DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION

Ten Village
Surat District

PREPARED BY

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
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NODAL OFFICERS NAME:

Assistant Prof. Dixit Chauhan

Bhagawan Mahavir College of Engineering and Technology

YEAR: 2020-21

GUJARAT TECHNOLOGICAL UNIVERSITY
Chandkheda, Ahmedabad – 382424 Gujarat

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Chandkheda, Ahmedabad – 382424 Gujarat

CERTIFICATE

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

Detail Project Report for,

VILLAGE: TEN, BARDOLI

DISTRICT: SURAT

Under

Vishwakarma Yojana: Phase-VIII

in partial fulfillment of the project offered by

GUJARAT TECHNOLOGICAL UNIVERSITY, CHANDKHEDA

During the academic year 2020-21.

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

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Principal Name and Signature:	**Dr. Vineet Goel**
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College Name:	**Bhagwan Mahavir College of Engineering & Technology**
College Stamp:	

ABSTRACT

Vishwakarma Yojana is the project for the Rurbanization of the village. Our vision for this project is to give something better for the redevelopment of the village. This yojna aims at developing the village by providing all the urban facilities that a city may have, yet maintaining the Rural soul. This can be achieved by considering various aspects such as Physical, Social, and Renewable infrastructural facilities. Under this scheme, the villages are surveyed and development schemes are proposed and implemented.

Our allocated village name is Ten which is located in Bardoli, taluka Surat, district. Which is around 32 Km from the center of city surat. This village has comprises of 1394 houses. It has a total population of 6251 with 2999 female population against 3252 males according census 2011 data. The main aspects for development of this village are Primary School, public toilets, community hall, Post Office etc. Some of the physical infrastructure like panchayat building, ITI, and well exist in the village and are properly maintained and utilized. More over Water tank is present but in bad condition. The village is like 60% of the pucca houses and 40% other kutchha houses and all the condition of the houses is average.

On the basis of collected data from Techno-economic survey of Ideal village & smart village survey, we found GAP between existing facilities of our village and required facilities as per norms. Based on the GAP analysis, we provided proposed designs for Part 1 Post Office, Public Health Center, Public Play Ground, Community Hall, Internal Street Road, Rain Water Harvesting System etc.

By introducing above mentioned amenities all the facilities can be made available to villagers which may reduce the migration. This will sustain the culture of cooperative living. Socioeconomic development will occur giving a sense of livelihood to the dwellers yet maintaining the essence of a village. And in part 2 we have decided some designs for future scope of the village development as, Primary School, Bank, Maintenance of Pond, Solid waste management, Maintenance of Water head Tank, Solar street lights and dustbins.

Key Words: Vishwakarma Yojna, Urbanization, Sustainable Development, Rurbanization, Infrastructure Details, Rural Development etc.

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

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ABBREVIATION

SHORT NAME / SYMBOL	FULL NAME
VY	Vishwakarma Yojana
IT	Information Technology
USAID	United State Agency for International Development
R & D	Research and Development
ATIS	Automatic Terminal Information Service
ITMS	Intelligent Transit Management System
BRTS	Bus Rapid Transit System
DPR	Detailed Project Reports
MMTH	Multi Modal Transportation Hub
MOU	Memorandum of Understanding
APMC	Agricultural Produce Market Committee
KW	Kilo Watt
KM	Kilometer
GDP	Gross Domestic Product
MLA	Member of the Legislative Assembly
LED	Light Emitting Diode
RCC	Reinforced Cement Concrete
PCC	Plain Cement Concrete
PHC	Primary Health Centre
LPCD	Liter Per Capita Per Day

Chapter 1:

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

1.1 Background & Study Area Location:

Baben village, which is located 36 km from Surat city. Here the villagers have all the facilities that one living in the city does. This village is also attached by having bardoli nagar palika nearer to its boundary. It is around 2.1 km away from bardoli. Distance between sub districts (Bardoli) to Baben is 2.1km. Here we the 8 students who visited ideal village selected in our district as Baben village, Near Bardoli on 12th September. We reached at morning 9 am to village baben & went to gram panchayat. There we met Deputy Sarpanch Bhaveshbhai Naginbhai Patel because sarpanch was on a meeting. Then we also visited Talati Shri A.V.Vishwabharan Sir. They give us information about their basic Amenities that are available in this Baben village.

Baben is a village panchayat located in the Surat district of Gujarat state,India. The latitude 21.1378786 and longitude 73.0966019 are the geocoordinate of the Baben. Total land area of baben have approx 465 hectare. The surrounding nearby villages and its distance from Baben are Umrakh 1.7 KM, Ten 1.8 KM, Astana 2.1 KM, and Bardoli 3.1 KM. The nearest railway station to Baben is Bardoli which is located in and around 1.0 kilometer distance. Gandhinagar is the state capital for Baben village. It is located around 245.2 kilometer away from Baben. Baben village, which is located some 35 km from Surat city, typifies development. Here villagers enjoy all the facilities that one living in the city does. The 2-km road from Bardoli to Baben gives a commuter the feeling of passing through a highway. This is because the village road is 12-meter-wide and is well lit with street lights.

Village:	Baben
Taluka:	Bardoli
District:	Surat
Land Area:	465 Hector
Language	Gujarati

Fig 1.1 Map of Baben

1.2 Concept: Ideal Village:

1.2.1 Objectives:

- 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.

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

➢ **Punsari - The village with Wi-Fi, CCTVs, AC classrooms and more**

Punsari, located in Gujarat, puts most metros to shame. Funded by the Indian government and the village own funding model. The village also boasts of a mini-bus commute system and various other facilities. The village has 23 communities with a population of 6000, including only 350 people living below the poverty line. Most of the people in the village are dependent on agriculture and milk production for livelihood. The major crops cultivated in the village are cotton, wheat, and potato. The trajectory of development can be broadly divided into five headings. The most important concern in rural development is to provide basic amenities to each person living in the rural area. Punsari stands out in this regard as it has constructed a reverse osmosis plant and since then provided house-to-house piped connections to supply chlorinated water. It also has its own 66 KVA substation for electricity generation and 100 per cent coverage of all streets with LED streetlights. A public address system with 120 waterproof speakers for announcing information and spreading messages has been another striking feature of this village. Punsari has five primary schools and four secondary schools. The class rooms in these schools are fully equipped with CCTV cameras, LED screens used for teaching, mineral water plants, separate toilets for girls and boys, computer labs, and well-stocked libraries. Mid-Day Meals program of the central government has been successfully implemented. Availability of these basic amenities within the premises of schools has also helped to reduce the dropout rate to zero. Punsari has a 24/7 primary health center equipped with a pharmacy and a library. It also has a 24/7 maternity ward to encourage institutional deliveries in the village.

1.2.3 The Idea of a model/Smart Village:

"A model village is a sustainable community that is able to generate and maintain the resources necessary to improve its level of wellbeing by strengthening the sustainability pillars of livelihood, infrastructure and services."

- A model village should have a water supply for every house with a proper drainage system. Hand pumps, wells, ponds can be a source of getting water.
- A village should have at least two schools, primary and secondary, along with proper housing.
- Proper road (pucca road) should be there for transporting goods and people from one place to another.
- Medical services and ambulance for 24 hours. More than one hospital should be built

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

There is sufficient evidence to suggest that the village was one of the important settlements in ancient India. The Rig Veda talks about the gram to which various families owed their allegiance. Valmiki's Ramayana talks of two types of villages – the ghosh and the gram. The ghosh was smaller than the gram and was also known as vraja, or brij (signifying a cattle farm). Both types of villages had their officials, called the mahattar. There is also a reference to a senior official called gramani or gramik. The Mahabharata talks of different types of settlements, for example, ghosh or brij (cattle farm), palli (small hutments), gram (villages around the forts), kharvata or pattan (towns), and pur, puri, nagar (cities of different types). The villages were linked with one another, culturally, socially and administratively.

1.3 Detail study:

- **Socio economic:**

The main source of income for the village people is agriculture, jobs, self-employed. Around 300 hector is agriculture land and around 60percent of people are engaged in agricultural while 25 percent are engaged in jobs & others are self-employed. The village also has a degree and diploma engineering college, a school and a restaurant. The village has its own ambulance. A big sugar factory & Higher Educational facilities is available for better employment, due to self-reliance new development of residential area is taking place. Many types of crops are to be farmed in the village like Wheat, Banana, Ladies-Finger, Bringer, Cucumber, Chili etc.

Fig. 1.2 Sugar factory of Baben

- **Physical and Demographical growth:**

As water is a basic need for all, Panchayat itself manage the water supply for each household. For storage purpose Panchayat having 7 overhead water tanks with the capacity varying from 20,000 to 1.5 lac litre within the area. They provide 160 LPCD water. They are using ground water as a source of water. They have provide water 6 hours daily and for the purification of water chlorination process is conducted. The charge each household only 10 rupees per year for water supply.

Fig. 1.3 Overhead Tanks

Table 1 Population of Baben

Year	Population	No. of Households	Male	Female
2001	8377	1592	4576	3801
2011	15610	3146	8642	6968

Fig 1.4 Gram panchayat

Fig. 1.5 Entrance Gate of Baben

Fig. 1.6 Bank of Baben

Fig. 1.7 ATM of Baben

Fig. 1.8 Lack of Baben

Fig. 1.9 Internal Road

Fig. 1.10 Primary School of Baben

Fig. 1.11 College of baben

1.4 SWOT analysis of Ideal village / Smart Village:

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

- **Strength:**
  - Lake site
  - Local businesses

- Schools and colleges
- Religious places (temples/masjid)
- Excellent water quality
- Easy access to highway
- Parking facilities

➢ **Weakness:**

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

➢ **Opportunities:**

- Construction of public library
- Construction of movie theatre
- Opportunities for local business
- Redevelopment of vacant land
- Entertainment parks

➢ **Threats:**

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

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

By seeing the kind of the village and the infrastructure we get to know about the new concept which we can try something new which is a problem or can say issue coming in the ideal Village. According to our view public things about the village is a big prospect in the upcoming future if the thinking changes the automatically the development gets its way.

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

1.6 Benefits of the visits of Ideal village / Smart Village:

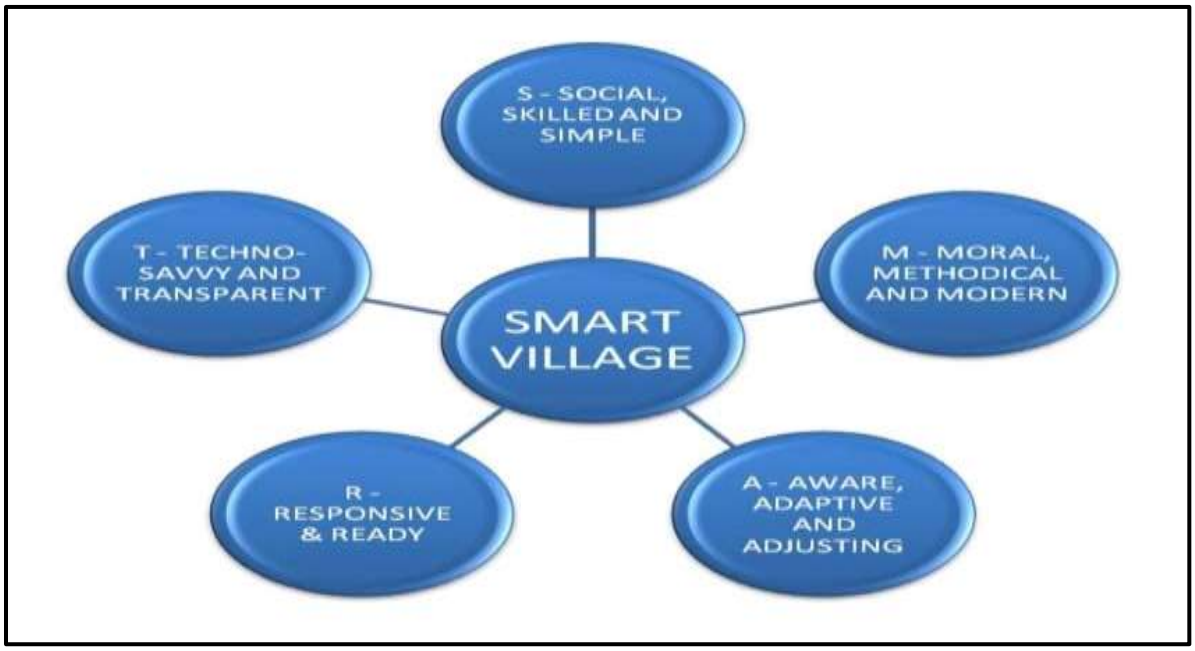
The visit to the Ideal village gives a wide idea about the place its geography, socio economic, infrastructure details. It explain us or gives an idea regarding the new things and futuristic things that could be a necessity for the village in next few year, thus this visit to the ideal Village is a good idea for starting the work regarding the viswakarma yojana.

To study about the development as well as the infrastructure facilities of the villages which is an idealvillage 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 which actually needs development and can implement the same for the development of the villages which are allotted to us in Vishwakarma Yojana Phase-VIII as our final year project. After visiting the village, we came to know about the various facilities that can be provided in a village for Reurbanizationof village and to reduce the migration of people from villages to city areas. We also came to know about the various methodologies and techniques that can be used for the development of the villages. The

sarpanch of Baben gram panchayat gave us a brief idea about the methods, techniques, strategies that muse be used for the development of any village and what plays an important role for the development of any village. As Baben has developed a lot during the year 2007 to 2020 we got a good knowledge related to ruraldevelopment and general infrastructure facilities to be provided in a village. Baben can also be consideredas bench mark for the development of other villages.

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

According to the study Ideal village deals with the proper availability of service to people to their means regardless of achieving their means for sustainable developments for various achievements of goals for village development.



1.12 Smart village concept

Chapter 2:
Literature Review

2.1 Introduction: Urban and Rural village concept:

"Urban village typically would mean a well-planned set up with a village concept of being fairly self-sufficient and not having the need to travel long distance to get daily things done. What is most important, perhaps, is that it's intended to tackle the problem of increasing population in cities." Urban design techniques such as public space and pedestrian are employed to facilitate the development of community by encouraging human interaction. This philosophy shares many attributes with the new urbanism school of thought.

Fig 2.1 Urban Areas of India

- **Concept of Rural development:**

Development can be defined as a process of directed change towards some objectives which are accepted as desirable goals. It means the continual improvement of the quality of human life. However, development has often been conceived in economic terms as sustained economic changes are necessary for the achievement of many social goals. The traditional concept of development meant only economic growth of the nation and its citizens.

According to the Census of India (2011), those areas where population is below 5000 and population density less than 400 per square kilometre are considered as villages or rural areas. In such areas at least 75 per cent of the males of the working population are engaged in agrarian sectors (Census of India, 2011). If we come to talk about the concept of development, it is an emergent property of the economic and social system.

Fig 2.3 Rural areas of India

2.2 Importance of Rural Development:

Rural development has always been a matter of concern for government of any nation. Though there is a marked difference between the severity of development issues of developed and developing nations of the world, still the common agenda of rural development tops the hit list of national developmental concerns of any country. In India, there are 6,40,867 villages. The Father of the Nation, Mahatma Gandhi said that, "India lives in its villages". It is true because 68.84 per cent of our country's population of whom about 75 percent of them are dependent on agriculture, lives in villages (Census of India, 2011). Hence we can well imagine that a majority of the development agendas in India cater to rural issues and have the motto of rural development. In order to meet different challenges in rural areas, rural development interventions are made by development agencies concerned. Thus, this project will aim to discuss the concept of rural development, its priority in India and agriculture being an integral part of it, importance of rural development indicators and the global inventory of indicators, the concept of Model Villages in India, how they are the micro embodiments of the global inventory and lastly, the recent national initiative of Sansad Adarsh Gram Yojana which is in tandem with the concept of Model Villages. The article also provides suggestions and explores future scope for improvisation of the existing rural development programmers in order to make them more effective.

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

In India, the "rural sector" means any place as per the "latest census" which meets the Following criteria:

- A population of less than 5,000
- Density of population less than 400 per sq. km and more than "25 per cent of the male.
- A Village is a clustered human settlement or community, larger than a hamlet but smaller than a town, with a population ranging from a few hundred to a few thousand.

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

DATA HIGHLIGHTS – CENSUS 2011

Table 2 Population of india (in Crore)

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

For the first time since Independence, the increase in population is more in urban areas than that inrural areas

- Rural – Urban distribution: 68.84% and 31.16%
- Level of urbanization increased from 27.81% in 2001 Census to 31.16% in 2011 Census
- The proportion of rural population declined from 72.19% to 68.84%

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

As per details from Census 2011, Gujarat has population of 6.04 Crores, an increase from figure of 5.07 Crore in 2001 census. Total population of Gujarat as per 2011 census is 60,439,692 of which male and female are 31,491,260 and 28,948,432 respectively. In 2001, total population was 50,671,017 in which males were 26,385,577 while females were 24,285,440. The total population growth in this decade was 19.28 percent while in previous decade it was 22.48 percent. The population of Gujarat forms 4.99 percent of India in 2011.

- **Gujarat Population:**

As per projection, population of Gujarat in 2020 is 7.04 Crore.

Table 3 Population of Gujarat

Description	2011	2001
Approximate Population	6.04 Crores	5.07 Crore
Actual Population	60,439,692	50,671,017
Male	31,491,260	26,385,577
Female	28,948,432	24,285,440
Population Growth	19.28%	22.48%
Percantage of total Population	4.99%	4.93%

2.6 Rural Development Issues - Concerns – Measures:

Problems faced for Rural Development in India:

1. The financial, manpower and managerial resources devoted to the implementation of rural development programs are utterly inadequate.
2. Better implementation of rural development programs can be ensured only if those responsible for actual implementation are paid reasonably well, appropriately trained, and sufficiently motivated. But this has not been done as yet.
3. It is being increasingly observed that the objectives of one program conflict with those of others, and there is no institutional mechanism for reconciling them. Consequently, many programs utterly fail in fulfilling their objectives. In addition, they also affect other programs.
4. In many cases, instruments of rural development are not properly selected, and their levels are not consistent with the objectives they seek to achieve. This results in the wastage of valuable public resources, and unnecessary delays in achieving the objectives.
5. Honesty, hard work, helping others, thrift and such other virtues indirectly help in economic development. In the Indian context, not much attention has been paid to this aspect of development.
6. Observance of rituals, lack of rational decisions in economic matters, spending huge amounts of money on marriage, birth or death ceremonies, prevalence of the caste system and the joint family system in the rural areas and illiteracy are some of the factors which arrest the rural development in India
7. The political parties have a vital role to play in rural development. But unfortunately this role has not been effectively realized by any democratic political party so far. The political parties, today, are guided more by party interests rather than by national interests.

- **Various Measures for Rural development**

Future policy will be built around the three thematic axes. For each axis a range of measures will be available. In the new Regulation, conditions under which the measures can be implemented have been streamlined and simplified.

- **Measures under Axis 1 (Improving the competitiveness of agricultural and forestry sector)**

Competitiveness requires that a reasonable balance is found between farm viability, environmental protection, and the social dimension of rural development. To enhance competitiveness investment support for physical capital will remain important. At the same time investments in human and social capital will be ever more important to enable agriculture and forestry to remain an innovative and dynamic sector contributing to growth in rural areas.

Under this axis, measures fall into three groups:

- Human resources
- Physical capital
- Food quality

- **Measures under Axis 2 (Improving the environment and the countryside):**

Payments under Axis aim at ensuring the delivery of environmental services by agro-environment measures in rural areas, and preserving land management (including in areas with physical and natural handicaps). These activities contribute to sustainable rural development by encouraging the main actors (farmers, foresters) to keep up land management so as to preserve and enhance the natural space and landscape. Measures are in the following groups under Axis 2:

- Sustainable use of agricultural land

Farmers play an essential role in providing environmental services and therefore, payments may be given to farmers who sign up voluntarily to agro-environmental commitments for a minimum period of five years.

- Sustainable use of forestry land

Forestry is an integral part of rural development and support for sustainable land use should encompass the sustainable management of forests and their multifunctional role. In this context, support will be available for the first afforestation of agricultural land, first establishment of agroforestry systems on agricultural land.

- **Measures under Axis 3 (quality of life in rural areas and diversification of the rural economy)**

A central objective of Axis 3 is to have a 'living countryside' and to help maintain and improve the social and economic fabric, in particular in the more remote rural areas facing depopulation.

- **There are three groups of measures under Axis 3:**
  - Diversification of the rural economy within this, three measures will be available: diversification into non-agricultural activities which will be available to a member of the farm household, support for business creation and development, which will be available only to micro-enterprises, and encouragement of tourism activities.
  - Improvement of the quality of life in rural areas within this group, two measures are available: the support for the setting up of basic services for the economic and rural population (including cultural and leisure activities) concerning a village or group of villages, and related small scale infrastructure and the conservation and upgrading of the rural heritage.
  - Training, skills acquisition and animation Training and information actions will be available for the rural population to achieve the objectives of increasing economic

diversification and improving the quality of life of rural areas. Also support will be available for skills acquisition and animation of rural areas and the implementation of local development strategies by public-private partnerships different to the Leader local action groups.

2.7 Various infrastructure & guidelines/Norms for village for the provision different infrastructure facilities:

The development of rural infrastructure could promote economic growth, improve the standard of living of the population and reduce the incidence of poverty by generating both farm and non-farm employment and earning opportunities, increasing productivity, providing access to basic goods and services and improving the health and physical condition of people. Empirical studies also report a strong relationship between infrastructure, economic growth, rural development and poverty reduction. In spite of the crucial importance of infrastructure, significant deficiencies have persisted in rural infrastructure across Indian states. The quantity and quality of infrastructure facilities are substantially lower in rural areas than in urban areas.

Roads: Transportation facility provide to village population so use people in road in one place to other place easily transportation.

Housing: Housing is one of basic requirements for human survival. For a shelter less person, possession of a house brings about a profound social change in his existence, endowing him with an identity, thus integrating him with his immediate social milieu. The Ministry of Rural Development is implementing prathanmantri awas yojana and constructed residential awas in rural area.

Irrigation: There is a definite gap between irrigation potential created and the potential utilized. Under Bharat Nirman it is planned to restore and utilize irrigation potential of 10 lakh hectare through implementation of extension, renovation and modernization of schemes along with command area development and water management practices. There are considerable areas in the country with unutilized ground water resources. Irrigation potential of 28 lakh hectare is planned to be created through ground water development. The remaining target for creation of irrigation potential of 10 lakh hectare is planned to be created by way of minor irrigation schemes using surface flow.10 lakh hectare of irrigation potential is also planned by way of repair, renovation and restoration of water bodies and extension, renovation and modernization of minor irrigation schemes.

Water Supply: To build rural infrastructure, Bharat Nirman has been launched by the Government of India in 2005 to be implemented in a period of four years from 2005-06 to 2008-09. Rural drinking water is one of the six components of Bharat Nirman. During Bharat Nirman period, 55,067 un-covered and about 3.31 lakh slipped back habitations are to be covered with provisions of drinking water facilities and 2.17 lakh quality-affected habitations are to be addressed for water quality problem.

Telephone Connections: There is no land line phone available in this village. Mobile phone network was available 1KM away from village till 2009. The proper use of mobile phone started in 2010. Telecom connectivity constitutes an important part of the effort to upgrade the rural infrastructure. Under the Bharat Nirman Programme, it will be ensured that 66,822 revenue villages in the country, which have not yet been provided with a Village Public Telephone (VPT), shall be covered.

Electrification: Many villages still receive only 2 to 6 hours of electricity per day which needs to drastically improve to empower the villages of India.

Rural credit: Banking services need to be popularized and credit should be available for basic services like agriculture.

2.8 Other Projects / Schemes of Gujarat / Indian Government:

Rural development is a process of improving quality of life and economic status of people living in villages. Education, entrepreneurship, physical infrastructure and social infrastructure also play a role in developing the rural regions. Rural development is characterized by its emphasis on locally produced economic development strategies. The main objective of the rural development is to remove poverty of the people and fill the widening gaps between rich and poor. Various policies and scheme by Government of India are:

- IRDP(Integrated Rural Development Program)
- SGSY(Swaranjayanti Gram Swarozgar Yojana)
- NRUM(National Rurban Mission)
- Pradhan Mantri Gram Sadak Yojana
- Indira Aawas Yojana
- Mahatma Gandhi National Rural Employment Guarantee Act-2005 DRDA(District Rural Development Agency)
- PURA(Provision of Urban Amenities in Rural Areas)
- PMGSY(Pradhan Mantri Gram Sadak Yojana)
- NRDWP(National Rural Drinking Water Programme)
- JNNURM(Jawaharlal Nehru National Urban Renewal Mission)
- IWDP (Integrated Wasteland Development Programme

Projects / Schemes by Private sectors:

- Intensive Agricultural Area Programme
- Intensive Agricultural District Programme
- High Yielding Varieties Programme
- Rural Industries Project

Propagation of technology/schemes for rural development is slow and there is a lacking in wider participation of different stakeholders. An ideal approach may therefore, include the government, panchayats, village personals, researchers, industries, NGOs and private companies to not only help in reducing this imbalance, but also to have a multiplier effect on the overall economy.

Chapter 3:

Smart Cities Concept ideas and its visit

3.1 Introduction:

3.1.1 Concept:

Smart Cities Mission is an urban renewal and retrofitting program by the Government of India with a mission to develop 100 cities all over the country making them citizen friendly and sustainable. The Union Ministry of Urban Development is responsible for implementing the mission in collaboration with the state governments of the respective cities.

- A smart is the integration of technology in to a strategic approach to sustainability.21st century has brought with it a new global trend of ”sustainable urban development” and this concept adds new dimensions to urbanization which require a quick need to upgrade existing cities.
- The concept of a smart city is a relatively new one.
- Through the years, with the significant contribution from various technologies like computer science, information technology, remote sensing, advance multimedia world etc.

3.1.2 Definitions of smart cities:

A city well performing in a forward-looking way in economy, people, governance, mobility, environment, and living, built on the smart combination of endowments and activities of self-decisive, independent and aware citizens.

A city “connecting the physical infrastructure, the IT infrastructure, the social infrastructure, and the business infrastructure to leverage the collective intelligence of the city”

A city that monitors and integrates conditions of all of its critical infrastructures, including roads, bridges, tunnels, rails, subways, airports, seaports, communications, water, power, even major buildings, can better optimize its resources, plan its preventive maintenance activities, and monitor security aspects while maximizing services to its citizens.

“The use of Smart Computing technologies to make the critical infrastructure components and services of a city–which include city administration, education, healthcare, public safety, real estate, transportation, and utilities–more intelligent, interconnected, and efficient”

3.2 vision - goals, standards, and performance measurement indicators:

The vision of smart cities is the urban center of future, made safe, secure environmentally green, and efficient because all structure – whether for power, water, transportation etc.

Smart cities Standards into 3 main levels, Strategic, Process and Technical

- **Level 1:** Strategic: These are smart city standards that aim to provide guidance to city leadership and other bodies on the “process of developing a clear and effective overall smart city strategy”. They include guidance in identifying priorities, how to develop a roadmap for implementation and how to effectively monitor and evaluate progress along the roadmap.
- **Level 2:** Process: Standards in this category are focused on procuring and managing smart city projects – in particular those that cross both organizations and sectors. These essentially offer best practices and associated guidelines.
- **Level 3:** Technical: This level covers the myriad technical specifications that are needed to actually implement Smart City products and services so that they meet the overall objectives.

➢ **What is performance measurement? (PM)**

PM is a management technique that organization uses for regular monitoring and reporting of the performance of various programmers, departments, or work units. It is concerned with not

only how much is being done, but also how efficiency of what quality. The City Managers' Association of Gujarat (CMAG) with technical assistance from International City/County Management Association (ICMA) and financial assistance from USAID had undertaken a programmer to introduce benchmarking as an analytical tool for policy makers to support the decision-making process in 2000. The performance assessment in this programme was applicable to all infrastructure aspects that come under the jurisdiction of a municipality and the financial aspects.

- Quantitative indicators that can be presented with a number.
- Qualitative indicators that can't be presented as a number.
- Leading indicators that can predict the outcome of a process.
- Input indicators that measure the amount of resources consumed during the generation of the outcome.
- Process indicators that represent the efficiency or the productivity of the process.
- Output indicators that reflect the outcome or results of the process activities.
- Practical indicators that interface with existing company processes.
- Directional indicators specifying whether or not an organization is getting better.
- Actionable indicators are sufficiently in an organization's control to effect change.
- Financial indicators used in performance measurement and when looking at an operating index.

3.3 Technological Options:

People are increasingly migrating from rural to urban areas. By 2050, about 86 percent of people in developed countries and 64 percent of people in developing countries are expected to live in cities. Because cities will absorb future population growth, it is crucial to use resources more efficiently.

- **Key points of smart technology:**

1. Smart energy:

By using renewable energy sources, manage water supply and have a waste management system, cities can reduce pollution and use less energy.

2. Smart mobility:

Smart mobility strives to find more sustainable transport options. Walking, cycling and combined mobility are a few of the solutions that partially could solve the problem.

3. Smart infrastructure:

Smart infrastructure creates the fundament for all smart solutions. By using new technology to convert raw data into information, urban and regional development can be planed and designed to fit future demand.

4. Smart public services:

By connecting city residents and authorities using innovative communication technology, cities can become safer, cleaner and the general city standard will improve.

5. Smart care:

To adapt to changes in population demographics, the development of smarter healthcare services will provide quality services also in the future. Smarter care will reduce costs and connect users within the healthcare industry to provide necessary patient information.

3.4 road maps and safe guards:

- Roadmap Design Principles:

- Build a vision of where the public safety community wants to go, determine what technologies are needed to get there, and provide a route for achieving the vision.
- Make R&D decisions based on capability requirements and priorities set by the public safety community.
- Assume that public safety may have to adjust operations to fully realize the benefits of new technologies.
- Leverage ongoing efforts by other partners to develop and implement the roadmap. This approach will allow PSCR to focus resources to complement and not duplicate ongoing efforts.
- Enable public safety to meet generational and public expectations.
- Identify R&D project opportunities in light of the evolution of technology capabilities and gaps forecasted by working group participants.

- **Safeguard for smart cities:**

Safeguarding our upcoming Smart Cities in India against cyber threats is essential if we want to fully exploit the benefits of a smart city. IT infrastructure will form the backbone of Smart Cities' infrastructure. Reliance on IT infrastructure makes it vulnerable to Cyber Threats if safeguards are not put in place in the planning stage itself.

Fig 3.1 Safeguards for smart Cities

A smart city environment will have networked utilities such as power supply, water supply, e-governance for its citizens, intelligent traffic management system, networked emergency services etc. Majority of the Smart City implementation will have a networked ICT backbone requiring network security. Technology will play a key role in the development of smart cities which lends itself open to cyber threats if safeguards are not incorporated in the planning stage. The smart cities will have to be built with concurrent cyber threat safeguards.

"Privacy by design" is an equally necessary means to ensure that smart cities do not devolve into surveillance programs. Privacy by design means that technology manufacturers and municipal purchasers must work together at all stages of product development to build privacy safeguards into smart cities technologies. It is not enough to bolt privacy safeguards onto completed tools at the last minute.

3.5 Issue and challenges:

- The High Power Expert Committee on Investment Estimates in Urban Infrastructure has assessed a Per Capita Investment Cost (PCIC) of $685 for a 20 yr. period.
- The total estimate of investment requirements for the smart city comes to $113 billion over 20 years (with an annual escalation of 10 percent from 2009-10 to 2014-15) Land acquisition, foreign direct investment and other questions still remain unresolved.

Fig 3.2 Five Challenges for smart cities

- The prospect of heavy sums of private sector finance, either domestic or foreign will be a challenge. These concerns mean many projects may not be commercially viable at the starting time.
- The failure of a PPP is often due to due to lack of realistic objectives, financial management, project governance, and equality in risk management
- The establishments that help cities manage electricity, water, waste, traffic flows, municipal operations, and city services are becoming increasingly complex and can be expensive.
- Although the return on investment may be attractive, complexities often make it challenging for cities to kick-start their Smart City projects.
- To develop smart cities in India, there is a need to address challenges relating to political alliance, financing and stakeholder management.
- Successful implementation of smart city solutions needs effective horizontal and vertical coordination between various institutions involving institutions providing various municipal amenities as well as effective coordination between central government (MoUD), state government as well as local government agencies on various issues related to financing, sharing of best practices and sharing of service delivery.
- Other challenges for India include merging technology with law enforcement.
- There is no point in installing high tech traffic signals if its implementation cannot be enforced. India will also have to find ways of encouraging private investment for infrastructure required for a smart city.

3.6 Smart Infrastructure - Intelligent Traffic Management:

- **Smart Infrastructure:**

Smart Utilization of Surat city's potential for enhancing quality of life for the citizens by providing equal access to best quality physical infrastructure, social infrastructure and mobility through leveraging state of the art technology: thus making Surat a futuristic global city with focus on enhancing economy, protecting the ecology and preserving the identity and culture of the citry.

- **Intelligent Traffic Management:**

Surat is implementing a city wide integrated system – "Intelligent Transit Management System" (ITMS), to manage diverse set of transportation needs for the city – this includes: (a) public transport and (b) vehicles related to civic services like Solid Waste Management, Drainage, Heavy Engineering, Emergency Services etc. ITMS is planned to bring in best-in-class operational efficiency and automation to the operational capability of city in respect to transport.

Fig 3.3 BRTS in Surat

Surat is the first city in Gujarat, and the second in India, to launch real time transit information with Google Maps. The new Google Transit feature will enable people in Surat to get real-time updated information on Surat Sitilink's transit routes. Commuters in Surat can simply type in their location and destination in Google Maps to get information about which bus to take and more importantly – they will be able to see when the next bus is arriving at the closest stop. Also, commuters will be able to get an estimation of how long the trip is going to take and if the bus they are planning to take is delayed. The new feature is available on both Android and iOS apps of Google Maps and users can also find the information by searching a bus stop on Google.

3.7 Cyber Security:

Cyber security is the body of technologies, processes and practices designed to protect networks, computers, programs and data from attack, damage or unauthorized access. In a computing context, security includes both cyber security and physical security. Ensuring cyber security requires coordinated efforts throughout an information system.

Elements of cyber security include:

- Application security
- Network security
- Operational security
- Information security
- End-user education

3.8 Redevelopment:

1. Surat Metro Rail Project:

As directed by Govt. of Gujarat, Detailed Project Report (DPR) for Surat Metro Rail project-Phase-I was prepared by Surat Municipal Corporation through DMRC (Delhi Metro Rail Corporation). Accordingly, DPR with Estimated Amount of Rs.12020 Crores is approved by Govt. of India in March 2019. The proposed Network of Surat Metro (Phase-I) is shown in the map below:

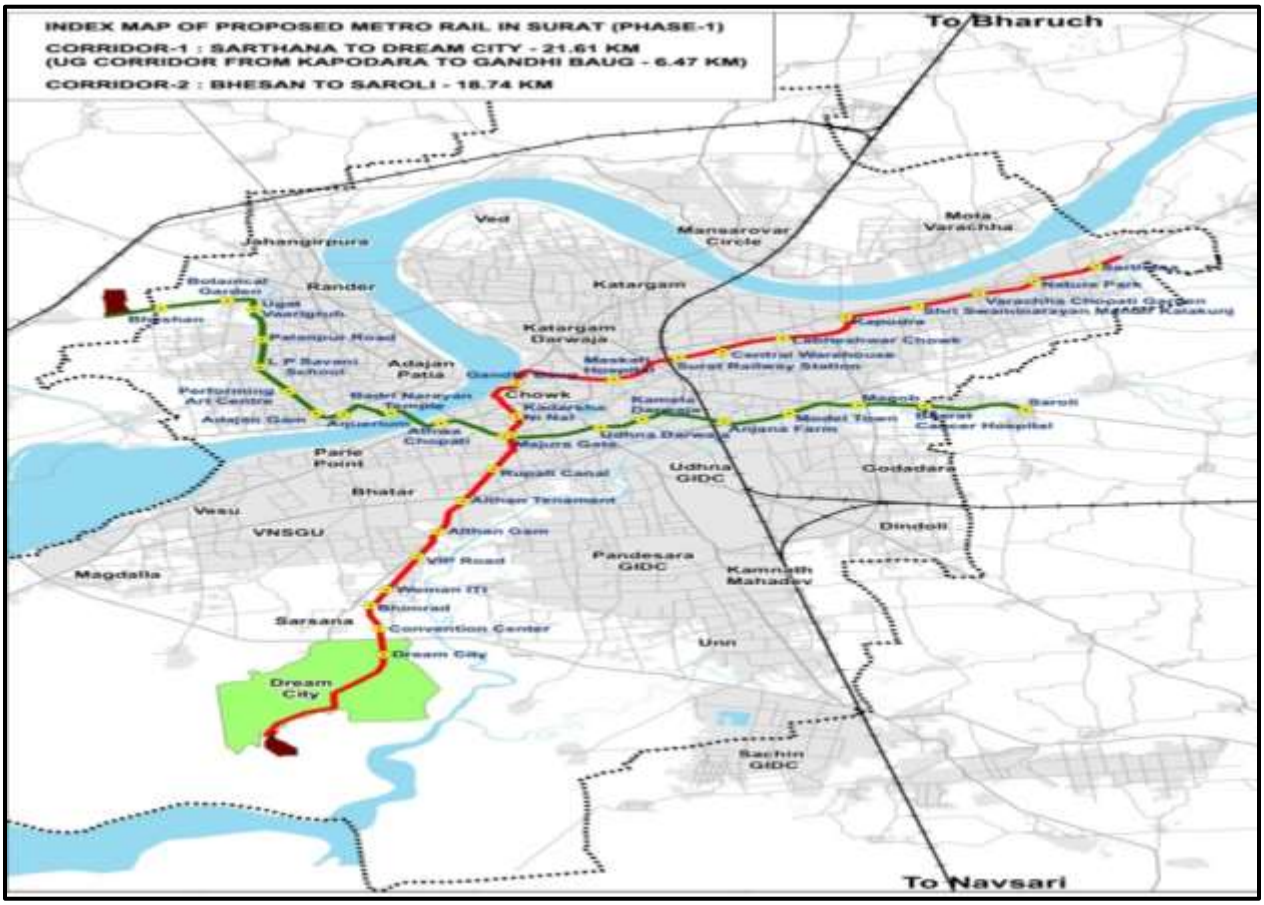


Fig 3.4 Surat Metro Rail Project

As per approved DPR, total 38 metro stations are planned in 2 metro corridors with total length of 40.35 Kms including underground metro route for 6.47 Kms. Corridor-1 : Sarthana to DREAM city (Khajod) and Corridor-2 : Bhesan to Saroli. Total implementation period for the project is 5 years starting from year 2019-20. As per approval of State Govt., implementation of metro project shall be carried out by GMRC (Gujarat Metro Rail Corporation, formerly known as MEGA) which is a 50:50 joint SPV of Govt. of Gujarat & Govt. of India.

2. Surat Railway Station - Proposed Redevelopment - MMTH Project:

Surat railway station is strategically located on one of the busiest railway routes connecting metro cities of New Delhi and Mumbai. It observes heavy passenger flows of around 2.5 Lacs passengers daily and hence becomes a critical point of interchange between different public transit modes.
Under the directions of Government of India through Ministry of Railways, MOU has been signed on Dt.17/08/2016 among Indian Railway Stations Development Corporation (IRSDC), Gujarat State Road Transport Corporation Limited (GSRTC) and Surat Municipal Corporation (SMC). These three parties have jointly agreed to develop a Multi Modal Transportation Hub (MMTH) at Surat Railway Station/Gujarat on DBFOT basis of PPP model. Project will be implemented through a joint venture Special Purpose Vehicle (SPV) with name of Surat Integrated Transportation Development Corporation Ltd (SITCO) incorporated under Companies Act on Dt.17/10/2017.

Fig 3.5 Future Plan of Surat railway Station

This is the first of its kind of infrastructure development where all the three levels of Government i.e. Central (Railways), State (GSRTC) and Urban Local Body (SMC) are forming a joint venture and pooling their combined land area of about 2.9 Laces Sq. Mt. to integrate different modes of transport i.e. rail, city bus, metro rail (future), long distance bus services, auto, taxi and private vehicles etc. for the maximum convenience of the passengers through seamless connectivity across all modes and provide international class of travel comfort. This will enhance the common man's experience and will reduce the overlapping of facilities and provide more compact services with maximum convenience. Conceptual Master Plan of the proposed development has been agreed and all parties have agreed in principle to pool in their land for 90 years lease period for the integrated development of the MMTH. This project is expected to be trendsetter in the country. Currently, different options of project re-structuring are being discussed among all 3 stakeholders to get the most competitive bid offers. Estimated Cost of mandatory part of MMTH project is Rs.895Cr.

3.9 Strategic Option for Fast Development:

Smart Infrastructure involves applying this to economic infrastructure for the benefit of all stakeholders. It will allow owners and operators to get more out of what they already have, increasing capacity, efficiency and resilience and improving services. It brings better performance at lower cost. Gaining more from existing assets is the key to enhancing service provision despite constrained finance and growing resource scarcity. It will often be more cost-effective to add to the overall value of mature infrastructure via digital enhancements than by physical enhancements – physical enhancements add `more of the same', whereas digital enhancements can transform the existing as well. Smart Infrastructure will shape a better future. Greater understanding of the performance of our infrastructure will allow new infrastructure to be designed and delivered more efficiently and to provide better whole life value.

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

More than 90% of the urban population has access to drinking water, and more than 60% of the population has access to basic sanitation. However, access to reliable, sustainable, and affordable water supply and sanitation (WSS) service is lagging behind. Are the Services Reliable? No Indian city receives piped water 24 hours a day, 7 days a week. Piped water is never distributed for more than a few hours per day, regardless of the quantity available. Raw sewage often overflows into open drains. Are the Services Technically and Financially Sustainable? Less than 50% urban population has access to piped water. The Non-Revenue Water (NRW: due to leakages, unauthorized connections, billing and collection inefficiencies, etc.) is huge, estimated between 40-70% of the water distributed. Operations and maintenance cost recovery through user charges is hardly 30-40%. Most urban operations survive on large operating subsidies and capital grants.

Indigenous technology: Technologies employed and discovered by the native inhabitants of a country are regarded as Indigenous technology. It constitutes an important part of its cultural heritage and protects the country against exploitation by industrialized countries. Scientists like C.V Raman, Homi J. Bhabha, Visvesvaraya etc. played an important role to shape the structure of Indigenous technology.

Importance of indigenous technology: It provides effective alternatives to western; it gives local people and development workers extra points when designing projects. They can choose from indigenous knowledge or combination of indigenous and western technology instead of searching only western technologies for the feasible solution. Indigenous technologies are cheaper than western technologies. They rely on locally available skills, materials and require little or no cash outlay.

Some of the examples of indigenous technologies are given below:

- Defense Technology
- Space Technology

3.11 Initiatives in village development by local self-Government:

Rural Local Governments (or Panchayat Raj Institutions)

- Zilla Panchayat
- Mandal or Taluka Panchayat
- Gram Panchayat

Initiation by Local People:

- Organizing programme for increase literacy for peoples of village.
- Providing enough information regarding to using of various facilities.
- Peoples have to learn various things regarding how to keep facilities in good condition.

3.12 Smart Initiatives by District Municipal Corporation:

- **Smart Street Lightning and monitoring system:**
  - **Project Brief**
  - Total 90,000 fittings across city
  - Conservation – 1.5 Cr units/year
  - Conversion so far – 55,000 fittings
  - Electricity Bill Savings: Rs. 9 Cr./year
  - Longer life than conventional light
  - Low Ultra Violet and Infrared Radiation

Fig 3.6 LED street light in Surat

3.13 Any projects contributed working by government / NGO / Other Digital Country concept:

- The panchayat raj system is a three-tier system with elected bodies at the village, taluka and district levels.
- The modern system is based in part on traditional panchayat governance, in part on the vision of Mahatma Gandhi and in part by the work of various committees to harmonize the highly centralized Indian governmental administration with a degree of local autonomy.
- The result was intended to create greater participation in local government by people and more effective implementation of rural development programs.

- Although, as of 2015, implementation in all of India is not complete the intention is for there to be a gram panchayat for each village or group of villages, a tehsil level council, and a zilla panchayat at the district level.

- Digi Locker
- MyGov.in
- eSign Framework
- Swachh Bharat Mission mobile app
- National Scholarship Portal
- eHospital
- Digitize India Platform
- Bharat Net
- Wi-fi Hotspots
- Next Generation Network
- Electronics Development Fund
- Centre of Excellence on Internet of Things (IoT)

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

Each village should have following 5 basic amenities in 5 year:

1. Roads
2. Electricity
3. Water
4. Hospitals
5. Schools Some

Basic amenities of for smart village from other countries are:

1. **Schooling:** smart class rooms can improve the quality of education by providing access to a large amount of educational resources.
2. **Health Care:** improving information available on the availability, location and cost of various types of health care.
3. **Agriculture:** provide information to farmers on the types of crop that can fetch them returns, by ensuring that there is no guilt of one product and shortage of another.

Chapter 4:

Allocated Village – Ten, Bardoli

4.1 Introduction:

4.1.1 Introduction about Ten Village Details:

According to census 2011, information the location code or village pin code of ten village is 394601. Ten village is located in Bardoli Tehsil of Surat district Gujarat, India. It is situated 2Km away from sub-district headquarter Bardoli and 32Km away from district headquarter Surat. As per 2009 states, Ten village is also a gram panchayat. The total geographical area of village is 569.1 hectares. Ten has a a total population of 6,251 peoples as per 2011 census. There are about 1,349 houses in ten village. Surat is nearest town to ten which is approximately 32Km away.

4.1.2 Justification/ need of the study:

The need of the study is to provide the basic requirements of people in the village and for City Development of the village. For this purpose the information of the village is collected based on different categories such as Education, Water Facilities, Drainage Facilities, Transportation Facilities, Primary Health Care, Bank Facilities, Public Toilets, Community hall and other amenities. 65% of the population of the country lives on agriculture which contributes only 15 % to the country‘s GDP. If we compare this with China which has a similar sector contribution to the GDP, only 30% of people depend on agriculture whereas in country like USA just 2% of the people are dependent on agriculture. Citification addresses this concern and imbalance by providing alternate jobs to village masses dependent upon agriculture. So it is very important to develop village area compare to city one.

4.1.3 Study Area:

Ten is a Village in Bardoli Taluka in Surat District of Gujarat State, India. It is located 31 KM towards East from District headquarters Surat. 9 KM from 279 KM from State capital Gandhinagar. Ten Pin code is 394601 and postal head office is Bardoli. Barasadi (2 KM) , Umrakh (3 KM) , Pisad (3 KM) , Vanesa (3 KM) , Astan (4 KM) are the nearby Villages to Ten. Ten is surrounded by Palsana Taluka towards west , KamrejTaluka towards North , Valod Taluka towards East , Mahuva Taluka towards South. Navsari , Surat Vyara , Songadh are the nearby Cities to Ten. There are many amenities and services are necessary and yet not available in the village. It is essential to develop the village for development of the and for the Nation. There are many infrastructure facility are necessary which is to be provide in Ten village like Primary Health Care Centre, Public Toilet, Recreational facility etc.

4.1.4 Objectives of the study:

Following are the various objectives of study.

- Old water tank is in bad condition. So it must need maintenance to increasing its life duration.
- Road network near gram panchayat was damaged. So it should need the proper maintenance.
- To fulfill common requirements amenities like public toilets, community hall etc.
- To improve living standard of people and education.
- Manage growth through good planning and appropriate development controls.
- Reduce of Urbanization migration.

- Fulfill common requirement of irrigation.
- Design of rain water harvesting tank.
- Solar street lights.
- Design of efficient drainage system.

4.1.5 Scope of the Study:

The Vishwakarma Yojana is organized by Central Government & it makes the easy way to connect people direct to Government.

- Create good environment between villagers.
- Developing and Using Sustainable and Economical Planning and Designing.
- Design, develop and provide more efficient and sustainable Planning in rural area.
- Earn money for villagers by receiving Tax and giving facilities.
- Providing better recreational centres in rural areas.
- Utilizing each resources maximum.

4.1.6 Methodology Frame Work for development of your village:

The main idea of Vishwakarma Yojana is to raise the standard of living in rural areas so by providing necessary amenities and infrastructure. In doing so, there is following methodology used:

- Visit of the Ten village and study of the area.
- Problem identification by data collection and surveys of the village.
- Suggestion of feasible solution to the identified problems to achieve higher living standards for the people of Ten.

➢ **Methodology:**

- Study objectives
- Literature Survey
- Survey of Ideal, Allocated & Smart Village
- Data Collection
- Data Analysis/Gap Analysis
- Planning Proposal
- Recommendations and Suggestion
- Conclusion

4.2 Study area profile:

4.2.1 Study Area Location with brief History land use details

- **Locality Name:** Ten
- **Taluka Name:** Bardoli
- **District:** Surat
- **State:** Gujarat
- **Population range of place:** Between 9,000 to 11,000
- **Language:** Gujarati and sindhi, Hindi, Marvadi, English, Marathi
- **Sarpanch Name:** Rinaben Devendra Chuadhry
- **Assembly MLA:** Ishwarbhai (Anil) Ramanbhai Parmar
- **Parliament MP:** Prabhubhai Nagarbhai Vasava

Fig. 4.1 Map of Ten Village

- **Brief History:**

Ten is a village situated in Bardoli Taluka district Surat, Gujarat. It's 31 km away from Surat city & 2 km from Bardoli Taluka. The three closest localities to Saribujrang are Baben, Barasadi, Umrakh. It is essential to develop the village under the district for the growth of state and also for the country. There are few problems in the village like need of children's playground, general market for the agriculture product, maintenance of school Building and Aanganwadi, Overhead water tank maintenance, solid waste disposal & drainage & other amenities.

4.2.2 Base Location map, Land Map, Gram Tal Map:

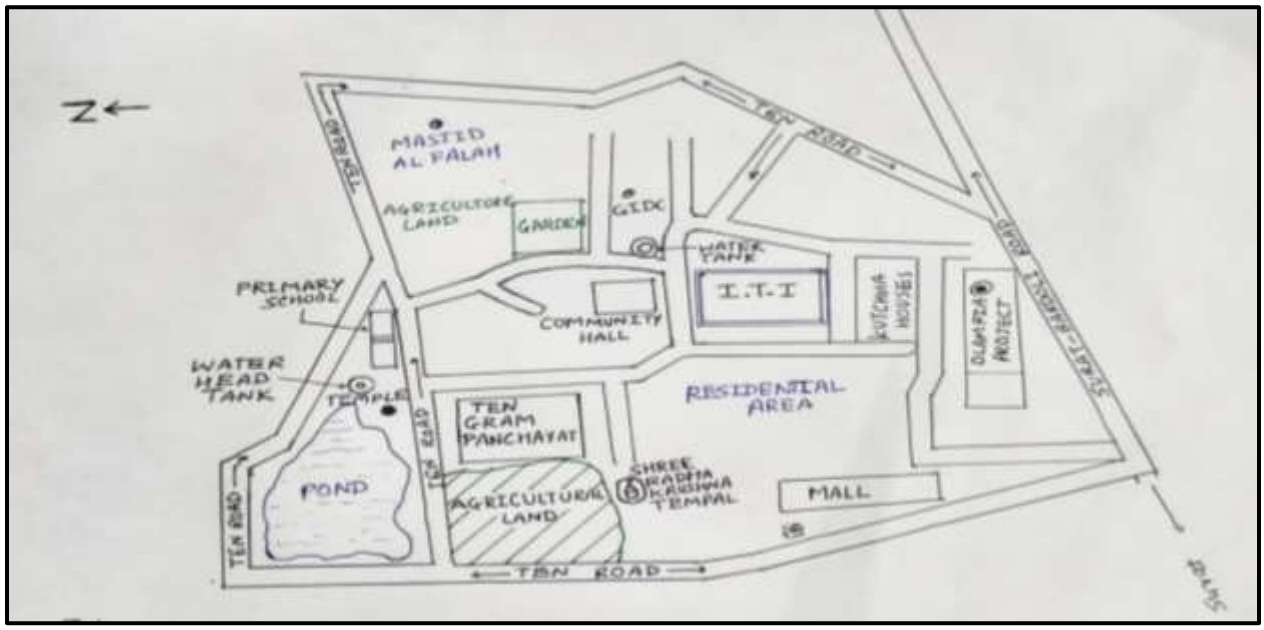


Fig 4.2 Base map of Ten village

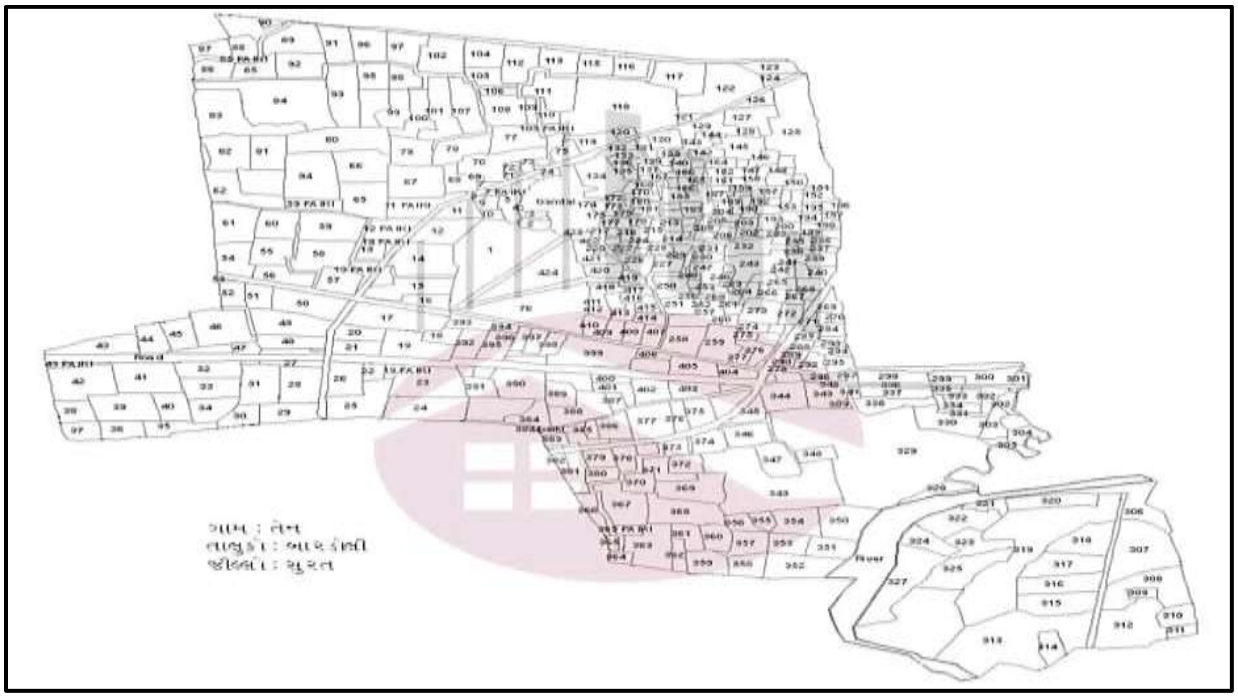


Fig 4.3 Gram Tal map of Ten village

4.2.3 Physical & Demographical Growth:

Ten village is located in Brdoli Tehsil of Surat District in Gujarat, India. It is situated 2km away from sub-district headquarter Bardoli 32km away from district headquarter Surat as per 2009 states. Ten village is also a gram panchayat. The total geographical area of village is 596.1 hectares. Ten has a total population of 6251 peoples as per 2011 census. There are about 1.394 houses in ten villages. Surat is nearest town to ten which is approximately 32Km away.

Table 4 Census details

Year	Population	Male	Female	No. of Households
2011	6251	3252	2999	1394

4.2.4 Economic generation profile:

The major sources of income are:

- Farming
- Animal Husbandry
- As Shopkeepers
- As workers in mills and factories

The villagers are dependent on agriculture for economic aspects. The mostly 70 % people are connecting with agricultural activity. They produce many type of crop in farms. Sugarcane is main crop taken by villagers. After agriculture, now they started a job outside a village like sugar factory worker, Driver, Laborers etc. And also new small scale business started at home in village.

4.2.5 Actual Problem faced by Villagers and smart solution:

- **Actual Problem faced by Villagers:**
  - There is no community toilet block in Village.

- There is no solid waste management facility in village.
- There is no proper drainage System.
- Internal Road are Kutchha and Bad Condition.
- Public Garden Condition is very bad.
- There is no Community hall available in Village.
- One Overhead Water tank is leakage.

➢ **We would like to suggest few smart solution for development of villages like,**

- Rain Water harvesting For Panchayat Building.
- Renovation of Overhead water tank and Bus stop.
- Bio-gas plant for sustainable energy sources.
- Renovation of Public Garden.
- Public Toilet Block.
- LED Street Light.
- Solid waste management
- Skill development center
- Solar street lights and dustbins

4.2.6 Social scenario:

No. of Households: 1394

Table 5 Social scenario

Census Parameters	Census Data
Total Literacy rate %	81.6% (5099)
Scheduled Tribes population%	44.7% (2792)
Schedule Caste Population%	10.3% (643)
Working Population	42.0%

4.2.7 Migration Reasons:

Main reason is job, and people don't like to travel a lot for work so they prefer to migrate.

4.3 Data Collection:

4.3.1 Describe Methods for data collection:

There are two methods for data Collection.

➢ **Primary Method**

- This survey is done with the collection of basic information about village facilities, such as:
- Visit of village, overview of village, document collection.
- Information of village population.
- Village map and other details from village authority.
- Organized the meeting with talati, sarpanch, deputy sarpanch and collect the rural issues from them.

  Data collected from Taluka District Office, Panchayat Office of Ten Village.

- **Secondary Method**
  Data Collected from Sarpanch, Panchayat member, Village dwellers, school teacher, Anganwadi worker & small industries workers.

Data collection is the process of gathering and measuring information on targeted variables in an established systematic fashion, which then enables one to answer relevant questions and evaluate outcomes. The data collection component of research is common to all fields of study including physical and social sciences, humanities and business. Data collection is done by gathering information from the respected authorities of Ten village.
The various dignitaries involved from gram panchayat office are:
Sarpanch: Rinaben Devendra Chuadhry
Talati: A. M. Pathan

4.3.2 Primary details of survey:

Primary details of Ten village attached with report in the form of Techno Economic Survey form. Primary survey details are collected by interacting with the village dwellers and questioning themabout the facilities available and require. They were asked to give suggestions about the works required to be carried out for the development of the village and to promote Rurbanization.

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

The average size of the house is 12 X 36ft^2
Geo-Tagging: The process of tagging infrastructure with geographical information like Latitude, Longitude, Distance, place name, etc. It is connected to GPS which are monitored through computer internet networks. It can be used to locate important places like labs, dispensaries, milk center, etc. Geo Tagging is not implemented in Ten village.

4.3.4 No of Human being in One House:

According to our survey there are 4 – 5 people per house.

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

All the material are available in market as it is near to Bardoli so, there is not anything that is not available in locally.

The most common building materials used in construction are:

- Wood
- Cement
- Bricks
- Blocks
- Concrete

4.3.6 Geographical Detail:

Ten village is situated in Tehsil Bardoli, District Surat and in State of Gujarat India. Total Geographical area of Ten village is 596.1 Hectares. Population density of Ten is 10 persons per Hectares. Total number of household in village is 1394. Sub District headquarter Bardoli nis 2Km from the village. District Headquarter Surat is 32 Km. Nearest town of the Ten village is Surat and nearest town distance is 32 Km Pin code of Ten village is 394601. As per census 2011 village code of Ten is 524303.
Elevation / Altitude: 34 meters, above sea level

4.3.7 Demographical Detail - Cast Wise Population Details:

Table 6 Demographical details

Description	Census 2011 Data
Scheduled Cast Person	643
Scheduled Cast Males	327
Scheduled Cast Females	316
Scheduled Tribe Person	1317
Scheduled Tribe Males	1421
Scheduled Tribe Females	1371
Total Person Literates	5099
Total Male Literates	2753
Total Female Literates	2346
Total Person Illiterates	1152
Total Male Illiterates	499
Total Female Illiterates	653

4.3.8 Occupational Detail - Occupation wise Details:

Total working population of Ten is 2626 which are either main or marginal workers. Total workers in the village are 2626 out of which 1917 are male and 709 are female. Total main workers are 2195 out of which female main workers are 1675 and male main workers are 520. Total marginal workers of village are 431.

Table 7 Ten Working Population

	Total	Male	Female
Total Workers	2626	1917	709
Main workers	2195	1675	520
Main worker Cultivators	71	64	7
Agriculture Labour	498	280	218
Household Industries	19	18	1
Other works	1607	1313	294
Marginal workers	431	242	189
Non-working person	3625	1335	2290

4.3.9 Agricultural Details:

People living in Ten depends on multiple skills, total workers are 2626 out of which man are 1917 and women are 709. Total 71 cultivators are depended on agriculture farming out of 64 are cultivated by man and 7 are women. 498 people works in agricultural land as labour in Ten, man are 280 and 218 are women. The 50 - 60% people are connecting with agricultural activity. They farming seasonal crop during season wise. They mostly farming of sugarcane to get a better revenue.

4.3.10 Physical Infrastructure Facilities - Manufacturing HUB:

Yes, There is some small scale industry available in the village. This is ruined by villager itself.

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

There is no such kind of Tourism development in village.

4.4 Infrastructure Detail:

4.4.1 Drinking Water:

Main source of drinking water of village is overhead tank the water which is collected in tanks installed near the borehole by pumping. There are 2 overhead tanks one is situated at Pond having capacity of 50,000 liter which gives untreated water to the dwellers. Second one Mineral water overhead tank is situated in front of public garden having capacity of 50,000 liters. There are 8 hand pumps are available in the village.

Fig. 4.4 Over head tank

4.4.2 Drainage Network:

There is a little portion of village having the drainage facilities & which are open drainage. The drain water is discharge in to village khadi. There is Septic tank is provided in every pucca houses of village. The poor drainage facilities available in the village so, need some renovation.

Fig. 4.5 Open Drainage

4.4.3 Transportation & Road Network:

The main road to reach the village is WBM which is adequate. The internal road in the village are R.C.C road and adequate. The internal street roads are WBM, R.C.C & Pavement blocks. The

approach roads to the village are maintained and internal linking roads are also in good condition. But few internal roads are damaged which needs reconstruction or maintenance.

Fig. 4.6 WBM Roads

Fig. 4.7 Paver Blocks Roads

Fig. 4.8 Road Damage

4.4.4 Housing condition:

There are total 1394 houses in village. There is 40% kutchha and 60 % pucca houses in village. So, we can say that the condition of houses is quite good but mostly needed to convert in pucca house. There physical as well as economic conditions are very poor. Although under the pradhanmantri aavas yojana scheme it will be taken by this village. So, that the kutchha house is converted into pacca house.


Fig 4.9 Houses in Ten village

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

Village having 6 nos. of Aanganwadi, 2 nos. of primary school, 1 nos. of secondary school & 1 nos. of Higher-secondary school. There is 1 ITI available in village and its condition is good and working.

Fig 4.10 Aanganwadi

Fig 4.11 Primary School

Fig 4.12 ITI, Ten village

➢ **Community Hall:**

Without TV Community Hall is available in village. The location of community hall is beside of ITI. The condition of community is bad.

Fig 4.13 Community Hall

➢ **Public Library:**

There is no library in village.

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

➢ **Existing Condition of Public Buildings:**

In Village 40% Houses Condition is Very Poor, but 60% Houses Condition is Very good. There are total 3 public buildings at village. They are as under,

1) Primary school
2) Aanganwadi
3) Community hall

➢ **Maintenance of existing Public Infrastructures:**

Among the public building, aanganwadi requires maintenance very much like painting work, extension of wall etc. A school need playground, repair work as per feedback from teacher. Public toilet is also not in the village which must be providing in village. Redesign of community hall is required.

4.4.7 Technology Mobile/ WIFI / Internet Usage Details:

Yes, there are having Mobile and internet usage but there are not having WIFI in general to make a smart village.

4.4.8 Sports Activity as Gram Panchayat:

No sport activities are carried out in Ten. Even for that perfect place is not also dominated. It's required one playground.

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

Public Garden: There is one public garden is available in village and its condition good.

Fig 4.16 public garden

➢ **Village Pond:**

There are 1 nos. of village pond are available in village. But one of them must be developed for tourisms which is near by Shri Sai Baba temple.


Fig 4.17 Village Pond

➢ **Other Recreational Facilities:**

There is no other Recreational facilities are available in village.

4.4.10 Other Facilities (e.g. like foot path development-Smart toilets-Coin operated entry, self-cleansing, waterless, public building):

There is 1 Shopping centre available in Village.


Fig 4.18 Shopping Centre

4.5 Existing Institution Like Village Administration Detail profile:

4.5.1 Bachat Mandali:

In the Kamrol village there is no any Bachat Mandali existing.

4.5.2 Dudh Mandali:
No Dudh Mandli available in village.

4.5.3 Mahila Forums:
There is no any mahila mandal existing in the Ten village. As per the interaction with villagers there is a system of asking before any kind of decision implementation in the village and that is a good thing in Ten village so that mahilas have the decision making authority.

4.5.4 Plantation for the Air Pollution:
There is no such activity done of tree plantation for the air pollution in the Ten village. But that kind of activities are done in the primary school by the students of the Ten village.

4.5.5 Rain Water Harvesting:
In the Ten village no one is using the system of rain water harvesting and there is no any kind of waste water recycling process done.

4.5.6 Agricultural development:
As per Interaction survey the farmers are adopting new methods for Farming and other agricultural activity.

4.5.7 Any Other:
There is 1 ITI (Industrial Training Institute) available in village. ITI established at Ten village GIDC in rental building. In the year of 2008 Institute has been declared as a Public Private Partnership mode and still developing through Industrial Partner BATLIBOI LTD, Surat. ITI shifted in its own new building at existing place and providing technical and non-technical training in different trades with intake capacity of 556 seats. ITI running two shifts: First shifts – 07:20am to 02:25pm and Second shift – 09:45am to 05:05pm.

Fig 4.20 ITI (Industrial Training Institute)

Chapter 5:
Technical Options with Case Studies:

5.1 Concept (Civil):

5.1.1 Advance Sustainable construction technique:

"Sustainable Construction" is a living concept and varies in different scenarios based on peoples' needs. Globally, construction industries are attempting to implement sustainable construction principles. The development of efficiency codes has prompted the development of new construction technologies and methods, many pioneered by academic departments of construction management that seek to improve efficiency and performance while reducing construction waste. New techniques of building construction are being researched, made possible by advances in 3D printing technology. Currently, sustainable construction has become main stream in the construction industry. The increasing drives to adopt a better way of construction, stricter industrial standards and the improvement of technologies have lowered the cost of applying the concept. The current cost of sustainable construction may be 0.4% lower than the normal cost of construction.

India's construction sector is assessed at Rs.4000 billion or $100 billion. As a result of government spending, private investments as well as foreign direct investment, has made India number one of the top ten spending nations on construction in the world. We manufacture more than 250 million tons of cement and are second only to China. A recent report "Global Construction 2020", estimates that India will be the third largest global construction market after China and USA. In order to improve the standard of living of her population, one of the key hurdles that face today's India is to overcome the challenge of infrastructure bottlenecks. Consequently the federal government has announced our 11th five years plan which allocates 9% of the GDP to infrastructure projects. The National Planning commission - an apex federal body has estimated an allocation of $515 billion which is equivalent to Rs.23 trillion to infrastructure sectors over the next five years. This includes construction of Roads, Highways, Airports, Bridges, Ports, Railways as well as water supply and sanitation amongst few others. The 12th five years plan projects an investment of 10% of the national GDP into infrastructure which equates to a staggering $1 trillion or equivalently Rs.45 trillion

5.1.2 Soil Liquefaction:

Soil liquefaction occurs when a saturated or partially saturated soil substantially loses strength and stiffness in response to an applied stress such as shaking during an earthquake or other sudden change in stress condition, in which material that is ordinarily a solid behaves like a liquid. The phenomenon is most often observed in saturated, loose, sandy soils. This is because loose sand has a tendency to compress when a load is applied. In response to soil compressing, the pore water pressure increases and the water attempts to flow out from the soil to zones of low pressure. However, if the loading is rapidly applied and large enough, or is repeated many times such that the water does not flow out before the next cycle of load is applied, the water pressures may build to the extent that it exceeds the force between the grains of soil that keep them in contact. These contacts between grains are the means by which the weight from buildings and overlying soil layers is transferred from the ground surface to layers of soil or rock at greater depths. This loss of soil structure causes it to lose its strength and it may be observed to flow like a liquid. Type of soil

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

Fig. 5.1 Soil Liquefaction

5.1.3 Sustainable Sanitation:

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

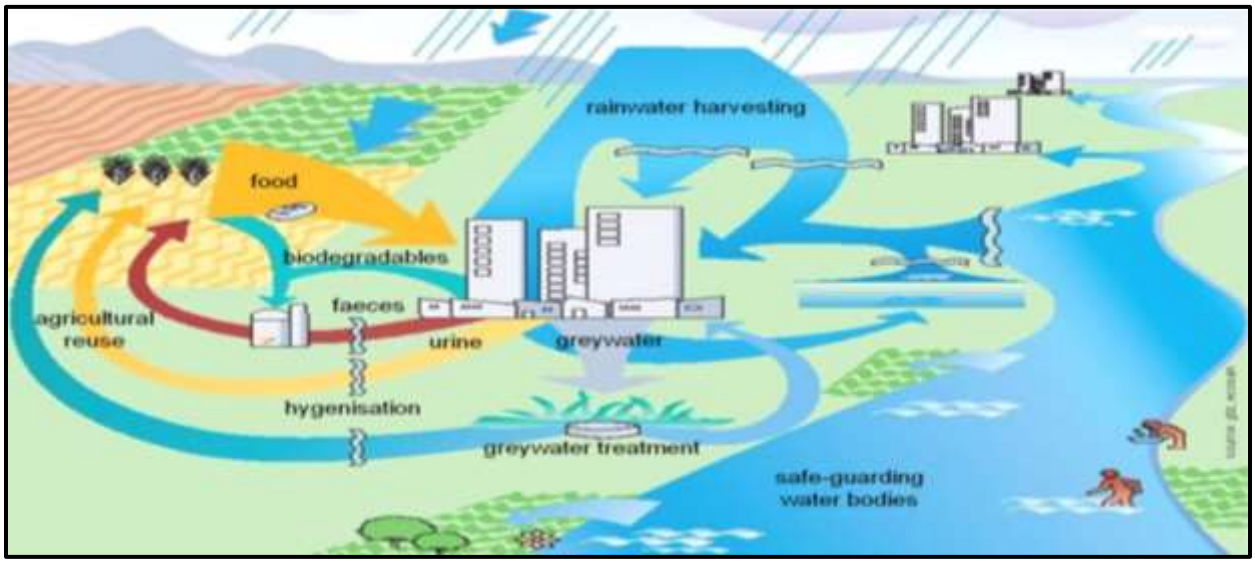


Fig. 5.2 Sustainable Sanitation

5.1.4 Transport Infrastructure / system:

Transport infrastructure consists of the fixed installations necessary for transport and includes roads, railways, airways, waterways, and terminals.

Transport is vital to the well-functioning of economic activities and a key to ensuring social well-being and cohesion of populations. 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. These include the existence of physical barriers or hindrances, such as insufficient or inadequate transport infrastructures, bottlenecks and missing links, as well as lack of funds to remove them. Solving these problems is not an easy task. It requires action on the part of the governments concerned, actions that are coordinated with other governments at international level.

5.1.5 Vertical Farming:

Vertical farming is the practice of growing crops in vertically stacked layers. It often incorporates controlled-environment agriculture, which aims to optimize plant growth, and soilless farming techniques such as hydroponics, aquaponics, and aeroponics. Some common choices of structures to house vertical farming systems include buildings, shipping containers, tunnels, and abandoned mine shafts. The modern concept of vertical farming was proposed in 1999 by Dickson Despommier, professor of Public and Environmental Health at Columbia University. Despommier and his students came up with a design of a skyscraper farm that could feed 50,000 people. Although the design has not yet been built, it successfully popularized the idea of vertical farming. Current applications of vertical farming's coupled with other state-of-the-art technologies, such as specialized LED lights, have resulted in over 10 times the crop yield than would receive through traditional farming methods. The main advantage of utilizing vertical farming technologies is the increased crop yield that comes with a smaller unit area of land requirement. Additionally, crops are resistant to weather disruptions because of their placement indoors, meaning fewer crops lost to extreme or unexpected weather occurrences. Because of its limited land usage, vertical farming is less disruptive to the native plants and animals, leading to further conservation of the local flora and fauna.

Fig. 5.3 Vertical Farming

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

Mechanism: In the case of Reinforced concrete structure the ingress of moisture or air may lead to corrosion of steel, cracking and spalling of the concrete cover thereby reducing durability of the concrete structure. Repair has been suggested as the protective solution for damaged structure due to corrosion. Corrosion of reinforcing steel is a significant economic and safety problem, preventing many buildings from attaining their design life. It is now a must look into field as corrosion of reinforcing steel is seen almost in every 10 out of 100 constructions within a life of 10 years. Nowadays the increase content of pollutants in the city atmosphere has very much affected the lifespan of RCC structures. The increased content of pollutants include a very high rates of Sulphates and Chlorides which when these mixes with rain water and falls over these structures and damages the visible parts.

Prevention: Corrosion of steel in reinforced concrete structures can be divided into four different categories, based on how they provide protection:

1) Alternative reinforcement and slab design method includes materials that electrically isolate the steel from the concrete and create a barrier for chloride ions, materials that protect steel galvanic-ally, and materials that have significantly higher corrosion thresholds than conventional reinforcing steel. Concrete slabs have been designed without any internal reinforcement.
2) Barrier methods protect reinforced concrete from corrosion damage by preventing water, oxygen, and chloride ions from reaching the reinforcement and initiating corrosion.
3) Electrochemical methods use current and an external anode to protect the reinforcement, even when the chloride ion concentration is above the corrosion threshold.

5.1.7 Sewage treatment plant:

Sewage treatment plant is a plant where waste water is treated. 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 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. 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 pretreatment 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. The term "sewage treatment plant" is nowadays often replaced with the term wastewater treatment plant or wastewater treatment station. Sewage can be treated close to where the sewage is created, which may be called a "decentralized" system or even an "on-site" system. Alternatively, sewage can be collected and transported by a network of pipes and pump stations to a municipal treatment plant. This is called a "centralized" system.

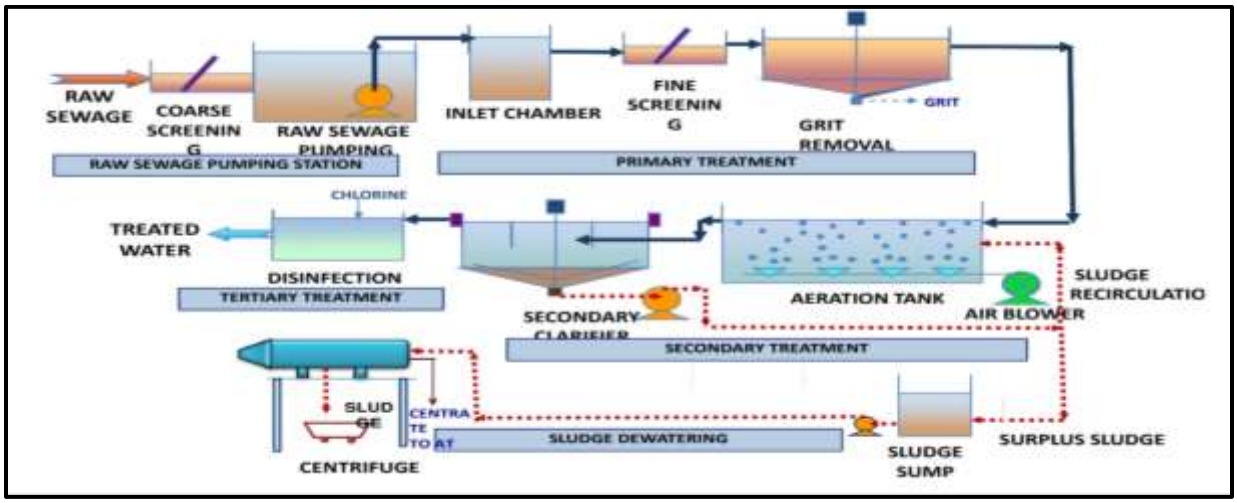


Fig.5.4 Typical Flow Diagram of Sewage Treatment Plant

Transformation of Waste to Energy:

The production of energy from waste involves the usage of the waste material as a fuel. It is usually done in a closed area and is properly mixed before the waste is combusted. Then, the negative air flow is given in order to remove the dust particles from the combustion chamber. After the preparation, the mixed waste is added to the chamber and the waste is exposed to the ample of oxygen and fire so that it burns up completely. The burning waste (fuel) results in the formation of steam that in turns rotates the turbine to generate electricity. This is very advantageous as it would reduce the dumped waste to an extent of 90% and also decrease in the greenhouse gas emission up to one ton for the same amount of waste.

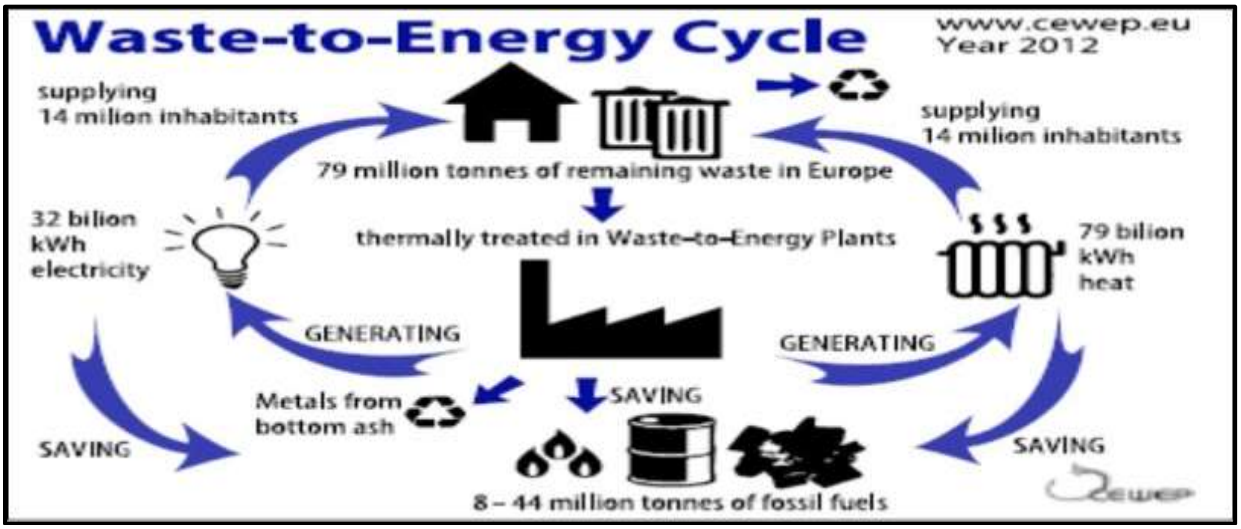


Fig. 5.5 Sustainable Waste Management-Case Study of Kanpur

An attempt has been made to workout sustainable municipal solid waste management for the city of Kanpur, India. In the present context, the population trends with forecast of population for the year 2051 were estimated along with solid waste generation. An effort has also been made to estimate the quantity of compost, bio fuel and energy that can be produced from the generation of solid waste during different years. In order to have sustainability, economic dimension in terms of

the possible financial cost of compost, bio fuel and energy were also estimated. The salient steps taken are as under**:**

Solid Waste Generation Trends and Projections of Kanpur:

The generating of the waste in the cities depends on various factors such as living standards, eating habits and extent of commercial activities. For the prediction of solid waste generated in Kanpur, the waste production assumed is 1 kg/capita/day for the year 2021. This is higher than the general value assumed as it takes into consideration the migrant laborers. Due to the migrations, changes in the lifestyle and increasing urbanization the waste production in kg/capita/day have increased by 0.1for the coming decades.

Table 8 Solid waste generation trends and forecasting

Year	Population	Assumed Waste Production (kg/per/capita/day)	Waste Produced per day (in kg)	Waste Produced per day (in tones)	Waste Produced per Year (in tones)
2011	45,81,268	0.9	41,23,141	4,123	15,04,947
2021	53,02,197	1	53,02,197	5,302	19,35,302
2031	61,10,890	1.1	67,21,979	6,722	24,55,522
2041	70,26,221	1.2	84,31,465	8,431	30,77,485
2051	80,71,431	1.3	1,04,92,860	10,493	38,29,894

Transformation Waste to Compost and Energy- A Case Study of Kanpur

Various reports were analyzed and the following deductions were made for the calculations of the compost, bio-fuel and energy produced from 1000 tons of waste. In India, The amount of highly calorific value waste accounts to only 15% of the total waste which can be incinerated in order to produce energy. Accordingly, based on assumptions, following can be produced from 1000 tons of waste.

BIO GAS PRODUCTION =21.43 m^3

100 tons per day= 1mw power generation

1000 tons per day=10 mw power generation

Compost = 81.43 tons

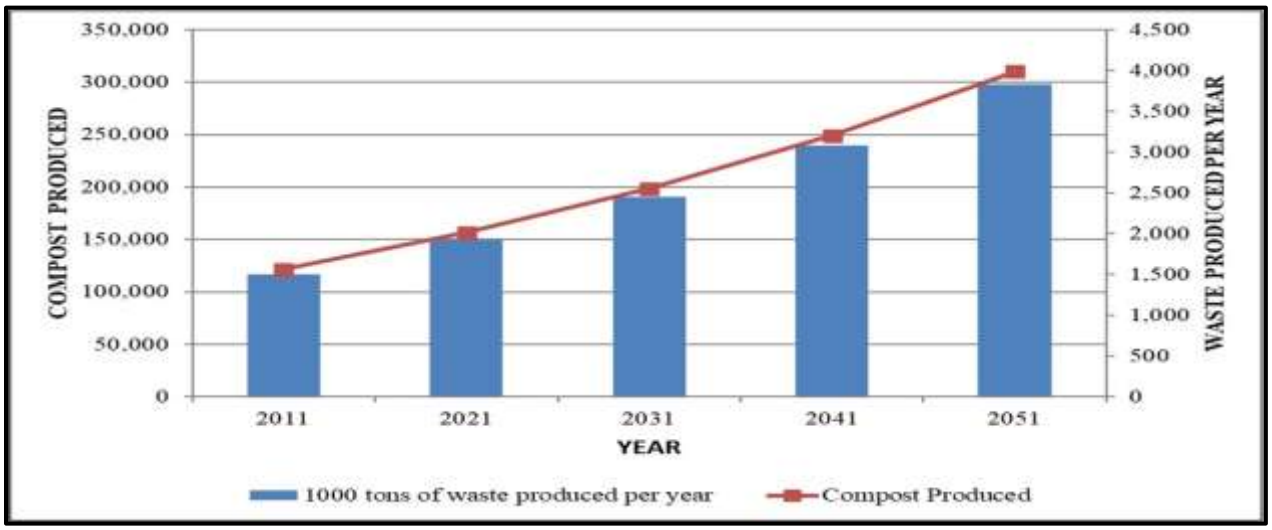


Fig. 5.6 Waste to compost production

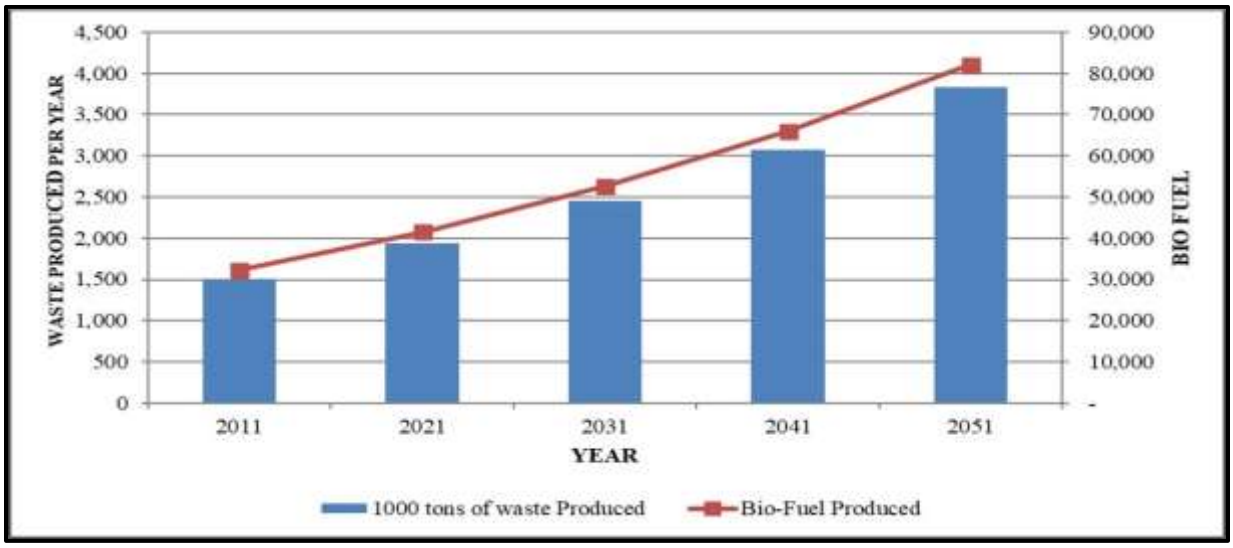


Fig. 5.7 Waste to Bio – Fuel Production

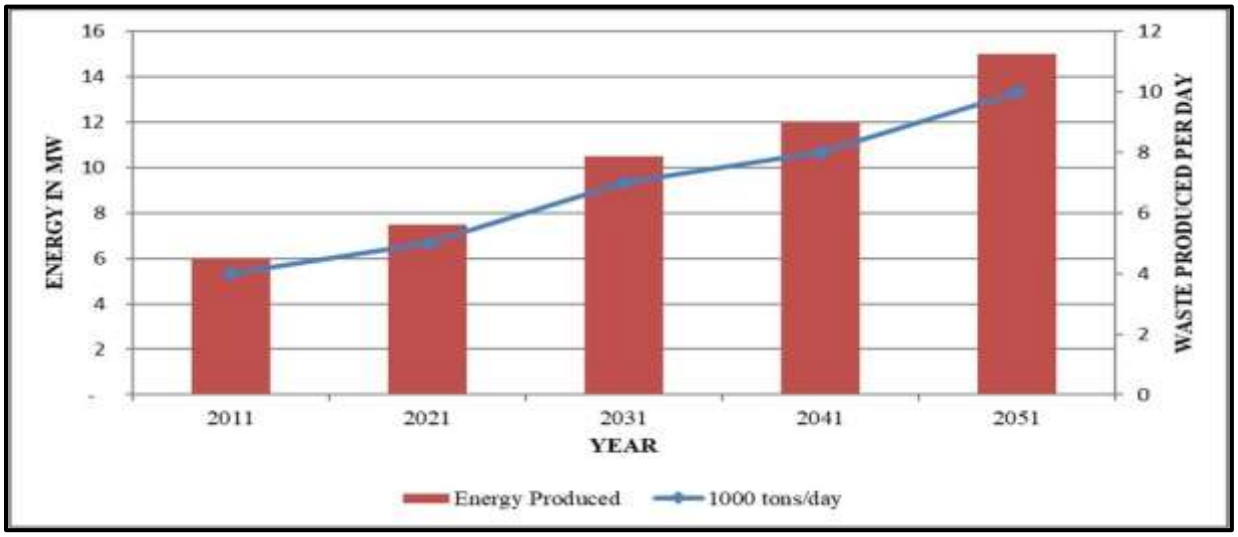


Fig. 5.8 Waste to Energy production

Table 9 Waste to compost, Bio – Fuel and Energy production

Years	Waste quantity in 1000 tons/day	Waste quantity in 1000 Tons/year	Compost production in tons /year	Bio fuel production in m^3/ year	Energy production in MW/day
2011	4	1,505	1,21,901	32,252	6
2021	5	1,935	1,56,759	41,467	8
2031	7	2,454	1,98,735	52,589	11
2041	8	3,077	2,49,276	65,940	12
2051	10	3,830	3,10,221	82,077	15

Economic Dimensions

- The following assumptions have been made in order to calculate the total economic value.

- Per ton cost of compost production as Rupees 10 which would increase in upcoming decades due to the increase in the waste generation, Hence, Rs. 5 increase have been taken per decade.

Cost of bio-fuel per liter = Rs. 45

Cost of per unit Power = Rs. 4

Table 10 The Economic Value generation from waste

Years	Compost quantity in tons/year	Value in rupees	Bio fuels quantity in m^3/year	Value in rupees	Power generation in MW/day	Value in rupees
2011	121,901	12,19,007	32,252	14,51,347	6	24
2021	156,759	15,67,595	41,467	18,66,077	8	53
2031	198,735	29,81,030	52,589	23,66,515	11	74
2041	249,276	49,85,525	65,940	29,67,307	12	84
2051	310,221	77,55,535	82,077	36,93,461	15	105

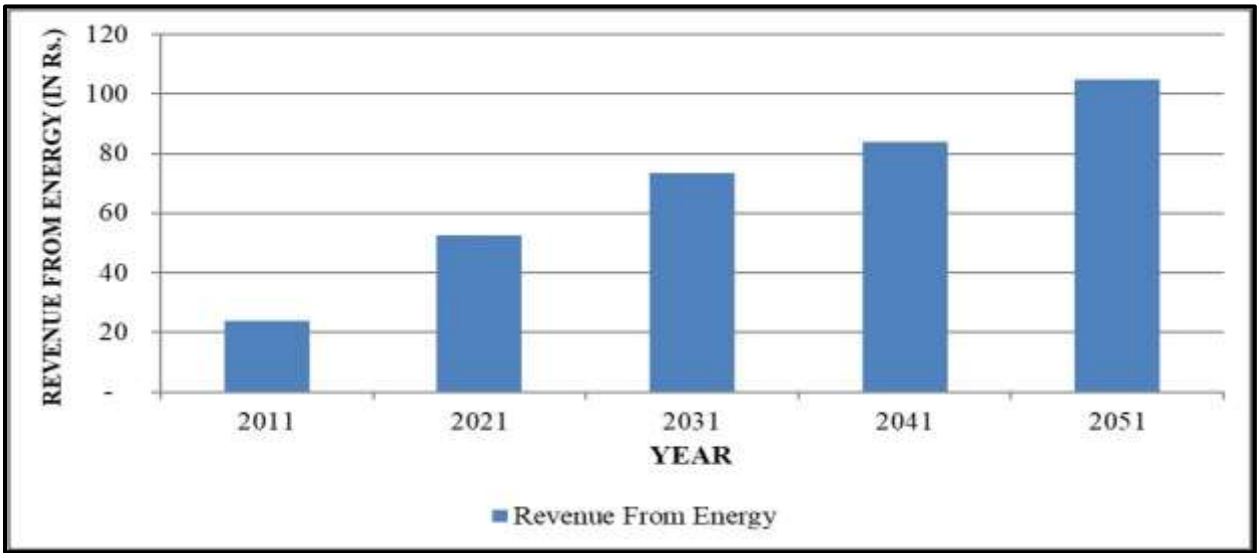


Fig. 5.9 Revenue Generation from Energy Production

With the emerging problem of indiscriminate disposal of municipal solid waste and consequential environmental pollution to a great extent, there is an urgent need to demonstrate environmentally sustainable management of municipal solid waste. Such a management strategy should be formulated for the next 30 years to make sustainable on a time scale. The present paper highlights a case study of Kanpur wherein trends of population and solid waste generation from 2011 to 2051 were estimated. Technological options were also briefly described for transformation of waste to usable products. Accordingly, it has been estimated that how much quantity of compost, bio fuels and energy that can be produced from waste generated in Kanpur on a time scale coupled with economic value likely to be generated from such products. However, segregation of waste preferably at source or otherwise at the disposal site should be carried out to make best use of degradable and non-degradable wastes separately. Moreover, effective strategy formulation, commitments, use of best technological options and implementation would surely achieve environmentally sustainable management of municipal waste.

Chapter 6:
Swatchh Bharat Abhiyan (Clean India)

➢ **What is Swatchh Bharat Abhiyan:**

Swatchh Bharat Abhiyan is a campaign in India that aims to clean up the streets, roads and infrastructure of India's cities, smaller towns, and rural area. Swatchh Bharat Mission, Swatchh Bharat Abhiyan, or Clean India Mission is a country-wide campaign initiated by the Government of India in 2014 to eliminate open defecation and improve solid waste management. Phase 1 of the mission lasted till October 2019. Phase 2 will be implemented between 2020-21 and 2024-25.

6.1 Swatchhta needed in allocated village:

Yes is needed as there door to door collection of the waste but then also public does beans are also required so that people can keep the cleanliness on the roads also and we have make them aware about the swachh Bharat abhiyan and to keep the cleanliness around them self also we have some photograph of we have clicked.

Fig. 6.1 Open Drainage

6.2 Guidelines – Implementation in allocated village with Photograph:

➢ **Guidelines for Gram Panchayat/ Village Water and Sanitation Committee:**

- The Gram Panchayats have a pivotal role to play in the implementation of the programme. States may decide to channel the fund flow for activities at the GP level through the Gram Panchayat institution. All Institutions and Committees working within the GP framework have to prioritize sanitation within their programmes.
- A Village Water and Sanitation Committee (VWSC) shall be constituted as a sub-committee of Gram Panchayat, for providing support in terms of motivation, mobilization, implementation and supervision of the programme. The VWSC should play a crucial role in the comprehensive and saturation approach to ODF Grams. The membership of a VWSC may have representation from each Ward of the GP and 6 more members. Women should form 50% of the members. There should be representation from SCs and STs and poorer sections of the society. This committee should function as a Standing Committee on Water and Sanitation of the Gram Panchayat and should be an integral part of the Village Panchayat. The composition and functions of the VWSC can be determined by the State Government.
- A separate account may be opened for each Village and Water Sanitation Committee of a GP and "Sarpanch/Pradhan" of the GP should be the Chairperson of each VWSC. The Swachh Bharat Funds should be routed through the account of the VWSC/GP. The account shall be subject to audits held from time to time including Social Audit.

- The GPs and the VWSCs shall 57ndeavour to make their GPs ODF and Swachh at the earliest. States should recognize and confer awards to such GPs.
- While the participation of the local bodies is advised, there shall be flexibility at the State and district levels to decide on the methodology of the implementation of the programme depending on local conditions and the role that the GPs and the VWSCs shall play Here we have seen door to door collections in the big cards that are carrying the garbage from village to the dump yard.

➢ **Guidelines for Different authorities:**

- All local bodies are required to set up few by-laws regarding waste management, segregation of waste within their society. They are also required to set up a system in place so as the process of waste segregation can be followed smoothly by all waste generators. They are also required to promote the idea of composting, waste segregation and waste management through different educative campaigns.

➢ **Waste Processing and Treatment Guidelines:**

- The new rules advise that the bio-degradable waste should be processed, treated and disposed of through composting or bio-machination within the premises as far as possible and the residual waste shall be given to the waste collectors or agency as directed by the local authority. The developers of Special Economic Zone, industrial estate, industrial park will also have to earmark at least 5 percent of the total area of the plot or minimum 5 plots/ sheds for recovery and recycling facility. The rules have also mandated bio-remediation or capping of old and abandoned dump sites within five years.

➢ **Implementation:**

Here we have seen door to door collection of garbage and the big carts that are carrying the garbage from the door to the dump yard by village vehicle.

Fig 6.2 Waste Collection Vehicle

6.3 Activities Done by Students for allocated village with Photograph:

Students have gathered with peoples of the villages with social distancing to give them the awareness / knowledge about the swatch bharat abhiyan and also thought them motive of cleanliness around them. We also give them methods like Biogas for Garbage that is produce in their houses.

Chapter 7:

Village condition due to Covid-19:

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

In March of 2020, the AMMACHI Labs field team members shifted their priorities from their normal work to making efforts to spread awareness and education on taking precautions again the spread of COVID-19. They shared verified informational videos and explained preventative measures like proper hand-washing to the members of the village communities. In many places, cloth masks were made and distributed as well.

As it unfolded, at the levels of the districts, small and medium towns and rural areas, neither the elected representatives of local institutions (the Gram Panchayat, in particular) nor the widespread and established civil society organizations had any noteworthy role to play either in creating awareness about the pandemic, helping local quarantine centers or in keeping a vigil on and registering incoming persons to the local places and so on. Instead, as pointed out by a local NGO, police were deployed at these local levels severely undermining the relevance and propriety of local representatives.

As we know it was the hard time for India and especially where its backbone is villages, Many NGO and public serving department came into action for conserving village. The sarpanch of Ten village played an important part in explaining the people and making them the impact of this dangerous virus. The Gram Panchayat played an important role in making knowing the right meaning of social distancing and wearing of mask.

7.1 Social workers in village

The sarpanch of village took the great initiative to hold various programs related handmade masks and necessity of wearing mask and social distancing.

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

Student took a great initiative going to home to home in villages to spread the impact of this deadly virus. Various camps were done by the village local students to show the making of mask, using of sanitizers and social distancing.

7.2 Village visit

7.3 Any other steps taken by the students / villagers:

A group of student taking seminar in Ten village of the people to teach the impact of covid19. They also took explained the important symptoms of the virus and informing the doctors of the symptoms if seen.

The Gram Panchayat appointed a special team of people that took the responsibility of daily need of villagers by door to door home service of Vegetables, Medicine, and Groceries etc. to ease the risk of mass gathering people and preventing to flow virus from one person to another.

Chapter 8:

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

➢ **Observation:**

According to taking primary survey & techno economic survey there are so many observations are getting as:

- There is no Post office in village.
- There is no primary health care center in village. .
- The condition of the primary school building is bad.
- There is no facility of play ground in school.
- Community hall of village is in bad condition and also lack in area and appearance.
- Maintenance Overhead water tank is required in village.
- The road in the village is in bad condition.

➢ **Recommendations:**

Various recommendations we get as,

- Post Office
- School Building
- Overhead Water Tank
- Redesign of community hall
- PHC
- Pond development
- Public Toilet
- Community Hall
- Agriculture Research Center

➢ **Suggestions:**

- As the village lack in the education sector, there is an undeveloped school in the village we will give a well-planned and design of school which will consist higher education department.
- As we have seen the above photo the roads in the village is in bad condition and as we know that road is the backbone of any village, we will do the re-designing work of Road.
- Playground in village
- Wifi Facility
- The angadwadi need repair works like, Painting, plastering etc.
- Rain water harvesting at rooftop of school
- Primary Health Centre

8.1 Design Proposals:

8.1.1 Sustainable Design:

Biogas plant:

- Biogas plant is one of the plants for renewable energy sources. It transforms rural village in to clean village and provide gas as energy source and gives fertilizer at end.
- Day to day operation.
- Daily 5000 - 5500 kg cow dung is fed into the plant. The amount of cow dung fed varies with number of cattle present (500/animal/day). Poultry waste and kitchen waste can also be added if it is available.
- Equal amount of water is added in the inlet tank, mixed (manually), and let in the digester. Water is procured manually from nearby wells (Maximum 50 feet away).
- The availability of water is not a problem as normally every household that has cattle has that much amount of water available. Entire operation of biogas plant is done by the woman in the household which calls upon extra efforts to be put in by her.
- The gas collected in the dome after digestion is used as and when required. The usability of gas depends on its pressure inside the dome.
- The output slurry is dried and used as manure in beneficiary's own farms. Initial cost of the plant.

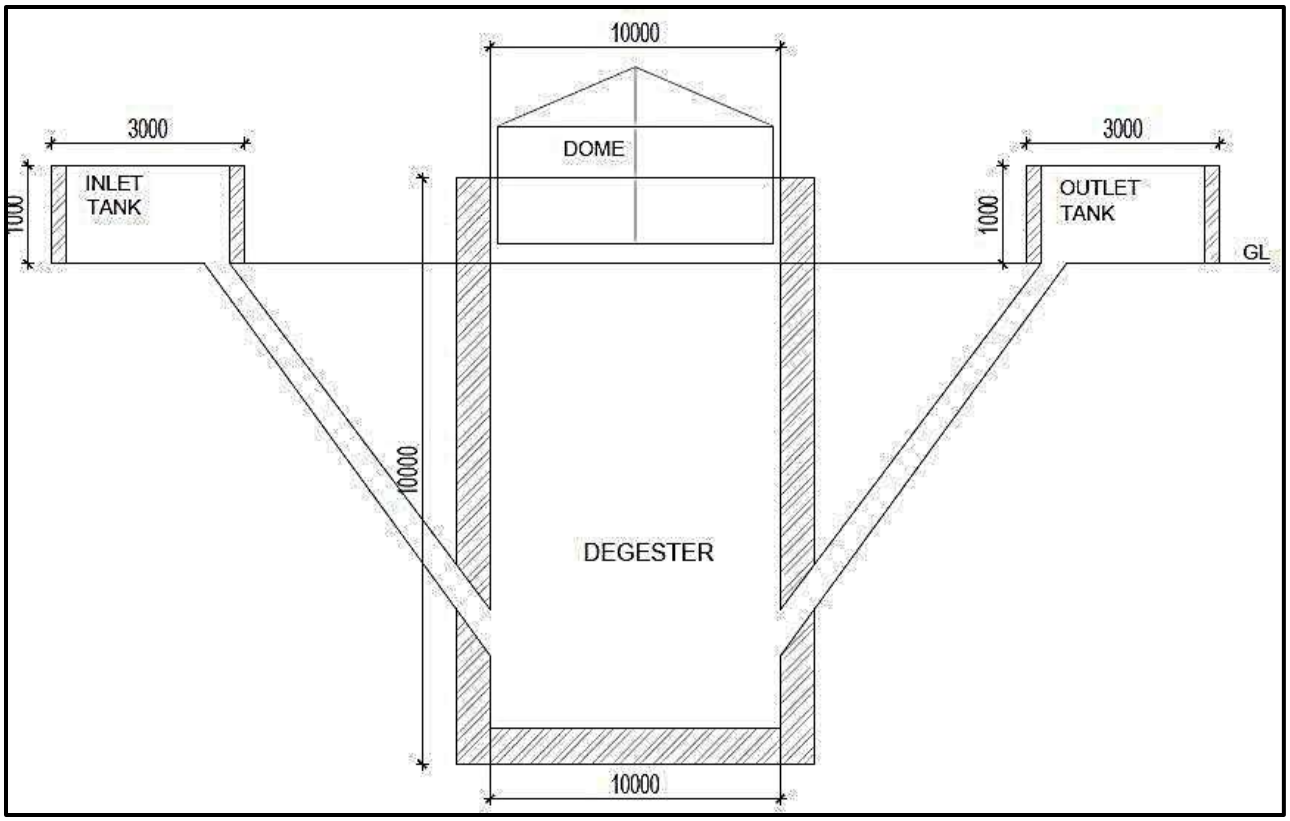


Fig.8.1 Biogas plant

Basic Things:

- Total numbers of animals in village =500
- As per standard data assume per day dung of animal=10.5Kg.
- So total per day dung = 500 * 10.5 =5250 Kg./day

Design of Digester:

- Assume retention period (RT) = 70days.
- Assume mixing proportion of solid and water is1:2.
- Now total amount of slurry per day (Sd) = Total per day dung + Water amount
  = 5250 + (2*5250)
  = 15750 Kg. / day
  = 15.75 m3 / day
- Digester volume (Vd) = Sd *RT
  = 15.75 * 70
  = 1102.5 m^3
- Assume cylinder shaped biogas plant.
- Provide total one numbers of units in different areas,
- So, digester volume becomes for one unit =1102.5/1= 1102.5 m3
- So, provide = 1100m3
- Total digester volume (Vd) = πr2h
- 1100 = πr210 (assume h=10m) So dimensions of digester are H = 10m
- R = 6m

Design of Gas Holder:

- Assume digester temperature= 26-28˚C
- Now from following fig find Gd by taking RT=70 days' Specific gas production Gd =37 Lit / Kg /day
- Daily gas production G = Gd X Feed volume
  = 37 X 5250
  = 194250 Lit.
  = 194.25 m3
- Now assume gas holder capacity =60
- Gas holder volume = Daily gas production X Capacity of holder= 194.25 X 0.6= 116.55 m^3
- So, take Gas holder volume = 120m^3
- Now for 1 unit provide volume of holder of each unit = 120 /1 = 120 m^3
- Take It = 120 m3Provide cylinder shaped holder; so…
- Volume =$\pi r^2 h$

120 = 3.14 X rX1 (assume h=1m) R = 6m
So, dimensions of Gas holder are: H= 1 m

Design of Inlet and Outlet:

- Total volume of slurry mix per unit = 15.75 /1= 15.75 m^3 / day
- Assume two-time filling operation in plant.
- So, take total volume of slurry = 15.75 ÷2 = 7.87 m^3 / day
- Take it = 8 m3/ day Provide rectangular tank…
- Total volume for one time mixing of slurry= L X B XH
- 8 = L X B X 1 (assume H=1m)
- Dimension of inlet are L = 3m, B = 3m&H = 1 m
- Here 8 m3 / day required < 9 m3 / day provided.
  Hence ok
- Provide same size for outlet tank also.

Table 11 Cost of Biogas Plant

Sr No.	Components	Capital Cost in Rs.
1.	Gas Holder and Frame	8000
2.	Piping and Stove	5000
3.	Civil engineering Construction	20,000
	TOTAL	**33,000**

8.1.2 Physical Design:

Primary Health Centre:
Villagers are very badly willing from health issue. So provide healthy environment there must be Primary health care center in village.

Design:

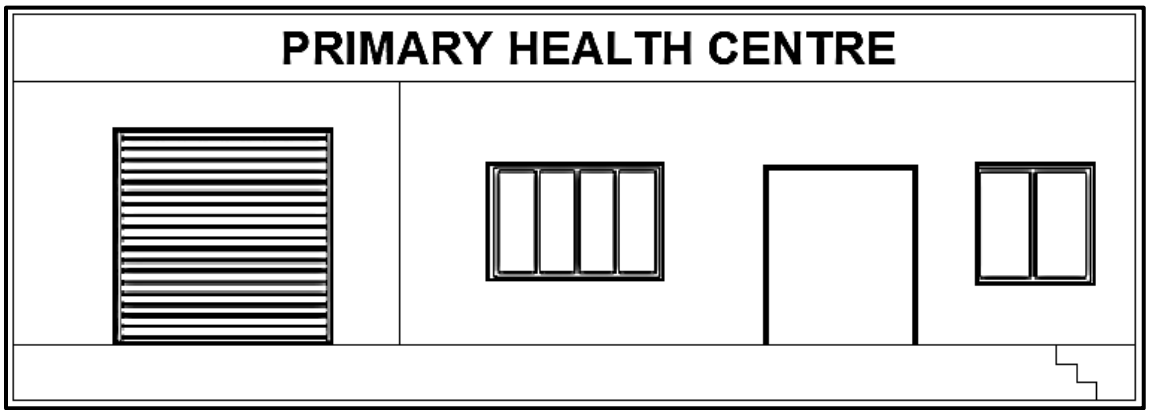


Fig 8.2 Elevation of PHC

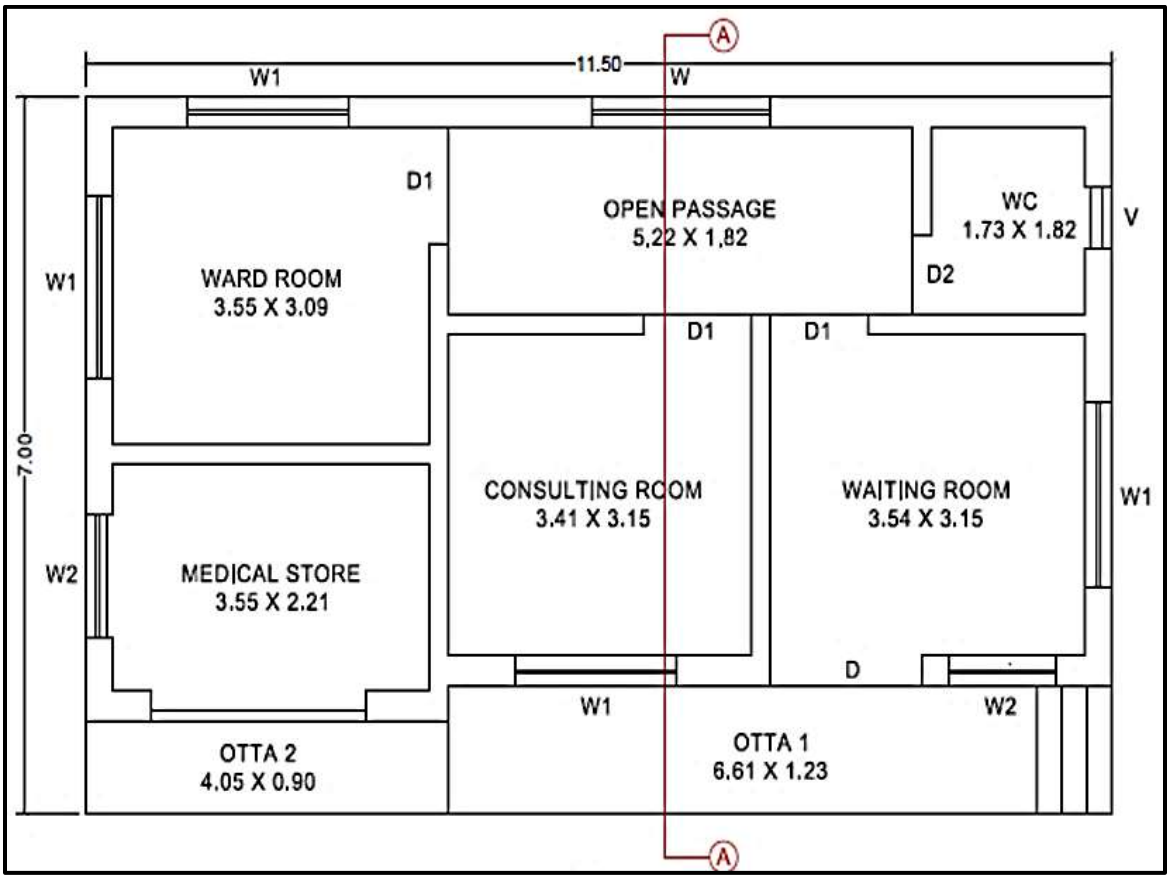
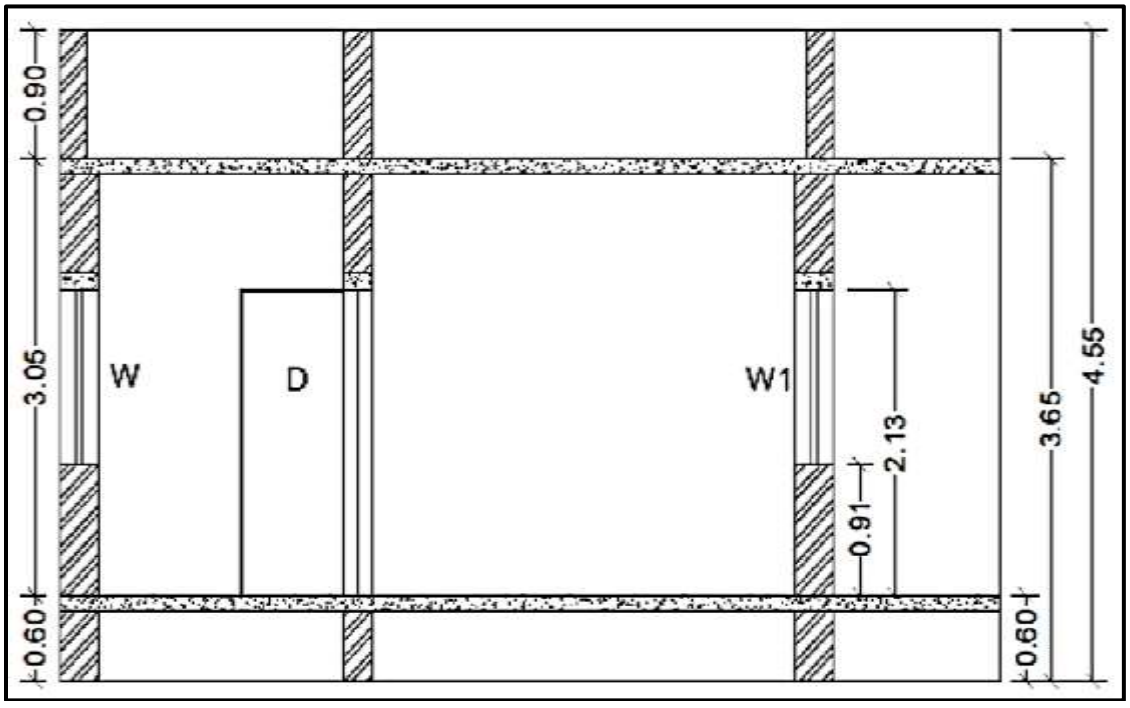
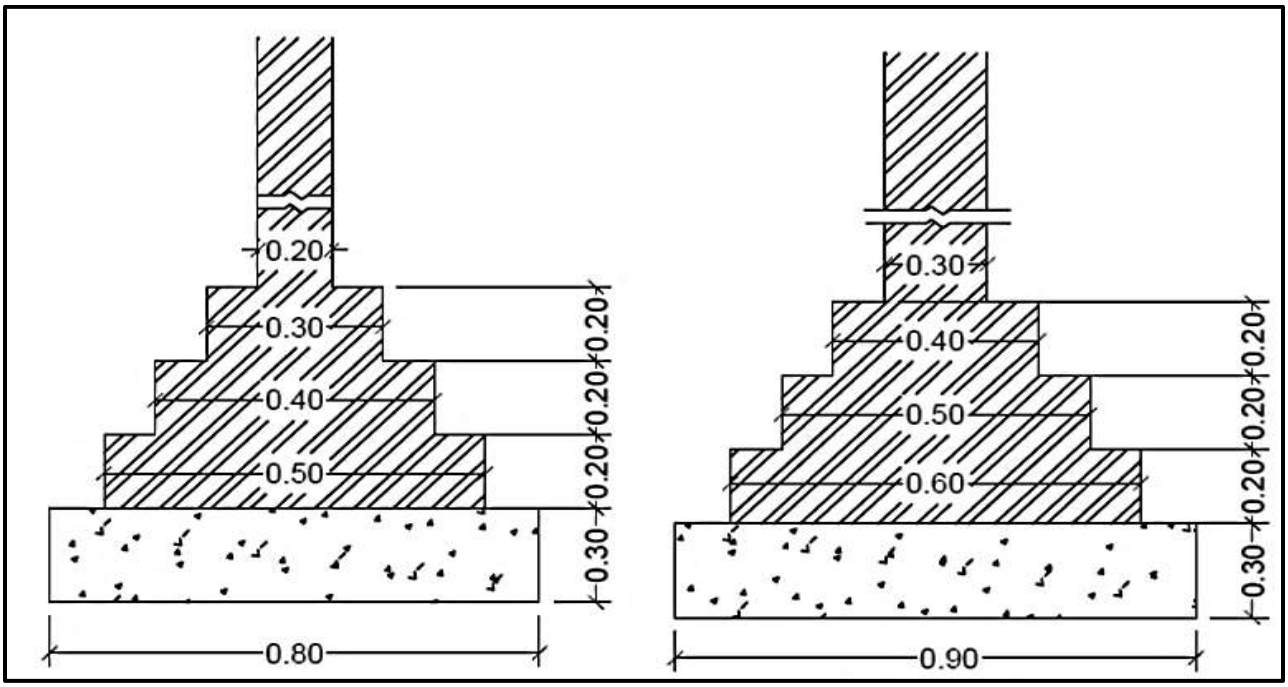


Fig 8.3 Plan of PHC



Section A -A



200mm Wall **300mm Wall**

Fig 8.4 Typical wall section

Table 12 Measurement Sheet of PHC

Sr. No.	Description	No.	Length(m)	Width(m)	Height(m)	Quantity
1.	**Excavation in foundation:**					
	Horizontal wall					
	L1 =11.52+2*0.45	1	12.42	0.9	1.5	16.76
	L2 =7.65+2*0.45	1	8.55	0.9	1.5	11.54
	L3 =7.65+2*0.40	1	8.45	0.8	1.5	10.14
	L4 =3.87+2*0.45	1	4.77	0.9	1.5	6.43
	L5 =3.87+2*0.40	1	4.67	0.8	1.5	5.60
	Vertical wall					
	S1=5.7-2*0.45	1	4.80	0.9	1.5	6.48
	S2=5.93-2*0.45	1	5.03	0.9	1.5	6.79
	S3=5.93-2*0.40	1	5.13	0.8	1.5	6.15
	S4=3.56-2*0.40	1	2.76	0.8	1.5	3.31
	S5=2.19-2*0.40	1	1.39	0.8	1.5	1.66
					Total =	**74.86m^3**
2.	**Plain cement concrete in foundation:**					
	Horizontal wall					
	L1=12.42	1	12.42	0.9	0.3	3.35
	L2=8.55	1	8.55	0.9	0.3	2.30
	L3=8.45	1	8.45	0.8	0.3	2.02

	L4=4.77	1	4.77	0.9	0.3	1.28
	L5=4.67	1	4.67	0.8	0.3	1.12
	Vertical wall					
	S1=4.8	1	4.80	0.9	0.3	1.29
	S2=5.03	1	5.03	0.9	0.3	1.35
	S3=5.13	1	5.13	0.8	0.3	1.23
	S4=2.76	1	2.76	0.8	0.3	0.66
	S5=1.39	1	1.39	0.8	0.3	0.33
					Total =	**14.93m^3**
3.	**B.W. up to plinth:**					
	Horizontal wall					
	L1					
	Step 1= 12.42-2*0.15=12.12	1	12.12	0.6	0.2	1.45 m³
	Step 2= 12.12-2*0.05=12.02	1	12.02	0.5	0.2	1.20 m³
	Step 3= 12.02-2*0.05=11.92	1	11.92	0.4	0.2	0.95 m³
	Step 4= 11.92-2*0.05=11.82	1	11.82	0.3	1.2	4.25 m³
	L2					
	Step 1= 8.55-2*0.15=8.25	1	8.25	0.6	0.2	0.99 m³
	Step 2= 8.25-2*0.05=8.15	1	8.15	0.5	0.2	0.81 m³
	Step 3= 8.15-2*0.05=8.05	1	8.05	0.4	0.2	0.64 m³
	Step 4= 8.05-2*0.05=7.95	1	7.95	0.3	1.2	2.86 m³
	L3					
	Step 1= 8.45-2*0.15=8.15	1	8.15	0.5	0.2	0.81 m³
	Step 2= 8.15-2*0.05=8.05	1	8.05	0.4	0.2	0.64 m³
	Step 3= 8.05-2*0.05=7.95	1	7.95	0.3	0.2	0.47 m³
	Step 4= 7.95-2*0.05=7.85	1	7.85	0.2	1.2	1.88m³
	L4					
	Step 1= 4.77-2*0.10=4.57	1	4.57	0.6	0.2	0.54 m³

	Step 2= 4.57-2*0.05=4.47	1	4.47	0.5	0.2	0.44 m^3
	Step 3= 4.47-2*0.05=4.37	1	4.37	0.4	0.2	0.34 m^3
	Step 4= 4.37-2*0.05=4.27	1	4.27	0.3	1.2	1.53 m^3
	L5					
	Step 1= 4.67-2*0.10=4.47	1	4.47	0.5	0.2	0.44 m^3
	Step 2= 4.47-2*0.05=4.37	1	4.37	0.4	0.2	0.34 m^3
	Step 3= 4.37-2*0.05=4.27	1	4.27	0.3	0.2	0.25 m^3
	Step 4= 4.27-2*0.05=4.17	1	4.17	0.2	1.2	1.00 m^3
	S1					
	Step 1= 4.8+2*0.15=5.1	1	5.1	0.6	0.2	0.61 m^3
	Step 2= 5.1+2*0.05=5.2	1	5.2	0.5	0.2	0.52 m^3
	Step 3= 5.2+2*0.05=5.3	1	5.3	0.4	0.2	0.42 m^3
	Step 4= 5.3+2*0.05=5.4	1	5.4	0.3	1.2	1.94 m^3
	S2					
	Step 1= 5.03+2*0.15=5.33	1	5.33	0.6	0.2	0.63 m^3
	Step 2= 5.33+2*0.05=5.43	1	5.43	0.5	0.2	0.54 m^3
	Step 3= 5.43+2*0.05=5.53	1	5.53	0.4	0.2	0.44 m^3
	Step 4= 5.53+2*0.05=5.63	1	5.63	0.3	1.2	2.02 m^3
	S3					
	Step 1= 5.13+2*0.1=5.43	1	5.43	0.5	0.2	0.54 m^3
	Step 2= 5.43+2*0.05=5.53	1	5.53	0.4	0.2	0.44 m^3
	Step 3= 5.53+2*0.05=5.63	1	5.63	0.3	0.2	0.33 m^3
	Step 4= 5.63+2*0.05=5.73	1	5.22	0.2	1.2	1.25 m^3

	S4					
	Step 1=					
	2.76+2*0.15=3.06	1	3.06	0.5	0.2	0.30 m³
	Step 2=					
	3.06+2*0.05=3.16	1	3.16	0.4	0.2	0.25 m³
	Step 3=					
	3.16+2*0.05=3.26	1	3.26	0.3	0.2	0.19 m³
	Step 4=					
	3.26+2*0.05=3.36	1	3.36	0.2	1.2	0.80 m³
	S5					
	Step 1=					
	1.39+2*0.15=1.69	1	1.69	0.5	0.2	0.16 m³
	Step 2=					
	1.69+2*0.05=1.79	1	1.79	0.4	0.2	0.14 m³
	Step 3=					
	1.79+2*0.05=1.89	1	1.89	0.3	0.2	0.11 m³
	Step 4=					
	1.89+2*0.05=1.99	1	1.99	0.2	1.2	0.47 m³
					Total =	**33.9m³**
4.	**Earth filling = Excavation – P.C.C - B.W up to plinth = 74.86-14.93-33.93 = 26.00**				**Total =**	**26.0m³**
5.	**B.W. up to slab**					
	Long wall L1	1	11.82	0.3	3	10.63 m³
	L2	1	7.95	0.3	3	7.15 m³
	L3	1	7.85	0.2	3	4.71 m³
	L4	1	4.27	0.3	3	3.84 m³
	L5	1	4.17	0.2	3	2.50 m³
	Short wall S1	1	5.4	0.3	3	4.86 m³
	S2	1	5.63	0.3	3	5.06m³
	S3	1	5.22	0.2	3	3.13 m³
	S4	1	3.36	0.2	3	2.01 m³
	S5	1	1.99	0.2	3	1.19 m³
					Total =	**45.08m³**
	Deduction for doors/window					
	D	1	1.7	0.3	2.13	1.08
	D1	3	1.20	0.2	2.13	1.53
	D2	1	0.76	0.2	2.13	0.32
	W	1	2	0.3	1.22	0.73

	W1	4	1.80	0.3	1.22	2.63
	W2	2	1.20	0.3	1.22	0.87
	V	1	0.6	0.3	0.6	0.10
						7.26m^3
	Deduction for Lintels					
	D	1	2	0.3	0.12	0.07
	D1	3	1.5	0.2	0.12	0.10
	D2	1	1.06	0.2	0.12	0.02
	W	1	2.3	0.3	0.12	0.08
	W1	4	2.1	0.3	0.1	0.30
	W2	2	1.5	0.3	0.12	0.10
						0.67m^3
	TOTAL = 45.08 -7.26-0.67 = 37.15m^3				**Total =**	**37.15m^3**
6.	**R.C.C. work in Slab:**					
	L=12.42+3x0.3=13.32					
	B=5.93+0.9+3x0.3=7.7	1	13.32	7.7	0.12	12.30 m^3
	Chajja					
	W	1	2	0.6	0.10	0.12 m^3
	W1	4	1.8	0.6	0.10	0.43 m^3
	W2	2	1.20	0.6	0.10	0.14 m^3
	TOTAL = 12.30 + 0.69 = 12.99m^3				**Total =**	**12.99m^3**
7.	**Inside plaster:**					
	Medical store	2	3.62		3	21.71m^2
		2	2.18		3	13.08 m^2
	Ward room	2	3.62		3	21.72 m^2
		2	3.25		3	19.50 m^2
	Open passage	2	5.40		3	32.40 m^2
		2	1.89		3	11.34 m^2
	Consulting Room	2	3.5		3	21.0 m^2
		2	3.31		3	19.86 m^2
	Waiting Room	2	3.7		3	22.20 m^2
		2	3.31		3	19.86 m^2
	Otta 2	1	3.96		3	11.88 m^2
	Otta 1	1	6.7		3	20.10 m^2
					Total =	**234.64m^2**
	Deduction:					
	D	1	1.7		2.13	3.62 m^2
	D1	3	1.20		2.13	1.89 m^2
	D2	1	0.76		2.13	2.71 m^2
	W	1	2		1.22	2.44m^2
	W1	4	1.8		1.22	8.78 m^2
	W2	2	1.20		1.22	2.92 m^2

	Total = 234.65 – 22.36 = 212.29m²				**Total =**	**212.29m²**
8.	**Outside plaster:**					
	L1=11.52+0.3=11.82	2	11.82		4.5	106.38 m²
	L2=5.93+0.3=6.23	2	6.23		4.5	56.07m²
					Total =	**162.45m²**
	Deduction					
	W	0.5	2		1.22	1.22m²
	W1	2	1.8		1.22	4.39 m²
	W2	1	1.20		1.22	1.46 m²
	Total= 162.45 – 7.07 = 153.38m²				**Total =**	**7.07m²**
					Total =	**155.38m²**
9.	**Flooring:**					
	Medical store	1	3.62	3.18		11.51m²
	Ward Room	1	3.62	3.25		11.76m²
	Open passage	1	5.40	1.89		10.20m²
	Consulting room	1	3.50	3.31		11.58 m²
	Waiting room	1	3.70	3.31		12.24m²
	Otta 1	1	6.70	1.23		8.24 m²
	Otta 2	1	3.96	0.9		3.56 m²
	WC	1	1.80	1.89		3.40 m²
					Total =	**72.49m²**
10.	**Dado work:**					
	W.C.	2	1.80		3	10.80m²
		2	1.89		3	11.34m²
					Total =	**22.14m²**
	Deduction					
	D2	1	0.76		2.13	1.61
	Total = 22.14 – 1.61 = 20.53m²				**Total =**	**20.53m2**

Table 13 Abstract Sheet of PHC

Sr. No.	Description	Qty.	Rate	Unit	Amount
1.	Excavation of foundation upto 1.5m depth sorting out and stacking of useful materials and disposing of excavated stuff up to 50M lead	74.86	67.2	Cu.m.	**5030.592**
2.	Providing and laying cement concrete 1:3:6(1cement: 3coase sand: 6 graded stone aggregate 20mm. Nominal size) and curing	14.93	2486	Cu.m.	**37115.98**

	complete excluding cost of formwork in foundation				
3.	Brick masonry work in common brunt clay building bricks having crushing strength not less than 35 kg/sq.cm in cement mortar 1:6(1 cement: 6 coarse sand) in foundation	33.93	3147	Cu.m.	**106777.7**
4.	Filling available excavated earth (excluding rocks)in sides of foundation etc in layers not exceeding 20 cm in depth consolidating each deposited layer ramming and watering	26.0	78.6	Cu.m.	**2043.6**
5.	Brick masonry in common brunt clay building bricks having crushing strength not less than 35 kg/sq.cm in cement mortar 1:6(1 cement: 6 coarse sand) in plinth	37.15	3650	Cu.m.	**135597.5**
6.	Providing and laying cement concrete 1:2:4(1cement: 2 coase sand: 4 graded stone aggregate 20mm. Nominal size)exposed work with curing etc complete including the cost of formwork but excluding the cost of reinforcement for RCC work in slab having more than 8cm and upto 10cm thickness	12.99	3372	Cu.m.	**43802.28**
7.	Providing 20mm thick cement plaster in single coat on rough side of single or half brick walls for interior plastering upto two level and finished even and smooth in even mortar 1:4 (1cement: 4 sand)	212.29	134	Sq.m.	**28446.86**
8.	20mm thick outside double coat sand faced ceent plaster on walls upto height 3 m above ground level consisting of 12mm thick backing coat of CM 1:3(1 cement: 3 coarse sand) and 8mm thick finishing coat of CM 1:1(1 cement:1 coarse sand)etc complete	155.38	174	Sq.m.	**27036.12**
9.	Providing and laying tiles 6mm thick in flooring, treads of steps laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3-coarse sand) finishing with flush pointing in white cement. white Glazed tiles	72.49	906	Sq.m.	**65675.94**
10.	Providing and laying tiles 6mm thick in dado and jointed with white cement slurry A) white Glazed tiles.	20.53	650	Sq.m.	**13344.5**
					Total = 464871.10 Rs.

8.1.3 Social Design:

Post Office:

As we have seen requirement of post office in village as per gap analysis, so according to requirement we have given design for 12.45m x 10.25m.

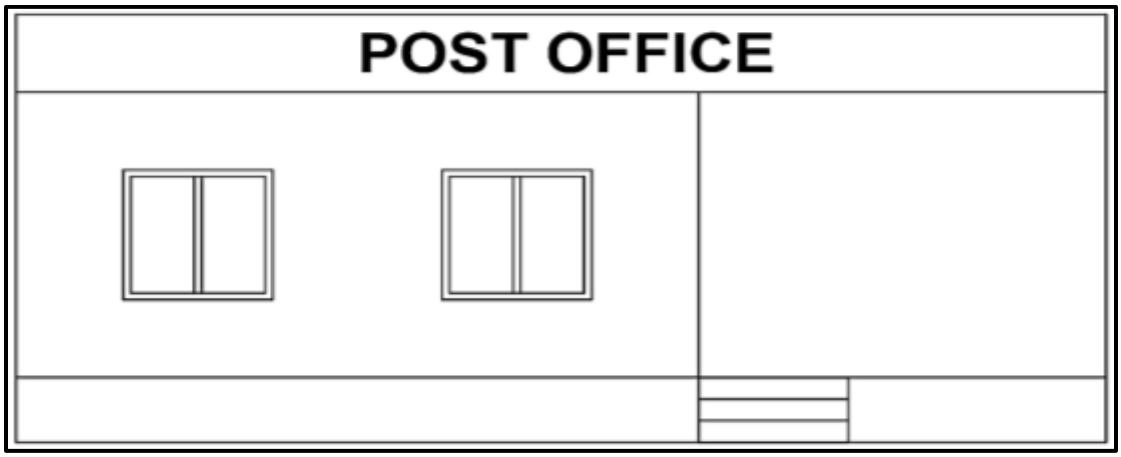


Fig 8.5 Elevation of Post Office

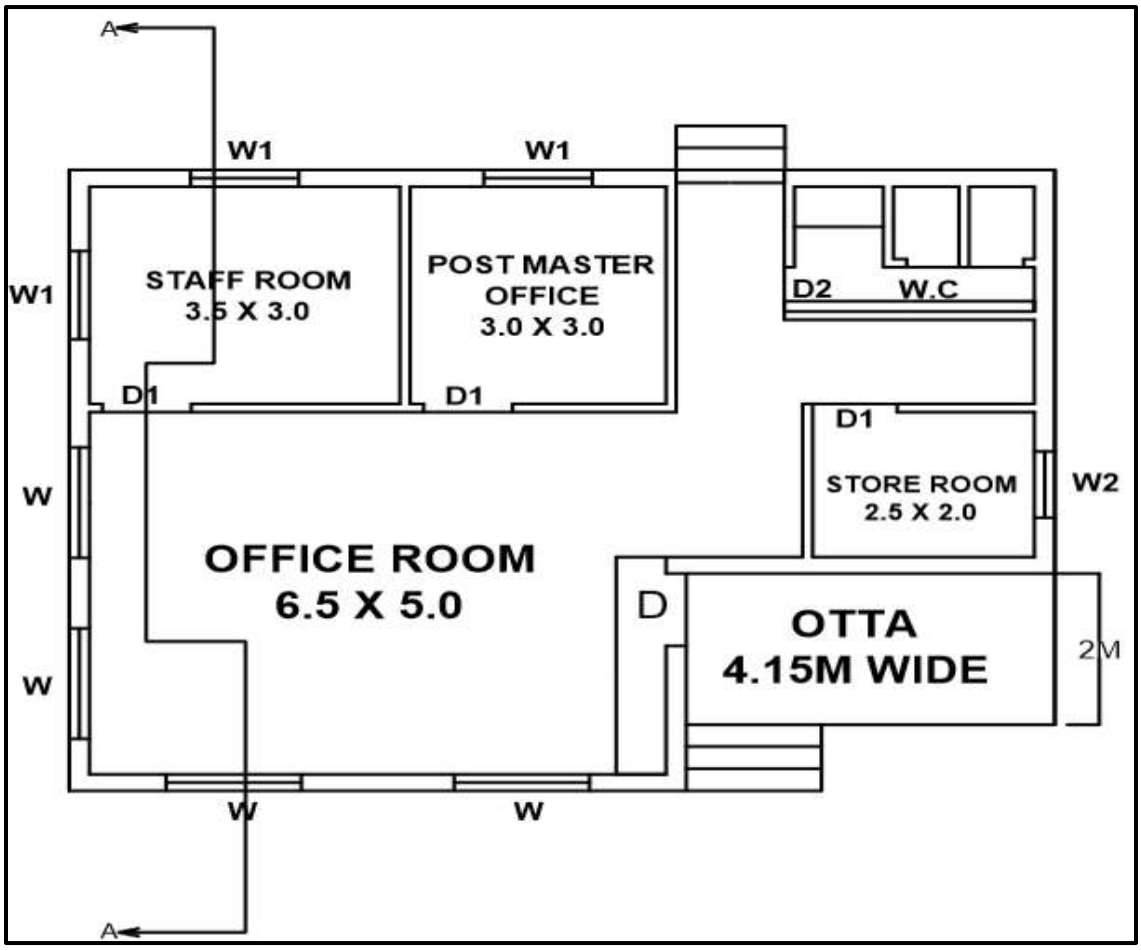


Fig 8.6 Plan of Post Office

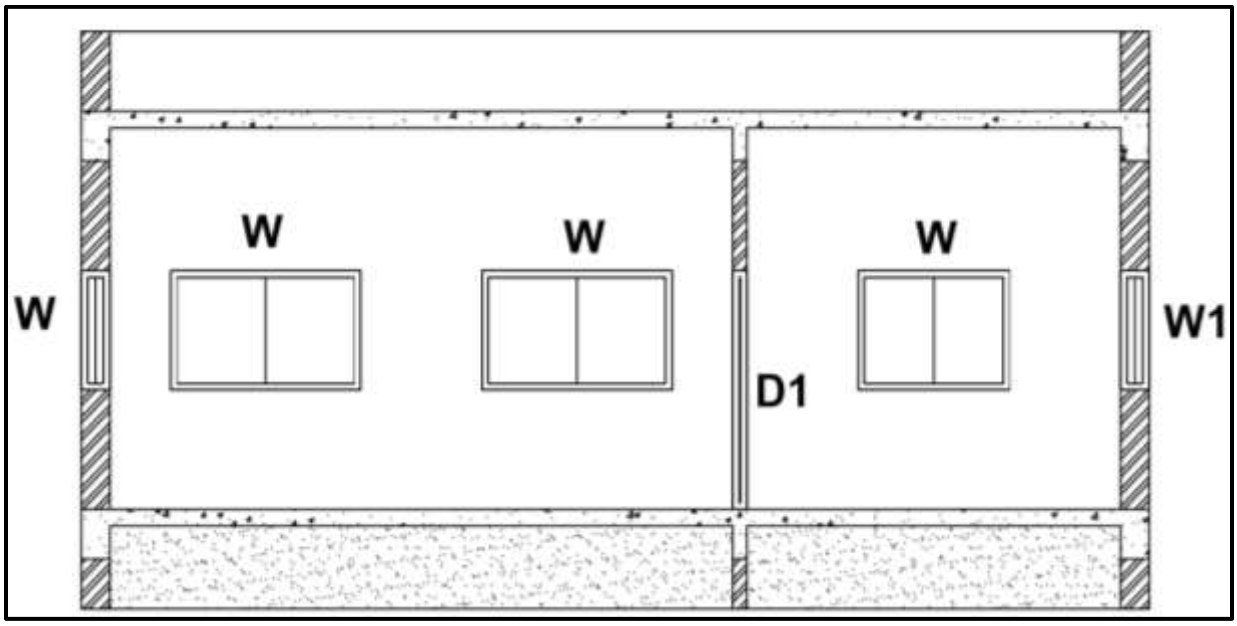
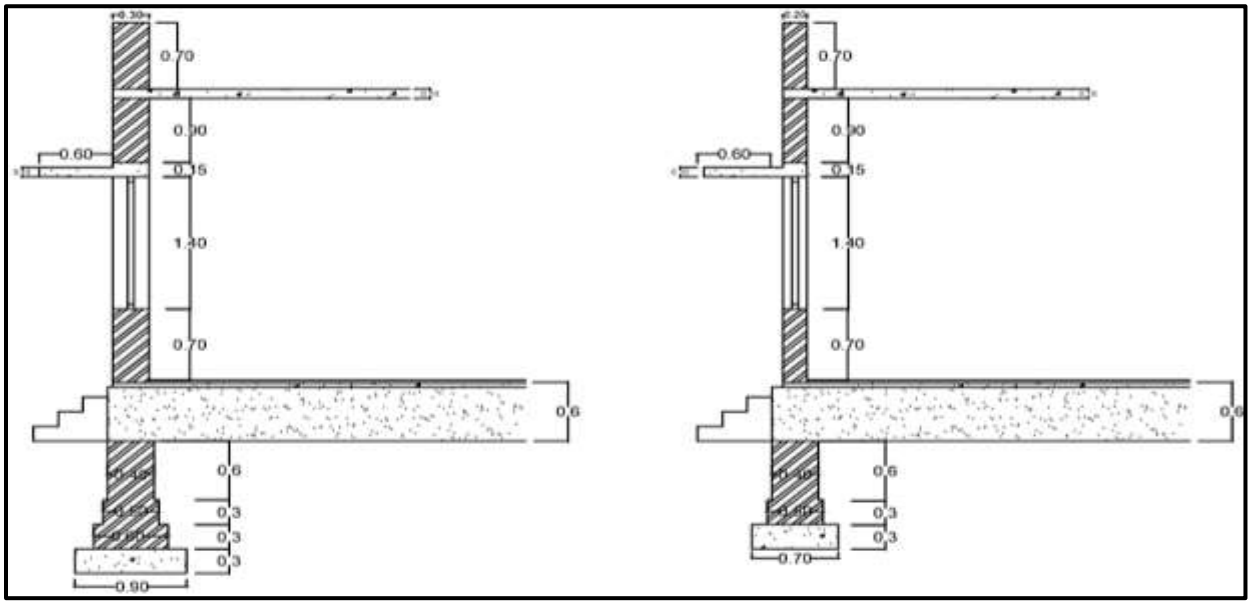


Fig. 8.7 Section of Post Office A-A



200mm Wall **300mm Wall**

Fig 8.7 Typical wall section of Post office

Table 14 Measurement Sheet of Post Office

Sr. No.	Description	No.	Length(m)	Width(m)	Height(m)	Quantity
1.	**Excavation in foundation:** 30cm wall 20cm wall	 1 1	 44.45 22.52	 0.9 0.7	 1.5 1.5	 60.0075 23.646
					Total =	**83.65m^3**
2.	**PCC in Foundation:** 30cm wall 20cm wall	 1 1	 44.45 22.52	 0.9 0.7	 0.3 0.3	 12.0 4.73
					Total =	**16.73m^3**
3.	**Brick work in foundation:** **30 cm wall** **(Below G.L)** Step -1 Step - 2 Step – 3 **(Above G.L)** Plinth **20cm wall** **(Below G.L)** Step - 1 step – 2 (40) step - 2 (40) **(Above G.L)** Plinth	 1 1 1 1 1 1 1 1	 44.75 44.85 44.95 44.95 19.02 19.62 20.12 25.32	 0.6 0.5 0.4 0.4 0.5 0.4 0.4 0.4	 0.3 0.3 0.6 0.6 0.3 0.3 0.6 0.6	 8.05 6.73 10.788 10.79 2.85 2.35 4.83 6.08
					Total =	**52.47m^3**
4.	**Earth filling:** Total Excavation - Total PCC - Total Brick work in foundation = 83.65- 16.73- 35.61 = 31.32m^3				**Earth filling**	**31.32m^3**

5.	**D.P.C:** 30cm wall 20cm wall	 1 1	 44.95 25.32	 0.4 0.4		 **17.98m^2** **10.128m^2**
6.	**Brick work in super structure:** 30 cm wall 20cm wall parapet wall	 1 1 1	 45.05 26.02 45.05	 0.3 0.2 0.3	 4 4 0.9	 54.06 20.82 12.16
						87.04m^3
7.	**Deduction in BW:** **Opening** w w1 w2 D D1 D2 D3	 4 3 1 1 4 1 2	 1.2 1.2 1.2 2.1 2.1 2.1 2.0	 0.3 0.3 0.3 0.3 0.2 0.2 0.2	 1.2 1.0 0.8 1.5 1.0 0.8 0.6	 1.73 1.08 0.29 0.94 1.68 0.34 0.48
						6.54m^3
8.	**Lintels:** w w1 w2 D D1 D2 D3	 4 3 1 1 4 1 2	 0.15 0.15 0.15 0.15 0.15 0.15 0.15	 0.3 0.3 0.3 0.3 0.2 0.2 0.2	 1.5 1.3 1.1 1.8 1.3 1.1 0.9	 0.27 0.17 0.05 0.08 0.17 0.03 0.05
						0.82m^3
Total Brick work in Super Structure = 79.68m^3						
9.	**Slab:** Part 1 Part 2	 1 1	 8.80 4.15	 7.10 5.60	 0.15 0.15	 9.37 3.49
						12.86m^3
RCC Lintel = 0.82m^3						

10.	**RCC Chajja:**					
	w	4	0.6	1.5	0.1	0.36
	w1	3	0.6	1.3	0.1	0.23
	w2	1	0.6	1.1	0.1	0.07
						0.66m^3
	Total RCC = 14.34m^3					
11.	**Steel:** **Assuming Steel = 1%** **Volume of Steel = 0.14** **Weight of Steel = 1125.45Kg**					
12.	**Plastering:**		**Walls**			
	Inside Plaster					
	Staff room	2	3.50		4	28.00
		2	3.0		4	24.00
	Post master office	2	3.0		4	24.00
		2	3.0		4	24.00
	office room	2	6.5		4	52.00
		2	5.0		4	40.00
	WC	2	2.8		4	22.40
		2	1.72		4	13.76
		4	1.2		4	19.20
	Store room	2	2.5		4	20.00
		2	2.0		4	16.00
	passage 1	2	2.1		4	16.80
		2	1.2		4	9.60
	passage 2	2	3.3		4	26.40
		2	1.4		4	11.20
	passage 3	2	1.2		4	9.60
		2	2.6		4	20.80
						377.76m^2
13.	**Celling:**					
	Staff Room		3.5	3		10.5
	Post Master office		3.0	3		9.0
	Office Room		6.5	5		32.5
	WC		2.8	1.72		4.8
	Store Room		2.5	2		5.0
	Passage 1		2.1	1.2		2.5
	Passage 2		3.3	1.4		4.7
	Passage 3		1.2	2.6		3.0
						72.0m^2

14.	Parapet wall:	1 2 1 2 1	8.2 6.5 3.2 4.2 5.0	0.9 0.9 0.9 0.9 0.9		7.38 11.7 2.88 7.47 4.5
						33.93m^2
15.	**Deduction:** D1 D2 D3	 3 1 2	 2.1 2.1 2.0	 1 0.8 0.6		 6.3 1.68 2.40
						10.38m^2
Total Internal Plaster = 473.30m^2						
16.	**Outside plastering:** LW SW	 2 2	 8.80 11.25	 5.65 5.65		 99.44 127.12
						226.57m^2
17.	**Parapet top:**	1 1 1 1 1 1	8.80 6.50 3.20 4.15 5.60 10.65	0.3 0.3 0.3 0.3 0.3 0.3		2.64 1.95 0.96 1.24 1.68 3.19
						11.67m^2
18.	**Chajja: Top/Bottom** w w1 w2 Chajja Sides	 8 6 2 16	 0.6 0.6 0.6 0.1	 1.5 1.3 1.1 0.6		 7.20 4.68 1.32 0.96
						14.16m^2
19.	**Deduction** w w1 w2 D D1	 4 3 1 1 1	 1.2 1.2 1.2 2.1 2.1	 1.2 1 0.8 1.5 1		 5.76 3.60 0.96 3.15 2.10
						15.57m^2

Total Outside plastering = 236.82m^2						
20.	**Flooring:**					
	Staff Room		3.5	3		10.5
	Post Master Room		3	3		9.00
	Office Room		6.5	5		32.5
	WC		2.8	1.72		4.80
	Store Room		2.5	2		5.00
	Otta		4.15	3.5		14.5
	Passage 1		2.1	1.2		2.50
	Passage 2		3.3	1.4		4.70
	Passage 3		1.2	2.6		3.00
						86.60m^2
21.	**PCC:**					
	Staff room		3.4	2.90		9.90
	Post master room		2.9	2.90		8.40
	Office room		6.4	4.90		31.4
	WC		2.7	1.62		4.40
	Store room		2.4	1.90		4.60
	Otta		4.05	3.40		13.8
	Passage 1		1.97	1.12		2.20
	Passage 2		3.17	1.32		4.20
	Passage 3		1.06	2.51		2.70
						81.40m^2
22.	**Murrum Filling:**					
	Staff room		3.4	2.90	0.47	4.68
	Post master room		2.9	2.90	0.47	3.99
	Office room		6.4	4.90	0.47	14.89
	WC		2.7	1.62	0.47	2.07
	Store room		2.4	1.90	0.47	2.16
	Otta		4.05	3.40	0.47	6.54
	Passage 1		1.96	1.12	0.47	1.04
	Passage 2		3.17	1.32	0.47	1.99
	Passage 3		1.06	2.51	0.47	1.27
						38.67m^3

Table 15 Abstract Sheet of Post Office

Sr. No.	Description	Qty.	Rate	Unit	Amount
1.	Excavation of foundation upto 1.5m depth sorting out and stacking of useful materials and disposing of excavated stuff up to 50M lead	83.65	67.2	Cu.m.	**5621.28**

2.	Providing and laying cement concrete 1:3:6(1cement: 3coase sand: 6 graded stone aggregate 20mm. Nominal size) and curing complete excluding cost of formwork in foundation	16.73	2486	Cu.m.	**41590.78**
3.	Brick masonry work in common brunt clay building bricks having crushing strength not less than 35 kg/sq.cm in cement mortar 1:6(1 cement: 6 coarse sand) in foundation	52.47	3147	Cu.m.	**165123.09**
4.	Filling available excavated earth (excluding rocks)in sides of foundation etc in layers not exceeding 20 cm in depth consolidating each deposited layer ramming and watering	31.32	78.6	Cu.m.	**2461.75**
5.	Brick masonry in common brunt clay building bricks having crushing strength not less than 35 kg/sq.cm in cement mortar 1:6(1 cement: 6 coarse sand) in plinth	79.68	3650	Cu.m.	**290832**
6.	Providing and laying cement concrete 1:2:4(1cement: 2 coarse sand: 4 graded stone aggregate 20mm. Nominal size)exposed work with curing etc. complete including the cost of formwork but excluding the cost of reinforcement for RCC work in slab having more than 8cm and up to 10cm thickness	14.34	3372	Cu.m.	**48354.48**
7.	Providing 20mm thick cement plaster in single coat on rough side of single or half brick walls for interior plastering upto two level and finished even and smooth in even mortar 1:4 (1cement: 4 sand)	473.30	134	Sq.m.	**63422.20**
8.	20mm thick outside double coat sand faced cent plaster on walls upto height 3 m above ground level consisting of 12mm thick backing coat of CM 1:3(1 cement: 3 coarse sand) and 8mm thick finishing coat of CM 1:1(1 cement:1 coarse sand)etc. complete	236.82	174	Sq.m.	**41206.68**
9.	Providing and laying tiles 6mm thick in flooring, treads of steps laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3-coarse sand) finishing with flush pointing in white cement. white Glazed tiles	86.60	906	Sq.m.	**78459.60**
					Total = 737071.86 Rs.

8.1.4 Socio Cultural Design:

Library:

We have designed a small Library of size 10m x 10m. The measurement sheets, abstract sheet and AutoCAD design are given below. We gave design of library as social Cultural design. We also give E-corner in library for the good connectivity of new technologies for the growth of people of Ten village.

Design:

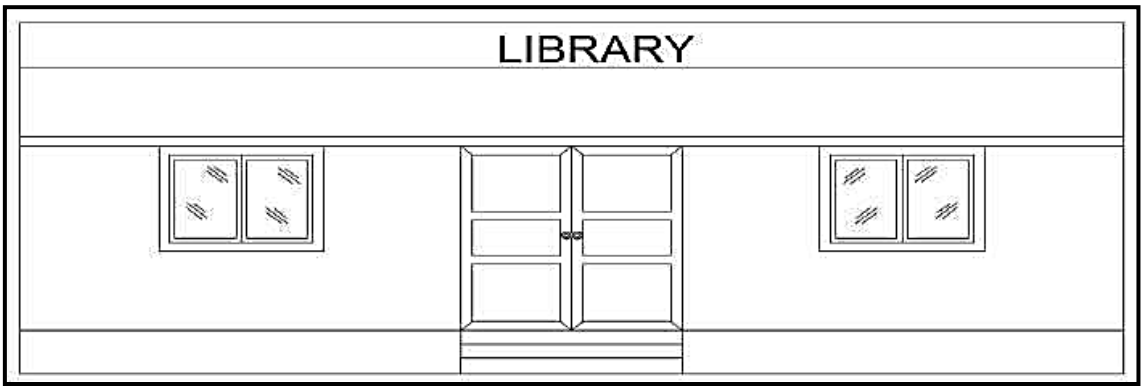


Fig.8.8 Elevation of library

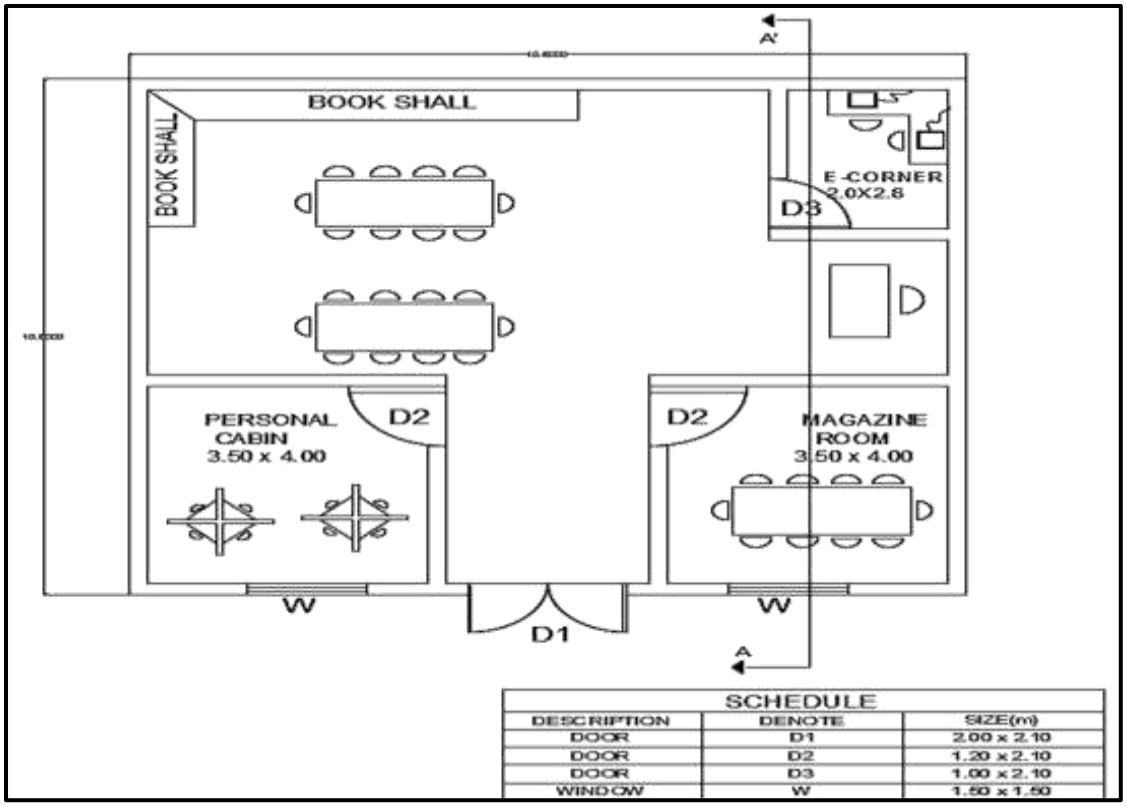


Fig.8.9 Plan of library

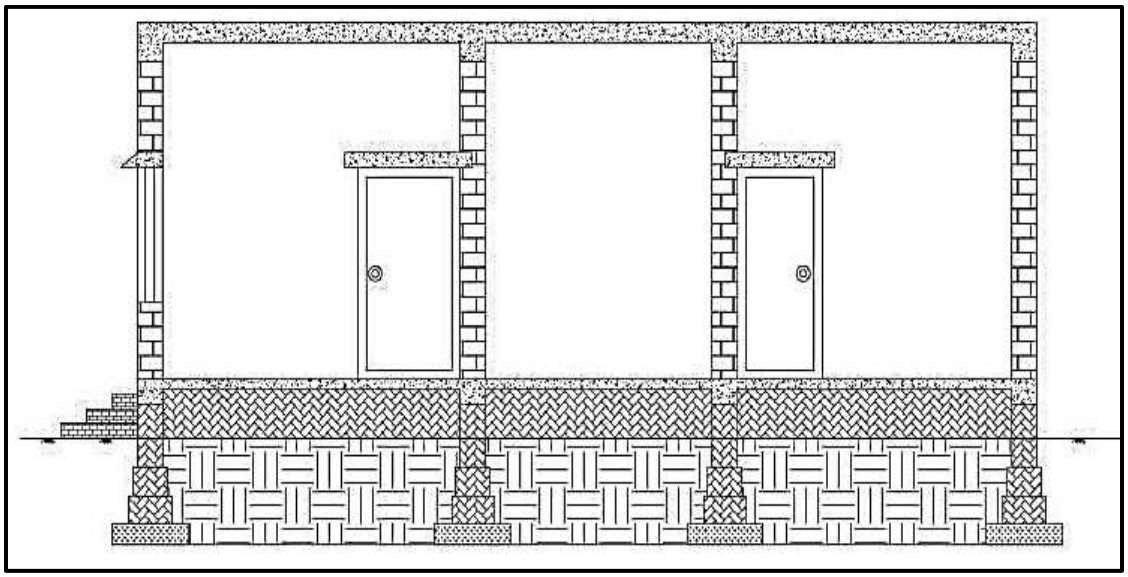


Fig.8.10 section of library

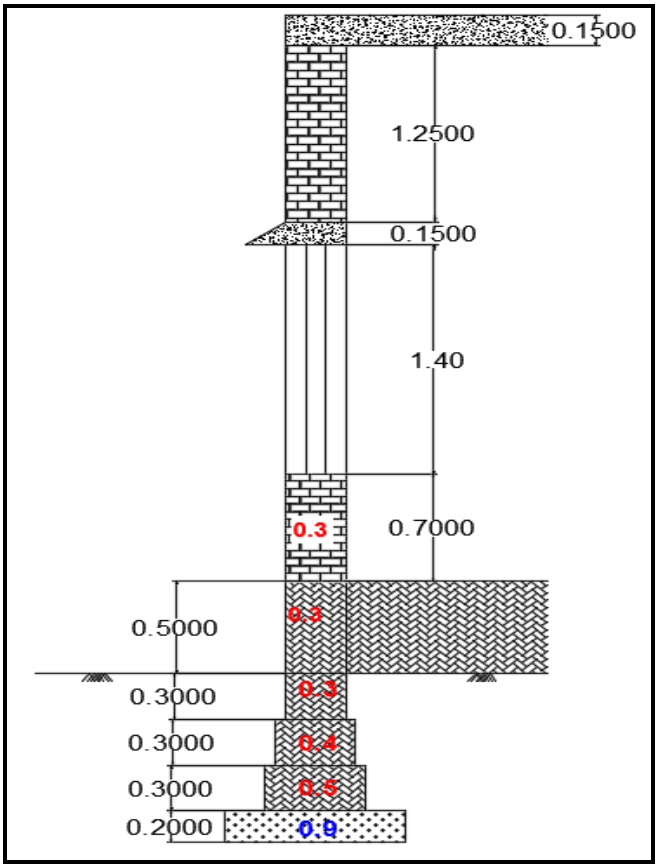


Fig.8.11 section of footing

Table 16 Measurement Sheet of Library

Sr. No.	Description	No.	Length (M)	Breadth (M)	Height (M)	Quantity
1.	**Excavation in Foundation** Total C. L=60.10 m **Total**	1	60.10	0.9	1.1	59.5 **59.5 m^3**
2.	**Plain cement concrete (P.C.C)in Foundation (1:4:8)** PCC	1	60.10	0.9	0.2	10.81
Total						**10.81 m^3**
3.	**Brickwork in Foundation upto Plinth level**					
	First step	1	60.10	0.5	0.3	9.01
	Second step	1	60.10	0.4	0.3	7.21
	Third step	1	60.10	0.3	0.8	14.42
	Steps:					
	First	1	2	0.9	0.15	0.27
	Second	1	2	0.6	0.15	0.18
	Third	1	2	0.3	0.15	0.09
	Total					**31.18 m^3**
4.	**Brickwork in superstructurein cement mortar 1:6**					
	Wall	1	61.9	0.3	3.5	64.99
						65.00 m^3
	Deduction for Door/Ventilation:					
	D1	1	2.0	0.3	2.1	1.26
	D2	2	1.2	0.3	2.1	1.51
	D3	1	1.0	0.3	2.1	0.63
	W	2	1.50	0.3	1.5	1.35
						(-) 4.75 m^3
Total						**60.25 m^3**
5.	**RCC Work**					
	Slab	1	10.6	10.6	0.15	16.854
		1	10.6	10.6	0.10	11.236
	Beam	4	10.6	0.3	0.2	2.544
		4	10.6	0.3	0.15	1.908
	Lintel	1	10.6	0.3	0.15	0.650
	Total					**33.192 m^3**
6.	**2 cm thick marble flooring** All	1	10	10		100.00
Total area						**100.00 m^2**

7.	**Smooth plaster on inside wallsand ceiling in cm (1:3)** Inside Wall Ceiling External Wall	4 4 4 2 2 1 4	10 3.5 4.0 2.0 2.8 10 10.6	 10 	3.5 3.5 3.5 3.5 3.5 3.5	35.00 49.00 72.00 14.00 19.60 100.00 37.10
						326.70 m^2
	Deduction for Door/Ventilation: D1 D2 D3 W	 2 4 2 4	 2.00 1.20 1.00 1.50	 	 2.10 2.10 2.10 1.50	 8.4 10.08 4.20 9.00
						(-) 31.60m^3
Total						**295.10 m^3**
8.	**Earth filling in Excavation** Total excavation for walls Brickwork up to G.L. PCC Total					**59.50 m^3** **(-)30.10m^3** **(-)10.81 m^3** **18.59m^3**

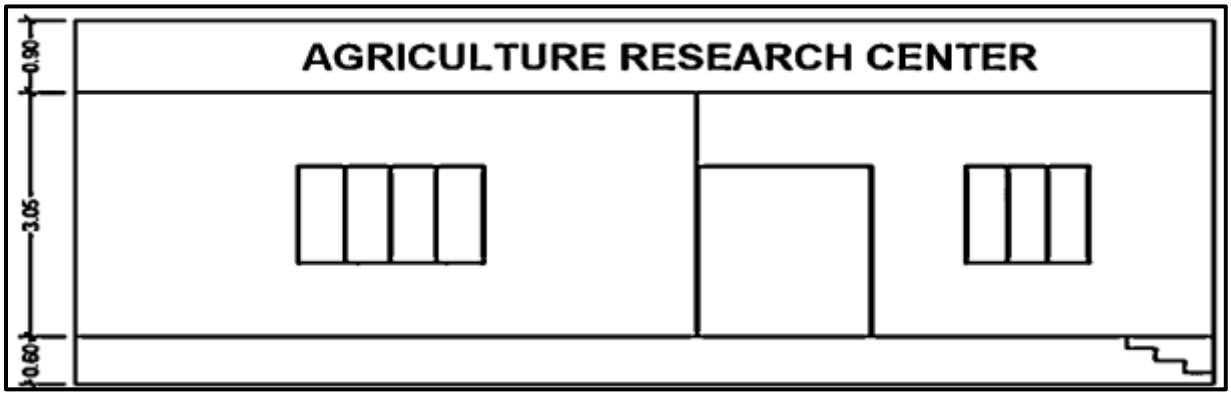
Table 17 Abstract Sheet of Library

Sr. No.	Particulars	Quantity	Unit	Rate	Per	Amount
1	Excavation inFoundation	59.5	m^3	85	m^3	**5057.50**
2	Plain cement concrete (P.C.C) in Foundation (1:4:8)	10.81	m^3	3000	m^3	**32430**
3	Brickwork in Foundation up to Plinth level	31.80	m^3	3200	m^3	**99776**
4	Brickwork in superstructure in cement mortar 1:6	60.25	m^3	3500	m^3	**210875**
5	RCC Work	33.192	m^3	8800	m^3	**292089.6**
6	2 cm thick marbleflooring	100.00	m^2	500	m^2	**50000**
7	Smooth plaster on inside walls and ceiling in cm (1:3)	295.10	m^2	150	m^2	**44265**

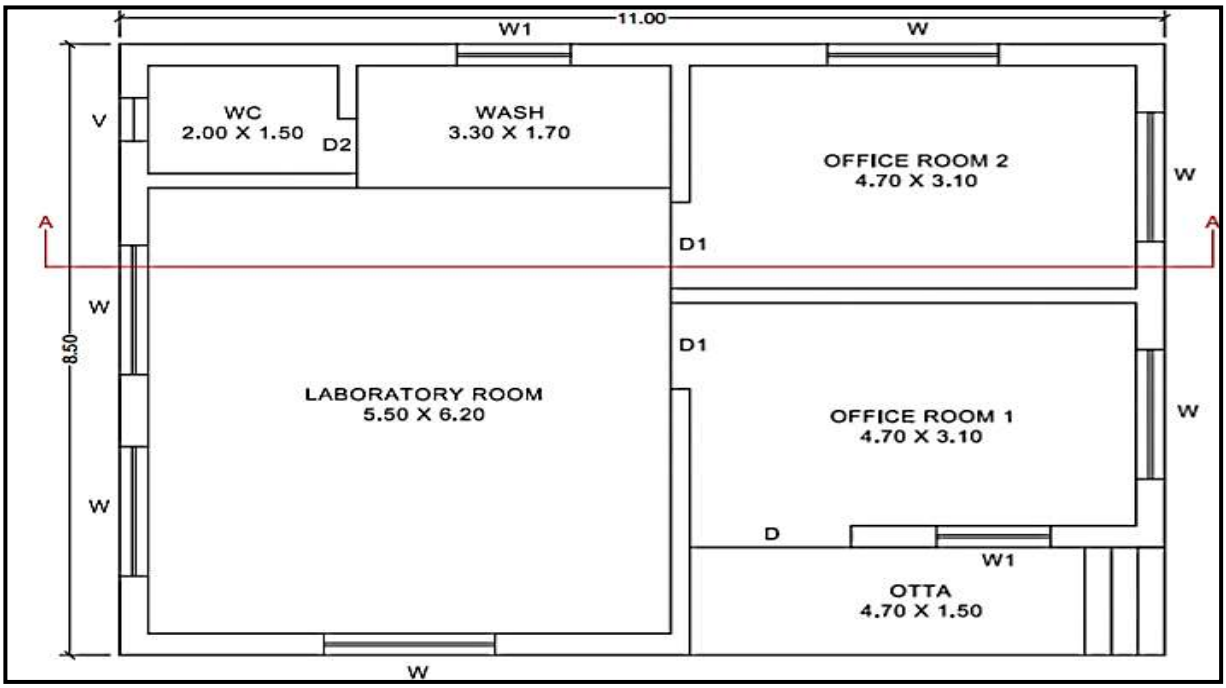
8	Earth filling inExcavation	18.59	m^3	50	m^3	**929.50**
	Total					**7,35,422.60 Rs.**
	Add 5% contingencies					**36,771.13 Rs.**
	Grand Total					**7,72,193.73 Rs.**

8.1.5 Smart Village Design:

Agriculture Research Center:

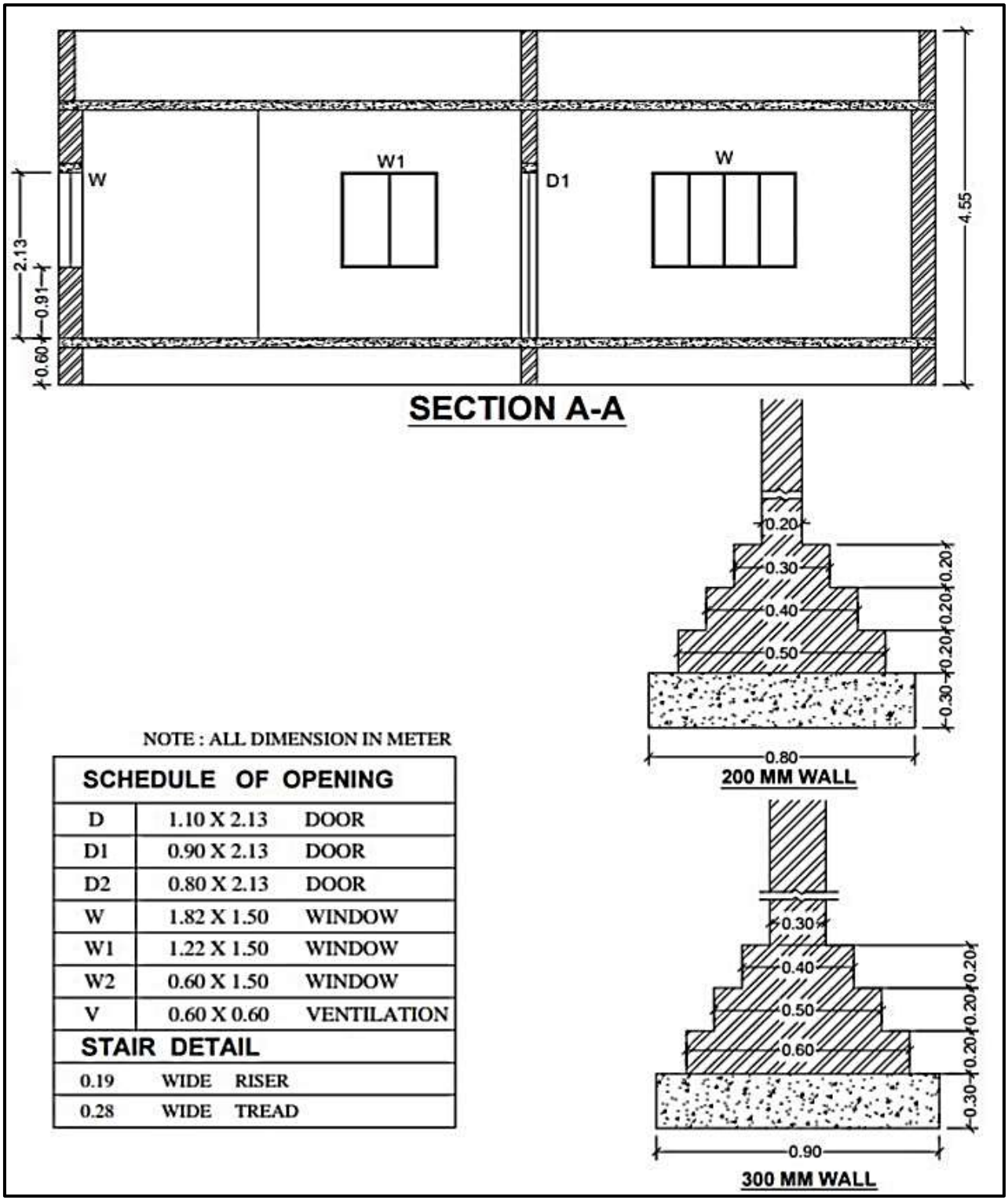


ELEVATION



PLAN

Fig. 8.13 Plan and Elevation of Agriculture Research Center



NOTE : ALL DIMENSION IN METER

SCHEDULE OF OPENING		
D	1.10 X 2.13	DOOR
D1	0.90 X 2.13	DOOR
D2	0.80 X 2.13	DOOR
W	1.82 X 1.50	WINDOW
W1	1.22 X 1.50	WINDOW
W2	0.60 X 1.50	WINDOW
V	0.60 X 0.60	VENTILATION
STAIR DETAIL		
0.19	WIDE	RISER
0.28	WIDE	TREAD

Fig. 14 Section of Agriculture Research Center

Table 18 Measurement Sheet of Agriculture Research Center

Sr No.	Description	No	Length(m)	Width(m)	Height(m)	Quantity
1.	**Excavation in foundation** **Horizontal wall**					
	L1 =10.7+2x0.45 =11.6	1	11.6	0.9	1.5	**15.66 m³**
	L2 =5.75+2x0.45=6.65	1	6.65	0.9	1.5	**8.97 m³**
	L3 =4.95+2x0.45=5.85	1	5.85	0.9	1.5	**7.90 m³**
	L4 =4.95+2x0.40=5.75	1	5.75	0.8	1.5	**6.9 m³**
	Short wall					
	S1=8.2-2x0.45=7.3	1	7.3	0.9	1.5	**9.85 m³**
	S2=6.7-2x0.45=5.8	1	5.8	0.9	1.5	**7.83 m³**
	S3=8.2-2x0.40=7.4	1	7.4	0.8	1.5	**8.88 m³**
						Total = 65.99m³
2.	**Plain cement concrete in foundation** Horizontal wall					
	L1	1	11.6	0.9	0.3	3.13 m³
	L2	1	6.65	0.9	0.3	1.80 m³
	L3	1	5.85	0.9	0.3	1.58 m³
	L4	1	5.75	0.8	0.3	1.38 m³
	Vertical wall					
	S1	1	7.3	0.9	0.3	1.97 m³
	S2	1	5.8	0.9	0.3	1.56 m³
	S3	1	7.4	0.8	0.3	1.78 m³
						Total = 13.2m³
3.	**B.W. Up To Plinth** **Horizontal Wall**					
	L1					
	Step 1=11.6-2x0.15=11.3	1	11.3	0.6	0.2	1.36 m³
	Step 2=11.3-2x0.05=11.2	1	11.2	0.5	0.2	1.12 m³
	Step 3=11.2-2x0.05=11.1	1	11.1	0.4	0.2	0.89 m³
	Step 4=11.1-2x0.05=11	1	11	0.3	1.2	3.96 m³
	L2					
	Step 1=6.65-2x0.15=6.35	1	6.35	0.6	0.2	0.76 m³
	Step 2=6.35-2x0.05=6.25	1	6.25	0.5	0.2	0.62 m³
	Step 3=6.25-2x0.05=6.15	1	6.15	0.4	0.2	0.49 m³
	Step 4=6.15-2x0.05=6.05	1	6.05	0.3	1.2	2.17 m³

	L3					
	Step 1=5.85-2x0.15=5.55	1	5.55	0.6	0.2	0.73 m^3
	Step 2=5.55-2x0.05=5.45	1	5.45	0.5	0.2	0.54 m^3
	Step 3=5.45-2x0.05=5.35	1	5.35	0.4	0.2	0.43 m^3
	Step 4=5.35-2x0.05=5.25	1	5.25	0.3	1.2	1.89 m^3
	L4					
	Step 1=5.85-2x0.05=5.55	1	5.55	0.5	0.2	0.55 m^3
	Step 2=5.55-2x0.05=5.45	1	5.45	0.4	0.2	0.44 m^3
	Step 3=5.45-2x0.05=5.35	1	5.35	0.3	0.2	0.32 m^3
	Step 4=5.35-2x0.05=5.25	1	5.25	0.2	1.2	1.26 m^3
	Vertical Wall					
	S1					
	Step 1=7.3+2x0.15=7.6	1	7.6	0.6	0.2	0.91 m^3
	Step 2=7.6+2x0.05=7.7	1	7.7	0.5	0.2	0.77 m^3
	Step 3=7.7+2x0.05=7.8	1	7.8	0.4	0.2	0.62 m^3
	Step 4=7.8+2x0.05=7.9	1	7.9	0.3	1.2	2.84 m^3
	S2					
	Step 1=5.8+2x0.15=6.1	1	6.1	0.6	0.2	0.73 m^3
	Step 2=6.1+2x0.05=7.7	1	6.2	0.5	0.2	0.62 m^3
	Step 3=6.2+2x0.05=7.8	1	6.3	0.4	0.2	0.50 m^3
	Step 4=6.3+2x0.05=7.9	1	6.4	0.3	1.2	2.30 m^3
	S3					
	Step 1=7.4+2x0.10=7.6	1	7.6	0.5	0.2	0.76 m^3
	Step 2=7.6+2x0.05=7.7	1	7.7	0.4	0.2	0.62 m^3
	Step 3=7.7+2x0.05=7.8	1	7.8	0.3	0.2	0.47 m^3
	Step 4=7.8+2x0.05=7.9	1	7.9	0.2	1.2	1.90 m^3
						30.57m^3
4.	**Earth Filling** = excavation quantity -p.c.c. quantity - B.W. quentity = 65.99-13.2-30.57 = 22.22				**Total =**	**22.22 m^3**
5.	**B.W. up to slab**					
	Horizontal wall					
	L1	1	11	0.3	3	9.9 m^3
	L2	1	6.05	0.3	3	5.44 m^3
	L3	1	5.25	0.3	3	4.72 m^3
	L4	1	5.25	0.2	3	3.15 m^3

	Vertical wall					
	S1	1	7.9	0.3	3	7.11 m³
	S2	1	6.4	0.3	3	5.76 m³
	S3	1	7.9	0.2	3	4.74 m³
					Total =	**40.82m3**
	For parapet wall					
	Long wall	2	11	0.9	1.2	23.76m³
	Short wall	2	8.5	0.9	1.2	18.36 m³
					Total =	**40.12m^3**
	Deduction for doors/window					
	D	1	1.70	0.3	2.13	1.08 m³
	D1	2	1.20	0.2	2.13	1.02 m³
	D2	1	0.76	0.2	2.13	0.32 m³
	W	6	1.80	0.3	1.20	3.89 m³
	W1	2	1.20	0.3	1.22	0.89 m³
	V	1	0.6	0.3	0.6	0.11 m³
						7.31m^3
	Deduction for Lintels					
	D	1	2	0.3	0.12	0.07 m³
	D1	2	1.5	0.3	0.12	0.07 m³
	D2	1	1.06	0.3	0.12	0.02 m³
	W	6	2.10	0.3	0.12	0.45 m³
	W1	2	1.5	0.3	0.12	0.10 m³
	V	1	0.9	0.3	0.12	0.03 m³
	TOTAL = 40.82 + 42.12 - 7.31 -0.74 **= 74.89**				**Total =**	**0.74m^3**
6.	**R.C.C. work in Slab**					
	L=11+0.3=11.3B=8.5+0.3=8.8	1	11.3	8.8	0.12	11.93 m³
	Chajja					
	W	6	2.10	0.6	0.10	0.75m³
	W1	2	1.5	0.6	0.10	0.18 m³
	TOTAL = 16.39 + 0.93 **= 17.31m^3**					
7.	**Inside plaster**					
	Laboratory	2	5.5		3	33 m²
		2	6.20		3	37.2 m²
	room	2	4.7		3	28.2 m²
		2	3.1		3	18.6 m²
	Office room 1	2	4.7		3	28.2 m²
	Office room 2	2	3.1		3	18.6 m²

	Otta **Deduction** D D1 D2 W W1 TOTAL = 177.9 - 18.29 **= 151.61m^2**	1 1 2 1 3 1	4.7 1.7 1.2 0.76 1.8 1.2		3 **Total =** 2.13 2.13 2.13 1.2 1.22 **Total**	14.1 m² **177.9m^2** 3.62 m² 5.11 m² 1.62 m² 6.48 m² 1.46 m² **18.29m^2**
8.	**Outside plaster** L1=11 L2=8.5 Deduction W W1 TOTAL= 175.5 - 7.94 **= 167.56m^3**	 2 2 3 1	 11 8.5 1.80 1.2		 4.5 4.5 **Total =** 1.2 1.22 **Total =**	 09 m² 76.5 m² **175.5m^2** 6.48 m² 1.46 m² **7.94m^2**
9.	**Flooring** Laboratory room wash Office room 1 Office room 2 Otta	 1 1 1 1 1	 5.5 3.3 4.7 4.7 4.7	 6.3 1.7 3.1 3.1 1.5		 34.1 m² 5.61 m² 14.57 m² 14.57 m² 7.05 m² **75.9m^2**
10.	**Dedo work** W.C. Wash Deduction D2 W1 **TOTAL**=36 - 3.08 **= 32.92m^2**	 2 2 1 1 1 1	 2 1.5 3.3 1.7 0.76 1.20	 	 3 3 3 3 2.13 1.22	 **12 m²** **9 m²** **9.9 m²** **5.1 m²** **36m^2** 1.62 1.46

Table 19 Abstract Sheet of Agriculture Research center

Sr No.	Description	Quantity	Rate	Per	Amount(Rs.)
1.	Excavation for foundation excavation in case of wall including centering, dewatering & disposing of 30m& lift of 1.5m etc.	**65.99**	**200**	**m^3**	**13198**
2.	P.C.C. in foundation: Providing and laying of foundation concrete of P.C.C. in 1:4:8.	**13.2**	**2500**	**m^3**	**33000**
3.	B.W. up to plinth :- Providing and laying of brick masonry work for sub structure using common clay building brick having crushing in 1:6 cement mortar properties using modular brick including necessary , leveling, curing etc.	**30.57**	**3800**	**m^3**	**116166**
4.	Earth filling:- Providing and roughing of foundation trenches of foundation in equal layer of selected soil approved by engineering, watering, leveling etc. complete.	**22.22**	**100**	**m^3**	**2222**
5.	B.W. up to slab :- Providing and laying of brick masonry work for sub structure using common clay building brick having crushing in 1:6 cement mortar properties using modular brick including necessary , leveling, curing etc.	**74.89**	**3800**	**m^3**	**284582**
6.	R.C.C. work in Slab, chajja,, lintel	**17.31**	**7500**	**m^3**	**129825**
7.	Inside plaster:- Including Surface leveling, filling, joints, necessary Provide and laying inside smooth painting scaffolding etc	**156.61**	**200**	**m^2**	**31322**

8.	Outside plaster :- Including Surface leveling, filling, joints, necessary Provide and laying inside smooth painting scaffoldingetc.	**167.56**	**250**	**m^2**	**41890**
9.	Flooring:- Providing and fixing of mosaic files in selected room with 20mm thick bed in 1:6 mix preparation including necessaryfixing, cutting, finishing the joint leveling curing etc.complete.	**75.9**	**800**	**m^2**	**60720**
10.	Dedo work :- Providing and fixing of glazed files dedo in selected room in 1:6 mixed proportion including necessary fixing, cutting, finishing, leveling, curing etc.	**32.92**	**600**	**m^2**	**19752**
				Total=	**7,34,197 Rs.**

8.1.6 Heritage Design:

Village Entrance Gate:

A village entrance gate as a heritage village design, a gate or gateway is a point of entry to a space which is enclosed by walls. Gates may prevent or control the entry or exit of individuals, or they maybe merely decorative. In the Ten village there is no any village entrance or front gate existing in the village.

Design:

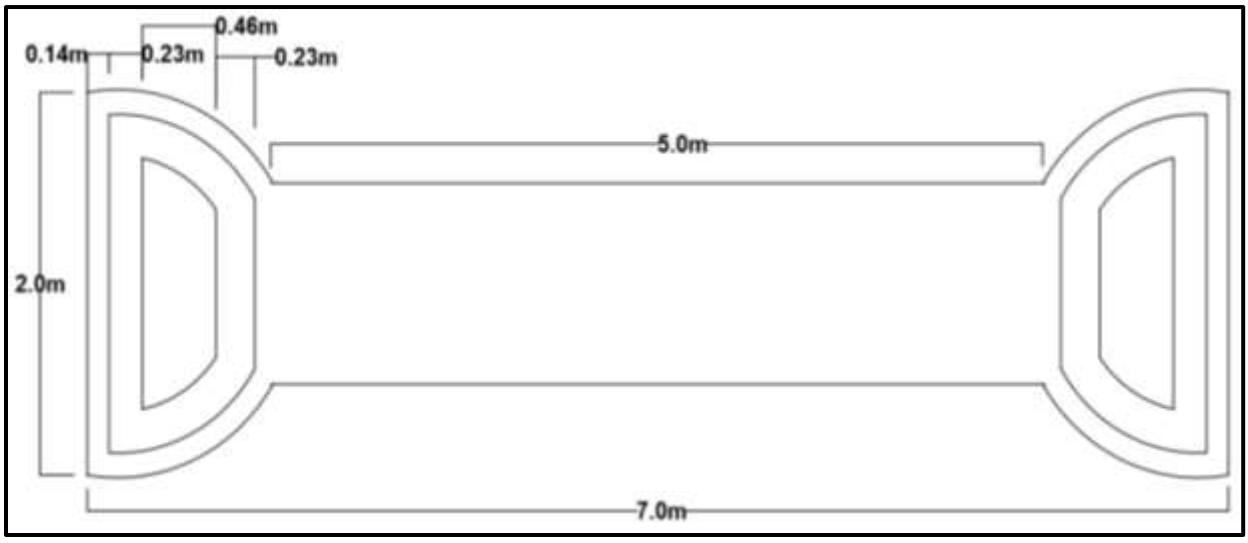


Fig. 15 Plan of Village Entrance Gate

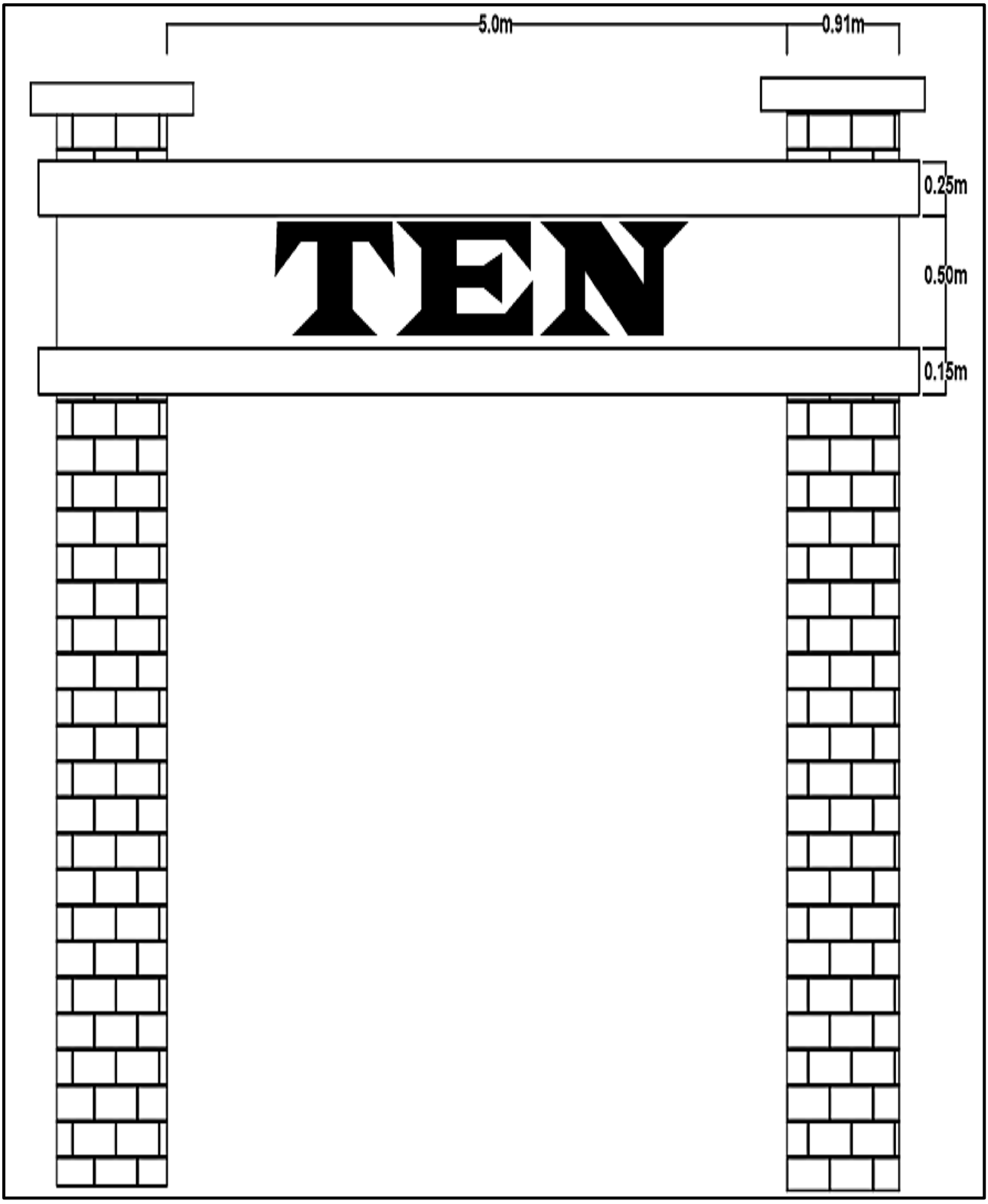


Fig. 16 Elevation of Village Entrance Gate

Table 20 Measurement Sheet of Village Entrance Gate

Sr.No	Description	Nos.	Length(m)	Width(m)	Height(m)	Total Quantity (m^3)
1	Basic Wall:9"	2	7.0	2.0	4.87	**136.36**
2	Basic Wall:Generic - 6" Masonry	1	1.52	0.15	1.83	**0.42**
3	Roofs 1	1	7.0	2.0	0.15	**2.10**
4	Roofs 2	1	7.0	2.0	0.15	**2.10**
5	Excavation	2	2	2	1.5	**12.0**

Table 21 Abstract Sheet of Village Entrance Gate

Sr No.	Description	per	Quantity(m^3)	Rate	Amount
1	Basic Wall: 9"	Ft^2	8.66	3500	**30310**
2	Basic Wall:Generic - 6" Masonry	Ft^2	1.04	130	**10231**
3	Roofs 1: Roofs 1	m^3	3.7	3500	**12950**
4	Floor: Generic - 6"	m^3	1.42	3500	**4970**
5	Excavation	m^3	13.5*2	350	**9450**
6	PCC	m^3	1.85	3500	**12950**
7	Basic Wall:00.30	Ft^2	1.8	90	**9360**
8	Basic Wall:0.40	Ft^2	2.8	90	**9360**
9	Basic Wall: Generic - 0.50	Ft^2	2.8	90	**9360**
				TOTAL	**108941 Rs.**

8.2 Reason for Students Recommending this Design:

- Biogas Plant - To provide gas as energy source and gives fertilizer at end.
- PHC – To provide healthy environment there must be Primary health care center in village.
- Post Office – To provide public facility that provides mail services, including accepting of letters and parcels which vary by country.
- Public library – To provide good connectivity of new technologies for the growth of people of Ten village.
- Agriculture Research Centre - To provide better place to research the new techniques related to the agriculture.
- Entrance gate – for the better aesthetic of the village main entrance.

8.3 About designs Suggestions / Benefit of the villagers:

1. Biogas plant: There is no biogas plant available in ten village. Biogas plant is one of the plants for renewable energy sources. It transforms rural village in to clean village and provide gas as energy source and gives fertilizer at end.
2. Primary Health Center: In the Ten village there is no any PHC or Medical store. So according to the feedback given by the villagers, one PHC should be there in the village.
3. Post Office: There is no Post Office in the Ten village. The population of Ten village is 6251 as per 2011 census. So it is required to have one Post Office in the village. The villagers have to go in Baben village for any public facilities like transferring mails, letters, parcels etc. so that we have decided and finalized the design of post office.
4. Public Library: We gave design of library as social design. We also give E-corner in library for the good connectivity of new technologies for the growth of people of Ten village.
5. Agriculture Research Centre: The design of Agriculture Research Centre is the smart concept in the Ten village. To carry out basic, strategic and applied research aimed at enhancement of production and productivity of maize crop in the village.
6. Entrance Gate: The Ten village has no main entrance gate at the village approach road. So that we have designed the village entrance gate as heritage village design.

➢ About Maintenance:

Maintenance can help:

- Prevent the process of decay and degradation.
- Maintain structural stability and safety.
- Prevent unnecessary damage from the weather or from general usage.
- Optimize performance.
- Determine the causes of defects and so help prevent re-occurrence or repetition.
- Ensure continued compliance with statutory requirements.

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

Chapter: 9

Future Development of the Village

- By conducting surveys and visit to our village Ten, Bardoli we will do the following work for the welfare of village in the Part II designs.

  - **Internal Street Road Design:** As we have seen the above photo the roads in the village is in bad condition and as we know that road is the backbone of any village, we will do the re-designing work of Road.
  - **Design of public toilet:** It will improve sanitation facility. It will be helpful to people who don't have toilets in their home
  - **Overhead Water Tank:** Design of Overhead water tank is required in village so the water can be stored for village purpose i.e. drinking and other cleaning works
  - **Community Hall design:** Community hall of village is in bad condition and also lack in area and appearance, So we will re-design the community hall and expand its area and esthetics
  - **Design of Aanganwadi:** Anganwadi gives them basic healthcare facility, and pre-schooling facility.
  - **Design of ATM:** Apart from cash withdrawal and checking account balance, ATMs today offer multiple facilities for the convenience of bank customers. As India is turning digital, it is imperative that rural communities are also benefitted from this wave and not left behind.

We also did physical survey of village by questioning village people about their local facilities, job opportunities, number of family members etc.

These are the proposed designs for the future development of Ten village for Vishwakarma Yojana phase VIII , Part 2 design.

Chapter: 10

Conclusion of the Entire Village Activities of the Project:

To make our country's economy strong, the rural economy has to grow consistently. Rural areas are still prey of problems of Malnutrition, illiteracy, unemployment and lack of basic infrastructure like Playgrounds, Schools, Hospitals, and Sewage etc.

The project work started with the visit of Ideal village. In south Gujarat, Baben village is an example of the best Ideal village by having all infrastructure facilities which might not be available in many small towns of Gujarat. Then by referring the case study of Smart village. We came to know what types of minimum facilities are required for Rurbanisation of village.

Next we visited Ten village by keeping in mind the Ideal village concept of Baben. After having discussion with Surpanch, village Visit and data collection, we came to the decision that many facilities and basic utilities were not available in Ten village.

With help Gap Analysis we conclude that some of different Smart Village facilities are required as basic or primary level which still lack in village. So according to Gap Analysis of Ten village, we observed condition of existing infrastructure remains unsatisfied in some areas as it needs proper maintenance and re-designing of different structure.

According to UDPFI norms, lacking in basic amenities and Smart Amenities can be provided as:

- Post Office
- Primary Health Centre
- Public Library
- Agriculture Research Centre
- Internal street road
- Village Entrance gate

While doing design of structures, we have visited the site where the structure is to be built. We have used reference books for structural design, IS codes for standard checks. We have used SOR (Schedule of Rates of Navsari District) for estimation and costing, and we have used Auto Cad software for Drawing

By constructing the required amenities to village, a step for the development village can be possible. So ultimately migration to the city from village will be reduced and livelihood of villagers will increase, so healthy and prosperous life can be possible for the villagers. Ultimate growth of village and people is base step for the development of country.

Vishwakarma Yojana aims to procure development in villages without losing essence. After all the way to uplift our country is through developing the villages. The scheme would reinforce-wellbeing of people and further quality of living standard.

Chapter 11:

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Chapter 12:

Annexure

12.1 Scanned copy (for Part-I), Original (for–Part-II) Ideal Village Survey Form:

Techno Economic Survey

For

Vishwakarma Yojana: Phase VIII

IDEAL VILLAGE SURVEY

An approach towards Rurbanisation for Village Development

Name of Village:	Balen
Name of Taluka:	Bardoli
Name of District:	Surat
Name of Institute:	Bhagwan Mahavir Surat
Nodal Officer Name & Contact Detail:	
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	F. B. Patel. સરપંચ ગ્રામ પંચાયત બાલેન તા. બારડોલી, જી. સુરત
Date of Survey:	

1. Demographical Detail:

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	8377	4576	3801	1599
ii)	2011	15610	8642	6968	5278

2. Geographical Detail:

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	466 hec
	Forest Area (In hect.)	-
	Agricultural Land Area (In hect.)	282 hec
	Residential Area (In hect.)	140 hec
	Other Area (In hect.)	41 hec
	Water bodies	-
	Nearest Town with Distance:	Bardoli 1 Km

3. **Occupational Details:**

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

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	NO Borewell Yes	- - Yes	- - -	- - -
	Suggestions if any:				
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	40000	80000	
	Underground Sump	Capacity:	-	-	
	Suggestions if any:				
C.	**Drainage Facility**				
	Available (Yes/ No)	Yes	Yes		Water ground
	Suggestions if any:				
D.	**Type of Drainage**				
	Closed/ Open				
	If Open than Pucca / Kutchcha				
	Whether drain water is discharged directly in to Water bodies/ Sewer plants				
	Suggestions if any:				

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E.	Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM				
	Village approach road	All weather			All Weather
	Main road	Yes			All weather
	Internal streets	Yes			All weather
	Nearest NH/SH/MDR/ODR Dist. in kms.	Yes			NH53 5Km
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	Yes	–	–	1Km Bardoli
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes	–	–	Balkan
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Yes	–	–	Auto / Private Vechile
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Yes	–	–	Govt 24h DGVCL
	Power supply for Domestic Use	Yes	–	–	24 hrs
	Power supply for Agricultural Use	Yes	–	–	Fixed hours
	Power supply for Commercial Use	Yes	–	–	24 hrs
	Road/ Street Lights	Yes	–	–	–

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	Electrification in Government Buildings/ Schools/ Hospitals	yes			
	Renewable Energy Source Facilities (Y/ N)	No			
	LED Facilities	yes			

Suggestions if any:

H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	yes			8 Nos
	Location Condition	good			
	Community Toilet (With bath/ without bath facilities)	yes			with Bath
	Solid & liquid waste Disposal system available	No			
	Any facility for Waste collection from road	yes			By Vehicle

Suggestions if any:

I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	yes	–	–	River, Borwell & Canal

Suggestions if any:

J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Pucca	–	–	Mixed near Kacha

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks

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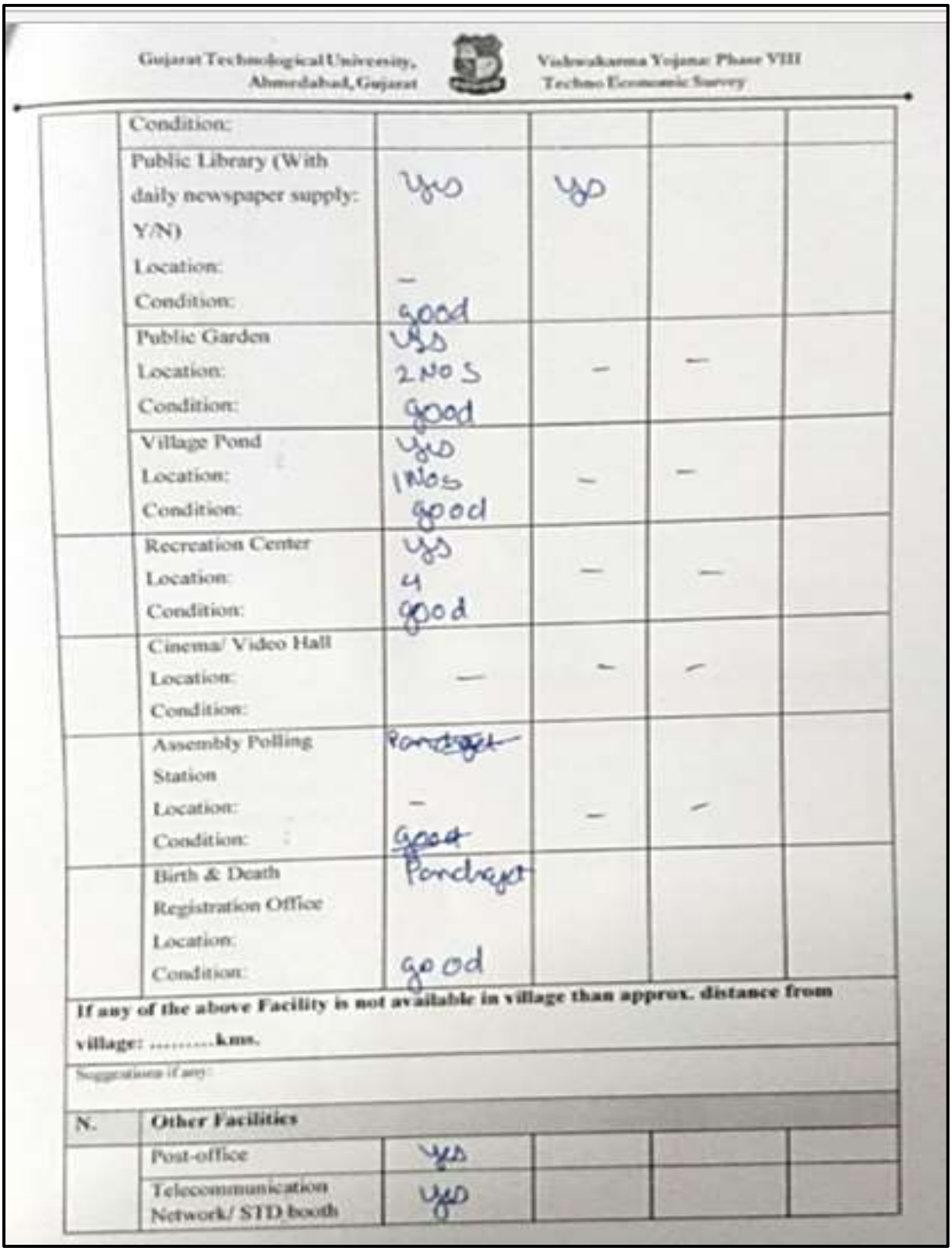
K.	Health Facilities:				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	Yes			Sub Centre PHC
	Private Clinic/Private Hospital/ Nursing Home	Yes			Private Owned Hospital
	If any of the above Facility is not available in village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

L.	Education Facilities:				
	Aaganwadi/ Play group	Yes	Yes		8Nos
	Primary School	Yes	Yes		1
	Secondary school	Yes	Yes		1
	Higher sec. School	Yes	Yes		1
	ITI college/ vocational Training Center				
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	Yes	Yes		1 Engineering
	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	Yes	–	–



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	Condition:				
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	Yes – good	Yes		
	Public Garden Location: Condition:	Yes 2 NOS good	–	–	
	Village Pond Location: Condition:	Yes 1 NOS good	–	–	
	Recreation Center Location: Condition:	Yes 4 good	–	–	
	Cinema/ Video Hall Location: Condition:	–	–	–	
	Assembly Polling Station Location: Condition:	Panchayat – Good	–	–	
	Birth & Death Registration Office Location: Condition:	Panchayat good			

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

Suggestions if any:

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

	General Market	Small	Yes		
	Shops (Public Distribution System)	–	–		
	Panchayat Building	Yes	1No.S		Good
	Pharmacy/Medical Shop	Yes	2-3		good
	Bank & ATM Facility	Yes	3-4		Good
	Agriculture Co-operative Society	Yes	NoS		good
	Milk Co-operative Soc.	–			
	Small Scale Industries	–			
	Internet Cafes/ Common Service Center/Wi Fi	–			
	Other Facility	No			
Suggestions if any:					

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

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

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	Yes

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

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)		
2.	Additional Information/ Requirement	All facilities available	

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

12.2 Scanned copy (for Part-I), Original (for–Part-II) Smart Village Survey details:

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

An approach towards "Rurbanisation for Village Development"

Name of District:	Surat
Name of Taluka:	Palsana
Name of Village:	Ena
Name of Institute:	Bhagwan Mahavir College
Nodal Officer Name & Contact Detail:	
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Kalpana S. Chaudary (Talati) તલાટી કમ મંત્રી ઓના-ગોદીયા ગૃપ ગ્રામ પંચાયત તા. પલસાણા, જિ. સુરત
Date of Survey:	

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	3777	1895	1882	888

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	628.93 hect.
2.	Forest Area (In hect.)	7.6 hect.
3.	Agricultural Land Area (In hect.)	16.4 hect.
4.	Residential Area (In hect.)	585.4 hect.
5.	Other Area (In hect.)	12.7 hect.
6.	Distance to the nearest railway station (in kilometers):	Bardoli 10 km

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7.	Name of Nearest Town with Distance:	Bardoli 7.21km
8.	Distance to the nearest bus station (in kilometers):	Bardoli 8km
9.	Whether village is connected to all road for the any facility or town or City?	NH 53

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1. farming 2. Job 3. Auto-Rikshaw Driver
Major crops grown in the village:	1. Sugar Cane Crop 2. Banana plant 3. Mango Tree

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	Yes			
	Public Tap/Standpipe	Yes			
	Tube Well Or Bore Well	Yes			
2.	**DUG WELL**				
	Protected Well				
	Un Protected Well	Yes			
3.	**WATER FROM SPRING**				
	Protected Spring	Yes			
	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	No			
	Other(Specify)**Lake/ Pond**	Yes			

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Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	✓		45000
	Underground Sump	Capacity:			
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET	Yes	✓		
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Yes	✓		
	Main road	Yes	✓		
	Internal streets	Yes	✓		
	Nearest NH/SH/MDR/ODR Dist. in kms.	Yes	✓		
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No	✓		
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes	✓		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto, Private vehicle	✓		
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Yes	✓		

3

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

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V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	Yes	✓		
	Sub-Centre	Yes	✓		
	PHC	Yes	✓		
	BLOCK PHC	Yes	✓		
	CHC/RH				
	District/ Govt. Hospital	Yes	✓		
	Govt. Dispensary				
	Private Clinic				
	Private Hospital/ Nursing Home				
	AYUSH Health Facility				
	sonography /ultrasound facility				
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	Yes -3			
	Primary School	Yes -2			
	Secondary school	Yes -1	✓		
	Higher sec. School	Yes -1	✓		
	ITI college/ vocational Training Center	No			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	No			
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				

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Suggestions if any:

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

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

Suggestions if any:

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

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

Suggestions if any:

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

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VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	Solar Energy Source			
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	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	✓		
2.	Recent Projects going on for Development of Village	Yes			
3.	Any NGO working for village development	NO			
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)	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		
2.	Additional Information/ Requirement		
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	cleaning daily fogging done in month	

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

12.3 Scanned copy (for Part-I), Original (for–Part-II) Allocated Village Survey Form:

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Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

Name of District:	Surat
Name of Taluka:	Bardoli
Name of Village:	Ten
Name of Institute:	Bhagwan mahavir College
Nodal Officer Name & Contact Detail:	
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Rinaben Devendra chavdry
Date of Survey:	12/10/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	6251	3252	2999	1394

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	596.1 hect.
2.	Forest Area (In hect.)	0.50 hect.
3.	Agricultural Land Area (In hect.)	481 hect.
4.	Residential Area (In hect.)	114.6 hect.
5.	Other Area (In hect.)	-
6.	Distance to the nearest railway station (in kilometers):	2.6 km (Bardoli Railway st.)

7.	Name of Nearest Town with Distance:	Navsari : 28 km, Surat : 33 km Vyara : 35 km
8.	Distance to the nearest bus station (in kilometers):	2.2 km (Central Bus Station)
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. Fishery 3. Sugar Cane factory workers

Major crops grown in the village:	1. Sugar Cane 2. Wheat 3. Vegetables

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
1.	**PIPED WATER**				
	Piped Into Dwelling	835 NOS.	Adequate		more required.
	Piped To Yard Plot				
	Public Tap Standpipe	6 NOS.	Adequate		
	Tube Well Or Bore Well	12 NOS.	Adequate		
2.	**DUG WELL**			Inadequate.	
	Protected Well				
	Un Protected Well				
3.	**WATER FROM SPRING**			Inadequate	
	Protected Spring				
	Unprotected Spring				
	Rainwater				
	Tanker Truck				
	Cart With Small Tank				
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/**	River			
	Irrigation Channel				
	Bottled Water				
	Hand Pump	6 NOS.		Inadequate.	

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	Other(Specify)Lake/ Pond	1 NOS.			Renovation requirement
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: 50,000.			Repair & maintenance required.
	Underground Sump	Capacity:		Inadequate	
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1			Inadequate	
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	WBM		Inadequate	Repair & maintenance requirement
	Main road	WBM	Adequate		
	Internal streets	CC		Inadequate	
	Nearest NH/SH/MDR/ODR Dist. in kms.	500m WBM			
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	Bardoli Rly station 2.6km	Adequate		
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Bardoli Bus station 2.2 km.			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto, Private Vehicles etc.	Adequate		
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	DGVCL	Adequate		

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	Power supply for Domestic Use	24hrs Daily	Adequate		
	Power supply for Agricultural Use	8hrs daily	Adequate		
	Power supply for Commercial Use	24hrs daily	Adequate		
	Road/ Street Lights	Night time.			
	Electrification in Government Buildings/ Schools/ Hospitals	24hrs	Adequate		
	Renewable Energy Source Facilities (Y/ N)	—			Available at Personal requirements
	LED Facilities	24 hrs			

Suggestions if any:

G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.			Inadequate	Available in all houses
	Location Condition				
	Community Toilet (With bath/ without bath facilities)		Adequate		
	Solid & liquid waste Disposal system available	Door to Door waste collection	Adequate		work by gram panchayat
	Any facility for Waste collection from road	daily road cleaning	Adequate		

Suggestions if any:

H.	**Main Source of Irrigation Facility:**				
	✓ TANK/POND	1 NOS.	Adequate		
	STREAM/RIVER				
	✓ CANAL		Adequate		
	WELL				
	✓ TUBE WELL	12 NOS.	Adequate		
	OTHER (SPECIFY)				

Suggestions if any:

I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	40% kutchha 60% Pucca			Required to all Pucca house.

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V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)			Inadequate.	
✓	Sub-Centre	1	Adequate.	Inadequate	
	PHC				
✓	BLOCK PHC	1	Adequate		Near gram panchayat
	CHC/RH				
	District/ Govt. Hospital	Near Bardoli			
	Govt. Dispensary				
	Private Clinic				
✓	Private Hospital/	2	Adequate.		
	Nursing Home			Inadequate	
	AYUSH Health Facility			Inadequate.	
	sonography /ultrasound facility				
	If any of the above Facility is not available in village than approx. distance from village: …2…kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	6 NOS.	Adequate		Renovation required
	Primary School	2 NOS	Adequate		Renovation required
	Secondary school	1 NOS	Adequate		maintanance required
	Higher sec. School	1 NOS	Adequate		
	ITI college/ vocational Training Center	1 NOS.	Adequate.		Good condition.
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities			Inadequate.	

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If any of the above Facility is not available in village than approx. distance from village: ..2....kms.

Suggestions if any:

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

If any of the above Facility is not available in village than approx. distance from village: ..2....kms.

Suggestions if any:

M.	Other Facilities	Condition	Location	Available (YES)	Available (NO)
	Post-office		2 km		NO
	Telecommunication Network/ STD booth				NO
	General Market	Good		Yes.	
	Shops (Public Distribution System)	Good		Yes.	
	Panchayat Building	Good		Yes	
	Pharmacy/Medical Shop			Yes	
	Bank & ATM Facility			Yes.	
	Agriculture Co-operative Society				NO
	Milk Co-operative Soc.			~~Yes~~	NO
	Small Scale Industries	Good		Yes	
	Internet Cafes/ Common Service Center/Wi Fi				NO
	Youth Club				NO
	Mahila Mandal			Yes	

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

Suggestions if any:

N.	Other Facilities	Condition		Available (YES)	Available (NO)
	1. Have these programme implemented the village?				
	2. Are there any beneficiaries in the village from the following programme?				
✓	3. Janani Suraksha Yojana	Working			
	4. Kishori Shakti Yojana	Working	primary school	yes.	
✓	5. Balika Samriddhi Yojana	Good			
✓	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	Working			
✓	11. Sanitation Programme (SP)				
	12. Rajiv Gandhi National Drinking Water Mission				
✓	13. Swarnjayanti Gram Swarozgar Yojana	Working			
	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)	Working			
✓	19. Indira Awas Yaojna (IAY)	Working			
	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			Inadequate.	Req.
2.	Bio-Gas Plant Solar Street Lights, Rain Water Harvesting System			Inadequate Inadequate Inadequate	Req.
3.	Any Other				

VII. DATA COLLECTION FROM VILLAGE

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

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other	maintenance Required... Newly Construct	In good condition
2.	Additional Information/ Requirement		
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	Daily cleaning under by gram Panchayat	

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:
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Email ID: rurban@gtu.edu.in

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12.4. Gap Analysis:

VILLAGE GAP Analysis				
Facilities	**Planning Commission/UDPFI Norms**	**Village Name:**	**Ten, Bardoli**	
		Population:		**6251**
		Existing	**Required as per Norms**	**Gap**
Social Infrastructure Facilities				
Education				
Anganwadi	Each or Per 2500 population	6	4	**2**
Primary School	Each Per 2500 population	2	4	**-2**
Secondary School	Per 7,500 population	1	1	**0**
Higher Secondary School	Per 15,000 Population	1	1	**0**
College	Per 125,000 Population	0	0	**0**
Tech. Training Institute	Per 100000 Population	1	0	**1**
Agriculture Research Centre	Per 100000 Population	0	1	**-1**
Health Facility		**0**		
Govt/Panchyat Dispensary or Sub PHC or Health Centre	Each Village	0	1	**-1**
PHC & CHC	Per 20,000 population	0	1	**-1**
Child Welfare and Maternity Home	Per 10,000 population	0	0	**0**
Hospital	Per 100000 Population	0	0	**0**
Public Latrines	1 for 50 families (if toilet is not there in home, especially for slum pockets & kutcha house)	2	2	**0**
Physical Infrastructure Facilities				
Transportation		**Adequate**	**Inadequate**	
Pucca Village Approach Road	Each village	yes		
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)	yes		

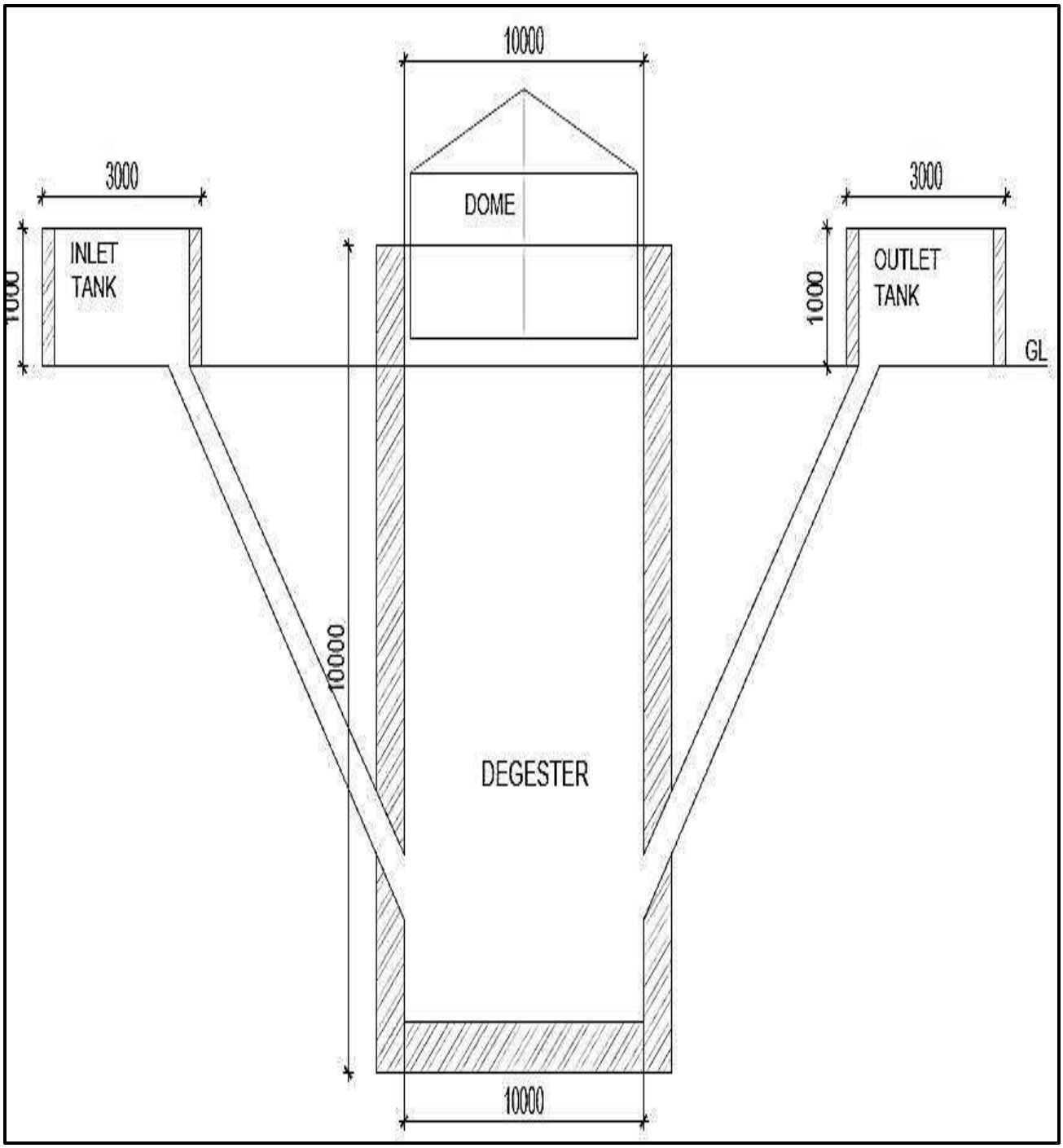
Drinking Water (Minimum 70 lpcd)		**Adequate**	**Inadequate**	
Over Head Tank	1/3 of Total Demand	**2 - Adequate**	-	
U/G Sump	2/3 of Total Demand	-	-	
Drainage Network		**Adequate**	**Inadequate**	
open		Yes	-	
cover		Yes	-	
Waste Management System		**Adequate**	**-**	
Electricity Network		**Adequate**	**-**	
Socio- Cultural Infrastructure Facilities				
Community Hall	Per 10000 Population	0	1	**-1**
community hall cum Public Library	Per 15000 Population	0	1	**-1**
Cremation Ground	Per 20,000 population	0	0	**0**
Post Office	Per 10,000 population	0	1	**-1**
Gram Panchayat Building	Each individual/group panchayat	1	1	**0**
APMC	Per 100000 Population	0	0	**0**
Fire Station	Per 100000 Population	0	0	**0**
Public Garden	Per village	1	1	**0**
Shopping mall	Per 40,000 Population	1	0	**1**
Police post	Per 40,000Population	0	0	**0**
Electrical Design				
Electiricity Network		**Adequate / Inadequate**		
Any Smart Village Facility				
Technology				
		ESR cap	2,00,000	
		Sump cap	2,00,000	

12.5 Summary Details of all the villages designs in table form part-I and part-II:

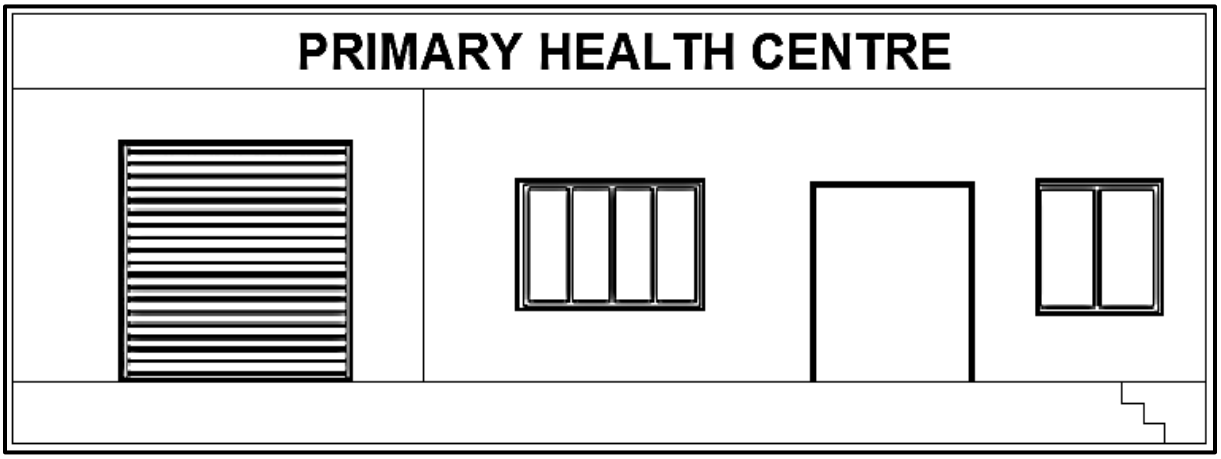
Sr. No.	Village	Discipline	DESIGN(Part-I)	DESIGN (Part-II)
1.	**Ten, Bardoli**	**Civil**	**Biogas Plant**	**Internal Street Road**
			Primary Health Center	**Community Hall**
			Post Office	**Public toilet**
			Public Library	**Overhead Water Reservoir**
			Agricultural Research center	**Aangadwadi**
			Village Entrance Gate	**ATM**
2.	Vav, Kamrej	Civil	Post Office	Bio Gas Plant
			Public Garden	Maintenance of PHC
			Water Harvesting System	Sewage Treatment Plant
			Community Hall	Library
			Skill Development Center	Road(Internal Road)
			-	-
3.	Palod, Mangrol	Civil	Bus Stand	Post office
			Garden	Rain Water Harvesting
			Library	Overhead water tank
			Community hall	Low Cost house
			Skill development center	Primary health center
			Village gate	Chabutra
4.	Madhi	Civil	Library	Maintenance Of Police Station
			Hospital	Public Garden
			River Front	Waste Water Treatment
			Fire Station	Medical Shop
			Village gate	Solid Waste Treatment
			Community Hall	Pucca Vegetable Market
5.	Nani Naroli, Mangrol	Civil	Bio Gas Plant	Tank Design For Water Harvesting
			High School	Road section
			Public toilet	Child Welfare And maternity Home
			Community Hall	Public Garden
			Bank	Common Service Center
			Village Gate	Chabutra
6.	Vankaner	Civil	Library	Lake Garden
			Skill Development Center	Science Development
			Community Hall	Cyber Café
			Aanganwadi	Child Welfare And maternity Home
			Public toilet	Overhead Tank
			Village Gate	Super Market

12.7 Drawings:

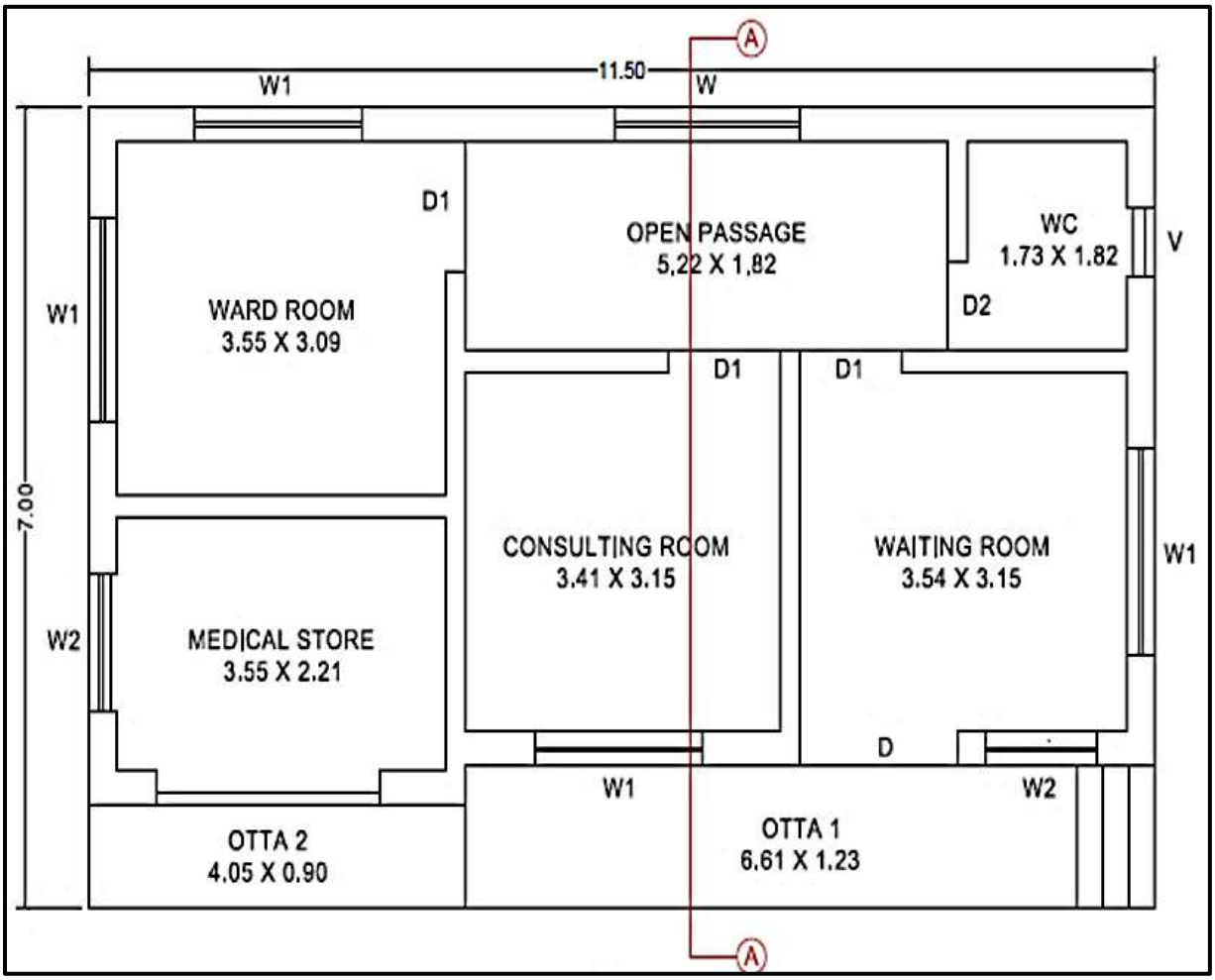
Biogas Plant:



Primary Health Center:

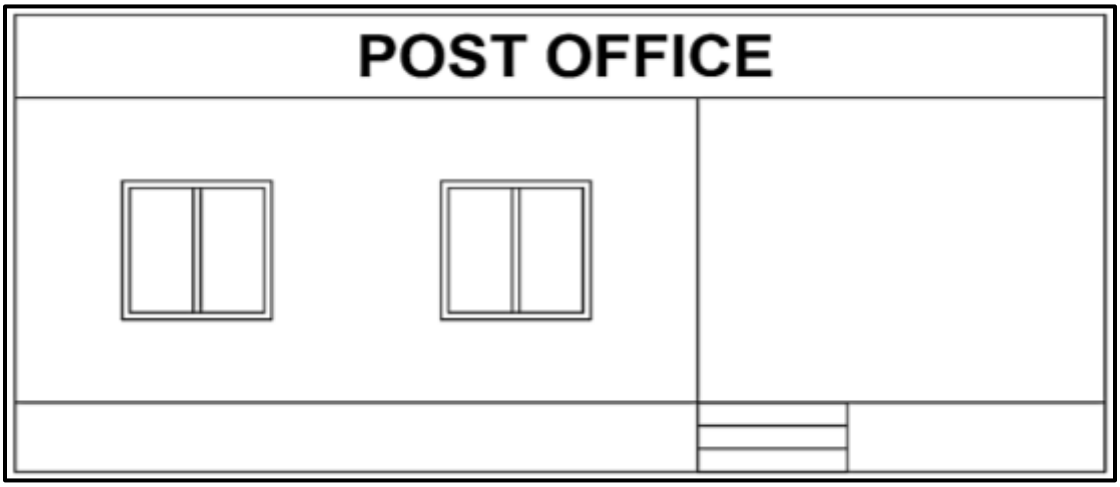


Elevation

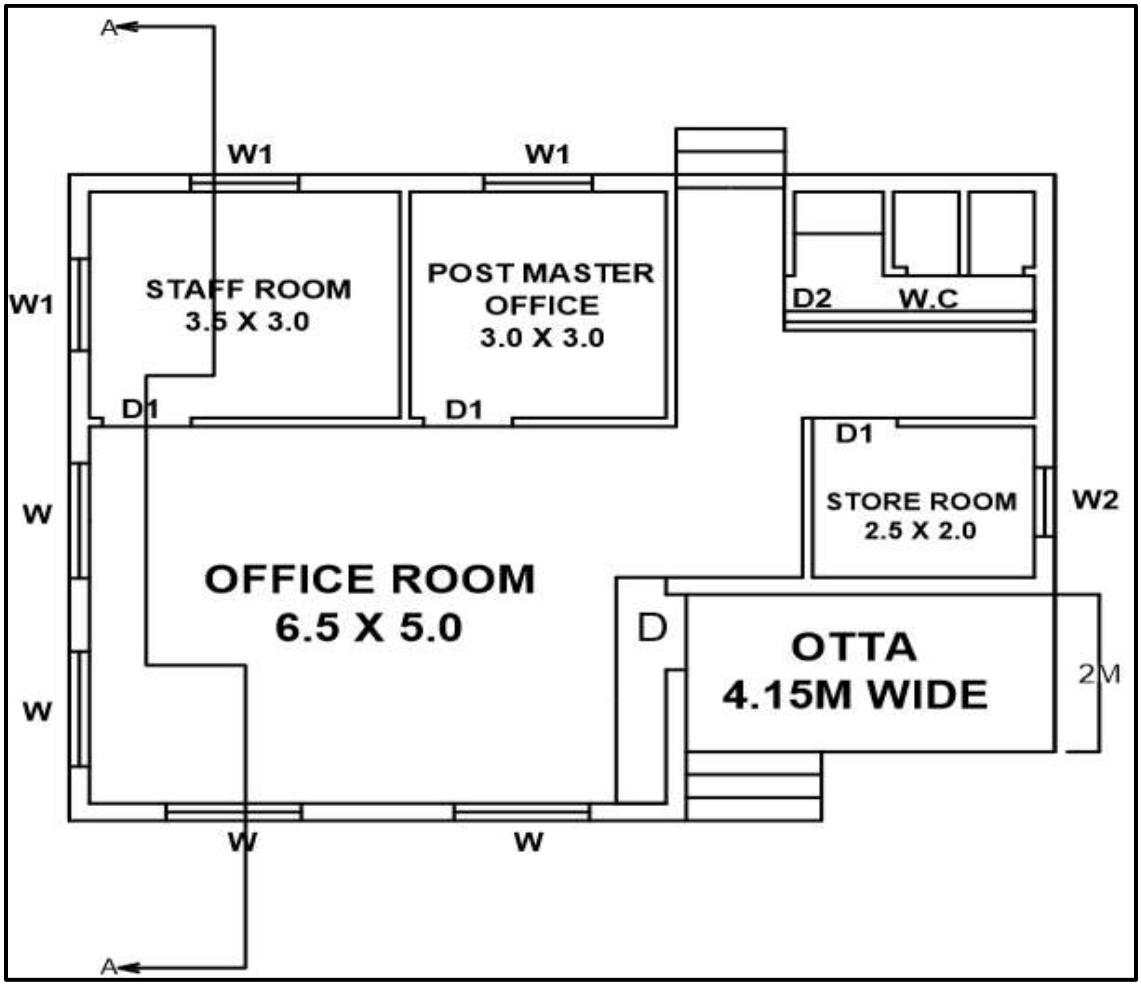


Plan

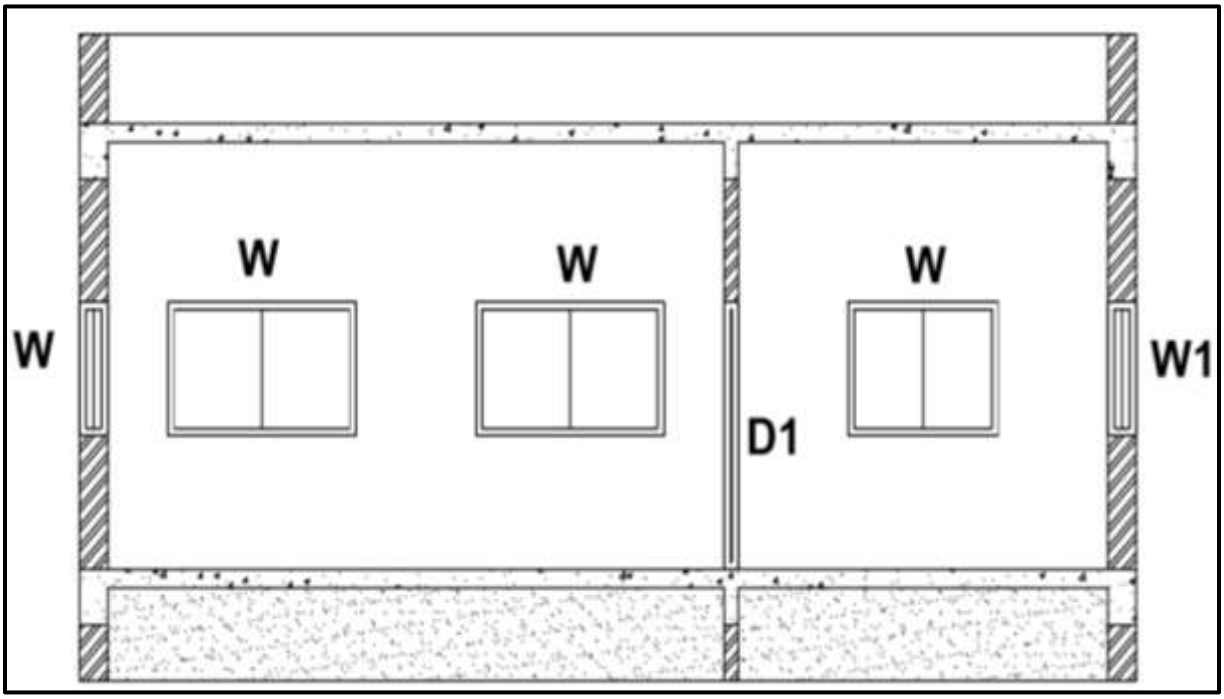
Post Office:



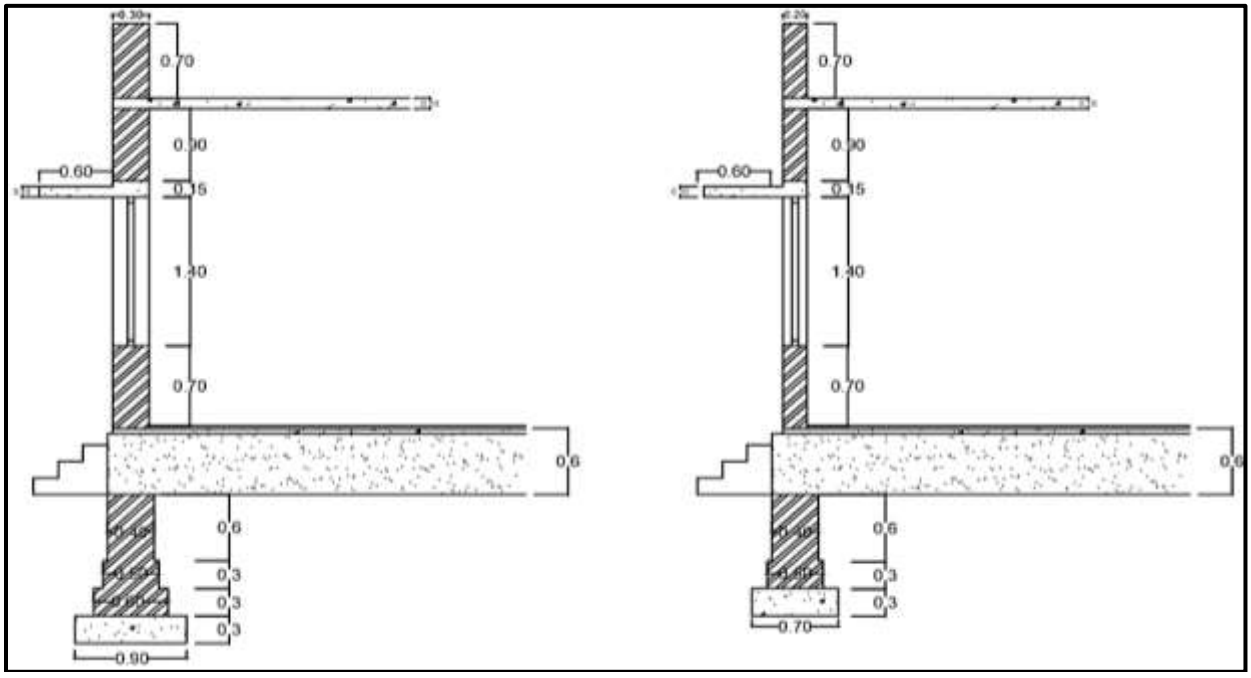
Elevation



Plan



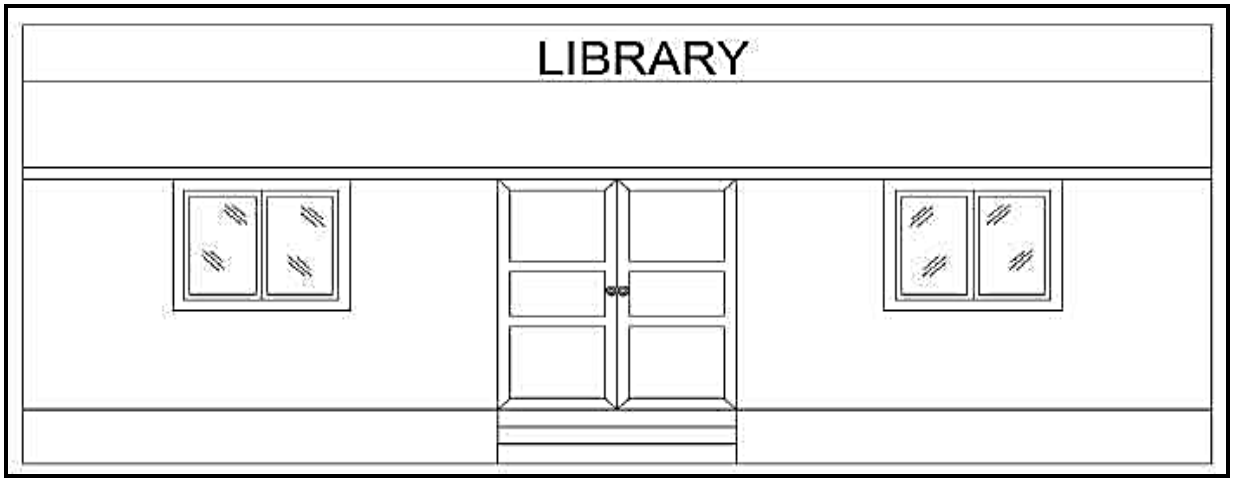
Section of Post Office A-A



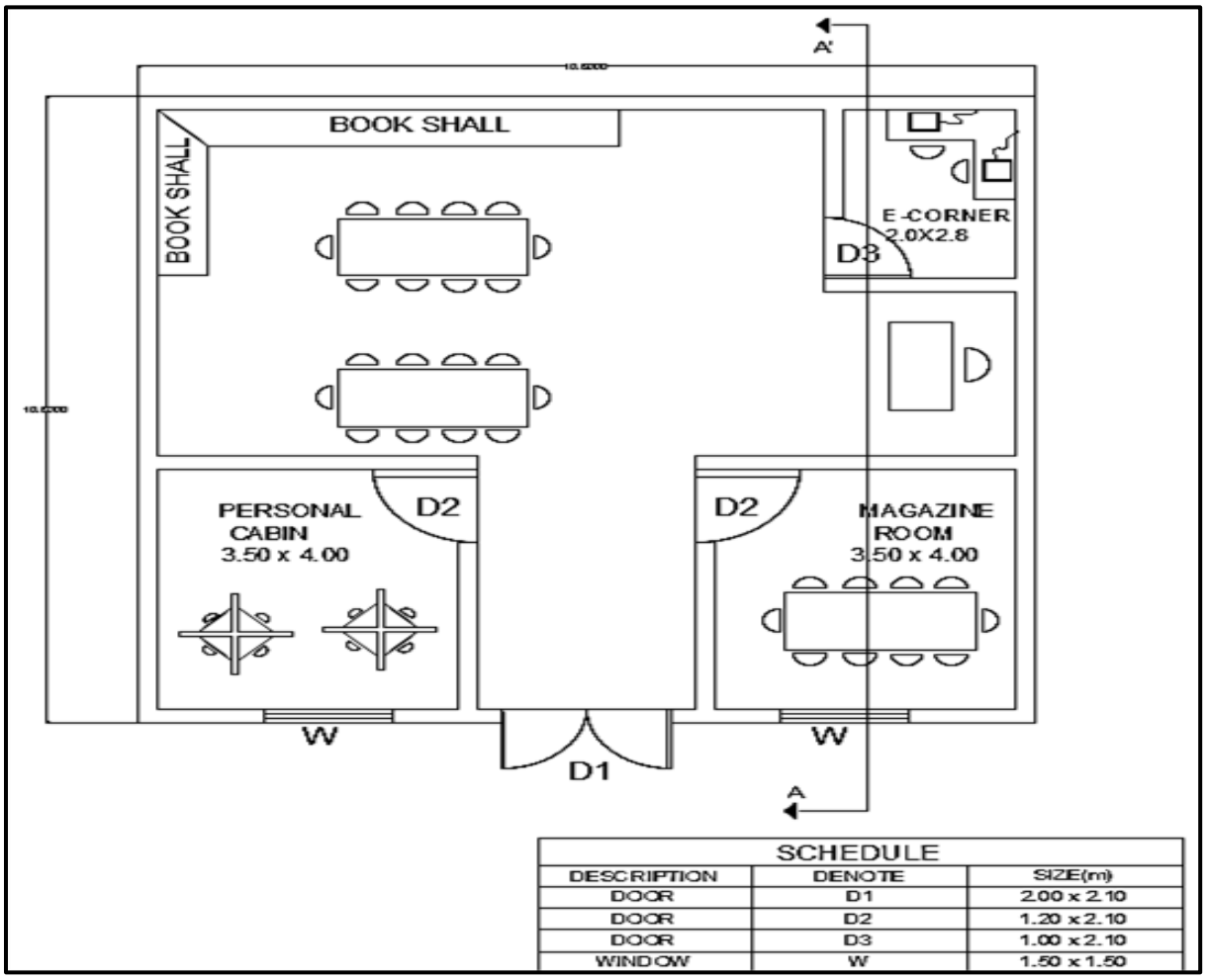
200mm Wall **300mm Wall**

Typical wall section of Post office

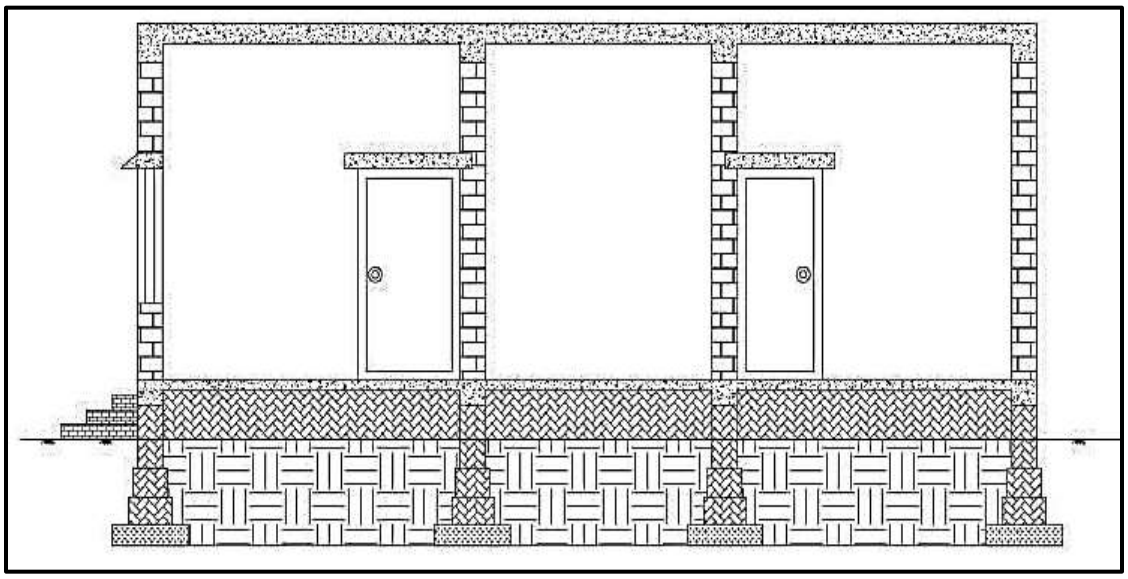
Public Library:



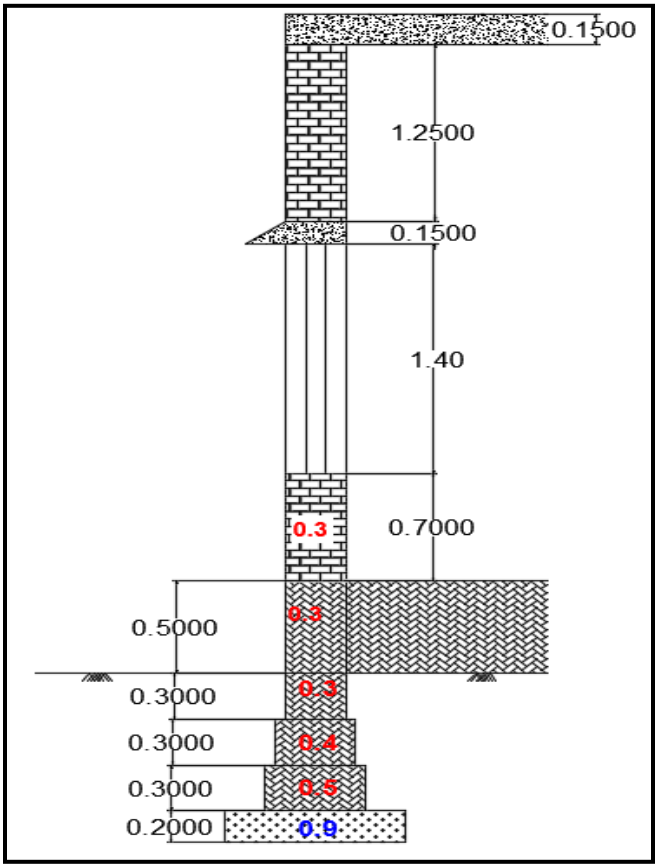
Elevation



Plan

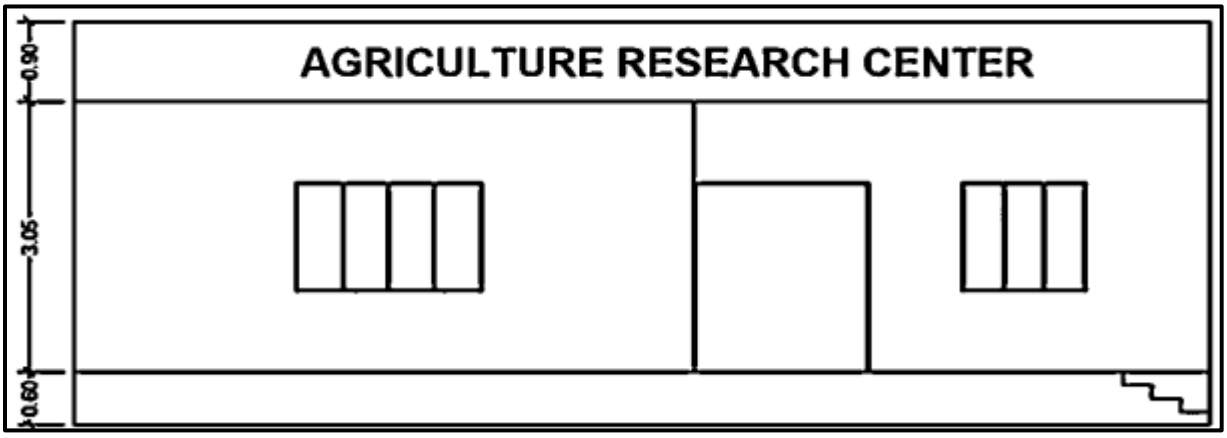


Section of library

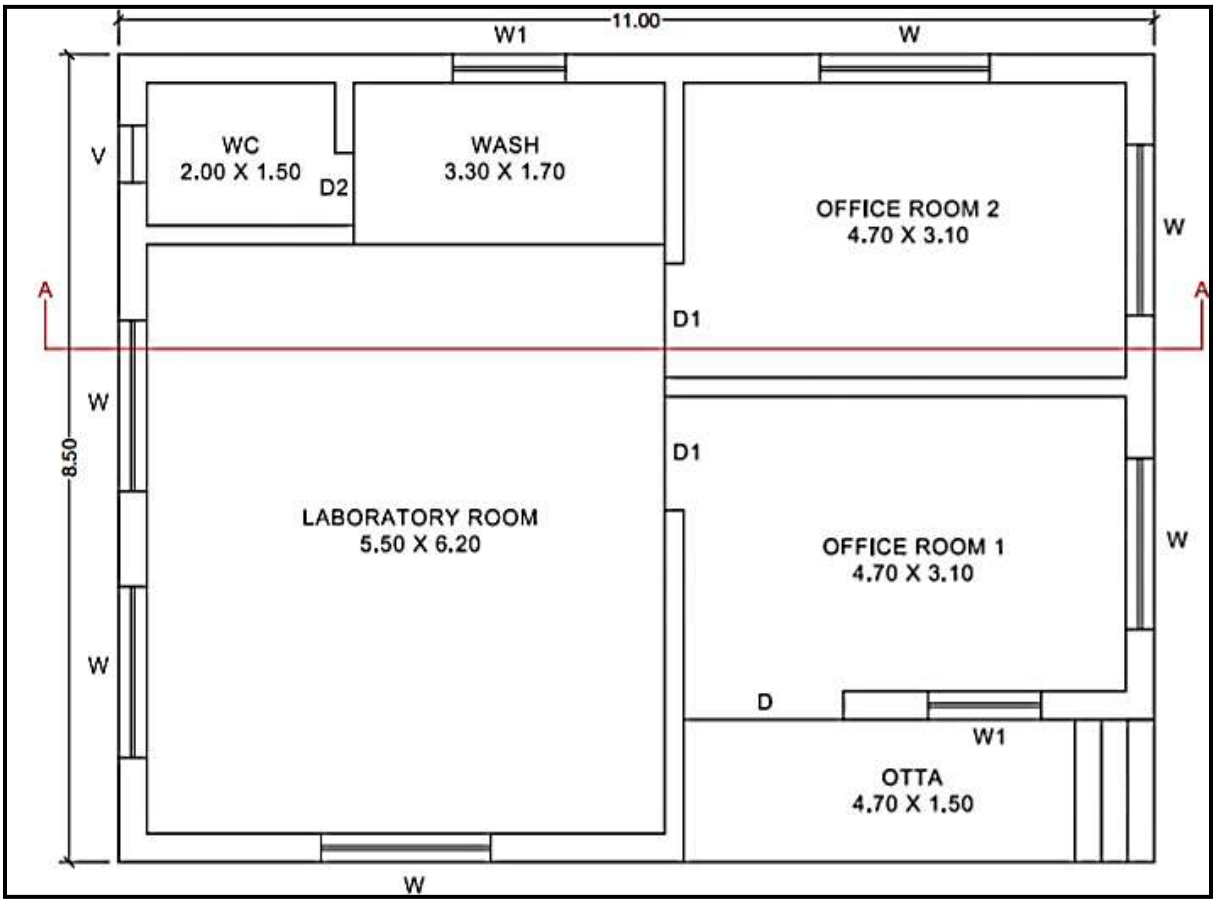


Section of footing

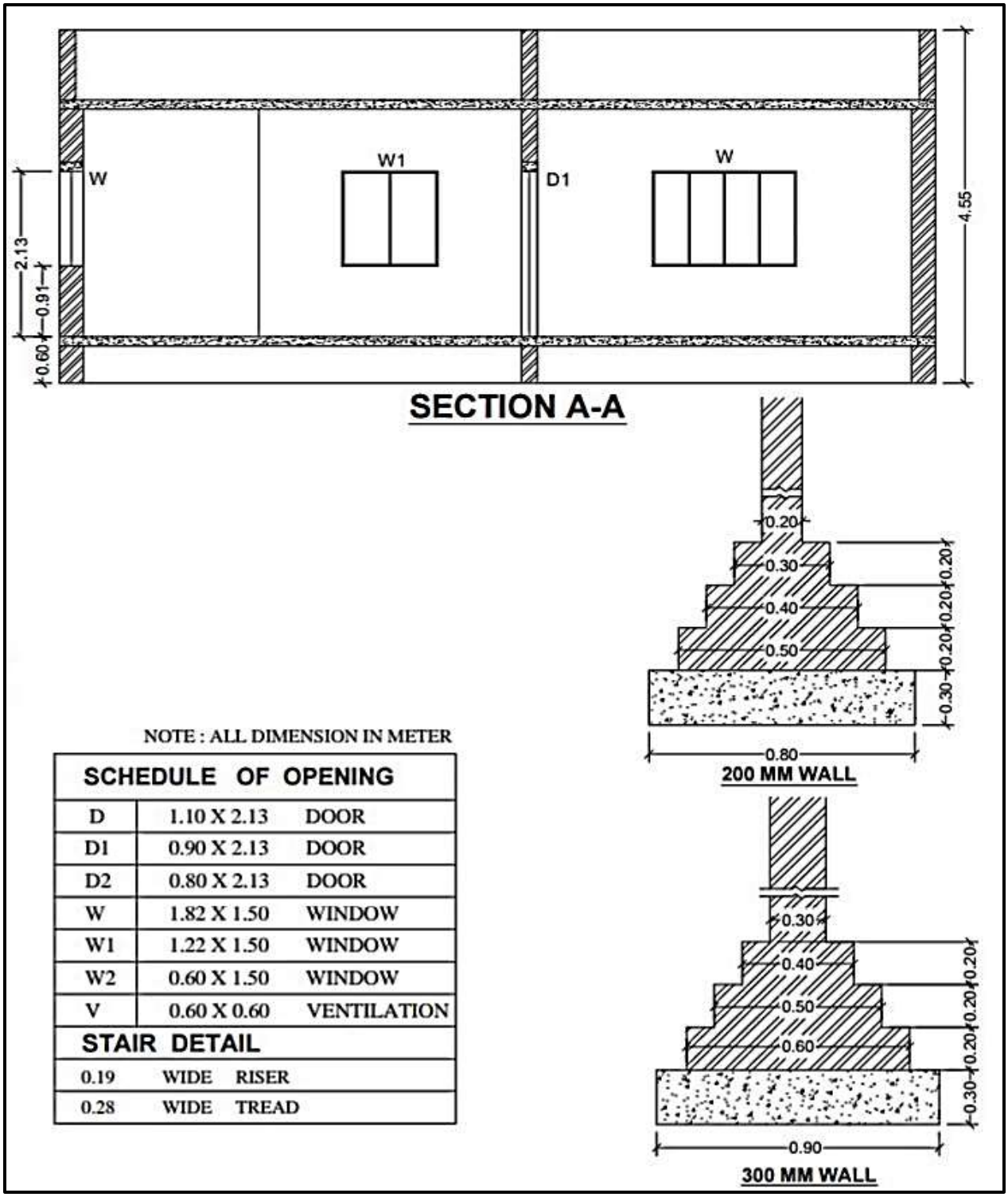
Agriculture Research Center:



Elevation



Plan

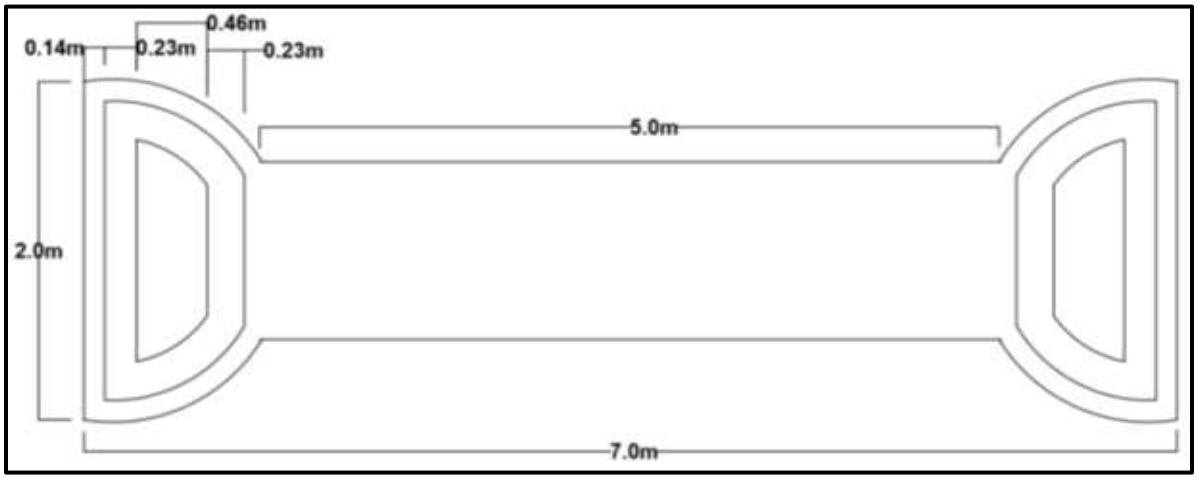


NOTE : ALL DIMENSION IN METER

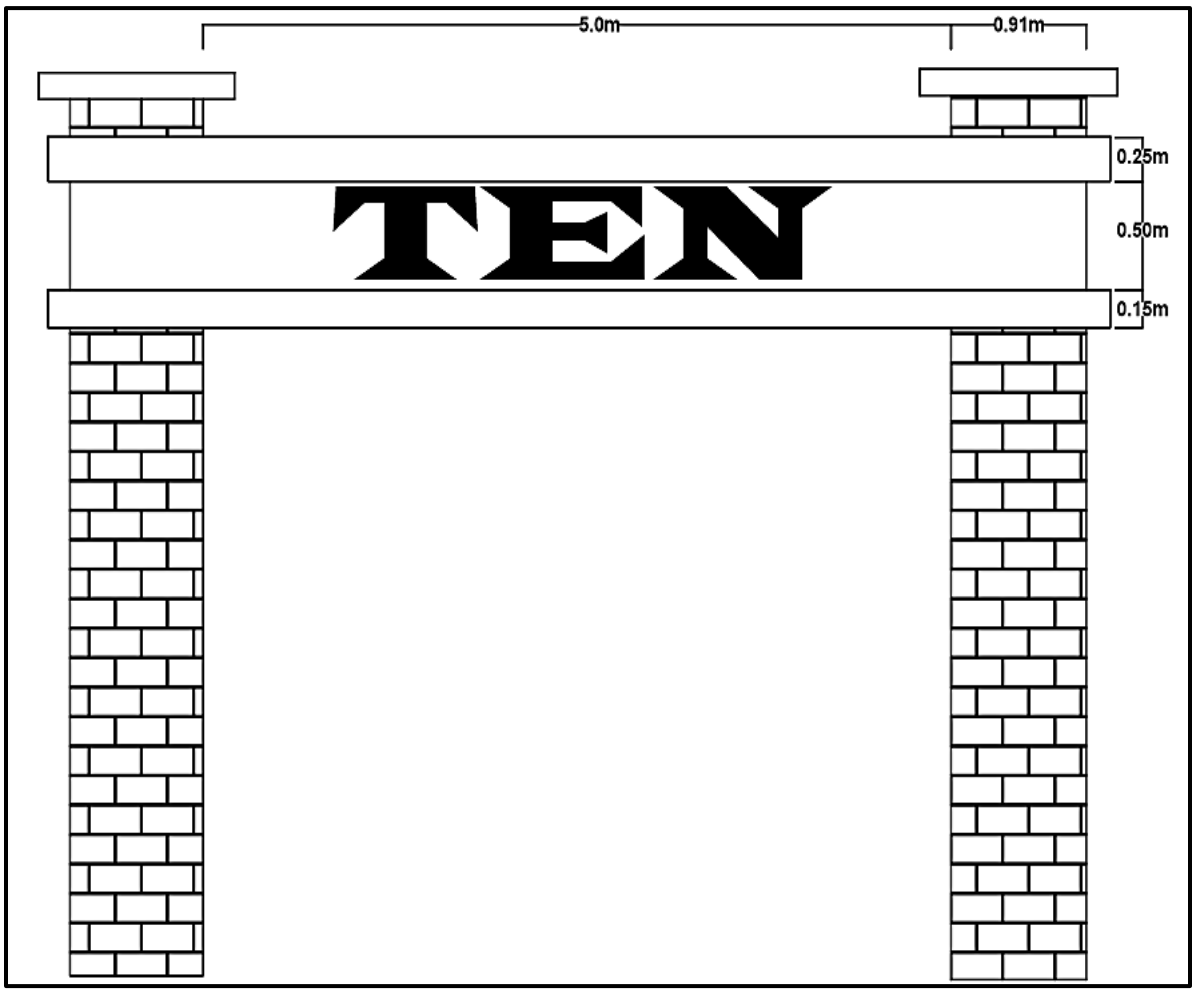
SCHEDULE OF OPENING		
D	1.10 X 2.13	DOOR
D1	0.90 X 2.13	DOOR
D2	0.80 X 2.13	DOOR
W	1.82 X 1.50	WINDOW
W1	1.22 X 1.50	WINDOW
W2	0.60 X 1.50	WINDOW
V	0.60 X 0.60	VENTILATION
STAIR DETAIL		
0.19	WIDE	RISER
0.28	WIDE	TREAD

Section of Agriculture Research Center

Village Entrance Gate:



Plan of Village Entrance Gate



Elevation of Village Entrance Gate

12.7 Summary of Good Photographs in Table format (Village visit, ideal, Smart Village or any):

Ideal Village Baben

Map of Baben

Lake city of Baben

Lack of Baben

Sugar factory

Gram panchayat

Entrance Gate of Baben

Bank of Baben

ATM of Baben

Primary School of Baben

Internal Road

Smart Village – Ena

Main gate of Ena village

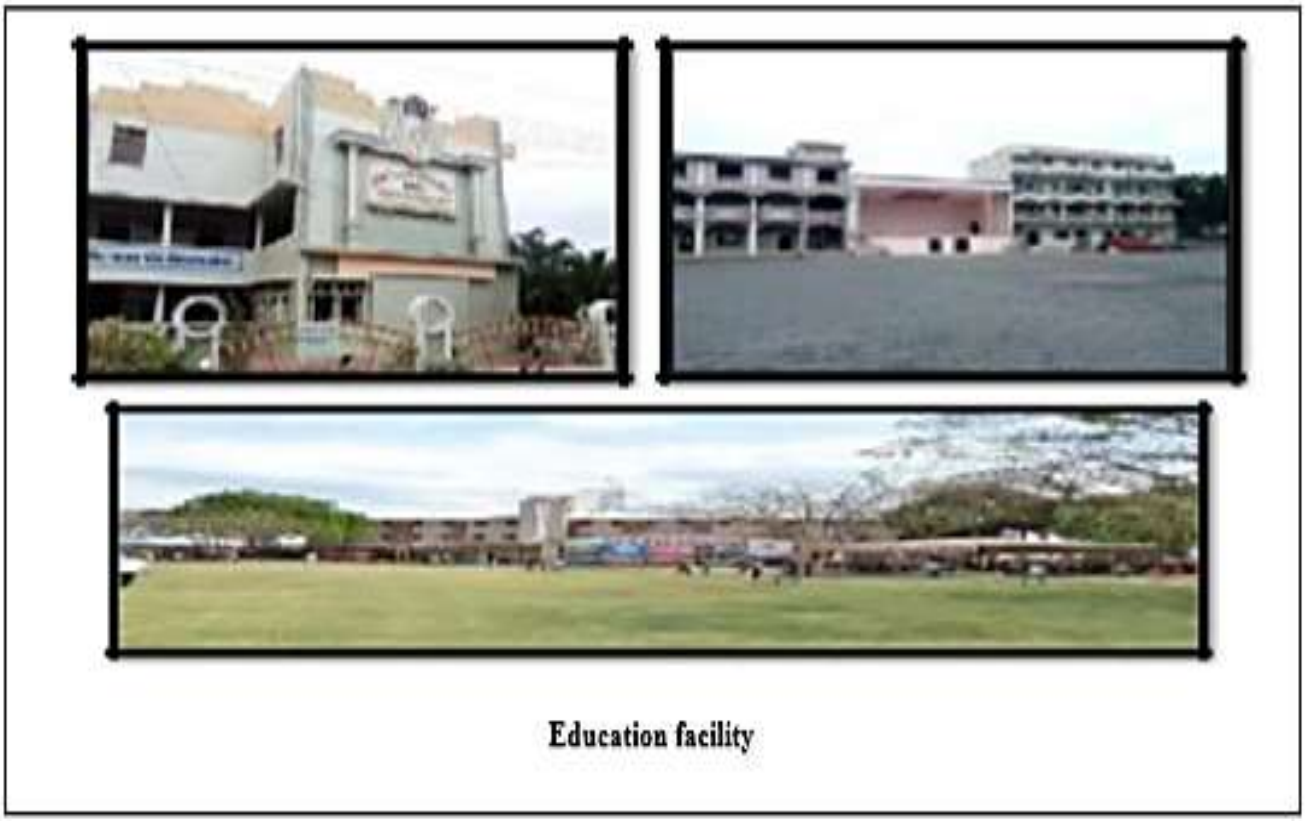
Google map of Ena village

Ena village water tank

Solid waste & road cleaning

Health care & panchayat ghar

Banking



Education facility

Allocated Village (Ten, Bardoli)

Map of Village

Overhead Water Tank

Education Facility

Public Garden

Community Hall

ITI of Ten, Bardoli

Village Pond

Shopping Mall of Ten

Open Drainage

Kuccha House

12.8 Village interaction with sarpanch Report with the photograph:

As per the Vishwakarma Yojana Phase VIII guidelines, we have to present our work in village for the effective implementation of Vishwakarma Yojana. So we presented our work to Sarpanch and Talati of village. We discuss about current problems and possible solutions of these problems.

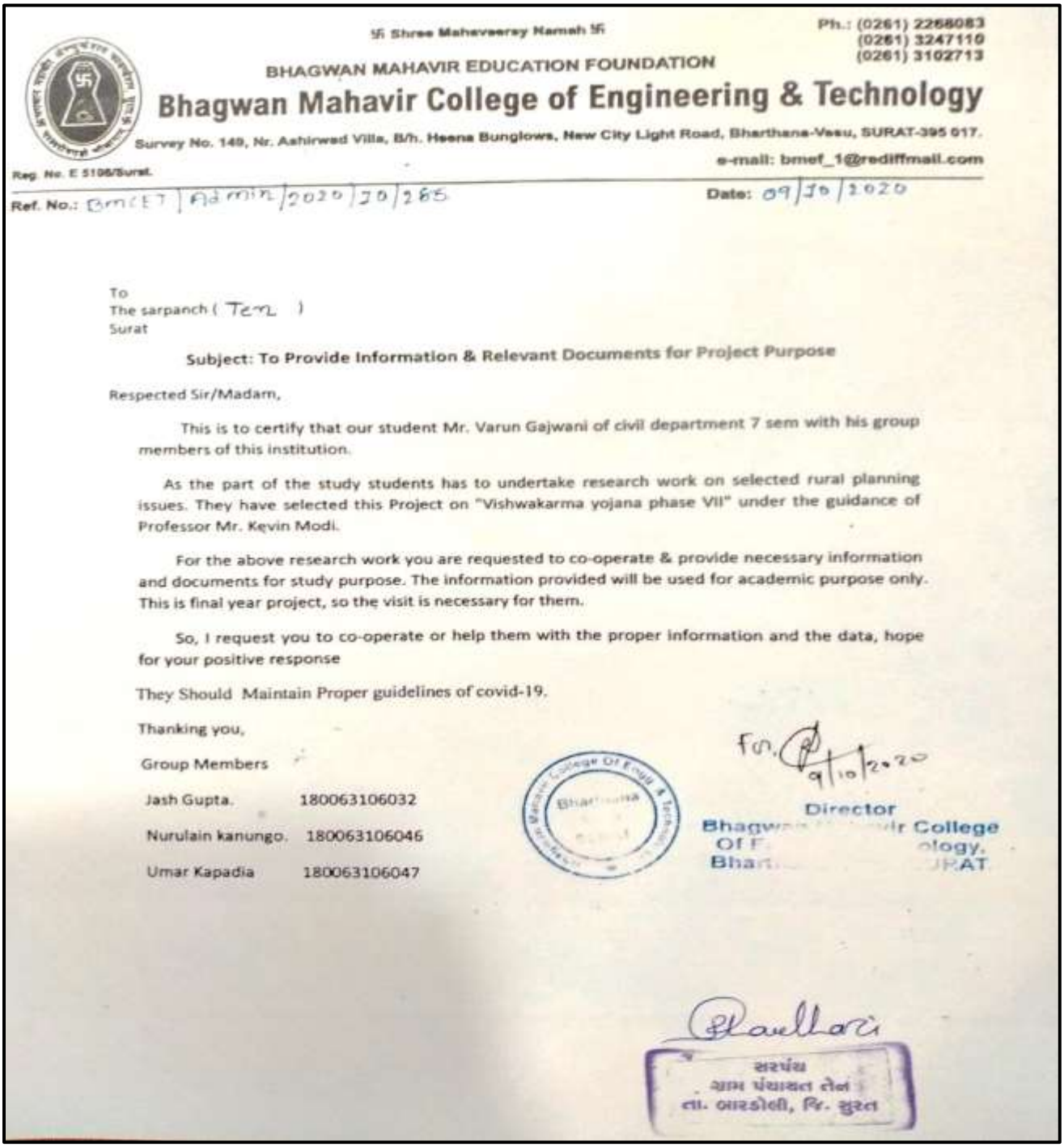
We discussed about implementation possibilities of our proposals and modification in our proposals. Also we discussed about sources of funding for implementation. Sarpanch Shri told us that main problem of village is housing and roads. Quoting Sarpanch's sentence "Villagers want basic needs like good house, road facility and education.

"We also interacted with people of village. One of them told us that there is injustice to poor people of village, as these people do not have land and they have to leave in Katchha house also government is not providing any help to them. Some of them do not have basic needs and LPG facility so they have to depend on wood". Also Government helped them to build toilets but there is not water tap connection in toilets.

To overcome these problems, we will try our best to provide possible solutions in the 2nd part of Vishwakarma Yojana Phase VIII.

Interaction with Sarpanch

12.9 Sarpanch Letter:



ॐ Shree Mahaveersy Namah ॐ

BHAGWAN MAHAVIR EDUCATION FOUNDATION

Bhagwan Mahavir College of Engineering & Technology

Survey No. 149, Nr. Aahirwad Villa, B/h. Heena Bunglows, New City Light Road, Bharthana-Vesu, SURAT-395 017.

Ph.: (0261) 2268083
(0261) 3247110
(0261) 3102713

e-mail: bmef_1@rediffmail.com

Reg. No. E 5106/Surat.

Ref. No.: BMCET/Admin/2020/10/265 Date: 09/10/2020

To
The sarpanch (Ten)
Surat

Subject: To Provide Information & Relevant Documents for Project Purpose

Respected Sir/Madam,

This is to certify that our student Mr. Varun Gajwani of civil department 7 sem with his group members of this institution.

As the part of the study students has to undertake research work on selected rural planning issues. They have selected this Project on "Vishwakarma yojana phase VII" under the guidance of Professor Mr. Kevin Modi.

For the above research work you are requested to co-operate & provide necessary information and documents for study purpose. The information provided will be used for academic purpose only. This is final year project, so the visit is necessary for them.

So, I request you to co-operate or help them with the proper information and the data, hope for your positive response

They Should Maintain Proper guidelines of covid-19.

Thanking you,

Group Members

Jash Gupta.	180063106032
Nurulain kanungo.	180063106046
Umar Kapadia	180063106047

Director
Bhagwan Mahavir College Of Engineering & Technology, Bharthana SURAT

સરપંચ
ગ્રામ પંચાયત તેન
તા. બારડોલી, જિ. સુરત

Chapter 13:

Future Designs of the Aspects

1. Civil Design 1

Design of Internal street road:

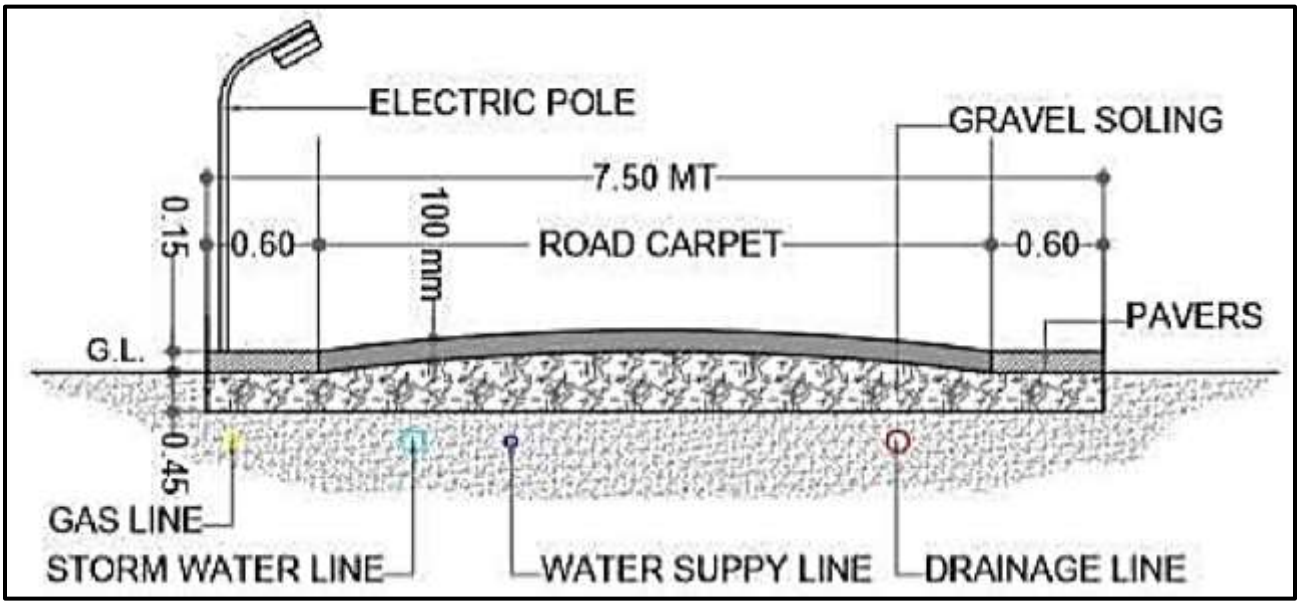


Fig 13.1 Section of 7.50m Wide Road (Single Lane)

Table 22 Measurement Sheet of Internal Street

Sr. No.	Item Description	No.	Length (m)	Width/ Breadth (m)	Height/ Depth (m)	Quantity
1	150 mm size boulders for soiling B=7.5+0.6+0.6 = 8.7 m	1	1000	8.7	0.15	**1305.00m^3**
2	50 mm size stone ballast for inner coat thickness of loose layer 8 x 1.5 = 12 cm	1	1000	8.7	0.12	**1044.00m^3**
	20 mm size stone grit for first painting coat (1.35 m3 per 100 m2)	1	1000	8.7	0.0135	**117.45m^3**

	Road tar for first painting coat (220 KG per 100 m2)	1	1000	8.7	2.2	**19140.00Kg**
3	40 mm size stone ballast for inner coat thickness of loose layer 8 x 1.5 = 12 cm	1	1000	8.7	0.12	**1044.00m^3**
	12 mm size stone grit for first painting coat (0.75 m3 per 100 m2)	1	1000	8.7	0.075	**652.50m^3**
	Road tar for first painting coat (120 KG per 100 m2)	1	1000	8.7	0.12	**1044.00Kg**

Table 23 Abstract Sheet of Internal Street

Sr. no	Item Description	QTY	Rate	Per	Amount (Rs.)
1	150 mm size boulders for soiling	1305.0 CUM	100	**m^3**	**130500**
2	50 mm size stone ballast for inner coat	50.0 CUM	2700	**m^3**	**1044**
	20 mm size stone grit for first painting coat	49.1 CUM	3500	**m^3**	**117.45**
	road tar for first painting coat	212.5 SQ.M	150	**TON**	**19140**
3	40 mm size stone ballast for inner coat	126.0 SQ.M	150	**m^3**	**1044**
	12 mm size stone grit for first painting coat	150.0 SQ.M	5	**m^3**	**625.5**
	road tar for first painting coat	43.0 SQ.M	5	**TON**	**1044**
			Total Rs.		**153514.95**
		Add 1.5% Water Charge			**2303**
		Add 10% con. Charge			**1535.1495**
		Total Estimate Cost in Rs.			**1,57,353**

2. Civil Design 2

Community Hall:

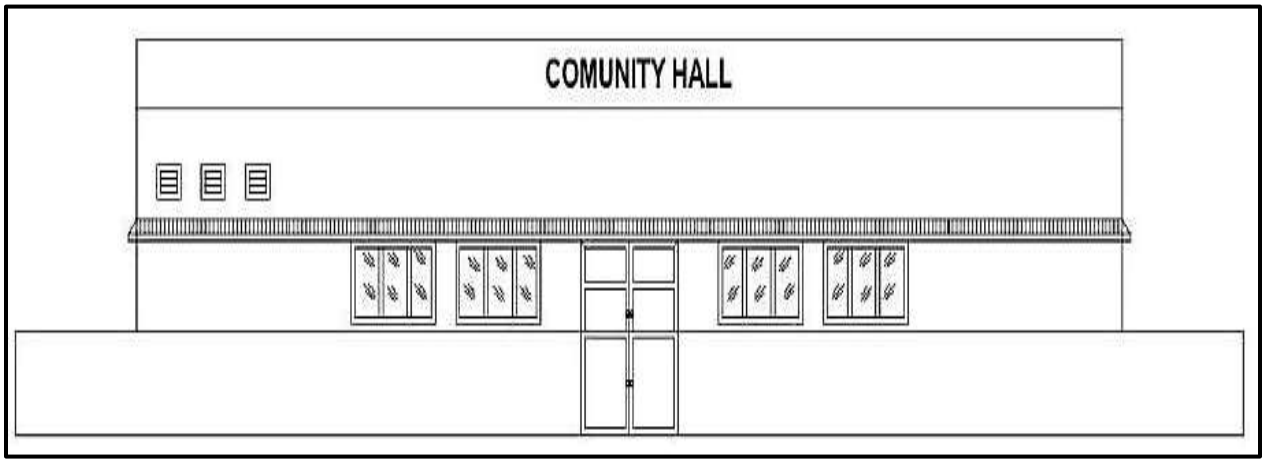


Fig 13.2 Elevation of Community Hall

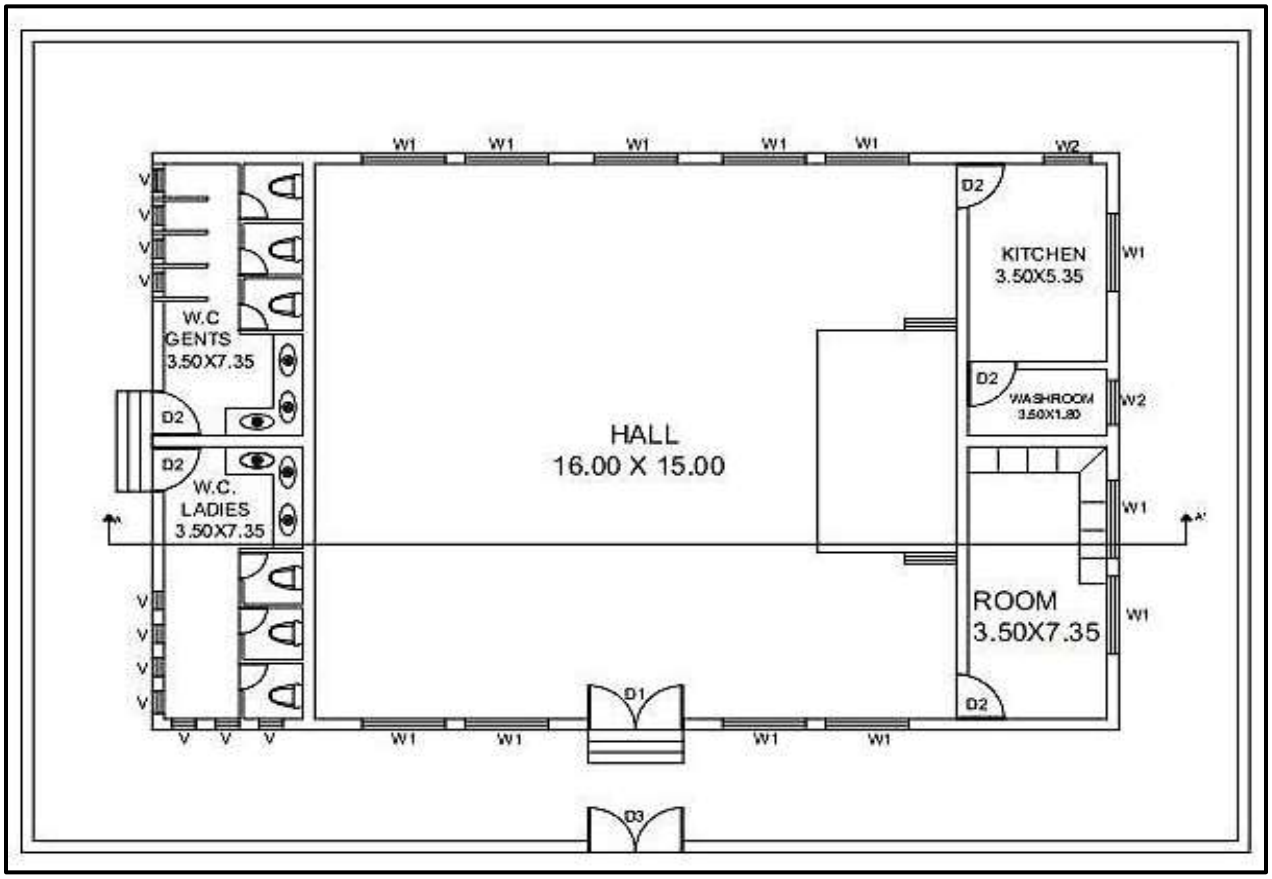


Fig 13.3 Plan of Community Hall

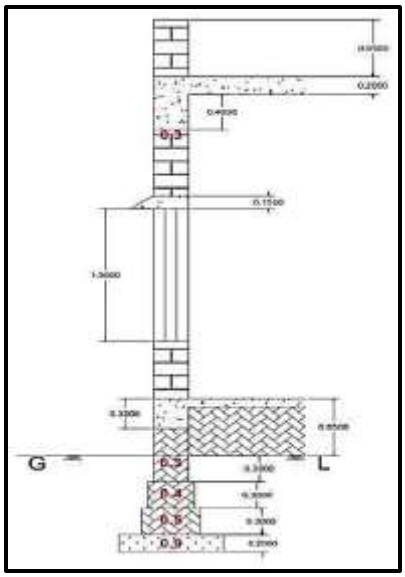


Fig 13.4 Footing Section

SCHEDULE		
Description	**Denote**	**Size (m)**
Door	**D1**	**2.40 x 2.10**
Door	**D2**	**1.20 x 2.10**
Door	**D3**	**2.40 x 1.50**
Window	**W1**	**2.10 x 1.50**
Window	**W2**	**1.20 x 1.50**
Ventilation	**V**	**0.60 x 0.60**

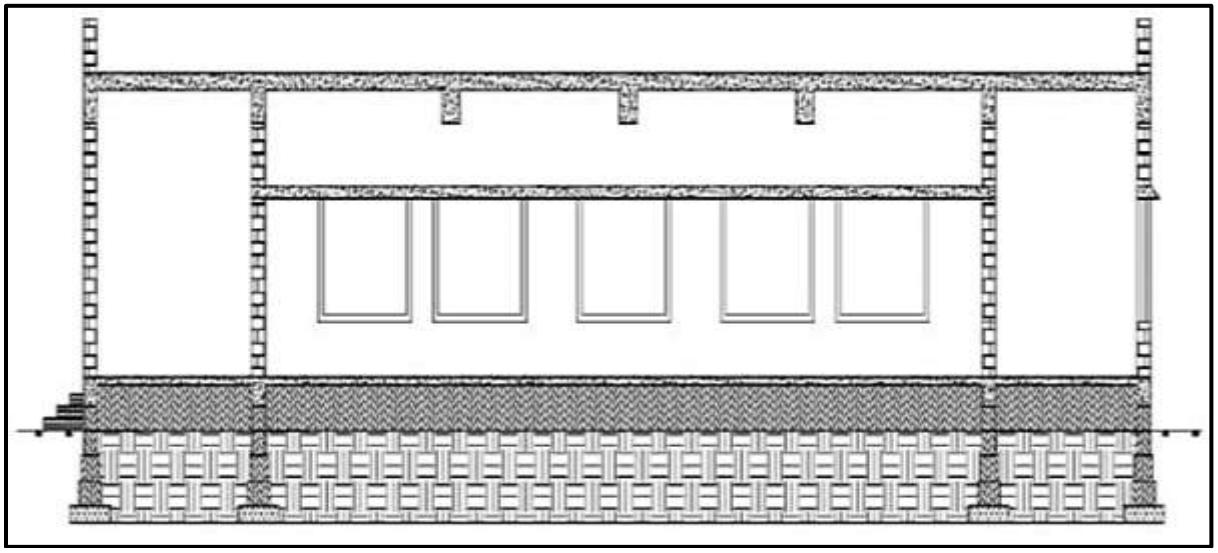


Fig 13.5 Section of Community Hall (AA')

Table 24 Measurement Sheet Community Hall

Sr No.	Description	No.	Length (M)	Breadth (M)	Height (M)	Quantity
1	Excavation in Foundation Compound Wall Internal Wall	1 1	104.80 113.00	0.9 0.9	1.1 1.1	103.75 111.87
					Total	**215.62 m^3**

2	Plain cement concrete (P.C.C) in Foundation (1:4:8)					
	Compound Wall	1	104.8	0.9	0.2	18.86
	Internal Wall	1	113.0	0.9	0.2	20.34
					Total	**39.20 m^3**
3	Brickwork in Foundation upto Plinth level					
	Compound Wall				0.3	5.72
	First step	1	104.80	0.5	0.3	12.57
	Second step	1	104.80	0.4	0.3	9.432
	Third step	1	104.80	0.3		37.722 m3
	Internal Wall				0.3	16.95
	First step	1	113.0	0.5	0.3	13.56
	Second step	1	113.0	0.4	0.8	27.12
	Third step	1	113.0	0.3		57.630 m3
	Steps:				0.15	0.324
	First	1	2.4	0.9	0.15	0.216
	Second	1	2.4	0.6	0.15	0.108
	Third	1	2.4	0.3		
	Steps:				0.15	0.54
	First	1	2.7	0.9	0.15	0.36
	Second	1	2.7	0.6	0.15	0.18
	Third	1	2.7	0.3		1.376 m3
					Total	**96.73 m3**
4	Brickwork in superstructure in cement mortar 1:6					47.16
	Compound Wall	1	104.8	0.3	1.50	103.86
	Internal Wall	1	113.0	0.3	3.00	151.02 m3
	Deduction for Door/Ventilation:					
	D1	1	2.40	0.3	2.10	1.512
	D2	4	1.20	0.3	2.10	3.024
	D3	1	2.40	0.3	1.50	1.080
	W1	11	2.10	0.3	1.50	10.395
	W2	2	1.20	0.3	1.50	1.080
	V	8	0.60	0.3	0.60	0.864
						(-) 17.955 m3

					Total	**113.00 m^3**
5	**RCC Work** Slab Beam Lintel	1 1 7 4	24.20 24.20 15.60 15.60	15.60 15.60 0.3 0.3	0.20 0.15 0.40 0.30	75.50 56.62 13.15 5.62 2.00
					Total	**150.84 m^3**
6	**2 cm thick marble flooring**	1 4	16 3.50	15 7.35		240.00 102.90
					Total area	**343.00 m^2**
7	**Smooth plaster on inside walls and ceiling in cm (1:3)** **Compound Wall**	2 2 2 2	30.4 21.4 31.0 22.0		1.5 1.5 1.5 1.5	91.20 64.20 93.00 66.00
						314.40 m^2
	Inside of the wall	8 8 2 2	3.50 7.35 16.00 15.00		3.60 3.60 3.60 3.60	100.80 211.68 115.20 108.00
						535.60 m^2
	Outside of the wall	2 2	24.20 15.60		3.50 3.50	169.40 109.20
						278.60 m^2
	Ceiling	4 1	3.50 15.00	7.35 16.00		102.90 240.00
						342.90 m^2
	Deduction for Door/Ventilation: D1 D2 D3 W1 W2 V	2 8 2 22 4 16	2.40 1.20 2.40 2.10 1.20 0.60		2.10 2.10 1.50 1.50 1.50 0.60	10.08 20.16 7.20 69.30 7.20 5.76 **(-) 119.70 m^2**
					Total	**1352.90 m^2**
8	**Earth filling in Excavation** Total excavation for walls Brickwork up to G.L. PCC					215.62 m^3 (-)39.20 m^3 (-)95.35 m^3
					Total	**81.00 m^3**

Table 25 Abstract Sheet of Community Hall

SR. NO.	PARTICULARS	QUANTITY	UNIT	RATE	PER	AMOUNT
1	Excavation in Foundation	215.62	m^3	85	m^3	18327.70
2	Plain cement concrete (P.C.C) in Foundation (1:4:8)	39.20	m^3	3000	m^3	117600.00
3	Brickwork in Foundation up toPlinth level	96.728	m^3	3200	m^3	309529.60
4	Brickwork in superstructure in cement mortar 1:6	113.00	m^3	3500	m^3	395500.00
5	RCC Work	150.84	m^3	8800	m^3	1327392.00
6	2 cm thick marble flooring	343.00	m^2	500	m^2	171500.00
7	Smooth plaster on inside walls and ceiling in cm (1:3)	1352.90	m^2	150	m^2	202935.00
8	Earth filling in Excavation	81.00	m^3	50	m^3	4050.00
	Total					25,46,834.30 Rs.
	Add 5% contingencies					1,27,341.71 RS.
	Grand Total					26,74,176.00 Rs.
					say	26,74,500.00 Rs.

3. Civil Design 3

Public Toilet

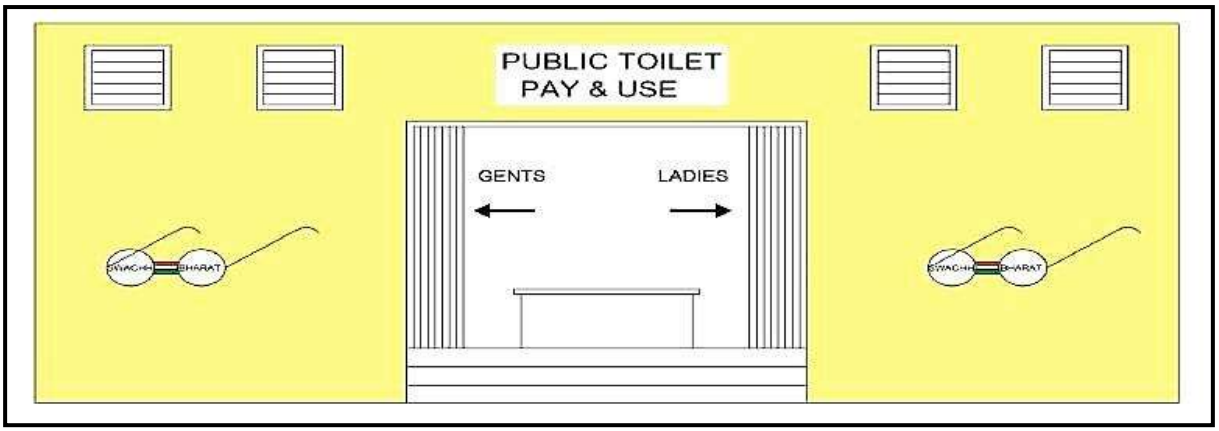


Fig 13.6 Elevation of Public Toilet

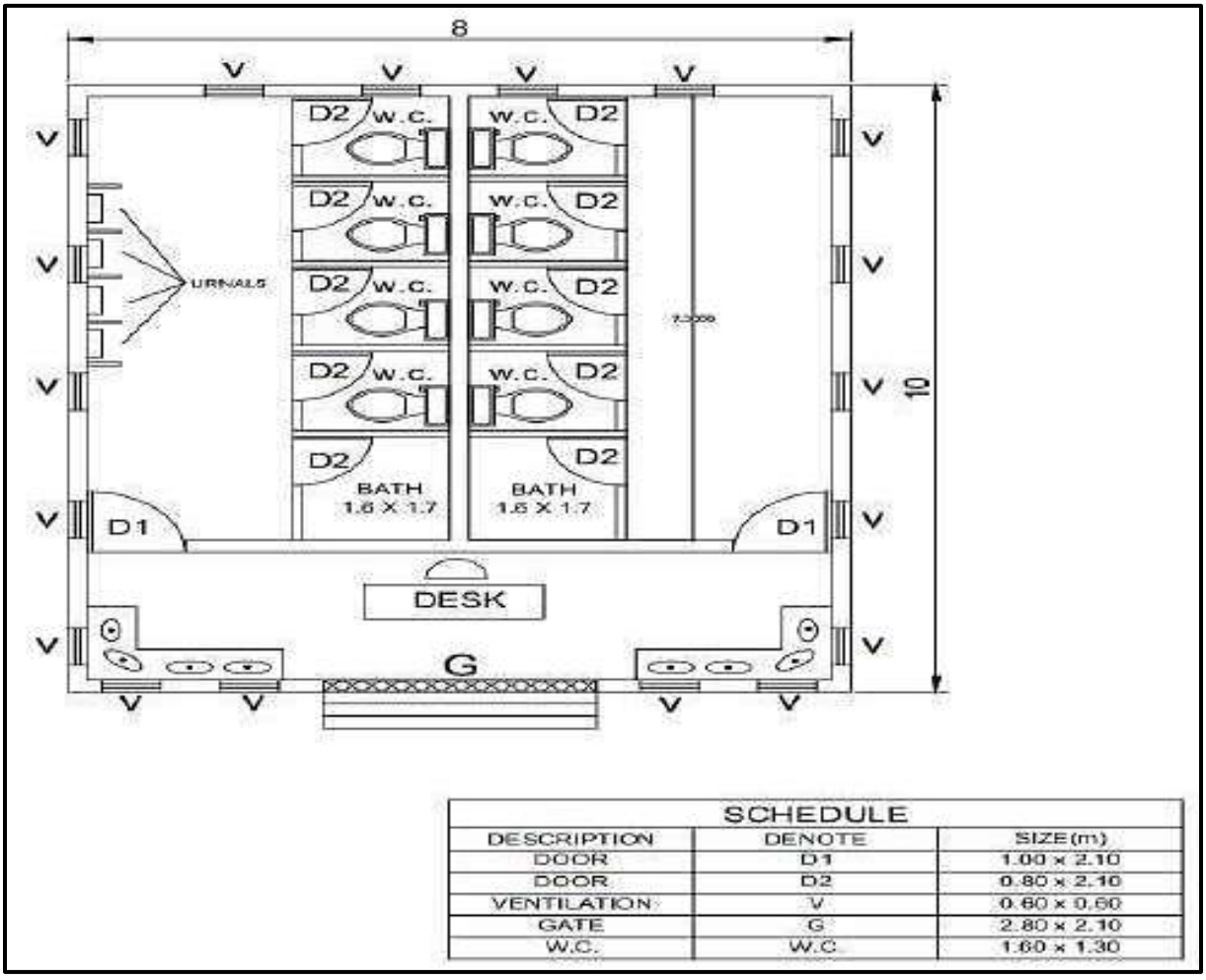


Fig 13.7 Plan of Public Toilet

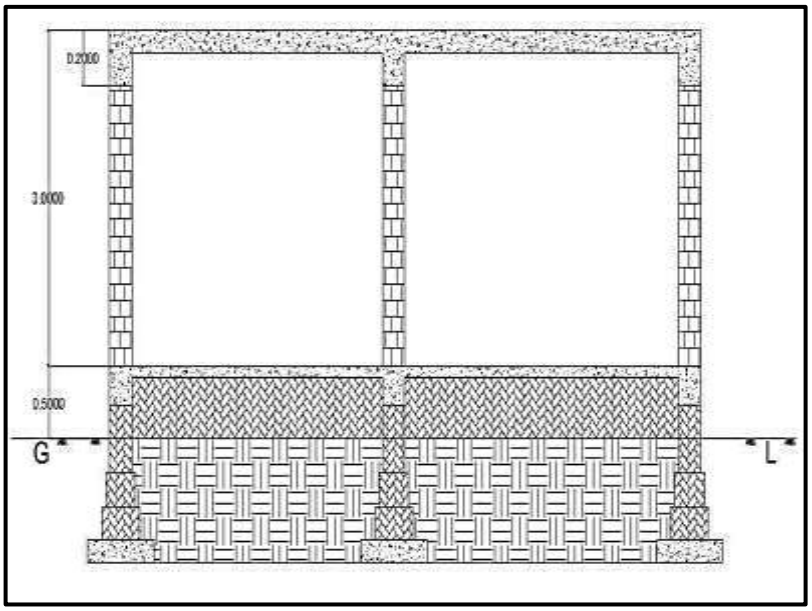


Fig 13.8 Section of public toilet

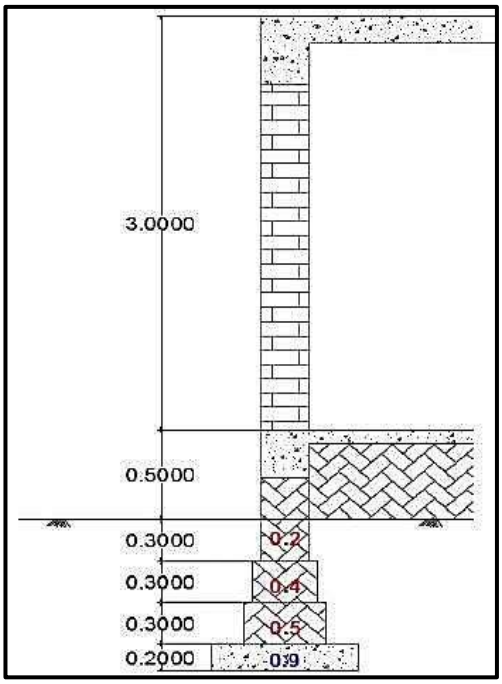


Fig 13.9 Wall Section of public toilet

Table 26 Measurement Sheet of Public Toilet

Sr. No.	Description	No.	Length (M)	Breadth (M)	Height (M)	Quantity
1	**Excavation in Foundation** Total C. L=48.70 m	1	48.70	0.9	1.1	48.21
					Total	**48.21 m^3**
2	**Plain cement concrete (P.C.C) in Foundation (1:4:8)** PCC	1	48.70	0.9	0.2	8.766
					Total	**8.766 m^3**
3	**Brickwork in Foundation up to Plinth level** First step Second step Third step **Steps:** First Second Third	 1 1 1 1 1 1	 48.70 48.70 48.70 2.80 2.80 2.80	 0.5 0.4 0.2 0.9 0.6 0.3	 0.3 0.3 0.7 0.15 0.15 0.15	 7.305 5.844 6.818 0.378 0.252 0.126
					Total	**20.723 m^3**

4	**Brickwork in superstructure in cement mortar 1:6** Wall Total C. L=50.10 m	1	50.10	0.2	3.0	30.00
						30.00 m^3
	Deduction for Door/Ventilation: Gate V	1 18	2.80 0.60	0.2 0.2	2.10 0.60	1.176 1.152
						(-) 2.328 m^3
					Total	**27.672 m^3**
5	**RCC Work** Slab Beam Lintel	1 1 3 3	8.0 8.0 8.0 8.0	10.0 10.0 0.2 0.2	0.15 0.10 0.2 0.15	12.00 8.00 0.96 0.72 0.50
					Total	**22.18 m^3**
6	**2 cm thick marble flooring** All	1	7.6	9.6		72.96
					Total area	**72.96 m^2**
7	**Smooth plaster on inside walls and ceiling in cm (1:3)** Inside Wall Ceiling External Wall **Deduction for Door/Ventilation:** Gate V	4 2 2 1 2 2 2 36	7.6 9.6 7.3 7.6 8.0 10.0 2.80 0.60	 9.6 	3.0 3.0 3.0 3.0 3.0 2.10 0.60	91.20 57.60 43.80 72.96 48 60 **373.56 m^2** 11.76 12.96
						(-) 24.72 m^3
					Total	**348.84 m^3**
8	**Earth filling in Excavation** Total excavation for walls Brickwork up to G.L. PCC					48.21 m^3 (-)19.967m^3 (-)8.766 m^3
					Total	**19.477 m^3**

Table 27 Abstract Sheet of Public Toilet

Sr. No.	Particulars	Quantity	Unit	Rate	Per	Amount
1	Excavationin Foundation	48.21	m^3	85	m^3	4097.85
2	Plain cement concrete (P.C.C) in Foundation (1:4:8)	8.766	m^3	3000	m^3	26298
3	Brickwork in Foundation upto Plinth level	20.723	m^3	3200	m^3	66313.6
4	Brickwork in superstructure in cement mortar1:6	27.672	m^3	3500	m^3	96852
5	RCC Work	22.18	m^3	8800	m^3	195184
6	2 cm thick marble flooring	72.96	m^2	500	m^2	36480
7	Smooth plaster on inside walls and ceiling in cm(1:3)	348.84	m^2	150	m^2	52326
8	Earth filling in Excavation	19.477	m^3	50	m^3	973.85
					Total	4,45,693.30 Rs.
					Add 5% contingencies	22,284.66 RS.
					Grand Total	4,67,977.96 Rs.
					say	4,68,000.00 Rs.

4. Civil Design 4

Over Head Reservoir

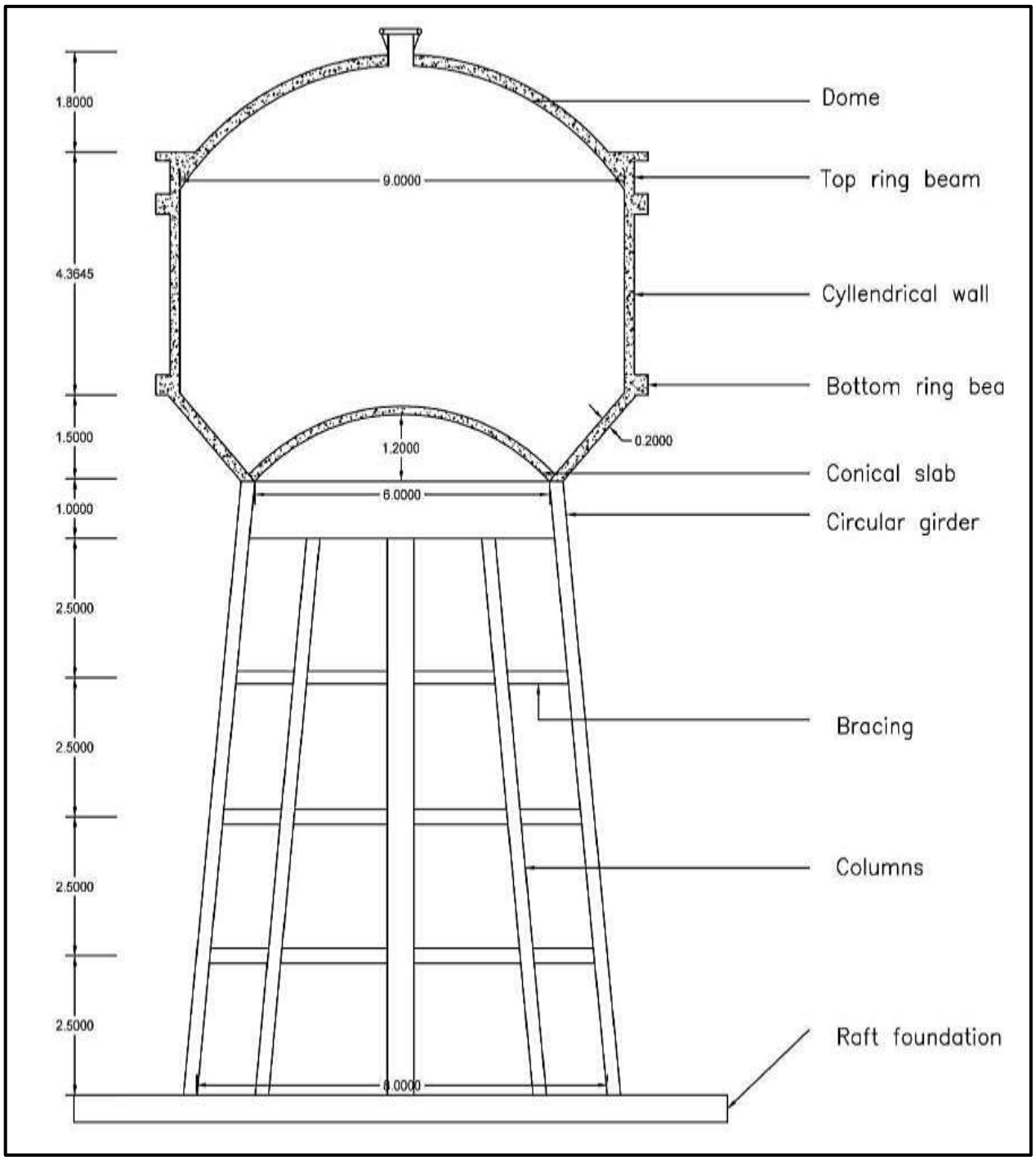


Fig 13.10 Elevation of Over Head Reservoir

Table 28 Measurement Sheet of Over Head Reservoir

Sr. No	Description	No	Length L (m)	Width B (m)	Height H (m)	Quantity	Total Quantity
1	**Excavation**	1	73.89		1	73.89	**73.89 m^3**
2	**R.C.C work in foundation**	1	7.06		0.2	1.41	**1.41 m^3**
3	**Steel in foundation** 1) Longitudinal 2) Transverse	 9 4	 π x 0.008^2 π x 0.008^2			 0.045 0.02	 **0.065 m**
4	**R.C.C work in columns** **Steel in columns**	8 8x6	0.3 x 0.3 π x 0.01^2		10 10	7.2 0.15	**7.2 m^3** **0.15 m**
5	**R.C.C. in bracing @ 2.5** **Steel in bracing @ 2.5m from G.L.**	8 8x8	0.63 0.63	0.3 π x 0.009^2	0.3	0.45 0.01	**0.45 m^3** **0.01 m**
6	**R.C.C. in bracing @ 5 from G.L**	8	0.57	0.3	0.3	0.414	**0.414 m^3**
7	**R.C.C. in bracing @ 7.5 from G.L**	8	0.45	π x 0.009^2		0.324	**0.324 m^3**
8	**Top ring RCC girder** A) RCC B) Steel Longitudinal Transvers	1 5 125	πD 6π 6π	0.4 x 0.6 π x 0.009^2		4.52 0.06 0.066	**4.52 m^3** **0.07 m**
9	**Bottom Dome** A) RCC in Dome B) Steel	1	22.61 L= 6.62		0.2 0.667	4.253 0.443	**4.253 m^3** **0.443 m**
10	A) RCC conical Slab B) Steel Steel for B.M	1 14 3	23.56 23.56 23.56	0.2 x 2.12 π x 0.008^2		9.94 0.066 0.014	**9.94 m^3** **0.08 m**

11	**a) RCC ring Beam @ B** **b) Steel**	1 6	28.27	0.25 x 0.5 π x 0.008^2	3.53 0.034	**3.53 m^3** **0.034 m**
12	**Cylindrical Wall** Main Steel	1 20	4.32	0.2 x 4 π x 0.006^2	22.61 0.098	**22.61 m^3** **0.098 m**
13	**RCC ring Beam @ A** a) Concrete b) Steel	1 4	9π 9π	0.2 x 0.04 π x 0.006^2	1.12 0.012	**1.12 m^3** **0.012 m**
14	**Top Dome RCC** a) Concrete b) Steel	1 100	9.93	50.89 x 0.19 π x 0.004^2	7.63 0.05	**7.63 m^3** **0.05 m**
15	**Total Plastering**	1			105.53	**105.53 m^2**

Table 29 Abstract Sheet of Over Head Reservoir

Sr. no	Description	Total Quantity	Rate	Per Unit	Total Amount
1	Excavation work in foundation	73.89	85.90	m^3	6,347.15
2	Total R.C.C work	63.80	7800	m^3	4,97,640.00
3	Total Plastering 1:6 1:2	105.53 65.44 40.09	 600 800	m^2	 39,264.00 32,072.00
4	Total Painting	105.53	250	m^2	26,382.50
5	Total Steel	19.88	63,266.74	Ton	12.58,094.00
Total Cost :					**18,59,799.65**
Add 5 % Contingency Charges:					92,989.95
Add 2 % Work Establishment Charges:					37,195.98
Add 3 % Electric Charges:					55,793.98
Add 2.5 % Sanitary & Plumbing Charge:					46,494.98
Grand Total :					**20,92,274.45 Rs.**

5. Civil Design 5

Aanganwadi

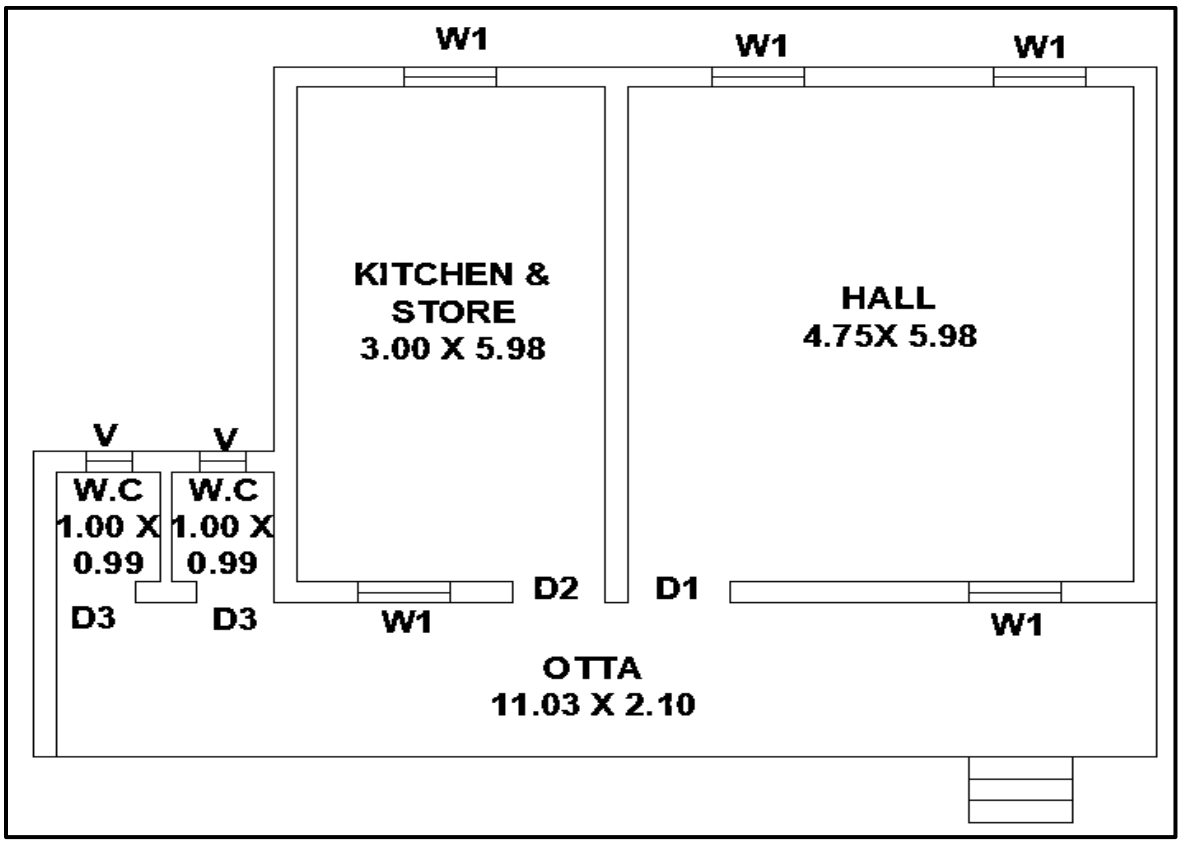


Fig 13.11 Plan of Aanganwadi

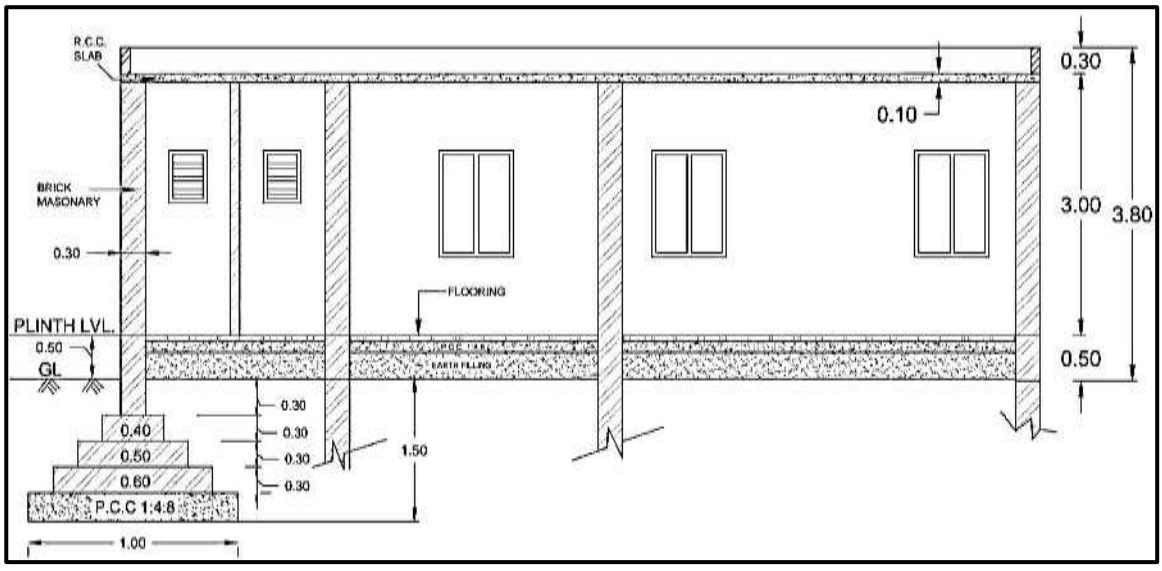


Fig. 13.12 Section of Aanganwadi

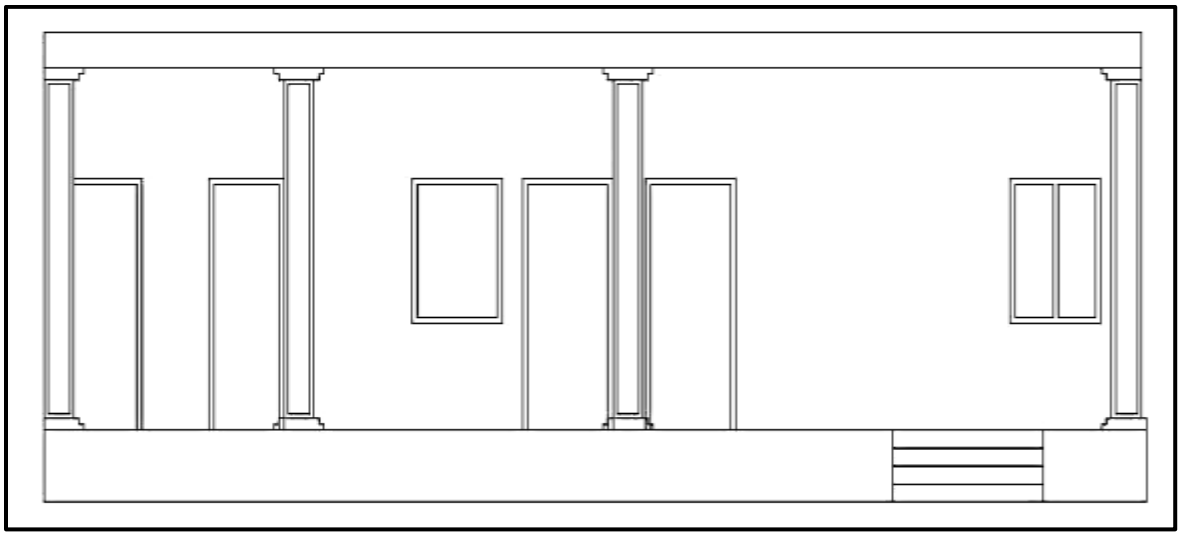


Fig. 13.13 Front View of Aanganwadi

Table 30 Measurement Sheet of Aanganwadi

Sr. no	Description	No	Length L (m)	Width B (m)	Height H (m)	Quantity	Total Quantity
1	**Excavation for foundation (by Center line method)**						
	Total length =56.03m L =56.03-(0.5x 1.0x4) =54.03m	1	54.03	1	1.50	81.05	**81.05 m^3**
2	**P.C.C. 1:4:8** **P.C.C. 1:4:8 for step**	1 1	54.03 1.5	1 0.6	0.20 0.10	10.80 0.09	10.90 m3
3	**Brick work**						
	Brick work up to plinth For step 0.60 m For step 0.50 m For step 0.40 m For step 0.30 m **Step for GL To PL** For 1st step For 2nd step	 1 1 1 1 1 1	 52.83 51.83 51.03 50.43 1.5 1.5	 0.60 0.50 0.40 0.30 0.6 0.3	 0.30 0.30 0.30 0.80 0.2 0.2	 9.51 7.77 6.12 12.10 0.18 0.09	**35.77 m^3**
4	**Brick work PL to SL** Total length =42.90m L= 42.90 - (0.5x0.30x4) =42.3m	1	42.3	0.30	2.9	38.07	
	Partition wall for W.C. Total length= 3.2m L = 3.2-(0.5x0.2x1) =3.1m	1	3.1	0.20	2.9	1.86	39.93 m^3

	Deduction						
	D1	1	1.00	0.3	2.13	0.64	
	D2	1	0.90	0.30	2.13	0.57	
	D3	2	0.76	0.20	2.13	0.65	
	W1	5	0.90	0.30	1.22	1.65	
	V	2	0.45	0.20	0.60	0.11	-3.62 m^3
	Deduction for lintels above door and windows with 15 cm bearing at each end						
	D1	1	1.3	0.30	0.15	0.06	-0.48 m3
	D2	1	1.2	0.30	0.15	0.05	
	D3	2	1.06	0.20	0.15	0.06	
	W1	5	1.2	0.30	0.15	0.27	
	V	2	0.75	0.20	0.15	0.04	
	Net quantity = 39.93-3.62-0.48 =35.83						**35.83 m^3**
5	**Brick work for parapet wall**	1	40.37	0.30	0.30	36.33	**36.33 m^3**
6	**Earth filling in Plinth**						
	Hall	1	4.75	5.98	0.25	7.10	
	Kitchen and Store	1	3	5.98	0.25	4.48	
	Otta	1	11.03	2.10	0.25	23.16	
	W.C	1	2.1	1.4	0.25	0.74	**35.48 m^3**
7	**RCC work for Slab**						
		1	8.63	8.68	0.10	7.50	
		1	2.40	3.50	0.10	0.84	**8.34 m^3**
8	**Mosaic Tiles Flooring**						
	Hall	1	4.75	5.98		28.40	
	Kitchen and Store	1	3	5.98		17.94	
	Otta	1	11.03	2.10		23.16	
	D1	1	1.00	0.30		0.30	
	D2	1	0.90	0.30		0.27	
	D3	2	0.76	0.20		0.30	**70.38 m^2**
9	**Tiles for W.C**						
	Walls	4	1.0		2.9	11.66	
	Walls	4	099		2.9	11.48	
	Flooring	2	1.00	0.99		1.98	**25.12 m^2**
	Deduction						
	D3	2	0.76		2.13	3.23	**-3.23 m^2**
	Net quantity =25.12 -3.23=21.89						**21.89 m^2**

10	**Wood work for door and window**						
	D1	1	1.00		2.13	2.13	
	D2	1	0.90		2.13	1.92	
	D3	2	0.76		2.13	3.23	
	W1	5	0.90		1.22	5.50	
	V	2	0.45		0.60	0.54	13.32 m2
11	**Smooth plaster 12cm thick inside the rooms and ceilings in C.M. 1:3**						
	Plaster for walls						
	Hall	2	4.75		2.9	27.55	
		2	5.98		2.9	34.68	
	Kitchen and store	2	3		2.9	17.4	
		2	5.98		2.9	34.68	
	Otta	1	11.03		2.9	31.98	
		1	2.10		2.9	8.19	
	Ceiling						
	Hall	1	4.75	5.98		28.40	
	Kitchen and Store	1	3	5.98		17.94	
	Otta	1	11.03	2.10		23.16	
	W.C.	2	1.00	0.99		1.98	**225.96 m^2**
	Deduction						
	D1	½	1.00		2.13	1.06	
	D2	½	0.90		2.13	0.96	
	D3	2/2	0.76		2.13	1.62	
	W1	5/2	0.90		1.22	2.74	**-6.41 m^2**
	Net quantity =225.96 -6.41= 219.55						**219.55 m^2**
12	**Rough plaster outside 15cm thick** Total length = 28.40	1	28.40		3.80	107.92	
	Otta plaster GL to PL L= 11.03	1	11.03		0.50	5.52	**113.44 m^2**
	Deduction						
	W1	5	0.90		1.22	5.49	**-5.50 m^2**
	Net quantity = 113.44-5.50= 107.94						**107.94 m^2**

Table 31 Abstract Sheet of Aanganwadi

Sr. no	Description	Total Quantity	Rate	Per Unit	Total Amount
1	Excavation in foundation	81.05	85.90	m^3	6,962.20
2	P.C.C. 1:4:8	10.90 m^3	2324.00	m^3	25,331.60

3	Brick work up to plinth	35.77	3000	m^3	1,07,310.00
4	Brick work in Super Structure up to slab	35.83	3500	m^3	1,25,405.00
5	Brick work for parapet wall	36.33	3000	m^3	1,08,990.00
6	Earth filling in plinth	35.48	300	m^3	10,644.00
7	RCC work in Slab, Chhajja and lintel	9.70	8800	m^3	87,472.00
8	Mosaic Tiles Flooring	70.38	636	m^2	44,761.00
9	Tiles for W.C	21.89	450	m^2	9,850.50
10	Wood work	13.32	7660	m^2	1,02,031.20
11	Smooth plaster 12cm thick	219.55	300	m^2	65,865.00
12	Rough plaster 15cm thick	107.94	450	m^2	48,573.00
13	Painting	327.50	250	m^2	81,750.00
Total :					**8,24,320.00 ₹**
Add 5 % Contingency Charges:					41,216.00 ₹
Add 2 % Work Establishment Charges:					16,484.40 ₹
Add 3 % Electric Charges:					24,729.60 ₹
Add 2.5 % Sanitary & Plumbing Charge:					20,608.00 ₹
Grand Total :					**9,27,358.00 ₹**

6. Civil Design 6

ATM

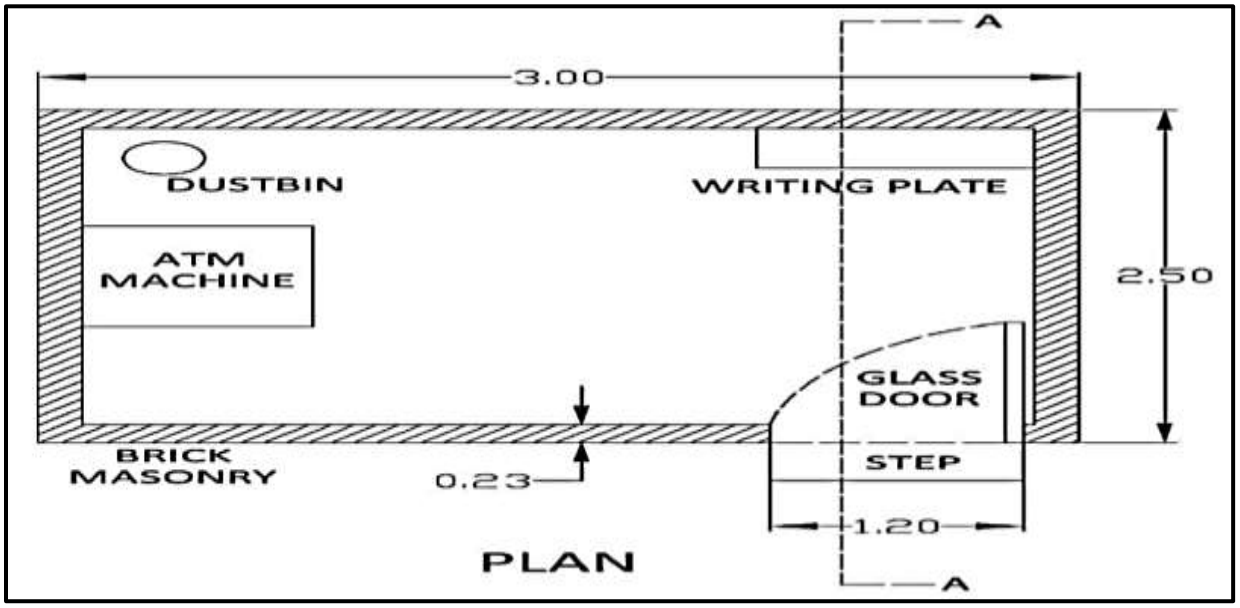


Fig 13.14 Plan of ATM

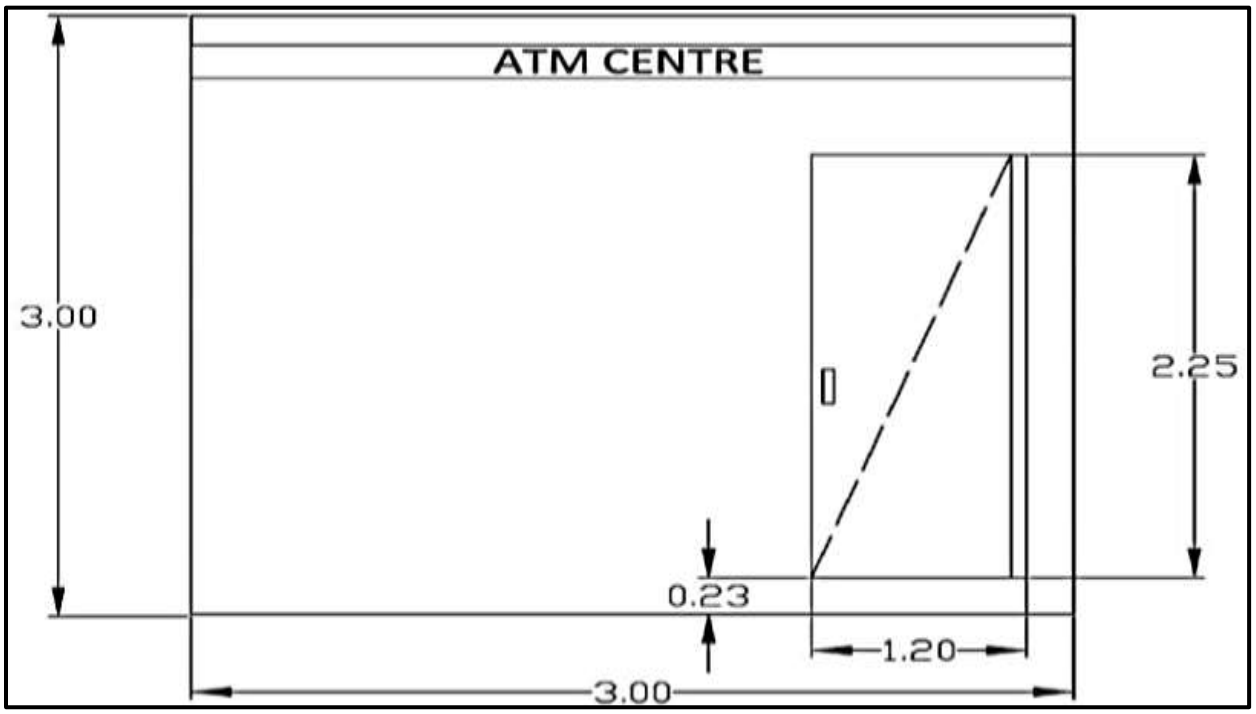


Fig 13.15 Elevation of ATM

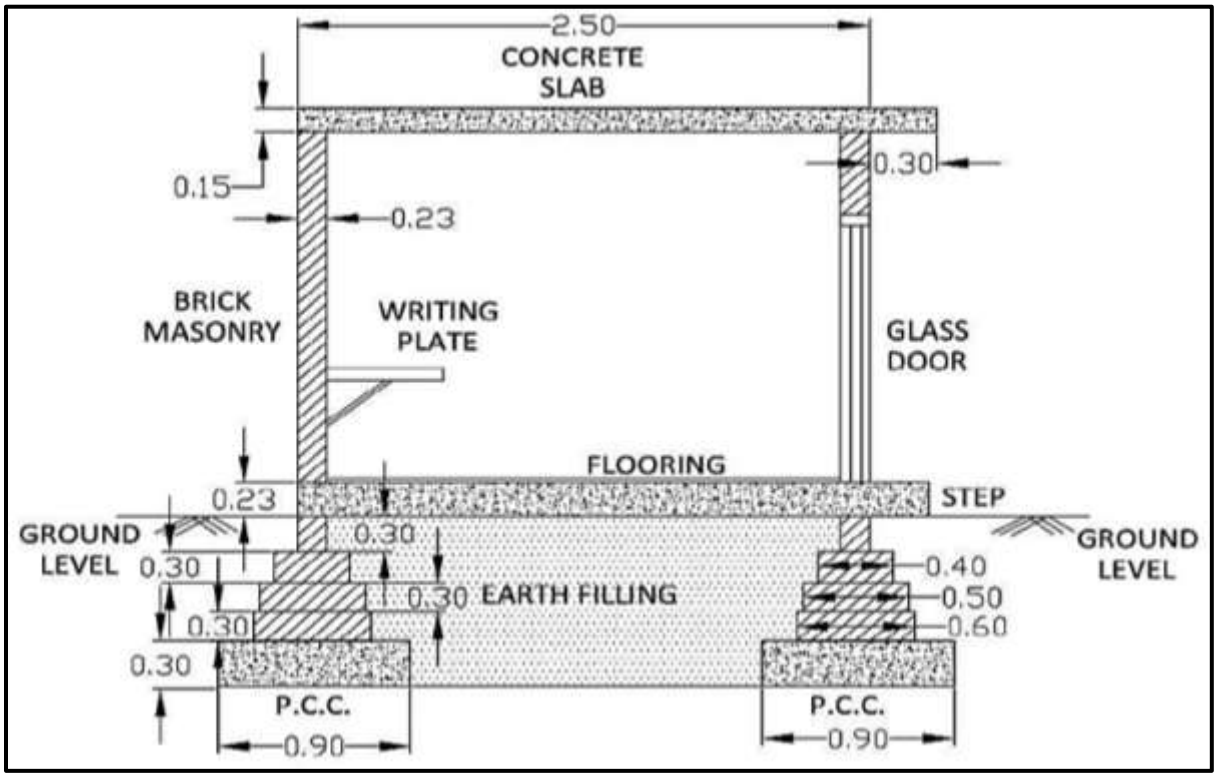


Fig 13.16 Section A-A of ATM

Table 32 Measurement Sheet of ATM

Sr. No	Description	No	Length L (m)	Width B (m)	Height H (m)	Quantity	Total Quantity
1	Excavation	1	11	0.90	1.5	14.85	**14.85 m^3**
2	P.C.C. 1:4:8	1	11	0.90	0.30	2.97	**2.97 m^3**
3	Brick Work up to GL For step 0.60 m For step 0.50 m For step 0.40 m For step 0.23 m	 1 1 1 1	 10.7 10.45 10.25 10.14	 0.60 0.50 0.40 0.23	 0.30 0.30 0.30 0.30	 1.92 1.56 1.23 0.70	 **5.41 m^3**
4	Earth filling in GL	1	2.5	2.0	1.5	7.5	**7.5 m^3**
5	Cement concrete for flooring	1	3.00	2.80	0.23	1.93	**1.93 m3**
6	Brick Work up to Slab Deduction for Door and frame	1 1	10.14 1.30	0.23 0.23	2.62 2.35	6.11 -0.71	**5.4 m3**
7	RCC work for Slab	1	3.00	2.80	0.15	1.26	**1.26 m3**
8	Tiles Flooring	1	2.54	2.34		5.94	
	Door	1	1.30	0.23		0.30	**6.24 m2**
A	Skirting	3		3.0 m^2		9.0	
		2		2.5 m^2		5.0	
	Deduction for Door	1		1.30 m^2		-1.30	**12.7 m^2**
9	Glass Door with Aluminum Frame	1	1.30		2.35	3.05	**3.05 m^2**
10	Smooth plaster 12cm thick inside and ceilings in C.M. 1:3						
	Cabin	2	2.54			5.08	

		2	2.04			4.08	
	Ceiling	1	2.54	2.54		6.54	
	Deduction for door	1	1.30		2.35	-3.05	**12.65 m^2**
11	Rough plaster outside 15cm thick	2	3.00		3.0	18	
		2	2.50		3.0	15	
	Deduction for door	1	1.30		2.35	-3.05	**29.95 m^2**

Table 33 Abstract Sheet of ATM

Sr. no	Description	Total Quantity	Rate	Per Unit	Total Amount
1	Excavation in foundation	14.85	85.90	m^3	**1,275.60**
2	P.C.C. 1:4:8	2.97	2324.00	m^3	**6,902.30**
3	Brick Work up to GL	5.41	3000	m^3	**16,230.00**
4	Earth filling in GL	7.5	50	m^3	**375.00**
5	Cement concrete for flooring	1.93	4250	m^3	**8,202.50**
6	Brick Work up to Slab	5.4	3500	m^3	**18,900.00**
7	RCC work for Slab	1.26	7800	m^3	**9,828.00**
8	Tiles Flooring and skirting	18.94	636	m^2	**12,054.80**
9	Glass Door with Aluminum Frame	3.05	3000	m^2	**9,150.00**
10	Smooth plaster 12cm thick	12.65	230	m^2	**2,910.00**
11	Rough plaster 15cm thick	29.95	300	m^2	**8,895.00**
12	Painting	42.6	250	m^2	**10,650.00**
Total :					**1,05,372.40**
Add 5 % Contingency Charges:					**5,268.60**
Add 2 % Work Establishment Charges:					**2,107.50**
Add 3 % Electric Charges:					**3,161.20**
Grand Total :					**1,15,909.70 Rs.**

Chapter 14:

Technical Options with Case Studies

14.1 Civil Engineering

14.1.1 Advanced Earthquake Resistant:

An Earthquake is Earth's Shaking or in other words release of energy due to the movement of tectonic plates. This can be destructive enough to kill thousands of people and bring huge economic loss. This natural disaster has many adverse effects on earth like ground shaking, landslides, rock falls from cliffs, liquefaction, fire, tsunami etc. Buildings are highly affected by an earthquake, and in some cases they are shattered down to the ground level. When the ground shaking occurs beneath the building's foundations they vibrate in an analogous manner with that of the surrounding ground. The inertia force of a structure can develop shearing effect on it which in turn causes stress concentration on the connections in structure and on the fragile walls. This results in partial or full failure of structure. The excitement and prevalence of shaking depends on the orientation of the building. High rise structures have the tendency to magnify the magnitude of long time periodic motions when comparing to the smaller one. Every construction has a resonant prevalence which are the characteristics of structure. Taller buildings have a tendency for long time periods than shorter one which make them relatively more susceptible to damage. Hence, one has to be careful while performing the analysis of a tall structure.

In order to analyze a tall structure many analysis procedures are valid like:

a) Equivalent static analysis
b) Response spectrum analysis
c) Linear dynamic analysis
d) Nonlinear static analysis or nonlinear pushover analysis and
e) Nonlinear dynamic analysis

Soil structure interaction analysis is also essential to be considered. After identifying the soil type, analyzing procedure is selected to do the detailed analysis of the interaction between soil and structure. To reduce the seismic effects on tall buildings several equipment is used like dampers or base isolation process. In dampers viscous damper, friction damper, yielding damper, magneto rheological fluid dampers tuned mass damper or harmonic absorber can be used. In base isolator magneto rheological elastomer, elastomeric bearing system, sliding system can be used.

14.1.2 Seismic Retrofitting of Buildings:

In recent times, reinforced concrete buildings have become common in India, particularly in towns and cities. Reinforced concrete (or simply *RC*) consists of two primary materials, namely concrete with reinforcing steel bars. Concrete is made of sand, crushed stone (called aggregates) and cement, all mixed with pre-determined amount of water. Concrete can be moulded into any desired shape, and steel bars can be bent into many shapes. Thus, structures of complex shapes are possible with RC.A typical RC building is made of horizontal members (beams and slabs) and vertical members (columns and walls), and supported by foundations that rest on ground. The system comprising of RC columns and connecting beams is called a RC Frame. The RC frame participates in resisting the earthquake forces. Earthquake shaking generates inertia forces in the

building, which are proportional to the building mass. Since most of the building mass is present at floor levels, earthquake-induced inertia forces primarily develop at the floor levels. These forces travel downwards – through slab and beams to columns and walls, and then to the foundations from where they are dispersed to the ground. As inertia forces accumulate downwards from the top of the building, the columns and walls at lower storeys experience higher earthquake-induced forces and are therefore designed to be stronger than those in storeys above.

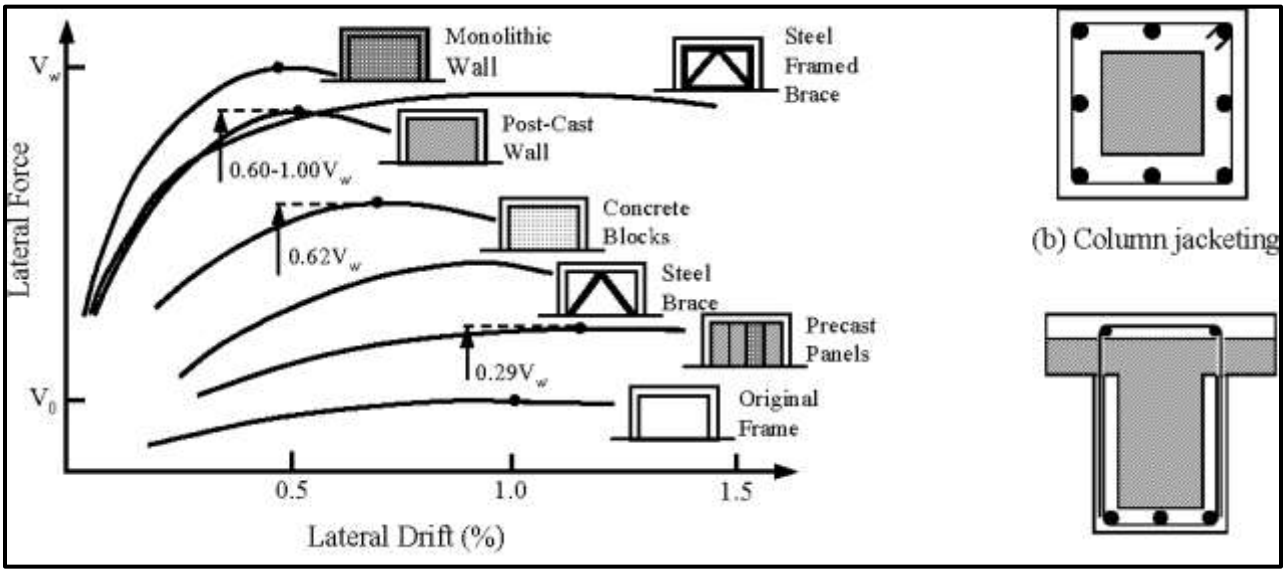


Fig 14.1 Conventional Strengthening methods used for Seismic Retrofitting

Addition of shear walls and bracings shown in Fig. 14.1 (a) is the most popular strengthening method due to its effectiveness, relative ease, and lower overall project cost compared to column and beam jacketing shown in Fig. 14.1(b) and (c), respectively. Relative effectiveness of various wall and bracing configurations are compared in Fig. 14.1(a). From this figure, it is seen that post-cast shear walls and steel braced frames are the most effective strengthening techniques.

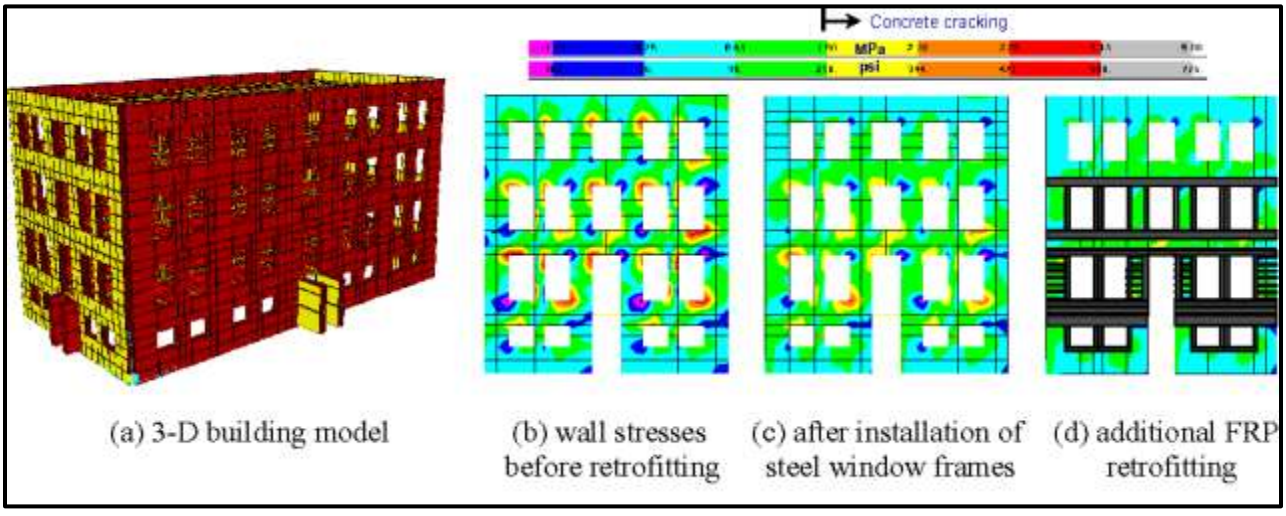


Fig 14.2 Conventional Strengthening methods used for 3-D Building

14.1.3 Advance Practices in Construction field in Modern Material, Techniques:

To understand all how and about of super performing construction materials we must study materials according to their use from very root to tip. By that way we can easily conclude and infer about the application, implementation and feasibility of that particular construction material. Elements of construction where these smart materials and techniques shall be implemented are: Foundation, Plinth, Beam, Column, Wall, Sill, Window, Door, Roof, Parapet, Skylights and Finishing Works. Construction materials are said to be super performing when they
Save overall building energy.

- Make building esthetical pleasing
- Cut cost of construction
- Easily available
- Increase life span of building
- Upgrade building quality
- Make the building safe for living

Some Super Performing Safe materials:

a) Collapse preventing Structure b) Bombproof fiber material
c) High pressure metal laminates d) Stratified wood panels
e) Metafloor

Super Performing Materials

Advancements in Concrete

Fig 14.3 Transparent Concrete

Fig 14.4 Permeable Concrete

14.1.4 Engineering Aspects of Soil mechanics - Environmental Impact Assessment:

Our daily life environment in Nigeria relates to air, noise, sunlight, geological features, fauna, flora, landscape and etcetera. All these affect the economy of the country: if the environment is abused, daily life style (living and working conditions, etc.) will be affected; and this will in turn affect the economy. As there is need to protect the environment in every possible way, it must also be noted that the need for the existence of infrastructure as an indispensable part of any economy cannot be over emphasized. As those infrastructures come into existence, there are resulting positive effects as well as adverse effects, which in many cases tend to out-number the positive effects; and yet not usually noticed. The impact of these projects on the environment range from cumulative to long term and short term impacts; and include impacts on human beings and man-made features, agriculture, effects on flora, fauna and geology, effects on land, effects on water, air and climate and, of course, the indirect and secondary impacts associated with the project. Environmental impact assessment may be said to be one of the vital steps required for careful planning and management of natural resources resulting from pressures placed on virtually all areas of the earth from the need to provide food, water, minerals, fuel, and other necessities for such increasing number of people. In other to properly assess environmental impact of civil engineering infrastructural development projects, it is necessary to perceive the environment from the point of the view of the entire physical setting, experiencing a complex array of interrelationships compassing life and development. Since the environment itself is multi-dimensional in nature, it means that the circumstances that create (adverse) impacts on it are multi-dimensional; and therefore require some sort of multidimensional or multidisciplinary handling. It is therefore very necessary to involve as many disciplines as should be interested or connected to the environment as possible. These professionals will carry out comprehensive investigations prior to the actual project execution. These investigations are usually geared towards the matching of ecological and technological requirements of land use with the qualities of land and the effect of the proposed use of such land on the environment.

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

a) Water Supply Development Techniques :

The water supply in India has increased greatly from 1980 to present. Still, many people lack access to clean water, toilets, and sewage infrastructure. Various government programs at national, state, and community level have brought rapid improvements in sanitation and the drinking water supply. Some of these programs are ongoing.

Challenges – As of 2010, only two cities in India - Thiruvananthapuram and Kota — get continuous water supply. In 2005 none of the 35 Indian cities with a population of more than one million distributed water for more than a few hours per day, despite generally sufficient infrastructure. Owing to inadequate pressure people struggle to collect water even when it is available. According to the World Bank, none have performance indicators that compare with average international standards] A 2007 study by the Asian Development Bank showed that in 20 cities the average duration of supply was only 4.3 hours per day.

Achievements –Navi Mumbai, a planned city with more than 1m inhabitants, has achieved continuous supply for about half its population as of January 2009. Badlapur, another city in the Mumbai Conurbation with a population of 140,000, has achieved continuous supply in 3 out of 10 operating zones, covering 30% of its population. Trivandrum, the capital of Kerala state with a population of 1,645,000 in 2011, is the largest Indian city and the only Million agglomeration that enjoys uninterrupted hygienic water supply. Malkapur, a town in Satara District of Maharashtra, is the first Indian town to provide 24*7 water supply with 100 percent coverage. The program started in 2008 as a pilot project and soon covered the entire city. The connection is 100 percent metered with telescopic tariff.

Innovative approaches – A number of innovative approaches to improve water supply and sanitation have been tested in India, in particular in the early 2000s. These include community- led total sanitation, demand-driven approaches in rural water supply and a public-private partnerships to improve the continuity of urban water supply in Karnataka, and the use of microcredits in water supply and sanitation to women in order to improve access to water.

b) Sewerage System Development Techniques:

The United Nations has recognized 19 of the world's biggest megacities with a population of 10 million and above. From India, five of Delhi, Mumbai, Kolkata, Bangalore and Chennai are in the list. The historic city of Hyderabad is on the way to step into megacity family with a population of 9.5 million. The city is known for its rivers and lakes from the early 19th century. The prominent among them is the river Musi, a tributary to river Krishna, originating from Ananthagiri Hills. The river travels 70 km upstream before entering Hyderabad near Rajendranagar, flowing west to east, bifurcate the old and new city on south and north of river Musi. The river traverses about 28km within the city limits and flows downstream, about 158km before joining the river Krishna, near Wazeerabad, Nalgonda District.

Status of Sewerage System – The first sewerage system with Sewage Treatment Plant (STP) facility for Hyderabad city dates back to 1931, covering an area of 54 sq. km with a population of 4, 68, 000, under the technical guidance of Sir Mokshagundam Visvesvaraiah. The system was meant to serve an area of 54 Sq.kms with 53 MLD capacity STP having a primary treatment facility. At that time Secunderabad had a sewerage system which was originally a combined system. Both the systems of Hyderabad and Secunderabad were amalgamated in the year 1964. Later in a phased manner, the sewerage system was upgraded during 1984, 1994 and 2004 with major interventions, particularly by laying certain trunk sewer mains network and construction of Sewage Treatment Plants (STPs).After transfer to HMWSSB, subsequently many improvements to the sewerage

network were carried out, keeping in pace with the population growth and expansion of the city. The existing sewerage system covers approximately 90% of the erstwhile core MCH area of 169.3 sq.km.

Proposed NRCD Project Phase-II – Under phase-II the NRCD covers an area 574.59 Sqkm; it is divided into 10 catchments for locating the STPs and it is proposed for 610 MLD capacity STP. The GoAP has forwarded the DPR proposals with the consent of 30% state share and requested the NRCD, MoEF, GoI to accord sanction to the project with 70% grant of GOI. The technical appraisal was completed. The final sanction was deferred stating that the adequate budget allocation was not available with NRCD, MoEF, GoI.

c) Waste Water Development Techniques :

Water is an essential resource that is required to sustain life. Its availability has to be adequate, safe and easily accessible. Current trends in climate change and rise in human population has compromised water adequacy, availability and safety. Wastewater managers around the world have the responsibility to ensure that the effluent that is eventually released into the environment does not degrade the quality of the recipient water bodies. Attaining sustainability in wastewater management is top in the of Sustainable Development Goals' Agenda. All in all, the realization of a more sustainable wastewater management will require a highly holistic and balanced approach in evaluating a particular management strategy's overall sustainability.

Wastewater Treatment Techniques – Treatment of wastewater can be undertaken in three stages: primary, secondary, and tertiary (or advanced). Primary or mechanical stage is designed to remove gross, suspended and floating solids from raw sewage that is direct from the source. It includes screening to trap solid objects and sedimentation by gravity to remove suspended solids that come from the catchment (Mannie and Bower 2014). Secondary stage is designed to remove the dissolved organic matter that escapes primary treatment. This stage comprises of microbes consuming the organic matter as food, and converting it to carbon dioxide, water, and energy for their own growth and reproduction (Tilley, 2014; Benammar et al., 2015; Dharmender et al., 2016). Generally, high-rate biological processes are normally characterized by relatively small reactor volumes and high concentrations of microorganisms compared with low rate processes (Mang and Li, 2010; Jeon et al., 2014; Sanjeev et al., 2014).

Advancement in Wastewater Treatment for Environmental Sustainability – To increase the efficiency of wastewater treatment, an additional stage has always been incorporated. The tertiary wastewater treatment stage can remove more than 99 percent of all the impurities from sewage, producing an effluent of almost drinking-water quality status (Vymazal, 2009; Francisca et al., 2016). An application of a typical tertiary treatment process is the modification of a conventional secondary treatment plant to remove additional nutrients such as phosphorus and nitrogen.

d) Sustainable Development Techniques:

Sustainable development is the organizing principle for meeting human development goals while simultaneously sustaining the ability of natural systems to provide the natural resources and ecosystem services on which the economy and society depend. The desired result is a state of society where living conditions and resources are used to continue to meet human needs without undermining the integrity and stability of the natural system. Sustainable development can be defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability goals, such as the current UN-level Sustainable Development Goals, address the global challenges, including poverty, inequality, climate change, environmental degradation, peace, and justice.

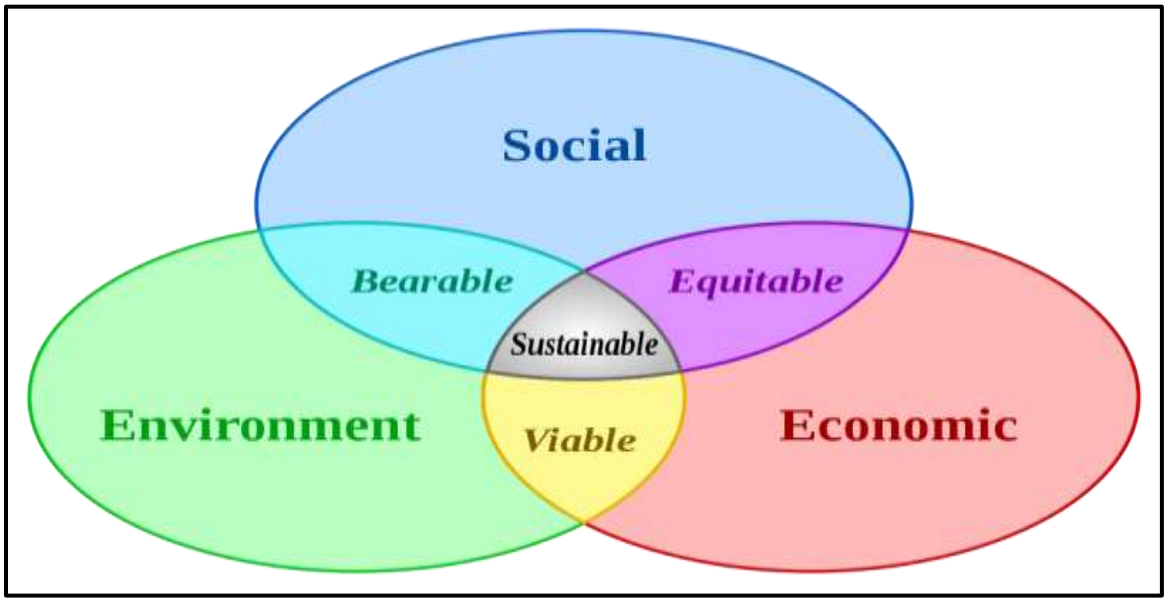


Fig 14.5 Sustainable Development Techniques

Development of the concept – Under the principles of the United Nations Charter the Millennium Declaration identified principles and treaties on sustainable development, including economic development, social development and environmental protection. Broadly defined, sustainable development is a systems approach to growth and development and to manage natural, produced, and social capital for the welfare of their own and future generations. The term sustainable development as used by the United Nations incorporates both issues associated with land development and broader issues of human development such as education, public health, and standard of living.

Environmental – Environmental sustainability concerns the natural environment and how it endures and remains diverse and productive. Since natural resources are derived from the environment, the state of air, water, and the climate is of particular concern. The IPCC Fifth Assessment Report outlines current knowledge about scientific, technical and socio-economic information concerning climate change, and lists options for adaptation and mitigation. Environmental sustainability requires society to design activities to meet human needs while preserving the life support systems of the planet. This, for example, entails using water sustainably, using renewable energy, and sustainable material supplies (e.g. harvesting wood from forests at a rate that maintains the biomass and biodiversity).

Economics – It has been suggested that because of rural poverty and overexploitation, environmental resources should be treated as important economic assets, called natural capital. Economic development has traditionally required a growth in the gross domestic product. This model of unlimited personal and GDP growth may be over. Sustainable development may involve improvements in the quality of life for many but may necessitate a decrease in resource consumption. According to ecological economist Malt Faber, ecological economics is defined by its focus on nature, justice, and time. Issues of intergenerational equity, irreversibility of environmental change, uncertainty of long-term outcomes, and sustainable development guide ecological economic analysis and valuation.

Chapter 15:

Sustainable features of Chapter 8 & 13 designs, Impact on society

Sr. No.	Design Name	Estimated Cost (Rs.)	Duration (months)	Requirements	Benefits
1.	**Biogas Plant**	33,000	2-3	Within 1Year	Biogas to be used as a fuel
2.	**Primary Health Center**	4,64,871.10	1-2	Long term (2-3 years)	Reduce health issues
3.	**Post Office**	7,37,071.86.	2	Within 1Year	Provides customer services to public.
4.	**Public Library**	7,72,193.73	3	Long term (2-3 years)	To increase literacy ofvillage.
5.	**Agricultural Research center**	7,34,197	2-3	Within 1Year	Too familiar with new Farming Techniques and machineries.
6.	**Village Entrance Gate**	1,08,941	2-3	Long term (3-4 years)	Aesthetic and Heritage.
7.	**Internal Street Road**	1,57,353	3-4	Within 1Year	Easy Transportation.
8.	**Community hall**	26,74,500.00	2-3	Long term (2-3 years)	group activities, Information and other purposes.
9.	**Public Toilet**	4,68,000.00	2-3	Within 1Year	-It will improve sanitation facility. -It will be helpful to peoplewho don't have toilets in their home.
10.	**Overhead Reservoir**	20,92,274.45	8-10	Within 1Year	Water storage utility
11.	**Aanganwadi**	9,27,358.00	2-3	Within 1Year	To make better place for Education
12.	**ATM**	1,15,909.70	4-5	Long term (3-4 years)	Emergencies that require monetary exchange

Chapter 16:

Survey by Interviewing With Talati and Sarpanch

Sr.	Questions	Yes/ No	Remarks
1	What are the sources of income in village?	Yes	Farming, GIDC
2	What are the chances of employment in village?	Yes	GIDC
3	What are the special technical facilities in village?	No	
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?	Yes	
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?	Yes	
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?	Yes	
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	**21%**
18	Is village improvement is observed in comparative scenario from past to present?	Yes	
19	Is any unavoidable difficulty village people are facing? Any natural calamity is there?	No	
20	Life Living standard of girls and women is appreciated and uplifted in village?	Yes	

Chapter 17:

Irrigation / Agriculture Activities, Alternate Technics and Solution

Irrigation/Agriculture Activities:

Irrigation in India includes a network of major and minor canals from Indian rivers, ground water well based systems, tanks, and other rainwater harvesting projects for agricultural activities. Of this groundwater system is the largest. In 2013-14, only about 36.7% of total agricultural land in India was reliably irrigated, and remaining 2/3rd cultivated land in India is dependent on monsoon. 65% of the India ground water. Currently about 51% of the agricultural area cultivating food grains is covered by irrigation. The rest of the area is dependent on rainfall which is most of the times unreliable and unpredictable.

Indian govt launched a demand side water management plan costing INR6000 crore or USD854 million across 8,350 water stressed villages of 78 districts in 7 states - Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh - over five years from 2021-2022 to 2026-27, with the view to harvest rainwater, enhance water table, water recharge rate with village panchayat level water management plans. Most of the canal irrigation is in the canal network of Ganga-Yamuna basin mainly in the states of Punjab, Haryana, and Uttar Pradesh and somewhat in Rajasthan and Bihar, while small local canal networks also exist in the south in Tamil Nadu, Karnataka, and Kerala, etc. The largest canal in India is Indira Gandhi Canal, which is about 650 km long. India has an ambitious river linking national project to enhance the coverage of canal irrigated area, reduce floods and water shortage.

Drip Irrigation:

Drip irrigation is the most efficient water and nutrient delivery system for growing crops. It delivers water and nutrients directly to the plant's roots zone, in the right amounts, at the right time, so each plant gets exactly what it needs, when it needs it, to grow optimally. Thanks to drip irrigation, farmers can produce higher yields while saving on water as well as fertilizers, energy and even crop protection products.

How does it work?

Water and nutrients are delivered across the field in pipes called 'dripper lines' featuring smaller units known as 'drippers'. Each dripper emits drops containing water and fertilizers, resulting in the uniform application of water and nutrients direct to each plant's root zone, across an entire field.

Why do farmer prefer drip irrigation:

The reason is simple. Drip Irrigation not only delivers greater ROI compared to other of irrigation methods, it also gives farmers an efficient and simple way to operate their farms.

- Higher consistent quality yields
- Huge water savings: no evaporation, no run off, no waste
- 100% land utilization - drip irrigates uniformly in any topography and soil type
- Energy savings: drip irrigation works on low pressure
- Efficient use of fertilizer and crop protection, with no leaching
- Less dependency on weather, greater stability and lower risk

Fig 17.1 Drip Irrigation

Fig 17.2 Sprinkler Irrigation

How does drip irrigation good for plants?

Just like people, plants like to get their water and nutrients in a balanced way. Nobody wants to eat a month's worth of food in one day, and the same goes for plants. This is why drip irrigation applies water and nutrients frequently and in small doses, ensuring optimal growing conditions that help produce the highest yields possible.

Here's why plants are more productive with drip irrigation:

- High availability of water and nutrients
- Doses of water and nutrients tailored to plant's development needs
- No saturation and good soil aeration
- Avoids high salinity caused by excessive fertilizer application
- No wetting of foliage that can result in fungal diseases

Sprinkler Irrigation:

Sprinkler irrigation (also known as a water sprinkler or simply a sprinkler) is a device used to irrigate agricultural crops, lawns, landscapes, golf courses, and other areas. They are also used for cooling and for the control of airborne dust. Sprinkler irrigation is the method of applying water in a controlled manner in way similar to rainfall. The water is distributed through a network that may consist of pumps, valves, pipes, and sprinklers.

Irrigation sprinklers can be used for residential, industrial, and agricultural usage. It is useful on uneven land where sufficient water is not available as well as on sandy soil. The perpendicular pipes, having rotating nozzles on top, are joined to the main pipeline at regular intervals. When water is pressurized through the main pipe it escapes from the rotating nozzles. It gets sprinkled on the crop. In sprinkler or overhead irrigation, water is piped to one more central location within the field and distributed by overhead high pressure sprinklers or guns.

As there is large production of sugarcane in Ten village, sprinkler irrigation is most suitable and economical in these condition.

Chapter 18:

Social Activities – Any Activates Planned By Students

Subject: Apology for not visiting the village due to this Covid – 19 pandemic.

Respected ma'am

We hereby Umar Kapadia and Jash gupta mark and apology for not visiting our Ten village for social activities in current project work DPR, Part-2 due to Covid-19. As the second wave of novel corona virus was more fatal, we couldn't make it to visit the village. We tried many times to contact the village authority for awareness camp, social activities, Survey and For Techno Economic Survey form. But the second wave of covid-19 spread in village much more times as expected. Due to this the gram panchayat decided not let outsider enter in the village. Though, we have done our work by telephonic conversation.

Hope you understand our situation. We thank you for your invaluable support.

Chapter 19:

Ten Village SAGY Questionnaire

SAGY Baseline Household Survey Questionnaire

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: Ten Gram Panchayat: Ten Ward No.

Block: Bardoli District: Surat

State: Gujarat L S Constituency: Bardoli Parliamentary

1. Family Identity and Size

Name of Head of Household	Shailesh patel							Male/ Female	M
SECC Survey ID:		Family Size	6	Over 18	4	6 to 18	2	Under 6	0

2. Category & Entitlement Details (Tick as appropriate)

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

2. Adults (above 18 years)

Name	Age	Sex M/F / O	Disability Status Y/N	Marital Status[3]	Education Status[4]	Adhaar Card (Y/ N)	Bank A/C (Y/N)	Social Security Pension[5]
Varun Patel	34	m	No	Yes	SSC	Y	Y	N
Shailesh Patel	41	m	No	Yes	HSC	Y	Y	N
Ramila patel	33	F	No	Yes	7th	Y	Y	N
Ruchita patel	40	F	No	Yes	SSC	Y	Y	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
Mahesh patel	15	m	No	No	School	Yes	10th	Yes
Navna patel	12	F	No	No	School	Yes	6th	Yes

4. Children below 6 years

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

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

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

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

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

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

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

5. Hand washing

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

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

7. Do members take Regular Physical Exercise

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

8. Consumption of Tobacco

	Smoking	Chewing
Adults	Yes	Yes
Children	No	No

9. House & Homestead Data

Own House: Yes / No	No. of Rooms: 1-2
Type: Kutcha / Semi Pucca / Pucca	
Toilet: Private / Community / Open Defecation	
Drainage linked to House: Covered / Open / None	
Waste Collection System	Door Step / Common Point / No Collection System
Homestead Land: Yes / No	Kitchen Garden : Yes / No
Compost Pit: Individual/ Group/ None	Biogas Plant: Individual/ Group/ None

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

Source of Water		Distance
Piped Water at Home	Yes / No	
Community Water Tap	Yes / No	
Hand Pump (Public / Private)	Yes / No	0.1 km
Open Well(Public / Private)	Yes / No	0.5 km
Other (mention): over head Tank		0.5 km

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	596.1 Hec	2. Cultivable Area	481 Hec
3. Irrigated Area		4. Uncultivable Area	0.5 Hec

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
Sugar Cane		
Wheat		
Vegetables		

17. Livestock Numbers

Cows: 21	Bullocks: 3	Calves: 5
Female Buffalo: 4	Male Buffalo: 3	Buffalo Calves: 3
Goats/ Sheep: 8	Poultry/ Ducks: 0	Pigs: 0
Any other: Type _____		No. ____
Shelter for Livestock: Pucca / Kutcha / None		
Average Daily Production of Milk(Litres): 14 Lit.		

18. What games do Children Play
- Mobile games
- Cricket
- Football

19. Do children play musical instrument (mention)
- Tabla

Schedule Filled By: Umar Kapadia
Principal Respondent:
Date of Survey: 21/6/21

SAGY Panchayat Details Survey Questionnaire:

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: Ten

b. Block: Bardoli

c. District: Surat

d. State: Gujarat

e. Lok Sabha Constituency: Bardoli Parliamentary

f. Number of Wards in the Gram Panchayat: 1

g. Number of Villages in the Gram Panchayat: 1

h. Names of Villages: TEN, BARDOLI

Demographic Information

Number of Households 1394 Total Population 6251 Male 3252 Female 2999

SC HHs 643 ST HHs 1327 OBC HHs – Other HHs –

I. Access to Infrastructure / Facilities / Services

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
a.	ANM/ Health Sub Centre	NO	3km
b.	Nearest Primary Health Centre (PHC)	NO	3km
c.	Nearest Community Health Centre (CHC)	NO	3km
d.	Nearest Post Office	NO	5km
e.	Nearest Bank Branch (Any)	NO	5km
f.	Nearest Bank with CBS Facility	NO	5km
g.	Nearest ATM	NO	5km
h.	Nearest Primary School	Yes	less than 1km
i.	Nearest Middle School	Yes	Less than 1km
j.	Nearest Secondary School	Yes	Less than 1km
k.	Nearest Higher Secondary School / +2 College	NO	3km
l.	Nearest Graduate College	NO	5km
m	Nearest ITI / Polytechnic Centre	~~No~~ Yes	0.5km
n	Kisan Seva Kendra	Yes	less than 1km

1

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

	Infrastructure Facilities / Services	Located within the GP Yes (Y)/No (N)	If located elsewhere (N), distance from the GP office
o	Agriculture Credit Cooperative Society	N	
p	Nearest Agro Service Centre	Y	
p	MSP based Government Procurement Centre	N	
q	Milk Cooperative /Collection Centre	N	
r	Veterinary Care Centre	Y	
s	Ayurveda Centre	Y	
t	E – Seva Kendra	Y	
u	Bus Stop	Y	
v	Railway Station	No	5 K.M
w	Library	No	
x	Common Service Centre	Y	

IV. Sports Facilities in the Gram Panchayat

a. Number of Play Grounds in the GP: Total 2 Public _____ Private _____

b. Mini Stadium : _____ 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: No.

c. Schools (Number)

Primary Private: 1 Primary Govt.: 2

Middle Private: 1 Middle Govt.: 2

Secondary Private: 1 Secondary Govt.: 0

Higher Secondary Private: 0 Higher Secondary Govt: 0

VI. Public Distribution System

	Item	Private Contractor	Women's SHG	Gram Panchayat	Cooperative	Other (Mention)	Location in GP (mention Location)	If outside GP, Location & distance from GP HQrs)
a.	Cereal (~~Rice~~/ Wheat/ Millets)	Yes					0.5 km	
b.	Kerosene	No						
c.	Other (mention)							

2

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	TEN	
b.	Hand Pump Coverage in Villages:	Covered ✓ / Not Covered	TEN	
c.	Coverage under Covered Drains:	Covered ✓ / Not Covered	TEN	
d.	Coverage under Open Drains:	Covered ✓ / Not Covered	TEN	
e.	Villages with Household Electricity Connection (Numbers)	Connected ✓ / Not Connected	TEN	

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	491 Hec	d.	Pasture / Grazing Land	No data	g.	Check Dam	0
b.	Irrigated Land	–	e.	Forests/ Plantations		h.	Wells/Bore Wells	1
c.	Un-irrigated Land	0.5 Hec	f.	Other Common Land		i	Tanks /Ponds	2 / 1

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

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire
(Note: Please aggregate information from village level questionnaires wherever relevant)

IX. Parameters relating to Households & Institutions

		Number
a)	Number of eligible Households for pension (old age, widow, disability)	60-65
b)	Number of Households receiving pension (old age, widow, disability)	60-65
c)	Number of eligible Households who are not receiving pension	-
d)	Number of Households eligible for Ration Card	Y-1500
e)	Number of eligible HHs having ration cards	Yes
f)	Number of households covered under RSBY (Rashtriya Swasthya Bima Yojana)	Y-300
g)	Number of HHs covered under AABY (Aam Aadmi Bima Yojana)	Y-300
h)	Number of active Job Card holders under MGNREGA	500
i)	Number of Job Card holders who completed 100 days of work during 2013-14	600
j)	Number of shops selling alcohol	~~4~~0
k)	Number of BPL families	51
l)	Number of landless households	51
m)	Number of IAY beneficiaries	Yes
n)	Number of FRA[2] beneficiaries	Yes
o)	Number of Community Sanitary Complexes	Y-2
p)	Number of Households headed by single women	2-5
q)	Number of Households headed by physically handicapped persons	Y-21
r)	Total number of Persons with Disability in the village	Y-21
s)	Number of SHGs	Yes
t)	Number of active SHGs	Yes-4
u)	Number of SHG Federations	NO
v)	Number of Youth Clubs	Yes
w)	Number of Bharat Nirman Volunteers	Yes

Name and Signature of Surveyor and Respondent'

Umar Kapadia			21/6/21
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

SAGY Baseline Village Details Survey Questionnaire:

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: Ten

b. Ward Number: _____

c. Gram Panchayat: Ten

d. Block: Bardoli

e. District: Surat

f. State: Gujarat

g. Lok Sabha Constituency: Bardoli Parliamentary

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

i. Names of Habitations / Hamlets: TEN

Demographic Information (As per 2011)

Number of Households 1394 Total Population 6251 Male 3252 Female 2999

SC HHs 643 ST HHs 1317 OBC HHs - Other HHs -

II. Access to Infrastructure/Amenities etc.

i.	Access to Infrastructure / Facilities / Services	Located in the Village Yes (Y)/No(N)	If located elsewhere (N), distance in kms from the village
a.	Nearest Primary School	Yes	less than 1km
b.	Nearest Middle School	Yes	Less than 1km
c.	Nearest Secondary School	Yes	Less than 1km
d.	Kisan Seva Kendra	Yes	Less than 1km
e.	Milk Cooperative /Collection Centre	NO	5km
g.	Health Sub Centre	NO	5km
h.	Bank	NO	2km
i.	ATM	NO	2km
j.	Bus Stop	NO	2km
k.	Railway Station	Yes	2km

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

1

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

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

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): 2
b.Mini Stadium : _____ Yes(Y) /No (N)

vii. Education, ICDS
a. Number of Anganwadi Centres: 6
c. Schools (Number)
Primary Private: 1 Primary Govt.: 2
Middle Private: 1 Middle Govt.: 2
Secondary Private: 1 Secondary Govt.: _____
Higher Secondary Private: 1 Higher Secondary Govt: _____

2

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

viii. Land Category		Area in Acres		Land Category	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	481 Hec	d.	Pasture / Grazing Land	No data	g.	Check Dam	0
b.	Irrigated Land	–	e.	Forests/ Plnatations		h.	Wells/Bore Wells	1
c.	Un-irrigated Land	0.51 Hec	f.	Other Common Land		I	Tanks /Ponds	2/1

ix. Entitlement Related Parameters		
1	Number of active Job Card holders under MGNREGA	Y-500
2	Number of active Job Card holders who have completed 100 days of work	Yes
3	Number of shops selling alcohol	NO
4	Number of BPL families	51
5	Number of landless households	Y-50
6	Number of IAY beneficiaries	Y-250
7	Number of FRA beneficiaries	NO
8	Number of common sanitation complexes	Y-6 Grind
9	Number of SHGs	11
10	Number of active SHGs	4
11	Existence of SHG Federation in the Village (Yes / No)	NO
12	Number of Youth Clubs	Yes
13	Number of Bharat Nirman Volunteers	Yes

Name and Signature of Surveyor and Respondent'

Umar Kapadia Umar			
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

Chapter 20:

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

DDO-Collector email sending soft copy attachment in the report for Vishwakarma Yojana phase VIII by Gujarat Technological University.

Mohammed Umar Kapadia <umarkjhdp1506047@gmail.com> 12:59 (0 minutes ago)

to collector-sur, ddo-surat, mam-bardoli

Respected Sir,

I am Umar Kapadia – 180063106047, Jash Gupta – 180063106032 from Bhagwan Mahavir College of Engineering & technology, Vesu, Surat affiliated to Gujarat Technology University-GTU. GTU has been assigned to Vishwakarma Yojana VY in which students survey various villages and Design various amenities to deliver it to them making them ideal for living a better life as per requirements & village problem statements.

The project is done for the development of Ten Village. Ten village is located in Bardoli Tehsil of Surat district Gujarat, India. It is situated 2Km away from sub-district headquarter Bardoli and 32 Km away from district headquarter Surat. As per 2009 states, the location code or village pin code of ten village is 394601. As we found there were many lacking facilities in the village. To cover these facilities and for betterment of the village we have provided 12 Designs of different facilities. We hope that you will consider our Ideas of Development. Thank you so much for your valuable time and consideration.

Ten, Bardoli VY Ph...

Chapter 21:

Comprehensive report for the entire Village

A comprehensive report is intended to explore a topic or an idea in great detail. In this report details of entire village (Ten village) are covered.

Our allocated village is Ten village. Ten village is located in Bardoli Tehsil of Surat district Gujarat, India. It is situated 2Km away from sub-district headquarter Bardoli and 32Km away from district headquarter Surat. As per 2009 states, Ten village is also a gram panchayat. The total geographical area of village is 569.1 hectares. Ten has a a total population of 6,251 peoples as per 2011 census. There are about 1,349 houses in ten village.

Under the guidance of Vishwakarma yojana we have done techno economic survey through which we have found many lacking facilities in the village. We have tried to design some of these facilities for better development of the village.

List of facilities designed for Ten village are as follow,

1. Biogas Plant
2. Primary Health Center
3. Post Office
4. Public library
5. Agriculture Research Center
6. Village Entrance Gate
7. Internal Street Road
8. Community Hall
9. Public toilet
10. Overhead Water Reservoir
11. Aanganwadi
12. ATM

1. Biogas Plant:

Biogas plant is one of the plants for renewable energy sources. It transforms rural village in to clean village and provide gas as energy source and gives fertilizer at end. Daily 5000 - 5500 kg cow dung is fed into the plant. The amount of cow dung fed varies with number of cattle present (500/animal/day). Poultry waste and kitchen waste can also be added if it is available. Entire operation of biogas plant is done by the woman in the household which calls upon extra efforts to be put in by her. The gas collected in the dome after digestion is used as and when required. The usability of gas depends on its pressure inside the dome.

Cost of construction: 33,000rs

2. Primary Health Center:

PHC is the first contact point between village community and the medical officer. The PHCs were envisaged to provide an integrated curative and preventive health care to the rural population with emphasis on preventive and promotive aspects of health care.

Cost of Construction: 4.64 lacks

3. Post Office:

A post office is a public facility that provides mail services, such as accepting letters and parcels, providing post office boxes, and selling postage stamps, packaging, and stationery. Post offices may offer additional services, which vary by country. These include providing and accepting government forms (such as passport applications), and processing government services and fees (such as road tax, postal savings, or bank fees).

Cost of Construction: 7.37 lacks

4. Public Library:

A library is a collection of resources in a variety of formats that is (1) organized by information professionals or other experts who (2) provide convenient physical, digital, bibliographic, or intellectual access and (3) offer targeted services and programs (4) with the mission of educating, informing, or entertaining a variety of audiences (5) and the goal of stimulating individual learning and advancing society as a whole.

Cost of Construction: 7.72 lacks

5. Agriculture Research Center:

Agricultural research can be broadly defined as any research activity aimed at improving productivity and quality of crops by their genetic improvement, better plant protection, irrigation, storage methods, farm mechanization, efficient marketing, and a better management of resources.

Cost of Construction: 7.34 lacks

6. Village Entrance gate:

Village entrance is grand entrance at very starting of road for reaching village. It shows villages entrance and gives warm welcome to all the visitors. It provides pleasant aesthetics of the village entrance. This entrance can also be used to block in coming or outgoing traffic in the time of need.

Cost of Construction: 1.10 lacks

7. Internal Street Road:

Roads play a very important role in the transportation of goods and passengers for short and medium distances. Road transport system establishes easy contact between farms, fields, factories and markets and provides door to door service.

Cost of Construction: 1.57 lacks

8. Community Hall:

Generally, for different gathering occasions/programs villages uses temporary tent called mandap.

This tent is made on road or open spaces which create lot of problems of people in surrounding area. Therefore, community hall is provided. Community hall means the use of building for community activities and generally not used for commercial purposes, and the control of which is vested in the Town of Killam, a local board or agent thereof.

Cost of Construction: 26.74 lacks

9. Public Toilet:

Toilets may also be called lavatories, washrooms or bathrooms in different functional, physical, social and cultural situations. A public toilet is a toilet built and/or managed by a government or public agency, or a privately managed toilet, which is available for public access. Sometimes it is free to use otherwise basic fees is collected from users.

Cost of Construction: 4.68 lacks

10. Overhead Water Reservoir:

Water tanks are used to provide storage of water for use in many applications, drinking water, irrigation agriculture, fire suppression, agricultural farming, both for plants and livestock, chemical manufacturing, food preparation as well as many other uses. Water tank parameters include the general design of the tank, and choice of construction materials, linings. Various materials are used for making a water tank: Concrete, Steel, Stone, plastics, fiberglass.

Cost of Construction: 20.92 lacks

11. Aanganwadi:

Anganwadi is a type of rural child-care center in India. 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 counseling and supply, nutrition education and supplementation, as well as pre-school activities.

Cost of Construction: 9.27 lacks

12. ATM:

An automated teller machine (ATM) is an electronic banking outlet that allows customers to complete basic transactions without the aid of a branch representative or teller. Anyone with a credit card or debit card can access cash at most ATMs. As India is turning digital, it is imperative that rural communities are also benefitted from this wave and not left behind.

Construction cost for making one ATM cabin will be 1.15 lakh rupees and plus cost of ATM will be approximately 6 lakhs rupees overall cost should be 7.15 lakh rupees.