DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII

AN APPROACH TOWARDS RURBANISATION

Pamol Village

Anand District

PREPARED BY

STUDENT NAME	BRANCH NAME	ENROLLMENT NO.
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KITE

Knowledge Institute of Technology & Engineering

Prof. Divyesh G Mandali
Assistant Professor
Civil Department
NODAL OFFICER
KITE-135

YEAR: 2020-21

GUJARAT TECHNOLOGICAL UNIVERSITY

Chandkheda, Ahmedabad – 382424 Gujarat

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CERTIFICATE

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

Detail Project Report for,

VILLAGE: Pamol

DISTRICT: ANAND

Under

Vishwakarma Yojana: Phase VIII

in partial fulfillment of the project offered by

GUJARAT TECHNOLOGICAL UNIVERSITY, CHANDKHEDA

during the academic year 2020-21.

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

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ABSTRACT

The Government of Gujarat has launched "Vishwakarma Yojana: An Approach towards Rurbanisation" for development of villages which is implemented by "Gujarat technological University". Vishwakarma Yojana would provide "Design to Delivery" solution for development of villages in 'City' areas. In this Project, we describe the ecosystem for a village and then map out an integrated design procedure for building an Ideal Village. We define an Ideal Village as a bundle of services which are delivered to its residents and businesses in an effective and efficient manner. Computing, communication and information technologies play a major role in design, delivery and monitoring of the services. The selected village is surveyed, data has been analyzed for the village and an Infrastructure facility has been found out by this Yojana with the help of UDPFI guidelines.

According to the selection process, we have hand-picked the village having name Pamol, it's in Anand District. The location code of our village is 388560. The total population of our village is 4804, having.

Village is far from the Borsad having distance of 10 km. The connecting roads were in good conditions. Regarding the transportation facilities peoples were having their personalized vehicles to travel. The problem was that the general market was far from their location. They have to visit Borsad for buying the main household's things.

Vishwakarma yojana provided benefit of development rural infrastructure of Gujarat technological university. Pamol is the part of the Anand district. So it is develop the village for growth of Anand district, state and country also. In Pamol village infrastructure facility like road, drinking water, drainage system, production of milk, pucca house are sufficient. We will provide like transportation system, rcc road, primary & secondary school, water supply system, PHC and solutions related to infrastructural problems. For future the village Pamol can use more advance technology for agricultural prospect and for other requirements also. They can make the village Wi-Fi zone and also provided bio gas plant.

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, drainage, and many such. 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: Rural development, provided better facilities to rural people, provided better infrastructure, sanitation facilities, better Technology provided.

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1.1 Background and Study Area Location:

❖ Background

"Rurbanisation" means soul of a village and the facilities/amenities of the urban, is a combined process of preserving the "soul of villages" by providing all the civic and infrastructure facilities available in big towns and cities to arrest migration and at the same time, bringing down the burden on big cities and towns bursting at their seams. Vishwakarma Yojana will create infrastructure - connectivity, civic and social infrastructure along with provision of alternative employment opportunities which are the key pillars that the concept of Rurbanisation hinges on. By taking up project under VY, a student is able to become both a good technologist as well as an agent of change for the better.

"Vishwakarma Yojana" is a Government of Gujarat allotted to GTU under which students are to be trained for technical association for rural development. Gujarat Technological University has been allotted an important and prestigious project of Vishwakarma Yojana by the Government of Gujarat from the year 2012-13. Vishwakarma Yojana is providing "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, Community Hall, Library, Recreation Facilities & other) and renewable energy (Rain Water Harvesting, Biogas Plant, Solar Street Lights & Other) for Sustainable development.

In this village we have study to the ideal village survey and to the ideas for our allocated village for the development of the village. We have study literature review and find the Rurban problems.

As a part of Vishwakarma Yojana Project, we visited Gana village, Anand and observed the different parameters such as important elements in village development like various infrastructure, economic and social growth and activities related to that, population, financial background, environmental sustainability, electricity, water supply, drainage network, waste management, educational facilities, mandals or trust or society etc.

We also meet Sarpanch and Talati of Gana gram Panchayat and villagers. In Gana village, the different infrastructures are there such as smart School, Sewage system, Bank, Hospital are available in the village. The road of RCC and Bitumen are well maintained.

- Present status and techno-economic survey of villages in given district of the state in terms of basic and public amenities, essential commodities, other infrastructural facilities for the need of people and on the adequacy of the available resource with reference to the population of the village and growth of the area with the consultation of local revenue authorities, T.D.O. and D.D.O. the future need of the village keeping to mind the need of days, future targeted population growth, growth of surrounding town or taluka places etc.

- We have visited an ideal village Gana of Gandhinagar district for the purpose of understanding the basic concept of an ideal village.Social infrastructure facilities (education, health, sanitation) socio- cultural facilities (community hall, library, recreation facilities & other) and sustainable infrastructures (rainwater 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 applies their technical knowledge in the rural infrastructure development.

❖ Study Area Location

For the purpose of Vishwakarma project, we have selected Gana village as an ideal village. We have visited Gana village and got information for development of our allocated village (Pamol). All types of necessary facilities are provided in Gana village.

It has good infrastructure facilities. Approach and main roads of village are of bitumen and internal street roads in the village are of R.C.C. and paver blocks. It is having good facility of education from primary education to higher secondary education.

The village is very much developed in term of basic facilities and amenities as the Sarpanch of the village is working very hard towards overall development of the village and development of the villagers. So, villagers are very happy with her work as she works hard for the development of the village.

Various recreational facilities like public garden, gym center, volleyball ground etc. are available in the village. There are 1 bank and 1 ATM available in village.

It is having good facility for drinking water R.O. water purification plant. Underground drainage system is excellently working in the village. People of village are aware and utilizing various renewable sources like solar panel (for producing electricity), Rainwater recharging and bio-gas plant for producing gas.

1. Total population of the Gana is 4079.
2. Gana is located in Anand taluka of Anand district of Gujarat. It is 9 km away from Anand.
3. Gana village most people are connected with agriculture activity.
4. And some of are connected with government sector.

1.2 Concept: Ideal Village, Normal Village

1.2.1 Objectives:

An ideal village has good system of sanitation and drainage. Because filth and rubbish of the village should be regularly removed away into the compost pits. An ideal village has very good drains so that the dirty water of the village is properly drained away.

1. To achieve faster and inclusive growth through infrastructure development, livelihood promotion, health and education, banking and insurance services, and delivery of public services using a bottom up approach.
2. To achieve the Millennium Development Goals (MDGs): eradicate extreme poverty and hunger, to achieve universal primary education, to promote gender equality and empower women, to reduce child mortality, to improve maternal health, to combat diseases, to ensure environmental sustainability, to develop global partnership for development
3. To bridge the digital divide and remove asymmetry of information between government and the people.
4. To provide opportunity to socially conscious citizens and organization to participate in nation building activities.

- **Dwelling-houses:**

➢ In an ideal village when we see the dwelling houses, they are very neat and clean. And the dwellers of these houses are also aware of the sanitation and drainage and thus they have good sanitation as well as good drainage system in their houses. They have good natural lighting facilities as they have sufficient windows in their houses and thus also has sufficient air. The roofs of these houses have at least good tiles.

- **Food and fodder:**

➢ The villagers grow food for themselves and fodder for their cattle. They eat fresh and healthy food. They grow good grass for fodder and also leave sufficient land for pasture.

- **Drinking water:**

➢ An ideal village should have good supply of drinking water. There are enough tube-wells in an ideal village. There are separate ponds for men and cattle.

- **Agriculture and Industry:**

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

- **Educational facilities:**

➢ There are Primary schools, High schools and craft schools in an ideal village. Primary education is free and compulsory.

- **Clinical facilities:**

➢ In an ideal village, there are clinical facilities for men and the domestic animals. Hence, there are dispensaries and veterinary dispensaries.

- **Other facilities:**

➢ We can find post-office, public library, playground, gymnasium and club-house there.

- **People:**

➢ People of an ideal village are very neat and clean. They are quite enlightened. They have a sense of discipline and co-operation. They have a spirit of service and sacrifice. They follow the principles of plain living and high thinking. They are active and cheerful.

1.2.2 Examples/Live Case Studies of Ideal Village from India / Gujarat

- Examples of ideal villages from India are as below:

1) Dharnai, Bihar

Once struggling to get basic electricity like most villages in India, Dharnai has now changed its fate and become the first village in India to completely run on solar power. Residents of Dharnai had been using diesel-based generators and hazardous fuel like cow dung to meet the electricity requirement for decades, which were both costly and unhealthy. Since the launch of Greenpeace's solar-powered 100 kilowatt micro-grid in 2014, quality electricity is being provided to more than 2,400 people living in this village in Jehanabad district.

Figure 1 Dharnai

2) Hiware Bazaar, Maharashtra

Amid the desperate denizens scrounging for water in the drought-affected parts of Maharashtra stands a village that has not felt the need to call a single water tanker – in fact, it hasn't called for one since 1995. The village also has 60 millionaires and the highest per-capita income in India.

Facing a major water crisis each year because of the measly rainfall it gets, the village decided to shun water-intensive crops and opted for horticulture and dairy farming. Their consistent water conservation initiatives led to rising groundwater levels and the village started to prosper. Today, the village has 294 open wells, each brimming with water just as the village brims with prosperity.

Figure 2 Hiware Bazaar

3) Odanthurai, Tamil Nadu

Odanthurai, a panchayat situated in Mettupalayam taluk of Coimbatore district, has been a model village for the other villages for more than a decade. The panchayat has not only been generating electricity for their own use, but also selling power to Tamil Nadu Electricity Board having already won international acclaim through its unique welfare schemes and energy self-sufficiency drives, Odanthurai near Mettupalayam has begun efforts to develop a corpus of Rs 5 crore to install wind and solar energy farms. This project will enable free supply of electricity to over 8,000 residents.

Figure 3 Odanthurai Village

The most notable among Odanthurai's self-help ventures is the 350-kw wind power generator that was set up in 2006 under the direction of a well functioning gram panchayat. Having seen the government help many private companies acquire land in Coimbatore district at subsidized prices for wind power projects, the enterprising Shanmugam thought, "Why not we set up a wind power project under panchayat ownership? After all a village community is the most legitimate owner of land and wind, the two natural resources that are enough for power generation."

4) Punsari, Gujarat

Punsari village, barely 100 km from Ahmedabad, could be a textbook case of development. Closed-circuit cameras, water purifying plants, biogas plants, air-conditioned schools, Wi-Fi, biometric machines – the village has it all. And all of it was done in a matter of eight years, at a cost of Rs. 16 crores. The man behind the transformation is its young tech-savvy sarpanch – 33-year-old Himanshu Patel – who proudly states that his village offers "the amenities of a city but the spirit of a village."

Figure 4 Punsari Village

5) Gangadevipalli, Andhra Pradesh

If India lives in its villages, then the model it perhaps must follow is Gangadevipalli, a hamlet in Andhra Pradesh's Warangal district where every house has the bare necessities of life, and more. From regular power and water supply to a scientific water filtration plant, a community-owned cable TV service and concrete, well-lit roads, this model village has been steadily gaining in prosperity thanks to a disciplined and determined community that has also managed to work in harmony towards goals set collectively.

Figure 5 Gangadevipalli Village

6) Piplantri, Rajasthan

For the last several years, the Piplantri village panchayat has been saving girl children and increasing the green cover in and around it at the same time. Here, villagers' plant 111 trees every time a girl is born and the community ensures these trees survive, attaining fruition as the girls grow up. They also set up a fixed deposit for the girls and make their parents sign an affidavit that ensures their education. To prevent these trees from being infested with termite, the residents planted over 2.5 million aloe vera plants around them. Now, these trees, especially the aloe vera, are a source of livelihood for several residents.

Figure 6 Piplantri Village

To ensure the financial security, after the birth of a girl child, the villagers contribute Rs 21,000 collectively and take Rs 10,000 from the parents and put it in a fixed deposit bank account, which can be used only after she turns 18. To make sure that girl child receives a proper education, the villagers make the parents sign an affidavit (legal contract) which restricts them from marrying her off before she attains the legal age for marriage.

7) Ramchandrapur, Telangana

The first village in Telangana region to win the Nirmal Puraskar in 2004-05, Ramchandrapur came into focus a decade ago when the villagers pledged to donate their eyes for the visually challenged. Among its many achievements, all the houses in the village have smokeless chullahs and toilets with tap-water facilities. It is the first village in the state to construct a sub-surface dyke on the nearby river and solve drinking water problems by constructing two over-head tanks in each house. The village does not have drainage system and all the water generated from each house is diverted to the gardens, which are planted by the villagers in each house.

Figure 7 Ramchandrapur Village

8) Shikdamakha, Assam

Way before Swacch Bharat, in 2010, a remote Assam village had set cleanliness goals for itself. Shikdamakha, near Guwahati, runs cleanliness drives and competitions, and wants to surpass Mawlynnong in Meghalaya as Asia's cleanest village. A plastic-free village that earned the maximum points in the cleanliness sub-index of Union Ministry of Drinking Water and Sanitation, Shikdamakha has also earned the coveted Open Defecation Free status recently.

Figure 8 Shikdamakha Village

9) Chizami, Nagaland

A small village in Nagaland's Phek district, Chizami has been scripting a quiet revolution in terms of socioeconomic reforms and environmental protection for almost a decade. A model village in the Naga society, Chizami is today visited by youth from Kohima and neighbouring villages for internships in the Chizami model of development.

What is unique in the Chizami model of development is that marginalised women have played an important role in bringing about this socio-economic and sustainable transformation that is rooted in traditional practices of the state.

Figure 9 Chizami Village

1.2.3 The Idea of Model / Smart Village

Exposure visits are a very important training methodology as it enables the participants from a different setting to interact with and learn from each other, allowing them to view practical/real life situations of successful integration of sustainable practices in the said filed.

During this meeting broader information exchanges took place between the two groups, beyond the core topic. It was observed that all the participants were enthusiastic for learning and implementing their learnings in their own village.

This visit was a step forward in the project as it was a real time experience for the participants on the struggle and hard work that goes into building a remarkable ideal village.

Smart Village is idea adopted by national, state and local governments of India, as an initiative focused on holistic rural development, derived from Mahatma Gandhi's vision of "Adarsh Gram" and "Swaraj".

68.9% of our population lives in rural areas according to Censes 2011. Though number is expected to fall in the coming years, it is still estimated that more than half of our population would be rural even in 2050. Despite being several past initiatives by governments at all levels i.e.; Central, State and Local – in past the level of improvement has not kept pace with the rising aspiration among Indians. On most development parameters, there is still significant gap between rural and urban India, as the table below:

The idea of an "Adarsh Gram" or model village has been explored earlier as well, most notably through the Pradhan mantri Adarsh 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 Mukhya Mantri Adarsh Gram Yojana along similar lines in 2011, with the allocation of Rs 10 lakh per village.

The proposed "Sansad Adarsh Gram Yojana" of the Central Government aims to involve MPs more directly in the development of model villages. By adopting a village(s) under this initiative, an MP has the opportunity to directly benefit all sections of a village community in an integrated, efficient and participatory fashion. The following sections in this brief highlight the important objectives that a model village could achieve, and covers the core features of a model village in India.

❖ Objectives of Model Village:

- To take governances to the door step of the people by enhancing outreach of programmes through a cadre of trained volunteers and champions in administration.
- To improve the quality of delivery mechanism by convergence of programmes land coordination among frontline workers, PRI representative and community resource persons/volunteers.

- To generate awareness about the government programmes among the people in rural areas.
- 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 other 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.

❖ Resources for model villages:

• Funds under existing schemes across different sectors such as health, education, skill development, livelihood etc could be utilized, and based on the specific demands of the village, resources could be channelized into the development of the village. Some important Centrally Sponsored Schemes (CSS) which could be utilized are NRLM, NHM, SSA, NREGA, BRGF, RKVY and Mid-day Meal Scheme.

• MPLAD funds (Rs 5 crore per year) could be utilized for the construction of high quality, sustainable assets such as school buildings, hospitals, Anganwadi Centres and school kitchens for Mid-Day meals. Funds could also be channelized into road construction, and the construction of toilets in schools and homes, particularly for girls.

• CSR funds, of which a much larger corpus is available after the latest amendment to the Companies Act, could also be used for the purpose of infrastructure development in the constituency.

• Self-help groups, who are eligible for subsidized loans under various Central and State government initiatives

- Gram Panchayats could also raise loans, if legally permitted to do so under the State Panchayati Raj Acts like in the case of Kerala.

1.2.4 Ancient History Civil Concept about Indian Village / other Countries Perspective about Village and it's new Development

Mahatma Gandhi is often quoted as having said: "Real India lives in its villages." The fact that in the early decades of the 20th century, India's urban segment constituted only 11 per cent of the total population gave strength to his argument. It was the villages in which 89 per cent of the population lived. That made India an agricultural country.

The development of Village India, for Gandhi, was the development of India. Illiteracy, ignorance, and poverty characterized the vast population of rural India. Gandhi organized mass movements to draw attention to the problems of the rural people, and also to involve the

peasants in the freedom struggle. Social scientists also became interested in studying rural problems, particularly the deteriorating rural economy.

It is obvious that the number of villages in a given state is dependent upon the size of the state and the proportion of population dependent on agriculture. In this context, it will be useful to understand two concepts, namely that of 'agricultural crowding' and Village group'.

The Mahabharata talks of different types of settlements, for example, ghosh or brij (cattle farm), palli (small hutments), gram (villages around the forts or durgs), kharvata or pattan (towns), and pur, puri, nagar (cities of different types). The villages were linked with one another, culturally, socially and administratively.

- **The villages were organized thus:**

a) 10 villages Samgrahana

b) 200 villages Karvatika

c) 400 villages Dronamukha

d) 800 villages Mahagrama or Sthatnuja

During the period of Chandragupta Maurya, the villages were divided into three categories according to their size: Jyeshtha (the biggest), Madhyama (medium sized) and Kanishtha (smaller ones).

1.3 Detail Study (Socio economic, Physical, demographic and infrastructure details) of Ideal Village

Figure 10 Gram Panchayat

The building in this image is "Shrimati Kamlaben and Shree Shanabhai Patel Gram Panchayat". It is the gram panchayat building of Gana Village. It is fully computerized and air conditioned. All the basic documents are available in panchayat like, birth and death certificate, property related documents, etc.

Figure 11 Community Hall

This is the community hall of the village. It is known as "Gana Patidar Samaj Community Hall". It was constructed and maintained by "Patel Samaj, Gana". It provides space and facilities for different types of function in the village. This hall is very helpful to villagers for organising any type of function as its rent is cheaper so than anyone can afford it.

Figure 12 Milk Co-Operative Society

This building is milk co-operative society of Gana Village. The cleanliness and hygiene of the building is maintained properly so that milk in the dairy does not get infected. Milk collected here is sold to villagers and goes to Amul Dairy. Here, the system for collection of the milk is semi-automated and the payment method is digital and so the payment of milk directly gets credited to distributer's bank account

Figure 13 School Building

The building in this image is of school in Gana which is known as "Shrimati K.D. Patel Vidhya Mandir". This school provides quality education from nursery to higher secondary". All the facilities like garden, drinking water plant, computer lab, etc. This school is managed and maintained by Gana Kelavni Mandal.

Figure 14 Hospital Building

The building in this image is Sarvajanik Hospital in Gana. It is known as "Shrimati Savitaben Chimanbhai Patel Sarvajanik Hospital". The hospital has five beds capacity, dressing room, Pharmacy and Pathology lab. It is managed and maintained by "Arogya Mandal Gana". The doctor practicing in this hospital has experience of more than 40 years and studied MBBS.

1.4 SWOT Analysis of Ideal Village

Strength

- Better natural resources
- Availability of enough agriculture land.
- Good educational status of the villagers.
- Good road network
- Good banking facilities.

Weakness

- No cinema hall in village.
- No recreation centres other than gym.

Opportunities

- Use of modern technique in agriculture and develop new cropping patent
- Development of waste lands and another village land.
- Develop WI-FI network in the village.

Threats

- Decreasing agricultural land
- Decreasing village population due to foreign migration

1.5 Future prospects of Development of the Ideal Village

- It is very important to understand those problems which have been retarding the growth of the state and the measures to eliminate such problems. At the same time, they must also be able to discover the prospects of the development of the economy with the available resource base of the state.

- Taking into consideration of all these issues, an attempt has been made through this paper to point out the main problems of the rural development of rurban leading to industrialization and agricultural, to suggest appropriate measures to overcome these problems and to throw light on the future prospects of pace development of its economy.

- Modern technology products could be a good tool to introduce the rural population to the world around. It will open their eyes and encourage their children to get better education. They are starting to dream about a better life like people in the urban areas. And we should help them improve their lives—it's in the interest of the country as a whole.

- For future prospect, the village Gana can use more advanced technologies for agricultural prospect and for other requirements also.

So, they provide funding for the development of the village. The different builders of Anand city and nearby are taking interest in developing properties near Gana village. So, there are many societies in village. The Anand city is growing very fast so in nearby future Gana village will become developed and become part of Anand Nagarpalika.

1.6 Benefits of the visits of Ideal Village

The benefits of visiting village are given below,

- To know the strength and weakness of village.
- We see some different type of little requirements of village.
- We discussed the good and bad thing about village from village people.
- We saw all type of basic and primary amenities available.
- From this village we get the actual definition idea of developed village.

- We get idea about how to develop our village.
- We know about which basic amenities should provide in village.
- Know about development of village only use by government scheme.
- We visited Gana village, Anand district, by the visit of the village Gana, we got an idea about an ideal village.
- We had seen much kind of new technologies which can be used in village that are being used in the urban area. By this visit of this village, it has improved our communication skills and we knew how to interact with the different peoples.
    - To improvement allocated village
    - To understand allocated village condition.
- 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 a 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.
- After visiting the village, we came to know about the various facilities that can be provided in a village for Rurbanization 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 Gana 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 Gana has developed a lot during the year 2007 to 2016 we got a good knowledge related to rural development and general infrastructure facilities to be provided in a village.
- Gana can also be considered as bench mark for the development of other villages.
- We created gap analysis table so that we came to know about lacking facilities in our allocated village.

1.7 Civil Aspects Required in Ideal Village / Smart Village

There are two civil aspects required in the ideal village. The ideal village “Gana” does not have public library which should be there as it is necessary for any village so that people can read books and gain knowledge about different things.

- Civil engineering projects are increasingly complex and are associated with situations where robust decisions are required to be taken. These decisions are made in different stages of civil engineering projects.

- For example, decision making takes place during feasibility study stage prior to design, procurement, and construction stages in order to determine the viability of project undertaken by an investor.
- With the help of an interdisciplinary approach to problem-solving, however, many innovations are being made in an effort to bring practical, repeatable implementation to construction.
- All the works of the village development are carried by the grampanchyat are in their presence and efforts to make their village world class and people will visit their village for their well-known facilities which are provided by grampanchyat.
- The other main requirement in the ideal village is beautification of the lake. As the lake is the main attraction of the village, it should be taken care properly and its beautification should be done. All the villages nearby have done this work, but in this village, it is not done.
- This regulation states that the scope of work program in Ideal Village/Smart Village had seven criteria covering (1) public services, (2) economic empowerment, (3) health, (4) education, arts, and culture, (5) improvement human resource capacity, (6) poverty, and (7) legal information. These aspects were taken as guidelines in developing the proposed smart village model.
- Smart Village was one of concepts for the developed villages in India. This concept was developed by Viswanadham and Vedula in their book entitled “Design of Smart Village”. A smart village model followed a model from smart city as an effect of integrated technology changes to be implemented in the remote areas.

Chapter. 2 Literature Review

2.1 Introduction: Urban & Rural Village Concept

❖ Urban Area:

An urban area is the region surrounding a city. Most people of urban areas have non-agricultural jobs. Urban areas are very developed, meaning there is a density of human structures such as houses, commercial buildings, roads, bridges, and railways. "Urban area" can refer to towns, cities, and suburbs.

Urban area is the region surrounding a city. Most inhabitants of urban areas have nonagricultural jobs. Urban areas are very developed, meaning there is a density of human structures such as houses, commercial buildings, roads, bridges, and railways. "Urban area" can refer to towns, cities, and suburbs.

It is highly dependent on crop farming, animal enterprises, tree crops and related activities.

Figure 15 Urban Area

❖ Rural Area:

A rural area is an open swath of land that has few homes or other buildings, and not very many people. A rural areas population density is very low. Many people live in a city, or urban area. Their houses and businesses are located very close to one another.

Rural is noticeably agricultural, its settlement system consists of villages or homesteads Socially it signifies greater inter dependence among people, more deeply rooted community life and a slow-moving rhythm of life built around nature and natural phenomenon; and occupationally.

Rural areas may develop randomly based on natural vegetation and fauna available in a region, but urban settlements are proper, planned, built up according to a process called urbanization. Rural people have low living standards and they lack of basic physical amenities. An urban area or urban agglomeration is a human settlement with high population density and infrastructure of built environment. Urban areas are created through urbanization and are categorized by urban morphology as cities, towns, conurbations or suburbs.

Figure 16 Rural Area

2.2 Importance of Rural Development

To make basic amenities like good roads and drinking water accessible to people even in remote villages, The Ministry of Rural Development, Government of India has re-launched the scheme Provision of Urban Amenities in Rural Areas as a Central Government scheme during the remaining period of the eleventh five-year plan. Ministry of Rural Development, with support from Department of Economic Affairs and the Asian Development Bank (which provided the technical assistance), intends to implement the Provision of Urban Amenities in Rural Areas scheme under a Public Private Partnership between Local executive bodies like the Gram Panchayat(s) and private sector partners. The vision of the scheme in particular is providing dual benefits like rural infrastructure development coupled with economic re-generation activities; it is the first attempt of the government in this direction of delivering basic amenities and infrastructure through this model to people in remote rural areas. All the efforts are directed to obtain dual benefits, provide a different framework for the efficient implementation of rural infrastructure development schemes and benefit from the private sector efficiencies in the management of assets and delivery of services.

Rural development is important not only for the majority of the population residing in a rural area but the growth of rural activities is necessary to stimulate the speed of overall economic expansion of the nation. Rural development is pretended to be noticeable importance in the country today than in the olden days in the process of the evolution of the nation. It is a strategy trying to obtain improved rural creation and productivity, higher socio-economic equality, and ambition, stability in social and economic development.

The primitive task is to decrease the famine roughly about 70 percent of the rural population, implement sufficient and healthy food. Later, serve fair equipment of clothing and footwear, a clean environment and house, medical attention, recreational provision, education, transport, and communication.

2.3 Ancient Villages / Different Definition of: Rural Urban Villages

Rural areas are the opposite of urban areas. Rural areas, often called "the country," have low population density and large amounts of undeveloped land. Usually, the difference between a rural area and an urban area is clear. This is because improved technology has decreased the need for agricultural workers and partly because cities are offering greater economic opportunities.

In a rural are a, there are fewer people, and their homes and businesses are located far away from one another.Agriculture is the primary industry in most rural areas. Most people live or work on farms or ranches. Hamlets, villages, towns, and other small settlements are in or surrounded by rural areas.

A village is a small settlement usually found in a rural setting. It is generally larger than a "hamlet" but smaller than a town. This type of village organization is called a nucleated settlement. Some villages are linear settlements. They are not clustered around a central public space, but around a line.

In a rural are a, there are fewer people, and their homes and businesses are located far away from one another.

An urban area is the region surrounding a city. Most inhabitants of urban areas have non- agricultural jobs. The population density is quite high. Urban areas are very developed, meaning there is a density of human structures such as houses, commercial buildings, roads, bridges, and railways. “Urban area" can refer to towns, cities, and suburbs. An urban area includes the itself, as well as the surrounding areas. Many urban areas are called metropolitan areas, when two or more metropolitan areas grow until they combine, the result may be known as a megalopolis.

Rural areas are the opposite of urban areas. Rural areas, often called "the country," have low population density and large amounts of undeveloped land. Usually, the difference between a rural area and an urban area is clear. This is because improved technology has decreased the need for agricultural workers and partly because cities are offering greater economic opportunities.

2.4 Scenario: Rural / Urban village of India population Growth

	1991-2001	2001-2011	Difference
India	21.5%	17.6%	-3.9%
Rural	18.1%	12.2%	-5.9%
Urban	31.5%	31.8%	+0.3%

Table 1 Population Growth in India

Per Year	1,55,31,000
Per Month	12,73,033
Per Day	42,434
Per Hour	1,768
Per Day	29

Table 2 Rate of Increase in Indian Population

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

➢ Gujarat Population 2011

- Total population 60,439,692
- Total population of Gujarat forms 4.66 percent of India in 2011.
- Total population of male: - 31,491,260
- Total population of female: 28,948,432
- Total population growth in decade is 19.28%
- Out of total population of Gujarat, 42.60% people lives in urban region and rest in rural.

Description	Rural	Urban
Population	57.14	42.60
Total population	34,694,609	25,745,083
MALE population	17,799,159	13,692,101
Female population	16,895,450	12,052,982
Population growth	9.31%	36%
Sex ratio	949	880
Literacy	21,420,842	19,672,516
Average literacy	71.71%	86.31%

Table 3 Demographic Data of Gujarat

2.6 Rural Development Issues - Concerns – Measures

Rural Issues and Concerns are given below:

- Market unavailable
- Water problem
- Sewage system
- Lower education
- Poor Health services
- Migration to urban areas
- Lower living standards
- No transportation facility
- Less awareness
- Less income opportunity

Various Measures for Rural Development are given below:

- Sustainable development
- Higher living standards
- Enough basic physical amenities
- Sanitation facilities
- Higher education
- More job opportunities

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

❖ Environmental problem:

1. Poor sanitation: -

Because of the illiteracy and poverty of people in rural area, the do not know the importance of sanitation and hygiene. Such an ignorance causes environmental pollution leading to the break out of a number of a number of epidemics like cholera, typhoid etc....

2. Conversion of farm land to housing land: -

To provide shelter to the increased population in rural areas, more and more agricultural land are being utilized for housing purposes by rural peoples. This results in decreased per capita availability of cultivated land which ultimately induces over cultivation.

3. Lack of drainage: -

Lack of drainage facilities and open defection make the rural areas filthy and unhygienic which directly or indirectly help in spreading of a number of diseases.

4. Indiscriminate use of pesticides and fertilizers: -

To increase the crop productivity for providing food to increased population, the illiterate rural farmers used a number of pesticides and agrochemicals accumulate in water bodies and soil causing potential health hazards in humans and other aquatic and terrestrial living organisms (animal).

5. Salination, desertification and degradation of lands: -

The over cultivation in farm lands in rural area misuse of water for irrigation lead to salination, desertification and degradation of lands.

❖ Economic problems: -

- Poverty
- Infrastructure
- No road, No electricity, less water, etc.
- Education No school
- Technology
- Less awareness

❖ Social problems: -

- Family:
  - Marriages at lower age, Marriages between blood relatives
- Health
  - No medicals, lack of resource, illiteracy
- Gender gap
  - Women place in family, women education, employment

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

Facilities	Planning commission/UDPFI Norms	Required as per Norms
Education		
Anganwadi	Each village	1
Primary School	Each village	1
Secondary School	For 7,500 Population	1
Higher Secondary school	Per 15,000 Population	1
College	Per 125,000 Population	1
Tech. Training institute	Per 100,000 Population	1
Agriculture Research Centre	Per 100,000 Population	1
Medical Facility		
Govt./Panchayat Dispensary or sub PHC or health centre	Each Village	1
PHC & CHC	Per 20,000 Village	1
Child Welfare and Maternity Home	Per 10,000 Population	1
Hospital	Per 10,000 Population	1
Transportation		
Pucca Village Approach Road	Each Village	1
`Bus/Auto Stand Provision	All villages connected by PT (ST Bus or Auto)	1
Drinking Water		
Water facilities		1
Over Head Tank	1/3 For Demand	1
U/G Sump	2/3 For Demand	1
Public Latrines	Each Village	1
Cremation ground	For 20,000 Population	1

Table 4 Guidelines for village for provision of infrastructure

2.8 Other Projects / Schemes of Gujarat / Indian Government

In other projects for the development of the rural area is the Public Private Partnership. Public-Private-Partnership is a mode of implementing government programmer/ 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 in them. Essentially, the shift in emphasis is form delivering services directly, to service management and coordination. The roles and responsibilities of the partners may vary from sector to sector.

Swachh Bharat Mission (Gramin), which was known as Nirmal Bharat Abhiyan (NBA), is a Community-led sanitation program initiated by GOI and is being implemented in the State since 2004-05. It is program which is basically people-centred sanitation and also a demand-driven program. The pattern of fund sharing by GOI and State Government is in the ratio of 75:25 approximately. GOI launched an award-based Incentive Scheme "Nirmal Gram Puraskar" (NGP) in the October 2003, for Gram Panchyats, Blocks, Districts and States which are fully sanitized and open defecation free. The total number of awards received by Gujarat is 2283 till 2011 which makes it to third place in country in terms of Nirmal Gram Puraskar (NGP) received. Swachh Bharat Mission (G) envisages covering the entire community for saturated outcomes with a view to create Nirmal Gram Panchayats with following priorities

- Provision of Individual Household Latrine (IHHL) of both Below Poverty Line (BPL) families and Identified APL households within a gram panchayat.
- Gram Panchayat where all habitation has access to water to be taken up priority may be given to gram panchayats having functional piped water supply.
- Provision of Sanitation facilities in government schools and anganwadis in government buildings within these GPs.
- Solid and Liquid waste management for proposed and existing Nirmal Grams.
- Extensive capacity building of the stake holders like panchayat Raj Institutional (PRIs) village water and sanitation committees and field functionaries for sustainable sanitation.
- Appropriate convergence with MGNRegs with unskilled man days and skilled man days.

Objectives of the Swacchh Bharat Mission are as following:

- Improve quality of life in the rural areas.
- Accelerate sanitation coverage in rural areas to achieve the vision of Swachh Bharat by 2019.
- Motivate Communities and PRIs promoting sustainable sanitation facilities through awareness and health education.

- Cover the remaining schools not covered under SSA and Anganwadi centres in rural areas with proper sanitation facilities.
- Encourage cost effective and appropriate technologies for safe and sustainable sanitation.
- Develop community managed environmental sanitation systems focusing on SLWM for overall cleanliness in the rural areas.

❖ Other Schemes:

Sr. No.	Govt. Schemes	Description
1.	Pradhan Mantri Adarsh Gram Sadak Yojana (PMAGSY)	It focuses on integrated development of 100 villages with a 50 per cent population of SCs.
2.	Bharat Nirman Yojana	It was launched in 2005 for building infrastructure and basic amenities in rural areas. It comprises of six components- rural housing, irrigation, drinking water, rural roads, electrification and rural telephony.
3.	Indira Awas Yojana	It is one of the six components of Bharat Nirman Yojana. It was introduced in 1985-86. It aims to help built or upgrade the households of people living under BPL.
4.	Jawaharlal Nehru National Urban Renewal Mission (JNNURM)	It was launched on 3rd December, 2005. The main objective of this scheme was fast track development of cities across the country.

Table 5 Government Schemes

Chapter. 3 Smart Village concept Idea and its Visit

3.1 Introduction: Concepts, Definitions and 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 Adarsh Gram.

The basic concept of smart village is to collect community effort and strength of people from various streams and integrate it with information technology to provide benefits to the rural community.

Smart village access to sustainable energy services act as a catalyst for development Enabling the provision of good education and healthcare, access to clean water, sanitation And nutrition, the growth of productive enterprise to boost income, and security.

Making a village “smart” is evolving as a strategy to ease the problems generated by the urban population growth and speedy urbanization. Yet little hypothetical research has sparingly discussed the phenomenon. To close the gap in the literature about smart cities and in response to the increasing use of the concept, this paper proposes an agenda to understand the concept of smart cities. Based on the exploration of a wide and extensive array of literature from various disciplinary areas we identify eight critical factors of smart city initiatives: management and organization, technology, governance, policy context, people and communities, economy, built infrastructure, and natural environment.

The concept of smart village is defined as below,

- Strategic Planning
- Mobility
- Wi-fi
- E-transportation
- Technological resiliency
- Cyber defence
- Renewable energy

Villages are the food basket of the nation. Village Panchayat are the centers of grass root democracy. However, the holistic development of rural India is still under tremendous pressure owing to the declining farm output, increasing trend of distressed migration, absence of basic amenities and emerging problems of environmental pollution and conflicts.

To make the villages smart means to make the country self-reliant, stronger and secured. Some of the ways to make villages smart include offering basic facilities, education, employment generation activities, technology etc. The concept of the smart village is not constructed on the image of a city or a very developed village of some states or nations.

3.2 Vision-Goals, Standards and Performance Measurement Indicators

Sr. No.	Parameter	Benchmark
A	Transport	• Maximum travel time of 30 minutes in small & medium size cities and 45 minutes in metropolitan areas. • Continuous unobstructed footpath for 2 m wide on either side of all street with row 12 m more. • Dedicated and physically segregated bicycle tracks with width of 2 m or more, one in each direction, should be provided on all streets with carriage way larger than 10 m. • High quality and high frequency mass transport within 800 m (10-15-minute walking distance) of all residences in areas over 175 persons / hect. Of built area.
B	Spatial Planning	• 175 persons per hect. Along transit corridors • 95% of residences should have daily needs retail, parks, primary schools and recreational areas accessible within 400 m walking distance. • At least 20% of all residential units to be occupied by economically weaker sections in each Transit Oriented Development Zone within 800 m of Transit Stations. • At least 30% residential and 30 commercial/ institutional in every TOD Zone within 800 m of Transit Stations.
C	Water Supply	• 24 x 7 supply of water. • 100% household with direct water supply connections. • 135 litres of per capita supply of water. • 100% metering of water connections. • 100% efficiency in collection of water related charges.

D	Sewerage & Sanitation	• 100% households should have access to toilets. • 100% schools should have separate toilets for girls. • 100% households should be connected to the waste water network. • 100% efficiency in the collection and treatment of waste water. • 100% efficiency in the collection of sewerage network.
E	Solid management	• 100% households are covered by daily door-step. • 100% collection of municipal solid waste. • 100% segregation of waste at source, i.e., biodegradable and non-degradable waste 100% recycling of solid waste.
F	Storm storage	• 100% coverage of road network with storm water drainage network. • Aggregate number of incidents of water logging reported in a year must be zero. • 100% rainwater harvesting.
G	Electricity	• 100% households have electricity connection 24 x 7 supply of electricity. • 100% metering of electricity supply. • 100% recovery of cost. • Tariff slabs that work towards minimizing waste.
H	Telephone Connections	• 100% households have a telephone connection including mobile phones.
I	Wi-Fi connectivity	• 100% households have a Wi-Fi internet connection or internet in mobile phone.
J	Health care facilities	• Availability of telemedicine facilities to 100% residents. • 30 minutes emergency response time. • 1 dispensary for every 15,000 residents.

		• Nursing home, child, welfare and maternity. • Centre-23 to 30 beds per lakh population. • Intermediate Hospital (Category B) – 80 beds per lakh population. • Intermediate Hospital (Category A) – 200 beds per lakh population. • Multi-specialty Hospital – 200 beds per lakh population. • Specialty Hospital – 200 beds per lakh population. • General Hospital – 500 beds per lakh population.

Table 6 Benchmarks for smart cities

3.3 Technological Options

The technological options for the smart villages are given below:

- **Smart Mobility**

Smart mobility refers to using modes of the transportation alongside or even instead of owing a gas-powered vehicle. This can take on many different forms, including ride-sharing, car-sharing, public transportation, walking, biking and more. Smart mobility is a new and revolutionary way of thinking about how we get around – one that is cleaner, safer and more efficient. The concept of smart mobility includes a wide range of modes of transportation: kick scooters, bicycles, buses, light rail trains, subways, streetcars, taxis, autonomous vehicles, walking, etc. Smart mobility is built on the following principles:

Figure 17 Smart Mobility

Flexibility: - Multiple modes of transportation allow travellers to choose which ones work best for a given situation.

Efficiency: - The trip gets the traveller to their destination with minimal disruption and in as little time as possible

Integration: - The full route is planned door-to-door, regardless of which modes of transportation are used.

Clean Technology: - Transportation moves away from pollution-causing vehicles to zero-emission ones.

- **Smart Infrastructure**

Smart infrastructure utilizes innovative methods of design and implementation in various sectors of infrastructure. And also, in planning to create communities that operate at a higher level of relative sustainability than their traditional counterparts.

Figure 18 Smart Infrastructure

Smart Infrastructure intelligently connects energy systems, buildings and industries to adapt and evolve the way we live and work. We work together with customers and partners to create an ecosystem that intuitively responds to the needs of people and helps customers to better use resources.

- **Smart Public Services**

Smart city is a city that uses technology to provide services and solve city problems. A smart city does thing like improve transportation and accessibility, and give its citizens a voice. Though the term 'smart cities' is new, the idea isn't.

Figure 19 Smart Public Services

Cyber-physical systems have a key role in such a process, especially regarding information-intensive services. The development of cyber-physical systems for public services at the core of the public service ecosystem provides a strategic tool for service transformation that opens up a horizon for a major advance in value co-creation in the public domain.

- **Smart Energy**

Smart energy is the process of using devices for energy efficiency. It focuses on powerful, sustainable renewable energy sources that promote greater eco-friendliness while driving down costs. In today's era, smart energy proves increasingly important, with forward-thinking companies making smart energy systems a top priority. This increased investment into smart energy systems poses many benefits to consumers, the environment, and to energy providers at large.

Figure 20 Smart Energy

It has to be renewable. Renewable energy comes from non-depletable sources that won't run out. Solar energy has become one of the dominant focuses for those looking to harvest the power of renewable energy.

3.4 Road Map and Safe Guards

- The visual perception of Indian villages has not changed much though certain corrective policy measures and infrastructural reforms have taken place.
- Governments need to transform our villages into smart habitats by generating lucrative economic opportunities and addressing the basic challenges rural areas are facing for decades.
- A combination of factors like agriculture becoming less remunerative, poor civil services, defunct infrastructure, and unavailability of good career opportunities has accelerated the migration from rural areas to cities.
- Another method to engage the citizens is by granting access to high-speed Internet and building Wi-Fi wireless infrastructure citywide.
- One goal of engaging the citizens is to build trust and make them part of the solution.
- The policy needs to define the roles, responsibilities, strategies, and objectives of the smart cities.
- Open data through the use of mobile applications is one way to establish such an engagement- mobility is a gateway to building a civic engagement, as it allows the public to connect to the city's infrastructure to perform services whenever they want from wherever they are.
- The first step in establishing a road map for a smart city is to know why there is a need fora smart city initiative.
- This can be done by studying the city's demographics, including the residents who are the principal stakeholders in the city.
- GIS is an essential economic development tool that many cities use for planning, analyses, and building lively communities that attract businesses and residents.

3.5 The second step in establishing a smart city Issues and Challenges

❖ Smart cities face challenges:

- Technology challenges with coverage and capacity.
- Digital security.
- Legislation and policies.
- Lack of confidence or reluctance shown by citizens (lack of clarity around benefits).
- Funding and business models.
- Interoperability.
- Existing infrastructure for energy, water and transportation systems.

The Smart Cities Mission requires smart people who actively participate in governance and reforms. Citizen involvement is much more than a ceremonial participation in governance.

Smart people involve themselves in the definition of the Smart City, decisions on deploying Smart Solutions, implementing reforms, doing more with less and oversight during implementing and designing post-project structures in order to make the Smart City developments sustainable.

Although the number of developers and innovators tackling Smart City innovations is increasing, there still remains a series of problems all developers face at some point or another in their solutions.

- **Inconsistent network connectivity:**

➢ For the smart management of a municipality, several sensors, cameras, and actuators are installed everywhere.

➢ These sensors gather and send large volumes of data in real time.

➢ Analysis and processing of the collected data should happen almost instantaneously for efficient management of city operations.

➢ And for instant processing, high-speed Internet connectivity is mandatory.

- **Lack of experienced professional:**

➢ Another most-pressing challenge for smart cities is the lack of skilled professionals.

➢ For preparing a strategy to achieve smart city project success, identifying areas for implementation of technologies, and operating these tools, tech experts are required.

- **Cyber security risks:**

➢ Though this data help in providing efficiency at municipality functions, it presents serious security risks that can't be ignored.

➢ Data from parking lots, CCTV cameras, EV charging stations, and GPS systems contains confidential information of citizens.

3.6 Smart Infrastructure- Intelligent Traffic Management

The next generation mobility workforce will undoubtedly face challenges that currently cannot be conceived as the transportation industry moves toward an entirely new landscape of autonomous and connected vehicles, smart infrastructure, big data, artificial intelligence, IoT, emerging modes, and ever-evolving technologies that change the way we do work. With these changes come shifts (often dramatic) in required skills and abilities for existing occupations and new jobs with work functions and requirements that did not previously exist. Science, Technology, Engineering, and Math (STEM) competencies will be required for all workers in this new era, whether in STEM fields or not.

Effective communication, teamwork, and leadership skills become “core” rather than “soft” skillsets. Next generation workers will need to continuously adapt and learn new skills in order to effectively integrate transformative technologies. And, workers must understand and assess impacts of technologies on people and issues regarding data including privacy, security, and ethics. They must make decisions regarding the best way forward for their company or organization to meet the demands of the communities they serve.

3.7 Cyber Security or any other concept as per the (ANNEXURE 1)

Cyber security in the context of Smart Cities is a hot topic. The objective of Smart Cities is to optimize the city in a dynamic way to offer a better quality of life to the citizens through the application of information and communication technology (ICT).

The range of areas where cities can become smarter is extensive: it is an evolution of "Connected Cities" with the prevalence of data exchange at a larger scale.

The benefits of Information and Computing Technologies (ICT) in a Smart City and of the Internet of Things are tremendous. Smart energy meters, security devices, smart appliances for health and domestic life: these and more offer unprecedented conveniences and improved quality of life.

City infrastructures and services are changing with new interconnected systems for monitoring, control and automation. These may include water and sanitation to emergency responders and disaster recovery.In the Southeast, air conditioners are almost crucial pieces of equipment for home comfort.

However, it can be difficult to find the right air conditioner for your home, one that will provide enough cool air in the summer to cool your home without driving your energy costs through the roof.

Cyber security is the protection of internet-connected systems, including hardware, software and data, from unethical use in a computing context, security comprises cyber security and physical security - both are used by enterprises to protect against unauthorized access to data centers and other computerized systems.

- **Methodology**

Several paradigms and categorical structures may be applied in analysing the benefits and detriments of this data environment. An applicable paradigm used for this analysis is that of IBM that the Smart City, its components and its citizens are

- Instrumented
- Interconnected
- Intelligent.

3.8 Retrofitting-Redevelopment-Greenfield Development District Cooling

In the Southeast, air conditioners are almost crucial pieces of equipment for home comfort. However, it can be difficult to find the right air conditioner for your home, one that will provide enough cool air in the summer to cool your home without driving your energy costs through the roof. We can help! At Hammond Services, we can help you choose the perfect air conditioner for your home, install it professionally, and even maintain/repair it in the years ahead.Energy integration is steadily fuelling ahead into the buildings sector, where the focus lies in looking over the usage of native flora, reducing the need for landscaping water, utilizing lower/energy green materials, and carrying out appropriate orientation of business facades

3.9 Strategic Options for Fast Development

The strategic components of area-based development in the Smart Cities Mission are city improvement (retrofitting), city renewal (redevelopment) and city extension (Greenfield development) plus a Pan-city initiative in which Smart Solutions are applied covering larger parts of the city. Below are given the Deion's of the three models of Area-based smart city development:

Retrofitting will introduce planning in an existing built-up area to achieve smart city objectives, along with other objectives, to make the existing area more efficient and liveable. In retrofitting, an area consisting of more than 500 acres will be identified by the city in consultation with citizens. Depending on the existing level 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.

Redevelopment will affect a replacement of the existing built-up environment and enable co-creation of a new layout with enhanced infrastructure using mixed land use and increased density. Redevelopment envisages an area of more than 50 acres, identified by Urban Local Bodies (ULBs) in consultation with citizens. For instance, a new layout plan of the identified area will be prepared with mixed land-use, higher FSI and high ground coverage. Two examples of the redevelopment model are the Saifee Burhani Upliftment Project in Mumbai (also called the Bhendi Bazaar Project) and the redevelopment of East Kidwai Nagar in New Delhi being undertaken by the National Building Construction Corporation.

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. One well known example is the GIFT City in Gujarat. 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).

Pan-city development envisages application of selected Smart Solutions to the existing city-wide infrastructure. Application of Smart Solutions will involve the use of technology, information and data to make infrastructure and services better. For example, applying Smart Solutions in the transport sector (intelligent traffic management system) and reducing average commute time or cost of citizens will have positive effects on productivity and quality of life of citizens. Another example can be waste water recycling and smart metering which can make a huge contribution to better water management in the city.

The smart city proposal of each shortlisted city is expected to encapsulate either a retrofitting or redevelopment or greenfield development model, or a mix thereof and a Pan-city feature with Smart Solution(s). It is important to note that pan-city is an additional feature to be provided. Since smart city is taking a compact area approach, it is necessary that all the city residents feel there is something in it for them also. Therefore, the additional requirement of some (at least one) city-wide smart solution has been put in the scheme to make it inclusive.

For North Eastern and Himalayan States, the area proposed to be developed will be one-half of what is prescribed for any of the alternative models - retrofitting, redevelopment or greenfield development.

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

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

To achieve the target of cleanliness, the technologies to treat the waste material should also be developed along with creating awareness. There are many technologies that are used to treat waste materials. They are usually very costly, very complex to be understood and viable only for large size units. At the same time, indigenous technologies are low-cost capital and easy to use and they can also be used by different size units. The objective of the workshop was to disseminate indigenous technologies of water, wastewater and solid waste treatment developed by the Bhabha Atomic Research Centre under "Swachh Bharat Abhiyan" and to bridge gap between the research at the research centres and the practical application of the technologies.

- The problem of water scarcity in urban area of developing countries is a major concern. It is estimated that by 2050, half of India's population will be living in urban areas and will face acute water problems.
- In India, it ranges from 16 to 300 liters/day depending on the locality and the economic strata.
- Chennai in 2005 faces severe drought so large amount of underground water extracted to cope up their urban water demand so water table fall to 8 to 10 mt.
- The prevailing water stress in many developing cities is not only due to source limitations but other factor such as poor distribution efficiency through city network and inequalities in service provision between the rich and the poor.
- Water availability, management and wastewater disposal are three major issues related to water supply in the urban settlement.
- One of the major challenges for the government is to elevate India to the international level of urban sanitation that is found in developed counties.
- As a step towards this, India along with other member states of the UN committed to the new global goals for sustainable development, which included target to ensure everyone everywhere, has access to basic toilets by 2030.
- But for this to be achieved, India must first concentrate on establishing the infrastructure Needed to set up the required number of toilets, refurbish and build efficient sewage networks.
- It must also ramp up the waste treatment facilities so that water bodies are not polluted by effluent discharge.

❖ **Environment Friendly Plasma Technologies:**

Solid waste dumping sites or landfill sites need more amount of land which is not available in urban areas. Incineration of solid waste pollutes the environment if the incinerators are not designed or operated properly. Thermal Plasma Technology is ideally suited for waste treatment.

By plasma technology Hazardous & toxic compounds are broken down to elemental constituents at high temperatures; Inorganic materials are converted to Vitrified Mass; and Organic materials are Pyrolyzed or Gasifier, converted to flue gases (H2 & CO) & Lower hydrocarbon gases when operated at low temperature (500 – 600OC). Disposal of carcass is also being thought of using plasma pyrolysis.

3.11 Initiatives in village development by local self-government

In the past "government as provider" approach, the priorities were to secure budget allocations and develop projects. The Housing Policy and the NCU statement implicitly give higher priority to two other requirements: first, the reform of policies and regulations that now inhibit development initiatives by the people; and second, more efficient resource management and the building of institutional capacity. Resource Management and Institutional Development. As discussed in Section 5, India's urban institutions do not have the capacity to provide adequate services at present, let alone address the requirements of accelerated urban growth in the future. Proposals relate to three types of institutions.

3.12 Smart Initiatives by District Municipal Corporation

Urban India faces an enormous challenge: managing its gigantic load of solid waste. It is not just a public health issue, but also turning out to be a serious law and order problem as people resort to violent methods to protest waste being dumped in their backyard.

- Publicize and propagate the scheme in the district.
- Encourage Gram Panchayat for taking part in the competition.
- Give in principle/administrative approval to works under Smart Village.
- Review the physical and financial achievements of the works every month.
- Co-ordinate with schemes of other Departments in the village.
- Guide the Gram Panchayat and help it achieve the goals of Smart Village.
- Submit progress report periodically to state level.
- Prepare smart village wise annual report and submit at the state level.
- The application of a wide range of electronic and digital technologies to communities and cities.
- The use of ICT to transform life and working environments within the region.
- The embedding of such Information and Communications Technologies (ICTs) in government systems.

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

Renew Power, under its CSR initiative "Lighting Lives" in rural India is working on its commitment to ensure the fruits of development reach the most marginalised. The concept of SVARG (Smart Village Adopted by Renew Group) was developed as a tool for a "Bottom-up approach" towards development ensuring energy security as the driver for development. Under SVARG, Renew Power decided to adopt a village from one of the most prosperous yet underdeveloped states - Uttar Pradesh, where approximately 30% of the people live below poverty line. Various government reports indicate that around 99% of the villages in UP are electrified, of which only 60% of the households have access to electricity, with 3 to 4 households receiving electricity for less than 12 hours a day.

One such village is Paniyara for whose inhabitants, access to electricity is a basic need. Availability of electricity and enhanced energy security would go a long way in transforming the lives of its residents - by improving education, catalysing women empowerment, creating livelihoods opportunities for youth among other benefits, Renew Power adopted and developed Paniyara over a period of 3 years as a "SMART Village" in 2016. Paniyara village is a medium - sized village, located in Arajiline block of Varanasi district. According to the 2011 population census, it had population of 1921. The major occupation there is agriculture followed by stray economic activities such as owing petty shops, with some inhabitants also working as labourers.

- **Key highlights of the CSR programme:**

- Establishment of Community-based solar micro-grids; providing electricity to households, government schools and Anganwadi centres.
- Establishment of "Renew Edu hub" – an education centre with a career building model for children and youth; it imparts education using technology and promotes digital literacy.
- Promotion of rural sports talent under Renew Scholarship for Exceptional Talent (ReSET).
- Access to safe drinking water Ro units in schools and Aanganwadi centres.
- Training and information centre for farmers.

- **Impacts of SVARG:**

In 2016, two community solar mini-grid of 11Kw were installed in the village, through which 50 households were electrified. In 2017, Renew Power installed three community solar grids in the village, through which 115 households belonging to economically weaker section were electrified. By end of August 2017, Renew Power supported the installation of community solar grids of total capacity 25 kW in Paniyara, ensuring 100% access to electricity covering 165 households, two government schools and 2 Anganwadi centres. After the installation of these grids, the beneficiary households are getting regular electricity supply. This has reduced the household expenditure on purchase of kerosene. Children have additional 1-2 hours of study time at home. Local petty shops on an average have additional 1-2 hours of business hours.

With the installation of street lights, there is an increased sense of security among women and adolescent girls. With the electrification of local schools, one can see an increase in the attendance levels in the classes. As per the school authorities, the attendance in the schools has increased by 15% in a year. Besides ensuring access to electricity in schools, basic infrastructure has also been developed in terms of improved access to drinking water and sanitation. This has led to a decline in dropout rate by 5% in the academic year 2018 as compared to 2017.

As a result of the CSR intervention of Renew Power, the Government Primary School has been upgraded to "Model English Medium School" in the academic year 2018. With the establishment of Edu hub in 2018, children and youth of Paniyara and neighbouring villages have access to a basic computer course. Since its launch in June 2018, 90 children have completed this course. Buoyed by this positive response from the children, the course has now been extended to youth and adolescent girls. The programme also focuses on capacity building of local farmers; by promoting effective agriculture management practices.

Regular training sessions are organised in partnership with Indian Vegetable Research Institute, Department of Agriculture, Government of Uttar Pradesh. Around 700 farmers from Paniyara and surrounding villages have been part of these sessions.

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

- Smart villages can be stewards of the environment aided by technologies to monitor key environmental indicators such as forest health, water quality, soil conditions and changes to the landscape.
- They can also reduce pressure on deforestation using efficient cook stoves to decrease the need for traditional biomass energy sources such as charcoal and wood a key driver of unsustainable forest use.
- Smart villages can host community-run recycling facilities ranging from those equipped to recycle wastewater and organic waste from ago-processing, to next-generation facilities for the recycling of e-waste, including energy-storage and generation technologies such as batteries and solar panels.
- Depending on geographical endowments, some smart villages will be able to operate as regional ecotourism hubs, an activity that can improve the welfare and connectivity of village.
- Economic Component: This component will include local administration and economic factors. It will cover governance models, bandwidth, mobility, cloud computing, entrepreneurship etc.
- Environmental Component: This component will address the issues related to resources and infrastructures available at local level. It may cover cleaner technologies, public and alternative transportation, green spaces, smart growth, climate change etc.
- Social Component: This component may address issues related to community life, participatory democracy, social innovation, proximity services etc.

Chapter. 4 Allocated village Pamol

4.1 Introduction

4.1.1 Introduction about Pamol village

- Pamol is a village located in Borsad Taluka of Anand district. Village is located 12 Km away from Anand. Total area of village is 648.3 hectares. Total population of village is 4804 among them 2510 are male and 2294 are female as per census 2011. Total households in Pamol village are 940 as per census. Main occupation of the Pamol village is Farming.
- According to Census 2011 information the location code or village code of Pamol village is 388560.
- Pamol village is located in Borsad of Anand district in Gujarat, India.
- It is situated 8km away from sub-district headquarter Borsad and 12km away from district headquarter Anand. As per 2009 stats, Pamol village is also a gram Panchayat.
- The total geographical area of village is 648.3 hectares. Pamol has a total population of 4804 peoples.
- There are about 940 houses in Pamol village. Anand is nearest town to Pamol which is approximately 12km away.
- Pamol is a large village located in Borsad of Anand district, Gujarat with 940 families residing. The Pamol village has population of 4804 of which 2510 are males while 2294 are females as per Population Census 2011.
- In Pamol village population of children with age 0-6 is 558 which makes up 9.12 % of total population of village. Average Sex Ratio of Pamol village is 991 which is higher than Gujarat state average of 919. Child Sex Ratio for the Pamol as per census is 1028, higher than Gujarat average of 890.
- Pamol village has lower literacy rate compared to Gujarat. In 2011, literacy rate of Pamol village was 70.05% compared to 78.03 % of Gujarat. In Pamol Male literacy stands at 74.23 % while female literacy rate was 65.80 %.

4.1.2 Need of study

- For purpose of data collection. Data regarding the demographic, geographic, social, economic, educational etc.
- To know the current development going on in village.
- To know the various benefits to villagers though various government schemes in village.
- Ultimately after visit of ideal and smart village, this village gives the actual scenario of rural area.
- To know which development of village is not available in the village.

4.1.3 Study Area

- Based on survey we tried to give design of basic facilities to fulfil their needs. By providing this basic facility to village for reduce urban city pressure and decrease migration rate, which is ultimate aim of Vishwakarma Yojana.
- In Pamol village some physical and social facilities are better like underground drainage, cement concrete road, primary school, secondary school.
- In the village lack of basic facilities like overhead tank, bus stop, general market, ATMs.
- We are given attractive of public library, bank and post office using smart technology for Pamol village. We are tried to give batter design to use maximum natural resources and provide all the basic needs.
- For development Pamol village we are try to provide required facilities like vegetable market as a physical infrastructure facility, as a social infrastructure facility, public library as a socio-culture infrastructure, liquid waste management as a sustainable infrastructure.
- Vishwakarma Yojana is a scheme to provide "design to delivery" solution for development of Rurban area. The development work of the village which is to be undertaken in particular includes:

1. Physical Infrastructure facilities like

- Water and Flood water Network
- Drainage and Solid waste management
- Road and Telecommunication
- Electricity & other

2. Social Infrastructure like

- Education, Public Library
- Health
- Recreational Facilities
- Community hall & Others

3. Renewable Energy

- Rain water harvesting
- Bio gas plant & Other Sustainable Development

The engineering college students study the area of village and make recommendation on the application of technology to achieve integrated and comprehensive development of allocated village as ideal, through project work and management.

4.1.4 Objectives of the study

The main objectives of the study are as following: -

- The main object of the study is to identify the village in all aspects.
- To study the present scenario of village, and involvement of villagers, Sarpanch, governments in development of village.
- To understand the future scope of development. Because ultimately our goal is to provide various facilities which required in the village.
- To study how to improve a drainage facility of rural areas.
- To study the existing growth, characteristics and development of villages.
- To provide basic amenities in the village, like transportation, sanitation, educational, health care facilities.

4.1.5 Scope of the Study

- The information and data from visit will help us to develop the methodology for improvement in village. The primary data collected through survey will give the level of services available in village and its requirements for improvement.
- The need of development of the villages and speed of education in the villages were understood and to achieve this community, development programmed was started.
- Based on these studies the requirement can be known and the further plan based on this requirement can be visualize for compacted development of the village.
- India is agriculture country and poverty can be removed through improvement in agriculture.
- It is very essential to develop village because India's development depends upon the progress of the villages.
- The study will focus the development trend, intensity of growth of the village, and find out the problems related to the Socio- Cultural or physical development to the area, social infrastructure services, and the administrative system of the village.
- Project proposal and sustainability as pectate' considering in micro level; it son guide the way. Rural sociology can help to organize the disorganized Indian in detail.
- The study of village gives the Is a son where there Is need of sustainable facilities like infrastructure facilities, community hall, primary health center.
- As it is post office, general market, solar energy source, recreation center, public garden, pure drinking water, road network.
- High secondary schools, farmer help center, electricity, sanitation, library, Aganwadi, overhead tank, police station, fire station, etc. are available or not.
- The information and data from visit will help us to develop the methodology for improvement in village. The primary data collected through survey will give the level of services available in village and its requirements for improvement.

4.1.6 Methodology Frame Work for development of Pamol

We visited the village and collected the required data from the village authority and villagers. We asked about the problems faced by the villagers related to infrastructure services. And from that data we have decided to provide designs of some basic facilities required in village for its development.

- Pamol village have some basic amenities like:
  - Cement concrete road
  - Public Health Center
  - Public toilet
  - Primary School
  - Public Garden
  - Community Hall
  - Aanganvadi

4.1.7 Available Methodology for development of village related to Civil

The available methodology for the development of the village is to provide design to village authorities and local government. We will provide AutoCAD designs of required facilities, estimated cost, etc., so that government can plan for the work.

4.2 Study Area Profile

4.2.1 Study Area Location with brief history land use details

- Name of Village: - Pamol
- Name of Taluka: - Borsad
- Name of District: - Anand
- Population range: - 4804 (As per census 2011)

- The village Pamol is located 12 km away from Anand city.
- Village is spread over an area of 648.3 hectare. Village peoples are mainly engaged with agricultural, business, jobs, and labour works.
- Major crops grown in village tobacco, banana, vegetable. 558 of population are under 6-year age. Literacy rate is about 42.5%.
- Total 4804 population residing in village as per census 2011.
- Pamol is a small village in Borsad taluka of Anand district in the Indian state of Gujarat. It is located around 6 km north east from Borsad.

- Pamol is surrounded by Petlad Taluka towards west , Anklav Taluka towards South , Borsad Taluka towards west , Sojitra Taluka towards west.
- Anand, Petlad, Vadodara, Nadiad are the nearby Cities to Pamol.
- Demographics of Pamol Gujarati is the Local Language here.
- It is surrounded by the fertile Charotar region which largely produces tobacco, Bananas, rice, cotton, lady finger, tomato, potato, and other agricultural crops.
- Patel owns the majority of business which is basically farming and farming products. Other major communities are Thakor,Brahmins, Chavda,Vankars, Maheshwari, Muslims and Christians.

4.2.2 Base Location map, Land Map, Gram Tal Map

Figure 21 Pamol Village Base Map

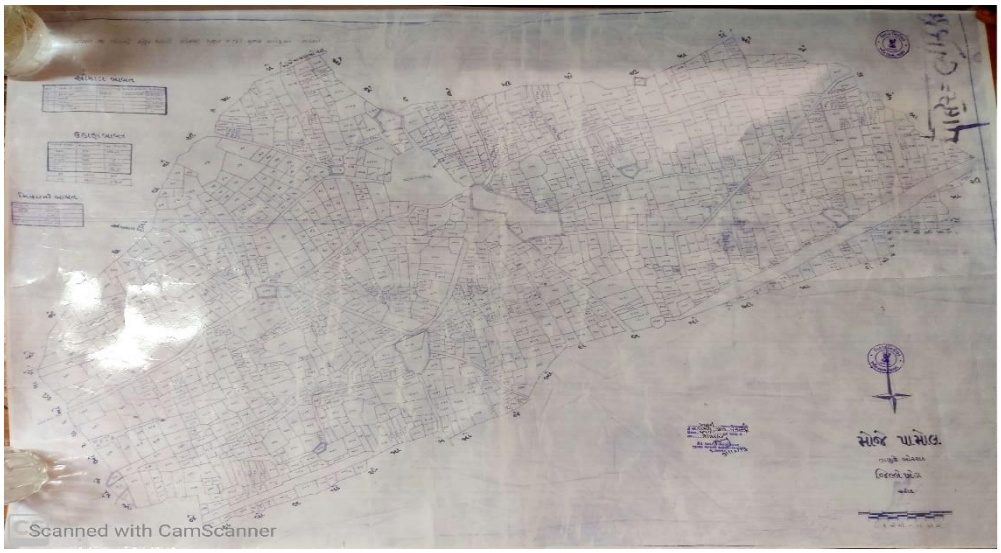


Figure 22 Gram Tal Map

When we went to village for the first time of village visit, we meet village Sarpanch and Talati and took the detail of village development and other details and map of village from the sarpanch which is as above.

4.2.3 Physical and Demographical Growth

Main Source of Drinking Water	1. Tap water 2. Bore Well 3. Tube Well 4. Water Tank Overhead Tank : 1. Capacity: - 50,000 lit 2. Capacity: - 1,00,000lit
Drainage System	1. Closed drainages are provided in the village (Pucca)
Road Network	1. All roads are in good conditions. 2. Main approach road is black topped road. 3. Internal streets roads are C.C roads.
Transportation Facility	1. Nearest railway station in village. 2. Nearest bus station in village (Main Road). 3. Local transportation is available in village.
Sanitation Facility	1. Public toilet is provided. 2. Tractors are available for waste disposal. 3. Dust bins at public places
Electricity Distribution	1. GEB 24 hrs. Power supply. 2. Road/ streets are provided with LED lighting. 3. All government buildings are fully facilitated with good lighting.
Housing conditions	1. 85% of the houses are Pucca. 2. All houses are consist of lighting, good ventilation and good sanitation with toilets.

Table 7 Physical growth

Sr. No	Census	Population	Male	Female	Total Households
1.	2001	-	-	-	-
2.	2011	4804	2510	2294	940

Table 8 Demographic Growth of Pamol Village

4.2.4 Economic generation profile / Banks

About the economic profile of this village, many villagers work in agricultural sector or labour work. The village has good electrification system which is distributed 24 x 7 for the domestic use and 8 hours for agricultural use. Village has good drainage system installed in 1/4th area of village.

4.2.5 Actual Problem faced by villagers and smart solution

Actual problems faced by villagers are no recreational facilities, no garden, there is no lake beautification done, etc. The smart solution for their problem is that, we can re-design existing primary school which is in bad condition but in large area. We can re-design school in which we can provide public garden and public library.

4.2.6 Social scenario – preservation of traditions, festivals, cuisine

In our allocated village i.e., Pamol village traditions are properly preserved. All the festivals are celebrated according to actual traditions. Even today in many houses in this village people prefer to eat only bajra rotla with milk. Many elders of this always wear lengha and jabbha.

4.2.7 Migration Reasons / Trends

In our allocated village “Pamol”, many of the villagers have migrated to different cities. They have migrated due to lack of basic facilities and less opportunities to earn good income. Most of the villagers have migrated to Borsad, Anand and Ahmedabad.

4.3 Data Collection

4.3.1 Describe methods for data collection

- Self-survey of the village.
- Interaction with the villagers.
- Techno economic survey.
- Physical survey of the village.
- Census 2011 reports and other reports published by different Ministries of the Government.
- Journals, Magazines and periodicals.
- Statement of villagers.
- Google information.
- Published reports of Central and State Governments and local bodies.

4.3.2 Primary details of survey

Pamol is a village located in Borsad Taluka of Anand district. Village is located 12 Km away from Anand. Total area of village is 648.3 hectares. Total population of village is 4804 among them 2510 are male and 2294 are female as per census 2011. Total households in Pamol village are 640 as per census. Main occupation of the Pamol village peoples is Farming.

4.3.3 Average size of the house – geo-tagging of house

Average size of house in the village is 1050 sq ft.

Most of the houses in the Pamol village is residential house and some of the are Pucca house 80% pucca & 20% Kutchha house.

4.3.4 Number of human beings in one house

The average number of human beings in one house are five members.

4.3.5 Material available locally in the village and material out sourced by the villagers

The construction of the houses was made of cement, sand, bricks and concrete. In this village kutcha houses are lesser than pucca house.

The locally available material is red bricks as there is brick manufacturing unit near the village. Other materials like aggregates, cement, reinforcement bars, etc. are to be brought from nearest city for the construction.

4.3.6 Geographical Detail

Sr. No.	Description	Information/ Detail
1.	Area of village (Approx.).	648.3 hector.
2.	Forest area.	0 hector.
3.	Agricultural area.	578 hector.
4.	Residential area.	17.55 hector.
5.	Distance to the nearest railway station.	8 km
6.	Name of the nearest town.	Vasad
7.	Distance to the nearest bus station.	In Village

Table 9 Geographical Detail

4.3.7 Demographical Detail – Caste wise Population Det326ails / which ID proof using by villagers

The ID proof used by most of the villagers are Aadhar Card and Voter's ID.

4.3.8 Occupational Detail – Occupation wise details / Majority business

Daily wages – 10% In Pamol village out of total population, 1782 were engaged in work activities.

75.11 % of workers describe their work as Main Work while 24.89 % were involved in Marginal activity providing livelihood for less than 6 months out of 1782 workers engaged in Main Work, 499 were cultivators while 812 was Agricultural laborer.

4.3.9 Agricultural Details / Organic Farming / Fishery

80% village is depended on agriculture as main source as income. Wheat and tobacco are main agricultural products produced in the village.

4.3.10 Physical Infrastructure Facilities – Manufacturing HUB / Warehouses

Wheat, Tobacco and milk are the main manufacturing products of the village.

In Pamol village 578 hector agricultural land is available for farming and bore well and piped water is used for irrigation purpose.

A Pamol village person mostly depends on agriculture product like Tobacco, Banana, Wheat, Vegetables, etc.

4.3.11 Tourism development available in the village for attracting the tourists

No tourism in this village.

4.4 Infrastructure Details

4.4.1 Drinking Water / Water Management Facilities

For drinking water purpose 1 Overhead Water tank and water distribution line is provided in village. Some of the people also use handpump for water purpose.

Figure 24 Drinking Water

Figure 23 Water Management Facilities

4.4.2 Drainage Network / Sanitation Facilities

In village drainage system work is going on. 1/4th village has got proper drainage facilities and remaining village will get it soon.

In village there is working efficiently closed drainage system is provided with maintenance repair.

The undergoing development of the public toilet in the Pamol village and house to house toilets are there in the village.

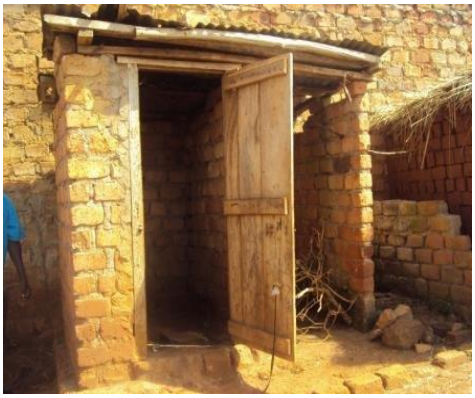


Figure 25 Sanitation Facilities

4.4.3 Transportation & Road Network

For transport network, bus stand is available in the village. Most of the villagers are depended on Rickshaws and private vehicles for transportation. Approach road of the village is Bitumen Road.

Main road of the village concrete road. Internal streets of the village are either of R.C.C. or paver blocks.

Figure 26 Road Network

4.4.4 Housing Conditions

There are 80% pucca houses in the village and 20% kuccha houses in the village.

Figure 27 Kaccha House

Figure 28 Pucca House

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

- **Health Facility**

The village has private clinics for the medical needs and they can also go to Borsad for health facilities. In our allocated village there is no Public Health Center.

- **Education Facility**

For education purpose, Primary School, Anganwadi and private schools are available. But government primary school is not in well condition and needs to be reconstructed.

Figure 29 Pamol Government School

- **Community Hall**

Our allocated village has one community hall but it is in very bad condition. It needs to be reconstructed at another place as using existing community hall is like putting life of village in danger.

Figure 30 Community Hall

- **Library**

There is no library in the village.

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

The public buildings such as Anganwadi and milk co – operative society building are in good condition. The village roads also need maintenance. But in one area of village anganwadi is required so new construction of anganwadi needed.

4.4.7 Technology Mobile / Wi-Fi / Internet Usage Details

In our allocated village most of people have smart phones. But village does not have Wi-Fi. Villagers are depended on the mobile data service providers for the internet.

4.4.8 Sports Activity as Gram Panchayat

There is no any sports activity as Gram Panchayat.

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

Public spaces in small municipalities have been crucial to the functioning of the community, their social, historically, and also economic life.

There is no availability of any socio-cultural facility like public library, public garden, park, etc.

4.4.10 Other Facilities

No facilities are there in village other than specified.

4.5 Existing Institutions like – Village Administration – Detail Profile

4.5.1 Bachat Mandali

Usually, villagers use Indian Post Savings account for bachat purpose. In the village people are not trusted and not satisfied to deposit money to bank or any other Bachat Mandali. And some people of villagers are use government bank like, Bank Of India for saving of money.

Figure 31 Bank Pamol Village

4.5.2 Dudh Mandali

The milk producers of the village with the support of the milk union form a village dairy cooperative society. The milk producers become members by buying a minimum of one share of the society and paying an entrance fee as per the bye-laws.

There are many villagers in the village who are depended on milk production for their income. So, there is a "Dudh Utpadak Sahakari Mandali Lt." i.e., "Milk co – operative Society limited" for the purpose of milk collection and distribution. People having cows and buffalos, come here with the milk and sell the milk to the society two times a day. And the people who want to buy milk, they can buy it from distribution counter in the society building. The milk is also sent to Amul Dairy.

Figure 32 Milk co-operative Society limited

4.5.3 Mahila Forum

There is no mahila forum in the village. We have discussed with the sarpanch regarding it and they are positive to form such a forum.

Women Forum has few socioeconomic and political objectives such as;

- To form organized groups of women who are employed in the informal or unorganized sector
- To build and improve the entrepreneurial skills of women through credit, training and extension services
- To identify the women involved in working in the informal sector and provide aid
- To mobilize credit and working women for joint action demanding their political and social rights

4.5.4 Plantation for Air Pollution

As there is no city or town near by the village and village is surrounded by the farms there is very lesser air pollution in the village.

4.5.5 Rain Water Harvesting – Waste water recycling

There is no plant for waste water recycling and also there is no arrangement for the rain water harvesting in the village. We are planning to provide design for the rain water harvesting in our allocated village.

4.5.6 Agricultural Development

Agriculture is the science, art and practice of cultivating plants and livestock. Agriculture was the key development in the rise of sedentary human civilization, whereby farming of domesticated species created food surpluses that enabled people to live in cities.

Figure 33 Agricultural Farming Technique

Most of the villagers in this village are depended upon farming for their income. The most common way used for agriculture in this village is irrigation by borewell. Even in this era of tractors, many people in village uses ox – plough for farming purpose.

4.5.7 Any Other

No other institutions are there in the village.

Chapter. 5 Technical Options with Case Studies

5.1 Concept (Civil)

5.1.1 Advance Sustainable construction techniques / Practices and Quantity Surveying

1) Modular Construction Techniques to Eliminate Waste

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

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

Figure 34 Modular Construction Techniques

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

2) Use of Green Building Materials

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

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

Through the use of sustainable building materials, new structures will have a lower carbon footprint and better energy efficiency. The amount of waste that ends up in landfills is reduced if the building needs to be renovated/demolished in the future.

3) Zero Energy Construction

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

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

- Using renewable energy sources (such as solar and wind) to power the building
- Efficient air ventilation systems that eliminate pollutants from the surrounding air
- Better insulation materials that minimise leaking air and noise pollution
- Using energy efficient indoor appliances

Figure 35 Zero Energy House

4) Flexible Space Design to Improve Functionality

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

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

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

5.1.2 Soil Liquification

Soil liquefaction, also called **earthquake liquefaction**, ground failure or loss of strength that causes otherwise solid soil to behave temporarily as a viscous liquid. The phenomenon occurs in water-saturated unconsolidated soils affected by seismic *S* waves (secondary waves), which cause ground vibrations during earthquakes. Although earthquake shock is the best known cause of liquefaction, certain construction practices, including blasting and soil compaction and vibroflotation (which uses a vibrating probe to change the grain structure of the surrounding soil), produce this phenomenon intentionally. Poorly drained fine-grained soils such as sandy, silty, and gravelly soils are the most susceptible to liquefaction.

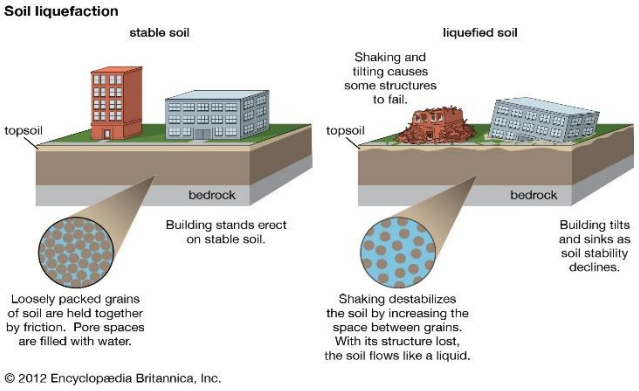


Figure 36 Soil liquefaction

Granular soils are made up of a mix of soil and pore spaces. When earthquake shock occurs in waterlogged soils, the water-filled pore spaces collapse, which decreases the overall volume of the soil. This process increases the water pressure between individual soil grains, and the grains can then move freely in the watery matrix. This substantially lowers the soil's resistance to shear stress and causes the mass of soil to take on the characteristics of a liquid. In its liquefied state, soil deforms easily, and heavy objects such as structures can be damaged from the sudden loss of support from below.

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.

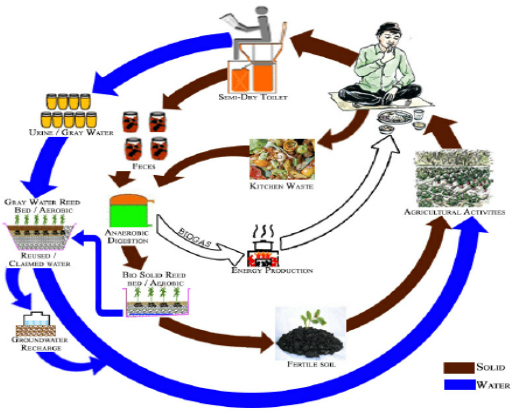


Figure 37 Sustainable Sanitation

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.

Some basic principles to be observed when planning and implementing a sustainable sanitation system are:

- 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, city).

5.1.4 Transport Infrastructure / system

Transport infrastructure is composed of the fixed installations of canals, waterways, airways, railways, roads, and terminals, as well as pipelines such as seaports, refuelling depots, trucking terminals, warehouses, bus stations, railway station, and airports.

Transport is vital to the well-functioning of economic activities and a key to ensuring social well-being and cohesion of populations. Transport ensures everyday mobility of people and is crucial to the production and distribution of goods. Adequate infrastructure is a fundamental precondition for transport systems. In their endeavour to facilitate transport, however, decision-makers in governments and international organizations face difficult challenges. It requires action on the part of the governments concerned, actions that are coordinated with other governments at international level.



Figure 38 Transport system

A. Roads

A road is a paved surface to facilitate the movement of people or goods with means, such as automobiles, bicycles, buses, vans or trucks. Roads in itself are not an interesting security target, but blocking a road will cause problems with the traffic flow and reachability of certain parts of the city or area.

B. Rails

Rails are the infrastructure for rail transport. A rail road which connects two locations is also called a rail line. As for roads, rails on itself are not an interesting security target, but blocking a railroad will cause large problems with the rail transport.

C. Pedestrian / Bicycle paths

Pedestrian paths or sidewalks, curbs, pavements, footpaths or platforms are paths alongside a road designated for pedestrians. Bicycle paths comprises of several different forms of cycling infrastructure, from non-segregated pathways aligned next to the road to segregated cycle facilities.

Segregated cycle facilities are a form of cycling infrastructure consisting of marked lanes, tracks, shoulders and paths designated for use by cyclists and from which motorised traffic is generally excluded. The term includes bike lanes, cycle tracks, separated bike lanes, road shoulders and side paths located within a road right-of-way.

D. Urban waterways

Inter and intra urban transport over waterways such as canals, rivers or other waterways forms a smaller although still important aspect of the urban transport system. For port cities such as Rotterdam, Antwerp or Hamburg the waterway system is of vital importance for their economic development.

E. Subway system

A rapid transit, underground, subway, elevated railway, metro or metropolitan railway system is an electric passenger railway in an urban area with a high capacity and frequency, and grade separation from other traffic. Rapid transit systems are typically located either in underground tunnels or on elevated rails above street level.

F. Bridges and fly-overs

A bridge is a structure built to span physical obstacles such as a body of water, valley, or road, for the purpose of providing passage over the obstacle. A flyover is a bridge, road, railway or similar structure that crosses over another road or railway forming a grade separation. Various different designs are possible depending on the length of the span and the conditions of the site.

Bridges and fly-overs form a vital and vulnerable element of a transport system since blocking can cause serious disruptions in the transportation system. Security risks are high since bridges and fly-overs are generally difficult to reach in case of emergencies.

5.1.5 Vertical Farming

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

Using Controlled Environment Agriculture (CEA) technology, this modern idea uses indoor farming techniques. The artificial control of temperature, light, humidity, and gases makes producing foods and medicine indoor possible. The main advantage of utilizing vertical farming technologies is the increased crop yield that comes with a smaller unit area of land requirement. Vertical farming technologies face economic challenges with large start-up costs compared to traditional farms.

In many ways, vertical farming is similar to greenhouses were metal reflectors and artificial lighting augment natural sunlight. The primary goal of vertical farming is maximizing crops output in a limited space. And, by using vertical farming we can grow different plants, fruits and vegetables in our house only.

There are four critical areas in understanding how vertical farming works:

1) Physical Layout
2) Lighting
3) Growing medium
4) Sustainability features

Firstly, the primary goal of vertical farming is producing more foods per square meter. To accomplish this goal, crops are cultivated in stacked layers in a tower life structure. Secondly, a perfect combination of natural and artificial lights is used to maintain the perfect light level in the room.

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

Types of vertical farming:

1. Building-based vertical farms

Abandoned buildings are often reused for vertical farming, such as a farm at Chicago called "The Plant," which was transformed from an old meatpacking plant. However, new builds are sometimes also constructed to house vertical farming systems.

2. Shipping-container vertical farms

Recycled shipping containers are an increasingly popular option for housing vertical farming systems. The shipping containers serve as standardized, modular chambers for growing a variety of plants, and are often equipped with LED lighting, vertically stacked hydroponics, smart climate controls, and monitoring sensors. Moreover, by stacking the shipping containers, farms can save space even further and achieve higher yield per sq. feet.

3. Deep farms

A "deep farm" is a vertical farm built from refurbished underground tunnels or abandoned mine shafts. As temperature and humidity underground are generally temperate and constant, deep farms require less energy for heating. Deep farms can also use nearby groundwater to reduce the cost of water supply. Despite low costs, a deep farm can produce 7 to 9 times more food than a conventional farm above ground on the same area of land, according to Saffa Riffat, chair in Sustainable Energy at the University of Nottingham.

Advantages of Vertical Farming:

- **Preparation for future:** By 2050, around 68% of the world population is expected to live in urban areas, and the growing population will lead to an increased demand for food.4 The efficient use of vertical farming may perhaps play a significant role in preparing for such a challenge.

- **Increased and Year-Round Crop Production**: Vertical farming allows us to produce more crops from the same square footage of growing area. In fact, 1 acre of an indoor area offers equivalent production to at least 4-6 acres of outdoor capacity. According to an independent estimate, a 30-story building with a basal area of 5 acres can potentially produce an equivalent of 2,400 acres of conventional horizontal farming. Additionally, year-round crop production is possible in a controlled indoor environment which is completely controlled by vertical farming technologies.

- **Less use of Water in cultivation**: Vertical farming allows us to produce crops with 70 to 95% less water than required for normal cultivation.

- **Not Affected by unfavourable Weather Conditions**: Crops in a field can be adversely affected by natural calamities such as torrential rains, cyclones, flooding or severe droughts—events which are becoming increasingly common as a result of global warming.

Indoor vertical farms are less likely to feel the brunt of the unfavourable weather, providing greater certainty of harvest output throughout the year.

- **Increased Production of Organic crops**: As crops are produced in a well-controlled indoor environment without the use of chemical pesticides, vertical farming allows us to grow pesticide-free and organic crops.

- **Human and Environmentally Friendly**: Indoor vertical farming can significantly lessen the occupational hazards associated with traditional farming. Farmers are not exposed to hazards related to heavy farming equipment, diseases like malaria, poisonous chemicals and so on. As it does not disturb animals and trees inland areas, it is good for biodiversity.

Limitations of Vertical Farming:

- **No established Economics:** The financial feasibility of this new farming method remains uncertain. The financial situation is changing, however, as the industry matures and technologies improve.

- **Difficulties with Pollination:** Vertical farming takes place in a controlled environment without the presence of insects. As such, the pollination process needs to be done manually, which will be labour intensive and costly.

- **Labour Costs:** As high as energy costs are in vertical farming, labour costs can be even higher due to their concentration in urban centres where wages are higher, as well as the need for more skilled labour. Automation in vertical farms, however, may lead to the need for fewer workers. Manual pollination may become one of the more labour-intensive functions in vertical farms.

- **Too much Dependency on Technology:** The development of better technologies can always increase efficiency and lessen costs. But the entire vertical farming is extremely dependent on various technologies for lighting, maintaining temperature, and humidity. Losing power for just a single day can prove very costly for a vertical farm. Many believe the technologies in use today are not ready for mass adoption.

Scope of vertical farming:

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

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

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

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

Figure 40 Vertical Farming

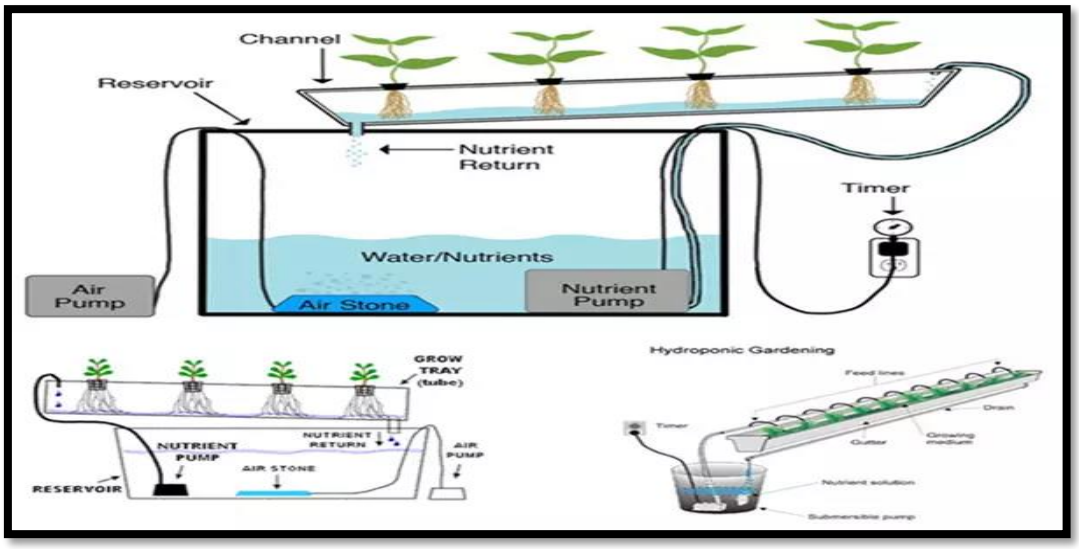


Figure 39 Vertical Farming Model

vertical farming cost in India:

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

- If the land is already owned for setting-up a vertical farm, then capital costs per acre every 5 years are Rs 30.5 lakhs.

- Operational costs, for example, tomatoes as the example crop, in 1 acre per year are Rs 9 lakhs but the revenue can be on an average around 33.5 lakhs.

- If the land is independently owned the profit potential of 15 lakhs per year is slightly less than if it were leased, averaging around 16.5 lakhs per year.

- But it is important to note that in the first year, 80% depreciation is available under the Indian Income Tax Act to the buyer. 75% of bank financing is available through agriculture loans and a 20% subsidy from the National Horticulture Board (NHB).

5.1.6 Corrosion Mechanism, Prevention & Repair Measures of RCC Structure

The durability of concrete structures is influenced by various factors, for example, ecological presentation, electrochemical responses, mechanical stacking, affect harm and others. Of all of these, consumption of the fortification is likely the primary driver for the disintegration of steel strengthens cement (RC) structures. Consumption administration is ending up progressively important because of the developing number of maturing foundation resources (e.g., spans, burrows and so on.) and the expanded prerequisite for impromptu upkeep with a specific end goal to keep these structures operational all through their outline life (and usually, past).

Figure 41 Corrosion of steel in RCC

The primary RC repair, restoration and recovery approaches by and large utilized can be extensively arranged under an) ordinary, b) surface medications, c) electrochemical medicines and d) outline arrangements. The overall point of this examination was to recognize the key consumption administration strategies and embrace exact examinations concentrated on full-scale RC structures to explore their long-haul execution.

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

Their commitments might be comprehensively arranged as I) Investigations on how particular medications and materials perform, ii) Investigations on the viability of existing techniques for estimations and creating options, iii) Changes to the current hypothesis of consumption commencement and capture furthermore iv) Changes to administration system methodologies.

The key discoveries from each examination bundle can be condensed as takes after:

- Macro cell movement seems, by all accounts, to be a result instead of a reason for beginning anode development in repaired solid structures, as has beforehand been exhibited;
- ICCP has industrious defensive impacts even after the interference of the defensive current;
- Discrete galvanic anodes introduced in the parent concrete encompassing the fix repair are an achievable contrasting option to galvanic anodes inserted inside the fix repairs of RC structures;
- Silanes may have a lingering hydrophobic impact even following 20 long stretches of administration.

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 to land.

Figure 42 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 (stormwater) 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.

Energy requirements:

For conventional sewage treatment plants, around 30 percent of the annual operating costs is usually required for energy. The energy requirements vary with type of treatment process as well as wastewater load. For example, constructed wetlands have a lower energy requirement than activated sludge plants, as less energy is required for the aeration step. Sewage treatment plants that produce biogas in their sewage sludge treatment process with anaerobic digestion can produce enough energy to meet most of the energy needs of the sewage treatment plant itself.

In conventional secondary treatment processes, most of the electricity is used for aeration, pumping systems and equipment for the dewatering and drying of sewage sludge. Advanced wastewater treatment plants, e.g. for nutrient removal, require more energy than plants that only achieve primary or secondary treatment.

Sludge treatment and disposal:

The sludges accumulated in a wastewater treatment process must be treated and disposed of in a safe and effective manner. The purpose of digestion is to reduce the amount of organic matter and the number of disease-causing microorganisms present in the solids. The most common treatment options include anaerobic digestion, aerobic digestion, and composting. Incineration is also used, albeit to a much lesser degree. The use of a green approach, such as phytoremediation, has been recently proposed as a valuable tool to improve sewage sludge contaminated by trace elements and persistent organic pollutants.

Sludge treatment depends on the amount of solids generated and other site-specific conditions. Composting is most often applied to small-scale plants with aerobic digestion for mid-sized operations, and anaerobic digestion for the larger-scale operations.

The sludge is sometimes passed through a so-called pre-thickener which de-waters the sludge. Types of pre-thickeners include centrifugal sludge thickeners, rotary drum sludge thickeners and belt filter presses. Dewatered sludge may be incinerated or transported offsite for disposal in a landfill or use as an agricultural soil amendment.

Reuse:

With suitable technology, it is possible to reuse sewage effluent for drinking water, although this is usually only done in places with limited water supplies, such as Windhoek and Singapore.

In arid countries, treated wastewater is often used in agriculture. For example, in Israel, about 50 percent of agricultural water use (total use was one billion cubic metres (3.5×1010 cu ft) in 2008) is provided through reclaimed sewer water. Future plans call for increased use of treated sewer water as well as more desalination plants as part of water supply and sanitation in Israel.

Constructed wetlands fed by wastewater provide both treatment and habitats for flora and fauna. Another example for reuse combined with treatment of sewage are the East Kolkata Wetlands in India. These wetlands are used to treat Kolkata's sewage, and the nutrients contained in the wastewater sustain fish farms and agriculture.

Chapter. 6 Swachh Bharat Abhiyan (Clean India)

6.1 Swachhta needed in allocated village

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

At the present, people are afraid to go out of home due to wide spread of Covid-19. However, the well-wishers of the village take care of the village, such as cleaning the village on time every day, disposing of sanitizers in the village, informing the people about the disease and take awareness.

- Cleanliness Drives across village with Sewa Bhaav and Positive Mind Set
- Cleanliness of nearby Monuments and Cultural Heritage Sites
- Collection of plastic material from all parts of village till it becomes Plastic Free
- Display of No Plastic Use at prominent places, houses, schools, shops, etc
- Distribution of Cloth Bags & Dust Bins
- Door to Door Plastic collection 'NishKaam Karma'
- Medicinal and Local Species Sapling Plantation
- Swachhta Abhiyan and Shramdaan by youth and villagers
- To create more awareness to the community on the adverse consequences of open defecation practices.
- To recognize the special needs of different categories of people and promote sanitation needs of specific groups like children, women, adolescents, aged people, disabled, etc.
- To promote environmental sanitation in all institutions like Anganwadis, Schools, public places, etc.
- To develop and promote technology options for different geographic locations and conditions of water availability, depth of water table, etc.
- To promote hygienic behaviour through change in knowledge-attitude practices and skills for improving environmental sanitation.

6.2 Guideline implementation in allocated village

These are the following Guidelines for the keep village clean.

- While traveling doesn't throw any wrapper, paper or any dry waste on road.
- Keep it in your bag or pocket (as it is a dry waste you can keep them in your bag/pocket).
- Keep paper bags with yourself to store wet waste and throw them in dustbin only.

- Spitting on roads (as it can be the reason of viral disease).
- Avoid chewing Pan-Masala, Gutka and Tobacco.
- Avoid use of plastic bag.
- Follow government's rules and regulations.
- If someone is breaking the rule then make them aware of it.
- Stop your friends if they are making such mistakes.
- Spread awareness to keep our village clean.

6.3 Activities Done by Students for allocated village with photograph

First we went to our allocated village and saw that there was a cleaning activities done daily, but in village some places not clean. So we cleaned it together with our friend and the cleaners of village. Then we also clean Dahemi and Pamol village with Friends.

This is very proud moment for us and the committee of Panchayat also supported us. Give tools for cleaning of village. As part of Swachh Bharat Mission we made an awareness companion in Pamol and Dahemi village. The aim of task is to explain the importance of cleanness and how to achieve it easily.

Important ladder sought to been gaged by us with villager stop reserve our village hygienic. Wearer propelling, he idea of Swachh Bharat through 4F's (Fresh mind, Fresh body, Fresh atmosphere and Fresh humanity).

Figure 43 Cleaning village with cleaners of village

Figure 46 Cleaning village with friend

Figure 44 Cleaning village

Figure 45 Cleaning Activity with all friends

Chapter. 7 Village Condition due to Covid-19

7.1 Taken steps in allocated village related to existing situation with photograph

In village and surrounding village use social media WhatsApp group has been create for awareness of Covid-19.

Information at the grassroots level and government guideline are being given to the people by putting posters at everywhere.

Regular cleaning activities and spreading sanitizer in village carried out. In our allocated village, the panchayat has sprayed the sanitizer in whole village 5 to 6 time.

Wearing the mask when in public was also made mandatory by the panchayat and on not doing so, panchayat has decided to fine such person with Rs. 100/-.

Sarpanch, Talati and other member of village people are go out village then first they sanitized then enter village. And as migrants return to village, they will need to be isolated to prevent the spread of the virus. Gram panchayat should take the initiative to set up local quarantine centeres with facilities such as food, drinking water, and toilet.

Figure 48 Spreading Sanitizer in village

Figure 47 Cleaning Work in village

7.2 Activities Done by Students for allocated village with photograph

We distributed masks in the village and asked people to wear masks. We explained to the people about Corona virus and tell them to wear mask and sanitized hand more and more time and keep their distance from each other. And we clean village with friends and cleaner of village.

Figure 49 Distribution of Mask in village

Chapter. 8 Sustainable Design Planning Proposal (Prototype Design) Part-I (Scenario / Existing Situation / Proposed Design in AutoCAD / Recapitulation Sheet / Measurement Sheet / Abstract Sheet / Sustainability of Proposal / Any other software)

8.1 Design Proposals

➢ The design proposals are:

- Anganwadi
- Municipal Washroom
- Public Health Centre
- Public Garden
- Bitumen Road
- Community hall

8.1.1 Design Proposal of Anganwadi (With Plan, Elevation, Section, Estimate and Costing)

Anganwadi is a type of rural child care center in India. They were started by the Indian government in 1975 as part of the Integrated Child Development Services program to combat child hunger and malnutrition.

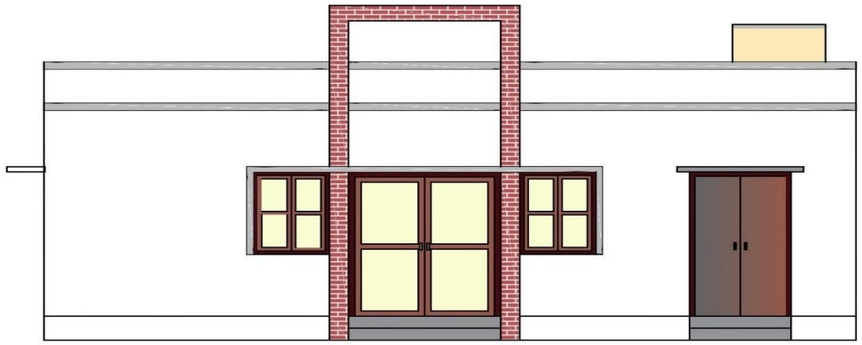
Anganwadi means "courtyard shelter" in Hindi. A typical Anganwadi center provides basic health care in a village. It is a part of the Indian public health care system. Basic health care activities include contraceptive counselling and supply, nutrition education and supplementation, as well as pre-school activities.

Anganwadi workers have the advantage over the physicians living in the same rural area, which gives them insight into the state of health in the locality and assists in identifying the cause of problems and in countering them.

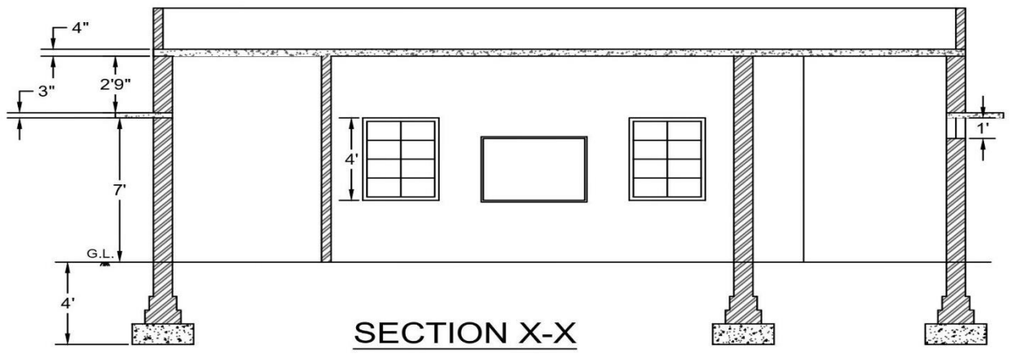
They also have better social skills and can therefore more easily interact with the local people. As locals, they know and are comfortable with the local language and ways, are acquainted with the people, and are trusted.

Public policy discussions have taken place over whether to make Anganwadis universally available to all eligible children and mothers who want their children there. This would require significant increases in budgetary allocation and a rise in the number of Anganwadis to over 16 lakhs.

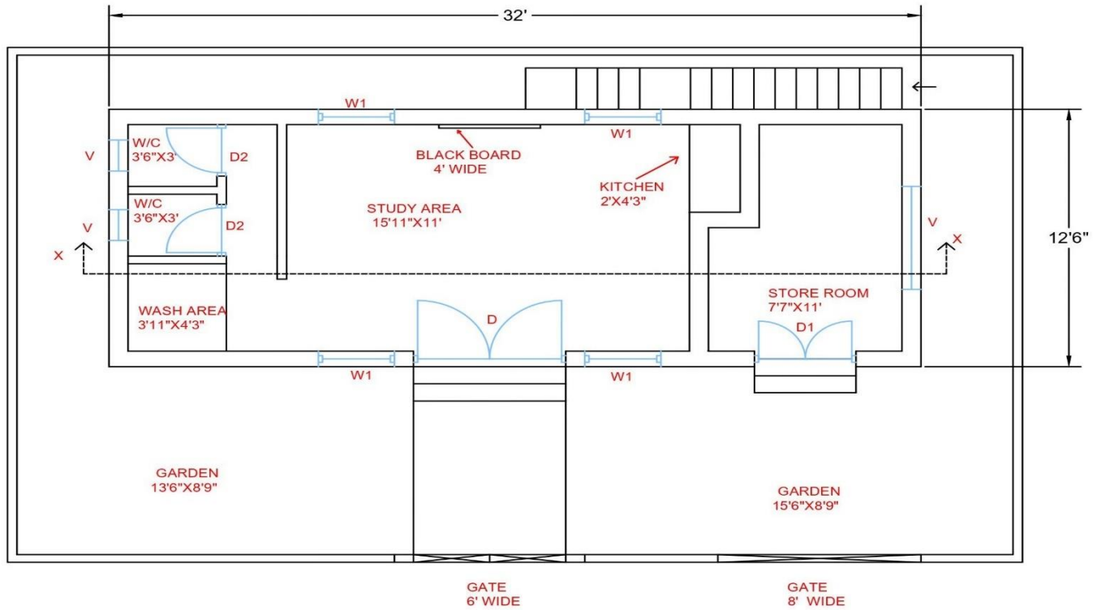
Design of Anganwadi with Plan, Elevation, Section, Estimating and Approximate Costing given in below. Plan of Anganwadi is 9.75m x 3.81m (32’x12’6”) and its approximate cost of public latrine block cost is about **2,36,000 INR**.



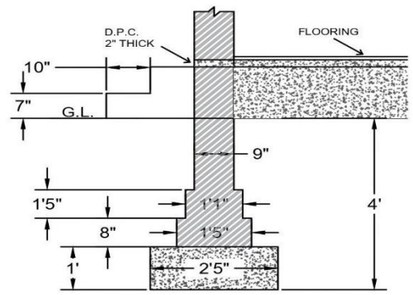
ELEVATION



SECTION X-X



PLAN



FOUNDATION DETAIL

OPENING SCHEDULE		
ITEMS	NOS.	SIZE
D	1	6'X7'
D1	1	4'X7'
D2	2	2'6"X7'
G	1	3'6" WIDE
W1	4	3'X4'
V	2	1'6"X2'
V1	1	5'X1'

Design Proposal of Anganwadi (With Plan, Elevation and Section)

INSTITUTE NAME	KNOWLEDGE INSTITUTE OF TECH. & ENGG.
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
PROJECT	VISHWAKARMA YOJANA
DRAWING NAME	ANGANWADI
GUIDED BY	PROF. DIVYESH MANDALI
PREPARED BY	MUSTAKIM I. MEMON
	ANIK A. VAHORA

Figure 50 Plan, Elevation and Section of Anganwadi

Measurement Sheet						
Item no	**Item description**	**No.**	**L**	**W**	**H**	**Quantity**
			(m)	**(m)**	**(m)**	**(m^3)**
1	Excavation for 0.229m thick wall	1	29.634	0.736	1.219	26.59
2	P.C.C. (1:4:8) foundation	1	29.634	0.736	0.304	6.63
3	Brick masonry up to plinth level					
	(i) 0.43 m thick wall	1	29.94	0.43	0.203	2.61
	(ii) 0.33 m thick wall	1	30.04	0.33	0.203	2.01
	(iii) 0.229 m thick wall	1	30.14	0.229	0.458	3.16
	Steps for main door					
	Step 1	1	1.83	0.51	0.178	0.17
	Step 2	1	1.83	0.254	0.178	0.08
	Steps for store room					
	Step 1	1	1.22	0.51	0.178	0.11
	Step 2	1	1.22	0.254	0.178	0.06
						8.20
4	Brick masonry above plinth to slab					
	0.229m thick wall	1	29.85	0.229	3.04	20.78
	Deduction for door & window					
	D (Door)	1	1.83	0.229	2.13	0.89
	D1 (Door 1)	1	1.22	0.229	2.13	0.60
	W1 (Window 1)	4	0.914	0.229	1.22	1.02
	V (Ventilation)	2	0.457	0.229	0.61	0.13
	V1 (Ventilation 1)	1	1.52	0.229	0.305	0.11
						-2.74
	Deduction for lintel	1	27.11	0.229	0.0706	**-0.47**
	Net brick masonry					**17.49**
	0.114 m thick wall	1	7.766	0.114	3.04	2.70

	Deduction for door & gap					
	D2 (Door 2)	2	0.762	0.114	2.13	0.37
	G (Gap)	1	1.06	0.114	3.04	0.37
						-0.74
	Deduction for lintel	1	3.96	0.114	0.076	**-0.03**
	Net brick masonry					**1.93**
5	Chajja					
	v1 (Ventilation 1)	1	1.8	0.46	0.076	0.06
	w1 (front)	1	4.1	0.46	0.076	0.14
	w1 (vertical front)	2	0.076	0.46	1.22	0.09
	w1 (back)	2	1.21	0.46	0.076	0.09
	w/c	2	1.066	0.914	0.46	0.90
	Store room	1	1.52	0.46	0.076	0.05
						1.33
6	Slab	1	9.754	3.805	0.1	**3.71**
7	Parapet	1	27.11	0.114	0.609	1.88
	Deduction for gap	1	0.609	0.114	0.609	-0.004
						1.88
8	Brick column above slab	2	0.228	0.228	1.22	**0.13**
9	Lintel above brick column	1	2.286	0.228	0.228	**0.19**
			(m)	(m)	(m)	(m)
10	Plaster					
	Inside	1	32.42		3.1	100.5
	Outside	1	23.15		3.1	71.76
	Parapet	2	27.11		0.609	16.5
						188.76
11	Flooring	1	9.754	3.805		**37.11**

Table 10 Approximate Estimate of Anaganwadi

Abstract Sheet						
Item no	**Item description**	**Qty.**	**Unit**	**Rate**	**Per**	**Amount**
				(Rs.)		**(Rs.)**
1	Excavation for 0.229m thick wall	26.58	m^3	100	m^3	2660
2	P.C.C. (1:4:8) foundation	6.63	m^3	3596	m^3	23845
3	Brick masonry up to plinth level	8.2	m^3	3713	m^3	30446
4	Earth filling	10.74	m^3	50	m^3	537
5	Brick masonry in super structure	19.55	m^3	3713	m^3	72590
6	R.C.C. Work	5.22	m^3	9520	m^3	49695
7	Parapet	16.13	m^2	417	m^2	6726
8	Plaster	188.7	m^2	145	m^2	27361
9	Flooring	37.11	m^2	425	m^2	15771
10	Paint	188.7	m^2	33.5	m^2	6321.45
11	Mild Steel Staircase	1	Nos.	8000	Nos.	8000
						235952.45
						Say Total 236000/- INR

Table 11 Approximate Costing of Anaganwadi

8.1.2 Design Proposal of Public Toilet (With Plan, Elevation, Section and Costing)

A public toilet is a room or small building with toilets (or urinals) and sinks that does not belong to a particular household.

Rather, the toilet is available for use by the general public, customers, travellers, employees of a business, school pupils, prisoners etc. Public toilets are commonly separated into male and female facilities.

Public toilets are typically found in many different places: inner-city locations, offices, factories, schools, universities and other places of work and study. Similarly, museums, cinemas, bars, restaurants, entertainment venues usually provide public toilets. Railway stations, filling stations, and long distance public transport vehicles such as trains, ferries, and planes usually provide toilets for general use. Portable toilets are often available at large outdoor events.

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 water (e.g. refilling water bottles), attend to menstrual hygiene needs, and use the waste bins.

Public toilets may also become places for harassment of others or illegal activities, particularly if principles of Crime prevention through environmental design (CPTED) are not applied in the design of the facility.

Public toilets play a role in community health and individual well-being. Where toilets are available, people can enjoy outings and physical activities in their communities.

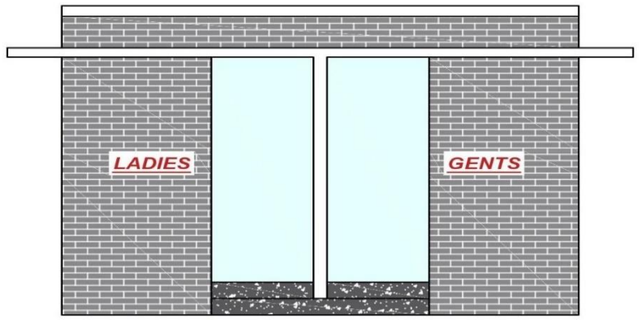
By letting people get out of their cars and onto their feet, bicycles and mass transit, public toilets can contribute to improved environmental health. Mental well-being is enhanced when people are out with families and friends and know a place "to go" is available.

Public toilets also serve people who are "toilet challenged". First, some people need to go very frequently, including young and old people, females who are pregnant or menstruating, and those with some medical conditions.

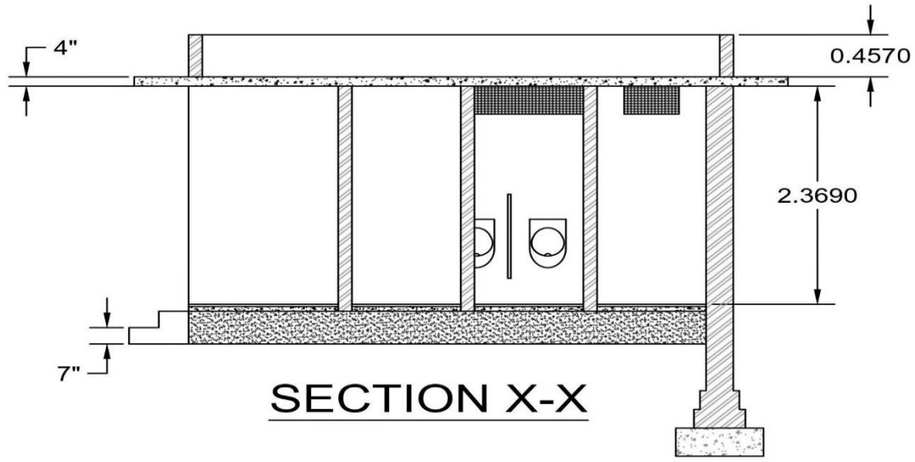
Second, some people need toilet access urgently, suddenly and without warning: such as those with chronic conditions such as Crohn's disease and colitis, and those temporarily afflicted with food-borne illnesses.

If bus and truck drivers on timed schedules have difficulty in accessing toilets, this puts them at risk of bladder and digestive health problems. Furthermore, if the concentration of a driver in urgent need is compromised, it becomes a broader public safety concern.

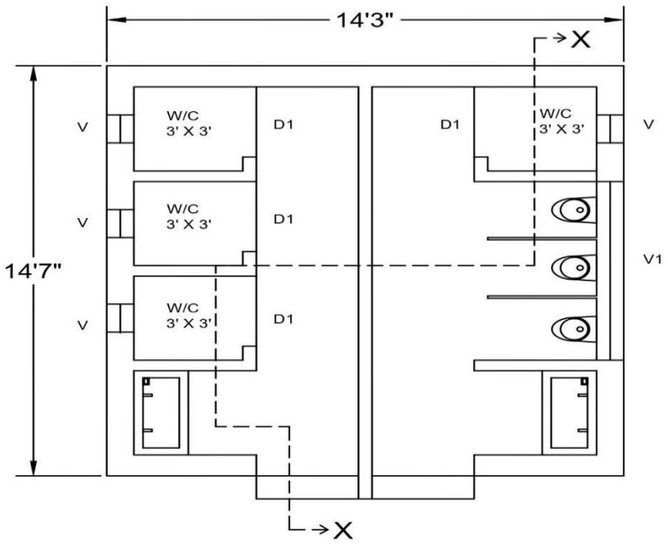
In our village there is Public toilet is not in good condition, so we decided to give proposal of new Public toilet in our village. Design of Public Toilet with Plan, Elevation, Section, Estimating and Approximate Costing given in below. Plan of public toilet is 4.34m x 4.45m (14’3” x 14’7”) and its approximate cost of public toilet cost is about **1,54,500 INR**.



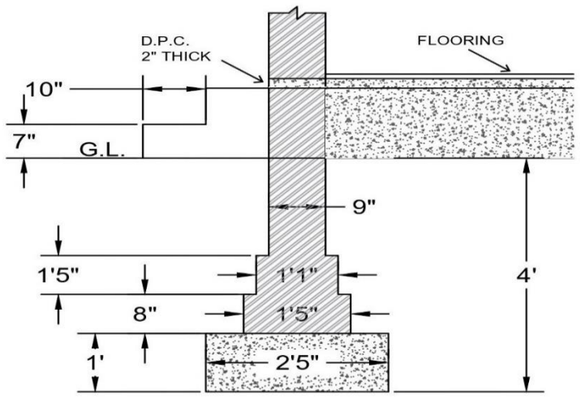
ELEVATION



SECTION X-X



PLAN



OPENING SCHEDULE		
ITEMS	NOS.	SIZE
G	2	3'X8'
D1	4	2'6"X7'
V	4	1'X1'6"
V1	1	6'4"X1'6"

Design Proposal of Public Toilet (With Plan, Elevation and Section)

INSTITUTE NAME	KNOWLEDGE INSTITUTE OF TECH. & ENGG.
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
PROJECT	VISHWAKARMA YOJANA
DRAWING NAME	MUNICIPAL WASHROOM
GUIDED BY	PROF. DIVYESH MANDALI
PREPARED BY	MUSTAKIM I. MEMON
	ANIK A. VAHORA

Figure 51 Plan, Elevation and Section of Public Toilet

Measurement Sheet						
Item no	**Item description**	**No.**	**L**	**W**	**H**	**Quantity**
			(m)	**(m)**	**(m)**	**(m^3)**
1	Excavation for 0.229m thick wall	1	16.67	0.736	1.219	**14.96**
2	P.C.C. (1:4:8) foundation	1	16.67	0.736	0.304	**3.73**
3	Brick masonry up to plinth level					
	(i) 0.43 m thick wall	1	16.67	0.43	0.203	1.46
	(ii) 0.33 m thick wall	1	16.67	0.33	0.203	1.12
	(iii) 0.229 m thick wall	1	16.67	0.229	0.458	1.75
	Steps					
	Step 1	1	1.83	0.51	0.178	0.17
	Step 2	1	1.83	0.254	0.178	0.08
						4.57
4	Brick masonry above plinth to slab					
	0.229m thick wall	1	16.16	0.229	2.44	9.03
	Deduction for gap & ventilation					
	G (Gap)	2	0.86	0.229	2.13	0.42
	V (Ventilation)	4	0.304	0.229	0.457	0.13
	V1 (Ventilation 1)	1	1.94		0.457	0.89
						-1.43
	Deduction for lintel	1	2.13	0.229	0.0706	-0.03
	Net brick masonry					**7.56**
	0.114 m thick wall	1	13.83	0.114	2.44	3.85
	Deduction for door					
	D1 (Door)	4	0.762	0.114	2.13	-0.74
	Deduction for lintel	1	4.412	0.114	0.076	-0.038

	Net brick masonry					**3.07**
5	Slab	1	5.254	5.368	0.1	**2.82**
6	Parapet	1	17.71	0.114	0.457	**0.92**
			(m)	**(m)**	**(m)**	**(m)**
7	Plaster					
	Inside	1	27.1		2.44	66.12
	Outside	1	16		2.44	39.04
	Parapet	2	17.71		0.457	16.19
						121.35
8	Flooring	1	3.88	3.99		**15.48**
9	Colour					
	Inside & Outside	1	43.1		2.44	105.16
	Parapet	1	17.71		0.457	8.09
						113.26

Table 12 Approximate Estimate of Public Toilet

Abstract Sheet						
Item no	**Item description**	**Qty.**	**Unit**	**Rate**	**Per**	**Amount**
				(Rs.)		**(Rs.)**
1	Excavation for 0.229m thick wall	14.95	m^3	100	m^3	1495
2	P.C.C. (1:4:8) foundation	3.72	m^3	3596	m^3	13377.12
3	Brick masonry upto plinth level	4.56	m^3	3713	m^3	16931.28
4	Earth filling	15.48	m^3	50	m^3	774
5	Brick masonry in super structure	10.64	m^3	3713	m^3	39506.32
6	R.C.C. Work	2.82	m^3	9520	m^3	26846.4
7	Parapet	8.09	m^2	417	m^2	3373.53
8	Plaster	121.35	m^2	145	m^2	17595.75
9	Flooring	15.48	m^2	425	m^2	6579

10	paint	121.35	m^2	33.5	m^2	4065.23
11	Toilet Seat	4	Nos.	2500	Nos.	10000
12	Urinal	3	Nos.	1300	Nos.	3900
13	Water Tank (1000 liters)	1	Nos.	10000	Nos.	10000
						154443.63
						Say Total Rs. 154500/-

Table 13 Estimated Costing of Public Toilet

8.1.3 Design Proposal of Public Health Center (With the Plan, Section, Elevation, Estimate and Costing)

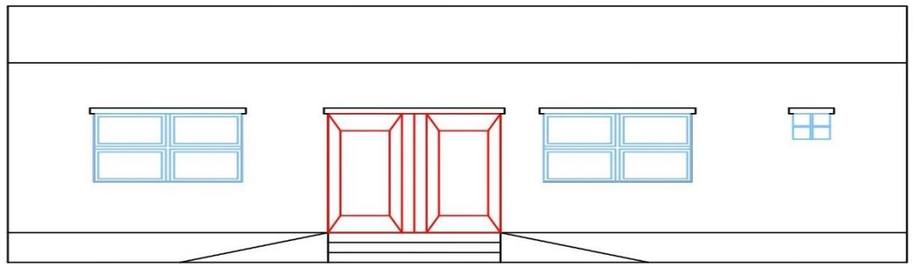
Primary Health Centre (PHCs), sometimes referred to as public health centres, are state-owned rural health care facilities in India.

They are essentially single-physician clinics usually with facilities for minor surgeries. They are part of the government-funded public health system in India and are the most basic units of this system. Presently there are 23673 PHCs in India.

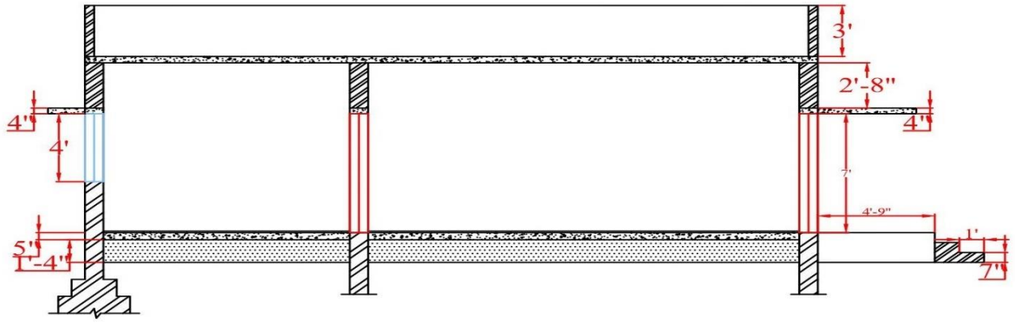
Apart from the regular medical treatments, PHCs in India have some special focuses.

- **Infant immunization programs**: Immunization for newborns under the national immunization program is dispensed through the PHCs. This program is fully subsidised
- **Anti-epidemic programs**: The PHCs act as the primary epidemic diagnostic and control centres for the rural India. Whenever a local epidemic breaks out, the system's doctors are trained for diagnosis. They identify suspected cases and refer for further treatment.
- **Birth control programs**: Services under the national birth control programs are dispensed through the PHCs. Sterilization surgeries such as vasectomy and tubectomy are done here. These services, too, are fully subsidised.
- **Pregnancy and related care**: A major focus of the PHC system is medical care for pregnancy and child birth in rural India. This is because people from rural India resist approaching doctors for pregnancy care which increases neonatal death. Hence, pregnancy care is a major focus area for the PHCs.
- **Emergencies**: All the PHCs store drugs for medical emergencies which could be expected in rural areas. For example antivenoms for snake bites, rabies vaccinations, etc.

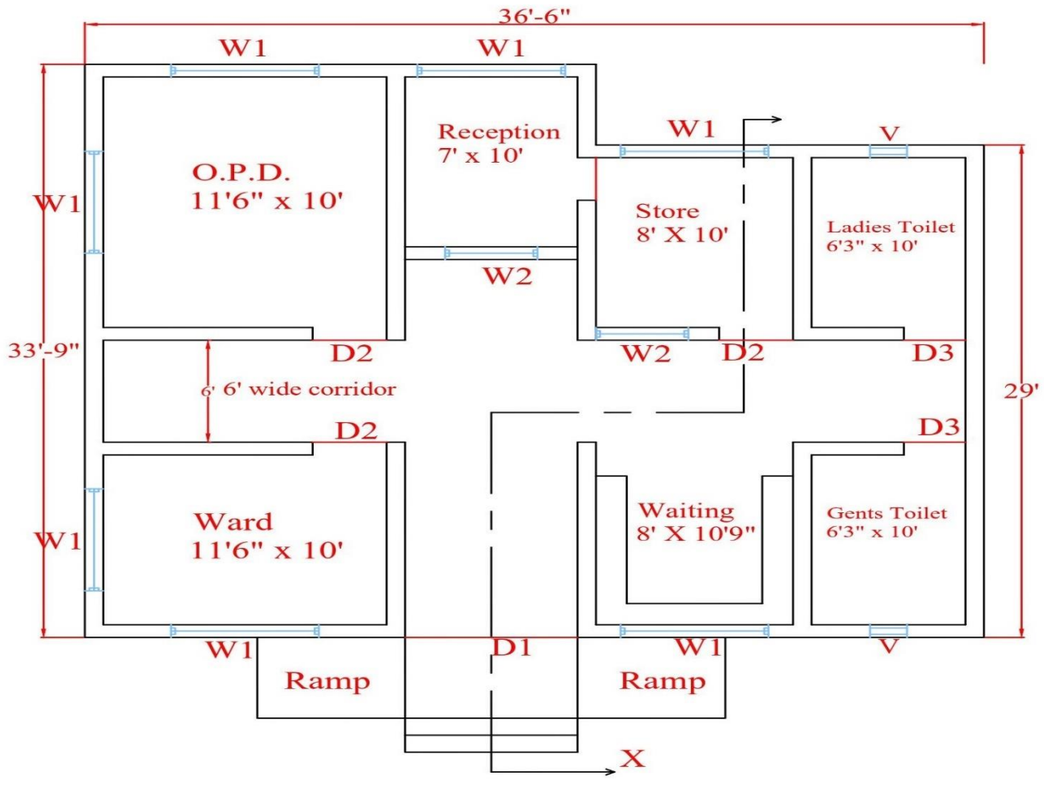
Pamol village doesn't have any type of health or medical facility. In emergency case the villagers don't have option of medical treatment. Villagers go to Borsad for all type of medical treatment. So, we decide to give design proposal of public health center, for basic medical treatment. Design of PHC with Plan, Elevation, Section, Estimating and Approximate Costing given in below. Approximate cost of the P.H.C. is **5,14,800 INR**.



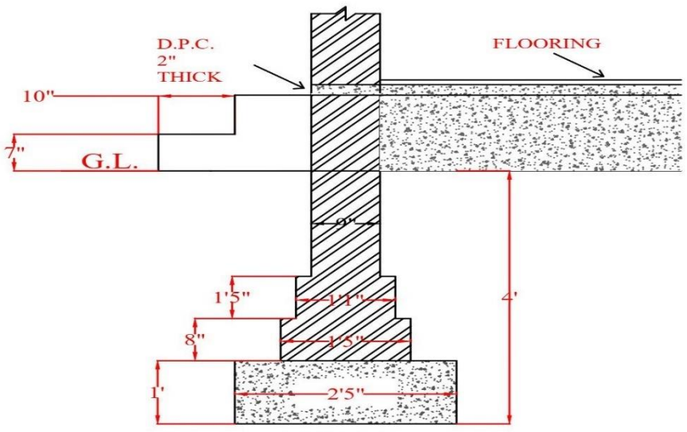
ELEVATION



SECTION X-X



PLAN: 36'3" X 33'9"



FOUNDATION DETAIL

OPENING SCHEDULE		
ITEMS	NOS.	SIZE
D1	1	7'X7'
D2	3	3'X7'
D3	3	2'6"X7'
W1	7	6'X4'
W2	2	4'X4'
V	4	1'6"X2'

Design Proposal of Public Health Center (With Plan and Section)

INSTITUTE NAME	KNOWLEDGE INSTITUTE OF TECH. & ENGG.
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
PROJECT	VISHWAKARMA YOJANA
DRAWING NAME	PUBLIC HEALTH CENTER
GUIDED BY	PROF. DIVYESH G. MANDALI
PREPARED BY	MUSTAKIM I. MEMON
	ANIK A. VAHORA

Figure 52 Plan, Elevation and Section of Public Health Centre

Measurement Sheet						
Item no	**Item description**	**No.**	**L**	**W**	**H**	**Quantity**
			(m)	**(m)**	**(m)**	**(m^3)**
1	Excavation for 0.229m thick wall	1	78.71	0.736	1.219	**70.62**
2	P.C.C. (1:4:8) foundation	1	78.71	0.736	0.304	**17.61**
3	Brick masonry up to plinth level					
	(i) 0.43 m thick wall	1	78.71	0.43	0.203	6.87
	(ii) 0.33 m thick wall	1	78.71	0.33	0.203	5.27
	(iii) 0.229 m thick wall	1	78.71	0.229	0.458	8.26
	Steps					
	Step 1	1	2.13	2.05	0.178	0.78
	Step 2	1	2.13	1.75	0.178	0.66
						21.84
4	Brick masonry above plinth to slab	1	78.71	0.229	3	54.07
	Deduction for					
	D1 (Door 1)	1	2.13	0.229	2.13	-1.04
	D2 (Door 2)	3	0.914	0.229	2.13	-1.34
	D3 (Door 3)	3	0.762	0.229	2.13	-1.12
	W1 (Window 1)	7	1.83	0.229	1.22	-3.58
	W2 (Window 2)	2	1.14	0.229	1.22	-0.64
	G (Gap)	3	1.83	0.229	3	-3.77
	V (Ventilation)	2	0.457	0.229	0.457	-0.10
	Deduction for lintel	1	78.71	0.229	0.0706	-1.27
	Net brick masonry					**41.23**
5	Slab	1	11.13	10.29	0.1	**11.45**
6	Parapet	1	42.82	0.114	0.457	**2.23**

			(m)	(m)	(m)	(m^2)
7	Plaster					
	Inside	1	82.75		2.44	201.91
	Outside	1	22.6		2.44	55.144
	Parapet	2	42.84		0.457	39.16
						296.21
8	Flooring	1	10	9.37		**93.70**
9	Colour					
	Inside & Outside	1	105.35		2.44	257.05
	Parapet	1	42.84		0.457	19.58
						276.63

Table 14 Approximate Estimate of Public Health Center

Abstract Sheet						
Item no	**Item description**	**Qty.**	**Unit**	**Rate**	**Per**	**Amount**
				(Rs.)		**(Rs.)**
1	Excavation for 0.229m thick wall	70.62	m^3	100	m^3	7062
2	P.C.C. (1:4:8) foundation	17.61	m^3	3596	m^3	63325.56
3	Brick masonry up to plinth level	21.84	m^3	3713	m^3	81091.92
4	Earth filling	17.39	m^3	50	m^3	869.5
5	Brick masonry in super structure	41.23	m^3	3713	m^3	153087
6	R.C.C. Work	11.45	m^3	9520	m^3	109004
7	Parapet	2.23	m^3	3713	m^3	8280
8	Plaster	296.21	m^2	145	m^2	42950.45
9	Flooring	93.7	m^2	425	m^2	39822.5
10	paint	276.63	m^2	33.5	m^2	9267.11
11	Mild Steel Staircase	1	Nos.	8000	Nos.	8000
						514760.015
						Say Total Rs. 514800/-

Table 15 Approximate Costing of Public Health Center

8.1.4 Design Proposal of Public Garden (With Plan, 3D, Section, Estimate and Costing)

A public garden is an institution that maintains collections of plants for the purposes of public education and enjoyment, in addition to research, conservation, and higher learning.

It must be open to the public and the garden's resources and accommodations must be made to all visitors. Public gardens are staffed by professionals trained in their given areas of expertise and maintain active plant records systems.

The most common form today is a residential or public garden, but the term garden has traditionally been a more general one.

A garden can have aesthetic, functional, and recreational uses:

- Cooperation with nature
    - Plant cultivation
    - Garden-based learning
- Observation of nature
    - Bird- and insect-watching
    - Reflection on the changing seasons

In our village, there is no re-creational area. So, we decided to give design of public garden for where public spend their peaceful time with family. Design of Public Garden with Plan, Elevation, Section Estimating and Approximate Costing and also 3D of Garden given in below. Approximate cost of public garden is **10,92,700 INR**.

Figure 53 3D Front view of Public Garden

Figure 54 3D Side view of Public Garden

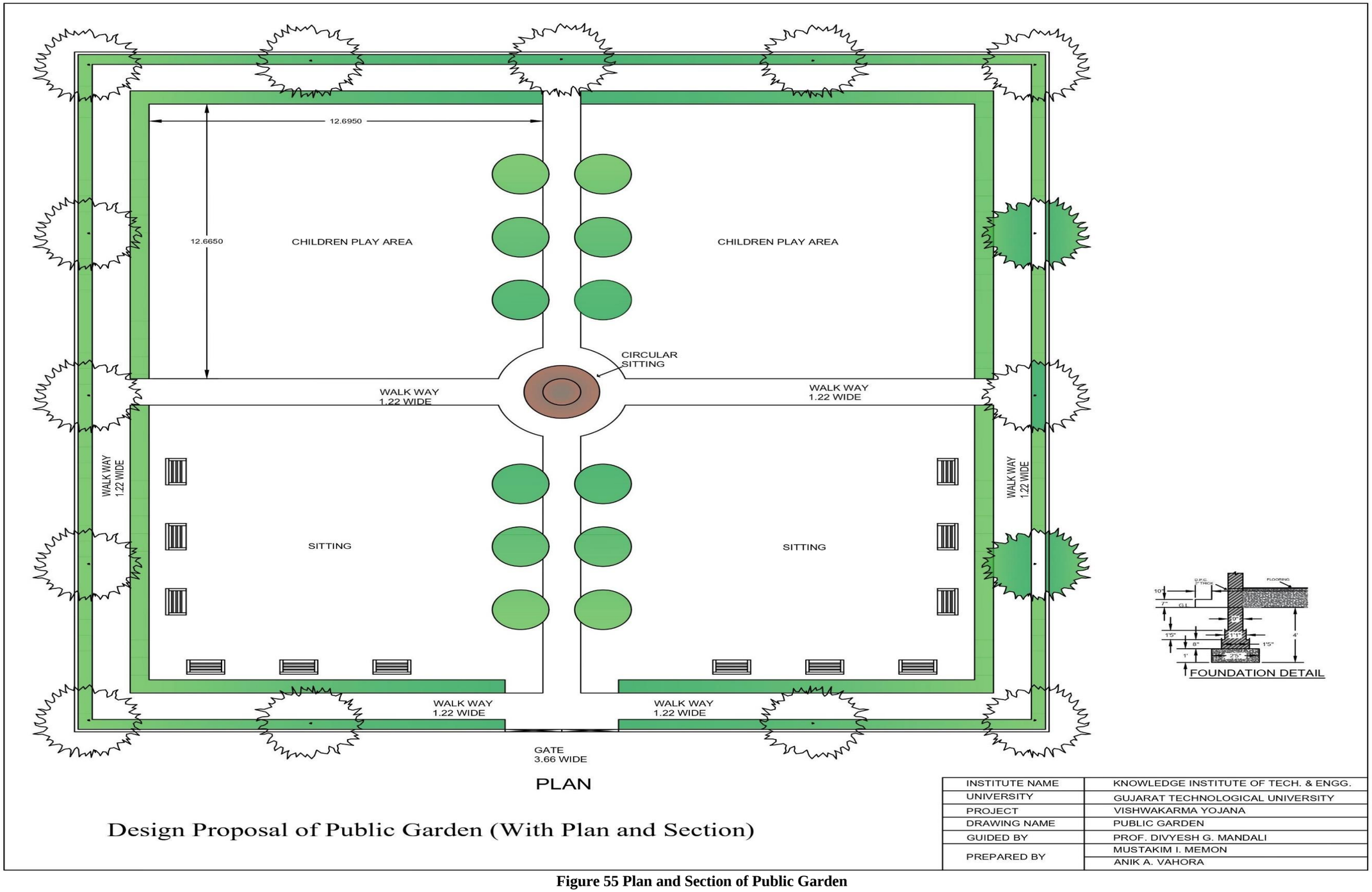


Figure 55 Plan and Section of Public Garden

Measurement Sheet						
Item No.	**Item description**	**No.**	**L**	**W**	**H**	**Quantity**
			(m)	**(m)**	**(m)**	**(m^3)**
1	Excavation for	1	125.52	0.74	1.22	**113.32**
2	P.C.C. (1:4:8) foundation	1	125.52	0.736	0.304	**28.08**
3	Brick masonry up to plinth level					
	(i) 0.43 m thick wall	1	125.52	0.43	0.203	10.96
	(ii) 0.33 m thick wall	1	125.52	0.33	0.203	8.41
	(iii) 0.229 m thick wall	1	125.52	0.229	0.458	13.16
						32.53
4	Brick masonry above plinth					
	0.114 m thick wall	1	125.52	0.114	1.22	17.46
	Deduction for gate	1	3.66	0.114	1.22	-0.51
	Net brick masonry					**16.95**

Table 16 Approximate Estimate of Public Garden

Abstract Sheet						
Item no	**Item description**	**Qty.**	**Unit**	**Rate**	**Per**	**Amount**
				(Rs.)		**(Rs.)**
1	Excavation for foundation	113.31	m^3	100	m^3	11331
2	P.C.C. (1:4:8) foundation	28.08	m^3	3596	m^3	100975.68
3	Brick masonry upto plinth level	32.53	m^3	3713	m^3	120783.89
4	Brick masonry in super structure	16.94	m^3	3713	m^3	62898.22
5	Stone Work	306.28	m^2	1775	m^2	543647
6	Paver concrete block	222	m^2	385	m^2	85470
7	Tree Plantation	32	Nos.	60	Nos.	1920
8	Bench	12	Nos.	5300	Nos.	63600
9	Slide	3	Nos.	18000	m^2	54000

10	See-saw	2	Nos.	10000	Nos.	20000
11	Climbing Frame	1	Nos.	28000	Nos.	28000
						1092625.79
						Say Total Rs. 1092700/-

Table 17 Approximate Costing of Public Garden

8.1.5 Design Proposal of Road (With the Section, Estimate and Costing)

A road is a thoroughfare, route, or way on land between two places that has been paved or otherwise improved to allow travel by foot or by some form of conveyance (including a motor vehicle, cart, bicycle, or horse).

In urban areas roads may diverge through a city or village and be named as streets, serving a dual function as urban space easement and route. Modern roads are normally smoothed, paved, or otherwise prepared to allow easy travel.

Road design is part of highway engineering. Structural road design is designing a road for its environment in order to extend its longevity and reduce maintenance. The Shell pavement design method is used in many countries for the design of new asphalt roadsides. Road construction requires the creation of an engineered continuous right-of-way or roadbed, overcoming geographic obstacles and having grades low enough to permit vehicle or foot travel and may be required to meet standards set by law or official guidelines.

The process is often begun with the removal of earth and rock by digging or blasting, construction of embankments, bridges and tunnels, and removal of vegetation (this may involve deforestation) and followed by the laying of pavement material. A variety of road building equipment is employed in road building.

Roads are designed and built for primary use by vehicular and pedestrian traffic. Storm drainage and environmental considerations are major concern. Erosion and sediment controls are constructed to prevent detrimental effects. Drainage lines are laid with sealed joints in the road easement with runoff coefficients and characteristics adequate for the land zoning and storm water system.

In our allocated village the internal streets are Stone roads and external roads are made up of Bitumen. In the rainy season roads gets clogged and people have to face very difficult for transporting from one place to another in the village. So, we decided to give a WBM road design. Approximate cost of Road of 1.2km is **13,57,000 INR**.

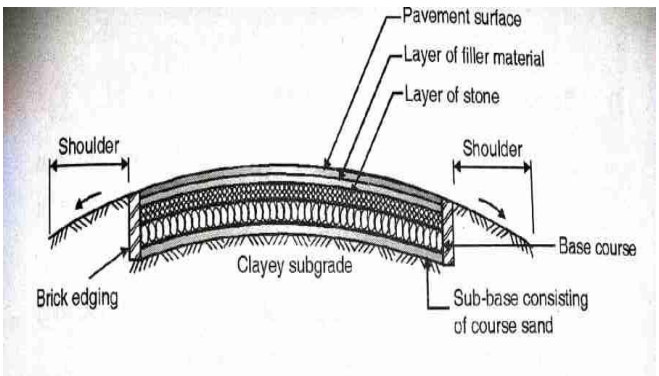


Figure 56 Road section

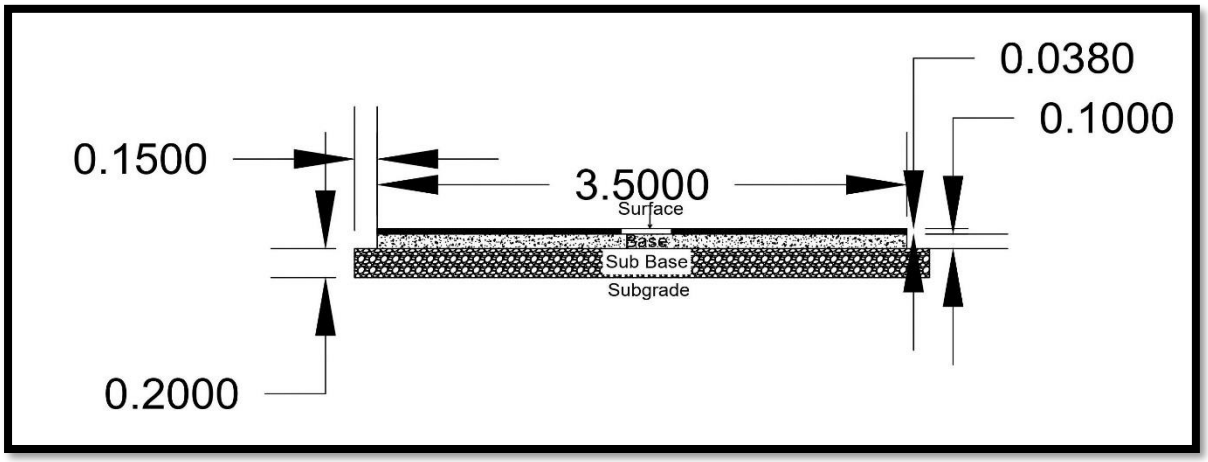


Figure 57 Section of Road

Measurement Sheet							
Item no	**Item description**	**No.**	**L**	**W**	**H**	**Quantity**	**Unit**
			(m)	**(m)**	**(m)**		
1	Subgrade	1	1200	3.8		4560	m^2
2	Sub base	1	1200	3.8	0.3	1368	m^3
3	Base layer	1	1200	3.5	0.15	630	m^3
4	Surface	1	1200	3.5	0.1	420	m^3

Table 18 Approximate Estimate of Road

Abstract Sheet						
Item no	**Item description**	**Qty.**	**Unit**	**Rate**	**Per**	**Amount**
				(Rs.)		**(Rs.)**
1	Subgrade	4560	m^2	20	m^2	91200
2	Sub base	912	m^3	430	m^3	392160
3	Base layer	420	m^3	480	m^3	201600
4	Surface	4200	m^3	160	m^2	672000
						1356960
						Say Total Rs. 1357000/-

Table 19 Approximate Costing of Road

8.1.6 Design Proposal of Community Hall (With the Plan, Section, Elevation, Estimate and Costing)

Community centres or community halls are public locations where members of a community tend to gather for group activities, social support, public information, and other purposes.

They may sometimes be open for the whole community or for a specialized group within the greater community. Community centres can be religious in nature, such as Christian, Islamic, or Jewish community centres, or can be secular, such as youth clubs.

Built as such - Buildings have been erected specifically to function as community centres at least as far back as 1880, perhaps even earlier.

A disused public building - When an official government building (such as a school or city hall) is no longer needed for its original purpose, it is sometimes offered to the community as gift, loan or sale.

A disused commercial building - When a commercial building of some local importance is no longer used, it is sometimes sold or donated to the community.

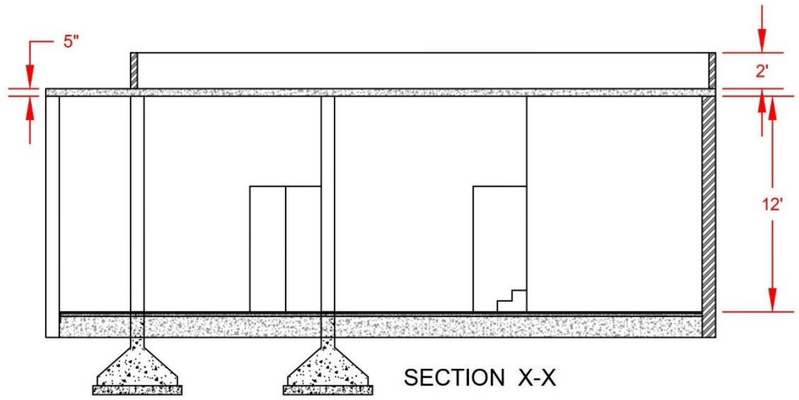
A building that served many of the purposes now given to the community centre in addition to a different primary use (such as school, church, inn, or town hall), which was later acquired so it could continue these functions after its primary use subsided.

Community centres generally perform many of the following functions in their communities:

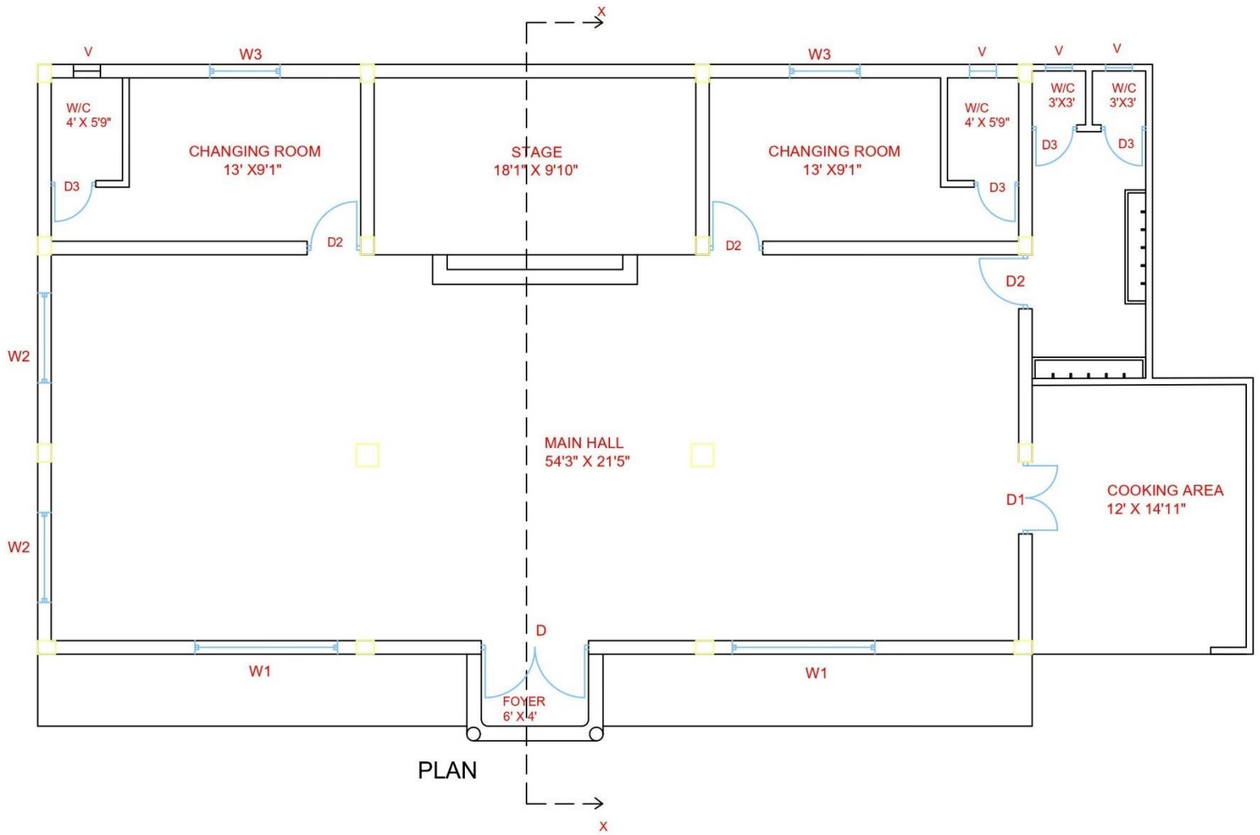
- As the place for all-community celebrations at various occasions and traditions.
- As the place for public meetings of the citizens on various issues.
- As the place where politicians or other official leaders come to meet the citizens and ask for their opinions, support or votes ("election campaigning" in democracies, other kinds of requests in non-democracies).
- As a place where community members meet each other socially.
- As a place housing local clubs and volunteer activities.
- As a place that community members (and sometimes others), can rent cheaply when a private family function or party is too big for their own home. For instance, the non-religious parts of weddings, funerals, etc.
- As a place that passes on and retells local history.
- As a place where local non-government activities are organised.
- As a community venue for entertainment.
- As a place of relief in instances of community tragedies.

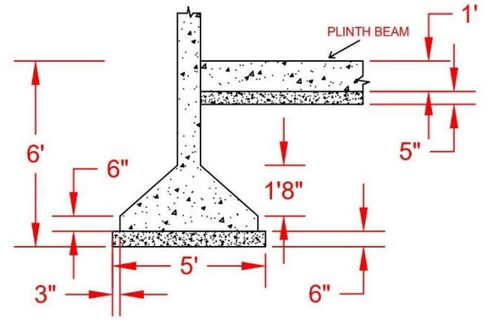
In our village, Community hall is very old and it is in critical condition. So, villagers don’t use the community hall. So, we decided to plan new design proposal of community hall. Design of Community Hall with Plan, Elevation, Section, Estimating and Approximate Costing given in below. Approximate cost of new community hall is about **5,63,400 INR**.

ELEVATION



SECTION X-X





FOUNDATION DETAIL

OPENING SCHEDULE		
ITEMS	NOS.	SIZE
D	1	6'X7'
D1	1	4'X7'
D2	3	3'X7'
D3	4	2'6"X7'
W1	2	8'X4'
W2	2	5'X4'
W3	2	4'X4'
V	4	1'6"X2'
GATE	1	10'X6'

INSTITUTE NAME	KNOWLEDGE INSTITUTE OF TECH. & ENGG.
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
PROJECT	VISHWAKARMA YOJANA
DRAWING NAME	COMMUNITY HALL
GUIDED BY	PROF. DIVYESH MANDALI
PREPARED BY	MUSTAKIM I. MEMON
	ANIK A. VAHORA

Design Proposal of Community Hall (With Plan, Elevation and Section)

Figure 58 Plan, Elevation and Section of Community Hall

Measurement Sheet						
Item no	**Item description**	**No.**	**L**	**W**	**H**	**Quantity**
			(m)	**(m)**	**(m)**	**(m^3)**
1	Excavation for foundation	18	1.04	1.04	1.22	**23.73**
2	P.C.C. (1:4:8) foundation	18	1	1	0.076	**1.37**
3	Footing	18	0.914	0.914	0.229	**3.44**
4	Earth Filling	1	16.08	9.31	0.365	**54.64**
5	Brick Steps					
	Step 1	1	2.33	1.47	0.178	0.61
	Step 2	1	1.83	1.22	0.178	0.40
						1.01
6	Brick masonry above plinth to slab					
	0.229m thick wall	1	67.57	0.229	3.66	56.63
	Deduction for door & ventilation					
	D (Door)	1	1.83	0.229	2.13	0.89
	D1 (Door 1)	1	1.22	0.229	2.13	0.60
	D2 (Door 2)	3	0.92	0.229	2.13	1.35
	D3 (Door 3)	4	0.76	0.229	2.13	1.48
	W1 (Window 1)	2	2.44	0.229	1.22	1.36
	W2 (Window 2)	2	1.52	0.229	1.22	0.85
	W3 (Window 3)	2	1.22	0.229	1.22	0.68
	V (Ventilation)	4	0.304	0.229	0.61	0.17
						-7.38
	Deduction for Column	14	0.304	0.229	3.66	-3.57
	Deduction for lintel	1	2.13	0.229	0.0706	-0.03
	Net brick masonry					**45.65**

	0.114 m thick wall	1	17.1	0.114	2.13	4.15
	Deduction for door					
	D1 (Door 1)	4	0.762	0.114	2.13	-0.74
	Deduction for lintel	1	4.412	0.114	0.076	-0.038
	Net brick masonry					**3.37**
7	R.C.C. Work					
	Slab	1	17	10	0.127	21.59
	Column					
	C1 (Column 1)	14	0.304	0.229	3.66	3.57
	C2 (Column 2)	2	0.304	0.304	3.66	0.68
	C3 (Column 3)	2	0.229	0.229	3.66	0.38
	Beam	8	103	0.229	0.5	94.35
						120.57
8	Parapet	1	17	10	0.609	**103.53**
			(m)	**(m)**	**(m)**	**(m)**
9	Plaster					
	Inside	1	68.1		3.66	249.25
	Outside	1	58.11		3.66	212.6826
	Parapet	2	54		0.609	65.77
						527.70
10	Flooring	1	16.54	9.54		**157.79**
11	Colour					
	Inside & Outside	1	126.21		3.66	461.93
	Parapet	1	54		0.609	32.89
						494.81

Table 20 Approximate Estimate of Community Hall

Measurement Sheet						
Item no	**Item description**	**Qty.**	**Unit**	**Rate**	**Per**	**Amount**
				(Rs.)		**(Rs.)**
1	Excavation	23.73	m^3	100	m^3	2373
2	P.C.C. (1:4:8)	1.37	m^3	3596	m^3	4926.52
3	Footing	3.44	m^3	9520	m^3	32748.8
4	Earth filling	54.64	m^3	50	m^3	2732
5	Brick masonry in super structure	50.03	m^3	3713	m^3	185761.39
6	R.C.C. Work	120.57	m^3	9520	m^3	1147826.4
7	Parapet	103.53	m^2	417	m^2	43172.01
8	Plaster	527.7	m^2	145	m^2	76516.5
9	Flooring	157.79	m^2	425	m^2	67060.75
10	paint	494.85	m^2	33.5	m^2	16577.475
						1579694.8
						Say Total Rs. 1580000/- INR

Table 21 Approximate Costing of Community Hall

8.2 Reason for Students Recommending this Design

1. Anganwadi: -

Anganwadi is a type of rural child care center in India. They were started by the Indian government in 1975 as part of the Integrated Child Development Services program to combat child hunger and malnutrition.

Anganwadi means "courtyard shelter" in Hindi. A typical Anganwadi center provides basic health care in a village. It is a part of the Indian public health care system. Basic health care activities include contraceptive counselling and supply, nutrition education and supplementation, as well as pre-school activities.

In our allocated village there are two Anganwadi but it was far away. So, the little children had trouble in going. The space provided was less than the number of children present there. So, we decided to build an Anganwadi.

2. Public Toilet: -

Public toilets are typically found in many different places: inner-city locations, offices, factories, schools, universities and other places of work and study. Similarly, museums, cinemas, bars, restaurants, entertainment venues usually provide public toilets. Railway stations, filling stations, and long distance public transport vehicles such as trains, ferries, and planes usually provide toilets for general use. Portable toilets are often available at large outdoor events.

If bus and truck drivers on timed schedules have difficulty in accessing toilets, this puts them at risk of bladder and digestive health problems. Furthermore, if the concentration of a driver in urgent need is compromised, it becomes a broader public safety concern.

3. Public Health Center: -

They are essentially single-physician clinics usually with facilities for minor surgeries. They are part of the government-funded public health system in India and are the most basic units of this system. Presently there are 23673 PHCs in India.

Pamol village doesn't have any type of health or medical facility. In emergency case the villagers don't have option of medical treatment. Villagers go to Borsad for all type of medical treatment. So, we decide to give design proposal of public health center, for basic medical treatment.

4. Public Garden: -

It must be open to the public and the garden's resources and accommodations must be made to all visitors. Public gardens are staffed by professionals trained in their given areas of expertise and maintain active plant records systems. The most common form today is a residential or public garden, but the term garden has traditionally been a more general one.

In our village, there is no re-creational area. So, we decided to give design of public garden for where public spend their peaceful time with family.

5. WBM Road: -

A road is a thoroughfare, route, or way on land between two places that has been paved or otherwise improved to allow travel by foot or by some form of conveyance (including a motor vehicle, cart, bicycle, or horse).

In our allocated village the internal streets are Stone roads and external roads are made up of Bitumen. In the rainy season roads gets clogged and people have to face very difficult for transporting from one place to another in the village. So, we decided to give a WBM road design.

6. Community Hall: -

Community centres or community halls are public locations where members of a community tend to gather for group activities, social support, public information, and other purposes.

In our village, Community hall is very old and it is in critical condition. So, villagers don't use the community hall. So, we decided to plan new design proposal of community hall.

8.3 About Design Suggestions / Benefits of Villagers

- Anganwadi is use for small children education and also for women health centre.
- PHC is used for treatments as soon as possible
- Bitumen road used for better and efficient transportation through the village.
- Public toilet is provide for village peoples for urination and defecation.
- Re-creational center for spend time with family or friends.
- Community hall for celebrate the functions.

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

- After carrying out survey and comparing the existing facilities of village with the basic amenities needed by a village based on population norms given by government of India and personal interview with many of the villagers of Pamol and meeting with Sarpanch and Talati, we finalize the remaining amenities required for fulfil basic need of this village, some of the facilities are designed and complete estimate is prepared.
- The study is aimed to know the basic scenario of village through techno economic survey and gap analysis done.
- This study framework can enable to local bodies of Pamol village to approach the various Govt. schemes.
- As major facilities are already available in village, few facilities are required which we Suggest.
- In this way with coordination between various Government agencies, we can develop Pamol village in better way as other smart or model villages.
- Village needs a good place for the recreational activities so proposal of new walk way garden is given.
- By carrying out the gap analysis we found the gap between the existing facilities and facility actually required as per norms and will suggest sustainable plans and give design like, Primary School, Public Library, Wall around Pond, Pavement Block, Market Yard, Rainwater Harvesting, Pavement Block, Water point, Bio-gas plant etc.,
- Aim of this study is to know the basic scenario of village through techno economic survey and gap analysis done.
- Through this study, we will try to make a master development plan for the village.
- Our master development plan might be include provisions of all the facilities suggest by us, then we focus on the improvement in the existing facilities. Our aim is to provide newly technological facilities in Pamol village.
- As new designs proposed by us, we will focus on regular maintenance of these facilities, because due to lack of maintenance, people could be avoid to use and hence it become obsolete.
- For maintenance purpose, we should provide a maintenance plan which is economical and effective. It can be done by villagers themselves.

Chapter. 10 Conclusion of the Entire Village Activities of the Report

- Vishwakarma Yojana aims the development of the villages with providing urban amenities without changing their soul. Through development of the villages we contribute to the development of the country.
- Until & unless the villages are not developed the country remains under developed, hence through Vishwakarma Yojana we young engineers tries to reduce the gap between urban & rural by designing proper plans & proposals.
- By carrying out the gap analysis we found the gap between the existing facilities & facility actually required as per norms & will suggest sustainable plans & proposals for filling these gaps & contribute to the development of the village.
- We have designed a Anganwadi and Health Center which is the key issue of Pamol village. And the public toilet is also important for villagers. Public garden is also use for recreational place where people spend time and they feel relax and fresh. Long-range planning must take place in a public forum, with opportunities for public participation, if it is to be representative. The support of the community can also foster improved implementation opportunities.
- An approach that will be used successfully when planning for the future of a community involves preceding the planning process with an exercise designed to develop vision of the future for the ―Vishwakarma Yojana‖.
- Developing village with a rural soul but with all Smart urban amenities that a city may have. This will help in developing Smart villages in sustainable manner, reduce migration from villages and prevent the cities from the urban pressure.
- This should lead to some rethinking about the meaning of efficiency beyond the usual conceptions of economic or technical efficiency.
- Indeed, employment expansion is at least as important as growth in productivity.
- In a sense, both represent the utilization of labour as a resource.
- It can be help to develop the other village as increase basic amenities and after that smart amenity on any country with the help Smart (Ideal) Village visit and Primary school and Health center Survey and Analysis. And its also help to increase GDP of state.
- Also increase country image in front of world as Good infrastructure; Good Economic Profile and Good Employment Solution; Good (Ideal Example) Smart Example of New infrastructure with Uses of renewable energy Solution Country.
- This should lead to some rethinking about the meaning of efficiency beyond the usual conceptions of economic or technical efficiency.
- Indeed, employment expansion is at least as important as growth in productivity. In a sense, both represent the utilization of labour as a resource.
- Why, then, does thinking about efficiency focus on one and neglect the other It is important to reflect on this question. The answer, which calls for change in both economics and politics, could make a real difference.

Chapter. 11 References Referred for this Project

1) Ideal Village Survey Form PHASE-VII
2) Smart Village Survey Form PHASE-VII
3) Allocated Village Survey Form PHASE-VII
4) Census Data, Ministry of Home Affairs, Govt. of India, www.censusindia.gov.in
5) UDPFI Guidelines, Ministry of Urban Development
6) Rural development scheme of Govt. of Gujarat
7) Schedule Of Rate
8) Dr. R.P. Rethaliya, Professional Practice and Valuation, Third Edition (2018), Atul Prakashan
9) IS 15797: 2008 for Roof top Rain Water Harvesting
10) IS 8827: 1978 Recommendation for basic requirement of School Building

Chapter. 12 Annexure Attachment

12.1 Survey form of Ideal Village

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

For

Vishwakarma Yojana: Phase VIII

IDEAL VILLAGE SURVEY

An approach towards Rurbanisation for Village Development

Name of Village:	Gana
Name of Taluka:	Anand
Name of District:	Anand
Name of Institute:	Knowledge Institute of Tech. & Engg.
Nodal Officer Name & Contact Detail:	Prof. Divyesh Mandali
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	
Date of Survey:	

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001				
ii)	2011	4079	2164	1915	866

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	341 Hector
	Forest Area (In hect.)	
	Agricultural Land Area (In hect.)	305 Hector
	Residential Area (In hect.)	17 Hctor
	Other Area (In hect.)	
	Water bodies	
	Nearest Town with Distance:	Anand (8 km)

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3. **Occupational Details:**

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

4. **Physical Infrastructure Facilities:**

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
	• Tap Water (Treated/ Untreated) • RO Water • Well (Covered/ Uncovered) • Hand pumps • Tube well/ Borehole • River/ Canal/ Spring/ Lake/ Pond	 Yes Yes Yes Yes	 ✓ ✓ ✓ ✓		 Meshwa
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: Fifty thousand	✓		3 nos
	Underground Sump	Capacity:		.	No
Suggestions if any:					
C.	**Drainage Facility**				
	Available (Yes/ No)	Yes	✓		
Suggestions if any:					
D.	**Type of Drainage**				
	Closed/ Open				
	If Open than Pucca / Kutcheha				
	Whether drain water is discharged directly in to Water bodies/ Sewer plants				
Suggestions if any:					

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Techno Economic Survey

E.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Yes	✓		
	Main road	Yes	✓		
	Internal streets	Yes	✓		
	Nearest NH/SH/MDR/ODR Dist. in kms.	Yes	✓		NH (8 km)
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No			Near Karamsad (2.5km)
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes	✓		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)				All
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Yes			MGVCL More than 6 hrs
	Power supply for Domestic Use	Yes			MGVCL
	Power supply for Agricultural Use	Yes			
	Power supply for Commercial Use	Yes			
	Road/ Street Lights	Yes			

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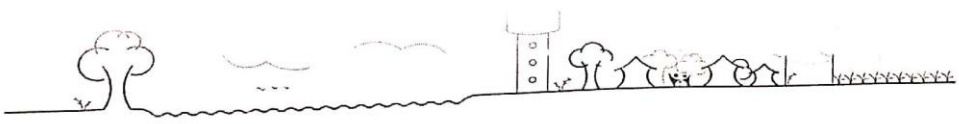
Vishwakarma Yojana: Phase VIII
Techno Economic Survey

E.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Yes	∟		
	Main road	Yes	∟		
	Internal streets	Yes	∟		
	Nearest NH/SH/MDR/ODR Dist. in kms.	Yes	∟		NH (8 km)
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No			Near Karamsad (2.5km)
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes	∟		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)				All
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Yes			MGVCL More than 6 hrs
	Power supply for Domestic Use	Yes			MGVCL
	Power supply for Agricultural Use	Yes			
	Power supply for Commercial Use	Yes			
	Road/ Street Lights	Yes			



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Techno Economic Survey

	Electrification in Government Buildings/ Schools/ Hospitals	Yes			
	Renewable Energy Source Facilities (Y/ N)	Yes			
	LED Facilities	Yes			
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks if available than Nos.	Yes			2 nos
	Location Condition	Good Good			
	Community Toilet (With bath/ without bath facilities)	Yes	✓		
	Solid & liquid waste Disposal system available	Yes	✓		
	Any facility for Waste collection from road				
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	Tube well			
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	10% kutchha			

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	Sub phc	✓		1 nos
	Private Clinic/Private Hospital/ Nursing Home	Yes	✓		2 nos
	If any of the above Facility is not available in village than approx. distance from village: ..8.....kms.				
Suggestions if any:					

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

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

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Gujarat Technological University, Ahmedabad, Gujarat

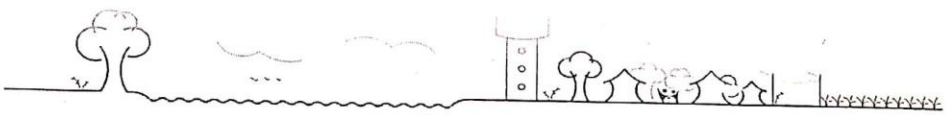
Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Condition:	Good			
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	No – –			
	Public Garden Location: Condition:	Yes			
	Village Pond Location: Condition:	Yes Good Good			
	Recreation Center Location: Condition:	Yes Good			Gym
	Cinema/ Video Hall Location: Condition:	–			
	Assembly Polling Station Location: Condition:	Yes Good Good			3 nos
	Birth & Death Registration Office Location: Condition:	Yes Good Good			Panchayat office.

If any of the above Facility is not available in village than approx. distance from village: ...8.....kms.

Suggestions if any:

N.	Other Facilities				
	Post-office	Yes	✓		
	Telecommunication Network/ STD booth	Yes		✓	



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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

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

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

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	Yes Soft copy

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Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VI
Techno Economic Survey

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

8. **Additional Information/ Requirement:**

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities(School Building, Health Center, Panchayat Building, Public Toilets & any other)	pond, Main drainage system	
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: rurban@gtu.edu.in

ગ્રામ પંચાયત ગાના તા.જી. આણંદ.

સરપંચ
ગ્રામ પંચાયત ગાના
તા.જી. આણંદ.
6/01/2021

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12.2 Survey form of Smart Village

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

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

Name of District:	Anand
Name of Taluka:	Petlad
Name of Village:	Dharmaj
Name of Institute:	Knowledge Institute of Tech. & Engg.
Nodal Officer Name & Contact Detail:	Prof. Divyesh Mandali
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Sarpanch (Deputy) Tusharbhai B. Patel
Date of Survey:	8-9-2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	10429	5380	5049	2232

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1444 Hectare / 22°25'0" North 72° 48'0" East
2.	Forest Area (In hect.)	13 Hect.
3.	Agricultural Land Area (In hect.)	1275 Hect.
4.	Residential Area (In hect.)	154.11 Hect
5.	Other Area (In hect.)	
6.	Distance to the nearest railway station (in kilometers):	In Village

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7.	Name of Nearest Town with Distance:	Petlad (12 km)
8.	Distance to the nearest bus station (in kilometers):	In Village
9.	Whether village is connected to all road for the any facility or town or City?	

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1. Self - employed 2. Job 3. Agricultural
Major crops grown in the village:	1. Tobacco 2. Wheat, rice 3. Vegetable

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	public Tap	✓		treated water
2.	**DUG WELL** Protected Well Un Protected Well	protected well	✓		
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring	protected spring	✓		
	Rainwater Tanker Truck Cart With Small Tank				
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel	Irrigation Channel	✓		
	Bottled Water Hand Pump				
	Other(Specify)**Lake/ Pond**	pond	✓		

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Suggestions if any:						
B.	**Water Tank Facility**					
	Overhead Tank	Capacity:	✓		3 nos. 1 Lakh litre	
	Underground Sump	Capacity:	–			
Suggestions if any:						
C.	**The Type of Drainage Facility**					
	A. UNDERGROUND DRAINAGE		✓		Good	
	1 Closed	Closed	✓			
	2 Open					
	B. OPEN WITH OUTLET	–				
	C. OPEN WITHOUT OUTLET	–				
Suggestions if any:						
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**					
	Village approach road	Bitumen	✓			
	Main road	R.C.C.	✓			
	Internal streets	R.C.C.	✓			
	Nearest NH/SH/MDR/ODR Dist. in kms.	MDR 1 km	✓			
Suggestions if any:						
E.	**Transport Facility**					
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	Yes	✓			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes	✓			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Yes	✓			
Suggestions if any:						
F.	**Electricity Distribution**					
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Govt.	✓		24 hrs	

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	Power supply for Domestic Use	24 hrs	✓		
	Power supply for Agricultural Use	8 hr	✓		
	Power supply for Commercial Use	24 hrs	✓		
	Road/ Street Lights	Yes	✓		LED Light
	Electrification in Government Buildings/ Schools/ Hospitals	Yes	✓		
	Renewable Energy Source Facilities (Y/ N)	Yes	✓		Solar Panel 5 to 01 light
	LED Facilities	Yes	✓		

Suggestions if any:

G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Yes	✓		3 nos
	Location Condition	Good			
	Community Toilet (With bath/ without bath facilities)	No			
	Solid & liquid waste Disposal system available	Yes	✓		
	Any facility for Waste collection from road	Yes	✓		

Suggestions if any:

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

Suggestions if any:

I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Total : 4123	✓		Kutcha :- 1200

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V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)		✓		5 Nos.
	Sub-Centre				
	PHC	Nearest (Dabhol)			
	BLOCK PHC				
	CHC/RH				
	District/ Govt. Hospital				
	Govt. Dispensary				
	Private Clinic	Yes	✓		3 nos
	Private Hospital/				
	Nursing Home				
	AYUSH Health Facility				Nearest (Pedadra)
	sonography /ultrasound facility				
	If any of the above Facility is not available in village than approx. distance from village: 6.....kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	Y	✓		5 nos
	Primary School	Y		✓	
	Secondary school	Y	✓		
	Higher sec. School	Y	✓		Private
	ITI college/ vocational Training Center	N			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	N			Nearest college (5km)

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Suggestions if any:

L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)	Good	Good	✓ (4)	
	Public Library (With daily newspaper supply: Y/N)	Good	Good	✓	
	Public Garden	Good	Good	✓	
	Village Pond	Good	Good	✓	
	Recreation Center	Good	Good	✓	(water Park)
	Cinema/ Video Hall	Good	Good	✓	
	Assembly Polling Station	Good	Good	✓	
	Birth & Death Registration	Good	Good	✓	(In Grum Panchayat)

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

Suggestions if any:

M.	Other Facilities	Condition	Location	Available (YES)	Available (NO)
	Post-office	Good	Good	✓	
	Telecommunication Network/ STD booth	—			✓
	General Market	Good	Good	✓	
	Shops (Public Distribution System)	Good	Good	✓	
	Panchayat Building	Good	Good	✓	
	Pharmacy/Medical Shop	Good	Good	✓	
	Bank & ATM Facility	Good	Good	✓	
	Agriculture Co-operative Society				✓
	Milk Co-operative Soc.	Good	Good	✓	
	Small Scale Industries	Good	Good	✓	
	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	Good	Good	✓	
	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	Good		✓	
	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)	Good		✓	
	12. Rajiv Gandhi National Drinking Water Mission				
	13. Swarnjayanti Gram Swarozgar Yojana	Good		✓	
	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)	Good		✓	
	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	25 % Solar	✓		
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	Yes Yes	✓ ✓		
3.	Any Other	—			

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy	Yes	✓		Soft copy
2.	Recent Projects going on for Development of Village	12th ongoing	✓		
3.	Any NGO working for village development				
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)	NO			

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

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1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other	Renovation	
2.	Additional Information/ Requirement		
3.	During the last six months how many times CLEANING .....Daily..... FOGGING.....Daily..... Drive was undertaken in the village?	Waste collection from D2D	Covid-19, Mosquito

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

Village Panchayat Dharmaj Ta. Petlad

Vice - Sarpanch
Village Panchayat, Dharmaj

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12.3 Survey form of Allocated Village

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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:	Anand
Name of Taluka:	Borsad
Name of Village:	Pamol
Name of Institute:	KITE, Bakrol
Nodal Officer Name & Contact Detail:	
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Harmukhbhai Chavda (Sarpanch)
Date of Survey:	

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	4804	2510	2294	950

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	648 Hector / Lat. : 22°26'38" N Long. : 72°56'42" E
2.	Forest Area (In hect.)	2 Hector
3.	Agricultural Land Area (In hect.)	578 Hector
4.	Residential Area (In hect.)	8 Hector
5.	Other Area (In hect.)	
6.	Distance to the nearest railway station (in kilometers):	Borsad (6.75 kms)

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7.	Name of Nearest Town with Distance:	Borsad (5KM)
8.	Distance to the nearest bus station (in kilometers):	In Village
9.	Whether village is connected to all road for the any facility or town or City?	

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1.	Agriculture
	2.	Job
	3.	Self employed

Major crops grown in the village:	1.	Tobacco
	2.	Banana
	3.	Vegetable

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
1.	**PIPED WATER**				
	Piped Into Dwelling	Yes	✓		
	Piped To Yard/Plot	No			
	Public Tap/Standpipe	No			
	Tube Well Or Bore Well	Yes			
2.	**DUG WELL**				50 Nos.
	Protected Well	–			
	Un Protected Well	–			
3.	**WATER FROM SPRING**				
	Protected Spring				
	Unprotected Spring	–			
	Rainwater				
	Tanker Truck				
	Cart With Small Tank				
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/**				
	Irrigation Channel	Yes			
	Bottled Water	–			
	Hand Pump	Yes		✓	

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	Other(Specify)Lake/ Pond				
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: 1 tank	Yes / No		treatments needed
	Underground Sump	Capacity:	No		
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A UNDERGROUND DRAINAGE 1	Yes	✓		
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Yes	✓		Bitumen
	Main road	Yes		✓	R.C.C.
	Internal streets	Yes	✓		Paver block
	Nearest NH/SH/MDR/ODR Dist. in kms.	Yes			SH (Nasad)
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	N			Borsad (6 km)
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes		✓	
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Yes	✓		All
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Yes	✓		MGVCL (More than 6 hrs)

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	Power supply for Domestic Use	Yes	✓		
	Power supply for Agricultural Use	Yes	✓		(8 hr)
	Power supply for Commercial Use	Yes	✓		
	Road/ Street Lights	Yes	✓		(LED/ bulb)
	Electrification in Government Buildings/ Schools/ Hospitals	Yes	✓		
	Renewable Energy Source Facilities (Y/ N)	Y			(5-7)
	LED Facilities	Yes			

Suggestions if any:

G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Yes		✓	4 nos
	Location Condition			✓	
	Community Toilet (With bath/ without bath facilities)	NO			
	Solid & liquid waste Disposal system available	Yes	✓		
	Any facility for Waste collection from road	-			

Suggestions if any:

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

Suggestions if any:

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

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V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)		✓		5 Nos.
	Sub-Centre				
	PHC	Nearest (Dabhol)			
	BLOCK PHC				
	CHC/RH				
	District/ Govt. Hospital				
	Govt. Dispensary				
	Private Clinic	Yes	✓		3 nos
	Private Hospital/				
	Nursing Home				
	AYUSH Health Facility				Nearest (Dedarda)
	sonography /ultrasound facility				
	If any of the above Facility is not available in village than approx. distance from village: 6.....kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	Y	✓		5 nos
	Primary School	Y		✓	
	Secondary school	Y	✓		
	Higher sec. School	Y	✓		Private
	ITI college/ vocational Training Center	N			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	N			Nearest college (5km)

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	If any of the above Facility is not available in village than approx. distance from village: ...6....kms.
Suggestions if any:	

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

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

Suggestions if any:

M.	Other Facilities	Condition	Location	Available (YES)	Available (NO)
	Post-office	Good	Good	✓	
	Telecommunication Network/ STD booth				✓
	General Market	Bad	Good	✓	
	Shops (Public Distribution System)	Good	Good	✓	
	Panchayat Building	Good	Good	✓	
	Pharmacy/Medical Shop	Bad	Bad	✓	
	Bank & ATM Facility	Good	Good	✓	(ATM :- No)
	Agriculture Co-operative Society				✓
	Milk Co-operative Soc.	Good	Good	✓	
	Small Scale Industries				✓
	Internet Cafes/ Common Service Center/Wi Fi				✓
	Youth Club				✓
	Mahila Mandal	Good	Good	✓	(5 Group)

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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	Good	Good	✓	✓ ✓ ✓ ✓
	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				NO
	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	N			
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	yes No	✓		Private
3.	Any Other	No			

VII. DATA COLLECTION FROM VILLAGE

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

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VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities,	Yes	Road
	School Building	yes	New
	Health Center	Yes	New
	Panchayat Building	No	Good condition
	Public Toilets & any other	Yes	New
2.	Additional Information/ Requirement		
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	Daily 10 times	(For covid-19)

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

સરપંચ
ગ્રામ પંચાયત, પામોલ
તા.બોરસદ, જી.આણંદ

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12.4 Gap Analysis of Allocated Village

VILLAGE GAP Analysis					
Village Facilities	**Planning Commission/UDPFI Norms**	**Village Name:**	Pamol		
		Population:			4804
		Existing	**Required as per Norms**	**Smart Village / Cities / Heritage Future Projection Design**	**Gap**
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	3	2	2	-1
Primary School	Each Per 2500 population	1	1	1	0
Secondary School	Per 7,500 population	1	1	1	0
Higher Secondary School	Per 15,000 Population	0	0	1	1
College	Per 125,000 Population	0	0	0	0
Tech. Training Institute	Per 100000 Population	0	0	1	1
Agriculture Research Centre	Per 100000 Population	0	0	0	0
Skill Development Center	Per 100000 Population	0	0	0	0
Health Facility					
Govt/Panchyat Dispensary or Sub PHC or Health Centre	Each Village	0	1	1	1
Primary Health & Child Health Center	Per 20,000 population	0	1	1	0
Child Welfare and Maternity Home	Per 10,000 population	0	0	0	0
Multispeciality Hospital	Per 100000 Population	0	0	0	0
Public Latrines	1 for 50 families (if toilet is not there in home, specially for slum pockets & kutcha house)	0	1	1	1
Physical Infrastructure Facilities					
Transportation	**Adequate / Inadequate**				Adequate
Pucca Village Approach Road	Each village				Inadequate
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)				Inadequate
Drinking Water (Minimum 70 lpcd)		**Adequate / Inadequate**			Adequate

Over Head Tank	1/3 of Total Demand				Adequate
U/G Sump	2/3 of Total Demand				
Drainage Network - Open		**Adequate / Inadequate**			Adequate
Drainage Network - Cover					
Waste Management System		**Adequate / Inadequate**			Adequate
Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	1	1	1	1
community hall and Public Library	Per 15000 Population	0	0	0	0
Cremation Ground	Per 20,000 population	0	0	0	0
Post Office	Per 10,000 population	1	1	1	0
Gram Panchayat Building	Each individual/group panchayat	1	1	1	0
APMC	Per 100000 Population	0	0	0	0
Fire Station	Per 100000 Population	0	1	1	1
Public Garden	Per village	0	0	0	0
Police post	Per 40,000Population	0	1	1	1
Shopping Mall					
Electrical Design					
Electricity Network		**Adequate / Inadequate**			
		Adequate			
Any Smart Village Facility					
Technology	NO				
		ESR cap	0		
		Sump cap	0		
		Lat	0		

Table 22 Gap Analysis of Allocated Village

12.5 Summary Details of All the Village Designs in Table Form

Pamol	
Anganwadi	In our allocated village there are two Anganwadi but it was far away. So the little children had trouble in going. The space provided was less than the number of children present there. So we decided to build an Anganwadi. Plan of Anganwadi is 9.75m x 3.81m (32'x12'6") and its approximate cost of public latrine block cost is about 2,36,000 INR.
Public Health Center	Pamol village doesn't have any type of health or medical facility. In emergency case the villagers don't have option of medical treatment. Villagers go to Borsad or Anand for all type of medical treatment. So, we decide to give design proposal of public health center, for basic medical treatment. Public health center having area 11.13m x 10.3m and it's approximate cost of the P.H.C. center is 5,14,800 INR.
Public Garden	In our village, there is no re-creational area. So, we decided to give design of public garden for where public spend their peaceful time with family. A public garden is an institution that maintains collections of plants for the purposes of public education and enjoyment, in addition to research, conservation, and higher learning. Approximate cost of public garden is 10,92,700 INR.
Public Toilet	In our village there is Public toilet is not in good condition, so we decided to give proposal of new Public toilet in our village. If bus and truck drivers on timed schedules have difficulty in accessing toilets, this puts them at risk of bladder and digestive health problems. Furthermore, if the concentration of a driver in urgent need is compromised, it becomes a broader public safety concern. Plan of public toilet is 4.34m x 4.45m (14'3" x 14'7") and its approximate cost of public toilet cost is about 1,54,500 INR.
Road	In our allocated village the internal streets are Stone roads and external roads are made up of Bitumen. In the rainy season roads gets clogged and people have to face very difficult for transporting from one place to another in the village. So, we decided to give a WBM road design. Approximate cost of Road of 1.2km is 13,57,000 INR.
Community Hall	In our village, Community hall is very old and it is in critical condition. So, villagers don't use the community hall. So, we decided to plan new design proposal of community hall. Approximate cost of new community hall is about 5,63,400 INR.

Dahemi	
ublic Library	In our allocated village there is no single library where villagers can read books and gain knowledge so we have provided library of 26' x 16' with estimated cost of Rs. 4,85,691/-
Public Toilet	There is a public toilet in our allocated village which is in very bad condition and can't be used at all. So, we redesigned a new public toilet of 20' x 15'having 4 toilets (2 for each i.e., gents and ladies) and 2 bathrooms (1 for each) with the estimated cost of Rs. 4,91,100/-.
WBM Road	In our allocated village there is a road which is in broken condition so we designed a WBM road with the approximate cost of Rs. 11,62,000 /-.
Market Yard	In our allocated village there is no market yard and villagers are using panchayat land for their kuccha shops. So, we designed a market yard on that land to replace kuccha shops with proper shops of 54'-6" x 21'-6" having 5 shops. Its estimated construction cost is Rs. 13,96,774/-.
Rain Water Harvesting System	For collection of rain water and decrease the surface run off of the rain we have designed a rain water harvesting system at an approximate cost of Rs. 43,100/-.
Drinking Water Point	We have provided design of drinking water point for our allocated village so that villagers can drink good water when outside the house. Its approximate cost is Rs. 70,450/-
Kasumbad	
Public Library	A public library is a library that is accessible by the general public and is usually funded from public sources, such as taxes. It is operated by librarians and library paraprofessionals, who are also civil servants. The public library is not available in our allocated village. So, we design public library for the readers who are fond of reading & wants to improve their knowledge also for students. In library, we provide a large reading hall, number of book shelves and also a computer room for reading e-books. The cost of the library is approx. 4.83 lakhs.
Public Toilet	A public toilet is a room or small building with toilets (or urinals) and sinks that does not belong to a particular household. Public toilets play a role in community health and individual well-being. Where toilets are available, people can enjoy outings and physical activities in their communities. Here, we give the AutoCAD design of public toilet. The cost of the toilet is approx. 5.08 lakhs.

Paver block	Roads are designed and built for primary use by vehicular and pedestrian traffic. The village has an interior road of R.C.C. but there is no street road is constructed. In the rainy season the road becomes muddy and the villagers who lives there are face difficulty to walk or passing with vehicle. So, we decided to construct a paver block road. we give the AutoCAD design of the road. The total length of road is 316m. The overall cost of this road is 5.21 lakh.
Primary School	In the village, there is a primary school which is in not good condition. Due to its condition the students and teachers are facing many problems so, we decided to reconstruct that school. We design the school with AutoCAD plan. In this design we provide classes with the capacity of 40 students. Also provide 5 large classrooms, principal's office, staff room, computer room, library etc. the school is design according to the Indian standard code IS:8827-1978. The approx. cost of school is 23 lakhs.
Public Garden	In our village, there is no re-creational area. So, we decided to give design of public garden for where villagers spend their peaceful time with family. Also, for a function like annual function of schools, family function. etc. The garden has children's play area, seating arrangement, drinking water, waterfall and large area of loan. Approximate cost of public garden is 5.70 lakhs.
Borewell Recharging	Rainwater harvesting is the storing of rainwater during the monsoon season for the purpose of using it during periods of water scarcity. So, we decided to give a design proposal for rain water recharge for the borewell. Approximate cost of rainwater recharging is about 35,000 Rs.

12.6 Summary of Good Photographs

Sr. No.	Picture	Sr. No.	Picture
1		2	
	Entrance Gate, Pamol		Milk Co-Operative Society, Pamol
3		4	
	Mask Distribution with Friends and village Sarpanch		Interaction with Pamol Sarpanch
5		6	
	Gram Panchayat, Pamol		Bank, Pamol

7		**8**	
	V.N. Patel Multipurpose School, Dharmaj		V.N. Vyayam Mandir, Dharmaj
9		**10**	
	Gram Panchayat, Dharmaj		Gram Panchayat, Gana
11		**12**	
	School, Gana		Community Hall, Pamol

Chapter. 13 From the Chapter- 9 future designs of the aspects (Feasibility, Construction, Operation and maintenance of various design options in Rural Areas along with cost with AutoCAD designs / Planning with any Software

13.1 Design Proposals

➢ The design proposals are:

- Rainwater Harvesting
- Drinking Water Point
- Market Yard
- Primary School
- Paver Block
- Public Library

13.1.1 Design Proposal of Rainwater Harvesting (With Plan, Section and Costing)

Rainwater harvesting is a sustainable process that helps in preserving water for future needs. Water scarcity is a major concern in today's scenario. The process of rainwater harvesting is a good way to conserve water.

Rainwater harvesting (RWH) is the collection and storage of rain, rather than allowing it to run off. Rainwater harvesting is one of the simplest and oldest methods of self-supply of water for households, and residential and household-scale projects, usually financed by the user.

In our allocated village there is no any rain water harvesting system is not available, rain water is flow on road and go to sewage. In the village we saw that the panchayat building is appropriate place and sufficient area is available to built rain water collection tank, and also need for drinking water point to panchayat members and around people who work there.

So, we decided to design rain water harvesting for public utility.

❖ The roof top area of Panchayat building is 50.5 sq.m.

Annual Rainfall in Borsad taluka = 600 mm (June to September)

Slab is Flat concrete slab, so efficient factor = 0.7

Therefor, Water availability (m^3) = 24000 liter or 24 m^3

(From IS 15797: 2008 Table:1)

❖ **Estimating the Size of the Required System:**

The size of the catchment area and tank should be enough to supply sufficient water for the users during the dry period. Assuming a full tank at the beginning of the dry season (and knowing the average length of the dry season and the average water use), the volume of the tank can be calculated by the following formula:

V= t x n x q (As per IS 15797: 2008 P. 7 clous:6.3)

V= 240 x 10 x 5

V= 12000 liter or 12 m^3

So, we design water tank for 12000 liter

IS 15797 : 2008

Table 1 Water Availability for a Given Roof Top Area and Rainfall (For Flat Roofs)

(*Clause* 5.1)

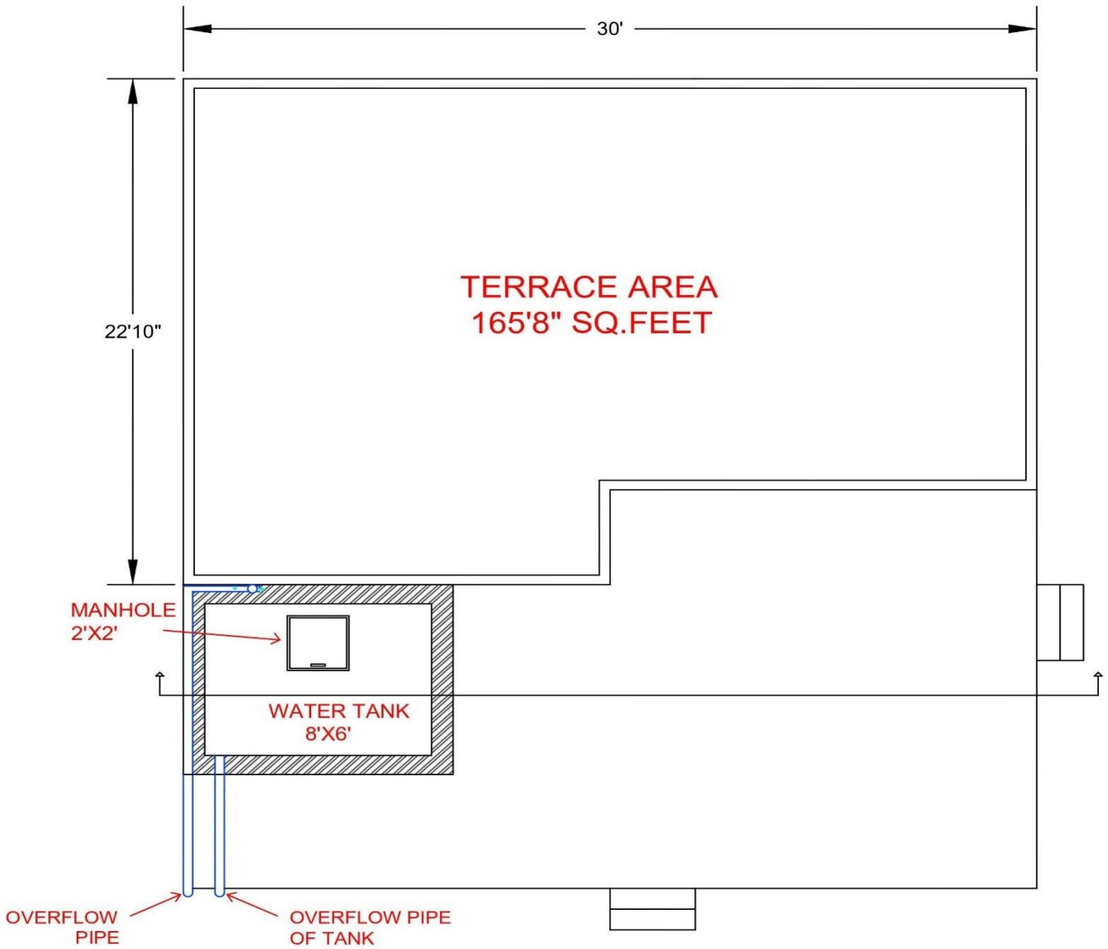
Sl No.	Roof Top Area m^2	Rainfall, mm												
		100	200	300	400	500	600	800	1 000	1 200	1 400	1 600	1 800	2 000
		Water availability (m^3)												
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
i)	20	1.6	3.2	4.8	6.4	8	9.6	12.8	16	19.2	22.4	25.6	28.8	32
ii)	30	2.4	4.8	7.2	9.6	12	14.4	19.2	24	28.8	33.6	38.4	43.2	48
iii)	40	3.2	6.4	9.6	12.8	16	19.2	25.6	32	38.4	44.8	51.2	57.6	64
iv)	50	4	8	12	16	20	24	32	40	48	56	64	72	80
v)	60	4.8	9.6	14.4	19.2	24	28.8	38.4	48	57.6	67.2	76.8	86.4	96
vi)	70	5.6	11.2	16.8	22.4	28	33.6	44.8	56	67.2	78.4	89.6	100.8	112
vii)	80	6.4	12.8	19.2	25.6	32	38.4	51.2	64	76.8	89.6	102.4	115.2	128
viii)	90	7.2	14.4	21.6	28.8	36	43.2	57.6	72	86.4	100.8	115.2	129.6	144
ix)	100	8	16	24	32	40	48	64	80	96	112	128	144	160
x)	150	12	24	36	48	60	72	96	120	144	168	192	216	240
xi)	200	16	32	48	64	80	96	128	160	192	224	256	288	320
xii)	250	20	40	60	80	100	120	160	200	240	280	320	360	400
xiii)	300	24	48	72	96	120	144	192	240	288	336	384	432	480
xiv)	400	32	64	96	128	160	192	256	320	384	448	512	576	640
xv)	500	40	80	120	160	200	240	320	400	480	560	640	720	800
xvi)	1 000	80	160	240	320	400	480	640	800	960	1 120	1 280	1 440	1 600
xvii)	2 000	160	320	480	640	800	960	1 280	1 600	1 920	2 240	2 560	2 880	3 200
xviii)	3 000	240	480	720	960	1 200	1 440	1 920	2 400	2 880	3 360	3 840	4 320	4 800

Figure 59 Table for finding water availability

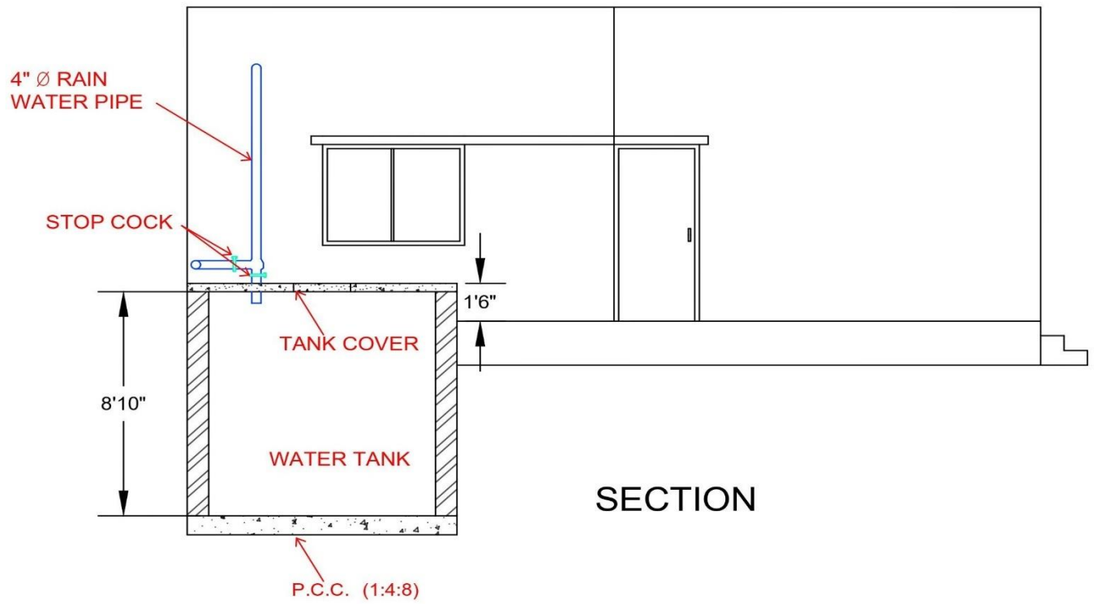
The Size of tank is L = 2.42m, B = 1.83m, H = 2.7m

Design of Rainwater Harvesting in Existing Panchayat Building with Plan, Section, Estimating and Approximate Costing given in below.

Figure 60 Photograph of Panchayat Building



TERRACE PLAN



SECTION

Design Proposal of Rainwater Harvesting (With Plan and Section)

INSTITUTE NAME	KNOWLEDGE INSTITUTE OF TECH. & ENGG.
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
PROJECT	VISHWAKARMA YOJANA
DRAWING NAME	RAIN WATER HARVESTING
GUIDED BY	PROF. DIVYESH MANDALI
PREPARED BY	MUSTAKIM I. MEMON
	ANIK A. VAHORA

Figure 61 Plan and Section of Panchayat Building for Rainwater Harvesting

Abstract Sheet						
Item no	**Item description**	**Qty.**	**Unit**	**Rate (Rs.)**	**Per**	**Amount (Rs.)**
1	Excavation for tank	16.95	m3	100	m3	1695
2	P.C.C. (1:4:8) foundation	1.51	m3	3596	m3	5430
3	Brick masonry	4.7	m3	3713	m3	17451
4	Tank Cover	0.64	m3	9520	m3	6093
5	Plaster	32	m2	145	m2	4640
6	100 mm dia. PVC Pipe	10	m	90	m	900
7	PVC Tee	1	Nos.	48	Nos.	48
8	PVC Elbow	4	Nos.	67	Nos.	268
9	Stopping Cock	2	Nos.	115	Nos.	230
10	PVC Solution	2	Nos.	215	Nos.	430
						37185
						Say Total INR 37500/-

Table 23 Approximate Costing of Rainwater Harvesting

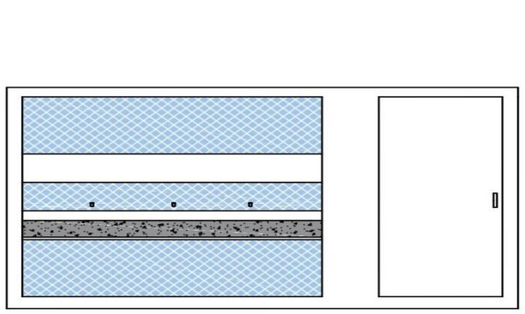
13.1.2 Design Proposal of Drinking Water Point (With Plan, Elevation, Section, and Costing)

Water is connected to every forms of life on earth. As a criteria, an adequate, reliable, clean, accessible, acceptable and safe drinking water supply has to be available for various users.

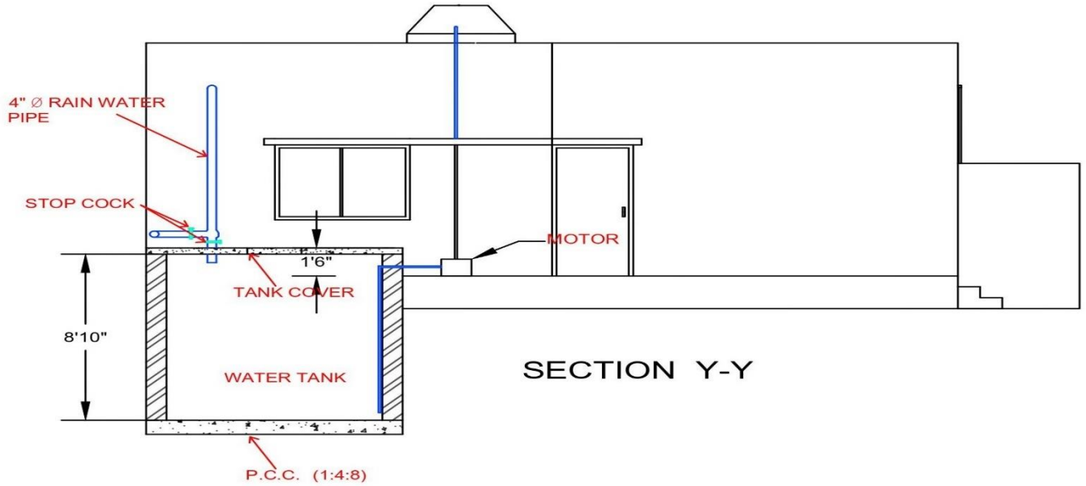
The United Nation (UN) and other countries declared access to safe drinking water as a fundamental human right, and an essential step towards improving living standards. It is provide safe and good quality water to villagers in summer. In certain cases, schemes to augment village drinking water sources are planned to make them capable of supplying water during summer months.

This facility is not available in Pamol village.

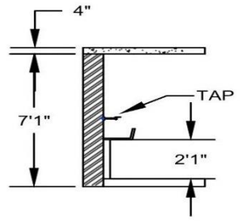
Pure water flushes out toxins, improves your complexion, relieves headaches, promotes weight loss, and aids in digestion. So, when your water is of poor quality, your mind and body can't function properly. Design of Drinking Water Point with Plan, Elevation and Section given in below.



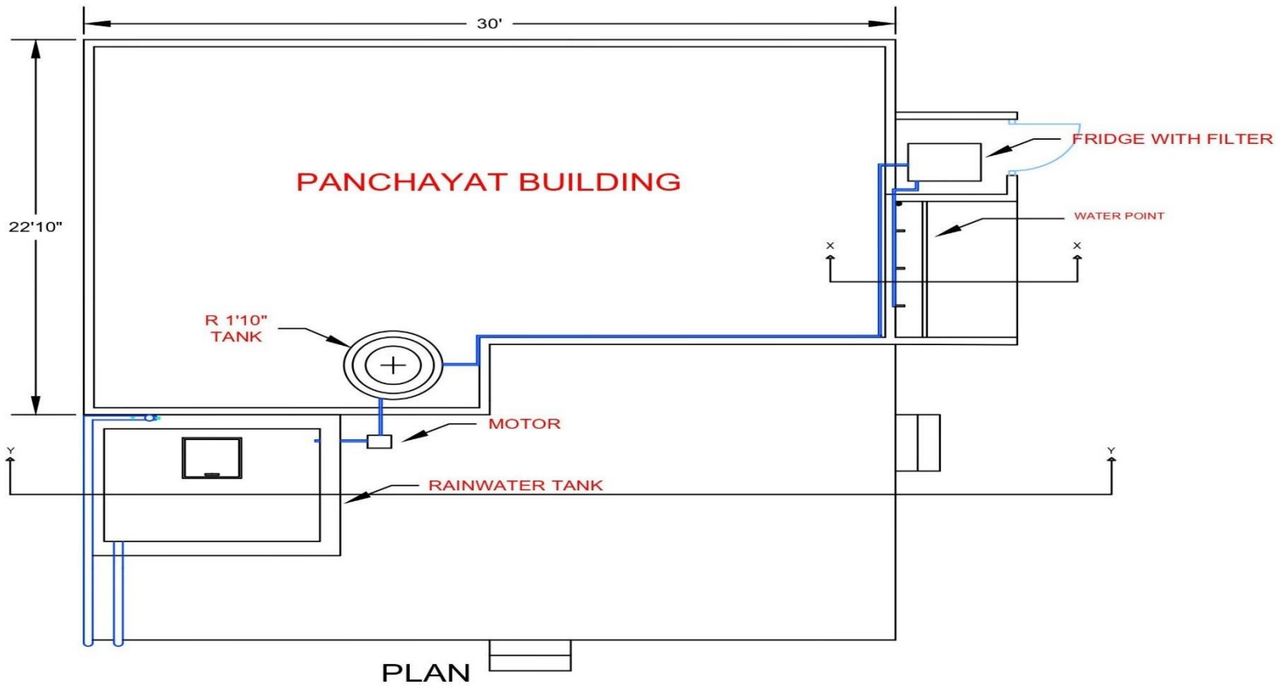
ELEVATION



SECTION Y-Y



SECTION X-X



PLAN

Design Proposal of Drinking Water Point (With Plan, Elevation and Section)

INSTITUTE NAME	KNOWLEDGE INSTITUTE OF TECH. & ENGG.
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
PROJECT	VISHWAKARMA YOJANA
DRAWING NAME	DRINKING WATER POINT
GUIDED BY	PROF. DIVYESH MANDALI
PREPARED BY	MUSTAKIM I. MEMON
	ANIK A. VAHORA

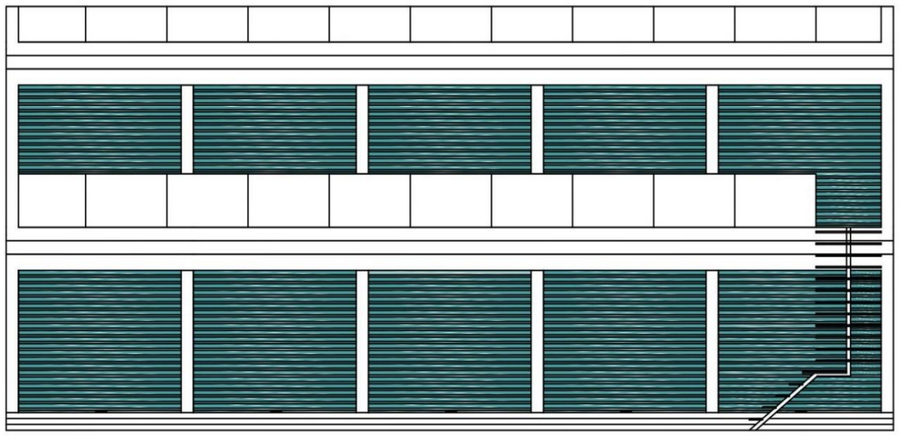
Figure 62 Plan, Elevation and Section of Drinking Water Point

Abstract Sheet						
Item no	**Item description**	**Qty.**	**Unit**	**Rate (Rs.)**	**Per**	**Amount (Rs.)**
1	Fridge with filter	1	Nos.	35000	Nos.	35000
2	Basin for water tap	1	Nos.	4000	Nos.	4000
3	P.C.C. (1:4:8)	1.51	m3	3596	m3	5430
4	Brick masonry	0.77	m3	3713	m3	2859
5	Slab	0.51	m3	9520	m3	4855
6	Plaster	18.6	m2	145	m2	2697
7	Plastic Water tank (1000 litre)	1	Nos.	5400	Nos.	5400
8	Motor	1	Nos.	3300	Nos.	3300
9	100 mm dia. PVC Pipe	14.5	m	90	m	1305
10	Water Tap	4	Nos.	200	Nos.	800
11	PVC Elbow	2	Nos.	67	Nos.	134
12	Stopping Cock	1	Nos.	115	Nos.	115
13	PVC Solution	2	Nos.	215	Nos.	430
						66325
						Say Total INR 66500/-

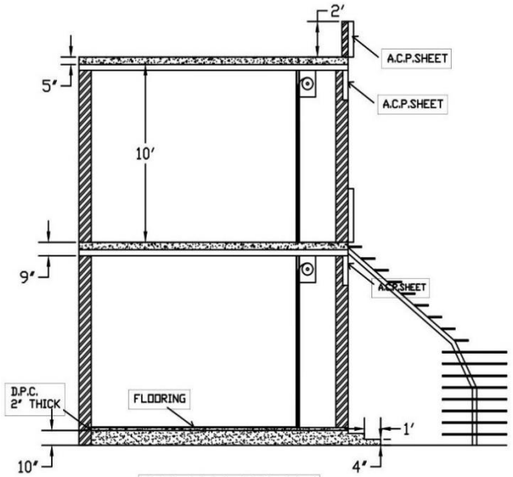
Table 24 Approximate Costing of Drinking Water Point

13.1.3 Design Proposal of Market Yard (With Plan, Elevation, Section, Estimate and Costing)

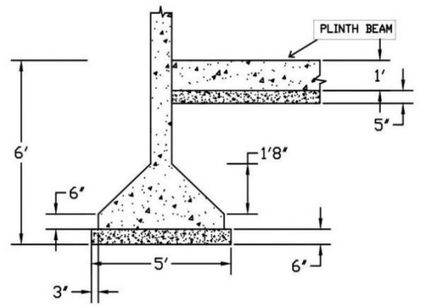
- A market yard or agricultural mandi is a place where all marketing activities are performed such as assembling, sale and purchase, grading, storage, banking, etc.
- In our allocated village some streets are outside and far away from the village, so people living there had facing difficulty in buying the necessity of life.
- So, we decided to build a Market Yard in centre of the village so all the villagers have easy to reach there.
- So, we decided to build a Market Yard for utility of villagers to buy things without going outside the village.
- Design of Market Yard with Plan, Elevation and Section given in below. Approximate cost of new Market Yard is about **6,75,000 INR**.



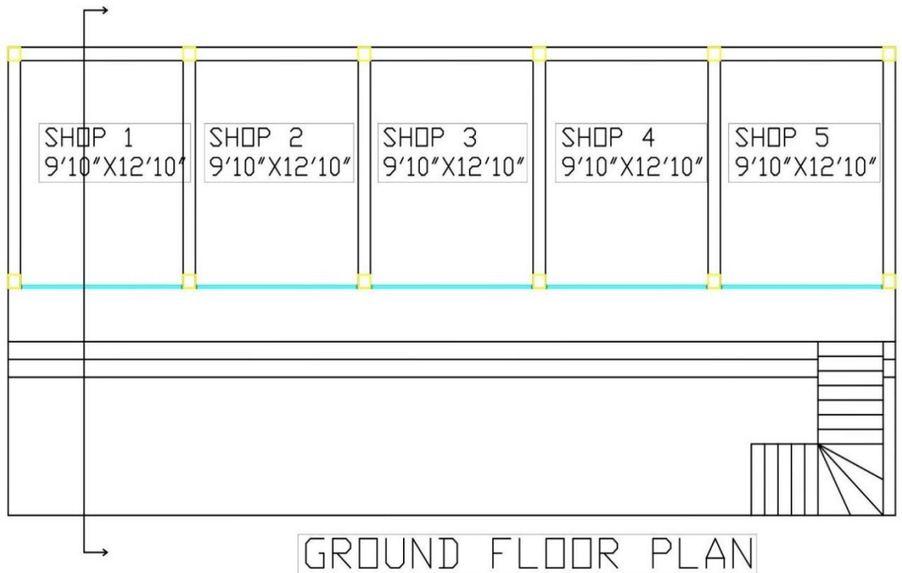
ELEVATION



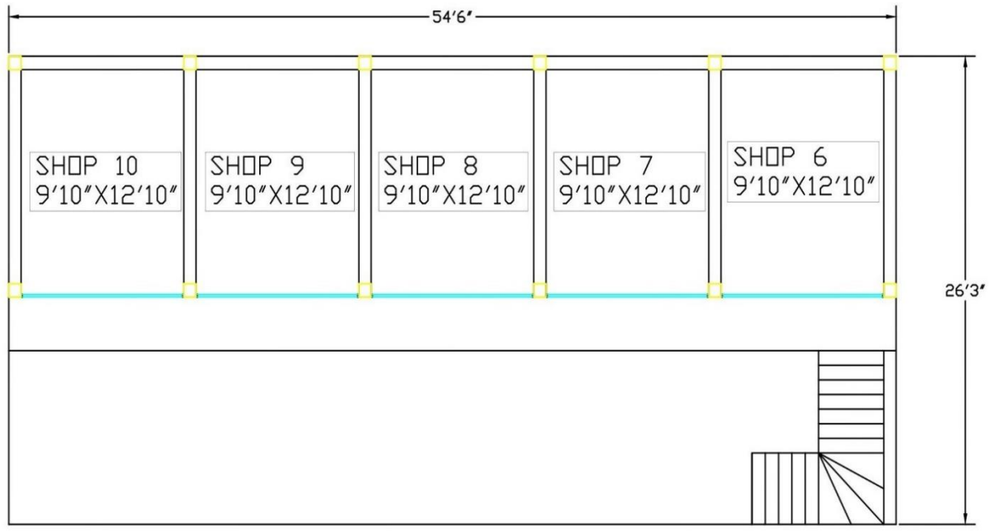
SECTION



FOUNDATION DETAIL



GROUND FLOOR PLAN

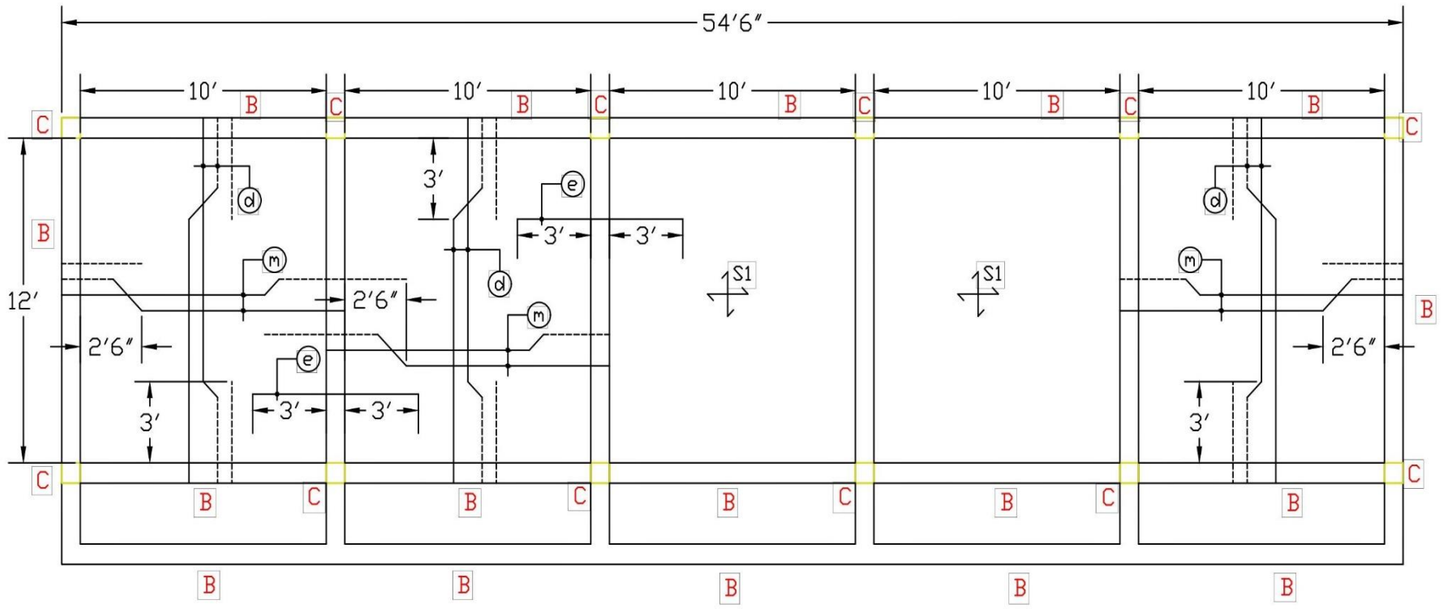


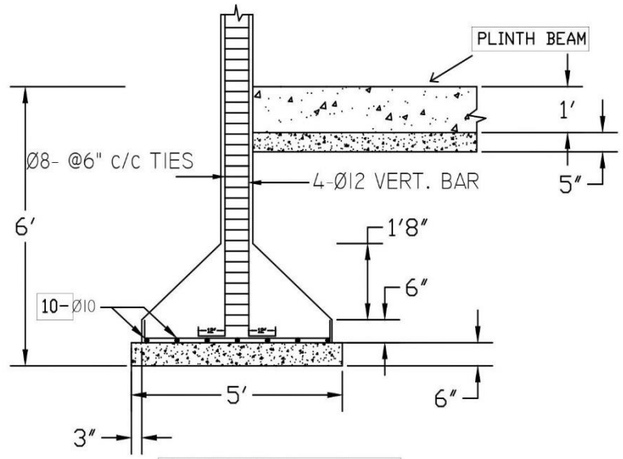
FIRST FLOOR PLAN

Design Proposal of Market Yard (With Plan, Elevation and Section)

INSTITUTE NAME	KNOWLEDGE INSTITUTE OF TECH. & ENGG.
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
PROJECT	VISHWAKARMA YOJANA
DRAWING NAME	MARKET YARD
GUIDED BY	PROF. DIVYESH MANDALI
PREPARED BY	MUSTAKIM I. MEMON
	ANIK A. VAHORA

Figure 63 Plan, Elevation and Section of Market Yard

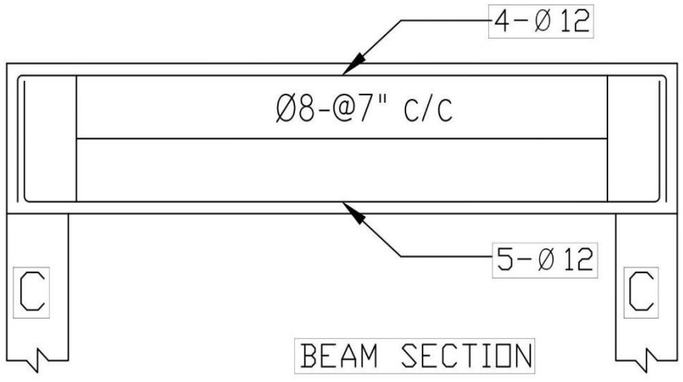




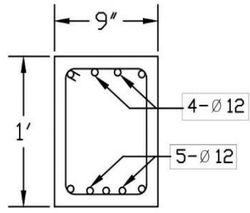
SECTION c'-c'

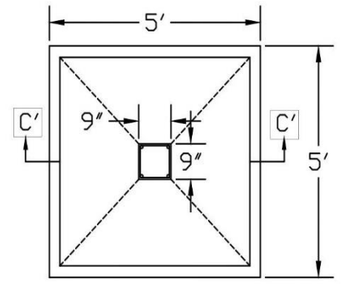
SLAB MARK	SLAB THICK	MAIN STEEL m	DIST. STEEL d	EXT. TOP e	REMARK
S1	0'-5"	Ø10-@7" C/C	Ø10-@7" C/C	Ø8-@7" C/C	TWO WAY SLAB

SLAB SCHEDULE



BEAM SECTION





COLUMN FOOTING

INSTITUTE NAME	KNOWLEDGE INSTITUTE OF TECH. & ENGG.
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
PROJECT	VISHWAKARMA YOJANA
DRAWING NAME	MARKET YARD STRUCTURE DETAIL
GUIDED BY	PROF. DIVYESH MANDALI
PREPARED BY	MUSTAKIM I. MEMON
	ANIK A. VAHORA

Figure 64 Structure Details of Market Yard

Measurement Sheet						
Item no	**Item description**	**No.**	**L**	**W**	**H**	**Quantity**
			(m)	**(m)**	**(m)**	**(m^3)**
1	Excavation for foundation	12	1	1	1.22	**14.63**
2	P.C.C. (1:4:8) foundation	12	1	1	0.076	**0.91**
3	Footing	12	0.914	0.914	0.229	**2.30**
4	Earth Filling	1	15.25	4.8	0.3	21.96
						39.80
5	Brick Steps for Main Entry					
	Step 1	1	16.62	1.52	0.101	2.55
	Step 2	1	16.62	1.22	0.101	2.05
	Step 3	1	16.62	0.91	0.101	1.53
	Net brick steps					**6.13**
6	Brick masonry above plinth to slab					
	0.23m thick wall	2	41.34	0.229	2.94	27.83
	Deduction for Column	24	0.229	0.229	6.33	-7.97
	Deduction for lintel	2	41.34	0.229	0.0706	-1.34
	Net brick masonry					**18.53**
7	R.C.C. Work					
	Slab	2	16.62	5.03	0.127	21.23
	Column					
	C1 (Column 1)	12	0.23	0.23	6.33	4.02
	Beam					
	B1 (Plinth Beam)	1	41.34	0.23	0.3	2.89
	B2 (Beam 2)	6	15.24	0.23	0.3	6.31
	B3 (Beam 3)	12	5.03	0.23	0.3	4.15
	Coping	1	41.34	0.23	0.1	0.95
						39.57
			(m)	**(m)**	**(m)**	**(m)**
8	Plaster					
	Inside	2	54.15		2.94	318.40
	Outside	2	1.38		2.94	8.11
	Parapet	1	26.68		0.914	24.39
						350.90
9	Flooring	2	15.25	4.8		**146.40**
10	Color					
	Inside & Outside	2	70.77		2.94	**416.13**

Table 25 Approximate Estimate of Market Yard

Abstract Sheet						
Item no	**Item description**	**Qty.**	**Unit**	**Rate (Rs.)**	**Per**	**Amount (Rs.)**
1	Excavation	14.63	m^3	100	m^3	1463
2	P.C.C. (1:4:8)	0.91	m^3	3596	m^3	3272.36
3	Footing	2.3	m^3	9520	m^3	21896
4	Earth filling	21.96	m^3	50	m^3	1098
5	Brick masonry	30.02	m^3	3713	m^3	111464.26
6	R.C.C. Work	39.57	m^3	9520	m^3	376706.4
8	Plaster	350.9	m^2	145	m^2	50880.5
9	Flooring	146.4	m^2	425	m^2	62220
10	Paint	416.13	m^2	33.5	m^2	13940.355
11	A.C.P. sheet	51.74	m^2	700	m^2	36218
12	Mild Steel Staircase	1	Nos.	8000	Nos.	8000
						673218.52
						Say Total INR 6,75,000/-

Table 26 Approximate Costing of Market Yard

13.1.4 Design Proposal of Primary School (With Plan, Elevation, Section, Estimate and Costing)

- When we visited the school, we observe that the school is in very bad conditions and lack of some facilities in school.
- In front of gov. school one private school is there, in the private school the facilities are more provided as compared to gov. primary school.
- Facilities like, Computer room and projectors.
- Due to lack of facilities in gov. primary school the students are studying over there have inadequate knowledge.
- So, we decided to built the new school on the same place.
- Existing total plot area of the school is 3500 m^2 and built-up area of school building is 500 m^2.
- Also, we consider existing built-up area of school for our new proposal school building.
- So, we decided to plan new design proposal of Primary School. Design of Primary School with Plan, Elevation and Section given in below. Approximate cost of new community hall is about **32,00,000 INR**.

Figure 65 Existing School Building Photographs

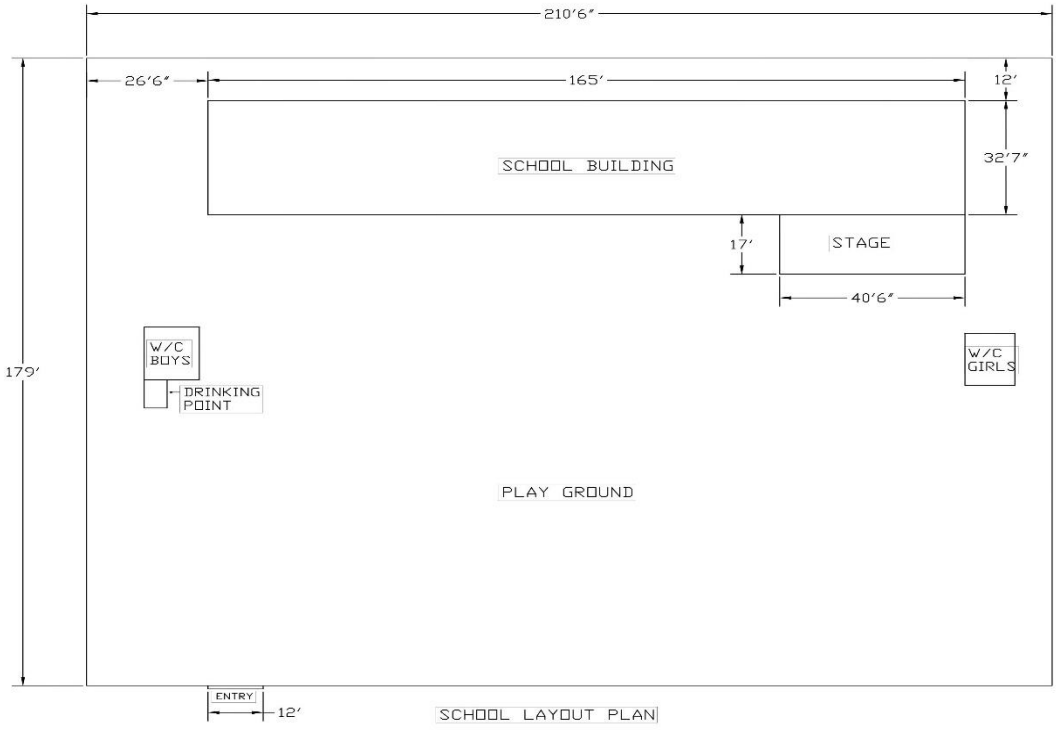


Figure 66 Layout of Existing School

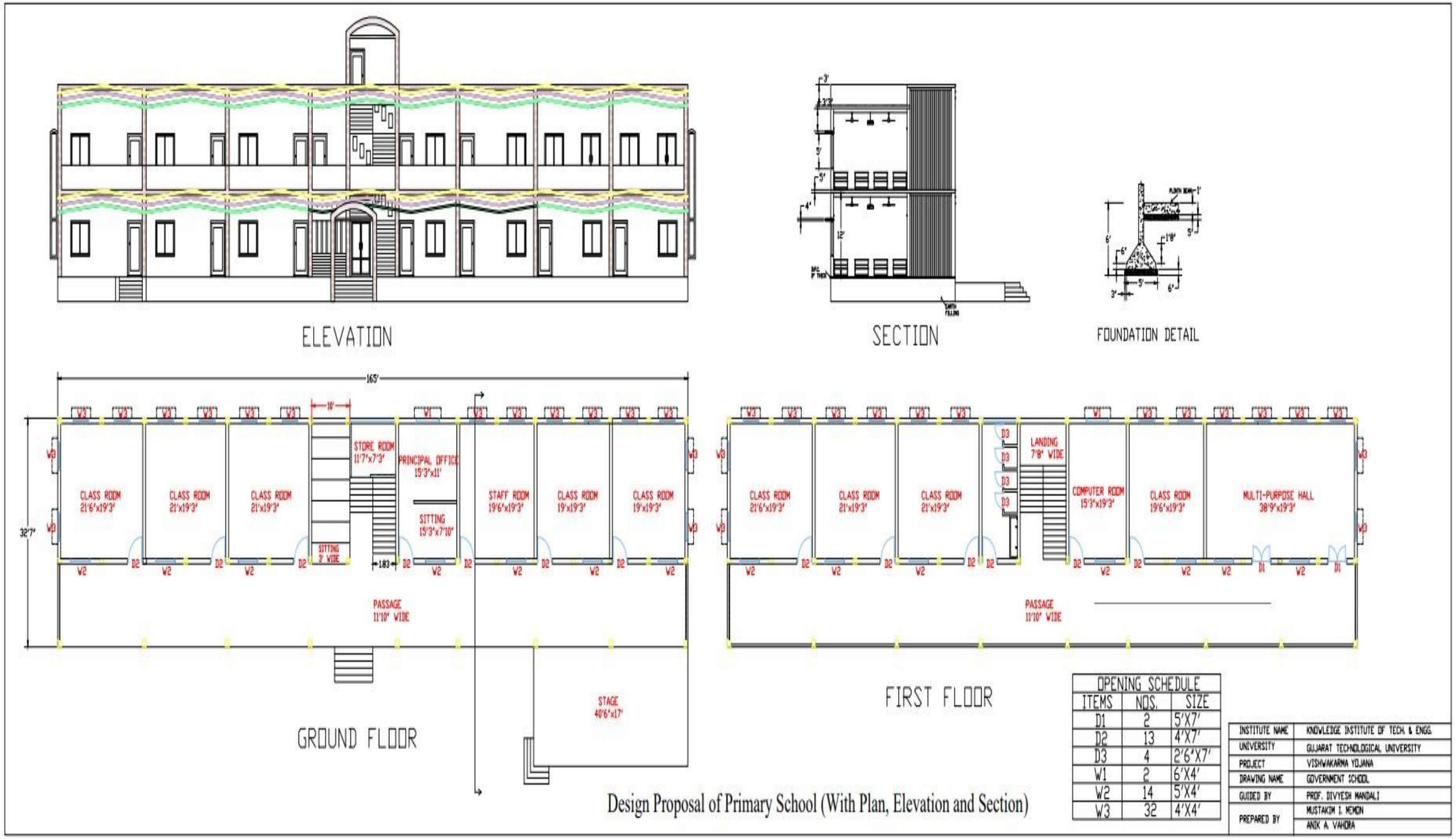


Figure 67 Plan, Elevation and Section of Primary School

Measurement Sheet						
Item no	**Item description**	**No.**	**L**	**W**	**H**	**Quantity**
			(m)	**(m)**	**(m)**	**(m^3)**
1	Excavation for foundation	43	1	1	1.22	**52.42**
2	P.C.C. (1:4:8) foundation	43	1	1	0.076	**3.27**
3	Footing	43	0.914	0.914	0.229	**8.23**
4	Earth Filling					
	For School Building	1	48.45	9.47	1.06	486.35
	For Stage	1	12	5	1.06	63.60
						549.95
5	Brick Masonry G.L to Plinth	1	207.56	0.23	0.66	31.51
	Brick Steps for Main Entry					
	Step 1	1	3.05	1.52	0.178	0.83
	Step 2	1	3.05	1.22	0.178	0.66
	Step 3	1	3.05	0.91	0.178	0.49
	Step 4	1	3.05	0.61	0.178	0.33
	Step 5	1	3.05	0.3	0.178	0.16
						1.49
	Brick Steps for Stage					
	Step 1	1	3.96	0.76	0.2	0.60
	Step 2	1	3.46	0.51	0.2	0.35
	Step 3	1	2.94	0.38	0.2	0.22
						1.18
	Net brick steps					**34.17**
6	Brick masonry above plinth to slab					
	0.23m thick wall	2	153.4	0.229	3.56	125.06
	Deduction for door & ventilation					
	D1	15	1.22	0.229	2.44	10.23
	D2	1	1.52	0.229	2.44	0.85
	W1	32	1.22	0.229	1.52	13.59
	W2	14	1.52	0.229	1.52	7.41
	W3	2	1.83	0.229	1.52	1.27
	V	2	2.67	0.229	0.61	0.75
						-34.09
	Deduction for Column	32	0.304	0.229	7.44	-16.57
	Deduction for lintel	2	153.4	0.229	0.0706	-4.96
	Net brick masonry					**69.43**

7	R.C.C. Work					
	Slab	2	50.3	10	0.127	127.76
	Staircase					
	Waist Slab	2	5.96	1.83	0.15	3.27
	Landing	2	3.66	2.5	0.15	2.75
	Steps	38	1.83	0.09	0.15	0.94
						6.96
	Column					
	C1 (Column 1)	9	0.304	0.304	8.36	6.95
	C2 (Column 2)	32	0.304	0.23	8.36	18.70
	C3 (Column 3)	2	0.229	0.229	3.78	0.40
	Beam					
	B1 (Plinth Beam)	1	207.56	0.23	0.3	14.51
	B2 (Beam 2)	6	45	0.23	0.3	18.63
	B3 (Beam 3)	18	5.87	0.23	0.3	7.29
	B4 (Beam 4)	18	3.3	0.23	0.23	3.14
	Coping	1	207.56	0.23	0.1	4.77
						209.12
8	Parapet	1	113	0.23	0.609	**15.83**
			(m)	**(m)**	**(m)**	**(m)**
9	Plaster					
	Inside	2	180.38		3.66	1320.38
	Outside	2	58		3.66	424.56
	Parapet	2	113		0.609	137.63
						1882.58
10	Flooring	1	48.45	9.47		**458.82**
11	Colour					
	Inside & Outside	2	238.38		3.66	1744.94
	Parapet	1	113		0.609	68.82
						1813.76

Table 27 Approximate Estimate of Primary School

Abstract Sheet						
Item no	**Item description**	**Qty.**	**Unit**	**Rate (Rs.)**	**Per**	**Amount (Rs.)**
1	Excavation	52.42	m^3	100	m^3	5242
2	P.C.C. (1:4:8)	3.27	m3	3596	m3	11758.92
3	Footing	8.23	m3	9520	m3	78349.6
4	Earth filling	550	m3	50	m3	27500
5	Brick masonry in super structure	103.6	m3	3713	m3	384666.8
6	R.C.C. Work	209.12	m3	9520	m3	1990822.4
7	Parapet	15.83	m3	3713	m3	58776.79
8	Plaster	1882.58	m2	145	m2	272974.1
9	Flooring	458.82	m2	425	m2	194998.5
10	paint	1813.76	m2	33.5	m2	60760.96
11	Stainless Steel Angles	735.21	kg	140	kg	102929.4
						3188779.5
						Say Total INR 3200000/-

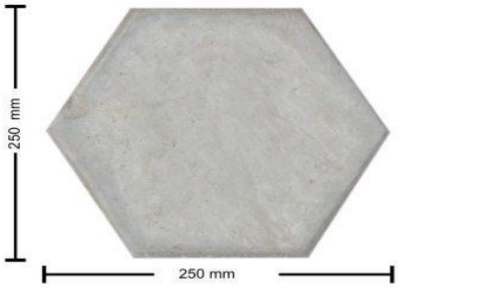
Table 28 Approximate Costing of Primary School

13.1.5 Design Proposal of Paver Block (With Plan, Section, Estimate and Costing)

- Paver blocks do not need special maintenance as compared to concrete or asphalt surfaces. A simple water washing can help keep the blocks clean and bright.
- Paver blocks are very durable, and if they are adequately interlocked, they can easily last for about 20 years. Paver blocks can withstand hefty vehicular load as well.
- In our allocated village many of societies of village have paver block and R.C.C road is made, but after visiting the village we saw some societies where roads are in very bad condition. So, we decided to made paver block road.
- We have decided to use 60 mm thickness paver block for residential streets.

  (As per IRC: SP:63-2004, P. 9)
- So, we have referred section for 60mm block from IRC:63-2004.
- The residential street area is 586.36 m^2.
- 1 m2 area = 14.5 Nos. Blocks
- Design of Paver Block with Plan, Elevation, Section, Estimate and App. Costing given in below. So, 586.36 m^2 area = 8502 Nos. Blocks are required.

Figure 70 Existing society road photograph



Technical Data	L (mm)	B (mm)	H (mm)	Unit/Area Sq.ft	Unit/sq.ft	Units/m2
ECO/EP/012	250	250	40-80	0.69	1.11	14.49

Figure 69 Size and Shape of Paver Block

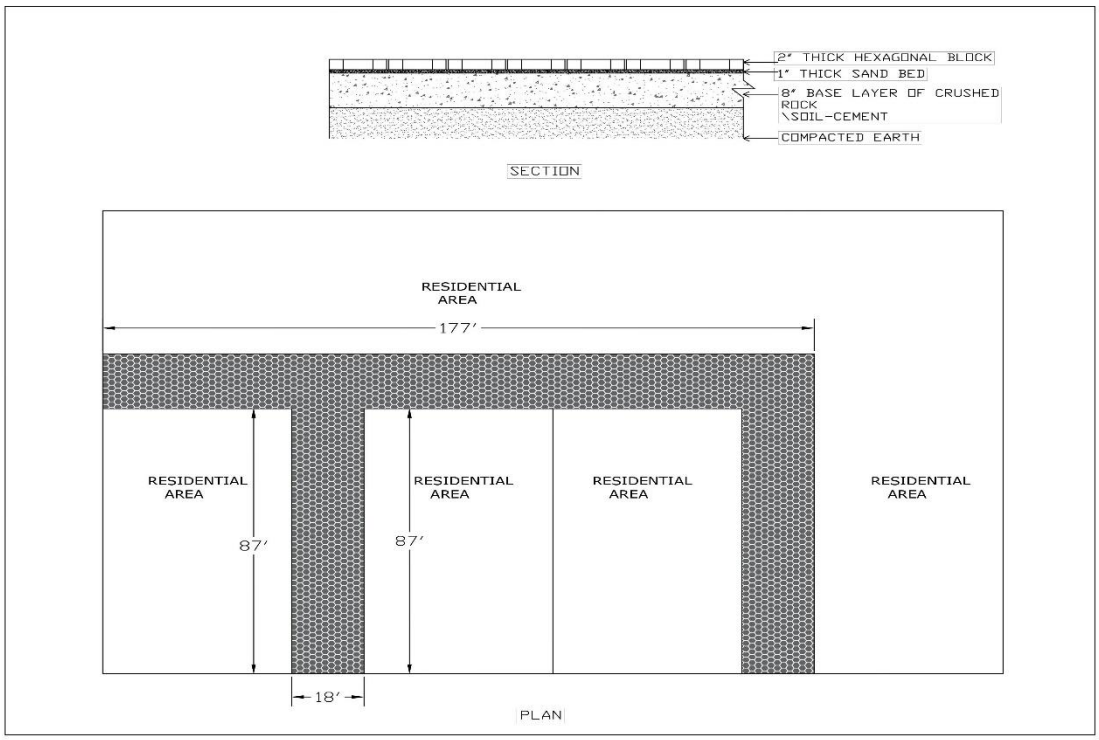


Figure 68 Plan and Section of Paver Block

Measurement Sheet							
Item no	Item description	No.	L	W	H	Quantity	Unit
			(m)	(m)	(m)		
1	Subgrade	1	107	5.48	-	586.36	m^2
2	Base layer	1	107	5.48	0.2	117.27	m^3
3	Sand Bed	1	107	5.48	0.03	17.59	m^3
4	Block Layer	1	107	5.48	-	586.36	m^2

Table 29 Approximate Estimate of Paver Block

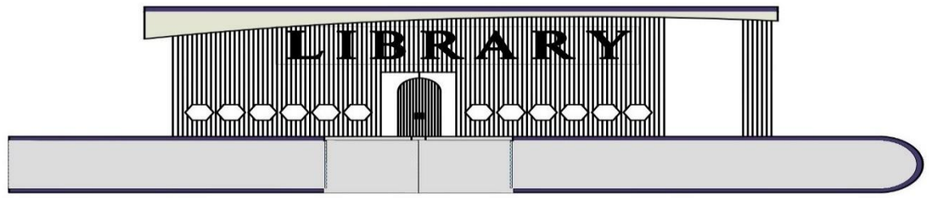
Abstract Sheet						
Item no	Item description	Qty.	Unit	Rate	Per	Amount
				(Rs.)		(Rs.)
1	Subgrade	586.36	m2	20	m2	11727.2
2	Base layer	117.27	m3	480	m3	56289.6
3	Sand Bed	17.6	m3	900	m3	15840
4	Block Layer	586.36	m2	375	m2	219885
						303741.8
						Say Total INR 303800/-

Table 30 Approximate Costing of Paver Block

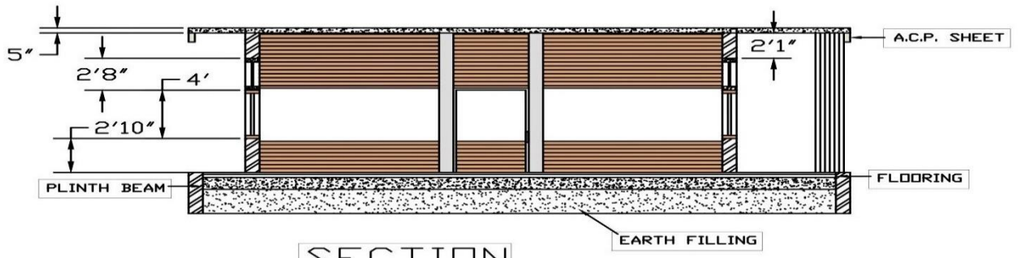
13.1.6 Design Proposal of Public Library (With Plan, Elevation, Section, Estimate and Costing)

Public libraries are constantly serving community functions and are performing various important roles in educational, economic, political, social and cultural development of the country. Information, as the most important instrument that lead to explosive growth of knowledge and the direct relation of information to developments in all walks of human life have elevated the role of Public libraries in our society.

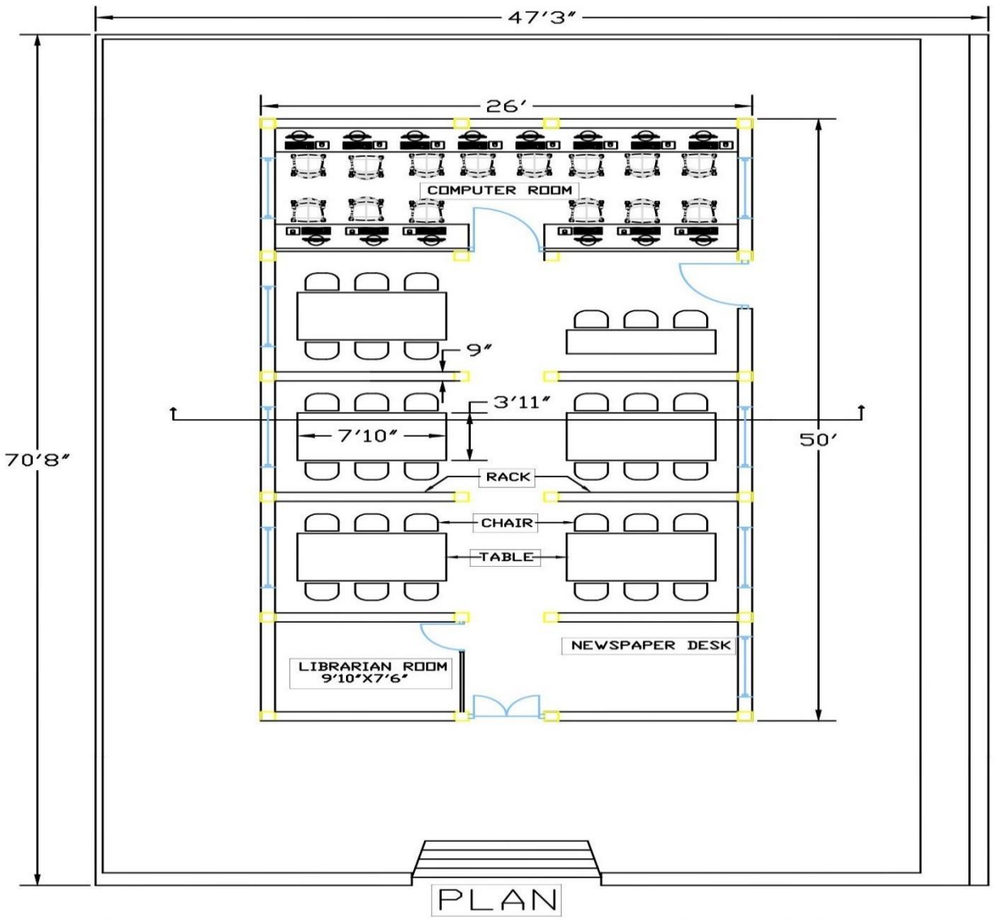
- To provide curriculum books and to promote educational, research, cultural, recreational and informational requirements of students, teachers, researchers and general users.
- To promote reading habits among students and people
- To promote effective use of library, user education / orientation of students.
- Collection and organization of relevant documents recorded in various print and non-print media.
- Design of Public Library with Plan, Elevation, Section, Estimate and App. Costing given in below. Approximate cost of new Public Library is about **11,53,000 INR**.



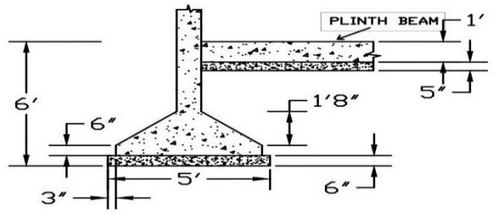
ELEVATION



SECTION



PLAN



FOUNDATION DETAIL

OPENING SCHEDULE		
ITEMS	NOS.	SIZE
D	3	4′X7′
W	8	5′X4′
V	8	5′5″X2′8″

INSTITUTE NAME	KNOWLEDGE INSTITUTE OF TECH. & ENGG.
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
PROJECT	VISHWAKARMA YOJANA
DRAWING NAME	PUBLIC LIBRARY
GUIDED BY	PROF. DIVYESH MANDALI
PREPARED BY	MUSTAKIM I. MEMON ANIK A. VAHORA

Design Proposal of Public Library (With Plan, Elevation and Section)

Figure 71 Plan, Elevation and Section of Public Library

We have used Revit software for 3D design of Library. Which is given below. And its plan and measurements are drawn in the above AutoCAD. For better and good view of 3D design we used real material which is available in Anand district.

Figure 72 3D View of Library

Figure 73 3D View of Computer Room in Library

Measurement Sheet						
Item no	**Item description**	**No.**	**L**	**W**	**H**	**Quantity**
			(m)	**(m)**	**(m)**	**(m^3)**
1	Excavation for foundation	24	1.52	1.52	1.83	**101.47**
2	P.C.C. (1:4:8) foundation	24	1.52	1.52	0.15	**8.32**
3	Footing	24	1.37	1.37	0.15	**6.76**
4	Earth Filling	1	14.39	21.54	0.91	282.06
	Deduction for Column	24	0.23	0.23	0.91	-1.16
						280.91
5	Brick Masonry G.L to Plinth	1	39.3	0.23	1.04	9.40
	Brick Steps for Main Entry					
	Step 1	1	3.05	0.92	0.178	0.50
	Step 2	1	3.05	0.69	0.178	0.37
	Step 3	1	3.05	0.46	0.178	0.25
	Step 4	1	3.05	0.23	0.178	0.12
						0.87
	Net brick steps					**10.27**
6	Brick masonry above plinth to slab					
	0.23m thick wall	1	46.32	0.229	3.53	37.44
	Deduction for door & ventilation					
	D1	2	1.22	0.229	2.44	1.36
	D2	1	0.76	0.229	2.44	0.42
	W	8	1.52	0.229	1.22	3.40
	V	8	1.65	0.229	0.82	2.48
						-7.66
	Deduction for Column	24	0.23	0.23	3.53	-4.48
	Deduction for lintel	1	46.32	0.229	0.0706	-0.75
	Net brick masonry					**24.55**
7	R.C.C. Work					
	Slab	1	10.52	16.61	0.127	22.19
	Deduction for gap	1	1.22	11.89	0.127	-1.84
	Column	24	0.23	0.23	6.36	8.07
	Beam					
	B1 (Plinth Beam)	1	39.3	0.23	0.3	2.75
	B2 (Beam 2)	4	15.24	0.23	0.3	4.21
	B3 (Beam 3)	10	2.89	0.23	0.3	1.99
	Coping	1	39.3	0.23	0.1	0.90
						38.28

			(m)	(m)	(m)	(m)
8	Plaster					
	Inside	1	44.48		3.53	157.01
	Deduction for					
	W	8	1.52		1.22	-14.84
	D	2	1.22		2.44	-5.95
	Outside	1	46.32		3.53	163.51
	Deduction for					
	W	8	1.52		1.22	-14.84
	D	2	1.22		2.44	-5.95
						278.95
9	Flooring	1	14.78	7.46		**110.26**
10	Colour					
	Inside & Outside	1	61.72		3.53	**217.87**

Table 31 Approximate Estimate of Public Library

Abstract Sheet						
Item no	**Item description**	**Qty.**	**Unit**	**Rate**	**Per**	**Amount**
				(Rs.)		**(Rs.)**
1	Excavation	101.47	m3	100	m3	10147
2	P.C.C. (1:4:8)	8.32	m3	3596	m3	29918.72
3	Footing	6.76	m3	9520	m3	64355.2
4	Earth filling	280.9	m3	50	m3	14045
5	Brick masonry	34.82	m3	3713	m3	129286.66
6	R.C.C. Work	38.28	m3	9520	m3	364425.6
7	Plaster	278.95	m2	145	m2	40447.75
8	Flooring	110.26	m2	425	m2	46860.5
9	Paint	217.87	m2	33.5	m2	7298.64
10	Computer	14	Nos.	27000	Nos.	378000
11	Chair for computer	14	Nos.	1500	Nos.	21000
12	Chair for reading	33	Nos.	700	Nos.	23100
13	Reading Table	6	Nos.	4000	Nos.	24000
						1152885
						Say Total INR 1153000/-

Table 32 Approximate Costing of Public Library

13.2 Reason for Students Recommending this Design

1) Rainwater Harvesting:

Rainwater harvesting is a sustainable process that helps in preserving water for future needs. Water scarcity is a major concern in today's scenario. The process of rainwater harvesting is a good way to conserve water.

In the village we saw that the panchayat building is appropriate place and sufficient area is available to make a rain water collection tank, and also need for drinking water point to panchayat members and around people who work there. So, we decided to design rain water harvesting for public utility.

2) Drinking Water Point:

Pure water flushes out toxins, improves your complexion, relieves headaches, promotes weight loss, and aids in digestion. So, when your water is of poor quality, your mind and body can't function properly.

It is provide safe and good quality water to villagers in summer. It is provide safe and good quality water to villagers in summer. This facility is not available in Pamol village.

3) Market Yard:

In our allocated village some streets are outside and far away from the village, so people living there had facing difficulty in buying the necessity of life. So, we decided to build a Market Yard in centre of the village so all the villagers have easy to reach there. So, we decided to build a Market Yard for utility of villagers to buy things without going outside the village.

4) Primary School:

When we visited the school, we observe that the school is in very bad conditions and lack of some facilities in school. In front of gov. school one private school is there, in the private school the facilities are more provided as compared to gov. primary school. Facilities like, Computer room and projectors. Due to lack of facilities in gov. primary school the students are studying over there have inadequate knowledge. So, we decided to built the new school on the same place.

5) Paver Block:

In our allocated village many of societies of village have paver block and R.C.C road is made, but after visiting the village we saw some societies where roads are in very bad condition. So, we decided to made paver block road.

6) Public Library:

To provide curriculum books and to promote educational, research, cultural, recreational and informational requirements of students, teachers, researchers and general users. Public libraries are constantly serving community functions and are performing various important roles in educational, economic, political, social and cultural development of the country.

To promote reading habits among students and people. To promote effective use of library, user education / orientation of students.

13.3 About designs Suggestions / Benefit of the villagers

- In our allocated village there is no any rain water harvesting system is not available, rain water is flow on road and go to sewage. Rainwater harvesting is a sustainable process that helps in preserving water for future needs.
- After provide rainwater harvesting, we though that this rain water is used for drinking purpose. It is provide safe and good quality water to villagers in summer. It is provide safe and good quality water to villagers in summer.
- In our allocated village some streets are outside and far away from the village, so people living there had facing difficulty in buying the necessity of life. So, we decided to build a Market Yard for utility of villagers to buy things without going outside the village.
- Due to lack of facilities in gov. primary school the students are studying over there have inadequate knowledge. So, we decided to built the new school on the same place.
- Paver blocks are very durable, and if they are adequately interlocked, they can easily last for about 20 years. Paver blocks can withstand hefty vehicular load as well.
- The preservation of truth is important, now more than ever. Libraries, which house centuries of learning, information, history, and truth, are important defenders in the fight against misinformation. To promote reading habits among students and people.

Chapter. 14 Technical Options with Case Studies

14.1 Civil Engineering

14.1.1 Advanced Earthquake Resistant

Earthquake-resistant structures are structures designed to protect buildings from earthquakes. While no structure can be entirely immune to damage from earthquakes, the goal of earthquake-resistant construction is to erect structures that fare better during seismic activity than their conventional counterparts. According to building codes, earthquake-resistant structures are intended to withstand the largest earthquake of a certain probability that is likely to occur at their location. Currently, there are several design philosophies in earthquake engineering, making use of experimental results, computer simulations and observations from past earthquakes to offer the required performance for the seismic threat at the site of interest.

These range from appropriately sizing the structure to be strong and ductile enough to survive the shaking with an acceptable damage. The conventional approach to earthquake resistant design of buildings depends upon providing the building with strength, stiffness and inelastic deformation capacity which are great enough to withstand a given level of earthquake-generated force. This is generally accomplished through the selection of an appropriate structural configuration and the careful detailing of structural members, such as beams and columns, and the connections between them.

Among the most important advanced techniques of earthquake resistant design and construction are:

1) Base Isolation Method of Earthquake Resistant Design:

A base isolated structure is supported by a series of bearing pads which are placed between the building and the building's foundation. A variety of different types of base isolation bearing pads have now been developed. The bearing is very stiff and strong in the vertical direction, but flexible in the horizontal direction.

Figure 74 Base Isolation

To get a basic idea of how base isolation works, examine Figure. This shows an earthquake acting on both a base isolated building and a conventional, fixed-base, building. As a result of an earthquake, the ground beneath each building begins to move. In Figure, it is shown moving to the left. Each building responds with movement which tends toward the right. The building undergoes displacement towards the right. The building's displacement in the direction opposite the ground motion is actually due to inertia. The inertial forces acting on a building are the most important of all those generated during an earthquake.

It is important to know that the inertial forces which the building undergoes are proportional to the building's acceleration during ground motion. It is also important to realize that buildings don't actually shift in only one direction. Because of the complex nature of earthquake ground motion, the building actually tends to vibrate back and forth in varying directions.

By contrast, even though it too displacing, the base-isolated building retains its original, rectangular shape. It is the lead-rubber bearings supporting the building that are deformed.

2) Energy Dissipation Devices

The second of the major new techniques for improving the earthquake resistance of buildings also relies upon damping and energy dissipation, but it greatly extends the damping and energy dissipation provided by lead-rubber bearings. As we've said, a certain amount of vibration energy is transferred to the building by earthquake ground motion. Buildings themselves do possess an inherent ability to dissipate, or damp, this energy. However, the capacity of buildings to dissipate energy before they begin to suffer deformation and damage is quite limited.

The building will dissipate energy either by undergoing large scale movement or sustaining increased internal strains in elements such as the building's columns and beams. Both of these eventually result in varying degrees of damage. So, by equipping a building with additional devices which have high damping capacity, we can greatly decrease the seismic energy entering the building, and thus decrease building damage.

Accordingly, a wide range of energy dissipation devices have been developed and are now being installed in real buildings. Energy dissipation devices are also often called damping devices. The large number of damping devices that have been developed can be grouped into three broad categories: Friction Dampers: these utilize frictional forces to dissipate energy Metallic Dampers: utilize the deformation of metal elements within the damper Viscoelastic Dampers: utilize the controlled shearing of solids Viscous Dampers: utilized the forced movement of fluids within the damped.

The large number of damping devices that have been developed can be grouped into three broad categories:

a) **Friction Dampers:** these utilize frictional forces to dissipate energy
b) **Metallic Dampers:** utilize the deformation of metal elements within the dampers
c) **Viscoelastic Dampers:** utilize the controlled shearing of solids
d) **Viscous Dampers:** utilized the forced of fluids within the dampers

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.

I. Need for Seismic Retrofitting:

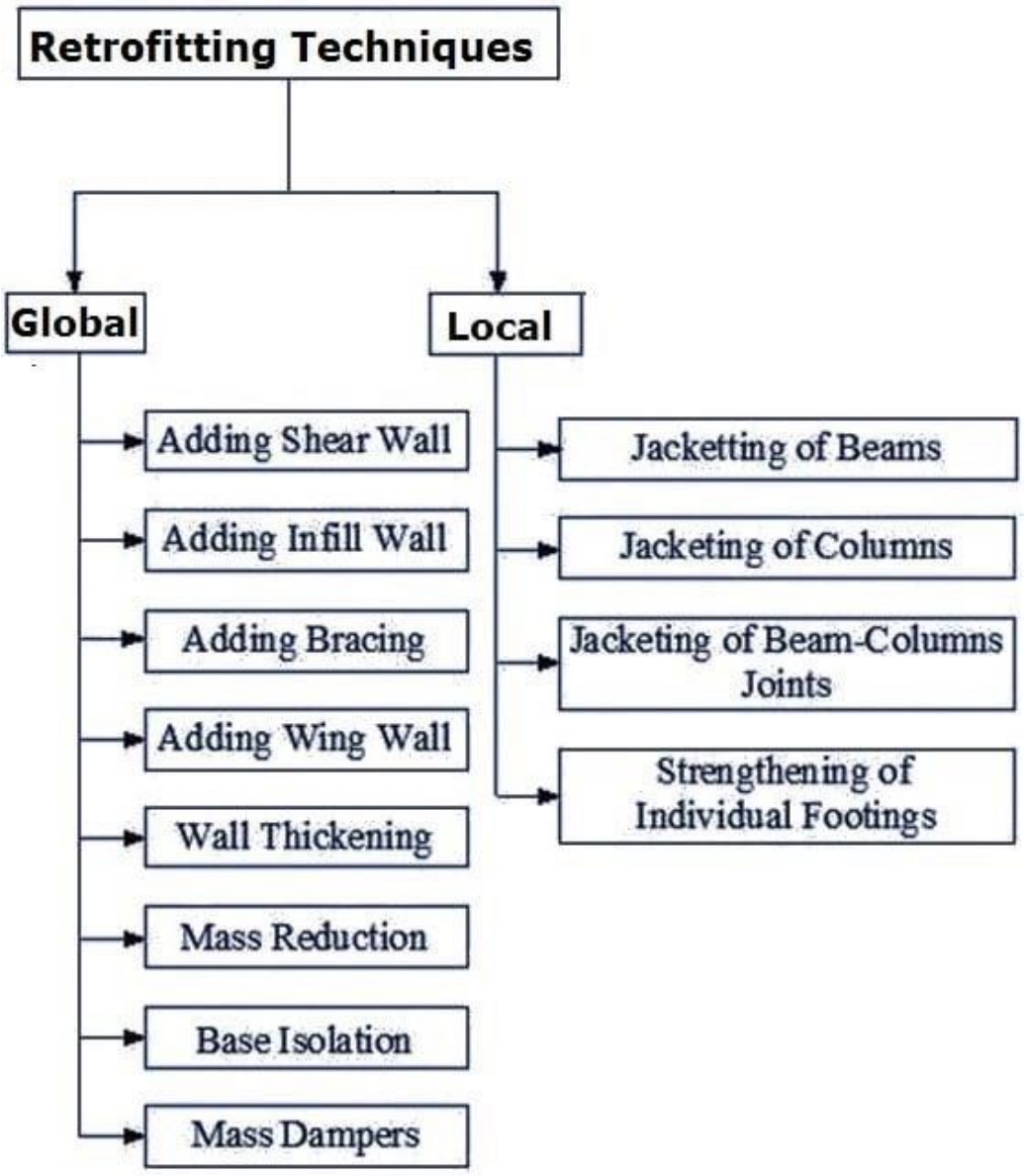
- To ensure the safety and security of a building, employees, structure functionality, machinery and inventory

- 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.

II. 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..

III. Classification of Retrofitting Techniques:



- **Adding New Shear Walls into the existing frames**

Figure 75 Additional Shear Wall

One of the most common methods to increase the lateral strength of the reinforced concrete buildings is to make a provision for additional shear walls. The technique of infilling/adding new shear walls is often taken as the best and simple solution for improving seismic performance. Therefore, it is frequently used for retrofitting of non-ductile reinforced concrete frame buildings. The added elements can be either cast in place or pre-cast concrete elements. New elements preferably be placed at the exterior of the building; however, it may cause alteration in the appearance and window layouts. Placing of shear walls in the interior of the structure is not preferred in order to avoid interior mouldings.

Technical Considerations:

The addition of new shear walls to existing frame has many technical considerations which may be summarized as (a) determining the adequacy of existing floor and roof slabs to carry the seismic forces; (b) transfer of diaphragm shear into the new shear walls with dowels; (c) adding new collector and drag members to the diaphragm; (d) increase in the weight and concentration of shear by the addition of wall which may affect the foundations.

Constructional Considerations:

The first consideration during construction is to find locations where walls can be added and well located which may align to the full height of the building to minimize torsion (Wylle, 1996). It is often desirable to locate walls adjacent to the beam between columns so that only minimum slab demolition is required with connections made to beam at the sides and /of columns. The design of the shear wall may be similar to new construction.

The longitudinal reinforcement must be placed at the ends of the wall running continuously through the entire height. In order to realize this end, the reinforcement has to pass through holes in slabs and around the beams to avoid interference. To achieve both conditions, boundary elements can be used. This retrofitting system is only adequate for concrete structures, which bring forth a big increase in the lateral capacity and stiffness. A reasonable structural ductility may be achieved if the wall is properly designed with a good detailing. The connection to the existing structure has to be carefully designed to guarantee shear transfer.

Limitations:

The main limitations of this method are (i) increase in lateral resistance but it is concentrated at a few places (ii) increased overturning moment at foundation causes very high uplifting that needs either new foundations or strengthening of the existing foundations (iii) increased dead load of the structure (iv) excessive destruction at each floor level results in functional disability of the buildings (v) possibilities of adequate attachment between the new walls and the existing structure. (vi) closing of formerly open spaces can have major negative impact on the interior of the building uses or exterior appearance.

- **Adding Steel Bracings**

An effective solution when large openings are required.

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

Another method of strengthening having similar advantages is the use of steel bracing. The structural details of connection between bracing and column are shown in Figure.

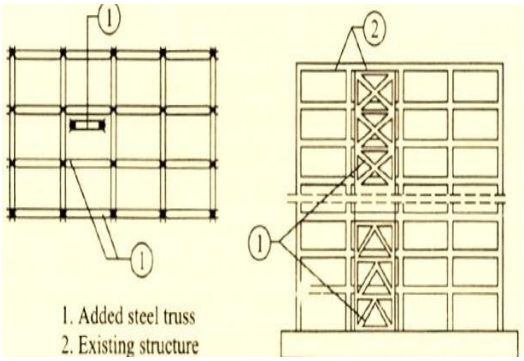


Figure 76 Adding STEEL Bracings

Technical Considerations:

The steel bracing system can be used for steel structures as well as concrete structures; several researchers have reported successful results while using steel bracing to upgrade the strength and stiffness of reinforced concrete structures. It has performed well-exhibited linear behaviour even up to twice the design code force. The effective slenderness ratio of brace should be kept relatively low so that braces are effective in compression as well as tension, suggested l/r ratio are 80 to 60 or even lower. Collector's members are recommended for transferring forces between the frame and bracing system. Careful consideration of connections of strengthening elements to the existing structures and to the foundations have to be consciously designed to ensure proper shear transfer. Column shear failure is not specifically prevented; therefore, close attention must be given to limit drifts of the strengthened frame. Local reinforcement to the columns may be needed to bear the increased load generated on them. The epoxies threaded rods have proved to be quite effective in connecting the bracing system to the concrete frame and in transferring the forces.

Constructional Considerations:

The available dead load of structure only has to be considered to determine the amount or number of bays of bracing that can be mobilized to resist overturning uplift, as steel bracing is relatively light. Bracing bays usually require vertical columns at ends to resist overturning forces to work vertically as chords of a cantilever truss and horizontally at each floor level. It is to be connected to the horizontal diaphragms by collectors or an opposite system of diagonals can be added to complete the truss network. Tension in braces should be avoided except in the case of light, simple buildings. Braces should have relatively low slenderness ratios so that they function effectively during compression. Members are to be selected to provide acceptable slenderness ratio and to make simple connection, which in its turn develops the strength of the member.

Limitations:

Some inconveniences may be experienced with steel bracing; e. g. lack of information about the seismic behaviour of the added bracing; undesirable changes take place regarding the original architectural feature of the building. Moreover, lack of cost efficiency and field experience may also cause inconvenience. In addition to this steel bracing system may be sensitive to construction errors or omissions, which cause reduction in member capacity at a

section. Section failure can impact the overall performance of the system. A moderate to high level of skilled labour is necessary for construction, due to the need for member fit-up adjustment and welding. Close quality control particularly with respect to welding is essential.

- **Base Isolation (or Seismic Isolation):**

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

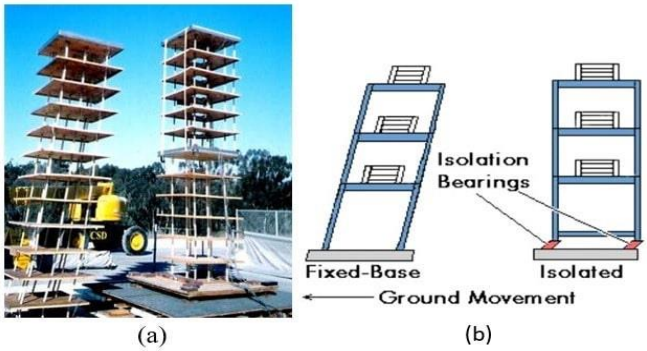


Figure 77 Base Isolated Structures (a)Model Under Test, (b) Diagrammatical Representation

- **Advantages of Base Isolation**

➢ Isolates Building from ground motion – Lesser seismic loads, hence lesser damage to the structure, -Minimal repair of superstructure.

➢ Building can remain serviceable throughout construction.

➢ Does not involve major intrusion upon existing superstructure

- **Disadvantages of Base Isolation**

➢ Expensive

➢ Cannot be applied partially to structures unlike other retrofitting

➢ Challenging to implement in an efficient manner

IV. Approximate Costing of Seismic Retrofitting of Buildings:

This section discusses the cost of revocability, in respective case study projects. The cost of revocability in the retrofit case study projects, has been appraised using a constant revocability rate of 10%, in successive years. This convention is consistent with previous work on whole-life costing, conducted by Ellingham and Fawcett (2006). The revocability rate of 10%, implies a proportionate increase or decrease, in the Future costs, of retrofit options, in successive years. The probabilities of Future cost estimates, has been apportioned using the Negative Binomial probability distribution. The bracketed cost values in below Table, refer to 'savings', rather than 'costs', consistent with International Financial Reporting Standards (IFRS). In the case study projects examined – SPACE and MS, the cost of revocability, pertains to the Future Costs in buildings, and is computed, over an estimated life of 20 years, 40 years, and 60 years.

Nearly 75% of the construction cost incurred when implementing seismic retrofit is associated with the structural cost, while the remaining 25% can be attributed to the restoration cost. Also from this table, it can be observed that the seismic retrofit cost values varied over a wide range from a minimum of 20.41 U.S.$/m^2 (INR 1500/m^2) to a maximum of 226.24 U.S.$/m^2 (INR 16700/m^2) Such a large variation makes it a challenging task to perform a cost-benefit analysis using these cost values.

Variable	Min	P1*	P2*	P3*	Max	Mean	Std.D
RNCC (U.S.$/m^2)	20.41	41.58	52.06	62.61	226.24	53.60	20.25
SC (U.S.$/m^2)	15.07	31.96	39.55	47.55	181.34	41.11	16.65
CC (U.S.$/m^2)	2.92	8.06	10.96	15.69	44.90	12.49	6.52

Table 33 Descriptive statistical summary of seismic retrofit cost indicators

Note: P1 = 25th percentile; P2 = 50th percentile; P3 = 75th percentile; Std.D = standard deviation.

V. Conclusion – Seismic Retrofitting Techniques for concrete structures:

- Seismic retrofitting is the modification of existing structures to make them more resistant to seismic activity, ground motion, or soil failure due to earthquakes.
- Seismic Retrofitting is a suitable technology for protection of a variety of structures.
- It has matured in the recent years to a highly reliable technology.
- But the expertise needed is not available in the basic level.
- The main challenge is to achieve a desired performance level at a minimum cost, which can be achieved through a detailed nonlinear analysis.
- Optimization techniques are needed to know the most efficient retrofit for a particular structure.
- Proper Design Codes are needed to be published as code of practice for professionals related to this field.

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

❖ Self-Compacting Concrete:

Self-compacting concrete (SCC) can be defined as fresh concrete that flows under its own weight and does not require external vibration to undergo compaction. It is used in the construction where it is hard to use vibrators for consolidation of concrete. Filling and passing ability, segregation resistance are the properties of self-compacting concrete. SCC possess superior flow ability in its fresh state that performs self-compaction and material consolidation without segregation issues. The materials, tests and properties of self-compacting concrete are explained in the below sections.

Figure 78 Self Compacting Concrete

Materials Used for self-compacting Concrete:

The main ingredients used in design of self-compacting concrete are:

1) Cement: Ordinary Portland Cement either 43 or 53 grade cement can be used.
2) Water: The quality of water used is same that followed for reinforced concrete and prestressed concrete construction.
3) Aggregates: The size of the aggregates used for SCC design is limited to 20mm. If the reinforcement employed for the structure is congested, the aggregate size used can be in the range 10 to 12mm. Well graded aggregates either round or cubical shape are a best choice. The fine aggregates used in SCC can be either natural aggregates or manufactured aggregates (M- Sand) with a uniform grade. The fine aggregates with particle size less than 0.125mm are generally employed.
4) Mineral Admixtures: The mineral admixtures used can vary based on the mix design and properties required. Mentioned below are the different mineral admixtures that can be used and their respective properties they provide. Ground Granulated Blast Furnace Slag (GGBS): The use of GGBS helps to improve the rheological properties of the self-compacting concrete. Fly ash: The fine fly ash particles help to improve the filling of the internal concrete matrix with fewer pores. This improves the quality and durability of the SCC structures. Silica Fumes: The use of silica fumes helps to increase the mechanical properties of the self-compacting concrete structure. Stone Powder: The use of stone powder in SCC is used to improve the powder content of the mix.
5) Chemical Admixtures: New generation superplasticizers are commonly used in SCC mix design. In order to improve the freeze and thaw resistance of the concrete structure, air entraining agents are used. To control the setting time, retarders are employed

Tests and properties of self-compacting concrete

The requirements of the self-compacting concrete are achieved by the properties in its fresh state. The three main properties of SSC are:

1. Filling Ability: This property of the concrete is the ability to flow under its own weight without any vibration provided intentionally.
2. Passing Ability: This property is the ability of concrete to maintain its homogeneity.
3. Segregation resistance: This is the resistance of the concrete not to undergo segregation when it flows during the self-compaction process.

Filling Ability Tests	Passing Ability Tests	Segregation Resistance Tests
Slump flow test	L-Box Test	V-funnel test at T5 minutes
T50cm Slump flow	J-ring test	GTM screen stability tests
Orimet	U-Box Test	
V-funnel Test	Fill-Box Test	

Table 34 Tests conducted on SSC

Advantages of Self-Compacting Concrete

1) The permeability of the concrete structure is decreased.
2) SCC enables freedom in designing concrete structures.
3) The SCC construction is faster.
4) The problems associated with vibration is eliminated.
5) The concrete is placed with ease, which results in large cost saving.
6) The quality of the construction is increase.
7) The durability and reliability of the concrete structure is high compared to normal concrete structures
8) Noise from vibration is reduced. This also reduce the hand arm vibration syndrome issues.

Disadvantages of Self-Compacting Concrete

1) There is no globally accepted test standard to undergo SCC mix design.
2) The cost of construction is costlier than the conventional concrete construction.
3) The use of designed mix will require more trial batches and lab tests.
4) The measurement and monitoring must be more precise.
5) The material selection for SCC is more stringent.

Applications of Self-Compacting Concrete

1) Construction of structures with complicated reinforcement
2) SSC is used for repairs, restoration and renewal construction.
3) Highly stable and durable retaining walls are constructed with the help of SSC
4) SCC is employed in the construction of raft and pile foundations.

14.1.4 Engineering Aspects of Soil mechanics - Environmental Impact Assessment

Environment Impact Assessment or EIA can be defined as the study to predict the effect of a proposed activity/project on the environment. A decision-making tool, EIA compares various alternatives for a project and seeks to identify the one which represents the best combination of economic and environmental costs and benefits.

EIA systematically examines both beneficial and adverse consequences of the project and ensures that these effects are taken into account during project design. It helps to identify possible environmental effects of the proposed project, proposes measures to mitigate adverse effects and predicts whether there will be significant adverse environmental effects, even after the mitigation is implemented. By considering the environmental effects of the project and their mitigation early in the project planning cycle, environmental assessment has many benefits, such as protection of environment, optimum utilisation of resources and saving of time and cost of the project. Properly conducted EIA also lessens conflicts by promoting community participation, informing decision makers, and helping lay the base for environmentally sound projects. Benefits of integrating EIA have been observed in all stages of a project, from exploration and planning, through construction, operations, decommissioning, and beyond site closure.

EIA is one of the successful policy innovations of the 20th Century for environmental conservation. Thirty-seven years ago, there was no EIA but today, it is a formal process in many countries and is currently practiced in more than 100 countries. EIA as a mandatory regulatory procedure originated in the early 1970s, with the implementation of the National Environment Policy Act (NEPA) 1969 in the US. A large part of the initial development took place in a few high-income countries, like Canada, Australia, and New Zealand (1973-74). However, there were some developing countries as well, which introduced EIA relatively early - Columbia (1974), Philippines (1978). The EIA process really took off after the mid-1980s. In 1989, the World Bank adopted EIA for major development projects, in which a borrower country had to undertake an EIA under the Bank's supervision.

The Indian experience with Environmental Impact Assessment began over 20 years back. It started in 1976-77 when the Planning Commission asked the Department of Science and Technology to examine the river-valley projects from an environmental angle. This was subsequently extended to cover those projects, which required the approval of the Public Investment Board. Till 1994, environmental clearance from the Central Government was an administrative decision and lacked legislative support.

On 27 January 1994, the Union Ministry of Environment and Forests (MEF), Government of India, under the Environmental (Protection) Act 1986, promulgated an EIA notification making Environmental Clearance (EC) mandatory for expansion or modernisation of any activity or for setting up new projects listed in Schedule 1 of the notification. Since then there have been 12 amendments made in the EIA notification of 1994.

The environment impact assessment consists of eight steps with each step equally important in determining the overall performance of the project. Typically, the EIA process begins with screening to ensure time and resources are directed at the proposals that matter environmentally and ends with some form of follow up on the implementation of the decisions and actions taken as a result of an EIA report. The eight steps of the EIA process are presented in brief below:

- Screening: First stage of EIA, which determines whether the proposed project, requires an EIA and if it does, then the level of assessment required.
- Scoping: This stage identifies the key issues and impacts that should be further investigated. This stage also defines the boundary and time limit of the study.
- Impact analysis: This stage of EIA identifies and predicts the likely environmental and social impact of the proposed project and evaluates the significance.
- Mitigation: This step in EIA recommends the actions to reduce and avoid the potential adverse environmental consequences of development activities.
- Reporting: This stage presents the result of EIA in a form of a report to the decision-making body and other interested parties.
- Review of EIA: It examines the adequacy and effectiveness of the EIA report and provides the information necessary for decision-making.
- Post monitoring: This stage comes into play once the project is commissioned. It checks to ensure that the impacts of the project do not exceed the legal standards and implementation of the mitigation measures are in the manner as described in the EIA report.

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

- **Treatment and recycling of blackwater and organic waste:**

Vacuum and gravity operated toilets using 0,5-1,5 liter per flush are commercially available. Using these toilets experience shows that 5-7 liters of blackwater is produced per person and day. Using conventional flush toilets, the daily per capita production of blackwater would be 6–15 times higher. Using a one litre toilet an average Norwegian family would produce 6-9 m3 blackwater per year and 15 families would produce about 10 m3 of blackwater per month. Such volumes are possible to handle separate. Even when the amount of flush water is only 1 litre the dry matter content (DM) is usually below 1 %.

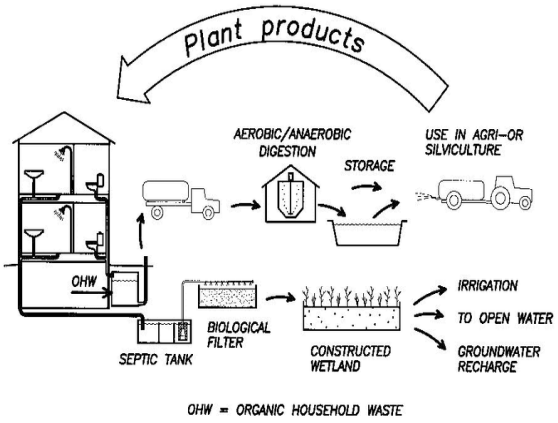


Figure 79 Treatment and recycling of blackwater and organic waste

In order to treat the blackwater successfully by liquid composting, which is the most common process in Norway, organic matter must be added. Grinded organic household waste, animal manure or residues from various food processing industries are all additives that bring the DM content up to a level where the composting process is successful. An energy efficient liquid composting unit is developed. The effluent from the liquid composting unit is hygienized and odourless. The unit is running with a positive energy balance if the heat generated by the composting process is utilized.

- **Large Conventional Treatment Systems:**

Sustainability aspects of nutrient removal (tertiary treatment):

The Norwegian Institute for Water Research (NIVA), showed in the 60`s and the 70`s, that it was important to remove phosphorus from wastewater in Norway, because phosphorus is the main limiting factor for algal blooms in rivers and lakes.

Phosphorus removal by chemical precipitation has been refined in Norway, Sweden and Finland over the last 30 years. The concentration of phosphorus is easily reduced down to 0,50 mg P/l in the effluent, measured as total phosphorus and a net removal of 95 % or more is achieved.

The cost and energy consumption in the chemical precipitation process is low compared to biological P-removal methods, because adding and mixing chemicals to the wastewater is far more energy efficient than the aeration needed for biological treatment processes. Chemical precipitation also removes other wastewater constituents than phosphorus.

Wastewater constituent	**Removal %**
Organic matter expressed as BOD_7	75-80
Suspended solids	85-90
Dissolved organic	30-55
Total nitrogen*	15-40

Table 35 Reduction of wastewater constituents other than phosphorus by chemical

Note: * If the sludge from a chemical treatment plant is digested and the sludge is dewatered and the water is sent back to the inlet the percent removal of nitrogen is reduced to approximately 5 %.

The energy consumption for chemical precipitation in Norway is only 0,23 kWh/m3 treated water for larger treatment plants. Most of this energy consumption is used for heating and ventilation of the buildings over the treatment basins. For biological treatment (activated sludge with only 30 % phosphorus removal) the energy use is in the order of 0,37 kWh/m3 showing that from an energy aspect chemical precipitation is more sustainable than a biological process.

Chapter. 15 Smart and/or Sustainable features of Chapter 8 & 13 designs, Impact on society. (For Allocated village development, Villagers happiness, comfortable and for enhancement of the village) (With the Smart village development Concept as Per Your Idea and Village Visit, Modern Technology with innovation). with doing small changes, Period, Amount Expenditure and Benefit – a) Immediately b) Within 1 year c) Long term (3-5 years) along with cost estimation.

Sr. No	Design name	Period	Expenditure Amount (INR)	Benefit
1	Anganwadi	Immediately	2,36,000	A typical Anganwadi center provides basic health care in a village as well as pre-school activities.
2	Public Toilet	Within 1 year	1,54,500	A public toilet is a room or small building with toilets (or urinals) and sinks that does not belong to a particular household.
3	Public Health Centre	Within 1 year	5,14,800	It will improve health facility.
4	Public Garden	Long Term	10,92,700	For entertainment purpose
5	WBM Road	Immediately	13,57,000	To use safe transportation
6	Community Hall	Within 1 year	5,63,400	It is used for group activities, social support, public information, and other purposes.
7	Rainwater Harvesting	Immediately	37,200	It is a sustainable process that helps in preserving water for future needs
8	Drinking Water Point	Within 1 year	66,500	It is provide safe and good quality water to villagers in summer. It is provide safe and good quality water to villagers in summer.

9	Market Yard	Within 1 year	6,75,000	A market yard is a place where all marketing activities are performed such as assembling, sale and purchase, grading, storage, banking, etc.
10	Primary School	Immediately	32,00,000	Children can understanding and appreciation of one another's diverse strengths, skills and personalities.
11	Paver Block	Immediately	3,03,800	Paver blocks are highly durable in build and has a life of minimum 20 years, therefore, once installed, then replace after a long time.
12	Public Library	Within 1 year	11,53,000	To promote reading habits among students and people.

Chapter. 16 Survey by Interviewing with Talati and / or Sarpanch

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Survey with Interviewing

SURVEY BY INTERVIEWING WITH TALATI AND/OR SARPANCH

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

CHAPTER- 16

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

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

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

સરપંચ
ગ્રામ પંચાયત, પામોલ
તા.બોરસદ, જી.આણંદ

Scanned with CamScanner

Chapter. 17 Irrigation / Agriculture Activities and Agro Industry, Alternate Technics and Solution

For the V- Yojana Project our allocated village is Pamol village. In our allocated village the main occupation is farming. Most of the villagers relies on farming for their earning. While interviewing with some of the farmers in the village we came to know that they are still using conventional methods for farming. They use chemicals for farming. So, we suggested them to do organic farming. We have discussed about organic farming in detail further.

- **Organic Farming:**

Organic farming is an agriculture process in India, which uses pest control which is been derived from organic manure and animal or plant waste. This farming has started to respond to the environmental suffering caused by chemical pesticides and synthetic fertilizers. It is a new system of agriculture that repairs, maintains, and improves the ecological balance. Organic farming uses organic inputs, green manures, cow dung, etc.

- **Principles of Organic Farming in India:**

Organic agriculture grows and develops with these principles. These can contribute to improving organic agriculture for the world.

There are four principles of organic farming are as follows:

- **Principles of Health:** The health of the ecosystem, people and communities.
- **Principles of Ecology:** The right balance between ecosystem and environment or nature.
- **Principles of Fairness:** Good human relationships and quality of life.
- **Principles of Care:** The considerations about the environment and environment of the future.

- **Types of Organic Farming:**

Organic farming is of two types:

a) Pure Organic Farming: - In pure organic farming, there is avoiding every unnatural chemical. In the process of pure farming, fertilizer and pesticides obtain from natural sources. It is called a pure form of organic farming.

Only using organic means, like biopesticides and organic manures. It completely avoids using any chemicals or inorganic pesticides. It is definitely much harder because of those things, but it is pure, and if you are selling it, food is much more expensive.

b) Integrated Organic Farming: - Integrated organic farming consists of integrated nutrients management and integrated pest management.

pure organic farmers don't want to use much or any technology in their work. This is different from integrated organic farming systems, which use all technology they can get to make their life easier and to make more food. But, they still don't include some big amounts of chemicals or pesticides or something like that. Still inside organic rules.

In India, approx. 2.78-million-hectare area is covered by organic agriculture. Some major organic products grown in India are oilseeds, tea, coffee, dried fruits, millets, cereals, spices, etc. These products are highly produced in India and exported by India. Sikkim, Uttarakhand, and Tripura are the major states to cultivate organic products in India. Other states for organic farming are Madhya Pradesh, Rajasthan and Maharashtra.

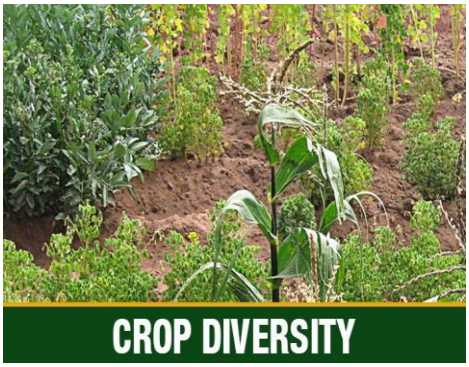
The first consumers interested in organic food sought non-pesticide foods, fresh and minimally processed foods. As organic food requirements increased, big organic food deliveries replaced direct procurements from growers. Today, there is no limit to the size of the farm where organic food is grown, so many large farms have departments where they grow organic food. It is difficult to distinguish such foods on the market, so product labelling has been introduced as a "certified organic" product.

- **Techniques of Organic Farming:**

1) **Soil Management:** Soil management is the primary technique of organic farming in India. After cultivation, soil loses its nutrients, and its fertilizer goes down. The process in which soil is recharging with all the necessary nutrients called soil management. Organic farming uses natural ways to increase the fertility of the soil. It uses bacteria, available in animal waste. The bacteria help in making the soil more productive and fertile.

2) **Weed Management:** Organic farming's main aim is to remove the weeds. Weeds are the unwanted plant, growing with the crop. Weeds Sticking with nutrients of the soil affected the production of the crops. There are two techniques which give a solution to the weed. i) Moving or cutting: In this process, cut the weed. ii) Mulching: In this process, farmers use a plastic firm or plant to residue on the soil's surface to block the weed's growth.

3) **Crop Diversity:** According to this technique, different crops can cultivate together to meet the growing demand for crops. Crop diversity loss threatens global food security, as the world's human population depends on a diminishing number of varieties of a diminishing number of crop species. Crop diversity is the variance in genetic and phenotypic characteristics of plants used in agriculture.



4) **Chemical Management in Farming:** Agricultural farms contain useful and harmful organisms that affect farms. To save crops and soil, the growth of organisms needs to be controlled. In this process, natural or fewer chemicals, herbicides, and pesticides used to protect soil and crops. Proper maintenance is required throughout the area to control other organisms.

5) **Biological Pest Control:** In this method, use living organisms to control pests with or without the use of chemicals. Natural enemies of insect pests, also known as biological control agents, include predators, parasitoids, pathogens, and competitors. Biological control agents of plant diseases are most often referred to as antagonists. Biological control agents of weeds include seed predators, herbivores, and plant pathogens.

➢ **Advantages of Organic Farming:**

- Organic farming in India is very economical, it uses no expensive fertilizers, pesticides, HYV seeds for the plantation of crops. It has no expenses.
- With the use of cheaper and local inputs, a farmer can earn a good return on investment.
- There is a huge demand for organic products in India and worldwide and can earn more income through export.
- Organic products are more nutritional, tasty, and good for health to chemical and fertilizer utilized products.
- Organic farming in India is very environment friendly, it does not use fertilizers and chemicals.

➢ **Disadvantages of Organic Farming:**

- Organic farming in India has fewer choices, and off-season crops are limited.
- Organic agricultural products are low in the early years. Farmers find it difficult to accommodate mass production.
- The main disadvantage of organic farming is the lack of marketing of the products and Inadequate infrastructure.

Chapter. 18 Social Activities – any Activates Planned by Students e.g., Teaching Learning Activities, Awareness Camp, Business idea for Self Help Group or any other

India targeting people living in remote rural areas to disseminate validated COVID-19 information over the phone. We find that relative to the information provided via text messages, discussing various precautions over the phone can significantly improve rural people's awareness and induce compliance with COVID-19 public health guidelines.

We also find compliance to be substantially higher among women, which is partially due to their concerns about the health of household members, and increased awareness. We find that disseminating information through both text-messages and phone calls (Activity 3) is the most effective means of communication in improving rural people's knowledge about COVID-19 precautions, followed by communications only via phone calls (Activity 2). Specifically, relative to people who only received text-messages (Activity 1), knowledge about COVID-19 precautions improved by 45–85 percentage points when they received both text-messages and phone calls, whereas awareness among those who only received phone calls improved by 28–53 percentage points in Pamol village. Furthermore, we also identify a significant improvement in people's compliance with health guidelines. Both Activity 2 and 3 had positive impacts on an index of people's compliance.

We distributed masks in the village and asked people to wear masks. We explained to the people about Corona virus and tell them to wear mask and sanitized hand more and more time and keep their distance from each other. And we clean village with friends and cleaner of village.

❖ **Following activities were conducted for awareness of COVID-19 in village:**

- Creating awareness about what is Covid-19 virus, how it spreads and explaining how social distancing checks spread of coronavirus
- Demonstrating how wearing of masks can reduce the risk of infecting others and protecting ourselves
- Correct method of using and discarding the masks
- Distribution of masks to the villagers
- Demonstration of correct method of washing with soap
- Effective use of sanitizers
- Distribution of sanitizers to the panchayat cleaning staff

Figure 80 Distribution of mask in village

Chapter. 19 Pamol Village SAGY Questionnaire Survey form with the Sarpanch Signature (Scanned copy attachment in the soft copy)

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: Pamol Gram Panchayat: Pamol Ward No.

Block: Borsad District: Anand

State: Gujarat L S Constituency:

1. Family Identity and Size

Name of Head of Household	Rajubhai Maheshbhai Rajput							Male/ Female	M
SECC Survey ID:		Family Size	5	Over 18	3	6 to 18	1	Under 6	1

2. Category & Entitlement Details (Tick as appropriate)

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

2. Adults (above 18 years)

Name	Age	Sex M/F / O	Disability Status Y/N	Marital Status[3]	Education Status[4]	Adhaar Card (Y/ N)	Bank A/C (Y/N)	Social Security Pension[5]
Rajubhai	40	M	N	2	04	Y	Y	N
Kantuben	36	F	N	2	02	Y	N	N
Kunal bhai	19	M	N	3	06	Y	N	N

3. Children from 6 years and up to 18 years

Name	Age	Sex M/F/O	Disability Y/N	Marital Code*	Level of Education: Code#	Going to School /College (Y/N)	Current Class	Computer Literate Y/N
Aruna	14	F	N	3	03	Y	7th	N

4. Children below 6 years

Name	Age	Sex M/F/ O	Disability Yes/No	Going to School (Y/N)	Going to AWC Y/N	De-worming Done	Fully Immu-nised Y/N	Mother's Age at the time of Child's Birth
Jigar	5	M	N	Y	N		Y	31

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

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

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

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

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

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SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

5. Hand washing

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

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

7. Do members take Regular Physical Exercise

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

8. Consumption of Tobacco

	Smoking	Chewing
Adults	1	0
Children	0	0

9. House & Homestead Data

Own House: Yes / ~~No~~	No. of Rooms: 3
Type: Kutcha / ~~Semi Pucca~~ / Pucca	Pucca
Toilet: Private / ~~Community~~ / Open Defecation	
Drainage linked to House: Covered / ~~Open~~ / ~~None~~	
Waste Collection System	Door Step / ~~Common Point~~ / ~~No Collection System~~
Homestead Land: Yes / ~~No~~	Kitchen Garden : ~~Yes~~ / No
Compost Pit: ~~Individual~~/ ~~Group~~/ None	Biogas Plant: ~~Individual~~/ ~~Group~~/ None

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

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

11. Source of Lighting and Power

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

12. Landholding (Acres)

1. Total	4	2. Cultivable Area	3
3. Irrigated Area	—	4. Uncultivable Area	1

13. Principal Occupations in the Household

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

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

15. Agriculture Inputs

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

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

Name	Unit	Quantity
Tobacco		
Rice		

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
Mobile games, like, cricket, Ground games, like, Gillin dandu etc.

19. Do children play musical instrument (mention)
NO

Schedule Filled By: Mustakim, Anik.
Principal Respondent: Rajubhai.
Date of Survey:

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Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

I. Basic Information

a. Gram Panchayat: Pamol

b. Block: Borsad

c. District: Anand

d. State: Gujarat

e. Lok Sabha Constituency: Anand

f. Number of Wards in the Gram Panchayat: 9

g. Number of Villages in the Gram Panchayat: 1

h. Names of Villages:
Pamol

Demographic Information

Number of Households 940 Total Population 4804 Male 2510 Female 2294

SC HHs 180 ST HHs 10 OBC HHs _____ Other HHs _____

I. Access to Infrastructure / Facilities / Services

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
a.	ANM/ Health Sub Centre	Y	
b.	Nearest Primary Health Centre (PHC)	Y	Dawol (10 km)
c.	Nearest Community Health Centre (CHC)	N	
d.	Nearest Post Office	Y	
e.	Nearest Bank Branch (Any)	Y (BOI)	
f.	Nearest Bank with CBS Facility	N	
g.	Nearest ATM	N	
h.	Nearest Primary School	Y	
i.	Nearest Middle School	Y	
j.	Nearest Secondary School	Y	
k.	Nearest Higher Secondary School / +2 College	Y	
l.	Nearest Graduate College	N	
m	Nearest ITI / Polytechnic Centre	N	
n	Kisan Seva Kendra	N	

1

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Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

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

IV. Sports Facilities in the Gram Panchayat

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

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

V. Education, ICDS

a. Number of Angan Wadi Centres: 6

b. Number of villages without Angan Wadi Centres —

Names of such villages: —

c. Schools (Number)

Primary Private: 1 Primary Govt.: 3

Middle Private: 1 Middle Govt.: 1

Secondary Private: 1 Secondary Govt.: 0

Higher Secondary Private: 1 Higher Secondary Govt: 0

VI. Public Distribution System

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

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Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

VII. Coverage of Villages under different Facilities & Services

	Parameter	Villages Status[1]	Names of Villages Covered	Names of Villages not Covered
a.	Piped Water Supply Coverage to Villages	Covered ✓ / Not Covered	Pamol	
b.	Hand Pump Coverage in Villages:	Covered / Not Covered ✓	Pamol	
c.	Coverage under Covered Drains:	Covered ✓ / Not Covered	Pamol	
d.	Coverage under Open Drains:	Covered / Not Covered ✓	Pamol	
e.	Villages with Household Electricity Connection (Numbers)	Connected ✓ / Not Connected	Pamol (95% household)	

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	1209	d.	Pasture / Grazing Land		g.	Check Dam	-
b.	Irrigated Land	319	e.	Forests/ Plantations	8	h.	Wells/Bore Wells	50
c.	Un-irrigated Land	423	f.	Other Common Land		i	~~Tanks~~ /Ponds	3

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

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Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

IX. Parameters relating to Households & Institutions

		Number
a)	Number of eligible Households for pension (old age, widow, disability)	270
b)	Number of Households receiving pension (old age, widow, disability)	270
c)	Number of eligible Households who are not receiving pension	0
d)	Number of Households eligible for Ration Card	800
e)	Number of eligible HHs having ration cards	
f)	Number of households covered under RSBY (Rashtriya Swasthya Bima Yojana)	580
g)	Number of HHs covered under AABY (Aam Aadmi Bima Yojana)	
h)	Number of active Job Card holders under MGNREGA	314
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	250
l)	Number of landless households	150
m)	Number of IAY beneficiaries	
n)	Number of FRA[2] beneficiaries	
o)	Number of Community Sanitary Complexes	3
p)	Number of Households headed by single women	15
q)	Number of Households headed by physically handicapped persons	0
r)	Total number of Persons with Disability in the village	15
s)	Number of SHGs	
t)	Number of active SHGs	
u)	Number of SHG Federations	
v)	Number of Youth Clubs	
w)	Number of Bharat Nirman Volunteers	

Name and Signature of Surveyor and Respondent'

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

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

4

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SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

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

I. Basic Information

a. Village: Pamol

b. Ward Number: 2

c. Gram Panchayat: Pamol

d. Block: Borsad

e. District: Anand

f. State: Gujart

g. Lok Sabha Constituency: Anand

h. Number of Habitations / Hamlets in the Gram Panchayat: 7

i. Names of Habitations / Hamlets:

Ramfudra
jivapura
Kothiyapura
Cossur
Sadhar talavdi
Khodanamano kuvo
fakiri talavdi

Demographic Information

Number of Households 600 Total Population 1800 Male 829 Female 745

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

II. Access to Infrastructure/Amenities etc.

i.	Access to Infrastructure / Facilities / Services	Located in the Village Yes (Y)/No(N)	If located elsewhere (N), distance in kms from the village
a.	Nearest Primary School	Y	In village
b.	Nearest Middle School	Y	Pamol
c.	Nearest Secondary School	Y	Pamol
d.	Kisan Seva Kendra	N	
e.	Milk Cooperative /Collection Centre	Y	Pamol
g.	Health Sub Centre	Y	Pamol
h.	Bank	Y	Pamol
i.	ATM	N	Davol (10 km)
j.	Bus Stop	Y	
k.	Railway Station	N	Davol (10 km)

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

1

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SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

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

ii. Road Connectivity

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

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

iii. Drinking Water Facilities

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

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

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

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

iv. Coverage of Habitations under Waste Management System

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

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

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

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

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

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

v. Coverage of Habitations under Electrification ✓

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

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

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

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

vi. Sports Facilities in the Village

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

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

vii. Education, ICDS

a. Number of Anganwadi Centres: 2

c. Schools (Number)

Primary Private: 1 Primary Govt.: 1

Middle Private: _____ Middle Govt.: _____

Secondary Private: 1 Secondary Govt.: 0

Higher Secondary Private: 1 Higher Secondary Govt: 0

2

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SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

viii. Land Category		Area in Acres		Land Category	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land		d.	Pasture / Grazing Land		g.	Check Dam	
b.	Irrigated Land		e.	Forests/ Plnatations	0	h.	Wells/Bore Wells	20
c.	Un-irrigated Land		f.	Other Common Land		I	~~Tanks~~ /Ponds	1

ix. Entitlement Related Parameters		
1	Number of active Job Card holders under MGNREGA	70
2	Number of active Job Card holders who have completed 100 days of work	10
3	Number of shops selling alcohol	0
4	Number of BPL families	75
5	Number of landless households	25
6	Number of IAY beneficiaries	0
7	Number of FRA beneficiaries	0
8	Number of common sanitation complexes	0
9	Number of SHGs	0
10	Number of active SHGs	0
11	Existence of SHG Federation in the Village (Yes / No)	0
12	Number of Youth Clubs	0
13	Number of Bharat Nirman Volunteers	0

Name and Signature of Surveyor and Respondent'

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

3

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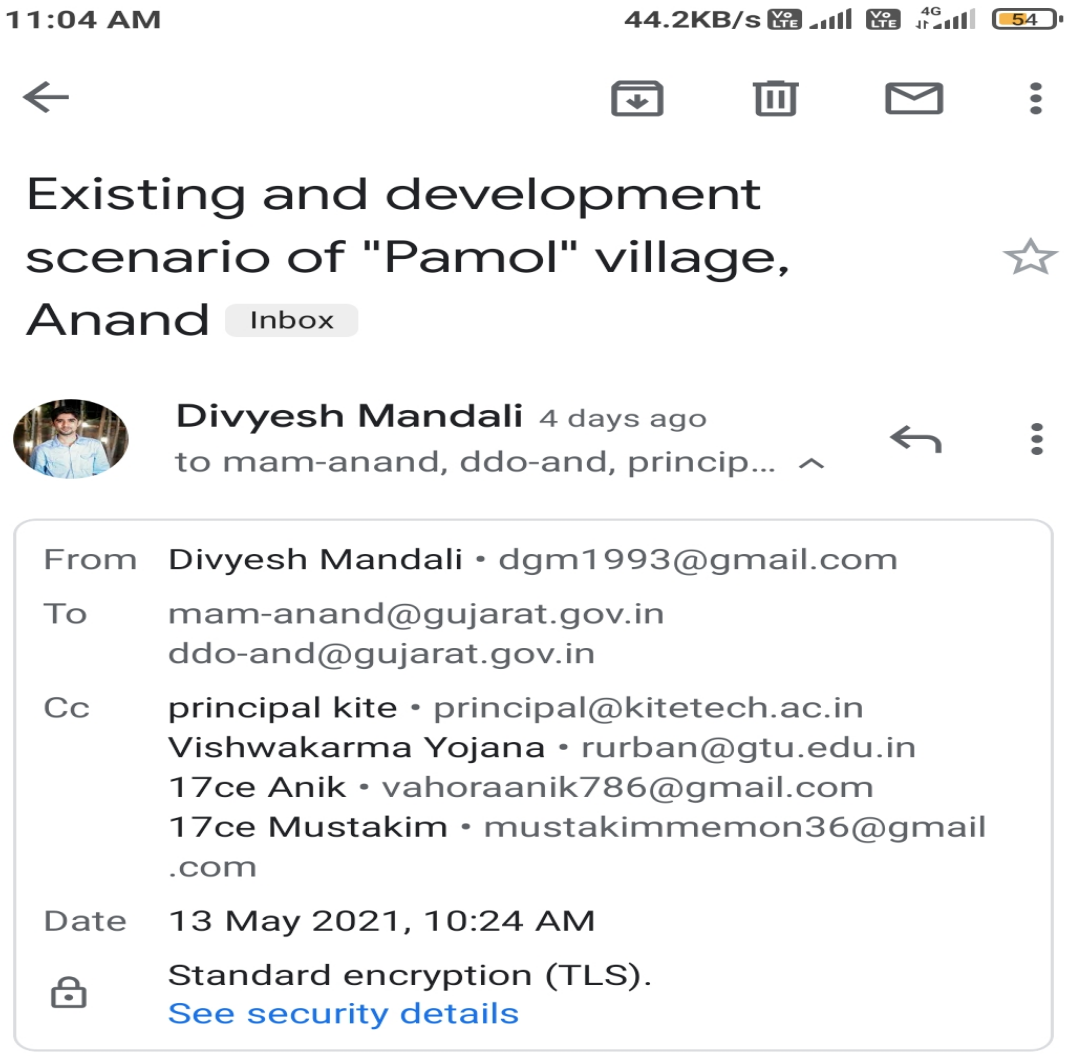
Chapter. 20 TDO-DDO-Collector email sending Soft copy attachment in the report



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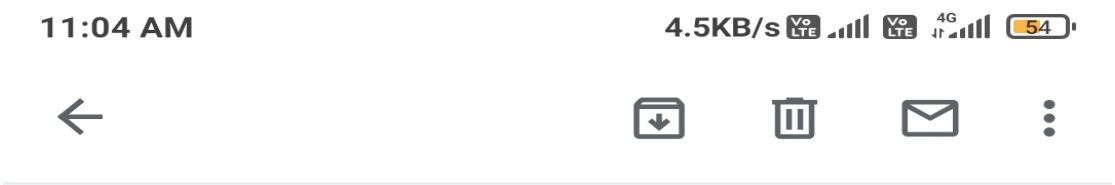
Existing and development scenario of "Pamol" village, Anand Inbox

Divyesh Mandali 4 days ago
to mam-anand, ddo-and, princip...

From Divyesh Mandali • dgm1993@gmail.com
To mam-anand@gujarat.gov.in
ddo-and@gujarat.gov.in
Cc principal kite • principal@kitetech.ac.in
Vishwakarma Yojana • rurban@gtu.edu.in
17ce Anik • vahoraanik786@gmail.com
17ce Mustakim • mustakimmemon36@gmail.com
Date 13 May 2021, 10:24 AM
Standard encryption (TLS).
See security details

Respected sir/madam,

We are the students of Knowledge Institute of Technology and Engineering, Bakrol, Anand affiliated to Gujarat Technological University-GTU. GTU has been assigned to Vishwakarma Yojana-VY in which students survey various villages and design



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

Village: - Pamol		Population: - 4804 (as of census 2011)
Key issue	Remark	Design given
Health care	Habitats have to travel	PHC (public health centre)

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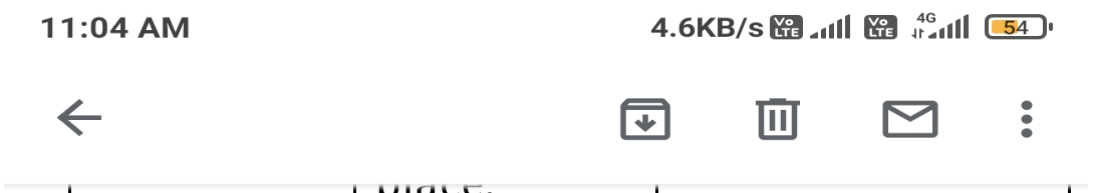
Health care	Habitats have to travel minimum 10 km for any care aid. In emergency case the villagers don't have option of medical treatment.	PHC (public health centre)
Toilet	If bus and truck drivers on timed schedules have difficulty in accessing toilets, this puts them at risk of bladder and digestive health problems.	Public toilet
Recreational area	Currently only village does not have any recreational place.	Public Garden Re-creational of pond
For Social Function	Community hall is very old and it is	Community hall



	place.	
For Social Function	Community hall is very old and it is in critical condition. So, villagers don't use the community hall.	Community hall
Road	There is problem of internal road especially in rainy season.	WBM Road

1	Anganwadi	Immediately	2,36,000 INR.	To facilitate pre-school activities
2	Public toilet	Within 1 year	1,54,500 INR.	Public toilet is a room or small building with toilets (or urinals).
3	Community Hall	Within 1 year	5,63,400 INR.	Used for group activities, social support, public information, and other purposes.
4	Public Garden	Long Term	10,92,700 INR.	For entertainment Purpose.
5	Rainwater Harvesting	Immediately	37,200 INR.	Sustainable process that helps in preserving water for future needs.
6	Market Yard	Within 1 year	6,75,000 INR.	For the Purpose of sale and purchase of goods and things.
7	WBM Road	Within 1 year	13,57,000 INR.	Reduce muddy Area in village. Improve Parking facility.
8	Primary	Immediately	32,00,000	Improve children

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				support, public information, and other purposes.
4	Public Garden	Long Term	10,92,700 INR.	For entertainment Purpose.
5	Rainwater Harvesting	Immediately	37,200 INR.	Sustainable process that helps in preserving water for future needs.
6	Market Yard	Within 1 year	6,75,000 INR.	For the Purpose of sale and purchase of goods and things.
7	WBM Road	Within 1 year	13,57,000 INR.	Reduce muddy Area in village. Improve Parking facility.
8	Primary School	Immediately	32,00,000 INR.	Improve children diverse strengths, skills and personalities.
9	Public Library	Within 1 year	11,53,000 INR.	To promote reading habits among students and people.
10	Public Health Centre	Within 1 year	5,14,800 INR.	It will improve health facility.
11	Drinking Water point	Immediately	66,500 INR.	For drinking purpose to all villagers and visitors.
12	Paver Block	Within 1 year	3,03,800 INR.	To give facility to society members to better for parking of vehicle and walking purpose.

--
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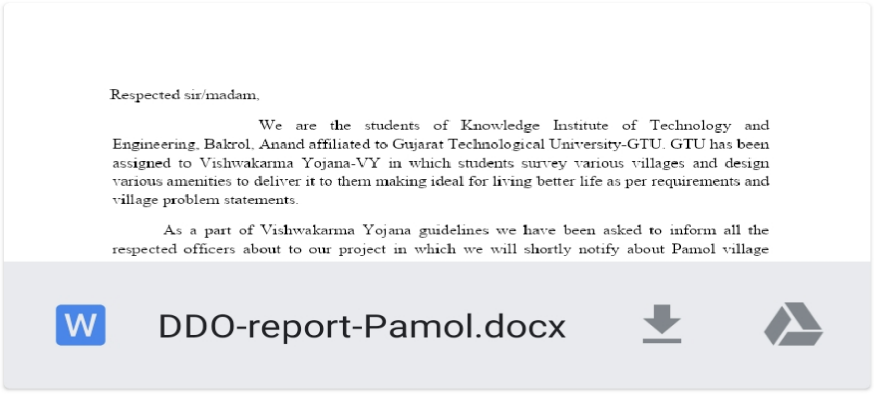
+91 94299 30060
Head Of the Department,
Assistant Professor ,
Civil Engineering Department,
Knowledge Institute of Technology & Engineering (KITE)-135,
Knowledge Campus, Bakrol- Vadtal road, Bakrol-388315

Assistant Professor ,
Civil Engineering Department,
Knowledge Institute of Technology & Engineering (KITE)-135,
Knowledge Campus, Bakrol- Vadtal road, Bakrol-388315

यदि आवश्यक नहीं हो तो कृपया इस परिपत्र को मुद्रित नहीं करे – पर्यावरण संरक्षण में अपना योगदान दें ।



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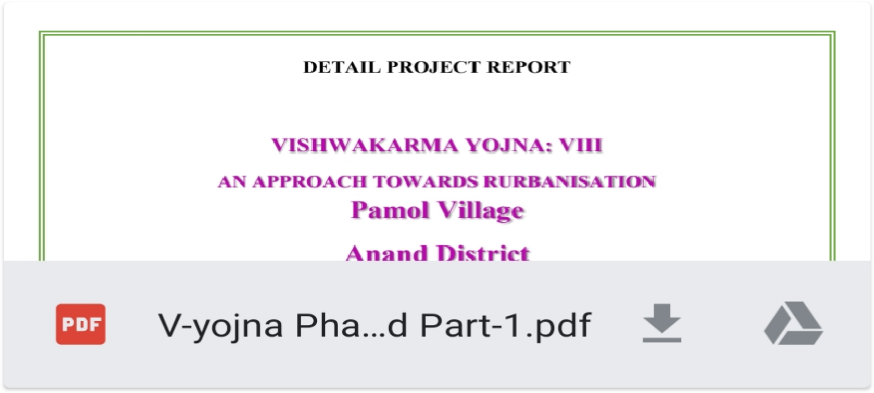

DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII

AN APPROACH TOWARDS RURBANISATION

Pamol Village

Anand District

V-yojna Pha...d Part-1.pdf

Reply Reply all Forward

Chapter. 21 Comprehensive report for the entire village

Pamol is a village located in Borsad Taluka of Anand district. Village is located 12 Km away from Anand. Total area of village is 648.3 hectares. Total population of village is 4804 among them 2510 are male and 2294 are female as per census 2011. Total households in Pamol village are 640 as per census. Main occupation of the Pamol village peoples is Farming.

Primary survey details are collect by observing the village and the present scenario of the village. There is main road is all weathered road and internal street is Bitumen. There is also pakka road in village. There is underground drainage system and it works in good condition. There is no sewer plant. There is no solar power for electric city but in some house, people are adopting personal solar system and no renewable power source. Drinking water is provided by the one overhead water tanks. The water is provided by the tap water in each and every house. There is no recreational area for the children as well as the senior citizen. The houses in the village 20% cutcha and 80% pukka. The general life style of village is based on agriculture. For education purpose in the village there are five Aaganwadi, and two primary school.

Figure 81 Pamol village photograph

For purpose of data collection. Data regarding the demographic, geographic, social, economic, educational etc. To know the current development going on in village. To know the various benefits to villagers though various government schemes in village. Ultimately after visit of ideal and smart village, this village gives the actual scenario of rural area. To know which development of village is not available in the village.

For health facilities there are two privet clinics and nearest village one PHC is available. There is community hall also for community function but in bad condition. For communication there is one post office also available. For commercial use there are shops not available. And the medical shop also there. There is bank facility also available. And milk co-operative soc. is there.

Based on the collection of the data of the village and survey work done in both semester we have to do some improvement in the Pamol village and do some give new design proposal in the village. We have to provide some facilities in the village like new and re-habitation of the existing school building etc.

There is a room which is not in good condition in primary school and the existing school is in very bad condition so it needs re-construction as per the demand of villagers and review of sarpanch and school teachers. We propose the design of the recreational park, road, drinking water point, community hall, library, etc.

It is also required to connect the grid of village with nearby substation. Because the village grid only connected with Pamol sub-station. In addition, the primary health is also needed as per villagers.

We use data collection methods like, Self-survey of the village, Interaction with the villagers, Techno economic survey, Physical survey of the village, Census 2011 reports and other reports published by different Ministries of the Government, Statement of villagers, Google information etc.

In village drainage system work is going on. 1/4th village has got proper drainage facilities and remaining village will get it soon. For transport network, bus stand is available in the village. Most of the villagers are depended on Rickshaws and private vehicles for transportation. Approach road of the village is Bitumen Road. Our allocated village has one community hall but it is in very bad condition. It needs to be reconstructed at another place as using existing community hall is like putting life of village in danger.

Based on survey we tried to give design of basic facilities to fulfil their needs. By providing this basic facility to village for reduce urban city pressure and decrease migration rate, which is ultimate aim of Vishwakarma Yojana. Vishwakarma Yojana is a scheme to provide “design to delivery‟ solution for development of Rurban area. We are given attractive of public library, bank and post office using smart technology for Pamol village. We are tried to give batter design to use maximum natural resources and provide all the basic needs.

In our allocated village some streets are outside and far away from the village, so people living there had facing difficulty in buying the necessity of life. So, we decided to build a Market Yard in centre of the village so all the villagers have easy to reach there.

In village and surrounding village use social media WhatsApp group has been create for awareness of Covid-19. Information at the grassroots level and government guideline are being given to the people by putting posters at everywhere. Regular cleaning activities and spreading sanitizer in village carried out. In our allocated village, the panchayat has sprayed the sanitizer in whole village 5 to 6 time. We have done different activities in our allocated village like surveying the village, swachta Abhiyan, Covid-19 awareness program, etc. Some of the photographs of our activities are given below: