land while growing is another sought-after advantage. Additionally, crops are resistant to weather disruptions because of their placement indoors, meaning less crops lost to extreme or unexpected weather occurrences. Because of its limited land usage, vertical farming is less disruptive to the native plants and animals, leading to further conservation of the local flora and fauna.

Vertical farming technologies face economic challenges with large start-up costs compared to traditional farms. In Victoria, Australia, a "hypothetical 10 level vertical farm" would cost over 850 times more per cubic meter of arable land than a traditional farm in rural Victoria. Vertical farms also face large energy demands due to the use of supplementary light like LEDs. Moreover, if non-renewable energy is used to meet these energy demands, vertical farms could produce more pollution than traditional farms or greenhouses.

Fig 34 Staff room

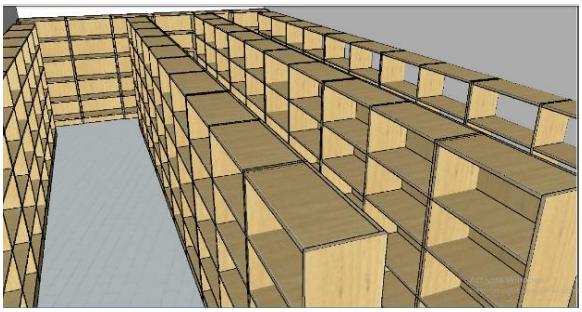


Fig 35 Store room

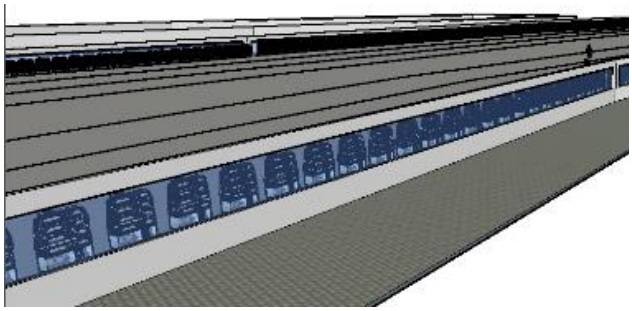


Fig 36 Front wall

Fig 37 First Floor

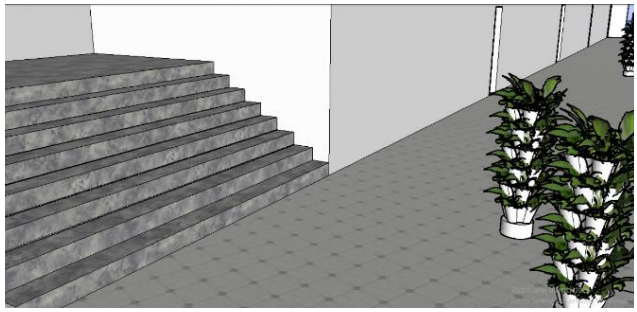


Fig 38 Stair Case

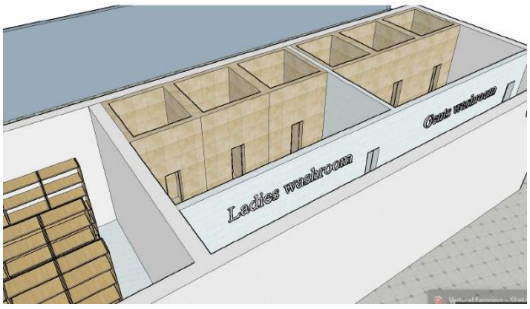


Fig 39 Wash room

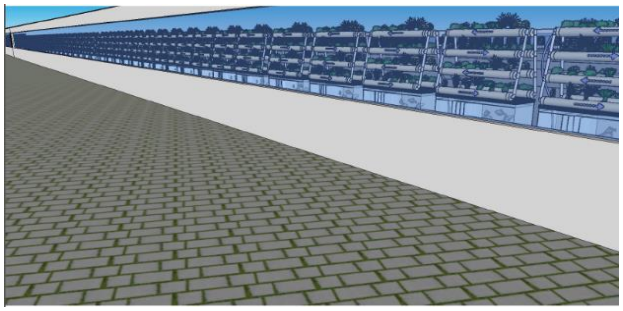


Fig 40 Back wall

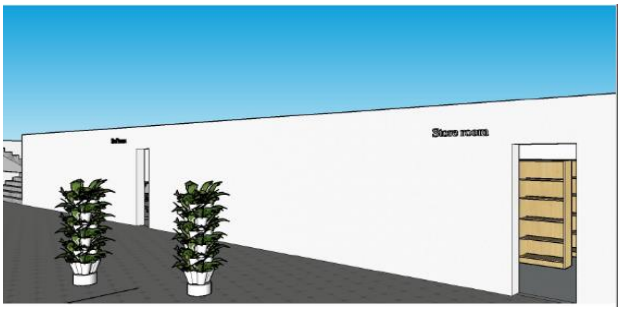


Fig 41 Store room

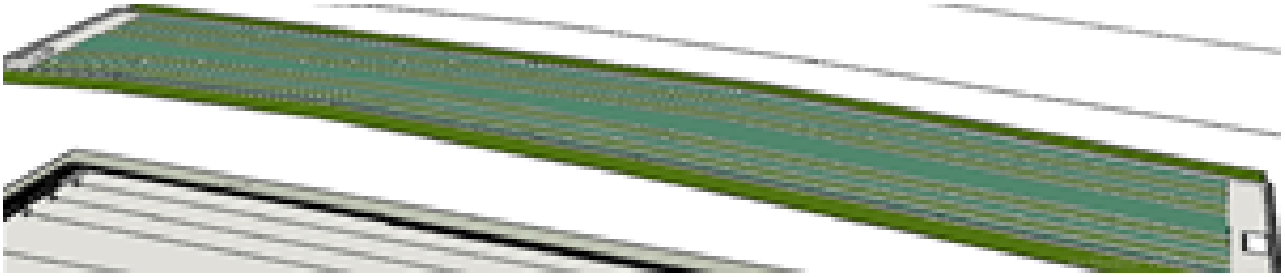


Fig 42 Second Floor Plan

5.1.6 Corrosion Mechanism, Prevention & Repair Measures of RCC Structure

Corrosion is the inevitable process that occurs when refined metals return to their more stable combined forms as oxides, carbonates and sulphides. The corrosion process may be defined as the surface wastage that occurs when metals are exposed to reactive environments. Costs associated with corrosion damage and control can be substantial, being as much as 3.5% of the GNP of some industrial countries. Reinforced concrete structures have not been immune to the ravages of corrosion despite the protection that concrete provides to embed steel. Reasons for the increasing incidence of corrosion damage to reinforced concrete structures include the use of deicing salts and calcium chloride set-accelerators, increased construction in aggressive environments, fast-track construction practices, changing cement composition resulting in finer grinding and lower cement contents, lower cover depths and poor construction practice including inadequate supervision. Reinforcement corrosion is particularly pernicious in that damage may occur rapidly and repairs are invariably expensive. Furthermore by the time visible corrosion damage is noticed, structural integrity may already be compromised. There is currently considerable debate about the merits of the various systems for the repair of reinforcement corrosion. This monograph attempts to clarify some of the important issues by drawing on international experience as well as local findings. Ultimately the effectiveness of repair systems should be measured in terms of cost, risk of failure and long-term performance. As such no single system is appropriate for all repairs but will depend on the type of structure, service conditions, level of deterioration and financial constraints of the project.

REPAIR STRATEGIES Numerous repair options are available and new technologies continue to make an impact in the field of concrete repairs. The suitability and cost-effectiveness of repairs depends on the level of deterioration and specific conditions of the structure.

a) Patch repairs before patch repairs are considered it is important that the distinction between chloride- and carbonation-induced corrosion is appreciated. As a general rule chloride-induced corrosion is far more pernicious and difficult to treat than carbonation-induced corrosion. This often dictates a completely different approach to repairing damage due to the two types of corrosion. Carbonation-induced corrosion causes general corrosion with multiple pitting along the reinforcement.

Carbonated concrete tends to have fairly high resistivity that discourages macro-cell formation and allows moderate corrosion rates. Steel exposed to corrosive conditions will therefore show signs of corrosion that can be easily identified (e.g. sur17 face stains, cracking or spelling of concrete). Repairs are generally successful provided all of the corroded reinforcement is treated. Chloride-induced corrosion is characterized by pitting corrosion with distinct anode and cathode sites. The presence of high salt concentrations in the cover concrete means that macro-cell corrosion is possible with relatively large catholic areas driving localized intense anodes. High corrosion rates can be sustained under such conditions resulting in severe pitting of the reinforcement and damage of the surrounding concrete.

Much of the reinforcement may be exposed to corrosive conditions without showing any signs of corrosion, this is particularly noticeable when corroded structures are demolished. Localized patch repairs of areas of corrosion damage are popular due to their low cost and temporary aesthetic relief. This form of repair has limited success against chloride-induced corrosion as the surrounding concrete may be chloride-contaminated and the reinforcement is therefore still susceptible to corrosion. The patched area of new repair material often causes the formation of incipient anodes adjacent to the repairs as shown in Figure 5. These new corrosion sites not only affect the structure but often also undermine the repair leading to accelerated patch failures in as little as two years. Consequently, it is necessary to remove all chloride-contaminated concrete from the vicinity of the reinforcement.

5.1.7 Sewage treatment plant

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

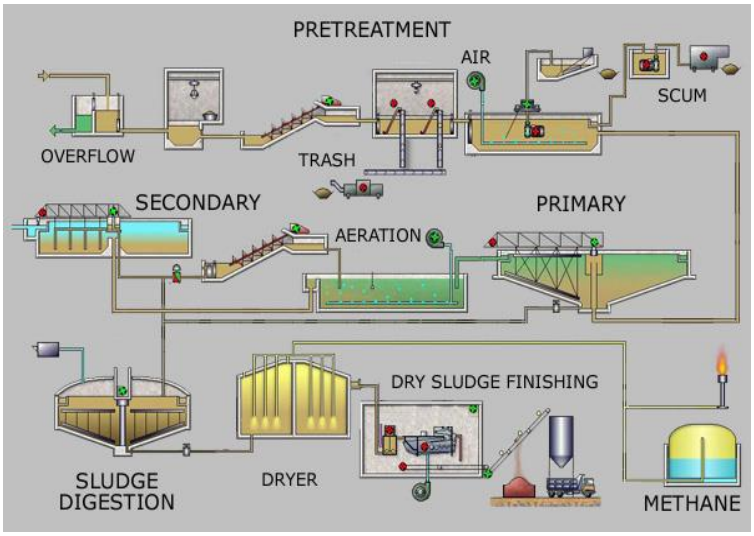


Fig 43 Sewage Treatment plant

Sewage treatment may also be referred to as wastewater treatment. However, the latter is a broader term that can also refer to industrial wastewater. For most cities, the sewer system will also carry a proportion of industrial effluent to the sewage treatment plant that has usually received pre-treatment at the factories to reduce the pollutant load. If the sewer system is a combined sewer, then it will also carry urban runoff (storm water) to the sewage treatment plant. Sewage water can travel towards treatment

plants via piping and in a flow aided by gravity and pumps. The first part of the filtration of sewage typically includes a bar screen to filter solids and large objects that are then collected in dumpsters and disposed of in landfills. Fat and grease are also removed before the primary treatment of sewage.

Sewage collection and treatment in the United States is typically subject to local, state and federal regulations and standards.

Treating wastewater has the aim to produce an effluent that will do as little harm as possible when discharged to the surrounding environment, thereby preventing pollution compared to releasing untreated wastewater into the environment.

Sewage treatment generally involves three stages, called primary, secondary and tertiary treatment.

- Primary treatment consists of temporarily holding the sewage in a quiescent basin where heavy solids can settle to the bottom while oil, grease and lighter solids float to the surface. The settled and floating materials are removed and the remaining liquid may be discharged or subjected to secondary treatment. Some sewage treatment plants that are connected to a combined sewer system have a bypass arrangement after the primary treatment unit. This means that during very heavy rainfall events, the secondary and tertiary treatment systems can be bypassed to protect them from hydraulic overloading, and the mixture of sewage and storm water only receives primary treatment.
- Secondary treatment removes dissolved and suspended biological matter. Secondary treatment is typically performed by indigenous, water-borne micro-organisms in a managed habitat. Secondary treatment may require a separation process to remove the micro-organisms from the treated water prior to discharge or tertiary treatment.
- Tertiary treatment is sometimes defined as anything more than primary and secondary treatment in order to allow ejection into a highly sensitive or fragile ecosystem (estuaries, low-flow Rivers, coral reefs...). Treated water is sometimes disinfected chemically or physically (for example, by lagoons and microfiltration) prior to discharge into a stream, river, bay, lagoon or wetland, or it can be used for the irrigation of a golf course, greenway or park. If it is sufficiently clean, it can also be used for groundwater recharge or agricultural purposes.

5.2 Concept (Electrical)

5.2.1 Management through Energy Harvesting Concept

In addition to NTN's original thick blade shape, winglets installed on the tips of the blades limit vortex turbulence and air separation from the tips, for an outstanding level of silence. Furthermore, the use of vertical blades bring maximum energy to be extracted from wind blowing from any direction, making this low-loss "**high-efficiency power generator" one of the key features of NTN's "Hybrid Street Lights**."Hybrid Street Lights that make almost no noise will play a role in various areas of local communities, including public facilities such as parks and schools,

as well as bus stops, parking areas, commercial buildings and disaster evacuation areas. The built-in battery provides power for illumination for 5 days when fully charged, and can also be used as electric power source for emergency during disasters. The blades and supporting columns can be colored to blend in with nearby scenery or to suit customer requirements.

This can come up in various ranges from 20-50 thousand Indian rupees, depending upon the configuration and specifications of the designed model. Optional functions are also being developed, such as adding an electrical panel for use as an advertising pillar, to give the lights diverse functionality and applications.

5.2.2 Programmable Load Shedding

Programmable load shedding time management system is a reliable circuit that takes over the manual task of switch ON/OFF the electrical devices with respect to time. It uses real time clock (RTC) interfaced to a microcontroller of 8051 family. ... Multiple ON/OFF time entry is the

Fig 44 Management through Energy Harvesting Concept

biggest advantage with this project.

Programmable load shedding time management system is a reliable circuit that takes over the manual task of switch ON/OFF the electrical devices with respect to time. It uses real time clock (RTC) interfaced to a microcontroller of 8051 family. ... Multiple ON/OFF time entry is the biggest advantage with this project.

load shedding 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 frequently asked ques clock (RTC) interfaced to a microcontroller of 8051 family. While 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 view more related ON/OFF time entry is the biggest advantage with this project. A matrix keypad helps to enter the time.

The demand for electrical energy is increasing. Today over 21% of the total electrical energy generated in Nigeria is lost in transmission (4-6%) and distribution (15-18%). The electrical power deficit is currently about 18% in the country. Clearly, reduction in distribution losses can reduce this deficit by significantly. Its possibility to bring down the distribution losses to a 6-8 % level in India with the help of newer technological option (including information technology) in the electrical power distribution sector which will enable better monitoring and control. The project Electricity and load shedding monitoring" are designed such that distribution point or grids monitored and load shedding from one central location. Load shedding in electrical supply networks is a controlled process in which the utility company drops off part of the load in order to balance the demand and the generated capacity. This is often done whenever there is excess load on the system. In standby generators, it involves disconnecting or shedding some circuits to

prevent an overload condition. The main aim of this work is to build a microcontroller based device the on/off a power supply whenever there is excess load on the system. Most common problems that we face is monitoring feeders, substation, Distribution Transformers and Distribution points from one central location. In this project we will be making a prototype to monitor a distribution point from a central location and if any problem occurs information will be sent to the central unit. Moreover theft is also quite common at the distribution points as it is not possible for someone to monitor them 24 hours. When load shedding occurs in an area the complete power to the concerned area is cut off, these include street lights, traffic signals and important utilities like hospitals, police stations & fire brigade even their power is turned OFF. In this project, this device can cut off the power to specific area by just sending an SMS to the concerned Distribution Point there by retaining power for the basic utilities.

5.2.3 Railway Security System using IoT

An **IoT** Based **Railway Security System** for Automated Manning at Level Crossings. ... To implement this technology, we are fixing two Infrared Sensors at a pre-calculated distance to calculate the speed of train and time taken by the train to reach level crossings. The objective of this project is to create a Security System for the goods that are carried in open top freight trains. The most efficient way to secure anything from thieves is to have a continuous observation. So for continuous observation of the open top freight train, Camera module2 has been used. Passive Infrared Sensor (PIR) 1 has been used to detect the motion or to sense movement of people, animals, or any object. So whenever a motion is detected by the PIR sensor, the Camera takes a picture of that particular instance. That picture will be send to the Raspberry PI which does Skin Detection Algorithm and specifies whether that motion was created by a human or not. If a human makes it, then that picture will send to the drop box. Any Official can have a look at the same. The existing system has a CCTV installed at various critical locations like bridges, railway stations etc. but they does not provide a continuous observation. This paper describes about the Security System that provides continuous observation for open top freight trains so that goods can be carried safely to its destination.

5.2.4 Moisture Monitoring System

Planting a tree in an environment where the seed or the plant would not get water adequately through 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.

Fig 45 Moisture Monitoring

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.

5.2.5 Home Automation using IoT / Any other methodology

The **IoT** based **Home Automation** will enable the user to use a **Home Automation** System based on Internet of Things (**IoT**). The modern homes are automated through the internet and the **home** appliances are controlled. The user commands over the internet will be obtained by the Wi-Fi modems. Today in the headway of Automation innovation, life is getting simpler and less demanding in all spheres. Home automation is a modern technology that modifies your home to perform different sets of task automatically. Today Automatic frameworks are being favored over manual frameworks. No wonders, home automation in India is already the buzz word, especially as the wave of second generation home owners grows, they want more than shelter, water, and electricity. The first and most obvious advantage of Smart Homes is comfort and convenience, as more gadgets can deal with more operations (lighting, temperature, and so on) which in turn frees up the resident to perform other tasks. Smart homes filled with connected products are loaded with possibilities to make our lives easier, more convenient, and more comfortable. There is no shortage of possibilities for smart home IoT devices as home automation seems to be the wave of the future. The requirement for Office and Home automation arises due to the advent of IoT, in a big way in homes and office space. The smart home/office gadgets interact, seamlessly and securely; control, monitor and improve accessibility, from anywhere across the globe. These smart automation devices happen to have an interface with IoT. IT automation will be the key to bridging the gap between human limitations and technology's capabilities. With automation, data can be instantly collected and seamlessly passed between devices as it's simultaneously analyzed. Home automation is an appealing context for the Internet of Things (IoT), by connecting the IP gateway directly to the Internet or through a home/residential gateway; this system can be managed remotely using a PC, Smart phone, Tablet or other devices

The IoT based Home Automation will enable the user to use a Home Automation System based on Internet of Things (IoT). The modern homes are automated through the internet and the home appliances are controlled. The user commands over the internet will be obtained by the Wi-Fi modems. The Microcontroller has an interface with this modem. The system status is displayed through the LCD display, along with the system data. This is a typical IoT based Home Automation system, for controlling all your home appliances. The smart home market is taking off as IoT device prices come down and the general public comes to understand the benefits of these products. And from smart homes, the next logical step is smart cities, which would take the IoT to the next level. And yet, smart homes are just one small part of our daily lives that the Internet of Things will transform in the coming years.

We have already witnessed some early commercial success in the IoT industry where today, everyone is talking about Internet of Things which is the "next big" thing in the world of technology. The prospect of 30 billion objects connected to the Internet by the year 2020 is staggering, as the opportunities for new lines of service and new business models grow out of this realm. IoT is based on the inclusion of devices in the world of connected environments. The devices are embedded and connected, based on a unique identity. The IoT devices in Home Automation have the maximum applications in energy. The home heating devices are able to control the temperature with the devices like laptops, tablets or smart phones and all of these appliances, systems, and devices contain sensors that connect them to a network. This is where IoT comes into place, and makes it such an integral part of the home automation. With the help of IoT technology, you can control devices as and when you want

.

The beauty of the Home Automation system lies in the fact that the settings are manageable from your smart phones and other remote-control devices. Smart home IoT devices can help reduce costs and conserve energy. The Home Automation segment includes smart lighting, smart TVs and other appliances. Wearable's (Smart Watch, fitness brands, smart headphones, smart clothing) are also expected to witness the growth in the future. IoT is really the secret that makes this whole system work. Today in India, nearly 22.5 per cent of the consumers surveyed were familiar with the concept of IoT, with maximum awareness seen in the 36-55 age group which clearly indicates that there is immense opportunity for increased adoption of such technologies. The future of the Home automation market will happen with few key upgradations in the Automation technology.

For example, Wireless Automation solutions as well as lowering of price points as the market begins to accept Home automation usage in larger volumes. With an increased internet penetration and data usage, the connected devices segment is expected to witness a huge growth by 2020. Home Automation in India is creating big opportunities, not only for Indian automation companies, but also for foreign companies. The rapid development of home-based automations, along with M2M (machine-to-machine) communications will continue to create billions of new connected objects over the next 5 years and beyond.

5.2.6 PC Based Electrical Load Control

The aim of this project is to control the electrical appliances through a personal computer (PC). For example, theatre lighting can be centrally controlled form the PC for better stage management. Presently, they are manually managed which makes it difficult to coordinate the lighting with the respective scene. With this system, one can control the electrical appliances ON/OFF by just being seated at one place using a PC.This system is integrated with the electrical loads and also connected to the PC where centralized control takes place. It uses an RS-232 protocol from the microcontroller to communicate with the PC. To turn on/off the appliances, we use Hyper Terminal on PC. Once the connection is established with the PC, then the system starts working. The microcontroller used in this project belongs to 8051 family.

This project can be further enhanced by implementing a GUI based control panel on the PC with appropriate embedded software. The intensity control can also be incorporated using power electronics devices. Note: The project works only on operating systems having hyper terminal (E.g. Windows XP). The computer must have a RS232 serial port. Electrical appliances can be controlled through a PC interfaced to a microcontroller. This interface is done through a level shifter IC. The loads are then controlled through the relays duly interfaced to the relay driver which in turn is connected to the microcontroller.

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.
i.e the programs written in one of the HLL like 'C' will compile the code to run on the system for a particular processor like x86 (underlying microprocessor in the computer).For example

compilers for Dos platform is different from the Compilers for Unix platform So if one wants to define a compiler then compiler is a program that translates source code into object code.

5.2.7 Electrical Parameters Measurements

Electrical 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. Using transducers, physical properties such as temperature, pressure, flow, force, and many others can be converted into electrical signals, which can then be conveniently measured and recorded. High-precision laboratory measurements of electrical quantities are used in experiments to determine fundamental physical properties such as the charge of the electron or the speed of light, and in the definition of the units for electrical measurements, with precision in some cases on the order of a few parts per million. Less precise measurements are required every day in industrial practice. Electrical measurements are a branch of the science of metrology.
Measurable independent and semi-independent electrical quantities comprise:

- Voltage, Electric current, Electrical resistance and electrical conductance
- Electrical reactance and susceptance
- Magnetic flux
- Electrical charge by the means of electrometer
- Partial discharge measurement
- Magnetic field by the means of Hall sensor
- Electric field
- Electrical power by the means of electricity meter
- S-matrix by the means of network analyzer (electrical)
- Electrical power spectrum by the means of spectrum analyzer

Measurable dependent electrical quantities comprise:

- Inductance
- Capacitance
- Electrical impedance defined as vector sum of electrical resistance and electrical reactance
- Electrical admittance, the reciprocal of electrical impedance
- Phase between current and voltage and related power factor
- Electrical spectral density
- Electrical phase noise
- Electrical amplitude noise
- Trans conductance
- Trans impedance
- Electrical power gain
- Voltage gain
- Current gain
- Frequency
- Propagation delay

6 Swatch Bharat Abhiyan (Clean India)

Swatch Bharat Mission (SBM), **Swatch Bharat Abhiyan (SBA),** or Clean India Mission is a country-wide campaign initiated by the Government of India in 2014 to eliminate open defecation and improve solid waste management (SWM). Phase 1 of the mission lasted till October 2019. Phase 2 will be implemented between 2020-21 and 2024-25.

Swatch Bharat Abhiyan campaign, launched on 2 October 2014 on birth anniversary of Mahatma Gandhi, aimed to eradicate open defecation by 2 October 2019, the 150th anniversary of the birth of Mahatma Gandhi, by constructing 90 million toilets in rural India at a projected cost of ₹1.96 lakh crore (US$27 billion). The national campaign spanned 4,041 statutory cities and towns. Conceived in March 2014 at a sanitation conference organized by UNICEF India and the Indian Institute of Technology as part of the larger Total Sanitation Campaign, which the Indian government launched in 1999.

he campaign's official name is in Hindi. In English, it translates to "Clean India Mission". The campaign was officially launched on 2 October 2014 at Rajghat, New Delhi by Prime Minister Narendra Modi. It is India's largest cleanliness drive to date with three million government employees and students from all parts of India participating in 4,043 cities, towns, and rural communities. At a rally in Champaran, the Prime minister called the campaign Satyagrah se Swachhagrah in reference to Gandhi's Champaran Satyagraha launched on 10 April 1916.

The mission was split into two: rural and urban. In rural areas "SBM - Gramin" was financed and monitored through the Ministry of Drinking Water and Sanitation; whereas "SBM - urban" was overseen by the Ministry of Housing and Urban Affairs.

As part of the campaign, volunteers, known as Swachhagrahis, or "Ambassadors of cleanliness", promoted indoor plumbing and community approaches to sanitation (CAS) at the village level.Other activities included national real-time monitoring and updates from non-governmental organizations such as The Ugly Indian, Waste Warriors, and SWaCH Pune (Solid Waste Collection and Handling).

The government provided subsidy for construction of nearly 110 million toilets between 2014 and 2019,although some Indians especially in rural areas choose to not use them.The campaign was criticized for using coercive approaches to force people to use toilets.Some people were stopped from defecating in open and threatened with withdrawal from government benefits.

Fig 46 PM SBM launching event

6.1.1 Swatchhta needed in allocated village -Existing Situation with photograph

Fig 47 Shop in village

Fig 48 Swachhata abhiyan

Fig 49 Tena lake

Fig 50 Temple Tenarang

6.1.2 Guidelines - Implementation in allocated village

Swatch Survekshan, commissioned by Ministry of Urban Development and carried out by Quality Council of India, is an extensive sanitation survey across several hundred cities to check the progress and impact of Swachh Bharat Abhiyan and to foster a spirit of competition among the cities. The performance of each city is evaluated on six parameters:

- Municipal solid waste, sweeping, collection and transportation
- Municipal solid waste, processing, and disposal of solid waste
- Open defecation free and toilets
- Capacity building and eLearning
- Provision of public toilets and community toilets
- Information, education and communication, and behavior change

6.1.3 Activities Done by Students for allocated village

Cleanness is seen in major part of village. For this door-to-door collection of garbage, cleaning of whole village twice a week (before covid) which includes cleaning of roads, public place like schools anganvadis etc. Efforts were made by villagers too by providing dustbin at their stores. Cleaning temples on daily basis, and they keep their surroundings clean. There's a lake where they gather for washing clothes, theirs animals etc. instead of this lake bank are clean. They also take care of water acclamation which leads to mosquito's problem. Road were kept clean and awareness related to Swachh Bharat Mission is promoted by paintings on wall of schools.

7 Village condition due to Covid-19

7.1.1 Taken steps in allocated village related to existing situation

We have also taken care of the guidelines that have been created for these covid-19, such as social distancing, wearing masks, and sanitizing our hands, and have created them as well. Here are some photos of the bag distribution process.

7.1.2 Activities Done by Students for allocated village Clean

- As Tenarang village is remote village there were not many cases of covid-19. Still there are 5-7 active case in village. All patients were home quarantined and doctors came regularly to examine them. They had followed each and every guidelines provided by government. Social distancing and sanitization of grampanchyat is carried out frequently, they also provide hand sanitizers for every person who visit gampanchyat.
- After lockdown lifted they face many problems due to this situation. They can't travel to nearby cities to buy or sell their vegetables as frequency of buses is less and majority of people depends on bus facility for travel. Some of retail store owners hire special facilities like mini truck for good, which is not economical in this situation.
- As per government guidelines, online studies of STD 1-5 were carried out. As its not possible for children's to visit anganvadis, workers of anganvadis provide food packets to children at their homes.

Fig 51 Sanitizer Distribution

7.1.3 Any other steps taken by the students / villagers

As a social activity, we distributed cloth bags and hand sanitizer in our village. In these pandemic situations, the use of sanitizer and masks is explained and made aware of. As pollution rises and recycling plastic bags becomes impossible, the use of paper and jute cloth bags for carrying items is explained in order to reduce the use of plastic bags. We have also taken care of the guidelines that have been created for these covid-19, such as social distancing, wearing masks, and sanitizing our hands, and have created them as well. Here are some photos of the bag distribution process.

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

Design Proposals Engineering design is the creative process of identifying needs and then devising a product or a process to fill those needs. After a need has been identified, the purpose of an engineering design project proposal is to succinctly communicate to your audience. All the given designs are done in AutoCAD, Staad.pro, Sketch up & Estimator 2.0

- Benefits of the product
- Project objectives
- Project specifications tied to the project objectives and the compatibility between the specification and the available hardware.
- Strategy for achieving project objectives
- Detail plan of action divided into a number of tasks to be performed by individual member of the design team to achieve the project objectives
- Time schedule depicting weekly progress and individual/team assignments
- Cost analysis
- Design verification procedures
- Procedures to quantify prototype performance

8.1 Design Proposals

8.1.1 Sustainable Design (Civil)

Sub-Dairy

A dairy is a business enterprise established for the harvesting or processing (or both) of animal milk – mostly from cows or buffaloes, but also from goats, sheep, horses, or camels – for human consumption. A dairy is typically located on a dedicated dairy farm or in a section of a multi-purpose farm (mixed farm) that is concerned with the harvesting of milk.

As an attributive, the word dairy refers to milk-based products, derivatives and processes, and the animals and workers involved in their production: for example dairy cattle, dairy goat. A dairy farm produces milk and a dairy factory processes it into a variety of dairy products. These establishments constitute the global dairy industry, a component of the food industry.

- Reason behind giving this design is that dairy has really very poor in condition it's required to reconstruction!

Fig 52 Dairy

Table 25 Measurment sheet

Description	Nos	L	B	H	Quantity
GROUND FLOOR					
EARTH WORKS					
EARTH WORKS EXCAVATION ORDINARY SOIL: Earth work excavation for foundation trenches in ordinary soil and depositing on bank with initial lead upto 50 mt.and lift upto 1.5 m including breaking clods ,watering ramming and sectioning of spoil bank etc. complete.					
Earth Work long	2.00	15.00	0.11	0.50	1.65
Earth Work Short	3.00	7.50	0.11	0.50	1.24
2.89 Cu.M.					
		Rate	67.00	Amount	193.63
EARTH WORKS FILLING PLINTH USING EARTH FROM SITE : Filling the plinth and side of the foundation with the cut earth available at site in layers not exceeding 20 cms in depth consolidating each deposited layers by ramming and watering. Measurements will be taken only the filled and compacted earth.					
Storage room	1.00	8.70	3.60	0.25	7.83
Manager room	1.00	5.60	3.60	0.25	5.04
Passage	1.00	12.90	2.22	0.25	7.16
Verandah	1.00	12.70	2.24	0.25	7.11
WC	1.00	1.40	3.10	0.25	1.09
28.23 Cu.M.					
		Rate	49.00	Amount	1383.27
ANTI TERMITE TREATMENT : Anti termite treatment by providing and injecting chemical emulsion/Aldrin /heptachleremulsible concentrates 0.50% and clilossdanceemulsifiable concentrate for pre constructional treatment and creating a chemical barrier as per I.S 6313 (Part II) 1951 in wall trench foundation top surface of plinth filling junction of wall and floor along the external perimeters of the building complete (areas of building shall be measured).					
Storage room	1.00	8.80	3.70	-	32.56
Manager room	1.00	5.70	3.70	-	21.09
Passage	1.00	13.00	2.32	-	30.16
Verandah	1.00	12.80	2.34	-	29.95
WC	1.00	1.50	3.20	-	4.80
118.56 Sq.M.					
		Rate	200.00	Amount	23712.00
25288.90					
BRICK WORKS SOLING IN FOUNDATION : Brick work soling in foundation including filling joints with local sand.					
Earth Work long	2.00	15.00	0.11	-	3.30
Earth Work Short	3.00	7.50	0.11	-	2.48
5.78 Cu.M.					
		Rate	130.00	Amount	751.40
BRICK WORKS FOUNDATION CM 1:3 : First class brick work masonry in C.M. 1:3 (1 cement 3 coarse sand) with approved good quality country burnt bricks of compressive strength 35 kg/m2 of standard size of on foundation. The rate shall include cost of all materials labour and other incidental charges of all materials to complete the work.					

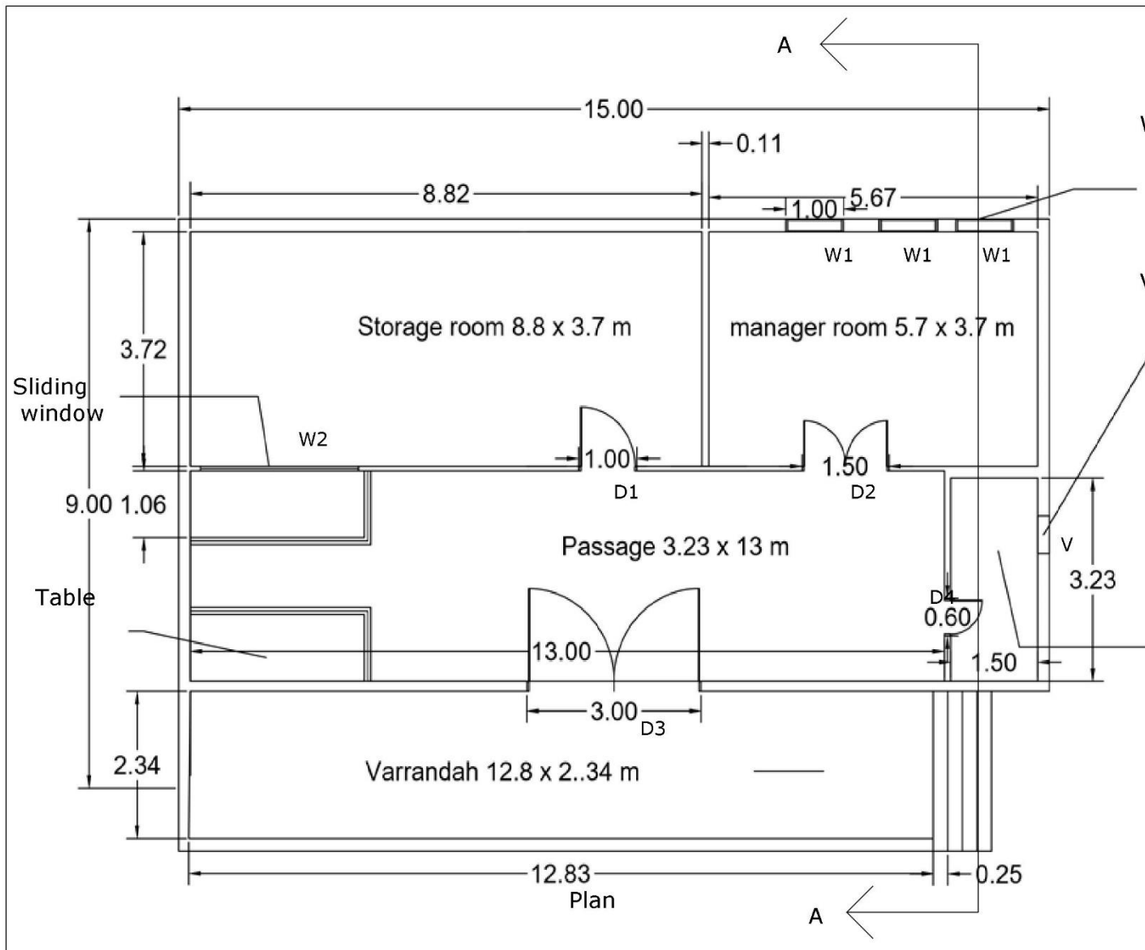
Foundation	1.00	15.00	9.00	0.25	33.75
33.75 Cu.M.					
		Rate	2,470.00	Amount	83362.50
BRICK WORKS BASEMENT CM 1:3 : First class brick work masonry in C. M. 1:3 (1 cement 3 coarse sand) with approved good quality country burnt bricks of compressive strength 35 kg/m2 of standard size of on basement. The rate shall include cost of all materials labour and other incidental charges of all materials to complete the work.					
Basement	1.00	15.00	9.00	0.25	33.75
33.75 Cu.M.					
		Rate	2,470.00	Amount	83362.50
BRICK WORKS CM 1:2 : First class brick work masonry in C. M. 1:2 (1 cement 2 coarse sand) with approved good quality country burnt bricks of compressive strength 35 kg/m2 of standard size of on super structure of all thickness. The rate shall include cost of all materials labour and other incidental charges of all materials to complete the work.					
Wall long	2.00	15.00	0.11	3.00	9.90
Wall Short	2.00	7.50	0.11	3.00	4.95
Wall long 2	1.00	3.75	0.11	3.00	1.24
Wall long 1	1.00	7.50	0.11	3.00	2.48
Varrandah	1.00	2.34	12.80	1.00	29.95
Total					48.52
Deduction for Openings					
D	1.00	1.00	0.20	2.10	0.42
D1	1.00	1.50	0.20	2.10	0.63
D2	1.00	0.60	0.11	2.10	0.14
D3	1.00	3.00	0.11	2.10	0.69
W1	3.00	1.00	0.11	1.50	0.50
W2	1.00	2.72	0.11	1.50	0.45
V1	1.00	0.60	0.11	0.60	0.04
Total					2.87
Description	Nos	L	B	H	Quantity
45.65 Cu.M.					
		Rate	2,500.00	Amount	114125.00
281601.40					
DOORS AND WINDOWS					
FRAMES WOOD : Supplying and fixing of doors and windows frames using good quality wood including M.S. clamps and fittings,fixing complete including a coat of tar at the contact surface of the frame.					
D	1.00	5.20	0.10	0.06	0.03
D1	1.00	5.70	0.10	0.06	0.03
D2	1.00	4.80	0.10	0.06	0.03
D3	1.00	7.20	0.10	0.06	0.04
W1	3.00	5.00	0.10	0.06	0.09
W2	1.00	9.94	0.10	0.06	0.06
V1	1.00	2.40	0.10	0.06	0.01
0.29 Cu.M.					

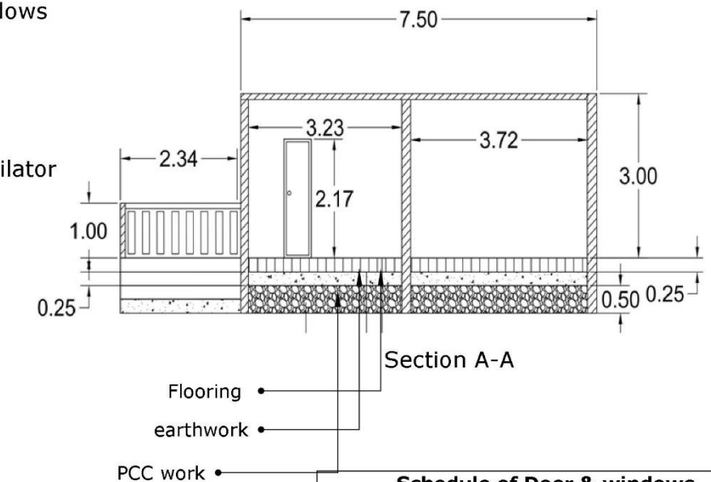
		Rate	27,840.00	Amount	8073.60
SHUTTERS METAL GLAZED : Supplying and fixing of glazed shutters of good quality metal.					
D	1.00	0.90	-	2.05	1.85
D1	1.00	1.40	-	2.05	2.87
D2	1.00	0.50	-	2.05	1.03
D3	1.00	2.90	-	2.05	5.95
W1	3.00	0.90	-	1.40	3.78
W2	1.00	2.58	-	1.40	3.61
V1	1.00	0.50	-	0.50	0.25
19.34 Sq.M.					
		Rate	144.00	Amount	2784.96
DOORS : Supplying and fixing of doors using good quality wood including M.S. clamps and fittings,fixing complete including a coat of tar at the contact surface of the frame.					
D D1 D2	1.00	1.00	-	2.10	2.10
D3	1.00	1.50	-	2.10	3.15
	1.00	0.60	-	2.10	1.26
	1.00	3.00	-	2.10	6.30
12.81 Sq.M.					
		Rate	2,780.00	Amount	35611.80
WINDOWS : Supplying and fixing of windows and vents using good quality wood including M.S. clamps and fittings,fixing complete including a coat of tar at the contact surface of the frame.					
W1	3.00	1.00	-	1.50	4.50
W2	1.00	2.72	-	1.50	4.08
V1	1.00	0.60	-	0.60	0.36
8.94 Sq.M.					
		Rate	2,780.00	Amount	24853.20
71323.56					
PLASTERING AND POINTING					
POINTING BRICKS CM 1:3 : Pointing bricks in CM 1:3.					
Description	Nos	L	B	H	Quantity
Wall long	4.00	15.00	-	3.00	180.00
Wall Short	4.00	7.50	-	3.00	90.00
Wall long 2	2.00	3.75	-	3.00	22.50
Wall long 1	2.00	7.50	-	3.00	45.00
varrandah	2.00	2.34	-	1.00	4.68
Total					342.18
Deduction for Openings					
D	1.00	1.00	-	2.10	2.10
D1	1.00	1.50	-	2.10	3.15
D2	1.00	0.60	-	2.10	1.26
D3	1.00	3.00	-	2.10	6.30
W1	3.00	1.00	-	1.50	4.50
W2	1.00	2.72	-	1.50	4.08
V1	1.00	0.60	-	0.60	0.36

Total					21.75
320.43 Sq.M.					
		Rate	61.00	Amount	19546.23
PLASTERING ROOF TOP CM 1:5 12 MM : Plastering with C.M. 1:5, 12mm thick with a neat flushing coat of cement slurry 2.20kg/m2 over water proofed roof slab by adding integral water proofing admoretere of approved brand as per specification including etc. complete.					
Roof Slabs	1.00	8.80	3.70	-	32.56
Roof Slabs 1	1.00	5.70	3.70	-	21.09
Roof Slabs 2	1.00	13.00	3.32	-	43.16
96.81 Sq.M.					
		Rate	94.00	Amount	9100.14
PLASTERING WALLS INT. CM 1:6 12 MM : Plastering witth cement mortar to inner walls, columns and other structural architectural features at all heights, floated hard and trowelled get smooth finish. The rate shall include provision of grooves scaffolding at any height curing etc. complete as directed bythe Engineer.					
Wall long	4.00	15.00	-	3.00	180.00
Wall Short	4.00	7.50	-	3.00	90.00
Wall long 2	2.00	3.75	-	3.00	22.50
Wall long 1	2.00	7.50	-	3.00	45.00
varrandah	2.00	2.34	-	1.00	4.68
Total					342.18
Deduction for Openings					
Outside Area	1.00	0.00	-	0.00	0.00
D	1.00	1.00	-	2.10	2.10
D1	1.00	1.50	-	2.10	3.15
D2	1.00	0.60	-	2.10	1.26
D3	1.00	3.00	-	2.10	6.30
W1	3.00	1.00	-	1.50	4.50
W2	1.00	2.72	-	1.50	4.08
V1	1.00	0.60	-	0.60	0.36
Total					21.75
					320.43 Sq.M.
Description	Nos	L	B	H	Quantity
		Rate	88.00	Amount	28197.84
56844.21					
PAINTING					
PAINTING CEILINGS AND SLABS CEMENT PAINT : Providing and applying two coats of approved brand and shade water proof cement paint over a coat of cement primer to give an ever shade on plastered surfase thereof includes watering and cleaning surface etc.					
Waist Slabs	1.00	2.83	2.34	-	6.62
Slabs	1.00	9.00	30.30	-	272.70
Roof Slabs	1.00	8.80	3.70	-	32.56
Roof Slabs 1	1.00	5.70	3.70	-	21.09

Roof Slabs 2	1.00	13.00	3.32	-	43.16
376.13 Sq.M.					
		Rate	35.00	Amount	13164.55
PAINTING ROOFTOPS COLOUR WASHING : Colour washing the roof over a coat of white wash.					
Roof Slabs	1.00	8.80	3.70	-	32.56
Roof Slabs 1	1.00	5.70	3.70	-	21.09
Roof Slabs 2	1.00	13.00	3.32	-	43.16
96.81 Sq.M.					
		Rate	12.00	Amount	1161.72
PAINTING ROOFTOPS CEMENT PAINT : Providing and applying two coats of approved brand and shade water proof cement paint over a coat of cement primer to give an ever shade on plastered surfase thereof includes watering and cleaning surface etc. complete as per the instruction of the site engineer.					
Roof Slabs	1.00	8.80	3.70	-	32.56
Roof Slabs 1	1.00	5.70	3.70	-	21.09
Roof Slabs 2	1.00	13.00	3.32	-	43.16
96.81 Sq.M.					
		Rate	35.00	Amount	3388.35
PAINTING WALLS INT. COLOUR WASHING : Colour washing the walls over a coat of white wash.					
Wall long	4.00	15.00	-	3.00	180.00
Wall Short	4.00	7.50	-	3.00	90.00
Wall long 2	2.00	3.75	-	3.00	22.50
Wall long 1	2.00	7.50	-	3.00	45.00
varrandah	2.00	2.34	-	1.00	4.68
Total					342.18
Deduction for Openings					
Outside Area	1.00	0.00	-	0.00	0.00
D	1.00	1.00	-	2.10	2.10
D1	1.00	1.50	-	2.10	3.15
D2	1.00	0.60	-	2.10	1.26
D3	1.00	3.00	-	2.10	6.30
W1	3.00	1.00	-	1.50	4.50
W2	1.00	2.72	-	1.50	4.08
V1	1.00	0.60	-	0.60	0.36
Description	Nos	L	B	H	Quantity
Total					21.75
320.43 Sq.M.					
		Rate	12.00	Amount	3845.16
21559.78					

Total for GROUND FLOOR	789466.24
	789466.24
	789466.00





Schedule of Door & windows

Sr no	Type of element	Dimension	Qantity
1	D1	1.00 X 2.13 m	1
2	D2	1.50 X 2.13 m	1
3	D3	3.00 X 2.13 m	1
4	D4	0.60 X 2.13 m	1
5	W1	1.00 X 1.50 m	3
6	W2	2.72 X 1.00 m	1
7	V	0.60 X 0.60 m	1

Design 1

C.K. Pithawala Collage of Engineering & Technology

VISHWAKARMA YOJNA: VIII AN APPROACH TOWARDS RURBANISATION **TENARANG Village**

Sub-Dairy

All Diamensions are in meter

CLIENT
C.K Pithawalla College of Engineering and Technology
Near Malvan Mandir Via Magdalla Port,
Dumas Rd, Surat, Gujarat
395007

PROJECT
VISHWAKARMA YOJNA: VIII AN APPROACH TOWARDS RURBANISATION **TENARANG Village**

DRAWN BY
Muskan Gheewala
Harshit Mehta

DESCRIPTION
Section,Plan,Elevation

71

8.1.2 Physical design (Civil)

Public Latrine

There is no provision of public toilet in Tenarang village. As proper sanitation is the primary need of health care facility. As public toilet serves as important facility of public. It needs to be developing in village. It serves as the better refreshment for the floating population or general public. It is mostly used by undefined users. Panchayat can generate income from it by pay and use concept. A public toilet is a room or small building with toilets (or urinals) that does not belong to a particular household. Rather, the toilet is available for use by the general public, customers, travelers, employees of a business, school pupils, prisoners etc. Public toilets are commonly separated into male and female facilities, although some are unisex, especially for small or single-occupancy public toilets. Increasingly, public toilets are accessible to people with disabilities. Public toilets are known by many other names depending on the country. Examples are: restroom, washroom, bathroom, water closet (W.C.), comfort room, ladies'/women's room and gents'/men's room.As an "away-from-home" toilet room, a public toilet can provide far more than access to the toilet for urination and defecation. People also wash their hands, use the mirrors for grooming, get drinking

Table no 27 MEASURMENT SHEET

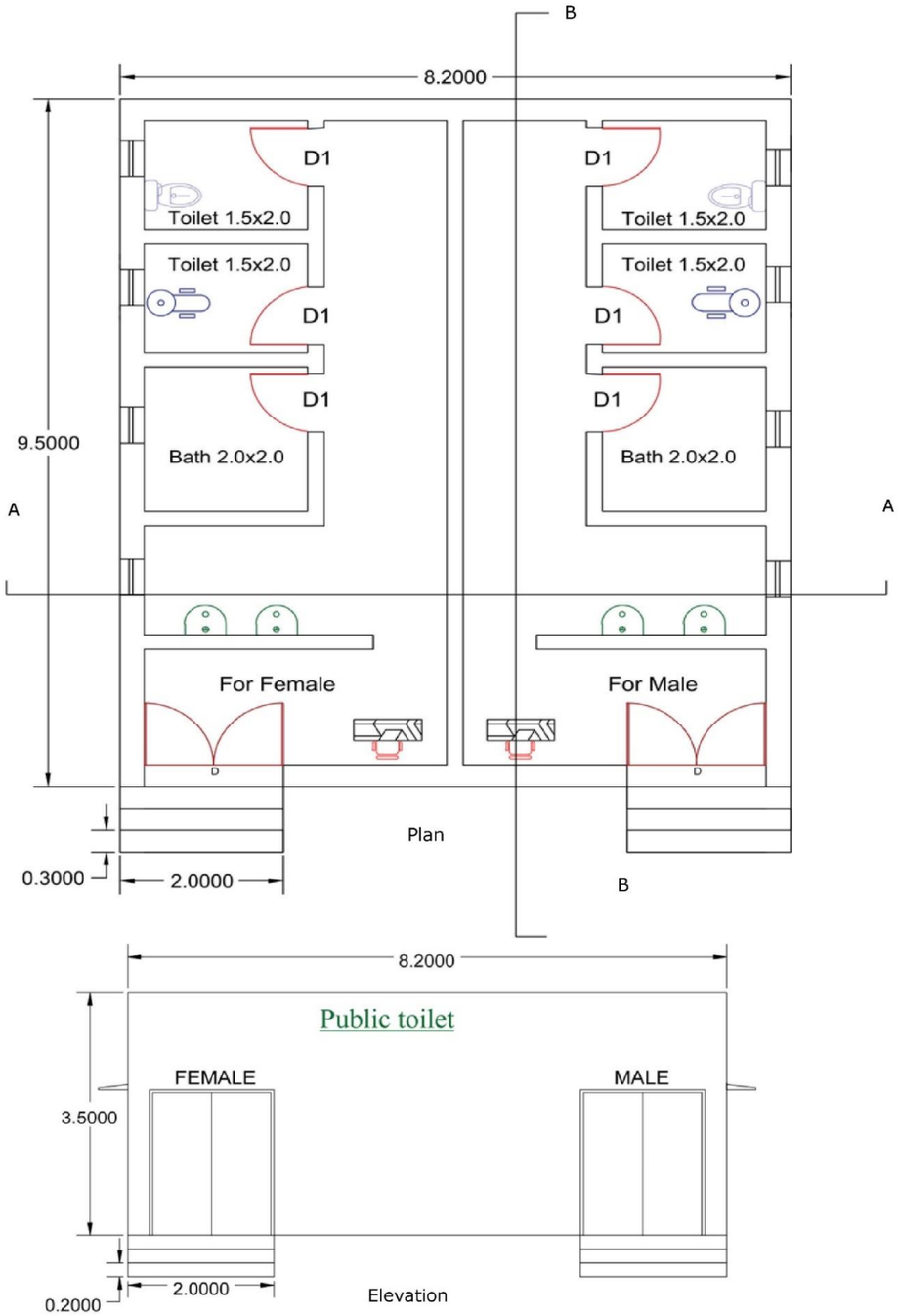
Sr. no	Descriptions	No.	Length(m)	Width (m)	Height (m)	Quantity	Total Quantity
1	Earthwork in excavation in foundation						
	L=65.9	1	65.9	0.8	1.5	79.08	
	Excavation for steps	2	1	2	0.2	0.4	
						Total =	45.48
2	P.C.C for Footing(1:3:6)						
	L = 65.9m	1	65.9	0.8	0.3	15.82	
	P.C.C for Steps	2	1	2	0.2	0.8	
						Total =	16.62
3	Brick Masonry up to plinth in CM (1:6)						
	L = 71m	1	71	0.2	1.2	17.04	
	For steps-1st steps	2	0.9	2	0.2	0.72	
	2nd steps	2	0.6	2	0.2	0.48	
	3rd steps	2	0.3	2	0.2	0.24	
						Total=	18.48
4	Earth filling in plinth area						
	Toilet	4	1.5	2	0.48	5.76	
	Bath	2	2	2	0.18	3.84	
	Passage1	2	8.9	1.5	0.48	12.816	
	Passage2	2	1.7	2.1	0.48	3.427	
						Total=	25.843

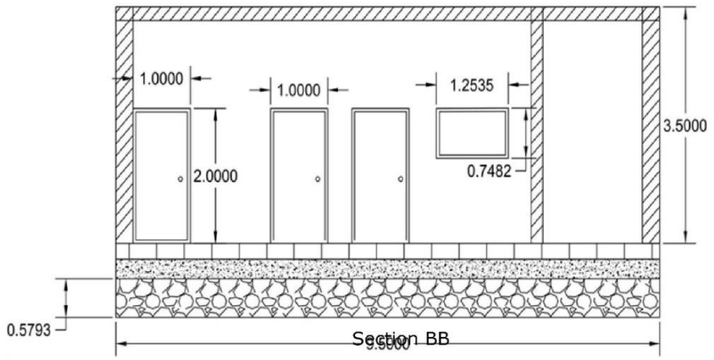
5	Brick masonry above plinth						
	L=71m	1	71	0.2	3	42.6	
	Parapet wall	1	33.8	0.2	0.5	3.38	
						Total=	45.98
	Deduction:-						
	D	2	1.7	0.2	2.1	0.714	
	D1	6	0.9	0.2	2	0.36	
	V1	6	0.5	0.2	0.6	0.06	
						Total=	1.134
					Total Quantity=		44.846
6	Smooth Plaster						
	Inside Plaster						
	Toilet-sides	8	1.5	-	3	36	
	Bath-sides	8	2	-	3	48	
	Passage-Sides	2	8.9	-	3	534	
						Total=	201.93
	Outer Plaster						
	L=35.4	1	35.4	-	3.6	127.44	
	For steps- 1st steps	4	0.9	-	0.2	0.72	
	2nd steps	4	0.6	-	0.2	0.48	
	3rd steps	4	0.3	-	0.2	0.24	
						Total=	124.41
7	Cement concrete for Lintel						
	D	2	2		0.2	0.1	0.08
	D_1	6	1.1		0.2	0.1	0.132
						Total=	0.121
8	Wood work for door/window frame						
	D	2	6.5	0.15	0.1	0.195	
	D_1	6	5.5	0.15	0.1	0.495	0.69
9	Wood work for door/window shutters						
	D	2	1.7	-	2.1	7.14	
	D_1	6	0.9	-	2	10.8	
	V_1 (Glass)	6	0.5	-	0.6	1.8	
						Total=	19.74

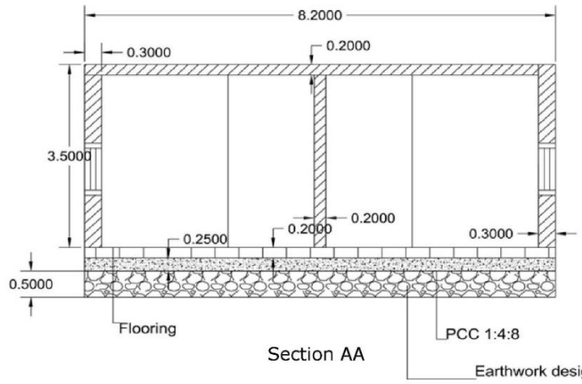
Abstract Sheet of Public Toilet:

Sr. no	Item Description	Quantity	Rate	Per	Amount (Rs.)
1	Earthwork in excavation in foundation	45.48m^3	100	m^3	4548
2	P.C.C(1:3:6)	20.66m^3	3530	m^3	72929.8
3	Earth Filling in plinth	25.843m^3	60	m^3	1550.5
4	Brick Masonry up to plinth in CM (1:6)	35.078m^3	3240	m^3	113652.7
5	Brick Masonry above plinth to slab in CM (1:6)	44.846 m^3	3920	m^3	175796.32
6	Smooth plaster inside	201.93 m^2	100	m^2	20193
7	Smooth plaster on outer wall	124.41 m^2	47	m^2	5847.27
8	White wash	326.34 m^2	63	m^2	20559.42
9	Wood work for door/window frame	0.69 m^2	3480	m^2	2401
10	Wood work for door/window shutters	19.74m^3	3480	m^3	68695.2
				Total Rs. =	486173
		Add 1.5% Water Charge			7300
		Add 10% Contractor Profit			48617
		Total Estimation cost in Rs.			542090

From the above quantities and abstract the total cost of construction of Public Toilet is around 5,42,909Rs.







Schedule of Door & windows

Sr no	Type of element	Dimension	Qantity
1	D1	1.00 X 2.00 m	6
2	D2	1.70 X 2.00 m	2
3	V	1.25X 0.74 m	8

Design 2

C.K. Pithawala Collage of Engineering & Technology

VISHWAKARMA YOJNA: VIII *AN APPROACH TOWARDS RURBANISATION* **TENARANG Village**

Public toilet

All Diamensions are in Feet-inch | Page no 71

CLIENT
C.K Pithawalla College of Engineering and Technology
Near Malvan Mandir Via Magdalla Port,
Dumas Rd, Surat, Gujarat
395007

PROJECT
VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS
RURBANISATION
TENARANG Village

DRAWN BY
Muskan Gheewala
Harshit Mehta

DESCRIPTION
Section,Plan,Elevation

75

8.1.3 Social design (Civil)

Hospital

The primary function of the Medical Centre is to provide medical services to Public. They are very convenient as they are often situated in rural areas where hospitals are not close by.

Most community clinics tend to offer care at lower costs than hospitals or other facilities. However, if you need a specialist clinic it may cost you more. It is important to know what type of service, care, or doctor you need. You don't want to waste time or money going from one to the other until you and the right one.

These clinics are cheaper to visit for basic treatments like colds and flu. The services and treatments available at these clinics are limited. Nurse practitioners generally work at these clinics.

Most of these nurses are not specialists but have general knowledge and training to deal with a large, but limited spectrum of issues.

Services like vaccinations, preventative care, and physical exams are offered. You can also have your blood pressure taken and do tests for HIV, insulin, cholesterol, and other such conditions. There are over a thousand of these clinics across the nation. They are very convenient to visit as they are in the center of where you would buy groceries or go for other errands. If you are given a prescription, it is very easy to just walk around the corner and buy your meds from the pharmacy.

Mobile phones are to be on silent when working in the clinics. Signs are displayed to encourage clients/patients and others. Mobile phone conversations are not permitted in the waiting room, corridors or general clinic areas. Clinical Practice Building is a smoke free environment.

General waste materials produced that do not fall into the clinical or related waste categories, but which may be lightly contaminated with blood or body substances though not to such an extent that it would be considered clinical waste, i.e. not contaminated with 'expressible blood' may be disposed of through the general waste processes of the clinics but must not be accessible to children.

Estimation of Clinic Quantity:

Table no 29 MEASURMENT SHEET

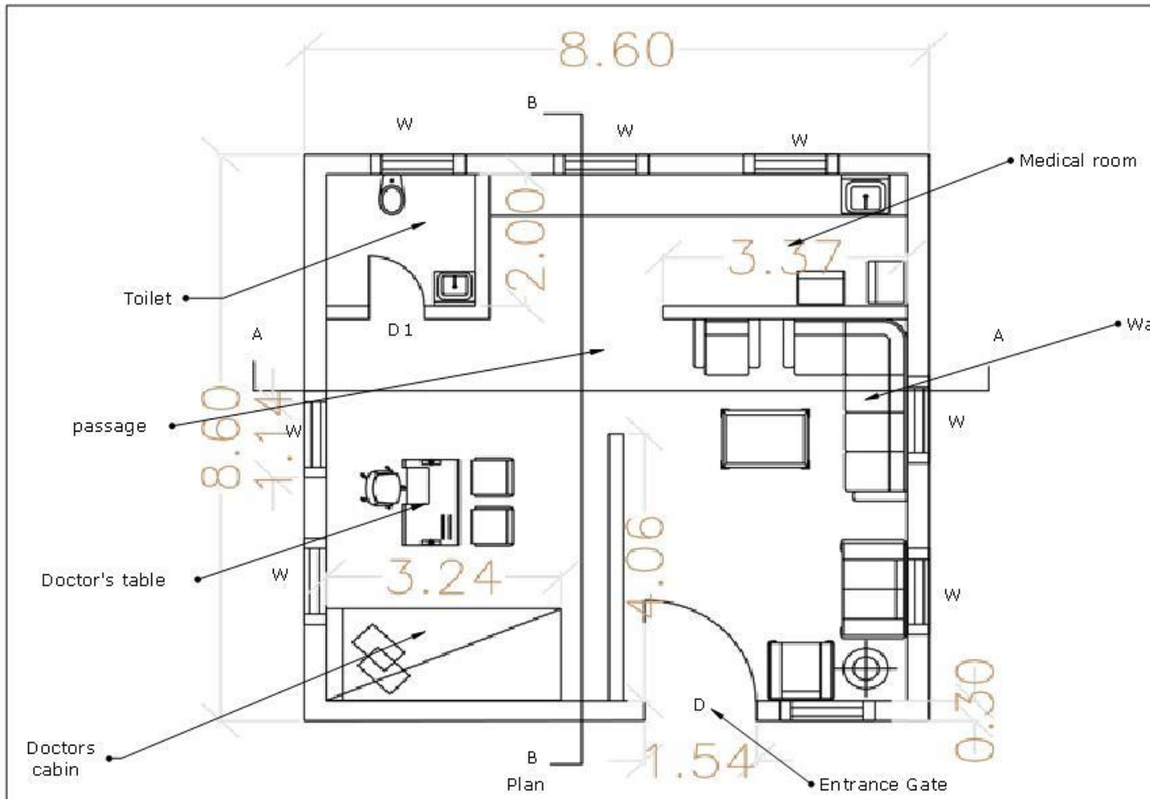
Sr. no	Description	No.	Length (m)	Width (m)	Height (m)	Quantity	Total quantity
1	Earthwork in excavation in foundation						
	Net C.L. length= 2.1*(0.5*0.9*3) = 30.75 m	1	30.75	0.9	1.10	30.44	
					Total =30.44m^3		
2	Brick Bat Cement Concrete(1:4:8) for foundation	1	30.75	0.9	0.2	5.54	
					Total =5.54m^3		
4	Earth Filling in plinth						
	Toilet	1	2.0	1.9	0.45	1.71	
	Storage	1	3.7	1.9	0.45	3.16	
	Doctor Room	1	3.0	3.8	0.45	5.13	
	Sitting Room	1	2.8	3.8	0.45	4.79	
					Total =14.79m^3		
3	Brick Masonry up to plinth in CM (1:6)						

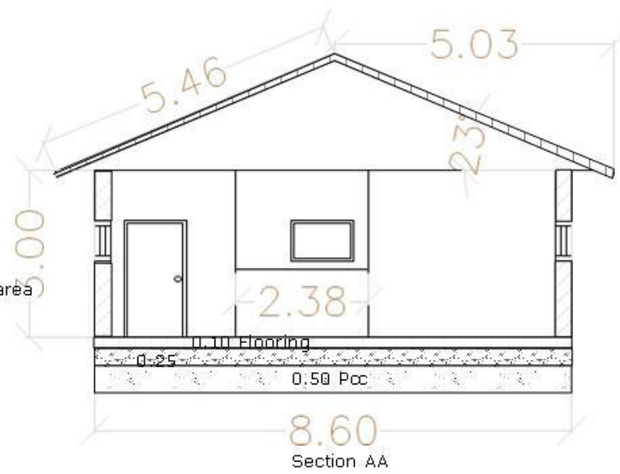
	L= 30.75-(0.5*0.5*3) =30m	1	30	0.5	0.3	4.5	
	L= 30.75-(0.5*0.4*3) =30.15m	1	30.15	0.4	0.3	3.62	
	L= 30.75-(0.5*0.3*3) =30.3m	1	30.3	0.3	0.85	7.73	
						Total =15.85m^3	
5	Brick Masonary above plinth to slab in CM (1:6)						
	L= 30.45m	1	30.45	0.2	3.0	18.27	
						Total =18.27m^3	
	Deduction of Door/Window						
	D1	1	1.1	0.2	2.1	0.46	
	D2	1	0.9	0.2	2.1	0.38	
	W1	1	2.5	0.2	1.4	0.7	
	W2	2	1.2	0.2	1.4	0.67	
	V	1	0.6	0.2	0.6	0.07	
					(-)	Total =2.28m^2	
	Net Quantity = 18.27-2.28 = 15.99m^3						
6	Smooth plaster inside Rooms & Ceiling						
	-Plaster For Wall:						
	Toilet	2	2.1		3	12.6	
		2	2.0		3	12	
	Storage	2	3.8		3	23	
		2	2.0		3	12	
	Doctor Room	2	3.1		3	19	
		2	3.9		3	23.4	
	Sitting Room	2	2.9		3	17.4	
		2	3.9		3	23.4	
						Total =143 m^2	
	Deduction of Door/Window						
	D1	1/2	1.1		2.1	1.16	
	D2	2/2	0.9		2.1	1.89	
	W1	1/2	2.5		1.4	1.75	
	W2	2/2	1.2		1.4	1.68	
	V	1/2	0.6		0.6	0.18	
					(-)	Total =6.66m^2	
	Net Quantity= 143-6.66 = 136.4m^2						
7	Smooth plaster on outer wall						
	L = 86.1m	1	86.1		3	245	
						Total =245m^2	
	Deduction of door/window = 6.66m^2						
	Net Quantity = 246-6.66 = 238.4m^2						
8	Paint Work (White Wash)						
	-For Inside Wall:						
	Toilet	2	2.1		0.3	1.26	

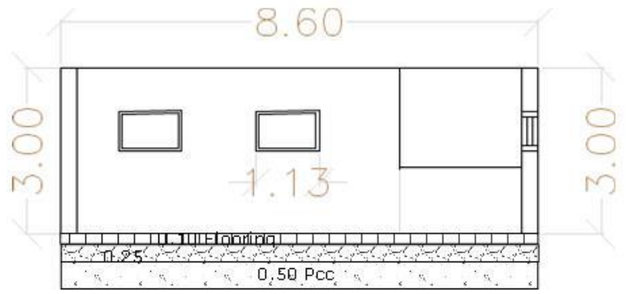
		2	2.0		0.3	1.2	
	Storage	2	3.8		0.3	2.28	
		2	2.0		0.3	1.2	
	Doctor Room	2	3.1		0.3	1.86	
		2	3.9		0.3	2.34	
	Sitting Room	2	2.9		0.3	1.74	
		2	3.9		0.3	2.34	
					Total =14.22m^2		
	Deduction of Door/Window						
	D1	1/2	1.1		2.1	1.16	
	D2	2/2	0.9		2.1	1.89	
	W1	1/2	2.5		1.4	1.75	
	W2	2/2	1.2		1.4	1.68	
	V	1/2	0.6		0.6	0.18	
					(-)	Total =6.66m^2	
	Net Quantity= 14.22-6.66 = 7.56m^2						
9	Paint Work on outer wall						
	L = 86.1m	1	86.1		3	245	
					Total =245m^2		
	Deduction of door/window = 6.66m^2						
	Net Quantity = 246-6.66 = 238.4m^2						

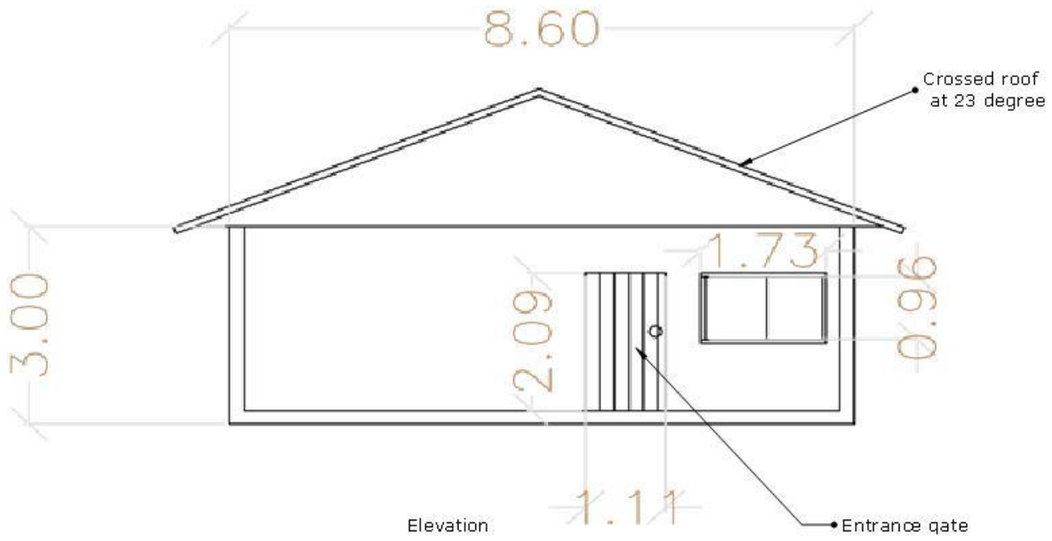
Abstract Sheet of Clinic: Table no 30 ABSTRUCT SHEET

Sr. no	Item Description	Quantity	Rate	Per	Amount (Rs.)
1	Earthwork in excavation in foundation	30.44m^3	100	m^3	3044
2	Brick Bat Cement Concrete(1:4:8) for foundation	5.54m^3	3530	m^3	19556.2
3	Earth Filling in plinth	14.79m^3	60	m^3	887.4
4	Brick Masonry up to plinth in CM (1:6)	15.85m^3	3240	m^3	51354
5	Brick Masonry above plinth to slab in CM (1:6)	15.99m^3	3920	m^3	62680.8
6	Smooth plaster inside Rooms & Ceiling	7.56m^2	150	m^2	1134
7	Smooth plaster on outer wall	238.4m^2	150	m^2	35760
8	Paint Work (White Wash)	136.4m^2	63	m^2	8583.12
9	Paint Work on outer wall	238.4m^2	63	m^2	15019
				Total Rs. =	198018
		Add 1.5% Water Charge			2970.2
		Add 10% Contractor Profit			19801.8
		Total Estimation cost in Rs.			220790









Schedule of Door & windows			
Sr no	**Type of element**	**Dimension**	**Qantity**
1	D	1.50 X 2.00 m	1
2	D1	1.00 X 2.00 m	1
3	W	1.13 x 1.00 m	7
4	V	0.60 x 0.60 m	1

Design 3

C.K. Pithawala Collage of Engineering & Technology

VISHWAKARMA YOJNA: VIII *AN APPROACH TOWARDS RURBANISATION* **TENARANG Village**

Clinic Section-Plan-Elevation

All Diamensions are in Meter

CLIENT
C.K Pithawalla College of Engineering and Technology
Near Malvan Mandir Via Magdalla Port,
Dumas Rd, Surat, Gujarat
395007

PROJECT
VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS
RURBANISATION
TENARANG Village

DRAWN BY
Muskan Gheewala
Harshit Mehta

DESCRIPTION
Section,Plan,Elevation

79

8.1.4 Socio-Cultural design (Civil)

Lake Beautification

Restoration and beautification of the lake is the process to treat and to eliminate the problems of the lake and ponds like degradation, an impurity in the lake, improper shoreline of a lake etc. and make the lake more beautiful and attractive.

Fig 53 nows days lake

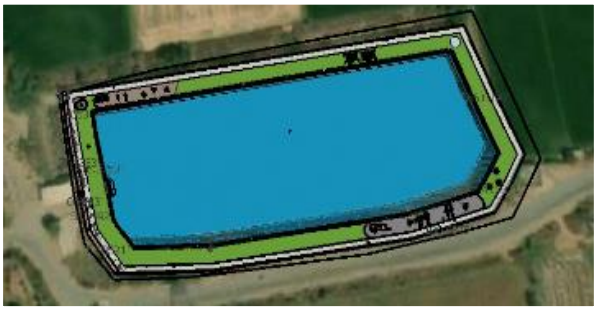


Fig 54 Future days lake

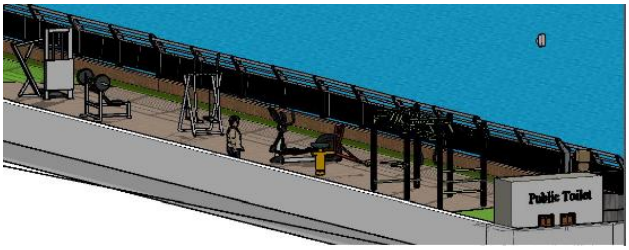


Fig 56 Gym area

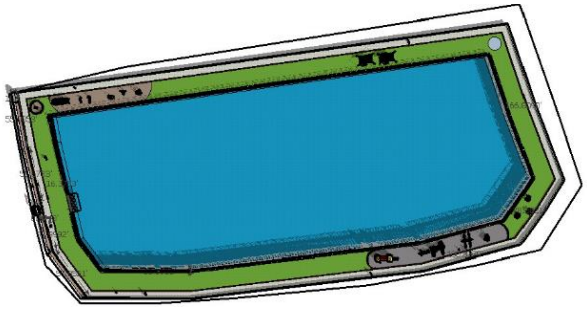


Fig 57 lake top view

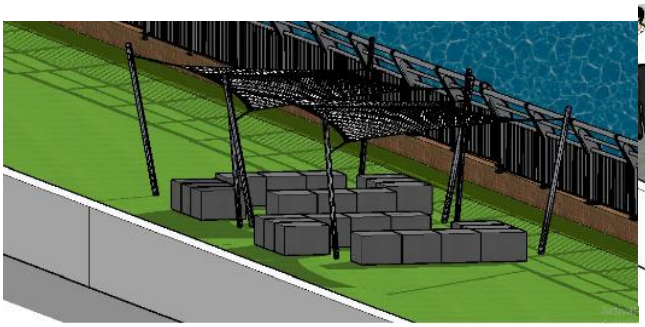


Fig 58 Sitting area

Fig 59 Playing area

Estimation

Table no 31 MEASURMENT SHEET

No	Description	Nos	L	B	H	Quantity
1	EARTH WORKS FILLING PLINTH USING EARTH OUTSIDE: Filling the plinth and side of the foundation with the earth brought from outside the site including breaking closed, levelling, watering, ramming etc. complete as instructed by the site engineers. Measurements will be taken only the filled and compacted earth.					
	Toilet	1	2.9	1.40		0.00
						0
2	Supplying, fitting, fixing and removing shuttering and staging. Measurements shall be taken as the actual surfaces in contact with the concrete or any other materials requiring formwork.					
	FORM WORK RCC: Form work for rcc.					
	Slabs	1	3	1.8	-	5.40
						5.40
	Supplying, cutting, bending and straightening reinforcement for R.C.C work; binding with 22 gauge binding wire etc. complete in all respects with deformed bars conforming to I.S 1786-1961 or IS 1139 and placing in position. Weight of steel=7850 Kg/m3.					
3	**STEEL REQUIREMENTS : Steel Requirements for Columns, Beams, Lintels, Slabs etc.**					
	Steel Requirements for All Rccs @1 % of vol. for 185.84 m3 of RCC.	14588.44	-	-	-	14588.44
						14,588.44
4	BRICK WORKS CM 1:2: First class brick work masonry in C. M. 1:2 (1 cement 2 coarse sand) with approved good quality country burnt bricks of compressive strength 35 kg/m2 of standard size of on super structure of all thickness. The rate shall include cost of all materials labour and other incidental charges of all materials to complete the work.					
	Outer long wall 1	1	162.7	0.23	1.07	40.04
	Outer long wall 2	1	153.44	0.23	1.07	37.76
	Outer Short wall 1	1	67.36	0.23	1.07	16.58
	Outer Short wall 2	1	74.67	0.23	1.07	18.38
	Inner longer wall 1	1	124.6	0.3	0.3	11.58
	Inner longer wall 2	1	134.5	0.3	0.3	12.5
	Inner Short wall 1	1	50.9	0.3	0.3	4.73
	Inner Short wall 2	1	56.08	0.3	0.3	5.21
	Sitting stone	1	61.87	0.27	0.61	10.19
	----					----
	Total					156.97
	Deduction for Openings					
	V1	1.00	0.60	0.60	1.50	0.54
	----					----
	Total					0.54
						156.43

5	BRICK WORKS CM 1:4: First class brick work masonry in C. M. 1:4 (1 cement 4 coarse sand) with approved good quality country burnt bricks of compressive strength 35 kg/m2 of standard size of on super structure of all thickness. The rate shall include cost of all materials labour and other incidental charges of all materials to complete the work.					
	outer long wall 1	1	162.7	0.23	1.07	40.04
	outer long wall 2	1	153.44	0.23	1.07	37.76
	outer Short wall 1	1	67.36	0.23	1.07	16.58
	outer Short wall 2	1	74.67	0.23	1.07	18.38
	inner longer wall 1	1	124.6	0.3	0.3	11.58
	inner longer wall 2	1	134.5	0.3	0.3	12.5
	inner Short wall 1	1	50.9	0.3	0.3	4.73
	inner Short wall 2	1	56.08	0.3	0.3	5.21
	Sitting stone	1	61.87	0.27	0.61	10.19
	----					----
	Total					156.97
	Deduction for Openings					
	V1	1	0.6	0.6	1.5	0.54
	----					----
	Total					0.54
						156.43
6	SOLID BLOCKS CM 1:6 : Cement solid brick work in cement mortar 1:6 with 40x20x20 cm size hollow bricks for superstructure including cost of all materials labor charges, scaffolding, raking joints, curing etc. complete as per direction of the Engineer in charge.					
	Outer long wall 1	1	162.7	0.23	1.07	40.04
	Outer long wall 2	1	153.44	0.23	1.07	37.76
	Outer Short wall 1	1	67.36	0.23	1.07	16.58
	Outer Short wall 2	1	74.67	0.23	1.07	18.38
	Inner longer wall 1	1	124.6	0.3	0.3	11.58
	Inner longer wall 2	1	134.5	0.3	0.3	12.5
	Inner Short wall 1	1	50.9	0.3	0.3	4.73
	Inner Short wall 2	1	56.08	0.3	0.3	5.21
	Sitting stone	1	61.87	0.27	0.61	10.19
	----					----
	Total					156.97
	Deduction for Openings					
	V1	2	0.6	0.6	1.5	1.08
	----					----
	Total					1.08
						155.89
7	FLOOR FINISHING CEMENT FLOATING COAT: Cement Flushing Coat.					
	Toilet	1	3	1.5	-	4.5
						4.50

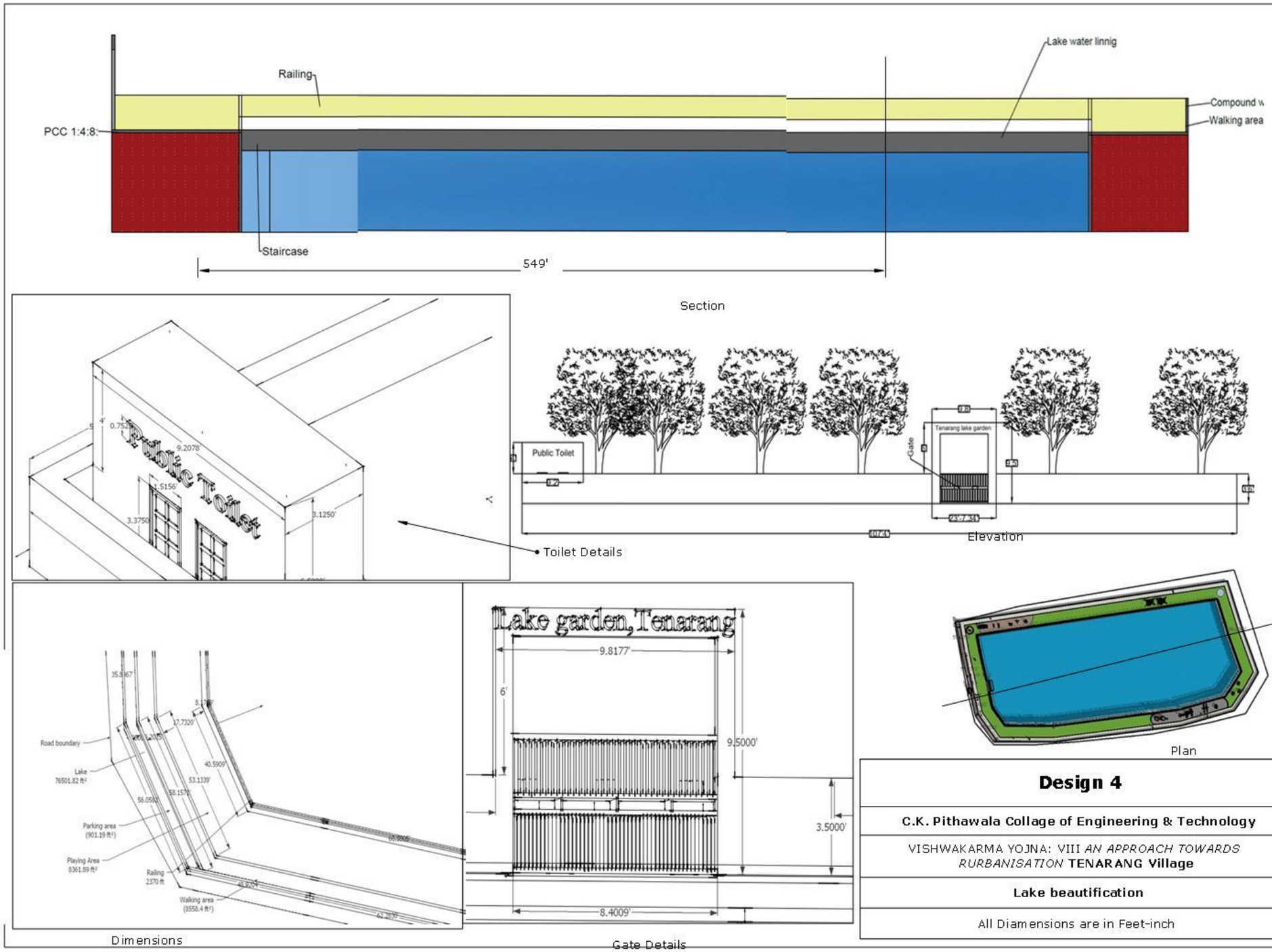
8	SHUTTERS ALUMINIUM GLAZED: Supplying and fixing of glazed shutters of good quality aluminum.					
	V1	2	0.51	-	1.41	1.44
						1.44
9	DOORS: Supplying and fixing of doors using good quality wood including M.S. clamps and fittings, fixing complete including a coat of tar at the contact surface of the frame.					
	Toilet	2	0.3	-	1.8	1.08
						1.08
10	PLASTERING CEILINGS AND SLABS CM 1:3 : Plastering witth cement mortar to ceilings, stairs, steps, slabs and other structural architectural features at all heights, floated hard and trowelled get smooth finish. The rate shall include provision of grooves scaffolding at any height curing etc. complete as directed by the Engineer.					
	Slabs	1	3	3.15	-	9.45
						9.45
11	PAINTING CEILINGS AND SLABS CEMENT PAINT : Providing and applying two coats of approved brand and shade water proof cement paint over a coat of cement primer to give an ever shade on plastered surface thereof includes watering and cleaning surface etc.					
	Slabs	1	3	3.15	-	9.45
						9.45
12	PAINTING CEILINGS AND SLABS COLOUR WASHING :Colour washing the ceilings over a coat of white wash.					
	Slabs	1	3	3.15	-	9.45
						9.45
13	PAINTING WALLS EXT. CEMENT PAINT : Providing and applying two coats of approved brand and shade water proof cement paint over a coat of cement primer to give an ever shade on plastered surfase thereof includes watering and cleaning surface etc. complete as per the instruction of the site engineer for exterial walls.					
	Outer Walls	1	0	-	0	0
						0.00
14	**PAINTING WALLS INT. WHITE CEMENT : Painting walls using white cement.**					
	outer long wall 1	2	162.7	-	1.07	348.18
	Outer long wall 2	2	153.44	-	1.07	328.36
	Outer Short wall 1	2	67.36	-	1.07	144.15
	Outer Short wall 2	2	74.67	-	1.07	159.79
	Inner longer wall 1	2	124.6	-	0.3	75.96
	Inner longer wall 2	2	134.5	-	0.3	81.99
	Inner Short wall 1	2	50.9	-	0.3	31.03
	Inner Short wall 2	2	56.08	-	0.3	34.19
	Sitting stone	2	61.87	-	0.61	75.48
	----					----
	Total					1279.13
	Deduction for Openings					
	Outside Area	1	0	-	0	0

	V1	2	0.6	-	1.5	1.8
	----					----
	Total					1.8
						1,277.33
15	GRILLS AND RAILS CAST IRON : Supplying and fixing handrails using cast iron grill at size 20 x 70 cm at 45 cm centre to center ie; 3 Nos, in between each vertical portion fixed in R.C.C 1:1.5:3 beam of sixe 12cm x 10cm at 1.40m intervals, including plaste ring with c. m 1:3, 9mm thick two coat with neat cement flushing coat etc. complete. (Total height of hand rail 90cm)					
	rails for safety	71	19.31	-	-	1371.01
						1,371.01

Abstract sheet

Table no 32 ABSTRUCT SHEET

Sl No	**Description**	**Quantity**	**Unit**	**Rate**	**Amount**
1	Earth works filling plinth using earth outside	0.00	Cu.M.	169	0.00
2	Form work rcc	5.40	Sq.M.	150	810.00
3	Steel requirements	14,588.	Kg	30	437653.20
4	Brick works cm 1:2	156.43	Cu.M.	2,500	391075.00
5	Brick works cm 1:4	156.43	Cu.M.	2,388	373554.84
6	Solid blocks cm 1:6	155.89	Cu.M.	1,627	253633.03
					1018262.87
7	Floor finishing cement floating coat	4.50	Sq.M.	151	679.50
8	Shutters aluminium glazed	1.44	Sq.M.	149	214.56
9	Doors	1.08	Sq.M.	2,780	3002.40
					3216.96
10	Plastering ceilings and slabs	9.45	Sq.M.	78	737.10
11	Painting ceilings and slabs cement paint	9.45	Sq.M.	35	330.75
12	Painting ceilings and slabs colour washing	9.45	Sq.M.	12	113.40
13	Painting walls ext. Cement paint	0.00	Sq.M.	35	0.00
14	Painting walls int. White cement	1,277.33	Sq.M.	31	39597.23
					40041.38
15	Grills and rails cast iron	1,371.01	M	1,000	1371010.00
					1371010.00
Total for LAND DEVELOPMENT					**2872411.01**
Total					**2872411.01**
Add 40.00 % for Electrification					**1148964.40**
Add 5.00 % for Plumbing					**143620.55**
Net Amount					**4164996.00**


Railing
Lake water linnig
PCC 1:4:8:
Compound w
Walking area
Staircase
549'
Section
Public Toilet
Tenarang lake garden
Gate
Elevation
Toilet Details
Lake garden,Tenarang
9.8177'
6'
9.5000'
3.5000'
8.4009'
Gate Details
Road boundary
Lake
Parking area
Playing Area
Railing
Walking area
Dimensions
Plan
Design 4
C.K. Pithawala Collage of Engineering & Technology
VISHWAKARMA YOJNA: VIII AN APPROACH TOWARDS RURBANISATION TENARANG Village
Lake beautification
All Diamensions are in Feet-inch
CLIENT
C.K Pithawalla College of Engineering and Technology
Near Malvan Mandir Via Magdalla Port,
Dumas Rd, Surat, Gujarat
395007
PROJECT
VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS
RURBANISATION
TENARANG Village
DRAWN BY
Muskan Gheewala
Harshit Mehta
DESCRIPTION
Section,Plan,Elevation
85

8.1.5 Smart Village Design (Civil)

Library

Importance of Library:

The importance of library cannot be over emphasized. A library is an important source of knowledge to young minds. It develops the important habit of reading among the students.
A library can be considered a store – house of knowledge.
In dictionaries the word "library" has been defined as "a building or room containing a collection of books". A library renders a great service to the society.
A library plays a very important role in promoting the progress of knowledge. There are many people who love reading. But they can't afford to buy books because the prices of books are very high. So when one becomes a member of a library, he can borrow valuable books. A member can borrow two books at a time and he can keep it with him for two weeks.
Libraries are particularly useful for poor children. Even those who are better off can't afford to buy all the books they require for their studies. A public library is a place that is open to poor and rich alike. They are allowed to enter the section free of charge. They can takedown notes from the books.

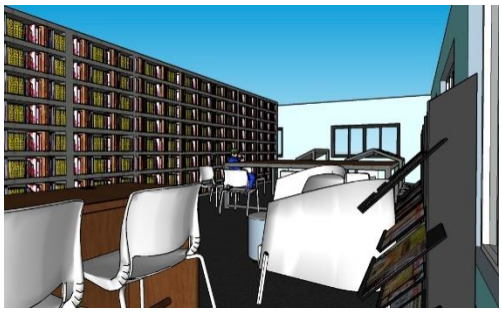


Fig 59 Book rack & Magazine stand

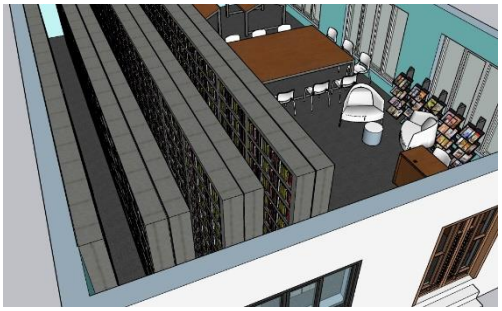


Fig 60 Library

Fig: 61 Newspaper stand

Estimation of Library Quantity:

Table no 33 MEASURMENT SHEET

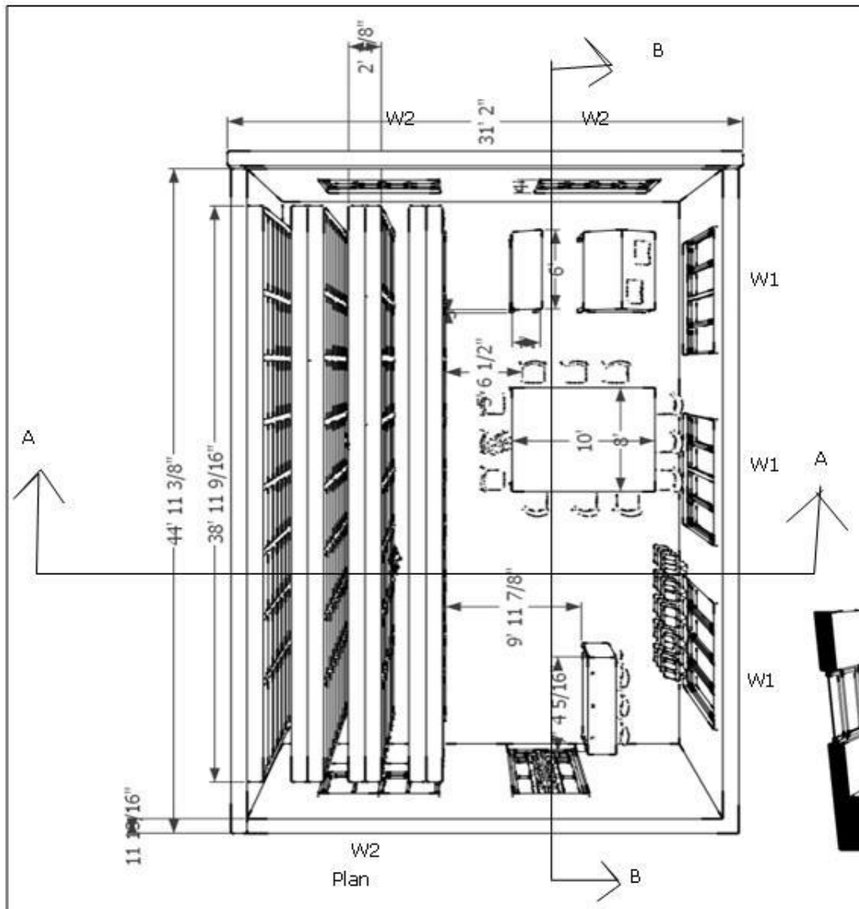
Sr. no	Description	No.	Length (m)	Width (m)	Height (m)	Quantity	Total quantity
1	Earthwork in excavation in foundation						
	Net C.L. length= 32.1*(0.5*0.9*3) = 30.75 m	1	30.75	0.9	1.10	30.44	
						Total =	$30.44m^3$
2	Brick Bat Cement Concrete(1:4:8) for foundation	1	30.75	0.9	0.2	5.54	
						Total =	$5.54m^3$
4	Earth Filling in plinth						
	Toilet	1	2.0	1.9	0.45	1.71	
	Storage	1	3.7	1.9	0.45	3.16	
	Doctor Room	1	3.0	3.8	0.45	5.13	
	Sitting Room	1	2.8	3.8	0.45	4.79	
						Total =	$14.79m^3$
3	Brick Masonry up to plinth in CM (1:6)						
	L= 30.75-(0.5*0.5*3) =30m	1	30	0.5	0.3	4.5	
	L= 30.75-(0.5*0.4*3) =30.15m	1	30.15	0.4	0.3	3.62	
	L= 30.75-(0.5*0.3*3) =30.3m	1	30.3	0.3	0.85	7.73	
						Total =	$15.85m^3$
5	Brick Masonary above plinth to slab in CM (1:6)						
	L= 30.45m	1	30.45	0.2	3.0	18.27	
						Total =	$18.27m^3$
	Deduction of Door/Window						
	D1	1	1.1	0.2	2.1	0.46	
	D2	1	0.9	0.2	2.1	0.38	
	W1	1	2.5	0.2	1.4	0.7	
	W2	2	1.2	0.2	1.4	0.67	
	V	1	0.6	0.2	0.6	0.07	
					(-)	Total =	$2.28m^2$
	Net Quantity = 18.27-2.28 = $15.99m^3$						
6	Smooth plaster inside Rooms & Ceiling						

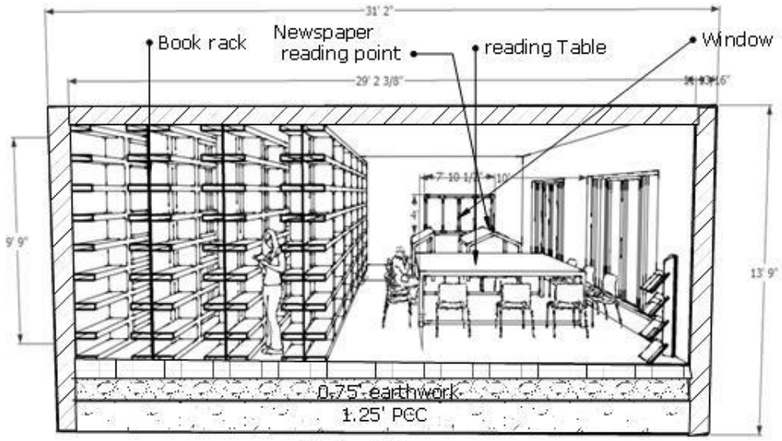
	-Plaster For Wall:						
	Toilet	2	2.1		3	12.6	
		2	2.0		3	12	
	Storage	2	3.8		3	23	
		2	2.0		3	12	
	Doctor Room	2	3.1		3	19	
		2	3.9		3	23.4	
	Sitting Room	2	2.9		3	17.4	
		2	3.9		3	23.4	
						Total =	143 m^2
	Deduction of Door/Window						
	D1	1/2	1.1		2.1	1.16	
	D2	2/2	0.9		2.1	1.89	
	W1	1/2	2.5		1.4	1.75	
	W2	2/2	1.2		1.4	1.68	
	V	1/2	0.6		0.6	0.18	
					(-)	Total =	6.66m^2
	Net Quantity= 143-6.66 = 136.4m^2						
7	Smooth plaster on outer wall						
	L = 86.1m	1	86.1		3	245	
						Total =	245m^2
	Deduction of door/window = 6.66m^2						
	Net Quantity = 246-6.66 = 238.4m^2						
8	Paint Work (White Wash)						
	-For Inside Wall:						
	Toilet	2	2.1		0.3	1.26	
		2	2.0		0.3	1.2	
	Storage	2	3.8		0.3	2.28	
		2	2.0		0.3	1.2	
	Doctor Room	2	3.1		0.3	1.86	
		2	3.9		0.3	2.34	
	Sitting Room	2	2.9		0.3	1.74	
		2	3.9		0.3	2.34	
						Total =	14.22m^2
	Deduction of Door/Window						
	D1	1/2	1.1		2.1	1.16	
	D2	2/2	0.9		2.1	1.89	
	W1	1/2	2.5		1.4	1.75	
	W2	2/2	1.2		1.4	1.68	

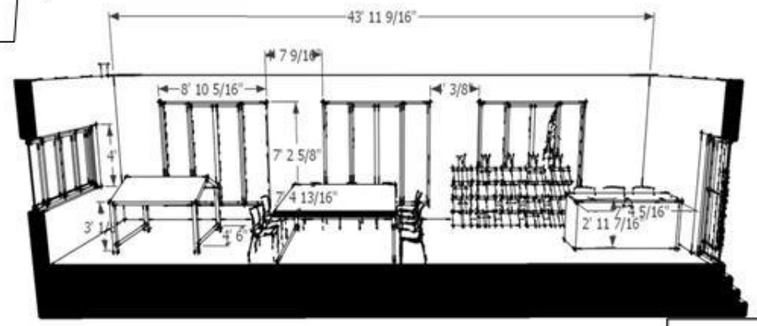
	V	1/2	0.6		0.6	0.18	
					(-)	Total =	$6.66m^2$
	Net Quantity= 14.22-6.66 = $7.56m^2$						
9	Paint Work on outer wall						
	L = 86.1m	1	86.1		3	245	
						Total =	$245m^2$
	Deduction of door/window = $6.66m^2$						
	Net Quantity = 246-6.66 = $238.4m^2$						

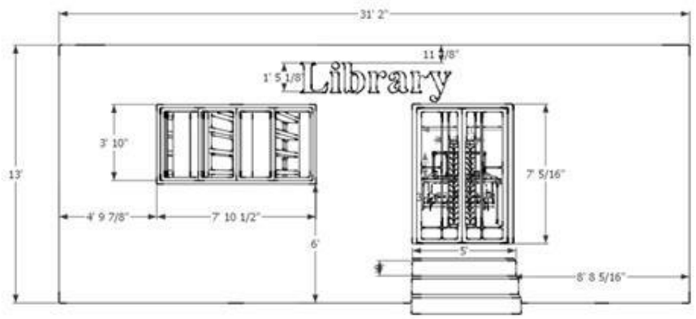
Abstract Sheet of Library

Sr. no	Item Description	Quantity	Rate	Per	Amount (Rs.)
1	Earthwork in excavation in foundation	$47.324m^3$	100	m^3	4732.4
2	Brick Bat Cement Concrete(1:4:8) for foundation	$8.604m^3$	3530	m^3	30372.12
3	Earth Filling in plinth	$59.85m^3$	60	m^3	3590.4
4	Brick Masonry up to plinth in CM (1:6)	$25.39m^3$	3240	m^3	82263.6
5	Brick Masonry above plinth to slab in CM (1:6)	$26.652\ m^3$	3920	m^3	104475.84
6	Smooth plaster inside Rooms & Ceiling	$269.485\ m^2$	100	m^2	26948.5
7	Smooth plaster on outer wall	$141.285\ m^2$	47	m^2	6640.39
8	White wash (inside)	$269.485\ m^2$	63	m^2	16977.5
9	White wash (outside)	$141.285\ m^2$	63	m^2	8900.9
10	Brick work for Parapet wall	$7.17m^3$	3600	m^3	25812
			Total Rs. =		288927
		Add 1.5% Water Charge			4334
		Add 10% Contractor Profit			28893
		Total Estimation cost in Rs.			322154









Schedule of Door & windows			
Sr no	**Type of element**	**Dimension**	**Qantity**
1	Door	7 ' X 5' ft	1
2	W1	7'2" x 8'10" ft	3
3	W2	7'10" x 3'10" ft	3

Design 5

C.K. Pithawala Collage of Engineering & Technology

VISHWAKARMA YOJNA: VIII *AN APPROACH TOWARDS RURBANISATION* **TENARANG Village**

Library Design

All Diamensions are in Feet-inch

CLIENT
C.K Pithawalla College of Engineering and Technology
Near Malvan Mandir Via Magdalla Port,
Dumas Rd, Surat, Gujarat
395007

PROJECT
VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS
RURBANISATION
TENARANG Village

DRAWN BY
Muskan Gheewala
Harshit Mehta

DESCRIPTION
Section,Plan,Elevation

90

8.1.6 Heritage Village Design (Civil)

Bank

A **bank** is a financial institution that accepts deposits from the public and creates a demand deposit while simultaneously making loans.[1] Lending activities can be performed either directly or indirectly through capital markets.

Due to the importance of banks in the financial stability of a country, most jurisdictions exercise a high degree of regulation over banks. Most countries have institutionalized a system known as fractional reserve banking, under which banks hold liquid assets equal to only a portion of their current liabilities. In addition to other regulations intended to ensure liquidity, banks are generally subject to minimum capital requirements based on an international set of capital standards,the Basel Accords.Banking in its modern sense evolved in the fourteenth century in the prosperous cities of Renaissance Italy but in many ways functioned as a continuation of ideas and concepts of credit and lending that had their roots in the ancient world. In the history of banking, a number of banking dynasties — notably, the Medici's, the Fugger's, the Welders, the Bahrenberg's, and the Rothschilds — have played a central role over many centuries. The oldest existing retail bank is Banca Monte deiPaschi di Siena (founded in 1472), while the oldest existing merchant bank is Berenberg Bank (founded in 1590).

Fig 62 Waiting area bank

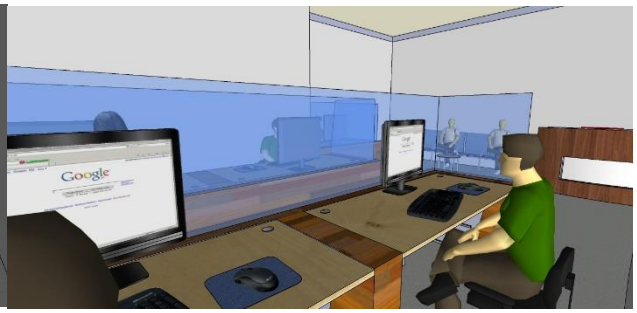


Fig 63 manager area

Estimation Measurement sheet

Table no 35 Measurment SHEET

no	Description	Nos	L	B	H	Quantity
1	Earth Work	16	1	1	1.5	24
				24.00		
2	EARTH WORKS FILLING PLINTH USING EARTH FROM SITE : Filling the plinth and side of the foundation with the cut earth available at site in layers not exceeding 20 cms in depth consolidating each deposited layers by ramming and watering. Measurements will be taken only the filled and compacted earth.					
	Work Area		4.3	7.57	0.15	4.88
	locker room	1	1.45	3.71	0.15	0.81
	Office area	1	3.73	3.71	0.15	2.08

	ATM+Security room	1	1.47	3.71		0
				7.77		
3	ANTI TERMITE TREATMENT: Anti termite treatment by providing and injecting chemical emulsion/Aldrin/heptachleremulsible concentrates 0.50% and clilossdanceemulsifiable concentrate for pre constructional treatment and creating a chemical barrier as per I.S 6313 (Part II) 1951 in wall trench foundation top surface of plinth filling junction of wall and floor along the external perimeters of the building complete (areas of building shall be measured).					
	Work Area	**1**	4.4	7.67	-	33.75
	locker room	1	1.55	3.81	-	5.91
	Office area	1	3.83	3.81	-	14.59
	ATM+Security room	1	1.57	3.81	-	5.98
				60.23		
4	PCC FOUNDATION 1:4:8 Providing and laying P.C.C. 1:4:8 using 40mm nominal size broken stone well consolidated including curing etc. complete for foundation.					
	Pcc	16	1	1	0.3	4.8
				4.80		
5	DAMP PROOF COURSE 1:2:4 : Providing 4 cm thick P.C.C. as a Damp Proof Course with stone chips and approved water proofing compound beneath the walls as per IS:2645-1964.					
	Wall	2	9.19	0.2	-	3.68
	Wall 2	2	7.67	0.2	-	3.07
	----					----
	Total					6.75
	Deduction for Openings					
	----					----
	Total					0
				6.75		
6	PCC FLOORING 1:4:8 CuM: Providing and laying P.C.C. 1:4:8 using 40mm nominal size broken stone well consolidated 100mm thick including ramming, curing etc. complete for flooring.					
	Work Area	1	4.4	7.67	0.15	5.06
	locker room	1	1.55	3.81	0.15	0.89

	Office area	1	3.83	3.81	0.15	2.19
	ATM+Security room	1	1.57	3.81	0.15	0.9
				9.04		
7	Reinforced cement concrete using 20mm machine crushed blue metal including all form work, watering, curing etc. complete, but excluding the cost of reinforcement. Steel staging and supports along with shutter ply or steel plates to be used and machine mix					
	RCC ALL RCCS READY MIX : RCC for All Rccs using Ready Mix.					
	Footings	16	1	1	0.3	4.8
	Columns	16	3.06	0.3	0.3	4.41
	Beams x direction	12	2.55	0.23	0.45	3.17
	Beams z direction	12	3.06	0.23	0.45	3.8
	Steps	4	2	0.2	0.09	0.14
	Waist Slabs	1	1.74	2	0.1	0.35
	Roof Slabs	16	9.19	7.67	0.15	169.17
				185.84		
8	Supplying, fitting, fixing and removing shuttering and staging. Measurements shall be taken as the actual surfaces in contact with the concrete or any other materials requiring formwork.					
	FORM WORK RCC : Form work for rcc.					
	Columns	16	6.72	0.3	-	32.26
	Beams x direction	12	2.55	1.13	-	34.58
	Beams z direction	12	3.06	1.13	-	41.49
	Steps	4	2	0.37	-	2.96
	Waist Slabs	1	1.74	2.2	-	3.83
	Roof Slabs	16	9.19	7.97	-	1171.91
				1,287		
9	Supplying, cutting, bending and straightening reinforcement for R.C.C work; binding with 22 gauge binding wire etc. complete in all respects with deformed bars conforming					

	to I.S 1786-1961 or IS 1139 and placing in position. Weight of steel=7850 Kg/m3.					
	STEEL REQUIREMENTS : Steel Requirements for Columns, Beams, Lintels, Slabs etc.					
	Steel Requirements for All Rccs @1 % of vol. for 185.84 m3 of RCC.	14588.44	-	-	-	14588.44
				14,588.		
10	BRICK WORKS CM 1:3 : First class brick work masonry in C. M. 1:3 (1 cement 3 coarse sand) with approved good quality country burnt bricks of compressive strength 35 kg/m2 of standard size of on super structure of all thickness. The rate shall include cost					
	Wall	**2**	9.19	0.2	3	11.03
	Wall 2	2	7.67	0.2	3	9.2
	----					----
	Total					20.23
	Deduction for Openings					
	Columns	16	3.06	0.3	0.3	4.41
	Beams x direction	12	2.55	0.23	0.45	3.17
	Beams z direction	12	3.06	0.23	0.45	3.8
	----					----
	Total					11.38
				8.85		
11	FLOOR FINISHING MARBLE TILES: Supplying and fixing 20mm thick marble slabs size 80cm x 150cm fixed into the floors.					
	locker room	1	1.55	3.81	-	5.91
				5.91		
12	FLOOR FINISHING CERAMIC TILES : Flooring with cermic tiles 225x225mm (NS) laid in 12mm thick cement 1:3 one coat and pointing with colouredcoment to mortar the tiles including cost of materials labour charge etc. complete for all levels.					
	ATM+Security room	1	1.57	3.81	-	5.98
	Office area	1	3.83	3.81	-	14.59
	Work Area	1	4.4	7.67	-	33.75
				54.32		
13	FLOOR FINISHING CEMENT FLOATING COAT : Cement Flushing Coat.					

	Work Area	1	4.4	7.67	-	33.75
	locker room	1	1.55	3.81	-	5.91
	Office area	1	3.83	3.81	-	14.59
	ATM+Security room	1	1.57	3.81	-	5.98
				60.23		
14	WALL FINISHING CEMENT FLOATING COAT : Wall finishing using Cement Flushing Coat.					
	Roof Slabs	1	9.19	-	7.67	70.49
				70.49		
15	SKIRTING MARBLE TILES IN SqM : Skirting using Marble Tiles					
	walls	2	9.19	-	3	55.14
	wall 2	2	7.67	-	3	46.02
				101.16		
16	DOORS : Supplying and fixing of doors using good quality wood including M.S. clamps and fittings, fixing complete including a coat of tar at the contact surface of the frame.					
	door	3	0.3	-	2.1	1.89
				1.89		
17	PLASTERING BASEMENT CM 1:5 12MM : Plastering with C.M. 1:5, 12mm thick with a neat flushing coat of cement slurry 2.20kg/m2 over water proofed roof slab by adding integral water proofing admoretere of approved brand as per specification including etc. com					
	Foundation	**4**	9.19	-	1.2	44.11
	Foundation 2	4	7.67	-	1.2	36.82
	----					----
	Total					80.93
	Deduction for Openings					
	----					----
	Total					0
				80.93		
18	PLASTERING WALLS CM 1:4 12 MM : Plastering with cement mortar to walls, columns and other structural architectural features at all heights, floated hard and trowelled get smooth finish. The rate shall include provision of grooves scaffolding at any					

	height					
	Wall	**4**	9.19	-	3	110.28
	Wall 2	4	7.67	-	3	92.04
	----					----
	Total					202.32
	Deduction for Openings					
	Columns	16	3.06	-	0.3	14.69
	Beams x direction	12	2.55	-	0.45	13.77
	Beams z direction	12	3.06	-	0.45	16.52
	----					----
	Total					44.98
				157.34		
19	PLASTERING CEILINGS AND SLABS CM 1:3 : Plastering with cement mortar to ceilings, stairs, steps, slabs and other structural architectural features at all heights, floated hard and trowelled get smooth finish. The rate shall include provision of grooves scaffolding at any height curing etc. complete as directed by the Engineer.					
	Roof Slabs	**1**	9.19	7.67	-	1127.8
	Waist Slabs	1	1.74	2	-	3.48
				1,131.28		
20	PLASTERING ROOF TOP CM 1:3 12 MM : Plastering with C.M. 1:3, 12mm thick with a neat flushing coat of cement slurry 2.20kg/m2 over water proofed roof slab by adding integral water proofing admoretere of approved brand as per specification including etc. complete.					
	Roof Slabs	**1**	9.19	7.67	-	1127.8
				1,127.80		
21	PAINTING BASEMENT WHITE CEMENT : Painting basement with white cement two coats.					
	Foundation	4	9.19	-	1.2	44.11
	Foundation 2	4	7.67	-	1.2	36.82
	----					----
	Total					80.93
	Deduction for Openings					

	----					----
	Total					0
				80.93		
22	PAINTING CEILINGS AND SLABS WHITE WASHING: White washing three coats to the ceiling.					
	Roof Slabs	16	9.19	7.67	-	1127.8
	Waist Slabs	1	1.74	2	-	3.48
				1,131.28		
23	PAINTING ROOFTOPS COLOUR WASHING: Color washing the roof over a coat of white wash.					
	Roof Slabs	16	9.19	7.67	-	1127.8
				1,127.80		
24	PAINTING WALLS EXT. WHITE WASHING: White washing three coats to the walls.					
	Outer Walls	1	33.72	-	3.3	111.28
				111.28		

Abstract sheet

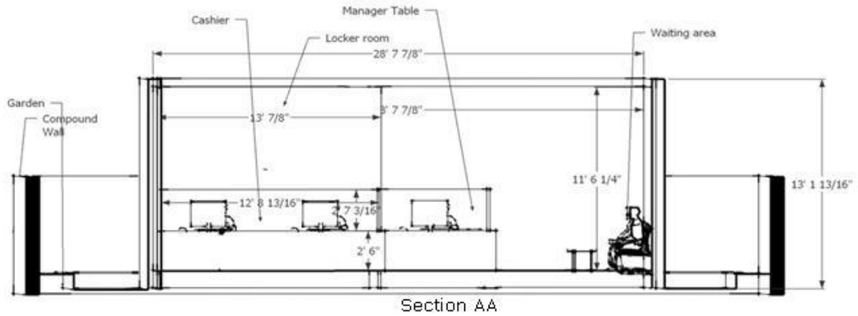
Table no 36 ABSTRACT SHEET

SlNo	Description	Quantity	Unit	Rate	Amount
Ground floor					
Earth works					
1	Earth works excavation	24.00	Cu.M	102.00	2448.00
2	Earth works filling plinth using Earth from site	7.77	Cu.M	49.00	380.73
3	Anti-termite treatment	60.23	Sq.M	200.00	12046.00
					14874.73
Pcc					
4	Pcc foundation 1:4:8	4.80	Cu.M	2,676.00	12844.80
5	Damp proof course 1:2:4	6.75	Sq.M	110.00	742.50
6	PCC FLOORING 1:4:8 cum	9.04	Cu.M	2,736.00	24733.44
					38320.74
Rcc					
7	Rcc all rccs ready mix	185.84	Cu.M	0.00	0.00
					0.00
Form works					
8	Form work rcc	1,287.03	Sq.M	150.00	193054.50
					193054.50
Steel requirements					

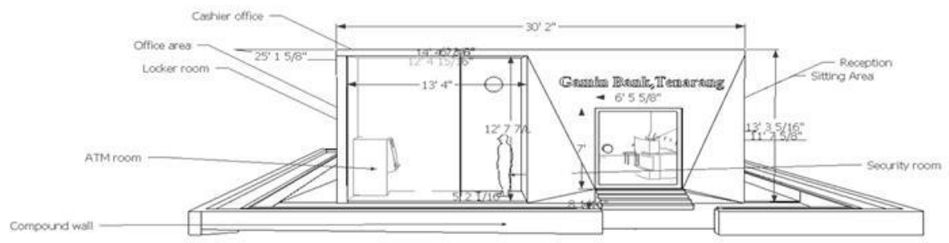
9	Steel requirements	14,588.44	Kg	30.00	437653.20
					437653.20
		Brick works			
10	Brick works cm 1:3	8.85	Cu.M	2,490.00	22036.50
					22036.50
		Floor and wall finishes			
11	Floor finishing marble tiles	5.91	Sq.M	700.00	4137.00
12	Floor finishing ceramic tiles	54.32	Sq.M	600.00	32592.00
13	Floor finishing cement floatingCoat	60.23	Sq.M	151.00	9094.73
14	Wall finishing cement floatingCoat	70.49	Sq.M	150.00	10573.50
15	SKIRTING MARBLE TILES IN sqm	101.16	Sq.M	600.00	60696.00
					117093.23
		Doors and windows			
16	Doors	1.89	Sq.M	2,780.00	5254.20
					5254.20
		Plastering and pointing			
17	Plastering basement cm 1:5 12mm	80.93	Sq.M	90.00	7283.70
18	Plastering walls cm 1:4 12 mm	157.34	Sq.M	94.00	14789.96
19	Plastering ceilings and slabs cm 1:3	1,131.28	Sq.M	78.00	88239.84
20	Plastering roof top cm 1:3 12 mm	1,127.80	Sq.M	101.00	113907.80
					224221.30
		Painting			
21	Painting basement white cement	80.93	Sq.M	31.00	2508.83
22	Painting ceilings and slabs white Washing	1,131.28	Sq.M	11.00	12444.08
23	Painting rooftops colour washing	1,127.80	Sq.M	12.00	13533.60
24	Painting walls ext. White washing	111.28	Sq.M	11.00	1224.08

Total for GROUND FLOOR 1082218.99

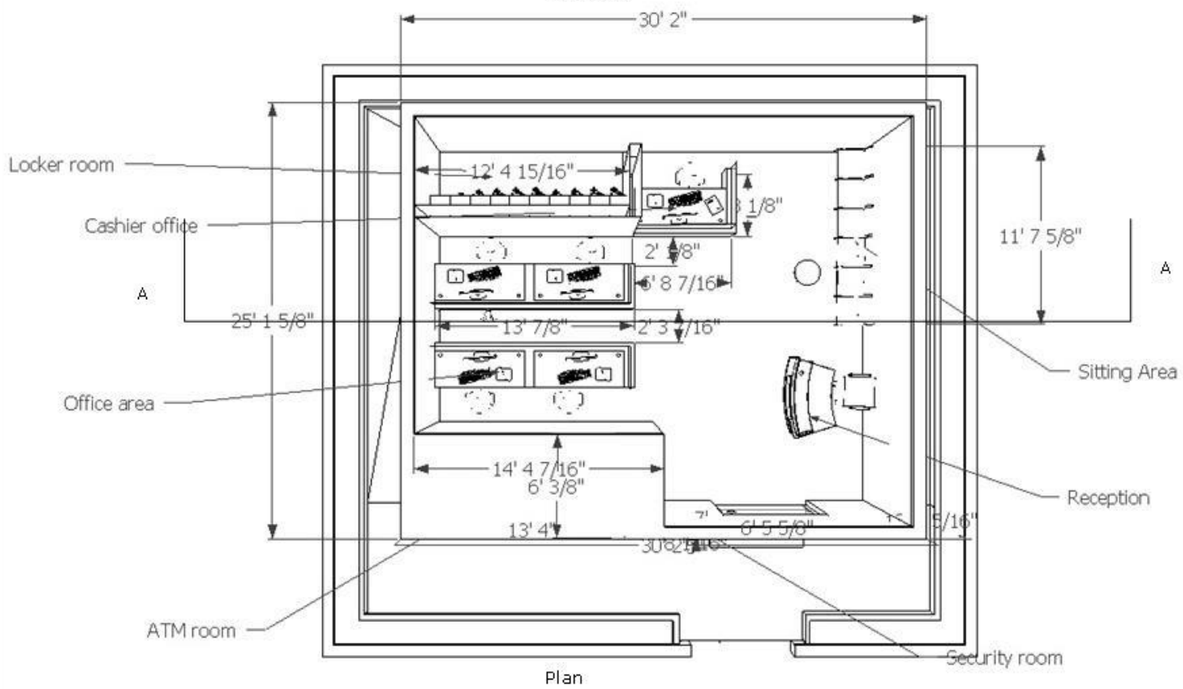
Total 1082218.99



Section AA



Elevation

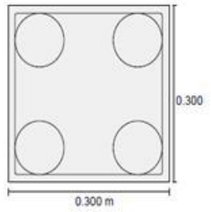


Plan

STAAD.Pro Query Concrete Design

Beam no. 7

Design Code: IS-456



Design Load

Load	2
Location	End 2
Pu(Kns)	6.090000
Mz(Kns-Mt)	0.020000
My(Kns-Mt)	1.430000

Design Results

Fy(Mpa)	500
Fc(Mpa)	30
As Reqd(mm²)	23.000000
As (%)	0.503000
Bar Size	12
Bar No	4

Column c/s details

STAAD.Pro Query Concrete Design

Beam no. 1

Design Code: IS-456

Design Load

Mz(Kn Met)	Dist.et	Load
1.150000	1.500000	1
-1.370000	0.000000	1
-2.040000	3.100000	1

Design Parameter

Fy(Mpa)	500.000000
Fc(Mpa)	30.000000
Depth(m)	0.230000
Width(m)	0.450000
Length(m)	3.063330

Beam c/s Details

Design 6

C.K. Pithawala Collage of Engineering & Technology

VISHWAKARMA YOJNA: VIII *AN APPROACH TOWARDS RURBANISATION* **TENARANG Village**

Bank

All Diamensions are in Feet-inch

CLIENT
C.K Pithawala College of Engineering and Technology
Near Malvan Mandir Via Magdalla Port,
Dumas Rd, Surat, Gujarat
395007

PROJECT
VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS
RURBANISATION
TENARANG Village

DRAWN BY
Muskan Gheewala
Harshit Mehta

DESCRIPTION
Section,Plan,Elevation

99

8.1.7 Electrical Design 1

Hybrid Streetlight

With the rapid economic development, energy consumption has increased year by year. The urgent need for new clean renewable energy exists. In the current number of renewable energy, wind and solar energy's potential is the largest, and has the most development value. They are an inexhaustible renewable energy. A basic benefit of hybrid energy is first, using a single solar or wind power, there is a problem that, when it is winter, the wind is rich but the solar energy is lacking; when it is summer, they are just the opposite. So, wind and solar energy can be very strong complementary for each other. The key feature of this new concept is the arrangement of a multiple Savories vertical axis wind turbine into the structure itself of the post. A photovoltaic panel is integrated to contribute to power generation. The energy is collected by a power conversion equipment along with a storage device which ensures the lighting also during windless nights. Among fields ready for a coupling between electrical sources and load, there is outdoor lighting. Pole structures carrying on lamps can be suited to allow the installation of renewable energy devices. Here we have presented in the Savories-type wind turbine, along with a tilted PV panel, into the light housing of a light post prototype.

8.1.7.1 Construction

- Photovoltaic (PV) module- monocrystalline/polycrystalline
- Small wind turbine-400W/600W/1500W/3000W (12V/24/48/96V)
- Light source – ultra bright LED light 20/30/40/60/80/90/120W
- Controller – 5/10/15A wind solar hybrid controller, automatic light controller, automatic operation, multi work mode, over charge protection, high wind protection etc.
- Energy Storage – sealed maintenance free deep cycled battery
- Battery Box – water proof design battery box
- Light Pole – 6/8/10/12/16m light pole with 30/50m/s wind resistance

8.1.7.2 Solar components

The solar energy is an uninterrupted source available for the entire nation at least for a few hours. Solar power is available (9am to 6pm) during the day hours. Recently the researchers has made a record by utilizing 44.4% of the energy from solar with Gallium Arsenide, at highways there is none street lights placed in a shady area, but only in the middle. Though the solar panel is in middle there will no fluctuation in the power generated by panel it will remain as a default output.As show in fig., the output of the solar energy is taken to a voltage regulator to maintain a constant voltage. The regulated voltage is stored in a DC-Battery source.

Fig 64 Solar Plate Specifications

Solar Plate Specifications

Nominal capacity: 100 Wp
MPP current: 5.9 A
MPP voltage: 17 V
Short circuit current: 6.5 A
Open circuit voltage: 21 V
Max. Voltage: 820 V
Length: 100.61 cm
Width: 66.6 cm
Depth: 3.51 cm
Weight: 7.5 kg

- The cost of per piece solar panel with maximum capacity 100Wp (peak watt) is ₹4500 (approx.) / 50, 00 €. And the same of per peak watt (Wp) is ₹45 / 0, 50 €.

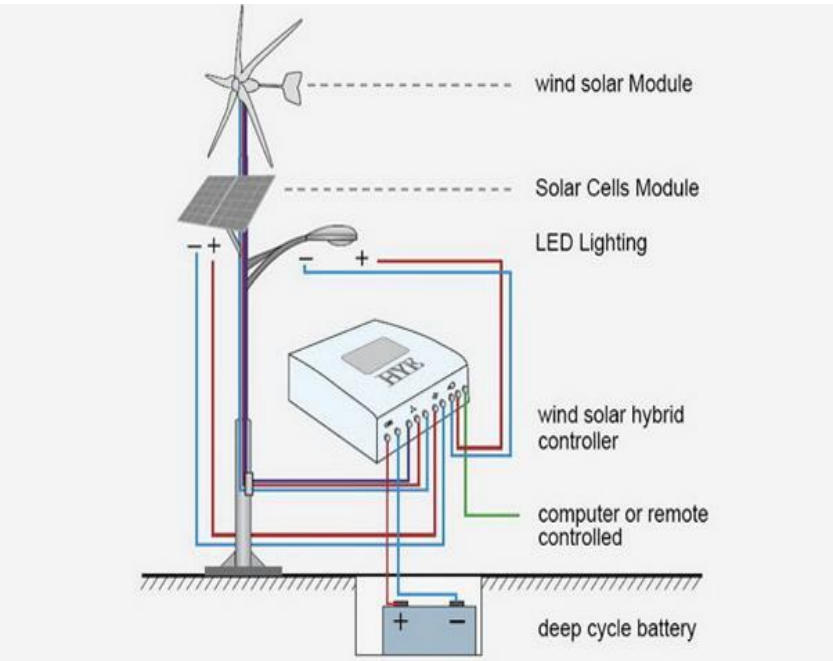


Fig 65 Hybrid Streetlight

8.1.7.3 Wind Components

Wind farms are erected based on the availability of atmospheric pressure of wind in a specific region. At Highways there is availability of wind by the motion of moving vehicles. When a free moving air particle is disturbed by forceful object succeeding in its path a pressure is developed at the body of the object and it is delivered to the surrounding near objects. By this phenomenon wind turbine is placed on the top of street light.

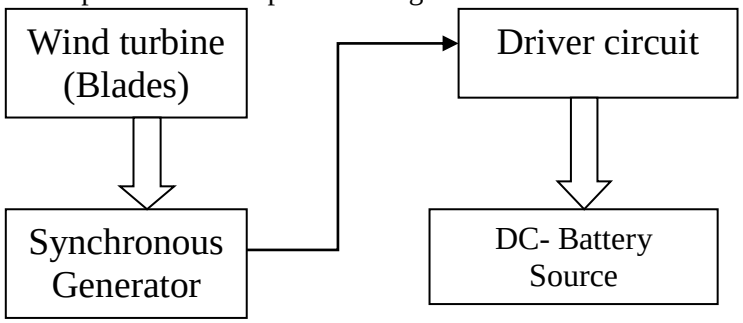


Fig 66 Block Diagram of working of wind energy generation

8.1.7.4 Materials and methods

- A wind turbine is composed of several composite parts; but the blades, made of fiber-reinforced epoxy or unsaturated polyester, represent the largest use of material. Other turbine parts made of polyester include the nacelle and the hub.
- A standard 35- to 40-meter blade for a 1.5-MW turbine weighs 6 to 7 tons.
- Both epoxy and polyester, and to a lesser extent vinyl ester, shared the wind blade business in the early days but epoxy earned preferred status as blades grew longer. Polyester is easier to process and is less expensive, but epoxy offers stronger mechanical performance particularly tensile and flexural strength for blades longer than 26 m (85 ft.). Unlike epoxy, polyester needs no post-curing but the blades are generally heavier. E-glass is by far the most used reinforcement, while more costly carbon fiber is employed on a limited basis for greater stiffness and reduced weight in longer blades.

- The turbines rotates when the pressure is developed the median of the turbine is coupled with synchronous generator.
- An AC output is obtained is given to the driver circuit were the AC input in converted to DC and the power is stored.

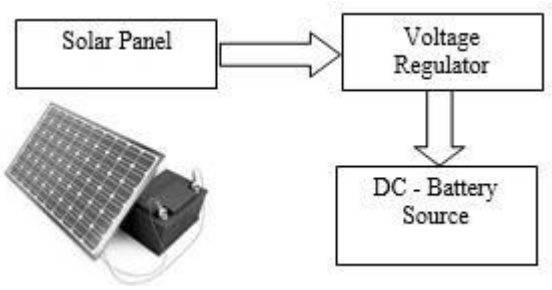


Table 36 Blade size and output

Blade Size in meters	Blade Size in Feet	Power Generated
35 – 40 m	131.2	**1.5 MW**
43 m	142	**2–2.5MW**
50 – 60 m	196.8	**7.5MW**
3.2m	10.496	**2 KW**
2m	6.56	**450W**

8.1.7.5 Operation of light source

- The loads are street light, traffic signal, direction indicator. All the loads are light loads. It's important to choose the type of lamps to be used. Currently at most of the Highway street lights, they prefer sodium vapor lamp or halogen lamp or CFL in some areas because it has a better scattering property. The use of these lamps consumes more power based on luminance.
- Each and every lamp varies from other based on high luminance its preferred for street lighting as show in the table below, it give a clear view about the kinds of lamps used in street light with different lumen capacity as per the required watts for luminance.

Table no 37 Type of Light with Various Composition

Sr. No	Type Of Light With Various Composition	Typical Luminous Efficiency (Lumen/Watt)
1	Mercury Vapour Lap	35-60
2	Low Pressure Sodium Vapour	100-200
3	High Pressure Sodium Vapour	85-150
4	Halogen	16-24
5	Led	30-90

The sodium vapor lamp consumes 100-200w of power for an hour

- Power consumed per day = 4800 W
- Power consumed per month = 144000 W
- Power consumed annually = 1752000 W

- The use of Power LED's reduces this power consumption being utilized, the luminance effect of power led is almost equivalent and better the present days lighting system. This power consuming can be reduced to a larger limit. The power consumption is minimized and rest of the power can be utilized for other purposes. The heating of lamp is another major factor which we need to consider it determines the life and ability of lamps brightness. The rectangular design of LED's are quite brilliant and spread the lights evenly throughout the place.
- The power led gives a better outcome than the normal LED's there are various shapes and designs available for effective brightness and scattering of light over the required area.
- There are various designs like square, rectangular, circular, strips and soon. The emission of light varies from each design available in the manufacturing.

8.1.7.6 Converter circuit

- The supply is from both sources. V1 is the supply from the wind and V2 is the supply from the solar the mode of operation of the circuit. A battery source is placed in between both the input sources v1 and v2, and source currents iL1 and iL2 are flowing from the source.
- The two Inductors L1 and L2 make the Input power ports as two current type sources. It results in drawing smooth currents from the sources. R L is the load resistance and switches S1 – S4 are the main controllable element that controls the power flow of the hybrid power system.

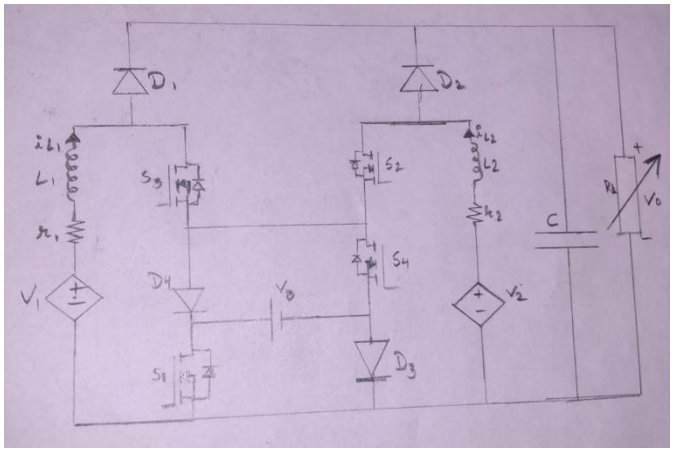


Fig 68: Circuit diagram of Converter

8.1.7.7 Operation and functioning

In this proposed hybrid system, solar and wind energy is made hybrid. The power obtained from the sources are converted to a DC and stored in a battery. Both the outputs are uneven, the rotation of the wind turbine may vary; it depends on the speed of the vehicle crossing the area at a particular instance. The blades of the turbine are made up of polymer or fiber. The wind energy generation system is placed at the corners edges of the streets or near the traffic signal were we can find a steady flow of vehicle. Use of Light weight blades can produce rotational motion at low wind. The solar output also depends on the intensity of the light. The lights are replaced by power lads for an effective output and low power consumptions. A switching circuit is made when there are voltage generation from solar the street lights gets TURNED OFF. In the absence of solar power the lights are TURNED ON. This power can also be synthesized by traffic signals, direction and distance indicator.

As shown in Fig., all the switching process are carried out in the controller unit alternate charging and discharging processes is carried out with the available resources guidelines of using the using the street lights gives idea about the betterment operation and management of the street light.

Cost Estimation

Primary cost elements tracked in the model include the following:

- Rotor
- Blades
- Hub
- Pitch mechanisms and bearings
- Spinner, nose cone
- Drive train, nacelle
- Low-speed shaft
- Bearings
- Gearbox
- Mechanical brake, high-speed coupling, and associated components
- Generator
- Variable-speed electronics
- Yaw drive and bearing
- Main frame
- Electrical connections
- Hydraulic and cooling systems
- Nacelle cover
- Control, safety system, and condition monitoring
- Tower
- Balance of station
- Foundation/support structure
- Transportation
- Roads, civil work
- Assembly and installation
- Electrical interface/connections
- Engineering, permits

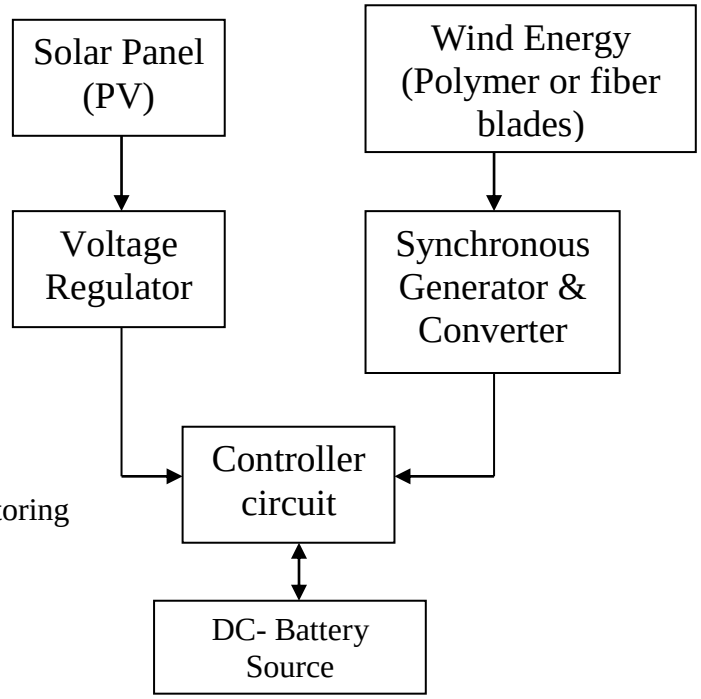


Fig 69 Flow chart of working of Hybrid power system in Street lights

Table no 38 WIND TURBINE

SR. NO.	WIND TURBINE	COST (IN ₹) (APPROX)
1	50W / 12/24V	21634
2	100W / 12/24V	42272
3	150W / 24V	51110
4	300W / 12V (6 blades)	65499

Similarly, cost of solar panel goes :
For 100 watt panel – Rs. 4500
For 200 watt panel – Rs. 6400
For 250 watt panel – Rs. 8000
Hybrid wind solar controller
LCD Economic PWM Wind Solar Hybrid System Controller (600w Wind + 400w Solar) 12v/24v costs upto 10k.

LED light system can come from wide range of 18w to 100w ranging ₹150-5000.
Though the installation cost is high, the payback period for the excess investment is approximately 5.9 yrs for the proposed HYBRID powered LED lighting system.
So, street light using hybrid power is economically feasible in considering the payback period and cost for life time. Hence the idea to replace the existing system by hybrid system is efficient both from economic and energy saving point of view.
Besides, the cost of PV and LED technology is reducing and the cost of energy is increasing. This will, in future, further reduce the payback period, life cycle cost of the proposed system and also the cost of installation. Hence the energy saving will be on the large and the initial investment will be on the smaller side in due course of time.

8.1.7.8 COST ANALYSIS

Energy Consumption

A typical street light having sodium vapour lamp consumes 100w for an hour.
Power consumed for 12 hour operation / day = 100 * 12 = 1200wh
Power consumed in annually = 1200 * 365 = 438000 Wh
Annual cost of street lighting, tariff being 4.5 / unit = 438Kwh * 4.5 = 1971

Energy Generation

Solar-

A 100w/12v solar panel calculation
Energy generated in 6 hours of direct sunlight / day = 100 * 6 = 600wh
Energy generated annually = 600 * 365 = 219000wh

Wind-

Blade length = 1m
Wind speed = 12m/s
Air density $\rho = 1.23\ kg/m^3$
Area= $\pi r^2 = 3.14\ m^2$
Pavail $= 1/2 * \rho * A * v^3 * Cp$
$= 1/2 * 1.23 * 3.14 * (12)^3 * 0.4 = 1337\ W$
Energy generated in a day = 1500 Wh (approx)
Energy generated annually = 1500 * 365 = 547500 Wh
Total annual energy generation = 547500 + 219000 = 766500 Wh
Energy saved in a year = 766500 – 438000 = 328500 Wh
Cost of extra generated power = 328.5 Kwh * 4.5 = Rs. 1478.25
Annual monetary saving = Annual cost of street lighting + cost of extra power produced
= 1971 + 1478.25
= Rs. 3500 on an average
From All the details for single light pole,
a total of 30 poles in the village will save total of 3500 * 30 = Rs. 105000
Installation cost of each light pole = Rs.10000
Total installation cost = Rs.300000
Annual maintainence cost = Rs. 35000
Overall payback period of the design = 300000 / (105000 – 35000) = 4.2 years

8.1.7.9 Benefits

- Wide applicable areas – hybrid system offers a much better reliability and sustainability to areas with less solar radiation level, long rainy season or long winter.

- Longer battery life – normally wind turbine generates more power during night, part of power generated will supply the light directly, part of power could charge the battery during night, so less charging and discharging loss from battery and also each battery charging cycle is prolonged.
- More cost-effective in windy areas – in the area with annual wind speed of 5-7m/s, wind solar hybrid system could have higher production to power higher capacity LED lights or more lights which could lower the system overall cost.
- Easier installation & Maintenance – solar street light system cannot put bigger (max. 360W in two sections) PV panels on light pole considering wind load; wind solar hybrid system allows bigger capacity installed on light pole, which could generate enough electricity to power 2-4 LED lights, which means one power system supply for 2-4 lights, it will be easy for installation and maintenance.

TO PUT IT IN EASE:

- Energy saving and environment friendly
- Easy installation.
- Low noise, high reliability
- Better efficiency
- Meets the basic power requirement of remote areas.
- 24*7 supply of electricity can be easily promised.
- Can be used as a standalone system.
- Low maintenance

8.1.8 Electrical Design 2

Automatic Water Level Controller using GSM

Unexpected shortage of water supply is common phenomena especially in dense population such as in hostels. Water supply in the village houses is usually drawn from tank at the roof top of the home. Apparently there is no early warning system to monitor the tank water level when it has reached the critical level. The situation worsened when there is no personnel or technician in-charge to do the maintenance at the time it is needed. It becomes worst especially at the week ends and public holidays. People have to wait for couples of days for the water supply to resume.

8.1.8.1 Components

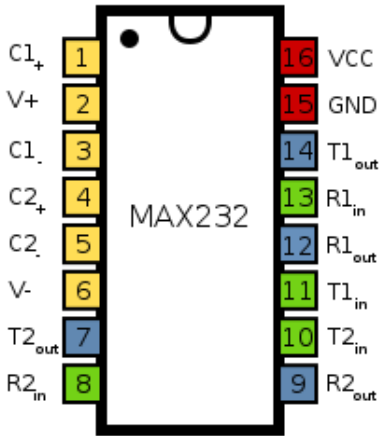


Fig 70 MAX 232

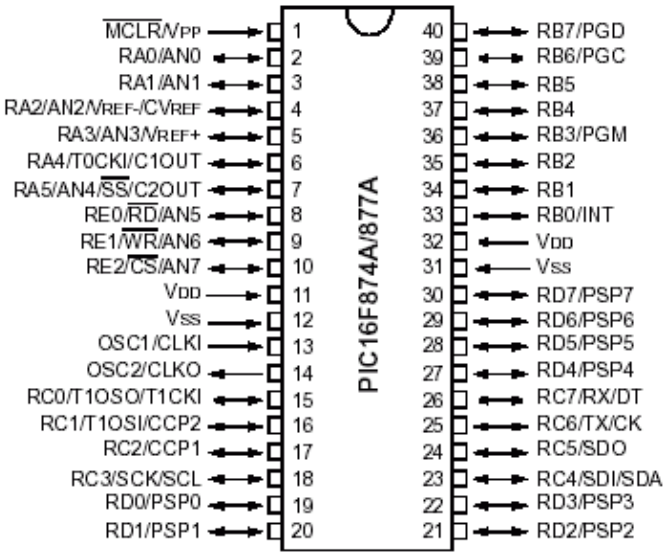


Fig 71 Pin diagram of PIC

1. MICROCONTROLLER:

We used PIC16F877A in a microcontroller circuit for processing unit. PIC microcontroller is used as a central processor because its capability to operate without other external components due to all necessary peripherals is already built into it. Thus it reduce time and space required to construct the device. This PIC works on a 5V DC power supply, with a 20 MHz crystal oscillator and 2 units of 22pF capacitors.

2. MAX 232:

The MAX 232 is a dual transmitter / dual receiver that typically is used to convert the RX, TX, CTS and RTS signals. On the GSM SIM 800 modem there is onboard MAX 232. Also we cannot establish a direct communication between microcontroller and GSM SIM 800 because operating voltages of both these are different. Since microcontroller operates at 5V and GSM modem at 3.3V so there is need to provide one driver IC. MAX 232 acts as a driver IC and helps to establish a communication between microcontroller and GSM modem. It is 16 pin IC.

3. MAGNETIC FLOAT SENSOR:

A float sensor is a device which is used to detect the level of liquid within a tank or container. Magnetic float sensor is an electromagnetic ON/OFF switch. It helps to sense the level of water present in the overhead tank. These sensors contains permanent magnet in the float. The switch is present in the white stem of the sensor. When water level increases float rises and as water level decreases float falls. This process will help to detect the water level within tank or container. Thereby the information which is obtained from the sensors is sent to user via GSM modem.

4. GSM SIM 800

SIM800 is a complete Quad-band GSM/GPRS solution in a SMT type which can be embedded in the customer applications. **SIM800** support Quad-band 850/900/1800/1900MHz, it can transmit Voice, SMS and data information with low power consumption. A SIM card is required for its operation and it works on AT commands.

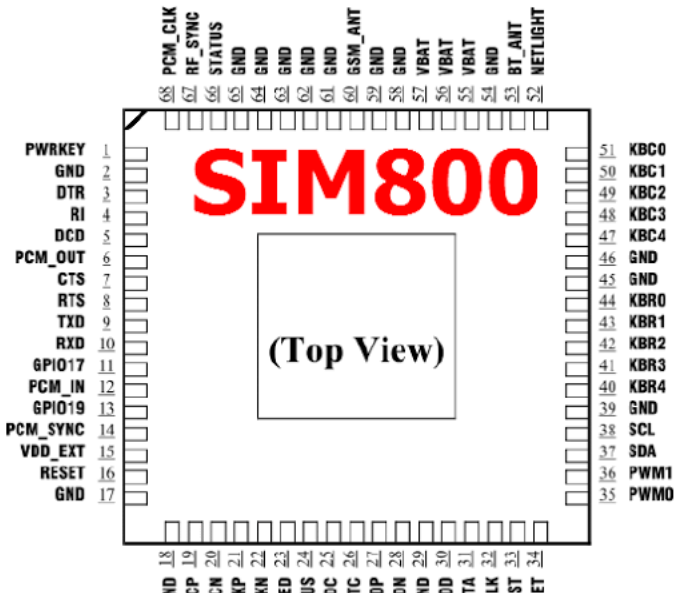


Fig. 72 GSM SIM 800

Fig. 73 Magnetic Float Sensor

PIC 16F877A microcontroller was used for the GSM circuit. It has 40 pins for multipurpose usage.Three of the pins at port A were used as an input from water level detector. RA0, RA1 and RA2 pins were input from water level detector circuit. Pin 13 and pin 14 were connected to 20 MHz crystal oscillator for delay. Pin no 1 was connected to MCLR (Master Clear) and at pin RE0 there was reset button to reset the activity loop done by the microcontroller. Port B was used as an output for PIC microcontroller and sent signal to GSM phone. Besides, the microcontroller interact with MAX232 at port C; RC6 as transmitter and RC7 as receiver.
For the MAX232 IC operation that act as a driver/receiver, the receiver and transmitter pin were used to receive and transmit data from GSM modem interconnected with female 9 pin connector. The signal from the microcontroller was connected to the receiver of MAX232 through pin R1OUT before converting the signal level, sent to the GSM modem through pin R1IN and finally sent SMS to the person in-charge hand phone.

8.1.8.2 System Architecture

The water level measurement system was designed to calculate water level and can work well to receive and send message to users. The initial setting data can be inputted into the system via SMS. Upon receiving the SMS to request water level data, the system will send the result of water level measurement data. It provides automated restarting if normal conditions are re-established. The use of mobile phone has become more common and this system is useful for farmers. r. This is not only for water tank but also used for oil level and chemical lab. They designed a system in such a way that its components will be able to prevent the wastage of water.

1. TRANSMITTER PORTION:

First, detection of water level in the tank is done by using magnetic float sensor. This information is send to user by SMS notification using GSM technology. Detection of water level will be done according to three stages- low, moderate and high; and this information is sent to user. User can also check the water level within tank by simply sending a message to GSM module at transmitting section by using an android application. This application can be developed online by using MIT app inventor. When user send message to GSM module at transmitter site as "*WLEVEL?03#" through an android app for knowing the water level. The GSM module at transmitter site will then send message to user according to water level within tank. Even if the water level is high or low then also a message is sent to user by GSM module automatically.

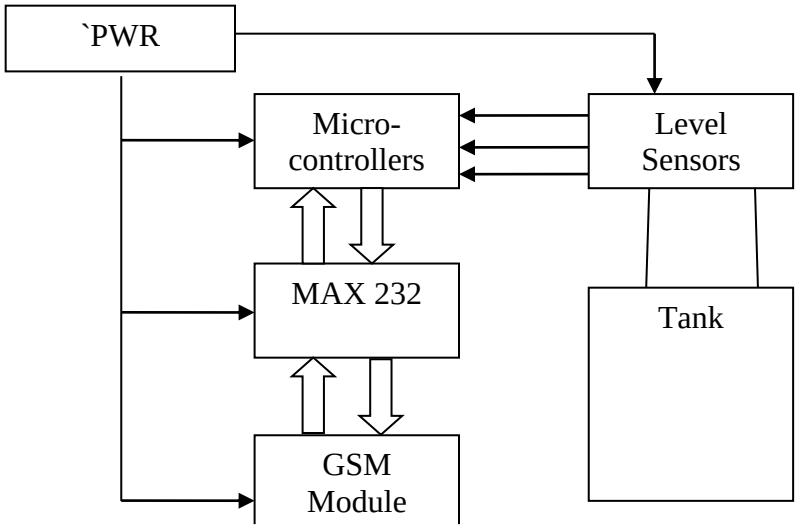


Fig. 74 Block Diagram of Transmitter Section

2. RECIEVER POR

According to information of the water level, user can ON or OFF the pump by sending message by using same android app. To turn ON the pump user will send message as "PMPON01#" and to turn OFF the pump user will send message as "PMPOFF02#".
So, there are three type of messages are sent by user by using app such as-

1- "*WLEVEL?03#"(this message is used to know water level within tank)
2- "PMPON01#" (to turn on the pump)
3- "PMPOFF02#" (to turn off the pump)

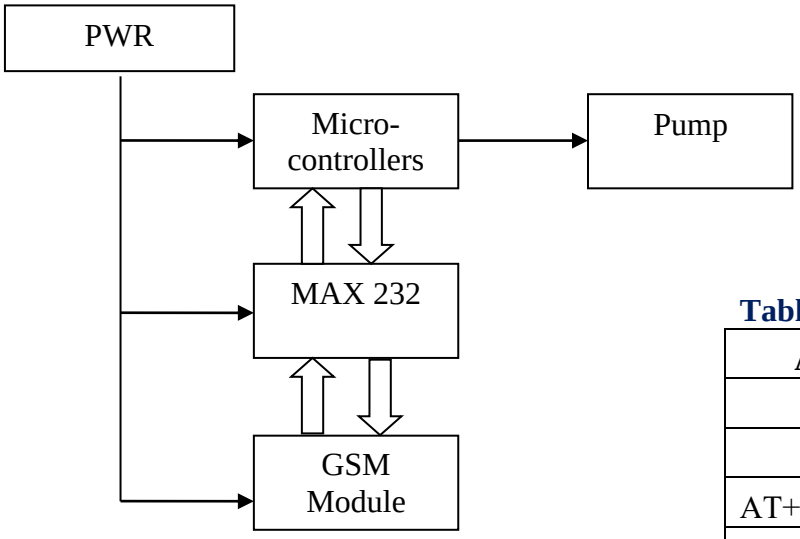


Fig. 75 Block Diagram of Receiving Section

Table 39 AT commands for GSM Modem

AT COMMANDS	USAGE
AT+CMGF=1	Text Mode
AT+CMGR=1	Read SMS
AT+CMGS="83xxxxxxxx"	Send SMS
AT+CMGDA	Delete All SMS

8.1.8.3 Benefits

The implemented overall system is user friendly, with less time required for working of system. The system is designed to avoid and control wastage of water and also to reduce manpower. Water is one of the most valued thing for all living beings on earth. If there was no water there would be no life on the earth. But unfortunately a large amount of water is being wasted by uncontrolled use. Some water level monitoring and control systems are also offered so far but most of the method have still some disadvantages. This design provides a system that could monitor the tank water level and report its level via SMS notification using GSM technology. It is developed with a capability to detect low level of the water in the tank and notify GSM modem to send SMS to the intended user hand phone or person in-charge. The microcontroller as central processor is connected to the modem using MAX232 to check the microcontroller operation. Also to implement the user friendly system

8.1.9 Electrical Design 3

Replacement of Light Source

8.1.9.1 Introduction

Invented by Thomas Edison in last quarter of the 19th century, modern incandescent electric light bulbs have been lighting much of the world for more than 100 years. Incandescent bulbs are lit by heating a wire tungsten filament until it begins to glow. Because approximately 90 percent of the energy generated in these bulbs is heat instead of light, they are extremelyinefficient. The average incandescent bulb has a lifespan of about 1,500 hours—a fraction of what you can get from a CFL or LED bulb.Halogen lights are a more efficient form of incandescent lighting because they last longer; however, they get hotter than regular incandescent bulbs and pose fire

and burn hazards.For nearly every incandescent bulb still in use today, there's a CFL or LED bulb that can replace it—saving energy and curbing carbon emissions. If you still have incandescent at work or home, it's time to send them back to the Dark Ages.

8.1.9.2 Types of light sources

- **A FLUORESCENT BULB** is a low-pressure mercury-vapor gas discharge bulb that uses fluorescent to produce visible light. Mercury vapor is produced when an electric current makes contact with the gas, which produces short-wave ultraviolet light which then causes a coating on the inside of the bulb to light. A fluorescent bulb is more efficient than an incandescent bulb but is less efficient than a LED bulb.

Fig 76 A FLUORESCENT BULB

- **INCANDASCENT BULBS** work by conducting an electric current along a filament made of a long, thin piece of tungsten metal. The filament must be heated to temperatures of about 2,300 °C to glow and emit a white-hot light. But the process transforms only 5-10% of the electricity used into visible light. The rest is transformed into heat, which can eventually increase the temperature of a room.

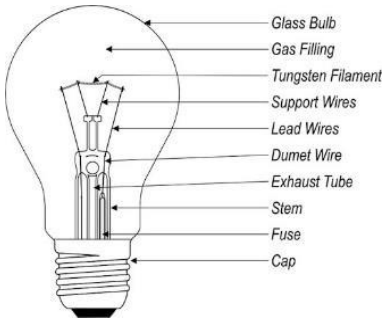


Fig 77 INCANDASCENT

Fig 78 CFL

- **CFL** bulbs are made of glass tubes filled with gas and a small amount of mercury. The amount is so small that an old-fashioned glass thermometer holds 100 times as much mercury as one CFL bulb. Light is emitted when mercury molecules in a CFL bulb become excited by electricity running between two electrodes at its base. The mercury emits an invisible ultraviolet light that becomes visible when it hits the white coating inside the CFL bulb.

- LED, or light-emitting diode, is a two-lead semiconductor light source. These types of bulbs are Solid State Lighting (SSL), organic light-emitting diodes (OLEDs) and light-emitting polymers (LEPs). LED lights are often more efficient, durable and longer lasting than other types of light bulbs.

That is the reason **behind recommendation of making the transition to LED bulbs throughout the home.**

Fig 80 LED bulbs

Comparison

- Energy Efficiency in order of most to least efficient, it is LED, CFL then incandescent. LED use about 90% less energy than incandescent and CFL use about 75% less energy than incandescent.
- Lifespan on average, incandescent light bulbs last 1,100 hours, CFL last 8,000 hours and LED last 15,000+ hours. That means for 15,000 hours of usage you would need 14 incandescent bulbs, 2 CFL bulbs and only 1 LED bulb.
- Environmental impact CFL bulbs aren't even as environmentally friendly as LED bulbs.
- Concluding from the basic comparison, undoubtedly, LED is superior. LED light bulbs use less energy, produce fewer toxins, are made from non-toxic materials and are recyclable. They are considered to be earth-friendly.
- Fluorescent lighting uses mercury which can be dangerous to our environment. It was found, if one 13-watt CFL and one 60-watt incandescent (which are considered almost equivalent) are lit up for 8,000 hours, the incandescent uses four times the energy and four times the mercury!

Table no 40 Comparison

	INCANDASCENT	CFL	LED
LIFE SPAN (avg)	1300h	8000h	25000h
WATTS used	60 W	13-15 W	6-8W
Avg cost / bulb (Rs)	70	150	250-300
Bulb for 25000h	21	3	1

Cost of bulb for 20year period (Rs)	1470	450	300
Cost of electricity (Rs) (25000h at Rs12 / KWh)	230.76	37.5	12
KW of electricity used	3290 KWh / year	780 KWh/year	330 KWh/year
Annual operating cost (Rs)	24215	5650	2420
Light output (lumens)			
450	40W	9-12W	4-5W
800	60W	13-15W	6-9W
1100	75W	18-25W	10-13W
1600	100W	24-30W	16-19W
2600	150W	30-55W	25-28W

8.1.9.3 COST ANALYSIS

Most of the houses in the area use incandescent type of lamp as light source. A typical house in vicinity consists of 8-10 incandescent bulbs which run smoothly for about 2-3 months.

INCANDESCENT

Maximum bulbs per house = 10
No. of bulbs / year = 10 * 4 = 40
No. of bulb in 10 years = 400
Cost per bulb = Rs. 70
Maximum cost / year = 4 * (10 * 70) = Rs. 2800
Maximum cost in 10 years = Rs. 28000

LEDBULBS

A single LED bulb has a life span of 5-6 years at peak.
Maximum bulbs per house = 10
No. of bulbs in 10 years = 20
Cost per bulb = Rs. 300
Maximum cost in 10 years = 20 * 300 = Rs. 6000
With no single thought, LED as a light source should be implemented in each of the household for large scale cost effectiveness and extensive economic conservation.

8.2 Reason for Students Recommending this Design

- Villagers Recommendation
- According to Situation in COVID-19
- Bank designed due to there is not any bank near 10 km.
- Lake beatification for recreational area.
- Public latrine as per gap analysis.
- Clinic there is no PHC/medication facility near 23 km.
- Library designed because of COVID-19 pandemic, there is no supplement of newspaper.

8.3 About designs Suggestions / Benefit of the villagers

- Economic profit
- Villagers facility
- Reduce manpower

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

After multiple visits and data collection, we reckon important and needed infrastructures in the village and will be providing as such,

1. **Entrance Gate**
   There is no entrance gate in the village available. On the village there is not any boundary of village available in village.

2. **Gram Panchayat**
   Gram panchayat of village is really needs maintenance in the village because there is gram panchayat in poor condition (gram panchayat image pg – 41)

3. **Community Hall**
   Community hall is available in village but there is a small according to villagers. To increase the capacity of community is required. And also a required maintenance (pg 41).

4. **Easy plan for Pucca house**
   According to survey there is 80% of the house are of kuchha house hence that there is req of easy plan that estimate cost within 20 lakhs construction of house (Fig given on pg 39)

5. **Police station**
   There is no police Station available in the village and according to gap analysis 1 police station required per village hence as per gap analysis in village is police station required.

6. **Bio Gas Plant**
   The use of biogas systems in an agrarian community can increase agricultural productivity. All the agricultural residue, and dung generated within the community is available for anaerobic digestion, whereas previously, a portion would be combusted daily for fuel. And major village income is vegetable. Hence one resource of income available in village

7. **Flat Plate Solar Water heater**
   In application to heat the water with zero electric charges in the coming future, a very cost saving design for the multipurpose water applications; in houses or in farms or in factories and industries.

8. **Design of biogas generator**
   Excess of bio-waste being left or burnt out as a residual, can be used a great source of electricity generation when used as biogas in the specific-fuel powered generators.

9. **Automatic sensor lights**
   Conservation of energy as most the electricity is wasted with the careless behaviour of the people letting the lights on even after use. Electricity can be saved when done on a larger scale like a town.

10 Conclusion of the Entire Village Activities of the Project

The students of GTU who were involved in this project were allocated with a village in our district for Rurbanisation. We made physical visits & did the Survey at Tenarang, Baben & Ena and did the SWOT analysis, which helped to know village strengths, weaknesses, opportunities & threats. From this, to analyse the problems and requirements of Tenarang village and started finding the solution. From various thinking, research, and group discussions it's decided to prepare a few designs as per the requirement of the villagers. Get to realized how poor the condition of our rural villages are and how much struggle they have to do to just get by and obtain the basic living amenities. It has to think of several designs which would not only lift the living standards of the people but also get the tourist economy flowing solving the unemployment, and immigration due to unemployment issues of the village.

Public toilet Swatch bharat is now main aim of India. It mean every corner of county is neat and clean. Adoption this, we have proposed efficient design for public sanitation. Public toilets are required in Tenarang village because existing service aren't good and due to ARYA club many visitors come to Tenarang. Some minimum charges are applied for visitors, to obtain handful of revenue. So considering all this facts we have decided to provided design of public toilets!

Lake Beautification The design of lake beatification one of the design requested by villagers. There is not any kind of recreational building available in the village.

Library It is everyone's right to get education. Focusing on this we have designed a simple but effective design of library, which will be helpful to students as well as other people too. This library will have local books as well as all educational books in it. This will provide a good platform for children to know about their locals and culture and elder people can read newspapers and other books over there. By doing gap analysis it was found that Tenarang village should have at least one library according to its population.

Bank (ATM) As per Gap analysis there is at least one ATM required in the village and for any kind of money transections villagers have to travel 4-5 km .it is also one the required design by the villagers.

Sub-Dairy They have one small distributary dairy but was not in good condition and doesn't have adequate storage facility. So we have proposed a detail design reconstruction of existing structure using concept taught in repair rehabilitation of concrete structure. Moreover villagers had emphasis on it because they were facing lot of problems.

Clinic Hospitals or small clinic is essential for any emergencies. But in Tenarang no such facility is found. In case of an emergency they have to travel 23 km to Surat for treatment. According to villagers request we planned and design clinic which will be helpful to villagers of Tenarang as well as Tenarang village. Considering current situation of COVID-19, this clinic will be helpful in vacation program Indian government is doing.

Intention to make Tenarang a self-sufficient and a sustainable village. With some of our creative design, the villagers will easily generate a revenue making the village a tourist place and hopefully the issues regarding the unemployment and migration due to unemployment would be solved. After completing this project in the Vishwakarma Yojana. Students can concluded that it should be ruralisation in Tenarang and its development. This project includes different designs as per required to fulfilment of villagers which increases its reliability. Now it's easy to talk any issue related with village development. The whole credit goes to our mentor and our nodal officer they refined our ideas and make this project wonderful.

Thank you...

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12 Annexure

12.1 Ideal village: Techno-economic survey

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

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

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

Name of District:	Surat
Name of Taluka:	Barodoli.
Name of Village:	BABEN.
Name of Institute:	C.K. Pithawalla College of Eng& Tech.
Nodal Officer Name & Contact Detail:	Dr. Bostri Chauhan. 9898865266
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Bhaveshbhai Patel (Sarpanch) Bhavinkumar Maisuria (Talati) 2-3 household survey. 1 Goramin bank
Date of Survey:	05/10/2020.

I. **DEMOGRAPHICAL DETAIL:**

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	15610	8642	6968	1202

II. **GEOGRAPHICAL DETAIL:**

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1634 Hectare (21.137878, 73.0966019)
2.	Forest Area (In hect.)	0
3.	Agricultural Land Area (In hect.)	400
4.	Residential Area (In hect.)	1234 Hectare
5.	Other Area (In hect.)	
6.	Distance to the nearest railway station (in kilometers):	Barodoli railway station 1 km dis

7.	Name of Nearest Town with Distance:	Bardoli (9.1 km) Surat (40 km)
8.	Distance to the nearest bus station (in kilometers):	Bardoli OLD bus station (1.2 km)
9.	Whether village is connected to all road for the any facility or town or City?	Yes, NH 53 connected to surat

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1. Farming (5955 ppl)
	2. Home-Domestic (65)
	3. Labour (1071)

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

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
1.	PIPED WATER Piped Into Dwelling Piped To Yard/Plot Public Tap/Standpipe Tube Well Or Bore Well	Yes.	Yes, 350 ha. covered by tube & bore.		- village individual water committee - chlorination, cleanness, colour - done by panchayat
2.	**DUG WELL** Protected Well Un Protected Well	✓			- Animal water facility 'Havada' (ફવાડ)
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring Rainwater Tanker Truck Cart With Small Tank	No water from spring.			- Board name '[illegible]' [illegible] 31 lakh by Gujarat government
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump Other(Specify)Lake/ Pond	850 ha no. 5 Yes	Irrigation done by Canal & Lake		

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Suggestions if any:						
B.	**Water Tank Facility**					
	Overhead Tank	Capacity:	૭૦ : 6	Lit ૬ m		
	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 Underground - 1 ૭૦ Pucca closed - 2 ૭૦s Pucca open - 3 ૭૦s Open		4 ૭૦s.		
Suggestions if any:						
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**					
	Village approach road	Pucca cemented			Opening gates every Streets	
	Main road	Pucca cement & ૭૦ad	Footpath			
	Internal streets	Pucca ૭d. & Bakk				
	Nearest NH/SH/MDR/ODR Dist. in kms.	NH 53 (2-3 km)				
Suggestions if any:						
E.	**Transport Facility**					
	Railway Station (Y/N) (If No than Nearest Rly Station—Kms)	Baodoli railway Station	2 km di's.			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station—Kms)	Baodoli OLD Bus Stati	1.2 km di's.			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Private veh.				
Suggestions if any:						
F.	**Electricity Distribution**					
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Yes.	More then 6 hrs			

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	Power supply for Domestic Use	99 connection	Yes		
	Power supply for Agricultural Use	150 connection	Yes		
	Power supply for Commercial Use	850 connection	Yes.		
	Road/ Street Lights	100 %.	Solar-Stars.		
	Electrification in Government Buildings/ Schools/ Hospitals	100 %.	Yes.		
	Renewable Energy Source Facilities (Y/ N)	Yes.			
	LED Facilities	100%.	Yes.		

Suggestions if any:

G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	2 nos.	Yes.		- Collect waste by dustbin and - Send municipal corporation to make vezonicompost and boring against to set it
	Location Condition	Good.			
	Community Toilet (With bath/ without bath facilities)	without Bath			
	Solid & liquid waste Disposal system available	Yes.	Available		
	Any facility for Waste collection from road	Dustbin by Panchayat.			

Suggestions if any:

H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL. OTHER (SPECIFY)	Lake, Canal & tube well around 700 ha			

Suggestions if any:

I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	100% pucca			

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V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	8 nos			- In house 2 anganwadi. - Total 5 anganwadi available - 100% vaccination by PHC
	Sub-Centre	Yes.			
	PHC				
	BLOCK PHC	Yes.			
	CHC/RH				
	District/ Govt. Hospital	Yes.			
	Govt. Dispensary				
	Private Clinic	Yes.			
	Private Hospital/ Nursing Home	Maternity hospital			
	AYUSH Health Facility				
	sonography /ultrasound facility	1			
	If any of the above Facility is not available in village than approx. distance from village: .0.....kms.				
	Suggestions if any:				
K.	**Education Facilities:**				
	Aaganwadi/ Play group	5 gov.			Lunch at sch.
	Primary School	1			
	Secondary school	1			
	Higher sec. School	1			
	ITI college/ vocational Training Center	1 different			
	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)			Newspaper Supply	✓
	Public Garden	Good	In village	✓	
	Village Pond	Good	"	✓	
	Recreation Center			✓	
	Cinema/ Video Hall				✓
	Assembly Polling Station				✓
	Birth & Death Registration		At Panchayat	✓	

If any of the above Facility is not available in village than approx. distance from village: 4-5 kms.

Suggestions if any:

M.	Other Facilities	Condition	Location	Available (YES)	Available (NO)
	Post-office	good.	village	✓	
	Telecommunication Network/ STD booth	Avg.		✓	
	General Market	Good.	0.5 km	✓	
	Shops (Public Distribution System)	Avg.	0 km	✓	
	Panchayat Building	Advance.		✓	
	Pharmacy/Medical Shop	1 no		✓	
	Bank & ATM Facility	4 no.	In village	✓	
	Agriculture Co-operative Society				✓
	Milk Co-operative Soc.				✓
	Small Scale Industries	Domestic.		✓	
	Internet Cafes/ Common Service Center/Wi Fi				✓
	Youth Club				✓
	Mahila Mandal				✓

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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				No.
	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)				

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	Yes, Solar Fund (Pri + govt.)			
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	NO. Yes NO.			
3.	Any Other				

VII. DATA COLLECTION FROM VILLAGE

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

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

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

IX. Smart Village / Heritage Details

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

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

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

સરપંચ
ગ્રામ પંચાયત તાબેના
તા. બારડોલી, જી. સુરત.

12.2 Smart village: Techno-economic

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Techno Economic Survey

For

Vishwakarma Yojana: Phase VIII

IDEAL VILLAGE SURVEY

An approach towards Rurbanisation for Village Development

Name of Village:	ENA
Name of Taluka:	Palsana
Name of District:	Surat.
Name of Institute:	C.K.P.C.E.T.
Nodal Officer Name & Contact Detail:	Boski P. chauhan 9898865266
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Naynaben Pihayi.
Date of Survey:	05/10/2020.

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001				
ii)	2011	3777	1895	1882	888

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	621.93 ha
	Forest Area (In hect.)	8 ha.
	Agricultural Land Area (In hect.)	Not given.
	Residential Area (In hect.)	611 ha
	Other Area (In hect.)	-
	Water bodies	Canal
	Nearest Town with Distance:	Surat 25 km

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3. Occupational Details:

Name of Three Major Occupation groups in Village	1. Agriculture (Sugercane, Banana)
	2. Job (Updown)
	3.

4. Physical Infrastructure Facilities:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
	• Tap Water (Treated/ Untreated)	Treated			
	• RO Water	Not available			
	• Well (Covered/ Uncovered)	NO.			
	• Hand pumps	Yes.	12-15 nos.		
	• Tube well/ Borehole	Yes			
	• River/ Canal/ Spring/ Lake/ Pond	Canal for irrigation	yes		
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	Yes	00 - 1	
	Underground Sump	Capacity:	Not available		
Suggestions if any:					
C.	**Drainage Facility**				
	Available (Yes/ No)	Yes, Available	dzd		
Suggestions if any:					
D.	**Type of Drainage**				
	Closed/ Open	Closed			
	If Open than Pucca / Kutchcha	Pucca 100 Y.			
	Whether drain water is discharged directly in to Water bodies/ Sewer plants	Discharged through sewage plant			
Suggestions if any:					

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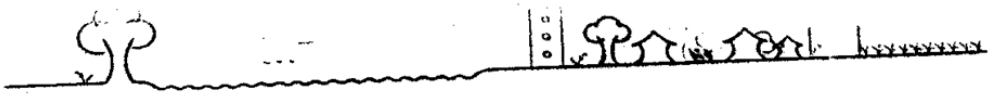
E.	**Road Network : All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Along Highway	(Block - CM road)		
	Main road	GOBM			
	Internal streets	Block.			
	Nearest NH/SH/MDR/ODR Dist. in kms.	NH 53 (2-3 km)			
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	Baben Railway Stn.	10-15 min dis.		
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes. 0 km. dis.			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto - Private Vehicles, Bus, Rickshaw			
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	DGBCL	Sufficient No. Power.		
	Power supply for Domestic Use	✓	Sufficient		
	Power supply for Agricultural Use	✓			
	Power supply for Commercial Use	✓	Sufficient		
	Road/ Street Lights	✓			

	Electrification in Government Buildings/ Schools/ Hospitals	Yes. there is available	CC TV Available		
	Renewable Energy Source Facilities (Y/ N)	Yes 100% complete			
	LED Facilities	Yes.			
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Yes available 2			
	Location Condition	within 1 km Extremely good			
	Community Toilet (With bath/ without bath facilities)	Yes			
	Solid & liquid waste Disposal system available	Dumping site within 1 km			
	Any facility for Waste collection from road	D2D.			
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	Canal			
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	90% Pucca roof			

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:	1 PHC				
	Private Clinic Private Hospital/ Nursing Home	8				
	If any of the above Facility is not available in village than approx. distance from village: .....kms.					
Suggestions if any:						

L.	**Education Facilities:**				
	Aaganwadi/ Play group	Available		1 no	
	Primary School	"		1 no	
	Secondary school	"		1 no	
	Higher sec. School	"		1 no	
	ITI college/ vocational Training Center	"		1 no.	
	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: ..10.. kms.				
Suggestions if any:					

M.	**Socio- Culture Facilities**				
	Community Hall (With or without TV) Location:	without TV. 100 m	very good		

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	Condition:	Good			
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	Yes, Secondary School - 150 m - Good.			
	Public Garden Location: Condition:	Yes 0 km Very good			
	Village Pond Location: Condition:	Yes - 0.5 km - Very good			Poor condition
	Recreation Center Location: Condition:	No. 1-2 km			
	Cinema/ Video Hall Location: Condition:	No 1-2 km			
	Assembly Polling Station Location: Condition:	Yes.			
	Birth & Death Registration Office Location: Condition:	Yes, in Panchayat			

If any of the above Facility is not available in village than approx. distance from village: 5-12 kms.

Suggestions if any:

N.	**Other Facilities**				
	Post-office	Yes			
	Telecommunication Network/ STD booth	Reliance Jio Issue (3:0)			

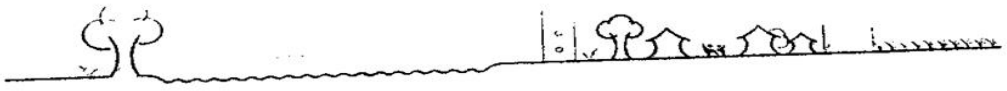
	General Market	✓			
	Shops (Public Distribution System)	Yes			
	Panchayat Building	Yes			
	Pharmacy/Medical Shop	Yes	0.5 km		
	Bank & ATM Facility	Yes	3 km		
	Agriculture Co-operative Society	NO			
	Milk Co-operative Soc.	Yes			
	Small Scale Industries	Yes	1 no.		
	Internet Cafes/ Common Service Center/Wi Fi	NO			
	Other Facility	Cricket ground			
Suggestions if any:					

6. **Sustainable /Green Infrastru, ture Facilities:**

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

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	



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Vishwakarma Yojana: Phase VI
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Recent Projects going on for Development of Village	Gramyasat (Development)
Any NGO working for village development	1 [Hope Foundation]

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)	Sup. med. School (Sardar patel)	
2.	Additional Information/ Requirement		

9. Smart Village Proposal Design

Sr. No.	Descriptions	Information/ Detail	Remarks
1.			

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

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

J. A. Patel.

12.3 Allocated village: Techno-economic survey

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

Name of District:	Surat
Name of Taluka:	Olpad
Name of Village:	Tenarang.
Name of Institute:	CKPCET.
Nodal Officer Name & Contact Detail:	Dr. Baskí P. Chauhan a 9824665266
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Prabhatbhai Desai. (Talati)
Date of Survey:	20/10/2020.

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	1976	1075	901	500 (Approx)

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	756 ha (21.2392274, 72.6695382169)
2.	Forest Area (In hect.)	–
3.	Agricultural Land Area (In hect.)	658 ha
4.	Residential Area (In hect.)	49 ha
5.	Other Area (In hect.)	–
6.	Distance to the nearest railway station (in kilometers):	13 km (Surat)

7.	Name of Nearest Town with Distance:	Surat 13 km.
8.	Distance to the nearest bus station (in kilometers):	Olpad / Surat
9.	Whether village is connected to all road for the any facility or town or City?	Yes (MDR)

III. OCCUPATIONAL DETAILS:

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

Major crops grown in the village:	1. Rice (Sidle)
	2. Wheat
	3. Vegetable

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
1.	PIPED WATER				There is not public bore-well (its private)
	Piped Into Dwelling	yes			
	Piped To Yard/Plot				
	Public Tap/Standpipe	yes			
	Tube Well Or Bore Well	yes			
2.	DUG WELL				
	Protected Well				
	Un Protected Well	yes	[Not used]		Same as Unprotected well.
3.	WATER FROM SPRING				
	Protected Spring				
	Unprotected Spring				
	Rainwater				
	Tanker Truck				
	Cart With Small Tank				
4.	SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/				
	Irrigation Channel				
	Bottled Water	yes			
	Hand Pump	yes			

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	Other(Specify) Lake/ Pond	Terrace lake			- For washing clothes
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	✓	50,000 lit.	
	Underground Sump	Capacity:		60,000 lit	5 - 6 nos.
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE	Drainage through pipe			Not 100 %. (60-70 % complete)
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Black topped pucca			
	Main road	All weather			Developed
	Internal streets	✓			
	Nearest NH/SH/MDR/ODR Dist. in kms.	MDR.			
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	Surat Railway Station	13 km away.		
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Olpad bus Station			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	GSRDC (Surat - Olpad)			
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Gov. (24hrs).	Yes		

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	Power supply for Domestic Use	✓			
	Power supply for Agricultural Use	✓			
	Power supply for Commercial Use	✓			
	Road/ Street Lights	Yes Street light			Solar (10%)
	Electrification in Government Buildings/ Schools/ Hospitals	No, Hospital available			
	Renewable Energy Source Facilities (Y/ N)	NO.			
	LED Facilities	✓			100%.

Suggestions if any:

G.	Sanitation Facility				
	Public Latrine Blocks if available than Nos.	Yes, Available	M 8.	F 2	
	Location Condition	Good			
	Community Toilet (With bath/ without bath facilities)	NO.			
	Solid & liquid waste Disposal system available	Not available			+All dispose goes into dump called 'KHADI' By Panchayat.
	Any facility for Waste collection from road	D2D collection			

Suggestions if any:

H.	Main Source of Irrigation Facility:				
	TANK/POND	✓			+Well is available But No use.
	STREAM/RIVER				
	CANAL	✓			
	WELL				
	TUBE WELL.				
	OTHER (SPECIFY)	Borewell			

Suggestions if any:

I.	Housing Condition:				
	Kutchha/Pucca (Approx. ratio)	80/20.	Pucca		

V. SOCIAL INFRASTRUCTURAL FACILITIES:

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

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

Suggestions if any:

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

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		0 km	✓	
	Telecommunication Network/ STD booth				✓
	General Market		13 km		✓
	Shops (Public Distribution System)			✓	
	Panchayat Building			✓	
	Pharmacy/Medical Shop		13 km		✓
	Bank & ATM Facility		4-5 km		✓
	Agriculture Co-operative Society		2 km		✓
	Milk Co-operative Soc.			✓	
	Small Scale Industries			✓	
	Internet Cafes/ Common Service Center/Wi Fi				✓
	Youth Club				✓
	Mahila Mandal			Yes (in a five)	

Req.

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Credit Cooperative Society				
Agricultural Cooperative Society	✓	very poor condition		
Milk Cooperative Society				
Fishermen's Cooperative Society				
Computer Kiosk/ e-chaupal /				
Mills / Small Scale Industries	glass factory / Edible oil			
Other Facility				

Suggestions if any:

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

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VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy				
2.	Recent Projects going on for Development of Village	Road deve Paver block.			
3.	Any NGO working for village development	NO.			
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)	NO. NO.			Covid-19 4-5 active

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Vishwakarma Yojana: Phase VIII
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VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities,	Road maintanance.	
	School Building	– NO	need
	Health Center	– NO	
	Panchayat Building	– Yes	needs Construction
	Public Toilets & any other	– Yes	– Need repair.
2.	Additional Information/ Requirement	Garden, Library	
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	2-3 times.	

IX. Smart Village / Heritage Details

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

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

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

તલાટી કમ મંત્રી
ગ્રામ પંચાયત તેના
તા. ઓલપાડ
M. 20/10/2020

12.4 Allocated village: Gap analysis

VILLAGE GAP Analysis

Village Name: Tenarang

Village Facilities	Planning Commission/UDPFI Norms	Population: Existing	Required as per Norms	Smart Village / Cities / Heritage Future Projection Design	Gap
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	2	2		0
Primary School	Each Per 2500 population	2	2		
Secondary School	Per 7 500 population	-	0		
Higher Secondary School	Per 15 000 Population	-	0		
College	Per 125 000 Population	-	0		
Tech Training Institute	Per 100000 Population	-	0		
Agriculture Research Centre	Per 100000 Population	-	0		
Skill Development Center	Per 100000 Population	-	0		
Health Facility		-	0		
Govt/Panchyat Dispensary or Sub PHC or Health Centre	Each Village	ND	ND		1
Primary Health & Child Health Center	Per 20 000 population	0	0		
Child Welfare and Maternity Home	Per 10 000 population	0	0		
Multispecialty Hospital	Per 100000 Population	0	0		1
Public Latrines	1 for 50 families (if toilet is not there in home specially for slum pockets & kutchi house)	3/2 = 5	10		5
Physical Infrastructure Facilities					
Transportation		Adequate / Inadequate			
Pucca Village Approach Road	Each village	Adequate			
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)	Inadequate			
Drinking Water (Minimum 70 lpcd)		Adequate / Inadequate			
Over Head Tank	1/3 of Total Demand				
U/G Sump	2/3 of Total Demand				
Drainage Network - Open		~~Adequate~~ / Inadequate			
Drainage Network - Cover					
Waste Management System		Adequate / ~~Inadequate~~			
Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	1	1		
~~Community hall~~ and Public Library	Per 15000 Population	0	0		1
Cremation Ground	Per 20 000 population	1	1		
Post Office	Per 10,000 population	0	1		1
Gram Panchayat Building	Each individual/group panchayat	0	0		
APMC	Per 100000 Population	0	0		
Fire Station	Per 100000 Population	0	0		
Public Garden (Bus stand ni jagya)	Per village	0	1		
Police post	Per 40 000Population	0	0		
Shopping Mall					
Electrical Design					
Electricity Network		~~Adequate~~ / Inadequate			
Any Smart Village Facility					
Technology					
		ESR cap	0		
		Sump cap	0		
		Lat	0		

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

Table -40 Summary Details of All Villages

Sr. no	Village	Description	Design Proposal (Part-1)	Design Proposal (Part-2)
1	Rajgari	Civil	Sarvajanik Sauch Griha	Bus stand
			Public Dispensary	Chabutra
			Police Outpost	Pravesh Dwar
			Solar Field	Public distribution system shop
			Csc Centre	Swimming pool
			Rain Water Harvesting	Door to door waste collection system
		Electrical	Automatic Plant Watering System	Automatic light: DIM and DIP control
			Temperature Control System	Overspeed indication and accident prevention system
			Smoke Detector System	Wireless mobile charging using inductive coupling
2	**Tenarang**	**Civil**	**Library**	**Pucca House**
			Public latrine	**Community Hall**
			Clinic	**Biogas Plant**
			Lake Beautification	**Gram Panchyat**
			Bank	**Police station**
			Vertical Farming	**Entrance Gate**
		Electrical	**Hybrid Street Light**	**Biogas Generator**
			Solar Powered Charger	**Footstep Power Generation**
			Replacement of Light Source	**Using piezo Electric Sensors**
3	Kunkni	Civil	Anganwadi	Reconstruction of panchayat building
			Clinic	General market
			Sprinkler Irrigation	Reconstruction of milk dairy
			Solid Waste Disposal	Bus stand

			Water Tank	Computer classes with cyber cafe
			Sewage Treatment Plant	Agriculture co-operative society
		Electrical	Smart Power Theft Detection system	Automated solar grass cutter
			Short circuit protection	Smart street light
			Vertical axis wind turbine	LPG leakage detecror
4	Narthan	Civil	Public Latrine Block	Agro Storage Unit
			Public Health Centre	Drinking Water Facility
			Community Hall	WBM Road
			Rain Water Harvesting with Ground Water Recharge	Overhead Water Tank
			General Market	Vermicomposting Unit
			Entrance Gate	Maintenance of Bus Stand
		Electrical	Auto Electronic School Bell	Generate power using microturbine
			Automated Night Lighting	Simple low power inverter
			Solar Powered Battery Charging With Reverse Current Protection	Remote operated home appliances control

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

All Designs are given earlier pages.

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

Table no 41 Summery of good photograph

ENA- Ideal village	
	
Temple & Bank	**Ena playground / Open theater space**

Ena Village street

Students @ENA village

Roads & Cleanness

Gram panchayat& PHC

Entrance GATE

Road cleaness

SBI bank at ena

Temple

School GATE

BABEN – smart village

Entrance road - BABEN

Asia's no 1 Sugar factory

Entrance GATE

SUGER factory

General market store

ATM facility

School at baben

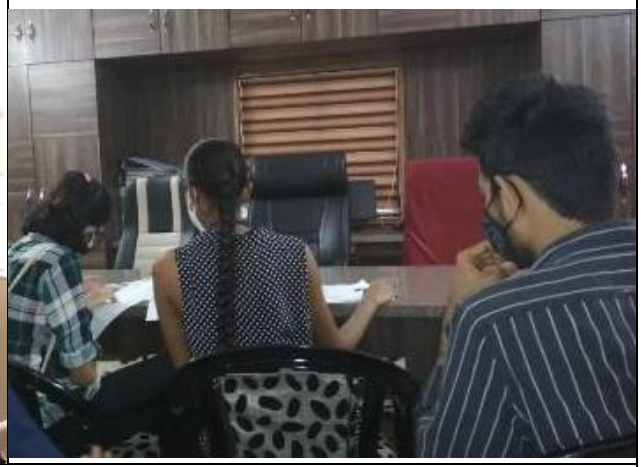
Baben gram panchayat

School AT BABEN

College AT BABEN

Solar facility

Temple

Interaction with Surpanch


Fig 81 Summery Of Good Photograph

12.8 Village Interaction with sarpanch Report with the photograph

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

Fig 82 Interview with Surpanch

12.9 Sarpanch Letter giving information about the village development

" સૌનો સાથ, સૌનો વિકાસ "

શ્રી જયેશભાઈ રામુભાઈ પટેલ

સરપંચ : ગ્રામ પંચાયત તેના

મુ. તેના, પો. પીંજરત, તા. ઓલપાડ, જિ. સુરત-૩૯૫૦૦૫.

જાવક નં. 2021,22/05/91

તારીખ : 18 /06 /2021

પ્રતિ,

ગુજરાત ટેકનોલોજીકલ યુનિવર્સિટી
અમદાવાદ, ગુજરાત.

વિષય: ગુજરાત ડેવલોપમેન્ટ પ્લાન્ટ બાબત

જય ભારત સાથે ઉપરોક્ત વિષય અન્વયે આપશ્રીને જણાવવાનું કે શ્રી. કે. પિપલાવાલા એન્જિનિયરીંગ કોલેજ, સુરત ના વિદ્યાર્થીઓ નામે મુસ્કાન હીવાલા, હર્ષિત મહેતા, પ્રિયાંશ જૈન જેઓ અમારા તેનાકંઠા ગામની મુલાકાત લઈ ગામમાં અપુરતી સુવિધાઓ જેવી કે કાચા મકાનોને પાકા બનાવાનો પ્લાન (પ્રધાનમંત્રી આવાસ યોજના હેઠળ), આરોગ્ય પ્લાન, ગામનો પ્રવેશદ્વાર, જાહેર શૌચાલય, તળાવ ડેવલોપમેન્ટ.. વગેરે જેવી ગામના વિકાસલક્ષી કામોની યાદી બનાવી વિલેજ પ્લાન તૈયાર કરેલ છે જે ખરેખર સૌરાષ્ટ્ર લાયક છે તે કામગીરી પણ સારી રીતે કરેલ છે. જેની નોંધ લેવા મહેરબાની કરશોજી.

આભાર સહ

સરપંચ
ગ્રામ પંચાયત તેના
તા. ઓલપાડ, જિ. સુરત.

12.10 Comprehensive report preparation as per format

CONCEPT

Vishwakarma Yojana is provides special scheme for development of village by GTU and Government of Gujarat in which students work together and collect data and information regards village development with the help of gram panchayat and stake holders.

Village have some basic facilities likes drinking water, drainage system, pucca road, and other facilities like primary school, primary health center, community hall, library, public latrine block, are sufficient so that village can develop. So, we will give proposal regarding sustainable energy sources and solution related to infrastructure problems.

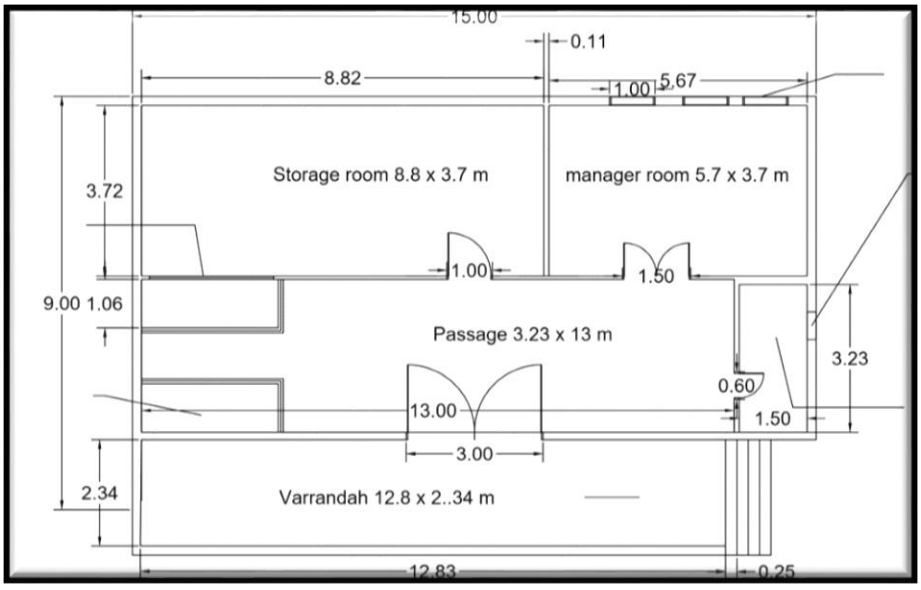
Efforts have been made in this project work to identify and plan some of the below facilities for sustainable development of village and to meet need of future population. Vishwakarma Yojana is one of the initiatives towards Rurbanisation that is village development by the government of Gujarat, which was allotted as a real time situation type project provides to GTU.

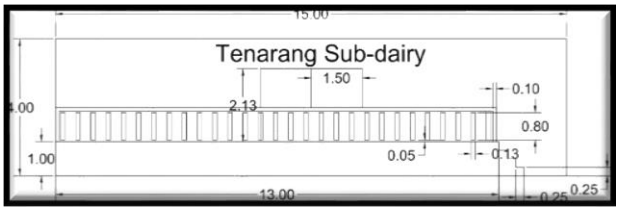
It is one of the strategies to reduce urban city pressure and lower the migration rate by developing village with a “rural soul” but with all urban amenities that a city may have. In this project the students meet the relevant citizens of village and survey the existing facilities.

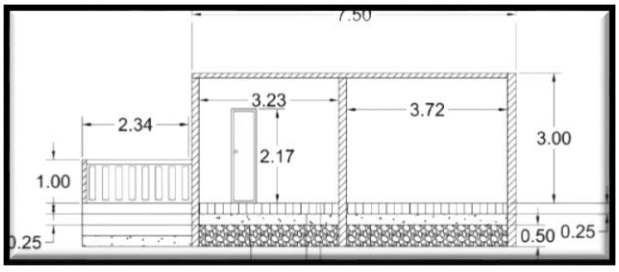
Then design of the sustainable infrastructure which is to be modified is carried out for the village. This includes implementation of engineering skills to prepare detailed project reports for village as a part of the final year project work. By this project certain experiences recreates a real work and need of application of an individual technical knowledge on any existing problems. Based on survey we tried to give design of basic facilities to fulfill their needs.

By providing these basic facilities to village for reduce urban city pressure and decrease migration rate, which is ultimate aim of Vishwakarma Yojana.

Tenarang Village, Olpad, Surat

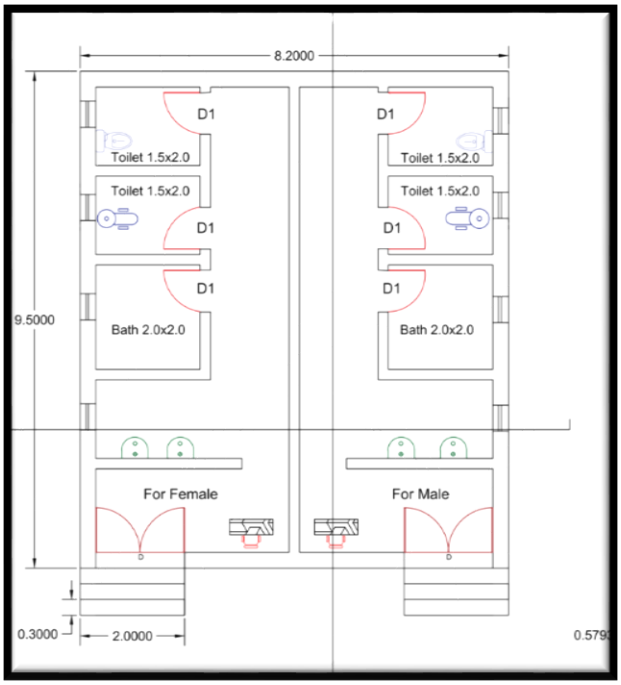


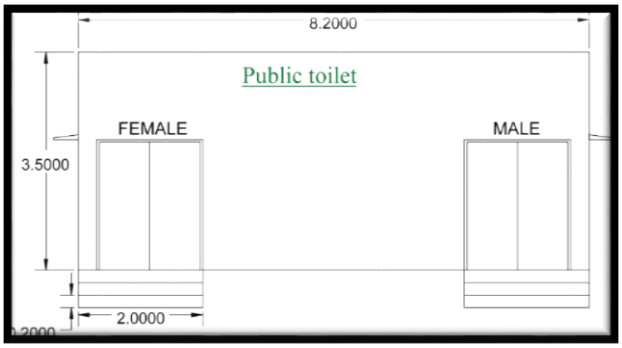


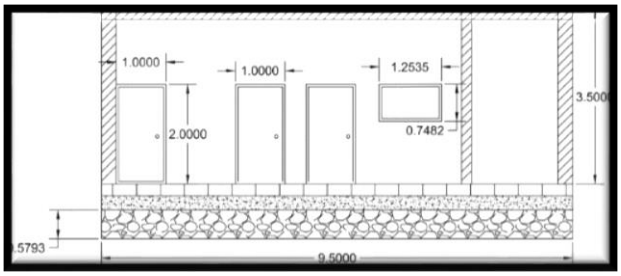


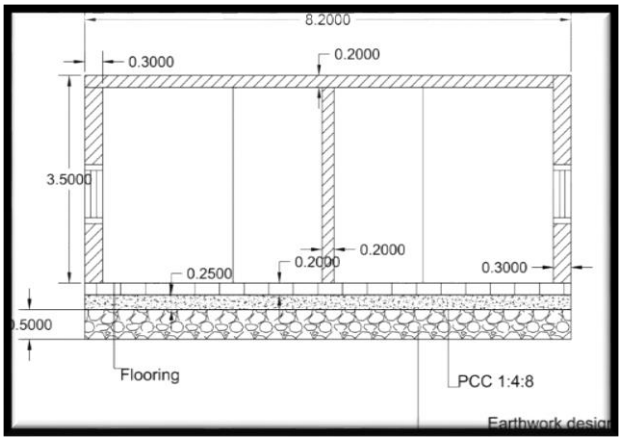
Design Infrastructure – SUB DAIRY
Village – TENARANG Village, Surat

Tenarang Village, Olpad, Surat



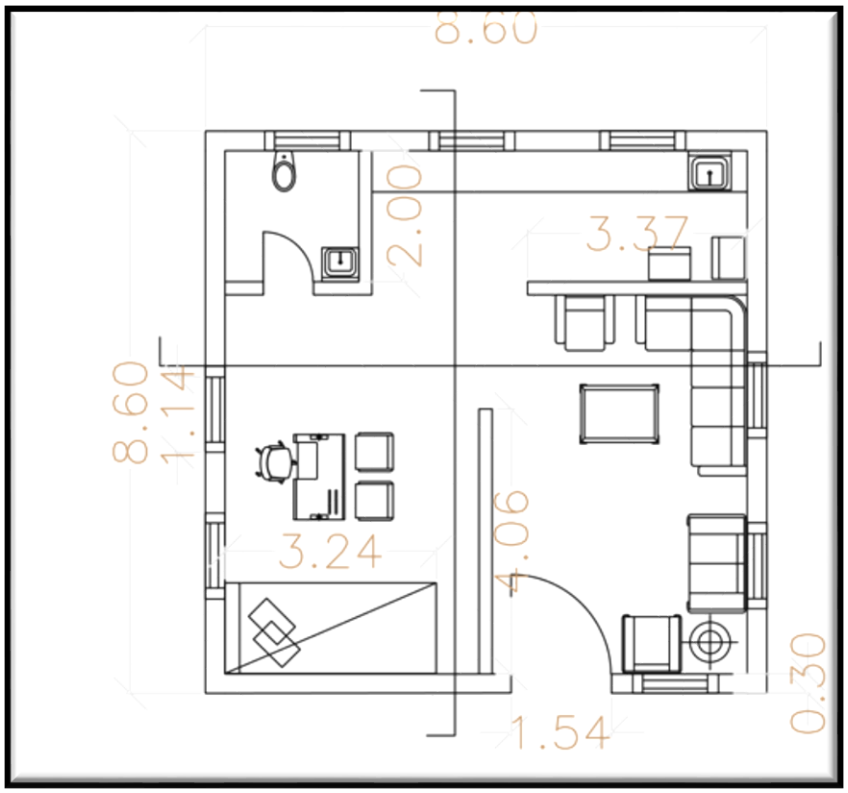


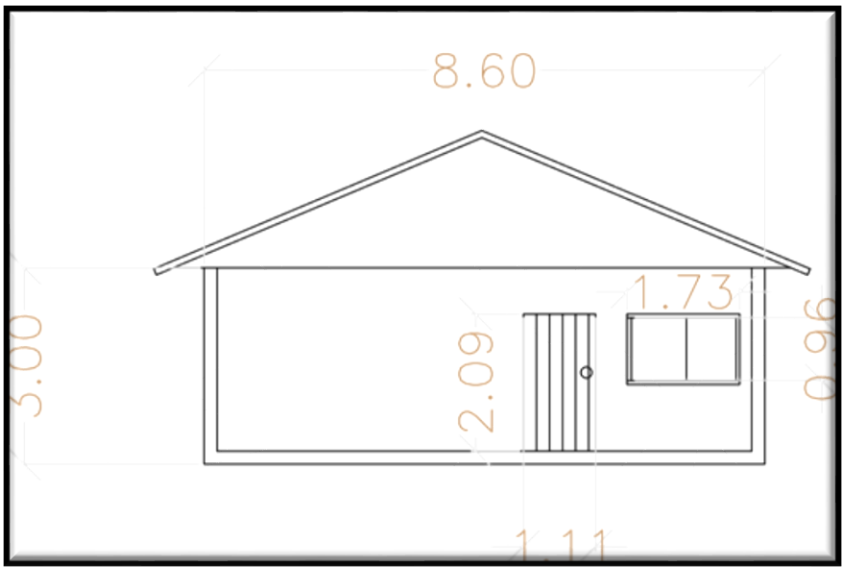




Design Infrastructure – PUBLIC LATRINE
Village – TENARANG Village, Surat

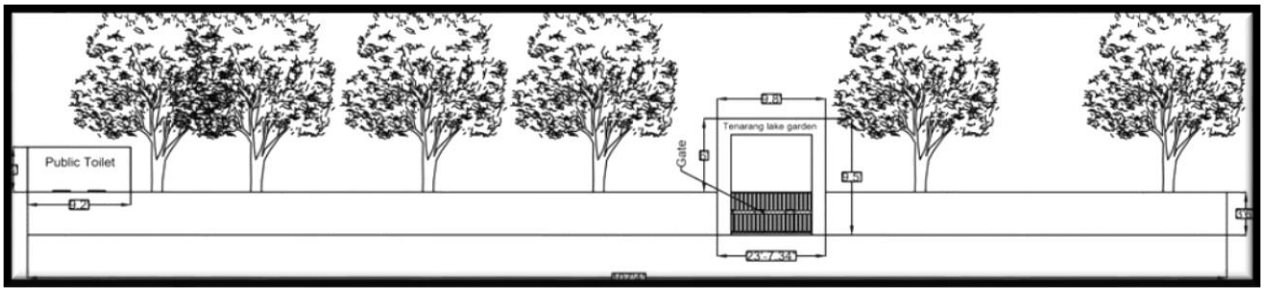
Tenarang Village, Olpad, Surat

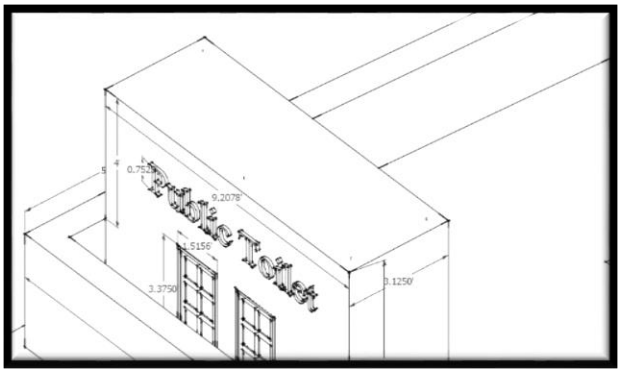


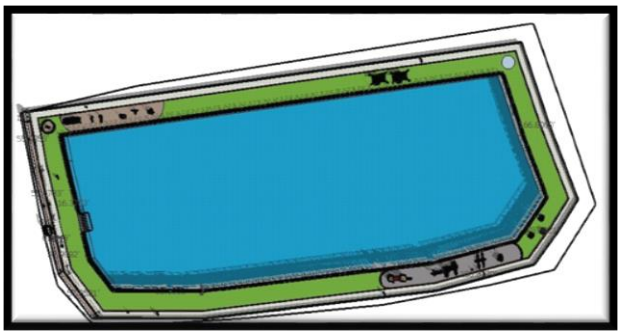


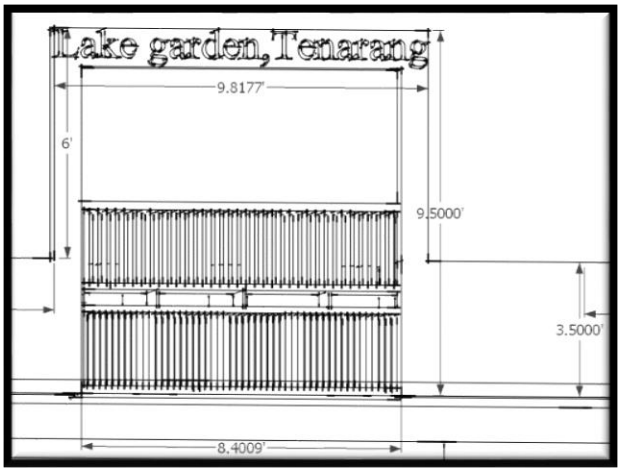
Design Infrastructure – CLINIC
Village – TENARANG Village, Surat

Tenarang Village, Olpad, Surat



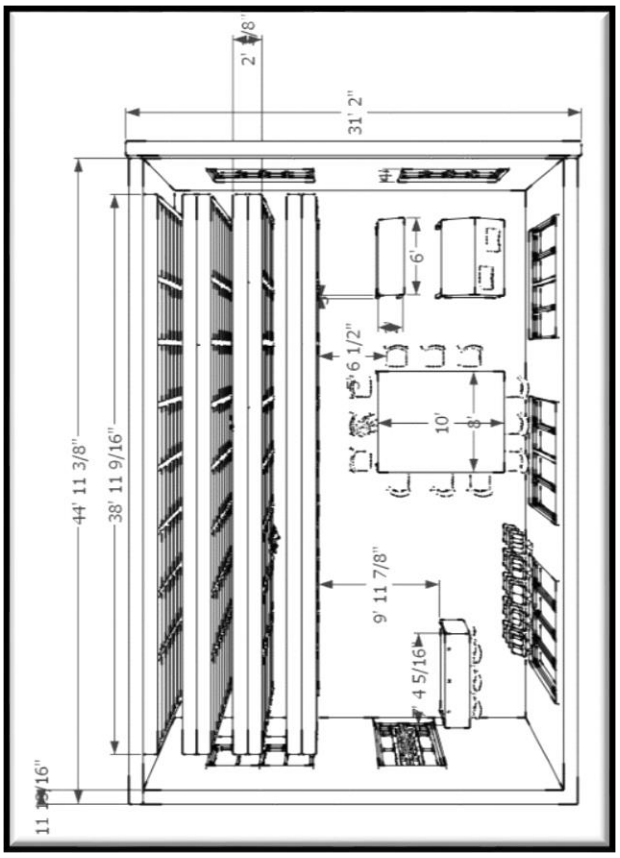


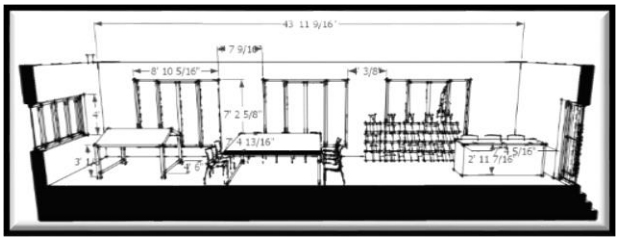


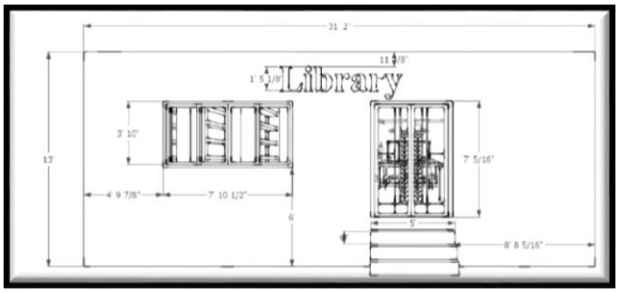


Design Infrastructure – LAKE BEAUTIFICATION
Village – TENARANG Village, Surat

Tenarang Village, Olpad, Surat

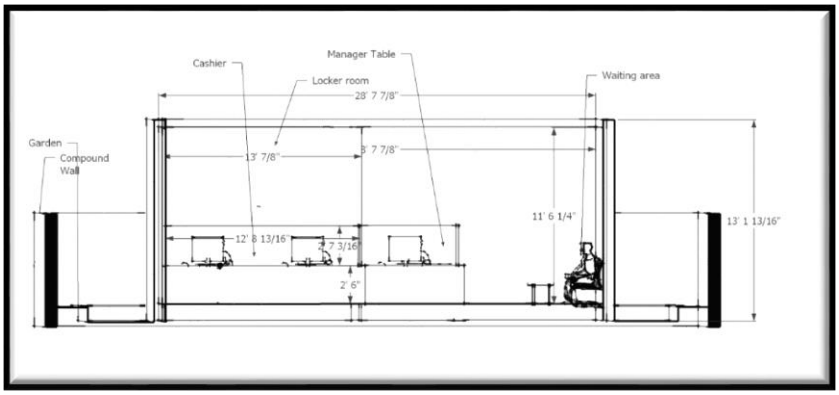


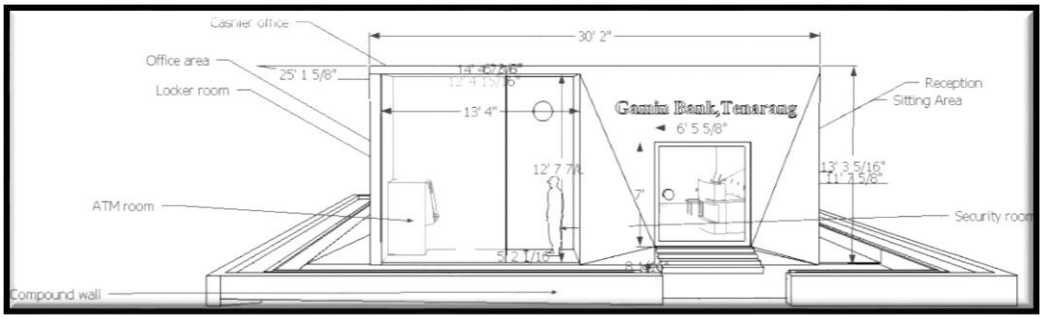


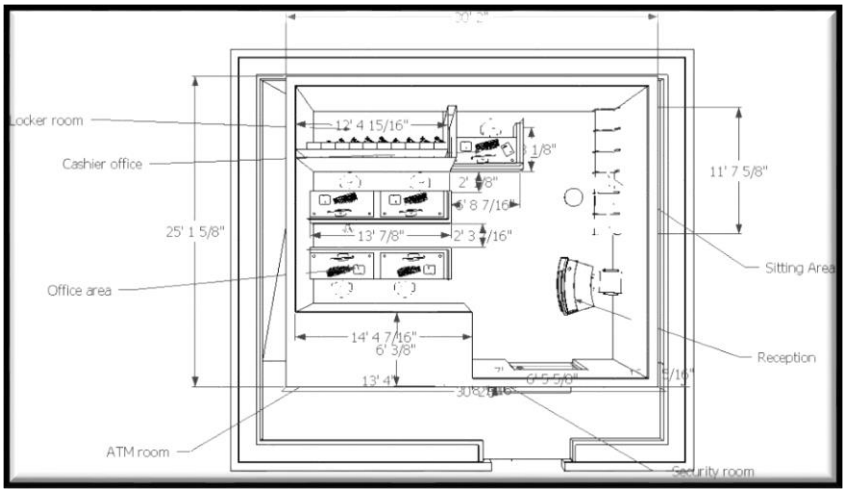


Design Infrastructure – LIBRARY
Village – TENARANG Village, Surat

Tenarang Village, Olpad, Surat







Design Infrastructure – BANK
Village – TENARANG Village, Surat

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

Design Proposals Engineering design is the creative process of identifying needs and then devising a product or a process to fill those needs. After a need has been identified, the purpose of an engineering design project proposal is to succinctly communicate to your audience. All the given designs are done in AutoCAD, Staad.pro, Sketch up & Estimator 2.O

13.1 Design Proposals

13.1.1 Civil Design 1

Pucca house plan

The term pucca means "solid" and "permanent", from Hindustani पक्का/پکّا pakkā, lit. '"ripe, cooked, experienced"'. It is contrasted with kutcha housing (कच्चा/کچّا kaccā lit. '"unripe, raw, inexperienced"'), referring to buildings of flimsy construction. Pucca homes are typically made of concrete, stone, clay tiles and/or metal, in contrast to older homes made of mud and organic material.

These building methods are more costly and labor-intensive than the more traditional building methods.In India, there is currently a large-scale effort to build pucca houses for people. The organization Indira Awas Yojana was created to help the rural poor throughout the country, by providing them with pucca houses. 267,543 houses were constructed under IAY during 2009.Pucca houses are sometimes built to replace homes damaged by natural disasters.

The permanency of pucca materials and techniques inevitably makes it less easy to adjust the house to the needs and habits of the occupants. Through pacification, the relationship between house and occupants becomes more rigid, more fixed.

Pucca house will be help of PRADHANMANTRI AVAS YOJNA

Introduction

Pradhan Mantri Awas Yojana (PMAY) is an initiative by the Government of India in which affordable housing will be provided to the urban poor with a target of building 2 crore (20 million) affordable houses by 31 March 2022.It has two components: Pradhan Mantri Awas Yojana (Urban) (PMAY-U) for the urban poor and Pradhan Mantri Awaas Yojana (Gramin)(PMAY-G and also PMAY-R) for the rural poor.This scheme is converged with other schemes to ensure houses have a toilet, Saubhagya Yojana electricity connection, Ujjwala Yojana LPG connection, access to drinking water and Jan Dhan banking facilities, etc.Total 1 crore homes are approved against total demand of 1.12 crore as of 28 December 2019**.**

The main features and benefits of PMAY scheme are mentioned as follows:

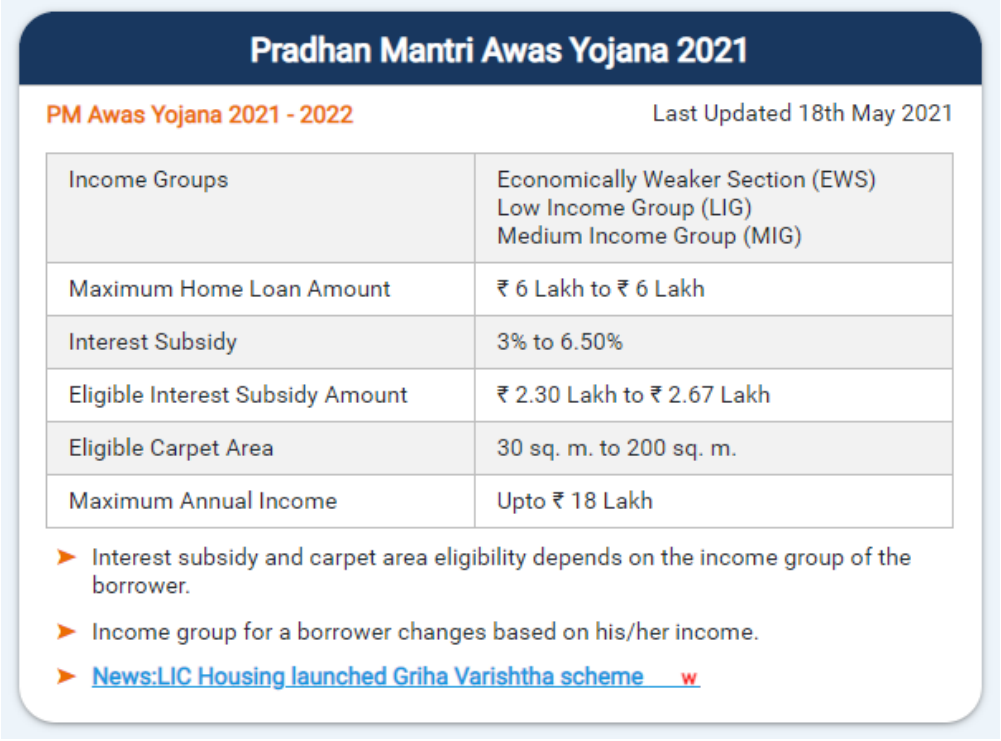
- Interest rate is provided at a subsidized rate of 6.50% p.a. if beneficiaries opt for housing loan for a tenure of up to 20 years.

- The interest subsidy will be provided for Middle Income Group (MIG) on housing loans for the acquisition/construction of houses (including repurchase).
- For Economically Weaker Section (EWS)/Lower Income Group (LIG), the interest rate subsidy will be provided on home loans for construction or acquisition of the house. Interest subsidy will also be provided on home loans taken for adding rooms, kitchens, etc. to existing dwellings.
- Under this Pradhanmantri Aavas Yojna, all the urban areas have been covered in India that includes 4041 statutory towns with the priority given to 500 Class I cities.
- Eco-friendly and sustainable technologies will be used for construction.
- For senior citizens and differently-abled, allocation of the ground floor will be preferred.

Eligibility criteria

Condition for PMAY: (a) Beneficiary max age 70 years, (b) EWS (Economic Weaker Section) family income limit is ₹3 lakhs per annum and for LIG (Lower Income Group) Family Income limit is ₹6 Lakhs per annum and Middle Income Group -(MIG-I) income between ₹6 lakhs to ₹12 lakhs per annum, (MIG-II) income between ₹12 lakhs to ₹18 lakhs per annum c) The beneficiary should not have an own dwelling unit on the name of any family member in any part of India. d)The loan applicant should not have availed any central/state government subsidy or benefit for buying a home under the PMAY scheme. e) Currently, the loan applicant should not own any property under their name and along with any of the family members (including the dependents). f) The home renovation or improvement loans, self-construction loans will be allocated only for EWS and LIG categories.

The houses given under this scheme will be owned by females or jointly with males.



Pradhan Mantri Awas Yojana 2021

PM Awas Yojana 2021 - 2022 — Last Updated 18th May 2021

Income Groups	Economically Weaker Section (EWS) Low Income Group (LIG) Medium Income Group (MIG)
Maximum Home Loan Amount	₹ 6 Lakh to ₹ 6 Lakh
Interest Subsidy	3% to 6.50%
Eligible Interest Subsidy Amount	₹ 2.30 Lakh to ₹ 2.67 Lakh
Eligible Carpet Area	30 sq. m. to 200 sq. m.
Maximum Annual Income	Upto ₹ 18 Lakh

- Interest subsidy and carpet area eligibility depends on the income group of the borrower.
- Income group for a borrower changes based on his/her income.
- News:LIC Housing launched Griha Varishtha scheme w

Fig 83 Eligibility Criteria of PMAY

Estimation

Table 42 Measurement Sheet

DETAILED ESTIMATE							
Vishwakarma project phase 8							
Number	**Discription**	**Nos**	**L**	**B**	**H**	**Quantity**	
	GROUND FLOOR						
	EARTH WORKS						
1	EARTH WORKS EXCAVATION ORDINARY SOIL : Earth work excavation for foundation trenches in ordinary soil and depositing on bank with initial lead upto 50 mt. and lift upto 1.5 m including breaking clods , watering ramming and sectioning of spoil bank etc. complete.						
	Earth Work	2	10.82	0.9	0.7	13.63	
	s.Earth Work	2	4.21	0.9	0.7	5.3	
						18.93	Cu.M.
			Rate	67.00	Amount		1268.31
2	EARTH WORKS FILLING FOUNDATION USING SAND : Filling the foundation trenches with the sand brought from outside the site including breaking clodes,levelling,watering,ramming etc. complete as instructed by the site engineers. Measurements will be taken only the filled and compacted sand.						
	Pcc L	2	10.82	0.7	0.2	3.03	
	Pcc S	2	4.41	0.7	0.2	1.23	
						4.26	Cu.M.
			Rate	769.00	Amount		3275.94
3	ANTI TERMITE TREATMENT : Anti termite treatment by providing and injecting chemical emulsion/Aldrin/heptachler emulsible concentrates 0.50% and clilossdance emulsifiable concentrate for pre contractional treatment and creating a chemical barrier as per I.S 6313 (Part II) 1951 in wall trench foundation top surface of plinth filling junction of wall and floor along the external perimeters of the building complete (areas of building shall be measured).						
	Bed	1	2.32	2.44	-	5.66	
	Kitchen	1	3	3.02	-	9.06	
	Stair	1	2.44	2.73	-	6.66	
	Living	1	4.95	3.02	-	14.95	
	WC	1	2.32	1.49	-	3.46	
	Toilet	1	2.32	1.49	-	3.46	
	Store	1	3.05	1.49	-	4.54	
	Verandah	1	10.82	1.14	-	12.33	

						60.12	Sq.M.
			Rate	200.00	Amount		12024.00
							16568.25
	PCC						
4	DAMP PROOF COURSE 1:2:4 : Providing 4 cm thick P.C.C. as a Damp Proof Course with stone chips and approved water proofing compound beneath the walls as per IS:2645-1964.						
	PLINTH	1	10.82	6.25	-	67.62	
	----					----	
	Total					67.62	
	Deduction for Openings						
	----					----	
	Total					0	
						67.62	Sq.M.
			Rate	110.00	Amount		7438.20
							7438.20
	RCC						
	Reinforced cement concrete using 20mm machine crushed blue metal including all form work, watering, curing etc. complete, but excluding the cost of reinforcement. Steel staging and supports along with shutter ply or steel plates to be used and machine mix						
5	**RCC FLOOR SLABS M15 : RCC for Floor Slabs using M15.**						
	Floor Slabs	1.00	6.25	10.82	0.30	20.29	
						20.29	Cu.M.
			Rate	3625.00	Amount		73551.25
6	**RCC LANDINGS M15 : RCC for Landings using M15.**						
	Landings	2.00	2.44	0.30	0.15	0.22	
						0.22	Cu.M.
			Rate	3625.00	Amount		797.50
							74348.75
	STEEL REQUIREMENTS						
	Supplying, cutting, bending and straightening reinforcement for R.C.C work; binding with 22 gauge binding wire etc. complete in all respects with deformed bars conforming to I.S 1786-1961 or IS 1139 and placing in position.Weight of steel=7850 Kg/m3.						
7	**STEEL REQUIREMENTS : Steel Requirements for Columns, Beams, Lintels, Slabs etc.**						
Steel Requirements for All Rccs @1 % of vol. for 185.84 m3 of RCC.		14588.44	-	-	-	14588.44	

Steel Requirements for Floor Slabs @1 % of vol. for 20.29 m3 of RCC.		1592.76	-	-	-	1592.76	
Steel Requirements for Landings @1 % of vol. for 0.22 m3 of RCC.		17.27	-	-	-	17.27	
					16,198.47		Kg
			Rate	30.00	Amount	485954.10	
						485954.10	
	BRICK WORKS						
8	BRICK WORKS FOUNDATION CM 1:3 : First class brick work masonry in C. M. 1:3 (1 cement 3 coarse sand) with approved good quality country burnt bricks of compressive strength 35 kg/m2 of standard size of on foundation. The rate shall include cost of all materials labour and other incidental charges of all materials to complete the work.						
	Foundation L	2	10.82	0.5	0.2	2.16	
	Foundation S	2	4.61	0.5	0.2	0.92	
						3.08	Cu.M.
			Rate	2,470.00	Amount		7607.60
9	BRICK WORKS FOUNDATION CM 1:4 : First class brick work masonry in C. M. 1:4 (1 cement 4 coarse sand) with approved good quality country burnt bricks of compressive strength 35 kg/m2 of standard size of on foundation. The rate shall include cost of all materials labour and other incidental charges of all materials to complete the work.						
	Foundation L	2	10.82	0.5	0.2	2.16	
	Foundation S	2	4.61	0.5	0.2	0.92	
						3.08	Cu.M.
			Rate	2,408.00	Amount		7416.64
10	BRICK WORKS BASEMENT CM 1:3 : First class brick work masonry in C. M. 1:3 (1 cement 3 coarse sand) with approved good quality country burnt bricks of compressive strength 35 kg/m2 of standard size of on basement. The rate shall include cost of all materials labour and other incidental charges of all materials to complete the work.						
	PLINTH	1	10.82	6.25	1	67.63	
						67.63	Cu.M.
			Rate	2,470.00	Amount		167046.10
11	BRICK WORKS CM 1:2 : First class brick work masonry in C. M. 1:2 (1 cement 2 coarse sand) with approved good quality country burnt bricks of compressive strength 35 kg/m2 of standard size of on super structure of all thickness. The rate shall include cost of all materials labour and other incidental charges of all materials to complete the work.						
	Wall L	2	10.82	0.23	3	14.93	

	Wall S	2	4.9	0.23	3	6.76	
	----					----	
	Total					21.69	
	Deduction for Openings						
	D1	4	0.9	0.23	2.1	1.74	
	W1	1	2.24	0.3	1.22	0.82	
	W2	3	0.91	0.23	1.21	0.76	
	W2	3	1.82	0.23	1.21	1.52	
	Columns	16	2.44	0.3	0.15	1.76	
	----					----	
	Total					6.6	
						15.09	Cu.M.
			Rate	2,500.00	Amount		37725.00
12	BRICK WORKS CM 1:4 : First class brick work masonry in C. M. 1:4 (1 cement 4 coarse sand) with approved good quality country burnt bricks of compressive strength 35 kg/m2 of standard size of on super structure of all thickness. The rate shall include cost of all materials labour and other incidental charges of all materials to complete the work.						
	Wall L	2	10.82	0.23	3	14.93	
	Wall S	2	4.9	0.23	3	6.76	
	----					----	
	Total					21.69	
	Deduction for Openings						
	D1	4	0.9	0.23	2.1	1.74	
	W1	1	2.24	0.3	1.22	0.82	
	W2	3	0.91	0.23	1.21	0.76	
	W2	3	1.82	0.23	1.21	1.52	
	Columns	16	2.44	0.3	0.15	1.76	
	----					----	
	Total					6.6	
						15.09	Cu.M.
			Rate	2,388.00	Amount		36034.92
							255830.26
	FLOOR AND WALL FINISHES						
13	FLOOR FINISHING CERAMIC TILES : Flooring with cermic tiles 225x225mm (NS) laid in 12mm thick cement 1:3 one coat and pointing with coloured coment to mortar the tiles including cost of materials labour charge etc. complete for all levels.						
	Bed	1	2.32	2.44	-	5.66	
	Kitchen	1	3	3.02	-	9.06	

	Stair	1	2.44	2.73	-	6.66	
	Living	1	4.95	3.02	-	14.95	
	Store	1	3.05	1.49	-	4.54	
						40.87	Sq.M.
			Rate	600.00	Amount		24522.00
							24522.00
	DOORS AND WINDOWS						
14	FRAMES WOOD : Supplying and fixing of doors and windows frames using good quality wood including M.S. clamps and fittings,fixing complete including a coat of tar at the contact surface of the frame.						
	D1	4	5.1	0.1	0.06	0.12	
	W1	1	5.42	0.1	0.06	0.03	
	W2	3	5.45	0.1	0.06	0.1	
	W2	3	7.27	0.1	0.06	0.13	
						0.38	Cu.M.
			Rate	27,840.00	Amount		10579.20
15	SHUTTERS ALUMINIUM GLAZED : Supplying and fixing of glazed shutters of good quality aluminium.						
	D1	4	0.8	-	2.05	6.56	
	W1	1	2.14	-	1.12	2.4	
	W2	3	0.77	-	1.11	2.56	
	W2	3	1.68	-	1.11	5.59	
						17.11	Sq.M.
			Rate	149.00	Amount		2549.39
16	DOORS : Supplying and fixing of doors using good quality wood including M.S. clamps and fittings,fixing complete including a coat of tar at the contact surface of the frame.						
	D1	4	0.9	-	2.1	7.56	
						7.56	Sq.M.
			Rate	2,780.00	Amount		21016.80
17	WINDOWS : Supplying and fixing of windows and vents using good quality wood including M.S. clamps and fittings, fixing complete including a coat of tar at the contact surface of the frame.						
	W1	1	2.24	-	1.22	2.73	
	W2	3	0.91	-	1.21	3.3	
	W2	3	1.82	-	1.21	6.61	
						12.64	Sq.M.
			Rate	2,780.00	Amount		35139.20

							69284.59
	PLASTERING AND POINTING						
18	PLASTERING CEILINGS AND SLABS CM 1:3 : Plastering with cement mortar to ceilings, stairs, steps, slabs and other structural architectural features at all heights, floated hard and trowelled get smooth finish. The rate shall include provision of grooves scaffolding at any height curing etc. complete as directed by the Engineer.						
	Floor Slabs	1	6.25	10.82	-	67.62	
	Landings	2	2.44	0.3	-	1.46	
						69.08	Sq.M.
			Rate	78.00	Amount		5388.24
							5388.24
	PAINTING						
19	PAINTING WALLS CEMENT PAINT : Providing and applying two coats of approved brand and shade water proof cement paint over a coat of cement primer to give an ever shade on plastered surfase thereof includes watering and cleaning surface etc. complete as per the instruction of the site engineer.						
	Wall L	4	10.82	-	3	129.84	
	Wall S	4	4.9	-	3	58.8	
	----					----	
	Total					188.64	
	Deduction for Openings						
	D1	4	0.9	-	2.1	7.56	
	W1	1	2.24	-	1.22	2.73	
	W2	3	0.91	-	1.21	3.3	
	W2	3	1.82	-	1.21	6.61	
	Columns	16	2.44	-	0.15	5.86	
	----					----	
	Total					26.06	
						162.58	Sq.M.
			Rate	35.00	Amount		5690.30
20	PAINTING CEILINGS AND SLABS CEMENT PAINT : Providing and applying two coats of approved brand and shade water proof cement paint over a coat of cement primer to give an ever shade on plastered surfase thereof includes watering and cleaning surface etc.						
	Floor Slabs	1	6.25	10.82	-	67.62	
	Landings	2	2.44	0.3	-	1.46	
						69.08	Sq.M.

			Rate	35.00	Amount		2417.80
21	PAINTING WALLS EXT. COLOUR WASHING : Colour washing the walls over a coat of white wash.						
	Outer Walls	1	34.14	-	2	68.28	
						68.28	Sq.M.
			Rate	12.00	Amount		819.36
22	PAINTING WALLS INT. COLOUR WASHING : Colour washing the walls over a coat of white wash.						
	Wall L	4	10.82	-	3	129.84	
	Wall S	4	4.9	-	3	58.8	
	----					----	
	Total					188.64	
	Deduction for Openings						
	Outside Area	1	34.14	-	2	68.28	
	D1	4	0.9	-	2.1	7.56	
	W1	1	2.24	-	1.22	2.73	
	W2	3	0.91	-	1.21	3.3	
	W2	3	1.82	-	1.21	6.61	
	Columns	16	2.44	-	0.15	5.86	
	----					----	
	Total					94.34	
						94.30	Sq.M.
			Rate	12.00	Amount		1131.60
							10059.06
	Total for GROUND FLOOR						949393.45
FIRST FLOOR							
	BRICK WORKS						
23	BRICK WORKS CM 1:2 : First class brick work masonry in C. M. 1:2 (1 cement 2 coarse sand) with approved good quality country burnt bricks of compressive strength 35 kg/m2 of standard size of on super structure of all thickness. The rate shall include costof all materials labour and other incidental charges of all materials to complete the work.						
	Wall L	2	10.82	0.23	3	14.93	
	Wall S	2	4.9	0.23	3	6.76	
	----					----	
	Total					21.69	
	Deduction for Openings						

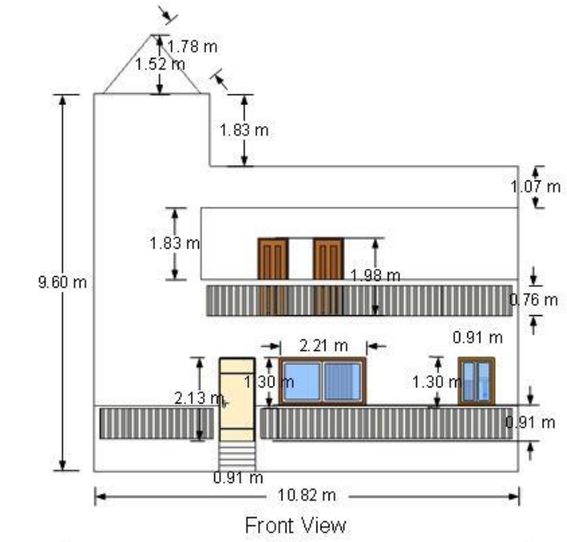
	D	1	1	0.23	2.1	0.48	
	D1	2	0.9	0.23	1.8	0.75	
	W2	2	0.91	0.23	2.13	0.89	
	----					----	
	Total					2.12	
						19.57	Cu.M.
			Rate	2,560.90	Amount		50116.81
							50116.81
	DOORS AND WINDOWS						
24	FRAMES WOOD : Supplying and fixing of doors and windows frames using good quality wood including M.S. clamps and fittings,fixing complete including a coat of tar at the contact surface of the frame.						
	D	1	5.2	0.1	0.06	0.03	
	D1	2	4.5	0.1	0.06	0.05	
	W2	2	8.21	0.1	0.06	0.1	
						0.18	Cu.M.
			Rate	28,280.00	Amount		5090.40
25	SHUTTERS ALUMINIUM GLAZED : Supplying and fixing of glazed shutters of good quality aluminium.						
	D	1	0.9	-	2.05	1.85	
	D1	2	0.8	-	1.75	2.8	
	W2	2	0.77	-	2.03	3.13	
						7.78	Sq.M.
			Rate	149.00	Amount		1159.22
26	DOORS : Supplying and fixing of doors using good quality wood including M.S. clamps and fittings,fixing complete including a coat of tar at the contact surface of the frame.						
	D	1	1	-	2.1	2.1	
	D1	2	0.9	-	1.8	3.24	
						5.34	Sq.M.
			Rate	2,943.92	Amount		15720.53
27	WINDOWS : Supplying and fixing of windows and vents using good quality wood including M.S. clamps and fittings,fixing complete including a coat of tar at the contact surface of the frame.						
	W2	2	0.91	-	2.13	3.88	
						3.88	Sq.M.
			Rate	2,943.92	Amount		11422.41
							33392.56
	Total for FIRST FLOOR						83509.38
			SECOND				

			FLOOR				
	DOORS AND WINDOWS						
1	DOORS : Supplying and fixing of doors using good quality wood including M.S. clamps and fittings,fixing complete including a coat of tar at the contact surface of the frame.						
	D	1	1	-	2.1	2.1	
						2.10	Sq.M.
			Rate	3,107.84	Amount		6526.46
							6526.46
	Total for SECOND FLOOR						6526.46
	Total					1039429.29	
	Net Amount					**1039429.00**	

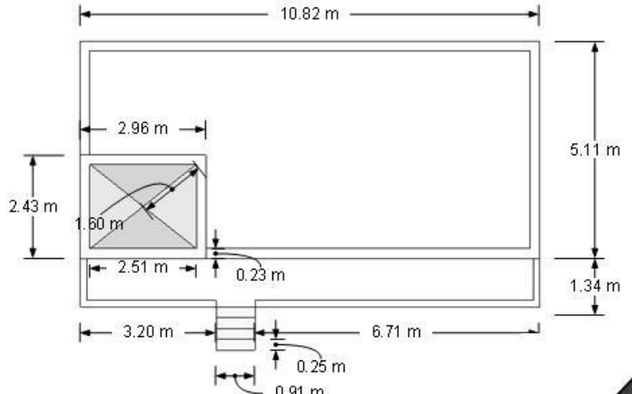
Table 43 Measurement Sheet

	Description	Quantity	Unit	Rate	Amount
	Total f or FOUNDATION Grou nd floor				0.00
	Earth works				
1	EARTH WORKS EXCAVATION ORDINARY SOIL	18.93	Cu.M	67.00	1268.31
2	EARTH WORKS FILLING FOUNDATION USING SAND	4.26	Cu.M	769.00	3275.94
3	ANTI TERMITE TREATMENT	60.12	Sq.M	200.00	12024.00
					16568.25
	Pcc				
4	DAMP PROOF COURSE 1:2:4	67.62	Sq.M	110.00	7438.20
					7438.20
	Rcc				
5	RCC FLOOR SLABS M15	20.29	Cu.M	3,625.00	73551.25
6	RCC LANDINGS M15	0.22	Cu.M	3,625.00	797.50
					74348.75
	Steel requirements				
7	STEEL REQUIREMENTS	16,198.47	Kg	30.00	485954.10
					485954.10
	Brick works				
8	BRICK WORKS FOUNDATION CM 1:3	3.08	Cu.M	2,470.00	7607.60
9	BRICK WORKS FOUNDATION CM 1:4	3.08	Cu.M	2,408.00	7416.64
10	BRICK WORKS BASEMENT CM 1:3	67.63	Cu.M	2,470.00	167046.10
11	BRICK WORKS CM 1:2	15.09	Cu.M	2,500.00	37725.00
12	BRICK WORKS CM 1:4	15.09	Cu.M	2,388.00	36034.92

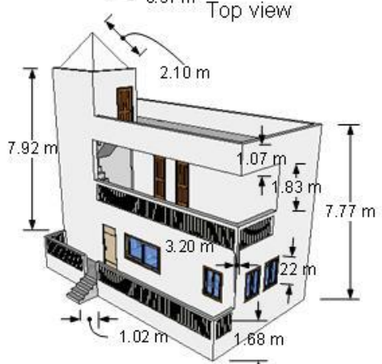
					255830.26
	Floor and wall finishes				
13	FLOOR FINISHING CERAMIC TILES	40.87	Sq.M	600.00	24522.00
					24522.00
	Doors and windows				
14	FRAMES WOOD	0.38	Cu.M	27,840.00	10579.20
15	SHUTTERS ALUMINIUM GLAZED	17.11	Sq.M	149.00	2549.39
16	DOORS	7.56	Sq.M	2,780.00	21016.80
17	WINDOWS	12.64	Sq.M	2,780.00	35139.20
					69284.59
	Plastering and pointing				
18	PLASTERING CEILINGS AND SLABS CM 1:3	69.08	Sq.M	78.00	5388.24
					5388.24
	Painting				
19	PAINTING WALLS CEMENT PAINT	162.58	Sq.M	35.00	5690.30
20	PAINTING CEILINGS AND SLABS CEMENT PAINT	69.08	Sq.M	35.00	2417.80
21	PAINTING WALLS EXT. COLOUR WASHING	68.28	Sq.M	12.00	819.36
22	PAINTING WALLS INT. COLOUR WASHING	94.30	Sq.M	12.00	1131.60
	10059.06				
	Total f or GROUND FLOOR 949393.45				
	FIRS T FLOOR				
	BRICK WORKS				
	BRICK WORKS CM 1:2	19.57	Cu.M	2,560.90	50116.81
	FRAMES WOOD	0.18	Cu.M	28,280.00	5090.40
	SHUTTERS ALUMINIUM GLAZED	7.78	Sq.M	149.00	1159.22
	DOORS	5.34	Sq.M	2,943.92	15720.53
	WINDOWS	3.88	Sq.M	2,943.92	11422.41
	33392.56				
	Total f or FIRST FLOOR83509.38				
	SECO ND FLOOR				
	DOORS AND WINDOWS				
	DOORS	2.10	Sq.M	3,107.84	6526.46
	6526.46				
	Total for SECOND FLOOR 6526.4 **Net Amount 1039429.00**				



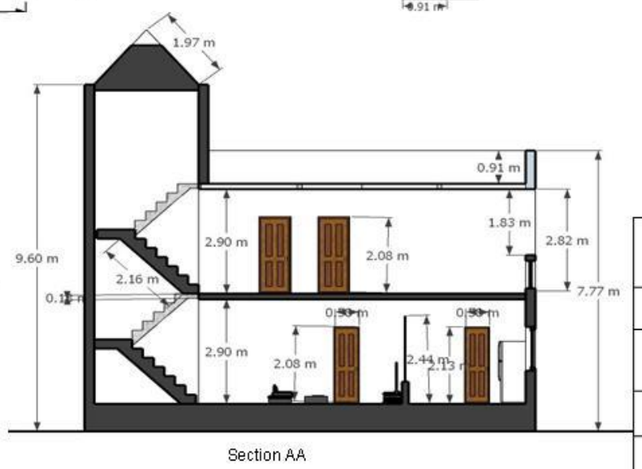
Front View



Top view



Isolated View



Section AA

Pucca House

Schedule of Door & windows

Sr no	Type of element	Dimension	Qantity
1	D1	1.00 X 2.13 m	1
2	D2	1.50 X 2.13 m	1
3	D3	3.00 X 2.13 m	1
4	D4	0.60 X 2.13 m	1
5	W1	1.00 X 1.50 m	3
6	W2	2.72 X 1.00 m	1
7	V	0.60 X 0.60 m	1

Design 7

C.K. Pithawala Collage of Engineering & Technology

VISHWAKARMA YOJNA: VIII *AN APPROACH TOWARDS RURBANISATION* **TENARANG Village**

Pucca House

All Diamensions are in Feet-inch

CLIENT
C.K Pithawalla College of Engineering and Technology
Near Malvan Mandir Via Magdalla Port,
Dumas Rd, Surat, Gujarat
395007

PROJECT
VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS
RURBANISATION
TENARANG Village

DRAWN BY
Muskan Ghoewala
Harshit Mehta

DESCRIPTION
Section,Plan,Elevation

170

13.1.2 Civil Design 2

Community Hall

The Government recognizes that village halls, community centres and other charities that provide space and facilities for community services and activities can make an enormous difference to the well being of their communities. These charities are an extremely important resource with a crucial role to play, not only in the economic and social regeneration of their local communities. Ageing rural populations, lack of interest among younger people or among new residents in commuter villages, competition from nearby towns and cities that are now easier to reach - all of these factors have been identified as problems for some rural village community hall.

The primary function of the MeCommunity hall is to provide sufficient space with facilities to Public for gathering . IT is very convenient in rural areas. The existing structure is not in good condition and lack many of the facilities. Moreover, due to increased population of Tenarang it doesn't hold all its users. So with help and guidance of Prabhat bhai(talati) expansion and renovation of existing structure is proposed with facilities like music system, proper washroom and a room to store things.

Estimation of Community Hall Quantity:

Table 45 Measurement Sheet

Sr. no	Description	No.	L. (m)	Width (m)	Height (m)	Quantity	Total quantity
1	Earthwork in excavation in foundation						
	Net C.L. length= 56.38*(0.5*0.9*3) = 76.11 m	1	76.11	0.9	1.10	75.35	
						Total =75.35m^3	
2	Brick Bat Cement Concrete(1:4:8) for foundation	1	76.11	0.9	0.2	13.69	
						Total =13.69m^3	
4	Earth Filling in plinth						
	Toilet	1	3.34	2.82	0.45	9.86	
	Storage	1	1.5	2.82	0.45	1.90	
	Main Room	1	12.45	10.75	0.45	60.22	
	Entrance	1	3.34	8	0.45	12.02	
						Total =84.00m^3	
3	Brick Masonry up to plinth in CM (1:6)						
	L= 76.11-(0.5*0.5*4) =75.11m	1	75.11	0.5	0.3	11.2	
	L= 76.11-(0.5*0.4*4) =75.31m	1	75.31	0.4	0.3	9.03	
	L= 76.11-(0.5*0.3*4) =75.51m	1	75.51	0.3	0.85	19.25	
						Total =39.48m^3	
5	Brick Masonary above plinth to slab in CM (1:6)						
	L= 76.11m	1	76.11	0.2	3.0	45.66	
						Total =45.66m^3	
	Deduction of Door/Window						

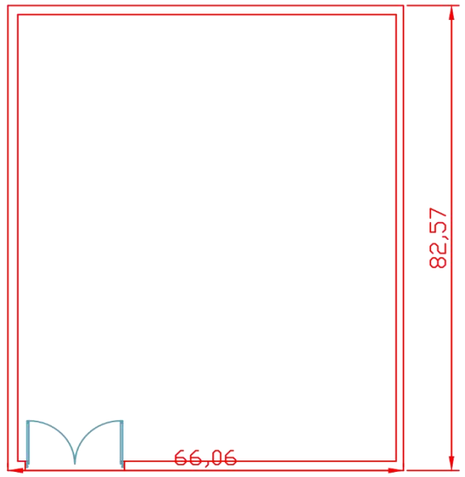
	D1	1	2	0.2	2.1	0.84	
	D2	4	0.8	0.2	2.1	1.34	
	W1	4	1.7	0.2	1.02	1.38	
	W2	5	1.8	0.2	0.8	1.44	
	V	2	0.6	0.2	0.6	0.14	
					(-)	Total =5.14m^2	
	Net Quantity = 45.66-5.14 = 40.52m^3						
6	Smooth plaster inside Rooms & Ceiling						
	-Plaster For Wall:						
	Toilet	2	3.97		4	31.76	
		2	2.82		4	22.56	
	Storage	2	2.82		4	22.56	
		2	1.5		4	12	
	Main Room	2	12.05		4	96.4	
		2	10.75		4	86	
	Entrance	2	8.03		4	64.24	
		2	3.34		4	26.72	
						Total =362.2 m^2	
	Deduction of Door/Window						
	D1	1/2	2		2.1	2.1	
	D2	2/2	0.8		2.1	3.36	
	W1	1/2	1.7		1.02	0.86	
	W2	2/2	1.8		0.8	2.88	
	V	1/2	0.6		0.6	0.18	
					(-)	Total =9.38m^2	
	Net Quantity= 362.2-9.38= 352.82m^2						
7	Smooth plaster on outer wall						
	L = 76.11m	1	76.11		4	304.4	
						Total =304.4m^2	
	Deduction of door/window = 9.38m^2						
	Net Quantity = 304.4-9.38 = 295.06m^2						
8	Paint Work (White Wash)						
	-For Inside Wall:						
	Toilet	2	3.97		0.4	3.17	
		2	2.82		0.4	2.25	
	Storage	2	2.82		0.4	2.25	
		2	1.5		0.4	1.2	
	Main Room	2	12.05		0.4	9.64	
		2	10.75		0.4	8.6	
	Entrance	2	8.03		0.4	6.42	
		2	3.34		0.4	2.67	
						Total =36.20m^2	
	Deduction of Door/Window						
	D1	1/2	2		2.1	2.1	
	D2	2/2	0.8		2.1	3.36	

	W1	1/2	1.7		1.02	0.86	
	W2	2/2	1.8		0.8	2.88	
	V	1/2	0.6		0.6	0.18	
					(-)	Total =9.38m^2	
	Net Quantity= 36.20-9.38 =26.64m^2						
9	Paint Work on outer wall						
	L = 76.11m	1	76.11		4	304.4	
					Total =304.4m^2		
	Deduction of door/window = 9.38m^2						
	Net Quantity = 304.4-9.38 = 295.06m^2						

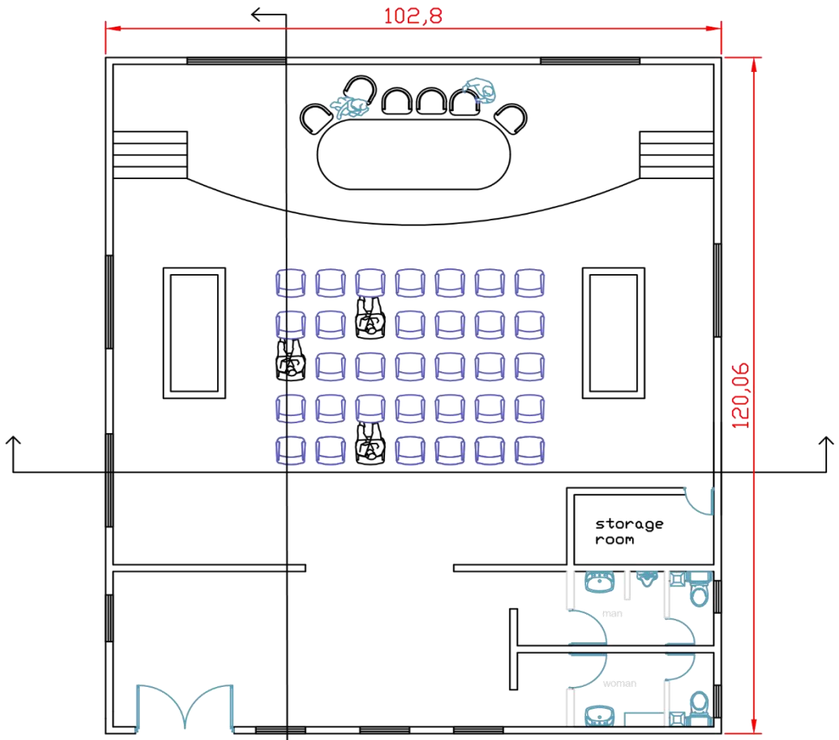
Abstract Sheet of Community hall:

Table 46 Abstract Sheet

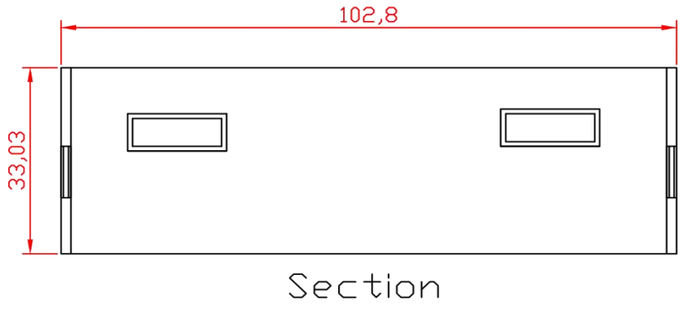
Sr. no	Item Description	Quantity	Rate	Per	Amount (Rs.)
1	Earthwork in excavation in foundation	75.35m^3	100	m^3	7535
2	Brick Bat Cement Concrete(1:4:8) for foundation	13.69m^3	3530	m^3	48325.7
3	Earth Filling in plinth	84.00m^3	60	m^3	5040
4	Brick Masonry up to plinth in CM (1:6)	39.48m^3	3240	m^3	127915.2
5	Brick Masonry above plinth to slab in CM (1:6)	40.52m^3	3920	m^3	158838.4
6	Smooth plaster inside Rooms & Ceiling	352.82m^2	150	m^2	52923
7	Smooth plaster on outer wall	295.06m^2	150	m^2	44259
8	Paint Work (White Wash)	26.64m^2	63	m^2	1678.32
9	Paint Work on outer wall	295.06 m^2	63	m^2	18588.7
				Total Rs. =	465103.3
		Add 1.5% Water Charge			6976.5
		Add 10% Contractor Profit			46510.3
		Total Estimation cost in Rs.			**518410.13**



Exesting plan



New Plan



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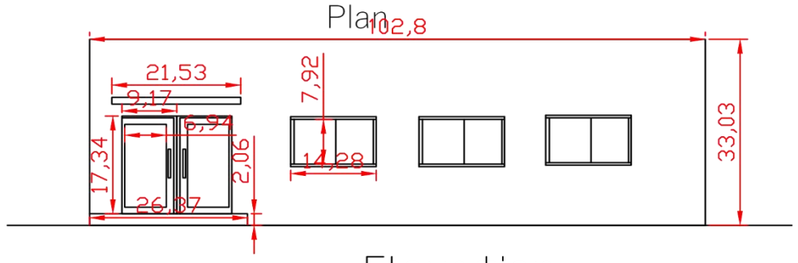
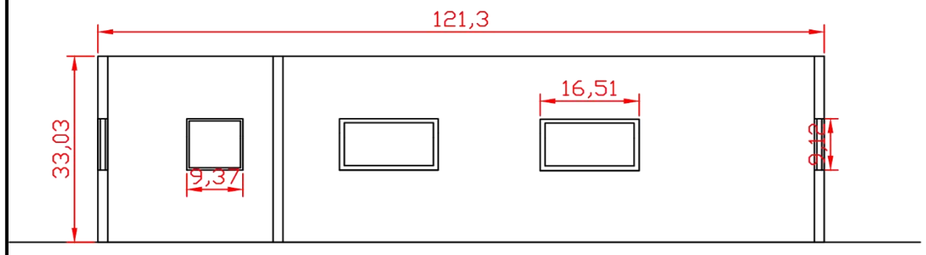


Elevation



Design 8

C.K. Pithawala Collage of Engineering & Technology

VISHWAKARMA YOJNA: VIII *AN APPROACH TOWARDS RURBANISATION* **TENARANG Village**

Community Hall

CLIENT
C.K Pithawalla College of Engineering and Technology
Near Malvan Mandir Via Magdalla Port,
Dumas Rd, Surat, Gujarat
395007

PROJECT
VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS
RURBANISATION
TENARANG Village

DRAWN BY
Muskan Gheewala
Harshit Mehta
DESCRIPTION
Section,Plan,Elevation

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13.1.3 Civil Design 3

Biogas Plant

Biogas is the mixture of gases produced by the breakdown of organic matter in the absence of oxygen (anaerobically), primarily consisting of methane and carbon dioxide. Biogas can be produced from raw materials such as agricultural waste, manure, municipal waste, plant material, sewage, green waste or food waste. Biogas is a renewable energy source.

Biogas is primarily methane (CH4) and carbon dioxide (CO2) and may have small amounts of hydrogen sulfide (H2S), moisture and siloxanes. The gases methane, hydrogen, and carbon monoxide (CO) can be combusted or oxidized with oxygen. This energy release allows biogas to be used as a fuel; it can be used for any heating purpose, such as cooking. It can also be used in a gas engine to convert the energy in the gas into electricity and heat. Biogas is estimated to have the potential to replace around 17% of vehicle fuel. Biogas can be cleaned and upgraded to natural gas standards, when it becomes bio-methane. Biogas is considered to be a renewable resource because its production-and-use cycle is continuous, and it generates no net carbon dioxide. As the organic material grows, it is converted and used. It then regrows in a continually repeating cycle. From a carbon perspective, as much carbon dioxide is absorbed from the atmosphere in the growth of the primary bio-resource as is released, when the material is ultimately converted to energy.

Design:

Total no. of animals (buffalo, cow) in village = 220

As per standard data assume per day dung of animals = 10.5 kg

So, total dung per day = 220 x 10.5 = 2310 kg/day

Design of Digester:

Assume retention period (R) = 70 days

Assume mixing proportion of solid and water is 1:2.

Now total amount of slurry per day (S) = Total dung per day + water amount

= 2310 + 2(2310)

= 6930 kg/day

= 9.373 m^3/day

Digester Volume = S x R = 9.373 x 70 = 656.13 m^3

Assume cylinder shape biogas plant.

Provide total 2 no. of unit in different area.

So, digester volume becomes = 656.12/3 =218.70 m^3

Provide =218.70 m3

Total digester volume (Vd) = $\pi r^2 h$

218.70= $\pi r^2 h$

Assume h = 4 m, r = 4m

So, dimensions are h = 4 m, r =4 m

Design of Gas Holder:

Assume digester temperature = 26-28 ^oC

Now,

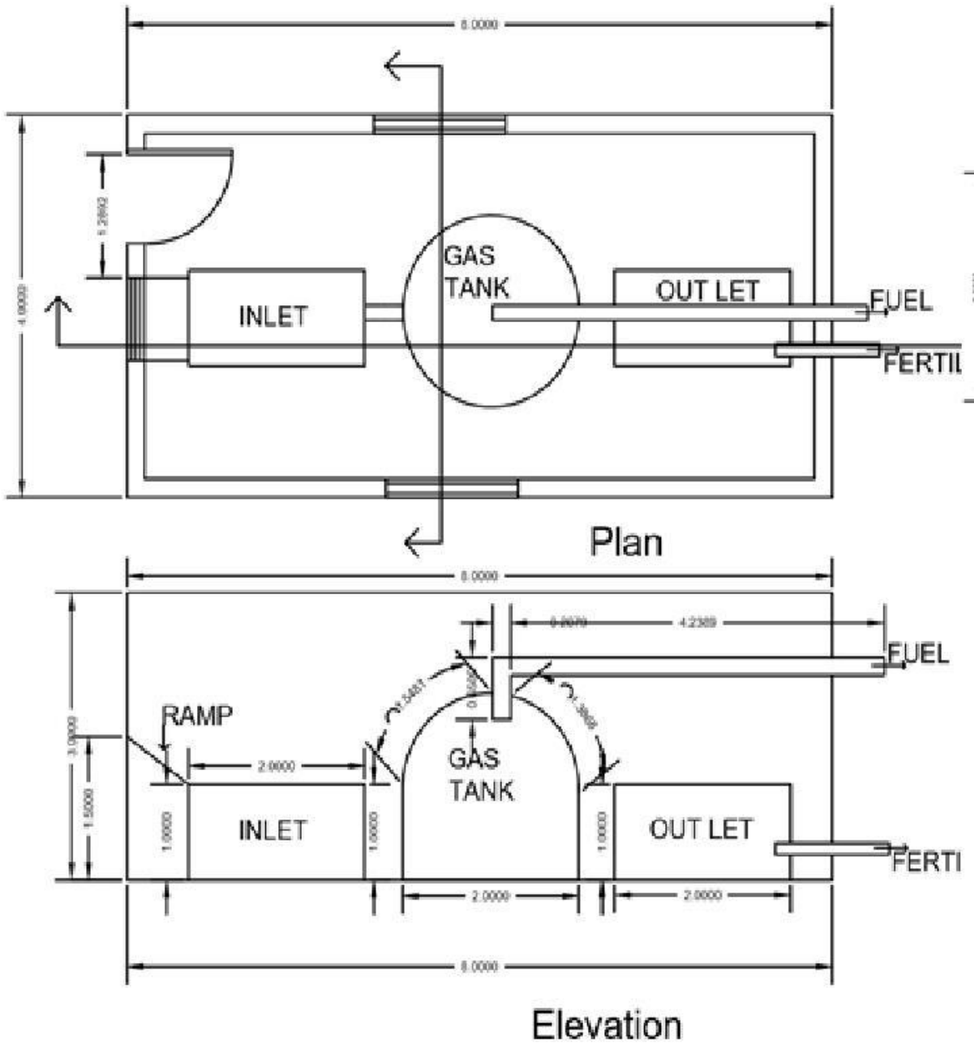
Specific Gas Production (Gd) = 37 litre/day

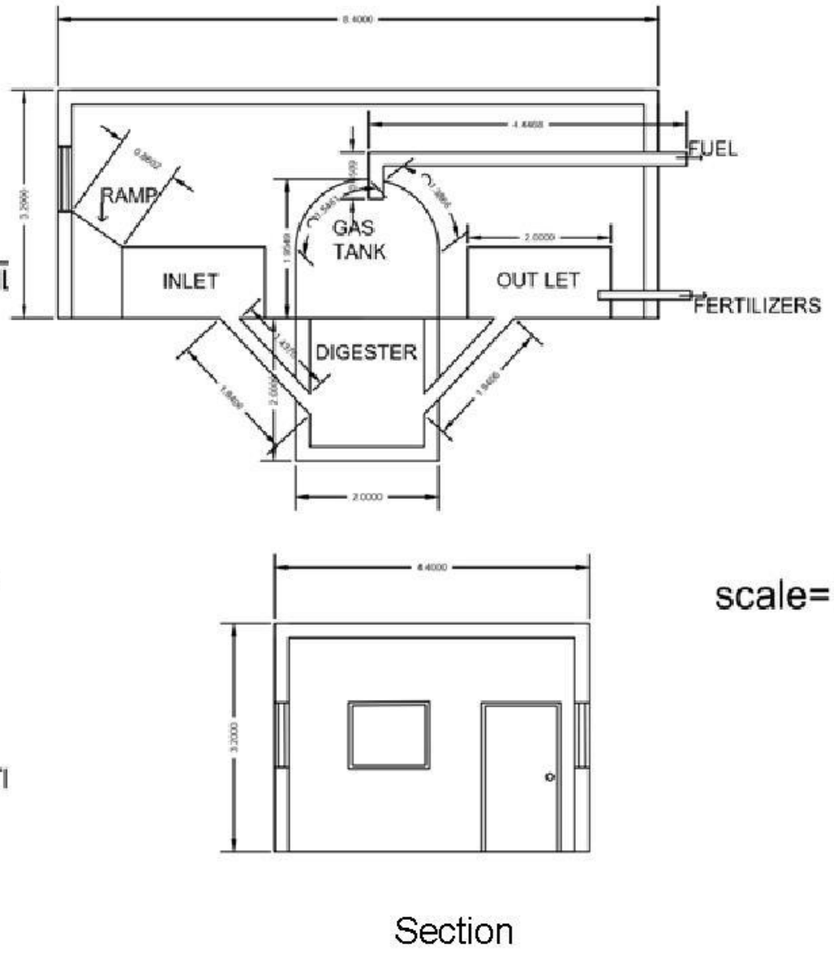
Daily Gas Production G = G_d x Feed Volume = 37 x 6930 = 256410 lit = 256.14 m^3

Now,
Assume Gas Holder capacity = 70%
Gas Holder Volume = Daily Gas Production x Capacity of Holder
= 256.14 x 0.70
= 179.2m^3 ~ 180 m^3
So, take gas holder volume = 200 m^3
Now, for 2 units provide volume of holder each unit =200 m3/ 2 = 100m^3
Provide cylinder shaped,
Therefore, Volume = $\pi r^2 h$
100 = $\pi r^2 h$
(1) Assume h = 2
r = 3.99 m
So, dimension of the gas holder: h = 2 m, r = 4 m
Design of Inlet and Outlet:
Total Volume of slurry mix deposit = 6930/ 2 = 4.6866 m^3/ day
Assume two time filling operation in plant.
So, take total volume of slurry = 4.6866 / 2 = 2.3433 m3/ day =3 m^3/ day
Provide Rectangular tank.
So, Total volume for one time mixing of slurry = L x B x H
3= L x B x 2
Dimensions of inlet: L =2 m
B = 0.8 m
H =2 m
Here, 3m^3/ day required $\leq$ 3 m^3/ day provided.
Hence OK.
Provide same size of outlet also.

Cost of biogas plant

The annual amount of excrements collected accounts for 80% of that discharge. The initial investment of biogas plant is 10,000 to 20,000 and which one can recover the cost by saving one LPG cylinder every month. Total cost for a biogas plant, including all essential installations, excluding land is between Rs. 100-150 per m^3 capacity. Therefore estimated cost is 80,000 Rs.





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PROJECT
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AN APPROACH TOWARDS
RURBANISATION
TENARANG Village

DRAWN BY
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Harshit Mehta

DESCRIPTION
Section, Plan, Elevation

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13.1.4 Civil Design 4

Gram panchayat

Gram Panchayat is a basic village governing institute in Indian villages. It is a democratic structure at the grass-roots level in India. It is a political institute, acting as cabinet of the village. The Gram Sabha work as the general body of the Gram Panchayat. The members of the Gram Panchayat are elected by the Gram Sabha.

There are about 250,000 Gram Panchayats in India. Established in various states of India, the Panchayat Raj system has three tiers: Zila Parishad, at the district level; Nagar Palika, at the block level; and Gram Panchayat, at the village level. Rajasthan was the first state to establish Gram Panchayat, Nagur village being the first village where Gram Panchayat was established, on 2 October 1959.

The failed attempts to deal with local matters at the national level caused, in 1992, the reintroduction of Panchayats for their previously used purpose as an organisation for local self-governance.

Estimation of Gram Panchayat

Table 47 Measurement Sheet

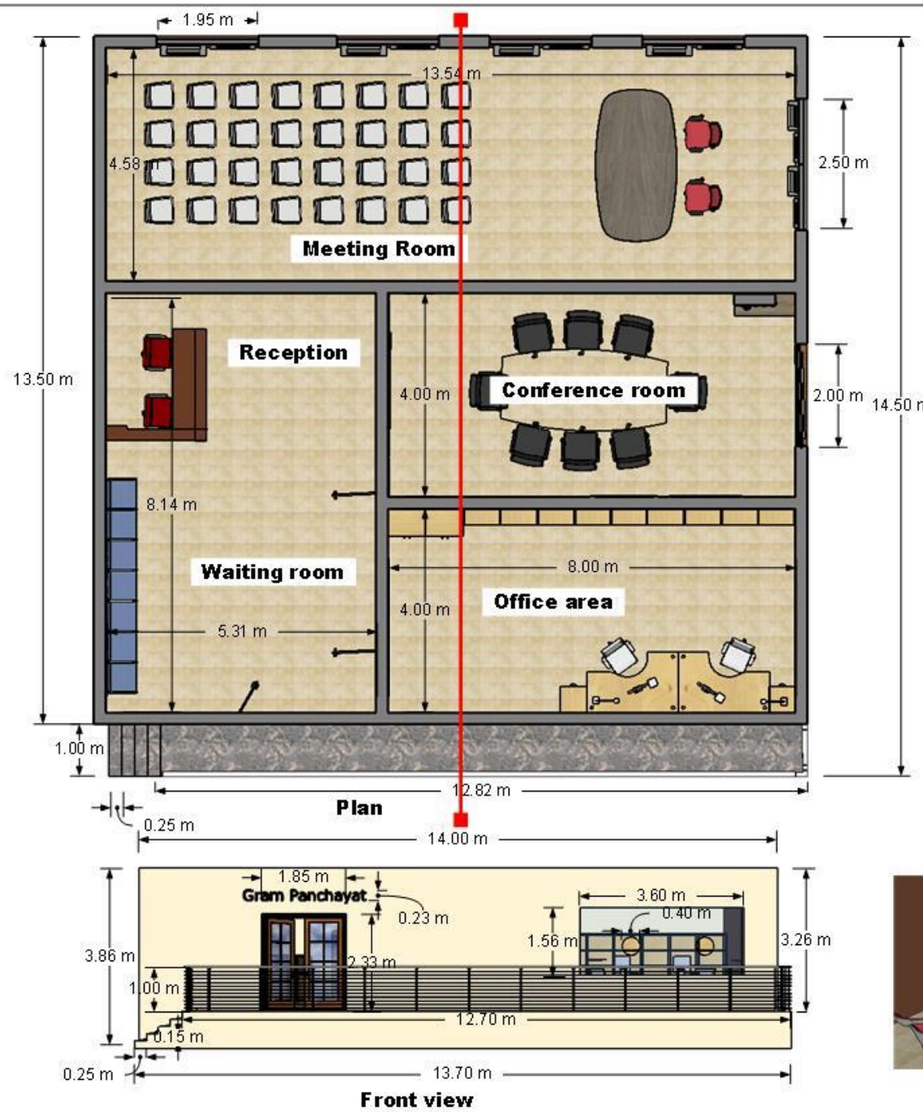
SlNo	Description	Quantity	Unit	Rate	Amount
GROU ND FLOOR					
	FLOOR AND WALL FINISHES				
1	FLOOR FINISHING CEMENT FLOATING	165.16	Sq.M	151.00	24939.16
2	SKIRTING CEMENT FLOATING COAT IN M : Skirting using Cement Flushing Coat.	110.64	m	10.00	1106.40
					26045.56
	DOORS AND WINDOWS				
3	FRAMES WOOD : Supplying and fixing of doors and windows frames using good quality wood including M.S. clamps and fittings,fixing complete including a coat of tar at the contact surface of the frame	0.38	Cu.M	27,840.00	10579.20
4	SHUTTERS ALUMINIUM GLAZED : Supplying and fixing of glazed shutters of good quality aluminium.	26.65	Sq.M	149.00	3970.85
5	DOORS : Supplying and fixing of doors using good quality wood including M.S. clamps and fittings,fixing complete including a coat of tar at the contact surface of the frame.	11.74	Sq.M	2,780.00	32637.20
6	WINDOWS : Supplying and fixing of windows and vents using good quality wood including M.S. clamps and fittings,fixing complete including a coat of tar at the contact surface of the frame.	16.38	Sq.M	2,780.00	45536.40

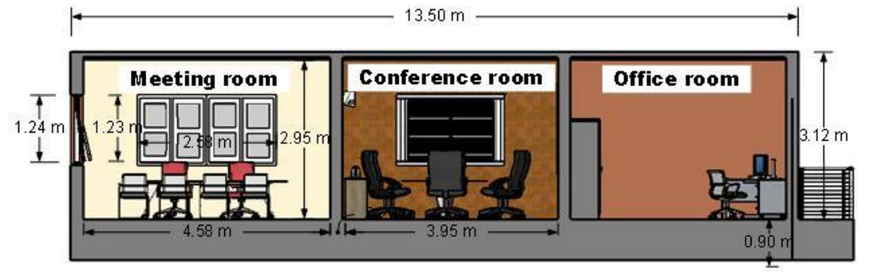
					92723.65
	PAINTING				
7	PAINTING WALLS WHITE CEMENT :	-28.12	Sq.M	31.00	871.72
	Painting walls using white cement.				
8	PAINTING CEILINGS AND SLABS COLOUR WASHING : Colour washing the	165.16	Sq.M	12.00	1981.92
	ceilings over a coat of white wash.				
9	PAINTING WALLS EXT. WHITE CEMENT :	199.66	Sq.M	31.00	6189.46
	Painting walls using white cement.				
10	PAINTING WALLS INT. COLOUR WASHING : Colour washing the walls over a coat of white wash.	43.88	Sq.M	12.00	526.56
					7826.22
Total for GROUND FLOOR					126595.43
Total					126595.43
Net Amount					**126595.00**

Abstract Sheet of Gram Panchayat

Table 48 Abstract Sheet

Sl no	Description	Quantity	Unit	Rate	Amount
	Ground floor				
	Floor and wall finishes				
1	Floor finishing cement floating coat	165.16	Sq.M	151.00	24939.16
2	Skirting cement floating coat in m	110.64	M	10.00	1106.40
	26045.56				
	Doors and windows				
3	Frames wood	0.38	Cu.M	27,840.00	10579.20
4	Shutters aluminium glazed	26.65	Sq.M	149.00	3970.85
5	Doors	11.74	Sq.M	2,780.00	32637.20
6	Windows	16.38	Sq.M	2,780.00	45536.40
	92723.65				
	Painting				
7	Painting walls white cement	-28.12	Sq.M	31.00	871.72
8	Painting ceilings and slabs colour Washing	165.16	Sq.M	12.00	1981.92
9	Painting walls ext. White cement	199.66	Sq.M	31.00	6189.46
10	Painting walls int. Colour Washing	43.88	Sq.M	12.00	526.56
					7826.22
				Total for GROUND FLOOR	**126595.43**
				Total Net Amount	**126595.00**





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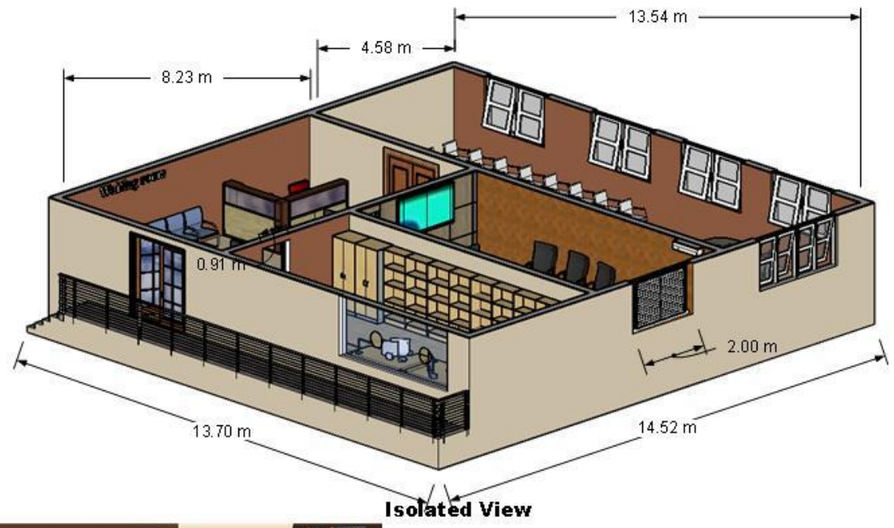
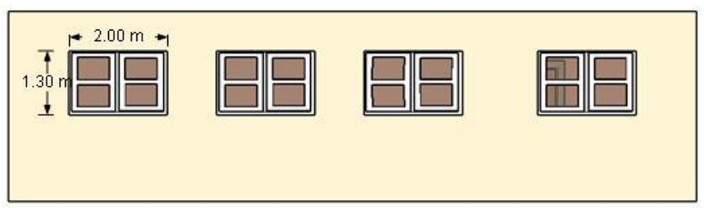


Isolated View

Front view

Meeting room



Back view

Conference room

Gram panchayat - Renovation

Schedule of Door & windows

Sr no	Type of element	Dimension	Qantity
1	D1	1.85 x 2.33 m	2
2	D2	1.00 x 2.10	2
5	W1	3.60 x 1.60	1
4	W2	2.00 x 1.30	1
5	W3	2.50 x 1.30	1
6	W4	2.00 x 1.30	4

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TENARANG Village

DRAWN BY
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Harshit Mehta

DESCRIPTION
Section,Plan,Elevation

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13.1.5 Civil Design 5

Police Station

A police station is a building which serves to accommodate police officers and other members of staff. These buildings often contain offices and accommodation for personnel and vehicles, along with locker rooms, temporary holding cells and interview/interrogation rooms. Police body of officers representing the civil authority of government. Police typically are responsible for maintaining public order and safety, enforcing the law, and preventing, detecting, and investigating criminal activities. There is no provision of police station in Tenarang village. As safety is essential for humans. As police station serves as important facility of public. It needs to be developing in village. It serves as the betterment for general public. It is used to maintain rules and regulation within village. A police station consist of one inspector room, waiting room and washroom. Rather, the police station is available for use by the general public, visitors of village, employees of a glass factory, prisoners etc. Increasingly, number of crimes leads to requirement of police station.

Estimation of Police station Quantity:

Table 49 Measurement Sheet

Sr. no	Description	No.	Length (m)	Width (m)	Height (m)	Quantity	Total quantity
1	Earthwork in excavation in foundation						
	Net C.L. length= 32.1*(0.5*0.9*3) = 30.75 m	1	30.75	0.9	1.10	30.44	
						Total =30.44m^3	
2	Brick Bat Cement Concrete(1:4:8) for foundation	1	30.75	0.9	0.2	5.54	
						Total =5.54m^3	
4	Earth Filling in plinth						
	Toilet	1	3.4	1.5	0.45	2.29	
	Storage	1	4	2.6	0.45	4.68	
	Complain Room	1	3.0	3.4	0.45	4.59	
	Inspector Room	1	4.6	4	0.45	8.28	
						Total =19.84m^3	
3	Brick Masonry up to plinth in CM (1:6)						
	L= 30.75-(0.5*0.5*3) =30m	1	30	0.5	0.3	4.5	
	L= 30.75-(0.5*0.4*3) =30.15m	1	30.15	0.4	0.3	3.62	
	L= 30.75-(0.5*0.3*3) =30.3m	1	30.3	0.3	0.85	7.73	
						Total =15.85m^3	
5	Brick Masonary above plinth to slab in CM (1:6)						
	L= 30.45m	1	30.45	0.2	3.0	18.27	
						Total =18.27m^3	
	Deduction of Door/Window						
	D1	1	1.2	0.2	2.1	0.50	
	D2	3	0.8	0.2	2.1	1.00	

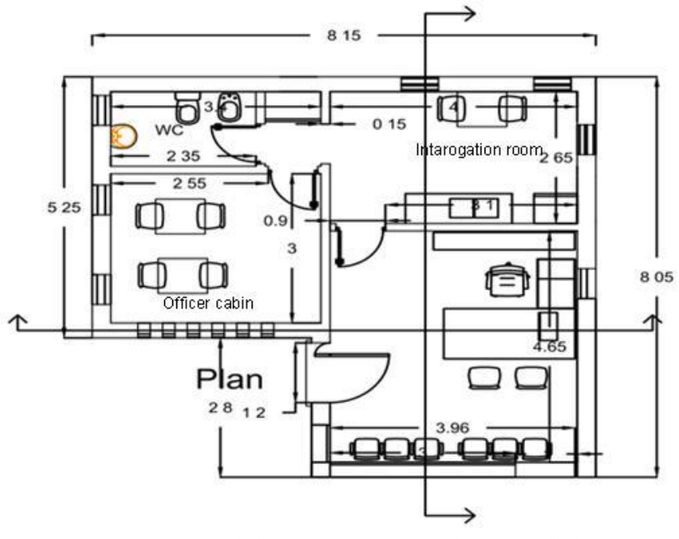
	W1	2	2.5	0.2	1.4	1.4	
	W2	4	1.2	0.2	1.4	1.33	
	V	1	0.6	0.2	0.6	0.07	
					(-)	Total =4.31m^2	
	Net Quantity = 18.27-4.31 = 13.99m^3						
6	Smooth plaster inside Rooms & Ceiling						
	-Plaster For Wall:						
	Toilet	2	3.4		3	20.4	
		2	1.5		3	9	
	Storage	2	4		3	24	
		2	2.6		3	15.6	
	Complain Room	2	3		3	18	
		2	3.4		3	20.4	
	Inspector Room	2	4.6		3	27.6	
		2	4		3	24	
						Total =159 m^2	
	Deduction of Door/Window						
	D1	1/2	1.2		2.1	1.26	
	D2	2/2	0.8		2.1	1.68	
	W1	1/2	2.5		1.4	1.75	
	W2	2/2	1.2		1.4	1.68	
	V	1/2	0.6		0.6	0.18	
					(-)	Total =4.87m^2	
	Net Quantity= 159-4.87 = 154.13m^2						
7	Smooth plaster on outer wall						
	L = 96.1m	1	96.1		3	288.3	
						Total =288.3m^2	
	Deduction of door/window = 4.87m^2						
	Net Quantity = 288.3-4.87 = 283.4m^2						
8	Paint Work (White Wash)						
	-For Inside Wall:						
	Toilet	2	3.4		0.3	2.04	
		2	1.5		0.3	0.9	
	Storage	2	4		0.3	2.4	
		2	2.6		0.3	1.56	
	Complain Room	2	3		0.3	1.8	
		2	3.4		0.3	2.04	
	Inspector Room	2	4.6		0.3	2.76	
		2	4		0.3	2.4	
						Total =15.9m^2	
	Deduction of Door/Window						
	D1	1/2	1.2		2.1	1.26	

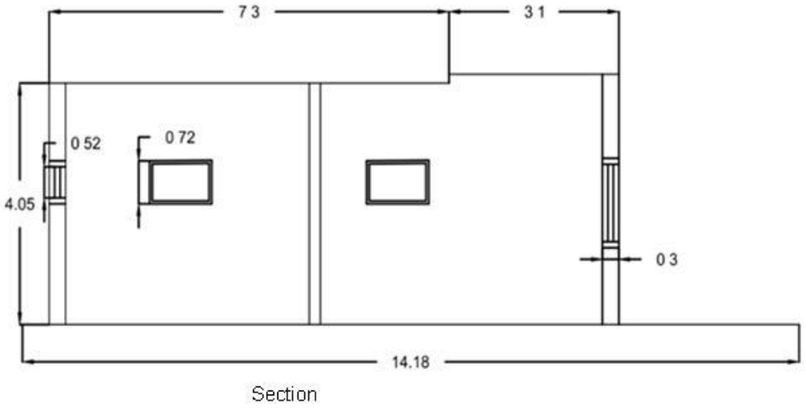
	D2	2/2	0.8		2.1	1.68	
	W1	1/2	2.5		1.4	1.75	
	W2	2/2	1.2		1.4	1.68	
	V	1/2	0.6		0.6	0.18	
					(-)	Total =4.87m^2	
9	Net Quantity= 15.9-4.87 = 11.03m^2						
	Paint Work on outer wall						
	L = 96.1m	1	96.1		3	288.3	
						Total =288.3m^2	
	Deduction of door/window = 4.87m^2						
	Net Quantity = 288.3-4.87 = 283.4m^2						

Abstract Sheet of Police station:

Table 50 Abstract Sheet

Sr. no	Item Description	Quantity	Rate	Per	Amount (Rs.)
1	Earthwork in excavation in foundation	30.44m^3	100	m^3	3044
2	Brick Bat Cement Concrete(1:4:8) for foundation	5.54m^3	3530	m^3	19556.2
3	Earth Filling in plinth	19.84m^3	60	m^3	1190.4
4	Brick Masonry up to plinth in CM (1:6)	15.85m^3	3240	m^3	51354
5	Brick Masonry above plinth to slab in CM (1:6)	13.99m^3	3920	m^3	54840.8
6	Smooth plaster inside Rooms & Ceiling	154.13m^2	150	m^2	23119.5
7	Smooth plaster on outer wall	283.4m^2	150	m^2	42510
8	Paint Work (White Wash)	136.4m^2	63	m^2	8583.12
9	Paint Work on outer wall	283..4m^2	63	m^2	17854.2
				Total Rs. =	202452.02
		Add 1.5% Water Charge			3036.7
		Add 10% Contractor Profit			20245.2
		Total Estimation cost in Rs.			**225734**





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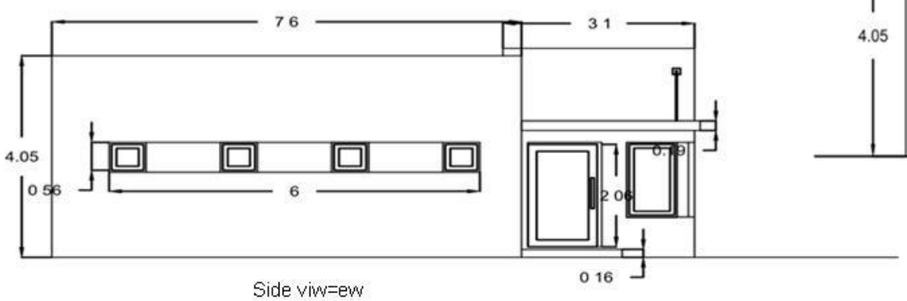

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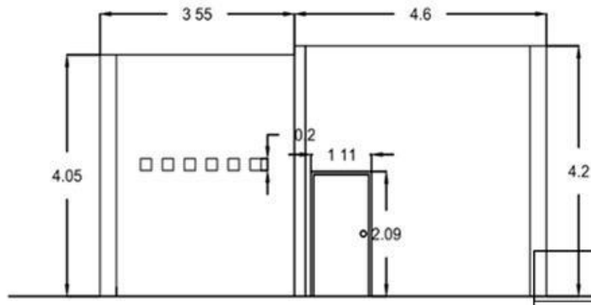
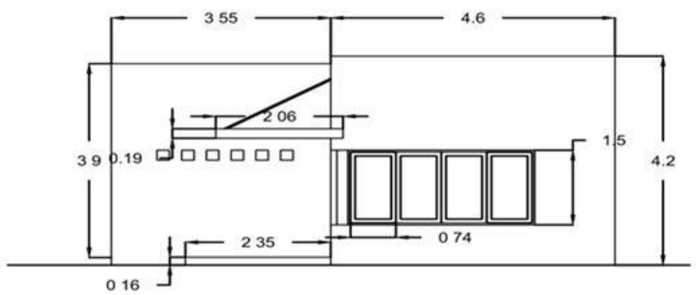


Section



Elevation

Police Station

Schedule of Door & windows

Sr no	Type of element	Dimension	Qantity
1	D1	1.2 x 2.10	2
2	D2	0.9 x 1.90	2
3	W1	1.00 X 1.50 m	5
4	W2	0.75 x 1.5 m	1
5	V	0.60 X 0.60 m	1

Design 11

C.K. Pithawala Collage of Engineering & Technology

VISHWAKARMA YOJNA: VIII *AN APPROACH TOWARDS RURBANISATION* **TENARANG Village**

Police Station

All Diamensions are in Feet-inch

CLIENT
C.K Pithawalla College of Engineering and Technology
Near Malvan Mandir Via Magdalla Port,
Dumas Rd, Surat, Gujarat
395007

PROJECT
VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS
RURBANISATION
TENARANG Village

DRAWN BY
Muskan Gheewala
Harshit Mehta

DESCRIPTION
Section,Plan,Elevation

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13.1.6 Civil Design 6

Entrance GATE

Table 51 Measurement Sheet

SlNo	Description	Quantity	Unit	Rate	Amount
	LAND DE VELOPMENT				
	EARTH WORKS				
1	EARTH WORKS EXCAVATION ORDINARY SOIL : Earth work excavation for foundation trenches in ordinary soil and depositing on bank with initial lead upto 50 mt. and lift upto 1.5 m including breaking clods , watering ramming and sectioning of spoil bank	55.24	Cu.M	67.00	3701.08
2	ANTI TERMITE TREATMENT : Anti termite treatment by providing and i.njecting chemical emulsion/ emulsible concentrates 0.50% and clilossdance emulsifiable concentrate for pre contractional treatment and creating a chemical barrier as per I.S 6313 (Part II) 1951 in wall trench foundation top surface of plinth filling junction of wall and floor along the external perimeters of the building complete	1.22	Sq.M	200.00	244.00
					3945.08
	PCC				
3	PCC FOUNDATION 1:4:8 : Providing and laying P.C.C. 1:4:8 using 40mm nominal size broken stone well consolidated including curing	19.05	Cu.M	2,676.00	50977.80
	etc. complete for foundation.				
4	DAMP PROOF COURSE 1:2:4 :	1.09	Sq.M	110.00	119.90
					51097.70
5	RCC ALL RCCS M15 : RCC for Columns,	60.27	Cu.M	3,738.00	225289.26
	Footings, Beams, Slabs etc using M 15.				
					225289.26

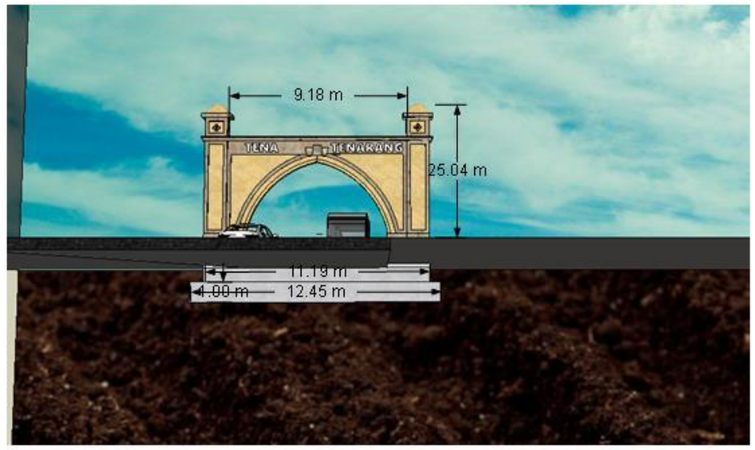
SlNo	Description	Quantity	Unit	Rate	Amount
6	BRICK WORKS BASEMENT CM	1.67	Cu.M	2,470.00	4124.90
7	BRICK WORKS CM 1:2 : First class brick work masonry in	16.76	Cu.M	2,500.00	41900.00
8	BRICK WORKS ARCH CM 1:3 : First class brick work masonry in C. M. 1:3 (1 cement 3 coarse sand) with approved good quality country burnt bricks of compressive strength 35 kg/m2 of standard size of on super structure of all thickness. The rate shall include cost of all materials labour and other incidental charges of all materials to	23.01	Cu.M	2,652.00	61022.52
					107047.42
	FLOOR AND WALL FINISHES				
9	WALL FINISHING CUDAPPAH STONE :	4.83	Sq.M	275.00	1328.25
					1328.25
	PAINTING				
10	PAINTING WALLS COLOUR WASHING :	5.79	Sq.M	12.00	69.48
					69.48
Total for LAND DEVELOPMENT		**388777.19**			
Total		**388778**			

Table 52 Abstract Sheet

Slno	Description	Quantity	Unit	Rate	Amount
Land de velopment					
Earth works					
1	Earth works excavation ordinary soil	55.24	Cu.M	67.00	3701.08
2	Anti termite treatment	1.22	Sq.M	200.00	244.00
3945.08					
Pcc					
3	Pcc foundation 1:4:8	19.05	Cu.M	2,676.00	50977.80
4	Damp proof course 1:2:4	1.09	Sq.M	110.00	119.90
51097.70					
Rcc					
5	Rcc all rccs m15	60.27	Cu.M	3,738.00	225289.26
225289.26					
Brick works					
6	Brick works basement cm 1:3	1.67	Cu.M	2,470.00	4124.90
7	Brick works cm 1:2	16.76	Cu.M	2,500.00	41900.00
8	Brick works arch cm 1:3	23.01	Cu.M	2,652.00	61022.52
107047.42					
Floor and wall finishes					
9	Wall finishing cudappah stone	4.83	Sq.M	275.00	1328.25
1328.25					
Painting					
10	Painting walls colour washing	5.79	Sq.M	12.00	69.48
69.48					

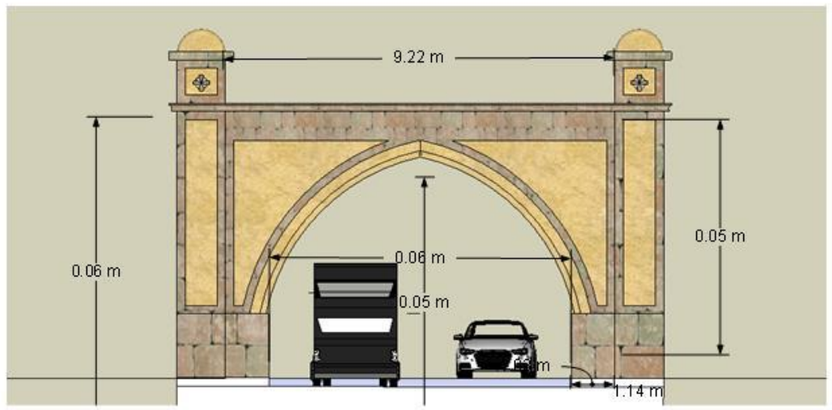
Total For LAND DEVELOPMENT 388777.19

Net Amount 388777.00

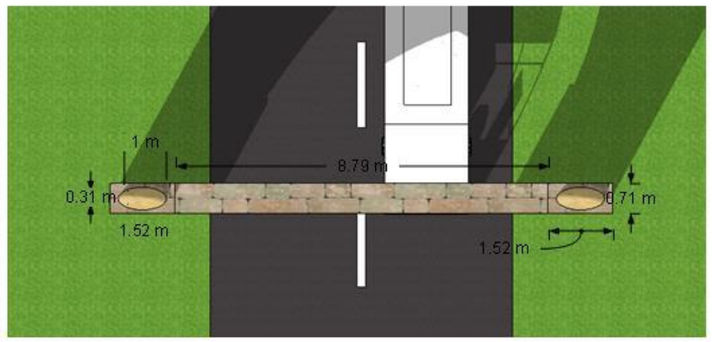


Front view with foundation

Isolated View



Rear View



Top View

Design 12
C.K. Pithawala Collage of Engineering & Technology
VISHWAKARMA YOJNA: VIII *AN APPROACH TOWARDS RURBANISATION* **TENARANG Village**
Entrance GATE
All Diamensions are in Feet-inch

CLIENT
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PROJECT
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AN APPROACH TOWARDS
RURBANISATION
TENARANG Village

DRAWN BY
Muskan Gheewala
Harshit Mehta

DESCRIPTION
Section,Plan,Elevation

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13.1.7 Electrical Design 1

SOLAR WATER HEATER

Solar water heaters (SWH) are basically a system that uses the sun radiations in order to heat water or air which can be used in domestics or industries. It is not a new technology since it was used in the 19th century, where they painted tanks with black paints in order to absorb sun energy. But the disadvantage back then was the lack of insulation, which led to loss of heat rapidly.

A solar thermal device captures and transfers the heat energy available in solar radiation which can be used for meeting the requirements of heat in different temperature ranges. In case of small systems (100 – 2000 litres / day), the hot water reaches the users end by natural (thermosyphon) circulation for which the storage tank is located above the collectors. In higher capacity system, a pump may be used for forced circulation of water.

COMPONENTS

Solar collectors convert sunlight to heat energy

Evacuated Tube Collectors

This type of solar collector uses a series of evacuated tubes to heat water for use. These tubes utilize a vacuum, or evacuated space, to capture the suns energy while minimizing the loss of heat to the surroundings. They have an inner metal tube which acts as the absorber plate, which is connected to a heat pipe to carry the heat collected from the Sun to the water.

Line Focus Collectors

These collectors, sometimes known as parabolic troughs, use highly reflective materials to collect and concentrate the heat energy from solar radiation. These collectors are composed of parabolic ally shaped reflective sections connected into a long trough. A pipe that carries water is placed in the center of this trough so that sunlight collected by the reflective material is focused onto the pipe, heating the contents. These are very high powered collectors and are thus generally used to generate steam for solar thermal power plants and are not used in residential applications.

Point Focus Collectors

These collectors are large parabolic dishes composed of some reflective material that focus the Sun's energy onto a single point. The heat from these collectors is generally used for driving Sterling engines. Although very effective at collecting sunlight, they must actively track the Sun across the sky to be of any value. These dishes can work alone or be combined into an array to gather even more energy from the Sun.

Flat Plate Collectors

These collectors are simply metal boxes that have some sort of transparent glazing as a cover on top of a dark-colored absorber plate. The sides and bottom of the collector are usually covered with insulation to minimize heat losses to other parts of the collector. Solar radiation passes through the transparent glazing material and hits the absorber plate. This plate heats up,

transferring the heat to either water or air that is held between the glazing and absorber plate. These plates are usually made out of metal that is a good conductor - usually copper or aluminum.

The solar radiation is absorbed by Flat Plate Collectors which consist of an insulated outer metallic box covered on the top with glass sheet. Inside there are blackened metallic absorber (selectively coated) sheets with built in channels or riser tubes to carry water. The absorber absorbs the solar radiation and transfers the heat to the flowing water.

Table 53 Design parameters

Design parameters	Value
Length of the collector	1.83 m
Width of the collector	1.22 m
Thickness of the insulator	0.025 m
Thickness of plate	2 mm
Length of tube	1.8 m
Length of absorber plate	1.9 m

Fig 84 FLAT PLATE COLLECTOR

Fig 85 FPC WATER HEATER

Heat transfer fluids carry the heat from solar collectors to water storage tanks, passing on the thermal energy by way of a heat exchanger. Different heat transfer fluids are suitable for different climates.

Water (suitable for medium temperature ranges)

Propylene Glycol, Glycerin (good for freezing cold temperatures

)**Heat exchangers**, a system used to transfer heat between two or more fluids and used in both cooling and heating processes; transfers solar heat from the transfer fluid to the home water supply.

Storage tanks store hot water when it is not in use. The tanks are generally made of stainless steel to avoid corrosion and are insulated to reduce heat losses.

Pipelines Hot water from the system is transferred to various utility points through insulated pipelines.

WORKING PRINCIPLE

In a typical solar water heater, water is heated by the solar thermal energy absorbed by the collectors. The hot water with lower density moves upwards and cold water with higher density moves down from the tank due to gravity head. A typical 100 liters insulated tank with a 2 m^2 collector area, will supply water at a temperature of 60 - 80°C.

Table 53 HEATING CAPACITY OF COLLECTORS AS PER AREA

CAPACITY (in L/day)	COLLECTOR AREA (in sq.m.) (RECOMMENDED)
100	2
200	4
300	6
500	8
1000	16

- **COST ANALYSIS**

A house is considered to have five persons, typically requiring 20 liters of water for per person per bath per day
Requirement of water for five persons per bath per day=100 litres
To fulfill the requirement of hot water for five person electric geyser is in use.
Recommended capacity of Geyser to satisfy five persons for bath=35 litre
Energy required by Geyser = 3kWh
Energy required to for heating of water to 60°C Time takes for 3kW, 35 litres Geyser to heat the water to 60°C = 35 minutes
Therefore, energy required to heat the water to 60°C = 35/60 × 3kWh = 1.75 kWh = 1.75 unit
Therefore, energy required to heat the water in one day = 1.75 unit per day
Energy required per day for heating of water without Solar water heater = 1.75 unit per day
Since billing is being done on the monthly basis, energy required per month for heating of water without solar water heater = 1.75×30 units = 57 units per month
Cost of 57 unit in one month = 57 * 4.5 = 256.5
Annual cost = 3078 (which is totally saved by solar powered system)
Total installation cost = 7000
Payback period = 2years 3 months

CONCLUSION

As a closure to this project, Solar Water Heater is one of the most beneficial method for heating shower water. And this is a great opportunity for villagers to reconsider their way of living and to adapt to this new technology that will save them great deal of money that can be used in other important things
As for the financial analysis, the investment amount was calculated and it is very convenient for the villagers since the value of the FPC can last up to 20 years. Even if something wrong happened within the system it can be easily fixed, since it is not a complicated design, and the maintenance fee is low. As for the future plans, I hope that this model satisfies the villagers and proves to be economically and environmentally useful for them.

13.1.8 Electrical Design 2

DESIGN OF BIOGAS GENERATOR

As the demand for the world's fuel increases, their prices rise. Renewable sources of energy often offer the most potential energy conservation and development options for the future. Biomass refers to the different forms of organic matter including crop residues, agro-industrial by products, urban and municipal wastes, and animal dung. This may be transformed by physical, chemical and biological processes to bio-fuels.

COMPONENTS

DIGESTER

A fixed-dome type small scale digester comprises of a closed, dome-shaped digester with an immovable, rigid gas-holder and a displacement pit, also named 'compensation tank'. The gas is stored in the upper part of the digester. This is the reservoir of organic wastes in which the substrate is acted on by anaerobic microorganisms to produce biogas.

Fig 86 DIGESTER NECK

GAS HOLDER

It can be said as an area where the biogas is stored under pressure and can be tapped off. Depending on the need and the capacity, different types of biogas plants have different gasholders. A fixed-dome gas-holder can be either the upper part of a hemispherical digester or a conical top of a cylindrical digester. In a fixed-dome plant the gas collecting in the upper part of the dome displaces a corresponding volume of digested slurry.

DISPLACEMENT TANK / SLURRY OVERFLOW (method of removing fully digested slurry and prevention of over pressurization of biogas)

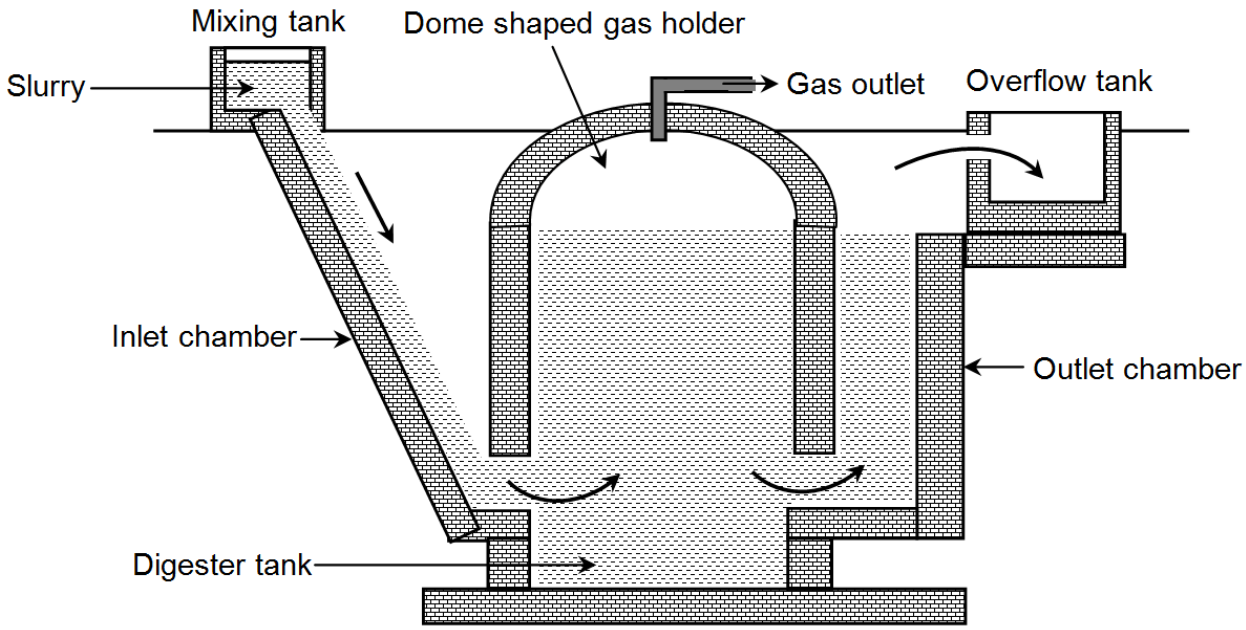


Fig 87 BIOGAS GENERATOR

- **GAS TURBINE**

A gas turbine is a combustion engine that can convert natural gas or other liquid fuels to mechanical energy. This energy then drives a generator that produces electrical energy.

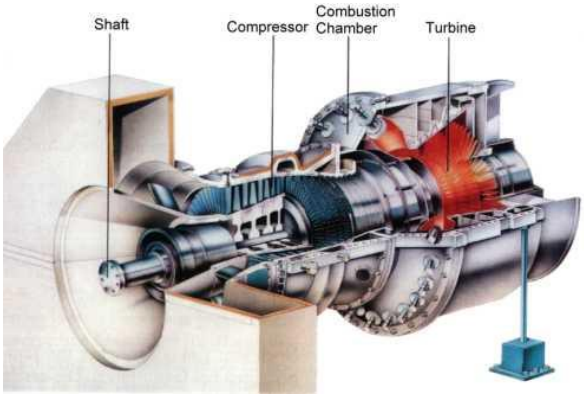


Fig 88 GAS TURBINE

- **GENERATION**

If the daily amount of available dung (fresh weight) is known, gas production per day in tropical countries like India will approximately correspond to the following values:

1 kg cattle dung - 40 liters (0.04 m³) biogas
1 kg buffalo dung - 30 liter (0.03 m³) biogas
1 kg pig dung - 60 liter (0.06 m³) biogas
1 kg chicken droppings - 70 liter (0.07 m³) biogas
1 kg human excreta – 20-70 liter (0.02-0.07 m³) biogas

The average calorific value of biogas is about 21-23.5 MJ/m³, so that 1 m³ of biogas corresponds to 0.5-0.6 l diesel fuel or about 6 kWh .

Small biogas turbines with power outputs of 30-75 kW.

With 1000 tonne of input / year,

- average biogas produced in a year is 47000 m³.
- average electrical power is 178600 KWh

USAGE OF EXTRA BIOGAS –

- After biogas is captured, it can produce heat and electricity for use in engines, micro turbines, and fuel cells. Biogas can also be upgraded into bio methane, also called renewable natural gas or RNG, and injected into natural gas pipelines or used as a vehicle fuel.
- Raw Biogas and Digestate

- Renewable Natural Gas
- Compressed Natural Gas and Liquefied Natural Gas

USAGE OF EXTRA ELECTRICITY –

- Can be sold to electrical companies.
- Or used in other village works such as agriculture farming, cattle farming

Electrification of whole village can be done for a year period as extreme quantity of biomass availability makes it easy and efficient.

BENEFITS

- Biogas generators provide a safe and cleaner way of storing excreta and subsequently bring about related advantages linked to safe sanitation.
- Simple design and maintenance.
- Lower operating costs and longer life span.
- Reduces greenhouse gases.
- Increases family income by selling supplemental electric energy to the electric power grid.

13.1.9 Electrical Design 3

FOOTSTEP POWER GENERATION USING PIEZO-ELECTRIC SENSORS

Electrical energy is generated by the footstep taken by the peoples as a result of walking. It is a fact that large amount of energy is lost by each person during routine walk which is the main source for this system.

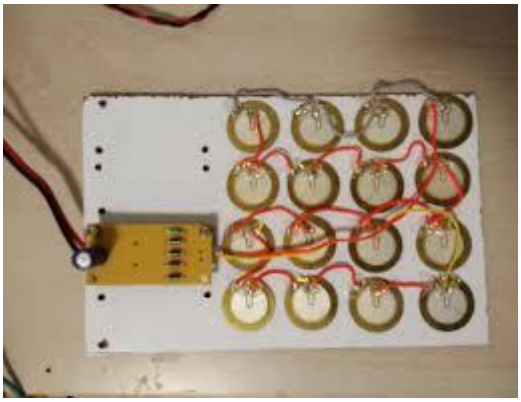


Fig 89 PIEZO ELECTRIC TILE

PIEZO-ELECTRIC EFFECT AND MATERIALS

Piezoelectric Effect is the ability of some piezoelectric materials (such as quartz, topaz) to generate an electrical charge in feedback to the mechanical stress. Piezoelectricity has both direct and converse effects i.e. mechanical stress results in AC voltage generation and vice-versa.

COMPONENTS

ARDUINO UNO

The Arduino MCU is there to provide control over various parts of the proposed system. The MCU upon getting successful authentication signal from the RFID module, relays power from Storage Device to the particular individual. The MCU also displays the remaining charge and Time a user has got based on the capacity of the rechargeable battery.

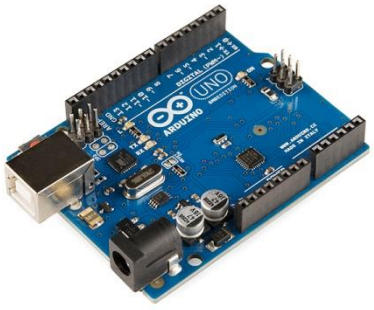


Fig 90 ARDUINO UNO

PIEZO-ELECTRIC SENSOR

Piezoelectric Sensor uses piezoelectric effect to measure pressure or mechanical energy by converting all of it to electrical energy signals. A Piezoelectric tile is a tile of dimension 25 cm x 30 cm. The thickness of the tile is 0.9 mm. On this tile 16 piezoelectric sensors are installed. The output power from a single piezo sensor is remarkably low therefore a combination of few Piezo sensors is used.

ELECTRICAL POWER FROM ONE PIEZO SHEET

Assuming that we stretch a PSI-5A (1.5" x 2.5" x .0075") sheet to ±500 micro strains quasi statically at a frequency just below its fundamental longitudinal resonance of 15 KHz, and that we collect 100% of the stored electrical energy at its height twice per cycle we would get approximately 9 watts of electrical power from the sheet. The mechanical energy input under these assumptions would be in excess of 100 watts. Resonant designs can be considerably more efficient.

ELECTRICAL POWER FROM A TYPICAL PIEZO BENDER ELEMENT

A "Double Quick Mount" bending element bolted to a rigid surface provides a convenient demonstration of a cantilever mount generator. Applying 80 gram force to its tip at a frequency of 60 Hz produces an open circuit voltage of 15V peak between its two electrical leads. When the leads are connected to a 8 Kohm resistive load, the output to the load is 5.3 Vrms, representing a power output of 3.6 mW.

HIGHEST VOLTAGE AND FREQUENCY LIMIT TO DRIVE A PIEZO SHEET

For low frequency operation (0 to 5 KHz) a conservative recommendation for applied bi-polar voltage for a .0075" thick single sheet of PSI-5A ceramic is ±90 volts. Voltage applied in the poling direction only can be raised up to ~300 volts and has a thickness mode vibration in the neighborhood of 13 MHz and a planar dilatation mode at around 14 KHz. At ultrasonic frequencies large surface area parts draw considerable current and resistive heating of the electrodes becomes the limiting factor.

CALCULATIONS

Power generated varies with different steps in piezoelectric array that is used. Based on practical results voltages obtained are:

- Minimum voltage = 1V per step
- Maximum voltage = 8V per step

Considering average weight as of the person stepping on the system to be 53 Kg the average calculation is:

- Steps are required to increase 1 V charge in battery = 700

To increase 12 V in battery:

Total steps needed = (12 × 700) =8400 steps

Considering the implementation of this system in places like schools, colleges and places of gathering where footsteps as source is easily available, if:

- Time required for 2 steps is 1 second
- Time required for 8400 steps = 8400/(60 × 2) = 70 minutes

According to a case study, when a piezo electric tile is used for flooring purposes then each slab is capable of producing 2.1 watts/hour in a football area if the stepping rate is 4-10seconds. Based on tests, it was found that walking 5 hours will generate enough electricity to light a bus stop continuously for over 12 hours.

BLOCK DIAGRAM

BENEFITS

- Zero side effect on human body.
- Can be easily used in roadways, public places or area with frequent locomotion.
- Easy to install.
- The output is proportional to number of steps.
- This type of energy is advantageous and even not need any type of fuel or power source to run.

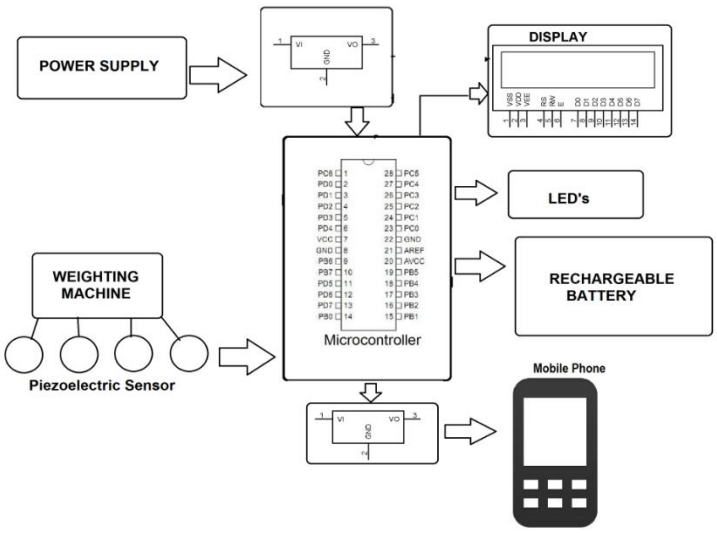


Fig 91 Block Diagram

13.2 Reason for Students Recommending this Design

- Villagers Recommendation
- According to Situation in COVID-19
- As per gap analysis
- Vertical farming due to economic growth of village.
- Lake beatification for recreational area.
- Public latrine as per gap analysis.
- Clinic there is no PHC/medication facility near 23 km.
- Library designed because of COVID-19 pandemic, there is no supplement of newspaper.

13.3 About designs Suggestions / Benefit of the villagers

- Economic profit
- Villagers facility
- Reduce manpower

14 Technical Options with Case Studies

14.1 Civil Engineering

14.1.1 Advanced Earthquake Resistant

Abstract

The field of Earthquake Engineering has existed in our country for over 35 years now. Indian earthquake engineers have made significant contributions to the seismic safety of several important structures in the country. However, as the recent earthquakes have shown, the performance of normal structures during past Indian earthquakes has been less satisfactory. This is mainly due to the lack of awareness amongst most practicing engineers of the special provisions that need to be followed in earthquake resistant design and thereafter in construction. A workshop was conducted at IIT Kanpur to discuss the role of earthquake-resistant construction in Civil Engineering curriculum. The workshop also discussed the avenues for dissemination of this knowledge to the students, practicing engineers and other people. In this paper, the main recommendations of the workshop and an action plan that can be implemented in the next few years have been described.

Introduction

Formal activities in the field of Earthquake Engineering in the country were started in the late fifties at the University of Rookie (UOR). The first Indian code was published by the Bureau of Indian Standards in 1962. Since then, Indian earthquake engineers have handled numerous prestigious and challenging projects in high seismic regions of the country. However, it has often been felt that an average civil engineer in the country even today looks at earthquake engineering as an area of super-specialty to be handled only by researchers and professors. The cause of earthquake-disaster mitigation through constructions that can appropriately withstand earthquakes, can be achieved only when the professional civil engineers in India take it upon themselves to ensure earthquake-resistant constructions.

A typical undergraduate civil engineering curriculum in the county does not include any coverage of earthquake engineering; the situation is no different in most other countries of the world. Even at the post-graduate level, only a small fraction of structural engineering students gets a chance to study earthquake engineering and design. This results in most civil engineers not receiving any formal training in earthquake engineering during the undergraduate or postgraduate studies. This needs to be corrected for a country like ours with an enormous earthquake problem.

A three-day workshop was held at the Indian Institute of Technology Kanpur during 10-12 October 1996 to discuss all aspects related to earthquake resistant construction in civil engineering curriculum. The questions that prompted this workshop include:

1. Should we continue to let earthquake-resistant constructions to be handled by specialists only, or should an average civil engineer responsible for construction be expected to know about appropriate earthquake technology for day-to-day constructions?
2. Should earthquake-resistant construction be taught as a separate subject in the engineering curriculum, or should the topics related to earthquake engineering be merged with the existing courses? For instance, it may be more effective to teach students about ductile detailing of reinforced concrete structures in the regular design course on reinforced concrete, than covering all aspects of earthquake engineering in one single course.

3. Should earthquake engineering maintain an identity outside the normal civil engineering industry or become a part of civil engineering industry itself?
4. .How best to achieve the following goal: professional civil engineers should be able to ensure earthquake-resistant constructions without seeking help from “earthquake engineering experts," particularly for the run-of-the-mill constructions.

As a preparation towards this workshop, two questionnaires were sent to all engineering colleges in the country. These questionnaires solicited information from the colleges, regarding: (a) state of teaching curriculum at undergraduate as well as at graduate levels vis-à-vis earthquake-resistant constructions, and (b) profile of faculty members, having expertise in earthquake-resistant constructions or interested in developing expertise in earthquake-resistant constructions. Responses received during this survey were made available to the workshop participants in the form of a directory.

To ensure a holistic approach to addressing the above questions, a very broad agenda was prepared for the workshop. Most of the time during the workshop was spent in across-the-table discussions. Participation was by invitation. This paper gives a summary of the discussions and recommendations made during the three days of deliberations.

14.1.2 Seismic Retrofitting of Buildings

Seismic Retrofitting Techniques are required for concrete constructions which are vulnerable to damage and failures by seismic forces. In the past thirty years, moderate to severe earthquakes occurs around the world every year. Such events lead to damage to the concrete structures as well as failures. Thus the aim is to focus on a few specific procedures which may improve the practice for the evaluation of seismic vulnerability of existing reinforced concrete buildings of more importance and for their seismic retrofitting by means of various innovative techniques such as base isolation and mass reduction. So Seismic Retrofitting is a collection of mitigation technique for Earthquake engineering. It is of utmost importance for historic monuments, areas prone to severe earthquakes and tall or expensive structures.

Keywords: Retrofitting, Base Isolation, Retrofitting Techniques, Jacketing, Earthquake Resistance

Introduction to Seismic Retrofitting Techniques:

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

1.1 Seismic Retrofitting of Concrete Structures:

Definition: It is the modification of existing structures to make them more resistant to seismic activity, ground motion, or soil failure due to earthquakes. The retrofit techniques are also applicable for other natural hazards such as tropical cyclones, tornadoes, and severe winds from thunderstorms.

1.2 Need for Seismic Retrofitting:

To ensure the safety and security of a building, employees, structure functionality, machinery and inventory Essential to reduce hazard and losses from non-structural elements. Predominantly concerned with structural improvement to reduce seismic hazard. Important buildings must be strengthened whose services are assumed to be essential just after an earthquake like hospitals.

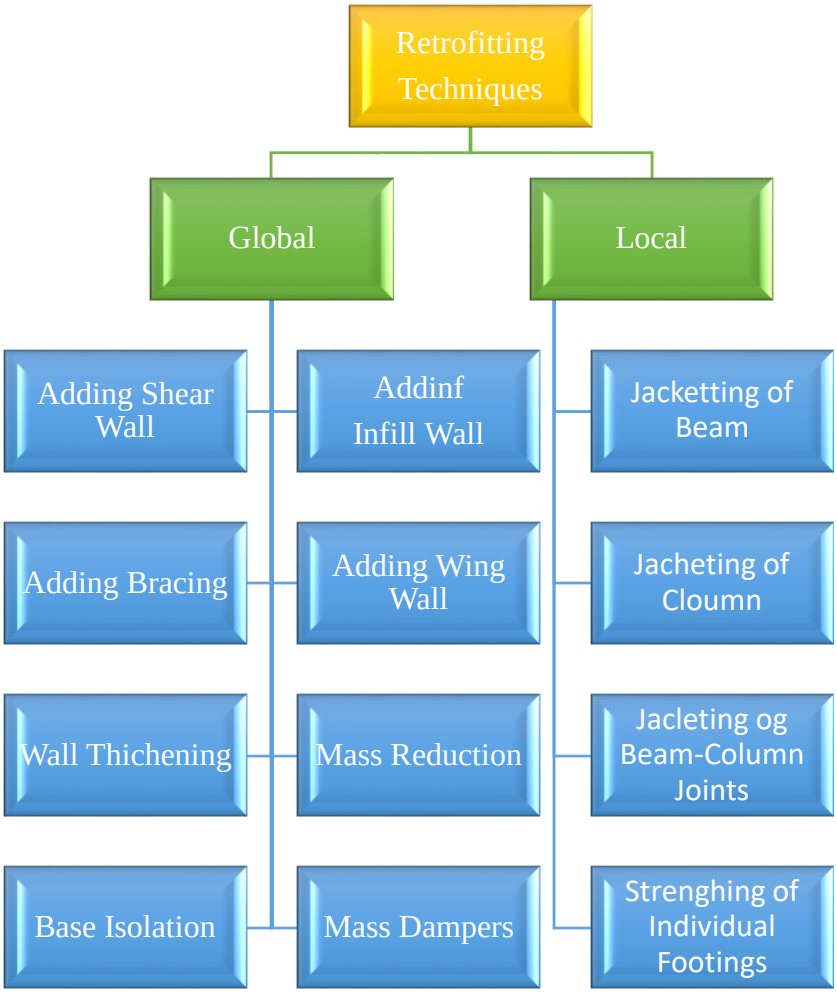
1.3 Problems faced by Structural Engineers are:

Lack of standards for retrofitting methods – Effectiveness of each methods varies a lot depending upon parameters like type of structures, material condition, amount of damage etc.,

1.4 Basic Concept of Retrofitting:

The aim is at: Up gradation of lateral strength of the structure Increase in the ductility of the structure Increase in strength and ductility

Classification of Retrofitting Techniques:



https://theconstructor.org/concrete/seismic-retrofitting-techniques-concrete-structures/11767/

Fig 92 Classification of Retrofitting Techniques

2.1 Adding New Shear Walls:

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

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

The construction industry is repeatedly criticized for being inefficient and slow to innovate. The basic methods of construction, techniques and technologies have changed little since Roman times. But the application of innovation in the construction industry is not straight forward. Every construction project is different, every site is a singular prototype, construction works are located in different places, and involve the constant movement of personnel and machinery. In addition, the weather and other factors can prevent the application of previous experience effectively. 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. Incorporating advanced construction technology into practice can increase levels of quality, efficiency, safety, sustainability and value for money. However, there is often a conflict between traditional industry methods and innovative new practices, and this is often blamed for the relatively slow rate of technology transfer within the industry. The adoption of advanced construction technology requires an appropriate design, commitment from the whole project team, suitable procurement strategies, good quality control, appropriate training and careful commissioning. Advanced construction technologies are commonly described as including (amongst many others) advanced forms of:

- 3D printing.
- Materials.
- Building information modeling (BIM).
- Cladding systems.
- Computer aided design and computer aided manufacturing (CAD/CAM).
- Computer numerical control.
- Construction Innovation Hub.
- Construction plant.
- Modern methods of construction.
- Modular construction.
- Offsite manufacturing.
- Prefabrication and preassembly.
- Research and development.
- Site investigations and surveying.
- Substructure works.
- Water engineering.
- Temporary works.
- Smart technology.
- Robotics.
- GPS controlled equipment.

14.1.4 Engineering Aspects of Soil mechanics - Environmental Impact Assessment

Soil mechanics is a branch of soil physics and applied mechanics that describes the behavior of soils. It differs from fluid mechanics and solid mechanics in the sense that soils consist of a heterogeneous mixture of fluids (usually air and water) and particles (usually clay, silt, sand, and gravel) but soil may also contain organic solids and other matter Along with rock mechanics, soil mechanics provides the theoretical basis for analysis in geotechnical engineering, a sub discipline of civil engineering, and engineering geology, a sub discipline of geology. Soil mechanics is used to analyze the deformations of and flow of fluids within natural and man-made structures that are supported on or made of soil, or structures that are buried in soils Example applications are building and bridge foundations, retaining walls, dams, and buried pipeline systems. Principles of soil mechanics are also used in related disciplines such as geophysical engineering, coastal engineering, agricultural engineering, and hydrology and soil physics.

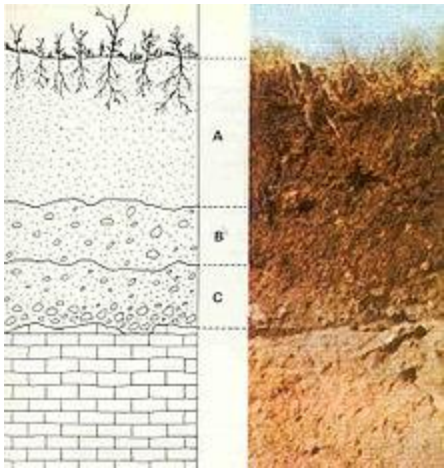


Fig 93 Example soil horizons. a) Top soil and colluvium b) mature residual soil c) young residual soil d) weathered rock.

This article describes the genesis and composition of soil, the distinction between pore water pressure and inter-granular effective stress, capillary action of fluids in the soil pore spaces, soil classification, seepage and permeability, time dependent change of volume due to squeezing water out of tiny pore spaces, also known as consolidation, shear strength and stiffness of soils. The shear strength of soils is primarily derived from friction between the particles and interlocking, which are very sensitive to the effective stress. The article concludes with some examples of applications of the principles of soil mechanics such as slope stability, lateral earth pressure on retaining walls, and bearing capacity of foundations.

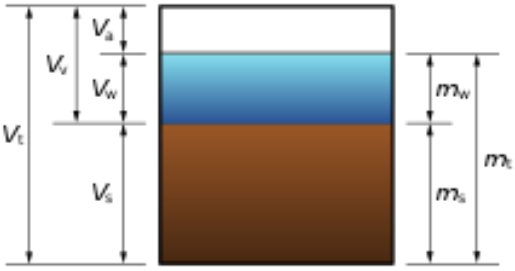


Fig 94 A phase diagram of soil indicating the masses and volumes of air, solid, water, and voids.

Silts, sands and gravels are classified by their size, and hence they may consist of a variety of minerals. Owing to the stability of quartz compared to other rock minerals, quartz is the most common constituent of sand and silt. Mica, and feldspar are other common minerals present in sands and silts. The mineral constituents of gravel may be more similar to that of the parent rock.

The common clay minerals are montmorillonite or spectate, illite, and kaolinite or kaolin. These minerals tend to form in sheet or plate like structures, with length typically ranging between 10−7 m and 4x10−6 m and thickness typically ranging between 10−9 m and 2x10−6 m, and they have a relatively large specific surface area. The specific surface area (SSA) is defined as the ratio of the surface area of particles to the mass of the particles. Clay minerals typically have specific surface areas in the range of 10 to 1,000 square meters per gram of solid. Due to the large surface area available for chemical, electrostatic, and van der Waals interaction, the mechanical behavior of clay minerals

is very sensitive to the amount of pore fluid available and the type and amount of dissolved ions in the pore fluid. The minerals of soils are predominantly formed by atoms of oxygen, silicon, hydrogen, and aluminum, organized in various crystalline forms. These elements along with calcium, sodium, potassium, magnesium, and carbon constitute over 99 per cent of the solid mass of soils

.

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

Abstract: An important part of the environmental degradation suered by the planet is caused by the discharge of untreated or poorly treated wastewater. Industrial, urban, and agricultural wastewater contain many different types of pollutants such as biodegradable and non-biodegradable organic matter, suspended solids, turbidity, nutrients, heavy metals, pesticides, pathogens, etc. All of the suppose a threat to the environment and human health, so the selected treatment techniques must be adapted to their nature in order to optimize their removal. In addition to efficiency, wastewater treatment methods must be sustainable, not only from an environmental point of view, but also economically and ethically. As a result, no technological dependence should be generated in less developed countries or communities. Therefore, this Special Issue deals with improvements in various aspects of wastewater treatment including different aspects of water treatment such as the development of mathematical models, the application of life cycle techniques, or the experimental optimization of wastewater treatment methods. Thirteen articles were accepted covering some of the most relevant fields of wastewater treatment: activated sludge, nanoparticle treatment, constructed wetlands, energy–water nexus, nutrient recovery, eco-friendly sorbents, and reverse osmosis.
Keywords: water treatment; activated sludge; modeling; constructed wetland; advanced oxidation techniques; reverse osmosis; sorbents

The objective of this Special Issue “Sustainable Wastewater Treatment Systems” has been to review the state-of-the-art of the latest advances in water management with an particular focus on sustainable methods of disinfection, grey water, constructed wetlands, ponds, membranes, reclaimed wastewater reuse, etc. Many submissions have been received with significant contributions for the main topics of interest in our Special Issue. However, only 13 high-quality papers were accepted after strict and rigorous review. In particular, these accepted papers mainly focused on various perspectives such as innovative applications and research covering the removal of nanoparticles, constructed wetlands, and microbial aspects of activated sludge, adaptation to climate change in water-energy coupling, nutrient recovery from wastewater, ecofriendly sorbents, advanced oxidation processes, membrane technology, and modeling in reverse osmosis optimization.

https://wedocs.unep.org/bitstream/handle/20.500.11822/8465/-Sanitation,_wastewater_management_and_sustainability_From_waste_disposal_to_resource_recovery-2016sanitation_wastewater_management_and_sustainabilit.pdf?sequence=2&isAllowed=y

14.2 Electrical Engineering

14.2.1 Design of Power Electronics converter

Nowadays, power electronic converters play an essential role in the majority of consumer electronic devices and are widely used in industrial applications. Since most of these applications are supplied through the AC grid, the use of rectifiers and DC-DC conveters are mandatory to adapt the grid voltage to the application requirements.

The electrical devices used to convert an alternating-current (AC) to a direct-current (DC) are known as rectifiers. So, the AC to DC conversion process is known as rectification. Depending on the rectifier type and the input AC voltage, the output DC voltage can be variable or not. Diode rectifiers make the output DC voltage to be input AC voltage dependent, while active rectifiers maintain the output DC voltage constant.

Rectifiers convert AC side voltages and currents to DC side voltages and currents. Depending on the rectifier type, the DC side voltage can be constant or AC input voltage dependent. In this chapter, different rectifier topologies have been studied. For each converter, analytical expressions for the estimation of the DC bus capacitor and power losses have been presented. The main characteristics of the analyzed converters can be summarized as:

- The three-phase DFE rectifier is a unidirectional, cheap, simple and reliable converter. As this converter does not provide any control over the output voltage, the DC side voltage is dependent on the AC input voltage. Compared to VSC type rectifiers, the AC side current waveform contains more harmonic components, which provoke heating and torque issues to the generators in the AC side.
- Compared with the DFE rectifier, 2L-VSC requires controlled switching devices that increase its complexity. However, the DC bus voltage controllability and the better AC side waveforms quality have become this converter in one of the most used rectifiers in several industrial applications.
- Multilevel converters overtake the 2L-VSC in terms of switch power losses, harmonic distortion, applied voltage derivatives to the AC side generator and common mode voltage. The 3L-NPC has become the preferred multilevel converter demonstrating a reliable and efficient performance. As each leg is composed of four series connected switching devices, the total DC bus voltage can be twice the DC bus voltage of the 2L-VSC. In consequence, this converter is better suited for medium voltage than the 2L-VSC.
- The modular structure of the CHB makes possible the operation of the converter at high voltages and the use of redundant modules leads to high reliability. Its main drawback is the high number of capacitors it requires. Furthermore, as the CHB converter is composed of single-phase HB converters, the second current harmonic component circulating through their DC bus capacitors makes the required DC bus capacitor larger than that required by three-phase converters.

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

An induction motor draws current more than the rated capacity during starting phase which might damage stator windings of three phase induction motor. To avoid the problem of high starting current, voltage is increased gradually from lower to higher level using smooth and soft starters. A smooth and soft starter is employed in a three phase induction motor to eliminate the surge in current and electromagnetic torque during starting. The surge in current and torque

are eliminated temporarily using soft started at the time of starting. This in turn reduces the stress applied on an electric motor and shaft attached with rotor. The soft starter also eliminates the unwanted effects in electric cables and power distribution network. This paper provides a detailed description of soft and smooth start to an induction motor. At the time of starting, an induction motor draws significant amount of current from the supply and this drawn current is higher than the rated current of three phase induction motor. The motor reaches the full rated speed instantaneously as soon as the voltage is applied. The smooth start of three phase induction motor is based on the delay angle of TRIAC circuit. The firing angle is delayed during starting and delay angle reduces as the motor picks up the speed. The firing delay angle is further reduced to zero when motor reaches full speed. This proposed technique provided reduced voltage at the time of starting and full rated voltage when motor reaches full speed. Due to proposed technique, motor starts at a slow speed and gradually increases to full rated speed. By using soft starters, performance of induction motor is improved and it also improves load torque characteristics.

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

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

insulation applied on stator windings. To avoid the problem of high starting current, there is a need of motor starters in an electric motor. The motor can be started in three ways. Firstly by applying full load voltage i.e. direct on line starting. Secondly, by applying voltage gradually using star-delta starter and soft starter. Thirdly, by applying part winding starting i.e. autotransformer starter. A soft starter provides reduced voltage and hence reduced torque on electric motor. A soft starter comprises of solid state devices like thermistors. The supply voltage to the motor is controlled by power semiconductor devices like thermistors. In a three phase induction motor, the torque is proportional to the square of the starting current which in turn, is proportional to the applied voltage. The starter works on the principle described above. Therefore, the torque and the current can be controlled by applying the reduced voltage at the time of starting of an electric motor. The two types of control are possible using soft starter. The first one is open loop control and second is closed loop control. In an open loop control, a start voltage is applied with time. This start voltage is applied irrespective of the current drawn or the speed of the motor. For each phase, two SCRs are connected in antiparallel direction and SCR are initially started at a delay angle of 180 during respective half wave cycles. Each SCR conducts in each half cycle. This delay is reduced gradually with time when applied voltage reaches to the full supply voltage. The reduced voltage ramps up to the full voltage and simultaneously, the firing angle is reduced from 180 to 0 . This type of system is known as time voltage ramp system. This method has a drawback that it cannot control the acceleration of motor. In a closed loop control, any characteristic of the motor is monitored for the desired response. The starting voltage is modified depending on required motor current or motor speed. The current in each phase is monitored properly and time voltage ramp is stopped when current in each phase exceeds a certain set point. The supply voltage applied to stator windings of three phase induction motor is controlled by controlling the conduction angle of SCRs. A soft starter basically comprises of two anti-parallel SCRs in each phase of three phase induction motor. There are total six SCRs required for all three phases for smooth acceleration of electric motor. These SCRs are power semiconductor devices which normally are in OFF state but these SCRs starts to conduct when firing signals are given to them and hence allows voltage and current to pass through them.

An effective and efficient technique has been presented in this paper which provides reduced voltage and reduced current at starting and at the same time, a control in an electromagnetic torque is also obtained. The motor torque is varied according to load torque and acceleration is maintained constant over the entire starting period with the help of this technique. The proposed approach eliminates shaft torque pulsations at the time of starting. The starting current is reduced significantly with the use of soft-starter circuit. The soft starter also eliminates the starting losses in the motor and hence it results in increased life and increased efficiency of an electric motor. It is found that the heating losses are reduced by 50% when soft-starters are employed during starting of three phase induction motor.

14.2.3 Advanced Wireless Power Transfer System

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

technology the use of portable device has increased such as mobile robots and electric vehicle. Mobility is the main concern of these equipment i.e. they are not connected to the main source of power. All these problems are the main motivation for researchers. Nikola Tesla was the first who introduce the concept of wireless power transfer. But this technology from the time of Tesla is underdeveloped due to lack of funding and technology .But research from past few years has always going on and recent development has been observed in the field . Wireless power transfer can be achieved by several methods. Here we discussed few methods such as induction coupling, resonating coupling, LASER technology for electrical power transfer.

- After the immense research in electromagnetic field by many pioneers and development of electromagnetic induction law by Michael Faraday which gives the basis of wireless power transfer.
- In 1891 Nikola Tesla was the first pioneer who started working on wireless power transfer system in his "experimental station" at Colorado, by using Tesla coils.
- Tesla want to develop a wireless power system that is capable of transmitting power over long distances. He proposed many such systems.
- Nikola Tesla successfully lighted a small incandescent lamp by means of a resonant circuit grounded on one end. The lamp is lighted by the current induced in the coil.
- Wardenclyffe tower was also designed by Tesla for Trans-Atlantic wireless telephone and also for demonstrating wireless electrical power transmission.
- In 2008 the wireless power consortium was established to connect all manufactures its Qi inductive power standard enable wireless power charging and powering of portable devices of capacity up to 5W with separation distance 4cm.
- In recent years the research on microwave and LASER wireless power transmission system such as solar power satellite has increased.
- Energy harvesting also called power harvesting which is the conversion of ambient energy from environment to electric power which mainly used to power mini watts wireless electronic devices .The ambient energy is produce from stray electric or magnetic field or radio waves.

INDUCTIVE COUPLING

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

Each of these coils connected without wires and it has been an important and popular technology to transfer power without wires because of its simplicity and reliability. Based on this technology there are various application device has been already made including electric brush and charging pad for cell phones or laptop. But this kind of method also have some limitation i.e. the range can be very less up to few cm and separation distance is very less than the coil diameter.

MAGNETIC RESONANCE COUPLING WPT

This is also one of the important method for transferring power based on near field technique. It generally overcome the disadvantage of upto some extent which arise in non-resonant inductive coupling. This type of coupling used the concept of resonance. At resonance we know that natural frequency and excitation frequency are same. This leads to the maximum amplitude that means a maximum amount of energy is transferred between two coils. Here the receiver and transmitter coils are tuned to be at same resonant frequency .This allow us to transfer significant amount of power by increasing distance between coils. These type of system are used for building mid-range power transfer. Mid-range can be specified by distance up to 10 times the diameter of the transmitting coil. Magnetic resonance coupling have several advantage such as efficiency increases with decrease in the radiation and power loss and range can be increase upto some meter and it is directional. The mainly disadvantage is that selection of resonance frequency which tunes with the natural frequency and it cannot be used for long range application.

MICROWAVE WPT

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

LASER WPT

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

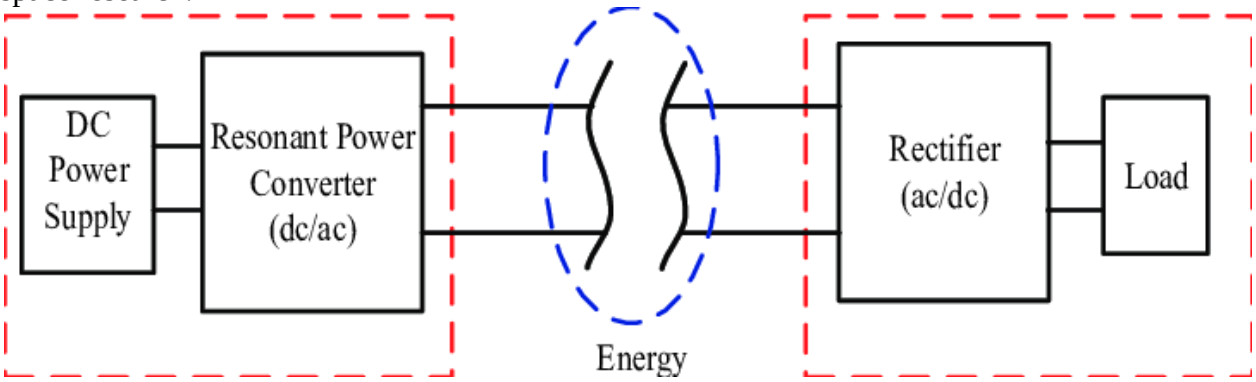


Fig 95 BLOCK DIAGRAM OF WPT SYSTEM

14.2.4 Industrial Temperature Controller

As the name implies, a temperature controller is an instrument used to control temperatures, mainly without extensive operator involvement. A controller in a temperature control system will accept a temperature sensor such as a thermocouple or RTD as input and compare the actual temperature to the desired control temperature, or set point. It will then provide an output to a control element.

A good example would be an application where the controller takes an input from a temperature sensor and has an output that is connected to a control element such as a heater or fan. The controller is usually just one part of a temperature control system, and the whole system should be analyzed and considered in selecting the proper controller.
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 temperature will 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 set point. This has the effect of slowing down the heater so that it will not overshoot the set point, but will approach the set point 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 set point 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 set point. At the set point (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 set point, the on- and off-times vary in proportion to the temperature difference. If the temperature is below set point, 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 the unit 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.

Standard Sizes

Since temperature controllers are generally mounted inside an instrument panel, the panel must be cut to accommodate the temperature controller. In order to provide interchangeability between temperature controllers, most temperature controllers are designed to standard DIN sizes.

The controller is one part of the entire control system, and the whole system should be analyzed in selecting the proper controller. The following items should be considered when selecting a controller-

- Type of input sensor (thermocouple, RTD) and temperature range.
- Type of output required (electromechanical relay, SSR, analog output)
- Control algorithm needed (on/off, proportional, PID)
- Number and type of outputs (heat, cool, alarm, limit)

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

Road accidents and traffic congestion are the major problems in urban areas. Currently there is no technology for accident detection. Also due to the delay in reaching of the ambulance to the accident location and the traffic congestion in between accident location and hospital increases the chances of the death of victim. There is a need of introducing a system to reduce the loss of life due to accidents and the time taken by the ambulance to reach the hospital. To overcome the drawback of existing system we will implement the new system in which there is an automatic detection of accident through sensors provided in the vehicle.

A main server unit houses the database of all hospitals in the city. A GPS and GSM module in the concerned vehicle will send the location of the accident to the main server which will rush an ambulance from a nearest hospital to the accident spot. Along with this there would be control of traffic light signals in the path of the ambulance using RF communication. This will minimize the time of ambulance to reach the hospital. A patient monitoring system in the ambulance will send the vital parameters of the patient to the concerned hospital. This system is fully automated, thus it finds the accident spot, controls the traffic lights, helping to reach the hospital in time.

Automatic Incident Detection (AID) system, provides a new technical means for the highway intelligent traffic management, improves the efficiency and reduces the work intensity of the highway management department. This paper takes the French Citlog video traffic incident automatic detection system for the technical background, introduces the principle, functions, technical characteristics and the preliminary project implementation plan of automatic detection system.

In present days the rate of accidents can be increased rapidly. Due to employment the usage of vehicles like cars, bikes can be increased, because of this reason the accidents can be happened due to over speed. People are going under risk because of their over speed, due to unavailability of advanced techniques, the rate of accidents can't be decreased.

To reduce the accident rate in the country this paper introduces a optimum solution. Automatic alert system for vehicle accidents is introduced; the main objective is to control the accidents by sending a message to the registered mobile using wireless communications techniques. When an accident occurs at a city, the message is sent to the registered mobile through GSM module in less time. Adriano is the heart of the system which helps in transferring the message to different devices in the system. Vibration sensor will be activated when the accident occurs and the information is transferred to the registered number through GSM module.

GPS system will help in finding the location of the accident spot. The proposed system will check whether an accident has occurred and notifies to nearest medical centers and registered mobile numbers about the place of accident using GSM and GPS modules. The location can be sent through tracking system to cover the geographical coordinates over the area. The accident can be detected by a vibration sensor which is used as major module in the system.

Whenever accident of vehicle is occurred then the device sends messages to given mobile number. The proposed system deals with the accident alerting and detection. Arduino is the heart of the system which helps in transferring the message to different devices in the system. Vibration sensor will be activated when the accident occurs and the information is transferred to the registered number through GSM module. Using GPS the location can be sent through tracking system to cover the geographical coordinates over the area. The accident can be detected by a vibration sensor which is used as major module in the system.

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

- **Observation and Brief write up**

➢ **Various infrastructure facilities which we observed in Tenarang village are as below:-**

❖ Physical Infrastructure Facilities:
- Houses
- Communication Electricity
- Drainage Line
- Road Network
- Drainage
- Door to door garbage collection
- Water supply system etc……

❖ Social Infrastructure Facilities:
- Aaganwadi

❖ Socio-Cultural Infrastructure Facilities:
- Panchayat bhavan
- Community hall

❖ Sustainable Infrastructure Facilities:
- Street Light

❖ Repair & Maintenance of Existing building:
- The Provision shall apply to the Repair, Alteration, and change of occupancy, addition and relocation of existing building and is to be maintained also.

❖ Maintenance is required at a places such as,
- Old panchayat bhavan
- Water tank

Also we observed in Tenarang village are,

- Nowadays villagers are faces the problem due to Covid-19.
- We observed that villagers are using fertilizer randomly sometime fertilizer and pesticides are creating bad effect on the crops.
- Old panchayat bhavan need repair and maintenance.

- Women need to be grown up their self.
- All farmers do not know about the latest technology of farming they done farm basied on old technology.
- There was not basic facility of PHC.

How can be improved with small changes, Period –

a) Immediately, b) Within 1 year and, c) Long term (3-5 years) along with cost estimation:

Sr. No	Design Name	Period	Amount Expenditure (Rs)	Benefits
1.	Sub-Dairy	Within 6 months	Rs.7,89,500/-	Milk dairy unit very useful that you can produce more than product such as milk, cheese, butter and their economics benefits.
2.	Public latrine	1 year	Rs.5,42,910/-	To provide sustainable sanitation facility & To promotes Swachh Bharat Yojana
3.	Clinic	1-1.5 years	Rs.2,20,800/-	They can get the primary treatment in the village and also some dieses can detect in primary health center, can also be used for vaccination of villagers.
4.	Lake beautification	1.5 – 2 years	Rs.41,64,996/-	Villagers can have some fun and also old aged people can sit there and children can play in the garden.
5.	Library	1-2 years	Rs.3,22,154/-	Provide refreshment to the village peoples. Children can use library for good for reading.
6.	Bank	Within 1 year	Rs.10,82,218/-	Provide finance to farmers and students. It will provide banking facilities to villagers.
7.	Pucca House	3-5 years	Rs.10,39,430/-	Improves quality of life of

				villagers, provide facility against water leaking due to rain water from roof.
8.	Community Hall	Within 1 year	Rs.5,18,410/-	To increase and strengthen the villager's family bonds and offers valuable community info. To increase and strengthen the villager's family bonds
9.	Biogas Plant	2 years	Rs.1,10,000/-	It is sustainable way to generate energy and as availability of cow dung is plenty biogas is economical.
10.	Gram Panchyat	Within 1 year	Rs.1,26,600/-	Providing proper Store room, meeting room to conduct recreational program , staff room with good facilities such as computer ,water closet.
11.	Police station	1-1.5 years	Rs.2,25,800/-	Provide feeling of safety amongst villagers.
12.	Entrance Gate	Within 6 months	Rs.3,88,777/-	Easy to recognize for visitors and improve aesthetic view of village.
13	Hybrid streetlight	In a week	300000	Development and cost Effectiveness
14	Automatic Water level Controller using GSM	In a week	5000	Advancement Of the village
15	Replacement to LEDS	In a week	50000	Development and cost Effectiveness
16	FPC solar water heater	In a week	10000	Development and cost Effectiveness
17	Design of Biogas Generator	In a month	100000	Saving of Environment and money
18	Footstep Power Generation Using piezo Electric Sensors	In a week	1000	Physical Power Generation With zero Pollution

16 Survey By Interviewing With Talati And/Or Sarpanch

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Survey with Interviewing

SURVEY BY INTERVIEWING WITH TALATI AND/OR SARPANCH

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

CHAPTER- 16

Sr.	Questions	Yes/No	Remarks
1	What are the sources of income in village?	Yes	Property tax, Profession tax
2	What are the chances of employment in village?	Yes	Glass
3	What are the special technical facilities in village?	No	
4	Is any debt on village dwellers?		
5	Are village people getting agricultural help?	Yes	Khetisal
6	Is women health awareness Prog. in organized in village?	Yes	
7	Are women having opportunity to work and income?	Yes	Private
8	Child girl education is appreciated in village?	Yes	
9	Facility of vaccination to child is available in village?	Yes	
10	Are village people aware about child vaccination and done to each and every child is regularly?	Yes	
11	Women help line number information is provided to village people?	Yes	
12	Is water scarcity in village? How many days per year?	Yes	365 days, available (Panchayat)
13	Is village under any debt?	No	
14	Is any serious issue due to debt taken bank or any person happened in village?	No	
15	Is any suicide like incident observed in village due to government policy, debt or fine taxing?	No	
16	Is any death of patient occur due to unavailability of medical facility in village?	No	
17	How many disabled physically changed is observed in village? Provide list with Male, female, girl, boy with age and type of disability and reason of disability.		1 (Satish bhai) (Industrial accident) (leg)
18	Is village improvement is observed in comparative scenario from past to present?		Road development, water development, education, cyclone effect (same time)
19	Is any unavoidable difficulty village people are facing? Any nature calamity is there?	No	
20	The 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.

Academic Studies Cell, Officer's
GTU, VY Section
Contact No – 079-23267588
Email ID: rurban@gtu.edu.in

તલાટી કમ મંત્રી
ગ્રામ પંચાયત તેના
તા. ઓલપાડ
dt: 05/3/21

17 Irrigation / Agriculture Activites And Agro Industry, Altenate Technics And Solution

Farming methods have evolved massively over the years, from basic, hand-held tools to the modern, sophisticated machinery we use today. Farmers are now embracing modernity, which has enabled them to achieve the highest potential in whichever farming activity they choose to undertake. Farming methods are increasingly becoming more refined, less manual, yields are increasing, and it's not uncommon to find beef poultry, beef cattle, and dairy cows on the same farm. But what is causing these changes? The answer is simple. Technology!

Technological advancements have permeated every industry across the world and agriculture is no exception. Nowadays, technology is significantly helping growers and farmers in several ways, including precise forecasting, data-driven decision making, and more. The changes have also resulted in a positive impact on the bottom line of most farmers and ultimately led to improved accesses to food products, at reasonable prices. Let's delve into the specific ways in which technology has revolutionised agriculture.

1. Online resources

The proliferation of internet technology has dramatically offered farmers unprecedented access to a wealth of valuable resources and tools to make farming easier. Notably, the internet has innumerable production and planning tools to help them forecast future crops.Additionally, the World Wide Web provides several farming forums that let them exchange ideas seek advice and participate in insightful discussions. These forums offer robust support groups that can help farmers without ever setting foot on the farm.

2. GPS

A few decades ago, the idea of tractors driving themselves on the farm was implausible. However, the entry of GPS technology has completely changed everything. GPS provides precise location information at any point near or on the earth's surface. So, farming machines integrated with GPS receivers can recognize their position within the farm and adapt their operation to maximize their efficiency at that location.Now, tractors equipped with GPS technology coupled with automatic steering systems are used to improve the placement of seeds on the farm, thereby reducing wastes and costs. Additionally, GPS guided drones are increasingly being used to perform tasks such as crop spraying, livestock monitoring and 3D mapping.

The applications of GPS are many and transcend their usage in tractors. For example, farmers can use a GPS receiver to detect preselected positions in a farm field for soil sample collection. The selected soil samples are then analysed to generate a fertility map in a geographic information system (GIS). Using the map, farmers can accurately prescribe the quantity of fertilizer required for each sampled section of the farm field. After that, the farmer can use Variable-rate technology (VRT) fertilizer applicators to distribute the precise amount of fertilizers in the area.

3. Sensors

Sensors, like GPS technology, are increasingly being used by farmers to comprehend their crops at a micro level, reduce environmental impacts, and conserve resources. Most of the

sensing technologies used in precision agriculture provide critical data that helps farmers to adapt their approaches to the changing environmental factors.

Location sensors use GPS satellites signals to ascertain longitude, latitude and altitude. To effectively triangulate a position, a farmer should have a minimum of three satellites. Optical sensors are also used in precision agriculture to aggregate and process plant colour and soil reflectance data. More precisely, they are used to determine the organic matter, moisture content and clay content in the soil.

Generally, sensors can monitor everything from soil temperature to humidity levels in grain silos. Also, they can offer very critical knowledge of soil health. And importantly, sensor technology helps farmers to use their irrigation waters more efficiently, minimising on wastage, and lowering costs.

4. Mobile devices

As technology improves every day, mobile technology also has advanced, as evidenced by the number of apps popping up. This development has significantly impacted every sphere of life with agriculture too benefiting from the progress. The actual game changes have been mobile applications. They have altered the lives of farmers and agricultural field holders, for the better. Famers have access to several mobile apps that can help them to collect information on their field farms, check the weather, and receive relevant updates.

With farmers getting insightful details from mobile apps, they are smoothly transitioning from handling fields to creating farm maps and facilitating the use of drones. The software behind the apps put them in the drivers' seat when managing everything from strategy formulation to tracking progress.

5. Smart farming

When all the above technologies are merged, the resulting product will be a smart farming system, often referred to as precision agriculture. Smart farming involves the implementation of contemporary Information and Communication Technologies (ICT) into agriculture, resulting in what is referred to as the Third Green Revolution. The revolution is slowly taking over the agricultural sector through the joint application of ICT solutions such as the Internet of Things (IoT), GPS, robotics, sensors and actuators, Big Data, Unmanned Aerial Vehicles (UAVs, drones), precision equipment, plus much more.

Using irrigation as an example, we can demonstrate how different technologies are combined to offer smart farming. Before watering the farm field, a farmer can mount a sensor on an irrigator to assess the moisture level of the soil. The information obtained is then used to vary the quantity of water required. Farmers can use drones to assess plant health and enable them to take any corrective measures, where applicable. Similarly, smart farming techniques allow farmers to monitor the individual needs of their animals better and regulate their nutrition correspondingly, thereby averting disease and improving their health.Smart farming provides farmers with limitless potential to deliver a more sustainable and productive output based on field-generated data. Also, it gives farmers an added value through better and timely decision-

18 Social Activities – Any Activates Planned By Students

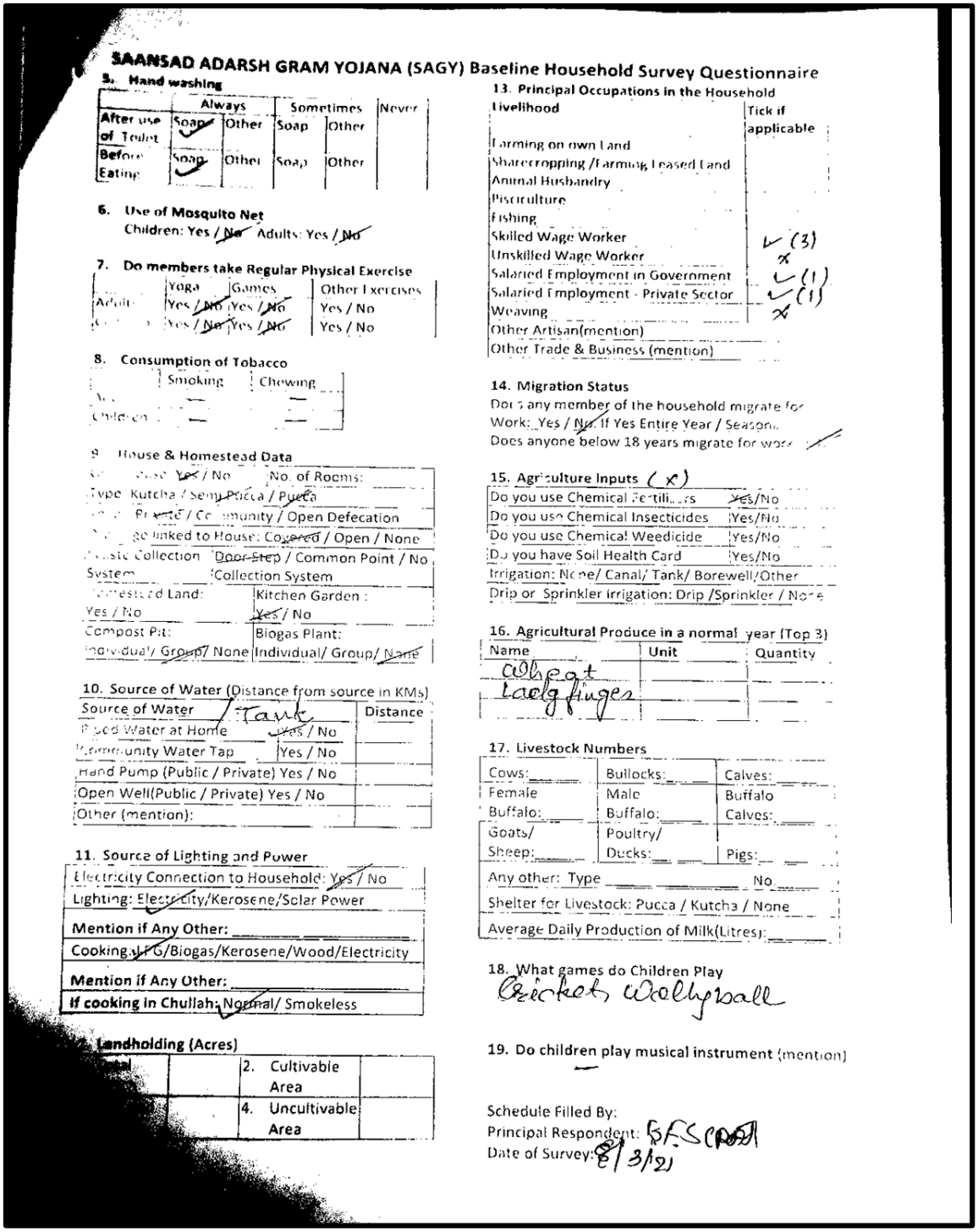
In the activity we did in the village we taught the villagers about the importance of Swachchhta and aware them about various schemes. We had around 10 students with us, to help distribution of jute bags hand woven. We told them about that jute bag in the village to awaken the villagers and maintain cleanliness. We also told the villagers not to use plastic bags as it harms environment. We taught the villagers how to make use of hand sanitizers frequently in this Covid situation. All students were divided into 5 teams, 2 of each so that we can cover maximum area for distribution of jute bags. We had great experience doing this activity.

Some of photos we have collected:


safari

Fig 96 Village bag distribution

19 Tenarang Village SAGY Questionnaire Survey form with the Sarpanch Signature



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
Adult:	Yes / ~~No~~	Yes / ~~No~~	Yes / No
[illegible]	Yes / ~~No~~	Yes / ~~No~~	Yes / No

8. Consumption of Tobacco

	Smoking	Chewing
[illegible]	—	—
Children	—	—

9. House & Homestead Data

[illegible] Yes / No No. of Rooms:
Type: Kutcha / Semi-Pucca / Pucca
[illegible] Private / Community / Open Defecation
[illegible] Linked to House: Covered / Open / None
Waste Collection System: Door-Step / Common Point / No Collection System

Homestead Land:	Kitchen Garden :
Yes / No	Yes / No
Compost Pit:	Biogas Plant:
Individual/ Group/ None	Individual/ Group/ None

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

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

11. Source of Lighting and Power

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

Landholding (Acres)

[illegible]		2. Cultivable Area	
		4. Uncultivable Area	

13. Principal Occupations in the Household

Livelihood	Tick if applicable
Farming on own Land	
Sharecropping /Farming Leased Land	
Animal Husbandry	
Pisciculture	
Fishing	
Skilled Wage Worker	✓ (3)
Unskilled Wage Worker	✗
Salaried Employment in Government	✓ (1)
Salaried Employment - Private Sector	✓ (1)
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 / Season
Does anyone below 18 years migrate for work ✗

15. Agriculture Inputs (✗)

Do you use Chemical Fertilizers	~~Yes~~/No
Do you use Chemical Insecticides	Yes/No
Do you use Chemical Weedicide	Yes/No
Do you have Soil Health Card	Yes/No
Irrigation: None/ Canal/ Tank/ Borewell/Other	
Drip or Sprinkler irrigation: Drip /Sprinkler / None	

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

Name	Unit	Quantity
Wheat		
Ladyfinger		

17. Livestock Numbers

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

18. What games do Children Play
Cricket, Volleyball

19. Do children play musical instrument (mention)
—

Schedule Filled By:
Principal Respondent: BFS (Post)
Date of Survey: 8/3/21

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
Adult	Yes / ~~No~~	Yes / ~~No~~	Yes / No
[illegible]	Yes / ~~No~~	Yes / ~~No~~	Yes / No

8. Consumption of Tobacco

	Smoking	Chewing
[illegible]	—	—
Children	—	—

9. House & Homestead Data

[illegible] ~~Yes~~ / No	No. of Rooms:
Type: Kutcha / Semi-Pucca / ~~Pucca~~	
[illegible] Private / Community / Open Defecation	
[illegible] ge 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	Tank	Distance
Piped Water at Home	~~Yes~~ / No	
Community Water Tap	Yes / No	
Hand Pump (Public / Private)	Yes / No	
Open Well(Public / Private)	Yes / No	
Other (mention):		

11. Source of Lighting and Power

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

12. Landholding (Acres)

[illegible]		2. Cultivable Area	
		4. Uncultivable Area	

13. Principal Occupations in the Household

Livelihood	Tick if applicable
Farming on own Land	
Sharecropping /Farming Leased Land	
Animal Husbandry	
Pisciculture	
Fishing	
Skilled Wage Worker	✓ (3)
Unskilled Wage Worker	✗
Salaried Employment in Government	✓ (1)
Salaried Employment - Private Sector	✓ (1)
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 / Season.
Does anyone below 18 years migrate for work ✓

15. Agriculture Inputs (✗)

Do you use Chemical Fertilizers	~~Yes~~/No
Do you use Chemical Insecticides	Yes/No
Do you use Chemical Weedicide	Yes/No
Do you have Soil Health Card	Yes/No
Irrigation: None/ Canal/ Tank/ Borewell/Other	
Drip or Sprinkler irrigation: Drip /Sprinkler / None	

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

Name	Unit	Quantity
Wheat		
Lady fingers		

17. Livestock Numbers

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

18. What games do Children Play
Cricket, Volleyball

19. Do children play musical instrument (mention)
—

Schedule Filled By:
Principal Respondent: [illegible]
Date of Survey: 8/3/21

Nanaad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

(NOTE: Please aggregate information from village level questionnaires where relevant)

I. Basic Information

a. Gram Panchayat Tenara

b. Block Olpad

c. District Surat

d. State Gujarat

e. Lok Sabha Constituency 24-Surat

f. Number of Wards in the Gram Panchayat 4

g. Number of Villages in the Gram Panchayat 1

h. Names of Villages

Demographic Information (2011)

Number of Households 500 Total Population 1976 Male 1075 Female 901

SC HHs 65 ST HHs 112 OBC HHs - Other HHs -

I. Access to Infrastructure / Facilities / Services

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (No. distance from the GP office
a.	ANM Health Sub Centre	No	5-7 km (Chaalod Kalan)
b.	Nearest Primary Health Centre (PHC)	No	
c.	Nearest Community Health Centre (CHC)	No	Olpad (8 km.)
d.	Nearest Post Office	Yes	
e.	Nearest Bank Branch (Any)	No	(5 km)
f.	Nearest Bank with CBS Facility		
g.	Nearest ATM	No	(5 km)
h.	Nearest Primary School	Yes	2 no (0 km)
i.	Nearest Middle School	Yes	
j.	Nearest Secondary School	No	
k.	Nearest Higher Secondary School / +2 College	No	
l.	Nearest Graduate College	No	
m.	Nearest ITI / Polytechnic Centre	No	
n.	Kisan Seva Kendra	No	

1

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
o	Agriculture Credit Cooperative Society	No	Piplasad (3 km)
p	Nearest Agro Service Centre	No	
p	MSP based Government Procurement Centre	No	
q	Milk Cooperative Collection Centre	Yes	Collection centre (Head office - Pipalsad)
r	Veterinary Care Centre	No	
s	Ayurveda Centre	No	
t	Seva Kendra	Yes	
u	Bus Stop	Yes	2 numbers
v	Railway Station	No	Surat
w	Library		
x	Common Service Centre	No	

IV Sports Facilities in the Gram Panchayat

a. Number of Play Grounds in the GP: Total 1 Public 1 Private 0

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

V Education, ICDS

a. Number of Angan Wadi Centres: 2

b. Number of villages without Angan Wadi Centres 0

Names of such villages: _____

c. Schools (Number)

Primary Private: ___ Primary Govt.: ✓ (2)

Middle Private: ___ Middle Govt.: (1) ✓

Secondary Private: ___ Secondary Govt.: ___

Higher Secondary Private: ___ Higher Secondary Govt: ___

VI. Public Distribution System

	Item	Private Contractor	Women's SHG	Gram Panchayat	Cooperative	Other (Mention)	Location in GP (mention Location)	If outside GP, Location & distance from GP HQrs)
	[illegible]							
a.	Cereal (Rice/ Wheat/ Millets)	✓					Tenarang	0 km
b.	Kerosene (LPG)	No						
c.	Other (mention)							

2

...ad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

...e 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 100% / Not Covered -		
b.	Hand Pump Coverage in Villages:	Covered - / Not Covered ✓	100. of hand pipe pump - 1	
c.	Coverage under Covered Drains:	Covered 70-80% / Not Covered		
d.	Coverage under Open Drains: 0 %	Covered 0 % / Not Covered ✓		
e.	Villages with Household Electricity Connection (Numbers)	Connected ✓ / Not Connected	100 % GSEB(HOME) 10-15 km	

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	756	d.	Pasture Grazing Land	1-2	g	Check Dam	1
b.	Irrigated Land	656	e.	Forests/ Plantations	-	h	Wells/Bore Wells	0
c.	Un-irrigated Land		f.	Other Common Land	5	i	Tanks/Ponds	2

whole village covered

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

3

Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

(Please aggregate information from village level questionnaires wherever relevant)

Questions relating to Households & Institutions

		Number
a)	Number of eligible Households for pension (old age, widow, disability)	80
b)	Number of Households receiving pension (old age, widow, disability)	80
c)	Number of eligible Households who are not receiving pension	0
d)	Number of Households eligible for Ration Card	100%
e)	Number of eligible HHs having ration cards	-
f)	Number of households covered under RSBY (Rashtriya Swasthya Bima Yojana)	-
g)	Number of HHs covered under AABY (Aam Aadmi Bima Yojana)	-
h)	Number of active Job Card holders under MGNREGA	Not available
i)	Number of Job Card holders who completed 100 days of work during 2013-14	-
j)	Number of shops selling alcohol	-
k)	Number of BPL families	37
l)	Number of landless households	40
m)	Number of JAY beneficiaries (કુટુંબોના આરોગ્યને લગતી યોજના)	0
n)	Number of FRA[2] beneficiaries	-
o)	Number of Community Sanitary Complexes	1 (15-)
p)	Number of Households headed by single women	50
q)	Number of Households headed by physically handicapped persons	0
r)	Total number of Persons with Disability in the village	2
s)	Number of SHGs	002
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

Muskan Ghreecala Harshit Mehta Paryaush Jain Surveyor	તલાટી કમ મંત્રી ગ્રામ પંચાયત તેનગ તા. ઓલપાડ PRI Respondent (Preferably Gram Panchayat Chairperson) / Alternate Respondent (Preferably Government official in the Gram Panchayat)	8/3/2021 Date of Survey

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

Gmail

Muskan Gheewala <muskanmgheewala@gmail.com>

Development scenario of T enarang village,Olpad,Surat.

Muskan Gheewala <muskanmgheewala@gmail.com> Tue, May 25, 2021 at 7:17 PM

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

To: ddo-sur@gujarat.gov.in, tdoolpad@gmail.com, collector-sur@gujarat.gov.in, gpdelasa-gj@gov.in
Cc: Vishwakarma Yojana <rurban@gtu.edu.in>

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

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

Sr. No	Design Name	Period	Amount Expenditure (Rs)	Benefits
1.	Sub-Dairy	Within 6 months	Rs.7,89,500/-	Milk dairy unit very useful in that you can produce more than product such as milk, cheese, butter and their economics benefits.
2.	Public latrine	1 year	Rs.5,42,910/-	To provide sustainable sanitation facility & To promotes Swachh Bharat Yojana

3.	Clinic	1-1.5 years	Rs.2,20,800/-	They can get the primary treatment in the village and also some the disease can detect in the primary health center, can also be used for vaccination of villagers.
4.	Lake beautification	1.5 – 2 years	Rs.41,64,996/-	Villagers can have some fun and also old aged people can sit there and children can play in the garden.
5.	Library	1-2 years	Rs.3,22,154/-	Provide refreshment to the village peoples. Children can use library for good for reading.
6.	Bank	Within 1 year	Rs.10,82,218/-	Provide finance to farmers and students. It will provide banking facilities to villagers.
7.	Pucca House	3-5 years	Rs.10,39,430/-	Improves quality of life of villagers, provide facility against water leaking due to rain water from roof.
8.	Community Hall	Within 1 year	Rs.5,18,410/-	To increase and strengthen the villager's family bonds and offers valuable community info. To increase and strengthen the villager's family bonds
9.	Biogas Plant	2 years	Rs.1,10,000/-	It is sustainable way to generate energy and as availability of cow dung is plenty biogas is economical.

10.	Gram Panchyat	Within 1 year	Rs.1,26,600/-	Providing proper Storeroom, meeting room to conduct the recreational program, staff room with good facilities such as computer, water closet.
11.	Police station	1-1.5 years	Rs.2,25,800/-	Provide a feeling of safety amongst villagers.
12.	Entrance Gate	Within 6 months	Rs.3,88,777/-	Easy to recognize for visitors and improve aesthetic view of village.
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14	Automatic Water level Controller using GSM	In a week	5000	Advancement Of the village
15	Replacement to LEDS	In a week	50000	Development and cost Effectiveness
16	FPC solar water heater	In a week	10000	Development and cost Effectiveness
17	Design of Biogas Generator	In a month	100000	Saving of Environment and money
18	Footstep Power Generation Using piezo Electric Sensors	In a week	1000	Physical Power Generation With zero Pollution

DPR .pdf
8323 K

Best Regards,
Muskan Gheewala, Harshit Mehta (Civil Engineering) & Priyansh Jain (Electrical Engineering)
U.G., Civil & Electrical Engineering
C.K. Pithawala College of Engineering &Technology, Vesu, Sura
Gujarat Technological University

21 Comprehensive report for the entire village

CONCEPT

Vishwakarma Yojana is provides special scheme for development of village by GTU and Government of Gujarat in which students work together and collect data and information regards village development with the help of gram panchayat and stake holders.

Village have some basic facilities likes drinking water, drainage system, pucca road, and other facilities like primary school, primary health center, community hall, library, public latrine block, are sufficient so that village can develop. So, we will give proposal regarding sustainable energy sources and solution related to infrastructure problems.

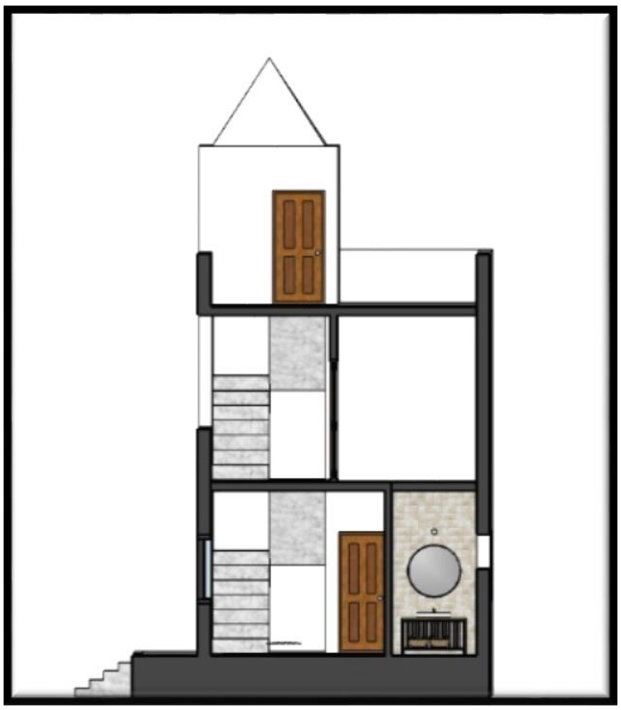
Efforts have been made in this project work to identify and plan some of the below facilities for sustainable development of village and to meet need of future population. Vishwakarma Yojana is one of the initiatives towards Rurbanisation that is village development by the government of Gujarat, which was allotted as a real time situation type project provides to GTU.

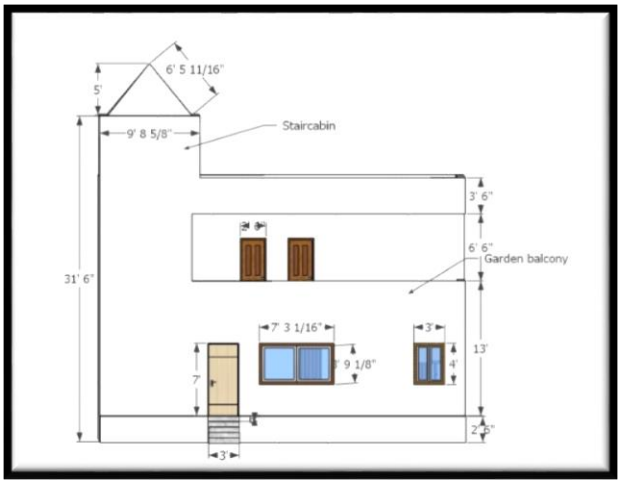
It is one of the strategies to reduce urban city pressure and lower the migration rate by developing village with a “rural soul” but with all urban amenities that a city may have. In this project the students meet the relevant citizens of village and survey the existing facilities.

Then design of the sustainable infrastructure which is to be modified is carried out for the village. This includes implementation of engineering skills to prepare detailed project reports for village as a part of the final year project work. By this project certain experiences recreates a real work and need of application of an individual technical knowledge on any existing problems. Based on survey we tried to give design of basic facilities to fulfill their needs.

By providing these basic facilities to village for reduce urban city pressure and decrease migration rate, which is ultimate aim of Vishwakarma Yojana.

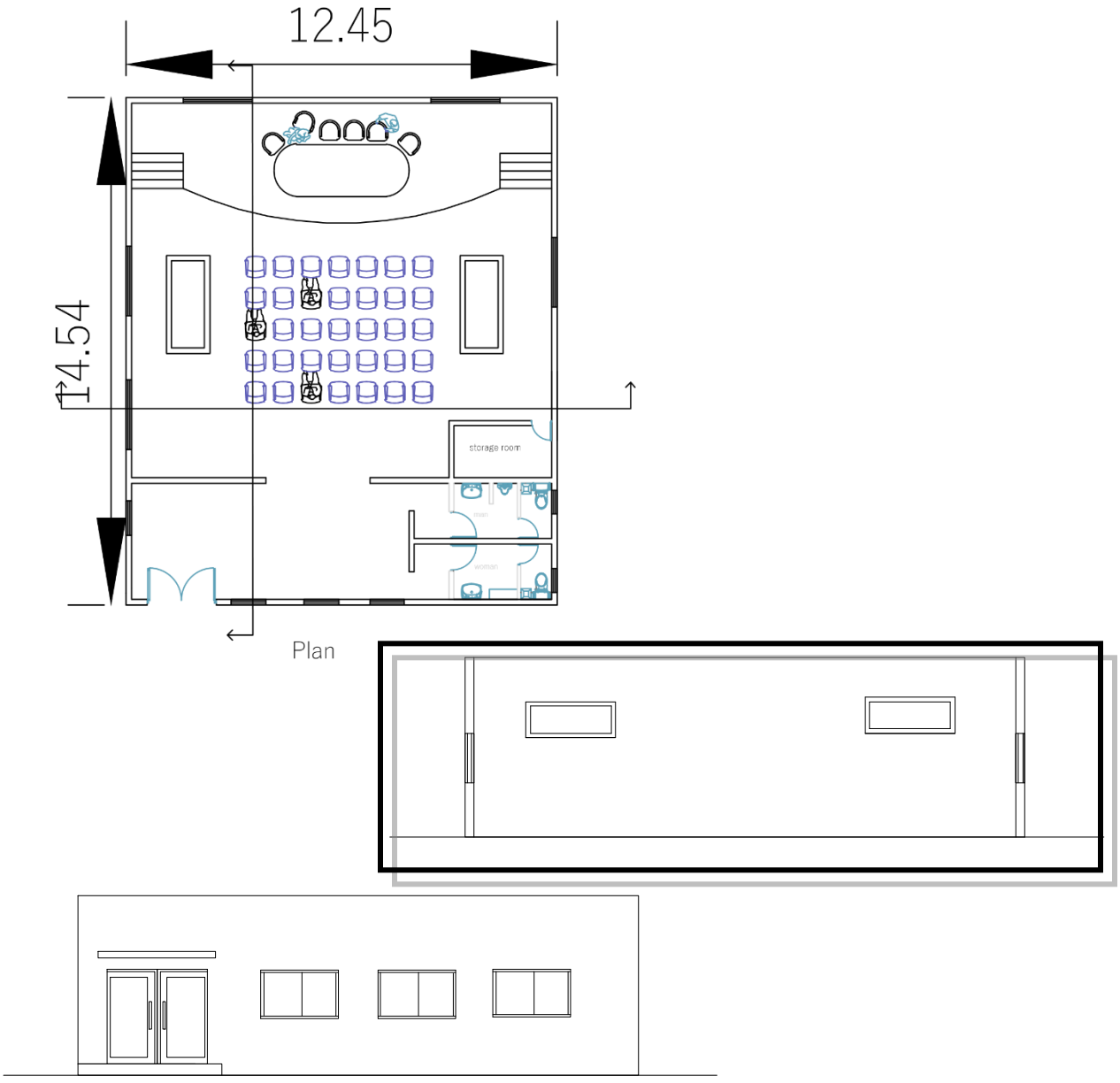
Tenarang Village, Olpad, Surat





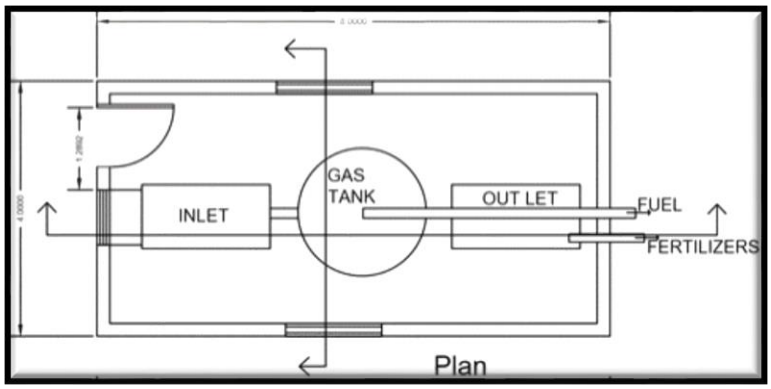
Design Infrastructure – PUCCA HOUSE
Village – TENARANG Village, Surat

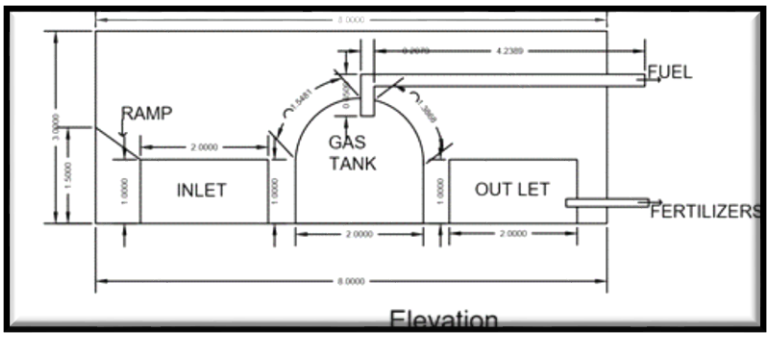
Tenarang Village, Olpad, Surat

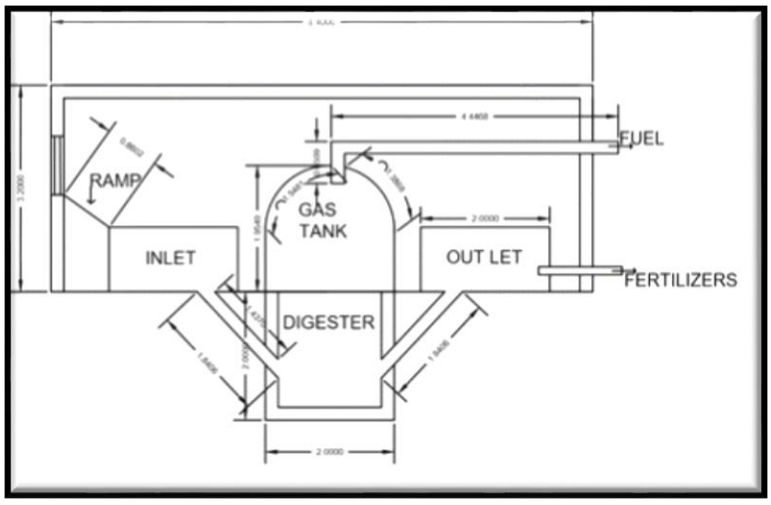


Design Infrastructure – COMMUNITY HALL
Village – TENARANG Village, Surat

Tenarang Village, Olpad, Surat

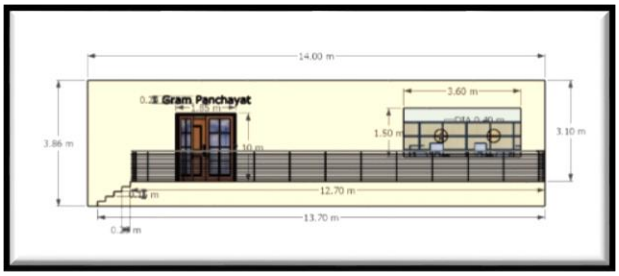


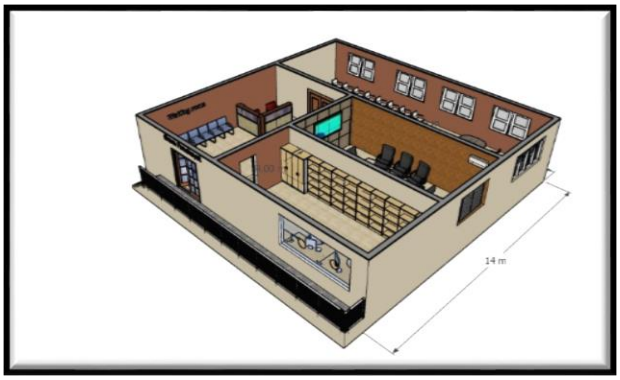


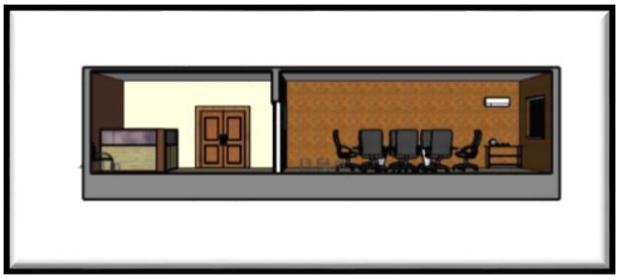


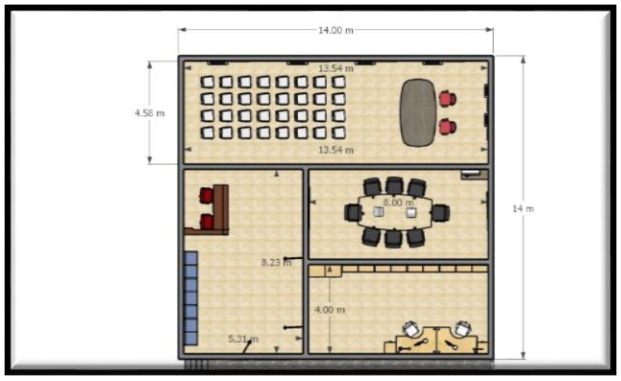
Design Infrastructure – BIOGAS PLANT
Village – TENARANG Village, Surat

Tenarang Village, Olpad, Surat



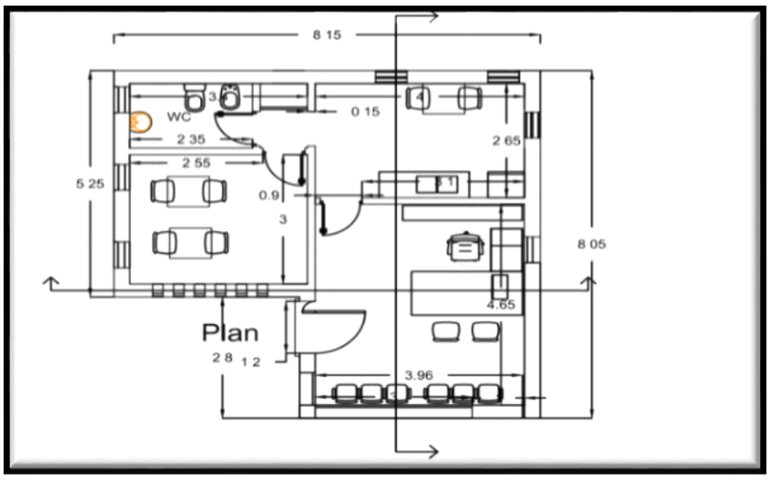


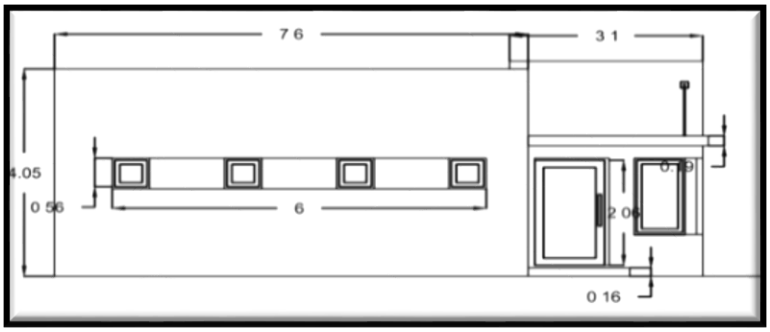


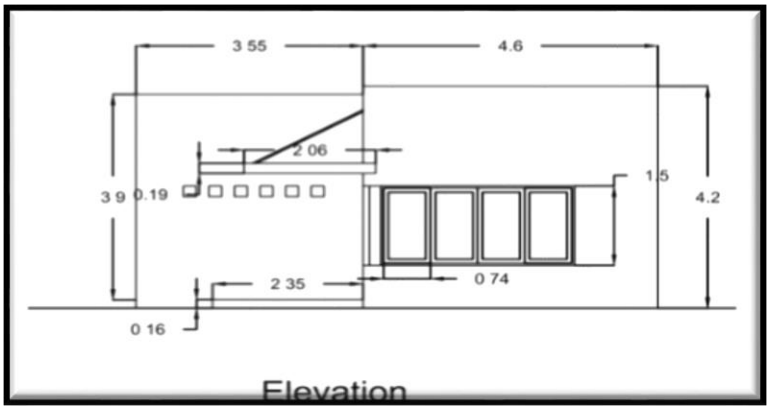


Design Infrastructure – GRAM PANCHAYAT
Village – TENARANG Village, Surat

Tenarang Village, Olpad, Surat

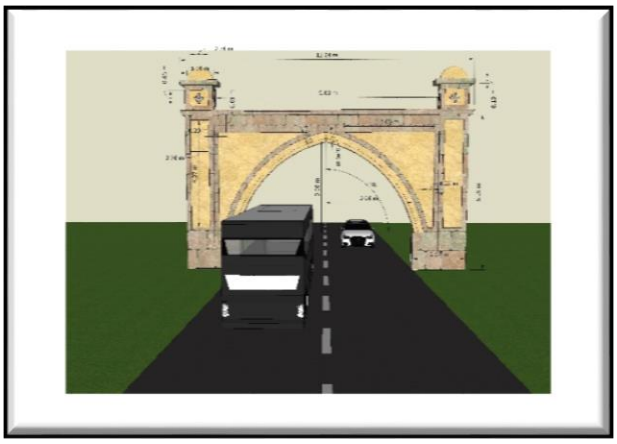


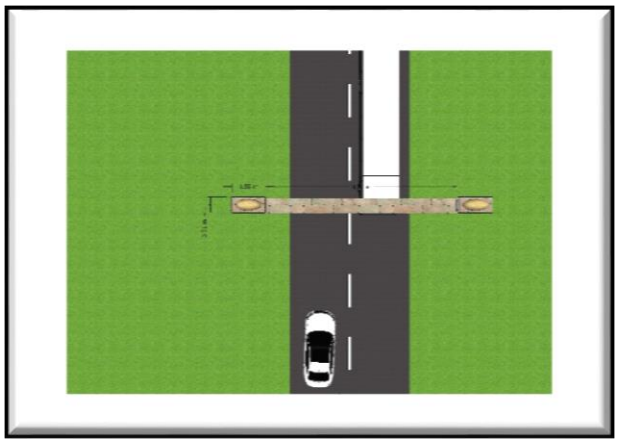




Design Infrastructure – POLICE STATION
Village – TENARANG Village, Surat

Tenarang Village, Olpad, Surat





Design Infrastructure – ENTRANCE GATE
Village – TENARANG Village, Surat

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

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

Nodal Officer
Dr. Boski Chauhan
Civil Engineering Department
C. K. Pithawala College of Engineering & Technology

Prof. Hetal Jivanramjiwala
Electrical Engineering Department
C. K. Pithawala College of Engineering & Technology