DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION
Balva Village

District - Gandhinagar

PREPARED BY

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
Arya Gajjar	Civil & Infrastructure Engineering	171310140013
Nishith Vaidya	Civil & Infrastructure Engineering	171310140061
Jinil Parekh	Electrical Engineering	171310109028

COLLEGE NAME -

ADANI INSTITUTE OF
INFRASTRUCTURE ENGINEERING

NODAL OFFICERS NAME-

PROF. UZAIR SHAIKH,
DR. SUBHANARAYAN SAHOO

COLLEGE LOGO

adani
Institute of Infrastructure

YEAR: 2020-21

GUJARAT TECHNOLOGICAL UNIVERSITY
Chandkheda, Ahmedabad – 382424 Gujarat

DETAIL PROJECT REPORT

ON

Vishwakarma Yojana: Phase VIII

AN APPROACH TOWARDS RURBANISATION

Balva Village

Gandhinagar District

Prepared By

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
Arya Gajjar	Civil & Infrastructure Engineering	171310140013
Nishith Vaidya	Civil & Infrastructure Engineering	171310140061
Jinil Parekh	Electrical Engineering	171310109028

COLLEGE NAME -

ADANI INSTITUTE OF
INFRASTRUCTURE ENGINEERING

NODAL OFFICERS NAME-

PROF. UZAIR SHAIKH,
DR. SUBHANARAYAN SAHOO

COLLEGE LOGO

Year: 2020-21

Gujarat Technological University,
Chandkheda, Ahmedabad – 382424 Gujarat

CERTIFICATE

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

Detail Project Report for,

VILLAGE: BALVA

DISTRICT: GANDHINAGAR

UNDER

Vishwakarma Yojana: Phase-VIII

In partial fulfillment of the project offered by

GUJARAT TECHNOLOGICAL UNIVERSITY, CHANDKHEDA

During the academic year 2020-21.

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

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
Arya Gajjar	Civil & Infrastructure Engineering	171310140013
Nishith Vaidya	Civil & Infrastructure Engineering	171310140061
Jinil Parekh	Electrical Engineering	171310109028

Date of Report Submission:	
Principal Name and Signature:	Dr. V M Patel
VY-Nodal Officer Name and Signature:	Prof. Uzair Shaikh, Dr.Subhanarayan Sahoo
Internal(Evaluator) Guide Name and Signature:	
College Name:	Adani Institute of Infrastructure Engineering
College Stamp:	

ABSTRACT

In our country large number of people still lives in villages, hence it is an important role to develop villages in order for the development of the country. Vishwakarma Yojana aim is to develop village with ‘rural soul’ and ‘urban amenities’. This Yojana is basically to develop rural areas with economical cost. Roadmap to our vision project will be such that we will find problems faced by villagers, find solutions and then short out solutions which has higher efficiency, longer durability along with economical cost and latest technologies. The idea of Rurbanization at recovery and renewal of both the physical just as friendly climate in village through a reasonable and financial utilization of assets is the idea for improvement or the village. It is intended to lessen and eliminate the country metropolitan gap and to prompt course of rustic change that isn't manipulative. Vishwakarma Yojana is a methodology towards Rurbanization, it has been proposed to give the advantage of certifiable experience to designing understudies and apply their specialized information in the arranging, advancement and the executives of country framework offices. Rurbanization implies metropolitan offices and conveniences in rustic region, creating town with assistance of country soul and metropolitan conveniences.

The Balva village is located in Kalol Taluka of Gandhinagar district in Gujarat, India. This village contains 1330 houses. It has a complete populace of 6504 with 3114 female populace against 3390 guys according to 2011 census information. The primary perspectives for improvement of this town are sewage, public latrines, local area lobby, and so forth a portion of the actual framework like dairy, panchayat building, grade school, and well exist in the town and are appropriately kept up with and used. More over Water tank is available yet in rough shape.

The Balva village is having school which gives quality knowledge to students, dairy is situated in village which helps villagers to sell milk of their cattle, village doesn’t have any social infrastructure like public toilets or community hall which needs to be made and concrete poles is placed to support transmission line in village. The design will be proposed which is cost effective and provide a better solution for the development of the Balva village. The design is given by putting in mind about what villagers need and for the socio-economic development of the village. The design given is from latest technologies available in Indian market. The village is having its leading and lagging sides but by overcoming the problems in a way that rural soul is maintained, this village is having that possibility of becoming an ideal village.

Keywords: Vishwakarma Yojana, Ideal Village, Balva Village, Covid-19, Community Hall, Solar Irrigation

ACKNOWLEDGEMENT

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

We wish to express our deep sense of gratitude to **Prof. (Dr.) Navin Sheth**, **Hon'ble Vice Chancellor, Gujarat Technological University-Ahmedabad**, for his encouragement and giving us the wonderful project.

We also express our gratitude to **Dr. K.N. Kher**, **Registrar, and Gujarat Technological University-Ahmedabad** for giving us complete support.

We express our sincere thanks to **Commissionerate of Technical Education, Gujarat State** for appreciating and acknowledging our work.

We express our sincere thanks to **DDO, TDO, Sarpanch, Talati and staff members of Ahmadabad** District for providing us with requisite data whenever we approached them. Especially our thanks are to all villagers and stake holders for their support during Survey.

We are also thankful to our **Prof**. (**Dr. V M Patel) Principal**, faculties of our colleges for their encouragement and support to complete this project work.

An act of gratitude is expressed to our internal guide / Evaluator / Nodal Officer,
Mr. Uzair Shaikh from college for their invaluable guidance, constant inspiration and active involvement in our project work.

We are also thankful to all the experts who provided us their valuable guidance during the work. We express our sincere thanks to, **Dr. Jayesh Deshkar, Hon'ble Director of Vishwakarma Yojana project and Principal, V.V.P Engineering College and Core Committee member of Vishwakarma Yojana project Prof(Dr.)Jigar Sevalia**, Professor, SCET, Surat, **Prof.K.L.Timani,** Associate Professor,VGEC, **Prof.Rena Shukla**, Associate Professor, LD Engineering College, **Prof.Y.B.Bhavsar,** Associate Professor,VGEC, **Prof.Jagruti Shah**, Assistant Professor, BVM Engineering College for providing us technical knowledge of this project work.

We are also thankful to **Ms. Darshana Chauhan, Vishwakarmrma Yojana**, for all support during our work. We therefore, take this opportunity for this Project work expressing our deep gratitude and sincere thanks for her cooperation to produce this project work in the present form.
Above all we would like to thank our Parents, family members and Friends for their encouragement and support rendered in completion of the present this work.

INDEX

CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. IDEAL VILLAGE

1.1 Background and Study Area Location

Background:

- Gozaria is a green village with lots of trees. Most of people are working in agriculture field. There is different part where people stay with special culture called Chowk.
- "In Gozaria village there are many chowk like Bhakt Chowk, Shakti Chowk, Krishna Chowk, Navarang Chowk, and Krushn Chowk. Gozaria adores a flourishing tradition, being the center of Gujarati cultural happenings and varied traditions of different cultural and sacred communities."
- "Popular celebrations and observances include Uttarayan, an annual kite flying day on 14 January."
- "The nine nights of Navratri are celebrated with people performing Garba, the traditional dance of Gujarat. The festival of lights, Deepavali is celebrated with the lighting of lamps in every house and the bursting of crackers."
- "Other festivals such as Holi and Ganesh Chaturthi are celebrated with interest."

Study Area Location:

"Gozaria is located at 23.478126°N, 72.56238°E. It has an average altitude of 81 meters (265 feet) above sea level. It is approximately 60 km away from the city of Ahmedabad and 32 km from Gandhinagar. The area of the Gozaria is around 3 km^2 and population in 2001 was 3132."

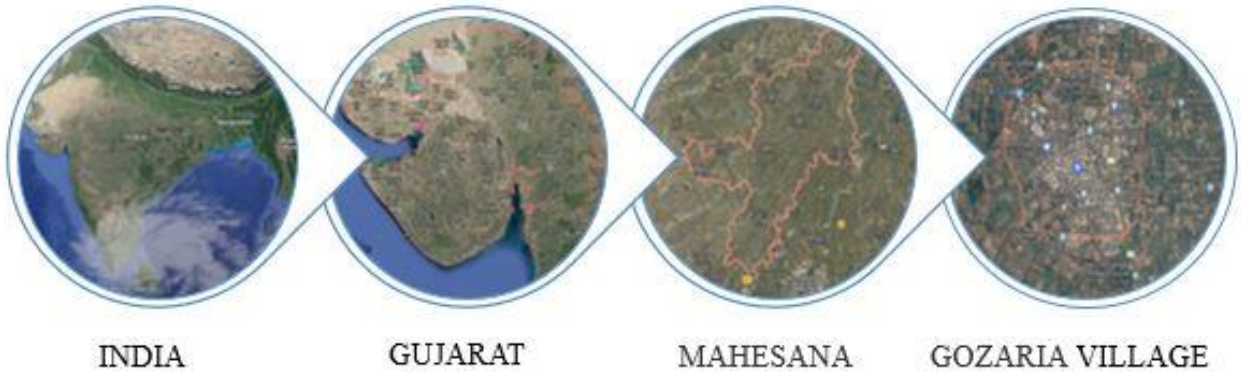


Figure 1 Location of Gozaria village

1.2 Concept: Ideal Village

1.2.1 Objectives

- An ideal Indian village must be constructed with perfect sanitation. It should have houses with sufficient light and ventilation. They also have courtyards that can be utilized for different purpose like planting vegetables and many other.
- The village lanes and streets should be free of all avoidable dust. It must fulfil the requirement of the fresh water that is available door to door.
- Proper common meeting places, common places for function and events, primary and secondary school for basic education, a cooperative dairy and it should have Panchayats for settling disputes. It should produce its own grains, vegetables and its own Khadi.

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

Jarod is a Census Town city in district of Vadodara, Gujarat. The Jarod Census Town has population of 7,200 of which 3,777 are males while 3,423 are females as per report released by Census India 2011.Population of Children with age of 0-6 is 866 which is 12.03 % of total population of Jarod (CT). In Jarod Census Town, Female Sex Ratio is of 906 against state average of 919. Moreover Child Sex Ratio in Jarod is around 835 compared to Gujarat state average of 890. Literacy rate of Jarod city is 91.33 % higher than state average of 78.03 %. In Jarod, Male literacy is around 94.52 % while female literacy rate is 87.85 %.Jarod Census Town has total administration over 1,601 houses to which it supplies basic amenities like water and sewerage. It is also authorize to build roads within Census Town limits and impose taxes on properties coming under its jurisdiction.

1.2.3 The Idea of a Smart Village

"Smart Village refers to a concept developed in rural area that provides solutions to problems occurred and improves the quality of life. The main problems faced by the rural areas must be excluded like cover poverty, low education and limited access to the new technology."

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

A town is a grouped human settlement or local area, bigger than a villa however more modest than a town (albeit the word is regularly used to portray the two villas and more modest towns), with a populace commonly going from a couple hundred to two or three thousand. However towns are frequently situated in rustic regions, the term metropolitan town is likewise applied to certain metropolitan areas. Towns are ordinarily long-lasting, with fixed homes; notwithstanding, transient towns can happen. Further, the homes of a town are genuinely near each other, not dissipated extensively over the scene, as a scattered settlement. Before, towns were a typical type of local area for social orders that training means agribusiness, and furthermore for some non-horticultural social orders. The Industrial Revolution pulled in individuals in bigger numbers to work in plants and production lines; the convergence of individuals made numerous towns develop into towns and urban communities. This likewise empowered specialization of work and specialties, and advancement of many exchanges. The pattern of urbanization proceeds, however not generally regarding industrialization. Truly homes were arranged together for amiability and protection and land encompassing the living quarters was cultivated. Customary fishing towns depended on craftsman fishing and found neighboring fishing grounds.

India:
"The spirit of India lives in its towns," pronounced M. K. Gandhi toward the start of twentieth century. As indicated by the 2011 statistics of India, 68.84% of Indians (around 833.1 million individuals) live in 640,867 unique towns. The size of these towns changes extensively. 236,004 Indian towns have a populace of less than 500, while 3,976 towns have a populace of 10,000+.

Provincial Development:
Rural improvement is the most common way of working on the personal satisfaction and financial prosperity of individuals living in country regions, regularly somewhat disconnected and meagerly populated regions. The requirement for country networks to move toward advancement according to a more extensive viewpoint has made more spotlight on an expansive scope of improvement objectives instead of only making impetus for rural or asset based organizations. Schooling, business venture, actual foundation, and social framework all assume a significant part in creating rustic districts. Rustic improvement is additionally portrayed by its accentuation on privately created financial advancement systems. As opposed to metropolitan locales, which have numerous likenesses, country regions are profoundly particular from each other. Consequently there are a huge assortment of provincial improvement approaches utilized worldwide. Provincial advancement is an extensive term. It basically centers on activity for the improvement of regions outside the standard metropolitan financial framework. We should consider what kind of provincial advancement is required in light of the fact that modernization of town prompts urbanization and town climate vanishes

1.3 Detail Study of Ideal Village

Table 1 Population Details of Gozaria Village

	Total	Male	Female
“Total No. of Houses	2,999	-	-
Population	13,933	7,256	6,677
Child (0-6)	1,465	805	660
Schedule Caste	568	286	282
Schedule Tribe	90	50	40
Literacy	90.83 %	94.45 %	86.95 %
Total Workers	4,676	4,011	665
Marginal Worker”	195	131	64

Work Profile

- "In Gozaria village out of total population, 4676 were engaged in work activities. 95.83 % of workers describe their work as Main Work while 4.17% were involved in marginal activity providing livelihood for less than 6 months. 4676 of workers engaged in main work, 729 wee cultivators while 1232 were Agricultural labourer."

Agriculture

- "Castor, Cotton and Bajra are agricultural commodities grown in the village. 8 hours' agricultural power supply in summer and 8 hours' agricultural power supply in winter is available in this village. Total irrigated area in this village is 1075 hectares from Boreholes or Tube wells 1075 hectares is the Source of irrigation."

Figure 2 Cotton and Castor

Drinking-Water and Sanitation

- Tube Wells is one of the Drinking Water sources. Drainage System is available in the Village. House to House waste Collection available in the village. There is also system available to collect garbage from the street. Drain water is cleared directly into water bodies

Figure 3 Drinking Water and Sanitation

Communication

- The village has facility of Post Office.
- The village has facility of Landline.
- The village has facility of Mobile Coverage.
- The village has facility of Internet Centre.
- The village has facility of Private Courier Facility

Figure 4 Post Office

Transportation

- The village has facility of Public Bus service.
- The village has facility of Private Bus service.
- There is no Railway Station in less than 10 km.
- District road passes through the village.
- Within the village there is Pucca road, Kuccha Road, Macadam Road and Foot Path are other Roads and Transportation.
- No Nearest National Highway in less than 10 km.

Figure 5 Bus Station

Commerce

- ATM and Commercial Bank are available in the village. Cooperative Bank facility is also available. Regular Market and Weekly santha facility are provided in this village.

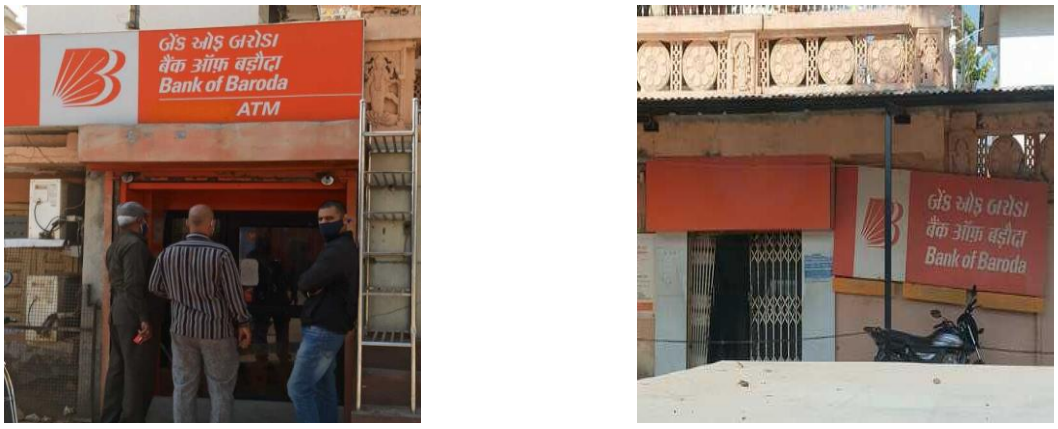


Figure 6 ATM and Bank

Source: Images taken by students

Other Amenities

- "The Village has 24-hour power supply in summer and 24-hour power supply in winter, Anganwadi center, ASHA, Birth & Death registration office, Sports facilities, Daily News Paper and Polling station are the other amenities are available in the village."


Figure 7 Library and Community Hall

Source: Images taken by students

1.4 SWOT Analysis of Ideal Village

Strength:

- The Village is encircled by farming area which establishes quiet climate for residents. The village has quality parks, great sail, and enormous zones of open source.
- Current organizations in village are thriving, which are adding to the area of most business properties.
- The village is resolved to develop itself in general just as the greatness of life offered to its occupants.

Weakness:

- Without municipal water administrations being given, inhabitants are compelled to penetrate wells for well water.
- Water quality is below the expectations of some village residents.
- The Village does not have any crisis administration of its own other than police administration.

Opportunities:

- The Village should also consider tearing down the broken-down homes and building new homes to create more visual appealing.
- Abating municipal revenues should provide a framework for more cooperative municipal service programs that are regionally motivated and not centered in individual societies
- The Village may be qualified to receive support in the form of grants or other funding as it moves forward with its goals.

Threats:

- There are too many townhouses, duplexes, and apartments in the Village.
- Overuse of the current green spaces and threats from outside developers who do not have a sense of community appear as the most significant challenges to the protection of the village's some degree of resources.
- Uncontrolled development and unenthusiastic zoning regulation enforcement is the biggest set of worries.

1.5 Future Prospect of Development of Gozaria Village

- It can become smart, with better internet speed and connectivity.
- It can become more attractive to foreign and local investors.
- It can provide greater chances for the jobseekers.
- It can solve many of the big social challenges such as diversity, climate change and the sustainable provision of food, and better use of biomass and renewable energy.
- Tourism and culture can inspire employment and investment in rural areas.

1.6 Benefits of the Visits of Gozaria Village

- General ideas of basic services include safe drinking water, sanitation, housing, all climate road, electrification, fuel, connectivity, healthcare center, school, playground and recreational services and many more that are needed in village.
- It also showed the basic lifestyle of the villagers and their needs for the development of their own village.
- By providing some of the features how migration of the people from the rural to urban areas can be reduced.

1.7 Civil Aspects Required in Gozaria Village

- The Gozaria village requires maintenance of Public amenities like Public Toilet, Library and Dairy.
- The Gozaria village lack the quality of internal street roads.
- The Gozaria village does not have Public Wi-Fi Services.
- The villagers do not use any Renewable sources of energy as Gozaria village does not have any Renewable resources.
- Some area of the Gozaria village lack proper Sanitation and Waste disposal system.

2. BALVA VILLAGE LITERATURE REVIEW

2.1 Introduction: Urban & Rural Village Concept

Urban:

"As per the census of India – 2011, the definition of urban area is as follows:

1. The place which has municipality, corporation, cantonment board or notified town area committee, etc.
2. The place which satisfies the following criteria:
    - Minimum population of 5000
    - At least 75% of male main working population engaged in nonagricultural pursuits
    - Density of population of at least 400 persons per sq. km."

Rural:

"Generally, a rural area is a geographical area that is located outside the cities or towns. Typical rural areas have low population density and small clearances. Rural areas are also known as 'countryside' or 'village'.

Agriculture is primary source of livelihood along with pottery, cottage industries etc. According to planning commission the town with maximum 15000 population is considered as rural. 'Panchayat' is authority to take decisions in such regions."

2.2 Importance of Rural Development

"Rural development is necessary not only for a majority of the population living in villages but the development of rural activities is essential to increase speed the leap of overall economic development of the country.

Figure 8 Importance of Rural Development

Rural development has supposed greater importance in India today than in the earlier period in the process of the improvement of the country.

The primary task is to moderate the hunger of about 70 percent of the rural population, providing sufficient and nutritious food. Then follow an adequate delivery of clothing and footwear, a clean house in a clean environment, medical care, recreational facility, education, transport and communication."

2.3 Ancient Villages / Different Definition of: Rural Urban Villages

We portray the term country as a segment arranged on the limits. It intends to a minor settlement, which is outside the lines of a town, business or mechanical space. It may cover, rural zone zones, towns or common neighborhood, there are customary plants and not created spaces.

In India, a city whose populace is lower than fifteen thousand is estimated as country, according to the arranging guidance. Gram Panchayat is in expert for taking care of such zones. Further, there is no administration board, inside the towns and most extreme % of the male populace are occupied with development and related exercises.

2.4 Scenario: Rural / Urban Village of India Population Growth as per Census 2011 and Latest

"Population (in crore)"

Table 2 Population of Rural and Urban areas as per census 2001 and 2011

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

"Literacy rate (in %)"

Table 3 Literacy Rates in Rural and Urban areas as per Census 2001 and 2011

	2001	2011	Difference
India	64.8	74.0	9.2
Rural	58.7	68.9	10.2
Urban	79.9	85.0	5.1

"Literacy rate (in %)"

Table 4 Literacy Rates in Rural and Urban area as per the males and females

	2001	2011	Difference
Male			
India	75.3	82.1	6.8
Rural	70.7	78.6	7.9
Urban	86.3	89.7	3.4
Female			
India	53.7	65.5	11.8
Rural	46.1	58.8	12.7
Urban	72.9	79.9	7

2.5 Scenario: Rural / Urban Village of Gujarat Population Growth as per Census 2011 and Latest

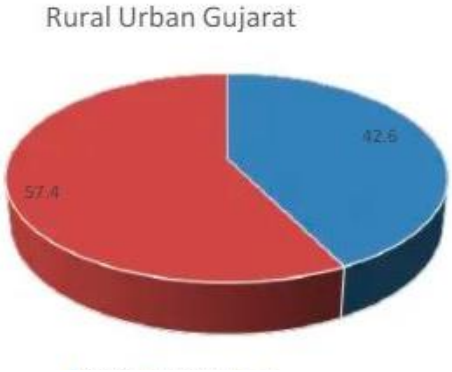


Figure 9 Population of Gujarat in %

Gujarat Urban Population as per Census 2011:

"Out of total population 42.60% people live in urban Gujarat. Total figures of population are 25,745,083 of which 13,692,101 are males and 12,052,982 are females. Average literacy rate in urban Gujarat is 86.31% in which males were 90.98% and females were 70.26%."

Gujarat Rural Population as per Census 2011:

"In rural Gujarat males were 17,799,159 and females were 16,895,450. The population growth was 57.40%. Average literacy rate in rural Gujarat is 71.71% of which 81.61% are males and 57.78% are females."

2.6 Population Growth of Gujarat

Table 5 "Population of Gujarat as per census 2001 and 2011"

Population	2001	2011
Male	26,385,577	31,491,260
Female	24,285,440	28,498,432
Total	50,671,017	60,439,692

2.7 Rural Development Issues and Concerns

- People are directly or indirectly dependent on agriculture and a large number of property-owners have small and medium sized landholding.
- Economy of the people living in rural areas is very less.
- The price the farmers get for their production of crops is less in relation to the work they put in.
- People have to migrate to the urban areas due to inaccessibility of education.

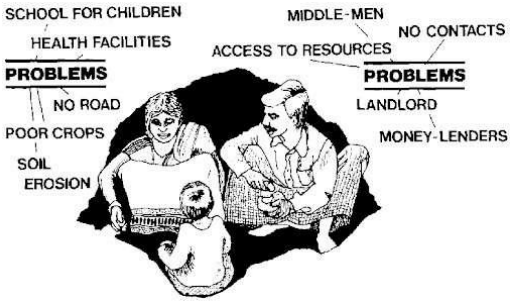


Figure 10 Rural Development Issues and Concerns

- The other rural problems are due to the fact that since the rural people do not live in intense commonalities, the availability of specialized service to them is minimum.
- Very less people are employed in the rural areas.
- Lack of physical facilities in rural areas.
- Lack of Social Infrastructure.
- Farmers are not having market area for selling their goods directly to the market.

2.8 Various Infrastructure Guidelines:

- Physical Infrastructure Design:

  Physical Infrastructure facilities describe to the inclusive water demand, drainage facilities, sanitation facilities, transportation network, and availability of electricity for domestic, commercial, agricultural and other, solid waste management. Under physical infrastructure facilities the lacking facility found was community hall.

- Social Infrastructure Design:

  Social infrastructure is a division of infrastructure accommodating services of health and education. The facilities like 'smart sanitation' comes under such design. Benefits of such smart sanitations are likely to remove the spread of diseases, discharge pollution of water, the composted human excreta can be used in fertilizers and this can seal farming soil with nutrients and this will also decrease the need of buying artificial fertilizers.

- Socio-Culture Design:

  This includes development of society, culture and system. The facility develops society by making common hall, public library, public garden, cinema hall, assembly polling birth and death registration office etc.

2.9 Schemes by Gujarat Government

Following are the projects/schemes by Govt. Sector:

1. Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
2. National Rural Livelihood
3. Pradhan Mantri Gram Sadak Yojana
4. Training to Rural Youth for Self-Employment (TRYSEM)
5. Antyodaya Anna Yojana (AAY)
6. Aam Aadmi Bima Yojana

Details of above schemes are –

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

MGNREGA Launched on 2nd February 2006 as an important initiative towards pro-poor development. For the first time, rural societies have been given not just a development programme but also a government of rights. The National Rural Employment Guarantee Act 2005(NREGA) guarantees 100 days of employment in a financial year to any rural household whose adult members are prepared to do unskilled manual work. This work guarantee also serves other objectives: producing fruitful assets and skills thereby improving

the rural economy, protecting the environment, empowering rural women, decreasing rural urban migration and nurturing social equity, among others. The Act offers an opportunity to reinforce our democratic processes by delivering principle role to Panchayats at all levels in its implementation and promises transparency through participation of public at planning and monitoring stages.

2. National Rural Livelihood:

This mission is designed to empower the women's self-help crowd model across the country. Under this scheme govt. provides loan up to 3 lakh rupee at rate of 7% which could be dropped to 4% on timely repayment.

3. Pradhan Mantri Gram Sadak Yojana:

Initially this was fully funded by central government but after some time changes were made and it is now funded in a ratio of 60:40 between central government and state government. The intention is to provide road facility to rural areas. Lunched by Ministry of Rural Development.

Figure 11 Pradhan Mantri Gram Sadak Yojana

4. Training to Rural Youth for Self-Employment (TRYSEM):

The aim is to provide technical and business expertise to rural BPL (Below Poverty Line) people who are in age group of 18-35. Later on this scheme was combined with Swarn Jayanti Swarojgar Yojana. Preparing is seen not just as far as arrangement of actual abilities. Yet in addition change in demeanor, improvement of inspiration and abilities in human relations and so forth, are additionally should be granted.
Independent work is characterized as beneficial work on a full time premise which brings about pay which is adequate for the group of the young cross the destitution line. Circumstance of work in which the methods for creation are possessed, recruited or taken on rent are taken to act naturally business circumstances.

5. Antyodaya Anna Yojana (AAY):

This scheme was to provide food grains to BPL families at a very subsidized rate. Total 35kg of food grains is provided to family at a rate of Rs.3/kg of rice and Rs.2/kg of wheat.

Figure 12 Antyodaya Anna Yojana

6. Aam Aadmi Bima Yojana:

Under this Yojana one member of the family is covered. The first-rate of Rs.200 per person per annum is shared by state and central government. The protected person need not to pay any first-rate if his/her age is between the 18 to 59 years. This scheme provides social security for rural households.

3. SMART VILLAGE

3.1 Introduction: Concepts & Definitions

Concept:

The smart village is the one which has sustainable energy, better-quality healthcare, decent education, clean and drinkable water, hygiene, work that gives good income to villagers, impartiality in gender and dependable security in residential as well as commercial.

Definition:

The village which has all essential and latest facilities for living and villagers don't need to migrate on the way to cities, such village is reflects the image of a smart village.

3.2 Vision-Goals, Standard and Performance Measure Indicators

Transport: The transportation facility should be fast and maximum time travel from village to city needs to 30 minutes. There should be devoted path for differently abled people or footpath on any side of the street. The transportation facility should be available at maximum waiting time of 15 minutes.

Water Supply: There must be 24×7 water supply. The household needs to be 100% with straight water supply connection. The drinkable water needs to be easily accessible at every house and water drinking stands.

Sanitation: All houses should have contact to toilets. All schools should have discrete toilets for girls. All houses need to be linked to waste water network. Higher effectiveness in collection and treatment of waste water management.

Electricity: There must be 24×7 Electricity accessible. All residential and offices should have metering of electricity. There must be precautionary steps from theft of electricity.

3.3 Technological Options

- Smart Infrastructure
- Smart Public Services
- Smart mobility
- Smart Energy Management

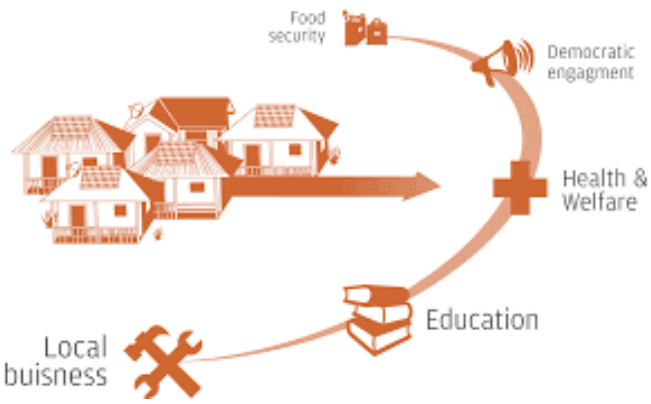


Figure 13 Smart Village

Source: [9]

3.4 Road Map and Safeguards

A smart city roadmap contains of four or three major Modules.

- Study the Community: Before determining to build a smart village, study the Community, know the Residents, the business's needs to be known the peoples and the Community's exceptional qualities, such as the citizens age, their education level, pastimes and city attraction.
- Develop a Smart Village Policy: Recover a policy to effort of the ingenuities
- Engage the Citizens: By fetching the inhabitants through the use of e- Government initiatives, open data, sport events, etc. it can be established.

3.5 Issues & Challenges

Spending Constraints

There is a huge inquiry of spending constraints, which essentially has lacking imaginative reasoning and made troubles for some different creativities. The spending impediments have made numerous hardships for a ton of keen drives that if suitably supported could be more practical and efficacious.

Absence of Knowledge

Different difficulties related to brilliant town drives in Punsari is the insufficiency of information on the general public utilizing current innovation. The residents' comprehension of this keen innovation imagination has generally not been useful for various reasons, one of which is because of the shortage of information on the public individuals regarding how to utilize ongoing advanced advances, Internet and other late innovation, and furthermore the way that there are not very many individuals, explicitly in rustic zones of India, likewise with different pieces of the arising scene, who realize how to expertly utilize and apply late computerized advances, for example, "brilliant meters".

3.6 Smart Infrastructure

Few key workings of Smart City Infrastructure:

- Smart Buildings
- Smart Mobility
- Smart Vitality
- Smart Waste Management
- Smart Health Care
- Smart Education
- Smart Connection
- Smart Transport System

Figure 14 Smart Infrastructure

3.7 Cyber Security

- Objective of Smart Village is improvement of village in such an approach that it offers excellence living to citizens through various applications from latest technologies. This process leads to data exchange at larger scale and more automation in village.

- Due to data exchange at larger scale, the need of Cyber Security increases to protect the data, privacy of people and many others expects. Hence, the government, app developers, policy makers, etc. needs to make Cyber Security at main concern.

3.8 Strategic Options for Fast Development

- Treat Sensors data as a valuable asset.
- Go small before going big.
- Work together and make improvement.
- Take response from citizens.
- Value each and every talent.
- Meetings to be organized for citizens to aware them with modern technologies.

3.9 India Urban Water and Sanitation Challenges and Role of Indigenous Technologies

"Swachh Bharat Abhiyan was launched by Hon'ble Prime Minister of India on 2nd Oct 2015, which held attention of not only Indian citizens but also in the world. Government has organized various seminars to make people alert about cleanliness. Not just this, government has also taken numerous steps for cleaning of rivers which are preserved as goddesses in our country."

To achieve target of cleanliness, it must be done by proper waste management, for such there are many technologies are used. These machineries are generally very costly and multifaceted. But at same time the Original technology are low costly, easy to use, can be used by different size units. Some of these technologies are as:

- Indigenous Water Purification Technology
- Environment Friendly Plasma Technology
- Unique Multi Stage Biological Treatment Solution

3.10 Initiatives in village by local self-government

Nearby government in India alludes to administrative locales underneath the level of the state. India is an administrative republic with three circles of government: focal, state and nearby. The 73rd and 74th established alterations give acknowledgment and insurance to nearby governments and also each state has its own neighborhood government legislation. Since 1992, nearby government in India happens in two exceptionally particular structures. Metropolitan territories, canvassed in the 74th amendment to the Constitution, have Nagar Palika however get their forces from the individual state governments, while the forces of country regions have been formalized under the panchayati raj framework, under the 73rd amendment to the Constitution.

- Maintenance and support to public hospitals of village
- Establishment and maintenance of primary school
- Planting and regular watering of trees
- Construction and maintenance of public library, garden, rest house, community hall, sports center, etc.
- Organizing public exhibition

- Organizing public entertainment
- Removing obstructions and projections in public streets and other places.

3.11 Smart Initiatives by District Municipal Corporation

Figure 15 Smart Initiatives by gandhianagar Municipal Corporation

Gandhinagar got ninth position among 30 new urban areas declared on 23rd June, 2017 by Ministry of Urban Development (MoUD) for advancement as savvy urban areas under the Smart City Mission. The execution of the Mission at the City level is being finished by a Special Purpose Vehicle (SPV) made for the reason. The SPV plans, assesses, supports, discharges reserves, carries out, oversees, works, screens and assesses the Smart City improvement projects. A Special Purpose Vehicle (SPV), Gandhinagar Smart City Development Limited (GSCDL), is framed for Gandhinagar city to consolidate Smart Solutions. Gandhinagar Smart City proposition comprised of two parts – (I) Area Based Development and (ii) Pan City Solution. As a piece of Area based advancement projects, major ABD projects incorporate tempest water waste in areas of Gandhinagar, people group latrine, underpass at G-4 and GH-4, Smart street, Four Laning, patching up of Anganwadi focuses, event congregations, open spaces, expertise improvement focus, and so on The skillet city arrangement incorporates astute traffic coordinated vehicle the executives, brilliant water and waste administration, continuous climate observing, CCTV reconnaissance, Wi-Fi administrations across city and online assistance conveyance to further develop public help conveyance and advanced consideration.

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

The initiative comprises of several projects which will focus on better governance, knowledge and universal phone connectivity across the country.

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

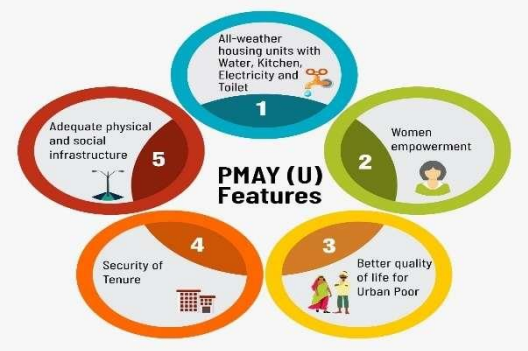


Figure 16 Pradhan Mantri Awas Yojana Features

3.13 How to implement other country smart villages projects in Indian village context

- The majority people in Germany live in rural areas (63.3%), therefore applying smart strategy for rural development is in line with country's general development goals. The concept is about Digital Village. The main objective of project is to encourage innovation, collaboration of local industries, sustainable and affordable solutions. The village is also connected with high speed broadband network.

- We can implement this in India in such ways like we can organize various programs for awareness of people with latest technologies that can gives fast and affordable solutions to their problems regarding agriculture or dairy, etc. We can also give them broadband network connection so that their data can be saved in cloud and even digitalization is implemented in village.
- Likewise, one ought to be make about the way forward in making Smart Villages. For instance, given the sheer size of a city, a green-field or brown-field Smart City is consistently practical. Then again, towns will in general be more modest. Consequently, changing each town in turn into a Smart Village would disintegrate economies of scale.

3.14 Civil Concept:

The ideal village from civil point of view is as follows:

- Smart Infrastructure
- Smart Agriculture
- Smart Connectivity
- Smart Security
- Smart Education
- Social Infrastructure

3.15 Electrical Concept

The ideal village from electrical point of view is as follows:

- Free from blackout.
- Secondary or Backup source of electricity for important buildings.
- The conductors on the electric poles should be properly isolated and connected.
- Every house or building in village should have proper electrical connectivity with metering to prevent electrical theft.
- The electric poles should be kept at some distance from nearby objects like trees.
- Electric poles should be placed strong enough to survive thunder like situations.
- The step-down transformers placed in village should be properly covered to prevent from atmospherically as well as human accidents and happening of short-circuits.

4. ABOUT BALVA VILLAGE

4.1 Introduction

4.1.1 Introduction about village details

- "Balva village is located in Kalol Taluka of Gandhinagar district in Gujarat, India. It is located 25 kms away from district headquarter Gandhinagar."
- "As per 2009 stats, Balva village is also a Gram Panchayat. Latitude and Longitude of the Balva village is 23.3525° N, 72.6596° E."

4.1.2 Need of study

- Rural development is apprehensive along with economic growth, improved standards of living of rural people by given that excellence services in such a way their culture doesn't get spoiled.
- In Vishwakarma Yojana students and faculty members meet different stakeholders of village, survey existing facilities.
- To deliver basic physical infrastructure Water Supply, Transport, Sewerage and Solid Waste Management should be the important focus and be provided.
- To provide inadequate Social infrastructure like health and education facilities and to ensure proper delivery of facilities to villagers.
- To encourage integrated development of rural areas by providing of quality housing, better connectivity, employment opportunities and supporting physical and social infrastructure.

Figure 17 Need for development

Source: Images taken by students

4.1.3 Study Area

- Our main study area is Social Infrastructure, it can be distinct as the construction and maintenance of facilities that support social services which include community hall, public toilet, heath care and other facilities.
- Social infrastructure plays a vibrant part in both the economic development of a village and the development of public's quality of life. Social infrastructure progresses social welfare and promotes economic development by providing basic services and facilities which allow various businesses to progress and flourish.

4.1.4 Objectives of study

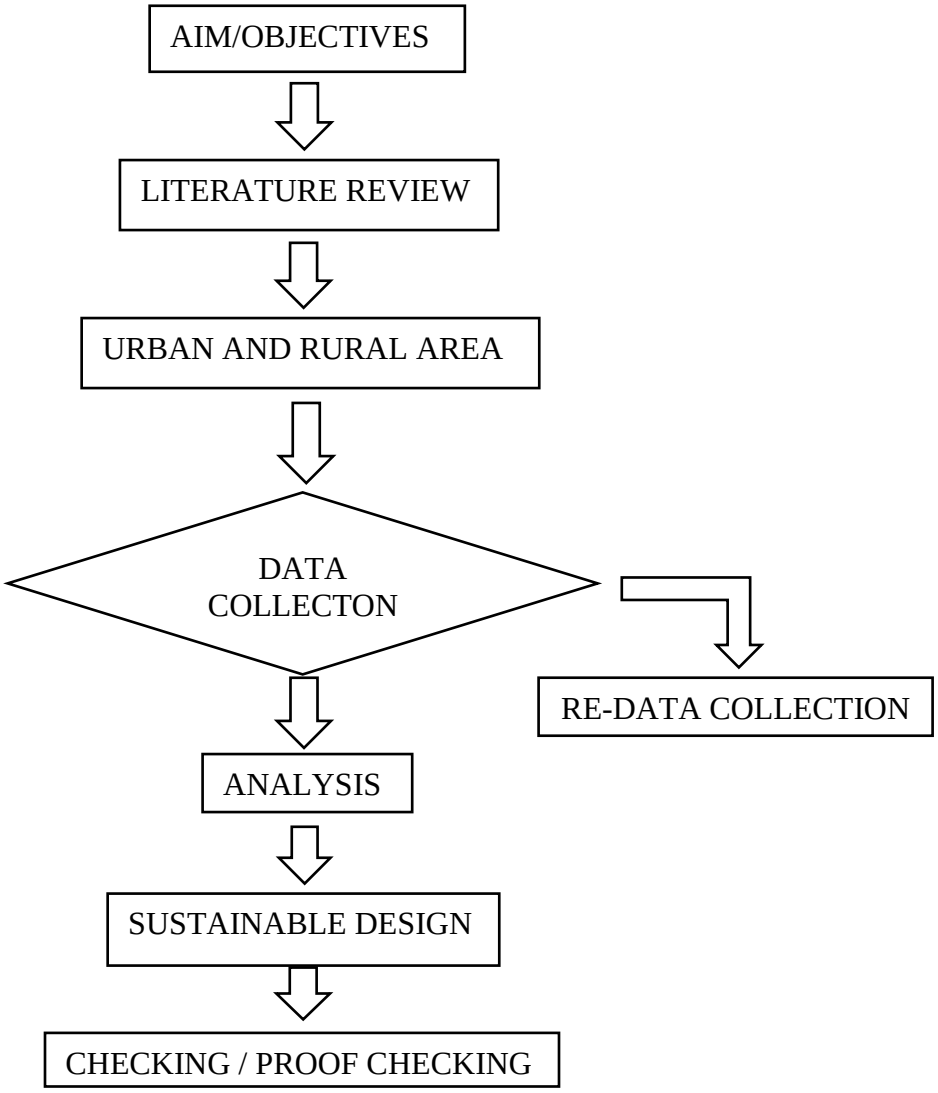
- To provide basic facilities in village like: Transportation, Education, Health Care, etc.
- To reduce migration from rural to urban
- Sustainable development
- To propose the comprehensive planning for ideal villages

4.1.5 Scope of the Study

Lessen relocation and decline neediness in to town because of progress given beneath content by utilizing and following town advancement plan:

- To guarantee coordinated improvement of town, individuals and climate by making economical plans for all to ideal degree as could really be expected
- The examination will center the improvement pattern, power of development of the town, and discover the issues identified with the Socio-Cultural or actual advancement of the space, social foundation administrations, and the authoritative frameworks of the town.

4.1.6 Methodology framework for development of BALVA village



4.1.7 Available Methodology for development of related to Civil/Electrical

We can do some extraordinary endeavors to expand creation of heartbeats and root vegetable.

- Also by Increase water system improvement, likely hardware and commitments for dry land development.
- By fortifying and growing the treatment of country improvement and public rustic business programs.
- Allot house areas to provincial families who are famished of them and foster bundles for building support moreover.
- Basic Necessities in Life – food, cover, garments, fundamental education, essential medical care and security of life and property.
- Also by seeking after excitedly projects of social, afforestation, to carry out of bio-gas plant, ranch ranger service and other substitute energy sources.

4.2 Balva Village Study Area Profile

4.2.1 Study Area location

- "According to Census 2011 information the location code or village code of Balva village is 511129."
- "Balva village is located in Kalol Taluka of Gandhinagar district in Gujarat, India."
- "It is situated 25 km away from sub-district headquarter Kalol and 14 km away from district headquarter Gandhinagar."
- "It is located 16 KM towards North from District headquarters Gandhinagar. 24 KM from. 16 KM from State capital Gandhinagar."
- "Balva Pin code is 382735 and postal head office is Nardipur."
- "Mansa, Gandhinagar, Kalol, Prantij are the nearby Cities to Balva."
- "This Place is in the border of the Gandhinagar District and Mahesana District. Mahesana District Kadi is west towards this place."

Figure 18 Balva Visit

Source: Images taken by students

4.2.2 Base Location Map/ Gram Tal Map

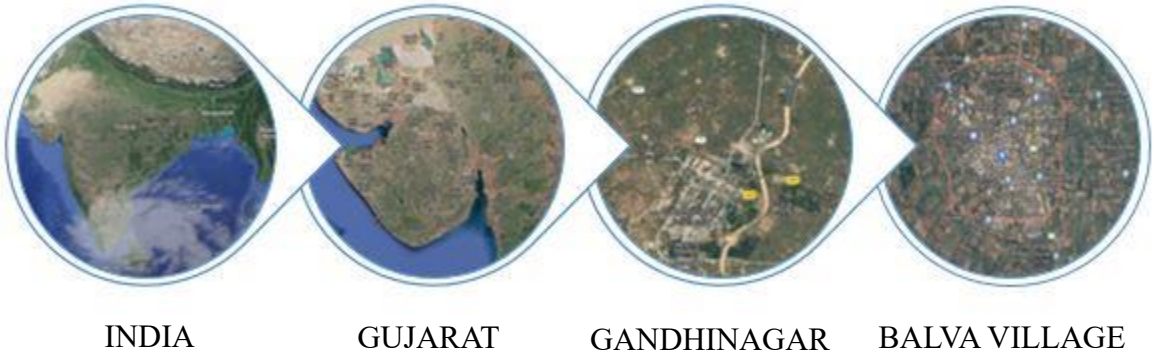
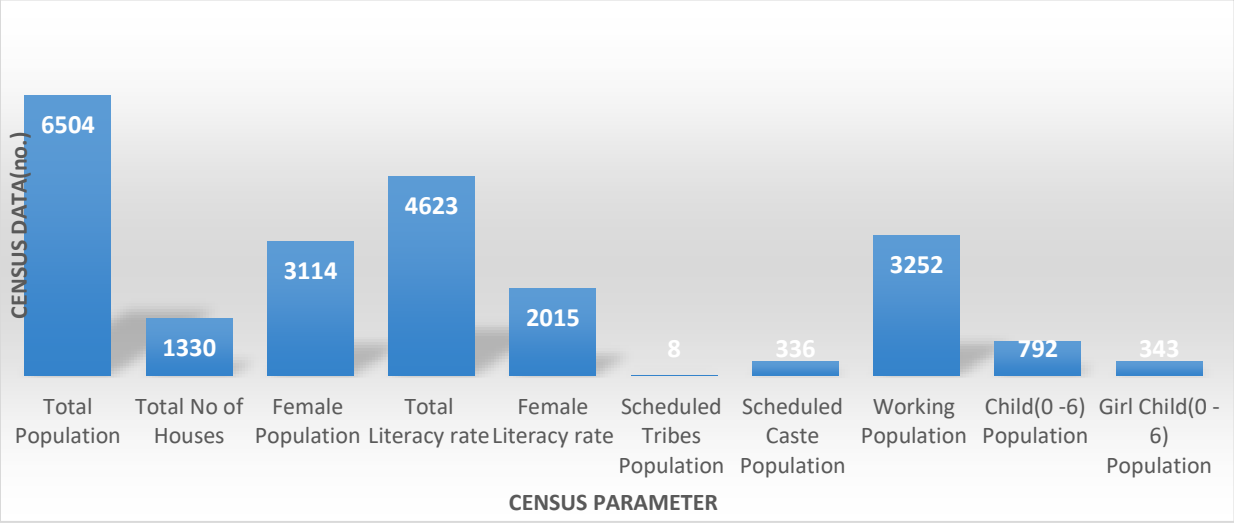


Figure 19 Location of Balva Village

Figure 20 Gram Tal Map

4.2.3 Physical & Demographical Growth



Source: [11]

Table 6 Total workers in the Balva village

	TOTAL	MALE	FEMALE
Total Workers:	3251	1977	1274
Main Workers:	2614	1809	805
Main Workers Cultivators:	843	785	58
Agriculture Labourer:	1026	631	395
Household Industries:	31	8	23
Other Workers:	714	385	329
Marginal Workers:	637	168	469
Non-Working Persons:	3253	1413	1840

4.2.4 Economic Generation Profile

- The economic growth of the Balva village is mostly depending on the two industries that is Agricultural and dairy industry.
- Mostly villagers are involved in the farming business and the main crops that are grown in the village are Cotton and mustard. They also produce tobacco and the potatoes.
- While female workers are more into the dairy industry as they distribute the milk to the dairy farm located in the village.

Figure 21 Agriculture

Source: Images taken by students

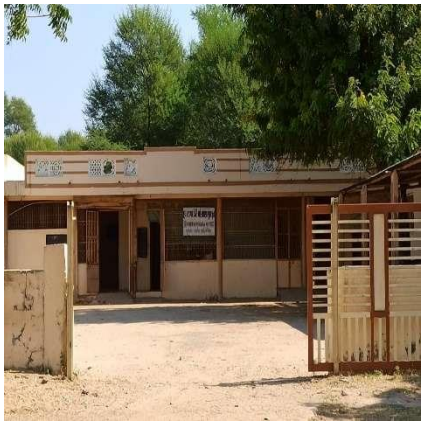


Figure 22 Dairy

Source: Images taken by students

4.2.5 Actual problem faced by Villagers

- During the village visit we came across many problems which were suggested by the Talati, Sarpanch and the villagers of Balva village.
- According to Sarpanch, in the village they don't have proper playground or sport center for the students.
- And villagers mainly faced problem because of the lack of social infrastructure like community hall and lack of public toilets in the village.
- Also there are no recreational facilities such as parks or garden in the village.
- As well as, there is an approach road which connects two villages and this is near to the school gate so during recess and leaving time there were number of accidents occurred in the past due to lack of markings and heavy traffic.
- They also faced problem of the blackout during the rainy season or windy weather which sometimes create great discomfort.

4.2.6 Social scenario -Preservation of traditions, Festivals, Cuisine

Gujarat Social Scenario

CULTURE : The Gujarati's are known for their different social legacy and rich customs. It is a lively blend of Hinduism, Islam, Jainism and Buddhism and furthermore a mix of various societies of the Gujarat resembles expressions, convictions, customs, customs, establishments, innovations, language, innovation and qualities. The way of life of individuals doesn't stop with one specific age yet rather the older folks of the local area see to that the people in the future likewise practice it which consequently prompts the astuteness and enthusiasm for social customs and ways of life. They likewise as a piece of their way of life hold hands to welcome the visitors and the older folks. The way of life of individuals of Gujarat is exceptionally adjusted in light of the way that they have an ideal arrangement of learning, strict practices and fantastic types of imaginative articulations. The way of life of the Gujarati's doesn't just wins in Gujarat yet it has been boundless to various pieces of the world and presently perceived as a worldwide culture. There isn't a lot of culture shock found in individuals of Gujarat thus it makes individuals intense and bold with part of energy to confront various difficulties raised by the worldwide situation.

CUSTOMS AND TRADITIONS : Though current and modern houses have come in Gujarat, still there are places which have their conventional homes and wooden houses. The vast majority of these

customarily constructed houses have delightful and complicatedly planned insides yet as a standard practice each house has an uncommon "Chabutara" worked for bird taking care of. Pachchikam adornments is one of the customary gems of individuals of Gujarat where rather than gold, the metal utilized in making of this trimming is silver. The Gujarati ladies as a piece of their practice convey a lot of keys on their midriff and the ring holder is typically made of silver. Some other adornments which is worn by the women as a component of their traditions incorporates mangalsutra, studs, jewelry, rings and bangles. The Gujarati have parcel of confidence in different divine beings and goddesses. Cow is considered as mother God or "Gau-Mata" and the Gujarati's have parcel of confidence in them. A portion of the services which are must to be commended by individuals of Gujarat are birth, string function, marriage and demise. In this load of functions the ceremonies and poojas are performed by the Brahmans. As a piece of the Gujarati's custom and custom they commend celebrations like Navratri and Diwali.

COOKING : Mostly Gujarati food is vegan in light of the fact that the state is overwhelmed by Jains and the Vaishnavas. A large portion of their staple food incorporates wheat and millet assortments like jowar and bajri. No supper of Gujarati will miss roti alongside an assortment of vegetable curries and dishes. The food is for the most part served on a metal plate which is called as thali and 4-5 little dishes put on it These thali predominantly comprises of roti, dal or kadhi, sabzi otherwise called shaak and rice. The Gujarati's are noted for their sweet tongue and each feast will be joined by a sweet dish. Sugar is likewise here and there exchanged by jaggery. A portion of the other normal food which is an unquestionable requirement for the Gujarati's in their thali are dal, steamed vegetables, natively constructed pickles, buttermilk and salad. Vaghaar is Gujarat food a mix of flavors, which is cleansed in hot oil and afterward added to the dal. Gujaratis by and large use parcel of salt, sugar, tomato and lemon in their food. Pastries, which were in the old occasions offered uniquely on party or then again some uncommon events, have now discovered their direction in the every day suppers. Ghee is an absolute necessity in the food of Gujarati's. Srikhand is a rich sweet made with curds and spiced with saffron, cardamom, nuts, and natural product. The Gujaratis evening nibble incorporate bhakri-shak or khichdi kadhi.

OCCUPATION : The significant control of individuals of Gujarat is horticulture for somewhere around one-half of the all out land region is cultivable. Other space of economy and occupation area incorporates dairy cultivating, essentially worried about milk creation. There are part of businesses which are engaged with the creation of manures and petrochemicals.

4.2.7 Migration Reasons / Trends

Movement of work occurs for different reasons, for different ranges and with different terms of business.

- Social movement - moving some place for a superior personal satisfaction or to be nearer to family or companions.
- Political movement - moving to get away from political oppression or war.
- Environmental reasons for relocation incorporate cataclysmic events like flooding. The climate has consistently been a driver of relocation, as individuals escape cataclysmic events, like floods, tropical storms and quakes. In any case, environmental change is relied upon to fuel outrageous climate occasions, which means more individuals could be moving.

4.3 Data Collection

4.3.1 Methods of data collection

There are various ways through which data was collected about the village

- Telephonic conversation with Talati.

Due to Covid 19 and initial lockdown it was difficult to visit the village hence limited data was collected by the telephonic conversation with the Talati.

- Questionnaires with the villagers and the Sarpanch of the village

During the village visit we get the opportunity to visit the village and ask the problems faced by the villagers.

Figure 23 Data Collection (Questionnaire)

- Documents and records

With the help of the documents and the records we get the necessary technical details of the Balva village. Also some of the data was collected form the online source. [2][3][4][5][7].

- Observations

During the village visit many data was collected in the form of images with the help of simple observation.

Figure 24 Data Collection (Observation)

Source: Images taken by students

4.3.2 Primary details of the survey

- During the first visit of the village, because of the pandemic situation we simply collected the data by the observation survey.
- We collected the images about the current situation of the village infrastructure, sanitation and various other facilities.

4.3.3 Average size of the House

- The total area of village is 1305 hectares (Census 2011). Balva has a total population of 6,504 peoples. There are about 1,330 houses in Balva village. The average size of the house in the Balva village is of 3 bhk tenement with terrace and separate or inbuilt toilets.

Figure 25 Average Size of House

4.3.4 No. of Human being in one house

- "The village is home to 1717 people, among them 874 (51%) are male and 843 (49%) are female. There are 353 households in the village and an average 5 persons live in every family. (Census 2011)"

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

- Mainly agriculture materials like vegetables, fertilizer for framing, raw cotton etc. are available locally.
- While all the necessary items for living like groceries, clothing, vehicles, materials for construction and many other are imported from the nearby cities or villages.

4.3.6 Geographical Detail

Figure 26 Geographical data

Source: [12]

4.3.7 Demographical detail

- "The Balva village has population of 6504 of which 3390 are males whereas 3114 are females as per Population Census 2011."
- "In Balva village population of children with age 0-6 is 792 which makes up 12.18 % of total population of village. Average Gender Ratio of Balva village is 919 which is equal than Gujarat state average of 919. Child Sex Ratio for the Balva as per census is 764, lesser than Gujarat average of 890."
- "Balva village has greater literacy rate compared to Gujarat. In 2011, literacy rate of Balva village was 80.93 % compared to 78.03 % of Gujarat. In Balva Male literacy stands at 88.68 % whereas female literacy rate was 72.72 %."
- In Balva village, villagers mostly use their Aadhaar Card, Election Card and Ration Card as the proof of identity.

Table 7 Demographical detail

Population	6504
Population density	498 per km^2
Growth of Population	19.2%
Gender Ratio	919
Sex Ratio Child	764
Literacy Rate	81%

4.3.8 Occupational Detail

- "Balva has 50% (3251) population involved in either main or marginal works. 58% male and 41% female population are working population. 53% of total male population are main (full time) workers and 5% are marginal (part time) workers. For women 26% of total female population are main and 15% are marginal staffs."

Table 8 Occupation Detail

	TOTAL	**MALE**	**FEMALE**
Total Workers:	3251	1977	1274
Main Workers:	2614	1809	805
Main Workers Cultivators:	843	785	58
Agriculture Labourer:	1026	631	395
Household Industries:	31	8	23
Other Workers:	714	385	329

Marginal Workers:	637	168	469
Non-Working Persons:	3253	1413	1840

4.3.9 Agricultural Details

- "The main crops grown in ***Kharif*** period are Great Millet, Bajra, Maize, Paddy, and Groundnut and in ***Rabi*** season these are Cotton, Wheat, Mustard, Cumin and Vegetables."
- "While the performance of rice, wheat, pulses and cotton in Gujarat is under the national average, the performance is above the national average for coarse cereals, oils seeds and onion."
- "Although potato is not a major crop, its yields in Gujarat are high."
- "The State finds a place between the top 3 in terms of productivity of bajra, groundnut, sesame, rapeseed and mustard, castor, onion, banana, chikoo, guava, cauliflower and tobacco."


Figure 27 Tobacco and Cotton

4.3.10 Physical Infrastructure Facilities - Manufacturing HUB / Ware Houses

Transportation offices are Government transport administration is accessible from fundamental thruway street. Nearby transportations are autorickshaw, chagdaa, private vehicles are accessible in Balva town. The town approach streets are made of WBM and interior streets are of RCC and furthermore paver squares and it is accessible in all roads in town. One overhead tank is accessible. Aside from this grade school, anganwadi, dairy, RO water plant, U/G sump, and so forth are additionally present in the Balva town. There are no any product houses or assembling center exercises dynamic in the Balva village.

4.3.11 Tourism development available in village

- "The area around Bavla has a number of sites of tourist interest, including the Jain temple of Savstirth Nagar, and a number of Swaminarayan temples. Ancient village of Harappan civilization, named as 'Lothal' is also close and temple of lord Ganesha, named as 'Ganpatipura'."


Figure 28 Tourist Place

4.4 Infrastructure Details

4.4.1 Drinking Water

- "Safe and readily available water is vital for public health, whether it is used for drinking, domestic use, food production or recreational purposes. Improved water supply and sanitation, and better management of water resources, can lift countries' economic growth and can contribute greatly to poverty reduction."


Figure 29 Drinking Facilities

4.4.2 Sanitation Facilities

- "The overall purposes of sanitation are to provide a healthy living environment for everyone, to protect the natural possessions (such as surface water, groundwater, soil), and to provide safety, security and dignity for people when they defecate or urinate."
- "Effective sanitation systems deliver barriers between excreta and humans in such a way as to break the disease transmission cycle (for example in the case of fecal-borne diseases)."
- "Providing sanitation to people requires attention to the entire system, not just focusing on practical aspects such as the toilet, or the wastewater treatment plant."

Figure 30 Sanitation Facilities

Source: Images taken by students

4.4.3 Transportation & Road Network

- "These roads serve as the feeder roads of the other Highways as well as the roads for inter-village movements. They pass through rural area linking the villages to one another and to the nearest District Roads, State Highways, National Highways, Railways, etc."

Figure 31 Road Network

Source: Images taken by students

4.4.4 Housing Condition

- The total geographical area of village is 1305 hectares.
- Balva has a total population of 6,504 peoples.
- There are around 1,330 houses in Balva village.

Figure 32 Housing Conditions

Source: Images taken by students

4.4.5 Social Infrastructure Facilities

Figure 33 Petrol pump and Hospital

Source: Images taken by students

Figure 34 Banks and School

4.4.6 Existing Condition of Public Buildings

Figure 35 Panchayat Office and Dairy

Source: Images taken by students

4.4.7 Technology Mobile/ WIFI / Internet Usage Details

Almost in all of the families, the villagers are the use of smartphone and they're additionally the use of the net facility for private usage. There aren't any non-public WIFI customers withinside the village as in keeping with the records collected. But withinside the panchayat constructing there may be a WIFI connection available.

4.4.8 Sports Activity as Gram Panchayat

Local Grampanchayat never organized sports activities in the Balva village but Khel Mohtsav is celebrated every year in the primary and secondary schools located within the village as a part of Khel Mahakumbh.

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

Public garden is not available in the village as per the lack of land problem

Table 9 Socio-Cultural Facilities

Description	Detail
Park	Yes
Pond	Yes
Public Garden	No

4.4.10 Other Facilities

There are no any kind of facilities like smart toilet, footpath development, self-cleansing, waterless public building etc. in the Balva village. There are some houses in which solar system is there like solar water heater and solar cooker. And according to current population the village has a smart thing which is RO water plant.

4.4.11 Any other details

- Balva village has various workplaces like General Market, Shops (Public Circulation Framework), Panchayat Building, Clinical Shop, Bank and ATM Post Office, etc in adequate condition.
- In inverse side Telecom Organization, Farming Co-employable Society, Milk Co-usable Society, Limited degree Businesses, Web Bistros/Normal Assistance Community/Wi Fi, Youth Club, Mahila Mandal, etc kind of workplaces are not there in the town.

4.5 Electrical Concept

4.5.1 Renewable Energy Source Particularly for villages

The renewable source of energy planned to be put to use for improving the overall energy scenario contain biomass, biogas and solar energy.

Biomass:

It can be produced from agro waste and can be applied to generate electricity in biomass plant. This plant discussed is noted to have advantages like:

- Provision of job opportunities to native people even if they are educated/uneducated, skilled/unskilled.
- Environmental friendly and sustainable result as it reduced the use of fossil fuels.
- Surplus power can be sold, provided to grid.
- By consuming strong waste, the measure of trash unloaded in landfills is decreased by 60 to 90 percent, and diminishes the expense of landfill removal and measure of land needed for landfill.
- Made available during demand and additional storage isn't required.

Solar Cooker:

It is an ideal device for domestic cooking during most of the year, but for monsoon season. In village most houses have foods like khichdi, rice, etc. which can be easily prepared in such solar cooker. This device needs an alternate option for cooking. The advantages of this are as follows:

- Expenses on fuels are totally removed as it uses solar energy.
- Saves time as cook need not to be present during cooking.
- Durable and simple to operate.
- Environmental Friendly

4.5.2 Irrigation Facilities

- Irrigation facilities in village play an important part in economy and development of village. The allocated village is having good ability for irrigation but we can improve it to next level. The idea is transformer is connected to solar plant ranging from 25KWp to 500KWp in community, public or private ownership. The PV plant will feed power to pumps used for irrigation. In case surplus power is available that power can be sold to grid and landlords/farmers can get income.

4.5.3 Electricity Facilities with Area

- The allocated 'Balva' village has total 7 step down transformers through which load is supplied in all over the village.

Figure 36 Transformer

Source: Images taken by students

4.6 Existing Institutions

4.6.1 Bachat Mandali

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

4.6.2 Dudh Mandali

There is one Dudh Mandali existing in the Balva village in Dairy.

4.6.3 Mahila forum

There is no any mahila mandal existing in the Balva village. According to the communication with townspeople there is an arrangement of asking before any sort of choice execution in the town and that is something to be thankful for in Balva village so that mahilas have the dynamic power.

4.6.4 Plantation for the Air Pollution

There is no such activity done of tree plantation for the air pollution in the Balva village. But that kind of activities are done in the primary school by the students of the Balva village.

4.6.5 Rain Water Harvesting - Waste Water Recycling

In the Balva village no one is using the system of rain water harvesting and there is no any kind of waste water recycling process done.

4.6.6 Agricultural Development

There is no agricultural co-operative office building in the Balva village. The village farmers have agricultural tools and equipment. All the agri-materials are available from Mansa Town which is 8 km away from the Balva village.

4.6.7 Any Other

There are no any other kind of institutions existing in the Balva village apart from panchayat building, dairy, primary school, government grocery shop, temples, anganwadi, etc.

5. TECHNICAL OPTIONS

5.1 Concept (Civil)

5.1.1 Advance Sustainable Construction Techniques and Quantity Surveying

- The development in development practices and materials procurement that can diminish waste energy and different failures at building locales are the fundamental piece of supportability.
- A procedure for saving time and materials for project workers can prompt higher accomplishment and superfluous waste.

Pre-assembling Materials in Controlled Environments

- Constructing however much of design in a deliberate climate as could be expected has built up the nature of structures and brought, about less waste.
- Being ready to cut materials decisively diminishes waste and makes structures that are sufficiently able to permit workers for hire to utilize steel outlining as tall as five stories.
- Mechanical providers use Building Information Management (BIM) frameworks to cut sheet metal for ventilation work in a desirable climate rather than outside to evade the shape changing issues brought about cold or blistering climate.
- The subsequent structures are then passed on where cement is filled them and the places are created in an Erector set-style design. It's a typical practice that saves time and improves include on the grounds that the arranging and gathering of framework were done in stockroom with admittance to gear not prompt accessible on close places of work.

Construction Waste Management

- Presently workers for hire are decreasing waste by utilizing single canisters as opposed to utilizing various containers for squander materials. Thus reducing waste is getting more feasible.
- We don't have to unmistakable materials since we can accomplish 75% landfill evasion through haulers.
- Having haulers can deal with assets in a solitary compartment for downtown ventures with little impressions have a significant effect. A few materials are recyclable on location specifically solid that can be squashed and utilized for establishment.

Managing the Site for Improved Environment

- To urban areas and the state and national government, storm water contamination avoidance has become an absolute necessity take care of issue.
- Various best practice approaches can be utilized to amuse water nearby and try not to have it stream into the neighborhood sewer framework. Residue fencing in close by a region can contained Runoff.
- Restrictions and foundations of basic strategies to lessen contamination as a result of worker security. There's no smoking on the site, for instance they travel over stroll off mats that eliminate earth, lead and other possibly risky substance from shoes while entering a structure. Workers for hire additionally convey reusing holders for food to diminish natural waste.

Lean Manufacturing to Reduce Energy

- Most of the snow takes off by the brush-mounted cycle. At that point snow trapped in the depressions of metal decks is eliminated by representatives utilizing brushes mounted on brush.
- To abstain from having rebar and different materials sitting external well, materials are shipped in the nick of time before establishment. The without a moment to spare framework welcomes materials close by the day they are required.
- It saves time, eliminates robbery on the place of work, kills harm, avoids sat around moving things, and numerous different things.

Material Selection

- Now Architects and customers for the most part select materials produced from reused products and from the nearby sources. The materials can be anything.
- Off-site development, enhanced site support, lean practices, landfill shrinking and green materials acquiring have change the manner in which structures are built today. Subsequently now buildings are greener.

Figure 37 Advance Sustainable Construction

Source : Google Images

5.1.2 Soil Liquefaction

Liquefaction is the phenomena when there is damage of strength in flooded and cohesion-less soil because of increased pore water pressure and hence effective stress is decrease due to dynamic loading.

Effects of Liquefaction: There can be many methods result in the soil and the structural buildings which can cause soil liquefaction.

- Sand Boiling:

  When the surface that is fully compacted, the water pressure below the surface makes the water to break out like a bubble and Liquefaction happens below.

- Surface landslides:

  Surface landslides happen due to failure of water carrying forms.

- Failures of structures under earthquake:

  Earthquake forces create the structures to lose its stability. It brings whole structure down when it either spilt or lean. It results in a huge loss of life and property because this doesn't offer enough time for evacuation that it.

Importance of Soil Liquefaction

After Liquefaction the soil no longer performs as an inactive grid of particles. It often result in a variety of structural failures because strength and stiffness of the liquefied soil is rapidly decreased. Hence a liquefied ground is no longer considered constant and fit for construction of structures. It loses the ability to take neither its self-weight nor the weight of buildings.

Figure 38 Soil Liquefaction

Source: Google images

Various methods of reducing Soil Liquefaction

1. By keeping away from liquefaction susceptible soils.
2. Fabricate liquefaction safe construction.
3. Improve the dirt qualities.

5.1.3 Sustainable Sanitation

To work well over the long-term some sanitation methods are developed which can achieve certain criteria. The experience of the user, excreta and wastewater collection methods, transportation or conveyance of waste, treatment, and reuse or disposal from Sustainable sanitation systems considering it as the full "sanitation value chain".

Most disinfection frameworks have been planned in light of the five angles, yet practically speaking they are flopping extremely frequently on the grounds that a portion of the measures are not met. Since there is nobody for-all sterilization arrangement which satisfies the manageability standards, assessment will rely upon the neighborhood system and should think about the current ecological, specialized, socio-social and financial conditions. Reasonable disinfection that takes into account asset recuperation can possibly add to roundabout economies and green urban communities, economical evolved ways of life, environmentally friendly power, and new plans of action for private area association.
A few models for improving present santitation temporarily, simply from an innovation point of view, are recorded beneath:

- Straightforward urinals with discrete gatherer frameworks could be introduced as opposed to utilizing latrines and pit toilets for peeing.
- Flush latrines could be altered to utilize less water or reuse greywater.
- Greywater could be source-isolated from the blackwater from latrines in this manner working on its treatment and giving freedoms to reuse.
- Blackwater from latrines could be held in conservancy tanks rather than open septic tanks and cess pits and afterward exhausted and moved to biogas reactors; on the other hand the latrines could be associated with biogas reactors.

The Sustainable Sanitation Alliance contains five features in its definition of “sustainable sanitation”:
Containment, Emplying, Transport, Treatment, Reuse or Disposal.

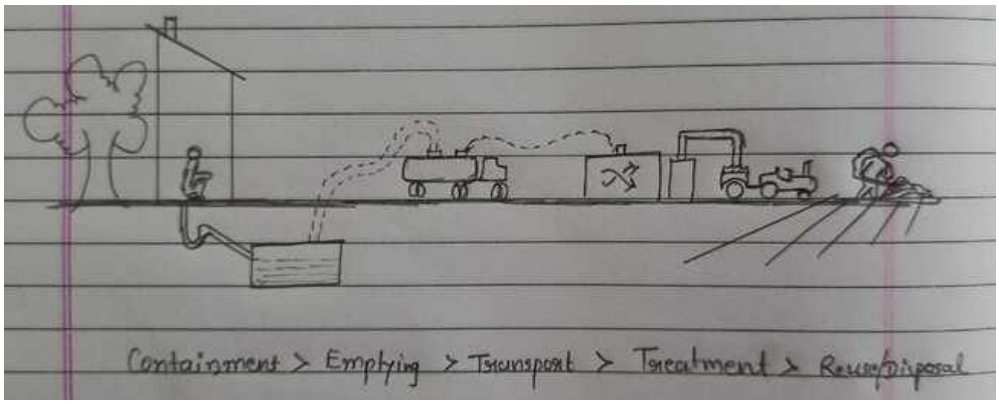


Figure 39 Process of Sustainable Sanitation

To protect human health is the main purpose of sustainable sanitation which is same as sanitation in universal. [21]

5.1.4 Transport Infrastructure/ System

The arrangement of contacts between hubs, organization and the interest can be called as a vehicle framework. These connections include puts spatially closing this interest streams among them and frameworks wanted to handle and connect these streams.
To encourage the development of passengers, cargo and data, cither as scheduled or joint segments, all the components of vehicle frame work are planned.

- **Request**: The versatility of individuals, cargo and data for variety of financial exercises.

- **Organizations**: The ability to deal with suburbanite or freight volumes and set of linkage communicating the availability between places.
- **Locations:** Demand is communicated as establishment, objective or point of travel to specified point of travel to a specified point. Creation and utilization together depicts request and where this request is occurring.
- **Flows:** This is joint capacity of the interest and the main part of linkages to help them. An organization made out of hubs and linkages in which the measure of traffic is estimated.
- **Infrastructures**: To handle demand with specific volume as well as frequency characteristics, the conveyances such as roads and terminals stating the physical reality of a network and designed.

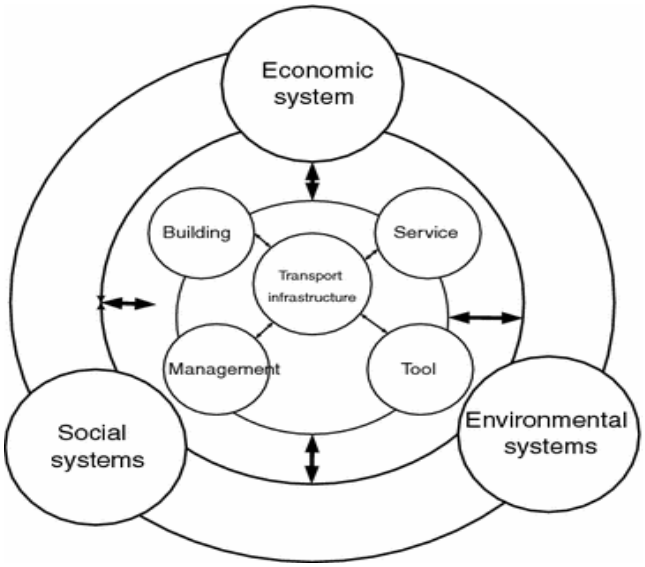


Figure 40 Transport Infrastructure

Transport in India comprises of transport via land, water and air. Public vehicle is the essential method of street transport for the greater part of the Indian residents, and India's public vehicle frameworks are among the most intensely utilized on the planet. India's road network is the second-biggest and one of the busiest on the planet, moving 8.225 billion travelers and more than 980 million tons of payload yearly, starting at 2015.

India's rail network is the fourth biggest and second busiest on the planet, shipping 8.44 billion travelers and 1.23 billion tons of cargo yearly, starting at 2019. Flight in India is comprehensively isolated into military and common flying which is the quickest developing flying business sector on the planet (IATA information) and Bangalore with 65% public offer is the biggest aeronautics producing center of India. India's waterways organization, as streams, trenches, backwaters and springs, is the 10th biggest stream network on the planet. Cargo transport by streams is profoundly under-used in India with the absolute load moved (in ton kilometers) by inland streams being 0.1 percent of the complete inland traffic in India.

Altogether, around 21% of families have bikes while 4.7 percent of families in India have vehicles or vans according to the 2011 Census. The car business in India is presently quickly developing

with a yearly creation of over 4.6 million vehicles, with a yearly development pace of 10.5% and vehicle volume is required to rise significantly later on.

5.1.5 Corrosion Mechanism, Prevention & Repair Measures of RCC Structure

CORROSION MECHANISM: Corrosion of concrete involves an electrochemical process in which both flow of electrical currents and chemical reactions occur. The steel in reinforced concrete structures is in passive conditions and are protected by a thin layer of oxide which is due to the alkalinity of concrete (pH between 12 to 13)

PREVENTION : Corrosion of metal in strengthened concrete systems may be divided into 4 exclusive categories, primarily based totally on how they offer safety:

- Alternative reinforcement and slab layout approach consists of substances that electrically isolate the metal from the concrete and create a barrier for chloride ions, substances that defend metal galvanic-ally, and substances which have considerably better corrosion thresholds than traditional reinforcing metal. Concrete slabs had been designed with none inner reinforcement.
- Barrier strategies defend strengthened concrete from corrosion harm through stopping water, oxygen, and chloride ions from achieving the reinforcement and starting up corrosion.
- Electrochemical strategies use modern and an outside anode to defend the reinforcement, even if the chloride ion awareness is above the corrosion threshold.
- Corrosion inhibitors provide safety through elevating the brink chloride awareness level, through decreasing the permeability of the concrete, or through doing both.

5.1.6 Vertical Farming

The act of making food on vertically slanted surfaces is known as vertical cultivating. It produces nourishments in vertical way stacked into layers usually incorporated into different developments like a high rise, steel trailers or repurposed stockroom instead of farming vegetables and different food sources on a solitary level, for example, in a field or nursery there are mainly four unstable spaces in seeing how vertical cultivating works:

- Physical design
- Lighting
- Growing medium
- Sustainability feature

Vertical farming utilizes a ton of power. As indicated by the report, this makes vertical farming costly, yet in addition gives issues manageability, with the energy utilized in the process far exceeding the advantages of decreased vehicle through nearby creation.

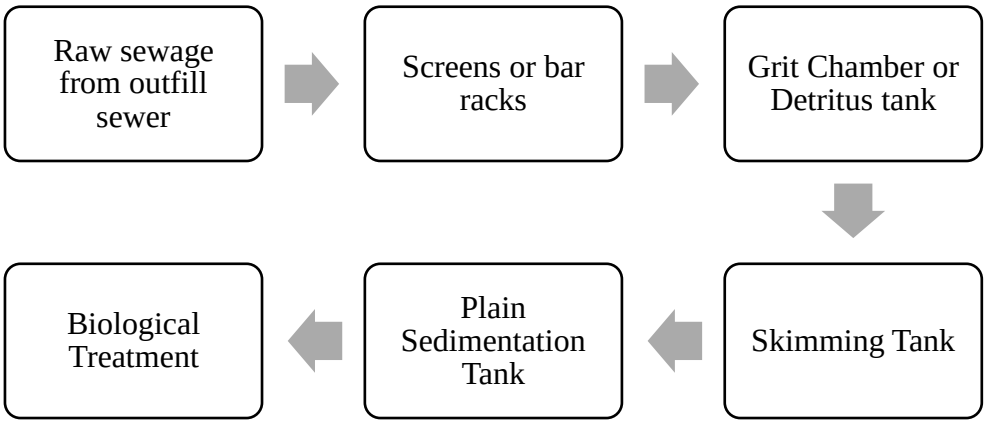
Figure 41 Vertical Farming

Source: Google images

Obviously there are likewise benefits. For example, vertical farming can develop more harvests with less land and less water than ordinary agribusiness, without any pesticides, all year. By fitting

developing conditions to the specific necessities of the plant, vertical cultivating could give a lot greater yields.

5.1.7 Sewage Treatment Plant



Cost estimation for scheduling and designing of sewage treatment plant:

Various instruments are arranged and planned by the treatment prerequisite of the wastewater created like the framework pilgrim, anaerobic puzzled reactor, planted channel and cleaning lake. DWWT can be associated with treat and reuse the wastewater at on location wastewater treatment plant to close the circle. 1 KLD to 100 KLD is the varying limit of the treatment plant.

The all out cost essentially includes arranging and planning, application and activity and support exercises of 25%, 60% and 15% individually. Land perquisite, establishment and activity and upkeep are the boundaries which are to be estimated while arranging and planning DWWT framework.

Land prerequisite:

All out region of the land needed to introduce various components of DWWT can be determined by the absolute volume. It for the most part relies regularly upon the idea of wastewater and profundity of the unit tanks.

Pilgrim: 0.5 m2/m3 daily flow

Anaerobic confused reactor: 1 m^2/m^3 daily flow

Built wetland: 30 m^2/m^3 daily flow

Anaerobic lakes: 4 m^2/m^3 daily flow

Establishment

Exercises like exhuming, putting, block work, plumbing, and flooring and so on alongside the expenses of development material are shrouded in this interaction. Dividers of strong concrete squares with outside and inside putting for water snugness, PCC base. PVC pipes, perplex dividers, rock channel, and media. RCC chunk, punctured pieces, vents lines and plants like Cana, cattails,

bulrushes and so forth are the required things for the development. Around Rs.2.5-3 lakhs is by and large the expense for the establishment of a plant of 8-9 KLD volume.

Operation & maintenance

Up-to some level DEWATS is effective when capacity is more but for larger capacity multi-units of DWWT method is recommended of smaller manageable sizes limited to 100kld. Average cost of structure is Rs. 25,000-30,000 per KL flow per day (approximately).

Table 10 Cost of Sedimentation Tank

Components	Surface area requirement (sq.m/KL)	Capacity(Cum/KL)	% of Total cost(approx.)	Total cost(approx.)
Settler	0.5	1	25	75000
Reactor	1	1.73(inner) 3(outer)	40	120000
Planned Filter	5	4	20	60000
Storage sump	-	1	5	15000
Polishing Pond	1	0.88	5	15000
Misc.	-	-	5	15000

Source: [22]

5.2 Electrical Concept

5.2.1 Programmable load shedding

Define: Burden shedding is the thing that electric utilities do when there is a colossal interest for power that surpasses the stockpile. In this manner in a dissemination framework it should be unequivocally controlled for explicit timeframe. Programmable burden shedding time usage framework is a solid circuit that assumes control over the manual undertaking of switch ON/OFF the electrical gadgets regarding time. It utilizes continuous clock (RTC) interfaced to a microcontroller of 8051 family. While the set time equivalents to the constant, then, at that point, microcontroller provides order to the relating hand-off to turn ON the heap and afterward one more order to turn OFF according to the program. Various ON/OFF time section is the greatest benefit with this venture. A grid keypad helps entering the time. A 7-sement show is interfaced to the microcontroller to show time.

Technical working: Here the it uses one real time clock IC DS1307 i.e., Interface to the MC pin 27 & 28. IT uses a crystal of 32.768 KHz to deliver timing reference. A matrix keypad is used for setting the time, relay ON time & OFF time. The relay is driven by pin 25 of MC through driving transistor BC547. Seven segment LED's are parallel connected to Port 0 through driving transistors four numbers BL.547 to the respective, anode seven segment.

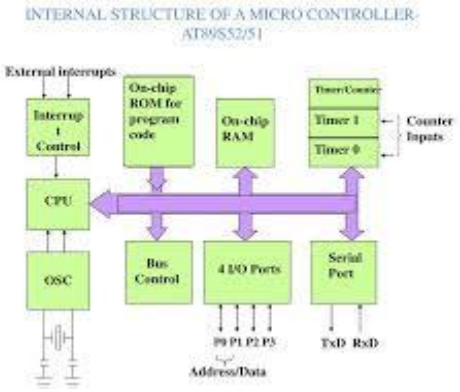


Figure 42 Internal Structure of Micocontroller

Benefits:

- Negligible losses
- Require little maintenance.
- Can work under ordinary atmospheric conditions

Components Used:

- POWER SUPPLY BLOCK
- VOLTAGE REGULATOR (LM 7805)
- MICROCONTROLLER (AT89S52/AT89C51)
- DS1307 RTC
- MATRIX KEYPAD
- RELAY
- SEVEN SEGMENT
- BC547
- RESISTORS
- CAPACITORS

Cost:

- VOLTAGE REGULATOR (LM 7805) - Rs.200 (Amazon)
- MICROCONTROLLER (AT89S52/AT89C51) - Rs.280 (Coumpany name: ATMEL)
- DS1307 RTC – Rs. 200 (Company name: TECHNOCARE)
- MATRIX KEYPAD (4*4) - Rs. 200 (Embeddinator's)
- RELAY (5v) – Rs. 150 (Company name: AUSLESE)
- SEVEN SEGMENT, BC547 – Rs 600 (Amazon)
- RESISTOR AND CAPACITOR BOX : Rs.100
- TOTAL COST : RS. 1730

Circuit Diagram:

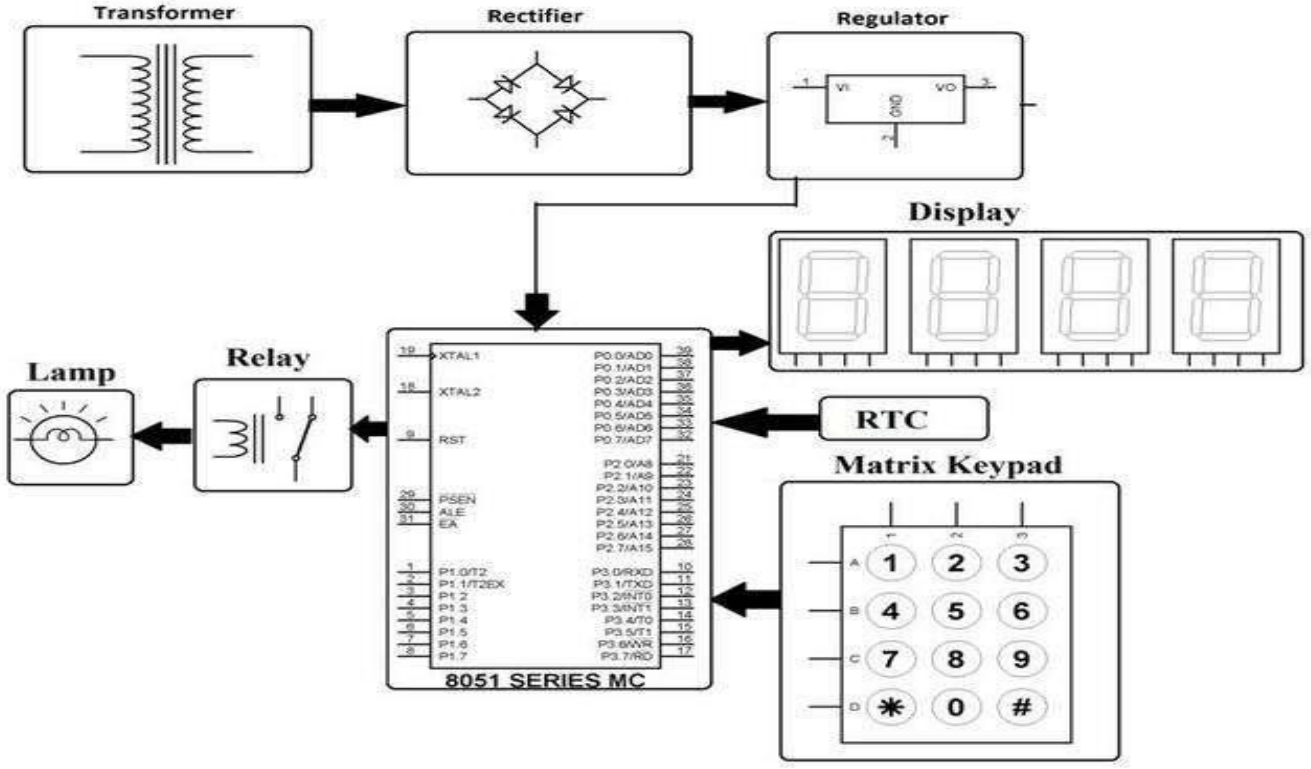


Figure 43 Programmable load shedding

5.2.2 Railway Security System using IoT

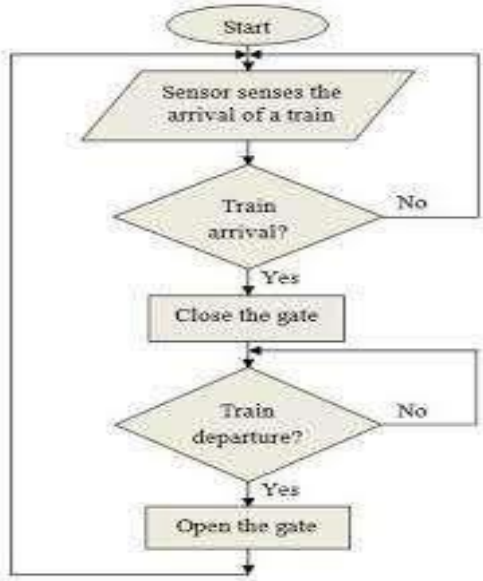


Figure 44 Railway Security System using IoT

In order to be apart of our surrounding with some change and advancement so that it can bring the better life of the middle class and lower class people to travel in high secutity and advanced locomotions the train is one and only most widely used transportion, and not only for this they are used for goods transportion also Indian railways are not able to facilate the customer properly due to crowded amount of people. Statistics show that the leading cause of death by injury in railways traffic accidents (two train collision each other). There are number of causes for which an accident can occur, some of them are; lack of training for driving or less experinessed, use of mobile phone while driving, unskilled drivers, driving while intoxicated, bad railway tack condition, overloading in tain and negligence traffic management. In this survey paper, we briefly review selected railway accidents detection techniques and propose a solution. Rear end crashes occur mainly due to obstracle and

crack in tracks. According to recent statistics, a major percentage of train accident happens due to not proper surveillance of railway securities.

This technology is for manned and unmanned crossings. To implement this technology, we are fixing two infrared devices at a pre-calculated distance to calculate the speed of train and time taken to reach the crossing. With this data the mechanization is done for opening and closing of crossing gates and to regulate road traffic users waiting time. This real time information is led to database server with the help of Wi-Fi module through IoT. With help of GSM module, intrusion detection is sent to position master, concerned train drivers and control room for efficient monitoring.

5.2.3 Management through Energy Harvesting

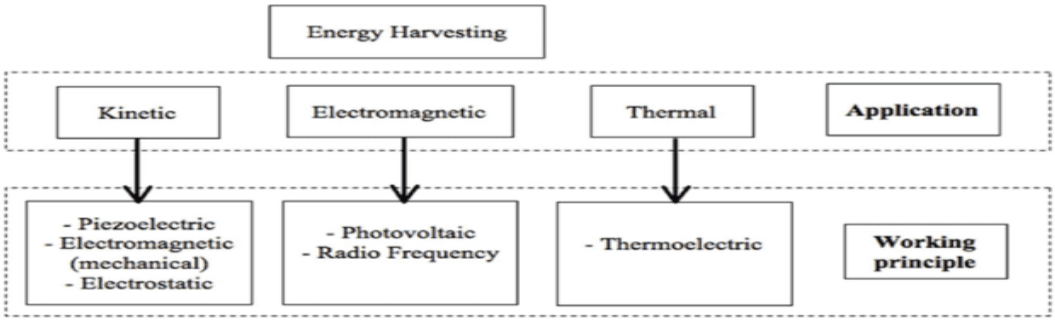


Figure 45 Management through Energy Harvesting

Source: Google images

SOLAR SYSTEM ON ROOFTOP OF HOUSE:

Solar energy can be transformed to electrical energy. Solar panels can be placed on the rooftop of the houses/buildings, invertor is needed and then it is linked with meter. The advantage of this implementation is such:

- Pollution free
- No additional fuel is required
- Surplus power can be sent back to grid and can get additional income

Costing (1 phase):

- The house with 1 AC, 6 led lights, 4 fans and some electric plugs requires –
- Solar Plant Size: 2.97kw
- No. of panels: 9
- Rate / KW: 41991/-
- Total Plant Cost: 124714/-

This costing differs with different respects such as usage of electricity, space required for plant, etc. If in future the usage of electricity increases, then solar plant is not adequate and hence electricity bill can be increased. The solar panel needs to be cleaned on regular intervals, if the panels are dusty then the efficiency losses.

Figure 46 SOLAR SYSTEM ON ROOFTOP

5.2.4 Moisture Monitoring System

Soil moisture monitoring is critical for managing water resources in an efficient manner. This applies to both irrigated and rainfed cropping systems. Water is increasingly becoming the most limiting resource needed to meet the food and fiber needs of a growing and more affluent population. Soil moisture monitoring can e.g. be used as a tool to assist irrigation scheduling. Irrigation management gives better crops, using fewer inputs, which increases profitability. Soil moisture sensors help with irrigation decisions. They are useful tools to understand what is happening in the root zone of your crop.

Responds to the following needs**:**

- Food security
- Improved irrigation techniques
- Real-time and remote-sensing capabilities to improve water management and efficiency of use

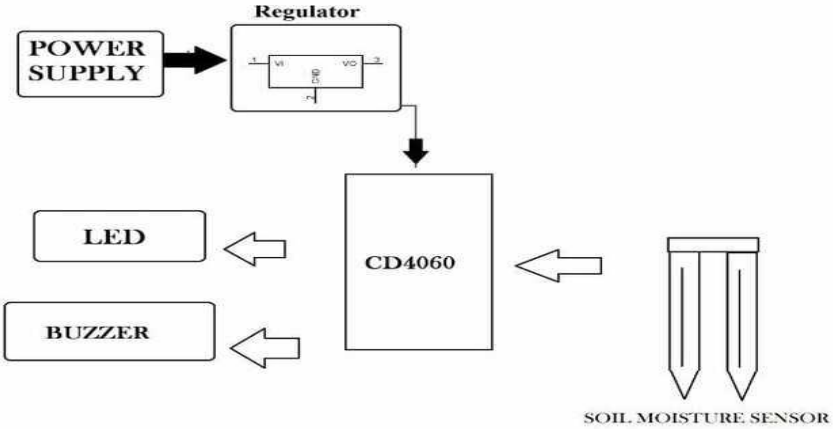


Figure 47 Connection Diagram for Moisture Monitoring System

Suitable for:

- Small-scale farmers
- Agriculture industry
- Rain-fed and irrigated agriculture

Equipments used:

Water Sensor, Buzzer, Resistors, Capacitors, Transistors, Cables and Connectors, Diodes, PCB and Breadboards, LED, Transformer/Adapter, Push Buttons, Switch, IC, IC Sockets.

Working:
The system timely monitors the wetness level of the soil. If at the time of observance it involves apprehend that the moisture level of the soil is under suggested then it'll raise an audio visual alert. This alert is then received by the care taker of the plant. once the care taker waters the plant the alarm burst and also the monitoring cycle continues.
In this system we tend to use a timer IC to time the watching process. A wetness level detector is employed to observe the moisture level of the soil. AN junction rectifier is used to grant visual alarm and a Buzzer is used to give audio alarm to the care taker of the plant. therefore during this project with the assistance of a straightforward combinative circuit and a sensor we are able to help save a plant by maintaining the moisture level of the soil of the plant, thus keeping the plant healthy.

5.2.5 Home Automation using IoT

With the help of IoT the facilities like light control can be done, safety of home gets enhanced, if home has a solar on roof top then its output can be easily monitored.

Applications using Home Iot:
Rebuilding consumer expectations, home automation has been projected to target wide array applications for the new digital consumer. Some of the areas where consumers can expect to see home automation led IoT-enabled connectivity are:

- Lighting control
- HVAC
- Lawn/Gardening management
- Smart Home Appliances
- Improved Home safety and security
- Home air quality and water quality monitoring
- Natural Language-based voice assistants
- Better Infotainment delivery
- AI-driven digital experiences
- Smart Switches
- Smart Locks
- Smart Energy Meters

Figure 48 Home Automation using IoT

Senors Used:
There are probably thousands of such sensors out there that can be a part of this list. Since this is an introduction towards smart home technology, we will keep it brief. We will break down IoT sensors for home automation by their sensing capabilities

- Temperature sensor
- Lux sensor
- Water level sensors
- Air composition sensors

- Video cameras for surveillance
- Voice/Sound sensors
- Pressure sensors
- Humidity sensors Accelerometers
- Infrared sensors
- Vibrations sensors
- Ultrasonic sensors

Depending upon what you need you may use one or many of these to build a truly smart home IoT product.

5.2.6 PC Based Electrical Load Control

In today's world .there is high a demand for PC based control system because of its various advantages s over manual control system, PC based control systems are highly reliable , accurate and time saving systems.

A PC based system which will control various devices like Motor, Light, and Fan etc. Designed a GUI (Graphical User Interface) on the PC and which helps to give command to the system. Microcontroller is used in order to receive commands from PC and accordingly control the devices connected to it. In this way this system is completely controlled by PC.

The system is incorporated with the electrical loads and also associated to the PC where centralized control takes place. It uses an MAX 232 protocol from the microcontroller to connect with the PC. To switch the appliances, Hyper Terminal is related on personal computer.

Once the connection is established with the PC, then the system begins working. The 8051 family microcontroller is used. Further, this can be upgraded by implementing a GUI based control board on the PC with suitable embedded system software. The power control can also be integrated using power electronics devices.

Figure 49 PC Based Electrical Load Control

5.2.7 Electrical Parameters Measurements

- Wh-Watt hour, the electrical energy consumed by a circuit over a period of time. For example, a light bulb consumes one hundred watts of electricity per hour. It is generally used in the following ways: Wh (watt-hour), kWh (kilowatt-hour), which is 1,000 watt-hours, or MWh (megawatt-hour), which is 1,000,000 watt-hours.
- dB-decibel, decibel is a unit of a tenth of a bell (symbol B), which is used to express the gain of voltage, current or power. It is a logarithmic unit expressed in dB, which is

generally used to express the ratio of input to output in an amplifier, audio circuit or speaker system.

- For example, the dB ratio of the input voltage (VIN) to the output voltage (VOUT) is expressed as 20log10 (Vout / Vin). The dB value can be a positive value (20dB) for gain, or a negative value (20dB) for uniform loss, that is, input = output is expressed as 0dB.
- θ-Phase angle, the phase angle is the difference in degrees between the voltage waveform and the current waveform with the same cycle time. It is either a time difference or a time change, and depending on the circuit components, it can have a "leading" or "lagging" value. The phase angle of the waveform is measured in degrees or radians.
- ω-Angular frequency, another unit mainly used for communication. The circuit that expresses the phasor relationship between two or more waveforms is called angular frequency, symbol ω. This is the rotation unit of the angular frequency $2\pi f$, the unit is radians per second, rads/s. The complete rotation of a cycle is 360 degrees or 2π, so a half circle is designated as 180 degrees or π radians.
- τ-Time constant. The time constant of an impedance circuit or a first-order linear system is the time it takes for the output to reach 63.7% of its maximum or minimum output value when it receives a step response input. It is a measure of reaction time.

Various Parameters , Its Measuring unit and Formula:

Table 11 ELECTRICAL MEASUREMENTS

PARAMETER	**MEASURING UNIT**	**FORMULA**
VOLTAGE	VOLT (V OR E)	E=I * R
CURRENT	AMP (I)	I= E/R
RESISTANCE	OHM (R)	R=E/I
CONDUCTANCE	MHO(G)	G=I/R OR I/E
POWER	WATT(W)	P= I*E OR I^2 R

6. SWATCHH BHARAT ABHIYAN

6.1 Swatchhta needed in allocated village:

- The village has no public toilets. Which is main need and also an important step of Swatchh Bharat Mission.
- There is one lake in village which is very dirty and full of algae which needs to be cleaned and even the path towards that lake was covered full of waste.
- The village has dustbins at some place but the waste from the dustbins needs to be taken on regular intervals which is lacking and due to which villagers than throw waste besides dustbins.


Figure 50 Improper Sanitation

6.2 Guidelines – Implementation in allocated village:

- Lake are being cleaned at least twice a year.
- Roads of village are swapped at on alternate days.
- Public dustbins are increased keeping wet and dry waste individually.


Figure 51 Guidelines- Implementation of Swatchh Bharat Abhiyan

Source: Images taken by students

6.3 Activities Done by Students in allocated village:

- Already Balva village has the good implementation of the Swatch Bharat because of the awareness and rules implemented by the sarpach of regular cleaning in the village.
- Still we carried out some cleaning activities near the primary school by the help of villagers.
- We also tried to explain the importance of sanitation to some elders of the village.
- While talking with the villagers we also taught them the importance of managing the waste. For example, collecting wet and dry waste in different dustbins to promote better sanitation.
- We tried to explain them the importance of proper cleanliness and how with simple and regular cleaning they can easily avoid many dangerous diseases like dengue and malaria.
- Also while visiting the primary school of the village, we talked with principal and fellow teachers and asked them to implement proper cleanliness in the school by providing dustbins in each and every classroom unlike using common dustbins between 3-4 classes.


Figure 52 Activities done by students

Source: Images taken by students

7. VILLAGE CONDITION DURING COVID-19

7.1 Taken steps in Balva village:

- During Lockdown villagers have strictly followed government norms and they have even put wooden barricades to stop outsiders from entering village.
- The farmers of village who was doing farming of vegetables have given to other villagers at reasonable cost or even for free.
- Few villagers have made cotton masks and sold it to villagers at reasonable cost.
- The villagers who use smartphones have installed Arogya Setu application on their device.
- Even after unlock people has maintained social distancing
- Circles were made in front of shops/vegetable market/dairy, etc. to follow social distancing rule in queue.
- Villagers who have other lungs related problem or old age have maintained strict rules and stayed in their houses until necessary.

7.2 Activities Done by Students for allocated village

- We remained friendly to villagers but with strict precautions.
- Social Distancing is maintained during the village visit.
- Social Distancing is maintained while taking the survey of the village and proper precautions are taken during the village visit.

7.3 Steps taken by Students

- We visited the primary school of the village and talked with the teachers about the proper implementation of covid-19 guidelines.
- During the visit we found some villagers with masks but they were not wearing it properly. We talked with them and explained the importance of mask and proper sanitation.

Figure 53 Steps for COVID 19

8. SUSTAINABLE DESIGN PLANNING PROPOSAL

Introduction:

Community halls are small sized building that can quarter a sports program along with the customary social and arts recreations. There are of various types and sizes, all have followings in common – different activities and gathering space along with additional housing which may include additional small sized halls.

Design must be made in a way that a different activities can be done without creating problems to each other. The building for restaurant should be beautifully pleasing and shows the care taken to provide a quality facility which is capable for meeting the developing obligations of the municipal.

Whereabouts:

- An arrangement of Centre with adequate parking of 2/4 wheelers is best, near to essential items shops and other facilities along with public transport. A site that is easily accessible to establish and nearby areas of development can engender a sense of ownership across the community.
- Schemes to position community buildings close to domestic areas or venerable people's housing can meet resistance. Potential site size may let the property and allied parking to be set at a rational distance from boundaries, or there may have to be some plant showing.
- Sport's necessities are often best set out where there is adequate space for an outdoor multi-use games area to additional activities taking place in the hall.
- If the site delivers for Bad-Minton, table tennis or tennis, the building could double as a building and will have to be align so that changing exits and the 'club room' relate to the outdoor facilities.
- Nearness to existing services electricity, gas, water and mains drainage, and to an existing street will all help to lower the cost.

Accommodation:

- Each location has separate supplies but 'core' accommodation for the smallest hall or community center will include:
- assembly space & main activity
- foyer
- tools and furniture store
- kitchen
- toilets, including facilities for differently abled people
- store for cleaners
- an office
- changing or dressing rooms
- more or larger activity spaces
- Meeting or club rooms.

Planning:

- The planned purpose of the building must be precisely dignified to attain an efficient plan form that authorities' pliability and parallel occupation by various user group's play practice in the main hall and an immediate yoga class in a small sized, nearby room.

- Lobbied dual doors can help segregate noise. Roads through the building should allow for suitable segregation of user groups.
- Main hall or public room shouldn't be allowed to be used for general access, and from the spaces they serve, the store should be directly accessible.
- Include no less than one meeting room. A main hall with extra rooms deals far more flexibility than a sub-divisible main space.
- The building technique, foyer and main circulation should be overlooked from location of an office.
- Locate toilets, counting the differently abled people's unit, near to the foyer.
- Ensure wheelchair allowance during the building.
- Kitchen area should be planned with counters serving two or more public areas.
- Linking adjoining assembly spaces with acoustically treated double doors, should be considered for benefits.
- Position changing rooms so that they can serve the offstage area.

Building Construction:

- Generally the most suitable process for community halls is traditional domestic construction. The only aspects that demand improvement of normal domestic building methods are clear span and height of main hall.
- Sectional buildings assessment of should cover permanence, strength and appearance as well as the requirements of maintenance of their interior and external finishes. Some equipment may not be right for heavily used wet areas and acoustic departure of rooms may be lower to purpose designed buildings. Any structural restrictions must be fully understood so that space standards are not compromised and costly modifications can be avoided.
- The steel portal frame, a common financial form of construction for light industrial buildings, is sometimes measured for community halls but can produce a building of unfamiliar shape and scale unless appropriately modified.

Office:

- In rural areas daily supervision is generally via a Rota of voluntary key holders accompanied when necessary by paid, feasibly part-time staff.
- In all but the minimum facilities some form of staffing will be necessary to take bookings, collect fees, supervise volunteers and safeguard that the building is secure & safe.
- An office is normally used as an area for staff, a reception and bookings point, a records store and a location for the illumination controls and fire alarm board.

Lavatory:

Plan male, female and differently abled people's lavatory (toilets) close to the entry foyer and consider the need for adjoining coat hanging space.
Female:

- Up to 50 persons – 2 WC
- Up to 100 persons – 3 WC
- For each additional 40 persons – 1 WC
- 1 washbasin plus 1 per 2 WCs.

Male:

- Up to 250 persons – 1 WC
- For each additional 500 persons – 1 WC
- Up to 100 persons – 2 Urinals
- 1 washbasin per WC plus 1 per 5 urinals.

There should be at least one toilet for wheelchair handlers.

Environmental services:

- To ensure full utilization of facility high level of comfort are vital. Ventilation and supple response lighting arrangements are needed for activities ranging from active to inactive, some requiring high lighting levels and others only contextual lighting.

Lighting:

- An appearance exposure system should be maintained throughout the building for all primary light sources. Sensor or time clock control will be essential for superficial lighting.
- The small sized hall and main hall will need an overall clarification system and will get benefit from secondary 'decorative' lighting.
- Emergency lighting will be necessary.

Ventilation:

- Set out windows to provide well-organized ventilation with suitable security. Consider the benefits of measured cross-ventilation throughout the building.
- Natural ventilation should be used wherever possible but mechanical exclusion must be used in kitchens, toilets and changing rooms.
- Fans and duct may have to be extended to the public areas if noise leakage from open windows is likely to be a problem.

Power:

- Remaining current circuit breakers should be identified for safety and guarded sockets are required where playgroups meet.
- The establishment is TNCS and has around 11 off 3 to 6 way combine sheets and another 20 or somewhere in the vicinity isolators incorperating wires.

Protection:

- Lightning security might be suitable in some rural areas where the separation and height of the hall may make it unsafe to lightning strikes.
- Electronic security sensors & alarms are suitable on some locations. Proper fire protection need to be involved.

8.1 Design Proposals

8.1.1 Socio-Culture Design (Community Hall)

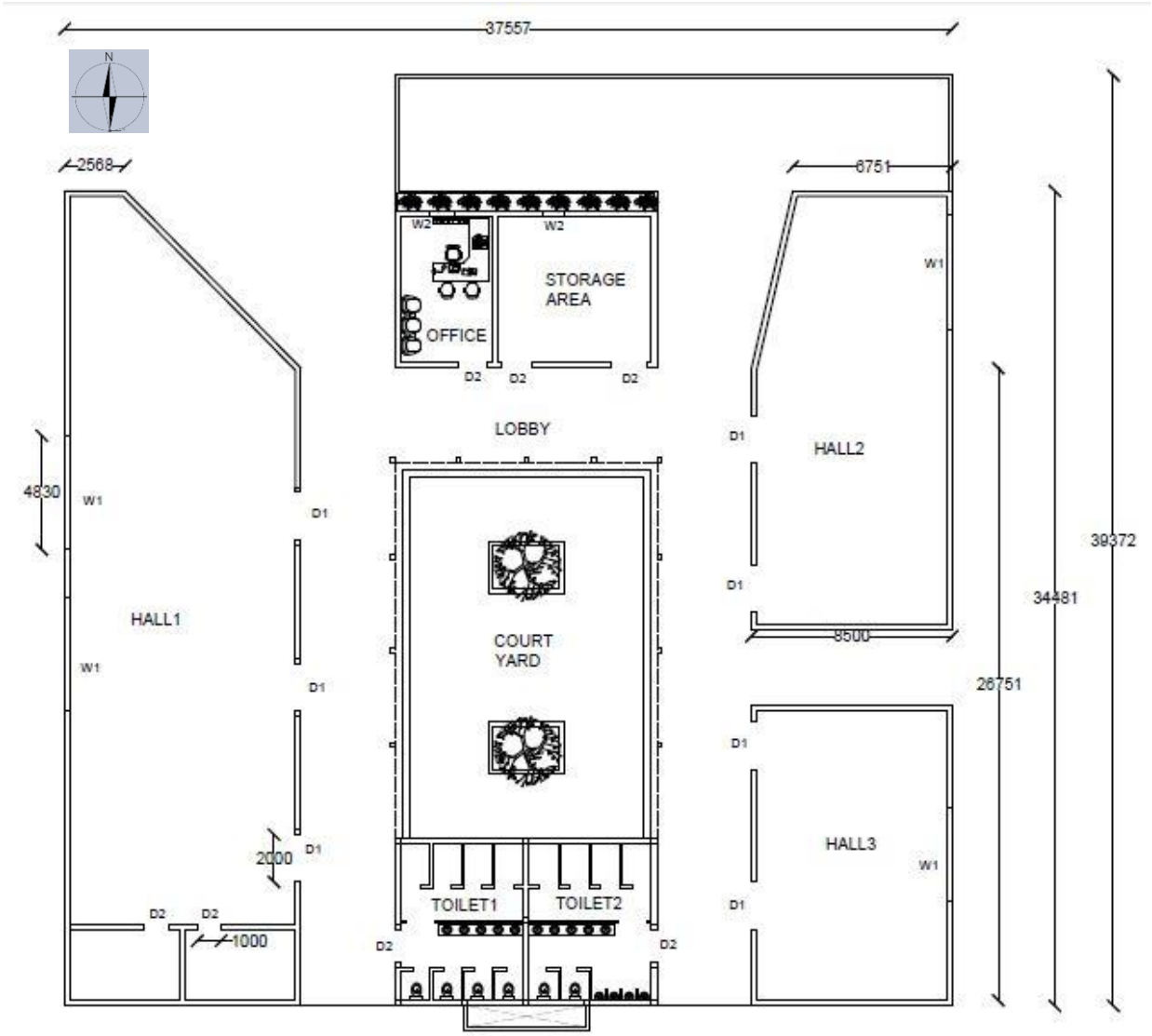


Figure 54 AutoCAD Plan

Figure 55 Section Plan

Figure 56 Front Elevation Plan

Note*: elevation can still be made in more improved design after confirming with the sarpanch

Table 12 Costing of Community Hall

Sr. no	Item description	Length	Width	Height	Total Quantity(m^3)	Rate	per	Total Amount Rs.
1	Excavation	39.3	37.5	1.5	2210.625	350	m^3	773718.75
2	Inner Wall	109	0.23	3.5	87.745	800	m^3	70196
3	Outer wall	125	0.23	3.5	100.625	1000	m^3	100625
4	PCC	39.3	37.5	0.15	221.0625	3400	m^3	751612.5
5	Roof	37.5	34.4	0.15	193.5	3500	m^3	677250
6	Gate	-	-	-	-	6000*3	-	18000
7	Door 1	-	-	-	-	3000*7	-	21000
8	Door 2	-	-	-	-	1800*7	-	12600
	Total							2425002.25

8.1.2 Public Toilet

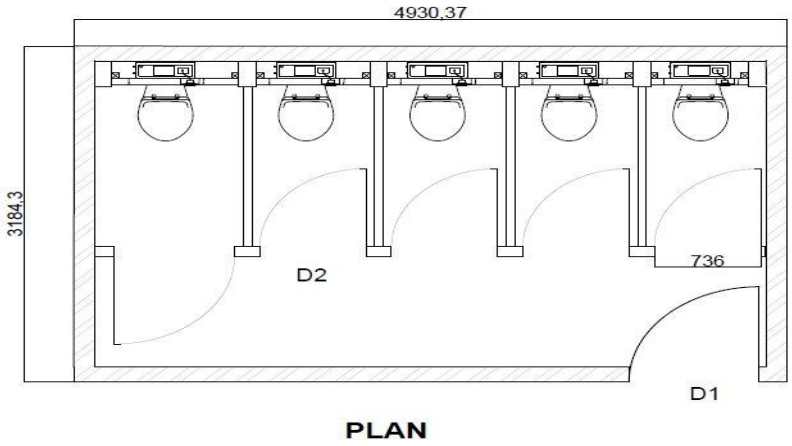


Figure 57 Plan of public toilet

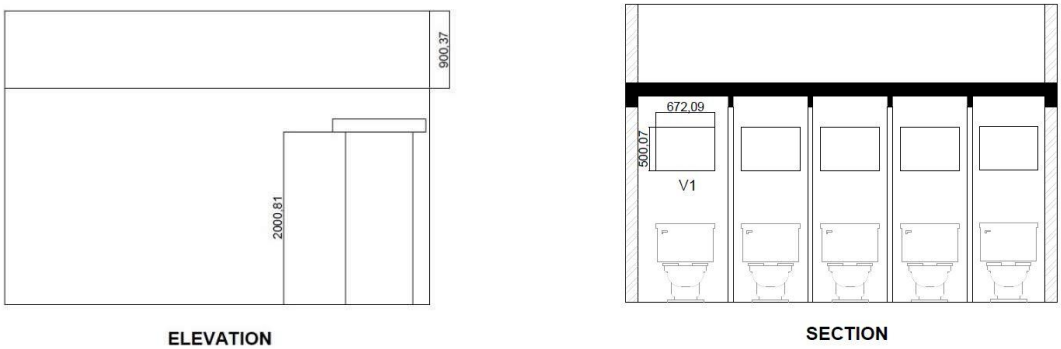


Figure 58 Elevation & section of Public Toilet

Table 13 Costing of Public Toilet

Sr. no	Item description	Length	Width	Height	Total Quantity(m^3)	Rate	per	Total Amount Rs.
1	Excavation	4.9	3.04	1.5	22.344	350	m^3	7820.4
2	Inner Wall	7.2	0.23	2.5	4.14	1200	m^3	4968
3	Outer wall	15.8	0.23	2.5	9.085	1200	m^3	10902
4	PCC	4.9	3.04	0.15	2.2344	3400	m^3	7596.96
5	Roof	4.9	3.04	0.15	2.2344	3500	m^3	7820.4
6	Toilet	-	-	-	-	3000*5	-	15000
7	Ventilation	-	-	-	-	500*5	-	2500
	Total							56607.76

8.1.3 Public Parking

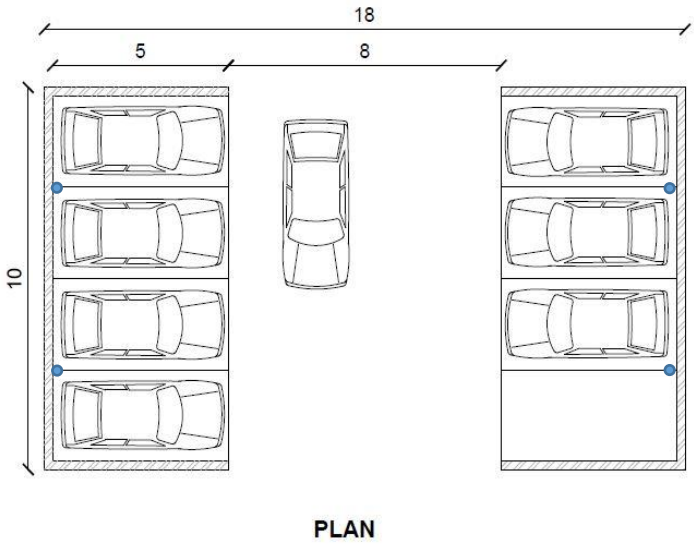


Figure 59 Plan of Parking

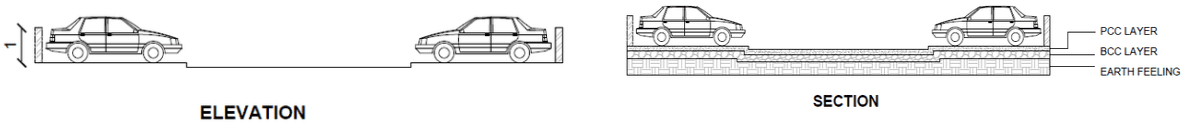


Figure 60 Elevation & Section of Parking

* represents the solar street light in the parking area

Table 14 Costing of Public Parking

Sr. no	Item description	Length	Width	Height	Total Quantity(m^3)	Rate	per	Total Amount
1	Excavation	19.76	12	0.2	47.42	350	m^3	16598.40
2	Outer wall	44	0.23	1.2	12.14	1200	m^3	14572.80
3	PCC	12	7.76	0.15	13.97	3400	m^3	47491.20
4	Marking	54	-	-	54(m)	60	m	3240.00
5	Parking Blocks	23.08	10	-	230.8(m^2)	280	m^2	64624
	Total							146526.40

8.1.4 ATM (Automated Teller Machine)

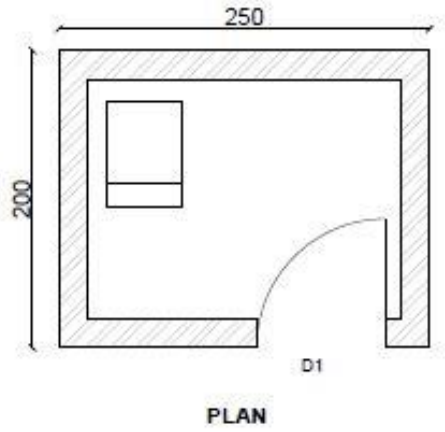


Figure 61 Plan of ATM

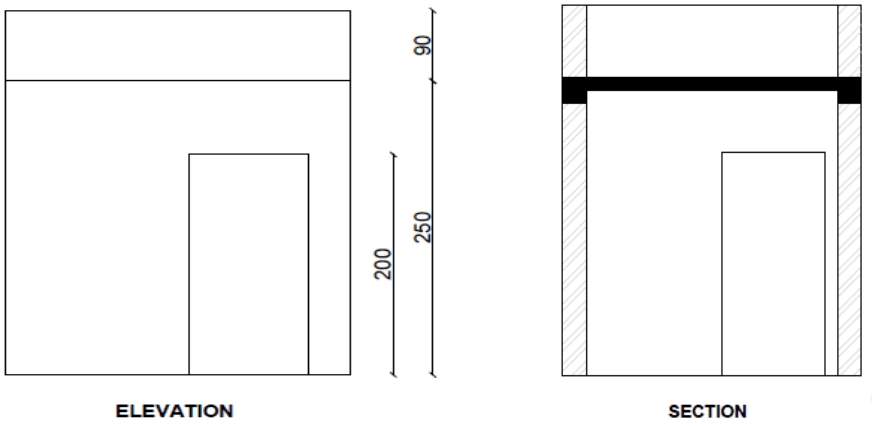
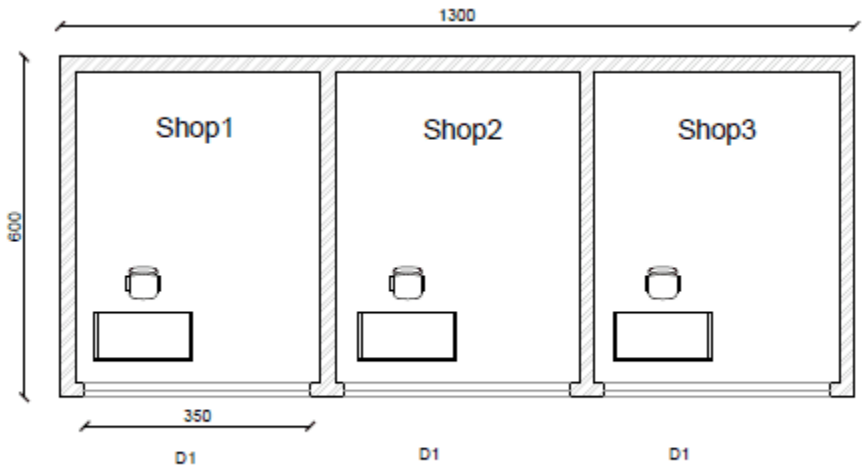


Figure 62 Elevation & Section of ATM

Table 15 Costing of ATM

Sr. no	Item description	Length	Width	Height	Total Quantity(m^3)	Rate	per	Total Amount Rs.
1	Excavation	2.5	2	1.5	7.5	350	m^3	2625
2	Wall	4.5	0.23	2.5	2.5875	1200	m^3	3105
3	PCC	2.5	2	0.15	0.75	3400	m^3	2550
4	Roof	2.5	2	0.15	0.75	3500	m^3	2625
5	Glass Door	-	-	-	-	6000	-	6000
6	Ventilation	-	-	-	-	500	-	500
	Total							17405

8.1.5 Shopping Area



PLAN

Figure 63 Plan of shopping area

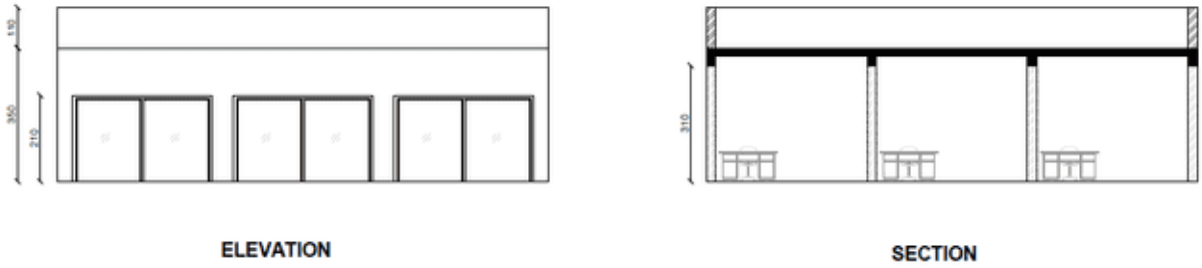


Figure 64 Elevation & Section of Shopping area

Table 16 Costing of shopping area

Sr. no	Item description	Length	Width	Height	Total Quantity(m^3)	Rate	per	Total Amount Rs.
1	Excavation	12.23	5.23	1.5	95.94	350	m^3	33580.52
2	Inner Wall	10.5	0.23	2.5	6.04	1200	m^3	7245.00
3	Outer wall	22.7	0.23	2.5	13.05	1200	m^3	15663.00
4	PCC	12.23	5.23	0.15	9.59	3400	m^3	32621.08
5	Roof	12.23	5.23	0.15	9.59	3500	m^3	33580.52
6	Rolling Shutter	-	-	-	-	9430*3	-	28290
7	Ventilation	-	-	-	-	2500*3	-	7500
	Total							158480.12

8.1.6 Steel Gate

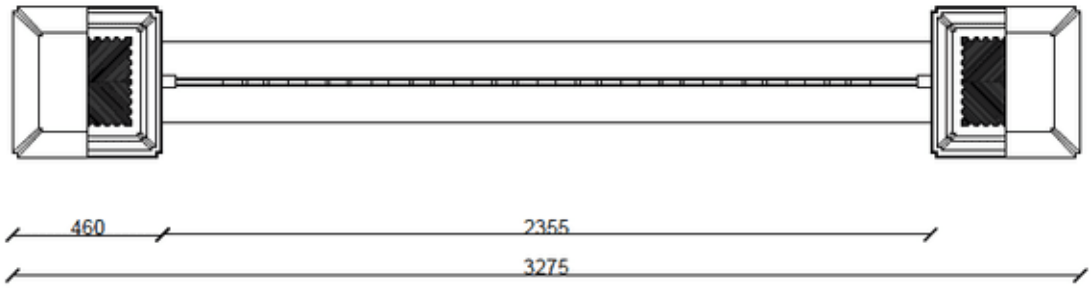


Figure 65 Plan and section of Steel Gate

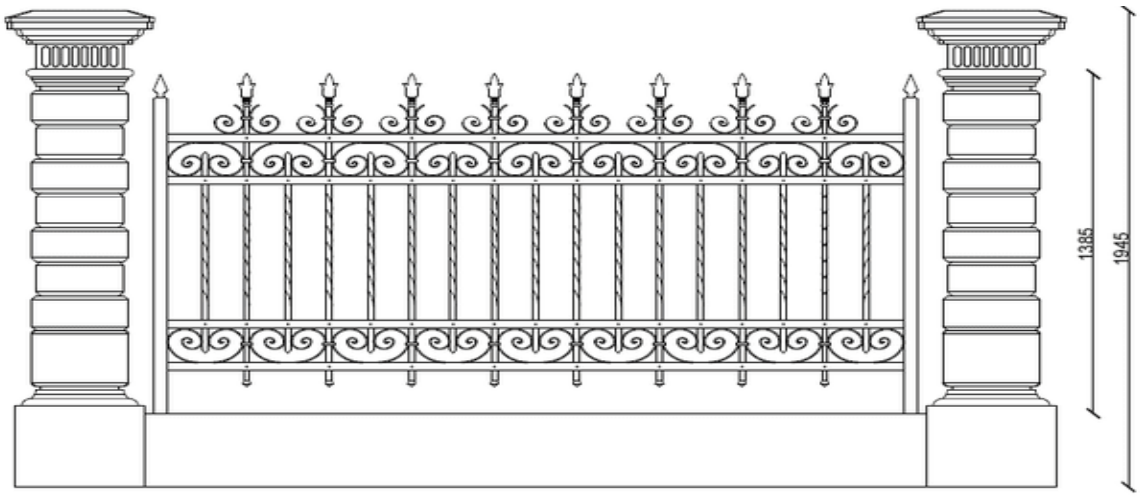


Figure 66 Elevation of steel gate

- Total weight of the Gate: 55.178 Kg
- Area of the Steel Gate: 8.78 m^2
- Cost of Steel Gate per square Feet: Rs. 500
- Total cost of Steel Gate: Rs. 47253.52

8.1.7 Solar Automatic Gate

- Electric Gate opener can be a great advancement in technology sector. But during blackouts they can't be used. To avoid such circumstances and lower the costing of electricity bill, solar gate openers can be used.
- They have batteries which get charged by solar panel and a mechanism which is connected to gate to open it. This system can also be done manually. Remote control is possible in this system. It increases the security along with cost cutting by use of renewable energy source.

- Location: This automatic gate is a great perspective for security reasons. Hence this gate can be equipped at BANK present in the village. The Bank has severe rooms that can be only accessed by specific peoples / staffs. Hence this can be a great location for such design.

- Advantage to village: These gates will only be opened by staff people and along with it their entry is stored in the data which can be helpful in future to monitor the activity. Hence this gates will create a great advancement in security point of view as well as it is runed by solar energy which creates cost cutting in terms of electricity bill too.
- Technical Specification are as follow:

Table 17 Technical Specification for Gate

Arduino based on ATmega328 MCU	1 quantity
Resistor	10kohm
Capacitors	i) 10 micro farad, 16v electrolytic ii) 100 nano farad, ceramic disk
Relay	5V, 1C/O relay
LCD	16*2 Alphanumeric display
Battery	12V
Solar Panel	300W

The Battery will get charged and gives power to Arduino which is 28 digit microcontroller unit (MCU). Fingerprint sensor module will be having direct connection with ATmega328 MCU which will further check the applied data of fringerprint with stored data. When it matches with the data of fingerprint module. The microcontroller will give command to operate further. The name of the person is displayed on the LCD panel present to viewer. The door gets unlocked by electronic coil connected to door which was locked basically by electromagnet.When coil is energized the slug pulled into centre of coil which allows the solenoid to move at one end and hence door gets unlocked. In this manner its working is done.
The following Figure 60 shows the circuit of the same design.
Costing for the same is given as below:

Arduino approximate price = 500 Rs.
Resistors Price = 100 Rs.
Capacitors Price = 150 Rs.
Relay Price = 550 Rs.
LCD price = 330 Rs.
Battery = 2000 Rs.
Solar Panel = 7000 Rs.
TOTAL PRICE = 10,630 Rs. Approximately.

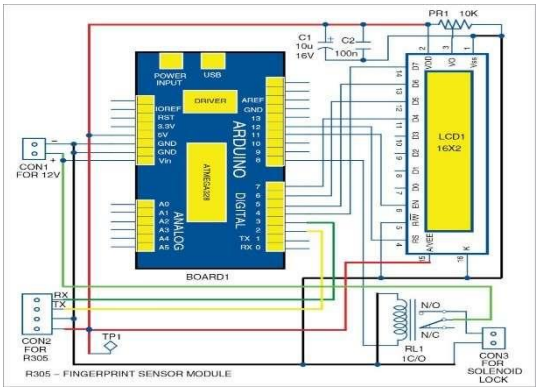


Figure 68 Circuit for gate

8.1.8 Lattice Steel Tower:

Doing Survey about power-cut we detected that during rainy season the concrete poles placed to support the live transmission lines falls down and due to which power cut happens. Most of the tallest steel cross section towers on the planet are really inherent water and utilized as oil stages. These designs are generally underlying enormous pieces ashore most ordinarily in Texas or Louisiana and afterward moved by freight boat to their last resting place. Since an enormous part of these pinnacles are submerged the authority tallness of such constructions is frequently held in debate.

Figure 69 Concrete Pole and Lattice Steel Tower

- Rehabilitation of concrete pole - The design is such that the poles are shifted besides its real location without changing distance between two poles. Basically pole remains the same just its position is changed which growths its grip from ground. But this explanation is just for temporary basis. It doesn't last long as the material is still same.
- Replacing Pole with lattice steel tower- The design is such that instead of concrete pole we place steel tower, it holds the grip, prevent from rusting and additional reliable in solidity than concrete poles. This design is lighter than concrete pole and has higher speed of construction. The drawback in this is that it is costlier and hence used generally in urban areas.
- Lattice Steel Tower with reduced based- This design will reconcile the benefit of concrete poles and steel poles. Though this design has lightly higher cost but this will make the electric poles last longer and eventually power-cuts will be reduced.

- Location: The lattice steel tower will be replaced in place of concrete poles at following locations in village where there is Tensioning of the network / power line, At corners of the network, At the end poles of the network.
- Advantages to villagers: The villagers facing blackout will reduce. The blackout in village genrally happens due to falling of those concrete poles and wire cuts in thunder atmosphere. By replacing poles with lattice steel poles, the chances of falling the pole is highly reduced. Hence, villagers will be getting continuous power supply in all kind of atmosphere which is greatly beneficial from them.

- Technical Features: There are 2 different voltage lines i.e. 11KVand 0.4KV. Here for both the lines the lattice steel tower can be installed. The power line data for installing steel tower is as follows:

11KV Line:

- Nominal voltage is 11000 volts and highest line voltage will be approx. 12000volts.
- The power line is 3 phase, 3 wire neutal earthed which provides resistance of 21 ohm and this will limit the fault current to 300A.
- The short circuit breaking rms current is 25KA at 11KV.

0.4KV Line:

- Nominal Voltage is 400 volts at 50 Hz frequency.
- The system will be of 3 phase, 4 wires including neutal solidly grounded.
- The following figure shows different types of tower with respect to transmission line.

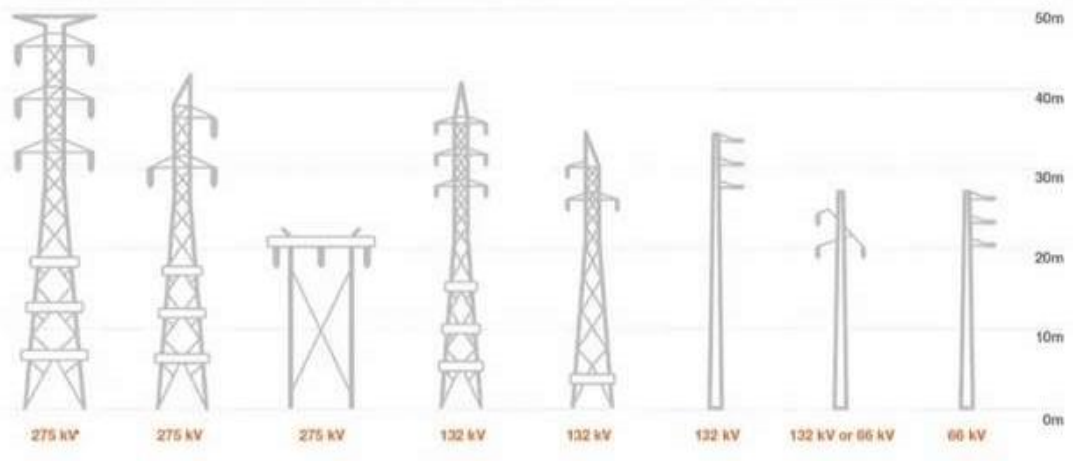


Figure 70 Types of Tower

- Costing: Based upon the two different types of lines the cost varies but the approximate costing details are given below:

  9 meter pole for 11kv line = 25000 Rs. Including cross arm woth Rs. 4000 as per the steel rate of Rs. 100 per kg.
  6 meter pole for 0.4kv line = 17000 Rs. Including the cross arm woth Rs. 2500 as per the steel rate of Rs.100 per kg.
  This assumptions of costing are also done on basis of various telephonic survey done at various electric poles making companies.

8.1.9 Automatic water plant system

- During summer days everyone is too lazy to water the plants that are grown on the border of the fields . So, this system will be water such plants automatically and the design is mentioned below.

Component Requirements:

Arduino UNO board, Soil moisture sensor, servo motor, 12v water pump, L293D motor drive to run the water pump.

Circuit Diagram:

The circuit diagram of automatic plant watering system is shown. The power required to turn ON the Arduino can be taken from 7V or 12V wall wart or plug-in adaptor.

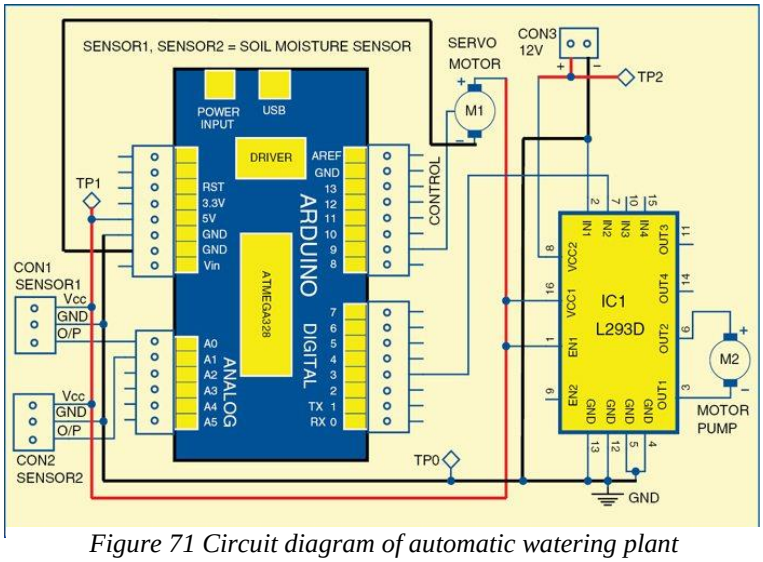


Figure 71 Circuit diagram of automatic watering plant

Working:

The moisture sensor gives a simple yield, which can undoubtedly be interfaced with Arduino. In this undertaking, two sensors can be associated with simple pins, A0 and A1, of the Arduino board. Every sensor has four pins (Vcc, Gnd, Ao and Do) accessible for interfacing with the Arduino board. Here, computerized yield pin (Do) isn't utilized. The water siphon and servo engine are constrained by Arduino associated with computerized pins 3 and 9, individually. That is, the servo engine signal control pin is associated with pin 9 of the Arduino board.

The program in the Arduino reads the moisture value from the sensor every 20 seconds. If the value reaches the threshold value, the program does the following three things:

- It moves the servo motor horn, along with the water pipe fixed on it, toward potted plant, whose moisture level is less than the predetermined/ threshold level.
- It starts the motor pump to supply water to the plant for a fixed period of time and then stops the water pump .
- It brings back the servo motor horn to its initial position.

Location:

On the edges of the farms and electricity can be taken from the motor room of the farm.

Technical specifications:

Sensore selection: Two types of soil moisture sensors are available in the market i.e. contact and non-contact sensors. Here, we are using a contact soil sensor because it has to measure the soil moisture in order to check the electrical conductivity

Benefits to villagers:

- The first and the foremost benefit is that the villagers time will be saved and they don't need to water each and every plant present of the sides of the farm, just by switching on the Arduino the whole system will start. Besides this, the mentioned design is a low cost project and also its like a one time investment for the owners of the farm or the farmers.

Costing:

- Soil Moisture sensor: Rs.165 – { Company name- Robocraze }
- Water Pump: Rs. 100 – { Company name – ERH INDIA }
- Arduino: Rs.710 – { Company name – Arduino UNO R3 }
- Servo motor: Rs. 500 – { Company name – Tower Pro }

Total approximate costing: Rs 1500/-

8.2 Reason for Recommending this Design

- Community halls are the socio-cultural building where people can organize various function and events for both personal and public events.
- In community hall villagers can also organize important meetings of panchayat.
- Also during the emergency like while on-going pandemic they can utilize the structure for the preparing extra bed hospital.
- The automatic water planting system will save time of the farmers and even the burden to water the plants regularly will be reduced to greater extent.
- No advance and very delicate components are used in the design, hence, if any part of the project is not working then that can be easily replaced and moreover, the location of the fault can also easily determined.
- There are various manufacturing companies of the components used in the project. So the user can choose the component according to the availability and the services of their choice, also the economic many a times varies from brands to brands, hence one can choose according to the decided budget.
- Also such structure help the village to raise the socio-economic wealth.
- Balva village is located near to the capital city Gandhinagar and is more developed in terms of necessary facilities but it doesn't have any recreational facilities or Social Infrastructure like Community Hall, parks, and other facilities.

8.3 Benefits of the Villagers

- Various community functions at various events and traditions this is the place made for.
- Public meetings of the peoples on various issues can be organized here.
- Representatives or other official leaders engage with the peoples of village and ask for their opinions, support or votes can be done here.
- Community members meet each other publically at this place.
- It’s a place for volunteer activities and housing local clubs.
- Place that public members can rent reasonably when a private family function or party is too big for their own home. For instance, the non-religious parts of weddings, memorials, etc.
- Place in which some local non-government activities are organized.
- Place for community venue for entertainment.
- It adds infrastructure value to the village.

9. Proposing Designs for Future Development of the Village for Part II Design

The Balva village already is making progress for becoming a smart or ideal village, but it still lacks in some infrastructure. So for the advancement of the town we will propose some plan for Part II plan in which a portion of the accompanying focuses will be thought of.

- Rain water harvesting :

  Rain water harvesting will be useful during the dry seasons as it will provide necessary amount of the water to the villagers and it will also be helpful for recharging the lake water in the village. Hence we will provide the design of the rain water harvesting along with detailed estimation.

- Market :

  Currently there is no particular market area in the village aside from the small shops that provides necessary items for the living. By providing the market design the villagers can buy the goods form the particular location and it will also help the village to achieve growth economically.

- Library :

  There is not a single infrastructure in the village where children or adults can read the books. Hence we will propose the design for the library for the development of the village.

- Park :

  In Balva village there are no recreational centre where villagers can enjoy or spend their free time. Hence we will provide park as a recreational centre of the village

- Main Gate :

  At the start of the village there are not any structure which represents the identity of the Balva village aside from the road signs. So by proposing the design of the main gate for the Balva village, it will get recognition and heritage development.

- Development Centre :

  There are no development Centre available in the Balva Village. Designing one will bring a lot of development for the people of the village. It will bring up the living standards of the people residing in the village. It can be also used for the women empowerment in the village.

10. CONCLUSION

By visiting the Balva village allocated to us, we came to know a lot about the village infrastructure and what are the needs of the villagers. We get the better idea of the infrastructure that is needed in the villages of India when we visited the smart village as we were able to define some requirements for our allocated village. By the help of various surveys provided by Vishwakarma Yojana we were able to get some basic requirements that are needed in the Balva village.

The Balva village mainly lacks at the socio-infrastructure as there are no community hall, parks or any other recreational area present. Hence by the implementation of the given proposed designs proposals, it can fulfill the infrastructure need of the village ultimately helping in reducing the migration of rural people towards the urban areas. Also it will help in the overall development of the village making it more prosperous. These conveniences planned under Vishwakarma Yojana will be useful for better improvement of village as truly just as socially, which improves the general way of life of individuals alongside country with saving nature step by step. We can say that every one of the missing conveniences are given will stop the relocation of rustic individuals towards the metropolitan zone. This can cause lessen the heap on metropolitan regions just as contamination in both area can be limited steadily.

The intention of Vishwakarma Yojana is to raise the way of life of the country zones to its specific degree up to the level of an ideal town circumstance. It is a viable government plan to build up the country zones under efficient expense with great functionality and effectiveness during its utilization. The task will in general improve the physical, social just as socio-social parts of the town by actualizing and adding lobbing different foundations concerning lesser or least obstruction to its provincial genuineness. The principle point is to create town with a "country soul" however with all metropolitan conveniences that a city may have. This project provides “DESIGN TO DELIVERY” solutions for development of villages in “RURBAN” areas.

11. REFERENCES

1. https://indikosh.com/vill/535226/balva
2. https://www.census2011.co.in/data/village/511129-balva-gujarat.html
3. https://indikosh.com/vill/537772/balva/amp
4. https://etrace.in/census/village/balva-kalol-district-gandhinagar-gujarat-511129
5. https://villageinfo.in/gujarat/gandhinagar/kalol/balva.html
6. http://www.vyojana.gtu.ac.in/PDF/8/Vishwakarma%20Yojana%20Project%20-%20Village%20Details%20from%20PHASE-I%20to%20VII.pdf
7. https://censusindia.gov.in/2011census/dchb/DCHB.html
8. https://revenuedepartment.gujarat.gov.in/village-map
9. https://www.google.com
10. https://www.drishtiias.com/to-the-points/paper3/different-irrigation-systems
11. http://www.onefivenine.com/india/villages/Gandhinagar/Kalol/Balva
12. https://www.google.com/maps?ll=23.298024,72.582374&z=11&t=h&hl=en&gl=US&mapclient=embed&q=Balva+Kalol+Gandhinagar+Gujarat
13. http://www.onefivenine.com/india/villages/Vadodara/Kawant/Gojariya
14. https://www.census2011.co.in/data/village/509515-Gozaria-gujarat.html
15. https://en.wikipedia.org/wiki/Gozaria
16. https://sportengland-production-files.s3.eu-west-2.amazonaws.com/s3fs-public/village-and-community-halls.pdf?NwtRYNuZMMWC5n9LvP_lB4RZ5DNeVUL7
17. https://www.edgefxkits.com
18. https://www.100projects.org
19. https://www.ieeexplore.ieee.org
20. https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.mdpi.com/2071-1050/10/7/2559/pdf&ved=2ahUKEwiy0_S3pcbtAhVQyjgGHYqnAN0QFjAAegQIAhAB&usg=AOvVaw2pOen-yfYH2qOhWBJ4ucvr
21. https://en.wikipedia.org/wiki/Sustainable_sanitation
22. https://www.cseindia.org/cost-estimation-for-planning-and-designing-of-decentralised-wastewater-treatment-system-2073#:~:text=Typically%20%2C%20for%20installation%20of%20a,2.5%2D3%20lakhs.&text=Decentralised%20wastewater%20treatment%20systems%20are,desirable%20performance%20of%20the%20plant.

12. ANNEXURE ATTACHMENT

12.1 Ideal Village Survey

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:	Gozaria
Name of Taluka:	Vijapur
Name of District:	Mehsana
Name of Institute:	Adani Institute of Infrastructure engineering
Nodal Officer Name & Contact Detail:	
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	ઈન્ચાર્જ, સરપંચ વ. ઉપ સરપંચ ગોઝારીયા ગ્રામ પંચાયત તા. જી. મહેસાણા Pin. 384470
Date of Survey:	8/12/2020

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	13,132	-	-	-
ii)	2011	13,933	7256	6677	2999

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector)	3 km²
	Coordinates for Location:	23.478126°N, 72.56238°E
	Forest Area (In hect.)	-
	Agricultural Land Area (In hect.)	500 hect
	Residential Area (In hect.)	450 hect.
	Other Area (In hect.)	
	Water bodies	0
	Nearest Town with Distance:	3 km from Kherpura

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana Phase VIII
Techno Economic Survey

3. Occupational Details:

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

4. Physical Infrastructure Facilities:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
	• Tap Water (Treated/ Untreated) • RO Water • Well (Covered/ Uncovered) • Hand pumps • Tube well/ Borehole • River/ Canal/ Spring/ Lake/ Pond	Treated — Narmada/ Tubewell Sujalam Suffalam Covered	✓ ✓ ✓		
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank (1)	Capacity: 2.5 liter			
	Underground Sump (1)	Capacity: 2.5 liter			
Suggestions if any:					
C.	**Drainage Facility**				
	Available (Yes/ No)	Yes	✓		
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	Yes	✓		
Suggestions if any:					

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

E.	Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM				
	Village approach road	4	✓		
	Main road	4	✓		
	Internal streets	More than 200	✓		
	Nearest NH/SH/MDR/ODR Dist. in kms. 0 km				
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	14 km from kalol			
	Bus station (Y/N) Condition: Good (If No than Nearest Bus Station---Kms)	own bus station	✓		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)				
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	More than 6hrs			
	Power supply for Domestic Use	—	—		
	Power supply for Agricultural Use	—	—		
	Power supply for Commercial Use	—	—		
	Road/ Street Lights	—	—		

	Electrification in Government Buildings/ Schools/ Hospitals				
	Renewable Energy Source Facilities (Y/ N)	-			
	LED Facilities	All			
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	7	✓		
	Location	Near Main road	-		
	Condition	Good			
	Community Toilet (With bath/ without bath facilities)	✓		✓	
	Solid & liquid waste Disposal system available	NO			
	Any facility for Waste collection from road	door to door	-		
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)		✓		
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	0.5			

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	2	✓		
	Private Clinic/Private Hospital/ Nursing Home	5	✓		
	If any of the above Facility is not available in village than approx. distance from village: ..– .... kms.				
Suggestions if any:					
L.	**Education Facilities:**				
	Aaganwadi/ Play group	College 1	✓		
	Primary School	1	✓		
	Secondary school	1	✓		
	Higher sec. School	1	✓		
	ITI college/ vocational Training Center	ITI College	✓		
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	Arts College	✓		
	If any of the above Facility is not available in village than approx. distance from village: ..–..... kms.				
Suggestions if any:					
M.	**Socio- Culture Facilities**				
	Community Hall (With or without TV) Location: In village	1 community hall without TV	✓		

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Condition: Good				
	Public Library (With daily newspaper supply: Y/N) Location: In village Condition: Good	1 library with good facility	✓		Maintenance is required
	Public Garden Location: Condition:	–			–
	Village Pond Location: In village Condition: Average	1 pond with good level quality of water	✓	✓	purification is required
	Recreation Center Location: In village Condition: Average	Medium hall is available			
	Cinema/ Video Hall Location: In village Condition: Average	Cinema hall with 30 seats	✓		Maintenance is needed
	Assembly Polling Station Location: In village Condition: Good	three stations are available	✓		
	Birth & Death Registration Office Location: In village Condition: Good	Birth & death registration is done in Panchayat hall	✓		
If any of the above Facility is not available in village than approx. distance from village: .....kms.					
Suggestions if any:					
N.	**Other Facilities**				
	Post-office	1	✓		
	Telecommunication Network/ STD booth	–	–		Not Needed

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	General Market	Big market	✓		
	Shops (Public Distribution System)	No. of shops available	✓		
	Panchayat Building	Good condition	✓		
	Pharmacy/Medical Shop	Available	✓		
	Bank & ATM Facility	Three major banks	✓		
	Agriculture Co-operative Society	Available	✓		
	Milk Co-operative Soc.	Available	✓		
	Small Scale Industries	GIDC	✓		
	Internet Cafes/ Common Service Center/Wi Fi	—			
	Other Facility				
Suggestions if any:					

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

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

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VI
Techno Economic Survey

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

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)	Public infrast. facilities are not good	Maintenance is required in Public Toilet
2.	Additional Information/ Requirement	—	—

9. **Smart Village Proposal Design**

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	—	—	—

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

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

12.2 Smart Village Survey

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

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

Name of District:	Gozaria.
Name of Taluka:	Vijapur
Name of Village:	Mehsana
Name of Institute:	Adani Institute of Infrastructure Engineering
Nodal Officer Name & Contact Detail:	
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	ચુકેશ કુમાર પટેલ ઈન્ચાર્જ, સરપંચ વ. ઉપ સરપંચ ગોઝારીયા ગ્રામ પંચાયત તા. જી. મહેસાણા Pin. 384470
Date of Survey:	8/12/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	13,132	-	-	-
2.	2011	13,933	7256	6677	2999

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	3km² 23.478126° N , 72.562258° E
2.	Forest Area (In hect.)	—
3.	Agricultural Land Area (In hect.)	800 heat.
4.	Residential Area (In hect.)	450 heat.
5.	Other Area (In hect.)	
6.	Distance to the nearest railway station (in kilometers):	3 km from Kharaniya

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

7.	Name of Nearest Town with Distance:	(3 km) Khatana
8.	Distance to the nearest bus station (in kilometers):	Own Bus Station (0 kms)
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. Carpentary 3. Business
Major crops grown in the village:	1. Sorghum bicolor 2. Pearl Millet 3. Groundnut

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	6	✓		
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 Channel Bottled Water Hand Pump Other(Specify)**Lake/ Pond**	3	✓		

21

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank (5)	Capacity: 2.5 Liter			
	Underground Sump (3)	Capacity: 2.5 Liter			
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET	Underground drainage	✓		
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	4			
	Main road	4			
	Internal streets	More than 500			
	Nearest NH/SH/MDR/ODR Dist. in kms. 0 KM				
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	14 km from Kalol			
	Bus station (Y/N) Condition: Good (If No than Nearest Bus Station---Kms)	1			
	Local Transportation (Auto/ Jeep/ Chhakda/ Private Vehicles/ Other)				
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)		~		

3

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Power supply for Domestic Use	✓			
	Power supply for Agricultural Use	✓			
	Power supply for Commercial Use	✓			
	Road/ Street Lights	✓			
	Electrification in Government Buildings/ Schools/ Hospitals	✓			
	Renewable Energy Source Facilities (Y/ N)				
	LED Facilities	All lights			
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Near main (T) road	✓		
	Location Condition	Good	✓		
	Community Toilet (With bath/ without bath facilities)	Yes		✓	
	Solid & liquid waste Disposal system available	No.			
	Any facility for Waste collection from road	Door to door	✓		
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND ✓ STREAM/RIVER CANAL ✓ WELL TUBE WELL ✓ OTHER (SPECIFY)		✓		
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	0.5	✓		

41

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	4	✓		
	Sub-Centre				
	PHC				
	BLOCK PHC				
	CHC/RH		✓		
	District/ Govt. Hospital	(2)	✓		
	Govt. Dispensary				
	Private Clinic	4 5	✓		
	Private Hospital/ Nursing Home	1	✓		
	AYUSH Health Facility				
	sonography /ultrasound facility	1	✓		
	If any of the above Facility is not available in village than approx. distance from village 14 kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	4	✓		
	Primary School	1	✓		
	Secondary school	1	✓		
	Higher sec. School	1	✓		
	ITI college/ vocational Training Center	1	✓		
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	1	✓		
	If any of the above Facility is not available in village than approx. distance from village ..... kms				

51

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Suggestions if any:

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

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

Suggestions if any:

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

19

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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

Suggestions if any:

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

71

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

VII. DATA COLLECTION FROM VILLAGE

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

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

18

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

1.	**Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other**	Public infra. facilities are good in Orozogiu village	Public Toilets are required proper maintenance
2.	**Additional Information/ Requirement**	–	
3.	**During the last six months how many times CLEANING** Every...Week..... **FOGGING**..During...winter..... **Drive was undertaken in the village?**		

IX. Smart Village / Heritage Details

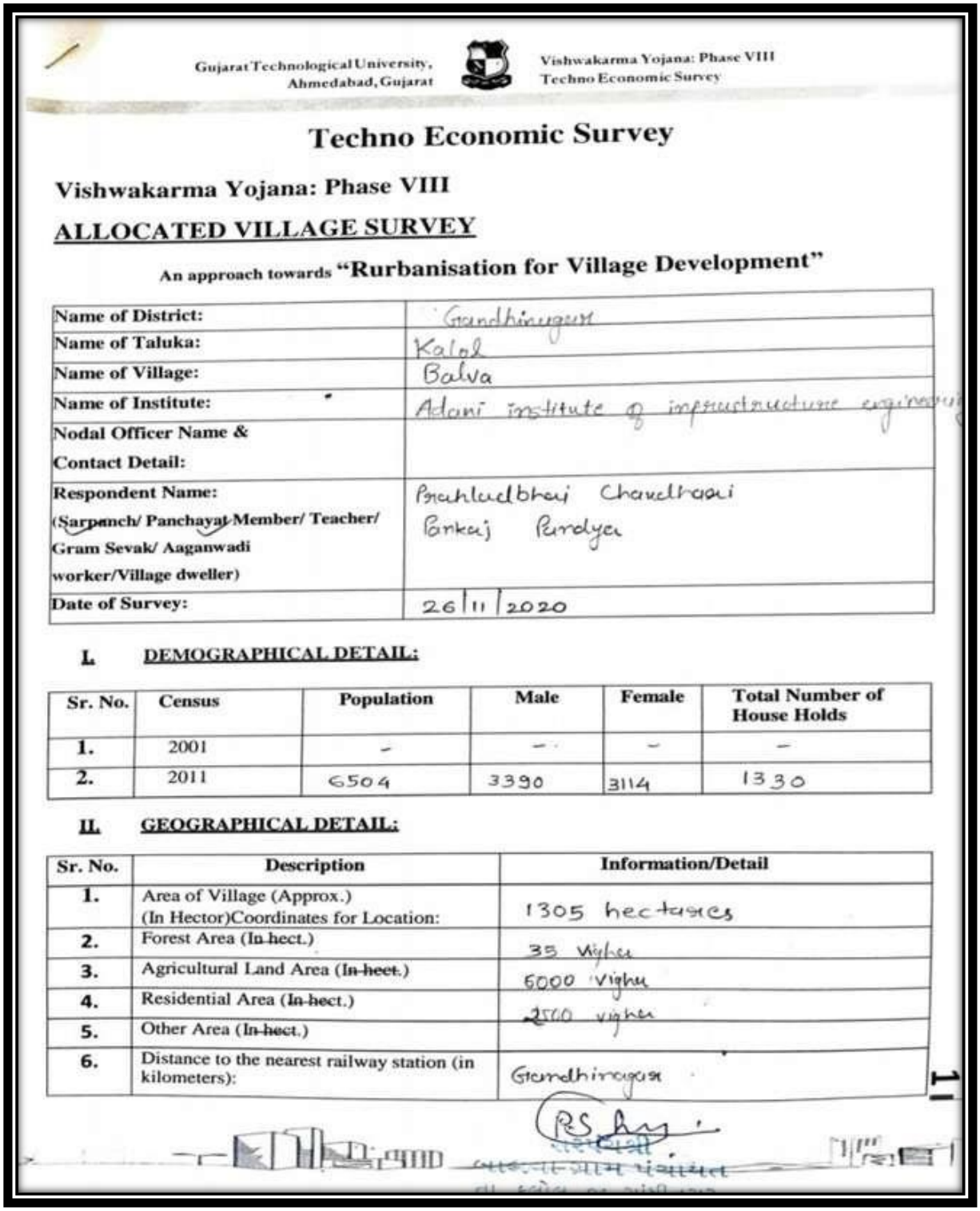
Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?	NO	

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

16

12.3 Allocated Village



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

Name of District:	Gandhinagar
Name of Taluka:	Kalol
Name of Village:	Balva
Name of Institute:	Adani institute of infrastructure engineering
Nodal Officer Name & Contact Detail:	
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Prahladbhai Chavdhani Pankaj Pandya
Date of Survey:	26/11/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	-	-	-	-
2.	2011	6504	3390	3114	1330

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1305 hectares
2.	Forest Area (In hect.)	35 vighe
3.	Agricultural Land Area (In hect.)	5000 vighe
4.	Residential Area (In hect.)	2500 vighe
5.	Other Area (In hect.)	
6.	Distance to the nearest railway station (in kilometers):	Gandhinagar

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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

III. OCCUPATIONAL DETAILS:

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

Major crops grown in the village:	1. Cotton
	2. Custor
	3. Mustard

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 ✓ (2)	through Narmada line	✓		
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 Channel ✓ Bottled Water ✓ Hand Pump		✓		

21

P.S ...
સરપંચશ્રી
બાલવા ગ્રામ પંચાયત

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Other(Specify)Lake/ Pond	1	✓		
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity: 2 lakh	✓		
	Underground Sump	Capacity: 2.5 lakh	✓		
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1		✓		
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	total : 4	✓		
	Main road	4	✓		
	Internal streets	✓	✓		
	Nearest NH/SH/MDR/ODR Dist. in kms. 2km	✓	✓		
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	Gamdhinagar			
	Bus station (Y/N) Condition: Average (If No than Nearest Bus Station---Kms)	Balva	✓		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Balva	✓		
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	✓	✓		

31

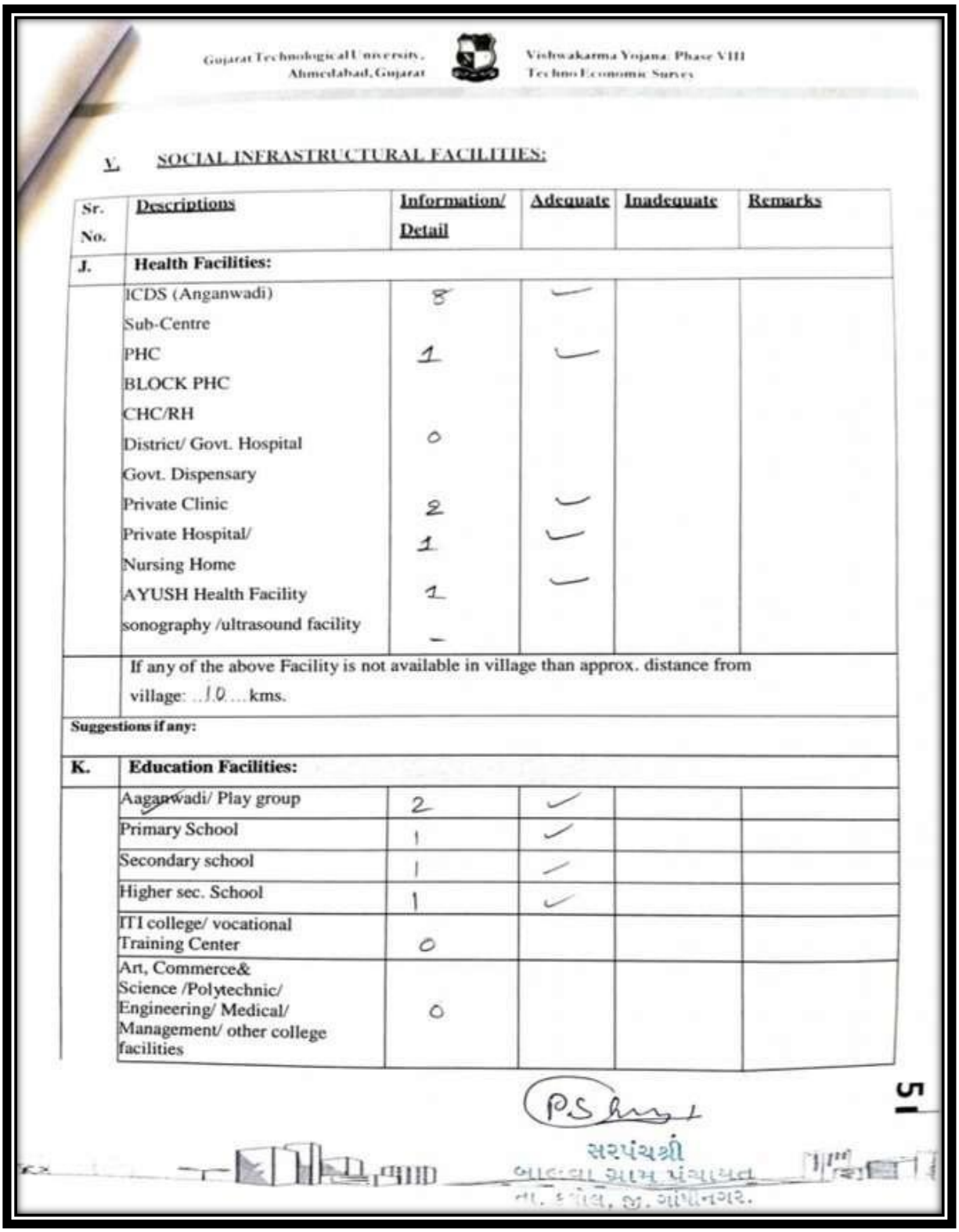
સરપંચશ્રી

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Power supply for Domestic Use	✓	✓		
	Power supply for Agricultural Use	✓	✓		
	Power supply for Commercial Use	✓	✓		
	Road Street Lights	✓	✓		
	Electrification in Government Buildings/ Schools Hospitals	✓	✓		
	Renewable Energy Source Facilities (Y/ N)	No			
	LED Facilities	Yes	✓		
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	No			
	Location Condition	–			
	Community Toilet (With bath/ without bath facilities)	No			
	Solid & liquid waste Disposal system available	Drainage	~		
	Any facility for Waste collection from road				
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND ✓ STREAM/RIVER CANAL ✓ WELL ✓ TUBE WELL ✓ OTHER (SPECIFY)	No. of Pond : 1	✓		
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	0.5	✓		

RSuthar
सरपंचश्री.



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	8	✓		
	Sub-Centre				
	PHC	1	✓		
	BLOCK PHC				
	CHC/RH				
	District/ Govt. Hospital	0			
	Govt. Dispensary				
	Private Clinic	2	✓		
	Private Hospital/ Nursing Home	1	✓		
	AYUSH Health Facility	1	✓		
	sonography /ultrasound facility	-			
	If any of the above Facility is not available in village than approx. distance from village: ..10....kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	2	✓		
	Primary School	1	✓		
	Secondary school	1	✓		
	Higher sec. School	1	✓		
	ITI college/ vocational Training Center	0			
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	0			

P.S

સરપંચશ્રી
બાલવા ગ્રામ પંચાયત
તા. કલોલ, જી. ગાંધીનગર.

51

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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)	0			✓
	Public Library (With daily newspaper supply: Y/N)	0			✓
	Public Garden	0			✓
	Village Pond	Good	In Balva	✓	
	Recreation Center	0			✓
	Cinema/ Video Hall	0			✓
	Assembly Polling Station	Good	In Balva	✓	
	Birth & Death Registration Office	Good	In Balva	✓	

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	Average	Balva	✓	
	Telecommunication Network/ STD booth				✓
	General Market			✓	
	Shops (Public Distribution System)	Good	Balva	✓	
	Panchayat Building	Good	Balva	✓	
	Pharmacy/Medical Shop	Good	Balva	✓	
	Bank & ATM Facility	Good	Balva	✓	
	Agriculture Co-operative Society				✓
	Milk Co-operative Soc.	Average	Balva	✓	
	Small Scale Industries				✓
	Internet Cafes/ Common Service Center/Wi Fi				✓
	Youth Club				✓
	Mahila Mandal (2)	Avg	Balva	✓	

19

સરપંચશ્રી

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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

Suggestions if any:

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

P.S
સરપંચશ્રી

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

P.S.
સરપંચશ્રી
બાલવા ગ્રામ પંચાયત
તા. કલોલ, જી. ગાંધીનગર.

18

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	Maintenance is required for existing Public infra. facilities	there are no public toilet
2.	Additional Information/ Requirement		
3.	During the last six months how many times CLEANING ..Every...2..Months..... FOGGING...During...winter..... Drive was undertaken in the village?		

IX. Smart Village / Heritage Details

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

સરપંચશ્રી

16

12.4 Gap Analysis

VILLAGE GAP Analysis

Village Facilities	Planning Commission/UDPFI Norms	Village Name: Population: Existing	Required as per Norms	Smart Village / Cities / Heritage Future Projection Design	Gap
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	3		4	-1
Primary School	Each Per 2500 population	1		2	1
Secondary School	Per 7,500 population	1		1	0
Higher Secondary School	Per 15,000 Population	1		1	0
College	Per 125,000 Population	0		1	+1
Tech. Training Institute	Per 100000 Population	0		0	0
Agriculture Research Centre	Per 100000 Population	0		0	0
Skill Development Center	Per 100000 Population	0		0	0
Health Facility		2		6	4
Govt/Panchyat Dispensary or Sub PHC or Health Centre	Each Village	2		5	3
Primary Health & Child Health Center	Per 20,000 population	2		5	3
Child Welfare and Maternity Home	Per 10,000 population	0		1	1
Multispeciality Hospital	Per 100000 Population	0		1	1
Public Latrines	1 for 50 families (if toilet is not there in home, specially for slum pockets & kutcha house)	0		7	7
Physical Infrastructure Facilities					
Transportation		Adequate / Inadequate			-
Pucca Village Approach Road	Each village	4		5	1
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)	1		1	0
Drinking Water (Minimum 70 lpcd)		Adequate / Inadequate (1)		3	
Over Head Tank	1/3 of Total Demand	2		5	3
U/G Sump	2/3 of Total Demand	2		3	1
Drainage Network - Open		Adequate / Inadequate			-
Drainage Network - Cover	✓			✓	-
Waste Management System	—	Adequate / Inadequate		✓	—
Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	—		1	1
community hall and Public Library	Per 15000 Population	—		1	1
Cremation Ground	Per 20,000 population	1		2	1
Post Office	Per 10,000 population	1		1	0
Gram Panchayat Building	Each individual/group panchayat	1		1	0
APMC	Per 100000 Population	0		-	-
Fire Station	Per 100000 Population	0		1/2	1/2
Public Garden	Per village	0		1/2	1/2
Police post	Per 40,000Population	1		1	0
Shopping Mall		✓			
Electrical Design					
Electricity Network		Adequate / Inadequate			
Any Smart Village Facility					
Technology					
Sloar LED Street light					
		ESR cap	0		
		Sump cap	0		
		Lat	0		

સરપંચશ્રી
બાલવા ગ્રામ પંચાયત
તા. કલોલ, જી. ગાંધીનગર.

*Note: All the reports mentioned in attachment will be provided as hard copy in the final report

12.5 Summary Details of all the Villages in Table form as Part-I & Part-II

Table 18 Summary of Designs

SR NO.	Village Type	Discipline	Part-I	Part-II
1.	Allocated Village	CIVIL	Community Hall	Rain Water harvesting
			Public Toilet	Market
			Public Parking	Library
			ATM	Park
			Shopping Area	Village Gate
			Steel Gate	Development Centre
2.	Ideal Village	CIVIL	Bus Stand	Bank
			Garden	Public Toilet
			Water tank	Anganwadi
			ATM	Krishi Kendra
			Public Library	Medicine Store
			Development Centre	Community Hall
3.	Smart Village	CIVIL	Public Library	Old-age Home
			Bank	Hospital
			Community Hall	Public Parking
			Dairy	Public Park
			Cyber cafe	Development Centre
			Village Gate	Laboratory

12.6 Drawings

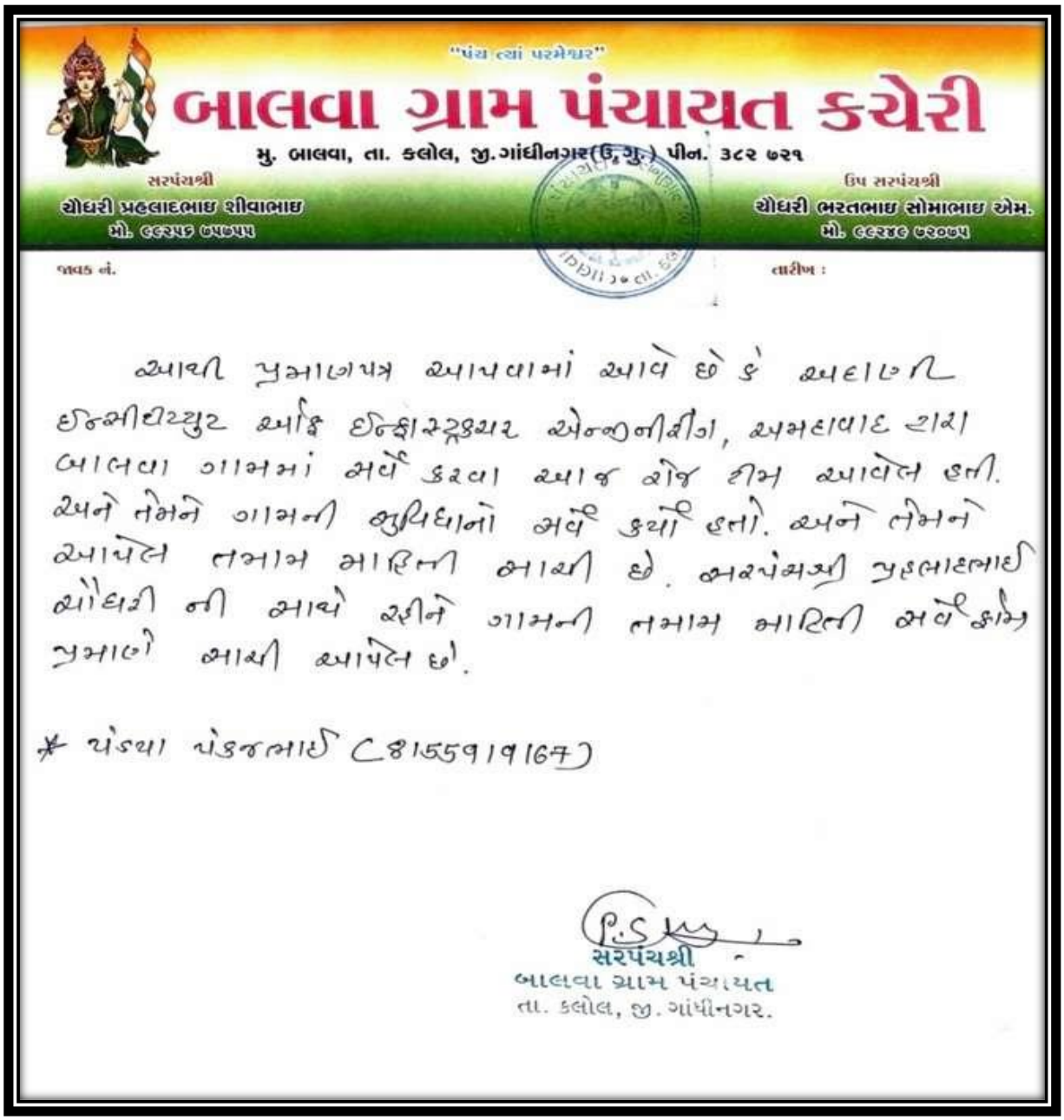
*All the drawings and images are attached in their perspective chapters along with the designs and their listing are mentioned in the list of figures along with their page numbers. Also we have attached A3 sheets of proposed designs at the end of the Vishwakarma Yojana Phase VIII Part-I report.

12.7 Summary of Good Photographs in Table Format

- Summary of Good Photographs of Balva Village.

- Summary of Good Photographs of Gozariya village.

12.8 Sarpanch Letter of Balva Village



"પંચ ત્યાં પરમેશ્વર"

બાલવા ગ્રામ પંચાયત કચેરી

મુ. બાલવા, તા. કલોલ, જી.ગાંધીનગર(ઉ.ગુ.) પીન. ૩૮૨ ૭૨૧

સરપંચશ્રી
ચૌધરી પ્રહલાદભાઇ શીવાભાઇ
મો. ૯૯૨૫૬ ૭૫૭૫૧

ઉપ સરપંચશ્રી
ચૌધરી ભરતભાઇ સોમાભાઇ એમ.
મો. ૯૯૨૪૬ ૭૨૦૭૫

જાવક નં. તારીખ :

આથી પ્રમાણપત્ર આપવામાં આવે છે કે અદાણી ઈલેક્ટ્રીસીટ્યુટ એન્ડ ઈન્ફ્રાસ્ટ્રકચર એન્જીનીરીંગ, અમદાવાદ દ્વારા બાલવા ગામમાં સર્વે કરવા આજ રોજ ટીમ આવેલ હતી. અને તેમને ગામની સુવિધાનો સર્વે કર્યો હતો. અને તેમને આપેલ તમામ માહિતી આથી છે. સરપંચશ્રી પ્રહલાદભાઈ ચૌધરી ની સાથે રહીને ગામની તમામ માહિતી સર્વે કામ પ્રમાણે આથી આપેલ છે.

* પંડ્યા પંકજભાઈ (8155919167)

P.S.
સરપંચશ્રી
બાલવા ગ્રામ પંચાયત
તા. કલોલ, જી. ગાંધીનગર.

Figure 72 Letter of Sarpanch (Balva)

12.9 Sarpanch Letter of Gozariya Village

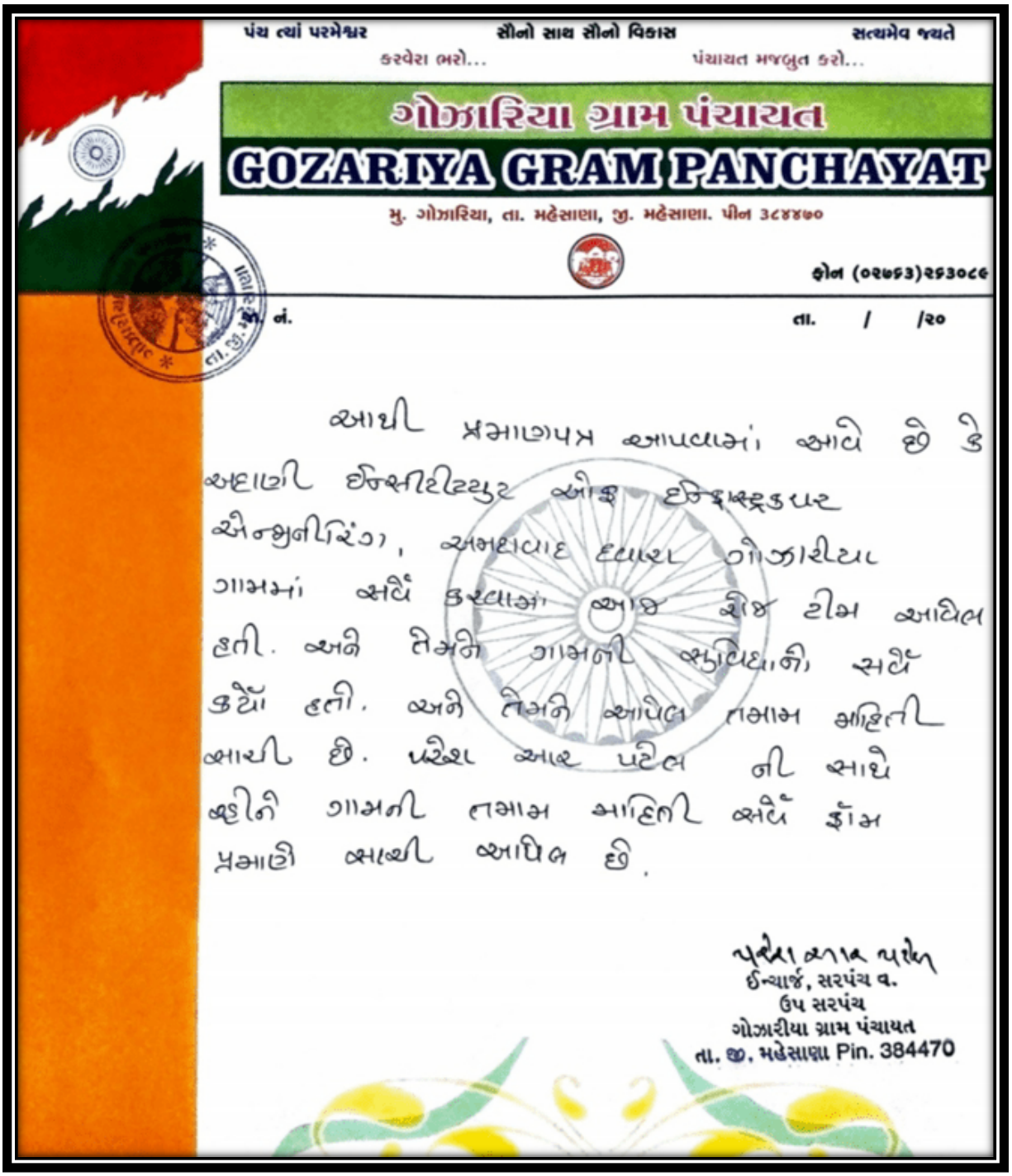


Figure 73 Letter of Sarpanch (Gozaria)

13. From the Chapter- 9 future designs of the aspects

13.1 Design Proposals

13.1.1 Civil Design 1

Library

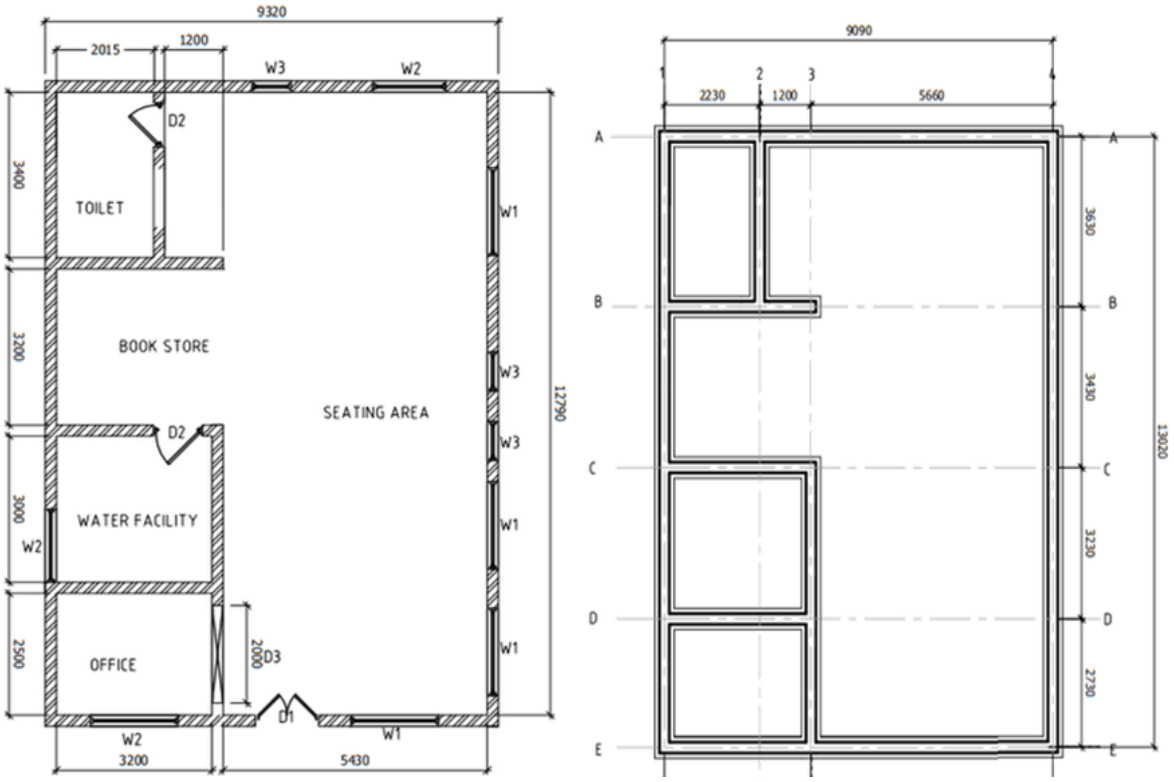


Figure 74 Plan & Foundation Plan of Library

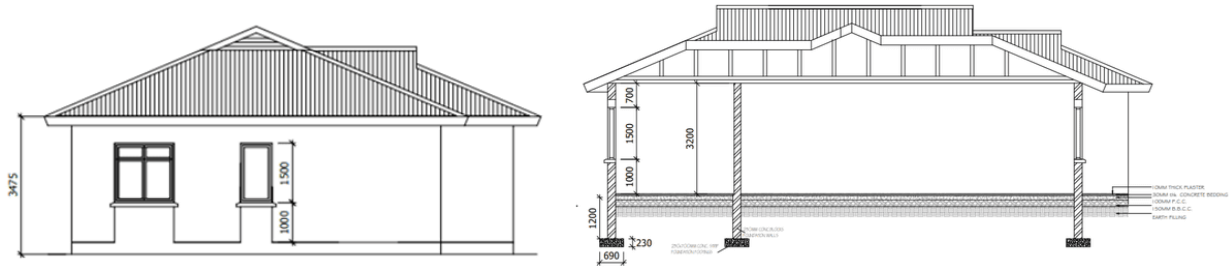


Figure 75 Elevation & Section of Library

Need of Library:

- The Balva village does not have any Library.
- They play an important role in language learning.
- They help boost local economies.
- They offer free educational resources to everyone.

Figure 76 Need of Library

Benefits of Library:

Figure 77 Benefits of Library

Table 19Costing of Library

Sr No.	Description	Nos.	Length(m)	Width(m)	Height(m)	Quantity	Unit	Rate(Rs.)	TOTAL RATE (Rs.)
1	Excavation	1	61.21	0.8	1.43	70.02424	m^3	170	11904.1208
2	PCC	1	61.595	0.69	0.15	6.375083	m^3	3200	20400.264
3	Brick Work in Foundaton	Total=	124.8	0.92	1.43	27.21971	m^3	3100	84381.09015
4	Earth Filling	Total=	18.2	24.8	3.45	74.037	m^3	500	37018.5
5	B.B.C.C	1	63.205	0.23	0.15	2.180573	m^3	2000	4361.145
6	DPC	1	63.205	0.23	0	14.53715	m^2	1200	17444.58
7	Concrete Bedding	1	63.205	0.23	0	14.53715	m^2	2100	30528.015
8	Brick Work in Super structure	Total=	34.805	2.53	8.4	39.31183	m^3	165	6486.45195
9	RCC Slab	1	9.09	13.02	0.15	17.75277	m^3	4750	84325.6575
TOTAL COST=									296849.8244
ADDING 6% of CONTIGENCY									
FINAL COST =								RS. 314,660.8139	

13.1.2 Civil Design 2
Bus Stop

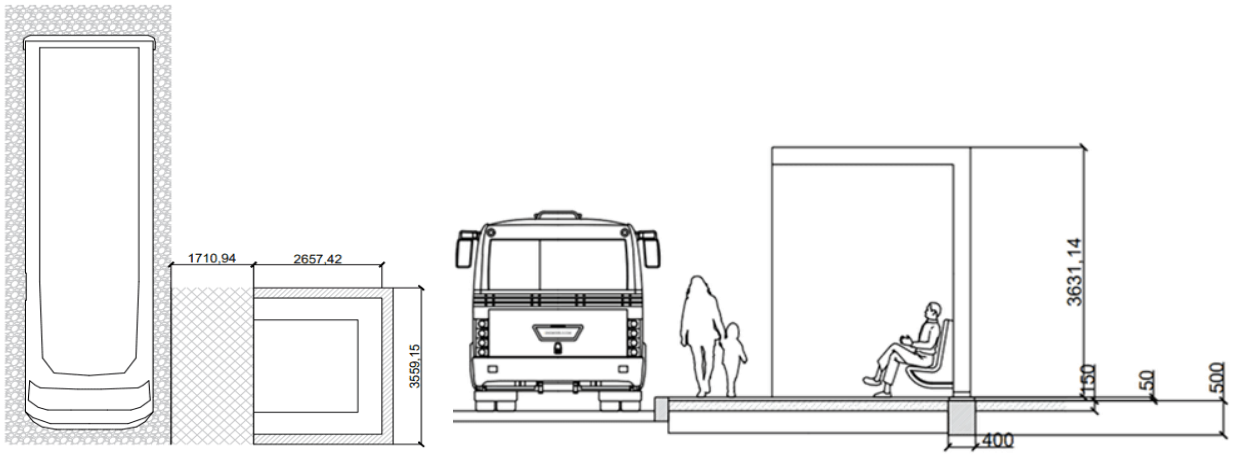


Figure 78 Plan & Section of Bus Stop

Need of Bus Stop:

- There is only one bus stop available in the village which is near the primary school located far away from the residential area.
- There are number of villagers that travel through bus, but stand on road and obstruct on coming traffic. Having bus stop will solve the problem.
- Bus stops prevent passengers from trying to board or alight in hazardous situations such as at intersections or where a bus is turning and is not using the curb lane.

Benefits of Bus Stop:

- Bus stops prevent passengers from trying to board or alight in hazardous situations such as at intersections or where a bus is turning and is not using the curb lane.
- A bus driver cannot be expected to continuously look for intending passengers. A bus stop means that the driver only needs to look for intending passengers at the approach to each bus stop.
- Bus turnouts, or lay-bys, allow buses to stop without impeding the flow of traffic on the main roadway.

LOCATION:
Providing the new bus stop at the main circle, so that it may reduce the commute time for the villagers.

Table 20 Costing of Bus Stop

Sr No.	Description	Nos.	Length(m)	Width(m)	Height(m)	Quantity	Unit	Rate(Rs.)	TOTAL RATE (Rs.)
1	Excavation	1	8.73	0.5	0.5	2.1825	m^3	170	371.025
2	PCC	1	8.73	0.5	0.15	0.65475	m^3	3200	2095.2
3	Brick Work in Foundaton	1	8.73	0.4	0.5	1.746	m^3	3100	5412.6
4	Earth Filling	Total=	4.36	6.59	1	7.08675	m^3	500	3543.375
5	B.B.C.C	1	8.73	0.23	0.15	0.301185	m^3	2000	602.37
6	DPC	1	8.73	0.23	0	2.0079	m^2	1200	2409.48
7	Concrete Bedding	1	8.73	0.23	0	2.0079	m^2	2100	4216.59
8	Brick Work in Super structure	1	8.73	0.23	3.5	7.02765	m^3	165	1159.56225
9	RCC Slab	1	2.77	3.27	0.15	1.358685	m^3	4750	6453.75375
TOTAL COST=									26263.956
ADDING 6% of CONTIGENCY									
FINAL COST =								RS. 27,840	

13.1.3 Civil Design 3
Development Center:

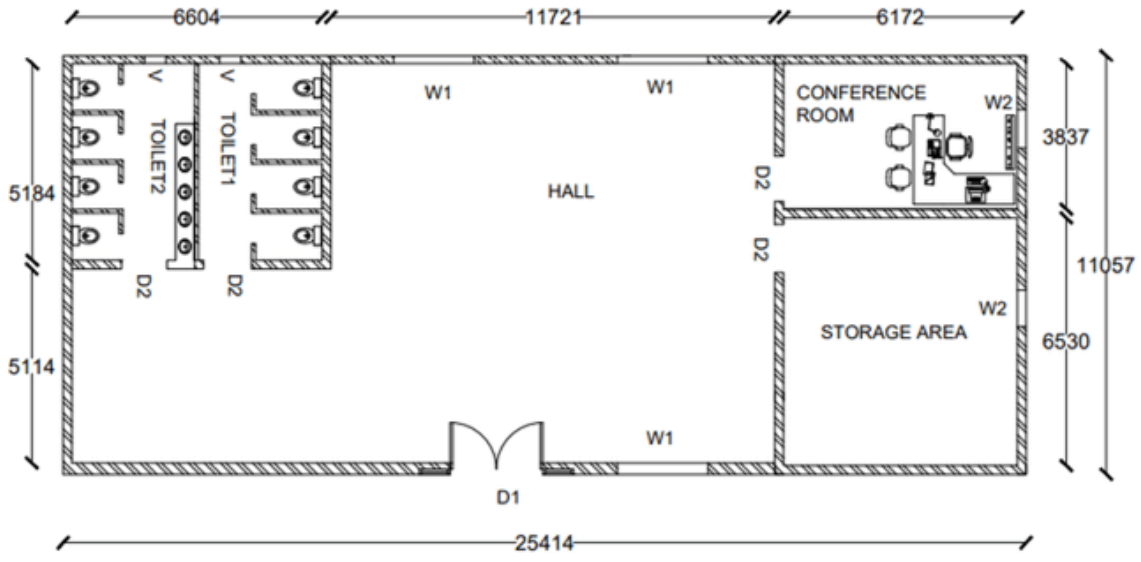


Figure 79 Plan of Development center

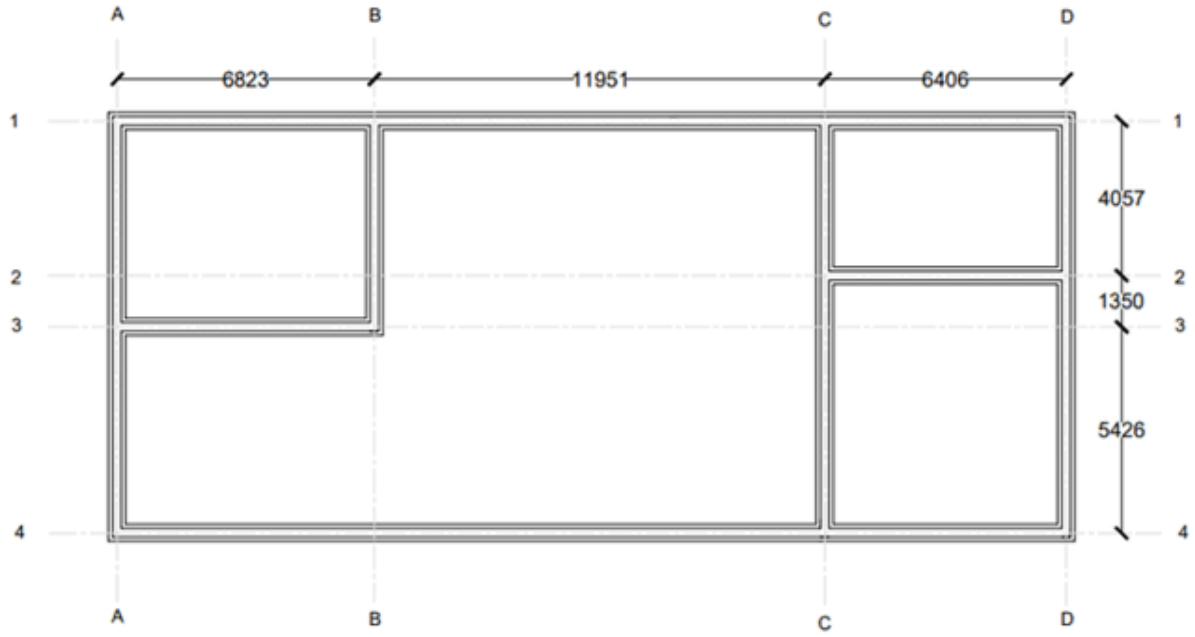


Figure 80 Foundation Plan of Development Center

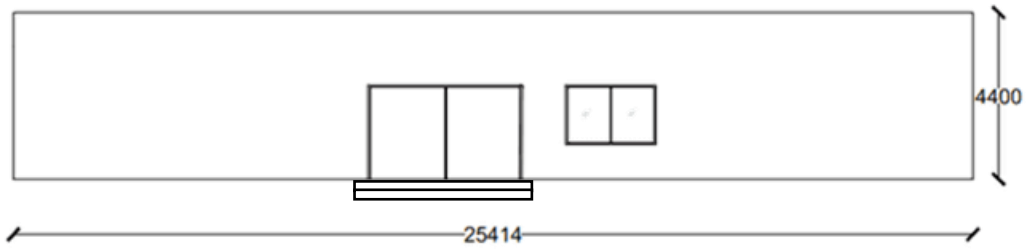


Figure 81 Elevation of Developmente Center

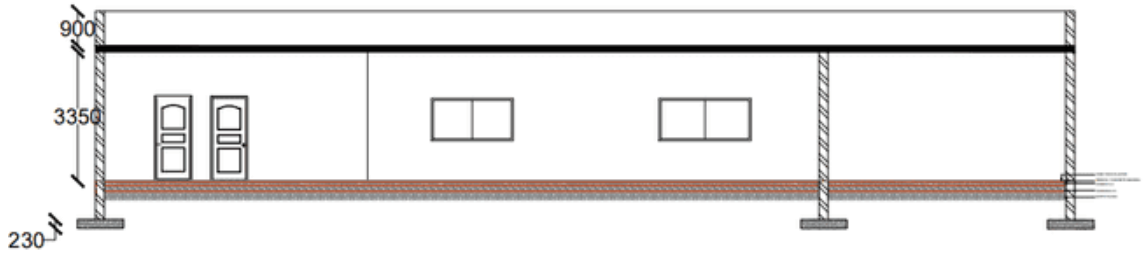


Figure 82 Section of Development Center

Need of Development Center:

- There is no development center accessible in the village.
- Nearby financial specialists can assemble and can foster their expert abilities.
- Local people can sort out proficient level workshops in their own village.

Benefits of Development Center:

- Cost saving in Infrastructure.
- Innovative and Quality work
- Focus on your core business
- 24/7 Services
- Improved Efficiency
- Faster Product Delivery
- No new infrastructure required

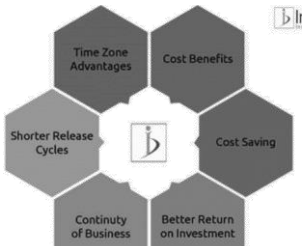


Figure 83 Benefits of Development Center

LOCATION: We will provide it near the Panchyat office which will make it easy accessible for the officials.

Table 21 Costing of Development Center

Sr No.	Description	Nos.	Length(m)	Width(m)	Height(m)	Quantity	Unit	Rate(Rs.)	TOTAL RATE (Rs.)
1	Excavation	1	103.01	1	0.65	66.9565	m^3	170	11382.605
2	PCC	1	104.49	0.63	0.15	9.874305	m^3	3200	31597.776
3	Brick Work in Foundaton	Total=	210.34	0.92	1.344	43.72685	m^3	3100	135553.2499
4	Earth Filling	Total=	31	37.37	3.45	175.5878	m^3	500	87793.875
5	B.B.C.C	1	105.81	0.3	0.15	4.76145	m^3	2000	9522.9
6	DPC	1	105.81	0.3	0	31.743	m^2	1200	38091.6
7	Concrete Bedding	1	105.81	0.3	0	31.743	m^2	2100	66660.3
8	Brick Work in Super structure	Total=	89.91	2.7	2.4	105.153	m^3	165	17350.245
9	RCC Slab	1	10.77	25.17	0.15	40.66214	m^3	4750	193145.1413
10	Brick Work in Parapet wall	Total=	35.99	0.6	1.8	19.4346	m^3	165	3206.709
TOTAL COST=									594304.4011
ADDING 6% of CONTIGENCY									
FINAL COST =								RS. 629,962.6652	

13.1.4 Civil Design 4
Cyber Café

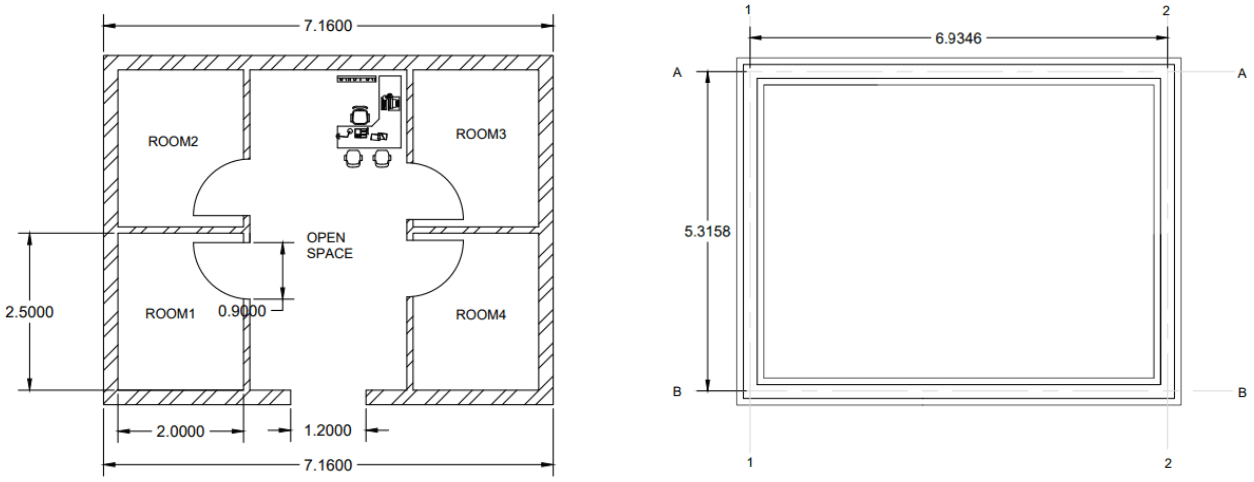


Figure 84 Plan & Foundation of Cyber Cafe

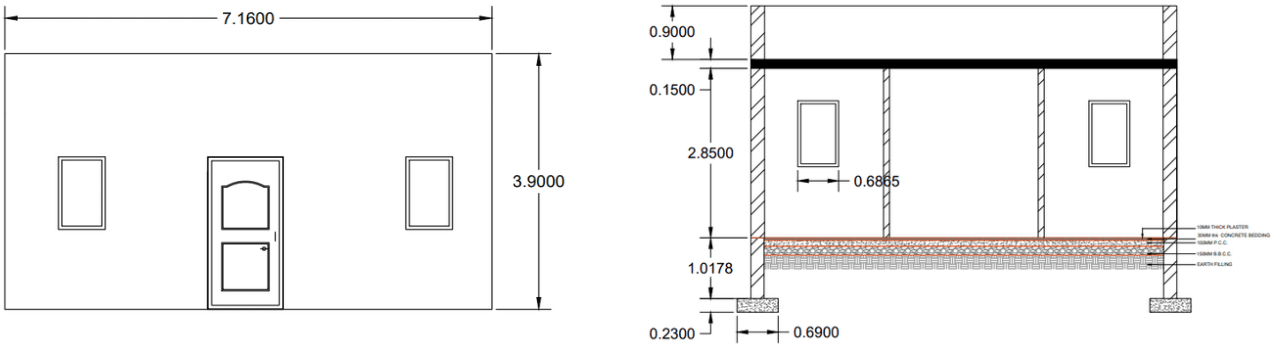


Figure 85 Elevation & Section of Cyber Café

Need of Cyber Café:

- In the Balva village there is no any cybercafé existing in the village.
- From the feedbacks which were given by the villagers we have decided to design a cybercafé as a smart village design for the main purpose of internet availability at any time for any person in the village.
- Ease of use; availability internet and for the people who can know about the internet ;etc.

Benefits of Cyber Café:

- You pay for what you use.
- Fast Internet
- Social Place
- Security
- Illegal Gambling Problem
- Internet Access for Everyone
- No Equipment Hassles

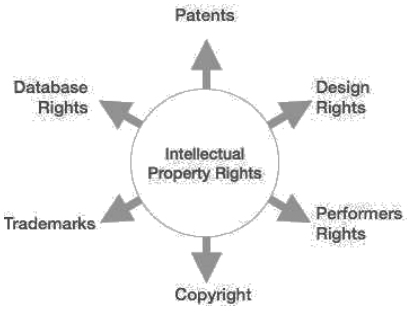


Figure 86 Benefits of Cyber Cafe

LOCATION: It will provided near the schools of the village making it easy to access.

Table 22 Costing of Cyber Cafe

Sr No.	Description	Nos.	Length(m)	Width(m)	Height(m)	Quantity	Unit	Rate(Rs.)	TOTAL RATE (Rs.)
1	Excavation	1	24.52	0.8	0.65	12.7504	m^3	170	2167.568
2	PCC	1	24.52	0.69	0.15	2.53782	m^3	3200	8121.024
3	Brick Work in Foundaton	Total=	49.04	0.92	1.344	10.1738384	m^3	3100	31538.89904
4	Earth Filling	1	6.7	5.1	0.69	23.5773	m^3	500	11788.65
5	B.B.C.C	1	24.52	0.23	0.15	0.84594	m^3	2000	1691.88
6	DPC	1	24.52	0.23	0	5.6396	m^2	1200	6767.52
7	Concrete Bedding	1	24.52	0.23	0	5.6396	m^2	2100	11843.16
8	Brick Work in Super structure	Total=	17.42	1.15	2.35	13.3538	m^3	165	2203.377
9	RCC Slab	1	6.93	5.33	0.15	5.540535	m^3	4750	26317.54125
10	Brick Work in Parapet wall	Total=	12.26	0.46	1.8	5.07564	m^3	165	837.4806
	TOTAL COST=								103277.0999
	ADDING 6% of CONTIGENCY								
	FINAL COST =							RS. 109,473.7259	

13.1.5 Civil Design 5
Retail Shop:

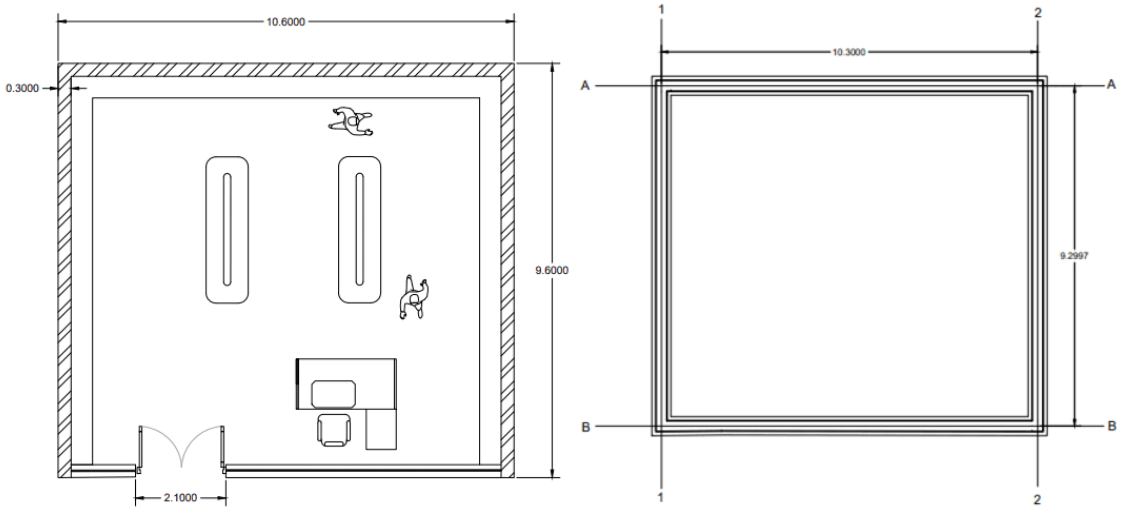


Figure 87 Plan & Foundation Plan of Retail Shop

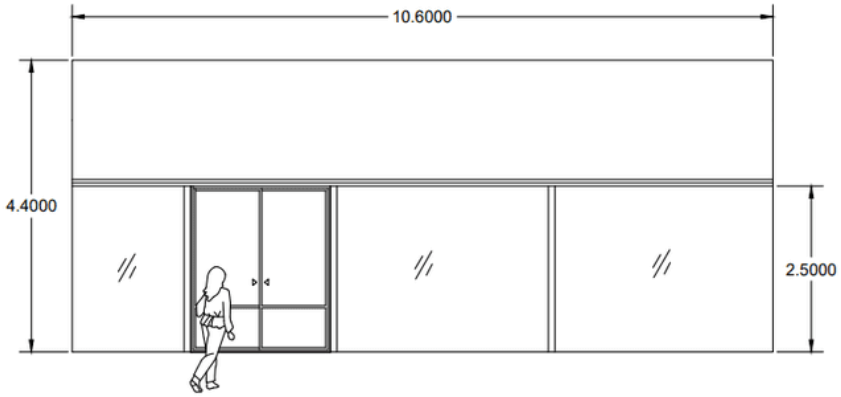


Figure 88 Elevation of Retail Shop

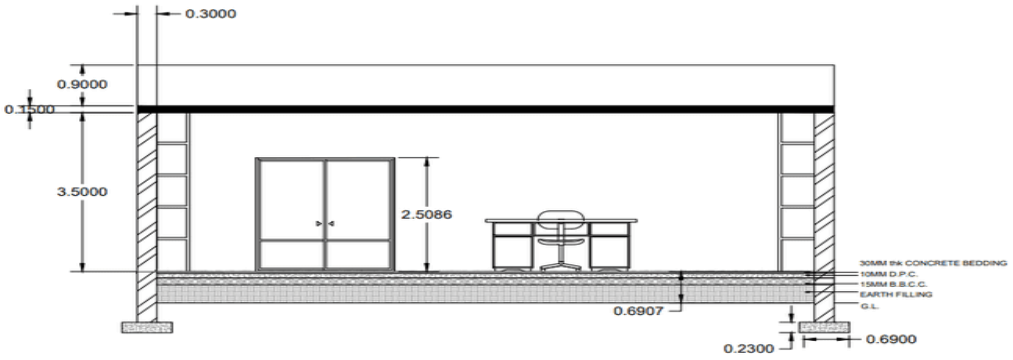


Figure 89 Section of Retail Shop

Need of Retail Shop:

- In the Balva village there is no any self-service shop and having variety in it.
- From the feedbacks which were given by the villagers we have decided to design a Retail Shop as a smart village design for the main purpose of every goods availability at any time for any person in the village.
- It offers large variety of goods to the customers at one place which leads to large turnover. Advertisements cost of operation and selling overheads are lesser.
- It enjoys the economies of large scale operation

LOCATION: We will provide it near to crossroad of the shops area available in the village.

Table 23 Costing of Retail Shop

Sr No.	Description	Nos.	Length(m)	Width(m)	Height(m)	Quantity	Unit	Rate(Rs.)	TOTAL RATE (Rs.)
1	Excavation	1	39.2	1	0.65	25.48	m^3	170	4331.6
2	PCC	1	39.2	0.69	0.15	4.0572	m^3	3200	12983.04
3	Brick Work in Foundaton	Total=	78.4	0.99	1.344	19.32168	m^3	3100	59897.208
4	Earth Filling	1	10	9	0.69	62.1	m^3	500	31050
5	B.B.C.C	1	39.2	0.3	0.15	1.764	m^3	2000	3528
6	DPC	1	39.2	0.3	0	11.76	m^2	1200	14112
7	Concrete Bedding	1	39.2	0.3	0	11.76	m^2	2100	24696
8	Brick Work in Super structure	Total=	18	0.9	1.8	32.9445	m^3	165	5435.8425
9	RCC Slab	1	10.6	9.6	0.15	15.264	m^3	4750	72504
10	Brick Work in Parapet wall	Total=	19.6	0.6	1.8	10.584	m^3	165	1746.36
	TOTAL COST=								230284.0505
	ADDING 6% of CONTIGENCY								
	FINAL COST =							RS. 244,101.0935	

13.1.6 Civil Design 6
Recreation Center:

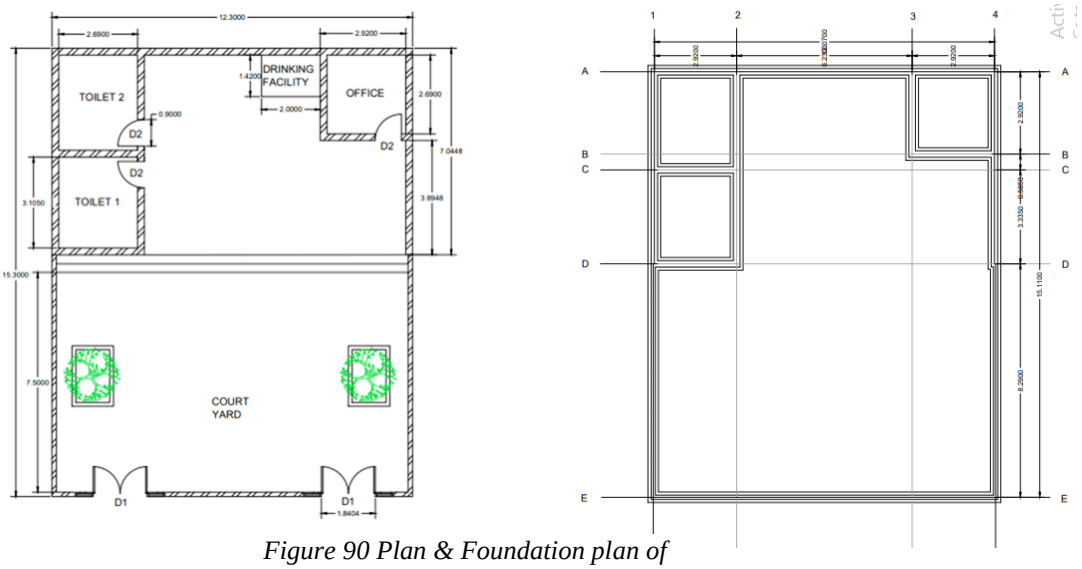


Figure 90 Plan & Foundation plan of Recreation Center

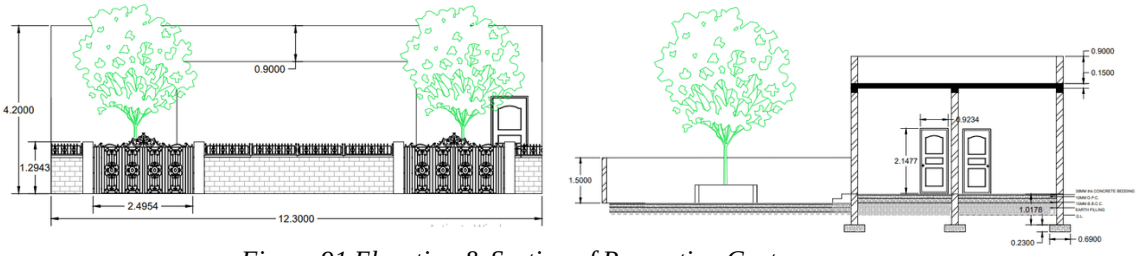


Figure 91 Elevation & Section of Recreation Center

Need of Recreation Center:

- There are no recreation center available in the Balva village.
- A quality recreation center is a valuable asset to any community.
- A well-run community center serves as a thriving hub of activity for youth, families, senior citizens, civic organizations, parks and recreation departments, and more.

Benefits of Recreation Center:

- Offer place for social interaction
- Enhance relationship skills - teach vital life skills
- Provide space to enjoy nature - clean air and water

LOCATION: An area is available near the Aganwadi of the village, which is the good location for such structure.

Table 24 Costing of Recreation Center

Sr No.	Description	Nos.	Length(m)	Width(m)	Height(m)	Quantity	Unit	Rate(Rs.)	TOTAL RATE (Rs.)
1	Excavation	1	42.55	0.8	0.65	22.126	m^3	170	3761.42
2	PCC	1	42.825	0.69	0.15	4.432388	m^3	3200	14183.64
3	Brick Work in Foundaton	Total=	86.8	0.92	1.344	18.0636	m^3	3100	55997.1662
4	Earth Filling	Total=	29.29	27.1	3.95	98.67685	m^3	500	49338.4245
5	B.B.C.C	1	43.975	0.23	0.15	1.517138	m^3	2000	3034.275
6	DPC	1	43.975	0.23	0	10.11425	m^2	1200	12137.1
7	Concrete Bedding	1	43.975	0.23	0	10.11425	m^2	2100	21239.925
8	Brick Work in Super structure	Total=	41.875	0.23	1.25	33.97158	m^3	165	5605.309875
9	RCC Slab	1	12.07	6.88	0.15	12.45624	m^3	4750	59167.14
10	Brick Work in Parapet wall	Total=	19.18	0.46	1.8	7.94052	m^3	165	1310.1858
	TOTAL COST=								225774.5864
	ADDING 6% of CONTIGENCY								
	FINAL COST =							RS. 239,321.0616	

13.1.7 Electrical Design 1

Arduino Based Liquid Vending Machine:

This is programmed fluid apportioning machine, which controls the progression of fluid/milk and supplies fixed measure of fluid. The client needs to type/select from show board for the measure of fluid/milk required. At that point the machine spill out accurate sum from the outlet valve present. By this way the client won't be cheated and the man administration needed for giving fluid/milk will be diminished or transformed into programmed. Henceforth this model assumes an extraordinary part in keeping up immaculateness in estimation alongside contactless conveyance of fluid/milk.

Block Diagram:

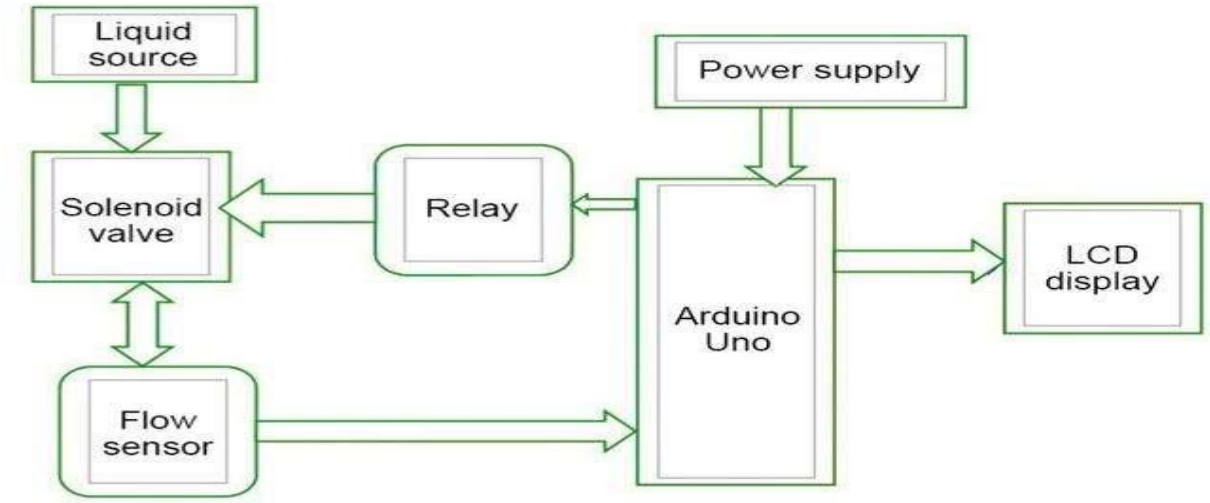


Figure 92 Block diagram of Vending Machine

Equipment's used along with specifications:

- ARDUINO - ATMEGA328
- LCD display - 16 × 2
- Resistor - 100E; 1k
- Diode - 1N4007
- Transistor - BC547
- Relay - 12V 1CO Relay
- Flow sensor

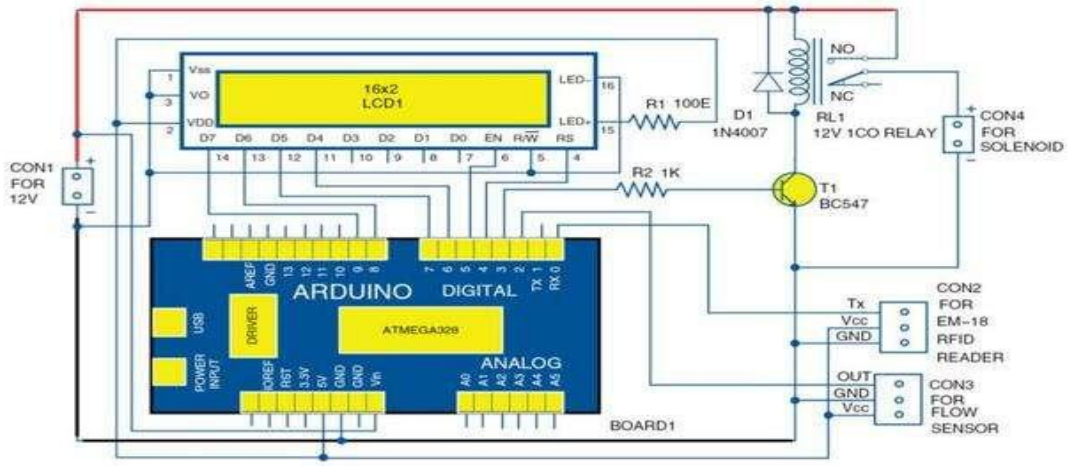


Figure 93 Circuit Diagram

Valve Mounting

Figure 94 Valve mounting

A 12V solenoid is utilized to control the progression of fluid. At the point when the solenoid gets invigorated, it opens its valve and permits liquid to move through the stream sensor; else it stays shut and doesn't permit liquid to stream across it. The solenoid valve utilized in this undertaking is appeared in figure.

Location for use:

- This model can be implemented at dairy situated in Balva village. It requires 12V battery to power the model which can be easily mounted in dairy or else direct supply from power socket will also be optimal for using this device.
- This device can be placed on places where liquid flow is sold on measurement like in some farms water is supplied from one source. So, we can implement this device and as per the requirement of buyer of water, that much accurate amount of water will be given to respective farm.
- This can also be used by an individual who sell milk of their own cattle. This will reduce the efforts and 12v battery is easy to mount at home. So for those individuals who run their own small scale dairy and sell milk this model will be beneficial.

Benefits to Villagers:

- The delivery of liquid/milk will be contactless which will in turn increase the hygiene. Hence the villagers will be protected from viral or contagious diseases.
- The customer can enter the amount of fluid/milk they want and that same exact amount of fluid will come through the valve which in turn increases the trust of customer by nullifying the chances of cheating in measurement.

Costing:

• Arduino - Rs.500
  - ATMEGA328
• LCD display - Rs.400
  - 16×2 local made lcd display
• Resistor box - Rs.50
  - 100E , 1k

• Diode - Rs.40
  - 1N4007
• Transistor - Rs.20
  - BC547
• Relay - Rs.30
  - 12V 1CO relay.
• Flow sensor - Rs.275
  - Pricing taken from robu.in the verified sensor making and selling company.
• **Approximate Total Costing: Rs.1500**

13.1.8 Electrical Design 2

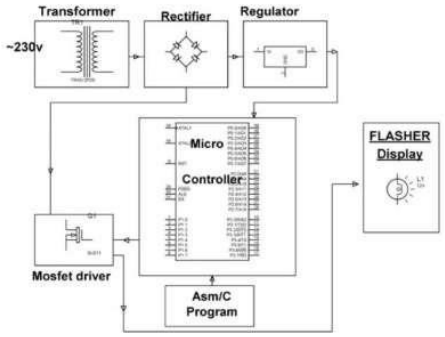


Figure 95 Circuit diagram of beacon flasher

Beacon Flasher:
Signal flasher is a plan drew in to provide flashing lamp reproducing a beacon light. This light is utilized as notice signal at different zones. In village this light can be fixed at vertical beginning and section point of dividers; before gates of dairy, gram panchayat office, and school, vehicle leaving territory, sanctuary, underground wells, electrical transformer or electrical supplies.
A low voltage light of 12V is driven by a force MOSFET in PWM mode drive which is gotten from a microcontroller. The obligation pattern of the PWM builds continuously and diminishes in certain time span microcontroller is locked in to give blazing light re-enacting a reference point light.
Equipment's used along with Specifications:
Power Supply Block
• Beacon Flasher Light - 12 V
• Microcontroller (AT89S52/ AT89C51)
  - 4.0 to 5.5 Operating range.
  - 32 programmable I/O lines.
  - 3 level program memory lock.
  - 8 interrupt sources.
  - Watchdog timer.
• PWM
  - Telecommunications
  - Power delivery
  - Voltage regulation
  - High switching frequency

• MOSFET
  - Acts as a switch
  - N-type and P-type
• Transistor - BC547
  - NPN Silicon
  - switching and amplification uses
• Diode - IN4007
  - AC to DC conversion
  - Current flow in only 1 direction
• Resistors and capacitors

Flow of Power Supply:
230V AC 50Hz - 12V Step down transformer - AC to DC Bridge rectifier - 470micro farad filter - 5V regulator.

Advantage to Villagers:
- Villagers entering village around night time will be alerted.
- Decrease in number of mishaps happens because of ignorance.
- Chances of obliteration to significant property will be diminished.

Location of Implementation:
- This can be located near the opening gates of dairy. Here power supply can be takes from dairy so there is no need of Implementation an additional battery for turning on this model.
- This can also be fitted near the entrance of gram panchayat to enhance the security of it and the power supply is easily available here.
- Implementation of this model can be done near underground wells of individual houses so as during night time one can be cautious and alerted. The power supply can be easily taken from individual houses near respective wells.
- It can be implemented near all valuable assets where the driver of vehicle need to be cautious during night time.In case of no power supply available one can install battery as per the requirements.

Costing:
Microcontroller - Rs.100
• PWM - Rs. 250
• Transistor - BC547 - Rs. 20
• Diode - IN4007 - Rs. 40
• Resistor and Capacitor box - Rs. 50
• Beacon Flasher light - Rs. 780
• Approximate Total Costing - Rs. 1,250

13.1.9 Electrical Design 3

Blown Fuse Indicator

A fuse is an electrical security gadget that works to give overcurrent assurance of an electrical circuit. Its fundamental part is a metal wire or strip that liquefies when an excessive amount of current moves through it, consequently intruding on the current. It is a conciliatory gadget; when a breaker has worked it is an open circuit, and it should be supplanted or overhauled, contingent upon type. For the most part, when hardware shows no force, the reason might be only a blown wire. Here is a blown fuse pointer circuit that shows the state of wire through LEDs. This conservative circuit is helpful and solid. It utilizes not many parts, which makes it cheap as well.

Circuit Diagram:

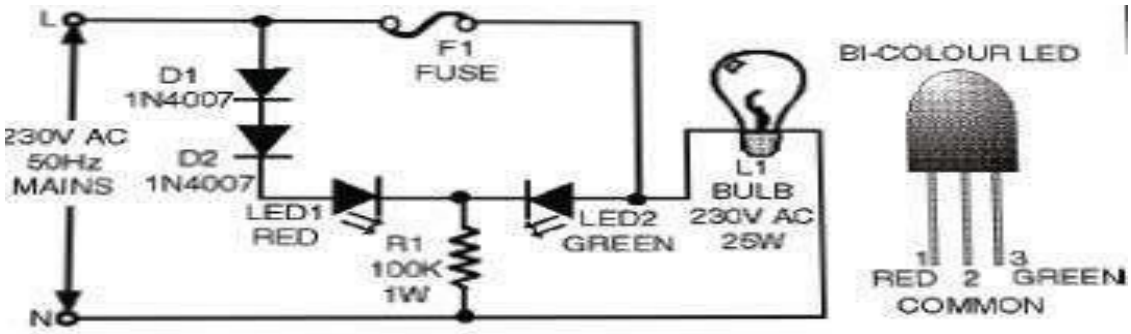


Figure 96 Circuit diagram of blown fuse indicator

Electrical Components Used:

- Diode - 1N4007 - Quantity: 2
- LED - Red and Green Coloured- Quantity: 1 each
- Resistor - 100K, 1W
- Fuse
- Bulb - 25W, 230V AC Operated

Operation of Model:

Under ordinary conditions (when circuit is okay), voltage drop in first arm is 2V + (2 x 0.7V) = 3.4V, while in second arm it is just 2V. So current courses during that time arm, i.e. through the green LED, making it glow; though the red LED stays off. At the point when the fuse brushes off, the stockpile to green LED gets hindered, and on the grounds that just one LED is in the circuit, the red LED shines. If there should be an occurrence of force disappointment, the two LEDs stay 'off'.

Figure 97 Location for BFI

Location of Implementation:

- This model can be implemented at the substance from where the electricity is transferred to village.
- The model can also be placed into effect where the step down transformer is placed in village near Dena Bank ATM as shown in figure. The power here can be easily available as the wires can be easily connected from ac supply. Hence this seems to be the perfect location for the implementation of this model.

Benefits to Villagers:

• The faults occurring due to short-circuit will be reduced and this will increase the reliability of system which in turn gives constant power supply to villagers.

• Sometimes the technical person has to check whole system to find out where the fault has occurred which increases time taken for resolving fault and in turn the village will be following black out condition. So by this model implementation the person will instantly came to know that fault is in the fuse wire connected and the fault can be rapidly solved. Hence this model helps in detecting location of fault.

• The fault sometimes occurs at night time which increases the risk because of lack of lights. Hence when the led is blown red and which states that fault has happened with fuse.

Costing:

• Diode - Rs. 40 × 2 = Rs.80 -1N4007 of 2 quantity

• LED - Rs.50- Red and green coloured

• Resistor Box - Rs.50 - 100k

• Fuse - Rs. 440 (Anchor Products)

• Bulb - Rs.899 (Philips Products)-25W, 230V AC operated

Total Approximate Pricing - Rs.1520

Additional Expansion in model:

• This circuit can be handily altered to deliver an alarm in meld blown condition (see Fig.). An optocoupler is utilized to trigger the alarm. At the point when the circuit blows, red LED shines. At the same time it turns 'ON' the alarm.

• One can also use 2 separate LEDs instead of bicolor LEDs. Similarly in place of 2 separate diodes one can use one single diode but here we have used separate diodes to increase voltage drop since two different LED's will produce different voltage drops.

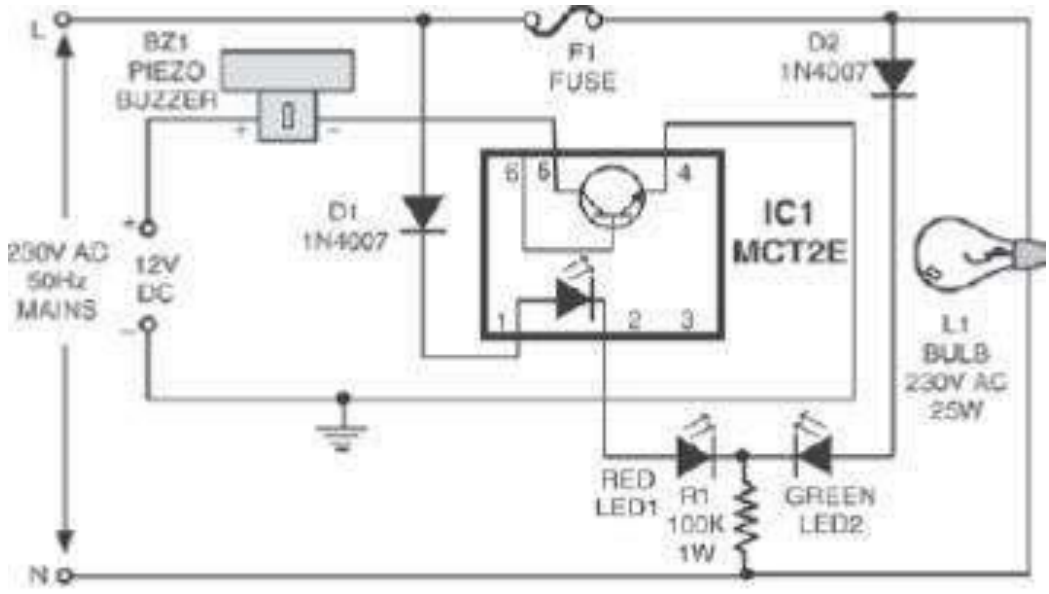


Figure 98 Additional expansion in BFI

13.2 Reason for Students Recommending this Design

- Libraries help connect communities.
- They preserve history, and more importantly, truth.
- Libraries make communities healthier.
- Improvement focus will assist with associating the Balva Village with different villages and near by metropolitan regions.
- It will add infrastructure value to the village.
- Cybercafé is an important structure which will be utilized by, people living in the village of even outsiders from nearby villages and relatives of the villagers can use or utilize a cybercafé for their different uses.
- Recreation Centers Have a Positive Impact on Community Youth
- Recreation Centers Provide an Opportunity for Education
- Recreation Centers Promote an Active and Healthy Community
- Recreation Centers Increase Property Values.
- The arduino based liquid vending machine will make the delivery of liquid/milk contactless which will eventually increase the hygiene and so the villagers will be protected from contagious diseases.
- Beacon flasher will alert the vehicles entering village during dawn and this will decrease the mishaps happening due to low light conditions.
- Blown fuse indicator will decrease the chances of short circuit current and increase the reliability of the system which in turn gives constant power supply to tye villagers and this concept will even protect the wire man who's fixing any fault in the system.
- The designs suggested will help villagers in terms of protection against contagious diseases, mishaps during night and electrical faults. Hence the villagers will still have the rural soul along with urban amenities

13.3 Benefit of the villagers

- Retail Shop is a self-service shop offering a wide variety of food, beverages, and household products, organized into sections. It is larger and has a wider selection than earlier grocery stores
- Retail Shop as an important infrastructure that will be utilized by, all the people living in the village of even outsiders from nearby villages and relatives of the villagers can use or utilize a supermarket for their different uses.
- Freedom of selection, shopping is very easy and quick, there is no risk of bad debts.
- Protect the environment
- Increase property value - attract new business
- Curb employee absenteeism - boost employee productivity
- Generate revenue
- This model will also reduce the work load of sellers. The customer has to enter the amount of fluid they want and machine will directly pass it through them. Hence the men power will be reduced and the seller can easily focus on billing counter or some other work sideways.

14. Technical Options with Case Studies

14.1 Civil Engineering

14.1.1 Advance Earthquake Resistant

Earthquake resistant design of buildings depends upon providing the building with strength, stiffness and inelastic deformation capacity which are adequately extraordinary to withstand a given degree of quake produced power. This is by and large cultivated through the choice of a fitting underlying design and the cautious specifying of primary individuals, like shafts and segments, and the associations between them. However, further developed methods for seismic tremor obstruction isn't to fortify the structure, yet to decrease the quake created powers following up on it.

Base Isolation Method

A base isolated design is upheld by a progression of bearing cushions which are put between the structure and the structure's establishment. (See Figure .) A wide range of sorts of base isolation bearing cushions have now been created. The bearing is firm and solid the upward way, yet adaptable the horizontal way.

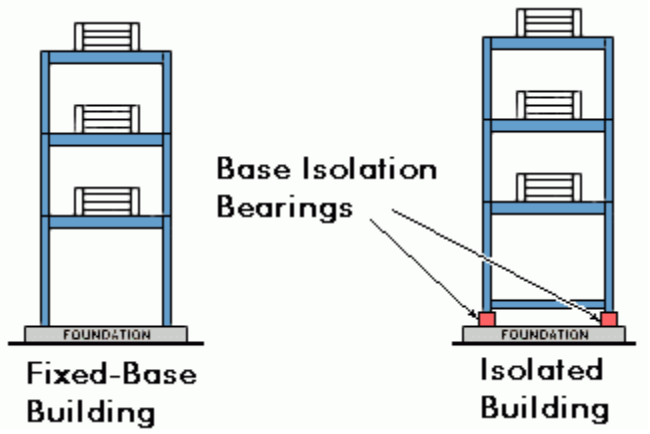


Figure 99 Base-Isolated and Fixed-Base Buildings

Earthquake Generated Forces

Figure . This shows a tremor following up on both a base-isolated structure and a traditional, fixed-base, and building. Because of an earthquake, the ground underneath each building starts to move. In Figure , it is shown moving to one side. Each building reacts with development which inclines toward the right. The structure goes through removal towards the right.

The structure's dislodging toward the path inverse the ground movement is in reality because of inactivity. The inertial powers following up on a structure are the more significant of each one of those created during a quake. Realize that the inertial powers which the structure goes through are corresponding to the structure's speed increase during ground movement. It is likewise essential to understand that structures don't really change in just a single course.

In view of the perplexing idea of seismic tremor ground movement, the building actually tends to vibrate back and forth in varying directions.

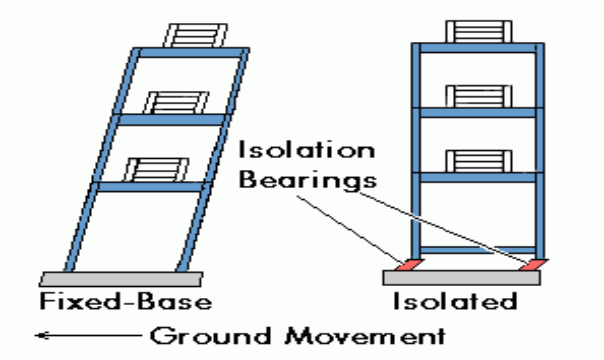


Figure 100 Isolated Bearing

Energy Dissipation Devices

The second of the major new procedures for improving the quake opposition of structures additionally depends after damping and energy scattering, yet it significantly expands the damping and energy dispersal given by lead-elastic heading. Structures themselves do have an inalienable capacity to disperse, or soggy, this energy. The structure will disseminate energy either by going through enormous scope development or supporting expanded inside strains in components like the structure's segments and bars. Both of these in the end bring about shifting levels of harm. In this way, by outfitting a structure with extra gadgets which have high damping limit, can enormously diminish the seismic energy entering the structure, and consequently decline building harm. Energy scattering gadgets are likewise frequently called damping gadgets.

- Friction Dampers: these utilize frictional forces to dissipate energy
- Metallic Dampers: utilize the deformation of metal elements within the damper
- Viscoelastic Dampers: utilize the controlled shearing of solids
- Viscous Dampers: utilized the forced movement of fluids within the damper

Damping Devices and Bracing Systems

Damping devices are usually installed as part of bracing systems. Figure shows one type of damper-brace arrangement, with one end attached to a column and one end attached to a floor beam. Primarily, this arrangement provides the column with additional support. Most earthquake ground motion is in a horizontal direction; so, it is a building's columns which normally undergo the most displacement relative to the motion of the ground.

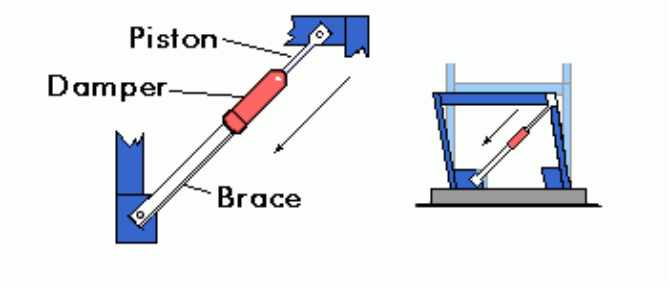


Figure 101 Damping Device Installed with Brace

14.1.2 Seismic Retrofitting of Buildings

Seismic retrofitting is the adjustment of existing designs to make them more impervious to seismic movement, ground movement, or soil disappointment because of tremors. The retrofit methods laid out here are likewise pertinent for other common dangers like typhoons, twisters, and serious breezes from tempests. While current act of seismic retrofitting is overwhelmingly worried about primary enhancements to lessen the seismic risk of utilizing the designs, it is comparably fundamental to diminish the dangers and misfortunes from non-underlying components.
Common seismic retrofitting techniques fall into several categories:

External post-tensioning

The use unbounded post-tensioning high strength steel tendons have been used to achieve a moment-resisting system that has self-centering capacity.

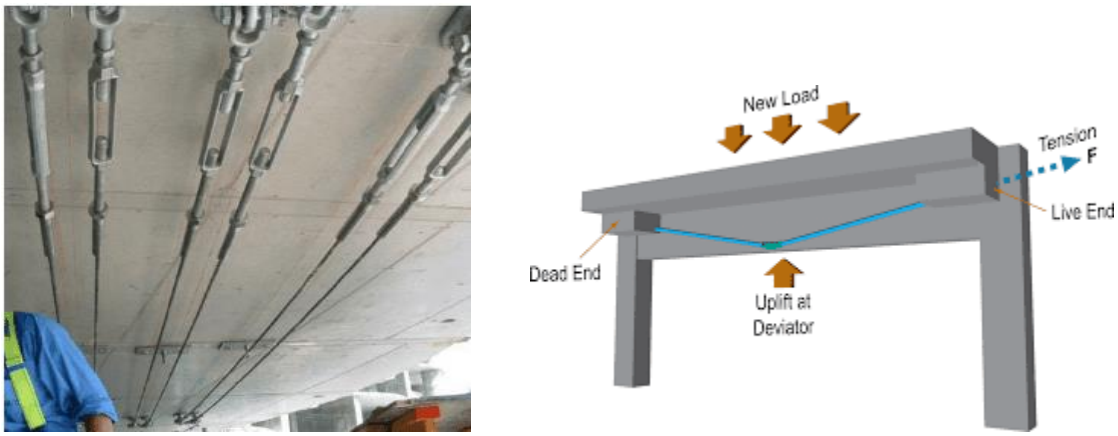


Figure 102 External post-tensioning

Base isolators

Base isolation is an assortment of structural components of a structure that ought to generously decouple the structure's design from the shaking ground in this way securing the structure's respectability and improving its seismic exhibition. This quake designing innovation, which is a sort of seismic vibration control, can be applied both to a recently planned structure and to seismic redesigning of existing constructions.

Supplementary dampers

Beneficial dampers assimilate the energy of movement and convert it to warm, accordingly damping resounding impacts in structures that are unbendingly connected to the ground. As well as adding energy dispersal ability to the design, strengthening damping can lessen the dislodging and speed increase interest .

Figure 103 Supplementary dampers

Tuned mass dampers

Tuned mass dampers (TMD) employ movable weights on some sort of springs. These are typically employed to reduce wind sway in very tall, light buildings. Similar designs may be employed to

impart earthquake resistance in eight to ten story buildings that are prone to destructive earthquake induced resonances.

Active control system

Very tall structures, when assembled utilizing current lightweight materials, may influence awkwardly (however not hazardously) in certain breeze conditions. An answer for this issue is to incorporate at some upper story an enormous mass, obliged, however allowed to move inside a restricted reach, and proceeding onward a type of bearing framework, for example, an air pad or water driven film. Water driven cylinders, fueled by electric siphons and gatherers, are effectively headed to counter the breeze powers and common resonances. These may likewise, if appropriately planned, be compelling in controlling over the top movement – with or without applied force – in a tremor. As a rule, however, present day steel outline elevated structures are not as dependent upon risky movement as are medium ascent (eight to ten story) structures, as the full time of a tall and monstrous structure is longer than the roughly one second stuns applied by a seismic tremor.

Slosh tank

A slosh tank is a huge holder of low consistency liquid (typically water) that might be put at areas in a design where horizontal influencing movements are critical, like the rooftop, and tuned to counter the nearby resounding powerful movement. During a seismic (or wind) occasion the liquid in the tank will slosh to and fro with the smooth movement normally coordinated and constrained by inner bewilders – allotments that forestall the actual tank getting full with the construction. The net unique reaction of the general construction is diminished due to both the neutralizing development of mass, just as energy scattering and vibration damping which happens when the liquid's dynamic energy is changed over to warm by the confuses. For the most part the temperature ascend in the framework will be negligible and is inactively cooled by the encompassing.

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

With the evolution of computer technology, the dimensions of the computer have shrunk while increasing its power and speed. The advanced technology of computers has valuable applications in building construction.

Computer for construction management

By working on his work, an individual can execute the method of the board. The manual strategies for getting ready bar outlines, C.P.M., P.E.R.T., and so forth have impediments. As the intricacy of the task expands, PCs demonstrate favorable.

PCs can portray the whole organization graphically and all the while give a work report of the advancement of each errand. Changes and modifications can be fused and the impact on the excess exercises is naturally figured. This pay an extremely helpful alternative in time slamming. PCs give a speedy and simple reference to examine the adjustment of time gauge of at least one exercises.

P.E.R.T. includes factual computation for assessed times. PCs are valuable in giving a rule system. It is valuable in precise calculations, fast reaction, and the capacity to respond to alterations. This aides in setting aside time and cash.

Computer for structural design
Underlying model is a designing science and is generally appropriate for processing. The plans of bars and chunks can be mechanized. On entering in the different burdens, sizes of steel and different boundaries are prepared for execution. The plans are exact and fast. Proper drawings can likewise be plotted through PC programs.

Computer for estimation and costing
It includes straightforward estimations like duplication and expansion. In any case, while manual estimations may be flawed, the PC computes with extraordinary speed and precision.

Computer for architectural and interior designs
The functioning drawings, electrical designs, furniture drawings, and so on can be set up with a PC. It fosters a dimensional viewpoint and helps in better representation. Any minor blunder is effectively recognized and can be altered before the real work starts. The shading plan of the task or inside adornment can likewise be finished with the assistance of PCs.

Computer for financial management
Monetary administration can be controlled through mechanized monetary and material timetables. Refreshed projects indicate the month to month monetary necessities. Work is never held up for absence of assets if PC innovation is appropriately carried out.

Modern Materials for Construction Projects
High Performance Concrete

- Very High Early Strength Concrete – 17.5 mPa in 6 hours
- High Early Strength Concrete – 42.5 mPa in 24 hours
- A Very High Strength – 86 mPa in 28 days
- High Early Strength with Fiber Reinforcement

Self–compacting Concrete (SCC)
Because of its high ease, the conventional technique for estimating functionality by droop doesn't work. The smoothness is to such an extent that any solid took care of to the droop cone crashes and burns on raising the droop cone; the distance across of the spread of cement is estimated as a sign of usefulness of SCC. This is called Slump Flow and is in the scope of 600 – 800 mm.

Fly Ash
The coarser materials are needed to be handled (for the most part with the assistance of Cyclones) prior to being considered for use as mineral admixture for concrete. There are a couple of preparing units in India, including the one as Nashik Thermal Power Station. According to the Euro Code for Concrete, just prepared fly debris can be allowed as mineral admixture in concrete. As far as possible the utilization of fly debris. About 35% of concrete might be supplanted by fly debris; the real rate substitution relying upon the result of preliminary blends.

High Volume Fly Ash Concrete (HVFA)
The high volume fly debris concrete (HVFA) addresses an arising innovation for exceptionally solid and asset productive solid constructions. Research facility and field experience have shown

that fly debris from current coal-terminated nuclear energy stations, when utilized in enormous volume (ordinarily 50 - 60% by mass of the absolute cementitious materials content, can grant amazing functionality in new cement at a water content that is 15 – 20% not exactly without fly debris. To get satisfactory strength at early age, further decreases in the blending water substance can be accomplished with better total reviewing and utilization of super-plasticizers.

Condensed Silica Fume (CSF)

Figure 104 Condensed Silica Fume

C SF is a side-effect of Ferro-Silicon industry and at present an imported item, effectively accessible in the Indian market. The molecule size is little, around multiple times less than that of concrete. It can possess the voids in the middle of concrete particles in a solid blend, diminish the water interest and in this manner add to an exceptionally thick cement of high sturdiness. Regularly, 5 - 10% of concrete can be supplanted by CSF to create solid cement. The item is costly and is utilized in created nations just for extremely high strength concrete (over 75 mPa). Unpredictable utilization of CSF for lower grades, notwithstanding special cases, just builds the task cost without comparing specialized advantages. In any event, when utilized, the rate substitution ought to be founded being investigated blends for each situation, which may differ from one to 10%. CSF may likewise be utilized for High Performance Concrete of lower grades.

Reinforcement

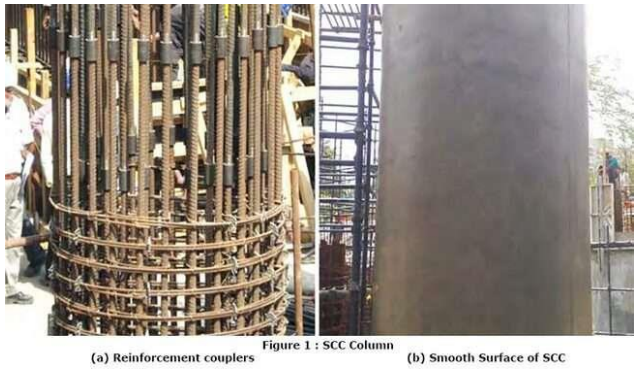


Figure 105 Reinforcement

The reconsidered BIS Code 1786 accommodates four evaluations of support described by the yield strength – Fe 415, Fe 500, Fe 550 and Fe 600. Every one of the 1st three evaluations is additionally accessible with unrivaled malleable properties and a classification is Fe 415D, Fe500D and Fe550D. Principally the bendable evaluations indicate a higher extension esteem. Utilization of higher evaluations diminishes the weight of steel in pressure individuals for example sections significantly, results in decongested support and works with simple situation and vibration of cement. Fe 415 and Fe 500 are effectively accessible on the lookout. Fe 550 is currently being offered by some great makers Tata Steel, Sail and so forth. After the update of the Code, Fe 550 is additionally offered in chosen breadths.

Cements Ternary Blended

Ternary mixed concretes containing the mix of fly debris slag, fly debris silica smoke or slag–silica rage are normally utilized for concrete in numerous pieces of the world. Generally mineral admixture utilized may introduce a free impact on concrete hydration. Limestone filler expansion produces good consequences for concrete test. Specifically, the actual impacts brought about by limestone filler upgrade the strength because of hydration speed increase of Portland clinker gains

at early age and the improvement of molecule pressing of the cementitious framework. Notwithstanding, the pace of hydration is at first lower than that relating to Portland concrete; shows a decrease of solidarity at early age and comparative or more prominent strength at later ages. Ternary concretes containing a restricted extent of limestone filler (close to 12%) and 20 – 30% GGBFS give a decent protection from chloride entrance and great execution in sulfate climate of low Portland concrete.

Figure 106 Ternary Blended Cements

Photo-catalytic Cement

The photograph reactant parts utilize the energy from bright beams to oxidize generally natural and some inorganic mixtures. Air contaminations that would ordinarily bring about staining of uncovered surfaces are eliminated from the environment by the parts, and the buildups are washed off by downpour. This concrete can be utilized to deliver cement and mortar items that save money on upkeep cost while they guarantee a cleaner climate.

Corrosion Inhibiters for Reinforced Concrete

Calcium nitrate has been proven to inhibit reinforcement corrosion. About 3–4% calcium nitrate of cement by weight is sufficient to protect the reinforcement steel against corrosion. Typically a corrosion inhibiter should

a. raise the level of chlorides necessary to initiate corrosion or
b. decrease the rate of corrosion after it has started or
c. Both. Since it does not necessarily prevent corrosion from happening altogether, it is more appropriate to call the product as corrosion retarders.

Figure 107 Corrosion Inhibiters for Reinforced Concrete

Application of Nano Technology

Lessening molecule size of a material to nano–scale regularly grants new properties or upgrades existing ones. This is average of nano particles of titanium dioxide, which keeps up its photocatalytic action in any event, when blended in with concrete.

Outside concrete based surfaces become unequivocally photocatalytic, prompting a vastly improved appearance and a huge decrease in centralization of contaminations in the encompassing air.

The photoactive titanium dioxide was discovered to be an all the more remarkable photocatalytic specialist when its molecule size diminished to non-size.

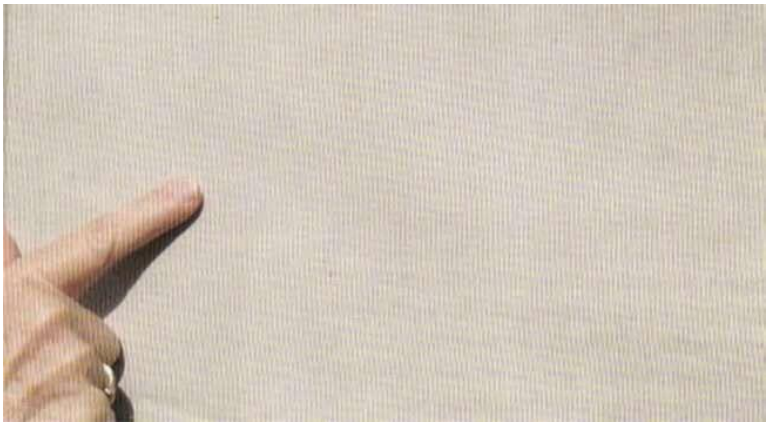


Figure 108 Photocatalytic Surface of Concrete of the building

Costing of Modern Materials

SR no.	MODERN MATERIALS	RATE (Rs.)
1	Laminated veneer lumber	150/ sq.ft
2	Autoclaved aerated concrete	3150/ cum
3	Stylish Wall Panels	190/ sq.ft
4	Self-healing concrete	2000 / kg
5	Straw roofing	280/ sq.ft
6	Corrugated iron	320/ sq.ft
7	Natural stone	300/ sq.ft
8	Waste materials	40/ kg
9	Hempcrete	13176/ sq.ft
10	Rammed earth wall	1200/ sq.m
11	Prefabricated panels	810/ sq.m
12	Algae curtains	23,000/ sq.m
13	Glass fiber reinforced concrete	5000/ cum
14	Concrete sheets	210/ sq.m
15	Stone cladding	45/ sq.ft
16	Reclaimed timber	48/ piece

14.1.4 Engineering Aspects of Soil mechanics - Environmental Impact Assessment Introduction

Environmental Impact Assessment (EIA) is an interaction of assessing the reasonable ecological effects of a proposed venture or advancement, considering between related financial, social and human-wellbeing impacts, both advantageous and unfavorable.

UNEP characterizes Environmental Impact Assessment (EIA) as an apparatus used to distinguish the natural, social and monetary effects of a venture before dynamic. It intends to anticipate natural effects at a beginning phase in project arranging and configuration, discover available resources to lessen antagonistic effects, shape undertakings to suit the nearby climate and present the forecasts and choices to leaders.

Environment Impact Assessment in India is legally supported by the Environment Protection Act, 1986 which contains different arrangements on EIA system and interaction.

History of EIA in India

The Indian involvement in Environmental Impact Assessment started more than 20 years back. It began in 1976-77 when the Planning Commission requested the Department from Science and Technology to inspect the stream valley projects from a natural point.

Till 1994, natural leeway from the Central Government was an authoritative choice and needed administrative help.

On 27 January 1994, the then Union Ministry of Environment and Forests, under the Environmental (Protection) Act 1986, proclaimed an EIA notice making Environmental Clearance (EC) compulsory for extension or modernization of any action or for setting up new undertakings recorded in Schedule 1 of the warning.

The Ministry of Environment, Forests and Climate Change (MoEFCC) informed new EIA enactment in September 2006.

The notice makes it obligatory for different ventures like mining, nuclear energy stations, waterway valley, foundation (street, interstate, ports, harbors and air terminals) and businesses including little electroplating or foundry units to get climate freedom.

However, dissimilar to the EIA Notification of 1994, the new enactment has put the onus of clearing projects on the state government relying upon the size/limit of the undertaking.

The EIA Process

EIA includes the means referenced underneath. Nonetheless, the EIA cycle is recurrent with communication between the different advances.

- Screening: The undertaking plan is evaluated for size of speculation, area and sort of improvement and if the task needs legal freedom.
- Scoping: The undertaking's likely effects, zone of effects, moderation prospects and need for observing.
- Collection of benchmark information: Baseline information is the ecological status of study territory.

- Impact forecast: Positive and negative, reversible and irreversible and impermanent and perpetual effects should be anticipated which assumes a decent comprehension of the undertaking by the appraisal office.
- Mitigation measures and EIA report: The EIA report ought to incorporate the activities and steps for forestalling, limiting or by passing the effects or probably the degree of pay for likely ecological harm or misfortune.
- Public hearing: On finish of the EIA report, public and natural gatherings living near project site might be educated and counseled.
- Decision making: Impact Assessment Authority alongside the specialists counsel the venture in-control alongside advisor to take an official choice, remembering EIA and EMP (Environment Management Plan).
- Impact Assessment Report: For each venture, potential options ought to be distinguished, and ecological characteristics analyzed. Choices should cover both venture area and interaction advances. Once choices have been surveyed, a relief plan ought to be drawn up for the chose alternative and is enhanced with an Environmental Management Plan (EMP) to control the advocate towards natural upgrades.
- Risk appraisal: Inventory investigation and peril likelihood and file likewise structure part of EIA systems.

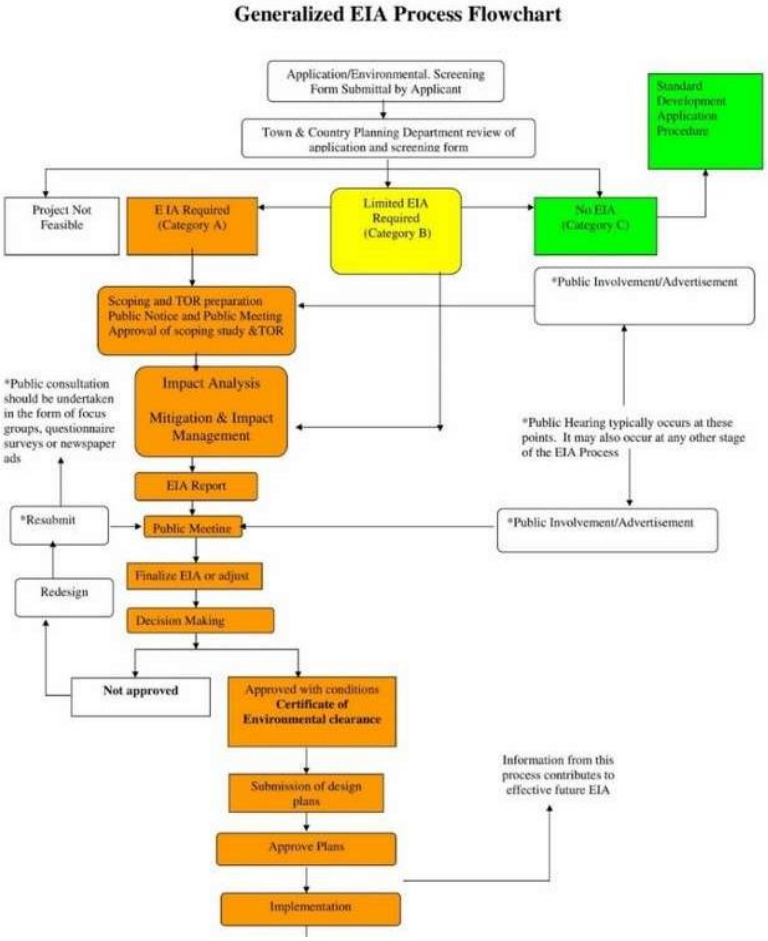


Figure 109 EIA process flowchart

Significance of EIA

- EIA joins climate with improvement for earth protected and practical turn of events.
- EIA gives a financially savvy strategy to dispense with or limit the unfavorable effect of formative undertakings.
- EIA empowers the leaders to break down the impact of formative exercises on the climate a long time before the formative venture is executed.
- EIA energizes the variation of relief methodologies in the formative arrangement.
- EIA ensures that the formative arrangement is ecologically stable and inside the restrictions of the limit of digestion and recovery of the biological system.

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

Water is the most valuable component/product accessible on the earth which is the fundamental life emotionally supportive network of the environment. The water sources are recognized and afterward they are utilized for different purposes and at different areas. Along these lines, water supply and dispersion offices are basic framework for the climate. These offices incorporate wells or water supply consumption structures, transmission mains, appropriation mains and individual assistance lines. Concerning supply source, water assurance may deliver specialized issues, however policy centered issues may emerge also. Responsibility for sources can be dubious, regardless of whether the source is ground water or surface water.

The utilization of water aside from drinking reason produces the wastewater which when released for the homegrown use creates sewage. The sewage assortment is helped out through sewer assortment framework. The sewage can't be straightforwardly let free in to the climate as there are for the most part prospects of dirtying the surface water or the ground water. In any event, for water system likewise, the sewage requires treatment. The sewer assortment and transport needs the treatment before its removal. The treated sewage can be reused for cooling reason, water system reason or in any event, for reusing in to the latrines and different applications relying upon the particular use barring drinking and washing. The sewerage is the sewage assortment network beginning from singular release focuses to midway assortment point, movement mains, treatment frameworks and safe removal in to the climate.

Numerous variables should be considered during arranging, plan and development of these frameworks. For new zones, the populace thickness, the accessible water supply source and its amount and the geology is considered. In created territories where there is existing underground utilities including existing water and sewer, phone, gas, electric, and link, it is particularly imperative to think about the effect of new water and sewer mains on these frameworks.
In all occurrences, cost viability is similarly pretty much as significant as specialized greatness. Undertakings should be monetarily attainable before they can be built. Chokhavatia Associates have insight in all features of Water Supply and Sewerage designing, including:

1. Feasibility Studies and Master Planning
2. Preliminary and last plan plans and Specifications
3. Project Management
4. Construction Administration and Inspection.

Disposal network

Figure 110 Sewage Network

The removal network is intended for the removal of fluid, vaporous and strong effluents. The removal network for the fluid effluents are a lot of fundamental for the accepting bodies with the goal that the effect on the getting bodies can be limited. The removal of treated gushing in to the streams or marine removal have the distinctive effect contrast with the removal of the treated effluents on to the land when the treated emanating is utilized either for water system or for planting. The land removal of the treated gushing is irreversible standards contrast with the removal of the treated emanating in to the getting streams or marine removal.

The removal of strong effluents [sludge produced from the fluid profluent treatment operations] requires legitimate removal. Any inadequacies in the removal organization of the strong effluents will establish a lot greater issues to the climate.

The removal of the vaporous gushing relies upon the meteorological conditions and inappropriate treatment of the vaporous profluent removal will significantly affect the human existence just as vegetation.

14.2Electrical Engineering

14.2.1 Design of Power Electronics Converter

Power electronic innovation manages handling and controlling the progression of electrical energy to supply voltages and flows in a structure that ideally appropriate for end client's prerequisites. A power electronic converter utilizes power electronic parts like SCRs, TRIACs, IGBTs, and so on to control and change over the electric force. The primary point of the converter is to deliver mounding power concerning a specific application.

Power electronic converters perform different fundamental force transformation capacities. This converter is a solitary force change stage that can play out any of the capacities in AC and DC power transformation frameworks. Contingent upon the sort of capacity performed, power electronic converters are ordered into following kinds.

1. AC to DC = Rectifier: It changes AC over to unipolar (DC) current. Here, the transformer changes the primary AC source supply to the contribution of rectifier stage. Generally it is a stage down transformer that diminishes the stock voltage to a circuit working reach. The rectifier changes over the low voltage AC supply into DC supply. It includes diode or potentially thyristors dependent on kind of rectifier. The yield of the rectifier is of beat DC and henceforth it is sifted utilizing channel circuit, which is typically made with a capacitor or a stifle.
2. DC to AC = Inverter: It changes DC over to AC of wanted recurrence and voltage.
3. DC to DC = Chopper: It changes steady over to variable DC or variable DC to consistent DC.The chopper circuit is associated between DC input source and DC load. This chopper comprises of force electronic exchanging gadgets, for example, thyristors which are associated so that they produce required DC voltage to the heap. The yield voltage is constrained by changing on schedule of the thyristor (or switch) which turns changes the width of DC voltage beat at the yield. This technique for exchanging is called as heartbeat

width tweak (PWM) control. The yield of the chopper can be less or more prominent than the information and furthermore it tends to be fixed or variable. These can be unidirectional or bidirectional gadgets dependent on the application it is proposed for. DC choppers are for the most part utilized in DC drives, i.e., electric vehicles and crossover electric vehicles.

4. AC to AC = Cycloconverter, Matrix converter: It changes over AC of wanted recurrence or potentially wanted voltage size from a line AC supply. AC/AC converters interface an AC source to AC loads by controlling measure of force provided to the heap. This converter changes over the AC voltage at one level to the next by shifting its extent just as recurrence of the stockpile voltage. These are utilized in various kinds of utilizations including continuous force supplies, high force AC to AC transmission, movable speed drives, sustainable power change frameworks and airplane converter frameworks.

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

An Induction engine would self be able to begin attributable to the connection between the pivoting attractive field transition and the rotor winding motion, causing a high rotor current as force is expanded. Subsequently, the stator draws high current and when the engine ranges to max throttle, a lot of current (more noteworthy than the appraised current) is drawn and this can cause warming up of the engine, in the end harming it. To forestall this, engine starters are required.
Motor turning over can be 3 ways:

1. Applying full burden voltage at time periods: Direct On Line Starting.
2. Applying decreased voltage progressively: Star Delta Starter and Soft starter.
3. Applying part winding beginning: Autotransformer starter.

Defining Soft start - In specialized terms, a delicate starter is any gadget that lessens the force applied to the electric engine. It for the most part comprises of strong state gadgets like thyristors to control the utilization of supply voltage to the engine. The starter chips away at the way that the force is relative to the square of the beginning current, which thusly is corresponding to the applied voltage. Accordingly the force and the current can be changed by decreasing the voltage at the hour of turning over the engine.

Technical Specifications:
There can be two sorts of control utilizing delicate starter:

1. Open Control: A beginning voltage is applied with time, regardless of the current drawn or the speed of the motor. For each stage, two SCRs are associated one after the other and the SCRs are led at first at a postponement of 180 degrees during the separate half-wave cycles (for which each SCR conducts). This postponement is diminished continuously with time until the applied voltage increase to the full inventory voltage. This is otherwise called Time Voltage Ramp System. This technique isn't applicable as it doesn't control the motor speed increase.

2. Shut Loop Control: Any of the motor yield qualities like the current drawn or the speed is observed and the beginning voltage is altered in like manner to get the necessary reaction. The current in each stage is checked and in the event that it surpasses a specific set point, the time voltage incline is ended. Accordingly the fundamental standard of the delicate starter is by controlling the conduction point of the SCRs the utilization of supply voltage can be controlled.

Benefits of Soft Start:

Since we have found out about how an electronic delicate beginning framework functions, let us remember a couple of reasons why it is liked over different techniques.

- Improved Efficiency: The effectiveness of the delicate starter framework utilizing strong state switches is more inferable from the low on-state voltage.
- Controlled startup: The beginning current can be controlled easily by effectively changing the beginning voltage and this guarantees smooth turning over of the motor with no jerks.
- Controlled speed increase: Motor speed increase is controlled easily.
- Minimal expense and size: This is guaranteed with the utilization of strong state switches.

Figure 111 Actual Implication

Components Used:

• Power switches like SCRs which should be stage controlled to such an extent that they are applied for each piece of the cycle. For a 3 stage engine, two SCRs are associated consecutive for each stage. The exchanging gadgets should be appraised at any rate multiple times more than the line voltage.

• Control Logic utilizing PID regulators or Microcontrollers or some other rationale to control the utilization of door voltage to the SCR, for example to control the terminating point of SCRs to make the SCR lead at the necessary piece of the stockpile voltage cycle.

Working of Circuit:

The circuit comprises of the accompanying segments. Two consecutive SCRs for each stage, for example 6 SCRs altogether. Control Logic hardware as two comparators-LM324 and LM339 to deliver the level and the incline voltage and an opt isolator to control the use of door voltage to each SCR in each stage. A force supply hardware to give the necessary dc supply voltage. The level voltage is produced utilizing the comparator LM324 whose rearranging terminal is taken care of utilizing a fixed voltage source and the noninverting terminal is taken care of through a capacitor associated with the authority of a NPN semiconductor. The charging and releasing of the capacitor cause the yield of the comparator to change appropriately and the voltage level to change from high to low. This yield level voltage is applied to the noninverting terminal of another comparator LM339 whose modifying terminal is taken care of utilizing an incline voltage. This incline voltage is created utilizing another comparator LM339 which analyses the throbbing DC voltage applied at its transforming terminal to the unadulterated DC voltage at its noninverting terminal and produces a zero voltage reference signal which is changed over to a slope signal by the charging and releasing of an electrolyte capacitor. The third comparator LM339 produces a High heartbeat width signal for each undeniable level voltage, which diminishes continuously as the level voltage lessens. This sign is rearranged and applied to the Opt isolator, which gives entryway heartbeats to the SCRs. As voltage level falls, the beat width of the opt isolator increments and more the beat width, lesser is the deferral and step by step the SCR is set off immediately. In this way by controlling the term between the beats or deferral between uses of heartbeats, the terminating point of SCR is controlled and the utilization of supply current is controlled, accordingly controlling the

engine yield force. The entire interaction is an open-circle control framework where the hour of utilization of entryway setting off heartbeats to each SCR is controlled dependent on how before the incline voltage diminishes from the level voltage.

Circuit Diagram:

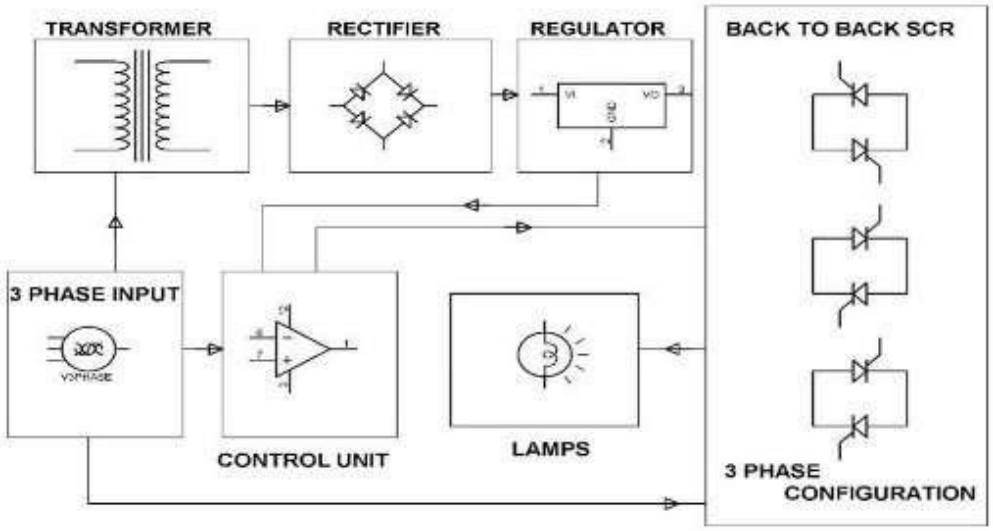


Figure 112 Circuit diagram

Costing of the design:

- SCR Power controller (3kw) : Rs. 9,000 (Company: Libratherm)
- Transformer: According to the necessity and availability
- Bridge Rectifier : Rs. 500 (Company : Regency semiconductor pvt. Ltd.)
- Voltage Regulator: Rs. 300 (Sold by: ElectronicsJagdamba)
- Total Costing: Rs.9,800

14.2.3 Advanced Wireless Power Transfer System

In present era, every human needs a system that transfer power in a very efficient way. Wireless power transfer is one of those system that become a highly active research area in past few years. Wireless power system transfer the power without using of wires and increase the efficiency by decreasing power loss .In this paper , different methods are discussed for wireless power transfer .In addition , a qualitative comparison between methods on the basis of separation distance ,power transmitting capacity, cost, efficiency and safety is discussed. Furthermore, we also discuss about recent technology on wireless power transfer such as Qi ,A4WP, and PMA technology. Furthermore there are plenty of application of WPT such as in medical science, solar power satellities (SPS) e.t.c.

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

The is a gadget to move power remotely as opposed to utilizing customary copper links and current conveying wires. The idea of remote force move was presented by Nikolas Tesla. This force is made to be moved inside a little reach just for instance charging battery-powered batteries and so forth for show purposes we have utilized a fan rather than battery that works by utilizing remote force. This requires an electronic circuit for change of AC 230V 50Hz to AC 12V, high recurrence and this is then taken care of to an essential loop of an air centre transformer. The auxiliary loop of the transformer creates 12V high recurrence. Hence by this way the force gets moved through essential curl to optional loop that are isolated by certain distance around 3cm. Here the essential curl goes about as transmitter and auxiliary loop gets the ability to run a heap. This undertaking can be utilized to charge batteries of a speed creator and comparative applications.

Hardware Requirements:

- HF Transformer
- 2 Inductor Coils
- Resistors
- Capacitors
- Transistors
- Cables and Connectors
- Diodes
- PCB and Breadboards
- LED
- Transformer/Adapter
- Push Buttons
- Switch

ADVANTAGES:

- It gives the human comfort as there is no chording or wiring problem, so mobility is easier.
- There is no problem of power failure and extensive heating.
- Cost of overall system decreases due to no uses of wires.
- Overall efficiency increases due to decrease in the power loss.
- It offers no corrosion as there is no exposure to the atmosphere which is Ecofriendly

All aspects of wireless power transmission system and we can conclude that it is an important research area for electrical engineers that has large scope in future in domain of power generation and transmission. Based on the study, we also conclude that from all method magnetic resonance coupling is the most efficient compare to other in all aspects. Microwave WPT gives us to increase the range up to KM and power transferring capacity upto MW, but it cannot safe for humans and animals due to its biological impact. Researchers have to find a safe solution for microwave WPT so that it cannot harm humans. WPT gives the comfort, convenience, safety, reliability, low cost, high efficiency simultaneously which make it one of the best research areas in electrical engineering.

Components Arrangement

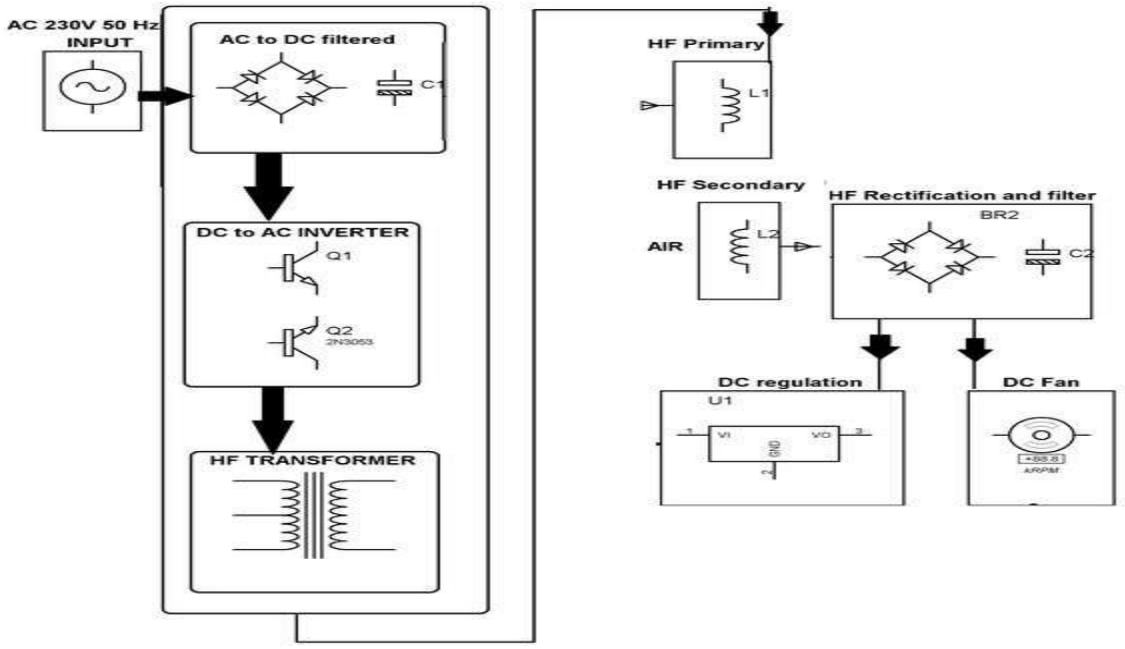


Figure 113 Components arrangement

14.2.4 Industrial Temperature Controller

The temperature controllers are utilized to keep up consistent temperature of cycle or plant or any material. In such temperature regulator framework there is one reference temperature considered set point or set temperature that is the ideal temperature that should be kept up.

This reference temperature is set by outer methods. Additionally it very well may be consistently customizable as indicated by prerequisites. When this temperature is set the framework attempts to keep up it by detecting the current temperature and controlling it utilizing radiator, cooler or blower and so forth.

It detects current temperature, contrasts it and reference temperature and produces blunder signal. At that point dependent on this blunder signal it controls warming component (or cooling component). Whenever set temperature is all the more then blunder signal is negative and the other way around.

So here I have given one such temperature control framework that detects current temperature utilizing temperature sensor. It contrasts it and the set temperature that is set by outer reference. Furthermore, it gives sign of mistake signal as sure or negative.

If blunder is positive that implies current temperature is more than set temperature that must be diminished.

If blunder is negative that implies current temperature is not exactly set temperature and it is needed to expand it.

Block Diagram:

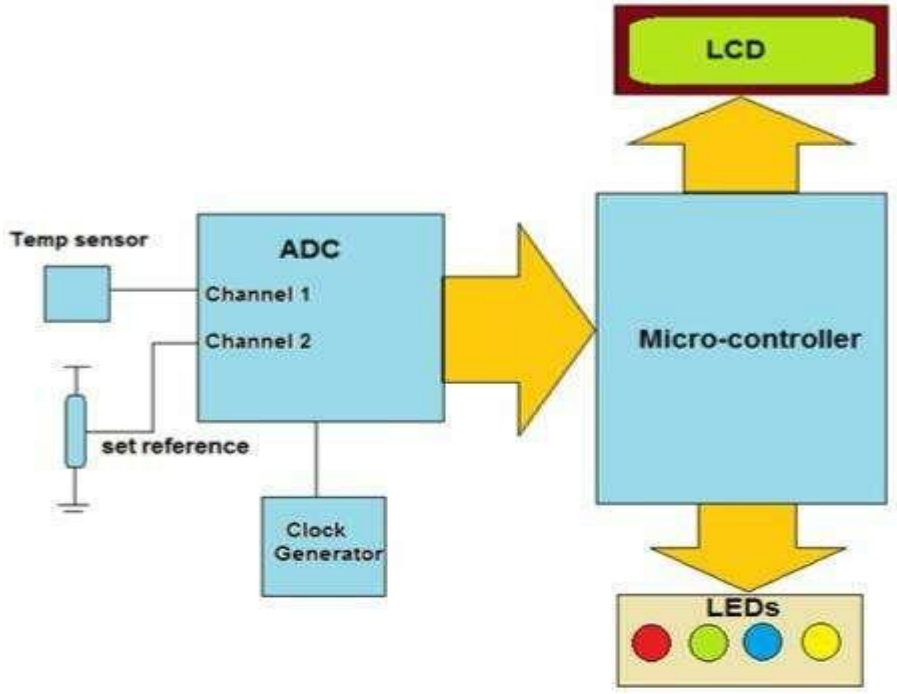


Figure 114 Block diagram

As demonstrated in above figure, significant structure squares of framework are temperature sensor, Analog to Digital Converter (ADC), miniature regulator, LCD, clock generator and LED markers.
Temperature sensor: It's a transducer. It gives comparing voltage (or current) yield as change in temperature. It tends to be aligned to degree Celsius. Else it must be aligned first.

Working:
Microcontroller first locks address of direct 1 in to ADC. At that point it states start sign to begin change. It hangs tight for end of transformation (EOC) signal from ADC. At the point when it gets it, it takes computerized contribution from P1 and in the wake of handling it shows it on LCD as set temperature.
Next microcontroller hooks address of channel 2. Again it declares start sign and hangs tight for EOC. At the point when it gets EOC, takes advanced info – measure it – shows it on LCD as current temperature.
Then microcontroller take contrast of these two temperature esteems that is the mistake. Assuming mistake is positive, it shows this on BLUE LED. In the event that blunder is negative, it gives sign on YELLOW LED.

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

This task is created for the clients to have mishap alert in current rush hour gridlock framework. This gadget can be utilized in exceptionally incidental territory and pin drop bends to stay away from mishaps. It comprises of two transmitters and two recipients. One transmitter is associated initial (One arm of the bend) and a recipient is fixed only inverse to the transmitter. At the point when the vehicle passes the main communicating and getting unit (One arm of the bend), it detects that one vehicle is crossing.

At the point when it crosses the second unit (Other arm of the bend), it likewise faculties. The microcontroller unit ascertains the speed=displacement/time taken. On the off chance that the speed surpasses the specific worth, it conveys message to the opposite side vehicle to be ready. It additionally alarms the opposite side vehicle when somebody crosses one side. Additionally it catches the rapid vehicle. Consequently the rapid vehicle can be followed without any problem. This is extremely emotional and reasonable strategy.

Radio transmitters: A radio transmitter comprises of a few components that work together to produce radio waves that contain helpful data like sound, video, or computerized information.

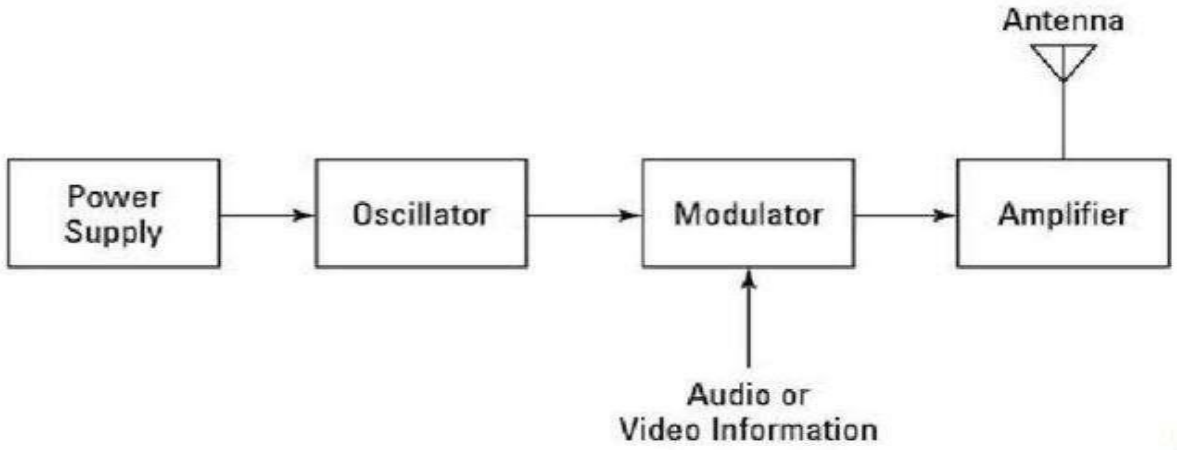


Figure 115 Radio transmitter

- Power supply: Provides the essential electrical ability to work the transmitter.
- Oscillator: Creates exchanging current at the recurrence on which the transmitter will send. The oscillator typically produces a sine wave, which is alluded to as a transporter wave.
- Modulator: Adds helpful data to the transporter wave. There are two primary approaches to add this data. The primary, called plentifulness adjustment or AM, makes slight increments or diminishes to the power of the transporter wave. The second, called recurrence regulation or FM, makes slight increments or diminishes the recurrence of the transporter wave.

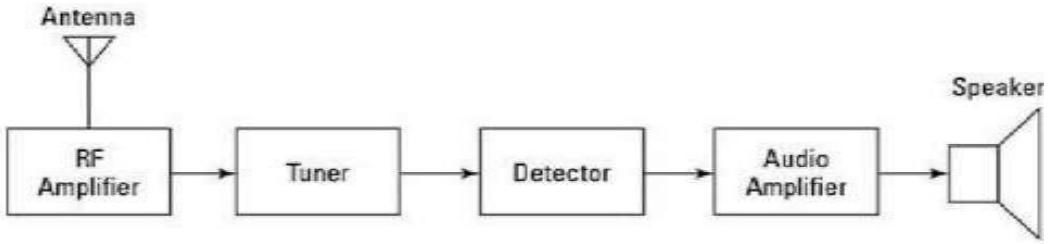


Figure 116 Radio receiver

- Amplifier: Amplifies the adjusted transporter wave to build its force. The more remarkable the enhancer, the more impressive the transmission.
- Antenna: Converts the enhanced sign to radio waves.
- *Radio Receiver:* A radio beneficiary is something contrary to a radio transmitter. It utilizes a receiving wire to catch radio waves, measures those waves to separate just those waves that are vibrating at the ideal recurrence, extricates the sound signals that were added to those waves, intensifies the sound signs, and lastly plays them on a speaker.
- Antenna: Captures the radio waves. Commonly, the receiving wire is essentially a length of wire. At the point when this wire is presented to radio waves, the waves instigate a little substituting current in the receiving wire. RF speaker: A touchy enhancer that intensifies the feeble radio recurrence (RF) signal from the receiving wire so the sign can be processed by the tuner.
- Tuner: A circuit that can remove signs of a specific recurrence from a blend of signs of various frequencies. All alone, the receiving wire catches radio floods, everything being equal, and sends them to the RF speaker, which obediently intensifies them all.
- Detector: Responsible for isolating the sound data from the transporter wave. For AM signals, this should be possible with a diode that simply amends the substituting current sign. What's left after the diode has its way with the rotating current sign is an immediate current sign that can be taken care of to a sound intensifier circuit. For FM flags, the identifier circuit is somewhat more convoluted.
- Audio intensifier: This part's responsibility is to enhance the frail sign that comes from the identifier so it tends to be heard. This should be possible utilizing a straightforward semiconductor intensifier circuit.

Hence in this manner the accident alerts in modern traffic signal control system works.

15. Smart and Sustainable features of designs and Impact on society.

Table 25 Smart and Sustainable features of designs and Impact on society

Sr. No.	Design Name	Amount Period	Expenditure (Rs.)	Benefit
1.	Community Hall	Long term (2-5 years)	242,5010	• Boosts the Local Economy. • Keeps Adolescents Safe. • Provides a Meeting Space. • Boosts Property Values.
2.	Public Toilet	Immediately	56,610	• It will improve disinfection office • It will be useful to individuals who don't have latrines in their home. • It will advance neatness in village.
3.	Public Parking	Immediately	146,530	• Better Usage of Land. • Improved Esthetics. • Increased Safety. • Improved Business
4.	ATM	Immediately	17,410	• Open or pull out a fixed store. • Re-energize your versatile. • Cover personal expense. • Store cash. • Pay protection premium. • Apply for individual credit. • Move money and Pay your bills.
5.	Shopping Area	Within 1 year	158,480	• A ton of assortment of items in a single spot for the customer. • Shopping Areas help the economy.
6.	Steel Gate	Immediately	47,260	• Expanded Security • Controlled Access • More slow Vehicle Speeds • Walker Safety • More noteworthy Privacy

7.	Library	Long term (2-5 years)	314,600	• The library goes about as an asset community and a clearinghouse of data on provincial turn of events . • It has fostered an electronic information base of the assets in its assortment. • The library has additionally completely robotized its everyday tasks.
8.	Bus Stop	Immediately	27,840	• It will help Villagers in transportation. • It facilitates the heap on the one bus station and help to decrease commotion contamination by simple control of less group.
9.	Development Center	Long term (2-5 years)	629,965	• The accentuation is to ability the adolescents in such a manner so they get business and furthermore improve business. • To give abilities to ladies with the goal that they become self-subordinate • To mindful residents in regards to new advancement plans for their improvement • To start new companies in village.
10.	Cyber Café	Immediately	109,475	• Animal will provide with shelter and food where they can feel safe and secure • Enough watering will be provided so they don't have to roam around village for water.
11.	Retail Shop	Within 1 year	244,110	• Items and costs are customized for working class and privileged in the public eye.
12.	Recreation Center	Within 1 year	3,60,000	• You pay for what you use. • Fast Internet • Illegal Gambling Problem • Internet Access for Everyone • No Equipment Hassles

16. Survey By Interviewing With Talati And/Or Sarpanch

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Survey with Interviewing

SURVEY BY INTERVIEWING WITH TALATI AND/OR SARPANCH

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

An approach towards "Rurbanisation for Village Development"

CHAPTER- 16

Sr.	Questions	Yes/No	Remarks
1	What are the sources of income in village?	Yes	Agriculture
2	What are the chances of employment in village?	Yes	In shops, buildings, etc
3	What are the special technical facilities in village?	Yes	In schools, projector, smart classes online classes etc
4	Is any debt on village dwellers?	No	
5	Are village people getting agricultural help?	Yes	
6	Is women health awareness Program organized in village?	No	
7	Are women having opportunity to work and income?	Yes	Mostly work at farms & nearby cities
8	Child girl education is appreciated in village?	Yes	People are more into it
9	Facility of vaccination to child is available in village?	Yes	At village Hospital
10	Are village people aware about child vaccination and done to each and every child as per norms?	Yes	
11	Women help line number information is provided to village people?	Yes	Awareness is spread by means of campaign
12	Is water scarcity in village? How many days per year?	No	
13	Is village under any debt?	No	
14	Is any serious issue due to debt from bank or any person happened in village?	No	
15	Is any suicide like incident observed in village due to government policy, debt or threatening?	No	
16	Is any death of patient occurred due to unavailability of medical facility in village?	No	
17	How many disabled (physically challenged) is observed in village? Provide list with Male/female/girl/boy with age and type of disability and reason of disability.	Yes	
18	Is village improvement is observed in comparative scenario from past to present?	Yes	Overall development of village
19	Is any unavoidable difficulty village people are facing? Any natural calamity is there?	No	
20	Life Living standard of girls and women is appreciated and uplifted in village?	Yes	Much better compared with last two decades

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

Figure 117 Survey By Interviewing With Talati And/Or Sarpanch

17. Irrigation / Agriculture Activites And Agro Industry, Alternate Techniques And Solution

Irrigation Activities in the Balva Village

- India's irrigation system covered yield region was about 22.6 million hectares in 1951, and it expanded to a capability of 90 mha toward the finish of 1995, comprehensive of trenches and groundwater wells.
- The absolute arable land in India is 160 million hectares (395 million sections of land). As per the World Bank, just about 35% of complete rural land in India was dependably inundated in 2010.
- In the Balva village, villagers use different types of irrigation methods for the crop yielding. The main source of the water is one big lake located in the village, wells and tube-wells, and Tanks.
- There are five basic methods of irrigation flooding, furrow irrigation, trickle, sprinkling, and sub irrigation in which sprinkling irrigation ares used in Balva village.

Figure 118 Irrigation system in the village

- In our point of view for watering enormous spaces of farmland in Balva village, trickle water system is the most proficient water system framework for diminishing water and manure misfortune. By separating the water down through the dirt and into the root framework, a portion of the water permeates down into the groundwater framework to be reused for inundating in future years.

Alternate Techniques And Solution

The issue of water deficiency keeps on developing - both locally and universally. Simultaneously the requirement for rebuilding of dry terrains and more food creation from deserts and dry grounds are both expanding.

Covered Clay Pot Irrigation

- One of the most considered, and exceptionally viable frameworks utilizes a covered mud pot loaded with water to flood plants.
- The capillary progression of water through the mud dividers of the pot is controlled by request - so little water is squandered.
- Highly suggested. For reclamation, gardens, finishing, cultivating.
- Clay pots functioned admirably even in the least, most blazing desert.

Figure 119 Covered Clay Pot Irrigation

- Excellent for seedlings or for beginning seeds or cuttings.
- Pot edge painted white to decrease dissipation.

Profound Pipe Irrigation

- This strategy for water system was recommended by a customary framework from India - where water was set in the empty stem of a dead plant to water further in the dirt.
- Subsequent research discovered one investigation and one report from India.
- This has been our best framework for reclamation work - modest, sturdy and viable.

Figure 120 Profound Pipe Irrigation

No waste

- Little water dissipates on the grounds that the water is set in the profound soil.
- Little time is squandered in light of the fact that it is quick and simple to fill the line.
- It functions admirably on slants.
- It grows enormous root frameworks.

Wick Irrigation

- Wick frameworks were likewise portrayed in reports from India.
- Wicks were generally joined with earth pots to water plantation trees.
- After attempting a few kinds of wick frameworks I figure this might be the following extraordinary thing.

Permeable Hose

- This framework utilizes an in an upward direction set defective or permeable hose segment.
- It plays out somewhat like a mud pot- - just it is less expensive and more modest.
- This can be taken care of by a container or appended to a trickle type line. Both have functioned admirably

Tree cover

- Watering into a tree cover is likewise compel if the base is fixed into the dirt.
- This should be possible by hand from a hose, water containers or utilizing a dribble type framework.

Punctured Pipe

- Sub-water system should likewise be possible with opened channel pipe.
- The pipe is laid somewhere down in the dirt and loaded up with water utilizing a water truck.
- Best for lines of plants - useful for finishing

Permeable Capsules

- A current transformation of covered mud pot water system was created in Brazil
- The mud is framed into a container that can be put on a water line.
- These functioned admirably - however were costlier to make.

18. Social Activities – Any Activates Planned By Students

Awareness Camp

The exercises at Village gave a stage to create mindfulness among customers about natural items (benefits, accessibility and so forth) and it helped in teaching the ranchers to utilize natural manures to develop food varieties and keep away from pollution, so individuals of the town can get unadulterated and quality nourishment for having a sound existence. As a piece of Vishwakarma Yojna, we had shown various recordings on online premise to ranchers to train various strategies of water system and which manures are appropriate for cultivating with sensible expense. Through this short mission, it was likewise felt that such endeavors would not serve until and except if, these are taken up in a constant mode.

Coronavirus related

Presently - a - days as we are under COVID - 19 LOCK DOWN, the locals are dealing with the issues as to the wellbeing and economy. So as a piece of Vishwakarma Yojana project, we are chipping away at the accompanying projects to redirect the psyche of individuals from this Pandemic. Also, we have done such countless exercises during lock down period in our distributed town.

Following exercises were led as of late:

- Creating mindfulness about what is Covid-19 infection, how it spreads and clarifying how friendly removing checks spread of Covid.
- Demonstrating how wearing of covers can decrease the danger of contaminating others and ensuring ourselves.
- Distribution of covers to the townspeople.
- Demonstration of right strategy for washing with cleanser.

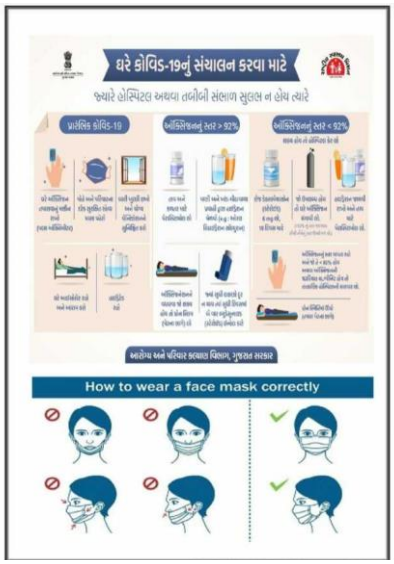


Figure 121 Covid Poster

Figure 122 Vaccination Center at Village school

Showing Learning Activity

Social-passionate learning (SEL) is quite possibly the most encouraging edges in instructive examination. Since scholarly and social-enthusiastic improvement are connected, educating both is the most ideal approach to advance deep rooted achievement. Yet, numerous schools don't have a clue how to guarantee that their social passionate learning exercises are zeroing in on the correct abilities.

The Collaborative for Academic, Social, and Emotional Learning (CASEL), a main master in incorporating SEL into school educational program, has assembled a rundown of center skills for understudies to acquire. These five key abilities are:

- Self-mindfulness: the capacity to recognize and evaluate your musings, sentiments, and qualities, just as how they meet with your practices.
- Self-the executives: the capacity to recognize as well as manage feelings, considerations, and activities.
- Responsible dynamic: the capacity to make positive, valuable decisions about your conduct.
- Social mindfulness: the capacity to take the point of view of and relate to other people, just as learning social and moral conduct.
- Relationship abilities: the capacity to get along and make significant associations with individuals in their day to day existence.

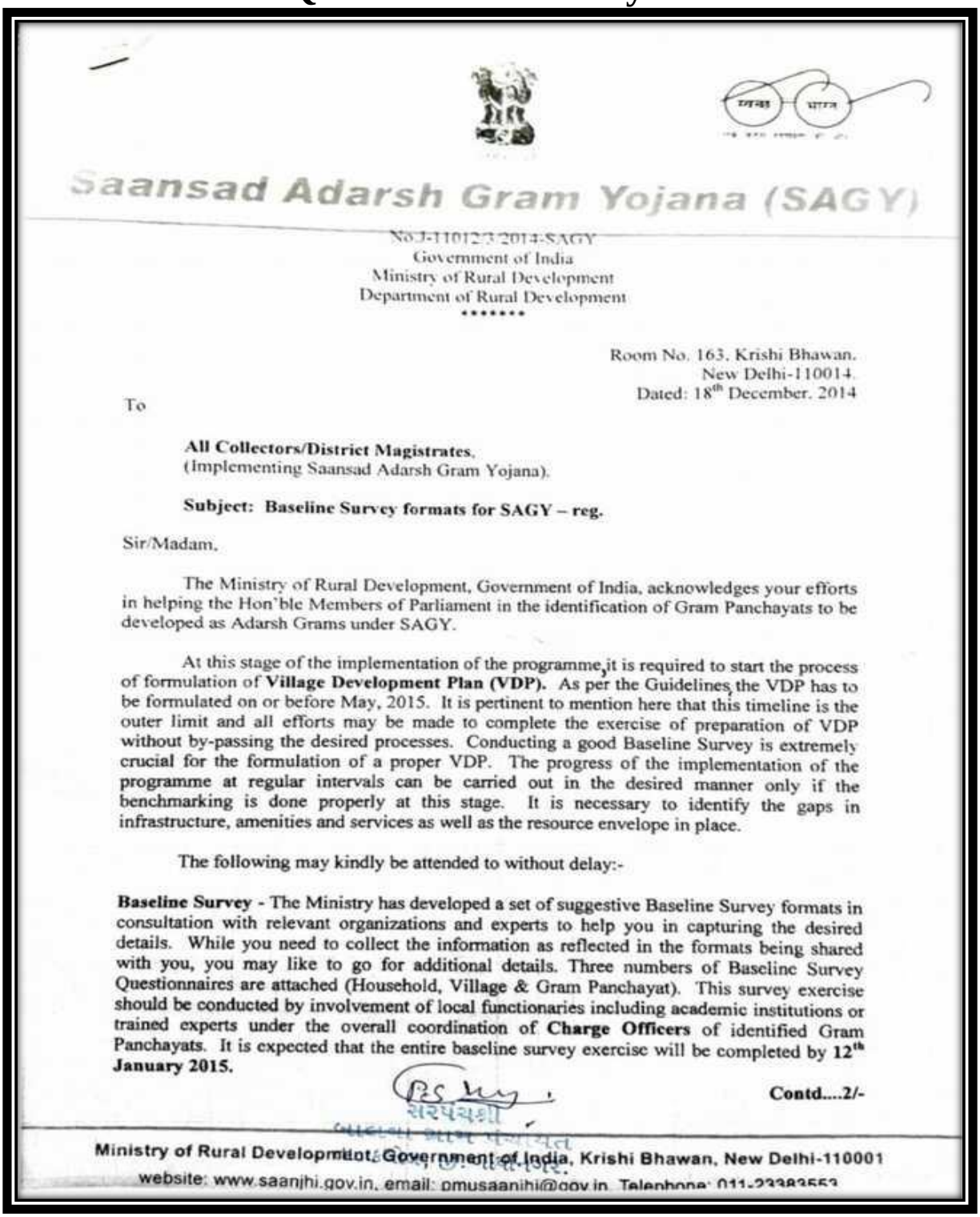
We realize that schooling assumes an exceptionally vital part in one's life. Instruction is indistinguishable and has become a piece of the essential necessities of life like food, safe house and apparel.


Figure 123 Students orientation

Since the COVID-19 pandemic showed up, schools have closed and understudies from rustic foundations and underestimated networks have been left without admittance to training.

The pandemic has intruded on all strolls of human existence, however particularly the existences of underestimated networks, as they were for the most part exposed to incompetent positions. Understudies from these networks can't bear the cost of online instruction as some don't get great web availability, while others can't bear the cost of the contraptions important, because of the monetary emergency.

19. Balva SAGY Questionnaire Survey Form



Saansad Adarsh Gram Yojana (SAGY)

No.J-11012/3/2014-SAGY
Government of India
Ministry of Rural Development
Department of Rural Development
****

Room No. 163, Krishi Bhawan,
New Delhi-110014.
Dated: 18th December, 2014

To

All Collectors/District Magistrates,
(Implementing Saansad Adarsh Gram Yojana).

Subject: Baseline Survey formats for SAGY – reg.

Sir/Madam,

The Ministry of Rural Development, Government of India, acknowledges your efforts in helping the Hon'ble Members of Parliament in the identification of Gram Panchayats to be developed as Adarsh Grams under SAGY.

At this stage of the implementation of the programme, it is required to start the process of formulation of **Village Development Plan (VDP).** As per the Guidelines, the VDP has to be formulated on or before May, 2015. It is pertinent to mention here that this timeline is the outer limit and all efforts may be made to complete the exercise of preparation of VDP without by-passing the desired processes. Conducting a good Baseline Survey is extremely crucial for the formulation of a proper VDP. The progress of the implementation of the programme at regular intervals can be carried out in the desired manner only if the benchmarking is done properly at this stage. It is necessary to identify the gaps in infrastructure, amenities and services as well as the resource envelope in place.

The following may kindly be attended to without delay:-

Baseline Survey - The Ministry has developed a set of suggestive Baseline Survey formats in consultation with relevant organizations and experts to help you in capturing the desired details. While you need to collect the information as reflected in the formats being shared with you, you may like to go for additional details. Three numbers of Baseline Survey Questionnaires are attached (Household, Village & Gram Panchayat). This survey exercise should be conducted by involvement of local functionaries including academic institutions or trained experts under the overall coordination of **Charge Officers** of identified Gram Panchayats. It is expected that the entire baseline survey exercise will be completed by **12th January 2015.**

Contd....2/-

Ministry of Rural Development, Government of India, Krishi Bhawan, New Delhi-110001
website: www.saanjhi.gov.in, email: pmusaanjhi@gov.in, Telephone: 011-23382553

-2-

Uploading of the data collected through Baseline Survey- After the collection of data, the same should be entered into the online portal at http://www.saanjhi.gov.in . You (District Collector/DM) being the Nodal Officer will ensure that the data is correctly compiled and uploaded on to the website latest by **20th January, 2015.**

The Ministry will be sharing with you the **structural framework of VDP** very shortly, which will give you an idea as regards the desired processes and structure of a VDP. We will be holding a dialogue with you through video conferencing facility in the near future for assessing the progress of baseline survey exercise and formulation of the VDP.

(Aparajita Sarangi)
Joint Secretary
19/12/14

Copy to:

Principal Secretaries/Secretaries (RD Department)/State Nodal Officers (SAGY)

સરપંચશ્રી
બાલવા ગ્રામ પંચાયત
તા. કલોલ, જી. ગાંધીનગર.

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: Balva

b. Block: Kalol

c. District: Gandhinagar

d. State: Gujarat

e. Lok Sabha Constituency: Mehsana parliamentary

f. Number of Wards in the Gram Panchayat: 12

g. Number of Villages in the Gram Panchayat: 2

h. Names of Villages: Brathpura

Demographic Information

Number of Households 1500 Total Population 6304 Male 3390 Female 1330

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	Y	-
b.	Nearest Primary Health Centre (PHC)	Y	-
c.	Nearest Community Health Centre (CHC)	N	N)
d.	Nearest Post Office	Y	-
e.	Nearest Bank Branch (Any)	Y	-
f.	Nearest Bank with CBS Facility	Y	-
g.	Nearest ATM	Y	-
h.	Nearest Primary School	Y	-
i.	Nearest Middle School	Y	-
j.	Nearest Secondary School	Y	-
k.	Nearest Higher Secondary School / +2 College	Y	-
l.	Nearest Graduate College	N	Y
m	Nearest ITI / Polytechnic Centre	N	Y
n	Kisan Seva Kendra	N	Y

P.S Bus.

1

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

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

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

IV. Sports Facilities in the Gram Panchayat

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

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

V. Education, ICDS

a. Number of Angan Wadi Centres: 2

b. Number of villages without Angan Wadi Centres 8

Names of such villages: Balva

c. Schools (Number)

Primary Private: - Primary Govt.: 1

Middle Private: - Middle Govt.: 1

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)	-	-	-	-	-	-	Manya
b.	Kerosene	-	-	-	-	-	-	"
c.	Other (mention)	-	-	-	-	-	-	

સરપંચશ્રી
બાલવા ગ્રામ પંચાયત

2

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

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

VII. Coverage of Villages under different Facilities & Services

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

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	2403	d.	Pasture / Grazing Land	-	g.	Check Dam	-
b.	Irrigated Land	2000	e.	Forests/ Plantations	11.57	h.	Wells/Bore Wells	135
c.	Un-irrigated Land	403	f.	Other Common Land	-	i	Tanks /Ponds	1

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

સરપંચશ્રી

3

Sansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

Note: Please aggregate information from village level questionnaires wherever relevant

IX. Parameters relating to Households & Institutions

		Number
a)	Number of eligible Households for pension (old age, widow, disability)	–
b)	Number of Households receiving pension (old age, widow, disability)	
c)	Number of eligible Households who are not receiving pension	
d)	Number of Households eligible for Ration Card	All
e)	Number of eligible HHs having ration cards	All
f)	Number of households covered under RSBY (Rashtriya Swasthya Bima Yojana)	–
g)	Number of HHs covered under AABY (Aam Aadmi Bima Yojana)	–
h)	Number of active Job Card holders under MGNREGA	–
i)	Number of Job Card holders who completed 100 days of work during 2013-14	–
j)	Number of shops selling alcohol	–
k)	Number of BPL families	–
l)	Number of landless households	–
m)	Number of IAY beneficiaries	–
n)	Number of FRA[2] beneficiaries	–
o)	Number of Community Sanitary Complexes	–
p)	Number of Households headed by single women	–
q)	Number of Households headed by physically handicapped persons	–
r)	Total number of Persons with Disability in the village	–
s)	Number of SHGs	–
t)	Number of active SHGs	–
u)	Number of SHG Federations	–
v)	Number of Youth Clubs	–
w)	Number of Bharat Nirman Volunteers	–

Name and Signature of Surveyor and Respondent'

Anya Gajjar Nishith Vaidya Jinil Parekh Surveyor	Prahladbhai Chaudhary (Sarpanch) PRI Respondent (Preferably Gram Panchayat Chairperson)	- Pankaj Pandya (Patavada) Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	26/11/2020 Date of Survey

P.S
સરપંચશ્રી
બાલવા ગ્રામ પંચાયત
તા. કલોલ, જી. ગાંધીનગર.

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

4

ANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: BALVA Gram Panchayat: BALVA GRAM PANCHAYAT Ward No. ____

Block: KALOL District: GANDHINAGAR

State: GUJARAT S Constituency: Mehsana parliamentary

1. Family Identity and Size

Name of Head of Household	Pankaj Parelya							Male/ Female	
SECC Survey ID:		Family Size	4	Over 18	1	to 18	2	Under 6	

2. Category & Entitlement Details (Tick as appropriate)

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

2. Adults (above 18 years)

Name	Age	Sex M/F / O	Disability Status Y/N	Marital Status[3]	Education Status[4]	Adhaar Card (Y/N)	Bank A/C (Y/N)	Social Security Pension[5]
Pankaj Parelya	45	M		Married	10	"	"	—
Poojaben Parelya	35	F		"	7	"	"	—

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
Sauryu Parelya	10	M		Single	5	Primary	5	Yes
Meet Parelya	8	M		Single	4	Primary	4	No

4. Children below 6 years

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

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

સરપંચશ્રી
બાલવા ગ્રામ પંચાયત
તા. કલોલ, જી. ગાંધીનગર.

SAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

and washing

	Always		Sometimes		Never
	Soap	Other	Soap	Other	
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: 2
Type: Kutcha / Semi Pucca / Pucca	
Toilet: Private / Community / Open Defecation	
Drainage linked to House: Covered / Open / None	
Waste Collection System	Door Step / Common Point / No Collection System
Homestead Land: Yes / No	Kitchen Garden : Yes / No
Compost Pit: Individual/ Group/ None	Biogas Plant: Individual/ Group/ None

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

Source of Water		Distance
Piped Water at Home	Yes / No	0
Community Water Tap	Yes / No	–
Hand Pump (Public / Private)	Yes / No	–
Open Well(Public / Private)	Yes / No	–
Other (mention): Over head tank		200 mt.

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	No	2. Cultivable Area	No
3. Irrigated Area	No	4. Uncultivable Area	No

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
Cotton		
Wheat		
Jar		

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

Computer, Cricket, Kabaddi

19. Do children play musical instrument (mention)

—

Schedule Filled By: Arya Gajjar, Nishith Vaidya, Jinil Parekh

Principal Respondent:

Date of Survey:

બાલવા ગ્રામ પંચાયત
તા. કલોલ, જી. ગાંધીનગર.

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

Gmail arya gajjar <aryagajjar.cie17@gmail.com>

Development scenario of Balva village, Gandhinagar, Gujarat.
2 messages

arya gajjar <aryagajjar.cie17@gmail.com> 28 August 2021 at 13:54
To: collector-gnr@gujarat.gov.in, tdo-gnr@gujarat.gov.in, ddo-gnr@gujarat.gov.in
Cc: rurban@gtu.edu.in

Respected Sir/Madam,

We are students of Adani institute of Infrastructure Engineering, Ahmedabad affiliated to Gujarat Technological University-GTU. GTU has been assigned to Vishwakarma Yojanaa-VY Phase-VIII in which students survey various villages 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 Balva Village profile of development and our design work for them which is as below.

Sr. No.	Design Name	Amount Period	Expenditure (Rs.)	Benefit
1.	Community Hall	Long term (2-5 years)	242,5010	•Boosts the Local Economy. •Keeps Adolescents Safe. •Provides a Meeting Space. •Boosts Property Values.
2.	Public Toilet	Immediately	56,610	•It will improve disinfection office •It will be useful to individuals who don't have latrines in their home. •It will promote neatness in the village.
3.	Public Parking	Immediately	146,530	•Better Usage of Land. •Improved Esthetics. •Increased Safety. •Improved Business
4.	ATM	Immediately	17,410	•Open or pull out a fixed store. •Re-energize your versatile. •Cover personal expenses. •Store cash. •Pay protection premium. •Apply for individual credit. •Move money and Pay your bills.
5.	Shopping Area	Within 1 year	158,480	•A ton of assortment of items in a single spot for the customer. •Shopping Areas help the economy.

6.	Steel Gate	Immediately	47,260	•Expanded Security •Controlled Access •More slow Vehicle Speeds •Walker Safety •More noteworthy Privacy
7.	Library	Long term (2-5 years)	314,600	•The library goes about as an asset community and a clearinghouse of data on provincial turn of events. •It has fostered an electronic information base of the assets in its assortment. •The library has additionally completely robotized its everyday tasks.
8.	Bus Stop	Immediately	27,840	•It will help Villagers in transportation. •It facilitates the heap on the one bus station and helps to decrease commotion contamination by simple control of fewer groups.
9.	Development Center	Long term (2-5 years)	629,965	•The accentuation is to enable adolescents in such a manner so they get business and furthermore improve business. •To give abilities to ladies with the goal that they become self-subordinate •To mindful residents in regards to new advancement plans for their improvement •To start new companies in the village.
10.	Cyber Café	Immediately	109,475	•Animal will provide with shelter and food where they can feel safe and secure •Enough watering will be provided so they don't have to roam around the village for water.
11.	Retail Shop	Within 1 year	244,110	•Items and costs are customized for the working class and privileged in the public eye.
12.	Recreation Center	Within 1 year	3,60,000	•You pay for what you use. •Fast Internet •Illegal Gambling Problem

8/28/2021 Gmail - Development scenario of Balva village, Gandhinagar, Gujarat.

				•Internet Access for Everyone •No Equipment Hassles

Please find herewith attached,
Detailed Project Report of Balva Village

AIIE_VY_BALVA VILLAGE-FULL REPORT.pdf

Best Regards,

Student Name	Branch Name	Enrollment No	Email ID
Arya Gajjar	Civil & Infrastructure Engineering	171310140013	aryagajjar.cie17@gmail.com
Nishith Vaidya	Civil & Infrastructure Engineering	171310140061	nishithvaidya.cie17@gmail.com
Jinil Parekh	Electrical Engineering	171310109028	jinilparekh.ele17@gmail.com

University: Gujarat Technological University, Chandkheda, Ahmedabad 382424 Gujarat.
College: Adani Institute of Infrastructure and Engineering, Shantigram, Nr. Vaishnodevi Circle, S.G. Highway, Ahmedabad, 382421.

postmaster@gujarat.gov.in <postmaster@gujarat.gov.in> 28 August 2021 at 13:54
To: aryagajjar.cie17@gmail.com

21. Comprehensive report for the entire village

Aim of project

The formative work in village that could embrace according to the need of the town specifically incorporates Physical, Social and Renewable framework Facilities. It is additionally proposed to outline "Vishwakarma Yojana" to give the advantage of genuine work insight to designing understudies of Gujarat Technological University and at the same time apply their specialized information in the advancement of foundation in country improvement.

The principle point is to optimize village with a "rural soul" however with all metropolitan conveniences that a city may have. This project provides “DESIGN TO DELIVERY” solutions for development of villages as
“RURBAN” areas.

Overview

Visiting the Balva village dispensed to us, we came to know a ton about the village situations and what are the necessities of the residents. We find out about the foundation that is required in the villages of India when we visited the shrewd village as we had the option to characterize a few necessities for our assigned village. By the assistance of different surveys given by Vishwakarma Yojana, we had the option to get some essential necessities that are required in the Balva village. At initial stage (Part 1) we received contact information of Talati of Balva village from VY section. So processing it we conducted a telephonic conversation with 'Yagneshbhai - Talati Balva village' and gathered some basic information of the problems villagers are facing, we also contacted villagers via telephone and discussed about issues they are facing. After the pandemic is bit normalized we visited the village putting all the problems as discussed by talati and villagers in mind.

As a civil engineering concepts we gathered a lot information and requirements where the village was lacking or need to have improvements. As electrical engineering concepts we gathered how power outages can be reduced, cost reduction can be done and many other parameters which can be beneficial for village.

Total nine designs were given which includes

Six Civil designs - Socio-Culture Design (Community Hall); Public Toilet; Public Parking; Automated Teller Machine(ATM); Shopping Area and Steel Gate.
Three Electrical designs- Solar Automatic Gate; Lattice Steel Tower and Solar Streetlight in Parking Area.

Those design concepts were given with location of implementation, design structure/circuit, costing and technical specifications or requirements. The designs suggested is cost efficient, reliable and fall under basic necessities for the betterment of villagers life.

In Part-II we continued our surveys and search for next few problems which can be solved by us and we can increase the quality of living for the villagers. So on the way towards it we have done conversation with few villagers and looked more precisely to the village facilities.

At the end we were ready with another nine designs which includes:
Civil Concept with six designs- Library; Development center; Bus stop; Retail shop; Recreation Center and Cyber Cafe.
Electrical Concept with three designs- Beacon Flasher; Arduino based liquid vending machine and Blown fuse indicator.

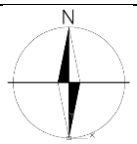
The designs from civil and electrical point of view was considered as necessary step towards RURBANIZATION of the village. The designs given with location for implementation, technical specifications or requirements, actual costings and design structure / electrical circuit.

At last we conclude by saying that the conveniences planned under this Vishwakarma Yojana will be useful for better advancement of the village as truly just as socially, which improves the way of life of individuals alongside village with protecting nature little by little. This will help in creating smart village in economical way, diminish movement from village and keep the urban communities from the metropolitan pressing factor. This should prompt some reevaluating about the significance of productivity past the regular originations of financial or specialized productivity. Without a doubt, business development is in any event as significant as development in usefulness. As it were, both address the usage of work as a asset. Why, at that point does considering effectiveness center around one and disregard the other It is essential to think about this inquiry.

The appropriate response, which calls for change in both financial aspects and legislative issues, could have a genuine effect. Basically, what we need is to enable the rustic individuals by giving them schooling and legitimate medical services. They need to have framework like power and water so they are liberated from the pattern of dry spells and floods.

We need to give them independent work with the goal that they need to remain in village as opposed to relocating in urban communities. There is a need to engage the locals, and not simply supporting them by food sponsorships, credit waivers which wind up devastating them. India will develop just when rustic India walks inseparably with urban communities in the twenty first century.

ABBREVIATIONS

SHORT NAME/ SYMBOL	FULL NAME
	North sign
°E	East
°N	North
km	Kilometer
ATM	Automated Teller Machine
KWp	Kilo-Watt Peak
PV	Photovoltaics
Sq. Mt	Square Meter
GUI	Graphical User Interface
PC	Personal Computer
WCs	Water Closets
DWWT	Duckweed Based Wastewater Treatment
KLD	Kilo Liters Per Day
KL	Kilo Liter
Lpcd	Liter per capita per day

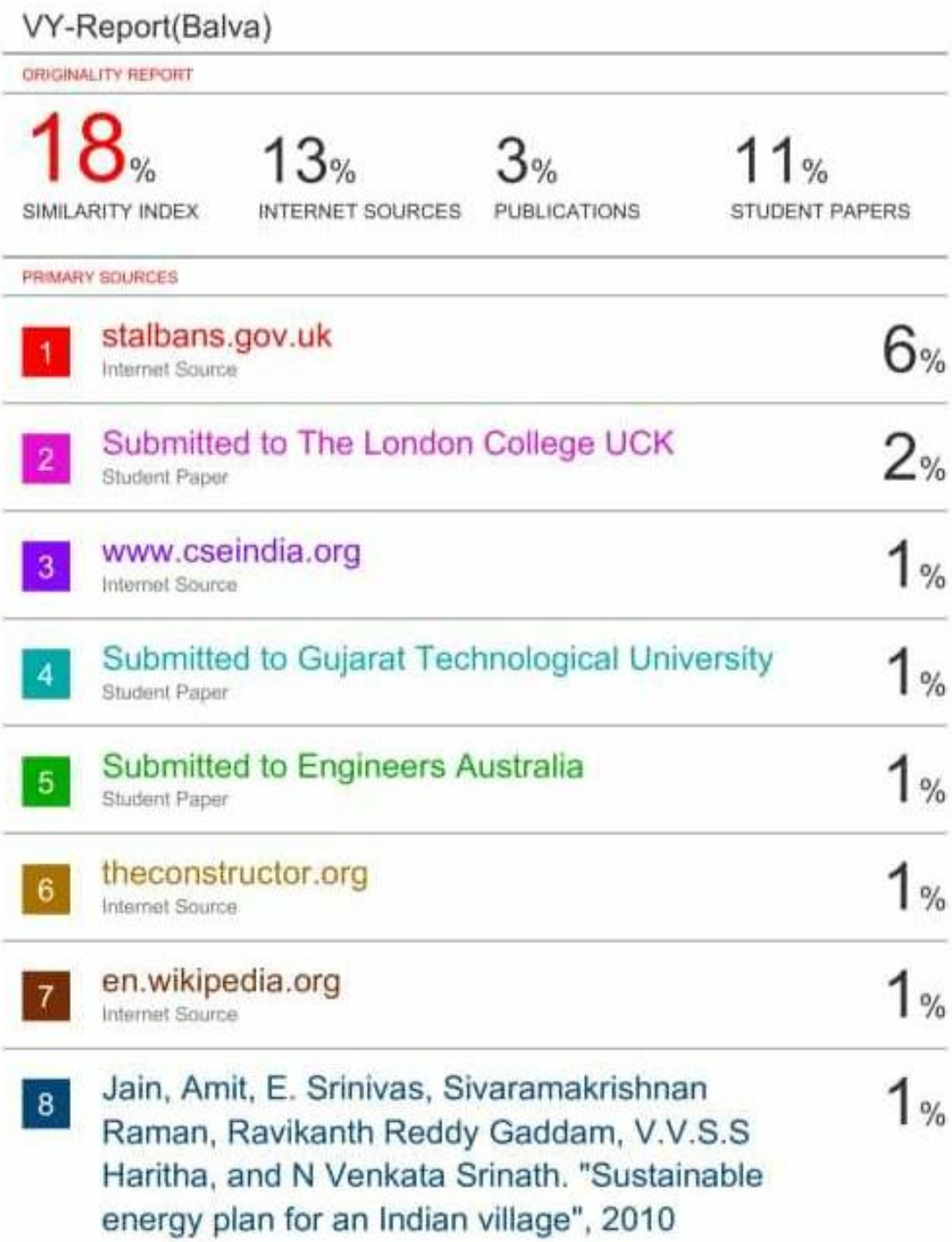
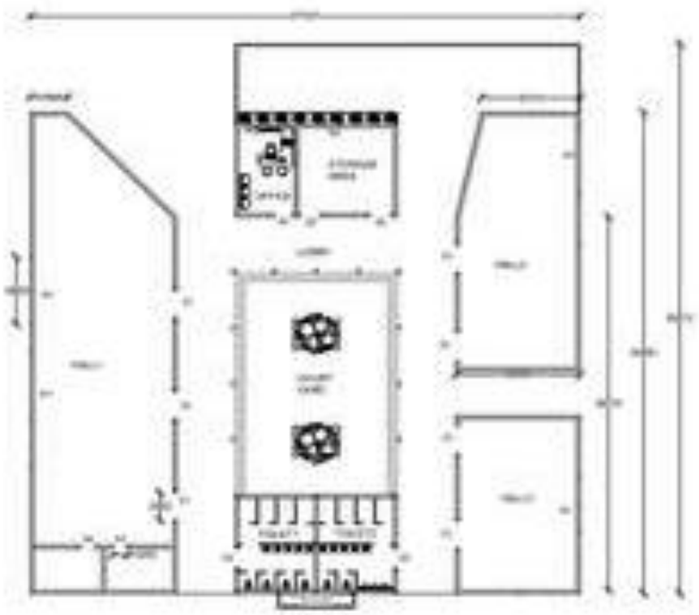


Figure 124 plagiarism report

ELEVATION

SECTION



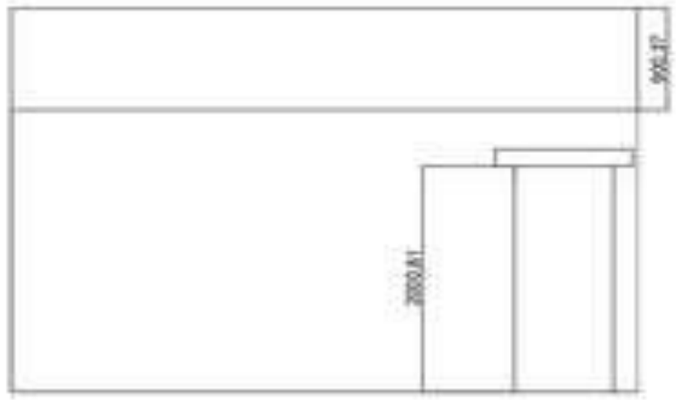
PLAN

SCHEDULE OF OPENING		
NAME	SIZE	QUANTITY
D1	2100mmX2000mm	7
D2	2100mmX1000mm	7
W1	4830mmX230mm	4
W2	1027mmX230mm	2

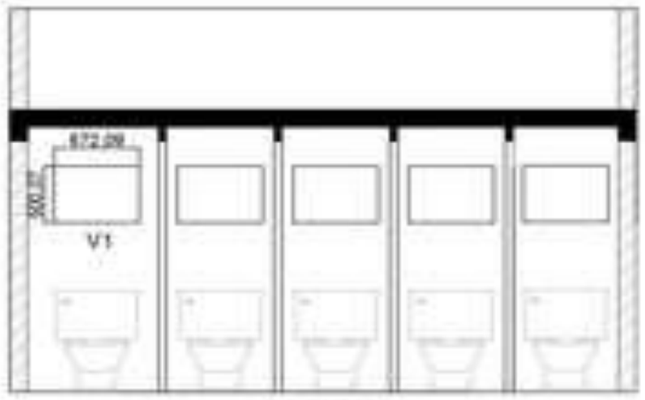
NOTES:

- ALL DIMENSIONS AND LEVELS ARE IN MILLIMETER UNTIL STATED.
- DO NOT SCALE THE DRAWING ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- UNLESS OTHERWISE SPECIFIED ALL THE CONCRETE SHOULD BE MIXED IN PROPORTION OF M-20 GRADE AS PER IS 456-2000.
- ALL CONCRETE SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
- ALL LOAD BEARING BRICK MASONARY WALL IN CEMENT MORTAR IN PROPORTION OF 1:6.
- DESIGN IS PREPARED ONLY FOR EDUCATION PURPOSE, CORRECTED ALL DATA MUST BE CHECK BEFORE USE.

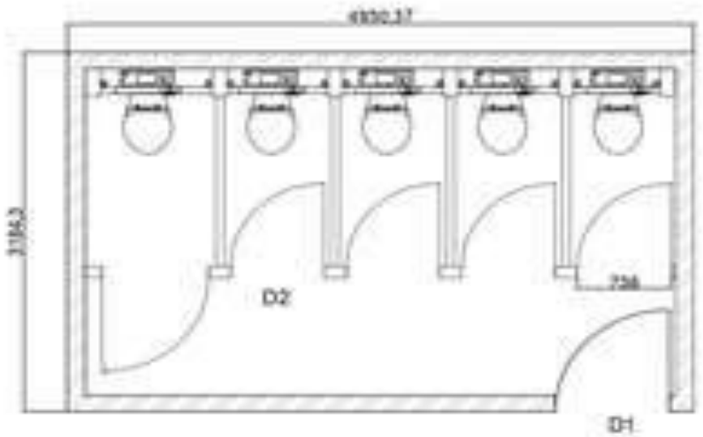
DESIGN NO:1	**COMMUNITY HALL**	
PREPARED BY:	Arya Gajjar Nishith Vaidya	SHEET NO:1
PROJECT NAME:	Vishwakarma Yojna Phase-VIII	
INSTITUTE NAME:	Adani Institute of Infrastructure Engineering	
UNIVERSITY NAME:	Gujarat Technological University	



ELEVATION



SECTION



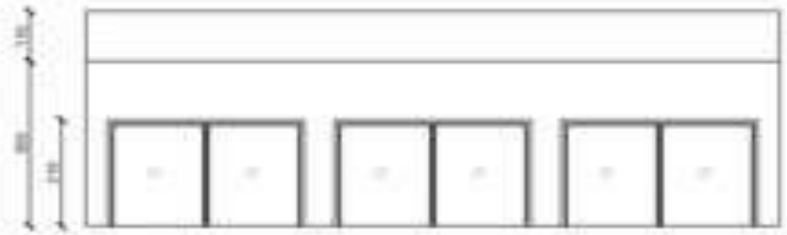
PLAN

SCHEDULE OF OPENING		
NAME	SIZE	QUANTITY
D1	2000cmX900cm	1
D2	2000cmX736cm	5
V1	672cmX500cm	5

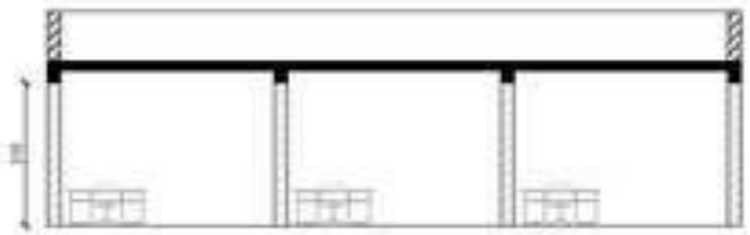
NOTES:

- ALL DIMENSIONS AND LEVELS ARE IN MILLIMETER UNTIL STATED.
- DO NOT SCALE THE DRAWING ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- UNLESS OTHERWISE SPECIFIED ALL THE CONCRETE SHOULD BE MIXED IN PROPORTION OF M-20 GRADE AS PER IS 456-2000.
- ALL CONCRETE SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
- ALL LOAD BEARING BRICK MASONARY WALL IN CEMENT MORTAR IN PROPORTION OF 1:6.
- DESIGN IS PREPARED ONLY FOR EDUCATION PURPOSE, CORRECTED ALL DATA MUST BE CHECK BEFORE USE.

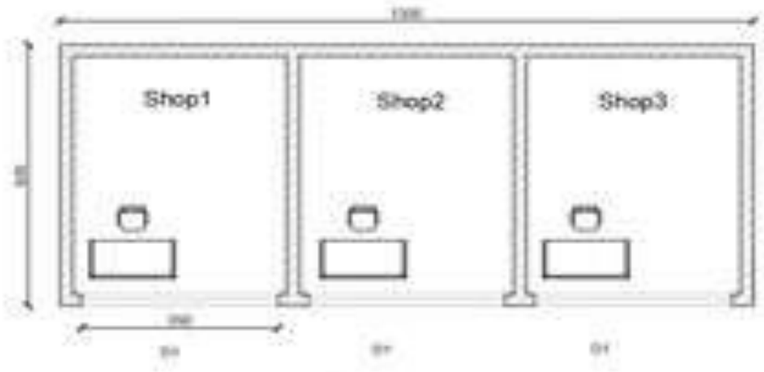
DESIGN NO:1	**PUBLIC TOILET**	
PREPARED BY:	Arya Gagar Nishith Vaidya	SHEET NO:2
PROJECT NAME:	Vishwakarma Yojna Phase-VIII	
INSTITUTE NAME:	Adani Institute of Infrastructure Engineering	
UNIVERSITY NAME:	Gujarat Technological University	



ELEVATION



SECTION



PLAN

SCHEDULE OF OPENING		
NAME	SIZE	QUANTITY
D1	210CMX350CM	3

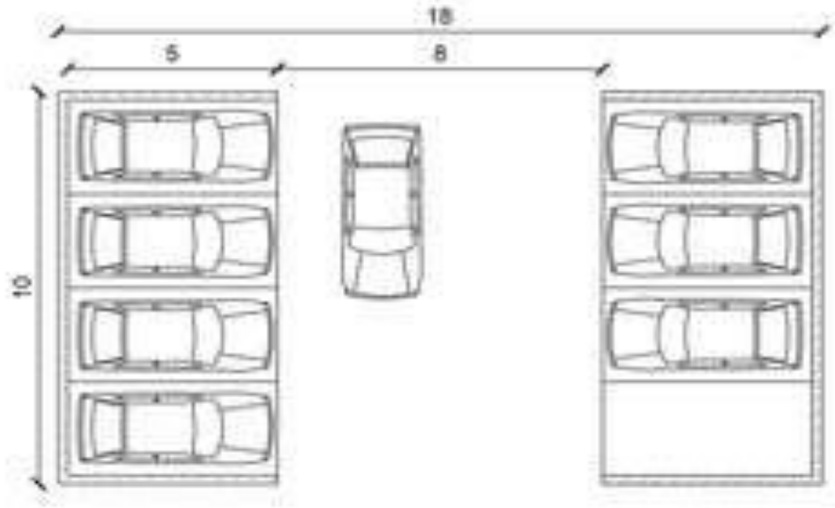
NOTES:

- ALL DIMENSIONS AND LEVELS ARE IN CENTIMETER UNTIL STATED.
- DO NOT SCALE THE DRAWING ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- UNLESS OTHERWISE SPECIFIED ALL THE CONCRETE SHOULD BE MIXED IN PROPORTION OF M-20 GRADE AS PER IS 456-2000.
- ALL CONCRETE SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
- ALL LOAD BEARING BRICK MASONARY WALL IN CEMENT MORTAR IN PROPORTION OF 1:6.
- DESIGN IS PREPARED ONLY FOR EDUCATION PURPOSE, CORRECTED ALL DATA MUST BE CHECK BEFORE USE.

DESIGN NO:1	**SHOPPING AREA**	
PREPARED BY:	Arya Gajar Nishith Vaidya	SHEET NO:3
PROJECT NAME:	Vishwakarma Yojna Phase-VIII	
INSTITUTE NAME:	Adani Institute of Infrastructure Engineering	
UNIVERSITY NAME:	Gujarat Technological University	

ELEVATION

SECTION

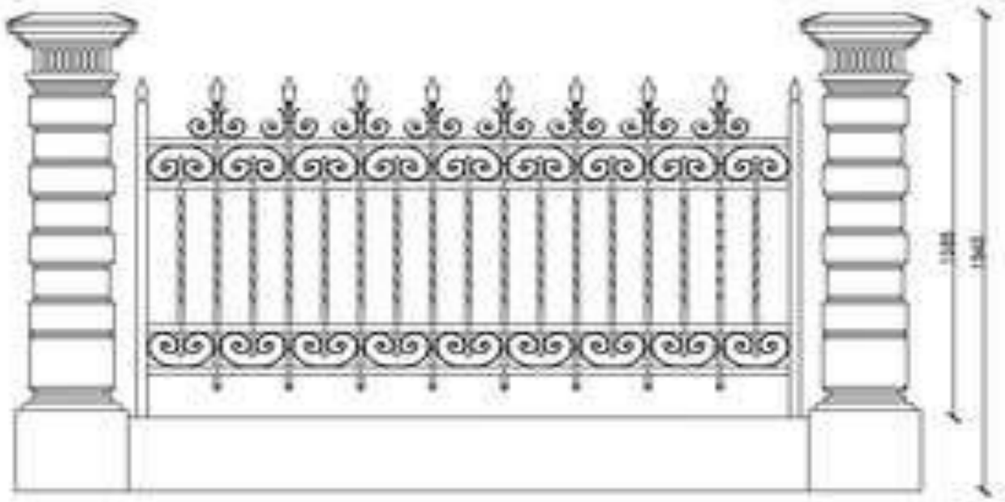


PLAN

NOTES:

- ALL DIMENSIONS AND LEVELS ARE IN METER UNTIL STATED.
- DO NOT SCALE THE DRAWING ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- UNLESS OTHERWISE SPECIFIED ALL THE CONCRETE SHOULD BE MIXED IN PROPORTION OF M-20 GRADE AS PER IS 456-2000.
- ALL CONCRETE SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
- ALL LOAD BEARING BRICK MASONARY WALL IN CEMENT MORTAR IN PROPORTION OF 1:6.
- DESIGN IS PREPARED ONLY FOR EDUCATION PURPOSE, CORRECTED ALL DATA MUST BE CHECK BEFORE USE.

DESIGN NO:1	**PUBLIC PARKING**	
PREPARED BY:	Arya Gajjar Nishith Vaidya	SHEET NO:4
PROJECT NAME:	Vishwakarma Yojna Phase-VIII	
INSTITUTE NAME:	Adani Institute of Infrastructure Engineering	
UNIVERSITY NAME:	Gujarat Technological University	



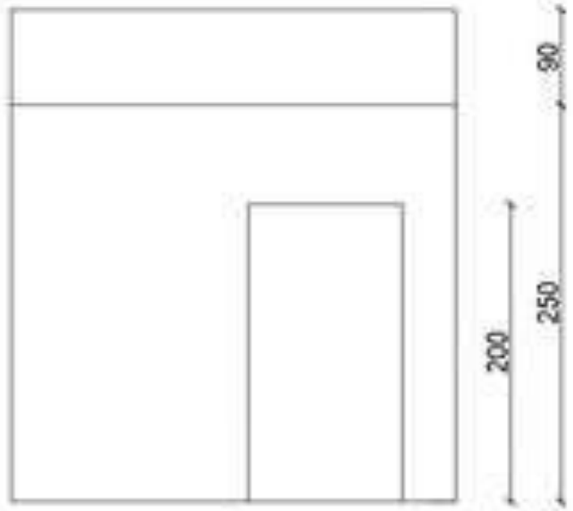
ELEVATION

PLAN

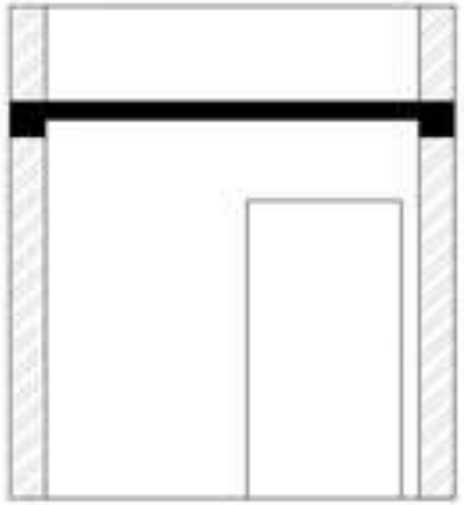
NOTES:

- ALL DIMENSIONS AND LEVELS ARE IN MILLIMETER UNTIL STATED.
- DO NOT SCALE THE DRAWING ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- UNLESS OTHERWISE SPECIFIED ALL THE CONCRETE SHOULD BE MIXED IN PROPORTION OF M-20 GRADE AS PER IS:456-2000.
- ALL CONCRETE SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
- ALL LOAD BEARING BRICK MASONARY WALL IN CEMENT MORTAR IN PROPORTION OF 1:6.
- DESIGN IS PREPARED ONLY FOR EDUCATION PURPOSE. CORRECTED ALL DATA MUST BE CHECK BEFORE USE.

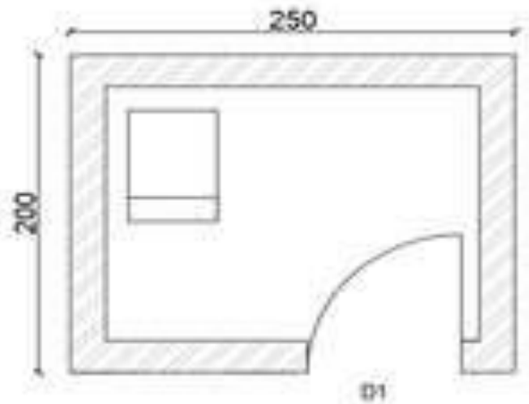
DESIGN NO:1	**STEEL GATES**	
PREPARED BY:	Arya Gagar Nishith Vaidya	SHEET NO:5
PROJECT NAME:	Vishwakarma Yojna Phase-VIII	
INSTITUTE NAME:	Adani Institute of Infrastructure Engineering	
UNIVERSITY NAME:	Gujarat Technological University	



ELEVATION



SECTION



PLAN

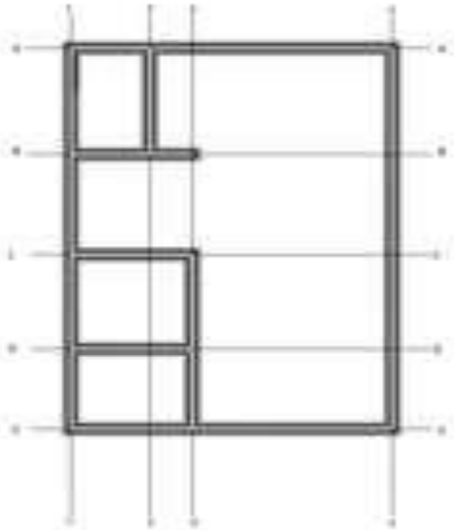
NOTES:

- ALL DIMENSIONS AND LEVELS ARE IN CENTIMETER UNTIL STATED.
- DO NOT SCALE THE DRAWING ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- UNLESS OTHERWISE SPECIFIED ALL THE CONCRETE SHOULD BE MIXED IN PROPORTION OF M-20 GRADE AS PER IS 456-2000.
- ALL CONCRETE SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
- ALL LOAD BEARING BRICK MASONARY WALL IN CEMENT MORTAR IN PROPORTION OF 1:6.
- DESIGN IS PREPARED ONLY FOR EDUCATION PURPOSE, CORRECTED ALL DATA MUST BE CHECK BEFORE USE.

SCHEDULE OF OPENING

NAME	SIZE	QUANTITY
D1	200cmX90cm	1

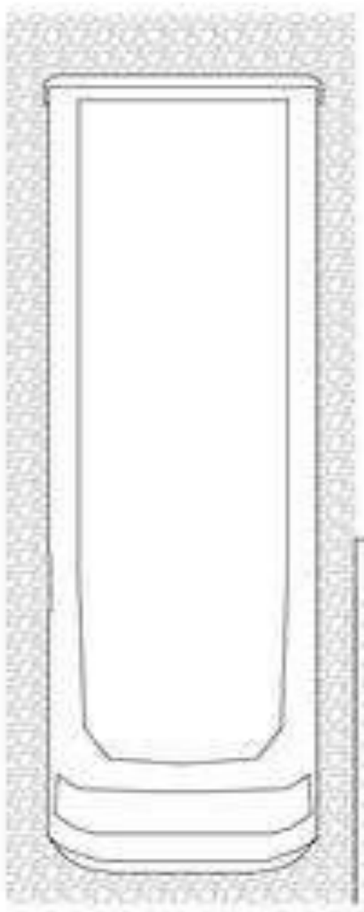
DESIGN NO:1	**ATM**	
PREPARED BY:	Arya Gagar Nishith Vaidya	SHEET NO:6
PROJECT NAME:	Vishwakarma Yojna Phase-VIII	
INSTITUTE NAME:	Adani Institute of Infrastructure Engineering	
UNIVERSITY NAME:	Gujarat Technological University	

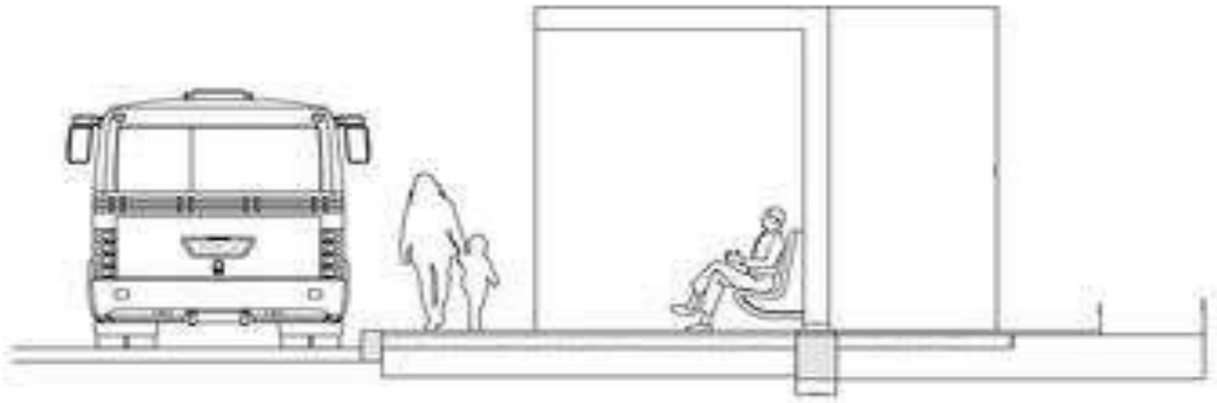


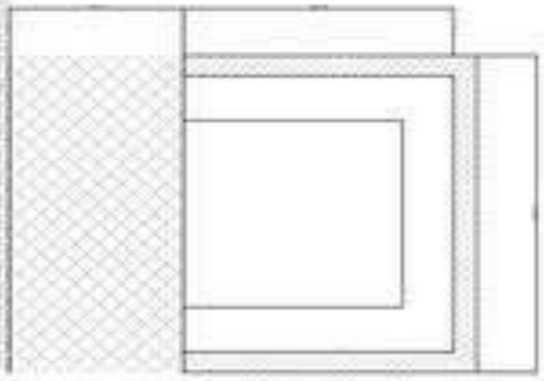
NOTES:

- ALL DIMENSIONS AND LEVELS ARE IN CENTIMETER UNTIL STATED.
- DO NOT SCALE THE DRAWING ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- UNLESS OTHERWISE SPECIFIED ALL THE CONCRETE SHOULD BE MIXED IN PROPORTION OF M-20 GRADE AS PER IS-456-2000.
- ALL CONCRETE SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
- ALL LOAD BEARING BRICK MASONARY WALL IN CEMENT MORTAR IN PROPORTION OF 1:6.
- DESIGN IS PREPARED ONLY FOR EDUCATION PURPOSE, CORRECTED ALL DATA MUST BE CHECK BEFORE USE.

DESIGN NO.7	**LIBRARY**	
PREPARED BY:	Arya Gajjar Nishith Vaidya	SHEET NO.7
PROJECT NAME:	Vishwakarma Yojna Phase-VIII	
INSTITUTE NAME:	Adani Institute of Infrastructure Engineering	
UNIVERSITY NAME:	Gujarat Technological University	



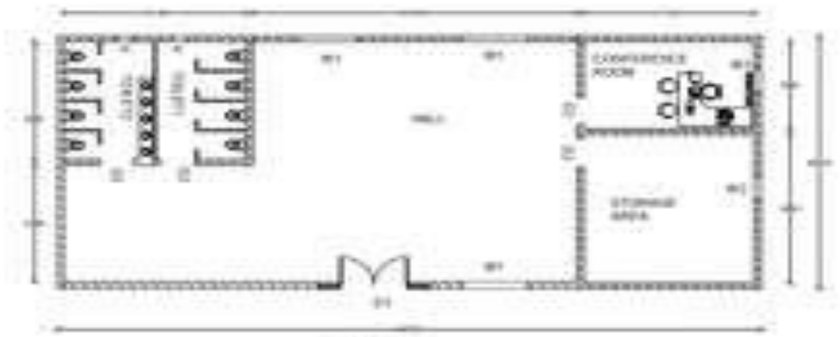




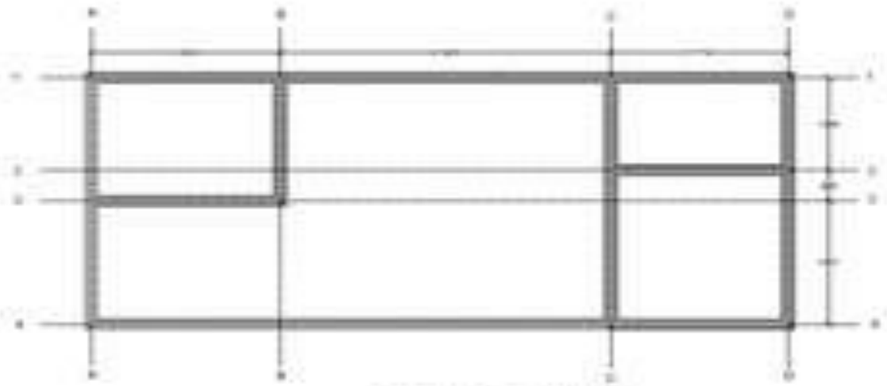
NOTES:

- ALL DIMENSIONS AND LEVELS ARE IN MILLIMETER UNTIL STATED.
- DO NOT SCALE THE DRAWING ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- UNLESS OTHERWISE SPECIFIED ALL THE CONCRETE SHOULD BE MIXED IN PROPORTION OF M-20 GRADE AS PER IS:456-2000.
- ALL CONCRETE SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
- ALL LOAD BEARING BRICK MASONARY WALL IN CEMENT MORTAR IN PROPORTION OF 1:6.
- DESIGN IS PREPARED ONLY FOR EDUCATION PURPOSE, CORRECTED ALL DATA MUST BE CHECK BEFORE USE.

DESIGN NO:1	**BUS STOP**	
PREPARED BY:	Arya Gajjar Nishith Vaidya	SHEET NO:6
PROJECT NAME:	Vishwakarma Yojna Phase-VIII	
INSTITUTE NAME:	Adani Institute of Infrastructure Engineering	
UNIVERSITY NAME:	Gujarat Technological University	

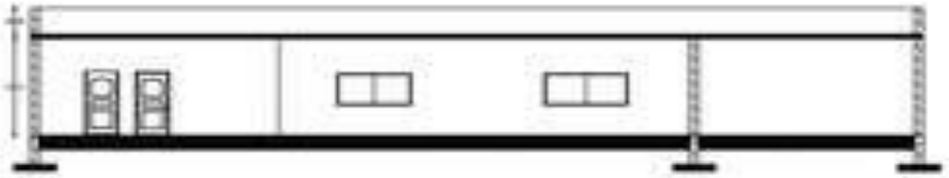


PLAN



FOUNDATION PLAN

ELEVATION



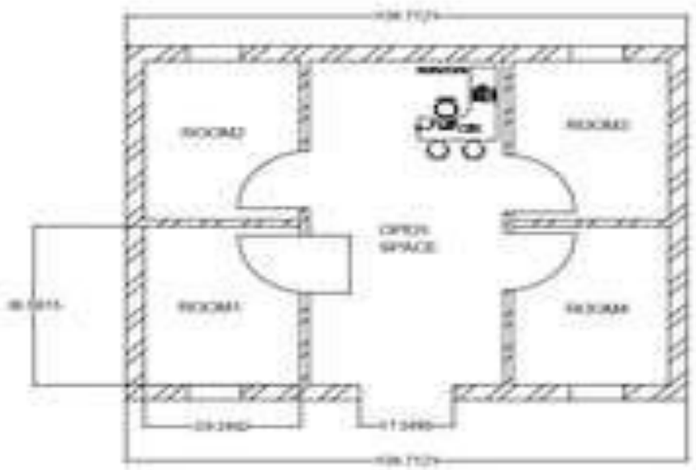
SECTION

SCHEDULE OF OPENING		
NAME	SIZE	QUANTITY
D1	2400mmX2500mm	1
D2	1200mmX2100mm	4
W1	2100mmX1300mm	3
W2	1000mmX700mm	2

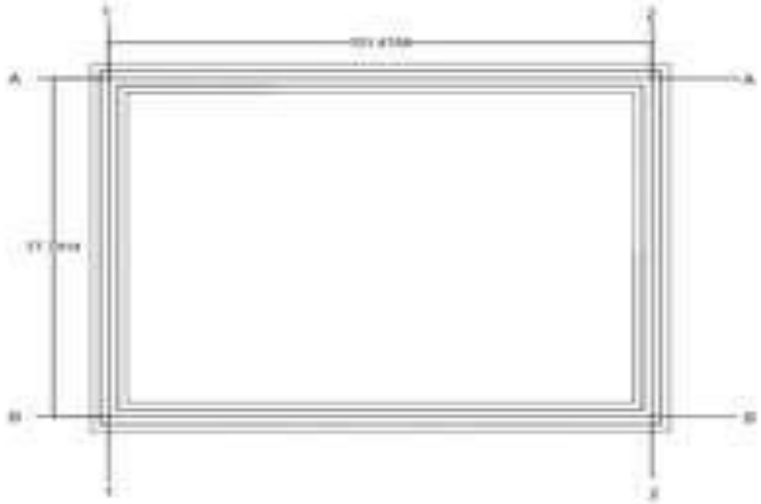
NOTES:

- ALL DIMENSIONS AND LEVELS ARE IN MILLIMETER UNTIL STATED.
- DO NOT SCALE THE DRAWING ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- UNLESS OTHERWISE SPECIFIED ALL THE CONCRETE SHOULD BE MIXED IN PROPORTION OF M-20 GRADE AS PER IS:456-2000.
- ALL CONCRETE SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
- ALL LOAD BEARING BRICK MASONARY WALL IN CEMENT MORTAR IN PROPORTION OF 1:6.
- DESIGN IS PREPARED ONLY FOR EDUCATION PURPOSE, CORRECTED ALL DATA MUST BE CHECK BEFORE USE.

DESIGN NO:9	**DEVELOPMENT CENTER**	
PREPARED BY:	Arya Gajjar Nishith Vaidya	SHEET NO:9
PROJECT NAME:	Vishwakarma Yojna Phase-VIII	
INSTITUTE NAME:	Adani Institute of Infrastructure Engineering	
UNIVERSITY NAME:	Gujarat Technological University	

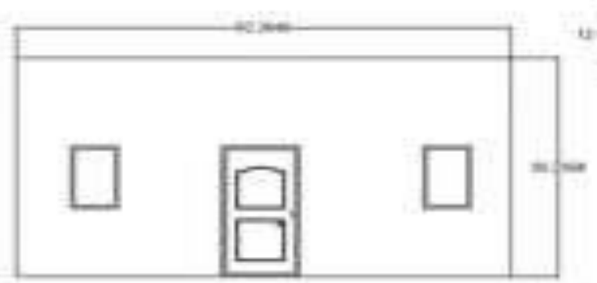


PLAN

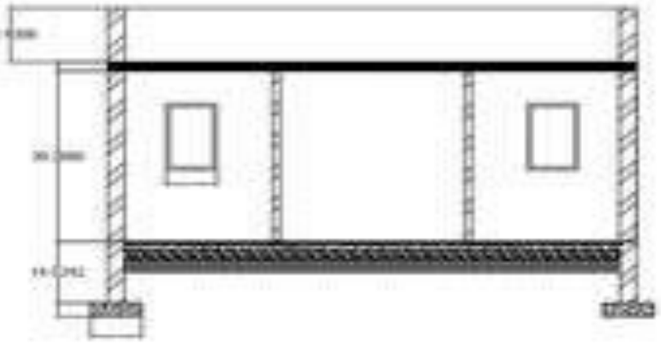


FOUNDATION PLAN

SCHEDULE OF OPENING		
NAME	SIZE	QUANTITY
D1	1.2mx2.1m	1
D2	2.1mX0.9m	4
W	1mX0.7m	5



ELEVATION

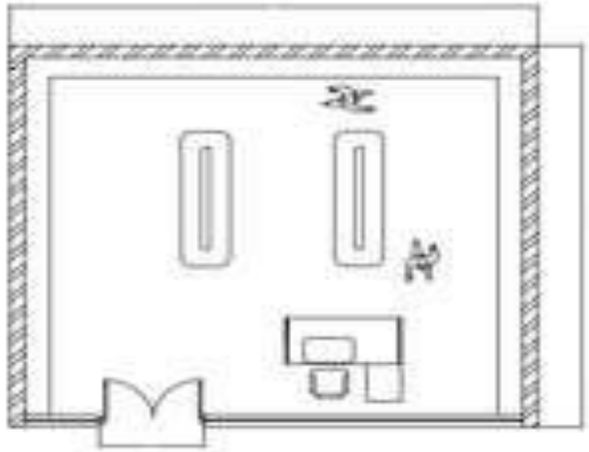


SECTION

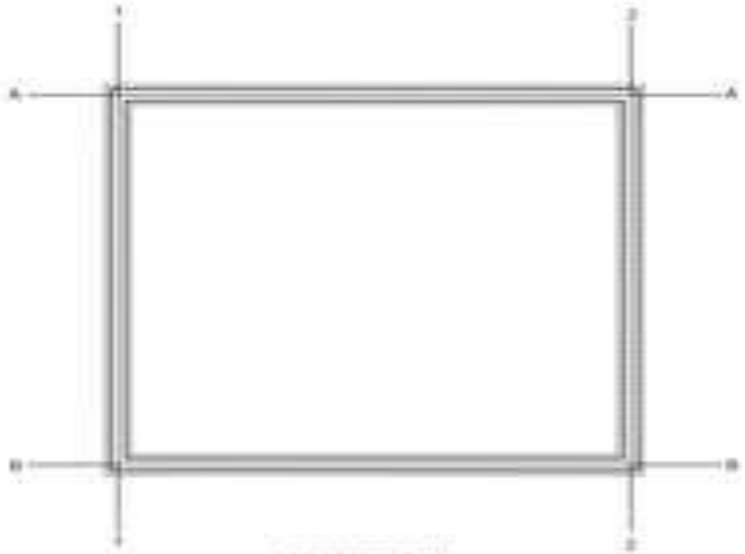
NOTES:

- ALL DIMENSIONS AND LEVELS ARE IN CENTIMETER UNITS, STATED.
- DO NOT SCALE THE DRAWING ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- UNLESS OTHERWISE SPECIFIED ALL THE CONCRETE SHOULD BE MIXED IN PROPORTION OF M-20 GRADE AS PER IS: 456-2000.
- ALL CONCRETE SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
- ALL LOAD BEARING BRICK MASONARY WALL IN CEMENT MORTAR IN PROPORTION OF 1:6.
- DESIGN IS PREPARED ONLY FOR EDUCATION PURPOSE, CORRECTED ALL DATA MUST BE CHECK BEFORE USE.

DESIGN NO.10	**CYBER CAFE**	
PREPARED BY:	Arya Gajjar Nishith Vaidya	SHEET NO:10
PROJECT NAME:	Vishwakarma Yojna Phase-VIII	
INSTITUTE NAME:	Adani Institute of Infrastructure Engineering	
UNIVERSITY NAME:	Gujarat Technological University	

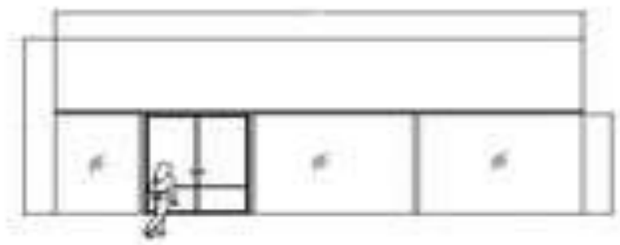


PLAN

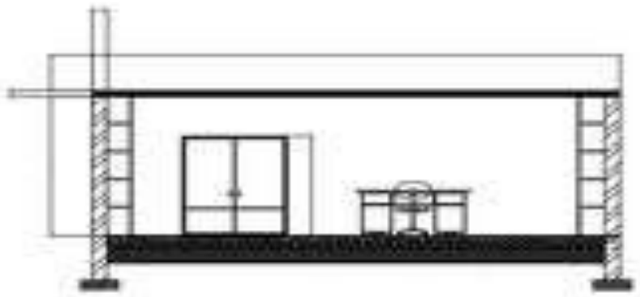


FOUNDATION PLAN

SCHEDULE OF OPENING		
NAME	SIZE	QUANTITY
D	2.1mx2.5m	1



ELEVATION

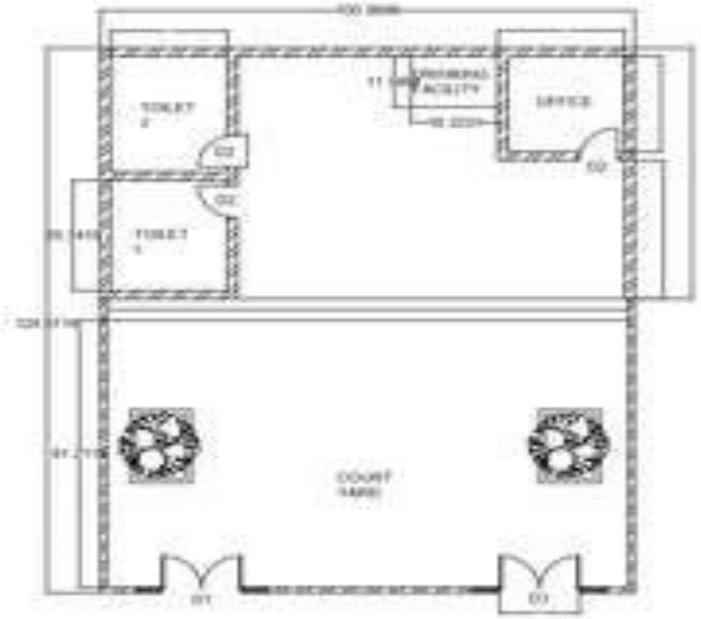


SECTION

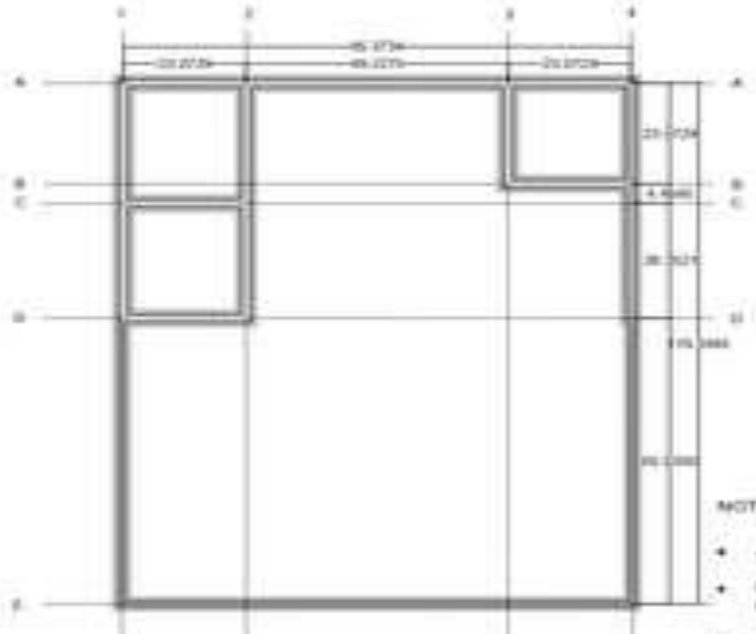
NOTES:

- ALL DIMENSIONS AND LEVELS ARE IN CENTIMETER UNTIL STATED
- DO NOT SCALE THE DRAWING ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- UNLESS OTHERWISE SPECIFIED ALL THE CONCRETE SHOULD BE MIXED IN PROPORTION OF M-20 GRADE AS PER IS:456-2000.
- ALL CONCRETE SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
- ALL LOAD BEARING BRICK MASONARY WALL IN CEMENT MORTAR IN PROPORTION OF 1:6.
- DESIGN IS PREPARED ONLY FOR EDUCATION PURPOSE, CORRECTED ALL DATA MUST BE CHECK BEFORE USE.

DESIGN NO.11	**RETAIL SHOP**	
PREPARED BY:	Arya Gajjar Nishith Vaidya	SHEET NO:11
PROJECT NAME:	Vishwakarma Yojna Phase-VIII	
INSTITUTE NAME:	Adani Institute of Infrastructure Engineering	
UNIVERSITY NAME:	Gujarat Technological University	



PLAN

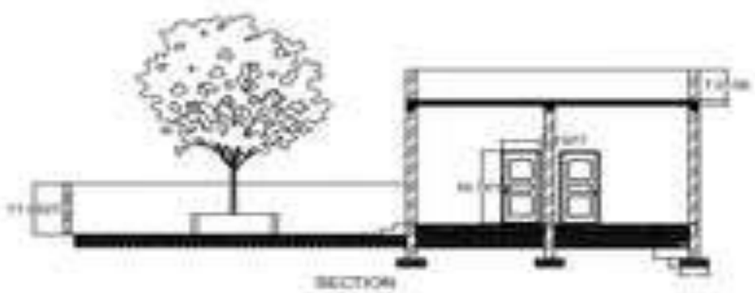


FOUNDATION PLAN

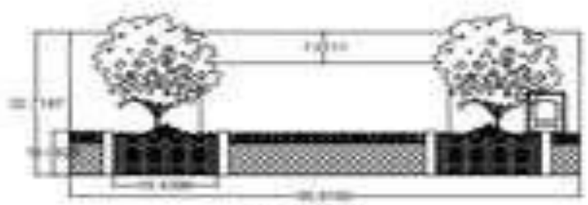
SCHEDULE OF OPENING		
NAME	SIZE	QUANTITY
D1	2.5mX1.3m	2
D2	0.9mX2.1m	3

NOTES:

- ALL DIMENSIONS AND LEVELS ARE IN CENTIMETER UNTIL STATED.
- DO NOT SCALE THE DRAWING ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- UNLESS OTHERWISE SPECIFIED ALL THE CONCRETE SHOULD BE MIXED IN PROPORTION OF M-20 GRADE AS PER IS 456-2000.
- ALL CONCRETE SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
- ALL LOAD BEARING BRICK MASONARY WALL IN CEMENT MORTAR IN PROPORTION OF 1:6.
- DESIGN IS PREPARED ONLY FOR EDUCATION PURPOSE, CORRECTED ALL DATA MUST BE CHECK BEFORE USE.



SECTION



ELEVATION

DESIGN NO.12	**RECREATION CENTER**	
PREPARED BY:	Arya Gajjar Nishith Vaidya	SHEET NO:12
PROJECT NAME:	Vishwakarma Yojna Phase-VIII	
INSTITUTE NAME:	Adani Institute of Infrastructure Engineering	
UNIVERSITY NAME:	Gujarat Technological University	