DETAIL PROJECT REPORT

VISHWAKARMA YOJANA: VIII
AN APPROACH TOWARDS RURBANISATION
MANEKPUR Village

VALSAD District

PREPARED BY

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
Mediwala Prince	Civil Engineering	170860106008
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COLLEGE NAME

LAXMI INSTITUTE OF TECHNOLOGY, SARIGAM

NODAL OFFICER'S NAME

MR. AMITKUMAR R. CHAUHAN

COLLEGE LOGO

YEAR: 2020-21

GUJARAT TECHNOLOGICAL UNIVERSITY
Chandkheda, Ahmedabad – 382424 Gujarat

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CERTIFICATE

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

Detail Project Report for,

VILLAGE - MANEKPUR

DISTRICT - VALSAD

Under

Vishwakarma Yojana: Phase-VIII

in partial fulfillment of the project offered by

GUJARAT TECHNOLOGICAL UNIVERSITY, CHANDKHEDA

during the academic year 2020-21.

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

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Date of Report Submission:	
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VY-Nodal Officer Name and Signature:	**Prof. Amit R. Chauhan**
Internal (Evaluator) Guide Name and Signature:	**Prof. Amit R. Chauhan**
College Name:	**LAXMI INSTITUTE OF TECHNOLOGY, SARIGAM**
College Stamp:	

ABSTRACT

The Vishwakarma Yojana 2020 – Phase VIII concerns with rurbanisation of the village which leads to developing a rural village into a smart village along with urban facilities. It is a step towards rurbanization of villages by the Government of Gujarat handed over to GTU. The vision of Vishwakarma Yojana is to reduce and remove the rural-urban gap through infusion of urban patterns and services in rural systems to ensure provision of quality lifestyles and livelihood options while keeping the basic rural soul intact. By studying the village life with respect to delivery of basic needs, the main aim is to reimagine, redesign, rejuvenate and strengthen the community life. It provides the benefits of practical work experience to engineering students and they can apply their technical knowledge in the development of infrastructure in rural development.

According to census 2011 information data, the location code/village code of Manekpur village is 523660. Manekpur village is in the tehsil of Umbergaon taluka of Valsad district in Gujarat state of India. It is situated 25 km far away from the sub-district headquarters of Umbergaon and 45 km away from district headquarters of Valsad.

The total geographical area of the village is 464.71 ha. Manekpur has a total population of 2,919 people. There are about 589 houses in the village itself. Umbergaon, Vapi, Daman and Diu, Silvassa are the nearby cities to Manekpur. Vapi is the nearest town to Manekpur which is approximately 20 km away.

According to the techno-economic survey we conducted in the Manekpur village; we found out that the village is having 4 numbers of Anganwadi, and 3 numbers of primary schools for educational purposes. It has a Gram panchayat & Post office in one building attached to one another on either side. The village doesn't have any kind of drainage system, public sanitation, and sustainable structure in it.

From the gap analysis of the allocated village, we have given the design and approximate construction cost of the project for rainwater harvesting plant, public toilet, post office, community hall, bank with an ATM facility and gram panchayat. Though these structures are not enough to make a village Smart, it will make Manekpur to look like an ideal, whereas in part 2 we will give designs to make it as a smart village. The designs we will be proposing for part 2 will be of a public library, bus stop, pond recreation, etc. which will help to make the village a smart and urban area.

Key Words: Village development, Rurbanisation, Manekpur, Maroli, Sarigam, Social development, Socio-cultural development, Sustainable development, Physical development, Smart Village needs, Smart Village development

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

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ABBREVIATIONS

SHORT NAME	FULL NAME
TDO	Taluka Development Officer
DDO	District Development Officer
RO	Reverse Osmosis
LED	Light Emitting Diode
CCTV	Closed Circuit Television
Wi-Fi	Wireless Fidelity
GIS	Geographic Information System
SAGY	Sansad Adarsh Gram Yojana
PHC	Primary Health Centre
CHC	Child Health Centre
UVG	Urban Village Groups
NSSO	National Sample Survey Office
ICT	Information and Communications Technology
CIO	Chief Information Officer
IoT	Internet of Things
DAS	Distributed Antenna System
GD	Greenfield Development
GIFT	Gujarat International Finance Tec (GIFT) City
CHP DH	Combine Heat and Power – District Heating
IPR	Intellectual Property Right
STP	Sewage Treatment Plant
BSNL	Bharat Sanchar Nigam Limited
NASSCOM	National Association of Software and Services Companies
DeitY	Department of Electronics & Information Technology
ERNET	Education and Research Network
GDP	Gross Domestic Product
ELCB	Earth Leakage Circuit Breaker
ATM	Automated Teller Machine
CD	Community Development
Ha	Hectare
CT	Census Town
INA	Industrial Notified Area
PMAYG	Pradhan Mantri Awas Yojana – Gramin
VOCs	Volatile Organic Compounds
UV	Ultra-Violet
PVC	Poly Vinyl Chloride
CI	Cast Iron
URDPFI	Urban & Regional Development Plans Formulation & Implementation
VY	Vishwakarma Yojana

Summary of Project Villages

Village Features	Allocated Village	Ideal Village	Smart Village
Village Name	Manekpur	Maroli	Sarigam
Taluka	Umbergaon	Umbergaon	Umbergaon
District	Valsad	Valsad	Valsad
Sarpanch	Kundaben Davaria	Lataben Marolikar	Hansaben Kombhaya
Distance (km)	15	17	22
Population (as per 2011 Census)	2919	15678	19903
Pin-code	396120	396130	396155
Survey	Techno-Economic Survey	Techno-Economic Survey	Smart Village Survey
Facilities	Wells, Handpumps, Water Tanks, Road Infrastructure, Health & Educational Facilities (Up to HSC only), etc.	Wells, Handpumps, Good Road Network, 24*7 Electricity, Sanitation, Irrigation, Health & Education (Up to HSC), etc.	Wells, Handpumps, Sanitation, Health & Educational Facilities (Up to UG, PG courses), 24*7 Electricity, Good Connectivity to NH, etc.
Technology	Internet Connectivity, Wi-Fi in Government Buildings and in Private Companies	Network Connectivity, C. C. T. V., New Advancements in Irrigation, New Technologies in Construction, etc.	Internet Connectivity, Wi-Fi in Government Buildings and in Private Companies, Use of Advance Machineries, Online Education, etc.
Problems	Drainage Facility, Bank, ATM, Community Hall, Sanitation, Non-Renewable Resources, etc.	Water Tanks, Drainage Facility, Recreation Centre, Bank, Renewable Resources	Village Roads, Drainage, Renewable Resources, etc.

Table 1 Summary of Project Villages

Chapter 1. Ideal Village visit from district of Gujarat state (Civil & Electrical Concept)

1.1. Background & Study Area Location

The Vishwakarma Yojana 2020 deals with rurbanisation of the village which leads to developing a rural village into a village with urban facilities. So, in accordance with that, we have taken Maroli as an ideal village i.e., the smart village should acquire minimum requirements that an ideal village should have.

Maroli is a village located in the Valsad district in the state of Gujarat, India. Its coordinates are 20.2979° N, 72. 7578° E. It is located 50 KM towards South from District headquarters Valsad and 405 KM from State capital Gandhinagar. It's pin-code is 396130 and its postal head office is Dhodipada.

The nearby villages from which Maroli can be approached are: Kalgam (3 KM), Sarai (4 KM), Mamakwada (5 KM), Seronda (5 KM), Fansa (5 KM), etc.

The nearby cities from which Maroli can be approached are: Umbergaon, Vapi, Daman and Diu, Amli, Dadra Nagar Haveli, etc.

It is located near the border of the Valsad district and Palghar district. Palghar district is in the south direction towards this place. It is near to the Maharashtra State Border, and it is near to Arabian sea so there's a chance of humidity in the monsoon weather. The map of Maroli and its satellite view is given below:

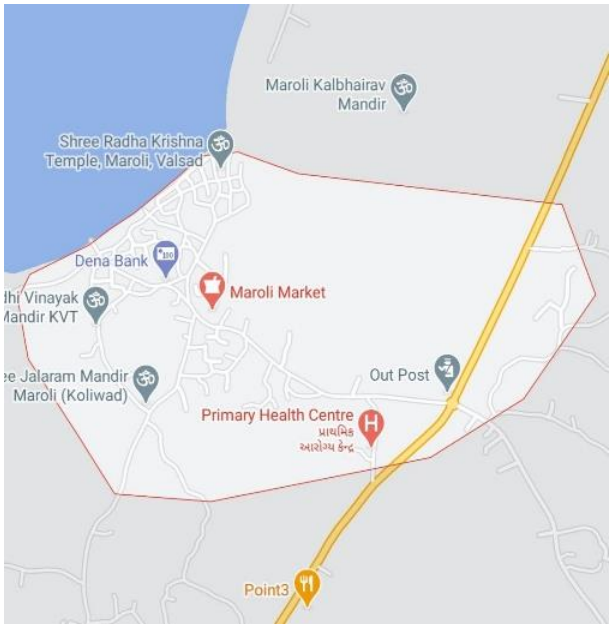


Figure 1 Map of Maroli

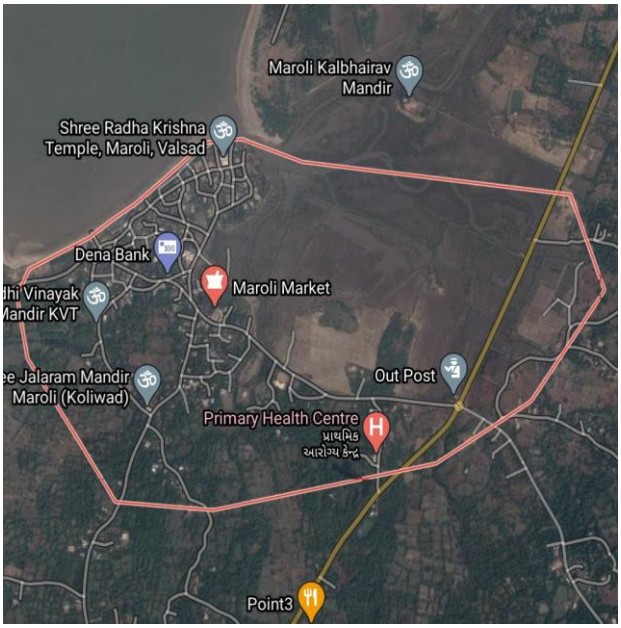


Figure 2 Satellite View of Maroli

1.2. Concept: Ideal Village, Normal Village

Ideal Village

An ideal village which is to be considered should have perfect sanitation facilities, all cottages and houses should have a proper light & ventilation system and should have a courtyard to grow vegetables and plants or for domestic use and to house their cattle. The village road lanes should be

free from dust and should also have proper drainage system with lighting systems. An ideal village should have a community hall to set up a meeting of Panchayat or else, aanganwadi and schools for the kids, secondary schools for proper education for the future of students. The villages should be free from threats and other miscellaneous activities so that any outsider can be safe in the village. Also, villages should have enough water availability for the purpose of irrigation and household utilities.

Normal village

A rural area is an open area of land that has few homes or other buildings, and not very many people. Rural area's population density is very low. Many people live in a city, or urban area. Their houses and businesses are located very close to one another. These rural areas may develop randomly based on natural vegetation and its fauna available in a region, but urban settlements are proper, planned, built up according to a process called urbanization. Rural people have low living standards, and they lack basic physical amenities.

1.2.1. Objectives

The major objectives that are to be followed for an ideal/normal village are as follows:

- The prior objective is to prevent distress migration from rural to urban areas, which is a common phenomenon in India's villages due to lack of opportunities and facilities which should be there for a decent standard of living.
- Make the village as a rurban core so that it could attract resources for the development of other villages in its vicinity.
- Provide easier, faster, and cheaper access to other urban/rural markets for commercializing of agricultural products or other marketable commodities which are produced from a particular village.
- To contribute towards social empowerment by engaging all sections of the community in the task of village development or for a meticulous work/section/program.
- To be creative in the limit of being sustainable cooperative living for inclusive and rapid development.

1.2.2. Example / Live Case Studies of Ideal Village of India / Gujarat

Case Study of Model Village from the state of Gujarat – Punsari

"Swarajya to Surajya (good governance)" has been hailed as the mantra for rural development in the state of Gujarat. The good governance model of this prosperous state from western part of India has been a matter of study for quite some time now. Several schemes have been launched in the past decade, such as Adarsh Gram, Smaras Gram, Tirth Gram, Sardar Awas, and Paawan Gram, to develop rural areas in Gujarat. The present paper adopts a constructive approach and aims to explore and understand the successful experiment of Punsari Village. The official document of the state government of Gujarat on smart and model village defines a model village as "A village which has foresight for the development and proper planning to keep the village clean, healthy, green, pollution free, crime free, and disease free with coordination of various community development and welfare schemes of Government. Smart village means a village which wishes to increase facilities for the citizens by taking decisions democratically. Smart village means a village in which the youth, women, farmers, village artisans, backward, and deprived people may get equal opportunity for development". These guidelines aim to offer a design of rural development that focuses not only on improving economic indicators of development but also on bettering the social indicators of development such as health, sanitation, education, women's empowerment, inclusiveness, etc. In this process, the Gram Panchayat must play a pivotal role. The present programme was inspired by the success of a small village from the District of Sabarkantha in Gujarat called Punsari. In the following section a detailed discussion on how this transformation took place is given. This is based on the information collected

through semi-structured in-depth interviews with the former village headman and current village headwoman.

About Village: Punsari

Punsari is located approximately 80 kilometres away from the state capital of Gandhinagar in Gujarat. It has had phenomenal success in the past decade under the leadership of a visionary and missionary Sarpanch (village headman) Mr. Himanshu Patel (who served as the Sarpanch from 2006 to 2016). The village has received several awards from the state as well as national government for its outstanding achievements and has become extremely popular across the country. This was the most important reason that motivated the author to visit and study this model village personally, to understand and explore how this transformation was made possible. 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.

Infrastructure Development. The most important concern in rural development is to provide basic amenities to people living in the rural area. Punsari makes it out in this regard as it has constructed a RO plant and since then provided house-to-house pipe connections to supply chlorinated water. It also has its own substation for electricity generation and 100% coverage of all streets with LED streetlights. The public address system with 120 waterproof speakers for announcing information and spreading messages has been another key feature of this village. The village head person uses this public announcement system to share what she thinks, plans, and is doing at the gram Panchayat. The entire village has been put under CCTV surveillance, which has helped to bring down crime rate to almost zero per cent. Each household has a personalized lavatory and the whole village has a well-designed drainage and storm water disposal system. Atal Express is a free bus service available for commuting to all the villagers. Punsari is the first fully Wi-Fi-covered village in India. There are also plans to do GIS mapping for the better implementation of many government schemes.

Education for all and free for all is the mantra this village has aspired to adopt. Punsari has five primary schools and four secondary schools. The classrooms 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. The Mid Meals programme 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.

Health, Sanitation & Women Empowerment. Punsari has a 24/7 primary health centre equipped with a pharmacy and a library. It also has a 24/7 maternity ward to encourage institutional deliveries in the village. In fact, the village has been successful in achieving the goal of 100% institutional deliveries. It has also been able to materialize the objective of 100% immunization and zero percent infant and maternal mortality rate. The waste collection system offers door-to-door collection service. The street polluters are heavily fined. There are 109 women self-help groups in the village, which has helped and changed the lives of more than 1200 women involved in them and provides vocational training.

Democratic Governance. A team of 22 full-time and 47 part-time employees along with the elected officials of the gram Panchayat under the leadership of village head person run this local unit. The village has developed an effective mechanism to redress grievances through a toll-free number. A complaint register is maintained to ensure timely grievance redress. A coordination committee involving elected representatives and government officials works tirelessly to achieve the goals of good governance.

1.2.3. The idea of a Modern / Smart village

Smart Village is a concept adopted by national, state, and local governments of India, as an initiative focused on holistic rural development. It has been derived from Mahatma Gandhi's vision of Adarsh Gram (Ideal Village) and Swaraj (Self Reliance). Honourable Prime Minister Narendra Modi has launched Sansad Adarsh Gram Yojana (SAGY or SAANJHI) on 2nd October 2014, which is the Gandhiji's birthday, in addition to Smart Cities and Digital India, as a development programme for India. The Parliamentarian's Model Village Scheme's main goal is for each Member of Parliament and Minister to adopt a rural village and develop it into a model by 2019 under the SAGY guidelines. The vision of SAGY is an integrated village development plan, encompassing personal, human, social, and economic dimensions.

1.2.4. Ancient history civil concept about Indian village / other country's perspective about village and its new development

The village in India holds a unique place, both in the social and economic spheres. Historical review of rural development gives us ideas not only about different programmes of the past but shows us the whole idea of changing and emerging concepts, approaches and strategies or its implementation. It becomes clear that the concept of Rural Development is interwoven in the heritage of Indian culture; it is as old as mankind. It dates to the seventeenth century with some voluntary efforts from the Quaker movement to the freedom movement of India and other movements like Srinikiten, Marthandam, Gurgaon Experiment, Vadodara Experiment. The policies and programmes during and after the period of Gandhiji are highly influenced by his ideas and philosophy of Sarvodaya, Village Development, All round Village services, Samagra Gram-Seva, Panchayati Raj and non-violent economy etc. After independence, rural development has taken a well-planned professional shape from a voluntary approach. It has become a government affair with a planning-by-planning commission. The review of the first to eleven five-year plan gives an idea of the importance and concern given to rural development. Various programmes and policies for rural development are introduced. Thus, it has been understood that Rural Development was, is and will be going to be a major concern for development policy, planning and implementation. Volunteered efforts before independence paved the basis for concrete policies for rural development, be it creation of separate ministry, separate department in planning commission, legal framework, political will and one of the important national agenda today.

1.3. Detail study (Socio-Economic, Physical, Demographic and Infrastructure details) of Ideal village / Smart Village with photograph

1. Socio-economic Details

Major sources of income in the village	Type	Percentage (including females)
1	Agriculture	30%
2	Fishing	20%
3	Labor Work	50%

Table 2 Socio-Economic Details

In case of educational details, the village has Aanganwadi (25 Nos.), Primary school (6 Nos.), Secondary school and High school (with cricket ground) in it. One of the schools named **Adarsh Bunyadi Shala Maroli** is the school which has all facilities, and it is located near main road of the market besides Sai Baba Mandir.

2. Physical Details

Maroli Village, with population of about 16,000 is Umbergaon sub district's the 2nd most populous village, located in Umbergaon sub district of Valsad district in the state Gujarat in India. Total geographical area of Maroli village is 19 km² and it is the 3rd biggest village by area in the sub district. Population density of the village is 838 persons per km².

Nearest town of the village is Umbergaon and distance from Maroli village to Umbergaon is 25 km. The village has its own post office and the pin code of Maroli village is 396130. The village comes under Maroli panchayat. Umbergaon is the sub district headquarter and the distance from the village is 25 km. The district headquarter of the village is Valsad which is 57 km away. 1.57 km². (8%) of the total village's area is covered by forest.

3. Demographic Details

Census Parameter	Census Data
Total Literacy rate %	72.6 % (11378)
Female Literacy rate	32.4 % (5085)
Male Literacy rate	40.2 % (6293)
Working Population %	35.7 %
Child (0 -6) Population by 2011	1522
Girl Child (0 -6) Population % by 2011	47% (715)

Table 3 Demographic Details

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2011	15678	8029	7649	3081

Table 4 Census Data

4. Geographic Details

Sr. No.	Description	Information
1.	Coordinates of Village	21.0239°N, 72.8886°E
2.	Total Area (in ha)	1072.46
3.	Residential Area (in ha)	3.00
4.	Forest Area (in ha)	4.43
5.	Irrigative Land Area (in ha)	576.73
6.	Non-Irrigative Land Area (in ha)	445.99
7.	Vacant Land Area (in ha)	12.30
8.	Water bodies	3 Nos. of Pond
9.	Nearest Town with Distance	Umbergaon (CT) (25 Kms.)

Table 5 Geographic Details

5. Infrastructure Details

Sr. No.	Infrastructure Type	Nos.	Condition
1.	Panchayat Office	2	Normal
2.	Polling booth station	5	Normal
3.	Birth & Death Certificate issuing dept.	1	Normal
4.	Community hall	3	Good
5.	Road Island	1	Good

6.	P. H. C.	1	Good
7.	C. H. C.	1	Good
8.	Post-Office	1	Bad
9.	Main Roads	-	Normal
10.	Village Approach Road	-	Good

Table 6 Infrastructure Details

1.4. SWOT analysis of Ideal Village / Smart Village

S - STRENGTH	O - OPPORTUNITY	W - WEAKNESS	T - THREATS
• Good Connectivity to Village • C. C. T. V. Camera Facility • Traffic Regulation Board on Roads • Education Facilities • Irrigation Activities • Fishing Activities • Sufficient Water • 24*7 Electricity	• Re-Use of Waste • Use of Modern Technology • Better Educational Systems • Weekly Seminars in Schools	• Free Wi-Fi Connection • Banking Facilities • Drainage System • Lack of Maternity Hospital	• Waste Disposal • Migration of People • Slow Development

Table 7 SWOT Analysis

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

Looking towards the condition of the ideal village, a set of different kinds of prospects can be put up.

- As we know due to the pandemic crisis, the amount of electrical consumption is more than previous data, and it is increasing day by day. So, to sustain for the future a particular village can set up a solar power plant project to feed a particular area and could be self-dependent.
- Going further about another renewable energy like wind energy, tidal, hydro energy etc. can also be taken under consideration as the ideal village is near to Arabian Sea and so these can act as beneficiaries.
- Future underground wiring systems can also be constructed so they look as beautiful as well as can get rid of falling poles in monsoonal weather.
- Moving ahead in the line the village must think of a Wastewater Treatment Plant and Solid Waste Management Plant, if a large amount of waste generation takes place.
- Creating a Green Building Infrastructure by converting a normal village into an eco-friendly village can also be a great step towards development.
- Overall developing a village by using Modern Planning Technique.
- Improvement in the existing facilities.
- Increasing the living standards of the people so that they can apply modern techniques.

1.6. Benefits of the visits of Ideal Village / Smart Village

By taking a visit to an ideal village, we understood different types of circumstances and opportunities faced by the people of the village. We learnt the facilities and different types of Yojana/Government Schemes that could be beneficial to a village, also in addition we saw how the people are lacking to pursue the amenities from the government.

A new thing we learnt is about SWOT (STRENGTH, WEAKNESS, OPPORTUNITIES & THREATS) analysis, by acquiring this thing a person can give an overview of a village in a short

explanation. We learnt how to interact with higher authorities of the village like Sarpanch, Talati, People of village itself and many other government officers. We also gained knowledge about preserving the environment and to make practical use of available energy sources. The most beneficial skill for a civil engineer is conceiving a survey inside a village by being a student, who we gained during this survey.

1.7. Civil aspects required in Ideal Village / Smart Village

- Inhabitants –
  A village is formed, governed, and maintained by its villagers. The people of an ideal village should be honest and hard-working. They should possess qualities like tolerance to every faith and religion, brotherhood, and unity. They should live like a large family and help one another in the hour of need. They should have a sense of discipline and a spirit of service before self. They should keep to themselves of not only the happenings of the village but also of the country and the world. Simple living and high thinking should be their motto in life.

- Basic Infra-structures –
  Besides the people, an ideal village should have the following basic infra-structures. Also, the ideal village should have decent quality government buildings like Panchayat building, public latrines & toilets, PHC & CHC, Hospitals (Government or Private), etc.

- Good Connectivity –
  Good connectivity is one of the most essential requirements of an ideal village. The village should be well-connected to other parts of the country by roads and by rails, if possible. The streets and lanes of the village should also be well maintained so that people can easily commute from one part to another. The village should have decent quality all-weather roads of bitumen and streets should have road material like cement concrete or paver blocks.

- Houses –
  The houses should be neat and clean. They should be well-ventilated to allow free flow of light and air. There should be good arrangements for proper sanitation and drainage systems.

- Sufficient sources of Potable water –
  An ideal village should have a good supply of clean drinking water. There should be enough wells, tube-wells and even submersibles to meet the needs of the villagers. It would help everyone get good drinking water. There should also be separate ponds for villagers to take baths and to get water for their cattle.

- Proper Sanitation and Drainage Facilities –
  An ideal village should have a good system of sanitation and drainage so that dirty water and waste can be easily drained out. It would help the village keep clean and free from many diseases caused by filthy water. It would also save the villagers from waterlogging during the rainy season.

- Pastureland for Cattle –
  Every villager living in a village keeps cattle. There should be enough pastureland for grazing their cattle. It should be within the village, at a distance from the houses or just outside the village.

- Food and Fodder –
  The villagers grow food and vegetables not only for themselves but also for the urban people. They also grow fodder for their cattle. They also produce dairy, poultry, and other products for their own

consumption as well as for supply to urban areas. There should be proper arrangements in the village itself to provide them with good seeds and all assistance related to their produce.

- Wholesale market within the village –
  Most of the people living in villages are farmers by profession. They grow food crops, cash crops and fodders in their fields. While they consume the food crops for themselves and the fodder for their cattle, the cash crops and the other surplus products are sold in the market to meet their other requirements. There should be provision for a wholesale market in the village itself so that the villagers can sell their surplus products there at reasonable rates and get good returns. This would save them from the hands of the middlemen and bring prosperity.

- Cottage Industries –
  An ideal village should have well-established small cottage industries so that the artisans and small farmers can utilize their skills and extra time to produce articles necessary for day-to-day use and earn a handsome profit by selling them in the market.

- Healthcare Centres and Hospitals –
  Besides food, the other most important aspect of human life is health. An ideal village should have proper facilities taking care of the health of the villagers as well as of their cattle and poultry. There should be one-two healthcare centres depending upon the population of the village. Besides health centres for the villagers, veterinary dispensaries should also be there to take care of their livestock.

- Educational facilities –
  An ideal village should have proper arrangements of education for the children. There should be Primary schools and High schools so that the little children need not go out of the village for education. Primary education should be free and compulsory for every child up to a certain age. There should also be soft skills training centres and preferably an adult education centre for the elders who want to get education.

Chapter 2. About Village - Literature Review – (Civil Concept)

2.1. Introduction: Urban & Rural village concept

- Urban Village Concept

Urban villages are widely seen to provide a solution to the demise of community that is often associated with modernism and sprawl. The concept uses the social and physical morphology of the traditional rural village as an inspiration for creating better functioning communities.

The concept of urban villages was formally born in Britain in the late 1980s with the establishment of the Urban Villages Group (UVG). Urban villages are seen to provide an alternative to recent patterns of urban development in many cities, especially decentralization. They are generally purported to provide a prominent level of self-containment (people working, recreating, and living in the same area). Help facilitate strong community institutions and interaction.

- Rural Village Concept

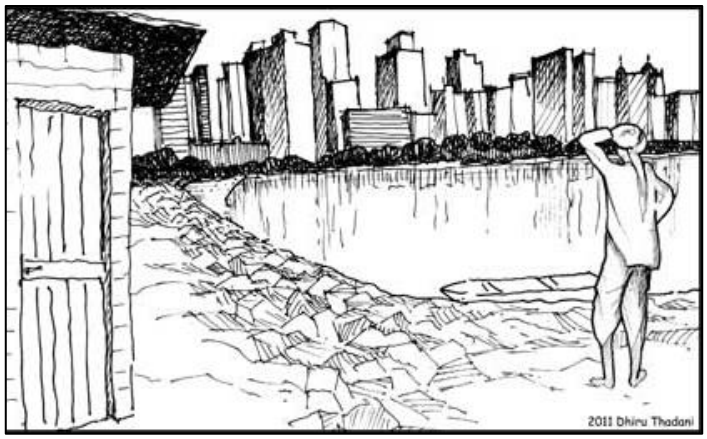


Figure 3 Rural Village

In general, rural area or countryside is a geographic area that is located outside towns and cities. Rural areas, also known as the 'countryside' or a 'village' in India has an extremely low population density. In rural areas, agriculture is the chief source of livelihood along with fishing, cottage industries, pottery etc. According to the Planning Commission, a town with a maximum population of 15,000 is considered rural in nature. In these areas the panchayat makes all the decisions. There are five people in the panchayat. The National Sample Survey Organization (NSSO) defines 'rural' as follows:
An area with a population density of up to 400 per square kilometre. Villages with clear surveyed boundaries but no municipal board. A minimum of 75% of male working population is involved in agriculture and allied activities.

2.2. Importance of the Rural development

- What Is Rural Development?
  Rural development is the process of improving the quality of life and economic well-being of people living in rural areas, often relatively isolated and sparsely populated areas. Education, entrepreneurship, physical infrastructure, and social infrastructure all play a significant role in developing rural regions.

- Importance of Rural Development

Rural development is necessary not only for an overwhelming majority of the population living in villages, but the development of rural activities is essential to accelerate the pace of overall economic development of the country. Rural development has assumed greater importance in India today than in the earlier period in the process of the development of the country. It is a strategy package seeking to achieve enhanced rural production and productivity, greater socio-economic equity, and aspiration, balance in social and economic development. The primary task is to mitigate the hunger of about 70 percent of the rural population, providing adequate and nutritious food. Then follow an adequate provision of clothing and footwear, a clean house in a clean environment, medical care, recreational facility, education, transport, and communication.

- Aims of Rural Development:
  1. The need of the hour is that rural development should aim at:
  2. Removal of unemployment
  3. Improve the standard of living
  4. Adequate income for nutritious food
  5. Availability of soft drinking water
  6. Hygienic living conditions
  7. Satisfactory educational facilities for learning
  8. Suitable medical facilities for treatment
  9. Proper house to live in
  10. Appropriate socio-cultural activities to enrich oneself
  11. Adequate all-weather roads for better communication.

- Objective of Rural Development
  1. To improve productivity and there by the income of the rural poor
  2. To ensure enlarged employment opportunities at a faster pace
  3. To achieve the removal of unemployment and a significant reduction in under employment
  4. To ensure an appreciable rise in the standard of living of the poorest sections of the population
  5. To provide some of the basic needs of the people - clean drinking water, elementary education, health care, rural roads etc.

2.3. Ancient Villages / Different definition of: Rural Urban Villages

- Ancient Village

  In earlier times when India got independence in 1947. During the first 25 years of independence most of the 99% villages in India were like ancient villages. Most Indian villages did not have electricity and road connection from rural areas in India towards urban areas was poor. Most village people did not have schools to educate their children.

- Different Definition of Rural Urban Village
  1. Definition of rural urban village
  2. Based on population

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

Population growth (in crores)

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

Table 8 Population Growth Details (in Crores)]

- For the first time since Independence, the absolute increase in population is more in urban areas that in rural areas
- Rural – Urban distribution: 68.84% & 31.16%
- Level of urbanization increased from 27.81% in 2001 Census to 31.16% in 2011 Census
- The proportion of the 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 a population of 6.04 Crores, an increase from the figure of 5.07 Crore in the 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 the previous decade it was 22.48 percent. The population of Gujarat forms 4.99 percent of India in 2011. In 2001, the figure was 4.93 percent. Recently as per Gujarat census data, 83.92% houses are owned while 13.54% were rented. In all, 65.95% couples in Gujarat lived in single family.

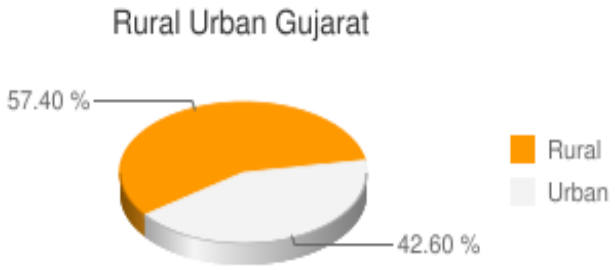


Figure 4 Rural - Urban population growth in 2011

Description	Rural	Urban
Population (%)	57.40%	42.6%
Total population	34,694,609	25,745,083
Male population	17,799,159	13,692,101
Female population	16,895,450	12,052,982
Population growth	9.31%	36%
Sex ratio	949	880
Child sex ratio (0-6)	914	852
Literates	21,420,842	19,672,516
Average literates	71.71%	86.31%
Male literates	81.61%	90.98%
Female literates	57.78%	70.26%

Table 9 Demographic Details of Gujarat

2.6. Rural Development Issues - Concerns – Measures

❖ **Rural development issues**

The basic issues of rural economy are related to the economic and the noneconomic environment. The economies are impacted by the national and international environment. The noneconomic environment consists of the socio-cultural environment, natural demographic physical and the political environment. The economic elements of the rural environment directly put an impact on the Indian business market. The business must understand the needs of the rural environment and change according to the rural markets to enhance the value to the society. The rural economic environment is a complicated process because it encompasses the rural values, ethics, and culture. The adaptation of government's values into the rural environment includes the following elements:

- Rural environment as a complex and dynamic strategy.
- It involves rural people's satisfaction and loyalty.
- Changing attitude of rural society.
- Focusing on continuous people service.
- Maintain a constant updating of technological changes.
- High technological purgation and modernization.
- Implement friendly policies.
- Assimilation of rural growth and development.

❖ **Rural development concerns**

The major problems consist of are as follows:

- Agriculture
- The ownership of the land
- Lack of education social evils
- Bad wealth
- Electricity
- Caste system
- Water
- Infrastructure problem

❖ **Rural development measures**

The main objective of rural development is to remove poverty from people living in the village and fill the widened gap between the rich and poor. This has been vocalized in the policy of the government. Keeping this in mind the government provide various schemes of development, especially the development of agriculture, the main occupation of rural people has been provided.

The major early programmers were:

- Intensive Agriculture Area Programmer (IAAP).
- Intensive Agriculture District Programmer (IADP).
- High Yielding Varieties Programmer (HYVP).
- Rural Industries Project and Rural Artisans Programmer (RIP and RAP).

Beside these programmers several poverty alleviation programmers have been launched by the central and state government for the rural people.

- 20-point Programmer
- Integrated Rural Development Programmer (IRDP)
- Training Rural Youths for Self-Employment (TRYSEM)
- National Rural Employment Programmer (NREP)
- Rural Landless Employment Guarantee Programmer (RLEGP)

- Jawahar Rozgar Yojana (JRY)
- Antyodaya Yojana.
- Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGA)
- Bharat Nirman Yojana

Figure 5 Rural Development Measures

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

Village Facilities	Planning Commission	Required as per Norms
EDUCATION FACILITIES		
Anganwadi	Each or per 2500 Population	1
Primary School	Each Per 2500 population	1
Secondary School	Per 7,500 population	1
Higher Secondary School	Per 15,000 Population	0
College	Per 125,000 Population	0
Tech. Training Institute	Per 100000 Population	0
Agriculture Research Centre	Per 100000 Population	0
HEALTH FACILITIES		
Govt/Panchayat Dispensary or Sub PHC or Health Centre	Each Village	1
Primary Health & Child Health Centre	Per 20,000 population	0
Child Welfare and Maternity Home	Per 10,000 population	0
Multispeciality Hospital	Per 100000 Population	0
TRANSPORTATION FACILITIES		
Pucca Village Approach Road	Each Village	1
Bus/Auto Stand Provision	All villages connected by PT (ST Bus or Auto)	1
DRINKING WATER FACILITIES		
Water facilities		1
Overhead tank	1/3 For Demand	1
U/G Sump	2/3 For Demand	1
OTHER FACILITIES		

Public Latrines	Each Village	1
Cremation ground	For 20,000 Population	0
Post Office	For 10,000 Population	0
Gram Panchayat Building	Each individual/group Panchayat	1
APMC	Per 100,000 Population	0
Fire Station	Per 100,000 Population	0
Police Station	Per 15,000 Population	0
Community Hall	Per 10,000 Population	0

Table 10 Infrastructure according to Norms

2.8. Other Projects / Schemes of Gujarat / Indian Government

❖ Schemes of Gujarat

Figure 6 Schemes of Gujarat

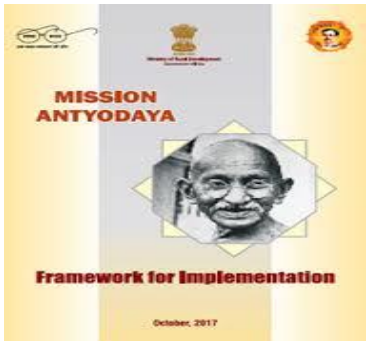
1. For agriculture
    - Biogas subsidies

    - Agri implements subsidies
    - Agriculture mechanization
    - Seeds sahaya
    - Bonds components of health
    - Components of irrigation facility
    - Components of crop protection
2. Panchayat and rural housing department
    - Sardar Patel Awas Yojana
    - Panchvati yojana
    - E gram yojana
    - Samras yojana
    - Gram sabha
    - Tirth gram yojana
    - Swatchhta gram swasth gram yojana
    - Jamin sampadani yojana

- Mahatma Gandhi cleanliness mission

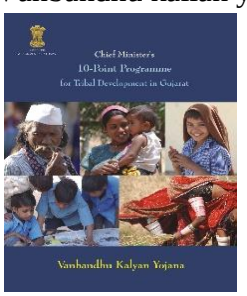
3. Rural development
   - Mahatma Gandhi national rural employment guarantee act (MGNREGA)
   - Swachh Bharat Mission (SBM)
   - Saansad adarsh gram yojana (SAGY)

   - Pradhan Mantri Awas yojana (Rural)
   - Integrated watershed management programme (IWMP)
   - Mission Mangalam
   - Mission Antyodaya



   - National rurban mission

4. Tribal development
   - Vanbandhu kalian yojana



   - Pre matric scholarship
   - Post matric scholarship
   - Government hostels

Vidya sadhna yojana (free bicycles)

Chapter 3. Smart (Cities / Village) Concept, Idea, and its Visit (Civil Concept)

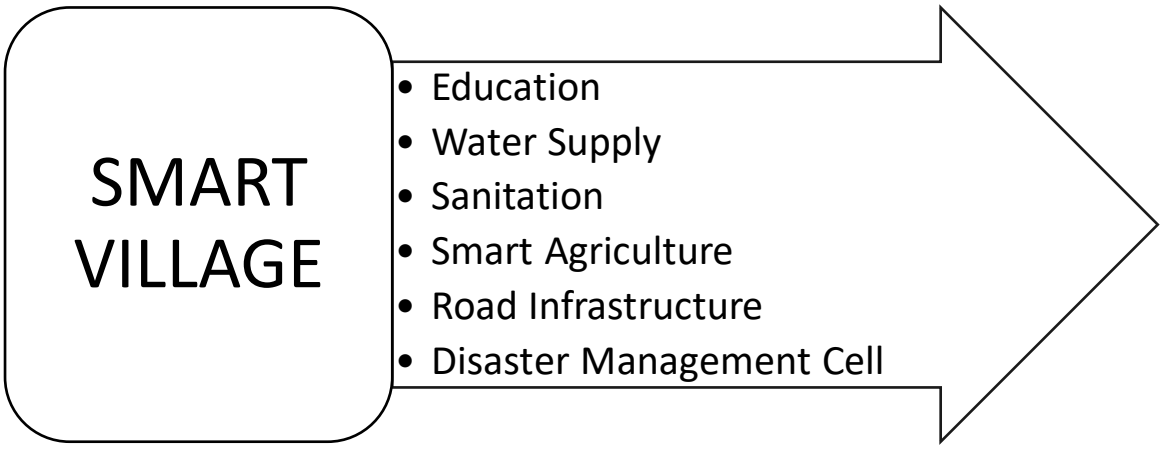
3.1. Introduction: Concepts, Definitions and Practices

3.1.1. Introduction

The 'smart village' is a model in which the energy acts as a catalyst for a range of development outcomes. If managed correctly, the technology would lead to a rapid improvement in health care, nutrition, education, and economic security. Villagers could thus capture many of the benefits of urban life while returning value aspects of rural life and ensuring balanced development at a national level.

Smart villages serve as complementary engines of economic growth to smart cities producing goods and services for local rural markets as well as high value added agricultural and rural industry products for both national and international markets. One of the key enablers of these development benefits in smart villages are sustainable electricity supplies and the availability of clean and efficient appliances for cooking.

In the Indian context, villages are the heart of the nation. Hence, for the development to percolate to the grass root level, focus must be developed to the progress of the village and to smarten the rural population using ICT (Information and Communications Technology) solutions to achieve self-sustainability.



Imbalance growth between rural and urban landscapes leads to the challenges of rapidity in previously crowded Indian urban masses. One of the main consequences of uncontrolled urbanization is lack of livelihoods, standard of living and amenities in the villages of India. Smart village concept may play a crucial role in maintaining the balance between the development of rural and urban areas and help to reduce migration of rural population in urban areas. Urban population density is increasing in an uncontrolled manner, while the numbers of cities are still inadequate to accommodate the migrating population from villages. This needs to be reversed and suitably managed to improve quality of life in Indian cities.

3.1.2. Concepts

The concept of Smart Cities is not new, it may have its origins in the Smart Growth movement of late 1990s, which advocated new policies for urban planning. Punsari (Gujarat, India) is widely recognized as an example of Smart Growth. The phrase has been adopted since 2005 by several technology companies for the application of complex information systems to integrate the operation of urban infrastructure and services such as buildings, transportation, electrical and water distribution,

and public safety. It has since evolved to mean almost any form of technology-based innovation in the planning, development, and operation of cities.

Today's cities face significant challenges such as lack of physical and social infrastructure, tremendous growing population, environmental and regulatory requirements, declination of tax bases and budgets, and increased costs. The cities must learn to identify new and innovative ways to manage the complexity of urban living, and problems ranging from pollution, overcrowding and urban sprawl to inadequate housing, high unemployment, resource management, environmental protection, and rising crime rates. Long standing urban challenges include housing, especially for low-income populations, infrastructure provision, and the delivery of a variety of services including water, sanitation, education, and health.

3.1.3. Definition – CIVIL

For simplicity, in this report we define smart cities as urban areas where digital capabilities create value which is a recurrent theme across many definitions. Recent smart city's literature emphasises the importance of citizen-centric thinking – ensuring that the value this creates has a tangible and positive impact on the quality of citizen life. We have identified some key digital capabilities used to create value in the smart city:

1. Increased data availability
2. Better connectivity
3. Greater processing power
4. Smart systems of Sanitation, Harvesting, Infrastructure, etc.

These capabilities are being enabled by a series of digital trends, which themselves are brought about by the development of both new digital technologies and innovative ways of using existing technologies.

3.2. Vision-Goals, Standards and Performance Measurement Indicators

3.2.1. Vision-Goals

The main purpose of the Smart City Mission is to drive commercial growth and improve the superiority of life of people by enabling local area development and binding technology, especially about the technology that leads to Smart conclusions. Area-based development will transform existing areas, including slums, into better planned ones, thereby improving liveability of the whole city. New areas (greenfield) will be developed around cities 7 to accommodate the expanding population in urban areas. Application of Smart Solutions will enable cities to use technology, information, and data to improve infrastructure and services. Comprehensive development in this way will improve quality of life, create employment, and enhance incomes for all, especially the poor and the disadvantaged, leading to inclusive cities.

3.2.2. Standards

The amount of activity in Smart City Standardization is one of the truly overwhelming points, this is partly due to the breadth and scope of Smart City activities, from water pipes to people and partly because it is early in the process and the standards bodies are still trying to understand how best to contribute in it.

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 that cross both organizations and sectors. These offer best practices and associated guidelines.

Level 3: Technical: - This level covers the countless technical specifications that are needed to implement actual Smart City products and services so that they meet their overall objectives.

3.2.3. Performance Measurements Indicators

The indicators for assessing smart city projects serve to assess or to evaluate single projects. They indicate differences which have been made by the project, by comparing the situation without the project and with the situation after the implementation of the project. As such they can also serve to benchmark projects against each other also.

The indicators for an ideal city focus on monitoring the development of a city towards a smarter city. The time component "development over the years" is an important feature. The city indicators may be used to show to what extent overall policy goals have been reached or are within reach.

3.3. Technological Options

3.3.1. Civil related Technological options

- Smart Buildings – Security cameras, fire safety, electricity management
- Smart Dairy – Remote supervision and monitoring in open fields and barns
- Smart Farming – Satellite data for farm activities
- Smart Agriculture – Smart agricultural equipment for crop production
- Smart Weather and Irrigation – Weather forecast water levels in dams
- Smart HealthCare – Smart beds and equipment to monitor patient
- Smart Education – Interactive learning through videos
- Smart Surveillance System – CCTV cameras and sensors to detect robbery
- Converting a normal city into -
    - Digital city
    - Information city
    - Intelligent city
    - Green Building

3.3.2. Other Technological options

- Cyber Security: As villages and their government relate to internet, cyber security is the most crucial factor to consider preventing data leakage & to reduce cybercrimes. The method for increasing the cyber security can be done by encrypting data, installing security software, using secure connection, etc. These things can be done individually by Govt. or by contracting trustable company for security i.e., Microsoft, Google, Norton, etc.
- Smart Data Hub: For many businesses, data center is the heart of software technology the thing enabling businesses to do more, efficiently expand their capabilities, and maintain the information necessary to run their business properly.

3.4. Road Map and Safeguards

FIRST STEP: The 1st step in establishing a road map for a smart city is to know why there is a need for a smart city initiative. It can be done by studying the city's demographics, including the residents who are the principal stakeholders in the city. People love to live in cities that are convenient, liveable, vibrant, and connected, so they can get anywhere whenever they want. By knowing the ages of the citizens, their educational background, their hobbies, the city attractions, the businesses, and the resources of the community are all key steps in getting to know the community and why there is a need

to build a smart city Geographic Information System (GIS) tools can be used to achieve this step. The government and the citizens' relationship are a supply and demand type of a relationship; the more services the citizens demand, the more services the government is obligated to deliver-as long as the citizens are willing to pay of course. Figure 4 illustrates the Citizens-Governments relationship-the figure expresses that the citizens' demands for services are kept in balance by the transfer of funds (taxes) from the citizens to the government.

SECOND STEP: The second step in establishing a smart city roadmap is by developing a policy that drives the whole initiatives. The policy needs to define the roles, responsibilities, strategies, and objectives of the smart cities. A project charter needs to be developed to give the CIO the appropriate power, money, and resources to get the job done.

THIRD STEP: The third element in developing a smart city roadmap is engaging the citizens with e-government and effective governance, which leads to the increase of efficiency and enhancing delivery of services. One goal of engaging the citizens is to build trust and make them part of the solution.

3.5. Issues & Challenges

3.5.1. Issues

- Key Issues in development of Human Being: - Controversy or dispute is a commencement of a conflict between statements of accepted fact and a new or unaccepted proposal that disagrees with, argues against, or debates the accepted knowledge or opinion. Controversies can range in scope from private disputes between two individuals to large-scale disagreements between societies.
- Governmental Issues: - Lack of Center-State Coordination; Fruitful implementation of a project can be done only if there is a coordination between various government bodies. There is a need of proper regulation when it comes to planning for the development of smart cities. Both horizontal and vertical coordination is the requisite right now.
- Financing: - Smart cities project is not smartly privileged and unfortunately, when it comes to funding, financing is said to be one of the biggest challenges when it comes to the smart city challenge.

3.5.2. Challenges

The most common smart city projects include smart lighting, intelligent transport systems and the smart utility metering for electricity and water. These modern technologies and integrations are totally based on sensor-Cantered collection and analysis of data. They offer cost-effective and innovative solutions to the growing number of challenges faced by the Municipalities. However, despite the countless benefits of smart city projects, many challenges remain when it comes to deployment, due to unique city requirements and differing interpretations of deployment concepts. These variations can be displayed into the following dimensions:

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

3.6. Smart Infrastructure - Intelligent Traffic Management

The 'smart city' concept will use advancements in technology and data to plan and operate cities better. For traffic management, the opportunities that these advancements afford are coupled with the challenges of a growing global urban population. A central challenge will be maintaining mobility of people around cities. Distributed Acoustic Sensing can enable existing or new roadside fibre optic cables to be converted into intelligent, distributed sensors which deliver traffic management information for traffic managers and road users, and mobility information for travellers planning their journey.

On the main arterial roads into and around smart cities, feed of spatially rich, low latency incident detection and congestion traffic information from fibre optic sensors could help to optimize the management of incidents and the optimization of flow, helping to reduce emissions. Additionally, the speed information could be used to calculate journey times between any locations along the monitored fibre sections, helping towards mobility of travellers by planning their optimal route or method of transport.

We can use IoT Based Systems, DAS based traffic monitoring assessments, new modern technologies with the use of 5G mobile technology, smart toll systems, using optic fibres etc.

3.7. Cyber Security Concept

Cybersecurity is a critical and an ongoing challenge for government, businesses, and universities. Focusing on the infrastructure layer of the network will be key in improving security and the leaders must think about what data is the most valuable and how to secure it. Today, there are more people living in cities than in the countryside, vehicles and energy consumption in cities are skyrocketing. The domestic and international mobility of citizens is significantly improved, and tourists are travelling extensively from one city to another. Under such circumstances, many metropolitan cities are dealing with challenges such as overpopulation, waste management, massive energy consumption and pollution because of the dramatic increase of migrants and travellers. Traditional access control systems, therefore, can no longer effectively deal with such multidimensional challenges, traffic jams and long queue waiting times should not be accepted as the norm. Cities must innovate themselves with better and smarter access control systems to track and manage their populations, vehicles, buildings, and touristic sites.

The IoT architecture plays a significant role in shaping this wave by establishing smarter access control systems in cities to address the new challenges. Smart and connected devices can be applied in an immense variety of scenarios in the city. Connecting them to a connected access control operation center significantly contributes to effective management of the city. Nevertheless, it is crucial to be aware of the cybersecurity dangers as there are multiple points of entry in such a large network of devices. In conclusion, the trend of adopting smarter access control systems and connecting them to a centralized network is going on in many big cities in the world. More research in perfecting the security of smart access control devices is expected soon.

3.8. Retrofitting- Redevelopment- Greenfield Development District Cooling

3.8.1. Retrofitting

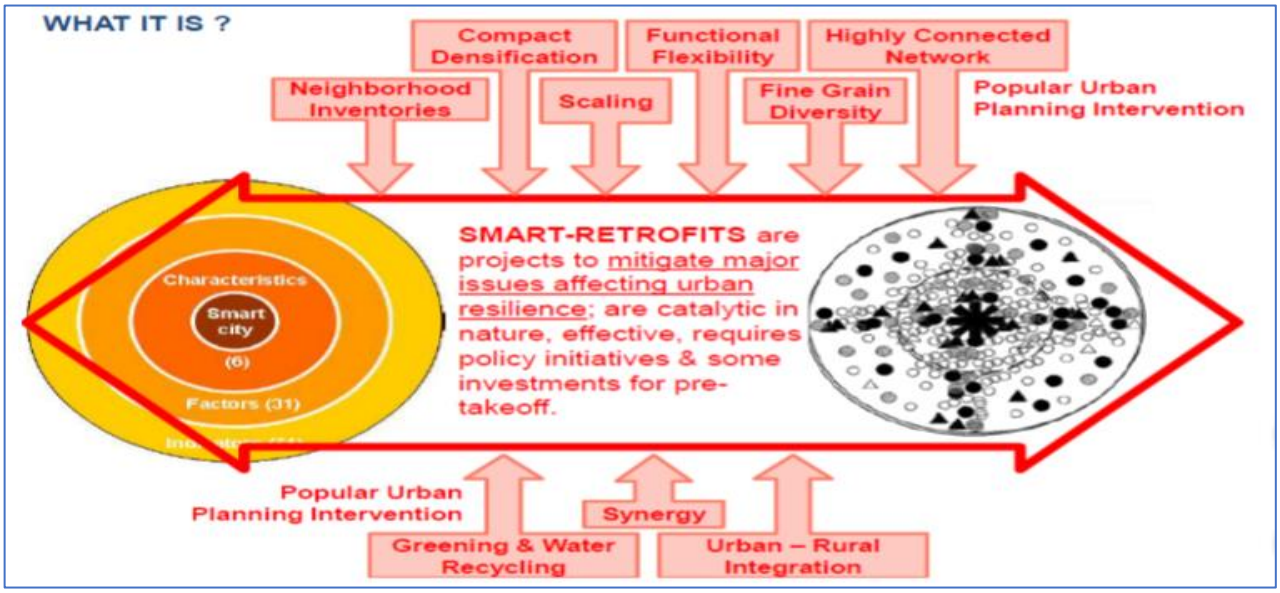


Figure 7 Smart Retrofits

Retrofitting is one of the strategic components which is introduced in planning an existing built-up area. It will help us to achieve several objectives of smart city like making the existing area more efficient and liveable along with others. In this method, an area more than 500 acres will be identified by the city in consultation with citizens. After identification and observation of the current situation of infrastructure services in the identified area and the vision of the residents, the cities will prepare a strategy to become smart. Since existing structures are to remain intact in this model, it is expected that more intensive infrastructure service levels and many smart applications will be packed into the retrofitted smart city. The entire process of retrofitting must be completed in a shorter time frame, as it will lead to help and assistance in other parts of the city or another city of similar condition. SMART-RETROFITS are projects to mitigate key issues affecting urban resilience; are catalytic in nature, effective, requires policy initiatives & some investments for pre-take-off.

3.8.2. Redevelopment

Redevelopment causes tremendous development in the infrastructure by utilizing the mixed land use patterns and increases density at the same time. When the area is greater than 50 acres, then for the sake of concerns of people, redevelopment is adopted. Talking about the economic side, such properties lower neighbouring property values and tax revenues even as they create pressure to raise taxes to maintain service levels. Addressing the issue of vacant and abandoned land and structures, whereas state governments play a vital role as well. The redevelopment process can create winners and losers too, with the losers too often racial and ethnic minorities and the poor. Physical and economic redevelopment are virtual imperatives for cities, but paths to redevelopment that minimize displacement and offset its negative consequences are unsure. It has created new, vibrant central city areas, and historic buildings have been restored to physical and economic vitality. At the same time, affordable housing has filtered upward in price and economic class.

3.8.3. Greenfield Development

Greenfield development will introduce most of the Smart Solutions in a previously vacant area (more than 250 acres) using innovative planning, plan financing and plan implementation tools provision for affordable housing, especially for poor people. GDs are required around cities to address the needs of the expanding population. from a legal perspective, the challenges in obtaining timely, effective, and affordable approvals for Greenfield residential development. We should focus on the

constraints on Greenfield developments, the need to integrate land use planning with the provision of infrastructure; and opportunities provided by the Special Housing Area legislation. There will be no perfect sites where the conversion of land for urban use has no effects; all areas will be constrained, and the conversion of any area will need to occur in the context of compromises having been made. One of the most prominent issues with Greenfield developments is to ensure that the development area can be appropriately served with infrastructure. New areas will be developed around cities to accommodate the expanding population in urban areas. One well known example is the GIFT City in Ahmedabad, Gujarat.
Some of the important determining factors about Greenfield development are:

- Areas of land that have never been used for construction, areas of natural, often grassed, land.
- Nothing to demolish, and no existing issues
- Cheaper to develop
- Demand for rural/suburban housing
- Easier to comply with environmental standards
- Profitable for local farmers to sell their land on, and they have a right to do so.

3.8.4. District Cooling & Heating

District Heating which can be also called heat networks or Teleheating is an arrangement for distribution of generated heat in a centralized location of a required area for residential and commercial heating or warming requirements i.e., space heating & water heating requirements at that place. The heat is often obtained from a cogeneration plant burning fossil fuels but progressively also biomass, although heat-only boilers, geothermal heating, heat pumps & central solar heating is also used. It is useful for the generation of nuclear power too. District heating plants can provide higher efficiencies and better pollution control than local boilers. According to some research, district heating with combined heat and power (CHP DH) is one of the most economical methods of reducing carbon emissions. It has one of the lowest carbon footprints of all fossil generation plants. A combination of CHP and centralized heat pumps are used in the Stockholm multi energy system. This allows the production of heat through electricity when there are plenty of irregular power productions and cogeneration of electric power and district heating when the availability of discontinuous power production is low.

District Cooling is the cooling similar to district heating explained above. Working on broadly similar principles to district heating, district cooling delivers chilled water or air to the buildings like offices and factories needing refrigeration or cooling. In winter, the source for the cooling can often be sea water or any nearby water source. So, it is an economic source rather than using electricity or fossil fuels to run compressors for cooling purposes.

3.9. Strategic Options for Fast Development

1. It starts with having a realistic plan

The lack of a solid definition for the term “smart city” should serve as a reminder of the importance of having a solid and realistic plan for transformation. If there is one lesson, we can draw from so-called digital transformation efforts whether they be in the city land or another sector. It is that they are easier to talk about than they are to realize.

2. Smart cities require extensive experimentation

One of the best models for studying smart cities is Singapore, which at once embodies the potential of technocentric governance while raising questions about the degree that a smart city should survey its citizens.

3. A smart city vision should energize the private sector

Private sector is the one who gets charged very slowly, because they don't get the support properly in a particular project.

4. Smart cities demand smart data

A city isn't smart because it uses technology. A city is smart because it uses technology to make its citizens' lives better. Building a smart city is a different type of endeavour than many technological projects because the demographic market is so broad — it includes, to some extent, everyone who lives there as well as visitors.

5. Get creative when rethinking transportation

While city planners across the world work to rethink the age-old question of how to best get people from point A to B, there seems to be little agreement on what the best path forward might be in the long run. On one hand, there are the techno-optimists who aggressively push a future where autonomous vehicles rule the road, electric vehicles outnumber those fuelled by gasoline, and the concepts of parking and traffic fatalities and even traffic jams begin to become irrelevant thanks to cutting-edge technology.

6. Smart city initiatives should complement low-tech initiatives

Cities aspiring to become "smart" run the risk of becoming so focused on technology that they lose sight of promising initiatives that don't require connected sensors, kiosks, or any other type of widget.

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

3.10.1. Urban Water & Sanitation Challenges

- On site challenges –
  The conventional engineered wastewater treatment system is extremely expensive and requires complex operations and maintenance costs of expanding sewer networks, which are very rudimentary or non-existent in many Indian cities. That mostly started off as unplanned settlements. The total capital cost of establishing collection and treatment systems for the entire urban wastewater generated is much more than what the government plans to spend; as a result, progress in increasing coverage is likely to be slow in the foreseeable future.

- Offsite challenges –
  Analysis exhibits that macro factors such as FTA (Free Trade Agreement), cost sensitivity, and varied climatic and usage considerations directly impact operations in India. There exist immense opportunities for foreign companies owing to Commercially viable advanced technology Environmentally conforming solutions. However, foreign companies need to overcome concerns such as: - Lack of Indian experience to meet tender requirements, Different waste treatment procedures. In Europe treatment is done at source whereas in India it is done at the end. The report evaluates key challenges faced by foreign companies such as: Red Tapism, lack of transparency, fierce competition, weak implementation of IPR regulations, diverse technical standards, complex capital raising criteria, bureaucratic bottlenecks, partner with a local company, starting the regulatory process early, etc.

3.10.2. Role of Indigenous Technologies

- Indigenous water purification technologies:
  These technologies can improve the drinking water quality of smaller villages as well as larger cities. It uses the Pressure Driven Membrane Processes. These are suitable for all capacity units. Water purification technologies make use of nuclear energy and solar energy also.

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

- Unique Multistage Biological Treatment Solution:
  Multistage Biological Treatment Solution (MSBTE) can be implemented on existing STP which are not able to process Sewage to optimum efficiency. MSBT can be implemented as a modular or container on the banks of rivers on Drains/Nalas which discharge wastewater to the river. It can also be implanted in small urban societies and housing complexes for better water management.

- Radiation Hygienization of Municipal Sewage Sludge:
  The Sewage is the wastewater generated from domestic premises and consists mainly of human waste. It typically contains 99.9% water and about 0.1% solid. The solid waste in sewage is typically organic in nature and is broken down in the sewage treatment plants resulting in sewage sludge as a by-product.

- Refuse Derived Fuel: An Emerging Processing Technology in MSWM:
  Refuse Derived Fuel (RDF) is a processed form of Municipal Solid Waste (MSW), and it can be a substitute for coal energy. The process of conversion of garbage into fuel pellets involves primarily Drying, Separation of incombustible, Size reduction and Palletization.

3.11. Initiatives in village development by local self-government

The programme, a brainchild of the rural development ministry, is aimed at driving all-round development of villages through a participative approach and will use the existing funds allocated for various development projects. According to the brief note shared by the ministry, members of parliament (MPs) from both houses will be the key drivers of this scheme with a mandate to initially adopt one village each that would be developed into Adarsh grams (model villages) by 2016.

Sansad Adarsh Gram Yojana

Sansad Adarsh Gram Yojana is a rural development programme focusing upon the development in the villages and rural areas which includes social-infrastructure development, socio-cultural development. The programme was launched by the Prime Minister of India, Narendra Modi on the birth anniversary of Jayaprakash Narayan, on 11 October 2014.

- Objectives:

  The development of model villages, called Adarsh Grams, through the implementation of existing schemes, and certain new initiatives to be planned for the local context, which may differ from village to village. Creating a model of local development which can be simulated in other villages.

- Funding:

  No new funds are allocated to this Yojana, and funds may be raised through Funds from presented schemes, such as the Indira Awas Yojana, Pradhan Mantri Gram Sadak Yojana, Mahatma Gandhi National Rural Employment Guarantee Scheme, and Backward Regions Grant Fund, etc.,

- The Member of Parliament Local Area Development Scheme (MPLADS),
- The gram panchayat's own revenue,
- Central and State Finance Commission Grants, and
- Corporate Social Responsibility funds

3.12. Smart Initiatives by District Municipal Corporation

Managing solid waste is a daunting task for every Urban Local Body (ULB) in India. The irony is that out of 400 municipal corporations and councils in India, only a handful of ULBs are managing their solid waste management, while reinventing some of the age-old garbage disposal methods with a touch of modern technologies. The Council has listed some of the proven examples that can be considered for tackling such a sensitive issue.

Figure 8 Process for SCP preparation

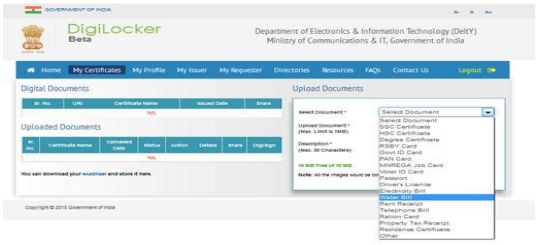
Take Pune's example. The city has managed to tackle the waste of over 1,700 tonnes that it generates daily, while ensuring minimization of landfill, freeing up urban land for more productive purposes. At present, the Pune Municipal Corporation (PMC) has combined an integrated approach with decentralized waste management by installing 25 bio-methane plants that produce 600 kW of electricity and compost as a by-product.

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

Honourable Prime Minister Narendra Modi launched the Digital Media to push the use of technology to connect and empower people in areas relating to health, education, labour and employment, commerce, etc. The initiative comprises of several projects which will focus on better governance, knowledge, and universal phone connectivity across the country.

Under this programme, the government plans to introduce Broadband Highways, Universal Access to Mobile Connectivity, Public Internet Access Programme, IT for Jobs and much more. The governance will shift from e-governance to m-governance where "M is not Modi Governance, it is Mobile Governance," said Modi. The initiative aims to bring big investments in the technology sector and this Rs 1.13 lakh crore initiative will help in creating a participative, transparent, and responsive government.

1. Digi Locker



The service was launched as an important facility to store crucial documents like Voter ID Card, Pan Card, BPL Card, Driving License, education certificates, etc. in the cloud.

2. MyGov.in

The portal works as an online platform to engage citizens in governance through a "Discuss," "Do" and "Disseminate" approach.

3. eSign Framework

This initiative would enable users to digitally sign a document online using Aadhaar authentication.

4. Swachh Bharat Mission Mobile app

The app will enable organizations and citizens to access information regarding the cleanliness drive and achieve the goals of the mission.

5. National Scholarship Portal

This initiative aims at making the scholarship process easy. From submitting the application, verification, sanction, and disbursal to the end beneficiary, everything related to government scholarships can be done on this single portal online.

6. e-Hospital

Online Registration System under this initiative enables people to avail services like online registration, payment of fees and appointment, online diagnostic reports, checking on the availability of blood online, etc.

7. Digitize India Platform

This initiative will involve digitization of data and records on a large scale in the country to make easy and quick access to them possible.

8. Bharat Net

Under this initiative, a high-speed digital highway will connect all 250,000-gram panchayats of the country. This is the world's largest rural broadband project using optical fibre.

9. Wi-fi Hotspots

Development of high speed BSNL wi-fi hotspots throughout the country is yet another initiative to improve digital connectivity in the country.

10. Next Generation Network

Launched by BSNL, this service will replace 30-year-old telephone exchanges to manage all types of services like voice, data, multimedia, and other types of communication services.

11. Electronics Development Fund

The fund will be set up to support the manufacturing of electronics products that would help create new jobs and reduce import. The funds will promote innovation, research, and product development to create a resource pool within the country.

12. Centre of Excellence on Internet of Things (IoT)

In partnership with NASSCOM, DeitY and ERNET in Bengaluru (Bangalore), Centre of Excellence will enable rapid adoption of IoT technology and encourage a new growth strategy. IoT will help the citizens in services like transport system, parking, electricity, waste management, water management and women's safety to create smart cities, smart health services, smart manufacturing, and smart agriculture, etc

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

3.14.1. Regarding Environment

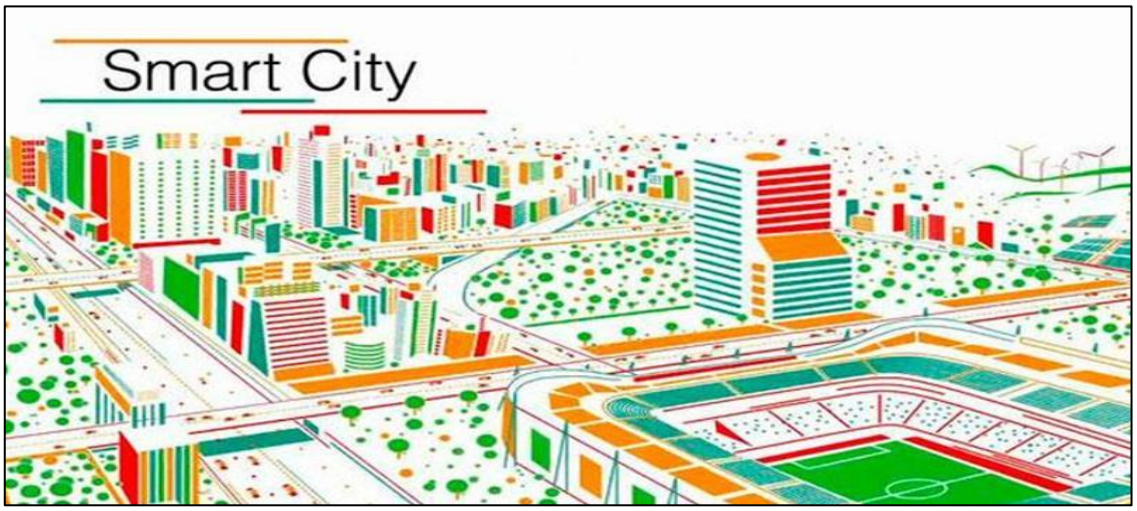


Figure 9 Smart City Mission

Under the Smart City Mission of India, a city is selected as a smart city if it satisfies the basic criteria on the grounds of its transportation system, water availability, water management, solid waste management plan, safety and security, energy availability, and housing situation. However, despite the well-recognized importance of environmental components in smart cities, the Smart City Mission has very limited environmental parameters in its selection process; for example, there is no mention of key terms such as green space, biodiversity, and climate change in its mission statement and guidelines. The term environment appears four times and air pollution only once in the document, while energy, water, and land are mentioned numerous times.

A comparison of sustainability indicators of the Smart City Mission with the United Nations Department of Economics and Social Affairs (UN DESA) indicators of sustainability, including environment, economy, equity, and implementation, shows a lack of focus on environmental sustainability in the Smart City Mission. UN DESA includes six components: natural hazards, atmosphere, water, ocean seas and coasts, biodiversity, and land, while the Smart City Mission only identifies three components - energy, atmosphere, and water - as indicators of urban environmental sustainability.

Smart cities aim to make their cities sustainable. Hence, we suggest the inclusion of the following environmental components, as these have been identified as key components of sustainable cities in the World Cities Report 2016 and sustainable development goals (SDGs), which are:

1. Land and Geography,
2. Climate,
3. Atmospheric pollution,
4. Water Resources,
5. Energy, &
6. Urban Green Space and Biodiversity

It is imperative that we include various components of the environment's ecosystem, as these parameters provide a holistic view to the Indian mission of smart cities. Most of the cities are already reeling under the stress of high pollution and are amongst one of the most polluted cities in the world. As most of the Indian population will be living in cities in the future, the Indian government needs to prepare for the equitable use of resources to promote sustainable development. This initiative would require inclusion of the parameters discussed in this paper as a vital component of smart city governance, as well as the generation of real-time spatial and temporal data. The digital ecosystem, consisting of big data, ICT, and IoT, should be integrated into our natural environment, which could well make the Smart City Mission in India a success.

3.14.2. Regarding Employment

Figure 10 Smart City Mission

Government of India's 'smart cities mission,' a flagship initiative, is aimed at developing 100 sustainable and citizen friendly cities across the country. Each of these smart cities will be a key driver of economic growth boosting the GDP of the country and creating multiple new-age employment opportunities. With increased urbanization, urban areas are expected to house 40 per cent of India's population and contribute to over 75 percent of India's GDP by 2030. This calls for large scale infrastructural development which is not just physical and institutional but also social and economic infrastructure. Only then these cities would attract investments leading to continuous growth and development.

A keyway of developing smart cities is by enabling smart evolved technology for local area development in the cities. Such development will generate employment for a large segment of the local population. Application of smart solutions will enable cities to use technology, information, and data to improve their services. Integration of technology is a major challenge and implementation of technology across smart cities needs a lot of hand holding now. To understand the dynamics of smart cities and to create a strong ecosystem it is important that the workforce has advanced skill sets.

Chapter 4. About MANEKPUR VILLAGE

4.1. Introduction

4.1.1. Introduction About Manekpur Village details

According to Census 2011 information data, the location code/village code of Manekpur village is 523660. The village Manekpur is in the Tehsil of Umbergaon taluka of Valsad district in Gujarat state of India, situated at 25 km far away from the sub-district headquarters of Umbergaon and 45 km away from district headquarters of Valsad. As per statistics of 2009, Manekpur is also now a Gram Panchayat.

The total geographical area of the village is 464.71 ha. Manekpur has a total population of 2,919 people according to the 2011 census. There are about 589 houses in the village itself. Umbergaon, Vapi, Daman and Diu, Silvassa are the nearby Cities to Manekpur. Vapi is the nearest town to Manekpur which is approximately 20 kms away.

Khattalwada (3 km), Ahu (4 km), Mamakwada (4 km), Sarai (4 km), Tumb (5 km) are the nearby Villages to Manekpur. Manekpur is surrounded by Talasari Taluka towards South, Vapi Taluka towards North, Dadra Nagar Haveli Taluka towards East, Daman Taluka towards North.

This place is near the border of the Valsad (Gujarat) district and Palghar (Maharashtra) district. It is near to the Maharashtra State Border. It is near to Arabian sea, so there is a climate of humidity in it.

4.1.2. Justification/ need of the study

The developmental work in villages that could undertake as per the need of the village includes,

- Sustainable Infrastructures amenities (Rainwater harvesting, Biogas plant, Eco Toilets, Solar Street lights & other)
- Socio-cultural Infrastructure amenities (Community Hall, Public library, recreation facilities)
- Physical Infrastructure facilities (Water, Drainage, Road, Electricity, Solid waste Management, Storm Water Network, Telecommunication &other)
- Social Infrastructure facilities (Education, Health, Sanitation) for effective development of Villages.

Vishwakarma Yojana has provided the platform for real world experience to engineering students and simultaneously apply their technical knowledge in rural infrastructure development.

4.1.3. Study Area (Broadly define)

The study area defines the project into two parts –

1. Civil Branch –

Civil department students will study on civil works like infrastructure, garbage management system, recreation works, drainage system, water pumping and distribution system, irrigation systems and other civil related work whichever is required in the village.

2. Electrical Branch –

Electrical department students will study electrical works like power supply in the village, 24x7 electricity in the households, power breakage problems, ELCB problems and solutions, street lighting, etc. and other electrical related works whichever is required for the enhancement of the village.

By doing this project, we could know the present conditions of the village in terms of basic and public amenities, essential commodities, other infrastructural amenities for the need of people and on the adequacy of the available resource with reference to the population of the village and growth of the area with the consultation of Local revenue authorities, TDO and DDO for the future need of the village for targeted population growth, etc. For lack of facilities of the village like public toilet, public garden, poor conditions of road and infrastructure etc. maintenance is required in govt. different structures of the village.

We visited the village and got the information that all type of facilities which are necessary for the village are not available. It has good facilities of education (including aanganwadi, primary & secondary schools), medical facilities (one PHC and 3 nos. of private clinics); moderate facility of road, agriculture; poor facility of government buildings (gram panchayat, post-office, and veterinary home). The village does not have any kind of drainage system, government water supply, government sanitary blocks, bank, and ATM facility in it.

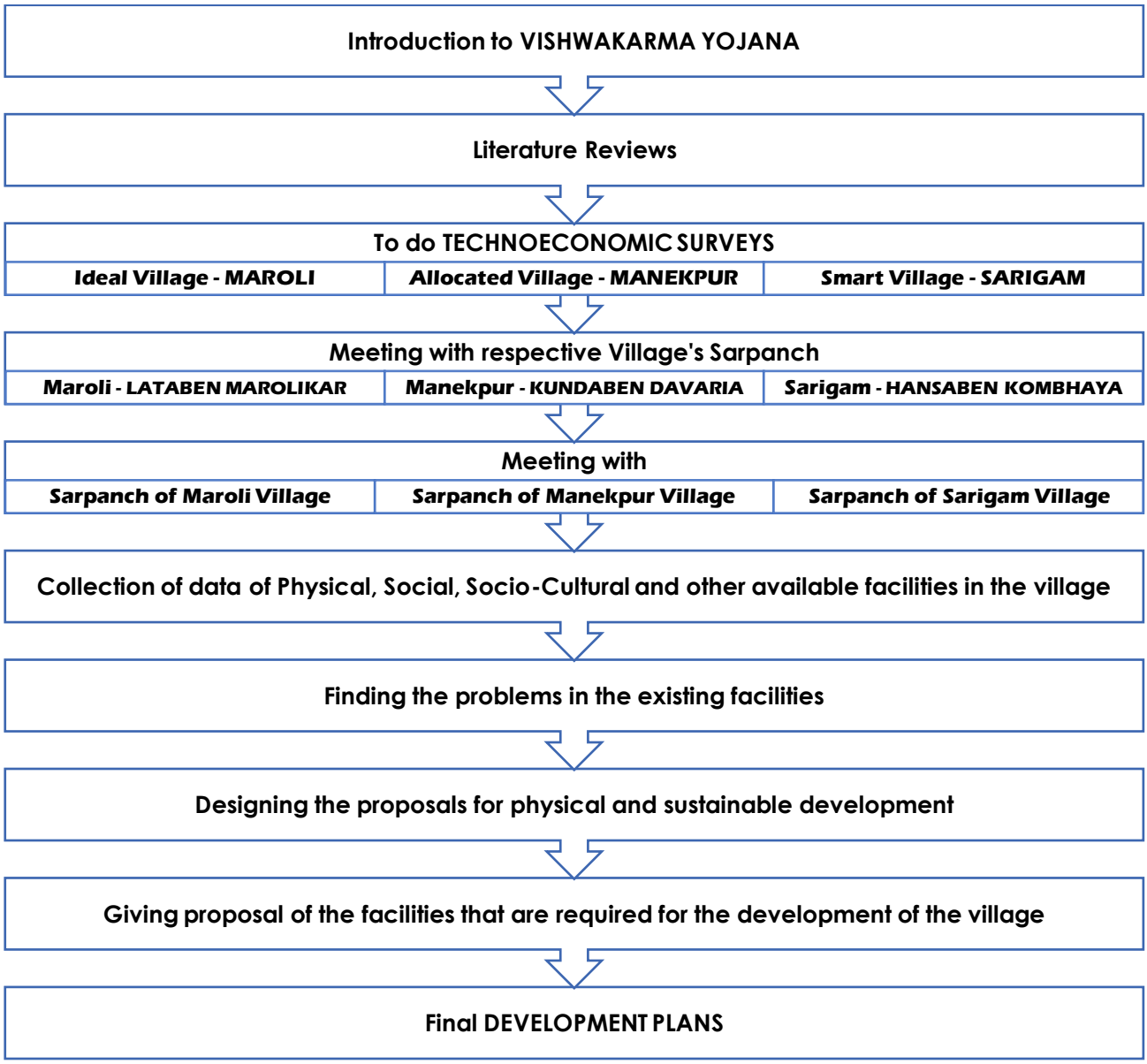
4.1.4. Objectives of the study

- Infrastructure Creations – Connectivity to village from distinct parts & vice versa, civic, and social infrastructure along with provision of alternative livelihood generation are one of the main pillars.
  - Basic Physical Infrastructure – Water Supply, Transport, Sewerage and Solid Waste Management should be the priority focus and be provided.
  - Basic Social Infrastructure – Health and Education amenities should be provided and proper delivery of amenities to village dwellers should be ensured.
  - Promote integrated development of rural areas with provision of quality housing, employment opportunities and supporting physical and social infrastructure.
- To reduce the migration of people from rural to urban areas for means of earning money and other amenities.
- Efficient Mass Transportation, Public transportation amenities that need to be developed like bus stops, transport depots etc.
- Improvements of sanitation in the village – sewerage and drainage line for household connection, door to door solid waste collection & dumping amenities, refurbishing of village lakes, water tanks and wells, construction of rainwater harvesting structures for sustainable development.
- Construction of socio-cultural amenities like community hall, public library, recreational activities centre and repairing of existing amenities.
- Repair & maintenance of existing public buildings like Gram Panchayat, Public Library, School Buildings, Health Centre, Public Toilet Block & others to be taken under consideration.

4.1.5. Scope of the Study

- The main scope is to provide a greater number of urban amenities to the village without disturbing the soul of the village.
- Migration of the people will be reduced.
- Future developments will be possible at an early stage.
- Levelling up the standards of people of the village.
- The people of village will get proper basic amenities like sanitation, water supply for irrigation, 24*7 electricity supply, new modern technical implementations, etc.

4.1.6. Methodology Framework for development of your village



4.1.7. Available Methodology for development of related to Civil/Electrical

Many methodologies are available, such as smart village concept having automated lighting system, green societies, sustainable construction methods. Various kinds of supply of construction materials like, Compressed Earth Blocks, Bricks, Culvert making plants can be adopted in the village to make it a more developed village.

4.2. MANEKPUR VILLAGE Study Area Profile

4.2.1. Study Area Location with brief History land use details

Sr. No.	Description	Data
1)	Village Name	Manekpur
2)	Gram Panchayat Name	MANEKPUR
3)	CD Block Name	Umbergaon
4)	Tehsil Name	Umbergaon
5)	Reference Year	2009
6)	Sub District HQ Name	UMBERGAON

7)	Sub District HQ Distance	25 Km
8)	District HQ Name	VALSAD
9)	District HQ Distance	45 Km
10)	Nearest Town	VAPI
11)	Nearest Town Distance	20 Km
12)	Pin code	396120
13)	Map Coordinates	20.2480959°N, 72.7954159°E

Table 11 Study Area Location of Manekpur

Manekpur is a village with its own gram panchayat located inside the village itself. The people of the village are good at interacting with us and so we interacted with them. The village has 3-4 major industries in it so that the problem of employment is not a big issue. Also, some villagers adopt farming as their occupation for earning money. The village has enough education facilities, road facilities, drinking facilities, etc. in it. As far as the youth of the village is concerned, they are somewhat attracted towards technology because they have online lectures from their home and so they use their / their parents' mobile/laptop to do their activities. In all, this village has a very proud history which will lead to a great future.

Sr. No.	Description	Information
1)	Total Area (in ha)	465 ha
2)	Residential Area (in ha)	-
3)	Forest Area (in ha)	30.2 ha
4)	Irrigated Land Area (in ha)	-
5)	Non-Irrigated Land Area (in ha)	-
6)	Vacant Land Area (in ha)	-
7)	Water bodies	3 Nos. of Pond

Table 12 Land Use Details of Manekpur

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

Figure 11 Map of Manekpur

Figure 12 Satellite Map of Manekpur

4.2.3. Physical & Demographical Growth

Physical Details

Sr. No.	Description	Information
1.)	Coordinates of Village	20.2480959°N, 72.7954159°E

2.)	Total Area (in ha)	465
3.)	Residential Area (in ha)	-
4.)	Forest Area (in ha)	30.2
5.)	Irrigative Land Area (in ha)	-
6.)	Non-Irrigative Land Area (in ha)	-
7.)	Vacant Land Area (in ha)	-
8.)	Water bodies	3 Nos. of Pond
9.)	Nearest Town with Distance	Umbergaon (CT) (25 Kms.)

Table 13 Physical Details of Manekpur

Demographic growth details

Sr. No.	Description	Census 2011 Data
1.)	Village Name	Manekpur
2.)	Tehsil Name	Umbergaon
3.)	District Name	Valsad
4.)	State Name	GUJARAT
5.)	Total Population	2919
6.)	Total Area	465 (Hectares)
7.)	Total No of House Holds	589
8.)	Total Male Population	1465
9.)	Total Female Population	1454
10.)	0-6 Age group Total Population	401
11.)	0-6 Age group Male Population	217
12.)	0-6 Age group Female Population	184
13.)	Total Person Literates	1578
14.)	Total Male Literates	915
15.)	Total Male Literates	663
16.)	Total Person Illiterates	1341
17.)	Total Male Illiterates	550
18.)	Total Male Illiterates	791
19.)	Scheduled Cast Persons	32
20.)	Scheduled Cast Males	20
21.)	Scheduled Cast Females	12
22.)	Scheduled Tribe Persons	1301
23.)	Scheduled Tribe Males	1286
24.)	Scheduled Tribe Females	1301

Table 14 Demographic Details of Manekpur

4.2.4. Economic generation profile / Banks

There is not a single bank located inside the village. Therefore, the villagers do not get the advantage of bank facilities. The nearest bank located to the village is Dena Bank (Khattalwada Branch), Bank of Baroda (Sanjan Branch), HDFC Bank (Sanjan Branch), State Bank of India (Nargol Branch), etc.

4.2.5. Actual Problem faced by Villagers and smart solution

The challenges faced by people in rural India are very different from the challenges faced by people living in cities. In cities, we have grown to use a certain sense of entitlement; we have access to luxuries but, people in villages can only dream of having it. The challenges faced by rural India can be broadly grouped into livelihood challenges (agriculture and allied sector and non-farm livelihoods in the informal/unorganized sector), entitlement challenges (food - Public Distribution System (PDS),

work- Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), and reliefs (state-sponsored, water, and cash), and social and behavioural challenges (awareness, fear/panic, rumours, domestic abuse, and discrimination).

Talking about actual problems faced by the villagers of the village & their solutions are –

Problems	Solutions
WATER PROBLEMS	Public supply of water taps at home to home
DRAINAGE PROBLEMS	Proper lined drainage canal should be provided
ROAD FACILITIES	Proper roads should be made with proper maintenance
SANITATION PROBLEMS	Cleanliness should be there inside the village
WASTE MANAGEMENTS	Solid and liquid waste management should be done
SECURITY ISSUES	Police security should at its peak point
AGRICULTURAL ASPECTS	Farmers should be prioritized for selling his crops
MEDICAL FACILITIES (ESPECIALLY FOR MATERNITIES)	Good medical facilities should be there in village

Table 15 Problems & Solutions

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

All types of caste are staying in this village, and all have their respective hamlets (ફળિયું)

- *Pangha Faliyu*
- *Vanjharvad Faliyu*
- *Patel Faliyu*
- *Tadav Faliyu*
- *Dungri Faliyu*
- *Ahir Faliyu*
- *Ashram Faliyu*
- *Khanvai Faliyu*
- *Nayak Faliyu*
- *Patkar Faliyu*
- *Soniyawadi Faliyu*
- *Ardeshar Faliyu*
- *Kunwarshah Faliyu*

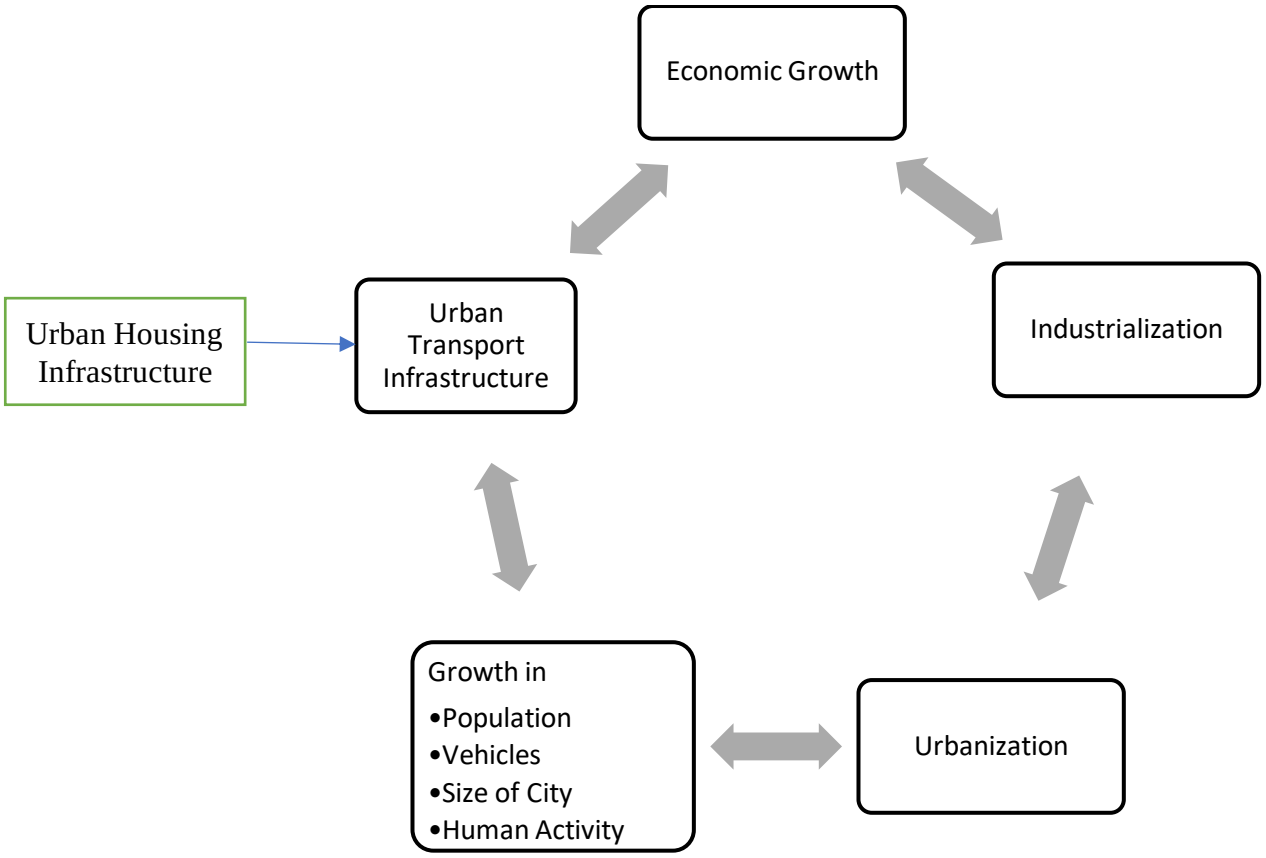
All festivals are celebrated with full enjoyment, happiness, and prosperity in the village, like Ganesh Chaturthi, Navratri, Janmashtami, Independence Day, etc. and the cuisine is also followed as per the Indian norms.

4.2.7. Migration Reasons / Trends

Reasons for migration in India

1981 Census	1991 Census	2001 Census
Employment	Employment	Work/Employment
Education	Business	Business
Family moved	Education	Education
Marriage	Family moved	Marriage
Others	Marriage	Moved with birth
	Natural Calamities	Moved with household

Table 16 Reasons of Migrations



- Migration of people from rural areas to urban areas in search of better employment opportunities.
- Better physical infrastructure in urban areas, i.e., road and transport, water supply, sewerage, drainage, electricity, solid waste management, etc.
- Better social infrastructure in urban areas, i.e., health and education facilities, parks and playgrounds, communication facilities, police services, etc.
- Poor living standards in rural areas.
- Shortage of rainfall, poor irrigation facilities and less agriculture production.
- Urban areas are centres of economic activities. Trade, commerce, and other economic activities thrive in areas where accessibility is high.

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

4.3.1. Describe Methods for data collection

The methods we adopted for data collection are:

- By visiting village
- By techno economic survey
- By interacting with the villagers
- By interacting with the government authorities and other government gram-sevaks.
- By taking photograph of existing situation
- By visiting different government websites for previous year data.

4.3.2. Primary details of survey details

Primary village survey details obtained by observing, the current condition of the village is –

Roads – The village approach road is all weathered typed road but at some places there are some ruts and potholes on the road, so that point should be taken under consideration. The main road is also an all-weathered typed road whereas the internal streets are made using paver blocks or cement concrete.

Drainage Facility – there is no drainage line in the village, so we talked to the villagers and their sarpanch, so they suggested setting up a COVERED LINED CANAL with proper discharge of sewage.

Sanitation Facility – After implementation of Swachh Bharat Yojana, the dwellers have occupied a private latrine block per house for sanitation purposes.

Streetlights – The village approach road does not have sufficient lighting systems, but inside the village there are only some areas where there is proper street lighting, and the rest of the village is suffering from darkness at night.

Educational Facilities – There are 4 nos. of Aanganwadi available, 3 nos. of primary schools, 1 no. of secondary with high secondary school available.

Occupational Details – The general earning of a village is based on agriculture as well as on the different industries like Apar, Viva, Moonlight Tube Industries, etc.

Recreational Activities – There is no recreational area for the children as well as the senior citizens.

Renewable Source – Solar Street lighting is available, but it needs to be renovated as it is not used for some time. Keeping solar lightning aside there is no other renewable power source. Or any other biogas plant in the village.

Irrigation Water – According to a survey there is no public supply of water for irrigation or drinking purposes, everyone has borewells or tube wells at their homes.

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

There is not any information available about Geo-Tagging House.

4.3.4. No of Human being in One House

According to the Census of 2011, the population was approximately 2919 and the households were 589. So, the number of human beings in one house is 4-5 persons in a house.

4.3.5. Material available locally in the village and Material Outsourced by the villagers

The construction Materials available and used locally within 20km-25km radius are as listed below:

- Cement
- Sand
- Black Sand
- Aggregates
- Shera Sheets & Other decorating materials
- Soil for earth filling
- Ready Mix Concrete
- Bricks (All Classes)
- Glass
- Bars (Fe-250 and Fe-415)
- Structural members useful for making steel
- Tar & Bitumen
- Various types of sections (I, H, T, C, O, etc.)
- Wood, Plywood, Teak Wood/ Saag Wood
- Tiles/ Flooring Material
- Marble
- Kota Stone
- Tiles (Ceramic, Mosaic, etc.)
- Piping & related materials
- Other Hardware
- Different kinds of Ceramic parts
- Lavatory Blocks
- Paints, Varnishes & related materials

4.3.6. Geographical Detail

Sr. No.	Description	Information
1.	Coordinates of Village	20.2480959°N, 72.7954159°E
2.	Total Area (in ha)	464.71
3.	Residential Area (in ha)	-
4.	Forest Area (in ha)	30.2
5.	Irrigative Land Area (in ha)	-
6.	Non-Irrigative Land Area (in ha)	-
7.	Vacant Land Area (in ha)	-
8.	Water bodies	3 Nos. of Pond
9.	Nearest Town with Distance	Umbergaon (CT) (25 Kms.)

Table 17 Geographic Details of Manekpur

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

Description	Census 2011 Data
Total Population	2919
Total Male Population	1465
Total Female Population	1454
0-6 Age group Total Population	401
0-6 Age group Male Population	217
0-6 Age group Female Population	184
Scheduled Cast Persons	32
Scheduled Cast Males	20
Scheduled Cast Females	12
Scheduled Tribe Persons	1301
Scheduled Tribe Males	1286
Scheduled Tribe Females	1301

Table 18 Demographic Details – Cast wise

4.3.8. Occupational Detail - Occupation wise Details / Majority business

Total working population of Manekpur is 945 which are either main or marginal workers. Total workers in the village are 945 out of which 768 are male and 177 are female. Total main workers are 852 out of which female main workers are 738 and male main workers are 114. Total marginal workers of the village are 93.

Worker's profile of Manekpur Village
(Manekpur Working Population - Census 2011)

	Total	Male	Female
Total Workers	945	768	177
Main Workers	852	738	114
Main Workers Cultivators	95	90	5
Agriculture Labourer	446	385	61
Household Industries	3	3	0
Other Workers	308	260	48

Marginal Workers	93	30	63
Non-Working Persons	1974	697	1277

Table 19 Occupational Details of Manekpur

4.3.9. Agricultural Details / Organic Farming / Fishery

Manekpur Manufacturers and Agricultural Commodities Data are as follows –

Description Type	Commodities
Agricultural Commodities (First)	PADDY
Manufacturers Commodities (First)	N/A
Agricultural Commodities (Second)	MANGO
Agricultural Commodities (Third)	SAPOTA
Forest Area (in Hectares)	30.2

Table 20 Agricultural Details of Manekpur

4.3.10. Physical Infrastructure Facilities - Manufacturing HUB / Warehouses

There are some major manufacturing hubs in the village –

- Apar Industries Ltd.
  It is an industry which gives Design, Development, Manufacturing & Supply of LV & HV XLPE Power Cable, Aerial Bunched Cable, PVC Power Cables, PVC & XLPE Control Cables, Signalling Cables, Quad Cable, Instrumentation Cable, Communication cable, Optical Fibre Cable, Covered Conductor & House Wires.

- Viva Composite Panel (Pvt.) Ltd.
  It is a quality driven organization offering a wide range of Aluminium composite sheets, aluminium composite panels.

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

There is no development of places for tourism purposes or for attracting the tourists to the village.

4.4. Infrastructure Details (With Exiting Village Photograph)

4.4.1. Drinking Water / Water Management Facilities

The drinking water is not provided by the government to the people. So, the people of the village have their own sources like borewell, RO Purified Water of 20 litres daily bottle facilities, Wells, etc.

Figure 13 Water Tanks in village

It can be managed by repairing the existing water tanks and by repairing the existing pipelines. As there are 3 elevated tanks in the village so the pressure will also be high and it will be sufficient to all to reduce use of economy in water purpose.

4.4.2. Drainage Network / Sanitation Facilities

There is an open type of drainage facility in Manekpur. The drain water gets discharged directly into its nearby water body or on the vacant land. The sewers laid are of no use as they are not properly placed. Also, it creates a nauseating smell & polluted atmosphere. It is not good for the people who are living near it.

As you can see, we have provided a picture of the drainage of the village and how the drain water gets discharged into vacant areas. This picture is shot at the time of monsoon so that we can get a clear idea about how the water drains need to be taken under consideration. Also, there is no drainage besides the road to drain out the storm water.

Figure 14 Drainage Facility in Village

4.4.3. Transportation & Road Network

The road network is good inside the village, but in case of village streets paths and footpaths, they need to be maintained; as they have got ruts, cracking and some potholes. Further talking about the lighting system, there is no lighting in the village approach road as well as the main road. Some places there are solar street lights but they also need maintenance and repair work.

4.4.4. Housing condition

70% of the housing is of Pucca (50% with cc plaster on the walls and 20% without plaster) housing whereas 30% of the housing is of Kutcha (mud/dung used as binder with the wood as a

supporting elements). Some of houses got an increment due to PMAY(G) mission and so they are having Pucca houses.

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

Figure 15 Health Facilities

Figure **15** shows the health facilities available inside the village like PHC, small clinics, nearby medical shops, etc.

Figure 16 Primary School

Figure 17 High school of Village

Figure 18 Anganwadi

Figure **16**, **17** and **18** shows the education facilities available inside the village like primary school, secondary & higher secondary school and aanganwadi. They are temporarily closed due to the COVID 19 pandemic situation.

Figure 19 Gram Panchayat & Post-Office

Figure **19** shows the panchayat building of the village which is in poor condition. It consists of both post office and gram panchayat in it.
There is no community hall or any public library in the village.

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

Figure **19** shows a picture of the existing condition of the panchayat & post office in the village. As you can see the condition is very poor, and they need to be repaired and maintained.

Figure 20 Bus stops

Figure **20** shows a picture of the existing condition of the bus stop in the village. As you can see the condition is very poor, because they are not in use too much.

Figure 21 Water Tanks

Figure **21** shows a picture of the existing condition of the water tanks in the village. As you can see the condition is very poor, because they are not in use too much. The pipelines are also laid but as we did the survey, the people did not receive the water.

4.4.7. Technology Mobile/ WIFI / Internet Usage Details

There is no public WIFI or any internet café in the village. The people use their own internet services for their use. As the current situation restricts the students to go to school so the government should provide a public WIFI so that the students cut down their own internet data usage.

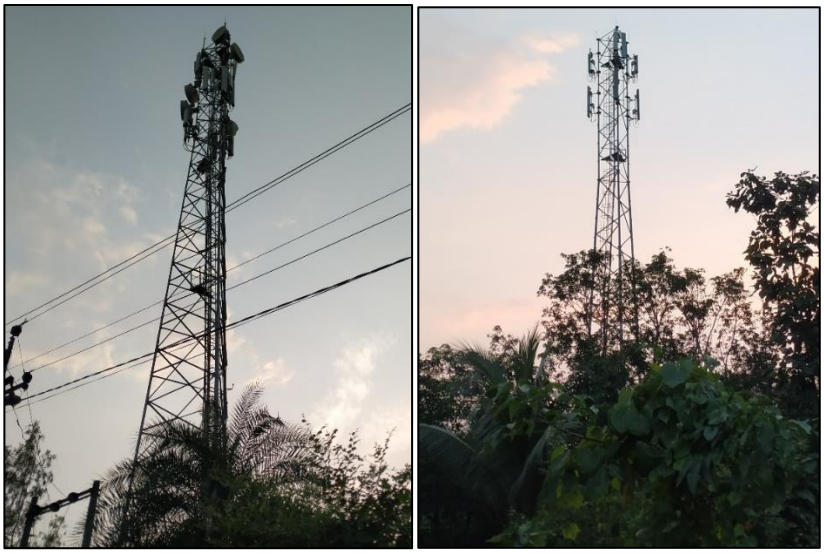


Figure 22 Network Towers

There are 2 nos. of available towers in the village for data and communication services.

4.4.8. Sports Activity as Gram Panchayat

No sports activity conducted by Gram Panchayat. The ones who are interested setups their own matches with other neighbouring village teams in case of cricket, volleyball, kabaddi, etc.

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

- Public Garden: There is no Public Garden in the village.
- Public Library: There is no Public Library in the village.
- Park/Playground: The children of the village school ground as their playground. There is no separate playground for kids or for adults to play.
- Village Pond: There is one pond or lake in the village.
- Community Hall: There is no community Hall in the village.

Figure 23 Village Pond

4.4.10. Other Facilities (e.g., like footpath development-Smart Toilets-Coin operated entry, self-cleansing, waterless, public building)

No other facilities are available like smart toilets, coin operated toilets, self-cleansing toilets, waterless toilets, etc. in the village. According to the villagers, if this is setup, then it will be beneficial for them as well.

4.4.11. Any other details

No other details other than mentioned above.

4.5. Existing Institution like - Village Administration – Detail Profile

4.5.1. Bachat Mandali

No Bachat Mandali is located inside a village.

4.5.2. Dudh Mandali

One society is available.

4.5.3. Mahila forum

No availability of Mahila forum for the village.

4.5.4. Plantation for the Air Pollution

Figure 24 Plantation in Village

There are already many plants in the village & has a high number of trees in it, though the villagers have grown a vast number of plants in vacant areas as shown in Figure **22**. This helps them for better quality of air circulation in the village.

4.5.5. Rainwater Harvesting - Waste Water Recycling

There is no availability of a water harvesting system in the village. This needs to be set up because when there is summer season the village people suffer from scarcity problems.

4.5.6. Agricultural Development

Figure 25 Agricultural Development

Figure **23** shows the pictorial view of the present agricultural development in the village. The farms inside the village grow various crops like paddy, mango(amba-kalam), chikoo, coconut, etc.

4.5.7. Any Other

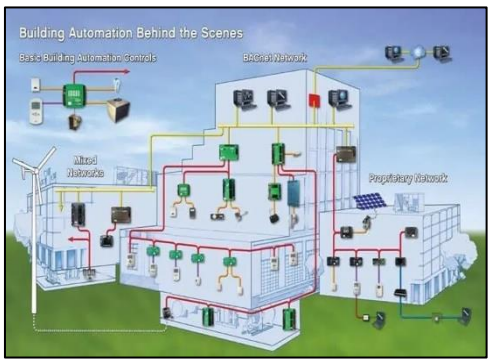
No other institutions in the village for the enhancement purpose.

Chapter 5. Technical Options with Case Studies

5.1. Concept (Civil)

5.1.1. Advance Sustainable construction techniques / Practices and Quantity Surveying

1. IoT Integrated Automated Building Systems



The Internet of Things (IoT) gives facility managers access to data that they did not previously have access to. These small, connected sensors can integrate with automated building systems to improve the sustainability of operations. For example, IoT sensors can dynamically adjust the required ventilation and lighting levels inside the building based on temperature, weather, and CO2 readings. The facility manager doesn't need to manually stay on top of these adjustments or input data from multiple pieces of equipment.

2. Synthetic Roof Underlayment

The underlayment on roofs is typically asphalt-based, which breaks down quickly. Replacing this layer is necessary to keep moisture out of the building's interior. Synthetic roof underlayment offers an alternative that weighs less and holds up to the wear and tear of an exterior environment. This material uses polymer that comes from recycled scrap materials. It also eliminates VOCs from the underlayment.

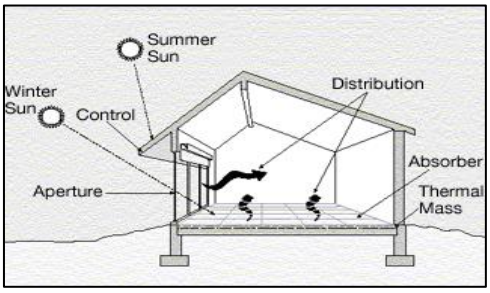
3. Green Roofs

Another innovation for the top of commercial properties comes from green roofs. Grass, plants, flowers, bushes, and other greenery grows on the roofing material. Stormwater is absorbed into the soil and managed more easily than with a bare roof. Heating and cooling costs are reduced, and the air quality is improved.

4. Grid Hybrid System

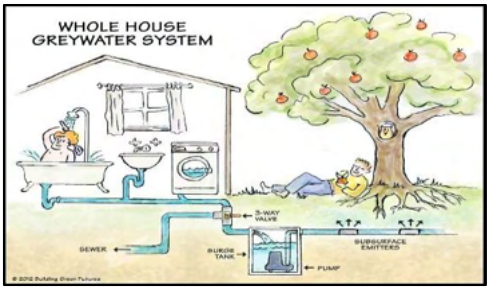
Renewable energy sources provide a sustainable way for organizations to power their commercial properties, but many grid systems lack storage to power facilities during times of low solar availability. A hybrid system stores excess energy and allows the renewable source to function at night, during overcast days and in other conditions that aren't ideal.

5. Passive Solar



Another way to leverage a sustainable solar energy source is to construct the building based on the passive solar concept. The facility's location and design maximize solar energy for heating during winter, while reducing its impact during warmer months.

6. Greywater Plumbing Systems

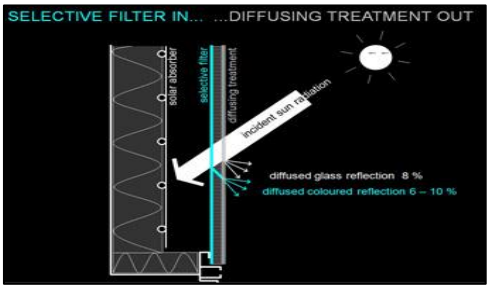


Greywater systems reduce the facility's need for freshwater, as everything except for toilet streams can be processed for reuse. The most common uses for this water include irrigation and supplying toilets with water.

7. Electrochromic Smart Glass

Electrochromic glass can shift from clear to opaque based on external stimuli such as an electrical current or UV rays. It eliminates the need for shades and other window treatments, while adapting to current conditions passively. Additional benefits include blocking most UV rays.

8. Solar Thermal Cladding



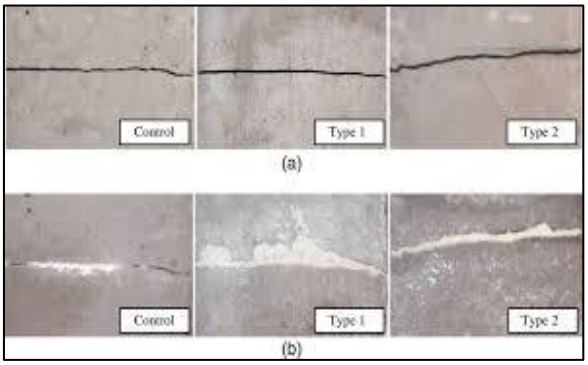
Solar thermal cladding is a passive solar building method designed specifically to hold heat during the winter. The sun's energy is stored within this material and passed through to the building for heat retention purposes.

9. Structural 3D Printing

Creating and moving building materials to the job site can have heavy environmental costs. As structure 3D printing begins moving forward, it becomes easier to cut down on shipping costs or reduce the weight of components.

10. Self-healing Concrete

This material is in its initial stages, but once it's commercially viable it opens many sustainable possibilities. Everything from roads to walkways can benefit from concrete that heals itself. Road crews would no longer need to shut down busy streets and highway lanes to address potholes and cracks.



11. Sustainable Indoor Environment Technologies

The health and safety of the building occupants are fundamental and must be guaranteed during the construction of any building or home. As such, sustainable indoor technologies are mandatory for green construction. The materials used must ensure green safety standards which include hazardous free elements, non-toxic materials, low volatile emissions, and moisture resistance.

12. Self-Powered Buildings

Self-powered buildings bring about the realization of zero-energy construction. The buildings are built such that they can generate sufficient power to support their own energy needs and even direct surplus energy back into the power grid. In most cases, wind power technology is used, and it is highly common in skyscrapers whereby wind turbines are mounted at the rooftops. The constant and heavy air currents at higher altitudes propel the turbine blades which generates the power requirements for the building.

13. Rammed Earth Brick

Rammed earth brick is an ancient construction technology which has lately been re-introduced to cater for the demands of environmental sustainability. The technique uses sustainably sourced raw materials. Due to technological advancements, the process of building a rammed-earth structure has been made easier but it still follows the ancient preparation process.

5.1.2. Soil Liquefaction

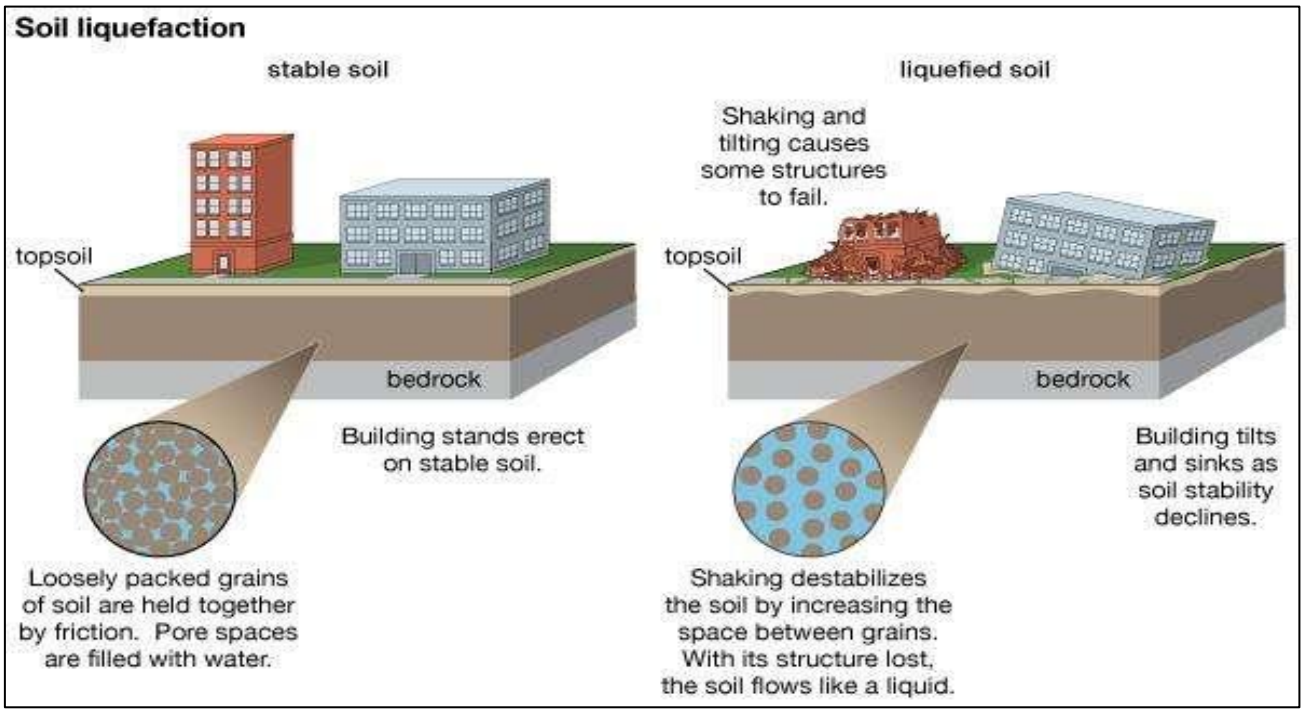


Figure 26 Qualities of a stable soil when compared to a liquefied soil

- Soil Liquefaction occurs when a saturated or partially saturated soil loses strength and stiffness in response to an applied stress such as shaking during an earthquake or other sudden change in stress condition, in which material that is ordinarily a solid behaves like a liquid.
- Increase in pore water pressure during undrained shearing causes which in turn reduces the shear strength.
- Pore pressure is often released through sand or water boils.
- The soil behaves more like a viscous fluid; heavy structures sink and light structures float.

"*A Phenomenon whereby a saturated or partially saturated soil substantially loses strength and stiffness in response to an applied stress, usually earthquake shaking or other sudden change in stress condition, causing it to behave like a liquid.*" is called Soil Liquefaction (*Hazen 1918*).
There are two types of soil liquefaction.
1) Flow liquefaction
2) Cyclic Mobility

❖ **How does Soil Liquefaction Work?**

The soil is a mixture of soil particles that stay connected. These particles naturally rest upon each other due to gravity and form grids based on its properties. Each particle produces its own contact force by the surrounding particle. These contact forces together hold all the individual soil particles in their place. Soil liquefaction occurs due to sudden and rapid load on the soil particle. The sudden water pressure leads to soil losing its cohesive strength. Once the soil

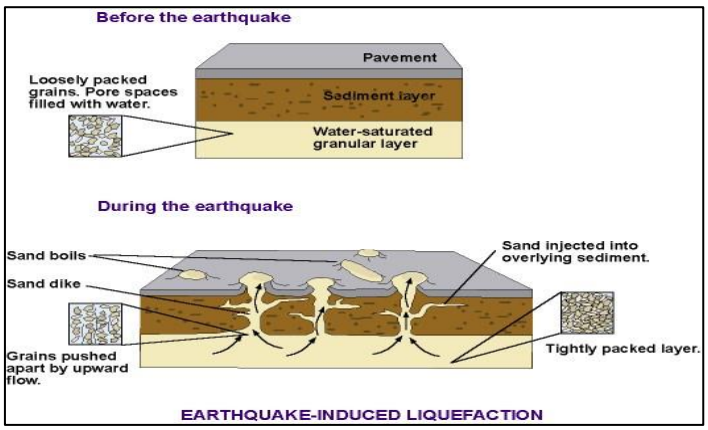


Figure 27 Soil Liquefaction

loses its cohesion, it gets softened, weak and loses its solid properties that are converted to liquid properties.

❖ **Effects of Liquefaction on Buildings**

1. Buckling of Piles: Pile foundations are embedded deep into the ground because of the soil support. But if the soil is not strong, the foundations buckle which leads to the collapse of the structure.
2. Spreading of ground: The soil starts to move in a downward direction due to the liquefaction. Slopes starting from an angle of 3 degrees are prone to lateral spreading.

The effects of soil liquefaction on the built environment can be extremely damaging. Buildings whose foundations stand directly on the sand, which liquefies, will experience a sudden loss of support. Where a thin crust of non-liquefied soil exists between building foundation and the liquefied soil, a 'punching shear' type foundation failure may occur. The irregular settlement of ground may also break underground utility lines. The upward pressure applied by the movement of liquefied soil through the crust layer can crack weak foundation slabs and enter buildings through service ducts and may allow water to damage the building contents and electrical services.

❖ **Methods to reduce damage due to Soil Liquefaction:**

1. By avoiding construction on saturated soils
2. Liquefaction-proof structural system
3. Improving Soil Conditions
4. Methods to mitigate soil liquefaction have been designed to improve soil strength and quality.
5. Methods such as Vibro compaction, dynamic compaction, and use of vibro stone columns are preferable.

5.1.3. Sustainable Sanitation

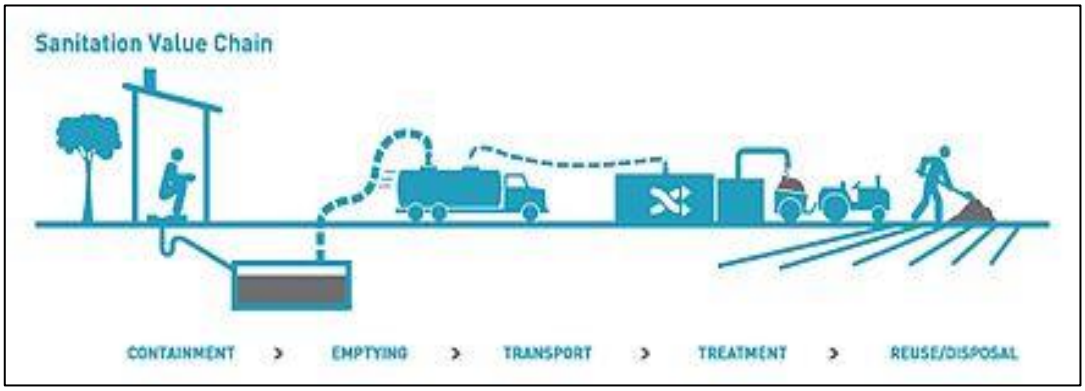


Figure 28 Sustainable Sanitation

Sustainable sanitation recognizes that to be sustainable, a sanitation approach must be socially acceptable and economically viable. In this way, sustainable sanitation is a loop- based approach that differs fundamentally from the current linear concepts of wastewater management, and that does not only recognize technology, but also social, environmental, and economic aspects. Sustainable sanitation is an approach that considers sanitation holistically. It recognizes that human excreta and wastewater are not waste products, but valuable resources. This view is based on the fact that wastewater and excreta contain a significant amount of energy plant nutrients and water that can be recycled and reused, thus protecting natural resources.

The main objective of a sanitation system is to protect and promote human health by providing a clean environment and breaking the cycle of disease. To be sustainable, a sanitation system must be not only economically viable, socially acceptable, and technically and institutionally appropriate, it should also protect the environment and the natural resources.

Today, the need for sustainability means that resource saving, and protection of the environment are vital and there is a need for innovation and rethinking. This cannot be achieved by conventional methods. Also, in our emerging consumer and chemical societies it will not be enough that residents pay for sanitation and water services – they must be partners to make sanitation sustainable.

Sustainable sanitation is a simple approach: the most basic principle is that is considered wastewater and excreta not as a waste, but as resources, that sanitation must be socially acceptable and should be as economically viable as possible. There is no one- fit-all approach much rather, the most adequate solution must be found from case to case, considering climate and water availability, agricultural practices, socio-cultural preferences, affordability, safety, and technical prerequisites – just to name a few.

When improving an existing and/or designing a new sanitation system, sustainability criteria related to the following aspects should be considered:

- **Health and hygiene:** It include the risk of exposure to pathogens and hazardous substances that could affect public health at all points of the sanitation system from the toilet via the collection and treatment system to the point of reuse or disposal and downstream populations. This topic also covers aspects such as hygiene, nutrition and improvement of livelihood achieved by the application of a certain sanitation system, as well as downstream effects.
- **Environment and natural resources:** It involve the required energy, water and other natural resources for construction, operation, and maintenance of the system, as well as the potential emissions to the environment resulting from its use. It also includes the degree of recycling and reuse practiced and the effects of these (e.g., reusing wastewater, returning nutrients and organic material to agriculture), and the protection of other non-renewable resources, e.g., through the production of renewable energies (such as biogas).
- **Technology and operation:** It incorporate the functionality and the ease with which the entire system including the collection, transport, treatment, and reuse and/or final disposal can be constructed, operated, and monitored by the local community and/or the technical teams of the local utilities.
- **Financial and economic issues:** It relate to the capacity of households and communities to pay for sanitation, including the construction, operation, maintenance, and necessary reinvestments in the system.

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 infrastructure refers to the framework that supports our transport system.

This includes roads, railways, ports, and airports. National and local governments are responsible for the development of our transport infrastructure.

ROAD	•**Total Road Length: 48,65,394 km** •Nh: 76,818 km •SH: 1,64,360 •Rural Roads: 19,38,220 km •Urban Roads: 4,64,294 km •Road Length increased betweem 1951 to 2012 •Road Length per 1000 sq. km: 1480 km •Road Length per 1000 population: 4.03 km
RAIL	•**7500 Railway Stations** •64,600 km route •12000 and 7000 pass & freight trains a day •2.8 million tonnes of freight a day •25 million pass a day •3rd largest rail network in the world
AIR	•**132 Airports in India** •32 International and 154 Domestic Airports •27 Proposed Airports •407.96 million international passengers traffic handled •121.51 million domestic passengers traffic handled in 2011-12 •1.4 & 0.8 million tonnes of cargo handled in 2011-12
WATER	•**12 Major Ports and 200 Non-Major Ports** •917 million tonnes of Cargo traffic handled •21.5 million passenger traffic handled •6 National Waterways of length 450. km serving 15 states •40% of cargo and 98% of passenger traffic handled by non-major ports.

Table 21 Transport Infrastructure

5.1.5. Vertical Farming

Vertical farming is cultivating and producing crops/ plants in vertically stacked layers and vertically inclined surfaces. The entire world is on the verge of population explosion and there is a gravest challenge of feeding the population. The population explosion has led to the decreased per capita land. Earlier with the aim of supplying the food to ever increasing population agricultural scientist stretched their innovative approaches to the tune of developing hybrid/ improved high yielding varieties, improved techniques, improved tools and implements, integrated practices in water, nutrient management and insect, pest management, greenhouse technology and even the genetically modified crops.

Figure 29 Vertical Farming

Vertical Farming or vertical agriculture facilitates viable agricultural production inside buildings, in the metropolitan areas of our cities. Vertical Farming is therefore a form of urban agriculture.

A Vertical Farm…

- …drastically reduces agricultural land use.
- …saves up to 95% water.
- …makes cultivation possible, independent of weather conditions & season.
- …delivers each harvest with continuous quality.
- …brings maximum freshness into the city.
- …saves on transport to the consumer.
- …limits CO2 and puts less strain on the climate.
- …brings agriculture back into urban everyday life

Advantages

- It offers a plan to handle future food demands
- It allows crops to grow year-round
- It uses significantly less water
- Weather doesn't affect the crops
- More organic crops can be grown
- There is less exposure to chemicals and disease

Disadvantages

- It could be very costly to build, and economic feasibility studies haven't yet been completed
- Pollination would be very difficult and costly
- It would involve higher labor costs
- It relies too much on technology and one day of power loss would be devastating.

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

The corrosion process that takes place in concrete is electrochemical in nature. Corrosion will result in the flow of electrons between anodic and cathodic sides on the rebar. Concrete, when exposed to wet and dry cycles, has sufficient conductivity to serve as an electrolyte.

The corrosion of steel in concrete in the presence of oxygen but without chlorides takes place in several steps:

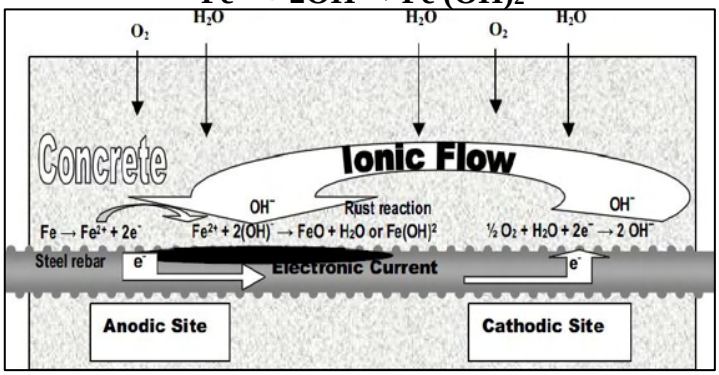
At the anode, iron is oxidized to the ferrous state and release electrons

$$Fe \rightarrow Fe^{2+} + 2e^-$$

These electrons migrate to the cathode where they combine with water and oxygen to form hydroxyl ions

$$2e^- + H_2O + 1/2O_2 \rightarrow 2OH^-$$

$$Fe^{2+} + 2OH^- \rightarrow Fe(OH)_2$$



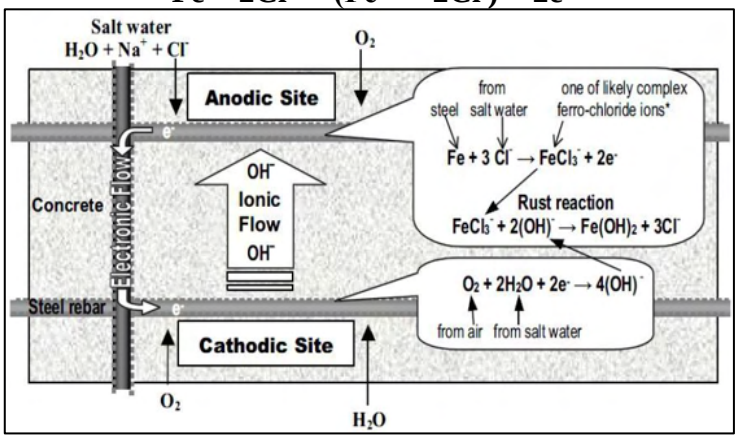
In the presence of water and oxygen, the ferrous hydroxide is further oxidized to form Fe_2O_3

$$4Fe(OH)_2 + O_2 + H_2O \rightarrow 4Fe(OH)_3$$

$$2Fe(OH)_3 \rightarrow Fe_2O_3.2H_2O$$

At the anode, iron reacts with chloride ions to form an intermediate soluble iron chloride complex

$$Fe + 2Cl^- \rightarrow (Fe^{2+} + 2Cl^-) + 2e^-$$



When the iron–chloride complex diffuses away from the bar to an area with higher pH and concentration of oxygen, it reacts with hydroxyl ions to form Fe $(OH)_2$. This complex reacts with water to form ferrous hydroxide.

$$(Fe^{2+} + 2Cl^-) + 2H_2O + 2e^- \rightarrow Fe(OH)_2 + 2H^+ + 2Cl^-$$

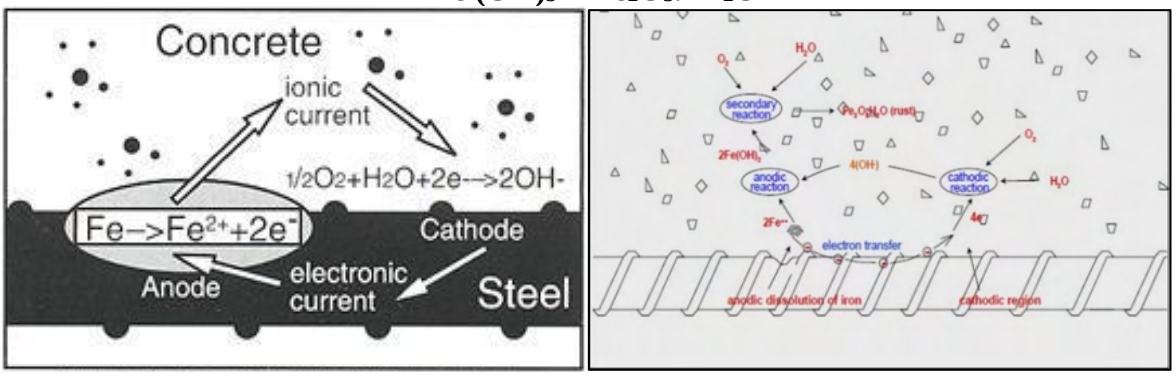
The hydrogen ions then combine with electrons to form hydrogen gas

$$2H^+ + 2e^- \rightarrow H_2\uparrow$$

As in the case of corrosion of steel without chlorides, the ferrous hydroxide, in the presence of water and oxygen, is further oxidized to form Fe_2O_3

$$4Fe(OH)_2 + O_2 + H_2O \rightarrow 4Fe(OH)_3$$

$$2Fe(OH)_3 \rightarrow Fe_2O_3.2H_2O$$



Corrosion Control Measures:

- Epoxy-coated reinforcing steel
- Galvanized steel
- Stainless steel
- Cement and pozzolans
- Water-cementitious materials ratio
- Aggregate
- Curing conditions
- Corrosion inhibitors
- Cathodic protection

Repair & Rehabilitation of Damaged RCC Structures:

To repair is defined as **"to replace or refix parts, compensating for loss or exhaustion."** One definition of the word **rehabilitate** is **"to restore to proper condition."** If we want to rehabilitate a structure, we want to restore it, not necessarily to its original condition, because if we do, it may fail again because of intrinsic flaws.

1. Patch Repair
2. Electrochemical Process
3. Cathodic Protection (CP)
4. Electrochemical Chloride Acceleration (ECE)
5. Electrochemical Re-alkalization
6. Corrosion Inhibitors
    a. Concrete admixture inhibitors - used as a preventative measure.
    b. Surface applied and drilled-in inhibitors - used as a curative or preventative measure.
7. Surface Treatments:
    a. Pore-liners
    b. Pore blockers
    c. Film-formers

5.1.7. Sewage Treatment Plan

Figure 30 Sewage Treatment Plant

Sewage treatment is the process of removing contaminants from municipal wastewater, containing household sewage plus some industrial wastewater. Physical, chemical, and biological processes are used to remove contaminants and produce treated wastewater (or treated effluent) that is safe enough for release into the environment. A by-product of sewage treatment is a semi-solid waste or slurry, called sewage sludge. The sludge must 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 which 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 which has usually received pre-treatment at the factories themselves 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 filtration of sewage typically includes a bar screen to filter solids and large objects which are then collected in dumpsters and disposed of in landfills. Fat and grease are also removed before the primary treatment of sewage.

5.1.8. Technical Case Study on "The Atal Tunnel"

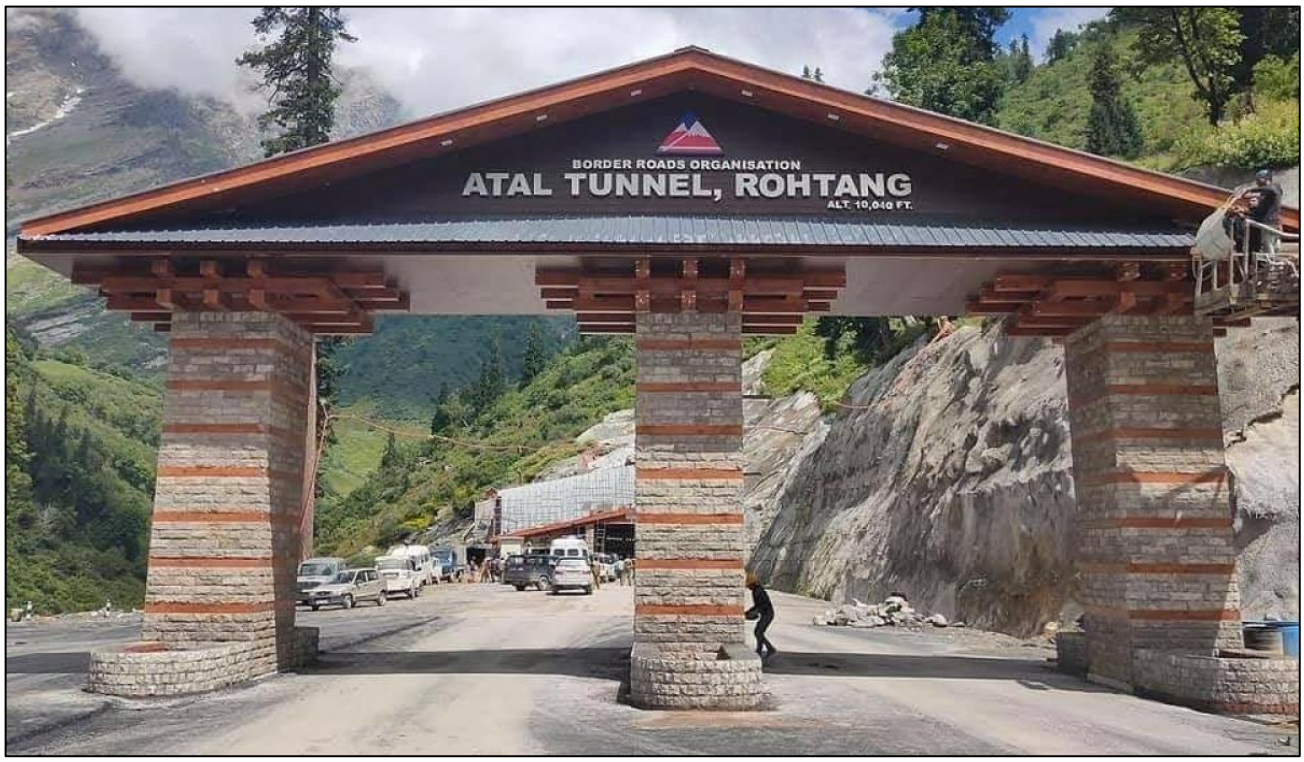


Figure 31 Atal Tunnel Entrance

The Atal Tunnel in Rohtang, Himachal Pradesh, India is the World's longest highway tunnel, constructed at an altitude of 3000 meters above MSL and is about 9.02 kilometres long, connecting Solang Valley near Manali to Sissu in Lahaul and Spiti district. It was inaugurated by the Prime Minister, Mr. Narendra Modi on October 3, 2020, in the presence of Rajnath Singh (Minister of Defence), Jai Ram Thakur (CM of Himachal Pradesh), and Anurag Thakur (Minister of State for Finance). The tunnel has been named after a former Indian Prime Minister, Atal Bihari Vajpayee.

The basic information regarding the Atal Tunnel has been given below in the table:

Atal Tunnel	
Project Name	Atal Tunnel
Location	Rohtang, Himachal Pradesh, India
Status	Active
Route	Leh–Manali Highway
Coordinates	32.401270°N 77.148335°E
Work Begun	28 June 2010
Inaugurated On	October 3, 2020
Inaugurated By	Mr. Narendra Modi
Length of the Tunnel	9.02 km
Altitude	3000 m above Mean Sea Level
Connection Between	Solang Valley near Manali to Sissu in Lahaul and Spiti district
Special Feature	World's longest highway tunnel
Constructive Feature	Horseshoe-shaped, single tube & double lane
Project Cost	Rs. 3,200 Crore (Approx.)
Constructed by	Borders Roads Organization (BRO)

Table 22 Details of Atal Tunnel

History & Location of Atal Tunnel

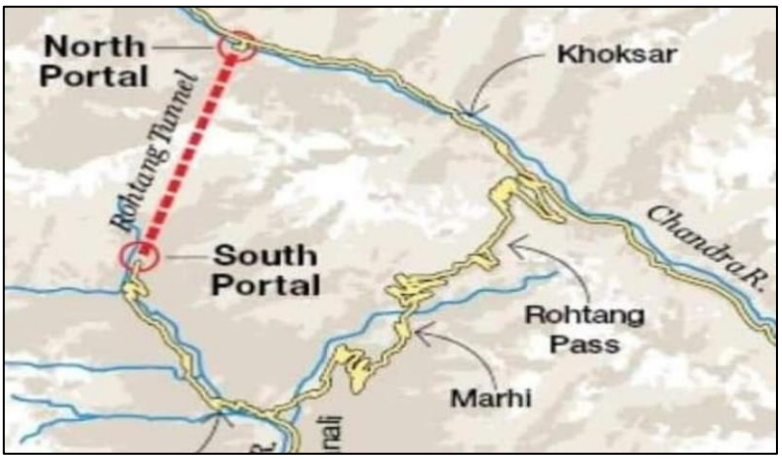


Figure 32 Location Map of Atal Tunnel

- Although inaugurated in 2020, the announcement and foundation for the tunnel were made two decades back.
- The initial announcement to create such a tunnel was made by Late Atal Bihari Vajpayee on June 3, 2000
- The responsibility to complete the construction was handed over to the Border Roads Organisation (BRO) in 2002. But due to the increasing cost of the project, from Rs 400 crore to Rs 900 crore, the project had been brought to a standstill.
- Later, in 2010, the UPA (United Progressive Alliance) Chairperson, Sonia Gandhi, laid the foundation of this project in Solang Valley, near Manali.
- Gradually the digging up process began for the tunnel and only energy services were allowed through the route.
- By September 2020, the entire construction was complete, and finally, on October 3, 2020, the project was inaugurated.
- It took decades to complete the project but today, it has opened a better path for armed forces, farmers, and tourism. And with exceptional safety features, it has given a new perspective to the Indian infrastructure and road safety.

Design & Construction of Atal Tunnel

The principal support system for the tunnel is a combination of fibre reinforced concrete and rock bolt. Yieldable steel ribs are used as additional support in poor rock areas. The tunnel has a semi-transverse ventilation with fans to circulate air. The long distance of the tunnel and the high altitude have necessitated the special ventilation system.

.

Construction of one of the two access roads was completed in 2005. The road connecting the south portal of the tunnel to Manali is 2.7 km long. It has 18 avalanche protection structures. The 23.8 km north portal road connects the tunnel to Manali-Sarchu road. The two roads have been constructed at the cost of Rs 1.8bn ($38m). The approach roads helped in carrying the construction material to the site. They were later developed to meet the specifications of a double lane National Highway. It is 8,802-metres long and about 3,000 metres above sea level. The single tube bi-lane tunnel, 5.5 metres high, was bored through solid rock nearly two kilometres under the Rohtang Pass. The makers used a drill and blast technique for excavation, coupled with the New Austrian tunnelling method for construction.

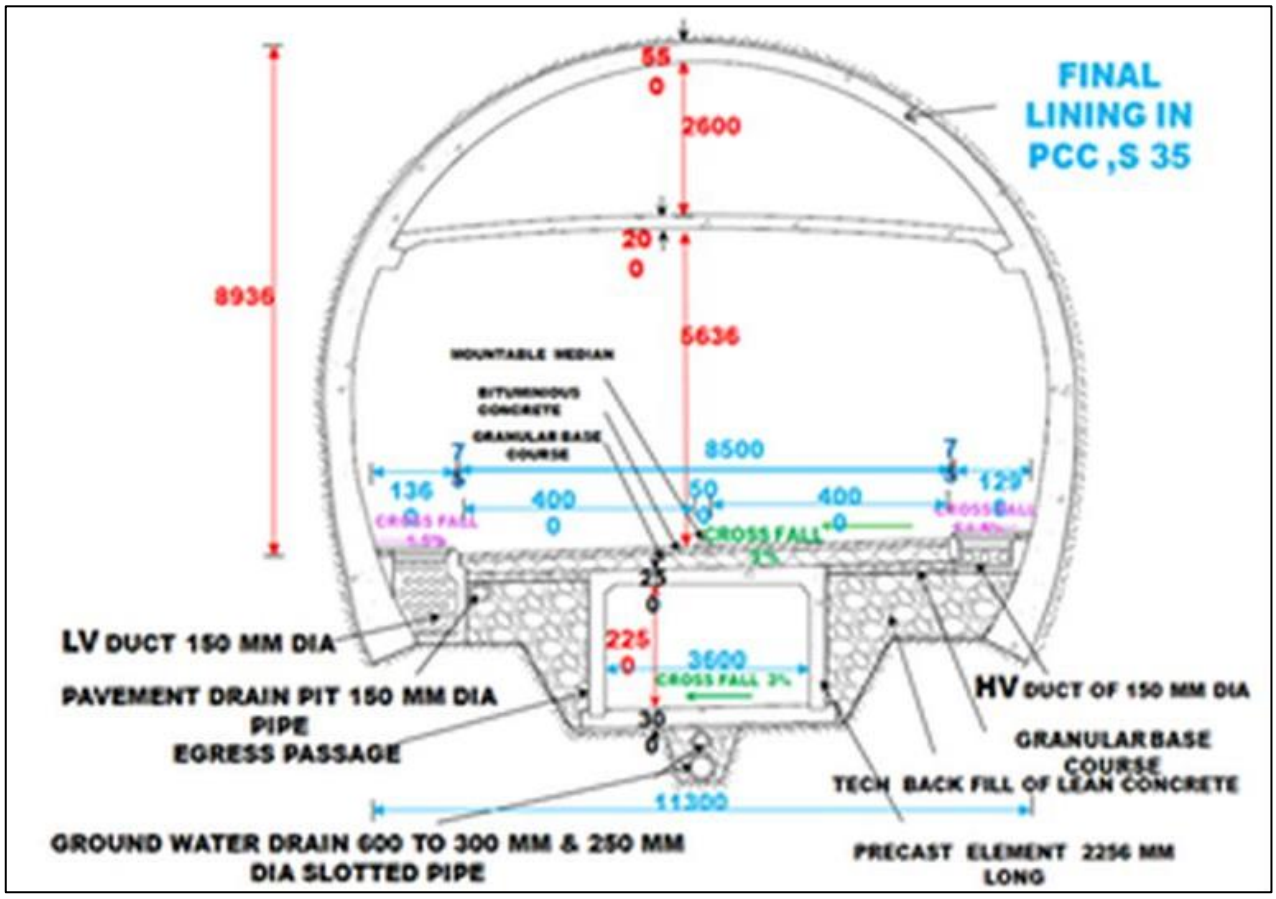


Figure 33 Cross-Section of Tunnel

Another parallel tunnel of 3.3×2.2 metres, an emergency passage of sorts, has been constructed under the Atal Rohtang tunnel with staircases at every 500 metres connecting it to the main tunnel. 3,000 cars and 1,500 trucks can pass through the Atal Tunnel at 80 km per hour.

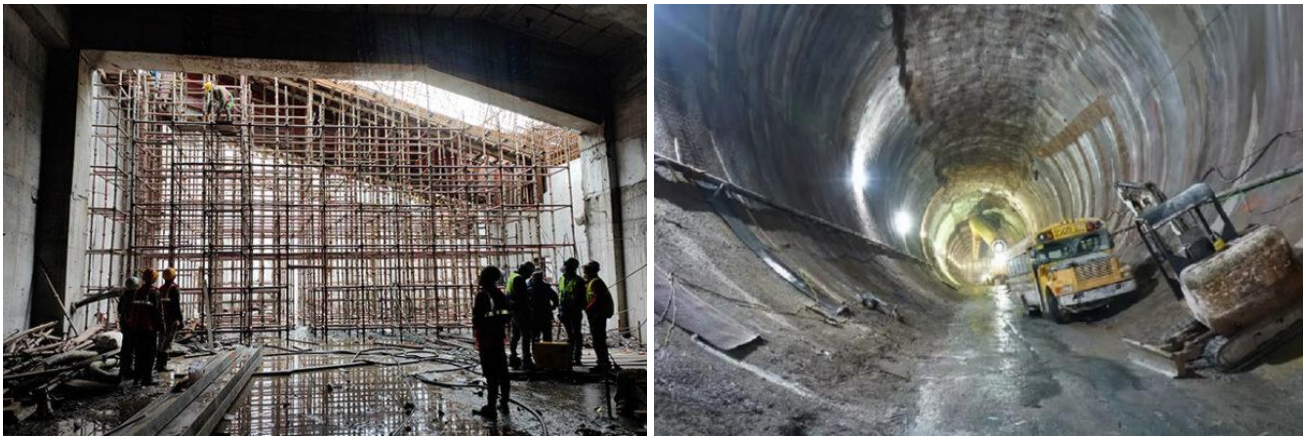
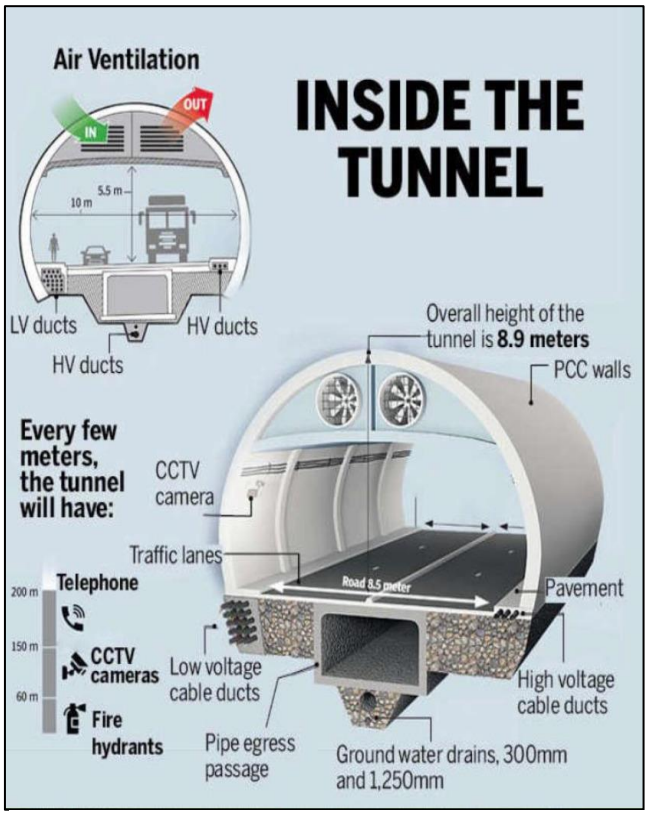


Figure 34 Construction Work of Atal Tunnel

- At 9.02 km (5.6 mi) length, the tunnel will be one of the longest road tunnels in India and is expected to reduce the distance between Manali and Leh by 46 km (28.6 mi) and to cut off drive time by 7 hours.
- The tunnel is at an elevation of 3,100 metres (10,171 ft) whereas the Rohtang Pass is at an elevation of 3,978 metres (13,051 ft).
- The tunnel keeps the highway open during the winter.
- Atal Tunnel is horseshoe shaped and is a single-tube, double-lane tunnel.
- It is also the country's first tunnel to have an escape tunnel within the main tunnel because of the topography.
- It is also the first tunnel to deploy the Rowa flyer technology, which allows engineers to work at inverted levels.
- The tunnel will provide all-weather connectivity to remote border areas of Himachal Pradesh and Ladakh which otherwise remain cut-off from the rest of the country for about six months during winters
- The tunnel has consumed **14,508 metric tonnes of steel** and **2,37,596 metric tonnes of cement**, and excavated out **14 lakh cubic metres soil and rocks**, using the drill and blast technique for excavation
- The New Austrian Tunnelling method for construction adopted for the tunnel.
- The following parameters have been set in design:
  - Upper tolerance limit for concentration – 150ppm
  - Visibility factor – 0.009/m
  - Vehicles
  - Cars – 3000 Nos.
  - Trucks – 1500 Nos.
  - Peak hour traffic – 337.50 PCUs
  - Design vehicular speed in Tunnel
  - Maximum Speed – 80 km/h (50 mph)
  - Minimum Speed – 30 km/h (19 mph)

Features of Atal Tunnel

- It has a semi-transverse ventilation system
- It has a 3.6 x 2.25 meters fire-proof emergency egress tunnel, which is built into the main tunnel itself. A total of 18 egresses are present in the tunnel, comprising an energy exit path after every 500 meters
- There are evacuation lights throughout the length of the tunnel.
- Tunnel entry barriers at both portals.
- Telephone connections at every 150 meters for emergency communication.
- Fire hydrant mechanisms at every 60 meters.
- Auto incident detection system with CCTV cameras at every 250 meters.
- Air quality monitoring at every 1 km.
- Evacuation lighting / Exit signs at every 25 meters.
- Broadcasting system throughout the tunnel.
- Fire rated dampers at every 50 meters.



Benefits of Atal Tunnel

- Because of heavy snow, the interconnecting path between Manali and Leh could not be used for 6 months of the year. This problem has been resolved by the construction of the Atal Tunnel. Now, using this tunnel, traveling will be possible throughout all 12 months.
- The biggest advantage of this tunnel is that it will help the military forces to have easy connectivity to all the border areas around.
- The transportation of troops and supplies will become more convenient for the Army Personnel.
- The entire route of the tunnel will reduce the distance between Leh and Manali by 46 km and reduce the travel time by 4 hours.
- Easy access to medication and necessities will be improved. People who had to travel miles earlier will now be able to get all commodities easily as transportation will become easy.
- A lot of economic benefits are provided to Leh and Ladakh through tourism. Thus, the Atal Tunnel will also prove helpful for tourists traveling to these areas.
- Another markable significance of the Atal Tunnel is that it will ensure that farmers are able to supply the vegetables and crops on time, without any effect on the quality of the crops.

Challenges faced in Construction

- The most exhausting task was to continue the excavation during heavy snowfall in winter. Excavation for tunnelling was done from both ends.
- However, as Rohtang pass closes during the winter, the north portal was not accessible during winter and the excavation was being done only from the south portal in winters. Only about one-

fourth of the entire tunnel was excavated from the north end and three-fourths was excavated from the south end.

- There were more than 46 avalanche sites on approaches to the tunnel.
- Other challenges to the progress of the tunnel included difficulties in disposing more than 8,00,000 m^3 of excavated rock and soil, heavy ingress of water (as much as 3 million litres per day in June 2012) that required constant dewatering, costlier treatment and slowed the progress of excavation from 5 metre per day to just half a metre a day and unstable rocks that slowed blasting and digging.
- A cloudburst and flash flood on 8 August 2003 killed 42 labourers who were building the temporary access road.

References

https://www.oneindia.com/india/atal-tunnel-pm-modi-to-open-world-s-longest-highway-tunnel-everything-you-need-to-know-3157340.html

https://www.firstpost.com/india/atal-tunnel-is-ready-after-10-years-worlds-longest-tunnel-at-10000-feet-will-connect-manali-and-leh-8821651.html

https://theconstructor.org/geotechnical/atal-rohtang-tunnel-construction-of-the-worlds-longest-highway-tunnel/95419/#:~:text=Atal%20tunnel%20(Rohtang)%20is%20a%20roadway%20tunnel%20constructed,the%20longest%20bi-directional%20single-tube%20roadway%20tunnel%20of%20India.

https://en.m.wikipedia.org/wiki/Atal_Tunnel

Chapter 6. Swachh Bharat Abhiyan (Clean India)

6.1. Swachhta needed in allocated village -Existing Situation with photograph

The village is clean at some places but on the other hand it also needs some cleanliness at some places. As we have provided some images from the village, you can see how the garbage is thrown at nearby / besides the culverts and at some free areas.

Figure 35 Pictures related to Swatchh Bharat Abhiyan


The one thing that can be noticed is that the village pond is clean i.e., no littering is done over there. Also, the approach road is clean, but the street roads are not. The villagers themselves clean their surroundings and burn the waste because there is no system for any type of waste collection from door to door or from the internal streets. So, these points need to be taken under consideration.


Only few of the people have received the latrines which are given by the government through Swatchh Bharat Abhiyan which is quite not acceptable. Many of the villagers have their own latrine, but some of them use open places for doing the latrine. So, in such cases they don't have an option and public latrine is also not in condition to get to be used.

Figure 36 Government Latrine Block

6.2. Guidelines - Implementation in allocated village with Photograph

The guidelines that should be follow are:

1) Stop littering and dispose garbage properly

2) Sort your Garbage

3) Maintain Hygiene

4) Re-Use and Re-cycle

5) Say NO to Plastic

6) Consume what you need

7) Water care

8) Reduce your carbon footprints

9) Check Air Pollution

10) Environmental education and tree plantation

6.3. Activities Done by Students for allocated village with Photograph

There is no activity done by students for doing Swatchh Bharat Abhiyan in the Manekpur village. Because there is a pandemic situation and everyone is maintaining social distance, we are prevented from doing such activities, because these activities need proper contact and that would not be possible for both of us.

Chapter 7. Village condition due to Covid-19

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

Currently, there are no more cases in the village. From March to September there are less than 10 cases in the village that are also too held due to the outsiders i.e., which migrated previously and came back in the corona pandemic due to lockdown in their corresponding city. The people of the village use masks as an option to prevent the germs from others whereas they also use sanitizers and soaps to keep themselves clean and hygienic.

As the unlock process is going on the villagers are starting their normal lifestyle, by keeping social distance. Only the marketplace is the place where there is a slight amount of congestion, but that too can be acceptable.

7.2. Activities Done by Students for allocated village with Photograph

Due to conduction of lockdown throughout India, we were not able to perform any kind of activities in the village regarding the COVID-19 scenario. Though we tried our best and we told the people of the village to use sanitizers and masks for their safety. We told them to keep their mask on while talking with us so that they can remember to stay aware from the coronavirus.

7.3. Any other steps taken by the students / villagers

No other steps are taken by students/villagers rather than the provided government's guidelines like,

- Regularly and thoroughly clean your hands with an alcohol-based hand rub or wash them with soap and water. This eliminates germs including viruses that may be on your hands.
- Avoid touching your eyes, nose, and mouth. Hands touch many surfaces and can pick up viruses. Once contaminated, hands can transfer the virus to your eyes, nose, or mouth. From there, the virus can enter your body and infect you.
- Cover your mouth and nose with your bent elbow or tissue when you cough or sneeze. Then dispose of the used tissue immediately into a closed bin and wash your hands. By following good 'respiratory hygiene,' you can protect the people around you from viruses, which cause colds, flu, and COVID-19.
- Clean and disinfect surfaces frequently, especially those which are regularly touched, such as door handles, faucets, and phone screens.

7.4. Steps that could be taken by Sarpanch / Students / Government / People to tackle COVID

The Covid-19 pandemic outbreak has affected the entire world and impacted the lives of people in different ways. Winning a battle against this pandemic is not easy, and we need to take certain precautionary measures to keep ourselves safe and healthy. Staying indoors, maintaining a distance of at least 3-6 feet while stepping outside, wearing masks, cleaning hands using sanitizer or soap, and strictly following government rules and procedures are significant to prevent the spread of this deadly virus. We can follow the following steps for our safety.

1. Limitations of Travel –

The very first measure to be taken by any society for controlling such a cruel and quick spread disease is to have restricted transportation. As transportation is restricted, there will be no more accommodation for the public crowd at the particular point.

2. Quarantining of people arriving village –

In response to the spread of the coronavirus, a person who comes from outside of the village, should be quarantined at some well facilitated quarantine centre and should be stamped on the hand so that other people may get attention for that person.

3. Banners at key points showing Safety Concerns –

For effective awareness hoardings or banners made by the school students, as a part of their drawing, project, or hobby; can be put up besides the congested places.

4. Distribution of masks –

Distribution of masks can be done by the government or by the people with high earnings. As such, the mask plays a crucial role in this pandemic situation to protect both the person who is speaking and the one who is speaking with that person.

5. Precautionary measures at the market areas –

Market is one of the most congested places in the village. Not only in the village but all over the country we could see, where there is a CBD, there is congestion of people. Therefore, the market area should be given more importance for safety.

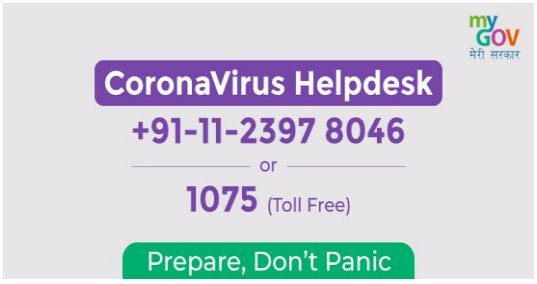
6. Sanitizing whole village once in a week –

Sanitizing of the streets of the village can be held with the help of sanitizing tempos, to make a safer and disinfected environment.

7. Online education –

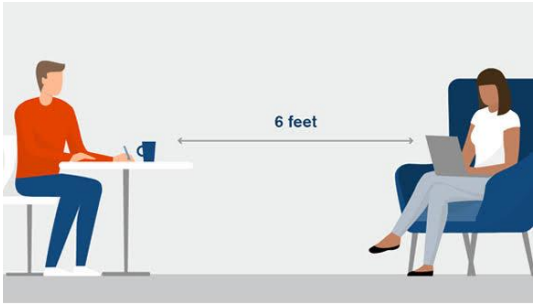
Online education is electronically supported learning that relies on the Internet for teacher/student interaction and the distribution of class materials. In COVID-19, online education is the most preferred way to receive education for students.

8. Help centre availability –



Proper help centres should be given to a particular set of villages so that in case of emergency, an ambulance or doctor is available for affected patients. A help centre should be 24 x 7 open for serving the public.

9. Social Distancing –



Social distancing, also called "physical distancing," means keeping a safe space between yourself & other people who are not from your household. Have a practice of social or physical distancing, stay at least 6 feet from other people who are not from your household in both indoor and outdoor spaces.

Chapter 8. Sustainable Design Planning Proposal (Prototype Design) – Part – I

(Proposed Design in AutoCAD & Sketchup / Measurement / Abstract Sheet)

8.1. Design Proposals

8.1.1. Sustainable Design (Civil) - Rainwater Harvesting Plant

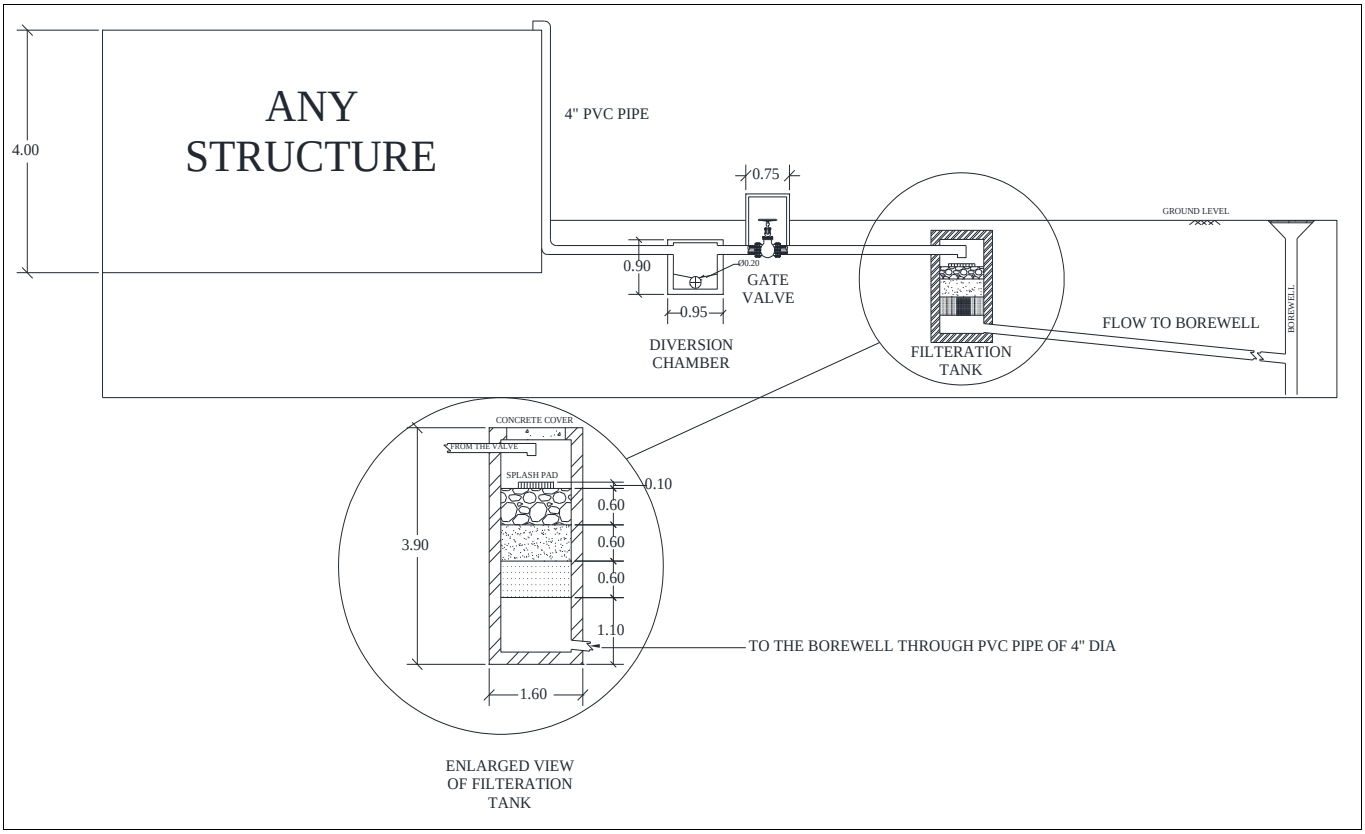


Figure 37 Rainwater Harvesting Concept (AutoCAD)

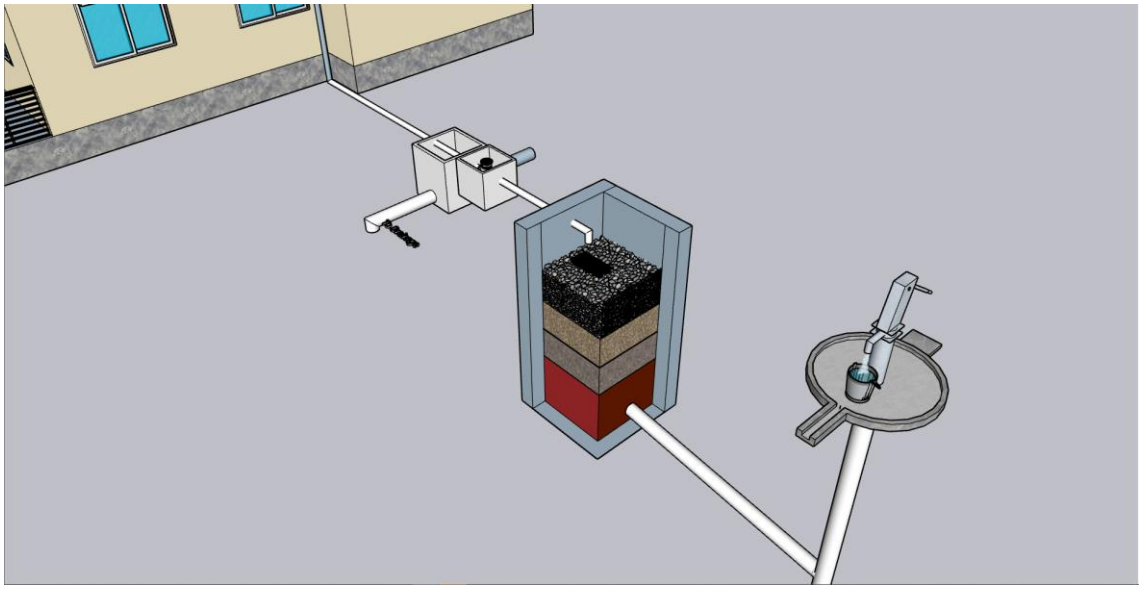


Figure 38 Rainwater Harvesting Plant Model (Sketchup)

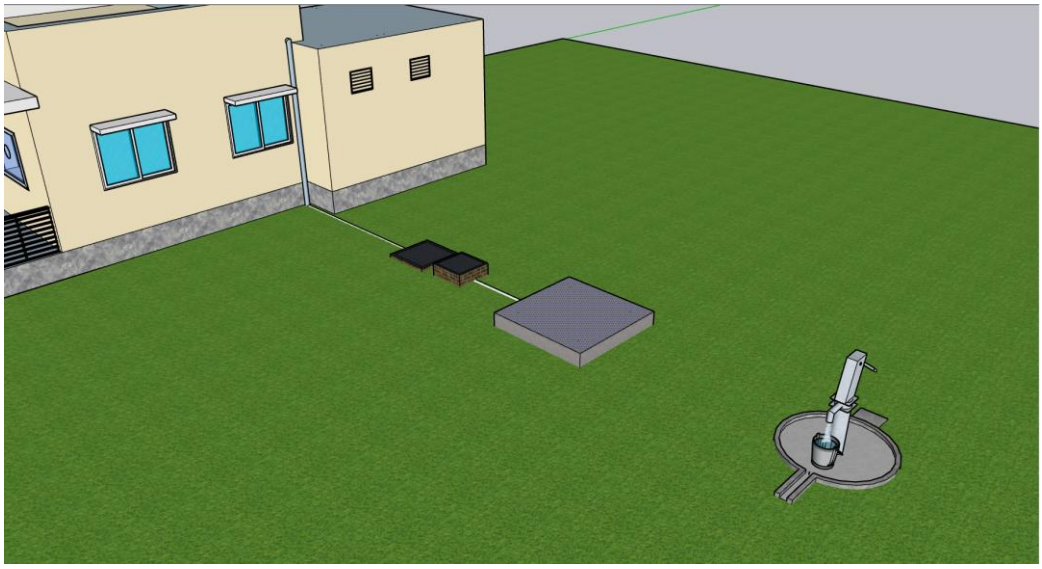


Figure 39 Iso-view of Rainwater Harvesting Plant

Figure 40 Rainwater Harvesting Plant (Sketchup)

Reference Material Link –
http://cpheeo.gov.in/upload/uploadfiles/files/Rainwater%20Harvesting%20Manual-CPWD.pdf
https://www.planndesign.com/sites/default/files/dwgs/2016/01/28/image1_12.jpg
https://en.wikipedia.org/wiki/Rainwater_harvesting
https://cleanenvironment.co.in/resource/resource3.pdf

ABSTRACT SHEET FOR RAIN-WATER HARVESTING PLANT

Sr No.	Description	Quantity	Rate	Per	Amount
1	Filtration Tank	1	₹ 15,000.00	Nos.	**₹ 15,000.00**
2	Diversion Tank	1	₹ 2,000.00	Nos.	**₹ 2,000.00**
3	4" PVC Pipe	20	₹ 1,400.00	ft	**₹ 28,000.00**
4	CI Gate Valve	2	₹ 1,400.00	Nos.	**₹ 2,800.00**
5	Elbow & all couplings (Finolex)	8	₹ 150.00	Nos.	**₹ 1,200.00**
6	Adhesive Solution	1	₹ 167.00	Litre	**₹ 167.00**
7	Brick Masonry Charge with Materials	7	₹ 7,722.65	m^3	**₹ 54,058.55**
TOTAL ESTIMATED CONSTRUCTION COST of RAIN-WATER HARVESTING PLANT					**₹ 1,03,225.55**

8.1.2. Physical design (Civil) - Public Toilet

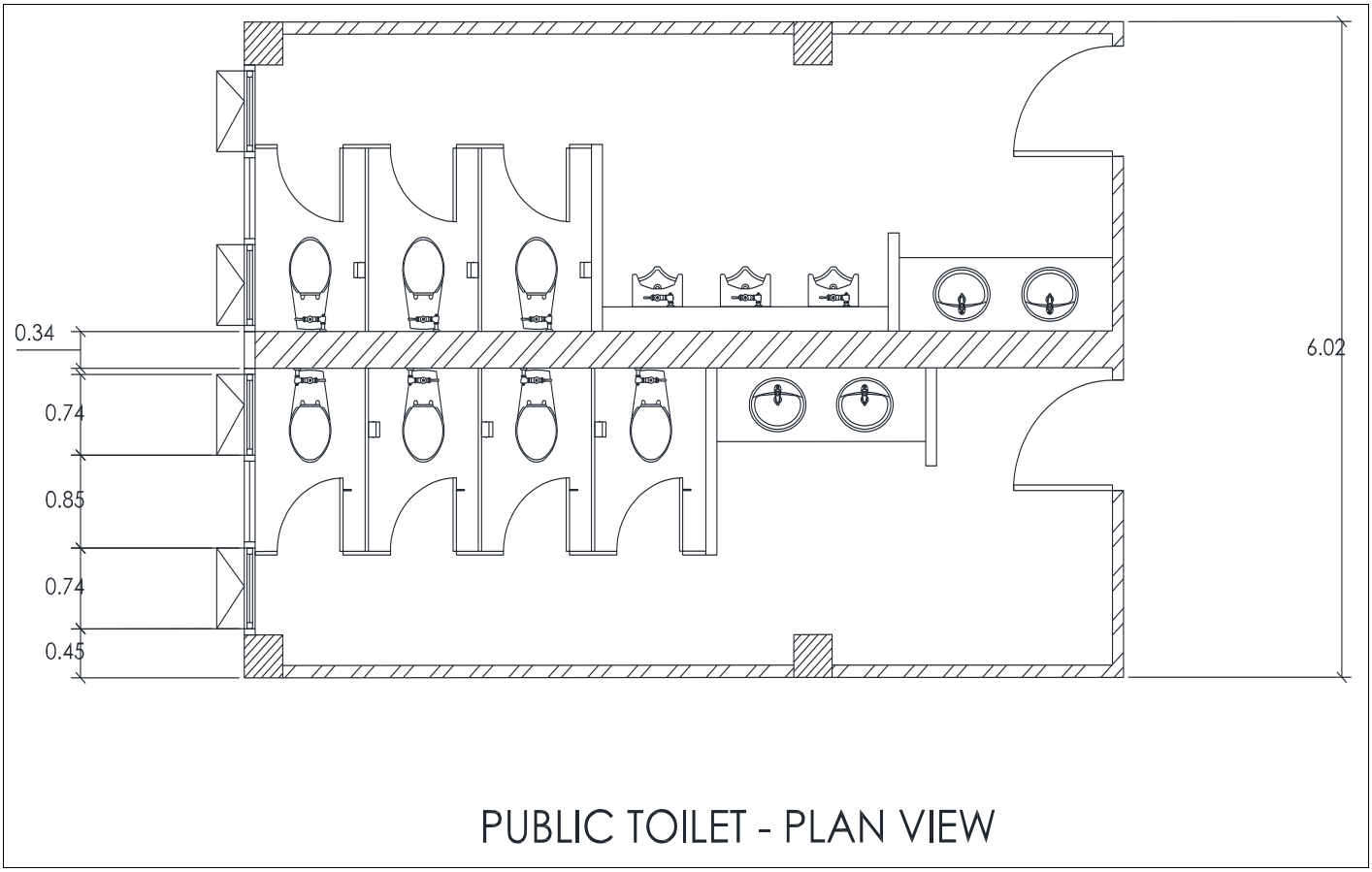


Figure 41 Plan of Public Toilet (AutoCAD)

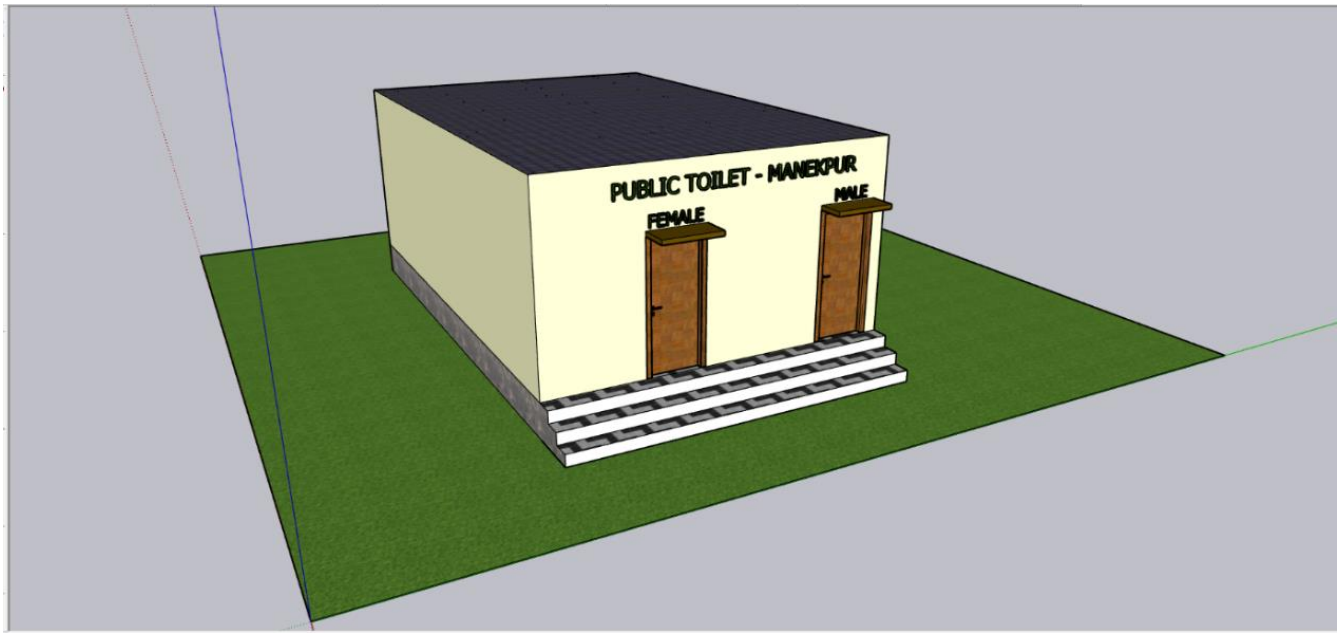


Figure 42 Iso-view of Public Toilet (Sketchup)

Figure 43 Male c/s view

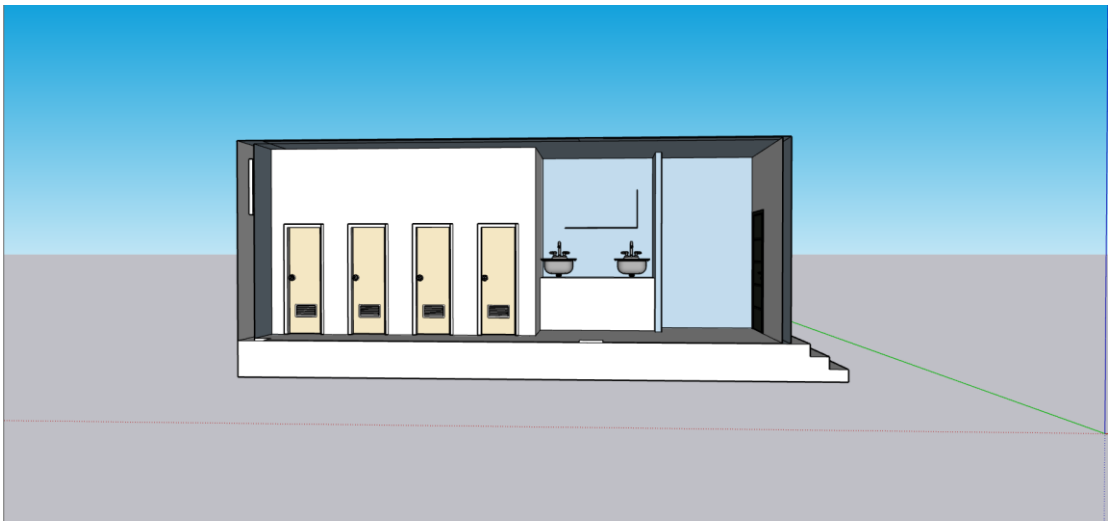


Figure 44 Female c/s view

MEASUREMENT FOR PUBLIC TOILET

Item No.	Description		No.	Length	Breadth	Height	Quantity	
1	**Earthwork in Excavation in Foundation**							
	LW	8.17	3	8.17	0.9	0.9	19.85	
	SW	5.42	2	5.42	0.9	0.9	8.78	
						NET TOTAL	**28.63**	**m³**
2	**P.C.C in foundation**							
	LW		3	8.17	0.9	0.3	6.62	
	SW		2	5.42	0.9	0.3	2.93	
						NET TOTAL	**9.54**	**m³**
3	**Brickwork in Foundation up to Plinth**							
	LW1							
	1st	8.14	3	8.14	0.6	0.2	2.93	
	2nd	8.13	3	8.13	0.5	0.2	2.44	
	3rd	8.12	3	8.12	0.4	0.2	1.95	
	4th	8.11	3	8.11	0.3	1.2	8.76	

	SW1							
	1st	5.72	2	5	0.6	0.2	1.20	
	2nd	5.82	2	5.1	0.5	0.2	1.02	
	3rd	5.92	2	5.2	0.4	0.2	0.83	
	4th	6.02	2	5.3	0.3	1.2	3.82	
						NET TOTAL	**22.95**	**m³**
4	**Damp Proof Course (2.5 cm thick)**							
	LW		3	8.11		0.3	7.30	
	SW		2	5.3		0.3	3.18	
						NET TOTAL	**10.48**	**m²**
5	**Brick work in super structure**							
	LW		3	8.11	0.3	3	21.90	
	SW		2	5.3	0.3	3	9.54	
	DEDUCTIONS							
	OPENINGS	D	2	0.9	0.3	2.1	1.13	
		W	4	0.74	0.3	0.45	0.40	
						NET TOTAL	**29.90**	**m³**
6	**Earth Filling in Plinth**							
	Male Toilet		1	8.95	2.56	0.48	11.00	
	Female Toilet		1	8.77	2.56	0.48	10.78	
						NET TOTAL	**21.77**	**.**
7	**2cm Thick Marble Floor**							
	Male Toilet		1	8.95	2.56		22.91	
	Female Toilet		1	8.77	2.56		22.45	
						NET TOTAL	**45.36**	**m²**
8	**Providing & Laying RCC Elements**							
	(a.) MAIN SLAB							
		L1	1	8.95	6.02	0.17	9.16	
	(b.) LINTEL						0.85	
						NET TOTAL	**10.01**	**m³**
9	**Providing M.S. Reinforcement (7.85 g/cm³)**							
	1% Volume of Concrete		1				787.14	
						NET TOTAL	**787.14**	**kg**
10	**Internal Plaster**							
	(b.) WALLS							
		Wall1	2	8.77		3	52.62	
		Wall2	2	2.56		3	15.36	
		Wall3	2	8.95		3	53.70	
	(b.) CEILING		1	7.6	7.9		60.04	
	DEDUCTIONS							
		D	2	0.9		2.1	3.78	
		W	7	0.74		0.45	2.33	
						NET TOTAL	**175.61**	**m³**

ABSTRACT SHEET FOR PUBLIC TOILET					
Sr No.	**Description**	**Quantity**	**Rate**	**Per**	**Amount**
1	Earthwork in Excavation in Foundation	28.63	₹ 252.30	m^3	**₹ 7,224.23**
2	P.C.C in Foundation (1:3:6)	9.54	₹ 6,126.25	m^3	**₹ 58,471.99**
3	Brickwork in Foundation	22.95	₹ 6,376.25	m^3	**₹ 1,46,303.06**
4	Damp Proof Course (2.5 cm thick)	10.48	₹ 347.90	m^2	**₹ 3,645.64**
5	Brick Masonry in Super Structure	29.90	₹ 7,722.65	m^3	**₹ 2,30,933.49**
6	Earth Filling in Plinth	21.77	₹ 219.65	m^3	**₹ 4,782.73**
7	2cm Thick Marble Floor (Udaipur green marble)	45.36	₹ 1,991.50	m^2	**₹ 90,340.81**
8	Providing & Laying RCC Elements	10.01	₹ 9,763.80	m^3	**₹ 97,730.07**
9	Providing M.S. Reinforcement (7.85 g/cm^3)	787.14	₹ 86.05	kg	**₹ 67,733.53**
10	Plaster Work	175.61	₹ 365.25	m^2	**₹ 64,141.19**
TOTAL ESTIMATED CONSTRUCTION COST of PUBLIC TOILET (without sanitary fittings)					**₹ 7,71,306.76**

8.1.3. Social design (Civil) - Post Office

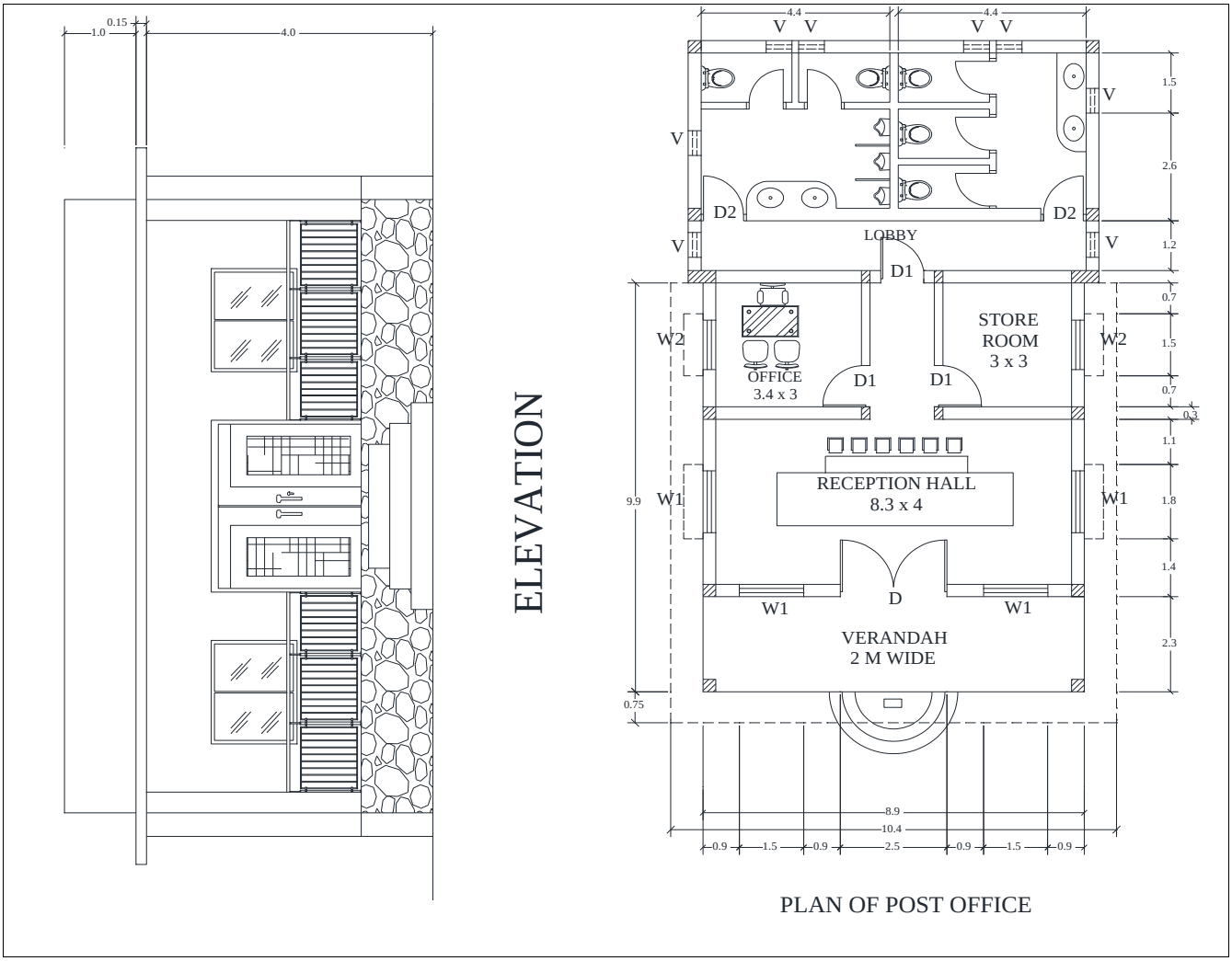


Figure 45 Plan of Post-Office (AutoCAD)

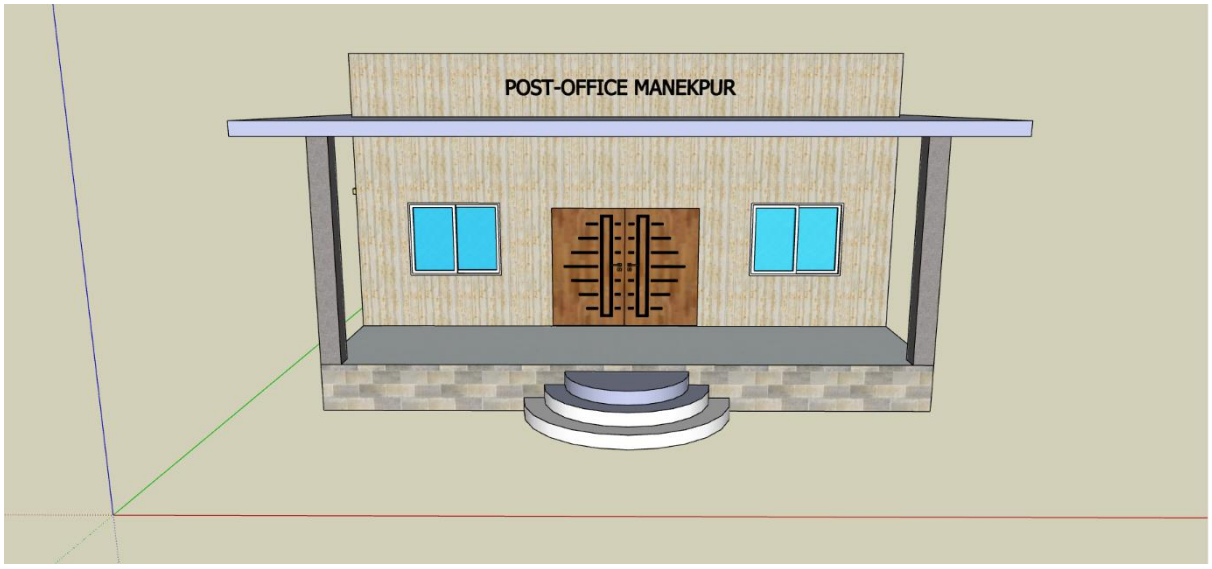


Figure 46 Post-Office (Sketchup)

Figure 47 Iso-view of Post-Office (Sketchup)

MEASUREMENT FOR POST-OFFICE

Item No.	Description		No.	Length	Breadth	Height	Quantity	
1	**Earthwork in Excavation in Foundation**							
	Working Area							
	LW	10.15	2	11.05	0.9	0.9	17.90	
	SW(I)	9.2	3	8.3	0.9	0.9	20.17	
	SW(II)	2.9	2	2	0.9	0.9	3.24	
	Toilet Area							
	LW	9.6	3	10.5	0.9	0.9	25.52	
	SW1	6.2	2	5.3	0.9	0.9	8.59	
	SW2	4.1	1	3.2	0.9	0.9	2.59	
						NET TOTAL	**78.00**	**m^3**
2	**Lime Concrete in Foundation**							
	Working Area							

	LW	10.15	2	10.15	0.9	0.3	5.48	
	SW(I)	9.2	3	9.2	0.9	0.3	7.45	
	SW(II)	2.9	2	2.9	0.9	0.3	1.57	
	Toilet Area							
	LW	9.6	3	9.6	0.9	0.3	7.78	
	SW1	6.2	2	6.2	0.9	0.3	3.35	
	SW2	4.1	1	4.1	0.9	0.3	1.11	
						NET TOTAL	**26.73**	**m³**
3	**Brickwork in Foundation**							
	STEPS							
	1st	0.9	1	3.30	0.3	0.9	0.89	
	2nd	1.2	1	4.24	0.3	0.6	0.76	
	3rd	1.5	1	5.18	0.3	0.3	0.47	
	Working Area							
	LW 1st	10.15	2	10.75	0.6	0.2	2.58	
	LW 2nd	10.15	2	10.65	0.5	0.2	2.13	
	LW Plinth Wall	10.15	2	10.55	0.4	0.2	1.69	
	SW(I) 1st	9.2	3	8.6	0.6	0.2	3.10	
	SW(I) 2nd	9.2	3	8.7	0.5	0.2	2.61	
	SW(I) Plinth Wall	9.2	3	8.8	0.4	0.2	2.11	
	SW(II) 1st	2.9	2	2.3	0.6	0.2	0.55	
	SW(II) 2nd	2.9	2	2.4	0.5	0.2	0.48	
	SW(II) Plinth Wall	2.9	2	2.5	0.4	0.2	0.40	
	Toilet Area							
	LW 1st	9.6	3	10.2	0.6	0.2	3.67	
	LW 2nd	9.6	3	10.1	0.5	0.2	3.03	
	LW Plinth Wall	9.6	3	10	0.4	0.2	2.40	
	SW(I) 1st	6.2	2	5.6	0.6	0.2	1.34	
	SW(I) 2nd	6.2	2	5.7	0.5	0.2	1.14	
	SW(I) Plinth Wall	6.2	2	5.8	0.4	0.2	0.93	
	SW(II) 1st	4.1	1	3.5	0.6	0.2	0.42	
	SW(II) 2nd	4.1	1	3.6	0.5	0.2	0.36	
	SW(II) Plinth Wall	4.1	1	3.7	0.4	0.2	0.30	
						NET TOTAL	**31.36**	**m³**
4	**Damp Proof Course (2.5 cm thick)**							
	Working Area							
	LW	10.55	2	10.55	0.4	-	8.44	
	SW(I)	8.8	3	8.8	0.4	-	10.56	
	SW(II)	2.5	2	2.5	0.4	-	2.00	
	Toilet Area							
	LW	10	3	10	0.4	-	12.00	
	SW1	5.8	2	5.8	0.4	-	4.64	
	SW2	3.7	1	3.7	0.4	-	1.48	
	DEDUCTIONS							
	VERANDAH							
	LW	8.9	2	8.9	0.4	-	7.12	
	SW	2	2	2	0.4	-	1.60	

	DOORS							
	D	1.5	1	1.5	0.4	-	0.60	
	D1	1	3	1	0.4	-	1.20	
	D2	0.9	2	0.9	0.4	-	0.72	
						NET TOTAL	**27.88**	**m²**
5	**Brick Masonry in Super Structure**							
	30 cm walls							
	Working Area							
	LW	10.15	2	10.45	0.3	3	18.81	
	SW(I)	9.2	3	8.9	0.3	3	24.03	
	SW(II)	2.9	2	2.6	0.3	3	4.68	
	Toilet Area							
	LW	9.6	3	9.9	0.3	3	26.73	
	SW1	6.2	2	5.9	0.3	3	10.62	
	20 cm walls							
	SW2	4.1	1	3.9	0.2	3	2.34	
	Parapet walls (Given only in Working area)							
	LW	9.2	2	9.4	0.2	1	3.76	
	SW	8.9	2	9.1	0.2	1	3.64	
	DEDUCTIONS							
	OPENINGS	D	1	1.5	0.3	2.1	0.95	
		D1	2	1	0.3	2.1	1.26	
		D2	3	0.9	0.3	2.1	1.70	
		W1	4	1.5	0.3	1.2	2.16	
		W2	2	1.2	0.3	1.2	0.86	
		V	8	0.6	0.3	0.45	0.65	
	VERANDAH	FRONT	1	8.9	0.3	3	8.01	
		SIDE	2	2	0.3	3	3.60	
						NET TOTAL	**75.42**	**m³**
6	**Plaster Work**							
	Internal Plaster							
	(a.) CEILING	Verandah	1	8.9	2	-	17.80	
		Reception Hall	1	8.3	4	-	33.20	
		Office	1	3.4	3	-	10.20	
		Storeroom	1	3	3	-	9.00	
		Lobby	1	8.9	1.2	-	10.68	
		Toilet	2	4.4	4	-	35.20	
	(b.) WALLS							
		Verandah Front	1	8.9	-	3	26.70	
		Reception Hall LW	2	8.3	-	3	49.80	
		Reception Hall SW	2	4	-	3	24.00	
		Office LW	2	3.4	-	3	20.40	
		Office SW	2	3	-	3	18.00	
		Storeroom LW	2	3	-	3	18.00	
		Storeroom SW	2	3	-	3	18.00	
		Lobby LW	2	8.9	-	3	53.40	
		Lobby SW	2	1.2	-	3	7.20	

		Toilet LW	4	4.4	-	3	52.80	
		Toilet SW	4	4	-	3	48.00	
		Brick Pillars	8	0.3	-	3	7.20	
	External Plaster							
	(a.) OUTER WALLS UPTO PARAPET							
		LW	2	13.5	-	5	135.00	
		SW	1	9.6	-	5	48.00	
	(b.) PARAPET							
		Top Vertical	2	10.2	0.2	-	4.08	
		Top Horizontal	2	8.9	0.2	-	3.56	
		Inside Vertical	2	9.9	-	1	19.80	
		Inside Horizontal	2	8.6	-	1	17.20	
	(c.) CHAJJAS							
		W1	8	1.8	0.45	-	6.48	
		W2	4	1.3	0.45	-	2.34	
		PERIPHERY of Working Area Vertical	2	10.6	0.75	-	15.90	
		PERIPHERY of Working Area Horizontal	1	8.9	0.75	-	6.68	
	DEDUCTIONS	D	1	1.5	-	2.1	3.15	
		D1	2	1	-	2.1	4.20	
		D2	3	0.9	-	2.1	5.67	
		W1	4	1.5	-	1.2	7.20	
		W2	2	1.2	-	1.2	2.88	
		V	8	0.6	-	0.45	2.16	
						NET TOTAL	**693.36**	**m²**
7	**Providing & Laying RCC Elements**							
	MAIN SLAB	Working Area (with CHAJJAS)	1	10.6	10.4	0.15	16.54	
		Toilet Area	1	5.9	9.6	0.15	8.50	
	CHAJJAS	Windows W1	4	1.5	0.45	0.05	0.14	
		Windows W2	2	1	0.45	0.05	0.05	
	BEAMS	Verandah Front	1	8.9	0.3	0.15	0.40	
		Verandah Side	2	2	0.3	0.15	0.18	
	COLUMNS	30 x 30 cm Columns	10	0.3	0.3	3	2.70	
		20 x 30 cm Columns	4	0.2	0.3	3	0.72	
		60 x 30 cm Columns	2	0.6	0.3	3	1.08	
	LINTELS (considering 15 cm on both sides)	For Doors D	1	1.8	0.3	0.15	0.08	
		For Doors D1	2	1.3	0.3	0.15	0.12	
		For Doors D2	3	1.2	0.3	0.15	0.16	
		For Windows W1	4	1.8	0.3	0.15	0.32	
		For Windows W2	2	1.5	0.3	0.15	0.14	
						NET TOTAL	**31.11**	**m³**
8	**Providing M.S. Reinforcement (7.85 g/cm³)**							
	1% Volume of Concrete		1				2446.6	
						NET TOTAL	**2446.6**	**kg**

ABSTRACT SHEET FOR POST-OFFICE					
Sr No.	**Description**	**Quantity**	**Rate**	**Per**	**Amount**
1	Earthwork in Excavation in Foundation	78.00	₹ 252.30	m^3	**₹ 19,680.16**
2	Lime Concrete in Foundation (1:3:6)	26.73	₹ 6,126.25	m^3	**₹ 1,63,754.66**
3	Brickwork in Foundation	31.36	₹ 6,376.25	m^3	**₹ 1,99,950.11**
4	Damp Proof Course (2.5 cm thick)	27.88	₹ 347.90	m^2	**₹ 9,699.45**
5	Brick Masonry in Super Structure	75.42	₹ 7,722.65	m^3	**₹ 5,82,457.71**
6	Plaster Work	693.36	₹ 365.25	m^2	**₹ 2,53,247.91**
7	Providing & Laying RCC Elements	31.11	₹ 9,763.80	m^3	**₹ 3,03,766.46**
8	Providing M.S. Reinforcement (7.85 g/cm^3)	2446.61	₹ 86.05	kg	**₹ 2,10,530.65**
	TOTAL ESTIMATED CONSTRUCTION COST of POST-OFFICE				**₹ 17,43,087.12**

8.1.4. Socio-Cultural design (Civil) - Community Hall

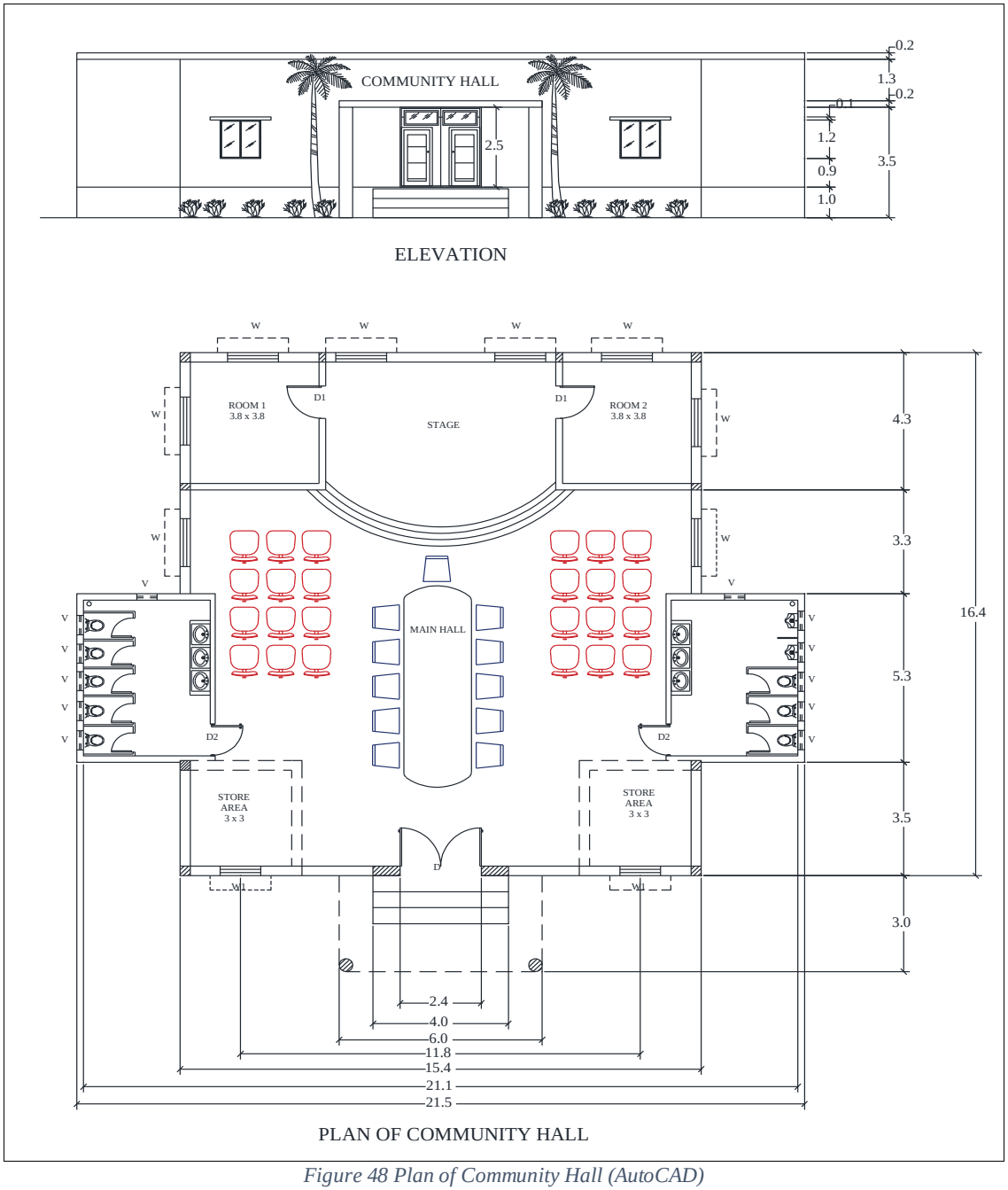


Figure 48 Plan of Community Hall (AutoCAD)

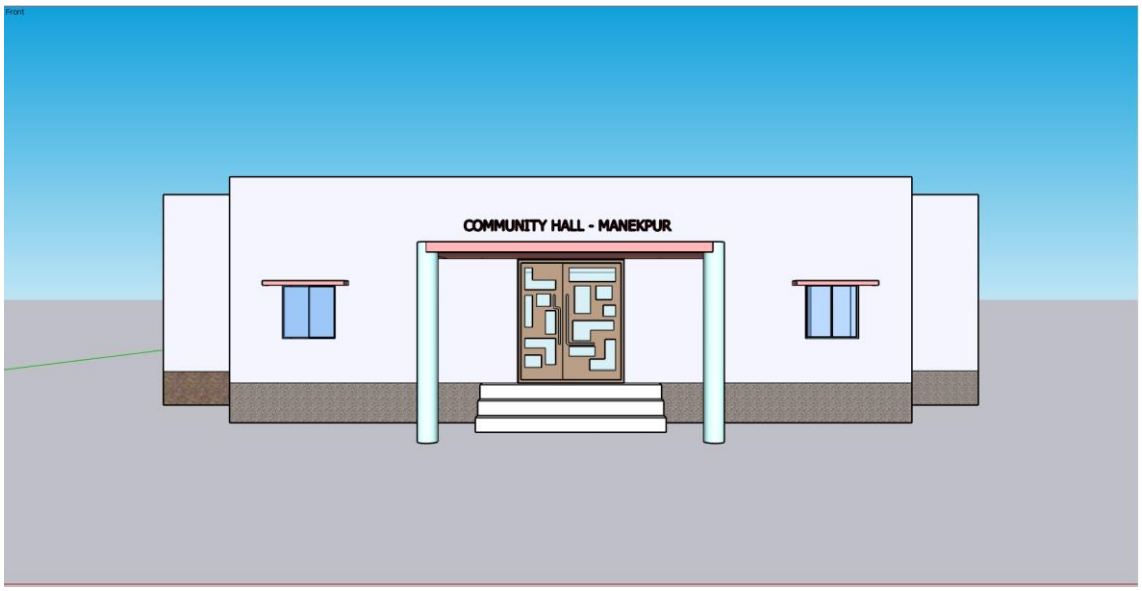


Figure 49 Community Hall (Sketchup)

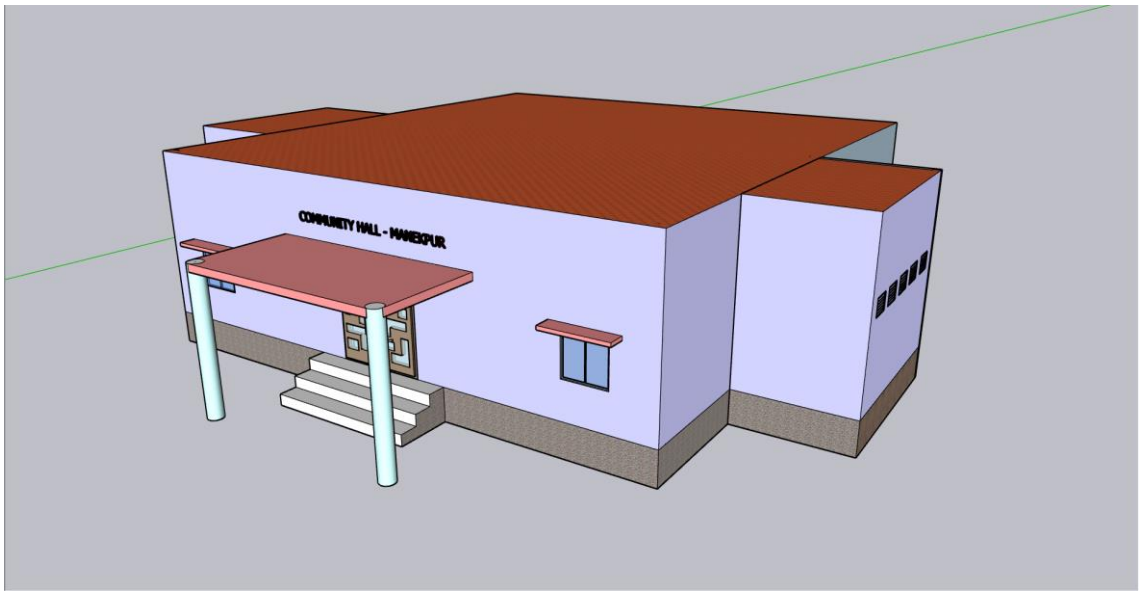


Figure 50 Iso-view of Community Hall (Sketchup)

MEASUREMENT FOR COMMUNITY HALL								
Item No.	Description		No.	Length	Breadth	Height	Quantity	
1	**Earthwork in Excavation in Foundation**							
	LW1	17	2	17	0.9	0.9	27.54	
	LW2	6.1	2	6.1	0.9	0.9	9.88	
	SW1	14.8	2	14.8	0.9	0.9	23.98	
	SW2	4.9	2	4.9	0.9	0.9	7.94	
						NET TOTAL	**69.34**	**m^3**
2	**P.C.C in foundation**							
	LW1		2	17	0.9	0.3	9.18	
	LW2		2	6.1	0.9	0.3	3.29	
	SW1		2	14.8	0.9	0.3	7.99	

	SW2		2	4.9	0.9	0.3	2.65	
						NET TOTAL	**23.11**	**m³**
3	**Brickwork in Foundation up to Plinth**							
	LW1							
	1st	16.7	2	16.7	0.6	0.2	4.01	
	2nd	16.6	2	16.6	0.5	0.2	3.32	
	3rd	16.5	2	16.5	0.4	0.2	2.64	
	4th	16.4	2	16.4	0.3	1.2	11.81	
	LW2							
	1st	5.8	2	5.8	0.6	0.2	1.39	
	2nd	5.7	2	5.7	0.5	0.2	1.14	
	3rd	5.6	2	5.6	0.4	0.2	0.90	
	4th	5.5	2	5.5	0.3	1.2	3.96	
	SW1							
	1st	15.1	2	15.1	0.6	0.2	3.62	
	2nd	15.2	2	15.2	0.5	0.2	3.04	
	3rd	15.3	2	15.3	0.4	0.2	2.45	
	4th	15.4	2	15.4	0.3	1.2	11.09	
	SW2							
	1st	5.2	2	5.2	0.6	0.2	1.25	
	2nd	5.3	2	5.3	0.5	0.2	1.06	
	3rd	5.4	2	5.4	0.4	0.2	0.86	
	4th	5.5	2	5.5	0.3	1.2	3.96	
						NET TOTAL	**56.50**	**m³**
4	**Damp Proof Course (2.5 cm thick)**							
	LW1		2	16.4	-	0.3	9.84	
	LW2		2	5.5	-	0.3	3.30	
	SW1		2	15.4	-	0.3	9.24	
	SW2		2	5.5	-	0.3	3.30	
						NET TOTAL	**25.68**	**m²**
5	**Brick work in super structure**							
	LW1		2	16.4	0.3	3	29.52	
	LW2		2	5.5	0.3	3	9.90	
	SW1		2	15.4	0.3	3	27.72	
	SW2		2	5.5	0.3	3	9.90	
	BRICK STEPS							
		Lower	2	4	0.6	0.15	0.72	
		Upper	2	4	0.3	0.15	0.36	
	DEDUCTIONS							
	OPENINGS	D	2	1.2	0.3	2.1	1.51	
		D1	2	1	0.3	2.1	1.26	
		D2	2	0.9	0.3	2.1	1.13	
		W1	6	1.5	0.3	1.2	3.24	
		W2	4	1.2	0.3	1.2	1.73	
		V	10	0.6	0.3	0.45	0.81	
						NET TOTAL	**68.44**	**m³**
6	**Earth Filling in Plinth**							

	Room1 and Room2		2	3.8	3.8	0.48	13.86	
	Toilet		2	4.9	6	0.48	28.22	
	Remaining Area		1	11.8	15.4	0.48	87.23	
	Vernadah		1	3	6	0.48	8.64	
						NET TOTAL	**137.95**	**m³**
7	**2cm Thick Marble Floor**							
	Room1 and Room2		2	3.8	3.8	-	28.88	
	Toilet		2	4.9	6	-	58.80	
	Remaining Area		1	11.8	15.4	-	181.72	
	Vernadah		1	3	6	-	18.00	
						NET TOTAL	**287.40**	**m²**
8	**Providing & Laying RCC Elements**							
	MAIN SLAB							
		L1	1	16 4	15.4	0.2	50.51	
		L2	2	6.1	5.3	0.2	12.93	
	CHAJJA							
		W1	6	1.8	0.6	0.1	0.65	
		W2	4	1.5	0.6	0.1	0.36	
	LINTEL						0.85	
						NET TOTAL	**65.30**	**m³**
9	**Providing M.S. Reinforcement (7.85 g/cm³)**							
	1% Volume of Concrete		1				5135.35	
						NET TOTAL	**5135.35**	**kg**
10	**Internal Plaster**							
	(b.) WALLS							
		Wall1	2	11.8	-	3	70.80	
		Wall2	2	15.4	-	3	92.40	
	(b.) CEILING		1	11.4	15.4	-	175.56	
	DEDUCTIONS							
	D		1	1.2	-	2.1	2.52	
	D2		1	0.9	-	2.1	1.89	
	W1		2	1.5	-	1.2	3.60	
						NET TOTAL	**330.75**	**m³**

ABSTRACT SHEET FOR COMMUNITY HALL

Sr No.	**Description**	**Quantity**	**Rate**	**Per**	**Amount**
1	Earthwork in Excavation in Foundation	69.34	₹ 252.30	m³	**₹ 17,493.47**
2	P.C.C in Foundation (1:3:6)	23.11	₹ 6,126.25	m³	**₹ 1,41,589.89**
3	Brickwork in Foundation	56.50	₹ 6,376.25	m³	**₹ 3,60,232.62**
4	Damp Proof Course (2.5 cm thick)	25.68	₹ 347.90	m²	**₹ 8,934.07**
5	Brick Masonry in Super Structure	68.44	₹ 7,722.65	m³	**₹ 5,28,507.28**
6	Earth Filling in Plinth	137.95	₹ 219.65	m³	**₹ 30,301.16**
7	2cm Thick Marble Floor (Udaipur green marble)	287.40	₹ 1,991.50	m²	**₹ 5,72,357.10**
8	Providing & Laying RCC Elements	65.30	₹ 9,763.80	m³	**₹ 6,37,595.67**
9	Providing M.S. Reinforcement (7.85 g/cm³)	5135.35	₹ 86.05	kg	**₹ 4,41,896.81**
10	Plaster Work	330.75	₹ 365.25	m²	**₹ 1,20,806.44**
	TOTAL ESTIMATED CONSTRUCTION COST of COMMUNITY HALL				**₹ 28,59,714.50**

8.1.5. Smart Village Design (Civil) - Bank with ATM

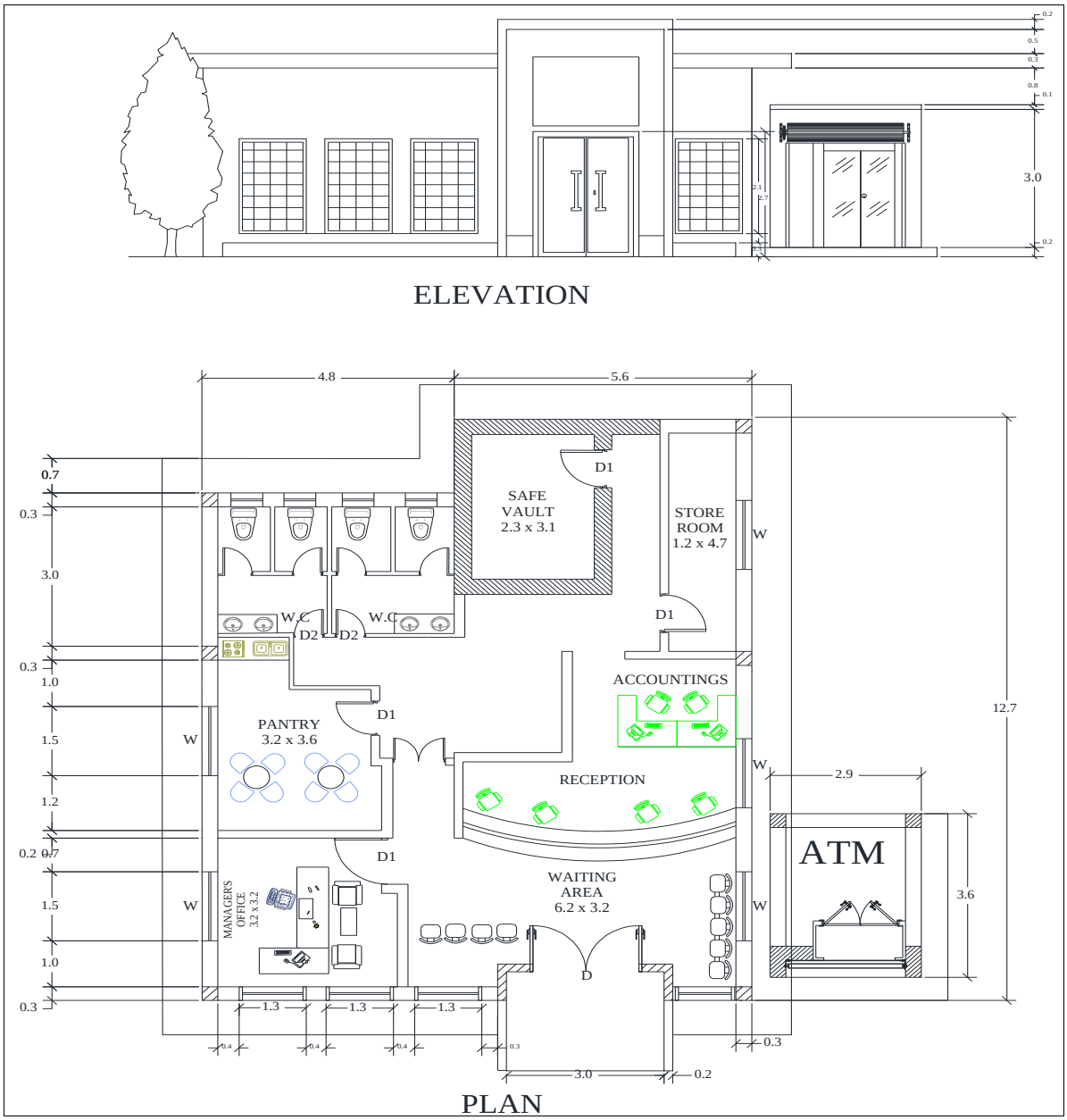


Figure 51 Plan of Bank & ATM (AutoCAD)

Figure 52 Bank & ATM (Sketchup)

Figure 53 Iso-view of Bank & ATM (Sketchup)

MEASUREMENT FOR BANK

Item No.	Description		No.	Length	Breadth	Height	Quantity	
1	**Earthwork in Excavation in Foundation**							
	LEFT V LW	10.7	1	11.6	0.9	0.9	9.40	
	RIGHT V LW	12.4	1	13.3	0.9	0.9	10.77	
	VAULT V LW	1.6	1	2.5	0.9	0.9	2.03	
	SW	10.1	2	9.2	0.9	0.9	14.90	
	SAFE VAULT							
	LW	3.4	2	4.3	0.9	0.9	6.97	
	SW	2.6	2	1.7	0.9	0.9	2.75	
						NET TOTAL	**46.82**	**m³**
2	**Lime Concrete in Foundation**							
	LEFT V LW	11.6	1	11.6	0.9	0.3	3.13	
	RIGHT V LW	13.3	1	13.3	0.9	0.3	3.59	
	VAULT V LW	2.5	1	2.5	0.9	0.3	0.68	
	SW	9.2	2	9.2	0.9	0.3	4.97	
	SAFE VAULT							
	LW	4.3	2	4.3	0.9	0.3	2.32	
	SW	1.7	2	1.7	0.9	0.3	0.92	
						NET TOTAL	**15.61**	**m³**
3	**Brickwork in Foundation**							
	LEFT V LW							
	1st	10.7	1	11.3	0.6	0.2	1.36	
	2nd	10.7	1	11.2	0.5	0.2	1.12	
	Plinth wall	10.7	1	11.1	0.4	0.2	0.89	
	RIGHT V LW							
	1st	12.4	1	13	0.6	0.2	1.56	
	2nd	12.4	1	12.9	0.5	0.2	1.29	
	Plinth wall	12.4	1	12.8	0.4	0.2	1.02	
	VAULT V LW							

	1st	1.6	1	2.2	0.6	0.2	0.26	
	2nd	1.6	1	2.1	0.5	0.2	0.21	
	Plinth wall	1.6	1	2	0.4	0.2	0.16	
	SW							
	1st	10.1	2	9.5	0.6	0.2	2.28	
	2nd	10.1	2	9.6	0.5	0.2	1.92	
	Plinth wall	10.1	2	9.7	0.4	0.2	1.55	
	SAFE VAULT							
	LW							
	1st	3.4	2	2.8	0.6	0.2	0.67	
	2nd	3.4	2	2.9	0.5	0.2	0.58	
	Plinth wall	3.4	2	3	0.4	0.2	0.48	
	SW							
	1st	2.6	2	2	0.6	0.2	0.48	
	2nd	2.6	2	2.1	0.5	0.2	0.42	
	Plinth wall	2.6	2	2.2	0.4	0.2	0.35	
						NET TOTAL	**16.61**	**m^3**
4	**Damp Proof Course (2.5 cm thick)**							
	LEFT V LW	11.1	1	11.1	0.4	-	4.44	
	RIGHT V LW	12.8	1	12.8	0.4	-	5.12	
	VAULT V LW	2	1	2	0.4	-	0.80	
	SW(I)	9.7	2	9.7	0.4	-	7.76	
	SAFE VAULT							
	LW	3	2	3	0.4	-	2.40	
	SW	2.2	2	2.2	0.4	-	1.76	
	DEDUCTIONS							
	DOORS	D	1	2	0.4	-	0.80	
		D1	1	1	0.4	-	0.40	
						NET TOTAL	**21.08**	**m^2**
5	**Brick Masonry in Super Structure**							
	30 cm walls							
	LEFT V LW	10.7	1	11	0.3	4.1	13.53	
	RIGHT V LW	12.4	1	12.7	0.3	4.1	15.62	
	SW(I)	10.1	2	9.8	0.3	4.1	24.11	
	20 cm walls							
	Office	LW	1	3.5	0.2	4.1	2.87	
		SW	1	3.5	0.2	4.1	2.87	
	Pantry	LW	1	3.5	0.2	4.1	2.87	
		SW	1	3.9	0.2	4.1	3.20	
	Toilet Area	LW	1	4.9	0.2	4.1	4.02	
		SW	1	3.05	0.2	4.1	2.50	
	DEDUCTIONS							
	Openings	D	1	2	0.3	2.7	1.62	
		D1	4	1	0.3	2.1	2.52	
		D2	2	0.8	0.3	2.1	1.01	
		W	5	1.5	0.3	1.2	2.70	
		V	4	0.6	0.3	0.45	0.32	

		GLASS	4	1.3	0.3	2.1	3.28	
						NET TOTAL	**60.14**	**m³**
6	**Plaster Work**							
	Internal Plaster							
	(a.) CEILING							
		Total Area	1	12	9.8	-	117.60	
		Deducted Area	1	4.5	1.3	-	5.85	
	(b.) WALLS							
		LEFT V LW	1	10.45	-	4.1	42.85	
		RIGHT V LW	1	12	-	4.1	49.20	
		SW(I)	2	9.8	-	4.1	80.36	
		SAFE VAULT Inner						
		LW	2	3.1	-	4.1	25.42	
		SW	2	2.3	-	4.1	18.86	
		SAFE VAULT Outer						
		LW(I)	1	3.47	-	4.1	14.23	
		LW(II)	1	2	-	4.1	8.20	
		SW	1	3	-	4.1	12.30	
	External Plaster							
	(a.) OUTER WALLS							
		LEFT V LW	1	11	-	4.1	45.10	
		RIGHT V LW	1	12.7	-	4.1	52.07	
		VAULT V LW	1	1.6	-	4.1	6.56	
		SW	2	10.4	-	4.1	85.28	
		Entrance Walls	4	2.14	-	4.1	35.10	
	(b.) CHAJJAS							
		LEFT V LW	2	12.52	0.75	-	18.78	
		RIGHT V LW	2	14	0.75	-	21.00	
		FRONT SIDE	2	10.4	0.75	-	15.60	
		FRONT SIDE EXTRA	2	3	1.4	-	8.40	
		BACK SIDE	2	10.4	0.75	-	15.60	
		VAULT V LW	2	1.6	0.75	-	2.40	
	DEDUCTIONS							
		D	1	2	-	2.7	5.40	
		D1	1	1	-	2.1	2.10	
		W	5	1.5	-	1.2	9.00	
		V	4	0.6	-	0.45	1.08	
		GLASS	4	1.3	-	2.1	10.92	
						NET TOTAL	**640.55**	**m²**
7	**Providing & Laying RCC Elements**							
	MAIN SLAB							
		Total Area	1	12.6	10.4	0.3	39.31	
		Deducted Area	1	4.8	1.6	0.3	2.30	
	CHAJJAS AT PERIPHERY							
		LEFT V LW	1	12.52	0.75	0.1	0.94	
		RIGHT V LW	1	14	0.75	0.1	1.05	

		FRONT SIDE	1	10.4	0.75	0.1	0.78	
		FRONT SIDE EXTRA	1	1.4	3	0.1	0.42	
		BACK SIDE	1	10.4	0.75	0.1	0.78	
		VAULT V LW	1	1.6	0.75	0.1	0.12	
	COLUMNS							
		30 x 30 cm Columns	6	0.3	0.3	4.1	2.21	
		Entrance Columns Vertical	2	0.6	0.2	4.1	0.98	
		Entrance Columns Horizontal	2	0.45	0.2	4.1	0.74	
	SAFE VAULT WALLS							
		Vertical	2	2.3	0.3	4.1	5.66	
		Horizontal	2	3	0.3	4.1	7.38	
		Extra	1	0.9	0.3	4.1	1.11	
	LINTELS (15 cm on both sides)							
		For Doors D	1	2.3	0.3	0.15	0.10	
		For Windows W1	5	1.8	0.3	0.15	0.41	
						NET TOTAL	**59.69**	**m³**
8	**Providing M.S. Reinforcement (7.85 g/cm³)**							
	1% Volume of Concrete		1				4693.75	
						NET TOTAL	**4693.75**	**kg**

MEASUREMENT FOR ATM

Item No.	Description		No.	Length	Breadth	Height	Quantity	
1	**Earthwork in Excavation in Foundation**							
	LW	3.3	2	3.9	0.6	0.6	2.81	
	SW	2.6	2	2	0.6	0.6	1.44	
						NET TOTAL	**4.25**	**m³**
2	**Lime Concrete in Foundation**							
	LW	3.9	2	3.9	0.6	0.3	1.40	
	SW	2	2	2	0.6	0.3	0.72	
						NET TOTAL	**2.12**	**m³**
3	**Brickwork in Foundation**							
	LW							
	1st	3.3	2	3.65	0.4	0.3	0.88	
	Plinth Wall	3.3	2	3.55	0.3	0.2	0.43	
	SW						0.00	
	1st	2.6	2	2.25	0.4	0.3	0.54	
	Plinth Wall	2.6	2	2.35	0.3	0.2	0.28	
	NET TOTAL						**2.12**	**m³**
4	**Damp Proof Course (2.5 cm thick)**							
	LW	3.55	2	3.55	0.3	-	2.13	
	SW	2.35	2	2.35	0.3	-	1.41	
						NET TOTAL	**3.54**	**m²**
5	**Brick Masonry in Super Structure**							
	LW	3.3	2	3.6	0.3	3	6.48	

	SW	2.6	1	2.9	0.3	3	2.61	
						NET TOTAL	**9.09**	**m³**
6	**Plaster Work**							
	Internal Plaster							
	(a.) CEILING							
			1	3.3	2.6	-	8.58	
	(b.) WALLS							
		LW	2	3.3	3	-	19.80	
		SW	1	2.6	3	-	7.80	
	External Plaster							
	(a.) OUTER WALLS							
		LW	2	3.6	3.1	-	22.32	
		SW	1	2.6	3.1	-	8.06	
						NET TOTAL	**30.38**	**m²**
7	**Providing & Laying RCC Elements**							
	MAIN SLAB							
		SLAB	1	3.6	2.6	0.1	0.94	
	COLUMNS							
		30 x 30 cm Columns	2	0.3	0.3	3	0.54	
		70 x 30 cm Columns	2	0.7	0.3	3	1.26	
		50 x 30 cm Column	1	0.5	0.3	3	0.45	
	BEAM							
		FRONT SIDE	1	2.6	0.3	0.2	0.16	
						NET TOTAL	**3.34**	**m³**
8	**Providing M.S. Reinforcement (7.85 g/cm³)**							
	1% Volume of Concrete		1				262.81	
						NET TOTAL	**262.81**	**Kg**

ABSTRACT SHEET FOR BANK & ATM

Sr No.	**Description**	**Quantity**	**Rate**	**Per**	**Amount**
1	Earthwork in Excavation in Foundation	51.07	₹ 252.30	m³	**₹ 12,883.95**
2	Lime Concrete in Foundation (1:3:6)	17.73	₹ 6,126.25	m³	**₹ 1,08,618.41**
3	Brickwork in Foundation	18.73	₹ 6,376.25	m³	**₹ 1,19,439.92**
4	Damp Proof Course (2.5 cm thick)	24.62	₹ 347.90	m²	**₹ 8,565.30**
5	Brick Masonry in Super Structure	69.23	₹ 7,722.65	m³	**₹ 5,34,623.61**
6	Plaster Work	670.93	₹ 365.25	m²	**₹ 2,45,056.45**
7	Providing & Laying RCC Elements	63.03	₹ 9,763.80	m³	**₹ 6,15,397.67**
8	Providing M.S. Reinforcement (7.85 g/cm³)	4956.56	₹ 86.05	kg	**₹ 4,26,512.09**
	TOTAL ESTIMATED CONSTRUCTION COST of BANK & ATM				**₹ 20,71,097.41**

8.1.6. Heritage Village Design (Civil) - Gram Panchayat

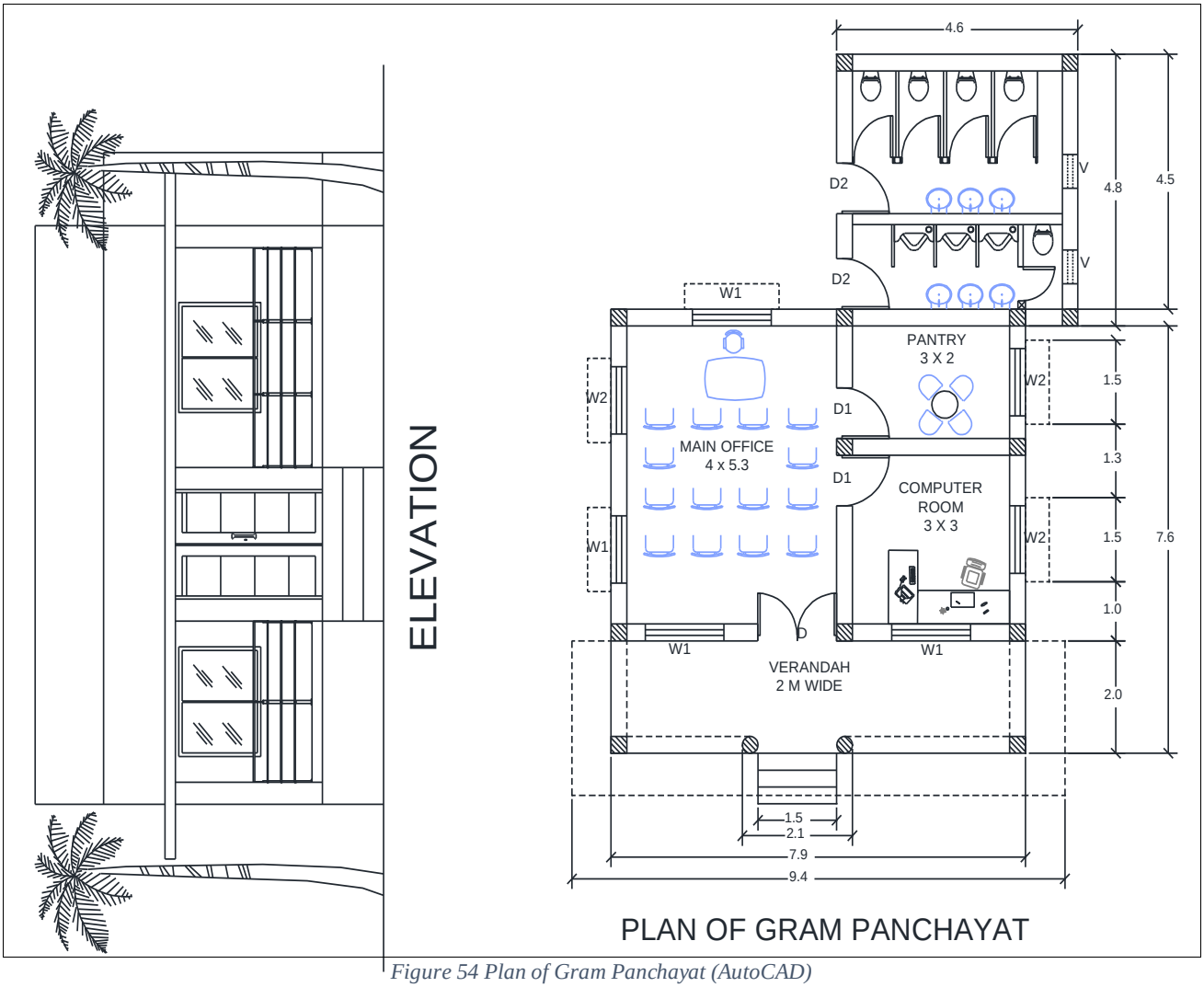


Figure 54 Plan of Gram Panchayat (AutoCAD)

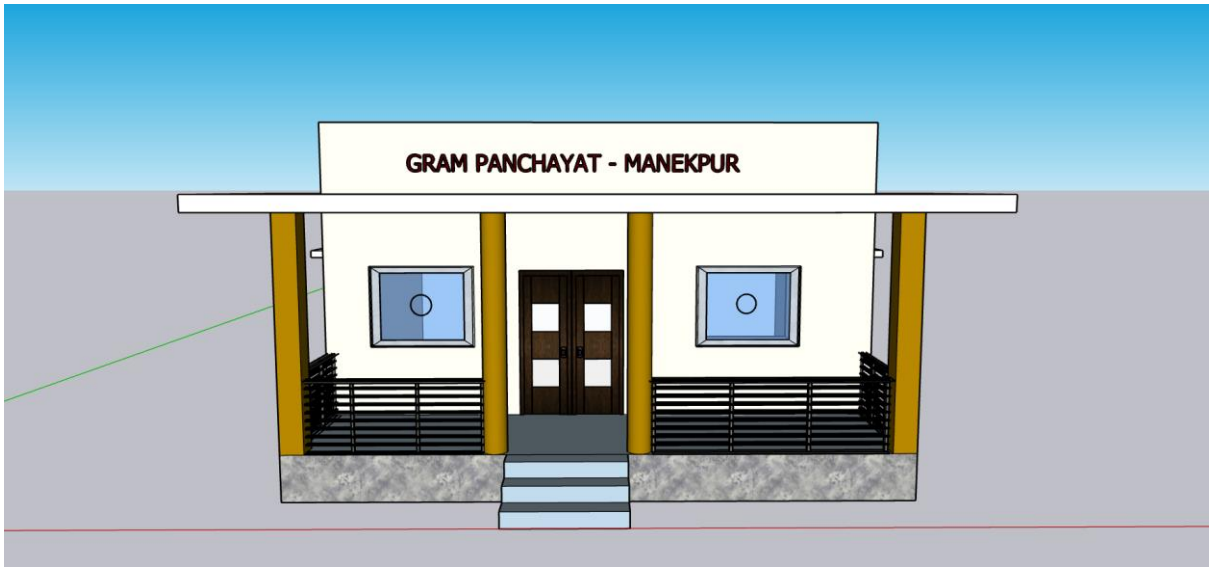


Figure 55 Gram Panchayat (Sketchup)

Figure 56 Iso-view of Gram Panchayat (Sketchup)

MEASUREMENT FOR GRAM-PANCHAYAT

Item No.	Description		No.	Length	Breadth	Height	Quantity	
1	**Earthwork in Excavation in Foundation**							
	LW1	8.5	2	8.5	0.9	0.9	13.77	
	LW2	5.4	2	5.4	0.9	0.9	8.75	
	LW3	4.2	1	4.2	0.9	0.9	3.40	
	SW1	4.7	3	4.7	0.9	0.9	11.42	
	SW2	3.4	2	3.4	0.9	0.9	5.51	
						NET TOTAL	**42.85**	**m^3**
2	**P.C.C in foundation**							
	LW1		2	8.5	0.9	0.3	4.59	
	LW2		2	5.4	0.9	0.3	2.92	
	LW3		1	4.2	0.9	0.3	1.13	
	SW1		3	4.7	0.9	0.3	3.81	
	SW2		2	3.4	0.9	0.3	1.84	
						NET TOTAL	**14.28**	**m^3**
3	**Brickwork in Foundation up to Plinth**							
	LW1							
	1st	8.2	2	8.2	0.6	0.2	1.97	
	2nd	8.1	2	8.1	0.5	0.2	1.62	
	3rd	8	2	8	0.4	0.2	1.28	
	4th	7.9	2	7.9	0.3	1.2	5.69	
	LW2							
	1st	5.1	2	5.1	0.6	0.2	1.22	
	2nd	5	2	5	0.5	0.2	1.00	
	3rd	4.9	2	4.9	0.4	0.2	0.78	
	4th	4.8	2	4.8	0.3	1.2	3.46	
	LW3							
	1st	3.9	1	3.9	0.6	0.2	0.47	
	2nd	3.8	1	3.8	0.5	0.2	0.38	

	3rd	3.7	1	3.7	0.4	0.2	0.30	
	4th	3.6	1	3.6	0.3	1.2	1.30	
	SW1							
	1st	5	3	5	0.6	0.2	1.80	
	2nd	5.1	3	5.1	0.5	0.2	1.53	
	3rd	5.2	3	5.2	0.4	0.2	1.25	
	4th	5.3	3	5.3	0.3	1.2	5.72	
	SW2							
	1st	3.7	2	3.7	0.6	0.2	0.89	
	2nd	3.8	2	3.8	0.5	0.2	0.76	
	3rd	3.9	2	3.9	0.4	0.2	0.62	
	4th	4	2	4	0.3	1.2	2.88	
						NET TOTAL	**34.91**	**m^3**
4	**Damp Proof Course (2.5 cm thick)**							
	LW1		2	7.9	-	0.3	4.74	
	LW2		2	4.8	-	0.3	2.88	
	LW3		1	3.6	-	0.3	1.08	
	SW1		3	5.3	-	0.3	4.77	
	SW2		2	4	-	0.3	2.40	
						NET TOTAL	**15.87**	**m^2**
5	**Brick work in super structure**							
	LW1		2	7.9	0.3	3	14.22	
	LW2		2	4.8	0.3	3	8.64	
	LW3		1	3.6	0.3	3	3.24	
	SW1		3	5.3	0.3	3	14.31	
	SW2		2	4	0.3	3	7.20	
	BRICK STEPS							
		Lower	2	0.6	1.5	0.15	0.27	
		Upper	2	0.3	1.5	0.15	0.14	
	DEDUCTIONS							
		D	2	1.5	0.3	2.1	1.89	
		D1	2	1	0.3	2.1	1.26	
		D2	2	0.9	0.3	2.1	1.13	
		W1	4	1.5	0.3	1.2	2.16	
		W2	3	1.2	0.3	1.2	1.30	
		V	2	0.6	0.3	0.45	0.16	
						NET TOTAL	**40.11**	**m^3**
6	**Earth Filling in Plinth**							
	Main Room		1	4	5.3	0.48	10.18	
	Pantry		1	3	2	0.48	2.88	
	Computer Room		1	3	3	0.48	4.32	
	Verandah		1	9.4	2	0.48	9.02	
	Toilet		1	4	4.2	0.48	8.06	
						NET TOTAL	**34.46**	**m^3**
7	**2cm Thick Marble Floor**							
	Main Room		1	4	5.3	-	21.20	
	Pantry		1	3	2	-	6.00	

	Computer Room		1	3	3	-	9.00	
	Verandah		1	9.4	2	-	18.80	
	Toilet		1	4	4.2	-	16.80	
						NET TOTAL	**71.80**	**m²**
8	**Providing & Laying RCC Elements**							
	MAIN SLAB							
		L1	1	7.9	7.6	0.2	12.01	
		L2	1	4.6	4.8	0.2	4.42	
	CHAJJA							
		w1	4	1.5	0.6	0.1	0.36	
		w2	3	1.5	0.6	0.1	0.27	
	LINTEL						0.85	
						NET TOTAL	**17.90**	**m³**
9	**Providing M.S. Reinforcement (7.85 g/cm³)**							
	1% Volume of Concrete		1				1407.97	
						NET TOTAL	**1407.97**	**Kg**
10	**Internal Plaster**							
	(b.) WALLS (Except Toilet)							
		Wall1	2	7.9	-	3	47.40	
		Wall2	2	7.6	-	3	45.60	
	(b.) CEILING		1	7.6	7.9	-	60.04	
	DEDUCTIONS							
		D	2	1.5	-	2.1	6.30	
		D1	1	1	-	2.1	2.10	
		W1	2	1.5	-	1.2	3.60	
		W2	1.5	1.2	-	1.2	2.16	
						NET TOTAL	**138.88**	**m²**

ABSTRACT SHEET FOR GRAM-PANCHAYAT

Sr No.	Description	Quantity	Rate	Per	Amount
1	Earthwork in Excavation in Foundation	42.85	₹ 252.30	m³	**₹ 10,810.80**
2	P.C.C in Foundation (1:3:6)	14.28	₹ 6,126.25	m³	**₹ 87,501.23**
3	Brickwork in Foundation	34.91	₹ 6,376.25	m³	**₹ 2,22,620.39**
4	Damp Proof Course (2.5 cm thick)	15.87	₹ 347.90	m²	**₹ 5,521.17**
5	Brick Masonry in Super Structure	40.11	₹ 7,722.65	m³	**₹ 3,09,778.66**
6	Earth Filling in Plinth	34.46	₹ 219.65	m³	**₹ 7,570.02**
7	2cm Thick Marble Floor (Udaipur green marble)	71.80	₹ 1,991.50	m²	**₹ 1,42,989.70**
8	Providing & Laying RCC Elements	17.90	₹ 9,763.80	m³	**₹ 1,74,811.08**
9	Providing M.S. Reinforcement (7.85 g/cm³)	1407.97	₹ 86.05	kg	**₹ 1,21,155.87**
10	Plaster Work	138.88	₹ 365.25	m²	**₹ 50,725.92**
	TOTAL ESTIMATED CONSTRUCTION COST of GRAM-PANCHAYAT				**₹ 11,33,484.84**

8.2. Reason of Students Recommending this Design

As far as we performed the techno economic survey of Manekpur, we got to know that the village has some of the major lacking structures in it. As per the ideal village, a village should have a

Sustainable Structure in it, and so for that purpose we gave the design of Rainwater Harvesting Plant which can be put up on any high rise or on a 2-storey structure. This will help the village's water scarcity problems in summer.

Next, possible design we gave, is of Public Toilet as Physical Design, because it is the most prominent design for a village, as some of the villagers have their private sanitation facility, but some do not have such facility, so they are lacking, and they use open areas for sanitation purpose.

Giving Post-Office as a Social Design will be helpful to the villagers and their unemployed youth too. As it will create a job opportunity for the youth and the existing structure of the post-office is too small of 20 m^2.

We are giving Community Hall design as Socio-Cultural Infrastructure because village don't have any kind of mass gathering hall for any program in which any meeting or gathering can be done.

One of the most important things for a person is to have money and keeping that in mind we gave a design of Bank which consists of an ATM too. So that the villagers do not have to travel a distance of 10 kms to go and withdraw their money. Also, the existing building of Gram Panchayat is too weak, old, and small and it is attached to the Post office from inside as well as outside. So, we decided to give a design of a new Gram Panchayat building to create a Heritage Infrastructure.

8.3. About designs Suggestions / Benefit of the villagers

- **From Rainwater Harvesting Plant**
  - They can get rid of the water scarcity problem in summer.
  - Can use stored water for irrigation needs.
  - Can store water in borewells so that the borewells stay recharged every time.
- **From Public Toilet**
  - They can be beneficial for sanitation facilities.
  - They can use their private as well as public.
  - Outsiders can locate and do their sanitation activities easily.
- **From Post-Office**
  - Village will have its own post, so they won't need to go each and every time to the nearest Sanjan sub-branch post office.
  - It will create a job opportunity for the youth of the village too.
- **From Community Hall**
  - It will be beneficial to those people who do not have land for doing any program in which mass gathering is required.
  - It will be helpful too to the government authorities where they can put up various kinds of meetings as well.
- **From Bank**
  - The villagers will get an ease to withdraw and deposit their money.
  - They won't have to travel long distances for their money.
- **From Gram Panchayat**
  - It will create an aesthetic look of the village.

Also, it would be creating job opportunities for people of the village.

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

By performing the various activities of Vishwakarma Yojana Phase VIII – Part 1, we got to know about the wideness of the adopted project. In this part we did various surveys, performed the tasks based on our needs, learnt new skills, new softwares, etc. From the data we received in part 1 we have given the design in the report. In part 1, we have given the design proposals of:

1. Rainwater Harvesting Plant as Sustainable Design
2. Public Toilet as Physical Design
3. Post Office as Social Design
4. Community Hall as Socio-Cultural Design
5. Bank with ATM as Smart Design
6. Gram Panchayat as Heritage Design

In Vishwakarma Yojana Phase VIII – Part 2 i.e., in next semester, we are thinking to propose the design of some urban amenities which should be helpful to the villagers in their life as well as it creates an aesthetic view for the village, so that, it creates an attraction for tourists and other people.

The proposed designs for part 2 will be:
1. Public Library
2. Public Garden
3. Village Entrance Gate
4. Aesthetic View at Pond, etc.

We are thinking to provide our best outcomes by giving better connectivity, accessibility, mobility as well as proper supply of needs to the village from our skills and mindset. We hope that villagers cooperate with us and cope up so that the outcome will be more powerful and beneficial to them.

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

Based on the whole report, the first thing we would like to conclude is that the Vishwakarma Yojana Phase VIII: An approach towards Rurbanisation, the name itself indicates the upliftment of any rural area into an urban sprawl. The project tends to improve the physical, social as well as social cultural aspects of a particular village by implementing and improvising various amenities in various forms with least amount of hindrance to the rural communalism.

After conducting the surveys of allocated, smart, and ideal, we get to know how the village is lacking in getting proper amenities which they should get as a prior commitment. Side by side the village interaction plays a significant role and from that we got the ideas that what they need in the village apart from the norms. We did a gap analysis by comparing the allocated Manekpur village with UDPFI/UDPRFI Norms and we came to know about the village gap, i.e., what is there and what is lacking.

For any rural village, the main concentration is having all basic amenities i.e., proper drinking water, sanitation facilities, medical facilities, educational background, waste management systems, proper road systems, security provisions, etc. This project report of Vishwakarma Yojana for Manekpur village provides some insights about the existing conditions of the village and, we have provided the required designs as per interaction with the villagers.

We are proposing some designs based on our techno economic survey, interactions with villagers, mindsets of villagers and gap analysis of the village for making it as an urban sprawled developed village. Following are the structures which we have given in the report.

Sr. No.	Type of Design	Type of Structure	Approximate Costing
1.	Sustainable Design (Civil)	Rainwater Harvesting Plant	**₹ 1,03,225.55**
2.	Physical design (Civil)	Public Toilet	**₹ 7,71,306**
3.	Social design (Civil)	Post Office	**₹ 17,43,087**
4.	Socio-Cultural Design (Civil)	Community Hall	**₹ 28,59,714**
5.	Smart Village Design (Civil)	Bank with ATM Facility	**₹ 20,71,097**
6.	Heritage Village Design (Civil)	Gram Panchayat	**₹ 11,33,484**

Table 23 Part 1 Design Conclusions

Chapter 11. References referred for this project

Census department, Ministry of Home Affairs, Govt. of India
www.censusindia.gov.in

Vishwakarma Yojana & its concept:
http://www.vyojana.gtu.ac.in/

Demographic and other data of the village:
www.censusindia.gov.in
https://www.census2011.co.in/

For Smart City concept and its visions:
https://www.thesmartcityjournal.com/en/articles/1333-smart-cities-futuristic-vision

For various details of Smart, Ideal & Allocated Village:
http://www.onefivenine.com/india/villag/Valsad

For different topics related to project:
https://en.wikipedia.org/wiki/Main_Page
https://cis-india.org/internet-governance/blog/adoption-of-standards-in-smart-cities.pdf
http://www.citykeys-project.eu/citykeys/cities_and_regions/performance-measurement-framework#:~:text=The%20indicators%20for%20smart%20cities,reached%2C%20or%20are%20within%20reach.
http://www.differencebetween.net/miscellaneous/difference-between-urban-and-rural/

For getting thorough data of the allocated village (Manekpur):
https://etrace.in/census/village/manekpur-umbergaon-district-valsad-gujarat-523660

Urban Transportation System Book by R. P. Rethaliya

Professional Practice and Valuation Book by R. P. Rethaliya, B. N. Dutta & A. S. Kotadia

For UDPRFI Guidelines
https://www.google.com/url?sa=t&source=web&rct=j&url=http://mohua.gov.in/upload/uploadfiles/files/URDPFI%2520Guidelines%2520Vol%2520I.pdf&ved=2ahUKEwiYzdH1gsHsAhWWc30KHcqaCnIQFjAHegQIARAB&usg=AOvVaw1eyAe-ZRvxoD5NLc3mh1r5
https://www.google.com/url?sa=t&source=web&rct=j&url=http://mohua.gov.in/
https://www.researchgate.net/publication/342163996_STRATEGY_FOR_THE_DEVELOPMENT_OF_SMART_CITIES_Retrofitting_Redevelopment_Greenfield_Development_PAN_City_Development

For proper location:
https://www.google.com/maps

Chapter 12. Annexure attachment

12.1. Survey form of Ideal Village Scanned copy attachment in the report for Part-I

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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

For

Vishwakarma Yojana: Phase VIII

IDEAL VILLAGE SURVEY

An approach towards Rurbanisation for Village Development

Name of Village:	Maroli
Name of Taluka:	Umbergaon
Name of District:	Valsad
Name of Institute:	Laxmi Institute of Technology, Sarigam
Nodal Officer Name & Contact Detail:	Amit R. Chauhan 94273 46011
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Lataben Gajanand Marolikar -Sarpanch
Date of Survey:	3/9/20

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001				
ii)	2011	15678	8029	7649	3081

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	1072.46 ha (21.0239° N, 72.8886° E)
	Forest Area (In hect.)	4.43 ha
	Agricultural Land Area (In hect.)	606.88 ha
	Residential Area (In hect.)	3 ha
	Other Area (In hect.)	12.30ha (Non-cultivable)
	Water bodies	3 Nos. of Pond
	Nearest Town with Distance:	25 km distance (Umbergaon)

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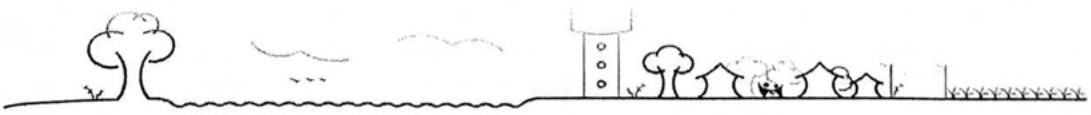
3. Occupational Details:

Name of Three Major Occupation groups in Village	1. Agriculture 2. Fishing 3. Labour work

4. Physical Infrastructure Facilities:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
	• Tap Water (Treated/ Untreated)	YES	YES		Nos. 1556
	• RO Water	NO			
	• Well (Covered/ Uncovered)	YES	YES		Covered Nos. 3
	• Hand pumps	YES	YES		Nos. 110
	• Tube well/ Borehole	YES	YES		Nos. 155
	• River/ Canal/ Spring/ Lake/ Pond	YES	YES	–	Nos. 3.
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: –	–	–	Not there
	Underground Sump	Capacity: –	–	–	Not there
Suggestions if any:	overhead tank should be setup.				
C.	**Drainage Facility**				
	Available (Yes/ No)	NO	–	–	NEEDED
Suggestions if any:	We talked to sarpanch, & they want drainage as early as possible.				
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:	Needed closed & Pucca Drainage facilities.				



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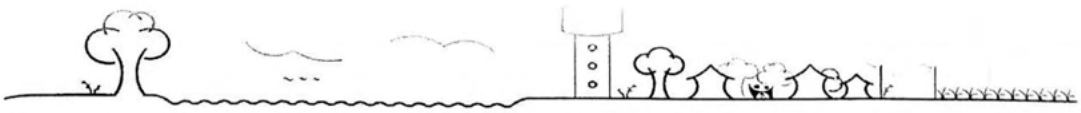
E.	Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM				
	Village approach road	YES	YES		Bitumen
	Main road	YES	YES		Bitumen
	Internal streets	YES		YES	Paver Blocks
	Nearest NH/SH/MDR/ODR Dist. in kms.	NH 48			22 km
Suggestions if any: Main roads are having ruts, so needed improvement.					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	NO			Bhilad ~~17~~ 17 km Sanjan ~~17~~ 17 km
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	YES	8 NOS.		Need to be Refurbish.
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto rickshaw & Private vehicles	→	→	approx 45 NOS.
Suggestions if any: –					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	YES By govt	YES		more than 6 hrs
	Power supply for Domestic Use	YES	YES		-
	Power supply for Agricultural Use	YES	YES		--
	Power supply for Commercial Use	YES	-		less amount of commercial power supply
	Road/ Street Lights	YES	YES		150 Nos



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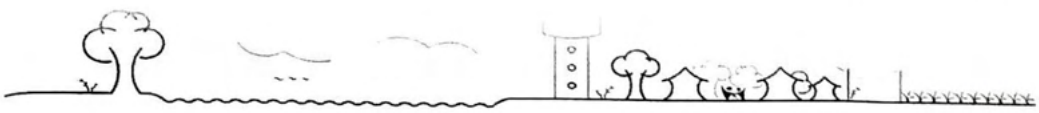
Techno Economic Survey

	Electrification in Government Buildings/ Schools/ Hospitals	YES	YES	-	-
	Renewable Energy Source Facilities (Y/ N)	NO	-	-	-
	LED Facilities	NO	-	-	-
Suggestions if any: Solar Power Plant need to setup for small scale industries					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	YES	YES	-	5-6 approx.
	Location Condition	- in market - Normal	-	-	-
	Community Toilet (With bath/ without bath facilities)	YES	-	YES	without Bath facilities
	Solid & liquid waste Disposal system available	NO	-	-	-
	Any facility for Waste collection from road	YES	-	YES	once in week.
Suggestions if any: Cleaning systems need to be improved.					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	Private wells / Handpumps	YES	-	-
Suggestions if any: -					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Kutchha → Pucca →	→ →	→ →	→ 420 Nos. → 3350 Nos.

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks



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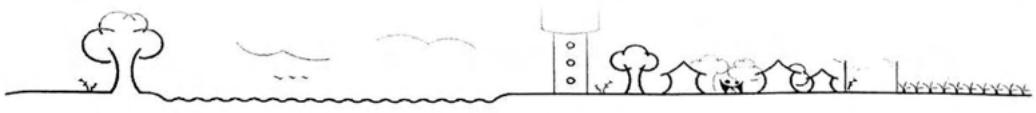
K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	PHC-YES CHC-YES Govt. H- No. mat. H-NO Good	YES YES		cant be reached due to COVID
	Private Clinic/Private Hospital/ Nursing Home	YES (Clinic)	YES		3 NOS.
	If any of the above Facility is not available in village than approx. distance from village: 23.....kms.				
Suggestions if any: Government Hospitals & maternity Homes should be setup. (with Ambulance)					
L.	**Education Facilities:**				
	Aaganwadi/ Play group	YES	YES		
	Primary School	YES	YES		
	Secondary school	YES	YES		
	Higher sec. School	YES	YES		
	ITI college/ vocational Training Center	NO			distance -18 km
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	NO			distance -18 km
	If any of the above Facility is not available in village than approx. distance from village: 18.....kms.				
Suggestions if any: once/twice a month, seminar should be put up, to enhance, student's knowledge					
M.	**Socio- Culture Facilities**				
	Community Hall (With or without TV) Location:	YES (In Dhodipada)	YES		without TV.



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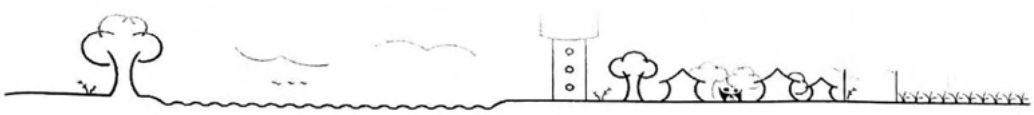
	Condition:	Good	–	–	–
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	NO	–	–	Needed
	Public Garden Location: Condition:	NO	–	–	–
	Village Pond Location: Condition:	YES Inside village Good	YES	–	–
	Recreation Center Location: Condition:	NO	–	–	–
	Cinema/ Video Hall Location: Condition:	NO	–	–	Needed
	Assembly Polling Station Location: Condition:	YES At panchayat Good	YES	–	–
	Birth & Death Registration Office Location: Condition:	YES At panchayat Good	YES		–
If any of the above Facility is not available in village than approx. distance from village: ...18....kms.					
Suggestions if any: Public library should be set up					
N.	**Other Facilities**				
	Post-office	YES	YES	–	2 NOS
	Telecommunication Network/ STD booth	NO	–	–	–



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	General Market	YES	YES		
	Shops (Public Distribution System)	YES	YES		
	Panchayat Building	YES	YES		
	Pharmacy/Medical Shop	YES	YES		
	Bank & ATM Facility	Bank - YES ATM - No			ATM needed
	Agriculture Co-operative Society	YES	YES		Khedi-Vibagh
	Milk Co-operative Soc.	YES	YES		
	Small Scale Industries	NO	-	-	-
	Internet Cafes/ Common Service Center/Wi Fi	NO	-	-	-
	Other Facility	C.C.T.V.			in the market
Suggestions if any: ATMs should be setup					

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

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
O.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	Not there	-	-	-
P.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	only rain water is used for irrigation purpose	YES	-	-
Q.	Any Other	NO	-	-	-

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	YES Soft copy, Available

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Vishwakarma Yojana: Phase VI
Techno Economic Survey

Recent Projects going on for Development of Village	Swachh Bharat Abhiyan, PMGSY, etc
Any NGO working for village development	NO

8. **Additional Information/ Requirement:**

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities(School Building, Health Center, Panchayat Building, Public Toilets & any other)	Repair for old Panchayat office & post office is going on	–
2.	Additional Information/ Requirement	Public Toilet is to be cleaned on regular intervals	–

9. **Smart Village Proposal Design**

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Fire safety, Ambulance, Bus-stops, solar power system should be taken under consideration	Needed as early as possible.	–

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

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

સરપંચ
ગ્રામ પંચાયત-મરોલી
તા. ઉમરગામ જિ. વલસાડ.

Survey form of Ideal Village Original copy attachment in the report for Part-II

12.2. Survey form of Smart Village Scanned copy attachment in the report for Part-I

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

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

Name of District:	Valsad
Name of Taluka:	Umbergaon
Name of Village:	Saligam
Name of Institute:	Laxmi Institute of Technology, Saligam
Nodal Officer Name & Contact Detail:	Amit R. Chauhan 94273 46011
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Gram Panchayat Workers. Pankaj Lx. Rai (Sarpanch)
Date of Survey:	03/09/20 & 5/2/2021.

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	472	297	175	132
2.	2011	19903	10943	8960	4647

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1312 ha (20.2860°N, 72.8575° E)
2.	Forest Area (In hect.)	
3.	Agricultural Land Area (In hect.)	200 ha
4.	Residential Area (In hect.)	400 ha.
5.	Other Area (In hect.)	395 ha. (Industrial Notified Area)
6.	Distance to the nearest railway station (in kilometers):	Bhilad Railway Station (5.2 km distance)

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Techno Economic Survey

7.	Name of Nearest Town with Distance:	Umbergaon (C.T.) (20.9 km distance)
8.	Distance to the nearest bus station (in kilometers):	5.2 km
9.	Whether village is connected to all road for the any facility or town or City?	YES

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1. Sarigam G.I.D.C 2. Private Shops 3. Farming
Major crops grown in the village:	1. Paddy (Rice) 2. Amba-kalam (Mango) 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 Piped To Yard/Plot Public Tap/Standpipe Tube Well Or Bore Well	YES YES YES	YES	–	Govt Govt as well as Privately Privately for Domestic use
2.	**DUG WELL** Protected Well Un Protected Well	Protected wells	YES	–	
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring Rainwater Tanker Truck Cart With Small Tank	Rainwater Collection	YES	–	Privately
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump Other(Specify)**Lake/ Pond**	Hand pump	YES	–	Government as well as Privately.

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Techno Economic Survey

Suggestions if any: –					
B.	**Water Tank Facility**				
	Overhead Tank Noc. 2 +	Capacity: 100000	YES		For Irrigation & INA
	Underground Sump	Capacity: –	–	YES	Not there.
Suggestions if any: –					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET	YES	-	YES	OPEN without outlet
Suggestions if any: Drainage lines need to be setup with lid & proper Lining					
D.	**Road Network : All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	All weather	YES	–	-
	Main road	All weather	–	YES	Need to improve
	Internal streets	Paver Block	YES		
	Nearest NH/SH/MDR/ODR Dist. in kms.	NH 48 (4.8 km)	–	–	S.H is connected to village.
Suggestions if any: Main roads need improvement with drainage facilities					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	YES	YES	–	Bhilad Railway Station (4 kms)
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	YES → Normal	–	YES	At Bhilad (3 kms).
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto Rickshaws & Private Vehicles	–	–	-
Suggestions if any: –					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Govt Provided	YES	–	more than 6 hours.

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Techno Economic Survey

	Power supply for Domestic Use	YES	YES	–	–
	Power supply for Agricultural Use	YES	YES	–	–
	Power supply for Commercial Use	YES	YES	–	–
	Road/ Street Lights	YES	YES	–	–
	Electrification in Government Buildings/ Schools/ Hospitals	YES	YES	–	Condition-Good
	Renewable Energy Source Facilities (Y/ N)	NO	–	–	–
	LED Facilities	NO	–	–	–

Suggestions if any: Solar plant can be put up in vacant land areas.

G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	YES	–	YES	4 Nos. of Blocks
	Location Condition	Loc:Market	–	–	Condition:Normal.
	Community Toilet (With bath/ without bath facilities)	YES	–	YES	without bath.
	Solid & liquid waste Disposal system available	Pumping system	YES	–	on vacant area behind Panchayat
	Any facility for Waste collection from road	manual cleaning	YES	–	It is done by sweepers.

Suggestions if any: Need to setup more number of latrine & urinal Blocks.

H.	**Main Source of Irrigation Facility:**				
	TANK/POND	NO	–	–	–
	STREAM/RIVER	NO	–	–	–
	CANAL	NO	–	–	–
	WELL	YES	YES	–	–
	TUBE WELL.	YES	YES	–	–
	OTHER (SPECIFY)	Rainwater	YES	–	–

Suggestions if any: Modern techniques can be adopted

I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	30:%	→	→	→ Kutchha Houses
		70:%	→	→	→ Pucca Houses.

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Techno Economic Survey

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	YES	YES	–	–
	Sub-Centre	NO	–	–	
	PHC	NO	–	–	Distance – 5 km
	BLOCK PHC	NO	–	–	–
	CHC/RH	NO	–	–	–
	District/ Govt. Hospital	YES	YES	–	–
	Govt. Dispensary	YES	YES	–	Govt. Homeopathy Clinic
	Private Clinic	YES	YES	–	in Market
	Private Hospital/ Nursing Home	YES	YES	–	Kikwala Hospital
	AYUSH Health Facility	No	–	–	distance - 5 km
	sonography /ultrasound facility	YES	YES	–	in rotary hospital
	If any of the above Facility is not available in village than approx. distance from village: ....4.....kms.				
	Suggestions if any: –				
K.	**Education Facilities:**				
	Aaganwadi/ Play group	YES	YES	–	–
	Primary School	YES	YES	–	–
	Secondary school	YES	YES	–	–
	Higher sec. School	YES	YES	–	–
	ITI college/ vocational Training Center	V.T.C YES	YES	–	–
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	YES	YES	–	L.I.T. (Engg.) SSR (B.Sc) (B.Com)(B.A)
	If any of the above Facility is not available in village than approx. distance from village: ..5....kms. (For S.S.R. (silvassa) College)				

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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)	Under construction	in market	YES	—
	Public Garden	—	—	—	NO
	Village Pond	Good	—	YES	—
	Recreation Center	—	—	—	NO
	Cinema/ Video Hall	—	—	—	NO
	Assembly Polling Station	Good	Panchayat	YES	—
	Birth & Death Registration	Good	Panchayat	YES	—

If any of the above Facility is not available in village than approx. distance from village: .....19.....kms. (Recreation centre) (Vapi)

Suggestions if any:

Community Halls Need to be Schep.

M.	Other Facilities	Condition	Location	Available (YES)	Available (NO)
	Post-office	Not good	market	YES	—
	Telecommunication Network/ STD booth	—	—	—	NO
	General Market	Normal	market	YES	—
	Shops (Public Distribution System)	Good	market	YES	—
	Panchayat Building	Good	market	YES	—
	Pharmacy/Medical Shop	Good	market	YES	—
	Bank & ATM Facility	Normal	near market	YES	—
	Agriculture Co-operative Society	Normal	near market	YES	—
	Milk Co-operative Soc.	—	—	—	NO
	Small Scale Industries	Normal	House holds	YES	—
	Internet Cafes/ Common Service Center/Wi Fi	—	—	—	NO
	Youth Club	—	—	—	NO
	Mahila Mandal	—	—	—	NO

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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	Only Agricultural Coop. Society	In the market	YES	–
	Other Facility	–	–	–	–

Suggestions if any: Internet Cafe For education & youth club can be setup

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?	–		YES	–
	3. Janani Suraksha Yojana	Good		YES	
	4. Kishori Shakti Yojana	–		–	NO
	5. Balika Samriddhi Yojana	Good		YES	–
	6. Mid-day Meal Programme	Normal		YES	–
	7. Intergrated Child Development Scheme (ICDS)	Good		YES	–
	8. Mahila Mandal Protsahan Yojana (MMPY)	–		–	NO
	9. National Food for work Programme (NFFWP)	–		–	NO
	10. National Social Assistance Programme	–		–	NO
	11. Sanitation Programme (SP)	Good		YES	–
	12. Rajiv Gandhi National Drinking Water Mission	–		–	NO
	13. Swarnjayanti Gram Swarozgar Yojana	–		–	NO
	14. Minimum Needs Programme (MNP)	–		–	NO
	15. National Rural Employment Programme	Implemented		YES	–
	16. Employee Guarantee Scheme (EGS)	Implemented		YES	–
	17. Prime Minister Rojgar Yojana (PMRY)	Implemented		YES	–
	18. Jawahar Rozgar Yojana (JRY)	Implemented		YES	–
	19. Indira Awas Yaojna (IAY)	Implemented		YES	–
	20. Samagra Awas Yojana (SAY)	Implemented		YES	–
	21. Sanjay Gandhi Niradhar Yojana (SGNY)	Implemented		YES	–
	22. Jawahar Gram Samridhi Yojana (JGSY)	Implemented		YES	–
	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	NO	–	–	–
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	Solar street light is there but not in working condition	–	–	Water Harvesting is done privately/ by citizens
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	Soft copy Available.	YES	–	–
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)	only earthquake of magnitude 4.4 took place.	–	–	on (1/3/19) Epicentre - Palghar.

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	Roads & Paver Blocks Need to be Improvised!.	New Panchayat Building is under construction.
2.	Additional Information/ Requirement	library construction need progress.	
3.	During the last six months how many times CLEANING ………………………… FOGGING……………………………… Drive was undertaken in the village?	cleaning is done daily	drive is taken once in 6 months

IX. Smart Village / Heritage Details

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?	C.C.T.V, wifi, Solar Plant, Biogas Plant, etc.	—

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

ઈન્ચાર્જ સરપંચ
ગ્રામ પંચાયત, સરીગામ
તા. ઉમરગામ, જી. વલસાડ.

[illegible]

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Survey form of Smart Village Original copy attachment in the report for Part-II

12.3. Survey form of Allocated Village Scanned copy attachment in the report for Part-I

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

Name of District:	Valsad
Name of Taluka:	Umbergaon
Name of Village:	Manekpur
Name of Institute:	Laxmi Institute of Technology, Sarigam
Nodal Officer Name & Contact Detail:	Amit R. Chauhan 9427346011
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Panchayat Members - Arjunbhai Davaria - Kishorebhai Maji [Deputy Sarpanch]
Date of Survey:	5/9/20

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	2919	1465	1454	589

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	464.71 ha → 20.253691°N 72.799484°E
2.	Forest Area (In hect.)	30.2 ha
3.	Agricultural Land Area (In hect.)	
4.	Residential Area (In hect.)	
5.	Other Area (In hect.)	
6.	Distance to the nearest railway station (in kilometers):	Sanjan Railway station (distance: 9 km)

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7.	Name of Nearest Town with Distance:	Umbergaon (distance 13.3 km)
8.	Distance to the nearest bus station (in kilometers):	Sanjan (distance: 8.3km)
9.	Whether village is connected to all road for the any facility or town or City?	Yes, it is connected

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1. Factory work / Employees
	2. Agriculture
	3. -

Major crops grown in the village:	1. Rice
	2. -
	3. -

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

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

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	Other(Specify)**Lake/ Pond**	A pond is located inside village	YES		It is not in use right now.
Suggestions if any: - Door to Door, Piped water can be given. Also pond can be recreated					
B.	**Water Tank Facility**				
	Overhead Tank (7 Nos)	Capacity:	YES		But, not in use
	Underground Sump	Capacity:	-		
Suggestions if any: Overhead Tank need repair works.					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1	No facility of drainage	-	-	-
Suggestions if any: - Covered Drainage lining should be setup.					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Allweather	YES	-	-
	Main road	Allweather	YES	-	-
	Internal streets	C.C/ Paver Blocks	-	YES	-
	Nearest NH/SH/MDR/ODR Dist. in kms.	NH-48 SH-73	-	-	- Distance (15 km) - Distance (12 km)
Suggestions if any: -					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	NO	-	-	Sanjan Station (distance: 8.3 km)
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	NO	-	-	Sanjan - (8.3 km) Umbergaon - (15 km)
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto, Chhakda, Pvt vehicles	YES	-	Auto & pvt vehicles are expensive
Suggestions if any: Public Transportation facilities need to be enhanced.					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	YES	YES	-	By govt. more than 6 hrs.

3

	Power supply for Domestic Use	YES	YES		By Govt.
	Power supply for Agricultural Use	YES	YES		By Govt
	Power supply for Commercial Use	YES	YES		By Govt
	Road/ Street Lights	YES		YES	Some lights are not working
	Electrification in Government Buildings/ Schools/ Hospitals	YES	YES		Need to keep high voltage boards
	Renewable Energy Source Facilities (Y/ N)	NO			
	LED Facilities	No			

Suggestions if any: Electrification in govt buildings need to upgrade as the boards of electricity & meter is too old & risky to use

G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	YES		YES	2 Nos of Block are available
	Location Condition	is in good condition			
	Community Toilet (With bath/ without bath facilities)	NO			
	Solid & liquid waste Disposal system available	Available	YES		Condition is good
	Any facility for Waste collection from road	Available		YES	It is done once in a year by sweepers

Suggestions if any: Dustbins, latrine Blocks & Urinals need to be setup.

H.	**Main Source of Irrigation Facility:**				
	TANK/POND	Available			1 Nos
	STREAM/RIVER	NO			
	CANAL	NO			
	WELL	YES			Privately
	TUBE WELL.	YES			Privately
	OTHER (SPECIFY)	NO			

Suggestions if any: Canal for irrigation need to be lined up & should be constructed.

I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	All Pucca Houses	YES	–	–

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V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	YES	YES	-	4 Nos.
	Sub-Centre	-	-	-	-
	PHC	YES	YES	-	20 Beds.
	BLOCK PHC	YES	YES	-	20 Beds
	CHC/RH	NO	-	-	-
	District/ Govt. Hospital	YES	YES	-	20 Beds
	Govt. Dispensary	YES	YES	YES	20 Beds
	Private Clinic	YES	YES		3 Clinics (Pvt.)
	Private Hospital/ Nursing Home	NO			
	AYUSH Health Facility	YES			
	sonography /ultrasound facility	NO			
	If any of the above Facility is not available in village than approx. distance from village: ..12.....kms. (Sanjan / Bhilad)				
Suggestions if any:	Maternity hospitals should be taken under consideration as distance is too far with poor quality roads.				
K.	**Education Facilities:**				
	Aaganwadi/ Play group	Available	YES		4 Nos
	Primary School	Available	YES		3 Nos
	Secondary school	Available	YES		1 Nos
	Higher sec. School	Available	YES		1 Nos
	ITI college/ vocational Training Center	Not Available			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	Not Available			

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If any of the above Facility is not available in village than approx. distance from village: ...13....kms. (Sarigam, College)

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				NO
	Village Pond	Normal	inside village	YES	
	Recreation Center				NO
	Cinema/ Video Hall				NO
	Assembly Polling Station	Normal	-	YES	-
	Birth & Death Registration Office	Normal	-	YES	-

If any of the above Facility is not available in village than approx. distance from village: ..10....kms. Sanjan

Suggestions if any: The facilities which are not available should be set up.

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

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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	out of the listed, only milk cooperative society is there		M.C.S & YES	
	Other Facility	—			

Suggestions if any: Panchayat Building, Post office etc, need to be renovate.

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

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	None of them are available			
2.	Bio-Gas Plant × Solar Street Lights Rain Water Harvesting × System	only Solar street is available & need to renovate			
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	Not available			
2.	Recent Projects going on for Development of Village	nothing is going on			
3.	Any NGO working for village development	Not Available			
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)	NO			

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

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building, Health Center, Panchayat Building, Public Toilets & any other	- Overhead Tanks - Panchayat Building - Post office - Ponds - Bus stops - Public Latrines	
2.	Additional Information/ Requirement	- Road system, needs Repair	
3.	During the last six months how many times CLEANING ..... FOGGING..... Drive was undertaken in the village?	cleaning is not done	

IX. Smart Village / Heritage Details

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?	Drainage, C.C.T.V, Underground wiring, Freewifi/ Cybercafe, Banks, ATM, etc	

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

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

સરપંચ
ગ્રામ પંચાયત માણેકપુર
તા. ઉમરગામ, જિ. વલસાડ.

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Survey form of Allocated Village Original copy attachment in the report for Part-II

12.4. Gap Analysis of the Allocated Village

VILLAGE GAP ANALYSIS					
Village Facilities	**Planning Commission**	**Village Name:**		**MANEKPUR**	
		Population:		**2,919**	
		Existing	**Required as per Norms**	**Smart Village/ Cities/ Heritage Future Projection Design**	**Gap**
Social Infrastructure Facilities					
EDUCATION FACILITIES					
Anganwadi	Each or per 2500 Population	4	2		**+2**
Primary School	Each Per 2500 population	3	2		**+1**
Secondary School	Per 7,500 population	1	0		**+1**
Higher Secondary School	Per 15,000 Population	1	0		**+1**
College	Per 125,000 Population	0	0		**0**
Tech. Training Institute	Per 100000 Population	0	0		**0**
Agriculture Research Centre	Per 100000 Population	0	0		**0**
Skill Development Centre	Per 100000 Population	0	0		**0**
HEALTH FACILITIES					
Govt/Panchayat Dispensary or Sub PHC or Health Centre	Each Village	0	1		**-1**
Primary Health & Child Health Centre	Per 20,000 population	1	0		**+1**
Child Welfare and Maternity Home	Per 10,000 population	0	0		**0**
Multispeciality Hospital	Per 100000 Population	0	0		**0**
Public Latrines	1 for 50 families (if toilet is not there in home, especially for slum pockets & kutcha house)	1 Public Toilet (With 4 blocks) & Others have in their home	10		**-10**

Physical Infrastructure Facilities					
Transportation		Adequate	Inadequate		
Pucca - Village Approach Road	Each village	✔			**Adequate**
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or auto)	✔			**Adequate**
Drinking Water (Minimum 70 lpcd)		Adequate	Inadequate		
Overhead tank	1/3 of Total Demand	✔ (3 Nos.)			**Need Maintenance & Repair work**
U/G Sump	2/3 of Total Demand	✔ (1 Nos.)			**Need Maintenance & Repair**
Drainage Network - Open			✕		**Inadequate**
Drainage Network - Covered			✕		**Inadequate**
Waste Management System		✔			**Adequate**
Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	0	0		**0**
Community Hall and Public Library	Per 15000 Population	0	0		**0**
Cremation Ground	Per 20,000 population	0	0		**0**
Post Office	Per 10,000 population	1	0		**+1**
Gram Panchayat Building	Each individual/group panchayat	1	1		**0 (Existing need to be Reconstructed)**
APMC (Agricultural Marketing Policy Centre)	Per 100000 Population	0	0		**0**
Fire Station	Per 100000 Population	0	0		**0**
Public Garden	Per village	0	0		**0**
Police post	Per 40,000 Population	0	0		**0**
Shopping Mall		No Mall only Village Market			**+1**

Electrical Design					
Electricity Network					**Adequate**
Any Smart Village Facility					
Technology					**No Other Technology**
		ESR cap	0		
		Sump cap	0		
		Lat	0		

Table 24 GAP Analysis

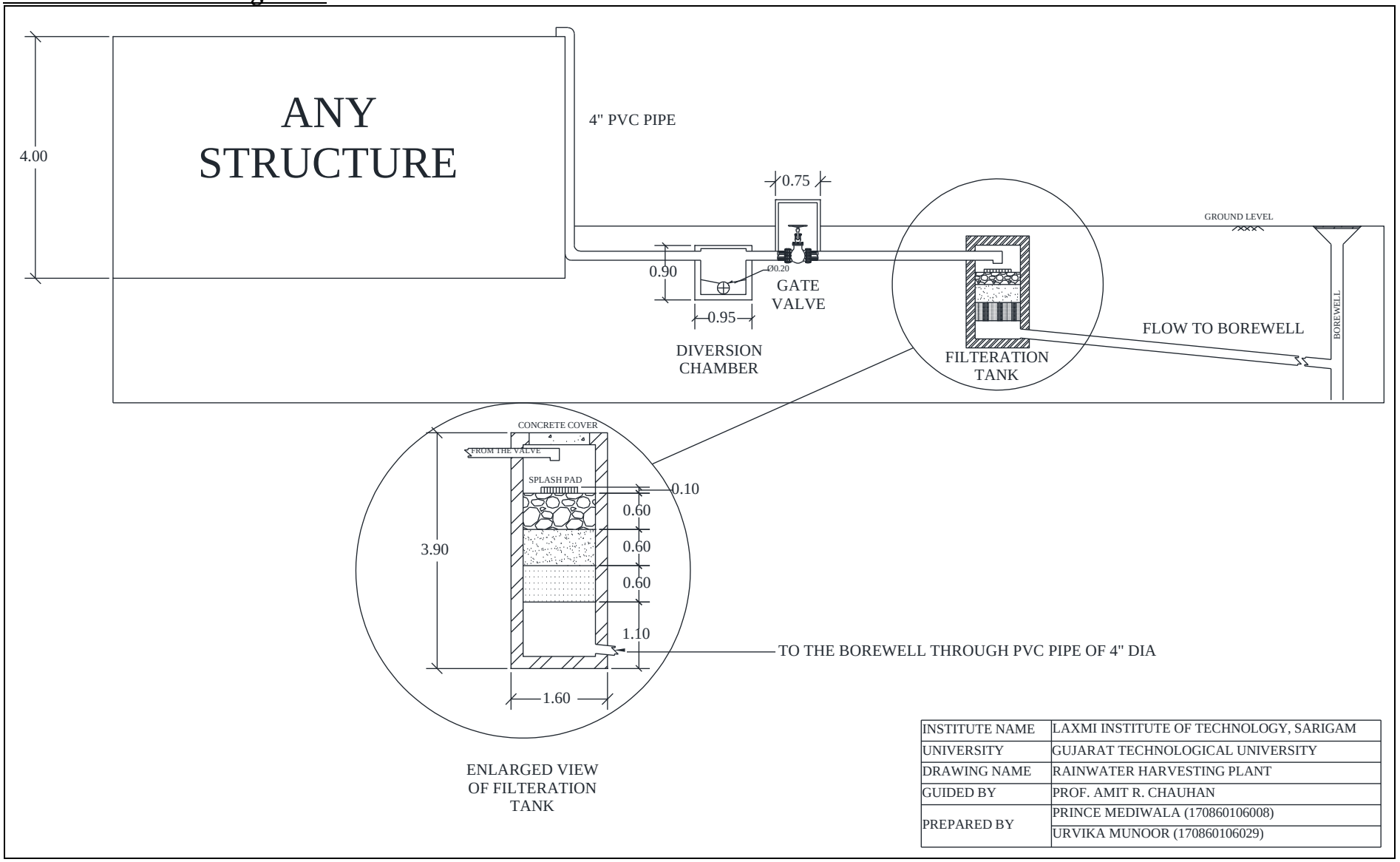
12.5. Summary Details of All the Villages Designs in Table form as Part-I and Part-II

Sr. No.	Village Name	Branch	Part 1	Part 2
1.	MANEKPUR	CIVIL	Rainwater Harvesting Plant	Drainage Design
			Public Toilet	Bus Stop
			Post Office	Public Library
			Community Hall	Public Garden
			Bank with ATM Facility	Village Entrance Gate
			Gram Panchayat	Pond Recreation
2.	CHANVAI	CIVIL	Drainage Line	Anganwadi
			Library	Public Garden
			Repair & Maintenance of Bus-stop	Village Market
			Community Hall	Cricket Ground
			Road Design	Vocational Training Centre
			Maternity Home	Village Pond Development
3.	ANJLAV	CIVIL	Designs of Laterals	PHC
			Manifolds	Public Toilet
			Mains of Drip Irrigation	Garden
			Basketball Court	Bus stand
			Post office	Library
			Bank	Cyber Cafe

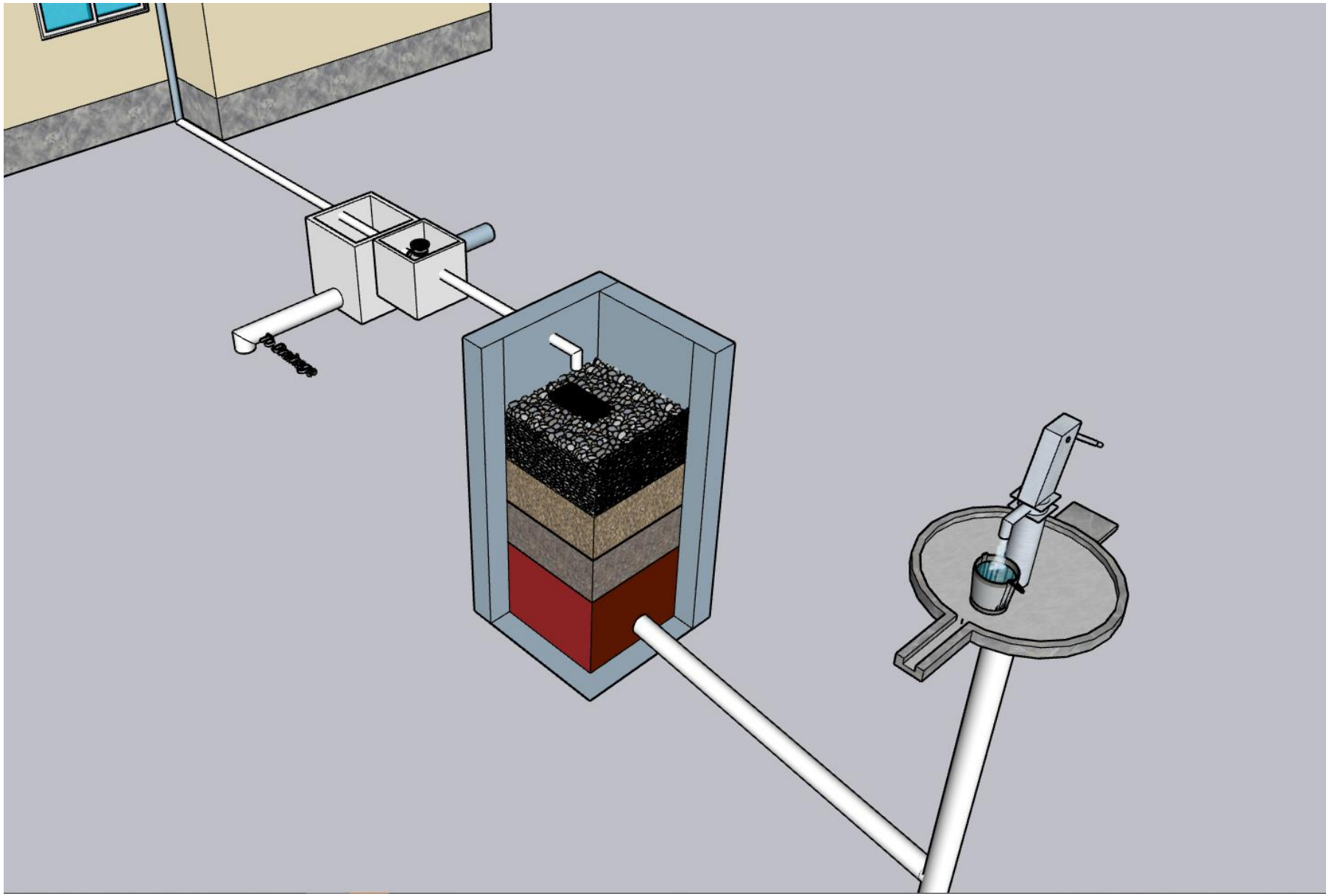
Table 25 Summary of Designs

12.6. Drawings (A3 Sheet)

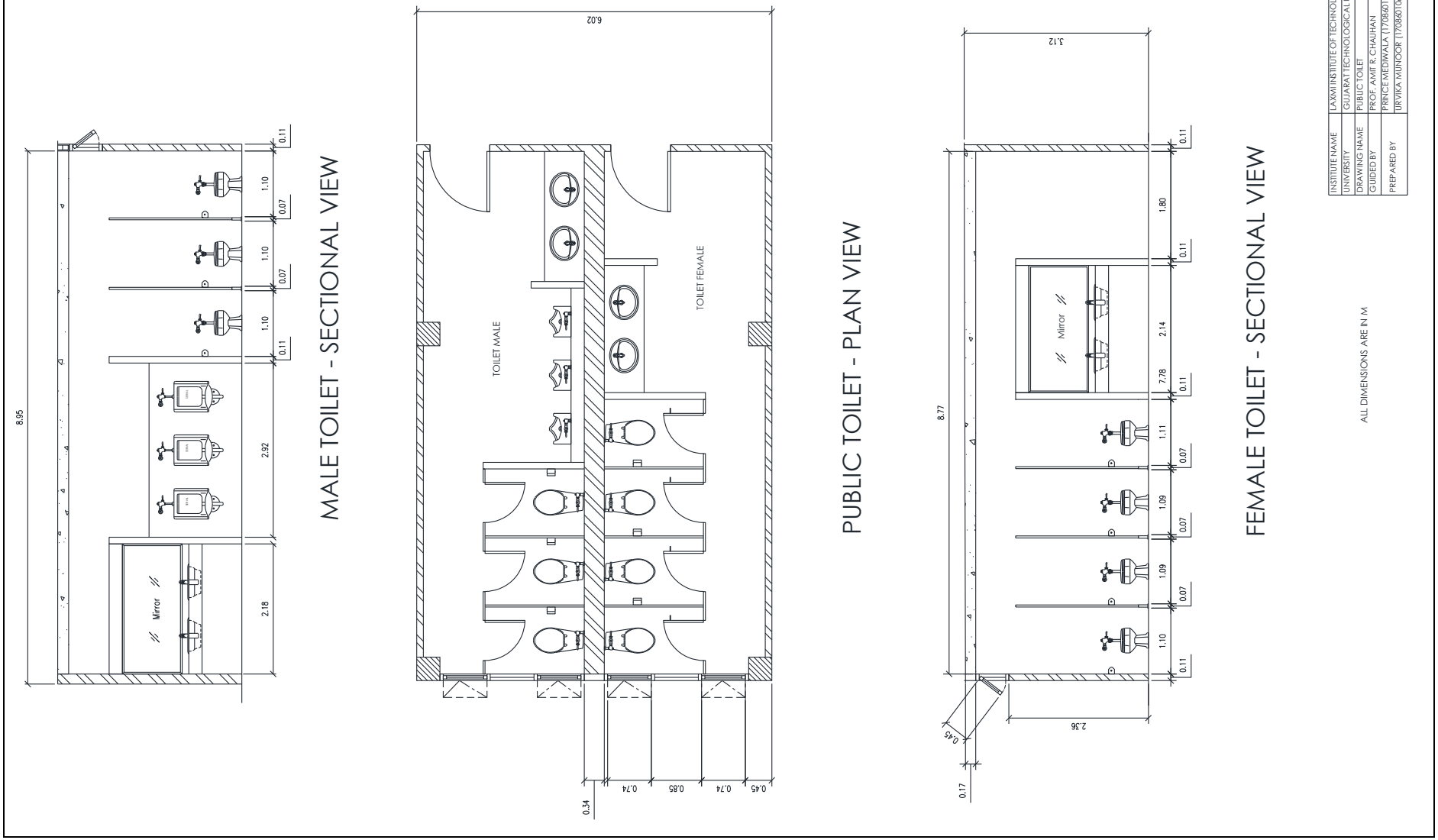
1. Rainwater Harvesting Plant

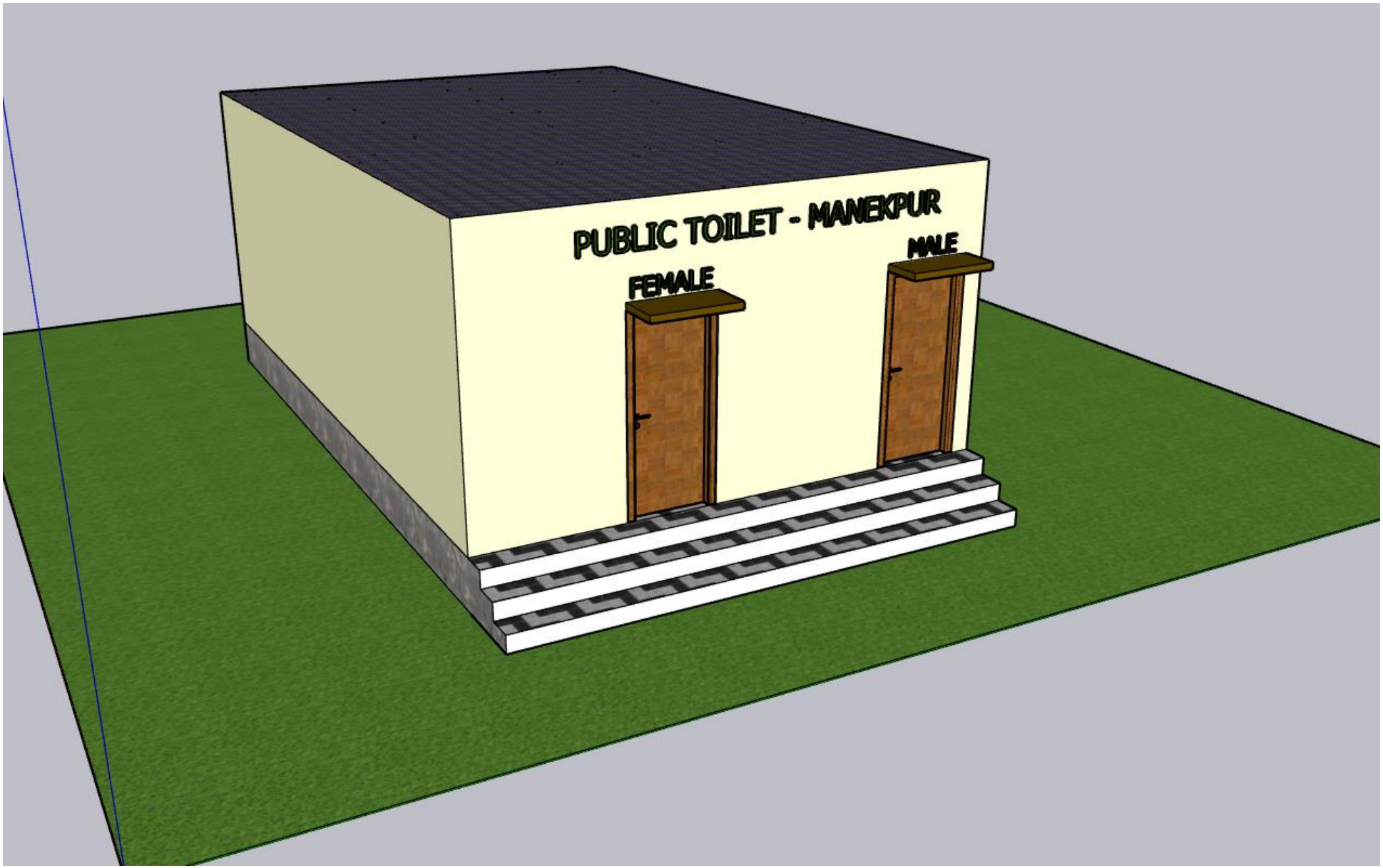


INSTITUTE NAME	LAXMI INSTITUTE OF TECHNOLOGY, SARIGAM
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
DRAWING NAME	RAINWATER HARVESTING PLANT
GUIDED BY	PROF. AMIT R. CHAUHAN
PREPARED BY	PRINCE MEDIWALA (170860106008)
	URVIKA MUNOOR (170860106029)

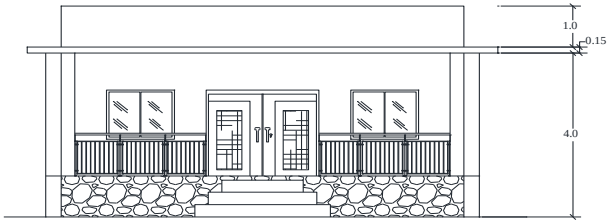


2. Public Toilet



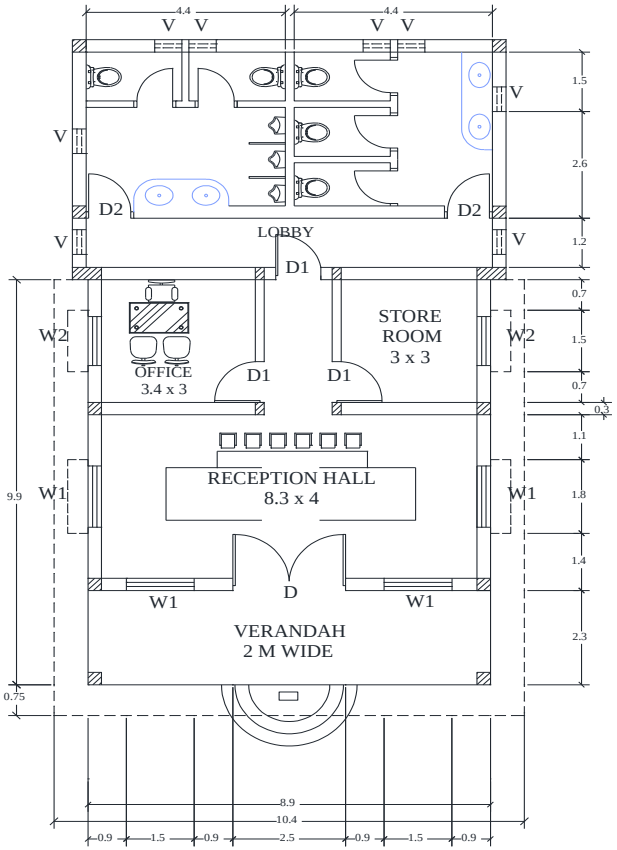

PUBLIC TOILET - MANEKPUR
FEMALE
MALE

3. Post-Office

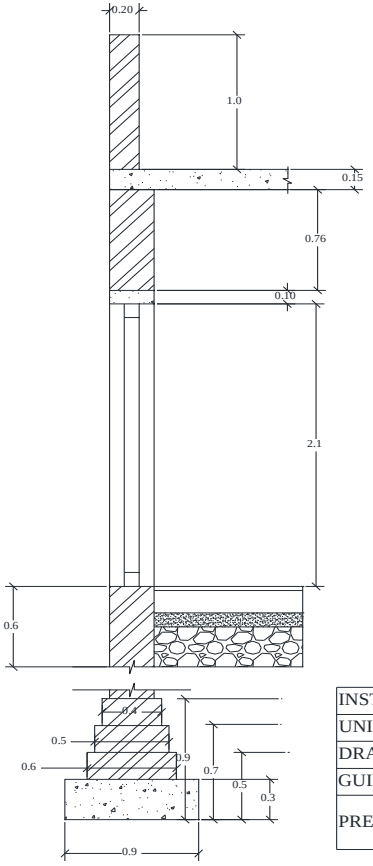


ELEVATION

SCHEDULE OF OPENINGS		
DOOR	D	1.5 X 2.1
DOOR	D1	1 x 2.1
DOOR	D2	0.9 x 2.1
WINDOW	W1	1.5 x 1.2
WINDOW	W2	1.2 x 1.2
VENTILATOR	V	0.6 x 0.45
ALL DIMENSIONS ARE IN M		



PLAN OF POST OFFICE



SECTION

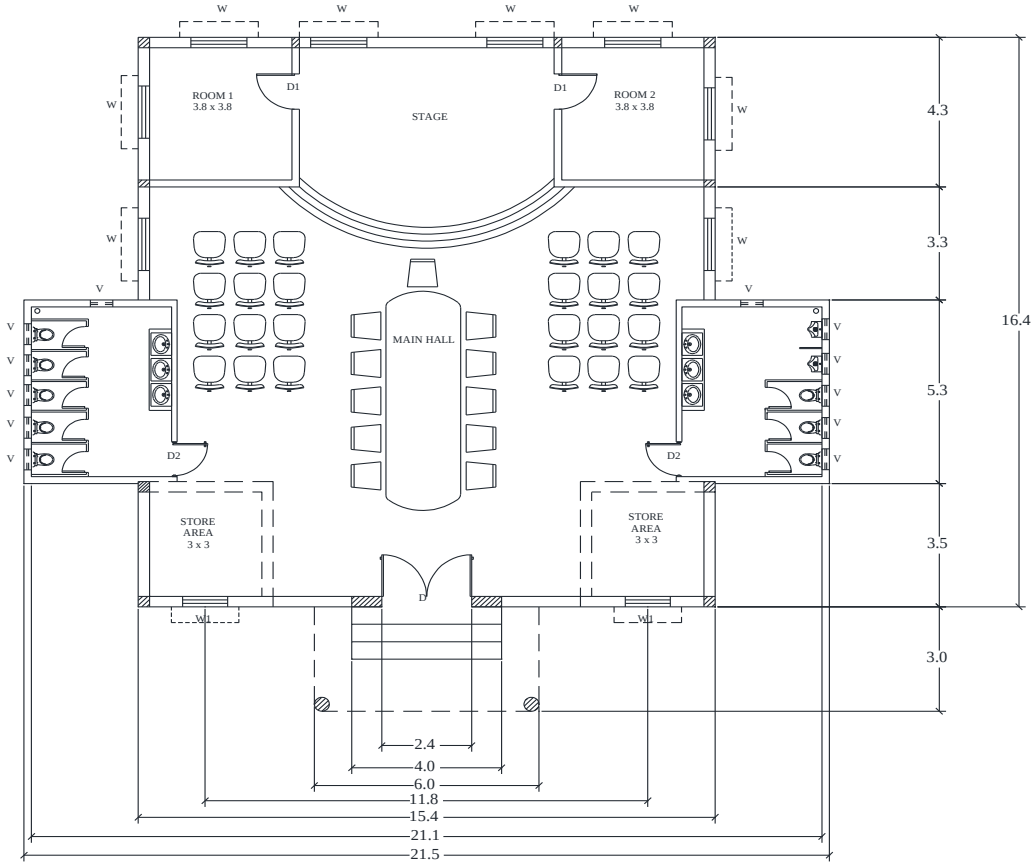
INSTITUTE NAME	LAXMI INSTITUTE OF TECHNOLOGY, SARIGAM
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
DRAWING NAME	POST OFFICE MANEKPUR
GUIDED BY	PROF. AMIT R. CHAUHAN
PREPARED BY	PRINCE MEDIWALA (170860106008)
	URVIKA MUNOOR (170860106029)


POST-OFFICE MANEKPUR

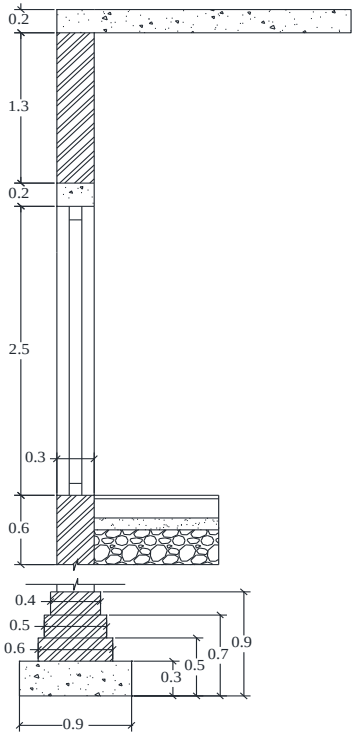
4. Community Hall

ELEVATION

SCHEDULE OF OPENINGS		
DOOR	D	1.2 X 2.1
DOOR	D1	1 x 2.1
DOOR	D2	0.9 x 2.1
WINDOW	W1	1.5 x 1.2
WINDOW	W2	1.2 x 1.2
VENTILATOR	V	0.6 x 0.45
ALL DIMENSIONS ARE IN M		

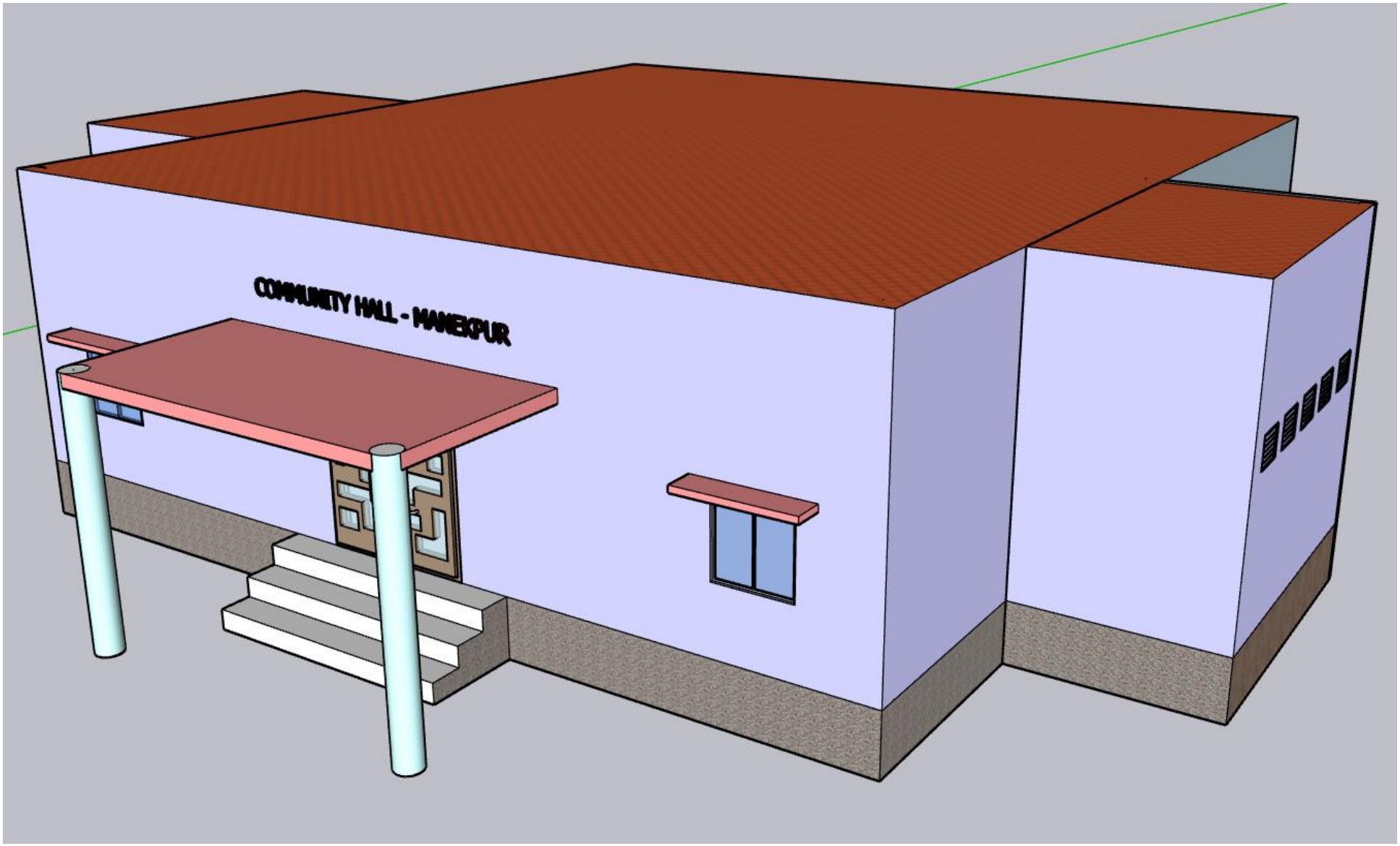


PLAN OF COMMUNITY HALL



SECTION

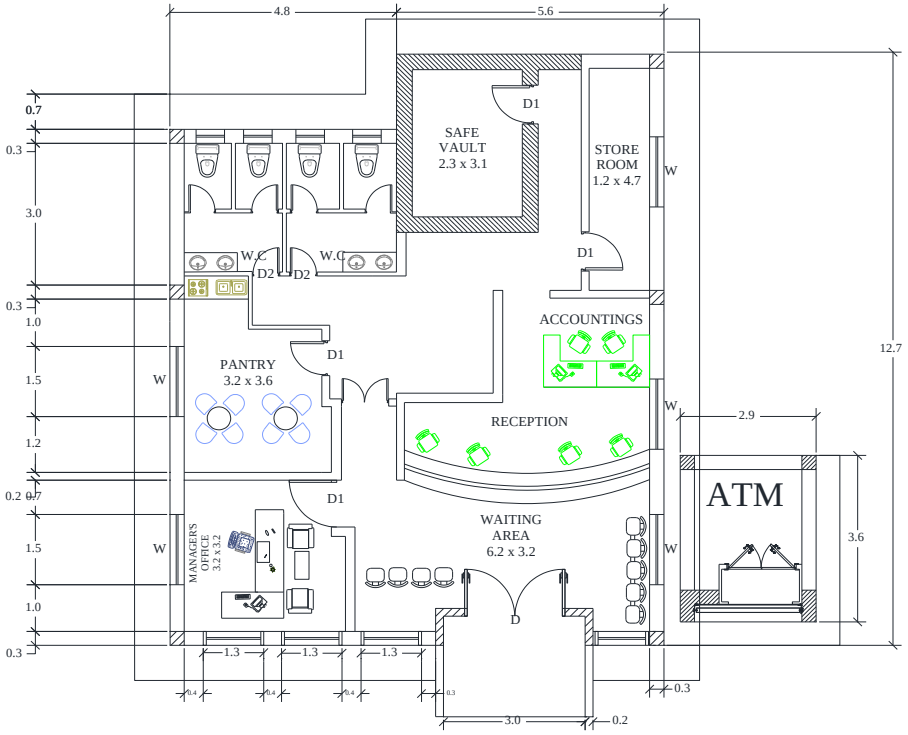
INSTITUTE NAME	LAXMI INSTITUTE OF TECHNOLOGY, SARIGAM
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
DRAWING NAME	COMMUNITY HALL
GUIDED BY	PROF. AMIT R. CHAUHAN
PREPARED BY	PRINCE MEDIWALA (170860106008)
	URVIKA MUNOOR (170860106029)


COMMUNITY HALL - MANEKPUR

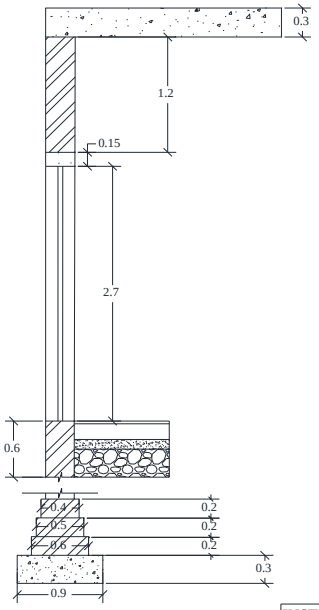
5. Bank with ATM

ELEVATION

SCHEDULE OF OPENINGS		
DOOR	D	2 x 2.7
DOOR	D1	1 x 2.1
DOOR	D2	0.8 x 1.2
WINDOW	W	1.5 x 1.2
VENTILATOR	V	0.6 x 0.45
ALL DIMENSIONS ARE IN M		

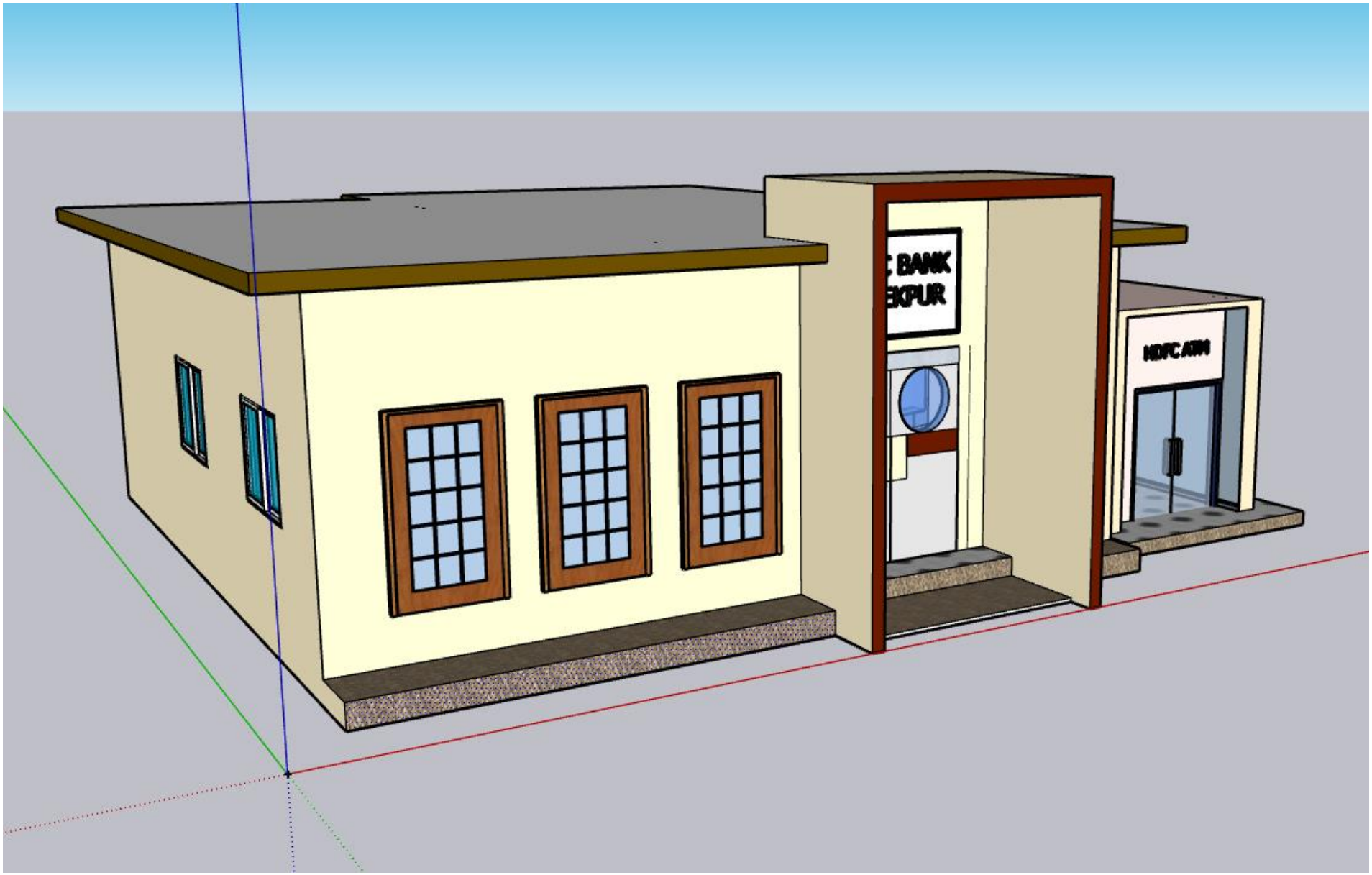


PLAN

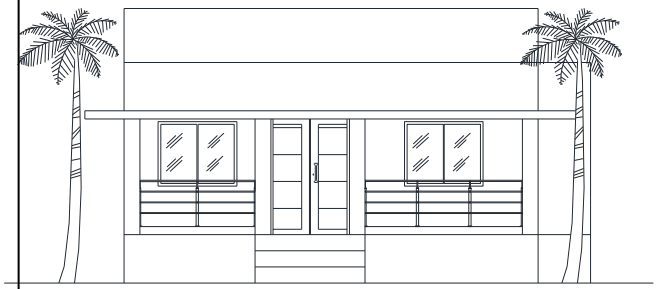


SECTION

INSTITUTE NAME	LAXMI INSTITUTE OF TECHNOLOGY, SARIGAM
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
DRAWING NAME	BANK WITH ATM
GUIDED BY	PROF. AMIT R. CHAUHAN
PREPARED BY	PRINCE MEDIWALA (170860106008)
	URVIKA MUNOOR (170860106029)

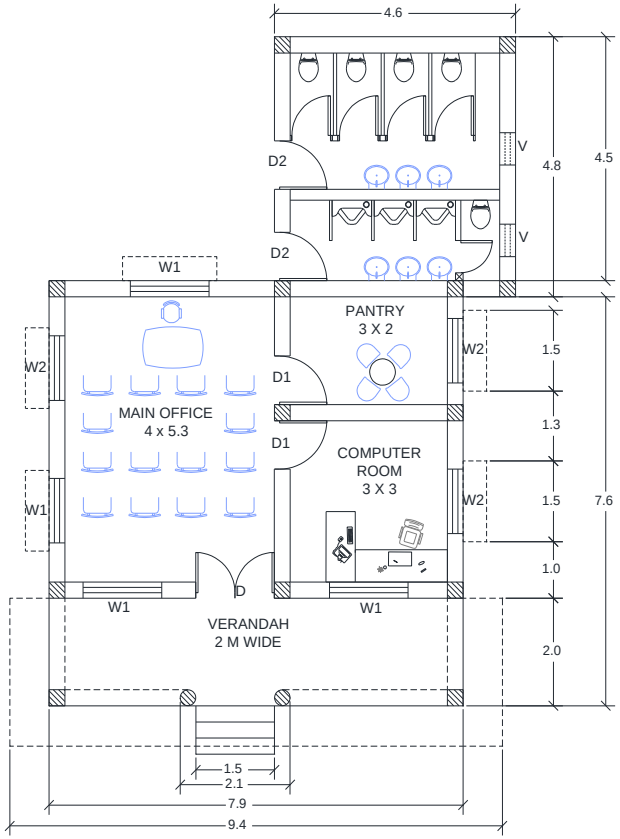

BANK
EKPUR
HDFC ATM

6. Gram Panchayat

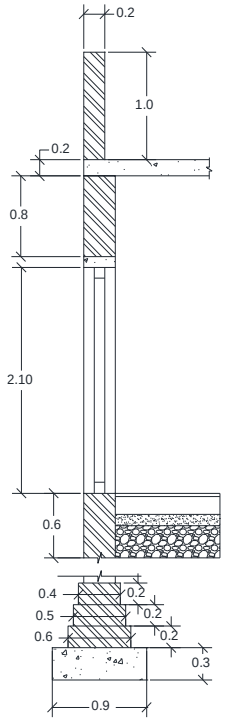


ELEVATION

SCHEDULE OF OPENINGS		
DOOR	D	1.5 X 2.1
DOOR	D1	1 x 2.1
DOOR	D2	0.9 x 2.1
WINDOW	W1	1.5 x 1.2
WINDOW	W2	1.2 x 1.2
VENTILATOR	V	0.6 x 0.45
ALL DIMENSIONS ARE IN M		



PLAN OF GRAM PANCHAYAT

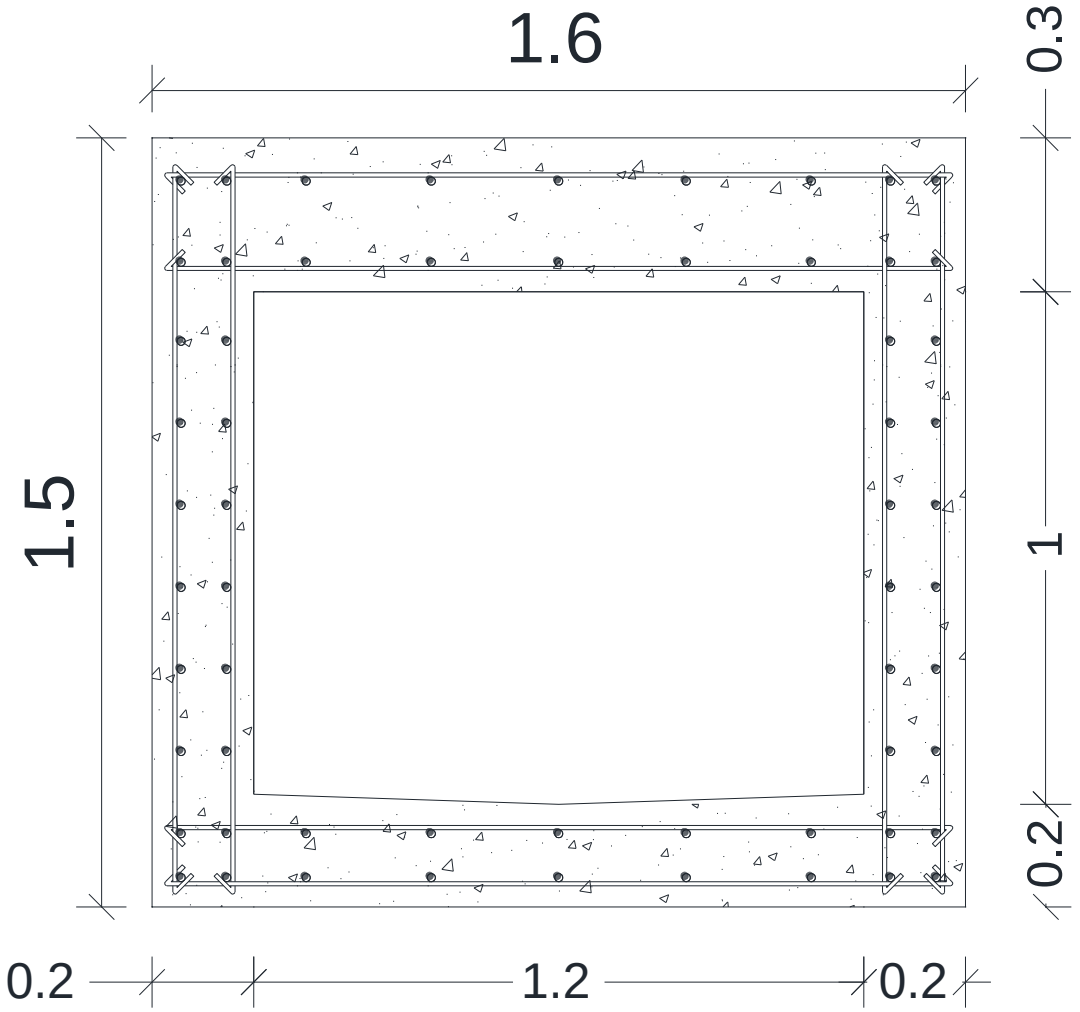


SECTION

INSTITUTE NAME	LAXMI INSTITUTE OF TECHNOLOGY, SARIGAM
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
DRAWING NAME	GRAM PANCHAYAT
GUIDED BY	PROF. AMIT R. CHAUHAN
PREPARED BY	PRINCE MEDIWALA (170860106008)
	URVIKA MUNOOR (170860106029)

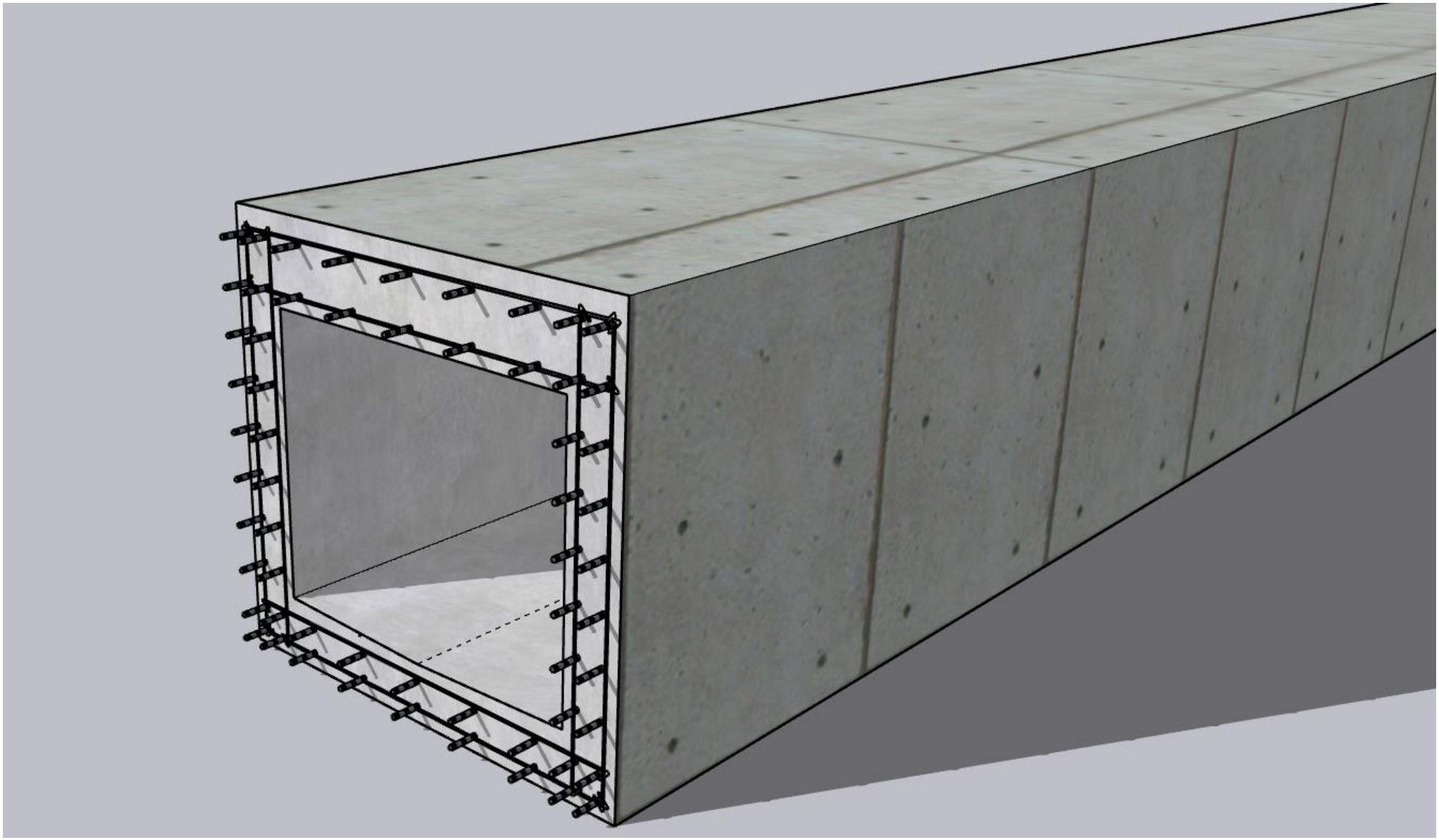

GRAM PANCHAYAT - MANEKPUR

7. Drainage Design

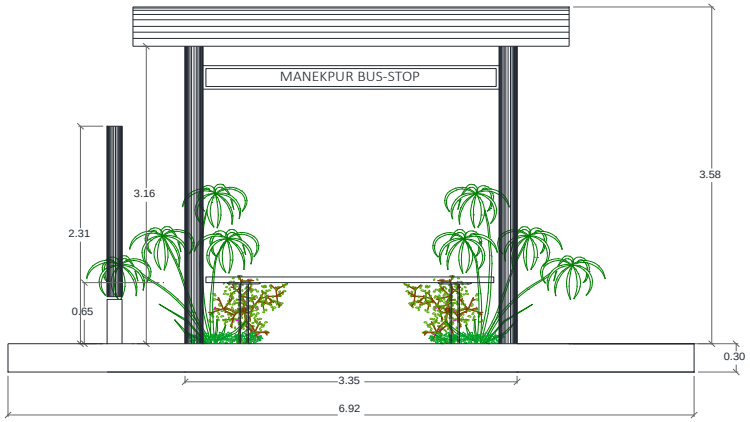


DRAINAGE
CROSS-SECTIONAL VIEW

INSTITUTE NAME	LAXMI INSTITUTE OF TECHNOLOGY, SARIGAM
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
DRAWING NAME	DRAINAGE (CROSS-SECTIONAL VIEW)
GUIDED BY	PROF. AMIT R. CHAUHAN
PREPARED BY	PRINCE MEDIWALA (170860106008)
	URVIKA MUNOOR (170860106029)

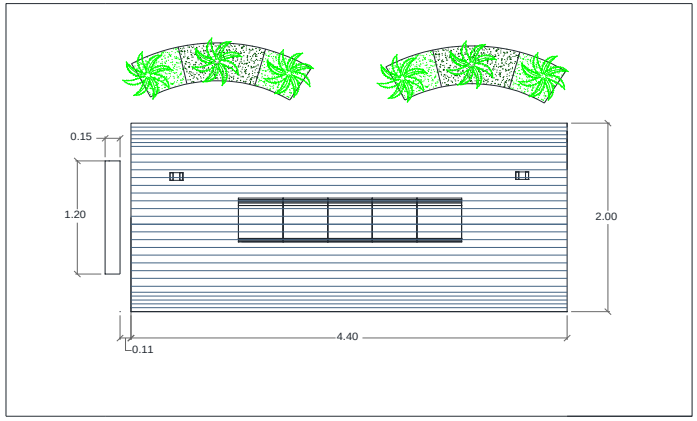


8. Bus Stop



FRONT ELEVATION

SIDE ELEVATION

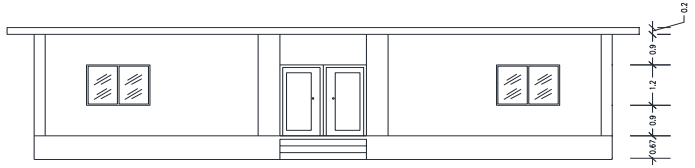


PLAN

INSTITUTE NAME	LAXMI INSTITUTE OF TECHNOLOGY, SARIGAM
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
DRAWING NAME	BUS STOP
GUIDED BY	PROF. AMIT R. CHAUHAN
PREPARED BY	PRINCE MEDIWALA (170860106008)
	URVIKA MUNOOR (170860106029)

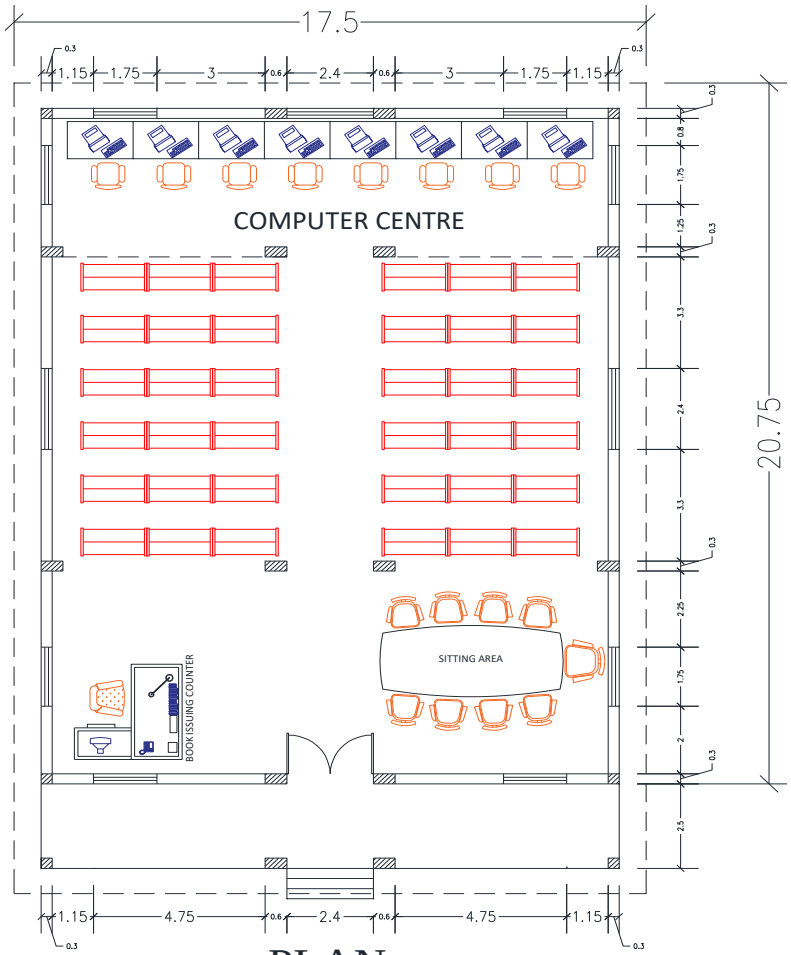

MANEKPUR BUS-STOP
BUS
TIMETABLE

9. Public Library

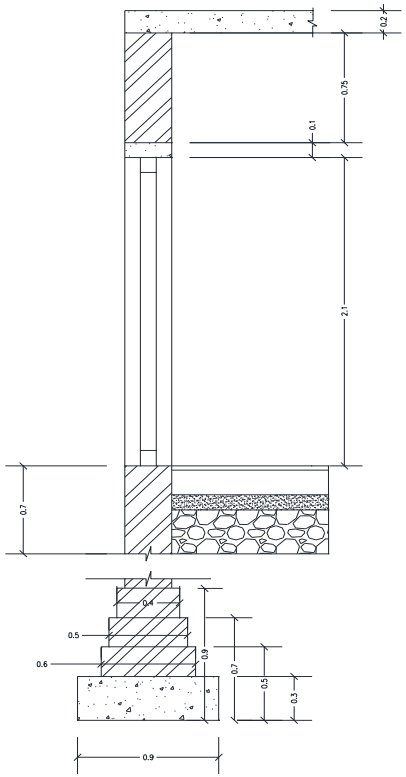


ELEVATION

SCHEDULE OF OPENINGS		
DOOR	D	2.4 X 2.1
WINDOW	W1	1.75 x 1.2
WINDOW	W2	2.4 x 1.2
ALL DIMENSIONS ARE IN M		



PLAN

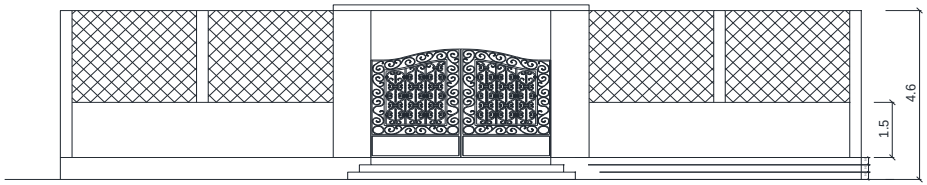


SECTION

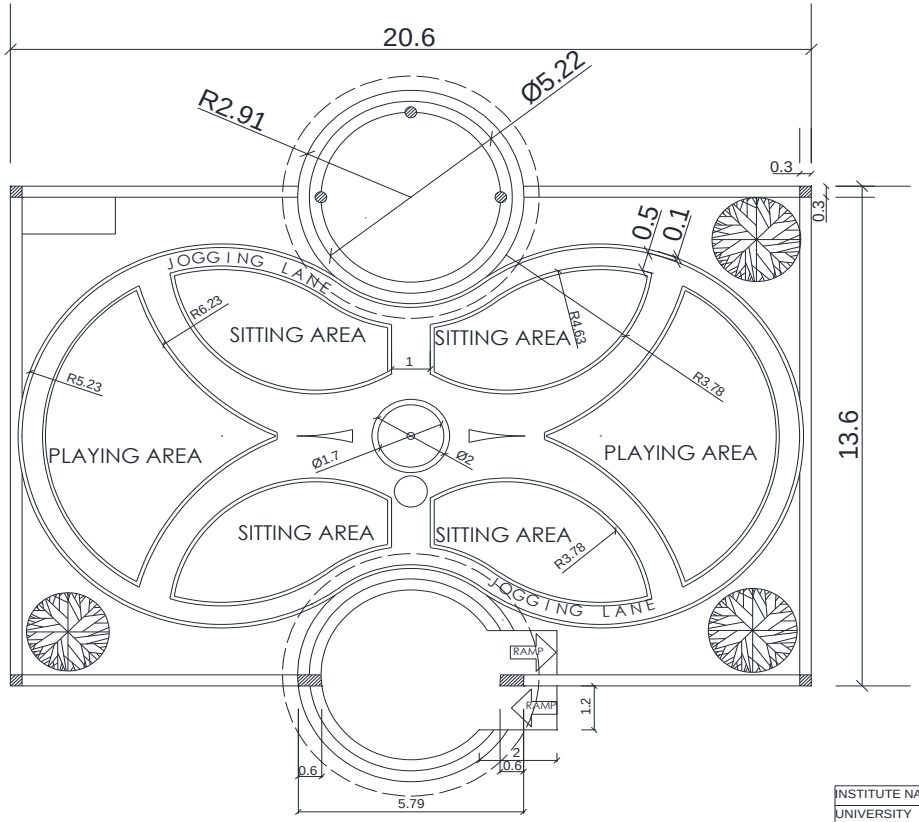
INSTITUTE NAME	LAXMI INSTITUTE OF TECHNOLOGY, SARIGAM
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
DRAWING NAME	PUBLIC LIBRARY - MANEKPUR
GUIDED BY	PROF. AMIT R. CHAUHAN
PREPARED BY	PRINCE MEDIWALA (170860106008)
	URVIKA MUNOOR (170860106029)


PUBLIC LIBRARY - MANEK

10. Public Garden

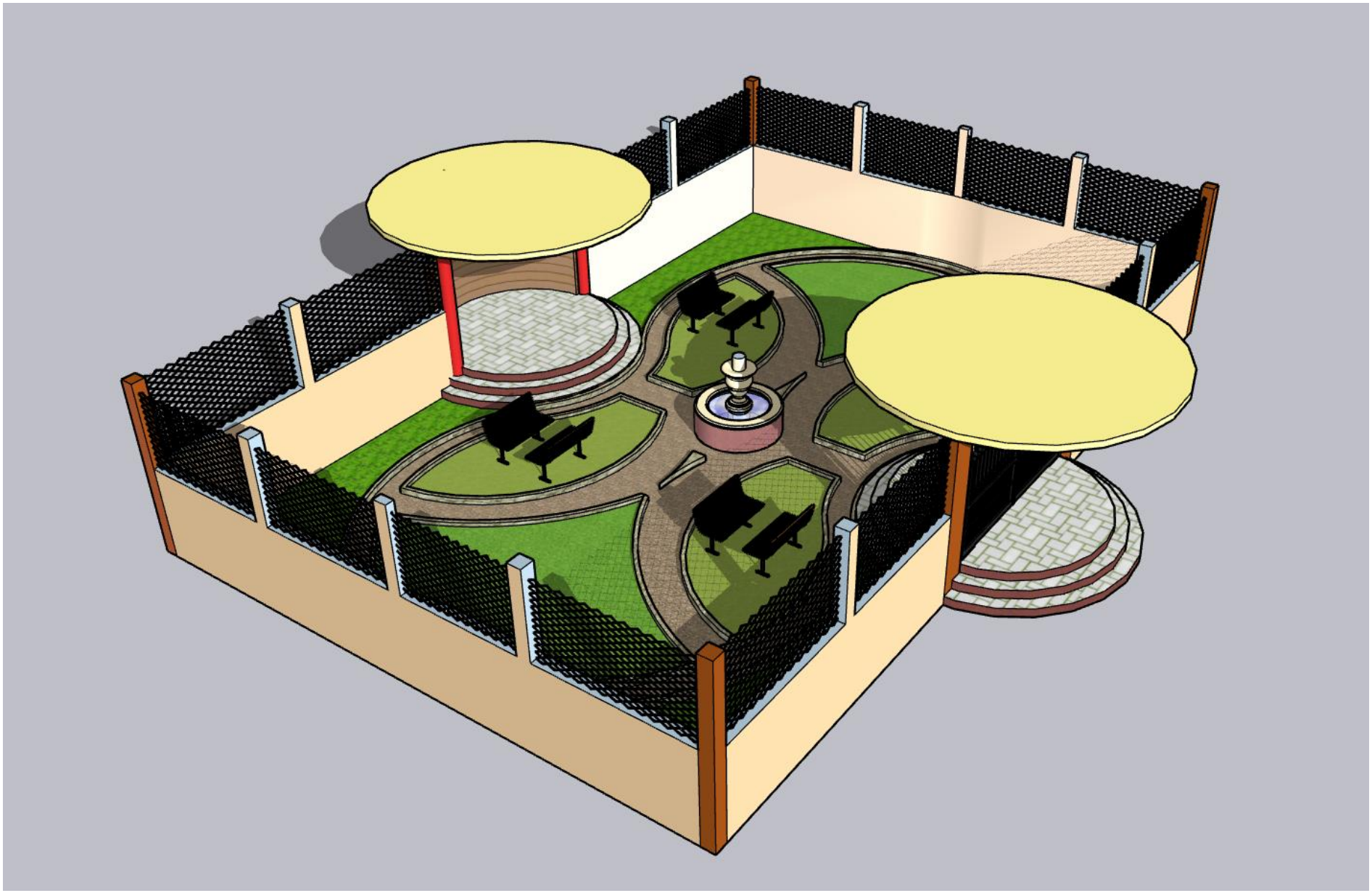


ELEVATION

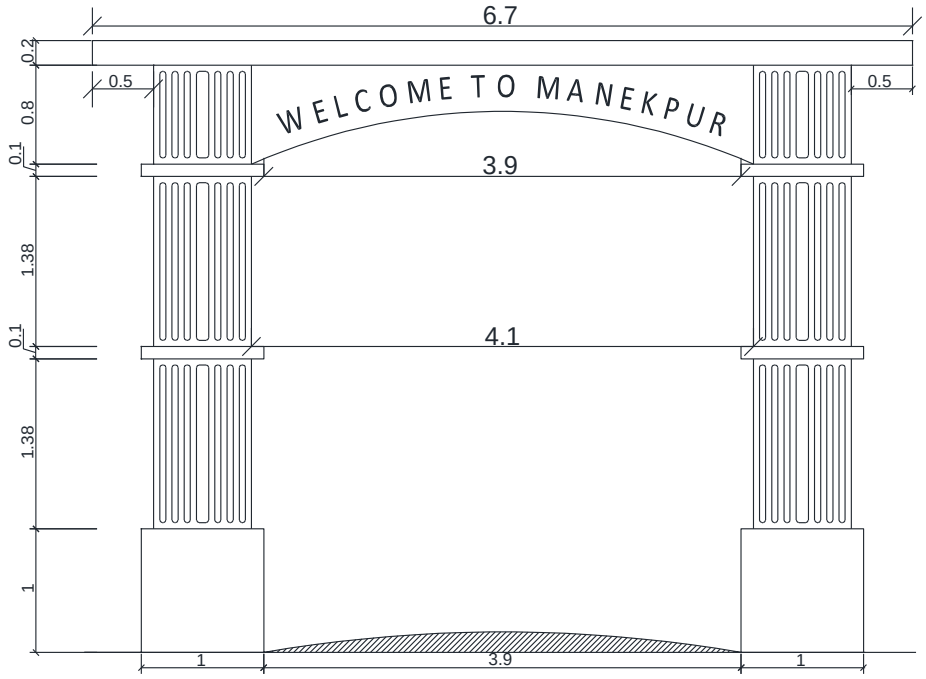


PLAN

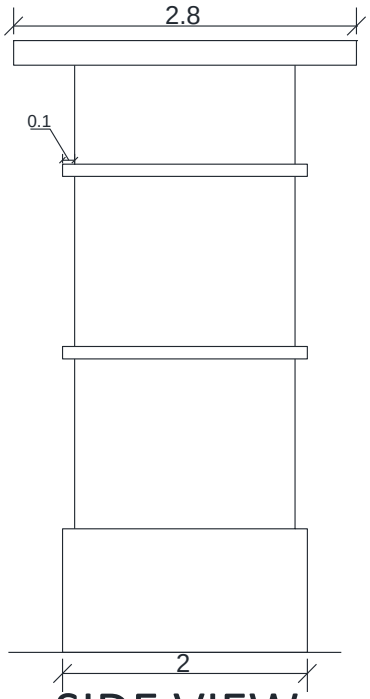
INSTITUTE NAME	LAXMI INSTITUTE OF TECHNOLOGY, SARIGAM
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
DRAWING NAME	PUBLIC GARDEN
GUIDED BY	PROF. AMIT R. CHAUHAN
PREPARED BY	PRINCE MEDIWALA (170860106008)
	URVIKA MUNOOR (170860106029)



11. Village Entrance Gate



ELEVATION

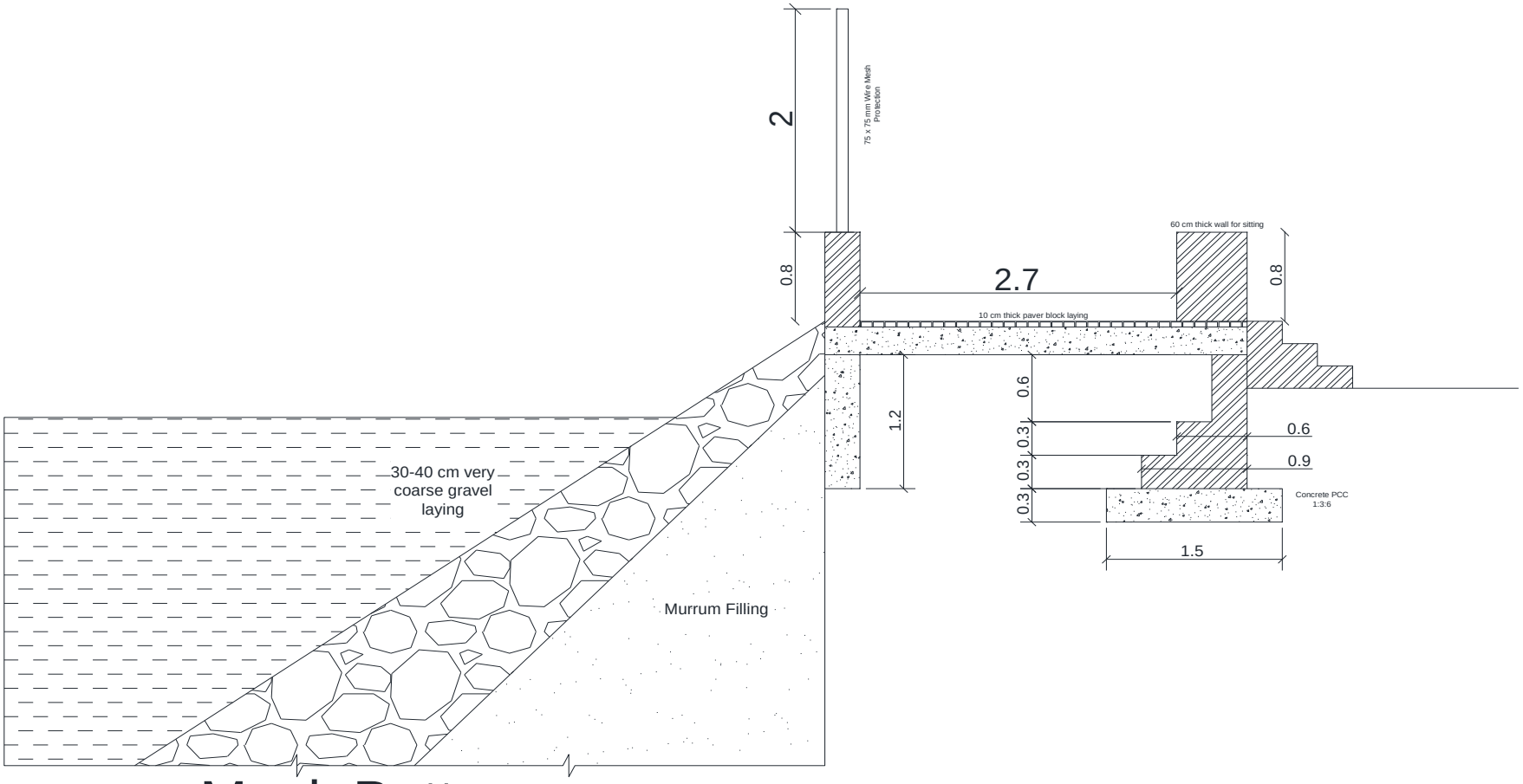


SIDE VIEW

INSTITUTE NAME	LAXMI INSTITUTE OF TECHNOLOGY, SARIGAM
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
DRAWING NAME	VILLAGE ENTRANCE GATE
GUIDED BY	PROF. AMIT R. CHAUHAN
PREPARED BY	PRINCE MEDIWALA (170860106008)
	URVIKA MUNOOR (170860106029)

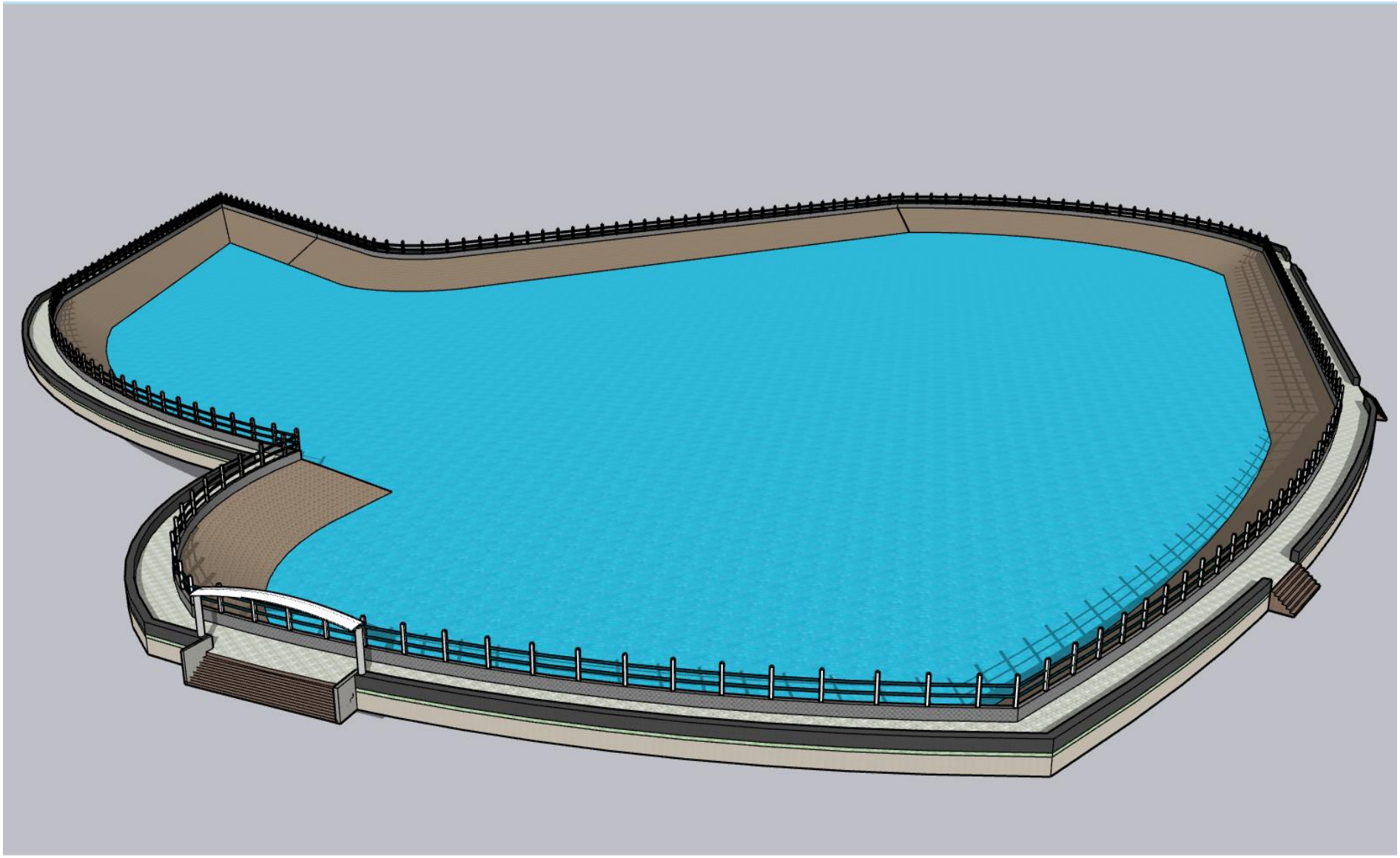

WELCOME TO MANEKPUR

12. Pond Recreation



CROSS-SECTIONAL VIEW OF POND

INSTITUTE NAME	LAXMI INSTITUTE OF TECHNOLOGY, SARIGAM
UNIVERSITY	GUJARAT TECHNOLOGICAL UNIVERSITY
DRAWING NAME	POND RECREATION
GUIDED BY	PROF. AMIT R. CHAUHAN
PREPARED BY	PRINCE MEDIWALA (170860106008)
	URVIKA MUNOOR (170860106029)



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

Allocated Village Photographs

Figure 57 High School

Figure 58 Primary School

Figure 59 Anganwadi

Figure 60 Temple

Figure 61 Village Pond

Figure 62 Village Farms

Figure 63 Primary Health Centre

Figure 64 Gram Panchayat - Manekpur

Figure 65 Nearby Check dam to Village

Figure 66 Veterinary Hospital

Figure 67 Village Interaction

Figure 68 Village Interaction

Figure 69 Village Interaction

Ideal Village Photographs

Figure 70 Interaction with Ideal Village's Sarpanch

Figure 71 Interaction with Ideal Village's Sarpanch

Figure 72 C. C. T. V. in Ideal Village

Figure 73 Approach Roads of Ideal Village

Figure 74 Market Area of Ideal Village

Figure 75 Bus stop of Ideal Village

Figure 76 School of Ideal Village

Figure 77 Agriculture at Ideal Village

Smart Village Photographs

Figure 78 Interaction at Smart Village

Figure 79 Interaction at Smart Village

12.8. Village Interaction with sarpanch report with the photograph

Figure 80 Village Interaction Report

In accordance with the guideline of **GTU Vishwakarma Yojana, Phase - VIII**, our college has also taken part in it, and so the interested student team have taken their nearby undeveloped village, because due to COVID-19 the village allocation was not done by GTU VY. Under this guideline we have taken **MANEKPUR** village as an allocated village and we presented our best efforts to implement the motto of VY which is "**AN APPROACH TOWARDS RURBANISATION**." The students' team of **Prince Mediwala** & **Urvika Munoor** presented the village development ideas of Manekpur village at Manekpur Panchayat office on **5th of September 2020** to **Mrs. Kundaben Davaria**, who is the sarpanch of Manekpur village. All the panchayat members along with her husband **Mr. Arjun Davaria** remained present to know how the development of Manekpur village is possible and to give their valuable feedback.

We presented our work under VY. We explained the core theme of VY, diverse benefits of village development and issues prevailing in villages. We explained various designs under,

Sustainable Design as	*Rainwater Harvesting Plant*
Physical Design as	*Public Toilet*
Social Design as	*Post Office*
Socio-Cultural Design as	*Community Hall*
Smart Design as	*Bank with ATM Facility*
Heritage Design as	*Gram Panchayat*

Manekpur village people shared various problems faced by them while designing, maintaining, and getting repaired of such a facility from the authorities and we gave various approaches and presented management techniques of such facilities with proposed design. The presentation was very much interactive and helpful to understand various amenities to be designed at village level for the overall development of the Manekpur village as Rurban town (Rural Soul + Urban Amenities).

Our team of VY thanked all the members of the village for their support during this work period and made them understand that the implementation of such facilities can build a better village and hence lead to build a strong nation.

For proposed design approvals, we went again to Manekpur panchayat on 10th December 2020, and we displayed our designs and took the signature with the stamp of sarpanch. The letter for such is listed in clause **12.9,** respectively.

12.9. Sarpanch Letter giving information about the village development

Date: 10/12/2020

VISHWAKARMA YOJANA PHASE: VIII

Village: Manekpur **District:** Valsad

SUBJECT: APPROVAL OF DESIGN PROPOSALS FOR MANEKPUR VILLAGE

To,
The Sarpanch,
Kundaben Davaria,
(Manekpur Village, Valsad District)

As per "Vishwakarma Yojana" guidelines, following student of **Laxmi Institute of Technology, Sarigam** have taken Manekpur as an allocated village to develop it under **Vishwakarma Yojana Phase VIII, Part I**. From the village visits and from the valuable information provided by you, we got to know about the lacking facilities in the **Manekpur** village. As a project outcome, we students have made some design of the structures which are essential for a village to update as an ideal village. We have also done the estimation and approximate costing of the proposed structures.

Kindly accept our design proposals. Be assured that this project is allocated by Government of Gujarat to the Gujarat Technological University, Chandkheda, Ahmedabad. So, we are proposing the design for the study purpose only.

Name	Enrolment No.	Mobile No.
Prince Mediwala	170860106008	9898499384
Urvika Munoor	170860106029	9514450142

Proposed designs for Manekpur Village

- Rainwater Harvesting Plant
- Public Toilet
- Post Office
- Community Hall
- Bank with ATM
- Gram Panchayat

Mr. Amit R. Chauhan,
Nodal Officer – Project,
Laxmi Institute of Technology, Sarigam, Valsad.

I, Sarpanch of Manekpur Village (Valsad district) undersigning the letter by accepting your proposed design for the development of village taken under "Vishwakarma Yojana".

Kundaben Davaria,
Sarpanch of Manekpur Village,
Valsad, Gujarat - 396170

Chapter 13. From the Chapter- 9, Future Designs of the Aspects

(Feasibility, Construction, Operation, and maintenance of various design options in Rural Areas along with cost with AutoCAD designs / planning with Sketchup)

13.1. Design Proposals

13.1.1. Civil Design 1 – Drainage

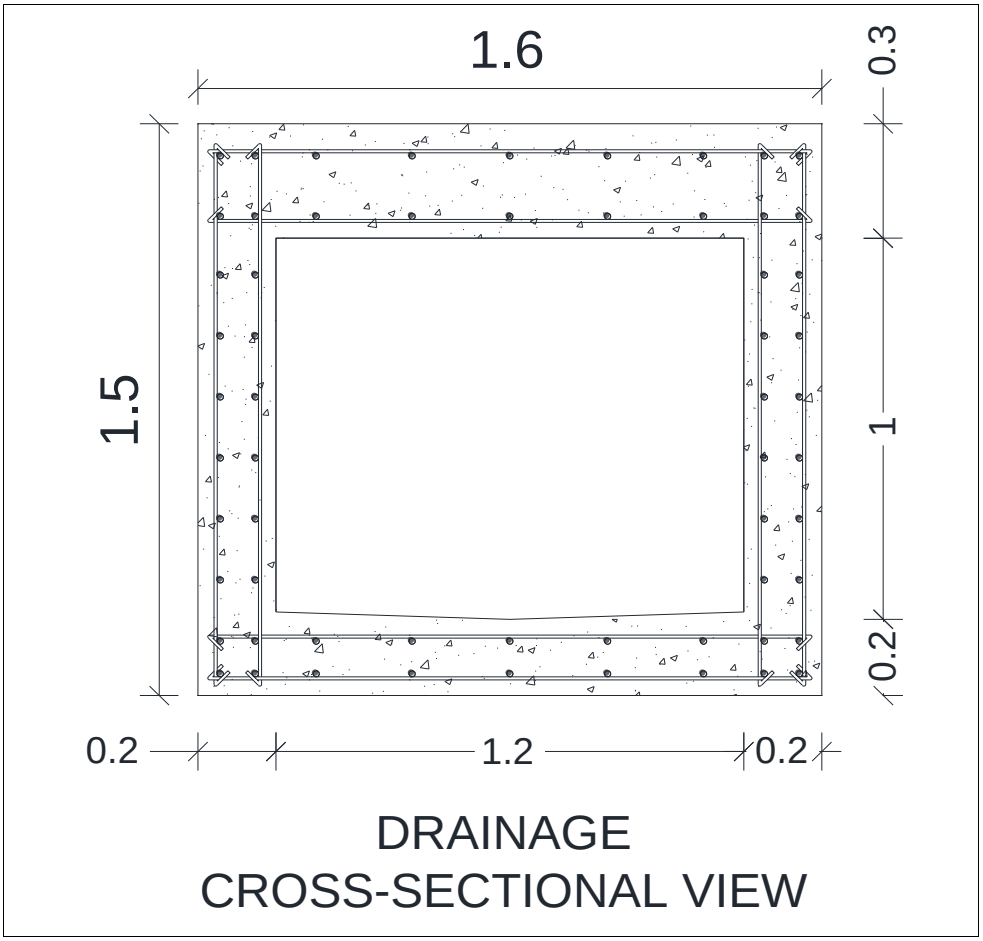


Figure 81 Plan of Cross-Sectional View of Drainage

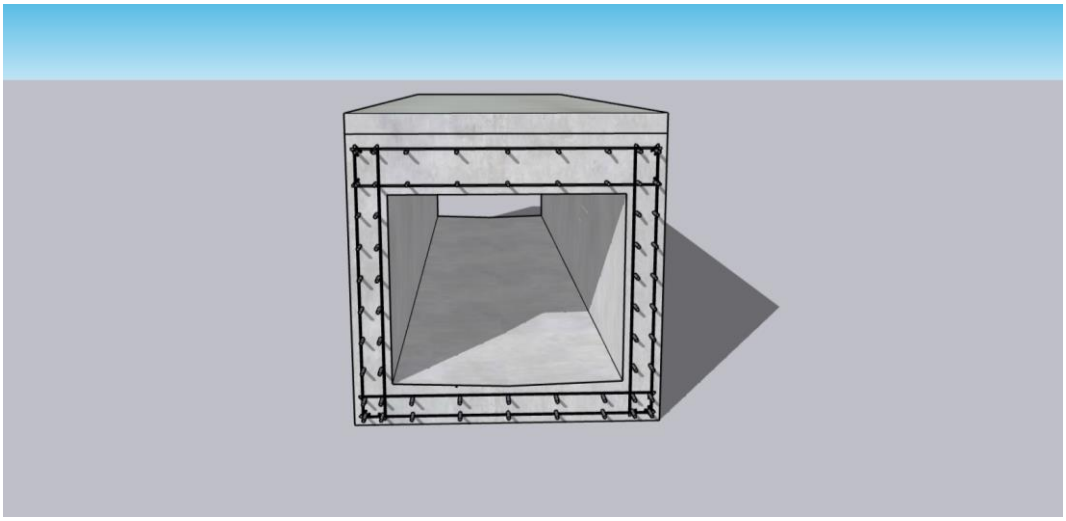


Figure 82 Drainage (Sketchup)

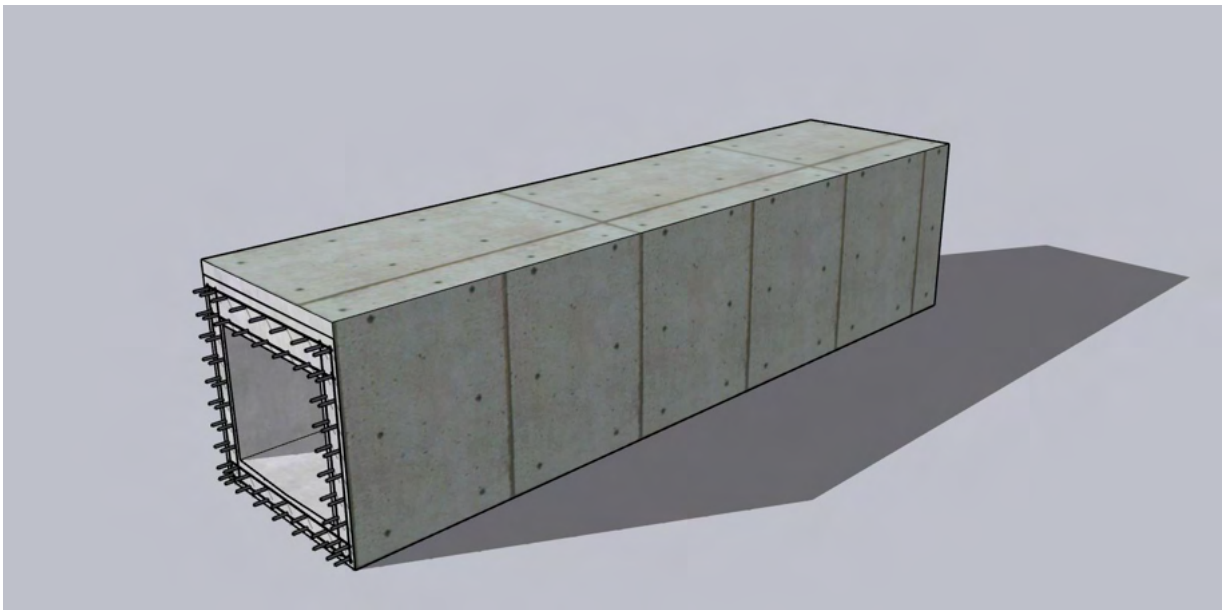


Figure 83 Iso-view of Drainage (Sketchup)

MEASUREMENT FOR DRAINAGE

Item No.	Description	No.	Length	Breadth	Height	Quantity	
1	**Earthwork in Excavation in Foundation**						
		1	1	1.6	1.6	2.56	
					NET TOTAL	**2.56**	**m³**
2	**Providing & Laying RCC Elements**						
	Vertical Sides	2	1	0.2	1.5	0.60	
	Base Slab	1	1	1.6	0.2	0.32	
	Top Slab	1	1	1.6	0.3	0.48	
					NET TOTAL	**1.40**	**cm³**

3	Providing M.S. Reinforcement (7.85 g/cm³)												
Sr. No.	Description	Nos.	Length	Breadth	Height	Ast reqd.	Ast on each face	Ast prov.	Detailing	No. of Bars	Weight(kg)	Price/kg	Total Cost of R/F
1	Vertical Side	2	1000	200	1500	450.00	225.00	245.17	8 ϕ @ 205 c/c	14.00	5.53	48	265.44
2	Top Side	1	1000	1600	300	720.00	360.00	409.01	10 ϕ @ 192 c/c	16.00	9.92	54	535.68
3	Bottom Side	1	1000	1600	200	480.00	240.00	243.98	8 ϕ @ 206 c/c	14.00	5.53	48	265.44
4	Dist. Steel (H)	1	1000	1600	200	384.00	192.00	176.37	8 ϕ @ 285 c/c	20.00	7.90	48	379.2
5	Dist. Steel (V)	1	1000	200	1500	360.00	180.00	176.37	8 ϕ @ 285 c/c	20.00	7.90	48	379.2
									NET TOTAL	**84.00**	**36.78**	**246.00**	**1824.96**

MEASUREMENT FOR DRAINAGE

Item No.	Description	No.	Length	Breadth	Height	Quantity	
1	**Earthwork in Excavation in Foundation**						
		1	1	1.6	1.6	2.56	
					NET TOTAL	**2.56**	**m³**
2	**Providing & Laying RCC Elements**						
	Vertical Sides	2	1	0.2	1.5	0.60	
	Base Slab	1	1	1.6	0.2	0.32	
	Top Slab	1	1	1.6	0.3	0.48	
					NET TOTAL	**1.40**	**cm³**

ABSTRACT SHEET FOR DRAINAGE

Sr No.	Description	Quantity	Rate	Per	Amount

1	Earthwork in Excavation in Foundation	2.56	₹ 252.30	m^3	**₹ 645.89**
2	Providing & Laying RCC Elements	1.40	₹ 9,763.80	m^3	**₹ 13,669.32**
3	Providing M.S. Reinforcement (7.85 g/cm^3)				**₹ 1,824.96**
	TOTAL ESTIMATED CONSTRUCTION COST of DRAINAGE per metre				**₹ 16,140.17**

13.1.2. Civil Design 2 – Bus-stop

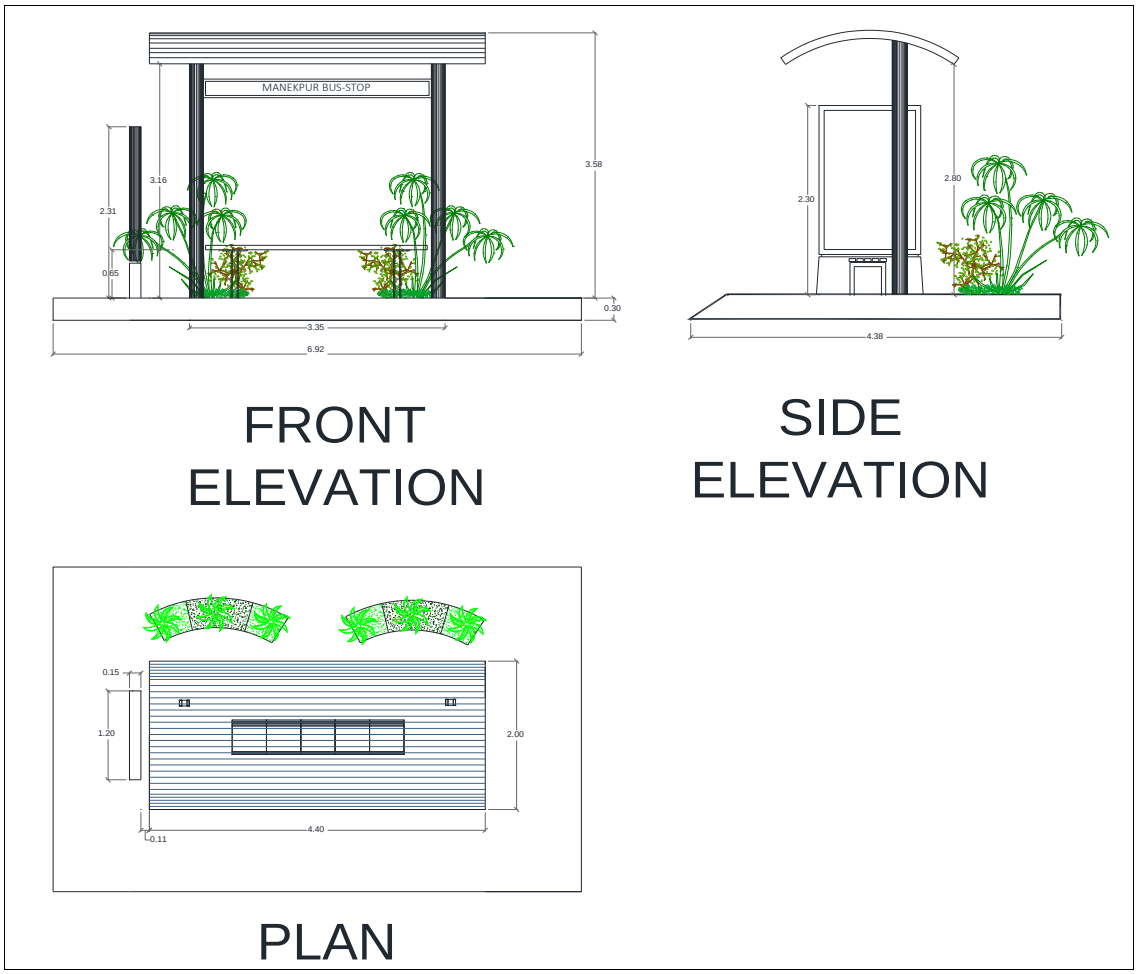


Figure 84 Plan of Bus Stop

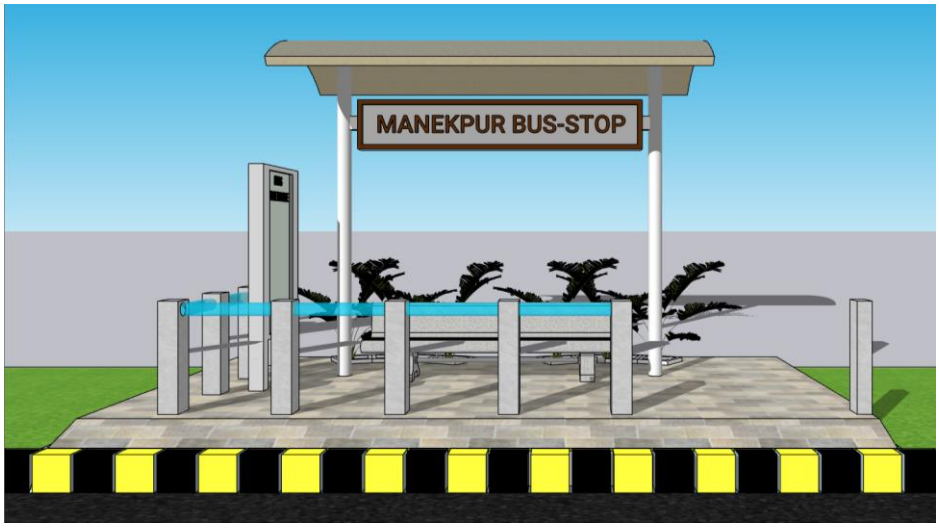


Figure 85 Bus Stop (Sketchup)

Figure 86 Iso-view of Bus Stop (Sketchup)

MEASUREMENT FOR BUS STOP

Item No.	Description	No.	Length	Breadth	Height	Quantity	
1	**Earthwork in Excavation in Foundation**						
	For Columns	2	0.3	0.3	0.6	0.11	
	For Base	1	6.92	4.38	0.3	9.09	
					NET TOTAL	**9.20**	**m³**
2	**P.C.C in foundation**						
	For Base	1	6.92	4.38	0.3	9.09	
					NET TOTAL	**9.09**	**m³**
3	**Brickwork in Plinth**						
	For Base	1	6.92	4.38	0.3	9.09	
					NET TOTAL	**9.09**	**m³**
4	**Damp Proof Course (2.5 cm thick)**						
	For Base	1	6.92	4.38	-	30.31	
					NET TOTAL	**30.31**	**m²**
5	**2cm Thick Marble Floor**						
	For Base	1	6.92	4.38	-	30.31	
	For Skirting - LS	2	6.92	0.3	-	4.15	
	For Skirting - SS	2	4.38	0.3	-	2.63	
					NET TOTAL	**37.09**	**m²**
6	**Providing & Laying Steel Elements**						
	For Curved Shed	1	2.49	-	4.4	10.96	
	For Name Board	1	3	-	0.25	0.75	
					NET TOTAL	**11.71**	**m²**

ABSTRACT SHEET FOR BUS STOP

Sr No.	Description	Quantity	Rate	Per	Amount
1	Earthwork in Excavation in Foundation	9.20	₹ 252.30	m³	**₹ 2,321.38**
2	P.C.C in Foundation (1:3:6)	9.09	₹ 6,126.25	m³	**₹ 55,705.26**
3	Brickwork in Foundation	9.09	₹ 6,376.25	m³	**₹ 57,978.48**

4	Damp Proof Course (2.5 cm thick)	30.31	₹ 347.90	m^2	**₹ 10,544.71**
5	2cm Thick Marble Floor (Udaipur green marble)	37.09	₹ 1,991.50	m^2	**₹ 73,863.94**
6	Providing & Laying Steel Elements				
	MS Plates for Naming (2mm thick)	8.07	₹ 200.00	ft^2	**₹ 1,614.59**
	MS Roofing Sheets	10.96	₹ 450.00	m^2	**₹ 4,930.20**
	Hollow Tubes Gal. 32 mm dia.	4.00	₹ 314.95	m	**₹ 1,259.80**
7	Cost of Cement Bench	1.00	₹ 8,000.00	Nos.	**₹ 8,000.00**
	TOTAL ESTIMATED CONSTRUCTION COST of BUS STOP				**₹ 2,06,958.55**

13.1.3. Civil Design 3 – Public Library

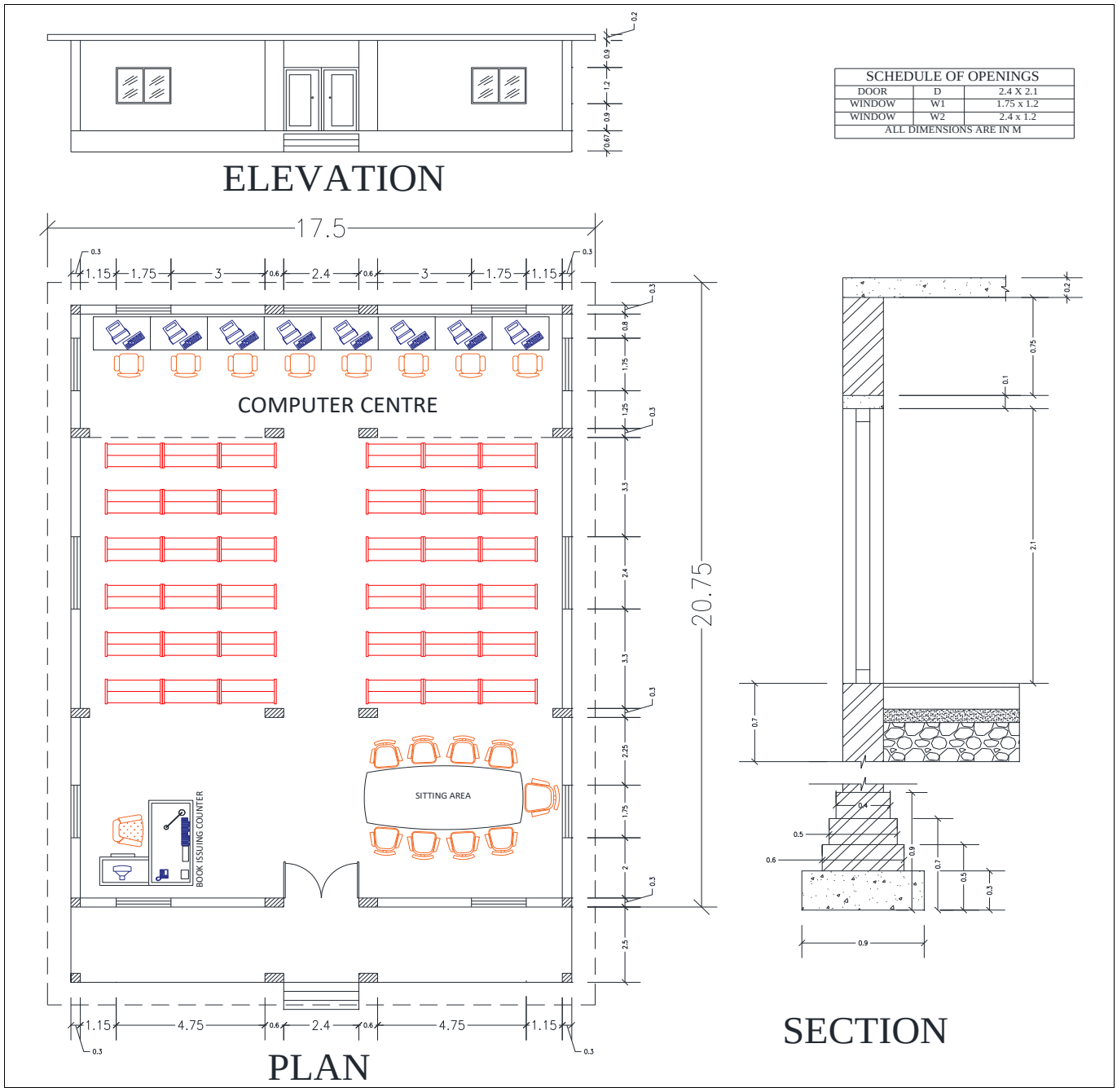


Figure 87 Plan of Public Library

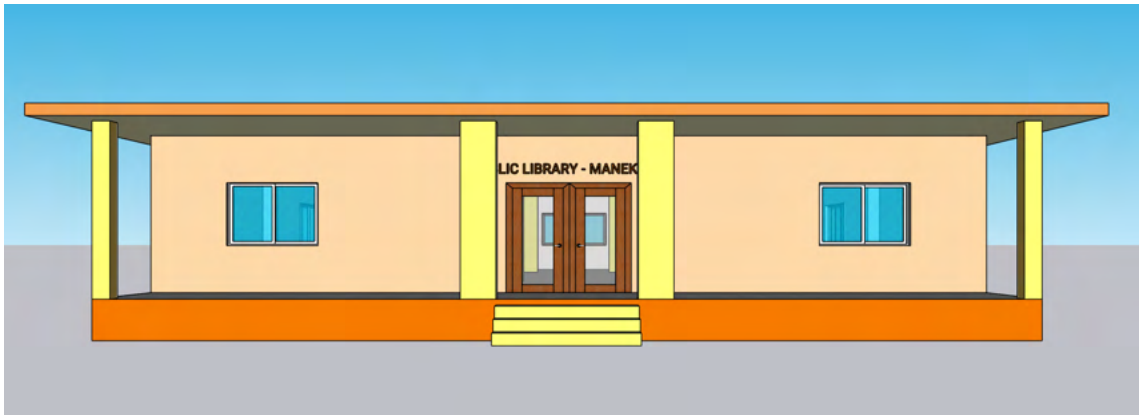


Figure 88 Public Library (Sketchup)

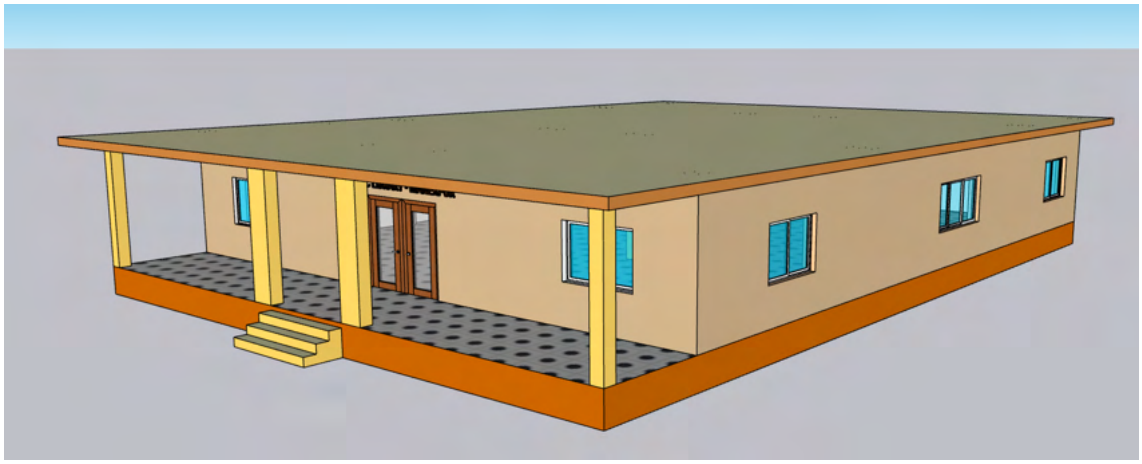


Figure 89 Iso-view of Public Library (Sketchup)

MEASUREMENT FOR PUBLIC LIBRARY

Item No.	Description	No.	Length	Breadth	Height	Quantity	
1	**Earthwork in Excavation in Foundation**						
	Net C.L. length						
	L = 2(15.7+19.7)						
	= 70.8 m	1	70.8	0.9	0.9	57.35	
					NET TOTAL	**57.35**	m^3
2	**Lime Concrete in Foundation**						
	Net C.L. length	1	70.8	0.9	0.3	19.12	
	L = 2(15.7+19.7)						
	= 70.8 m						
					NET TOTAL	**19.12**	**m^3**
3	**Brickwork in Foundation**						
	Up to plinth level						
	1st	1	70.80	0.6	0.2	8.50	
	2nd	1	70.80	0.5	0.2	7.08	
	3rd	1	70.80	0.4	0.2	5.66	
	plinth wall	1	70.80	0.3	0.7	14.87	
	STEPS						
	1st	1	2.40	0.9	0.15	0.32	
	2nd	1	2.40	0.6	0.15	0.22	

	3rd	1	2.40	0.3	0.15	0.11	
					NET TOTAL	**36.76**	**m³**
4	**Damp Proof Course (2.5 cm thick)**						
	Net C.L. length	1	70.8	0.3	-	21.24	
	L = 2(15.7+19.7)						
	= 70.8 m						
					NET TOTAL	**21.24**	**m²**
5	**Brick Masonry in Super Structure**						
	Net C.L. length						
	L = 2(15.7+19.7) = 70.8 m	1	70.8	0.3	3.15	66.91	
	DEDUCTIONS						
	D	1	2.4	0.3	2.1	1.51	
	W1	8	1.75	0.3	1.2	5.04	
	W2	3	1.2	0.3	1.2	1.30	
	VERNADAH	1	2.5	0.3	3.15	3.45	
					NET TOTAL	**55.61**	**m³**
6	**Plaster Work**						
	Internal Plaster						
	(a.) CEILING	1	15.4	19.4	-	298.76	
	(b.) WALLS	2	15.4	-	3.15	97.02	
		2	19.4	-	3.15	122.22	
	DEDUCTIONS						
	D	1	2.4	-	2.1	5.04	
	W1	8	1.75	-	1.2	16.80	
	W2	3	1.2	-	1.2	4.32	
					NET TOTAL	**491.84**	**m²**
7	**Providing & Laying RCC Elements**						
	MAIN SLAB	1	15.4	19.4	0.1	29.88	
	COLUMNS	8	0.6	0.3	3.15	4.54	
					NET TOTAL	**34.41**	**m³**
8	**Providing M.S. Reinforcement (7.85 g/cm³)**						
	1% Volume of Concrete	1				2706.16	
					NET TOTAL	**2706.16**	**kg**

ABSTRACT SHEET FOR PUBLIC LIBRARY

Sr No.	Description	Quantity	Rate	Per	Amount
1	Earthwork in Excavation in Foundation	57.35	₹ 252.30	m³	**₹ 14,469.41**
2	Lime Concrete in Foundation (1:3:6)	19.12	₹ 6,126.25	m³	**₹ 1,17,133.90**
3	Brickwork in Foundation	36.76	₹ 6,376.25	m³	**₹ 2,34,390.95**
4	Damp Proof Course (2.5 cm thick)	21.24	₹ 347.90	m²	**₹ 7,389.40**
5	Brick Masonry in Super Structure	55.61	₹ 7,722.65	m³	**₹ 4,29,456.57**
6	Plaster Work	491.84	₹ 365.25	m²	**₹ 1,79,644.56**
7	Providing & Laying RCC Elements	34.41	₹ 9,763.80	m³	**₹ 3,35,972.36**

8	Providing M.S. Reinforcement (7.85 g/cm³)	2706.16	₹ 86.05	kg	**₹ 2,32,865.07**
	TOTAL ESTIMATED CONSTRUCTION COST of PUBLIC LIBRARY				**₹ 15,51,322.20**

13.1.4. Civil Design 4 – Public Garden

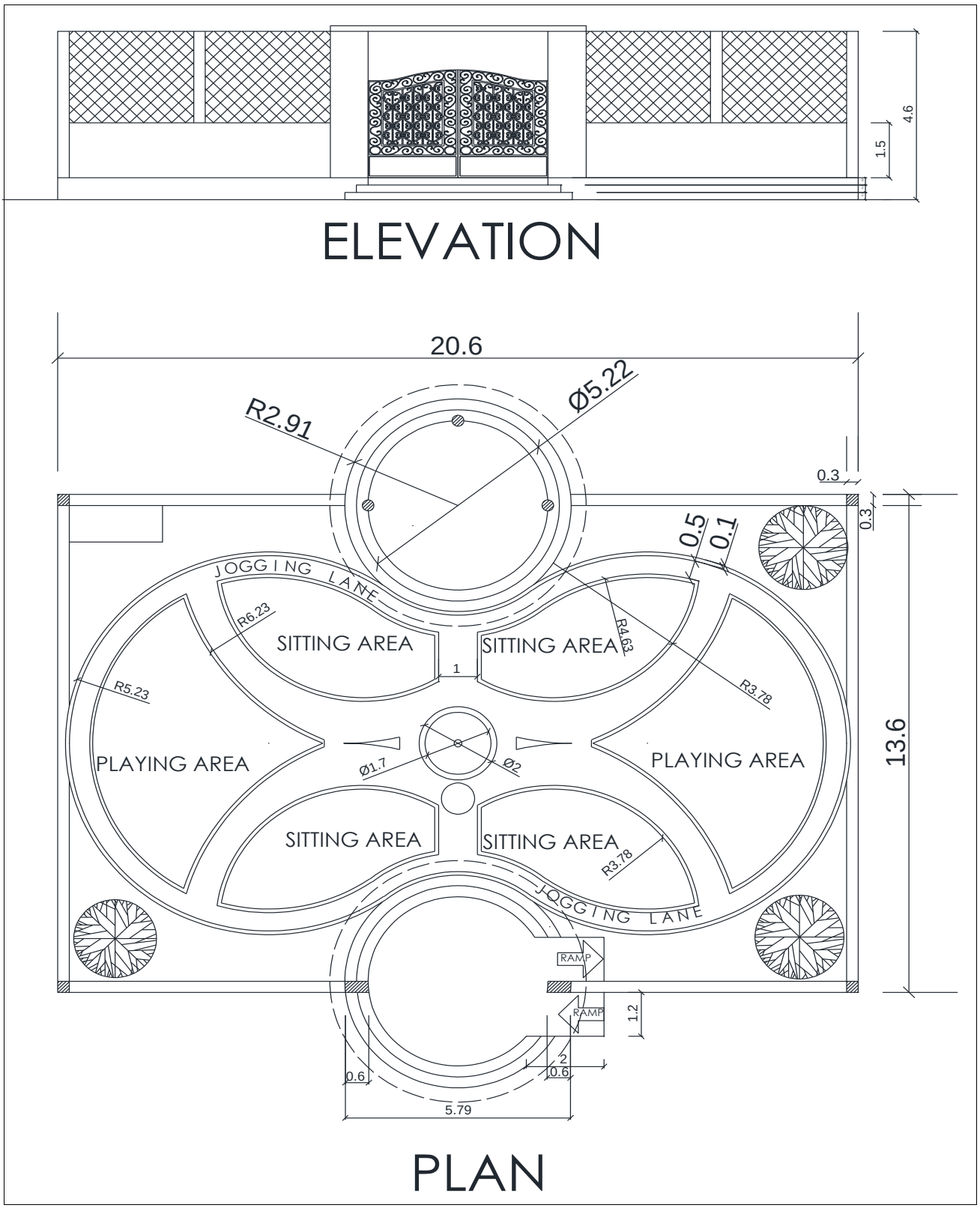


Figure 90 Plan of Public Garden

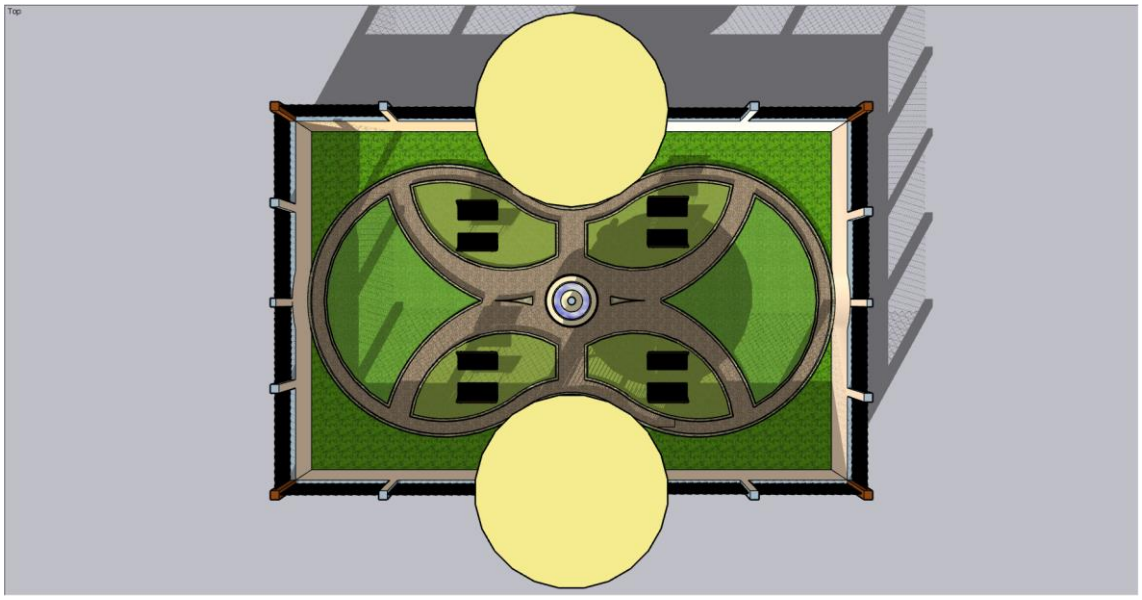


Figure 91 Public Garden (Sketchup)

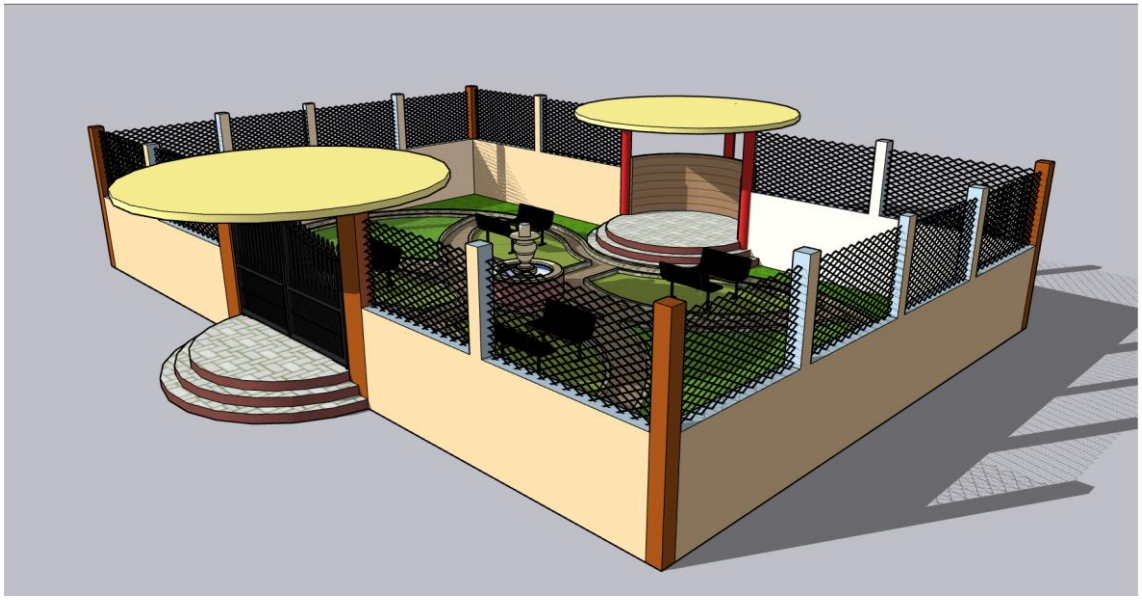


Figure 92 Iso-view of Public Garden (Sketchup)

MEASUREMENT FOR PUBLIC GARDEN

Item No.	Description		No.	Length	Breadth	Height	Quantity	
1	**Earthwork in Excavation in Foundation**							
	LW	20.9	2	20.9	0.6	1	25.08	
	LW	13.6	2	13.6	0.6	1	16.32	
						NET TOTAL	**41.40**	**m³**
2	**P.C.C in foundation**							
	LW		2	20.9	0.6	0.3	7.52	
	SW		2	13	0.6	0.3	4.68	
						NET TOTAL	**12.20**	**m³**
3	**Brickwork in Foundation up to Plinth**							
	LW		2	20.6	0.3	0.7	8.65	
	SW		2	13	0.3	0.7	5.46	
						NET TOTAL	**14.11**	**m³**

4	**Damp Proof Course (2.5 cm thick)**							
	LW		2	20.6	0.3	-	12.36	
	SW		2	4.8	0.3	-	2.88	
						NET TOTAL	**15.24**	**m²**
5	**Brick work in super structure**							
	LW		2	20.6	0.3	2.1	25.96	
	SW		1	13	0.3	2.1	8.19	
	SW		2	6.64	0.3	2.1	8.37	
	BRICK STEPS							
		1st	2	d = 5.82	a = 26.60	0.2	10.64	
		2nd	2	d = 5.22	a = 21.40	0.2	8.56	
		3rd	2	d = 4.62	a = 16.76	0.2	6.70	
	DEDUCTIONS							
		Openings	2	4.62	0.3	2.1	5.82	
						NET TOTAL	**62.60**	**m³**
6	**2cm Thick Marble Floor**							
	Opening		2	r = 5.82	a = 26.60	-	53.20	
						NET TOTAL	**53.20**	**m²**
7	**Providing & Laying RCC Elements**							
	Curved Slabs		2	r = 6.6	a = 34.22	0.15	10.27	
	Columns							
		C1	4	0.3	0.3	5	1.80	
		C2	2	0.6	0.3	5	1.80	
		C3	3	r = 0.3	a = 0.071	5	1.06	
						NET TOTAL	**14.93**	**m³**
8	**Providing M.S. Reinforcement (7.85 g/cm³)**							
	1% Volume of Concrete		1				1173.80	
						NET TOTAL	**1173.80**	**kg**
9	**Artificial Grass Laying**							
	Area		1	13	20	-	260.00	
	DEDUCTIONS							
		Fountain	1	r = 2	a = 3.14	-	3.14	
		Walking area	1	-	a = 64.11	-	64.11	
						NET TOTAL	**192.75**	**m²**

ABSTRACT SHEET FOR PUBLIC GARDEN

Sr No.	Description	Quantity	Rate	Per	Amount
1	Earthwork in Excavation in Foundation	41.40	₹ 252.30	m³	**₹ 10,445.22**
2	P.C.C in Foundation (1:3:6)	12.20	₹ 6,126.25	m³	**₹ 74,764.76**
3	Brickwork in Foundation	14.11	₹ 6,376.25	m³	**₹ 89,981.64**
4	Damp Proof Course (2.5 cm thick)	15.24	₹ 347.90	m²	**₹ 5,302.00**
5	Brick Masonry in Super Structure	62.60	₹ 7,722.65	m³	**₹ 4,83,400.82**
6	2cm Thick Marble Floor (Udaipur green marble)	53.20	₹ 1,991.50	m²	**₹ 1,05,947.80**
7	Providing & Laying RCC Elements	14.93	₹ 9,763.80	m³	**₹ 1,45,736.43**
8	Providing M.S. Reinforcement (7.85 g/cm³)	1173.80	₹ 86.05	kg	**₹ 1,01,005.18**

9	Artificial Grass Laying	192.75	₹ 950.00	m²	**₹ 1,83,110.99**
10	Paver Block Laying	64.11	₹ 635.00	m²	**₹ 40,709.85**
11	Fountain	1.00	₹ 15,000.00	m²	**₹ 15,000.00**
12	Bench	8.00	₹ 3,800.00	m²	**₹ 30,400.00**
	TOTAL ESTIMATED CONSTRUCTION COST of PUBLIC GARDEN				**₹ 12,85,804.68**

13.1.5. Civil Design 5 – Village Entrance Gate

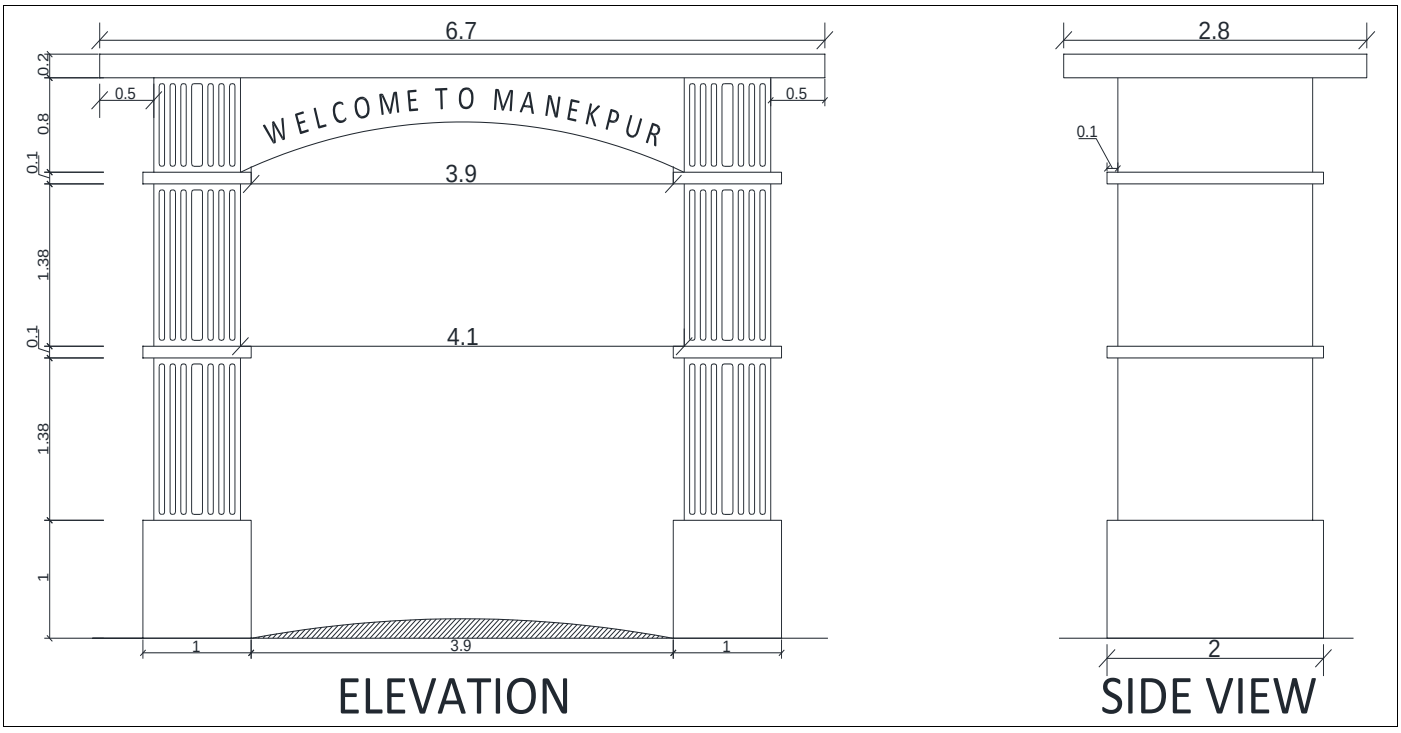


Figure 93 Plan of Village Entrance Gate

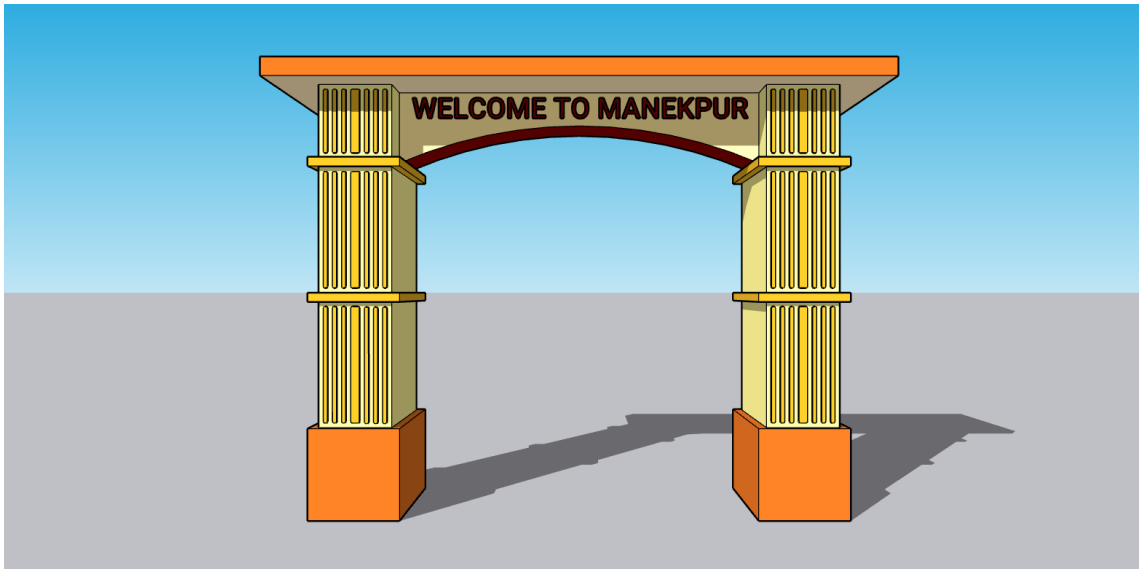


Figure 94 Village Entrance Gate (Sketchup)

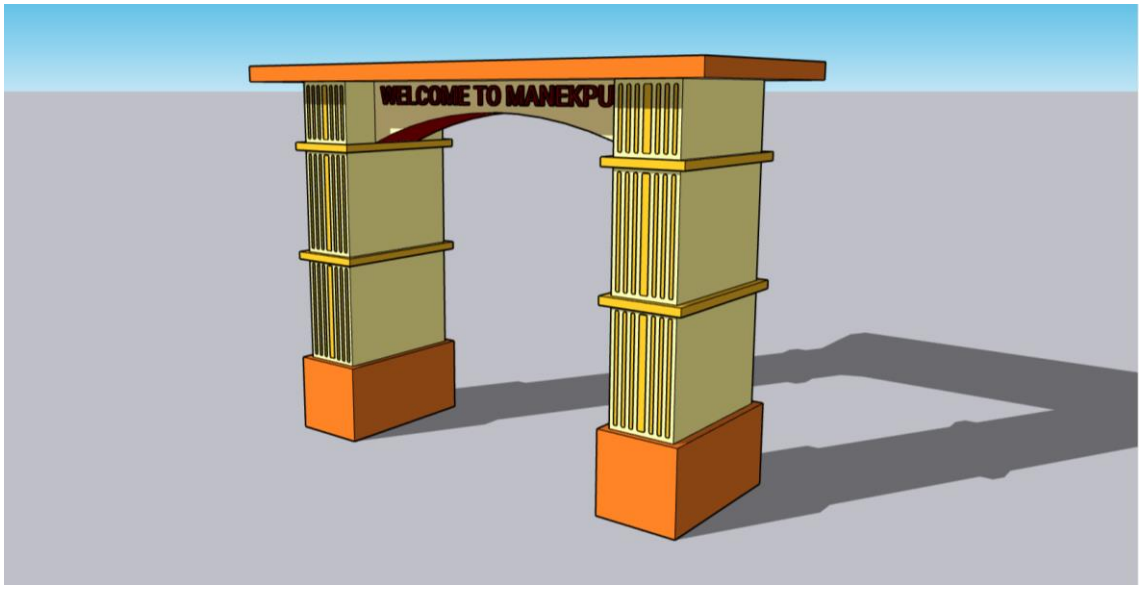


Figure 95 Iso-view of Village Entrance Gate (Sketchup)

MEASUREMENT FOR VILLAGE ENTRANCE GATE

Item No.	Description	No.	Length	Breadth	Height	Quantity	
1	**Earthwork in Excavation in Foundation**						
	For Columns	2	1	2	1.3	5.20	
					NET TOTAL	**5.20**	**m³**
2	**P.C.C in foundation**						
	For Columns	2	1	2	0.3	1.20	
					NET TOTAL	**1.20**	**m³**
3	**Brickwork in Foundation upto Plinth**						
	For Columns	2	1	2	1	4.00	
					NET TOTAL	**4.00**	**m³**
4	**Damp Proof Course (2.5 cm thick)**						
	For Columns	2	1	2	-	4.00	
					NET TOTAL	**4.00**	**m²**
5	**Brick work in Super Structure**						
	For Columns	2	1	2	4.76	19.04	
					NET TOTAL	**19.04**	**m³**
6	**Providing & Laying RCC Elements**						
	For Main Slab	1	6.7	2.8	0.2	3.75	
	For Curved Portion	1	4.1	0.8	0.8	2.62	
	DEDUCTIONS						
	For Curved Portion $\left(\frac{\theta}{360} * \pi - \frac{\sin\theta}{2}\right) r^2$	1	θ = 46.7	r = 5.17	0.8	0.93	
					NET TOTAL	**5.45**	**m³**
7	**Providing M.S. Reinforcement (7.85 g/cm³)**						
	1% Volume of Concrete	1				427.89	
					NET TOTAL	**427.89**	**kg**
8	**Plaster**						
	Longer side	4	1	-	4.76	19.04	

	Shorter Side	4	2	-	4.76	38.08	
	DEDUCTIONS						
	For Curved Portion	2	0.8	-	0.8	1.28	
					NET TOTAL	**55.84**	**m²**

ABSTRACT SHEET FOR VILLAGE ENTRANCE GATE

Sr No.	Description	Quantity	Rate	Per	Amount
1	Earthwork in Excavation in Foundation	5.20	₹ 252.30	m^3	**₹ 1,311.96**
2	P.C.C in Foundation (1:3:6)	1.20	₹ 6,126.25	m^3	**₹ 7,351.50**
3	Brickwork in Foundation	4.00	₹ 6,376.25	m^3	**₹ 25,505.00**
4	Damp Proof Course (2.5 cm thick)	4.00	₹ 347.90	m^2	**₹ 1,391.60**
5	Brick Masonry in Super Structure	19.04	₹ 7,722.65	m^3	**₹ 1,47,039.26**
6	Providing & Laying RCC Elements	5.45	₹ 9,763.80	m^3	**₹ 53,193.18**
7	Providing M.S. Reinforcement (7.85 g/cm³)	427.89	₹ 86.05	kg	**₹ 36,819.58**
8	Plaster Work	55.84	₹ 365.25	m^2	**₹ 20,395.56**
	TOTAL ESTIMATED CONSTRUCTION COST of VILLAGE ENTRANCE GATE				**₹ 2,93,007.64**

13.1.6. Civil Design 6 – Pond Refurbishment

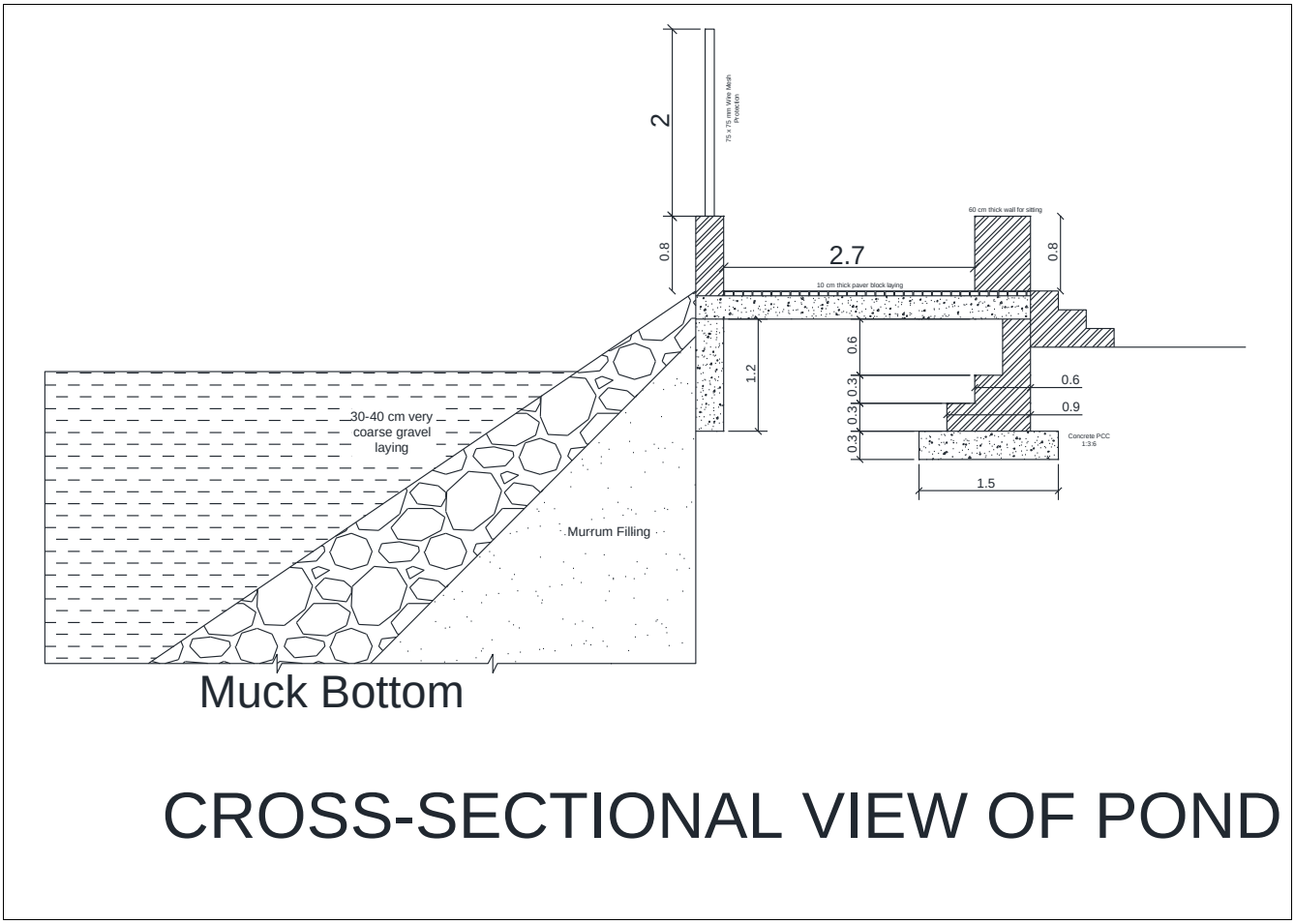


Figure 96 Plan of Cross-Sectional View of Pond

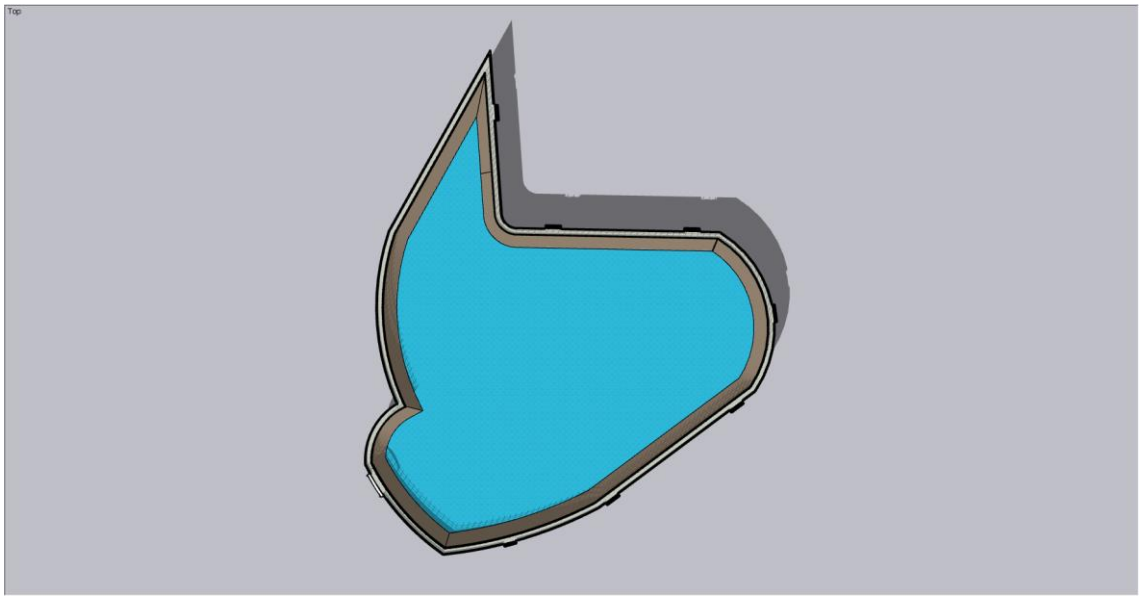


Figure 97 Pond Recreation (Sketchup)

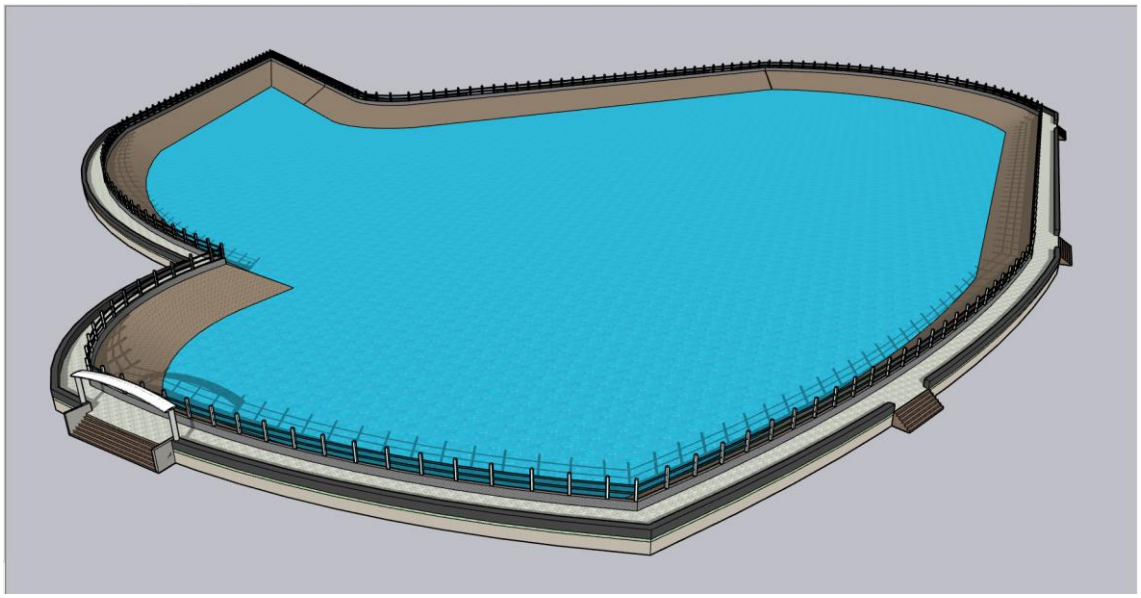


Figure 98 Iso-view of Pond Recreation (Sketchup)

PERIMETER OF POND	***712.62***	***m***
AREA OF POND	***24840.89***	***m²***

MEASUREMENT FOR POND RECREATION

Item No.	Description	No.	Length	Breadth	Height	Quantity	
1	**Earthwork in Excavation in Foundation**						
	PERIMETER	1	712.62	3.8	1.5	4061.93	
					NET TOTAL	**4061.93**	**m³**
2	**P.C.C in foundation**						
	PERIMETER	1	712.62	1.5	0.3	320.68	
					NET TOTAL	**320.68**	**m³**
3	**Brickwork in Foundation up to Plinth**						

	PERIMETER	1	712.62	0.9	0.3	192.41	
	PERIMETER	1	712.62	0.6	0.3	128.27	
	PERIMETER	1	712.62	0.3	0.6	128.27	
					NET TOTAL	**448.95**	**m³**
4	**Brick work in super structure**						
	PERIMETER OUTSIDE	2	712.62	0.3	0.8	342.06	
	PERIMETER INSIDE	2	682.62	0.6	0.8	655.32	
	STAIRS 1st	8	8	0.9	0.6	34.56	
	STAIRS 2nd	8	8	0.6	0.4	15.36	
	STAIRS 3rd	8	8	0.3	0.2	3.84	
	DEDUCTIONS						
	STAIRS	8	8	0.6	0.8	30.72	
					NET TOTAL	**1020.41**	**m³**
5	**Earth Filling in Plinth**						
	Sloped Area	1	682.62	a =	4	2730.48	
					NET TOTAL	**2730.48**	**m³**
6	**Paver Flooring**						
	Main area	1	712.62	2.7	-	1924.07	
					NET TOTAL	**1924.07**	**m²**
7	**Providing & Laying RCC Elements**						
	Inside Support	1	682.62	0.3	1.2	245.74	
	Slab	1	712.62	3.6	0.3	769.63	
					NET TOTAL	**1015.37**	**m³**
8	**Providing M.S. Reinforcement (7.85 g/cm³)**						
	1% Volume of Concrete	1				79848.92	
					NET TOTAL	**79848.92**	**kg**
9	**Rubble Laying**						
	Sloped Area	1	682.62	a =	3	2047.86	
					NET TOTAL	**2047.86**	**m²**

ABSTRACT SHEET FOR POND RECREATION

Sr No.	Description	Quantity	Rate	Per	Amount
1	Earthwork in Excavation in Foundation	4061.93	₹ 252.30	m³	**₹ 10,24,825.95**
2	P.C.C in Foundation (1:3:6)	320.68	₹ 6,126.25	m³	**₹ 19,64,559.72**
3	Brickwork in Foundation up to Plinth	448.95	₹ 6,376.25	m³	**₹ 28,62,621.26**
4	Brick Masonry in Super Structure	1020.41	₹ 7,722.65	m³	**₹ 78,80,290.91**
5	Earth Filling in Plinth	2730.48	₹ 219.65	m³	**₹ 5,99,749.93**
6	Paver Flooring	1924.07	₹ 1,991.50	m²	**₹ 38,31,793.37**
7	Providing & Laying RCC Elements	1015.37	₹ 9,763.80	m³	**₹ 99,13,896.94**
8	Providing M.S. Reinforcement (7.85 g/cm³)	79848.92	₹ 86.05	kg	**₹ 68,70,999.31**
9	Rubble Laying	2047.86	₹ 6,120.80	m²	**₹ 1,25,34,541.49**
	TOTAL ESTIMATED CONSTRUCTION COST of POND RECREATION				**₹ 4,74,83,278.89**

13.2. Reason for Students Recommending this Design

As far as we performed the techno economic survey of Manekpur, we got to know that the village is having some of the major lacking structures in it. As per the ideal village, a village should have a Drainage Structure in it, and so for that purpose we gave the design of Drainage which can be put up beside the village roads in order to reduce the disposal of grey water in their surroundings which may further cause harmful disease. So, we have given the design of drainage along with its costing per metre of its length.

Other, design we gave is of Bus Stop as you can see the present conditions of the bus stop in the village, which is very poor and needs maintenance. But we could also see that some bus stops are having low elevation that the road, so in monsoon the bus stop gets waterlogged because all water from the camber of the road settles down there. So, we chose the new design for the bus stop which is at a higher elevation than the older ones.

Giving Public Library as a Civil Design will be helpful to the villagers and their unemployed youth too. It will be helpful to the people who want to read the book and who want to use the computer for a short time.

We are giving a design of the village entrance gate to improve the frontal view of the village. The gate is designed in an old heritage construction manner so that it matches the name of the village. Also, it will create an aesthetic view and amplify the charm of the village for a long time of about 15-20 years.

As a step towards the smart village a village needs to have some recreational work to play for kids, relax for adults and to do yoga for the senior citizens. Also, for the youth or teenagers the most important thing is to have a good body and so that a good running track is to be there. So, for the people of the Manekpur village we gave the public garden an aesthetic view which enhances the village beauty as well as enhances the mood of the people. We gave this design to fulfil the need of the garden which is not there in the 10 km radius of the village. Pond recreation is another design which is a bit costlier, but it will play a major role in upgrading the village to a smart village. The construction of the pond will take many years but when it is completed, the product will show its value in half of the time.

13.3. About designs Suggestions / Benefit of the villagers

❖ **From Drainage**

- To collect surface runoff during monsoon season.
- To minimize water logging problems.
- To dispose greywater of the households and to have a proper liquid management system.

❖ **From Bus Stop**

- To minimize the use of private vehicles.
- As a good bus stop will be there, the number of passengers will be more, boarding from the bus stop.
- Outsiders can arrive in the village, easily in a cost-efficient manner.

❖ **From Public Library**

- Village will have its own library, so that the people who want to read the books or eBooks or want to use a computer for their educational purpose can use it.
- Access to books for competitive exams, for the students of the village, because the books are costlier.

❖ **From Public Garden**

- For relaxation of the people and to remove their stress level so that they can boost up their strength.
- Children can play inside it.

❖ **From Village Entrance Gate**

- To enhance the aesthetic view of the village.
- To create tourism and recreational work in the village.

❖ **From Pond Recreation**

- It will create an aesthetic look of the village.

Also, it will make village more art-conscious and more beautiful,

Chapter 14. Technical Options with Case Studies

(EXPLAIN ALL TOPIC AND FOR MINIMUM ONE TOPIC EXPLAIN NEW CONCEPT, DESIGN, PROTOTYPE MODEL WITH ACTUAL COST ESTIMATION)

14.1. Civil Engineering

14.1.1. Advanced Earthquake Resistant

The earthquake, considered as the independent natural phenomenon of vibration of the ground, in very few cases poses a threat to humans, as for example when it causes major landslides or tidal waves (tsunamis). The earthquake becomes a dangerous phenomenon only when it is considered in relation to structures. Of course, the problem is the structure under seismic excitation and not the earthquake itself. This is because the structural system is designed for gravity loads and not for the horizontal inertia loads that are generated due to ground accelerations during an earthquake. Therefore, the earthquake has begun to become a problem for humans since they started building. Since the early steps of the technological development of humanity the joy of creation was associated with the fear that some superior force would destroy in a few seconds what was built with great effort over a lifetime. In other words, the earthquake was always associated with the structure and therefore it mainly concerns the structural engineer.

Earthquakes, because of the deaths and the damage to buildings that they cause, have several economic, social, psychological, and even political effects in the areas and the countries where they take place. Thus, many scientists deal with this problem, such as seismologists, engineers, psychologists, economists and so on. All these scientific disciplines are coordinated by special bodies on a national level and by special institutes of interdisciplinary character, or at the university level, by interdepartmental cooperation. The goal of all these efforts is basically the earthquake-resistant structure, which is its improvement from the safety-cost point of view, which are two antagonistic parameters.

Design Principles & Design Seismic Actions

The most logical approach to the seismic design problem is to accept the uncertainty of the seismic phenomenon and consequently to design the structure in such a way that an adequate reserve of resistance is available to prevent failure in the case of a major earthquake, but at little or no additional cost compared to designing the structure to resist frequent earthquake motions. Thus, the seismic design philosophy can be summarized in the following requirements.

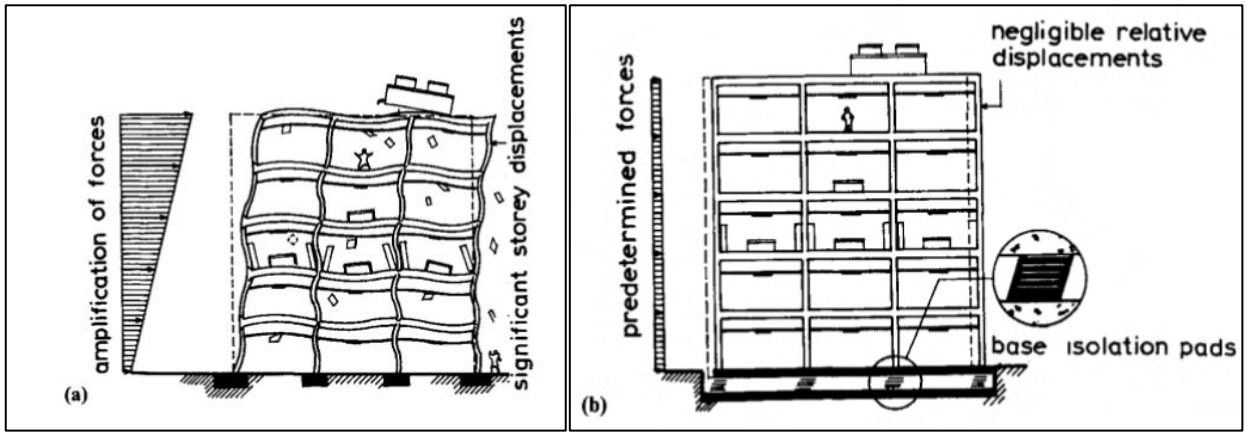


Figure 99 Behavior of building under earthquake

1. Serviceability limit state: Structures must resist low-intensity earthquakes without any structural damage. Thus, during small and frequent earthquakes all structural components forming the structure should remain in the elastic range.

2. Ultimate limit state: Structures should withstand an earthquake of moderate intensity ('design earthquake' having a peak acceleration with 90% probability of not being exceeded in 50 years) with very light and repairable damage in the structural elements, as well as in the infill elements.

3. Collapse limit state: Structures should withstand high-intensity earthquakes with a return period much longer than their design life without collapsing.

Structural systems covered by seismic codes

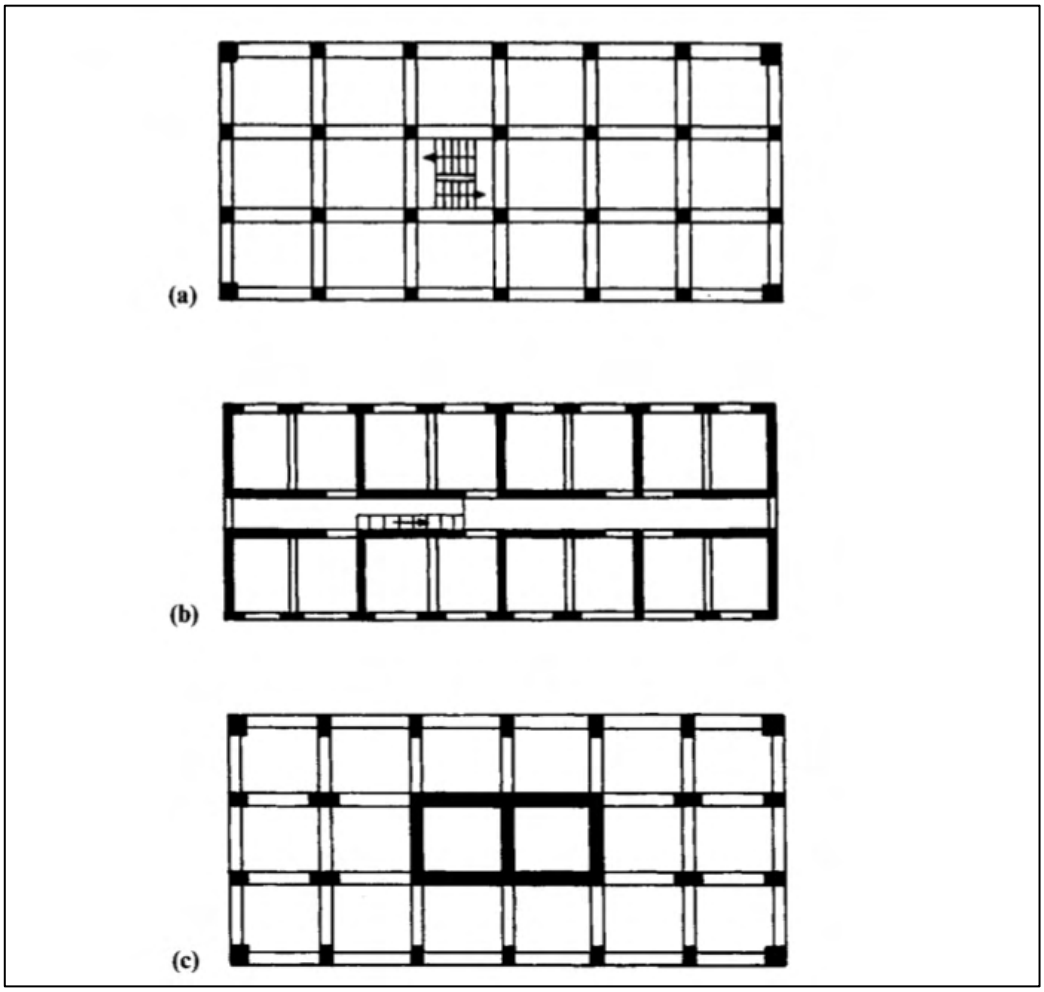


Figure 100 (a) A typical form of a frame system (b) a typical configuration of R/C Shear wall System (c) a system with a core and frames

The structural system should preferably be composed of frames, either alone or coupled with shear walls in two directions, so that a clearly defined flow of lateral forces is achieved. The structural systems covered by ECI should belong to one of the following structural types according to their behaviour under horizontal seismic action:

1. Frame system: Structural system in which both the vertical and lateral loads are resisted by space frames.

2. Wall system (coupled or uncoupled): Structural system in which both vertical and lateral loads are resisted by vertical structural walls coupled or uncoupled, with high shear resistance.
3. Dual system: Structural system in which support for vertical loads is provided by a space frame and resistance to lateral loads is provided in part by the frame system and in part by structural walls, isolated or coupled.
4. Core system: Dual or wall system without satisfactory torsional rigidity, e.g., a structural system composed of flexible frames combined with walls concentrated near the centre of the building in plan.
5. Inverted pendulum system: Structural system where 50% of its mass is in the upper third of the height of the structure.

14.1.2. Seismic Retrofitting of Buildings

Seismic retrofitting is the modification of existing structures to make them more resistant to seismic activity, ground motion, or soil failure due to earthquakes. With better understanding of seismic demand on structures and with our recent experiences with large earthquakes near urban centres, the need for seismic retrofitting is well acknowledged. Prior to the introduction of modern seismic codes in the late 1960s for developed countries and late 1970s for many other parts of the world, many structures were designed without adequate detailing and reinforcement for seismic protection. In view of the imminent problem, various research work has been carried out. State-of-the-art technical guidelines for seismic assessment, retrofit and rehabilitation have been published around the world – such as the ASCE-SEI 41 and the New Zealand Society for Earthquake Engineering (NZSEE)'s guidelines. These codes must be regularly updated; the 1994 Northridge earthquake brought to light the brittleness of welded steel frames.

The retrofit techniques outlined here are also applicable for other natural hazards such as tropical cyclones, tornadoes, and severe winds from thunderstorms. Whilst current practice of seismic retrofitting is concerned with structural improvements to reduce the seismic hazard of using the structures, it is similarly essential to reduce the hazards and losses from non-structural elements. It is also important to keep in mind that there is no such thing as an earthquake-proof structure, although seismic performance can be enhanced through proper initial design or subsequent modifications.

STRATEGIES

Seismic retrofit (or rehabilitation) strategies have been developed in the past few decades following the introduction of new seismic provisions and the availability of advanced materials (e.g., fiber-reinforced polymers (FRP), fiber reinforced concrete and high strength steel).

- Increasing the global capacity (strengthening). This is typically done by the addition of cross braces or new structural walls.
- Reduction of the seismic demand by means of supplementary damping and/or use of base isolation systems.
- Increasing the local capacity of structural elements. This strategy recognises the inherent capacity within the existing structures, and therefore adopts a more cost-effective approach to selectively upgrade local capacity (deformation/ductility, strength, or stiffness) of individual structural components.
- Selective weakening retrofit. This is a counter-intuitive strategy to change the inelastic mechanism of the structure, while recognising the inherent capacity of the structure.

- Allowing sliding connections such as passageway bridges to accommodate additional movement between seismically independent structures.
- Addition of seismic friction dampers to simultaneously add damping and a selectable amount of additional stiffness.

Recently more holistic approaches to building retrofitting are being explored, including combined seismic and energy retrofitting. Such combined strategies aim to exploit cost savings by applying energy retrofitting and seismic strengthening interventions at once, hence improving the seismic and thermal performance of buildings.

Performance objectives

In the past, seismic retrofit was primarily applied to achieve public safety, with engineering solutions limited by economic and political considerations. However, with the development of Performance-based earthquake engineering (PBEE), several levels of performance objectives are gradually recognised:

- Public safety only. The goal is to protect human life, ensuring that the structure will not collapse upon its occupants or passers-by, and that the structure can be safely exited. Under severe seismic conditions the structure may be a total economic write-off, requiring tear-down and replacement.
- Structure survivability. The goal is that the structure, while remaining safe for exit, may require extensive repair (but not replacement) before it is useful or considered safe for occupation. This is typically the lowest level of retrofit applied to bridges.
- Structure functionality. Primary structure undamaged and the structure is undiminished in utility for its primary application. A high level of retrofit, this ensures that any required repairs are only "cosmetic" – for example, minor cracks in plaster, drywall, and stucco. This is the minimum acceptable level of retrofit for hospitals.
- Structure unaffected. This level of retrofit is preferred for historic structures of high cultural significance.

Techniques

Retrofitting Techniques		
	Global	Adding Shear Wall Adding Infill Wall Adding Bracing Adding Wing Wall Wall Thickening Mass Reduction Base Isolation Mass Dampers
	Local	Jacketting of Beams Jacketing of Columns Jacketing of Beam-Columns Joints Strengthening of Individual Footings

Table 26 Retrofitting Techniques

Typical Retrofit Solutions

- Soft-story failure
- Beam-column joint connections
- Shear failure within floor diaphragm
- Multiple piers in shallow pits
- Reinforced concrete column burst
- Reinforced concrete wall burst
- Damage to masonry (infill) walls
- Lift
- Soil
- Utility pipes and cables: risks
- Tunnels
- Underwater tubes
- BART tube

Figure 101 Column Retrofitting

Bridge Retrofit

Bridges have several failure modes.

- Expansion rockers
- Deck rigidity
- Lattice girders, beams, and ties
- Hot rivets
- Fill and overpass
- Viaducts
- Wood frame structure
- Reinforced and unreinforced masonry

Figure 102 Bridge Retrofitting

14.1.3. Advance Practices in Construction field in Modern Material, Techniques and Equipments

Figure 103 Modern Methods of Construction

Modern construction methods (MMC) are methods that are developed in the construction industry with proper planning and design so that each project reduces the construction time, cost and maintains overall sustainability. There are many methods followed and constructed in the present scenario. Most famous and highly applied methods of modern construction are listed and explained below.

1) Precast Flat Panel System

This method of construction involves the procedure of making floor and wall units off site. For this, separate factory outlets and facilities are required.

Once the panel units are made as per the design specification and requirements, they are brought to the site and placed. This method is best suited for repetitive construction project activities. The panels manufactured have the services of windows, doors & the finishes. This method also brings building envelope panels which are provided with insulation and decorative cladding that is fitted by the factory which can also be used as load – bearing elements.

2) 3D Volumetric Construction

As the name implies, the 3D volumetric construction involves the manufacture of 3D units in the form of modules off site. At the time of installation, they are brought to the site and assembled module by module. Each modular unit manufactured are 3D units, hence this construction is called as 3D volumetric construction or modular construction.

The transportation of the modules can be carried out in various forms or methods. This can involve the transportation of the basic structure or a completed unit with all the internal and external finishes, services installed within it, that the only part remaining is the assembly. The factory construction brings different units of the same product maintaining their quality throughout. Hence this method is best suited for repetitive projects so that rapid assembly of the products is possible.

3) Flat Slab Construction

The flat slabs are structural elements that are highly versatile in nature. This versatility is used widely in construction. The flat slab provides minimum depth and faster construction. The system also provides column grids that are flexible.

Wherever it is necessary to seal the partitions to the slab soffit as a reason of acoustic and fire concerns, the flat slabs are a desirable solution. When compared with other forms of construction, the flat slabs are faster and more economic in nature. The flat slab construction is also a means of increasing the energy efficiency as this allows the exploitation of building thermal mass in the design of ventilation, heating, and the cooling requirements.

4) Precast Concrete Foundations

For the rapid construction of foundation, the precast concrete system can be employed. This method is more suited for a bespoke design. Here, the elements required for the construction of foundation are constructed separately in the factory & brought to the site and assembled. The manufactured product must have the assured quality as specified by the designer.

The foundation assembled is supported by concrete piles. During assembling, both the systems are connected. These foundation systems help in increasing the productivity, increase quality, decrease the soil excavation quantity. This is best suited for extreme and adverse weather conditions. When the construction is dealt on a highly contaminated ground, this system of construction is a best choice.

5) Twin Wall Technology

The twin wall technology is a hybrid solution of wall system that combines the qualities of erection speed and precast concrete with the structural integrity of in-situ concrete. This type of wall system guarantees structural integrity and waterproof reliability for the structure.

The twin wall system has two wall slabs that are separated as shown in the figure. The two slabs are separated by a cast in lattice girders. The procedure involves:

1. The wall units are placed in the site.
2. The twin units are propped temporarily.
3. The wall units are later joined by means of reinforcing.
4. The gap between the wall units is filled by means of concrete.

This system of construction is faster than normal construction methods and economical. The twin wall system is employed in association with the construction of precast floors.

6) Insulating Concrete Formwork

The system of insulating concrete formwork (ICF) has twin walled panels that are either polystyrene panels or blocks. These are built quickly to create the formwork as the wall of the buildings.

The formwork that is made is filled with concrete. This concrete is factory produced that has quality assurance so that it is ready – mixed concrete. Mostly the mix is ready mix concrete.
Higher level of thermal insulation is provided by expanded polystyrene blocks. The concrete core will provide good robustness and better sound insulation.

7) Precast Cladding Panels

The cladding system is the installation of a material over another that finally acts as a skin or a layer. This system of layer is not only intended for aesthetics, but it can help in controlling the infiltration of the weather elements.

No kind of waterproof condition is provided by the cladding. Instead, the cladding is a control measure against water penetration. This safely help in directing the water or the wind so that there is control of the runoff. This helps to prevent the infiltration into the building structure.

8) Concrete Walls and Floors

Concrete walls are applied for seat walls, retaining walls, decorative exterior, and interior finishes. The concrete is also used as a flooring material. As per the latest technology, the concrete floors can be provided with good finish to provide smooth and attractive flooring.

When compared with any other material, the concrete floors provide a wide variety of material for applications like acid-stained painted, radiant floors, overlays, and micro toppings. The concrete flooring can also be called cement flooring. When compared with other flooring types, concrete flooring is affordable, and maintenance is easy. Proper sealing of concrete flooring can be cleaned by a dust mop.

14.1.4. Engineering Aspects of Soil mechanics - Environmental Impact Assessment

Soil Mechanics & its basic review

- The term "soil" can have different meanings, depending upon the field in which it is considered.
- To a geologist, it is the material in the thin zone of the Earth's surface within which roots occur, and which are formed as the products of past surface processes. The rest of the crust is grouped under the term "rock".
- To a pedologist, it is the substance existing on the surface, which supports plant life.
- To an engineer, it is a material that can be:
  - built on: foundations of buildings, bridges
  - built in basements, culverts, tunnels
  - built with embankments, roads, dams
  - supported: retaining walls
- Soil Mechanics is a discipline of Civil Engineering involving the study of soil, its behaviour and application as an engineering material.
- Soil Mechanics is the application of laws of mechanics and hydraulics to engineering problems dealing with sediments and other unconsolidated accumulations of solid particles, which are produced by the mechanical and chemical disintegration of rocks, regardless of whether they contain an admixture of organic constituents.
- Soil consists of a multiphase aggregation of solid particles, water, and air. This fundamental composition gives rise to unique engineering properties, and the description of its mechanical behaviour requires some of the most classic principles of engineering mechanics.
- Engineers are concerned with soil's mechanical properties: permeability, stiffness, and strength. These depend primarily on the nature of the soil grains, the current stress, the water content, and unit weight.

Environmental Impact Assessment

Environmental Impact Assessment (EIA) is a process of evaluating the environmental impacts of a proposed project or development, considering inter-related socio-economic, cultural, and human-health impacts, both beneficial and adverse.

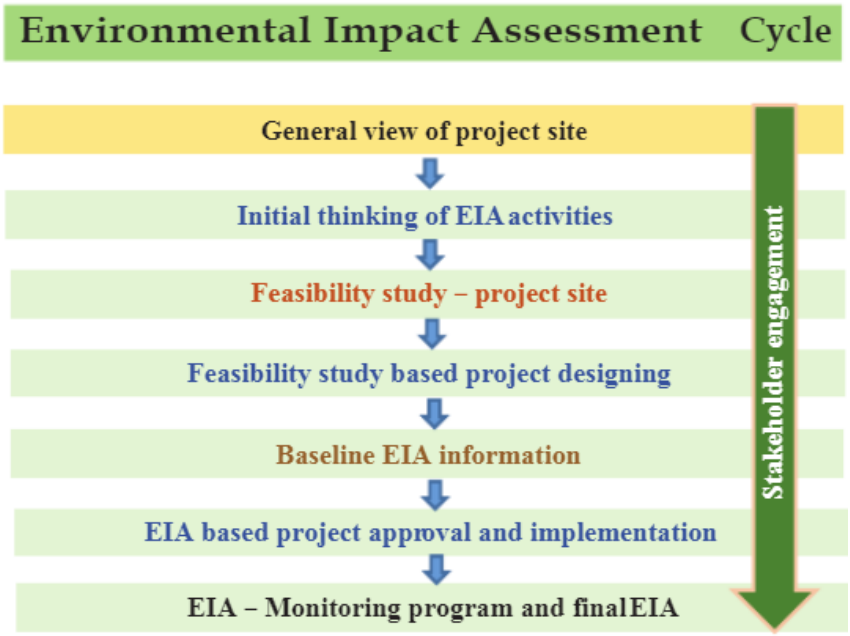


Figure 104 EIA Cycle

Economic, social, and environmental change is inherent to development. Whilst development aims to bring about positive change it can lead to conflicts. In the past, the promotion of economic growth as the motor for increased well-being was the main development thrust with little sensitivity to adverse social or environmental impacts. The need to avoid adverse impacts and to ensure long term benefits led to the concept of sustainability. This has become accepted as an essential feature of development if the aim of increased well-being and greater equity in fulfilling basic needs is to be met for this and future generations.

To predict environmental impacts of any development activity and to provide an opportunity to mitigate against negative impacts and enhance positive impacts, the environmental impact assessment (EIA) procedure was developed in the 1970s. An EIA may be defined as a formal process to predict the environmental consequences of human development activities and to plan appropriate measures to eliminate or reduce adverse effects and to augment positive effects.

EIA thus has three main functions:

- to predict problems.
- to find ways to avoid them, and
- to enhance positive effects.

The third function is of particular importance. The EIA provides a unique opportunity to demonstrate ways in which the environment may be improved as part of the development process. The EIA also predicts the conflicts and constraints between the proposed project, programme or sectoral plan and its environment. It provides an opportunity for mitigation measures to be incorporated to minimize problems. It enables monitoring programmes to be established to assess future impacts and provide data on which managers can take informed decisions to avoid environmental damage.

EIA is a management tool for engineers and decision makers and complements other project studies on engineering and economics. Environmental assessment is now accepted as an essential part of development planning and management. It should become as familiar and important as economic analysis in project evaluation.

Water quality: organic pollution of surface waters may create favourable conditions for the breeding of culicine vectors of filariasis. Pesticide residues, a long-term environmental and health risk, may also lead to a rapid induction of resistance in disease vectors, thus rendering future emergency applications of pesticides in the fight against disease outbreaks less effective.

Groundwater: may be polluted with pesticide residues and fertilizers. Therefore, high levels of nitrates may end up in drinking water which may lead to severe illness or even death for some bottle-fed infants.

Salinity effects: as for the fall in the water table, saline intrusion of groundwater may force people to use unsafe drinking water and change their water contact patterns. If such effects cannot be prevented or are considered an acceptable trade-off, then proper water supplies should be installed to counter the health risks involved.

Ecological imbalances: the emergence of new agricultural pests following irrigation development will trigger pest control activities that can range from simple applications of pesticides to complex integrated pest management strategies. Such activities should be carefully assessed for their human health risks: pesticide poisoning of farm workers (to be countered by standard labelling, strict handling procedures and protective clothing); and. effects on insect populations that may favour a rapid build-up of vector densities. Managers of Integrated Pest Management programmes should attempt to include vectors in their monitoring activities and liaise with health authorities on early warning mechanisms for disease outbreaks.

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

Water is the most precious element available on the earth which is the main life support system of the environment. The water sources are identified and then they are used for various purposes & at various locations. Thus, water supply and distribution facilities are important infrastructure for the environment. These facilities include wells or water supply intake structures, transmission mains, distribution mains and individual service lines. Regarding water supply source, water determination may not only bring forth technical issues, but political issues may arise as well. Ownership of water sources can be controversial, whether the source is ground or surface water.

Water supply and sewerage infrastructure is essential to secure water supply by maintaining drinking water quality, preserving water quality at water sources, and ensuring proper sewage treatment for protecting public health. With technological expertise and know-how, we, Toshiba, supply highly reliable plants to maintain stable and efficient operations, as well as offer the best solution to improve the energy efficiency of the plant, streamline operations and provide new value to our clients.

Sewerage

It is the science and art of collecting, treating and disposal of sewage. There are three types of sewerage system.

- Separate system. In this system the sanitary sewage and storm water are carried separately in two sets of sewers.
- Combined sewerage system. In this system the sewage and storm water are carried combined in only one set of sewers to the wastewater.
- Partially separate sewerage system. This system is the compromise between separate and combined systems taking the advantages of both systems.

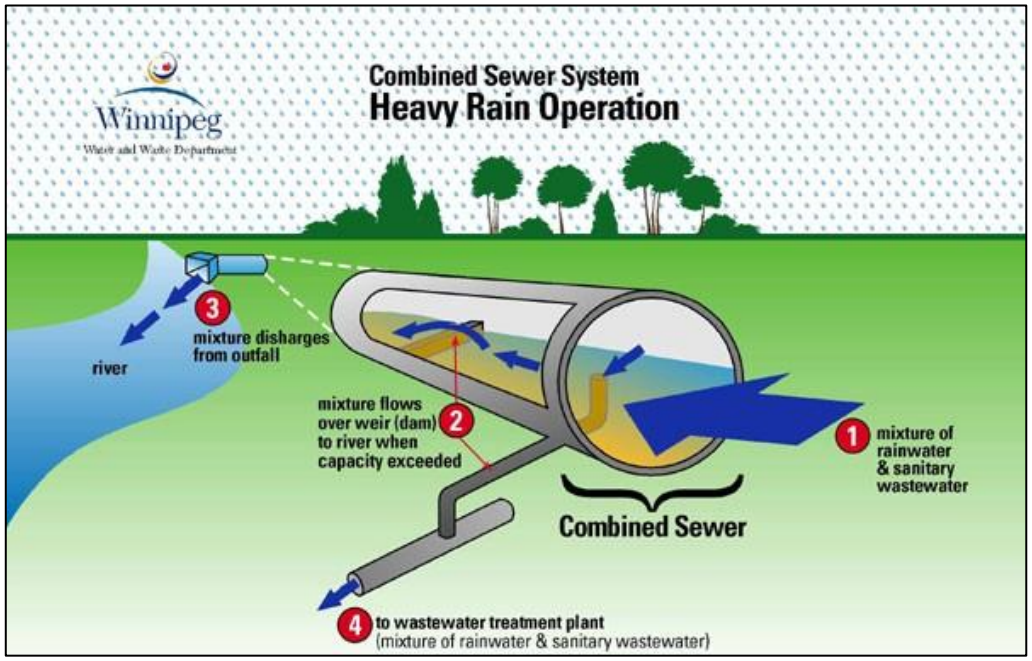


Figure 105 Sewerage System

Following are types of sewers according to material:
1. Asbestos Cement (AC) Sewer
2. Brick Sewer
3. Cement Sewer
4. Cast iron (CT) Sewer
5. Steel Sewers
6. Plastic Sewers

DESIGN OF WWTP

Flowchart of Wastewater Treatment Plant

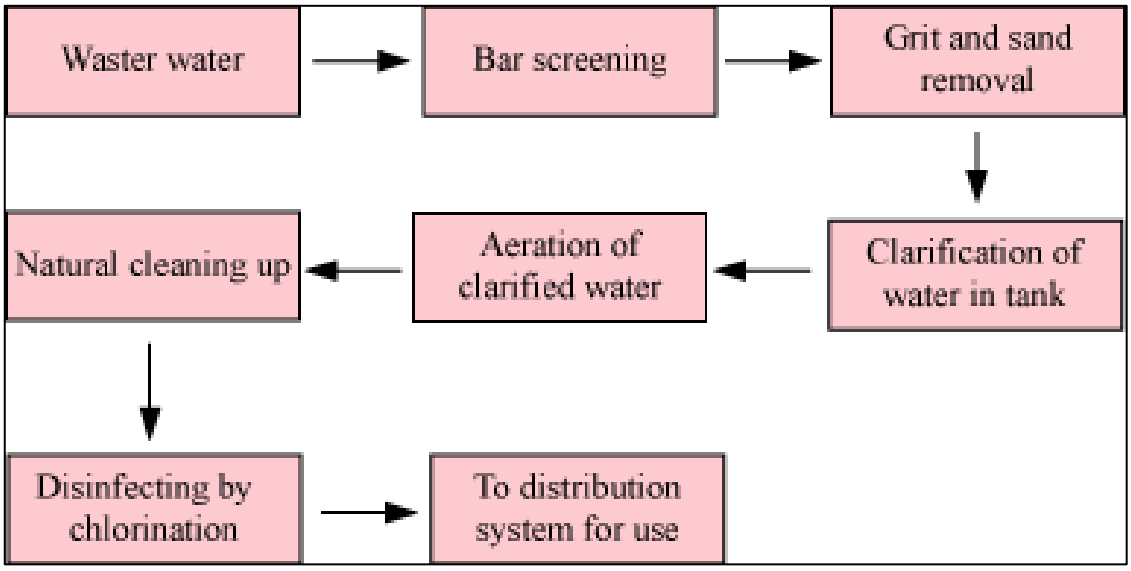


Figure 106 Flowchart

Model of Wastewater Treatment Plant

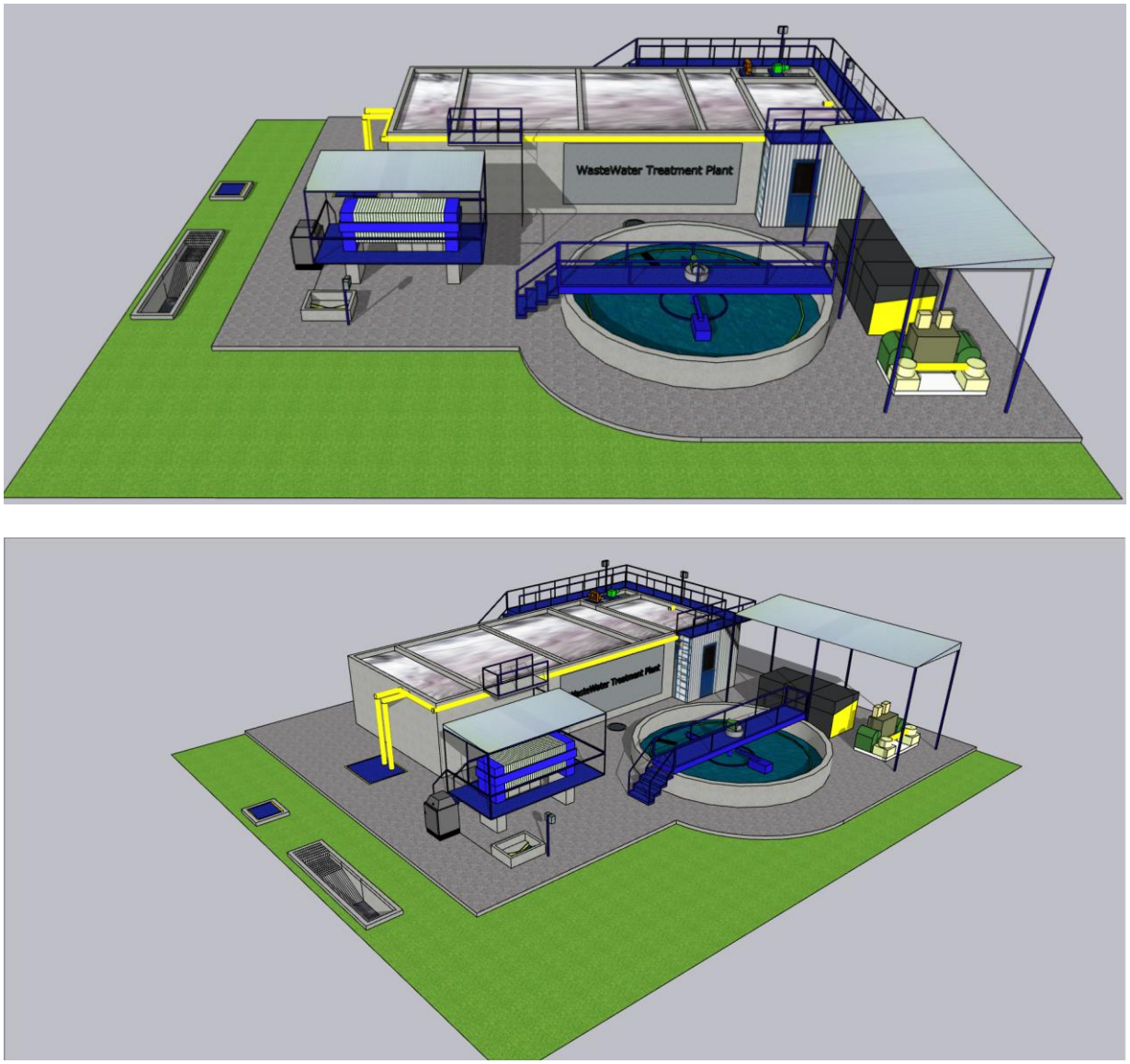


Figure 107 Model for Wastewater Treatment Plant (Sketchup)

Estimate Costing

Sr No.	Name of Unit	Estimated Cost
1	Bar Screen	7,500
2	Grit Chamber	2,50,000
3	Skimming Tank	2,00,000
4	Plain Sedimentation Tank	3,00,000
5	Decant Tank	4,00,000
6	Aeration Tank (concrete)	6,00,000
7	Trickling Filter	5,00,000
8	Final Holding Tank	1,65,000
9	Sludge Digestion Tank	60,000

Table 27 Estimate Costing of WWTP

Total cost estimation for the wastewater treatment plant is **₹ 24,82,500** approximately **₹ 26,00,000**

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

(For Allocated village development, villager's happiness, comfortable and for enhancement of the village)

(With the Smart village development concept as per your idea and village visit, modern technology with innovation).

With doing small changes, Period, Amount Expenditure and Benefit –

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

b) If possible, List the sources of the funding available with the Village gram panchayat

Sr. No.	Design Name	Design Period	Expenditure Amount (in rupees)	Benefits
1	Rainwater Harvesting Plant	Immediately	₹ 1,03,225.55	People can get rid of water scarcity problem in summer.
2	Public Toilet	Immediately	₹ 7,71,306.76	Beneficial for sanitation facilities
3	Post-Office	Within 1 year	₹ 17,43,087.12	Good Infrastructure & good employment
4	Community Hall	Within 1 year	₹ 28,59,714.50	Helpful for mass gathering program
5	Bank with ATM	Within 1 year	₹ 20,71,097.41	They won't have to go travel long distance for their money withdrawal.
6	Gram Panchayat	Within 1 year	₹ 11,33,484.84	Good Infrastructure & good employment
7	Drainage (per m)	Long Term	₹ 16,140.17	Proper dispose of greywater of households
8	Bus Stop	Immediately	₹ 2,06,958.55	Maximization in use of public transport
9	Public Library	Within 1 year	₹ 15,51,322.20	Access to use of books and computers for people
10	Public Garden	Immediately	₹ 12,85,804.68	People can relax after having a stressful day
11	Village Entrance Gate	Immediately	₹ 2,93,007.64	To enhance aesthetic view
12	Pond Recreation (approx.)	Long Term	₹ 4,74,83,278.89	For aesthetic purpose and for youngsters to jog around

Table 28 Smart/Sustainable Features

For funding purposes, the village would be totally dependent on the government. As the expenditure of the structure is very high especially structures crossing 20 lacs like Pond, Community Hall, Bank etc, cannot be funded by any individual household or any group.

For small structures like Bus-stop, Rainwater Harvesting Plant, etc. Some people may donate money in the memory of their dead people. Therefore, for the whole project, government funding will be better and will be more appreciated by the villagers.

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

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Survey with Interviewing

SURVEY BY INTERVIEWING WITH TALATI AND/OR SARPANCH

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

An approach towards "Rurbanisation for Village Development"

CHAPTER- 16

Sr.	Questions	Yes/No	Remarks
1	What are the sources of income in village?	Yes	Agriculture & Industry
2	What are the chances of employment in village?	Yes	
3	What are the special technical facilities in village?	Yes	
4	Is any debt on village dwellers?	No	
5	Are village people getting agricultural help?	Yes	All facilities
6	Is women health awareness Program organized in village?	Yes	9/3/21 held
7	Are women having opportunity to work and income?	Yes	75% goes
8	Child girl education is appreciated in village?	Yes	good
9	Facility of vaccination to child is available in village?	No	
10	Are village people aware about child vaccination and done to each and every child as per norms?	Yes	ongoing (45-60 yrs)
11	Women help line number information is provided to village people?	Yes	-
12	Is water scarcity in village? How many days per year?	No	
13	Is village under any debt?	No	
14	Is any serious issue due to debt from bank or any person happened in village?	No	
15	Is any suicide like incident observed in village due to government policy, debt or threatening?	No	
16	Is any death of patient occurred due to unavailability of medical facility in village?	No	
17	How many disabled (physically challenged) is observed in village? Provide list with Male/female/girl/boy with age and type of disability and reason of disability.	Yes	2-3
18	Is village improvement is observed in comparative scenario from past to present?	Yes	after project implementation
19	Is any unavoidable difficulty village people are facing? Any natural calamity is there?	No	
20	Life Living standard of girls and women is appreciated and uplifted in village?	Yes	-

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

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

સરપંચ
ગ્રામ પંચાયત માણેકપુર
તા. ઉમરગામ, જિ. વલસાડ.

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

Water is a critical input into agriculture in all its aspects having a determining effect on the eventual crop yield. Good seeds & fertilizers fail to achieve their full potential if crops or plants are not optimally watered. Adequate availability of water is important for animal husbandry as well too. Fisheries are also directly dependent on water resources. India accounts for approx. 17% of the world's population but only 4% of the world's freshwater resources. Distribution of these resources across the vast expanse of the country are also uneven.

The increasing demands on water resources by India's burgeoning population and diminishing quality of existing water resources because of pollution and the additional requirements of serving India's spiralling industrial and agricultural growth have led to a situation where the consumption of water is rapidly increasing while the supply of fresh water remains constant. Surveys conducted by the Tata Institute of Social Sciences showed most of urban cities are water deficient. 40% of water demand in urban India is met by ground water. As a result, ground water tables in most cities are decreasing at alarming rate of 2-3 meters per year.

Water scarcity has many negative impacts on our environment, including lakes, rivers, wetlands, and other freshwater resources. Additionally, water overuse can cause water shortage, often occurs in areas of irrigation agriculture, and harms the environment in several ways including increased salinity, nutrient pollution, and the degradation and loss of flood plains and wetlands. Furthermore, water shortage makes flow management in the rehabilitation of urban streams problematic too. Owing to the poor water resource management system and climate change India faces a persistent water shortage. As per OECD environmental outlook 2050, India would face severe water constraints by 2050. Indian agriculture accounts for 90% water use due to fast-track ground water depletion and poor irrigation systems.

Figure 108 Indian Farmer

India's Agriculture Sector

India ranks 2nd worldwide in farm output. Agriculture and allied sectors like forestry and fisheries accounted for 13.7% of the GDP in 2013 and employed 50% of the workforce. The irrigation infrastructure includes a network of canals from rivers, groundwater, well-based systems, tanks, and other rainwater harvesting products for agriculture activities. Today the ground system is the largest, covering - 160 million ha of cultivated land in India with 39 million hectares irrigated by ground water, 22 million hectares by irrigated canals and about two third of cultivation in India is still dependent on the monsoon.

"*The earth, the land and the water are not an inheritance from our forefathers but on loan from our children. So, we have to hand it over to them at least as it was handed over to us.*"

- Mahatma Gandhi

India is the world's largest producer of fresh fruits and vegetables, milk, major spices, various crops such as jute, staples such as millets and castor oil seed and other products. It is also the 2nd largest producer of wheat and rice. The average size of the around 138 million farms was around 1.15 hectare in 2010/11 and average size of large-scale farmers' farms (170.000) is around 37 hectares in 2016 (BEML India country report 2016). Agricultural extension has only one extension worker per 800-1000 farmers and degree of mechanization reaches less than 50% (BEML India country report 2016). Indicators of water stress & scarcity are used to reflect the overall water availability in a country or a region. As per the international norms, a country is classified as water stressed and water scarce if per capita water availability goes below 1700 m^2 and 1000 m^3, respectively. With 1544 m^3 per capita water availability, India is already a water-stressed country and is moving towards turning into water scarce.

Types of Agriculture

Although agriculture is not uniform across the world, it is the most widespread activity. It is classified based on the type of crop being grown, scale of cultivation, intensity, mechanization level, combinations of livestock and how farm produce is distributed. The following are the different types of agricultural activities worldwide:

1. Shifting Cultivation
2. Nomadic Herding
3. Rudimentary Sedentary Tillage
4. Livestock Ranching/Pastoral Farming
5. Commercial Plantations
6. Mixed Farming
7. Specialized Horticulture
8. Subsistence Farming
9. Intensive Subsistence Farming with/without Rice as a Dominant Crops
10. Mediterranean Agriculture
11. Dairy Farming
12. Commercial Grain Farming
13. Arable Farming

Prospects and Outcomes

Presently, India is facing a shortage in available water resources that has implications on India's agriculture sector. Several regions in the country are experiencing water stress and problems. If water use efficiency does not improve, the country could suffer under water scarcity in the next 1 to 2 decades or may be early. It is exceedingly important that the agriculture sector contributes to prevent the exacerbation of the situation by making best use of the available technologies & resources to increase water use efficiency. Improvement of policies, strategies, and regulatory measures to prevent water misuse should be taken into consideration. Awareness & orientation of water users in the agriculture sector to switch to more water efficient production methods can help the country against water scarcity. Moreover, enforcement of best practices can help present policy makers and planners to enhance governance structures to further understand key indicators that can assist in data-driven decision-making. These challenges can be better implicated, provided there are favourable policies and mechanisms that encourage the agriculture sector to buckle water use efficiency.

Target studies could include case studies of:

- Ground-water management
- Specific socio-economic impacts resulting from over abstraction and pollution caused by the agriculture sector
- Competition among water users (private & public) regarding the agriculture sector

India must review its current trend of producing water intensive crops, such as sugarcane and rice in water scarce areas. Also, it should review its policies related to exporting of water intensive crops such as rice, cotton, etc. Lack of adequate enforcement and monitoring of existing water policies undermines water governance.

1. Technologies such as conservative agriculture should be popularized, as it is known to hype water use efficiency.
2. Practicing management agriculture on a large scale has the added advantage of conserving soil moisture, improving soil nutrient status, soil texture, less weeds, among others.
3. Water pricing for the agriculture sector should be reviewed and revised.
4. Watershed development must be planned to pave the way to safeguard the surface and ground water recharge mechanisms.
5. Increase awareness to increase water use efficiency in the agriculture sector.
6. Declining water tables results in an increase in the cost of pumping, salinization, presence of heavy metals etc, thus raising questions about the cost of crop production and quality of the produce.
7. Introduce clearer incentive structure that improves the water use efficiency in the agriculture sector thus for ensuring long term sustainability of this natural resource.
8. Strengthening cross-sectoral water governance that includes the agriculture sector for better coordination & resolving conflicts.
9. Ensuring sustainable financing or subsidies, to ensure that existing public irrigation infrastructure is maintained.

Chapter 18. Social Activities – Any Activities Planned by Students

(e. g. Teaching Learning activities, awareness camp, business idea for SELF HELP GROUP or any other)

Social activity relates direct contact to the villagers and their mindset. It is an event or pursuit that brings members of the village or any community together, to get knowledge sharing sessions as well as some kind of good work. In case of social activity in Manekpur, we thought of having an AWARENESS CAMP about COVID-19 vaccination and its procedure, which covers following types of questionnaires such as

- What is a COVID-19 vaccine?
- Different brands of vaccine available in the market.
- How to get vaccinated?
- Can a person get vaccinated without registration?
- Can I get vaccinated without a photo ID?
- When will the vaccine be available for my age group?
- Can I choose the vaccine from the brands?
- Can a pregnant lady get vaccinated?
- Who is paying for the vaccine?
- Can I get vaccinated against COVID-19 while I am currently sick with COVID-19?
- Precautions and procedures for vaccination.
- Is it mandatory for all to take the vaccine?
- Does one need to wear a mask or take precautions after getting vaccinated?
- Is only one dose of vaccine required?
- Are there any side-effects of COVID-19 vaccine?
- How Indian vaccines are effective than other country's vaccines?
- If I have already had Covid and I am recovered, do I still need to get vaccinated with a COVID-19 vaccine?

Figure 109 Poster for Camp

Figure 110 Fact vs. Myth

We would have been also covering the topic of Myths and Facts about COVID-19 vaccine for e. g.,

Myth: You can get COVID-19 from the vaccine.
Fact: You cannot get COVID-19 from the vaccine because it does not contain the live virus.

Myth: Certain blood types have less severe COVID-19 infections, so getting a vaccine is not necessary.
Truth: Research has shown there is no reason to believe being a certain blood type will lead to increased severity of COVID-19. By choosing to get vaccinated, you are protecting not only yourself and your family but your community as well.

Myth: The COVID-19 vaccine causes infertility in women.
Fact: Misinformation on social media suggests the vaccine trains the body to attack syncytia 1, a protein in the placenta, which could lead to infertility in women. The truth is, there is an amino acid sequence shared between the spike protein and a placental protein; however, experts say it's too short to trigger an immune response and therefore doesn't affect fertility.

Myth: The COVID-19 vaccine includes a tracking device.
Fact: A video shared thousands of times on Facebook makes false claims about the products of syringe maker Apiject Systems of America, which has a contract with the government to provide medical-grade injection devices for vaccines. The company has an optional version of its product that contains a microchip within the syringe label that helps providers confirm a vaccine dose's origin. The chip itself is not injected into the person getting the vaccine.

Myth: The COVID-19 vaccine will alter my DNA.

Fact: The first vaccines granted emergency use authorization contain messenger RNA (mRNA), which instructs cells to make the "spike protein" found on the new coronavirus. When the immune system recognizes this protein, it builds an immune response by creating antibodies — teaching the body how to protect against future infection. The mRNA never enters the nucleus of the cell, which is where our DNA (genetic material) is kept. The body gets rid of the mRNA soon after it's finished using the instructions.

For the last several months, the cases of coronavirus are getting up on a hike on the daily basis and as far as we know that the second wave of COVID-19, is worse than its first wave and due to the implementation of the lockdown in various areas we could get reached up for this process. Even we thought of having an online webinar but that was not a good idea because 50% of adult villagers are not educated yet and so they don't know the usage of Google meet or zoom or any other kind of webinar platform. Also, we must think for the villagers that there is no mass gathering of people, we did not set up the awareness camp.

BENEFICIARIES to Villagers after camp

Below are some points listed, that how the AWARENESS CAMP will be beneficial to the villagers

- They will have proper information against vaccination process
- Free from myths and facts regarding such.
- Encouragement for getting vaccinated as early as possible.
- Doubt will be cleared regarding vaccines.
- It will develop an understanding to tackle the pandemic.

Chapter 19. MANEKPUR Village SAGY Questionnaire Survey form with the Sarpanch Signature

(Scanned copy attachment in the soft copy report and original copy in hardbound report)

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: Manekpur Gram Panchayat: Manekpur Ward No. 2

Block: Umbergaon District: Valsad

State: Gujarat L S Constituency: 26-valsad

1. Family Identity and Size

Name of Head of Household	Hemant Vanjara							Male/ Female	M
SECC Survey ID:		Family Size	5	Over 18	3	6 to 18	2	Under 6	-

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	✓ 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]
Hemant Vanjara	42	M	N	Yes	10	Y	Y	-
Poorvi Vanjara	30	F	N	Yes	10	Y	Y	-
Harsa Vanjara	62	F	N	Yes	-	Y	Y	-

3. Children from 6 years and up to 18 years

Name	Age	Sex M/F/O	Disability Y/N	Marital Code*	Level of Education: Code#	Going to School /College (Y/N)	Current Class	Computer Literate Y/N
Nehil Vanjara	14	M	N	-	8th	school	8th	Y
Shreya Vanjara	8	F	N	-	3rd	school	3rd	Y

4. Children below 6 years

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

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

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

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

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

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

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

5. Hand washing

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

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

7. Do members take Regular Physical Exercise

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

8. Consumption of Tobacco

	Smoking	Chewing
Adults	No	No
Children	No	No

9. House & Homestead Data

Own House: Yes / No	No. of Rooms: 6
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	No
Community Water Tap	Yes / No	No
Hand Pump (Public / Private)	Yes / No	No
Open Well(Public / Private)	Yes / No	No
Other (mention):		Private Pump

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	-	2. Cultivable Area	-
3. Irrigated Area	-	4. Uncultivable Area	

13. Principal Occupations in the Household

Livelihood	Tick if applicable
Farming on own Land	Yes
Sharecropping /Farming Leased Land	No
Animal Husbandry	No
Pisciculture	No
Fishing	No
Skilled Wage Worker	-
Unskilled Wage Worker	-
Salaried Employment in Government	~~Yes~~ No
Salaried Employment - Private Sector	Yes
Weaving	No
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
Rice	-	-

17. Livestock Numbers

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

18. What games do Children Play
FreeFire, Khokho

19. Do children play musical instrument (mention) - No

Schedule Filled By: Prince Mediwala
Principal Respondent: Nehil Vanjara
Date of Survey: 16/4/2021

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: Manekpur

b. Block: Umbergaon

c. District: Valsad

d. State: Gujarat

e. Lok Sabha Constituency: 26

f. Number of Wards in the Gram Panchayat: 8

g. Number of Villages in the Gram Panchayat: 1

h. Names of Villages:
only one under Gram Panchayat
– MANEKPUR

Demographic Information

Number of Households ~~584~~ 1300+ Total Population 3100 2919 Male 1465 Female 1454

SC HHs 12 ST HHs 1000 OBC HHs 60-70 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	Yes	
b.	Nearest Primary Health Centre (PHC)	Yes	
c.	Nearest Community Health Centre (CHC)	No	Sarigam (13)
d.	Nearest Post Office	Yes	
e.	Nearest Bank Branch (Any)	No	Sanjan (10)
f.	Nearest Bank with CBS Facility	No	Sanjan (10)
g.	Nearest ATM	No	Sanjan (10)
h.	Nearest Primary School	Yes	
i.	Nearest Middle School	Yes	
j.	Nearest Secondary School	Yes	
k.	Nearest Higher Secondary School / +2 College	Yes	
l.	Nearest Graduate College	No	Sarigam (13)
m	Nearest ITI / Polytechnic Centre	No	Sarigam (13)
n	Kisan Seva Kendra	No	Sarigam (13)

1

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

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

IV. Sports Facilities in the Gram Panchayat

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

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

V. Education, ICDS

a. Number of Angan Wadi Centres: 4

b. Number of villages without Angan Wadi Centres -

Names of such villages: -

c. Schools (Number)

Primary Private: 2 Primary Govt.: 3

Middle Private: 2 Middle Govt.: 2

Secondary Private: 2 Secondary Govt.: 2

Higher Secondary Private: 2 Higher Secondary Govt: 2

VI. Public Distribution System

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

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 ✓		Manekpur
b.	Hand Pump Coverage in Villages:	Covered ✓ (70+) Not Covered	Manekpur	
c.	Coverage under Covered Drains:	Covered ✓ (SWD) Not Covered	Manekpur	
d.	Coverage under Open Drains:	Covered Not Covered ✓		Manekpur
e.	Villages with Household Electricity Connection (Numbers)	Connected ✓ Not Connected	Manekpur	

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	150 ha	d.	Pasture / Grazing Land	–	g.	Check Dam	20+
b.	Irrigated Land	80+ ha	e.	Forests/ Plantations	400 ha	h.	Wells/Bore Wells	30+
c.	Un-irrigated Land	30+ ha	f.	Other Common Land		i	Tanks /Ponds	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)	150+
b)	Number of Households receiving pension (old age, widow, disability)	150+
c)	Number of eligible Households who are not receiving pension	-
d)	Number of Households eligible for Ration Card	1300+
e)	Number of eligible HHs having ration cards	1300+
f)	Number of households covered under RSBY (Rashtriya Swasthya Bima Yojana)	-
g)	Number of HHs covered under AABY (Aam Aadmi Bima Yojana)	-
h)	Number of active Job Card holders under MGNREGA	150-200
i)	Number of Job Card holders who completed 100 days of work during 2013-14	-
j)	Number of shops selling alcohol	-
k)	Number of BPL families	250+
l)	Number of landless households	-
m)	Number of IAY beneficiaries	-
n)	Number of FRA[2] beneficiaries	-
o)	Number of Community Sanitary Complexes	-
p)	Number of Households headed by single women	10+
q)	Number of Households headed by physically handicapped persons	2+
r)	Total number of Persons with Disability in the village	-
s)	Number of SHGs	-
t)	Number of active SHGs	-
u)	Number of SHG Federations	-
v)	Number of Youth Clubs	-
w)	Number of Bharat Nirman Volunteers	-

Name and Signature of Surveyor and Respondent' Kundaben Davariya

Prince Mediwala & Urvika Munoor Surveyor	PRI Respondent (Preferably Gram Panchayat Chairperson)	સરપંચ ગ્રામ પંચાયત માણેકપુર Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	17/4/21 Date of Survey

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

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

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

I. Basic Information

a. Village: Manekpur
b. Ward Number: 2
c. Gram Panchayat: Manekpur
d. Block: ~~Dist~~ Umbergaon
e. District: Valsad
f. State: Gujarat
g. Lok Sabha Constituency: 26 - Valsad
h. Number of Habitations / Hamlets in the Gram Panchayat: 14

i. Names of Habitations / Hamlets:

① Navinagri	⑤ Tadav	⑨ Khanvai	⑬ Ardeshar
② Pangha	⑥ Dungri	⑩ Nayak	⑭ Kunwarshah
③ Vanjharvad	⑦ Ahir	⑪ Patkar	
④ Patel	⑧ Ashram	⑫ Soniyawadi	

Demographic Information

Number of Households 1300+ Total Population 3100 Male 1465+ Female 1454+

SC HHs 12 ST HHs 1000+ OBC HHs 70+ 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	
b.	Nearest Middle School	Yes	
c.	Nearest Secondary School	Yes	
d.	Kisan Seva Kendra	No	- Sanjan (10km)
e.	Milk Cooperative /Collection Centre	Yes	
g.	Health Sub Centre	Yes	
h.	Bank	No	- Sanjan (10 km)
i.	ATM	No	- Sanjan (10 km)
j.	Bus Stop	Yes	
k.	Railway Station	No	- Sanjan (10 km)

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

1

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

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

ii. Road Connectivity ✓ - [1]

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: [2] *(1-All 2-None 3-Some)*

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

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

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

b. Coverage under Open Drains: [3] *(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 : No Yes(Y) /No (N)

vii. Education, ICDS

a. Number of Anganwadi Centres: 4

c. Schools (Number)

Primary Private: 2 Primary Govt.: 3

Middle Private: 2 Middle Govt.: 2

Secondary Private: 2 Secondary Govt.: 2

Higher Secondary Private: 2 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	150ha	d.	Pasture / Grazing Land	–	g.	Check Dam	20+
b.	Irrigated Land	80+ha	e.	Forests/ Plnatations	400ha	h.	Wells/Bore Wells	30+
c.	Un-irrigated Land	30+ha	f.	Other Common Land		I	Tanks /Ponds	1

ix. Entitlement Related Parameters		
1	Number of active Job Card holders under MGNREGA	150-200
2	Number of active Job Card holders who have completed 100 days of work	–
3	Number of shops selling alcohol	–
4	Number of BPL families	250+
5	Number of landless households	–
6	Number of IAY beneficiaries	–
7	Number of FRA beneficiaries	–
8	Number of common sanitation complexes	–
9	Number of SHGs	–
10	Number of active SHGs	–
11	Existence of SHG Federation in the Village (Yes / No)	No
12	Number of Youth Clubs	–
13	Number of Bharat Nirman Volunteers	–

Name and Signature of Surveyor and Respondent'

Prince Mediwala & Urvika Munoor Surveyor	PRI Respondent (Preferably a ward member from a ward that is fully or partially covered under the Village)	Kundaben Davaia સરપંચ ગ્રામ પંચાયત માણેકપુર તા. ઉમરગામ, જિ. વલસાડ Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	17/04/2021 Date of Survey

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

Gmail

Prince Mediwala <mediwalaprince@gmail.com>

DETAILED PROJECT REPORT FOR MANEKPUR VILLAGE UNDER VISHWAKARMA YOJANA - PHASE VIII

Prince Mediwala <mediwalaprince@gmail.com> 8 September 2021 at 07:58
To: collector-val@gujarat.gov.in, ddo-val@gujarat.gov.in, tdo-umbergaon@gujarat.gov.in
Cc: Vishwakarma Yojana <rurban@gtu.edu.in>

VISHWAKARMA YOJANA-VALSAD-MANEKPUR.pdf
(21,402K)

Respected Sir/Ma'am,

This is Prince Mediwala, student of **Laxmi Institute of Technology, Sarigam** which is under **Gujarat Technological University (GTU)**. I'm sending you this email with my project report attached. The project was done under guidelines of the **Vishwakarma Yojana**, the initiative taken by GTU.

The project is done for the development of **MANEKPUR Village**. Manekpur is a village situated near Umbergaon, making Umbergaon as a parent town. The distance between Manekpur and Umbergaon is 15 kms which is approximately 20-25 minutes for travelling. The postal code for Manekpur village is 396120, address to Manekpur, Umbergaon Taluka, Valsad District, Gujarat.

As we found there were many lacking facilities in the village, so in order to overcome these lacking facilities and for the betterment of the village, we have provided 12 designs of different facilities.

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

Sr. No.	Design Name	Expenditure Amount (in rupees)	Benefits
1	Rainwater Harvesting Plant	₹ 1,03,225.55	People can get rid of the water scarcity problem in summer.
2	Public Toilet	₹ 7,71,306.76	Beneficial for sanitation facilities
3	Post-Office	₹ 17,43,087.12	Good Infrastructure & good employment
4	Community Hall	₹ 28,59,714.50	Helpful for mass gathering program
5	Bank with ATM	₹ 20,71,097.41	They won't have to travel long distances for their money withdrawal.
6	Gram Panchayat	₹ 11,33,484.84	Good Infrastructure & good employment
7	Drainage (per m)	₹ 16,140.17	Proper dispose of greywater of households
8	Bus Stop	₹ 2,06,958.55	Maximization in use of public transport
9	Public Library	₹ 15,51,322.20	Access to use of books and computers for people
10	Public Garden	₹ 12,85,804.68	People can relax after having a stressful day
11	Village Entrance Gate	₹ 2,93,007.64	To enhance aesthetic view
12	Pond Recreation (approx.)	₹ 4,74,83,278.89	For aesthetic purpose and for youngsters to jog around

Please find the attachment.

Best Regards,
Prince Mediwala(170860106008) & Urvika Munoor(170860106029),
U. G. Civil Engineering,
Laxmi Institute of Technology, Sarigam, Valsad,
Gujarat Technological University.

VISHWAKARMA YOJANA-VALSAD-MANEKPUR.pdf
21402K

Chapter 21. COMPREHENSIVE REPORT

ON

VISHWAKARMA YOJANA: PHASE VIII

LAXMI INSTITUTE OF TECHNOLOGY, SARIGAM

Prepared by

Mr. Amit R. Chauhan

Asst. Prof. Civil Engineering Department

Year: 2020-21

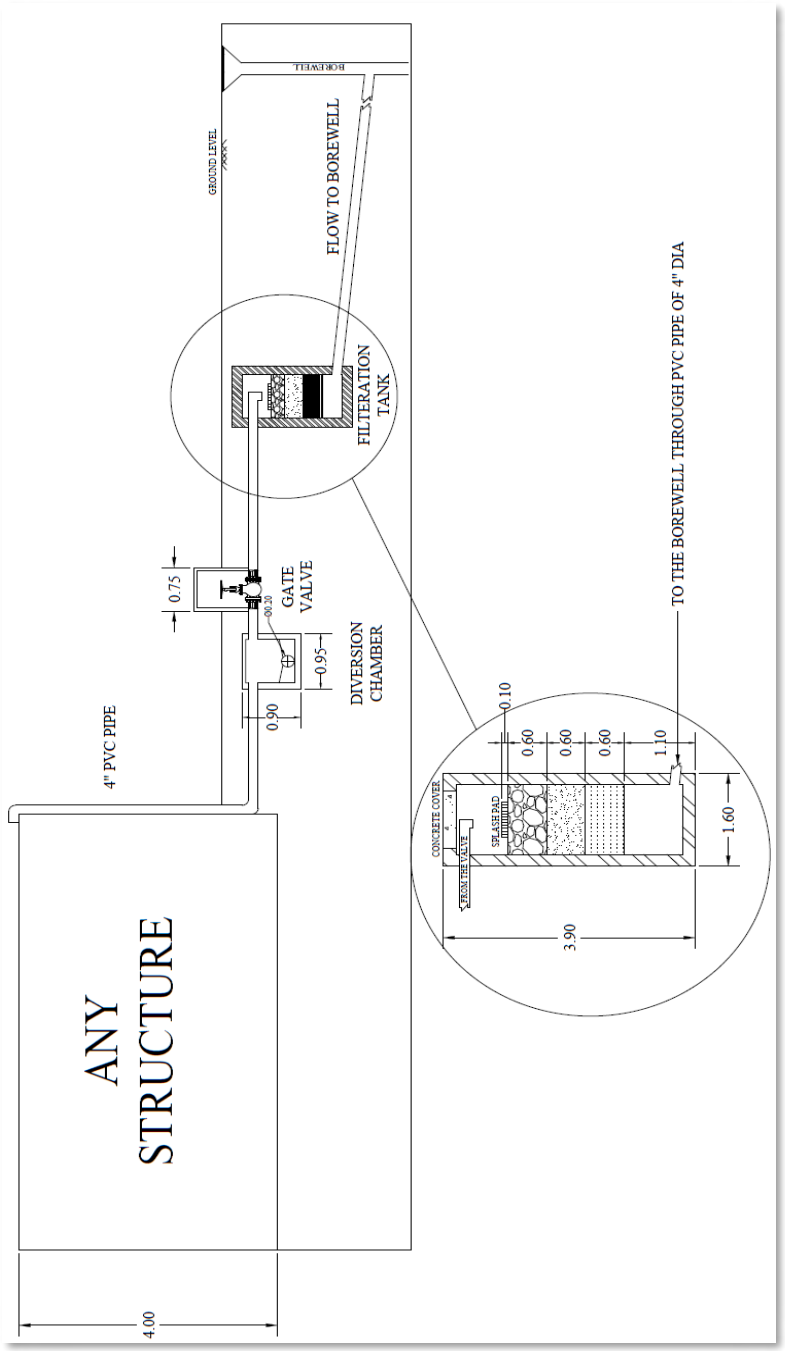
Gujarat Technological University,
Chandkheda, Ahmedabad – 382424 Gujarat

CONCEPT

Vishwakarma Yojana provides a special scheme for village development of villages by GTU and Government of Gujarat in which students work together and collect data and information regarding village development with the help of gram panchayats and stakeholders. Villages have some basic facilities like drinking water, drainage system, pucca road, and other facilities like primary school, primary health center, community hall, library, public latrine block, are sufficient so that village can develop. So, we will give proposals regarding sustainable energy sources and solutions related to infrastructure problems. Efforts have been made in this project to identify and plan some of the below facilities for sustainable development of the village and to meet the needs of the future population. Vishwakarma Yojana is one of the initiatives towards Rurbanization that is village development by the government of Gujarat, which was allotted as a real time situation type project provided to GTU.

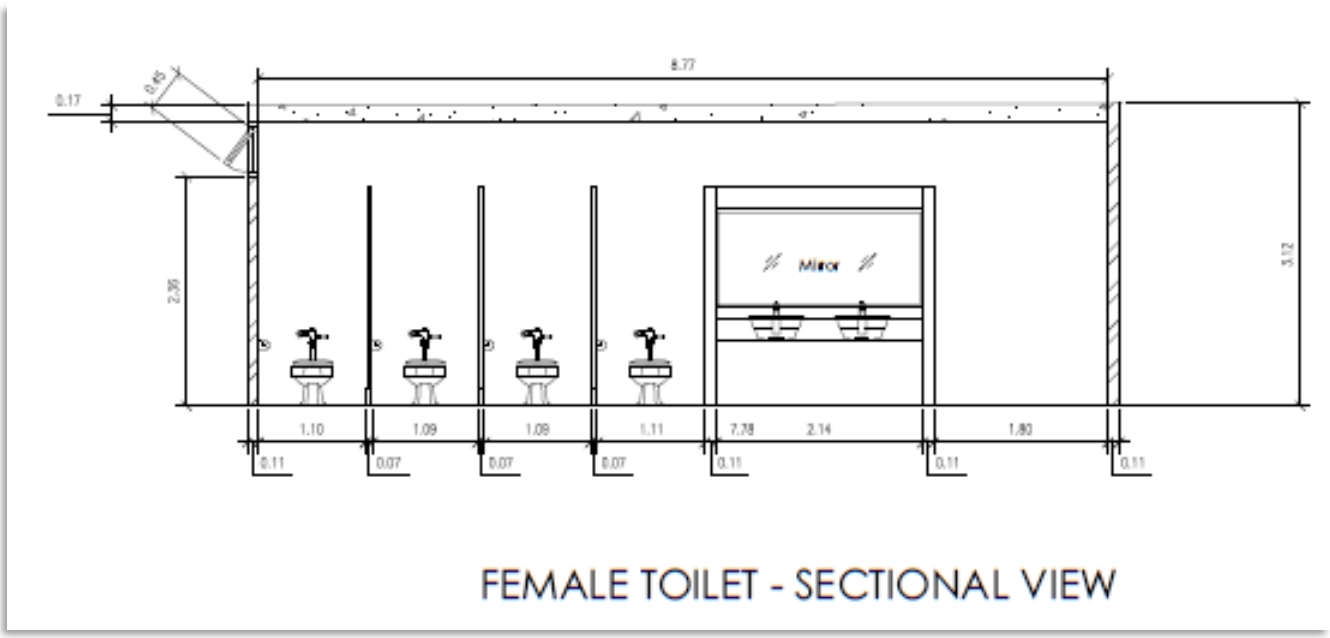
It is one of the strategies to reduce urban city pressure and lower the migration rate by developing villages with a "rural soul" but with all urban amenities that a city may have. In this project the students meet the relevant citizens of the village and survey the existing facilities. Then design of the sustainable infrastructure which is to be modified is carried out for the village. This includes implementation of engineering skills to prepare detailed project reports for the village as a part of the final year project work. By this project certain experiences recreates a real work and need of application of an individual technical knowledge on any existing problems. Based on the survey we tried to give the design of basic facilities to fulfil their needs. By providing these basic facilities to villages to reduce urban city pressure and decrease migration rate, which is the aim of Vishwakarma Yojana.

Village – Manekpur
District – Valsad

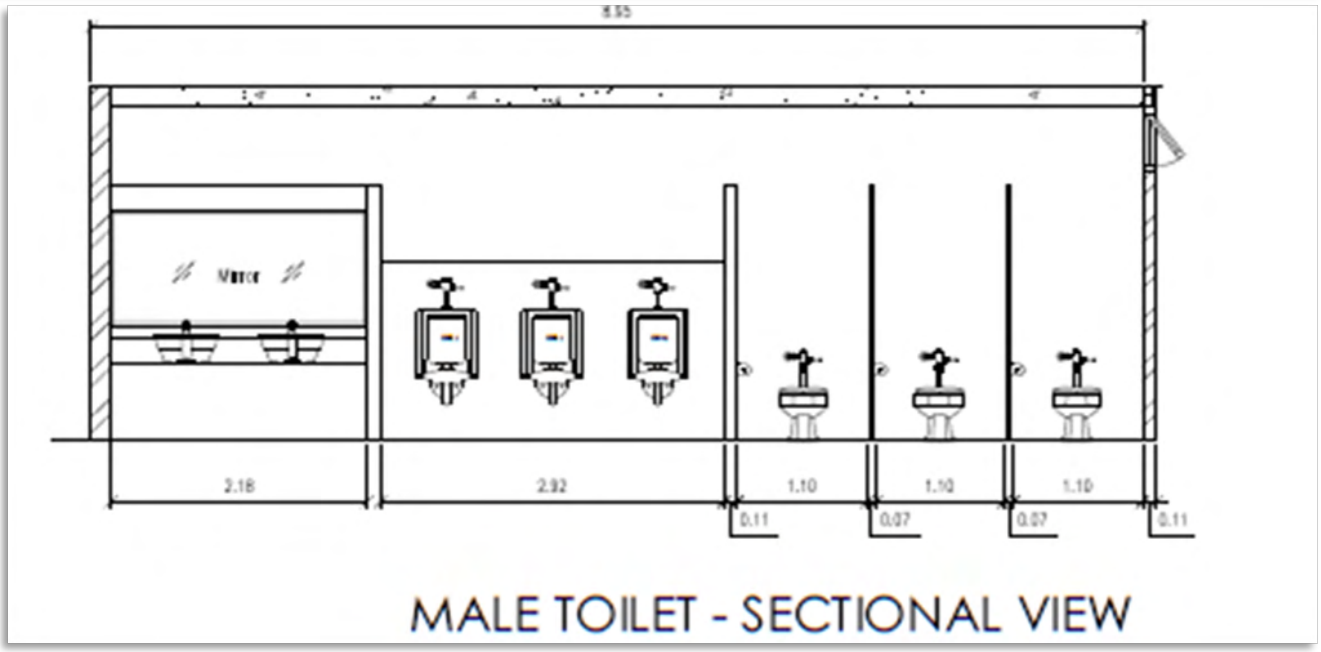


Design Infrastructure: Rainwater Harvesting Plant

Village – Manekpur
District – Valsad



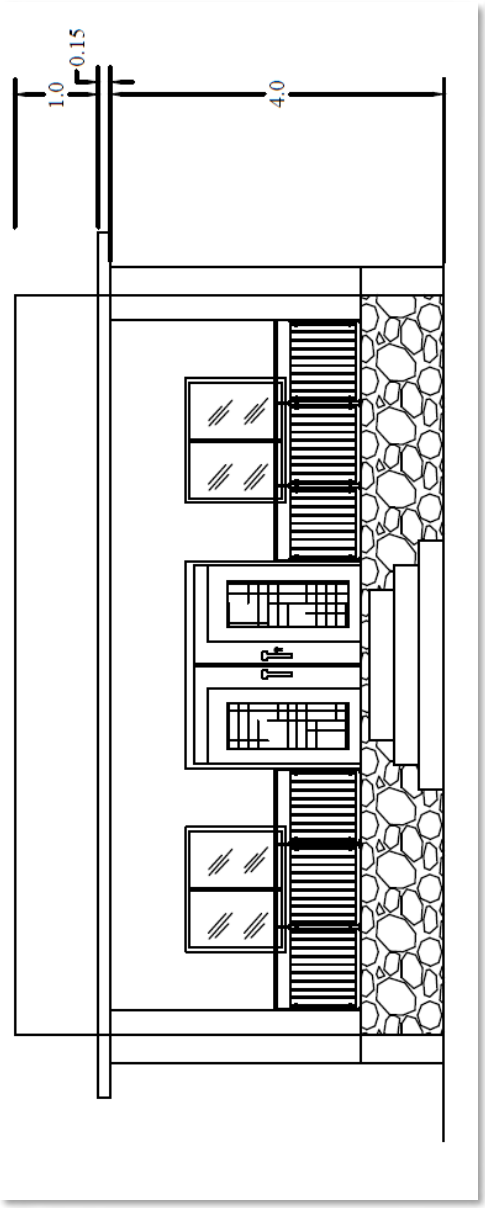
FEMALE TOILET - SECTIONAL VIEW

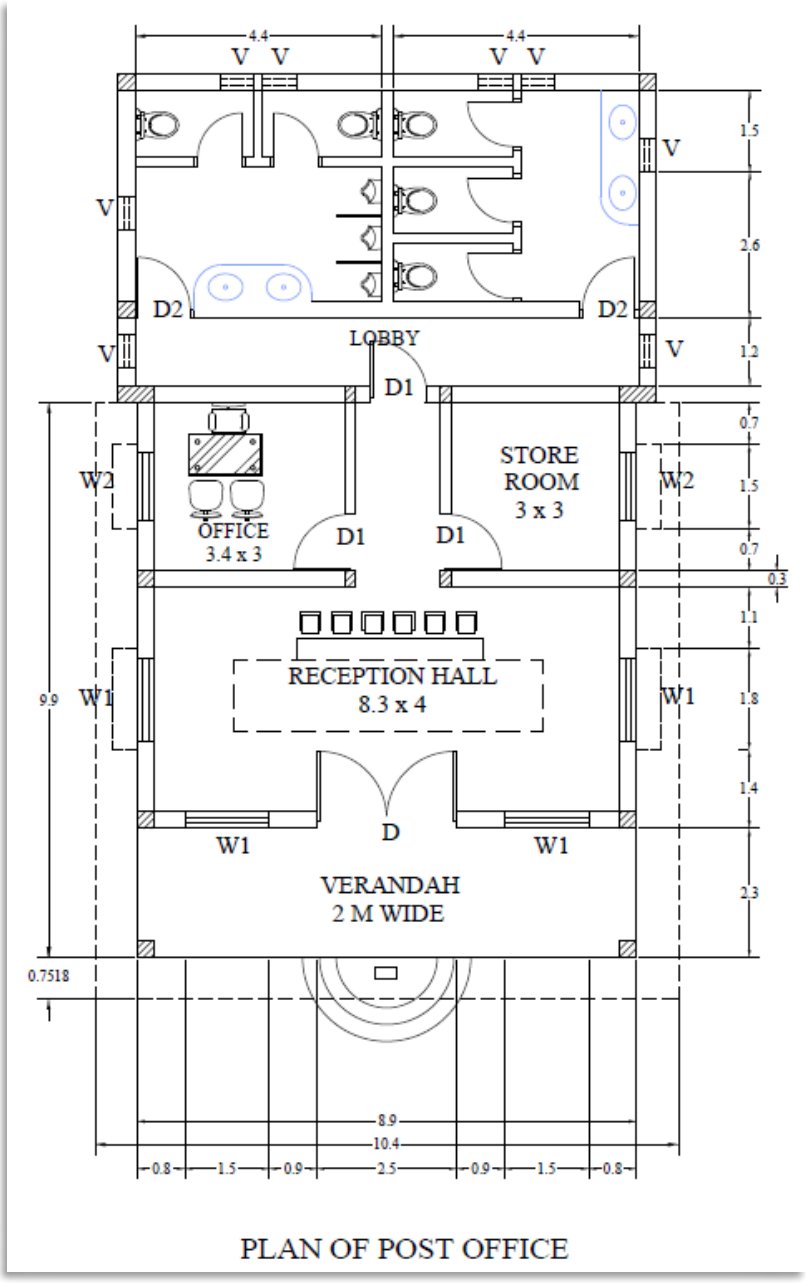


MALE TOILET - SECTIONAL VIEW

Design Infrastructure: Public Toilet

Village – Manekpur
District – Valsad

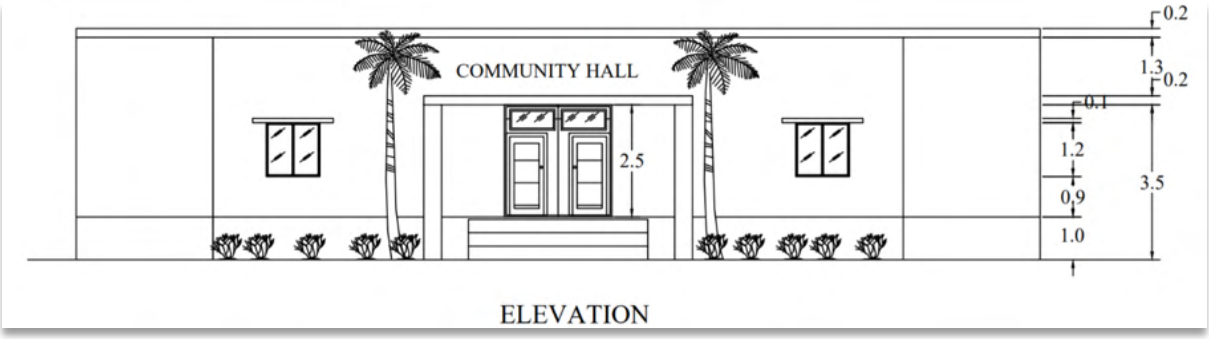




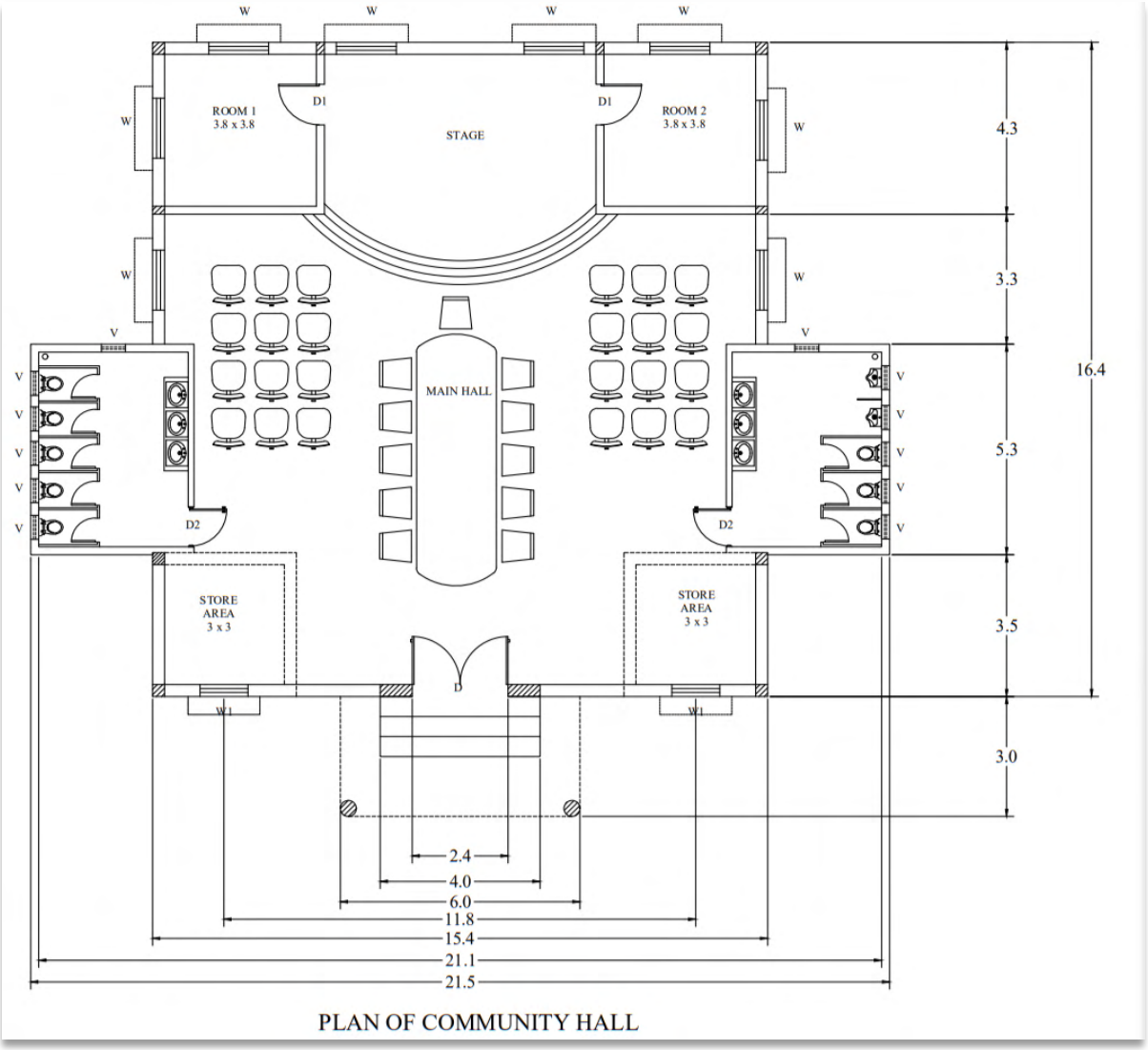
PLAN OF POST OFFICE

Design Infrastructure: Post Office

Village – Manekpur
District – Valsad



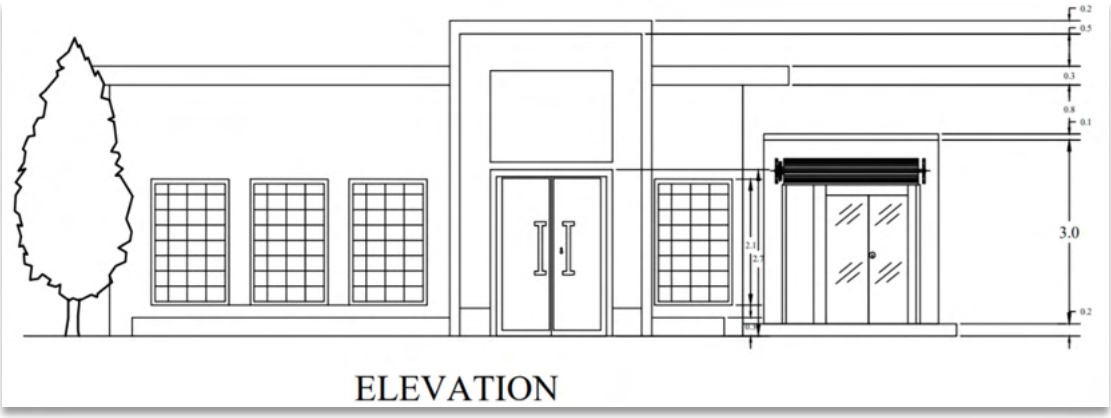
ELEVATION

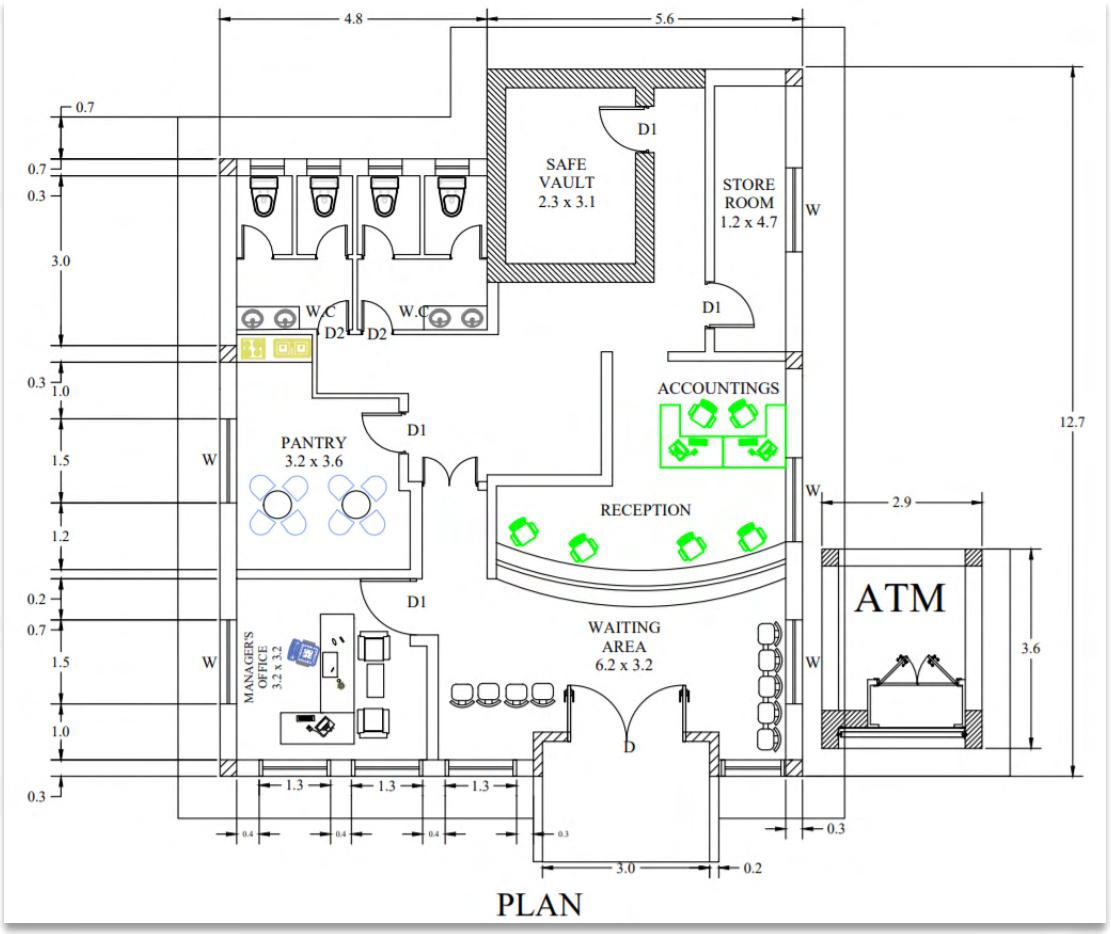


PLAN OF COMMUNITY HALL

Design Infrastructure: Community Hall

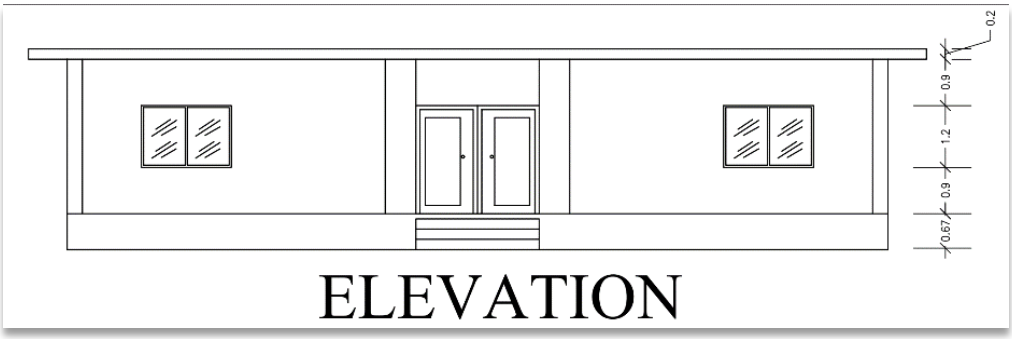
Village – Manekpur
District – Valsad



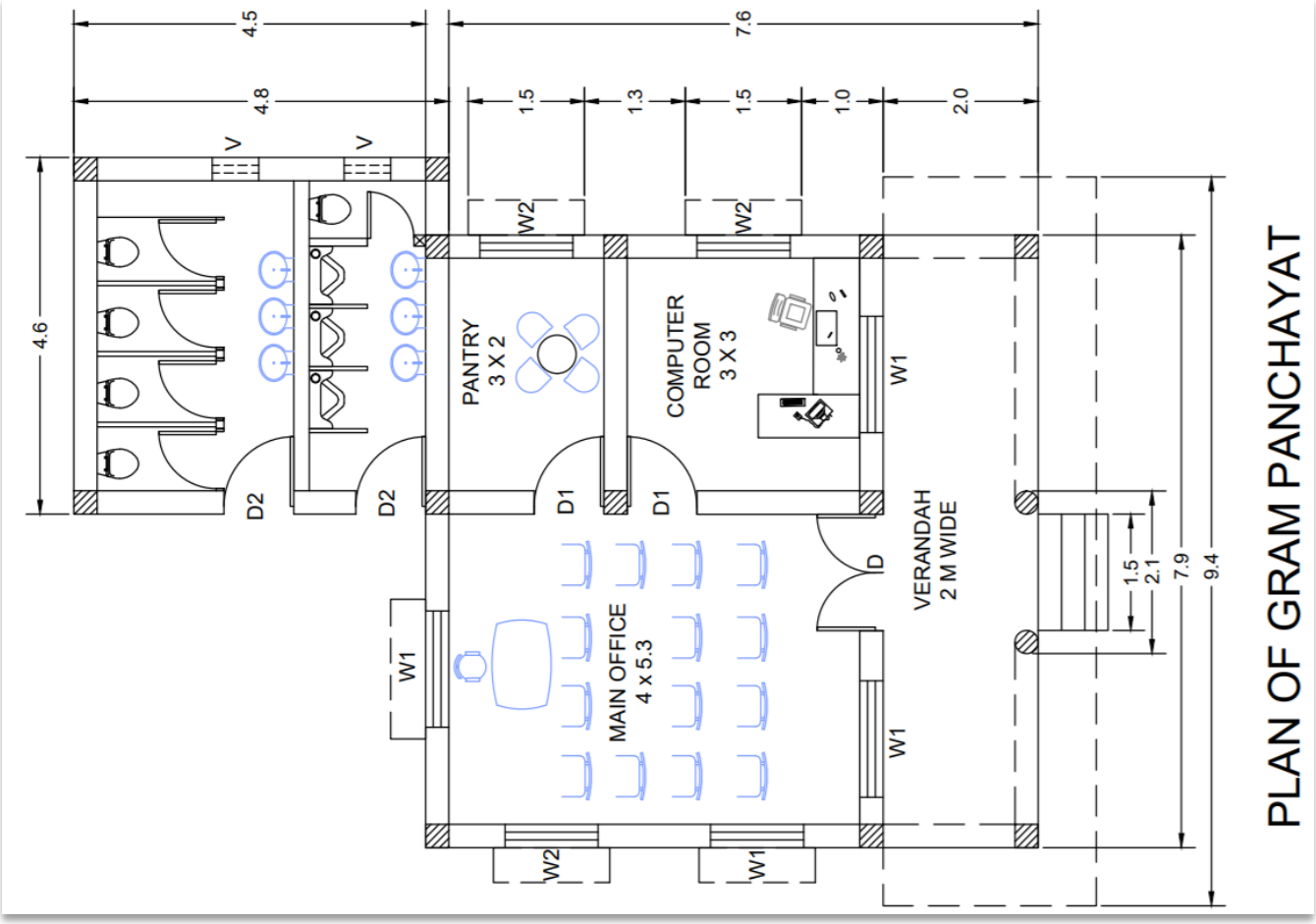


Design Infrastructure: Bank with ATM Facility

Village – Manekpur
District – Valsad



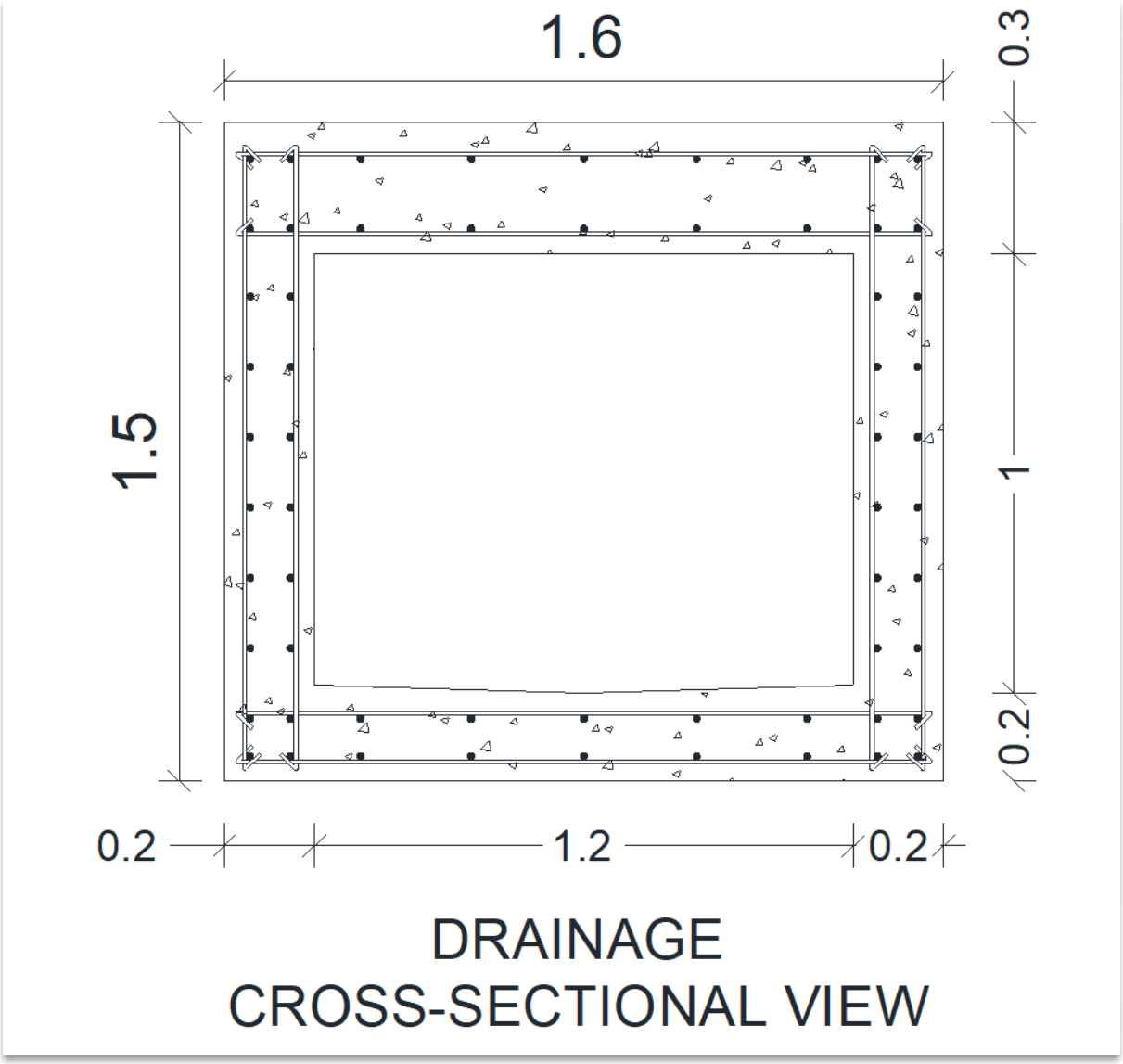
ELEVATION



PLAN OF GRAM PANCHAYAT

Design Infrastructure: Gram Panchayat

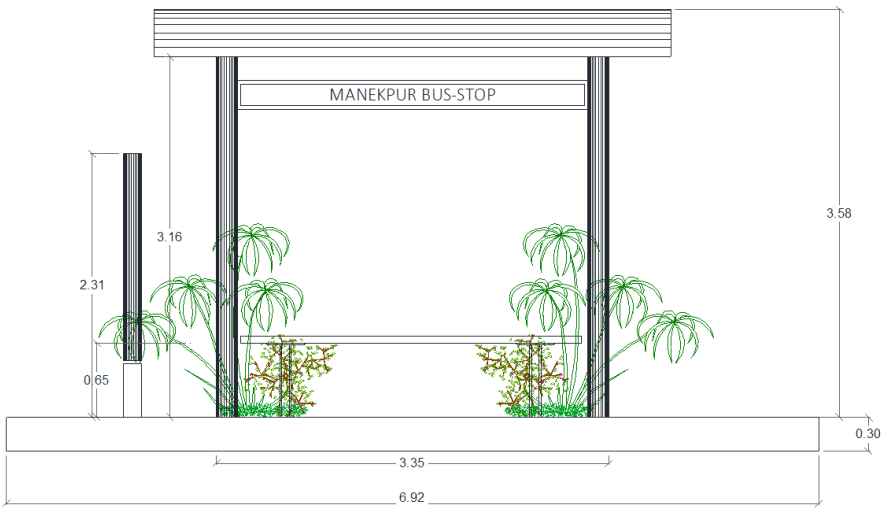
Village – Manekpur
District – Valsad



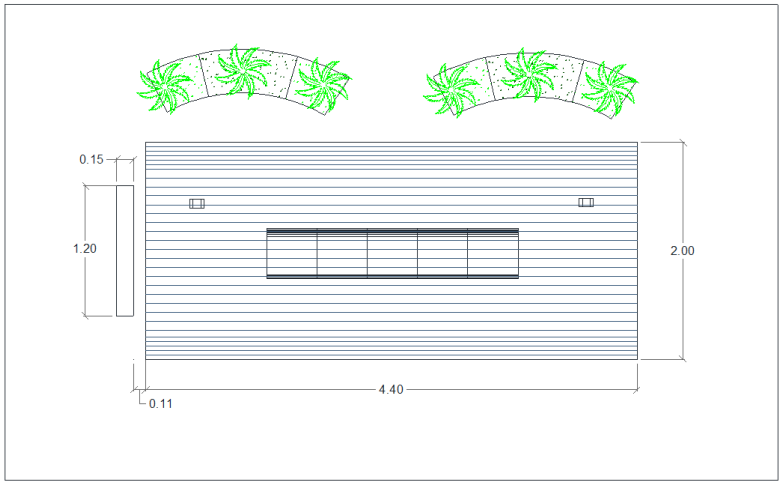
DRAINAGE
CROSS-SECTIONAL VIEW

Design Infrastructure: Drainage Cross-Sectional View

Village – Manekpur
District – Valsad



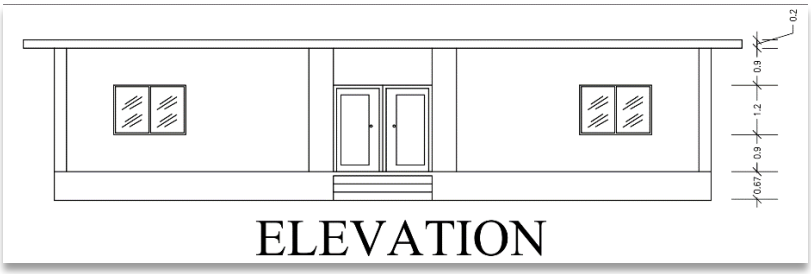
FRONT ELEVATION



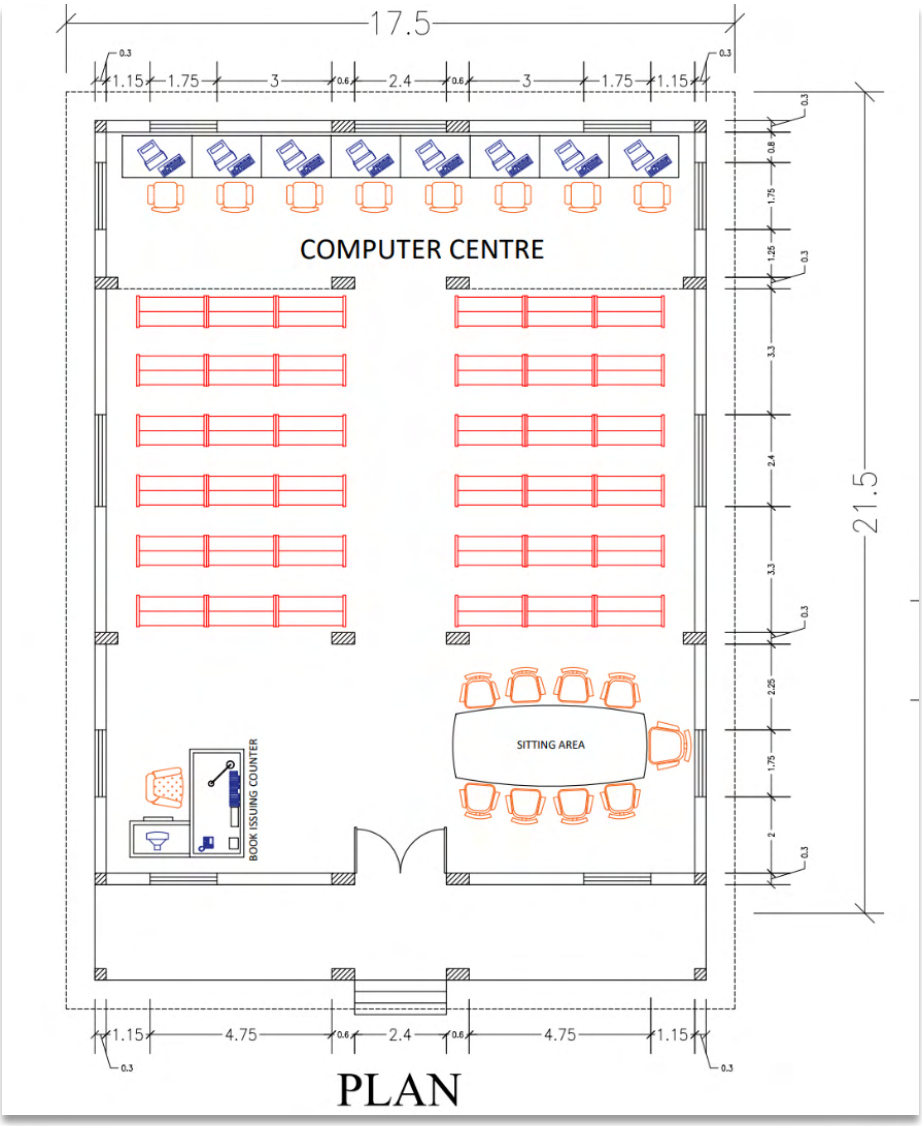
PLAN

Design Infrastructure: Bus Stop

Village – Manekpur
District – Valsad



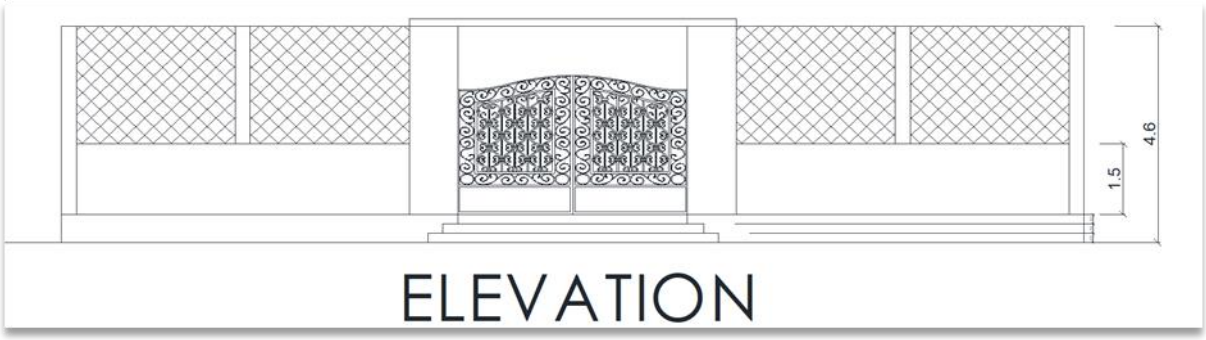
ELEVATION



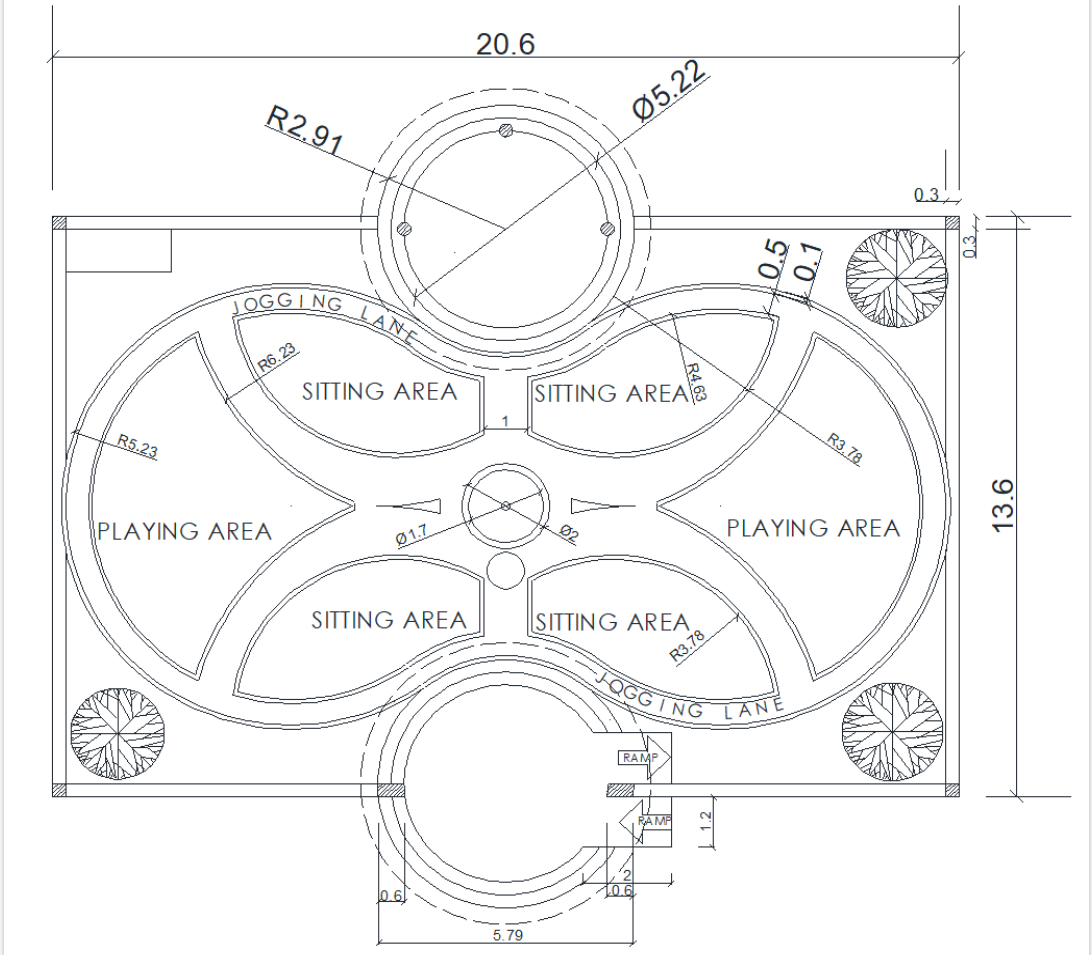
PLAN

Design Infrastructure: Public Library

Village – Manekpur
District – Valsad



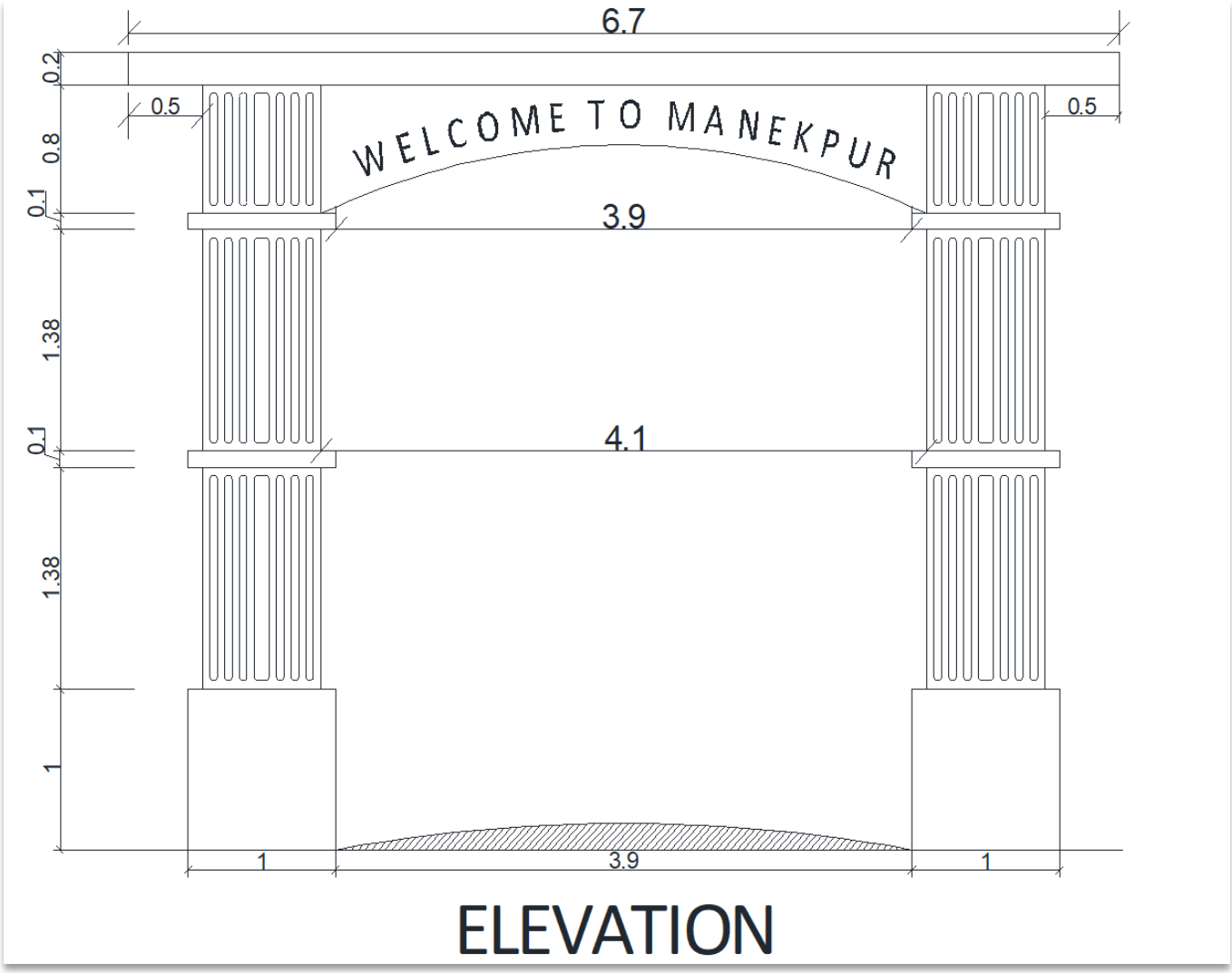
ELEVATION



PLAN

Design Infrastructure: Public Garden

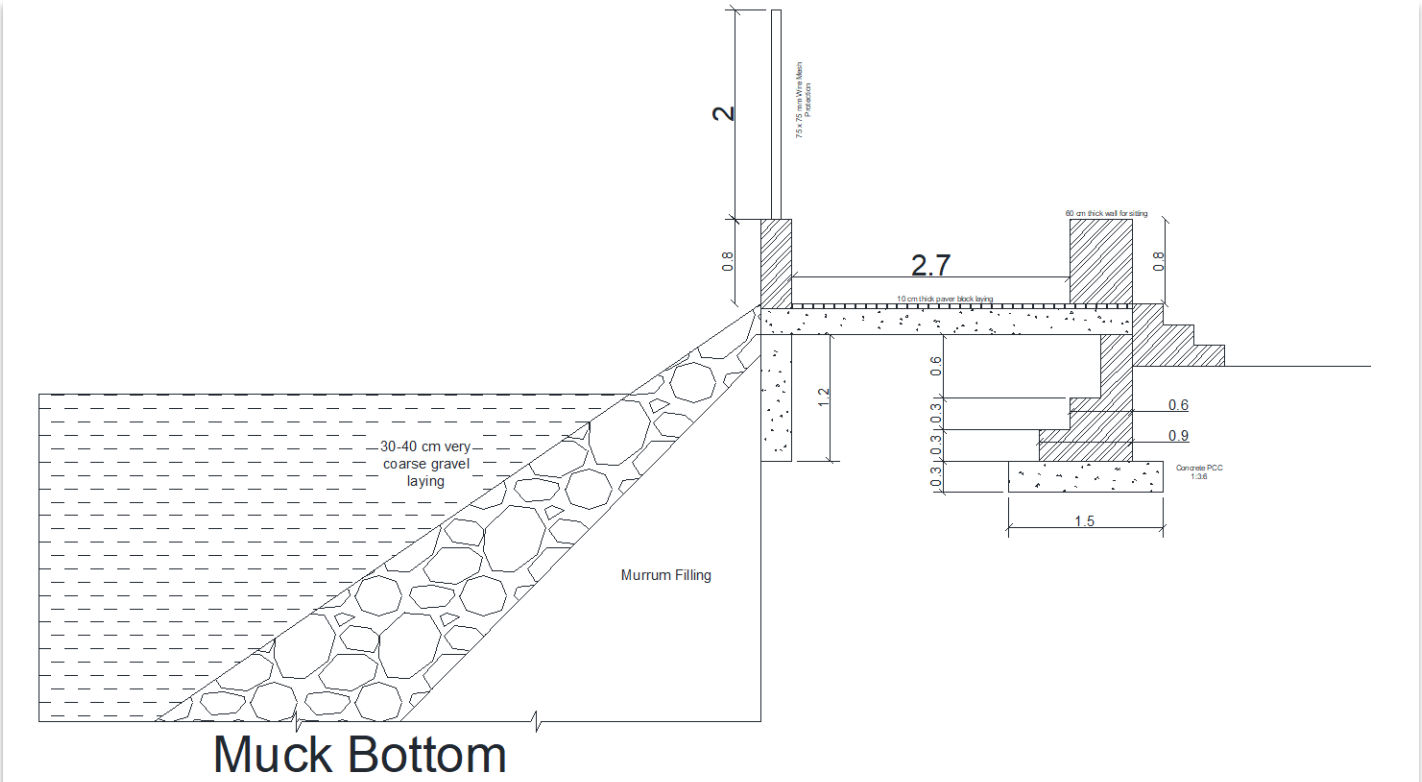
Village – Manekpur
District – Valsad



ELEVATION

Design Infrastructure: Village Entrance Gate

Village – Manekpur
District – Valsad



CROSS-SECTIONAL VIEW OF POND

Design Infrastructure: Pond Recreation

NODAL OFFICER STATEMENT:

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

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

Nodal Officer:
Mr. Amit R. Chauhan
Laxmi Institute of Technology, Sarigam