DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION
KANBHA Village
AHMEDABAD District

PREPARED BY

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PROF.SRINATH KARLI

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/Diploma Engineering successfully submitted.

Detail Project Report for,

VILLAGE KANBHA

DISTRICT AHMEDABAD

Under

Vishwakarma Yojana: Phase-VIII

In partial fulfillment of the project offered by

GUJARAT TECHNOLOGICAL UNIVERSITY, CHANDKHEDA

During the academic year 2020-21.

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

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ABSTRACT

Developing village with a 'rural soul' but with all urban amenities that a city may have"

Vishwakarma yojana deals with the concept of urbanization means to develop the village by providing all the facilities of urban areas but with an aim to conserve the soul of the villages. It intends to reduce the urban pressure and to reduce the rate of migration.
The main objective of this yojana is –"creation of all the basic facilities or infrastructure such as Connectivity, civic, physical infrastructure along with the provision of economy generation by maintaining the natural surroundings of the area is the key element of this yojana" KANBHA is a Village in Daskroi Taluka in Ahmedabad District of Gujarat State, India. It is located 35 km towards east from district headquarters Gandhinagar. After our visit to the village we observed that the conditioned of the village was not proper means the development of the village is in unplanned manner. The facilities provided in the village are not properly maintained which degrades the aesthetics view of the village.
According to our survey we concluded that it is a highly unplanned city and the facilities provided in the village are inappropriate. The main and the most important facility for the development of Village (road) is not in proper condition. So the first thing we had decided is that all the approach Roads as well as internal roads should be made of bitumen (also known as allweather roads).On The basis of gap analysis we had decided to made anangwadi for providing proper and efficient Education of the small children.
For future prospect, the village should use advance technologies in agricultural, water supply as Well as for other fields. They can install solar street light all along the streets to reduce the accidents on the roads. Rain water harvesting system should be installed in every household to conserve the Water. Gardens, playgrounds should be developed in the village for the recreation of the children.
The waste generated by animals should be utilized to generate electricity for this a biogas plant should be installed in the village. For the purpose of beautification street lights should be installed to have better visibility during night and to reduce accidents. As far as possible for maintaining the natural
Surroundings of the village sustainable development method such as rain water Harvesting, solar panels, bio gas plant, etc should be adopted for the development of the village.

KEY WORDS: sustainable development, rain water harvesting, urbanization, Aesthetics, Recreation facilities.

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ABBREVIATIONS

SHORT NAME / SYMBOL	FULL NAME
CC	Cement Concrete
RCC	Reinforced Cement Concrete
UTC	Universal Time Coordinate
GEB	Gujarat Electricity Board
AMC	Ahmedabad Municipal Corporation
AUDA	Ahmedabad Urban Development Association
PHC	Primary Health Centre
DC	Data Centre
MCTS	Mother and Child Tracking System
STE	Solar Thermal Energy
JSY	Janani Suraksha Yojana
NRHM	National Rural Health Mission
ICT	Information & Communication Technology
ICDS	Integrated Child Development Scheme
IST	Indian Standard Time
UGVC	Uttar Gujarat Vij Corporation
LED	Light Emitting Diodes
RO	Reverse Osmosis
IOT	Internet of Things
DER	Distributed Energy Resources
CC3D	Cyber City 3 Dimension
ATM	Automatic Teller Machine
WBM	Water Bound Macadam
AISE	All India Education System
NRDWP	National Rural Drinking Water Program
AC	Air Conditioner
NSSO	National Sample Survey Organization
CRSP	Central Rural Sanitation Program

CHAPTER-1
IDEAL VILLAGE VISIT FROM DISTRICT OF GUJARATSTATE (CIVIL & ELECTRICAL CONCEPT)

1.1Background and study area location: VAHELAL

Vahelal is a village situated in Daskroi Block of Ahmedabad district in Gujarat. Positioned in rural area of Ahmedabad district of Gujarat, it is one among the 56 villages of Daskroi Block of Ahmedabad district. As per the administration register, the village code of Vahelal is 511634. The village has 684 families.

The total geographical area of village is 794.93 hectares. Vahelal has a total population of 3,074 peoples. There are about 684 houses in Vahelal village. Ahmadabad is nearest town to Vahelal which is approximately 25km away. According to Census 2011, Vahelal's population is 3074. Out of this, 1560 are males while the females count 1514 here. This village has 316 kids in the age group of 0-6 years. Among them 161 are boys and 155 are girl.

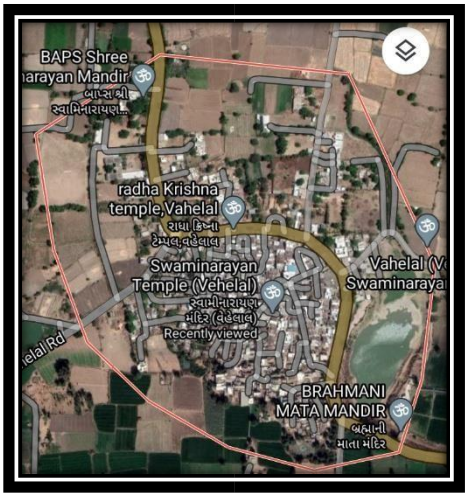

Fig.1 Vahelal village

fig.2 Vahelal

1.2CONCEPTS: IDEAL VILLAGE, NORMAL VILLAGE:

- To provide all the basic facilities to the people to make their life easy and comfortable.
- To provide technical solution of their problem so that they do not need to migrate to urban area.
- Creation of infrastructure – connectivity, civic and social infrastructure along with the provision of the alternative livelihood generation is the key pillars.
- Reduce migration from rural areas to urban areas due to lack of basic facilities and other services which are available in rural areas.
- Promote integrated development to the rural areas with the provision of good quality of housing conditions, better quality of water, proper and good connectivity to roads etc.

1.2.2Live Case studies of ideal village of India/Gujarat

- **CASE STUDY: Payvihir, Maharashtra:**

Fig-3 Case study. **Fig-4**

An obscure village in the foothills of Melghat region of Amravati district in Maharashtra, Payvihir, has set an example for the country by consistently showing how communities and NGOs can work together to conserve the environment and ensure sustainable livelihood for people.

In 2014, Payvihir bagged the Biodiversity Award from the United Nation's Development Programme for turning a barren, 182-hectare land under community forest right, into a forest. Recently, the village also came up with an out-of-the-box idea of selling organic sitafals (custard apples) and mangoes in Mumbai under their brand Naturals Melghat!

Fig.5 **case study**

CASE STUDY: Odanthurai, Tamil Nadu

Odanthurai, a panchayat situated in Mettupalaya mtaluk of Coimbatore district, has been a model village for the other villages for more than a decade. The panchayat has not only been generating electricity for their own use, but also selling power to Tamil Nadu Electricity Board.

Fig-6 Case study

- Having already won international acclaim through its unique welfare schemes and energy self-sufficiency drives, Odanthurai near Mettupalayam has begun efforts to develop a corpus of Rs 5 crore to install wind and solar energy farms. This project will enable free supply of electricity to over 8,000 residents.

1.2.3The Idea of a model

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

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

- The various infrastructure facilities such as houses, schools, colleges, hospitals, etc. are available in the village.
- Agricultural as well as milk cooperative society are also provided in the village.

➢Overhead water tank, sump, PHC etc.

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

Physical & demographic growth:

Vahelal is a large village located in Daskroi Taluka of Ahmadabad district, Gujarat with total 684 families residing. The Vahelal village has population of 3074 of which 1560 are males while 1514 are females as per Population Census 2011.

Table 1

tablet	Male	Female	Total
Total No. of Houses	-	-	684
Population	1,560	1514	3074
Child (0-6)	161	155	316
Literacy	92.85 %	83.96 %	88.47%

Demographic and Infra structures:

- Approach roads of Vahelal are well developed and connected to SP ring road circle.
- Infrastructure of village is good and developed as we can see in pictures of Vahelal.
- The roads of village are so good and have good facilities in the village like Pucca houses Atm banks etc.

Fig.7Shop Vahelal

Fig.8 YantricBhavan

Fig.9 PasuDavakhanu

Fig.10 Internal streets of ahelal

Fig11HGCE COLLEGE OF VAHELAL

SWOT analysis of Ideal village / Smart Village:

STRENGTH	WEAKNESS	OPPORTUNITY
➢ Education ➢ Road network ➢ Gram panchayat ➢ Building ➢ Bank	➢ No Cinema Hall & recreational facilities ➢ No water treatment plant	➢ To make whole village make digital and Wi-fi connected

Table 4

1.4 Future prospects of village:

- In Vahelal village, they are going to maintenance for bio gas plant and Solar Street Light.
- They are going to developed village with more technologies like rain water harvesting system.

1.5 Future prospects of the Ideal Village: -

- In village, they are going to apply for PHC and Banking facility
- They are going to developed village with more technologies like rain water harvesting system And bio gas plant.

1.6 Benefits of the visits of Ideal village / Smart village

- To know the strength of village and weakness of villages
- We realize some different type of little requirements of village.
- We discussed the good and bad thing about village
- We sow all type of basic and primary facility available
- There is proper planning of main road, division of varandha and construction work.
- To know the physical development of village.
- To know the physical availability of the amenities in the village.

CHAPTER-2
KANBHA VILLAGE LITERATURE REVIEW – (CIVIL)

2.1 Introduction: Urban & Rural village concept:

According to Herald globe theory an urban area is a human arrangement with high people density and infrastructure of built environment. Urban areas are created through urbanization and are Categorized by urban morphology as cities, towns, conurbations or suburbs. In urbanism, the term Contrasts to rural areas such as villages and hamlets and in urban sociology or anthropology It contrasts with natural environment. The creation of early predecessor of urban areas during the Urban rebellion led to the creation of human civilization with modern urban planning, which along with other human activities such as exploitation of natural resources leads to human impact onthe atmosphere.

FIG-12

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

- Rural area: The area which has less population, 70% population engage with agriculture Occupation. Typical rural areas have a low population and small settlements of human. Agriculture areas are commonly rural, as are other types of areas such as forests.
- Village: as per census 2011 the population of village is between 2000 to 20000 and basic.
- Facilities like primary school, PHC is available and living standard of people is low as compared to urban area.

- Village is a settlement having low population density and more area than hamlet and less then

2.3 Ancient Village/Different Definition of: Rural area/Villages:

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

2.4 & 2.5. Scenario: Rural / Urban India & Gujarat Census 2011:

According to the census of India 2011, these are a few of trends of urban and rural population of India.For the first time after independence the increasing population is more in urban area that in rural area.

Rural population-68.84%. **Urban population-31.16%**

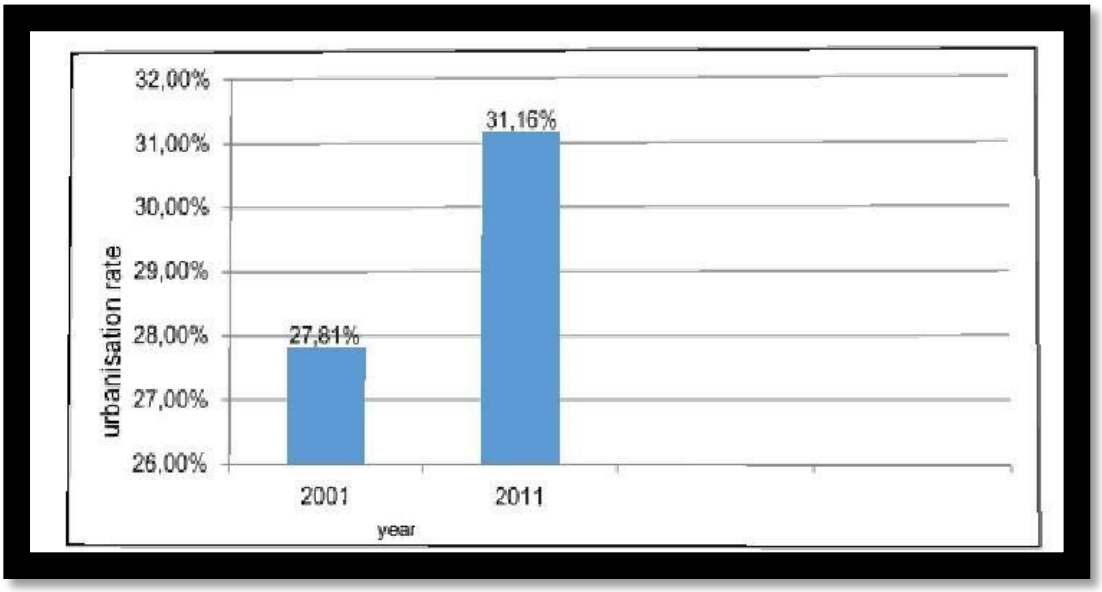

Fig-13 Urbanization vs year

Table-3

Description	2001	2011
Approximate Population	5.07 Crore	6.04 Crores

Actual Population	50,671,017	60,439,692
Male	26,385,577	31,491,260
Female	24,285,440	28,948,432
Population growth	22.48%	19.28%

2.6. Rural Issues & Concerns

- Market unavailable
- No transportation facility
- Lake of education
- Lake of awareness
- No proper sewage system
- Migration to urban area
- Not available electricity

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

1. **Waste management system**: If Prime Minister Narendra Modi's Clean India Campaign has to India will need an efficient waste management system. This is a key infrastructure required to improve sanitation and prevent outbreak of diseases. At present, wastes from households are mostly disposed in city outskirts by municipalities. There is an urgent need to set up recycling facilities as a lot of times the waste often ends up in rivers polluting them. Also, drainage facilities are a major problem with most towns getting flooded during the monsoons.
2. **Power:** The government has electrified over 7,000 villages in 2015-16 which stands 37 per cent higher than the previous three years. But this
may not necessarily mean that all houses in the villages have access to electricity. This is because it takes time to set up the infrastructure such as transformers and power lines needed to distribute the electricity to every house. According to a study, the delay in actual electrification ranged from two years (in the case of Jharkhand and Bihar, which saw a recent wave of electrification) to more than 25 years in Odisha and about 15 years in the case Madhya Pradesh and Uttar Pradesh.

3. **Roads:**There is a positive relationship between connectivity and development in smaller towns and villages in India. With better roads and highways, there can be a better flow of business, trade and communication that will eventually enhance growth. Mountainous areas and remote villages are cut off from the network of roads, which need to be connected. The government has allocated thousands of crores for building a strong transport network that can link different cities and small towns with regional hubs. However, several projects across the country have seen slow progress over the years severely impacting the economic progress of the small towns.

4. **Schools:** Many small towns lack basic educational infrastructure. Most schools don't have Proper toilets, electricity, and proper buildings with roofs. There is also lack of drinking water. The

condition of government schools is also not satisfactory, according to many reports. There Have been several cases of poisoning due to poor quality mid-day meals in government schools.

5. **Hospitals**: The number of hospitals and medical dispensaries need to be pumped up in rural India. The government hospitals in most parts of the country are not up to the mark and medicines not readily available. According to a study, rural public health facilities have a hard time ensuring a regular presence of medical professionals, trained doctors and pharmacists. In addition, there is a high level of absenteeism of those already employed.
6. **Affordable Housing:** Owning a house is an aspiration for a lot of middle-class Indians but the cost of buying a property is extremely high. Banks offer home loans for purchase, which has to be paid back in monthly instalments. High EMI rates and low earnings builds pressure on the people. The present government has acknowledged this problem and announced the "Housing for All by 2022" scheme. However, considering the present market conditions, many industry experts call it a far-fetched idea. In an interview to the Business Insider, global real estate company JLL India's country head AnujPuri told the Business Insider said that making 2 crore urban houses and 4 crore rural houses available is a huge.

7. **Water supply:** Among the 122 countries that are ranked in quality of portable water, India falls at 120, despite having 4 per cent of the world's water resources. There is inadequate piped water supply across rural India and the houses that receive water are mostly untreated. During years of bad monsoon, crops suffer because of the lack of irrigation facilities.
8. **Sanitation Facilities:** Open defecation is a major issue in rural and semi-rural India despite themany governmental schemes and awareness programmes. According to a United Nations report in 2010, out of a total of 2.5 billion people worldwide that defecate openly, 665 million belong to India. And what is more alarming is the fact that some 88 per cent of diarrhoeal deaths worldwide are attributable to unsafe water, inadequate sanitation and poor hygiene. "Improving access to safe drinking water, adequate sanitation and promoting good hygiene are key components in preventing diarrhoea," the report said.

2.8 Ancient / Existing Electrical concept study as a Literature Review for Village development:

- Public transportation
- Aware to people
- Sanitation facility
- Electricity
- Water demand
- Education
- Hospital

2.9 Other Projects / Schemes of Gujarat / Indian Government

Fig.14 National Rurban Mission

fig.15 Pradhan MantriAdarshYojna

Fig.16National Social Assistance Gramin

fig.17 Saansad adarsh gram yojana

Doodh sanjivni yojana

Rooftop solar scheme

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

3.1 Understanding Smart Cities (Concepts, Definitions and Practices):

- To close the gap in the literature about smart cities and in response to the increasing use of the Concept, this paper proposes a agenda to understand the concept of smart cities.
- A smart city is an urban area that uses different types of electronic Internet of things (IoT) sensors to collect data and then use these data to manage assets and resources efficiently.
- Based on the exploration of a wide and extensive array of literature from various disciplinary areas We identify eight critical factors of smart city initiatives: management and organization, technology, Governance, policy context, people and communities, economy, built infrastructure, and natural environment.
- This includes data collected from citizens, devices, and assets that is processed and analysed to Monitor and manage traffic and transportation systems, power plants, water supply networks, waste management, crime detection, information systems, schools, libraries, hospitals, and other community services.
- The framework suggests directions and agendas for smart city research and outlines practical implications for government professionals.

3.2Vision-Goals, Standards and Performance Measurement Indicators:

A. Transport: Maximum travel time of 30 minutes in small &medium size cities and 45 minutes in metro polianites. Continuous unobstructed footpath for 2 m wide on either side of all street with Row 12 m more dedicated and physically segregated bicycle tracks with width of 2 m or more, one in each direction, should be provided on all streets with carriage way larger than 10 m. High quality and high frequency mass transport within 800m (10-15-minute walking distance) of all residences in areas over 175persons / ha of built area).

B. Spatial Planning:175 persons per Ha along transit corridors. 95% of residences should have daily needs retail, parks, primary schools and recreational areas accessible within 400m walking distance.95% residences should have access to employment and public and institutional transport or bicycle or walk. At least 20% of all residential units to be occupied by economically weaker sections in each Transit oriented Development Zone 800m from Transit Stations. At least 30% residential and 30 commercial/institutional inventory TOD Zone within800m of Transit Stations.
Water Supply:

- 24 x 7 supply of water
- 100% household with direct water supply connections
- 135 litters of per capita supply of water
- 100% metering of water connection.
- 100% efficiency in collection of water related Charges **Sewerage &Sanitation:**

- 100% households should have access to toilets
- 100% schools should have separate toilets for girls
- 100% households should be connected to the waste water network ▪100% efficiency in the collection and treatment of waste water ▪100% efficiency in the collection of sewerage network.

E.Solid Management:

- 100% households are covered by daily door-step
- collection system
- 100% collection of municipal solid waste
- 100% segregation of waste at source, i.e. bio- degradable and non-degradable waste ▪100% recycling of solid waste **F.Storm storage:**
- 100% coverage of road network with storm water
- 100 % rainwater harvesting **G.Electricity:**
- 100% households have electricity connection24 x 7 supply of electricity
- 100% recovery of cost
- Tariff slabs that work towards minimizing waste

H.Health care facilities

- 30 minutes' emergency response time
- Intermediate Hospital (Category B) – 80 beds per lakh population
- Intermediate Hospital (Category A) – 200 beds per lakh population
- Multi-Specialty Hospital – 200 beds per lakh population▪Specialty Hospital – 200 beds per lakh population

3.3Technological Options:

- **Smart IOT devices:**

"As cities move from millions to billions and then trillions of devices transmitting usable and potentially unusable information, bandwidth efficiency and capacity could be challenged. Short range notification that a user-selected need can be fulfilled nearby, whether it is the location of a subway station or a service, provides convenience without tying up some of the bandwidth of the carrier data networks. Perhaps this will have the side benefit of a reduction in the number of signs and therefore the visual clutter that they cause on our city streets,"

- **Smart energy:**

"Lighting is ubiquitous—it's everywhere that people work, travel, shop, dine, and relax. Digital communications and energy-efficient LED lighting are revolutionizing urban lighting infrastructures already in place, transforming them into information pathways with the capacity to collect and share data and offer new insights that enable, and really drive, the smart city," Said Susanne Seitinger, PhD., Philips Lighting, professional systems.

3.4 Road Map and Safe Guards:

- Major technological, economic and environmental changes have generated interest in

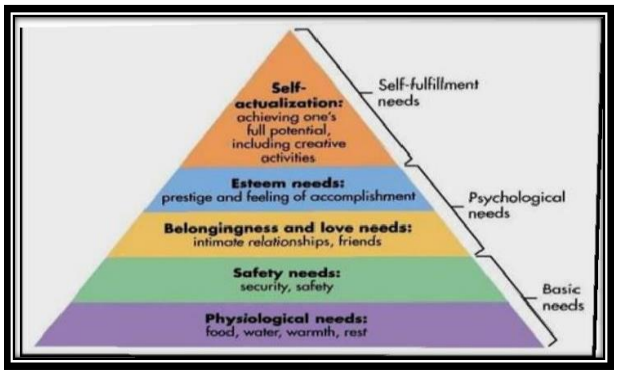

Fig.19

smart cities, including climate change, economic restructuring, the move to online retail and entertainment, ageing populations, urban population growth and pressures on public finances. The European Union (EU) has devoted constant efforts to devising a strategy for achieving 'smart' urban growth for its metropolitan city-regions. The EU has developed a range of programmes under 'Europe's Digital Agenda". In 2010, it highlighted its focus on strengthening innovation and investment in ICT services for the purpose of improving public services and quality of life. Arup estimates that the global market for smart urban services will be $400 billion per annum by 2020. Examples of Smart City technologies and programs havein Singapore, Dubai, Milton Keynes, Southampton, Amsterdam, Barcelona, Madrid, Stockholm, Chi and New York.

The smart city concept integrates information and communication technology (ICT), and various physical devices connected to the IoT network to optimize the efficiency of city.

operations and services and connect to citizens. Smart city technology allows city officials to interact directly with both community and city infrastructure and to monitor what is happening in the city and how the city is evolving. ICT is used to enhance quality, performance and interactivity of urban services, to reduce costs and resource consumption and to increase contact between citizens and government. Smart city applications are developed to manage urban flows and allow for real-time responses. A smart city may therefore be more prepared to respond to challenges than one with a simple "transactional" relationship with its citizens. Yet, the term itself remains unclear to its specifics and therefore, open to many interpretations.

3.5 Issues & Challenges:

Issues concerned with developing Smart City Projects:

Under the flagship —Safe City project, the Union Ministry proposes USD 333 million to make seven big cities (Delhi, Mumbai, Kolkata, Chennai, Ahmedabad, Bangalore and Hyderabad) to centre on technological progress rather than manpower. Ministry of Urban Development plans to invest more than USD 20 billion in the metro rail projects in coming years. The proposed 534 km, Mumbai-Ahmedabad high speed rail project will have an investment of around USD 10.5 billion.

Challenges for Smart City Projects in India:

The High-Power Expert Committee on Investment Estimates in Urban Infrastructure has assessed a per Capita Investment Cost (PCIC) of $685 for a 20 years period. The total estimate of investment requirements for the smart city comes to $113 billion over 20 years (with an annual escalation of 10 percent from 2009-10 to 2014-15) Land acquisition, foreign direct investment and other questions still remain unresolved. The prospect of heavy sums of private sector finance, either domestic or foreign will be a challenge. These concerns mean many projects may not be commercially viable at the starting time.

3.6 Smart Infrastructure – Intelligent Traffic Management:

Smart infrastructure provides the foundation for all the key themes related to a smart city, including smart people, smart mobility, smart economy, smart living, smart governance and smart environment. The central characteristic that underlies most of these components is that they are connected and that they generate data, which may be used intelligently to ensure the optimal use of resources and improve performance. This section introduces some key Components of smart city infrastructure and concludes by highlighting the need for a combined method in dealing with such infrastructure.

Intelligent transport systems vary in technologies applied, from basic management systems such as navigation; traffic control systems; container management systems; variable message signs; automatic or cameras to monitor applications, such as security CCTV systems, and automatic incident detection or stopped vehicle detection systems; to more advanced applications that integrate live data and feedback from a number of other sources, such as parking systems; weather information; bridge de-icing (US deicing) systems; and the like. Additionally, predictive techniques are being developed to allow advanced modelling and comparison with historical baseline data. Some of these technologies are described in the following sections.[1]

Smart infrastructure includes following:

- Smart building
- Smart mobility
- Smart energy
- Smart waste management
- Smart Health

FI -2

3.7Cyber Security:

Cyber security in the context of Smart Cities is a hot topic. The objective of Smart Cities is to optimize the city in a dynamic way tooffer a better quality of life to the citizens through the application of information and communication technology (ICT). The range of areas where cities can become smarter is extensive: it is an evolution of “Connected Cities” with the prevalence of

data exchange at a larger scale. Cyber security or information technology security are the techniques of protecting computers, networks, programs and data from unauthorized access or attacks that are aimed for exploitation. … network security includes activities to protect the usability, reliability, integrity and safety of the network.

- Municipalities should support the development of a harmonized cyber security framework.
- The European Commission and Member States should foster knowledge exchange and collaboration in cyber security among industry, Member States and municipalities
- IPT Operators should develop a clear definition of their security requirements
- IPT Operators and Municipalities should allocate higher spending on cyber security

➢Manufacturers and solution vendors should integrate security in their product

3.8 Retrofitting- Redevelopment- Greenfield Development District Cooling

- **Air conditioners and hammed services:**

In the Southeast, air conditioners are almost crucial pieces of equipment for home comfort. However, it can be difficult to find the right air conditioner for your home, one that will provide enough cool air in the summer to cool your home without driving your energy costs through the roof. We can help! At Hammond Services, we can help you choose the perfect air conditioner for your home, install it professionally, and even maintain/repair it in the years ahead.

3.9Strategic Options for Fast Development:

- Sometimes the smartest tech is low-tech

When exploring ways to extract value from open sensor data, don't overlook the invaluable role inexpensive, low-tech options can play in advancing smart city goals.

- Collaborate, collaborate, collaborate

Open data sharing and collaboration with residents, civic tech communities and ecosystem partner's is essential for driving smart city innovation. ▪Go small before you go big

The use of pilot projects and open sensor data can play a pivotal role in ensuring high returns for smart city initiatives.

- Attend to the tech must-haves

Some technologies that are promoted as essential are really just nice-to-haves, but there are two technologies for succeeding with open sensor data that are undeniably musthaves.

- Treat your sensor data like a valuable asset: it is!

Cities are discovering the importance of having full access to their own smart city data, and can share it with others.

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

Swatch Bharat Abhiyan was launched by Hon'ble Prime Minister of India on 2nd October, 2015, which caught attention of everybody not only in India, but also in the world. The government thus taken various steps to create awareness among the masses for keeping the area surrounding them

neat and clean. Government is also paying special attention for cleaning of rivers, railway stations, tourist destinations and other public places.

- To achieve the target of cleanliness, the technologies to treat the waste material should also be Developed along with creating awareness. There are many technologies that are used to treat waste material. They are usually very costly, very complex to be understood and viable only for large size units. At the same time, indigenous technologies are low cost capital and easy to use and they can also be used by different size units. In India, they are particularly suitable for the small and medium units. In this regard, a National workshop on Indigenous water, Wastewater and Solid Waste Treatment Technologies was organised by the Department of Atomic Energy (DAE) in January, 2015 at Gujarat Technological University (GTU) in Ahmadabad.

- The objective of the workshop was to disseminate indigenous technologies of water, wastewater and solid waste treatment developed by the Bhabha Atomic Research Centre (BARC) under "Swatchh Bharat Abhiyan" and to bridge gap between the research at the research centres and the practical application of the technologies. The BARC is playing a pivotal role in the development of these technologies.

Some of these technologies are as follows:

- **Environment friendly Plasma technologies:**

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

- **Indigenous water purification technologies:**

Cities. It uses the Pressure Driven Membrane Processes. These are suitable for all capacity units e.g. they are adaptable from household level unit or community level unit to large scale unit. Water purification technologies make use of the nuclear energy and solar energy also.

3.11 Initiatives in village development by local self-government:

First it was the cities and now it's the turn of Indian villages to undergo a makeover.oHaving moved a step ahead with the release of the draft concept note on the smart city scheme, the government is geared up to launch the SaansadAdarsh Gram Yojana (SAGY) on Saturday at a function to celebrate the birth anniversary of Jayaprakash Narayan.oThe programme, a brainchild of the rural development ministry, is aimed at driving allround development of villages through a participative approach and will use the existing funds allocated for various development projects.oAccording 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.

3.12Smart Initiatives by District Municipal Corporation:

Managing solid waste is a daunting task for every urban local body (ULB) in India. The irony is such 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 ageold garbage disposal methods with a touch of new technologies. The Council has listed some of the proven examples that can be considered for tackling such a sensitive issue.

ace Pune's example. The city has managed to tackle the waste of over 1,700 tones that it generates daily, while ensuring minimization of land fill, 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:

Lake redevelopment

The historic Kankaria Lake has been a part of Ahmedabad since its foundation was laid by its then ruler Ahmed Shah in 1451. Originally planned as a green destination, it suffered due to heavy vehicular traffic encircling the lakeside road, unorganized and informal activities in the area as well as an unkempt environment.

Initiated by the Ahmedabad Municipal Corporation, the primary objective of the Kankaria Lakefront Development was to transform this city-scale public space with efficient and robust infrastructure. The strategies to implement this transformation included creating complete pedestrian zones encircling the lake's edge, developing an outer ring road by strengthening the existing road network, creating approximately 6 km of access streets as well as new access Points to the lakefront, enhancing recreational potential by improving public facilities, preserving historic buildings and encouraging overall development within the precinct

FIG-21

The pedestrian promenade is lined with gardens, food courts and organized vending spaces. The design of the promenade includes 2 km-long uninterrupted pedestrian zone along the edge of the lake lined by street furniture. The street furniture zone comprises trees, lights, seating facilities and dustbins act as a buffer between the pedestrian zone and the cycle track.

Amongst the various recreational activities provided, the mini train circling around the lake is the most popular. While designing, great attention was paid to the detailing of sidewalks, carriageways and on-street parking.

BEFORE

FIG3.22

FIG. 23

FIG.24

AFTER

FIG.25

FIG.26

FIG.27

The pedestrian promenade is lined with gardens, food courts and organized vending spaces. The design of the promenade includes 2 km-long uninterrupted pedestrian zone along the edge of the lake lined by street furniture. The street furniture zone comprises trees, lights, seating facilities and dustbins act as a buffer between the pedestrian zone and the cycle track. Amongst the various recreational activities provided, the mini train circling around the lake is the most popular. While designing, great attention was paid to the detailing of sidewalks, carriageways and on-street parking.

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CHAPTER-4
ABOUT KANBHA VILLAGE

4.1 Introduction:

4.1.1 Introduction About Kanbha Village details :

- **Locality Name:** Kanbha
- **Taluka Name:** Daskroi
- **District:** Ahmedabad
- **State:** Gujarat
- **Language:** Gujarati and Hindi
- **Time zone:** IST (UTC+5:30)
- **Telephone Code / Std Code:** 02717
- **4.1.2 Justification/ need of the study:**

Vishwakarma Yojana is one of the initiatives towards Rurbanisation by government of Gujarat, which was allotted as a pilot project to GTU. The students and Faculty Members meet all the stakeholders in a village, survey the existing facilities. Then they re-imagine and re-design the whole of the infrastructure of the village. The students and Faculty Members meet all the stake-holders in a village, survey the existing facilities. Then they re-imagine and re-design the whole of the infrastructure of the village. The students use their engineering skills to prepare detailed project reports for the infra-structure as a part of their Final Year project work. **4.1.3 Study area (broadly defined):**

Kanbha is a Village in Daskroi Taluka in Ahmedabad District of Gujarat State, India. It is located 11 KM towards from District headquarters Ahmadabad 27 KM from State capital Gandhinagar.

4.1.4 Objectives of the study:

- Creation of infrastructure – connectivity, civic and social infrastructure along with Provision of alternative livelihood generation are the key pillars.
- Basic Socio-cultural Infrastructure – Community Hall, Public library, recreation facilities should be the priority focus and be provided.
- Basic Sustainable Infrastructure – Rainwater harvesting system, Bio gas plant, solar street light facilities, eco-friendly toilet should be provided and ensure proper delivery of facilities to village dwellers.
- Promote integrated development of rural areas with provision of quality housing, better connectivity, employment opportunities and supporting physical and social infrastructure.

4.1.5 Scope of study:

To provide basic facility this is essential requirement for the village.

Due to providing facilities future development of village will be possible. ▪Thus migration in urban area is reduce

- **4.1.6Methodology / Study framework:**

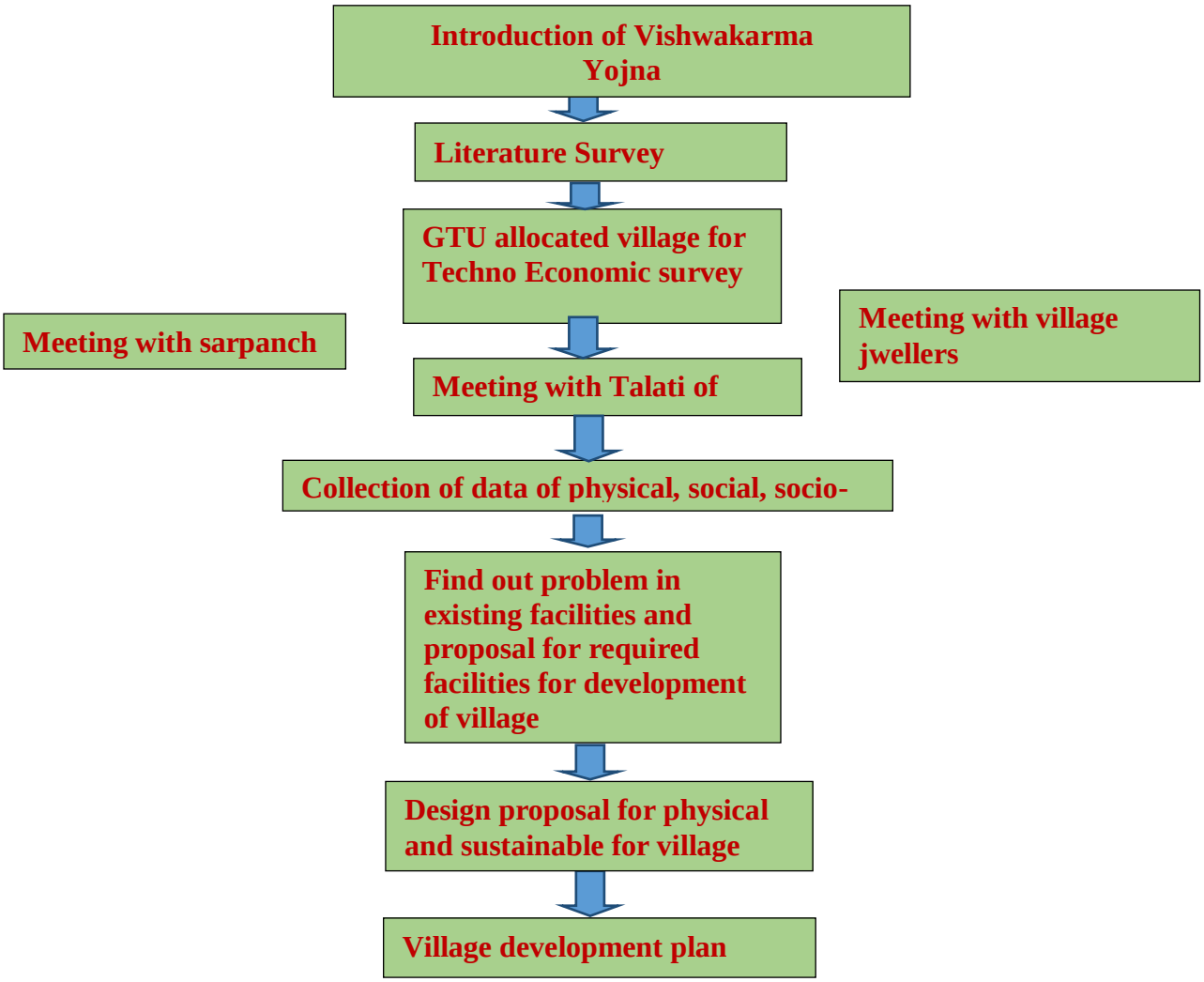


Fig-4.1.6 methodology

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

- **Water tank facility**
- **Transportation facility**
- **Health facility**
- **Education facility**
- **24 hr. electricity**

4.2 Kanbha study area profile:

4.2.1 Study Area Location with brief History land use details:

- Kanbhais a Village in Daskroi Taluka in Ahmadabad District of Gujarat State, India
- It is located 11 KM towards East from District head Quarters Ahmedabad.
- **Locality Name:** Kanbha
- **Taluka Name:** Daskroi
- **District:** Ahmedabad
- **State:** Gujarat
- **Language:** Gujarati and Hindi
- **Time zone:** IST (UTC+5:30)
- **Telephone Code / Std Code:** 02717

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

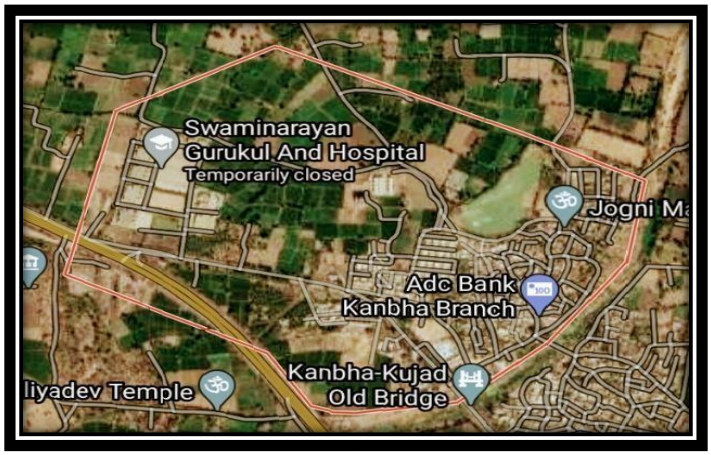


Fig.29

4.2.3 Physical & Demographical Growth

Table-4

Census	Male	Female	Population	Total no of household
2001	-	-	3940	-
2011	2428	2069	4498	1285

4.2.4 Economic generation profile / Banks:

- One bank is available in the village.
- Through which the people of village can be easily withdraw and deposit the money.

4.2.5 Actual Problem faced by Villagers and smart solution:

- Not available waste management system.
- Not available higher secondary school.

4.2.6 Social scenario:

- It was found that all the people of this village are not connected with today's technology. ▪The major crops produced in the village are Wheat and castor etc
- The major population is get income through the business work and farming work, there are no other job opportunities.
- The education is limited to 10 Standard.

4.3 Data Collection KANBHA VILLAGE, (Photograph/Graphs/Chartscollectio):

4.3.1 Describe Methods for data collection:

- Base line survey is a standard for any intervention during and post application of any development program. A complete baseline survey was undertaken which involved household census survey, bio-physical survey and Village level data collection from Talati. This gave in the details of the
- Demographic profile of the village, the literacy percentage, SC/ST population, cattle population and net consumption rate in the village, average milk production of the cattle and various schemes running and their benefits Bio- physical survey was undertaken to identify various natural resources available in the village. It included the soil typology, well in the area, crop taken in the field, cropping pattern, fertilizer used and various sources of irrigation in the field.

4.3.2 Primary details of survey details:

- Kanbha village is situated in Daskroi Taluka in Ahmedabad district of Gujarat state. People of this village living in peaceful manner. This village having very proud history. This village waiting for industrial development. Education, drinking water, road and electricity are the main concern of this village. If banks and finance institutions provide loan and other financial support to the villagers, this village will see the real development. Medical and health services has to be improved.

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

- There is total 1054 houses in village. Most of the houses in village are pucca houses. The ratio of pakka house id 5:4.

The process of tagging something (i.e any objects, infrastructure Etc.) with geographical information like latitude, longitude, distance, place name, accuracy data in form of geospatial metadata (may be any QR code, RSS feeds, SMS messages) is called as geotagging.

4.3.4No of Human being in One House:

- Here are 1285 no. of houses in village. 5906 population are in village.
- Minimum 2to 3 and maximum 7to. 8

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

- Most of the houses in the village are pakka houses and are made up of materials which are locally available in the village. For the construction of houses, the materials which are locally available are cement, sand, steel, wood, water, bricks and aggregates etc.

- Major economic option of the village is farming so there are no more locally material available like standard bricks, aggregates, concrete and reinforcements. So, this material is brought from nearest city for construction of the houses.

4.3.6Geographical Detail:

The total geographical area of the village is approximately 937 hectares covering the total area of the village. Out of which 725 hectare is the agricultural land used for farming and other agricultural practices. There is no railway station Kanbha in less than 10 km.

4.3.7Demographical Detail:

Table: 5

Scenario	Male	Female	Population	No of household
2001	-	-	3940	-
2011	2428	2069	4498	1285

4.3.8 Occupational Detail:

52% population of Kanbha connected with agriculture occupation. Other occupation is daily Wages and some people connected with animal husbandry. The farmers use drip irrigation system, tube well, well and mostly Depend on Rain for the purpose of Agriculture.

4.3.9Agricultural Details:

Most of the people of village engaged with the agricultural activities. other work of the villagers is doing animal husbandry and labour work, household industries.

4.3.10 Physical Infrastructure Facilities – Manufacturing HUB / Ware Houses:

Wheat, Arenavirus and milk are the main manufacturing product of this village

4.3.10 Tourism development available in the village for attracting the Tourist:

No tourism in this village

4.4 Infrastructure Details (With Exiting Village Photograph):

The village has one overhead tank and one tube well bore. Overhead tank capacity is 60000 litters. The village has a drinking water facility also have primary school, gram panchayat and aanganvadi.

4.4.1 Drinking Water / Water Management Facilities:

- The village has drinking water facility. 4 head pumps are there and also

Fig.30 **4.4.2**

Drainage Network / Sanitation Facilities:

- The village has an underground drainage system. All houses have a proper sanitation facility.

4.4.3 Transportation & Road Network:

Fig 31

fig 32

4.4.4 Housing condition:

- The village has a kuccha/pukka house.

Fig.33

fig.34

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

- The village have bank, Milk co-operative bank, private health center, Gram panchayat and primary school.

Fig-35 school

fig.36 Prathmikaarogyakendra

Fig.37 kanbha gram panchayat

fig.38 kanbha bank

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

- The village has public toilet but condition is not good

4.4.7 Technology Mobile/ WIFI / Internet Usage Details:

- Not available Wi-Fi facility

4.4.8 Sports Activity as Gram Panchayat:

- No any sport activity does in village as Gram panchayat.

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

- The village have community hall, public garden and pond.

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

- No other facilities available in village.

4.5Electrical Concept:

Fig.39

4.5.1 Renewable energy source planning particularly for villages:

➢Not available

4.5.2 Irrigation Facilities:

- The main source of Irrigation facilities are Canal and Tube well.

4.5.3 Electricity Facilities with Area:

- The village has 24 hr electricity available by poles and wires

4.6Existing Institution like – Village Administration – Detail Profile:

4.6.1 Bachat Mandali:

- The village has a Bachat Mandali.

4.6.2 Dudh Mandali:

- The village has a Dudh Mandali.

4.6.3 Mahila forum:

- The village has MahilaMandal**4.6.4 Plantation for the Air Pollution:** ➢Not available

4.6.5 Rain Water Harvesting – Waste Water Recycling:

- Ponds are available for water storage.

CHAPTER-5
Technical Options with Case Studies

5.1 Concept (Civil):

5.1.1 Advance Sustainable construction techniques / Practices and Quantity Surveying:

METHOD OF PLACING OF CONCRETE:

- TREMIE METHOD
- TOGGLE BAGS
- PUMPS METHOD
- BAG WORKS

TRENCHLESS TECHNOLOGY:

- Trenchless technology methods include all method of installing or renewing underground utility systems with minimum disruption of the surface or subsurface.
- Trenchless technology consists of various methods, materials and equipment for inspection, utilization and rehabilitation.
- Trenchless technology has become popular for underground utility construction road crossing.
- In recent years, there has been remarkable progress in development of new trenchless technology equipment and method.

MODERN CONSTRUCTION MATERIALS:

- Fly ash bricks
- Translucent concrete
- Sensi titles
- Carbone neon tubes
- Self-healing concrete
- 3D graphene
- Aero graphite
- Laminated timber
- Transparent aluminum
- Translucent wood
- Light-generating concrete
- Modular bamboo
- Biochar
- Spider silk
- Wool brick

- Nanocrystal
- Unfired clay bricks etc.

Fig.40

- **Materials**

One of the best ways to practice sustainability in construction is through the materials that are used. A new generation of stronger, lighter and more sustainable building materials can help solve many problems in the industry as well as push current practices to be more sustainable. These materials have the added benefit of protecting the environment by reducing the carbon footprint of the buildings that use these materials. They promote a cleaner Earth and a future of sustainability while also being aesthetically appealing and much more efficient.
sustainable building materials

- **Methods**

Sustainable construction isn't just about using the newest materials; it's also about using building methods that enhance renewable and sustainable efforts. Some of these methods include:

- Cutting materials precisely in order to reduce waste
- Controlling waste management, such as separating and recycling waste
- Constructing green buildings
- Adaptive reuse projects that transform old buildings
- Managing construction sites to improve the environment
- Examples include treating water on-site, no smoking, recycling food containers, etc.
- Conserving Energy
- Selecting sustainable and recycled materials
- different sustainable construction methods

What Are the Benefits of Sustainable Construction?

Sustainable building isn't just good for the environment, although that is a fantastic reason to adopt sustainable practices. There are many benefits to adopting eco-friendly methods in the construction industry, such as:

sustainable construction promotes renewable energy …….

Sustainable construction also promotes sustainability and efficient energy use. With renewable energy construction on the rise, coupled with sustainable construction methods, more people are beginning to see the importance and efficiency of using sustainable methods. It also sends a clear message to the industry and everywhere else: sustainability is viable and important.

What are the Challenges of Sustainable Construction?

Although the benefits to sustainable construction are present and obvious, transitioning isn't an overnight process. It takes time and preparation to utilize the best practices. Training needs to be implemented in order to start practicing sustainable methods, and that takes time and money.

Another obstacle that many companies may come across is the actual principal cost of sustainable construction. The general consensus is that sustainable construction comes at a premium and the cost is higher than what the demand actually is, despite the evidence to the contrary.

Nevertheless, as more interest in sustainability efforts continue to rise, more construction firms are making the switch to sustainable construction, with green building activity on the rise.

Importance of Sustainable Construction

Whether it's the price tag for the materials, the training that goes behind it, or resistance to adapting to new methods (why fix if it isn't broke as the old saying goes), there is some pushback on green construction.

Despite that pushback, however, more owners and developers, both public and private, are turning to a greener and more sustainable form of construction. Especially since the effects of climate change can already be felt across the globe.

5.1.2 Soil Liquefaction:

Soil liquefaction occurs when a saturated or partially saturated substantially loses strength and stiffness in response to an applied stress such as shaking during an earthquake or other sudden change in stress condition, in which material that is ordinarily a solid behaves like a liquid. In soil mechanics, the term "liquefied" was first used by Allen Hazen in reference to the 1918 failure of the Cadavers Dam in California.

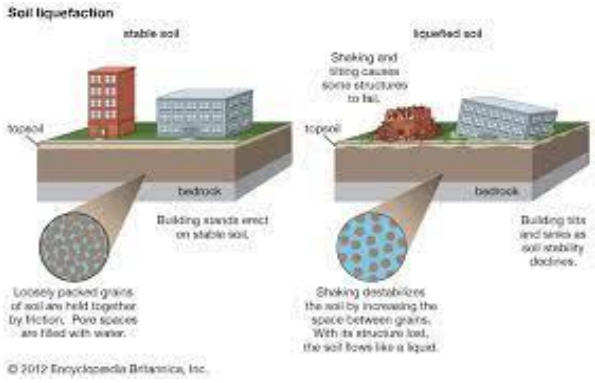


Fig41 soil liquefication

If the pressure of the water in the pores is great enough to carry all the load, it will have the effect of holding the particles apart and of producing a condition that is practically equivalent to that of quicksand… the initial movement of some part of the material might result in accumulating pressure, first on one point, and then on another, successively, as the early points of concentration were liquefied.

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

Effect:

1.The effects of lateral spreading (River Road in Christchurch following the 2011 Christchurch earthquake):

Fig.42

Quicksand:

Quicksand forms when water saturates an area of loose sand and the sand is agitated. When the water trapped in the batch of sand cannot escape, it creates liquefied soil that can no longer resist force. Quicksand can be formed by standing or (upwards) flowing underground water (as from an underground spring), or by earthquakes. In the case of flowing underground water, the force of the water flow opposes the force of gravity, causing the granules of sand to be more buoyant. In the case of earthquakes, the shaking force can increase the pressure of shallow groundwater, liquefying sand and silt deposits. In both cases, the liquefied surface loses strength, causing buildings or other objects on that surface to sink or fall over.

The saturated sediment may appear quite solid until a change in pressure or a shock initiates the liquefaction, causing the sand to form a suspension with each grain surrounded by a thin film of water. This cushioning gives quicksand, and other liquefied sediments, a spongy, fluidlike texture. Objects in the liquefied sand sink to the level at which the weight of the object is equal to the weight of the displaced sand/water mix and the object floats due to its buoyancy.

Quick clay:

Quick clay, known as Leda Clay in Canada, is a water-saturated gel, which in its solid form resembles highly sensitive clay. This clay has a tendency to change from a relatively stiff condition to a liquid mass when it is disturbed. This gradual change in appearance from solid to liquid is a process known as spontaneous liquefaction. The clay retains a solid structure despite its high-water content (up to 80% by volume), because surface tension holds water coated flakes of clay together. When the structure is broken by a shock or sufficient shear, it enters a fluid state.

Quick clay is found only in northern countries such as Russia, Canada, Alaska in the U.S., Norway, Sweden and Finland, which were glaciated during the Pleistocene epoch.

Quick clay has been the underlying cause of many deadly landslides. In Canada alone, it has been associated with more than 250 mapped landslides. Some of these are ancient, and may have been triggered by earthquakes.

5.1.3 Sustainable Sanitation:

- Sustainable sanitation is a sanitation system designed to meet certain criteria and to work well over the long-term. The Sustainable Sanitation Alliance (Susana) includes five features (or criteria) in its definition of "sustainable sanitation." Systems need to be economically and socially acceptable, technically and institutionally appropriate and protect the environment and natural resources.

Planning for sustainable sanitation:

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

"Bellagio Principles for Sustainable Sanitation") during its 5th Global Forum in November 2000:

- Human dignity, quality of life and environmental security at household level should be at the center of any sanitation approach.
- In line with good governance principles, decision-making should involve participation of all stakeholders, especially the consumers and providers of services.
- Waste should be considered a resource, and its management should be holistic and form part of integrated water resource, nutrient flow and waste management processes. ❖**Planning for sustainable sanitation:**

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

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

Human dignity, quality of life and environmental security at household level should be at the centre of any sanitation approach.

In line with good governance principles, decision-making should involve participation of all stakeholders, especially the consumers and providers of services.

Waste should be considered a resource, and its management should be holistic and form part of integrated water resource, nutrient flow and waste management processes.

The domain in which environmental sanitation problems are resolved should be kept to the minimum practicable size (household, community, town, district, catchment, city).

These planning guidelines have been revised further and are now used in various training courses for urban planners.

Optimization of resource recovery:

Sustainable sanitation that allows for resource recovery has the potential to contribute to circular economies and green cities, sustainable food chains, renewable energy, and new business models for private sector involvement.
Five recommendations were made in 2020 for the optimization of resource recovery: (i) prioritize short systems that close the loop at the lowest possible level; (ii) separate waste streams as much as possible, because this allows for higher recovery potentials; (iii) use storage and treatment technologies that contain the products as much as possible, avoid leaching technologies (e.g. single pits) and technologies with high risk of volatilization (e.g. drying beds); (iv) design sinks to optimize recovery and avoid disposal sinks; and (v) combine various reuse options for different side streams (e.g. urine diversion systems that combine reuse of urine and production of biofuel from feces).

5.1.4 Transport Infrastructure / system:

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

1.Roads
2.Rails
3.Pedestrian
4.Water way
5.Sub-Way
6.Bridge and fly
7.Terminal

- A road is a paved surface to facilitate the movement of people or goods with [#_Road_transport road transport] means, such as automobiles, bicycles, buses, vans or trucks.
- **Rails:**
- Rails are the infrastructure for rail transport. A rail road which connects two locations is also called a rail line. As for roads, rails on itself are not an interesting security target, but blocking a railroad will cause large problems with the rail transport.
- **Pedestrian / Bicycle paths:**
- Pedestrian paths or sidewalks, curbs, pavements, footpaths or platforms are paths alongside a road designated for pedestrians. Bicycle paths comprises of several different forms of cycling infrastructure, from non-segregated pathways aligned next to the road to segregated cycle facilities.
- Segregated cycle facilities are a form of cycling infrastructure consisting of marked lanes, tracks, shoulders and paths designated for use by cyclists and from which motorized traffic is

generally excluded. The term includes bike lanes, cycle tracks, separated bike lanes, road shoulders and side paths located within a road right-of-way.

Urban Waterway:

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

Subway system:

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

Bridges and fly-overs:

A bridge is a structure built to span physical obstacles such as a body of water, valley, or road, for the purpose of providing passage over the obstacle [3]. A flyover is a bridge, road, railway or similar structure that crosses over another road or railway forming a grade separation. Various different designs are possible depending on the length of the span and the conditions of the site.

Terminal:

A terminal is any location where freight and passengers either originates, terminates, or is handled in the transportation process. Terminals are central and intermediate locations in the movements of passengers and freight.

Fig-44 pedestrian.

Fig.45 subway

5.1.5 Vertical Farming:

Vertical farming is the practice of growing crops in vertically stacked layers. It often incorporates controlled-environment agriculture, which aims to optimize plant growth, and soilless farming techniques such as hydroponics, equipoises, and aeroponics. Some common choices of structures to house vertical farming systems include buildings, shipping containers, tunnels, and abandoned my shafts.

The modern concept of vertical farming was proposed in 1999 by Dickson Despoiler, professor of Public and Environmental Health at Columbia University. Despoiler and his students came up

with a design of a skyscraper farm that could feed 50,000 people. Although the design has not yet been built, it successfully popularized the idea of vertical farming. Current applications of vertical farming's coupled with other state-of-the-art technologies, such as specialized LED lights, have resulted in over 10 times the crop yield than would receive through traditional farming methods. [failed verification] There have been several different means of implementing vertical farming systems into communities such as: Paignton, Israel, Singapore, Chicago, Munich London, Japan, and Lincolnshire.

FIG-46

fig.47

The main advantage of utilizing vertical farming technologies is the increased crop yield that comes with a smaller unit area of land requirement. The increased ability to cultivate a larger variety of crops at once because crops do not share the same plots of land while growing is another sought-after advantage. Additionally, crops are resistant to weather disruptions because of their placement indoors, meaning less crops lost to extreme or unexpected weather occurrences. Lastly, because of its limited land usage, vertical farming is less disruptive to the native plants and animals, leading to further conservation of the local flora and fauna.

Vertical farming technologies face economic challenges with large start-up costs compared to traditional farms. In Victoria, Australia, a "hypothetical 10 level vertical farm" would cost over 850 times more per cubic meter of arable land than a traditional farm in rural Victoria.[4] Vertical farms also face large energy demands due to the use of supplementary light like LEDs. Moreover, if non-renewable energy is used to meet these energy demands, vertical farms could produce more pollution than traditional farms or greenhouses.

Techniques of Vertical Farming:

Fig.48 Hydroponics Aquaponics Aeroponics

Types of Vertical Farming:

1. Building-based Vertical Farms:

Abandoned buildings are often reused for vertical farming, such as a farm at Chicago called "The Plant," which was transformed from an old meatpacking plant.[21] However, new builds are sometimes also constructed to house vertical farming systems. For example, a company named "Vertical Harvest" built a three-story hydroponic greenhouse next to a parking lot in Jackson, Wyoming, and aims to grow 100,000 lbs. of produce annually.

2. Shipping-container Vertical Farms:

Recycled shipping containers are an increasingly popular option for housing vertical farming systems. The shipping containers serve as standardized, modular chambers for growing a variety of plants, and are often equipped with LED lighting, vertically stacked hydroponics, smart climate controls, and monitoring systems. Moreover, by stacking the shipping containers, farms can save space even further and achieve higher yield per square foot. Currently, there are many commercial shipping-container vertical-farming units on the market, such as the "Greenery" from Freight Farms and the "Terraform" from Local Roots.

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

Sources of e-waste Almost every used electronic items are considered as e-waste such as discarded cell phones, cameras, CD players, TVs, radios, drillers, fax machines, photocopiers, printers, toners, ink cartridges, batteries, re-chargeable batteries, digital calculators and clocks, CRT monitors, electric solders, computer mother boards, key board, industrial and house hold electronic machinery such as oven, fridge, sewing& washing machines, fan, air-conditioner, grinder, iron, heater, military and laboratory electronic equipment's, etc

Causes of defects in concrete structures can be broadly categorized as:

Structural deficiency resulting from errors in design, loading criteria, unexpected overloading, etc
Structural deficiency due to construction defects.
Damage due to fire, floods, earthquakes, cyclones etc.
Damage due to chemical attack.

- Damage due to marine environments.
- Structural Defects due to Design and Detailing
- Damage due to abrasion of granular materials.

In such case, the design is required to be reviewed in detail and remedial measures worked out by the design team. Once this is done the methods of carrying out the remedial measures will be similar to those arising out of other defects.

It is very necessary to choose the right type of cement for the concrete going into the structure under consideration. Ordinary Portland cement is the most common of all cements. Provided the quality of cement conforms to the relevant standard specifications, at the time of use, normally no problem is encountered in respect of ordinary Portland cement. Where the concrete is exposed to aggressive environment, it may be necessary to use special cements, such as, sulphate resisting Portland cement, blast furnace slag cement, low C3A cement. The quality of aggregates, particularly in respect of alkali-aggregate reaction, needs to be taken into account, fortunately cases of defects / failures attributed to alkali aggregate reaction in India are very rare.

The use of water containing salt for making concrete can also contribute to deterioration of the concrete. The accuracy of weighing the various components is very much dependent on the quality of the weigh batching system, available. Spring loaded dials of the weigh batchers contribute towards excessive variability in the quality of weigh-batched concrete in India.

Other contributory factors that add to bad workmanship include segregation, improper placement, inadequate or excessive vibration leakage of mortar through shuttering joints, inadequate concrete cover, in sufficient curing etc.

Proper detailing of reinforcement, including adequate cover is essential to ensure successful placement of concrete. Bad detailing results in congestion of reinforcement to such an extent that concrete just cannot be placed and compacted properly, even if the concrete is workable. Detailing of reinforcement should be based on a proper appreciation of how the concrete placement and compaction is going to be carried out.

5.1.7 Sewage treatment plant:

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

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 (storm water) to the sewage treatment plant. Sewage water can travel towards treatment plants via piping and in a flow aided by gravity and pumps. The first part of 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.

Process Step:

Sewage treatment generally involves three stages, called primary, secondary and tertiary treatment. Primary treatment consists of temporarily holding the sewage in a quiescent basin where heavy solids can settle to the bottom while oil, grease and lighter solids float to the surface. The settled and floating materials are removed and the remaining liquid may be discharged or subjected to secondary treatment. Some sewage treatment plants that are connected to a combined sewer system have a bypass arrangement after the primary treatment unit. This means that during very heavy rainfall events, the secondary and tertiary treatment systems can be bypassed to protect them from hydraulic overloading, and the mixture of sewage and storm water only receives primary treatment. Secondary treatment removes dissolved and suspended biological matter. Secondary treatment is typically performed by indigenous, water-borne micro-organisms in a managed habitat. Secondary treatment may require a separation process to remove the micro-organisms from the treated water prior to discharge or tertiary treatment.

Tertiary treatment is sometimes defined as anything more than primary and secondary treatment in order to allow ejection into a highly.

Sensitive or fragile ecosystem (estuaries, low-flow rivers, coral reefs…).

Treated water is sometimes disinfected chemically or physically (for example, by lagoons and microfiltration) prior to discharge into a stream, river, bay, lagoon or wetland, or it can be used for the irrigation of a golf course, greenway or park. If it is sufficiently clean, it can also be used for groundwater recharge or agricultural purposes.

Fig-49

Pre-treatment:

Pre-treatment removes all materials that can be easily collected from the raw sewage before they damage or clog the pumps and sewage lines of primary treatment clarifiers. Objects commonly removed during pre-treatment include trash, tree limbs, leaves, branches, and other large objects.

The influent in sewage water passes through a bar screen to remove all large objects like cans, rags, sticks, plastic packets etc. carried in the sewage stream. This is most commonly done with an automated mechanically raked bar screen in modern plants serving large populations, while in smaller or less modern plants, a manually cleaned screen may be used. The raking action of a mechanical bar screen is typically paced according to the accumulation on the bar screens and/or flow rate. The solids are collected and later disposed in a landfill, or incinerated. Bar screens or mesh screens of varying sizes may be used to optimize solids removal. If gross solids are not removed, they become entrained in pipes and moving parts of the treatment plant, and can cause substantial damage and inefficiency in the process.

Grit removal:

Grit consists of sand, gravel, cinders, and other heavy materials. It also includes organic matter such as eggshells, bone chips, seeds, and coffee grounds. Pre-treatment may include a sand or grit channel or chamber, where the velocity of the incoming sewage is adjusted to allow the settlement of sand and grit. Grit removal is necessary to (1) reduce formation of heavy deposits in aeration tanks, aerobic digesters, pipelines, channels, and conduits; (2) reduce the frequency of digester cleaning caused by excessive accumulations of grit; and (3) protect moving mechanical equipment from abrasion and accompanying abnormal wear. The removal of grit is essential for equipment with closely machined metal surfaces such as comminatory, fine screens, centrifuges, heat exchangers, and high-pressure diaphragm pumps. Grit chambers come in 3 types: horizontal grit chambers, aerated grit chambers and vortex grit chambers. Vortex type grit chambers include mechanically induced vortex, hydraulically induced vortex, and multi-tray vortex separators. Given that traditionally, grit removal systems have been designed to remove clean inorganic particles that are greater than 0.210 millimeters (0.0083 in), most grit passes through the grit removal flows under normal conditions. During periods of high

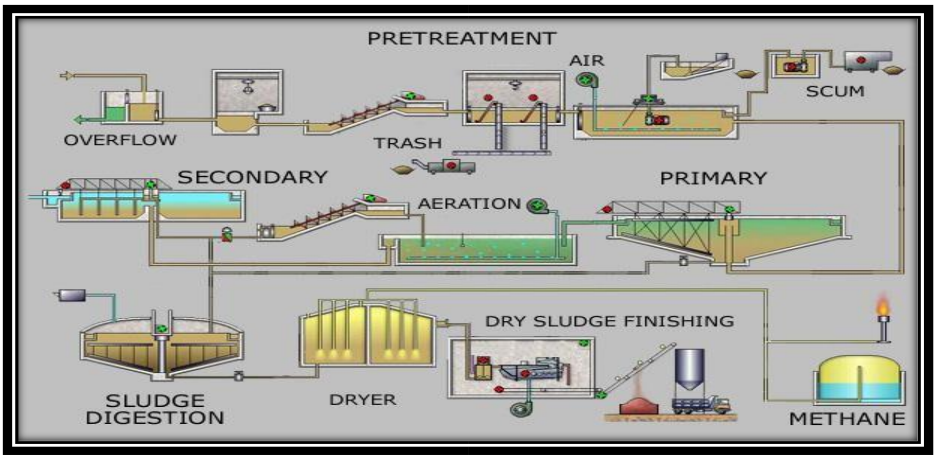


fig .50

flow deposited grit is suspended and the quantity of grit reaching the treatment plant increases substantially. It is, therefore important that the grit removal system not only operate efficiently during normal flow conditions but also under sustained peak flows when the greatest volume of grit reaches the plant

Flow equalization:

Clarifiers and mechanized secondary treatment are more efficient under uniform flow conditions. Equalization basins may be used for temporary storage of diurnal or wet weather flow peaks. Basins provide a place to temporarily hold incoming sewage during plant maintenance and a means of diluting and distributing batch discharges of toxic or high-strength waste which might otherwise inhibit biological secondary

Treatment (including portable toilet waste, vehicle holding tanks, and septic tank pumpers). Flow equalization basins require variable discharge control, typically include provisions for bypass and cleaning, and may also include aerators. Cleaning may be easier if the basin is downstream of screening and grit removal.

Fig.51 Primary treatment plant

fig.52 Secondary treatment plant

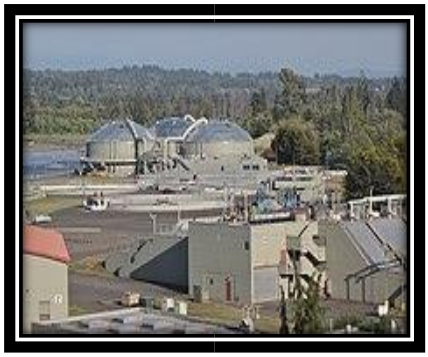
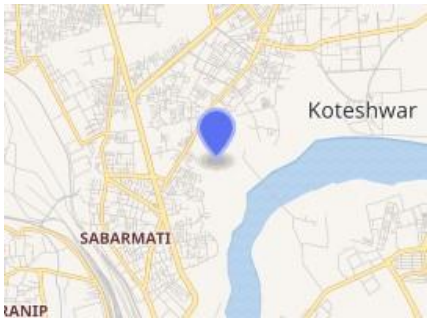


Fig.54 Tertiary treatment plant.

Fig.54 Biological nutrient removal

5.1.8 Technical case – "Study on Narendra Modi Stadium in Ahmedabad

The Narendra Modi Stadium, commonly known as the Motera Stadium, is a cricket stadium situated inside the Sardar Patel Sports Enclave[8]in Ahmedabad, Gujarat, India. As of 2021, it is the largest cricket stadium in the world and the largest stadium in the world, with a seating capacity of 132,000 spectators.[3][9]It is owned by the Gujarat Cricket Association and is a venue for Test, ODI, andT20Icricket matches.



location Ahmedabad Stadium

The stadium was constructed in 1983 and was first renovated in 2006.[10]It became the regular venue for international matches in the city. In 2015, the stadium was closed and demolished before being completely rebuilt by February 2020, with an estimated cost of ₹800crore(US$110 million)

History

1982–2006 (Early years)

Formerly known as the Gujarat Stadium, the ground was renamed in tribute to Sardar Vallabhbhai Patel, India's first Home Minister and Deputy Prime Minister. Before the Sardar Patel Stadium, international cricket matches in the city were played at the Ahmedabad Municipal Corporation's stadium of the same name(Sardar Patel Stadium) in the Navrangpura area. In 1982, the Government of Gujarat donated a 100-acre (400,000 m^2) stretch of land on the banks of the Sabarmati River to build a new stadium. The construction of the Sardar Patel Stadium was completed in nine months.[4]Since then, all International cricket fixtures for the city are hosted here. In the 1984-85 Australia-India series, Sardar Patel Stadium hosted its first ODI, in which Australia defeated India.

Sunil Gavaskar was the first cricketer to score 10,000 runs in Test cricket against Pakistan in the stadium in 1987.[15]In 1983,KapilDevtook a nine-wicket haul against the West Indies in 1983, and claimed his 432nd Test wicket at the stadium to become the highest wicket-taker in the world in 1995, which broke Sir Richard Hadlee's previous record.[16]In 1996, the ground hosted a low-scoring Test match against South Africa, where the visitors lost 105–170.JavagalSrinathtook six wickets in the fourth inning of the match. South Africa won in a rematch game when they bowled India out for 76 runs in the first session of the Test match in 2008 and won the game by an inning and 90 runs.

After starting demolition work at the end of 2015, the Gujarat Cricket Association issued are quest for tender on 1 January 2016 in The Times of India and The Indian Express. Nine bidders showed interest and purchased the tender documents, out of which three submitted

Technical and Financial bids on time; they were the Shapo or ji Pallonji Group, Nagarjuna Construction Company, and Larsen &Toubro. A Tender Commercial Committee (TCC) of nine experts was formed to evaluate tenders. Additionally, STUP Consultants was appointed as the Project Management Consultant to evaluate proposals and technical details of each bid working with the TCC.[18]

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

Conception

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

Work

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

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

Stadium design and facilities

The redesigned stadium occupies 63 acres of land, with three entry points compared to one in the old stadium, with a metro line at one of the entry points. It contains 76 corporate boxes that can hold 25 persons each, a 55-room clubhouse, an Olympic sized swimming pool, and four dressing rooms. A unique feature of the stadium is the LED lights on the roof instead of the usual floodlights at cricket grounds. The LED lights are installed on an anti-bacterial, fireproof canopy with PTFE membrane that covers 30 out of 55 metres width of sitting area. The roof was done by the company Walter PMoore and was specifically designed to be lightweight and separate from the seating bowls in order to make it fairly earthquake resistant. The structure eliminates the need for pillars and gives spectators an unobstructed view of the entire field from any place in the Stadium.
Outside of the main ground, the stadium is able to accommodate several other features, including an Olympic-sized swimming pool, an indoor cricket academy, badminton and tennis courts, a squash arena, a table tennis area, a 3D projector theater, and a clubhouse with three practice grounds and 50 rooms. The parking lot can accommodate 3,000 cars and 10,000 two-wheelers. Sardar Patel Stadium also has a huge ramp designed to facilitate the movement of around 60,000 people simultaneously. The stadium has been designed such that patrons fill the lower levels of the ground for smaller events to maintain the crowd atmosphere when not at capacity.

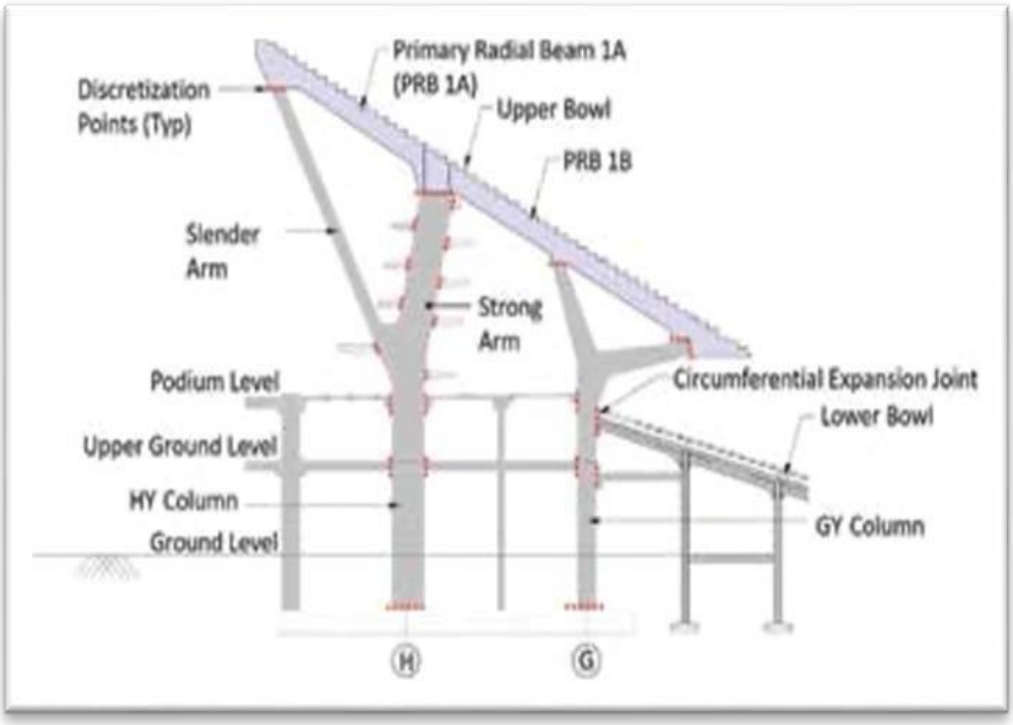
Foundation and substructure

The structural elements of the Sardar Patel Stadium are:

1. Upper and lower bowls planned for seating
2. A podium level to enter the upper and lower bowls
3. Vomitory staircases designed for the entry and exit of the audience from the stadium
4. HY and GY columns
5. Primary, secondary, and circumferential beams
6. Structural steel roof

The stadium has an oval and divided into six different sections by expansion joints. Also, the expansion joints were provided to isolate the podium level from ramps. A circumferential expansion joint was provided to isolate the upper and lower bowls. At each expansion joint, twin columns were used to support the components up to the podium level. Lower-bowl and podium-level plan
The roller boundary condition was formed at expansion joints for each circumferential beam by placing corbels on the primary radial beams at the top of the upper bowl. Similarly, the roller boundary condition was formed at the lower bowl by supporting the lower bowl's radial beams through the upper bowl columns near the podium level.
The main structural components of the upper bowl comprise Y-shaped columns situated on the circumferential grids G and H and named as GY and HY columns. Primary radial beams are connected to the GY and HY columns.

To reduce the deflection of primary radial beams and the thickness of the slab, secondary radial beams were provided in between. Thus, the podium level consists of primary and secondary radial beams, circumferential beams, and precast hollow-core slab panels.



Structural elements of the Sardar Patel Stadium

Narenda Modi stadium with Donald trump

CHAPTER-6
Swachh Bharat Abhiyan (Clean India)

6.1Swatchhta needed in allocated village -Existing Situation with photograph

- Swatch Bharat Mission is a mass movement for cleanliness launched on 2nd October 2014 by the prime Minister of India. The Swatchhta Abhiyan has turned into a National Movement with citizens now becoming active participants in cleanliness activities across the nation. The dream of a 'Clean India' once seen by Mahatma Gandhi is being realized with millions of people across the country joining the cleanliness initiatives of the government departments, NGOs and local community centres to make India clean as a part of this 'Jan Andolan'.

1. Swatchh Bharat Abhiyan App:

- He/ she will open this App and take picture of the waste/ garbage dump.
- National Server will process the image and grade this waste/ garbage dump as Red, Yellow or Green. Red for Urgent Action, Yellow for taking Notice and Green to indicate Clean.
- Now consider that many persons have uploaded such information, all such Geo-Tags will be seen to anyone on Google Map (or on ISRO's BHUWAN).
- The mission was split into two: rural and urban. In rural areas "SBM - Gramin" was financed
- and monitored through the Ministry of Drinking Water and Sanitation; whereas "SBM - urban"
- was overseen by the Ministry of Housing and Urban Affairs.
- • The government provided subsidy for construction of nearly 110 million toilets between 2014
- and 2019, although many Indians especially in rural areas choose to not use them.The campaign
- was criticized for using coercive approaches to force people to use toilets. Many households
- were threatened with a loss of benefits such as access to electricity or food entitlements through
- the public distribution system.
- • In a kuha village the garbage collect from the different place of village can be dump in the
- nearest place because none of the government facility for the collecting or dumping are not
- available in our village, there for villagers are dump the garbage and all type of waste in open
- area, the open dumping area can produce more pollution and disease.
- There for we decide to design waste management in our village development project.

6.2 Guidelines – Implementation in allocated village with Photograph:

- Eradication of Manual Scavenging
- To effect behavioral change regarding healthy sanitation practices
- Generate awareness about sanitation and its linkage with public health capacity augmentation.
- for ULBs to create an enabling environment for private sector
- Elimination of open defecation

Participation in Capex (capital expenditure) and OpenX (operation and maintenance) Mission strategy. The estimated cost of implementation of SBM (Urban) based on unit and per capita costs for its various components is Rs. 62,009 Crore.

The Government of India share as per approved funding pattern amounts to Rs. 14,623 Crore. In addition, a minimum additional amount equivalent to 25% of Go funding, amounting to Rs.4,874Crore shall be contributed by the States as State/ ULB share.

The balance funds are proposed to be generated through various other sources of fund which're, but not limited to:

- Private Sector Participation
- Additional Resources from State Government/ ULB
- Land Leveraging
- Swatchh Bharat Kosh
- Market Borrowing
- Corporate Social Responsibility

6.2Activities Done by Students for allocated village with Photograph:

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FIG.55 KANBHA VILLAGE ROAD

CHAPTER-7
Village condition due to Covid-19

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

- Due to Covid-19 Kanbha village totally lockdown.
- All the villagers are followed the all rule by government. ➢All the people aremanage the social distance.

FIG-56

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

Fig.57

Fig.58

7.3 Any other steps taken by the students / villagers: NO

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

8.1Design Proposals:

- Public Toilet
- Super Market
- Post Office
- Library
  - Bus stand

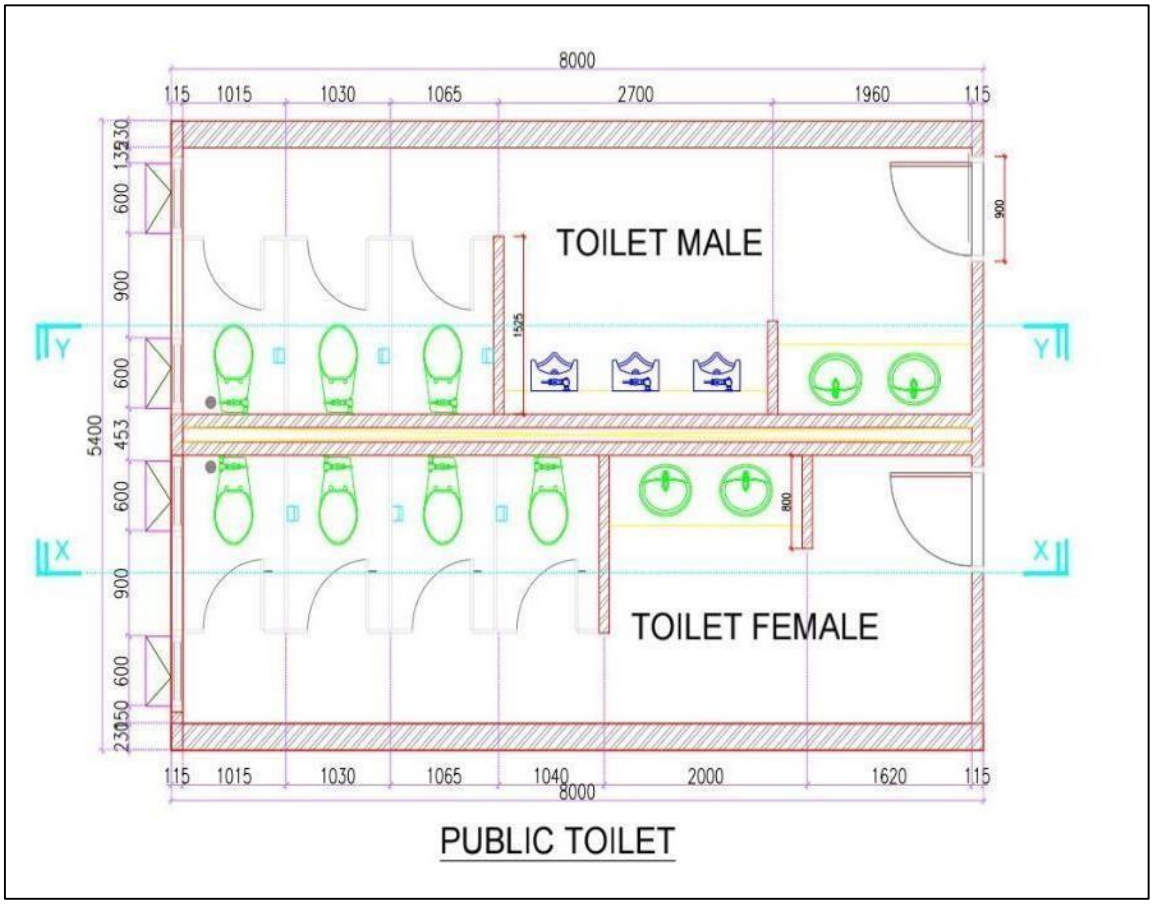

Fig-59 public toilet

8.1.1Sustainable Design (Civil):

- The sustainable toilets we have designed will reduce the negative impact of wastage on the environment.

[Table:6 Measurements Sheet]

No	Item description	No	Length	Width	Height	quantity
1	EXCAVATION FOR FOUNDATION	1	29.8	0.9	1.1	29.50m3
2	PCC	1	29.8	0.9	0.10	2.68m3
3	LEVEL BRICK MASONARY UPTO PLINTH					
	STEP OF 0.5M WIDTH	1	29.8	0.5	0.3	4.47
	STEP OF 0.4M WIDTH	1	29.8	0.4	0.3	3.87
	FIRST STEP	1	1.2	0.6	0.150	0.108
	SECOND STEP	1	1.2	0.3	0.150	0.054
					TOTAL	8.50m3
4	C.M BRICK MASONARY ABOVE PLINTH LEVEL UPTO SLAB (1:6)	1	29.8	0.225	3	20.11m3
	DEDUCTION FORDOORS AND WINDOWS					
	D1	5	1	0.115	2	1.15
	D2	1	1	0.225	2	0.45
	W1	2	1	0.225	1	0.45
	W2	4	0.5	0.225	0.5	0.225
					NET BRICK WORK	17.83m3
5	RCC WORK					
	SLAB	1	10.4	4	0.15	6.24
					TOTAL	6.24m3
6	FLOORING	1	9.42	3.4		32m2
7	INSIDE SMOOTH PLASTER OF WALL AND CELLING (10 MM THICK)					
	TOILET 1	2	1.3		3	7.8m2
		2	2.0		3	12
	TOILET 2	2	1.2		3	7.8
		2	2.0		3	12
	TOILET 3	2	1.2		3	7.2
		2	2.0		3	12
	TOILET 4	2	1.3		3	7.8
		2	2.0		3	12

	TOILET 5	2	2.0		3	12
			2.0		3	12
	CELLING					
	TOILET 1	1	1.3	2.0		2.6
	TOILET 2	1	1.3	2.0		2.6
	TOILET 3	1	1.2	2.0		2.4
	TOILET 4	1	1.3	2.0		2.6
	TOILET 5	1	2.0	2.0		4.0
	PASSAGE	1	2.2	2.0		4.0
				TOTAL	PLASTER	120.8m2
	DEDUCTION FOR DOORS AND WINDOWS					
	DOORS	3.0	1		2	6
	WINDOWS	2.5	1		1	2.5
				NET	PLASTER	112.3m2

ABSTRACT SHEET

NO	ITEM DESCRIPTION	QUNTITY	Rate	PER	AMOUNT
1	EXCAVATION IN FOUNDATION	29.50m3	153.50	m3	4528.25
2	PCC (1:4:8) IN FOUNDATION	2.68m3	3200	m3	8576
3	BRICK MASONARY	8.50m3	3200	m3	27200
	UPTO PLINTH IN C.M (1:6)				
4	BRICK MASONARY ABOVE PLINTH UPTO SLAB LEVEL IN C.M (1:6)	17.83m3	3500	m3	62405
5	RCC WORK IN SLAB	6.24m3	8800	m3	54912
6	FLOORING	32m2	634.28	m2	20296.96
7	PLASTER WORK I WALLS AND CELLING IN 10 MM THICK	112.3m2	84	m2	9433.2

- **Total Rs. 187351.41**
- **Add 3% contingencies Rs. 5620.54**
- **Add 2% work charge establishment RS. 3747.02**

- **Grand Total Rs. 196718.972**

8.1.2Physical design (Civil):

Super Market:

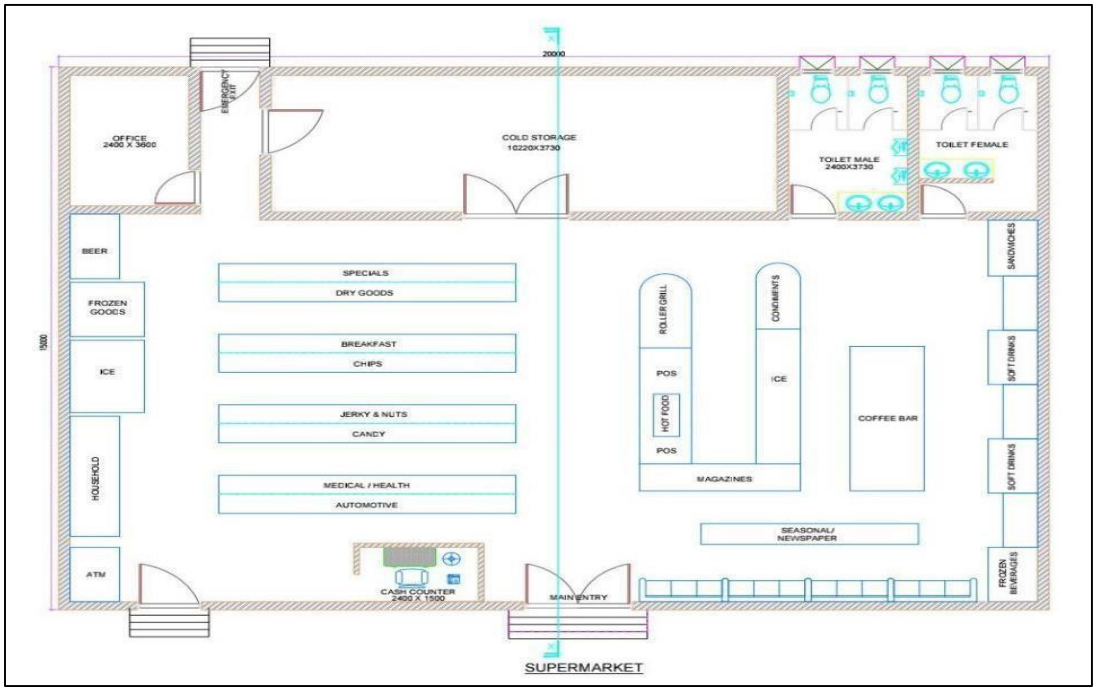

FIG. 60

[Table :7 MEASUREMENT SHEET]

SUPER MARKET							
No.	**Description**	**No**	**Length**	**Breadth**	**Height**	**Quantity**	**Total Quan**
1	**Excavation In Foundation**						
	LW1=20+1.2	2	21.7	1.2	1.2	62.5	
	LW2=20.0+1.2	1	21.2	1.2	1.2	30.53	
	SW1=15+1.2	2	16.2	1.2	1.2	46.66	
	SW2=4+1.2	4	5.2	1.2	1.2	29.95	
	SW3=1.5+1.2	1	2.7	1.2	1.2	3.89	
	CCW=5.0+.65	1	5.65	0.65	0.6	2.2	**175.72**
2	**PCC In Foundation**						
	Long Wall 1	2	21.7	1.2	0.3	15.62	
	Long Wall 2	1	21.2	1.2	0.3	7.63	
	Short Wall 1	2	16.2	1.2	0.3	11.66	
	Short Wall 2	4	5.2	1.2	0.3	7.49	
	Short Wall 3	1	2.7	1.2	0.3	0.97	
	CCW	1	5.65	0.65	0.3	1.1	**44.48**

3	**Brick Work**						
	Long Wall 1						
	First Step						
	Length=20.0+.09	2	20.9	0.9	0.3	11.29	
	Second step						
	Length=20.0+0.6	2	20.6	0.6	0.3	7.42	
	Third Step						
	Length=20.0+0.45	2	20.45	0.45	0.3	5.32	**24.22**
	Long Wall 2						
	First step						
	Length=20.9	1	20.9	0.9	0.3	5.64	
	Second step						
	Length=20.6	1	20.6	0.6	0.3	3.71	
	Third step						
	Length=20.45	1	20.45	0.45	0.3	2.76	12.11
	Short Wall 1						
	First step						
	Length=15.9	2	15.9	0.9	0.3	8.56	
	Second step						
	Length=15.6	2	15.6	0.6	0.3	3.82	
	Third step						
	Length=15.45	2	15.45	0.45	0.3	4.17	16.57
	Short Wall 2						
	First step						
	Length=4.9	4	4.9	0.9	0.3	5.29	
	Second step						
	Length=4.6	4	4.6	0.6	0.3	3.31	
	Third step						
	Length=4.45	4	4.45	0.45	0.3	2.40	11.01
	Short Wall 3						
	First step						
	Length=2.4	1	2.4	0.4	0.3	0.65	
	Second step						
	Length=2.1	1	2.1	0.1	0.3	0.38	
	Third step						
	Length=1.95	1	1.95	0.95	0.3	0.26	1.29
	CCW						
	First step						
	Length=5.6	1	5.45	0.6	0.3	0.98	
						0.98	66.19

4	**Brick work in super structure**						
	Long Wall 1=20	2	20	0.23	5.55	51.06	
	Long Wall 2=20	1	20	0.23	4.2	19.32	
	Short Wall 1=15	2	15	0.23	5.55	38.30	
	Short Wall 2=4	4	4	0.23	4.2	15.46	
	Short Wall 3=1.5	1	1.5	0.115	4.2	0.72	
	CCW=5	1	5	0.23	1	1.15	
	Deduction Door/Window						
	D1	2	2.1	1	2.4	10.8	
	D2	3	1.2	1	2.1	7.56	
	D3	3	0.9	1	2.1	5.67	
						-23.31	102.70
5	**Plaster**						
	Long Wall 1 =20	2	20		5.55	222.00	
	Long Wall 2 =20	1	20		4.2	64.0	
	Short Wall 1 =15	2	15		5.55	166.50	
	Short Wall 2 =4	4	4		4.2	67.20	
	Short Wall 3 =1.5	1	1.5		4.2	6.30	
	CCW =5	1	5		1	5.00	
	Plaster (Ceiling)	20	15			300	
						1702.00	
	Deduction Door/Window						
	D1	2	2.1		2.4	10.08	
	D2	3	1.2		2.1	7.56	
	D3	3	0.9		2.1	5.67	
						46.62	1748.62

ABSTRACT SHEET

NO	PERTICULARS OF ITEM	QUANTITY	PER	RATE	AMOUNT
1	Excavation In Foundation	175.72	m^3	150	26358.525
2	Plain Cement Concrete (1:3:6)	44.48	m^3	3000	133445.25
3	Brickwork In Foundation	66.19	m^3	3200	211795.2
4	Brickwork In Superstructure	102.70	m^3	3500	359434.25
5	20mm Plaster	1748.62	m^3	150	262293

6	150 mm THK RCC Slab	45.00	m^3	4100	184500.0
				Total=	1177826.2
	2%Contingencies				**23556.5245**
	3% Work Charge Establishment				**35334.7868**
				Grand total	**1236717.5**

8.1.3Social design (Civil):

Post office

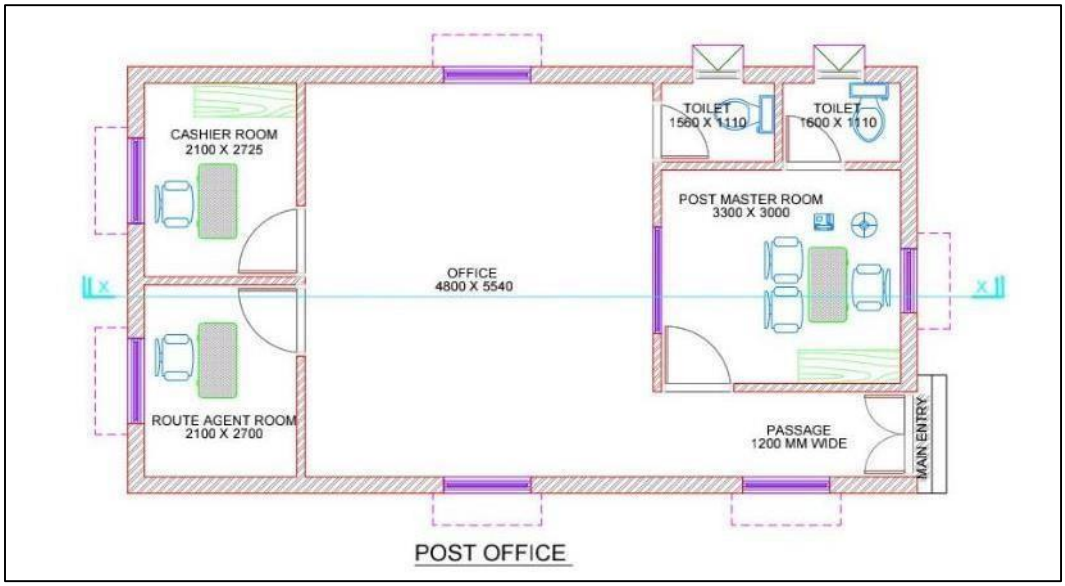

Fig-61 post office

[Table: 8 Measurement Sheet]

NO	DESCRIPTIOSHSHSH	NO	LENGTH	BREADTH	HEIGHT	QUN	Total
1	**Excavation In Foundation**						
	LW1=10.9+0.9 =11.8	2	11.8	0.9	0.9	19.12	
	LW2=6.0+0.9 = 6.9	2	6.9	0.9	0.9	11.18	
	SW1=5.4+0.9 = 6.3	1	6.3	0.9	0.9	5.10	
	SW2=4.35+0.9 =5.25	1	5.25	0.9	0.9	4.25	
	SW3=3.3+0.9 = 4.2	2	4.2	0.9	0.9	6.80	
	SW4=2.1+0.9 = 3.0	1	3	0.9	0.9	2.43	

							48.88
2	**PCC FOUNDATION**						
	Long Wall 1	2	11.8	0.9	0.15	3.19	
	Long Wall 2	1	6.9	0.9	0.15	0.93	
	Short Wall 1	1	6.3	0.9	0.15	0.85	
	Short Wall 2	1	5.25	0.9	0.15	0.71	
	Short Wall 3	2	4.2	0.9	0.15	1.13	
	Short Wall 4	1	3	0.9	0.15	0.41	
							7.22
3	**Brick Work**						
	Long Wall 1						

	First Step						
	Length=10.9+0.6	2	11.5	0.6	0.2	2.76	
	second Step						
	Length =10.9+0.45	2	11.35	0.45	0.2	2.04	
	Third step						
	Length=10.9+0.375	2	11.275	0.375	0.2	1.69	6.49
	Long Wall 2						
	First step						
	Length =6.0+0.6=6.6	1	6.6	0.6	0.2	0.79	
	Second step						
	Length =6.0+0.45=6.45	2	6.45	0.45	0.2	1.16	
	Third step						
	Length =6.0+0.375	2	6.375	0.375	0.2	0.96	
						2.91	
	Short Wall 3						
	First step						
	Length =3.3+0.6=3.9	2	3.9	0.6	0.2	0.94	
	Second step						
	Length =3.3+0.45=3.75	2	3.75	0.45	0.2	0.68	
	Third step						
	Length =3.3+0.375	2	3.675	0.375	0.2	0.55	
						2.16	
	Short Wall 4						
	First step						
	Length =2.1+0.6=2.7	1	2.7	0.6	0.2	0.32	
	Second step						
	Length =2.1+0.45=2.55	1	2.55	0.45	0.2	0.23	
	Third step						

	Length =2.1+0.375	1	2.475	0.375	0.2	0.19	
						0.74	15.37
4	**Brick Work in Super Structure**						
	Long Wall 1 =10.9	2	10.9	0.23	4.8	24.07	
	Long Wall 2 =6	2	6	0.23	3.45	9.53	
	Short Wall 1 =5.4	1	5.4	0.115	4.8	2.98	
	Short Wall 2 =4.35	1	4.35	0.115	3.45	2.73	
	Short Wall 3 =3.3	2	3.3	0.115	3.45	2.62	
	Short Wall 4 =2.1	1	2.1	0.115	3.45	0.83	
	Deduction Door/Window						
	D1	1	1.2	1	2.1	2.52	
	D2	3	0.9	1	2.1	5.67	
	D3	2	0.75	1	2.1	3.15	
	W1	6	0.9	1	2.1	6.48	
	W2	1	1.5	1	2.1	1.80	
						-19.62	22.13
5	**Plaster**						
	Long Wall 1 =10.9	2	10.9		4.8	104.64	
	Long Wall 2 =6.0	2	6		3.45	41.40	
	Short Wall 1 =5.4	1	5.4		4.8	25.92	
	Short Wall 2 =4.35	1	4.35		3.45	15.01	
	Short Wall 3 =3.3	2	3.3		3.45	22.77	
	Short Wall 4 =2.1	1	2.1		3.45	7.25	
	Plaster (Ceiling)	10.9	6			65.4	
	Deduction Door/Window						
	D1	1	1.2		2.1	2.52	
	D2	3	0.9		2.1	5.67	
	D3	2	0.75		2.1	3.15	
	W1	6	0.9		1.2	6.48	
	W2	1	1.5		1.2	1.80	
						-39.24	604.1
	Slab Cement Concreate	10.9	6		0.125		8.175
6	125 mm RCC Slab	8.18	M^3	4100	33517.5		
	Total	**=279741.0**					
	2% Contingencies	**=5594.8**					
	3% Work Charge Establishment	**=8392.2**		Grand Total	293728.03		

ABSTRACT SHEET:

1	Excavation in foundation	175.72	m^3	150	26358.525	
2	Plain Cement Concrete	44.48	m^3	3000	133445.25	
3	Brickwork In Foundation	66.19	m^3	3200	211795.2	
4	Brickwork In Superstructure	102.7	m^3	3500	359434.25	
5	20mm Plaster	1748.62	m^3	150	262293	
6	150 mm THK Rcc Slab	45	m^3	4100	184500	
					Total	**1177826.2**
			2% Contingencies			23556.5245
			3% Work Charge Establishment			35334.7868
				Grand Total		**1236717.5**

8.1.4Socio-Cultural design (Civil): Library

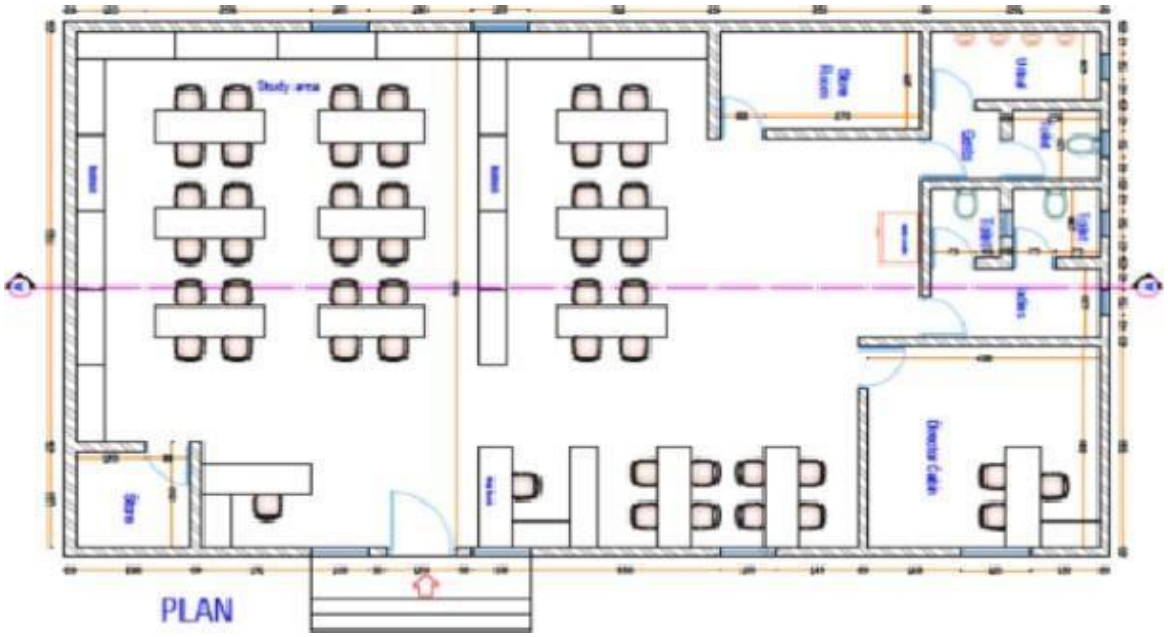

Fig.62 library

[Table :9 Measurement Sheet]

NO	Item description	NO	Length	Width	Height	Qty	Total
1	**Excavation for foundation**	1	38.11	0.9	1.1	37.72m3	
2	**PCC**	1	38.11	0.9	0.2	6.85m³	
3	**BRICK MASONARY UPTO PLINTH LEVEL**						
	STEP OF 0.6M WIDTH	1	38.86	0.6	0.3	6.99	
	STEP OF 0.5M WIDTH	1	39.11	0.5	0.3	5.86	
	FIRST STEP	1	1.2	0.6	0.150	0.108	
	Second step	1	1.2	0.3	0.150	0.54	**13.012m³**
4	**BRICK MASONARY ABOVE PLINTH LEVEL UPTO SLAB C.M (1:6)**	1	39.79	0.225	3	26.85m³	
	DEDUCTION		FOR		DOORS		
	D1	2	1	0.225	2	0.90	
	D2	1	1	0.225	2	0.45	
	Windows	6	1	0.225	1	1.35	
	Lintel						
	Doors	3	1.3	0.225	0.15	0.131	
	Windows	6	1.3	0.225	0.15	0.263	**23.75m³**
5	**RCC WORK**						
	Slab	1	10	10	0.15	15	
	Lintel	1	11.7	0.225	0.15	0.39	
							15.39m³
6	**Flooring**	1	9.325	9.325		85.95m²	
7	**INSIDE SMOOTH PLASTER OF WALL AND CELLING (10 MM THICK)**						
	Book self	2	3.2		3	19.2m²	
		2	4.1		3	24.6	
	Study room	2	3.2		3	19.2	
		2	3.7		3	22.2	
	Reading area	2	5.1		3	30.6	
		2	9.7		3	58.2	
	Book self	1	3.2	4.1		13.1	
	Study room	1	3.2	3.7		11.8	

	Reading room	1	5.1	9.7		49.47	
							248.37m²
	DEDUCTION FOR DOORS AND WINDOWS						
	Doors	1.5	1		2	3	
	Windows	3	1		1	3	
							243.37m²

Abstract sheet:

NO	ITEM DISCRIPTION	QUNTITY	RATE	PER	AMOUNT
1	EXCAVATION FOUNDATION	37.72m³	153.50	M³	5790.02
2	PCC (1:4:8) IN FOUNDATION	6.85m³	3200	M³	21920
3	BRICK MASONARY UPTO PLINTH IN C.M (1:6)	13.012m³	3200	m³	41638.4
4	BRICK MASONARY ABOVE PLINTH UPTO SLAB LEVEL IN C.M (1:6)	23.75m³	3500		83125
5	RCC WORK IN SLAB AND LINTEL	15.39m³	8800		135432
6	FLOORING	86.95m²	634.28		55150.64
7	PLASTER WORK IN WALLS AND CELLING IN 10 MM THICK	242.37m²	84		20359.08
8	FURNITURE				
	Chairs	90	600	No	54000
	TABLES	43	3000	No	129000
	BOOK SELF	12	1000	No	12000
	COMPUTERS	10	5000	No	50000

Total Rs. 608415.14
Add 3% contingencies Rs. 18252.45
Add 2% work charge establishment Rs. 12168.30

Grand Total Rs. 639108.89

8.1.5Smart Village Design (Civil):

Bus stand

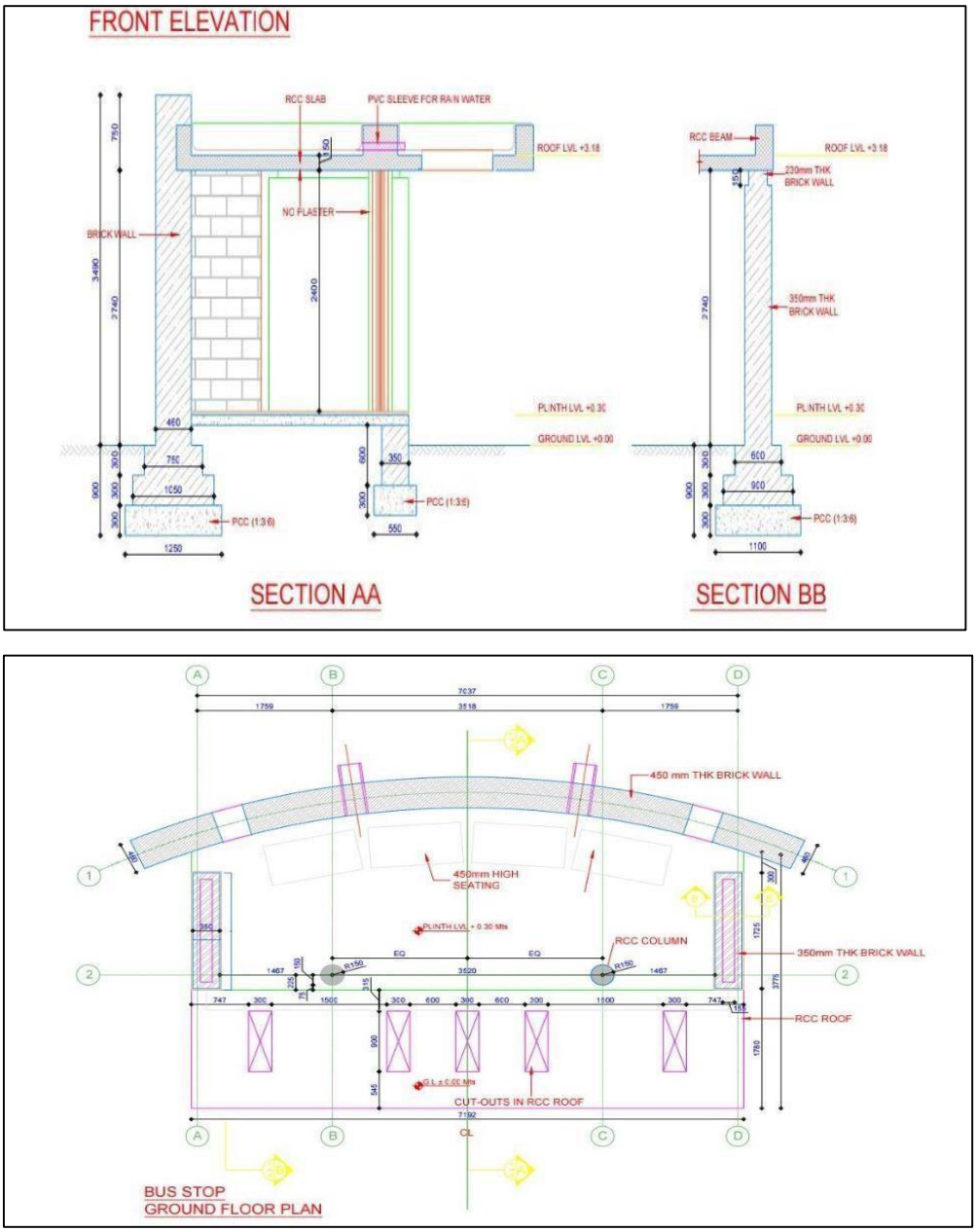

Fig: design of bus stand with section elevation and plan

Fig.63 bus stand

[Table: 10 Measurement Sheet]

N	DESCRIPTION	NO	LENGTH	BRETH	HEIGHT	QUN	TOTAL
1	**Excavation Foundation**						
	LW1=9.0+0.9 = M	1	10.25	1.25	0.9	11.53	
	LW2=9.0+1.250 = M	1	10.25	1.25	0.9	11.53	
	SW=1.725+1.10	2	2.825	1.1	0.9	5.59	**17.12**
2	**PCC FOUNDATION**						
	Long Wall	1	10.25	1.25	0.3	3.84	
	Short Wall	2	2.825	1.1	0.3	1.86	**5.71**
3	Brick Work Foundation						
	Long wall						
	First step						
	Length	1	10.05	1.05	0.3	3.17	
	Second step						
	Length =9.0+0.75=9.75	1	9.75	0.75	0.3	2.19	5.36
	Short Wall						
	First step						
	Length =1.725+.9	2	2.625	0.9	0.3	1.42	
	Second step						
	Length =1.725+.6	2	2.325	0.6	0.3	0.84	
						2.25	**7.61**
4	**Brick Work in Super Structure**						
	Long Wall						
	Length =9.0M	1	9	0.46	3.49	14.45	
	Short Wall						
	Length =1.725	2	1.725	0.35	2.74	3.31	
	Deduction Door/Window						
	D1	1	16.65	0.9	0.3	4.50	
	D2	1	16.65	0.9	0.3	4.50	
	W1	1	16.65	0.9	0.3	4.50	
	W2	1	16.65	0.9	0.3	4.50	
						-17.98	**-0.22**
5	**Plaster**						
	Long Wall =15.3	2	10		0.3	6.0	
	Short Wall =15.3	2	16.65		0.3	9.99	
	Plaster (Ceiling)	10	15				
	DeductionDoor/Window						
	D1	1	16.5		0.3	5.0	

	D2	1	16.5		0.3	5.0	
	W1	1	16.5		0.3	5.0	
	W2	1	16.5		0.3	5.0	
						-39.60	**371.58**

ABSTRCT SHEET: **Grand Total = 103958.7**

NO	PARTICULARS OF ITEM	QUANTITY	PER	RATE	AMOUNT
	Excavation In Foundation	17.12	M^3	150	2568.7125
2	Plain Cement Concrete (1:3:6)	5.71	m^3	3000	17124.75
3	Brickwork In Foundation	7.61	M^3	3200	24364.8
4	Brickwork In Superstructure	-0.22	M^3	3500	-786.975
5	20mm Plaster	371.58	M^3	150	55737

8.1.6 Heritage Village Design (Civil):

Underground water tank:

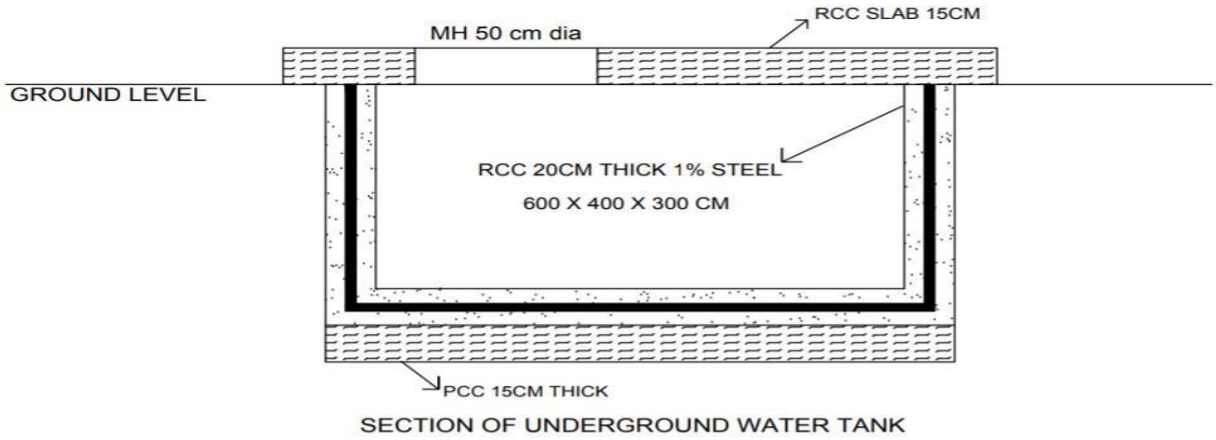

Fig 64 underground water tank

[Table: 12Measurement sheet]

No	DESCRIPTION	NO	LENGTH	BREDTH	HEIGHT	QUT	R
1	EXCAVTION	1	6.4	4.4	3.35	94.336	L=6+0.20+0.20
							B=4+0.20+0.20
							H=3+0.20+0.15
2	PCC (1:4:8)	1	6.4	4.4	0.15	4.224	
3	RCC						
	(1) IN FLOOR	1	6.4	4.4	0.3	8.448	
	(2) IN WALL						
	Long Wall	2	6.4	0.2	2	5.12	
	Short Wall	2	4	0.2	2	3.2	
	Slab	1	7	5	0.15	5.25	
							TOTAL RCC=
							13.57
4	DEDUCTION OF M.H	1	Area thickness	X	$\pi*$ (0.25 $*$ 0.25) *0.15		0.029
	TOTAL RCC		13.57-0.2				13.541
5	STEEL IN RCC @1%		1/100 * 13.541				0.13541 Cubic m

ABSTRACT SHEET:

NO	DESCRIPTION OF ITEM	QUNTITY	RATE	PER	AMOUNT
1	Excavation	94.336	90	M3	8490.24
2	PCC	4.224	3500	M3	14784
3	RCC	13.541	3500	M3	47393.5
4	Steel in RCC @ 1% Of RCC	0.13541	90	Kg	12.1869
		TOTAL			**70679.93**
		Add 3% Contingencies			**2120**
		Add 2% work charge Establishment			**1413**
		Total cost			**74212.93**

8.2 Reason for Students Recommending this Design:

- There is no physical good infrastructure for public transportation like bus stand is not available so we strongly recommended the bus stand.
- In Kanbha village there is no available library so we have planned library.
- There is no structure of post office available in the village there is only sub post office that is in someone's house, no public structure is available so we recommend the post office.
- There are no good public toilets available in working condition so for sanitary purpose we recommend the public toilets.
- We recommend the super market in the village for social purposes.

8.3 About designs Suggestions / Benefit of the villagers:

- The roads of the village are in not good condition that need to be repaired
- There are no good medical and primary facilities available in the village so that is the strong suggestion.

BENEFIT:

- Because of our proposed design the village is going to have good transportation structure like bus station to wait for bus because of post office they will not have to take their post to sub pots someone's house.
- Because of library good education and knowledge of the good books.
- Because of the public toilets the village would be cleaner and for the travelers or for the peoples who don't have the toilets in their house.

Advantages of Supermarkets:

- Freedom of Selection
- Fixed prices
- Lower price
- Availability of goods based on daily demand.
- Availability of verity goods
- Availability of standard goods
- More sell
- More profit
- No risk
- No loss
- Increase in demand

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

- For the future development of the village, we have decided to give the design of post office.
- The road which is the main and the important facilities to generate income or economy is not proper and so its maintenance is required or necessary.
- Creation of one Mandali in the village in form of physical structure.
- Village for the children as there is lack of recreational facilities provided in the village.
- One primary public health Centre.
- In the next semester, we can provide community toilet, solid waste management, closed drainage, maternity homes, maternity homes, higher secondary school, public library, public garden, village pond, cinema hall, panchayat building, bank, internet café.

And Part two we have design:

- RCC Roads: -

The new RCC roads will have best durability and will be long lasting. The roads will be made with best quality goods etc.

- Post office: -

The developed post office will have larger staff probably of 150 members which will give flexibility and smooth services for parcel and courier and many more.

- Play Ground: -

  In village the children are easy to play the game and healthy life. So, we design the playground.

- Community Hall: -

  In village we design community hall to village people are meet in a general room and take a decagon
  Any type of condition

- Public Garden: -

  We design a public garden to villagers to meet the people and children are playing in garden. People of
  Villagers get fresh air and friendly atmosphere.

- Mahila Mandli: -

  We design a mahila mandi to all women in village are all information about the new technology and all information.

CHAPTER-10
Conclusion of the Entire Village Activities of the Project

THE BASIC AMENITIES WHICH CAN BESUGGESTED IN THE VILLAGE TO MAKE IT SMART VILLAGE ARE AS FOLLOWS:

→ Vishwakarma yojana an approach towards Urbanization means to provide all the basic necessities
of the urban areas to the rural people by conserving their soul natural surroundings.
→ For the development of the village the first and foremost thing is to generate employment so that
poverty can be eradicated.
→ We should provide all the basic facilities to the people living in the village so that they do not have
to migrate to urban areas to fulfil their needs and other amenities.
→ By developing Rural India, the future scenario for urbanization can be developed in sustainable manner.
→ Also, with the help of gap analysis we conclude that the facilities to be provided in the village to make it smart required are the basic and other primary facilities
which lacks in the village.
→ So according to gap analysis of KANBHA village we observed that the road of the villages are not in proper condition also there are no facility.
infrastructures with regards to lesser or least hindrance to its rural authenticity. Main Smart Aim: ―Developing village with a _rural soul,, but with all Smart urban amenities that a city may have‖.
This will help in developing Smart villages in sustainable manner, reduce migration from villages and prevent the cities from the urban pressure. This should lead to some rethinking about the meaning of efficiency beyond the usual conceptions of economic or technical efficiency. Indeed, employment expansion is at least as important as growth in productivity. In a sense, both represent the utilization of labor as a resource.
on one and neglect the other It is important to reflect on this question. The answer, which calls for change in both economics and politics, could make a real difference
People of village migrate from rural to urban for better education, to get employment, to live standard life.

THE BASIC AMENITIES WHICH CAN BE SUGGESTED IN THE VILLAGE TO MAKE IT SMART VILLAGE ARE AS FOLLOW:

Public library, bus stand, community hall, public toilet, post office, repair works of the roads, sport building, public health center, etc.

CHAPTER-11
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CHAPTER-12 Annexure Attachment

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

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

Techno Economic Survey

For

Vishwakarma Yojana: Phase VIII

IDEAL VILLAGE SURVEY

An approach towards Rurbanisation for Village Development

Name of Village:	Vahelal
Name of Taluka:	Dascroi
Name of District:	Ahmedabad
Name of Institute:	Harsmath Koscoomi College of Farm
Nodal Officer Name & Contact Detail:	Prof Girishchandra Kheshi Bhai
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Sarpanch :- Ashvin bhai Talati - Hasit bhai Gram Sevak :- Prakash bhai (not present)
Date of Survey:	

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	-	-	-	-
ii)	2011	3074	1560	1514	941

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	794.94.69
	Forest Area (In hect.)	-
	Agricultural Land Area (In hect.)	579.48.12
	Residential Area (In hect.)	-
	Other Area (In hect.)	-
	Water bodies	Pond
	Nearest Town with Distance:	Nadiad 9

3. Occupational Details:

Name of Three Major Occupation groups in Village	1.	Agriculture
	2.	Private Job
	3.	Govt. Jobs

4. Physical Infrastructure Facilities:

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

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E.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	civilable	✓		
	Main road	civilable	✓		
	Internal streets	civilable	✓		
	Nearest NH/SH/MDR/ODR Dist. in kms.	NH 59 (15 Kms)	✓		
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station—Kms)	Nearoda 14Km (yes)	✓		
	Bus station (Y/N) Condition: (If No than Nearest Bus Station—Kms)	yes good	✓		AMTS ST
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto Private vehicles	✓		
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Private more than 6hrs	✓		
	Power supply for Domestic Use	available	✓		
	Power supply for Agricultural Use	civilable	✓		
	Power supply for Commercial Use	available	✓		
	Road/ Street Lights	available	✓		

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	Electrification in Government Buildings/ Schools/ Hospitals	Available	✓		
	Renewable Energy Source Facilities (Y/ N)	Yes (not in Domestic)	✓		in Available
	LED Facilities	Yes	✓		
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	yes 2	✓		
	Location Condition	In village Good	✓		
	Community Toilet (With bath/ without bath facilities)	Yes	✓		
	Solid & liquid waste Disposal system available	Yes dumping	✓		
	Any facility for Waste collection from road	Yes	✓		Door to door
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	Canal Borewell	✓		
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Pucca 90%			Good Condition

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks

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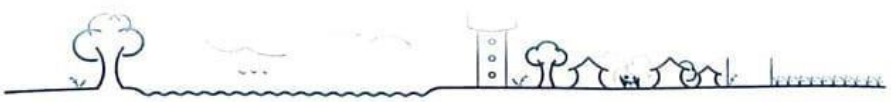
K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	Subcenter and PHC available (Good)	✓		
	Private Clinic/Private Hospital/ Nursing Home	Private clinic	✓		
	If any of the above Facility is not available in village than approx. distance from village: 14.....kms. Nearby				
Suggestions if any:					
L.	**Education Facilities:**				
	Aaganwadi/ Play group	available	✓		
	Primary School	available	✓		
	Secondary school	available	✓		
	Higher sec. School	available	✓		
	ITI college/ vocational Training Center	available	✓		
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	available (HSC CE)	✓		
	If any of the above Facility is not available in village than approx. distance from village: 14.....kms. Nearby				
Suggestions if any:					
M.	**Socio- Culture Facilities**				
	Community Hall (With or without TV) Location:	Yes (3) Without TV	✓		



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	Condition:	good	✓		
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	yes in village not good		✓	
	Public Garden Location: Condition:	yes in village good	✓		
	Village Pond Location: Condition:	yes in village good	✓		
	Recreation Center Location: Condition:	No		✓	
	Cinema/ Video Hall Location: Condition:	No –		✓	
	Assembly Polling Station Location: Condition:	yes in village good	✓		
	Birth & Death Registration Office Location: Condition:	yes online good	✓		online
If any of the above Facility is not available in village than approx. distance from village: ..14....kms. Nearest					
Suggestions if any:					
N.	**Other Facilities**				
	Post-office	yes	✓		not building
	Telecommunication Network/ STD booth	yes not STD	–		

	General Market	Yes	✓		
	Shops (Public Distribution System)	Yes	✓		
	Panchayat Building	Yes	✓		
	Pharmacy/Medical Shop	Yes	✓		
	Bank & ATM Facility	Yes	✓		
	Agriculture Co-operative Society	Yes	✓		
	Milk Co-operative Soc.	Yes	✓		
	Small Scale Industries	Yes	✓		
	Internet Cafes/ Common Service Center/Wi Fi	Yes	✓		
	Other Facility	waste disposal plants	✓		
Suggestions if any:		waste disposal plant.			

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

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

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	Base.map / Hard copy

Recent Projects going on for Development of Village	~~YES~~ Sarcehuta abhiyan
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)**	yes Panchayat house	
2.	**Additional Information/ Requirement**		
	Know For its Temple	-	
	and history	-	

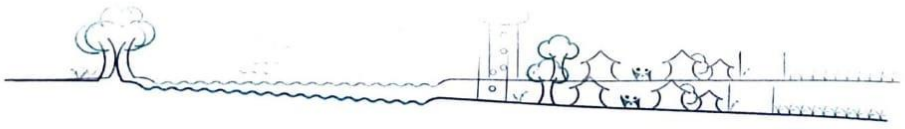
9. **Smart Village Proposal Design**

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Bus stand		

વહેલાલ ગ્રામ પંચાયત
તા.દસક્રોઇ

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

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



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

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:	Gandhinagar
Name of Taluka:	Gandhinagar
Name of Village:	Limbodiya
Name of Institute:	Hasmukh goscamni college of engineering
Nodal Officer Name & Contact Detail:	Prof Seemanth Kaladi
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Patel Harshadbhai Babubhai
Date of Survey:	23 - 10 - 2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	1241	679	612	245

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	351 hectoq
2.	Forest Area (In hect.)	NIL
3.	Agricultural Land Area (In hect.)	280 hectoq
4.	Residential Area (In hect.)	140 hectoq
5.	Other Area (In hect.)	70 hectoq
6.	Distance to the nearest railway station (in kilometers):	medqq (2km)

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7.	Name of Nearest Town with Distance	Ahmedabad (7 Km)
8.	Distance to the nearest bus station (in kilometers)	1 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.	Farming
	2.	daboka cook
	3.	Employement

Major crops grown in the village:	1.	Bajara
	2.	paddy
	3.	Vegetable

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

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

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Suggestions if any:					
B.	**Water Tank Facility**	1. Capacity - 50,000 lit. 2. Capacity - 10000 Lit			
	Overhead Tank	Capacity			
	Underground Sump	Capacity 1.5 Lakh Lit		✓	
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1 open 2 close B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET	yes close	✓		
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Black Topped	✓		
	Main road	Black Topped	✓		
	Internal streets	R.C.C. Road	✓		
	Nearest NH/SH/MDR/ODR Dist. in kms.	Yes 7 Km			
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station—Kms)	No			Valod (5 km)
	Bus station (Y/N) Condition: (If No than Nearest Bus Station—Kms)	Yes	✓		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto Jeep Private	✓		
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	UGVCL Yes	✓		24 hrs

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	Power supply for Domestic Use	UGVCL	✓		24 hrs
	Power supply for Agricultural Use	UGVCL	✓		24 hrs
	Power supply for Commercial Use	UGVCL	✓		24 hrs
	Road/ Street Lights	UGVCL	✓		24 hrs
	Electrification in Government Buildings/ Schools/ Hospitals	UGVCL	✓		24 hrs
	Renewable Energy Source Facilities (Y/ N)	UGVCL	✓		~~24 hrs~~
	LED Facilities	Yes	✓		6 hrs
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Yes			
	Location Condition	Good			
	Community Toilet (With bath/ without bath facilities)	No			
	Solid & liquid waste Disposal system available	✓	✓		
	Any facility for Waste collection from road	No			
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL OTHER (SPECIFY)	Well Tube well	✓		
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	Both	✓		Pucca - 74.6 Kutcha - 25.5

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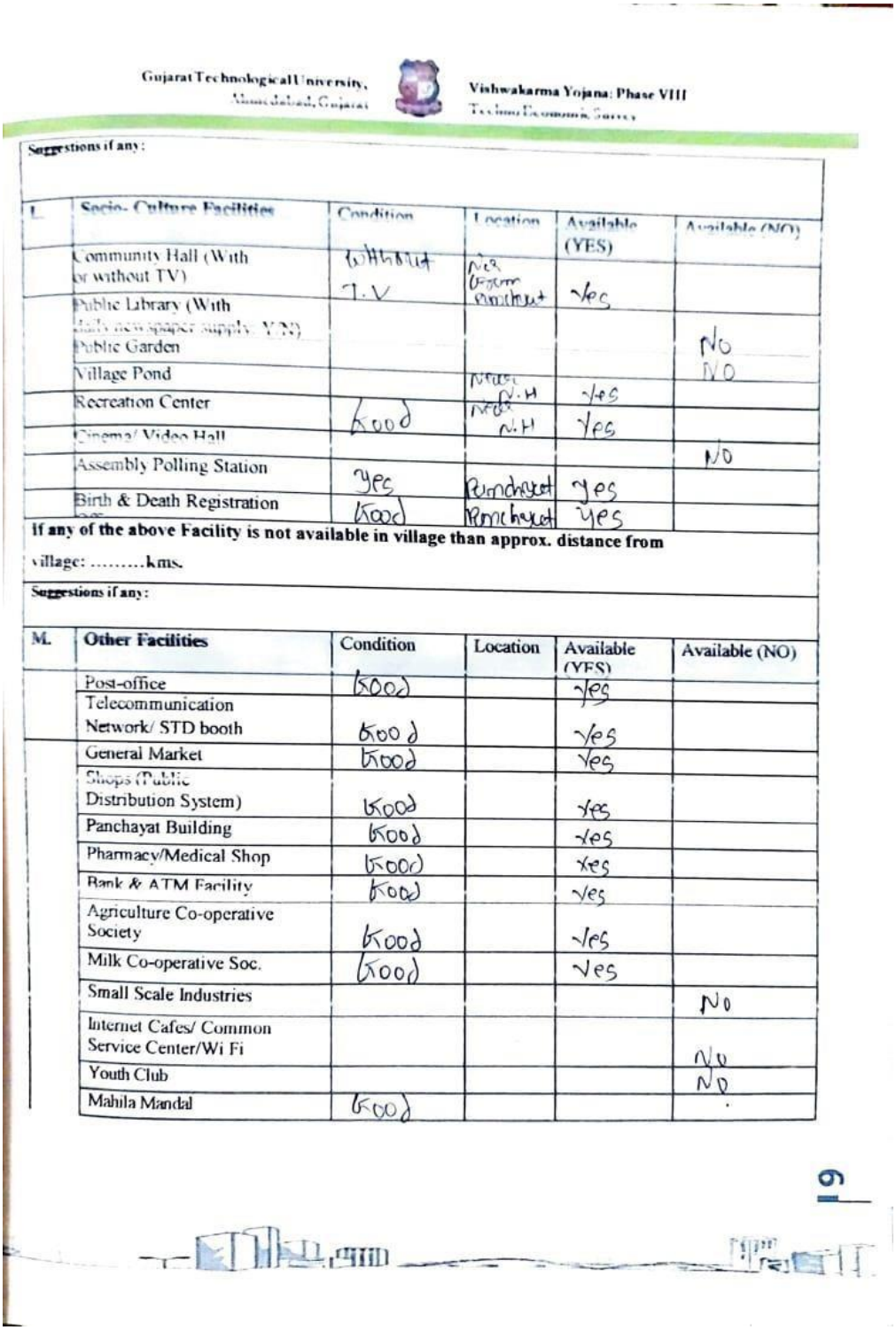
V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	4 CDS			
	Sub-Centre	2 complete	✓		
	PHC				
	BLOCK PHC	PHC			
	CHC/RH				
	District Govt. Hospital				
	Govt. Dispensary				
	Private Clinic	Private clinic	✓		
	Private Hospital/				
	Nursing Home				
	AYUSH Health Facility				
	Sonography /ultrasound facility				
	If any of the above Facility is not available in village than approx. distance from village. ....5....kms. Valod				
	Suggestions if any: Govt Hospital C.H.C				
K.	**Education Facilities:**				
	Aaganwadi/ Play group	Yes			No. 7
	Primary School	Yes			No. 7
	Secondary school	Yes			No. 7
	Higher sec. School	Yes			No. 7
	ITI college/ vocational Training Center	-	-	-	-
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	-	-	-	-
	If any of the above Facility is not available in village than approx. distance from village: 5-1....kms. Enusem Engineering college.				



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Suggestions if any:

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

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

Suggestions if any:

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

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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		NO		
	Solar Street Lights		yes		
	Rain Water Harvesting System		NO		
3.	Any Other		NO		

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy		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)	Earthquake			2001

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

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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	NO	
2.	Additional Information/ Requirement		
3.	During the last six months how many times CLEANING .....4..... FOGGING..... Drive was undertaken in the village?		

IX. Smart Village / Heritage Details

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

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 / તલાટી કમ મંત્રી
લેબડીયા-કરાઈ ગૃપ ગ્રામ પંચાયત
તા.જી.ગાંધીનગર

12.3 SURVEY FORM OF ALLOCTED VILLAGE SCANNED COPY ATTACHMENT IN THE REPORT

Gujarat Technological University, Ahmedabad, Gujarat

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Techno Economic Survey

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

Name of District:	Ahemedabad
Name of Taluka:	Dascroi
Name of Village:	Kanbha
Name of Institute:	Hasmukh goscwami college of engi
Nodal Officer Name & Contact Detail:	Prof. Saimuth Kaveli
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Sarpanch Thakor baliben
Date of Survey:	20-10-2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	5109	-	-	-
2.	2011	4498	2355	2143	-

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	332 hector
2.	Forest Area (In hect.)	-
3.	Agricultural Land Area (In hect.)	1321 hector
4.	Residential Area (In hect.)	80 hector
5.	Other Area (In hect.)	-
6.	Distance to the nearest railway station (in kilometers):	16 Km

7.	Name of Nearest Town with Distance:	Ahemedabad (15 Km)
8.	Distance to the nearest bus station (in kilometers):	0.5
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.	Agriculture
	2.	Dairy
	3.	Chhutak Mazdi.

Major crops grown in the village:	1.	Kapas
	2.	Aperenda
	3.	Other

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		✓	x	
2.	**DUG WELL** Protected Well ✓ Un Protected Well	Pagotesa well			Empty
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring				
	Rainwater Tanker Truck Cart With Small Tank				
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump	Nurereda Concel Tube well	✓	x	

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	Other(Specify)Lake/ Pond	Yes			
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	5000 ltr		
	Underground Sump	Capacity:	10000 ltr		
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1	Khal Kuchi			
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Jammed R.C.C.			
	Main road	Jammed			
	Internal streets	R.C.C (1 Road)			
	Nearest NH/SH/MDR/ODR Dist. in kms.	N.H (0. Km)			
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	NO (15 Km)			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Yes			
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Yes			

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Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
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	Power supply for Domestic Use	All time			
	Power supply for Agricultural Use	All time	(12hrs)		
	Power supply for Commercial Use	All time			
	Road/ Street Lights	All time			
	Electrification in Government Buildings/ Schools/ Hospitals	All time			
	Renewable Energy Source Facilities (Y/ N)	NO			
	LED Facilities	yes			
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Yes	(3)		
	Location Condition	-			
	Community Toilet (With bath/ without bath facilities)	yes without Bath			
	Solid & liquid waste Disposal system available	Yes			
	Any facility for Waste collection from road	yes			
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND	Pond			
	STREAM/RIVER	Riverd			
	CANAL	NO			
	WELL	yes			
	TUBE WELL	yes			
	OTHER (SPECIFY)	NO			
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)		650 Pucca	250 Kutchh	

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)				
	Sub-Centre	yes			
	PHC	yes			
	BLOCK PHC	YES			
	CHC/RH	No			
	District/ Govt. Hospital	No (sola civil)			
	Govt. Dispensary	no			
	Private Clinic	yes			
	Private Hospital/	No			
	Nursing Home	No			
	AYUSH Health Facility	No			
	Sonography /ultrasound facility	No			
	If any of the above Facility is not available in village than approx. distance from village. 4.....kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Anganwadi/ Play group	yes			
	Primary School	yes			
	Secondary school	yes			
	Higher sec. School	no			
	ITI college/ vocational Training Center	NO			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	NO			

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

Suggestions if any:

L.	Socio- Culture Facilities	Condition	Location	Available (YES)	Available (NO)
	Community Hall (With or without TV)	~~No~~	-	-	NO
	Public Library (With daily newspaper supply- Y/N)	yes	in village	good	-
	Public Garden	yes	in village	good	-
	Village Pond	yes	in village	good	-
	Recreation Center	no	-	-	NO
	Cinema/ Video Hall	No	-	-	NO
	Assembly Polling Station	yes	Primary School	good	-
	Birth & Death Registration Office	yes	ayam Panchayat	good	-

If any of the above Facility is not available in village than approx. distance from village: ...~~1~~...kms. Singarva

Suggestions if any:

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

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

Suggestions if any:

N.	Other Facilities	Condition		Available (YES)	Available (NO)
	1. Have these programme implemented the village?				
	2. Are there any beneficiaries in the village from the following programme?				
	3. Janani Suraksha Yojana	good	~~yes~~	yes	-
	4. Kishori Shakti Yojana	-		-	NO
	5. ~~Balika Samriddhi Yojana~~	-			NO
	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)	good		yes	-
	10. National Social Assistance Programme	-		-	NO
	11. Sanitation Programme (SP)	-		-	NO
	12. Rajiv Gandhi National Drinking Water Mission	-		-	NO
	13. Swarnjayanti Gram Swarozgar Yojana	-		-	NO
	14. Minimum Needs Programme (MNP)	-		-	NO
	15. National Rural Employment Programme	-		-	NO
	16. Employee Guarantee Scheme (EGS)	-		-	NO
	17. Prime Minister Rojgar Yojana (PMRY)	-		-	NO
	18. Jawahar Rozgar Yojana (JRY)	-		-	NO
	19. Indira Awas Yaojna (IAY)	close		yes	-
	20. Samagra Awas Yojana (SAY)	-		-	NO
	21. Sanjay Gandhi Niradhar Yojana (SGNY)	-		-	NO
	22. Jawahar Gram Samridhi Yojana (JGSY)	-		-	NO
	23. Other (SPECIFY)	good Pandit Deendayal Yojana		yes yes	-

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Adoption of Non-Conventional Energy Sources/ Renewable Energy Sources	–	✓	–	–
2.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	–	–	–	–
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	Photo	✓	–	–
2.	Recent Projects going on for Development of Village		✓		
3.	Any NGO working for village development	–	–	✓	–
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)	disease	✓	–	–

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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	yes (All)	
2.	Additional Information/ Requirement		
3.	During the last six months how many times CLEANING .....yes..... FOGGING.....No..... Drive was undertaken in the village?	4 month ma cleaning no.	

IX. Smart Village / Heritage Details

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

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

તા.દસ્ક્રોઇ, જી.અમદાવાદ

સરપંચ
કણભા ગ્રામ પંચાયત
તા.દસ્ક્રોઇ, જી.અમદાવાદ

12.4 Gap Analysis of the Allocated Village

VILLAGE GAP Analysis

Village Facilities	Planning Commission/UDPFI Norms	Village Name: KANBHA ,DASKROI Population: 4498 Existing	Required as per Norms	Smart Vilage / Cities / Heritage Future Projection Design	Gap
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	1	2		1
Primary School	Each Per 2500 population	1	-		0
Secondary School	Per 7,500 population	1	-		0
Higher Secondary School	Per 15,000 Population	0	1	1	1
College	Per 125,000 Population	0	1	1	1
Tech. Training Institute	Per 100000 Population	0			
Agriculture Research Centre	Per 100000 Population	0			
Skill Development Center	Per 100000 Population	0			
Health Facility					
Govt/Panchyat Dispensary or Sub PHC or Health Centre	Each Village	1	2		
Primary Health & Child Health Center	Per 20,000 population	1			
Child Welfare and Maternity Home	Per 10,000 population				
Multispeciality Hospital	Per 100000 Population				
Public Latrines	1 for 50 families (if toilet is not there in home, specially for slum pockets & kutcha house)	1	1		
Physical Infrastructure Facilities					
Transportation		Adequate / Inadequate			
Pucca Village Approach Road	Each village	✓			
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)		✓		
Drinking Water (Minimum 70 lpcd)		Adequate / Inadequate			
Over Head Tank	1/3 of Total Demand	✓			
U/G Sump	2/3 of Total Demand				
Drainage Network - Open		Adequate / Inadequate			
Drainage Network - Cover		cover	cover		
Waste Management System		Adequate / Inadequate		✓	
Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	-	1	1	1
community hall and Public Library	Per 15000 Population	-	1	1	1
Cremation Ground	Per 20,000 population	-	1		0
Post Office	Per 10,000 population	-	1	1	1
Gram Panchayat Building	Each individual/group panchayat	1	1		0
APMC	Per 100000 Population	-	1		0
Fire Station	Per 100000 Population	-	1		0
Public Garden	Per village	-	1		0
Police post	Per 40,000Population	-	1		0
Shopping Mall					
Electrical Design					
Electricity Network		Adequate / Inadequate			
Any Smart Village Facility					
Technology	SOLAR	0	-	1	
	rain water harwesting	0	-	1	
		ESR cap	0		
		Sump cap	0		
		Lat	0		

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

NO	Village Name	Design proposal	
		Part 1	**Part 2**
1	**KANBHA**	Public toilet	Public Garden
		Super market	Maintenance of RCC Road
		Post office	Hospital
		Library	Community Hall
		Bus stand	Playground
		Underground water tank	Bio Gas Plant
2	**BILASIYA**	Public toilet	Bank
		Public garden	Bus Stop
		Library	Rain Water Harvesting system
		Solar water distribution pump	Grocery Store
		Community hall	Pharmacy Clinic
		Public health Centre	Animal Husbandry
3	**KUHA**	Public toilet	Road
		Government medical shop	Play Ground
		Auditorium	Activity Club
		Public library	Mahela Mandali
		Waste management	Gate
		Ground water recharge by vertical shaft	Water Tank
4	**KUBADTHAL**	Bank	Government Grocery Shop
		Arogya Kendra	Community Hall
		Post office	Public Library
		Skill development class	Maintenance of Panchayat Building
		Cyber cafe	Public Toilet

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

IDEAL VILLAGE	SMART VILLAGE	ALLOCATED VILLAGE
		
		
		

All village compare with fig 65

12.8 Village Interaction with sarpanch Report with the photograph:

A Report On

Interactive Presentation (Vishwakarma Phase 8)

At

Kanbha village, Ahmedabad District

As per the circular of GTU guidelines, GTU had informed all the team members of Vishwakarma Yojana to present their work in the allocated village for the successful and effective implementation of Vishwakarma YojanaPhase-8.

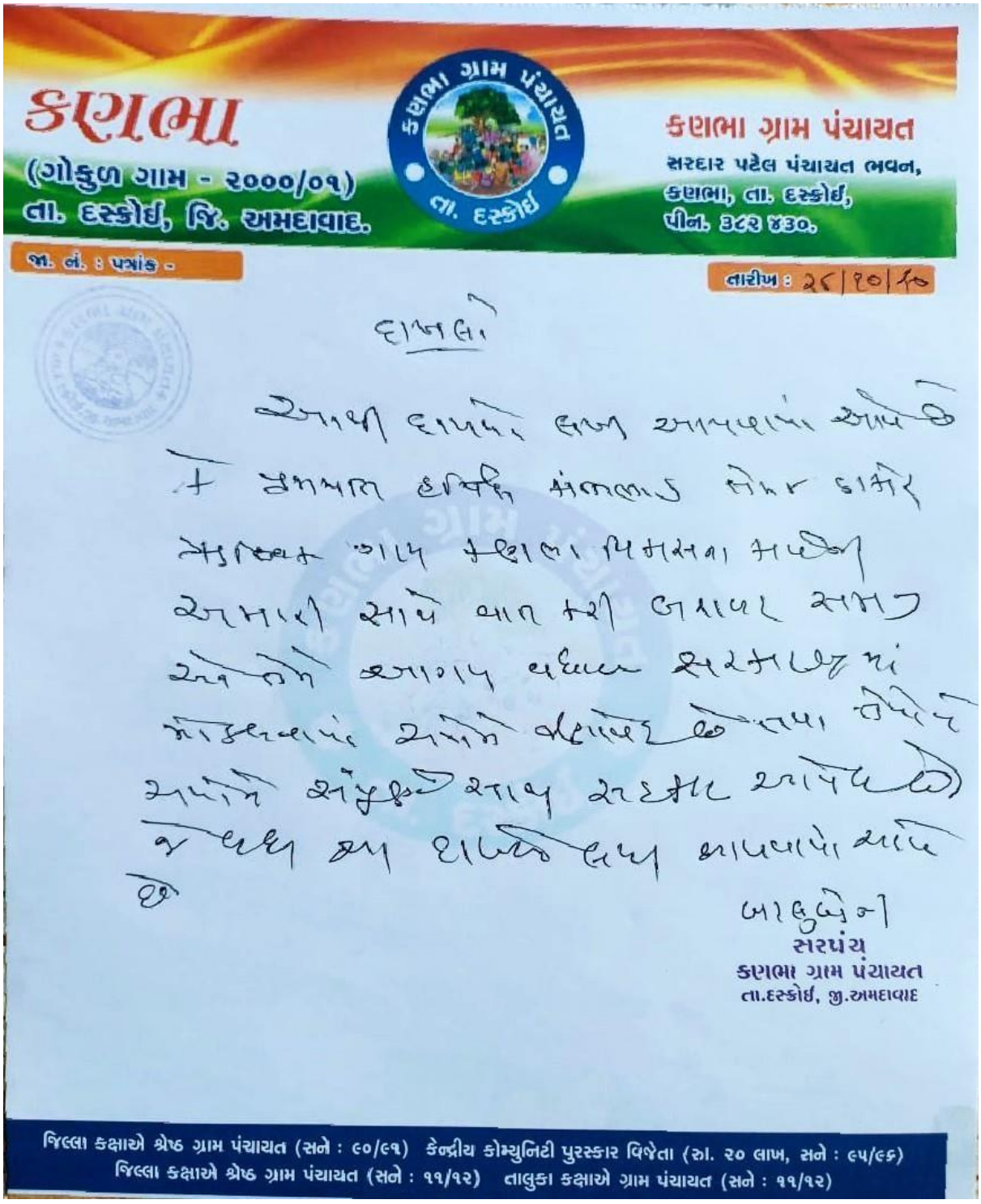
Under their guidelines the members of the team of Kanbha village presented the plan for the development of the village at Kanbha gram panchayat office. Sarpanch, village dwellers were present to know how the development of the village can be done.

Some of them also gave their own ideas and the facilities which are required in the village. We presented our work under the guidelines of VY Phase-7. We also made them understand about the main objective of the project, its benefits for the development of village and other issues and concerns prevailing in the village.

We explained them about the various designs we are going to proposed in the village for its development. The designs which we are going to proposed were designated as Physical infrastructure, social infrastructure, Social and Cultural facilities, Repair and Maintenance of existing structures and the most important facility of Sustainable/ Renewable Energy Source of planning.

Fig 66 Sarpanch of Kanbha

12.9. information about the village development:



CHAPTER 13
future designs of the aspects (Feasibility, Construction, Operation and maintenance of various design options in Rural Areas along with cost with AutoCAD designs / planning with any software

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

13.1 DESIGN PROPOSALS

- for part 2: proposals
- design of public garden
- maintenance design of RCC roads
- design of Hospital
- Community Hall
- Playground
- Mahila Mandli

Recommendations of the Design: -

- **Public garden: -** For children's and senior citizens in the village we have designed playground for their hygiene and comfort
- **Hospital: -** In the village there is Arogya Kendra but it is in maintenance there is no enough space than design a health center for village people.
- **Community hall: -** In village not any function plot for family.so design the community hall.
- **Biogas plant: -** In the village facility of environmentally friendly gas use.

Suggestions / Benefit of the villagers: -

- Sustainable Infrastructure Facilities should need such as: green building, Solar system, Biogas plant, Rainwater Harvesting, etc.
- Physical Infrastructure Facilities should need such as: primary school, drainage system, bus stand, sanitation facilities, Child Welfare center etc.

13.1.1 DESIGN OF PUBLIC GARDEN

Fig, design of public garden

MEASUREMENT SHEET:

No	DESCRIPTION	N	LENGH	BREAT	HEIGHT	QUANTITY	Total
1	Excavation in foundation						
	CW1=205+0.75=205.75	1	205.75	0.75	0.6	92.59	
							92.59
2	Pcc in foundation						
	Compound wall	1	205.75	0.75	0.2	30.86	
							30.86
3	Brick work in foundation						
	Long wall						
	First step						
	Length=205+0.6=205.6	1	205.6	0.6	0.2	24.67	
	Second step						
	Length=205+0.375=205.375	1	205..375	0.375	0.2	15.40	
						40.08	40.08
4	Brick work in super structure						
	COMPOUND WALL						
	Length=205	1	205	0.23	1.5	70.73	
	Deduction door/window						
	D1	1	5	1	1.5	7.50	
						-7.50	63.23
5	Plaster						
	COMPOUND WALL=205	1	205		1.5	307.50	
						615.00	
	Deduction door/window						
	D1	1	5		1.5	7.5	
						-15.00	630.00

ABSTRACT SHEET

No	Item	Quantity	Per	Rate	Amount
1	Excavation in foundation	92.59	M^3	150	13888.25
2	P.C.C 1:3:6	30.86	M^3	3000	92587.5
3	Brick work in foundation	40.08	M^3	3200	128240.4
4	Brick work in superstructure	63.23	M^3	3500	221287.56
5	20mm Plaster	630	M^3	150	94500
				TOTAL	550503
	2% Contingencies				11010.0705
	3% Work Charge Establishment				16515.1058
	GREAND TOTAL				578028.88

13.2 PHYSICAL DESIGN: RCC ROAD WORK:

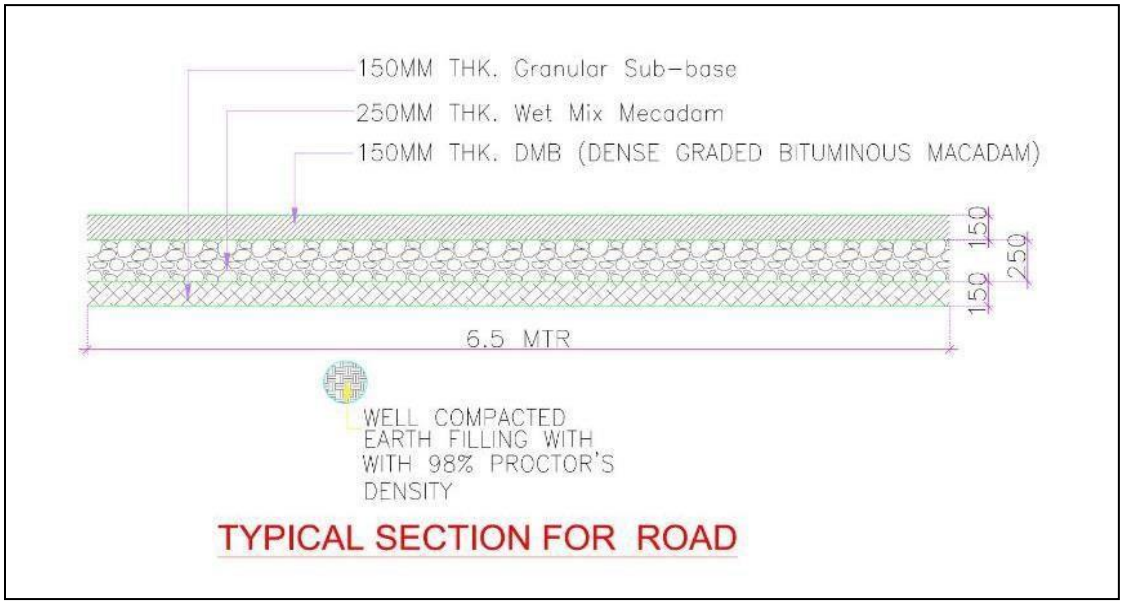


Fig 89 design of RCC road

MEASUREMENT SHEET:

Sr.no	item	no	length	Breadth	depth	quantity
1	Excavation For Road	1	3400	6.5	0.4	8840
2	Conveyance				22100	22100
3	Granular Sub-base With Coarse Graded	1	3400	6.5	0.15	3315

1	6165	Earth work in cutting in all sorts of soil & Murom including, conveying, breaking clods spreading the stuff as &were dire. Within a lead of 50 m from end of cutting.	47	M^3	289755
2	22100	Conveyance charge of earth, lime, Murom, building rubbish, manure, garbage, sludge, excavated rock, fly ash, aggregates of any kind Including spreading &leveling etc. complete.	175	M^3	3867500
3	3738	Granular Sub-Base with Coarse Graded Material (Table: - 400- 2) (Construction of granular sub-base by providing coarse graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with motivator at OMC, and compacting with vibratory roller to achieve the desired density, complete for Grade - V Material. (As per as per Mort 5th Revision table 400.1) (Govt. R & B NH Division SOR 2012/13 Ch-4 Item No. 4.1.b.(i) Page No.19 + Carting as per Statement No. 05 Sereno. 3.2.1B(2)) for grading- I Material	1200	M^3	4485600
4	5525	Wet Mix Macadam (Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density.	1575	M^3	8701875

5	3315	Providing and applying primer coat with cationic bitumen emulsion SS1 grade conforming to IS: 8887 on prepared surface of wet mix macadam including clearing of Wet mix macadam surface with air compressor to remove all loose material other foreign material. The primer shall be sprayed uniformly at the rate of 0.70-1.0 kg/sq.mt. The tack coat shall be applied by a self-propelled or towed bitumen pressure sprayer, equipped for spraying the material uniformly at a specified rate. No dilution or heating at site of RS1 bitumen emulsion shall be permitted. RA based on Govt R & B NH Division SOR 2012/13 Ch-5 ItemNo.5.10 Pg. No.27 & Current market rate	64	M^3	212160
6		Dense Graded Bituminous Macadam (Providing and laying dense bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tons per hour using crushed aggregates of specified grading, premixed with bituminous binder @ min 4.5% by weight of total mix, transporting the hot mix to work site, laying with a self-propelled paving machine equipped with an electronic sensing device to the required grade, level and alignment, rolling with 810 tone static weight or vibratory roller or with a pneumatic tier roller of 12 to 15 tone weight to achieve the desired compaction as per	3807	M^3	0

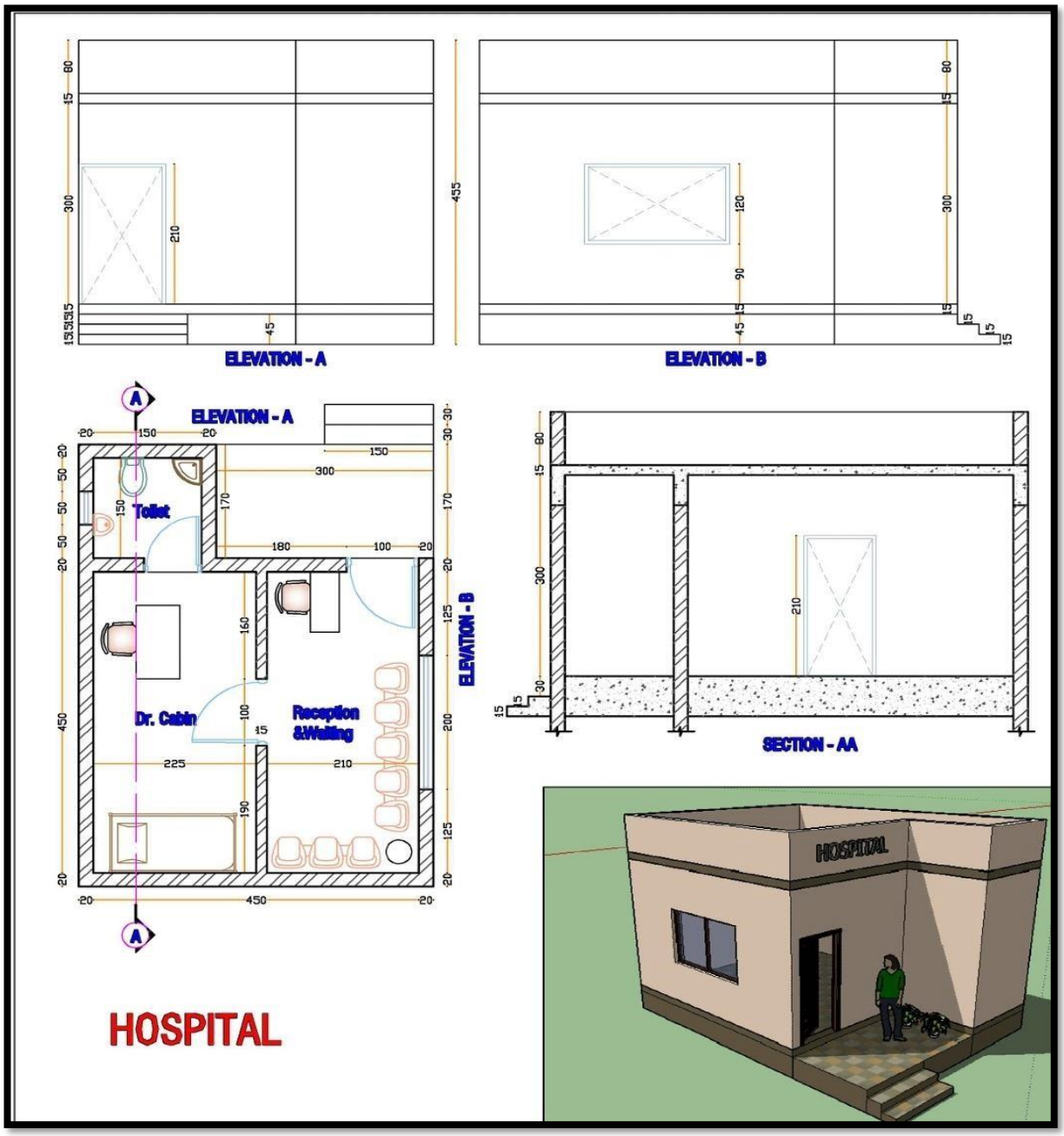
		approved design mix . for Grading-II (26.5 mm nominal size) 3407.00 As per AMC Circular dated on 26-02-2014			
	4707	A production	3667	m.t	17260569
	4707	Carting	90	m.t	423630
	4707	Laying	50	m.t	235350
7	31506	Providing and applying tack coat with Cationic Bitumen Emulsion 7 139.0 0 M.T. 1039.50 RS1 complying with IS: 8887. The tack coat shall be applied by a self-propelled or towed bitumen pressure sprayer, equipped for spraying the material uniformly at a specified rate. No dilution or heating at site of RS1 bitumen emulsion shall be permitted.	13	M^2	409578
8	15753	Manufacturing testing supplying loading transporting to work site unloading lowering in trench laying and jointing RCC NP3 class pipe in C M 1:1 including all jointing material such as cement, sand hump bitumen as directed. Testing the pipe line to a head of 1.5 m and hydraulic test as directed etc. complete	690	RMT	108695 70
9	3400	Constructing B.P. type Catch pit of size 0.60 x 0.60 depth up to 0.75 mt including excavation, P.C.C. (1:4:8), 23 cm thick brick masonry wall in CM (1:6) with 40 2788.00 Nos. 4mm thick IPS flooring in the prop M15 at bottom and 15 mm thick cement plaster inside the catch pit in the proportion of CM (1:3) without jali etc. comp. as directed.	2788	NOS	947920 0
10	3400	Grating (Jali): 740 x 740 x 90 mm	820	NOS	278800

		square jali, 10:00 MT load design, 90 x 2 mm MS flat all round, Frame: 10 15.00 600 x 600 mm clear opening, outer size- 900 x 900 x 165 mm. On the upper periphery of frame 25 x 3 mm wide MS flat should be well embedded in concrete to protect the edges of frame.			0
11	4500	Raising &repairing damaged M.H. upto Finished Road Level incl. removing damaged brick and repairing by masonry in C.M. 1:5 and plaster in C.M. 1:3 and fixing C.I. steps and M.H. and carting the same as directed.	820	NOS.	3690000
12	225	Total amount of Provision for Price variation in Bitumen For DBM	5000	m.t	1125000
				Total amount	63837787
				2% sup. &Conte Rs.	127676
				Grand amount	65114543

- **2% SUPERVISION AND CONTRACTER 127675**
- **GRAND TOTAL 65114543 Rs**

13.3 Design of Hospital

.



MEASUREMENT SHEET

No	Item Description	No	Length (m)	Breadth	Height	Quantity
1	Excavation in foundation Total Centre line length	1	27.8	0.9	1.1	27.52m^3
2	P.C.C in foundation	1	27.8	.09	0.2	5m^3
3	Brickwork Foundation					
	Step 1					
	L=28.2m	1	28.2	0.5	.03	4.23m^3
	Step 2					
	L=28.3m	1	28.3	.04	0.3	3.39m^3
	Step 3					
	L=28.4m	1	28.4	0.3	0.6	5.11m^3
					TOTAL	12.73M^3
4	Provide and laying CC (1:4:8)					
	For plinth	1	4.9	5.6	0.6	16.4m^3
	For Roof	1	2.5	3.2	0.15	3.35m^3
					TOTAL	19.81M^3
5	Brick work in superstructure	1	28.5	.02	3	17.1m^3
	Brickwork for parapet	1	21.55	0.2	0.8	3.4m^3
	Deduction for door and window					
	D1	3	1	0.2	2.1	1.26
	W1	1	2	0.2	1.2	0.48
	W2	1	0.5	0.2	1.2	0.12
					TOTAL	1.863M^3
6	Plastering for wall	4	4.5		3	54
		4	1.5		3	18
		2	2.25		3	13.5
		2	2.10		3	12.6
					TOTAL	98.1M^3
	Plastering for celling	1	2025	4.5		10.12
		1	1.5	1.5		2.25
		1	2.1	4.5		9.45
					TOTAL	21.82M^3
	Deduction					
	D1	5	1		2.1	10.5
	W1	1	2		1.2	2.4
	W2	1	0.5		1.2	0.6
					TOTAL	13.5M^3

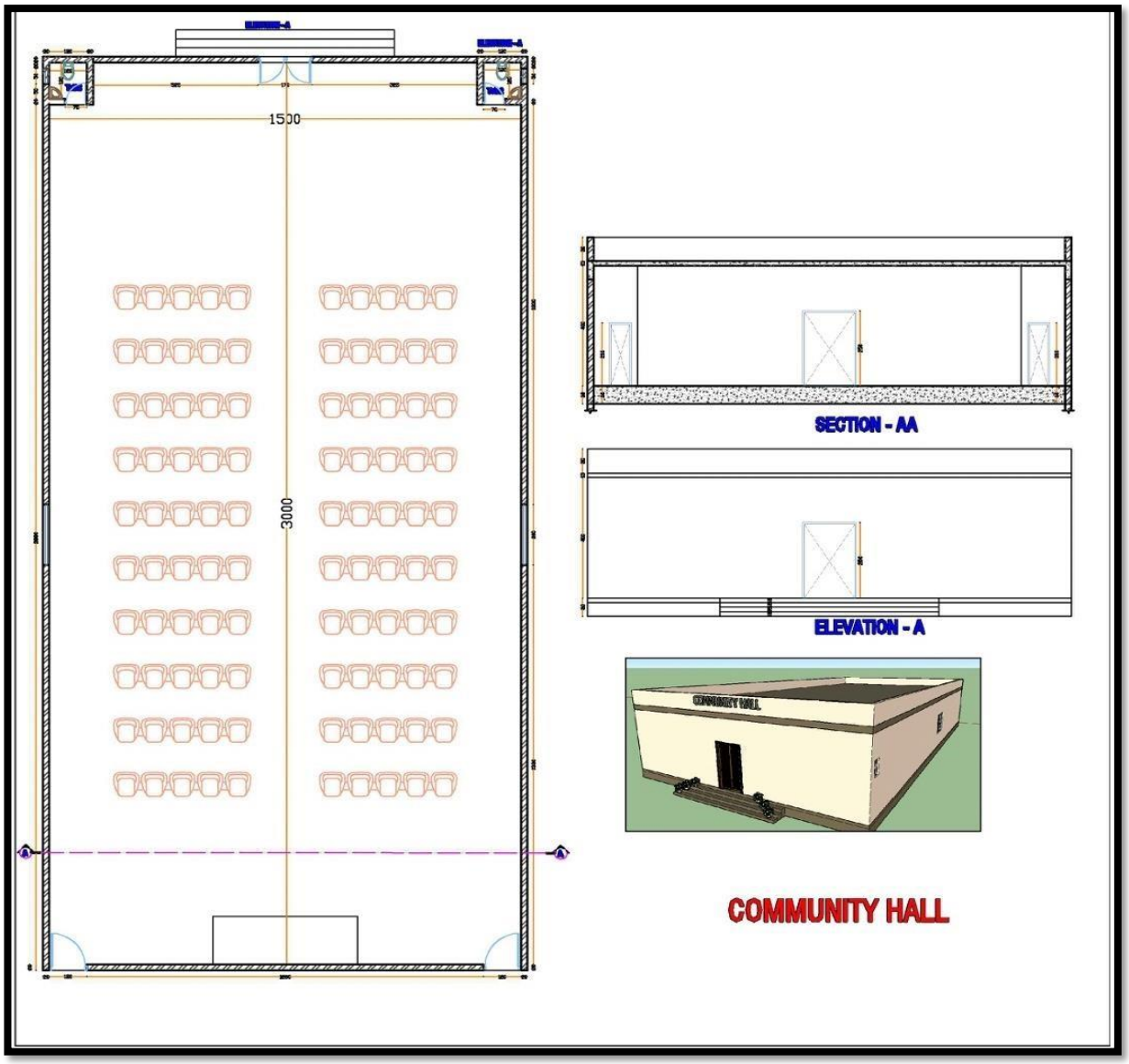
						106.42M^3

ABSTRACT SHEET

No	Particular of item	Quantity	Per	Rate	Amount RS
1	Excavation in foundation	27.52m^3	M^3	150	RS 4128
2	Brick work in foundation	12.73m^3	M^3	3000	RS 38190
3	Plain concrete cement (P.C.C) in foundation in 1:3:6	5m^3	M^3	3200	RS 16000
4	CC (1:4:8) for plinth%roof	19.81m^3	M^3	2415	RS 47853.22
5	Brickwork in superstructure (1:4)	18.687m^3	M^3	3500	RS 65404.5
6	Plastering	106.42m^3	M^3	150	RS 15963
				TOTAL	Rs 187538.7
	2% Contingency			RS 3750.77	
	3% Work charge establishment			RS 5626.16	
	GRAND TOTAL			Rs 196916	

- 2% CONTINGENCY RS. 3750.77
- 3% WORK CHARGE ESTABLISHMENT RS. 5626.16
- GRAND TOTAL RS. 196916.17

13.4 Design of Community Hall:



MEASUREMENT SHEET

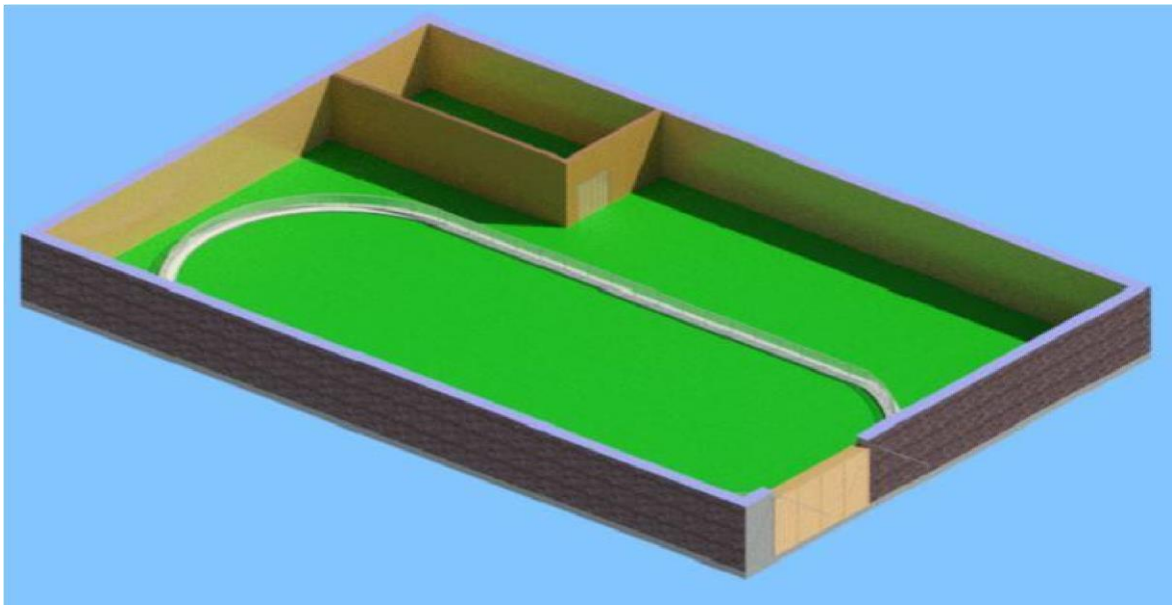
No	Item	No	Length	Breadth	Height	Quantity
1	Excavation in foundation					
	Total Centre Line Length	1	84.2	0.9	1.1	83.3m^3
2	P.C.C in foundation	1	84.2	0.9	0.2	15.156m^3

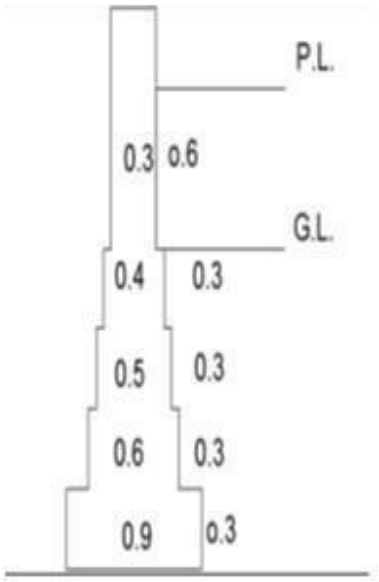
3	Brickwork in foundation					
	Step 1					
	L=85m	1	85	0.5	0.3	12.75m^3
	Step 2					
	L=85.2	1	85.2	0.4	0.3	10.22m^3
	Step 3					
	L = 85.4m	1	85.4	0.3	0.6	15.372m^3
					TOTAL	38.346m^3
4	Provide and laying cc(1:4:8)					
	For Plinth	1	15	30	0.6	270m^3
	For Roof	1	15	30	0.15	67.5m^3
					TOTAL	337.5M^3
5	Brickwork in superstructure	1	85.6	0.2	4	68.48m^3
	Brickwork for parapet	1	79.1	0.2	0.8	12.65m^3
	Deduction for Win & Door					
	D1	1	1.7	0.2	2.12	0.714
	D2	2	0.8	0.2	2.1	0.672
	W1	2	1	0.2	1.2	0.48
					TOTAL	1.866m^3
6	Plastering for wall	6	1.2		4	28.8m^3
		2	28.6		4	228.8m^3
		1	10		4	40m^3
	Plastering for celling	2	1.2	1.2		2.88
		1	28.6	10		286
					TOTAL	288.88m^3
	Deduction					
	D1	2	0.7		2.1	2.94
	D2	2	0.8		2.1	3.36
	W1	2	1		1.2	2.4
					TOTAL	577.78m^3

ABSTRACT SHEET

No	Item	Quantity	Per	Rate	Amount
1	Excavation in foundation	83.35m^3	m^3	150	RS 12502.5
2	Brickwork in foundation	38.34m^3	M^3	3000	RS 115038
3	Plain cement concrete 1:3:6	15.156m^3	M^3	3200	RS 48499.2
4	CC 1:4:8 plinth and roof	337.5m^3	M^3	2415	RS 815062.5
5	Brickwork in superstructure	66.614m^3	M^3	3500	RS 233149.2
6	Plastering	577.78m^3	M^2	150	RS 86667
				TOTAL	Rs 310917.5
	3% Work charge establishment	RS 39327	GRAND	TOTAL	Rs 1376463.

13.5: Playground design (Garden) (30m x 20m):





D	2.0 × 2.10
D1	1.2 × 2.10
W1	2.0 × 1.40

MEASUREMENT SHEET

No	Item	No	Length	Breadth	Height	Quantity
1	Excavation in foundation					
	LW 1					
	L + 30+2*0.45+0.3	2	31.2	0.9	0.9	50.544
	LW 2					
	L + 11+2*0.45+0.3	1	11.2	0.9	0.9	9.072
	SW 1					
	L + 20-0.9	2	19.1	0.9	0.9	30.942
	SW 2					
	L + 5-0.9	1	4.1	0.9	0.9	3.321
					TOTAL	93.879M^3
2	P.C.C in foundation					
	LW 1	2	31.2	0.9	0.3	16.85
	LW 2	1	11.2	0.9	0.3	3.024
	SW 1	2	19.1	0.9	0.3	3.024
	SW 2	1	4.1	0.9	0.3	1.107
					TOTAL	31.29m^3
3	Brickwork in foundation (Long Wall 1)					
	0.5m step	2	30.8	0.5	0.3	9.24
	0.4m step	2	30.7	.04	0.3	7.368
	0.3m step	2	30.6	0.3	0.6	11.016
	(Long Wall 2)					
	0.5m step	1	10.8	0.5	0.3	1.62
	0.4m step	1	10.74	0.4	0.3	1.284
	0.3m step	1	10.6	0.3	0.6	1.908
	(Short Wall 1)					
	0.5m step	2	19.5	0.5	0.3	5.85
	0.4m step	2	19.6	0.4	0.3	4.704
	0.3m step	2	19.7	0.3	0.6	7.092
	(Short Wall 2)					
	0.5m step	1	4.5	0.5	0.3	0.675
	0.4m step	1	4.6	0.4	0.3	0.552
	0.3m step	1	4.7	0.3	0.6	0.846
4	Brickwork in superstructure					
	LW 1	2	30.6	0.3	3.5	64.26
	LW 2	1	10.6	0.3	3.5	11.13
	SW 1	2	19.7	0.3	3.5	41.37
	SW 2	1	4.7	0.3	3.5	4.395
					TOTAL	+121.70m^3
	Deduction for door and window					

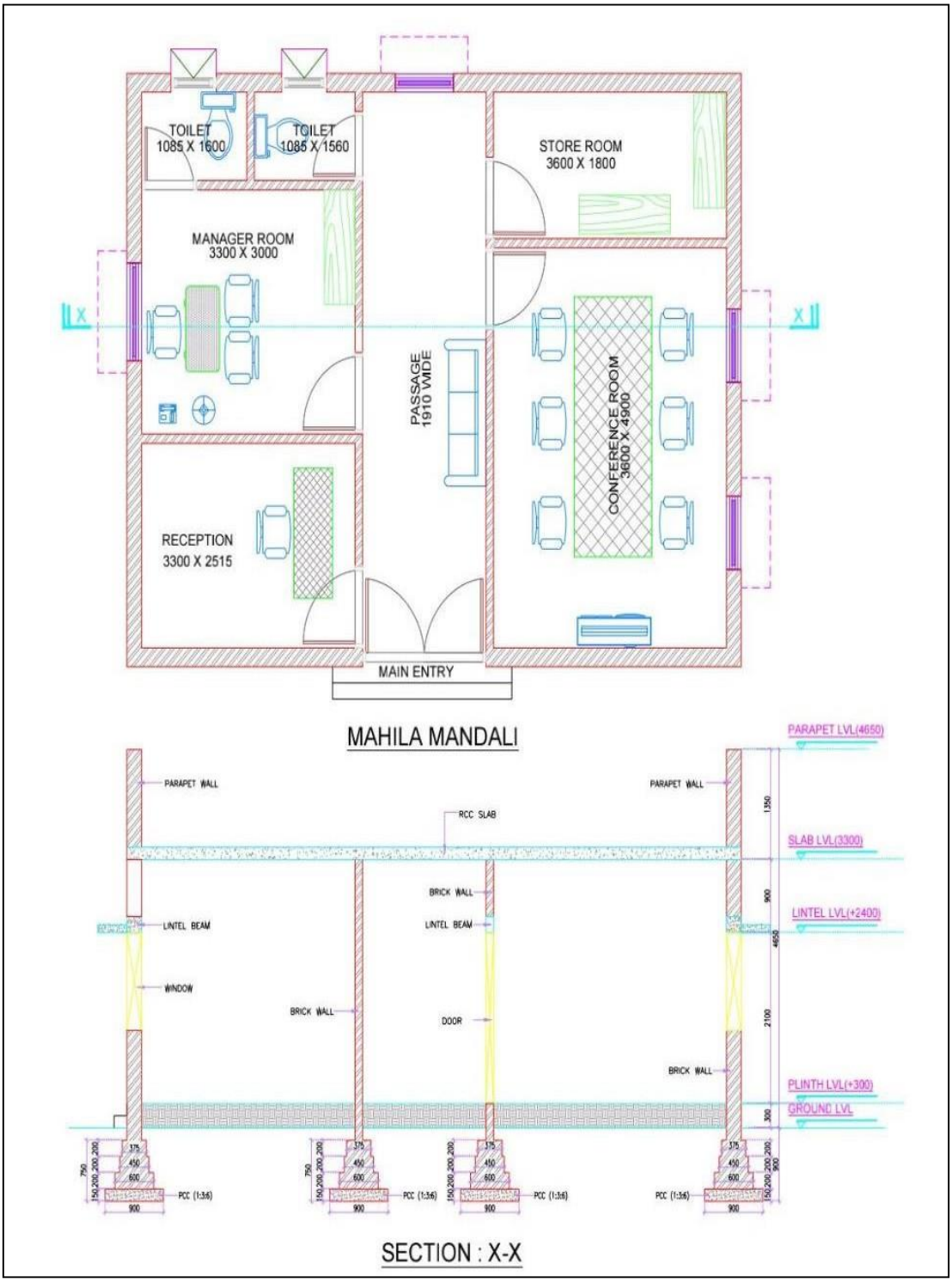
	D1	1	2	0.2	2.1	0.84
	D2	1	1.2	0.2	2.1	0.504
	W	2	1.2	0.2	1.4	2.016
					TOTAL	119.60m^3
5	Plastering					
	Room	2	5		3	30
			10		3	60
	Celling plaster		5	10		50
						+ 140m^3
	Deduction for window					
	D	½	2		2.1	2.1
	W	½	1.2		2.1	1.26
					TOTAL	4.2m^3
						135m^3

ABSTRACT SHEET

No	Item	Quantity	Per	Rate	Amount RS
1	Excavation in foundation	93.879m^3	M^3	150	14081
2	P.C.C in foundation 1:3:6	31.11m^3	M^3	3000	93873
3	Brickwork in foundation	52.19m^3	M^3	3200	166896
4	Brickwork in superstructure 1:4	119.60m^3	M^3	150	20370
5	12mm plastering	1353.8m^3	M^2	150	20370
				TOTAOL	713820

- TOTAL COST 713820.32 Rs

13.6 Mahila Mandli



MESSURMENT SHEET:

No	Description	No	Length	Breadth	Height	Quantity
1	Excavation Foundation					
	LW1=9.5+0.9	2	10.4	0.9	0.9	16.85
	LW2=7.3+0.9	2	8.2	0.9	0.9	13.28
	SW1=7+0.9	2	7.9	0.9	0.9	12.80
	SW2=3.6+0.9	1	4.3	0.9	0.9	3.48
	SW3=3.3+0.9	2	4.2	0.9	0.9	6.80
	SW4=1.6+0.9	2	2.5	0.9	0.96	4.05
					TOTAL	**57.27**
2	Brickwork work foundation					
	Long Wall 1					
	1st step length=9.5+0.6	2	10.1	0.6	0.2	2.42
	2nd step length=9.5+0.45	2	9.95	0.45	0.2	1.79
	3rd step length=9.5+0.375	2	9.875	0.375	0.2	1.48
					TOTAL	**5.70**
	Long Wall 2					
	1st step length=7.3+0.6	2	7.9	0.6	0.2	1.90
	2nd step length=7.3+0.45	2	7.75	0.45	0.2	1.41
	3rd step length=7.3+0.375	2	7.675	0.375	0.2	1.15
					TOTAL	**4.44**
	Short Wall 1					
	1st step length=7.0+0.6	2	7.6	0.6	0.2	1.82
	2nd step length=7.0+0.45	2	7.45	0.45	0.2	1.34
	3rd step length=7.0+0.375	2	7.375	0.375	0.2	1.11
					TOTAL	**4.27**
	Short wall 2					
	1St step length=3.6+0.6	1	4.2	0.6	0.2	0.50
	2nd step length=3.6+0.45	1	4.05	0.45	0.2	0.36
	3rd step length=3.6+0.375	1	3.975	0.375	0.2	0.30
					TOTAL	**1.17**
	Short wall 3					
	1st step length=3.3+0.6	2	3.9	0.6	0.2	0.94
	2nd step length=3.3+0.45	2	3.75	0.45	0.2	0.68
	3rd step length=3.3+0.375	2	3.675	0.375	0.2	0.55
					TIOTAL	**2.16**
	Short wall 4					
	1st step length=1.6+0.6	2	2	0.6	0.2	0.48
	2nd step length=1.6+0.45	2	2.05	0.45	0.2	0.37
	3rd step length=1.6+0.375	2	1.975	0.375	0.2	0.30
					TOTAL	**1.15**
						18.88
3	P.C.C foundation					

	Long wall 1	2	10.4	0.9	0.15	2.81
	Long wall 2	2	8.2	0.9	0.15	2.21
	Short wall 1	2	7.9	0.9	0.15	2.81
	Short wall 2	1	4.3	0.9	0.15	0.58
	Short wall 3	2	4.2	0.9	0.15	1.13
	Short wall 4	2	2.5	0.9	0.15	0.68
					TOTAL	**9.54**
4	Plaster					
	Long wall 1=9.5	2	9.5		4.8	91.20
	Long wall 2=7.3	2	7.3		3.45	50.37
	Short wall 1 =7	2	7		4.8	67.20
	Short wall 2 = 3.6	1	3.6		3.45	12.42
	Short wall 3 = 3.3	2	3.3		3.45	22.77
	Short wall 4 = 1.6	2	1.6		3.45	11.04
	Plaster celling	9.5	7.3			69.35
					TOTAL	**648.70**
	Deduction door/window					
	D1	1	1.8		2.1	3.78
	D2	4	0.9		2.1	7.56
	D3	2	0.75		2.1	3.15
	W1	4	0.9		1.2	4.32
	W2	1	1.05		1.2	1.26
					TOTAL	**-40.14**
						688.84
5	Brickwork superstructure					
	Long wall 1 = 9.5	2	9.5	0.23	4.8	20.98
	Long wall 2 = 7.3	2	7.3	0.23	3.45	11.59
	Short wall 1 = 7.0	2	7	0.115	4.8	7.73
	Short wall 2 = 3.6	1	3.6	0.115	3.45	1.43
	Short wall 3 = 3.3	2	3.3	0.115	3.45	2.62
	Short wall 4 = 1.6	2	1.6	0.115	3.45	1.27
	Deduction window and door					
	D1	1	1.8	1	2.1	3.78
	D2	4	0.9	1	2.1	7.56
	D3	2	0.75	1	2.1	3.15
	W1	4	0.9	1	1.2	4.32
	W2	1	1.05	1	1.2	1.26
					TOTAL	**20.07**
						25.54
6	Slab cement concrete	9.5	7.3		0.125	8.66875

ABSTRACT SHEET

No	Item	Quantity	Per	Rate	Amount RS
1	Excavation in foundation	57.27	M^3	150	8590.1
2	P.C.C 1:3:6	9.54	m^3	3000	28633.5
3	Brickwork in foundation	87.67	M^3	3200	280555.2
4	Brickwork in superstructure	96.02	M^3	3500	336082.95
5	20mm plaster	2207.92	M^3	150	331188
6	150mm thick RCC slab	54.91	M^3	4100	225139.2
				TOTAL	1373715.89
	2% Contingencies				27474.315
	3% Work charge Establishment				41211.4725
	GRAND TOTAL				1442401.5 Rs

- 2% Contingencies 27474.315Rs.
- 3% Work Charge Establishment 41211.4725 Rs.
- GRAND TOTAL 1442401.5 Rs.

CHAPTER 14
Technical Options with Case Studies

14.1 Civil Engineering

14.1.1 Advance Earthquake Resistant:

Earthquake-resistant or aseismic structures are designed to protect buildings to some or greater extent from earthquakes. While no structure can be entirely immune to damage from earthquakes, the goal of earthquake-resistant construction is to erect structures that fare better during Seismic activity than their conventional counterparts. According to building codes, earthquake-resistant structures are intended to withstand the largest earthquake of a certain probability that is likely to occur at their location. This means the loss of life should be minimized by preventing collapse of the buildings for rare earthquakes while the loss of the functionality should be limited for more frequent ones.[1]

To combat earthquake destruction, the only method available to ancient architects was to build their landmark structures to last, often by making them excessively stiff and strong.

Currently, there are several design philosophies in earthquake engineering, making use of experimental results, computer simulations and observations from past earthquakes to offer the required performance for the seismic threat at the site of interest. These range from appropriately sizing the structure to be strong and ductile enough to survive the shaking with an acceptable damage, to equipping it with base isolation or using structural vibration control technologies to minimize any forces and deformations. While the former is the method typically applied in most earthquake-resistant structures, important facilities, landmarks and cultural heritage buildings use the more advanced (and expensive) techniques of isolation or control to survive strong shaking with minimal damage. Examples of such applications are the Cathedral of Our Lady of the Angels and the Acropolis Museum.

Trends and projects

Some of the new trends and/or projects in the field of earthquake engineering structures are presented.

Building materials:

Based on studies in New Zealand, relating to Christchurch earthquakes, precast concrete designed and installed in accordance with modern codes performed well.[2] According to the Earthquake Engineering Research Institute, precast panel buildings had good durability during the earthquake in Armenia, compared to precast frame-panels.[3]

Earthquake shelter:

One Japanese construction company has developed a six-foot cubical shelter, presented as an alternative to earthquake-proofing an entire building.[4]

Concurrent shake-table testing:

Concurrent shake-table testing of two or more building models is a vivid, persuasive and effective way to validate earthquake engineering solutions experimentally.

Thus, two wooden houses built before adoption of the 1981 Japanese Building Code were moved to E-Defence for testing (see both pictures aside). The left house was reinforced to enhance its seismic resistance, while the other one was not. These two models were set on E-Defence platform and tested simultaneously.[6]

Combined vibration control solution:

Close-up of abutment of seismically retrofitted Municipal Services Building in Glendale, California

Seismically retrofitted Municipal Services Building in Glendale

Designed by architect Merrill W. Baird of Glendale, working in collaboration with A. C. Martin Architects of Los Angeles, the Municipal Services Building at 633 East Broadway, Glendale was completed in 1966.[7] Prominently sited at the corner of East Broadway and Glendale Avenue, this civic building serves as a heraldic element of Glendale's civic centre.

In October 2004 Architectural Resources Group (ARG) was contracted by Nabi Youssef & Associates, Structural Engineers, to provide services regarding a historic resource assessment of the building due to a proposed seismic retrofit.

In 2008, the Municipal Services Building of the City of Glendale, California was seismically retrofitted using an innovative combined vibration control solution: the existing elevated building foundation of the building was put on high damping rubber bearings.

Steel plate walls system:


Coupled steel plate shear walls, Seattle

The Ritz-Carlton/JW Marriott hotel building engaging the advanced steel plate shear walls system, Los Angeles

A steel plate shear wall (SPSW) consists of steel infill plates bounded by a column-beam system. When such infill plates occupy each level within a framed bay of a structure, they constitute a SPSW system.[8] Whereas most earthquake resistant construction methods are adapted from older systems, SPSW was invented entirely to withstand seismic activity.

SPSW behavior is analogous to a vertical plate girder cantilevered from its base. Similar to plate girders, the SPSW system optimizes component performance by taking advantage of the post-buckling behavior of the steel infill panels.

The Ritz-Carlton/JW Marriott hotel building, a part of the LA Live development in Los Angeles, California, is the first building in Los Angeles that uses an advanced steel plate shear wall system to resist the lateral loads of strong earthquakes and winds.

Kashiwazaki-Kariwa Nuclear Power Plant is partially upgraded:

The Kashiwazaki-Kariwa Nuclear Power Plant, the largest nuclear generating station in the world by net electrical power rating, happened to be near the epicenter of the strongest M_w 6.6 July 2007 Chūetsu offshore earthquake.[10] This initiated an extended shutdown for structural inspection which indicated that a greater earthquake-proofing was needed before operation could be resumed.[11]

On May 9, 2009, one unit (Unit 7) was restarted, after the seismic upgrades. The test run had to continue for 50 days. The plant had been completely shut down for almost 22 months following the earthquake.

Seismic test of seven-story building

A destructive earthquake struck a lone, wooden condominium in Japan.[12] The experiment was webcast live on July 14, 2009 to yield insight on how to make wooden structures stronger and better able to withstand major earthquakes.[13]

The Miki shake at the Hyogo Earthquake Engineering Research Centre is the capstone experiment of the four-year NEESWood project, which receives its primary support from the U.S. National Science Foundation Network for Earthquake Engineering Simulation (NEES) Program.

"NEESWood aims to develop a new seismic design philosophy that will provide the necessary mechanisms to safely increase the height of wood-frame structures in active seismic zones of the United States, as well as mitigate earthquake damage to low-rise wood-frame structures," said Rosowsky, Department of Civil Engineering at Texas A&M University. This philosophy is based on the application of seismic damping systems for wooden buildings. The systems, which can be installed inside the walls of most wooden buildings, include strong metal frame, bracing and dampers filled with viscous fluid.

Super frame earthquake proof structure:

The proposed system is composed of core walls, hat beams incorporated into the top-level, outer columns, and viscous dampers vertically installed between the tips of the hat beams and the outer columns. During an earthquake, the hat beams and outer columns act as outriggers and reduce the overturning moment in the core, and the installed dampers also reduce the moment and the lateral deflection of the structure. This innovative system can eliminate inner beams and inner columns on each floor, and thereby provide buildings with column-free floor space even in highly seismic regions.[14][15]

Earthquake Architecture:

The term 'seismic architecture' or 'earthquake architecture' was first introduced in 1985 by Robert Retherming. The phrase “earthquake architecture” is used to describe a degree of architectural expression of earthquake resistance or implication of architectural configuration, form or style in earthquake resistance. It is also used to describe buildings in which seismic design considerations impacted its architecture. It may be considered a new aesthetic approach in designing structures in seismic prone areas.

GUIDELINES FOR EARTHQUAKE RESISTANT CONSTRUCTION:

In addition to the main earthquake design code 1893 the BIS (Bureau of Indian Standards) has published other relevant earthquake design codes for earthquake resistant construction Masonry structures (IS-13828 1993) • Horizontal bands should be provided at plinth, lintel and roof levels as per code • Providing vertical reinforcement at important locations such as corners, internal and external wall junctions as per code. • Grade of mortar should be as per codes specified for different earthquake zones. • Irregular shapes should be avoided both in plan and vertical configuration. • Quality assurance and proper workmanship must be ensured at all cost without any compromise. In RCC framed structures (IS-13920) • In RCC framed structures the spacing of lateral ties should be kept closer as per the code • The hook in the ties should be at 135 degrees instead of 90 degrees for better encouragement. • The arrangement of lateral ties in the columns should be as per code and must be continued through the joint as well.

14.1.2 Seismic Retrofitting:

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 centers, the need of seismic retrofitting is well acknowledged. Prior to the introduction of modern seismic codes in the late 1960s for developed countries (US, Japan etc.) and late 1970s for many other parts of the world (Turkey, China etc.),[1] 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[2] and the New Zealand Society for Earthquake Engineering (NZSEE)'s guidelines.[3] These codes must be regularly updated; the 1994 Northridge earthquake brought to light the brittleness of welded steel frames, for example.[4]

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 predominantly 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 greatly enhanced through proper initial design or subsequent modifications.

External bracing of an existing reinforced concrete parking garage (Berkeley)

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. fibre-reinforced polymers (FRP), fibre and high strength steel).[5]

- 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.[6]
- Increasing the local capacity of structural elements. This strategy recognizes 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 recognizing the inherent capacity of the structure.[7]
- 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 passersby, 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 generally 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.

Typical retrofit solutions:

✦ Soft-story failure:

Partial failure due to inadequate shear structure at garage level. Damage in San Francisco due to the Loma Prieto event.

This collapse mode is known as *soft story collapse*. In many buildings the ground level is designed for different uses than the upper levels. Low rise residential structures may be built over a parking garage which have large doors on one side. Hotels may have a tall ground floor to allow for a grand entrance or ballrooms. Office buildings may have retail stores on the ground floor with continuous display windows.

Traditional seismic design assumes that the lower stories of a building are stronger than the upper stories; where this is not the case—if the lower story is less strong than the upper structure—the structure will not respond to earthquakes in the expected[*clarification needed*] fashion. Using modern design methods, it is possible to take a weak lower story into account. Several failures of this type in one large apartment complex caused most of the fatalities in the 1994 Northridge earthquake.

Typically, where this type of problem is found, the weak story is reinforced to make it stronger than the floors above by adding shear walls or moment frames. Moment frames consisting of inverted U bents are useful in preserving lower story garage access, while a lower cost solution may be to use shear walls or trusses in several locations, which partially reduce the usefulness for automobile parking but still allow the space to be used for other storage.

Beam-column joint connections:

Corner joint steel reinforcement and high tensile strength rods with grouted anti-burst jacket below

Beam-column joint connections are a common structural weakness in dealing with seismic retrofitting. Prior to the introduction of modern seismic codes in early 1970s, beam-column joints were typically non-engineered or designed. Laboratory testing's have confirmed the seismic vulnerability of these poorly detailed and under-designed connections.[19][20][21][22] Failure of beam-

column joint connections can typically lead to catastrophic collapse of a frame-building, as often observed in recent earthquakes.

For reinforced concrete beam-column joints – various retrofit solutions have been proposed and tested in the past 20 years. Philosophically, the various seismic retrofit strategies discussed above can be implemented for reinforced concrete joints. Concrete or steel jacketing have been a popular retrofit technique until the advent of composite materials such as Carbon fibre-reinforced polymer (FRP). Composite materials such as carbon FRP and aramic FRP have been extensively tested for use in seismic retrofit with some success.[25][26][27] One novel technique includes the use of selective weakening of the beam and added external post-tensioning to the joint[28] in order to achieve flexural hinging in the beam, which is more desirable in terms of seismic design.

Widespread weld failures at beam-column joints of low-to-medium rise steel buildings during the Northridge 1994 earthquake for example, have shown the structural deviancies of these 'modern-designed' post-1970s welded moment-resisting connections.[29] A subsequent SAC research project [4] has documented, tested and proposed several retrofit solutions for these welded steel moment-resisting connections. Various retrofit solutions have been developed for these welded joints – such as a) weld strengthening and b) addition of steel haunch or 'dog-bone' shape flange.[30]

Following the Northridge earthquake, a number of steel moment -frame buildings were found to have experienced brittle fractures of beam to column connections. Discovery of these unanticipated brittle fractures of framing connections was alarming to engineers and the building industry. Starting in the 1960s, engineers began to regard welded steel moment-frame buildings as being among the most ductile systems contained in the building code. Many engineers believed that steel moment-frame buildings were essentially invulnerable to earthquake induced damage and thought that should damage occur, it would be limited to ductile yielding of members and connections. Observation of damage sustained by buildings in the 1994 Northridge earthquake indicated that contrary to the intended behaviour, in many cases, brittle fractures initiated within the connections at very low levels of plastic demand. In September, 1994, The SAC joint Venture, AISC, AISI, and NIST jointly convened an international workshop in Los Angeles to coordinate the efforts of various participants and to lay the foundation for systematic investigation and resolution of the problem. In September 1995 the SAC Joint Venture entered into a contractual agreement with FEMA to conduct Phase II of the SAC Steel project. Under Phase II, SAC continued its extensive problem-focused study of the performance of moment resisting steel frames and connections of various configurations, with the ultimate goal of developing seismic design criteria for steel construction. As a result of these studies, it is now known that the typical moment-resisting connection detail employed in steel moment frame construction prior to the 1994 Northridge earthquake had a number of features that rendered it inherently susceptible to brittle fracture.[31]

Shear failure within floor diaphragm:

Floors in wooden buildings are usually constructed upon relatively deep spans of wood, called joists, covered with a diagonal wood planking or plywood to form a subfloor upon which the finish floor surface is laid. In many structures these are all aligned in the same direction. To prevent the beams from tipping over onto their side, blocking is used at each end, and for additional stiffness, blocking or diagonal wood or metal bracing may be placed between beams at one or more points in their spans. At the outer edge it is typical to use a single depth of blocking and a perimeter beam overall.

If the blocking or nailing is inadequate, each beam can be laid flat by the shear forces applied to the building. In this position they lack most of their original strength and the structure may further collapse. As part of a retrofit the blocking may be doubled, especially at the outer edges of the building. It may be appropriate to add additional nails between the sill plate of the perimeter wall erected upon the floor diaphragm, although this will require exposing the sill plate by removing interior plaster or exterior siding. As the sill plate may be quite old and dry and substantial nails must be used, it may be necessary to pre-drill a hole for the nail in the old wood to avoid splitting. When the wall is opened for this purpose, it may also be appropriate to tie vertical wall elements into the foundation using specialty connectors and bolts glued with epoxy cement into holes drilled in the foundation.

Sliding off foundation and "cripple wall" failure:

House slid off of foundation

Low cripple wall collapse and detachment of structure from concrete stairway

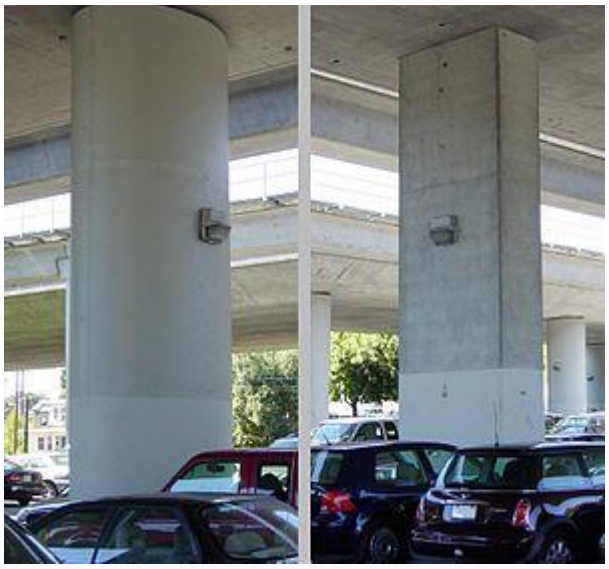
Single or two-story wood-frame domestic structures built on a perimeter or slab foundation are relatively safe in an earthquake, but in many structures built before 1950 the sill plate that sits between the concrete foundation and the floor diaphragm (perimeter foundation) or stud wall (slab foundation) may not be sufficiently bolted in. Additionally, older attachments (without substantial corrosion-proofing) may have corroded to a point of weakness. A sideways shock can slide the building entirely off of the foundations or slab.

Often such buildings, especially if constructed on a moderate slope, are erected on a platform connected to a perimeter foundation through low stud-walls called "cripple wall" or *pin-up*. This low wall structure itself may fail in shear or in its connections to itself at the corners, leading to the building moving diagonally and collapsing the low walls. The likelihood of failure of the pin-up can be reduced by ensuring that the corners are well reinforced in shear and that the shear panels are well connected to each other through the corner posts. This requires structural grade sheet plywood, often treated for rot resistance. This grade of plywood is made without interior unfilled knots and with more, thinner layers than common plywood. New buildings designed to resist earthquakes will typically use OSB (oriented strand board), sometimes with metal joins between panels, and with well attached stucco covering to enhance its performance. In many modern tract homes, especially those built upon expansive (clay) soil the building is constructed upon a single and relatively thick monolithic slab, kept in one piece by high tensile rods that are stressed after the slab has set. This post stressing places the concrete under compression – a condition under which it is extremely strong in bending and so will not crack under adverse soil conditions.

Multiple piers in shallow pits:

Some older low-cost structures are elevated on tapered concrete pylons set into shallow pits, a method frequently used to attach outdoor decks to existing buildings. This is seen in conditions of damp soil, especially in tropical conditions, as it leaves a dry ventilated space under the house, and in far northern conditions of permafrost (frozen mud) as it keeps the building's warmth from destabilizing the ground beneath. During an earthquake, the pylons may tip, spilling the building to the ground. This can be overcome by using deep-bored holes to contain cast-in-place reinforced pylons, which are then secured to the floor panel at the corners of the building. Another technique is to add sufficient diagonal bracing or sections of concrete shear wall between pylons.

Reinforced concrete column burst:



Jacketed and grouted column on left, unmodified on right

Reinforced concrete columns typically contain large diameter vertical rebar (reinforcing bars) arranged in a ring, surrounded by lighter-gauge hoops of rebar. Upon analysis of failures due to earthquakes, it has been realized that the weakness was not in the vertical bars, but rather in inadequate strength and quantity of hoops. Once the integrity of the hoops is breached, the vertical rebar can flex outward, stressing the central column of concrete. The concrete then simply crumbles into small pieces, now unconstrained by the surrounding rebar. In new construction a greater number of hoop-like structures are used.

One simple retrofit is to surround the column with a jacket of steel plates formed and welded into a single cylinder. The space between the jacket and the column is then filled with concrete, a process called grouting. Where soil or structure conditions require such additional modification, additional pilings may be driven near the column base and concrete pads linking the pilings to the pylon are fabricated at or below ground level. In the example shown not all columns needed to be modified to gain sufficient seismic resistance for the conditions expected. (This location is about a mile from the Hayward Fault Zone.)

Reinforced concrete wall burst:

Concrete walls are often used at the transition between elevated road fill and overpass structures. The wall is used both to retain the soil and so enable the use of a shorter span and also to transfer the weight of the span directly downward to footings in undisturbed soil. If these walls are inadequate, they may crumble under the stress of an earthquake's induced ground motion.

One form of retrofit is to drill numerous holes into the surface of the wall, and secure short **L**-shaped sections of rebar to the surface of each hole with epoxy adhesive. Additional vertical and horizontal rebar is then secured to the new elements, a form is erected, and an additional layer of concrete is poured. This modification may be combined with additional footings in excavated trenches and additional support ledgers and tie-backs to retain the span on the bounding walls.

Damage to masonry (infill) walls[edit]

In masonry structures, brick building structures have been reinforced with coatings of glass fiber and appropriate resin (epoxy or polyester). In lower floors these may be applied over entire exposed surfaces, while in upper floors this may be confined to narrow areas around window and door openings. This application provides tensile strength that stiffens the wall against bending away from the side with the application. The efficient protection of an entire building requires extensive analysis and engineering to determine the appropriate locations to be treated.

In reinforced concrete buildings, masonry infill walls are considered non-structural elements, but damage to infills can lead to large repair costs and change the behaviour of a structure, even leading to aforementioned soft-storey or beam-column joint shear failures. Local failure of the infill panels due to in and out-of-plane mechanisms, but also due to their combination, can lead to a sudden drop in capacity and hence cause global brittle failure of the structure. Even at lower intensity earthquakes, damage to infilled frames can lead to high economic losses and loss of life.[32]

To prevent masonry infill damage and failure, typical retrofit strategies aim to strengthen the infills and provide adequate connection to the frame. Examples of retrofit techniques for masonry infills include steel reinforced plasters,[33][34] engineered cementitious composites,[35][36] thin layers fibre-reinforced polymers (FRP),[37][38] and most recently also textile-reinforced mortars (TRM).[39][40]

Lift:

Where moist or poorly consolidated alluvial soil interfaces in a "beach like" structure against underlying firm material, seismic waves traveling through the alluvium can be amplified, just as are water waves against a sloping beach. In these special conditions, vertical accelerations up to twice the force of gravity have been measured. If a building is not secured to a well-embedded foundation, it is possible for the building to be thrust from (or with) its foundations into the air, usually with severe damage upon landing. Even if it is well-founded, higher portions such as upper stories or roof structures or attached structures such as canopies and porches may become detached from the primary structure.

Good practices in modern, earthquake-resistant structures dictate that there be good vertical connections throughout every component of the building, from undisturbed or engineered earth to foundation to sill plate to vertical studs to plate cap through each floor and continuing to the roof structure. Above the foundation and sill plate the connections are typically made using steel strap or sheet stampings, nailed to wood members using special hardened high-shear strength nails, and

heavy angle stampings secured with through bolts, using large washers to prevent pull-through. Where inadequate bolts are provided between the sill plates and a foundation in existing construction (or are not trusted due to possible corrosion), special clamp plates may be added, each of which is secured to the foundation using expansion bolts inserted into holes drilled in an exposed face of concrete. Other members must then be secured to the sill plates with additional fittings.

Soil:

One of the most difficult retrofits is that required to prevent damage due to soil failure. Soil failure can occur on a slope, a slope failure or landslide, or in a flat area due to liquefaction of water-saturated sand and/or mud. Generally, deep pilings must be driven into stable soil (typically hard mud or sand) or to underlying bedrock or the slope must be stabilized. For buildings built atop previous landslides the practicality of retrofit may be limited by economic factors, as it is not practical to stabilize a large, deep landslide. The likelihood of landslide or soil failure may also depend upon seasonal factors, as the soil may be more stable at the beginning of a wet season than at the beginning of the dry season. Such a "two season" *Mediterranean climate* is seen throughout California.

In some cases, the best that can be done is to reduce the entrance of water runoff from higher, stable elevations by capturing and bypassing through channels or pipes, and to drain water infiltrated directly and from subsurface springs by inserting horizontal perforated tubes. There are numerous locations in California where extensive developments have been built atop archaic landslides, which have not moved in historic times but which (if both water-saturated and shaken by an earthquake) have a high probability of moving *en masse*, carrying entire sections of suburban development to new locations. While the most modern of house structures (well tied to monolithic concrete foundation slabs reinforced with post tensioning cables) may survive such movement largely intact, the building will no longer be in its proper location.

Utility pipes and cables: risks:

Natural gas and propane supply pipes to structures often prove especially dangerous during and after earthquakes. Should a building move from its foundation or fall due to cripple wall collapse, the ductile iron pipes transporting the gas within the structure may be broken, typically at the location of threaded joints. The gas may then still be provided to the pressure regulator from higher pressure lines and so continue to flow in substantial quantities; it may then be ignited by a nearby source such as a lit pilot light or arcing electrical connection.

There are two primary methods of automatically restraining the flow of gas after an earthquake, installed on the low-pressure side of the regulator, and usually downstream of the gas meter.

- A caged metal ball may be arranged at the edge of an orifice. Upon seismic shock, the ball will roll into the orifice, sealing it to prevent gas flow. The ball may later be reset by the use of an external magnet. This device will respond only to ground motion.
- A flow-sensitive device may be used to close a valve if the flow of gas exceeds a set threshold (very much like an electrical circuit breaker). This device will operate independently of seismic motion, but will not respond to minor leaks which may be caused by an earthquake.

It appears that the most secure configuration would be to use one of each of these devices in series.

Tunnels:

Unless the tunnel penetrates a fault likely to slip, the greatest danger to tunnels is a landslide blocking an entrance. Additional protection around the entrance may be applied to divert any falling material (similar as is done to divert snow avalanches) or the slope above the tunnel may be stabilized in some way. Where only small- to medium-sized rocks and boulders are expected to fall, the entire slope may be covered with wire mesh, pinned down to the slope with metal rods. This is also a common modification to highway cuts where appropriate conditions exist.

Underwater tubes:

The safety of underwater tubes is highly dependent upon the soil conditions through which the tunnel was constructed, the materials and reinforcements used, and the maximum predicted earthquake expected, and other factors, some of which may remain unknown under current knowledge.

BART tube:

A tube of particular structural, seismic, economic, and political interest is the BART (Bay Area Rapid Transit) transbay tube. This tube was constructed at the bottom of San Francisco Bay through an innovative process. Rather than pushing a shield through the soft bay mud, the tube was constructed on land in sections. Each section consisted of two inner train tunnels of circular cross section, a central access tunnel of rectangular cross section, and an outer oval shell encompassing the three inner tubes. The intervening space was filled with concrete. At the bottom of the bay a trench was excavated and a flat bed of crushed stone prepared to receive the tube sections. The sections were then floated into place and sunk, then joined with bolted connections to previously-placed sections. An overfill was then placed atop the tube to hold it down. Once completed from San Francisco to Oakland, the tracks and electrical components were installed. The predicted response of the tube during a major earthquake was likened to be as that of a string of (cooked) spaghetti in a bowl of gelatin dessert. To avoid overstressing the tube due to differential movements at each end, a sliding slip joint was included at the San Francisco terminus under the landmark Ferry Building.

The engineers of the construction consortium PBTB (Parsons Brinckerhoff-Tudor-Bechtel) used the best estimates of ground motion available at the time, now known to be insufficient given modern computational analysis methods and geotechnical knowledge. Unexpected settlement of the tube has reduced the amount of slip that can be accommodated without failure. These factors have resulted in the slip joint being designed too short to ensure survival of the tube under possible (perhaps even likely) large earthquakes in the region. To correct this deficiency the slip joint must be extended to allow for additional movement, a modification expected to be both expensive and technically and logistically difficult. Other retrofits to the BART tube include vibratory consolidation of the tube's overfill to avoid potential liquefying of the overfill, which has now been completed. (Should the overfill fail there is a danger of portions of the tube rising from the bottom, an event which could potentially cause failure of the section connections.)

Bridge retrofit

Bridges have several failure modes.

Expansion rockers

Many short bridge spans are statically anchored at one end and attached to rockers at the other. This rocker gives vertical and transverse support while allowing the bridge span to expand and contract with temperature changes. The change in the length of the span is accommodated over a gap in the roadway by comb-like expansion joints. During severe ground motion, the rockers may jump from their tracks or be moved beyond their design limits, causing the bridge to unship from its resting point and then either become misaligned or fail completely. Motion can be constrained by adding ductile or high-strength steel restraints that are friction-clamped to beams and designed to slide under extreme stress while still limiting the motion relative to the anchorage.

Deck rigidity

Additional diagonals were inserted under both decks of this bridge

Suspension bridges may respond to earthquakes with a side-to-side motion exceeding that which was designed for wind gust response. Such motion can cause fragmentation of the road surface, damage to bearings, and plastic deformation or breakage of components. Devices such as hydraulic dampers or clamped sliding connections and additional diagonal reinforcement may be added.

Lattice girders, beams, and ties:

Obsolete riveted lattice members

Lattice girders consist of two "I"-beams connected with a criss-cross lattice of flat strap or angle stock. These can be greatly strengthened by replacing the open lattice with plate members. This is usually done in concert with the replacement of hot rivets with bolts.

Bolted plate lattice replacement, forming box members

Hot rivets:

Many older structures were fabricated by inserting red-hot rivets into pre-drilled holes; the soft rivets are then peened using an air hammer on one side and a bucking bar on the head end. As these cool slowly, they are left in an annealed (soft) condition, while the plate, having been hot rolled and quenched during manufacture, remains relatively hard. Under extreme stress the hard plates can shear the soft rivets, resulting in failure of the joint.

The solution is to burn out each rivet with an oxygen torch. The hole is then prepared to a precise diameter with a reamer. A special *locator bolt*, consisting of a head, a shaft matching the reamed hole, and a threaded end is inserted and retained with a nut, then tightened with a wrench. As the bolt has been formed from an appropriate high-strength alloy and has also been heat-treated, it is not subject to either the plastic shear failure typical of hot rivets nor the brittle fracture of ordinary bolts. Any partial failure will be in the plastic flow of the metal secured by the bolt; with proper engineering any such failure should be non-catastrophic.

Fill and overpass:

Elevated roadways are typically built on sections of elevated earth fill connected with bridge-like segments, often supported with vertical columns. If the soil fails where a bridge terminates, the bridge may become disconnected from the rest of the roadway and break away. The retrofit for this is to add additional reinforcement to any supporting wall, or to add deep caissons adjacent to the edge at each end and connect them with a supporting beam under the bridge.

Another failure occurs when the fill at each end moves (through resonant effects) in bulk, in opposite directions. If there is an insufficient founding shelf for the overpass, then it may fall. Additional shelf and ductile stays may be added to attach the overpass to the footings at one or both ends. The stays, rather than being fixed to the beams, may instead be clamped to them. Under moderate loading, these keep the overpass centered in the gap so that it is less likely to slide off its founding shelf at one end. The ability for the fixed ends to slide, rather than break, will prevent the complete drop of the structure if it should fail to remain on the footings.

Viaducts:

Large sections of roadway may consist entirely of viaduct, sections with no connection to the earth other than through vertical columns. When concrete columns are used, the detailing is critical. Typical failure may be in the toppling of a row of columns due either to soil connection failure or to insufficient cylindrical wrapping with rebar. Both failures were seen in the 1995 Great Hanshin

earthquake in Kobe, Japan, where an entire viaduct, centrally supported by a single row of large columns, was laid down to one side. Such columns are reinforced by excavating to the foundation pad, driving additional pilings, and adding a new, larger pad, well connected with rebar alongside or into the column. A column with insufficient wrapping bar, which is prone to burst and then hinge at the bursting point, may be completely encased in a circular or elliptical jacket of welded steel sheet and grouted as described above.

Cypress Freeway viaduct collapse. Note failure of inadequate anti-burst wrapping and lack of connection between upper and lower vertical elements.

Sometimes viaducts may fail in the connections between components. This was seen in the failure of the Cypress Freeway in Oakland, California, during the Loma Prieta earthquake. This viaduct was a two-level structure, and the upper portions of the columns were not well connected to the lower portions that supported the lower level; this caused the upper deck to collapse upon the lower deck. Weak connections such as these require additional external jacketing – either through external steel components or by a complete jacket of reinforced concrete, often using stub connections that are glued (using epoxy adhesive) into numerous drilled holes. These stubs are then connected to additional wrappings, external forms (which may be temporary or permanent) are erected, and additional concrete is poured into the space. Large connected structures similar to the Cypress Viaduct must also be properly analyzed in their entirety using dynamic computer simulations.

Residential retrofit:

Side-to-side forces cause most earthquake damage. Bolting of the mudsill to the foundation and application of plywood to cripple walls are a few basic retrofit techniques which homeowners may apply to wood-framed residential structures to mitigate the effects of seismic activity. The City of San Leandro created guidelines for these procedures, as outlined in the following pamphlet. Public awareness and initiative are critical to the retrofit and preservation of existing building stock, and such efforts as those of the Association of Bay Area Governments are instrumental in providing informational resources to seismically active communities.

Wood frame structure:

Most houses in North America are wood-framed structures. Wood is one of the best materials for earthquake-resistant construction since it is lightweight and more flexible than masonry. It is easy to work with and less expensive than steel, masonry, or concrete. In older homes the most significant weaknesses are the connection from the wood-framed walls to the foundation and the relatively weak "cripple-walls." (Cripple walls are the short wood walls that extend from the top

of the foundation to the lowest floor level in houses that have raised floors.) Adding connections from the base of the wood-framed structure to the foundation is almost always an important part of a seismic retrofit. Bracing the cripple-walls to resist side-to-side forces is essential in houses with cripple walls; bracing is usually done with plywood. Oriented strand board (OSB) does not perform as consistently as plywood, and is not the favored choice of retrofit designers or installers.

Retrofit methods in older wood-frame structures may consist of the following, and other methods not described here.

- The lowest plate rails of walls (usually called "mudsills" or "foundation sills" in North America) are bolted to a continuous foundation, or secured with rigid metal connectors bolted to the foundation so as to resist side-to-side forces.
- *Cripple walls* are braced with plywood.
- Selected vertical elements (typically the posts at the ends of plywood wall bracing panels) are connected to the foundation. These connections are intended to prevent the braced walls from rocking up and down when subjected to back-and-forth forces at the top of the braced walls, not to resist the wall or house "jumping" off the foundation (which almost never occurs).
- In two-story buildings using "platform framing" (sometimes called "western" style construction, where walls are progressively erected upon the lower story's upper diaphragm, unlike "eastern" or *balloon framing*), the upper walls are connected to the lower walls with tension elements. In some cases, connections may be extended vertically to include retention of certain roof elements. This sort of strengthening is usually very costly with respect to the strength gained.
- Vertical posts are secured to the beams or other members they support. This is particularly important where loss of support would lead to collapse of a segment of a building. Connections from posts to beams cannot resist appreciable side-to-side forces; it is much more important to strengthen around the perimeter of a building (bracing the cripple-walls and supplementing foundation-to-wood-framing connections) than it is to reinforce post-to-beam connections.

Wooden framing is efficient when combined with masonry, if the structure is properly designed. In Turkey, the traditional houses (bagdadi) are made with this technology. In El Salvador, wood and bamboo are used for residential construction.

Reinforced and unreinforced masonry:

In many parts of developing countries such as Pakistan, Iran and China, unreinforced or in some cases reinforced masonry is the predominantly form of structures for rural residential and dwelling. Masonry was also a common construction form in the early part of the 20th century, which implies that a substantial number of these at-risk masonry structures would have significant heritage value. Masonry walls that are not reinforced are especially hazardous. Such structures may be more appropriate for replacement than retrofit, but if the walls are the principal load bearing elements in structures of modest size they may be appropriately reinforced. It is especially important that floor and ceiling beams be securely attached to the walls. Additional vertical supports in the form of steel or reinforced concrete may be added.

In the western United States, much of what is seen as masonry is actually brick or stone veneer. Current construction rules dictate the amount of *tie–back* required, which consist of metal straps secured to vertical structural elements. These straps extend into mortar courses, securing the veneer

to the primary structure. Older structures may not secure this sufficiently for seismic safety. A weakly secured veneer in a house interior (sometimes used to face a fireplace from floor to ceiling) can be especially dangerous to occupants. Older masonry chimneys are also dangerous if they have substantial vertical extension above the roof. These are prone to breakage at the roofline and may fall into the house in a single large piece. For retrofit, additional supports may be added; however, it is extremely expensive to strengthen an existing masonry chimney to conform with contemporary design standards. It is best to simply remove the extension and replace it with lighter materials, with special metal flue replacing the flue tile and a wood structure replacing the masonry. This may be matched against existing brickwork by using very thin veneer (similar to a tile, but with the appearance of a brick).

14.1.3 ADVANCED CONSTRUCTION TECHNIQUES – EQUIPMENTS, USE, ADVANTAGES, TECHNOLOGY:

The Indian **advanced construction techniques** industry is experiencing a period of fast growth. Aiming to overcome the housing problem, it also has to face the dual challenge of fulfilling the needs of the client and maintain the quality standards.

At the same time, the up-gradation of technology through the adoption of new techniques has become necessary to survive in a tough competitive environment.

The traditional methods of construction are inadequate in executing the work speedily with economy and quality. The construction industry in India must switch over to advanced construction techniques to achieve its goal in “minimum time with maximum efficiency”.

ADVANCED CONSTRUCTION TECHNIQUES

ADVANCED CONSTRUCTION TECHNIQUES – NECESSITY:

The building construction activity, especially the residential and commercial complex is highly labour intensive with very little mechanization. Approximately 35% of the total construction cost is spent on labour.
The labourers have their limitations and may fail to meet the time limits. The quality of workmanship, too, differs from person to person. Hence, quality standards cannot be maintained. Wastage of material is considerably high as it is handled and utilized manually.
The objective of the construction organizations should be 'speed and economy'. This cannot be achieved with labor-oriented advanced construction techniques.
Only studying and adopting modern industrial techniques and equipment is the solution. By this, one can save material, reduce labour expenses, and increase the speed of work, leading to the economy in construction.
Though the scope of the subject is vast, in this chapter we shall discuss only the advanced techniques to be used in advanced construction techniques activities.

EQUIPMENT USED FOR SMALL AND MEDIUM CONSTRUCTION WORK:

Chain and pulley block.
Grouting pumps.
Sprayers for painting work.
Tile cutters.
Portable hand drilling machines.
Horizontal trolleys, wheelbarrows.
Pumps.

Vibrators for compaction of concrete, surface vibrators.
Auto ramming concrete block machine.
Sand washing machine.
Vertical lifts, hoists, winches.

14.1.4 Engineering aspect of soil mechanisms:

Soil mechanics is a branch of soil physics and applied mechanics that describes the behaviour of soils. It differs from fluid mechanics and solid mechanics in the sense that soils consist of a heterogeneous mixture of fluids (usually air and water) and particles (usually clay, silt, sand, and gravel) but soil may also contain organic solids and other matter.Along with rock mechanics, soil mechanics provides the theoretical basis for analysis in geotechnical engineering,[5] a subdiscipline of civil engineering, and engineering geology, a subdiscipline of geology. Soil mechanics is used to analyse the deformations of and flow of fluids within natural and man-made structures that are supported on or made of soil, or structures that are buried in soils.[6] Example applications are building and bridge foundations, retaining walls, dams, and buried pipeline systems. Principles of soil mechanics are also used in related disciplines such as geophysical engineering, coastal engineering, agricultural engineering, hydrology and soil physics.

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



Slope instability issues for a temporary flood control levee in North Dakota, 2009

14.1.5 Water supply and sanitation in India:

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

In 1980 rural sanitation coverage was estimated at 1% and it reached 95% in 2018. The share of Indians with access to improved sources of water has increased significantly from 72% in 1990 to 88% in 2008.[9]

At the same time, local government institutions mandated to provide drinking water and sanitation services are seen as weak and lack the financial resources to carry out their functions. In addition, only two Indian cities have continuous water supply and according to an estimate from 2018 about 8% of Indians still lack access to improved sanitation facilities.

Water supply continuity:

A young girl carrying water in India

Challenges. As of 2010, only two cities in India — Thiruvananthapuram and Kota — get continuous water supply.[18] In 2005 none of the 35 Indian cities with a population of more than one million distributed water for more than a few hours per day, despite generally sufficient infrastructure. Owing to inadequate pressure people struggle to collect water even when it is available. According to the World Bank, none have performance indicators that compare with average international standards.[19] A 2007 study by the Asian Development Bank showed that in 20 cities the average duration of supply was only 4.3 hours per day. None of the 20 cities had continuous supply. The longest duration of supply was 12 hours per day in Chandigarh, and the lowest was 0.3 hours per day in Rajkot.[5] According to the results of a Service Level Benchmarking (SLB) Program carried out by the Ministry of Urban Development (MoUD) in 2006 in 28 cities, the average duration of supply was 3.3 hours per day, with a range from one hour every three days to 18 hours per day.[4] In Delhi residents receive water only a few hours per day because of inadequate management of the distribution system. This results in contaminated water and forces households to complement a deficient public water service at prohibitive 'coping' costs; the poor suffer most from this situation. For example, according to a 1996 survey households in Delhi spent an average of ₹2,182 (US$30.60) per year in time and money to cope with poor service levels.[20] This is more than two times as much as the 2001 water bill of about US$18 per year of a Delhi household that uses 20 cubic meters per month.

Achievements. Jamshedpur, a city in Jharkhand with 573,000 inhabitants, provided 25% of its residents with continuous water supply in 2009.[21] Navi Mumbai, a planned city with more than 1m inhabitants, has achieved continuous supply for about half its population as of January 2009.[22] Badlapur, another city in the Mumbai Conurbation with a population of 140,000, has achieved continuous supply in 3 out of 10 operating zones, covering 30% of its population.[23] Trivandrum, the capital of Kerala state with a population of 1,645,000 in 2011, is the largest Indian city and the only Million agglomeration that enjoys uninterrupted hygienic water supply.[24] Malkapur, a town in Satara District of Maharashtra, is the first Indian town to provide 24*7 water supply with 100 percent coverage. The program started in 2008 as a pilot project and soon covered the entire city. The connection is 100 percent metered with telescopic tariff. The project is still functioning successfully.[25][26] A nearby village, Kaapil, has also been successful in providing continuous piped water supply to all households. The model is same as Malkapur.

Sanitation:

For years, most Indians depended on on-site sanitation facilities which means mainly pit latrines in rural areas. The government has been investing heavily in building sanitation units, in a nation-wide campaign called the Swachh Bharat Mission, with satisfying results. Between 2014 and 2020, the Indian government managed to make household toilets accessible to over 99% of the population.[27] This translates to a total of 110 million toilets build since 2014, according to Statista. Preceding this success is the success of the Slum Sanitation Program in Mumbai that has provided access to sanitation for a quarter million slum dwellers.[28][29] Sewage, where available, is often in a bad state. In Delhi the sewage network has lacked maintenance over the years and overflow of raw sewage in open drains is common, due to blockage, settlements and inadequate pumping capacities.[30] The capacity of the 17 existing wastewater treatment plants in Delhi is adequate to cater a daily production of waste water of less than 50% of the drinking water produced.[19] Of the 892 million people in the world that defecate openly, some 15 million live in India, making it the country with the highest number of people who defecate in the open.[31] This has serious public health implications.

A specific Indian problem is also the (officially prohibited) "manual scavenging" which is connected to the officially banned caste system,[32][33] and relates to unsafe and undignified emptying of toilets and pits, as well as handling of raw, untreated human excreta.

CHAPTER 15.

Smart and/or Sustainable features of Chapter 8 & 13 designs, Impact on society. (For Allocated village development, villagers' happiness, comfortable and for enhancement of the village) (With the Smart village development Concept as Per Your Idea and Village Visit, modern technology with innovation).

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

Sr No	Proposed Design Names	Period	Amount Expenditures	Benefits
1	Public Toilet	Immediately	196718.972	More access to urination and defection
2	Super Market	With 6 months	1236717.5	Available for all goods and services
3	Post Office	With 6 months	293728.03	Improve the village service.
4	Library	With 1 year	639108.89	Improve in study in village student.
5	Bus Stand	With 4 months	103958.7	Improve village transportation system.
6	Underground water tank	With 6 months	74212.93	Improve village water store facility
7	design of public garden	With 1 year	92587.5	Improve village beauty.
8	maintenance design of RCC roads	Immediately	65114543.9	Improve village road and safety.
9	design of Hospital	With 2 years	573000	Improve the Medical service.
10	Playground	With 1 year	713820	Improve the village structure.
11	Mahila Mandli	With 1 year	342188.325	Helping the village women to get new information or knowledge the new facility of any resource
12	Community Hall	With 1 year	1376463.25	Villager are meet and any social or culture program play in stage

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?	Y	Agricultural Industrial
2	What are the chances of employment in village?	Y	
3	What are the special technical facilities in village?	N	
4	Is any debt on village dwellers?	N	
5	Are village people getting agricultural help?	Y	
6	Is women health awareness Program organized in village?	Y	
7	Are women having opportunity to work and income?	Y	
8	Child girl education is appreciated in village?	Y	
9	Facility of vaccination to child is available in village?	Y	
10	Are village people aware about child vaccination and done to each and every child as per norms?	Y	School vaccination setup center
11	Women help line number information is provided to village people?	Y	
12	Is water scarcity in village? How many days per year?	N	
13	Is village under any debt?	N	
14	Is any serious issue due to debt from bank or any person happened in village?	N	
15	Is any suicide like incident observed in village due to government policy, debt or threatening?	N	
16	Is any death of patient occurred due to unavailability of medical facility in village?	N	
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.	N	
18	Is village improvement is observed in comparative scenario from past to present?	Y	PMGSY
19	Is any unavoidable difficulty village people are facing? Any natural calamity is there?	N	
20	Life Living standard of girls and women is appreciated and uplifted in village?	Y	

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
કણભા ગ્રામ પંચાયત
તા.દસ્ક્રોઈ, જી.અમદાવાદ

CHAPTER 1 7
IRRIGATION / AGRICULTURAL ACTIVITIES, AGRO INDUSTRY & ALTERNATE TECHNIQUES.

Drip irrigation is a type of micro-irrigation system that has the potential to save water and nutrients by allowing water to drip slowly to the roots of plants, either from above the soil surface or buried below the surface. The goal is to place water directly into the root zone and minimize evaporation. Drip irrigation systems distribute water through a network of valves, pipes, tubing, and emitters. Depending on how well designed, installed, maintained, and operated it is, a drip irrigation system can be more efficient than other types of irrigation systems, such as surface irrigation or sprinkler irrigation.

Ancient China

Primitive drip irrigation has been used since ancient times. *Fan Shengzhi shu*, written in China during the first century BCE, describes the use of buried, unglazed clay pots filled with water, sometimes referred to as Olla's, as a means of irrigation.

Modern development

Germany: subsurface pipe

Modern drip irrigation began its development in Germany in 1860 when researchers began experimenting with subsurface irrigation using clay pipe to create combination irrigation and drainage systems.

Perforated pipe

The research was later expanded in the 1920s to include the application of perforated pipe systems.[4]

Australia: use of plastic

The usage of plastic to hold and distribute water in drip irrigation was later developed in Australia by Hannes Thill.

Israel: plastic emitter

Usage of a plastic emitter in drip irrigation was developed in Israel by Simcha Blass and his son Yeshayahu.] Instead of releasing water through tiny holes easily blocked by tiny particles, water was released through larger and longer passageways by using friction to slow water inside a plastic emitter. The first experimental system of this type was established in 1959 by Blass, who partnered later (1964) with Kibbutz Hazera to create an irrigation company called Netafim. Together they developed and patented the first practical surface drip irrigation emitter.

US: drip tape:

In the United States, the first drip tape, called *Dew Hose*, was developed by Richard Chapin of Chapin Watermains in the early 1960s.[6][7][8] The evolution of drip tape which made drip tape

adopted and used at a big scale was the introduction of T-Tape in 1987 by Plastro Irrigation, that had the first slit outlet and a laminar flow track which later evolved into a turbulent flow regulating flow track. Chapin Watermains was acquired by Jain Irrigation in 2006 and is housed under its US subsidiary Jain Irrigation Inc, USA.

First introduced in California in the late 1960s, only 5% of irrigated land used this system by 1988. By 2010, 40% of irrigated land in California used this system.[12]

Trickle ring:

A trickle ring is a circular device which evenly distributes water around the base of a tree or shrub. Connected to a water supply by a garden hose or tubing adapter fitting, trickle rings may be integrated into an irrigation network which waters many plants at the same time. By regulating the flow of water through the trickle ring, soil can be saturated at a rate which conserves water by minimizing wasteful surface runoff and losses due to evaporation.[*citation needed*]

Significance:

Modern drip irrigation has arguably become the world's most valued innovation in agriculture since the invention in the 1930s of the impact sprinkler, which offered the first practical alternative to surface irrigation.

Current developments:

Careful study of all the relevant factors like land topography, soil, water, crop and agro-climatic conditions are needed to determine the most suitable drip irrigation system and components to be used in a specific installation.

Micro-spray heads:

Drip irrigation may also use devices called micro-spray heads, which spray water in a small area, instead of dripping emitters. These are generally used on tree and vine crops with wider root zones.

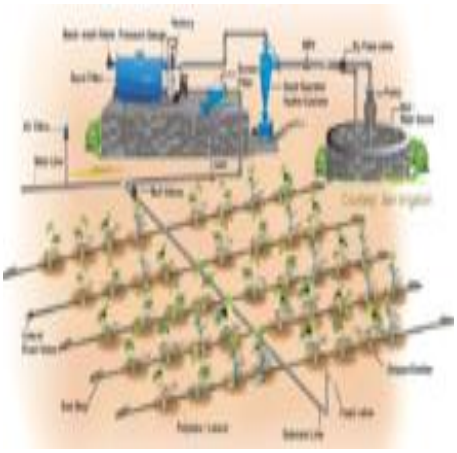
Subsurface drip irrigation:

Subsurface drip irrigation (SDI) uses permanently or temporarily buried dripperline or drip tape located at or below the plant roots. It is becoming popular for row crop irrigation, especially in areas where water supplies are limited, or recycled water is used for irrigation.

Global reach and market leaders:

As of 2012, China and India were the fastest expanding countries in the field of drip- or other micro-irrigation, while worldwide well over ten million hectares used these technologies.[13] Still, this amounted to less than 4 percent of the world's irrigated land.[13] That year, Israel's Netafim was the global market leader (a position it maintained in 2018[14]), with India's Jain Irrigation being the second-biggest micro-irrigation company.[13] In 2017 Rivulids bought Euro drip and became the world's second largest irrigation systems manufacturer.[15]

Components and operation



Drip irrigation system layout

Water distribution in subsurface drip irrigation

Nursery flowers watered with drip irrigation in Israel

Horticulture drip emitter in a pot

Pot irrigation by on-line drippers

Drip irrigation and spare drip irrigation tubes in Banana farm in chaina wall

Components used in drip irrigation (listed in order from water source) include:

- Pump or pressurized water source
- Water filter(s) or filtration systems: sand separator, Fertigation systems (Venturi injector) and chemigation equipment (optional)
- Backwash controller (Backflow prevention device)
- Pressure control valve (pressure regulator)
- Distribution lines (main larger diameter pipe, maybe secondary smaller, pipe fittings)
- Hand-operated, electronic, or hydraulic control valves and safety valves
- Smaller diameter polyethylene tube (often called "laterals")
- Poly fittings and accessories (to make connections)
- Emitting devices at plants (emitter or dripper, micro spray head, inline dripper or inline drip tube)

In drip irrigation systems, pump and valves may be manually or automatically operated by a controller.

Most large drip irrigation systems employ some type of filter to prevent clogging of the small emitter flow path by small waterborne particles. New technologies are now[*when?*] being offered that minimize clogging. Some residential systems are installed without additional filters since potable water is already filtered at the water treatment plant. Virtually all drip irrigation equipment manufacturers recommend that filters be employed and generally will not honor warranties unless this is done. Last line filters just before the final delivery pipe are strongly recommended in addition to any other filtration system due to fine particle settlement and accidental insertion of particles in the intermediate lines.

Drip and subsurface drip irrigation is used almost exclusively when using recycled municipal wastewater. Regulations typically do not permit spraying water through the air that has not been fully treated to potable water standards.

Because of the way the water is applied in a drip system, traditional surface applications of timed-release fertilizer are sometimes ineffective, so drip systems often mix liquid fertilizer with the irrigation water. This is called fertigation; fertigation and chemigation (application of pesticides and other chemicals to periodically clean out the system, such as chlorine or sulfuric acid) use chemical injectors such as diaphragm pumps, piston pumps, or aspirators. The chemicals may be added constantly whenever the system is irrigating or at intervals. Fertilizer savings of up to 95% are being reported from recent university field tests using drip fertigation and slow water delivery as compared to timed-release and irrigation by micro spray heads.

Properly designed, installed, and managed, drip irrigation may help achieve water conservation by reducing evaporation and deep drainage when compared to other types of irrigation such as flood or overhead sprinklers since water can be more precisely applied to the plant roots. In addition, drip can eliminate many diseases that are spread through water contact with the foliage. Finally, in regions where water supplies are severely limited, there may be no actual water savings, but rather simply an increase in production while using the same amount of water as before. In very arid regions or on sandy soils, the preferred method is to apply the irrigation water as slowly as possible.

Pulsed irrigation is sometimes used to decrease the amount of water delivered to the plant at any one time, thus reducing runoff or deep percolation. Pulsed systems are typically expensive and require extensive maintenance. Therefore, the latest efforts by emitter manufacturers are focused on developing new technologies that deliver irrigation water at ultra-low flow rates, i.e. less than 1.0 L (2.1 US pints; 1.8 imperial pints) per hour. Slow-and-even delivery further improves water use efficiency without incurring the expense and complexity of pulsed delivery equipment.

An emitting pipe is a type of drip irrigation tubing with emitters pre-installed at the factory with specific distance and flow per hour as per crop distance.

An emitter restricts water flow passage through it, thus creating head loss required (to the extent of atmospheric pressure) to emit water in the form of droplets. This head loss is achieved by friction/turbulence within the emitter.

Advantages of Drip Irrigation: -

- Water is used at maximum optimum level.
- As water is applied locally and leaching is reduced, fertilizer/nutrient loss is minimized.
- Weeds cannot absorb water as no water is available for them and thus grow in less number
- Crop yield is maximum
- Fertilizers can be used with high efficiency.
- Minimum operating cost
- No soil erosion
- Soil infiltration capacity is increased.
- Fertilizers and ground water is not mixed.
- Seed germination is improved.
- We can use recycled water safely.
- It is not necessary to level the fields.
- We can irrigate water in irregular shaped lands.
- Waste of fertilizers is reduced by 50%
- Energy cost is reduced as it is operated in lower pressure than other irrigation methods.

CHAPTER 18
SOCIAL ACTIVITIES – ANY PLANNED BY STUDENTS

Kanbha village during covid19: -

What you need to know: -

- Stay home if sick.
- Wear masks in public settings, like on public and mass transportation, at events and gatherings, and anywhere they will be around other people.
- Use social distancing (stay at least 6 feet away from others).
- Before you go, call and ask what extra prevention strategies they are using, like requiring staff to wear masks.
- Wash your hands with soap and water for at least 20 seconds when you get home.

Clean hands often: -

- Consider providing hand sanitizer in addition to clearly marked hand washing areas.
- **Wash your hands** for at least 20 seconds when entering and exiting social gatherings. If soap and water are not readily available, use a hand sanitizer that contains at least 60% alcohol. Cover all surfaces of your hands and rub them together until they feel dry.
- Make sure there is adequate soap or hand sanitizer containing at least 60% alcohol available in the restrooms and encourage guests not to form a line at the door. Consider also providing cleaning supplies that allow guests to wipe down surfaces before they leave.
- Remind guests to wash their hands before serving or eating food.
- Use single-use hand towels or paper towels for drying hands so guests do not share a towel.

  - This type of activity done in covid 19 in kanbha village.
  - We share covid information to village people and explain all virus cycle.

CHAPTER: 19
KANBHA VILLAGE S A G Y QUESTIONNARIE SURVEY FORM

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: Kanbha Gram Panchayat: _____ Ward No. _____

Block: _____ District: Ahmedabad

State: Gujarat LS Constituency: _____

1. Family Identity and Size

Name of Head of Household	Prajapati Rameshbhai Sakarbhai						Male/ Female	M
SECC Survey ID:		Family Size	4	Over 18	4	6 to 18	-	Under 6	-

2. Category & Entitlement Details (Tick as appropriate)

Social Category[1]	OBC	Life Insurance	1. All Adults 2. Some Adults 3. None	AABY	1. Yes 2. No	Kisan Credit Card	Yes / No	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]
Prajapati Rameshbhai	46	M	N	Y	8	Y	Y	
Prajapati Vimalaben	42	F	N	Y	6	Y	Y	
Prajapati Alpeshbhai	26	M	N	N	9	Y	Y	
Prajapati Vishalbhai	24	M	N	N	9	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
Nill								

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 Immunised Y/N	Mother's Age at the time of Child's Birth
Nil								

[1] Scheduled Caste 1, Scheduled Tribe 2, Other Backward Castes 3, Other 4
[2] Enter the BPL Survey round being used in the Gram Panchayat for identification of BPL Families (e.g. 1997/2002/2011)
[3] Marital Status: Not Married – 1, Married – 2, Widowed – 3, Divorced/Separated – 4
[4] Level of Education: Not Literate – 01, Literate – 02, Completed Class 5 - 03, Class 8th – 04, Class 10th-05, Class 12th-06, ITI Diploma-07 Graduate 08, Post Graduate/Professional – 09 (write the highest level applicable)
[5] No Pension – 0, Old Age Pension – 1, Widow Pension – 2, Disability Pension – 3, Other Pension – 4 (mention)

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

5. Hand washing

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

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

7. Do members take Regular Physical Exercise

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

8. Consumption of Tobacco

	Smoking	Chewing
Adults	—	Yes
Children	—	—

9. House & Homestead Data

Own House: Yes / No	No. of Rooms: 3
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 Yes	Kitchen Garden : Yes / No Yes
Compost Pit: Individual/ Group/ None	Biogas Plant: Individual/ Group/ None

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

Source of Water		Distance
Piped Water at Home	Yes / No	
Community Water Tap	Yes / No	
Hand Pump (Public / Private)	Yes / No	20m
Open Well(Public / Private)	Yes / No	
Other (mention):		

11. Source of Lighting and Power

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

12. Landholding (Acres)

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

13. Principal Occupations in the Household

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

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

15. Agriculture Inputs

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

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

Name	Unit	Quantity
—	—	—
—	—	—
—	—	—

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
Volley ball Cricket
Kabaddi

19. Do children play musical instrument (mention)

Schedule Filled By:
Principal Respondent:
Date of Survey: 12/06/2021

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: Kambha

b. Block: Gram Area

c. District: Ahmedabad

d. State: Gujarat

e. Lok Sabha Constituency: –

f. Number of Wards in the Gram Panchayat: –

g. Number of Villages in the Gram Panchayat: –

h. Names of Villages: Kambha

Demographic Information

Number of Households 1100 Total Population 6000 Male 3570 Female 2430

SC HHs – ST HHs – OBC HHs – Other HHs –

I. Access to Infrastructure / Facilities / Services

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

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	1
r	Veterinary Care Centre	No	–
s	Ayurveda Centre	No	–
t	E – Seva Kendra	No	–
u	Bus Stop	Yes	1
v	Railway Station	No	–
w	Library	Yes	1
x	Common Service Centre	No	–

IV. Sports Facilities in the Gram Panchayat

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

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

V. Education, ICDS

a. Number of Angan Wadi Centres: 5

b. Number of villages without Angan Wadi Centres –

Names of such villages: –

c. Schools (Number)

Primary Private: 1 Primary Govt.: 1

Middle Private: – Middle Govt.: –

Secondary Private: – Secondary Govt.: 1

Higher Secondary Private: – Higher Secondary Govt: 1

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)	–	–	–	–	gov	–	–
b.	Kerosene	–	–	–	–	gov	–	–
c.	Other (mention)	–	–	–	–		–	–

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	–	d.	Pasture / Grazing Land	–	g.	Check Dam	–
b.	Irrigated Land	4250	e.	Forests/ Plantations	27%	h.	Wells/Bore Wells	1
c.	Un-irrigated Land	–	f.	Other Common Land	–	i	Tanks /Ponds	1

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

++++++++++++++++++++++++++-*****-

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

viii. Land Category	Area in Acres		Land Category	Area in Acres		Irrigation Structure	No.
a. Cultivable Land	—	d.	Pasture / Grazing Land	-	g.	Check Dam	—
b. Irrigated Land	4250	e.	Forests/ Plnatations	27+/-	h.	Wells/Bore Wells	1
c. Un-irrigated Land	—	f.	Other Common Land	—	i	Tanks /Ponds	1

ix. Entitlement Related Parameters	
1 Number of active Job Card holders under MGNREGA	—
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	550
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	0
13 Number of Bharat Nirman Volunteers	0

Name and Signature of Surveyor and Respondent'

1) Prajapati Harshil. K. 2) Thakor Rutvik. A Surveyor	PRI Respondent (Preferably a ward member from a ward that is fully or partially covered under the Village)	સરપંચ કણભા ગ્રામ પંચાયત તા.દસ્ક્રોઈ, જી.અમદાવાદ Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	12/06/21 Date of Survey

3

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

Gujarat Technological University Mail - Development scenario of Kanbha.

Vishwakarma Yojana <rurban@gtu.edu.in>

Gmail

Development scenario of Kanbha village, Daskroi, Ahmedabad

Thakor Rutvikkumar <rutvikthakor1999@gmail.com> Fri, Sep 10, 2021 at 11:32 AM
To: ddo-sur@gujarat.gov.in, tdoolpad@gmail.com, collector-sur@gujarat.gov.in, gpdelasa-gj@gov.in
Cc: Vishwakarma Yojana <rurban@gtu.edu.in>

Respected Sir/Madam

We are the students of **Hasmukh Goswami college of engineering** affiliated to Gujarat Technological University-GTU. GTU has been assigned to Vishwakarma Yojana-VIII in which students survey various village and ***designs various amenities To Deliver*** **it to** them making them ideal for living better life as per requirements & village problem statements. As a part of Vishwakarma Yojana's guidelines, we have been asked to inform all the respected officers about our project in which we will shortly notify about Kanbha Village profile of issues for development and our design work for them which is as below.

Sr No	Proposed Design Names	Period	Amount Expenditures	Benefits
1	Public Toilet	Immediately	196718.972	More access to urination and defection
2	Super Market	With 6 months	1236717.5	Available for all goods and services
3	Post Office	With 6 months	293728.03	Improve the village service.
4	Library	With 1 year	639108.89	Improve in study in village student.
5	Bus Stand	With 4 months	103958.7	Improve village transportation system.
6	Underground water tank	With 6 months	74212.93	Improve village water store facility
7	design of public garden	With 1 year	92587.5	Improve village beauty.
8	maintenance design of RCC roads	Immediately	65114543.9	Improve village road and safety.
9	design of Hospital	With 2 years	573000	Improve the Medical service.
10	Playground	With 1 year	713820	Improve the village structure.
11	Mahila Mandli	With 1 year	342188.325	Helping the village women to get new information or knowledge the new facility of any resource
12	Community Hall	With 1 year	1376463.25	Villager are meet and any social or culture program play in stage

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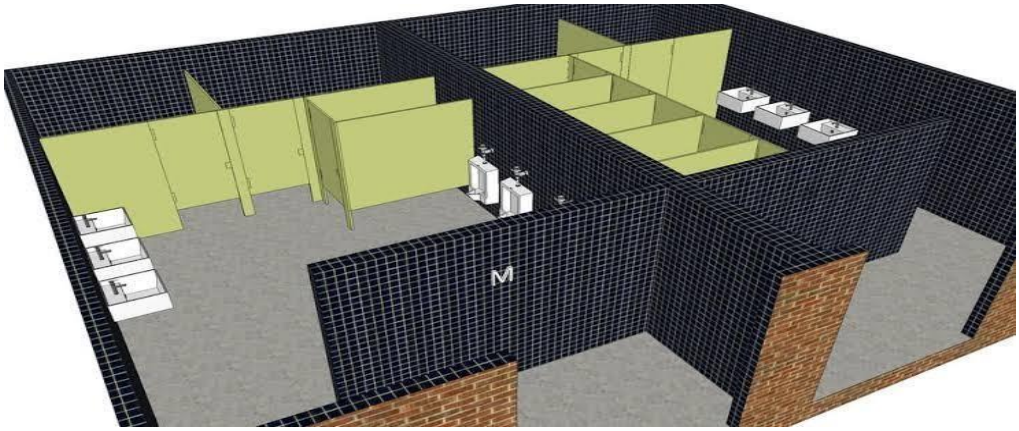
Kanbha final report_VY(VIII).pdf
12358k

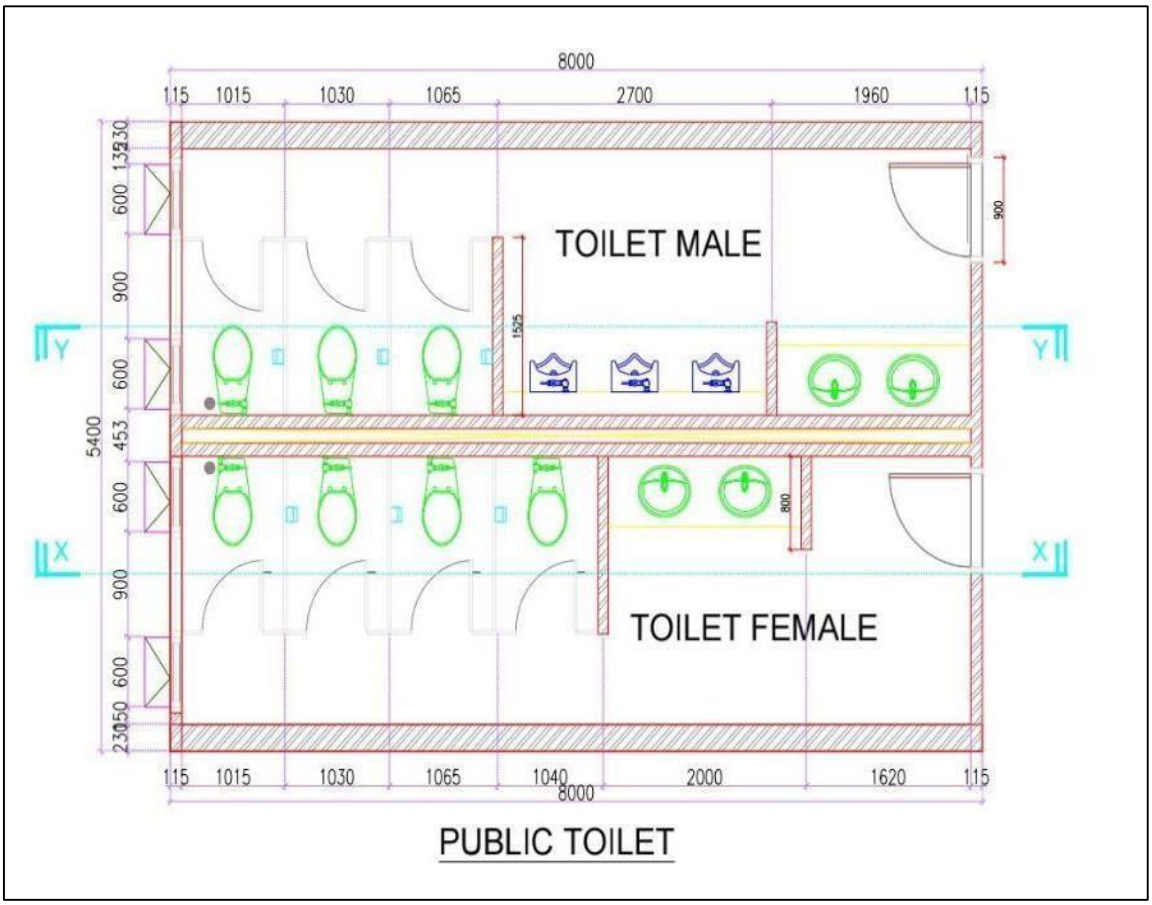
CHAPTER-21.
Comprehensive Report for The Entire Village

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

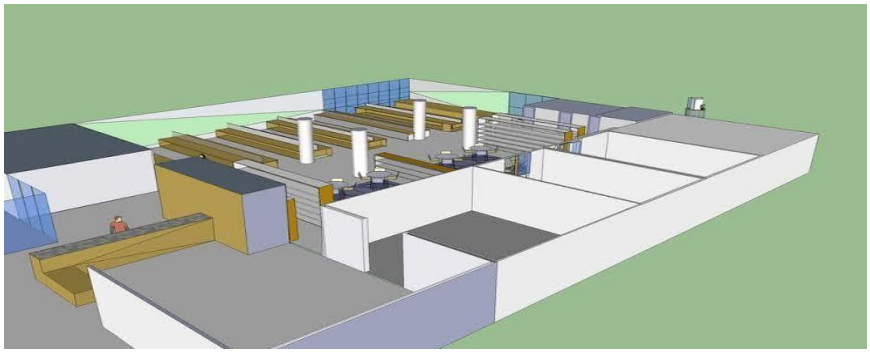
It is one of the strategies to reduce urban city pressure and lower the migration rate by developing village with a “rural soul” but with all urban amenities that a city may have. In this project the students meet the relevant citizens of village and survey the existing facilities. Then design of the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

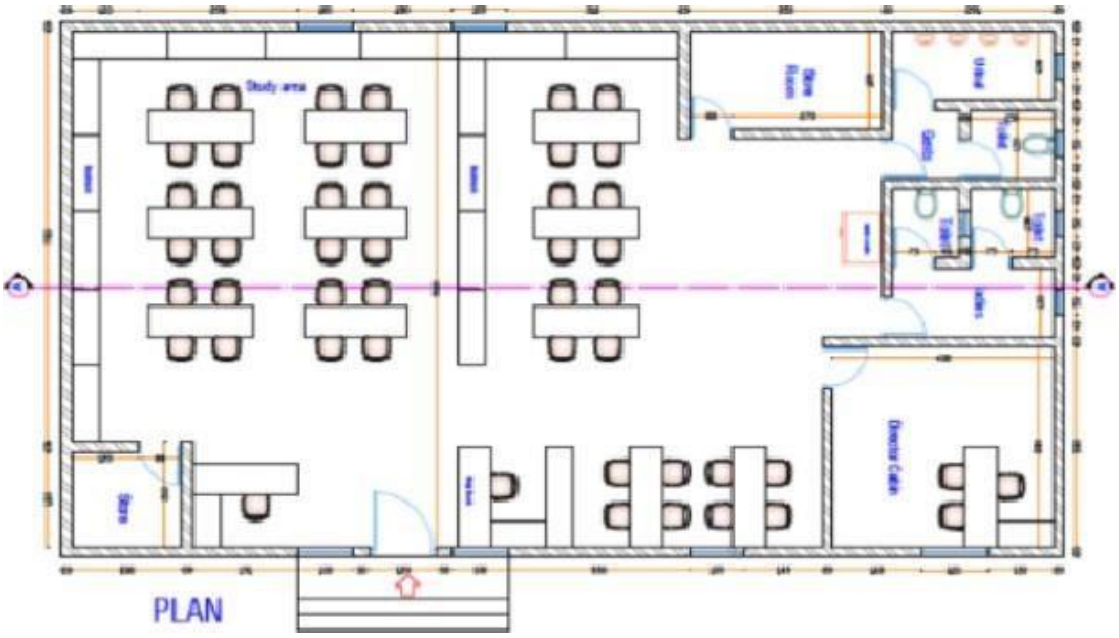
1.DESIGN INFRASTRUCTURE: PUBLIC TOILET



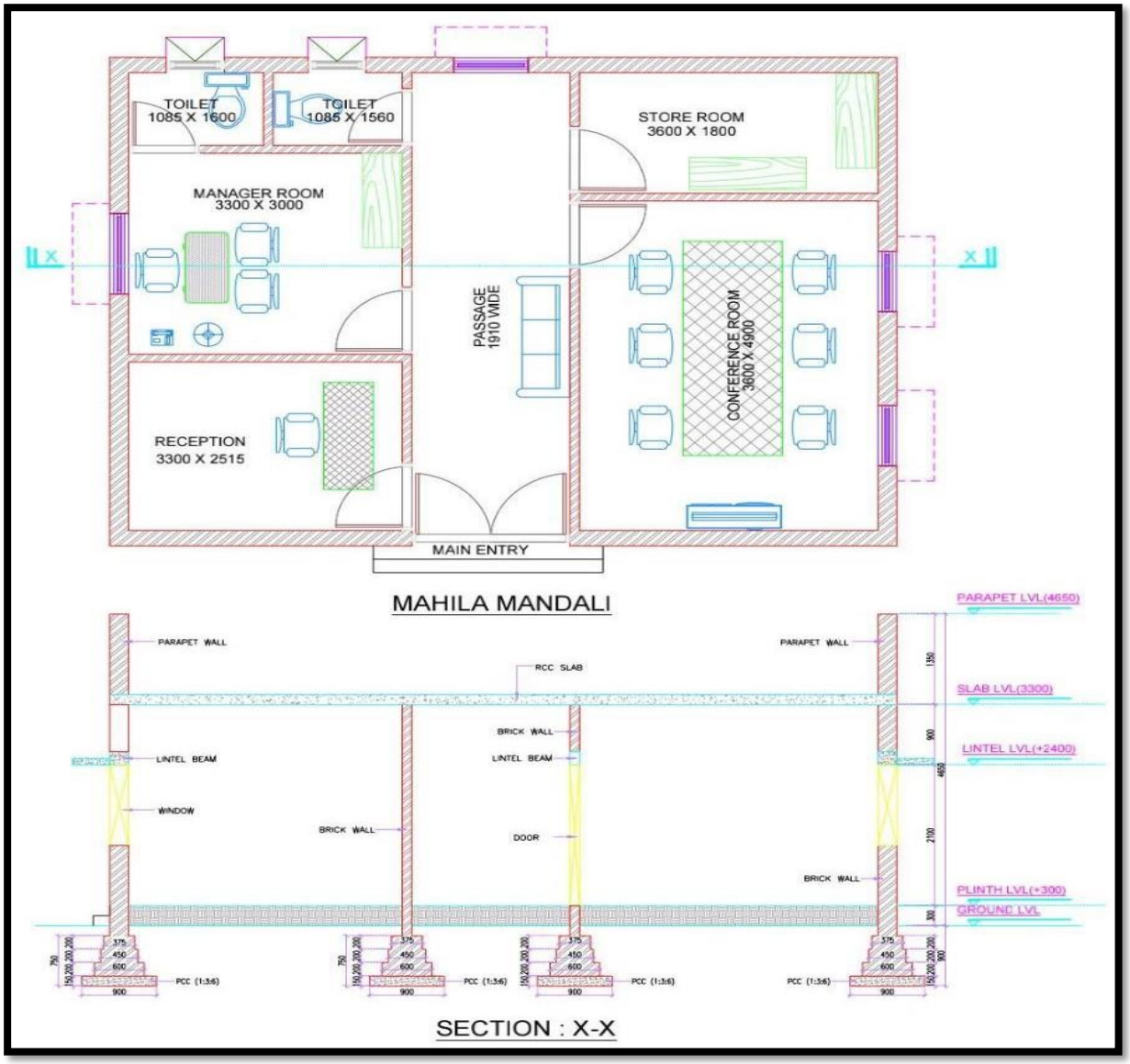


2.DESIGN INFRASTRUCTURE: LIBRARY

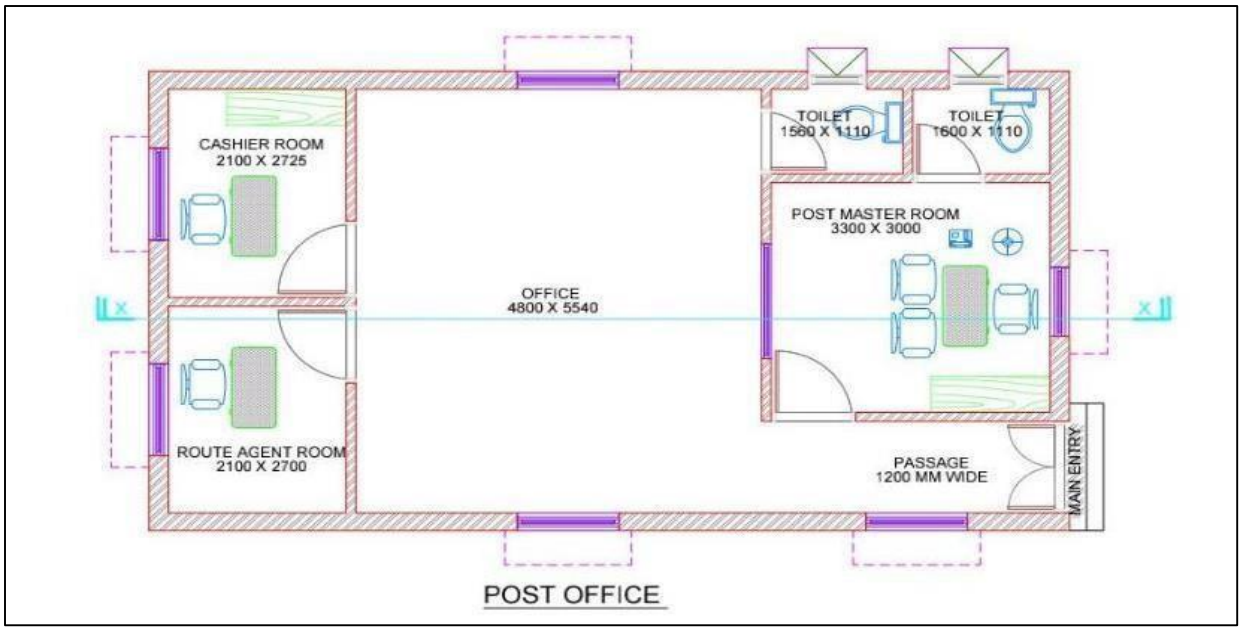




3.DESIGN INFRASTRUCTURE: COMMUNITY HALL



4.DESIGN OF POST OFFICE:



5.DESIGN INFRASTRUCTURE: Hospital

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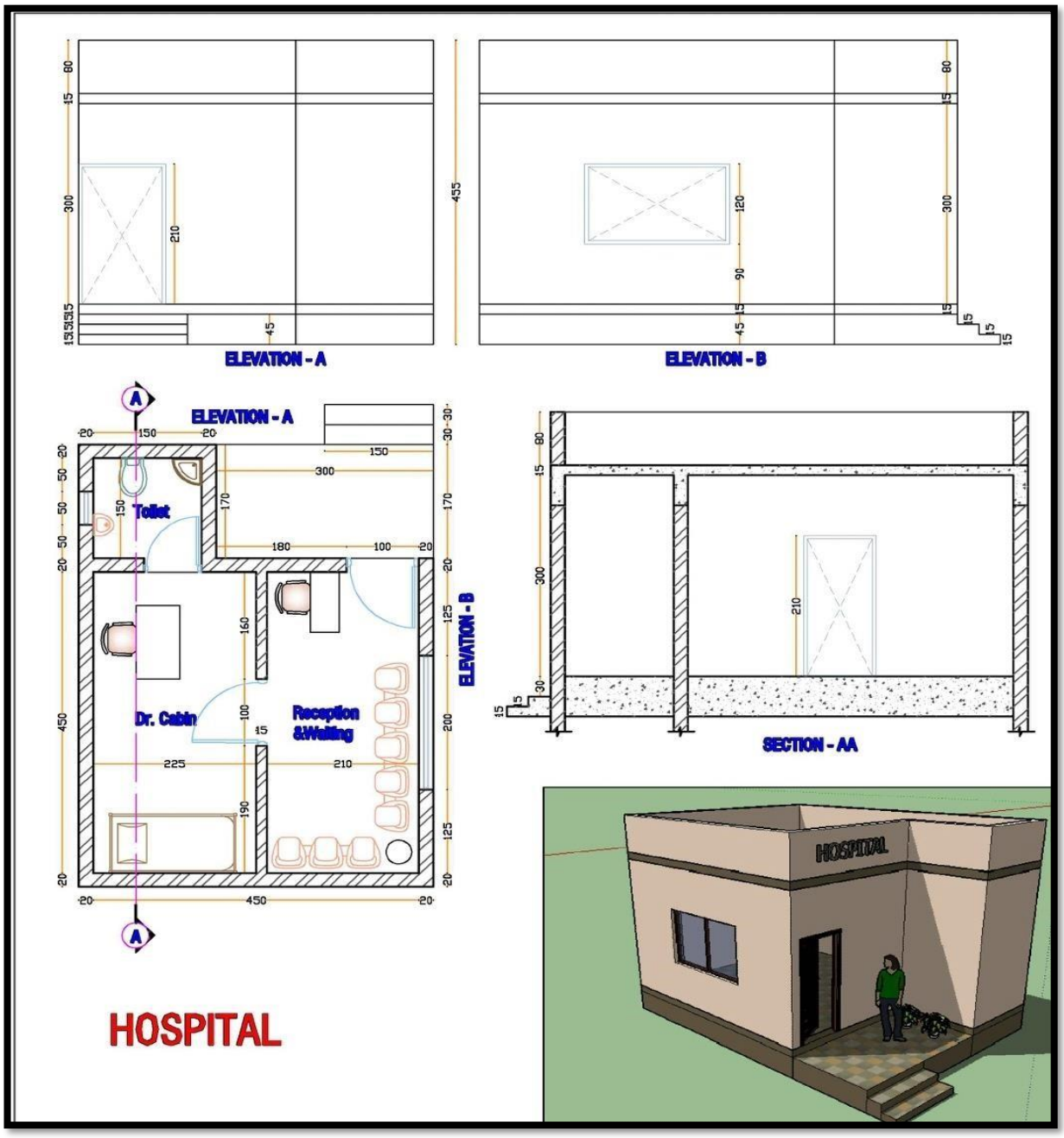
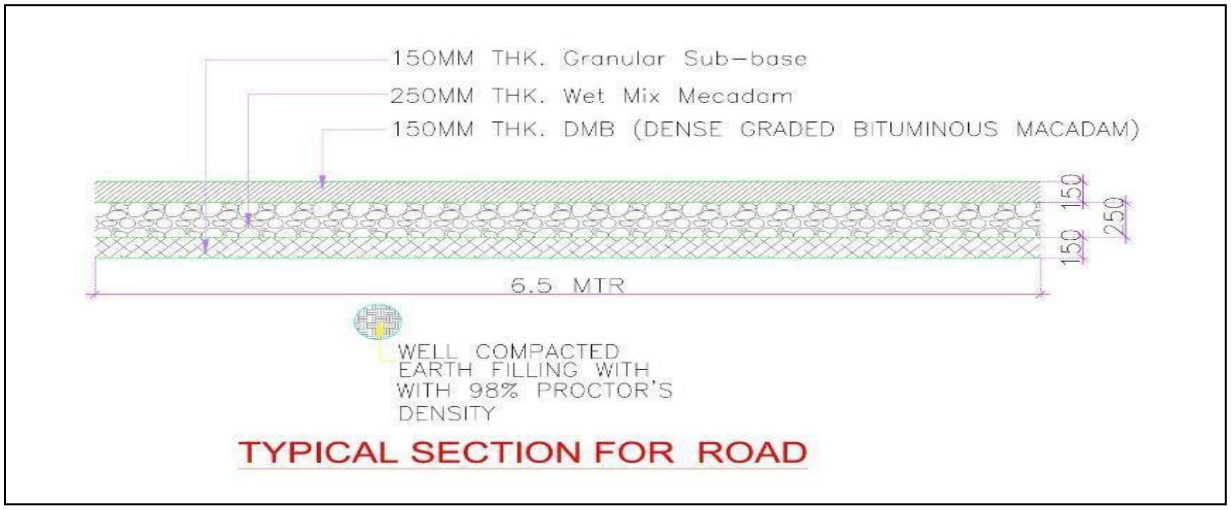
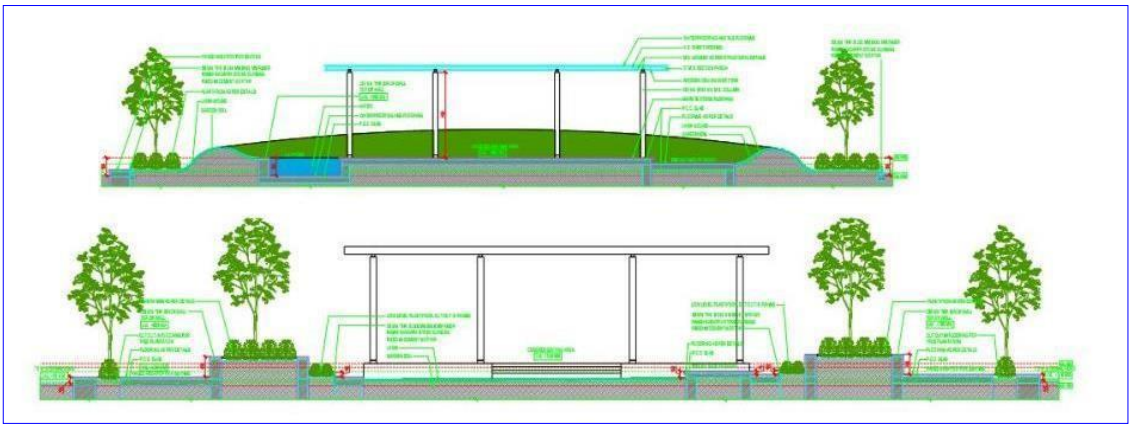


6.DESIGN INFRASTRUCTURE: RCC ROAD



7 PUBLIC GARDENS



NODAL OFFICER STATEMENT:

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

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

Lastly, we all enjoyed the informational as well as practical journey of civil engineering work.

Nodal Officer
Mr. Srinath Karli
Hasmukh Goswami of College