DETAIL PROJECT REPORT

ON

VISHWAKARMA YOJNA: VIII

AN APPROACH TOWARDS RURBANISATION
VALUKAD village

BHAVNAGAR District

PREPARED BY

STUDENT NAME	BRANCH NAME	ENROLLMENT NO.
Patel Dhwanil Paritoshbhai	Civil	170210106044
Gohil Mandipkumar Rajubhai	Civil	180213106004

Government Engineering College, Bhavnagar

Prof. Chintan A. Gajjar
NODAL OFFICERS NAME

YEAR: 2020-21

GUJARAT TECHNOLOGICAL UNIVERSITY
Chandkheda, Ahmedabad – 382424 Gujarat

DETAIL PROJECT REPORT

ON

Vishwakarma Yojana: Phase VIII

AN APPROACH TOWARDS RURBANISATION
VALUKAD village

BHAVNAGAR District

PREPARED BY

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
Patel Dhwanil Paritoshbhai	Civil	170210106044
Gohil Mandipkumar Rajubhai	Civil	180213106004

Government Engineering College, Bhavnagar

Prof. Chintan A. Gajjar
NODAL OFFICERS NAME

Year: 2020-21

Gujarat Technological University,
Chandkheda, Ahmedabad – 382424 Gujarat

CERTIFICATE

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

Detail Project Report for,

VILLAGE :- VALUKAD

DISTRICT :- BHAVNAGAR

Under

Vishwakarma Yojana: Phase VIII

in partial fulfillment of the project offered by

GUJARAT TECHNOLOGICAL UNIVERSITY, CHANDKHEDA

During the academic year 2020-21.

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

STUDENT NAME	BRANCH NAME	ENROLLMENT NO
Patel Dhwanil Paritoshbhai	Civil	170210106044
Gohil Mandipkumar Rajubhai	Civil	180213106004

Date of Report Submission:	
Principal Name and Signature:	DR. G. P. VADODARIA
VY-Nodal Officer Name and Signature:	PROF. C. A. GAJJAR
Internal (Evaluator) Guide Name and Signature:	
College Name:	GOVERNMENT ENGINEERING COLLEGE, BHAVNAGAR.
College Stamp:	

ABSTRACT

Vishwakarma Yojana project and how you do your vision project: Vishwakarma Yojana is an approach towards rurbanisation and Vishwakarma Yojana would provide "Design to Delivery" solution for development of villages in 'Rurban' areas. The team has conducted Vishwakarma Yojana Project for Valukad village with the vision of the developmental work in villages that could be undertaken as per the need of the village, in particular includes Physical, Social and Sustainable infrastructure facilities.

About your village description: Valukad village is located in Ghogha Tehsil of Bhavnagar District in Gujarat, India. It is situated 15km away from Districts headquarter Bhavnagar and 21 km away from Sub District Headquarter Ghogha. As per 2009 statistics, Valukad is the Gram Panchayat of Valukad village. The total geographical area of village is 2155.7 hectares. Valukad has a total population of 6881 peoples. There are about 1158 houses in Valukad village. As per 2019 stats, Valukad village comes under Bhavnagar Rural assembly & Bhavnagar parliamentary constituency. Bhavnagar is nearest town to Valukad which is approximately 15km away. The basic facilities available in the village are like public health centre, small scale industries, new Panchayat building, drainage facilities, pucca road, school, etc.

About existing village condition: In Valukad village water supplied to the people is sufficient. Drainage system is inadequate. Although the water supply is sufficient the water distribution system is improper in village. There is improper street lighting facilities in village. All the village roads are Pucca roads. In the village lack of basic facilities like bus stops, public toilet, post office, hostel building, community hall, etc.

About your proposed designs your view for village development: For development of the village infrastructure facilities like community bath & toilet, public facilities like bus station, public library, are required. For development of the village proper facility for diversion/distribution of water in order to make appropriate use of pond water by villagers and for better visibility Renewable energy LED street light may be provided.. Based on the survey we tried to give design of required basic facilities to fulfill their needs. By providing these basic facilities to villager's migration rate will be decreased. And this is ultimate aim of the Vishwakarma Yojana.

About future scope of the village development: According to UDPFI norms, the team can enhance and design basic facilities which are unavailable at present in the village. These may include but not limited to (a) physical infrastructure including Solid waste Management, Water supply in village, (b) social infrastructure including some Community Hall, Recreational club, socio cultural center, (c) Recreational Facilities like Joggers park, Redevelopment of existing pond of Valukad village, etc. In a nutshell, the future scope would be study of urban replicating amenities that would be sustainable in rural areas of Bhavnagar.

Key Words: Rurban, Smart village, Gap analysis, Sustainable development, etc

ACKNOWLEDGEMENT

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

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

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

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

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

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

An act of gratitude is expressed to our internal guide / Evaluator / Nodal Officer, **Prof. C. A. GAJJAR** from college **GOVERNMENT ENGINEERING COLLEGE, BHAVNAGAR.** For their invaluable guidance, constant inspiration and active involvement in our project work.

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

We are also thankful to **Ms. Darshana Chauhan, Vishwakarmrma Yojana**, for all support during our work. We therefore, take this opportunity for this Project work expressing our deep gratitude and sincere thanks for her cooperation to produce this project work in the present form.

Above all we would like to thank our Parents, family members and Friends for their encouragement and support rendered in completion of the present this work.

CONTENT

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

SHORT NAME / SYMBOL	FULL NAME
CCTV	Closed-Circuit Television
LED	Light Emitting Diode
MDM	Mid Day Meal
CDP	Community Development Program
NES	National Extension Services
UNDP	United Nations Development Program
IRDP	Integrated Rural Development Program
SGSY	Swarnjayanti Gram Swarozgar Yojana
PRI	Panchayati Raj Institutions
ICAR	Indian Council for Agricultural Research
IRRI	International Rice Research Institute
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
PPP	Public Private Partnership
ST	Statutory Town
CT	Census Town
MCD	Municipal Corporation of Delhi
UDPFI	Urban and Regional Development Plans Formulation and Implementation
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
NRuM	National Rurban Mission
EAG	Empowered Action Group
MIC	Marketing Information Centre
CGF	Critical Gap Funding
SPMRM	Shyama Prasad Mukherji Rurban Mission
SCP	Smart City Proposal
PMC	Project Management Consultants
NGO	Non Governmental Organisation
HRIDAY	Heritage City Development and Augmentation Yojana
SBM	Swachh Bharat Mission
SPV	Special Purpose Vehicle
ULB	Urban Local Bodies
MoUD	Ministry of Urban Development
SCADL	Smart City Ahmedabad Development Limited
AFCS	Automated Fare Collection Service
AVLS	Automatic Vehicle Location System
VPSD	Vehicle Planning Schedule and Dispatch System
DMS	Depot Management System
PIS	Passenger Information System
MoHUA	Ministry of Housing and Urban Affairs

ASHA	Accredited Social Health Activist
SHC	Sub Health Center
SSA	Sarva Shiksha Abhiyaan
IMR	Infant Mortalitiy Rate
NRHM	National Rural Health Mission
NRLM	National Rural Livelihood Mission
NSSO	National Sample Survey Organisation
BMC	Bhavnagar Municipal Corporation
BIM	Building Information Management
GIFT City	Gujarat International Finance Tec-City

Chapter 1: Ideal village visit from District of Gujarat State

1.1 Background & Study Area Location:-

Kukad is a village in Ghogha Tehsil, Bhavnagar district and Gujarat State. Kukad village pincode is 364120. Kukad village total population is 2132 and number of houses are 386. Female population is 48.3%. Village literacy rate is71.20% and female literacy rate is 32%.

We have selected Kukad as ideal village because it has many facilities which are yet to be provided or are missing in the allocated, some them are lack of public toilet facilities, lack of sub post office , lack of public bus stand, lack of hostel, lack of storage building etc.

Kukad village has a power supply with 24 hour power supply in summer as well as in winter. Various other amenities in the village are anganwadi center, ASHA, Birth & Death registration office, Daily newspaper and polling stations are the other amenities additional to the basic amenities in the village.

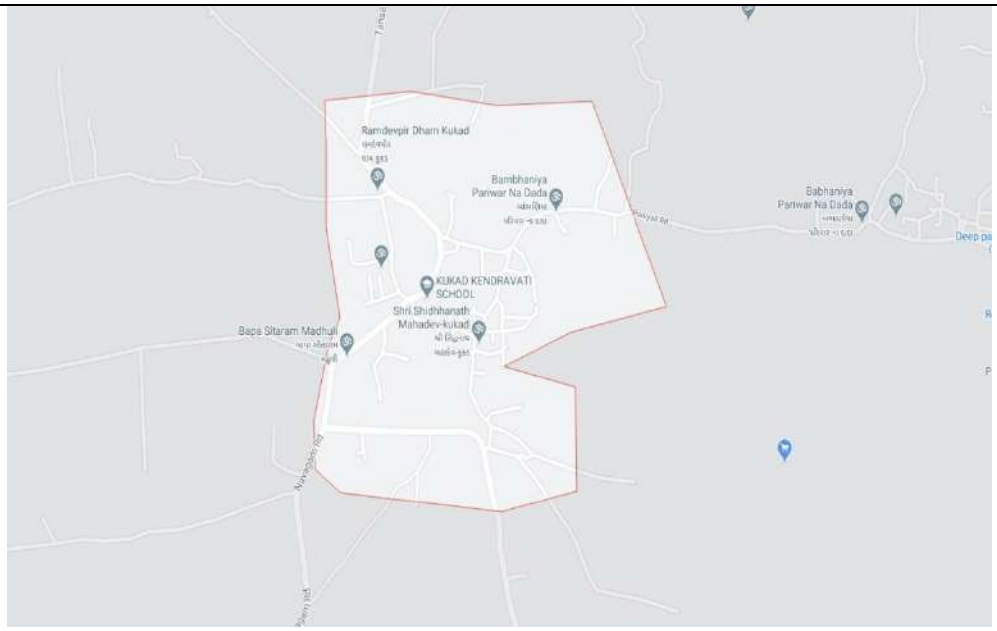


Fig1.1 Map of Kukad

- **Study Area Location**

Kukad is a Village in Ghogha Taluka in Bhavnagar District of Gujarat State, India. It is located 37 KM towards South from District head quarters Bhavnagar. 14 KM from Ghogha. 233 KM from State capital Gandhinagar. There has been use of advance technology in sanitation. Efforts have been made for empowerment of farmers and increasing the cultivation of crop. Some of the facilities provided by gram panchayat include suitable water supply and drainage facilities.

Fig1.2 Satellite view of Kukad

1.2 Concept: Ideal Village :-

Kukad is a village located in Bhavnagar district in the state of Gujarat, India. In this village sufficient LED street lighting facility is available. Government bus transportation facility is available in village. Water tank & water supply are sufficient to water supply to the village. RCC roads are there throughout the village made by gram panchayat. In this village appropriate waste collection and disposal facility are available. In this village there is highly equipped sub health centre (SHC) available.

1.2.1 Objectives of the Ideal Village :-

- To create village infrastructures by opening and constructing school building, community hall, multi-purpose training hall, indoor-stadium, mini- stadium, marketing sheds, waiting sheds, guest houses, tourist homes, cultural hail, solar energy centers, gobar gas plant, multi- purpose playgrounds, vocational training centers, low-cost sanitary latrines, etc. at all rural villages.
- To take up agriculture, sericulture, horticulture and fishery development projects at all suitable tribal areas.
- To take up Universalization of Elementary Education (Sarva Shiksha Abhyan) projects, residential and non residential school, non- formal and adult education centers, second language learning centers, Computer training centre, girls and boys hostel at some selected places with a view to provide free education for all.
- To establish vocational training centers for imparting entrepreneurial development training in various fields to educated unemployed youths of Tribal/Minority community so as to provide them with self employment opportunities.

- To take up Scientific method on various programs on Education, Economic, & Social upgradation of skills for development of the welfare of the society.
- To take up environmental orientation projects for checking ecological imbalance, to protect wildlife and to preserve energy and natural resources.
- To take up health and sanitation programmes and to establish community health centers, research and training centers for herbal medicines, homeopathic drugs, ayurvedic drugs, nurses training centers etc. at some selected places of rural areas. To run drug de-addiction and rehabilitation centers at some selected places with a view to check juvenile delinquency and also to help them regaining a pire and normal life.
- To construct Inter-Village Roads, bridges, culverts with a view to provide transport facilities to the poor Tribals for carrying their agro- horticultural produces and forest products to the main market for sale which facility is not available in the past.
- To take up livestock development projects such as dairy, poultry, piggery, duckery, goatery etc. farming as an alternative means of livelihood other than farming.
- To run small scale industry such as weaving, tailoring, black smithy, handloom, and loin-loom weaving and crafts production centers, embroidery etc. at all suitable places for the income of the poor tribals.
- To set up fruit processing centers and cold-storage with a view to preserve fruits for obtaining maximum benefits from agro-horticultural products produces in rural areas.
- To take up watershed development, waste land development social forestry projects etc. so that the barren lands be made productive again for the development of the rural poor people.
- To run orphanages, aged homes, working women hostel, widows welfare centre, social care centers, child-care centers etc. so that these needy persons be provided free fooding, clothing, education, medicines, shelter thereby making their lives comfortable and prosperous.
- To apply scientific methods on jhuming and terrace cultivations with a view to enhance the productivity of rural/hill lands for the socio-economic development of tribals and other backward classes.
- To take up drinking water supply programmes so that the rural poor people be provided safe drinking water wherever necessary.
- To establish Rehabilitation and De-addiction Centre for dependant substances like drugs and alcohol at all possible areas of the North-Eastern Region.
- To appoint and supervise paid staffs and employees of the Organisation to run various projects.
- To set up branch Offices of the Organisation in all suitable places.

1.2.2 Case Study of other state Ideal Village :-

Ramachandrapuram - A Model Village

Ramachandrapuram is a small village with 471 households in Karimnagar district in Telangana. It has achieved remarkable transformation through innovations in self-governance arrangements, and participating planning and development. The most interesting feature of this story of transformation is the structural innovations and the "Village Government" that carried the process.

Various transformation carried out in village are eradication of the liquor production and sale. Awareness against alcoholism by house-to-house visits of village committee members. The Sarpanch revived the village school and developed better education as a part of the ICDS project; Also initiated two Aanganwadi centers.

"Cabinet System" Panchayat has all the elected members constituting the "Village Cabinet", with each ward member acting as a "Minister''."Water System" distributed from two water tanks. The Gram Panchayat encouraged people to build soakage pits near the discharge points.

The major impacts in village were the school was well-equipped to teach updated courses. The village got its own substation ensuring uninterrupted power supply. Piped water from the river is supplied to village, avoiding the fluoride contaminated groundwater. Frequently held Gram Sabhas are considered very important in getting all villagers on board in various developmental projects. In first of its kind, all the residents of Ramchandrapuram village have pledged to donate their eyes after death.

Fig1.3Ramachandrapuram village

Major resources of village are that this village now prides for being amongst the Model Villages of India. There sources are also arranged from annual turnover from all the agricultural activities

in Ramchandrapurm which is now worth over Rs. 3.5 crore. There are 29 SHGs, 7 farmer's groups and also a thrift group each for men and women. They also save through private savings. The village has 1,490 registered voters with 1,750 insurance policies, and a total premium payout of the village is between Rs. 30-40 lakhs. Individual household savings also amounts to about Rs.40-50 lakh. Put together Rs. 1 crore is the collective annual saving in this small village.


Fig1.4 Ramachandrapuram village School And Road

1.2.3 The Idea of a model/Smart Village :-

The Idea of a model village 68.9% of our population lives in rural areas (Census 2011). Though number is expected to fall in the coming years, it is still estimated that more than half of our population would be rural even in 2050. Despite there being several past initiatives by governments at all levels – Central, State and Local – in the past, the level of improvement has not kept pace with the rising aspirations among Indians. On most development parameters, there is still a significant gap between rural and urban India, as the table below illustrates:

Sector	Parameter	Urban	Rural
Expenditure poverty	% people below poverty line (2011-12) (Tendulkar estimates)	14%	26%
	% people below poverty line (2011-12) (Rangarajan estimates)	27.2%	31.3%
Education	Literacy Rate - 2011	85%	68.9%
	Average years of school education of working population	8.42	4.72
Health	Infant Mortality Rate (IMR) – 2011	28	46
	Life Expectancy at birth - 2002-06	68.8	62.1

Table 1.1 Development Parameter

One reason for the failure of rural development schemes has been the lack of a holistic focus on the village as a unit. Separate flagship schemes targeting different sectors such as health (NRHM), education (SSA) and livelihood (NREGA, NRLM) have been launched in the past, but

met with limited success. The "Model Village" concept could address these challenges comprehensively. It can address resource deficits in each of these sectors, with adequate focus on the special needs of every village. The idea of an "Adarsh Gram" or model village has been explored earlier as well, most notably through the Pradhanmantri Adarsh Gram Yojana, launched by the Central Government in 2009-10. The scheme was implemented in pilot mode in 1000 villages of Assam, Bihar, Himachal Pradesh, Rajasthan and Tamil Nadu, with an allocation of Rs 10 lakh per village. This limit was later raised to Rs 20 lakh per village. The target villages under the scheme were those with more than 50% of the population belonging to Scheduled Castes (SCs). Additionally, State governments have also taken steps in this direction. Himachal Pradesh launched a Mukhya Mantri Adarsh Gram Yojana along similar lines in 2011, with the allocation of Rs 10 lakh per village. The proposed "Sansad Adarsh Gram Yojana" of the Central Government aims to involve MPs more directly in the development of model villages. By adopting a village(s) under this initiative, an MP has the opportunity to directly benefit all sections of a village community in an integrated, efficient and participatory fashion. The following sections in this brief highlight the important objectives that a model village could achieve, and covers the core features of a model village in India. Section 6 covers the important guidelines under the new "Sansad Adarsh Gram Yojana".

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

Following the Gandhian vision and dream of Gram Swaraj (village level self-governance) (Bardhan, 2007), rural development has always been given critical salience in the planning process of independent India. It began with launching of the Community Development Programmes (hereafter CDP) in 1952 followed by the National Extension Services (hereafter NES) in 1953. These two programmes had ambitious objectives and envisioned community participation but failed miserably due to their top down development paradigm (see the works of Sreedhar & Rajasekhar, 2014; Patel, 2014; UNDP, 2000). Later, successive Five-Year Plans led to the creation of essential physical and institutional infrastructure to bring about socio-economic changes in rural areas (Patel, 2014).

The Fifth Five-Year Plan proposed different approaches to rural development such as Area Development, Target Group Approach, and comprehensive development approach. Schemes involving special financial and fiscal concessions, bank loans on soft terms, and capital subsidies were also introduced into underdeveloped areas to attract increased investments for development. (Patel, 2014). The Integrated Rural Development Programme (hereafter IRDP) launched in 1976 aimed at alleviating rural poverty and at holistic rural development through self-employment opportunities. The IRDP was conceptualized as a programme oriented towards development of a given area rather than development of a specific sector. It was designed to alleviate poverty through local level planning, taking into account the development of local resources including human resources through formulating projects on scientific lines.

IRDP also failed to realize its targets. "Swarnjayanti Gram Swarozgar Yojana" (SGSY) is a programme for self-employment of the rural poor and has been implemented since 1999, after restructuring and merging the erstwhile IRDP and its allied programmes. In 2011, the government announced National Rural Livelihood mission with an objective to further the cause

of rural development. All these programmes have met with partial success but still much needs to be achieved. It is important to identify and understand specific concerns, needs, and challenges in different rural areas of the country and adopt specific policies rather than adopting a "one – size fits-all" approach. Universal programmes need to be tweaked to suit local requirements so that their success is guaranteed.

During his position as a Prime Minister of India, Late Shri Rajivbhai Gandhi's contribution to realising the Gandhian dream of rural self – governance is unforgettable. However, his government's initiative in the form of the 65th and 66th constitutional amendment bills was defeated in the upper house of the Indian Parliament. Finally, after the pronouncement of New Economic Policy in 1991, what followed in 1993 was a new polity policy in the form of the historic 73rd and 74th Constitutional Amendment Acts, which added the third tier to the Indian federal polity. These two acts constitutionally recognised rural local governance and made it responsible for performing twenty-nine functions. These functions are exclusively to be performed by a three-tier Panchayati Raj Structure which begins with Gram Panchayat (local body at the village level), Panchayat Samiti (local body at the block level, i.e. above village) and Zilla Parishad (local body at the district level, i.e. above block).

The above stated history can be concluded as a statement that 'These grass-roots level units are the schools of Indian democracy.'If they are fed with appropriate inputs, it will be easier to earn outputs that will strengthen democracy as a whole in India. These institutions have been strengthened through salient constitutional provisions such as reservation of seats for women and marginalised sections of the society, and constitution of state election commission and state finance commission. However, the ground analysis of these institutions reveals that they have not been honestly vested with the functions, functionaries, and financial resources in many states in India. This masses the spirit of decentralized democracy and hampers rural development programmes as well. In fact, it still remains a rubber stamp third tier of Indian federalism (Tremblay, 2001). Financial paucity is the biggest problem faced by the PRIs.

According to visitors, you cannot find a single cigarette butt or a plastic bag lying around there.8 Ankapoor is located in the District of Nizamabad in the state of Telangana. Ankapoor has been globally recognized as a "model agricultural village" for its achievements in introducing modern technologies in agriculture while ensuring the participation of all sections of the village community, particularly women. Organizations like the Indian Council for Agricultural Research (ICAR), International Rice Research Institute (IRRI), Manila and International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) have formally commended the developments in agriculture in the village.

Kumbalangi is essentially a fishing hamlet that has developed as a unique rural tourist destination in Kerala's Ernakulam district. The Kumbalangi Integrated Tourism village Project was launched in 2004, focusing on eco-tourism, while offering tourists a glimpse of the rich and rustic life of the Indian countryside. The important attractions in Kumbalangi include organic farm produce used to prepare meals for tourists, toddy tapping, and crab farming. To keep the village clean and serve its energy needs, households are also provided with subsidies for setting up mini biogas plants in their households. These villages in different parts of our country are guiding posts and give hope and optimism to work in the direction of holistic rural development.

1.3 Detail Study :-

➢ Demographical detail :-

Sr. no.	Census	Population	Male	Female	Total households
1	2001	-	-	-	-
2	2011	2132	1103	1029	386

Table 1.2 Demographical Growth

➢ Geographical detail :-

Sr no.	Description	Information/Details
1	Area of village (approx.)	1104.00 hectare
2	Agiculture land (approx.)	840.00 hectare
3	Residential Area (approx.)	10 hectare
4	Waste land (approx.)	77 hectare
5	Other (approx.)	68 hectare
6	Coordinates for location	Lat.21.4884272 Long.72.1756733

Table 1.3 Geographical Growth

➢ Economic profile :-

In this village there are major occupational are available :-

- Agriculture
- Field Workers
- Gruh Udhyog Production Work

Kukad has 38% (808) population engaged in either main or marginal works. 57% male and 17% female population are working population. 56% of total male population are main (full time) workers and 1% are marginal (part time) workers. For women 14% of total female population are main and 3% are marginal workers.

➢ Social scenario /profile :-

- In village there is all caste people are available.
- One community hall is also available in the village.
- Bus station is available.
- Place for social gatherings are available in village.
- Public playground facility is also available in village.
- Pohrii Aai temple is a nearby place from village famous for tourism.

➢ Infrastructures facilities :-

- There are 386 houses in village and an average 6 person live in every family. All of houses are pucca.
- Facilities like School, Community hall, Bus Stand, Aganwadi, Solar Street light, Public Playground, Underground Drainage Facilities, etc.

Fig. 1.5 Gram Panchayat

Fig. 1.6 Sub Health Center

Fig.1.7 Anganvadi

Fig.1.8 Bus Station

Fig.1.9 Public Toilet

Fig.1.10 Veterinary Hospital

Fig.1.11 Sub Post Office

Ideal Village / Key elements :-

Ideal village Sustainability:-

- Better health – with special focus on maternal and child health
- Practical and smart education
- Housing & livelihood
- Capacity building of all stakeholders
- Clean drinking water & sanitation

Resources :-

- Rain water harvesting
- Use solar street lights

1.4 SWOT Analysis of Ideal village :-

Strengths :-

- Better education
- Pucca Houses
- Availability of enough irrigation and agriculture land.
- Community Hall
- Public Playground
- Post Office

Weakness :-

- Lack of sanitation facilities
- Lack of banking facilities
- Lack of Funding

Opportunity:-

- MGNREGA scheme
- Proper road connectivity
- Small scale industry

Threats :-

- Inappropriate sustainable facilities
- Unemployment
- Inappropriate medical treatment facilities

1.5 Future prospects of the Ideal Village:-

- They are going to develop village with more facilities like paver blocks, primary veterinary hospital with latest technology.
- In village, they are going to apply for PHC and Banking facility.

1.6 Benefits of the visits:-

- We come to know about various governmental organizations working within the village.
- We learned about various documentation works regarding data collection and its analysis.
- It improved our communication skills as well as we learned about various governmental schemes which are to be implemented in villages.
- We come to know about the real proble situations faced by the village dwellers and their lifestyles.

1.7 Civil aspects required in Ideal village / Smart village:-

Comparison between ideal village facilities (as compared to project village) and the smart village facilities with the village of selected as a Vishwakarma Project.

- IDEAL VILLAGE NAME :- KUKAD
- SMART VILLAGE NAME :- VAVDI, NEAR TANSA VILLAGE
- AVAILABLE FACILITIES MARKED AS :- YES

SR. NO.	FACILITIES	KUKAD (IDEAL VILLAGE)	VAVDI (SMART VILLAGE)	VALUKAD (SELECTED VILLAGE)
1.	APPROPRIATE POND DEPTH	YES	YES	NO
2.	APPROPRIATE COMMUNITY TOILET AND BATH	YES	NO	NO
3.	APPROPRIATE BUS-STOP FACILITIES	YES	YES	NO
4.	LED STREET LIGHTING FACILITIES	YES	YES	NO
5.	APPROPRIATE CONDITION OF WATER STORAGE TANKS	YES	YES	NO
6.	USABLE CONDITION OF SURFACE WATER BY VILLAGE DWELLERS	YES	YES	NO
7.	APPROPRIATE WASTE DISPOSAL FACILITES	YES	YES	NO
8.	APPROPRIATE RAIN WATER HARVESTING FACILITIES	NO	YES	NO
9.	APPROPRIATE CHECK-DAM CONDITION	YES	YES	NO
10.	APPROPRIATE USE OF RENEWABLE SOURCE OF ENERGY	NO	YES	NO

Table 1.4 Civil Aspects

Chapter 2 : Valukad Village Literature Review

2.1 Introduction Urban & Rural Village Concept :-

Rural areas are also known as the 'countryside' or a 'village' in India. It has a very low population density. In rural areas, agriculture is the chief source of livelihood along with fishing, cottage industries, pottery etc.

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. In these areas the panchayat makes all the decisions. There are five people in the panchayat. 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 75% of male working population involved in agriculture and allied activities.

RBI defines rural areas as those areas with a population of less than 49,000 (tier -3 to tier-6 cities). It is generally said that the rural areas house up to 70% of India's population. Rural India contributes a large chunk to India's GDP by way of agriculture, self-employment, services, construction etc. As per a strict measure used by the National Sample Survey in its 63rd round, called monthly per capita expenditure, rural expenditure accounts for 55% of total national monthly expenditure. The rural population currently accounts for one-third of the total Indian FMCG sales.

The term "Urban Village" is currently being used by developers, governments, and the planning profession to describe a new patterning of human settlement. This paper will review the manner in which the concept "Urban Village" is being employed, will come to suggest that developers, governments, and planners are moving in the right direction but are not going far enough, and will finally propose the characteristics and qualities of a version of "Urban Village" that is a genuine synergy of ecology and urbanism.

Fig.2.1 Urban village

Fig.2.2 Rural village

2.2 Importance of the Rural development :-

Rural development is important not only for the majority of the population residing in a rural area but the growth of rural activities is necessary to stimulate the speed of overall economic expansion of the nation. Rural development is pretended to be noticeable importance in the country today than in the olden days in the process of the evolution of the nation. It is a strategy trying to obtain improved rural creation and productivity, higher socio-economic equality, and ambition, stability in social and economic development.

The primitive task is to decrease the famine roughly about 70 percent of the rural population, implement sufficient and healthy food. Later, serve fair equipment of clothing and footwear, a clean environment and house, medical attention, recreational provision, education, transport, and communication. Rural development is important because of the following reasons :-

(i) Large Proportion Of Population Living In Rural Areas	1. Rural people account for about 3/4th (75%) of the total population. 2. In 2016, 68.84% of people accounted for the rural population. 3. However, they have always lagged much behind the overall progress of the economy.
(ii) Agriculture-major Source Of Livelihood	1. Agriculture is still the major source of livelihood in rural areas. 2. More than two-thirds of India's population depends on it. 3. So, the development of agriculture will contribute to the betterment of rural areas and rural people.
(iii) Lack Of Basic Necessities	1. Majority of the poor people lives in rural areas. 2. They do not have access to basic necessities of life like a proper meal, health facilities, sanitation, etc.

Table 2.1 Importance of Rural Development

2.3 Ancient Villages / Different Definition of: Rural areas/Villages :-

There is sufficient evidence to suggest that the village was one of the important settlements in ancient India. The Rig Veda talks about the gram to which various families owed their allegiance. Valmiki's Ramayana talks of two types of villages – the ghosh and the gram. The ghosh was smaller than the gram and was also known as vraja, or brij (signifying a cattle farm). Both types of villages had their officials, called the mahattar. There is also a reference to a senior official called gramani or gramik.

The Mahabharata talks of different types of settlements, for example, ghosh or brij (cattle farm), palli (small hutments), gram (villages around the forts or durgs), kharvata or pattan (towns), and pur, puri, nagar (cities of different types). The villages were linked with one another, culturally, socially and administratively.
The administrator of ten villages was called dashi; of 20 villages, vinshati; of 100 villages, shati, and of over 1,000 villages, sahasra gramadhipati. This is a clear indication of the interlink-ages between the villages. Kautilya's Arthashastra suggests that river, hill, forests, ditches, tanks, bunds or trees demarcated village boundaries. He prescribed that villages should be situated at distances of one or two krosha (in Rajasthan, it is spelt as koss, which is the equivalent of two miles or 3.219 km) from each other so that in times of need, one village could go to the help of the other.

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

Population growth of India as per Census 2011 :-

- For the first time since Independence, the absolute increase in population is more in urban area that in rural area.
- Rural – Urban distribution: 68.84% & 31.16% .
- Level of urbanization increased from 27.81% in 2001 Census to 31.16% in 2011 Census.
- The proportion of rural population declined from 72.19% to 68.84% .

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

Table 2.2 Population of India

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

Population growth of India as per Census 2011 :-

- For the first time since Independence, the absolute increase in population is more in urban area that in rural area.
- Rural – Urban distribution: 68.84% & 31.16%.
- Level of urbanization increased from 27.81% in 2001 Census to 31.16% in 2011 Census.
- The proportion of rural population declined from 72.19% to 68.84%.

Description	Rural	Urban
Population%	57.40%	42.60%
Total Population	34,694,609	25,745,083
Male Population	17,799,159	13,692,101
Female Population	16,895,450	12,052,982
Population Growth	9.31%	36.00%
Sex Ratio	949	880
Child Sex Ratio (0-6)	914	852
Child Population (0-6)	4,824,903	2,952,359
Child Percentage (0-6)	13.91%	11.47%
Literates	21,420,842	19,672,516
Average Literacy	71.71%	86.31%
Male Literacy	81.61%	90.98%
Female Literacy	57.78%	70.26%

Table 2.3 Demographic data of Gujarat

2.6 Rural Development Issues - Concerns - Measures :-

Issues :-

People related issues :-

- Traditional way of thinking.
- Poor understanding.
- Low level of education to understand development efforts and new technology.
- Deprived psychology and scientific orientation.
- Lack of confidence.
- Poor awareness.
- Low level of education.

Agriculture related issues :-

- Lack of expected awareness, knowledge, skill and attitude.
- Unavailability of inputs.
- Poor marketing facilities.

- Insufficient extension staff and services.
- Small size of landholdings.

Infrastructure related issues :-

- Water
- Electricity
- Transport
- Educational instutuions
- Communication
- Health
- Employment
- Storage facilties, etc.

Economic issues :-

- Unfavourable economic condition to adopt high cost technology.
- High cost of inputs.
- Under privileged rural industries.

Measures :-

- Providing basic facilities of helthcare for each and every people.
- Providing free education to poor children.
- Give loans to rural areas peolles that they can develop their small scale business.
- Make agricultural reforms as primary sector is most occupied sector in villages.
- Developing roads to provide better transport facilities.
- Proper sewage management.
- Correct implementions of scheme like swardoya swarojgar gramin yojna, MNREGA, to p rovide work to needy people.
- Develop insfrastructure of villages also help in their development.

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

Various infrastructure guidelines have been tabulated here for the provisions of different infrastructure facilities in context of Urban Development Plans Formulation and Implementation (UDPFI) guidelines.

Facilities	Planning Commission/UDPFI Norms
	Social Infrastructure Facilities
Education	
Aanganwadi	Each or Per 2500 population
Primary School	Each Per 2500 population
Secondary School	Per 7,500 population
Higher Secondary School	Per 15,000 Population
College	Per 125,000 Population
Tech. Training Institute	Per 100000 Population
Agriculture Research Centre	Per 100000 Population
Health Facility	
Govt/Panchyat Dispensary or Sub PHC or Health Centre	Each Village
PHC & CHC	Per 20,000 population
Child Welfare and Maternity Home	Per 10,000 population
Hospital	Per 100000 Population
Public Latrines	1 for 50 families (if toilet is not there in home, especially for slum pockets &kuttcha house)
	Physical Infrastructure Facilities
Transportation	
Pucca Village Approach Road	Each village
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)
Drinking Water (Minimum 70 lpcd)	
Over Head Tank	1/3 of Total Demand
U/G Sump	2/3 of Total Demand
Drainage Network	
Open	
Cover	
Waste Management System	
Electricity Network	
	Socio- Cultural Infrastructure Facilities
Community Hall	Per 10000 Population
Public Library	Per 15000 Population
Cremation Ground	Per 20,000 population
Post Office	Per 10,000 population
Gram Panchayat Building	Each individual/group Panchayat
APMC	Per 100000 Population
Fire Station	Per 100000 Population
Public Garden	Per village
Police post	Per 40,000Population

Table 2.4 Norms for Villages

2.9 Other Projects / Schemes of Gujarat / Indian Government :-

The Government of Gujarat, having realised the importance of the all-inclusive rural development, has been constantly endeavoring to make rural life better. While it continues to do so, it has achieved fantastic results because of this sustained effort. The basis of Gujarat model of development is 'People's Participation', as it reflects in its pledge of 'Collective Efforts and Inclusive Growth'. The Rural Development stories emanating out of Gujarat show how the State Government has enabled people to uplift their livelihoods through this model.

Gujarat has effectively utilized the funding from Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), a momentous initiative towards pro-poor growth, to create sustainable and productive assets and in turn helped boosting the rural economy, protecting the environment, empowering rural women, reducing rural urban migration and fostering social equity among others.

'Mission Mangalam' is an award-winning venture aimed at poverty elimination and women empowerment. It aims at uplifting women belonging to the poor families by giving them enough support to enable them to utilize their skills and improve their conditions. The programme is implemented by Gujarat Livelihood Promotion Company.

Much manage and conserve rain-water, Watershed Management Programme was incorporated. It aims at promoting agriculture by eliminating the scarcity of water resource and in turn create employment opportunities for the rural families.

The state government recognizes the practical and social importance of one's own house and thus, Gujarat has been pro-active in the implementation of Indira Aawas Yojana, which provides pucca houses to the rural poor. With all this and more, the Government of Gujarat has been proactive in the amelioration of rural lives, and it aims at continuing its efforts with increased vigour.

But in above details, what may be the role of a student or academic institution, especially of a higher and / or technical education? The answer lies within the vision and mission of Vishwakarma Yojana Project under which the developmental work in villages that could be undertaken as per the need of the village in particular includes Physical infrastructure facilities (Water, Drainage, Road, Electricity, Solid waste Management, Storm Water Network, Telecommunication & Other), Social infrastructure facilities (Education, Health, Community Hall, Library, Recreation Facilities & other) and renewable energy (Rain water harvesting, Biogas plant, Solar Street lights & Other) for Sustainable development. Under the same scheme, the villages of “Rurban” area will be adopted by the engineering colleges under the Gujarat Technological University. The Engineering colleges would study the identified villages and make the recommendations on the application of technology to achieve integrated and comprehensive development, through project preparation and management.of the area of this state remains arid with saline water which is unusable for the agricultural purpose. This area depends mainly on seasonal rain-water. Thus, to effectively.

Chapter 3 :Smart (Cities / Village) Concept Idea and its visit

3.1 Introduction Smart Village (Concepts, Definitions and Practices) :-

Concept:-

The basic concept of smart village is to collect community efforts and strength of people fromvarious streams and integrate it with informationtechnology to provide benefits to the ruralcommunity. According to Mahatma Gandhi's philosophy and thoughts smart village project provides, "Global means to the local needs." The concept of smart village is defined as below, Smart Village and its Importance. The idea of smart village in the present day context seems more reasonable as there is a limit of growth of cities which is leadingto creation of urban jungles, where the population ratio per km ofland is way above the desired norms. To take baby steps initially would lead to a campaign at National level once the fruits of this effort start bearing fruits, which surely would be visible for all to see sooner than expected. Just like smart cities, a smart village should be interactive and multi-functional; there should be active participation of people in various activities. A smart village is one which will automatically link local production with local procurement and local distribution. Asmart village will also have power, knowledge, healthcare,technology, entrepreneurship and internet connectivity.

Defitions :-

As per statistics there are 676 districts in 29 states and 7 Union territories in India with a total number of 6, 38,000 villages. All areas which are not categorized as urban area are considered as rural area. Numbers of villages in India are approximately 6, 38,588. According to 2011 census, rural area has population of 68.84%, whereas urban area has population of 31.16% only.

A rural area is a geographic area that is located outside cities and towns are also known as 'village' in India. In Smart Villages access to sustainable energy services acts as a catalyst for development – enabling the provision of good education and healthcare, access to clean water, sanitation and nutrition, the growth of productive enterprises to boost incomes, and enhanced security, gender equality and democratic engagement.

Practices:-

The core infrastructure elements in a smart village would include :-

1. adequate water supply,
2. assured electricity supply,
3. sanitation, including solid waste management,
4. efficient urban mobility and public transport,
5. affordable housing, especially for the poor,
6. robust IT connectivity and digitalization,
7. good governance, especially e-Governance and citizen participation,
8. sustainable environment, ix. safety and security of citizens, particularly women, children and the elderly, and
9. health and education.

3.2 Vision-Goals, Standards and Performance Measurement Indicators :-

To accomplish the 'Smart Village/Ward' status, the community, individually and collectively, will be empowered to take smart decisions using smart technologies and with the support of smart manpower and by managing to be self-sufficient.

Homes with access to toilet, safe drinking water and regular power.A Smart Village knows all information about its citizens, available resources, applicable services and schemes. Every household has diversified livelihood opportunities and/or micro enterprise. Microenterprise a business operating on a very small scale, especially one with a sole proprietor and fewer than six employees. Maintain its Identity, culture and Heritage. Plans for development based on People, Assets and Service Centric information and tracks its progress. It works towards Revenue generation. Has functional solid/liquid waste management system. End all preventable maternal deaths and infant deaths. Which means proving good basic health facilities in Health care centred.100% institutional deliveries.Interacts with Govemment, NGO's, Social Entrepreneurs, Experts for its needs Functional toilet, potable water electricity available in schools, health centres.Awareness on new technologies that can be implemented in villages, farms and nearby places.e.g. Drip Irrigation, Solar Panels Lighting Systems on streetlights etc. Good facilities for Domestic animals like dogs and cattle: dispensaries, pond for cattle, veterinary hospitals and vets.

Energy & Buildings

? Problem or need	R Reason for problem	S Possible solutions	V Vision (Goal)
Policies			
• Distributed generation and its limits • Reliance on single energy source	• Lack of awareness • Legacy of design: central production	• Micro grids & islanding • Load balancing • Transactional energy: market & technology	• Clean, efficient and sustainable energy sources • Nearly zero energy buildings
Markets			
• Reuse of waste heat • Primary energy vs. delivered energy (process losses)	• Uncertainty • No ROI for environmental protection • Variable discount rate & time value for money • Costs & pay pack time	• Size-based sliding scale pricing & taxation	• Pricing policy that provides ROI on resilience, environment etc. • Dynamic energy prising
Products or services			
• Building stock inertia • Design to change user behaviour • Energy efficiency & losses	• Renovation need is huge	• Grid monitoring • Adaptive building management • User education • Real time feedback & pricing	• Smart grid & city • Adaptable and flexible structure design
Technologies			
• Resilience • Accessibility and affordability	• Lack of ROI for resilience • Fluctuating supply from RES	• Response market & mechanisms	• Holistic design • Novel building materials • Different design levels: Horizontal, vertical, temporal, 3D etc.

Fig.3.1 Energy & Buildings

Infrastructures, Assets, Resources & Waste

? Problem or need	R Reason for problem	S Possible solutions	V Vision (Goal)
Policies			
• Transition to sustainable energy & resource efficiency			• Self-managing multi-functional infrastructure for resource efficiency and zero waste.
Markets			
• Reduce life cycle costs • Building stock management	• Legacy of infrastructure and investment		• Smart energy management for water, waste and energy management / and smart technology
Products or services			
• Adaptive infrastructures • Integration of existing infrastructure with new infra	• Clean water scarcity		• Effective urban water and waste water management • Effective waste & resource management • Zero waste
Technologies			
			• Sustainable use of resources

Fig.3.2Infrastructures, Assets, Resources & Waste

Transport & Land Use

? Problem or need	R Reason for problem	S Possible solutions	V Vision (Goal)
Policies			
• Too much land use for transport and infrastructure (parking lots)	• Locations not optimally planned	• Better management coordination: municipal to regional level	
Markets			
• Cities develop quickly • Resident dissatisfaction with land use	• Work opportunities higher in city → Urbanisation • Values (interests) of residents changing faster than development	• Better means for public participation in development process	
Products or services			
• Slow development and changes in transport & land use • Energy demanding solutions • Too much time	• Capital intensive development, different obstacles e.g. legality and public acceptance • Lack of public transportation & non-mobilised options	• Intelligent transport system • Retrofitting current systems to become more energy efficient and less fuel consuming + ITS	
Technologies			
• Optimal regional layouts is not yet understood/explored	• Non-multidisciplinary research and collaboration → sub-optimisation	• Support for initiatives towards multidisciplinary research and collaborations	

Fig.3.3Transport & Land Use

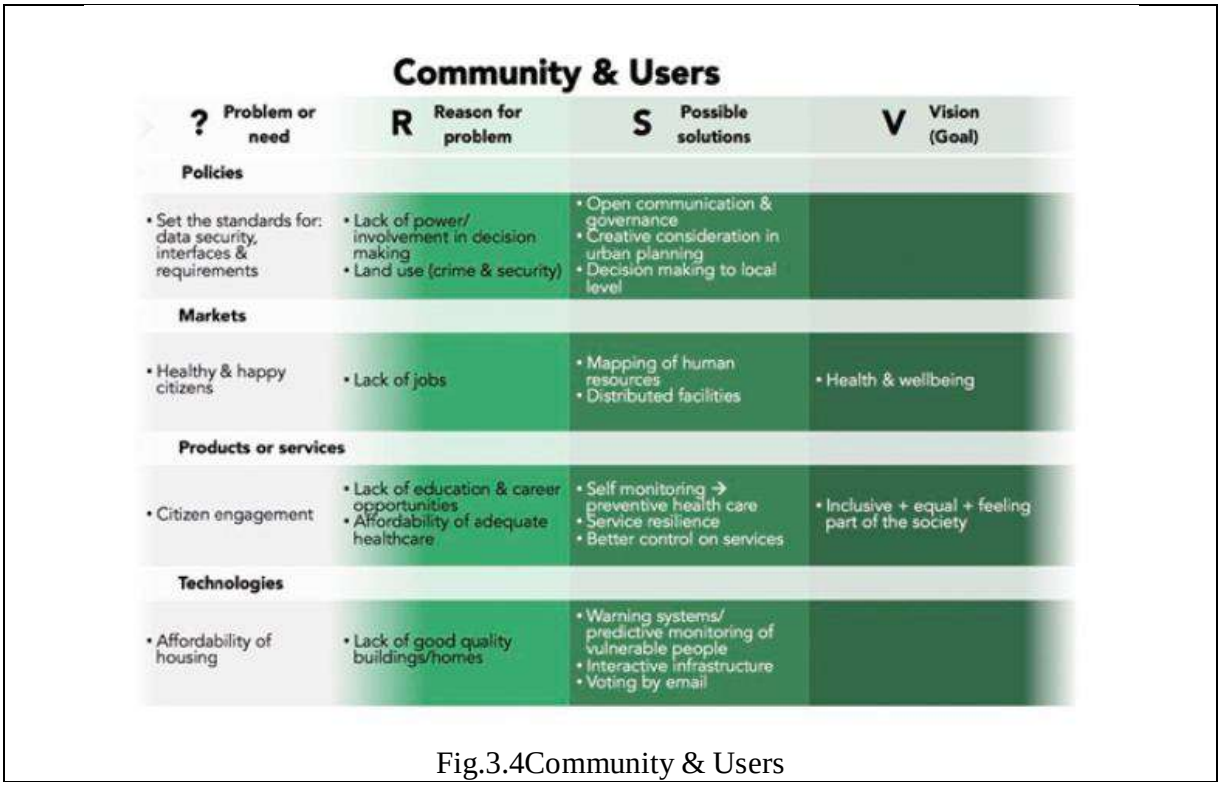


Fig.3.4Community & Users

3.3 Technological Options :-

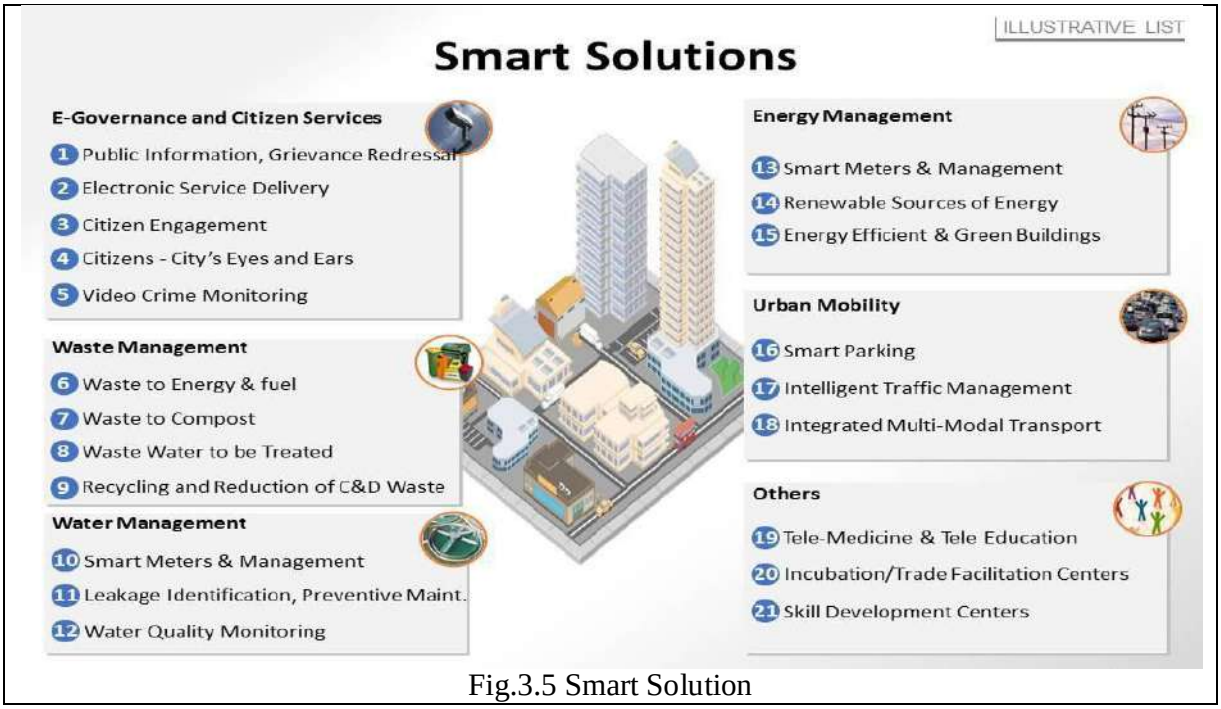


Fig.3.5 Smart Solution

3.4 Road Map and Safe Guards :-

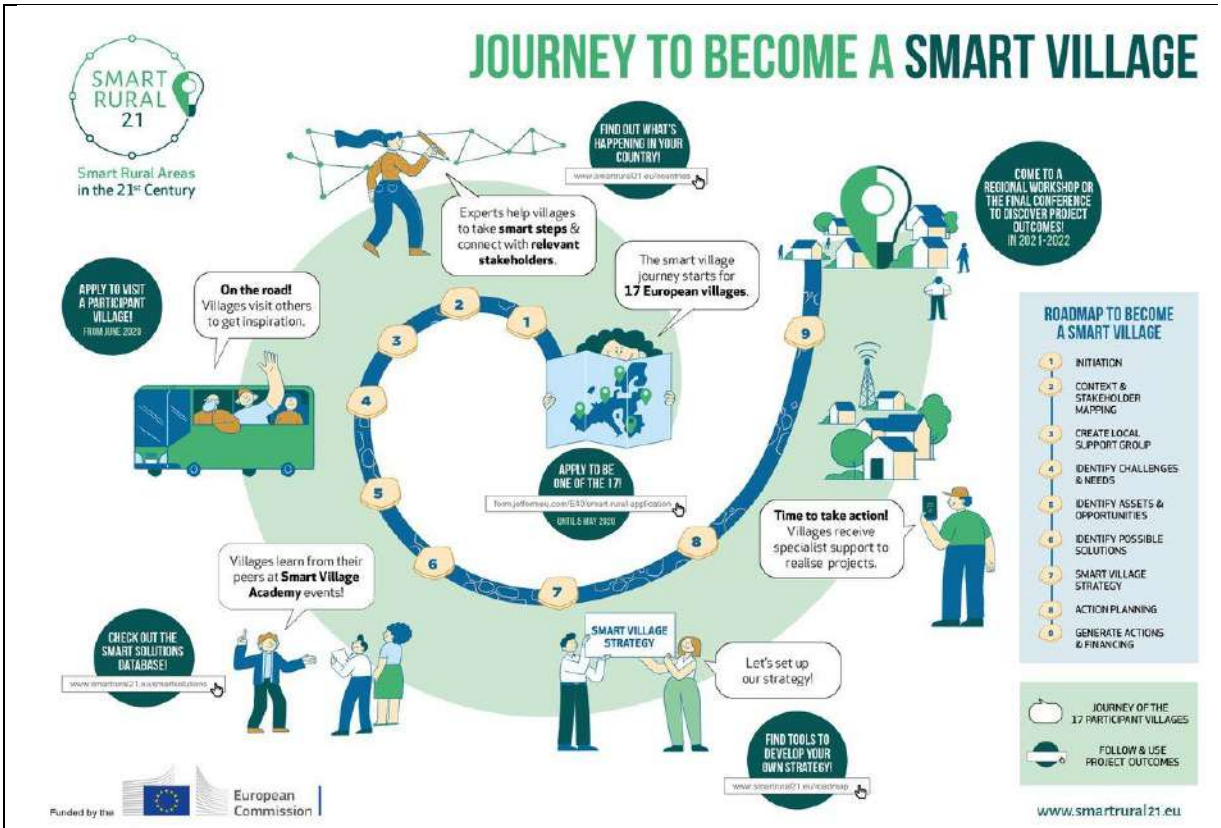


Fig.3.6 Road Map

3.5 Issues & Challenges :-

This is the first time, a MoUD programme is using the 'Challenge' or competition method to select cities for funding and using a strategy of area-based development. This captures the spirit of 'competitive and cooperative federalism'.

States and ULBs will play a key supportive role in the development of Smart Cities. Smart leadership and vision at this level and ability to act decisively will be important factors determining the success of the Mission.

Understanding the concepts of retrofitting, redevelopment and greenfield development by the policy makers, implementers and other stakeholders at different levels will require capacity assistance.

Major investments in time and resources will have to be made during the planning phase prior to participation in the Challenge. This is different from the conventional DPR-driven approach.

The Smart Cities Mission requires smart people who actively participate in governance and

reforms. Citizen involvement is much more than a ceremonial participation in governance. Smart people involve themselves in the definition of the Smart City, decisions on deploying Smart Solutions, implementing reforms, doing more with less and oversight during implementing and designing post-project structures in order to make the Smart City developments sustainable. The participation of smart people will be enabled by the SPV through increasing use of ICT, especially mobile-based tools.

3.6 Smart Infrastructure - Intelligent Traffic Management:-

This can be understood with real life example in the form of success story. The success story of Smart City Ahmedabad Development Limited (SCADL) in transforming their manually operated bus transit system into a smart transportation system has to serve as the best example. Smart City Ahmedabad Development Limited (SCADL) partnered with NEC to build a transportation system that reflects a smart city.

A smart city is the one where everything from menial routines to tourist activities is effortless and having an intelligent transport management system truly aids this. The key is to have systematic processes and smart technologies in each part of the transportation. For example, the SCADL's smart transportation system took care of different aspects of the problem like - the lack of a strict schedule, the inconsistent and un-secure payment options, lack of tracking options for the vehicles, inefficient routing, etc.

Each of these aspects of the problem was assessed and an easy solution was set in place. The Automated Fare Collection Service (AFCS) facilitated the easy cashless payment option via prepaid RuPay card or Smartphone for the passengers, while the Automatic Vehicle Location System (AVLS) allowed them to get the current location and other information of the bus, in real time. The Vehicle Planning Schedule and Dispatch System (VPSD) provided a revamped and optimized schedule for the buses and the Depot Management System (DMS) helped with the allocation and optimization of the crew and the overall bus operations. In addition to this, Passenger Information System (PIS) provided real-time bus information via mobile app, website, and in-station boards to enable passengers to plan their route and estimate waiting and arrival times.

This successful implementation of the intelligent transport management system stands testament to what the future can hold. This smart transportation system was successfully launched in 2017 and has played a monumental role in citing Ahmadabad as a smart city. This success story stands as an inspiration to India's smart city dream. It proves that with proper processes that optimally utilize the power of IT and data analyzing technology, building 100 smart cities is not farfetched. But it makes another thing much clearer - having an intelligent transport management system is the heart of making this dream a reality.

Fig.3.7 Ahmedabad Municipal Transport Service

3.7 Cyber Security :-

Cyber security is important because government, military, corporate, financial, and medical organizations collect, process, and store unprecedented amounts of data on computers and other devices. A significant portion of that data can be sensitive information, whether that be intellectual property, financial data, personal information, or other types of data for which unauthorized access or exposure could have negative consequences. Organizations transmit sensitive data across networks and to other devices in the course of doing businesses, and cyber security describes the discipline dedicated to protecting that information and the systems used to process or store it. As the volume and sophistication of cyber attacks grow, companies and organizations, especially those that are tasked with safeguarding information relating to national security, health, or financial records, need to take steps to protect their sensitive business and personnel information. As early as March 2013, the nation's top intelligence officials cautioned that cyber attacks and digital spying are the top threat to national security, eclipsing even terrorism.

Methodology

Several paradigms and categorical structures may be applied in analyzing the benefits and detriments of this data environment. An applicable paradigm used for this analysis is that of IBM that the Smart City, its components and its citizens are :-

- Instrumented
- Instrumented
- Intelligent

3.8 Retrofitting- Redevelopment- Greenfield Development District Cooling :-

Retrofitting :-

Development of an existing built area greater than 500 acres so as to achieve the objective of smart cities missing to make it more efficient and livable for e.g. Local Area Development (Ahmedabad)

Redevelopment :-

Replace existing built environment in an area of more than 50 acres and enable co-creation of a new layout, especially enhanced infrastructure, mixed land use and increased density e.g. Bhendi Bazar, Mumbai.

Greenfield :-

Develop a previously vacant area of more than 250 acres using innovative planning, plan financing and plan implementation tools with provision for affordable housing, especially for the poor e.g. New Town, Kolkata, Naya Raipur, GIFT City.

District Cooling :-

Saurashtra's commercial capital Rajkot, which was picked up by the United Nations (UN) for its feasibility to implement district cooling system, is all set for a big leap. Its greenfield smart city 'Raiya', which was planned under the Centre's Smart City Mission, will be deploying a district cooling system, which eliminates use of air conditioners and other equipment that emit greenhouse gases. The district cooling system will be implemented in the 930-acres Raiya greenfield smart city.

The recently-published report titled 'District Energy Initiatives in Cities' by the UN finds that this unique project has a great potential in cities like Thane, Coimbatore, Pune and Bhopal. That said, once implemented, not a single building in the city will require air conditioning. Chilled water will be distributed in the buildings directly from a pipeline to terminal equipment such as air handling and fan coil units, which will throw cool air even in sizzling summers. District cooling system requires a lot of water. But here, water from stormwater drainages will be treated and used for this considering that Rajkot is a water-scarce city.

The town planning for this smart city will be completed within six months. This will have a central cooling system and no building will require air conditioners. The entire project will cost Rs 1,600 crore and will be implemented on a PPP mode, where an operator will invest and municipal corporation we will also get fees from the system users.

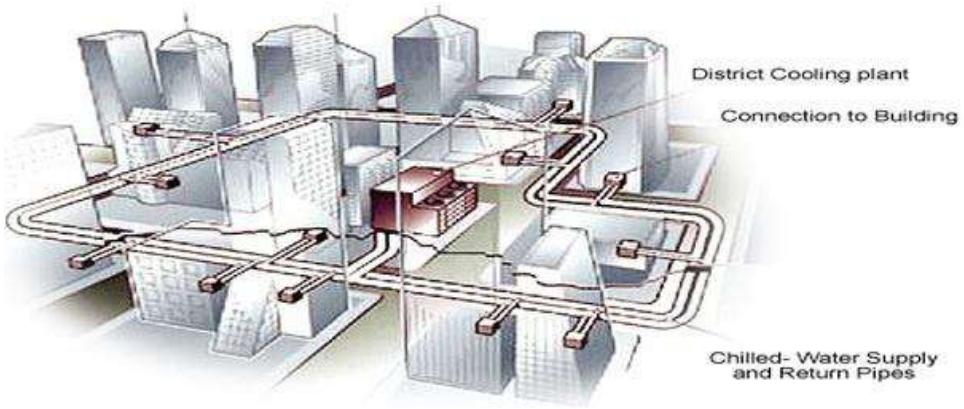


Fig.3.8 District Cooling System

3.9 Strategic Options for Fast Development :-

The strategic components of area-based development in the Smart Cities Mission are city improvement (retrofitting), city renewal (redevelopment) and city extension (Greenfield development) plus a Pan-city initiative in which Smart Solutions are applied covering larger parts of the city.

Our acronym for SMART should be:-
S - Sustainable
M - Measurable
A - Affordable
R – Replicable
T - Technology

Key attributes of smart village include :-
• Homes with access to toilet, clean drinking water and affordable electricity.
• Diversified livelihood opportunities with micro – enterprise.
• Plans for development of people, assets, service centric information, revenue generation and maintaining its identity and cultural heritage.
• Interaction with government, NGOs, experts, social entrepreneurs, etc.
• Awareness of newer technologies which can be implemented in the village for its upliftment and holistic development.

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

Urban Water and Sanitation Challenges :-

The key challenges identified in the note are:-
1. Clarifying the Mandates of Water Supply and Sanitation Service Providers
2. Improving the Governance of Water Supply and Sanitation Service Providers
3. Financing Water Supply and Sanitation Operations and Infrastructure Development
4. Regulating the Urban Water Supply and Sanitation Service
5. Building Capacity, Developing Procedures and Professionalizing Actors of the Water Supply and Sanitation Sector. 6. Developing Procedures for Community Participation

Role of IndigenousTechnologies :-

Pre-cast toilets :-

Pre-cast toilets have proved useful in meeting largescale sanitation needs quickly because these toilets, pre-cast in a concrete box at the yard and then cured, plastered, painted, and fixed with tiles and side walls, can be hoisted using a crane and lowered into position wherever required. In Visakhapatnam, the cost of each unit was 23 000 rupees (including the costs of materials, the bio-digester, and transport). Such precast toilets have made it possible for several corporate houses to contribute to improving sanitation in schools to meet the goals of the SBM sooner.

Radiation Hygienization of Municipal Sewage Sludge:-

The Sewage is the waste water generated from domestic premises and consists mainly of human waste. It typically contains 99.9% water and about 0.1% solid. The solid waste in sewage is typically organic in nature and is broken down in the sewage treatment plants resulting in sewage sludge as a byproduct. In Radiation Hygienization process dry sludge generated at STP's is hygienized using radiation technology using standard Gamma facility at a Dose of 10 kGs. Such radiation plants are operating in India for sterilizing medical products.

The BARC UF Membrane Technology for Domestic Water Purifiers:-

Water filters manufactured by Sondhka based on membrane based water Purification Technology has been developed by BARC. Benefits of BARC Polysulfone Membrane are high tech 0.02micron or 20nm, simple form factor, rugged (life of more than 1 year) and low maintenance (about Rs. 500 per year). It is very easy to use and very low cost solution for the water contamination.

Indigenous water purification technologies:-

These technologies can improve the drinking water quality of smaller villages as well as larger cities. It uses the Pressure Driven Membrane Processes. These are suitable for all capacity units e.g. they are adaptable from household level unit or community level unit to large scale unit. Water purification technologies make use of the nuclear energy and solar energy also.

3.11 Initiatives in village development by local self-government :-

Various initiatives in village development by local self government are :-

- Establishment of smart school with all amenities is done within the village.
- Under the Sujalam Sufalam Yojana the ponds or lakes were treated looking forward towards its development.
- The quality of roads whether it may be approach road or it may be village roads all were developed.
- For the cremation ceremony the required facilities like ground, bathing facilities etc. were provided to villagers.
- Maintenance of cleanliness is throughout carried out by using smart techniques.
- For solving various health related problems using aurvedic options as well as for curing of various diseases within the village an Aaushadhi Baug (The Medicine Park) is developed.
- Door to door provision of water and solution of various sanitation challenges are also being carried out by local self-government.
- Health & wellness center comprising of latest technology is developed in the village.
- Due to all such initiatives in taken in direction for the development of village by the local self-government it has made village possible to not have a single COVID positive case in entire village till date.

3.12 Smart Initiatives by District Municipal Corporation :-

What is this Eco-Bricks ?

In a large plastic bottle, small bags or plastic bags are crushed by hand and inserted into the mouth of the bottle in small sizes. Filling a plastic bottle completes its density and can be used.
In Bhavnagar, a sculpture, a garden wall or a place like Bortalawa will be used to make benches. The biggest advantage of Ecobrick is that it is never eaten. So it can also be used again and again.

Campaign :-

3 bottle depositors will get Rs.10.Collection center will be started in Office of 13 wards' by district municipal corporation as ecobrick campaign to release plastics.
District Municipal Corporation has launched a campaign for the removal of plastic wool. For the first time in Bhavnagar. It will also give money to people by taking plastic waste. Plastic bags are packed in plastic bottles at a price of Rs 10 per 3 bottles. This is the first time such an experiment has been conducted in Gujarat. In 13 wards of Bhavnagar Municipal Corporation(BMC), household waste plastic waste such as plastic bag or sachet bag, plastic used in packing snacks, Pan-Mawa Gutkha papers etc. are cleaned and washed. It can be solidified by filling it in a clean plastic bottle larger than one liter and can be used as an echo. Plastic waste generated in various units of the city (residential area, commerce, shops, lorries, stalls etc.) can be collected and distributed. The ward office of 13 wards of the solid waste management department of the corporation can be given at the Collection Center. Loose or empty or broken

bottles will not be accepted. Scheme wise eco beak bottles will be accepted from 5 am to 9:30 am to 11 pm and from 2.30 pm to 4.30 pm at the ward office. The cost of Rs 10 is too high for those who collect. Also when Saurashtra is ahead in eating pan mawa, as muchplastic waste as it can get out of the atmosphere is good for the environment

Fig.3.9 Eco-brick Campaign

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

Case Study Discussions on ONGC already implemented under CSR Project :-

Rural Development Projects :-

The Company's CSR initiatives in this area may include activities aimed at rural development through, among others, the following initiatives :-

- Adoption of villages, particularly in underdeveloped/ backward districts by undertaking reconstruction or rehabilitation in a holistic manner;
- Providing infrastructure and other support facilities to schools, health centres, hospitals, etc. located in rural areas;
- Improving accessibility to water, especially drinking water, through installation /repair of hand pumps, tube wells, wells and other such water distribution / facilities;
- Building and promoting usage of sanitation facilities in rural areas especially in rural schools;
- Promoting and educating about use of alternate and renewable sources of energy through the installation of solar lights and other similar infrastructure; and
- Developing information centres for rural populace to aid economic and social progress in the rural areas.

Slum Area Development :-

The Company's CSR initiatives in this area may include activities aimed at slum area development through, among others, the following initiatives

- Improve the quality of life of slum residents, including increase the standard of Health, Education and Community life.
- Sustainable improvements in the standards of Living, skill up gradation / increase potential income of people living in slums and reduce gender disparity, drug addiction etc.

- Capacity of local people and their institutions to engage with local authorities and other service providers for the sustainable provision of basic services.
- Scale-up the delivery of basic infrastructure services for safe water, sanitation, better and affordable housing, and waste removal through collaborative efforts with local people and municipal authorities.
- Income-generation activities
- Supplementary education to the school going and dropout children's, nutritious food to the malnourished children's, medical advice from general physician, medical services, immunization concept to the mothers, and vocational training to the adult women.

Initiative implemented in Dahod District :-

ONGC is taking up large scale CSR projects in 20 Aspirational Districts of the country. At Dahod District in Gujarat, multiple interventions have been undertaken after carrying out a detailed need assessment survey. These interventions spread across seven talukas of Dahod in the field of safe drinking water, irrigation, rural development, construction of IHHL, developing Anganwadis , smart digital classes and many more projects. The details of the projects are:

- Digital education for 532 schools
- Construction of 19 check dams
- Construction of 5 community tube wells
- Construction of 5 community wells
- Integrated Agri diary with farming model projects for marginal farmers in 5 villages
- Construction of toilets in 60 Anganwadis
- Construction of IHHLs in 8 villages in first phase
- Construction of 50 no.s of Anganwadis
- Repair of 7 check dams constructed during 1990s.

The focus in all other aspirational districts, are mainly in the field of education and health care. The projects are undertaken after consultation with the District Administration. At Bokaro, interventions are towards construction of toilets, solar street lights, hand pumps and skill development. At other locations, similar projects have already been taken up and there are plans to take up major projects in the next financial year.

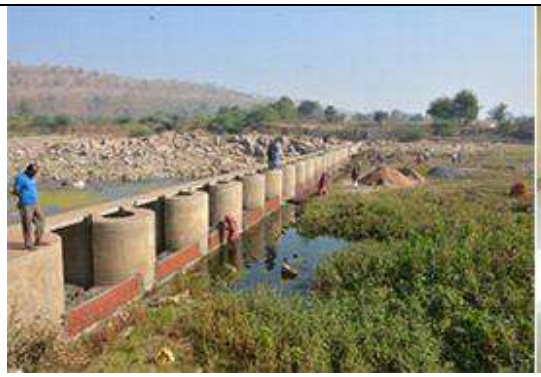


Fig.3.10 Check dam at Dahod

Fig.3.11 Digital Classroom at Dahod

3.14 How to implement other Countries smart villages projects in Indian village context (Regarding environment, Employment, etc.) :-

On basis of Technology Infrastructure :-
It is no secret that India missed reaping the benefits of the first, second and third industrial revolutions. Now the fourth is upon us. It would witness the fusion of physical, biological, and digital worlds with the mainstreaming of technologies such as 3D printing, artificial intelligence and machine learning.

According to the World Economic Forum, almost 90% of the world's data was created in the last two years. Going forward, the pace will only increase. With this data explosion, cloud technology will be instrumental in shaping disruptions and redefining customer experiences, innovation methodologies, and governance models, not only for urban India but also for "Bharat."

Smart villages must be data-driven and cloud-powered. District collectors – the Indian Administrative Service officers in charge – should consider re-skilling block development officers (implementers of rural schemes) in basic data collection and analysis so that they monitor education, healthcare, agriculture, and financial inclusion metrics. Progress on these metrics must be shared with the chief minister's office, local administration, and villagers. This would ensure transparency of goals and outcomes.

Let us take healthcare as an example. Infant mortality rates are alarming in Harisal. Last year, in April and May, 158 children under the age of one perished. Given the acute shortage of doctors – one for a population of 11,000 – tele-medicine and tele-consultation are necessary but not sufficient to transform healthcare. Even though we have engaged leading doctors from nearby cities, long-term success will be contingent upon regular data collection, monitoring, and analysis.

Cataract is another common occurrence in the region. Considering constraints of income and distance to the nearest treatment centre, it is vital to build up predictive capabilities using advanced analytics – again premised on data.

Similar arguments can be advanced for education where building a digital classroom will help but not until learning outcomes are measured and students' progress tracked.

On basis of Ecosystem :-
Developing an economically viable and culturally sensitive ecosystem in villages is of paramount importance. Unfortunately, direct access to the market has been a major challenge largely due to multiple intermediaries and lack of skilled workforce. Even Amravati, well-known for its garments, gets almost 7,000 weavers from Bengal every season to fill the local labour gap.

To counter this challenge, a three-pronged strategy will be useful: provide training that supplements indigenous skills, ensure digital and IT-readiness, and link skilling-interventions to market – both online and offline.

Almost 70% of India lives in villages where the social and economic conditions are sub-optimal. The country has often been touted as an emerging superpower even though most Indians remain super poor. This is why empowering villages through technology and creating rural innovation clusters will be critical to reconcile India's "super power-super poor" conundrum and realize the true potential of Digital India.

3.15 Visit of VAVDI Smart village for the Vishwakarma Yojana Project:-

Vavdi village is located in Ghogha Tehsil of Bhavnagar district in Gujarat, India. It is situated 20km away from sub-district headquarter Ghogha and 35km away from district headquarter Bhavnagar. As per 2009 stats, Vavdi village is also a gram Panchayat. The total geographical area of village is 1400.08 hectares.

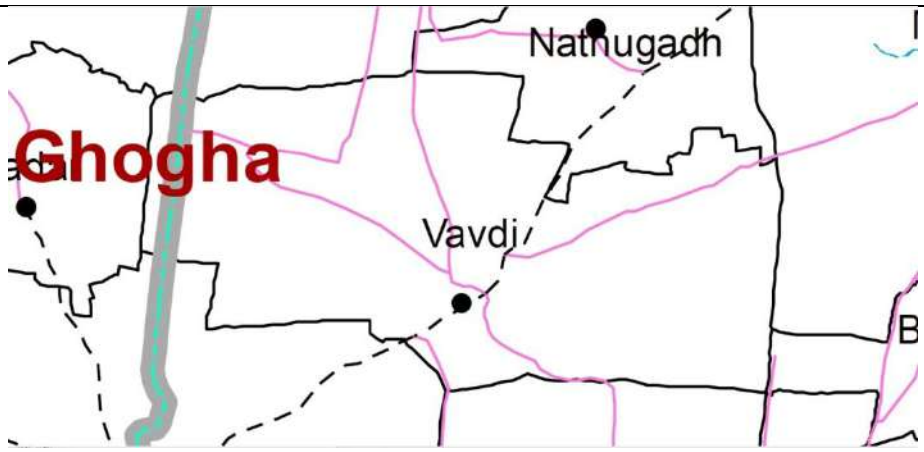


Fig3.12 Vavdi village Map

Various initiatives in Smart village VAVDI development by local self government are :-

- Establishment of smart school with all amenities is done within the village.
- Under the Sujalam Sufalam Yojana the ponds or lakes were treated looking forward towards its development.
- The quality of roads whether it may be approach road or it may be village roads all were developed.
- For the cremation ceremony the required facilities like ground, bathing facilities etc. were provided to villagers.
- Maintenance of cleanliness is throughout carried out by using smart techniques.
- For solving various health related problems using aurvedic options as well as for curing of various diseases within the village an Aaushadhi Baug (The Medicine Park) is developed.
- Door to door provision of water and solution of various sanitation challenges are also being carried out by local self-government.
- Health & wellness center comprising of latest technology is developed in the village.
- Due to all such initiatives in taken in direction for the development of village by the local self-government it has made village possible to not have a single COVID positive case in entire village till date.

Chapter 4 : About Valukad village

4.1 Introduction about village :-

4.1.1 Introduction About Valukad village details :-

Valukad village is located in Ghogha Tehsil of Bhavnagar district in Gujarat, India. It is situated 21km away from sub-district headquarter Ghogha and 15km away from district headquarter Bhavnagar. As per 2009 stats, Valukad village is also a gram Panchayat. Around 65% population of the village engaged with the agricultural activities. The basic facilities available in the village like drainage facilities, physical health center, school, post office, etc.

4.1.2 Justification / need of the study :-

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

4.1.3 Study Area (Broadly define) :-

Valukad village is located in Ghogha Tehsil of Bhavnagar district in Gujarat, India. It is situated 21km away from sub-district headquarter Ghogha and 15km away from district headquarter Bhavnagar. As per 2009 stats, Valukad village is also a gram Panchayat.The total geographical area of village is 2155.7 hectares. Valukad has a total population of 6,881 peoples. There are about 1,158 houses in Valukad village. As per 2019 stats, Valukad villages comes under Bhavnagar Rural assembly & Bhavnagar parliamentary constituency. Bhavnagar is nearest town to Valukad which is approximately 15km away**.**

4.1.4 Objectives of the study :-

The main objectives of project work are, to provide basic amenities in the village, like transportation, sanitation, institutional, storage building facilities :-

1. To reduce migration from rural to urban.
2. To promote integrated development.
3. To provide sustainable development.
4. To propose the comprehensive planning suited for ideal village.

4.1.5 Scope of the Study :-

- From the Gap analysis, development tactics for village development will be proposed and planning suggestions for physical infrastructure, social infrastructure and renewable energy source will be suggested for the village. This study will focus on the development of the village.
- To Improve life style of villagers by helping them to develop their skill by assisting them in implementing income generating activities in close coordination and cooperation with national and international organizations.
- By the analyzing the present conditions we can improve the basic amenities and facilities like sanitation facilities, transport facility, institutional facility, etc.

4.1.6 Methodology Frame Work for development of your village :-

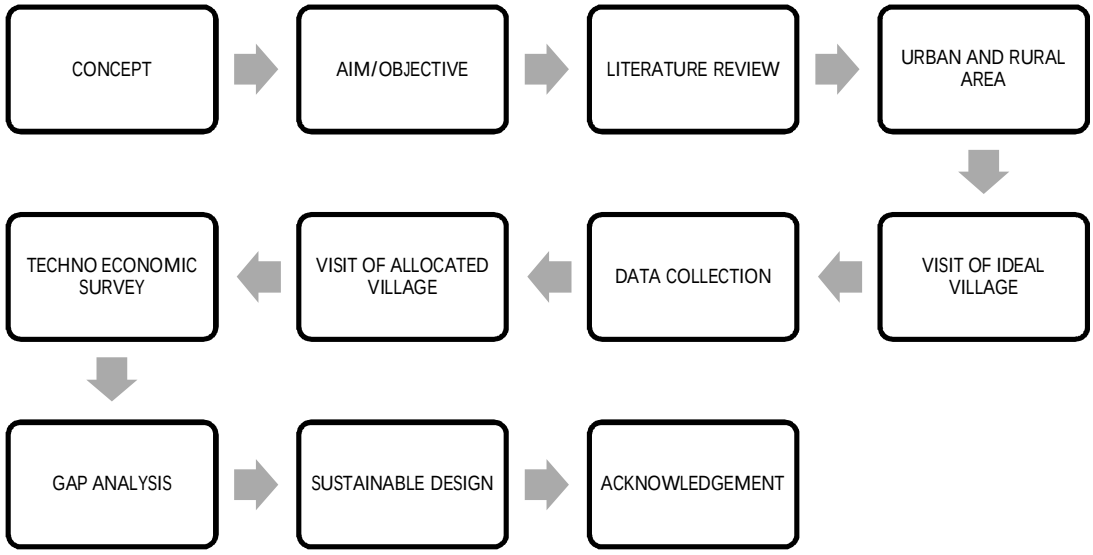


Table 4.1Frame Work for development

4.1.7 Available Methodology for development of related to Civil :-

- Gram Panchayat building is available and newly constructed.
- There are total no. 8 of aanganwadis.
- Newly constructed public health center is available.
- School with all latest facilities is present is village.
- Appropriate road street light facilities is available within the village.

4.2 Valukad Village Study Area Profile :-

4.2.1 Study Area Location with brief history land use details :-

Valukad :	Village Overview
Gram Panchayat :	Valukad
Block / Tehsil :	Ghogha
District :	Bhavnagar
State :	Gujarat
Pincode :	364060
Area :	2155.7 hectares
Population :	6,881
Households :	1,158
Assembly Constituency :	Bhavnagar Rural
Parliament Constituency :	Bhavnagar
Nearest Town :	Bhavnagar (15 km)

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

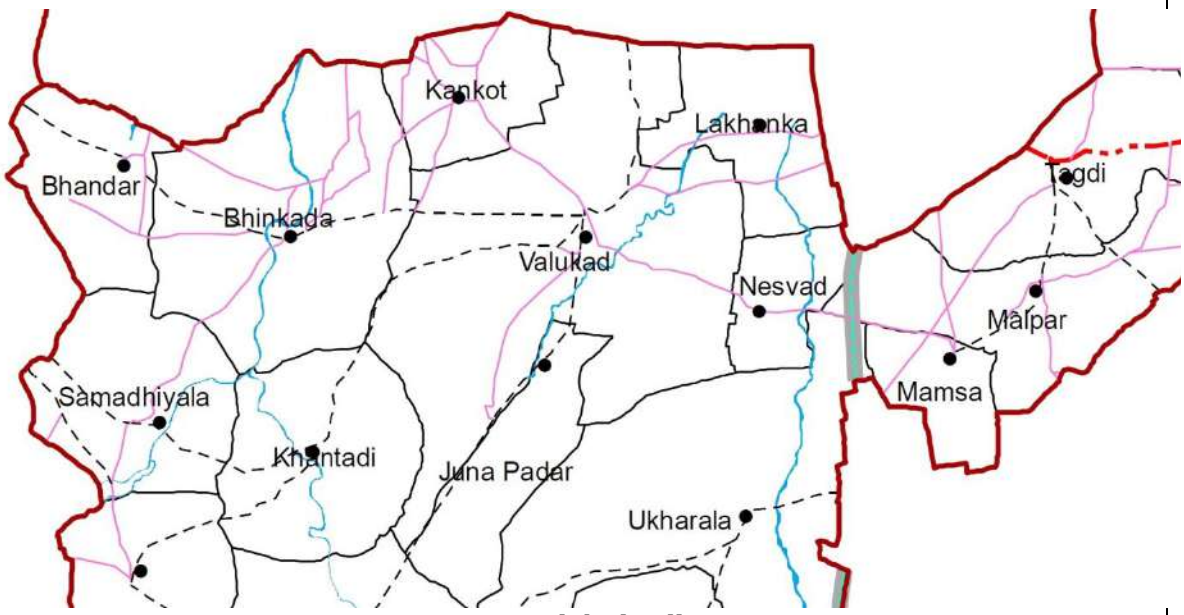


Fig4.1 Valukad Village

Valukad village Gram Panchayat name is **Valukad**. Valukad is 21 km distance from Sub District Headquarter Ghogha and it is 15 km distance from District Headquarter Bhavnagar. Nearest Statutory Town is **Bhavnagar** in 15 km Distance . Valukad Total area is 1589 hectares, Non-Agricultural area is 5.45 hectares and Total irrigated area is 817 hectares.

4.2.3 Physical & Demographical Growth :-

Particulars	Total	Male	Female
Total No. of Houses	1158	-	-
Population	6881	3503	3378
Child (0-6)	861	451	410
Schedule caste	480	248	232
Schedule tribes	0	0	0
Literacy	76.16%	84.67%	67.42%
Total workers	2806	1851	955
Main workers	2582	-	-
Marginal workers	224	79	145

Table 4.2 Physical & Demographical Growth

4.2.4 Economic generation profile / Banks :-

About the economic profile of this village, many citizens' work interest is farming and labour work. The village doesn't have any better facilities regarding public transport and sanitation but has good water supply system which distributed 24*7 hours for domestic use and for agricultural use. village does not have good sanitation and public transport system, etc. Agriculture production and small scale works is also the prime source of income.

4.2.5 Actual Problem faced by villagers and smart solution :-

Various problem faced by villagers are :-

1. Inappropriate depth of pond.
2. Absent facility of community toilet and bath.
3. Bus-stop facility absent.
4. Inappropriate LED street lights.
5. Deteriorate condition of water storage tank.
6. No facility for diversion/distribution of water in order to make appropriate use of pond water by villagers. (Recently water distribution is carried out by MAHI-PARIEG YOJANA)
7. Waste collection is only carried out within the village while any facility for its disposal is unavailable.
8. Absence of Rain Water Harvesting System.
9. Recently occurrence of Check-Dam failure.
10. Inappropriate use of Renewable energy sources.
11. Inappropriate recreational facilities. (Garden, Playground, Children play area, etc.)

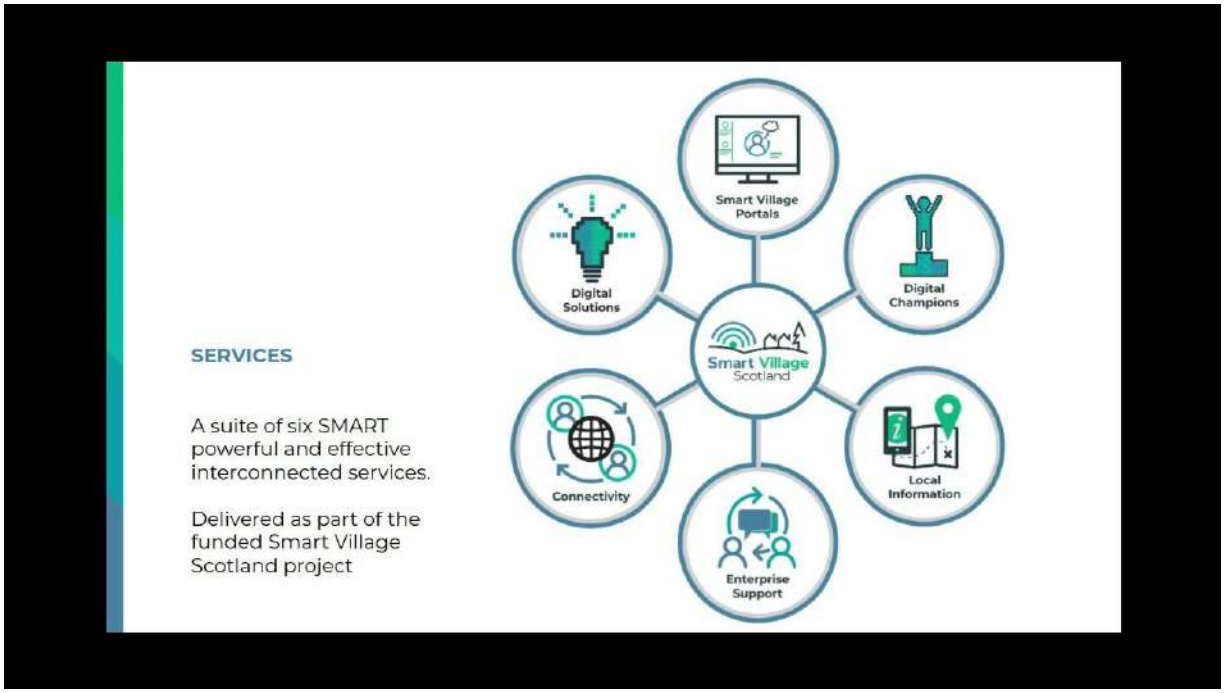


Fig4.2 Smart Solutions

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

Traditions :-

- **Touching feet of elders**: Indian tradition has rich cultural values. In India, younger show great respect to their elders. They tough the feet of their elders daily after waking up and especially on the festive occasions or before starting an important work.
- **Namaste**: The gesture of the Namaste greeting is also part of the Indian culture. People greet each other by saying “Namaste” while joining their hands. “Namaste” means “Hello”. (Also read, the meaning of Namaste here.)Most Indians have a habit of shaking their heads while talking.
- **Fasting:** Many Hindus follow the custom of fasting during any religious occasion like Maha-Shivratri,, Diwali, Karvachauth, etc. Wives go on fasting for their Husband’s long life in many occasionslike “Karvachauth”, etc.Many people belonging to Muslim faith go for fasting for around 30 days during the month of Ramazan.
- **Atithi Devo Bhava**: In India, people feel great when any guest comes to their home. They greet their guests with respect and them with utmost care. Indian believes in the concept of “Atithi Devo Bhava” which means “The Guest is considered equal to God”.
- **Vedic Mantras**: Chanting of ancient Vedic mantras are common practice during all religious events. Some mantras are repeated several times by the preist and other devotees and are incorporated as part of the puja.
- **Yoga and Meditation**: Yoga is another ancient practice that involves certain breathing and postural exercises aimed at uplifting the bodily, mental, and spiritual well-being. Meditation, also known as Dhyan in Hindi, is aimed at focusing inwards instead of the

outside world. The Indian way of meditation offers immense health benefits and is quiet popularity all around the world.

- **Religions**
  India is birth place of four major religions, such as, Hinduism, Sikhism, Jainism and Buddhism. Otherreligions exist as minorities here, including Abrahamic religions. India is called a **land of diversity**, i.e.,people belonging to almost every faith can be found in India. Many religions coexist in India such as Hinduism, Sikhism, Jainism, Buddhism, Islam, Christianity, Zoroastrians, Judaism and many more. People of all religions live together with great peace

Festivals :-

There are different types of festivals celebrated in India with joy and happiness. Different people celebrate different festivals as per their religion, caste and culture. People celebrate National festivals like Independence Day, Republic Day and Gandhi Jayanti. They also celebrate religious festivals like Diwali, Holi, Durga Puja, Dussehra, Vasant Panchami, Eid, Guru Nanak Jayanti, Mahavir Jayanti, Buddha Purnima, Christmas, New Year and many more. Young generation also celebrate Mothers day, Fathers Day, Friendship day, etc.

Cuisine :-

From ultra spicy food to delectable confectionery and southern curries flavored with kokum, Indian culinary culture is delicious and diverse.

Not only in taste but also in the way of cooking, Indian foods are totally different from the rest of the world. Indian foods showcase the perfect mixture of tradition, culture, and love. It is evolving from ages and that's why there are different forms of Indian food.

As per the region and state, different kinds of Indian Foods are available like Bengali food, Gujarati food and many more.

Indian cuisines are characterized by spices and a wide array of ingredients. Based on the area, different forms of food are North Indian food, South Indian food, etc. North Indian food mainly includes items which are bread related like Tandoori roti, Nan, Kulcha, etc. East Indian Food mainly relates to staple food (such as rice) and sweet dishes like Roshogollas, Sandesh, Sweet curd, etc. South Indian Food mainly includes items which are made of rice powder like Idli, Sambar vada, Upma, Dosa, etc. Chilli is an essential ingredient in most Indian cuisines.

The idea of the food festival is primarily to re-integrate value back into food systems and food culture. Through such festivals, communities become aware of the importance of reviving their traditional food practices and production, leading to increased local resilience and food security. They beautify their food through presenting traditional dishes, as well as explaining and documenting the cultural and ecological links. Food festivals are multidimensional community driven initiatives that empower people via a ground up approach.

4.2.7 Migration Reasons / Trends :-

Migrations are caused by a variety of factors including economic, social and political factors. They are briefly described as under.

1. Marriage:
Marriage is a very important social factor of migration. Every girl has to migrate to her in-law's place of residence after marriage. Thus, the entire female population of India has to migrate over short or long distance. Among the people who shifted their resistance more than half (56.1%) moved due to marriage in 1991.

2. Employment:
People migrate in large number from rural to urban areas in search of employment. The agricultural base of rural areas does not provide employment to all the people living there. Even the small-scale and cottage industries of the villages fail to provide employment to the entire rural folk. Contrary to this, urban areas provide vast scope for employment in industries, trade, transport and services. About 8.8 per cent of migrants migrated for employment in 1991.

3. Education:
Rural areas, by and large, lack educational facilities, especially those of higher education and rural people have to migrate to the urban centres for this purpose. Many of them settle down in the cities for earning a livelihood after completing their education.

4. Lack of Security:
Political disturbances and interethnic conflicts drive people away from their homes. Large number of people has migrated out of Jammu and Kashmir and Assam during the last few years due to disturbed conditions there.People also migrate on a short-term basis in search of better opportunities for recreation, health care facilities, and legal advices or for availing service which the nearby towns provide.

4.3.Data Collection of Valukad Village (Photograph/Graphs/Charts/Table):-

4.3.1 Describe Methods for data collection:-

Base line survey is a standard for any intervention during and post application of any development programme. A complete 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. It included the soil typology, well in the area, crop taken in the field, cropping pattern, fertilizer used and various sources of irrigation in the field.

4.3.2 Primary details of survey :-

Valukad village Gram Panchayat name is Valukad. Valukad is 21 km distance from Sub District Headquarter Ghogha and it is 15 km distance from District Headquarter Bhavnagar.

4.3.3 Average size of the House :-

In Valukad, approximate ratio of the houses is 40% house Pukka and 60% kutcha and the average bungalow type houses are more preferable to build by the dwellers.

4.3.4 No of Human being in One House :-

In village generally each family consist average 4 to 5 member. There are about 391children in village as per ICDS data.

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

Most of the houses have been constructed of mud and cow dung and the roof tops are made of desi naliyaa. There are very few Pucca Homes madeof Bricks and Stones in the village. The ratio of kuccha to Pukka House is 60:40.Materials like Cement, Marble, Steel Reinforcement, Sand, Aggregate have to be Purchased from Outside as there is no material shop in the village.

4.3.6 Geographical Detail :-

According to Census 2011 information the location code or village code of Valukad village is 516296. Valukad village is located in Ghogha Tehsil of Bhavnagar district in Gujarat, India. It is situated 21km away from sub-district headquarter Ghogha and 15km away from district headquarter Bhavnagar. As per 2009 stats, Valukad village is also a gram Panchayat.

The total geographical area of village is 2155.7 hectares. Valukad has a total population of 6,881 peoples. There are about 1,158 houses in Valukad village. As per 2019 stats, Valukad villages comes under Bhavnagar Rural assembly & Bhavnagar parliamentary constituency. Bhavnagar is nearest town to Valukad which is approximately 15km away.

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

Particulars	Total	Male	Female
No. Of families	1158	3503	3378
No. Of families of Schedule caste	480	248	232
No. Of families of Schedule tribes	0	0	0

Table 4.3. Cast Wise Population Details

Generally AADHAR card is used as ID proof by villagers.

4.3.8 Occupational Detail - Occupation wise Details / Majority business :-

Particulars	**Nos.**
Total main workers	2582
Farmers	860
Labourers	944

Household workers	47
Others	731
Total marginal workers	224
Farmers	22
Labourers	106
Household workers	29
others	67
Non-workers	4075

Table 4.4. Occupation Wise Details

4.3.9 Agricultural Details / Organic Farming / Fishery :-

In the Valukadvillage Sugarcane, Jowar, Bajra, Wheat, Cotton, Vegetables and Fodder are the main Crops grown inthe village. Many farmers also use latest technique of organic farming to produce good commodity or agricultural product.

4.3.10 Physical Infrastructure Facilities - Manufacturing HUB / Ware Houses :-

There are no large Scale Manufacturing Industries in the village. Small scale industries such as Papad making and Agarbatti making exist in the village.

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

There is no major tourist attraction in the village except for an lake side view and nearby hills.

4.4 Infrastructure Details (With Exiting village Photograph) :-

4.4.1 Drinking Water / Water Management Facilities :-

There are Two water tanks available in Valukad village. Overhead tank is 40,00,000 litre capacity with underground sump of 10.00.000 litre capacity.Total water storage capacity is 40,00,000litre in the village but is sufficient for village as per population of village.Drinking water is adequate and also has a storage capacity.For domestic and drinking purpose Panchayat collect water from dug well and lake.

Fig4.3 Overhead Water Tank (1)

Fig4.4 Overhead Water Tank (2)

4.4.2Drainage Network / Sanitation Facilities :-

Village has good condition of drainage network.Closed drainage system as well as open drainage system available in village.Village doesn‘t have any public toilet in village.

4.4.3 Transportation & Road Network :-

Village are covered with all-weather road and its internalstreet road R.C.C. road transportation network is good in village, nearby railway station Bhavnagar 15 km away from village. There is no bus station in the village Gamtal.People use owns two-wheeler or four-wheeler areused for travelling through main road.

Fig4.5 Pucca Road

Fig4.6 Paver Block Street

4.4.4 Housing condition :-

The ratio of kuccha to pucca house is 0.25%. Condition of house is well maintained and properly constructed in line. Houses have basic facility like water supply tap, clean house, electricity line etc.

Fig4.7 Pucca House

Fig4.8 Kuccha-Pucca House

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

In village, deficiency of social infrastructure likecommunity hall, library, recreation infrastructure etc.

Fig4.9 Veterinary Hospital

Fig4.10 Primary Health Center

4.4.6 Existing Condition of Public Buildings & Maintenance of existingPublic Infrastructures:-

In village existing public building are panchayat building, school, aanganwadi, etc. all the structure are newly constructed and in well maintenance.

Fig4.11 Panchayat Building

Fig4.12 Aanganwadi

Fig4.13 Govt. Primary Boys School

Fig4.14 Govt. Primary Girls School

4.4.7 Technology Mobile/ WIFI / Internet Usage Details:-

In village 50 to 60% use smart phone. 25 to 30% use a normal phone and rest of people does not use phone.

4.4.8 Sports Activity as Gram Panchayat:-

No activity of sports is conducted by gram panchayat but school conducted asport activity during a sport weak or any function.

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

In village lack of socio-cultural facility like publicgarden, park, playground, theater, walking area, etc. Village have many ponds near gamtal.

Fig4.15Village Pond

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

Most of the other facilities are not present in village.

4.4.11Any other details:-

In the village, the road facility needs maintenance. Lack of post office facilities and for activities related to post there are many problem faced by the villagers hence, its requirement is highly required.

4.5 Electrical Concept :-

4.5.1 Renewable energy source planning particularly for villages :-

At present there are lighting poles for the use of renewable energy source but there are no renewable source to use the renewable energy source.

4.5.2 Irrigation Facilities :-

In village main source of irrigation is well, tube well, pond, Mahi Pariyaj water supply line and is adequate for villagers.

4.5.3 Electricity Facilities with Area :-

The village gamtal has a power supply with 24 hrs. power supply in summer and 24 hrs. power supply in winter. In agricultural area only 8 hrs. power supply in summer and 8 hrs. power supply in winter.

4.6 Existing Institution like - village Administration – Detail Profile :-

4.6.1 Bachat Mandali :-

Village have no bachat mandali.

4.6.2 Dudh Mandali :-

Village have private dudh mandali.

4.6.3 Mahila forum :-

No mahila forum in village.

4.6.4 Plantation for the Air Pollution :-

In a village every year plantation drive is arranged by panchayat and all the village dewellers participates in this activity.

4.6.5 Rain Water Harvesting - Waste Water Recycling :-

There is facility of rain water harvesting in a village.

4.6.6 Agricultural Development :-

Main source of income in this village is farming. Farmers use drip irrigation system to do farming.The main agriculture product is cotton, wheat, jowar, groundnut**.** 1573.14hector area

covered in the agriculture activity out of 2153.76 hector. There are agro-stores also available in the village.

4.6.7 Any Other :-

Fig4.16 Cluster Resource Center

Fig4.17 Rain water harvesting

Fig4.18 Valukad outpost police station

Fig4.19 Biomedical storage building

Fig4.20 Multipurpose school

Fig4.21 Cremation ground

Fig4.22 Village bank

Fig4.23Customer service point

Chapter 5 : Technical Options with Case Studies

5.1 Concept (Civil) :-

5.1.1 Advance Sustainable construction techniques / Practices and Quantity Surveying:-

Fivetechniques for Sustainable Building Construction are as follows:-

1. Prefabricating Materials in Controlled Environments
Constructing as much of a structure in a controlled environment as possible has improved the quality of buildings and resulted in less trash, says Spencer Finseth, principal of Minneapolis-based Greiner Construction.

Being able to cut materials precisely decreases waste and creates buildings that are strong enough to allow contractors to use wood framing as high as five stories, he says.

Mechanical contractors use Building Information Management (BIM) systems to cut sheet metal for duct work in a controlled environment instead of outside to avoid the shape-changing problems caused by cold or hot weather, according to Mike Smoczyk, director of professional development for Minneapolis-based Kraus-Anderson. That same duct work is delivered to a project “wrapped and sealed tightly and kept out of the elements” to avoid damage, he says. He estimates that prefabrication probably accounts for 15% of any project and likely more for hotels.

2. Construction Waste Management
Reducing waste is becoming more achievable for contractors as haulers have grown more sophisticated in recent years. Where jobsites once had trash bins for different types of waste, they now need just one, in many cases, because haulers use pickers to separate materials.
“Through haulers, we can achieve 75% landfill avoidance through their process and we don’t need to separate materials to do it,” says Dale Forsberg, president of St. Louis Park-based Watson-Forsberg. “On a couple of sites, we’ve hit 95%.”

The three largest construction projects underway in the Twin Cities all have a recycling rate of more than 90%, according to Zachary Hansen, environmental health director, St. Paul-Ramsey County Public Health department, speaking at a recent conference sponsored by the Minneapolis-based Environmental Initiative. The projects include the Vikings Stadium in Minneapolis, the St. Paul Saints Ballpark and the Ford plant in St. Paul.

3. Managing the Site for Improved Environment
Stormwater pollution prevention has become a “big deal” to municipalities and the state and federal government, says Smoczyk at Kraus-Anderson. “Municipalities do not want a [construction] development that dumps a bunch of bad water into the storm sewer system and overflows it,” he says.

Forsberg says worker safety has led to restrictions and the institution of simple ways to reduce pollution. There's no smoking on the site, for example. When workers enter a building, they travel over "walk-off mats" that remove dirt, lead and other potentially dangerous chemicals from their shoes. Contractors also bring recycling containers for food to decrease organic waste.

4. Lean Manufacturing to Reduce Energy

McGough's Brenteson says his company encourages rethinking construction approaches through lean thinking. "It's finding the wasteful activities we're doing and eliminating them," he explains.

One success involved a McGough employee who modified a brush that works in conjunction with snow blowers to reduce the amount of time required to clean metal floor decks in winter. The process begins with a brush-mounted snow blower — again, modified a bit by McGough — that takes off the majority of the snow. Then, workers used brushes mounted on broom handles to remove snow caught in the grooves of the metal decks.

"It saves time, eliminates theft on the jobsite, eliminates damage, eliminates wasted time moving things," he adds. "Those are lean practices but they are sustainable things, too, in a sense."

5. Material Selection

Architectsandclients seeking LEED can achieve many points by selecting materials manufactured from recycled products and from local sources. The materials can be anything, from renewable products such as bamboo for floors, to wood from vendors approved by the Minneapolis-based Forest Stewardship Council.

As buildings become greener, so do construction sites. Off-site fabrication, improved on-site maintenance, lean practices, landfill avoidance and green materials acquisition have begun to fundamentally, albeit slowly, transform the way buildings are constructed today.

Fig5.1 Sustainable Construction Methods

5.1.2 Soil Liquefaction :-

Local soil conditions have a significant effect on damage to structures caused by earthquakes. During an earthquake, different kinds of soil conduct generated seismic waves in different ways and their effect on structures depends on the characteristics of the foundation soil. Many earthquakes, such as those that occurred in Japan in 1964 (Niigata) and in 1995 (Kobe), emphasized the impact and the possibility of the soil liquefaction. **Liquefaction** is one of the most dramatic phenomena and causes of damage to structures during the earthquake.

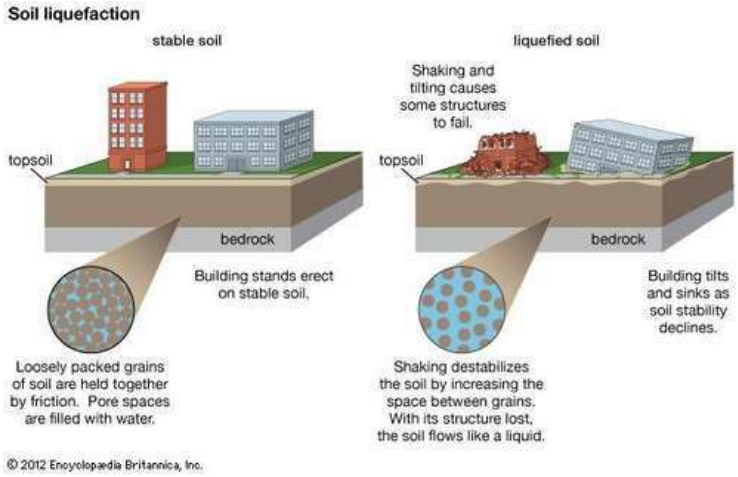


Fig5.2Soil Liquefaction

However, liquefaction doesn't occur as a result of any strong earthquake; several conditions must be met for its' occurrence. The main factors which affect liquefaction occurrence are the degree of soil compactness, particle size and degree of water saturation.The coarse material (sands) have proven to be the most susceptible to the liquefaction process, considering all the factors. The reason is usually higher porosity (amount of fine grain in soil volume) than in fine grain soils. A seismic wave may cause complete loss of soil shear strength, if such material is almost completely filled with water. The soil particles begin to move freely in the water and the soil behaves like thick liquid.

There are different remediation methods against liquefaction which are described in general form in this paper. In other part, these remediation methods are specialized for underground structures. Based on these methods some case studies which are used this methods are introduced. In Figures two cases which are damaged during an earthquake by liquefaction are shown.

Fig5.3 Uplifted sewage manhole during the 2004 Niigataken-chuetsu earthquake

Fig5.4 Uplifted sewage tank during 1964 Niigata earthquake

Description of liquefaction occurrence

Certain materials have a tendency to decrease the volume or compactness during the deposition of any type of load (static or dynamic). Since the earthquake load is cyclic and fast, the soil has no possibility of draining the water in the pores and there is an increase in the pore pressure (*Picture 2*).

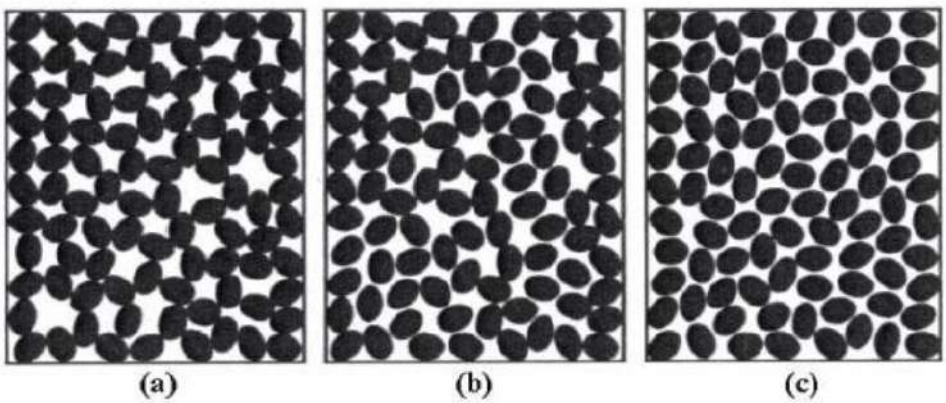


Fig5.5 Sand liquefaction model a) idle state (particles touch each other); b) partial liquefaction; c) overflowing

With the increase in pore water pressure, the effective stress in the soil is reduced. When the pore pressure reaches the value of the overall stresses, it causes the loss of stiffness and shear soil strength, as well as the potential soil settling (the weighing of the heavier structures).

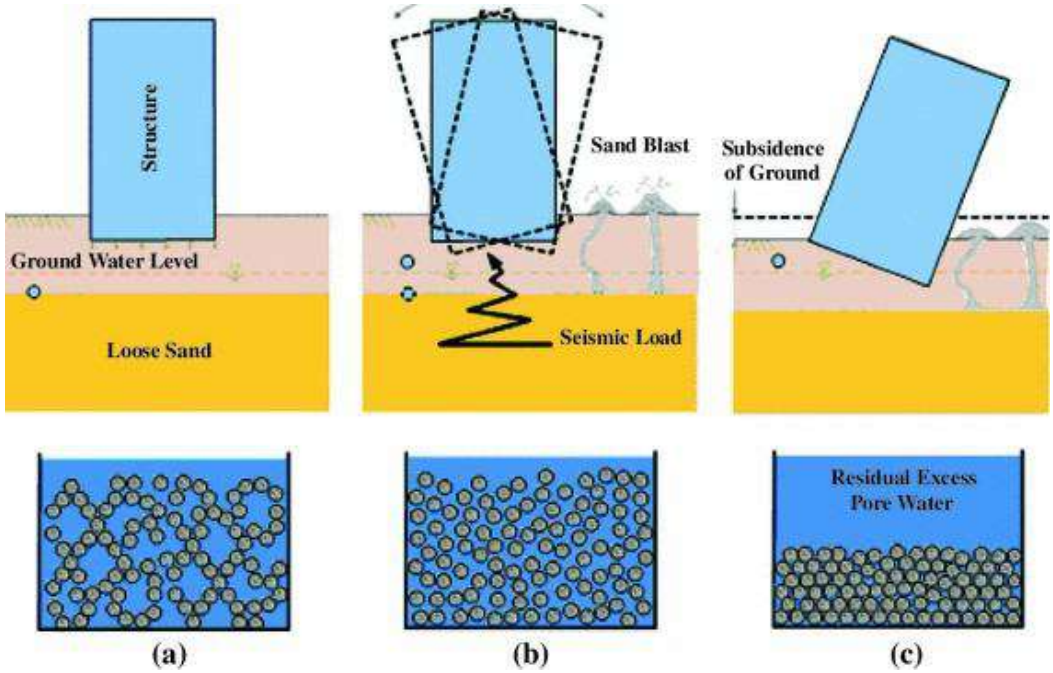


Fig5.6Scheme of the differential settlement of the structure due to the foundation soil liquefaction

Soil Details

g	19	kN/m³	Unit weight of soil (gamma)
c' (or su)	150	kN/m²	For undrained soils use phi' = 0
f	0	deg	Angle of friction (phi')
a	0.4		Adhesion Factor
Ks	0		Coefficient of Earth Pressure
d	0	deg	Angle of friction between pile and soil
Water Table	20	m	Depth to Water Table

Pile Details

Shape	ci		sq=Square, ci=Circular
	Circular		
Diameter	2.31	m	Diameter of pile
Toe Depth	10	m	Depth to base of pile

Load 5000 kN Applied load - includes weight of pile

Safety Factors

Base 2.0 Shaft 2.0

Results

10m long Circular pile
2.31m diameter
Undrained Analysis (Phi=0)

Base Resistance

5658 kN

Shaft Resistance

4354 kN

Total ultimate resistance

10012 kN **(Base + Shaft)**

Allowable Load

5006 kN

Overall factor ofsafety

2.00

OK

Actual Load <=Allowable

Pile Volume

41.9 m³

Pile Capacity Calculations

Bearing Capacity Factors

Nq=	0.77		Depth/Width =	4.33	
Nc=	9.00				
Overburden stress			**Areas**		
sigma_b=	190.00	(at Base)	Base (Ab) =	4.19	m²
sigma_s=	95.00	(average for Shaft)	Shaft (As) =	72.6	m²

Base Bearing Capacity	**Base Resistance**
qu=suNc (for undrained analysis) qu=cNc+sigma_b*Nq (for drained analysis)	Qb=qu*Ab
qu = 1350 kN/m²	**Qb= 5658 kN**
Shaft skin friction	**Shaft Resistance**
fs=alpha.su (for undrained analysis) fs=c'+Ks.sigma_s.tan(delta) (for drained analysis)	Qs=fs*As
fs= 60.0 kN/m²	**Qs= 4354 kN**

Table 5.1. Design of Pile

GENERAL REMENDATION METHODS :-

Remediation methods against liquefaction are classified into two categories:

Those that improve the liquefiable soil to prevent liquefaction. In this category following concepts are used.

1- Use material with high density or increase the density of existence material
2- Use not-liquefiable grain size
3- Stable the skeleton of soil
4- Decrease the saturation of soil
5- Immediate dissipation of increased excess pore pressure
6- Reduction of shear stress by increasing confining pressure
7- Reduction of shear stress by building an underground wall

REVIEW OF CASE STUDIES :-

Tunnel Construction Beneath Airport Runway, Japan

A 70-m-wide underpass for vehicles was planned beneath a functioning airport runway in Japan (Ichihashi et al., 1992). The runway had been built on top of a concrete slab supported by steel sheet piles, as depicted in Fig. 17. However, not all sheet piles extended to the bearing layer and some underpinning was necessary to support the excavation. The excavation would require dewatering, which could also cause settlement. It was determined that settlement and heave to the runway could not exceed 50 mm.

As reported by Ichihashi et al. (1992), jet grouting was used to form soil-cement piles that extend to the bearing layer, and cut-off walls to prevent lowering of the water level outside the excavation. Since the soil could be improved by jet grouting through chill holes less than 220 mm in diameter, minimal damage occurred to the runway. To prevent settlement, a steel guide casing was first installed down to the top of the zone to be grouted. The grout pipe was then

lowered down through the guide casing and advanced to the final depth, 2 m into the bearing layer.

A tank containing a sand pump was attached to the casing guide at the ground surface to prevent waste slurry from flowing onto the runway. A triple jet system was used. Grout injection pressures varied between 30 and 40 MPa. Air injection pressures varied between 0.6 and 0.7 MPa. The drill rod was withdrawn at a rate between 50 and 100 mm/min. During the excavation of the tunnel, measured settlement and heave of the runway surface was less than 3 mm.

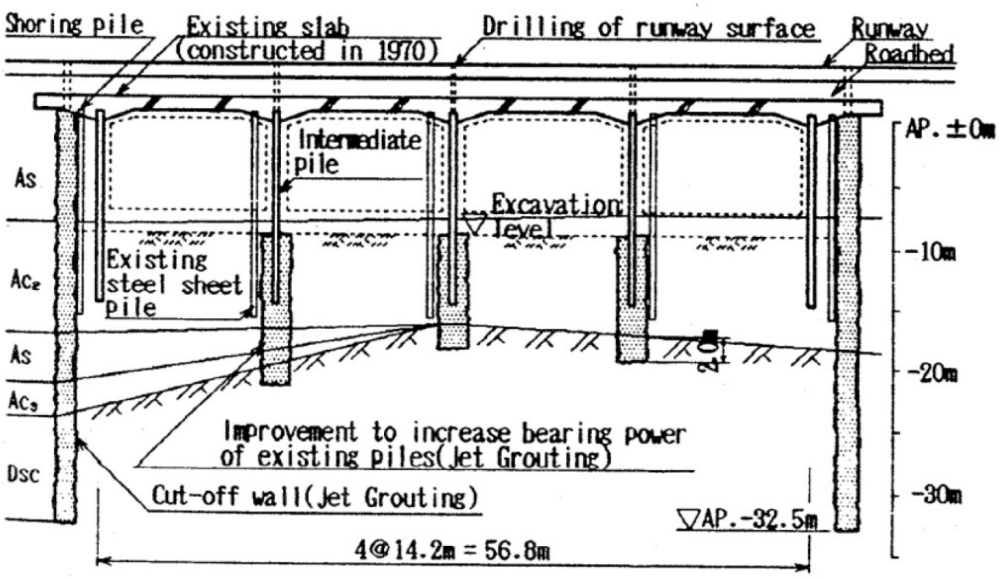


Fig5.7Excavation support seepage control by jet Grouting beneath existing airport runway

5.1.3 Sustainable Sanitation :-

According to the Sustainable Sanitation Alliance, when improving an existing and/or designing a new sanitation system, sustainability criteria related to the following aspects should be considered.

- **Health**

Poorly handled fecal sludge poses high health risks (much spillage and no personal protective equipment for the workers). Health aspects include the risk of exposure to pathogens and hazardous substances that could affect public health at all points of the sanitation system from the toilet via the collection and treatment system to the point of reuse or disposal. The topic also covers aspects such as hygiene, nutrition and the improvement of livelihood achieved by the application of a certain sanitation system, as well as downstream effects.

- **Environment and natural resources**

Environment and natural resources aspects involve the required energy, water and other natural resources for construction, operation and maintenance of the system, as well as the potential emissions to the environment resulting from use. It also includes the degree of recycling and reuse of excreta practiced and the effects of these, for example reusing the wastewater, returning nutrients and organic material to agriculture, and the protecting of other non-renewable resources, for example through the production of renewable energy (e.g. biogas or fuel wood).

- **Technology and operation**

Technology and operation aspects incorporate the functionality and the ease with which the system can be constructed, operated and monitored using the available human resources (e.g. the local community, technical team of the local utility etc.). It also concerns the suitability to achieve an efficient substance flow management from a technical point of view. Furthermore, it evaluates the robustness of the system, its vulnerability towards disasters, and the flexibility and adaptability of its technical elements to the existing infrastructure, to demographic and socio-economic developments and climate change.

- **Finance and economics**

Financial and economic issues relate to the capacity of households and communities to pay for sanitation, including the construction, maintenance and depreciation of the system. Besides the evaluation of investment, operation and maintenance costs, the topic also takes into account the economic benefits that can be obtained in "productive" sanitation systems, including benefits from the production of the recyclables (soil conditioner, fertiliser, energy and reclaimed water), employment creation, increased productivity through improved health and the reduction of environmental and public health costs.

- **Socio-cultural and institutional aspects**

Socio-cultural and institutional aspects take into account the socio-cultural acceptance and appropriateness of the system, convenience, system perceptions, gender issues and impacts on human dignity, the contribution to subsistence economies and food security, and legal and institutional aspects.

- **Planning for sustainable sanitation**

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

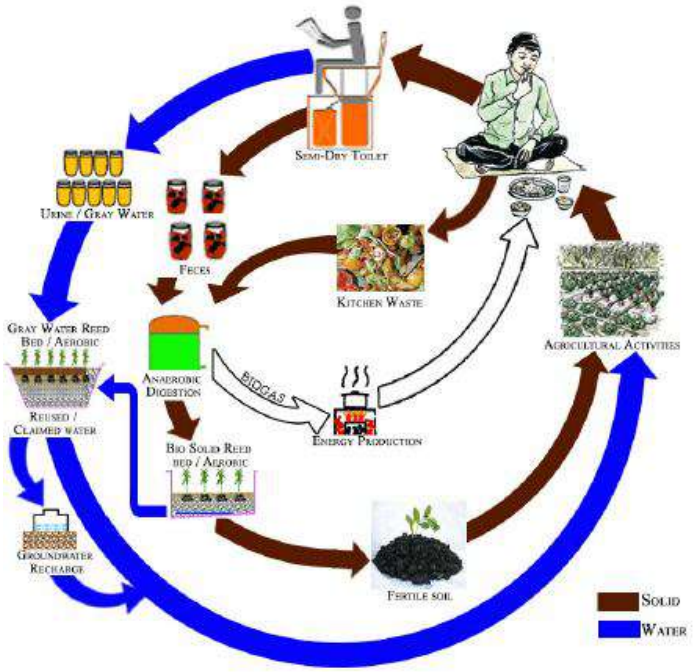


Fig5.8 Sustainable Sanitation

5.1.4 Transport Infrastructure / System:-

Transportation systems, either existing or envisaged for the future, can be classified according to these components and their relations to the larger economic, social, and physical systems in which they occur. Guideways often reside on or within Earth's surface and are therefore described as surface or ground transportation systems. Examples are highways and railways. Some systems, however, have their guideways in the air or on the water. In this case, their principal facilities are ports, either airports or harbors. Of course, a canal is also a guideway consisting of water held in a channel.

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.

Each transportation system operates within a larger economic, social, and physical environment, as noted above. Accordingly, each system generates certain external effects, or externalities, on its environment. Among these are emissions, noise, and damage to property and persons, both those using the system and those adjacent to it. Emissions, largely from vehicles, degrade the air, water, and soil through their exhaust and spills of hazardous materials. Noise from vehicle operations impact society within hearing distance. Passengers and bystanders are injured or killed when crashes occur, and accidents also damage or destroy goods and property.

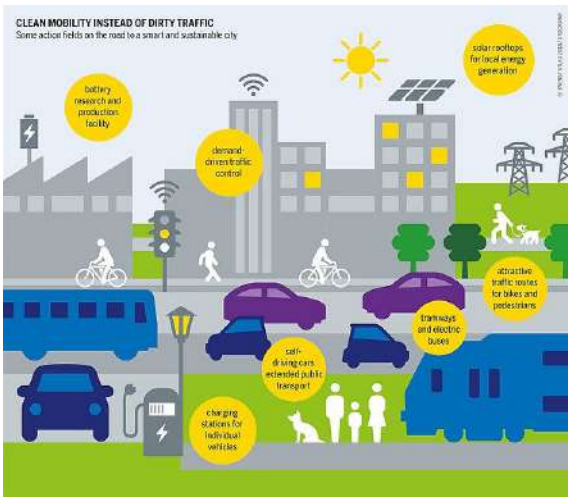


Fig5.9 Transport Infrastructure System

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. As of 2020, there is the equivalent of about 30 ha (74 acres) of operational vertical farmland in the world. Although the design has not yet been built, it successfully popularized the idea of vertical farming. Current applications of vertical framings coupled with other state-of-the-art technologies, such as specialized LED lights, have resulted in over 10 times the crop yield than would receive through traditional farming methods.

Types of vertical farming :-

Building-based vertical farms
Abandoned buildings are often reused for vertical farming, such as a farm at Chicago called “The Plant,” which was transformed from an old meatpacking plant. However, new builds are sometimes also constructed to house vertical farming systems.

Shipping-container vertical farms
Recycled shipping containers are an increasingly popular option for housing vertical farming systems. The shipping containers serve as standardized, modular chambers for growing a variety of plants, and are often equipped with LED lighting, vertically stacked hydroponics, smart climate controls, and monitoring sensors. Moreover, by stacking the shipping containers, farms can save space even further and achieve higher yield per square foot.

Deep farms
A “deep farm” is a vertical farm built from refurbished underground tunnels or abandoned mine shafts. As temperature and humidity underground are generally temperate and constant, deep farms require less energy for heating. Deep farms can also use nearby groundwater to reduce the cost of water supply. Despite low costs, a deep farm can produce 7 to 9 times more food than a conventional farm above ground on the same area of land, according to Saffa Riffat, chair in Sustainable Energy at the University of Nottingham. Coupled with automated harvesting systems, these underground farms can be fully self-sufficient.

Fig5.10 Vertical farm in Moscow

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

Corrosion Mechanism :-

Some metals, such as gold, silver, and platinum, occur naturally in their pure form. Many other metals, including iron, are found in their natural state as ores, natural oxides, sulphides, and other reaction products. These metals must be derived from their ores by smelting, from which the metal absorbs and retains the energy needed to free it from the ore. This metallic state is unstable, however, because the metal tends to recombine with elements in the environment and return to its natural state, losing the extra energy in the process. The process of a metal reverting to its natural state is called oxidation, or corrosion.

PREVENTION METHODS:-

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

- **Alternative reinforcement and slab design method**includes materials that electrically isolate the steel from the concrete and create a barrier for chloride ions, materials that protect steel galvanic-ally, and materials that have significantly higher corrosion thresholds than conventional reinforcing steel. Concrete slabs have been designed without any internal reinforcement.
- **Barrier methods** protect reinforced concrete from corrosion damage by preventing water, oxygen, and chloride ions from reaching the reinforcement and initiating corrosion.
- **Electrochemical methods** use current and an external anode to protect the reinforcement, even when the chloride ion concentration is above the corrosion threshold.
- **Corrosion inhibitors** offer protection by raising the threshold chloride concentration level, by reducing the permeability of the concrete, or by doing both.

Repair Measures of RCC Structure:-

Epoxy-coated reinforcement was developed in the early 1970s, in response to the need for better corrosion protection on reinforced concrete. The method of coating reinforcing steel with epoxy was adapted from the method used by utility companies for coating pipes in the petroleum industry. The bar is cleaned by blasting with grit to a near-white finish to remove mill-scale, rust and contaminates. The bar is then heated to the temperature required for the application of the epoxy powder, typically 230°C, and passed through an electrostatic spray that applies charged, dry epoxy powder to the steel. The epoxy melts, flows and cures on the bars, which then are quenched, usually with a water spray bath .

Epoxy-coated steel, along with higher quality concrete and deeper cover, can provide effective protection against corrosion distress for more than a decade. Many investigators are of the opinion that epoxy-coated steel is a viable option for long-term protection of reinforced concrete structures. In their opinion, reports of problems with epoxy-coated reinforcement are isolated, and each problem is caused by some shortcoming in the specific materials or construction in the particular.

Fig5.11 Corrosion of RCC Structure

5.1.7 Sewage treatment plant :-

Essentially, a sewage treatment plant operates by circulating air to encourage the growth of bacteria to break down sewage. The goal being to deliver much cleaner, more environmentally friendly effluent. It involves a similar process to a typical septic tank but has some key differences. Sewage treatment plants, depending on their size, can treat the waste of commercial properties or a number of domestic dwellings.

What Are 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.

Why Are Sewage Treatment Plants Required?

The first thought for anyone planning a new development should be getting connected to mains sewers. They are typically the most cost-effective and reliable method of dealing with your wastewater. However, getting a mains sewer connection isn't always possible. In some scenarios, the distance from the nearest sewer or the layout of the land can make it impossible to have your property serviced by a mains sewer. That's where sewage treatment plants and other alternatives come in. The operation of a sewage treatment plant means that you can have one installed almost anywhere, as long as you have an electrical connection.

Do Sewage Treatment Plants Still Need Emptying?

The purpose of a sewage treatment plant is to treat the wastewater as thoroughly as practically possible – and, even though such plants can often deal with more waste than a septic tank, they will still need emptying from time to time. Over time, sludge can also build up in the system, so it's important that a treatment plant is regularly maintained at least once a year or as you are advised by the installer.

Advantages of a sewage treatment plant

- Reliable and unlikely to encounter problems with only regular maintenance
- Can be installed even on challenging or compact sites
- Cost-effective over time, with only installation, power and maintenance to pay for

Disadvantages of a sewage treatment plant

- The plant needs a constant supply of electricity to run
- Will require professional maintenance annually, and in the unlikely event of problems
- Design and installation of the system needs to be undertaken professionally

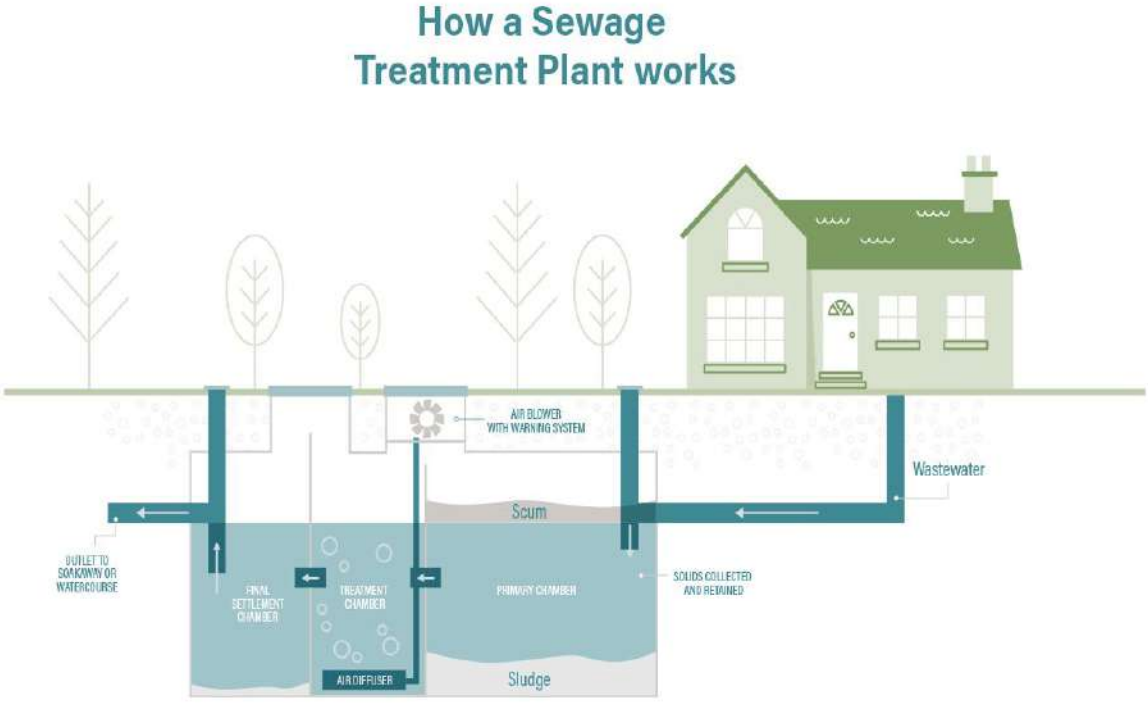


Fig5.12 Sewage Treatment Plant

Chapter 6:Swatchh Bharat Abhiyan (Clean India)

6.1Swatchhta needed in allocated village – Existing situation with photograph:-

"Cleanliness is Godliness" is the mantra of Mahatma Gandhiji, Father of Nation. He demonstrated, propagated and insisted for individual and community cleanliness throughout his life. Following his footprints, Swachh bharat Mission campaign achieved encouraging results. This vision will be translated into action by bringing in community participation for clean toilets and integrated waste management to make Gujarat open defecation free, zero waste, dust free, plastic free and green. The objectives of the Swachh Bharat Mission are:

- To bring improvement in general quality of life in Urban and Rural areas.
- Encouraging sustainable sanitation facilities through creating awareness and health education, giving inspiration to communities and PanchayatiRaj Institutions.
- Encouraging affordable and proper technology for ecological life and sustainable sanitation.
- The schools which are not covered under SarvaSikshaAbiyan be covered, to provide Anganwadi centers of rural area with proper sanitation and health facilities and provide active engagement about health education and sanitation facilities to students.
- Focusing on solid and liquid waste in Urban and Rural areas for entire cleanliness, develop environmental sanitation system being arranged by community.

(a) Swachhata observed during village visit :-

Fig6.1 Swachhata observed during village visit

(b) Sectors in the village where the cleanliness was not observed / not followed by villagers:-

Fig6.2 Cleanliness not observed/followed by villagers

(c) Cleanliness observed at main locations of a village :-

Fig6.3 Cleanliness observed at main location of village

(d) Awareness of Headman of village and Principal of the school :-

Fig6.4 Awareness of Headman of village

(e) Practices followed by villagers :-

Fig6.5 Practices followed by villagers

(f) Your views on what more can be done for increasing cleanliness in the village by headman, other important persons and villagers? :-

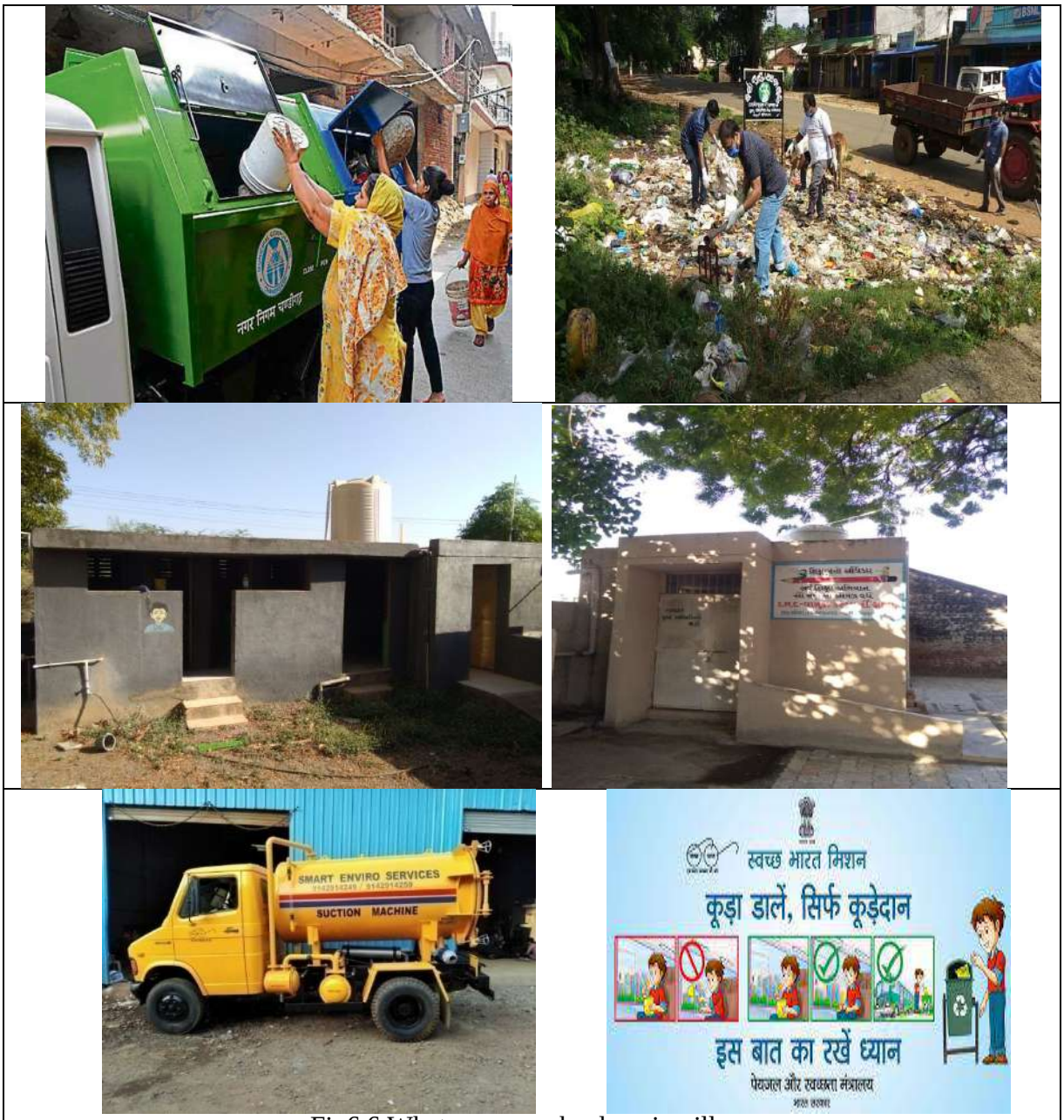


Fig6.6 What more can be done in village

6.2 Guidelines - Implementation in allocated village with Photograph:-

The general features of Swachh Bharat Mission are given below:

- Implementation and monitoring at State level by Swachh Bharat Mission.
- Phase-wise implementation of block wise programme from 2014-15 to 2018-19.
- Determination of "Zero waste" policy in the State.
- Formation and implementing of "Public Health Bye-Laws for all cities.

- Sanitation for all
- Formation of task force for supervision of programme for all cities at City Level.
- Free health check-up of sanitation and drainage employees twice in a year.
- Planning of eco-friendly crematorium in the Municipalities.
- Ratings of cities for cleanliness to inter cities, cleanliness competition and prizes.
- Financial / technical assistance to Local Self Government bodies, training and capacity building.
- Intensive sanitation drive for first 3 Months.
- Public awareness and public participation.
- Bring about an improvement in the general quality of life in the urban areas.
- Accelerate sanitation coverage in urban areas.
- Generate felt demand for sanitation facilities though awareness creation and health education.
- Cover schools/ Anganwasis in urban areas with sanitation facilities and promote hygiene education and sanitary habits among students.
- Encourage cost effective and appropriate technologies in sanitation.
- Eliminate open defection to minimize risk of contamination of drinking water sources and food.
- Convert dry latrines to pour flush latrines, and eliminate manual scavenging practice, wherever in existence in urban ar

In context of above features and under Swachh Bharat Mission, following guidelines have been framed by Government of India. The guidelines are with hyperlink, so that the successors in Vishwakarma Yojana can get an advantage of directly referring the guidelines and can find the report worth reading:

No.	Title
1	Swachh Bharat Mission - Urban Guidelines
2	G.R. Pay & Use Toilet
3	G.R. Individual Toilet
4	G.R. Pay & Use Block
5	Gujarat State Urban Solid Waste Management and Sanitation Policy-2018
6	Solid Waste Management Rules 2016
7	Plastic Waste Management Rules 2016
8	Gujarat Waste Energy Policy 2016
9	Construction and Demolition Rules 2016
10	Advisory on decentralised composting
11	Bulk Waste Generator Book
12	C&D Waste Ready Reckoner
13	Waste to Wealth

No.	Title
14	GR Of Kailashdam
15	UD AND UHD GR DATED-20.01.2015 FOE 'OPEN DEFECATION FREE TOWNS'

Table 6.1.Guidelines links

Norms & Guidelines followed in the village to make it ODF Plus:-

1. All households in the village have access to a functional toilet facility.
2. The villages with more than 100 Households ahould have a CSC.
3. All schools/ Anganwadi Centers (AWC)/ Panchayat Ghar in the village have access to a functional toilet, with separate toilet for male and female.
4. All public place in village are observed to have minimal litter, minimal stagnant wastewater and no plastic waste dump.
5. At least 80% household, and all schools, Anganwadis, Panchayat ghar have arrangement for managing biodegradable waste and liquid waste.
6. The village has a plastic segregation and collection system.
7. The village should prominently display at least five ODF-Plus IEC message through wall-paintings/billboards etc on each on the following themes : ODF Sustainability and continued toilet usage; Handwashing with soap; Biodegradable Waste Management through use of compost pits; Plastic Waste Management; and Liquid Waste Management through soak pits.

6.3 Activities Done by Students for allocated village with Photograph:-

Because of prevailing pandemic situations of COVID-19, the team members were unable to practice any activities in the allocated village, but the team has observed various points and can recommend following practices either to be initiated or continued to be carried forward by the villagers:

- ✓ Elimination of open defecation
- ✓ Eradication of Manual Scavenging
- ✓ Adoption of Modern and Scientific methods for Solid Waste Management
- ✓ Make people aware about behavioral change regarding healthy sanitation practices including for the cases of household toilets, public toilets and communal toilet facilities
- ✓ Spreading generate awareness about sanitation and its linkage with public health
- ✓ Capacity Augmentation for local bodies to create an enabling environment for private sectors (if any)
- ✓ Comprehensive Sanitation Planning, implementation and monitoring

Chapter 7:Village condition due to Covid-19

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

The nation-wide lockdown imposed in India from March 25 to May 31, 2020 following the breakout of the COVID-19 pandemic affected rural India in diverse ways. This was only to be expected given the great variation in production systems and socio-economic conditions in villages across agro-ecological zones. However, the impact is differential across socio-economic classes and regions of the country, which are observed and narrated by the researchers T.S. Modak, S. Baksi and D. Johnson, which are presented below:

1. The impact on harvesting operations in the irrigated villages was limited, mainly because of the easy availability, and widespread use of combine harvesters in most of the surveyed villages. While it is too early to conclude, one can argue that the use of machines for various agricultural operations has received a thrust under the current crisis. In rainfed villages, being the lean agricultural season, the opportunities for farm employment were already restricted.

2. The major impact on agriculture, however, was in terms of access to marketing channels, and price received for the produce. In villages of Punjab and Kerala, there was active intervention by respective State governments to ensure procurement at fair prices. Such institutional mechanisms were absent in other States. The local market channel of sale through small traders and merchants had collapsed, and gravely impacted poor peasants for whom these traders were the main channel. Restricted mobility hindered access to regulated markets even for richer capitalist farmers. The disruption of the supply chain has led to a slump in the local farm harvest prices for most agricultural produce. Producers of perishable goods, particularly vegetables, were severely affected. Among them, the worst hit were poor peasants, without any access to storage facilities or procurement centers.

3. While agricultural operations were not affected much in the irrigated villages, a tendency seemingly encouraged by the lockdown is an expanded use of family labour among smaller landowners. The tendency to use family and exchange labour among poor peasants implies that the scope of agricultural wage work was lower for manual workers during the lockdown.

4. Non-agricultural work, which was crucial in the lean agricultural season, had completely collapsed. In the complete absence of non-farm employment, workers, and even artisans, were being forced to seek employment in agriculture. The reduced mobility due to the lockdown also implied that workers who otherwise regularly migrated for work were now competing for agricultural employment. As a consequence, a downward pressure on rural wage-rates was already beginning to be felt. The Covid-19 lockdown has broken down the complementary relationship between agricultural and non-agricultural work, where the surplus labour from the former was usually absorbed by the latter.

5. Despite income flows drying up for all socio-economic classes to varying degrees, the immediate impact was most severely felt by manual workers and poor peasants who did not have any savings. With meager cash in hand, no home produce for consumption, and lack of employment, the class of manual workers were certainly the worst affected. In addition, a major blow to the class of manual workers, and poor peasants has been the complete breakdown in receipt of remittances. The combination of low levels of income, ineffective public distribution systems, and negligible income-support had serious implications for subsistence of these households, leading to increased indebtedness especially from informal sources. The class of landlord and capitalist farmer was the least impacted by the lockdown. Better access to storage facilities and regulated markets implied that their farm incomes were relatively protected. Also, they had sufficient cash in hand and food stocks for daily household consumption.

To sum up, the Covid-19 lockdown has worsened the already prevalent distress in the Indian countryside especially for manual worker and poor peasant households. There is also a fear that if the lockdown restrictions are prolonged, crop production in the kharif season will be severely affected. Government intervention is critical to maintain a basic level of household consumption and to resume normal agricultural production.

The allocated village for the team has not been proven as a difference maker than the other and in context of above mentioned situations. Below are the steps taken in the allocated village:
In Valukad awareness about Covid-19 is at good level. villagers know how to
protect themselves from this pandemic.

We arrange meeting with Sarpanch Chhayaben Rao and Talati Mantri Jagdishbhai Solanki, also with the representative of the village to give informationabout Covid-19.
In this meeting we discussed about :-

- Formation of Covid 19.
- Government rules and regulation on about lockdown.
- 14 days Isolation importance.
- Precaution to prevent Covid 19.
- Flow medium of Covid 19.
- Spared of Covid 19.
- Cooperation of villagers with health care workers as well as Covid warriors.
- Importance of mask and sanitizer.
- Importance of avoid social gathering.
- How to improve Immunity.
- Necessary amount of ration and grocery were made available for villagers at rationing shops.

We also visit some shop and temples to give them importance of avoid social gathering. Proper way to use of mask and sanitizer.How to Improve the Immunity. Show them poster of awareness about Covid 19 and explained it.

After lockdown the Government of Gujarat took certain steps for village laborers or workers who were unemployed due to pandemic of Covid-19, they were helped by Government by issuing the

job-cards under MGNREGA scheme and for Valukad there are total 1061 job-cards issued from which male workers job-card issued are 561 and female are 500.

Fig7.1Pledge taken against COVID-19 by villagers

Fig7.2Steps for prevention of COVID-19 in PHC Center

Fig7.3 COVID-19 Awareness slogans painted in village

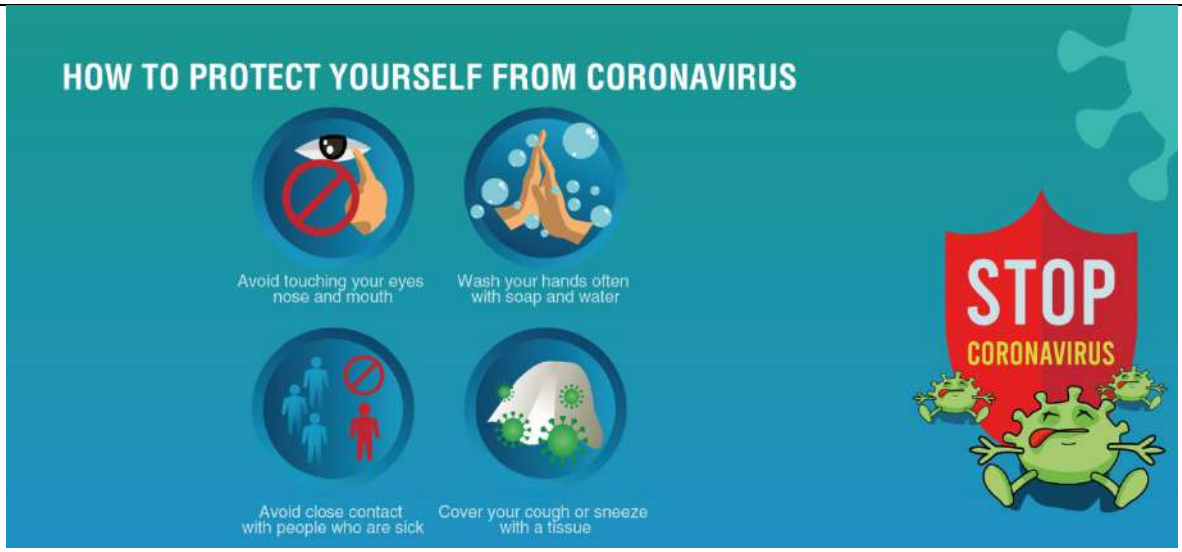


Fig7.4 Digital poster for COVID-19 awareness

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

Because of prevailing pandemic situations of COVID-19, the team members were unable to practice any activities in the allocated village, but the team has observed various points and can recommend following practices either to be initiated or continued to be carried forward by the villagers to fight against COVID-19:-

- ✓ Making the villagers aware about initial preparedness through following common and specific guidelines levied by Central and State Governments time by time.
- ✓ Identifying the possibilities of development of screening facilities either at village entrance or common entrance point of either Taluka or nearby region.
- ✓ Tracing the contacts or migrants in the village.
- ✓ Testing to treatment facilities and centers in the village.
- ✓ Identifying manpower augmentation and training
- ✓ Suggesting various locations for temporary shelter homes either for isolation or for quarantine.
- ✓ Analysing post COVID-19 effects on agriculture, industry, employment and per capita income at village level.
- ✓ Simplifying administration, health-care and other local mercantile / industrial processes and strategies.
- ✓ Encouraging health workers, school teachers and aanganwadi people.

7.3 Any other steps taken by the students / villagers:-

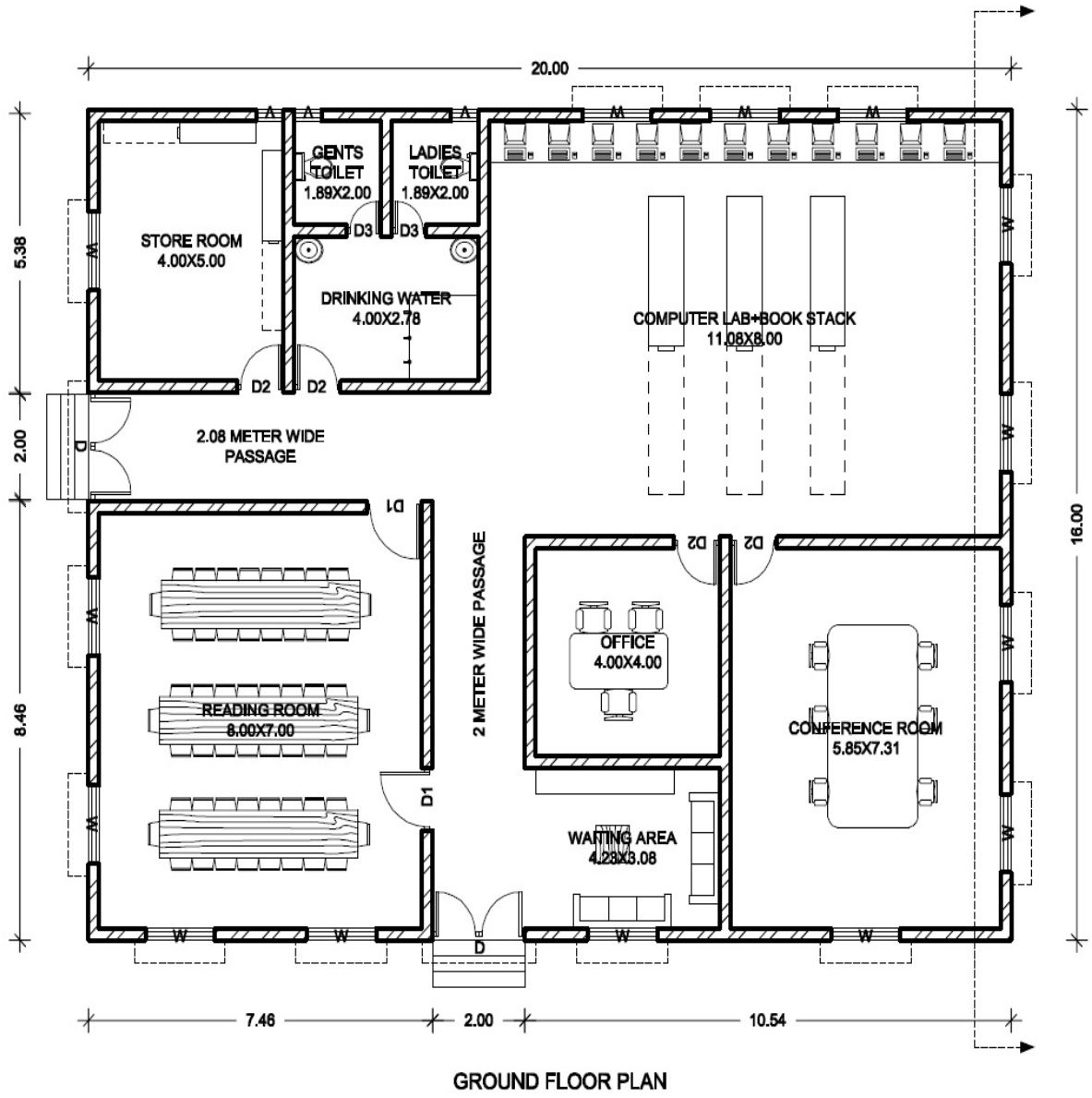
As mentioned earlier, the team members found themselves unable to carry out any activities or steps because of COVID-19 Pandemic situation, but based on the village visit, following points can be suggested either as simultaneous or parallel to points suggested in above topic no. 7.2:

- ✓ Continuous contact between Gram Panchayat and District Level Control Room or Task Force for getting latest guidelines, practices and steps taken for fighting against COVID-19 Pandemic situations.
- ✓ Continuing the practice of social distancing, wearing masks and consulting health care units without shying.
- ✓ Distribution of food, fruit, dairy products, grain, vegetables, oils, petroleum products, etc. should be observed so that neither scarcity nor rush can be observed.
- ✓ Inter-village and intra-village active cases movements as well as rural to urban to and fro migration should be observed and recorded so that contact tracing can be practiced effectively.
- ✓ Awareness to governance through social media and digital platform should be practiced, which may lead less movement for various purposes.
- ✓ Making villagers aware and educated have become must, even if they are vaccinated in nearby future.

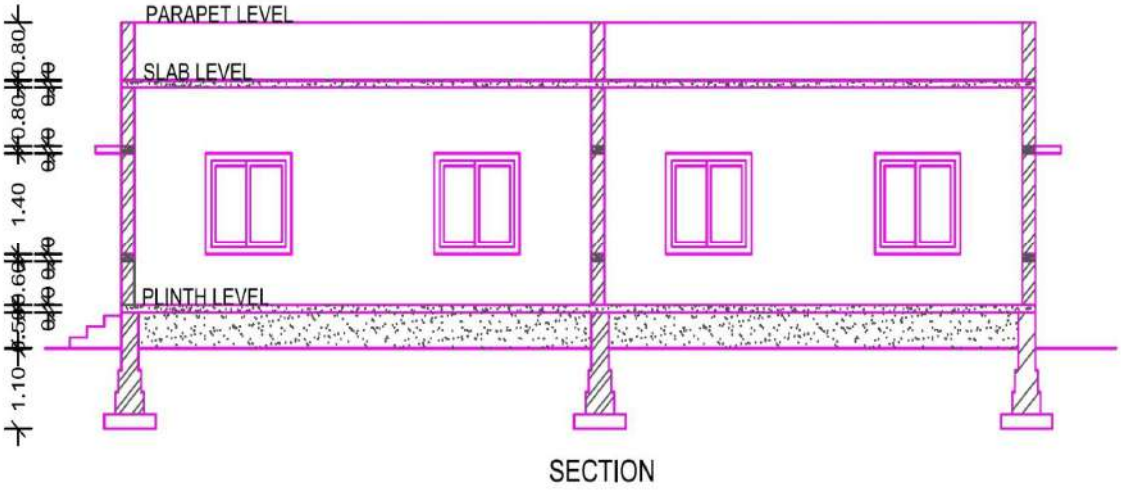
Chapter 8 : Sustainable Design Planning Proposal (Prototype Design)- Part- I

8.1 Design Proposals :-

- **Design & Estimate of Public Library**



GROUND FLOOR PLAN



SECTION

Fig8.1 3D of Public Library

QUANTITY SHEET LIBRARY								
SR. NO.	**DESCRIPTION**	**UNIT**	**NOS.**	**L**	**B**	**H**	**Total**	**Total Quantity**
1	**Excavation for foundation in ordinary soil**							
	L = (19.77*2)+(15.77*2)+(5.23*2) +(4.23*1)+(8.46*1)+(10.54*1) +(12.54*1)+(6.46*1)+(4.23*1) +(7.54*1)+(7.23*1)+(2.23*1) = 145	cu.m	1	136.45	0.9	1.1	135.0855	**135.0855**
	NET CENTER LINE LENGTH (L) = 136.45							
2	**PCC (1:4:8)**							
	L = (19.77*2)+(15.77*2)+(5.23*2) +(4.23*1)+(8.46*1)+(10.54*1) +(12.54*1)+(6.46*1)+(4.23*1) +(7.54*1)+(7.23*1)+(2.23*1) = 145	cu.m	1	136.45	0.9	0.2	24.561	**24.561**
	NET CENTER LINE LENGTH (L) = 136.45							
3	**Brick masonary in plinth and foundation**							
	1st footing							
	L = (19.77*2)+(15.77*2)+(5.23*2) +(4.23*1)+(8.46*1)+(10.54*1) +(12.54*1)+(6.46*1)+(4.23*1) +(7.54*1)+(7.23*1)+(2.23*1) = 145	cu.m	1	140.25	0.5	0.3	21.0375	
	NET CENTER LINE LENGTH (L) = 140.25							**76.362**
	2nd footing							
	L = (19.77*2)+(15.77*2)+(5.23*2) +(4.23*1)+(8.46*1)+(10.54*1) +(12.54*1)+(6.46*1)+(4.23*1) +(7.54*1)+(7.23*1)+(2.23*1) = 145	cu.m	1	141.2	0.4	0.3	16.944	
	NET CENTER LINE LENGTH (L) = 141.2							
	3rd footing							

	L = (19.77*2)+(15.77*2)+(5.23*2) +(4.23*1)+(8.46*1)+(10.54*1) +(12.54*1)+(6.46*1)+(4.23*1) +(7.54*1)+(7.23*1)+(2.23*1) = 145	cu.m	1	142.15	0.3	0.9	38.3805	
	NET CENTER LINE LENGTH (L) = 142.15							
4	**Brick masonary in super stucture**							
	L = (19.77*2)+(15.77*2)+(5.23*2) +(4.23*1)+(8.46*1)+(10.54*1) +(12.54*1)+(6.46*1)+(4.23*1) +(7.54*1)+(7.23*1)+(2.23*1) = 145	cu.m	1	142.815	0.23	3	98.54235	
	NET CENTER LINE LENGTH (L) = 142.815							
	parapet long wall	cu.m	2	20	0.23	0.7	6.44	**97.22813**
	parapet short wall	cu.m	2	15.54	0.23	0.7	5.00388	
	deduction							
	doors							
	D	cu.m	-2	2	0.23	2.1	-1.932	
	D1	cu.m	-2	1.2	0.23	2.1	-1.1592	
	D2	cu.m	-4	1	0.23	2.1	-1.932	
	D3	cu.m	-2	0.75	0.23	2.1	-0.7245	
	windows	cu.m	-14	1.5	0.23	1.4	-6.762	
	ventilation	cu.m	-3	0.6	0.23	0.6	-0.2484	
5	**DPC**							
	L = (19.77*2)+(15.77*2)+(5.23*2) +(4.23*1)+(8.46*1)+(10.54*1) +(12.54*1)+(6.46*1)+(4.23*1) +(7.54*1)+(7.23*1)+(2.23*1) = 145	sq.m	1	142.15	0.3	-	42.645	**39.075**
	NET CENTER LINE LENGTH (L) = 142.15							
	deduction							
	D	cu.m	-2	2	0.3		-1.2	
	D1	cu.m	-2	1.2	0.3		-0.72	
	D2	cu.m	-4	1	0.3		-1.2	
	D3	cu.m	-2	0.75	0.3		-0.45	
6	**20mm thick 1:3 External sand faced plaster**							**339.6878**
	Long wall	sq.m	2	20	-	4.6	185.4	

						35		
	Short wall	sq.m	2	15.54	-	4.635	144.0558	
	Terrace parapet wall	sq.m	2	19.54	-	0.7	27.356	
		sq.m	2	15.54	-	0.7	21.756	
	deduction							
	doors	sq.m	-2	2	-	2.1	-8.4	
	windows	sq.m	-14	1.5	-	1.4	-29.4	
	ventilation	sq.m	-3	0.6	-	0.6	-1.08	
7	**20mm thick 1:3 Internal smooth plaster**							
	store room	sq.m	2	4		2.9	23.2	
		sq.m	2	5		2.9	29	
	deduction	sq.m					0	
	door	sq.m	-1	1		2.1	-2.1	
		sq.m					0	
	toilet	sq.m	4	1.89		2.9	21.924	
		sq.m	4	2		2.9	23.2	
	open space	sq.m	2	4		2.9	23.2	
		sq.m	2	2.77		2.9	16.066	
	deduction	sq.m					0	
	doors	sq.m					0	
	D3	sq.m	-2	0.75		2.1	-3.15	
	D2	sq.m	-1	1		2.1	-2.1	
		sq.m					0	
	reading room	sq.m	2	7		2.9	40.6	
		sq.m	2	8		2.9	46.4	**547.895**
	deduction	sq.m					0	
	door	sq.m	-2	1.2		2.1	-5.04	
		sq.m					0	
	computer lab	sq.m	2	11.08		2.9	64.264	
		sq.m	2	8		2.9	46.4	
	deduction	sq.m	-1	2.77		2.9	-8.033	
		sq.m	-1	0.77		2.9	-2.233	
		sq.m					0	
	conference room	sq.m	2	5.85		2.9	33.93	
		sq.m	2	7.31		2.9	42.398	
	deduction	sq.m	-1	1		2.1	-2.1	
		sq.m					0	
	office	sq.m	4	4		2.9	46.4	
	deduction	sq.m	-1	1		2.1	-2.1	
		sq.m					0	
	reception area	sq.m	2	4.23		2.9	24.534	
		sq.m	1	3.08		2.9	8.932	

	passage	sq.m	1	8.69		2.9	25.201	
		sq.m	1	7.46		2.9	21.634	
		sq.m	1	8.46		2.9	24.534	
		sq.m	1	4.46		2.9	12.934	
8	**10mm thick 1:3 plaster on slab**							
	store room	sq.m	1	4	5		20	
	toilet block	sq.m	1	3.78	2		7.56	
	open space	sq.m	1	4	2.77		11.08	
	reading room	sq.m	1	7	8		56	**289.5387**
	computer lab	sq.m	1	11.08	8		88.64	
	conference room	sq.m	1	5.85	7.31		42.7635	
	office	sq.m	1	4	4		16	
	reception area	sq.m	1	4.23	3.08		13.0284	
	passage 1	sq.m	1	7.46	2.08		15.5168	
	passage 2	sq.m	1				18.95	
9	**PCC (1:3:6) below floors**	cu.m	1	20	16	0.1	32	**32**
10	**Vitrified tiles in flooring**							
	store room	sq.m	1	4	5		20	
	toilet block	sq.m	1	3.78	2		7.56	
	open space	sq.m	1	4	2.77		11.08	
	reading room	sq.m	1	7	8		56	
	computer lab	sq.m	1	11.08	8		88.64	
	conference room	sq.m	1	5.85	7.31		42.7635	
	office	sq.m	1	4	4		16	
	reception area	sq.m	1	4.23	3.08		13.0284	**286.8017**
	passage 1	sq.m	1	7.46	2.08		15.5168	
	passage 2	sq.m	1				18.95	
	deduction							
	door							
	D	sq.m	-2	2	0.23		-0.92	
	D1	sq.m	-2	1.2	0.23		-0.552	
	D2	sq.m	-4	1	0.23		-0.92	
11	**Terrace tiles**	sq.m	1	19.54	15.54	-	303.6516	**303.6516**
12	**Skirting**							
	Rooms	r.m	1	198.19	-	-	198.19	
	deduction							
	doors							**190.29**
	D1	r.m	-2	1.2			-2.4	
	D2	r.m	-4	1			-4	
	D3	r.m	-2	0.75			-1.5	
13	**RCC (1:2:4)**							
	RCC slab (10cm thick)	cu.m	1	20	16	0.1	32	**37.88491**
	RCC Lintel	cu.m	1	137.77	0.23	0.1	3.16871	

	RCC chajjas (10cm thick)							
	Above doors and windows	cu.m	2	2.46	0.45	0.1	0.2214	
	Above windows	cu.m	14	1.96	0.45	0.1	1.2348	
	RCC Stairs	cu.m	2	2	0.9	0.45	1.62	
	deduction	cu.m	-4	2	0.3	0.15	-0.36	
14	**Paint**							
	external paint							
	Long wall	sq.m	2	20	-	4.635	185.4	
	Short wall	sq.m	2	15.54	-	4.635	144.0558	
	Terrace parapet wall	sq.m	2	19.54	-	0.7	27.356	
		sq.m	2	15.54	-	0.7	21.756	**339.6878**
	deduction							
	doors	sq.m	-2	2	-	2.1	-8.4	
	windows	sq.m	-14	1.5	-	1.4	-29.4	
	ventilation	sq.m	-3	0.6	-	0.6	-1.08	
	internal paint							
	store room	sq.m	2	4		2.9	23.2	
		sq.m	2	5		2.9	29	
	deduction	sq.m					0	
	door	sq.m	-1	1		2.1	-2.1	
		sq.m					0	
	toilet	sq.m	4	1.89		2.9	21.924	
		sq.m	4	2		2.9	23.2	
	open space	sq.m	2	4		2.9	23.2	
		sq.m	2	2.77		2.9	16.066	
	deduction	sq.m					0	
	D3	sq.m	-2	0.75		2.1	-3.15	**547.895**
	D2	sq.m	-1	1		2.1	-2.1	
		sq.m					0	
	reading room	sq.m	2	7		2.9	40.6	
		sq.m	2	8		2.9	46.4	
	deduction	sq.m					0	
	door	sq.m	-2	1.2		2.1	-5.04	
		sq.m					0	
	computer lab	sq.m	2	11.08		2.9	64.264	
		sq.m	2	8		2.9	46.4	
	deduction	sq.m	-1	2.77		2.9	-8.033	
		sq.m	-1	0.77		2.9	-2.233	
		sq.m					0	

	conference room	sq.m	2	5.85		2.9	33.93	
		sq.m	2	7.31		2.9	42.398	
	deduction	sq.m	-1	1		2.1	-2.1	
		sq.m					0	
	office	sq.m	4	4		2.9	46.4	
	deduction	sq.m	-1	1		2.1	-2.1	
		sq.m					0	
	reception area	sq.m	2	4.23		2.9	24.534	
		sq.m	1	3.08		2.9	8.932	
	passage	sq.m	1	8.69		2.9	25.201	
		sq.m	1	7.46		2.9	21.634	
		sq.m	1	8.46		2.9	24.534	
		sq.m	1	4.46		2.9	12.934	
	slab bottom							
	store room	sq.m	1	4	5		20	
	toilet block	sq.m	1	3.78	2		7.56	
	open space	sq.m	1	4	2.77		11.08	
	reading room	sq.m	1	7	8		56	
	computer lab	sq.m	1	11.08	8		88.64	**289.5387**
	conference room	sq.m	1	5.85	7.31		42.7635	
	office	sq.m	1	4	4		16	
	reception area	sq.m	1	4.23	3.08		13.0284	
	passage 1	sq.m	1	7.46	2.08		15.5168	
	passage 2	sq.m	1	18.95			18.95	
15	**Earth Filling in Plinth**							
	store room	sq.m	1	4	5	0.5	10	
	toilet block	sq.m	1	3.78	2	0.5	3.78	
	open space	sq.m	1	4	2.77	0.5	5.54	
	reading room	sq.m	1	7	8	0.5	28	
	computer lab	sq.m	1	11.08	8	0.5	44.32	**144.76935**
	conference room	sq.m	1	5.85	7.31	0.5	21.38175	
	office	sq.m	1	4	4	0.5	8	
	reception area	sq.m	1	4.23	3.08	0.5	6.5142	
	passage 1	sq.m	1	7.46	2.08	0.5	7.7584	
	passage 2	sq.m	1	18.95	-	0.5	9.475	

Table 8.1Quantity Sheet of Public Library

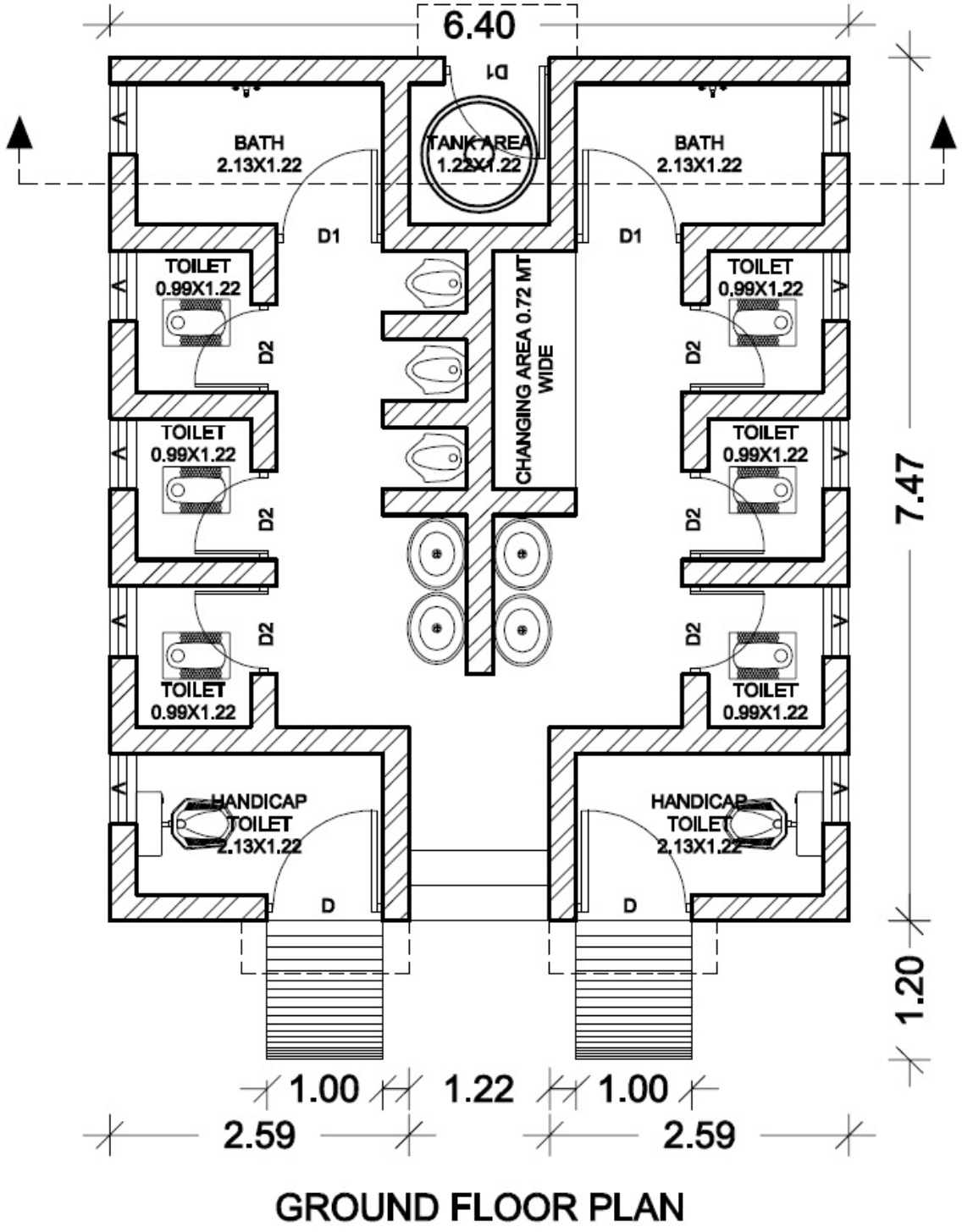
ABSTRACT SHEET FOR LIBRARY					
SR NO.	**DESCRIPTION**	**QUANTITY**	**RATE**	**UNIT**	**AMOUNT RS.**
1	Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(B) Dense or Hard soil	135.0855	85.9	cu.m	11603.84445
2	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- Graded brick bat aggregate 40mm normal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton)	24.561	2157	cu.m	52978.077
3	Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:5. (1- Cement : 5 -fine sand)(C) Fly Ash Bricks (upto 10 ton)	76.362	3344	cu.m	255354.528
4	Brick work in super strucrture in cement mortar	97.22813	3500	cu.m	340298.455
5	Providing and laying damp proof course 25mm thick cement concrete 1:2:4 (1- Cement : 2 coarse sand : 4 stone aggregate 10 mm nominal size) and curing complete (upto 10 ton)	39.075	159	sq.m	6212.925
6	20mm thick sand faced cement plaster on walls upto height 10 metres above ground level consisting of 12mm thick backing coat of C.M. 1:3 (1-cement : 3-sand) and 8mm thick finishing coat of C.M. 1:1 (1-cement : 1-sand) etc. complete.	339.6878	205	sq.m	69635.999
7	Providing 20mm thick cement plaster in single coat on single or half brick walls for interior plastering upto floor two level and finished even and smooth in (i) Cement mortar 1:3 (1-cement:3-sand)	547.895	150	sq.m	82184.25
8	Providing 10mm thick cement plaster in single coat on brick/concrete walls for interior plastering upto floor two level and finished even and smooth in (i)Cement mortar 1:3 (1-cement:3-sand)	289.5387	87.2	sq.m	25247.77464

9	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- crushed stone aggregates 20 mm nominal size) and curing complete including cost of formwork in (A) Wall Caps / Coping (more than 10 ton)	32	2712	cu.m	86784
10	Providing and laying Vitrified tiles 8 to 10 mm thick , 24'' x 24'' in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3-coarse sand) finishing with flush pointing in white cement. (upto 10 ton)	286.8017	888	sq.m	254679.9096
11	Providing and laying chequered terrazo tiles 28mm thick with marble chips of sizes upto 6mm in treads of stairs and staircases in 12mm thick bed of lime mortar 1:1.5 (1- Lime putty :1.5 coarse sand) or C.M. 1:6 jointed with neat cement slurry mixed with pigment to match the shade of tiles including rubbing and polishing complete. (B) Dark shades using ordinary cement (upto 10 ton)	303.6516	467	sq.m	141805.2972
12	Providing and laying marble chips skirting (Terrazo) or dedo rubbed, and polished to Granolithic finish top layer 6mm thick with white,black or white and black marble chips of size from smallest to 4mm nominal size laid in cement marble powder mix 3:1 (3-Cement : 1 marble powder by weight) in proportion of 4:7 (4-cement marble powder mix : 7-marble chips by volume) 20mm thick with under layer 14mm thick cement plaster 1:3 (1-cement : 3-coarse sand) (A) Dark shade pigment with ordinary cement (In top layer only) (upto 10 ton)	190.29	386	sq.m	73451.94
13	Providing and laying controlled cement concrete 1:2:4 and exposed work with curing etc. complete including the cost of formwork and including the cost of reinforsement for R.C.Cwork in (iii) Slabs having more than 10 cm and upto 13 cm. thickness	37.88491	8800	cu.m	333387.208
14	Finishing wall with water proofing cement paint of on wall surfaces (Two coats) to give an approved brand and manufacture and of required shape even shade after	339.6878	36.1	sq.m	12262.72958

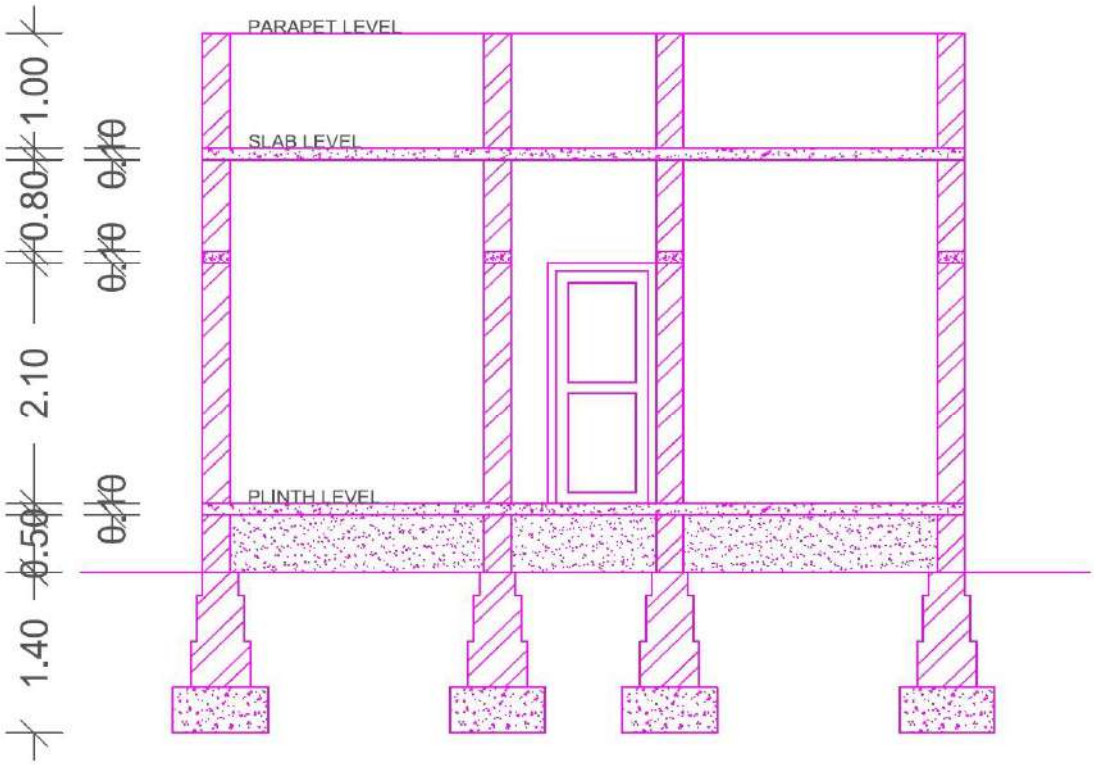
	thoroughly brushing the surface to remove all dirt and remains of loose powered materials.				
15	Wall painting (two coats) with plastic emulsion paint of approved brand and manufacture on undecorated wall surface to give an even shade including throughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth.	837.4337	49.6	sq.m	41536.71152
16	Filling available excavated earth (excluding rock) in trenches. plinth, sides of foundations etc. in layers not exceeding 20 cm. in depth consolidating each disposited layer by ramming and watering.	144.76935	76.5	cu.m	11074.85528
	TOTAL				**1798498.504**
17	Add 3% contigencies				53954.95513
18	Add 5% work charge establishment				89924.92521
19	Add 10% plumbing and sanitary works				179849.8504
20	Add 10% electrification charge				179849.8504
TOTAL ESTIMATED COST					**2302078.085**

Table 8.2 Abstract Sheet of Public Library

- **Design & Estimate of Public Bath & Toilet**



GROUND FLOOR PLAN



SECTION

Fig8.2 3D of Public Bath & Toilet

QUANTITY SHEET BATH & TOILET								
SR. NO.	DESCRIPTION	UNIT	NOS.	L	B	H	Total	Total Quantity
1	**Excavation for foundation in ordinary soil**							**61.1744**
	L = (6.17*4)+(7.24*2)+(4.34*3)+(1.22*4)+(1.45*4)+(0.84*4) = 66.22	cu.m	1	54.62	0.8	1.4	61.1744	
	NET CENTER LINE LENGTH (L) = 54.62							
2	**PCC (1:4:8)**							**17.4784**
	L = (6.17*4)+(7.24*2)+(4.34*3)+(1.22*4)+(1.45*4)+(0.84*4) = 66.22	cu.m	1	54.62	0.8	0.4	17.4784	
	NET CENTER LINE LENGTH (L) = 54.62							
3	**Brick masonary in plinth and foundation**							**36.31**
	1st footing							
	L = (6.17*4)+(7.24*2)+(4.34*3)+(1.22*4)+(1.45*4)+(0.84*4) = 66.22	cu.m	1	58.97	0.5	0.4	11.794	
	NET CENTER LINE LENGTH (L) = 58.97							
	2nd footing							
	L = (6.17*4)+(7.24*2)+(4.34*3)+(1.22*4)+(1.45*4)+(0.84*4) = 66.22	cu.m	1	60.42	0.4	0.4	9.6672	
	NET CENTER LINE LENGTH (L) = 60.42							
	3rd footing							
	L = (6.17*4)+(7.24*2)+(4.34*3)+(1.22*4)+(1.45*4)+(0.84*4) = 66.22	cu.m	1	61.87	0.3	0.8	14.8488	
	NET CENTER LINE LENGTH (L) = 61.87							
4	**Brick masonary in super stucture**							**44.21635**

	L = (6.17*4)+(7.24*2)+(4.34*3)+(1.22*4)+(1.45*4)+(0.84*4) = 66.22	cu.m	1	62.885	0.23	3	43.39065	
	NET CENTER LINE LENGTH (L) = 62.885							
	parapet long wall	cu.m	2	7.01	0.23	1	3.2246	
	parapet short wall	cu.m	2	6.4	0.23	1	2.944	
	deduction							
	doors							
	D	cu.m	-2	1	0.23	2.1	-0.966	
	D1	cu.m	-3	0.91	0.23	2.1	-1.31859	
	D2	cu.m	-6	0.76	0.23	2.1	-2.20248	
	ventilation	cu.m	-10	0.61	0.23	0.61	-0.85583	
5	**DPC**							
	L = (6.17*4)+(7.24*2)+(4.34*3)+(1.22*4)+(1.45*4)+(0.84*4) = 66.22	sq.m	1	61.87	0.3	-	18.561	
	NET CENTER LINE LENGTH (L) = 61.87							
	deduction							**15.774**
	doors							
	D	cu.m	-2	1	0.3		-0.6	
	D1	cu.m	-3	0.91	0.3		-0.819	
	D2	cu.m	-6	0.76	0.3		-1.368	
6	**20mm thick 1:3 External sand faced plaster**							
	Long wall	sq.m	2	7.47	-	4.965	74.1771	
	Short wall	sq.m	2	6.4	-	4.965	63.552	**147.8481**
	Terrace parapet wall	sq.m	2	7.01	-	1	14.02	
		sq.m	2	5.94	-	1	11.88	
	deduction							
	doors	sq.m	-	2	-	2.1	-8.4	

			2					
		sq.m	-1	0.91		2.1	-1.911	
	ventilation	sq.m	-10	0.61	-	0.61	-3.721	
		sq.m	-1	1.22		3	-3.66	
7	**20mm thick 1:3 Internal smooth plaster**							
	bath	sq.m	4	2.13		2.9	24.708	
		sq.m	4	1.22		2.9	14.152	
	deduction							
	door	sq.m	-2	0.91		2.1	-3.822	
	handicap toilet	sq.m	4	2.13		2.9	24.708	
		sq.m	4	1.22		2.9	14.152	
	toilet	sq.m	12	0.99		2.9	34.452	
		sq.m	12	1.22		2.9	42.456	
	deduction							**237.684**
	doors							
	D2	sq.m	-6	0.76		2.1	-9.576	
		sq.m						
	tank room	sq.m	4	1.22		2.9	14.152	
	passage	sq.m	2	4.11		2.9	23.838	
		sq.m	2	1.14		2.9	6.612	
		sq.m	2	1.68		2.9	9.744	
		sq.m	2	3.66		2.9	21.228	
		sq.m	10	0.72		2.9	20.88	
8	**10mm thick 1:3 plaster on slab**							
	bath	sq.m	2	2.13	1.22		5.1972	
	handicap toilet	sq.m	2	2.13	1.22		5.1972	
	toilet	sq.m	6	0.99	1.22		7.2468	**34.66**
	tank room	sq.m	1	1.22	1.22		1.4884	
	passage	sq.m	1	1.68	1.22		2.0496	
		sq.m	2	1.64	4.11		13.4808	
9	**PCC (1:3:6) below floors**	cu.m	1	6.4	7.47	0.1	4.7808	**4.7808**
10	**Vitrified tiles in flooring**							**32.5233**

	bath	sq.m	2	2.13	1.22		5.1972	
	handicap toilet	sq.m	2	2.13	1.22		5.1972	
	toilet	sq.m	6	0.99	1.22		7.2468	
	tank room	sq.m	1	1.22	1.22		1.4884	
	passage	sq.m	1	1.68	1.22		2.0496	
		sq.m	2	1.64	4.11		13.4808	
	deduction							
	door							
	D	sq.m	-2	1	0.23		-0.46	
	D1	sq.m	-3	0.91	0.23		-0.6279	
	D2	sq.m	-6	0.76	0.23		-1.0488	
11	**Terrace tiles**	sq.m	1	5.94	7.01	-	41.6394	**41.6394**
12	**Skirting**							
	Rooms	r.m	1	86.58	-	-	86.58	
	deduction							
	doors							
	D	r.m	-2	1			-2	**77.29**
	D1	r.m	-3	0.91			-2.73	
	D2	r.m	-6	0.76			-4.56	
13	**RCC (1:2:4)**							
	RCC slab (10cm thick)	cu.m	1	6.4	7.47	0.1	4.7808	
	RCC Lintel	cu.m	1	58.82	0.23	0.1	1.35286	
	RCC chajjas (10cm thick)							
	Above ramp	cu.m	2	1.96	0.45	0.1	0.1764	**7.16926**
	RCC Stairs	cu.m	1	1.22	0.6	0.4	0.2928	
	deduction	cu.m	-2	1.22	0.3	0.2	-0.1464	
	RCC ramp	cu.m	2	1.2	0.99	0.6	0.7128	
14	**Paint**							
	external paint							
	bath	sq.m	2	2.13	1.22		5.1972	
	handicap toilet	sq.m	2	2.13	1.22		5.1972	
	toilet	sq.m	6	0.99	1.22		7.2468	**34.66**
	tank room	sq.m	1	1.22	1.22		1.4884	
	passage	sq.m	1	1.68	1.22		2.0496	
		sq.m	2	1.64	4.11		13.4808	

	internal paint							
	bath	sq.m	4	2.13		2.9	24.708	
		sq.m	4	1.22		2.9	14.152	
	deduction							
	door	sq.m	-2	0.91		2.1	-3.822	
		sq.m						
	handicap toilet	sq.m	4	2.13		2.9	24.708	
		sq.m	4	1.22		2.9	14.152	
	toilet	sq.m	12	0.99		2.9	34.452	
		sq.m	12	1.22		2.9	42.456	
	deduction							**237.684**
	doors							
	D2	sq.m	-6	0.76		2.1	-9.576	
		sq.m						
	tank room	sq.m	4	1.22		2.9	14.152	
	passage	sq.m	2	4.11		2.9	23.838	
		sq.m	2	1.14		2.9	6.612	
		sq.m	2	1.68		2.9	9.744	
		sq.m	2	3.66		2.9	21.228	
		sq.m	10	0.72		2.9	20.88	
	slab bottom							
	bath	sq.m	2	2.13	1.22		5.1972	
	handicap toilet	sq.m	2	2.13	1.22		5.1972	
	toilet	sq.m	6	0.99	1.22		7.2468	**34.66**
	tank room	sq.m	1	1.22	1.22		1.4884	
	passage	sq.m	1	1.68	1.22		2.0496	
		sq.m	2	1.64	4.11		13.4808	
15	**Earth Filling in Plinth**							
	bath	sq.m	2	2.13	1.22	0.5	2.5986	
	handicap toilet	sq.m	2	2.13	1.22	0.5	2.5986	
	toilet	sq.m	6	0.99	1.22	0.5	3.6234	**17.33**
	tank room	sq.m	1	1.22	1.22	0.5	0.7442	
	passage	sq.m	1	1.68	1.22	0.5	1.0248	
		sq.m	2	1.64	4.11	0.5	6.7404	

Table 8.3 Quantity Sheet of Public Bath & Toilet

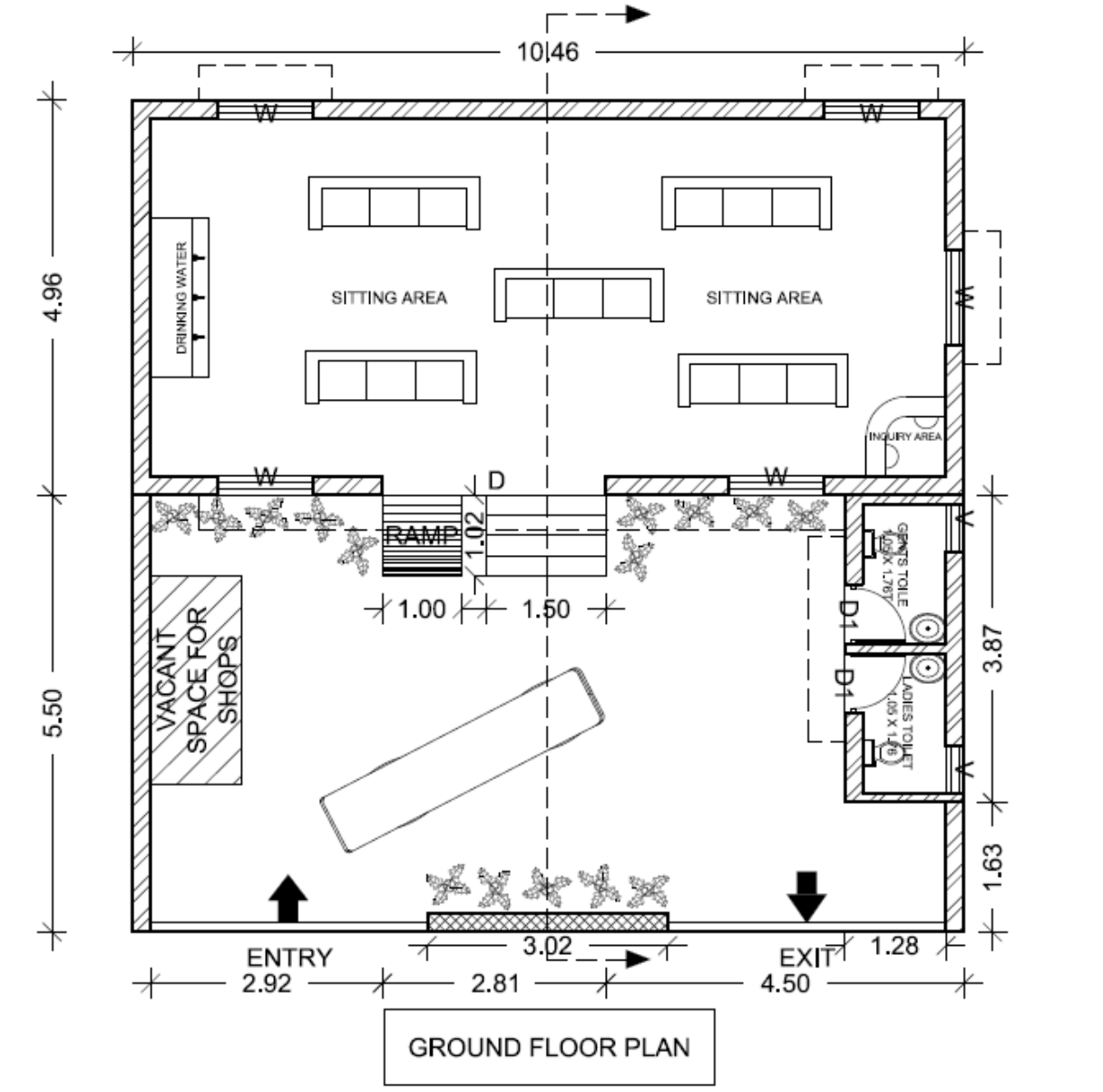
ABSTRACT SHEET FOR BATH & TOILET					
SR NO.	**DESCRIPTION**	**QUANTITY**	**RATE**	**UNIT**	**AMOUNT RS.**
1	Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(B) Dense or Hard soil	61.1744	85.9	cu.m	**5254.88096**
2	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- Graded brick bat aggregate 40mm normal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton)	17.4784	2157	cu.m	**37700.9088**
3	Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:5. (1- Cement : 5 -fine sand)(C) Fly Ash Bricks (upto 10 ton)	36.31	3344	cu.m	**121420.64**
4	Brick work in super strucrture in cement mortar	44.21635	3500	cu.m	**154757.225**
5	Providing and laying damp proof course 25mm thick cement concrete 1:2:4 (1- Cement : 2 coarse sand : 4 stone aggregate 10 mm nominal size) and curing complete (upto 10 ton)	15.774	159	sq.m	**2508.066**
6	20mm thick sand faced cement plaster on walls upto height 10 metres above ground level consisting of 12mm thick backing coat of C.M. 1:3 (1-cement : 3-sand) and 8mm thick finishing coat of C.M. 1:1 (1-cement : 1-sand) etc. complete.	147.8481	205	sq.m	**30308.8605**
7	Providing 20mm thick cement plaster in single coat on single or half brick walls for interior plastering upto floor two level and finished even and smooth in (i) Cement mortar 1:3 (1-cement:3-sand)	237.684	150	sq.m	**35652.6**
8	Providing 10mm thick cement plaster in single coat on brick/concrete walls for interior plastering upto floor two level and finished even and smooth in (i)Cement mortar 1:3 (1-cement:3-sand)	34.66	87.2	sq.m	**3022.352**

9	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6-crushed stone aggregates 20 mm nominal size) and curing complete including cost of formwork in (A) Wall Caps / Coping (more than 10 ton)	4.7808	2712	cu.m	**12965.5296**
10	Providing and laying Vitrified tiles 8 to 10mm thick , 24'' x 24'' in flooring treads ofsteps and landing laid on a bed of 12mmthick cement mortar 1:3 (1-cement : 3-coarse sand) finishing with flush pointing inwhite cement. (upto 10 ton)	32.5233	888	sq.m	**28880.6904**
11	Providing and laying chequered terrazo tiles 28mm thick with marble chips of sizes upto 6mm in treads of stairs and staircases in 12mm thick bed of lime mortar 1:1.5 (1- Lime putty :1.5 coarse sand) or C.M. 1:6 jointed with neat cement slurry mixed with pigment to match the shade of tiles including rubbing and polishing complete. (B) Dark shades using ordinary cement (upto 10 ton)	41.6394	467	sq.m	**19445.5998**
12	Providing and laying marble chips skirting (Terrazo) or dedo rubbed, and polished to Granolithic finish top layer 6mm thick with white,black or white and black marble chips of size from smallest to 4mm nominal size laid in cement marble powder mix 3:1 (3-Cement : 1 marble powder by weight) in proportion of 4:7 (4-cement marble powder mix : 7-marble chips by volume) 20mm thick with under layer 14mm thick cement plaster 1:3 (1-cement : 3-coarse sand) (A) Dark shade pigment with ordinary cement (In top layer only) (upto 10 ton)	77.29	386	sq.m	**29833.94**
13	Providing and laying controlled cement concrete 1:2:4 and exposed work with curing etc. complete including the cost of formwork and including the cost of reinforsement for R.C.Cwork in (iii) Slabs having more than 10 cm and upto 13 cm. thickness	7.16926	8800	cu.m	**63089.488**

14	Finishing wall with water proofing cement paint of on wall surfaces (Two coats) togive an approved brand and manufacture and of required shape even shade after thoroughly brushing the surface to remove all dirt and remains of loose powered materials.	34.66	36.1	sq.m	**1251.226**
15	Wall painting (two coats) with plastic emulsion paint of approved brand and manufacture on undecorated wall surface to give an even shade including thoroughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth.	272.344	49.6	sq.m	**13508.2624**
16	Filling available excavated earth (excluding rock) in trenches. plinth, sides of foundations etc. in layers not exceeding 20 cm. in depth consolidating each disposited layer by ramming and watering.	17.33	76.5	cu.m	**1325.745**
	TOTAL				**560926.0145**
17	Add 3% contigencies				**16827.78043**
18	Add 5% work charge establishment				**28046.30072**
19	Add 10% plumbing and sanitary works				**56092.60145**
20	Add 10% electrification charge				**56092.60145**
TOTAL ESTIMATED COST					**717985.2985**

Table 8.4 Abstract Sheet of Public Bath & Toilet

- **Design &Estimate of Public Bus-Stand**



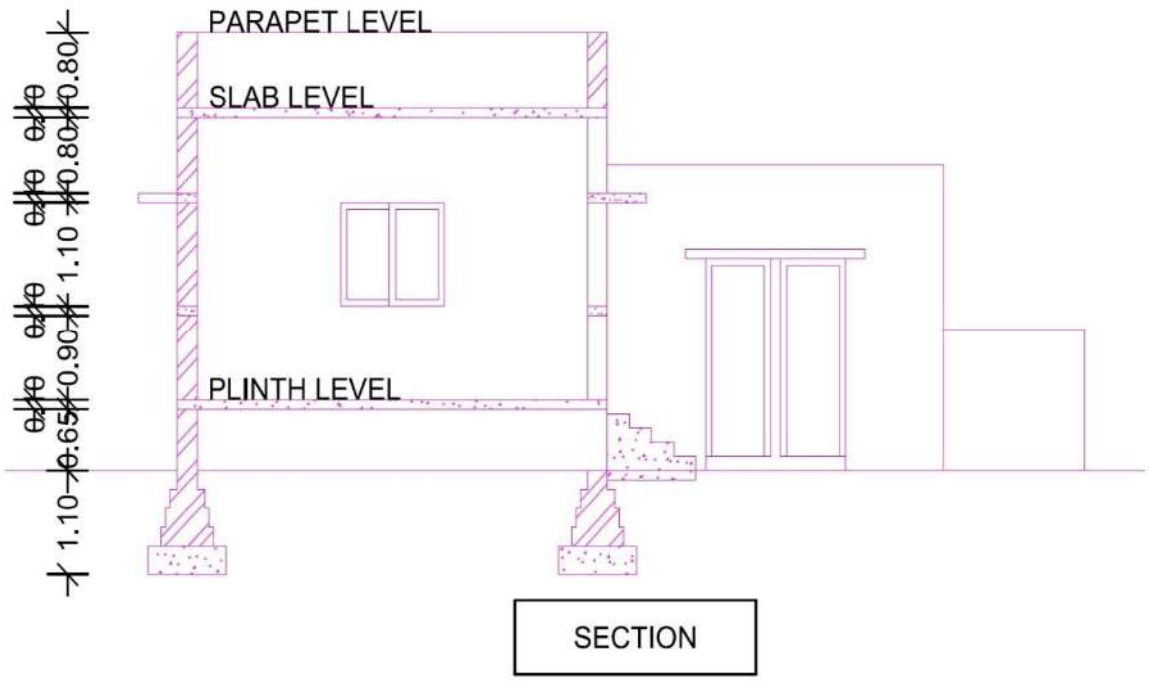


Fig8.3 3D of Public Bus-Stand

QUANTITY SHEET BUS-STAND (WAITING AREA BLOCK)								
SR. NO.	**DESCRIPTION**	**UNIT**	**NOS.**	**L**	**B**	**H**	**Total**	**Total Quantity**
1	**Excavation for foundation in ordinary soil**							
	L = ((10+0.23)*2+(4.5+0.23)*2)	cu.m	1	29.92	0.9	1.1	29.6208	**29.6208**
	NET CENTER LINE LENGTH (L) = 29.92							
2	**PCC (1:4:8)**							
	L = ((10+0.23)*2+(4.5+0.23)*2)	cu.m	1	29.92	0.9	0.3	8.0784	**8.0784**
	NET CENTER LINE LENGTH (L) = 29.92							
3	**Brick masonary in plinth and foundation**							
	1st footing							
	L = ((10+0.23)*2+(4.5+0.23)*2)	cu.m	1	29.92	0.6	0.2	3.5904	
	NET CENTER LINE LENGTH (L) = 29.92							
	2nd footing							
	L = ((10+0.23)*2+(4.5+0.23)*2)	cu.m	1	29.92	0.5	0.2	2.992	
	NET CENTER LINE LENGTH (L) = 29.92							**14.82536**
	3rd footing							
	L = ((10+0.23)*2+(4.5+0.23)*2)	cu.m	1	29.92	0.4	0.2	2.3936	
	NET CENTER LINE LENGTH (L) = 29.92							
	4th footing							
	L=((10+0.23)*2+(4.5+0.23)*2)	cu.m	1	29.92	0.23	0.85	5.84936	
	NET CENTER LINE LENGTH (L) = 29.92							
4	**Brick masonary in super stucture**							
	L = ((10+0.23)*2+(4.5+0.23)*2)	cu.m	1	29.92	0.23	3	20.6448	
	NET CENTER LINE LENGTH (L) = 29.92							**23.13685**
	parapet long wall	cu.m	2	10.46	0.23	0.8	3.84928	

	parapet short wall	cu.m	2	4.5	0.23	0.8	1.656	
	deduction							
	doors	cu.m	-1	2.81	0.23	2.1	-1.35723	
	windows	cu.m	-5	1.2	0.23	1.2	-1.656	
5	**DPC**							
	L = ((10+0.23)*2+(4.5+0.23)*2)	sq.m	1	29.92	0.23	-	6.8816	**6.2353**
	NET CENTER LINE LENGTH (L) = 29.92							
	deduction							
	doors	sq.m	-1	2.81	0.23	-	-0.6463	
6	**20mm thick 1:3 External sand faced plaster**							
	Long wall	sq.m	2	10.46	-	4.65	97.278	
	Short wall	sq.m	2	4.96	-	4.65	46.128	
	Terrace parapet wall	sq.m	2	10	-	0.8	16	**153.505**
		sq.m	2	4.5	-	0.8	7.2	
	deduction							
	doors	sq.m	-1	2.81	-	2.1	-5.901	
	windows	sq.m	-5	1.2	-	1.2	-7.2	
7	**20mm thick 1:3 Internal smooth plaster**							
	Long wall	sq.m	2	10	-	2.9	58	**84.1**
	Short wall	sq.m	2	4.5	-	2.9	26.1	
8	**10mm thick 1:3 plaster on slab**	sq.m	1	10	4.5	-	45	**45**
9	**PCC (1:3:6) below floors**	cu.m	1	10.46	4.5	0.1	4.707	**4.86**
	PCC (1:3:6) below stairs	cu.m	1	1.5	1.02	0.1	0.153	
10	**Vitrified tiles in flooring**							
	Room	sq.m	1	10	4.5	-	45	**45.6463**
	doors	sq.m	1	2.81	0.23		0.6463	
11	**Terrace tiles**	sq.m	1	10	4.5	-	45	**45**
12	**Skirting**							
	Room	r.m	1	29	-	-	29	**26.19**
	deduction							
	doors	r.m	-1	2.81	-	-	-2.81	
13	**RCC (1:2:4)**							
	RCC slab (10cm thick)	cu.m	1	10.46	4.5	0.1	4.707	
	RCC Lintel	cu.m	1	30.84	0.23	0.1	0.70932	**7.31037**
	RCC chajjas (10cm thick)							

	Above doors and windows	cu.m	1	8.11	0.45	0.1	0.36495	
	Above windows	cu.m	3	1.66	0.45	0.1	0.2241	
	RCC Stairs	cu.m	1	1.5	1.02	0.75	1.1475	
	deduction	cu.m	-4	1.5	0.25	0.15	-0.225	
	RCC RAMP	cu.m	1	1.02	1	0.75	0.3825	
14	**Paint**							
	Internal	sq.m	1	29		2.9	84.1	
	deduction							
	doors	sq.m	-1	2.81		2.1	-5.901	
	windows	sq.m	-5	1.2		1.2	-7.2	**246.304**
	External	sq.m	1	30.84		4.65	143.406	
	deduction							
	doors	sq.m	-1	2.81		2.1	-5.901	
	windows	sq.m	-5	1.2		1.2	-7.2	
	slab bottom	sq.m	1	10	4.5		45	
15	**Earth Filling in Plinth**	cu.m	1	10	4.5	0.65	29.25	
	door	cum	1	2.81	0.23	0.65	0.420095	**29.670095**

QUANTITY SHEET BUS-STAND (TOILET BLOCK)								
SR. NO.	**DESCRIPTION OF ITEMS**	**UNIT**	**NOS.**	**L**	**B**	**H**	**Total**	**Total Quantity**
1	**Excavation for foundation in ordinary soil**							
	L = ((1.76+0.12)*4+(1.05+0.23)*3)	cu.m	1	10.61	0.75	0.9	7.16175	7.16175
	TOTAL CENTER LINE LENGTH (L) = 11.36							
	NET CENTER LINE LENGTH (L) = 10.61							
2	**PCC (1:4:8)**							
	L = ((1.76+0.12)*4+(1.05+0.23)*3)	cu.m	1	10.61	0.75	0.3	2.38725	2.38725
	NET CENTER LINE LENGTH (L) = 10.61							
3	**Brick masonary in plinth and foundation**							
	1st footing							2.97542
	L =	cu.m	1	10.91	0.45	0.2	0.9819	

	((1.76+0.12)*4+(1.05+0.23)*3)							
	NET CENTER LINE LENGTH (L) = 10.91							
	2nd footing							
	L = ((1.76+0.12)*4+(1.05+0.23)*3)	cu.m	1	10.96	0.4	0.2	0.8768	
	NET CENTER LINE LENGTH (L) = 10.96							
	3rd footing							
	L = ((1.76+0.12)*4+(1.05+0.23)*3)	cu.m	1	11.1	0.26	0.2	0.5772	
	NET CENTER LINE LENGTH (L) = 11.10							
	4th footing							
	L = ((1.76+0.12)*4+(1.05+0.23)*3)	cu.m	1	11.24	0.12	0.4	0.53952	
	NET CENTER LINE LENGTH (L) = 11.24							
4	**Brick masonary in super stucture**							
	LONG WALL	cu.m	2	3.64	0.23	3	5.0232	
	SHORT WALL	cu.m	3	1.51	0.12	3	1.6308	
	parapet long wall	cu.m	2	3.64	0.23	0.8	1.33952	7.39334
	parapet short wall	cu.m	2	1.51	0.12	0.8	0.28992	
	deduction							
	doors	cu.m	-2	0.75	0.23	2.1	-0.7245	
	VENTILATION	cu.m	-2	0.6	0.23	0.6	-0.1656	
6	**20mm thick 1:4 External sand faced plaster**							
	Long wall	sq.m	2	3.64	-	2.45	17.836	
	Short wall	sq.m	2	1.51	-	2.45	7.399	
	Terrace parapet wall	sq.m	2	3.64	-	0.8	5.824	29.605
		sq.m	2	1.51	-	0.8	2.416	
	deduction							
	doors	sq.m	-2	0.75	-	2.1	-3.15	
	VENTILATION	sq.m	-2	0.6	-	0.6	-0.72	
7	**12mm thick 1:4 Internal smooth plaster**							33.292
	Long wall	sq.m	2	3.64	-	2.9	21.112	

	Short wall	sq.m	4	1.05	-	2.9	12.18	
8	**6mm thick 1:4 plaster on slab**	sq.m	1	1.05	3.64	-	3.822	3.822
9	**PCC (1:3:6) below floors**	cu.m	1	1.51	3.87	0.1	0.58437	0.58437
10	**Vitrified tiles in flooring**							
	Room	sq.m	2	1.05	1.76		3.696	4.041
	doors	sq.m	2	0.75	0.23		0.345	
11	**Skirting**							
	Room	r.m	2	5.62	-	-	11.24	9.74
	deduction							
	doors	r.m	-2	0.75	-	-	-1.5	
12	**RCC (1:1.5:3)**							
	RCC slab (10cm thick)	cu.m	1	1.51	3.87	0.1	0.58437	
	RCC Lintel	cu.m	1	3.87	0.23	0.1	0.08901	
	RCC chajjas (10cm thick)							0.78948
	Above doors	cu.m	1	2.58	0.45	0.1	0.1161	
13	**Paint**							
	Internal	sq.m	2	3.696		2.9	21.4368	
	deduction							
	doors	sq.m	-2	0.75		2.1	-3.15	
	VENTILATION	sq.m	-2	0.6		0.6	-0.72	116.5428
	External	sq.m	1	30.84		3.25	100.23	
	deduction							
	doors	sq.m	-2	0.75		2.1	-3.15	
	VENTILATION	sq.m	-5	0.6		0.6	-1.8	
	slab bottom	sq.m	2	1.05	1.76		3.696	

QUANTITY SHEET BUS-STAND (COMPOUND WALL)								
SR NO.	**DESCRIPTION**	**UNITS**	**NOS.**	**L**	**B**	**H**	**TOTAL**	**TOTAL QUANTITY**
1	**EXCAVATION**							
	LONG WALL	CUM	1	5.5	0.46	0.43	1.0879	1.410314
	SHORT WALL	CUM	1	1.63	0.46	0.43	0.322414	
2	**BRICK MASONARY IN COMPOUND WALL**							
	LONG WALL	CUM	1	5.5	0.23	1.5	1.8975	2.45985
	SHORT WALL	CUM	1	1.63	0.23	1.5	0.56235	
3	**PLASTER**	SQM	2	7.13		1.5	21.39	21.39

5	**PLASTER ON TOP**							
	LONG WALL	CUM	1	5.5	0.23		1.265	1.6399
	SHORT WALL	CUM	1	1.63	0.23		0.3749	
6	**PLASTER ON FRONT**							
	LONG WALL	CUM	1	5.5	1.5		8.25	10.695
	SHORT WALL	CUM	1	1.63	1.5		2.445	

Table 8.5Quantity Sheet of Public Bus-Stand

ABSTRACT SHEET FOR BUS-STAND (WAITING AREA BLOCK)					
SR NO.	**DESCRIPTION**	**QUANTITY**	**RATE**	**UNIT**	**AMOUNT RS.**
1	Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(B) Dense or Hard soil	29.6208	85.9	cu.m	2544.42672
2	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- Graded brick bat aggregate 40mm normal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton)	8.0784	2157	cu.m	17425.1088
3	Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:5. (1- Cement : 5 -fine sand)(C) Fly Ash Bricks (upto 10 ton)	14.82536	3344	cu.m	49576.00384
4	Brick work in super strucrture in cement mortar	23.13685	3500	cu.m	80978.975
5	Providing and laying damp proof course 25mm thick cement concrete 1:2:4 (1- Cement : 2 coarse sand : 4 stone aggregate 10 mm nominal size) and curing complete (upto 10 ton)	6.2353	159	sq.m	991.4127
6	20mm thick sand faced cement plaster on walls upto height 10 metres above ground level consisting of 12mm thick backing coat of C.M. 1:3 (1-cement : 3-sand) and 8mm thick finishing coat of C.M. 1:1 (1-cement : 1-sand) etc. complete.	153.505	205	sq.m	31468.525

7	Providing 20mm thick cement plaster in single coat on single or half brick walls for interior plastering upto floor two level and finished even and smooth in (i) Cement mortar 1:3 (1-cement:3-sand)	84.1	150	sq.m	12615
8	Providing 10mm thick cement plaster in single coat on brick/concrete walls for interior plastering upto floor two level and finished even and smooth in (i)Cement mortar 1:3 (1-cement:3-sand)	45	87.2	sq.m	3924
9	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6-crushed stone aggregates 20 mm nominal size) and curing complete including cost of formwork in (A) Wall Caps / Coping (more than 10 ton)	4.86	2712	cu.m	13180.32
10	Providing and laying Vitrified tiles 8 to 10 mm thick , 24'' x 24'' in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3- coarse sand) finishing with flush pointing in white cement. (upto 10 ton)	45.6463	888	sq.m	40533.9144
11	Providing and laying chequered terrazo tiles 28mm thick with marble chips of sizes upto 6mm in treads of stairs and staircases in 12mm thick bed of lime mortar 1:1.5 (1- Lime putty :1.5 coarse sand) or C.M. 1:6 jointed with neat cement slurry mixed with pigment to match the shade of tiles including rubbing and polishing complete. (B) Dark shades using ordinary cement (upto 10 ton)	45	467	sq.m	21015

12	Providing and laying marble chips skirting (Terrazo) or dedo rubbed, and polished to Granolithic finish top layer 6mm thick with white,black or white and black marble chips of size from smallest to 4mm nominal size laid in cement marble powder mix 3:1 (3-Cement : 1 marble powder by weight) in proportion of 4:7 (4-cement marble powder mix : 7-marble chips by volume) 20mm thick with under layer 14mm thick cement plaster 1:3 (1-cement : 3-coarse sand) (A) Dark shade pigment with ordinary cement (In top layer only) (upto 10 ton)	26.19	386	sq.m	10109.34
13	Providing and laying controlled cement concrete 1:2:4 and exposed work with curing etc. complete including the cost of formwork and including the cost of reinforsement for R.C.Cwork in (iii) Slabs having more than 10 cm and upto 13 cm. thickness	7.31037	8800	cu.m	64331.256
14	Finishing wall with water proofing cement paint of on wall surfaces (Two coats) to give an approved brand and manufacture and of required shape even shade after thoroughly brushing the surface to remove all dirt and remains of loose powered materials.	70.999	36.1	sq.m	2563.0639
15	Wall painting (two coats) with plastic emulsion paint of approved brand and manufacture on undecorated wall surface to give an even shade including thoroughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth.	175.305	49.6	sq.m	8695.128
16	Filling available excavated earth (excluding rock) in trenches. plinth, sides of foundations etc. in layers not exceeding 20 cm. in depth consolidating each disposited layer by ramming and watering.	29.670095	76.5	cu.m	2269.762268

ABSTRACT SHEET FOR BUS-STAND (TOILET BLOCK)					
SR NO.	**DESCRIPTION**	**QUANTITY**	**RATE**	**UNIT**	**AMOUNT RS.**
1	Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(B) Dense or Hard soil	7.16175	85.9	cu.m	615.194325
2	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- Graded brick bat aggregate 40mm normal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton)	2.38725	2157	cu.m	5149.29825
3	Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:5. (1- Cement : 5 -fine sand)(C) Fly Ash Bricks (upto 10 ton)	2.97542	3344	cu.m	9949.80448
4	Brick work in super strucrture in cement mortar	7.39334	3500	cu.m	25876.69
5	20mm thick sand faced cement plaster on walls upto height 10 metres above ground level consisting of 12mm thick backing coat of C.M. 1:3 (1- cement : 3- sand) and 8mm thick finishing coat ofC.M. 1:1 (1- cement : 1-sand) etc. complete.	29.605	205	sq.m	6069.025
6	Providing 20mm thick cement plaster in single coat on single or half brick walls for interior plastering upto floor two level and finished even and smooth in (i) Cement mortar 1:3 (1-cement:3-sand)	33.292	150	sq.m	4993.8
7	Providing 10mm thick cement plaster in single coat on brick/concrete walls for interior plastering upto floor two level and finished even and smooth in (i)Cement mortar 1:3 (1-	3.822	87.2	sq.m	333.2784

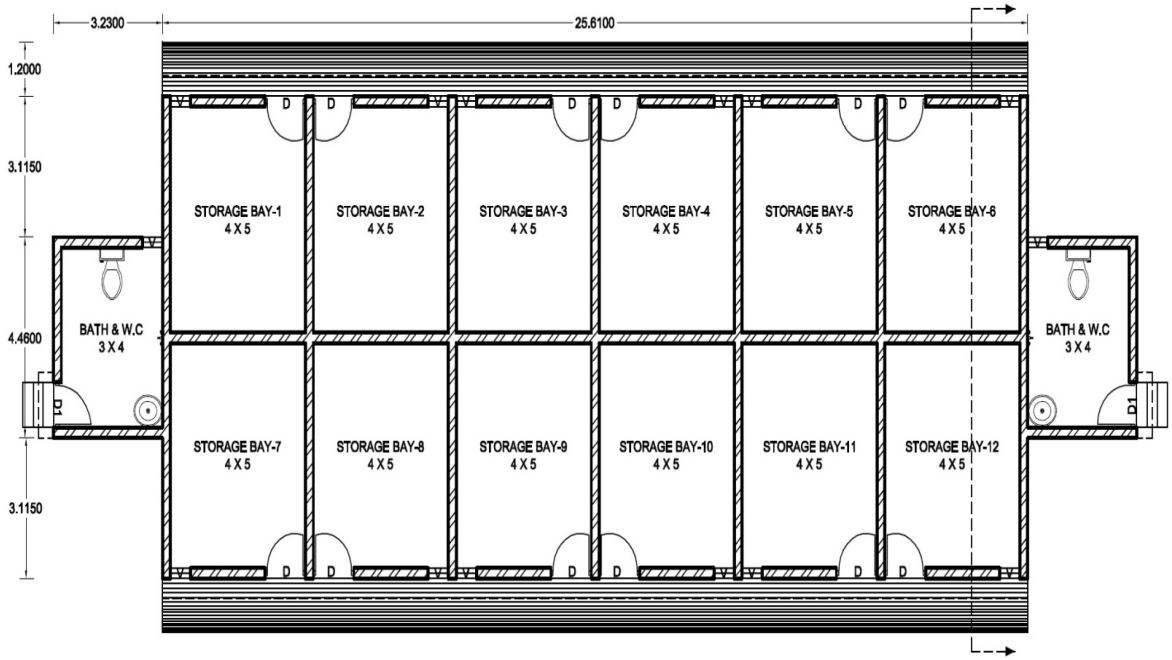
	cement:3-sand)				
8	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- crushed stone aggregates 20 mm nominal size) and curing complete including cost of formwork in (A) Wall Caps / Coping (more than 10 ton)	0.58437	2712	cu.m	1584.81144
9	Providing and laying Vitrified tiles 8 to 10 mm thick , 24'' x 24'' in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3- coarse sand) finishing with flush pointing in white cement. (upto 10 ton)	4.041	888	sq.m	3588.408
10	Providing and laying marble chips skirting (Terrazo) or dedo rubbed, and polished to Granolithic finish top layer 6mm thick with white,black or white and black marble chips of size from smallest to 4mm nominal size laid in cement marble powder mix 3:1 (3- Cement : 1 marble powder by weight) in proportion of 4:7 (4-cement marble powder mix : 7-marble chips by volume) 20mm thick with under layer 14mm thick cement plaster 1:3 (1-cement : 3-coarse sand) (A) Dark shade pigment with ordinary cement (In top layer only) (upto 10 ton)	9.74	386	sq.m	3759.64
11	Providing and laying controlled cement concrete 1:2:4 and exposed work with curing etc. complete including the cost of formwork and including the cost of reinforcement for R.C.Cwork in (iii) Slabs having more than 10 cm and upto 13 cm. thickness	0.78948	8800	cu.m	6947.424
12	Finishing wall with water proofing cement paint of on wall surfaces (Two coats) to give an approved brand and manufacture and of required shape even shade after thoroughly brushing the surface	95.28	36.1	sq.m	3439.608

	to remove all dirt and remains of loose powered materials.				
13	Wall painting (two coats) with plastic emulsion paint of approved brand and manufacture on undecorated wall surface to give an even shade including thoroughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth.	21.2628	49.6	sq.m	1054.63488

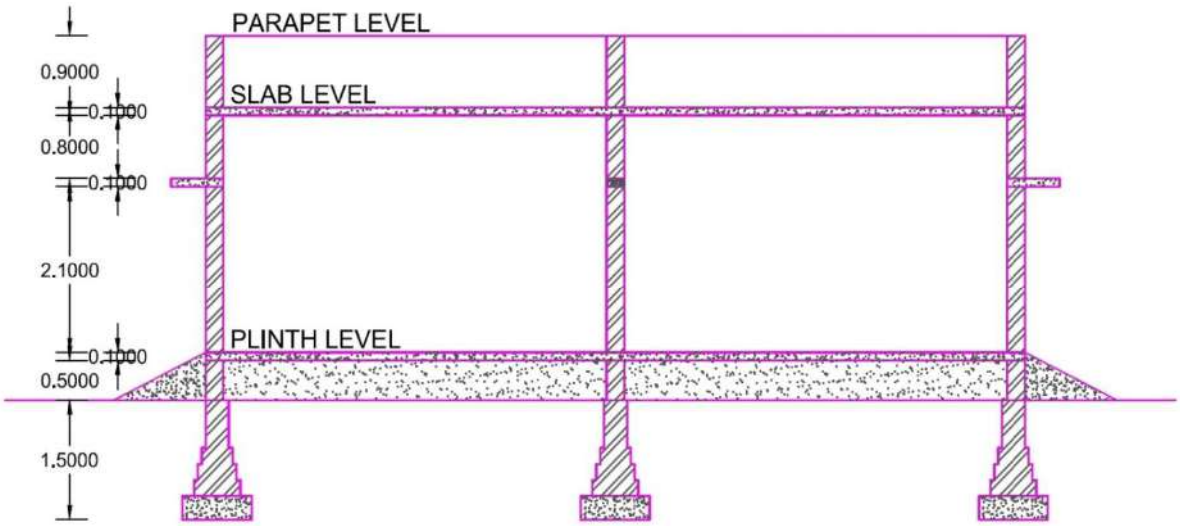
ABSTRACT SHEET FOR BUS-STAND (COMPOUND WALL)					
SR NO.	**DESCRIPTION**	**QUANTITY**	**RATE**	**UNIT**	**AMOUNT RS.**
1	Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(B) Dense or Hard soil	1.410314	85.9	cu.m	121.1459726
2	Brick work in super strucrture in cement mortar	2.45985	3500	cu.m	8609.475
3	20mm thick sand faced cement plaster on walls upto height 10 metres above ground level consisting of 12mm thick backing coat of C.M. 1:3 (1-cement : 3-sand) and 8mm thick finishing coat of C.M. 1:1 (1-cement : 1-sand) etc. complete.	33.7249	205	sq.m	6913.6045
	TOTAL				**451227.0789**
1	Add 3% contigencies				13536.81237
2	Add 5% work charge establishment				22561.35394
3	Add 10% plumbing and sanitary works				45122.70789
4	Add 10% electrification charge				45122.70789
TOTAL ESTIMATED COST					**577570.661**

Table 8.6 Abstract Sheet of Public Bus-Stand

- **Design & Estimate of Public Storage Building**



GROUND FLOOR PLAN



SECTION

Fig8.4 3D of Public Storage Building

QUANTITY SHEET FOR STORAGE BUILDING								
SR. NO.	**DESCRIPTION**	**UNIT**	**NOS.**	**L**	**B**	**H**	**Total**	**Total Quantity**
1	**Excavation for foundation in ordinary soil**							**214.704**
	L = (12.46*3)+(25.38*3)+(10.69*2) =170.74	cu.m	1	159.04	0.9	1.5	214.704	
	NET CENTER LINE LENGTH (L) = 159.04							
2	**PCC (1:4:8)**							**42.9408**
	L = (12.46*3)+(25.38*3)+(10.69*2) =170.74	cu.m	1	159.04	0.9	0.3	42.9408	
	NET CENTER LINE LENGTH (L) = 159.04							
3	**Brick masonary in plinth and foundation**							**109.2824**
	1st footing							

	L = (12.46*3)+(25.38*3)+(10.69*2) =170.74	cu.m	1	162.94	0.6	0.2	19.5528	
	NET CENTER LINE LENGTH (L) = 162.94							
	2nd footing							
	L = (12.46*3)+(25.38*3)+(10.69*2) =170.74	cu.m	1	164.24	0.5	0.2	16.424	
	NET CENTER LINE LENGTH (L) = 164.24							
	3rd footing							
	L = (12.46*3)+(25.38*3)+(10.69*2) =170.74	cu.m	1	165.54	0.4	0.2	13.2432	
	NET CENTER LINE LENGTH (L) = 165.54							
	4rd footing							
	L = (12.46*3)+(25.38*3)+(10.69*2) =170.74	cu.m	1	166.84	0.3	1.2	60.0624	
	NET CENTER LINE LENGTH (L) = 166.84							
4	**Brick masonary in super stucture**							
	L = (12.46*3)+(25.38*3)+(10.69*2) =170.74	cu.m	1	167.75	0.23	3	115.7475	
	NET CENTER LINE LENGTH (L) = 165.54							
	parapet long wall	cu.m	2	25.61	0.23	0.9	10.60254	
	parapet short wall	cu.m	2	17.15	0.23	0.9	7.1001	**124.36974**
	deduction							
	doors							
	D	cu.m	-12	1.2	0.23	2.1	-6.9552	
	D1	cu.m	-2	1	0.23	2.1	-0.966	
	ventilation	cu.m	-14	0.6	0.23	0.6	-1.1592	
5	**DPC**							
	L = (12.46*3)+(25.38*3)+(10.69*2) =170.74	sq.m	1	166.84	0.3	-	50.052	**45.132**

	NET CENTER LINE LENGTH (L) = 166.84							
	deduction							
	doors							
	D	cu.m	-12	1.2	0.3		-4.32	
	D1	cu.m	-2	1	0.3		-0.6	
6	**20mm thick 1:3 External sand faced plaster**							
	Long wall	sq.m	2	25.61	-	4.83	247.3926	**448.8936**
	Short wall	sq.m	2	17.15	-	4.83	165.669	
	Terrace parapet wall	sq.m	2	25.15	-	0.9	45.27	
		sq.m	2	16.69	-	0.9	30.042	
	deduction							
	doors	sq.m	-12	1.2	-	2.1	-30.24	
		sq.m	-2	1		2.1	-4.2	
	ventilation	sq.m	-14	0.6	-	0.6	-5.04	
7	**20mm thick 1:3 Internal smooth plaster**							
	Storage Bay	sq.m	12	8		2.9	278.4	**707.6**
		sq.m	12	10		2.9	348	
	Bath & W.C.	sq.m	2	6		2.9	34.8	
		sq.m	2	8		2.9	46.4	
8	**10mm thick 1:3 plaster on slab**							
	Storage Bay	sq.m	12	4	5		240	**264**
	Bath & W.C.	sq.m	2	3	4		24	
9	**PCC (1:3:6) below floors**	cu.m	1	25.61	17.15	0.1	43.92115	**43.92115**
10	**Vitrified tiles in flooring**							
	Storage Bay	sq.m	12	4	5		240	
	Bath & W.C.	sq.m	2	3	4		24	
	deduction							**260.228**
	door							
	D	sq.m	-12	1.2	0.23		-3.312	
	D1	sq.m	-2	1	0.23		-0.46	
11	**Terrace tiles**	sq.m	1	25.15	16.69	-	419.7535	**419.7535**
12	**Skirting**							
	Rooms	r.m	1	244	-	-	244	**227.6**
	deduction							
	doors							

	D	r.m	-12	1.2			-14.4	
	D1	r.m	-2	1			-2	
13	**RCC (1:2:4)**							
	RCC slab (10cm thick)	cu.m	1	302.58			302.58	
	RCC Lintel	cu.m	1	170.28	0.23	0.1	3.91644	
	RCC chajjas (10cm thick)							
	Above storage bay	cu.m	2	25.61	0.45	0.1	2.3049	**328.27194**
	Above bath & WC	cu.m	2	1.46	0.45	0.1	0.1314	
	RCC Stairs	cu.m	2	1	0.6	0.9	1.08	
	deduction	cu.m	-6	1	0.15	0.2	-0.18	
	RCC ramp	cu.m	2	25.61	1.2	0.6	18.4392	
14	**Paint**							
	external paint							
	Long wall	sq.m	2	25.61	-	4.83	247.3926	
	Short wall	sq.m	2	17.15	-	4.83	165.669	
	Terrace parapet wall	sq.m	2	25.15	-	0.9	45.27	**448.8936**
		sq.m	2	16.69	-	0.9	30.042	
	deduction							
	doors	sq.m	-12	1.2	-	2.1	-30.24	
		sq.m	-2	1		2.1	-4.2	
	ventilation	sq.m	-14	0.6	-	0.6	-5.04	
	internal paint							
	Storage Bay	sq.m	12	8		2.9	278.4	
		sq.m	12	10		2.9	348	**707.6**
	Bath & W.C.	sq.m	2	6		2.9	34.8	
		sq.m	2	8		2.9	46.4	
	slab bottom							
	Storage Bay	sq.m	12	4	5		240	**264**
	Bath & W.C.	sq.m	2	3	4		24	
15	**Earth Filling in Plinth**							
	Storage Bay	sq.m	12	4	5	0.5	120	**132**
	Bath & W.C.	sq.m	2	3	4	0.5	12	

Table 8.7 Quantity Sheet of Public Storage Building

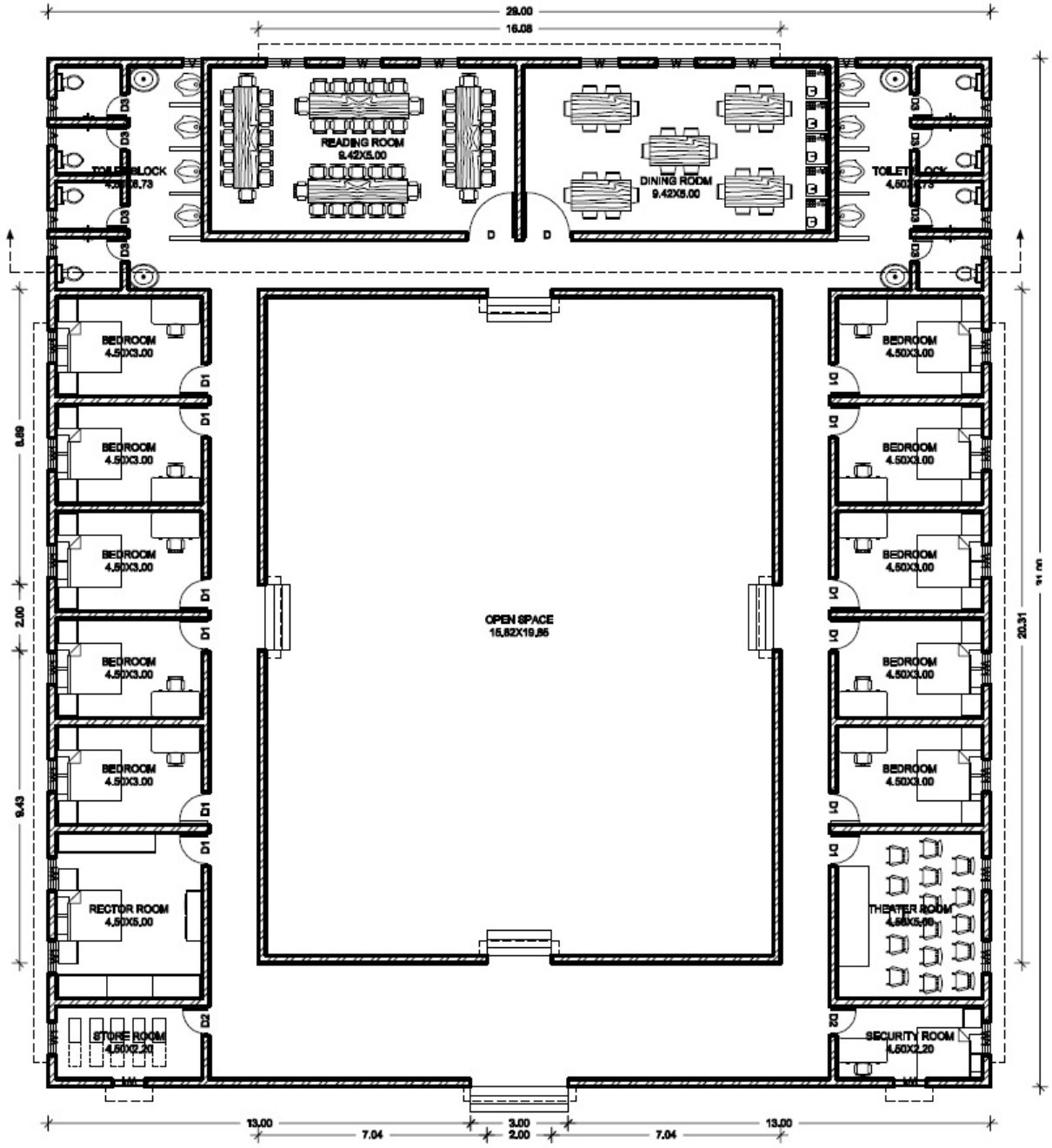
ABSTRACT SHEET FOR STORAGE BUILDING					
SR NO.	**DESCRIPTION**	**QUANTITY**	**RATE**	**UNIT**	**AMOUNT RS.**
1	Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(B) Dense or Hard soil	214.704	85.9	cu.m	**18443.0736**
2	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- Graded brick bat aggregate 40mm normal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton)	42.9408	2157	cu.m	**92623.3056**
3	Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:5. (1- Cement : 5 -fine sand)(C) Fly Ash Bricks (upto 10 ton)	109.2824	3344	cu.m	**365440.3456**
4	Brick work in super strucrture in cement mortar	124.36974	3500	cu.m	**435294.09**
5	Providing and laying damp proof course 25mm thick cement concrete 1:2:4 (1- Cement : 2 coarse sand : 4 stone aggregate 10 mm nominal size) and curing complete (upto 10 ton)	45.132	159	sq.m	**7175.988**
6	20mm thick sand faced cement plaster on walls upto height 10 metres above ground level consisting of 12mm thick backing coat of C.M. 1:3 (1-cement : 3-sand) and 8mm thick finishing coat of C.M. 1:1 (1-cement : 1-sand) etc. complete.	448.8936	205	sq.m	**92023.188**
7	Providing 20mm thick cement plaster in single coat on single or half brick walls for interior plastering upto floor two level and finished even and smooth in (i) Cement mortar 1:3 (1-cement:3-sand)	707.6	150	sq.m	**106140**

8	Providing 10mm thick cement plaster in single coat on brick/concrete walls for interior plastering upto floor two level and finished even and smooth in (i)Cement mortar 1:3 (1-cement:3-sand)	264	87.2	sq.m	**23020.8**
9	Providing and laying cement concrete 1:3:6 (1- Cement : 3-Coarse sand : 6- crushed stone aggregates 20 mm nominal size) and curing complete including cost of formwork in (A) Wall Caps / Coping (more than 10 ton)	43.92115	2712	cu.m	**119114.1588**
10	Providing and laying Vitrified tiles 8 to 10 mm thick , 24'' x 24'' in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3-coarse sand) finishing with flush pointing in white cement. (upto 10 ton)	260.228	888	sq.m	**231082.464**
11	Providing and laying chequered terrazo tiles 28mm thick with marble chips of sizes upto 6mm in treads of stairs and staircases in 12mm thick bed of lime mortar 1:1.5 (1- Lime putty :1.5 coarse sand) or C.M. 1:6 jointed with neat cement slurry mixed with pigment to match the shade of tiles including rubbing and polishing complete. (B) Dark shades using ordinary cement (upto 10 ton)	419.7535	467	sq.m	**196024.8845**
12	Providing and laying marble chips skirting (Terrazo) or dedo rubbed, and polished to Granolithic finish top layer 6mm thick with white,black or white and black marble chips of size from smallest to 4mm nominal size laid in cement marble powder mix 3:1 (3-Cement : 1 marble powder by weight) in proportion of 4:7 (4-cement marble powder mix : 7-marble chips by volume) 20mm	227.6	386	sq.m	**87853.6**

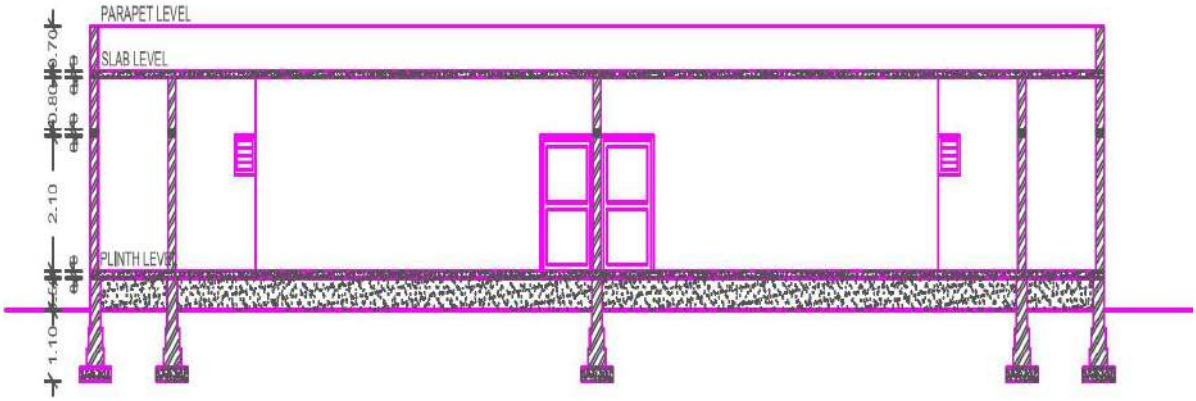
	thick with under layer 14mm thick cement plaster 1:3 (1-cement : 3-coarse sand) (A) Dark shade pigment with ordinary cement (In top layer only) (upto 10 ton)				
13	Providing and laying controlled cement concrete 1:2:4 and exposed work with curing etc. complete including the cost of formwork and including the cost of reinforsement for R.C.Cwork in (iii) Slabs having more than 10 cm and upto 13 cm. thickness	328.27194	8800	cu.m	**2888793.072**
14	Finishing wall with water proofing cement paint of on wall surfaces (Two coats) to give an approved brand and manufacture and of required shape even shade after thoroughly brushing the surface to remove all dirt and remains of loose powered materials.	448.8936	36.1	sq.m	**16205.05896**
15	Wall painting (two coats) with plastic emulsion paint of approved brand and manufacture on undecorated wall surface to give an even shade including thoroughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth.	971.6	49.6	sq.m	**48191.36**
16	Filling available excavated earth (excluding rock) in trenches. plinth, sides of foundations etc. in layers notexceeding 20 cm. in depth consolidatingeach disposited layer by ramming andwatering.	132	76.5	cu.m	**10098**
	TOTAL				**4737523.389**
17	Add 3% contigencies				**142125.7017**
18	Add 5% work charge establishment				**236876.1695**
19	Add 10% plumbing and sanitary works				**473752.3389**
20	Add 10% electrification charge				**473752.3389**
	TOTAL ESTIMATED COST				**6064029.938**

Table 8.8 Abstract Sheet of Public Storage Building

- **Design &Estimate of Public Hostel**



GROUND FLOOR PLAN



SECTION

Fig8.5 3D of Public Hostel

QUANTITY SHEET FOR HOSTEL								
SR. NO.	**DESCRIPTION OF ITEMS**	**UNIT**	**NOS.**	**L**	**W**	**H**	**TOTAL**	**TOTAL QUANTITY**
1	**EXCAVATION IN FOUNDATION**	cum	1	357.38	0.9	1.1	353.8062	353.8062
	L = (29-0.23)*5)+((4.5+0.23)*10)+((31+0.23)*4)+((6.73+0.23)*2)+((19.85+0.23)*2)+((5+0.23)*1)=375.38							
	NET C.L. LENGTH = 357.38							
2	**PCC IN FOUNDATION**	cum	1	357.38	0.9	0.2	64.3284	64.3284
	L = (29-0.23)*5)+((4.5+0.23)*10)+((31+0.23)*4)+((6.73+0.23)*2)+((19.85+0.23)*2)+((5+0.23)*1)=375.38							
	NET C.L. LENGTH = 357.38							
3	**BRICK MASOANARY IN FOUNDATION**							187.5438
	FIRST FOOTING	cum	1	365.38	0.5	0.3	54.807	
	L = (29-0.23)*5)+((4.5+0.23)*10)+((31+0.23)*4)+((6.73+0.23)*2)+((19.85+0.23)*2)+((5+0.23)*1)=375.38							
	NET C.L. LENGTH = 365.38							
	SECOND FOOTING	cum	1	367.38	0.4	0.3	44.0856	
	L = (29-0.23)*5)+((4.5+0.23)*10)+((31+0.23)*4)+((6.73+0.23)*2)+((19.85+0.23)*2)+((5+0.23)*1)=375.38							
	NET C.L. LENGTH = 367.38							
	THIRD FOOTING	cum	1	369.38	0.3	0.8	88.6512	
	L = (29-0.23)*5)+((4.5+0.23)*10)+((31+0.23)*4)+((6.73+0.23)*2)+((19.85+0.23)*2)+((5+0.23)*1)=375.38							
	NET C.L. LENGTH = 369.38							
4	**BRICK MASONARY IN SUPERSTRUCTURE**	cum	1	370.78	0.23	3	255.8382	261.50494

	L = (29-0.23)*5)+((4.5+0.23)*10)+((31+0.23)*4)+((6.73+0.23)*2)+((19.85+0.23)*2)+((5+0.23)*1)=375.38							
	NET C.L. LENGTH = 370.78							
	parapet long wall	cum	2	31	0.23	0.7	9.982	
		cum	2	20.31	0.23	0.7	6.53982	
	parapet short wall	cum	2	28.54	0.23	0.7	9.18988	
		cum	2	15.62	0.23	0.7	5.02964	
	deduction							
	D	cum	-2	1.5	0.23	2.1	-1.449	
	D1	cum	-12	1	0.23	2.1	-5.796	
	D2	cum	-2	0.9	0.23	2.1	-0.8694	
	D3	cum	-8	0.75	0.23	2.1	-2.898	
	windows							
	W	cum	-6	1.2	0.23	1.2	-1.9872	
	W1	cum	-18	1	0.23	1.2	-4.968	
	ventilations	cum	-10	0.6	0.23	0.6	-0.828	
	gap 1	cum	-1	3	0.23	2.1	-1.449	
	gap 2	cum	-4	2	0.23	2.1	-3.864	
	gap 3	cum	-2	1	0.23	2.1	-0.966	
5	**DPC**							
	L = (29-0.23)*5)+((4.5+0.23)*10)+((31+0.23)*4)+((6.73+0.23)*2)+((19.85+0.23)*2)+((5+0.23)*1)=375.38	sqm	1	369.38	0.3		110.814	
	NET C.L. LENGTH = 369.38							
	deduction							102.58
	D	sqm	-2	1.5	0.23		-0.69	
	D1	sqm	-12	1	0.23		-2.76	
	D2	sqm	-2	0.9	0.23		-0.414	
	D3	sqm	-8	0.75	0.23		-1.38	
	gap 1	sqm	-1	3	0.23		-0.69	
	gap 2	sqm	-4	2	0.23		-1.84	
	gap 3	sqm	-2	1	0.23		-0.46	
6	**20mm thick 1:3 External sand faced plaster**							
	Long wall 1	sqm	2	31	-	4.4	272.8	916.854
	Short wall 1	sqm	2	29	-	4.4	255.2	
	Long wall 2	sqm	2	19.85	-	4.4	174.68	
	Short wall 2	sqm	2	15.62	-	4.4	137.456	

	Terrace parapet wall outside	sqm	2	31	-	0.7	43.4	
		sqm	2	29	-	0.7	40.6	
	Terrace parapet wall inside	sqm	2	19.85	-	0.7	27.79	
		sqm	2	15.62	-	0.7	21.868	
	deduction							
	windows							
	W	sqm	-6	1.2	-	1.2	-8.64	
	W1	sqm	-18	1	-	1.2	-21.6	
	ventilation	sqm	-10	0.6	-	0.6	-3.6	
	Gap 1	sqm	-1	3	-	2.1	-6.3	
	Gap 2	sqm	-4	2	-	2.1	-16.8	
7	**20mm thick 1:3 Internal smooth plaster**							
	bedroom	sqm	20	4.5	-	2.9	261	
		sqm	20	3	-	2.9	174	
	rector room	sqm	2	4.5	-	2.9	26.1	
		sqm	2	5	-	2.9	29	
	theater room	sqm	2	4.5	-	2.9	26.1	
		sqm	2	5	-	2.9	29	
	security room	sqm	2	4.5	-	2.9	26.1	
		sqm	2	2.2	-	2.9	12.76	
	store room	sqm	2	4.5	-	2.9	26.1	
		sqm	2	2.2	-	2.9	12.76	
	reading room	sqm	2	9.42	-	2.9	54.636	
		sqm	2	5	-	2.9	29	
	dining room	sqm	2	9.42	-	2.9	54.636	
		sqm	2	5	-	2.9	29	1468.552
	toilet block	sqm	16	2	-	2.9	92.8	
		sqm	16	1.57	-	2.9	72.848	
	toilet passage	sqm	4	6.73	-	2.9	78.068	
		sqm	4	2.5	-	2.9	29	
	Lobby	sqm	2	23.81	-	2.9	138.098	
		sqm	2	19.08	-	2.9	110.664	
		sqm	2	20.31	-	2.9	117.798	
		sqm	2	16.08	-	2.9	93.264	
	deduction							
	D	sqm	-2	1.5	-	2.1	-6.3	
	D1	sqm	-12	1	-	2.1	-25.2	
	D2	sqm	-2	0.9	-	2.1	-3.78	
	D3	sqm	-8	0.75	-	2.1	-12.6	
	Gap 3	sqm	-2	1.5	-	2.1	-6.3	

8	**10mm thick 1:3 plaster on slab**							
	bedroom	sqm	10	4.5	3	-	135	
	rector room &theater room	sqm	2	4.5	5	-	45	
	store room & security room	sqm	2	4.5	2.2	-	19.8	
	dining room & reading room	sqm	2	9.42	5	-	94.2	510.9
	toilet block	sqm	2	4.5	6.73	-	60.57	
	passage	sqm	2	1.5	25.31	-	75.93	
		sqm	1	16.08	1.5	-	24.12	
		sqm	1	16.08	3.5	-	56.28	
9	**PCC (1:3:6) below floors**	cum	1	29	31	0.1	89.9	58.8943
	deduction	cum	-1	15.62	19.85	0.1	-31.0057	
10	**Vitrified tiles in flooring**							
	bedroom	sqm	10	4.5	3	-	135	
	rector room & theater room	sqm	2	4.5	5	-	45	
	store room & security room	sqm	2	4.5	2.2	-	19.8	
	dining room & reading room	sqm	2	9.42	5	-	94.2	
	toilet block	sqm	2	4.5	6.73	-	60.57	
	passage	sqm	2	1.5	25.31	-	75.93	505.656
		sqm	1	16.08	1.5	-	24.12	
		sqm	1	16.08	3.5	-	56.28	
	deduction							
	D	sqm	-2	1.5	0.23	-	-0.69	
	D1	sqm	-12	1	0.23	-	-2.76	
	D2	sqm	-2	0.9	0.23	-	-0.414	
	D3	sqm	-8	0.75	0.23	-	-1.38	
11	**Terrace tiles**							
		sqm	1	28.54	6.73	-	192.0742	
		sqm	2	6.23	23.81	-	296.6726	545.0268
		sqm	1	16.08	3.5	-	56.28	
12	**Skirting**							
	Rooms	rm	1	486.58	-	-	486.58	
	deduction							475.58
		sqm	-1	3	-	-	-3	
	Gap 2	sqm	-4	2	-	-	-8	
13	**RCC (1:2:4)**							
	RCC slab (10cm thick)	cum	1	29	31	0.1	89.9	73.35639
	deduction	cum	-1	15.62	19.85	0.1	-31.0057	

	RCC Lintel	cum	1	370.78	0.23	0.1	8.52794	
	RCC chajjas (10cm thick)							
		cum	2	22.31	0.45	0.1	2.0079	
		cum	1	16.03	0.45	0.1	0.72135	
		cum	1	3.46	0.45	0.1	0.1557	
		cum	4	2.46	0.45	0.1	0.4428	
		cum	2	1.46	0.45	0.1	0.1314	
	RCC Stairs							
	outside	cum	1	3	0.75	0.6	1.35	
	Inside	cum	4	2	0.75	0.6	3.6	
	deduction							
		cum	-6	3	0.25	0.15	-0.675	
			-24	2	0.25	0.15	-1.8	
14	**Paint**							
	external paint							
	Long wall 1	sqm	2	31	-	4.4	272.8	
	Short wall 1	sqm	2	29	-	4.4	255.2	
	Long wall 2	sqm	2	19.85	-	4.4	174.68	
	Short wall 2	sqm	2	15.62	-	4.4	137.456	
	Terrace parapet wall outside	sqm	2	31	-	0.7	43.4	
		sqm	2	29	-	0.7	40.6	
	Terrace parapet wall inside	sqm	2	19.85	-	0.7	27.79	916.854
		sqm	2	15.62	-	0.7	21.868	
	deduction							
	windows							
	W	sqm	-6	1.2	-	1.2	-8.64	
	W1	sqm	-18	1	-	1.2	-21.6	
	ventilation	sqm	-10	0.6	-	0.6	-3.6	
	Gap 1	sqm	-1	3	-	2.1	-6.3	
	Gap 2	sqm	-4	2	-	2.1	-16.8	
	internal paint							
	bedroom	sqm	20	4.5	-	2.9	261	
		sqm	20	3	-	2.9	174	
	rector room	sqm	2	4.5	-	2.9	26.1	
		sqm	2	5	-	2.9	29	1758.0907
	theater room	sqm	2	4.5	-	2.9	26.1	
		sqm	2	5	-	2.9	29	
	security room	sqm	2	4.5	-	2.9	26.1	
		sqm	2	2.2	-	2.9	12.76	
	store room	sqm	2	4.5	-	2.9	26.1	

		sqm	2	2.2	-	2.9	12.76	
	reading room	sqm	2	9.42	-	2.9	54.636	
		sqm	2	5	-	2.9	29	
	dining room	sqm	2	9.42	-	2.9	54.636	
		sqm	2	5	-	2.9	29	
	toilet block	sqm	16	2	-	2.9	92.8	
		sqm	16	1.57	-	2.9	72.848	
	toilet passage	sqm	4	6.73	-	2.9	78.068	
		sqm	4	2.5	-	2.9	29	
	Lobby	sqm	2	23.81	-	2.9	138.098	
		sqm	2	19.08	-	2.9	110.664	
		sqm	2	20.31	-	2.9	117.798	
		sqm	2	16.08	-	2.9	93.264	
	deduction							
	D	sqm	-2	1.5	-	2.1	-6.3	
	D1	sqm	-12	1	-	2.1	-25.2	
	D2	sqm	-2	0.9	-	2.1	-3.78	
	D3	sqm	-8	0.75	-	2.1	-12.6	
	Gap 3	sqm	-2	1.5	-	2.1	-6.3	
	slab bottom							
	store room	sq.m	1	4	5		20	
	toilet block	sq.m	1	3.78	2		7.56	
	open space	sq.m	1	4	2.77		11.08	
	reading room	sq.m	1	7	8		56	
	computer lab	sq.m	1	11.08	8		88.64	
	conference room	sq.m	1	5.85	7.31		42.7635	
	Office	sq.m	1	4	4		16	
	reception area	sq.m	1	4.23	3.08		13.0284	
	passage 1	sq.m	1	7.46	2.08		15.5168	
	passage 2	sq.m	1	18.95			18.95	
15	**Earth Filling in Plinth**							
	bedroom	cum	10	4.5	3	0.5	67.5	
	rector room & theater room	cum	2	4.5	5	0.5	22.5	
	store room & security room	cum	2	4.5	2.2	0.5	9.9	
	dining room &reading room	cum	2	9.42	5	0.5	47.1	255.45
	toilet block	cum	2	4.5	6.73	0.5	30.285	
	passage	cum	2	1.5	25.31	0.5	37.965	
		cum	1	16.08	1.5	0.5	12.06	
		cum	1	16.08	3.5	0.5	28.14	

Table 8.9 Quantity Sheet of Public Hostel

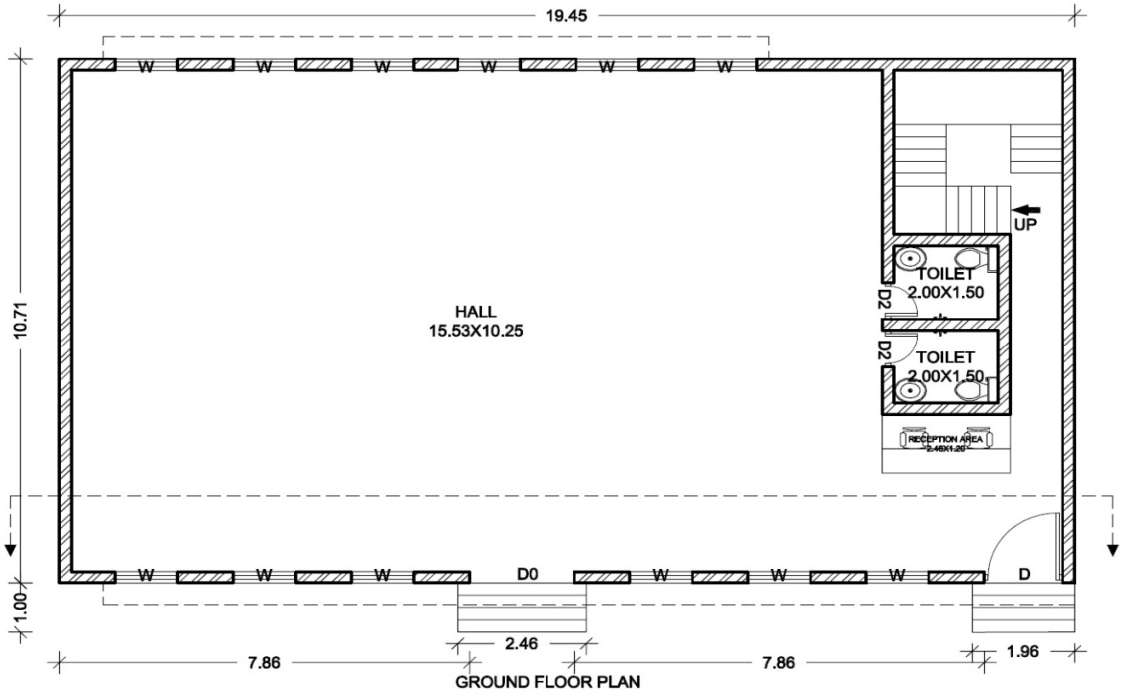
ABSTRACT SHEET FOR HOSTEL					
SR NO.	**DESCRIPTION**	**QUANTITY**	**RATE**	**UNIT**	**AMOUNT RS.**
1	Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(B) Dense or Hard soil	353.8062	85.9	cu.m	30391.95258
2	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- Graded brick bat aggregate 40mm normal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton)	64.3284	2157	cu.m	138756.3588
3	Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:5. (1- Cement : 5 -fine sand)(C) Fly Ash Bricks (upto 10 ton)	187.5438	3344	cu.m	627146.4672
4	Brick work in super strucrture in cement mortar	261.50494	3500	cu.m	915267.29
5	Providing and laying damp proof course 25mm thick cement concrete 1:2:4 (1- Cement : 2 coarse sand : 4 stone aggregate 10 mm nominal size) and curing complete (upto 10 ton)	102.58	159	sq.m	16310.22
6	20mm thick sand faced cement plaster on walls upto height 10 metres above ground level consisting of 12mm thick backing coat of C.M. 1:3 (1-cement : 3-sand) and 8mm thick finishing coat of C.M. 1:1 (1-cement : 1-sand) etc. complete.	916.854	205	sq.m	187955.07
7	Providing 20mm thick cement plaster in single coat on single or half brick walls for interior plastering upto floor two level and finished even and smooth in (i) Cement mortar 1:3 (1-cement:3 sand)	1468.552	150	sq.m	220282.8

8	Providing 10mm thick cement plaster in single coat on brick/concrete walls for interior plastering upto floor two level and finished even and smooth in (i)Cement mortar 1:3 (1-cement:3-sand)	510.9	87.2	sq.m	44550.48
9	Providing and laying cement concrete 1:3:6 (1- Cement : 3-Coarse sand : 6- crushed stone aggregates 20 mm nominal size) and curing complete including cost of formwork in (A) Wall Caps / Coping (more than 10 ton)	58.8943	2712	cu.m	159721.3416
10	Providing and laying Vitrified tiles 8 to 10 mm thick , 24'' x 24'' in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3-coarse sand) finishing with flush pointing in white cement. (upto 10 ton)	505.656	888	sq.m	449022.528
11	Providing and laying chequered terrazo tiles 28mm thick with marble chips of sizes upto 6mm in treads of stairs and staircases in 12mm thick bed of lime mortar 1:1.5 (1- Lime putty :1.5 coarse sand) or C.M. 1:6 jointed with neat cement slurry mixed with pigment to match the shade of tilesincluding rubbing and polishing complete. (B) Dark shades using ordinary cement (upto 10 ton)	545.0268	467	sq.m	254527.5156
12	Providing and laying marble chips skirting (Terrazo) or dedo rubbed, and polished to Granolithic finish top layer 6mm thick with white,black or white and black marble chips of size from smallest to 4mm nominal size laid in cement marble powder mix 3:1 (3- Cement : 1 marble powder by weight) in proportion of 4:7 (4-cement marble powder mix : 7-marble chips by volume) 20mm thick with under layer 14mm thick cement plaster	475.58	386	sq.m	183573.88

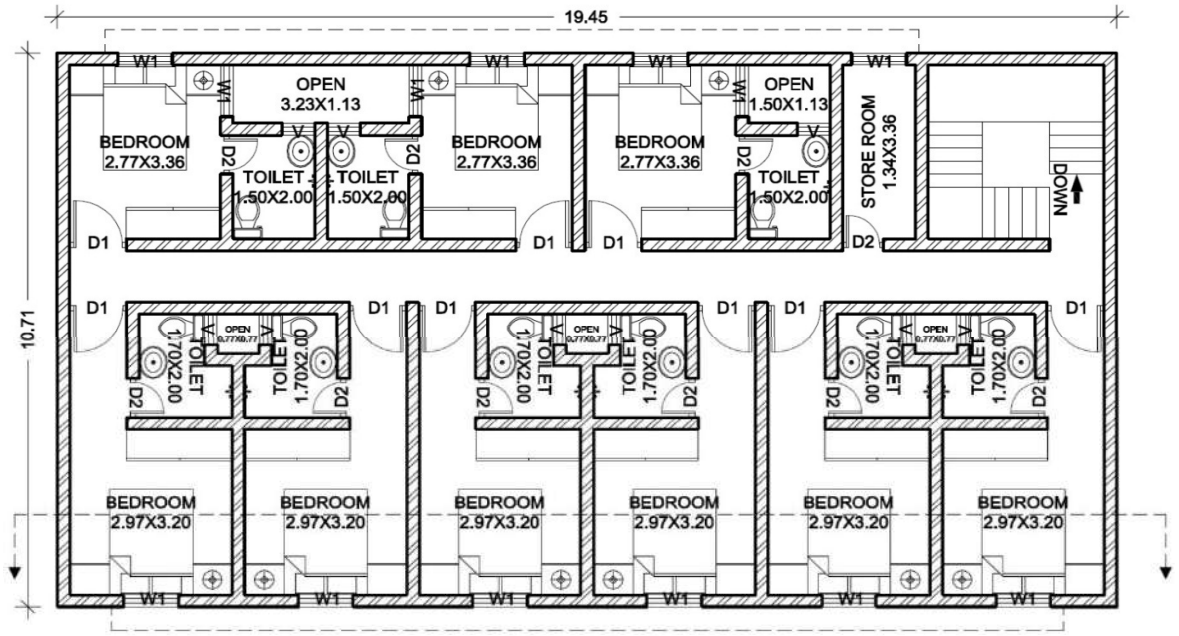
	1:3 (1-cement : 3-coarse sand) (A) Dark shade pigment with ordinary cement (In top layer only) (upto 10 ton)				
13	Providing and laying controlled cement concrete 1:2:4 and exposed work with curing etc. complete including the cost of formwork and including the cost of reinforsement for R.C.Cwork in (iii) Slabs having more than 10 cm and upto 13 cm.thickness	73.35639	8800	cu.m	645536.232
14	Finishing wall with water proofing cement paint of on wall surfaces (Two coats) to give an approved brand and manufacture and of required shape even shade after thoroughly brushing the surface to remove all dirt and remains of loose powered materials.	916.854	36.1	sq.m	33098.4294
15	Wall painting (two coats) with plastic emulsion paint of approved brand and manufacture on undecorated wall surface to give an even shade including thoroughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth.	1758.0907	49.6	sq.m	87201.29872
16	Filling available excavated earth (excluding rock) in trenches. plinth, sides of foundations etc. in layers not exceeding 20 cm. in depth consolidating each disposited layer by ramming and watering.	255.45	76.5	cu.m	19541.925
	TOTAL				**4012883.789**
17	Add 3% contigencies				120386.5137
18	Add 5% work charge establishment				200644.1894
19	Add 10% plumbing and sanitary works				401288.3789
20	Add 10% electrification charge				401288.3789
TOTAL ESTIMATED COST					**5136491.25**

Table 8.10 Quantity Sheet of Public Hostel

- **Design & Estimate of Public Shelter House**



GROUND FLOOR PLAN



FIRST FLOOR PLAN

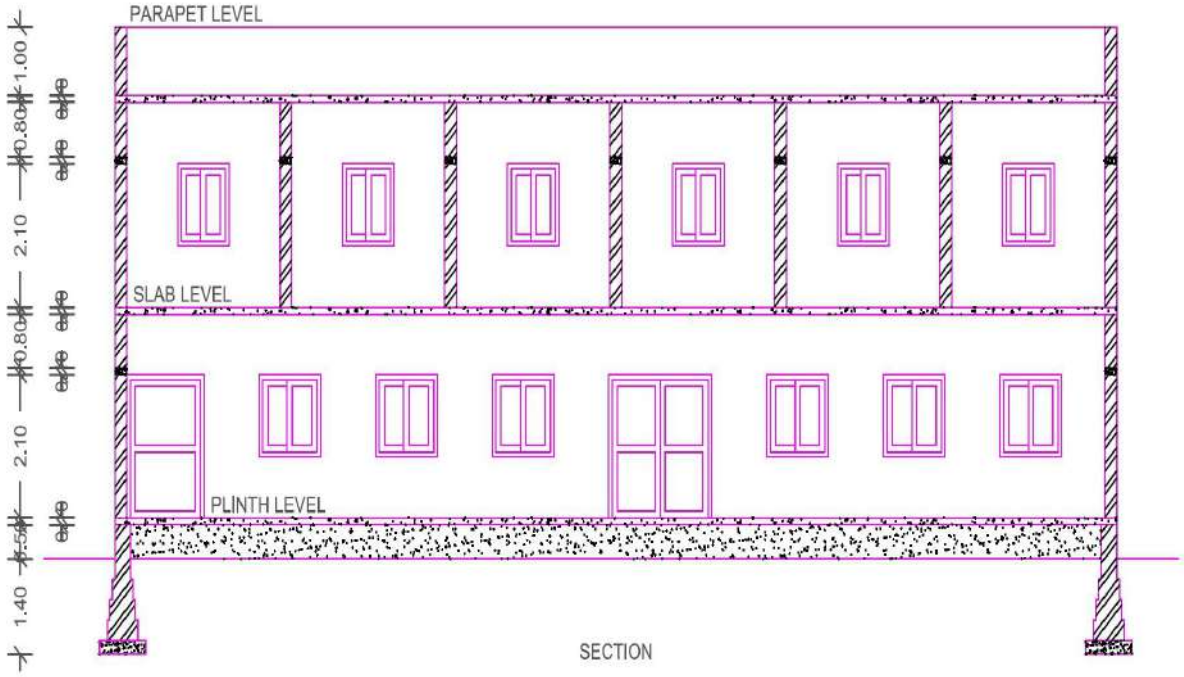


Fig8.6 3D of Public Shelter House

QUANTITY ESTIMATE OF GENERAL SHELTER HOME								
SR. NO	DESCRIPTION	UNIT	NOS.	L	B	H	TOTAL	TOTAL QUANTITY
1	**EXCAVATION**	cum	1	78.32	0.9	1.4	98.68	**98.68**
	L=((19.45-0.23)*2)+((10.71-0.23)*3)+((3.23+0.23)*3)+((3.69-0.23))=83.72							
	NET CL LENGTH = 78.32							
2	**P.C.C IN FOUNDATION**	cum	1	78.32	0.9	0.2	14.10	**14.10**
	L=((19.45-0.23)*2)+((10.71-0.23)*3)+((3.23+0.23)*3)+((3.69-0.23))=83.72							
	NET CL LENGTH = 78.32							
3	**BRICK MASONARY IN PLINTH AND FOUNDATION**							**48.576**
	1ST FOOTING	cum	1	80.12	0.6	0.3	14.42	
	L=((19.45-0.23)*2)+((10.71-0.23)*3)+((3.23+0.23)*3)+((3.69-0.23))=83.72							
	NET CL LENGTH = 80.12							
	2ND FOOTING	cum	1	80.72	0.5	0.3	12.11	
	L=((19.45-0.23)*2)+((10.71-0.23)*3)+((3.23+0.23)*3)+((3.69-0.23))=83.72							
	NET CL LENGTH = 80.72							
	3RD FOOTING	cum	1	81.32	0.4	0.3	9.76	
	L=((19.45-0.23)*2)+((10.71-0.23)*3)+((3.23+0.23)*3)+((3.69-0.23))=83.72							
	NET CL LENGTH = 81.32							
	4TH FOOTING	cum	1	81.92	0.3	0.5	12.29	
	L=((19.45-0.23)*2)+((10.71-0.23)*3)+((3.23+0.23)*3)+((3.69-0.23))=83.72							
	NET CL LENGTH = 81.32							
4	**BRICK MASONARY IN SUPER STRUCTURE**							**181.67**
	GROUND FLOOR							
	L=((19.45-0.23)*2)+((10.71-0.23)*3)+((3.23+0.23)*3)+((3.69-0.23))=83.72							
	NET CL LENGTH = 81.32	cum	1	82.34	0.23	3	56.81	
	FIRST FLOOR							

	L=104.29+89.41 = 193.7							
	NET CL LENGTH = 188.18	cum	1	188.18	0.23	3	129.84	
	parapet long wall	cum	2	19.45	0.23	1	8.95	
	parapet short wall	cum	2	10.71	0.23	1	4.93	
	deduction							
	doors							
	D0	cum	-1	2	0.23	2.1	-0.97	
	D	cum	-1	1.5	0.23	2.1	-0.72	
	D1	cum	-9	1.04	0.23	2.1	-4.52	
	D2	cum	-12	0.75	0.23	2.1	-4.35	
	windows							
	W	cum	-12	1.2	0.23	1.2	-3.97	
	W1	cum	-13	1	0.23	1.2	-3.59	
	ventilation (V)	cum	-9	0.6	0.23	0.6	-0.75	
5	**DPC**							
	L=((19.45-0.23)*2)+((10.71-0.23)*3)+((3.23+0.23)*3)+((3.69-0.23))=83.72							
	NET CL LENGTH = 81.32	sqm	1	81.92	0.3		24.58	**23.43**
	deduction							
	D0	sqm	-1	2	0.23		-0.46	
	D	sqm	-1	1.5	0.23		-0.35	
	D2	sqm	-2	0.75	0.23		-0.35	
6	**20mm thick 1:3 External sand faced plaster**							
	Long wall	sqm	2	19.45		8.03	312.37	
	Short wall	sqm	2	10.71		8.03	172.00	
	Terrace parapet long wall	sqm	2	18.99		1	37.98	
	Terrace parapet short wall	sqm	2	10.245		1	20.49	**533.59**
	deduction							
	doors							
	D0	sqm	-1	2		2.1	-0.97	
	D	sqm	-1	1.5		2.1	-0.72	
	windows							
	W	sqm	-12	1.2		1.2	-3.97	
	W1	sqm	-10	1		1.2	-3.59	
7	**20mm thick 1:3 Internal smooth plaster**							
	ground floor	sqm	2	18.99		2.9	110.14	**1028.40**
		sqm	2	10.25		2.9	59.45	

		sqm	1	7.04		2.9	20.42	
		sqm	1	2.46		2.9	7.13	
		sqm	1	3.69		2.9	10.70	
		sqm	1	2.23		2.9	6.47	
		sqm	1	3.36		2.9	9.74	
		sqm	1	3.23		2.9	9.37	
		sqm	4	2		2.9	23.20	
		sqm	4	1.5		3	18.00	
	deduction							
	D2	sqm	-2	0.75		2.1	-3.15	
	first floor	sqm	6	5.66		2.9	98.48	
		sqm	6	2.97		2.9	51.68	
		sqm	6	3.2		2.9	55.68	
		sqm	6	1.93		2.9	33.58	
		sqm	6	2.46		2.9	42.80	
		sqm	6	2		2.9	34.80	
		sqm	6	1.7		2.9	29.58	
		sqm	6	1		2.9	17.40	
		sqm	6	0.5		2.9	8.70	
		sqm	6	1		2.9	17.40	
		sqm	6	1.2		2.9	20.88	
		sqm	2	18.99		2.9	110.14	
		sqm	2	1		2.9	5.80	
		sqm	6	3.36		2.9	58.46	
		sqm	6	2.77		2.9	48.20	
		sqm	6	1.5		2.9	26.10	
		sqm	6	2		2.9	34.80	
		sqm	4	1.13		2.9	13.11	
		sqm	6	1.62		2.9	28.19	
		sqm	2	3.36		2.9	19.49	
		sqm	2	1.34		2.9	7.77	
		sqm	2	3.23		2.9	18.73	
		sqm	2	3.36		2.9	19.49	
	deduction							
	D1	sqm	-9	1.04		2.1	-19.66	
	D2	sqm	-10	0.75		2.1	-15.75	
	windows							
	W1	sqm	-3	1		1.2	-3.60	
	ventilation (V)	sqm	-9	0.6		0.6	-3.24	
	gap	sqm	-1	1		2.1	-2.10	
8	**10mm thick 1:3 plaster on**							**354.87**

	slab							
	ground floor							
	hall	sqm	1	15.53	10.25		159.18	
	reception	sqm	1	3.46	3.21		11.11	
	passage	sqm	1	3.69	1		3.69	
	staircase	sqm	1	3.23	3.36		10.85	
	toilet	sqm	2	2	1.5		6.00	
	first floor							
	bedroom	sqm	6	2.97	3.2		57.02	
	entry	sqm	6	2.46	1.04		15.35	
	toilet	sqm	6	1.7	2		20.40	
	passage	sqm	1	18.99	1		18.99	
	bedroom	sqm	3	2.77	3.36		27.92	
	toilet	sqm	3	1.5	2		9.00	
	store	sqm	1	1.34	3.36		4.50	
	staircase	sqm	1	3.23	3.36		10.85	
9	**PCC (1:3:6) below floors**	cum	1	19.45	10.71	0.1	20.83	**20.83**
10	**Vitrified tiles in flooring**							
	ground floor							
	hall	sqm	1	15.53	10.25		159.18	
	reception	sqm	1	3.46	3.21		11.11	
	passage	sqm	1	3.69	1		3.69	
	staircase	sqm	1	3.23	3.36		10.85	
	toilet	sqm	2	2	1.5		6.00	
	first floor							
	bedroom	sqm	6	2.97	3.2		57.02	
	entry	sqm	6	2.46	1.04		15.35	
	toilet	sqm	6	1.7	2		20.40	**349.85**
	passage	sqm	1	18.99	1		18.99	
	bedroom	sqm	3	2.77	3.36		27.92	
	toilet	sqm	3	1.5	2		9.00	
	store	sqm	1	1.34	3.36		4.50	
	staircase	sqm	1	3.23	3.36		10.85	
	deduction							
	doors							
	D0	sqm	-1	2	0.23		-0.46	
	D	sqm	-1	1.5	0.23		-0.35	
	D1	sqm	-9	1.04	0.23		-2.15	
	D2	sqm	-12	0.75	0.23		-2.07	

11	**Terrace tiles**	sqm	1	18.99	10.25		194.65	**194.65**
12	**Skirting**							
	ground floor	rm	1	88.92			88.92	
	first floor	rm	1	238.97			238.97	**324.39**
	deduction	rm	-1	2			-2.00	
		rm	-1	1.5			-1.50	
13	**RCC (1:2:4)**							
	RCC slab (10cm thick)	cum	2	19.45	10.71	0.1	41.66	
	deduction	cum	-2	3.23	3.36	0.1	-2.17	
	RCC Lintel							
	ground	cum	1	82.34	0.23	0.1	1.89	
	first	cum	1	188.18	0.23	0.1	4.33	
	RCC chajjas (10cm thick)							
		cum	1	18.62	0.45	0.1	0.84	
		cum	1	12.75	0.45	0.1	0.57	**50.24**
		cum	1	14.93	0.45	0.1	0.67	
		cum	1	17.47	0.45	0.1	0.79	
	RCC Stairs	cum	1	2.46	1	0.6	1.476	
		cum	1	1.96	1	0.6	1.176	
	deduction							
		cum	-6	2.46	0.25	0.15	-0.5535	
		cum	-6	1.96	0.25	0.15	-0.441	
14	**Paint**							
	external paint							
	Long wall	sqm	2	19.45		8.03	312.37	
	Short wall	sqm	2	10.71		8.03	172.00	
	Terrace parapet long wall	sqm	2	18.99		1	37.98	
	Terrace parapet short wall	sqm	2	10.245		1	20.49	
	deduction							**533.59**
	doors							
	D0	sqm	-1	2		2.1	-0.97	
	D	sqm	-1	1.5		2.1	-0.72	
	windows							
	W	sqm	-12	1.2		1.2	-3.97	
	W1	sqm	-10	1		1.2	-3.59	
	internal paint							**1383.27**
	ground floor	sqm	2	18.99		2.9	110.14	

		sqm	2	10.25		2.9	59.45
		sqm	1	7.04		2.9	20.42
		sqm	1	2.46		2.9	7.13
		sqm	1	3.69		2.9	10.70
		sqm	1	2.23		2.9	6.47
		sqm	1	3.36		2.9	9.74
		sqm	1	3.23		2.9	9.37
		sqm	4	2		2.9	23.20
		sqm	4	1.5		3	18.00
	deduction						
	D2	sqm	-2	0.75		2.1	-3.15
	first floor	sqm	6	5.66		2.9	98.48
		sqm	6	2.97		2.9	51.68
		sqm	6	3.2		2.9	55.68
		sqm	6	1.93		2.9	33.58
		sqm	6	2.46		2.9	42.80
		sqm	6	2		2.9	34.80
		sqm	6	1.7		2.9	29.58
		sqm	6	1		2.9	17.40
		sqm	6	0.5		2.9	8.70
		sqm	6	1		2.9	17.40
		sqm	6	1.2		2.9	20.88
		sqm	2	18.99		2.9	110.14
		sqm	2	1		2.9	5.80
		sqm	6	3.36		2.9	58.46
		sqm	6	2.77		2.9	48.20
		sqm	6	1.5		2.9	26.10
		sqm	6	2		2.9	34.80
		sqm	4	1.13		2.9	13.11
		sqm	6	1.62		2.9	28.19
		sqm	2	3.36		2.9	19.49
		sqm	2	1.34		2.9	7.77
		sqm	2	3.23		2.9	18.73
		sqm	2	3.36		2.9	19.49
	deduction						
	D1	sqm	-9	1.04		2.1	-19.66
	D2	sqm	-10	0.75		2.1	-15.75
	windows						
	W1	sqm	-3	1		1.2	-3.60
	ventilation (V)	sqm	-9	0.6		0.6	-3.24
	gap	sqm	-1	1		2.1	-2.10

	slab bottom							
	ground floor							
	hall	sqm	1	15.53	10.25		159.18	
	reception	sqm	1	3.46	3.21		11.11	
	passage	sqm	1	3.69	1		3.69	
	staircase	sqm	1	3.23	3.36		10.85	
	toilet	sqm	2	2	1.5		6.00	
	first floor							
	bedroom	sqm	6	2.97	3.2		57.02	
	entry	sqm	6	2.46	1.04		15.35	
	toilet	sqm	6	1.7	2		20.40	
	passage	sqm	1	18.99	1		18.99	
	bedroom	sqm	3	2.77	3.36		27.92	
	toilet	sqm	3	1.5	2		9.00	
	store	sqm	1	1.34	3.36		4.50	
	staircase	sqm	1	3.23	3.36		10.85	
15	**Earth Filling in Plinth**							
	ground floor							
	hall	sqm	1	15.53	10.25	0.5	79.59	**95.42**
	reception	sqm	1	3.46	3.21	0.5	5.55	
	passage	sqm	1	3.69	1	0.5	1.85	
	staircase	sqm	1	3.23	3.36	0.5	5.43	
	toilet	sqm	2	2	1.5	0.5	3.00	

Table 8.11 Quantity Sheet of Public Shelter House

ABSTRACT SHEET FOR SHELTER HOME					
SR NO.	**DESCRIPTION**	**QUANTITY**	**RATE**	**UNIT**	**AMOUNT RS.**
1	Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(B) Dense or Hard soil	98.68	85.9	cu.m	8476.88688
2	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- Graded brick bat aggregate 40mm normal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton)	14.10	2157	cu.m	30408.5232
3	Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:5. (1- Cement : 5 -fine sand) (C) Fly Ash Bricks (upto 10 ton)	48.576	3344	cu.m	162438.144
4	Brick work in super strucrture in cement mortar	181.67	3500	cu.m	635832.47
5	Providing and laying damp proof course 25mm thick cement concrete 1:2:4 (1- Cement : 2 coarse sand : 4 stone aggregate 10 mm nominal size) and curing complete (upto 10 ton)	23.43	159	sq.m	3724.734
6	20mm thick sand faced cement plaster on walls upto height 10 metres above ground level consisting of 12mm thick backing coat of C.M. 1:3 (1-cement : 3- sand) and 8mm thick finishing coat of C.M. 1:1 (1-cement : 1-sand) etc. complete.	533.59	205	sq.m	109385.2735
7	Providing 20mm thick cement plaster in single coat on single or half brick walls for interior plastering upto floor two levelB and finished even and smooth in (i) Cement mortar 1:3 (1-cement:3-sand)	1028.40	150	sq.m	154259.25

8	Providing 10mm thick cement plaster in single coat on brick/concrete walls for interior plastering upto floor two level and finished even and smooth in (i)Cement mortar 1:3 (1-cement:3-sand)	354.87	87.2	sq.m	30944.93432
9	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- crushed stone aggregates 20 mm nominal size) and curing complete including cost of formwork in (A) Wall Caps / Coping (more than 10 ton)	20.83	2712	cu.m	56493.5364
10	Providing and laying Vitrified tiles 8 to 10 mm thick , 24'' x 24'' in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3- coarse sand) finishing with flush pointing in white cement. (upto 10 ton)	349.85	888	sq.m	310662.6264
11	Providing and laying chequered terrazo tiles 28mm thick with marble chips of sizes upto 6mm in treads of stairs and staircases in 12mm thick bed of lime mortar 1:1.5 (1- Lime putty :1.5 coarse sand) or C.M. 1:6 jointed with neat cement slurry mixed with pigment to match the shade of tiles including rubbing and polishing complete. (B) Dark shades using ordinary cement (upto 10 ton)	194.65	467	sq.m	90900.3825
12	Providing and laying marble chips skirting (Terrazo) or dedo rubbed, and polished to Granolithic finish top layer 6mm thick with white,black or white and black marble chips of size from smallest to 4mm nominal size laid in cement marble powder mix 3:1 (3- Cement : 1 marble powder by weight) in proportion of 4:7 (4- cement marble powder mix : 7- marble chips by volume) 20mm thick with under layer 14mm thick cement plaster 1:3 (1-cement : 3-coarse	324.39	386	sq.m	125214.54

	sand) (A) Dark shade pigment with ordinary cement (In top layer only) (upto 10 ton)				
13	Providing and laying controlled cement concrete 1:2:4 and exposed work with curing etc. complete\ including the cost of formwork and\ including the cost of reinforcement for R.C.Cwork in (iii) Slabs having more than 10 cm and upto 13 cm. thickness	50.24	8800	cu.m	442115.96
14	Finishing wall with water proofing cement paint of on wall surfaces (Two coats) to give an approved brand and manufacture and of required shape even shade after thoroughly brushing the surface to remove all dirt and remains of loose powered materials.	533.59	36.1	sq.m	19262.47987
15	Wall painting (two coats) with plastic emulsion paint of approved brand and manufacture on undecorated wall surface to give an even shade including thoroughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth.	1383.27	49.6	sq.m	68610.09776
16	Filling available excavated earth (excluding rock) in trenches. plinth, sides of foundations etc. in layers not exceeding 20 cm. in depth consolidating each disposited layer by ramming and watering.	95.42	76.5	cu.m	7299.320175
	TOTAL				**2256029.159**
17	Add 3% contigencies				67680.87477
18	Add 5% work charge establishment				112801.458
19	Add 10% plumbing and sanitary works				225602.9159
20	Add 10% electrification charge				225602.9159
TOTAL ESTIMATED COST					**2887717.324**

Table 8.12 Abstract Sheet of Public Shelter House

8.2 Reason for Students Recommending this Design

Sr No.	Proposed design	Reasons for recommendation of proposed designs
1	Public Library	There are many primary & higher secondary school in the village and population of village is also high & students are also more and therefore high requirement of such kind of facility is required in the village
2	Public Bath & Toilet	In the village there is no any facility regarding sanitation and also the existing structure are in very poor condition or are not in useable condition hence, these kind of facility is highly required in village as well as needed as got informed from the village dwellers
3	Public Bus-Stand	In the village, government bus and private bus facilities are must to be provided but the bus stand facility is not available in the village and this design was also recommended by the honorable Sarpanch as well as the village dwellers
4	Public Storage Building	In nearby village most of agricultural activities are to be conducted by the farmers therefore to store the agricultural commodity and also to store others material there is no facility within a village.
5	Public Hostel	There are many secondary and higher secondary school in the village and hence many students come for studies in our village from other villagesand therefore for the purpose of residing for those students there are no such kind of facility available within the village.
6	Public Shelter Home	Many pedestrian use to pass from our village while going to nearby religious place Uccha Kotda, Bagdana and Malnath Mahadev temple.

Table 8.13 Reasons for students recommending this design

8.3 About designs Suggestions / Benefit of the villagers

Sr No.	Proposed design	Benefit of the villagers by proposed designs
1	Public Library	People and students of village directly get the benefits of such kind of facility available within the village for reading peacefully, to create an awareness about the education and also to increase the education level & Literacy rate of village.
2	Public Bath & Toilet	By providing these kind of facility in the village the sanitation & healthy environment within the village gets increased & infectious disease and mosquitoes nuisance are becoming least.
3	Public Bus-Stand	By providing such kind of facility in the village the villagers will directly get the benefits of easy & comfortable means of transport and also there are many possibilities that the village can become a better transportation hub in the near future.
4	Public Storage Building	By providing these kind of facility in the village the farmers directly get the benefits to store the commodity in this structure and also protect his commodity from the extreme weather conditions and infectious disease as well as this structure is also used for multipurpose activities in future.
5	Public Hostel	By providing such kind of facility in the village students can peacefully live in the village and also it acts as a adding facility to the students of other village & it also create a educational environment within a village.
6	Public Shelter Home	By providing such kind of facility within the village or nearby the village the pedestrian passing from the village can get rest or temporary reside at that place.

Table 8.14 Benefits of the villagers

Chapter 9: Proposing designs for Future Development of the village for the PART-II Design

In this part of project we have proposed some basic facilities through our sustainable, physical and smart village design in our allocated village after completing all surveys and sit visits we have proposed our best design in this part.

In part-II of this project we are going to improve some of basic amenities in village that is at present is not good or not much efficient or not useful to current scenario of village. By this part-I design now we have our more wide perspective to develop the village in according to make it smart village by providing missing infrastructures.

According to UDPFI norms we are going to provide some facilities that is at present is not available in Valukad village like physical infrastructure including solid waste management and in social infrastructure including some community hall, recreational centre and socio cultural centre.

The village is now on the path of becoming smart village by our given design but the villagers have to maintain the given facilities by themselves. To make this possible we are going to give them smart design and smart technology to maintain infrastructure, by this we are closer to give them good living standards. And make it good model village for its surrounding villages.

SR NO.	PROBLEM DEFINITION
1	Design of Vegetable Market
2	Design of Community Hall
3	Design of Street Light
4	Design of Sport Complex
5	Design of RCC Road in Main Bazaar
6	Design of lake front

Table 9.1 Problem Definition for Design Part-II

Chapter 10 :Conclusion of the Entire village Activities of the Project

The project work started with the basic data collection, survey work and it progressed through meeting with headman, Talati-cum-Mantri shri and Principal of the existing school. The gap analysis was later framed and 6 various design problems were identified. The proposed solutions are framed in such a way that the village can enhance the overall physical, social and educational conditions of villagers and can promise the sustainable growth of the village in context to the Bhavnagar City, in which the village falls.

The concluding remarks of the project in the form of team details, problem definition and designed solutions are as follows:

village and Team Details					
village name:	**Team details:**	**(1) Enrollment No.:**	170210106044	**(1) Name:**	PATEL DHWANIL PARITOSHBHAI
Valukad		**(2) Enrollment No.:**	180213106004	**(2) Name:**	GOHIL MANDIPKUMAR RAJUBHAI

Problem Definition and Design Details			
Sr. No.	**Problem Definition**	**Capacity (mention unit)**	**Estimated cost (in Rs.)**
Design - 1	PUBLIC LIBRARY	UNDER 320.00 SQ.MT OF AREA	2302078
Design - 2	PUBLIC BATH & TOILET	AT A TIME 10 PERSONS CAN USE	717985
Design - 3	PUBLIC BUS-STAND	UNDER 109.44 SQ.MT OF AREA	577571
Design - 4	PUBLIC STORAGE BUILDING	12 NOS. OF STORE ROOMS	6064030
Design - 5	PUBLIC HOSTEL	20 NOS. OF STUDENTS	5136491
Design - 6	PUBLIC SHELTER HOME	18 NOS. OF GUESTS	2887717

Table 10.1 Summary Details of village Designs

It is truly believed by the project team that if the above mentioned design solutions are implemented then the village can replicate the basic facilities of nearby city and be able to lessen the migration from the village to nearest or other cities. The growth of the village can be enhanced and the prosperity as well as living conditions of the people can be well-furnished in a controlled way, such that it can fulfill the dream of father of our nation, Shri Mohandas KaramchandGandhiji that "*The true India lives in the village.*

Chapter 11:References refereed for this project

1. https://censusindia.gov.in/- Census department website
2. UDPFI (Urban Development Plan Formulation & Implementation) Guidelines
3. Schedule Of Rate (S.O.R.) -Bhavnagar District 2015-16
4. http://www.vyojana.gtu.ac.in/- Vishwakarma literatures
5. http://theconstructor.org/practical-guide/rate-analysis
6. Google maps
7. Google Earth
8. Autocad 2013& Autocad 3Ds Max
9. https://swachhbharatmission.gov.in/SBMCMS/index.htm - Swachh Bharat Mission

Chapter 12 :Annexure attachment

12.1 Survey form of Ideal village :-

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

For

Vishwakarma Yojana: Phase VIII

IDEAL VILLAGE SURVEY

An approach towards Rurbanisation for Village Development

Name of Village:	KUKad
Name of Taluka:	Ghogha
Name of District:	Bhavnagar
Name of Institute:	GEC Bhavnagar
Nodal Officer Name & Contact Detail:	Prof. C. A. Gajjar M.No :-
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Sarpanch & Village Dweller
Date of Survey:	10/11/2020

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	-	-	-	-
ii)	2011	2132	1103	1029	386

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	1104
	Forest Area (In hect.)	—
	Agricultural Land Area (In hect.)	840
	Residential Area (In hect.)	10
	Other Area (In hect.)	254
	Water bodies	240
	Nearest Town with Distance:	Alang (9KM)

3. Occupational Details:

Name of Three Major Occupation groups in Village	1. Cultivator 2. Agricultural labourer 3. Private buisness.

4. Physical Infrastructure Facilities:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
	• Tap Water (Treated/ Untreated)	Treated	Yes	-	
	• RO Water	-	-	Yes	
	• Well (Covered/ Uncovered)	Covered	Yes	-	-
	• Hand pumps		Yes	-	
	• Tube well/ Borehole	-	Yes	-	
	• River/ Canal/ Spring/ Lake/ Pond		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		Yes	
	If Open than Pucca / Kutchcha	Kutcha		Yes	
	Whether drain water is discharged directly in to Water bodies/ Sewer plants		Yes		-
Suggestions if any:					

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

E,	Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM				
	Village approach road	All Weather	Yes		
	Main road	Bitumen	Yes		
	Internal streets	Paver Block	Yes		
	Nearest NH/SH/MDR/ODR Dist. in kms.	Tansa (NH-51) (10 km)	-		
Suggestions if any:					
F.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No Bhavnagar (35 KM)			
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	No Bhavnagar (35 KM)			
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)		Yes		
Suggestions if any:					
G.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Govt.	Yes		
	Power supply for Domestic Use		Yes		
	Power supply for Agricultural Use		Yes		8 hrs
	Power supply for Commercial Use		Yes		
	Road/ Street Lights		Yes		

	Electrification in Government Buildings/ Schools/ Hospitals		Yes		
	Renewable Energy Source Facilities (Y/ N)		Yes		
	LED Facilities		Yes		
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	1 Nos.	Yes		
	Location Condition	Village Working			
	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:					
I.	**Irrigation Facility:**				
	Main Source of Irrigation (Stream/River/ Canal/ Well/ Tube well/ Other)	Well Tube Well	Yes		
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	60% Kucha 40% Pucca	Yes		

5. Social Infrastructural Facilities:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:-	Sub-Centre 1 Nos.	Yes	— No No	—
	Private Clinic/Private Hospital/ Nursing Home	—	—	No	
	If any of the above Facility is not available in village than approx. distance from village: 35 kms.				
Suggestions if any:					
L.	**Education Facilities:**				
	Aaganwadi/ Play group	2 Nos.	Yes	—	—
	Primary School	2 Nos.	Yes	—	—
	Secondary school	1 Nos.	Yes	—	—
	Higher sec. School	1 Nos.	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: 35 kms.				
Suggestions if any:					
M.	**Socio- Culture Facilities**				
	Community Hall (With or without TV) Location: Village	—	Yes	—	—

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Condition:	Working		-	-
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	-	-	No	-
	Public Garden Location: Condition:	-	-	No	-
	Village Pond Location: Condition:	- Near Village Working	Yes	-	-
	Recreation Center Location: Condition:	-	-	No	-
	Cinema/ Video Hall Location: Condition:	-	-	No	-
	Assembly Polling Station Location: Condition:	-	Yes	-	-
	Birth & Death Registration Office Location: Condition:	-	Yes	-	-
If any of the above Facility is not available in village than approx. distance from village: ....35....kms.					
Suggestions if any:					
N.	**Other Facilities**				
	Post-office	Sub-Post	Yes	-	-
	Telecommunication Network/ STD booth		Yes	-	-

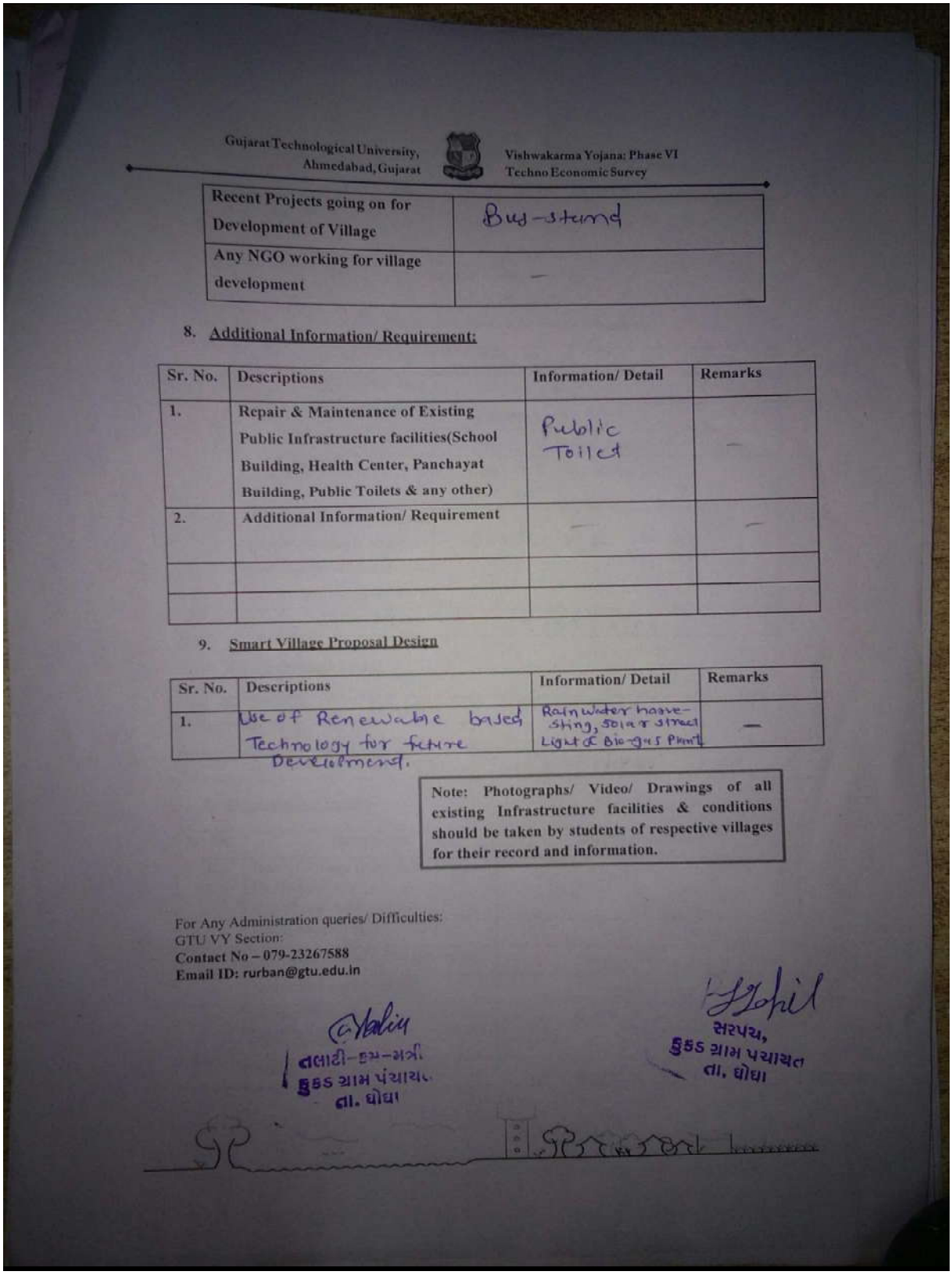
	General Market			No	-
	Shops (Public Distribution System)		Yes		
	Panchayat Building		Yes		
	Pharmacy/Medical Shop			No	
	Bank & ATM Facility			No	
	Agriculture Co-operative Society		-	No	-
	Milk Co-operative Soc.		Yes		
	Small Scale Industries			No	-
	Internet Cafes/ Common Service Center/Wi Fi			No	
	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			Yes	
P.	Bio-Gas Plant Solar Street Lights Rain Water Harvesting System		-	Yes	-
Q.	Any Other				

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	Yes



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VI
Techno Economic Survey

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

8. Additional Information/ Requirement:

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Repair & Maintenance of Existing Public Infrastructure facilities(School Building, Health Center, Panchayat Building, Public Toilets & any other)	Public Toilet	—
2.	Additional Information/ Requirement	—	—

9. Smart Village Proposal Design

Sr. No.	Descriptions	Information/ Detail	Remarks
1.	Use of Renewable based Technology for future Development.	Rain Water harvesting, Solar street Light & Bio-gas Plant	—

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

તલાટી-કમ-મંત્રી
૬૬૬ ગ્રામ પંચાયત
તા. ઘોઘા

સરપંચ,
૬૬૬ ગ્રામ પંચાયત
તા. ઘોઘા

Table 12.1 Ideal Village Survey Form

12.2 Survey form of Smart village :-

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

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

Name of District:	Bhavnagar
Name of Taluka:	Ghogha
Name of Village:	Vavdi
Name of Institute:	GEC Bhavnagar
Nodal Officer Name & Contact Detail:	Prof. C.A.Gajjar Mo.No:-
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller):	Sarpanch & Village dweller
Date of Survey:	29/11/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	-	-	-	-
2.	2011	2360	1232	1128	424

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1398
2.	Forest Area (In hect.)	-
3.	Agricultural Land Area (In hect.)	1138
4.	Residential Area (In hect.)	4
5.	Other Area (In hect.)	256
6.	Distance to the nearest railway station (in kilometers)	Bhavnagar - (30 km)

7.	Name of Nearest Town with Distance:	Ghogha (20 km)
8.	Distance to the nearest bus station (in kilometers):	Bhavnagar (30 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. Cultivators
	2. Agricultural labourer
	3.

Major crops grown in the village:	1. Cotton
	2. Ground nut
	3. Sesame

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	Yes	–	–
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring	–	Yes	–	–
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump Other(Specify)**Lake/ Pond**	Hand Pump & Lake & Pond	Yes	–	–

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
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 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET	under ground Drainage	Yes		

Suggestions if any:

D.	Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM				
	Village approach road	Bitumen	Yes	-	-
	Main road	Bitumen	Yes		-
	Internal streets	Paver block	Yes	-	-
	Nearest NH/SH/MDR/ODR Dist. in kms.	NH-51 (10 KM)			

Suggestions if any:

E.	Transport Facility				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No	-	Yes	@ Bhavnagar (30 km)
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	No		Yes	@ Bhavnagar (30 km)
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto, Jeep Chhakda/ Private Vehicle	Yes	-	

Suggestions if any:

F.	Electricity Distribution				
	(Y/N) Govt./ Private (Less than 6 hrs. More Than 6 hrs)	Govt.	Yes		More than 6 hr

31

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Power supply for Domestic Use	-	Yes		
	Power supply for Agricultural Use			Yes	
	Power supply for Commercial Use		Yes		
	Road/ Street Lights		Yes		
	Electrification in Government Buildings/ Schools/ Hospitals		Yes		
	Renewable Energy Source Facilities (Y/ N)		Yes		
	LED Facilities		Yes		
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	-	-	Yes	
	Location Condition	—	—	—	—
	Community Toilet (With bath/ without bath facilities)	—	—	Yes	
	Solid & liquid waste Disposal system available	—	—	Yes	—
	Any facility for Waste collection from road	—	—	Yes	—
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL OTHER (SPECIFY)	Well Tube Well	Yes	-	-
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	60% Kuccha 40% Pucca	-	Yes	

41

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi)	2 Nos.			
	Sub-Centre	1 Nos.			
	PHC	–			
	BLOCK PHC	–			
	CHC/RH	–			
	District/ Govt. Hospital	–		Yes	
	Govt. Dispensary	–			
	Private Clinic	–			
	Private Hospital/	–			
	Nursing Home	–			
	AYUSH Health Facility	–			
	sonography /ultrasound facility	–			
	If any of the above Facility is not available in village than approx. distance from village: 30....kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	2 Nos.	Yes	–	
	Primary School	1 Nos.	Yes		
	Secondary school	1 Nos.	Yes	–	
	Higher sec. School	–	–	Yes	
	ITI college/ vocational Training Center		–	Yes	
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities			Yes	
	If any of the above Facility is not available in village than approx. distance from village: 30....kms.				

5

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Suggestions if any:

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

If any of the above Facility is not available in village than approx. distance from village: ..30...kms.

Suggestions if any:

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

19

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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

Suggestions if any:

N.	Other Facilities	Condition		Available (YES)	Available (NO)
	1. Have these programme implemented the village? 2. Are there any beneficiaries in the village from the following programme? 3. Janani Suraksha Yojana 4. Kishori Shakti Yojana 5. Balika Samriddhi Yojana 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) 18. Jawahar Rozgar Yojana (JRY) 19. Indira Awas Yaojna (IAY) 20. Samagra Awas Yojana (SAY) 21. Sanjay Gandhi Niradhar Yojana (SGNY) 22. Jawahar Gram Samridhi Yojana (JGSY) 23. Other (SPECIFY)			Yes	

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

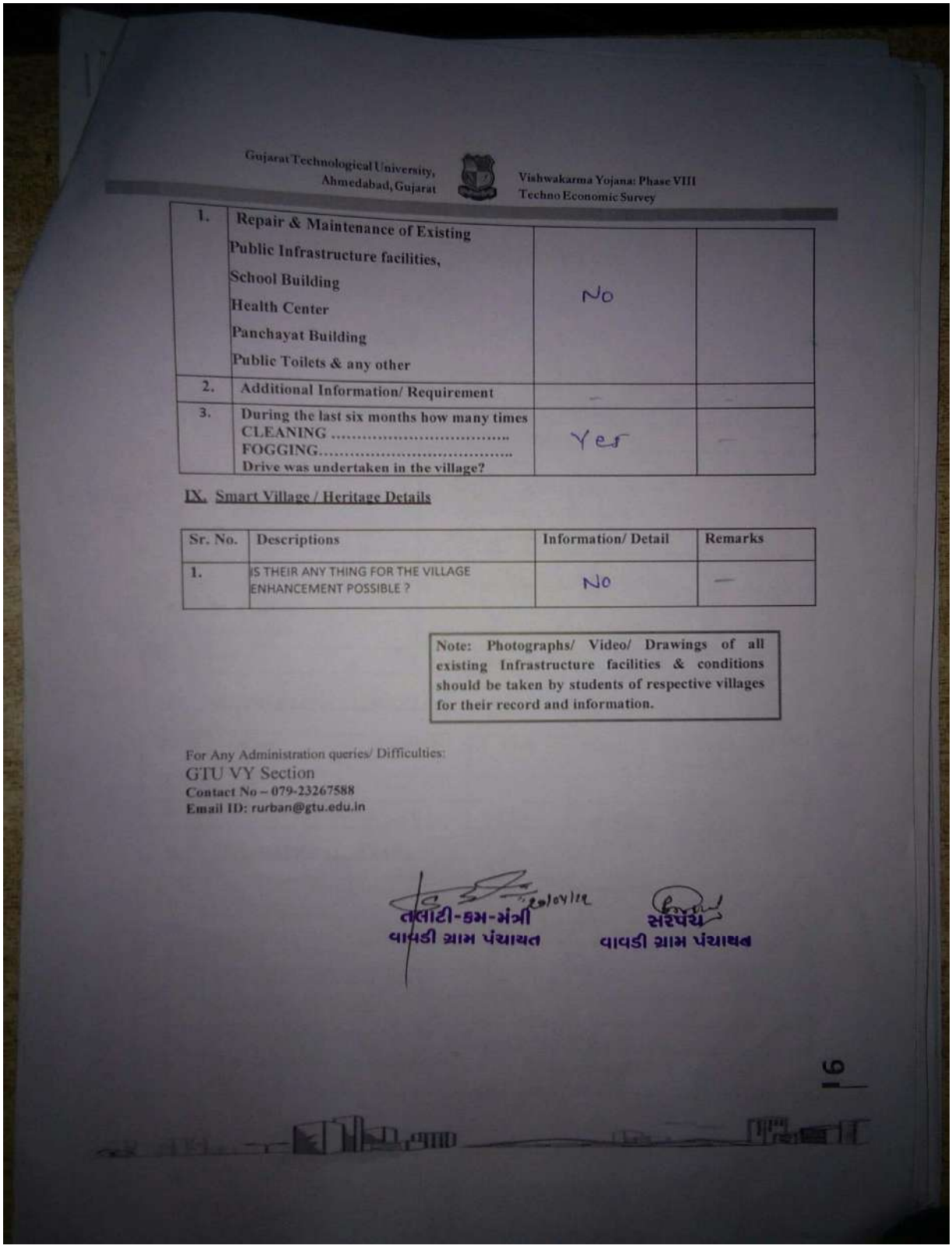
VII. DATA COLLECTION FROM VILLAGE

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

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

8



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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

IX. Smart Village / Heritage Details

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

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

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

20/04/19
તલાટી-કમ-મંત્રી
વાવડી ગ્રામ પંચાયત

સરપંચ
વાવડી ગ્રામ પંચાયત

9

Table 12.2 Smart Village Survey Form

12.3 Survey form of Allocated village :-

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

Name of District:	Bhavnagar
Name of Taluka:	Ghogha
Name of Village:	Valukad
Name of Institute:	GEC Bhavnagar
Nodal Officer Name & Contact Detail:	Prof. C. A. Gajjar Mo. No :-
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Sarpanch, Panchayat member and village dweller.
Date of Survey:	16/10/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001	–	–	–	–
2.	2011	6881	3503	3378	1158

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	2153.7659
2.	Forest Area (In hect.)	–
3.	Agricultural Land Area (In hect.)	1533.1699
4.	Residential Area (In hect.)	238469
5.	Other Area (In hect.)	558.7693
6.	Distance to the nearest railway station (in kilometers)	Bhavnagar – (15 KM)

7.	Name of Nearest Town with Distance:	Bhavnagar (15 KM)
8.	Distance to the nearest bus station (in kilometers):	Bhavnagar (15 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. Cultivators 2. Agricultural Labourer 3. Diamond Worker

Major crops grown in the village:	1. Pearmillet / bajra 2. Cotton 3. Coriender

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	Yes	-	-
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring Rainwater Tanker Truck Cart With Small Tank	Rainwater Tanker Truck	Yes	-	-
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump	Irrigation channel	Yes	-	-

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Other(Specify)Lake/ Pond	Lake/ Pond	Yes	-	-
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	Under-ground	Yes		
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	R.C.C/bitumen	Yes	-	-
	Main road	Black Topped Pucca	Yes	-	-
	Internal streets	Paver block	Yes	-	-
	Nearest NH/SH/MDR/ODR Dist. in kms.	NH-51 (5 KM)	-	-	-
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No	——	Bhavnagar @ 15 KM	
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	No	——	Bhavnagar @ 15 KM	
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto/Jeep/Private Vehicle/others			
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	Govt.	Yes		

3

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

	Power supply for Domestic Use	-	Yes	-	-
	Power supply for Agricultural Use	-	Yes		8hr
	Power supply for Commercial Use	-	Yes	-	-
	Road/ Street Lights	-	Yes	-	-
	Electrification in Government Buildings Schools/ Hospitals	-	Yes	-	-
	Renewable Energy Source Facilities (Y/ N)	-	Yes	-	-
	LED Facilities	-		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	Personal Collection Box	-	-	-
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL OTHER (SPECIFY)	Stream Well Tube well Tank Pond	Yes	-	-
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	40% Pucca 60% Kuccha	-	-	-

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

V. SOCIAL INFRASTRUCTURAL FACILITIES:

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks
J.	**Health Facilities:**				
	ICDS (Anganwadi) Sub-Centre PHC BLOCK PHC CHC/RH District/ Govt. Hospital Govt. Dispensary Private Clinic Private Hospital/ Nursing Home AYUSH Health Facility sonography /ultrasound facility	8. No ICDS (Aanganwadi) 1 No PHC 4-5 Nos. Private clinic 1 No's. Veterinary Hospital.	Yes	-	-
	If any of the above Facility is not available in village than approx. distance from village: 15 ....kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group	8	Yes	-	-
	Primary School	4	Yes	-	-
	Secondary school	1	Yes	-	-
	Higher sec. School	4	Yes	-	-
	ITI college/ vocational Training Center	-	-	No	-
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities	-	-	No	-

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

If any of the above Facility is not available in village than approx. distance from village: 15....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	Working	Near village	Yes	–
	Recreation Center	–	–	–	No
	Cinema/ Video Hall	–	–	–	No
	Assembly Polling Station	–	–	Yes	–
	Birth & Death Registration Office	–	–	Yes	–

If any of the above Facility is not available in village than approx. distance from village: 15.....kms.

Suggestions if any:

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

19

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

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

Suggestions if any:

N.	Other Facilities	Condition		Available (YES)	Available (NO)
	1. Have these programme implemented the village? 2. Are there any beneficiaries in the village from the following programme? 3. Janani Suraksha Yojana 4. Kishori Shakti Yojana 5. Balika Samriddhi Yojana 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) 18. Jawahar Rozgar Yojana (JRY) 19. Indira Awas Yaojna (IAY) 20. Samagra Awas Yojana (SAY) 21. Sanjay Gandhi Niradhar Yojana (SGNY) 22. Jawahar Gram Samridhi Yojana (JGSY) 23. Other (SPECIFY)				

71

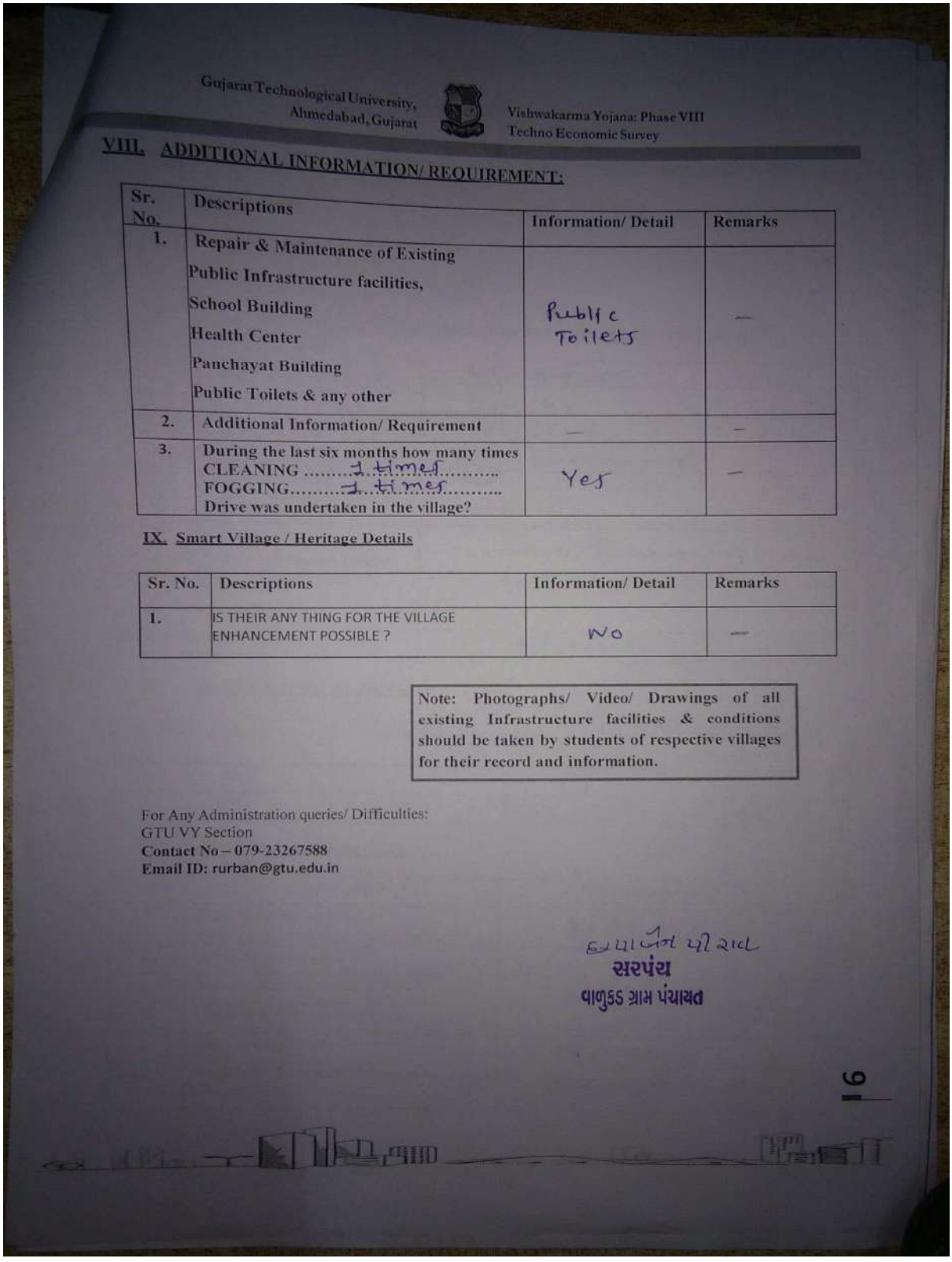
VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

VII. DATA COLLECTION FROM VILLAGE

Sr. No.	Descriptions	Information/ Details	Adequate	Inadequate	Remarks
1.	Village Base Map Available: Hard Copy/Soft Copy	–	Yes	–	–
2.	Recent Projects going on for Development of Village	Compound Wall at Crematm Place	–	–	–
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	–

18



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Techno Economic Survey

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

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

IX. Smart Village / Heritage Details

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

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

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

સરપંચ
વાળુકડ ગ્રામ પંચાયત

16

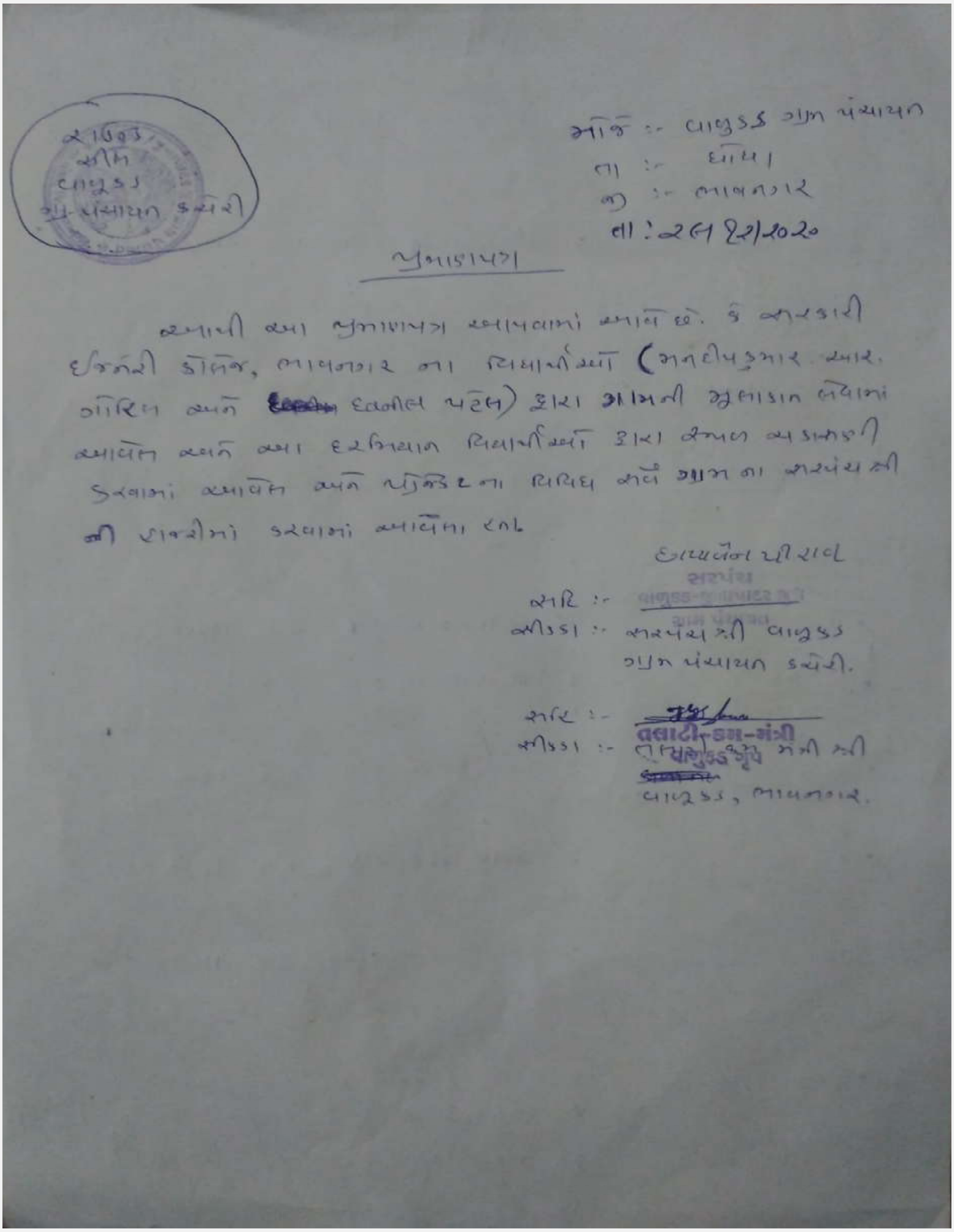


Table 12.3 Allocated Village Survey Form

12.4 Gap Analysis of the Allocated village :-

VILLAGE GAP Analysis					
Village Facilities	Planning Commission/UDPFI Norms	Village Name:	VALUKAD		
		Population:			7975
		Existing	Required as per Norms	Smart Vilage / Cities / Heritage Future Projection Design	Gap
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	4	4		0
Primary School	Each Per 2500 population	3	4		-1
Secondary School	Per 7,500 population	1	1		0
Higher Secondary School	Per 15,000 Population	1	0		1
College	Per 125,000 Population	0	0		0
Tech. Training Institute	Per 100000 Population	1	0		1
Agriculture Research Centre	Per 100000 Population	0	0		0
Skill Development Center	Per 100000 Population	0	0		0
Health Facility					0
Govt/Panchyat Dispensary or Sub PHC or Health Centre	Each Village	1	1		0
Primary Health & Child Health Center	Per 20,000 population	1	1		0
Child Welfare and Maternity Home	Per 10,000 population	0	1		-1
Multispeciality Hospital	Per 100000 Population	0	0		0
Public Latrines	1 for 50 families (if toilet is not there in home, specially for slum pockets & kutcha house)	0	1		-1
Physical Infrastructure Facilities					
Transportation		Adequate		Inadequate	
Pucca Village Approach Road	Each village	√			
Bus/Auto Stand provision	All Villages connected by PT (ST Bus or Auto)			√	
Drinking Water (Minimum 70 lpcd)		Adequate		Inadequate	
Over Head Tank	1/3 of Total Demand	√			
U/G Sump	2/3 of Total Demand	√			
Drainage Network		Adequate		Inadequate	
Drainage Network - Open		√			
Drainage Network - Cover		√			
Waste Management System		Adequate		Inadequate	
				√	
Socio- Cultural Infrastructure Facilities					
Community Hall	Per 10000 Population	0	1		-1
community hall and Public Library	Per 15000 Population	0	1		-1
Cremation Ground	Per 20,000 population	4	1		3
Post Office	Per 10,000 population	1	1		0
Gram Panchayat Building	Each individual/group panchayat	1	1		0
APMC	Per 100000 Population	0	1		-1
Fire Station	Per 100000 Population	0	0		0
Public Garden	Per village	0	1		-1
Police post	Per 40,000Population	0	1		-1
Shopping Mall					
Electrical Design					
Electricity Network		Adequate		Inadequate	
		√			
Any Smart Village Facility					
Technology		Adequate		Inadequate	
				√	
		ESR cap	4 LAKH LTR.		
		Sump cap			
		Lat			

Table 12.4 Gap Analysis Survey Form

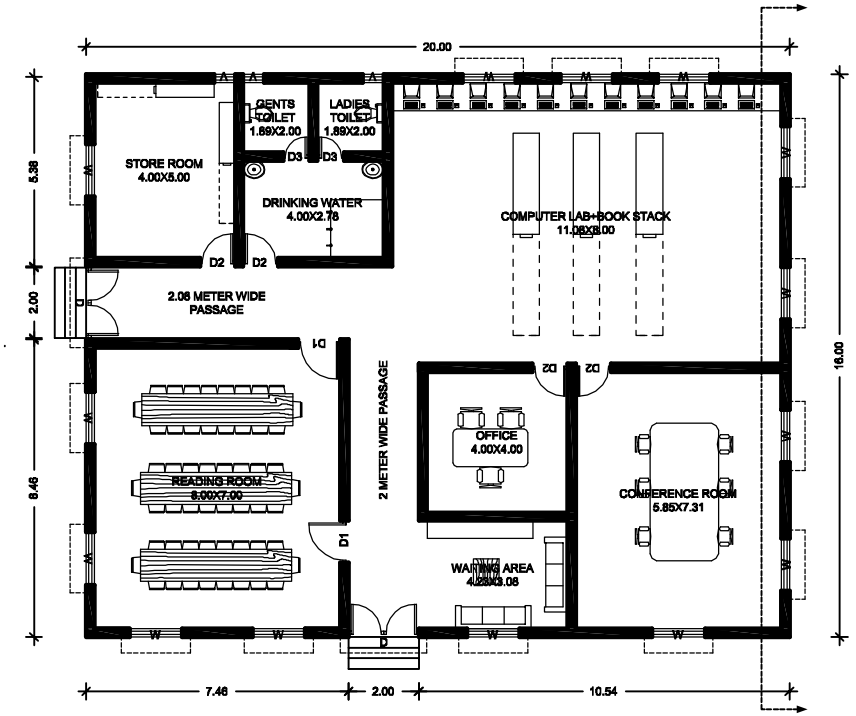
12.5 Summary Details of All the villages Designs in Table form as Part-I and Part-II :-

Sr. no.	Village Name	Discipline	Phase - I	Phase - II
1.	**Shampara**	Civil	Rain Water Harvesting System	Village Bank
			Septic tank	Washing Ghat with Circulatory tank
			Primary Health Centre	Agricultural Product Market Building
			Community hall	Library
			Vegetable Market	Skill Training Institute
			Recreational Centre	Lake front for tourism development point
2.	**Songadh**	Civil	College Building	Secondary School Building
			Design of Septic Tank	Recreation center
			Design of Sports Complex	Rainwater harvesting system
			Bus Stand	Public Toilets & Baths
			Design of Shelter Home	Defence training center
			Agriculture Market Building	Science center/Museum/Similar building
3.	**Valukad**	Civil	Public Library	Vegetable Market building
			Public Bath & Toilet	RCC road
			Public Bus-Stand	Street Light network expantion
			Public Storage Building	Sports complex
			Public Hostel	Community hall
			Public Shelter Home	Lake front for tourism development point
4.	**Kalatalav**	Civil	Public Toilets & Baths	Rain water harvesting system
			Anganwadi	Under ground water sump

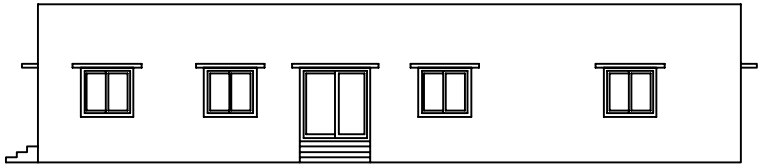
			Primary & Secondary School	Elevated storage resorvoire
			Vegetable Market	Water supply distribution system
			Bank	Slill training institure
			Street Light	Zinga production and storage building
5.	**Dharuka**	Civil	Sustainable Design RCC Road	Post office
			Storage Building	Retaining & flood protection wall
			Rainwater Harvesting	Bituminous road
			Water Supply Storage and Distribution	Washing Ghat with Circulatory tank
			Sewerage System in Mafanagar of Dharuka	Primery health center
			Recreation Centre	Defence training center
6.	**Bambhaniya**	Civil	Public Health Center	Bus stop
			Community Hall	Village Bank
			Street Light	Secondary School Building
			Drainage system	Vegetable Market building
			Elevated Service Reservoir	Recreation center
			RCC Road	Post office
7.	**Morchand**	Civil	Anganwadi Building	Bus stop
			Agricultural Product Market Building	RCC road
			Secondary School Building	Street Light network expantion
			Hostel Building	Sports complex
			Bank Building	Public Toilets & Baths
			Library Building	Community hall

Table12.5 Summary Details of All the Villages Designs in Part-II

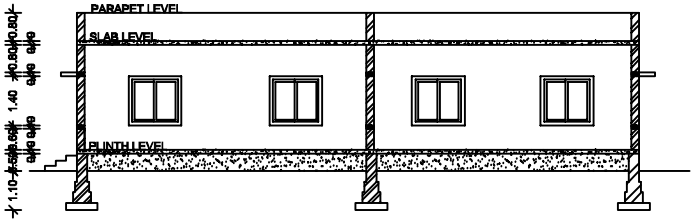
12.6 Drawings (If, required,A1, A2, A3 design is not visible then Only) :-



GROUND FLOOR PLAN



ELEVATION



SECTION

TITLE : PROPOSED LIBRARY LAYOUT
PLANS FOR STUDY PURPOSE
AT VILLAGE : VALUKAD,
TALUKA : GHOGHA,
DISTRICT : BHAVNAGAR.
FOR VISHVAKARMA YOJANA PHASE - VIII

SCALE : 1 : 100

AREA TABLE	SQ.MT.
NET PLOT AREA	320.00
AREA UNDER CONSTRUCTION	320.00

OPENING SCHEDULE		RCC STAIR DETAIL	
D	2.00 X 2.10	TRADE	0.30
D1	1.20 X 2.10	RISE	0.15
D2	1.00 X 2.10	WIDTH	2.00
D3	0.75 X 2.10		
W	1.50 X 1.40		
V	0.60 X 0.60		

COLOR NOTE		
PLOT BOUNDARY		PROPOSED WORK

ALL DIMENSION ARE IN METERS

VISHWAKARMA YOJANA PHASE - VIII

VILLAGE : VALUKAD

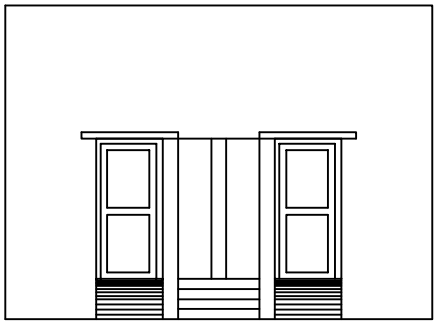
TALUKA : GHOGHA, BHAVNAGAR.

TITLE : LIBRARY BLOCK LAYOUT

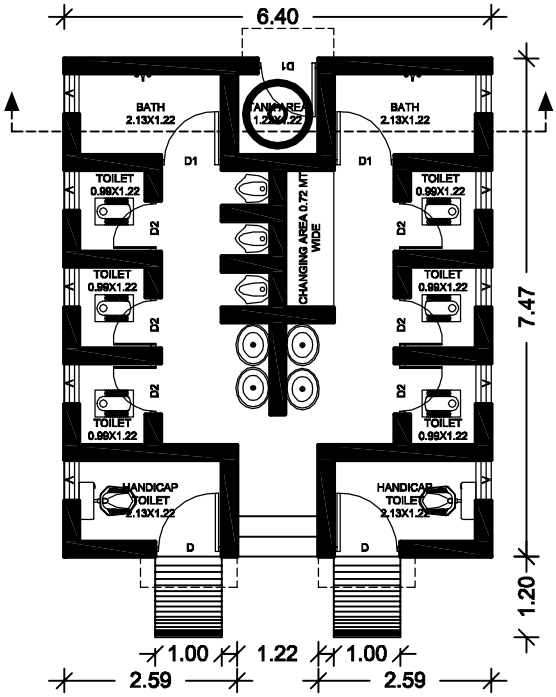
SCALE :- 1:100

DRAWN BY : DHWANIL PATEL
MANDIP GOHIL

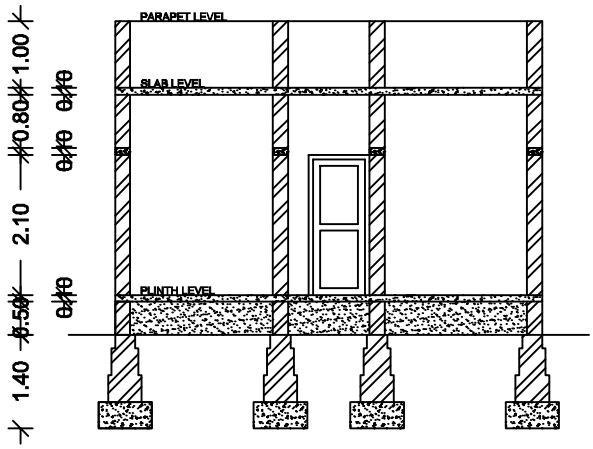
DRAWING NO. 01



ELEVATION



GROUND FLOOR PLAN



SECTION

TITLE : PROPOSED BATH & TOILET LAYOUT PLANS FOR STUDY PURPOSE AT VILLAGE : VALUKAD, TALUKA : GHOGHA, DISTRICT : BHAVNAGAR. FOR VISHVAKARMA YOJANA PHASE - VIII

N

SCALE : 1 : 100

AREA TABLE	SQ.MT.
NET PLOT AREA	47.80
AREA UNDER CONSTRUCTION	47.80

OPENING SCHEDULE		RCC STAIR DETAIL	
D	1.00 X 2.10	TRADE	0.30
D1	0.91 X 2.10	RISE	0.15
D2	0.76 X 2.10	WIDTH	2.00
V	0.61 X 0.61	RAMP	1:2

COLOR NOTE

●	PLOT BOUNDARY	○	PROPOSED WORK

ALL DIMENSION ARE IN METERS

VISHWAKARMA YOJANA PHASE - VIII

VILLAGE : VALUKAD

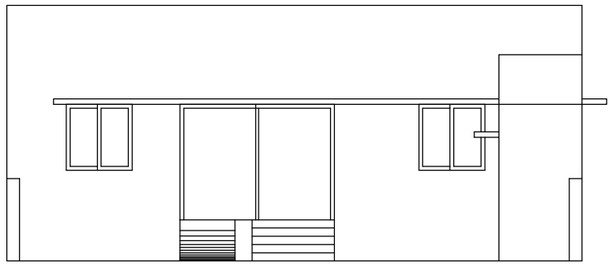
TALUKA : GHOGHA, BHAVNAGAR.

TITLE : BATH & TOILET BLOCK LAYOUT

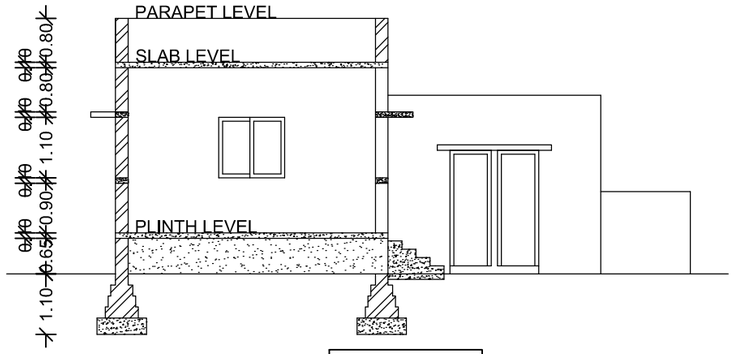
SCALE :- 1:100

DRAWN BY : DHWANIL PATEL
MANDIP GOHIL

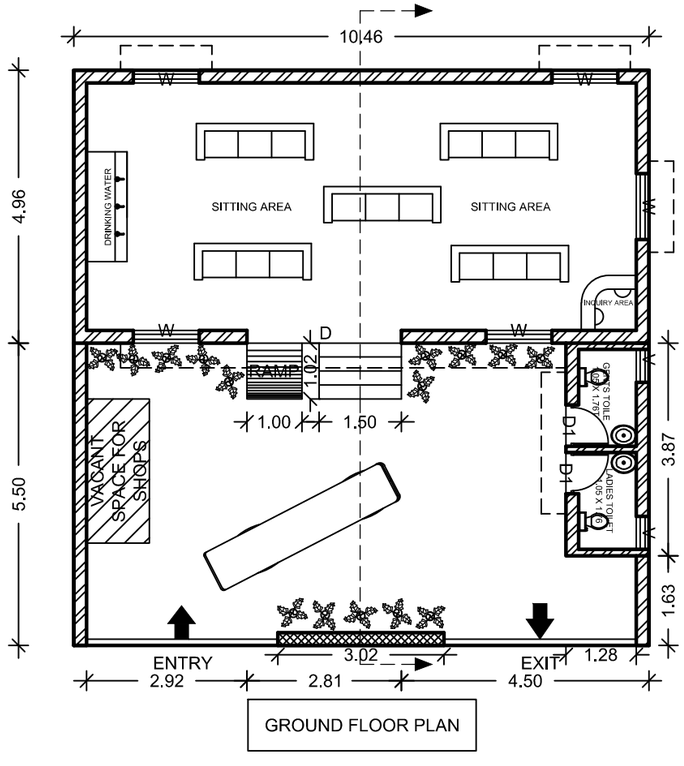
DRAWING NO. 02



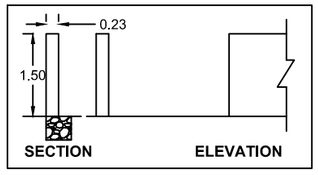
ELEVATION



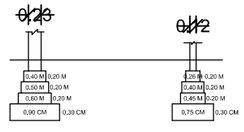
SECTION



GROUND FLOOR PLAN



COMPOUND WALL DETAIL



TITLE : PROPOSED BUS-STAND BLOCK PLANS FOR STUDY PURPOSE AT VILLAGE : VALUKAD, TALUKA : GHOGHA, DISTRICT : BHAVNAGAR. FOR VISHVAKARMA YOJANA PHASE - VIII

N

SCALE : 1 : 100

AREA TABLE	SQ.MT.
NET PLOT AREA	109.44
AREA UNDER CONSTRUCTION	57.73

OPENING SCHEDULE		RCC STAIR DETAIL	
D	2.81 X 2.10	TRADE	0.25
D1	0.75 X 2.10	RISE	0.15
W	1.20 X 1.20	WIDTH	1.50
V	0.60 X 0.60	RAMP	1:1.36

COLOR NOTE

●	PLOT BOUNDARY	○	PROPOSED WORK

ALL DIMENSION ARE IN METERS

VISHWAKARMA YOJANA PHASE - VIII

VILLAGE : VALUKAD

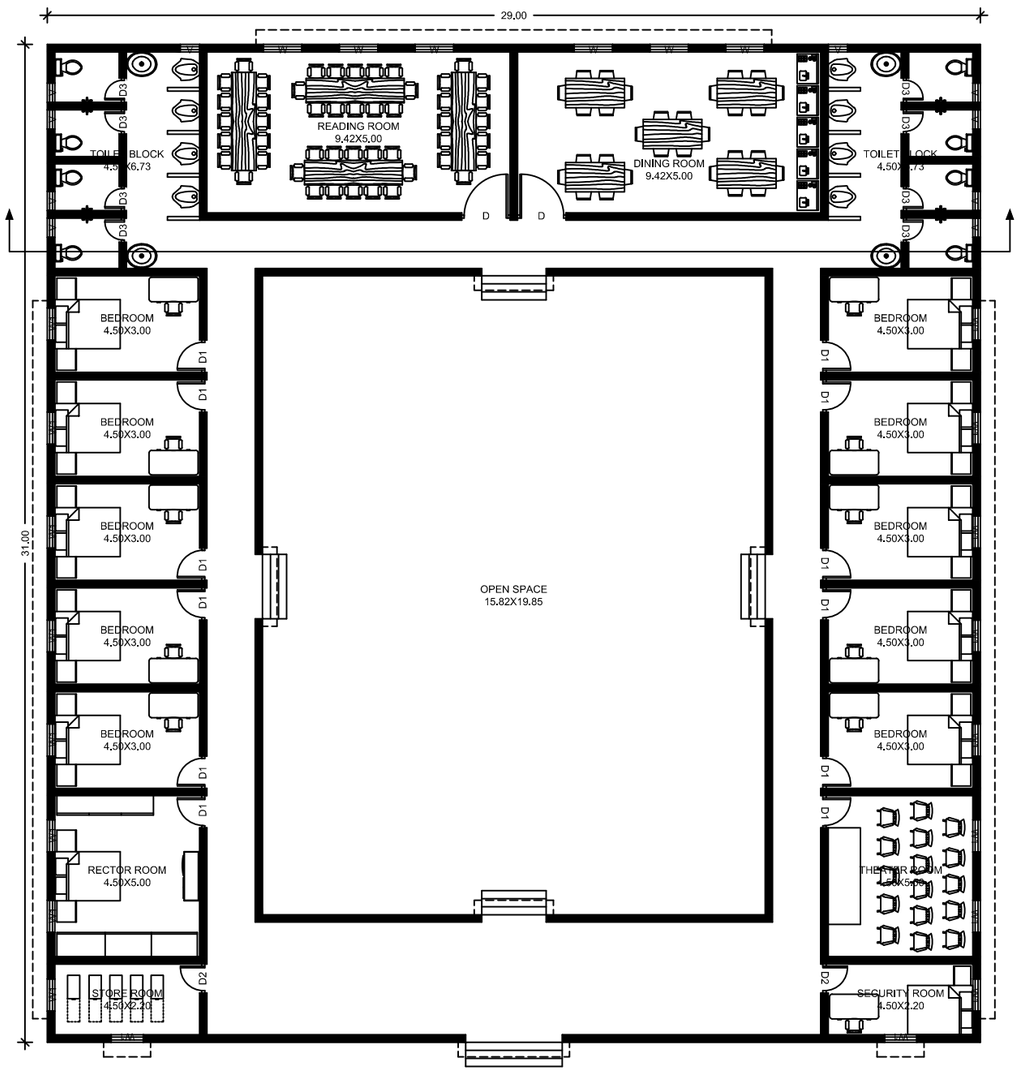
TALUKA : GHOGHA, BHAVNAGAR.

TITLE : BUS-STAND BLOCK LAYOUT

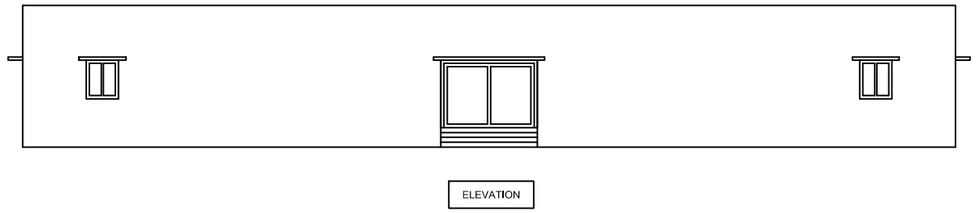
SCALE :- 1:100

DRAWN BY : DHWANIL PATEL
MANDIP GOHIL

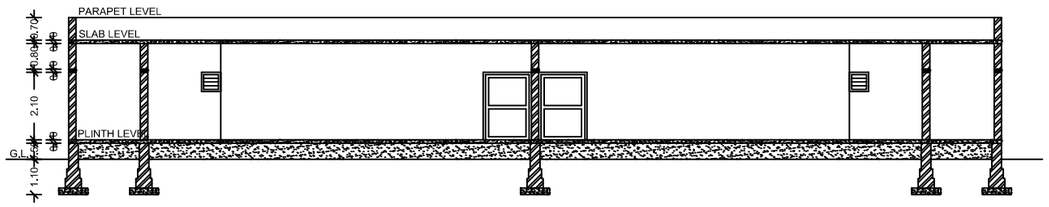
DRAWING NO. 03



GROUND FLOOR PLAN



ELEVATION



SECTION

TITLE : PROPOSED HOSTEL LAYOUT
PLANS FOR STUDY PURPOSE
AT VILLAGE : VALUKAD,
TALUKA : GHOGHA,
DISTRICT : BHAVNAGAR.
FOR VISHVAKARMA YOJANA PHASE - VIII

N

SCALE : 1 : 100

AREA TABLE	SQ.MT.
NET PLOT AREA	588.94
AREA UNDER CONSTRUCTION	588.94

OPENING SCHEDULE		RCC STAIR DETAIL	
D	1.50 X 2.10	TRADE	0.25
D1	1.00 X 2.10	RISE	0.15
D2	0.90 X 2.10	WIDTH	2.00
D3	0.75 X 2.10		
W	1.20 X 1.20		
W1	1.00 X 1.20		
V	0.60 X 0.60		

COLOR NOTE

●	PLOT BOUNDARY	○	PROPOSED WORK

ALL DIMENSION ARE IN METERS

VISHWAKARMA YOJANA PHASE - VIII

VILLAGE : VALUKAD

TALUKA : GHOGHA, BHAVNAGAR.

TITLE : HOSTEL BLOCK LAYOUT

SCALE :- 1:100

DRAWN BY : DHWANIL PATEL
MANDIP GOHIL

DRAWING NO. 05

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





Fig12.1Summary of Good Photographs

12.8 Village Interaction with Sarpanch Report :-

By following and respecting the Govt.'s COVID-19 Guidelines, On the date 23th October 2020 at Valukad Panchayat office we have carried out the Techno Economic Survey with Sarpanch Shrimati. Chhayaben Rao Ma'am.Talati Mantri Shri Jagdishbhai Solanki and other Panchayat members, village dwellers has remained present to give their feedback.

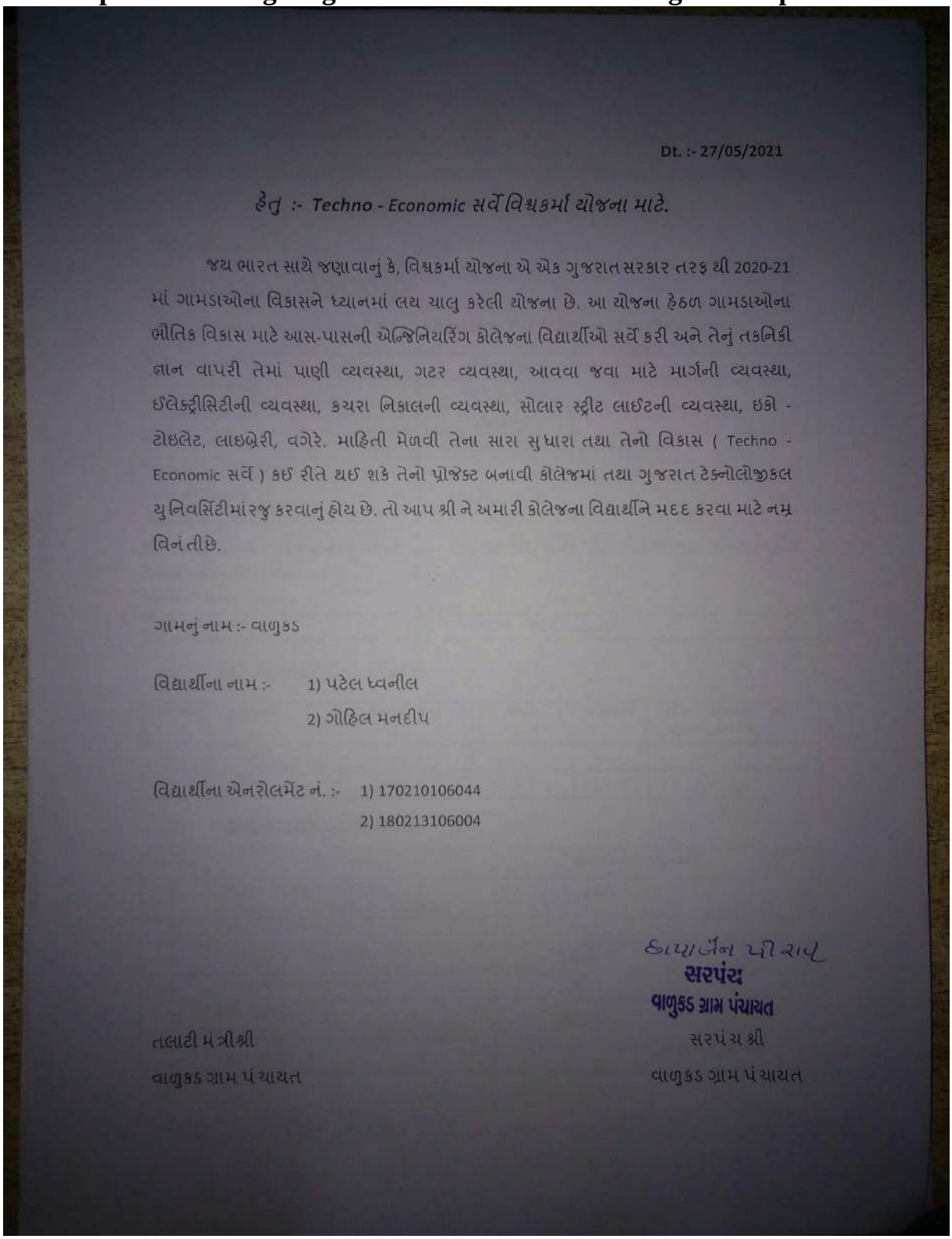
We explained how the development of Valukad village is possible we presented our study work under this project. We explained theme of Vishwakarma Yojana, various benefits physical infrastructure, social infrastructure, social infrastructure and socio-cultural facilities such a internal street road, light, public toilet and bath, bus stand & other.

village dwellers shared different problems faced by them before this project implementation while designing such a facilities, we gave various method and technics of such facility with proposed design.

The presentation was very helpful to understand what village dwellers actually needs in the village and what amenities to be designed at village level for the overall development of the Valukad village as Rurban town.

Our team thanked all the dwellers of the village for their support during this work period and made them understand that the implementation of this project can build a better village for upcoming future.

12.9 Sarpanch Letter giving information about the village development :-



Dt. :- 27/05/2021

હેતુ :- Techno - Economic સર્વે વિશ્વકર્મા યોજના માટે.

જય ભારત સાથે જણાવાનું કે, વિશ્વકર્મા યોજના એ એક ગુજરાત સરકાર તરફ થી 2020-21 માં ગામડાઓના વિકાસને ધ્યાનમાં લય ચાલુ કરેલી યોજના છે. આ યોજના હેઠળ ગામડાઓના ભૌતિક વિકાસ માટે આસ-પાસની એન્જિનિયરિંગ કોલેજના વિદ્યાર્થીઓ સર્વે કરી અને તેનું તકનિકી જ્ઞાન વાપરી તેમાં પાણી વ્યવસ્થા, ગટર વ્યવસ્થા, આવવા જવા માટે માર્ગની વ્યવસ્થા, ઈલેક્ટ્રીસિટીની વ્યવસ્થા, કચરા નિકાલની વ્યવસ્થા, સોલાર સ્ટ્રીટ લાઈટની વ્યવસ્થા, ઇકો - ટોઇલેટ, લાઇબ્રેરી, વગેરે. માહિતી મેળવી તેના સારા સુધારા તથા તેનો વિકાસ (Techno - Economic સર્વે) કઈ રીતે થઈ શકે તેનો પ્રોજેક્ટ બનાવી કોલેજમાં તથા ગુજરાત ટેક્નોલોજીકલ યુનિવર્સિટીમાં રજુ કરવાનું હોય છે. તો આપ શ્રી ને અમારી કોલેજના વિદ્યાર્થીને મદદ કરવા માટે નમ્ર વિનંતીછે.

ગામનું નામ :- વાળુકડ

વિદ્યાર્થીના નામ :- 1) પટેલ ધ્વનીલ
2) ગોહિલ મનદીપ

વિદ્યાર્થીના એનરોલમેંટ નં. :- 1) 170210106044
2) 180213106004

સરપંચ
વાળુકડ ગ્રામ પંચાયત

તલાટી મંત્રીશ્રી
વાળુકડ ગ્રામ પંચાયત

સરપંચ શ્રી
વાળુકડ ગ્રામ પંચાયત

Fig12.2 Letter from Sarpanch

Chapter 13: From the Chapter 9 future designs of the aspects (Feasibility, Construction, Operation and maintenance of various design options in Rural Areas along with cost with AutoCAD designs/planning with any software.

13.1 Design Proposals :-

13.1.1 Civil Design 1 :-

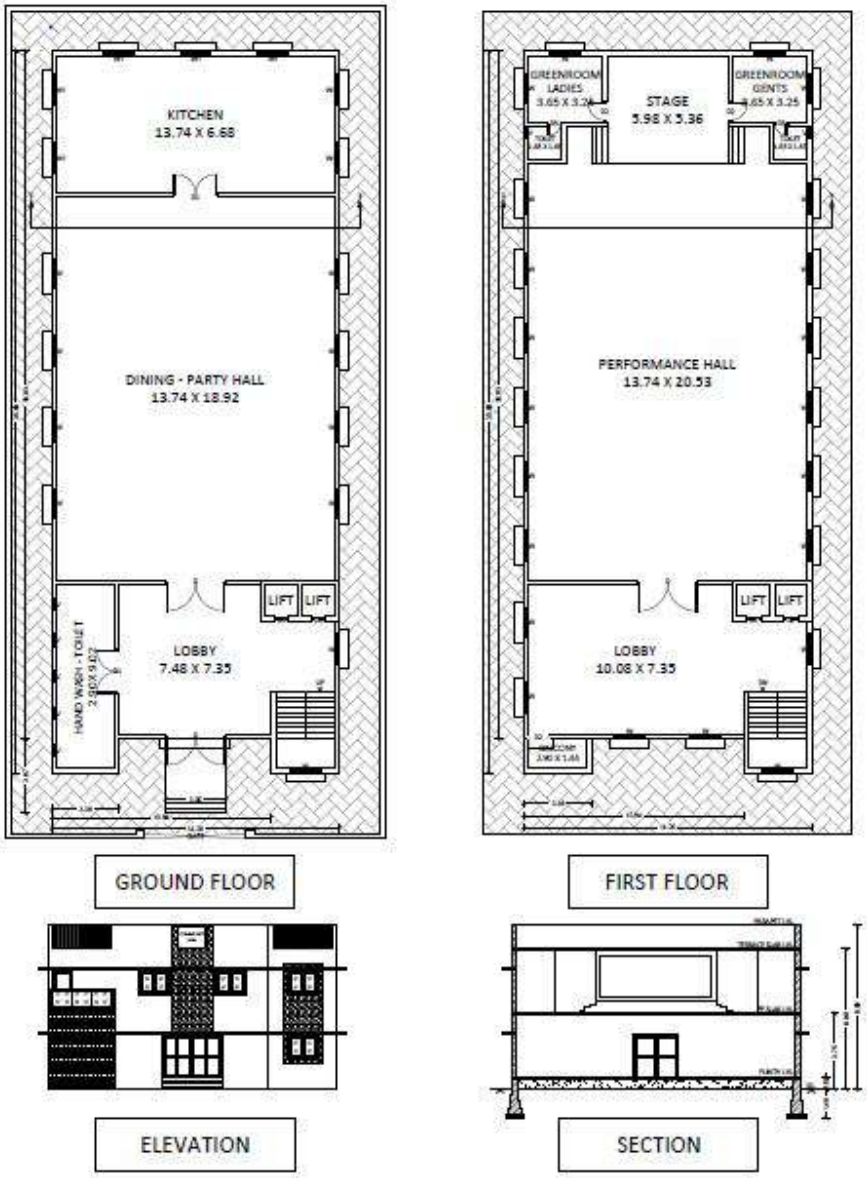


Fig13.1 3D of Community Hall

QUANTITY ESTIMATE OF COMMUNITY HALL									
SR. NO	**ITEM**	**UNIT**	**NOS.**	**L**	**B**	**H**	**QUANTITY**	**TOTAL QUANTITY**	**REMARKS**
1	**EXCAVATION**	cum	1	141.52	0.9	1.4	178.32		
	L=((102.149)*1)+((13.97)*2)+((7.583)*2)= 145.12								
	NET CL LENGTH = ((102.149)*1)+((13.97)*2)+((7.583)*2)-(0.5*0.90*8)) = 141.52							**178.32**	
2	**P.C.C IN FOUNDATION**	cum	1	141.52	0.9	0.2	25.47		
	NET CL LENGTH = ((102.149)*1)+((13.97)*2)+((7.583)*2)-							**25.47**	

	(0.5*0.90*8)) = 141.52								
	NET CL LENGTH = 141.52								
3	**BRICK MASONARY IN PLINTH AND FOUNDATION**								
	1ST FOOTING	cum	1	142.72	0.6	0.3	25.69		
	NET CL LENGTH = ((102.149)*1) +((13.97)*2)+ ((7.583)*2)- (0.5*0.60*8)) = 142.72								
	NET CL LENGTH = 142.72								
	2ND FOOTING	cum	1	143.12	0.5	0.3	21.47		
	NET CL LENGTH = ((102.149)*1) +((13.97)*2)+ ((7.583)*2)- (0.5*0.50*8)) = 143.12							**85.968**	
	NET CL LENGTH = 143.12								
	3RD FOOTING	cum	1	143.52	0.4	0.3	17.22		
	NET CL LENGTH = ((102.149)*1) +((13.97)*2)+ ((7.583)*2)- (0.5*0.40*8)) = 143.52								
	NET CL LENGTH = 143.52								
	4TH	cum	1	143.92	0.3	0.5	21.59		

	FOOTING								
	NET CL LENGTH = ((102.149)*1) +((13.97)*2)+ ((7.583)*2)- (0.5*0.30*8)) = 143.92								
	NET CL LENGTH = 143.92								
4	**BRICK MASONARY IN SUPER STRUCTURE**								
	GROUND FLOOR &								
	NET CL LENGTH = ((102.149)*1) +((13.97)*2)+ ((7.583)*2)- (0.5*0.23*8)) = 144.20								
	NET CL LENGTH = 144.20	cum	2	144.2	0.23	3	199.00	**198.47**	
	parapet short wall	cum	2	14.2	0.23	1.15	7.51		
	parapet long wall	cum	2	35.6	0.23	1.15	18.83		
	deduction								
	doors								
	D	cum	-3	3	0.23	2.1	-4.35		
	D1	cum	-2	2.25	0.23	2.1	-2.17		
	D2	cum	-3	1	0.23	2.1	-1.45		
	D3	cum	-6	0.75	0.23	2.1	-2.17		
	windows								
	W	cum	-32	1.5	0.23	1.2	-13.25		
	W1	cum	-7	1.5	0.23	1.2	-2.90		
	ventilation (V)	cum	-7	0.6	0.23	0.6	-0.58		
5	**DPC**							**40.42**	

	NET CL LENGTH = ((102.149)*1) +((13.97)*2)+ ((7.583)*2)- (0.5*0.30*8)) = 143.92								
	NET CL LENGTH = 143.92	sqm	1	143.92	0.3		43.18		
	deduction								
	D	sqm	-2	3	0.23		-1.38		
	D1	sqm	-2	2.25	0.23		-1.04		
	D3	sqm	-2	0.75	0.23		-0.35		
6	**20mm thick 1:3 External sand faced plaster**								
	GROUND FLOOR + FIRST FLOOR + PARAPET WALL	sqm	2	102.94		8.05	1657.33	**1645.36**	
	deduction								
	Doors								
	D	sqm	-1	3		2.1	-4.41		
	windows								
	W	sqm	-32	1.5		1.2	-3.97		
	W1	sqm	-7	1.5		0.9	-3.59		
	Ventilation (V)	sqm	-7	0.6		0.6	-2.52		
7	**20mm thick 1:3 Internal smooth plaster**								
	ground floor & first floor	sqm	8	13.74		2.9	318.77		
		sqm	4	6.74		2.9	78.18	**1041.80**	
		sqm	4	18.92		2.9	219.47		
		sqm	4	2.9		2.9	33.64		
		sqm	4	9.02		2.9	104.63		
		sqm	4	7.48		2.9	86.77		
		sqm	4	7.35		2.9	85.26		
		sqm	16	1.6		2.9	74.24		

		sqm	4	2.9		2.9	33.64		
		sqm	4	3.75		3	45.00		
	deduction								
	D	sqm	-2	3		2.1	-12.60		
	D1	sqm	-2	2.25		2.1	-9.45		
	D2	sqm	-3	1		2.1	-6.30		
	D3	sqm	-6	0.75		2.1	-9.45		
8	**10mm thick 1:3 plaster on slab**							**986.06**	
	ground floor & First floor	sqm	2	493.02	_	_	986.04		
9	**PCC (1:3:6) below floors**	cum	1	493.02	_	0.1	49.30	**49.30**	
10	**Vitrified tiles in flooring**							**981.21**	
	ground floor & first floor	sqm	2	493.02	_	_	986.04		
	deduction								
	doors								
	D	sqm	-3	3	0.23		-2.07		
	D1	sqm	-2	2.25	0.23		-1.04		
	D2	sqm	-3	1	0.23		-0.69		
	D3	sqm	-6	0.75	0.23		-1.04		
11	**Terrace tiles**	sqm	1	493.02	_	_	493.02	**493.02**	
12	**Skirting**							**241.77**	
	ground floor	rm	1	145.12			145.12		
	first floor	rm	1	110.15			110.15		
	deduction	rm	-3	3			-9.00		
		rm	-2	2.25			-4.50		
		rm	-3	1			-3.00		
		rm	-6	0.75			-4.50		
13	**RCC (1:2:4)**							**144.66**	
	RCC slab (10cm thick)	cum	2	493.02		0.1	98.60		
	RCC Lintel								
	ground & first floor	cum	1	143.74	0.23	0.1	3.31		
	RCC chajjas (10cm thick)								
		cum	38	1.96	0.45	0.1	3.35		
	RCC Stairs	cum	2	2.9	1	3	17.4		
		cum	2	3.75	1	3	22.5		
	deduction								

		cum	-2	2.9	0.25	0.15	-0.2175		
		cum	-2	3.75	0.25	0.15	-0.28125		
14	**Paint**								
	external paint								
	GROUND FLOOR + FIRST FLOOR + PARAPET WALL	sqm	2	102.94		8.05	1657.33		
	deduction							**1645.36**	
	Doors								
	D	sqm	-1	3		2.1	-4.41		
	windows								
	W	sqm	-32	1.5		1.2	-3.97		
	W1	sqm	-7	1.5		0.9	-3.59		
	Ventilation (V)	sqm	-7	0.6		0.6	-2.52		
	internal paint								
	ground floor & first floor	sqm	8	13.74		2.9	318.77		
		sqm	4	6.74		2.9	78.18		
		sqm	4	18.92		2.9	219.47		
		sqm	4	2.9		2.9	33.64		
		sqm	4	9.02		2.9	104.63		
		sqm	4	7.48		2.9	86.77		
		sqm	4	7.35		2.9	85.26		
		sqm	16	1.6		2.9	74.24		
		sqm	4	2.9		2.9	33.64	**2027.84**	
		sqm	4	3.75		3	45.00		
	deduction								
	D	sqm	-2	3		2.1	-12.60		
	D1	sqm	-2	2.25		2.1	-9.45		
	D2	sqm	-3	1		2.1	-6.30		
	D3	sqm	-6	0.75		2.1	-9.45		
	paint on slab								
	ground floor & First floor	sqm	2	493.02	_	_	986.04		
15	**Earth Filling in Plinth**								
	ground floor	cum	1	493.02		0.5	246.51		

Table 13.1 Quantity sheet of Community Hall

ABSTRACT SHEET FOR COMMUNITY HALL					
SR NO.	**DESCRIPTION**	**QUANTITY**	**RATE**	**UNIT**	**AMOUNT RS.**
1	Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(B) Dense or Hard soil	178.32	85.9	cu.m	15317.27568
2	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- Graded brick bat aggregate 40mm normal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton)	25.47	2157	cu.m	54946.5552
3	Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:5. (1- Cement : 5 -fine sand)(C) Fly Ash Bricks (upto 10 ton)	85.968	3344	cu.m	287476.992
4	Brick work in super strucrture in cement mortar	198.47	3500	cu.m	694650.6
5	Providing and laying damp proof course 25mm thick cement concrete 1:2:4 (1- Cement : 2 coarse sand : 4 stone aggregate 10 mm nominal size) and curing complete (upto 10 ton)	40.42	159	sq.m	6426.144
6	20mm thick sand faced cement plaster on walls upto height 10 metres above ground level consisting of 12mm thick backing coat of C.M. 1:3 (1-cement : 3-sand) and 8mm thick finishing coat of C.M. 1:1 (1-cement : 1-sand) etc. complete.	1645.36	205	sq.m	337299.128
7	Providing 20mm thick cement plaster in single coat on single or half brick walls for interior plastering upto floor two level and finished even and smooth in (i) Cement mortar 1:3 (1-cement:3-sand)	1041.80	150	sq.m	156270.6

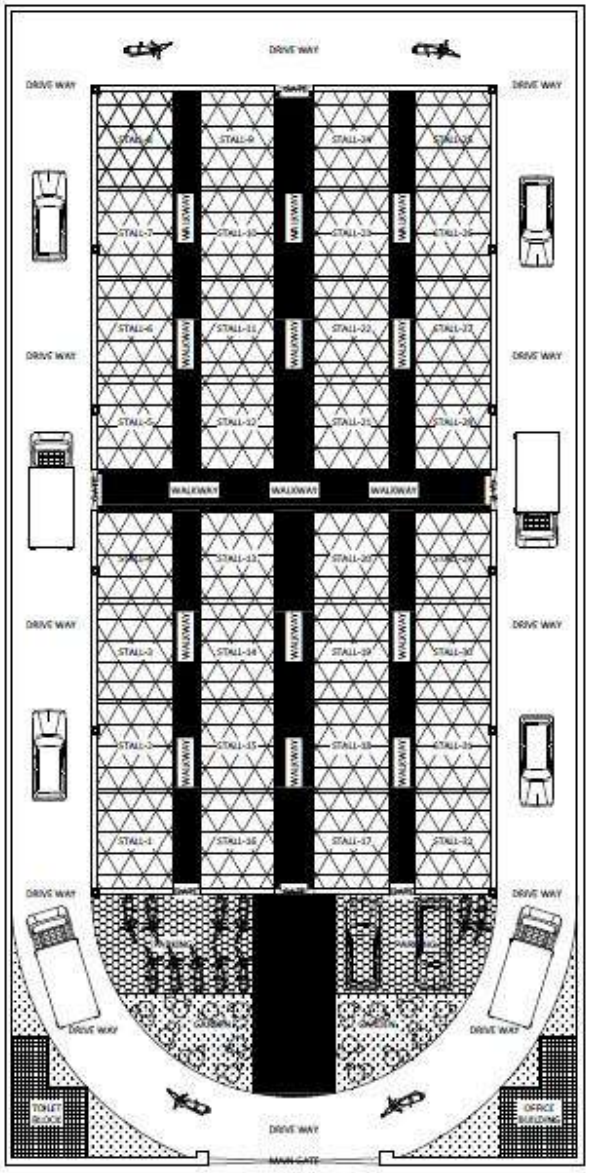
8	Providing 10mm thick cement plaster in single coat on brick/concrete walls for interior plastering upto floor two level and finished even and smooth in (i)Cement mortar 1:3 (1-cement:3-sand)	986.06	87.2	sq.m	85984.432
9	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- crushed stone aggregates 20 mm nominal size) and curing complete including cost of formwork in (A) Wall Caps / Coping (more than 10 ton)	49.30	2712	cu.m	133707.024
10	Providing and laying Vitrified tiles 8 to 10 mm thick , 24'' x 24'' in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3-coarse sand) finishing with flush pointing in white cement. (upto 10 ton)	981.21	888	sq.m	871314.48
11	Providing and laying chequered terrazo tiles 28mm thick with marble chips of sizes upto 6mm in treads of stairs and staircases in 12mm thick bed of lime mortar 1:1.5 (1-Lime putty :1.5 coarse sand) or C.M. 1:6 jointed with neat cement slurry mixed with pigment to match the shade of tiles including rubbing and polishing complete. (B) Dark shades using ordinary cement (upto 10 ton)	493.02	467	sq.m	230240.34
12	Providing and laying marble chips skirting (Terrazo) or dedo rubbed, and polished to Granolithic finish top layer 6mm thick with white,black or white and black marble chips of size from smallest to 4mm nominal size	241.77	386	sq.m	93323.22

	laid in cement marble powder mix 3:1 (3- Cement : 1 marble powder by weight) in proportion of 4:7 (4-cement marble powder mix : 7-marble chips by volume) 20mm thick with under layer 14mm thick cement plaster 1:3 (1-cement : 3-coarse sand) (A) Dark shade pigment with ordinary cement (In top layer only) (upto 10 ton)				
13	Providing and laying controlled cement concrete 1:2:4 and exposed work with curing etc. complete including the cost of formwork and including the cost of reinforsement for R.C.Cwork in (iii) Slabs having more than 10 cm and upto 13 cm. thickness	144.66	8800	cu.m	1273033.256
14	Finishing wall with water proofing cement paint of on wall surfaces (Two coats) to give an approved brand and manufacture and of required shape even shade after thoroughly brushing the surface to remove all dirt and remains of loose powered materials.	1645.36	36.1	sq.m	59397.55376
15	Wall painting (two coats) with plastic emulsion paint of approved brand and manufacture on undecorated wall surface to give an even shade including throughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth.	2027.84	49.6	sq.m	100581.0624
16	Filling available excavated earth (excluding rock) in trenches. plinth, sides of foundations etc. in layers not exceeding 20 cm. in depth consolidating each disposited layer by ramming and watering.	246.51	76.5	cu.m	18858.015

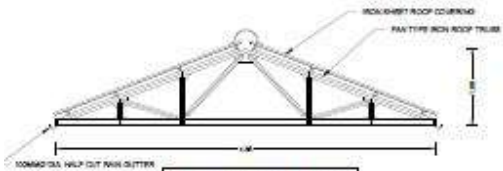
	TOTAL				**4418826.678**
17	Add 3% contigencies				132564.8003
18	Add 5% work charge establishment				220941.3339
19	Add 10% plumbing and sanitary works				441882.6678
20	Add 10% electrification charge				441882.6678
TOTAL ESTIMATED COST					**5656098.148**

Table 13.2 Abstract sheet of Community Hall

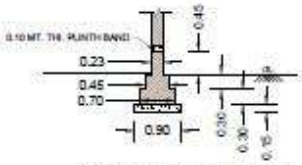
13.1.2 Civil Design 2 :-



LAYOUT PLAN FOR VEGETABLE MARKET BUILDING



DETAILS OF ROOF TRUSS
SCALE : 1 : 200



DETAILS OF FOUNDATION

ELEVATION

QUANTITY SHEET OF VEGETABLE MARKET									
SR. NO.	DESCRIPTION OF ITEMS	UNIT	NOS.	L	B	H	Quanity	Total Quantity	Rem arks
1	**Excavation for foundation in ordinary soil**							60.129	
	L = (14.77*2)+(29.77*2)=89.08	cu.m	1	89.08	0.9	0.75	60.129		
	NET CENTER LINE LENGTH (L) = 89.08 m								
2	**PCC (1:4:8)**							12.123	
	L = (14.77*2)+(29.77*2)=89.08	cu.m	1	89.8	0.9	0.15	12.123		
	NET CENTER LINE LENGTH (L) = 89.08 m								
3	**Brick masonary in plinth and foundation**							48.5369	
	1st footing								
	L = (14.77*2)+(29.77*2)=89.08	cu.m	1	89.8	0.7	0.3	18.858		
	NET CENTER LINE LENGTH (L) = 89.08 m								
	2nd footing								
	L = (14.77*2)+(29.77*2)=89.08	cu.m	1	89.8	0.45	0.3	12.123		
	NET CENTER LINE LENGTH (L) = 89.08 m								
	3rd footing								
	L = (14.77*2)+(29.77*2)=89.08	cu.m	1	89.8	0.23	0.85	17.5559		
	NET CENTER LINE LENGTH (L) = 89.08 m								
4	**DPC**							20.4884	
	L =	sq.m	1	89.08	0.23	-	20.4884		

	(14.77*2)+(29.77*2)=89.08								
	NET CENTER LINE LENGTH (L) = 89.08 m								
5	**PCC (1:3:6) below floors**	cu.m	1	15	30	0.1	45	45	
6	**Vitrified tiles in flooring**	sq.m	1	15	30		450	450	
7	**Earth Filling in Plinth**	cu.m	1	15	30	0.35	157.5	157.5	
8	**Safety grill and elevation pipes**	kg	Lumpsum				8000.00	8000.00	
9	**Steel Roof Truss**	kg	550 each*6 nos.truss				3300	3300	
10	**Paint On Roof Truss**	kg	Lumpsum				10000	10000	

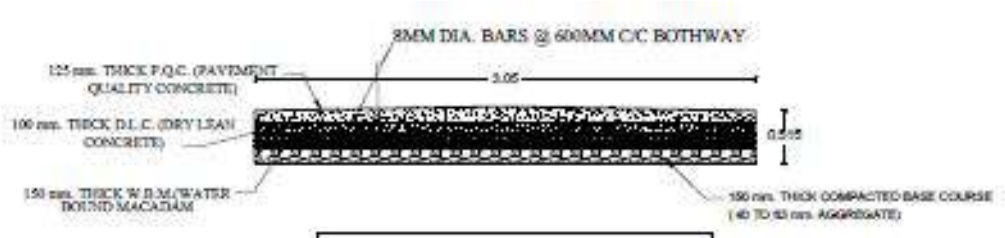
Table 13.3 Quantity sheet of Vegetable Market

ABSTRACT SHEET OF VEGETABLE MARKET					
SR NO.	**DESCRIPTION**	**QUANTITY**	**RATE**	**UNIT**	**AMOUNT RS.**
1	Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(B) Dense or Hard soil	60.129	85.9	cu.m	5165.0811
2	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- Graded brick bat aggregate 40mm normal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton)	12.123	2157	cu.m	26149.311
3	Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:5. (1- Cement : 5 -fine sand)(C) Fly Ash Bricks (upto 10 ton)	48.5369	3344	cu.m	162307.3936

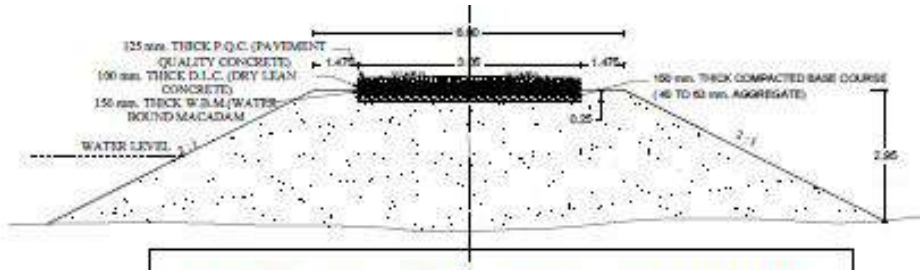
4	Providing and laying damp proof course 25mm thick cement concrete 1:2:4 (1- Cement : 2 coarse sand : 4 stone aggregate 10 mm nominal size) and curing complete (upto 10 ton)	20.4884	159	sq.m	3257.6556
5	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- crushed stone aggregates 20 mm nominal size) and curing complete including cost of formwork in (A) Wall Caps / Coping (more than 10 ton)	45	2712	cu.m	122040
6	Providing and laying Vitrified tiles 8 to 10 mm thick , 24" x 24" in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3-coarse sand) finishing with flush pointing in white cement. (upto 10 ton)	450	888	sq.m	399600
7	Filling available excavated earth (excluding rock) in trenches. plinth, sides of foundations etc. in layers not exceeding 20 cm. in depth consolidating each disposited layer by ramming and watering.	157.5	76.5	cu.m	12048.75
8	safety grill and elevation	Lumpsum			8000
9	Steel Roof Truss including all expenses	3300	80	kg	264000
10	Paint On Roof Truss	1000	260	kg	260000
	TOTAL				1262568.191
17	Add 3% contigencies				37877.04574
18	Add 5% work charge establishment				63128.40957
19	Add 10% plumbing and sanitary works				126256.8191
20	Add 10% electrification charge				126256.8191
TOTAL ESTIMATED COST					**1616087.285**

Table 13.4 Abstract sheet of Vegetable Market

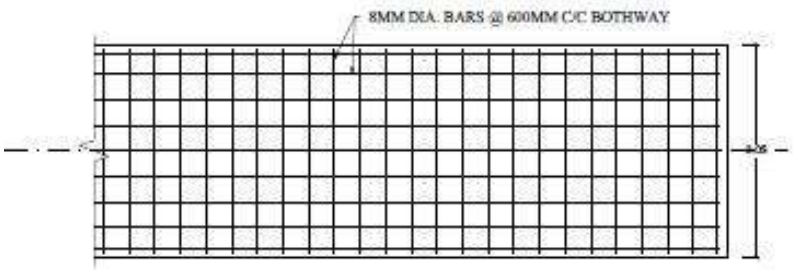
13.1.3 Civil Design 3 :-



PAVEMENT DETAIL



ADOPTED TYPICAL CROSS SECTION OF R.C.C. PAVEMENT ROAD



PLAN SHOWING DETAILS OF REINFORCEMENT

QUANTITY SHEET OF R.C.C. ROAD							
Item No.	**Description**	**Nos.**	**L**	**B**	**H**	**Qty.**	**Unit**
1	Box cutting the road surface to proper slope and camber for making a base of road work including removing the excavated stuff and dispositing on the road side slope as directed up to 50.0 mt lead [ch-26/ item no.8.0.]						
		1.00	250.00	3.05	0.25	190.62	Cumt.
		Say Total Qty.				**191.00**	Cumt.
2	Collection carting & staking of Machine Cut Crushed Stone Aggregate of Hard Quality on road site including all taxes and royalties.....Etc.comp.						
	(i) 40mm to 63 mm Size aggregate	1.00	250.00	3.05	0.15	114.37	
	Add 8% for Voids	1.00	250.00	0.08		20.00	
		Total Qty				134.37	Cumt.
		Say Total Qty.				**135.00**	Cumt.
3	Collection carting & staking Machine Cut Stone Dust on road site including all taxes and royalties.....Etc.comp.						
	Take 25% of Item No-2	1.00	250.00		0.25	62.50	Cumt.
		Say Total Qty.				**63.00**	Cumt.
4	Spreading the stone aggregate for rolling and W.B.M. including filling the interstices to required camber and gradient (excluding spreading of Blindage)						
	As per Item No. 2.	1.00	250.00			250.00	Cumt.
		Say Total Qty.				**250.00**	Cumt.
5	Spreading blindage or road crust filling the gaps in metal and leveling to camber and gradient as directed.(i) Murrum						
	As per Item No. 3	1.00	250.00		0.25	62.50	Cumt.
		Say Total Qty.				**63.00**	Cumt.

6	Rolling and consolidating water bound macadam (except laterite and Kankar) including watering not exceeding 150mm thickness (Main layer including binding materials) including filling in depressions which occur during the process.(B) With power roller exceeding 8 tonne and not exceeding 12 tonne. in 1 cmt WBM =6.66 smt						
		1.00	250.00	3.05		762.50	Sq.Mt
		Say Total Qty.				**763.00**	Sq.Mt
7	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- hand broken stone aggregates (40 mm) nominal size) and curing complete including cost of formwork WITH PANNEL VIBRATOR and Average 100 mm thick						
		1.00	250.00	3.05	0.10	76.25	Cumt.
		Say Total Qty.				**77.00**	Cumt.
8	Providing & laying cotrolled cement concrete M-300 & curing complate excluding the cost of form work & reinforcementetc.comp.						
		1.00	250.00	3.05	0.125	95.31	Cumt.
		Say Total Qty.				**96.00**	Cumt.
9	Compaction & finishing of cement concrete surface by Trimix incl.surface vibrator,power floater , power troweler & as per instruction etc. Comp including groove cutting						
		1.00	250.00	3.05		762.50	Sq.Mt
		Say Total Qty.				**763.00**	Sq.Mt
10	supplying and spreading hardner on finishing surface use minimum 3.5kg/ sqmt (RA)						
		1.00	250.00	3.05		762.50	Sq.Mt
		Say Total Qty.				**763.00**	Sq.Mt

Table 13.5 Quantity sheet of R.C.C. Road

ABSTRACT SHEET FOR R.C.C. ROAD					
R&B SOR 2015-2016			**Estimated Coast**		**837589.00**
Item No.	**Discription of Item**	**Qty**	**Rate**	**Per**	**Amount**
1	Box cutting the road surface to proper slope and camber for making a base for road work including removing the excavated stuff and depositing on the road side slope as directed upto All LEAD LIFT				
	[ch-26/ item Code 26008 P.No.178]		65.50		
	Add 1% LC		0.65		
		191.00	66.15	Cumt.	12634.65
2	Collection carting & staking of Machine Cut Crushed Stone Aggregate of Hard Quality on road site including all taxes and royalties.....Etc.comp. (i) 40mm to 63 mm Size aggregate				
	As per Lead Chart		602.35		
			6.02		
		135.00	608.37	Cumt.	87605.28
3	Collection carting & staking Murrum on road site including all taxes and royalties.....Etc.comp.				
	As per Lead Chart		204.12		
			2.04		
		63.00	206.16	Cumt.	7421.76
4	Spreading the stone aggregate for rolling and W.B.M. including filling the interstices to required camber and gradient (excluding spreading of Blindage) (i) 40mm to 63 mm Size aggregate(HB)				
	SOR R&BBhav2015-16, Item Code26018A No.18/26.20 P.No.180		157.00		
			1.57		
		250.00	158.57	Cumt.	39642.50
5	Spreading blindage or road crust filling the gaps in metal and leveling to camber and gradient				

	as directed.(i) Murrum				
	SOR R&B Bhav 2015-16, ItemCode 26020ANo.20/26.23 P.No.180		92.70		
			0.92		
		63.00	93.62	Cumt.	5898.06
6	Rolling and consolidating water bound macadam (except laterite and Kankar) including watering not exceeding 150mm thickness (Main layer including binding materials) including filling in depressions which occur during the process.(B) With roller exceeding 8 tonne and not exceeding 12 tonne.				
	SORR&BBhav 2015-16, ItemCode 26022 CH 26 P.No.181		9.50		
			0.09		
		763.00	9.59	Smt.	7317.17
7	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- hand broken stone aggregates (40 mm) nominal size) and curing complete including cost of formwork WITH PANNEL VIBRATOR and Average 100 mm thick				
	(A) Foundation and Plinth				
	SORR&BBhav 2015-16, ItemCode 05003 CH 5 P.No.47		2321.00		
	Add LC 1%		23.21		
		77.00	2344.21	Cumt.	180504.17
8	Providing & laying cotrolled cement concrete M-300 & curing complate excluding the cost of form work & reinforcement etc.comp. (Average 0.125m Thick)				
	[ch-5/ item no.25/5.8.3(A)]P.No.56		3939.00		
	Add LC 1%		39.39		

		96.00	3978.39	Cumt.	381925.44
9	Compaction & finishing of cement concrete surface by Trimix incl.surface vibrator,power floater , power troweler & as per instruction etc. Comp including groove cutting				
	(Market Rate)		78.00		
	Add LC 1%		0.78		
		763.00	78.78	Sqmt.	60109.14
10	supplying and spreading hardner on finishing surface use minimum 3.5kg/ sqmt				
	As per R.A.2		60.00		
	Add LC 1%		0.6		
		763.00	60.60	Sqmt	46237.80
				Total Amount Rs.....	829295.97
				Add 1% QC Rs.....	8292.96
				Total Amount Rs.....	837588.93
				Say Total Amount Rs.....	837589.00

Table 13.6 Abstract sheet of R.C.C. Road

13.1.4 Civil Design 4 :-

➢ DESIGN OF STREET LIGHTING

- CONSIDERATION

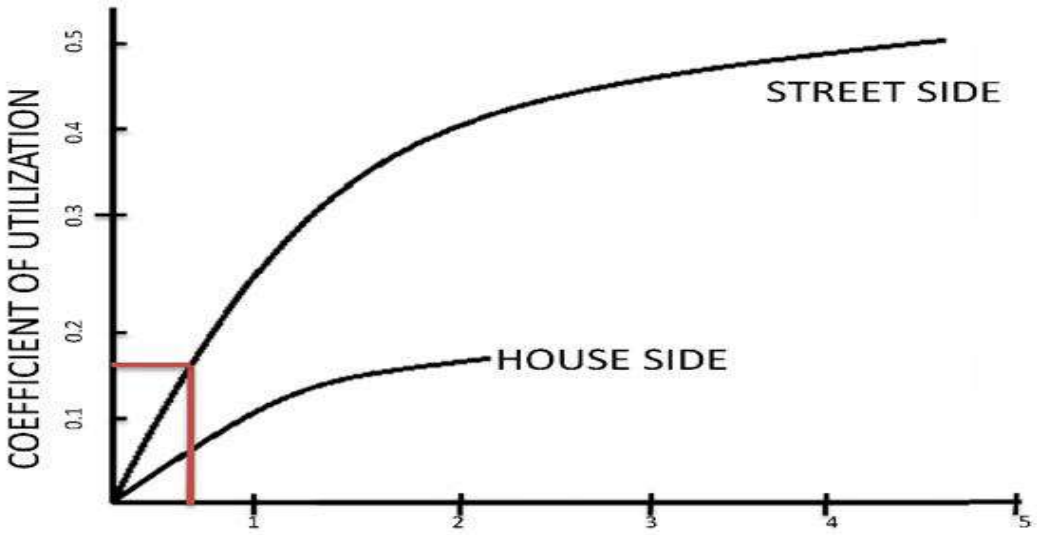
DATA:-

- Stretch = 800 m
- Road width = 6 m
- Lux = 5 lumen per sq m
- Maintenance factor = 0.8
- Lumen= 8000
- Mounting height= 8m

STEP-1:- Find coefficient of utilization:-

Luminaries are properly selected and mounted on a and effective with minimum cost. For a 230 volts system, a voltage drop of5% is allowed although in external cases 15% voltage drop is sometimestolerated.

For various types of luminaries' distribution,are available for determination of avg. LUX of intensity over the roadwaysurface where lamp lumen, mounting height, width of paved area andspacing b/w lighting poles are known. The typical utilisation coefficient isgiven in figure,



RATIO = $\frac{WIDTHOFAREA}{MOUNTINGHEIGHT}$

Ratio = 6m/8m = 0.75
Using 0.75 value of ratio we got the coefficient of utilization is 0.18.

STEP-2 :- Calculates distance between each street light pole:-

Luminaries are properly selected and mounted on a location most feasible and effective with minimum cost. For a 230 volts system, a voltage drop of 5% is allowed although in external cases 15% voltage drop is sometimes tolerated.

Road detail: the width of road is 6m
Pole detail: the height of pole is 8m
Luminaries of each pole: wattage of luminaries is 30-Watt, lamp output (LL) is 8000lumens, required lux level (Eh) IS 5 lux, coefficient of utilization factor (Cu) is 0.18, lamp lumen depuration factor (LLD) is 0.8, maintains factor (MF) IS 0.8.

Spacing between each pole = (LL*CU*MF)/(Eh*W)

Here, CU is calculateshow in above figure…
Pavement width/ mounting height = 6/8 = 0.75 Approx.
So, cu is = 0.18
Spacing between each pole = 8000*0.18*0.8/5*6
= 38.4 m
= 38 m Approx.
spacing between each pole is 38 m approx.

There for total numbers of street lights required are 21 for 800m stretch of road.

ESTIMATION:

One street light set consists of,
LED Lamp

Battery

TYPE 1 Street Light:-

Power and type of Lamp: 11W LED LIGHT

Cost of one street light set at current price is **Appx. Rs. 23,625/-**
Total number of SL required = 21
Total Cost = Number of LED street lights x Cost of one set of SL

Total Cost = Rs. 21 x 23,625
= Rs. 496,125/-

TYPE 2 Street Light :-

Power and type of Lamp: 20W LED LIGHT

Cost of one street light set at current price is Appx. Rs. 33,600/-
Total number of SL required =26
Total Cost = Number of LED street lights x Cost of one set of SL
Total Cost = Rs. 21 x 33,600
= Rs. 705600/-

TOTAL ESTIMATED COST OF S.S.L. PROJECT:

Cost for Type-1 Street Light + cost for Type-2 Street Light

= Rs. 4,96,125 +7,05,600

= Rs. 12,01,725 /-

DESIGN LIFE: 15 year

INSTALLATON COST: **Approx. Rs. 12,01,725 /-**

MAINTENANCE:To be replaced after 15 year.

LED lamp to be replaced after 10 year & its cost appx.Rs.4000.

Battery to be replaced after 8-9 year & its cost appx.Rs.4000-6000.

Pole need to be painted every three year to prevent corrosion.

DESIGN AS PER DIALux SOFTWARE

STREET LIGHT DESIGN OF VALUKAD VILLAGE

Pole Detail Images OF Street Light Design :-

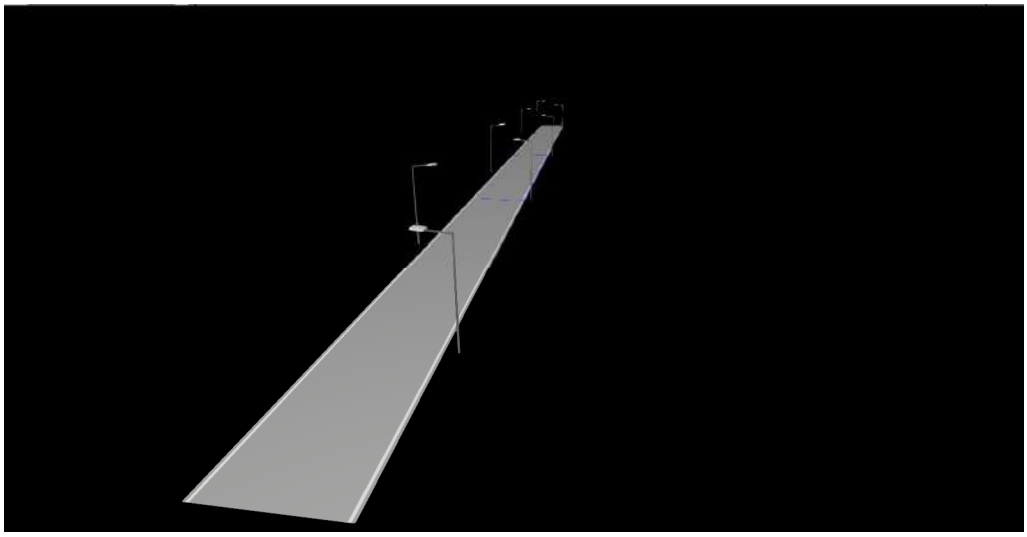


Fig13.2 Road Scene - 1

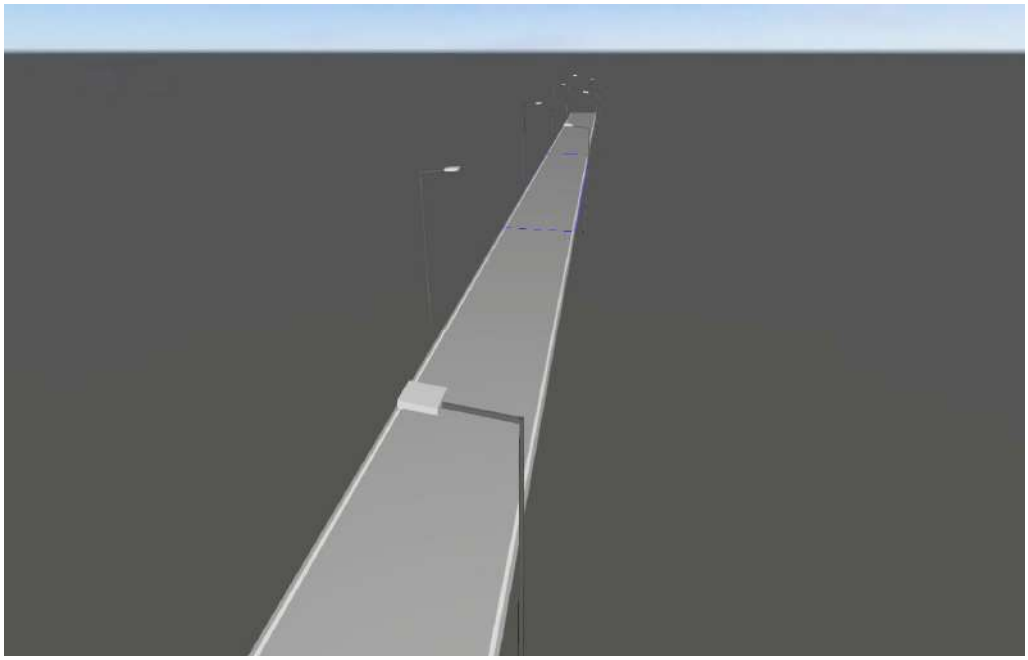
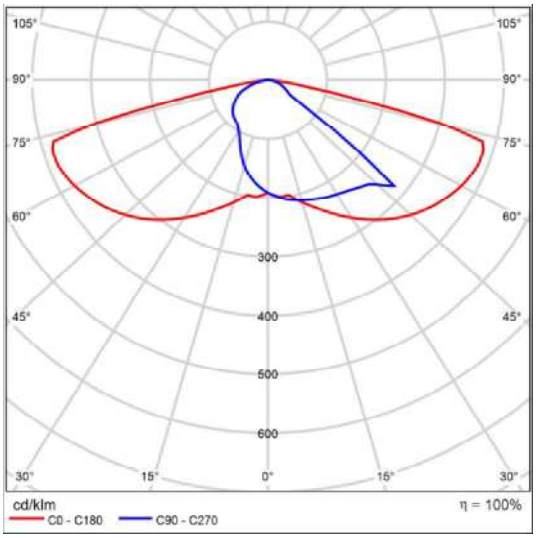


Fig13.3 Road Scene - 2

Product data sheet

Thorn DYANA2 LED 72L70 NR 740 CL2 MLE [STD]



Article No.	96264357
P	152.0 W
Φ_{Lamp}	20060 lm
$\Phi_{Luminaire}$	20060 lm
η	100.00 %
Luminous efficacy	132.0 lm/W
CCT	4000 K
CRI	70

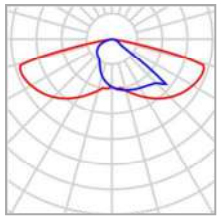
Polar LDC

A high-quality LED luminaire with narrow road light distribution and Electronic, control gear. Body and spigot: die-cast aluminum, textured dark grey finish. Canopy: spun aluminum, textured anthracite finish. Enclosure: 5mm thick, toughened glass. Class II electrical, IP66. Supplied, ready to install, in a single box. Complete with 4000K LED.

Mounting: Ø60mm side entry with 0° tilt.

Dimensions: 760 x 600 x 130 mm Luminaire input power: 152 W Weight: 14.7 kg
Scx: 0.049 m²
Street 1 · Alternative 1
Summary (according to EN 13201:2015)

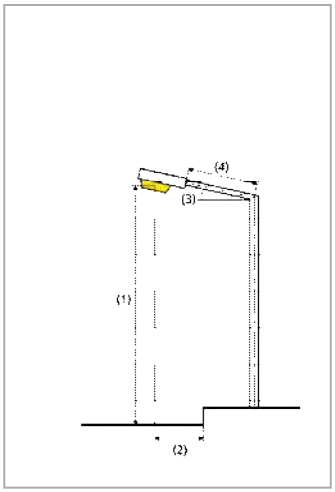
.



Manufacturer	Thorn	P	30.0 W
Article No.	96264357	ΦLamp	7000 lm
Article name	DYANA2 LED ʁ 740 CL2 MLE	ΦLuminaire	7000 lm
		η	100.00 %
Fitting	user-defined		

DYANA2 LED 72L70 NR 740 CL2 MLE [STD] (both sides offset)

Pole distance	38.000 m
Light spot height	8.000
Light point overhang	1.000 m
Boom inclination	5.0°
Boom length	1.500 m
Annual operating hours	4000 h: 100.0 %, 30.0 W
Consumption	1560.0 W/km
ULR / ULOR	0.00 / 0.00



Max. luminous intensities
Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.70°: 611 cd/klm
≥ 80°: 99.9 cd/klm
≥ 90°: 0.00 cd/klm

Luminous intensity classThe luminous intensity values in [cd/klm] for calculation of the luminous intensity class refer to the luminaire luminous flux according to EN 13201:2015.

Glare index class	D.5

Street 1 · Alternative 1
Summary (according to EN 13201:2015)

Results for valuation fields

A maintenance factor of 0.67 was used for calculating for the installation.

Results for energy efficiency indicators

Symbol	Calculated	Consumption
Street 1 Dp	0.013 W/lx*m²	-

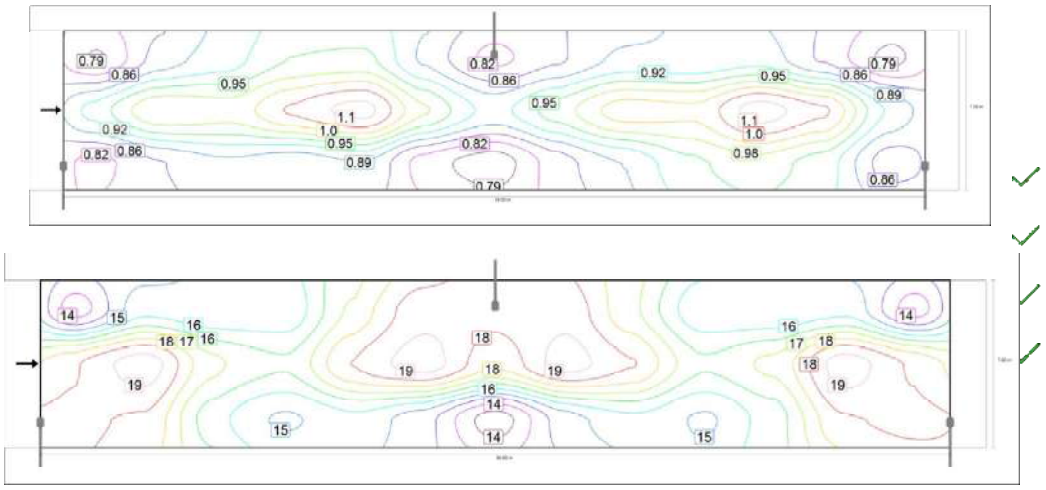
DYANA2 LED 72L70 NR 740
CL2 MLE [STD] (both sides offset)
Design for 0.9 kWh/m² yr. 240.0 kWh/yr.

Street 1 · Alternative 1
Roadway 2 (M4)

Results for valuation field

	Symbol	Calculated	Target	Check
Roadway 2 (M4)	L_{av}	0.92 cd/m²	≥ 0.75 cd/m²	✓
	U_o	0.85	≥ 0.40	✓
	U_l	0.83	≥ 0.60	✓
	TI	11 %	≤ 15 %	✓
	R_{EI}	0.47	≥ 0.30	✓

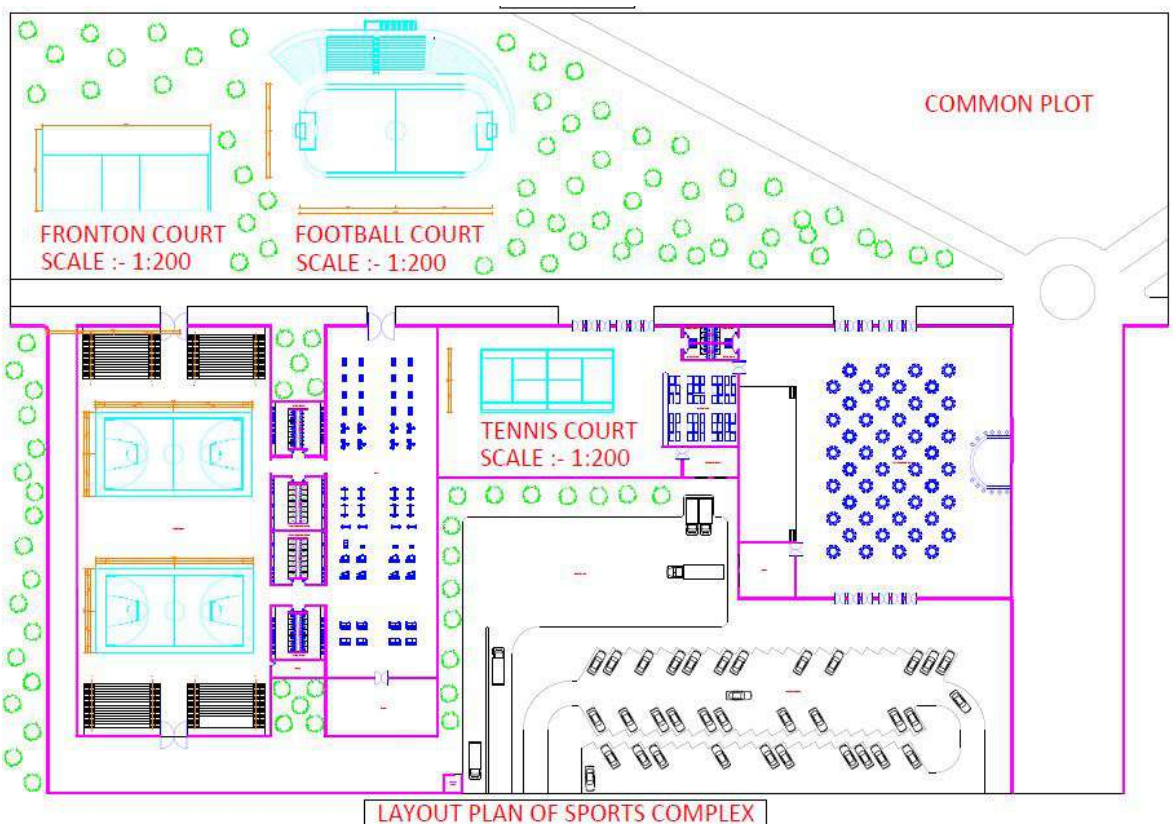
Position:
Maintenance value, horizontal illuminance [lx] (Iso-illuminance curves)



REFRENCES:-

- https://en.wikipedia.org/wiki/Street_light
- https://www.electrical4u.com/road-lighting-design/
- https://www.researchgate.net/publication/283759053_A_New_Approach_to_Street_Lighting_Design
- Highway Engineering by khanna, justo and veer Raghavan
- Bureau of Indian Standards (national lighting code 2010)code of practice for lighting of public through fares.
- DIALuxevo software

13.1.5 Civil Design 5 :-



QUANTITY SHEET OF SPORTS COMPLEX									
SR. NO.	**DESCRIPTION OF ITEMS OF BUILDING COMPONENTS**	**UNIT**	**NOS.**	**L**	**B**	**H**	**Quanity**	**Total Quantity**	**Remarks**
1	**Excavation for foundation in ordinary soil**								
	NET CENTER LINE LENGTH (L) = 932.00 m	cu.m	1	932	0.9	0.75	629.1	629.1	
2	**PCC (1:4:8)**								
	NET CENTER LINE LENGTH (L) = 932.00 m	cu.m	1	932	0.9	0.15	125.82	125.82	
4	**DPC**								
	NET CENTER LINE LENGTH (L) = 932.00 m	sq.m	1	932	0.23	-	214.36	214.36	
5	**PCC (1:3:6) below floors**	cu.m	1	932	30	0.1	2796	2796	
6	**Brick Masonary**	cu.m	1	932	0.23	5	1071.8	1071.8	
7	**Vitrified tiles in flooring**	sq.m	1	170	50	-	8500	8500	
8	**Earth Filling in Plinth**	cu.m	1	932	30	0.35	9786	9786	
9	**Safety grill and elevation pipes**	kg	Lumpsum				80000.00	80000	
10	**Plaster**	sq.m	1	932.00	-	5.00	4660.00	4660.00	
11	**Paint**	kg	Lumpsum				100000	100000	
12	**Compound Wall**	cu.m	1	700	0.23	2.75	442.75	442.75	
13	**RCC**	cu.m	1	58.32	16	0.15	139.968	139.968	
SR. NO.	**DESCRIPTION OF ITEMS OF COURTS AND OTHER AREA**	**UNIT**	**NOS.**	**L**	**B**	**H**	**Quanity**	**Total Quantity**	**Remarks**
13	**Football Court**	sq.m	1	66	20	-	1320	1320	
14	**Tennis Court**	sq.m	1	14	20	-	280	280	
15	**Squash Court**	sq.m	1	15	30	-	450	450	
16	**Parking area and Goods yard**	sq.m	1	97.8	50	-	4890	4890	
17	**Architectural Landscaping**	sq.m	1	100	72	-	7200	7200	

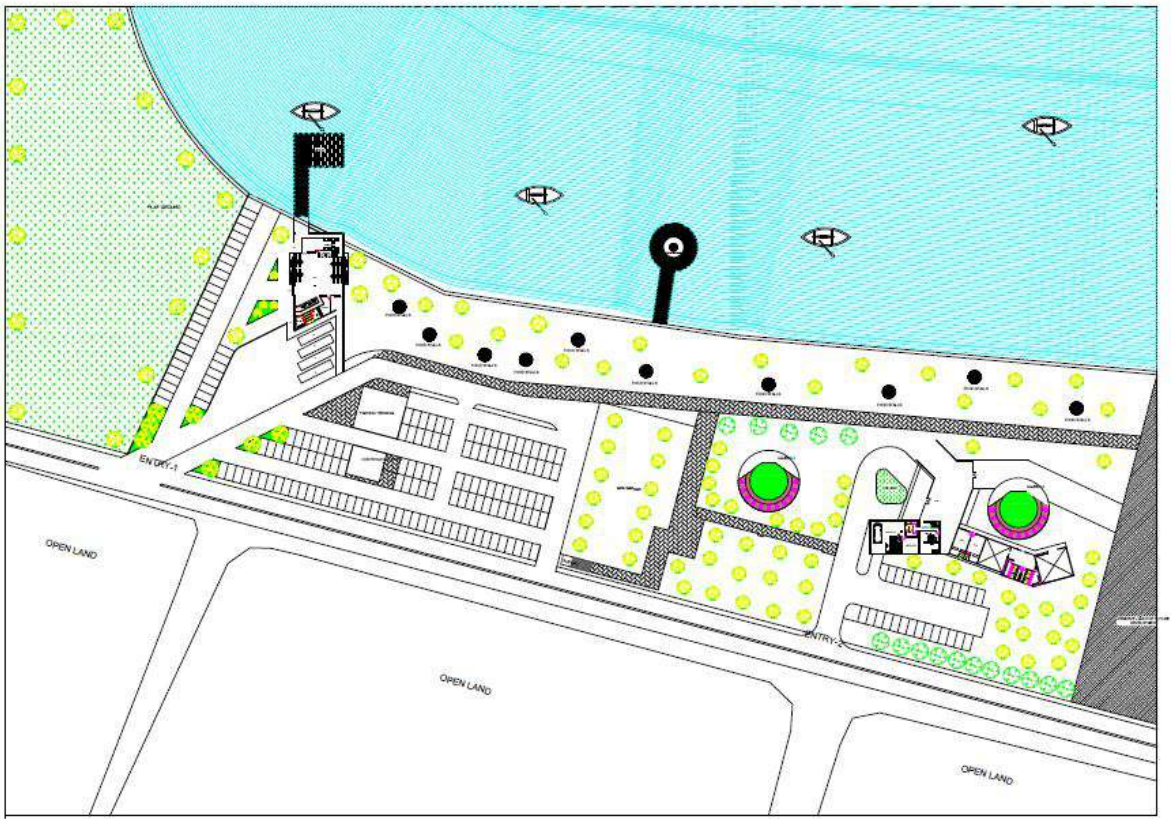
Table 13.7 Quantity sheet of Sports Complex

ABSTRACT SHEET OF SPORTS COMPLEX					
SR NO.	**DESCRIPTION**	**QUANTITY**	**RATE**	**UNIT**	**AMOUNT RS.**
1	Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(B) Dense or Hard soil	629.1	85.9	cu.m	54039.69
2	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- Graded brick bat aggregate 40mm normal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton)	125.82	2157	cu.m	271393.74
3	Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:5. (1- Cement : 5 -fine sand)(C) Fly Ash Bricks (upto 10 ton)	1514.55	3344	cu.m	5064655.2
4	Providing and laying damp proof course 25mm thick cement concrete 1:2:4 (1- Cement : 2 coarse sand : 4 stone aggregate 10 mm nominal size) and curing complete (upto 10 ton)	214.36	159	sq.m	34083.24
5	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- crushed stone aggregates 20 mm nominal size) and curing complete including cost of formwork in (A) Wall Caps / Coping (more than 10 ton)	2796	2712	cu.m	7582752
6	Providing and laying Vitrified tiles 8 to 10 mm thick , 24" x 24" in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3-coarse sand) finishing with flush pointing in white cement. (upto 10 ton)	8500	888	sq.m	7548000

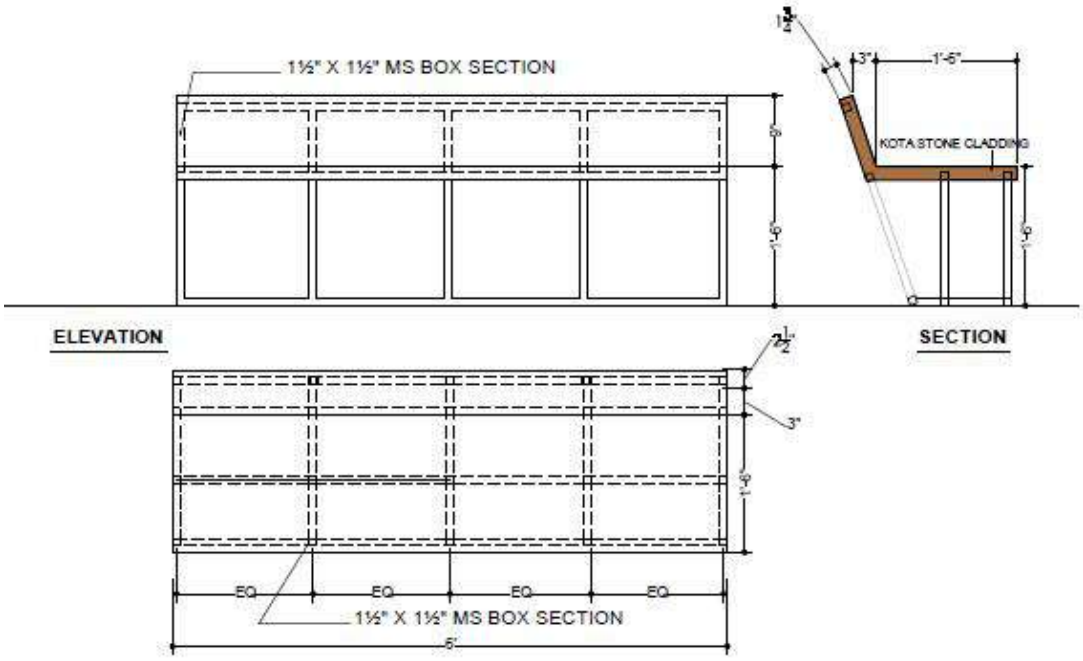
7	Filling available excavated earth (excluding rock) in trenches. plinth, sides of foundations etc. in layers not exceeding 20 cm. in depth consolidating each disposited layer by ramming and watering.	9786	76.5	cu.m	748629
8	safety grill and elevation	Lumpsum			8000
9	Plaster	4660.00	220	sq.m	1025200
10	Paint	Lumpsum			100000
11	RCC	139.968	8000	cu.m	1119744
12	Football Court	1320	1000	nos.	1320000
13	Tennis Court	280	1000	nos.	280000
14	Squash Court	450	1000	nos.	450000
15	Parking area and Goods yard	4890	800	sq.m	3912000
16	Architectural Landscaping	7200	500	sq.m	3600000
	TOTAL				33118496.87
17	Add 3% contigencies				993554.9061
18	Add 5% work charge establishment				1655924.844
19	Add 10% plumbing and sanitary works				3311849.687
20	Add 10% electrification charge				3311849.687
	TOTAL ESTIMATED COST				**42391675.99**

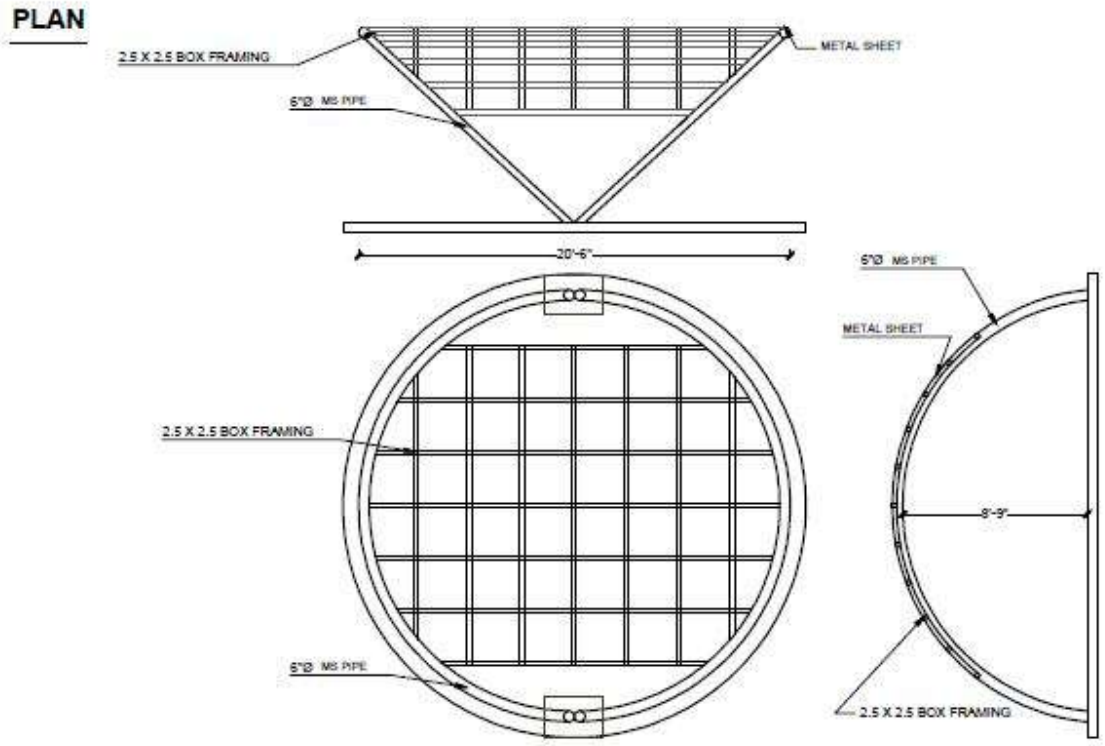
Table 13.8 Abstract sheet of Sports Complex

13.1.6 Civil Design 6 :-



LAYOUT PLAN OF LAKE FRONT





GAZEBO DETAIL

QUANTITY SHEET OF LAKE FRONT									
. NO .	**DESCRIPTION OF ITEMS OF BUILDING COMPONENTS**	**UNIT**	**NOS.**	**L**	**B**	**H**	**Quanity**	**Total Quantity**	**Remarks**
1	**Excavation for foundation in ordinary soil**								
	NET CENTER LINE LENGTH (L) = 255.00 m	cu.m	1	255	0.9	0.8	172.125	172.125	
2	**PCC (1:4:8)**								
	NET CENTER LINE LENGTH (L) = 255.00 m	cu.m	1	255	0.9	0.2	34.425	34.425	
4	**DPC**								
	NET CENTER LINE LENGTH (L) = 255.00 m	sq.m	1	255	0.23	-	58.65	58.65	
5	**PCC (1:3:6)**	cu.m	1	255	4	0.1	102	102	

	below floors								
6	**Brick Masonary**	cu.m	1	255	0.23	5	293.25	293.25	
7	**Vitrified tiles in flooring**	sq.m	1	45	20	-	8500	8500	
8	**Earth Filling in Plinth**	cu.m	1	255	4	0.4	357	357	
9	**Safety grill and elevation pipes**	kg	Lumpsum				100000.00	100000	
10	**Plaster**	sq.m	1	255.00	-	5.00	1275.00	1275.00	
11	**Paint**	kg	Lumpsum				120000	120000	
12	**Compound Wall**	cu.m	1	983	0.23	2.8	621.7475	621.7475	
13	**RCC**	cu.m	1	45	20	0.2	135	135	
SR. NO.	**DESCRIPTION OF ITEMS OF COURTS AND OTHER AREA**	**UNIT**	**NOS.**	**L**	**B**	**H**	**Quanity**	**Total Quantity**	**Remarks**
14	**Gazebo**	cu.m	2	7	5	1.5	105	105	
15	**Food Court**	sq.m	10	12.5	1	-	125	125	
16	**Paver Block and Walkway flooring**	r.m	1	1985	-	-	1985	1985	
17	**Parking area**	sq.m	1	80	60	-	4800	4800	
18	**Fountain area**	sq.m	1	7	5	-	35	35	
19	**Dock area**	sq.m	1	12	10.5	-	126	126	
20	**Architectural Landscaping**	sq.m	1	150	70	-	10500	10500	

Table 13.9 Quantity sheet of Lake Front

ABSTRACT SHEET OF LAKE FRONT					
SR NO.	**DESCRIPTION**	**QUANTITY**	**RATE**	**UNIT**	**AMOUNT RS.**
1	Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(B) Dense or Hard soil	172.125	85.9	cu.m	14785.5375
2	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- Graded brick bat aggregate 40mm normal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton)	34.425	2157	cu.m	74254.725
3	Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:5. (1- Cement : 5 -fine sand)(C) Fly Ash Bricks (upto 10 ton)	914.9975	3344	cu.m	3059751.64
4	Providing and laying damp proof course 25mm thick cement concrete 1:2:4 (1- Cement : 2 coarse sand : 4 stone aggregate 10 mm nominal size) and curing complete (upto 10 ton)	58.65	159	sq.m	9325.35
5	Providing and laying cement concrete 1:3:6 (1- Cement : 3- Coarse sand : 6- crushed stone aggregates 20 mm nominal size) and curing complete including cost of formwork in (A) Wall Caps / Coping (more than 10 ton)	102	2712	cu.m	276624
6	Providing and laying Vitrified tiles 8 to 10 mm thick , 24'' x 24'' in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3- coarse sand) finishing with flush pointing in white cement. (upto 10 ton)	8500	888	sq.m	7548000

7	Filling available excavated earth (excluding rock) in trenches. plinth, sides of foundations etc. in layers not exceeding 20 cm. in depth consolidating each disposited layer by ramming and watering.	357	76.5	cu.m	27310.5
8	safety grill and elevation	Lumpsum			100000
9	Plaster	1275.00	220	sq.m	280500
10	Paint	Lumpsum			120000
11	RCC	135	8000	cu.m	1080000
12	Gazebo	105	6000	nos.	630000
13	Food Court	125	1000	nos.	125000
14	Paver Block and Walkway flooring	1985	750	nos.	1488750
15	Parking area	4800	500	sq.m	2400000
16	Fountain area	35	5000	sq.m	175000
17	Dock area	126	7500	sq.m	945000
18	Architectural Landscaping	10500	500	sq.m	5250000
	TOTAL				23604301.75
17	Add 3% contigencies				708129.0526
18	Add 5% work charge establishment				1180215.088
19	Add 10% plumbing and sanitary works				2360430.175
20	Add 10% electrification charge				2360430.175
	TOTAL ESTIMATED COST				**30213506.24**

Table 13.10 Abstract sheet of Lake Front

13.2 Reason for Students Recommending this Design :-

Sr No.	Proposed design	Reasons for recommendation of proposed designs
1	Community Hall	There are no any public place for social gathering in village. To conduct the meeting with villagers and other cultural activity not to be carried out at one place.
2	Vegetable Market Building	There are no any facility available in village to buy or sell the vegetable at a one place.
3	R.C.C road in Main Bazaar	The old concrete + bitumen road in the village is deteriorate and road is in very poor condition.
4	Lake Front	There are large reservoir (lake) are being there in village but this lake is not properly cleaned and maintain in good condition by the villagers.
5	Sports Complex	There are many school in the village but proper sports ground or stadium facility not available in the village.
6	Street Light	In the village many parts of village is unlighten and this basic facility is not available within the village.

Table 13.11 Reasons for students recommending this design

13.3 About designs Suggestions/ Benefit of the villagers :-

Sr No.	Proposed design	Benefit of the villagers by proposed designs
1	Community Hall	Villagers get benefits to gathering at a one place for the important announcement by the panchyat.
2	Vegetable Market Building	To provide a such kind of facility in the village then villagers or farmer can easily buying or selling his goods in the market.
3	R.C.C road in Main Bazaar	To provide a fast transportation within the village. To improve the load carrying capacity of the road.
4	Lake Front	If we provide a such kind of facility in the village then this place make a tourism hub for the nearby villagers. To provide this facility village lake regain his water carrying capacity and also improve the cleanliness around the lake.
5	Sports Complex	To provide a such kind of facility in the village people or children of the village can be play a various indoor/outdoor game at a one place. To carried out a sports competition or event like a khelmahakumbh easily in the village.
6	Street Light	To provide a good visibility during the night time. Villagers can easily passed from the any part of village during the night with no any fear or threat.

Table 13.12 Benefits of the villagers

Chapter 14 : Technical Options with Case Studies

14.1 Civil Engineering :-

14.1.1 Advanced Earthquake Resistant :-

Earthquake-resistant structures are structures designed to protect buildings from earthquakes. While no structure can be entirely immune to damage from earthquakes, the goal of earthquake-resistant construction is to erect structures that fare better during seismic activity than their conventional counterparts. According to building codes, earthquake-resistant structures are intended to withstand the largest earthquake of a certain probability that is likely to occur at their location. Currently, there are several design philosophies in earthquake engineering, making use of experimental results, computer simulations and observations from past earthquakes to offer the required performance for the seismic threat at the site of interest.

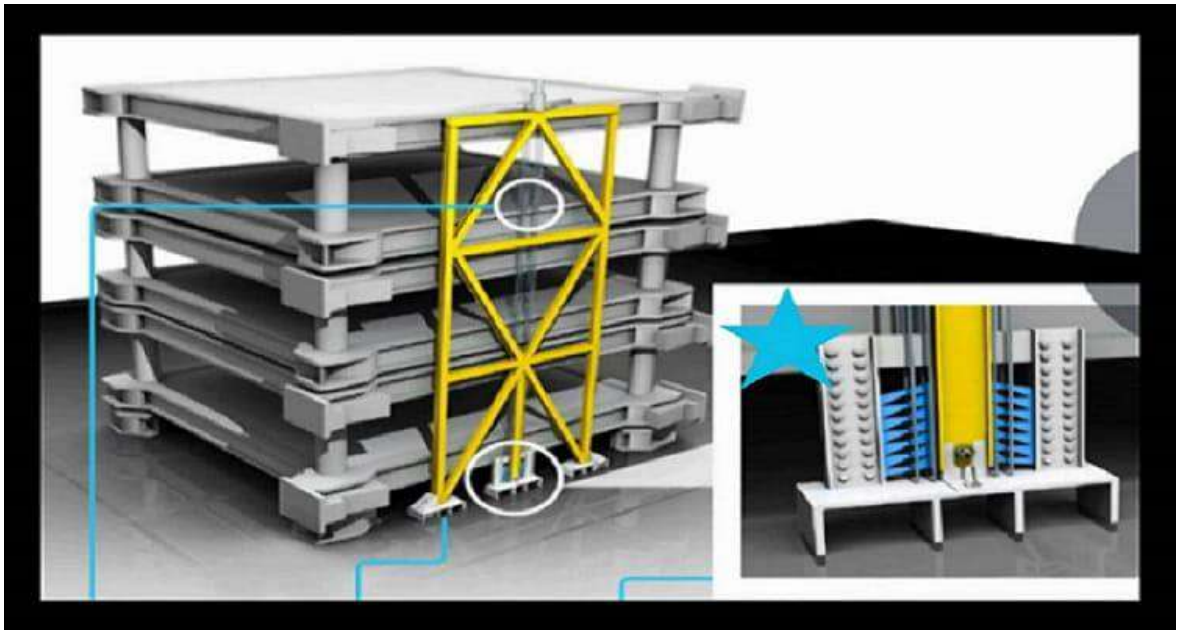


Fig14.1 Advance Earthquake Resistance Technique

Strategies For Earthquake Resistant Construction:-

In accumulation to the earthquake design code 1893 the Bureau of Indian Standards has distributed to applicable earthquake design codes for earthquake resistant construction Masonry structures (IS-13828 1993).

- Delivering vertical reinforcement at significant locations such as internal corners, and external wall junctions as per code.
- Horizontal bands should be provided at lintel, plinth and roof levels as per code.
- Proper workmanship and Quality assurance must be guaranteed for all cost without any

concession In RCC framed structures (IS-13920) .

- Grade of mortar should be as per codes definite for dissimilar earthquake zones.
- Asymmetrical shapes should be evaded both in vertical and plain configuration.
- In RCC framed structures the arrangement of lateral ties should be retained closer as per the code
- Whenever laps are to be offered, the lateral ties (stirrups for beams) should be at nearer spacing as per code.
- The hook in the ties should be at 135 degree as an alternative of 90 degree for better anchoragement.

14.1.2 Seismic Retrofitting of Buildings :-

Retrofitting means providing something with a component or feature not fitted during manufacture or adding something that it did not have when first constructed. It is often used in relation to the installation of new building systems, such as heating systems, but it might also refer to the fabric of a building, for example, retrofitting insulation or double glazing.

The process of retrofitting involves the careful balancing of different elements and their effects on the overall performance of a building. A change in one part of a building can affect another, and sometimes this is only apparent after irreversible defects have occurred.
For example:

- Sealing buildings to improve their air-tightness can cause condensation problems.
- Insulating a roof without also ventilating it can cause decay of timber structure.
- Internal wall insulation will remove the benefits of thermal mass which may have a detrimental effect on fuel usage.
- External wall insulation will prevent the thermal store of heat from solar gain to be utilized within the building.
- Poorly installed cavity wall insulation can create cold spots that then have damp problems that are extremely difficult to rectify.
- Pre-existing problems can be covered up, and so more difficult to diagnose and rectify.

Fig14.2 Retrofitting of Structures

Case Study:-

Introduction :-

During 1920's, when Britishers were ruling India, several bungalow type residential buildings were built in Delhi. These 'Lutyens Bungalow Zone' (LBZ) bungalows includes the '1, K.Kamaraj Lane', '12, Teen MurthiMarg', '14, Ashok Road' and '9, Janpath Road'. They are used to accommodate members of the parliament or senior government officials and their families. The buildings are load-bearing masonry structures with roof made of lime concrete and steel joists. At present these buildings are treated as having historic value. In a typical LBZ building there are number of walls in both X & Y direction making the structure act like a box under lateral load. The walls parallel to lateral load act as web and that perpendicular act as flanges. The resistance of the box is much higher than resistance of individual wall. The box action in walls results from interaction between web and flanges. T and L junction becomes effective zones and their satisfactory functioning is responsible for developing this interaction. The detail for the Kamaraj Lane building is presented here.

Description of the Historic LBZ Bungalow:-

The approximate plan size of the building is (21.4 X 18.1m). The building is a (unreinforced) load bearing masonry structure. The walls are made of unreinforced burnt-clay brick masonry. The thickness of the wall of the main portion of the building was 450 mm and for a few peripheral walls the thickness was 290 mm. There are no visible cracks in the wall or roof. The brick or the mortars are not deteriorated. The roof was made of lime concrete and was in the form of jack arches in between steel joists. The spaces above the arches are filled to have a flat roof top. The plan, front elevation and photographs of the building is shown in Figs. 1, 2 and 3.

Structural Model :-

The computer model of the building consists of wall and slab segments created using the plate elements in the structural analysis program STAAD Pro 2006. Brick properties were assigned to wall elements with 290 mm thickness for the outer walls, 450 mm thickness for the inner walls and 650mm at the fire place. Similarly lime concrete properties were assigned for the slab elements with thickness 150 mm for all slabs. The parapet wall also has brick property and is 290 mm thick. The building rests on continuous wall foundation and is assumed to be hinged at the base at the plinth level in the analysis model.

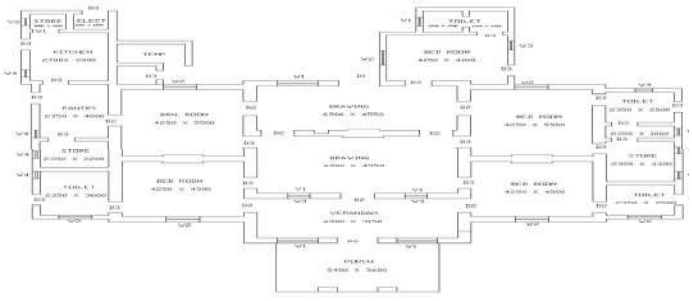


Figure 14.3 Typical Plan of Building

Figure 14.4 Photography of Front Elevation of Building

The structural model of the building with seismic loading in X&Z directions is shown in Fig. 3.

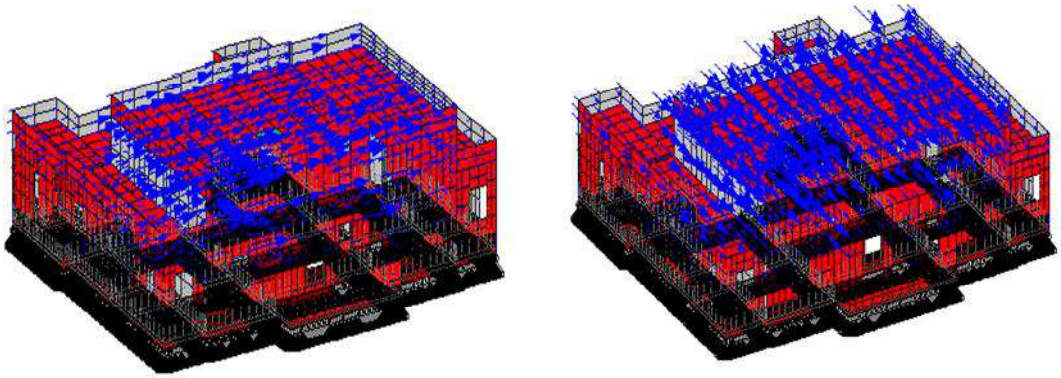


Figure 14.5 Structural model of building with seismic load in X and Z directions

Computer Method of Analysis :-

Equivalent static (linear elastic) method of analysis is used. In the equivalent static analysis, the essential provisions in IS 1893: 2002, "Criteria for earthquake resistant design of structures", is considered. In static analysis, the vibration, mode shapes or the time-wise variation of the quantities are not considered. Because of the difficulties and uncertainties in a non-linear dynamic analysis, this is not used in the current design. Table-1 shows the parameters used in the analysis.

No.	Parameter	Values
1	Zone Factor	0.24
2	Importance Factor	1.5
3	Response Reduction factor	1.5
4	Fundamental Natural Period	0.1 sec
5	Rock and Soil Site Factor	2

6	Damping ratio	5%
7	Type of structure	3
8	Depth of foundation	1m below Ground Level

Table 14.1 Parameter used for Seismic Analysis

Results of Analysis :-

Maximum Compressive stress in Brick Element = 0.385 N/mm^2
Permissible Compressive stress in Brick Element = 0.75 N/mm^2
Maximum Tensile stress in Brick Element = 0.133N/mm^2
Permissible Tensile stress in Brick Element = 0.0 N/mm^2

It can be seen that the compressive stress in the brick elements is within the permissible compressive stress. But the tensile stress in brick masonry exceeds the permissible limit. It was concluded that the structure is unsafe under earthquake loading and the structure will be subjected to a large amount of cracks (which may be beyond repair) in the event of an earthquake.

Retrofitting Scheme :-

In order to increase the permissible tensile stress of the walls,it is proposed to retrofit the walls of the masonry building utilizing the concept of applying Ferro-cement bands. Ferro-cement band is a concrete element made of concrete mortar and wire meshes.These bands are provided on the exterior and interior surface of the building both in the vertical and horizontal directions (as per IS:13935-1993).The exterior and interior bands are connected at intervals with 8mm tie rods.These bands are provided in the different levels of the building.

They are described asfollows:-

Plinth band :- The Ferro-cement bands (300mm wide and 50mm thick) are provided at the plinth level on both sides of the wall.

Sill band :- The Ferro-cement bands (300m wide and 50mm thick) are provided at the sill level on both sides of the wall.

Lintel band :- The Ferro-cement bands (300m wide and 50mm thick) are provided at the lintel level on both sides of the wall.

Roofband :- TheFerro-cement bands (200mwideand50mm) thick are provided at the roof level on both sides of the wall. The roof band are folded and connected to the Steel I section at therooflevel.

At openings :- At the openings like door, windows and ventilator, vertical bands (300mm wide and 50mm thick)are provided on both sides of the wall till the roof slab.They are inter-connected with the horizontal bands.

At L joints:- At the L joints vertical bands are provided on both the intersecting walls (without any discontinuity at the junction) with ferro-cement, 300mm wide and 50mm thick. The bands are provided on both sides of the wall.

At T joints:- At the T joints vertical bands are provided similar to L joints meeting together with 300mm wide and 50mm thick ferro-cement bands. The bands are provided on both sides of thewall.

The details of the retrofitted building plan and elevation of the building are shown in Fig.

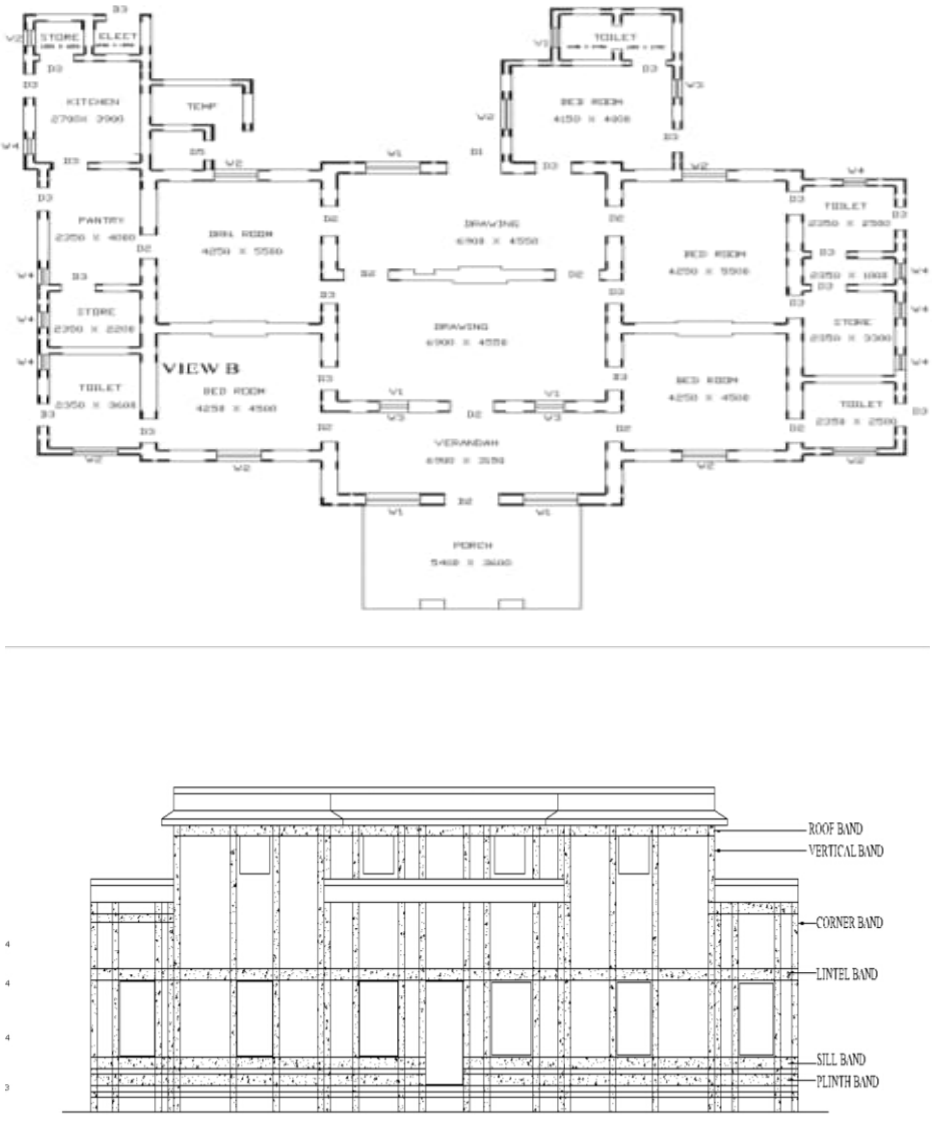


Figure 14.6 Plan and Front Elevation of Retrofitted building

Computer Model Incorporating Retrofitting Scheme:-

The plate elements that are retrofitted with the Ferro-cement bands are chosen and updated with the combined property of 'masonry with Ferro-cement'. The property for the Ferro-cement band for different thickness of wall is shown in Table 2.

No.	*Description*	*For 450 mm Wall*	*For 290 mm Wall*
1	Elastic Modulus kN/m^2	8684460	12229630
2	Poison ratio	0.17	0.17
3	Density kN/m^3	20.5	20.5
4	Thermal co-efficient	Thermal co-efficient	$11X10^{-6}$

Table 14.2 Properties of Ferro-cement Band

Results of Computer Analysis of Retrofitted Model:-

The stress values of the computer analysis of the retrofitted model are shown Fig. 6. The stress obtained from the analysis is compared with permissible stress values.

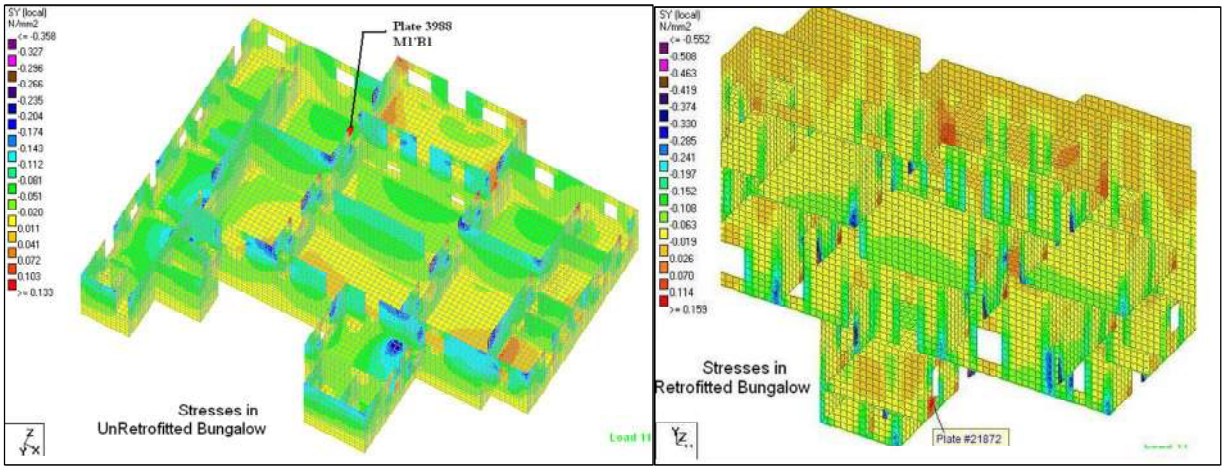


Figure 14.7 Stress Values at Critical locations

Maximum Compressive stress in Brick Element =0.129N/mm^2
Permissible Compressive stress in Brick Element =0.75 N/mm^2
Maximum Tensile stress in Brick Element =0.036N/mm^2
Permissible Tensile stress in Brick Element =0.0 N/mm^2
Maximum Compressive stress in Ferro-cement Element = 0.619 N/mm^2
Permissible Compressive stress in Ferro-cement Element = 2.87 N/mm^2
Maximum Tensile stress in Ferro-cement Element =0.159N/mm^2
Permissible Tensile stress in Ferro-cement Element =1.124N/mm^2

Method and Sequence of Retrofitting:-

The method of constructing the Ferrocement band is given below:-

1. Chipping of the plaster and brick work: Chip the plaster for 25mm thickness and brickwork 30mm thickness, amounting to a total thickness of 55mm from the building in all the vertical and horizontal bandedareas.
2. Providingthefirstcoatofmortaronchippedarea:Provide the first coat of cement mortar in the ratio of 1:2 (water cement ratio of 0.4) on the chipped area for a thickness of25mm.
3. Providing chicken mesh on the first coat of mortar: Provide a chicken mesh of 22 gauge on the firstcoat.
4. Providing wire mesh on the chicken mesh: The next step is providing wire mesh of 4mm diameter at 25mmx25mm spacing (or equivalent).The wire meshes are attached to the brickwalls with steel pins.
5. Providingthesecondcoatofmortaronthewiremesh: Second coat of mortar of same mix over the wire mesh of thickness 25mm isprovided.
6. Providing the third coat of mortar: 5 mm fine plaster is provided over the Ferro cement band. The retrofitting is done room by room. It must be ensured that there's sufficient overlapping of meshes where construction joints are created.The overlapping of meshes must befor 450mm length. Also lapping of meshes is avoided at corners and joints.

Conclusion:-

The procedure described show show the building can be made safe against earthquake by retrofitting. Retrofitting brings down the stresses to permissible levels, thus enhancing safety. Even after the retrofitting is complete, the original look and feel of the building is retained.Also the strengthening of some beams/slabs was done using Carbon fibre sheet and the overhead tank was strengthened using steel plates. The method used is economic and also recommended bystandards.

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

SR NO.	USE OF TECHNIQUE / EQUIPMENT	WORK ACTIVITY	ADVANTAGES
01	Precast lintel and chajja	Masonry work above lintel level	Saving the time.
02	Providing cavities in masonry duringexcavation	Concreting of hold fast for doors and windows	Breaking of concrete block/brick is avoided which saves labour time.
03	Wheel barrows, trolleys cranes, chains pulley block	Shifting/lifting of any type of material	Shifting by manual head load is avoided. Maximum output with minimum efforts.
04	Prefabricated units	Doors, windows, grills, walls, slabs, etc.	Fast erections, saving of time in casting and curing.
05	Steel shuttering material	All centering work	Works out to be cheaper as more repetition is possible.

06	Auto ramming block machine (For mechanical compaction)	Casting of concrete blocks for masonry	Increases the production and quality remarkably.
07	Sand washing machines	Concreting, masonry, plastering	Decrease in silt content, results into better plastering and uniform higher strength concrete.
08	Small capacity concrete mixers	Concreting at upper floors	Portable, speed and quality is maintained without extra consumption of cement.
09	Sand screening machines	Masonry, plastering, etc.	Time saving for screening and less wastage of sand.
10	Form vibrator	Casting of slab	Better compaction, less honeycombing of the concrete.
11	Tower hoist bucket	Transporting material e.g. bricks, sand, cement	Shifting of material vertically with speed and extra quantity.
12	Travelling belt conveyor/trolley	Slab concreting	Labour required to transport wet concrete is reduced, speed and quality increases.
13	Dumpers	Transporting building material	Unloading operation is easy, and can be done as and when required. Speed increases.
14	Admixtures and plasticizers	Concreting and water-proofing	Increases the workability strength, reduces the curing period and improves the quality.
15	Loaders	Shifting of materials and refilling	Reduce the labour for loading of trucks. Speed increases.

Table 14.3 Various techniques, equipments and their advantages in building construction

14.1.4 Engineering Aspects Of Soil mechanics-Environmental Impact Assessment :-

An Environmental Impact Assessment is a formal method of judging the impact that any new developmental project would have on the environment and its constituents. This can include changes that the project would create in the physical aspects of existing geography, chemical changes to the atmosphere including air and water, biological changes that affect plant, animal and human life, cultural impact of a project on the society in the area, and other socio-economic effects that the project can have.

Such an assessment allows problems to be foreseen, so that the design and planning of the projects is modified to reduce any negative effects. It is now fashionable to build green buildings which have a positive effect on the environment.

There is historical precedent for the now mandatory Environmental Impact Assessments (EIA). Past efforts by governments have resulted in bans on activities that caused noxious odours,

garbage dumps were positioned at places far away from habitation, and commercial activities were restricted to town centres.

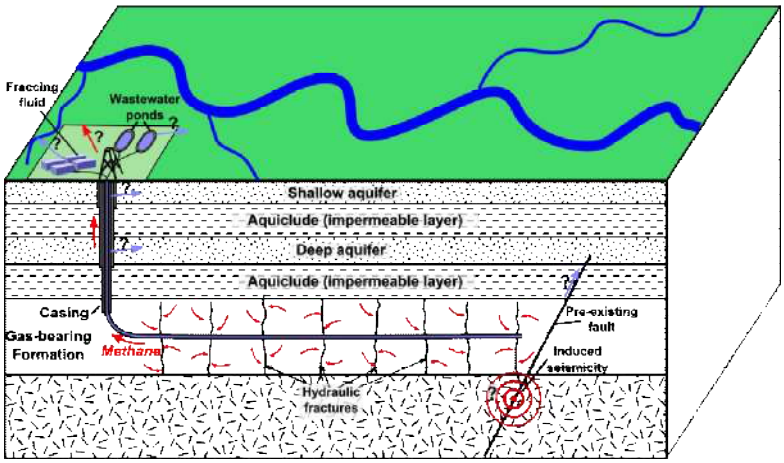


Fig14.8 Environmental impact of hydraulic fracturing

14.1.5 Water Supply – Sewerage system - WasteWater –Sustainable development techniques :-

- **Water Supply :-**Meeting the present-day need for safe, reliable, and affordable water, which minimises adverse effects on the environment, whilst enabling future generations to meet their requirements.

  With growing numbers of people on our planet, it is essential that clean water is provided to people across the globe in a sustainable and fair manner. We need to use water efficiently and to achieve water sustainability we need to :-

- Make sure there is a balance between what is consumed and what is used.
- Ensure that water remains of a good quality and avoid pollution of our water sources.
- Allow for stores to be built up for drier periods in our changing climate.
- Manage the water that falls in places effectively.
  If we can do this we will have sustainable water supply which meets the present-day need for safe, reliable, and affordable water, which minimises adverse effects on the environment, whilst enabling future generations to meet their requirements.

Sustainable water supply means to find reliable and resilient approaches to various human needs for water for that does neither exhaust the water sources and the local economy nor have long term negative impact on the environment.

Agriculture consume about 70% of the current world water supply, whereas domestic and industrial use is about 8% and 22% respectively (WBCSD 2009). Read more about the water cycle here.

This course focuses on domestic water supply. Potable water for domestic use is normally derived from surface or groundwater sources or from rainwater harvesting (RWH). Other

sources are harvesting of fog or air moisture, bottled water or even melting of snow or ice or sea water desalination.

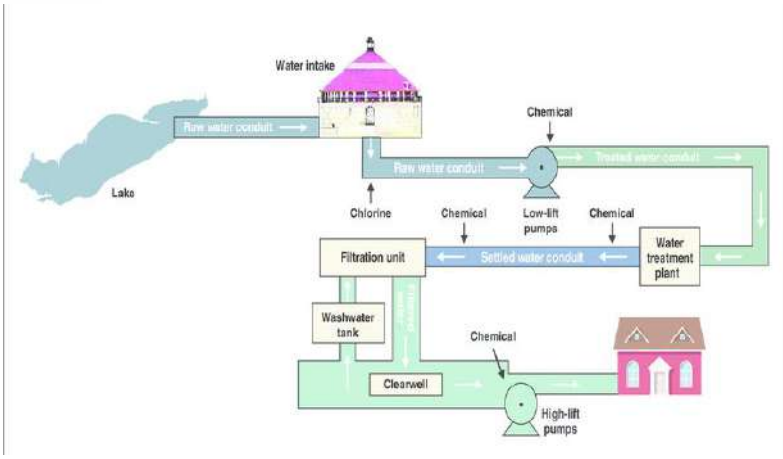


Fig14.9 Sustainable water supply technique

- **Sewerage system& Waste Water :-**

  From a public health perspective, treatment of the wastewater produced by the population and industries in a given urban area is critical to ensure stable growth. Wastewater must also be treated to an extent that it does not affect the environment into which it is discharged, the goal being to ensure that urban growth is sustainable. The project consists of determining whether the normal processes that take place in a wastewater treatment plant (WWTP)—i.e. elimination of all pollutants—can be carried out with very low levels of oxygen.

  In a context in which the main energy consumption in WWTPs is related to the supply of oxygen for the biological process, achieving this goal would significantly increase the sustainability of water treatment processes by lowering fossil fuel consumption and significantly reducing greenhouse gas emissions. This would allow for the recovery of a vital natural resource, water, without affecting the availability of other resources, such as energy, and without polluting the environment directly, through contaminated water discharges, or indirectly, through greenhouse gas emissions.

  Preserving the environment involves developing processes for treating contaminated water to ensure sustainable growth of urban areas and protection of natural areas. But it's also important to bear in mind the issue of fossil fuel consumption and greenhouse gas emissions resulting from these processes: this innovation seeks to protect the environment at all levels by ensuring a sustainable future in water treatment and sanitation.

Fig14.10 Sustainable sewerage system & waste water development techniques

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

(For Allocated village development, villagers happiness, comfortable and for enhancement of the village) (With the Smart village development Concept As Per Your Idea And Village Visit, modern technology with innovation).

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

a) **Immediately b)Within 1year c) Long term(3-5years) along with cost estimation.**
b) **If possible, List the sources of the funding available with the Village gram panchayat.**

Chapter 8 & 13 designs Impact on Society Civil design:-

- **Part-1 Design Problems :-**

1. **Design of Public library :-**People and students of village directly get the benefits of such kind of facility available within the village for reading peacefully, to create an awareness about the education and also to increase the education level & Literacy rate of village.

2. **Design of Public toilets and bath:-**By providing these kind of facility in the village the sanitation & healthy environment within the village gets increased & infectious disease and mosquitoes nuisance are becoming least.

3. **Design of Bus-stand :-**In local cities, it is important to improve bus service level in order to keep the number of passengers and to maintain bus routes since there is no other public transportation system operated except bus. Our research focuses on the punctuality, which is one of the most important factors to determine the level of bus service. Improvement of the punctuality of bus service does not provide benefits only to bus users but also to bus operators.

4. **Design of Storage building:-**By providing these kind of facility in the village the farmers directly get the benefits to store the commodity in this structure and also protect his commodity from the extreme weather conditions and infectious disease as well as this structure is also used for multipurpose activities in future.

5. **Design of Hostel building :-**By providing such kind of facility in the village students can peacefully live in the village and also it acts as a adding facility to the students of other village & it also create a educational environment within a village.

6. **Design of Shelter home:-**By providing such kind of facility within the village or nearby the village the pedestrian passing from the village can get rest or temporary reside at that place.

- **Part-2 Design Problems :-**

7. **Design of Community hall:-**A community hall is for social bonds that are created at community centers help build strong, safe and inclusive communities; social interaction, volunteerism, civic pride and aesthetics all play a role. After-school programs can help deter at-risk youth from criminal activities and can provide a constructive environment.

8. **Design of vegetable market building :-**A Vegetable market, like any other type of market, is a location at which there is a public gathering of buyers and sellers at a known time. All retail markets involve a large number of transactions of relatively small quantities of goods on a face-to-face basis between a seller and buyer. An essential feature of a market is the opportunity it can provide to immediately and easily compare prices between different sellers of the same product.

9. **Design of R.C.C road in main bazaar :-** For durability, the most important advantage of a concrete road is its service life due to exceptional durability. According to several researches, concrete roads are more comfortable to drive. For good performance, application, less fuel consumption, less pollution, better visibility and less deformation.

10. **Design of lake front :-**For better recreation of public resources as well as increament in village beauty also developing village into an attractive tourist spot. Good recreation centre increase property value.

11. **Design of sports complex :-**Sports Facilities Advisory knows that these potential community benefits readily come with a sports centre. It helps in staying healthy longer, reduce stress, benefits to families, reduce crime rates with children, keeps young villagers alert and healthy. Improves cultural diversity.

12. **Design of street light (expansion in village):-**Street lighting provides a number of important benefits. It can be used to promote security in urban areas and to increase the quality of life by artificially extending the hours in which it is light so that activity can take place. Street lighting also improves safety for drivers, riders, and pedestrian.

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

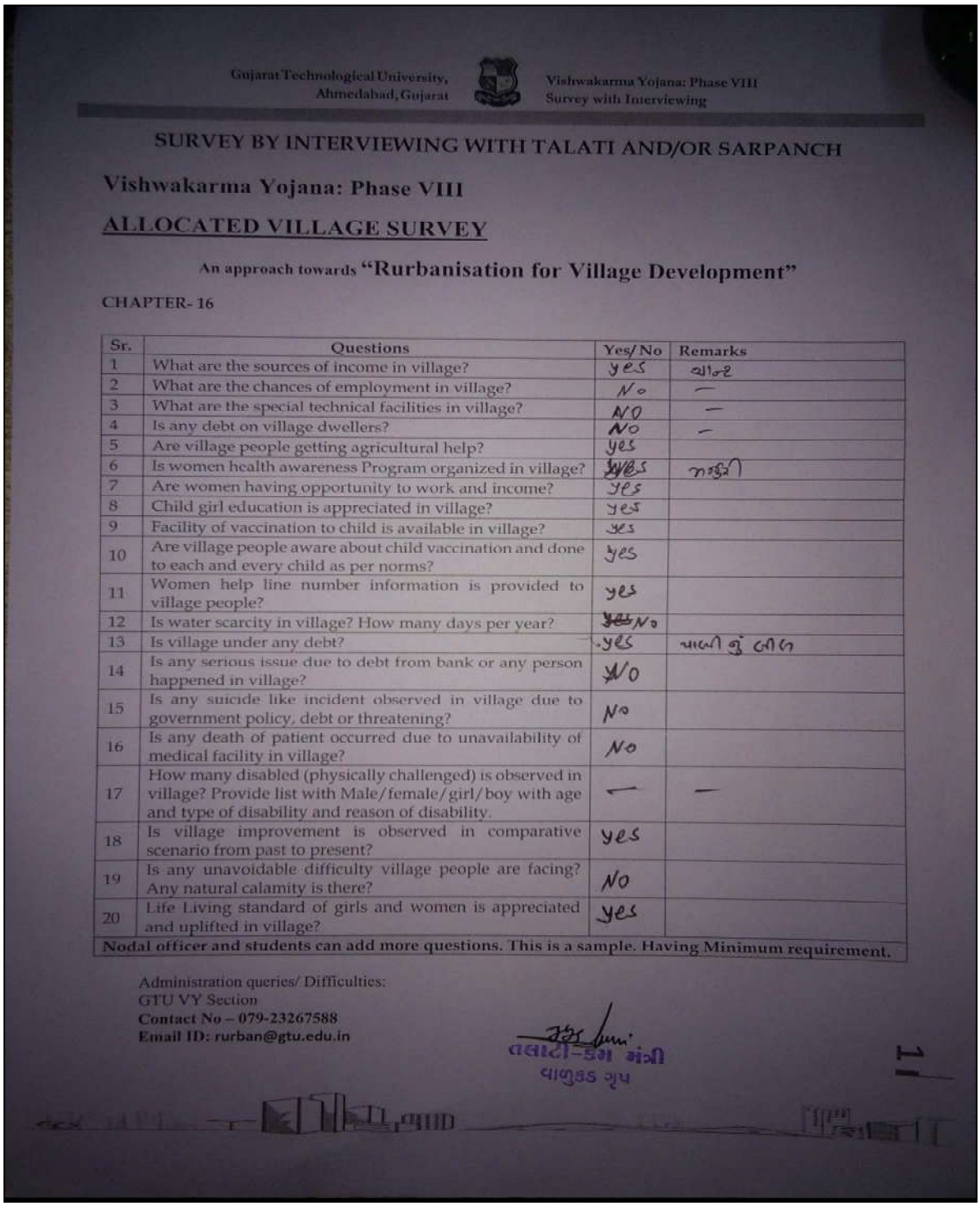
a) Immediately b) Within 1 year c) Long term (3-5 years) along with cost estimation.

CIVIL DESIGN				
Sr.	Design name	Period	Amount in Rs.	Benefits
1	**Public Library**	Within 1 Yr.	23,02,078	⇒ Provide reading facilities to the village peoples. ⇒ Student use library to improve their knowledge.
2	**Public Toilets And Bath**	Immediate	7,17,985	⇒ We can keep village neat and clean. ⇒ We can reduce the diesese. ⇒ Good manner for villager.
3	**Bus Stand**	Immediate	5,77,571	⇒ Use for villagers transportation and many other functions.
4	**Storage Building**	Long term	60,64,030	⇒ Very useful for farmers of village and village dwellers. . ⇒ To store the important goods for the long time.
5	**Hostel Building**	Long term	51,36,491	⇒ Student come from outside can stay easily in the village. ⇒ Affordable and effective living facility for the student.
6	**Shelter Home**	Long term	28,87,717	⇒ It will provide temporary shelter to padyatri. ⇒ Provide shelter to affected people from natural calamities.
7	**Community Hall**	Within 1 Yr.	56,56,098	⇒ To provide a social gathering place for vilagers. ⇒ To provide a space for cultural fest or carried out activities in village.
8	**Vegetable Market Building**	Within 1 Yr.	16,16,087	⇒ To provide a one stop market within the village to reduce the time of farmers to sold his commodity.

9	**R.C.C Road In Main Bazaar**	Immediate	8,37,589	⇒ Villagers can maintain the average speed on road. ⇒ To provide fast transportation within the village.
10	**Design Of Lake Front**	Long term	3,02,13,506	⇒ Improve the aesthetics view of village. ⇒ To attract the nearby village to visit the village. ⇒ To develop village like tourism hub in nearby future.
11	**Sports Complex**	Long term	4,23,91,676	⇒ Provide a sport facilities nearby village to improve sports culture in village. ⇒ To arrange a sports fest of the school or event like a khelmahakumbh within the village.
12	**Street Light**	Immediate	12,01,725	⇒ Reduce the accident during the nights. ⇒ To give a pleaseant atmosphere during nights to the villagers.

Table-15.1 Design and their expenditure, benefits and period

Chapter 16 : Survey By Interviewing With Talati And/Or Sarpanch :-



Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Survey with Interviewing

SURVEY BY INTERVIEWING WITH TALATI AND/OR SARPANCH

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

An approach towards "Rurbanisation for Village Development"

CHAPTER- 16

Sr.	Questions	Yes/ No	Remarks
1	What are the sources of income in village?	yes	ખેતર
2	What are the chances of employment in village?	No	—
3	What are the special technical facilities in village?	NO	—
4	Is any debt on village dwellers?	No	—
5	Are village people getting agricultural help?	yes	
6	Is women health awareness Program organized in village?	~~yes~~	ના છે
7	Are women having opportunity to work and income?	yes	
8	Child girl education is appreciated in village?	yes	
9	Facility of vaccination to child is available in village?	yes	
10	Are village people aware about child vaccination and done to each and every child as per norms?	yes	
11	Women help line number information is provided to village people?	yes	
12	Is water scarcity in village? How many days per year?	~~yes~~ No	
13	Is village under any debt?	yes	પાણી નું ખેતર
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?	yes	
19	Is any unavoidable difficulty village people are facing? Any natural calamity is there?	NO	
20	Life Living standard of girls and women is appreciated and uplifted in village?	yes	

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

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

તલાટી-કમ મંત્રી
વાળુકડ ગૃપ

Table-16.1 Survey Form by interviewing with Talati

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

Agriculture activities and Agro Industry in India:-

India is the second-largest populated country accounting for 18% of the total world population. With an increase in the population, the need for various agricultural products has increased significantly. This rise has prompted the farmers to adopt enhanced technologies and methods in dairy, fisheries and livestock in order to meet the diversified food needs of the people. Additionally, more than 50% of India's population is dependent on agricultural products which is further promoting the growth of the market.

Over the past few years, India's GDP has been growing at a steady pace which has resulted in a rise in the disposable incomes of the consumers. This rise has driven the agriculture market both in terms of the producer and consumer. It has enabled farmers to invest more in advanced agricultural infrastructure such as irrigation facilities, quality seeds, equipment's, fertilizers, warehousing, cold storage, etc. It has also increased the consumers purchasing power creating a positive impact on the domestic demand of agriculture products.

India represents one of the most bio-diverse countries in the world. The country encompasses various types of climatic conditions and soil types suitable for cultivating a large number of cereals, fruits, vegetables, flowers, cash crops, etc. The Indo-Gangetic plain, for instance, represents one of the most fertile lands across the globe. In addition, India also represents the second largest fish producing country in the world. The country has diverse resources ranging from deep seas to lakes in the mountains and more than 10% of the global biodiversity in terms of fish and shellfish species.

Government support plays a vital role in the growth of the Indian agriculture sector as agriculture remains a primary means of livelihood for more than 50% to 60% of the India's total population and as such represents the most important vote bank for any government. The Indian government is providing subsidies to farmers on water, power, agricultural equipment, fertilizers, hybrid seeds, etc. The Government has also exempted agriculture income under the Indian income tax act, meaning income earned from agricultural operations is not taxed. Moreover, both state and central government often waive off loans given to farmers.

The introduction of contract farming has also created a positive impact on the agriculture industry. Contract farming reduces the load on the central and state level procurement system by increasing the private sector investments in agriculture. It also provides more exposure to the farmers to world class mechanized technology related to agriculture.

The emergence of modern retail has also been an important catalyst for the agriculture industry. Modern retail helps in the elimination of middle men from the distribution chain, thereby providing better remuneration to the farmers. Organized retail enables the farmers to directly sell their produce to modern organized retail networks, thereby helping them to get a better price as compared to small-scale local vegetable markets. These retailers have also started signing supply

agreements with various farmers which further assures them of a minimum income. Moreover, these agreements help farmers in reducing wastage, transportation costs and providing fresh supply of food items to the consumer.

For such a predominantly agricultural country as India, resources of cultivable soil and water are of crucial importance. Although India does possess extensive areas of fertile alluvial soils, especially on the Indo-Gangetic Plain, and other substantial areas of relatively productive soils, such as the black *(regur)* soils of the Deccan lava plateau, the red-to-yellow lateritic soils that predominate over most of the remainder of the country are low in fertility. Overall, the per capita availability of cultivable area is low, and less than half of the cultivable land is of high quality. Moreover, many areas have lost much of their fertility because of erosion, alkalinisation (caused by excessive irrigation without proper drainage), the subsurface formation of impenetrable hardpans, and protracted cultivation without restoring depleted plant nutrients.

Crops :-

Population growth has, over the centuries, resulted in a continuous diminution of forest land. Most of India's formerly forested area has been converted to agricultural use (though some of that land is no longer productive), and other large areas have been effectively turned into wasteland from either overgrazing or overexploitation for timber and firewood. The problem of obtaining sufficient firewood, mainly for cooking, is particularly acute. In many areas forests have ceased to exist, and the only trees of consequence are found in protected village.

Most Indian farms grow little besides food crops, especially cereal grains, and these account for more than three-fifths of the area under cultivation. Foremost among the grains, in terms of both area sown and total yield, is rice, the crop of choice in almost all areas with more than 40 inches (1,000 mm) of average annual precipitation, as well as in some irrigated areas. Wheat ranks second in both area sown and total yield and, because of the use of HYVs, leads all grains in yield per acre. Wheat is grown mainly on the fertile soils of northern and northwestern India in areas with 15 to 40 inches (380 to 1,000 mm) of average annual precipitation, often with supplementary irrigation. Unlike rice, which is mainly grown during the kharif (summer) season, wheat is primarily a rabi (cool-season) crop.

Fig17.1 kharif crop

Fig17.2 rabi crop

Other important cereals, in descending order of sown acreage, are sorghum (called jawar in India), pearl millet (bajra), corn (maize), and finger millet (rabi). All these typically are grown on relatively infertile soils unsuitable for rice or wheat, while corn cultivation is also favoured in

hilly and mountainous regions. After cereals, pulses are the most important category of food crop. These ubiquitous leguminous crops—of which the chickpea (gram) is the most important—are the main source of protein for most Indians, for whom the consumption of animal products is an expensive luxury or is proscribed on religious grounds.

Forestry :-

Forestry in India is a significant rural industry and a major environmental resource. India is one of the ten most forest-rich countries of the world. In 2018, the total forest and tree cover in India increased to 24.39% or 8,02,088 km^2. It increased further to 24.56 percent or 807,276 square kilometres in 2019.

The principal areas for commercial forestry, in order of importance, are the Western Ghats, the western Himalayas, and the hill regions of central India. In an effort to counteract forest depletion, the central and state governments have vigorously supported small-scale afforestation projects; these have met with mixed success, both economically and ecologically.

Population growth has, over the centuries, resulted in a continuous diminution of forest land. Most of India's formerly forested area has been converted to agricultural use (though some of that land is no longer productive), and other large areas have been effectively turned into wasteland from either overgrazing or overexploitation for timber and firewood. The problem of obtaining sufficient firewood, mainly for cooking, is particularly acute. In many areas forests have ceased to exist, and the only trees of consequence are found in protected village groves, often planted with mangoes or other fruit trees, where people and animals can seek shade from the fierce summer sun. In some areas, especially the northeast, bamboo thickets provide an important substitute for wood for structural purposes.

Forestry in India is more than just about wood and fuel. India has a thriving non-wood forest products industry, which produces latex, gums, resins, essential oils, flavours, fragrances and aroma chemicals, incense sticks, handicrafts, thatching materials and medicinal plants. About 60% of non-wood forest products production is consumed locally. About 50% of the total revenue from the forestry industry in India is in non-wood forest products category.

Fig17.3 forest area-1

Fig17.4 forest area-2

Commercial forestry is not highly developed in India. Nevertheless, the annual cutting of hardwoods is among the highest of any country in the world. Species that are sources of timber, pulp, plywood, veneers, and matchwood include teak, deodar, *Sal*, sissoo, and chirpine. Virtually

any woody vegetation is used for firewood, much of it illegally gathered, and substantial amounts go into making charcoal. Minor forest products include bamboo, cane, gum, resins, dyes, tanning agents, lac, and medicinal plants.

Alternative Farming Techniques and Solution Organic Farming :-

Organic agriculture can be considered a subset of sustainable agriculture, the difference being that organic implies certification in accordance with legal standards. Sir Albert Howard was widely considered to be the father of modern organic farming worked as an agricultural adviser in Pusa, Bengal from 1905 to 1924.

Fig17.5 Organic farming

The principles of organic farming is the maintenance of soil fertility by bio-intensive nutrient management, recycling of agricultural wastes, vermin composting, avoidance or reduction of external inputs, use of natural forms of pest management and weed control (Goldsmith and Hilde yard 1996; Hansen et al. 2006). The organic movement began in the 1930s and 1940s as a reaction to the growing reliance of agriculture on synthetic fertilizers.

Organic agricultural methods are standard, internationally regulated and legally enforced International Federation of Organic Agriculture Movements (IFOAM) an international umbrella organization for organic organizations established in 1972. This is known as certification.

Certification of organic food products is advantageous for both producers as well as consumers. Farmers fallowing certification are rewarded with eliminating the risk of exposure to toxic agrochemicals, premium prices and better market access. Several countries have already adopted community certification of organic food. Organic agriculture world over involves certain basic steps as like:

- Green manuring
- Bio fertilizers
- Crop rotation
- Cover cropping
- Soil Health Management

Green Manuring :-

A green manure is a type of cover crop grown primarily to add nutrients and organic matter to the soil for soil improvement and soil protection. Typically a green manure crop is grown for a specific period, plowed and incorporated into the soil.

- Leguminous green manures contain nitrogen-fixing symbiotic bacteria in root nodules that fix atmospheric nitrogen in a form that plants can use.
- Green manures increase the percentage of organic matter (biomass) in the soil, thereby improving water retention, aeration, and other soil characteristics.
- The root systems of some varieties of green manure grow deep in the soil and bring up nutrient resources unavailable to shallower-rooted crops.
- Common cover crop functions of weed suppression and prevention of soil erosion and compaction are often also taken into account when selecting and using green manures.
- Some green manure crops, when allowed to flower, provide forage for pollinating insects.

Bio fertilizers :-

Bio fertilizers are the substance which contains symbiotic nutrients fixating living microbes which are capable of colonizing in rhizosphere and enhances plant growth by increasing the availability of primary nutrients or by synthesizing growth promoting.

Fig17.6 Bio Fertilizer

Rhizobium, Azospirillum and phosphobacteria encourage plant growth by producing growth regulators, facilitating nutrient uptake, accelerating mineralization, reducing plant stress, stimulating nodulation and promoting nitrogen fixation.

Crop Rotation :-

Crop rotations serve to provide new above-and below-ground habitats as each new crop has a distinct chemical and biological make-up, introducing new vegetation types to the landscape eventually increases crop residues to the soil ecosystem.

By interrupting the continuous presence of a crop host, crop rotation serves to break the build-up in the cycles of weeds and insects and diseases, thus eliminating the need for pesticide application. Fallow periods i.e. ground left uncultivated for an extended period of time, allow a

limited amount of secondary succession to advance and hence the recovery of the diversity of both terrestrial and below-ground species are possible.

Natural Farming:-

Natural Farming is unique in that it is not meant to be commercialized but rather practiced by individual farmers with cheap, easily available ingredients and microbes or mycorrhizae indigenous to each locale or farm. These microorganisms are:

- cultured in a simple wooden box of rice
- mixed with brown sugar and stored in a crock
- Further propagated on rice bran or wheat mill run mixed with soil and cultured again.
- The resultant product is then mixed with compost, added to potting soil or spread on beds before planting, the process takes 3–4 weeks.

Eco-Farming:-

Eco-farming or site-appropriate agriculture involves treating both regions used for agriculture and individual farms as ecological systems. "Site" restricted to natural conditions like soil, climate and temperature. The demand for stability and sustainability stems from the obligation of each generation to pass on to future generations an environment that remains capable of guaranteeing the fundamentals of human existence. Consideration must also be given to economic development i.e. price– cost ratios, incomes, farm-specific conditions i.e. access to factors of production and the internal forces influencing a farm's operations like self-sufficiency, risk minimization and preservation of soil fertility. Countries must develop forms of agriculture that permit a high degree of self-sufficiency and decentralization at national and regional levels. The essential characteristics of these Eco farming systems are:

- maximal but sustainable use of local resources
- minimal use of purchased inputs, only as complementary to local resources
- emphasis on subsistence cropping, combined with complementary production for the market
- ensuring the basic biological functions of soil-water-nutrients-humus
- maintaining a diversity of plant and animal species as a basis for ecological balance and economic stability, with primary emphasis on local species, varieties and races
- conserving life support systems and ecosystem services
- Creating an attractive overall land cape which gives satisfaction to the local people.

Fig17.7 Eco farming

Chapter 18: Social Activities–Any Activates Planned By Students. e.g Teaching Learning activities, awareness camp, business idea for SELF HELP GROUP OR ANY OTHER.

Awareness for Covid-19 and importance of mask, sanitizer and social distancing:-

We all are very well know about current scenario so instead of gathering people we decide to spread awareness about covid-19 and importance of mask, sanitizer and social distancing through social media and through WhatsApp. We type a message in which we write how covid-19 spread, how we can break chain of spread of covid-19, how can we protect our self from covid-19, how we can improve our immune system and how proper use of mask and sanitizer are used for protection.

We also send some photos and videos regarding how wear mask properly and some home remedies for improve immune system. We also suggest some medicine which are use full for normal fewer and cold. We also suggest some medicine for those who are home quarantine because of covid-19 or who are infected. We suggest some medicine like zinc, vitamin B-12, iron-manganese, vitamin-C and paracetamol.

We will try our best to do some small activity with following all precaution from covid-19, so we will try to spread awareness in social media other than that we hadn't do any activity in village due to covid-19.

We also suggest some medicine which are use full for normal fewer and cold. We also suggest some medicine for those who are home quarantine because of covid-19 or who are infected. , how can we protect our self from covid-19, how we can improve our immune system and how proper use of mask and sanitizer are used for protection.

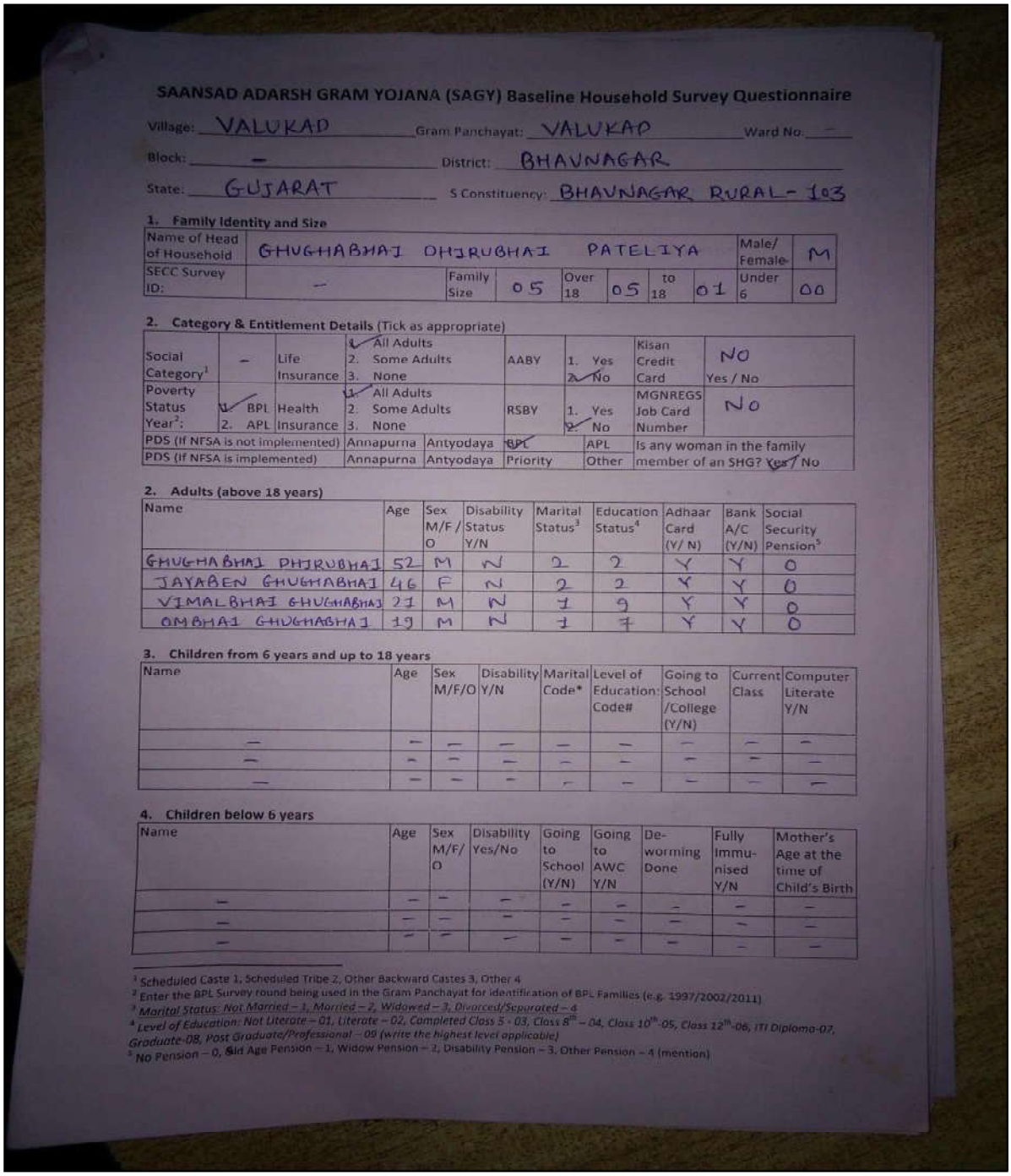
Tree plantataion:-

We do tree plantation in village as a social activity. We plant tree in front of panchayat buildings plane area, and also in school of nagarpipaliya village. Due to covid-19 we not together many people, plantation done by our team of 2 people. We also request principal of school to do plantation I school as well as in village after pandemic is over and they give us good response for that suggestion. We also request serpanch and talati to do tree plantation and take care of trees until they grew up and they also give very good response to our suggestion.

Eco campaign :-

We are distribute the cuttings of the tree like mangoes, nim and ayurvedic seed to help the villagers to nearby village or nearby home to make village green and also to increase the green cover of village.

Chapter 19 :Valukad Village SAGY Questionnaire Survey form with the Sarpanch Signature (Scanned copy attachment in the soft copy report and Original copy in hard bound report).



SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: VALUKAD Gram Panchayat: VALUKAD Ward No: –

Block: – District: BHAVNAGAR

State: GUJARAT S Constituency: BHAVNAGAR RURAL - 103

1. Family Identity and Size

Name of Head of Household	GHUGHABHAI DHIRUBHAI PATELIYA							Male/ Female	M
SECC Survey ID:	–	Family Size	05	Over 18	05	to 18	01	Under 6	00

2. Category & Entitlement Details (Tick as appropriate)

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

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]
GHUGHABHAI DHIRUBHAI	52	M	N	2	2	Y	Y	0
JAYABEN GHUGHABHAI	46	F	N	2	2	Y	Y	0
VIMALBHAI GHUGHABHAI	21	M	N	1	9	Y	Y	0
OMBHAI GHUGHABHAI	19	M	N	1	7	Y	Y	0

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
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–

4. Children below 6 years

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

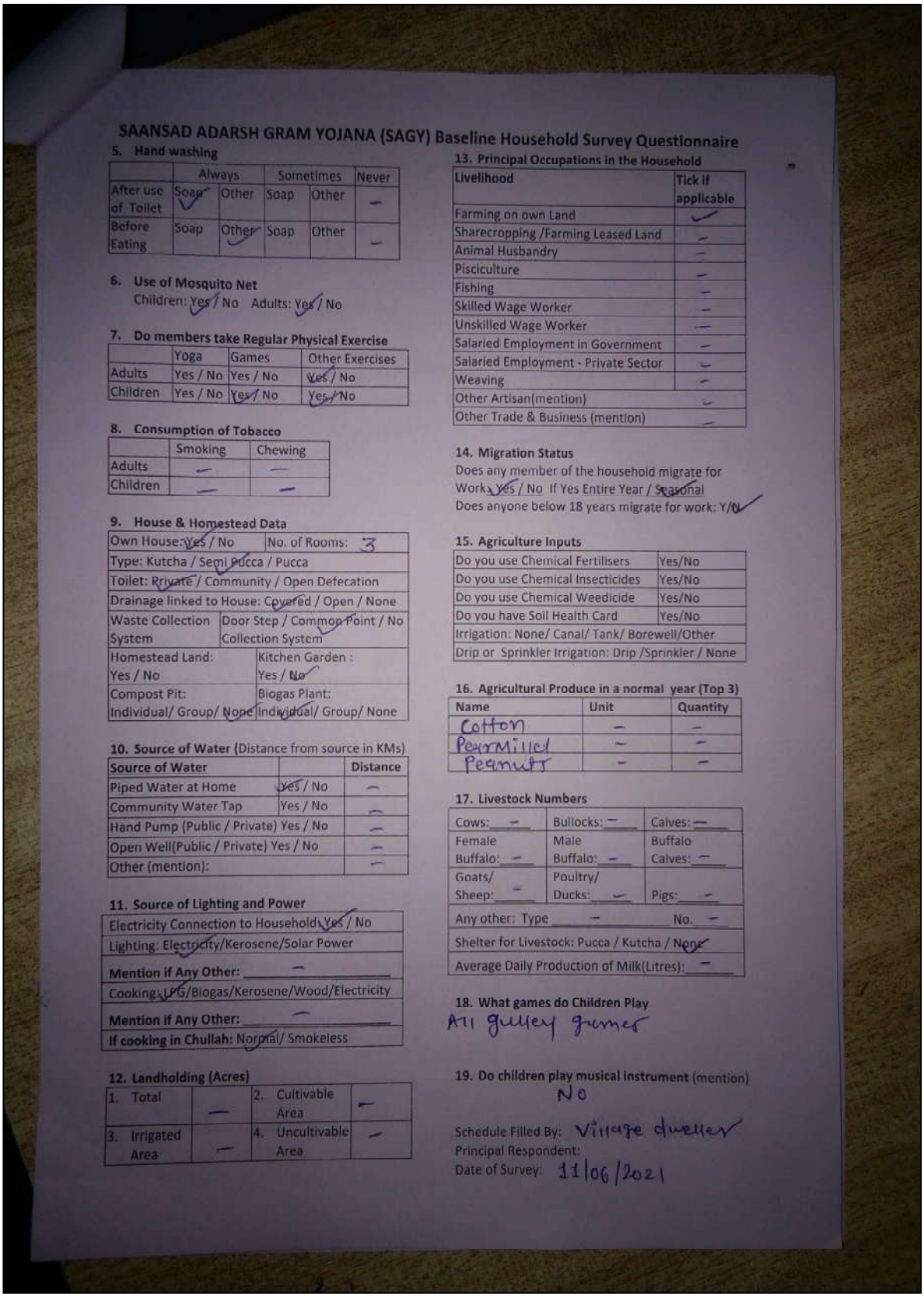
[1] Scheduled Caste 1, Scheduled Tribe 2, Other Backward Castes 3, Other 4

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

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

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

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



SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

5. Hand washing

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

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

7. Do members take Regular Physical Exercise

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

8. Consumption of Tobacco

	Smoking	Chewing
Adults	–	–
Children	–	–

9. House & Homestead Data

Own House: Yes / No	No. of Rooms: 3
Type: Kutcha / Semi Pucca / Pucca	
Toilet: Private / Community / Open Defecation	
Drainage linked to House: Covered / Open / None	
Waste Collection System	Door Step / Common Point / No Collection System
Homestead Land: Yes / No	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	–	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
Cotton	–	–
Pearmilled Peanuts	–	–
	–	–

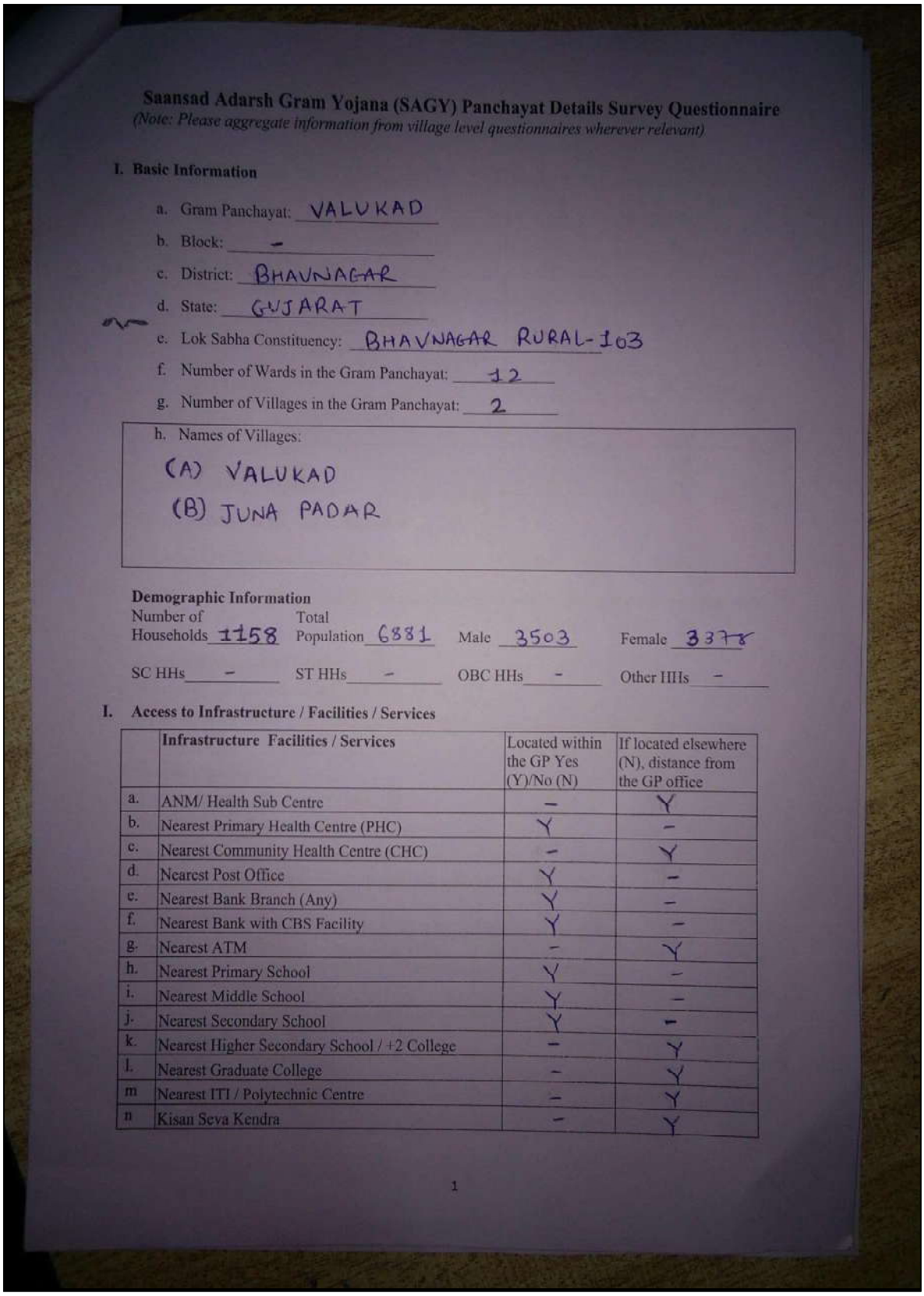
17. Livestock Numbers

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
All gulley gamer

19. Do children play musical instrument (mention)
No

Schedule Filled By: Village dweller
Principal Respondent:
Date of Survey: 11/06/2021



Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

I. Basic Information

a. Gram Panchayat: VALUKAD

b. Block: -

c. District: BHAVNAGAR

d. State: GUJARAT

e. Lok Sabha Constituency: BHAVNAGAR RURAL-103

f. Number of Wards in the Gram Panchayat: 12

g. Number of Villages in the Gram Panchayat: 2

h. Names of Villages:

(A) VALUKAD

(B) JUNA PADAR

Demographic Information

Number of Households 1158 Total Population 6881 Male 3503 Female 3378

SC HHs - ST HHs - OBC HHs - Other HHs -

I. Access to Infrastructure / Facilities / Services

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

1

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

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

IV. Sports Facilities in the Gram Panchayat

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

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

V. Education, ICDS

a. Number of Angan Wadi Centres: 8

b. Number of villages without Angan Wadi Centres 0

Names of such villages: –

c. Schools (Number)

Primary Private: 0 Primary Govt.: 3

Middle Private: 1 Middle Govt.: –

Secondary Private: – Secondary Govt.: –

Higher Secondary Private: – Higher Secondary Govt: 1

VI. Public Distribution System

	Item	Private Contractor	Women's SHG	Gram Panchayat	Cooperative	Other (Mention)	Location in GP (mention Location)	If outside GP, Location & distance from GP HQrs)
a.	Cereal (Rice/ Wheat/ Millets)	–	–	–	–	Dealer	Yes	–
b.	Kerosene	–	–	–	–	Dealer	Yes	–
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

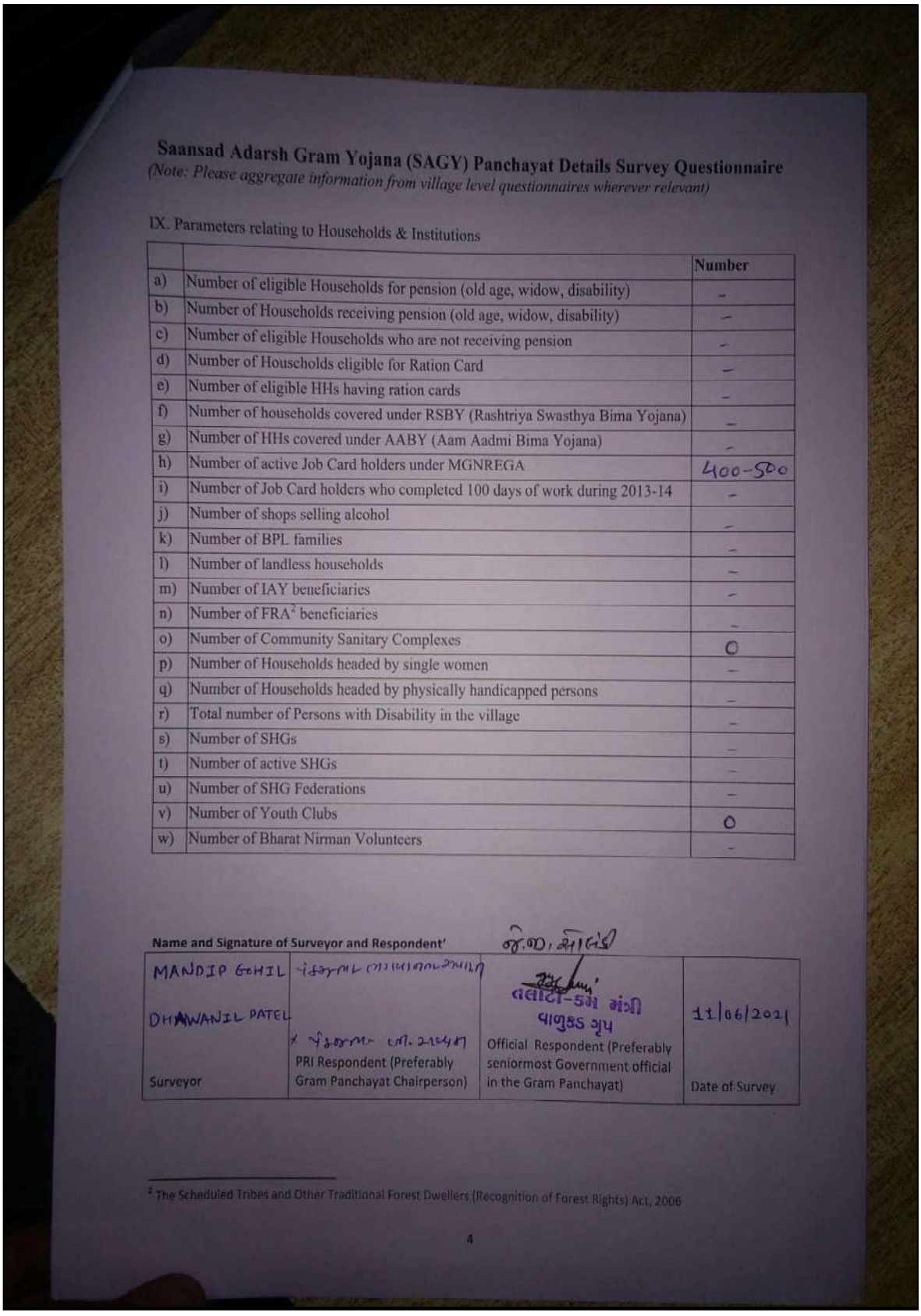
	Parameter	Villages Status[1]	Names of Villages Covered	Names of Villages not Covered
a.	Piped Water Supply Coverage to Villages	Covered: Yes Not Covered: -	VALUKAD JUNA PADAR	-
b.	Hand Pump Coverage in Villages:	Covered: - Not Covered: -	-	-
c.	Coverage under Covered Drains:	Covered: Yes Not Covered: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

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	10
b.	Irrigated Land	-	e.	Forests/ Plantations	-	h.	Wells/Bore Wells	2
c.	Un-irrigated Land	-	f.	Other Common Land	1380.72	i	Tanks /Ponds	1/1

[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

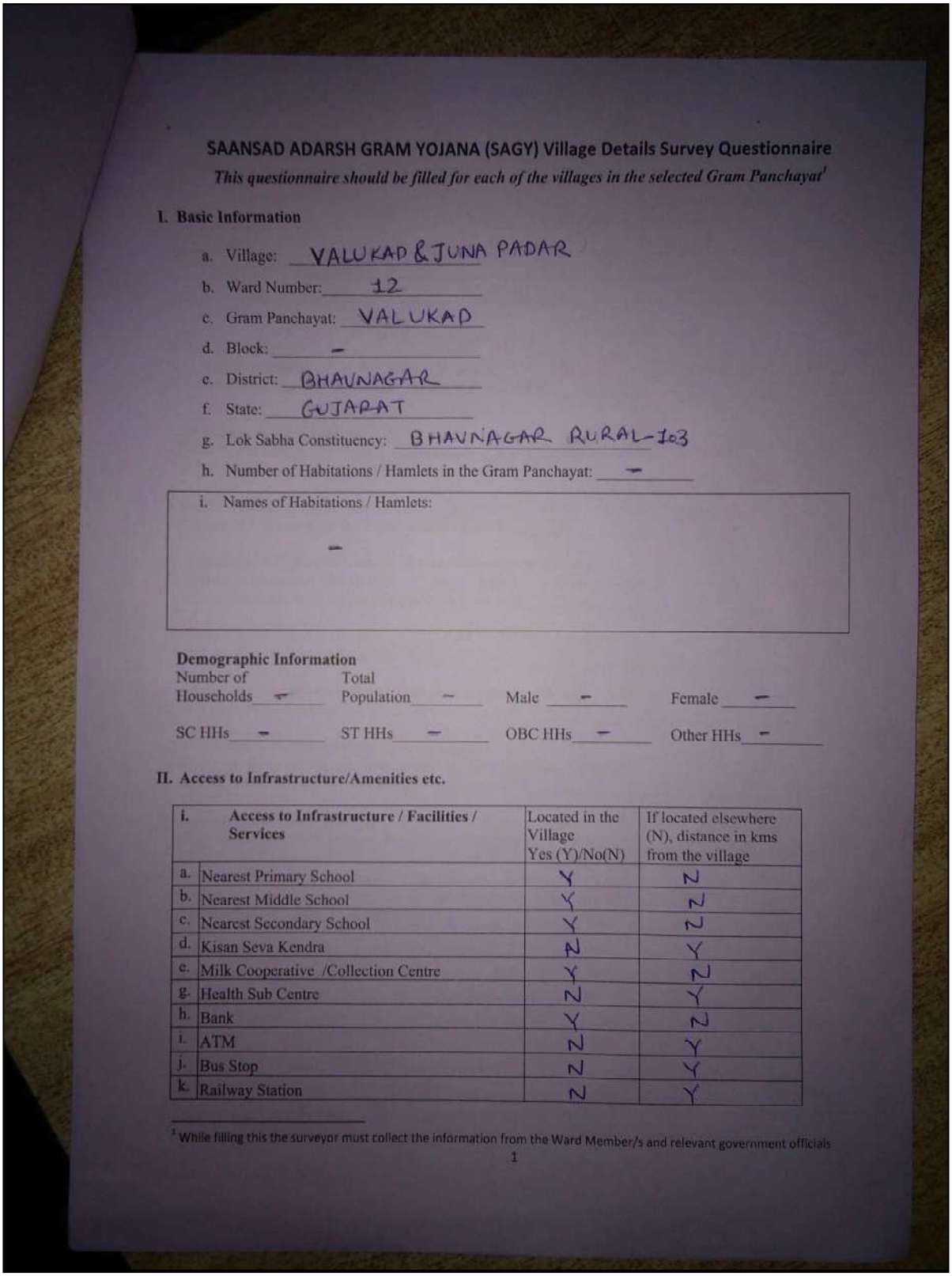
		Number
a)	Number of eligible Households for pension (old age, widow, disability)	-
b)	Number of Households receiving pension (old age, widow, disability)	-
c)	Number of eligible Households who are not receiving pension	-
d)	Number of Houscholds eligible for Ration Card	-
e)	Number of eligible HHs having 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	400-500
i)	Number of Job Card holders who completed 100 days of work during 2013-14	-
j)	Number of shops selling alcohol	-
k)	Number of BPL families	-
l)	Number of landless households	-
m)	Number of IAY beneficiaries	-
n)	Number of FRA[2] beneficiaries	-
o)	Number of Community Sanitary Complexes	0
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	0
w)	Number of Bharat Nirman Volunteers	-

Name and Signature of Surveyor and Respondent'

MANDIP GOHIL DHAWANIL PATEL Surveyor	PRI Respondent (Preferably Gram Panchayat Chairperson)	તલાટી-કમ મંત્રી વાળુકડ ગૃપ Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	11/06/2021 Date of Survey

[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: VALUKAD & JUNA PADAR
b. Ward Number: 12
c. Gram Panchayat: VALUKAD
d. Block: -
e. District: BHAVNAGAR
f. State: GUJARAT
g. Lok Sabha Constituency: BHAVNAGAR RURAL-103
h. Number of Habitations / Hamlets in the Gram Panchayat: -
i. Names of Habitations / Hamlets: -

Demographic Information

Number of Households - Total Population - Male - Female -

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	Y	N
b.	Nearest Middle School	Y	N
c.	Nearest Secondary School	Y	N
d.	Kisan Seva Kendra	N	Y
e.	Milk Cooperative /Collection Centre	Y	N
g.	Health Sub Centre	N	Y
h.	Bank	Y	N
i.	ATM	N	Y
j.	Bus Stop	N	Y
k.	Railway Station	N	Y

[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	Y	N
m	Common Service Centre	Y	N
n	Veterinary Care Centre	Y	N

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

iii. Drinking Water Facilities

a.Piped Water Supply Coverage to Habitations: 1 (1-All 2-None 3-Some)

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

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

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

iv. Coverage of Habitations under Waste Management System

a. Coverage under Covered Drains: – (1-All 2-None 3-Some)

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

b. Coverage under Open Drains: _____ (1-All 2-None 3-Some)

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

c. Coverage under Doorstep Waste Collection: (1-All 2-None 3-Some)

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

v. Coverage of Habitations under Electrification

a. Coverage under Household Connections: (1-All 2-None 3-Some)

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

b.Coverage under Street Lighting: All(1-All 2-None 3-Some)

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

vi. Sports Facilities in the Village

a.Number of Play Grounds in the Village (minimum size 200 square meters): 0

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

vii. Education, ICDS

a. Number of Anganwadi Centres: 8

c. Schools (Number)

Primary Private: 0 Primary Govt.: 3

Middle Private: 1 Middle Govt.: 0

Secondary Private: 0 Secondary Govt.: 0

Higher Secondary Private: 0 Higher Secondary Govt: 1

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	10
b.	Irrigated Land	–	e.	Forests/ Plnatations	–	h.	Wells/Bore Wells	2
c.	Un-irrigated Land	–	f.	Other Common Land	1380	I	Tanks /Ponds	1/1

ix. Entitlement Related Parameters		
1	Number of active Job Card holders under MGNREGA	400 - 500
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	–
5	Number of landless households	–
6	Number of IAY beneficiaries	–
7	Number of FRA beneficiaries	0
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'

MANDIP GOHIL DHAWANIL PATEL 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)	11/06/2021 Date of Survey

3

Table-19.1 SAGY Form

Chapter 20 : TDO-DDO-Collectore mail sending Soft copy attachment in the report.

8/12/2021 Gmail - DEVELOPMENT SCENARIO OF VALUKAD VILLAGE, TA.:- GHOGHA, DIST.:- BHAVNAGAR

Gmail

Dhwanil Patel <dhwanilpatel04@gmail.com>

DEVELOPMENT SCENARIO OF VALUKAD VILLAGE, TA.:- GHOGHA, DIST.:- BHAVNAGAR

3 messages

Dhwanil Patel <dhwanilpatel04@gmail.com> Mon, Aug 9, 2021 at 11:41 AM
To: ddo-banv@gujarat.gov.in
Cc: rurban@gtu.edu.in, cagcivilbvn@gmail.com, mandipgohel23@gmail.com

Respected Sir / Madam

We are students of Government Engineering College, Bhavnagar affiliated to Gujarat Technological University - GTU. Gujarat Technological University has been assigned to the project Vishwakarma Yojana Phase - VIII in which, students have to survey about various villages and design various amenities to deliver it to them, making them ideal for living a better life as per their requirement and also as per the village problem statements.

We have made a detailed report on the Village :- Valukad, Ta. :- Ghogha, Dist. :- Bhavnagar. We have also attached the village development report combined for Part - 1 and Part - 2. We have added the estimates, costings and drawings of designs as well. As a part of Vishwakarma Yojana guidelines, we have been asked to inform all the respected officials about our project in which, we will briefly notify about Valukad village profile and about the issues requiring development along with our design work to overcome them, which is given as below :-

CIVIL DESIGN			
Sr.	**Design Name**	**Period**	**Amount in Rs.**
1	Public Library	Within 1 Yr.	23,02,078
2	Public Toilets And Bath	Immediate	7,17,985
3	Bus Stand	Immediate	5,77,571
4	Storage Building	Long term	60,64,030
5	Hostel Building	Long term	51,36,491
6	Shelter Home	Long term	28,87,717
7	Community Hall	Within 1 Yr.	56,56,098
8	Vegetable Market Building	Within 1 Yr.	16,16,087
9	R.C.C Road In Main Bazaar	Immediate	8,37,589
10	Design Of Lake Front	Long term	3,02,13,506
11	Sports Complex	Long term	4,23,91,676
12	Street Light	Immediate	12,01,725

GTU-VY-PHASE-VIII-VALUKAD.pdf
18101K

Chapter 21 : Comprehensive report for the entire village.

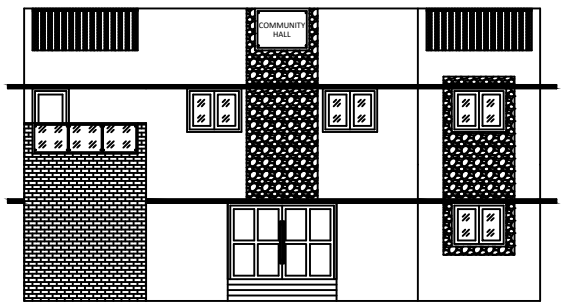
We study some case study for ideal village and smart village development, identify new techniques and learn about sustainable development techniques. Smart Villages access to sustainable energy services acts as a catalyst for development - enabling the provision of good education and healthcare, access to clean water, sanitation and nutrition, the growth of productive enterprises to boost incomes, and enhanced security, gender equality and democratic engagement. It can be help to develop the other village as increase basic amenities and after that smart amenities on any country with the help Smart (Ideal) Village visit and solid and liquid waste water management system Survey and Analysis. And it's also help to increase GDP Of state and also increase country image in front of world as Good infrastructure; Good Economic Profile and Good Employment Solution; Good (Ideal Example) Smart Example of New infrastructure with Uses Of renewable energy Solution Country.

We visit ideal village and smart village for study and know the existing situation of village. We see all facilities in village and see their condition. Major facilities are in good and workable condition. Over all village condition is good. We interact with both village Sarpanch and Talati Mantri. We discuss village condition with them and ask for necessary data for our survey. Also they say about dome facilities May not in workable condition in their respective village. They also say about some of its facilities may require maintenance.

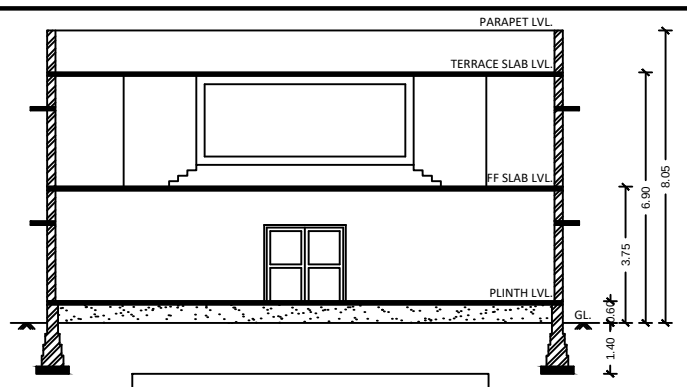
After visiting ideal village and smart village we visit our allocated village Valukad. We visit village interact with Sarpanch and Talati Mantri and a few of villagers. We see all the existing facilities of village take some good photograph of them we seem some lack of facilities in village and talk about that with Sarpanch. Sarpanch told us about their condition. Majority of facilities are need some maintenance and some of them are in very good condition. Likewise, Panchayat building is newly constructed. High school and primary school are at good condition. Water storage facilities need some maintenance.

After study the village and facilities at village we do gap analysis and then we identify some facilities that are not at village. We short list 6 design that are most important and we gave their plan, elevation, section and 3D view. We also give another 6 designs in Phase-2. We try to give design as per norms. We make sure that, which design we gave is maintain time by time and for that we give some method, recommended and new material introduce to Sarpanch and Talalti.

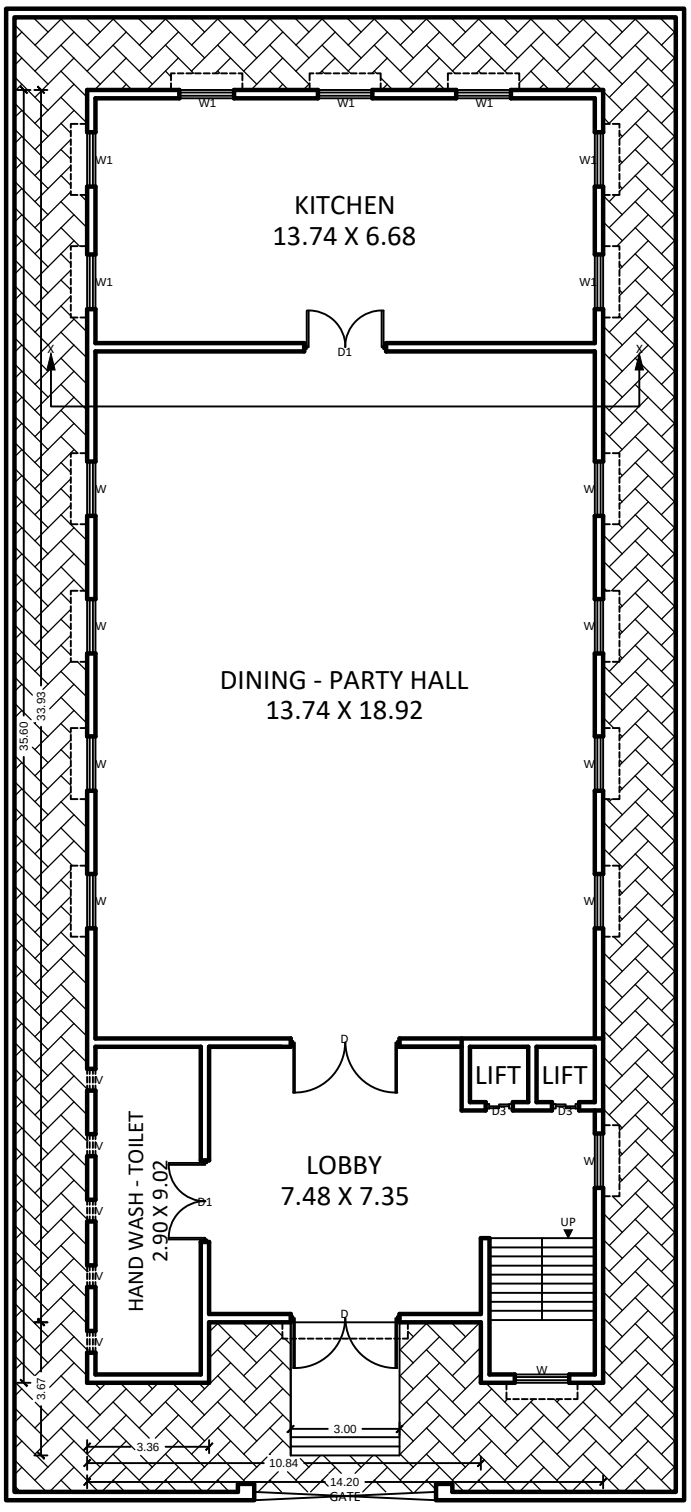
We try our best to full fill our project moto which is "Developing village with a 'rural soul' but with all urban amenities that a city may have" and we also learn new thing and we seeing forward to develop our village under Vishwakarma Yojana.



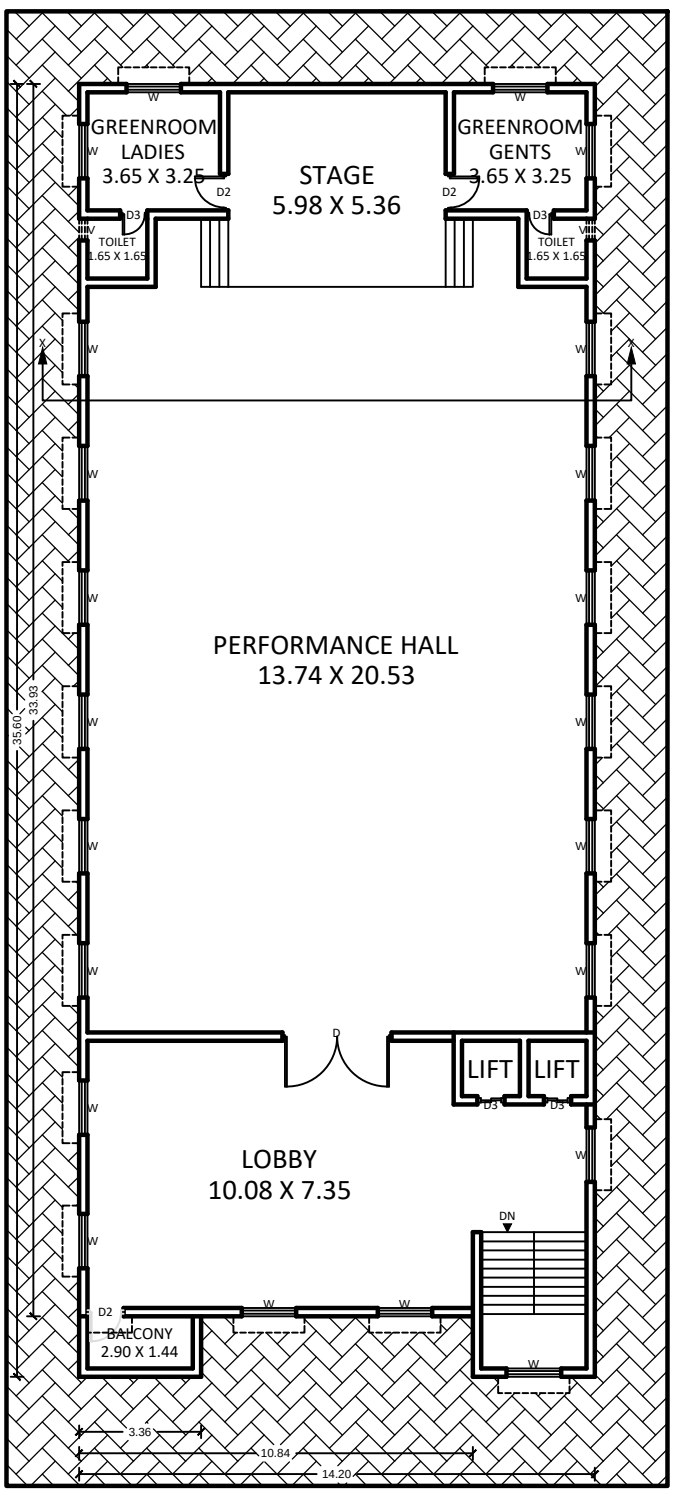
ELEVATION



SECTION



GROUND FLOOR



FIRST FLOOR

TITLE : PROPOSED COMMUNITY HALL LAYOUT PLANS FOR STUDY PURPOSE AT VILLAGE : VALUKAD, TALUKA : GHOGHA, DISTRICT : BHAVNAGAR. FOR VISHVAKARMA YOJANA PHASE - VIII

N

SCALE : 1 : 100

AREA TABLE	SQ.MT.
NET PLOT AREA	738.92
AREA UNDER CONSTRUCTION	493.03

OPENING SCHEDULE		RCC STAIR DETAIL	
D	3.00 X 2.10	TRADE	0.25
D1	2.25 X 2.10	RISE	0.15
D2	1.00 X 2.10	WIDTH	1.00
D3	0.75 X 2.10		
W	1.50 X 1.20		
W1	1.50 X 0.90		
V	0.60 X 0.60		

COLOR NOTE

PLOT BOUNDARY	PROPOSED WORK

ALL DIMENSION ARE IN METERS

VISHWAKARMA YOJANA PHASE - VIII

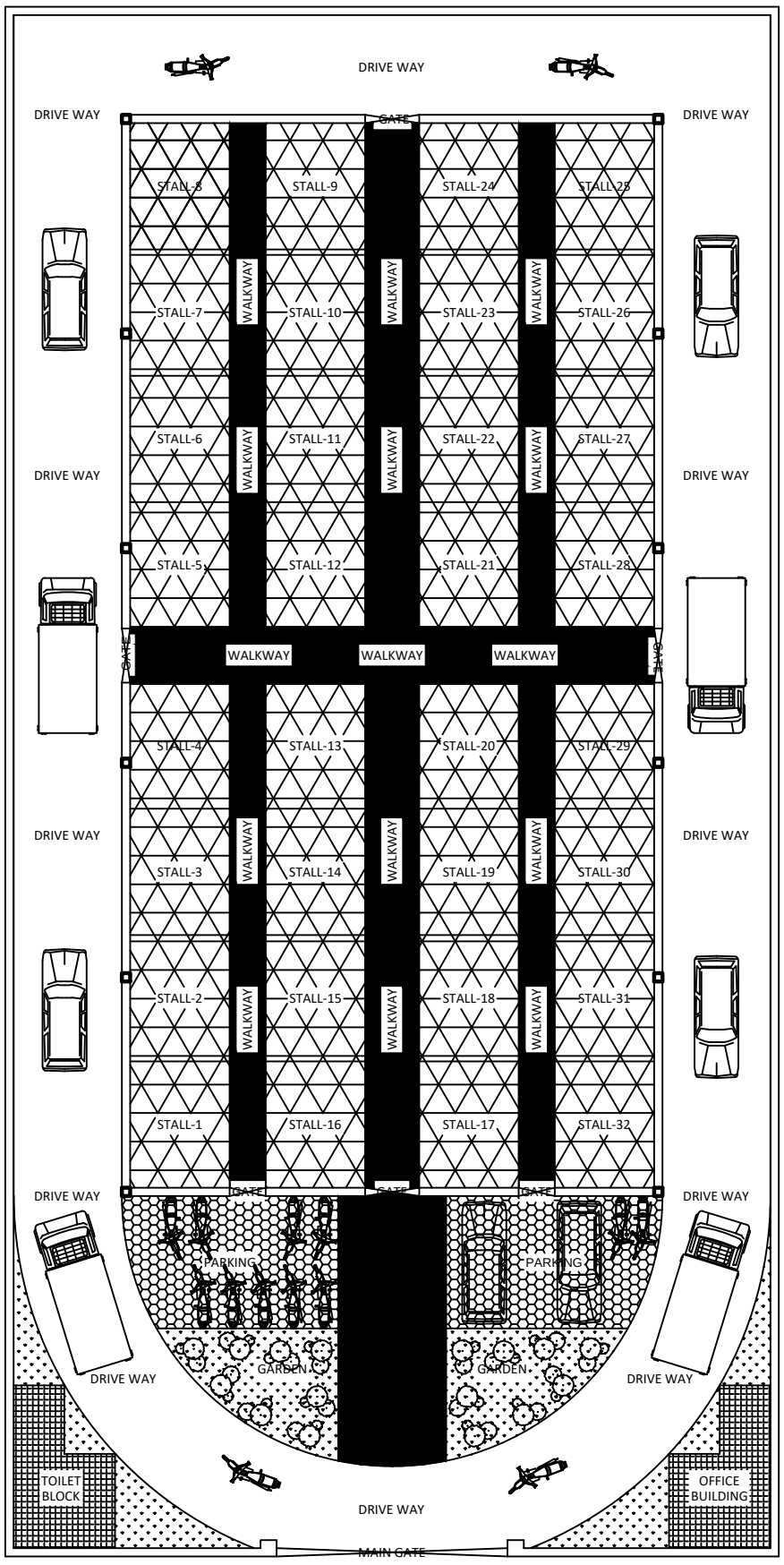
VILLAGE : VALUKAD

TALUKA : GHOGHA, BHAVNAGAR.

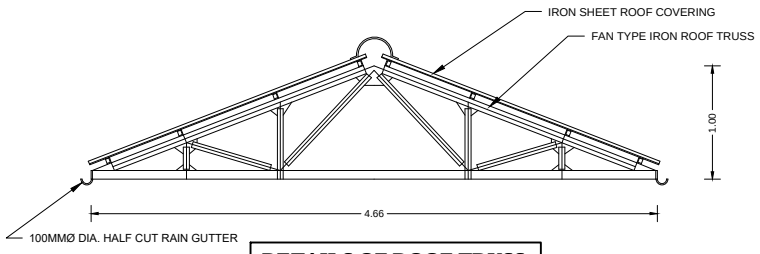
TITLE : COMMUNITY HALL BLOCK LAYOUT

SCALE :- 1:100	DRAWN BY : DHWANIL PATEL MANDIP GOHIL

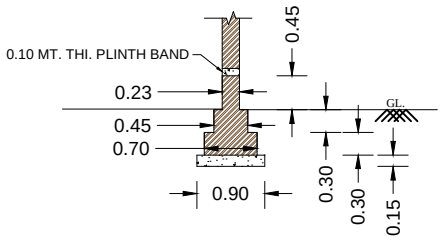
DRAWING NO. 07



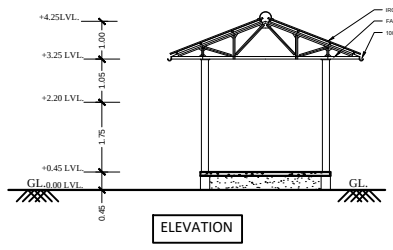
LAYOUT PLAN FOR VEGETABLE MARKET BUILDING



DETAILS OF ROOF TRUSS
SCALE : 1 : 200



DETAILS OF FOUNDATION



ELEVATION

TITLE : PROPOSED VEGETABLE MARKET BUILDING LAYOUT
PLANS FOR STUDY PURPOSE
AT VILLAGE : VALUKAD,
TALUKA : GHOGHA,
DISTRICT : BHAVNAGAR.
FOR VISHVAKARMA YOJANA PHASE - VIII

SCALE : 1 : 100

AREA TABLE	SQ.MT.
NET PLOT AREA	922.78
AREA UNDER CONSTRUCTION	450.00
OTHER DETAILS AS PER SHOWN IN DRAWING	

COLOR NOTE

●	PLOT BOUNDARY	○	PROPOSED WORK

ALL DIMENSION ARE IN METERS

VISHWAKARMA YOJANA PHASE - VIII

VILLAGE : VALUKAD

TALUKA : GHOGHA, BHAVNAGAR.

TITLE : VEGETABLE MARKET BUILDING BLOCK LAYOUT

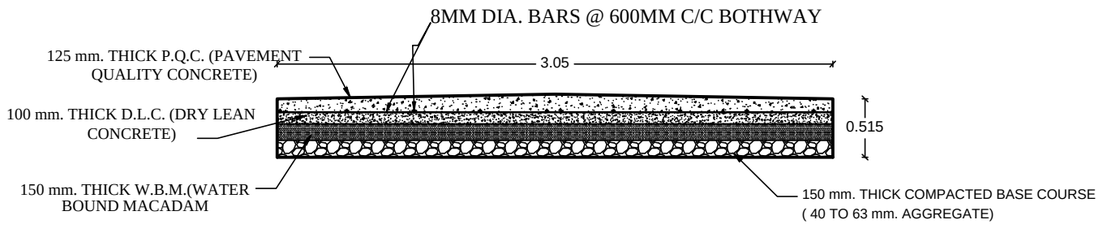
SCALE :- 1:100

DRAWN BY : DHWANIL PATEL
MANDIP GOHIL

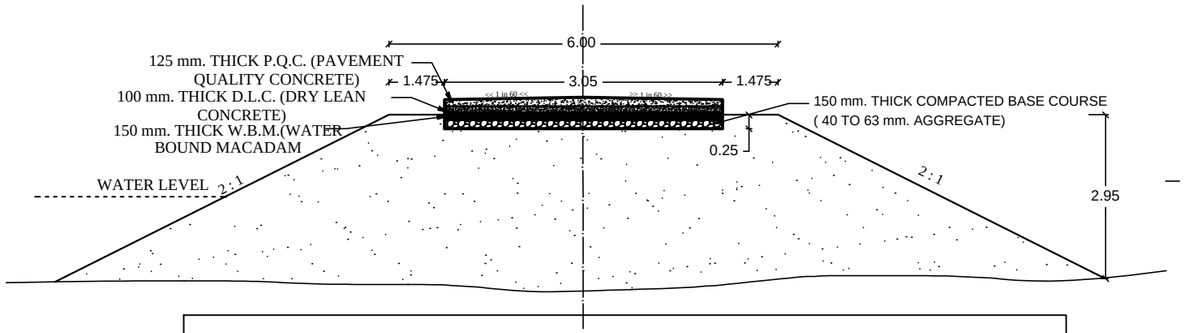
DRAWING NO. 08

TITLE :-

R.C.C. ROAD IN MAIN BAZZAR

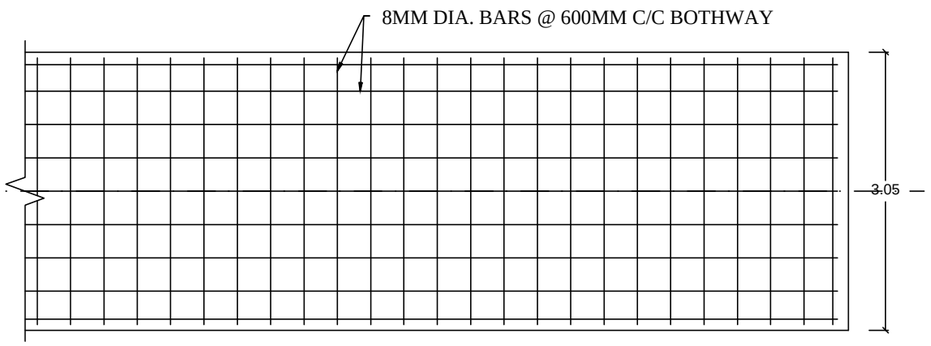


PAVEMENT DETAIL



ADOPTED TYPICAL CROSS SECTION OF R.C.C. PAVEMENT ROAD

NOTE :
CONCRETE GRADE = M-30
STEEL GRADE = Fe415
AGGREGATE SIZE = 40 to 63 MM
S.B.C. = 225 KN/M^2



PLAN SHOWING DETAILS OF REINFORCEMENT

TITLE : PROPOSED RCC ROAD DESIGN
PLANS FOR STUDY PURPOSE
AT VILLAGE : VALUKAD,
TALUKA : GHOGHA,
DISTRICT : BHAVNAGAR.
FOR VISHVAKARMA YOJANA PHASE - VIII

N

LENGTH OF ROAD = 250 MT.
TOTAL WIDTH OF ROAD = 6 MT
WIDTH OF PAVEMENT = 3.05 MT

ALL DIMENSION ARE IN METERS

VISHWAKARMA YOJANA PHASE - VIII

VILLAGE : VALUKAD

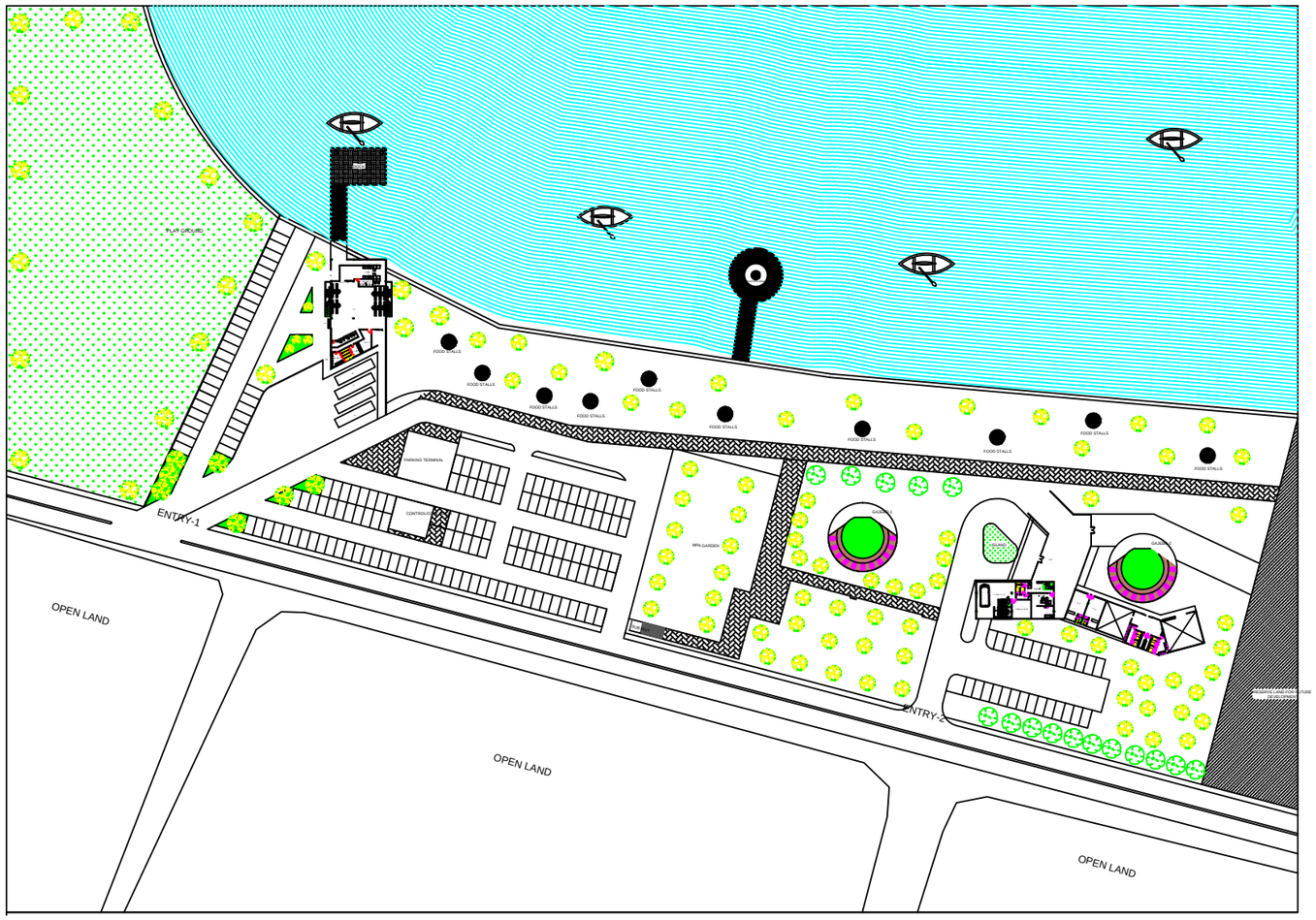
TALUKA : GHOGHA, BHAVNAGAR.

TITLE : RCC ROAD DESIGN

SCALE :- 1:100

DRAWN BY : DHWANIL PATEL
MANDIP GOHIL

DRAWING NO. 09



TITLE : PROPOSED LAKE FRONT LAYOUT
PLANS FOR STUDY PURPOSE
AT VILLAGE : VALUKAD,
TALUKA : GHOGHA,
DISTRICT : BHAVNAGAR.
FOR VISHVAKARMA YOJANA PHASE - VIII

N

SCALE : 1 : 100

AREA TABLE	SQ.MT.
NET PLOT AREA	60000.00
AREA UNDER CONSTRUCTION	33300.00

OTHER DETAILS ARE AS PER SHOWN IN DRAWING

ALL DIMENSION ARE IN METERS

VISHWAKARMA YOJANA PHASE - VIII

VILLAGE : VALUKAD

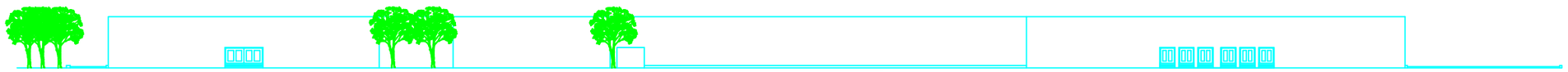
TALUKA : GHOGHA, BHAVNAGAR.

TITLE : LAKE FRONT BLOCK LAYOUT

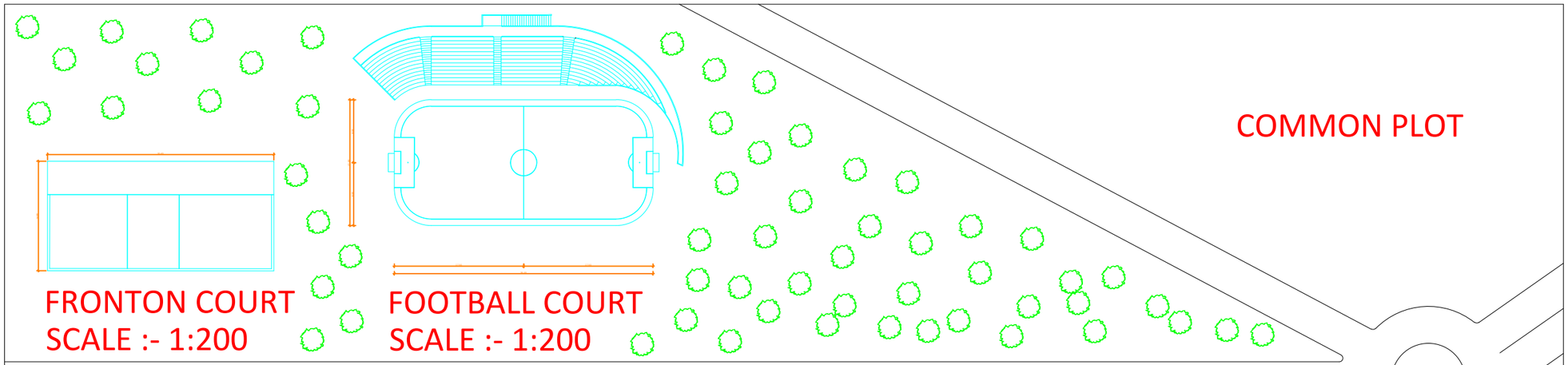
SCALE :- 1:100

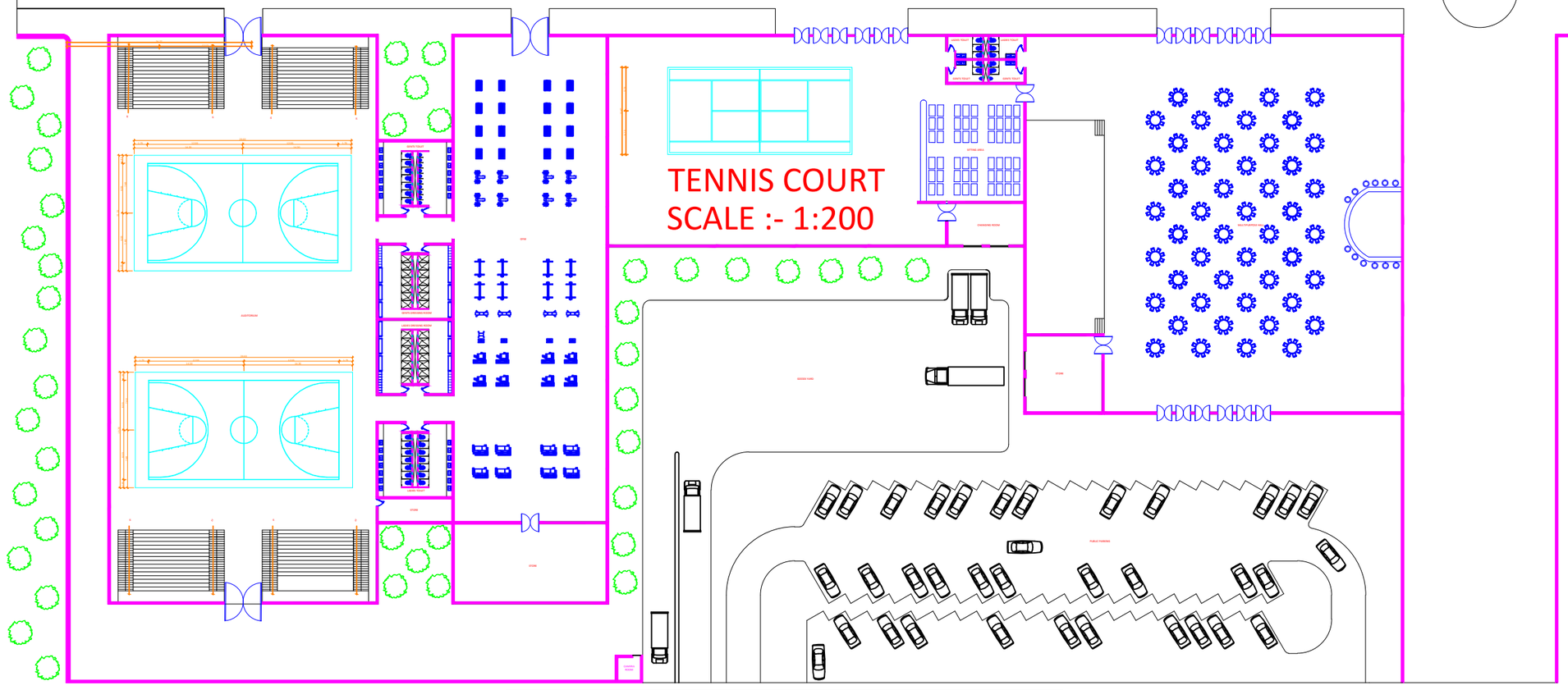
DRAWN BY : DHWANIL PATEL
MANDIP GOHIL

DRAWING NO. 10



ELEVATION





LAYOUT PLAN OF SPORTS COMPLEX

TITLE : PROPOSED SPORTS COMPLEX BUILDING LAYOUT PLANS FOR STUDY PURPOSE
AT VILLAGE : VALUKAD,
TALUKA : GHOGHA,
DISTRICT : BHAVNAGAR.
FOR VISHVAKARMA YOJANA PHASE - VIII

N

SCALE : 1 : 100

AREA TABLE	**SQ.MT.**	
NET PLOT AREA	28722.24	
AREA UNDER CONSTRUCTION	8864.50	
OPENING SCHEDULE	**RCC STAIR DETAIL**	
AS PER SHOWN IN DRAWING	TRADE	0.25
	RISE	0.15

COLOR NOTE

●	PLOT BOUNDARY	○	PROPOSED WORK

ALL DIMENSION ARE IN METERS

VISHWAKARMA YOJANA PHASE - VIII

VILLAGE : VALUKAD

TALUKA : GHOGHA, BHAVNAGAR.

TITLE : SPORTS COMPLEX BLOCK LAYOUT

SCALE :- 1:100	**DRAWN BY : DHWANIL PATEL MANDIP GOHIL**

DRAWING NO. 11