DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION
Handiya Village

Mahisagar District

PREPARED BY

STUDENT NAME	BRANCH NAME	ENROLLMENT NO.
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Ghanchi Mahammadarsil F.	Civil	180163106010
Shah Vivek N.	Electrical	180163109023

NODAL OFFICER NAME
Prof. Ankit J. Patel

Government Engineering College,
Modasa

YEAR:2020-21

GUJARAT TECHNOLOGICAL UNIVERSITY
Chandkheda, Ahmedabad– 382424 Gujarat

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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 : HANDIYA

DISTRICT : MAHISAGAR

Under

VishwakarmaYojana: Phase-VIII

In partial fulfillment of the project offered by

GUJARAT TECHNOLOGICAL UNIVERSITY, CHANDKHEDA

During the academic year 2020-21.

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

STUDENT NAME	BRANCH NAME	ENROLLMENT NO.
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Date of Report Submission:	
Principal Name and Signature:	**Prof. Dr. B.J. Shah**
VY-Nodal Officer Name and Signature:	**Prof. Ankit J. Patel**
Internal(Evaluator) Guide Name and Signature:	**Prof. Ankit J. Patel**
College Name:	**Government Engineering College, Modasa**
College Stamp:	

ABSTRACT :

Vishwakarma Yojana project and how you do your vision project: Vishwakarma yojana provides the benefits of real work experience to engineering students and students can apply their technical knowledge in the development of infrastructure in rural development.

Rurbanisation is the concept of providing villagers the basic amenities required along with keeping the village soul alive.This project gives new ideas for Development of rural villages.As a measure to strengthen the Panchayat Raj Institutions in terms of functions, powers and finance.

About your village description: Handiya village is located in Balasinor Tehsil of Kheda district in Gujarat, India. It is situated 2km away from sub-district headquarter Balasinor and 72km away from district headquarter Nadiad. Handiya has total population of 2179 peoples.

About existing village condition: There are many facilities which are lack in Handiya village like, proper roads, closed drainage system, solid waste management plant, dairy, post office, gov.dispensary, and recreational centers iuse, high school building, library, Tape water, street lights, community toilet.

About your proposed designs your view for village development: On the basis of survey data we have observed that there are some physical infrastructures like water tank, dairy, primary school, etc. but among them some are not in usable condition which creates problems for villagers. The work of Sarpanch and Talati is good as per the feedback given by villagers. Clinic facility is also not available. Construction of roads are in better condition and usable. More such problems are identified and are to be designed and renovated in the project phases.

About future scope of the village development: Based on the survey we tried to give design of required basic facilities to fulfill their needs.In part 2 we have decided some designs for future scope of the village development as, animal Shelter, Citizen Service Centre, Library,etc.By providing ithese basic facilities to villagers migration rate will be decreased. This is ultimate aim of the Vishwakarma Yojana.

Key Words : Rurbanization, Reduce the Migration, Sustainability, Rural Soul, Traditional Identities,Village Development, Agricultural Modernizing.

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

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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.

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ABBREVIATIONS

SHORT NAME / SYMBOL	FULL NAME
GIS	Geographical Information System
PMGSY	Pradhan Mantri Gram Sadak Yojna
VY	Vishwakarma Yojana
NGO	Non-Governmental organization
DDO	District Development Officer
TDO	Taluka Development Officer
SC	Schedule Cast
GHG	Green House Gases
ST	Schedule Tribe
RCC	Reinforced concrete structure
SAGY	Sansad Adarsh Gram Yojana
BARC	Bhabha Atomic Research Centre
SWOT	Strength, Weakness, Opportunity, Threats
NGO	Non-Governmental Organization
BM	Brick Masonry
D	Door
W	Window
V	Ventilator
WC	Water Closet
PHC	Primary Health Centre
CHC	Community Health Centre
CU.M	Cubic Meter
M	Meter
KM	Kilometer
GSRTC	Gujrat State Road Transportation Corporation
URDPFI	Urban and Regional Development Plans Formulation and Implementation Guidelines
EG	Electrochemmical Glass
NH	National Highway
SH	State Highway
ODR	Other district roads
MDR	Major district Road
SBA	Swachh Bharat Abhiyan
WSR	Wireless Sensor Network
ICDS	Integrated Child Development Skill
GDP	Gross Domestic Product
RGVGY	Rajiv Gandhi Vidhyut Gramin Yojana
SLWM	Solid and Liquid Waste Management

1 Ideal Village visit from District of Gujrat State

1.1 Background and Study area location - Punsari:

Punsari is a village located in Sabarkantha district in the state of Gujarat, India.Punsari is considered as India's smartest village. The village is located at about 80km from the state capital, Gandhinagar. Punsari is 20km from Parvati Hills. Parvati Hills is the largest table top land of India.

The village has undergone transformation under the panchayat. panchayat raj system was established in year 1600. Consequently, Punsari received the award of being the best Gram Panchayat in Gujarat.There has been use of new and advanced technology in education. This village has wi-fi connection for all people. Efforts have been made for the empowerment of women and increasing security in the village. Some of the facilities provided by the panchayat include local mineral water supply, sewer & drainage project, a healthcare centre, banking facilities and toll-free complaint reception service.

The main non farming activity is dairy in this village. The village has undergone a transformation under the panchayat. There has been use of new and advanced technology in education.

F-1.1 Map and Location of Punsari Village

➢ Study Area Location:

This village is comes under Sabarkantha District.Total area of the village is 3 km^2.Over all area of village is l6km^2.Village is expand in 8km diameter..Pin no. of the village is 383307.STD Code of the village is 0277686.Official Website the village is **http.-//www.punsarigrampanchayat.in7**

1.2 Concept : Ideal Village, Normal Village:

An ideal Villages project assists in this by putting concepts Such as hygiene education, environmental health, health promotion and environmental protection into action in rural communities. An ideal Villages project enables a village to mobilize the human and financial resources needed to address many health and quality-of-life issues.

1.2.1 Objectives:

- Provide a help in setting up good roads infrastructure & transportation.
- To achieve the removal of unemployment and a significant reduction in under employment.
- To contribute towards social empowerment by engaging all sections of the community in the task of village development.
- To improve productivity and there by the income of the rural poor .
- To prevent distress migration from rural to urban areas, which is a common phenomenon in India's villages due to lack of opportunities and facilities that guarantee a decent standard of living.
- To provide easier, faster and cheaper access to urban markets for agricultural produce or other marketable commodities produced in such villages.

1.2.2 Example/Live case studies of ideal villages of India/Gujrat:

- **Dharnai - First fully solar-powered village :**

A village in Bihar, which is one of the poorest states in India, has developed its own **solar- powered system** for electricity, beating 30 years of darkness. With the help of Greenpeace India solar-powered micro-grid, this Indian village is now empowered with electricity. The solar micro-grid supplies the electricity for homes, street lighting for roads and lanes, and water pump.t. Dharnai is the first Indian village where all aspects of life are powered by solar energy.

- **Mawl ynnong - Asia's cleanest village :**

Mawlynnong, a small village in Meghalaya, was awarded the prestigious tag of 'Cleanest Village in Asia' in 2003 by Discover India Magazine. According to visitors, you cannot find a single cigarette butt/plastic bag lying around there.

- **Chansad (Vadodara):**

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1.2.3 The Idea of a model/Smart Village:

Smart Village is a concept adopted by national, state and local governments of India, as an initiative focused on holistic rural development, derived from

Mahatma Gandhi's vision of Adarsh Gram (Ideal Village) and Swaraj (Self Reliance).

What is Smart Village ?

What is a Smart Village? Smart Villages is a relatively new concept within the realm of EU policy making. The emerging concept of Smart Villages refers to rural areas and communities which build on their existing strengths and assets as well as on developing new opportunities.

Why do we need Smart Village ?

The driving motivation behind the concept on " Smart Village " is that the technology should acts as a catalyst for development, enabling education and local business opportunities, improving health and welfare, enhancing democratic engagement and overall enhancement of rural village dwellers.

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

A village is a clustered human settlement or community, larger than a hamlet but smaller than a town (although the word is often used to describe both hamlets and smaller towns), with a population typically ranging from a few hundred to a few thousand. Though villages are often located in rural areas, the term urban village is also applied to certain urban neighborhoods. Villages are normally permanent, with fixed dwellings; however, transient villages can occur. Further, the dwellings of a village are fairly close to one another, not scattered broadly over the landscape, as a dispersed settlement. In the past, villages were a usual form of community for societies that practice subsistence agriculture, and also for some non-agricultural societies.This also enabled specialization of labor and crafts, and development of many trades. The trend of urbanization continues, though not always in connection with industrialization. Historically homes were situated together for sociability and defense and land surrounding the living quarters was farmed. Traditional fishing villages were based on artisan fishing and located adjacent to fishing grounds.

- **Lothal :**

Lothal was one of the southernmost cities of the ancient Indus Valley Civilization, located in the Bhal region of the modern state of Gujarat.

Construction of the city began around 2200 BCE.Discovered in 1954, Lothal was excavated from 13 February 1955 to 19 May 1960 by the Archaeological Survey of India (ASI). Lothal is situated

F-1.2 Lothal

near the village of Saragwala in the Dholka Taluka of Ahmadabad district. It is six kilometers south-east of the Lothal- Bhurkhi railway station on the Ahmadabad-Bhavnagar railway line. It is also connected by all-weather roads to the cities of Ahmadabad (85 km/53 mi), Bhavnagar, Rajkot and Dholka. The nearest cities are Dholka and Bagodara. Resuming excavation in 1961.

1.3 Detail Study of Ideal Village with Photograph:

Located in Gujarat's Sabarkantha district, Punsari village has emerged as a model village with modern urban amenities such as 24X7 power supply, WiFi connectivity, and pucca roads connecting the village with other villages and towns. Punsari stands out in this regard as it has constructed a reverse osmosis plant and since then provided house-to-house piped connections to supply chlorinated water.

F-1.3 Punsari Village

Demographics:

The population of Punsari was 5500 as per 2011 census of India which has increased to 5500 in 2011. As of June 2012, the population is 6000.

Infrastructures facilities :

This village have very good infrastructure facility. There are private colleges, schools, anganvadi, bank, post office and primary health center. The village having 80% pukka houses. A big ground is also available but right now there were grass and trees are grown.

The most important concern in rural development is to provide basic amenities to each person living in the rural area. Punsari stands out in this regard as it has constructed a reverse osmosis plant and since then provided house-to-house piped connections to supply chlorinated water. The entire village has been put under CCTV surveillance, which has helped to bring down crime rate to almost zero per cent. Each household has a personalised lavatory and the whole village has a well-designed drainage and storm water disposal system. Atal Express is a free bus service available for commutation to all the villagers. Punsari is the first fully Wi-Fi-covered village in India.

Electricity:

It also has its own 66 KVA substation for electricity generation and 100 per cent coverage of all streets with LED streetlights. A public address system with 120 waterproof speakers for announcing information and spreading messages has been another striking feature of this village. The village headperson uses this public announcement system to share what s/he thinks, plans, and is doing at the gram Panchayat.

F-1.4 Infrastructure Facility in Punsari

Social scenario: The village has 23 communities with a population of 6000, including only 350 people living below the poverty line.

Physical Aminities:

- **Water:**

The panchayat has installed a reverse osmosis plant in 2010 to ensure the supply of clean drinking water to the villagers. During weddings and other ceremonies, water tankers are arranged. Drinking water taps are available for all. The village also has a proper sanitation and drainage system, which is completely underground.

- **Drainage System:**

Underground drainage system is provided in whole village. But there is not proper system for outlet of the waste water. Waste water is free away 2 km apart from village. There is no waste Water treatment plant. So, they people are not treated waste water as irrigation purpose.

- **Solid Waste Management:**

In this village, solid waste is damped in to the soil. They are not burnt the solid waste so, less pollution is occur in this village. They people are not using bio gas plant. They are taking waste from house to house. Gram panchayat provide a bucket to the all people for collection of the waste.

F-1.5 Solid Waste Management of Punsari

- **Road:**

Village having 70% RCC road network. Rickshaws are also used for transportation purpose within the village.

F-1.6 Roads of Punsari

- **Electricity:**

There is a 66 KV sub-station that supplies power to the village. Jyoti gram electricity provide the electricity to the village. 1400 street light is provided in the village. Villagers can get 24 X 7 electricity. Single phase and 3 phase electricity system is available for farmer. Farmer can get 8 hour 3 phase electricity.

F-1.7 66-KV Substation of Punsari

- **Healthg, Snitation and Women Empowerment:**

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

F-1.8 Medical Facility of Punsari

1.4 SWOT Analysis of Ideal Village:

T-1.1 SWOT Analysis

Strength	Weakness	Oppurtunities	Threats
Bsic Physical inrastrucuture	Open Drainage	Green Development	Water Crisis
Quality of Housing	Storm Water Network	Use of Solar panel	Increase in Pollution
Better Connectivity	Less Space	Advanced Hospital	Open Drainage System
Mass Transport Faclity	Less Green Development	Use more modern Technologies	
C.C.T.V. Camera			
Banking Facility			
65 KV sub-station			
Reverse Osmosis(R.O.) Plant			
Wi-Fi Zone			

1.5 Future Prospect of development of the Ideal Village:

Solar street light, Play ground, Waste water treatment Plant, Haveli, Rain Water Harvesting, Fire Station

1.6 Benefits of visit of Ideal Village:

Towns and villages experience cultural and economic growth and regeneration. Villages become more attractive to foreign and domestic investors. It provides greater opportunities for the jobseekers.To know the strength and weakness of village. Get a such surveyor experience in illiterate people. To know about working of Gram panchayat. We see some different type of little requirements of village.

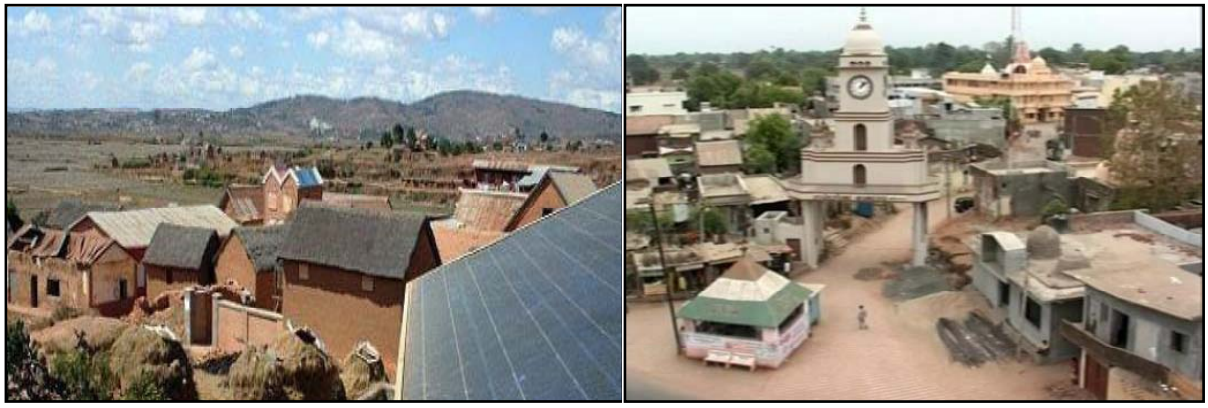
1.7 Civil aspects required in Ideal village :

Civil engineering projects are increasingly complex and are associated with situations where robust decisions are required to be taken. These decisions are made in different stages of civil engineering projects. For example, decision making takes place during feasibility study stage prior to design, procurement, to determine the viability of project undertaken by an investor.

2 Literature Review

2.1 Introduction Urban and Rural village Concept:

➢ **Rural:**



F-2.1 Rural Area

Rural has been defined in two different ways, most often in terms of non-urban status.

- The Federal Office of Rural Health Policy (ORHP).
- The National Sample Survey Organization (NSSO).

1. The Federal Office of Rural Health Policy (ORHP) defines:
Rural as located outside a Metropolitan Statistical Area (MSA), or located in a rural census tract of a MSA as determined under the Rural Urban Commuting Area codes.

2. The National Sample Survey Organisation (NSSO) defines 'rural' as follows: An area with a population density of up to 400 per square kilometer,

- Villages with clear surveyed boundaries but no municipal board,
- A minimum of 759a of male working population involved in agriculture and allied activities.

➢ **Urban:**

"Urban" is a place-based characteristic that incorporates elements of population density, social and economic organization, and the transformation of the natural environment into a built environment.

Census of India 2011, defines 'urban' as follows: All places with a municipality, corporation, cantonment board or notified town area committee, which satisfied the

F-2.2 Urban Area

following criteria:

a) A minimum population of 5,000;
b) At least 75 per cent of the male main working population engaged in non-agricultural pursuits; and
c) A density of population of at least 400 persons per sq. km.

2.2 Importance of Rular development:

The rural society is considered as the backbone of Indian society. Rural society is the fundamental basis of human civilization and cultureSo rural area or village is the well-spring of our culture and civilization. The development of all aspects within rural communities is vital for the effective development of the country. These include, education, employment opportunities, housing, civic amenities and the environmental conditions Thus, to know about the life of urban community it is essential to know their original place of living, that is rural community. 60% population of India still lives in rural area.

2.3 Ancient Village/Different Defination of Rural Urban Villages:

As urban markets saturate and companies spread their wings in search of new markets, everybody has the same question on their lips: what constitutes a 'rural' market? The quest to discover the real rural India still continues in great earnest. Almost every economic agency today has a definition of rural India. Here are a few definitions.

According to the Planning Commission, a town with a maximum population of 15,000 is considered rural in nature.

The National Sample Survey Organization (NSSO) defines 'Rural' as follows:

- An area with a population density of up to 400 per square kilometer,
- Villages with clear surveyed boundaries but no municipal board,
- A minimum of 75% of male working population involved in agriculture and allied activities.

RBI defines rural areas as those areas which has a population of less than 49,000.

The Census of India 2001 defines Urban as:

- All statutory places with municipality, corporation, cantonment board or notified town area committee
- Minimum population of 500
- Density of population of at least 400 per sq. km.
- At least 75% of male working population engaged in non-agricultural activities.

Village is a clustered human settlement or a community, larger than a hamlet but smaller than a town, with a population ranging from a few hundred to a few thousand.

2.4 Scenario: Rural/Urban Villages of India Popullation Growth:

The urban population of India has seen a rise from 17.1 per cent to 29.2 per cent between 1950 and 2015. Meanwhile, the rural population declined from 82.9 per cent (in 1915) to 2015's 67.2 per cent. The speculation for the year 2050 suggests that the urban-rural segregation will be 52.8 and 47.2 with a difference of 5.6 per cent. The population growth rates in both urban and rural areas suggest a similar story. The urban rate has consistently overpowered the total population growth rate over the last seventy years. This trend is set to continue for the next 30 years.

There was a clear increase in the population growth rate from 1950 to 1975. But, the growth rate took a hit as a result of the forced sterilization program under the Indira Gandhi government.It came down to 1.23 from the all-time high figure of 2.31 during 1975-80. The urban population saw a steep decline following the implementation of the sterilization program with the growth rate decreasing to 3.35 from 3.84 in the year 1975. The report suggests that the rural population growth rate will turn negative in the next fifteen years. Thus, in 2050, it is expected to be 1.06, in contrast to the urban growth rate of 1.54. The report suggests that the rate of urbanization, which has been increasing since 1950, is expected rise further till 2035. It is supposed to start decreasing slightly in the next few years. Within a decade of globalization, the rate of urbanization increased by one-third of its previous growth. The swelling of the population in the cities has been a result of labor migrations that have taken place in the past decade because of industrial growth. This created millions of employment opportunities for the rural poor.

The national capital, Delhi, especially has seen an explosion of population. It saw a 26-time increase since 1950 when the population was just a million people. The current population of the national capital is 28 million, which equals to half of the population of all the ten ASEAN country capitals combined. Kolkata has seen a three-time increase in the urban population while Mumbai's population has increased by over six-fold since 1950. Bengaluru, the new entrant on the list, in 2015 crossed the 10 million-mark, ten times the number of people in 1950s. All these cities will see a further rise in the population in the next fifteen years. The number of urban agglomerations consisting more than a million people is also expected to be doubled by 2035.

2.5 Scenario: Rural/Urban Villages of Gujrat as per census 2011 and Latest:

The total **population growth of Gujarat** in this decade was 19.28 percent while in previous decade it was 22.48 percent. The population of Gujarat forms 4.99 percent of India in 2011. In 2001, the figure was 4.93 percent.

	DESCRIPTION	2011	2001
Gujarat	Actual Population	6.04 crores	5.07 crores
	Male	3l,49l,260	26,385,577
	Female	28,948,432	24,285,440
	Population Growth	19.289c	22.489o
	Sex Ratio	919	920
	Density/km2	308	258
	Literacy	78.03 %	69.14 9r
	Area(Km2)	196,244	196,024

T-2.1 Population Gujrat

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

2.6 Rural Development Issues - Concerns and Measures:

❖ **Issues and Concerns**:

The concerns in relation to rural credit other than those relating to structural issues are generally expressed in terms of

- Inadequacy of credit
- Constraints on timely availability of credit
- High interest rates
- Neglect of small and marginal farmers,
- Low credit-deposit ratios in several states and
- Continued presence of informal markets.

Rural Agricultural Health and Safety:

According to the National Institute for Occupational Safety and Health (NIOSH), of the 1,854,000 full-time workers employed in production agriculture in 2012, 374 farmers and farmworkers died from a work-related injury for, a fatality rate of

20.2 deaths per 100,000 workers. During that same year, agricultural workers experienced 167 non-fatal injuries daily, with 5% of these injuries causing a permanent disability. Tractor rollovers were the leading cause of death, but many other hazards exist on the farm.

Rural People with Disabilities:

People with disabilities, young and old, who live in rural areas where essential services are often limited or non-existent face difficulties seldom encountered in urban areas. Access to housing, transportation, employment, educational programs, and specialized healthcare are some of the challenging issues found throughout rural.

❖ **Measures**

The Rural Development Division looks after the following programs being implemented by the Ministry of Rural Development (MORD):

[A] Pradhan Mantri Awas Yojana: Housing for All (Urban):

Hon'b1e Prime Minister envisioned Housing for All by 2022 when the Nation completes 75 years of its Independence. In order to achieve this objective, Central Government has launched a comprehensive mission "Pradhan Mantri Awas Yojna—Housing for All (Urban)".

- The mission seeks to address the housing requirement of urban poor including slum dwellers through following program verticals:
- Slum rehabilitation of Slum Dwellers with participation of private developers using land as a resource
- Promotion of Affordable Housing for weaker section through credit linked subsidy
- Affordable Housing in Partnership with Public & Private sectors
- Subsidy for beneficiary-led individual house construction /enhancement

[B] Jawahar Rozgar Yojana:

The Government of India has made and keeps making provisions to improve the quality of life for rural India through its five year plans and many other schemes generally termed as Yojana's. Rozgar Yojana is an important move towards wage employment program. Jawahar Rowgar Yojana was introduced by the Indian government with an agenda of attaining self-sufficiency in providing sustainable employment to the rural population and helps remove poverty to the extent possible in less time.

- **Evolution of Scheme:**

Jawahar Rozgar Yojana or JRY in itself is not a new scheme, it's the merger of two important program of National Rural Employment Program (NREP) and Rural Landless Guarantee Program (RLGP) which was given birth on lst April 1989 with

the condition of sharing the cost in the ratio of 80:20 between the central government and the State Government.

➢ **Objectives of Jawahar Rozgar Yojana:**

- Providing employment reinforcement to unemployed an under-employed population in the rural areas.
- Enhancing the rural Infrastructure and establishments for the benefits of the rural areas.
- With an Aim inclined towards BPL families' preference were given to the OBCs, SC/STs etc.
- Special reservation for women almost up to one third of the employment opportunities.
- Focus to cover every possible village with the help of Panchayati Raj.

Bharat Nirman through Pradhan Mantri Gram Sadak Yojana:

Rural connectivity is one of the major goals of Bharat Nirman. In India, there are more than 6 lakh villages located in different terrains.The climatic condition also varies from place to place to a great extent. Due to improper planning, some villages are having multi road connection while others are deprived of even single road connection.

In Pradhan Mantri Gram Sadak Yojana (PMGSY) has been decided to give one and only connection to each village. It is centrally sponsored program with 1009c financial assistance. All PMGSY roads are guaranteed defect free by the contractors for a period of 5 years and maintained by him under a contract. Funds for the maintenance contract are provided from the State Budget. After the period of 5 years, the roads will be transferred to the District Panchayat for further maintenance.

PMGSY achievements can be summarized as follows:

- 53,000 Km. of new rural roads constructed
- 27,000 Km. of rural roads upgraded and modernized
- 37,000 habitations provided all weather connectivity opening access for agricultural produce
- Rs. l5,l 17 crore invested up to January 2006

[C] Some Other Development Schemes:

1. Pradhan Mantri Adarsh Gram Sadak Yojana (PMAGSY):

It focuses on integrated development of 100 villages with a 50 per cent population of SCs.

2. Bharat Nirman Yojana:

It was launched in 2005 for building infrastructure and basic amenities in rural areas. It comprises of six components—rural housing, irrigation, drinking water,

rural roads, electrification and rural telephony.

3. Indira Awas Yojana:

It is one of the six components of Bharat Nirman Yojana. It was introduced in 1985-86. It aims to help built or upgrade the households of people living under BPL.

2.7 Various infrastructure guidelines with the norms for villages for the provisons of different infrastructure facilities:

- **Water supply:-** Delivery of safe drinking water is vital for protecting public health and of promoting more secure livelihoods. The traditional approach to water quality and safety management has relied on the testing of drinking water, as it leaves the treatment works or at selected points, either within the distribution system or at consumer taps. It is referred to as end-product testing

Various methods for water supply:

- Gravity-fed water supply systems in hilly areas
- Dug well-based rural water supply systems
- Borewell-based rural water supply systems (hand pump operated)
- Pond-based rural water supply systems with appropriate treatment and rain water harvesting systems through surface storage
- Groundwater recharging systems
- Rooftop rainwater harvesting systems

- **Sanitation Facilities: -** Demand and supply of sanitation facilities and services should be addressed concurrently to ensure toilet adoption and sustained use and enable scale Adoption and sustained use of sanitation facilities requires construction of safe toilets and their sustained use. Access to a toilet does not mean it is used or used consistently by everyone at all times. Poorly constructed and managed facilities may lead to households reverting to open defecation.
- **Hospital: -** National Rural Health Mission (NHM) was launched in the year 2005 to strengthen the Rural Public Health System and has since met many hopes and expectations. The Indian Public Health Standards (IPHS) for Sub-centers, Primary Health Centers (PHCs), Community Health Cen-tres (CHCs), Sub-District and District Hospitals were published in January/ February, 2007 and have been used as the reference point for public health care infrastructure planning and up-gradation in the States and UTs. These IPHS guidelines will act as the main driver for continuous improvement in quality and serve as the bench mark for assessing the functional status of health facilities. States and UTs should adopt these IPHS guidelines for strengthening the Public Health Care Institutions and put in their best efforts to achieve high quality of health care across the country.

- **Roads: -** The Union ministry of rural development has recently issued fresh guidelines under the 'Pradhan Mantri Gram Sadak Yojana' (pmgsy) to prevent construction of poor- quality roads and streamline the bidding process throughout India. pmgsy is the largest rural road connectivity program in the world. The new rules stipulate a standard procedure for road construction. They envisage a three-tier quality control system, with executive engineers at the lowest rung and national quality monitors at the top level. The contractor has to give a five-year guarantee for the work done. The state governments, too, have been made responsible for the maintenance of roads in rural areas for a period of five years.

2.8 Ancient/Existing Electrical concept syudy as a Literature Riview for Village Development :

Concept:

The basic concept of smart village is to collect community efforts and strength of people from various streams and integrate it with information technology to provide benefits to the rural community. According to Mahatma Gandhi's philosophy and thoughts smart village project provides, "Global means to the local needs."

Remote Village Electrification through Renewable Solar energy: a Case Study of Sagar Island, West Bengal, India :

Introduction:

Energy is a driving force to foster economic, social and health condition. Energy effect all the dimensions and supporting pillars of sustainability (IEA, 2001; Sharma, 2007). All of these supporting pillars namely Environment, Social and Economic should go hand in hand without compromising on its ability for the future generation to satisfy their own need.It is thought that conventional as well as renewable energy will be used to achieve this objective, renewable energy sources would be used in a decentralized manner where conventional grid connectivity is not possible. Average annual solar radiation is about 1600 kWh/m2 on horizontal surface. In a year average 250 sunny days and 55 overcast days observed in the study area. The annual average solar radiation on horizontal surface is about 4.91 kWh/m2/day. The Electricity act 2003 (EA03) marked an increase in urgency attached to the problem at the national level, codifying the requirement to supply electricity to all villages. To implement the law , the government launched the Rajiv Gandhi GrameenVidyutikaranYojana initiative in 2005, with the aim of achieving universal electrification by 2012.In theory, electricity produced under the Rajiv Gandhi scheme is supposed to cover operational costs (except for households below the poverty line). The Rajiv Gandhi guidelines also emphasize distributed generation options in cases where grid extension is not feasible, with

individual states required to submit proposals to the Ministry of Non – conventional Energy sources (MNES). MNES envisions a major role for renewable sources in meeting the 2012 electricity requirement (Banerjee 2006). WBREDA became interested in Sagar Island in 1994, and has since both photovoltaic systems to electricity much of the island. The program began with the installation of individual solar lighting systems, which now provide electricity for more than 2000 families (Ashden 2003).There are now ten solar photovoltaic power plants carrying a total capacity of ≥ 300 kW and powering ≥ 2000 families for six hours a day (Ashden,2002).

Study Area:

Sagar Island (also known as Ganga Sagar) lies on the continental shelf of Bay of Bengal about 150 km (80 nautical miles) south of Kolkata, in West Bengal. The area of the island is about 251.59 sq km with 43 villages and a population of over 180408 with population density of 717 / sq km. The latitude of the study area is 21o 37/ N to 21052/ N and the longitude of the study area is 88002/ E to 88011/E. The Island has scatter Mangrove swamp, waterways and small rivers. The island is a famous Hindu pilgrimage. Every year on the day of Maker sankranti (middle of January thousand of Hindus gather to take a holy dip at the confluence of Ganga and offer puja in Kapil Muni Temple. The Sundarban along the Bay of Bengal has through quaternary (began about 2 million Years ago and extends to the present) sediments deposited mainly by the mighty river Ganges, Brahmaputra, Meghna and their numerous distributaries. The building up of this estuarine area is not complete. The mangrove dominated delta is a complex ecosystem comprising one of the three largest single tract of mangrove forests of the world. The Sundarban floor varies from 0.9m to 2.11 m above sea level. Sagar Island such an area, which despite its tremendous economic potentiality is lagging behind in comparison with many other areas which are in geo-economic, geo-environmental and geo-hydrological in same region. This study will emphasize on finding out the reasons behind the backwardness, identifying the areas of potentials and highlighting the prospects therein

The Criteria for village Electrification of Isolated Island:

The criteria for village electrification are as : (a) identification of parameters such as: (i) Economic :cost of product, maintenance and operating cost, prevailing subsidy, tax benefits, benefits due to absence /lesser amountof social / scarcity /opportunity costetc- all in annualized quantities. (ii) Social: Energy habit ofthe customer, social custom, aesthetic value of the product customers goodwill for reasons such as lowering ofpollution by use of these "green system" , political goodwill/ propaganda, population density & accessibility ofthe location, grid connectivity, etc. (iii) Environmental : Availability of solar radiation and other

environmentalconditions that would significantly affect the performance of the SPVsystem in consideration. (iv) Supply oftime:A:24hourssupply, B:fixed timesupply,C:Anytimesupply.

Demand Assessment:

It was found in almost all locations, people use kerosene for lighting purposes and the keroseneconsumption varies from 4 liters to 7 liters/month per household. The access to electricity is one of theirpriorities and most of the households are interested to take the service connections. It was estimated that demandperhouseholdwouldbeapproaching30unitspermonthwithdurationofsupplyfo ratleast8hours.Itwasfound that people needs electricity for two hours (4am to 6 am) for domestic purposes and 6 hours (6 pm to 12pm)inthe evening.

Actual Status of electrification through PV system:

There are ten solar-power stations in the study area which were installed in various locations in remotevillages in between the year of 1996 to 2006. Kamalpur was the first solar-power station, installed in 1996 withpower generation capacity of 26 (kW). About 55.67 % of households are connected with solar electricity in thisvillage. However, 27.84 % households are consuming grid electricity. Rest of the households has no electricityand deepened on kerosene for lighting in night. After two years Mritunjoynagar solar-powered station hasinstalled (1998) with the aforementioned power generation capacity and 72.92% households are enjoying solarelectric facility. Unfortunately, there is no facility of grid electricity in this village. Hence, 27.08 % householdsare using kerosene to get the light.

2.9 Other Projects / Schemes of Gujrat / Indian Government:

- **Projects / Schemes by Government sector:**
  - IRDP(Integrated Rural Development Program)
  - SGSY(Swaranjayanti Gram Swarozgar Yojana)
  - NRUM(National Rurban Mission)
  - Pradhan Mantri Gram Sadak Yojana
  - Indira Aawas Yojana
  - Mahatma Gandhi National Rural Employment Guarantee Act-2005 DRDA(District Rural Development Agency)
  - PURA(Provision of Urban Amenities in Rural Areas)
  - PMGSY(Pradhan Mantri Gram Sadak Yojana)
- **Projects / Schemes by Private sectors:**
  - Intensive Agricultural Area Programme
  - Intensive Agricultural District Programme
  - High Yielding Varieties Programme
  - Rural Industries Project

3 Smart (Cities / Village) Concept as per your Idea and its Visit (Civil & Electrical Concept)

3.1 Concepts, Definations and Practices:

The meaning of smart village is all the necessaries facilities is developed in the village and no need to moves in city for any kind of requirement.

The concept of Smart City embraces several definitions depending on the meanings of the word "smart". Intelligent city, knowledge city, ubiquitous city, sustainable city, digital city, etc. Many definitions of Smart City exist, but no one has been universally acknowledged yet. From literature analysis it emerges that Smart City and Digital City are the most used terminologies in literature to indicate the smartness of a city.

3.2 Vision-Goals, Standards and Performance Measurement Indicators:

The vision of smart cities is that the smart cities are the center of the future, secure environmentally green, made safe, efficient because of all structure- whether for water, power, Transportation. Are designed, constructed making use of integrated materials, sensors, and network which are interfaced computerized system of database, decision making algorithms.

Calculation of the 79 different Livability indicators prescribed in the 'Livability Standards in Cities' requires data on a large number of aspects of urban infrastructure, governance, municipal finances, social infrastructure, economic aspects etc. Wherever such data is regularly compiled by the ULBs or other service providers such as DISCOMS, Water and Sewerage Utilities etc. it should be sourced from the records of such providers.

In some cases, the data may require on field through physical surveys. For certain indicators such as pollution, modal split of urban transport, water quality etc. data will have to be obtained from physical surveys as per standards and prescribed survey and sampling techniques. Some indicators such as per capita availability of open spaces will require map-based analysis, and necessary maps may need to be prepared for cities where such information or maps are not available.

3.3 Technological Options:

Cities and communities across the Nation are today facing complex and persistent challenges stemming from changing populations and infrastructure. In particular, demands on city infrastructure, systems, and services are growing and changing, prompting important new needs, such as more effective use of limited space, greater walkability, and ways to support residents across all socioeconomic

statuses. The need for improved resilience in the face of natural and man-made disasters adds to the challenges that cities and communities are facing. These challenges directly manifest for city residents as well. Being able to address these challenges is in and of itself difficult.

Ongoing city operations are often dependent upon the very infrastructure, services, and systems that could benefit from innovation and finding the time, energy, and resources to improve city capabilities without adversely affecting these ongoing operations is not trivial. Consider, for example, routine roadway construction projects; cities and communities must often conduct these projects during limited nighttime and weekend hours, so as to minimize disruptions for residents who rely upon the roadways to commute to and from work.

At the same time, advances in networking and information technology over the last several decades have transformed individuals' lives, rapidly altering how we live, work, and communicate. Integrating these digital technologies with physical infrastructure at the city level similarly enables innovative opportunities and solutions to the challenge's cities are facing. By working closely with cities to support this integration in ways described in this strategic plan, Federal agencies can help facilitate solutions to city challenges and catalyze the smart of the future.

3.4 Road Map and Safe Guards:

The purpose of building smart cities is to make the lives of the people safer and easier. Technology can be used as an instrument to protect lives and improve services and, furthermore, it can be used to protect Personally Identifiable Information and cities critical infrastructures, such as water treatment systems, transportation, hospitals, and power plants. Technology can be used to reduce crimes by geographically spotting areas with high crime rates, identifying specific crime patterns, and reporting it to law enforcement instantly, many of these services are achieved.

Sensors are small measurement devices that can be integrated with electronics to detect certain smells, sound, or levels of variations. Sensors can be passive or active. Passive sensors do not necessarily take action; they simply collect data, and they are used mainly to measure weather conditions, such as Ozone levels, wind speed, or the sun's ultraviolet levels. Active sensor devices, on the other hand, use electronics to process data and take action.

3.5 Issues & Challenges:

1. Retrofitting existing legacy city: infrastructure to make it smart, there are a number of issues to consider when reviewing a smart city concept. The most important is to determine the existing cities weak areas that need utmost consideration, e.g. 100-per-cent distribution of water supply and sanitation. The

integration of formerly isolated legacy systems to achieve citywide efficiencies can be a significant challenge.

2. Financings of smart cities: The High-Power Expert Committee on Investment Estimates in Urban Infrastructure has assessed a per-capita investment cost of Rs 43,386 for a 20year period. Using an average figure of 1 million people in each of the 100 smart cities, the total estimate of investment requirements for the smart city comes to Rs 7 lakh crore over 20 years. This translates into an annual requirement of Rs 35,000 crore. One needs to see how these projects will be financed as the majority of project need would move through complete private investment or through PPPs (public-private partnership).

3. Availability of city development plan: Most of our cities don't have a city development plan, which is the key to smart city planning and encapsulates, and encapsulates all a city needs to improve and provide better opportunities to its citizens. Unfortunately, 70-80 % of Indian cities don't have.

4. Financial sustainability of ULBS: Most ULBS are not financially self-sustainable and tariff levels fixed by the ULBs for providing services often do not mirror the cost of supplying the same. Even if additional investments are recovered in a phased manner, inadequate cost recovery will lead to continued financial losses.

5. Technical constraints of ULBS: Most ULBS have limited technical capacity to ensure timely and cost-effective implementation and subsequent operations and maintenance owing to limited recruitment over a number of years along with inability of the ULBs to attract best of talent at market competitive compensation rates.

6. Three-tier governance: Successful implementation of smart city solutions needs effective horizontal and vertical coordination between various institutions providing various municipal amenities as well as effective coordination between local government, state government, central government, agencies on various issues related to financing and sharing of best practices and service delivery processes.

7. Providing clearances in a timely manner: For timely completion of the project, all clearances should use online processes and be cleared in a time-bound manner. A regulatory body should be set up for all utility services so that a level playing field is made available to the private sector and tariffs are set in a manner that balances financial sustainability with quality

8. Dealing with a multivendor environment: Another major challenge in the smart city space is that software infrastructure in cities contains components supplied by different vendors. Hence, the ability to handle complex combinations

of smart city solutions developed by multiple technology vendors becomes very significant.

9. Capacity building program: Building capacity for 100 smart cities is not an easy task and most ambitious projects are delayed owing to lack of quality machinery and manpower, both at the center and state levels. In terms of funds, only around 5 per cent of the central allocation may be allocated for capacity building programs that focus on training, contextual research, knowledge exchange and a rich database. Investments in capacity building programs have amultiplier effect as they help in time-bound completion of projects and in designing programs, developing faculty, building databases as well as designing tool kits and decision support systems. As all these have a lag time, capacity building needs to be strengthened right at the starting.

10.Reliability of utility services: For any smart city in the world, the focus is on reliability of utility services, whether it is water, telephone, electricity, broadband services. Smart cities should have to provide electricity 24 Hours. This translates into an annual requirement of Rs 35,000 crore. One needs to see how these projects will be financed as the majority of project need would move through complete private investment or through PPPs.

3.6 Smart Infrastructures – Intelligent Traffic Management:

Smart Information and Communications Technology has the potential to transform the way we plan and manage infrastructure. New developments in computer hardware, new applications and software are changing the face of the infrastructure sector, and society more generally; driving greater efficiency, increasing productivity, and greatly simplifying construction processes and life-of-asset maintenance. Australia has generally been proactive in adopting these new technologies for the planning, design and ongoing maintenance of infrastructure, the fast pace of new developments means that there is much more that needs to be done.

F-3.1 Smart Infrastructure

➢ **Smart infrastructure includes following:**

- Smart building
- Smart mobility

- Smart energy
- Smart waste management
- Smart health
- Smart security

3.7 Cyber Security:

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

Over the past few years, Technology has begun to play an important role in our daily lives. Internet enabled gadgets have changed the way in which we work or do our daily chores. Digitization has an impact on personal lives, education, health, government and national security. Due to increase in complexity of smart city systems and globally connected social, economic, political systems, etc. has increased vulnerability of security of a city. The cyber threats have amplified due to infinite supply of data. Smart surveillance technology or analytics to manage the crowd, traffic, cyber security, data privacy, building codes to manage natural/man-made disasters, etc. are some parameters that would make a city safe. Different challenges to our security and expectations of privacy have arrived due to innovations in IT. Humans are already interconnected via gadgets. Standards are evolved for all these potentially connected systems. This will lead to improve in quality in life.

Ensuring cyber security requires coordinated efforts throughout an information system. Elements of cyber security include:

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

Smart Transportation will also provide an access to a web of connected data from GPS location. Integrated systems and cyber security will aid public safety. We examine two important challenges : Security and Privacy.

Securing smart cities is a not-for-profit global initiative which aims at solving the existing and future cyber security problems of smart cities through collaboration between companies, government, media outlets and individuals across the world.

3.8 District Cooling and Heating / Green building:

District cooling systems produce chilled water, steam or hot water at a central plant and then pipe that energy out (either underground or over rooftops) to buildings for

air conditioning, space heating and water heating. As a result, these buildings don't require their own chillers, air conditioners, boilers or furnaces.

District cooling systems are a highly efficient way for many owners and manufacturers to effectively address each of these challenges while meeting their comfort and process cooling and heating needs.

District Cooling Systems are positioned as an effective technology to mitigate the heat island effect exacerbated by conventional, stand-alone cooling systems.

Key features:

- ✓ 50% energy efficiency improvement while electricity consumption is decreased by 35%.
- ✓ 50% CO2 emissions savings and decrease of water usage by 65%.
- ✓ Architectural heritage preservation.

Profitability:

- ✓ This solution significantly reduces usage costs for end customers, compared to stand-alone units.
- ✓ The comparable reductions in cost relative to energy and water use.

Categories of Application:

- ✓ Advanced grid infrastructure
- ✓ Etc.

Heat sources in use for various district heating systems include, power plants designed for combined heat and power including both combustion and nuclear power plants; and simple combustion of a fossil fuel or biomass; geothermal heat; solar heat; industrial heat pumps which extract heat from, river or lake water, seawater, sewage, and waste heat from industrial processes.

3.9 Stratagic Options for Fast Development:

Smart Infrastructure involves applying this to economic infrastructure for the benefit of all stakeholders. It will allow owners and operators to get more out of what they already have, increasing capacity, efficiency and resilience and improving services.

It brings better performance at lower cost. Gaining more from existing assets is the key to enhancing service provision despite constrained finance and growing resource scarcity. It will often be more cost-effective to add to the overall value of mature infrastructure via digital enhancements than by physical enhancements – physical enhancements add `more of the same', whereas digital enhancements can transform the existing as well.

Smart Infrastructure will shape a better future. Greater understanding of the performance of our infrastructure will allow new infrastructure to be designed and delivered more efficiently and to provide better whole life value.

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

Technologies employed and discovered by the native inhabitants of a country are regarded as Indigenous technology. It constitutes an important part of its cultural heritage and protects the country against exploitation by industrialized countries.

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

Operations and maintenance cost recovery through user charges is hardly 30-40%. Most urban operations survive on large operating subsidies and capital grants.

3.11 Initiatives in villages development by local self-Government:

The institutions of Local Government have flourished in India since time immemorial. The Panchayats or Village Governments, as they were called, were ancient institutions and were themselves small republics. They exercised power in various spheres such as industrial, commercial, administrative, and social including civic education and religious functions. The development of Urban Local Self-Government, as compared to that of Rural Local Self Government, has been very slow after independence. The first two Plans did not carry much for the improvement of Urban Local Bodies. It was only at the end of the Second Plan that the planners focused their attention on the Urban Local Bodies. In the Third Plan, it was suggested strengthening the Municipal Administration by the way of better Personnel and Finances and by enlarging their jurisdiction and functions. It was also suggested to cover all the Towns and Cities having a population of over one lakh under the scheme of planning in an organic way.

- **Rural Local Governments (or Panchayat Raj Institutions):**
  - Zilla Panchayat
  - Mandal or Taluka Panchayat
  - Gram Panchayat
- **Initiation by Local People:**
  - Organizing programme for increase literacy for peoples of village.
  - Providing enough information regarding to using of various facilities.

- Peoples have to learn various things regarding how to keep facilities in good condition

3.12 Smart Initiatives by district Municipal corporation:

- Solid waste management.
- Selvedge water disposal.
- Effective road transportation.
- Maintained street light facilities.
- Agriculture awakening centre.

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

- The panchayat raj system is a three-tier system with elected bodies at the village, taluka and district levels.
- The modern system is based in part on traditional panchayat governance, in part on the vision of Mahatma Gandhi and in part by the work of various committees to harmonize the highly centralized Indian governmental administration with a degree of local autonomy
- Although, as of 2015, implementation in all of India is not complete the intention is for there to be a gram panchayat for each village or group of villages, a tehsil level council, and a zilla panchayat at the district level.

3.14 How to implement other Countries smart village projects in Indian village context (Regarding Environment , Employment):

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

1. Roads
2. Electricity
3. Water
4. Hospitals

Basic amenities of for smart village from other countries are:

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

4 About Handiya Village

4.1 Intriduction:

4.1.1 Introduction about Handiya Village:

Handiya village is located in Balasinor Tehsil of Kheda district in Gujarat, India. It is situated 2km away from sub-district headquarter Balasinor and 72km away from district headquarter Nadiad. it is the 17th smallest village by area in the sub district. Population density of the village is 714 persons per km2.

As per constitution of India and Panchyati Raaj Act, Handiya village is administrated by Sarpanch (Head of Village) who is elected representative of village.

4.1.2 Justification/ need of the study:

The Goal of research proposal is to present and justify the need to study a research problem and to present the practical ways in which this research should be conducted.

There are number of schemes of the Government which are being operated and run for rural development in the rural areas of the country. Evolution taken up so far for these schemes has been more or less in a piecemeal form, i.e. generally for each scheme separately.There are number of schemes of the Government which are being operated and run for rural development in the rural areas of the country.It has become difficult to get an overall picture of the development in totality in the rural areas and is difficult to assess the impact of any one particular scheme, since most of the schemes are complementary and supplementary and most of the time, they all are contributing to the impact. Hence, a view has been formed to take up studies on trial basis to assess the impact of the important schemes as a whole in rural development in selected village

4.1.3 Study Area:

The total geographical area of village is 304.81 hectares.Handiya has total population of 2179 peoples. There are 432 houses in Handiya Village.As per census 2011 there are 1094 male and 1085 females are there in the village Handiya. There are total 352 children out of which 185 are male and 167 are female.

4.1.4 Objectives of Study:

The main objective of the study undertaken is to utilize the results to provide true feedback of the present state of implementation of all development schemes in the rural areas. The observation made during the study are to inputs to help in bringing about changes in the formulation or reformulation.

- To assess problems, constrains in the effective implementation.
- To know the basic requirement of village.
- To provide the basic facilities in rural areas like Education, Health, irrigation, electric power etc.
- To suggest strategies and policies that would enable Government of India to increase the pace of rural development.
- To assess the adequacy of these schemes in solving and providing solution to problems of rural development.
- To provide the impact of these various Programmes.
- To gauge the general opinion of the people towards these schemes and programs of the government.

4.1.5 Scope of the Study:

The aim of project is to develop the village with job opportunity for villagers. A team of project is finding the problem or need of a village in terms of socio – cultural or physical or social infrastructure and to design that facility with efficient engineering solution which include the design proposal and estimate cost to facilitate the require facility for the future growth of village with urban facilities.

The study will focus the development trend, intensity of growth of the village, and find out the problems related to the socio-cultural or physical development of the area, social infrastructure services, and the administrative systems of the village. The study of village gives the reason where there is need of sustainable facilities like infrastructure facilities, community hall, primary health center, post office, general market, pure drinking water, road network, schools, electricity, sanitation, library, aaganwadi, overhead tank, police station, fire station, etc. are available or not.

Rural settlement engulfed in urban limits during the process of development, and also those located in the fringe areas of large cities, can be termed as urban villages.

4.1.6 Methodology Framework for Development of Village:

To achieve the aim by passing through the objectives, the study will be done in the following Methodology, described as follows:

1) Literature study:

The various theories and case studies to be referred to the understanding of various issues related to the urban, to define the “Fringe villages”, to study the various issues of “Fringe villages”

2) Field Visit:

The field visit will be started from collection of revenue maps and ‘gametal’ maps if possible, along with the map and other basic information of the study areas.

3) Primary Survey and Interview:

The primary surveys such as household surveys, questionnaire survey, to know the real status of the infrastructure services and quality of life they are living in the particular area and the major problems and issues they are facing, questionnaire survey of the real estate developers to know the scope and trend and scope of the development and status of the market and demand of that place.

4) Data Analysis:

An analysis form is used for finding a requirement of village as per government norms. A data collected during village survey is also used for an analysis government data on paper data.

5) Issues findings, development of Strategy:

From the above study in the detail of the literature review, situation analysis, study of the existing institutional framework, primary and secondary data analysis and mapping the best appropriate strategy to be formulated with possible recommendation, implementation strategy and allocating the roles and responsibilities of the different local bodies which give a scope for villagers to show their ability and chances of job opportunity.

6) Final Proposal:

Strategic theme-based proposal for Fringe villages from analysis in the form of R-Urban Town.

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

- **Objects:**
  - Aaganwadi
  - Panchayat office
  - Solar Street Light
  - Power Station
  - Primary school
  - Animal Shelter
  - Drainage system
  - Health Centre
- **Mthodology:**
  - Design objectives
  - Technical approach
  - Proposed sustainability features
  - Identify customer needs
  - Identify local/state/federal engineering and construction specifications
  - Project management structure

4.2 Handiya Village Study Area Profile:

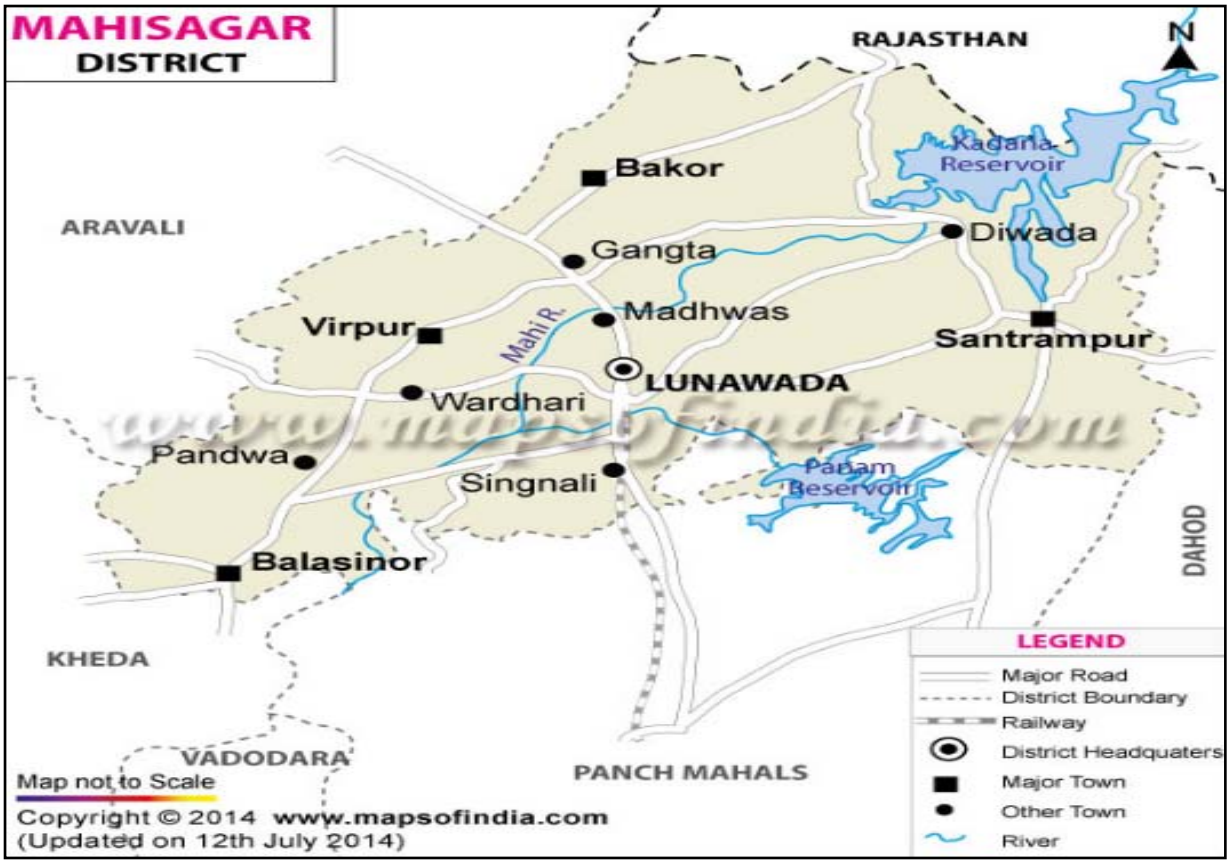
4.2.1 Study Area Location with brief History land use details:

Handiya village is located in Balasinor Tehsil of Kheda district in Gujarat, India. It is situated 2km away from sub-district headquarter Balasinor and 72km away from district headquarter Nadiad. it is the 17th smallest village by area in the sub district. It is small village cnosisting population of 2179 only.Population density of the village is 714 persons per km2.

The nearest town to the Handiya is Gondal which is 20 km away from village. The other nearest town is the Virpur that is 7 km away from the village. The village has bus stop, Gram Panchayat, Pond, Angadvadi, Well, Villahe pond, Primary and Secondary School etc.

The nearest river is Mahisagar River and it is the main source of irrigation for village.There is a Localized Irrigation.

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



F-4.1 Base Location Map

F-4.2 Village Map

F-4.3 Gram Tal Map

4.2.3 Physical & Demographical Grotwh :

- The total geographical area of village is 304.81 hectares.
- Handiya has total population of 2179 peoples. There are 432 houses in Handiya Village.
- As per census 2011 there are 1094 male and 1085 females are there in the village Handiya. There are total 352 children out of which 185 are male and 167 are female.

4.2.4 Economic Genration Profile:

Handiya (Balasinor) has 39% (858) population engaged in either main or marginal works. 52% male and 27% female population are working population. 45% of total male population are main (full time) workers and 7% are marginal (part time) workers. For women 14% of total female population are main and 13% are marginal workers.

4.2.5 Actual Problem faced by villagers and smart sollution:

During an interaction with people of Kamrol village we understood their problems and issues like:

- There is no community hall available in the village
- There is no bank existing in the village
- There is no ATM in the village

Other than these the villagers have no any issues and they are satisfied with the work of Sarpanch and Talati of Kamrol village.

Smart solutions:

- Comminity Hall
- Bank with ATM
- ATM
- Solar-street Lite
- Solid Waste Management

4.2.6 Social Scenario – Preservation of traditions, Fastivals, Cuisine:

In 2011	Literacy Percantage (%)	Increase in Literacy (%)
Male	89.33	+11
Female	80.50	+42
Overall	84.89	+26

T-4.1 Litaracy Percentage of Handiya

Festivals: The Village folk Culture is dance including garba, dandiya, raas, tipani, etc.

Traditional wear: they wear traditional cloths like chaniyacholi, kediyo, dhoti, kachhado, gujrati sadi etc.

Cuisine: The regular food is Gujrati thali, Indian food, the villagers prefers the vegetables to eat which is they grow in their farm.

4.2.7 Migration Reasons:

In Handiya Village people are migrate because of better opportunity for jobs, Business, High living standard. People are migrate to Ahmedabad because Ahmedabad is the biggest economic hub of Gujrat. People earn more in the city rather than village that's why people migrate from village to city.

4.3 Data Collection of Handiya Village:

4.3.1 Methods for Data Collection:

- By filling of survey forms
- By interaction with the villagers
- By interaction with the sarpanch/panchayat members
- By observing the current condition of the village
- Visiting different locations of the village

4.3.2 Primary Details of Survey:

Base line survey is a benchmark for any intervention during and post implementation of any development programme. A detailed baseline survey was undertaken which involved household census survey, Bio- physical survey and Village level data collection from Sarpanch. This gave in the details of the demographic profile of the village, the literacy percentage, SC/ST population, cattle population and net consumption rate in the village, average milk production of the cattle and various schemes running and their benefits Bio-physical survey was undertaken to identify various natural resources available in the village.

The village has no specified size of house, but the Financially Capable villagers have good constructed House and and poor villagers have small size or medium size house. The Average size of house is 100 var plot per house

- **Geo-Tagging of House:**

There is no Geo-Tagging of house is carried out because wo go for Home interview survey

4.3.3 Number of Human Being in One House:

As per population and house hold number the average Human being in the one House is 4.Each House has 4 persons in the house

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

- **Which Martial Use locally:** The village has no specific material. All the martial which is required which has been Transported to village from the nearest town like Surat.

- **Out sourced material:** The Out sourced materials are sand Aggregates, Cement, Blocks, Steels and bitumen which is used for the construction of road and building.

4.3.5 Geographical Detaills:

Handiya is a Village in Balasinor Taluka in Kheda District of Gujarat State, India. It is located 81 KM towards East from District head quarters Kheda. 9 KM from . 90 KM from State capital Gandhinagar

- **PIN Code:** 388265
- **Location Code:** 517364
- **District:** MAHISAGAR
- **State:** GUJARAT
- **Time Zone:** IST(UTS+5:30)
- **Elevation/Altitude:** 69 meters, Above Sea Level

It is 72 m(236 ft) above sea level. The total land area of village Handiya is 304.81 hectares. There are about 183 houses in Handiya village. Virpur is nearest town to Handiya which is approximately 5km away.

Study area location of village handiya is given below:

F-4.4 Study area of Handiya

4.3.6 Demographical Details:

The village is home to 2179 people, among them 1094 (50%) are male and 1085 (50%) are female.Child (aged under 6 years) population of Handiya (Balasinor)

village is 16%, among them 53% are boys and 47% are girls. There are 432 households in the village and an average 5 persons live in every family.

- **Cast Factor:**

99% of the whole population are from general caste, 0.18/% are from schedule caste and 0.55% are schedule tribes.

4.3.7 Occupatonal Details:

In Handiya village 80 to 85% people connected with agriculture activities it's the villages main source of income.Out of that 42 to50% people are connecting with both agriculture and labor work.But 5 to 10% people are connected for industrial working.

4.3.8 Agricultural Details:

Majority of the population of Handiya village are occupied in farming. The main crops grown in the village are: wheat, cotton, rice, etc. There are no any farmer or villager using organic farming or fishery.

4.3.9 Physical Infrastructure Facilities – Manufacturing HUB/ Ware House:

No Manufacturing HUB/ Ware House in these village.

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

In Handiya village there are no any tourism activities available for attracting the tourist.

4.4 Infrastructure Details:

4.4.1 Drinking Water/Water Managements Facilities:

F-4.5 Water facilities in Handiya

There is tap water system in the village. There is 100% treated water is distributed in the village.The main source of water for the village is mahisagar River which is only 3 km away from the village There are 4 wells and 3 hand pumps in the village. In evry farm there are small wells to collect rain water and use it for irrigation.

4.4.2 Drainage Network/ Sanitation Facilities:

F-4.6 Drainage System in Handiya

There is Open drainage system in Handiya which need to be improved. The drain water is discharged directly in to its nearby water body.

- **Sanitation Facility**:

There are 3 Public Latrine Blocks in the village. There is also toilet facilities in schools and Gram Panchayat.There are also Toilet facility in every house.There is good system for the disposal of the solid and liquid waste management in the village. Dustbins are provided at equal interval of distance and all the houses have given their own dustbins by the Gram Panchayat. The waste is disposed near the village by digging pit.

F-4.7 Sanitation Facility in Handiya

4.4.3 Transportation & Road Network:

There is bus stop in the village. 40% roads are kachha roads and 60% roads are C.C. roads.Internal road having width of 5.5 m. There is no railway station in the village. People use the nearest railway station of sevaliya town which is 13 km away from the village. People use their own vehicles for the local transportation.

F-4.8 Roads of Handiya

4.4.4 Housing Condition:

There are 30% pucca houses and 70% kachcha houses in the village Handiya.

F-4.9 Housing Condition of Handiya

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

- **Health Facility:**

There is no Primary Health Center (PHC) in the village.There is small hospital at a distance of 3Km in Balasinor.People have to go to its nearby town for further treatment. There are no any private hospitals in Handiya.

F-4.10 Health Facility

- **Gram Panchayat:**

F-4.11 Gram Panchayat of Handiya

F-4.12 Photo with Sarapach

- **Education Facilities:**

There is one Anganwadi in the village. There is also one Primary school and Secondary school.There is no ITI college or any other college in the village. There is ITI Collage, B.Com and Arts Collage is located at highway which is away 2Km from the village.

F-4.13 Angadwadi of Handiya

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

- The condition of public building is moderate.
- **Maintainance:**
  - There is necessity of improvement in the Drainage facility and Drainage network in the village.
  - It is required to provoide Biogas plant in the village.
  - We can also provide Rain Water Harvesting system in the village to store the rain water.
  - It is require to maintain and repair the kachha roads in the village.

4.4.7 Technology Usage Details:

In village 35 to 40% use smart phone are 20 to 25% use a normal phone and rest of people are not use phone. 60% people have knowledge about internet.

4.4.8 Sport Activity as Gram Panchayat:

There is no sport activity is conducted by Gram Panchayat.

4.4.9 Socio-Cultural Faciities:

- **Community Hall :** There is no community hall in the village.
- **Public Garden:** There is no Public Garden in the village.
- **Public Library:** There is no Public Library in the village.
- **Village Pond:** There is small pond 5Km away from the village

F-4.14 Pond in Handiya

4.4.10 Oher Facilities:

- There are 80% street lights in the village.
- There are no Solar atreets lights in the village.
- There is no any Biogas plants in the village.
- There is no provision for rain water harvesting in ther village.
- The village is not having facility of Bank
- There is one ATM 2Km away from the village.

4.4.11 Any other Details:

In the village, the road faciliy needs a maintainance.

4.5 Electrical Concepts:

4.5.1 Renewable energy source planning particularly for villages:

- **Overview of Gujrat:**

Situated in the western part of India, Gujarat is the 6th largest state in terms of area and 9th most populous state with over 60 million inhabitants. Gujarat is one of the prosperous and efficiently governed state in India. Gandhinagar is the capital of the state, however Ahmedabad is known as the financial capital of the state.

Ahmedabad ranks 3rd in the Forbes list of world's fastest growing cities. It contributed 7.3% to India's GDP in FY 2014. Some of the key highlights of the state are outlined below.

- **Parameter Information:**

Population and Demographics Total Population at around 6.63 Crore in 2016.57% Rural, 43% UrbanDecadal population growth: 19.28%

GDP INR 895,202 Cr at current prices in FY 2015 with growth rate of 7.7% Per Capita Income INR 124,358 at current prices in FY 2015.Area 1.96 lakh square kilometre (6 % of country).

Households Total 10,617,437 HHs are electrified as on FY 2016.

Urban electrified HH 4,837,828.

Rural electrified HH 5,779,609.

Source: Census 2011, Ministry of Statistics, Statistics Times.

Gujarat has a well-diversified industry profile. It accounts for 90% of the total diamond exports,80% of the processed diamonds, 34% in produced petroleum products, 27% in chemical and pharma and 10% in engineering industries from India. Gujarat's GDP has been registering a growth of around 10% during the past decade. State's per capita consumption of 1,839 Kwh against nation's 957 kwh in FY 2014-15 reveals states progressive mind-set.

•Traditionally, Gujarat has been able to attract significantly high levels of investments, including Foreign Direct Investments (FDI). In 2015, over USD 12 billion worth ofinvestments were made across various sectors. This impressive

investment focus hasbeen a prime driver forGujarat to generate and sustain accelerated economic growth.
Gujarat was top state in attracting foreign direct investment in 2015 Manufacturing
The share of industrial sector in the GDP of Gujarat is nearly 36%, compared to 44% coming of the services sector in FY 2014. Over a period of time,Gujarat has successfully diversified its industrial base and emerged as an industrial hub of India.
The State offers adequate road connectivity, reliableand consistent power supply to its consumers and has easy accessibility to the western, middle-east and African markets. It has 41 ports and provides for the longest coastline in India. Gujarat was amongst the first states in India to set-up an industrial park and is a leading State in harnessing wind energy.
The Government of India (GoI) has set ambitious renewable electricity targets for the short to medium term. By 2022 the country aims to have 175 GW of installed renewable electricity capacity. In 2018 the GoI announced an increased ambition of 227 GW renewable capacity by 2022 and 275 GW by 2027. At the United Nations' Climate Summit in New York on 23 September 2019, the Prime Minister of India announced a new target of 450 GW of renewable electricity capacity, without specifying a date. At the end of November 2019 grid-connected renewable electricity capacity reached 84 GW, with 32 GW coming from solar photovoltaic (PV), around 37 GW from onshore wind and the remainder from small hydro. Solar PV has been on a rapid rise in recent years.
To increase investment in renewable electricity in a cost-effective way, India has introduced national competitive auctions for wind and solar PV. Lessons have been learned following the abrupt change in the renewables support scheme from feed-in-tariffs to centrally run reverse auctions. Current auction volumes show that wind power has developed at a much slower pace than solar PV. The auctions complement other policy measures at state level, such as Renewable Purchase Obligations, and at a local level, such as further support for rooftop PV installations. To ensure continuous progress in the growth of renewables, auction design, grid connections and the financial health of the power distribution companies (DISCOMs) are critical elements for reform.
Lessons have been learned following the abrupt change in the renewables support scheme from feed-in-tariffs to centrally run reverse auctions.

- **Roof Top Solar PV:**

For residential and commercial solar PV applications, the GoI has set an ambitious target of 40 GW of rooftop solar by 2022 within the 100 GW solar target. The MNRE has adopted guidelines for the implementation of Phase II of its Grid-Connected Rooftop Solar Programme.

The target is supported by RPOs, rooftop auctions and programmes that facilitate the deployment of rooftop solar PV on government buildings across states. The MNRE has several policies to incentivise and facilitate rooftop installations: a) providing central financial assistance for residential, institutional, social and government buildings; b)advising states to implement net/gross metering regulations and tariff orders; c) providing a model memorandum of understanding, power purchase agreement (PPA) and CAPEX agreement for rooftop projects in the government sector; and d) appointing experts to support public-sector undertakings in the implementation of rooftop projects in ministries and departments.

- **Offshore Wind:**

The GoI estimates the potential of offshore wind to be in the region of 10-20 GW. A good alternative to onshore wind, offshore wind, however, has yet to be adopted in India. An initial tender of 1 GW is expected to be held and a white paper is being developed in collaboration with the European Union to identify bottlenecks in the supply chain and industry infrastructure, as India does not have a large-scale offshore turbine industry.

- **Off-grid solar PV:**

Various schemes are available at both national and state level to support the uptake of off grid electrification, mainly through solar technologies. In 2015 the Deen Dayal UpadhyayaGram Jyoti Yojana (DDUGJY) scheme was launched to support the adoption of decentralised distributed electricity in rural India via off-grid installations, mainly mini-grids.In 2017 the Off-Grid and Decentralised Solar PV Programme was put in place to facilitateuptake of various solar PV applications for lighting and water pumping in rural areas byproviding financial means to the implementing agencies. The programme was extended until the end of the 2020 financial year.

In December 2018 the Atal Jyoti Yojana (AJAY) Phase II programme was initiated tofinance the installation of over 3 million solar street lights in selected regions. Initiated by the GoI in February 2019 (and followed by guidelines in July 2019), the KUSUM scheme will support farmers to replace existing diesel pumps with solar PV pumps (with both on-grid and off-grid features). The scheme will allow farmers to become prosumers and sell power to the DISCOMs at a predetermined price. The scheme aims to add solar and other renewable capacity of 28 GW by 2022. It has three main components:

a) financing of 10 GW of renewable energy plants, each up to 2 MW capacity.
b) offering 1.75 million standalone solar agriculture pumps, central government to provide 30% subsidy and state government to provide 30% subsidy.

c) converting 1 million grid connected agriculture pumps to solar powered operation with central government and state government providing 30% subsidy each.
India also supports off-grid EfW uptake by providing capital subsidies for the purchase and installation of biomass gasifiers in rural areas.

- **Bioenergy and Waste:**

India is close to meeting its 2022 target for 10 GW of bioenergy capacity. The principal contributor is the use of bagasse in sugar mill co-generation plants. The Scheme to Support Promotion of Biomass-Based Co-generation in Sugar Mills and Other Industries offers central financial assistance in the form of a capital subsidy per additional MW of capacity delivered by investment in more efficient co-generation technology and runs until 2020. There is scope to increase electricity generation from sugar mills when they are upgraded to more efficient co-generation systems.
India's 2016 waste management rules provide the basis for stimulating greater exploitation of EfW. For example, the rules stipulate that states should: procure all electricity generated from EfW projects; support the promotion of using waste in industry when it is available within a 100-kilometre radius; encourage waste segregation and require that non recyclable waste of high calorific value be used for energy.

- **Barriers to investment in renewable energy projects:**

Besides permitting and network expansion delays, the key barriers to investment in renewable energy projects in India are the small transaction size for distributed energy projects, the credit rating of the off-taker, the absence of clear business models for rooftop solar and the disaggregated nature of the market.

4.5.2 Irrigation Facilities:

The main source of irrigation in the village is Mahisagar River. It is 3 km away from the village.
Generally, they uses Localized irrigation system for crops.

F-4.15 Localized Irrigation

4.5.3 Electricity Facilities with Area:

Rural electrification is the process of bringing electrical power to rural and remote areas. Rural communities are suffering from colossal market failures as the national grids fall short of their demand for electricity.

As of 2017, over 1 billion people worldwide lack household electric power-14% of the global population. Electrification typically begins in cities and towns and gradually extends to rural areas, however, this process often runs into obstacles in developing nations.

- **Social and Economics benefits:**

Education:

Access to electricity facilitates sustainable economic and social growth. First, through an increase in educational achievement. Students who were previously forced to study when the sun was shining are now able to study by the light of LEDs early in the morning or late into the night. In Kenya for example, interviews with school teachers revealed that access to light has allowed for extra hours of teaching earlier and later in the day to cover material not adequately reviewed during normal hours. Additionally, schools with access to electricity are able to recruit higher quality teachers and have seen improvements on test scores and graduation rates, raising the human capital entering the labor force in the future.

Job Creation:

When expanding the electrical grid, there is a demand for thousands of jobs ranging from business development to construction. Projects to spread electricity create a wealth of job opportunities and help to alleviate poverty. For example, India set a target of 175GW of clean energy to be installed by 2022 to increase electrification throughout the country. An estimated 300,000 jobs will need to be created in order to reach these lofty goals.

Health Care Improvements:

The availability of electricity can drastically increase the quality of healthcare provided. Improved lighting increases the time patients can come and get treatment. Refrigerators can be used to conserve incredibly valuable vaccines and blood. Sterilization measures will be improved and the implementation of high tech machines such as x-rays or ultrasound scanners can provide doctors and nurses the tools they need to perform. The locals are forced to travel 2–3 hours across the river for treatment or access to vaccines. With access to electricity, treatment would be far more accessible to the local population.

Additional Benefits:

- Reduce isolation and marginalization through telephone lines and Television
- Improve safety with the implementation of street lighting, lit road signs
- Reduce expenses on expensive fossil fuel lamps i.e. kerosene.

Tachnology:

Renewable off-grid enterprises have emerged in many areas to meet the demand for electricity in rural communities. Due to their geographical location and relatively low aggregate demand, expanding the nationwide grid to rural areas is expensive and challenging.

- Wind mechanical water pumps
- Diesel solar hybrid power systems: especially for telecommunications worldwide. Fully commercial and the preferred option for remote telecommunications, commercially evolving for village power.
- Bioenergy
- Micro hydro is very widely implemented in Nepal, Vietnam, and China.

4.6 Existing Institution:

4.6.1 Bachat Mandali:

There is no Bachat Mandali in Handiya Village.

4.6.2 Dudh Mandali:

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

F-4.16 Dudh Mandali of Handiya

4.6.3 Mahila Forum:

There is no mahila foroum in village.

4.6.4 Plantation for the Air Pollution:

There is no such activity done of tree plantation for the air pollution in the Handiya village.

4.6.5 Rain Water Harvestiong:

There is no facility of water harvesting in the village.

4.6.6 Agricultural Development:

Tradition agricultural adopted.But most farmer adopt organic farming.

4.6.7 Any Other:

There are no any other kind of institutions existing in the Handiya village.

5 Tchnical Options with Case Studies

5.1 Concepts(Civil):

5.1.1 Advance Sustainable Construction Techniques:

The construction industry is repeatedly criticised for being inefficient and slow to innovate. The basic method of construction, techniques and technologies have changed little since roman times

The term ‘advanced construction technology’ covers a wide range of modern techniques and practices that encompass the latest development in materials technology, design procedures, quantity surveying, facilities management, services, structural analysis and design, and management studies.

Top 10 sustainable building methods currently in use or under development.

1. (IoT) Integrated Automated Building Systems:

The Internet of Things (IoT) gives facility managers access to data that they did not previously have access to. These small connected sensors can integrate with automated building systems to improve the sustainability of operations. For **2. Synthetic Roof Underlayment (SRU):**

The underlayment on roofs is typically asphalt-based, which breaks down relatively quickly. Replacing this layer is necessary to keep moisture out of the building's interior. Synthetic roof underlayment offers an alternative that weighs less and holds up to the wear and tear of an exterior environment.

3. Green Roofs (GR):

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

4. Grid Hybrid System (GHS) :

Renewable energy sources provide a sustainable way for organizations to power their commercial properties, but many grid systems lack storage to power facilities during times of low solar availability.

5. Passive Solar (PS):

Another way to leverage a sustainable solar energy source is to construct the building based on the passive solar concept. The during winter, while reducing its impact during warmer months.

6. Grey water Plumbing Systems (GPS):

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

7. Electro chromic Glass (EG):

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

8. Solar Thermal Cladding (STC):

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

9. Structural 3D Printing (S3DP):

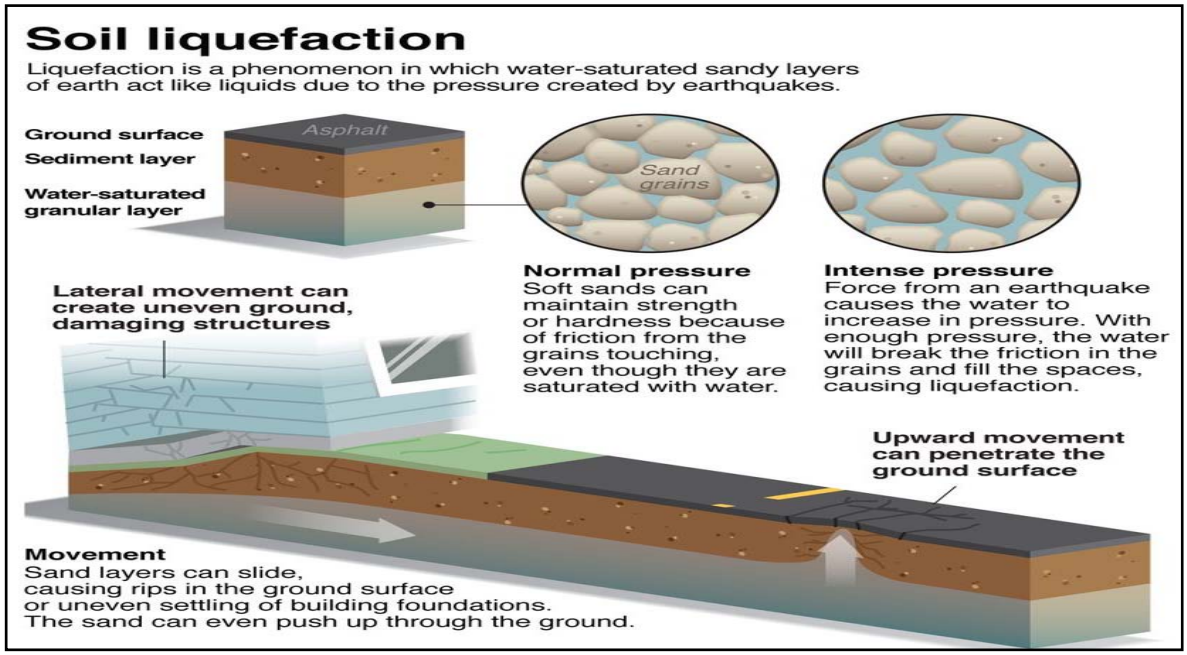
Creating and moving building materials to the job site can have heavy environmental costs. As structure 3D printing begins moving forward, it becomes easier to cut down on shipping costs or reduce the weight of components.

10. Self-healing Concrete:

This material is in its early stages, but once it's commercially viable it opens up many sustainable possibilities. Everything from roads to walkways can benefit from concrete that heals itself.

5.1.2 Soil Liquification:

Soil liquefaction, also called **earthquake liquefaction**, ground failure or loss of strength that causes otherwise solid soil to behave temporarily as a viscous liquid. The phenomenon occurs in water-saturated unconsolidated soils affected by seismic S waves (secondary waves), which cause ground vibrations during earthquakes. Although earthquake shock is the best known cause of liquefaction,



F-5.1 Soil Liquification

certain construction practices, including blasting and soil compaction and vibroflotation (which uses a vibrating probe to change the grain structure of the surrounding soil), produce this phenomenon intentionally. Poorly drained fine-grained soils such as sandy, silty, and gravelly soils are the most susceptible to liquefaction.

5.1.3 Sustainable Sanitation:

The main objective of a sanitation system is to protect and promote human health by providing a clean environment and breaking the cycle of disease.

A sanitation system has to be economically viable, socially acceptable, technically and institutionally appropriate, and protect the environment and natural resources.

Most sanitation systems have been designed with these aspects in mind, but they fail far too often because some of the criteria are not met. In fact, there is probably no system which is absolutely sustainable. The concept of sustainability is more of a direction than a state to reach. Nevertheless, it is crucial that sanitation systems are evaluated carefully with regard to all dimensions of sustainability.

F-5.2 Sustainable Station

5.1.4 Transport Infrastructure:

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

F-5.3 Transport Infrastructure

Transport is vital to the well-functioning of economic activities and a key to ensuring social well-being and cohesion of populations. Transport ensures everyday mobility of people and is crucial to the production and distribution of goods. Adequate infrastructure is a fundamental precondition for transport systems. In their endeavour to facilitate transport, however, decision-makers in governments and international organizations face difficult challenges. These include the existence of physical barriers or hindrances, such as insufficient or inadequate transport infrastructures, bottlenecks and missing links, as well as lack of funds to remove them. Solving these problems is not an easy task. It requires action on the part of the governments concerned, actions that are coordinated with other governments at international level.

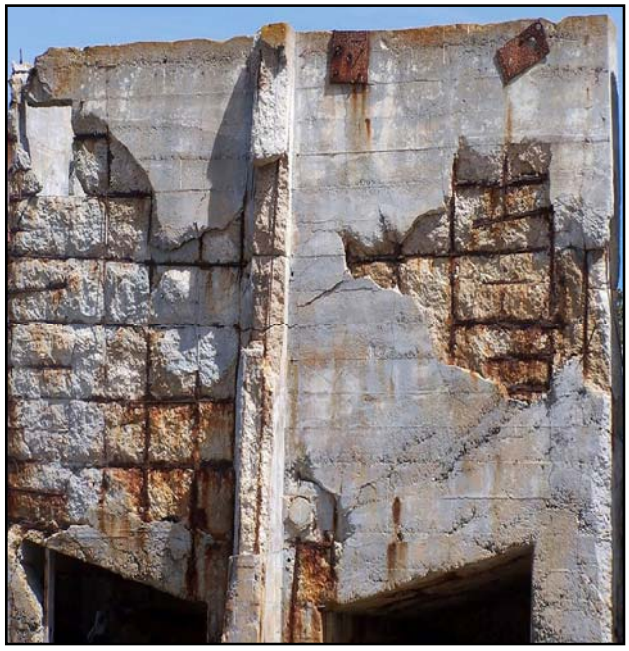
5.1.5 Vertical Farming:

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

F-5.4 Verticle Farming

5.1.6 Corrosion mechanism, prevention & repair measures of RCC structure:

Corrosion Mechanism, Prevention & Repair Measures of RCC Structure Though concrete is quite strong mechanically, it is highly susceptible to chemical attack and thus structure gets damaged and even fail unless some preventive measures are adopted to counteract this and thereby increasing the durability of structure. In the case of Reinforced concrete structure the ingress of moisture or air may lead to corrosion of steel, cracking and spilling of concrete cover thereby reducing durability of concrete structure. Repair has been suggested as the protective solution for damaged structure due to corrosion.



F-5.5 Corrosion in R.C.C.

5.1.7 Sewage Treayment Plant:

Sewage treatment is the process of removing contaminants from wastewater and household sewage water.

Sewage treatment is the process of removing contaminants from municipal wastewater, containing mainly household sewage plus some industrial wastewater. Physical, chemical, and biological processes are used to remove contaminants and produce treated wastewater (or treated effluent) that is safe enough for release into the environment. A byproduct of sewage treatment is a semi-solid waste or slurry, called sewage sludge.Sewage water can travel towards treatment plants via piping and in a flow aided by gravity and pumps. The first part of the filtration of sewage typically includes a bar screen to filter solids and large objects that are then collected in dumpsters and disposed of in landfills. Fat and grease are also removed before the primary treatment of sewage.

The Stages of sewage Treatment:

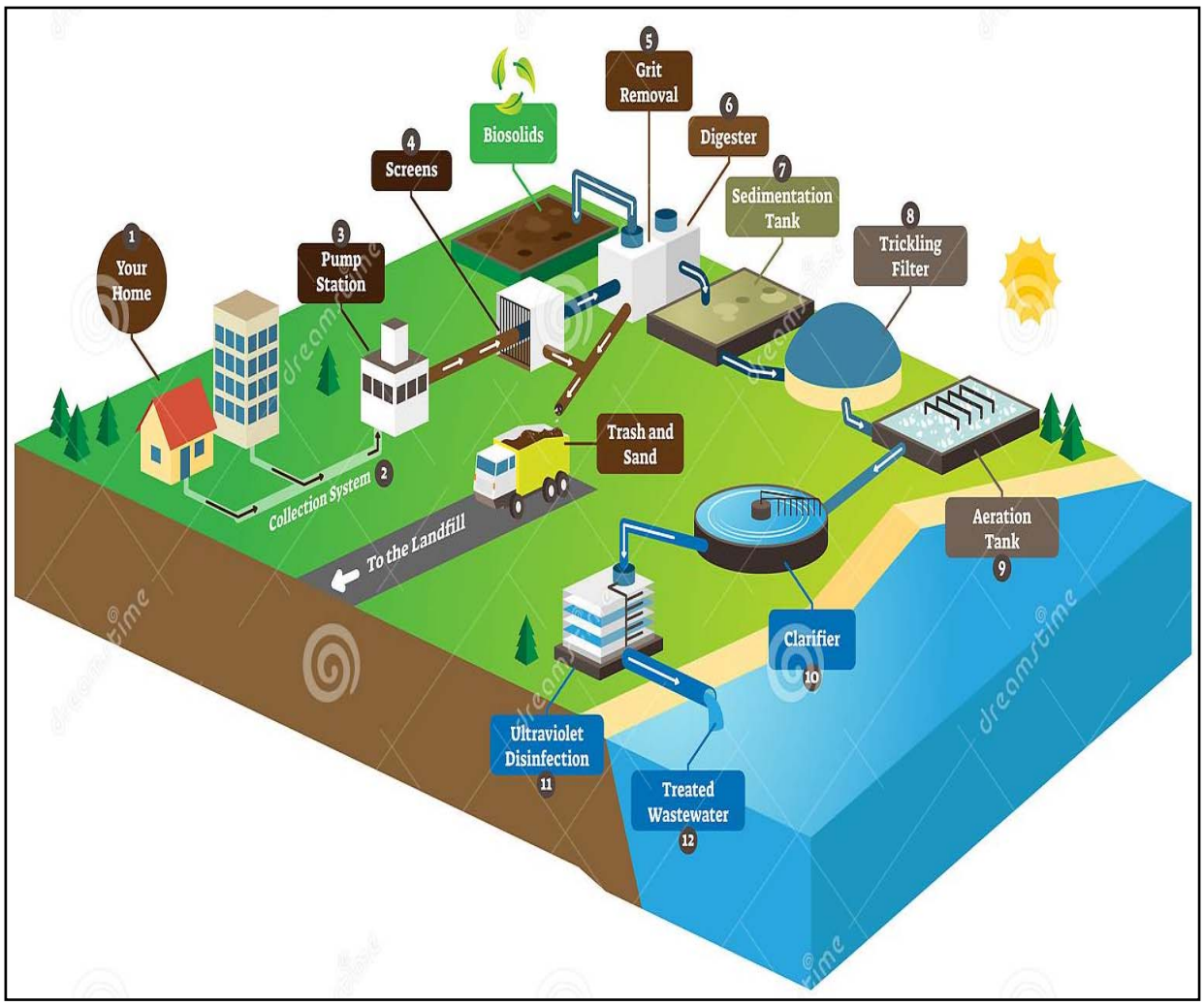
The general construction of a sewage treatment plant doesn't differ too drastically from that of a septic tank. Just as with a septic tank, sewage flows from the property being serviced into the first chamber of the sewage treatment plant. Here, the water sits until grease, oil and scum have floated to the top and solids have settled on the bottom of the tank.

Once the process of separation has taken place, the liquid travels into a second chamber which is where sewage treatment plants differ from septic tanksThis

bacteria helps to break down the contaminants in the water, effectively cleaning it. For most cities, the sewer system will also carry a proportion of industrial effluent to the sewage treatment plant that has usually received pre-treatment at the factories to reduce the pollutant load.

The final stage of a sewage treatment plant is one last settlement tank. This final tank allows the very last solids that may remain to sink to the bottom of the tank before the effluent is discharged into a soakaway or watercourse.

Once the treatment process has been completed and the wastewater has been treated as thoroughly as possible, it can be discharged into the environment. This is another key area where sewage treatment plants differ from sewage treatment plants.This is because of the vastly improved effluent quality that the treatment process produces.



F-5.6 Sewage Treatment Plant

5.1.8 Technical Case Study On Flyover at Nashik on NH-3 :

Introduction :

The work has been awarded to M/s Larsen & Toubro-M/s Ashoka Buildcon Limited Consortium and agreement is signed with the Concessionaire M/s L & T-PNG Tollway Private Limited, on 8th July, 2009. Design & Preconstruction activates are in progress. Work is expected to be started in January, 2010. The construction period is 30 months (including monsoon period.) Project envisages up gradation of existing 2 lane carriageways to 6 lane divided carriageway i.e (3-lane on each side) configuration with 5m wide median at centre.

This project involves construction of 5.50 km long (4lane) flyover for through traffic flying over four busy junctions viz. Aurangabad Naka Junction, peth Junction, Dwarka Junction & Mumbai Naka. Along this 5.5 Km long flyover, 4 lane divided carriageway at grade road in addition to 2-lane service road on either side (total 12-lane carriageway within the city portion) with Up/Down ramps at Dwarka Junction where NH-50 meets with NH-3 are being provided. The Pimpalgaon Nashik Gonde mad project serves with a elevated corridor, seven flyovers, two major bridges, six vehicular under passed, six pedestrian under passes, six pedestrian under passes and a subway. The flyover passing through Nashik city a Pathardi is India's longest integrated flyover.

It has been categorised as 'A Class' loading design. The Elevated Corridor also gives the city 12 lane road for traffic passing through the city.Four flyovers are in the Nashik Municipal corporation limit and two are outside it. There are 8 underpasses beneath these flyovers that will facilitate city traffic movement. A part from these flyovers it has two major bridges and 11 small bridges and a subway. There are 34 bus bays and 4 Truck lay byes.

Necessicity :

- To minimize traffic problems at major intersections such as Dwarka, Mumbai naka etc.
- To minimize rate of accidents.
- To reduce time for vehicles passing over the flyover.

Methodology :

The segments are transported to the site from the P.C. yard then at the site there is launcher resting on two piers. First of all segments ES1 and RS1 are lifted then each consecutive segments are lifted with the help of launcher from both the piers towards the centre of the span. For joining the two consecutive segment gluing material is used which consist of epoxy resin and hardener. These two elements after mixing with each other are to be applied within 2 hrs. Only.

Foundation :

The type of foundation mainly used are as follows:

1. Open foundation
2. Pile foundation

The selections of type of foundation depends upon the standard penetration number followed by standard penetration test, following conditions were considered while deciding the type of foundation:

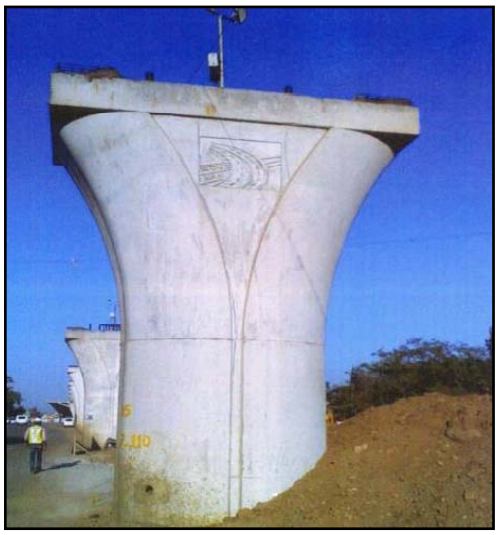
F-5.7 Foundation of pier

- If span is greater than 50, then open foundation is used at the particular place.
- If span is less the 50 then use pile foundation is used at the particular place.
- The Concrete used for foundation is of M35 grade. The concreting work is done by time method.

Piers :

The piers are mainly of two types

1. Fixed pier
2. Free Pier



F-5.8 Pier at the site

The fixed pier carry's dead load and moments whereas the free pier carry's only dead load Position of piers are such that they are alternately placed such as one fixed pier & one free pier. The height of the pier above the ground level excluding the pier cap is 350mm. A pier cap is also provided of 500mm thickness at the top of pier.The average distance between the two consecutive piers is 30m.

Following activities are carried out while casting of pier:

- Steel reinforcement
- Placing the shuttering for pier, the shuttering is made of steel.
- Removal of shuttering after the 24 hrs. of concreting
- White wash (lime) is applied to pier so as to maintain the heat of hydration & balance the chemical reaction and also it is dressed with jute sheets.

Segments :

Segments are design for different span:

- 30m - 68 no. of curve span.

- 30m - 160 no. of straight span.
- 40m - 5 no. of span.
- 26.8m - 2 no. of span.
- 23.1m - 2 no. of span.
- 21.865m - 1 no. of span.

There are in all total 171 no of span. Specific name or we can say designation is given to every span. 12 segments are placed between two consecutive piers covering a span of 30m Length of each segment is 19.7m approximately.

There specification are as follows:

- Rs1-2(parabolic) 1.5m in width, web thickness - 600mm, 2Nos.
- Rs2-2(parabolic) 3m in width, web thickness - 600mm, 2Nos.
- Rs3-2(parabolic) 3m in width, web thickness - 600mm, 350mm (varying thickness) 2Nos.
- Rs 4 - 4 (straight) 3m in width, web thickness-350mm. 4Nos.

F-5.9 Formwork of the Segment at the casting yard

F-5.10 Segment at the site

F-5.11 Segment being lifted and placed

F-5.12 Placing of segment in order

F-5.13 Segment being placed in position

F-5.14 Final view of span

Avantages and Disadvantages of Flyover at Nashik on NH-3:

Advantages:

- As it is said infrastructure plays very important role in growth of nation thus this infrastructure project is important for national growth from infrastructure point of view.
- Due to precast methods used much time is saved and speedy construction activities are carried out.
- The impact of the flyover construction to curb traffic congestion problem has been assessed in terms of traffic decongestion, time saving and fuel saving.

Disadvantages:

- Many trees were cut during the project so it indirectly affects the environment.
- Transportation of segments from yard to site affects the project cost drastically.
- Big container making problem at the Dwarka junction.

Coclusion:

- Precast segmental construction is a versatile technique for construction of present day fast track jobs.
- In casting yard better control on quality & dimensional tolerances can be achieved. Segment casting can start independently as work on foundations progresses, their-by reducing overall completion time.
- This project will add beauty to the Nashik city with its appealing aesthetics.
- Selecting innovative design concepts and construction methodologies can tackle problems occurring in construction. A well-conceived construction mythology can result into least traffic disturbance, construction delays and noise & visual pollution.

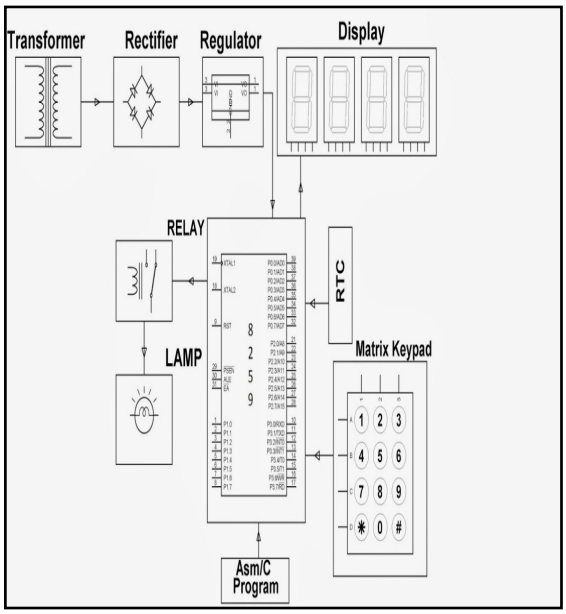
5.2 Concept(Electrical) :

5.2.1 Programmable Load Shedding:

Abstract:
In today's world, there is a continuous need for automatic appliances with the increase in standard of living, there is a sense of urgency for developing circuits that would ease the complexity of life.
Programmable load shedding time management system is a reliable circuit that takes over the manual task of switch ON/OFF the electrical devices with respect to time. It uses real time clock (RTC) interfaced to a microcontroller of 8051 family.

Software Implamentation:

STEP 01: Start.
STEP 02: Initialize RTC.
STEP 03: Initialize LCD.
STEP 04: Turn on relay.
STEP 05: Display time on LCD.
STEP 06: If pin P3.2=0 then go to step 7 else goto step8.
STEP 07: Read character 'n' from keypad.
STEP 08: If n=1 then goto step 10.
STEP 09: Update the current time and goto step13.
STEP 10: set the power off alarm time and power off interval, goto step13.
STEP 11: Display "try again" and go to step 13.



F-5.15 Block Diagram

STEP 12:If current time matches the alarm time then go to step14 else go to step5.
STEP 13: Turn off the relay.
STEP 14: Set the new value of alarm time as the power on time.
STEP 15: display the current time and power on time on LCD.
STEP 16: If current time matches the alarm time go to step 16.
STEP 17: Turn on relay and go to step5.
STEP 18: END.

5.2.2 Maintainance through Energy Harvesting Concept:

Energy harvesting is the process by which ambient energy is captured and converted into electricity for small autonomous devices, such as satellites, laptops and nodes in sensor networks without the need for battery power. Energy harvesting applications reach from vehicles to the smart grid.
With electronic circuits now capable of operating at microwatt levels, it is feasible to power them from non-traditional sources. This has led to energy harvesting,

which provides the power to charge, supplement or replace batteries in systems where battery use is inconvenient, impractical, expensive or dangerous.In addition, otherwise wasted energy from industrial processes, solar panels, or internal combustion engines, can be harvested for useful purposes.Key component in energy harvesting is power converter that can operate with ultralow voltage inputs.
Now that we have described why it is feasible and what it can do, how does energy harvesting actually work? Put simply, it is a process that:

- Captures minute amounts of energy
- Accumulates that energy
- Stores the energy
- Maintains the stored energy as a power source

Typical energy harvesting inputs include:

- Solar power
- Thermal energy
- Wind energy
- Salinity gradients
- Kinetic energy

Today, energy harvesters do not usually produce enough energy to perform mechanical work, however they provide small amounts of power to support low-energy electronics. In most cases, the "fuel" " for energy harvesters is naturally present and may be considered free. Using natural sources in remote areas for energy harvesting is an attractive alternative to inconvenient utility and battery power.Energy harvesting can also be an alternative energy source that supplements the primary power source and enhances its reliability.

Energy Harvesting IC:

Linear Technology's LTC3108, a highly integrated dc-dc converter is intended for energy harvesting. It can harvest and manage surplus energy from extremely low-input voltage sources such as TEG (thermoelectric generators), thermopiles. and small solar cells.

The LTC3108 utilizes a MOSFET switch to form a resonant step-up oscillator using an external step-up transformer and a small coupling capacitor. This allows it to boost input voltages as low as 20mV, high enough to provide multiple regulated output voltages for powering other circuits. The frequency of oscillation is determined by the inductance of the transformer secondary winding and is typically in the range of 20kHz to 200kHz. For input voltages as low as 20mV, a primary-secondary turns ratio of about 1:100 is recommended. For higher input voltages, this ratio can be lower.

LDO Output:

A 2.2V LDO can support a low-power processor or other low-power ICs. The LDO is powered by the higher value of either VAUX or VOUT. This enables it to become active as soon as VAUX has charged to 2.3V, while the VOUT storage capacitor is still charging. In the event of a step load on the LDO output, current can come from the main VOUT capacitor if VAUX drops below VOUT. The LDO requires a 1µF ceramic capacitor for stability. Larger capacitor values can be used without limitation, but will increase the time it takes for all the outputs to charge up. The LDO output is current limited to 4mA typical.

The main output is pin-selectable via VS1 and VS2 for one of four fixed voltages (2.35V, 3.3V, 4.1V, or 5V) to power a wireless transmitter or sensors. A second switched output can be enabled by the host to power devices that do not have a micropower shutdown capability. The addition of a storage capacitor provides continuous power even when the input energy source is unavailable.

A power-good comparator monitors VOUT. The PGD pin is an open-drain output with a weak pull-up (1MΩ) to the LDO voltage. Once VOUT charges to within 7% of its regulated voltage, the PGOOD output goes high. If VOUT drops more than 9% from its regulated voltage, PGD goes low. The PGD output is designed to drive a microprocessor or other chip I/O and is not intended to drive a higher current load such as an LED. Pulling PGOOD up externally to a voltage greater than VLDO will cause a small current to be sourced into VLDO. PGOOD can be pulled low in a wire-OR configuration with other circuitry.

VOUT2 is an output that can be turned on and off by the host, using the VOUT2_EN pin. When enabled, VOUT2 is connected to VOUT through a 1.3Ω P-channel MOSFET switch. This output, controlled by a host processor, can be used to power external circuits such as sensors and amplifiers, that do not have a low power sleep or shutdown capability. VOUT2 can be used to power these circuits only when they are needed.

Piezoelectric Energy Harvesting:

Linear Technology's LTC3588-1 is an ultralow quiescent current power supply for energy harvesting and/or low current step-down applications (Fig. 13-3). The IC interfaces directly to a piezoelectric or alternative ac power source, to rectify a voltage waveform and store harvested energy on an external capacitor, and maintain a regulated output voltage bleed off any excess power via an internal shunt regulator, and maintain a regulated output voltage by means of a nanopower

When the voltage on VIN rises above the UVLO rising threshold the buck converter is enabled and charge is transferred from the input capacitor to the output capacitor. A wide (~1V) UVLO hysteresis window is employed with a lower threshold approximately 300mV above the selected regulated output voltage to prevent short cycling during buck power-up. When the input capacitor voltage is

depleted below the UVLO falling threshold, the buck converter is disabled. Extremely low quiescent current (450nA typical) in UVLO allows energy to accumulate on the input capacitor in situations where energy must be harvested from low power sources.

Analog Devices' ADP5091/92 is an intelligent integrated energy harvesting nano-powered management solution that converts dc power from PV cells or thermoelectric generators.The IC charges storage elements such as rechargeable Li-Ion batteries, thin film batteries, super capacitors, or conventional capacitors, and powers up small electronic devices and battery-free systems.

The ADP5091/92 provides efficient conversion of the harvested limited power from a 16 µW to 600 mW range with sub-µW operation losses. With the internal cold-start circuit, the regulator can start operating at an input voltage as low as 380 mV. After a cold startup, the regulator is functional at an input voltage range of 80 mV to 3.3 V. You can program an additional 150mA regulated output with an external resistor divider or VID pin.

The charging control function of ADP5091/92 protects rechargeable energy storage, which is achieved by monitoring the battery voltage with programmable charging termination voltage and shutdown discharging voltage. In addition, a programmable PGOOD flag with programmable hysteresis monitors the SYS voltage.

An optional primary cell battery can be connected and managed by an integrated power path management control block that is programmable to switch the power source from the energy harvester, termination voltage and shutdown discharging voltage rechargeable battery, and primary cell battery.

- The ADP5091/92 is available in a 24-lead LFCSP and is rated for a −40°C to +125°C junction temperature range.

5.2.3 Moisture Monitoring System:

Planting a tree in an environment where the seed or the plant would not get water adequately through natural sources like rain or ground water in its initial phases has been always a matter of concern for tree planters. This is where an autonomous moisture monitor for plants system can help.

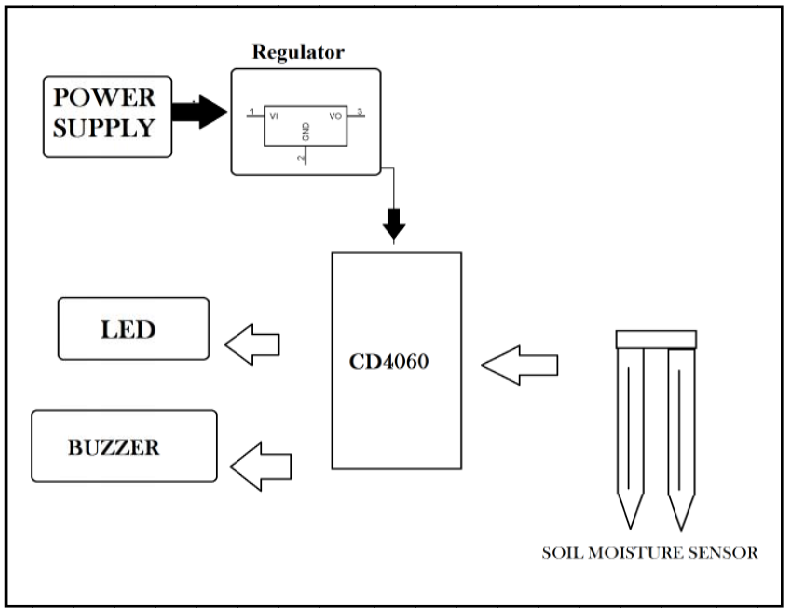
The system timely monitors the moisture level of the soil. If at the time of monitoring it comes to know that the moisture level of the soil is lower than recommended then it will raise an audio visual alert. This alert is then received by the care taker of the plant. When the care taker waters the plant the alarm goes off and the monitoring cycle continues.

In this system we use a timer IC to time the monitoring process. A moisture level sensor is used to detect the moisture level of the soil. An LED is used to give visual alarm and a Buzzer is used to give audio alarm to the care taker of the plant.

Thus in this project with the help of a simple combinational circuit and a sensor we can help save a plant by maintaining the moisture level of the soil of the plant, thus keeping the plant healthy.

Hardware Specification:

- Water Sensor
- Buzzer
- Resistors
- Capacitors
- Transistors
- Cables and Connectors
- Diodes
- PCB and Breadboards
- LED



F-5.16 Moisture Monitoring System

5.2.4 PC Based Electrical Load ControL:

Automation system is mostly depending upon the power systems in industrial, residential or commercial, which needs remote controlling and monitoring. By employing wireless technologies.Keil an ARM Company makes C compilers, macro assemblers, real-time kernels, debuggers, simulators, integrated environments, evaluation boards, and emulators for ARM7/ARM9/Cortex-M3, XC16x/C16x/ST10, 251, and 8051 MCU families.

Compilers are programs used to convert a High Level Language to object code. i.e the programs written in one of the HLL like 'C' will compile the code to run on the system for a particular processor like x86 (underlying microprocessor in the computer).

Power Supply:

- The 230V AC supply is first stepped down to 12V AC using a step down transformer.
- The AC ripples is filtered out by using a capacitor and given to the input pin of voltage regulator 7805.
- At output pin of this regulator we get a constant 5V DC which is used for MC and other ICs in this project.

Microcontroller:

It is a smaller computer; it has on-chip RAM, ROM, I/O ports. The features of this microcontroller include the following.

- 8K Bytes of In-System Programmable (ISP) Flash Memory

- 4.0V to 5.5V Operating Range
- 32 Programmable I/O Lines
- Three 16-bit Timer/Counters
- Eight Interrupt Sources
- Full Duplex UART Serial Channel

MAX232:

- The MAX232 is an integrated circuit that converts signals from an RS-232serial port to signals suitable for use in TTL compatible digital logic circuits.
- he MAX232 is a dual driver/receiver and typically converts the RX, TX, CTS and RTS signals.
- When a MAX232 IC receives a TTL level to convert, it changes a TTL Logic 0 to between +3 and +15V, and changes TTL Logic 1 to between -3 to -15V, and vice versa for converting from RS232 to TTL

Db9 Connector:

The DB9 (originally DE-9) connector is an analog 9-pin plug of the D-Sub miniature connector family

Relay:

- A relay is an electrically operated switch.
- Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts.
- The coil current can be on or off so relays have two switch positions and have double throw (changeover) switch contacts as shown in the diagram.
- For example a low voltage battery circuit can use a relay to switch a 230V AC mains circuit.
- There is no electrical connection inside the relay between the two circuits, the link is magnetic and mechanical.
- To drive relay through MC ULN2003 relay driver IC is used.
- Relay Driver ULN2003
- If the logic at input 1B is high then the output at its corresponding pin 1C will be low

Project Working:

The main goal of this project is to control the electrical load through a PC (personal computer). For example, lighting in the theatre can be controlled form the PC for superior stage management.At present, they are physically controlled which makes it complex to organize the lighting with the particular scene. By employing this system, one can manage the electrical load ON/OFF by just being seated at one place using a PC.

5.2.5 Solar Street Light [Case Study] :

LED Light Characteristics:

- Lifespan:- More than 50000 Hrs.
- Color Rendering Index:- >75(white)
- I/P voltage Range:- 100~265V AC, 50Hz +3% -5%
- Total harmonic Distortion:- <10%
- Fixture material:- AL Die cast
- Maximum Voltage Across:- 3.15~3.35V, 700mA at Each LED
- Luminaries IP rating:- IP 65
- Efficiency of power supply:- 80%

F-5.17 Solar Street Light

MODEL Description	11W-CFL	6W-LED	7W-LED	12W-LED	15W-LED	20W-LED
System Voltage	12V	12V	12V	12V	12V	12V
Battery Capacity	12V/75Ah	12V/40Ah	12V/26Ah	12V/40Ah	12V/60Ah	12V/75Ah
Solar panel	12V/74W	12V/40W	12V/30W	12V/74W	12V/60W	12V/80W
Light Type	CFL	LED	LED	LED	LED	LED
Pole Height	12	12	12 (4M)	15 (5 M)	15 (6 M)	20 (6 M)
System Cost	20,000	20,000	-	22,000	-	-
Distance Between two poles	10~15m	5~10m	5~10m	10~15m	15~20m	15~20m

T-5.1 Model Specification

Features(Advantages):

- Free from noise, smoke and pollution.
- Requires very little maintenance.
- Advance electronic design for charge controller and inverter.
- Eco- friendly system

Applications:

- Factories
- Industries
- Hotels, Shopes, Show rooms and Hospitals.
- Banks & telecom Towers

5.2.6 PC Based Electrical Load Control:

Automation system is mostly depending upon the power systems in industrial, residential or commercial, which needs remote controlling and monitoring. By employing wireless technologies, it is more competent to execute a suitable technology depending upon the requirements of the proposed system like speed, cost, and distance.

PC Based Electrical Load Control System:

The PC based electrical load control system can be built with 8051 series Microcontroller, Level Shifter IC, DB Connector, Relays, Transformer, Diodes, Capacitors, Resistors, LED, Crystal, Lamps, Keil compiler and Language: Embedded C or Assembly.

For example compilers for Dos platform is different from the Compilers for Unix platform So if one wants to define a compiler then compiler is a program that translates source code into object code.

Power Supply

- The 230V AC supply is first stepped down to 12V AC using a step down transformer.
- This is then converted to DC using bridge rectifier.
- The AC ripples is filtered out by using a capacitor and given to the input pin of voltage regulator 7805.
- At output pin of this regulator we get a constant 5V DC which is used for MC and other ICs in this project.

Microcontroller:

It is a smaller computer; it has on-chip RAM, ROM, I/O ports. The progress of technology equipments is becoming simpler and easier for us. Automated systems have more benefits over manual system.The features of this microcontroller include the following.

- 8K Bytes of In-System Programmable (ISP) Flash Memory
- 4.0V to 5.5V Operating Range
- Eight Interrupt Sources
- Full Duplex UART Serial Channel

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- The MAX232 is a dual driver/receiver and typically converts the RX, TX, CTS and RTS signals.
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- Automated systems have more benefits over manual system.

- When a MAX232 IC receives a TTL level to convert, it changes a TTL Logic 0 to between +3 and +15V, and changes TTL Logic 1 to between -3 to -15V, and vice versa for converting from RS232 to TTL

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Relay:

- Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts.
- There is no electrical connection inside the relay between the two circuits, the link is magnetic and mechanical.
- To drive relay through MC ULN2003 relay driver IC is used.

5.2.7 Electrical Parameters Measurement:

Abstract:

The electric power parameters remote measuring system based on wireless is designed. The measuring data is transmitted to monitor center by GPRS network, analyzed and processed.

The electrical parameters measurement exercises were designed to emphasize the following concepts in order:

- Use an ohmmeter to measure resistance of individual resistors, resistors connected in series and parallel.
- Understand how resistance changes when resistors are connected in series as compared to when resistors are connected in parallel.
- Use a voltmeter to measure the source voltage, and the voltage across individual resistors connected in a series circuit.

Verify Kirchhoff's Voltage Law (KVL) in the series circuit:

In addition, measurements must emphasize the following rule: When resistors are connected in a series circuit, the voltage across a particular resistor is directly proportional to its resistance value.

Use an ammeter to measure the source current and the current flowing through individual resistors connected in a parallel circuit.

Verify Kirchhoff's Current Law (KCL) in the parallel circuit:

Note, experience has shown that it takes some time, spanning over multiple laboratory sessions, for some undergraduate Electrical and Computer Engineering students to grasp the concept of creating working circuits on breadboards.

Owing to limited available laboratory session time, the exercise of learning how to build circuits on breadboard was omitted. Though, a basic discussion of how resistors are connected, on a breadboard, was carried out at the beginning of the laboratory exercise.

6 Swatch Bharat Abhiyan (Clean India)

6.1 Swatchhta needed in Handiya Village:

The Nirmal Bharat Abhiyan has been restructured into the Swachh Bharat Mission (Garmin). The mission aims to make India an open defecation free country in Five Years. It seeks to improve the levels of cleanliness in rural areas through Solid and Liquid Waste Management activities and making Gram Panchayats Open Defecation Free (ODF), clean and sanitized.

In a village a need of swatchhta is more because unavailability of solid waste management like collection of waste collection dustbin and management of that waste. due to this village people are throw all waste around the village border. Some industry is also throwing a solid waste in the village border.

F-6.1 Existing Photo of Village Street

6.2 Guidelines-Implementation in Handiya Village:

the people are cleaning their nearby area regularly and collect that waste and dispose it to out of the village and burn it. No daily basis waste collection is there in the Handiya village.

6.3 Activities done by Students in Handiya Village:

- While traveling doesn't throw any wrapper, paper or any dry waste on road. Keep it in your bag or
- Pocket (as it is a dry waste you can keep them in your bag/pocket).
- Keep paper bags with yourself to store wet waste and throw them in dustbin only.
- We have also done a cleaning of village street.
- We have suggested them for not dumping the waste in village streets and dispose it at right place.
- Spitting on roads (as it can be the reason of viral disease).
- Avoid use of plastic bag.

7 Village Condition due to Covid-19

7.1 Taken steps in Handiya village related to existing situation:

- The sanitization process was done during the lockdown period when first case of covid 19 came in the village.
- Almost all villagers was tested by the government's Health Workers through very efficiently door to door testing by them.
- A small Covid Health centre has been emplemented.

F-7.1 Activities in Handiya Village by Health Workers

7.2 Activities done by Students for Handiya village:

- Distribution of masks and sanitizers.
- Free distribution of cooked meals and ration
- As migrants return to villages, they will need to be isolated to prevent the spread of the virus. Gram panchayat should take the initiative to set up local quarantine centres.

7.3 Any other steps taken by Students/Villagers:

- There is no any Steps taken by students/Villagers due to covid-19 guidelines.

F-7.2 Mask and Sanitizer distribution to needy people

8 Sustainable Design Planning Proposals (Prototype Design) - Part-I

8.1 Design Proposals:

✓ **Sustainable Design : Primary School**

There is one Primary School in Handiya.Which is Old and there are also structural problems in the structure

✓ **Physical Design : Primary Health Centre**

Handiya village has no Hospital, Health care center, no private clinic that's why people have to go Balasinor village.

✓ **Social Design : Community Hall**

Community hall is a public location where members of a community gather for group activities, events, festivals and social purpose. They may sometimes be open for whole community or for a specialized group example Mahila mandal hall. A community hall of village generally consists of a hall , storage or kitchen area and washroom.

✓ **Socio-Cultural Design : Skills Development Unit**

No Skill Development centre is available in handiya village, due to which villagers who want to learn new skils have to go to the nearest town.

✓ **Smart Village Design : Agro Storage Unit**

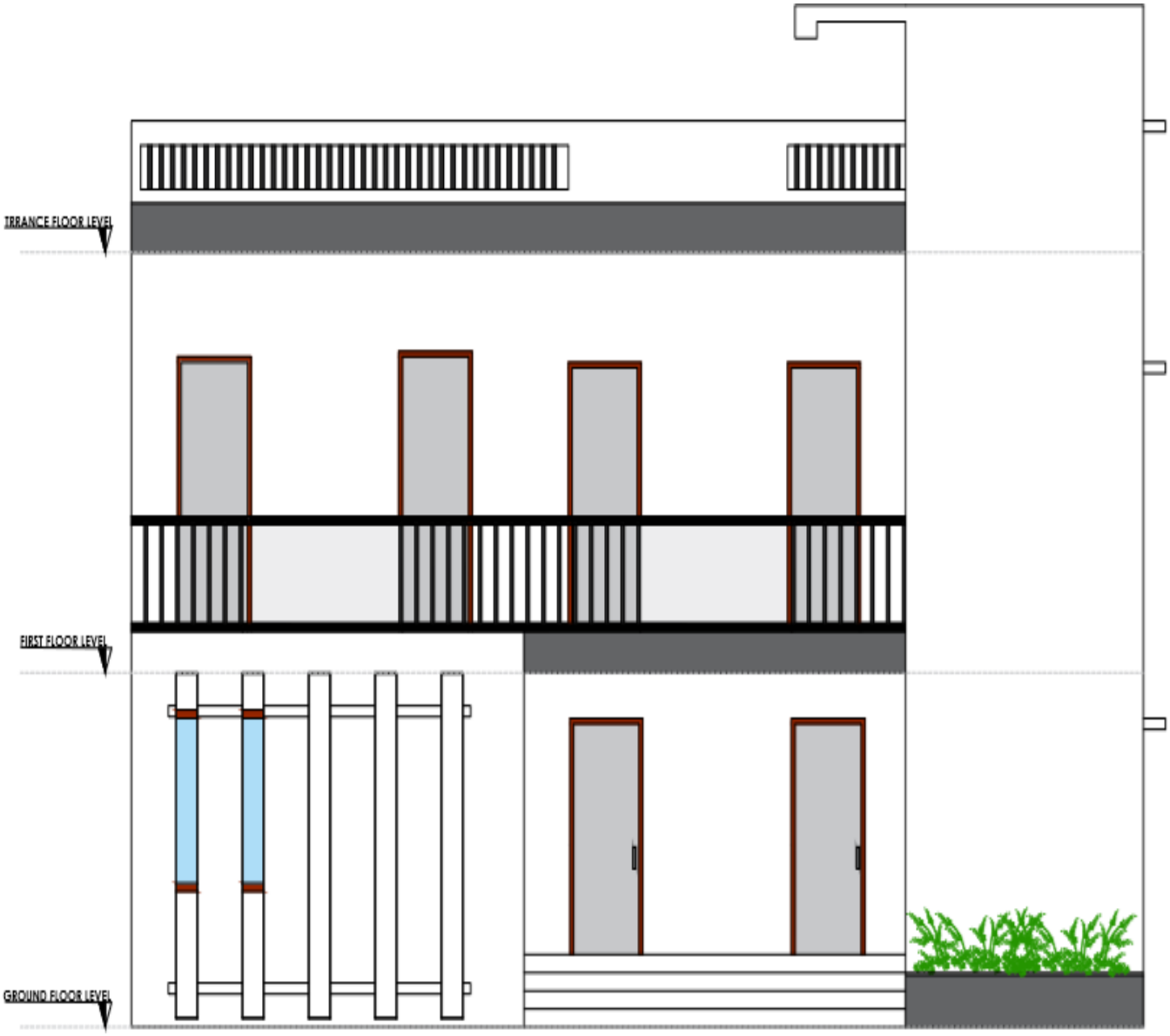
In Handiya Agro product is produce in big amount, But the village does not have the storage building for agro product therefore the villagers need a storage house for their agro product so they can store their agro product safely.

✓ **Haritage Village Design : Angadvadi**

There is one angadvadi in village, Which is to small and old. There are also Structural problem present in its construction.

8.1.1 Sustainable Design (Civil): Primary School

Handiya Village have one primary school but the plan and construction of village is old and there are many structural problem in the primary school Building and sarpanch and villager also give us feed back that a new plan of primary is required and as population is also growing so number of student is also increasing so as per requirement we give the plan of the primary school.



F-8.1 Elevation of Primary School

F-8.2 Ground Floor Plan of primary school

❖ Estimation of Primary School:

BUILDING ESTIMATE						
QUANTITY SHEET						
Sr. No.	**Item Description**	**No.**	**Length (m)**	**Widht/ Breadth (m)**	**Height/ Depth (m)**	**Quanity (CU M)**
1	Earthwork in Excavation in Foundation:					
	L=15.8 m	3	15.8	1	1.5	71.10
	L=6.1m	4	6.1	1	1.5	36.60
	L=5.2m	1	5.2	1	1.5	7.80
	S1=11.4	2	11.4	1	1.5	34.20
	S2=9.17	2	9.17	1	1.5	27.51
		TOTAL QTY.				149.70
2	P.C.C in Excavation in Foundation:					
	L=15.8 m	3	0.9	1.3	0.3	1.05
	L=6.1m	4	0.9	1.3	0.3	1.40
	L=5.2m	1	0.9	1.3	0.3	0.35
	S1=11.4	2	0.9	1.3	0.3	0.70
	S2=9.17	2	0.9	1.3	0.3	0.70
				TOTAL QTY.		3.51
3	Brick Masonary upto plinth					
Step 1	L1=15.4 m	3	15.4	0.5	0.3	6.93
Step 2	L1=15.3m	3	15.3	0.4	0.3	5.51
Step 3	L1=5.2m	3	15.2	0.3	0.3	4.10
Step 1	L2=5.7m	4	5.7	0.5	0.3	3.42
Step 2	L2=5.6m	4	5.6	0.4	0.3	2.69
Step 3	L2=5.3m	4	5.3	0.3	0.3	1.91
Step 1	L3=4.8m	4	4.8	0.5	0.3	2.88

Step 2	L3=4.7m	4	4.7	0.4	0.3	2.26
Step 3	L3=4.6m	4	4.6	0.3	0.3	1.66
Step 1	S1=11.8m	2	11.8	0.5	0.3	3.54
Step 2	S1=11.9m	2	11.9	0.4	0.3	2.86
Step 3	S1=5.2m	2	15.2	0.3	0.3	2.74
Step 1	S2=9.57	2	9.57	0.5	0.3	2.87
Step 2	S2=9.67	2	9.67	0.4	0.3	2.32
Step 3	S2=9.77	2	9.77	0.4	0.3	2.34
				TOTAL QTY.		48.02
4	Brick Masonary above plinth up to slab in c.m (1:6)					
	LONG WALL					
	L1=5.1m	2	11.8	0.2	3.2	15.10
	L2=5.2m	2	11.9	0.2	3.2	15.23
	L3=4.5m	2	15.2	0.2	3.2	19.46
	S1=5.3m	2	9.57	0.2	3.2	12.25
	S2=9.87	2	9.67	0.2	3.2	12.38
				TOTAL QTY.		74.42
5	DEDUCTION OF DOOR AND WINDOW					
	D1	7	1	0.2	2.1	2.94
	D2	3	0.7	0.2	2.1	0.88
	D3	1	0.8	0.2	2.1	0.34
	W1	6	1.6	0.2	1.4	2.69
	W2	4	0.7	0.2	1.4	0.78
	W3	4	1.2	0.2	1.4	1.34
	V1	2	0.6	0.2	0.6	0.14
				TOTAL QTY.		5.30
6	Deducation for lintel					

	window & door					
	D1	7	1.3	0.2	3.2	5.82
	D2	3	1	0.2	3.2	1.92
	D3	1	1.1	0.2	3.2	0.70
	W1	6	1.9	0.2	0.15	0.34
	W2	4	1	0.2	0.15	0.12
	W3	4	1.5	0.2	0.15	0.18
	V1	2	0.9	0.2	0.15	0.05
				TOTAL QTY.(m2)		9.14
				NET QTY.(m2)		60.48
7	1:3 Plaster for wall					
	CWSN	2	1.3	3		7.80
		2	2.4	3		14.40
	DRINKING AREA	2	1.3	3		7.80
		2	2	3		12.00
	TOILET	2	1.4	3		8.40
		2	1.7	3		10.20
	TOILET 1	2	4.7	3		28.20
		2	1.7	3		10.20
	CLASSROOM	2	5.4	3		32.40
		2	4.9	3		29.40
	Celling plaster					
	CWSN	1	1.3	2.4		3.12
	DRINKING AREA	1	1.3	2		2.60
	TOILET	1	1.4	1.7		2.38
	TOILET 1	1	4.7	1.7		7.99
	CLASSROOM	1	5.4	4.9		26.46
				TOTAL QTY.(m2)		203.35
8	Deducation for Door and Window					

	D1	2.5	1		2.1	5.25
	D2	2	0.7		2.1	2.94
	D3	1	0.8		2.1	1.68
	W1	2	1.6		1.4	4.48
	W2	1	0.7		1.4	0.98
	W3	1	1.2		1.4	1.68
	V1	1	0.6		0.6	0.36
				TOTAL QTY.(m2)		17.37
				Net QTY.(m2)		185.98
9	1:3 Plaster for wall					
	Frist Floor					
	CLASSROOM 1	2	4.8	3		28.80
		2	5	3		30.00
	CLASSROOM 2	2	4.8	3		28.80
		2	5	3		30.00
	PASSANGE	2	1	3		6.00
		2	3	3		18.00
	Celling plaster					
	CLASSROOM 1	1	4.8	5		24.00
	CLASSROOM 2	1	4.8	5		24.00
	PASSANGE	1	1	3		3.00
				TOTAL QTY.(m2)		192.60
10	Deducation for lintel Paint work					
				NET QTY.(m2)		60.48
11	Brick Masonary Parapet wall					
		26		10	1.5	390.00
				TOTAL QTY.		390.00
12	1:3 Plaster for wall	2	13		4.5	117.00
	outer face	2	10		4.5	90.00

	TOTAL QTY.	207.00
	NET QTY.(m2)	197.86

❖ **Abstract Sheet of Primary School:**

Abstract Sheet of Primary School Building					
Sr. No.	**Item Description**	**QTY.**	**Rate**	**Per**	**Amount (Rs.)**
1	Earthwork in excavation in foundation	149 CUM	90	CUM	13,410
2	Earth filling in plinth	130 CUM	2700	CUM	1,29,600
3	Brick masonary upto plinth in CM (1:6)	48 CUM	3500	CUM	6,89,500
4	smooth plaster inside rooms & ceilling	204 SQ.M	150	SQ.M	29,700
5	smooth plaster on outer wall	197 SQ.M	150	SQ.M	29,550
6	paint work (white wash)	204 SQ.M	5	SQ.M	990
7	paint work on outer wall	198 SQ.M	5	SQ.M	990
8	Brick work for parapet wall	390 CUM	3500	CUM	13,65,000
			Total Rs.		22,58,740
		Add 1.5% Water Charge			33,881
		Add 10% con.Charge			22,587.4
		Total Estimate Cost in Rs.			23,15,209

8.1.2 Physical Design (Civil) : Primary Health Centre

Handiya village has no Hospital, Health care center, no private clinic that's why people have to go Balasinor village. Primary health care center is the basic need of the people so we design a Primary Health Centre for village.

F-8.3 Plan and Elevation of Primary Health Centre

❖ Estimation of Primary Health Centre:

ESTIMATE OF P.H.C BUILDING							
QUANTITY SHEET							
Sr No.	**Item Discription**	**NO.**	**Lenth (m)**	**Width (m)**	**Height (m)**	**Cubic Meter**	
1.	EXCAVATION WORK						
	LONG WALL						
	LW1	2	11.01	0.9	1.2	23.78	
	LW2	1	8.26	0.9	1.2	8.92	
	LW3	1	1.94	0.9	1.2	2.10	
	LW4	1	2.42	0.9	1.2	2.61	
	LW5	1	3.06	0.9	1.2	3.30	
	SHORT WALL						
	SW1	2	5.35	0.9	1.2	11.56	
	SW2	1	1.43	0.9	1.2	1.54	
	SW3	1	3.29	0.9	1.2	3.55	
	SW4	1	0.43	0.9	1.2	0.46	
	SW5	2	5.39	0.9	1.2	11.64	
					TOTAL	69.48	CU.M.
2	P.C.C. WORK						
	LONG WALL						
	LW1	2	11.01	0.9	0.3	5.95	
	LW2	1	8.26	0.9	0.3	2.23	
	LW3	1	1.94	0.9	0.3	0.52	
	LW4	1	2.42	0.9	0.3	0.65	
	LW5	1	3.06	0.9	0.3	0.83	
	SHORT WALL						
	SW1	2	5.35	0.9	0.3	2.89	
	SW2	2	1.43	0.9	0.3	0.77	
	SW3	2	3.29	0.9	0.3	1.78	
	SW4	2	0.43	0.9	0.3	0.23	

	SW5	2	5.39	0.9	0.3	2.91	
	STAIR	2	4.073	0.75	0.1	0.61	
					TOTAL	29.11	CU.M.
3	BRICK WORK UPTO PLINTH LEVEL						
	1ST STEP BRICK WORK						
	LONG WALL						
	LW1	2	10.714	0.6	0.3	3.86	
	LW2	1	7.966	0.6	0.3	1.43	
	LW3	1	1.646	0.6	0.3	0.30	
	LW4	1	2.124	0.6	0.3	0.38	
	LW5	1	2.86	0.6	0.3	0.51	
	SHORT WALL					0.00	
	SW1	2	5.654	0.6	0.3	2.04	
	SW2	1	1.73	0.6	0.3	0.31	
	SW3	1	3.595	0.6	0.3	0.65	
	SW4	1	0.732	0.6	0.3	0.13	
	SW5	2	5.696	0.6	0.3	2.05	
	2ND STEP BTRICK WORK					0.00	
	LONG WALL					0.00	
	LW1	2	10.614	0.5	0.3	3.18	
	LW2	1	7.866	0.5	0.3	1.18	
	LW3	1	1.546	0.5	0.3	0.23	
	LW4	1	2.024	0.5	0.3	0.30	
	LW5	1	2.76	0.5	0.3	0.41	
	SHORT WALL						
	SW1	2	5.452	0.5	0.3	1.64	
	SW2	1	1.536	0.5	0.3	0.23	
	SW3	1	3.395	0.5	0.3	0.51	

	SW4	1	0.523	0.5	0.3	0.08	
	SW5	2	5.496	0.5	0.3	1.65	
	3RD STEP BRICK WORK						
	LONG WALL						
	LW1	2	10.514	0.4	0.3	2.52	
	LW2	1	7.766	0.4	0.3	0.93	
	LW3	1	1.446	0.4	0.3	0.17	
	LW4	1	1.924	0.4	0.3	0.23	
	LW5	1	2.66	0.4	0.3	0.32	
	SHORT WALL						
	SW1	2	5.552	0.4	0.3	1.33	
	SW2	1	1.636	0.4	0.3	0.20	
	SW3	1	3.495	0.4	0.3	0.42	
	SW4	1	0.623	0.4	0.3	0.07	
	SW5	2	5.596	0.4	0.3	1.34	
	STEPS						
	1ST STEP	1	3.9	0.3	0.15	0.18	
	2ND STEP	1	3.6	0.3	0.15	0.16	
	3RD STEP	1	3.3	0.3	0.15	0.15	
					TOTAL	29.11	CU.M.
4	BRICK WORK (SUPER STRUCTURE)						
	LONG WALL						
	LW1	2	11.01	0.3	3	14.31	
	LW2	1	8.26	0.3	3	11.56	
	LW3	1	1.94	0.3	3	5.24	
	LW4	1	2.42	0.3	3	5.72	
	LW5	1	3.06	0.3	3	6.36	
	SHORT WALL						
	SW1	2	5.35	0.3	3	8.65	

	SW2	1	1.43	0.3	3	4.73	
	SW3	1	3.29	0.3	3	6.59	
	SW4	1	0.43	0.3	3	3.73	
	SW5	2	5.39	0.3	3	8.69	
	DEDUCTION						
	DOOR D1	6	1	0.3	2.1	3.4	
	WINDOW W1	3	2	0.3	1.5	3.8	
	W2	3	0.9	0.3	1.5	2.7	
	VENTILATION V	1	0.6	0.3	0.6	1.5	
					TOTAL	86.98	CU.M.
5	R.C.C. WORK FOR SLAB						
	G.F. SLAB	1	6.55	10.2	0.2	16.95	
					TOTAL	16.95	CU.M.
6	PARAPET WALL BRICK WORK						
	LONG WALL	2	9.35	0.3	1.5	11.15	
	SHORT WALL	2	6.25	0.3	1.5	8.05	
					TOTAL	19.2	SQ.M.
7	PLASTER WORK						
	EXTERNAL WALL	2	9.65		3	12.65	
		2	6.55		3	9.55	
	INTERNAL WALL						
	OTTA	2	1.9		3	4.9	
	FLYOVER	2	1.8		3	4.8	
		2	2.4		3	5.4	
	OFFICE	2	4.11		3	7.11	
		2	2.44		3	5.44	
	STAIR CASE	1	3.7		3	6.7	
		1	0.91		3	3.91	
	STORE ROOM	2	1.22		3	4.22	

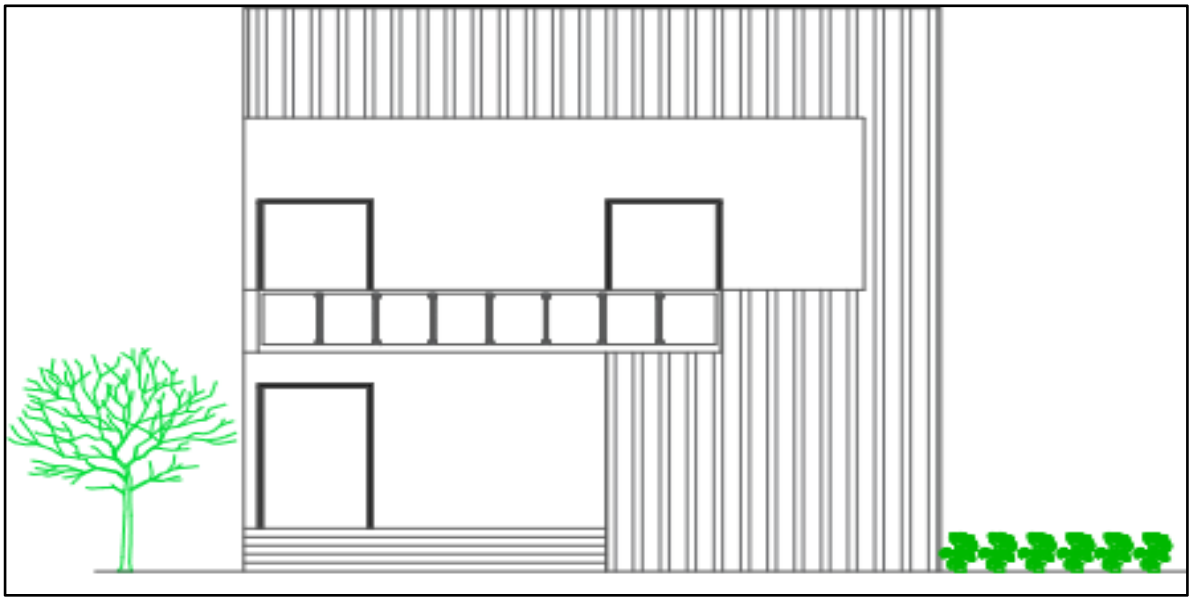
		2	1.4		3	4.4	
	HEAD OFFICE	2	2.75		3	5.75	
		2	2.43		3	5.43	
	HEAD OFFICE ENTERANCE	2	1.5		3	4.5	
		2	0.94		3	3.94	
	PANTRY	2	1.5		3	4.5	
		2	2		3	5	
	TOILET	2	2.1		2.7	4.8	
		2	1		2.7	3.7	
					TOTAL	145.1	
	CEILING						
	FLYOVER	1	1.8	2.4		4.32	
	OFFICE	1	4.11	2.44		10.0284	
	STAIR CASE	1	3.7	0.91		3.367	
	STORE ROOM	1	1.22	1.4		1.708	
	HEAD OFFICE	1	2.75	2.43		6.6825	
	HEAD OFFICE ENTERANCE	1	1.5	0.94		1.41	
	PANTRY	1	1.5	2		3	
	TOILET	1	2.1	1		2.1	
	OTTA	1	1.9	1.8		3.42	
					TOTAL	36.0359	
	DEDUCTION						
	DOOR D1	6	1		2.1	3.1	
	WINDOW W1	3	2		1.5	3.5	
	W2	3	0.9		1.5	2.4	
	VENTILATION V	1	0.6		0.6	1.2	
					TOTAL	10.2	
					TOTAL	170.935	SQ.M.

❖ **Abstract Sheet of Primary Health Centre:**

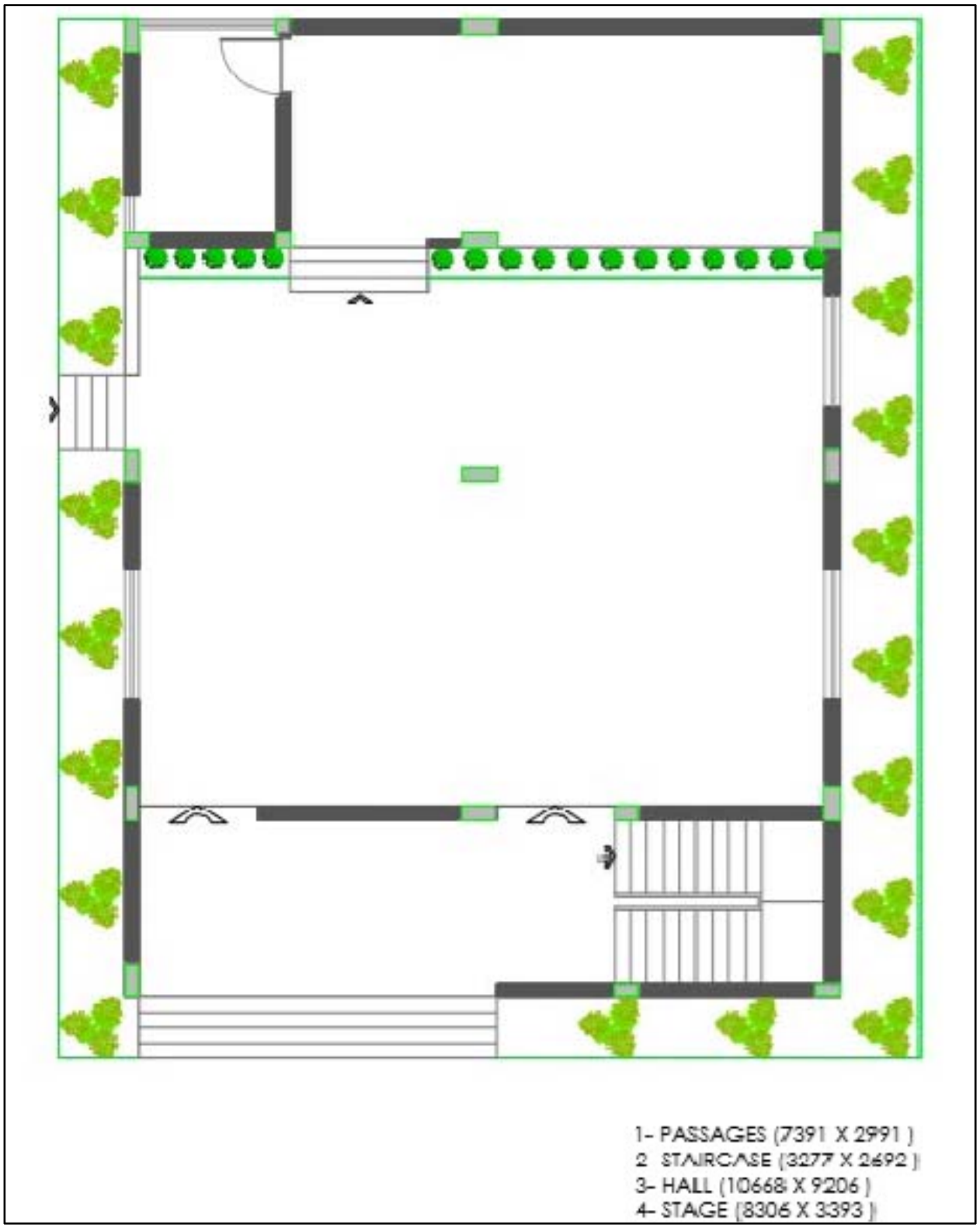
Abstract Sheet of P.H.C. Building					
Sr. No.	**Item Description**	**QTY.**	**Rate**	**Per**	**Amount (Rs.)**
1	Earthwork in excavation in foundation	69.48	90	CUM	6253.2
3	Brick masonary upto plinth in CM (1:6)	29.11	3500	CUM	101885
4	smooth plaster inside rooms + Ceiling	170.935	150	SQ.M	25640.2
5	smooth plaster on outer wall	22.2	150	SQ.M	3330
6	paint work (white wash)	145.1	5	SQ.M	725.5
7	paint work on outer wall	22.2	5	SQ.M	111
8	Brick work for parapet wall	19.2	3500	CUM	67,200
			Total Rs.		2,05,144
		Add 1.5% Water Charge			3,077
		Add 10% contracter Charge			20,514.4
		Total Estimate Cost in Rs.			2,28,737

8.1.3 Social Design (Civil) : Community Hall

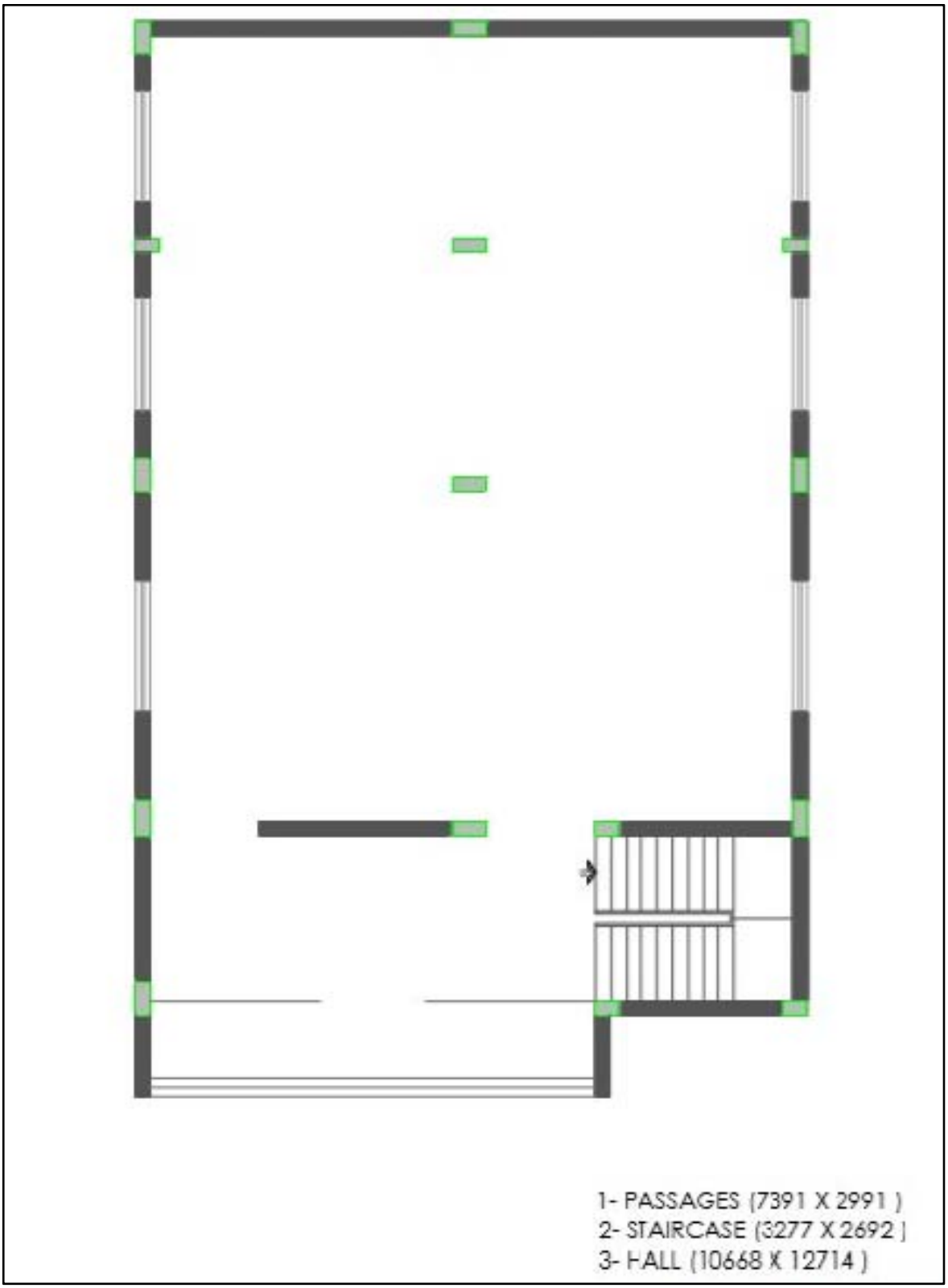
Handiya Village has no community hall, therefore villager have no specific place for function, social gathering, meeting etc., so as per the feedback and request from the villagers we have design the community hall for village.



F-8.4 Elevation of Community Hall



F-8.5 Ground floor plan of community hall



F-8.6 First floor plan of community hall

❖ Estimation of Community Hall :

BUILDING ESTIMATE						
QUANTITY SHEET						
Sr. No.	**Item Description**	**No.**	**Length (m)**	**Width/ Breadth (m)**	**Height/ Depth (m)**	**Quantity (CU M)**
1	Earthwork in Excavation in Foundation:					
	L1 =11	3	11	1	1.5	49.50
	L2 =4.50	1	4.5	1	1.5	6.75
	S1 =15.5	2	15.5	1	1.5	46.50
	S2 =4	1	4	1	1.5	6.00
	S3 =5	1	5	1	1.5	7.50
				TOTAL QTY.		108.75
2	footing upto plinth Foundation:					
	L1 =10.7	3	10.7	1	0.3	9.63
	L1 =4.2	1	4.2	1	0.3	1.26
	S1 =11.9	2	11.9	1	0.3	7.14
	S1 =12.9	2	12.9	1	0.3	7.74
	S2 =4.5	1	4.5	1	0.3	1.35
	S2 =4.8	1	4.8	1	0.3	1.44
	S3 =5.5	1	5.5	1	0.3	1.65
	S3 =5.5	5.5	5.5	1	0.3	9.08
				TOTAL QTY.		12.18
3	P.C.C Foundation:					
	L1 =11	3	11	1	0.2	6.60
	L2 =4.5	1	4.5	1	0.2	0.90
	S1 =15.5	2	15.5	1	0.2	6.20
	S2 =4	1	4	1	0.2	0.80
	S3 =5	1	5	1	0.2	1.00

				TOTAL QTY.		14.50
3	B.B.C.C Foundation:					
	L1 =11	3	11	1	0.2	6.60
	L2 =4.5	1	4.5	1	0.2	0.90
	S1 =15.5	2	15.5	1	0.2	6.20
	S2 =4	1	4	1	0.2	0.80
	S3 =5	1	5	1	0.2	1.00
				TOTAL QTY.		14.50
4	Brick Masonry above plinth up to slab in c.m (1:6)					
	L=11m	3	11	0.2	4	26.40
	L=4.5m	1	4.5	0.2	4	3.60
	S1=11.4m	2	15.5	0.2	4	24.80
	S2=4m	1	4	0.2	4	3.20
	S3=5m	1	5	0.2	4	4.00
				TOTAL QTY.		84.55
5	Deducation for Door					
	DOOR D1	2	3.5	0.2	3.5	4.90
	DOOR D2	1	1.2	0.2	3.5	0.84
	WINDOW W1	4	1.2	0.2	1.4	1.34
	VENTILATION V1	2	0.6	0.2	0.6	0.14
				TOTAL QTY.		1.49
6	Deducation for lintel window & door					
	D1	2	3.5	0.2	0.15	0.21
	D2	1	1.2	0.2	0.15	0.04
	W1	4	1.2	0.2	0.15	0.14
	V1	2	0.6	0.2	0.15	0.04

				TOTAL QTY.		0.18
				NET QTY.(m2)		82.88
7	1:3 Plaster for wall					
	HALL	2	10.6	3.5		74.20
		2	9.2	3.5		64.40
	STORE ROOM	2	2.1	3.5		14.70
		2	3.3	3.5		23.10
	STAGE	2	8.3	3.5		58.10
		2	3.3	3.5		23.10
	Celling plaster					
	HALL	1	10.6	9.2		97.52
	STORE ROOM	1	2.1	3.3		6.93
	STAGE	1	8.3	3.3		27.39
				TOTAL QTY.		389.44
	Deducation for Door					
	D1	2.5	3.5	0.2	3.5	6.13
	D2	2	1.2	0.2	3.5	1.68
	W1	1	1.2	0.2	0.4	0.10
	V1	2	0.6	0.2	0.3	0.07
				TOTAL QTY.(m2)		7.97
				NET QTY.(m2)		381.47
8	Inside Panit on Wall					
				TOTAL QTY.(m2)		381.47
9	Outside Panit on Wall					
	HALL	2	16.1	9.2	11.1	296.24
				TOTAL		677.71

				QTY.(m2)		
	Deducation for Door and Window & Lintel			NET QTY.(m2)		669.73
10	paint work (white wash)					
				TOTAL QTY.(m2)		669.73
9	paint work on outer wall					
NET QTY.(m2)						670.00
11	Brick Masonary Parapet wall					
	L1 =16	2	16	0.2	1.5	9.60
	S1 =11.1	2	11.1	0.2	1.5	6.66
				TOTAL QTY.		16.26

❖ **Abstract sheet of Community Hall :**

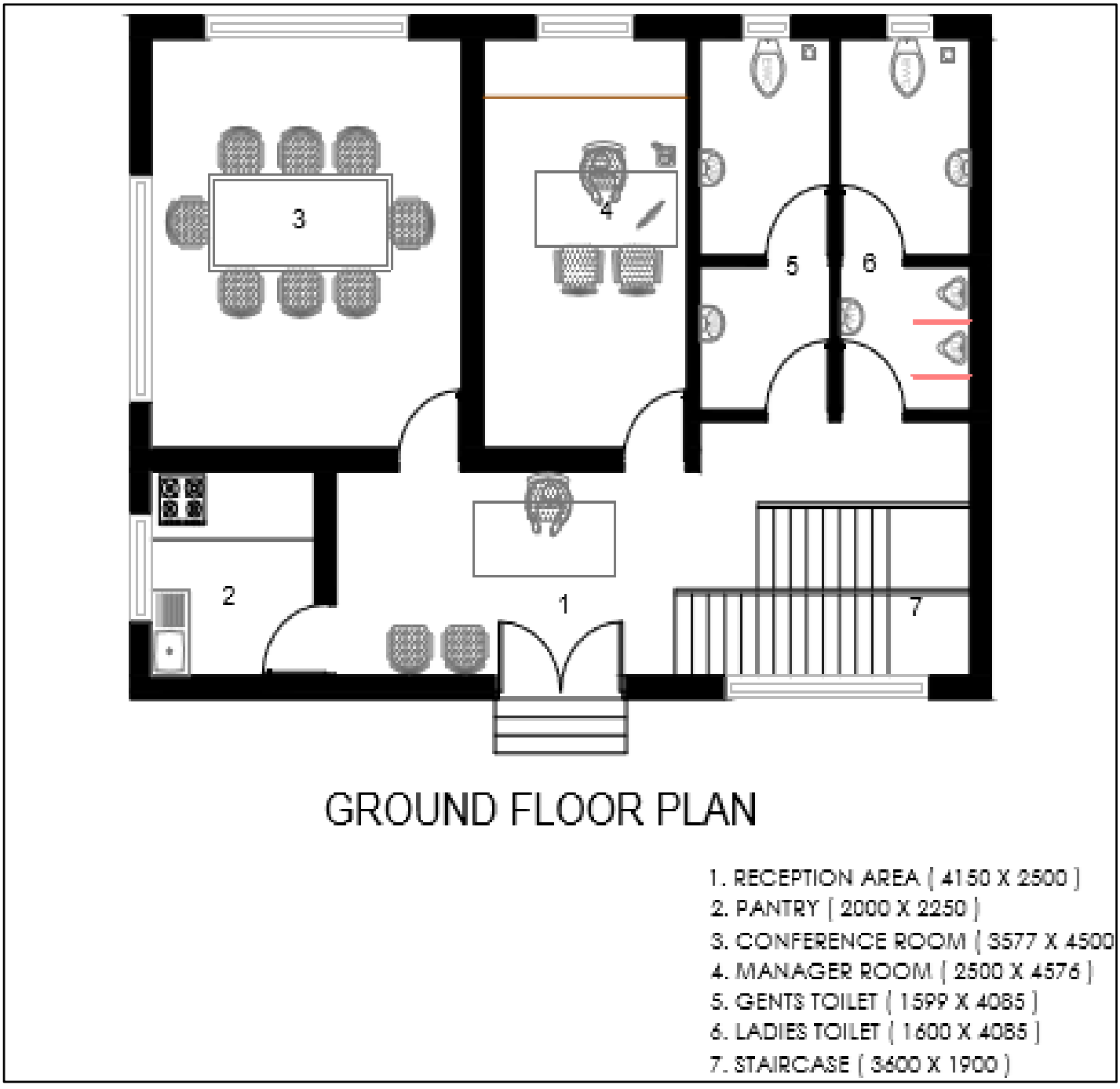
Abstract Sheet of Community hall					
Sr No.	**Item Description**	**QTY**	**Rate**	**Per**	**Amount (Rs.)**
1	Earthwork in excavation in foundation	108.0 CUM	90	CUM	9720
2	Earth filling in plinth	126.0 CUM	2700	CUM	340200
3	Brick masonary upto plinth in CM (1:6)	84.0 CUM	3500	CUM	294000
4	smooth plaster inside rooms & ceilling	82.9 SQ.M	150	SQ.M	12432
5	smooth plaster on outer wall	381.4 SQ.M	150	SQ.M	57210
6	paint work (white wash)	669.1 SQ.M	5	SQ.M	3345.5
7	paint work on outer wall	667.0 SQ.M	5	SQ.M	3335
8	Brick work for parapet wall	16.3 CUM	3500	CUM	56910
			Total Rs.		777152.5

	Add 1.5% Water Charge	11657
	Add 10% con.Charge	7771.525
	Total Estimate Cost (Rs.)	7,96,581

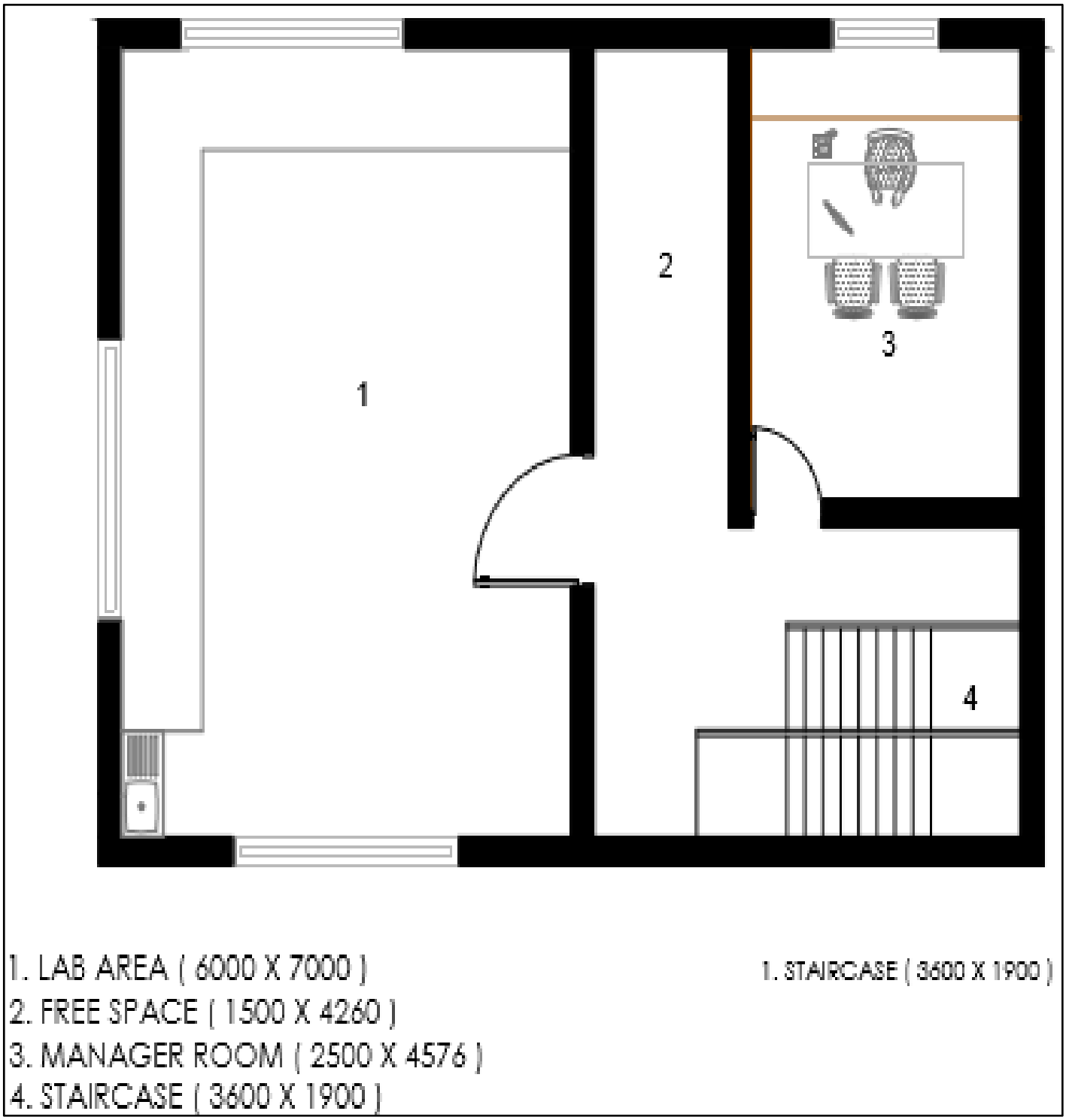
8.1.4 Socio-Cutural Design (Civil) : Skills Development Centre

Handiya village do not have any centre for training, Learning and practicing for any skills like Karate, Cultural Dance class etc. So villagers have to travel out of their village if they want to learn any new skills.

F-8.7 Elevation of Skill Development Centre



F-8.8 Ground Floor Plan of Skill Development Centre



F-8.9 First Floor Plan of Skill Develpoment Centre

❖ Estimation of Skill Development Centre :

BUILDING ESTIMATE						
QUANTITY SHEET						
Sr. No.	**Item Description**	**No.**	**Length (m)**	**Widht/ Breadth (m)**	**Height/ Depth (m)**	**Quantity (CU M)**
1	Earthwork in Excavation in Foundation:					
	L1 =11.1	3	11.1	1	1	33.30
	L2 =3.9	1	3.9	1	1	3.90
	S1 =8.1	3	8.1	1	1	24.30
	S2 =5.9	2	5.9	1	1	11.80
	S3 =3.5	1	3.5	1	1	3.50
				TOTAL QTY.		73.30
2	pad footing up to plinth Foundation:					
	L1 =10.6	3	10.6	1	0.3	9.54
	L1 =10.3	3	10.3	1	0.3	9.27
	L2 =3.4	1	3.4	1	0.3	1.02
	L2 =3.1	1	3.1	1	0.3	0.93
	S1 =7.6	3	7.6	1	0.3	6.84
	S1 =7.3	3	7.3	1	0.3	6.57
	S2 =5.4	2	5.4	1	0.3	3.24
	S2 =5.1	2	5.1	1	0.3	3.06
	S3 =3.0	1	3	1	1.5	4.50
	S3 =2.7	1	2.7	1	1.5	4.05
				TOTAL QTY.		49.02
3	P.C.C Foundation					
	L1 =11.1	3	11.1	1	1.5	49.95
	L2 =3.9	1	3.9	1	1.5	5.85

	S1 =8.1	3	8.1	1	1.5	36.45
	S2 =5.9	2	5.9	1	1.5	17.70
	S3 =3.5	1	3.5	1	1.5	5.25
				TOTAL QTY.		109.95
3	B.B.C.C Foundation:					
	L1 =11.1	3	11.1	1	0.2	6.66
	L2 =3.9	1	3.9	1	0.2	0.78
	S1 =8.1	3	8.1	1	0.2	4.86
	S2 =5.9	2	5.9	1	0.2	2.36
	S3 =3.5	1	3.5	1	0.2	0.70
				TOTAL QTY.		14.66
3	B.B.C.C Foundation:					
	L1 =11.1	3	11.1	0.2	3.5	23.31
	L2 =3.9	1	3.9	0.2	3.5	2.73
	S1 =8.1	3	8.1	0.2	3.5	17.01
	S2 =5.9	2	5.9	0.2	3.5	8.26
	S3 =3.5	1	3.5	0.2	3.5	2.45
				TOTAL QTY.		51.31
5	Deduction for Door and Windowas					
	D1	1	1.5	0.2	3.2	0.96
	D2	7	1.2	0.2	3.2	5.38
	W1	2	1.2	0.2	1.4	0.67
	W2	2	0.9	0.2	1.4	0.50
	V1	2	0.6	0.2	0.6	0.14
				TOTAL QTY.		7.65
6	Deducation for lintel window & door					
	D1	1	1.5	0.2	0.15	0.05
	D2	7	1.2	0.2	0.15	0.25

	W1	2	1.2	0.2	0.15	0.07
	W2	2	0.9	0.2	0.15	0.05
	V1	2	0.6	0.2	0.15	0.13
				NET QTY.(m2)		82.88
7	1:3 Plaster for wall					
	PANTRY	2	2	3.5		14.00
		2	2.25	3.5		15.75
	CO ROOM	2	3.5	3.5		24.50
		2	4.5	3.5		31.50
	MANAGER ROOM	2	2.5	3.5		17.50
		2	4.5	3.5		31.50
	GENTS TOILET	2	1.5	3.5		10.50
		2	4	3.5		28.00
	LADIES TOILET	2	1.6	3.5		11.20
		2	4	3.5		28.00
				NET QTY.(m2)		212.45
8	Celling plaster					
	PANTRY	1	2	2.25		4.50
	CO ROOM	1	3.5	4.5		15.75
	MANAGER ROOM	1	2.5	4.5		11.25
	GENTS TOILET	1	1.5	4		6.00
	LADIES TOILET	1	1.6	4		6.40
				TOTAL QTY.		43.90
	Deduction for Door Window					
	D1	1	1.5	0.2	0.15	0.05
	D2	1	1.2	0.2	0.15	0.04
	W1	1	1.2	0.2	0.15	0.04
	W2	1	0.9	0.2	0.15	0.03
	V1	1	0.6	0.2	0.15	0.06

				TOTAL QTY.		0.21
				NET QTY.(m2)		168.34
9	Outer side plaster					
		2	10.5	3.5		73.50
		2	7.5	3.5		52.50
				TOTAL QTY.		126.00
				NET QTY.(m2)		43.12
10	Paint Work On Outer Wall					
				TOTAL QTY.		43.12
11	Brick work for parapet wall					
		2	10.5	0.2	1.5	6.30
		2	7.5	0.2	1.5	4.50
				TOTAL QTY.		10.80

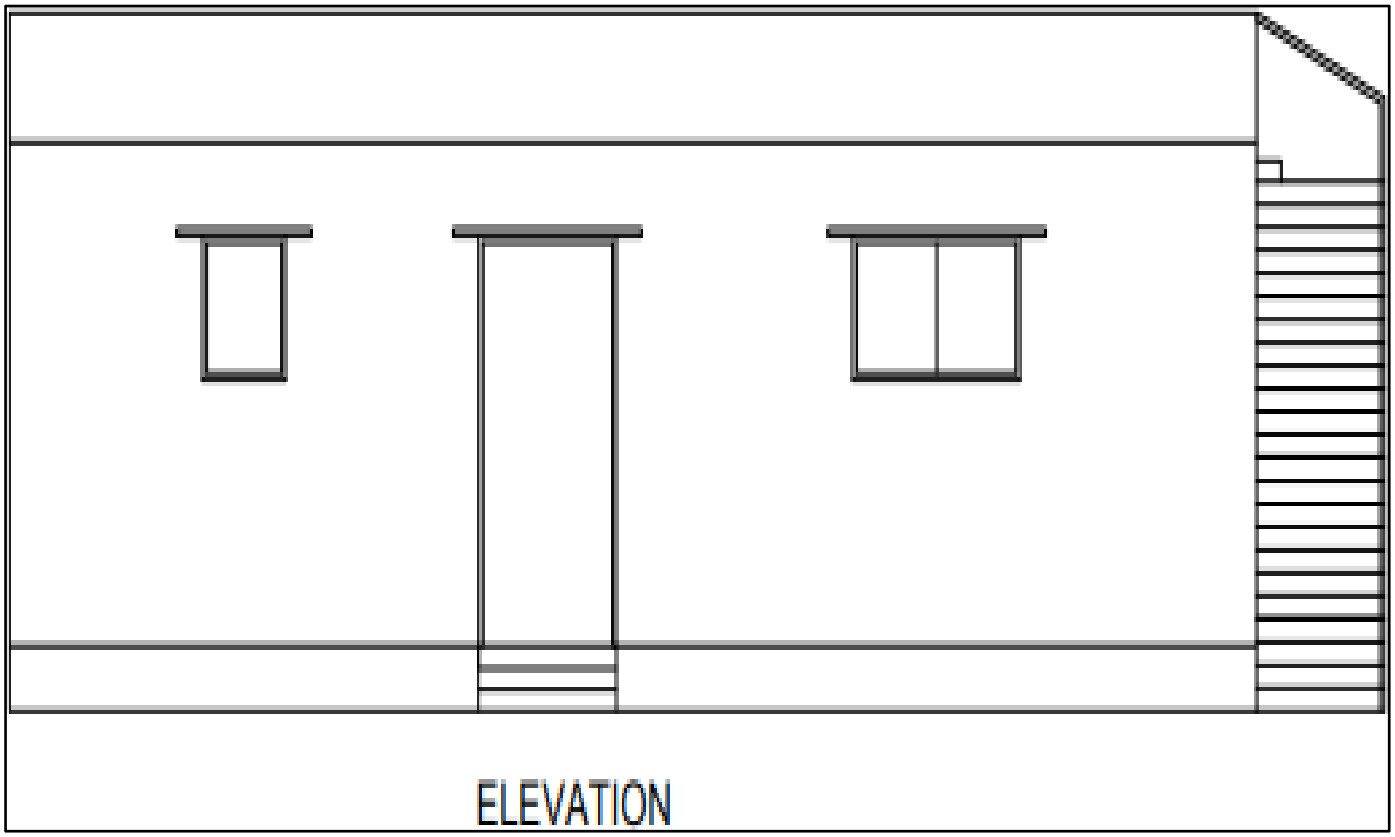
❖ Abstract Sheet of Skill Developoment Centre :

Abstract Sheet of Skill Development Centre					
Sr. No.	**Item Description**	**QTY.**	**Rate**	**Per**	**Amount (Rs.)**
1	Earthwork in excavation in foundation	73.6 CU.M	90	CU.M	6624
2	Earth filling in plinth	50.0 CU.M	2700	CU.M	135000
3	Brick masonry up to plinth in CM (1:6)	49.1 CU.M	3500	CU.M	171850
4	smooth plaster inside rooms & ceiling	212.5 SQ.M	150	SQ.M	31875
5	smooth plaster on outer wall	126.0 SQ.M	150	SQ.M	18900
6	paint work (white wash)	150.0 SQ.M	5	SQ.M	750
7	paint work on outer wall	43.0 SQ.M	5	SQ.M	215
8	Brick work for parapet wall	10.8 CU.M	3500	CU.M	37800

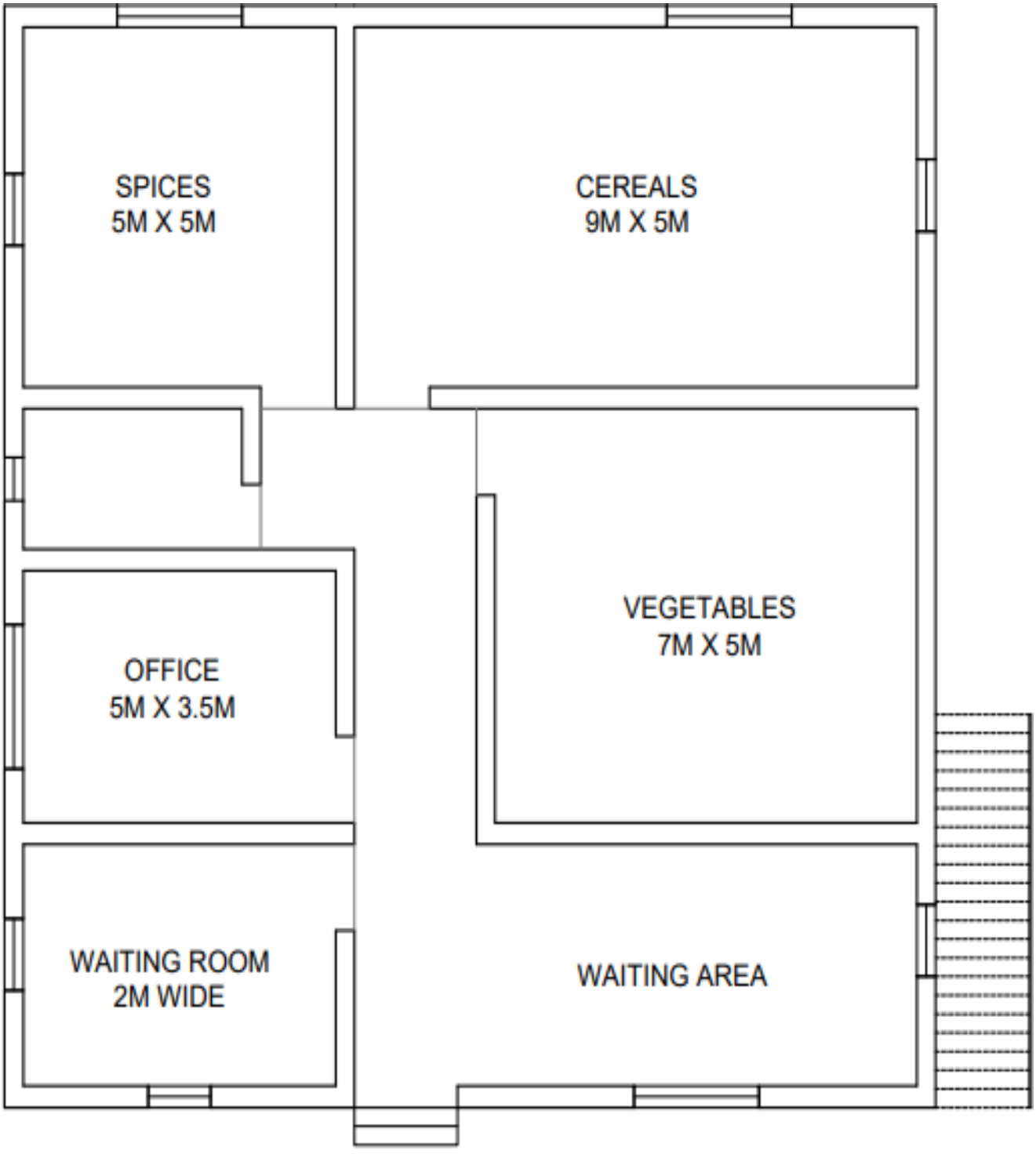
		Total Rs.	403014
	Add 1.5% Water Charge		6045
	Add 10% con. Charge		4030.14
	Total Estimate Cost in Rs.		4,13,089

8.1.5 Smart Village Design (Civil) : Agro Storage Unit

The 70% population of the Handiya village is doing farming and other 20 % people are doing Labour work in farm so, Agro product is produce in big amount, But the village does not have the storage building for agro product therefore the villagers need a storage house for their agro product so they can store their agro product safely.



F-8.10 Elevation of Agro storage unit



F-8.11 Plan for Agro storage unit

❖ Estimation of Agro Storage Unit:

BUILDING ESTIMATE						
QUANTITY SHEET						
Sr. No.	**Item Description**	**No.**	**Length (m)**	**Widht/ Breadth (m)**	**Height/ Depth (m)**	**Quantity (CU.M)**
1	Earthwork in Excavation in Foundation:					
	Excavation for For foundation	16	4	4	1.5	384.00
	Excavation for For step	1	2.4	0.7	0.2	0.34
				TOTAL QTY.		384.34
2	P.C.C in Excavation in Foundation:					
	P.C.C. for foundation	16	4	4	0.1	25.60
	P.C.C. for steps	1	2	0.7	0.1	0.14
				TOTAL QTY.		25.74
3	R.C.C. for foundation					
	Volume	16	0.19			3.04
				TOTAL QTY.		3.04
	R.C.C for beam					
	steps 1	16	5.23	0.23	0.3	5.77
	steps 2	4	4	0.23	0.3	1.10
	steps 3	4	2.23	0.23	0.3	0.62
						7.49
4	Brick Masonary in super structure					
	Long wall 1 L=12m	3	12	0.23	3.5	28.98
	Long wall 2 L= 5m	1	5	0.23	3.5	4.03
	Short wall 1 S=14m	4	14	0.23	3.5	45.08
	Short wall 1 S=5m	1	5	0.23	3.5	4.03
	Brick masonry steps					

	step 1	1	2	0.7	0.3	0.42
	step2	1	2	0.35	0.3	0.21
				TOTAL QTY.		82.74
	Deduction for Door & window					
	D	1	1.85	0.23	2.1	0.89
	D1	4	1.2	0.23	2.1	2.32
	D2	1	0.9	0.23	2.1	0.43
	W	6	2	0.23	1.2	3.31
	W1	3	1	0.23	1.2	0.83
	V1	1	0.6	0.23	1.2	0.17
				TOTAL QTY.(m3)		7.95
5	Flooring					
	Kota stone					
	Room 1	1	5	5		25.00
	Room 2	1	9	5		45.00
	Room 3	1	7	5		35.00
				TOTAL QTY.(m2)		105.00
	Marbel					
	Office	1	5	3		15.00
	Verandah	1	2.4	3		7.20
	open area 1	1	2	5		10.00
	open area 2	1	5	1.5		7.50
				TOTAL QTY.(m2)		39.70
6	R.C.C. for slab (1:1.5:3)	1	13	7.5		97.50
				TOTAL QTY.(m3)		97.50
7	out side plaster					
	L2(13+15)	1	56	3.5		196.00

				TOTAL QTY.(m2)		196.00
	Deduction					
	D	1	1.85	2.1		3.89
	W	6	2	1.2		14.40
	W1	3	1	1.2		3.60
				TOTAL QTY.(m2)		21.89
8	Inside plaster (1:4)					
	Long wall 1	4	12	3.5		168.00
	Long wall 2	1	5	3.5		17.50
	short wall 1	6	14	3.5		294.00
	short wall 2	1	5	3.5		17.50
				TOTAL QTY.(m2)		497.00
	Deduction					
	D	1	1.85	2.1		3.89
	D1	10	1.2	2.1		25.20
	D2	2	0.9	2.1		3.78
	W	5	2	1.2		12.00
	W1	3	1	1.2		3.60
				TOTAL QTY.(m2)		48.47
9	colour outside					
	L=2(13+15)	1	56	3.5		196.00
				TOTAL QTY.(m2)		196.00
	Deduction					
	D	1	1.85		2.1	3.89
	W	6	2		1.2	14.40
	W1	3	1		1.2	3.60
			TOTAL QTY.(m2)			21.89

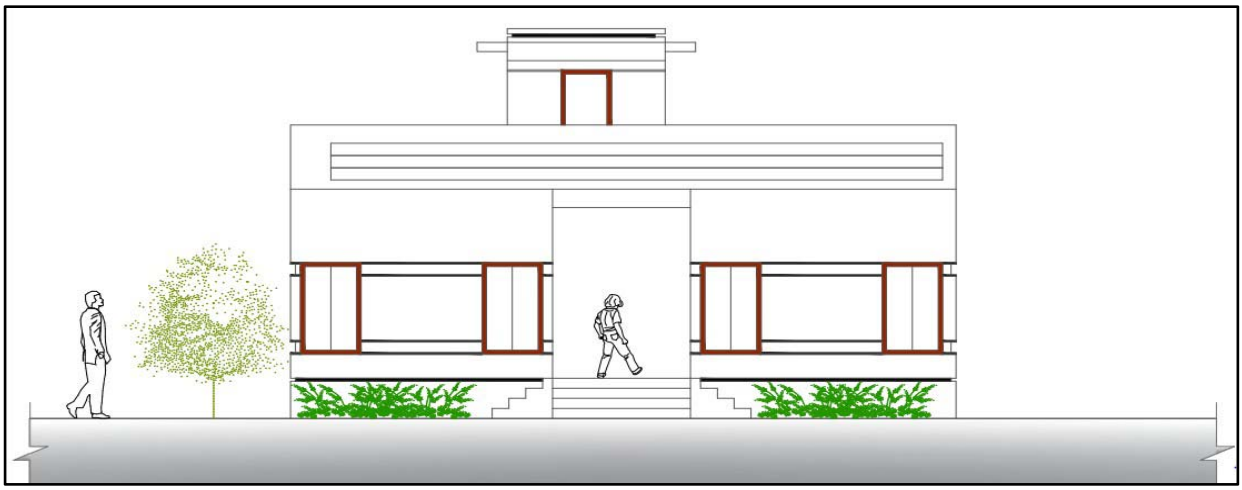
10	Colour inside					
	long wall 1	4	12		3.5	168.00
	long wall 2	1	5		3.5	17.50
	Short wall 1	6	14		3.5	294.00
	Short wall 2	1	5		3.5	17.50
			TOTAL QTY.(m2)			497.00
	Deduction					
	D	1	1.85		2.1	3.89
	D1	10	1.2		2.1	25.20
	D2	2	0.9		2.1	3.78
	W	5	2		1.2	12.00
	W1	3	1		1.2	3.60
			TOTAL QTY.			48.47
11	Wood work					
	Door (400 thick) & Window					
	D	1	1.85		2.1	3.89
	D1	5	1.2		2.1	12.60
	D2	1	0.9		2.1	1.89
	W	6	2		1.2	14.40
	W1	3	1		1.2	3.60
			TOTAL QTY.			36.38
12	R.C.C. Chajja					
	W	5	2.4	0.65	0.1	0.78
	W1	3	1.6	0.65	0.1	0.31
	W3	1	5	0.65	0.1	0.33
			TOTAL QTY.(m3)			1.42
13	R.C.C. Column	16	0.23	0.23	5	4.23
			TOTAL QTY.(m3)			4.23

❖ **Abstract Sheet of Agro Storage Unit :**

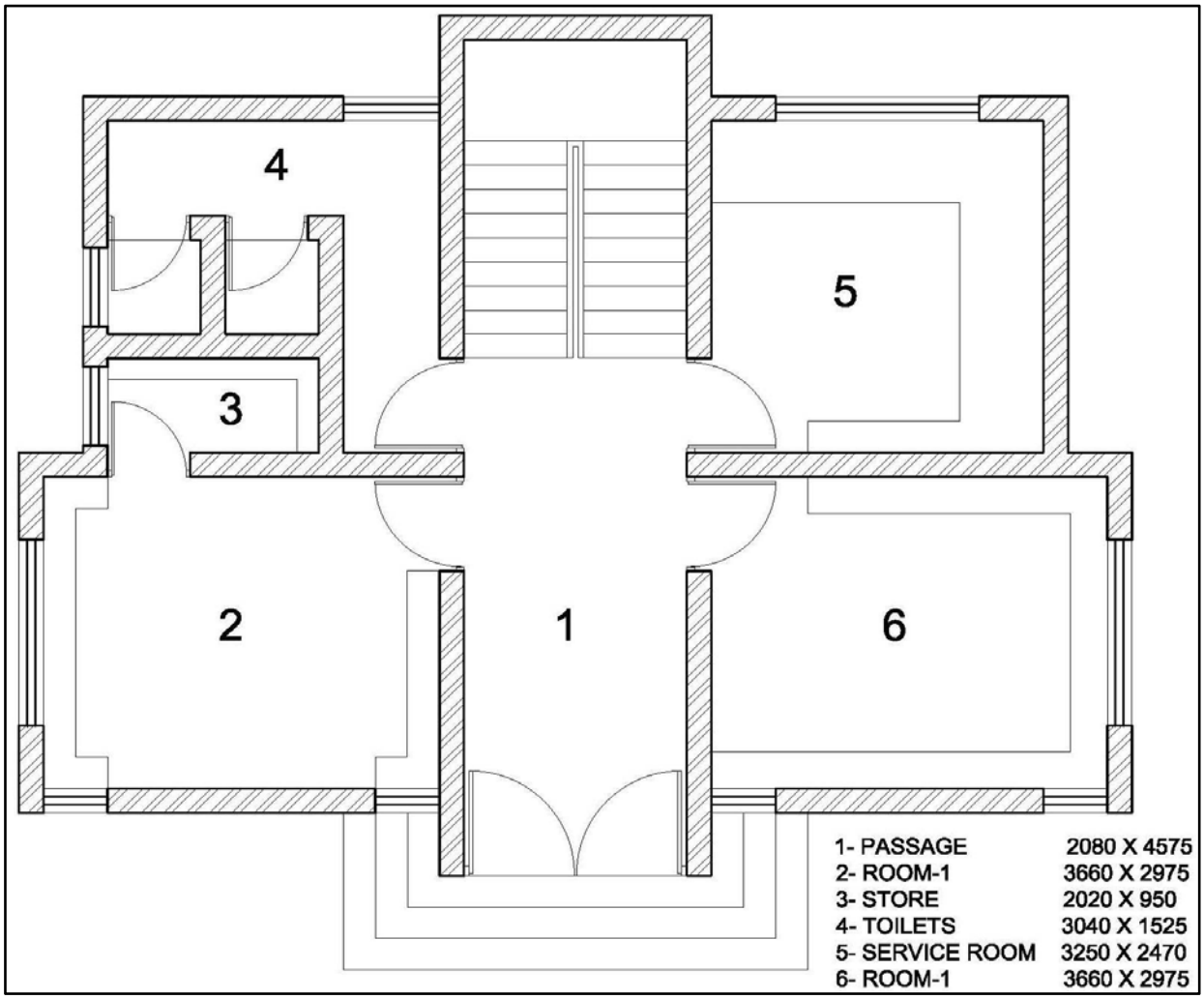
Abstract Sheet of Agro Storage Unit					
Sr. No.	**Item Description**	**QTY.**	**Rate**	**Per**	**Amount (Rs.)**
1	Earthwork in excavation in foundation	384.34	90	CU.M	34590.6
2	P.C.C. for Foundation	25.74	3150	CU.M	81081
3	R.C.C. for Foundation And Beam	24	9218	CU.M	221232
4	Brick masonary in super Structure	74.25	3321	SQ. M	246584.25
5	Flooring	60.5	742	SQ.M	44891
6	R.C.C. for Slab	29.25	4937	SQ. M	144407.25
7	Outside Plaster (1:4)	174.12	132	SQ.M	22983.84
8	Inside Plaster (1:4)	448.54	100	SQ.M	44854
9	Colour outside	174.12	130	SQ.M	22635.6
10	Colour inside	448.54	90	SQ.M	40368.6
11	Wood work for Door and Windows	33.56	245	SQ.M	8222.2
12	R.C.C. for Chajja	1.41	4235	CU.M	5971.35
13	R.C.C. for Column	4.23	4792	CU.M	20,270.16
				Total Rs.	9,38,091.8
			Add 1.5% Water Charge		14,071
			Add 10% co. Charge		9,380.918
			Total Estimate Cost in Rs.		9,61,544

8.1.6 Haritage Village Design (Civil) : Angadvadi

Handiya village have 2 Anganwadi but the student of Village is more so the village required one more anganwadi. We talk to the villagers and sarpanch they give us the feedback that one more anganwadi is required. And, the one of the anganwadi's Condition is so weak and construction is old so the all the above basis we decide to give the plan of anganwadi



F-8.12 Elevation of angadvadi



F-8.13 Plan of Angadwadi

❖ Estimation of Angadwadi:

BUILDING ESTIMATE OF ANGANWADI							
QUANTITY SHEET							
Sr. No.	**DESCRIPTION**	**NO.**	**LENGTH**	**WIDTH**	**HEIGHT**	**QUINTIY**	
1	EXCAVATION WORK						
	LONG WALL						
	LW1	2	3.95	0.9	1.2	8.532	
	LW2	2	3.45	0.9	1.2	7.452	
	LW3	2	8.02	0.9	1.2	17.3232	
	LW4	3	1.65	0.9	1.2	5.346	
	SHORT WALL					0	
	SW1	4	2.91	0.9	1.2	12.5712	
	SW2	2	2.45	0.9	1.2	5.292	
	SW3	1	1.48	0.9	1.2	1.5984	
	SW4	2	1.32	0.9	1.2	2.8512	
					TOTAL	60.966	CU.M
2	P.C.C. WORK AT FOOTING (1:4:8)						
	LONG WALL						
	LW1	2	3.95	0.9	0.3	2.133	
	LW2	2	3.45	0.9	0.3	1.863	
	LW3	2	8.02	0.9	0.3	4.3308	
	LW4	3	1.65	0.9	0.3	1.3365	
	SHORT WALL					0	
	SW1	4	2.91	0.9	0.3	3.1428	
	SW2	2	2.45	0.9	0.3	1.323	
	SW3	1	1.48	0.9	0.3	0.3996	
	SW4	2	1.32	0.9	0.3	0.7128	

	STEPS						
	BASE STEP P.C.C.	1	4.05	1.22	0.1	0.4941	
					TOTAL	15.7356	CU.M
3	BRICK WORK UPTO PLINTH LEVEL						
	1ST STEP BRICK WORK						
	LONG WALL						
	LW1	2	3.65	0.6	0.3	1.314	
	LW2	2	3.15	0.6	0.3	1.134	
	LW3	2	7.72	0.6	0.3	2.7792	
	LW4	3	1.35	0.6	0.3	0.729	
	SHORT WALL					0	
	SW1	4	3.21	0.6	0.3	2.3112	
	SW2	2	2.75	0.6	0.3	0.99	
	SW3	1	1.78	0.6	0.3	0.3204	
	SW4	2	1.62	0.6	0.3	0.5832	
	2ND STEP BRICK WORK					0	
	LONG WALL					0	
	LW1	2	3.55	0.5	0.3	1.065	
	LW2	2	3.05	0.5	0.3	0.915	
	LW3	2	7.62	0.5	0.3	2.286	
	LW4	3	1.25	0.5	0.3	0.5625	
	SHORT WALL					0	
	SW1	4	3.31	0.5	0.3	1.986	
	SW2	2	2.85	0.5	0.3	0.855	
	SW3	1	1.88	0.5	0.3	0.282	
	SW4	2	1.72	0.4	0.3	0.4128	
	3RD STEP BRICK WORK					0	
	LONG WALL					0	

	LW1	2	3.45	0.4	0.3	0.828	
	LW2	2	2.95	0.4	0.3	0.708	
	LW3	2	7.55	0.4	0.3	1.812	
	LW4	3	1.15	0.4	0.3	0.414	
	SHORT WALL					0	
	SW1	4	3.41	0.4	0.3	1.6368	
	SW2	2	2.95	0.4	0.3	0.708	
	SW3	1	1.98	0.4	0.3	0.2376	
	SW4	2	1.82	0.4	0.3	0.4368	
	STAIR					0	
	1ST STEP	1	2.9	0.6	0.15	0.261	
	2ND STEP	1	3.4	0.85	0.15	0.4335	
	3RD STEP	1	3.95	1.05	0.15	0.622125	
					TOTAL	26.62313	CU.MT.
4	BRICK MASONARY ABOVE PLINTH LEVEL						
	LONG WALL						
	LW1	2	3.05	0.3	3	5.49	
	LW2	2	2.52	0.3	3	4.536	
	LW3	2	7.12	0.3	3	12.816	
	LW4	3	0.75	0.3	3	2.025	
	SHORT WALL					0	
	SW1	4	3.81	0.3	3	13.716	
	SW2	2	3.35	0.3	3	6.03	
	SW3	1	2.38	0.3	3	2.142	
	SW4	2	2.22	0.3	3	3.996	
	DEDUCTION				TOTAL	50.751	CU.MT.
	DOOR D1	4	1.2	0.3	2.1	3.024	
	D2	3	0.9	0.3	2.1	1.701	
	WINDOW W1	3	2.4	0.3	1.5	3.24	

	W2	5	0.9	0.3	1.5	2.025	
	VENTILATION V	3	0.6	0.3	0.6	0.324	
					TOTAL (-)	10.314	CU.MT.
					TOTAL	42.057	CU.MT.
5	PLASTER WORK (INTERNAL WALL)						
	PASSAGE	2	2.083		3	12.498	
		2	4.572		3	27.432	
	ROOM 1	2	3.658		3	21.948	
		2	2.972		3	17.832	
	ROOM 2	2	3.708		3	22.248	
		2	2.972		3	17.832	
	STORE ROOM	2	2.017		3	12.102	
		2	0.95		3	5.7	
	TOILET	2	3.038		3	18.228	
		2	1.524		3	9.144	
	SERVICE ROOM	2	3.251		3	19.506	
		2	2.466		3	14.796	
	STAIRCASE AREA	2	2.692		3	16.152	
		1	2.083		3	6.249	
	PASSAGE	1	2.83	4.57		12.9331	
	ROOM 1	1	3.658	2.97		10.86426	
	ROOM 2	1	3.708	2.972		11.02018	
	STORE ROOM	1	2.017	0.95		1.91615	
	TOILET	1	3.038	1.524		4.629912	
	SERVICE ROOM	1	3.251	2.466		8.016966	
	STAIRCASE AREA	1	2.083	2.692		5.607436	
					TOTAL	276.655	SQ.MT.
	DEDUCTION						

	DOOR D1	4	1.2		2.1	10.08	
	D2	3	0.9		2.1	5.67	
	WINDOW W1	3	2.4		1.5	10.8	
	W2	1	0.9		1.5	1.35	
	VENTILATION V	3	0.6		0.6	1.08	
					TOTAL (-)	28.98	SQ.MT.
					TOTAL	247.674	SQ.MT.
6	PLASTER WORK (EXTERNAL WALL)						
		2	10.06	7.41	3.2	477.0854	
	DEDUCTION						
	ENTERANCE	1	2.4		3	7.2	
	WINDOW W1	3	2.4		1.5	10.8	
	WINDOW W2	5	0.9		1.5	6.75	
	VENTILATION V	2	0.6		0.6	0.72	
					TOTAL (-)	25.47	SQ.MT.
					TOTAL	451.6154	SQ.MT.
7	PARAPET WALL BRICK WORK						
	LONG WALL	2	5.79	0.3	1.5	5.211	
	SHORT WALL	2	8.85	0.3	1.5	7.965	
	STAIR WALL	2	1.67	0.3	2.1	2.1042	
		1	2.235	0.3	0.6	0.4023	
					TOTAL	15.6825	CU.MT.
8	R.C.C. WORK FOR SLAB						
		1	9.15	6.1	0.2	11.163	
					TOTAL	11.163	CU.MT.

❖ **Abstract Sheet of Angadwadi:**

Abstract Sheet of Anganwadi					
Sr. No.	**Item Description**	**QTY.**	**Rate**	**Per**	**Amount (Rs.)**
1	Earthwork in excavation in foundation	60.96	90	CUM	5486.4
2	Earth filling in plinth	18.376	2700	CUM	49615.2
3	Brick masonry up to plinth in CM (1:6)	26.623	3500	CUM	93180.5
4	smooth plaster inside rooms & ceiling	247.674	150	SQ.M	37151.1
5	smooth plaster on outer wall	451.6154	150	SQ.M	67742.31
6	paint work (white wash)	247.674	5	SQ.M	1238.37
7	paint work on outer wall	451.6154	5	SQ.M	2258.077
8	Brick work for parapet wall	15.6825	3500	CUM	54888.75
			Total Rs.		311560.707
		Add 1.5% Water Charge			4673
		Add 10% con.Charge			3115.60707
		Total Estimate Cost in Rs.			3,19,350

8.1.7 Electric Design 1: Design of Lighting System Automation for a Supermarket

For the development of an electric lighting project, the supermarket has prepared a description of its requirements and a catalog on which the project should be guided and developed, taking into account both therequirementsofthecustomer and alltherulesand standardsforelectro technicaldesign.

- The main illumination through the zones and the accent lighting must be separated in separate groups that canbecontrolledeitherautomaticallyor manually.

- Each second luminary'sline(forgenerallighting) must be taken from an other phase of the system.

- Set the interior illumination unit to the e-mail section room and manual and automatic control switchesinstalled inthe security room together with BMS.

- The light control panel must be installed in the security room, the remote control switches must work in 3modes: automatic control, on and off. The cables between the illuminating switch and the control panel must beclearly indicated in the electrical engineering part of the project. The switchboard must provide a switch formanual emergency lighting, and a relay that will turn on emergency lighting in the event of a fire alarm, and are lay which will turn on the light when receiving a signal from the security panel.

- For accent lighting, power is supplied through three-phase contactors controlled by the controller's timefunction.

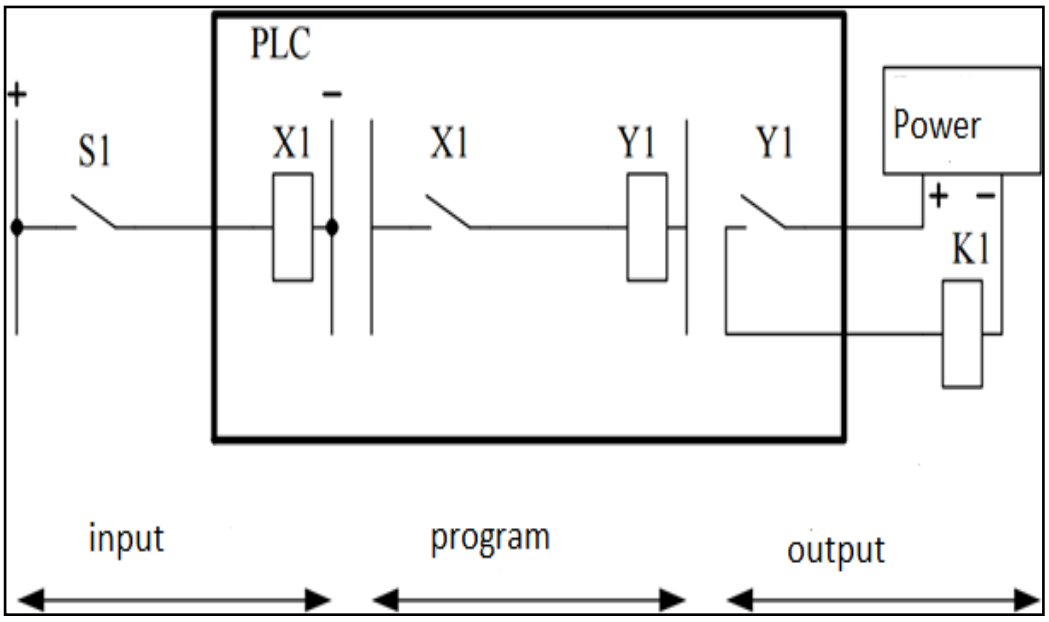
- Add basic light luminaries with 5-core cables to ensure that lighting can be switched on in various variations.Each individually controlled group of luminaries must be evenly distributed throughout the entire sales area, sothatincasewhenoneofthelightinggroupsisdisconnected,thegrassremainsevenlyilluminated.

- The illuminator for internal and external store lighting, installed in the security room, the remote controlswitches must operate in three modes - automatic, switching on, off. Connect the power supply to the remote control from the electrical lighting circuit(A1).The switches on the control panel need to indicate the position of the switch with the signs:R-manual operation (on),A-automatic control:0-no position(off).

The automated system is controlled by Schnaider Electric's Modicon TM221CE24R programmable LightingController with the TM3DQ8R expansion module, which in turn controls magnetic contactors that in turn willincludecertainlightinggroups.

Logic controller TM221CE24Rhas several powerful functions and applications that canper form sever alautomation tasks and can handle a wide range of hardware. Configuration and programming of the controller isperformed using the SoMachine Basic computer program, which supports three programming languages: IL(InstuctionList), LD(Stair Diagram), Grafset(List).

The controller is powered by an AC voltage from 100 to 240 V AC. The controller has built-in real-time clockand has512KB ofRAM and 1.5MB of flash memory.

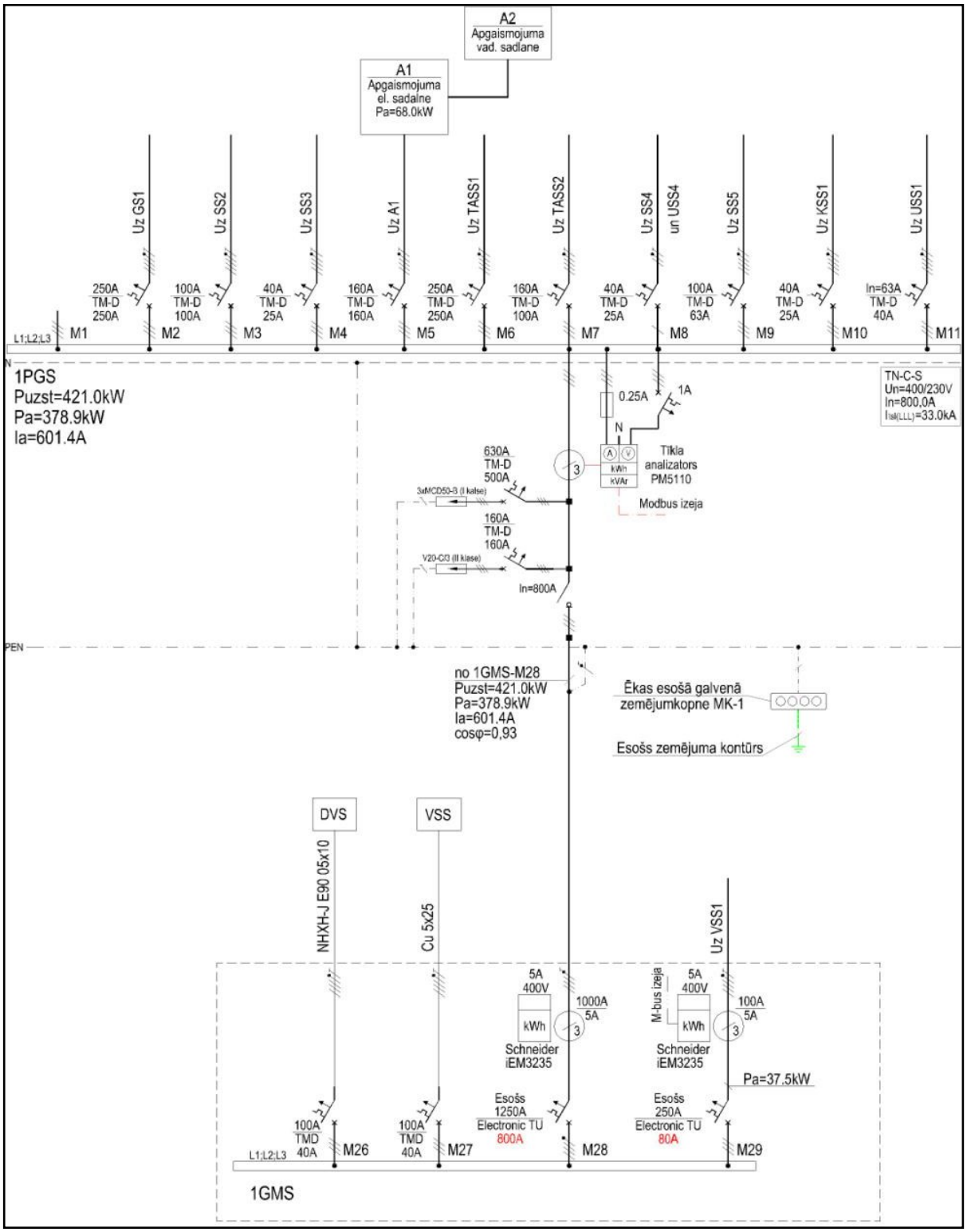


F-8.14 Power system

Switch Nr.	Gropes
S1	Lighting in the trading hall
S2	Lighting in the trading hall
S3	Lighting in the trading hall
S4	Accent lightingin thesalesarea inthefish andmeat weighing area
S5	Accent lightingin thetradinghallintheconfectioneryarea
S6	Accent lightinginthesales area inthebreadarea
S20	Emergencylightingthroughoutthesupermarketarea

T-8.1 List of groups controlled by switches (fragment)

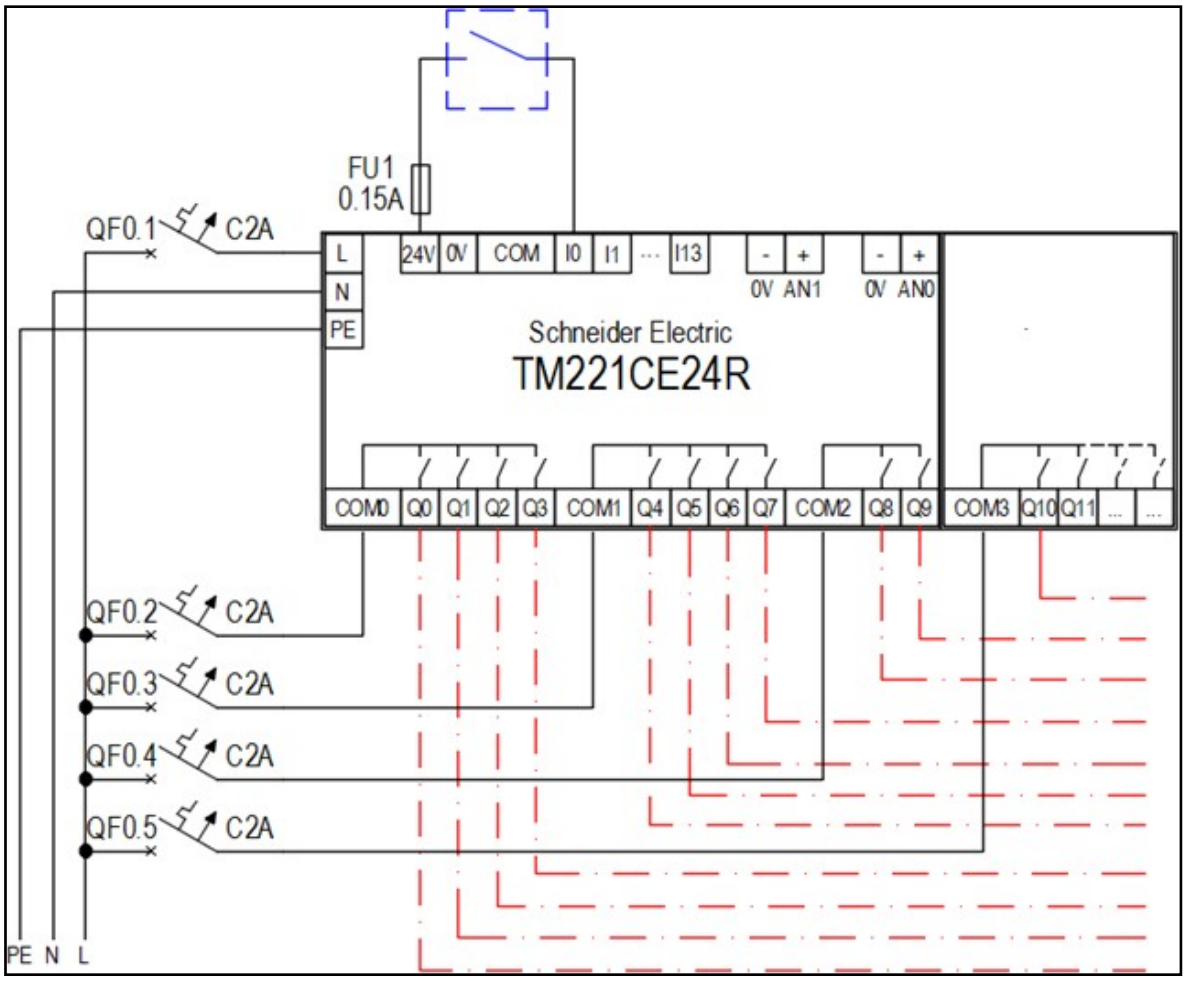
The electrical connection to the illumination control unit A2 will be supplied from the illumination distribution A1, which in turn will receive power from the 1PGS and is protected by a 160A automatic switch. 1PGS saddle is fed from the main distribution unit1GM Sinthe mall.



F-8.15 Supermark etelectrical circuit diagram from the shopping center division

The controller and its control chains are fed from the lighting circuit A1 through the 6A automatic switch. Thecontroller is designed to connect 230V power through the 2A automatic switch, and each of the relay groupinputs has its own 2A automatic switch.From the controller inputs, only one of which is supplied with a 24Vsignal through the AS system relay 2 of the security system, and the signal input is protected by a 0.15A fuse.From the controller relay outputs, the signals are further subjected to 3 position switches, from which, inanticipation of the position of the switch, the signal is fed further to the magnetic contactors of the A1 terminaland a certaingroupoflightsisswitchedon.

As a control signal, 230V AC voltage is used, so no voltage converters are required in the system.The lighting automation system isinstalled in accordance with the design of the illuminated distribution assembly monolithic circuitry and the illumination control panel extended circuits.



F-8.16 Controller Mounting Scheme

➢ Calculation of Lighting power and Energy consumption:

The power consumed by each lighting group is calculated according to formula 1 which takes into account thenumber of individual luminaries in the group and the nominal power of the luminaire Calculation of power for the lighting group QF1.1:

$$P_{gr1.1} = \sum P_{ni} * n_i = 46 * 98 = 4500W$$

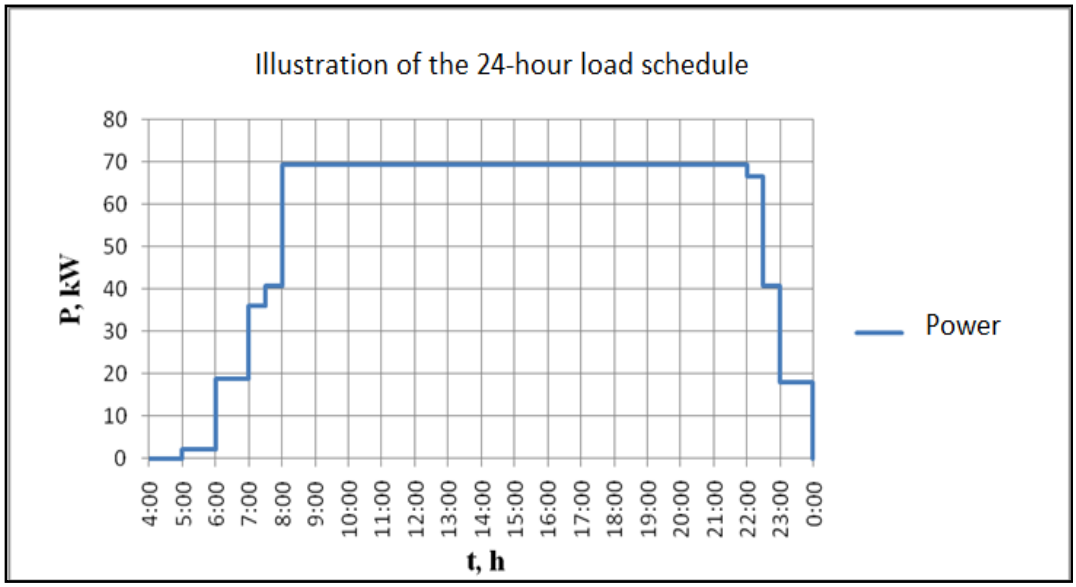
Where: $P_{gr1.1}$ = The powerof the lighting group QF1.1
Pni– rated lamp rated luminary;
ni–number of luminaries;
In turn,the total amount of power consumed by the entire lighting system depends on the time of day and is calculated as the sum of the power of all the illumination groups turned on.

Total installed power (Pu) calculation for all lighting

$$P_u = \sum P_{gr,i} = 70.2 \text{ KW}$$

Where $P_{gr,i}$ is the power of a separate lighting group.

The graph below shows the total daily power consumption of automatically controlled luminaries in a supermarket.



F-8.17 Illustration of the 24-hour load schedule

After that, when the power of each light group is known and the time it is kept on, it is possible to calculate the energy consumption according to given formula:

$$E = P_{gr.i} * t_i$$

Where, E = amount of electricity consumed [kW*h]
$P_{gr.i}$ = power of the particular lighting group [kW]
t_i-time of the set state of the particular group[h]

When calculating the electricity consumption, 1102.18 kW* h is consumed per day for lighting. If there was nosuch automated system and all lighting would be switched on from the very first morning starting from the firstworks and turned off only on the evening after all employees had already left, then electricity consumptionwould be 1318.41 kW*hovernight.Fromtheseresultsbythe given formula:

$$\Delta E = \frac{E_2 - E_1}{E_1} * 100\%$$

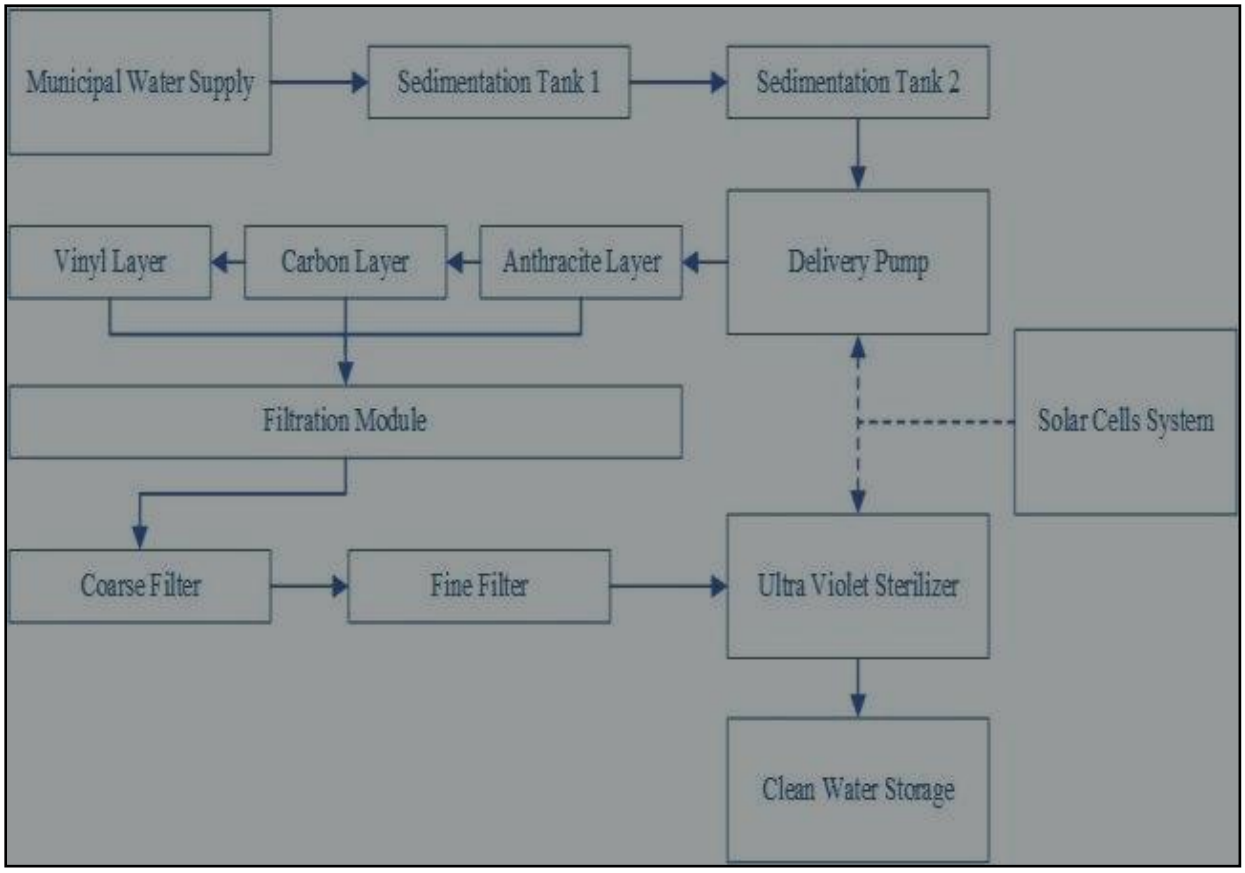
Where, E1 = amount of electricity consumed for the automated system [kW*h]
E2 = amount of electricity consumed for the automated system [kW*h]

It turns out that in the case of a manual system, when all lights are switched on in the morning and turned off only in the evening, the power consumption is by 20% more than the use of an automated system, with which the programmable logic controller can set daily clock timetables that lead to timely lighting turning “on” and “off”.The amount of electricity saved during the year is very significant at 78924kW/h, which in turn translates into €10809 per year.

8.1.8 Electric Design 2 : Solar-powered Water Purification

Electric System Design:

Evaluating the right size for the solar panel's operation leads to an estimate of the size of the solar conversion system, as well as the design of other devices in the system, to suit the electrical energy requirements of the day. The calculations will need to back up in case of unexpected weather condition. The simplify calculations by taking the electrical losses and the performance of the primary equipment into account, solar panels have a 90% efficiency and wiring losses of 3%.



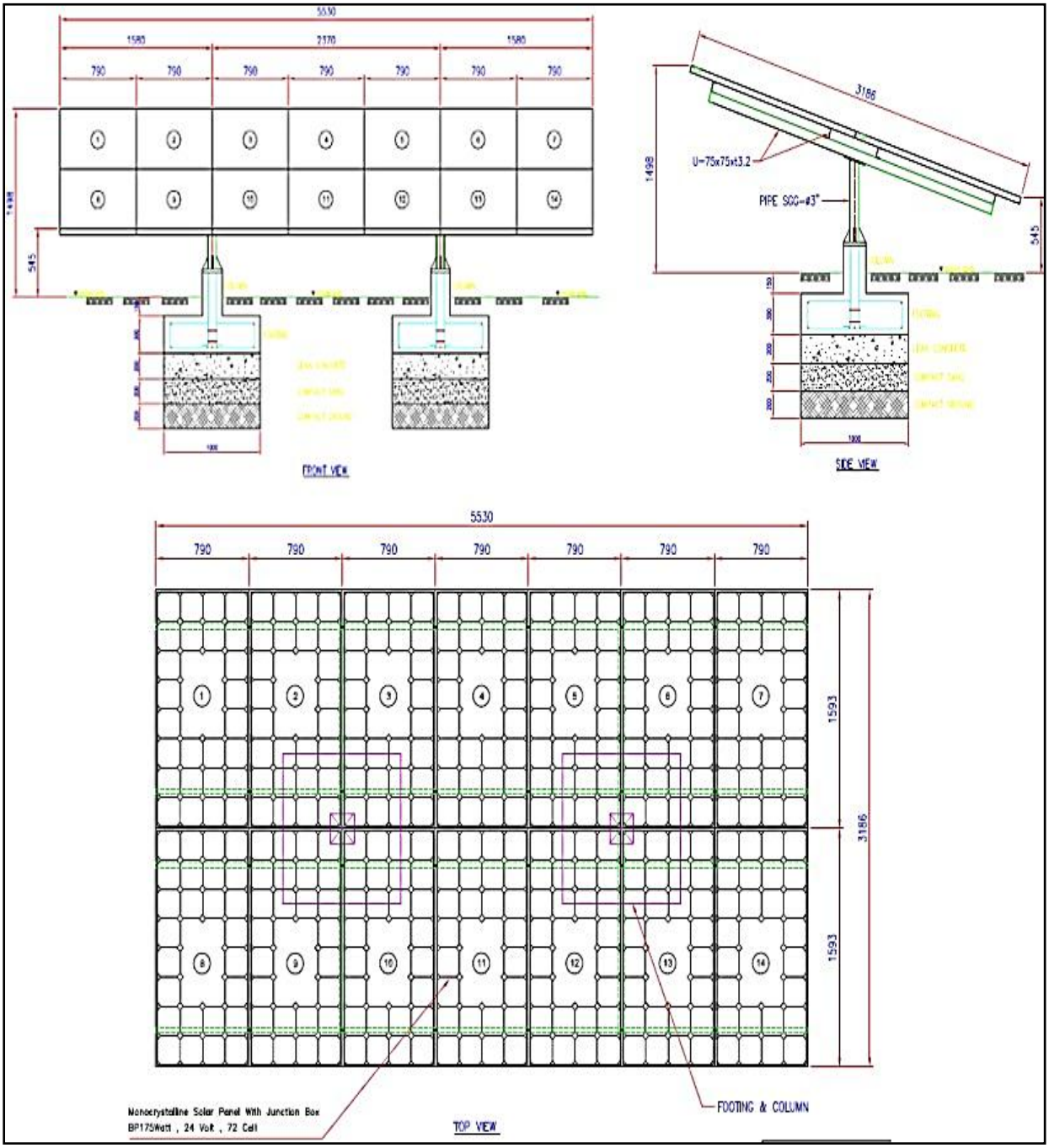
F-8.18 Solar cell application circuit for water filtration system

If the installed system at an average temperature of 30 degrees Celsius and completed wiring, the power input to the load from a 75- watt solar panel is 65.45 watts, and then multiplied by the Peak Sun Hours (PHS) value, that is the period of significant solar radiation and cloudless, an active load in the system are described in given Table.

Loads in the System			
Loads	Power (Watts)	Usage time (hr./day)	Energy Consumption (W.hr./day)
DC water pump	750	3	2250
UV Sterlizer	30	3	90

T-8.2 Active Loads in the system

From the DC pump that required 24-48 volts, 750 watts and 11.5 amps and 30 watts UV system. The electricity consumed calculation each day leads to the selection of 14 panels of 75 watts, 17 volts, 4.45 amps. The installation of solar panels is divided into 3 parts as follows. The overall solar conversion system has been shown in given Figgure.



F-8.19 Configuration of the solar energy conversion system

- The required voltage is 24-48 volts, separate the solar panel into three sets of 4 solar panels each, connected in series acquiring 68 volts and 4.45 amps each module.
- The current requirement of 11.5 amps, connect those three modules in pillared configuration to achieve 13.35 amps.

8.1.9 Electrical Design 3 : Design of home load management system for load rationing

Home load calculation and management:

First of all, the Home load is calculated for each home appliances so that electric utility can set a threshold value for tripping the load and the Diversity Factor and Demand Factor. Their diversity factor is defined as the ratio of the individual maximum demand of the system to the maximum demand of the whole system

$$\text{Diversity Factor (DF)} = \frac{\text{Sum of Individual Maximum Demand}}{\text{Maximum Demand of the System}}$$

The diversity factor and the load are very closely related to each other. The demand factor is the ratio of the sum of maximum demand of the system to the system's whole connected load.

$$\text{Demand Factor (DF)} = \frac{\text{Sum of Maximum Demand}}{\text{Total Connected Load}}$$

Consider the example that a home has the total connected load of 100 A but has the maximum demand on a peak time is 60 A; hence the demand factor is 0.6 that is less than 1.

Now, separate loads of the low power appliances and loads of heavy/inductive appliances will be calculated by using the real-time example of a typical home in which all the appliances for example, fans, electric motors, AC, washing machine, Television (TV), energy savers, microwave oven, electric iron, refrigerators, electric heaters, and so on. A typical home load classification is given in Table, and the AC current rating of some appliances along with their power ratings is mentioned in Table.

From the above calculations, the home's total connected load is 38 A, in which 33.25 A are of heavy loads. The use of these appliances can vary season to season. The base load of the above-mentioned home load is 9.9 A.

Design of control system:

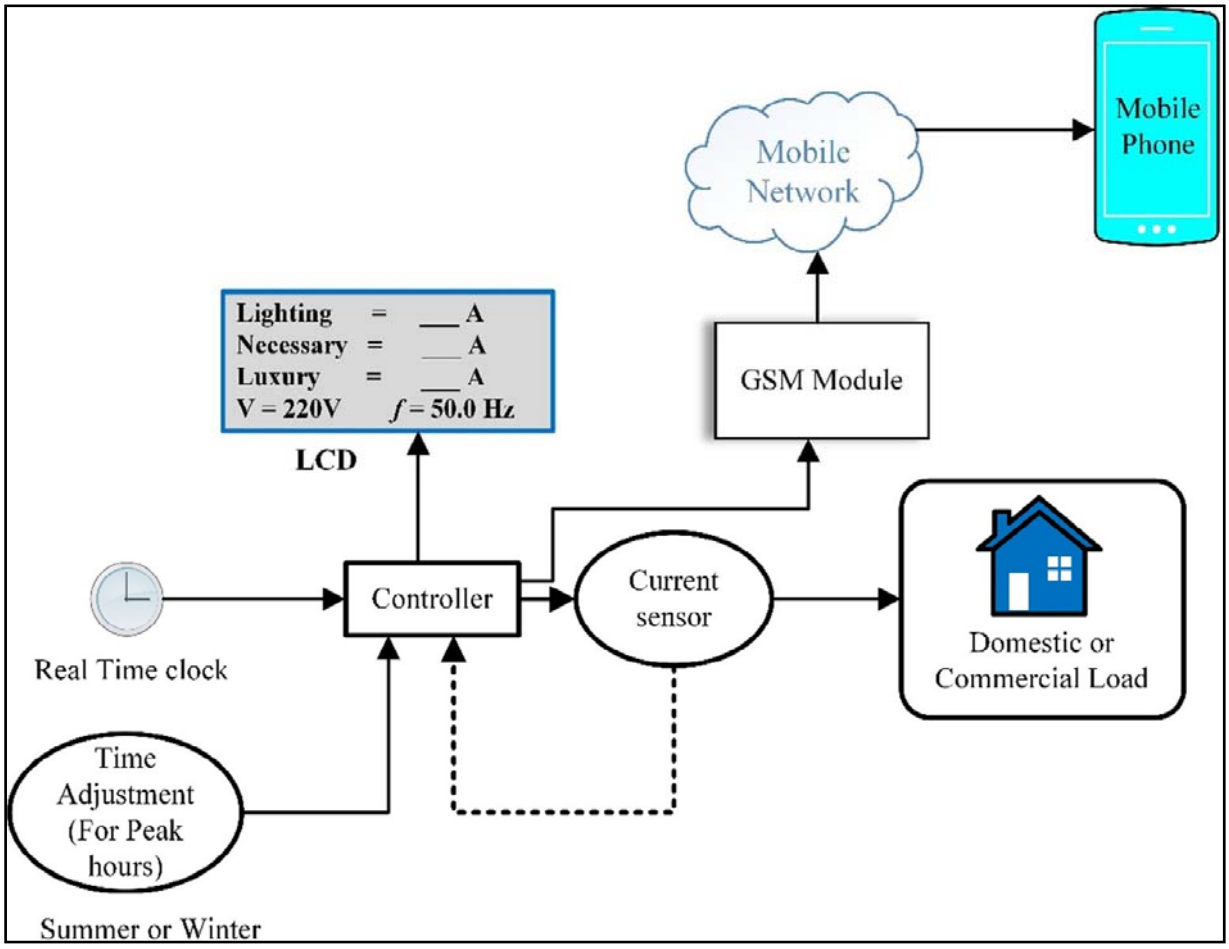
The block diagram of the load management and control system is shown in Figure. The main components of the pro- posed method are a current transformer, Analog to digital converter, Arduino UNO microcontroller, power supply, LCD.

Load type	Power (Pmax) (W)	AC/DC	Appliance	Urgency	Usage time duration
Primary	150	Both	AC/DC Fans AC/DC energy savor, LEDs Mobile/Laptop and small gadgets chargers, TV, Computer, AC lights, DSL adapter	First	Full Day
Regular (necessary)	400-1200	Both	AC/DC Fridge AC/DC Deep Freezer, Uninterruptable Power Supply (UPS)	Second	Full Day
Regular (luxury)	1200	DC	DC inverter AC	Third	On Demand
Brust (luxury)	1000-2000	AC	Pump motor, washing machine, juicer, electric oven, Irons and electric gas heaters	Fourth	Occasionally

T-8.3 Home load types and classification

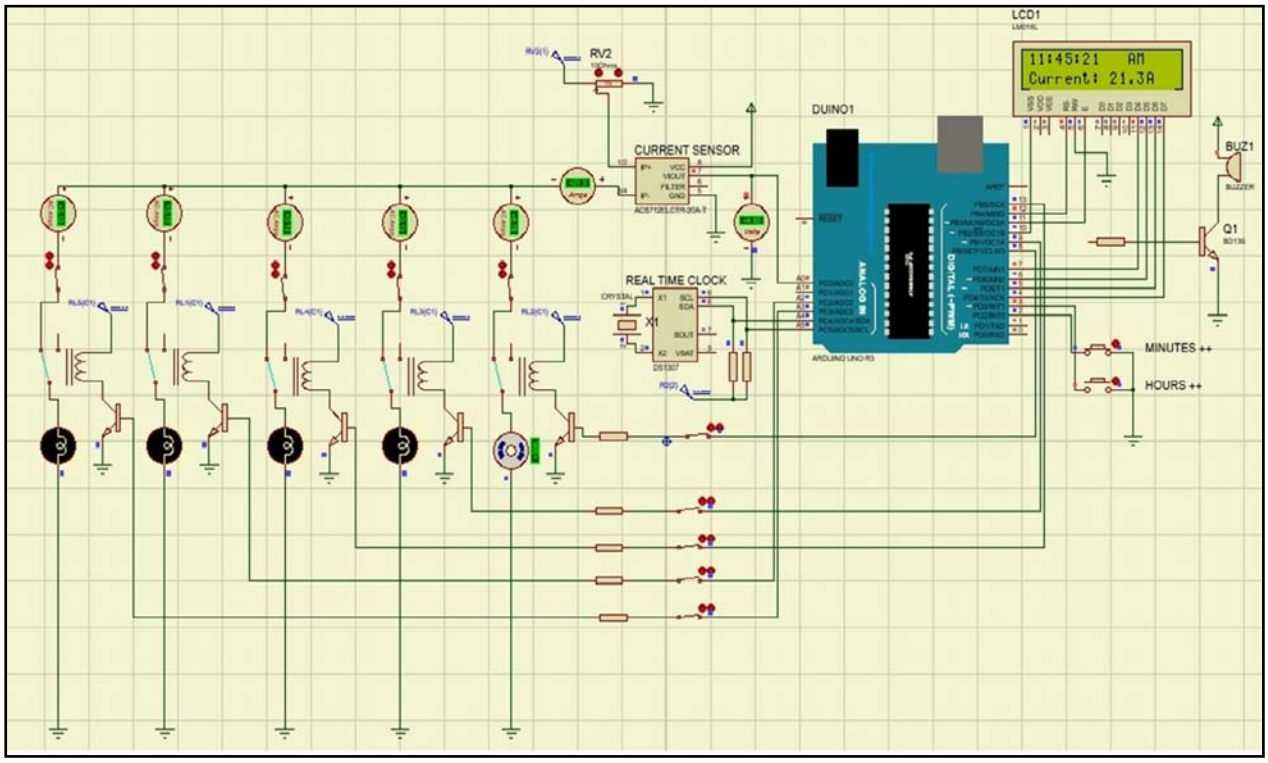
Appliances	Quantity	Power (W)	Current (A)	Total current (A)
Energy saver	30	24	0.10	3.27
Fans	5	100	0.454	2.27
Electric iron	1	1000	4.54	4.54
TV	1	100	0.454	0.454
AC	1	2400	10	10
Refrigerator	1	200	0.909	0.909
Heater	1	2000	9.09	9.09
Microwave oven	1	1500	6.81	6.81
Washing machine	1	500	2.27	2.27
Electric motor	1	1.5	5.08	5.08
Total load				**38**

T-8.4 Home Load Calculations



F-8.20 Proposed control system block diagram

RESULTS AND DISCUSSIONS:



F-8.21 Circuit diagram of the simulation during off-peak hours

Serial no.	Item name	Quantity	Per unit cost (RS)	Total (RS)
1	Arduino Mega	1	1100	1100
2	ACS712 Current sensors	3	250	750
3	Transformer	1	300	300
4	Other Electronic Components	1	200	200
5	LCD 20 × 4	1	570	570
6	Switch board	1	200	200
7	Power supply	2	250	500
8	Arduino cables	2	150	300
9	Relay	5	150	750
10	GSM module	1	2500	2500
			Total including GSM	7170 RS.
			Total (without GSM)	4670 RS.

T-8.5 Equipment cost for load management device

The Arduino sketch was made for the load management system design on Arduino compiler IDE, and a flow chart of the proposed control scheme is illustrated in Figure 4. The complete design, including Arduino UNO, current sensor, and connected devices, are made and simulated on Proteus Professional Software. The circuit diagram used for simulation in Proteus is shown in above Figure.The current sensor ACS712 is used instead of CT to measure the current of active loads. A current sensor is continuously monitoring the load current of the home appliances to check the value of the load current. If the amount of the load current is higher than the set value, then Arduino will send the trip signal to the relay to switch off the heavy loads until the desired amount of the load is reached. A real-time clock is also attached to measure the peak and off-peak time. There are four electric lamps, and one motor is used as a heavy load in this simulation. Each electric lamp consumed 2.85 A, and the motor consumed 9.9 A. These loads are connected with Arduino UNO via a relay.

8.2 Reasons for Student Recommending this Designs :

India lives in its villages, and while the cities have grown immensely over the last 20 years, rural areas have not seen that kind of development.When we talk about allocated village, there is lack of basic facilities like Primary Health Centre, Community Hall etc.so, this is the reason to recommend this designs like, Primary School, Angadvadi, Skill Development Centre, Agro Storege Unit etc.

8.3 Benefits of the villageres:

- For improve health of village people one health center must be required.
- There is no Primary Health Centre in village so people suffered to find Imergencies service.For improve comfort of village people Primary Health Centre must be available in village.
- To improve or updating electric system in the village.
- To improve ground water table rain water harvesting system is help to store rain water and we can use this water for other purposes.
- Maintenance is required for effective function and use of existing facility available in village.

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

After completion of visit & data collection the project carried out in the current semester by the group members which includes the design of a sustainable facilities. Future scope would be study over other different urban amenities that would be sustainable in rural areas.

- **In the Phase-II we will give the below design :**

1. Animal Shelter :

There is no shelter house in Handiya for some poor animals.A shelter houses a variety of needy animals who are looking for some help from concerned humans.Animals are wandering in village, shelter will provide them a house.

2. Drinking Water Facility:

There is no drinking water facility in Handiya, water bores from the open wells.

3. Cemetery :

In village there is no special place for cemetery.Villagers do cemetery in open air.

4. Public Toilet :

There is a Public Toilet in Handiya but it is in very poor condition.

5. Bank with ATM service :

In Handiya village, there is no any bank or ATM machine.A bank with ATM should be there to provide flexibility of urgent cash requirements and provide banking syastem to the villagers.

6. Citizen Service centre :

In the Handiya village there is no any recreational area existing. So that for the better entertainment purpose for citizens we have proposed one design of Citizen service cntre as recreational area in the village.

10 Conclusion of the Entire Village Activities of the project

For India's economy to be strong, the rural economy needs to grow. Rural areas are still plagued by problems of malnourishment, illiteracy, unemployment and lack of basic infrastructure like schools, hospitals, sanitation, etc. Our villages need to grow in tandem with cities and standard of life has to improve there for inclusive growth to happen. If rural India is poor, India is poor.

While we have latest services and products available in our cities now, villagers are still coping with age old products.

1. While we have international fully air conditioned schools in our cities, the schools in villages still don't have benches and chairs, leave alone computers. We have a huge shortage of teachers in rural areas, and the school dropout rate is huge.

2. In cities, we have wide roads, flyovers and underpasses while many villages still don't have proper roads. Urban-rural road links can play a vital role in rural growth.

3. Employment opportunities are hardly there in villages which forces youth to move to cities creating imbalance in the ecosystem and leaving the villages deprived.

4. While we may have numerous hospitals, nursing homes and medical facilities in cities, villages neither have health awareness nor health facilities. See the condition of major hospitals like AIIMS to know how many villagers have to flock to cities for even basic treatments.

These amenities designed under this project will be helpful for better development of village as physically as well as socially, which improves the overall lifestyle of people along with nation with preserving nature bit by bit.

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

11 Rfferences refereed for this project

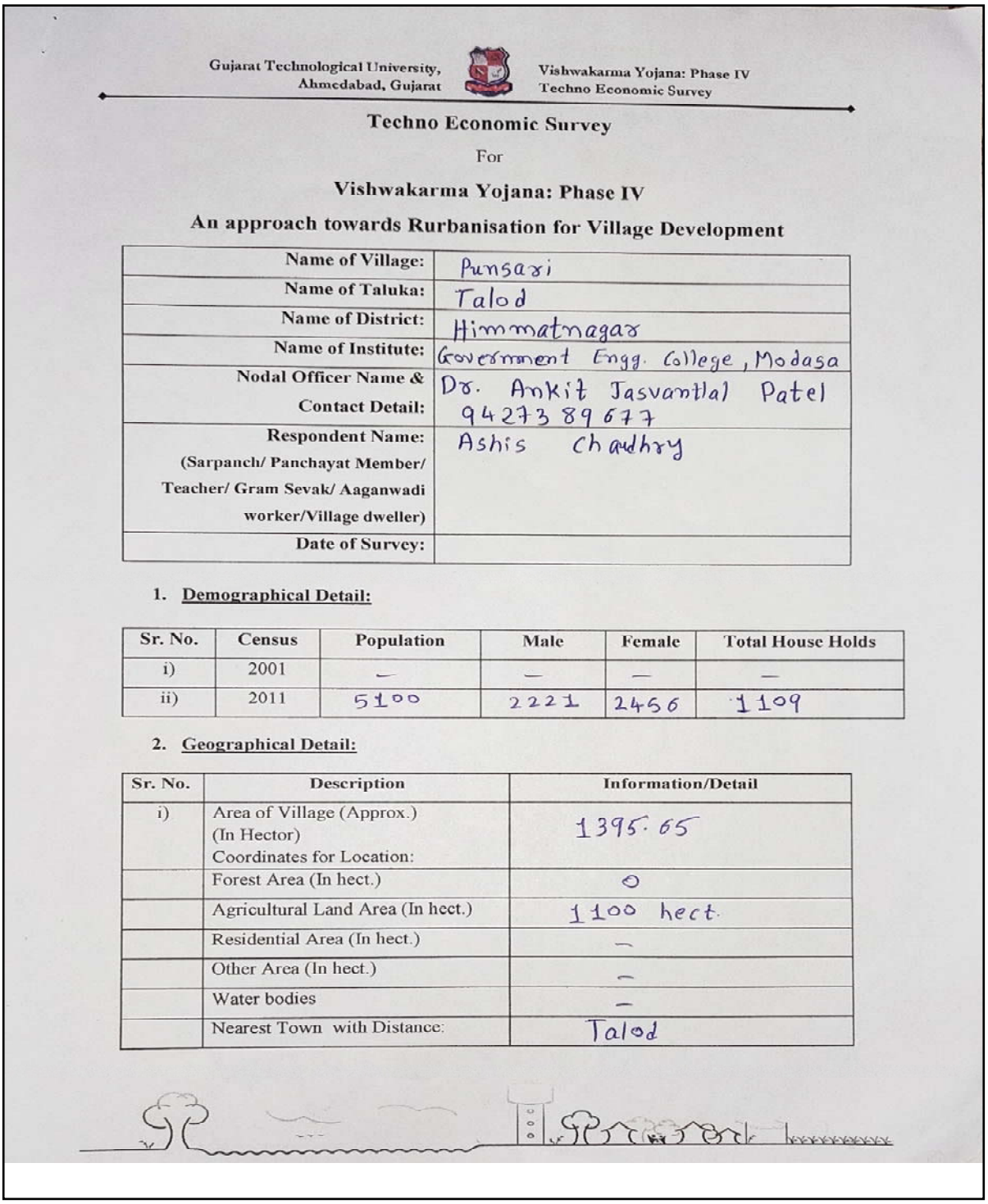
First, we was Meet Our Internal Guide Ankit Sir and we Discuss about our project and then we visited the Handiya village and there we met with the sarapanch of Handiya village and also we discuss on urbanization of Handiya village.

Websites:

- **https://www.wikipedia.com/**
- **https://www.onefivenine.com/**
- **https://www.sciencedirect.com/**
- **https://patents.google.com/**
- **https://www.slideshare.net/bibhabasumohanty/water-distribution-system**
- **GTU guidelines and briefings, https://www.gtu.ac.in/Circular.aspx**
- **https://www.eurekalert.org/**
- **https://elevationmap.net/**
- **https://freeprojectsforall.com/civil-project-on-corrosion-mechanism-prevention-repair-measures-of-rcc-structure/**
- **http.-//www.punsarigrampanchayat.in7**
- **https://censusindia.gov.in/**
- **https://www.villagemaps.in/**
- **http://www.vyojana.gtu.ac.in/**
- **https://sswm.info/node/7722**
- **https://link-springer-com-443.webvpn.jnu.edu.cn/chapter/10.1007%2F978-3-030-04085-7_6**

12 Annexure Attachment

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



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase IV
Techno Economic Survey

Techno Economic Survey

For

Vishwakarma Yojana: Phase IV

An approach towards Rurbanisation for Village Development

Name of Village:	Punsari
Name of Taluka:	Talod
Name of District:	Himmatnagar
Name of Institute:	Government Engg. College, Modasa
Nodal Officer Name & Contact Detail:	Dr. Ankit Jasvantlal Patel 9427389677
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Ashis Chaudhry
Date of Survey:	

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	–	–	–	–
ii)	2011	5100	2221	2456	1109

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	1395.65
	Forest Area (In hect.)	0
	Agricultural Land Area (In hect.)	1100 hect.
	Residential Area (In hect.)	–
	Other Area (In hect.)	–
	Water bodies	–
	Nearest Town with Distance:	Talod

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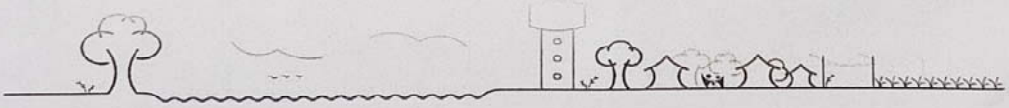
3. Occupational Details:

Name of Three Major Occupation groups in Village	1. Aggricultural 2. Milk Production 3. Small Scale Industries

4. Physical Infrastructure Facilities:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
	• Tap Water (Treated/ Untreated) • RO Water • Well (Covered/ Uncovered) • Hand pumps • Tube well/ Borehole • River/ Canal/ Spring/ Lake/ Pond	Yes Yes yes	✓ ✓ ✓		– – –
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	–	–	–
	Underground Sump	Capacity:	–	–	–
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	Pucca	✓		–
	Whether drain water is discharged directly in to Water bodies/ Sewer plants	Water bodies	✓		–
Suggestions if any:					



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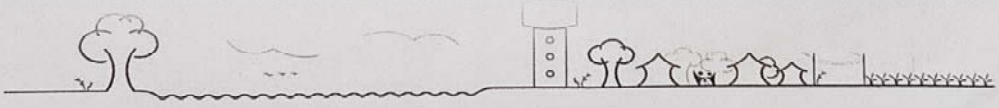
E.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Black Topped Pucca	✓		–
	Main road	R.C.C	✓		–
	Internal streets	R.C.C	✓		–
	Nearest NH/SH/MDR/ODR Dist. in kms.	–	–	–	–
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	NO	–	–	–
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes	✓		–
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Panchayat Bus	✓		–
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Yes, own Power Station (More than 6hrs)	✓		–
	Power supply for Domestic Use	24 hrs	✓		–
	Power supply for Agricultural Use	24 hrs	✓		–
	Power supply for Commercial Use	24		✓	–
	Road/ Street Lights	Yes	✓		–



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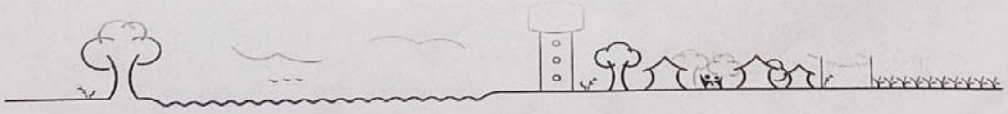
	Electrification in Government Buildings/ Schools/ Hospitals	Yes	✓		-
	Renewable Energy Source Facilities (Y/ N)	Yes	✓		-
	LED Facilities	Yes		✓	-
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	-	-	-	-
	Location Condition	-	-	-	-
	Community Toilet (With bath/ without bath facilities)	Yes	✓		-
	Solid & liquid waste Disposal system available	Yes	✓		-
	Any facility for Waste collection from road	Door to Door waste collection	✓		-
Suggestions if any:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	River, Well	✓		-
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	70%. 30%.	✓		-

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks



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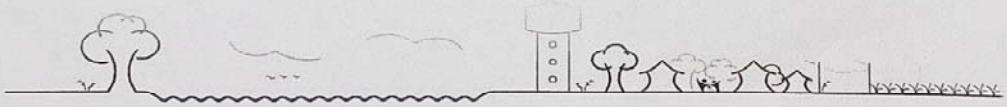
K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	PHC Yes	✓		–
	Private Clinic/Private Hospital/ Nursing Home	Yes	–	–	–
	If any of the above Facility is not available in village than approx. distance from village: ...–.....kms.				
Suggestions if any:					
L.	**Education Facilities:**				
	Aaganwadi/ Play group	8	✓		–
	Primary School	5(1-8 std.)	✓		–
	Secondary school				–
	Higher sec. School	1	✓		–
	ITI college/ vocational Training Center	1	✓		–
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities				–
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					
M.	**Socio- Culture Facilities**				
	Community Hall (With or without TV) Location:	Yes			



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Vishwakarma Yojana: Phase IV
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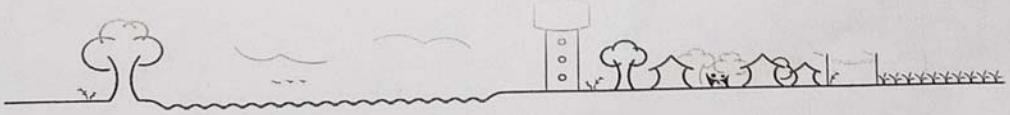
	Condition:	Good	✓		-
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	Yes	✓	-	Mobile Library
	Public Garden Location: Condition:	1 Good	✓		-
	Village Pond Location: Condition:	-			
	Recreation Center Location: Condition:	NO	-		
	Cinema/ Video Hall Location: Condition:	NO	-		
	Assembly Polling Station Location: Condition:	1 Good	✓		-
	Birth & Death Registration Office Location: Condition:	1 Good	✓		-
If any of the above Facility is not available in village than approx. distance from village: ……kms.					
Suggestions if any:					
N.	**Other Facilities**				
	Post-office	1	✓		-
	Telecommunication Network/ STD booth	1	✓		-



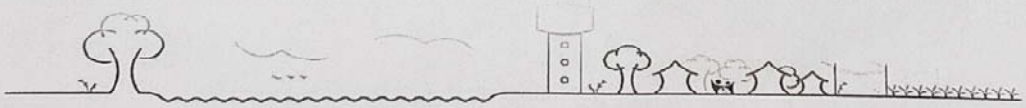
	General Market	1	✓		-
	Shops (Public Distribution System)	Yes	✓		-
	Panchayat Building	Yes	✓		-
	Pharmacy/Medical Shop	Yes	✓		-
	Bank & ATM Facility	Yes, 2-2	✓		-
	Agriculture Co-operative Society	-	-	-	-
	Milk Co-operative Soc.	Yes	✓		-
	Small Scale Industries	Yes	✓		-
	Internet Cafes/ Common Service Center/Wi Fi	Yes	✓		-
	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	Remarkable energy source	✓		-
P.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System	Yes Yes Yes	✓ ✓ ✓		-
Q.	Any Other				

7. **Data Collection From Village**

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



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

8. **Additional Information/ Requirement:**

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities(School Building, Health Center, Panchayat Building, Public Toilets & any other)	Not Required	—
2.	Additional Information/ Requirement	-66 KVA Substation -R.O. System	—
		E-Gram Panchayat	—
		Public Address System	—

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

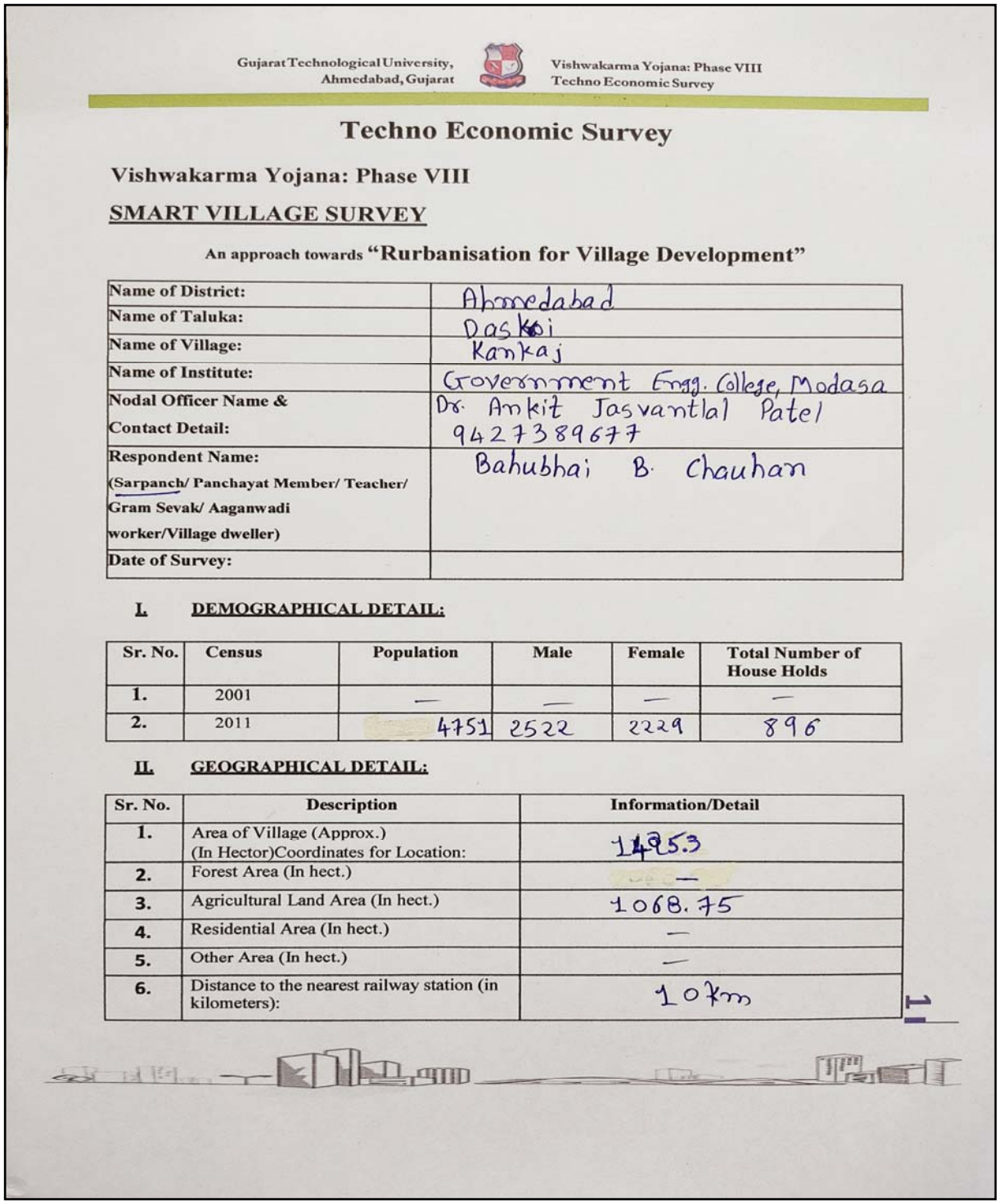
For Any Technical queries/ Difficulties:
Ms Jagruti Shah, OSD
Contact no. 9978980170

For Any Administration queries/ Difficulties:
Ms. Darshana Chauhan, OSD
Contact No. 9909944891

Email ID: rurban@gtu.edu.in

તલાટી કમમંત્રી
પુંઢારી ગ્રામ પંચાયત
તા.તલોદ, જિ.સાબરકાંઠા.

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



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Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

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

Name of District:	Ahmedabad
Name of Taluka:	Daskoi
Name of Village:	Kankaj
Name of Institute:	Government Engg. College, Modasa
Nodal Officer Name & Contact Detail:	Dr. Ankit Jasvantlal Patel 9427389677
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Bahubhai B. Chauhan
Date of Survey:	

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	—	—	—	—
2.	2011	4751	2522	2229	896

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1495.3
2.	Forest Area (In hect.)	—
3.	Agricultural Land Area (In hect.)	1068.75
4.	Residential Area (In hect.)	—
5.	Other Area (In hect.)	—
6.	Distance to the nearest railway station (in kilometers):	10km

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7.	Name of Nearest Town with Distance:	Ahmedabad - 14 Km
8.	Distance to the nearest bus station (in kilometers):	11 Km
9.	Whether village is connected to all road for the any facility or town or City?	Yes

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1. Agricultural 2. Small Scale Industry 3. Milk Production
Major crops grown in the village:	1. Wheat 2. Tomatos 3. -

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

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

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Techno Economic Survey

Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	–	–	–
	Underground Sump	Capacity:	–	–	–
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET	Under-ground drainage	✓	–	Good & clean facility
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	R.C.C.	✓	–	–
	Main road	R.C.C.	✓	–	–
	Internal streets	R.C.C.	✓	–	–
	Nearest NH/SH/MDR/ODR Dist. in kms.	SH-142	✓	–	–
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	17.1 Km	✓	–	–
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes	✓	–	–
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto	✓	–	–
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Gov. More than 6 hour.	✓	–	–

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Techno Economic Survey

	Power supply for Domestic Use	Gov.	✓	–	–
	Power supply for Agricultural Use	Gov	✓	–	–
	Power supply for Commercial Use	Gov.	✓	–	–
	Road/ Street Lights	Gov.	✓	–	–
	Electrification in Government Buildings/ Schools/ Hospitals	Gov.	✓	–	–
	Renewable Energy Source Facilities (Y/ N)	Yes	✓	–	–
	LED Facilities	Yes	✓	–	–
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	–	–	–	–
	Location Condition	–	–	–	–
	Community Toilet (With bath/ without bath facilities)	Yes, without bath	✓	–	–
	Solid & liquid waste Disposal system available	Yes	✓	–	–
	Any facility for Waste collection from road	Door to Door	✓	–	–
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL. OTHER (SPECIFY)	Well, River	✓	–	–
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	80% Pucca 20% Kutchha	✓	–	–

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Techno Economic Survey

V. SOCIAL INFRASTRUCTURAL FACILITIES:

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

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Suggestions if any:

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

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

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	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries	Less	✓	–	–
	Other Facility	Gau-Sala Good Condition	✓	–	–

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	Medium		✓	
	5. Balika Samriddhi Yojana	Medium		✓	
	6. Mid-day Meal Programme				✓
	7. Intergrated Child Development Scheme (ICDS)				✓
	8. Mahila Mandal Protsahan Yojana (MMPY)				✓
	9. National Food for work Programme (NFFWP)				✓
	10. National Social Assistance Programme				✓
	11. Sanitation Programme (SP)				✓
	12. Rajiv Gandhi National Drinking Water Mission				✓
	13. Swarnjayanti Gram Swarozgar Yojana				✓
	14. Minimum Needs Programme (MNP)				✓
	15. National Rural Employment Programme				✓
	16. Employee Guarantee Scheme (EGS)				✓
	17. Prime Minister Rojgar Yojana (PMRY)	Good		✓	
	18. Jawahar Rozgar Yojana (JRY)	Good		✓	
	19. Indira Awas Yaojna (IAY)	Good		✓	
	20. Samagra Awas Yojana (SAY)	Medium		✓	
	21. Sanjay Gandhi Niradhar Yojana (SGNY)				✓
	22. Jawahar Gram Samridhi Yojana (JGSY)	Good		✓	
	23. Other (SPECIFY)				✓

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

VII. DATA COLLECTION FROM VILLAGE

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

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

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1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other	Public Infrastructure Facility	-
2.	Additional Information/ Requirement	NO	-
3.	During the last six months how many times CLEANING ..... FOGGING..... 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 ?	-	-

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

ગામ મોરચા
સરપંચ
પાલડી-કાંકજ ગ્રામ પંચાયત
તા.દસક્રોઈ, જી.અમદાવાદ.

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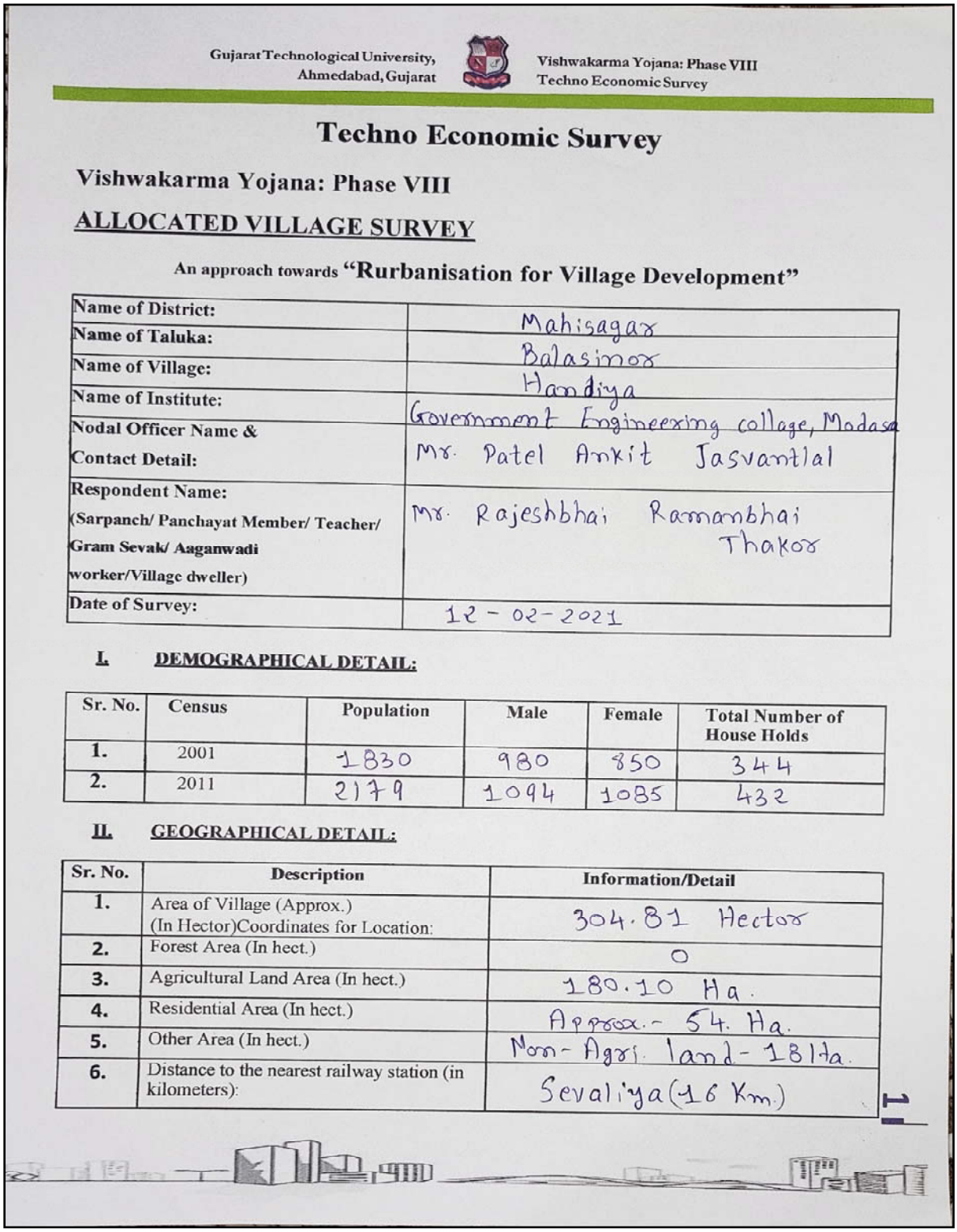
12.3 Survey form of Allocated Village Scanned copy attachment in the report for Part-I :



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Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

Name of District:	Mahisagar
Name of Taluka:	Balasinor
Name of Village:	Handiya
Name of Institute:	Government Engineering collage, Madasa
Nodal Officer Name & Contact Detail:	Mr. Patel Ankit Jasvantlal
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Mr. Rajeshbhai Ramanbhai Thakor
Date of Survey:	12-02-2021

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	1830	980	850	344
2.	2011	2179	1094	1085	432

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	304.81 Hector
2.	Forest Area (In hect.)	0
3.	Agricultural Land Area (In hect.)	180.10 Ha.
4.	Residential Area (In hect.)	Approx.- 54. Ha.
5.	Other Area (In hect.)	Non-Agri. land- 181Ha.
6.	Distance to the nearest railway station (in kilometers):	Sevaliya (16 Km.)

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7.	Name of Nearest Town with Distance:	Balasinor - 2 Km
8.	Distance to the nearest bus station (in kilometers):	Balasinor - 2 Km
9.	Whether village is connected to all road for the any facility or town or City?	Yes

III. OCCUPATIONAL DETAILS:

Name of Three Major Occupation groups in Village	1.	Dairy & Animal Hus.
	2.	Shopekeeping
	3.	Agriculture Farming

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

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
1.	**PIPED WATER** Piped Into Dwelling Piped To Yard/Plot Public Tap/Standpipe Tube Well Or Bore Well	Yes		✓	-
2.	**DUG WELL** Protected Well Un Protected Well	Yes		✓	Unprotected well - 11
3.	**WATER FROM SPRING** **Protected Spring** Unprotected Spring Rainwater Tanker Truck Cart With Small Tank	NO			
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump	Yes		✓	-

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	Other(Specify) **Lake/ Pond**	✓		✓	
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	1.5 lac/lit		✓
	Underground Sump	Capacity:	—		
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1	NO			
Suggestions if any:	Necessity of Drainage facility				
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	Kutchha		✓	—
	Main road	W.B.M	✓		—
	Internal streets	C.C. Road	✓		—
	Nearest NH/SH/MDR/ODR Dist. in kms.		✓		—
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	NO Sevaliya (16 km)			Sevaliya (16 km)
	Bus station (Y/N) Condition: **(If No than Nearest Bus Station---Kms)**	NO Balasinor (2 km)			Nearest Balasinor (2 km)
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Private Vehicles			
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)				Froom, Gram-Panchayat

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	Power supply for Domestic Use	Yes		✓	–
	Power supply for Agricultural Use	Yes		✓	–
	Power supply for Commercial Use	Yes	✓		–
	Road/ Street Lights	Yes	✓		–
	Electrification in Government Buildings/ Schools/ Hospitals	Yes		✓	–
	Renewable Energy Source Facilities (Y/ N)	NO			–
	LED Facilities	NO			–
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	NO			–
	Any facility for Waste collection from road	NO			–
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL OTHER (SPECIFY)	Well		✓	–
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	40 %. Kutchha 60 %. C.C. Road	✓		–

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V. SOCIAL INFRASTRUCTURAL FACILITIES:

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

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

Suggestions if any:

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

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				NO
	Telecommunication Network/ STD booth				NO
	General Market				NO
	Shops (Public Distribution System)				NO
	Panchayat Building	Medium	-	Yes	
	Pharmacy/Medical Shop				NO
	Bank & ATM Facility				NO
	Agriculture Co-operative Society				NO
	Milk Co-operative Soc.				NO
	Small Scale Industries	Medium	-	Yes	
	Internet Cafes/ Common Service Center/Wi Fi				NO
	Youth Club				NO
	Mahila Mandal				NO

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

Suggestions if any:

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

17

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	–	✓	Soft Copy
2.	Recent Projects going on for Development of Village	NO	–	–	–
3.	Any NGO working for village development	NO	–	–	–
4.	Any natural calamity in the village during the last one year: EARTHQUAKES FLOODS CYCLONE DROUGHT LANDSLIDES AVALANCHE OTHER (SPECIFY)	NO	–	–	–

8

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities, School Building Health Center Panchayat Building Public Toilets & any other	Yes Yes Yes	- - -
2.	Additional Information/ Requirement	Yes	
3.	During the last six months how many times CLEANING .....2..... FOGGING.....0..... Drive was undertaken in the village?	Necessity of cleaning village	-

IX. Smart Village / Heritage Details

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	IS THEIR ANY THING FOR THE VILLAGE ENHANCEMENT POSSIBLE ?	Solar street lights Road Network Drainage System	—

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

તારીખ 21/2/2021

સરપંચશ્રી
ગ્રામ પંચાયત
તા.બાલાસિનોર

12.4 Gap Analysis of the Allocated Village : (T-12.1 Gap Analysis)

VILLAGE GAP Analysis					
VillageFacilities	PlanningCommission/ UDPFINorms	VillageName:	Handiya (Balasinor, Mahisagar)		
		Population: 2179			
		Existing	Required asperNorms	SmartVilage/Cities /HeritageFutureProjection Design	Gap
SocialInfrastructureFacilities					
Education					
Anganwadi	EachorPer2500population	1	1	-	0
PrimarySchool	EachPer2500population	1	1	-	0
SecondarySchool	Per7,500population	0	0	-	0
HigherSecondarySchool	Per15,000Population	0	0	-	0
College	Per125,000Population	0	0	-	0
Tech.TrainingInstitute	Per100000Population	0	0	-	0
AgricultureResearchCentre	Per100000Population	0	0	-	0
SkillDevelopmentCenter	Per100000Population	0	0	-	0
HealthFacility					
Govt/PanchyatDispensaryorSubPHCorHealth Centre	EachVillage	0	1	-	-1
PrimaryHealth&ChildHealthCenter	Per20,000population	0	0	-	0
ChildWelfareandMaternityHome	Per10,000population	0	0	-	0
MultispecialityHospital	Per100000Population	0	0	-	0
PublicLatrines	1for50families(iftoiletisnot thereinhome,speciallyforslumpockets&kutchahouse)	0	0	-	0
PhysicalInfrastructureFacilities					
Transportation		**Adequate**			
PuccaVillageApproachRoad	Eachvillage	**Inadequate**			
Bus/AutoStandprovision	AllVillagesconnectedbyPT(STBusorAuto)	**Inadequate**	Nearest Balasinor [2 km away]		
DrinkingWater(Minimum70lpcd)		**Adequate**	-	-	-
OverHeadTank	1/3ofTotalDemand	**Adequate**	1	1	0
U/GSump	2/3ofTotalDemand	**Inadequate**	0	1	-1
DrainageNetwork-Open		**Inadequate**			
DrainageNetwork-Cover		**Required**			
WasteManagementSystem		**Inadequate**			
Socio-CulturalInfrastructureFacilities					
CommunityHall	Per10000Population	0	1	-	-1
communityhallandPublicLibrary	Per15000Population	0	0	-	0
CremationGround	Per20,000population	0	1	-	-1
PostOffice	Per10,000population	0	1	-	-1
GramPanchayatBuilding	Eachindividual/grouppanchayat	1	1	-	0
APMC	Per100000Population	0	0	-	0
FireStation	Per100000Population	0	0	-	0
PublicGarden	Pervillage	0	1	-	-1
Policepost	Per40,000Population	0	0	-	0
ShoppingMall : Shops are available in the village					
ElectricalDesign					
ElectricityNetwork		**Adequate**			
AnySmartVillageFacility					

Technology					
		ESRcap	1.5 lac litres		
		Sumpcap	-		
		Lat	-		

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

Sr. No.	Village	Discription	Part 1	Part 2
1.	Handiya	Civil	Primary School	Animal Shelter
			Primary Health Centre	Drinking Water Facilities
			Community Hall	Cemetery
			Skill Development Unit	Public Toilet
			Agro Storage Unit	Bank and ATM Service
			Angadwadi	Citizen Service Centre
		Electrical	Automatic Light system	Street Light Systerm
			Solar Water purification	Agricultural Monitoring
			System for Load rotationing	Automated Irrigation system
2.	Pindharada	Civil	Bank	Solid waste management
			Public Toilet	ATM
			Bio gas plant	Solar street lights
			Community hall	Pharmacy store
			Pick up bus stand	Public Garden
			Crematoria	PHC
		Electrical	Design of Solar Power	Primary Energy Audit
			Primary energy Audit	Solar Water Purifier
			Solar Street Light	Solar PV Water Pumping System for Irrigation

T-12.2 Summary of Design

12.6 Drawings (If, required,A1, A2, A3 design is not visible then Only) :

All the drawings and images are attached in their respective chapters along with designs and their listing is mentioned in the list of figures along with their page numbers.

12.7 Summary of Good Photographs in Table Format (Village visit, Ideal village) : (T-12.3 Summary of Village Photographs)

❖ Summary Of Photographs Of Handiya-Allocated Village:

❖ Summary Of Photographs Of Punsari-Ideal Village:

12.8 Village Interaction with sarpanch/talati Report with the photograph:

Village Interaction with Talati/Sarpanch Letter

Vishwakarma Yojna Phase VIII

Handiya Village, District : Mahisagar

Village Code :388260

Village Interaction Form With Sarpanch/Talati Of Handiya Village

I sarpanch/talati of Handiya village undersigned gives approval of doing village interaction activity under Vishwakarma yojna phase- VIII an approach towards rurbanisation by students of Government engineering college, modasa named MahammadArsil F. Ghanchi [180160106010], Yogi Shastri [180160106028] and Vivek Shah [180163109023].

Date: 12/02/21

Sign :

8/2/2021

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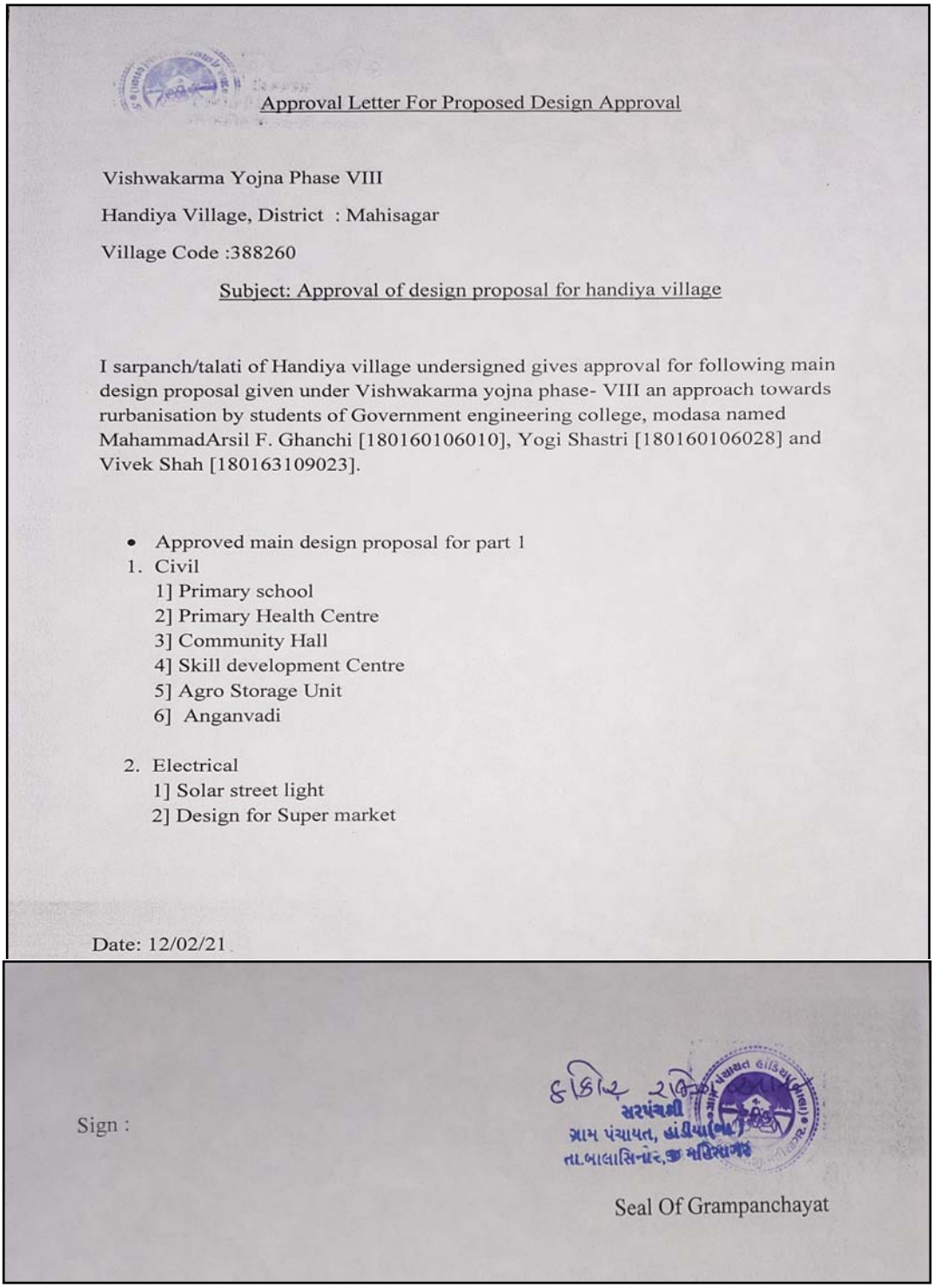
તા.ભાલાસિનોર,જી.મહિસાગર

Seal Of Grampanchayat

12.9 Sarpanch Letter giving information about the village development :



Approval Letter For Proposed Design Approval

Vishwakarma Yojna Phase VIII

Handiya Village, District : Mahisagar

Village Code :388260

Subject: Approval of design proposal for handiya village

I sarpanch/talati of Handiya village undersigned gives approval for following main design proposal given under Vishwakarma yojna phase- VIII an approach towards rurbanisation by students of Government engineering college, modasa named MahammadArsil F. Ghanchi [180160106010], Yogi Shastri [180160106028] and Vivek Shah [180163109023].

- Approved main design proposal for part 1

1. Civil
   1] Primary school
   2] Primary Health Centre
   3] Community Hall
   4] Skill development Centre
   5] Agro Storage Unit
   6] Anganvadi

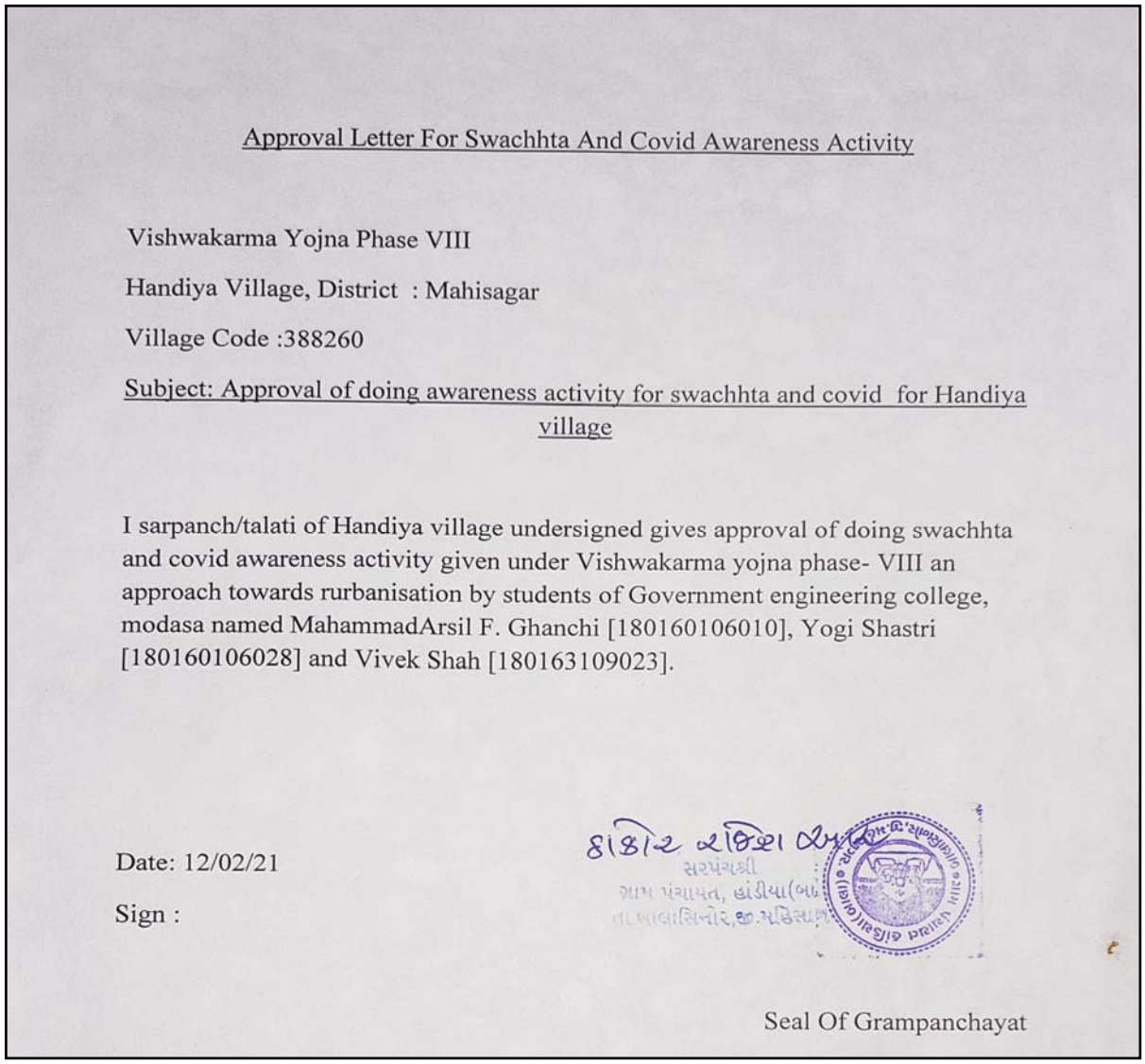
2. Electrical
   1] Solar street light
   2] Design for Super market

Date: 12/02/21

Sign :

Seal Of Grampanchayat

- **Approval Letter For Swachhta & Covid Awareness Activity approval :**



Approval Letter For Swachhta And Covid Awareness Activity

Vishwakarma Yojna Phase VIII

Handiya Village, District : Mahisagar

Village Code :388260

Subject: Approval of doing awareness activity for swachhta and covid for Handiya village

I sarpanch/talati of Handiya village undersigned gives approval of doing swachhta and covid awareness activity given under Vishwakarma yojna phase- VIII an approach towards rurbanisation by students of Government engineering college, modasa named MahammadArsil F. Ghanchi [180160106010], Yogi Shastri [180160106028] and Vivek Shah [180163109023].

Date: 12/02/21

Sign :

Seal Of Grampanchayat

12.10 Comprehensive report preparation as per formate:

- **Introduction:**

Vishwakarma Yojana is one of the approaches to reduce urban city Pressure and lower the migration rate by developing village with a ‘rural soul’ but with all urban amenities that a city may have. The developmental work in villages that could undertake as per the need of the village in particular includes Physical, Social and Renewable infrastructure Facilities. It is also proposed to frame “Vishwakarma Yojana” to provide the benefit of real work experience to engineering students of Gujarat Technological University and simultaneously apply their technical

knowledge in the development of infrastructure in rural development.The developmental work in villages that could undertaken as per the need of the village in particular includes Physical infrastructure facilities, Social infrastructure facilities and renewable energy for Sustainable development.

- **Objectives of the study:**

a. Creation of Infrastructure:

To provide connectivity, civic and social infrastructure along with provision of alternative Economy generation is the key pillars that the concept hinges on.

b. Basic Physical Infrastructure:

To provide Water Supply, Transport, Sewerage and Solid Waste Management should be the priority focus and be provided. To provide internal roads within village settlement, Efficient Mass Transportation systems to improve connectivity between urban and rural areas, Public transportation facilities that need to be developed like bus stops, transport depot etc.

c. Basic Social Infrastructure:

To provide Health and Education facilities should be provided and ensure proper delivery of facilities to village dwellers.Promote integrated development of rural areas with provision of quality housing, better connectivity, employment opportunities and supporting physical and social infrastructure.Reduce migration from rural to urban areas due to lack of basic services and sufficient economic activities in rural areas.

d. Identification of Other Facility:

Identification of sanitation facility that need improvement solid waste collection and waste management Internal road within village settlement and public transportation facility that need to be developed like bus-stop , transport depot etc. Electricity connection, Rain water harvesting, Renewable sources management.

- **Study Area:** Handiya village is located in Balasinor Tehsil of Kheda district in Gujarat, India. It is situated 2km away from sub-district headquarter Balasinor and 72km away from district headquarter Nadiad. it is the 17th smallest village by area in the sub district. It is small village cnosisting population of 2179 only.Population density of the village is 714 persons per km².The total geographical area of village is 304.81 hectares.Handiya has total population of 2179 peoples. There are 432 houses in Handiya Village.As per census 2011 there are 1094 male and 1085 females are there in the village Handiya. There are total 352 children out of which 185 are male and 167 are female.
- **Mthodology:**

i. Literature study
ii. Field Visit
iii. Primary Survey and Interview

iv. Data Analysis
v. Issues findings, development of Strategy
vi. Final Proposal

- **Scope of the Study:** The aim of project is to develop the village with job opportunity for villagers. A team of project is finding the problem or need of a village in terms of socio – cultural or physical or social infrastructure and to design that facility with efficient engineering solution which include the design proposal and estimate cost to facilitate the require facility for the future growth of village with urban facilities.
- **Data Collection:**

a. General:

Our team collected data from Gramsevak, School teacher, Aanghanvadi worker as well as following method, The general data is collect by the observation of village.

- By techno economical survey
- By questioning to villagers
- By taking photograph of existing situation

b. Survey Data:

- There is bus stop in the village. 40% roads are kachha roads and 60% roads are C.C. roads
- There are 30% pucca houses and 70% kachcha houses in the village Handiya.
- The Average size of house is 100 Sq.Yard plot per house.
- There are 432 households in the village and an average 5 persons live in every family.
- There is Open drainage system in Handiya.
- In village 35 to 40% use smart phone are 20 to 25% use a normal phone and rest of people are not use phone. 60% people have knowledge about internet.

c. Availability of Amenities:

There following types of amenities are available such as electrical facilities, Education facilities, water facility, ATM service.

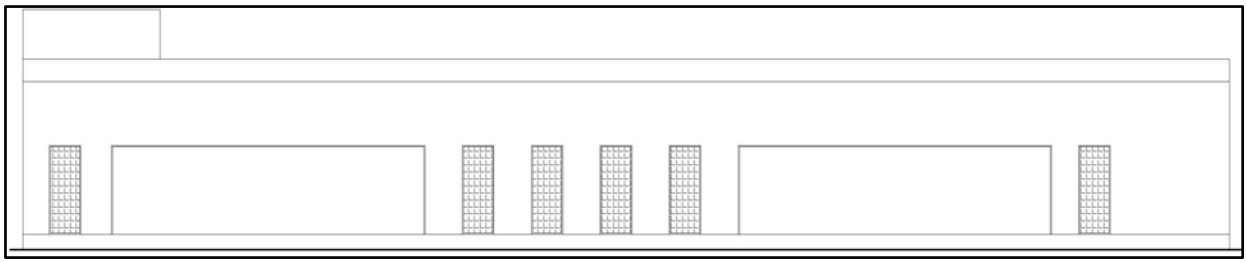
- **Design Proposals:**

a. Primary School
b. Primary Health Centre
c. Community Hall
d. Skills Development Unit
e. Agro Storage Unit
f. Angadvadi

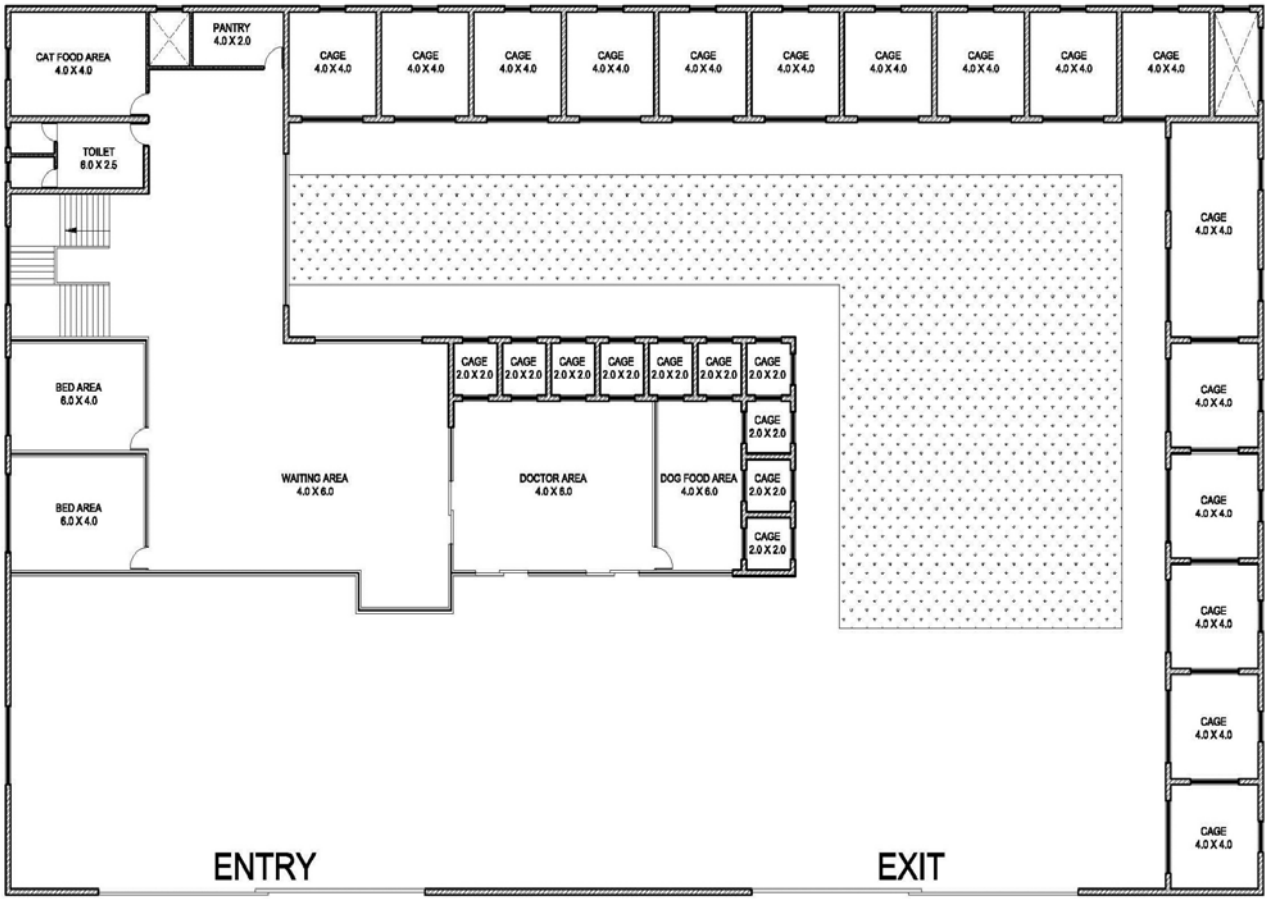
13 From the Chapter- 9 future designs of the aspects Sustainable Design Planning Proposals (Prototype Design) - Part- II

13.1 Design Proposals:

13.1.1 Animal Shelter:



F-13.1 Elevation of Animal Shelter



F-13.2 Plan of Animal Shelter

❖ Estimation of Animal Shelter:

BUILDING ESTIMATE						
QUANTITY SHEET						
Sr. No.	**Item Description**	**No.**	**Length (m)**	**Widht/ Breadth(m)**	**Height/ Depth(m)**	**Quantity (CU M)**
1	Earthwork in Excavation in Foundation:					
	L1 =34.53	5	34.53	1	1.5	258.98
	L2 =21.14	4	21.14	1	1.5	126.84
	S1 =3.3	1	3.3	1	1.5	4.95
	S2 =12.82	1	12.82	1	1.5	19.23
	S3 =8.87	1	8.87	1	1.5	13.31
					TOTAL QTY.	423.30
2	P.C.C Foundation:					
	L1 =34.53	5	34.53	1	0.3	51.80
	L2 =21.14	4	21.14	1	0.3	25.37
	S1 =3.3	1	3.3	1	0.3	0.99
	S2 =12.82	1	12.82	1	0.3	3.85
	S3 =8.87	1	8.87	1	0.3	2.66
					TOTAL QTY.	84.66
3	Pad footing in Foundation					
STEP 1	L1 =34.23	5	34.23	0.7	0.3	35.94
STEP 2	L1 =34.08	5	34.08	0.15	1.6	40.90
STEP 1	L2 =20.84	4	20.84	0.7	0.3	17.51
STEP 2	L2 =20.69	4	20.69	0.15	1.6	19.86
STEP 1	S1 =3.6	1	3.6	0.7	0.3	0.76
STEP 2	S1 =3.7	1	3.7	0.15	1.6	0.89
STEP 1	S2 =13.12	1	13.12	0.7	0.3	2.76
STEP 2	S2 =13.27	1	13.27	0.15	1.6	3.18
STEP 1	S3 =9.17	1	9.17	0.7	0.3	1.93
STEP 2	S3 =9.32	1	9.32	0.15	1.6	2.24
					TOTAL QTY.	125.95

4	Brickwork in S.S					
	L1 =34.53	5	34.53	0.15	3.2	82.87
	L2 =21.14	4	21.14	0.15	3.2	40.59
	S1 =3.3	1	3.3	0.15	3.2	1.58
	S2 =12.82	1	12.82	0.15	3.2	6.15
	S3 =8.87	1	8.87	0.15	3.2	4.26
					TOTAL QTY.	135.46
5	Deducation for D & W					
	W1	4	2	0.2	1.6	2.56
	W2	44	1.5	0.2	1.6	21.12
	V1	1	0.5	0.2	1.6	0.16
	D1	1	2	0.2	1.6	0.64
	D2	1	1.5	0.2	1.6	0.48
	D3	4	1	0.2	1.6	1.28
	D4	2	0.8	0.2	1.6	0.51
	D5	2	0.7	0.2	1.6	0.45
					TOTAL QTY.	27.20
	Deducation for Lintels					
	W1	4	2.3	0.2	0.12	0.22
	W2	44	1.8	0.2	0.12	1.90
	V1	1	0.8	0.2	0.12	0.02
	D1	1	2.3	0.2	0.12	0.06
	D2	1	1.8	0.2	0.12	0.04
	D3	4	1.3	0.2	0.12	0.12
	D4	2	1.1	0.2	0.12	0.05
	D5	2	1	0.2	0.12	0.05
					TOTAL QTY.	2.46
					NET QTY.	105.80
6	RCC WORK INSLAB					
	AREA 160 Sq.m.	1	160	0.12		19.20
7	Plaster inside					
	BED AREA	4	4.2	3.2		53.76
		4	2.3	3.2		29.44

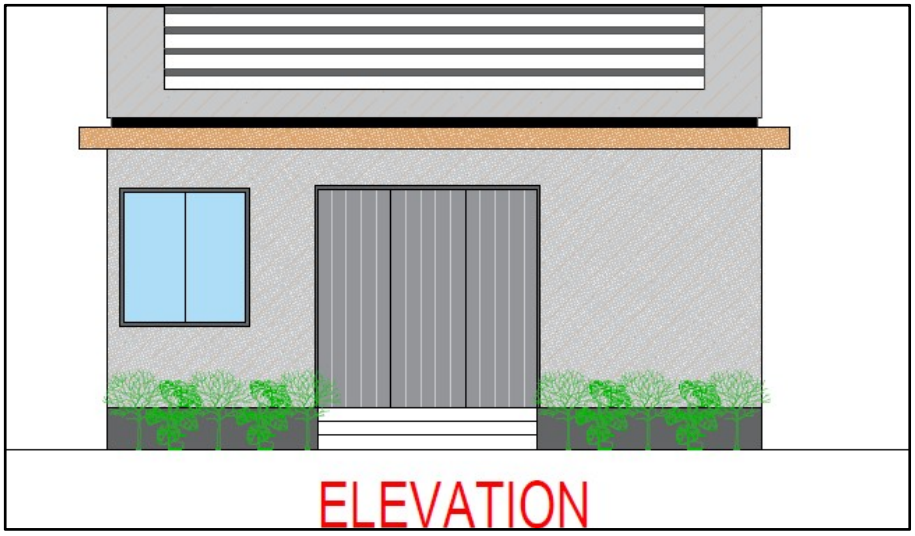
	SITTING AREA	2	5.6	3.2		35.84
		2	5.4	3.2		34.56
	SERIVCE OFFICE	2	5.9	3.2		37.76
		2	4	3.2		25.60
	CAT FOOD AREA	2	2.4	3.2		15.36
		2	4	3.2		25.60
	TOILET	2	3.5	3.2		22.40
		2	2.5	3.2		16.00
	DOG FOOD AREA	2	3.5	3.2		22.40
		2	2.5	3.2		16.00
	PANTRY	2	3.3	3.2		21.12
		2	1.3	3.2		8.32
				TOTAL QTY.		364.16 Sq.m.
	Celling Plaster					
	BED AREA	2	4.2	2.3		19.32
	SITTING AREA	1	5.6	5.4		30.24
	SERIVCE OFFICE	1	5.9	4		23.60
	CAT FOOD AREA	1	2.4	4		9.60
	TOILET	1	3.5	2.5		8.75
	DOG FOOD AREA	1	3.5	2.5		8.75
	PANTRY	1	3.3	1.3		4.29
				TOTAL QTY.		104.55
	DEDUCTION D & W					
	W1	1	2		1.6	3.20
	W2	0.5	1.5		1.6	1.20
	V1	1.2	0.5		1.6	0.96
	D1	0.4	2		1.6	1.28
	D2	2	1.5		1.6	4.80
	D3	0.9	1		1.6	1.44
	D4	0.2	0.8		1.6	0.26
	D5	2	0.7		1.6	2.24

					TOTAL QTY.	15.38
					NET QTY.	225.74
	DEDUCTION W & V					
	W1	4	2	0.6	0.2	1.60
	W2	1	1.5	0.6	0.2	0.30
	V1	2	0.5	0.6	0.2	0.20
					TOTAL QTY.	2.10

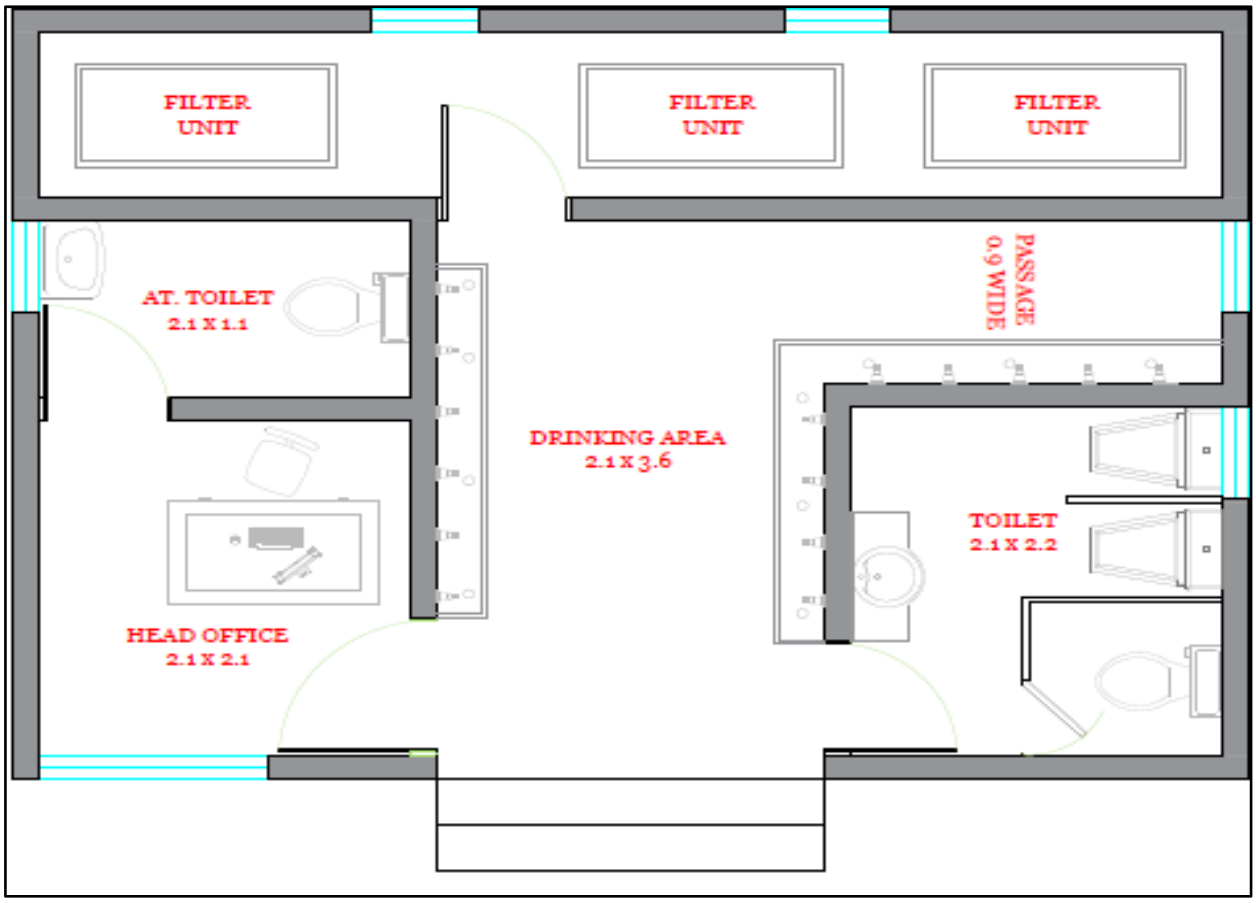
❖ AbstractSheet of Animal Shelter:

Abstract Sheet					
Sr. No.	**Item Description**	**QTY.**	**Rate**	**Per**	**Amount (Rs.)**
1	Earthwork in excavation in foundation	423.5 CU.M	90	CU.M	38115
2	P.C.C foundation	84.7 CU.M	2700	CU.M	228582
3	Pad Footing Upto Plinth	126.0 CU.M	3500	CU.M	440825
4	Brick work for S.S	135.1 SQ.M	150	SQ.M	20268
5	R.C.C Slab & Chajja	22.2 CU.M	150	SQ.M	3334.5
6	smooth plaster on inter wall	225.7 SQ.M	5	SQ.M	1128.7
7	Brick work for parapet wall	10.0 CU.M	5	CU.M	50
			Total Rs.		732303.2
		Add 1.5% Water Charge			10985
		Add 10% con.Charge			7323.032
		Total Estimate Cost in Rs.			7,50,611

13.1.2 Drinking Water Facilities Units:



F-13.3 Elevation of Drinking water facilities unit



F-13.4 Plan of drinking water facilities unit

- **Estimation of Drinking Water Facilities Unit:**

BUILDING ESTIMATE						
QUANTITY SHEET						
Sr. No.	**Item Description**	**No.**	**Length (m)**	**Widht/ Breadth(m)**	**Height/ Depth (m)**	**Quantity (CU.M)**
1	Earthwork in Excavation in Foundation:					
	L1 =7.90	3	7.9	1	1.5	35.55
	S1 =3.8	2	3.8	1	1.5	11.40
	S2 =2.60	1	2.6	1	1.5	3.90
	S3 =2.10	1	2.1	1	1.5	3.15
					TOTAL QTY.	54.00
2	P.C.C Foundation:					
	L1 =7.90	3	7.9	1.5	0.3	10.67
	S1 =3.8	2	3.8	1.5	0.3	3.42
	S2 =2.60	1	2.6	1.5	0.3	1.17
	S3 =2.10	1	2.1	1.5	0.3	0.95
					TOTAL QTY.	16.20
3	Pad footing in Foundation					
STEP 1	L1 =7.50	3	7.5	0.7	0.3	4.73
STEP 2	L1 =7.25	3	7.25	0.15	1.6	5.22
STEP 1	S1 =4.2	2	3.4	0.7	0.3	1.43
STEP 2	S1 =4.45	2	3.15	0.15	1.6	1.51
STEP 1	S2 =3.00	1	2.2	0.7	0.3	0.46
STEP 2	S2 =3.25	1	1.95	0.15	1.6	0.47
STEP 1	S3 =2.50	1	1.7	0.7	0.3	0.36
STEP 2	S3 =2.75	1	1.45	0.15	1.6	0.35
					TOTAL QTY.	14.52
4	Brickwork in S.S					
	L1 =7.90	3	7.9	0.15	3.2	11.38
	S1 =3.8	2	3.8	0.15	3.2	3.65

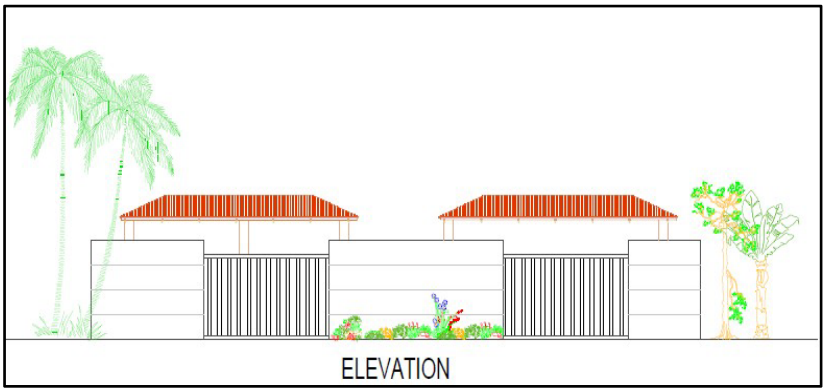
	S2 =2.60	1	2.6	0.15	3.2	1.25
	S3 =2.10	1	2.1	0.15	3.2	1.01
					TOTAL QTY.	17.28
5	Staircase Qty					
	L1 =2.10	1	2.1	0.6	0.15	0.19
	L1 =2.10	1	2.1	0.3	0.15	0.09
					TOTAL QTY.	0.28
6	Deduction for D & W					
	W1	1	1.3	0.15	1.5	0.29
	V1	5	0.6	0.15	0.15	0.07
					TOTAL QTY.	0.36
7	Deduction for D & W					
	W1	1	1.3	0.15	0.12	0.02
	V1	5	0.6	0.15	0.12	0.05
					TOTAL QTY.	0.08
					NET QTY.	21.59
8	R.C.C Slab & Chaaja					
	L=7.00	1	7	5	0.12	4.20
	B=5.00	1				
	R.C.C Chaaja					
	W1	1	1.3	0.6	0.12	0.09
	V1	5	0.6	0.6	0.12	0.22
					TOTAL QTY.	4.51
9	Plaster inside					
	HEAD OFFICE	4	2.1		3	25.20
	TOILET	2	2.1		3	12.60
		2	1.1		3	6.60
	D.A	2	2.1		3	12.60
		2	2.9		3	17.40
	TOILET	2	2.1		3	12.60
		2	1.1		3	6.60
	F.U	2	6.7		3	40.20
		2	1		3	6.00

					TOTAL QTY.	139.80
10	Celling Plaster					
	HEAD OFFICE	2	1.2		2.1	5.04
	TOILET	2	2.1		1.1	4.62
	D.A	2	2.1		2.9	12.18
	TOILET	2	2.1		1.1	4.62
	F.U	2	6.7		1	13.40
					TOTAL QTY.	185.66
	Deduction for D & W					
	W1	2	1.3		1.5	3.90
	V1	2	0.6		0.15	0.18
					TOTAL QTY.	4.08
					NET QTY.	321.38

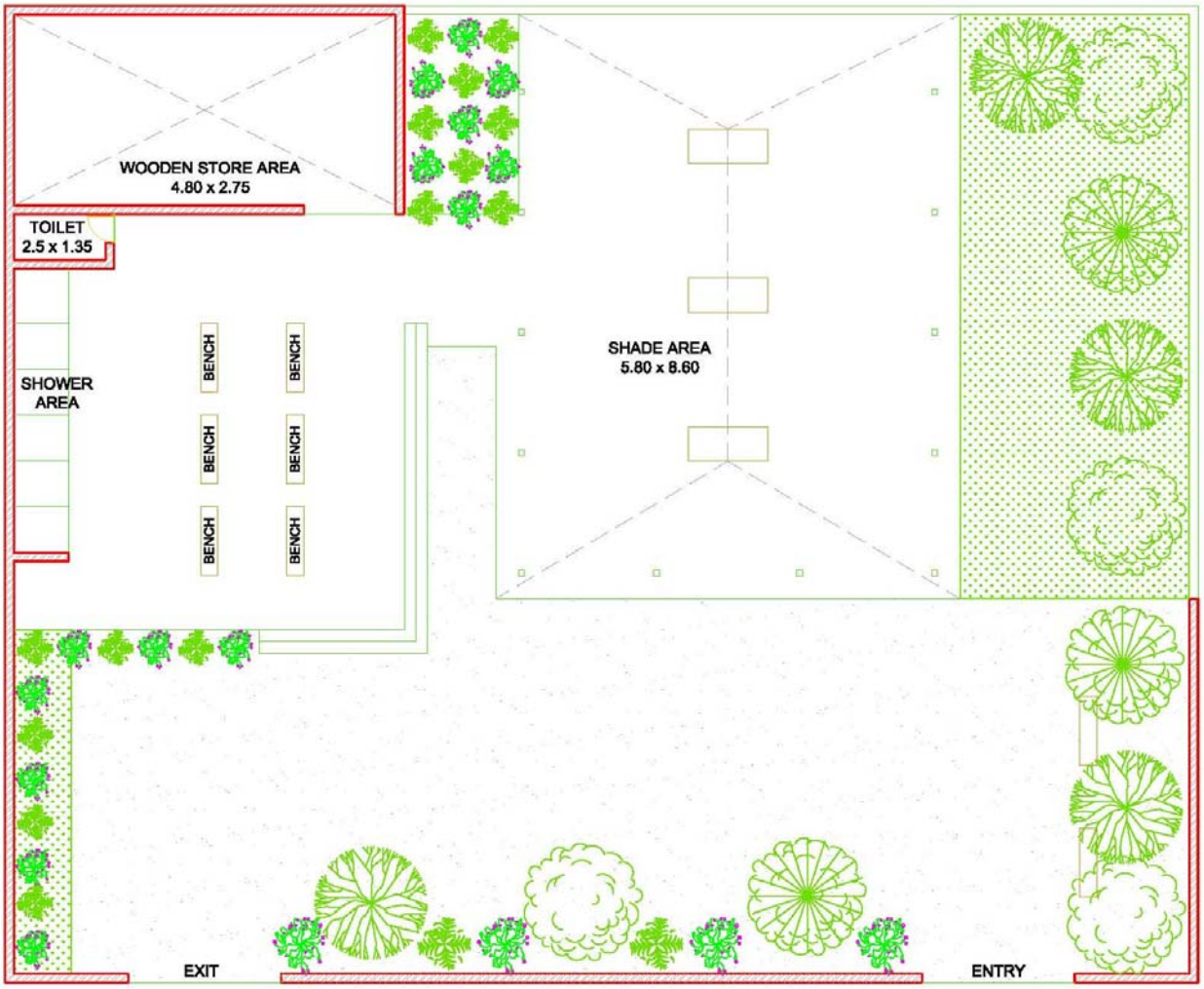
- **Abstract Sheet of drinking water facilities unit:**

Abstract Sheet					
Sr. No.	**Item Description**	**QTY.**	**Rate**	**Per**	**Amount (Rs.)**
1	Earthwork in excavation in foundation	54.0 CUM	90	CUM	4860
2	P.C.C foundation	16.2 CUM	2700	CUM	43740
3	Pad Footing Upto Plinth	14.1 CUM	3500	CUM	49420
4	Brick work for S.S	21.6 SQ.M	150	SQ.M	3238.5
5	R.C.C Slab & Chajja	4.5 CUM	150	SQ.M	676.5
6	Staircase Qty	0.3 CUM	5	SQ.M	1.4
7	smooth plaster on inter wall	321.4 SQ.M	5	SQ.M	1606.9
8	Brick work for parapet wall	10.0 CUM	5	CUM	50
			Total Rs.		103593.3
		Add 1.5% Water Charge			1554
		Add 10% con.Charge			1035.933
		Total Estimate Cost in Rs.			1,06,183

13.1.3 Design of Cemetery:



F-13.5 Elevation of Cemetery



F-13.6 Plan of Cemetery

- **Estimation of Cemetery:**

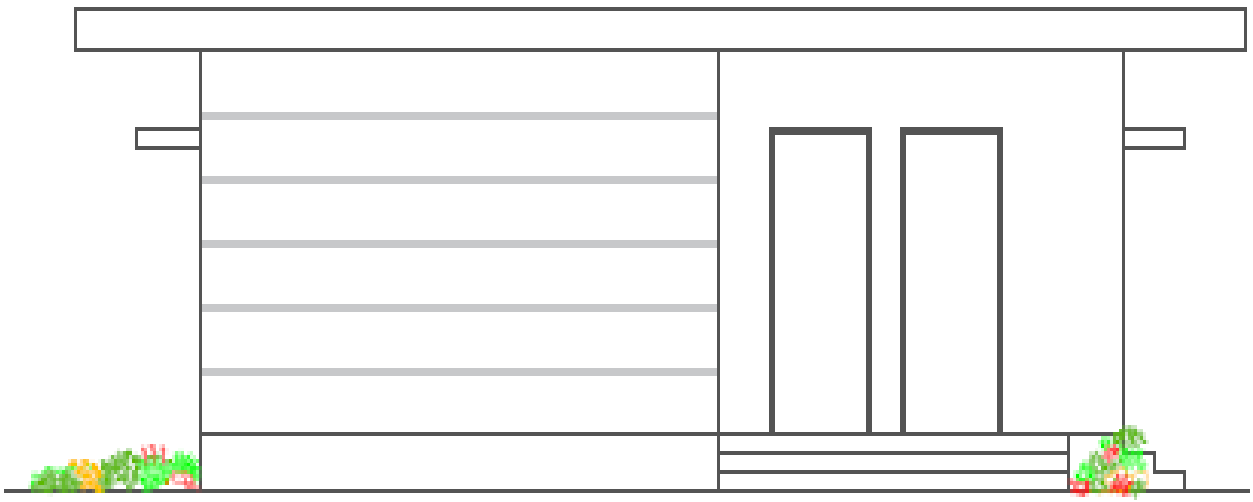
BUILDING ESTIMATE						
QUANTITY SHEET						
Sr. No.	**Item Description**	**No.**	**Length (m)**	**Width/ Breadth (m)**	**Height/ Depth (m)**	**Quantity (CU.M)**
1	Earthwork in Excavation in Foundation:					
	L1 =15.60	4	15.6	1	1.5	93.60
	S1 =3.9	1	3.9	1	1.5	5.85
	S2 =1.50	1	1.5	1	1.5	2.25
	S3 =0.50	1	0.5	1	1.5	0.75
		TOTAL QTY.				102.45
2	P.C.C Foundation:					
	L1 =15.60	4	15.6	1.5	0.3	28.08
	S1 =3.9	1	3.9	1.5	0.3	1.76
	S2 =1.50	1	1.5	1.5	0.3	0.68
	S3 =0.50	1	0.5	1.5	0.3	0.23
		TOTAL QTY.				30.74
3	Pad footing in Foundation					
STEP 1	L1 =15.20	4	15.2	0.7	0.3	12.77
STEP 2	L1 =14.95	4	14.95	0.15	1.6	14.35
STEP 1	S1 =4.6	1	4.55	0.7	0.3	0.96
STEP 2	S1 =4.80	1	4.8	0.15	1.6	1.15
STEP 1	S2 =1.90	1	1.9	0.7	0.3	0.40
STEP 2	S2 =2.15	1	2.15	0.15	1.6	0.52
STEP 1	S3 =0.90	1	0.9	0.7	0.3	0.19
STEP 2	S3 =1.15	1	1.15	0.15	1.6	0.28
		TOTAL QTY.				30.61
4	Brickwork in S.S					
	L1 =15.60	4	15.6	0.15	3.2	29.95
	S1 =3.9	1	3.9	0.15	3.2	1.87

	S2 =1.50	1	1.5	0.15	3.2	0.72
	S3 =0.50	1	0.5	0.15	3.2	0.24
					TOTAL QTY.	32.78
5	Staircase Qty					
	L1 =4.70	1	4.7	0.6	0.15	0.42
	L1 =4.70	1	4.7	0.3	0.15	0.21
					TOTAL QTY.	0.63
6	Deducation for D & W					
	D1	1	0.7	0.15	2.1	0.22
	V1	1	0.9	0.15	0.15	0.02
					TOTAL QTY.	0.24
7	Deducation for D & W					
	D1	1	0.7	0.15	0.12	0.01
	V1	1	0.9	0.15	0.12	0.02
					TOTAL QTY.	0.03
					NET QTY.	32.51
8	R.C.C Slab & Chaaja					
	R.C.C Chaaja					
	D1	1	0.7	0.6	0.12	0.05
	V1	1	0.9	0.6	0.12	0.06
					TOTAL QTY.	0.12
9	Plaster inside					
	TOILET	2	2.4		3	14.40
		2	1.3		3	7.80
					TOTAL QTY.	22.20
10	Deducation D & W					
	D1	2	0.7		2.1	2.94
	V1	2	0.9		0.15	0.27
					TOTAL QTY.	3.21
					NET QTY.	18.99

- **Abstactsheet of Cemetery:**

Abstract Sheet					
Sr. No.	**Item Description**	**QTY.**	**Rate**	**Per**	**Amount (Rs.)**
1	Earthwork in excavation in foundation	102.5 CUM	90	CU.M	9220.5
2	P.C.C foundation	30.3 CUM	2700	CU.M	81918
3	Pad Footing Upto Plinth	30.6 CUM	3500	CU.M	107135
4	Brick work for S.S	32.5 SQ.M	150	SQ.M	4872
5	R.C.C Slab & Chajja	0.1 CUM	150	SQ.M	18
6	Staircase Qty	0.6 CUM	5	SQ.M	3.15
7	Smooth plaster on inter wall	19.0 SQ.M	5	SQ.M	95
			Total Rs.		1911501.85
		Add 1.5% Water Charge			28673
		Add 10% con.Charge			19115.0185
		Total Estimate Cost in Rs.			19,59,289

13.1.4 Design of Public Toilet:



ELEVATION

F-13.7 Elevation of Public Toilet

GROUND FLOOR PLAN

F-13.8 Plan of Public Toilet

- **Estimation of Public Toilet:**

BUILDING ESTIMATE						
QUANTITY SHEET						
Sr. No.	**Item Description**	**No.**	**Length (m)**	**Widht/ Breadth (m)**	**Height/ Depth (m)**	**Quantity (CU.M)**
1	Earthwork in Excavation in Foundation:					
	L1 =9.70	4	9.7	1	1.5	58.20
	L2 =8.30	4	8.3	1	1.5	49.80
	S1 =0.7	1	0.7	1	1.5	1.05
	S2 =4.20	1	4.2	1	1.5	6.30
	S3 =5.50	1	5.5	1	1.5	8.25
					TOTAL QTY.	123.60
2	P.C.C Foundation:					
	L1 =9.70	4	9.7	1	0.3	11.64
	L2 =8.30	4	8.3	1	0.3	9.96
	S1 =0.7	1	0.7	1	0.3	0.21
	S2 =4.20	1	4.2	1	0.3	1.26
	S3 =5.50	1	5.5	1	0.3	1.65
					TOTAL QTY.	24.72
3	Pad footing in Foundation					
STEP 1	L1 =9.40	4	9.4	0.7	0.3	7.90
STEP 2	L1 =9.25	4	9.25	0.15	1.6	8.88
STEP 1	L2 =8.00	1	8	0.7	0.3	1.68
STEP 2	L2 =7.85	1	7.85	0.15	1.6	1.88
STEP 1	S1 =1.0	1	1	0.7	0.3	0.21
STEP 2	S1 =1.2	1	1.15	0.15	1.6	0.28
STEP 1	S2 =4.50	1	4.5	0.7	0.3	0.95
STEP 2	S2 =4.65	1	4.65	0.15	1.6	1.12
STEP 1	S3 =5.80	1	5.8	0.7	0.3	1.22
STEP 2	S3 =5.95	1	5.95	0.15	1.6	1.43
					TOTAL QTY.	25.53
4	Brickwork in S.S					

	L1 =9.70	4	9.7	0.12	3.2	14.90
	L2 =8.30	4	8.3	0.12	3.2	12.75
	S1 =0.7	1	0.7	0.12	3.2	0.27
	S2 =4.20	1	4.2	0.12	3.2	1.61
	S3 =5.50	1	5.5	0.12	3.2	2.11
					TOTAL QTY.	31.64
5	Staircase Qty					
	L1 =3.39	1	3.39	0.6	0.15	0.31
	L1 =3.39	1	3.39	0.3	0.15	0.15
	STAGE STAIRCASE					
	L1 =1.85	1	1.85	0.6	0.15	0.17
	L1 =1.85	1	1.85	0.3	0.15	0.08
					TOTAL QTY.	0.71
6	Deducation for D & W					
	V1	9	0.5	0.12	0.8	0.43
					TOTAL QTY.	0.43
	Deducation for Lintels above D&W					
	V1	9	0.8	0.12	0.15	0.13
					TOTAL QTY.	0.13
					NET QTY.	31.08
7	RCC WORK IN SLAB/CHJJA					
	L=8.8M	1	8.8	7.5	0.15	9.90
	B=7.5M					
	V1	9	0.8	0.6	0.12	0.52
					TOTAL QTY.	10.42
8	Plaster inside					
	ENTRY AREA	2	3.8		3.2	24.32
		2	2.4		3.2	15.36
	WASH BASIN AREA	2	3		3.2	19.20
		2	2		3.2	12.80
	1.0 WIDE	2	1		3.2	6.40
		2	2.2		3.2	14.08

	F.BATH	2	1.5		3.2	9.60
		2	3.8		3.2	24.32
	F.TOILET	2	2.8		3.2	17.92
		2	1.5		3.2	9.60
	TOILET	8	0.85		3.2	21.76
		8	1.6		3.2	40.96
	M.TOILET	2	1.8		3.2	11.52
		2	1.1		3.2	7.04
	TOILET_1	4	0.85		3.2	10.88
		4	1.7		3.2	21.76
	STORE ROOM	2	1.5		3.2	9.60
		2	1.9		3.2	12.16
	F.BATH	2	3.7		3.2	23.68
		2	1.6		3.2	10.24
	WASH BASIN	2	2		3.2	12.80
		2	3.1		3.2	19.84
					TOTAL QTY.	355.84
7(i)	Celling Plaster					
	ENTRY AREA	1	3.8	2.4		9.12
	WASH BASIN AREA	1	3	2		6.00
	1.0 WIDE	1	1	2.2		2.20
	F.BATH	1	1.5	3.8		5.70
	F.TOILET	1	2.8	1.5		4.20
	TOILET	1	0.85	1.7		1.45
	M.TOILET	2	1.8	1.1		3.96
	TOILET 1	5	0.85	1.7		7.23
	STORE ROOM	1	1.5	1.9		2.85
	F.BATH	1	3.7	1.6		5.92
	WASH BASIN	1	2	3.1		6.20
					TOTAL QTY.	54.82
	DEDUCTION D& F					
	V1	2	0.8	0.6	0.12	0.12
					TOTAL QTY.	0.12
					NET QTY.	410.55

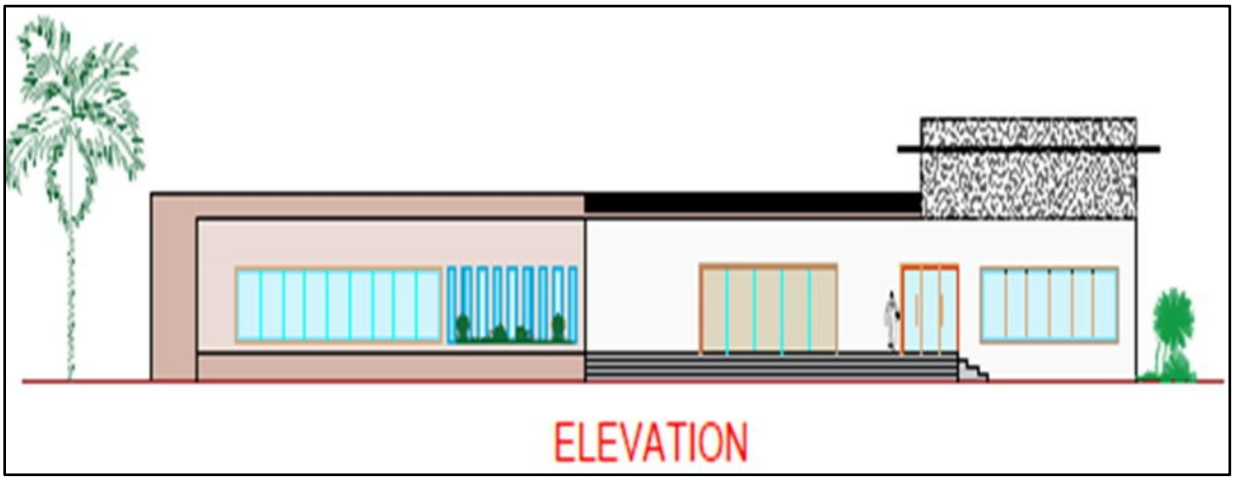
	Store	2	2.3		3.5	16.10
		2	1.8		3.5	12.60
	Toilet M & F	4	2.1		3.5	29.40
		4	1.5		3.5	21.00
	Lobby	2	2.3		3.5	16.10
		2	1.8		3.5	12.60
	Store	2	2.3		3.5	16.10
		2	1.8		3.5	12.60
	S.O	2	3.3		3.5	23.10
		2	4.8		3.5	33.60
	Toilet	2	1.2		3.5	8.40
		2	1.2		3.5	8.40
				NET QTY.(m2)		1199.70
	Ceiling Plaster					
	Entry	1	8.7	2.1		18.27
	Mech & Ele.	1	4.8	3.9		18.72
	Toilet M & F	1	2.4	1.2		2.88
	Urinary	1	2.4	2.2		5.28
	Toilet_1	1	4.3	1.5		6.45
	C.D.O	1	4.2	4.8		20.16
	G.R.R	1	4.8	3.9		18.72
	Toilet M & F	1	2.4	1.2		2.88
	Marketing Office &	1	3.7	4.2		15.54
	Accouting Office	1	3.7	4.2		15.54
	Cleck	1	3.1	3.4		10.54
	Toilet_2	1	1.8	3.2		5.76
	F.M.O	1	4.8	4.8		23.04
	Reception	1	4.8	3.1		14.88
	Setting Area	1	9.8	4.9		48.02
	Kichten	1	3	4.8		14.40
	Store	1	2.3	1.8		4.14
	Toilet M & F	1	2.1	1.5		3.15
	Lobby	1	2.3	1.8		4.14
	Store	1	2.3	1.8		4.14
	S.O	1	3.3	4.8		15.84

	Toilet	1	1.2	1.2		1.44
					TOTAL QTY.	1473.63
	Deducation for Door Window					
	D1	2.5	1.8		2.6	11.70
	D2	2	2.7		2.6	14.04
	D3	1	0.9		2.6	2.34
	D4	2	0.75		2.6	3.90
	D5	2	1.5		2.6	7.80
	W1	2	0.6		2.6	3.12
	W2	2.5	1.5		1.8	6.75
	W3	2	0.9		1.8	3.24
					NET QTY.(m2)	1199.70
	Parpet brick wall					
		1	259.36	0.3	1.5	116.71
					TOTAL QTY	116.71

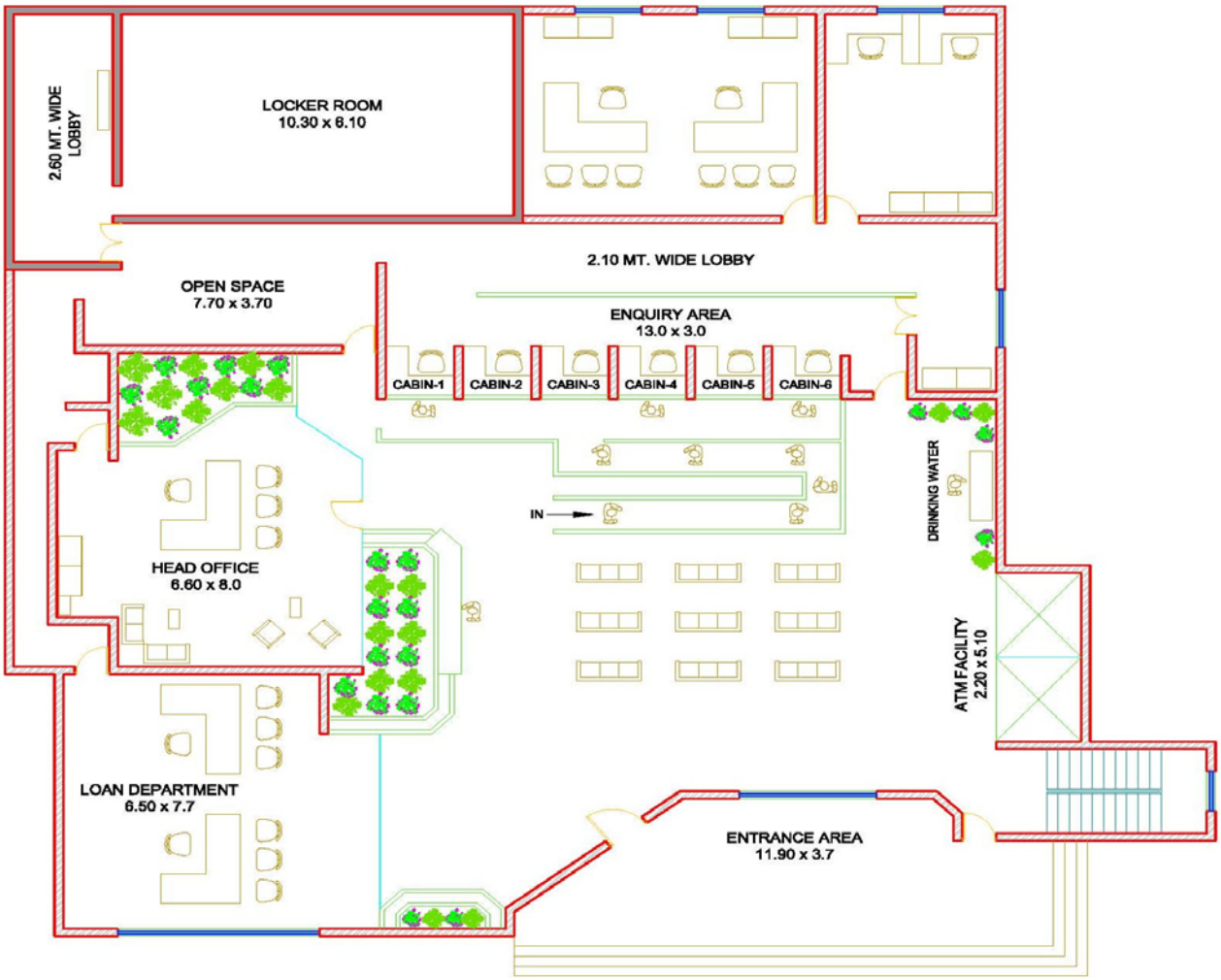
- **Abstract Sheet of Public Toilet:**

Abstract Sheet					
Sr. No.	**Item Description**	**QTY.**	**Rate**	**Per**	**Amount (Rs.)**
1	Earthwork in excavation in foundation	123.3 CUM	90	CU.M	11097
2	P.C.C foundation	24.7 CUM	2700	CU.M	66744
3	Pad Footing Upto Plinth	25.5 CUM	3500	CU.M	89355
4	Brick work for S.S	31.6 SQ.M	150	SQ.M	4746
5	R.C.C Slab & Chajja	10.4 CUM	150	SQ.M	1563
6	smooth plaster on inter wall	410.6 SQ.M	5	SQ.M	2052.75
7	Brick work for parapet wall	12.0 CUM	5	CU.M	60
				Total Rs.	175617.75
			Add 1.5% Water Charge		2634
			Add 10% con.Charge		1756.1775
			Total Estimate Cost in Rs.		1,80,008

13.1.5 Design of Bank with ATM Service:



F-13.9 Elevation of Bank with ATM Service



F-13.10 Plan of Bank with ATM Service

- **Estimation of Bank with ATM Service:**

BUILDING ESTIMATION						
QUANTITY SHEET						
Sr. No.	**Item Description**	**No.**	**Length (m)**	**Widht/ Breadth (m)**	**Height/ Depth (m)**	**Quantity(CU.M)**
1	Earthwork in Excavation in Foundation:					
	L1 =29.00	3	29	1	1.5	130.5
	L2 =26.68	7	26.68	1	1.5	280.14
	S1 =20.4	1	20.36	1	1.5	30.54
	S2 =12.02	1	12.02	1	1.5	18.03
	S3 =6.30	1	6.3	1	1.5	9.45
		TOTAL QTY.				468.66
2	P.C.C Foundation:					
	L1 =29.00	3	29	1	0.3	26.1
	L2 =26.68	7	26.68	1	0.3	5.60
	S1 =20.4	1	20.36	1	0.3	6.11
	S2 =12.02	1	12.02	1	0.3	3.61
	S3 =6.30	1	6.3	1	0.3	1.89
		TOTAL QTY.				43.31
3	Pad footing in Foundation					
STEP1	L1 =28.70	3	28.7	0.7	0.3	18.08
STEP2	L1 =28.20	3	28.2	0.2	1.6	9.02
STEP1	L2 =26.40	7	26.4	0.7	0.3	38.81
STEP2	L2 =25.90	7	25.9	0.2	1.6	58.02
STEP1	S1 =20.7	1	20.7	0.7	0.3	4.35
STEP2	S1 =21.7	1	21.7	0.2	1.6	6.94
STEP1	S2 =12.30	1	12.3	0.7	0.3	2.58
STEP2	S2 =12.80	1	12.8	0.2	1.6	4.10
STEP1	S3 =6.60	1	6.6	0.7	0.3	1.39
STEP2	S3 =7.10	1	7.1	0.2	1.6	2.27
		TOTAL QTY.				163.56

4	Brickwork in S.S					
	L1 =29.00	3	29	0.2	3.2	55.68
	L2 =26.68	7	26.68	0.2	3.2	119.53
	S1 =20.4	1	20.36	0.2	3.2	13.03
	S2 =12.02	1	12.02	0.2	3.2	7.69
	S3 =6.30	1	6.3	0.2	3.2	4.03
					TOTAL QTY.	199.10
5	Staircase Qty.					
STEP1	L1 =11.90	1	11.9	0.9	0.15	1.61
STEP2	L1 =11.90	1	11.9	0.6	0.15	10.71
STEP3	L1 =11.90	1	11.9	0.3	0.15	5.36
	SEC. LELVEL					
STEP1	L1 = 1.50	1	1.5	0.9	0.15	0.20
STEP2	L1=1.5	1	1.5	0.6	0.15	0.14
STEP3	L1 =1.50	1	1.5	0.3	0.15	0.07
					TOTAL QTY.	18.09
6	Deducation for D & W					
	W1	1	10.29	0.2	1.6	3.29
	W2	3	4.4	0.2	1.6	4.22
	W3	1	0.6	0.2	1.6	0.19
	W4	1	6.06	0.2	1.6	1.94
	W5	1	1.09	0.2	1.09	0.24
	W6	1	2.2	0.2	1.6	0.70
	D1	1	1.8	0.2	1.8	0.65
	D2	1	2	0.2	1.8	0.72
	D3	7	0.9	0.2	1.8	2.27
	D4	2	1.8	0.2	1.8	1.30
	D5	1	1.1	0.2	1.8	0.40
					TOTAL QTY.	15.92
	Deducation for Lintels above D&W					
	W1	1	10.44	0.2	0.15	0.31
	W2	3	4.55	0.2	0.15	0.41

	W3	1	0.75	0.2	0.15	0.02
	W4	1	6.21	0.2	0.15	0.19
	W5	1	1.24	0.2	0.15	0.04
	W6	1	2.35	0.2	0.15	0.07
	D1	1	1.95	0.2	0.15	0.06
	D2	1	2.15	0.2	0.15	0.06
	D3	7	1.05	0.2	0.15	0.22
	D4	2	1.95	0.2	0.15	0.12
	D5	1	1.25	0.2	0.15	0.04
					TOTAL QTY.	1.54
					NET QTY.	182.80
7	Plaster inside					
	ENTRY AREA	2	11.9		3.2	76.16
		2	3.7		3.2	23.68
	LOAN DEP.	2	6.5		3.2	41.60
		2	7.7		3.2	49.28
	HEAD OFFICE	2	6.4		3.2	40.96
		2	9.5		3.2	60.80
	O.S	2	7.7		3.2	49.28
		2	3.7		3.2	23.68
	EQUREY AREA	2	13.9		3.2	88.96
		2	3		3.2	19.20
	LOBBY 2.6M	2	8.1		3.2	51.84
		2	2.6		3.2	16.64
	LOKAR ROOM	2	10.3		3.2	65.92
		2	6.1		3.2	39.04
	CON. OFFICE	2	7.7		3.2	49.28
		2	6.1		3.2	39.04
	DEPOST	2	4.5		3.5	31.50
		2	6.1		3.5	42.70
	2.0 WIDE	2	16.31		3.5	114.17
		2	2.1		3.5	14.70
					TOTAL QTY.	938.43
	Celling Plaster					
	ENTRY AREA	1	11.9	3.7		44.03
	LOAN DEP.	1	6.5	7.7		50.05

	HEAD OFFICE	1	6.4	9.5		60.80
	O.S	1	7.7	3.7		28.49
	EQUREY AREA	1	13.9	3		41.70
	LOBBY 2.6M	1	8.1	2.6		21.06
	LOKAR ROOM	1	10.3	6.1		62.83
	CON. OFFICE	1	7.7	6.1		46.97
	DEPOSIT	1	4.5	6.1		27.45
	2.0 WIDE	1	16.31	2.1		34.25
					TOTAL QTY.	417.63
	DEDUCTION D& F					
	W1	1	10.29		1.6	16.46
	W2	2	4.4		1.6	14.08
	W3	1	0.6		1.6	0.96
	W4	4	6.06		1.6	38.78
	W5	2	1.09		1.09	2.38
	W6	3	2.2		1.6	10.56
	D1	5	1.8		1.8	16.20
	D2	1	2		1.8	0.36
	D3	2	0.9		1.8	0.32
	D4	1	1.8		1.8	3.24
	D5	1	1.1		1.8	1.98
					TOTAL QTY.	111.48
					NET QTY.	409.31
	Store	2	2.3		3.5	16.1
		2	1.8		3.5	12.6
	Toilet M & F	4	2.1		3.5	29.4
		4	1.5		3.5	42
	Lobby	2	2.3		3.5	32.2
		2	1.8		3.5	12.6
	Store	2	2.3		3.5	16.1
		2	1.8		3.5	12.6
	S.O	2	3.3		3.5	23.1
		2	4.8		3.5	33.6
	Toilet	2	1.2		3.5	8.4
		2	1.2		3.5	8.4

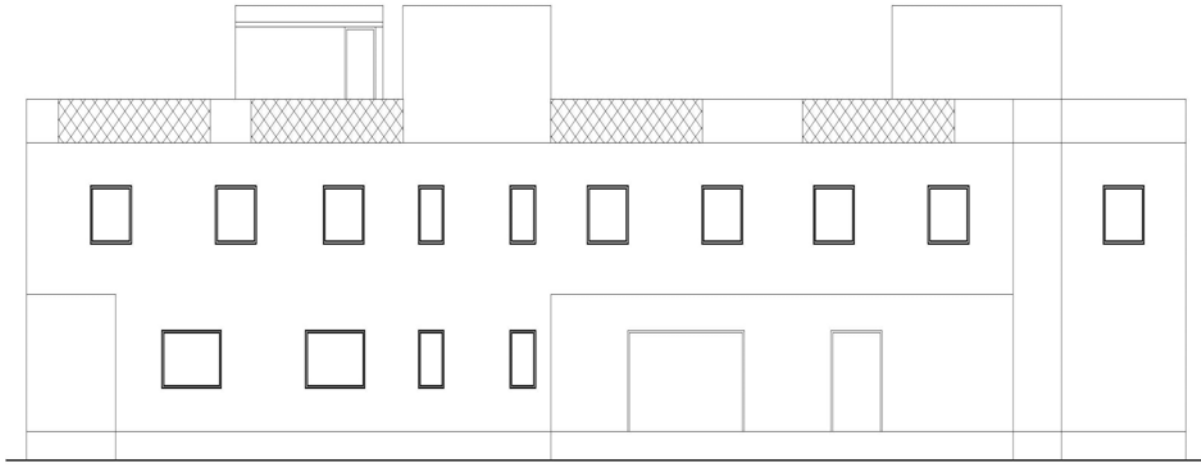
				NET QTY.(m2)		247.1
8	Ceiling Plaster					
	Entry	1	8.7	2.1	18.27	333.79
	Mech & Ele.	1	4.8	3.9	18.72	350.43
	Toilet M & F	1	2.4	1.2	2.88	8.29
	Urinary	1	2.4	2.2	5.28	2.79
	Toilet_1	1	4.3	1.5	6.45	41.60
	C.D.O	1	4.2	4.8	20.16	406.43
	G.R.R	1	4.8	3.9	18.72	350.43
	Toilet M & F	1	2.4	1.2	2.88	8.29
	Marketing Office & Accouting Office	1	3.7	4.2	15.54	241.49
		1	3.7	4.2	15.54	241.49
	Cleck	1	3.1	3.4	10.54	111.09
	Toilet_2	1	1.8	3.2	5.76	33.18
	F.M.O	1	4.8	4.8	23.04	530.84
	Reception	1	4.8	3.1	14.88	221.41
	Setting Area	1	9.8	4.9	48.02	2305.92
	Kichten	1	3	4.8	14.4	207.36
	Store	1	2.3	1.8	4.14	17.14
	Toilet M & F	1	2.1	1.5	3.15	9.92
	Lobby	1	2.3	1.8	4.14	17.14
	Store	1	2.3	1.8	4.14	17.14
	S.O	1	3.3	4.8	15.84	250.91
	Toilet	1	1.2	1.2	1.44	2.70
					TOTAL QTY.	5697.31
	Deducation for Door & Window					
	D1	2.5	1.8		2.6	11.7
	D2	2	2.7		2.6	14.04
	D3	1	0.9		2.6	2.34
	D4	2	0.75		2.6	3.9
	D5	2	1.5		2.6	7.8
	W1	2	0.6		2.6	3.12
	W2	2.5	1.5		1.8	6.75
	W3	2	0.9		1.8	3.24
				NET QTY.(m2)		409.1

	Parpet brick wall	1	259.36	0.3	1.5	116.71
					TOTAL QTY	116.71

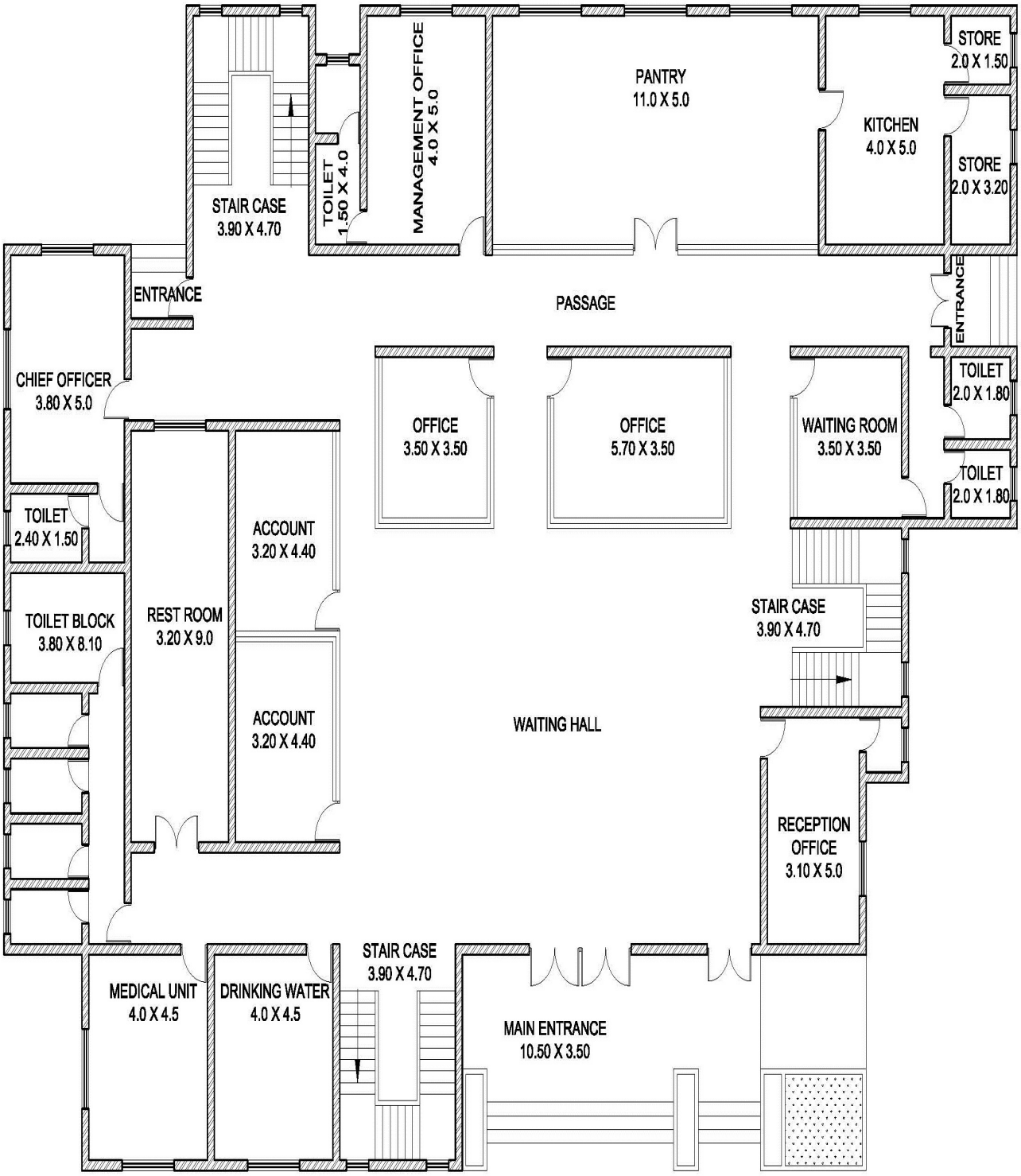
- **Abstract Sheet of Bank with ATM Service:**

Abstract Sheet					
Sr. No.	**Item Description**	**QTY.**	**Rate**	**Per**	**Amount (Rs.)**
1	Earthwork in excavation in foundation	468.7 CUM	90	CU.M	42179.4
2	P.C.C foundation	93.7 CUM	2700	CU.M	253071
3	Pad Footing Upto Plinth	163.5 CUM	3500	CU.M	572250
4	Brick work for S.S	199.1 SQ.M	150	SQ.M	29859
5	R.C.C Slab & Chajja	0.6 CUM	150	SQ.M	88.5
6	Staircase Qty	3.6 CUM	5	SQ.M	18
7	smooth plaster on inter wall	409.1 SQ.M	5	SQ.M	2045.55
8	Brick work for parapet wall	10.0 CUM	5	CU.M	50
			Total Rs.		899561.45
		Add 1.5% Water Charge			13493
		Add 10% con.Charge			8995.6145
		Total Estimate Cost in Rs.			9,22,050

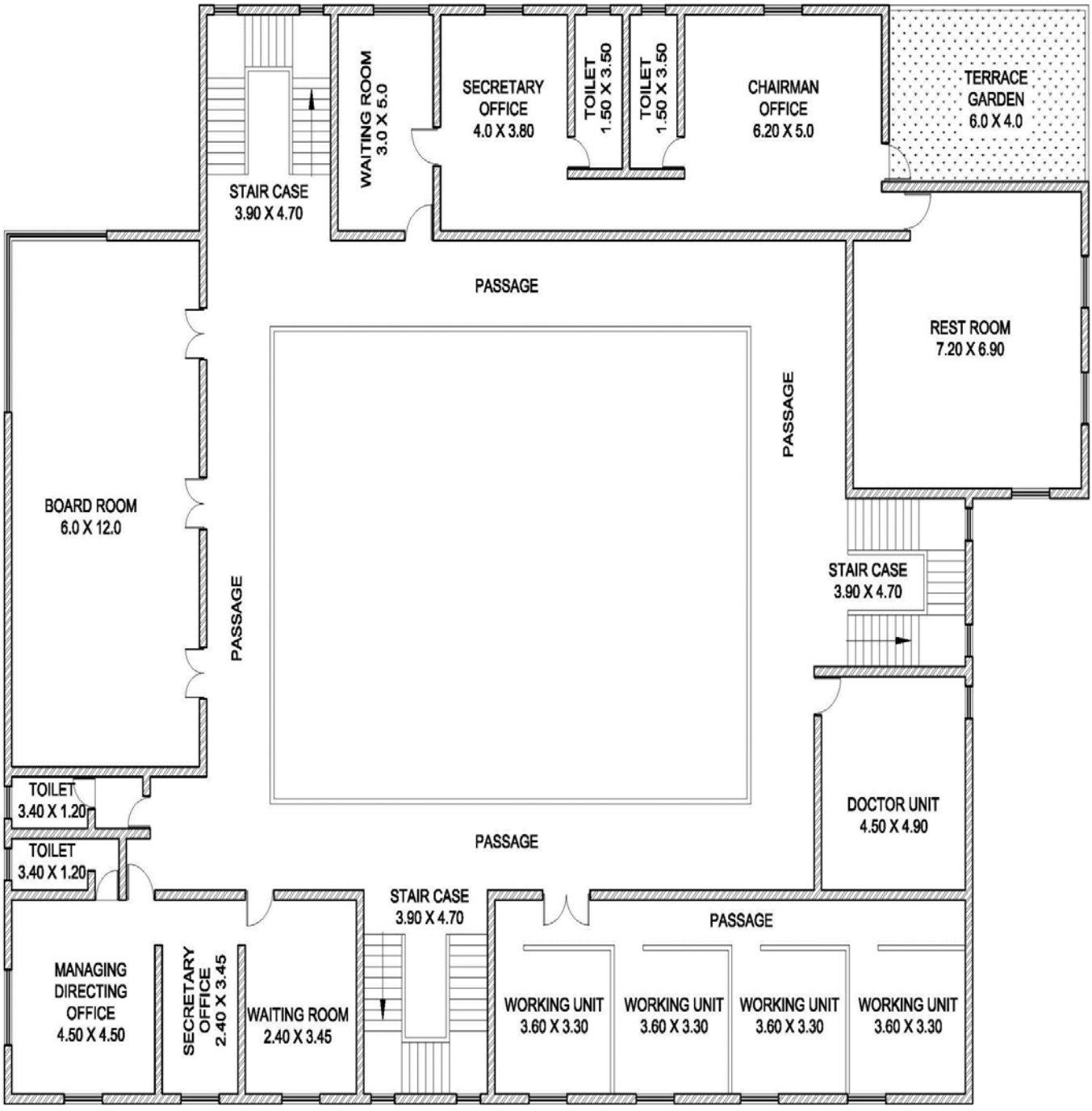
13.1.6 Design of Citizen Service Center:



F-13.11 Elevation of Citizen Service center



F-13.12 Ground floor plan of Citizen Service center



F-13.13 First floor plan of Citizen Service center

- **Estimation of Citizen Service Center:**

BUILDING ESTIMATE						
QUANTITY SHEET						
Sr. No.	**Item Description**	**No.**	**Length (m)**	**Widht/ Breadth (m)**	**Height/ Depth (m)**	**Quantity(CU.M)**
1	Earthwork in Excavation in Foundation:					
	L1 =30	4	32	1	1.1	140.80
	L2 =25.95	5	25.95	1	1.1	142.73
	S1 =5.4	6	5.4	1	1.1	35.64
	S2 =6	2	6	1	1.1	13.20
	S3 =21	1	21	1	1.1	23.10
	S4 =5	1	5	1	1.1	5.50
	S5 =9	1	9	1	1.1	9.90
	S6 =5.30	1	5.3	1	1.1	5.83
	S7 =4.70	1	4.7	1	1.1	5.17
	S8 =4.40	1	4.4	1	1.1	4.84
	S9 =3.30	1	3.3	1	1.1	3.63
	S10 =3.00	2	3	1	1.1	6.60
					TOTAL QTY.	396.94
2	Pad Footing Upto Plinth Foundation:					
	L1 =29.50	4	29.5	0.5	0.3	17.70
	L2 =25.49	5	25.4	0.5	0.3	19.05
	S1 =5.9	6	5.9	0.5	0.3	5.31
	S2 =6.5	2	6.5	0.5	0.3	1.95
	S3 =21.5	1	21.5	0.5	0.3	3.23
	S4 =5.5	1	5.5	0.5	0.3	0.83
	S5 =9.5	1	9.5	0.5	0.3	1.43
	S6 =5.80	1	5.8	0.5	0.3	0.87
	S7 =5.20	1	5.2	0.5	0.3	0.78
	S8 =4.90	1	4.9	0.5	0.3	0.74
	S9 =3.80	1	3.8	0.5	0.3	0.57
	S10 =3.50	2	3.5	0.5	0.3	1.05

STEP 2	L1 =28.55	4	28.55	0.225	1.2	30.83
STEP 2	L2 =24.99	5	24.99	0.225	1.2	33.74
					TOTAL QTY.	118.06
3	P.C.C Foundation:					
	L1 =30	4	32	1	0.3	38.40
	L2 =25.95	5	25.95	1	0.3	38.93
	S1 =5.4	6	5.4	1	0.3	9.72
	S2 =6	2	6	1	0.3	3.60
	S3 =21	1	21	1	0.3	6.30
	S4 =5	1	5	1	0.3	1.50
	S5 =9	1	9	1	0.3	2.70
	S6 =5.30	1	5.3	1	0.3	1.59
	S7 =4.70	1	4.7	1	0.3	1.41
	S8 =4.40	1	4.4	1	0.3	1.32
	S9 =3.30	1	3.3	1	0.3	0.99
	S10 =3.00	2	3	1	0.3	1.80
					TOTAL QTY.	108.26
4	B.B.C.C Foundation:					
	L1 =30	4	32	1	0.2	25.60
	L2 =25.95	5	25.9	1	0.2	25.90
	S1 =5.4	6	5.4	1	0.2	6.48
	S2 =6	2	6	1	0.2	2.40
	S3 =21	1	21	1	0.2	4.20
	S4 =5	1	5	1	0.2	1.00
	S5 =9	1	9	1	0.2	1.80
	S6 =5.30	1	5.3	1	0.2	1.06
	S7 =4.70	1	4.7	1	0.2	0.94
	S8 =4.40	1	4.4	1	0.2	0.88
	S9 =3.30	1	3.3	1	0.2	0.66
	S10 =3.00	2	3	1	0.2	1.20
					TOTAL QTY.	72.12
5	Brick Masonary above plinth up to slab in c.m (1:6)					
	L1 =30	4	32	0.225	4	115.20

	L2 =25.95	5	25.95	0.225	4	116.78
	S1 =5.4	6	5.4	0.225	4	29.16
	S2 =6	2	6	0.225	4	10.80
	S3 =21	1	21	0.225	4	18.90
	S4 =5	1	5	0.225	4	4.50
	S5 =9	1	9	0.225	4	8.10
	S6 =5.30	1	5.3	0.225	4	4.77
	S7 =4.70	1	4.7	0.225	4	4.23
	S8 =4.40	1	4.4	0.225	4	3.96
	S9 =3.30	1	3.3	0.225	4	2.97
	S10 =3.00	2	3	0.225	4	5.40
					TOTAL QTY.	324.77
6	Deduction for Door & Window					
	D1	1	1.8	0.225	2.6	1.05
	D2	1	2.7	0.225	2.6	1.58
	D3	18	0.9	0.225	2.6	9.48
	D4	16	0.75	0.225	2.6	7.02
	D5	2	1.5	0.225	2.6	1.76
	W1	4	0.6	0.225	2.6	1.40
	W2	10	1.5	0.225	1.8	6.08
	W3	3	0.9	0.225	1.8	1.09
	V1	9	0.6	0.225	0.6	0.73
					TOTAL QTY.	30.19
6	Deduction for Lintel Window & Door					
	D1	1	2.1	0.225	0.15	0.07
	D2	1	3	0.225	0.15	0.10
	D3	18	1.2	0.225	0.15	0.73
	D4	16	1.05	0.225	0.15	0.57
	D5	2	1.8	0.225	0.15	0.12
	W1	4	0.9	0.225	0.15	0.12
	W2	10	1.8	0.225	0.15	0.61
	W3	3	1.2	0.225	0.15	0.12
	V1	9	0.9	0.225	0.15	0.27

					TOTAL QTY.	2.71
					NET QTY.(m2)	27.48
7	1:3 Plaster for wall					
	Entry	2	8.7		3.5	60.90
		2	2.1		3.5	14.70
	Mech & Ele.	4	4.8		3.5	67.20
		4	3.9		3.5	54.60
	Toilet M & F	8	2.4		3.5	67.20
		8	1.2		3.5	33.60
	Urinary	2	2.4		3.5	16.80
		2	2.2		3.5	15.40
	Toilet_1	2	4.3		3.5	30.10
		2	1.5		3.5	10.50
	C.D.O	2	4.2		3.5	29.40
		2	4.8		3.5	33.60
	G.R.R	2	4.8		3.5	33.60
		2	3.9		3.5	27.30
	Toilet M & F	2	2.4		3.5	16.80
		2	1.2		3.5	8.40
	Marketing Office &	4	3.7		3.5	51.80
	Accouting Office	4	4.1		3.5	57.40
	Cleck	2	3.1		3.5	21.70
		2	3.4		3.5	23.80
	Toilet_2	2	1.8		3.5	12.60
		2	3.2		3.5	22.40
	F.M.O	4	4.8		3.5	67.20
	Reception	2	4.8		3.5	33.60
		2	3.1		3.5	21.70
	Setting Area	2	9.8		3.5	68.60
		2	4.9		3.5	34.30
	Kichten	2	3		3.5	21.00
		2	4.8		3.5	33.60
	Store	2	2.3		3.5	16.10
		2	1.8		3.5	12.60

	Toilet M & F	4	2.1		3.5	29.40
		4	1.5		3.5	21.00
	Lobby	2	2.3		3.5	16.10
		2	1.8		3.5	12.60
	Store	2	2.3		3.5	16.10
		2	1.8		3.5	12.60
	S.O	2	3.3		3.5	23.10
		2	4.8		3.5	33.60
	Toilet	2	1.2		3.5	8.40
		2	1.2		3.5	8.40
					NET QTY.(m2)	1199.70
	Ceiling Plaster					
	Entry	1	8.7	2.1		18.27
	Mech & Ele.	1	4.8	3.9		18.72
	Toilet M & F	1	2.4	1.2		2.88
	Urinary	1	2.4	2.2		5.28
	Toilet_1	1	4.3	1.5		6.45
	C.D.O	1	4.2	4.8		20.16
	G.R.R	1	4.8	3.9		18.72
	Toilet M & F	1	2.4	1.2		2.88
	Marketing Office &	1	3.7	4.2		15.54
	Accouting Office	1	3.7	4.2		15.54
	Cleck	1	3.1	3.4		10.54
	Toilet_2	1	1.8	3.2		5.76
	F.M.O	1	4.8	4.8		23.04
	Reception	1	4.8	3.1		14.88
	Setting Area	1	9.8	4.9		48.02
	Kichten	1	3	4.8		14.40
	Store	1	2.3	1.8		4.14
	Toilet M & F	1	2.1	1.5		3.15
	Lobby	1	2.3	1.8		4.14
	Store	1	2.3	1.8		4.14
	S.O	1	3.3	4.8		15.84
	Toilet	1	1.2	1.2		1.44
					TOTAL QTY.	1473.63

6	Deducation for Door &Window					
	D1	2.5	1.8		2.6	11.70
	D2	2	2.7		2.6	14.04
	D3	1	0.9		2.6	2.34
	D4	2	0.75		2.6	3.90
	D5	2	1.5		2.6	7.80
	W1	2	0.6		2.6	3.12
	W2	2.5	1.5		1.8	6.75
	W3	2	0.9		1.8	3.24
					NET QTY.(m2)	1199.70
6	Parpet brick wall					
		1	259.36	0.3	1.5	116.71
					TOTAL QTY	116.71

- **Abstract Sheet of Citizen service center:**

Abstract Sheet					
Sr. No.	**Item Description**	**QTY.**	**Rate**	**Per**	**Amount (Rs.)**
1	Earthwork in excavation in foundation	396.6 CUM	90	CU.M	35697.6
2	Pad Footing Upto Plinth	118.2 CUM	2700	CU.M	319140
3	P.C.C foundation	108.1 CUM	3500	CU.M	378210
4	B.B.C.C foundation	72.1 SQ.M	150	SQ.M	10818
5	smooth plaster on outer wall	1199.0 SQ.M	150	SQ.M	179850
6	paint work (white wash)	1199.0 SQ.M	5	SQ.M	5995
7	paint work on inner wall	1034.0 SQ.M	5	SQ.M	5170
8	Brick work for parapet wall	116.1 CUM	3500	CU.M	406350
			Total Rs.		1341230.6
		Add 1.5% Water Charge			20118
		Add 10% con.Charge			13412.306
		Total Estimate Cost in Rs.			13,74,761

13.1.7 Electric Design 1: Energy-Efficient Street Lightning System

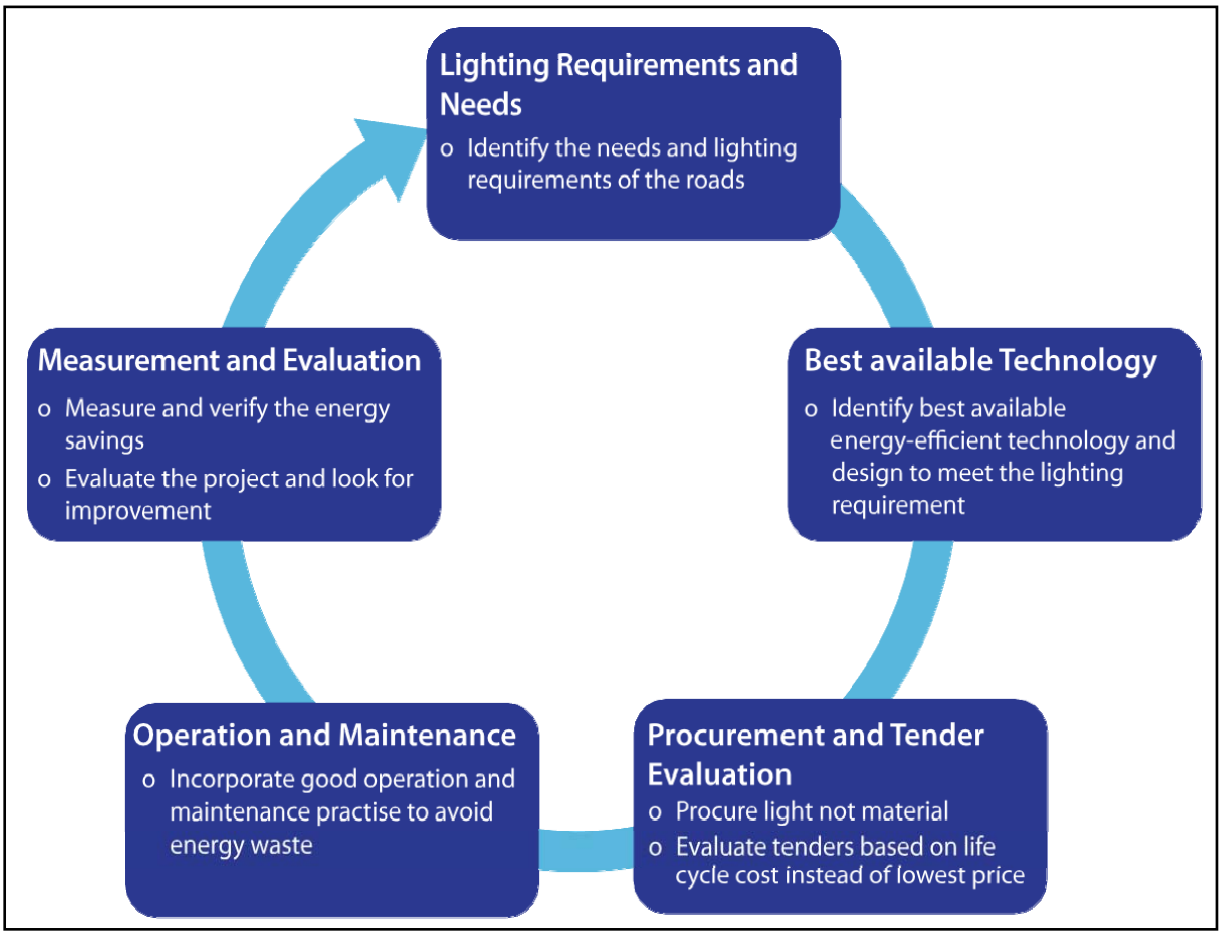
Energy-efficient street lighting projects have several stages.

In the last few years, technological advancements in lighting systems that consist of one or more components:

- Low loss ballasts
- Constant wattage high intensity electronic ballasts
- Energy-efficient luminaires

Guidance for lighting of public streets, roads, and highways is provided in the Indian Standard (BIS, 1981). The most common reasons for inefficient street lighting systems in municipalities are:

- Selection of inefficient luminaires
- Poor design and installation
- Lack of expense
- Poor power quality
- Poor operation and maintenance practices



F-13.14 Energy-efficient Street Lighting Project Cycle

- **Technical Assessment of Street Lighting Technologies for Energy: Efficiency:**

Lighting components can be grouped based on their functions. They are generally described as the structural systems, electrical systems, and optical systems. The items covered include:

Structural:

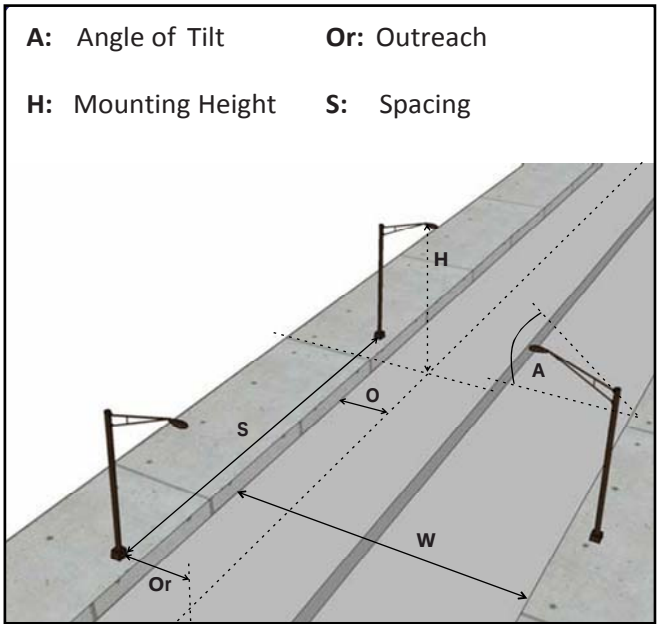
- Poles
- Pole Bases (foundations)

Optical:

- Luminaires

Electrical:

- Lamps
- Ballasts
- Service Cabinets (fuse box)



F-13.15 Street Lighting Features

All systems should be designed to minimize life-cycle cost, while meeting lighting requirements (e.g., minimum illuminance requirements to ensure proper functioning and safety of users). To achieve an effective energy- efficient design, it is essential to select the proper lamp/ ballast combination that produces high lumens per watt together with fixtures that meet design requirements and minimize glare, light trespass, and light pollution.

Lamp Technology:

The most important element of the illumination system is the light source. It is the principal determinant of the visual quality, cost, and energy efficiency aspects of the illumination system. An electric light source is a device, which transforms electrical energy, or power (in watts), into visible electromagnetic radiation, or light (lumens). The rate of converting electrical energy into visible light is called "luminous efficacy" and is measured in lumens per watt.

Type of Lamp	Luminous Efficacy (lm/W)	Color Rendering Properties	Lamp life in hrs	Remarks
High Pressure Mercury Vapor (MV)	35 - 65	Fair	10,000 -15,000	High energy use, poor lamp life
Metal Halide (MH)	70 - 130	Excellent	8,000 - 12,000	High luminous efficacy, poor lamp life

High Pressure Sodium Vapor (HPSV)	50 - 150	Fair	15,000-24,000	Energy-efficient, poor color rendering
Low Pressure Sodium Vapor	100 - 190	Very Poor	18,000-24,000	Energy-efficient, very poor color rendering
Low Pressure Mercury Fluorescent Tubular Lamp (T12 &T8)	30 - 90	Good	5,000-10,000	Poor lamp life, medium energy use, only available in low wattages
Energy-efficient Fluorescent Tubular Lamp (T5)	100 - 120	Very Good	15,000-20,000	Energy-efficient, long lamp life, only available in low wattages
Light Emitting Diode (LED)	70 - 160	Good	40,000-90,000	High energy savings, low maintenance, long life, no mercury. High investment cost, nascent technology

T-13.1 Lamp Technology

Luminaires:

Lighting energy efficiency is a function of both the light source (the light "bulb" or lamp) and the fixture, including necessary controls, power supplies, other electronics, and optical elements. These are important to ensure luminaire efficiency and cutoff and glare control, to guarantee the right level of lighting while avoiding light pollution.

Section	Overall length 11 m + 25 mm (base plate)			Overall length 9.5 m +25 mm (base plate)		
	Outside Dia. (mm)	Thickness (mm)	Length (mm)	Outside Dia. (mm)	Thickness (mm)	Length (mm)
Bottom section	139.7	4.85	5600	165.1	4.85	5000
Middle section	114.3	4.5	2700	139.7	4.5	2250
Top section	88.9	3.25	2700	114.3	3.65	2250
Planting depth	1800 mm			1800 mm		
Nominal weight of the pole	160 kg			147 kg		

Tolerance on mean weight for bulk supply is 7.5 % Tolerance for single pole weight is 10%

T-13.2 Specifications for Street Lighting Poles (BIS, 1981)

Group	Recommended Mounting Height
A	9 to 10 meters
B	7.5 to 9 meters
Others (roads bordered by trees)	Less than 7.5 meters

T-13.3 Mounting of luminaries

T-13.4 Recommended Levels of Illumination (BIS, 1981)

Type of Road	Road Characteristics	Average Level of Illumination on Road Surface in Lux	Ratio of Minimum/ Average Illumination	Type of Luminaire Preferred
A-1	Important traffic routes carrying fast traffic	30	0.4	Cutoff
A-2	Main roads carrying mixed traffic like city main roads/streets, arterial roads, throughways	15	0.4	Cutoff
B-1	Secondary roads with considerable traffic like local traffic routes, shopping streets	8	0.3	Cutoff or semi-cutoff
B-2	Secondary roads with light traffic	4	0.3	Cutoff or semi-cutoff

Lamp		Application	Desired Illumination (Lux)	Mounting height (m)	Width of road (m)	Spacing between poles (m)	Uniformity ratio	Angle of tilt (degree)	Over hang (m)
Watt	Lamp output	Residential	6	6	8	30	0.24	5	0.8

70 w	5800 lumens	Shopping street/road	10	6	6	25	0.38	5	0.8
		Factory road	15	6	6	17	0.53	5	0.8
150 w	14000 lumens	Factory road							
250 w	27000 lumens		30	10	15	30	0.42	15	2.0

T-13.5 Best Practices for HPSV

M&V Options:

M&V of savings can be calculated by following the IPMVP guidelines (Efficiency Valuation Organization, 2007). The IPMVP is the culmination of many years of development of M&V concepts and methodologies through the cooperation of international experts and practitioners. There are two basic methods for calculating savings: the retrofit isolation method and the whole facility method, and each method can be further sub-divided into two sub- options (Options A and B for retrofit isolation method and Options C and D for whole-facility method). Options A, B and C are outlined below (as Option D – Calibrated Simulation, is not suitable for this application).

The appropriate method is selected based on the needs of the utility. If an assessment of a particular retrofit is to be done, then the retrofit isolation method should be used. On the other hand, if the total energy use is to be determined, the whole facility method should be selected. The following section describes the methods and options.

Type of Lamp	Luminous Efficacy	Color Rendering Properties	Lamp Life in Hours	Remarks	Installed Cost [Only Lamp + Luminaire Supply]	Annual Energy Cost	Annual Operating Cost	Total Annualized Cost [Energy Cost + Operating Cost]
	(lm/W)				(INR)	(INR)	(INR)	(INR)
High Pressure Mercury Vapor(MV)	35-65 lm/W	Fair	5,000	High energy use, poorlamp life	465,800	805,920	43,625	849,545
Metal Halide (MH)	70-130 lm/W	Excellent	8,000	High luminous efficacy,poor lamp life	2,449,615	464,954	77,703	542,657
High Pressure Sodium Vapor (HPSV)	50-150 lm/W	Fair	15,000	Energy-efficient, poorcolor rendering	1,750,286	345,394	10,512	355,906
Low Pressure Sodium Vapor	100-190 lm/W	Very Poor	15,000	Energy-efficient, verypoor color rendering	1,370,400	394,200	119,837	514,037

Low Pressure Mercury Fluorescent Tubular Lamp(T12 &T8)	**30-90 lm/W**	**Good**	**5,000**	**Poor lamp life, medium energy use, only available in low wattages**	**390,857**	**550,629**	**36,041**	**586,670**
Energy-efficient Fluorescent Tubular Lamp (T5)	**100-120 lm/W**	**Very Good**	**5,000**	**High luminous efficacy,only available in low wattages**	**510,000**	**474,500**	**105,120**	**579,620**
Light Emitting Diode (LED)	**70-160 lm/W**	**Good**	**50,000**	**High energy savings, low maintenance, long life, no mercury. High investment cost, nascenttechnology**	**6,000,000**	**372,300**	**0 [incon-sequentia l]**	**372,300**

T-13.6 Cost information for India – Various EE Street Lighting Technologies

Retrofit Isolation Method:

Option A – Key Parameter Measurement:

This option only measures the key parameter/s used in the energy computation. It is most applicable when operation conditions are either constant (operating hours can be estimated based on historical patterns of use) or variable (where measurement of operating hours will have to be done on site) and it is possible to assume parameters with a level of certainty that is acceptable to all parties. Savings are typically determined by field measurement of the key performance parameter (s) which define the energy use of the system affected by the energy conservation measure (ECM). The frequency of measurement ranges from short-term to continuous, depending on the expected variations in the measured parameter, and the length of the reporting period.

Example: The type of lamp fitting in a lighting installa- tion is changed to a more efficient type while maintaining the same quality of lighting. Energy savings are determined by measuring the energy used by the old and new lighting systems. However the numbers of hours of use may have to be stipulated if the lights are controlled manually. In this case only performance (power drawn by the lighting circuit which was upgraded and in some cases lighting level mea- surements before and after the project implementation) is measured while operation is stipulated.

$$\mathbf{kWh(Savings)} = (\mathrm{kW_{Pre}} - \mathrm{kW_{Post}}) * \mathrm{hours}$$

In this case, the energy savings are achieved by reducing the installed lighting demand.

Option B-All Parameter Measurement:

This option is used for a single ECM where all factors governing energy use are included. Here, both the performance and the operation should be monitored and measured. Savings are determined by field measurement of the energy use of the system under consideration. The savings are verified by engineering calculations using short-term or continuous measurements, depending on the expected variations in the savings and the length of the reporting period.

Example: In the example above, if automatic lighting controls are included there is no point in stipulating hours of operation, as that would not allow measurement of the impact of the controls. Therefore, total consumption before and after the ECM should be measured and compared.

Examples for routine adjustments include agreed burn out, and switching on and off time. Non-routine adjustments include an increase in the agreed burn out, additional load, change of wattage, non-functioning of timers or controls, and unauthorized tapping of power.

Whole Facility Method:

Option C – Whole Facility

This option is used for either a single ECM or multiple ECMs within a whole facility or complete street lighting installation. Savings are determined by measuring energy use at the whole-facility or sub-facility level. Continuous measurements of the entire facility's energy use are taken throughout the reporting period. Both baseline and reporting period data are needed for the calculation using this option. Energy use should be measured by utility meters for 12 months of the base year and continuously throughout the post-retrofit period.The actual measured consumption in the post-retrofit period is compared with an estimate of what the consumption would have been, in the post-retrofit period, without the ECM. The post- retrofit savings are the difference between the estimated "baseline energy use" in the post-retrofit period and the actual energy measured in the post-retrofit period.

Example: An entire street lighting system is retrofitted with various ECMs including lighting retrofits (replace- ments of lights and fixtures), a power conditioning unit, a dimming mechanism, and supervisory control and data acquisition (SCADA) systems.

$$\mathbf{kWh(Savings)} = (\mathrm{kW}) * (\mathrm{hrs_{Pre}} - \mathrm{hrs_{Post}}) \pm \mathrm{Adjustments}$$

In this case the ECMs may have individual contributions to the total savings and may also interact with other ECMs (e.g., reducing lighting im- pacts due to controlled voltage supply); the overall effect may therefore be difficult to determine if only individual measures are taken.

Advantages of Effective Energy- efficient Street Lighting:

- Uniformly lit roads and sidewalks

- Reduced glare and improved visibility
- Improved safety and security
- Energy savings
- Capital cost savings
- Maintenance cost savings
- Aesthetically pleasing atmosphere

13.1.8 Electric Design 1: IOT based Smart Agriculture Monitoring System

Agriculture is done in every country from ages. Agriculture is the science and art of cultivating plants. Agriculture was the key development in the rise of sedentary human civilization. Agriculture is done manually from ages. As the world is trending into new technologies and implementations it is a necessary goal to trend up with agriculture also. IOT plays a very important role in smart agriculture. IOT sensors are capable of providing information about agriculture fields. we have proposed an IOT and smart agriculture system using automation.

If the temperature goes above the level, fan starts. This all is displayed on the LCD display module. This all is also seen in IOT where it shows information of Humidity, Moisture and water level with date and time, based on per minute. Temperature can be set on a particular level, it is based on the type crops cultivated. If we want to close the water forcefully on IOT there is button given from where water pump can be forcefully stopped.

Hardware Specifications:

Arduino, GSM Modem , Wifi Modem , Temperature Sensor, Humidity Sensor , Water Sensor , Mini Exhaust Fan, Water Pump, Crystal Oscillator, Resistors, Capacitors , Transistor, Cables and Connectors , Diodes, PCB and Breadboards, LED, Transformer/Adapter, Push Buttons, Switch, IC, IC Sockets

Description of the block diagram:

The project block diagram consists of the following sub-blocks and devices:

- The **temperature sensor** measures the ambient temperature of the crop.
- The **water level sensor** measures the water level of the crop.
- **Soil moisture sensor** measures the level of moisture in the soil.
- **GSM modem** is used to send SMS notifications to the user at an interval of 5 minutes.
- The WiFi module is used to send the sensor values to the remote server via a WiFi connection and IOT protocols.
- Arduino controller communicates with the GSM modem and WiFi module, gathers data from the sensors and activates the output devices.

- Relays are used to turn on the fan as well as the water pump in order to maintain the temperature and moisture level of the crop.
- The buzzer is turned on when any of the sensor values crosses a certain threshold.

13.1.9 Electrical Design 2: Automated Irrigation System

Methodology:

The system method includes the implementation of proto-type device work robotically and controlled thru the mobile application. For the prototype format drawing up the timeline and reading related works will be step one. After looking into benefits and downsides of previous studies in the subject of an automatic irrigation system, we can start implementing the layout and automation method for executable. The timeline of the project became set on the flowchart of the project. The steps can will be in the following process chart:

Related work and Background Review:

In the beginning, we should have enough knowledge on how irrigation systems work and how it can be built in an efficient way. This chapter focuses on similar attempts in other papers. The sensor sends a message from the field to the person approximately the extent of water within the area if it will increase or decreases then the operator controls the pump to regulate or flip off the telephone. The blessings of this machine are that it depends on the sun energy to get hold of electricity.

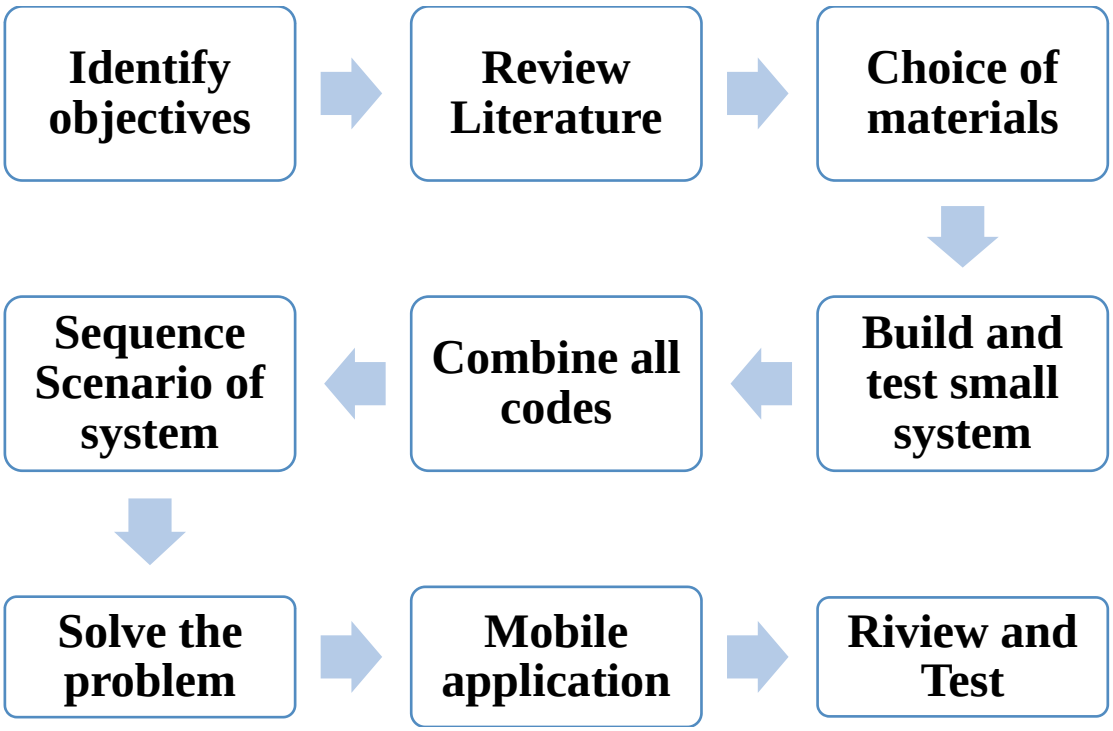
Design and implementation of an Automatic irrigation system:

In this machine the basic idea is to rely on the type of soil and the amount of water needed by each type of soil. This process is done by measuring the level of moisture in each type and using the pump to supply water. The result indicates that sandy soil requires less water than clay soils.

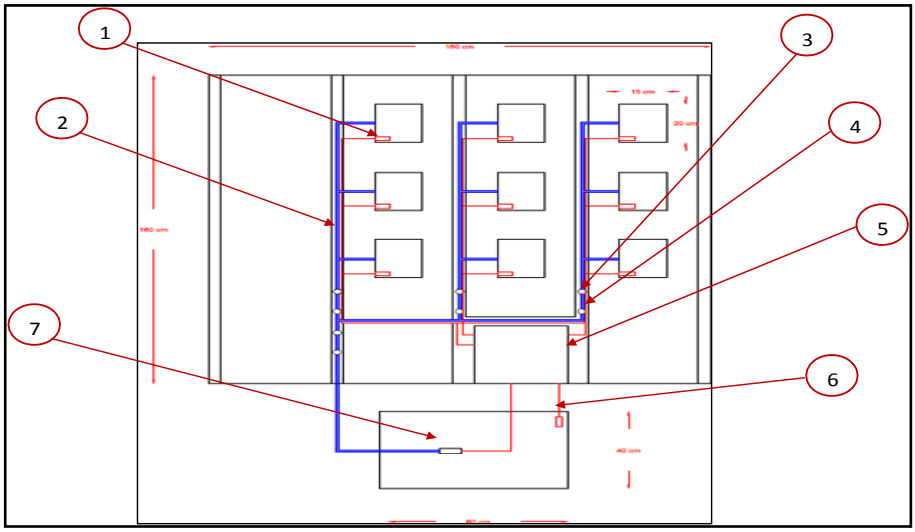
Sensor-based Automatic Irrigation System:

This system also depends on the measurement of soil humidity and temperature. The system works by sending a signal from farm controller to user phone and it phone must be in automatic reply in case that soil needs water. a signal from phone send to farm controller again to switch on or off the system

Step 1: Start the process.
Step 2: Initialize power is supplied to GSM.
Step 3: Check the moisture level (less than or more than).
Step 4: If the level will be more than fixed criteria, no Need for irrigation.
Step 5: If the Moisture level is less than fixed criteria, start irrigation.
Step 6: Initialization of pump and rain gun.
Step 7: After the process completed, it moves to the original state.
Step 8: Stop the process



F-13.16 Process Flowchart



1. Moisture sensor
2. Pipes
3. Valve
4. Flowmeter
5. Controller box
6. Water level sensor
7. Pumps

F-13.17 CAD Project Plan

13.2 Reasons for Students Recommending this Design:

After completion of visit & data collection the project carried out in the current semester by the group members which includes the design of a sustainable facilities. Villagers gives us suggestions that they require Cemetery, public garden, Bank, prathmik Arogya Kendra, Animal Shelter, well-constructed road etc. which is help full for villagers.

13.3 About designs Suggestions / Benefit of the villagers:

- **Animal Shelter:**

  To help break the cycle of pet overpopulation. to save life.

- **Drinking Facilities Units:**

  Provide good quality of Drinking water.

- **Cemetery:**

  Social Benefits to villagers.

- **Public Toilets:**

  To facilitates a toilet facility and promotes Swachh Bharat Yojana.

- **Bank with ATM:**

  The benefits of using bank ATM cards are more than evident.

- **Citizen Service Centre:**

  To promote rural entrepreneurship, enable community participation and effect collective action for social improvement

14 Technical Options with Case Studies

14.1 Civil Engineering:

14.1.1 Advanced Earthquake Resistant [Case Study]:

Introduction:

Swift release of stress in the form of waves during the deformation and brittle rupture of rocks due to the gigantic tectonic plates is known as an Earthquake. These seismic waves travel in all directions through the earth layer with large strain energy, reflecting and refracting at each interfaces.

Vrtical Irregularities:

Vertical irregularities are the irregularities which are caused due to the sudden change in mass, stiffness and geometry which leads to discontinuity in load transfer. Vertical irregularities is one of the major reasons behind the irregularities and failure of the structure during Earthquake forces.

Soil Structure Interaction:

Soil Structure Interaction can be defined as the coupling of the structure and the soil during an Earthquake. It is one of the most flourishing areas of research for structural engineer. SSI is influenced by two types of loading .i.e. Dynamic loading and static loading. When the structure is hit by the seismic waves, these waves tend to generate vibrations or motion on the structure. In order to resist the motion, the structure needs to overcome its own inertia force which in result deals with SSI. There are two types of primary issues of soil structure interaction:

- Inertial Interaction.
- Kinematic Interaction.

When soil undergoes deformation and stress, they induce base shear and moments in the vibrating structure. Such cases lead to dynamic response of the structure by creating dynamic interacting system between soil and the structure. This type of interaction is known as Inertial Interaction. This phenomenon due to the wave propagation consideration is known as Kinematic Interaction.

Structure Detailing:

The structural building considered has been already constructed in Sikkim, India. It is vertically irregular in nature and comprises of B-3 and G+4. The total area comprises of 18.01m x 16.92 m. The soil condition of the structure is dense gravel soil with soil bearing capacity of 180 kN/m2. The grade of concrete used is M30 and grade of steel is Fe 500. The loads considered are: Dead load of 1 kN/m2, Live Loads of 3 kN/m2, 4 kN/m2 and 5 kN/m2 respectively. The frame Loads provided were of 11 kN/m as exterior wall load and 5.08 kN/m as partition wall load. The structure was modeled and response spectrum analysis was carried out using E-tabs

software. The same structure was analyzed considering soil structure interaction for X and Y direction respectively. The material properties of a structure are shown in Table 14.1, frame properties of beam, slab and column are shown in Table14.2. The frame loads are shown in Table 14.3 and the shell loads are shown in Table 14.4.

Sr.No.	Material Properties	Values	Unit
1	Characteristic strength of concrete	M 50	kN/m2
2	Characteristic strength of reinforcement	Fe 500	kN/m2

T-14.1 Material properties of a structure considered.

Sr. No.	Properties	Dimensions	Unit
1	Beam (B1)	500 x 500	mm
2	Beam (B2)	600 x 600	mm
3	Slab (S1)	127	mm
4	Column (C1)	400 x 300	mm
5	Column (C2)	500 x 450	mm
6	Column (C3)	600 x 500	mm
7	Column (C4)	300 x 400	mm
8	Column (C5)	500 x 400	mm

T-14.2 Frame Properties of beam, Slab and Column

Sr. No.	Frame Loads	Values	Unit
1	Exterior wall load	11.65	kN/m
2	Partition wall load	5.08	kN/m

T-14.3 Frame Loads

Sr. No.	Shell Loads	Values	Unit
1	Dead Load	1	kN/m2
2	Live Load	3	kN/m2
3	Live Load	4	kN/m2
4	Live Load	5	kN/m2
5	Floor Finish	1	kN/m2

T-14.4 Shell Loads

Results:

After analysis of the structure, seismic weight was obtained and base shear was calculated. The base shear calculated manually was compared to that obtained from E-Tabs. The seismic weight and base shear of the structure are shown in Table 14.5 and Table 14.6 respectively. The parameters considered such as

Displacement and Story Shear was calculated and compared considering with and without soil structure interaction for both X and Y direction respectively.

Sr. No.	Seismic weight	Values	Units
1	Dead Load	13834.13	kN
2	Live Load	1506.81	kN
3	Floor Load	1766.64	kN
4	Wall Load	12797.08	kN

T-14.5 Seismic Weight

Sr. No.	Base Shear	Values	Units
1	X direction(VB_X)	945.94	kN
2	Y direction(VB_Y)	952.404	kN

T-14.6 Base Shear

Conclusion:

From the above study, the parameters considered were compared and the following conclusion were drawn:

1. the structure undergoes 52.95 % more displacement when soil structure interaction is taken into consideration comparative to without soil structure interaction in y direction.
2. 49.14 % more story shear was observed when soil structure interaction was taken into consideration comparative to without soil structure interaction in x direction.
3. 71.32 % more story shear was observed when soil structure interaction was taken into consideration comparative to without soil structure interaction in y direction.
4. 8.65 % more story shear was observed in x direction than in y direction for basement 1.
5. 0.835 % more story shear was observed in x direction than in y direction for basement 3.
6. Displacement below ground level was negligible due to presence of foundation at each of these levels.
7. As per above conclusion it is advisable to check model with the SSI for max deflection and min base shear.

14.1.2 Seismic Retrofitting of School Building:

Introduction:

School buildings have immense importance in pre and post earthquake scenario. Damage or collapse of these structures can magnify the impact of disasters, and in past severe earthquakes it has been observed that failure of these building had

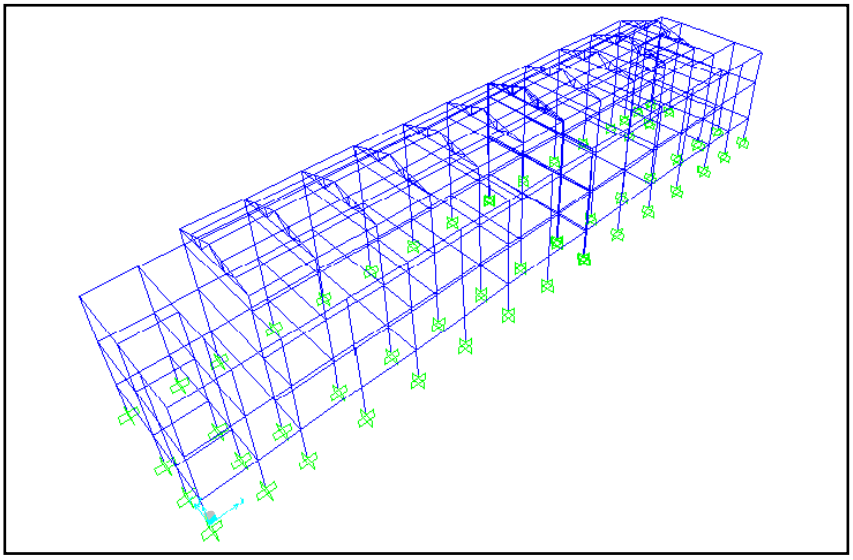
created havoc among the society. Collapse of school buildings caused death of children in past major earthquakes. Death and injuries to children usually have psycho-social impact on society which ultimately increases the impact of earthquakes manifold. Another important use of school buildings is as a temporary shelter for people who lost their accommodation in the event. But unfortunately such situations have arisen many times in past major earthquake events like Bhuj 2001 and Sikkim 2011 earthquakes. These structures have important role to play after devastating earthquake event and Immediate Occupancy (IO) level performance is required for such important buildings.

Description of Building Studied:

Studied block of school building is made of reinforced concrete frame with infill as brick masonry. In the seismic event of 18" September 2011, block has suffered damage in the form of cracks in columns of the corridor and bathroom area.The school building was constructed in 1985 according to seismic code IS 1893:1975 and IS 456:1978.Grade of concrete and steel used for construction are M15 and Fe250 respectively. Plan of school building is asymmetric and also block has two parts in longitudinal direction separated by crumple joint of 0.10 mPlan dimension of building block is 49.lx 9.5 m. In longitudinal direction, lengths of two pans are 28 and 21m respectively and separated by 0.10m gap.

Modelling:

A block of school building has been modelled using SAP 2000 software. A 3D model of the block is made for analysis since block is asymmetric in plan.Beams and columns have been modelled as frame elements. The slabs have been assumed as rigid diaphragms; therefore ground and first floors are modelled as rigid diaphragms. Steel trusses and purlins are modelled as frame elements. The base of 3D frame building model is considered fixed to calculate the eanhquake response. Initial stiffness of beams and columns has been taken as 0.5E,lt and 0.7E It



F-14.1 Model of School Building Block

respectively, since initial stiffness corresponds to fully cracked section stiffness in case of existing buildings

Model Analysis:

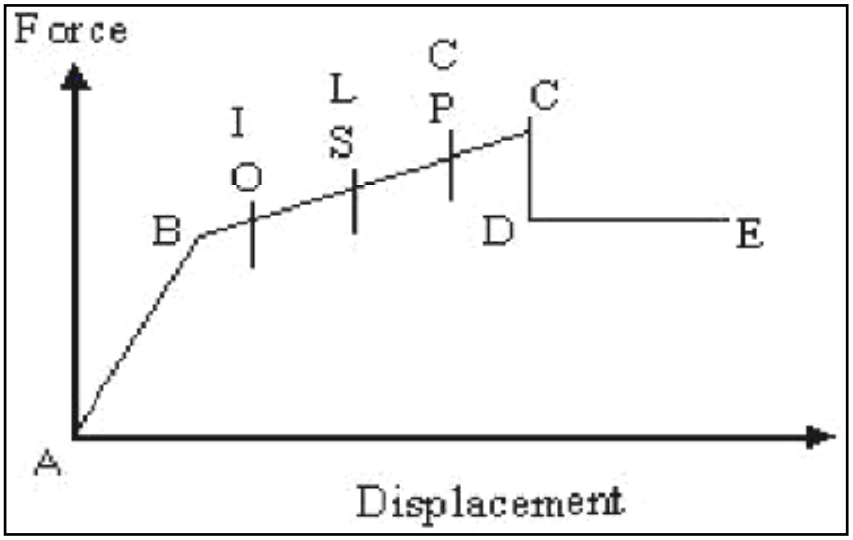
To study dynamic response of building modal analysis has been carried out using software. Time periods are evaluated for first three fundamental vibration modes of the building.

Mode No.	Time Period (Sec)	Vibration Mode
1	0.769	Longitudinal
2	0.584	Torsional
3	0.558	Transverse

T-14.7 Time Periods (in sec) for first three modes of vibration

Analysis of Results:

Pushover analysis is performed using software along X and Y directions and pushover curves are plotted.Base shear and roof displacement at performance point is found out using ATC-40.The status of performance has also been evaluated in terms of number of hinges for DBE and MCE level of earthquakes.Existing component response has been evaluated by hinge performance point defined by ATC-40 in which B, C, D, and E represent effective yield point, yielding with strain hardening, strength degradation and final collapse respectively. Between points B and C three more points Immediate Occupancy (IO), Life Safety (LS) and Collapse Prevention(CP) are introduced to define acceptance hinge criteria.To have lO level performance no hinges should be in the range of IO-LS. But in the analysis for school building some hinges are located in lO- LS category under MCE level demand. IO-LS level hinges have appeared at the same location where damages have been observed after the Sikkim earthquake of September 2011. Location of formation of these hinges has been found in columns of bathroom areas and corridors mostly. Hinges have appeared in column



F-14.2 Different stages of plastic hinge

before formation of hinges in beam which shows reinforced concrete frame designed as Weak column-Strong beam design concept.

Direction	Earthquake Level	A-B	B-IO	IO-LS	LS-CP	CP-C	C-D	D-E	>E	Total
X	DBE	743	71	0	0	0	0	0	0	814
	MCE	559	187	68	0	0	0	0	0	814
Y	DBE	765	49	0	0	0	0	0	0	814
	MCE	660	120	34	0	0	0	0	0	814

T-14.8 Number of Hinges in each range at performance point

Column Id	Additional shear strength required in hinge region (kN)	Additional shear strength required in nonhinge region (kN)	Thickness of frp in hinge region (mm)	Thickness of frp in nonhinge region (mm)
CI-73	19.481	0.193	0.406	Not Required
CI-74	64.008	44.720	1.333	0.93
CI-75	52.533	33.245	1.094	0.69
CI-76	53.972	34.684	1.124	0.72
CI-77	19.855	0.567	0.414	0.01
CI-81	31.952	12.665	0.666	0.26
CI-84	80.639	61.351	1.680	1.28
C5-85	41.948	25.071	0.874	0.52
C5-87	29.466	12.590	0.614	0.26
C4-113	5.478	Not Required	0.065	Not Required
C5-136	13.655	Not Required	0.284	Not Required
C5-137	17.181	Not Required	0.358	Not Required
CI-138	30.094	10.807	0.627	0.23
C1-139	45.323	26.035	0.944	0.54
C1-140	38.85	19.57	0.81	0.41
C1-141	42.69	23.40	0.89	0.49
C1-142	45.75	26.46	0.95	0.55
Cl-143	32.48	13.19	0.68	0.27
Cl-144	22.25	2.96	0.46	0.06
C3-149	35.14	15.85	0.37	0.17
C3-150	54.11	34.83	0.56	0.36
C3 -151	55.21	35.92	0.58	0.37

T-14.9 Thickness of FRP required in hinge and nonhinge regions of columns

Conclusi

Conclusion:

It has been observed and felt after every earthquake failure of school buildings has created chaos in society. A large numbers of these deficient structures need to be retrofitted with economical techniques. It has been seen that enhanced performance of these structures can save numbers of lives and make society disaster resilient. Due to importance of school buildings in post disaster scenario, these structures should have IO level performance. To identify the performance of school buildings, first they need to be evaluated. In this paper assessment of damaged reinforced concrete framed school building has been carried out and for damaged columns retrofitting is done. To capture the dynamic response under earthquake forces modal analysis has been done. To evaluate the performance of building block nonlinear pushover analysis has been performed and performance point is calculated for DBE as well as MCE level seismic demand. Analysis of block has revealed that block is safe and has IO level performance for DBE level but under MCE level demand some of the columns have damaged due to formation of hinges at the ends. Member level retrofitting can be applied to increase the seismic resistance capacity of columns. So, using GFRP member level retrofitting is done for damaged columns and thickness of FRP is calculated. And depending on availability of GFRP sheet thickness, number of layers can be applied. Overlaying of GFRP on columns increased seismic shear strength and their performances. By making these structures earthquake resistant for future earthquakes disaster resilient society can be achieved

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

Introduction:

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

Super Performing Materials:

- **Foamed Aluminum:**

"Light-as-air, stronger-than-steel materials are just beginning to shape our world. Foamed aluminum first emerged from the lab in the frame of a 1998 Karman concept car. Ten times stronger than traditional aluminum at just one tenth the weight, the material allows a more fuel-efficient vehicle. Its isotropic cellular structure helps the frame absorb shock and serves as an insulating firewall between

the engine and the rest of the car. The foaming process can also be applied to steel, lead, tin, and zinc."

Woven Stainless steel:

K5 New York is now offering woven stainless steel in 18 different weaves, produced in Switzerland by G. Bopp. This product has been used in projects as diverse as railing systems and furniture components. Custom weaves and patterns are also possible.

- **Creative Weave Metal Mesh:**

Metal meshes have been known as decorative and functional design elements in architecture for only a few years. During the continuous product development along with ordinary use such as an fence element it became clear that metal meshes also have considerable technical advantages which are extremely relevant in the field of architecture.

Aerogel:

Aerogel or "Air glass" is a transparent material that looks like glass, insulates better than mineral wool and is more heat resistant than aluminum. The material has many interesting properties and possible applications such as insulation in windows and solar collectors, windows in firewalls, a component in air-conditioning equipment, etc. Aerogel is molded, giving the possibility of getting different shapes: cylinders, cubes, plates of varying thickness etc. Chemically, Aerogel is composed of quartz and a great deal of air, making it fragile. The grains of quartz are small compared to the wavelength of light, giving Aerogel good transparency properties. At around 750°C (1380°F), it starts to shrink and slowly collapses to a piece of ordinary quartz. Aerogel can be cut with a band saw and holes can be drilled with a metal drill. It should be noted that Aerogel is non-flammable and non-toxic.

- **Laminated Thermo Plastic Panels:**

Blizzard Composite GmbH manufactures high-tech plastic composites for the architectural field as well as the trucking industry. Their core expanding machinery heats up and vertically expands solid thermoplastic sheets, which are then processed into sandwich panels by lamination equipment. Due to the unique geometry of the Pep Core, the panels are oflow weight and provide an excellent combination of high stiffness and compressive strength.

Conclusion:

Sr. No.	Materials	Uses	Advantages
1	High Performance Concrete	Beam	On long span structures like bridges and halls
2	Light Transmitting	Interior walls	Energy Saving

	Concrete		
3	Pervious Concrete	Paving, Parking, Walkways	Will be permeable for water supporting water table recharge
4	Floating Concrete	Marine architecture	Will save construction cost
5	Weave Metal Mesh	Half walls, Fences, Acoustic walls	Cost and time effective
6	Aerogel	Skylight, Thermal panels	Heat resistive, transparent
7	Super Black	Paints, Varnishes and Finishes	Less Reflective, absorptive
8	Banner work	Shading device, Landscape element	Time, Cost, Energy efficient
9	Geoweb	Vertical Gardening, Green walls	Energy conserving, Water conserving
10	Framing Track	Flexible boundaries	Quick and versatile
11	3D Molded Plywood	Furniture, Formworks	Time Saving, Repetitive design
12	Braille Tiles	On Floor or Walls	Signage for Blinds
13	Rubber Side Walks	Foot path, Walkways	Waste managing, Time saving, Eco-Friendly
14	Natural Fiber Insulation	Thermal Panels, Blocks	Re-Used Technique i ,Re purposed
15	Fly Ash Concrete	Beams, Columns, Slab	Repurposed , Provides strength to base material

14.1.4 Engineering Aspects Of Soil mechanics - Environmental Impact Assessment of Kol-Dam :

Introduction:

Environmental Impact assessment (EIA) is the assessment of the environmental consequences of a plan, policy, program, or actual projects prior to the decision to move forward with the proposed action. In this context, the term "environmental impact assessment" (EIA) is usually used when applied to actual projects by individuals or companies and the term "Strategic Environmental Assessment" (SEA) applies to policies, plans and programmes most often proposed by organs of state.It is a tool of environmental management forming a part of project approval and decision-making.Environmental assessments may be governed by rules of administrative procedure regarding public participation and documentation of decision making, and may be subject to judicial review.

Situation of EIA in India:

The Environmental Impact Assessment (EIA) experience in India indicates that the lack of timely availability of reliable and authentic environmental data has been a major bottleneck in achieving the full benefits of EIA. The environment being a multi-disciplinary subject, a multitude of agencies are involved in collection of environmental data. However, no single organization in India tracks available data from these agencies and makes it available in one place in a form required by environmental impact assessment practitioners. Further, environmental data is not available in enhanced forms that improve the quality of the EIA.

In 2020, the Government of India proposed a new EIA 2020 Draft, which was widely criticized for heavily diluting the EIA.Many Environmental groups started a campaign demanding the withdrawal of the Draft, in face of these campaigns, the Government of India resorted to banning/blocking the websites of these groups.

Conclusion:

It has been concluded from the present investigations that construction have resulted in loss of on-farm income sources like agriculture land, farm land trees and livestock population as well as associated income of project affected families from these resources was also affected in the area.

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

Introduction:

In order to develop sustainable wastewater treatment it is needed to view the wastewater treatment systems using a holistic approach. A holistic approach implies considering the primary and secondary environmental effects and costs that the systems produce. Examples are the pollution produced at the power plant (generating electricity for wastewater treatment) and the energy cost of producing treatment chemicals. Designing or selecting a treatment system based on sustainability criteriainvolves a multidisciplinary approach where engineers cooperate with social scientists, economists, biologists, health officials and the public.

Sustainability Analysis Of Wastewater Treatment Systems:

In earlier times and even to day, engineers and politicians nearly always use a simple cost/benefit analysis when choosing a wastewater system. This means that, for instance, only the discharge of organic matter (BOD) or phosphorus and the cost is looked upon. However, the quest for sustainability is necessary because we see many problems are coming like global warming, acidification, diminishing ozone layer, micro-organic pollutants and other toxic chemical matters, eutrophication, diminishing important resources like phosphorus, potassium and oil and other threats to mankind, flora and fauna. The notion sustainability should

include ecology, economy and sociological aspects and the sustainability must also perform on three different stages:

1. Local, where hygienic and health aspects are of concern in time scales of hours or days.
2. Regional, where classic environmental problems operate in time scales of months or years.
3. Global, where sustainability matters in a time scale of decades or centuries.

To compare two wastewater alternatives the following indicators may be considered as relevant for a sustainability analysis (Lindholm and Nordeide 2000):

- Discharge of pollution to local recipients and major recipients. For instance: phosphorus, nitrogen and organic matter (BOD).
- The amount of micro-organic pollutants and heavy metals in the sludge going to agriculture.
- Amount of phosphorus, potassium and nitrogen recirculated for plant production.
- Discharge of climate gases like methane and CO2.
- Use of electric energy and fossil energy.
- Use of products with hazardous components.
- Use of finite or critical resources.
- Noise, smell, insects and other disturbances in the operation and construction period.
- Safety for children.

Indicators that are approximately the same for both alternatives may be eliminated. The system borders for the analysis of the sustainability of a wastewater system arevery important for the assessment. A wider or narrower definition of the systemstudied may alter the result of the assessment completely.The assessment may bestudied on a global scale, on a regional/city scale or on a block /neighbourhood scale.The two last ones are appropriate for studies of infrastructure systems, even if theglobal context should be considered at all times.The system borders should be large enough to include not only the infrastructure itself, but also the city area it serves and the productive land and waters that enable the cycles of nutrients to be closed

Conclusion:

Evaluation of sustainable wastewater treatment systems depends on a number of factors, energy use and recycling beeing two essential parameters. Chemical precipitation is more energy efficient than biological treatment methods and

chemical precipitation prior to nitrogen removal reduces both space and energy need for the subsequent nitrogen removal step.

14.2Electrical Engineering:

14.2.1 Design of Power Electronics converter:

As the technology for the power semi conductor devices and integrated circuit develops, the potential for applications of power electronics become wider.There are already many power semi conductor devices that are commercially available, however, the development in this direction is continuing.

- The power semiconductor devices or power electronic converter fallgenerallyinto six categories :
  - AC to DCConverter(ControlledRectifier)
  - DCto DC Converter(DCChopper)
  - AC to AC Converter(ACvoltageregulator)
  - DC to AC Converter(Inverter)
  - Static Switches
- The design of power electronics converter circuits requires design thepowerand controlcircuits.
- The voltage and current harmonics that are generated by the powerconverters can be reduced or minimized with a proper choice of thecontrolstrategy.
- Power Electronics defined as the application of solid-state(devices)electronicsforthecontrolandconversionofelectricpower.
- Powerelectronicshavealreadyfoundanimportantplaceinmodern technology and are now used in a great variety of high-power product, including heat controls, light controls, electricmotor control, power supplies, vehicle propulsion system andhighvoltage direct current(HVDC) systems.
- Uncontrolled turn on and off (PowerDiode)
- Controlled turn on uncontrolled turn off (Thyristors)
- Pulsegate requirement (SCR,GTO)

Controlled turn on and off characteristic (Power Transistor, BJT, MOSFET, GTO, IGBT)

- Continuousgate signal requirement(BJT, MOSFET, IGBT)
- Bipolarvoltage-withstandingcapability (SCR,GTO)
- Unipolar voltage-withstanding capability (BJT, MOSFET, GTO,IGBT)
- Bidirectional currentcapability(TRIAC)
- Undirectional currentcapability (SCR,GTO,BJT,MOSFET,IGBT)

AC-DC Converters:

- A single-phase converter with two natural commutated thyristor is shown

- Average value of the output voltage can be controlled by varying the conduction time of thyristors.
- This converters are also known as controlled rectifiers.

AC-AC Converters:

- Used to obtain variable AC output voltage from a fixed AC source
- a single-phase converter with a TRIAC is shown below

DC-DC Converters:

- Is also known as Chopper or Switching Regulator
- The average output voltage is controlled by varying the conduction of transistor, t1t1.
- If TT is the chopping period, then t1=δTt1=δT
- δδ is called as the duty cycle of chopper

DC-AC Converters:

- Is also known as Inverter
- If transistor Q1-Q1 and Q2-Q2 conduct for one-half period and Q3-Q3 and Q4-Q4 conduct the other half, the output voltage is of alternating form.

Static Switches:

- Power devices can be operated as static switches or contactors, the supply to these switches could be either AC or DC and the switches are called as AC static switches or DC switches.

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

Introduction:

The ac motor starters are increasingly becoming popular due to its controlled soft-starting capability. The ac motor starter provides limited starting current and hence conventional electromagnetic line starters and reducedvoltage starters are replaced with ac motor starters.

Operating Principle Of Soft Starter:

A soft starter provides reduced voltage to stator windings of three phase induction motor by controlling the acceleration of an electric motor. A three phase induction motor is a self-starting motor and electromagnetic torque is produced due to an interaction between revolving magnetic field around rotor and rotor current. Initially during starting, a rated voltage is applied which causes high current to flow through stator windings.

Circuit Diagram:

The circuit diagram of soft-starting of three phase IM is shown in Fig.1. The circuit diagram comprises of voltage regulator, zero crossing detector, bridge rectifier, 4N25 opt-Isolator, Atmega 328P microcontroller and TRIAC circuitA 12 V DC

regulated supply is obtained with the help of step-down transformer and bridge circuit. The step down transformer converts 230V to 12V ac supply and then it is fed to bridge circuit. The bridge circuit in turn converts ac supply to dc supply. This dc supply is given to regulator IC to get positive 12V dc regulated supply. The main part of the circuit is zero crossing detector circuit which is made up of four diodes connected to form bridge rectifier circuit and output of bridge rectifier is fed to 4N25 optoIsolator. Then output of 4N25 optoIsolator is applied to interrupt pin of Atmega 328P. Whenever the input AC waveform crosses the zero reference point, a high pulse signal triggered from 4N25 optoIsolator is given to interrupt pin of Atmega 328P. When Atmega 328P receives high signal from interrupt pin, it interrupts Atmega 328P by providing high signal on interrupt pin and then it initiates delay counter from that point and hence it provides triggering pulse to gate signal of TRIAC through MOC3021 optoIsolator.Initially,

Sr. No.	Name of Component used	Rating of Components	Number of Components
1	Tranformer	220-240/12V	3
2	Diode	1N4007	12
3	Opto-Isolater	4N25	2
4	Arduino	ATMEGA328P	1
5	LCD Display	16*2	1
6	Voltage Regulator IC	7805	1
7	Capacitor	470uF	1
8	TRIAC	BT136	3
9	Toggle Switch	-	1
10	Resistence	120 Ω 330 Ω 1000 Ω 3.3 KΩ 10 KΩ	3 4 3 2 2
11	Bulb	60W	3

T-14.10 Components Schedule

After a series of experimentation on hardware prototype, it is found that the voltage limiting process in the soft starting is efficient method as compared to direct on line and star-delta starter. The amount of voltage is controlled or adjusted by changing the firing angle of SCRs.

Advantages And Disadvantages Of Soft Starters:

The soft starters used in three phase induction motor eliminates high inrush current and high mechanical torque on startup. It reduces cable and switch-gear rating in power supply network. It prevents any dip in line voltage. The soft starter has

desirable features of soft, step-less acceleration & deceleration. It also avoids current and torque peaks and provides less electrical stress on the power supply network and mechanical stress on entire drive. It reduces stress on couplings and other transmission devices such as gear boxes, shafts, belts etc.

14.2.3 Advanced Wireless Power Transfer System:

Introduction:

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.

Literature Review:

- After the immense research in electromagnetic field by many pioneers and development of electromagnetic induction law by Michael Faraday which gives the basis of wireless power transfer.
- In 1891 Nikola Tesla was the first pioneer who started working on wireless power transfer system in his "experimental station" at Colorado, by using Tesla coils.
- Tesla want to develop a wireless power system that is capable of transmmitting power over long distances. He proposed many such systems.
- Wardenclyffe tower was also designed by Tesla for Trans-Atlantic wireless telephone and also for demonstrating wireless electrical power transmission.
- In 2008 the wireless power consortium was established to connect all manufactures its Qi inductive power standard enable wireless power charging and powering of portable devices of capacity up to 5W with separation distance 4cm.
- In recent years the research on microwave and LASER wireless power transmission system such as solar power satellite has increased.
- Energy harvesting also called power harvesting which is the conversion of ambient energy from environment to electric power which mainly used to power mini watts wireless electronic devices .The ambient energy is produce from stray electric or magnetic field or radio waves.
- **Wireless Power Transfer Method:**

- **Inductive Coupling:**

This type of WPT is simply based on inductive coupling between two coils. This is a type of near field technique measuring with appliance near the source. It is generally based on the principle of mutual induction, where two coils are placed vicinity to each other and there is no physical connection between these two coils. The simplest example is transformer where the transfer of energy takes place due

to electromagnetic coupling.Based on this technology there are various application device has been already made including electric brush and charging pad for cell phones or laptop. But this kind of method also have some limitation.

- **Microwave WPT:** This is one of the type of far-field technique of WPT which have range upto KM, with power transfer upto MW. This method uses microwave frequency ranging from 1GHZ to 1000GHZ generated from the microwave generator. First the microwave is generated by microwave generator which pass through the coax-waveguide adapter to the waveguide circulator .
- **Application Of WPT:**
- **Medical Devices:** The most important application of WPT is in medical science. As we know medical device uses very small amount of power. Some medical device are LAVAD heart assist pumps, pacemaker and infusion pumps. With using the WPT technology, the power can sufficiency supplied to medical device without harming human body.
- **Electrical Vehicles:** Electrical vehicles are the new technology which uses electrical energy for their operation. WPT also marketed the electrical vehicles which attract the consumers to buy it and decrease the load on diesel and petrol vehicles.
- **Solar Power Satellite (SPS) :** The most important application of WPT system is solar power satellite that uses the microwave for energy transferring. Satellites are generally equipped with solar power transmitter and receiver antenna. Solar panel converted the generated electricity into high power microwave beams and directed towards the ground station receiver antenna. The major problem with this system is it biological effect of microwave radiation on human and animals, if they are distracted from their path. The receiving zone of SPS is much larger for getting a small amount ofpower. For achieving 750MW power with power intensity of 1mw/cm2, we have to take a area with 10KM diameter so that radiation level is in safe zone.

14.2.4 Industrial Temperature Controllers:

Temperature controllers are used in most of the manufacturing industries. The industries like textile mill, pharmaceutical industry, oil refinery etc. all requires temperature controller.

· If error is positive that means current temperature is more than set temperature that has to be reduced
· If error is negative that means current temperature is less than set temperature and it is required to increase it.

As shown in above figure, major building blocks of system are temperature sensor, Analog to Digital Converter (ADC), micro-controller, LCD, clock generator and LED indicators.

ADC: Its analog to digital converter with built in multiplexer. It takes two analog inputs one from temperature sensor and another from reference potentiometer. It gives 8-bit digital output corresponding selected analog input. To get the digital output of any one channel, micro controller will select the required channel and takes digital output.

LED Indicators (T-14.11) : Show different Indicators like,

Reading channel 1 temperature	Red LED
Reading channel 2 temperature	Green LED
Sensor temperature is more than set temparature (+Ve error)	Blue LED
Sensor temperature is less than set temparature (-Ve error)	Yellow LED

- **Connections:**

1. LM35 temperature sensor is connected to channel 2 (IN1) of ADC0808. It will sense the current temperature and gives analog voltage output as 10 mV / oC
2. A 1K pot is connected to channel 1 (IN0) of ADC0808. It will set the reference temperature between 0 to 255.
3. The control signals START, EOC and OE of ADC0808 are connected to port P3 pins P3.4, P3.5 and P3.6 respectively. These pins are used to control ADC operation like start conversion, enable output, check end of conversion etc.
4. Port P2 pins P2.0 to P2.3 drives four different colour LEDs as shown. So these pins gives various indications through LEDs

- **Working and operation:** Microcontroller first latches address of channel 1 in to ADC. Then it asserts start signal to start conversion. It waits for end of conversion (EOC) signal from ADC.Next microcontroller latches address of channel 2. Again it asserts start signal and waits for EOC. When it gets EOC, takes digital input – process it – displays it on LCD as current temperature.Then microcontroller take difference of these two temperature values that is the error. If error is positive then it indicates this on BLUE LED. If error is negative then it gives indication on YELLOW LED· This process is continuously repeated after every two second

14.2.5 Accident Alerts In Modern Traffic Signal Control System-Camera Surveilance System:

The main aim of this project is to construct a smart vehicle system with minimizing the limitations of existing methods and also enhancing the security of vehicles and human beings and also reduces the accidental injuries.

smart vehicle system will entail a speed and other parameters of vehicle sensing mechanism which automatically messages to personal contacts with the details of vehicle position when an accident occurs using the GSM/GPRS system. The system also contains fire sensor and an eye blink sensor. A fire sensor, eye blink sensor which senses various parameters of the vehicle is connected to a microcontroller which detects when the abnormal conditions occur or any accidents occur then sends text message, using GSM technology, to the driver's private contacts.

Road accident is most unwanted thing to happen to a road user, though they happen quite often. The most unfortunate thing is that we don't learn from our mistakes on road. Most of the road users are quite well aware of the general rules and safety measures while using roads but it is only the laxity on part of road users, which cause accidents and crashes. Most of the fatal accidents occur due to over speeding. It is a natural psyche of humans to excel.But when we are sharing the road with other users we will always want to take control.Increase in speed multiplies the risk of accident and severity of injury during accident.Vehicle moving on high speed will have greater impact during the crash and hence will cause more injuries.some deaths also happen due to the lack of immediate first aid.

Another problem is that the lack of information about the vehicle position.We propose an intelligent vehicle system for accident prevention and making the world a much better and safe place to live. Detecting humans or animals including obstacles will certainly give us a better solution to reduce the death of human in road crash. Impact Of The Proposed Solution: At present criteria, we cannot detect where the accident has occurred and hence no information related to it, leading to the death of an individual.

This project presents vehicle accident detection and alert system with SMS to the user defined mobile numbers. The GPS tracking and GSM alert based algorithm is designed and implemented with LPC2148 MCU in embedded system domain. The proposed Vehicle accident detection system can track geographical information automatically and sends an alert SMS regarding accident. Experimental work has been carried out carefully. The result shows that higher sensitivity and accuracy is indeed achieved using this project. This made the project more user-friendly and reliable.

A Switch is also provided in order to terminate the sending of a message in rare case where there is no casualty, this can save the precious time of the medical rescue team. When the accident occurs the alert message is sent automatically to the rescue team and to the police station. The message is sent through the GSM module and the location of the accident is detected with the help of the GPS module.

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

T-15.1 Design and their benefits

Sr. No.	Design Name	Period	Amount (Rs.)	Benefits
1.	Community Hall	Within 1 year	Rs. 7,96,581/-	To increase and strengthen the villager's family bonds and offers valuable community information
2.	Agro Storage Unit	Within 1 year	Rs.9,61544/-	Benefits to the farmers, they can easily storage their Agricultural production.
3.	Primary School	Within 1 year	Rs. 23,15,209/-	Primary education increases the knowledge of children which increase social and emotional development.
4.	Skill Development Centre	Within 6 months	Rs. 4,13,089/-	No Skill Development centre is available in handiya village, due to which villagers who want to learn new skils have to go to the nearest town.
5.	Primary Health Centre	Within 6 months	Rs. 2,28,737/-	To provide primary medical care to the villagers
6.	Anganvdi	Immediately	Rs. 3,19,350/-	Aganwadi centers provides basic health care, basic health care activities include contraceptive counseling and supply, nutrition education and supplementation, as well as pre-school activities.
7.	Drinking Facility Units	Immediately	Rs. 1,06,183/-	Provide good quality of drinking water.

8.	Cemetery	1 to 2 year	Rs. 19,59,289/-	Socialbenefits to the villagers.
9.	Animal Shelter	1 year	Rs.7,50,611 /-	For help to break the cycle of pet Overpopulation to save life.
10.	Bank with ATM	1 & 2 years	Rs.9,22,050/-	The benefits of using bank ATM cards are more than evident.
11.	Public Toilet	Immediately	Rs. 1,80,008/-	To facilitates a toilet facility and promotes Swachh Bharat Yojana
12.	Citizen Service Centre	Within 1 year	Rs.13,74,761/-	To promote rural entrepreneurship, enable community participation and effect collective action for social improvement.

T-15.2 Yojanas available for development of village

Sr. No.	Yojanas
1	Saansad Adarsh Gram Yojsana (SAGY)
2	Pradhan Mantri Awaas Yojana-Gramin (PMAY-G)
3	Pradhan Mantri Gram Sadak Yojana (PMGSY)
4	Shyama Prasad Mukherji Rurban Mission (SPMRM)
5	Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM)
6	The Mahatma Gandhi National Rural Employment Guarantee Act 2005
7	Gram Swaraj Abhiyan

16 Survey By Interviewing With 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	have Some gov. Policy
2	What are the chances of employment in village?	yes	-
3	What are the special technical facilities in village?	NO	need pure water
4	Is any debt on village dwellers?	NO	-
5	Are village people getting agricultural help?	yes	mostly people are farmer
6	Is women health awareness Program organized in village?	NO	-
7	Are women having opportunity to work and income?	NO	-
8	Child girl education is appreciated in village?	yes	Praimary School avbl.
9	Facility of vaccination to child is available in village?	NO	-
10	Are village people aware about child vaccination and done to each and every child as per norms?	NO	-
11	Women help line number information is provided to village people?	NO	need thise
12	Is water scarcity in village? How many days per year?	yes	-
13	Is village under any debt?	yes	-
14	Is any serious issue due to debt from bank or any person happened in village?	NO	-
15	Is any suicide like incident observed in village due to government policy, debt or threatening?	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.	-	-
18	Is village improvement is observed in comparative scenario from past to present?	-	-
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?	-	-

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
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સરપંચશ્રી
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તા.બાલાસિનોર, જી.મહિસાગર

17

17 Irrigation/Agriculture Activites And Agro Industry, Altenate Technics And Solution

Introduction:

Irrigation is the process of applying water to the crops artificially to fulfil their water requirements. Nutrients may also be provided to the crops through irrigation. The various sources of water for irrigation are wells, ponds, lakes, canals, tube-wells and even dams. Irrigation offers moisture required for growth and development, germination and other related functions.

The frequency, rate, amount and time of irrigation are different for different crops and also vary according to the types of soil and seasons. For example, summer crops require a higher amount of water as compared to winter crops.

Types of Irrigation:

There are different types of irrigation practised for improving crop yield. These types of irrigation systems are practised based on the different types of soils, climates, crops and resources. The main types of irrigation followed by farmers include:

Surface Irrigation:

In this system, no irrigation pump is involved. Here, water is distributed across the land by gravity.

Localized Irrigation:

In this system, water is applied to each plant through a network of pipes under low pressure.

Sprinkler Irrigation:

Water is distributed from a central location by overhead high-pressure sprinklers or from sprinklers from the moving platform.

Drip Irrigation:

In this type, drops of water are delivered near the roots of the plants. This type of irrigation is rarely used as it requires more maintenance.

Centre Pivot Irrigation:

In this, the water is distributed by a sprinkler system moving in a circular pattern.

Sub Irrigation:

Water is distributed through a system of pumping stations gates, ditches and canals by raising the water table.

Manual Irrigation:

This a labour intensive and time-consuming system of irrigation. Here, the water is distributed through watering cans by manual labour.

Irrigation mathods or techniques:

1. Traditional Irrigation techniques

   (i) Check Basin Method

   (ii) Furrow Irrigation Method

   (iii) Strip Irrigation Method

   (iv) Basin Irrigation Method.

2. Modern Irrigation techniques

   (v) Sprinkler Irrigation Method

   (vi) Drip Irrigation Method

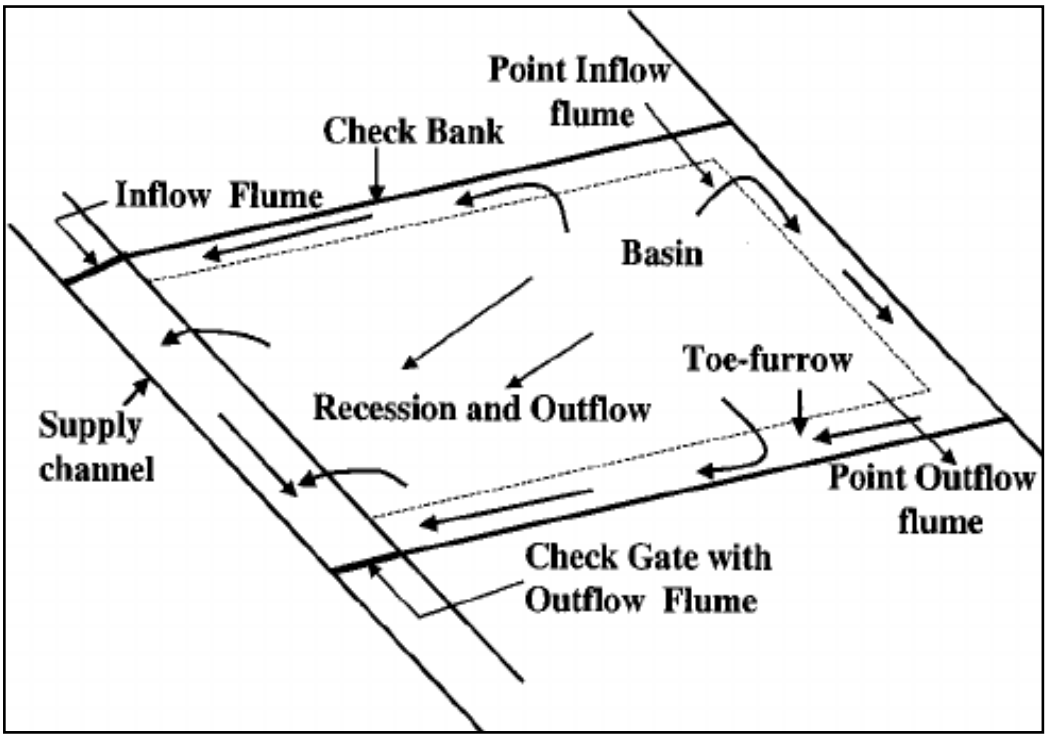
   (vii) Pot Irrigation Method.

1. Traditional Irrigation Methods/techniques:

(i) Check Basin Method:

In this method, the whole field is divided into basins according to the capacity of water. Basins are connected through a 'Dhora' (A small drain type flow way), which has raised earthen walls on both sides. 'Dhora' is of two types, one is the main 'Dhora' and the other 'Dhora' is connected to basins. Size of basins are made according to the inflow of water.

These basins are surrounded by small furrows. Branch 'Dhora' flows towards the slope from the main 'Dhora'. If the slope of branch 'Dhora' is steep, 'mooonja' or polythene is spread in it to prevent erosion of sides. The main source of water is located at the highest place in the field.



F-17.1 Check Basin Method

The width of drains is affected by factors like flow of water, percentage, slope and structure of the ground etc. The length of 'Dhora'is different depending on the basis of slope and formation of the fields. This method is also prevalent in India as it does not cause any burden on the farmer.

Advantages:

1. It is the best method of irrigation for leveled fields.
2. It does not require any technical knowledge.
3. This method is more useful in soils having lesser infiltration.
4. In this method, rain water stays in basins, hence soil erosion is not caused.
5. It has lesser economic investment.

Disadvantages:

1. Due to seepage in drains, wastage of water is caused.

2. Machines cannot be used m this method because during spray of insecticides or fertilizers, the earthen walls of basins are damaged.

3. There IS imbalance in distribution of labour. After growth of crops, water reaches the basins in disproportionate quantity thereby causing wastage of water.

4. Creation of problem of water logging.

(ii) Furrow Irrigation Method:

Furrow irrigation method is resorted to where crops are one grown in rows. Along the side of rows of crops, 'Dol'is formed, and in between two such 'Dols', a furrow is formed in which water flows for irrigation. The quantity of flow of water depends on demand of water by plants and the rate of infiltration.

Furrow Irrigation Method

In different situations, different furrow methods are used (Surajbhan 1978). They are mainly of five types:

1. Slopy Furrow

2. Leveled Furrow

3. Contour Furrow

4. Serial Furrow

5. Corrugated Furrow

Advantages:

1. Large areas can be irrigated at a time.

2. It saves labour since once the furrow is filled, it is not necessary to give water a second time.

3. It is a comparatively cheaper method.

4. Plants gets suitable quantity of water by this method.

Disadvantages:

1. Due to imbalance in flow of water, wastage of water is caused in it.
2. It is not suitable in all types of crops.
3. Making 'Dol' for drains requires more labour information.

(iii) Strip Irrigation Method:

In strip irrigation method, fields are divided into strips of different size. A boundary called 'Med' is formed to separate the strips. These strips are constructed according to the slope. The source of water is situated at the highest place in the field from where the whole field can get the flow of water.

The width of strips is decided as per quantity of water. More wastage of water is caused if strips are wider. Length of strip is decided by the slope of land and its structure. Effect of soil composition is also visible on it.

Advantages:

1. It is possible to irrigate more area at a lesser expenditure.
2. It requires less labour.
3. Method of irrigation is easy and it causes lesser erosion.

Disadvantages:

1. It is not suitable for all types of crops.
2. It is not possible to get balanced supply of water.
3. It is not suitable for all soil compositions.

(iv) Basin Irrigation Method:

This irrigation method is more suited for horticulture development. In this method, a raised platform called 'Thanvla' is formed around trees or bushes and they are connected with each other through drains and the water reaches from one tree to the other. This method is not suitable for crops.

Advantages:

1. It saves time. Once the water is opened, it reaches other trees automatically.
2. Its economic investment is less.
3. It is beneficial for more trees.

Disadvantages:

1. It is not useful for all crops.
2. Diseases spread in trees.
3. Wastage of water is caused in it.

2. Modern Irrigation techniques:

(v) Sprinkler Irrigation Method:

In present times, when water crisis is developing very fast everywhere, we should adopt improved techniques of irrigation to encourage suitable water management. Sprinkler irription method is an easy and simple method of irrigation in present times.

F-17.2 Sprinkler Irrigation Method

The whole land becomes available for cultivation of crops, whereas in traditional irrigation methods, 15 to 20 per cent land remains vacant in depres-sions and boundaries. Modern equipment's can also be used in it due to absence of depressions and boundaries. Rate of infiltration is higher in sandy soils where frequency of watering is more. Hence, sprinkler irrigation method is more suited to sandy soils.

In sprinkler irrigation method, water is taken from source to the fields through pipes, whereas in surface irrigation methods only 30-45 per cent water reaches the crops. Such loss of water is avoided in sprinkler irrigation method. The problem of water logging or 'kallar' may be caused in case of excess water from surface irrigation, whereas no such problem is caused in sprinkler irrigation method. The balance of groundwater is also maintained.

For development of sprinkler irrigation method, the following circumstances are essential:

1. It is done in areas having scarcity of water.
2. Uneven ground level where irrigation is not possible by other irrigation methods.
3. Places having maximum temperature where crops might get destroyed, sprinkler irrigation method maintains humid environment for the crops.
4 .Where soil textures may be of different nature, for example, sandy soil at some places and stony soil at others places.
5. It requires lesser number of labourers hence, it can be developed even where there are less workers.
6. Irrigation may be required in large areas.
7. There should be average technical knowledge.

In areas where change in temperature of earth, environment and humidity is required for growth of crops, sprinkler irrigation method is possible to a certain extent. Due to continuous spray of water, there IS improvement in physical conditions of earth and composition of soil. In kallar or reh soils, land can be improved by sprinkler irrigation, whereas surface irrigation needs much more water for it.

Thus, it is a suitable irrigation method for sustainable development of water resources in present times. It is installed in fields by three methods:

1. Permanent:

In this method, the main line and branch pipelines are permanently installed in the field. After that it is not possible to shift its place. In this system, labour involved in shifting of lines from time to time is saved but it is quite expensive. The pipeline remains safe being underground, whereas in case it is outside, the breakages are

more by frequent changing. Such an arrangement is suitable for canal irrigated areas having 'barabandi' where water becomes available for a very limited time.

2. Semi-permanent:

In this method, the main pipeline is perma-nently fixed under the ground level but branch pipelines are kept outside temporarily so that by changing their places, the whole of the land might be irrigated.

3. Temporary:

In this case, the whole arrangement is temporary and their places can be transferred as per requirement. In this method, more irrigation is possible with lesser investment. It of course needs more labour.

Due to different surface levels, location of tube wells and size of farm lands are different, hence sprinkler irrigation method has not been considered as a suitable method in all cases.

Advantages:

1. There is increase in production and compactness.
2. It is helpful in soil conservation and stabilization of sand dunes in desert areas.
3. Sprinkler system is considered more suitable in areas where slit is coagulated on surface of soil after rains, prevents growth of crop.
4. This system saves the crop from extreme frost or temperature.
5. Fertilizer application as well as insecticide spray can be done by sprinkler system.
6. Waste land can be improved by less water. Physical condition and composition of soil can be maintained in a balanced condition by continuous sprinkling.

Disadvantages/Defects:

1. Sprinkler irrigation method is expensive.
2. It requires technical knowledge.
3. Sprinkler irrigation method cannot be used in all crops.
4. Crop is damaged by changing sprinkler system again and again.
5. Water to be used in sprinkler method should be clean.

In spite of the above defects, sprinkler irrigation method is being adopted with great speed due to increasing water crisis.

(vi) Drip Irrigation:

A newly developed irrigation system known as drip irrigation or trickle irrigation, originally developed in Israel, is becoming popular in areas of water scarcity. In this irrigation system, a small amount of water is applied at frequent intervals in the form of water droplets through perforations in plastic pipes or through nozzles attached to tubes spread over the soil to irrigate a limited area around the plant.

This system of irrigation is established on the basis of type of crop, distance between plants, requirement of water for crops and distance of water source from the field.

A precise amount of water equal to the daily consumptive use or the depleted soil water needs to be applied. The soil water can be maintained at the field capacity during the crop growing period. Deep percolation losses can be completely prevented and the evaporation loss is also reduced.

The application of water and piping systems needs to be designed according to the type of crops, topography and weather conditions typical to the geographical area.

The basic equipment for drip irrigation consists of a water supply head, a main pipe, lateral pipes and drippers. The water flow in the pipe system is controlled with control valves and fertilizers can be applied at the water source. As water passes through the very small outlets of drippers, it is filtered before h is distributed in the pipe system.

Structure of Drip Irrigation Method:

The following are the main organs of drip irrigation method: water pump, main PVC, pipeline, branch PVC pipeline connected to main line, plastic pipes connected to branch line, drippers connected with plastic pipes, fertilizer tank for application of fertilizers, valve, water measure, pressure controller, filter etc. Internal radius of side pipe is from 10 to 32 mm. Side pipelines are fitted with drippers from where water falls in drops. Efficiency of drip irrigation method depends on suitable operation of drippers. Flow rate of drippers is 2 to 10 litres per hour.

Advantages:

1. In this method, water directly reaches the roots of the plants, which take water to plants in balanced quantities.
2. Drip irrigation method saves 30 to 70 per cent water and it is possible to irrigate three times more area with the same amount of water.
3. In this method, weeds do not spread because water reaches only near plants and does not spread in the whole field.
4. Fertilizers and insecticides can also reach the plant directly by solution in the water and it saves 30 to 60 per cent chemical fertilizers as well as 40 to 50 per cent pesticides along with saving of water.
5. Even in case of uneven lands, drip irrigation method can do balanced irrigation.
6. Cultivation in saline and alkaline soil also can be done by this method of irrigation.
7. Crop production is higher by 20 to 40 per cent in drip irrigation method.
8. Lesser labourers are required for irrigation work.

9. Bacteria causing diseases in crops do not grow because of dry atmosphere near plants.

Disadvantages:

1. Drip irrigation method is expensive.
2. It requires special technical knowledge for successful operation of this method.
3. In heavy soils, it creates problems of flow and water blockages.
4. Plants are able to get nutritive elements in a very limited area.
5. It is not suitable for every crop.
6. Utmost care has to be taken for holes of drippers, because soil may come along with water at any time, which will prevent water dripping smoothing from holes.
7. Animals may cause damage to branch pipelines and dripper pipelines.
8. Most of the drippers work on pressure. Wherever land is sloppy, pressure on valves increases by 50 to 10 per cent, which results in stoppage of working of valves on the upper side.

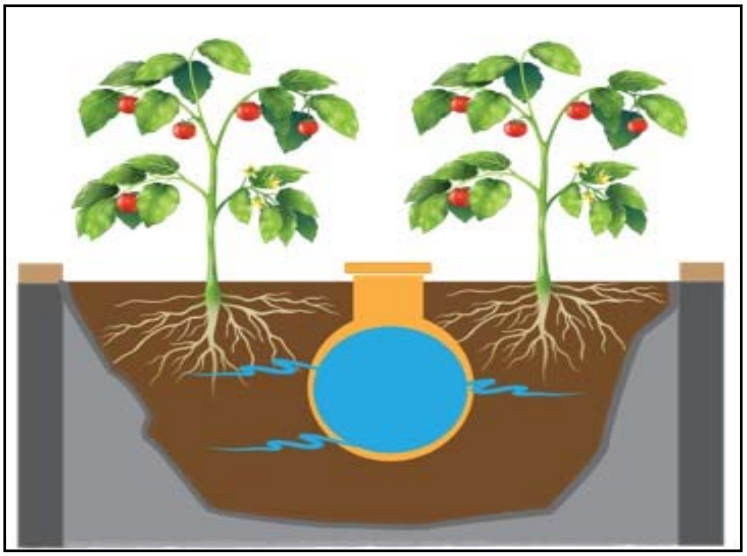
(vii) Pot Irrigation Method:

Pot irrigation method is more suitable for areas having scanty rainfall. In saline areas where flow irrigation is not suited, pot irrigation method is successful. An earthen pitcher is used in this method. The pitcher is fixed in the ground up to neck.

Holes are made in the pitcher and water is filled in it so that seepage of water through the holes keeps the nearby soil moist. Water is filled in these pitchers at regular intervals. This method can be considered as an alternative of drip irrigation method.

Pot irrigation method can be adopted in the following conditions:

1. Unlevelled land which is uneven.
2. Area having maximum shortage of water.
3. Such difficult areas where supply of fruits and vegetables is difficult and they are costly.
4. Where there is saline water, making surface irrigation difficult.



F-17.3 Pot Irrigation Method

In this method, distribution of humidity around sides of pitcher is affected by many factors, mainly size of the pitcher, seepage of water per unit of area

and type of soil. Humidity is spread in the same proportion as the size of the pitcher. Distance of pitcher also affects the moist area. Normally, distance between two pitchers should be kept so much that the humid area between them does not overlap.

Advantages:

1. In this method, only the area near the pot gets irrigated and not the whole area.
2. Evaporation of water is minimum in this method.
3. Water seepage below the ground is also in minimum quantity.
4. It is the best method for horticulture crops and vegetables.
5. Once the pitchers are fixed, irrigation can be done for six years, which reduces expenditure.
6. It needs minimum technical knowledge.

Defects:

1. Irrigation in this method is possible in a limited area.
2. This method requires clean water because unclean water would cause blockage of minor holes, which would not be able to provide moisture any longer.
3. It is costly to draw out pitchers again and again and re-fix them.
4. It is not suitable for every crop.

18 Social Activities Planned By Students

- We Distributed masks and sanitizers to them for covid awarness.
- We have suggested them for not dumping the waste in village streets and dispose it at right place.
- We have also done a cleaning of village street through Swatchh Bharat Abhiyan.
- Free distribution of cooked meals and ration by the help of local NGO.
- As migrants return to villages, they will need to be isolated to prevent the spread of the virus and preparation od third wave.Gram panchayat should take the initiative to set up local quarantine centres, So we suggedted them some tips to convert not used structures into isolation centers.
- There is no any other steps taken by students/Villagers due to covid-19 guidelines.

F-18.1 Social Activity done by Students

19 SAGY Questionnaire with the Sarpanch Signature

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: Handiya Gram Panchayat: Handiya Ward No. –

Block: – District: Mahisagar

State: Gujrat L S Constituency: –

1. Family Identity and Size

Name of Head of Household	[redacted] Maherci Pravinbhai								Male/ Female	109 4 1085
SECC Survey ID:	–	Family Size	4	Over 18	3	6 to 18	1	Under 6	0	

2. Category & Entitlement Details (Tick as appropriate)

Social Category[1]		Life Insurance	1. All Adults 2. Some Adults 3. None	AABY	1. Yes 2. No	Kisan Credit Card	NO Yes / No
Poverty Status Year[2]:	1. BPL 2. APL	Health Insurance	1. All Adults 2. Some Adults 3. None	RSBY	NO 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]
Maherci Pravinbhai	42	M	N	yes	9th	yes	y	–
Maherci hiten	21	M	N	No	college	Yes	y	–

3. Children from 6 years and up to 18 years

Name	Age	Sex M/F/O	Disability Y/N	Marital Code*	Level of Education: Code#	Going to School /College (Y/N)	Current Class	Computer Literate Y/N
Maherci jay	12	M	N	NO	conf.	Yes	yes	yes

4. Children below 6 years

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

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

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

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

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

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

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

5. Hand washing

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

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

7. Do members take Regular Physical Exercise

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

8. Consumption of Tobacco

	Smoking	Chewing
Adults	some	-
Children	no	-

9. House & Homestead Data

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

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

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

11. Source of Lighting and Power

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

12. Landholding (Acres)

1. Total	304. hect	2. Cultivable Area	-
3. Irrigated Area	-	4. Uncultivable Area	-

13. Principal Occupations in the Household

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

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

15. Agriculture Inputs

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

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

Name	Unit	Quantity
-	-	-

17. Livestock Numbers

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

18. What games do Children Play
cricket

19. Do children play musical instrument (mention)
no

Schedule Filled By:
Principal Respondent:
Date of Survey:

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: Handiya

b. Block: -

c. District: mahisagar

d. State: Gujrat

e. Lok Sabha Constituency: -

f. Number of Wards in the Gram Panchayat: -

g. Number of Villages in the Gram Panchayat: -

h. Names of Villages:

Demographic Information

Number of Households 432 Total Population 2179 Male 1094 Female 1085

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	No	
b.	Nearest Primary Health Centre (PHC)	Yes	
c.	Nearest Community Health Centre (CHC)	No	
d.	Nearest Post Office	No	
e.	Nearest Bank Branch (Any)	No	
f.	Nearest Bank with CBS Facility	No	
g.	Nearest ATM	Yes	
h.	Nearest Primary School	Yes	
i.	Nearest Middle School	No	
j.	Nearest Secondary School	No	
k.	Nearest Higher Secondary School / +2 College	No	
l.	Nearest Graduate College	Yes	
m	Nearest ITI / Polytechnic Centre	Yes	
n	Kisan Seva Kendra	No	

1

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

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

IV. Sports Facilities in the Gram Panchayat

a. Number of Play Grounds in the GP: Total 1 Public School ground Private NO

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

V. Education, ICDS

a. Number of Angan Wadi Centres: yes(2)

b. Number of villages without Angan Wadi Centres –

Names of such villages: _____

c. Schools (Number)

Primary Private: – Primary Govt.: 1

Middle Private: – Middle Govt.: –

Secondary Private: – Secondary Govt.: –

Higher Secondary Private: – Higher Secondary Govt: –

VI. Public Distribution System

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

2

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

VII. Coverage of Villages under different Facilities & Services

	Parameter	Villages Status[1]	Names of Villages Covered	Names of Villages not Covered
a.	Piped Water Supply Coverage to Villages	Covered yes / Not Covered	1	Handiya
b.	Hand Pump Coverage in Villages:	Covered yes / Not Covered	-	-
c.	Coverage under Covered Drains:	Covered No / Not Covered	-	-
d.	Coverage under Open Drains:	Covered yes / Not Covered	-	-
e.	Villages with Household Electricity Connection (Numbers)	Connected No / Not Connected	-	-

VIII. Land and Irrigation

	Private Land	Area in Acres		Common Land	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	-	d.	Pasture / Grazing Land	-	g.	Check Dam	No
b.	Irrigated Land	1080hec	e.	Forests/ Plantations	-	h.	Wells/Bore Wells	No
c.	Un-irrigated Land	124 hec	f.	Other Common Land	-	i	Tanks /Ponds	No

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

3

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

IX. Parameters relating to Households & Institutions

		Number
a)	Number of eligible Households for pension (old age, widow, disability)	-
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	Most of houshold
e)	Number of eligible HHs having ration cards	-
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	no one
k)	Number of BPL families	mostly
l)	Number of landless households	mostly
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'

Surveyor	PRI Respondent (Preferably Gram Panchayat Chairperson)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	Date of Survey
	18-2-2021		

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

4

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

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

I. Basic Information

a. Village: Handiya

b. Ward Number: -

c. Gram Panchayat: Handiya.

d. Block: -

e. District: mahisagar

f. State: Gujrat

g. Lok Sabha Constituency: -

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

i. Names of Habitations / Hamlets:

Demographic Information

Number of Households 432 Total Population 2179 Male 1094 Female 1085

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

II. Access to Infrastructure/Amenities etc.

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

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

1

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

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

ii. Road Connectivity

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

If 3 mention the name of the habitations where not available: 1 - All

iii. Drinking Water Facilities

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

If 3 mention the name of the habitations not covered:

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

If 3 mention the name of the habitations not covered:

iv. Coverage of Habitations under Waste Management System

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

If 3 mention the name of the habitations not covered:

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

If 3 mention the name of the habitations not covered:

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

If 3 mention the name of the habitations not covered: 2 None

v. Coverage of Habitations under Electrification

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

If 3 mention the name of the habitations not covered: 1 - All

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

If 3 mention the name of the habitations not covered: 3 - Some

vi. Sports Facilities in the Village

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

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

vii. Education, ICDS

a. Number of Anganwadi Centres: -

c. Schools (Number)

Primary Private: - Primary Govt.: 1

Middle Private: - Middle Govt.: -

Secondary Private: - Secondary Govt.: -

Higher Secondary Private: - Higher Secondary Govt: -

2

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

viii. Land Category		Area in Acres		Land Category	Area in Acres		Irrigation Structure	No.
a.	Cultivable Land	–	d.	Pasture / Grazing Land	–	g.	Check Dam	–
b.	Irrigated Land	180 Hect	e.	Forests/ Plnatations	–	h.	Wells/Bore Wells	–
c.	Un-irrigated Land	224 Hect	f.	Other Common Land	–	I	Tanks /Ponds	–

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

Name and Signature of Surveyor and Respondent'

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

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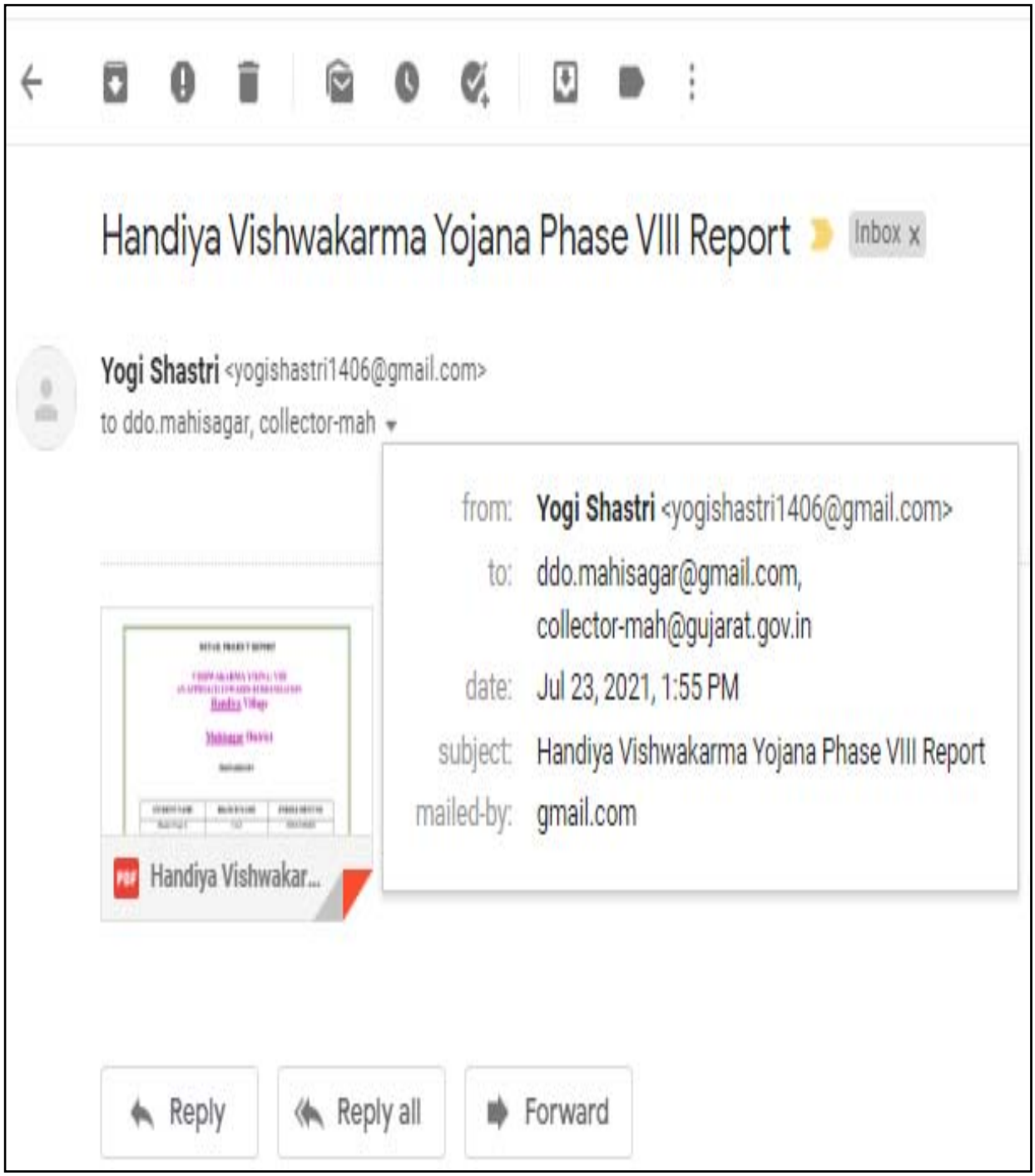

21 Comprehensive report for the entire village

- **Introduction:**

Handiya village is located in Balasinor Tehsil of Kheda district in Gujarat, India. It is situated 2km away from sub-district headquarter Balasinor and 72km away from district headquarter Nadiad. it is the 17th smallest village by area in the sub district. Population density of the village is 714 persons per km².As per constitution of India and Panchyati Raaj Act, Handiya village is administrated by Sarpanch (Head of Village) who is elected representative of village.

- **Study Area Profile:**

Handiya village is located in Balasinor Tehsil of Kheda district in Gujarat, India. It is situated 2km away from sub-district headquarter Balasinor and 72km away from district headquarter Nadiad. it is the 17th smallest village by area in the sub district. It is small village cnosisting population of 2179 only.Population density of the village is 714 persons per km². The nearest town to the Handiya is Virpur which is 20 km away from village. The other nearest town is the Balasinor that is 7 km away from the village. The village has bus stop, Gram Panchayat, Pond, Angadvadi, Well, Villahe pond, Primary and Secondary School etc. The nearest river is Mahisagar River and it is the main source of irrigation for village.There is a Localized Irrigation.

- **Data Collection:**

a. General:

Our team collected data from Gramsevak, School teacher, Aanghanvadi worker as well as following method, The general data is collect by the observation of village.

- By techno economical survey
- By questioning to villagers
- By taking photograph of existing situation

b. Survey Data:

- There is bus stop in the village. 40% roads are kachha roads and 60% roads are C.C. roads
- There are 30% pucca houses and 70% kachcha houses in the village Handiya.
- There is no Geo-Tagging of house is carried out because wo go for Home interview survey.
- The Average size of house is 100 Sq.Yard plot per house.
- There are 432 households in the village and an average 5 persons live in every family.

- There is tap water system in the village.
- There is Open drainage system in Handiya.
- In village 35 to 40% use smart phone are 20 to 25% use a normal phone and rest of people are not use phone. 60% people have knowledge about internet.

c. Availability of Amenities:

There following types of amenities are available such as electrical facilities, Education facilities, water facility, ATM service.

➢ **Design Proposals with their benefits:**

a. Primary School: Primary education increases the knowledge of children which increase social and emotional development.

b. Primary Health Centre: To provide primary medical care to the villagers

c. Community Hall: To increase and strengthen the villager's family bonds and offers valuable community information.

d. Skills Development Unit: There is no Skill Development centre available in handiya village, due to which villagers who want to learn new skils have to go to the nearest town.

e. Agro Storage Unit: It will be Benefit to the farmers, they can easily store their Agricultural production.

f. Drinking Facility Units: To Provide good quality of drinking water.

g. Cemetery: For Social benefits to the villagers.

h. Animal Shelter: For help to break the cycle of pet overpopulation to save life.

i. Angadvadi: Aganwadi centers provides basic health care, basic health care activities include contraceptive counseling and supply, nutrition education and supplementation, as well as pre-school activities.

j. Bank with ATM: The benefits of using bank ATM cards are more than evident.

k. Public Toilet: To facilitates a toilet facility and promotes Swachh Bharat Yojana

l. Citizen Service Centre: To promote rural entrepreneurship, enable community participation and effect collective action for social improvement.

➢ **Conclusion:**

From techno-economical Survey we conclude that we can reduce the migration rate from Rural to Urban ara by providing the basic requirements and amenities to our allocated Village like Good quality education facility, Physical Facilities, Social-Cultural Facility for the village.