DETAIL PROJECT REPORT

VISHWAKARMA YOJNA: VIII
AN APPROACH TOWARDS RURBANISATION
KALATALAV

Village

BHAVNAGAR

District

PREPARED BY

NAME	BRANCH NAME	ENROLLMENT NO
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GOVERNMENT ENGINEERING COLLEGE, BHAVNAGAR

PROF.V.S. DAVE
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H.O.D. DEPT. OF CIVIL ENGINEERING

YEAR:2020-21

GUJARAT TECHNOLOGICAL UNIVERSITY
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CERTIFICATE

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

Detail Project Report For,

VILLAGEKALATALAV

DISTRICT BHAVNAGAR

Under

VishwakarmaYojana: Phase-VIII

In partial fulfillment of the project offered by

GUJARATTECHNOLOGICALUNIVERSITY
Chandkheda. Ahmedabad- 382424 Gujarat

During the academic year 2020-21.

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

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College Name:	**GOVERNMENT ENGINEERING COLLEGE, Bhavnagar**
College Stamp:	

ABSTRACT

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 KalatalavVillage 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.

Kalatalav village is located in Bhavnagar Tehsil of Bhavnagar District in Gujarat, India. It is situated 5km away from Bhavnagar, which is both district & sub-district headquarter of Kalatalav village. As per 2009 statistics, Kalatalav is the Gram Panchayat of Kalatalav Village. The total geographical area of village is 4794.93 hectares. Kalatalav has a total population of 3,854 peoples. There are about 989 houses in Kalatalav village. As per 2019 stats, Kalatalav Villages comes under Bhavnagar Rural assembly & Bhavnagar parliamentary constituency. Bhavnagar is nearest town to Kalatalav which is approximately 5km away. The basic facilities available in the village are like post-office, small scale industries, panchayat building drainage facilities, pucca road, school, etc.

In Kalatalav village, drainage system is unavailable. The condition of roads is Poor except entrance. All the village roads are Pucca roads. There is no transportation facility in the village. In the village lack of basic facilities like public toilet, poor condition of panchayat building, Drainage system, public garden, community hall, etc.

For development of the village infrastructure facilities like panchayat building, secondary school and public facilities like bus station are required. For sustainable development of the village rain water harvesting system, solar 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.

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 Kalatalav village, etc. In a nutshell, the future scope would be study of urban replicating amenities that would be sustainable in rural areas of Bhavnagar.

Rurban, Smart village, Gap analysis, Sustainable development

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.

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ABBREVIATIONS

SHORT NAME / SYMBOL	FULL NAME
VY	Vishwakarma Yojana
TDO	Taluka Development Officer
DDO	District Development Officer
SH	State Highway
MDR	Major District Road
VR	Village Road
AR	Approach Road
PCC	Plain Cement Concrete
RCC	Reinforced Cement Concrete
BM	Brick Masonry
UDPFI	Urban Development Plans Formulation And Implementation
PHC	Public Health Center
SWOT	Strength Weakness Opportunity
NGO	Non-governmental Organization
PHC	Public Health Centre
CHC	Community health centre
APMC	Agricultural produce market committee
U/G	Underground sump
SC	Schedule caste
ST	Schedule Tribe
PMGSY	Pradhan Mantri Gram Sadak Yojana
RGGVY	Rajiv Gandhi Grameen Vidyutikaran Yojana
IAY	Indira Awash Yojana
PMAGY	Pradhan Mantri Adarsh Gram Yojana
NRHM	National Rural Health Mission
SSA	SarvaSiksha Abhiyan
GP	Gram Panchayat
GL	Ground Level
PL	Plinth Level
LL	Lintel Level
SL	Slab Level
PRL	Parpet Level
Cu.mt.	Cubic Meter
Sq.mt.	Square Meter
Rn.mt.	Runing Meter

1. Ideal Village Visit from Koliyak Village

1.1 Background & Study AreaLocation:

The term rural development represents improvement in the quality of life of the people in rural areas. As per Chambers (1983), "rural development is a strategy to enable a specific group of people, poor rural women and men, to gain for themselves and their children more of what they want and need".

Koliyaak village is located in Bhavnagar district of Gujarat state. It is situated 23km away from Bhavnagar. On November 27th we have visited our ideal village to carry out over Techno Economic Survey for Vishwakarma Project. This village is currently focusing on tourism development due to huge attraction of religious visitors. SH-37 state highway passes through Koliyaak and the main roads of village are of bituminous all weather in good conditions. Internal street of village is having blacked paved roads. Irrigation facilities in village is good because it has many sources like river, lake, canal, tube well. And power supply for agriculture use is more than 8 hours. For educations purpose village is having 4-anganwadi ,5-primary,1-high school and 1-higher secondary school which is sufficient compare to our allocated village. Street lighting facilities are also available.

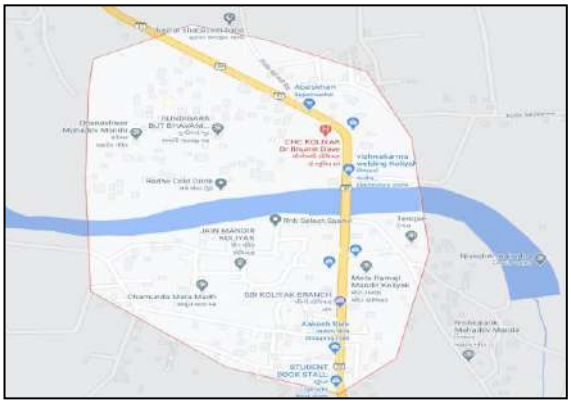


Figure:1.1 Satellite view of KoliyaakFigure:1.2 Satellite view of Koliyaak

This village is well known for its religious shiv Temple **Nishkalank Mahadev** at Middle of **ARABIAN SEA** Koilyaakvillageat Bhavnagar district of Gujarat. The temple is full of wonders and awe. The temple is buried inside the sea. on heavy tides day, all that can be seen the flag and pillar. It is beyond one's comprehension that there is a lord shiva temple just under the fierce sea. The temple has 5 distinct swayumbu shiva lingams inside. In every Friday all visitors can visit nishkalankmahadev

Figure:1.3 NishkalankMahdev Temple Koliyaak

❖ Study Area Location

- **Demographicaldetail: -**

Sr.no.	Census	Population	Male	Female	Totalhouse hold
1	2001	2422	-	-	600
2	2011	4740	2470	2270	750

Tabale-1.1 Demographical Growth

- **Geographical detail: -**

Sr no.	Description	Information/Detail
1.	Area of village (approx..)	21.38 hector
2.	Forest Area (approx..)	65.60 hector
3.	Agricultural Land Area (approx.)	13.39 hector
4.	Residential area (approx..)	16.28 hector
5.	Water bodies (approx.)	0.77 hector
6.	Other (approx.)	1.54 hector
7.	Nearest Town with distance	26 KM form Bhavnagar

Table-1.2Geographical Growth

1.2 Concept: IdealVillage:

1.2.1. Objectives:

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. Hence, in this context, the major objectives of ideal village in context of normal village should be as follows:

- Prevent distress migration from rural to urban areas, which is a common phenomenon in India's villages due to lack of opportunities and facilities that guarantee a decent standard of living.
- Make the model village a "hub" that could attract resources for the development of other villages in its vicinity.
- Provide easier, faster and cheaper access to urban markets for agricultural produce or other marketable commodities produced in such villages.
- Contribute towards social empowerment by engaging all sections of the community in the task of village development.
- Create and sustain a culture of cooperative living for inclusive and rapid development.

1.2.2. Example/live case studies of ideal village ofIndia/Gujarat

The case of village Punsari from the Sabharkantha District of the state of Gujarat has been studied as an example/live case study of ideal village of Gujarat, as it stands out as a smart and model village. The grassroots leadership, community participation, decentralization of powers to local bodies in rural areas and financial support in the form of variousgovernment schemes has brought far reaching changes in the rural landscape of India.Economic progress has to coincide with social progress which is inclusive, sustainable, and sensitive not only to its environment but to its people as well. The village has received several awards from the state aswell as national government for its outstanding achievements and has become extremely popular across the country.

The facilities like (a) *infrastructure development* in the village in context of electrical supply, CCTV, public address system (in the form of 120 waterproof loud speakers), (b) *education*, in the form of 5 primary schools and 4 secondary schools, comprises other advantages like LED screen, CCTV in the schools, separate toilets for boys and girls, computer labs, stocked libraries, mid-day-meal (MDM), (c) *health, sanitation and woman empowerment* in the village are in the form of 24/7 primary health center equipped with a pharmacy and library and maternity ward with zero maternity death, door-to-door waste collection, training for collection and disposal, street polluters are heavily fined and a self-made group for providing vocational training to empower women, (d) *democratic governance* in the form of a team of 22 full-time and 47 part-time employees along with the elected officials of the gram Panchayat along with grievance redress toll free number and complaint register. As "Swarajya (self-governance) to Surajya (goodgovernance)" has been found as the

mantra for rural development in the Pansuri Village of Sabarkantha District of Gujarat State, it has been considered as an ideal village case study for the report preparation.

1.2.3 The Idea of a model/Smart Village

Developments a highly complex, relative, and multi-dimensional concept. The core focus of this term even today continues to be economic growth. However, some quintessential terms such as sustainability and inclusiveness have been added to broaden the scope of this concept. From a holistic perspective, development is directed to achieve goals in health, education, public infrastructure, and empowerment of the people particularly at grass-roots level. The term rural development represents improvement in the quality of life of the people in rural areas. As per Chambers (1983), "rural development is a strategy to enable a specific group of people, poor rural women and men, to gain for themselves and their children more of what they want and need". According to Sreedhar and Rajasekhar (2014), rural development as a phenomenon can be viewed as the result of interactions between various physical, environmental, technological, economic, socio-cultural, and institutional factors in the rural areas of a nation. Sridhar and Rajasekhar add that as a strategy, rural development is the approach or operational design to bring about the desired positive change in the socio-economic and cultural life of the people. Although development of rural areas has always been a priority of Indian government since independence, off late rapid urbanization has diverted attention of the government onto urban areas. Hence, in a nutshell, an equal attention needs to be paid to the goal of rural rejuvenation.

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 Programmed (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 programmed 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 programmers need to be tweaked to suit local requirements so that their success is guaranteed.

India has a chequered history of Panchayati Raj (rural grass-roots institutions) starting from self-sufficient and self-governing village communities to modern-day organized village governance system in the format of Panchayati Raj Institutions or PRIs. The informal village level council of five elderly men (traditional Panchayats) and the present day democratically elected Panchayats state a lot about the deep-rooted culture of self-governance in this country. Sir Charles Metcalf called the traditional Panchayats of India little republics. However, these informal Panchayats suffered the onslaught of Mughal and British imperialism and could never be revived through democratic means in the pre- independence period. The CDP and NES were the first failed baby steps taken in that direction. The Balwant Rai Mehta Committee (1956) and Ashok Mehta committee (1966) recommended that a formal democratically elected structure had to be crafted at the grass-roots level in order to actualize the objectives of rural development programmers. Most of the other government committees7 also recommended that people's participation in planning and implementation and grass-roots leadership is a key to fructify objectives of rural development.

During his position as a Prime Minister of India, Late Sheri Rajivbhai Gandhi's contribution to realizing 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 recognized 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). This has led to decentralization of not only functions but also of functionaries and finances. It has widened the scope for people's participation in the process of rural as well as self-development. Joshi (2017) calls these Panchayats the central processing units of Indian democracy.

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 marginalized 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 mass the spirit of decentralized democracy and hampers rural development programmers 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. If PRIs are to work as prime mechanism of development, they have to be given proper financial aid, especially in a global world. However, the situation is not so bad that it does not give us any ray of hope. Certain villages in India are growing exceptionally well. Hiware Bazar, located in the District of Ahmednagar, in Maharashtra, has transformedfrom a place fraught with issues to possibly the richest village in India.

The sole reason for this fairy-tale change is one man called PopatraoPawar. He banned all addictive substances to minimize expense and encouraged the villagers to invest in rainwater harvesting, etc. There are a record 60 millionaires in the village and barely any poor. From 168 below poverty line families in 1995, Hiware Bazar now has just three. The villagers continue to strive to see the day when not one person is poor. Mawlynnong, a small village in Meghalaya, was awarded the prestigious tag of 'Cleanest Village in Asia' in 2003 by Discover India Magazine. Located at about 90 kilometres from Shillong, the village offers a skywalk that can be taken as you explore it. 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 (Socio economic, physical, and demographic and infrastructure details) of Ideal village / Smart Village with photograph

Punsari is located approximately 80 kilometres away from the state capital of Gandhinagar in Gujarat. It has had phenomenal success in the past decade under the leadership of a visionary and missionary Sarpanch (village headman) Mr. Himanshu Patel (who served as the Sarpanch from 2006 to 2016). The village has received several awards from the state as well as national government for its outstanding achievements and has become extremely popular across the country. This was the most important reason that motivated the author to visit and study this model village personally, to understand and explore how this transformation was made possible. The village has 23 communities with a population of 6000, including only 350 people living below the poverty line. Most of the people in the village are dependent on agriculture and milk production for livelihood.

Infrastructure Development: The most important concern in rural development is to providebasic amenities to each person living in the rural areaPunsari stands out in this regard as it hasconstructed a reverse osmosisplant and since then provided house-to-house piped connections tosupply chlorinated water. It also has its own 66 KVA substation for electricity generation and100 per cent coverage of all streets with LED streetlights. A public address system with 120waterproof speakers for announcing information and spreading messages has been another striking feature of this village. The village headperson uses this public announcement system to share what he thinks, plans, and is doing at the gram Panchayat. The entire village has been put under CC TV surveillance, which has helped to bring down crime rate to almost zero per cent. Each household has a personalized lavatory and the whole village has a well-designed drainage and storm water disposal system. Atal Express is a free bus service availablefor commutation tall the villagers. Punsari is the first fully Wi-Fi-coveredvillage in India. There are also plans to do GIS mapping for the better implementation of many government schemes. Some of the popular national banks and their ATM centers are now available as well.

Education: Education for all and free for all is the mantra this village has aspired to adopt. Punsari has five primary schools and four secondary schools. The class rooms in these schools are fully equipped with CCTVcameras, LED screens used for teaching, mineral water plants, separate toilets for girls and boys, computer labs, and well-stocked libraries. MidMealsprogramme of the central government has been successfully implemented. Availability of these basic amenities within the premises of schools has also helped to reduce the dropout rate to zero.

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

Democratic Governance: A team of 22 full-time and 47 part-time employees along with the elected officials of the gram Panchayat under the leadership of village headperson run this local unit. The village has developed an effective mechanism to redress grievances through a

toll-free number. A complaint register is maintained in order to ensure timely grievance redress. Aco-ordination committee involving elected representatives and government officials works tirelessly to achieve the goals of good governance.

Figure:1.4 Ideal village photos

1.4 SWOT analysis of Ideal village / Smart Village

Punsari model village definitely has an excellent record in terms of fewer people living below poverty line, availability of schools, water facilities, free Wi-Fi facility, roads, proper solid waste management etc. The village has proved itself on important development indicators like health, education, social services, women empowerment, which have already been discussed in the previous section. However, during the field wok the author observed that mere physical indicators of development are at times misleading. A model village is not necessarily an ideal village. An ideal village in author's opinion is the one that has been able to transcend social inequalities, reduce subordination of women, develop true community spirit, and work tirelessly to respect and recognize constitutional values. Villages in India are notorious for the caste divide, communal tensions, social injustices, and, at times, instances of violence. Punsari has performed exceptionally well in providing basic amenities, reducing inequalities among different social groups, and improving some major social indicators of development. However, it has yet to accomplish its goal of becoming an ideal village where every citizen hailing from different socio-economic background has a voice and choice. This was observed by the author while interacting with the current Punsari village headwoman. Interaction with her has revealed certain issues that are conveniently overlooked under the grand saga of village development. These are discussed in the following paragraph.

Sunanda Patel, current village headwoman, hails from the dominant caste called Chawdhary Patel. Interestingly but not surprisingly, Himanshu Patel also comes from the same caste group. Ms Patel did not have any experience in governance and was never involved in any political activity, yet she was fully supported and backed by Himanshu Patel (former village headman) so that she could be successfully instituted as the Sarpanch of Punsari Village. At the time of rural local body election in 2016, the post of village headperson was reserved for a female candidate (according to the provisions of the 73rd Constitutional Amendment Act). Himanshu Patel had to step down, but he wanted to institute a woman from his own caste group. Hence, it was necessary to prevent women from other caste groups from winning the election in the village. However, the fact was that women from other caste groups also stood for election. In order to prevent these other (read lower caste) women from becoming the village headperson, Himanshu Patel not only mobilized his resources but also the influence that he had earned in the past ten years. This was a strategic decision taken by this previous headman to enable him to continue his influence on village politics. Therefore, Ms Sunanda Patel was supported and eventually won. The author asked this new puppet-like female Sarpanch about her future plans – what strategies she would adopt to implement her plans, etc. The answers were imprecise and inefficient. In fact, within few minutes after the interview began, her husband joined her in the office and made sure that Ms Patel answered as per a pre-determined design. She was blowing the trumpet of development achieved by Himanshu Patel and could not say anything concrete about her plans and programmers. This interview has reinforced the fact that (in most cases barring few exceptions) a woman merely plays a role of a rubber stamp and real governance is in the hands of dominant village men. It also exposes the way rural democratic institutions are actually working in India (cf. Kumar, 2006). Another important fault line found in this village is that the Gram Sabha (village assembly) meetings are not conducted on regular basis. Article 243(b) defines the Gram Sabha as "a body consisting of persons registered in the electoral rolls relating to a village comprised within the area of the Panchayat at the village level". Gram Sabha is an integral part of the Gandhian concept of village Swaraj (rural self-government).

The objective of Gram Sabha is to enable each and every voter in a villageto participates in decision-making at the local level. It is a constitutional body consisting of all persons

registered in the electoral rolls of the villagePanchayat. It provides a political forum to people in the village where they can meet and discuss their common problems, and consequently, understand the needs and aspirations of the community. Thus, the Gram Sabhaisexpected to be an epitome of participatory, deliberative, and direct democracy. It is the body that should provide valuable inputs to the GramPanchayat to lead local government effectively. The Gram Sabha is also to act as awatchdog in the interest of village communities by monitoring the functioning of the Gram Panchayat. However, the effectiveness of GramSabha has been marred by issues like social exclusion, dangerous information gap, and political apathy on part of villagers, dependency syndrome, and political culture of patronage. Furthermore, Joshi (2017) stresses low participation in Gram Sabha meetings and irregular and informal ways of its conduct as some of the major concerns at the grass roots. These field observations gleaned from the model village Punsari help usunderstand the fact that the physical development of a village does not necessarily promise change in its social environment.

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

Future plans:

After successfully serving for two terms as village headman, HimanshuPatel stepped down from the post since this time it was reserved for a female candidate. He now wants to focus on preparing a team of young local level leaders who are not only from his own state but from across the country. He has already networked with a thousand such young villageheadmen from different corners of India, cutting across party ideologies. The aim of such a group is to share experiences of rural development among themselves. Nonetheless, what is important to note here is that Himanshu Patel does not intend to replicate the model of Punsari in other parts of the country. He rather believes that every village should be unique example rooted in its own ecology and environment. He hasbeen appointed programme officer to overlook the implementation of Nandgram project which is based on a PPP model. Vedanta Companyis contributing 1000 crore rupees under its CSR initiative. The proposed programme focuses on nutrition of infants and children and fights against under and malnutrition in India.

1.6 Benefits of the visits of Ideal village / Smart Village

In context of Vishwakarma Yojana Project, the study of ideal / smart village strengthens the thinking process about how the allocated should be developed. One may think for the allocated villages in respect of Punsari Village:

- To trigger processes which lead to a holistic development of the identified Gram Panchayats
- To substantially improve the standard of living and quality of life of all section of the population through -

1. Improved basic amenities
2. Higher productivity
3. Enhanced human development
4. Better livelihood opportunity
5. Reduced disparities
6. Access to right and entitlements
7. Wider social mobilization
8. Enriched social capital

- To generate models of local level development and effective local government which can motivate and inspire neighboring Gram Panchayats to learn and adapt
- To nurture the identified Adarsh Grams as schools of local development to train other gram panchayat

1.7. Electrical / Civil aspects required in Ideal village / Smart Village

- In ideal village it should be powered by solar off/on frid system for government buildings
- In deal village street lightuing should be powered by solar panel
- Road are made up of RCC.
- A good plantation and greean space avelable for environment friendliness atmosphyer
- Good physical infrastructure should be avilabel in the village
- Good educational infrastructure is available in village. To improve the quality of educations in village
- Source of drinking water should be of water supplyed by piped water and rain and bore well mauinly

2. Literature Review – (Civil & Electrical Concept)

2.1Introduction: Urban & Rural village concept

As per the Census of India (2011) document, the term 'urban' means constituents of urban area, which are Statutory Town (ST), Census Town (CT) and Outgrowths; while the term 'rural' means all the area other than urban area and whose basic unit is a revenue village. The urban village as an entity exists only as a concept. Administratively, it merges with the urban ward as soon it gets notified, but has starkly different characteristics from the rest of the ward. The rural-urban conflicts are strongly manifested here. Recently in Bhavnagar City, Adhewada Village has been merged in Bhavnagar Municipal Corporation and divided into 2 separate wards. Before few years, Sidsar Village – another village of Bhavnagar Taluka – was merged under the administrative boundary of Bhavnagar Municipal Corporation.

In the wake of current planning mechanisms, most of the urban villages have the pattern of development that emerges in these areas is haphazard and chaotic. Uncontrolled invasion of non-compatible land-uses and elimination of traditional interrelationships by outside and superfluous forces leads to the disintegration of the communities. As a consequence of economic and speculative forces unleashed on villages in the periphery of the metropolis, massive transformation in their physical form and socio-cultural setup takes place.

In the above context, it has been observed in Ahmedabad, before and after its involvement under Smart City Mission, some villages have experienced population growth rates of up to 700 per cent in a decade. The village is confronted with a forced upsurge of deleterious activities, but it lacks any mechanisms to control them earlier. Though, urban villages (just like Bavla in case of Ahmedabad) provide economic advantages such as cheap land prices and inexpensive housing to the service classes in the nearby metro city, their social and physical environment undergoes gradual upgradation. The land and property prices have evolved even in village Dholka, after Ahmedabad has been named in Smart City Mission!

At the country level, as an example of New Delhi, the journey for the rural village begins the day it is notified by the Municipal Corporation of Delhi (MCD) for acquisition. Panchayats are superseded and the Delhi Development Authority acquires the land for development works. The MCD deals with the supply of infrastructural facilities and once the development work is complete, the urban village is transferred to this body for maintenance and upkeep. The entire process may take anything between 15 to 20 years -- a fairly long period for a village to lie without coordinated administration. It is during this transition stage that maximum speculative development happens in the villages. Lack of land-use regulations give birth to several illegal colonies and absence of control over pollution norms result in small-scale polluting factories taking root. Some such as *Mundka* village in north Delhi emerge as the worst hit. Here environmentally hazardous activities such as the recycling of hospital waste and plastic waste thrive. Following the government's ban on polluting industries, several of them continue to quietly operate behind closed doors. As the city sleeps, these units come alive.

In vision of a Civil Engineer and in context of town planning and regional planning, any particular patch of land – ranging from a small area to a town/city – should be planned and grown in controlled fashion. After naming the team under allocated village as part of Vishwakarma Yojana Project (VIII Phase), the team has made up its mind with the generalized goals like identifying problems to be addressed based on priority, lowering the migration from rural to urban centers, providing better living conditions in rural area along

with visualization of the planned & controlled progressive growth of an allocated village after a decade or two.

2.2 Importance of the Rural development

Rural development usually relates to the method of enhancing the quality of life and financialwell-being of an individual specifically living in populated and remote areas. Traditionallyruraldevelopment is centered on the misuse of land-intensive natural resources such as forestry andagriculture. But today, increasing urbanisation and change in global production, networks havetransformed the nature of rural areas.

Today, rural development still remains the core of the overall development of the country. It has become more than two-thirds of the country's people is dependent on agriculture for their livelihood and one-third of rural India is still below the poverty line. Therefore, it is important for the government to be productive and provide enough facility to upgrade their standard of living.

Rural development is a complete term that concentrates on the action taken for the development of rural areas, which improve the village economy. However, few areas that demand more focused attention and new initiatives are.

- Education
- Public Health and Sanitation
- Women Empowerment
- Infrastructure Development (e.g., electricity, irrigation, etc.)
- Facilities for agriculture extension and research
- Availability of Credit
- Employment opportunity

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.

2.3 Ancient Villages / Different Definition of: Rural Urban Villages

In the following content, various definitions of 'urban village' have been presented to know how the term has various horizon ranging from local level to international level and also in context of various research scholars as well as universities:

(1) As mentioned in topic no. 2.1, the urban village as an entity exists only as a concept. Administratively, it merges with the urban ward as soon it gets notified, but has starkly

different characteristics from the rest of the ward. The rural-urban conflicts are strongly manifested here.

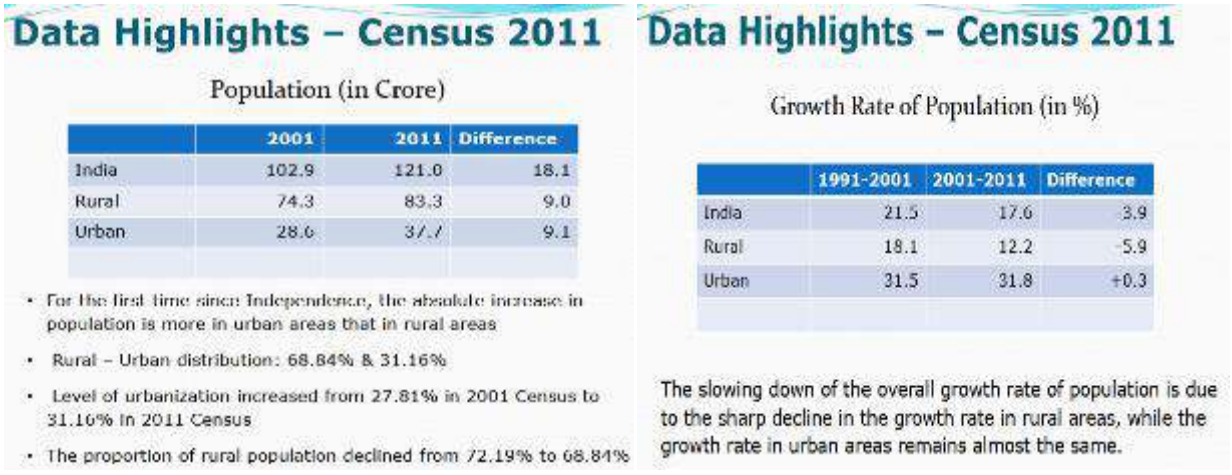
(2) As per the definition given by GaigongmeiGangmei, "*Urban village typically would mean a well-planned set-up with a village-concept of being fairly self-sufficient and not having the need to travel long distances to get daily things done. What is most important, perhaps, is that it's intended to tackle the problem of increasing population in cities.*"

(3) As stated in topic no. 2.1 and observed by Mr. Kapil Chaudhary – Urban Planner and Director of Spatial Designs that "*The Delhi urban villages have some of these salient features, especially mixed-use zoning. What has become more apparent, thought, is how each urban village differs from each other.*"

(4) In urban planning and design, "*An urban village is an urban development typically characterized by medium-density housing, mixed use zoning, good public transit and an emphasis on pedestrianization and public space.*"

(5) In July 2002, Biddulph M., *et. al.*, stated the concept of 'urban village' and provided its use in cases like (a) To investigate the variety of values and meanings ascribed to developments informed by the urban village concept, on the part of all those individuals involved, (b) To assess the extent to which the urban village as a lived experience accords with the intentions and perceptions of those who promote and use it, (c) To assess the extent to which principles of development accord with user aspirations.

(6) In context of Mr. E. Christopher Mare, Doctoral Researcher of Village Design Institute, Fielding Graduate University (2006), has mentioned the concept of 'urban village' in context of a briefing sheet – practiced in U.K. – as "*An urban village is a concept of settlement which is small enough to create a community in the truest sense of the word – a group of people who support each other, but big enough to maintain a reasonable cross section of facilities.*" Within the same report, the researcher mentioned one of the key characteristics of an urban village as "Each Urban Village is planned and developedthrough a Master Plan, backed by a series of codes, and an environmental action plancoveringhow the environmental impact of the village is to be managed andminimized."



Source: *https://censusindia.gov.in/2011-prov-results/paper2/data_files/india/Rural_Urban_2011.pdf*

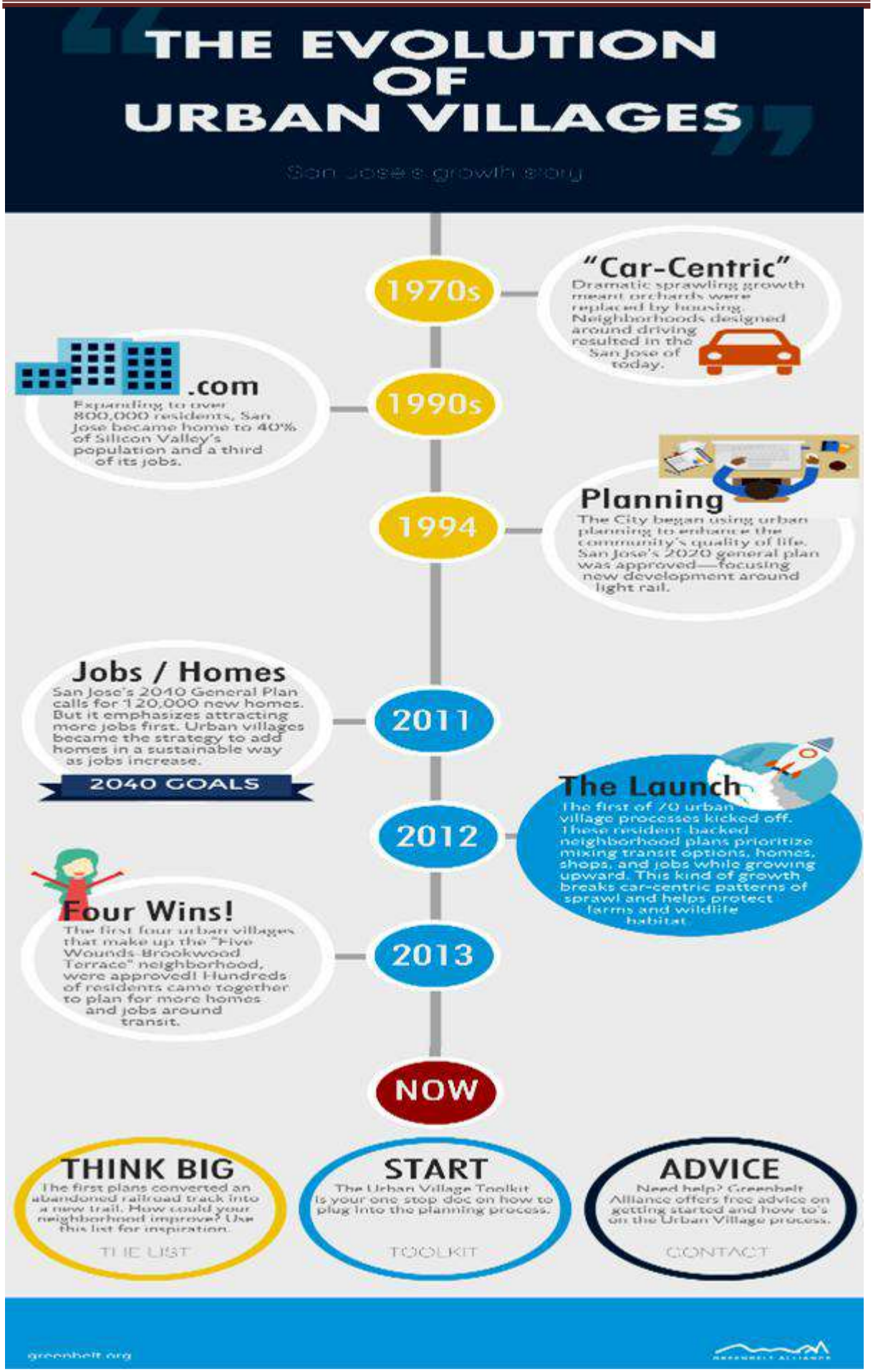
Figure:2.1 Census DATA 2011

On the other way, the concept of 'rural village' is very clear and specific in terms of the synonymous words' conjunction in the form of 'rural' and 'village'. There is very thin difference between the same. The team, based on the background of various colleagues and discussion with elders as well as faculties, identifies the difference in a way that when a person uses the term 'village' that means the location will have specific revenue boundary, agriculture as its main economy and has limited mix-zoning in land use; while when a person uses the term 'rural' that means it adds a sense of imaginary comparison in context of urban area and may comprise single or multiple villages who have either mix-zoning type of land use as well as agriculture and small scale industries as their major economy drivers.

One famous newspaper "The Hindustan Times" published an opinion type article with the headline as "India needs a rural centric development model" (24th July, 2020) stating in context of migration activities observed during the COVID-19 situation in India. It also revealed the fact that India is the second largest country in terms of numbers of migrant workers, while the first is China. The article concluded with the statement as "To convert the 'crisis into an opportunity', this is the alarming time for India to identify and implement rurban development models as well as rural centric development models."

Further, in an article of Retd. Prof. Vijay Kumar Sarabu, Warangal, India, who has published nearly 100 publications, has mentioned in his 'Way forward article' in October-2018 that "*Government should go for appraisal of various rural development schemes and programmes in order to uplift rural areas. Rural entrepreneurship finds it difficult to take off is due to lack of capital accumulation, risk taking and innovation. The rural development programs should combine infrastructure development, education, health services, investment in agriculture and the promotion of rural non-farm activities in which women and rural population can engage themselves. Rural development and rural entrepreneurship are the way of converting developing country into developed nation.*"

As a concluding approach of this topic, the following chart can be referred for urban and rural villages' origin, evolution and their present perspective for respective development in context of case study of San Joes City of California:

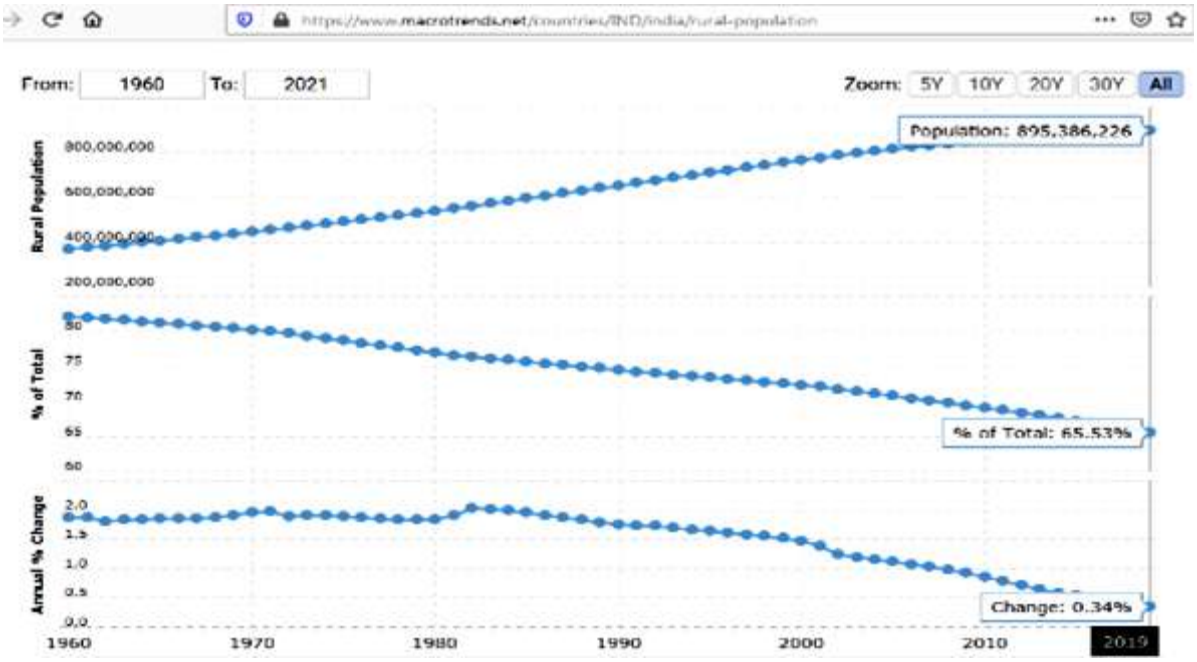

THE EVOLUTION OF URBAN VILLAGES
San Jose's growth story
1970s
"Car-Centric"
Dramatic sprawling growth meant orchards were replaced by housing. Neighborhoods designed around driving resulted in the San Jose of today.
1990s
.com
Expanding to over 800,000 residents, San Jose became home to 40% of Silicon Valley's population and a third of its jobs.
1994
Planning
The City began using urban planning to enhance the community's quality of life. San Jose's 2020 general plan was approved—focusing new development around light rail.
2011
Jobs / Homes
San Jose's 2040 General Plan calls for 120,000 new homes. But it emphasizes attracting more jobs first. Urban villages became the strategy to add homes in a sustainable way as jobs increase.
2040 GOALS
2012
The Launch
The first of 70 urban village processes kicked off. These resident-backed neighborhood plans prioritize mixing transit options, homes, shops, and jobs while growing upward. This kind of growth breaks car-centric patterns of sprawl and helps protect farms and wildlife habitat.
2013
Four Wins!
The first four urban villages that make up the "Five Wounds-Brookwood Terrace" neighborhood, were approved! Hundreds of residents came together to plan for more homes and jobs around transit.
NOW
THINK BIG
The first plans converted an abandoned railroad track into a new trail. How could your neighborhood improve? Use this list for inspiration.
THE LIST
START
The Urban Village Toolkit is your one stop doc on how to plug into the planning process.
TOOLKIT
ADVICE
Need help? Greenbelt Alliance offers free advice on getting started and how to's on the Urban Village process.
CONTACT
greenbelt.org

2.4 Scenario: Rural / Urban village of India population Growth

As per the article published in Down to Earth's *print edition (dated 16-31 October, 2019,) entitled as "Census 2021: India's Urban-Rural Conundrum", it is mentioned that if one is g*oing by census definition, a habitation is declared urba, if it has a minimum population of 5,000; at least 75 per cent of the male working population is engaged in non-agricultural pursuits; and population density is at least 400 people per sq km. Such habitations are called Census Towns.

For the first time in history, the Census 2011 reported a decline in the population growth rate of rural India. However, at that time India was still predominantly rural, with the urban population being just 30 per cent. Between Census 2001 and Census 2011, the number of Census Towns increased from 1,362 to 3,894. This indicates that people in rural areas are quitting farming or joining non-farm livelihoods. Another concern is that these non-farm jobs are mostly in urban areas. In recent years, these urban employment sources have not been able to meet the surging job demands due to the exodus from agriculture. As the latest economic data points out, manufacturing, construction and other related sectors have not been able to generate employment as they used to earlier. All these sectors are experiencing slowdown.

This leaves us with that big conundrum: We urbanise and celebrate it as a sure shot path to prosperity, but urbanisation doesn't provide basic livelihood to people who have migrated from rural areas. The trend that can be observed from past 5 to 6 decades is also presented below:



With the above latest article details, the team hereby wants to present some glimpse of Population Census of 2011 – Population – Growth – Variation, with the reference of "Rural – Urban Distribution of Population in India – Census 2011", by Dr. C. Chandramouli, Registrar General & Censor Commissioner of India – year 2011, which are as follows:

- Out of the total of 1210.2 million population in India, the size of Rural population is833.1 million (or68.84% of the Total Population).

- Urban population 377.1 million (or 31.16%); Increase in Rural areas: 90.4 million ;Increase in Urban areas: 91.0 million
- During 2001-11 the growth of Rural Population has been 12.18%
- Growth in Rural Population in India is steadily declining since 1991
- General decline in RuralGrowth Rate among all 3categoriesduring the lastdecade2001-11
- Whereas Non-EAG (Empowered Action Group) Stateshaveshown decline ingrowth since 1971-81, the EAG States (i.e., Rajasthan, Uttar Pradesh, Uttarakhand, Bihar, Jharkhand, Madhya Pradesh, Chhatisgarh and Orissa) havedeclined only during thelast decade.
- Growth in Rural Areas in Non-EAG States during 2001-11 has sharply declined to 5.71%.

There has been a spurt in growth of population in Urbanareas in the country, whichcould be due to: Migration, Natural increase and inclusion of new area under 'urban'.

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

As per details from Census 2011, Gujarat has population of 6.04 Crores, an increase from figure of 5.07 Crore in 2001 census. Total population of Gujarat as per 2011 census is 60,439,692 of which male and female are 31,491,260 and 28,948,432 respectively. In 2001, total population was 50,671,017 in which males were 26,385,577 while females were 24,285,440. The total population growth in this decade was 19.28 percent while in previous decade it was 22.48 percent. The population of Gujarat forms 4.99 percent of India in 2011. In 2001, the figure was 4.93 percent. Recently as per Gujarat census data, 83.92% houses are owned while 13.54% were rented. In all, 65.95% couples in Gujarat lived in single family. In 2011, 57.87% of Uttar Pradesh population had access to Banking and Non-Banking Finance Corporation. Only 3.13% of Uttar Pradesh population had internet facility which is likely to improve in 2021 due to Jio. 6.10% of family in Uttar Pradesh owned car while 34.14% owned two wheller. In few months we will also get details of election data for Gujarat.

Out of total population of Gujarat, 42.60% people live in urban regions. The total figure of population living in urban areas is 25,745,083 of which 13,692,101 are males and while remaining 12,052,982 are females. The urban population in the last 10 years has increased by 42.60 percent. Sex Ratio in urban regions of Gujarat was 880 females per 1000 males. For child (0-6) sex ratio the figure for urban region stood at 852 girls per 1000 boys. Total children (0-6 age) living in urban areas of Gujarat were 2,952,359. Of total population in urban region, 11.47 % were children (0-6). Average Literacy rate in Gujarat for Urban regions was 86.31 percent in which males were 90.98% literate while female literacy stood at 70.26%. Total literates in urban region of Gujarat were 19,672,516.

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

Description	Rural	Urban
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 2.1Details of Rural/ Urban data as per Census 2011

Data on Rural & Urban Areas
Figures at a Glance
GUJARAT

	2001	2011
No. of Districts	25	26
No. of Sub-Districts	226	225
No. of Towns	242	348
No. of Statutory	168	195
No. of Census Towns	74	153
No. of Villages	18,539	18,225

Percentage of Urban Population	
2001	2011
37.36	42.58

		Total	Rural	Urban
Population	**Persons**	60,383,628	34,670,817	25,712,811
	Males	31,482,282	17,802,975	13,679,307
	Females	28,901,346	16,867,842	12,033,504
DECADAL Population GROWTH 2001-2011		**Absolute**		
		Total	Rural	Urban
	Persons	9,712,611	2,930,050	6,782,561
	Males	5,096,705	1,485,204	3,611,501
	Females	4,615,906	1,444,846	3,171,060
SEX RATIO (females per 1000 males)		918	947	880
Population IN THE AGE GROUP 0-6		**Absolute**		
		Total	Rural	Urban
	Persons	7,494,176	4,676,249	2,817,927
	Males	3,974,286	2,452,807	1,521,479
	Females	3,519,890	2,223,442	1,296,448
CHILD SEX RATIO (0-6 years) (females per 1000 males)		886	906	852
LITERATES		**Absolute**		
		Total	Rural	Urban
	Persons	41,948,677	21,896,928	20,051,749
	Males	23,995,500	12,756,737	11,238,763
	Females	17,953,177	9,140,191	8,812,986

		Percentage		
		Total	Rural	Urban
	Persons	19.17	9.23	35.83
	Males	19.32	9.10	35.87
	Females	19.01	9.37	35.78
		Percentage to Total Population		
		Total	Rural	Urban
	Persons	12.41	13.49	10.96
	Males	12.62	13.78	11.12
	Females	12.18	13.18	10.77
		Literacy Rate		
		Total	Rural	Urban
	Persons	79.31	73.00	87.58
	Males	87.23	83.10	92.44
	Females	70.73	62.41	82.08

2.6 Rural Development Issues - Concerns - Measures

The development of rural India is grim and scaling up more in comingdays. The reason behind isthat more fund is pumping for development at urban then rural andhence, migration is steadilyincreasing every year after Independence towards cities. Under SGSY programmes,

some of the challengesidentifiedby Chandra Dass (2004) are given below so as to overcome them:

1. There should be a regular follow-up of development of skills, maintenance of accounts, enhancement of productivity, marketing, selling etc.

Proper identification of local needs and demand-based trades to be encouraged.

2. Enterprises with a sustainable outlook, from the entrepreneur's point of view rather than from the stakeholder's point of view, should be evolved.
3. Ranking of areas of training for rural people to be done with sincerity. It includes agriculture, animal husbandry, handicrafts, food and paddy processing.
4. Very practical oriented syllabus for training is to be designed.
5. The trainers should have integrated outlook and must emphasis on practical training.
6. District level Marketing Information Centre (MIC) to be established.
7. Promoting opportunity for marketing outside their locality.
8. Quality of low-cost products with enhanced capacity of artisans to face global threat.
9. Code of conduct, value and moral education workshops for both stakeholders and beneficiaries need to be conducted.
10. Enhancing skills and knowledge programmes should also cover stakeholders and Panchayati Raj Institute (PRI) representatives.
11. Encouragement and special thrust required for PRIs and officials.
12. Opportunities for experiential learning, attending training and exposure visit for stakeholders and rural entrepreneurs should be increased in proportion to the increasing number of target groups.

In context of the above challenges, Mr. Vasava B., researcher from Veer Narmad University, Gujarat, has identified some of the practical suggestions and measures based on his experience while working with several rural area and NGOs like developmental, activist whoare educating, makingawareness and implementing projects at rural levels for the holisticdevelopment of all strata ofclass and caste, which are as follows:

1. Involvement Beneficiaries from the Beginning till End.
2. Planning to be done at Micro to Macro levels.
3. Creating Ownership of Project Work & Assets.
4. Educating Beneficiaries about the Project Proposal(s) through PRA Exercise.
5. Recruiting Committed, Honest and Trustworthy Local Personnel forImplementation of Project Activities.
6. High lighting major activities done by VOs/NGOs/Departments at Public place(s).
7. Avoiding shifting/transferring committed and hardworking staff till project work iscompleted.
8. Panchyati Raj Institutions' members should be paid salary/honorarium againsttheir work – which will reduce malpractices and corruption.
9. Promoting Social Audit among all Stakeholders.
10. Strengthening Local Bodies like PRIs, Village Institutions, SHGs, VOs,

Further, the researcher concluded with the statements that without giving proper exposure, training to all stakeholders and not having commitment, transparency, openness and honesty with beneficiaries it will be more challenges for development in rural India. But there is

nothing is impossible for good things, yes, there may be lots of hurdles but when people's participation is there it will be achievable. If we have to reduce overcrowded cities then holistic approach is necessary for rural development; otherwise, it will be wasting of money, energy, resources and many more. Strategies can be decided once the ground reality is understood in a proper manner and as per the situation, any strategy can be decided as per the community and their ideology, their past records and so on. Here it is given real example which cannot be possible everywhere, but everything is shown to beneficiaries, their participation is there from the beginning would lead towards sustainable development with less hazards.

2.7 Various Measures for Rural Development

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)*

Figure. 2.2 Measures for Rural Development

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*

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

❖ According to UDPFInorms:

Facilities	Planning Commission/UDPFI Norms	Required as per Norms
Education		
Aganwadi	Each Village	1
Primary School	Each Village	1
Secondary School	Per 7,500 Population	2

Higher Secondary School	Per 15,000 Population	1
College	Per 125,000 Population	1
Tech. Training Institute	Per 100,000 Population	1
Agriculture Research Centre	Per 100,000 Population	1
Medical Facility		
Gov./Panchayat Dispensary or Sub PHC or Health Centre	Each Village	1
PHC & CHC	Per 20,000 Population	1
Child Welfare and Maternity Home	Per 10,000 Population	1
Hospital	Per 100,000 Population	1
Transportation		
Pucca Village Approach Road	Each Village	
Bus/Auto Stand Provision	All Villages connected by PT (ST Bus or Auto)	1
Drinking Water		
Over Head Tank	1/3 of Total Demand	1.6 lac cap
U/G Sump	2/3 of Total Demand	3.2 lac cap
Public Latrines	Each Village	60
Cremation Ground	Per 20,000 Population	1
Post Office	Per 10,000 Population	1
Gram Panchayat Building	Each individual/group Panchayat	1
APMC	Per 100,000 Population	1

Table No. 2.2 Guidelines/Norms for Villages for the provisions of different infrastructurefacilities

2.9 Ancient / Existing Electrical concept study as a Literature Review for village development

2.10 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 programmed is implemented by Gujarat Livelihood Promotion Company.

Much 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 manage and conserve rain-water, Watershed Management Programmed 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.

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

3.1 Introduction: Concepts, Definitions and Practices

There is no universally accepted definition of a smart city. It means different things to different people. The conceptualisation of Smart City, therefore, varies from city to city and country to country, depending on the level of development, willingness to change and reform, resources and aspirations of the city residents. A smart city would have a different connotation in India than, say, Europe. Even in India, there is no one way of defining a smart city.

In the approach of the Smart Cities Mission, the objective is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions. The focus is on sustainable and inclusive development and the idea is to look at compact areas, createa**replicable model which will act like a light house to other aspiring cities**.
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.

The smart city proposal of each shortlisted city is expected to encapsulate either a retrofitting or redevelopment or greenfield development model, or a mix thereof and a Pan-city feature with Smart Solution(s). It is important to note that pan-city is an additional feature to be provided. Since smart city is taking a compact area approach, it is necessary that all the city residents feel there is something in it for them also. Therefore, the additional requirement of some (at least one) city-wide smart solution has been put in the scheme to make it inclusive.
For North Eastern and Himalayan States, the area proposed to be developed will be one-half of what is prescribed for any of the alternative models - retrofitting, redevelopment or greenfield development.

Regarding the concept of 'Smart Village', Government of India's Ministry of Rural Development has already launched 'Shyama Prasad Mukherji Rurban Mission (SPMRM) and this National Rurban Mission has identified a term 'Rurban Village', which has been adopted as a concept of 'Smart Village' for the report preparation by the team.

Large parts of rural areas in the country are not stand-alone settlements but part of a cluster of settlements, which are relatively proximate to each other. These clusters typically illustrate potential for growth, have economic drivers and derive locational and competitive advantages. Hence, making a case for concerted policy directives for such clusters, these clusters once developed can then be classified as 'Rurban'. Hence, taking cognizance of this, the advantages of clusters, both from an economic view point as well as to optimize benefits of infrastructure provision, the Mission aims at development of 300 Rurban clusters, in the next five years. These clusters would be strengthened with the required amenities, for which it is proposed that resources be mobilized through convergence of various schemes of the Government, over and above which a Critical Gap Funding (CGF) would be provided under this Mission, for focused development of these clusters.

Mission's Vision

The National Rurban Mission (NRuM) follows the vision of "Development of a cluster of villages that preserve and nurture the essence of rural community life with focus on equity and inclusiveness without compromising with the facilities perceived to be essentially urban in nature, thus creating a cluster of "Rurban Villages".

Mission's Objective

The objective of the National Rurban Mission (NRuM) is to stimulate local economic development, enhance basic services, and create well planned Rurban clusters.

Mission's Outcome

The larger outcomes envisaged under this Mission are:

(i) Bridging the rural-urban divide-viz: economic, technological and those related to facilities and services,
(ii) Stimulating local economic development with emphasis on reduction of poverty and unemployment in rural areas,
(iii) Spreading development in the region
(iv) Attracting investment in rural areas.

3.2 Vision-Goals, Standards and Performance Measurement Indicators

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

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Culture, Government of India M.. *National Mission on Cultural Mapping And Roadmap*. Ministry of Culture, 2017.
Heritage City Development and Augmentation Yojana (HRIDAY). New Delhi, India: Ministry

of Urban Development, Govt. of India, 2014.
Guidelines for Swachh Bharat Mission (SBM). New Delhi, India: Ministry of Urban Development, Govt. of India, 2014.
AMRUT Mission Statement and Guidelines In *AMRUT Mission Guidelines*. New Delhi, India: Ministry of Urban Development, Govt. of India, 2015.
Smart City Mission Statement and Guidelines In *Smart Cities Mission Guidelines*. New Delhi, India: Ministry of Urban Development, Govt. of India, 2015.

Each aspiring city competes for selection as a smart city in what is called a 'City Challenge'. There are two stages in the selection process. After the number has been indicated to the respective Chief Secretaries, as outlined in para 8 above, the State/UT will undertake the following steps/stages:

Stage 1 of the competition: **Shortlisting of cities by States**

The State/UT begins with shortlisting the potential smart cities on the basis of conditions precedent and scoring criteria and in accordance with the total number allocated to it. The first stage of the competition will be intra-state, in which cities in the State will compete on the conditions precedent and the scoring criteria laid out. These conditions precedent have to be met by the potential cities to succeed in the first round of competition and the highest scoring potential smart cities will be shortlisted and recommended to participate in Stage 2 of the Challenge.
The cities emerging successful in the first round of competition will be sent by the State/UT as the recommended shortlist of smart cities to MoUD by the stipulated date (to be indicated in the letter to Chief Secretaries).

Stage 2 of the competition: **The Challenge round for selection**

In the second stage of the competition, each of the potential 100 smart cities prepare their proposals for participation in the 'City Challenge'. This is a crucial stage as each city's Smart City Proposal (SCP) is expected to contain the model chosen, whether retrofitting or redevelopment or greenfield development or a mix thereof, and additionally include a Pan-City dimension with Smart Solutions. The SCP will also outline the consultations held with the city residents and other stakeholders, how the aspirations are matched with the vision contained in the SCP and importantly, what is the proposal for financing of the smart city plan including the revenue model to attract private participation. An evaluation criterion for the SCPs has been worked out by MoUD based on professional advice and this should act as guidance to the cities for preparing their proposal. The criteria and the documents to be sent with the application are also framed under Smart City Mission.

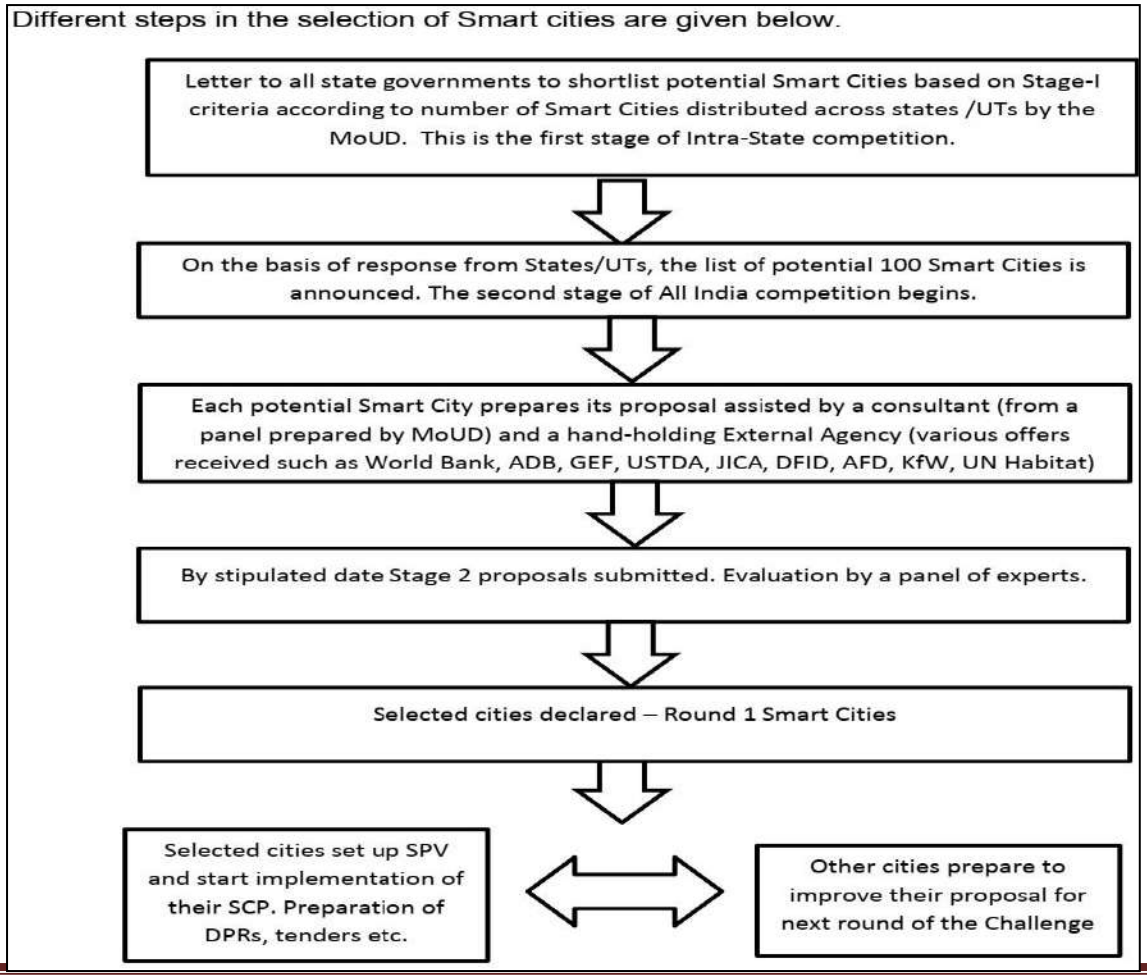
By a stipulated date, to be indicated by MoUD to the States/UTs, proposals will be submitted to MoUD for all these 100 cities. These will be evaluated by a Committee involving a panel of national and international experts, organizations and institutions. The winners of the first round of Challenge will be announced by MoUD. Thereafter, while the winning cities start taking action on making their city smart, those who do not get selected will start work on improving their SCPs for consideration in the second round. Depending on the nature of the SCPs and outcomes of the first round of the Challenge, the MoUD may decide to provide handholding assistance to the potential Smart Cities to upgrade their proposals before starting the second round.

While in context of 'Smart Village' or 'Rurban Village' and for effective planning and development of rural areas, efficient use of rural land and investment for various activities like housing, physical and social infrastructure, transportation, etc. has to be made. This warrants

that natural resources particularly rural land is used in an efficient and equitable manner. For the promotion of integrated and inclusive rural development, spatial planning becomes imperative. Hence, in the year 2019, the "Guidelines for Model Land Uses, Development Controls, and Service Level Benchmarks with Appropriate Enforcement Mechanisms for Rurban Clusters" were prepared and submitted to The Ministry of Rural Development by School of Planning and Architecture, New Delhi. Along with the report, the following three detailed reports have been published as an open source on the website platform by the Ministry of Rural Development.

Figure. 3.1Frameworks of implementation

While, the framework and policy guidelines for the Smart City is as follows:



3.3 Technological Options

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. Below are given the divisions of the three models of Area-based smart city development:

Retrofitting will introduce planning in an existing built-up area to achieve smart city objectives, along with other objectives, to make the existing area more efficient and liveable. In retrofitting, an area consisting of more than 500 acres will be identified by the city in consultation with citizens. Depending on the existing level of infrastructure services in the identified area and the vision of the residents, the cities will prepare a strategy to become smart. Since existing structures are largely to remain intact in this model, it is expected that more intensive infrastructure service levels and a large number of smart applications will be packed into the retrofitted smart city. This strategy may also be completed in a shorter time frame, leading to its replication in another part of the city.

Redevelopment will affect a replacement of the existing built-up environment and enable co-creation of a new layout with enhanced infrastructure using mixed land use and increased density. Redevelopment envisages an area of more than 50 acres, identified by Urban Local Bodies (ULBs) in consultation with citizens. For instance, a new layout plan of the identified area will be prepared with mixed land-use, higher FSI and high ground coverage. Two examples of the redevelopment model are the SaifeeBurhani Upliftment Project in Mumbai (also called the Bhendi Bazaar Project) and the redevelopment of East Kidwai Nagar in New Delhi being undertaken by the National Building Construction Corporation.

- ***Greenfield development*** will introduce most of the Smart Solutions in a previously vacant area (more than 250 acres) using innovative planning, plan financing and plan implementation tools (e.g. land pooling/ land reconstitution) with provision for affordable housing, especially for the poor. Greenfield developments are required around cities in order to address the needs of the expanding population. One well known example is the GIFT City in Gujarat. Unlike retrofitting and redevelopment, greenfielddevelopmentscould be located either within the limits of the ULB or within the limits of the local Urban Development Authority (UDA).
- ***Pan-city development*** envisages application of selected Smart Solutions to the existing city-wide infrastructure. Application of Smart Solutions will involve the use of technology, information and data to make infrastructure and services better. For example, applying Smart Solutions in the transport sector (intelligent traffic management system) and reducing average commute time or cost of citizens will have positive effects on productivity and quality of life of citizens. Another example can be waste water recycling and smart metering which can make a huge contribution to better water management in the city.

3.4 Road Map and Safe Guards

In context of ‘Smart Village’ or ‘Rurban Village’ and for effective planning and development of rural areas, efficient use of rural land and investment for various activities like housing, physical and social infrastructure, transportation, etc. has to be made. This warrants that natural resources particularly rural land is used in an efficient and equitable manner. For the promotion of integrated and inclusive rural development, spatial planning

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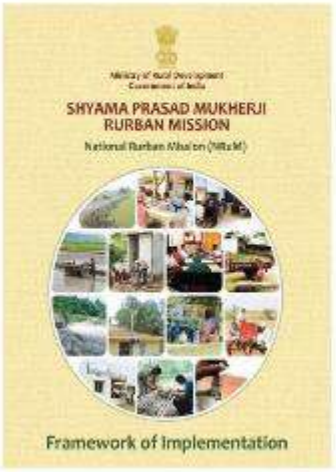
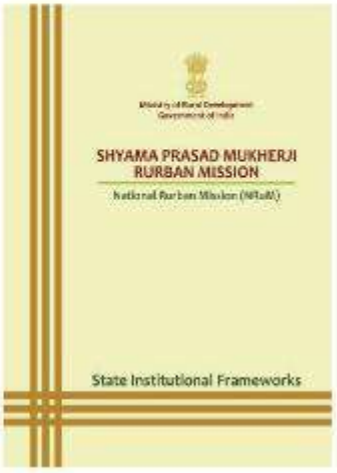
Frameworks of Implementation



Frameworks of Implementation

Integrated Cluster Action Plan



State Institutional Framework

Rurban Mission was implemented in 50 towns of Gujarat in 2011. The aim was to bridge the rural-urban divide and achieve balanced socio-economic development. Various yojanas like E-gram Vishvagram Yojana, Tirth Gram Yojana, Nirmal Gujarat, Swachha Gram Swasth Gram Yojana, JaminSampadan Yojana, Gram Mitra Yojana, Sardar Patel Awas Yojana were integrated to form Rurban schemes. As way forward, the various suggestions received in each of these included: (1) Encouraging public private partnership in physical and social infrastructure development etc., (2) Alliance of GSWC with spot exchanges, (3) Collaborations with NGOs, (4) Capacity building and skill development initiatives.

For the smart cities, The implementation of the Mission at the City level will be done by a Special Purpose Vehicle (SPV) created for the purpose. The SPV will plan, appraise, approve, release funds, implement, manage, operate, monitor and evaluate the Smart City development projects. Each Smart City will have a SPV which will be headed by a full time CEO and have nominees of Central Government, State Government and ULB on its Board. The States/ULBs shall ensure that, (a) a dedicated and substantial revenue stream is made available to the SPV so as to make it selfsustainable and could evolve its own credit worthiness for raising additional resources from the market and (b) Government contribution for Smart City is used only to create infrastructure that has public benefit outcomes.

The execution of projects may be done through joint ventures, subsidiaries, public-private partnership (PPP), turnkey contracts, etc. suitably dovetailed with revenue streams.

The SPV will be a limited company incorporated under the Companies Act, 2013 at the city-level, in which the State/UT and the ULB will be the promoters having 50:50 equity shareholding. The private sector or financial institutions could be considered for taking equity stake in the SPV, provided the shareholding pattern of 50:50 of the State/UT and the ULB is maintained and the State/UT and the ULB together have majority shareholding and control of the SPV.

Funds provided by the Government of India in the Smart Cities Mission to the SPV will be in the form of tied grant and kept in a separate Grant Fund. These funds will be utilized only for the purposes for which the grants have been given and subject to the conditions laid down by the MoUD.

The State Government and the ULB will determine the paid-up capital requirements of the SPV commensurate with the size of the project, commercial financing required and the financing modalities. To enable the building up of the equity base of the SPV and to enable ULBs to contribute their share of the equity capital, GoI grants will be permitted to be utilized as ULBs share of equity capital in the SPV, subject to the conditions given in Annexure 5. Initially, to ensure a minimum capital base for the SPV, the paid-up capital of the SPV should be such that the ULB's share is at least equal to Rs.100 crore with an option to increase it to the full amount of the first instalment of Funds provided by GoI (Rs.194 crore). With a matching equity contribution by State/ULB, the initial paid up capital of the SPV will thus be Rs. 200 crores (Rs. 100 crores of GoI contribution and Rs. 100 crore of State/UT share). Since the initial GoI contribution is Rs.194 crore, along with the matching contribution of the State Government, the initial paid up capital can go up to Rs.384 crore at the option of the SPV. The paid-up capital may be enhanced in the subsequent years as per project requirements, with the provision mentioned above ensuring that ULB is enabled to match its shareholding in the SPV with that of the State/UT.

After selection of the cities in Stage II of the Challenge, the process of implementation will start with the setting up of the SPV. As already stated, it is proposed to give complete flexibility to the SPV to implement and manage the Smart City project and the State/ULB will undertake measures. The SPV may appoint Project Management Consultants (PMC) for designing, developing, managing and implementing area-based projects. SPVs may take assistance from any of the empanelled consulting firms in the list prepared by MoUD and the handholding agencies. For procurement of goods and services, transparent and fair procedures as prescribed under the State/ULB financial rules may be followed. Model frameworks as developed by MoUD may also be used for Smart City projects.

3.5 Issues & Challenges

Issues in 'Smart Cities'

- Poor urban spatial planning is evident in the city with residential and industrial areasdeveloped without adequate supporting infrastructure such as public open spaces, education, healthcare and adequate road network etc.
- Proliferation of informal sector- both residential/commercial, large number of slums withevery third resident in city is a slum dweller.
- More growth in private owned vehicles has resulted in traffic increase &congestion along with deteriorating air quality.
- Public transport sector within few cities of Gujarat is yet poor.
- High cost of water.
- Weak environmental resilience and waste management, nearly 50% of population haveaccess to sewerage network and a few percentages of roads have storm water drainage.
- Tremendous potential for enhanced opportunities in youth-oriented education, skill development and commercial avenues.

- Entrepreneurial city with a culture focused on work and business; has heterogeneous & cosmopolitan population.
- Larger and increasing number of internet users in the state is suitably poised to enter a new era of economic and digital vibrancy by specializing in respective and quaternary sectors.
- Development/Investments under Super Corridor, IT Park, Medcity, nearby Industrial areas are expected to provide employment to the people in upcoming years.

***Issues* in 'Rurban Village'**

	Desirable Component	Existing Situation
1	Skill Development training Linked to Economic Activities	Existing skills in the GP (Handicraft/Handloom/Industrial etc) Skilled members at the household level
2	Agri-services and Processing	Detail the existing Agri services and processing industries present in the cluster.
3	Digital Literacy	Detail the existing levels in terms of core IT infrastructure as well as general digital literacy levels at the HH and Village level.
4	24x7 Piped Water Supply	Existing levels of water supply at the household level.
5	Sanitation	Coverage of Individual Toilets in the GP at the household level.
6	Solid and Liquid Waste Management	Existing arrangement for solid and liquid waste management at the Household/Village and Cluster level.
7	Access to Village Streets with Drains	Existing coverage of village streets and drains.
8	Village Street Lights	Coverage of existing GP streets with street lights.
9	Health	Access to clinics and health centres at the household and village level.
10	Up gradation of primary, secondary and higher secondary schools.	Existing nos of primary, secondary and higher secondary schools in the cluster and existing conditions.
11	Inter village roads connectivity	Connectivity between GPs within the cluster with roads and public transport
12	Citizen Service Centres	Existing no. of citizen service centres at the GP level.
13	Public transport	Existing levels of availability w.r.t. Public Transport facilities both intra and inter GP
14	LPG Gas Connections	Access to LPG connections at the household level (No of household with LPG connections).

Source: Respective Scheme Data Base/GP records/census of India/other reliable source.

Challenges in 'Smart Cities'

- Unchecked growth of slums along with unplanned/haphazard development shall continue to pose greatest threat to city's rational growth and quality of life, which is receding.
- Slums are spread across various cities in varying degrees of squatter, have made delivery of services to urban poor difficult, negatively affecting the general visage of the city.
- Environmental degradation in various cities in general and contamination of naturaldrainage paths in particular coupled with inadequate public green/open spaces pose threat for the cities.

- Traffic congestion, rapid increase in private vehicles and lack of adequate multi-modalpublic transport options, unless mitigated shall continue to degrade air quality adverselyimpacting public health and increased commute times.

Challenges in 'Rurban Village'

A		B	C	D= C-B
	Desirable Component	**Existing Situation**	**Desired Levels**	**Gaps/Need**
1	Skill Development training Linked to Economic Activities	Existing skills in the villages. (Handicraft/Handloom/Industrial etc) No of skilled members at the HH level.	At-least 70 percent household with one beneficiary in each household.	Identification of training needs in terms of sector and no of people to be trained with age profiling.
2	Agri-services and Processing	Detail the existing Agri services and processing industries present in the cluster. (Including storage infrastructure).		Identification of support to any agri based service/industry/ storage infrastructure.
3	Digital Literacy	Detail the existing levels in terms of core IT infrastructure as well as general digital literacy levels at the HH and Village level.	At least one e-literate person in every household.	Identification of no of people to be digitally literate in the cluster.
4	24x7 Piped Water Supply	Existing levels of water supply at the household level.	70 liters per capita per day (lpcd) of safe drinking water for every households throughout the year.	Identification of Augmentation needs at the household level and type of augmentation- source/ transmission/distribution.
5	Sanitation	Coverage of Individual Toilets in the villages at the household level.	100% HH with Individual Household Latrines.	Identification of no of households to be covered with individual latrines.
6	Solid and Liquid Waste Management	Existing arrangement for solid and liquid waste management at the Household/ Village and Cluster level.	Collection at HH level Treatment at Cluster Level.	Identification of SWM facilities at collection/transportation/ treatment.
7	Access to Village Streets with Drains	Existing coverage of village streets and drains.	All village streets to be covered with drains.	Identification of length of streets yet to be covered with drains.
8	Village Street Lights	Coverage of village streets with lights.	All village streets to be covered with street lights as per norms.	Identification of no of street lights to be provided.
9	Health	Access to clinics and health centres at the household and village level.	Access to Health infrastructure as per norms.	Identification of need for Mobile Health Units.
10	Up gradation of primary, secondary and higher secondary schools	Existing nos of primary, secondary and higher secondary schools in the cluster and existing conditions.	Ensuring primary and secondary school within a reasonable distance from all households along with facilities of Drinking water provisions, Toilet blocks (separate for boys and girls) and adequate class rooms.	Identification of upgradation needs/new facilities in the primary and secondary schools.
11	Inter village roads connectivity	Connectivity between villages within the cluster with roads and public transport	Ensure connectivity between all villages.	Identification of need for new connectivity between villages.
12	Citizen Service Centres	Existing no. of citizen service centres at the village level.	One ICT enabled front end Common Service Centre (CSC) per 2 to 3 villages.	Identification of no of CSCs required for the cluster.
13	Public transport	Existing levels of availability w.r.t. Public Transport facilities both intra and inter village.	Public transport to block from each village.	Need for additional facilities to improve public transport access to each village.
14	LPG Gas Connections	Access to LPG connections at the household level.	One LPG retail outlet per village or per 1800 households.	Need for additional retail outlets in the cluster.

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 IoT 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.

3.7 Cyber Security or any other concept

India’s digitalisation roadmap is expected to catapult its digital economy to 1 trillion USD by 2025. India is witnessing an unforeseen digital transformation, and at the same time, a rapid rate of urbanisation. The Government of India’s 100 Smart Cities Mission blends these digitalisation and urbanisation waves, and endeavours to accomplish urban renewal through a Pan-City Smart Solutions initiative, and technology-enabled ‘city improvement (retrofitting), city renewal (redevelopment) and city extension (greenfield development)’. While the smart city initiative focuses on sustainable development of our cities and harnessing digital technologies for integrated citizen service delivery, it demands a strong focus on cyber security. It is imperative for stakeholders to review and make efforts towards ensuring the safety, security and privacy of citizens and enhancing our cities’ capability to mitigate cyber security risks.Recognising cyber security as a key priority, the Ministry of Housing and Urban Affairs (MoHUA) published the ‘Cyber Security Framework for Smart Cities’ on 20 May 2016 and issued an advisory to all smart cities to drive conformance to this framework.

This report on 'Creating cyber secure smart cities', jointly developed by DSCI and PwC, is an attempt to reinforce the attention that smart city administrators need to give to cyber security in all their projects while incorporating smart solutions. The report acknowledges that cyber security is the combined responsibility of various stakeholders. With a fine blend of global and Indian instances, this report serves as a preliminary guide for smart city stakeholders to understand the risks and steps that need to be taken to enhance the cyber security posture of smart cities.

3.8 Retrofitting- Redevelopment- Greenfield Development District Cooling

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. Below are given the divisions of the three models of Area-based smart city development:

- ***Retrofitting*** will introduce planning in an existing built-up area to achieve smart city objectives, along with other objectives, to make the existing area more efficient and liveable. In retrofitting, an area consisting of more than 500 acres will be identified by the city in consultation with citizens. Depending on the existing level of infrastructure services in the identified area and the vision of the residents, the cities will prepare a strategy to become smart. Since existing structures are largely to remain intact in this model, it is expected that more intensive infrastructure service levels and a large number of smart applications will be packed into the retrofitted smart city. This strategy may also be completed in a shorter time frame, leading to its replication in another part of the city.
- ***Redevelopment*** will affect a replacement of the existing built-up environment and enable co-creation of a new layout with enhanced infrastructure using mixed land use and increased density. Redevelopment envisages an area of more than 50 acres, identified by Urban Local Bodies (ULBs) in consultation with citizens. For instance, a new layout plan of the identified area will be prepared with mixed land-use, higher FSI and high ground coverage. Two examples of the redevelopment model are the SaifeeBurhani Upliftment Project in Mumbai (also called the Bhendi Bazaar Project) and the redevelopment of East Kidwai Nagar in New Delhi being undertaken by the National Building Construction Corporation.
- *Greenfield development* will introduce most of the Smart Solutions in a previously vacant area (more than 250 acres) using innovative planning, plan financing and plan implementation tools (e.g. land pooling/ land reconstitution) with provision for affordable housing, especially for the poor. Greenfield developments are required around cities in order to address the needs of the expanding population. One well known example is the GIFT City in Gujarat. Unlike retrofitting and redevelopment, greenfield developments could be located either within the limits of the ULB or within the limits of the local Urban Development Authority (UDA).

3.9 Strategic Options for Fast Development

From ideation to implementation at various levels, the monitoring can work as a key medium and hence it can be suggested to have 3 levels of committees i.e., National level, State level and City level, as detailed below:

National Level: An Apex Committee (AC), headed by the Secretary, MoUD and comprising representatives of related Ministries and organisations will approve the Proposals for Smart Cities Mission, monitor their progress and release funds. This Committee will meet periodically, as considered necessary.

State Level: There shall be a State level High Powered Steering Committee (HPSC) chaired by the Chief Secretary, which would steer the Mission Programme in its entirety. The HPSC will have representatives of State Government departments. The Mayor and Municipal Commissioner of the ULB relating to the Smart City would be represented in the HPSC. There would also be a State Mission Director who will be an officer not below the rank of Secretary to the State Government, nominated by the State Government. The State Mission Director will function as the Member-Secretary of the State HPSC.

City Level: A Smart City Advisory Forum will be established at the city level for all 100 Smart Cities to advise and enable collaboration among various stakeholders and will include the District Collector, MP, MLA, Mayor, CEO of SPV, local youths, technical experts, and at least one member from the respective area.

The implementation of the Mission at the City level will be done by a Special Purpose Vehicle (SPV) created for the purpose. The SPV will plan, appraise, approve, release funds, implement, manage, operate, monitor and evaluate the Smart City development projects. Each smart city will have a SPV which will be headed by a full time CEO and have nominees of Central Government, State Government and ULB on its Board. The States/ULBs shall ensure that, (a) a dedicated and substantial revenue stream is made available to the SPV so as to make it self-sustainable and could evolve its own credit worthiness for raising additional resources from the market and (b) Government contribution for Smart City is used only to create infrastructure that has public benefit outcomes. The execution of projects may be done through joint ventures, subsidiaries, public-private partnership (PPP), turnkey contracts, etc suitably dovetailed with revenue streams.

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

The problem of access to safe drinking water and sanitation facilities in urban areas of India is a major concern. There is a need to reuse treated wastewater in order to meet the current and future demands for water.

The consistent increase in the rate of growth of India's population has also led to the increase in demand for water, particularly in the urban areas where the rate of increase is highler compared to rural areas. In 2001, urban population was 285 million and assuming water supply of 135 litres per capita per day, the domestic water demand is estimated at around 38,475 million litres per day (MLD), whereas as in 2011 urban population was 377 million

with a domestic water demand of 50,895 MLD. It shows that growth in urban population leads to additional water demand of 12,420 MLD in urban areas. The water supply of 135 litres per capita per day (LPCD) as a service level benchmark should be given for domestic water use in urban local bodies. However, currently as per Central Public Health and Environmental Engineering Organisation (CPHEEO), an average water supply in urban local bodies is 69.25 LPCD. This indicates that there is a vast gap between the demand and supply of water in urban areas of India.

The problem of access to safe drinking water and sanitation facilities in urban areas of India is also a major concern. It is estimated that by 2050, half of India's population will be living in urban areas and will face acute water problems. At present, 163 million people do not have access to safe drinking-water and 210 million people lack access to improved basic sanitation in India. In urban areas, 96% have access to an improved water source and 54% to improved sanitation. Whereas in rural areas, which accounts for 72% of India's population lives, only 84% have access to safe water and only 21% for sanitation. In addition, there is a lack of wastewater treatment facilities to treat the wastewater of a growing population. There is a need to reuse treated wastewater in order to meet the current and future demands for water.

The prevention of pollution of water sources is extremely critical in order to continue to supply water of quality standards. Available data suggests that pollution levels have increased in surface water as well as groundwater. More than 100 million people in urban areas exposed to poor water quality. A lack of sufficient infrastructure, services and funds to support water and wastewater treatment facilities required for an urban area further exacerbates the problem. Moreover, the drainage and solid waste collection services are not adequate in most of the urban areas. The systems are either poorly planned and designed, or operated without inadequate maintenance. Use of natural capacities of soil and vegetation (green infrastructure) can be applied to absorb and treat waste water. Natural systems are found to be more cost-effective and require low building, labour and maintenance costs.

The time has come to have a retrospect view on the water use and misuse to take serious actions that will lead towards sustainable urban water management. Sustaining healthy environments in the urbanized world of the 21st century represents a major challenge for human settlements, development and management. Again, flexible and innovative solutions are needed to cope with sudden and substantial changes in water demand for people and their associated economic activities.

In order to meet the future urban water challenges, there needs to be a shift in the way we manage urban water systems. An Integrated Urban Water Management approach must be adopted which involves managing freshwater, wastewater, and storm water, using an urban area as the unit of management. The approach encompasses various aspects of water management, including environmental, economic, technical, political, as well as social impacts and implications. The international convention has the broad aim of facilitating water for all in a safe and sustainable way, thereby aiming to achieve SDG 6.

This event will provide a platform to highlight current and future water related issues and recognize good water governance practices and solutions through discussions among water experts from various fields such as academics, research, policy, industry and civic society.

3.11 Initiatives in village development by local self-government

Different ministries of the government of India formulate various development schemes not to raise the profit but to maximise the welfare of the people. Some schemes like National Rural Livelihood Mission, MGNREGA, Bharat Nirman etc. are made by the government for rural development of India.Some important facts related to the various rural development schemes are mentioned below for the aspirants of some prestigious exams like IAS/PCS/SSC/CDS/Banking etc.

1. DeenDayal Upadhyay Grameen Kaushal Yojna
2. Roshni: Skill Development Scheme for Tribals

3. Swachchh Bharat Mission
4. Sansad Adarsh Gram Yojna
5. Heritage Development and Augmentation Yojna (HRIDAY)
6. Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)
7. National Rural Livelihood Mission
8. Pradhan Mantri Gram SadakYojna
9. Training to Rural Youth for Self Employment (TRYSEM)
10. Antyodaya Anna Yojna (AAY)
11. Village Grain Bank Scheme
12. National Rural Health Mission
13. AamAadmiBimaYojna
14. Kutir Jyoti Programme
15. SarvaSiksha Abhiyan

3.12 Smart Initiatives by District Municipal Corporation

The Bombay Provincial Municipal Corporation (BPMC) Act (1949) is the governing act for the Ahmedabad and Surat Municipal Corporations, while Bhavnagar Municipal Corporation was constituted under the Gujarat Municipalities Act (1963). Because of these acts, and the constitutional amendments, the municipal corporations have been relatively financially autonomous bodies. It becomes the responsibility of the local bodies (Municipal Corporation/ Urban Development Authority/ Municipality) to provide for the services of water supply and distribution, sewerage collection and treatment, solid waste collection and disposal, and Urban transportation including roads, flyovers, by passes, bus and/ or rail network for urban transportation.

The Bhavnagar Municipal Corporation has maintained the transparency and developed contact medium through digital medium in the form of website and mobile based application. An illustration of various services are given as part of screenshot from BMC's website.

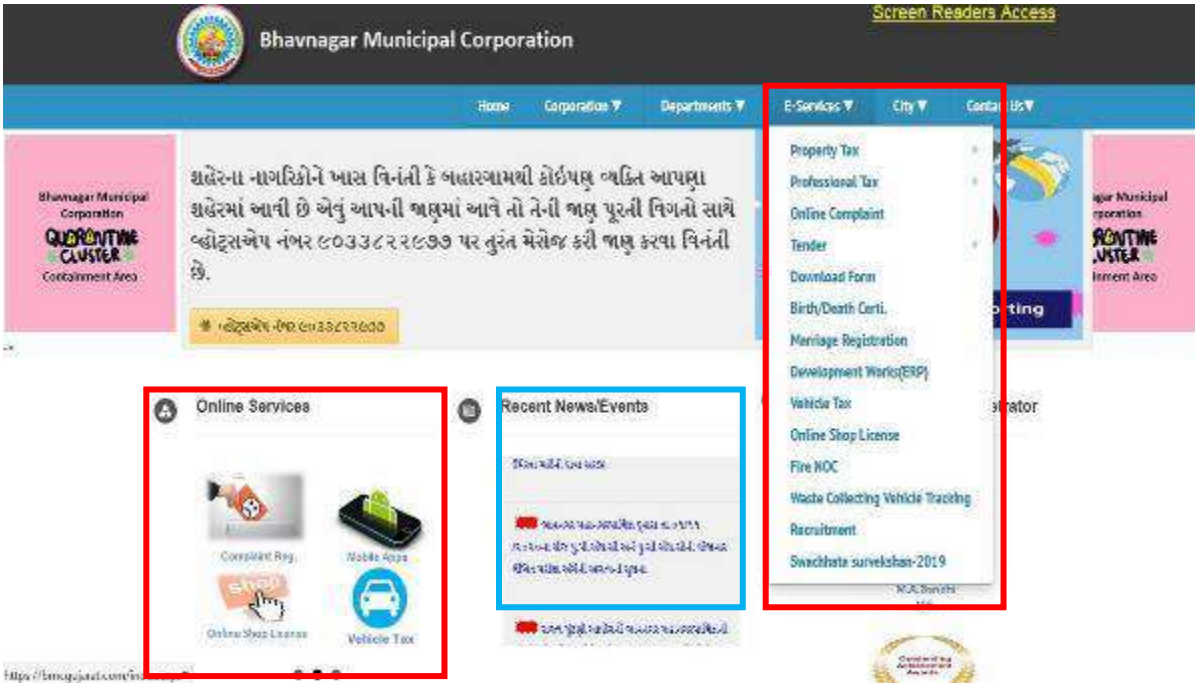


Figure. 3.2 Smart Initiatives by District Municipal Corporation

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

There is no any project either at present or under pipeline contributed working by Government / NGO / Other as part of Digital Country Concept either in Bhavnagar City or District.

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

Worldwide Initiatives for Smart Villages:

Smart Village initiative: new thinking for off-grid communities worldwide and IEEE Smart Village: Empowering off-grid communities are both worldwide active and striving to meet the SDG 2030, especially goal 7, Affordable and Clean Energy. The first one promotes access to sustainable energy as a main catalyst for the development of good education and healthcare systems, access to clean water, sanitation, economic growth, enhanced security, gender equality, etc. The most important vision of the Initiative is to apply more holistic and integrated approaches to enable the access to the energy in the rural contexts, while connecting/involving governments, developmental and private sector in the process. The component most emphasized is how to connect renewable sources of energy with ICT. The activities of the Initiative are taking place in six large regions, namely East Africa, West Africa, South Asia, South-East Asia, South America, and Central America, Caribbean, Mexico—the so-called developing world with limited possibilities to access (educational, electrical, economic and other) infrastructure. To find the most suitable solutions, there is a wide range of professionals working on the field and otherwise: villagers, NGOs, development organizations, entrepreneurs, policy makers, engineers, and experts from the field of humanities. Their search for solutions is encompassing and, based on long-term - research, analyzing local and regional circumstances, identifying cross-cutting issues and proposing suitable solutions. More than 30 workshops have been organized where more than thousand stakeholders from 70 countries have presented their views and evidence. By now, the majority of their activities were funded by Cambridge Malaysian Education and Development Trust and Malaysian Commonwealth Studies Centre.

Similarly, the IEEE Smart Village initiative is aiming to promote off-grid communities through education and the creation of sustainable businesses in the energy sector. The initiative was originally established as a Community Solutions Initiative (2009) and took over the current name in 2014. The activities are spread worldwide, by now serving more than 50,000 people, living in 34 villages, mostly located in African continent (e.g., Benin, Cameroon, Kenya, Malawi, Namibia, Nigeria, South Sudan, Zambia), but also in Haiti and India. Its main financing mechanism is fundraising. Besides the development of energy-smart villages mentioned before, the main products of the initiative's efforts are a SunBlazer II—a mobile solar-based power base station and Learning beyond the Light Bulb—a nine-month program of remote study that enables the exchange of practices of all communities in order to create the mutual benefit, and equips the students with knowledge on different development models and other skills and knowledge needed for the fieldwork.

One of the most propulsive worldwide programs is the CIGAR research program on Climate Change, Agriculture and Food Security (CCAFS) that started in 2011. The program is funded by the CIGAR fund and different donors (e.g., Australia, Irish Aid, Netherlands, New Zealand, Switzerland, Thailand, UK Aid, US Aid, the EU, and the International Fund

for Agricultural Development). Within its framework, the concept of Climate Smart Villages is being developed and put into practice in different parts of the world, whereas the ones with the most climate-related difficulties are chosen (West and East Africa, Latin America, South and Southeast Asia). This is an ever-evolving program where different stakeholders (researchers, politicians, framers, local residents) are collaborating in order to find the most productivity enhancing and smart solutions considering the local conditions. Their solutions are based on smart technologies and services, designed in collaboration with local people, and aim at lessening the climate footprint from the perspective of the developing agricultural activities, while not reducing their benefits for the given community. The program is claimed to be very successful, as there is more than 30 existing climate-Smart Villages all over the globe. More importantly, the villages are on a good track to being sustainable in the long term as the program aims to train the local people and not providing locals with the external teachers on the long-term basis. Within this objective, an important role is also played by women. One of the other practical outputs of the program is, for example, the CCAFS Climate Analogues Tool for making rain and climate predictions, developed to help smaller farmers make decisions based on accurate information.

Initiatives, Operation and Implementation in India

Perhaps one of the most extensive and most recent attempts of smart transformation development is India. Firstly, urbanization of India is increasing rapidly as never before. According to the predictions of the United Nations, by 2050, almost 814 million of Indian people will live in towns and cities, which is twice as many as today. Secondly, in 2015, the Government of India, Ministry of Urban Development launched a nationwide program Smart city mission. The aim of the Mission is the comprehensive development of (physical, institutional, social, economic) infrastructure, and thus improvement of the quality of life and to attract people and investments. The governmental mission covers 100 cities, selected in-

the “City Challenge” process, but also recognizes that there is no single definition of the Smart City that would encompass important factors for all the different cases and therefore aims to set the examples that could be replicated in various regions and cities within the country.

Thirdly, a Smart City initiative was supplemented by the Indian Smart Villages Initiative aimed at harnessing the benefits of ICT for the people living in the rural sites. Despite the urbanization processes, in India, around 67% of population still lives in the rural areas, but rural-urban migrations are posing big problems in India. For example, according to the estimates of Indian Ministry of Statistics and Programme Implementation, in years 2009/2010 more than 60% of the male rural-urban migrations was due to employment related reasons. Agriculture only has a minor part in the Indian economy (e.g., around 17%), compared to the services sector that is flourishing (almost 54%). As it has been stated by Srivatsa, to somehow maintain the “equilibrium” between the urban and rural areas, the smart development of both has to be parallel and simultaneous. In this way, the large migration from rural to urban areas can be limited or even stagnate [5] (p. 4). It is anticipated that carefully designed Smart Villages will provide a basic framework for local people to enhance their participation on a local level and to improve their economic, social and living conditions and thus make their community stronger and more flexible for the challenges of the outside world. Within the “Digital India” plans, Indian government envisages that, by the year 2019, 250,000 Indian villages will have access to the internet and telecommunications networks. Therefore, there is a need to design and develop villages that have established good endo- and exogenous connections, e.g., they have good connections to the outside world, but, at the same time they maintain their independence in providing employment and

services. To summarize, in the Indian case, two approaches are used as being complementary, Smart Villages serving as engines to Smart Cities' economic growth, by producing services and goods for rural but also for wider (inter)national markets. Unfortunately, there is no synthesis on how many Smart Villages has already been developed/ established in India, there are only some fragmented lists and websites dedicated to specific villages, which makes it difficult to keep up with the numbers.

A closer look at the initiatives working at the worldwide level presented above enables us to make some very broad conclusions. Looking at the main objectives and activities taking place within their frameworks, but also regarding some other reports [27,28] and models, the energy sector lies at the core of dealing with sustainable and smart community development. Even though the focus on sustainable energy supply is not explicitly in the forefront of the global developmental initiatives, it is implicitly involved within other objectives, such as lessening the climate footprint of agricultural practices. As it will become more evident in the next sub-chapter, a closer look at the European practices reveals also that focus areas of global initiatives have different social and economic conditions and therefore propose different solutions adapted to needs of the communities. Whereas global initiatives are primarily focusing on the areas with the lack of basic infrastructure (electricity, water supply, internet access, etc.), the European initiatives are working in the areas with basic infrastructure already provided and are therefore addressing different challenges of smart and sustainable development through products and services with social, economic, and environmental benefits.

3.15 Visit of Selected Smart Village for the Vishwakarma Yojana Project

3.15.1 Details of Budhel Smart Village

Name of Village: -Budhel
Name of Taluka: - Bhavnagar
Name ofDistrict: - Bhavnagar

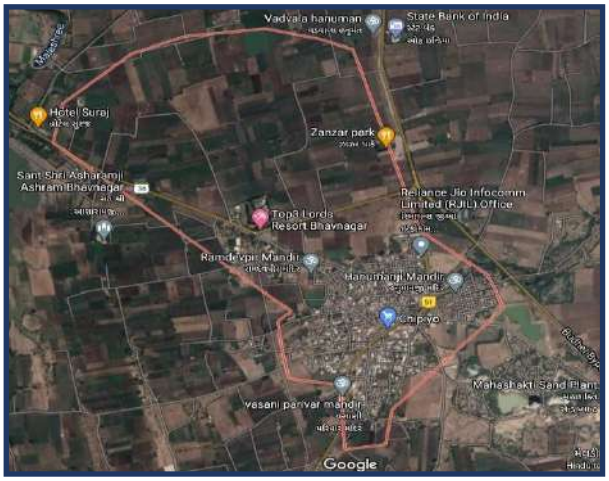


Figure:3.3Setellite view of Budhel

Due to COVID-19 we have not visited our (Budhel) smart village, but it contains some extra ordinary facilitescompaired to the others villages, like Hospitals, Banks, ATM, Primery& Secondary school, good internal road connectivity as well as the main Somnath highway connectivity near by, it is a junction were all the vehicle arechanging its directions at budhelchowkadi and it connects to the Asia's largest ship breacking yard Alang and Ghogha Ro-Ro ferry port and other service like C.C.T.V. Cameras on road, Wi-fi service, water connectivity, drainage network and solar street ligting on internal streets of bhudhel.

4. About Kalatalav Village

4.1 Introduction

4.1.1. Introduction About KalatalavVillagedetails

According to Census 2011 information the location code or village code of Kalatalav village is 516243. Kalatalav village is located in Bhavnagar Tehsil of Bhavnagar district in Gujarat, India. It is situated 5km away from Bhavnagar, which is both district & sub-district headquarter of Kalatalav village. As per 2009 stats, Kala Talao is the gram panchayat of Kalatalav village.

The total geographical area of village is 4794.93 hectares. Kalatalav has a total population of 3,854 peoples. There are about 989 houses in Kalatalav village. As per 2019 stats, Kalatalav villages comes under Bhavnagar Rural assembly & Bhavnagar parliamentary constituency. Bhavnagar is nearest town to Kalatalav which is approximately 18km away.

4.1.2.Justification/ need of thestudy

Aim of the project is to provide urban amenities in rural areas and maintaining the rural soul. This will help in developing villages in sustainable manner, reduce migration from villages and prevent the cities from the urban Pressure.

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

Vishwakarma Yojana would provide "Design to Delivery" solution for development of villages in 'Rurban' areas. The developmental work in villages that could 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, RecreationFacilities& other) and renewable energy (Rain water harvesting, Biogas plant, Solar Street lights & Other) for Sustainable development. Under this scheme, the villages of "Rurban" area will be adopted by the engineering colleges under the Gujarat Technological University.

4.1.3 Study Area

About 70% of India's population, or 750 million, live in its 600,000 villages. More than 85% of these.

Villages are in the plains or on the Deccan plateau. The average village has 200-250 households, and occupies an area of 5 sq. km. Most of this is farmland, and it is typical to find all the houses in one or two clusters. Villages are thus spaced 2-3 km apart, and spread out in

all directions from the market towns. The market centers are typically spaced 30-40 km apart. Each such centre serves a catchment of around 250-300 villages in a radius of about 20 km.
As the population and the economy grow, several large villages are continually morphing into towns and market centers. Around 65% of the State's population is living in rural areas. People in rural areas should have the same quality of life as is enjoyed by people living in sub urban and urban areas. Further there are cascading effects of poverty, unemployment, poor and inadequate infrastructure in rural areas on urban centers causing slums and consequential social and economic tensions manifesting in economic deprivation and urban poverty. Hence Rural Development which is concerned with economic growth and social justice, improvement in the living standard of the rural people by providing adequate and quality social services and minimum basic needs becomes essential.

The Next Two Billion People will live in cities and town; So We Need To Plan Now. Almost all future population growth in the next 40 years will be absorbed by cities of the developing world, which are unprepared for such rapid expansion. Planning needs to begin now to take advantage of the many benefits cities can offer. While cities concentrate poverty, they also provide the best means of escaping it. Cities have long been the engines of economic growth. Densely populated areas can be more environmentally sustainable than sprawling communities and allow for more efficient provision of services. The ideas, connections and activities in cities often generate the solutions to the problems they create

4.1.4 Objectives of the study

Creation of infrastructure - connectivity, civic and social infrastructure along with provision of alternative

• Basic physical infrastructure – Water Supply, Transport, Sewerage and Solid Waste Management should be the priority focus and be provided.

• Basic Social infrastructure – Health and Education facilities should be provided and ensure proper delivery of facilities to village dwellers.

• Promote integrated development of rural areas with provision of quality housing, better connectivity, employment opportunities and supporting physical and social infrastructure.

• Reduce migration from rural to urban areas due to lack of basic services and sufficient economic activities in rural areas.

• Internal roads within village settlement, Efficient Mass Transportation systems to improve connectivity between urban and rural areas, Public transportation facilities that need to be developed like bus stops, transport depot etc

• Identification of sanitation facilities that need improvement – sewerage and drainage line for household connection, door to door solid waste collection & dumping facilities

• Electricity connections like street lighting that is energy efficient and eco-friendly

• Refurbishing of village lakes, water tanks and wells, construction of rain water harvesting structures for sustainable Development

4.1.5 Scope of the Study

Long-range planning must take place in a public forum, with opportunities for public participation, if it is to be representative. The support of the community can also foster improved implementation opportunities.

An approach that will beused successfully when planning for the future of a community involves preceding the planning processwith an exercise designed to develop vision of the future for the "Vishwakarma Yojana."

4.1.6 Methodology Frame Work for development of your village

Ideal village survey	Allocated village survey	Rurbanization process
• Techno Economic Survey of Koliyak village • Gap analysis • SWOT analysis	• Techno Economic Survey of Kalatalav village • Gap analysis • SWOT analysis	• Problem deffinatios findings • Planning of economical and sustainable designs

- Ideal village survey of Koliyak village, Bhavnagar
- Datacollection.
- Gap analysis for facilities available as per ideal village norms & requirement.
- Techno-economic survey of Koliyak village, Bhavnagar.
- SWOT analysis of Koliyak village, Bhavnagar.
- Techno-economic survey of allotted village Kalatalav, Bhavnagar.
- Meeting with dwellers of village, Sarpanch&Talatimantri.
- Consulting with all related to village and analyse problem faced by Kalatalavvillage.
- Gap analysis ofKalatalavvillage.
- SWOT analysis of Kalatalavvillage.
- Finding best, economical & sustainable solution for problems as per UDPFIGuidelines.
- Best Proposal and Design for solvingproblem.
- Detail progress report and detail design done in final project report.

4.1.7 Available Methodology for development of related to Civil/Electrical

- C.C blocks paving of internal streets is just compleated
- Increase in storage of rain water harvesting potential, to develop and disseminate technologies and inputs for over come the scaresity of drinking water in summers.
- At this time ther is no water supply of drinling water so the local authority make sures that every dwellers can have sufficeant water supply of drinking water waterntanker.
- At this time thers is RCC road is about to compleat.

4.2 Kalatalav Study AreaProfile

4.2.1. About Kalatalav Village

Kala Talav is a medium size village located in Bhavnagar Taluka of Bhavnagar district, Gujarat with total 989 families residing. The Kala Talav village has population of 3854 of which 2278 are males while 1576 are females as per Population Census 2011.

Country	India
State	Gujarat
District	Bhavnagar
Sub District	Bhavnagar
Area	4794.90 Hector
Panchayat	Kalatalav
Nearest town	Bhavnagar (18 km)
Pincode	364001
Latitude	21.772800
Longitude	72.153560
Language	Gujarati

Table No. 4.1: Study area location of Kalatalav

1. Area of Village (Approx.) (In Hector)	4794.90 Hector
2. Forest Area (In hect.)	0 Hector
3. Agricultural Land Area (In hect.)	12.5 Hector
4. Residential Area (In hect.)	1270.5 Hector
5. Other Area (In hect.)	4.5 Hector

Table No. 4.2: Land use details of Kalatalav

4.2.2 Base Location map, Land Map, Gram Tal Map

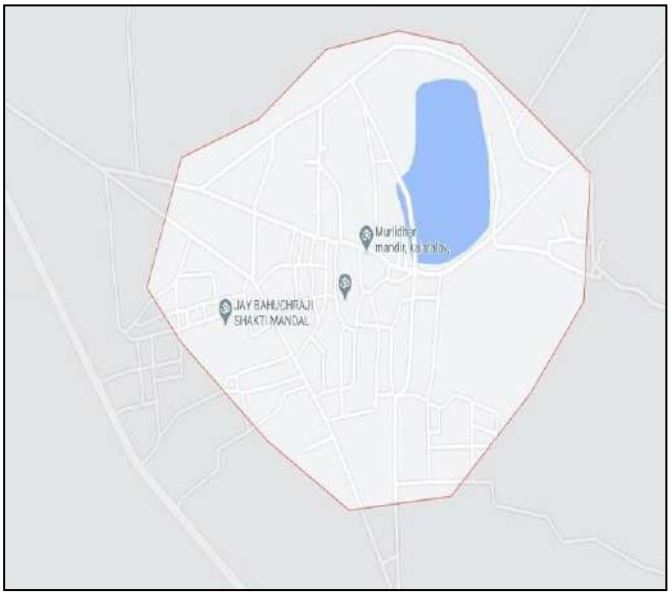


Figure:4.1Setellite view of KalatalavFigure:4.2 Street view of Kalatalav

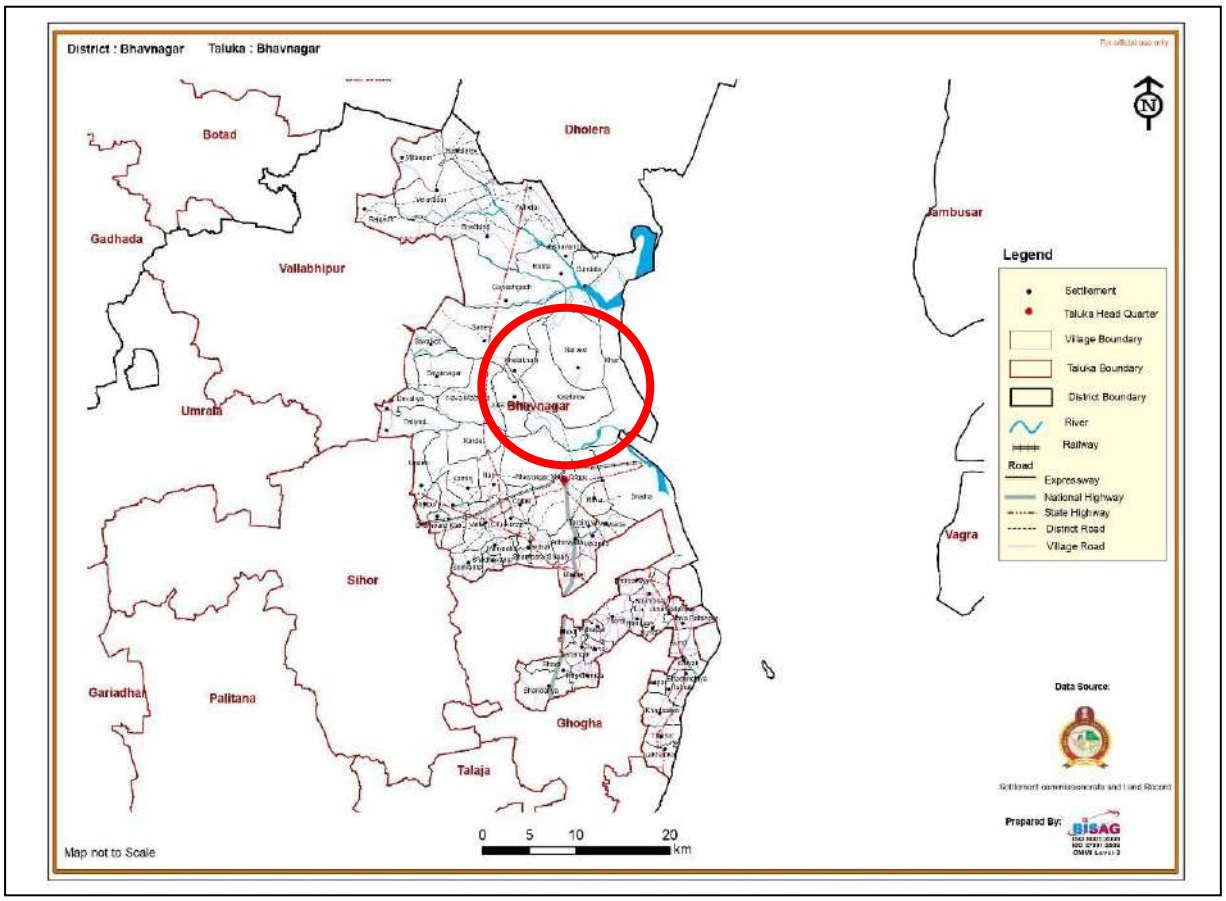


Figure:4.3 Base map of Kalatalav

4.2.3 Physical & Demographical Growth

Sr.no.	Census	Population	Male	Female	Total house holds
1.	2001	1483	781	722	313
2.	2011	3854	2278	1576	989

Table No. 4.3: Detail Population of Kalatalav as per Census 2001 & 2011

4.2.4 Economic generation profile / Banks

- **Three Major Occupation Groups inVillage**
  - House hold industries
  - LabourWorkinginIndustries (mainly in NIRMA Factory near abour 5 kms. away from kalatalav)
  - Fishing
- **Major Crops Grown in TheVillage**
  - Cotton
  - Sesame
  - sorghum

4.2.5 Actual Problem faced by Villagers and smart solution

Poblem faced by Villagers

- Village roads are in bad or in poor conditions
- There are no publics toilets and bathsin village
- School does not have sufficient class roomthay are studying under the wooden shead
- Secondary school is working under leased-rental building.
- Requirement of new school class rooms.
- Existing Anganwadi is layed in promery school campus. Therofore they need seprate Anganwadi building.
- Requirement of a Bank in village as there are no banks.
- No street lights are avaible in village.
- Requirement of Vegitable/fish maket in village
- Ther are no Bus stand in for publictransportion.
- about covid19.

Solution:

- Proper economic and efficient maintanenceof roads.
- Wearegiventhesmartsolutionanddesignofpublictoilets and bathsetc.
- Design of smart Anganwadi.
- Design of smart and efficient bank building.
- Electrical point of view we giving design of Solar street lighting as anRenewable Energy soures.
- We are going to design smart primary plus secondery school buildings in village.
- We are designinig Economical as wel as elegentvegitalbe and fiush market

4.2.6 Social scenario -Preservation of traditions, Festivals, Cuisine

Particulars	Total	Male	Female
Total No. of Houses	989	-	9
Population	3584	2278	1576
Child	538	284	254
Schedule Casts	0	0	0
Schedule Tribes	0	0	0
Litracy	68.18%	78.49%	52.65%
Total Workers	2287	1645	642

Table No. 4.4: Social Scenario of Kalatalav Village

Festival:

Navratri, Uttarayan, Rathyatra, Ganpati Mohotsav, Diwali, Raksha Bandhan, etc.

Cuisine:

Loclly available vagitables and fihes from the sea is used as main Cusines for village dwellers. From seafood they make Local fish curry, shripms, crab curry and other very delisus curry and other vegitableshaks and subjjis.

4.2.7 Migration Reasons / Trends

- Poor farmer are migrating from village because of scresity of waters and less agriculturable lands in village
- New generation is not having any kind of smart or advance infrastructres for ther lifestyles.
- No any physicale infrastructures like public toilets and water supply network in village
- Less educatioanalfacilites in village.
- No any other occupations or job opertunites in village.
- To get higer income and high living standerds.
- Labour Market Segregation
- Employment Intensity and Wage Income
- nsecurity and Vulnerability
- Migrant Workers with Families
- Long Working Hours and Social Security etc.

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

4.3.1 Describe Methods for data collection

We have collected data from firstly in ideal village survey at koliyak near Bhavnagar and then allottedKalatalav village, we also surveyed the smart village Budhel near Bhavnagar by follo

wing method.

- Collection of Information from Talati Mantri, Sarpanch, Gram Sevak and School Principal.
- Techno-economic survey of ideal village Koliyak and other reference.
- Techno-economic survey of smart village Budheland reference.
- Techno- Economic survey of allotted village Kalatalav.
- Gap analysis and SWOT analysis as per collected data of allvillages.
- From Director of Census operations Gujarat 2001 & 2011records.
- By exploring the village by visiting the village.

4.3.2 Primary details of survey details

Kalatalav is a village located in Bhavnagar Taluka of Bhavnagar district. Village is located 18 Km away from Bhavnagar. Total area of village is 4794.90 hectares. Total population of village is 3854 among them 2278 are male and 1576 are female as per census 2011. Total households in Kalatalav village are 989 as per census. Main occupation of the Kalatalav village peoples is Farming and fishing. Population density of the village is 80 persons per km2.main crosp of village is cotton, sorghum and sesame.

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

Kalatalav is a medium village located in Bhavnagar Taluka of Bhavnagar district, Gujarat with total 989 families residing. The Kalatalav village has population of 3854 among them 2278 are male and 1576 are female as per census 2011. There are about 571 houses. Most of the houses in the Kalatalav village is residential house and some of the are Puchha house 90% pucca &10% Kutchha house.

4.3.4 No of Human being in One House

In genralther are 989 hjose hold is there and from that we can say that each family have 4 to 5 members in each one house in village.

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

the allocated village is very bizarre in nature ther are no any specific materials to exports to out side of village.

4.3.6 Geographical Detail

Sr. No.	Description	Information/Detail
1	Area of Village (Approx.) (In Hector) Coordinates for Location:	4794.90
2	Forest Area (In Hect.)	0.00
3	Agricultural Land Area (In hect.)	12.5
4	Residential Area (In hect.)	1270.50
5	Other Area (In hect.)	4.5
6	Distance to the nearest railway station with distance	Bhavnagar Turminus railway station at 10 kms.
7	Nearest Town with Distance:	Bhavnagar at 18 kms.
6	Distance to the nearest bus station	Bhavnagar Bus stand at 15 kms.

Table No. 4.5: Geographical Detail

4.3.7 Demographical Detail - Cast Wise Population Details / Which ID proof usingby villagers

Particulars	Total	Male	Female
Total No. of Houses	989	-	9
Population	3584	2278	1576
Child	538	284	254
Schedule Casts	0	0	0
Schedule Tribes	0	0	0
Litracy	68.18%	78.49%	52.65%
Total Workers	2287	1645	642

Table No. 4.6: Demographical Detail – Cast Wise Population Detail

Identity cadr used by villagers is mainly Aadhar Card issued by Government of India and alsotheyuse Election ID card and Ration Card. As an ID proof.

4.3.8 Occupational Detail - Occupation wise Details / Majority business

People living in Kalatalav depend on multiple Ocsupatios, total workers are 2287 out of which men are 1645 and women are 642. Total 450 Cultivators are depended on agriculture farming out of 300 are cultivated by men and 150 are women. Other people peoplework in agricultural land as a labour and fishing buissnessinKalatalav.

- **Name of three Major Occupation Groups inVillage**
  - Agriculture 40%
  - Labor Work in NIRMA FACTORY LIMITED and other. 30%
  - Fishing 30%

4.3.9 Agricultural Details / Organic Farming / Fishery

Agricultural area of Kalatalav village is 12.50 Hector. 40 % workers of village are attached with agricultural activities. Village farmers are farming sesame sourgum and cotton maily as their crops. In recent time farmers of village are getting vision on organic farming and itstechniques by young farmares by the help og local athourity. In Fishing they are aminly harvesting shrimps, mud crabs, small fish and prowns.

4.3.10 Physical Infrastructure Facilities - Manufacturing HUB / Ware Houses

Kalatalav village have the biggest Nirmafactoy LTD. Wich is manufacture some of camichles and washing powders, washing soaps and other chamicles related to chamicaleindustires.

4.3.11 Tourism development available in the village for attracting the tourist

- In Kalatalavvillage there no any famus place to visit.
- A small small temple is locally famus in kalatalav village.
- Kalatalav village pond is very seanic place to visit at the time of sun set.

4.4. Infrastructure Details (With Exiting Village Photograph)

4.4.1. Drinking Water / Water ManagementFacilities

Figuer 4.4 Kalatalav Village Pond/Lake

Figure 4.5Kalatalav Village Under Ground Water Storage Tank

4.4.2. Drainage Network / SanitationFacilities

In the Kalatalav village there are very good drainage network system. All hosues are connected to thehouse sewer

Wich leads to lateral sewer and then it is connected to the main branch sewer to discharge sewerage in to sea area directly.

Some of houseare having W.C./ Bath facelites. There is no proper Public Toilet & Bath Blocks in the vicinity of Kalatalav village due to this sanitation problem take place, to over come we have designed Public toilets and bath in this project.

Due to lack of knowledge and not proper arrangements of dustbin and other reasonthet are not having any proper solid waste management techniques.

4.4.3 Transportation & Road Network

In the village thereis decent R.C.C. approach road, all other artiral roads is under construction due to COVID-19 some of the road work are pending, but in upcoming time it may get started very soon. The streets of village are having C.C. paver block pavement in it which is in very good conditions.

Some of the main road need some maintainance work and some may need new construction.

4.4.4 Housing condition

In the village there is mixed type of buildings/houses like kachha and pakkamakan. It contains 90% PakkaMakan and 10% KachhaMakan.

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

Village contains following infrastructure Facilities,

In the Health sector Village has a Primary health center in the premiseis of Sarpanch office. Village has a Primary School which has built in industrial shed and other classroom is of good building, and it has Anganwadi building in the primises of Primary School Building. ButVillage does not have any library or community hall.

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

In thisvillage the following infrastructure needs maintenances or new building construction,

1. Primary school needs new building/renovation.
2. Anganwadi needs new building.
3. Some of the RCC roads needs repair and maintance work.
4. Some Internal street CC block pavement is under settlement.

4.4.7 Technology Mobile/ WIFI / Internet Usage Details

Telecommunication Network and internet facilities are available and they are in good working condition.

Village need to build Internet cafes, common service centers and wifi.

4.4.8 Sports Activity as Gram Panchayat

Sport activities are not conducted by gram panchayat

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

This village have a pond at center of village but does not have socio-cultural Facilities, public garden, park or other recreation facilities

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

No such facilities are available, need to construct public toilets with self-cleansing system of drainage

4.4.11 Any other details

In village the following infrastructure need new building construction,

1. public gardens
2. Bank and ATM facilities
3. General market
4. Recreation centers like cinema hall / video hall
5. Public library
6. Medical shop/Pharmacy

4.4.5 Electrical Concept

In KALATALAV village availability of electricity is not 24x7, village need more electrical infrastructure for the betterment of villagers and village.

4.5.1 Renewable energy source planning particularly for villages

Currently there are no planning or upcoimg projects for village about Renewable energy source because there are lack of basic facilities available in village.

4.5.2 Irrigation Facilities

Irrigation facilities in village are inadequate due shortage of water in village.

There is urgent based need of Water supply facilities. Even drinking water in school are supplied by tankers.

4.5.3 Electricity Facilities within the Area

Yes, the village has government electricity distrubition more than 6 hours.

4.6Existing Institution like - Village Administration – Detail Profile

1. Public Health centers
2. ICDS (Anganwadi)

4.6.1 BachatMandali

There is no BachatMandalis in vicinity of village.

4.6.2 DudhMandali

In this village ther is milk co-operative society

4.6.3 Mahila forum

There is no Mahila forum in vicinity of village.

4.6.4 Plantation for the Air Pollution

There are no need of plantation for air pollution due to less vehicles in village and does not have factory which may lead to air pollution.

4.6.5 Rain Water Harvesting - Waste Water Recycling

We need to construct rain water harvesting to overcome the scarcity of water problems in village.

4.6.6 Agricultural Development

Agricultural development in this village is at very low production, need to increase yield of crop production.

4.6.7 Any Other

Main sources of income of the villagers are from;

1. House-hold industries
2. Labours
3. Fisher man

5. Technical Options with Case Studies

5.1 Concept (Civil)

5.1.1 Advance Sustainable construction techniques / Practices and Quantity Surveying

Solar power

In green construction, there is active solar power and the other is passive solar power. Active solar power is the use of functional solar systems that absorb the sun's radiation to cater for heating and electricity provision. It reduces the need for the use of electricity or gas. Passive solar power is a design that uses the sun's rays to warm homes through the strategic placement of windows and the use of heat-absorbing surfaces. The windows let in energy and the heat absorbed reduces the need for warming the house during cold periods such as winter.

Biodegradable materials

The use of biodegradable materials is an eco-friendly means of making construction sustainable. Most traditional construction methods lead to the accumulation of waste products and toxic chemicals, the majority of which take hundreds of years to degrade. Biodegradable materials such as organic paints, therefore, aid to limit the negative impacts on the environment as they easily breakdown without the release of toxins. The use of biodegradable materials for building foundation, walls and insulators are also part of sustainable construction technologies.

Green insulation

Insulation is among the greatest concerns when it comes to construction of buildings and homes. The use of green insulation has proven to be a sustainable construction technology as it eliminates the need for high-end finishes made from non-renewable materials. Green insulation offers a solution by making use of old and used materials such as denim and newspaper.

Cool roofs

Cool roofs are sustainable green design technologies which aim at reflecting heat and sunlight away. It aids in keeping homes and buildings at the standard room temperatures by lowering heat absorption and thermal emittance. Cool roofs can reduce temperatures by more the 50 degree Celsius during summer.

Sustainable resource sourcing

Sustainable resource sourcing ensures the use of construction materials designed and created from recycled products and have to be environmentally friendly. Overall, the materials are remanufactured, recycled, recyclable, and obtained from sustainable sources.

Low-energy house and Zero-energy building design

Sustainable construction technologies typically include mechanisms to lessen energy consumption. The construction of buildings with wood, for instance, is a sustainable construction technology because it has a lower embodied energy in comparison to those build of steel or concrete. Sustainable green construction also makes use of designs that cut back air leakage and allows for free flow of air while at the same time using high-performance windows and insulation techniques.

Water efficiency technologies

There are several water efficient technologies used, which are all part of sustainable construction technologies. Essentially, the technologies encompass re-use and application of efficient water supply systems. Examples include the use of dual plumbing, greywater re-use, rainwater harvesting and water conservation fixtures. In urban areas, the technologies intend to lower water wastage by 15% to address freshwater shortages.

Sustainable indoor environment technologies

The health and safety of the building occupants are fundamental and must be guaranteed during the construction of any building or home. As such, sustainable indoor technologies are mandatory for green construction. The materials used have to ensure green safety standards

which include hazardous free elements, non-toxic materials, low volatile emissions, and moisture resistance.

5.1.2 Soil Liquefaction

Soil liquefaction, also called **earthquake liquefaction**, ground failure or loss of strength that causes otherwise solid soil to behave temporarily as a viscous liquid. The phenomenon occurs in water-saturated unconsolidated soils affected by seismic S waves (secondary waves), which cause ground vibrations during earthquakes. Although earthquake shock is the best known cause of liquefaction, certain construction practices, including blasting and soil compaction and vibroflotation (which uses a vibrating probe to change the grain structure of the surrounding soil), produce this phenomenon intentionally. Poorly drained fine-grained soils such as sandy, silty, and gravelly soils are the most susceptible to liquefaction.

Granular soils are made up of a mix of soil and pore spaces. When earthquake shock occurs in waterlogged soils, the water-filled pore spaces collapse, which decreases the overall volume of the soil. This process increases the water pressure between individual soil grains, and the grains can then move freely in the watery matrix. This substantially lowers the soil's resistance to shear stress and causes the mass of soil to take on the characteristics of a liquid. In its liquefied state, soil deforms easily, and heavy objects such as structures can be damaged from the sudden loss of support from below.

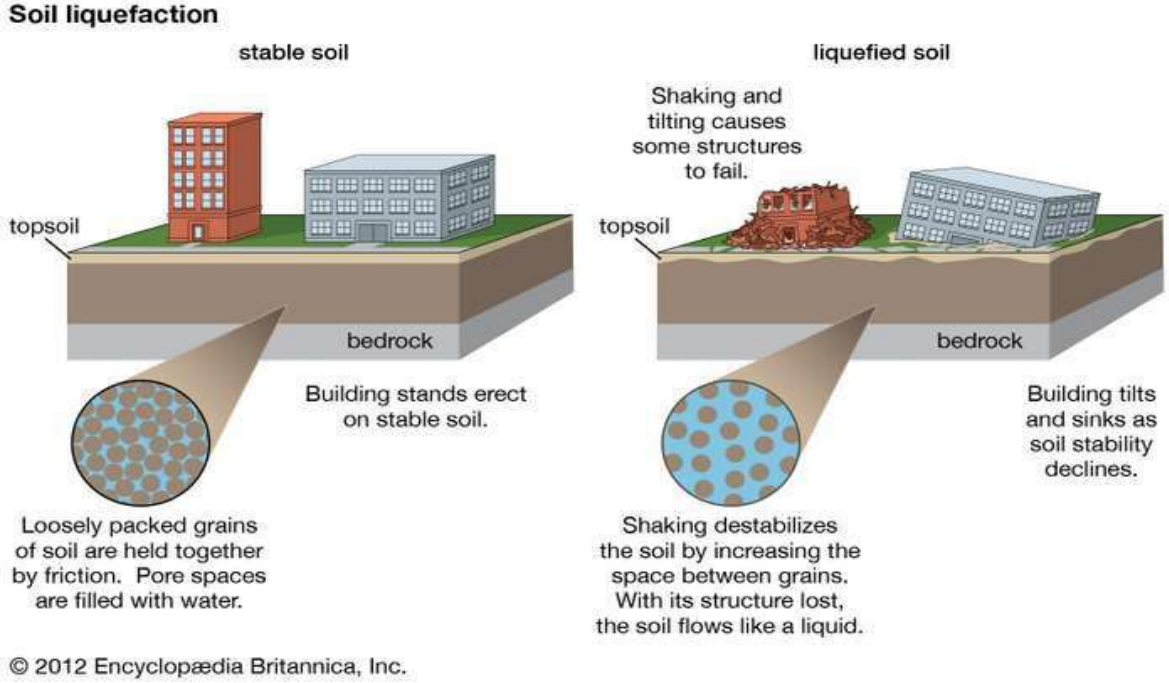


Figure 5.1 Soile Liquefaction

5.1.3 Sustainable Sanitation

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

To qualify as **sustainable sanitation**, a sanitation system has to be economically viable, socially acceptable, technically and institutionally appropriate, and protect the environment and natural resources.

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

Since appropriateness to the context is such a core criterion for sustainable sanitation, there is no one-size-fits-all sanitation solution. However, taking into consideration the entire range of sustainability dimensions, it is important to observe some basic principles when planning and implementing a sanitation system.

5.1.4 Transport Infrastructure / system

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

5.1.5 Vertical Farming

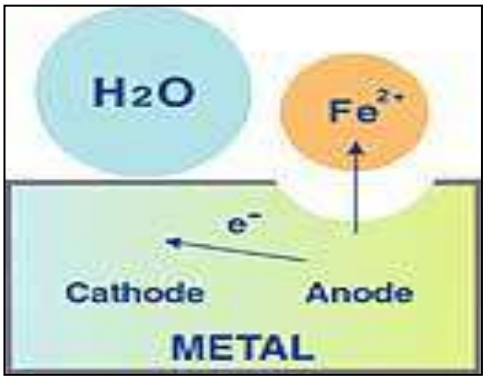
In simple terms, Vertical farming is a method to produce leafy veggies (spinach, amaranthus, mint, lettuce, kale, basil) and some non-tree fruits (tomatoes, brinjal, strawberries) where there is nearly no available arable land; these are grown in vertically stacked layers made of PVC pipes resembling a multi-storied building of plants. The plants are grown in a controlled environment under artificial lighting using LED bulbs, either in a building and polyhouse on rooftops or open land.

Figure 5.2 Vertical Farming

Vertical farming can be either aeroponics (growing plants in air or mist without the use of soil or an aggregate medium) or hydroponics (growing plants using mineral nutrient solutions in water solvent without soil)

5.1.6 Corrosion Mechanism, Prevention & Repair Measures of RCC Structure

Corrosion Mechanism



In the presence of moisture, an oxidation reaction takes place on the energized area of the metal surface to elute metal as an ion (anode). A reduction takes place on low energy area (cathode).On the metal surface, oxidation on anode and reduction on cathode proceed in equal rates and metal corrosion takes place. Normally, corrosion of metal occurs on anode.

Figure 5.3 Corrosion mechanism

Ways to Prevent Corrosion of Metal Parts

Protective Coating

Coatings can provide a layer of protection against corrosion by acting as a physical barrier between the metal parts and oxidizing elements in the environment. One common method is galvanization, in which manufacturers coat the part with a thin layer of zinc.

Powder coatings are another effective way to prevent corrosion in metal parts. With proper application, a powder coating can seal the surface of the part away from the environment to guard against corrosion.

Environmental Control

Many environmental factors impact the likelihood of corrosion. It helps to keep metal parts in a clean, dry place when not in use. If you intend to store them for a long time, consider using methods to control the level of sulfur, chloride, or oxygen in the surrounding environment.

Galvanic corrosion occurs when metal parts with two different electrode potentials are in contact along with an electrolyte like saltwater. This causes the metal with higher electrode activity to corrode at the point of contact. One can prevent galvanic corrosion by storing these parts separately. This effect can also work as an anti-corrosion measure, as explained below.

Cayhodic Protection

It is possible to prevent corrosion by applying an opposing electrical current to the metal's surface. One method of cathodic protection is an impressed current, using an outside course of electrical current to overpower a corrosive current in the part.

A less-complex method of cathodic corrosion protection is the use of a sacrificial anode. This involves attaching a small, reactive metal to the part you wish to protect. Metal ions will flow from the reactive metal to the less active part, reducing corrosion at the expense of the smaller piece.

Miantenance

Protective coatings, environmental control, and cathodic protection are effective ways of preventing corrosion in metal parts. However, these measures are nothing without ongoing maintenance and monitoring. Coatings can wear over time; even small nicks and scratches can lead to corrosion. Be sure to keep parts clean and apply additional protection as necessary.

Repair Measures of RCC Structure

The Repair and Rehabilitation of structures include the following

- Inspection methods, assessment, monitoring, maintenance of structures.
- Concrete durability, fatigue issues in bridges, laboratory studies, dynamic testing & analysis
- Seismic strengthening

- General repairs

REPAIRANDREHABILITATIONOF R.C.C. STRUCTURES

Structure repair and rehabilitating is a process whereby an existing structure is enhanced to increase the probability that the structure will survive for a long period of time and also against earthquake forces. This can be accomplished through the addition of new structural elements, the strengthening of existing structural elements, and/or the addition of base isolators. Deterioration of concrete and corrosion of embedded reinforcement structure might make the R.C.0 structure structurally deficient. Corrosion can be controlled to some extent by fixing of chloride or protective coating (Powder coatings based on thermosetting epoxy, polyester or acrylic technology, are electro statically sprayed.) or cathodic protection. Once this has happened, two alternatives of fixing the problem are to replace the structure or to strengthen it. Economically, repair and strengthening are often the only viable solution.

SURFACE PREPARATION AND INTERFACIAL BOND FOR APPLICATION OF PATCH REPAIRS, SEALERS AND COATINGS IN CONCRETE REPAIR

The main purpose of surface preparation is to provide maximum coating adhesion and to increase the surface area by increasing the roughness of the surface. Achieving an adequate lasting bond between repair materials and existing concrete is a critical requirement for durable concrete repair. Good surface preparation using proper concrete removal methods and workmanship is the key element in a long-lasting concrete repair technique.

CONVENTIONAL STRENGTHENING METHODS

1. Grouting Process : - Grouting is the process of placing a material into cavities in concrete or masonry structures for the purpose increasing the load bearing capacity of a structure, restoring the monolithic nature of a structural member, filling voids around pre cast connections and steel base plates, providing fire stops, stopping leakages, placing adhesives and soil stabilization. Primary grouting materials and their common uses are:

Methods of application normally used include: hand pumps, piston pumps, single and plural component pumps, gravity and dry packing placement, micro capsules and single component pressurized cartons.

2.Guniting Process: - Guniting is an effective technique, which has been extensively used in the rehabilitation of structurally distressed RC members. There have been cases of heavy rusting of the mesh in the form of powder or in the form of a sheet coming out. De- stressing before restoration is possible only in the case of overhead tanks which can be restored when the tanks are empty.

APPLICATION OF EPOXY RESINS TO STRENGTHEN THE STRUCTURAL MEMBER WITH EXTERNAL REINFORCEMENT

In these methods of strengthening, an epoxy adhesive normally consisting of two components - a resin and a hardener is used to bond steel plates to overstressed regions of RC members. Normally, the steel plates are located in the tension zone of concrete to enhance the flexural capacity. The plates can also be placed in the compression and shear regions for enhancing the axial and shear-capacities of the RC structural elements. As the adhesive provides a continuous shear connection between the RC member and the external plates, a concrete-adhesive-steel composite structural member is developed to cater for the additional live load effects on the structures.

Section Enlargement/jacketing:-In this method the entire height of the column section is increased and a cage of additional main reinforcement bars with shear stirrups is provided

right from the foundation as per the requirement of additional load, etc. However, there are many instances where the column section is increased with additional reinforcement bars only on one face, and that too starting from the floor slab level of a particular floor and only up to the height of deterioration of the column. The enlargement should be bonded to the existing concrete to produce a monolithic member a composite system, Cement mortar is used for these enlargements.

Post tensioning:-External prestressing is now widely developed for concrete strengthening in the United States, Japan, and Switzerland. External prestressing techniques have been employed with great success to correct excessive and undesirable deflections in existing structures. They have also been used to strengthen existing concrete structures to carry additional loads.Prestressing may be used on tile inside of box girders or the outside of I girders to increase the capacity of existing bridges and to provide improved resistance to fatigue and cracking. The following are the advantages of external prestressing.

Simple Construction Methods:-Simple strand or tendon profile resulting in simple construction on tile site. Few or no problems with tendon grouting. Possibility of inspection during the lifetime of the structure with x-ray or other nondestructive detection techniques. Replaceabilty of strands and tendons. The disadvantages of external prestressing are those which arise from it location outside the structure.

MATERIALS USED IN REPAIRS

1. Polymer modified concrete/cement mortar.
2. Fiber-Reinforced Plastics
3. Epoxy resins
4. Polymer-based materials.
5. High performance cement.
6. Fibre reinforced polymer tubes for pile/column.
7. Epoxide resin latex and polymer-based latex.
8. Fiber-reinforced polymer

5.1.7 Sewage treatment plant

INTRODDUCTION

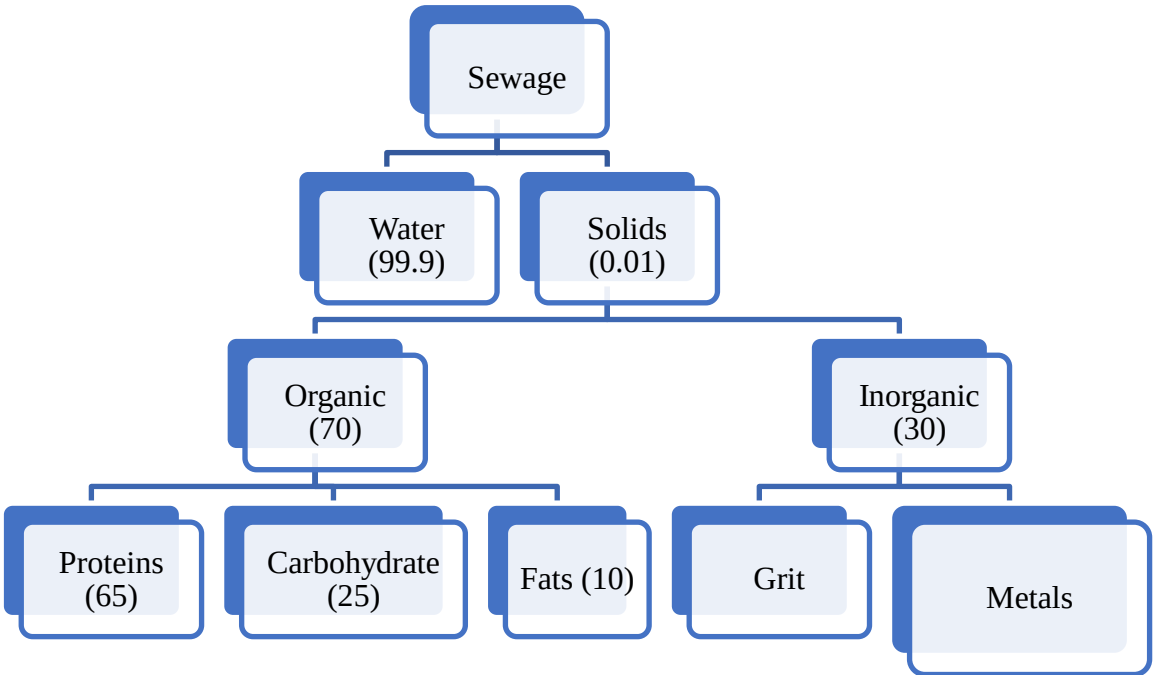
Water, food and energy securities are emerging as increasingly important and vital issues for Bangladesh and the world. Most of the river and canals in Bangladesh is polluted and experiencing moderate to severe water shortages, brought on by the simultaneous effects of agricultural growth, industrialization and urbanization. Sewage is a major point source of pollution. Current and future fresh water demand could be met by enhancing water use efficiency and demand management. Thus, wastewater/low quality water is emerging as potential source for demand management after essential treatment. Also, sewage can be viewed as a source of water that can be used for various beneficial uses including ground water recharge through surface storage of treated water and/or rain/flood water in an unlined reservoir. In order to reduce substantial expenditure on long distance conveyance of sewage as well as treated water for recycling, decentralized treatment of sewage is advisable. Sewage wastewater treatment consist of different processes which protect the environment & human through cleansing the water pollutant.

SEWAGE

Sewage is the wastewater generated by a community, namely: a) domestic wastewater, from bathrooms, toilets, kitchens, etc., b) raw or treated industrial wastewater discharged in the sewerage system, and sometimes c) rain-water and urban runoff. Domestic wastewater is the main component of sewage, and it is often taken as a synonym. The sewage flow rate and

composition vary considerably from place to place, depending on economic aspects, social behavior, type and number of industries in the area, climatic conditions, water consumption, type ofsewers system, etc. The main pollutants in sewage are suspended solids, soluble organiccompounds, and fecal pathogenic microorganisms, but sewage is not just made up of humanexcrement and water. A variety of chemicals like heavy metals, trace elements, detergents, solvents,pesticides, and other unusual compounds like pharmaceuticals, antibiotics, and hormones can alsobe detected in sewage. With urban runoff come potentially toxic compounds like oil from cars andpesticides that may reach the treatment plant and, eventually, a water body.

COMPOSITION OF SEWAGE



CLASSIFICATION OF SEWAGE

Sewage may be classified mainly into three types, namely, domestic sewage, industrial sewage, and storm sewage.

1. Domestic or Sanitary Sewage

Domestic sewage consists of liquid wastes originating from urinals, latrines, bathrooms, kitchen sinks, wash basins, etc. of the residential, commercial or institutional buildings. This sewage is generally extremely foul, because of the presence of human excreta in it.

2. Industrial Sewage or Wastewater

Industrial sewage consists of liquid wastes originating from the industrial processes of various industries, such as Dyeing, Paper making, brewing, etc. The quality of the industrial sewage depends largely upon the type of industry and the chemicals used in their process waters. Sometimes, they may be very foul and may require extensive treatment before being disposed of in public sewers.

3. Storm Sewage

Storm sewage means water that is discharged from a surface as a result of rainfall, snow melt or snowfall.

WHY WE TREAT WASTEWATER?

It's a matter of caring for our environment and for our own health.
To prevent groundwater pollution.
To prevent sea shore.
To prevent marine life.
Protection of public life
To reuse the treated effluent, for agriculture, for groundwater recharge, for industrial recycle
Solving social problem caused by the accumulation of wastewater.
If wastewater is not properly treated, then the environment and human health can be negatively impacted.

WASTEWATER CHARACTERISTICS

Wastewater is characterized in terms of its:

- Physical
- Chemical
- Biological

Physical Characteristics of Wastewater

The physical characteristics of wastewater are based on color, odor, temperature, solids and turbidity.

Color: Fresh wastewater is usually a light brownish-gray color. However, typical wastewater is gray and has a cloudy appearance. The color of the wastewater will change significantly if allowed to go septic (if travel time in the collection system increases). Typical septic wastewater will have a black color.

Odor: Fresh domestic wastewater has a musty odor. If the wastewater is allowed to go septic, this odor will significantly change to a rotten egg odor associated with the production of hydrogen sulfide (H_2S).

Temperature: The temperature of wastewater is commonly higher than that of the water supply because of the addition of warm water from households and industrial plants. However, significant amounts of infiltration or storm water flow can cause major temperature fluctuations. The ideal temperature of sewage for the biological activities is 20°c.

Solids: All the materials in the liquid except water are called as solids. Solids are classified into three main types. All the matter that remains as residue upon evaporation at 103° C to 105° C is called total solids. Those solids that are not dissolved in wastewater are called suspended solids. When suspended solids float, they are called floatable solids or scum. Those suspended solids that settle are called settleable solids, grit, or sludge. All solids that burn or evaporate at 500°C to 600°C are called volatile solids. Those solids that do not burn or evaporate at 500°C to 600°C, but remain as a residue, are called fixed solids. Fixed solids are usually inorganic in nature and may be composed of grit, clay, salts, and metals.

Turbidity: Turbidity is a measure of water clarity how much the material suspended in waterdecreases the passage of light through the water.

Chemical Characteristics of Wastewater

Chemical characteristics of wastewater are: organic matter, measurements of organic matter, inorganic matter, gases, pH.

pH: This is a method of expressing the acid condition of the wastewater. pH is expressed on a scale of 1 to 14. For proper treatment, wastewater pH should normally be in the range of 6.5 to 9.0. The determination of pH value of sewage is important, because of the fact that efficiency of certain treatment methods depends upon the availability of a suitable pH value.

Gases: These are gases that are dissolved in wastewater. The specific gases and normal

concentrations are based upon the composition of the wastewater. Typical domestic wastewater contains oxygen in relatively low concentrations, carbon dioxide, and hydrogen sulfide.

Inorganic Matter: The main inorganic materials of concern in wastewater are chloride, nitrogen, phosphorus, sulfur, toxic inorganic compounds, and heavy metals.

Organic Matter: Organic matter consists of Carbohydrates such as cellulose, cotton, fiber, starch, sugar, etc. Fats and oils received from kitchens, laundries, garages, shops, etc. Nitrogenous compounds like proteins and their decomposed products.

Oxygen Demand: There are three ways of expressing oxygen demand as like as Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Theoretical Oxygen Demand (ThOD).

Biological Characteristics of Wastewater

The biological characteristics of sewage are due to the presence of bacteria and other living microorganisms, such as algae, fungi, protozoa, etc. The former are more active.

CHARACTERIZATION OF SEWAGE

Wastes are usually treated by supplying them with oxygen so that bacteria can utilize the waste as food.

The general equation is:

Waste+ Oxygen $\xrightarrow{\text{bacteria}}$ Treated waste + new bacteria

OXYGEN DEMAND

The amount of oxygen used by bacteria and other wastewater organisms as they feed upon the organic solids in the wastewater.

There are three ways of expressing oxygen demand

1. Theoretical Oxygen Demand (ThOD)
2. Biochemical Oxygen Demand (BOD)
3. Chemical Oxygen Demand (COD)

SEWAGE TREATMENT

Sewage treatment is the process of removing contaminants from wastewater, primarily from household sewage. It includes physical, chemical, and biological processes to remove these contaminants and produce environmentally safe treated wastewater.

OBJECTIVES OF SEWAGE TREATMENT

Removal of micro-organic which may be the cause of dangerous diseases

Removal of floatable and postponed particles

To improve the quality of wastewater.

To make the wastewater usable for agricultural, aquaculture etc.

TYPES OF SEWAGE TREATMENT

Sewage treatment, however, can also be organized or categorized by the nature of the treatment process operation-

Physical

Chemical

Biological

PHASES of SEWAGE TREATMENT

1. Preparatory or Preliminary Treatment
2. Primary or Physical Treatment
3. Secondary or Biological Treatment
4. Tertiary or Advanced Treatment
5. Sludge Treatment

6. Disinfection

SELF-PURIFICATION IN A RIVER

Self-purification is the ability of rivers to purify itself of contaminants by natural processes. It is produced by certain processes which work as rivers move downstream. These mechanisms can be inform of dilution of polluted water with influx of surface and groundwater or through certain complex hydrologic, biologic and chemical processes such as
sedimentation (behind obstruction), coagulation, volatilization, precipitation of colloids and its subsequent settlement at the base of the channel, or lastly due to biological uptake of pollutants.
There are two broad stages of self-purification

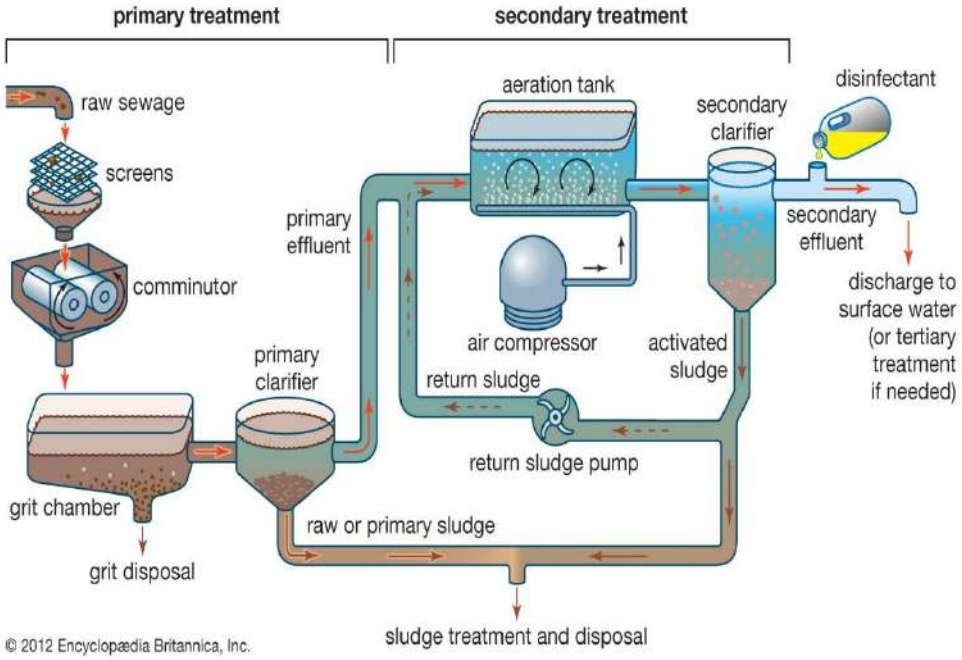
Reversible stage
Irreversible stage

Reversible stage: The reversible stage of self-purification is the stage at which the natural processes of a river can easily deal with incoming pollutants within a considerable stretch of the river.

Irreversible stage: The irreversible stage is when the rate of contamination exceeds the natural capacity of the river, and thus restoration can practically be achieved by evacuation of wastes.

FACTORS AFFECTING SELF PURIFICATION

1. Dilution
2. Current
3. Temperature
4. Sunlight
5. Rate of Oxidation
6. Dispersion due to current
7. Reduction



5.1.8 Case Study

VERTICAL FARMING

Abstract: The vertical farm is a world-changing innovation whose time has come. Imagine a world where every town has their own local food source, grown in the safest way possible, where no drop of water or particle of light is wasted. Smart farming makes a tremendous contribution for food sustainability for 21stcentury. The reason is that the environmental and water management affects plant growth directly. Vertical farming is considered as a modern tool for feeding large world population by year of 2050.Erecting a farm that is in close proximity to the people which it serves by availability of cheaper, organic, disease-free crops alongside sustaining the limited natural resources.

Keywords — Smart Farming, Food Sustainability, World-Changing Innovation.

I.INTRODUCTION TO VERTICAL FARMING Vertical farming is the practice of growing crops in vertically stacked layers or integrated in other structures (such as in a skyscraper or old warehouse) with use of less water and no soil. The modern ideas of vertical farming use indoor farming techniquesand controlled environment agriculture (CEA) technology, where all environmental factors can be controlledsuch as artificial control of light, humidity, temperature also Bio fortification which is to breed crops to increase their nutritional value.

II.NEED FOR VERTICAL FARMING Increasing food demand due to growing population along with ever decreasing arable lands poses as one of the greatest challenges. The high yield farming methods that support our immense population are characterized by their instable consumption of our limited reserves of fresh water, fossil fuel and soil. Vertical farming is the urban farming of crops inside a building in a city or urban centre, wherein the floors are designed to accommodate certain crops.

Vertical farming creates an alternate source of sustainable food production units for today's urban needs and future generation.

III.BREIF HISTORY OF MODERN FARMING The hanging garden of Babylon poses as the earliest method to grow plants vertically. In 1915, the American geologist Gilbert Ellis Bailey used the concept of the tall multi-story buildings for indoor cultivation. Vertical farming as a concept was developed in the recent years (1999)through the advances in technology by Dickson Despommier, an Emeritus Professor of Microbiology at the Columbia UniversityHe explains that hydroponic crops could be grown on upper floor and the lower floors would be suited for chickens and fish that eat plants waste.

IV.SCOPE AND POTENTIAL

a. Less deforestation and land use. This means less erosion and less flooding.
b. Abandoned or unused properties will be used productively.
c. Crops will be protected from harsh weather conditions like floods, droughts and Snow.
d. Reduction in vehicular transport as the crops produced is easily consumed.
e. Less CO2 emission and pollution by decreasing reliance on coal burning product.
f. Overall wellness as city wastes will be channelized directly into farm buildings.
g. Water is used more effectively.

V.HOW DOES VERTICAL FARMING WORK There are four critical areas in understanding how vertical farming works:

a. Physical layout
b. Lighting
c. Growing medium
d. Sustainability features.

VI. HYDROPONICS

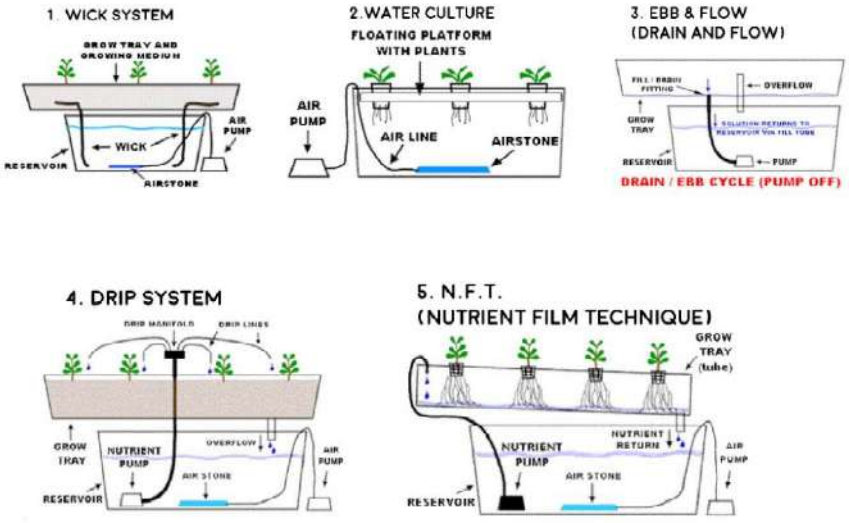
A. About Hydroponics is a method of growing plants without soil. Instead of having their roots supported and nourished by soil, the plant are supported by an inert growing medium

like cocopeat and are fed via a nutrient-rich water solution and uses about 70% less water than traditional farming. Hydroponic systems may be as simple as a glass of water filled with pebbles and water containing fertilizer or as complex as a large greenhouse structure containing beds of clay pellets/troughs filled with cocopeat that are periodically supplied with a nutrient solution. Nutrient Film technique (NFT) is also a kind of hydroponic farming that is adopted by many commercial farmers these days.

B. Investment Required Hydroponics can be done in 3 ways: 1. Progressive farmers can adopt it in commercial farming, 2. People can adopt it as hobby, and 3. Can be most beneficial for urban farming in metros.

SYSTEM REQUIREMENTS

1	pH control	5 -7 or slightly acidic
2	Electrical conductivity	1.2 -3.5 mho
3	Horticulture lighting	Direct sunlight or supplement lighting for 8-10 hrs. per day
4	Temperature	50 -70 degrees for fall plants and 60-80 degrees for spring plants.
5	Supplements	nitrogen-phosphorus-potassium rich formula
6	Oxygen	Supplemental oxygen supply is required for optimal nutrient uptake.
7	Structure & Support	Stakes and strings are usually needed to support plants as they grow



Types of Systems

The features and benefits of NFT method include:

- No soil is neede
- the water stays in the system and can be reused,lower water consumption
- Nutrition levels can be controlled
- Stable, higher yields and shorter times between harvests
- Produces highly nutritious, attractive crops
- Less pest and disease attack, easier to get rid of than in soil
- Easier to harvest and source of income from direct sales.

Sky Green Vertical Farming, Singapore Sky Greens is world's first low carbon, hydraulic driven vertical farm. Uses green urban solutions to achieve production of safe, fresh and delicious vegetables, using minimal land, water and energy resources. Sky Greens is the innovation hub of its holding company, Sky Urban Solutions Holding Pte Ltd, where continuous innovations in next generation of urban agriculture solutions takes The farm can produce up to 30kg of vegetables a day, or 6 to 7kg for each square metre a month. In comparison, traditional farms yield 2 to 3kg for each square metre a month.

The farm harnesses natural sunlight and uses 40W electricity to power one 9 meter tall tower for unique hydraulic water driven system for stack rotation and 0.5litre of water to rotate 1.7 ton vertical structure which is recycled and reused. Since it is a protected environment it ensures that the system can be relatively maintenance free and have low manpower dependency.

6. Swatchh Bharat Abhiyan (Clean India)

To accelerate the efforts to achieve universal sanitationcoverage and to put focus on sanitation, thePrimeMinister of India launched the Swachh Bharat Abhiyanon 2nd October, 2014. SBA aims to achieve SwachhBharat by 2019, as a fitting tribute to the 150th BirthAnniversary of Mahatma Gandhi.

6.1 Swatchhta needed in Kalatalav village -Existing Situation with photograph

Regarding cleanliness in the Kalatalav village at present there is no any plan or strategy for solid waste management or any kind of sanitation programme. Due to this reasons the present situation of Kalatalav village is not good according to swatchhta, on the streets / roads of Kalatalav village you can see the scattered waste in he pictures, this scattered waste invite flys, mosquitoes and many other insects.due to this disease like malaria and dengue spreads in the village there is an requirement cleanliness program by local government and students to promote theswatchhataabhiyan in kalatalav village and which includes cleaning of streets/ roads, collecting of solid waste from every house and disposal of waste regularlyout side of village and etc. activits.

Figure 6.1 Existing situation of Kalatalav village Swatchhata

6.2Guidelines - Implementation in allocated village with Photograph

We like our homes neat and clean. When it comes to cleanliness, we become best orators then how our surroundings are not as clean as our homes? How many of us actually make an effort to clean our community or have stopped someone from spreading filth? We are the best critics of our society, when we see an unattended garbage or filthy roads, we blame the municipal corporation workers or panchayats, it's true it's their duty to clean the city but what about our social responsibilities towards our village? **We see, We Blame, but we need to be the change we want to see and raise our voice, make a change and change the game.**

From this we have pepared the 10 steps to achive the goal of swachhataabhiyan as follows:

1.Stop littering and dispose garbage properly:

We have a very bad habit of disposing the thrash right where we are sitting or standing. Don't do that. Don't litter in your streets, your society, the woods, the water bodies, or your surroundings. Start with yourself by being a model example and encourage others to do the same. Throwing thrash at wrong places never goes away, ever. It will find it's way to effect you so dispose it in dustbin only for your own good.

2.Sort your Garbage:

Sorting garbage seems like a mundane task? tedious task? Well, it's one of the most effective way of controlling the garbage disposal crises of the world. Sort them into two categories (Biodegradable and non biodegradable). How simple is that! Once you start implementing then encourage your neighbors to do the same, you will see a drastic change in the environment contamination condition because by proper thrash sorting biodegradable garbage can be broken down thus reducing thrash.

Figure 6.2Solid waste dustbins

3. Maintain Hygiene:

By maintaining hygiene both inside and outside our home, we immediately stop the breeding spots of mosquitoes and flies that spread diseases. "*Diarrhoea* is a leading killer of children, accounting for 9 per cent of all *deaths* among *children* under age 5 worldwide" (UNICEF). Dirty hands is one of the main cause, children and elders both should always wash their hands properly and regularly specially before eating and encourage and educate others to do the same.

4. Re-Use and Re-cycle:

Reuse and recycle are those two-magic mantra in creating cleaner surroundings. If there is something that you don't need anymore; find another way of using it, if not then find someone who might need it; if it's broken then try to fix it before disposing. Think before you dispose anything. This small habit of recycling and reusing should be encouraged.

5. Say NO to Plastic:

Plastics are the poison to our environment, animals and us. The plastic we use always comes back to poison us via our food etc. So, say NO to plastic bags, instead use papar-bags or khadi/fabric/juit bags. And always dispose it in dustbins.

6. Consume what you need:

Need and requirement are two different things. Here moot point is not how much you can pay for your usage but it's about how much is left over this planet for an individual and how much we can consume. Excess use of anything will only decreases its availability and will go waste. Consider bigger picture and act accordingly

7. Water care:

Water is life and its availability per capita has been on the decline in India. The main reasons have been the increasing population leading to the increasing demand for water. Agriculture is

the main consumer of water along with many industries and life sources so harvesting rainwater is one of the best ways everyone can make water available in their surroundings. Moreover, water reuse with water treatment and recycling of water is another good option to reduce its consumption.

8. Reduce your carbon footprints:

Carbon Footprint:The total sets of greenhouse gas *emissions* caused by an organization, event, product or person. Go for energy efficient appliances and limit the usage of air conditioners, water heaters, dishwashers or thermostats. keep your carbon footprints in check and control the greenhouse effect.

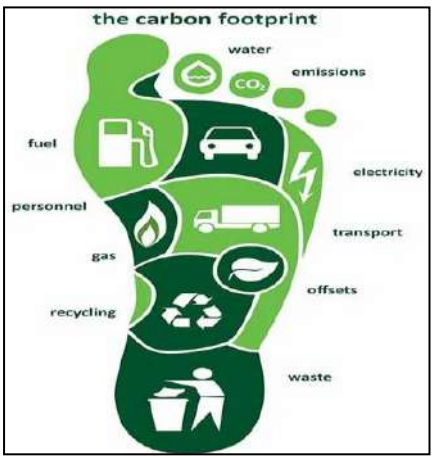


Figure 6.3 Carbon Foot Print

9. Check Air Pollution:

Burning thrash may seem like an easy and attractive option but by burning thrash we release a lot of toxins to the environment and pollute the air. Likewise, we burn a lot of fuel in our vehicle and sometimes not have it properly serviced which causes even more air pollution. Try to use public transport or car pooling and reduce Air pollution.

10. Environmental education and tree plantation:

Every educational body must conduct workshops to educate society about the importance of environment in modern world. Children and even elders must be taught how to keep their surroundings clean and also how to maintain proper hygiene and its importance. Tree plantation should be encouraged as they have countless benefits.

These are some of the steps to make a cleaner India. We not only need to read it but also implement it in our daily life and make sure people around us do the same.

6.3Activities Done by Students for allocated village with Photograph

As we know the pandemic is going on in the country, we have not that much time of any swatcchatacmpaine in village but we have shared the all information about swatcchataabhiyan to the Talatimantri, Sarpanch, Pnchayatsabhya and village dwellers. With the help of online mediums and poster sharing and poster presentation in panchayat building.

7. Village condition due to Covid-19

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

Complete Lockdown at Gram Panchayat level has been done by Gram Panchayat.
Prohibition of entrance of the external people at village level.
Formation of Corona volunteers.
Production and distribution of face mask
Maintaining of Social distance through Suggested standard ofMoHFW within the village.
Awareness generation camp by the sarpanch and panchayat sabhyawithin the villages.
Formation of quarantine centre at Gram Panchayat level.
Awareness generation camp through mobile van and wall painting.

Figure 7.1 Covid-19 Situation InKalatalav

7.2 Activities Done by Students for Kalatalavvillage with Photograph

As we all know that the pandemic is very vulnerable to all of humenbeaing. As per the instruction and direction of our state guidelines about COVID-19. we arranged the small meating at panchayat building with all safety guidelines &precuations, to avair the dwellers of kalatalav village, with Talatimantri& sarpanch. And give them proper knowledge of COVID-19 that, how it's spreads, how it will affect the childrens, young, and aiged persons having low immune power. And how we can be Safe aginst this virus by following this measure.

Figure 7.2 Covid-19 Precautions

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

8.1 Design Proposals

8.1.1 Sustainable Design (Civil)

PUBLIC TOILETS AND BATHS

Figure 8.1.1 3D View of Publlic Toilets & Baths

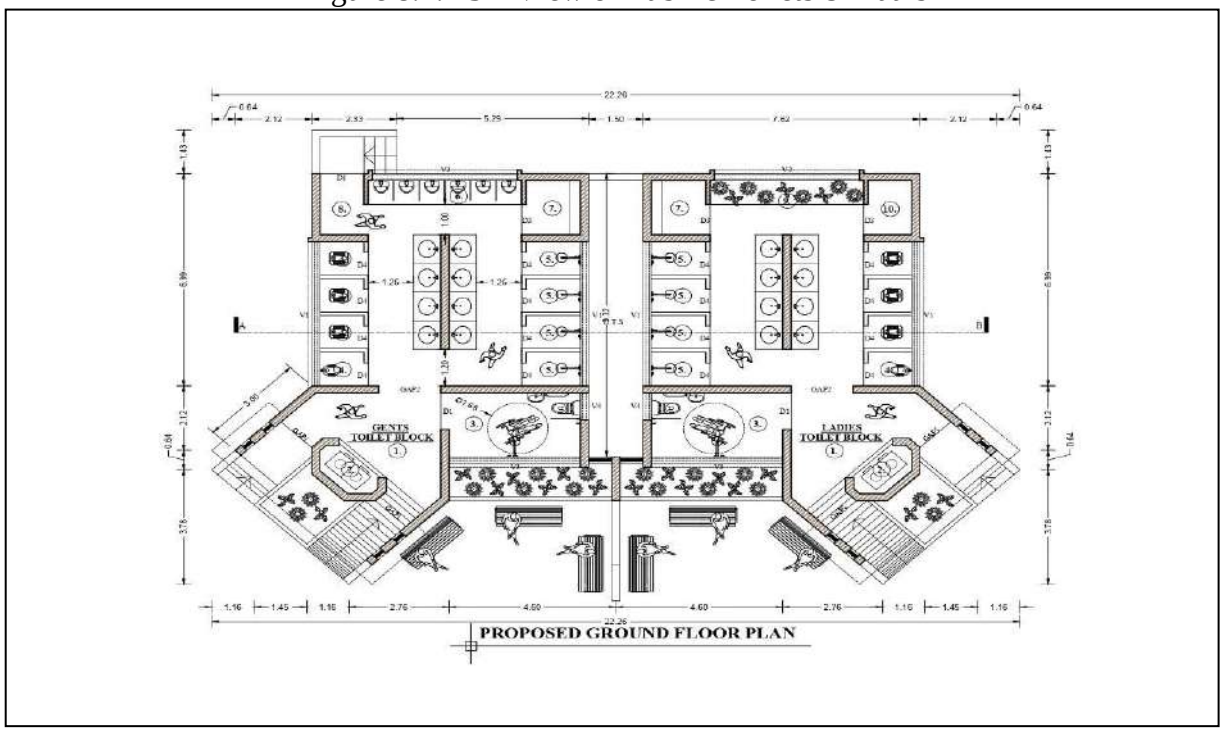


Figure 8.1.2 Ground Floor Plan of Publlic Toilets & Baths

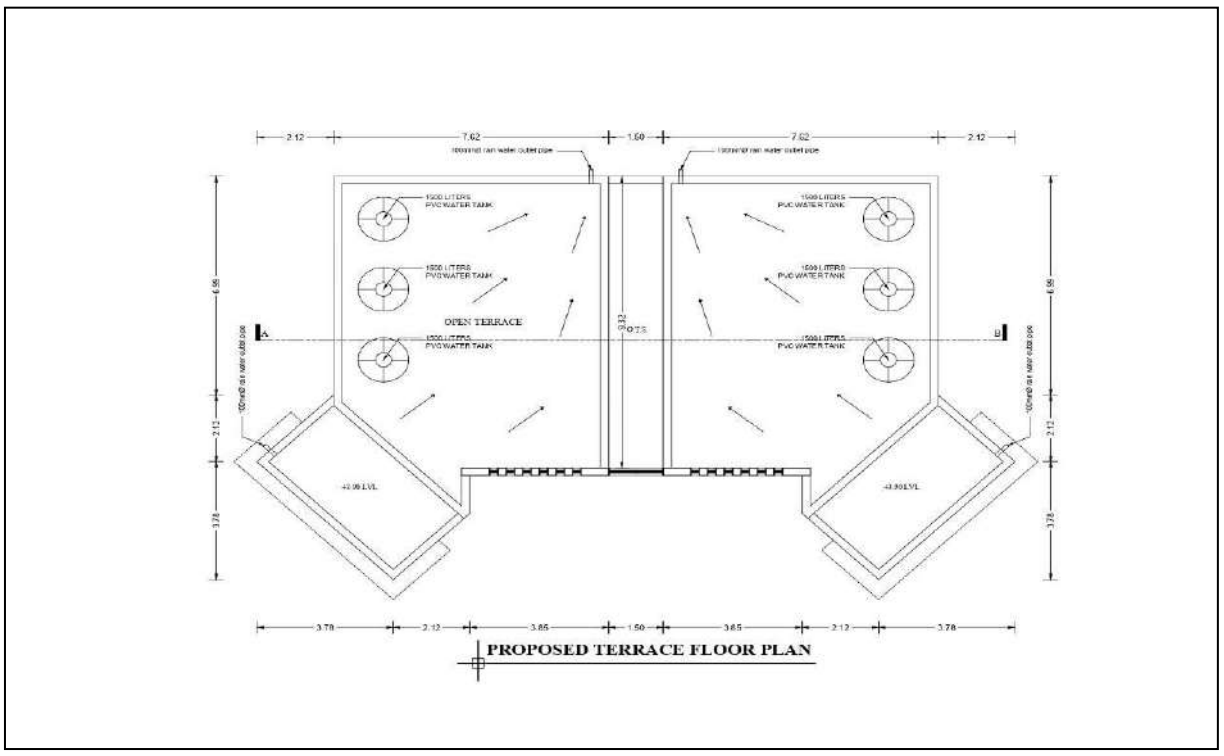


Figure 8.1.2Terrace Floor Plan of Publlic Toilets & Baths

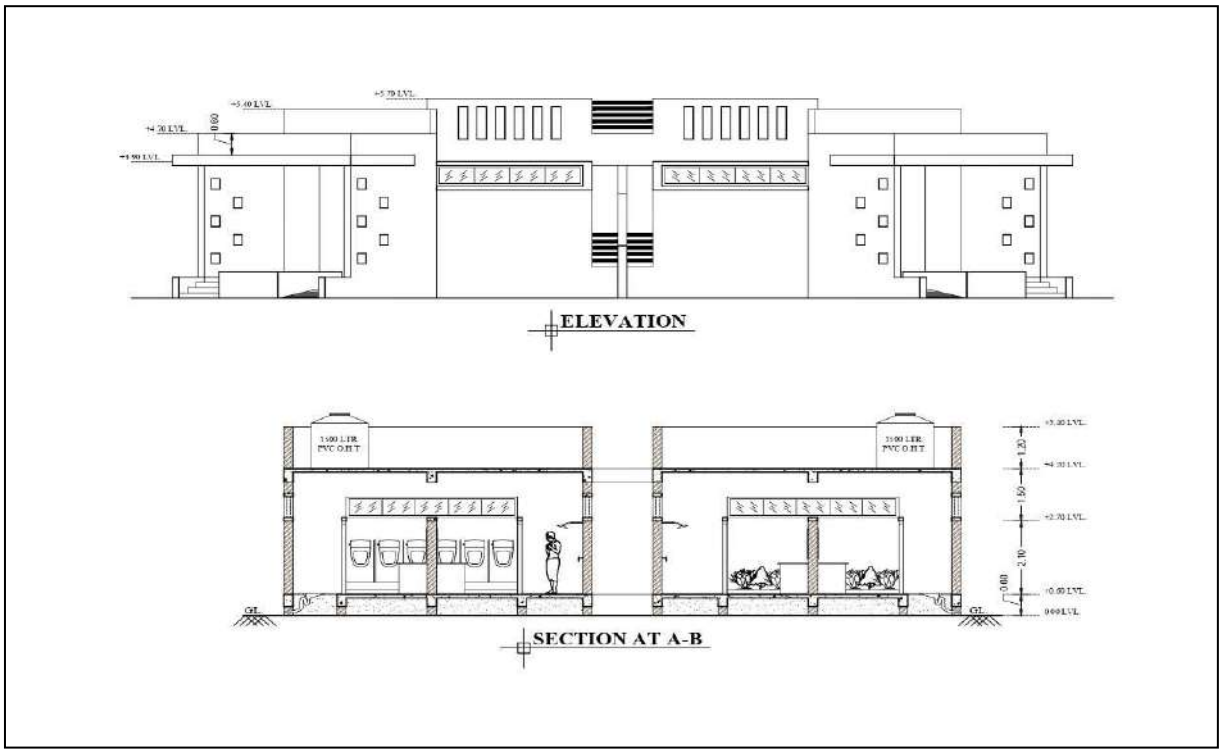


Figure 8.1.3Elevation & Section of Publlic Toilets & Baths

QUANTITY SHEET OF PUBLIC TOILETS & BATH							
SR. NO.	DISCRIPTION	NOS.	Length (L)	Width (W)	Depth (H)	Total	Unit
1	**Excavation in foundation**						
	LONG WALL SHAORT WALL						
	Long wall	2	10.32	1.00	1.50	**30.96**	**cu.mt.**
		2	9.41	1.00	1.50	**28.23**	**cu.mt.**
		2	8.36	1.00	1.50	**25.08**	**cu.mt.**
	short wall	2	8.76	1.00	1.50	**26.27**	**cu.mt.**
		4	8.39	1.00	1.50	**50.34**	**cu.mt.**
		2	3.62	1.00	1.50	**10.86**	**cu.mt.**
		4	3.39	1.00	1.50	**20.31**	**cu.mt.**
	COOLER POINT	2	3.74	1.00	1.50	**11.22**	**cu.mt.**
	CENTER LINE LENGTH						
	4.94	mt.					
	net center line length						
	3.74	mt.					
	Total excavaion					**203.27**	**cu.mt.**
2	**P.C.C. In Foundation**						
	LONG WALL SHAORT WALL						
	Long wall	2	10.32	1.00	0.15	**3.10**	**cu.mt.**
		2	9.41	1.00	0.15	**2.82**	**cu.mt.**
		2	7.76	1.00	0.15	**2.33**	**cu.mt.**
	short wall	2	8.76	1.00	0.15	**2.63**	**cu.mt.**
		4	8.39	1.00	0.15	**5.03**	**cu.mt.**
		2	3.62	1.00	0.15	**1.09**	**cu.mt.**
		4	3.39	1.00	0.15	**2.03**	**cu.mt.**
	COOLER POINT	2	3.74	1.00	0.15	**1.12**	**cu.mt.**
	CENTER LINE LENGTH						
	4.94	mt.					
	net center line length						
	3.74	mt.					
	Total P.C.C.					**20.15**	**cu.mt.**
3	**Brick masonry**						
	Brick masonry in foundation						
	LONG WALL SHAORT WALL						
	FOOTING NO 1						
	Long wall	2	10.02	0.70	0.45	**6.31**	**cu.mt.**
		2	9.11	0.70	0.45	**5.74**	**cu.mt.**

		2	7.46	0.70	0.45	**4.70**	**cu.mt.**
	short wall	2	8.61	0.70	0.45	**5.42**	**cu.mt.**
		4	8.09	0.70	0.45	**10.19**	**cu.mt.**
		2	3.62	0.70	0.45	**2.28**	**cu.mt.**
		4	3.24	0.70	0.45	**4.08**	**cu.mt.**
	COOLER POINT	2	4.10	0.70	0.45	**2.58**	**cu.mt.**
	CENTER LINE LENGTH						
	4.94	mt.					
	net center line length						
	4.1	mt.					
	FOOTING NO 2						
	Long wall	2	9.82	0.50	0.45	**4.42**	**cu.mt.**
		2	8.91	0.50	0.45	**4.01**	**cu.mt.**
		2	7.26	0.50	0.45	**3.27**	**cu.mt.**
	short wall	2	8.51	0.50	0.45	**3.83**	**cu.mt.**
		4	7.89	0.50	0.45	**7.10**	**cu.mt.**
		2	3.62	0.50	0.45	**1.63**	**cu.mt.**
		4	3.14	0.50	0.45	**2.82**	**cu.mt.**
	COOLER POINT	2	4.34	0.50	0.45	**1.95**	**cu.mt.**
	CENTER LINE LENGTH						
	4.94	mt.					
	net center line length						
	4.34	mt.					
	FOOTING NO 3						
	Long wall	2	9.62	0.30	0.45	**2.60**	**cu.mt.**
		2	8.71	0.30	0.45	**2.35**	**cu.mt.**
		2	7.06	0.30	0.45	**1.91**	**cu.mt.**
	short wall	2	8.41	0.30	0.45	**2.27**	**cu.mt.**
		4	7.69	0.30	0.45	**4.15**	**cu.mt.**
		2	3.62	0.30	0.45	**0.98**	**cu.mt.**
		4	3.04	0.30	0.45	**1.64**	**cu.mt.**
	COOLER POINT	2	4.58	0.30	0.45	**1.24**	**cu.mt.**
	CENTER LINE LENGTH						
	4.94	mt.					
	net center line length						
	4.58	mt.					
	Brick masonry in Plinth						
	Long wall	2	9.32	0.23	0.45	**1.93**	**cu.mt.**
		2	8.64	0.23	0.45	**1.79**	**cu.mt.**
		2	6.99	0.23	0.45	**1.45**	**cu.mt.**

	short wall	2	8.37	0.23	0.45	**1.73**	**cu.mt.**
		4	7.62	0.23	0.45	**3.15**	**cu.mt.**
		2	3.62	0.23	0.45	**0.75**	**cu.mt.**
		4	3.00	0.23	0.45	**1.24**	**cu.mt.**
	COOLER POINT	2	4.66	0.23	0.45	**0.97**	**cu.mt.**
	CENTER LINE LENGTH						
	4.94	mt.					
	net center line length						
	4.664	mt.					
	Brick masonry in Super structure						
	Long wall	2	9.32	0.23	3.17	**13.59**	**cu.mt.**
		4	6.76	0.23	2.10	**13.06**	**cu.mt.**
		4	3.78	0.23	2.10	**7.30**	**cu.mt.**
		4	6.76	0.23	2.10	**13.06**	**cu.mt.**
		2	3.62	0.23	3.17	**5.28**	**cu.mt.**
	short wall	2	8.37	0.23	3.17	**12.21**	**cu.mt.**
		4	1.32	0.23	2.10	**2.55**	**cu.mt.**
		3	1.32	0.23	2.10	**1.91**	**cu.mt.**
		3	1.50	0.23	2.10	**2.17**	**cu.mt.**
		2	2.10	0.23	3.17	**3.06**	**cu.mt.**
		4	3.00	0.23	3.17	**8.75**	**cu.mt.**
	COOLER POINT	2	3.74	0.23	3.17	**5.45**	**cu.mt.**
	CENTER LINE LENGTH						
	4.94	mt.					
	net center line length						
	3.74	mt.					
	Gross brick masonary					**188.87**	**cu.mt.**
	Deduction						
	D1	3	1.20	0.23	2.10	1.74	cu.mt.
	D2	1	1.00	0.23	2.10	0.48	cu.mt.
	D3	3	0.90	0.23	2.10	1.30	cu.mt.
	D4	16	0.75	0.23	2.10	5.80	cu.mt.
	V1	4	4.75	0.23	0.60	2.62	cu.mt.
	V2	2	4.00	0.23	0.60	1.10	cu.mt.
	V3	1	3.65	0.23	0.60	0.50	cu.mt.
	V4	2	0.60	0.23	0.60	0.17	cu.mt.
	gap2	2	1.70	0.23	3.20	2.50	cu.mt.
			total deduction			**16.22**	cu.mt.
	Net brick masonry in super structure					**172.65**	cu.mt.
4	**RCC work**						
	Plinth beam concrete						

	Long wall	2	9.32	0.23	0.35	**1.50**	**cu.mt.**
		4	6.76	0.23	0.35	**2.18**	**cu.mt.**
		4	3.78	0.23	0.35	**1.22**	**cu.mt.**
		4	6.76	0.23	0.35	**2.18**	**cu.mt.**
		2	3.62	0.23	0.35	**0.58**	**cu.mt.**
	short wall	2	8.37	0.23	0.35	**1.35**	**cu.mt.**
		4	1.32	0.23	0.35	**0.43**	**cu.mt.**
		3	1.32	0.23	0.35	**0.32**	**cu.mt.**
		3	1.50	0.23	0.35	**0.36**	**cu.mt.**
		2	2.10	0.23	0.35	**0.34**	**cu.mt.**
		4	3.00	0.23	0.35	**0.97**	**cu.mt.**
	COOLER POINT	2	4.66	0.23	0.35	**0.75**	**cu.mt.**
	CENTER LINE LENGTH						
	4.94	mt.					
	net center line length						
	4.664	mt.					
	G.F. Lintel / Chajja concrete						
	Long wall	2	9.32	0.23	0.10	**0.43**	**cu.mt.**
		4	6.76	0.23	0.10	**0.62**	**cu.mt.**
		4	3.78	0.23	0.10	**0.35**	**cu.mt.**
		4	6.76	0.23	0.10	**0.62**	**cu.mt.**
		2	3.62	0.23	0.10	**0.17**	**cu.mt.**
	short wall	2	8.37	0.23	0.10	**0.39**	**cu.mt.**
		4	1.32	0.23	0.10	**0.12**	**cu.mt.**
		3	1.32	0.23	0.10	**0.09**	**cu.mt.**
		3	1.50	0.23	0.10	**0.10**	**cu.mt.**
		2	2.10	0.23	0.10	**0.10**	**cu.mt.**
		4	3.00	0.23	0.10	**0.28**	**cu.mt.**
	COOLER POINT	2	4.66	0.23	0.10	**0.21**	**cu.mt.**
	CENTER LINE LENGTH						
	4.94	mt.					
	net center line length						
	4.664	mt.					
	Entrance &Chajja concrete						
	Entrance slab	2	5.34	3.00	0.10	**1.60**	**cu.mt.**
	triangular portion	2	3.45	3.45	0.10	**1.19**	**cu.mt.**
	chajja on entrance	4	2.23	0.115	0.10	**0.10**	**cu.mt.**
		2	5.34	0.115	0.10	**0.12**	**cu.mt.**
	V1	2	4.86	0.115	0.10	**0.11**	**cu.mt.**
	V2	2	3.85	0.115	0.10	**0.09**	**cu.mt.**
	V3	2	4.23	0.115	0.10	**0.10**	**cu.mt.**
	main slab beam	6	7.62	0.23	0.40	**4.21**	**cu.mt.**
		2	3.62	0.23	0.40	**0.67**	**cu.mt.**

		2	9.55	0.23	0.40	**1.76**	**cu.mt.**
		4	6.76	0.23	0.40	**2.49**	**cu.mt.**
		4	3.00	0.23	0.40	**1.10**	**cu.mt.**
	COOLER POINT	2	4.66	0.23	0.10	**0.21**	**cu.mt.**
	CENTER LINE LENGTH						
	4.94	mt.					
	net center line length						
	4.664	mt.					
	main slab						
	ON W.C. AND BATH	2	7.62	6.99	0.125	**13.32**	**cu.mt.**
	ON DISABLED TOILET	2	4.08	2.33	0.125	**2.38**	**cu.mt.**
	ON TRIANGULAR PORTION	2	3.45	3.45	0.125	**1.49**	**cu.mt.**
	ON ENTRANCE	2	3.00	5.34	0.125	**4.01**	**cu.mt.**
	Total concrete work					**50.57**	**cu.mt.**
5	**Murum filling in plinth**						
	Entrance	2	2.15	2.15	0.50	4.62	cu.mt.
	Water cooler point	2	2.00	1.00	0.50	2.00	cu.mt.
	Disabled toilet	2	4.26	7.16	0.50	30.50	cu.mt.
	W.C.	8	0.20	1.10	0.50	0.88	cu.mt.
	Bath	8	1.50	1.10	0.50	6.60	cu.mt.
	Urinal	1	4.23	0.80	0.50	1.69	cu.mt.
	Electric room	2	1.50	1.79	0.50	2.69	cu.mt.
	Passage	2	1.20	1.80	0.50	2.16	cu.mt.
	Green Area	1	4.23	0.80	0.50	1.69	cu.mt.
	Store room	2	1.20	1.80	0.50	2.16	cu.mt.
	Total Murum filling in plinth					**54.99**	cu.mt.
6	**P.C.C at plinth level**						
	Entrance	2	2.15	2.15	0.10	0.92	cu.mt.
	Water cooler point	2	2.00	1.00	0.10	0.40	cu.mt.
	Disabled toilet	2	4.26	7.16	0.10	6.10	cu.mt.
	W.C.	8	0.20	1.10	0.10	0.18	cu.mt.
	Bath	8	1.50	1.10	0.10	1.32	cu.mt.
	Urinal	1	4.23	0.80	0.10	0.34	cu.mt.
	Electric room	2	1.50	1.79	0.10	0.54	cu.mt.
	Passage	2	1.20	1.80	0.10	0.43	cu.mt.
	Green Area	1	4.23	0.80	0.10	0.34	cu.mt.
	Store room / back entry	2	1.20	1.80	0.10	0.43	cu.mt.
	Total P.C.C at plinth level					**11.00**	cu.mt.
7	**D.P.C. on plinth beam**						

	Long wall	2	9.32	0.23		**4.29**	**sq.mt.**
		4	6.76	0.23		**6.22**	**sq.mt.**
		4	3.78	0.23		**3.48**	**sq.mt.**
		4	6.76	0.23		**6.22**	**sq.mt.**
		2	3.62	0.23		**1.67**	**sq.mt.**
	short wall	2	8.37	0.23		**3.85**	**sq.mt.**
		4	1.32	0.23		**1.21**	**sq.mt.**
		3	1.32	0.23		**0.91**	**sq.mt.**
		3	1.50	0.23		**1.04**	**sq.mt.**
		2	2.10	0.23		**0.97**	**sq.mt.**
		4	3.00	0.23		**2.76**	**sq.mt.**
	COOLER POINT	2	3.74	0.23		**1.72**	**sq.mt.**
	CENTER LINE LENGTH						
	4.94	mt.					
	net center line length						
	3.74	mt.					
	total D.P.C. on plinth					**34.33**	**cu.mt.**
8	**Internal plaster**						
	Entrance	4	2.15		3.50	30.10	**sq.mt.**
		4	2.15		3.50	30.10	**sq.mt.**
	Water cooler point	4	2.00		3.50	28.00	**sq.mt.**
		4	1.00		3.50	14.00	**sq.mt.**
	Disabled toilet	4	4.26		3.50	59.64	**sq.mt.**
		4	7.16		3.50	100.24	**sq.mt.**
	W.C.	8	1.20		2.32	22.22	**sq.mt.**
		8	1.10		2.32	20.37	**sq.mt.**
	Bath	8	1.50		2.32	27.78	**sq.mt.**
		8	1.10		2.32	20.37	**sq.mt.**
	Urinal	2	4.23		3.50	29.61	**sq.mt.**
		4	0.80		3.50	11.20	**sq.mt.**
	Electric room	4	1.50		3.50	21.00	**sq.mt.**
		4	1.79		3.50	25.06	**sq.mt.**
	Green Area	2	4.23		3.50	29.61	**sq.mt.**
		4	0.80		3.50	11.20	**sq.mt.**
	Store room/ back entry	4	1.20		3.50	16.80	**sq.mt.**
		4	1.80		3.50	25.20	**sq.mt.**
	Sealing plaster						
	main	2	7.16	6.76		96.80	**sq.mt.**
	disabled toilet	2	3.62	2.33		16.87	**sq.mt.**
	triangular portion	2	3.45	3.45		11.90	**sq.mt.**
	entrance	2	3.00	4.88		29.28	**sq.mt.**
	Gross Internal plaster					**677.36**	**sq.mt.**

	both side plaster is same so the deduction will be calculated only one side						
	Deduction						
	D1	3	1.20		2.10	7.56	**sq.mt.**
	D2	1	1.00		2.10	2.10	**sq.mt.**
	D3	3	0.90		2.10	5.67	**sq.mt.**
	D4	16	0.75		2.10	25.20	**sq.mt.**
	GAP1	7	1.20		3.20	26.88	**sq.mt.**
	GAP2	2	1.70		3.20	10.88	**sq.mt.**
	V1	4	4.75		0.60	11.40	**sq.mt.**
	V2	2	4.00		0.60	4.80	**sq.mt.**
	V3	1	3.65		0.60	2.19	**sq.mt.**
	total deduction					**96.68**	**sq.mt.**
	Total Internal plaster					**580.68**	**sq.mt.**
9	**External plaster including parapet inside plaster**						
	BACK SIDE WALL	2	7.63		6.83	104.16	**sq.mt.**
	O.T.S.	2	9.55		6.83	130.45	**sq.mt.**
	FRONT SIDE OF DISABLED TOILET	2	3.85		6.83	52.59	**sq.mt.**
		2	1.22		5.73	13.98	**sq.mt.**
		4	3.23		5.73	74.03	**sq.mt.**
	LEFT SIDE (G) % RIGHT SIDE (L)	2	6.99		6.83	95.48	**sq.mt.**
	Total external plaster					**470.70**	**sq.mt.**
10	**Tiles work**						
	Floor Tiles						
	Entrance	2	2.15	2.15		9.25	**sq.mt.**
	Water cooler point	2	2.00	1.00		4.00	**sq.mt.**
	Disabled toilet	2	4.26	7.16		61.00	**sq.mt.**
	W.C.	8	0.20	1.10		1.76	**sq.mt.**
	Bath	8	1.50	1.10		13.20	**sq.mt.**
	Urinal	1	4.23	0.80		3.38	**sq.mt.**
	Electric room	2	1.50	1.79		5.37	**sq.mt.**
	Passage	2	1.20	1.80		4.32	**sq.mt.**
	Green Area	1	4.23	0.80		3.38	**sq.mt.**
	Store room / back entry	2	1.20	1.80		4.32	**sq.mt.**
	umras of door						
	D1	3	1.20	0.23		0.83	**sq.mt.**
	D2	1	1.00	0.23		0.23	**sq.mt.**
	D3	3	0.90	0.23		0.62	**sq.mt.**
	D4	16	0.75	0.23		2.76	**sq.mt.**
	GAP1	7	1.20	0.23		1.93	**sq.mt.**

	GAP2	2	1.70	0.23		0.78	**sq.mt.**
	V1	4	4.75	0.23		4.37	**sq.mt.**
	V2	2	4.00	0.23		1.84	**sq.mt.**
	V3	1	3.65	0.23		0.84	**sq.mt.**
	Total floor tiles					**124.19**	**sq.mt.**
11	**Wall Tiles**						
	W.C.	16	1.20	2.20		42.24	**sq.mt.**
		16	1.10	2.20		38.72	**sq.mt.**
	Bath	16	1.50	2.20		52.80	**sq.mt.**
		16	1.10	2.20		38.72	**sq.mt.**
	wash basin wall	4	4.01	2.20		35.29	**sq.mt.**
	urinal wall	1	4.23	2.20		9.31	**sq.mt.**
		2	0.79	2.20		3.48	**sq.mt.**
	Total					**220.55**	**sq.mt.**
	Diduction						
	d4	16	0.75		2.10	25.20	sq.mt.
	Total diduction					**25.20**	**sq.mt.**
	Net Wall Tiles					**195.35**	**sq.mt.**
12	**Alumium doors & windows**						
	D1	3	1.20		2.10	7.56	**sq.mt.**
	D2	1	1.00		2.10	2.10	**sq.mt.**
	D3	3	0.90		2.10	5.67	**sq.mt.**
	D4	16	0.75		2.10	25.20	**sq.mt.**
	V1	4	4.75		0.60	11.40	**sq.mt.**
	V2	2	4.00		0.60	4.80	**sq.mt.**
	V3	1	3.65		0.60	2.19	**sq.mt.**
	Total area of Alumium doors & windows					**58.92**	**sq.mt.**
13	**Total intermal Color work**						
	Internal Color work same as internal plaster work					**580.68**	**sq.mt.**
14	**Total Extermal Color work**						
	External color work same as external plaster work					**470.70**	**sq.mt.**
15	**Quantity of Steel**						
	asuming(HYSD & MILD STELL) 1.2% steel of 1cu.mt. concrete work					**4764.07**	**kg.**
16	**Safety grill and elevation pipes**	lumpsum				**500.00**	**kg.**

ABSTRACT SHEET OF PUBLIC TOILETS & BATH						
SR. NO.	**DISCRIPTION**	**QTY.**	**PER**	**RATE**	**PER**	**TOTAL AMOUNT**
1	Excavation for foundation upto 1.5 m depth includingExcavation 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.(A)Loose or soft soil sr.no.1, Item coad.04B00 1A, tem no.as per NBO.0, SOR PAGE.NO.41(R & B SOR 2015-16 Bhavnagar)	203.27	CU.MT.	119.00	CU.MT.	Rs 24,189.13
2	PCC : Providing and laying cement concrete 1:3:6 (1-Cement : 3-coarse sand : 6-hand broken stone aggregates 40mm nominal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton) sr.no.5, Item coad.5003,Item no.as per NBO.5.3.2,SOR PAGE.NO.47(R & B SOR 2015-16 Bhavnagar)	20.15	CU.MT.	2255.00	CU.MT.	Rs 45,438.25
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 1:6 (1- Cement :6 -fine sand)(A) Modular (upto 10 ton. sr.no.7,Item coad.06002 A,Item no.as per NBO.6.13,SOR PAGE.NO.68 (R & B SOR 2015-16 Bhavnagar)	172.65	CU.MT.	3114.00	CU.MT.	Rs 537,632.10

4	RCC WORK: Providing and laying ordinary cement concrete 1:2:4 (1-Cement 2-coarse sand : 4- graded stone aggregates 20mm nominal size) exposed work with curing etc. complete including the cost of formwork but excluding the cost of reinforsement for R.C.C work in (iv)Footing having more than 15 cm. thicknes sr.no.100, Item coad.05028 D,Item no.as per NBO.0,SOR PAGE.NO.59 (R & B SOR 2015-16 Bhavnagar)	50.57	CU.MT.	3800.00	CU.MT.	Rs 192,166.00
5	2cm (3/4") thick damp proof course with cement and approved coarse sand 1:2 with and including water proofing materials as ordered by the Engineer in charge in the proportion as specified by the manufacturers including supply of all material, labour and T&P etc. required for proper completion of the work including proper curing and shuttering as necessary.	34.33	SQ.MT.	200.00	SQ.MT.	Rs 6,866.00
6	INTERNALPLASTER: Providing 15mm thick cement plaster in single coat on Rough (Similar)side of 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, sr.no.4, Item coad.17002 A, Item no.as per NBO.17.6 SOR PAGE.NO.132 (R & B SOR 2015-16 Bhavnagar)	580.68	SQ.MT.	117.00	SQ.MT.	Rs 67,939.56

7	EXTERNAL PLASTER: 20 mm thick sand faced cement plaster on walls. At all heights above ground level consisting of 12 mm thick backing coat of C.M. 1:3 (1 cement: 3 sand) and 8 mm thick finishing coat of C.M. 1:1 (1 cement : 1 sand) etc. complete. sr.no.9, Item coad.17003 B, item no.as per NBO.17.25, SOR PAGE.NO.133 (R & B SOR 2015-16 Bhavnagar)	470.70	SQ.MT.	150.00	SQ.MT.	Rs 70,605.00
8	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. (upto10 ton) sr.no.19, Item coad.14008 C, Item no.as per NBO.14.29(C1) SOR PAGE.NO.121 (R & B SOR 2015-16 Bhavnagar)	124.19	SQ.MT.	761.00	SQ.MT.	Rs 94,508.59
9	Providing and laying coloured glazed tiles of the size 300mm x 200 mm x 8 mm / 300 mm x 450 mm x 8 mm in skirting, risers of steps and dedo on 10 mm. thick cement plaster 1:3 (1 cement: 3 coarse sand) & jointed with white cement slurry.sr.no.38,Item coad.14036, SOR PAGE.NO.125 (R & B SOR 2015-16 Bhavnagar)	195.35	SQ.MT.	891.00	SQ.MT.	Rs 174,056.85

10	Aluminium doors and windowsProviding and fixing extruded aluminum window having extruded aluminum Colour anodized section frame main outer size 127mm x 38.10mm x 1.35mm (of Jindal Section no:2443,@ Wt.1.384 Kg/mt),horizontal Four track member size 122.20mm x 31.75mm x 1.10mm (of Jindal Section no:8787,@ Wt. 1.205 Kg/mt),vertical member of size 122.20mm x 31.75mm x 1.50mm (of Jindal Section no:8935,@ Wt. 1.398 Kg/mt) with sliding shutters of horizontal member size 40mm x 18mm x 1.29mm (of Jindal Section no:8949 @ wt.of .456Kg/mt),vertical member of size 40mm x 18mm x 1.29mm (of Jindal Section no:8947 @ wt.of 0.456Kg/mt/Section 8948,@ Wt.0.457 Kg/mt) with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminum fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc complete for window. sr.no.19 item coad.11026, (R & B SOR 2015-16 Bhavnagar)	58.92	SQ.MT.	2520.00	SQ.MT.	Rs 148,478.40
11	Applying two coats of Birla (white cement based) or Asian (acrylic lapy- putty) or equivalent & two coats of primer ofapproved brand and manufacture on new wall surface to give an even shade including thoroughly brushing thesurface free from mortar dropping and other foreign matter and sand paperedsmooth.sr.no.35 Item coad.19035, Item no.as per NBO. - SOR PAGE.NO.141 (R & B SOR 2015-16 Bhavnagar)	508.68	SQ.MT.	47.00	SQ.MT.	Rs 23,907.96

12	Finishing wall with weather proof exterior emulsion paint on wall surface (two coats) to give an required shape even shade after thoroughly brushing the surface to remove all dirt, and remains of loose powdered materials.etc complete. sr.no.34 Item coad.19031, Item no.as per NBO.- SOR PAGE.NO.141 (R & B SOR 2015-16 Bhavnagar)	470.70	SQ.MT.	72.00	SQ.MT.	Rs 33,890.40
13	Iron fabrication work for SAFETY GRIL including cuttig welding placing on site with 1 coat of primer & 2 coat of industrial oil paint etc complete	1500.00	Kg.	80.00	Kg.	Rs 120,000.00
	TOTAL					**Rs 1,539,678.24**
14	Add 3% contigenceies		0.03			Rs 46,190.35
15	Add 5% Work charged establishment		0.05			Rs 76,983.91
16	Add 20% plumbing &Sanitory work		0.20			Rs 307,935.65
17	Add 10% Electrification		0.10			Rs 153,967.82
	GRAND TOTAL					Rs 2,124,755.97
					SAY	**Rs 2,125,000.00**
	RUPEES TWENTY ONE LAKHS TWENTY FIVE THOUSAND ONLY.					

8.1.2 Physical design (Civil)

ANGANWADI

Figure 8.1.2.1 3D View of Anganwadi

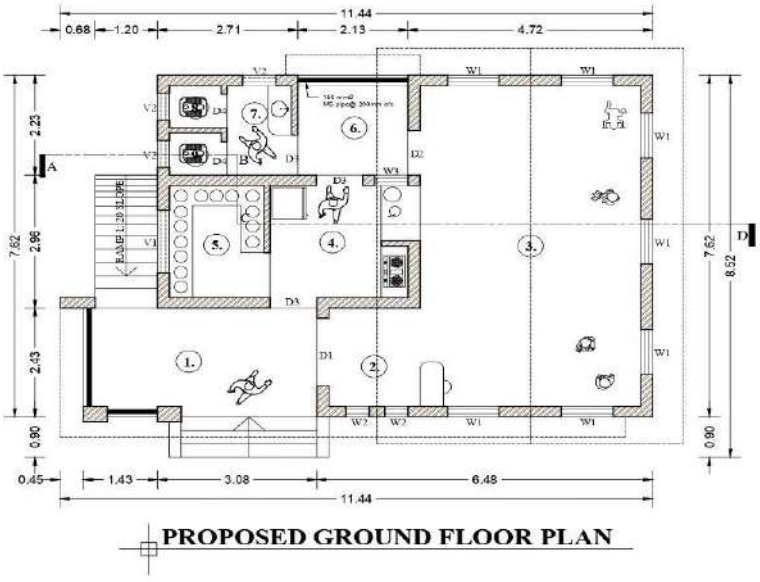


Figure 8.1.2.2Anganwadi Ground Floor Plan

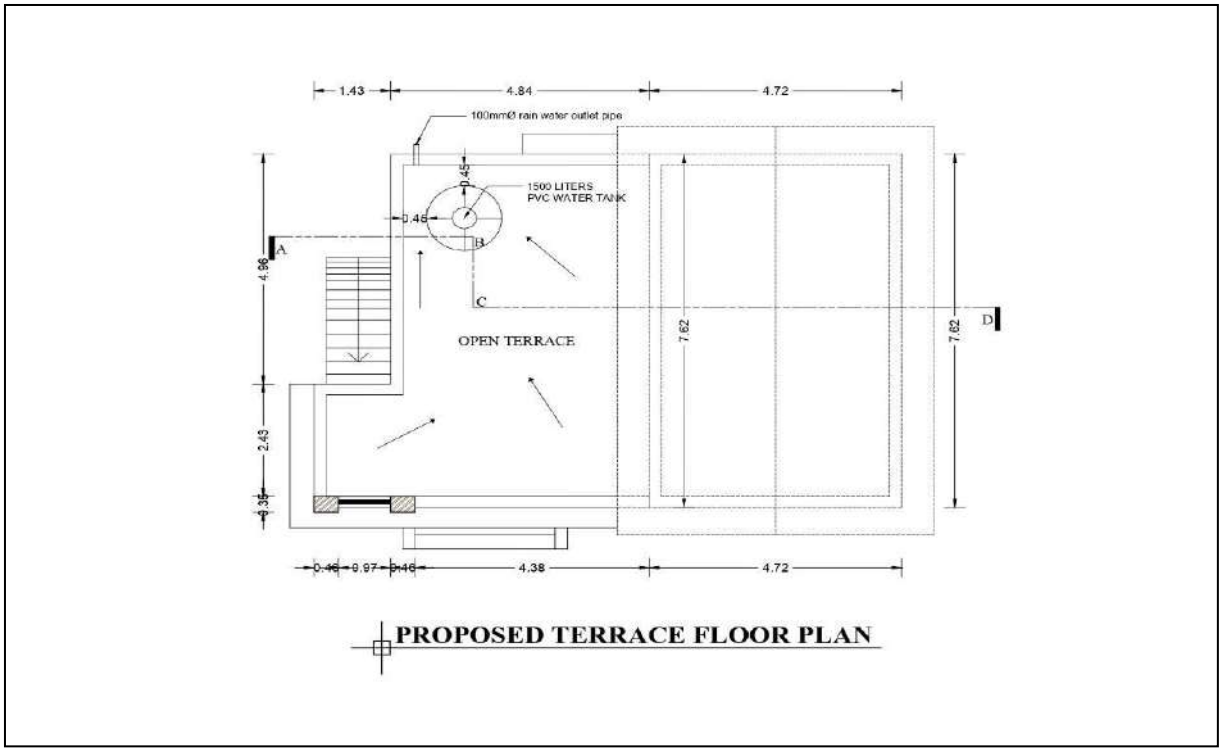


Figure 8.1.2.3AnganwadiTrerrace Floor Plan

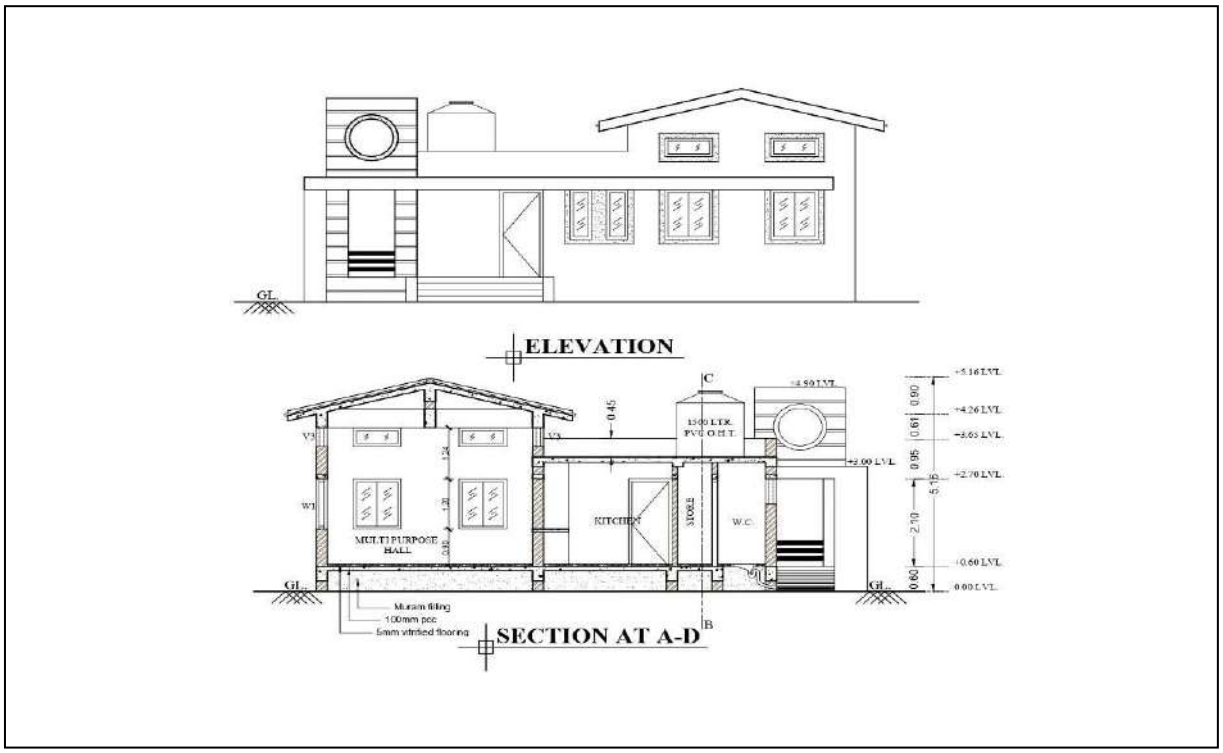


Figure 8.1.2.4Anganwadi Elevation & Section

QUANTITY SHEET OF ANGANWADI							
SR. NO.	**DISCRIPTION**	**NOS.**	**Length (L)**	**Width (W)**	**Depth (H)**	**Total**	**Unit**
1	**Excavation in foundation**						
	LONG WALL SHAORT WALL						
	SHORT WALL	2	8.39	1.00	1.50	**25.17**	**cu.mt.**
		3	5.96	1.00	1.50	**26.82**	**cu.mt.**
		2	3.43	1.00	1.50	**10.29**	**cu.mt.**
	LONG WALL	1	11.76	1.00	1.50	**17.64**	**cu.mt.**
		1	7.27	1.00	1.50	**10.91**	**cu.mt.**
		2	5.84	1.00	1.50	**17.52**	**cu.mt.**
	Total excavaion					**108.35**	**cu.mt.**
2	**P.C.C. In Foundation**						
	LONG WALL SHAORT WALL						
	SHORT WALL	2	8.39	1.00	0.15	**2.52**	**cu.mt.**
		3	5.96	1.00	0.15	**2.68**	**cu.mt.**
		2	3.43	1.00	0.15	**1.03**	**cu.mt.**
	LONG WALL	1	11.76	1.00	0.15	**1.76**	**cu.mt.**
		1	7.27	1.00	0.15	**1.09**	**cu.mt.**
		2	5.84	1.00	0.15	**1.75**	**cu.mt.**
	Total P.C.C.					**10.83**	**cu.mt.**
3	**Brick masonry**						
	Brick masonry in foundation						
	LONG WALL SHAORT WALL						
	FOOTING NO 1						
	SHORT WALL	2	7.92	0.70	0.45	**4.99**	**cu.mt.**
		3	5.49	0.70	0.45	**5.19**	**cu.mt.**
		2	2.96	0.70	0.45	**1.86**	**cu.mt.**
	LONG WALL	1	11.29	0.70	0.45	**3.56**	**cu.mt.**
		1	6.80	0.70	0.45	**2.14**	**cu.mt.**
		2	5.37	0.70	0.45	**3.38**	**cu.mt.**
	FOOTING NO 2						
	SHORT WALL	2	8.12	0.50	0.45	**3.65**	**cu.mt.**
		3	5.69	0.50	0.45	**3.84**	**cu.mt.**
		2	3.16	0.50	0.45	**1.42**	**cu.mt.**
	LONG WALL	1	11.49	0.50	0.45	**2.59**	**cu.mt.**
		1	7.00	0.50	0.45	**1.58**	**cu.mt.**
		2	5.57	0.50	0.45	**2.51**	**cu.mt.**
	FOOTING NO 3						

	SHORT WALL	2	8.32	0.30	0.45	**2.25**	**cu.mt.**
		3	5.89	0.30	0.45	**2.39**	**cu.mt.**
		2	3.36	0.30	0.45	**0.91**	**cu.mt.**
	LONG WALL	1	11.69	0.30	0.45	**1.58**	**cu.mt.**
		1	7.20	0.30	0.45	**0.97**	**cu.mt.**
		2	5.77	0.30	0.45	**1.56**	**cu.mt.**
	Brick masonry in Plinth						
	SHORT WALL	2	7.62	0.23	0.25	**0.88**	**cu.mt.**
		3	5.19	0.23	0.25	**0.90**	**cu.mt.**
		2	2.43	0.23	0.25	**0.28**	**cu.mt.**
	LONG WALL	1	11.44	0.23	0.25	**0.66**	**cu.mt.**
		1	6.50	0.23	0.25	**0.37**	**cu.mt.**
		2	5.07	0.23	0.25	**0.58**	**cu.mt.**
	Total Brick masonry in Plinth & foundation					**50.02**	**cu.mt.**
	Brick masonry in SUPER STRUCTURE						
	SHORT WALL	2	7.62	0.23	3.88	**13.60**	**cu.mt.**
		2	5.19	0.23	2.52	**6.02**	**cu.mt.**
		2	2.43	0.23	2.52	**2.82**	**cu.mt.**
	LONG WALL	2	4.72	0.23	3.88	**8.42**	**cu.mt.**
		3	4.84	0.23	2.52	**8.42**	**cu.mt.**
		1	1.76	0.23	2.52	**1.02**	**cu.mt.**
	BRICK PILLAR1	1	0.68	0.23	2.52	**0.39**	**cu.mt.**
	BRICK PILLAR2	2	0.46	0.35	2.52	**0.81**	**cu.mt.**
	Brick masonary in parapet						
	SHORT WALL	1	7.62	0.23	0.45	**0.79**	**cu.mt.**
		1	4.96	0.23	0.45	**0.51**	**cu.mt.**
		1	2.43	0.23	0.45	**0.25**	**cu.mt.**
	LONG WALL	1	4.38	0.23	0.45	**0.45**	**cu.mt.**
		1	1.20	0.23	0.45	**0.12**	**cu.mt.**
		1	6.04	0.23	0.45	**0.63**	**cu.mt.**
	round elevation design	1	1.89	0.23	1.89	**0.82**	**cu.mt.**
	Gross brick masonary					**45.08**	**cu.mt.**
	Deduction						

	D1	1	1.50	0.23	2.10	0.72	cu.mt.
	D2	1	1.00	0.23	2.10	0.48	cu.mt.
	D3	3	0.90	0.23	2.10	1.30	cu.mt.
	D4	2	0.75	0.23	2.10		
	W1	7	1.00	0.23	1.20	1.93	cu.mt.
	W2	2	0.45	0.23	1.20	0.25	cu.mt.
	W3	1	0.65	0.23	1.00	0.15	cu.mt.
	V1	1	1.40	0.23	0.60	0.19	cu.mt.
	V2	2	0.60	0.23	0.60	0.17	cu.mt.
	V3	10	1.00	0.23	0.45	1.04	cu.mt.
			total deduction			**6.24**	cu.mt.
	Net brick masonry in super structure					**38.84**	cu.mt.
4	**RCC work**						
	RCC plinth beam concrete						
	SHORT WALL	2	7.62	0.23	0.35	**1.23**	**cu.mt.**
		3	5.19	0.23	0.35	**1.25**	**cu.mt.**
		2	2.43	0.23	0.35	**0.39**	**cu.mt.**
	LONG WALL	1	11.44	0.23	0.35	**0.92**	**cu.mt.**
		1	6.50	0.23	0.35	**0.52**	**cu.mt.**
		2	5.07	0.23	0.35	**0.82**	**cu.mt.**
	G.F. Lintel / Chajja concrete	1	20.05		0.10	**2.01**	**cu.mt.**
	SHORT WALL	2	7.62	0.23	0.10	**0.35**	**cu.mt.**
		3	5.19	0.23	0.10	**0.36**	**cu.mt.**
		2	2.43	0.23	0.10	**0.11**	**cu.mt.**
	LONG WALL	1	11.44	0.23	0.10	**0.26**	**cu.mt.**
		1	6.50	0.23	0.10	**0.15**	**cu.mt.**
		2	5.07	0.23	0.10	**0.23**	**cu.mt.**
	RCC cahajja1	1	10.91	0.45	0.10	**0.49**	**cu.mt.**
	RCC cahajja2	1	2.43	0.45	0.10	**0.11**	**cu.mt.**
	RCC cahajja3	1	2.59	0.45	0.10	**0.12**	**cu.mt.**
	Slab concrete of kitchen, store &w.c.	1	5.07	5.19	0.10	**2.63**	**cu.mt.**
	Slab concrete of verandah	1	4.74	2.66	0.10	**1.26**	**cu.mt.**
	Slab beams concrete	3	7.62	0.23	0.45	**2.37**	**cu.mt.**
		4	4.72	0.23	0.45	**1.95**	**cu.mt.**

	slant roof slab concrete	2	8.82	3.06	0.125	**6.75**	**cu.mt.**
	slanting length of roof=3.06						
	Total conctere work					**24.28**	**cu.mt.**
5	**Murum filling in plinth**						
	verandah	1	4.51	2.43	0.50	5.48	cu.mt.
	waiting	1	17.60	2.00	0.50	17.60	cu.mt.
	multipurpose room	1	4.26	7.16	0.50	15.25	cu.mt.
	kitchen	1	2.67	2.50	0.50	3.34	cu.mt.
	store	1	2.83	2.50	0.50	3.54	cu.mt.
	covered court	1	2.13	2.00	0.50	2.13	cu.mt.
	wash	1	1.25	2.00	0.50	1.25	cu.mt.
	wc	2	0.94	1.00	0.50	0.94	cu.mt.
	Total Murum filling in plinth					**49.53**	cu.mt.
6	**P.C.C at plinth level**						
	verandah	1	4.51	2.43	0.10	1.10	cu.mt.
	waiting	1	17.60	2.00	0.10	3.52	cu.mt.
	multipurpose room	1	4.26	7.16	0.10	3.05	cu.mt.
	kitchen	1	2.67	2.50	0.10	0.67	cu.mt.
	store	1	2.83	2.50	0.10	0.71	cu.mt.
	covered court	1	2.13	2.00	0.10	0.43	cu.mt.
	wash	1	1.25	2.00	0.10	0.25	cu.mt.
	wc	2	0.94	1.00	0.10	0.19	cu.mt.
	Total P.C.C at plinth level					**9.91**	cu.mt.
7	**D.P.C. on plinth beam**						
	SHORT WALL	2	7.62	0.23		**3.51**	**sq.mt.**
		3	5.19	0.23		**3.58**	**sq.mt.**
		2	2.43	0.23		**1.12**	**sq.mt.**
	LONG WALL	1	11.44	0.23		**2.63**	**sq.mt.**
		1	6.50	0.23		**1.50**	**sq.mt.**
		2	5.07	0.23		**2.33**	**sq.mt.**
	total D.P.C. on plinth					**14.66**	**sq.mt.**
8	**Internal plaster**						
	verandah	2	4.74		2.10	19.91	**sq.mt.**

		2	2.20		2.10	9.24	**sq.mt.**
	waiting	2	1.76		2.50	8.80	**sq.mt.**
		1	2.20		2.50	5.50	**sq.mt.**
	multipurpose room	2	4.26		3.88	33.06	**sq.mt.**
		2	7.16		3.72	53.27	**sq.mt.**
	kitchen	2	2.67		2.50	13.35	**sq.mt.**
		2	2.50		2.50	12.50	**sq.mt.**
	store	2	2.83		2.50	14.15	**sq.mt.**
		2	2.50		2.50	12.50	**sq.mt.**
	covered court	2	2.13		2.50	10.65	**sq.mt.**
		2	2.00		2.50	10.00	**sq.mt.**
	wash	2	1.25		2.50	6.25	**sq.mt.**
		2	2.00		2.50	10.00	**sq.mt.**
	wc	4	0.94		2.50	9.40	**sq.mt.**
		4	1.00		2.50	10.00	**sq.mt.**
	Sealing plaster						
	verandah	1	4.51	2.43		10.96	**sq.mt.**
	waiting	1	17.60	2.00		35.20	**sq.mt.**
	multipurpose room	1	4.26	7.16		30.50	**sq.mt.**
	kitchen	1	2.67	2.50		6.68	**sq.mt.**
	store	1	2.83	2.50		7.08	**sq.mt.**
	covered court	1	2.13	2.00		4.26	**sq.mt.**
	wash	1	1.25	2.00		2.50	**sq.mt.**
	wc	2	0.94	1.00		1.88	**sq.mt.**
	Gross Internal plaster					**337.63**	**sq.mt.**
	both side plaster is same so the deduction will be calculated only one side						
	Deduction						
	D1	1	1.50		2.10	3.15	**sq.mt.**
	D2	1	1.00		2.10	2.10	**sq.mt.**
	D3	3	0.90		2.10	5.67	**sq.mt.**
	D4	2	0.75		2.10	3.15	**sq.mt.**
	W1	7	1.00		1.20	8.40	**sq.mt.**
	W2	2	0.45		1.20	1.08	**sq.mt.**
	W3	1	0.65		1.00	0.65	**sq.mt.**
	V1	1	1.40		0.60	0.84	**sq.mt.**
	V2	2	0.60		0.60	0.72	**sq.mt.**
	V3	10	1.00		0.45	4.50	**sq.mt.**
	total deduction					**30.26**	**sq.mt.**

	Total Internal plaster					**307.37**	**sq.mt.**
9	**External plaster including parapet inside plaster**						
	multi purpose hall out side	2	4.72		4.48	42.29	**sq.mt.**
		1	7.62		4.32	32.92	**sq.mt.**
	rest of the area	1	4.84		4.33	20.96	**sq.mt.**
		1	5.19		4.33	22.47	**sq.mt.**
		1	2.81		4.33	12.17	**sq.mt.**
		1	6.52		4.33	28.23	**sq.mt.**
	chajjas	1	10.46		1.13	11.82	**sq.mt.**
		1	2.88		1.13	3.25	**sq.mt.**
		1	2.59		1.13	2.93	**sq.mt.**
		2	5.92		1.06	12.55	**sq.mt.**
		2	8.82		1.06	18.70	**sq.mt.**
	Total external plaster					**208.29**	**sq.mt.**
10	**Tiles work**						
	Floor Tiles						
	verandah	1	4.51	2.43		10.96	**sq.mt.**
	waiting	1	17.60	2.00		35.20	**sq.mt.**
	multipurpose room	1	4.26	7.16		30.50	**sq.mt.**
	kitchen	1	2.67	2.50		6.68	**sq.mt.**
	store	1	2.83	2.50		7.08	**sq.mt.**
	covered court	1	2.13	2.00		4.26	**sq.mt.**
	wash	1	1.25	2.00		2.50	**sq.mt.**
	wc	2	0.94	1.00		1.88	**sq.mt.**
	umras of door						
	gap1	1	2.62	0.23		0.60	**sq.mt.**
	gap2	1	0.97	0.23		0.22	**sq.mt.**
	gap3	1	2.20	0.23		0.51	**sq.mt.**
	gap4	1	1.20	0.23		0.28	**sq.mt.**
	d1	1	1.50	0.23		0.35	**sq.mt.**
	d3	4	0.90	0.23		0.83	**sq.mt.**
	gap in store	1	0.90	0.23		0.21	**sq.mt.**
	d2	1	1.00	0.23		0.23	**sq.mt.**
	d4	2	0.75	0.115		0.17	**sq.mt.**
	ramp	1	2.96	1.20		3.55	**sq.mt.**
	Total floor tiles					**105.99**	**sq.mt.**
11	**Wall Tiles**						

	Kitchen	1	1.15		1.61	1.85	sq.mt.
		2	0.52		1.61	1.67	sq.mt.
	w.c.	4	0.94		2.10	7.90	sq.mt.
		4	1.00		2.10	8.40	sq.mt.
	Total					**19.82**	**sq.mt.**
	Diduction						
	d4	2	0.75		2.10	3.15	sq.mt.
	v	2	0.60		0.60	0.72	sq.mt.
	Total diduction					**3.87**	**sq.mt.**
	Net Wall Tiles					**15.95**	**sq.mt.**
12	**Skirting tiles**						
	verandah	1	4.51			4.51	rn.mt.
		1		2.43		2.43	rn.mt.
	waiting	1	17.60			17.60	rn.mt.
		1		2.00		2.00	rn.mt.
	multipurpose room	1	4.26			4.26	rn.mt.
		1		7.16		7.16	rn.mt.
	kitchen	1	2.67			2.67	rn.mt.
		1		2.50		2.50	rn.mt.
	store	1	2.83			2.83	rn.mt.
		1		2.50		2.50	rn.mt.
	covered court	1	2.13			2.13	rn.mt.
		1		2.00		2.00	rn.mt.
	wash	1	1.25			1.25	rn.mt.
		1		2.00		2.00	rn.mt.
	wc	2	0.94			1.88	rn.mt.
	-	2		1.00		2.00	rn.mt.
	-						
	Total skirting					**59.72**	**rn.mt.**
13	**Alumium doors & windows**						
	D1	1	1.50		2.10	3.15	**sq.mt.**
	D2	1	1.00		2.10	2.10	**sq.mt.**
	D3	3	0.90		2.10	5.67	**sq.mt.**
	D4	2	0.75		2.10	3.15	**sq.mt.**
	W1	7	1.00		1.20	8.40	**sq.mt.**
	W2	2	0.45		1.20	1.08	**sq.mt.**
	W3	1	0.65		1.00	0.65	**sq.mt.**
	V1	1	1.40		0.60	0.84	**sq.mt.**
	V2	2	0.60		0.60	0.72	**sq.mt.**
	V3	10	1.00		0.45	4.50	**sq.mt.**

	Total area of Alumium doors & windows					**30.26**	**sq.mt.**
14	**Total intermal Color work**						
	Internal Color work same as internal plaster work					**307.37**	**sq.mt.**
15	**Total Extermal Color work**						
	External color work same as external plaster work					**208.29**	**sq.mt.**
16	**Quantity of Steel**						
	Assuming (HYSD & MILD STELL) 1.2% steel of 1cu.mt. concrete work					**2287.13**	**kg.**
17	**Safety grill and elevation pipes**	lumpsum				**800.00**	**kg.**

ABSTRACT SHEET OF ANGANWADI						
SR. NO.	**DISCRIPTION**	**QTY.**	**PER**	**RATE**	**PER**	**TOTAL AMOUNT**
1	Excavation for foundation upto 1.5 m depth includingExcavation 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.(A)Loose or soft soil sr.no.1, Item coad.04B00 1A, tem no.as per NBO.0, SOR PAGE.NO.41(R & B SOR 2015-16 Bhavnagar)	108.35	CU.MT.	119.00	CU.MT.	Rs 12,893.65
2	PCC : Providing and laying cement concrete 1:3:6 (1-Cement : 3-coarse sand : 6- hand broken stone aggregates 40mm nominal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton) sr.no.5, Item coad.5003,Item no.as per NBO.5.3.2,SOR PAGE.NO.47(R & B SOR 2015-16 Bhavnagar)	10.83	CU.MT.	2255.00	CU.MT.	Rs 24,421.65
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 1:6 (1- Cement :6 -fine sand)(A) Modular (upto 10 ton. sr.no.7,Item coad.06002 A,Item no.as per NBO.6.13,SOR PAGE.NO.68 (R & B SOR 2015-16 Bhavnagar)	38.84	CU.MT.	3114.00	CU.MT.	Rs 120,947.76
4	RCC WORK: Providing and laying ordinary cement concrete 1:2:4 (1-Cement 2- coarse sand : 4- graded stone aggregates 20mm nominal size) exposed work with curing etc. complete including the cost of formwork but excluding the cost of reinforsement for R.C.C work in (iv)Footing having more than 15 cm. thicknes sr.no.100, Item coad.05028 D,Item no.as per NBO.0,SOR PAGE.NO.59 (R & B SOR 2015-16 Bhavnagar)	24.28	CU.MT.	3800.00	CU.MT.	Rs 92,264.00
5	Murum filling in plinth with good quality of murum and two rounds of machine compaction.	49.53	CU.MT.	50.00	CU.MT.	Rs 2476.50

6	PCC: Providing and laying cement concrete 1:3:6 (1-Cement: 3-coarse sand : 6- hand broken stone aggregates 40mm nominal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton)	9.91	CU.MT.	2900.00	CU.MT.	Rs 28,739.00
7	2cm (3/4") thick damp proof course withcement and approved coarse sand 1:2 withand including water proofing materials asordered by the Engineer in charge in theproportion as specified by the manufacturers including supply of allmaterial, labour and T&P etc. required forproper completion of the work includingproper curing and shuttering as necessary.	14.66	SQ.MT.	200.00	SQ.MT.	Rs 2,932.00
8	INTERNAL PLASTER: Providing 15mm thick cement plaster in single coat on Rough (Similar)side of 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, sr.no.4, Item coad.17002 A, Item no.as per NBO.17.6, SOR PAGE.NO.132 (R & B SOR 2015-16 Bhavnagar)	307.37	SQ.MT.	117.00	SQ.MT.	Rs 35,962.29
9	EXTERNAL PLASTER: 20 mm thick sand faced cement plaster on walls. At all heights above ground level consisting of 12 mm thick backing coat of C.M. 1:3 (1 cement: 3 sand) and 8 mm thick finishing coat of C.M. 1:1 (1 cement : 1 sand) etc. complete. sr.no.9, Item coad.17003 B, item no.as per NBO.17.25, SOR PAGE.NO.133 (R & B SOR 2015-16 Bhavnagar)	208.29	SQ.MT.	150.00	SQ.MT.	Rs 31,243.50
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. (upto10 ton), sr.no.19, Item coad.14008 C, Item no.as per NBO.14.29(C1) SOR PAGE.NO.121 (R & B SOR 2015-16 Bhavnagar)	105.99	SQ.MT.	761.00	SQ.MT.	Rs 80,658.39

11	Providing and laying coloured glazed tiles of the size 300mm x 200 mm x 8 mm / 300 mm x 450 mm x 8 mm in skirting, risers of steps and dedo on 10 mm. thick cement plaster 1:3 (1 cement: 3 coarse sand) & jointed with white cement slurry.sr.no.38,Item coad.14036, SOR PAGE.NO.125 (R & B SOR 2015-16 Bhavnagar)	15.95	SQ.MT.	891.00	SQ.MT.	Rs 14,211.45
12	Aluminium doors and windowsProviding and fixing extruded aluminum window having extruded aluminum Colour anodized section frame main outer size 127mm x 38.10mm x 1.35mm (of Jindal Section no:2443,@ Wt.1.384 Kg/mt),horizontal Four track member size 122.20mm x 31.75mm x 1.10mm (of Jindal Section no:8787,@ Wt. 1.205 Kg/mt),vertical member ofsize 122.20mm x 31.75mm x 1.50mm (of Jindal Section no:8935,@ Wt. 1.398 Kg/mt) with sliding shutters of horizontal member size 40mm x 18mm x 1.29mm (of Jindal Section no:8949 @ wt.of .456Kg/mt),verticalmember of size 40mm x 18mm x 1.29mm (of Jindal Section no:8947 @ wt.of0.456Kg/mt/Section 8948,@ Wt. 0.457 Kg/mt) with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminum fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc complete for window. sr.no.19 item coad.11026 (R & B SOR 2015-16 Bhavnagar)	30.26	SQ.MT.	2520.00	SQ.MT.	Rs 76,255.20
13	Applying two coats of Birla (white cement based) or Asian (acrylic lapy-putty) or equivalent & two coats of primer ofapproved brand and manufacture on new wall surface to give an even shade includingthoroughly brushing the surface free from mortar dropping and other foreignmatter and sand papered smooth.sr.no.35, Item coad.19035 Item no.as per NBO. -SOR PAGE.NO.141 (R & B SOR 2015-16 Bhavnagar)	307.37	SQ.MT.	47.00	SQ.MT.	Rs 14,446.39

14	Finishing wall with weather proof exterior emulsion paint on wall surface (two coats) to give an required shape even shade after thoroughly brushing the surface to remove all dirt, and remains of loose powdered materials.etc complete sr.no.34 Item coad.19031, Item no.as per NBO.- SOR PAGE.NO.141 (R & B SOR 2015-16 Bhavnagar)	208.29	SQ.MT.	72.00	SQ.MT.	Rs 14,996.88
15	Iron fabrication work for SAFETY GRIL including cuttig welding placing on site with 1 coat of primer & 2 coat of industrial oil paint etc complete	2000.00	Kg.	80.00	Kg.	Rs 160,000.00
	TOTAL					**Rs712448.66**
16	Add 3% contigenceies		0.03			Rs 21,373.46
17	Add 5% Work charged establishment		0.05			Rs 35,622.43
18	Add 10% plumbing &Sanitory work		0.10			Rs 71244.87
19	Add 10% Electrification		0.10			Rs 71244.87
	GRAND TOTAL					Rs 9,11,934.29
					SAY	**Rs 9,11,950.00**
	RUPEES NINE LAKH ELEVEN THOUSAND NINE HUNDRED FIFTY ONLY.					

8.1.3 Social design (Civil)

PRIMARY AND SECONDARY SCHOOL

Figure 8.1.3.1 3D View of Primary & Secondary School

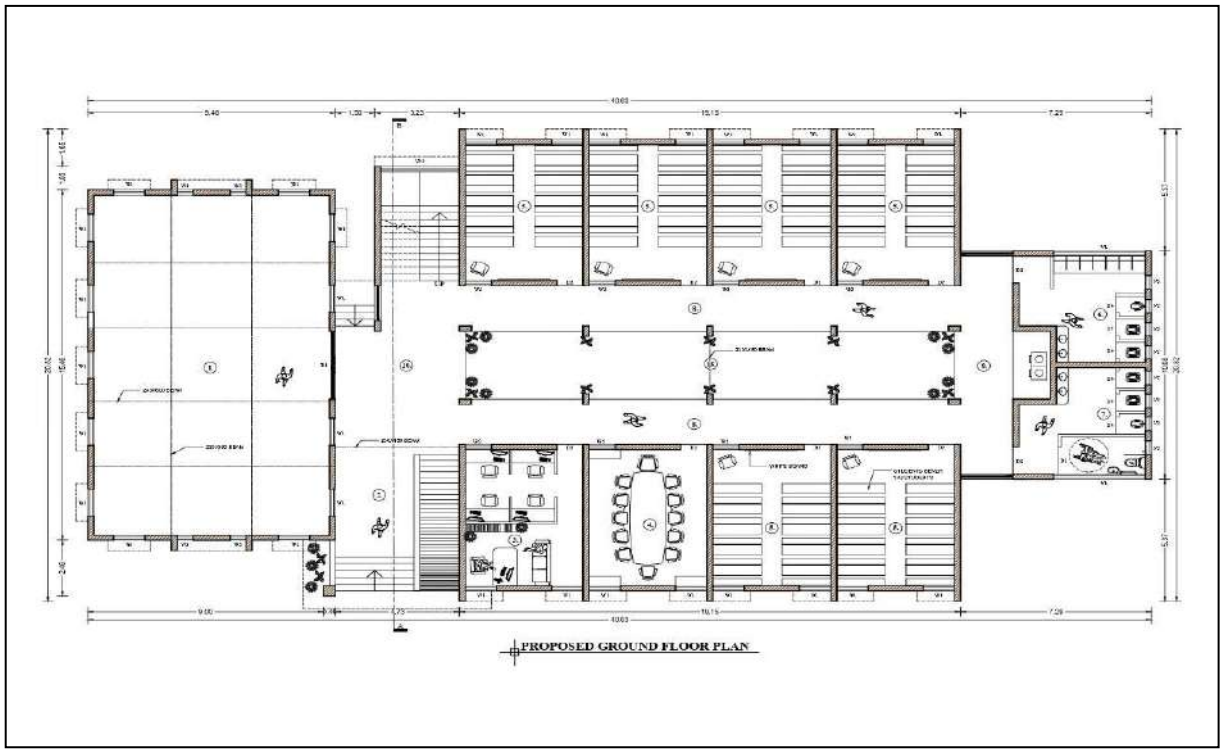


Figure 8.1.3.2 Ground Floor Plan of Primary & Secondary School

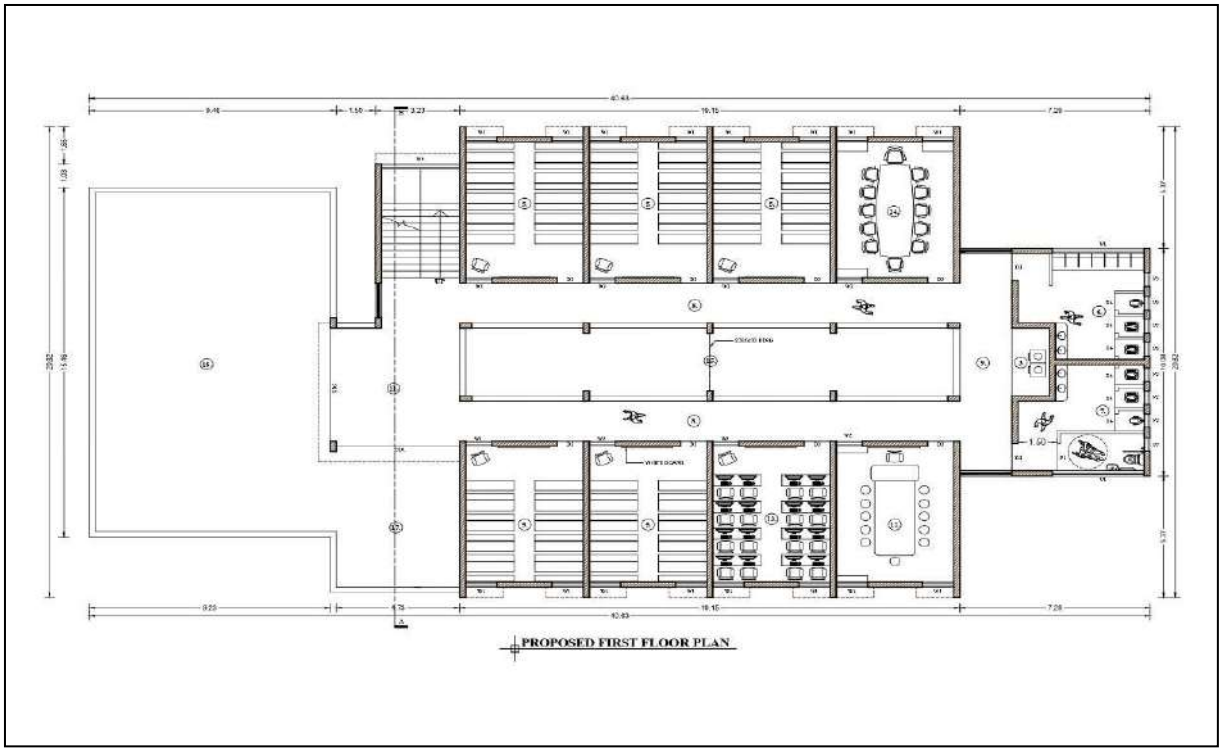


Figure 8.1.3.3Trerrace Floor Plan of Primary & Secondary School

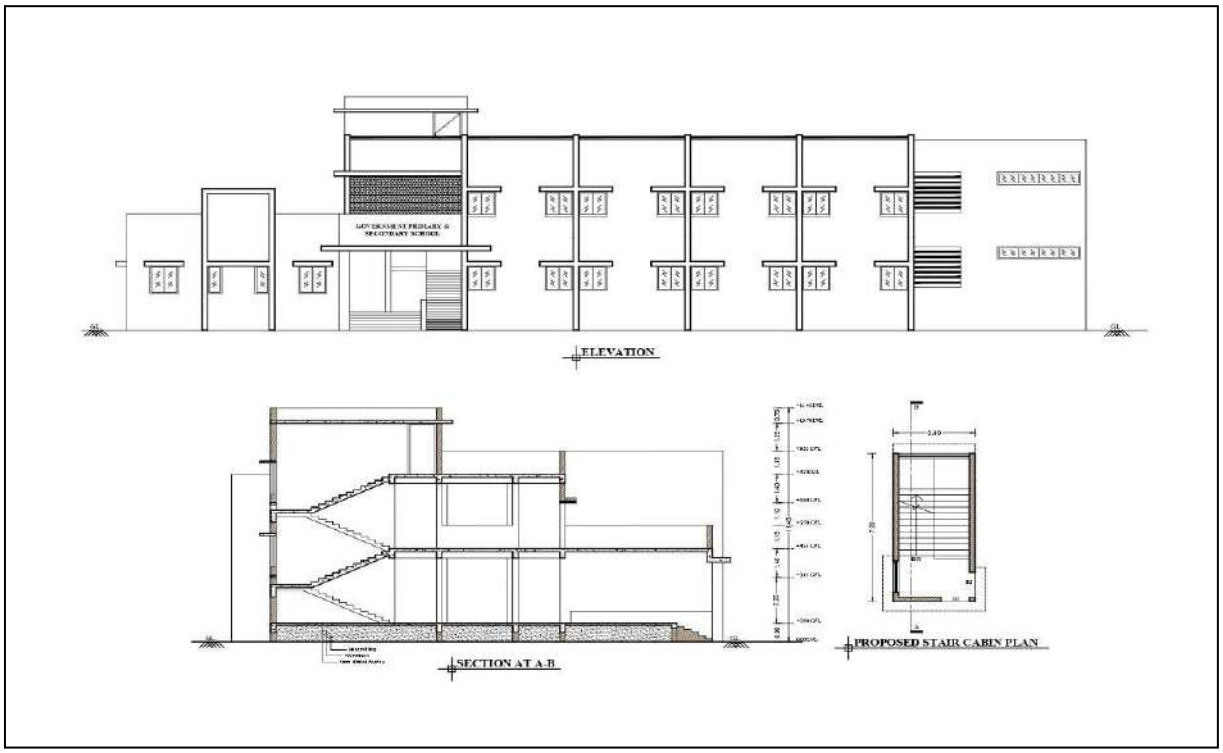


Figure 8.1.4.4Elevation & Section of Primary & Secondary School

QUANTITY SHEET OF PRIMARY AND SECONDARY SCHOOL							
SR. NO.	**DISCRIPTION**	**NOS.**	**Length (L)**	**Width (W)**	**Depth (H)**	**Total**	**Unit**
1	**Excavation in foundation**						
	LONG WALL SHAORT WALL						
	Long wall	2	16.43	1.20	1.50	**59.15**	**cu.mt.**
		1	8.23	1.20	1.50	**14.81**	**cu.mt.**
		2	21.79	1.20	1.50	**78.44**	**cu.mt.**
		6	10.11	1.20	1.50	**109.19**	**cu.mt.**
		2	11.05	1.20	1.50	**39.78**	**cu.mt.**
	short wall						
		2	8.26	1.20	1.50	**29.74**	**cu.mt.**
		1	2.03	1.20	1.50	**3.65**	**cu.mt.**
		4	18.18	1.20	1.50	**130.90**	**cu.mt.**
		2	24.91	1.20	1.50	**89.68**	**cu.mt.**
		2	6.09	1.20	1.50	**21.92**	**cu.mt.**
		1	2.43	1.20	1.50	**4.37**	**cu.mt.**
		1	1.26	1.20	1.50	**2.27**	**cu.mt.**
		1	6.16	1.20	1.50	**11.09**	**cu.mt.**
	Total excavaion					**594.99**	**cu.mt.**
2	**P.C.C. In Foundation**						
	LONG WALL SHAORT WALL						
	Long wall	2	16.43	1.20	0.15	**5.91**	**cu.mt.**
		1	8.23	1.20	0.15	**1.48**	**cu.mt.**
		2	21.79	1.20	0.15	**7.84**	**cu.mt.**
		6	10.11	1.20	0.15	**10.92**	**cu.mt.**
		2	11.05	1.20	0.15	**3.98**	**cu.mt.**
	short wall						
		2	8.26	1.20	0.15	**2.97**	**cu.mt.**
		1	2.03	1.20	0.15	**0.37**	**cu.mt.**
		4	18.18	1.20	0.15	**13.09**	**cu.mt.**
		2	24.91	1.20	0.15	**8.97**	**cu.mt.**
		2	6.09	1.20	0.15	**2.19**	**cu.mt.**
		1	2.43	1.20	0.15	**0.44**	**cu.mt.**
		1	1.26	1.20	0.15	**0.23**	**cu.mt.**
		1	6.16	1.20	0.15	**1.11**	**cu.mt.**
	Total P.C.C.					**59.50**	**cu.mt.**
3	**Brick masonry**						
	LONG WALL SHAORT WALL						
	FOOTING NO.1						
	Long wall	2	16.43	1.00	0.45	**14.79**	**cu.mt.**
		1	8.03	1.00	0.45	**3.61**	**cu.mt.**

		2	21.59	1.00	0.45	**19.43**	**cu.mt.**
		6	9.91	1.00	0.45	**26.76**	**cu.mt.**
		2	10.85	1.00	0.45	**9.77**	**cu.mt.**
	short wall						
		2	8.46	1.00	0.45	**7.61**	**cu.mt.**
		1	2.23	1.00	0.45	**1.00**	**cu.mt.**
		4	18.38	1.00	0.45	**33.08**	**cu.mt.**
		2	25.11	1.00	0.45	**22.60**	**cu.mt.**
		2	6.29	1.00	0.45	**5.66**	**cu.mt.**
		1	2.63	1.00	0.45	**1.18**	**cu.mt.**
		1	1.46	1.00	0.45	**0.66**	**cu.mt.**
		1	5.96	1.00	0.45	**2.68**	**cu.mt.**
	FOOTING NO.2						
	Long wall	2	15.93	0.70	0.45	**10.04**	**cu.mt.**
		1	7.73	0.70	0.45	**2.43**	**cu.mt.**
		2	21.29	0.70	0.45	**13.41**	**cu.mt.**
		6	9.61	0.70	0.45	**18.16**	**cu.mt.**
		2	10.55	0.70	0.45	**6.65**	**cu.mt.**
	short wall						
		2	8.76	0.70	0.45	**5.52**	**cu.mt.**
		1	2.53	0.70	0.45	**0.80**	**cu.mt.**
		4	18.68	0.70	0.45	**23.54**	**cu.mt.**
		2	25.41	0.70	0.45	**16.01**	**cu.mt.**
		2	6.59	0.70	0.45	**4.15**	**cu.mt.**
		1	2.93	0.70	0.45	**0.92**	**cu.mt.**
		1	1.76	0.70	0.45	**0.55**	**cu.mt.**
		1	5.66	0.70	0.45	**1.78**	**cu.mt.**
	FOOTING NO.3						
	Long wall	2	15.68	0.45	0.45	**6.35**	**cu.mt.**
		1	7.48	0.45	0.45	**1.51**	**cu.mt.**
		2	21.04	0.45	0.45	**8.52**	**cu.mt.**
		6	9.36	0.45	0.45	**11.37**	**cu.mt.**
		2	10.30	0.45	0.45	**4.17**	**cu.mt.**
	short wall						
		2	9.01	0.45	0.45	**3.65**	**cu.mt.**
		1	2.78	0.45	0.45	**0.56**	**cu.mt.**
		4	18.93	0.45	0.45	**15.33**	**cu.mt.**
		2	25.66	0.45	0.45	**10.39**	**cu.mt.**
		2	6.84	0.45	0.45	**2.77**	**cu.mt.**
		1	3.18	0.45	0.45	**0.64**	**cu.mt.**
		1	2.01	0.45	0.45	**0.41**	**cu.mt.**
		1	5.41	0.45	0.45	**1.10**	**cu.mt.**
	PLINTH MASONARY						
	Long wall	2	15.46	0.23	0.45	**3.20**	**cu.mt.**

		1	7.26	0.23	0.45	**0.75**	**cu.mt.**
		2	20.82	0.23	0.45	**4.31**	**cu.mt.**
		6	9.14	0.23	0.45	**5.68**	**cu.mt.**
		2	10.08	0.23	0.45	**2.09**	**cu.mt.**
	short wall						
		2	9.00	0.23	0.45	**1.86**	**cu.mt.**
		1	2.54	0.23	0.45	**0.26**	**cu.mt.**
		4	18.69	0.23	0.45	**7.74**	**cu.mt.**
		2	25.42	0.23	0.45	**5.26**	**cu.mt.**
		2	6.60	0.23	0.45	**1.37**	**cu.mt.**
		1	2.94	0.23	0.45	**0.30**	**cu.mt.**
		1	1.77	0.23	0.45	**0.18**	**cu.mt.**
		1	5.65	0.23	0.45	**0.58**	**cu.mt.**
	BRCK MASONARY IN GROUND FLOOR						
	Long wall	2	15.46	0.23	3.20	**22.76**	**cu.mt.**
		1	7.26	0.23	3.20	**5.34**	**cu.mt.**
		10	6.91	0.23	3.20	**50.86**	**cu.mt.**
		2	10.08	0.23	3.20	**14.84**	**cu.mt.**
	short wall						
		2	9.00	0.23	3.20	**13.25**	**cu.mt.**
		1	3.00	0.23	3.20	**2.21**	**cu.mt.**
		16	4.50	0.23	3.20	**52.99**	**cu.mt.**
		2	7.06	0.23	3.20	**10.39**	**cu.mt.**
		1	3.40	0.23	3.20	**2.50**	**cu.mt.**
	BRCK MASONARY IN FIRST FLOOR						
	Long wall	2	15.46	0.23	1.10	**7.82**	**cu.mt.**
		1	7.26	0.23	3.20	**5.34**	**cu.mt.**
		10	6.91	0.23	3.20	**50.86**	**cu.mt.**
		2	10.08	0.23	3.20	**14.84**	**cu.mt.**
	short wall						
		2	9.00	0.23	1.10	**4.55**	**cu.mt.**
		1	3.00	0.23	3.20	**2.21**	**cu.mt.**
		16	4.50	0.23	3.20	**52.99**	**cu.mt.**
		2	7.06	0.23	3.20	**10.39**	**cu.mt.**
		1	3.40	0.23	3.20	**2.50**	**cu.mt.**
	BRCK MASONARY IN TERRACE FLOOR						
	STAIR CABIN						
		2	3.00	0.23	3.25	**4.49**	**cu.mt.**
		2	7.25	0.23	3.25	**10.84**	**cu.mt.**
	PARAPET					**0.00**	**cu.mt.**
	LONG WALL	1	5.92	0.23	1.15	**1.57**	**cu.mt.**
		3	5.60	0.23	1.15	**4.44**	**cu.mt.**

		1	10.08	0.23	1.15	**2.67**	**cu.mt.**
	SHORT WALL						
		1	1.50	0.23	1.15	**0.40**	**cu.mt.**
		2	18.69	0.23	1.15	**9.89**	**cu.mt.**
		2	7.29	0.23	1.15	**3.86**	**cu.mt.**
		1	4.96	0.23	1.15	**1.31**	**cu.mt.**
	GROSS Brick masonary					**719.28**	**cu.mt.**
	Deduction						
	D1	1	1.50	0.23	2.10	**0.72**	**cu.mt.**
	D2	16	1.00	0.23	2.10	**7.73**	**cu.mt.**
	D3	6	0.90	0.23	2.10	**2.61**	**cu.mt.**
	D4	4	0.75	0.23	2.10	**1.45**	**cu.mt.**
	W1	45	1.20	0.23	1.20	**14.90**	**cu.mt.**
	W2	16	1.00	0.23	1.20	**4.42**	**cu.mt.**
	W3	4	0.60	0.23	1.20	**0.66**	**cu.mt.**
	V1	4	3.52	0.23	0.60	**1.94**	**cu.mt.**
	V2	16	0.60	0.23	0.60	**1.32**	**cu.mt.**
			total deduction			**35.76**	cu.mt.
	Net brick masonry in super structure					**683.52**	cu.mt.
4	**RCC work**						
	GROUND FLOOR						
	PLINTH BEAM						
	Long wall	2	15.46	0.23	0.45	**3.20**	**cu.mt.**
		1	7.26	0.23	0.45	**0.75**	**cu.mt.**
		10	6.91	0.23	0.45	**7.15**	**cu.mt.**
		2	10.08	0.23	0.45	**2.09**	**cu.mt.**
	short wall						
		2	9.00	0.23	0.45	**1.86**	**cu.mt.**
		1	3.00	0.23	0.45	**0.31**	**cu.mt.**
		16	4.50	0.23	0.45	**7.45**	**cu.mt.**
		2	7.06	0.23	0.45	**1.46**	**cu.mt.**
		1	3.40	0.23	0.45	**0.35**	**cu.mt.**
	GROUND FLOOR LINTEL						
	Long wall	2	15.46	0.23	0.15	**1.07**	**cu.mt.**
		1	7.26	0.23	0.15	**0.25**	**cu.mt.**
		10	6.91	0.23	0.15	**2.38**	**cu.mt.**
		2	10.08	0.23	0.15	**0.70**	**cu.mt.**
	short wall						
		2	9.00	0.23	0.15	**0.62**	**cu.mt.**
		1	3.00	0.23	0.15	**0.10**	**cu.mt.**
		16	4.50	0.23	0.15	**2.48**	**cu.mt.**

		2	7.06	0.23	0.15	**0.49**	**cu.mt.**
		1	3.40	0.23	0.15	**0.12**	**cu.mt.**
	GROUND FLOOR SLAB BEAM						
	Long wall	2	15.46	0.23	0.45	**3.20**	**cu.mt.**
		1	7.26	0.23	0.45	**0.75**	**cu.mt.**
		10	6.91	0.23	0.45	**7.15**	**cu.mt.**
		2	10.08	0.23	0.45	**2.09**	**cu.mt.**
	short wall						
		2	9.00	0.23	0.45	**1.86**	**cu.mt.**
		1	3.00	0.23	0.45	**0.31**	**cu.mt.**
		16	4.50	0.23	0.45	**7.45**	**cu.mt.**
		2	7.06	0.23	0.45	**1.46**	**cu.mt.**
		1	3.40	0.23	0.45	**0.35**	**cu.mt.**
	COLUMNS						
		1	0.46	0.46	3.20	**0.68**	**cu.mt.**
		10	0.23	0.46	3.20	**3.39**	**cu.mt.**
	GROUND FLOOR SLAB						
	PRAYER HALL	1	9.00	15.00	0.10	**13.50**	**cu.mt.**
	ENTRANCE	1	4.76	6.23	0.10	**2.97**	**cu.mt.**
	APRINCIPALE OFFICE	1	4.50	6.00	0.10	**2.70**	**cu.mt.**
	STAFF ROOM	1	4.50	6.00	0.10	**2.70**	**cu.mt.**
	CLASS ROOM	6	4.50	6.00	0.10	**16.20**	**cu.mt.**
	BOYS TOILET	1	4.83	4.70	0.10	**2.27**	**cu.mt.**
	GIRLS TOILET	1	4.83	4.70	0.10	**2.27**	**cu.mt.**
	PASSAGE	2	18.69	2.00	0.10	**7.48**	**cu.mt.**
	PASSAGE	1	2.00	9.49	0.10	**1.90**	**cu.mt.**
	FOYER	1	5.00	5.00	0.10	**2.50**	**cu.mt.**
	FIRST FLOOR						
	FIRST FLOOR LINTEL						
	Long wall	2	15.46	0.23	0.10	**0.71**	**cu.mt.**
		1	7.26	0.23	0.10	**0.17**	**cu.mt.**
		10	6.91	0.23	0.10	**1.59**	**cu.mt.**
		2	10.08	0.23	0.10	**0.46**	**cu.mt.**
	short wall						
		2	9.00	0.23	0.10	**0.41**	**cu.mt.**
		1	3.00	0.23	0.10	**0.07**	**cu.mt.**
		16	4.50	0.23	0.10	**1.66**	**cu.mt.**
		2	7.06	0.23	0.10	**0.32**	**cu.mt.**
		1	3.40	0.23	0.10	**0.08**	**cu.mt.**
	FIRST FLOOR SLAB BEAM						
	Long wall	2	15.46	0.23	0.45	**3.20**	**cu.mt.**
		1	7.26	0.23	0.45	**0.75**	**cu.mt.**
		10	6.91	0.23	0.45	**7.15**	**cu.mt.**

		2	10.08	0.23	0.45	**2.09**	**cu.mt.**
	short wall						
		2	9.00	0.23	0.45	**1.86**	**cu.mt.**
		1	3.00	0.23	0.45	**0.31**	**cu.mt.**
		16	4.50	0.23	0.45	**7.45**	**cu.mt.**
		2	7.06	0.23	0.45	**1.46**	**cu.mt.**
		1	3.40	0.23	0.45	**0.35**	**cu.mt.**
	COLUMNS						
		1	0.46	0.46	3.20	**0.68**	**cu.mt.**
		10	0.23	0.46	3.20	**3.39**	**cu.mt.**
	FIRST FLOOR SLAB						
	LIBRARY	1	4.50	6.00	0.10	**2.70**	**cu.mt.**
	SCIENCE LAB	1	4.50	6.00	0.10	**2.70**	**cu.mt.**
	COMPUTER LAB	1	4.50	6.00	0.10	**2.70**	**cu.mt.**
	CLASS ROOM	5	4.50	6.00	0.10	**13.50**	**cu.mt.**
	BOYS TOILET	1	4.83	4.70	0.10	**2.27**	**cu.mt.**
	GIRLS TOILET	1	4.83	4.70	0.10	**2.27**	**cu.mt.**
	PASSAGE	2	18.69	2.00	0.10	**7.48**	**cu.mt.**
	PASSAGE	1	2.00	9.49	0.10	**1.90**	**cu.mt.**
	FOYER	1	5.00	5.00	0.10	**2.50**	**cu.mt.**
	TERRACE FLOOR						
	STAIR CABIN						
		1	3.48	7.26	0.10	**2.53**	**cu.mt.**
	G.F.& F.F.CHAJJA						
	W1	45	1.43	1.66	0.10	**10.68**	**cu.mt.**
	W2	16	1.46	1.46	0.10	**3.41**	**cu.mt.**
	W3	4	1.06	1.06	0.10	**0.45**	**cu.mt.**
	Total concrete work					205.26	**cu.mt.**
5	**D.P.C. on plinth beam**						
	Long wall	2	15.46	0.23		**7.11**	**sq.mt.**
		1	7.26	0.23		**1.67**	**sq.mt.**
		2	20.82	0.23		**9.58**	**sq.mt.**
		6	9.14	0.23		**12.61**	**sq.mt.**
		2	10.08	0.23		**4.64**	**sq.mt.**
	short wall					**0.00**	**sq.mt.**
		2	9.00	0.23		**4.14**	**sq.mt.**
		1	2.54	0.23		**0.58**	**sq.mt.**
		4	18.69	0.23		**17.19**	**sq.mt.**
		2	25.42	0.23		**11.69**	**sq.mt.**
		2	6.60	0.23		**3.04**	**sq.mt.**
		1	2.94	0.23		**0.68**	**sq.mt.**
		1	1.77	0.23		**0.41**	**sq.mt.**
		1	5.65	0.23		**1.30**	**sq.mt.**

	total D.P.C. on plinth beam					**74.64**	**sq.mt.**
6	**Internal plaster**						
	GROUND FLOOR						
	PRAYER HALL	2	9.00		3.50	**63.00**	**sq.mt.**
		2		15.00	3.50	**105.00**	**sq.mt.**
	ENTRANCE	1	4.76		3.50	**16.66**	**sq.mt.**
		1		6.23	3.50	**21.81**	**sq.mt.**
	PRINCIPALE OFFICE	2	4.50		3.50	**31.50**	**sq.mt.**
		2		6.00	3.50	**42.00**	**sq.mt.**
	STAFF ROOM	2	4.50		3.50	**31.50**	**sq.mt.**
		2		6.00	3.50	**42.00**	**sq.mt.**
	CLASS ROOM	12	4.50		3.50	**189.00**	**sq.mt.**
		12		6.00	3.50	**252.00**	**sq.mt.**
	BOYS TOILET	2	4.83		3.50	**33.81**	**sq.mt.**
		2		4.70	3.50	**32.90**	**sq.mt.**
	GIRLS TOILET	2	4.83		3.50	**33.81**	**sq.mt.**
		2		4.70	3.50	**32.90**	**sq.mt.**
	PASSAGE	1	18.69		3.50	**65.42**	**sq.mt.**
		1		2.00	3.50	**7.00**	**sq.mt.**
	PASSAGE	1	2.00		3.50	**7.00**	**sq.mt.**
		1		9.49	3.50	**33.22**	**sq.mt.**
	FOYER	1	5.00		3.50	**17.50**	**sq.mt.**
		1		5.00	3.50	**17.50**	**sq.mt.**
	STAIR CASE	2	5.03		3.50	**35.21**	**sq.mt.**
		1		3.50	3.50	**12.25**	**sq.mt.**
	seling plater						
	PRAYER HALL	1	9.00	15.00		**135.00**	**sq.mt.**
	ENTRANCE	1	4.76	6.23		**29.65**	**sq.mt.**
	APRINCIPALE OFFICE	1	4.50	6.00		**27.00**	**sq.mt.**
	STAFF ROOM	1	4.50	6.00		**27.00**	**sq.mt.**
	CLASS ROOM	6	4.50	6.00		**162.00**	**sq.mt.**
	BOYS TOILET	1	4.83	4.70		**22.70**	**sq.mt.**
	GIRLS TOILET	1	4.83	4.70		**22.70**	**sq.mt.**
	PASSAGE	2	18.69	2.00		**74.76**	**sq.mt.**
	PASSAGE	1	2.00	9.49		**18.98**	**sq.mt.**
	FOYER	1	5.00	5.00		**25.00**	**sq.mt.**
	FIRST FLOOR						
	LIBRARY	1	4.50		3.50	**15.75**	**sq.mt.**
		1		6.00	3.50	**21.00**	**sq.mt.**
	SCIENCE LAB	1	4.50		3.50	**15.75**	**sq.mt.**
		1		6.00	3.50	**21.00**	**sq.mt.**
	COMPUTER LAB	1	4.50		3.50	**15.75**	**sq.mt.**
		1		6.00	3.50	**21.00**	**sq.mt.**
	CLASS ROOM	5	4.50		3.50	**78.75**	**sq.mt.**

		5		6.00	3.50	**105.00**	**sq.mt.**
	BOYS TOILET	1	4.83		3.50	**16.91**	**sq.mt.**
		1		4.70	3.50	**16.45**	**sq.mt.**
	GIRLS TOILET	1	4.83		3.50	**16.91**	**sq.mt.**
		1		4.70	3.50	**16.45**	**sq.mt.**
	PASSAGE	2	18.69		3.50	**130.83**	**sq.mt.**
		2		2.00	3.50	**14.00**	**sq.mt.**
	PASSAGE	1	2.00		3.50	**7.00**	**sq.mt.**
		1		9.49	3.50	**33.22**	**sq.mt.**
	FOYER	1	5.00		3.50	**17.50**	**sq.mt.**
		1		5.00	3.50	**17.50**	**sq.mt.**
	STAIR CASE	2	5.03		3.50	**35.21**	**sq.mt.**
		1		3.50	3.50	**12.25**	**sq.mt.**
	seling plater						
	LIBRARY	1	4.50	6.00		**27.00**	**sq.mt.**
	SCIENCE LAB	1	4.50	6.00		**27.00**	**sq.mt.**
	COMPUTER LAB	1	4.50	6.00		**27.00**	**sq.mt.**
	CLASS ROOM	5	4.50	6.00		**135.00**	**sq.mt.**
	BOYS TOILET	1	4.83	4.70		**22.70**	**sq.mt.**
	GIRLS TOILET	1	4.83	4.70		**22.70**	**sq.mt.**
	PASSAGE	2	18.69	2.00		**74.76**	**sq.mt.**
	PASSAGE	1	2.00	9.49		**18.98**	**sq.mt.**
	FOYER	1	5.00	5.00		**25.00**	**sq.mt.**
	TERRACE FLOOR						
	STAIR CABIN	2	3.00	3.50		**21.00**	**sq.mt.**
		2	6.79	3.50		**47.53**	**sq.mt.**
	Gross Internal plaster					**2744.66**	**sq.mt.**
	both side plaster is same so the deduction will be calculated only one side						
	Deduction						
	D1	1	1.50		2.10	**3.15**	**sq.mt.**
	D2	16	1.00		2.10	**33.60**	**sq.mt.**
	D3	6	0.90		2.10	**11.34**	**sq.mt.**
	D4	4	0.75		2.10	**6.30**	**sq.mt.**
	W1	45	1.20		1.20	**64.80**	**sq.mt.**
	W2	16	1.00		1.20	**19.20**	**sq.mt.**
	W3	4	0.60		1.20	**2.88**	**sq.mt.**
	V1	4	3.52		0.60	**8.45**	**sq.mt.**
	V2	16	0.60		0.60	**5.76**	**sq.mt.**
			total deduction			**155.48**	**sq.mt.**
	Total Internal plaster					**2589.18**	**sq.mt.**
7	**External plaster including parapet inside plaster**						
	BACK SIDE	1	9.46		10.73	**101.51**	**sq.mt.**

		1	6.00		10.73	**64.38**	**sq.mt.**
		1	1.50		10.73	**16.10**	**sq.mt.**
		1	3.23		10.73	**34.66**	**sq.mt.**
		1	1.65		10.73	**17.70**	**sq.mt.**
		1	19.15		10.73	**205.48**	**sq.mt.**
		1	5.37		10.73	**57.62**	**sq.mt.**
		1	7.29		10.73	**78.22**	**sq.mt.**
	RIGHT SIDE	1	20.82		10.73	**223.40**	**sq.mt.**
		1	5.37		10.73	**57.62**	**sq.mt.**
	FRONT SIDE	1	7.29		10.73	**78.22**	**sq.mt.**
		1	19.15		10.73	**205.48**	**sq.mt.**
		1	4.73		10.73	**50.75**	**sq.mt.**
		1	0.46		10.73	**4.94**	**sq.mt.**
		1	9.00		10.73	**96.57**	**sq.mt.**
	LEFT SIDE	1	0.46		10.73	**4.94**	**sq.mt.**
		1	15.46		10.73	**165.89**	**sq.mt.**
	Total external plaster					**1463.46**	**sq.mt.**
8	**Tiles work**						
	Floor Tiles						
	GROUND FLOOR						
	PRAYER HALL	1	9.00	15.00		**135.00**	**sq.mt.**
	ENTRANCE	1	4.76	6.23		**29.65**	**sq.mt.**
	APRINCIPALE OFFICE	1	4.50	6.00		**27.00**	**sq.mt.**
	STAFF ROOM	1	4.50	6.00		**27.00**	**sq.mt.**
	CLASS ROOM	6	4.50	6.00		**162.00**	**sq.mt.**
	BOYS TOILET	1	4.83	4.70		**22.70**	**sq.mt.**
	GIRLS TOILET	1	4.83	4.70		**22.70**	**sq.mt.**
	PASSAGE	2	18.69	2.00		**74.76**	**sq.mt.**
	PASSAGE	1	2.00	9.49		**18.98**	**sq.mt.**
	FOYER	1	5.00	5.00		**25.00**	**sq.mt.**
	FIRST FLOOR						
	LIBRARY	1	4.50	6.00		**27.00**	**sq.mt.**
	SCIENCE LAB	1	4.50	6.00		**27.00**	**sq.mt.**
	COMPUTER LAB	1	4.50	6.00		**27.00**	**sq.mt.**
	CLASS ROOM	5	4.50	6.00		**135.00**	**sq.mt.**
	BOYS TOILET	1	4.83	4.70		**22.70**	**sq.mt.**
	GIRLS TOILET	1	4.83	4.70		**22.70**	**sq.mt.**
	PASSAGE	2	18.69	2.00		**74.76**	**sq.mt.**
	PASSAGE	1	2.00	9.49		**18.98**	**sq.mt.**
	FOYER	1	5.00	5.00		**25.00**	**sq.mt.**
	TERRACE						
	-	2	18.69	8.00		**299.04**	**sq.mt.**
	-	1	7.29	9.62		**70.13**	**sq.mt.**
	-	1	4.73	5.00		**23.65**	**sq.mt.**

	STAIR CABIN TOP	1	3.00	6.80		**20.40**	**sq.mt.**
	Total floor tiles					**1338.16**	**sq.mt.**
9	**Wall Tiles**						
	Both toilets						
	W.C.	6	1.90	2.10		23.94	**sq.mt.**
	W.C.	6	1.00	2.10		12.60	**sq.mt.**
		2	2.29	2.10		9.62	**sq.mt.**
		2	1.62	2.10		6.80	**sq.mt.**
		2	1.43	2.10		6.01	**sq.mt.**
		2	1.88	2.10		7.90	**sq.mt.**
		2	4.83	2.10		20.29	**sq.mt.**
	Total					**87.15**	**sq.mt.**
	Diduction						
	D3	2	1.20		2.10	5.04	sq.mt.
	D4	6	0.75		2.10	9.45	sq.mt.
	V1	2	3.52		0.60	4.22	sq.mt.
	V2	2	0.60		0.60	0.72	sq.mt.
	Total diduction					**4.94**	**sq.mt.**
	Net Wall Tiles					**82.21**	**sq.mt.**
10	**Alumium doors & windows & steel door**						
	D1	1	1.50		2.10	**3.15**	**sq.mt.**
	D2	16	1.00		2.10	**33.60**	**sq.mt.**
	D3	6	0.90		2.10	**11.34**	**sq.mt.**
	D4	4	0.75		2.10	**6.30**	**sq.mt.**
	W1	45	1.20		1.20	**64.80**	**sq.mt.**
	W2	16	1.00		1.20	**19.20**	**sq.mt.**
	W3	4	0.60		1.20	**2.88**	**sq.mt.**
	V1	4	3.52		0.60	**8.45**	**sq.mt.**
	V2	16	0.60		0.60	**5.76**	**sq.mt.**
	Total area of Alumium doors & windows					**155.48**	**sq.mt.**
11	**Total intermal Color work**						
	Internal Color work same as internal plaster work					**2589.18**	**sq.mt.**
12	**Total Extermal Color work**						
	External color work same as external plaster work					**1463.46**	**sq.mt.**
13	**Quantity of Steel**						
	asuming(HYSD & MILD STELL) 1.2% steel of 1cu.mt. concrete work					**24169.03**	**kg.**
14	**Safety grill and elevation pipes**	lumpsum				**5000.00**	**kg.**

ABSTRACT SHEET OF PRIMARY AND SECONDARY SCHOOL						
SR. NO.	**DISCRIPTION**	**QTY.**	**PER**	**RATE**	**PER**	**TOTAL AMOUNT**
1	Excavation for foundation upto 1.5 m depth includingExcavation 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.(A)Loose or soft soil sr.no.1, Item coad.04B00 1A, tem no.as per NBO.0, SOR PAGE.NO.41(R & B SOR 2015-16 Bhavnagar)	594.99	CU.MT.	119.00	CU.MT.	Rs 70,803.81
2	PCC : Providing and laying cement concrete 1:3:6 (1-Cement : 3-coarse sand : 6- hand broken stone aggregates 40mm nominal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton) sr.no.5, Item coad.5003,Item no.as per NBO.5.3.2,SOR PAGE.NO.47(R & B SOR 2015-16 Bhavnagar)	59.50	CU.MT.	2255.00	CU.MT.	Rs 134,172.50
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 1:6 (1-Cement :6 -fine sand)(A) Modular (upto 10 ton.)sr.no.7,Item coad.06002 A,Item no.as per NBO.6.13,SOR PAGE.NO.68 (R & B SOR 2015-16 Bhavnagar)	683.52	CU.MT.	3114.00	CU.MT.	Rs 2,128,481.28
4	RCC WORK: Providing and laying ordinary cement concrete 1:2:4 (1-Cement 2- coarse sand : 4- graded stone aggregates 20mm nominal size) exposed work with curing etc.complete including the cost of formwork but excluding the cost of reinforsement for R.C.C work in (iv)Footing having more than 15 cm. thicknes sr.no.100, Item coad.05028 D,Item no.as per NBO.0,SOR PAGE.NO.59 (R & B SOR 2015-16 Bhavnagar)	205.26	CU.MT.	3800.00	CU.MT.	Rs 779,988.00

5	2cm (3/4") thick damp proof course withcement and approved coarse sand 1:2 with and including water proofing materials as ordered by the Engineer in charge in the proportion as specified by the manufacturers including supply of allmaterial, labour and T&P etc. required forproper completion of the work including proper curing and shuttering as necessary.	74.61	SQ.MT.	200.00	SQ.MT.	Rs 14,922.00
6	INTERNAL PLASTER : Providing 15mm thick cement plaster in single coat on Rough (Similar)side of 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, sr.no.4, Item coad.17002 A, Item no.as per NBO.17.6 SOR PAGE.NO.132 (R & B SOR 2015-16 Bhavnagar)	2589.18	SQ.MT.	117.00	SQ.MT.	Rs 302,934.06
7	EXTERNALEXTERNAL : 20 mm thick sand faced cement plaster on walls. At all heights above ground level consisting of 12 mm thick backing coat of C.M. 1:3 (1 cement : 3 sand) and 8 mm thick finishing coat of C.M. 1:1 (1 cement : 1 sand) etc. complete.sr.no.9, Item coad.17003 B, item no.as per NBO.17.25, SOR PAGE.NO.133 (R & B SOR 2015-16 Bhavnagar)	1463.46	SQ.MT.	150.00	SQ.MT.	Rs 219,519.00
8	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. (upto10 ton) sr.no.19, Item coad.14008 C, Item no.as per NBO.14.29(C1) SOR PAGE.NO.121 (R & B SOR 2015-16 Bhavnagar)	1338.16	SQ.MT.	761.00	SQ.MT.	Rs 1,018,339.76

9	Providing and laying coloured glazed tiles of the size 300mm x 200 mm x 8 mm / 300 mm x 450 mm x 8 mm in skirting, risers of steps and dedo on 10 mm. thick cement plaster 1:3 (1 cement : 3 coarse sand) & jointed with white cement slurry. sr.no.38,Item coad.14036, SOR PAGE.NO.125 (R & B SOR 2015-16 Bhavnagar)	82.21	SQ.MT.	891.00	SQ.MT.	Rs 73,249.11
10	Aluminium doors and windowsProviding and fixing extruded aluminum window having extruded aluminum Colour anodized section frame main outer size 127mm x 38.10mm x 1.35mm (of Jindal Section no:2443,@ Wt.1.384 Kg/mt),horizontal Four track member size 122.20mm x 31.75mm x 1.10mm (of Jindal Section no:8787,@ Wt. 1.205 Kg/mt),vertical member of size 122.20mm x 31.75mm x 1.50mm (of Jindal Section no:8935,@ Wt. 1.398 Kg/mt) with sliding shutters of horizontal member size 40mm x 18mm x 1.29mm (of Jindal Section no:8949 @ wt.of .456Kg/mt),vertical member of size 40mm x 18mm x 1.29mm (of Jindal Section no:8947 @ wt.of 0.456Kg/mt/Section 8948,@ Wt. 0.457 Kg/mt) with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminum fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc complete for window. sr.no.19 item coad.11026, (R & B SOR 2015-16 Bhavnagar)	155.48	SQ.MT.	3500.00	SQ.MT.	Rs 544,180.00

11	Applying two coats of Birla (white cement based) or Asian (acrylic lapy- putty) or equivalent & two coats of primer of approved brand and manufacture on new wall surface to give an even shade including thoroughly brushing thesurface free from mortar dropping and other foreign matter and sand papered smooth.sr.no.35 Item coad.19035, Item no.as per NBO.- SOR PAGE.NO.141 (R & B SOR 2015-16 Bhavnagar)	2589.18	SQ.MT.	47.00	SQ.MT.	Rs 121,691.46
12	Finishing wall with weather proof exterior emulsion paint on wall surface (two coats) to give an required shape even shade after thoroughly brushing the surface to remove all dirt, and remains of loose powdered materials.etc complete. sr.no.34 Item coad.19031,Item no.as per NBO.- SOR PAGE.NO.141 (R & B SOR 2015-16 Bhavnagar)	1463.46	SQ.MT.	72.00	SQ.MT.	Rs 105,369.12
13	Iron fabrication work for iron steel truss including cuttig welding placing on site with 1 coat of primer & 2 coat of industrial oil paint etc complete	5000.00	Kg.	85.00	Kg.	Rs 425,000.00
	TOTAL					**Rs 5,938,650.10**
14	Add 1% contigenceies		0.01			Rs 59,386.50
15	Add 3% Work charged establishment		0.03			Rs 178,159.50
16	Add 3% plumbing &Sanitory work		0.03			Rs 178,159.50
17	Add 3% Electrification		0.03			Rs 178,159.50
18	Add 15% full furnishing		0.15			Rs 890,797.52
	GRAND TOTAL					Rs 7,423,312.63
					SAY	Rs 7,423,300.00
	RUPEES SEVENTY FOUR LAKHS TWENTY THREE THOUSAND THREE HUNDRED ONLY.					

8.1.4 Socio-Cultural design (Civil)

VEGETABLE MARKET

Figure 8.1.4.1 3D View of Vegetable Market

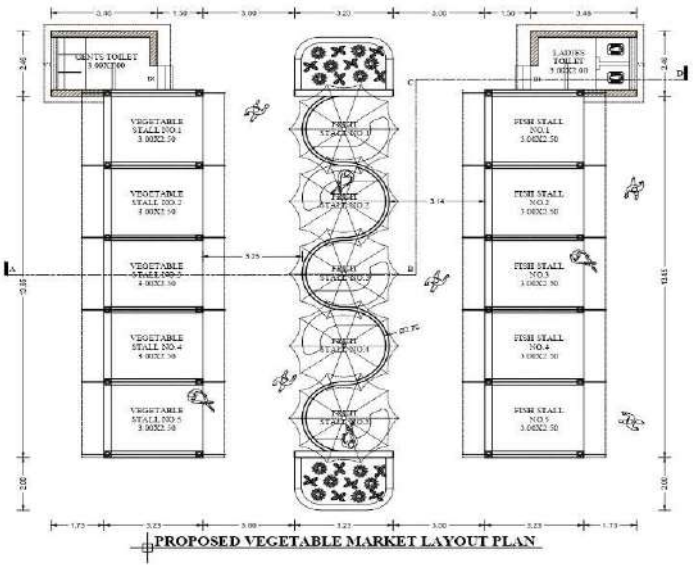


Figure 8.1.4.2 Ground Floor Plan of Vegetable Market

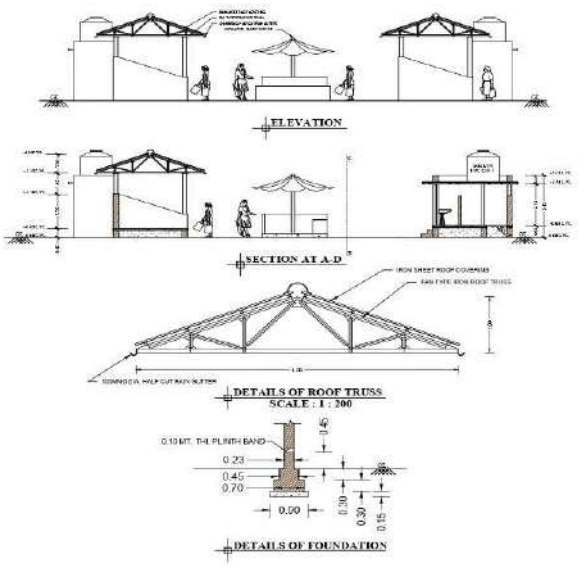


Figure 8.1.4.3Elevation & Section of Vegetable Market

QUANTITY SHEET OF VEGITABLE MARKET							
SR. NO.	**DISCRIPTION**	**NOS.**	**Length (L)**	**Width (W)**	**Depth (H)**	**Total**	**Unit**
1	**Excavation in foundation**						
	LONG WALL SHAORT WALL						
	Long wall	4	14.32	0.90	1.20	**61.86**	**cu.mt.**
		4	3.13	0.90	1.20	**13.52**	**cu.mt.**
	short wall	12	3.00	0.90	1.20	**38.88**	**cu.mt.**
		2	1.17	0.90	1.20	**2.52**	**cu.mt.**
		2	3.00	0.90	1.20	**6.48**	**cu.mt.**
	Total excavaion					**123.26**	**cu.mt.**
2	**P.C.C. In Foundation**						
	Long wall	4	14.32	0.90	0.15	**7.73**	**cu.mt.**
		4	3.13	0.90	0.15	**1.69**	**cu.mt.**
	short wall	12	3.00	0.90	0.15	**4.86**	**cu.mt.**
		2	1.17	0.90	0.15	**0.31**	**cu.mt.**
		2	3.00	0.90	0.15	**0.81**	**cu.mt.**
	Total P.C.C.					**15.41**	**cu.mt.**
3	**Brick masonry**						
	Brick masonry in foundation						
	LONG WALL SHAORT WALL						
	FOOTING NO 1						
	Long wall	4	14.12	0.70	0.30	**11.86**	**cu.mt.**
		4	2.93	0.70	0.30	**2.46**	**cu.mt.**
	short wall	12	3.00	0.70	0.30	**7.56**	**cu.mt.**
		2	1.27	0.70	0.30	**0.53**	**cu.mt.**
		2	3.00	0.70	0.30	**1.26**	**cu.mt.**
	FOOTING NO 2						
	Long wall	4	13.87	0.45	0.30	**7.49**	**cu.mt.**
		4	2.68	0.45	0.30	**1.45**	**cu.mt.**
	short wall	12	3.00	0.45	0.30	**4.86**	**cu.mt.**
		2	1.39	0.45	0.30	**0.38**	**cu.mt.**
		2	3.00	0.45	0.30	**0.81**	**cu.mt.**
	plinth Masonary						
	Long wall	4	13.65	0.23	0.45	**5.65**	**cu.mt.**
		4	2.46	0.23	0.45	**1.02**	**cu.mt.**
	short wall	12	3.00	0.23	0.45	**3.73**	**cu.mt.**
		2	1.50	0.23	0.45	**0.31**	**cu.mt.**

		2	3.00	0.23	0.45	**0.62**	**cu.mt.**
	Brick masonry in Super structure						
	Long wall	4	13.65	0.23	1.75	**21.98**	**cu.mt.**
		4	2.46	0.23	2.55	**5.77**	**cu.mt.**
	short wall	12	3.00	0.23	1.25	**10.35**	**cu.mt.**
		2	1.50	0.23	2.25	**1.55**	**cu.mt.**
		2	3.00	0.23	2.25	**3.11**	**cu.mt.**
	Fruit stall	5	3.93	0.12	1.20	**2.71**	**cu.mt.**
	GROSS Brick masonary					**95.45**	**cu.mt.**
	Deduction						
	D1	2	0.75	0.23	2.10	0.72	cu.mt.
	v1	2	2.00	0.23	0.60	0.55	cu.mt.
			total deduction			**1.28**	cu.mt.
	Net brick masonry in super structure					**94.17**	cu.mt.
4	**RCC work**						
	Raft of fruit stall	5	3.93	0.12	0.20	**0.47**	**cu.mt.**
	on plinth area	2	3.23	13.65	0.10	**8.82**	**cu.mt.**
	Toilet (G)	1	3.00	2.00	0.10	**0.60**	**cu.mt.**
	Toilet (L)	1	3.00	2.00	0.10	**0.60**	**cu.mt.**
	toilets slab	2	4.14	2.92	0.125	**3.02**	**cu.mt.**
	Total concrete work					13.04	**cu.mt.**
5	**Murum filling in plinth**						
	stalls	10	3.23	11.81	0.45	**171.66**	**cu.mt.**
	Toilet (G)	1	3.00	2.00	0.45	**2.70**	**cu.mt.**
	Toilet (L)	1	3.00	2.00	0.45	**2.70**	**cu.mt.**
	Total Murum filling in plinth					177.06	**cu.mt.**
6	**D.P.C. on plinth beam**						
	Long wall	4	13.65	0.23		**12.56**	**sq.mt.**
		4	2.46	0.23		**2.26**	**sq.mt.**
	short wall	12	3.00	0.23		**8.28**	**sq.mt.**
		2	1.50	0.23		**0.69**	**sq.mt.**

		2	3.00	0.23		**1.38**	**sq.mt.**
	total D.P.C. on plinth beam					**12.61**	**sq.mt.**
7	**Internal plaster**						
	stall	20	3.23		1.25	80.75	**sq.mt.**
		10	3.00		1.98	59.40	**sq.mt.**
	toilets	4	3.00		2.10	25.20	**sq.mt.**
		4	2.00		2.10	16.80	**sq.mt.**
	Sealing plaster						
	toilets	2	3.00	2.00		12.00	**sq.mt.**
	Gross Internal plaster					**194.15**	**sq.mt.**
	both side plaster is same so the deduction will be calculated only one side						
	Deduction						
	D1	1	1.00		2.10	2.10	**sq.mt.**
	V1	2	2.00		0.60	2.40	**sq.mt.**
	total deduction					**4.50**	**sq.mt.**
	Total Internal plaster					**189.65**	**sq.mt.**
8	**External plaster including parapet inside plaster**						
	left side wall	2	13.65		2.30	62.79	**sq.mt.**
		2	2.92				
	front side wall	2	1.73		4.43	15.33	**sq.mt.**
		2	3.00		1.67		
	rigth side wall	2	2.23		4.43		
	back side wall	2	4.14		4.43	36.68	**sq.mt.**
	Total external plaster					**114.80**	**sq.mt.**
9	**Tiles work**						
	Floor Tiles						
	VEGETABLE STALL	5	3.23	2.50		40.38	**sq.mt.**
	FISH STALL	5	2.27	2.00		22.70	**sq.mt.**
	FRUIT STALL	5				29.68	**sq.mt.**
	toilets	2	3.00	2.00		12.00	**sq.mt.**
	Total floor tiles					**104.76**	**sq.mt.**

10	**Wall Tiles**						
	Both toilets	4	3.00	2.10		25.20	**sq.mt.**
		4	2.00	2.10		16.80	**sq.mt.**
	Total					**42.00**	**sq.mt.**
	Diduction						
	d4	2	1.00		2.10	4.20	sq.mt.
	v1	2	2.00		0.60	2.40	sq.mt.
	Total diduction					**6.60**	**sq.mt.**
	Net Wall Tiles					**35.40**	**sq.mt.**
11	**Alumium doors & windows & steel door**						
	D1	2	1.00		2.10	4.20	**sq.mt.**
	v1	2	2.00		0.60	2.40	**sq.mt.**
	Total area of Alumium doors & windows					**6.60**	**sq.mt.**
12	**Total intermal Color work**						
	Internal Color work same as internal plaster work					**189.65**	**sq.mt.**
13	**Total Extermal Color work**						
	External color work same as external plaster work					**114.80**	**sq.mt.**
14	**Quantity of Steel**						
	Assuming (HYSD & MILD STELL) 1.2% steel of 1cu.mt. concrete work					**1228.38**	**kg.**
15	**Safety grill and elevation pipes**	lumpsum				**8000.00**	**kg.**

ABSTRACT SHEET OF VEGETABLE MARKET						
SR. NO.	**DISCRIPTION**	**QTY.**	**PER**	**RATE**	**PER**	**TOTAL AMOUNT**
1	Excavation for foundation upto 1.5 m depth includingExcavation 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.(A)Loose or soft soil sr.no.1, Item coad.04B00 1A, tem no.as per NBO.0, SOR PAGE.NO.41(R & B SOR 2015-16 Bhavnagar)	123.26	CU.MT.	119.00	CU.MT.	Rs 14,667.94
2	PCC : Providing and laying cement concrete 1:3:6 (1-Cement : 3-coarse sand : 6- hand broken stone aggregates 40mm nominal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton) sr.no.5, Item coad.5003,Item no.as per NBO.5.3.2,SOR PAGE.NO.47(R & B SOR 2015-16 Bhavnagar)	15.41	CU.MT.	2255.00	CU.MT.	Rs 34,749.55
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 1:6 (1-Cement :6 -fine sand)(A) Modular (upto 10 ton. sr.no.7,Item coad.06002 A,Item no.as per NBO.6.13,SOR PAGE.NO.68 (R & B SOR 2015-16 Bhavnagar)	94.17	CU.MT.	3114.00	CU.MT.	Rs 293,245.38
4	RCC WORK: Providing and laying ordinary cement concrete 1:2:4 (1-Cement 2- coarse sand : 4- graded stone aggregates 20mm nominal size) exposed work with curing etc.complete including the cost of formwork but excluding the cost of reinforsement for R.C.C work in (iv)Footing having more than 15 cm. thicknes sr.no.100, Item coad.05028 D,Item no.as per NBO.0,SOR PAGE.NO.59 (R & B SOR 2015-16 Bhavnagar)	13.04	CU.MT.	3800.00	CU.MT.	Rs 49,552.00

5	2cm (3/4") thick damp proof course withcement and approved coarse sand 1:2 with and including water proofing materials as ordered by the Engineer in charge in the proportion as specified by the manufacturers including supply of allmaterial, labour and T&P etc. required forproper completion of the work including proper curing and shuttering as necessary.	12.61	SQ.MT.	200.00	SQ.MT.	Rs 2,522.00
6	INTERNAL PLASTER : Providing 15mm thick cement plaster in single coat on Rough (Similar)side of 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, sr.no.4, Item coad.17002 A, Item no.as per NBO.17.6 SOR PAGE.NO.132 (R & B SOR 2015-16 Bhavnagar)	189.65	SQ.MT.	117.00	SQ.MT.	Rs 22,189.05
7	EXTERNALPLASTER : 20 mm thick sand faced cement plaster on walls. At all heights above ground level consisting of 12 mm thick backing coat of C.M. 1:3 (1 cement : 3 sand) and 8 mm thick finishing coat of C.M. 1:1 (1 cement : 1 sand) etc. complete. sr.no.9, Item coad.17003 B, item no.as per NBO.17.25, SOR PAGE.NO.133 (R & B SOR 2015-16 Bhavnagar)	114.80	SQ.MT.	150.00	SQ.MT.	Rs 17,220.00
8	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. (upto10 ton) sr.no.19, Item coad.14008 C, Item no.as per NBO.14.29(C1) SOR PAGE.NO.121 (R & B SOR 2015-16 Bhavnagar)	104.76	SQ.MT.	761.00	SQ.MT.	Rs 79,722.36

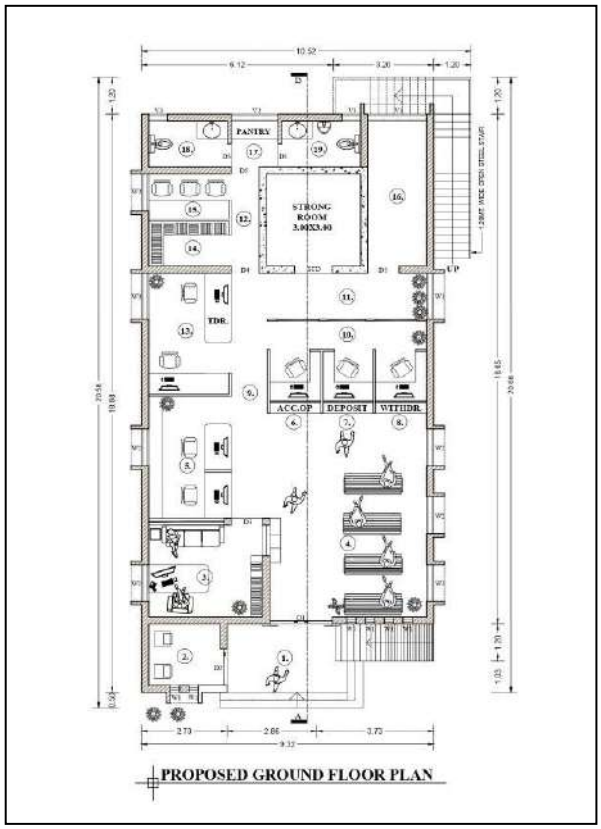
9	Providing and laying coloured glazed tiles of the size 300mm x 200 mm x 8 mm / 300 mm x 450 mm x 8 mm in skirting, risers of steps and dedo on 10 mm. thick cement plaster 1:3 (1 cement : 3 coarse sand) & jointed with white cement slurry. sr.no.38,Item coad.14036, SOR PAGE.NO.125 (R & B SOR 2015-16 Bhavnagar)	35.40	SQ.MT.	891.00	SQ.MT.	Rs 31,541.40
10	Aluminium doors and windowsProviding and fixing extruded aluminum window having extruded aluminum Colour anodized section frame main outer size 127mm x 38.10mm x 1.35mm (of Jindal Section no:2443,@ Wt.1.384 Kg/mt),horizontal Four track member size 122.20mm x 31.75mm x 1.10mm (of Jindal Section no:8787,@ Wt. 1.205 Kg/mt),vertical member of size 122.20mm x 31.75mm x 1.50mm (of Jindal Section no:8935,@ Wt. 1.398 Kg/mt) with sliding shutters of horizontal member size 40mm x 18mm x 1.29mm (of Jindal Section no:8949 @ wt.of .456Kg/mt),verticalmember of size 40mm x 18mm x 1.29mm (of Jindal Section no:8947 @ wt.of 0.456Kg/mt/Section 8948,@ Wt. 0.457 Kg/mt) with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminum fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc complete for window. sr.no.19 item coad.11026, (R & B SOR 2015-16 Bhavnagar)	6.60	SQ.MT.	3500.00	SQ.MT.	Rs 23,100.00

11	Applying two coats of Birla (white cement based) or Asian (acrylic lapy- putty) or equivalent & two coats of primer ofapproved brand and manufacture on new wall surface to give an even shade including thoroughly brushing thesurface free from mortar dropping and other foreign matter and sand papered smooth.sr.no.35 Item coad.19035,Item no.as per NBO.- SOR PAGE.NO.141 (R & B SOR 2015-16 Bhavnagar)	189.65	SQ.MT.	47.00	SQ.MT.	Rs 8,913.55
12	Finishing wall with weather proof exterior emulsion paint on wall surface (two coats) to give an required shape even shade after thoroughly brushing the surface to remove all dirt, and remains of loose powdered materials.etc complete. sr.no.34 Item coad.19031,Item no.as per NBO.- SOR PAGE.NO.141 (R & B SOR 2015-16 Bhavnagar)	114.80	SQ.MT.	72.00	SQ.MT.	Rs 8,265.60
13	Iron fabrication work for iron steel truss including cuttig welding placing on site with 1 coat of primer & 2 coat of industrial oil paint etc complete	6500.00	Kg.	85.00	Kg.	Rs 552,500.00
	TOTAL					**Rs 1,138,188.83**
14	Add 3% contigenceies		0.03			Rs 34,145.66
15	Add 5% Work charged establishment		0.05			Rs 56,909.44
16	Add 8% plumbing &Sanitory work		0.08			Rs 91,055.11
17	Add 8% Electrification		0.08			Rs 91,055.11
	GRAND TOTAL					Rs 1,411,354.15
					SAY	**Rs 1,411,350.00**
	RUPEES FORTY LAKHS ELEVEN THOUSAND THREE HUNDRED FIFTY ONLY.					

8.1.5 Smart Village Design (Civil)

BANK

Figure 8.1.5.1 3D View of Bank



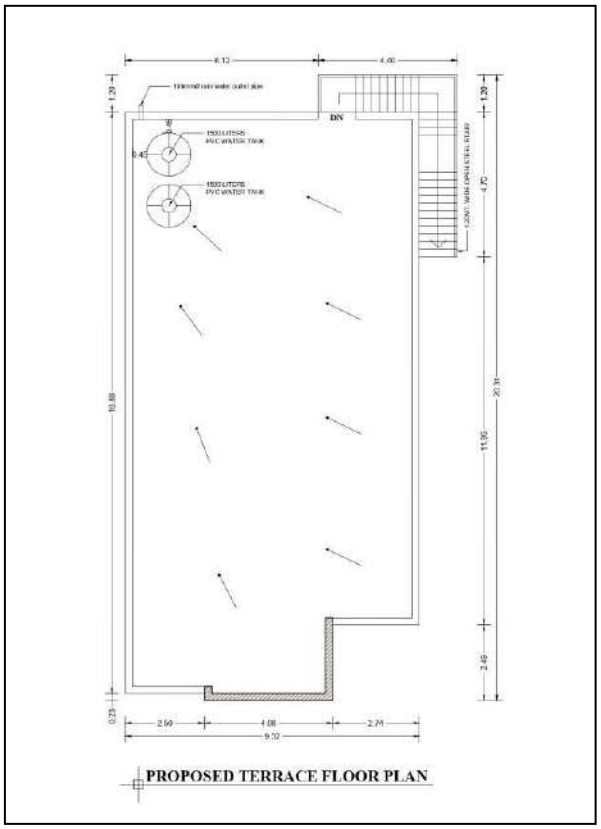


Figure 8.1.5.2 Ground Floor Plan of BankFigure 8.1.5.3 First Floor Plan of Bank

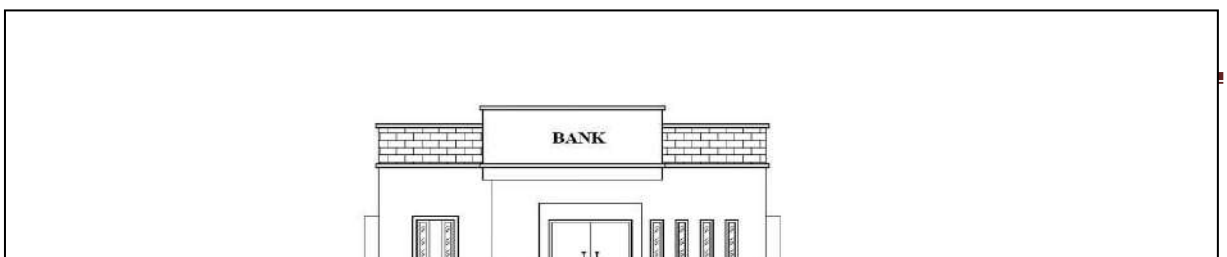


Figure 8.1.5.4Elevation & Section of Bank

QUANTITY SHEET OF BANK							
SR. NO.	**DISCRIPTION**	**NOS.**	**Length (L)**	**Width (W)**	**Depth (H)**	**Total**	**Unit**
1	**Excavation in foundation**						
	LONG WALL SHAORT WALL						
	Long wall	2	19.65	1.00	1.50	**58.95**	**cu.mt.**
		2	2.62	1.00	1.50	**7.85**	**cu.mt.**
		2	2.23	1.00	1.50	**6.69**	**cu.mt.**
		3	0.73	1.00	1.50	**3.29**	**cu.mt.**
	short wall	4	9.32	1.00	1.50	**55.92**	**cu.mt.**
		1	4.25	1.00	1.50	**6.37**	**cu.mt.**
		1	1.50	1.00	1.50	**2.25**	**cu.mt.**
	Total excavaion					**141.31**	**cu.mt.**
2	**P.C.C. In Foundation**						
	Long wall	2	19.65	1.00	0.15	**5.90**	**cu.mt.**
		2	2.62	1.00	0.15	**0.78**	**cu.mt.**
		2	2.23	1.00	0.15	**0.67**	**cu.mt.**
		3	0.73	1.00	0.15	**0.33**	**cu.mt.**
	short wall	4	9.32	1.00	0.15	**5.59**	**cu.mt.**
		1	4.25	1.00	0.15	**0.64**	**cu.mt.**
		1	1.50	1.00	0.15	**0.23**	**cu.mt.**
	Total P.C.C.					**14.13**	**cu.mt.**
3	**Brick masonry**						
	Brick masonry in foundation						
	LONG WALL SHAORT WALL						
	FOOTING NO 1						
	LONG WALL SHAORT WALL						
	Long wall	2	19.35	0.70	0.45	**12.19**	**cu.mt.**
		2	2.47	0.70	0.45	**1.55**	**cu.mt.**
		2	2.53	0.70	0.45	**1.59**	**cu.mt.**
		3	1.03	0.70	0.45	**0.97**	**cu.mt.**
	short wall	4	9.32	0.70	0.45	**11.74**	**cu.mt.**
		1	4.10	0.70	0.45	**1.29**	**cu.mt.**
		1	1.80	0.70	0.45	**0.57**	**cu.mt.**
	FOOTING NO 2						
	LONG WALL SHAORT WALL						
	Long wall	2	19.15	0.50	0.45	**8.62**	**cu.mt.**
		2	2.37	0.50	0.45	**1.06**	**cu.mt.**

		2	2.73	0.50	0.45	**1.23**	**cu.mt.**
		3	1.23	0.50	0.45	**0.83**	**cu.mt.**
	short wall	4	9.32	0.50	0.45	**8.39**	**cu.mt.**
		1	4.00	0.50	0.45	**0.90**	**cu.mt.**
		1	2.00	0.50	0.45	**0.45**	**cu.mt.**
	FOOTING NO 3						
	LONG WALL SHAORT WALL						
	Long wall	2	18.95	0.30	0.45	**5.12**	**cu.mt.**
		2	2.27	0.30	0.45	**0.61**	**cu.mt.**
		2	2.93	0.30	0.45	**0.79**	**cu.mt.**
		3	1.43	0.30	0.45	**0.58**	**cu.mt.**
	short wall	4	9.32	0.30	0.45	**5.03**	**cu.mt.**
		1	3.90	0.30	0.45	**0.53**	**cu.mt.**
		1	2.20	0.30	0.45	**0.30**	**cu.mt.**
	Brick masonry in Plinth						
	LONG WALL SHAORT WALL						
	Long wall	2	18.88	0.23	0.30	**2.61**	**cu.mt.**
		2	2.23	0.23	0.30	**0.31**	**cu.mt.**
		2	2.54	0.23	0.30	**0.35**	**cu.mt.**
		3	1.04	0.23	0.30	**0.22**	**cu.mt.**
	short wall	4	9.09	0.23	0.30	**2.51**	**cu.mt.**
		1	3.44	0.23	0.30	**0.24**	**cu.mt.**
		1	1.81	0.23	0.30	**0.12**	**cu.mt.**
	Brick masonry in Super structure						
	LONG WALL SHAORT WALL						
	Long wall	2	18.88	0.23	3.21	**27.88**	**cu.mt.**
		2	2.23	0.23	3.21	**3.29**	**cu.mt.**
		2	2.54	0.23	3.21	**3.75**	**cu.mt.**
		3	1.04	0.23	3.21	**2.30**	**cu.mt.**
	short wall	4	9.09	0.23	3.21	**26.84**	**cu.mt.**
		1	3.44	0.23	3.21	**2.54**	**cu.mt.**
		1	1.81	0.23	3.21	**1.34**	**cu.mt.**
	PARAPET						
	LONG WALL SHAORT WALL						
	Long wall	1	18.88	0.23	1.10	**4.78**	**cu.mt.**
		1	16.65	0.23	1.10	**4.21**	**cu.mt.**
		1	2.23	0.23	1.50	**0.77**	**cu.mt.**
		1	0.46	0.23	1.50	**0.16**	**cu.mt.**
	short wall	1	2.27	0.23	1.10	**0.57**	**cu.mt.**
		1	3.62	0.23	1.50	**1.25**	**cu.mt.**

		1	2.51	0.23	1.10	**0.64**	**cu.mt.**
		1	8.86	0.23	1.10	**2.24**	**cu.mt.**
	GROSS Brick masonary					**153.25**	**cu.mt.**
	Deduction						
	D1	1	2.00	0.23	2.10	0.97	cu.mt.
	D2	1	1.20	0.23	2.10	0.58	cu.mt.
	D3	2	1.00	0.23	2.10	0.97	cu.mt.
	D4	2	0.90	0.23	2.10	0.87	cu.mt.
	D5	2	0.75	0.23	2.10	0.72	cu.mt.
	STD.	1	1.20	0.23	2.10	0.58	cu.mt.
	V1	1	1.87	0.23	0.60	0.26	cu.mt.
	V2	1	1.50	0.23	0.60	0.21	cu.mt.
	V3	2	0.60	0.23	0.60	0.17	cu.mt.
			total deduction			**5.32**	cu.mt.
	Net brick masonry in super structure					**147.94**	cu.mt.
4	**RCC work**						
	Plinth beam concrete						
	Long wall	1	18.88	0.23	0.30	**1.30**	**cu.mt.**
		1	16.65	0.23	0.30	**1.15**	**cu.mt.**
		1	2.23	0.23	0.30	**0.15**	**cu.mt.**
		1	0.46	0.23	0.30	**0.03**	**cu.mt.**
		1	2.27	0.23	0.30	**0.16**	**cu.mt.**
	short wall	1	3.62	0.23	0.30	**0.25**	**cu.mt.**
		1	2.51	0.23	0.30	**0.17**	**cu.mt.**
		1	8.86	0.23	0.30	**0.61**	**cu.mt.**
	LINTEL AND CHAJJA concrete						
	Long wall	1	18.88	0.23	0.30	**1.30**	**cu.mt.**
		1	16.65	0.23	0.30	**1.15**	**cu.mt.**
		1	3.00	0.23	0.30	**0.21**	**cu.mt.**
		1	2.00	0.23	0.30	**0.14**	**cu.mt.**
		1	2.27	0.23	0.30	**0.16**	**cu.mt.**
		3	3.00	0.23	0.30	**0.62**	**cu.mt.**
		3	1.50	0.23	0.30	**0.31**	**cu.mt.**
	short wall	4	8.86	0.23	0.30	**2.45**	**cu.mt.**
		1	2.27	0.23	0.30	**0.16**	**cu.mt.**
		1	3.63	0.23	0.30	**0.25**	**cu.mt.**
	CHAJJA CONCRETE						

	W1	1	1.07	0.35	0.10	**0.04**	**cu.mt.**
	W2	6	1.43	0.35	0.10	**0.30**	**cu.mt.**
	W3	2	1.73	0.35	0.10	**0.12**	**cu.mt.**
	V1	1	2.33	0.35	0.10	**0.08**	**cu.mt.**
	main slab beam						
	Long wall	4	18.88	0.23	0.30	**5.21**	**cu.mt.**
		1	16.65	0.23	0.30	**1.15**	**cu.mt.**
		1	2.00	0.23	0.30	**0.14**	**cu.mt.**
	short wall	6	8.86	0.23	0.30	**3.67**	**cu.mt.**
		1	2.27	0.23	0.30	**0.16**	**cu.mt.**
	SRONG ROOM CONCRETE						
	LONG WALL	2	3.00	0.23	3.31	**4.57**	**cu.mt.**
		2	2.54	0.23	3.21	**3.75**	**cu.mt.**
	main slab beam	1	9.32	16.65	0.125	**19.40**	**cu.mt.**
		1	6.58	2.46	0.125	**2.02**	**cu.mt.**
		1	4.08	0.23	0.125	**0.12**	**cu.mt.**
	Total concrete work					51.28	**cu.mt.**
5	**Murum filling in plinth**						
	Entrance	1	3.62	2.23	0.50	4.04	cu.mt.
	atm kiosk	1	2.27	2.00	0.50	2.27	cu.mt.
	manger cabin	1	3.63	3.00	0.50	5.45	cu.mt.
	waiting, and other cabins	1	5.00	11.23	0.50	28.08	cu.mt.
		1	3.86	8.00	0.50	15.44	cu.mt.
	staf dining and stationary	1	3.53	3.00	0.50	5.30	cu.mt.
	strong room	1	3.00	3.00	0.50	4.50	cu.mt.
	electric room	2	1.87	4.73	0.50	8.85	cu.mt.
	toilets	2	2.52	1.50	0.50	3.78	cu.mt.
	pantry	1	1.50	1.50	0.50	1.13	cu.mt.
	Total Murum filling in plinth					**78.81**	cu.mt.
6	**P.C.C at plinth level**						
	Entrance	1	3.62	2.23	0.10	0.81	cu.mt.
	atm kiosk	1	2.27	2.00	0.10	0.45	cu.mt.
	manger cabin	1	3.63	3.00	0.10	1.09	cu.mt.
	waiting, and other cabins	1	5.00	11.23	0.10	5.62	cu.mt.

		1	3.86	8.00	0.10	3.09	cu.mt.
	staf dining and stationary	1	3.53	3.00	0.10	1.06	cu.mt.
	strong room	1	3.00	3.00	0.10	0.90	cu.mt.
	electric room	2	1.87	4.73	0.10	1.77	cu.mt.
	toilets	2	2.52	1.50	0.10	0.76	cu.mt.
	pantry	1	1.50	1.50	0.10	0.23	cu.mt.
	Total Murum filling in plinth					**15.76**	cu.mt.
7	**D.P.C. on plinth beam**						
	Long wall	1	18.88	0.23		**4.34**	**sq.mt.**
		1	16.65	0.23		**3.83**	**sq.mt.**
		1	2.23	0.23		**0.51**	**sq.mt.**
		1	0.46	0.23		**0.11**	**sq.mt.**
		1	2.27	0.23		**0.52**	**sq.mt.**
	short wall	1	3.62	0.23		**0.83**	**sq.mt.**
		1	2.51	0.23		**0.58**	**sq.mt.**
		1	8.86	0.23		**2.04**	**sq.mt.**
	total D.P.C. on plinth beam					**12.76**	cu.mt.
8	**Internal plaster**						
	A.T.M. KIOSK	2	2.27		3.56	16.16	**sq.mt.**
		2	2.00		3.56	14.24	**sq.mt.**
	Maneger cabin	2	3.63		3.56	25.85	**sq.mt.**
		2	3.00		3.56	21.36	**sq.mt.**
	waiting hall and other chanbers	2	8.86		3.56	63.08	**sq.mt.**
		2	11.23		3.56	79.96	**sq.mt.**
	strong room	2	3.00		3.56	21.36	**sq.mt.**
		2	3.00		3.56	21.36	**sq.mt.**
	dining & stationary	2	3.53		3.56	25.13	**sq.mt.**
		2	3.00		3.56	21.36	**sq.mt.**
	electric room room	2	1.87		3.56	13.31	**sq.mt.**
		2	4.73		3.56	33.68	**sq.mt.**
	toilets	4	2.52		3.56	35.88	**sq.mt.**
		4	1.50		3.56	21.36	**sq.mt.**
	pantry	2	1.50		3.56	8.01	**sq.mt.**
		2	1.50		3.56	8.01	**sq.mt.**
	Sealing plaster						
	Verandah	1	3.85	2.23		8.59	**sq.mt.**
	ATM Kiosk	1	2.27	2.00		4.54	**sq.mt.**

	Weiting& Manger cabin	1	8.86	11.23		99.50	**sq.mt.**
	Trong Room	1	3.00	3.00		9.00	**sq.mt.**
	Dining & Stationary	1	3.00	4.88		14.64	**sq.mt.**
	Electrick room	1	1.87	4.73		8.85	**sq.mt.**
	Toilets	2	2.52	1.50		7.56	**sq.mt.**
	Pantry	1	1.50	1.50		2.25	**sq.mt.**
	Gross Internal plaster					**585.04**	**sq.mt.**
	both side plaster is same so the deduction will be calculated only one side						
	Deduction						
	D1	1	2.00		2.10	4.20	**sq.mt.**
	D2	1	1.20		2.10	2.52	**sq.mt.**
	D3	2	1.00		2.10	4.20	**sq.mt.**
	D4	2	0.90		2.10	3.78	**sq.mt.**
	D5	2	0.75		2.10	3.15	**sq.mt.**
	STD.	1	1.20		2.10	2.52	**sq.mt.**
	V1	1	1.87		0.60	1.12	**sq.mt.**
	V2	1	1.50		0.60	0.90	**sq.mt.**
	V3	2	0.60		0.60	0.72	**sq.mt.**
	total deduction					**23.11**	**sq.mt.**
	Total Internal plaster					**561.93**	**sq.mt.**
9	**External plaster including parapet inside plaster**						
	left side wall	1	18.88		6.69	126.31	**sq.mt.**
	front side wall	1	9.32		6.69	62.35	**sq.mt.**
	rigth side wall	1	18.88		6.69	126.31	**sq.mt.**
	back side wall	1	9.32		6.69	62.35	**sq.mt.**
	Total external plaster					**377.32**	**sq.mt.**
10	**Tiles work**						
	Floor Tiles						
	Verandah	1	3.85	2.23		8.59	**sq.mt.**
	ATM Kiosk	1	2.27	2.00		4.54	**sq.mt.**
	Weiting& Manger cabin	1	8.86	11.23		99.50	**sq.mt.**
	Trong Room	1	3.00	3.00		9.00	**sq.mt.**
	Dining & Stationary	1	3.00	4.88		14.64	**sq.mt.**
	Electrick room	1	1.87	4.73		8.85	**sq.mt.**

	Toilets	2	2.52	1.50		7.56	**sq.mt.**
	Pantry	1	1.50	1.50		2.25	**sq.mt.**
	umras of door						
	D1	1	2.00	0.23		0.46	**sq.mt.**
	D2	1	1.20	0.23		0.28	**sq.mt.**
	D3	2	1.00	0.23		0.46	**sq.mt.**
	D4	2	0.90	0.23		0.41	**sq.mt.**
	D5	2	0.75	0.12		0.18	**sq.mt.**
	STD.	1	1.20	0.23		0.28	**sq.mt.**
	TERRACE FLOOR TILES	1	8.86	16.19		143.44	**sq.mt.**
		1	6.12	2.23		13.65	**sq.mt.**
		1	3.62	0.23		0.83	**sq.mt.**
	Total floor tiles					**314.91**	**sq.mt.**
11	**Wall Tiles**						
	Both toilets	4	1.50	2.20		13.20	**sq.mt.**
		4	2.52	2.20		22.18	**sq.mt.**
	pantry	1	1.50	2.20		3.30	**sq.mt.**
	Total					**38.68**	**sq.mt.**
	Diduction						
	d4	2	0.75		2.10	3.15	sq.mt.
	v2	2	1.50		0.60	1.80	sq.mt.
	v3	2	0.60		0.60	0.72	sq.mt.
	Total diduction					**4.95**	**sq.mt.**
	Net Wall Tiles					**33.73**	**sq.mt.**
12	**Alumium doors & windows & steel door**						
	D1	1	2.00		2.10	4.20	**sq.mt.**
	D2	1	1.20		2.10	2.52	**sq.mt.**
	D3	2	1.00		2.10	4.20	**sq.mt.**
	D4	2	0.90		2.10	3.78	**sq.mt.**
	D5	2	0.75		2.10	3.15	**sq.mt.**
	STD.	1	1.20		2.10	2.52	**sq.mt.**
	V1	1	1.87		0.60	1.12	**sq.mt.**
	V2	1	1.50		0.60	0.90	**sq.mt.**
	V3	2	0.60		0.60	0.72	**sq.mt.**

	Total area of Alumium doors & windows					**23.11**	**sq.mt.**
13	**Total intermal Color work**						
	Internal Color work same as internal plaster work					**561.93**	**sq.mt.**
14	**Total External Color work**						
	External color work same as external plaster work					**377.32**	**sq.mt.**
15	**Quantity of Steel**						
	asuming(HYSD & MILD STELL) 1.2% steel of 1cu.mt. concrete work					**4830.99**	**kg.**
16	**Safety grill and elevation pipes**	lumpsum				**2000.00**	**kg.**

ABSTRACT SHEET OF BANK						
SR. NO.	**DISCRIPTION**	**QTY.**	**PER**	**RATE**	**PER**	**TOTAL AMOUNT**
1	Excavation for foundation upto 1.5 m depth includingExcavation 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.(A)Loose or soft soil sr.no.1, Item coad.04B00 1A, tem no.as per NBO.0, SOR PAGE.NO.41(R & B SOR 2015-16 Bhavnagar)	141.31	CU.MT.	119.00	CU.MT.	Rs 16,815.89
2	PCC : Providing and laying cement concrete 1:3:6 (1-Cement : 3-coarse sand : 6- hand broken stone aggregates 40mm nominal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton) sr.no.5, Item coad.5003,Item no.as per NBO.5.3.2,SOR PAGE.NO.47(R & B SOR 2015-16 Bhavnagar)	14.13	CU.MT.	2255.00	CU.MT.	Rs 31,863.15
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 1:6 (1-Cement :6 -fine sand)(A) Modular (upto 10 ton. sr.no.7,Item coad.06002 A,Item no.as per NBO.6.13,SOR PAGE.NO.68 (R & B SOR 2015-16 Bhavnagar)	147.94	CU.MT.	3114.00	CU.MT.	Rs 460,685.16
4	RCC WORK: Providing and laying ordinary cement concrete 1:2:4 (1-Cement 2- coarse sand : 4- graded stone aggregates 20mm nominal size) exposed work with curing etc.complete including the cost of formwork but excluding the cost of reinforsement for R.C.C work in (iv)Footing having more than 15 cm. thicknes sr.no.100, Item coad.05028 D,Item no.as per NBO.0,SOR PAGE.NO.59 (R & B SOR 2015-16 Bhavnagar)	51.28	CU.MT.	3800.00	CU.MT.	Rs 194,864.00

5	2cm (3/4") thick damp proof course withcement and approved coarse sand 1:2 with and including water proofing materials as ordered by the Engineer in charge in the proportion as specified by the manufacturers including supply of allmaterial, labour and T&P etc. required for proper completion of the work includingproper curing and shuttering as necessary.	12.76	SQ.MT.	200.00	SQ.MT.	Rs 2,552.00
6	INTERNAL PLASTER : Providing 15mm thick cement plaster in single coat on Rough (Similar)side of 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, sr.no.4, Item coad.17002 A, Item no.as per NBO.17.6 SOR PAGE.NO.132 (R & B SOR 2015-16 Bhavnagar)	561.93	SQ.MT.	117.00	SQ.MT.	Rs 65,745.81
7	EXTERNALPLASTER : 20 mm thick sand faced cement plaster on walls. At all heights above ground level consisting of 12 mm thick backing coat of C.M. 1:3 (1 cement : 3 sand) and 8 mm thick finishing coat of C.M. 1:1 (1 cement : 1 sand) etc. complete. sr.no.9, Item coad.17003 B, item no.as per NBO.17.25, SOR PAGE.NO.133 (R & B SOR 2015-16 Bhavnagar)	377.32	SQ.MT.	150.00	SQ.MT.	Rs 56,598.00
8	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. (upto10 ton) sr.no.19, Item coad.14008 C, Item no.as per NBO.14.29(C1) SOR PAGE.NO.121 (R & B SOR 2015-16 Bhavnagar)	314.44	SQ.MT.	761.00	SQ.MT.	Rs 239,288.84

9	Providing and laying coloured glazed tiles of the size 300mm x 200 mm x 8 mm / 300 mm x 450 mm x 8 mm in skirting, risers of steps and dedo on 10 mm. thick cement plaster 1:3 (1 cement : 3 coarse sand) & jointed with white cement slurry. sr.no.38,Item coad.14036, SOR PAGE.NO.125 (R & B SOR 2015-16 Bhavnagar)	33.73	SQ.MT.	891.00	SQ.MT.	Rs 30,053.43
10	Aluminium doors and windowsProviding and fixing extruded aluminum window having extruded aluminum Colour anodized section frame main outer size 127mm x 38.10mm x 1.35mm (of Jindal Section no:2443,@ Wt.1.384 Kg/mt),horizontal Four track member size 122.20mm x 31.75mm x 1.10mm (of Jindal Section no:8787,@ Wt. 1.205 Kg/mt),vertical member of size 122.20mm x 31.75mm x 1.50mm (of Jindal Section no:8935,@ Wt. 1.398 Kg/mt) with sliding shutters of horizontal member size 40mm x 18mm x 1.29mm (of Jindal Section no:8949 @ wt.of .456Kg/mt),verticalmember of size 40mm x 18mm x 1.29mm (of Jindal Section no:8947 @ wt.of 0.456Kg/mt/Section 8948,@ Wt. 0.457 Kg/mt) with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminum fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc complete for window. sr.no.19 item coad.11026, (R & B SOR 2015-16 Bhavnagar)	23.11	SQ.MT.	3500.00	SQ.MT.	Rs 80,885.00

11	Applying two coats of Birla (white cement based) or Asian (acrylic lapy- putty) or equivalent & two coats of primer ofapproved brand and manufacture on new wall surface to give an even shade including thoroughly brushing thesurface free from mortar dropping and other foreign matter and sand papered smooth.sr.no.35 Item coad.19035, Item no.as per NBO.- SOR PAGE.NO.141 (R & B SOR 2015-16 Bhavnagar)	561.93	SQ.MT.	47.00	SQ.MT.	Rs 26,410.71
12	Finishing wall with weather proof exterior emulsion paint on wall surface (two coats) to give an required shape even shade after thoroughly brushing the surface to remove all dirt, and remains of loose powdered materials.etc complete, sr.no.34 Item coad.19031, Item no.as per NBO.- SOR PAGE.NO.141 (R & B SOR 2015-16 Bhavnagar)	377.32	SQ.MT.	72.00	SQ.MT.	Rs 27,167.04
13	Iron fabrication work for SAFETY GRIL including cuttig welding placing on site with 1 coat of primer & 2 coat of industrial oil paint etc complete	2000.00	Kg.	80.00	Kg.	Rs 160,000.00
	TOTAL					**Rs1,392,929.03**
14	Add 3% contigenceies		0.03			Rs 41,787.87
15	Add 5% Work charged establishment		0.05			Rs 69,646.45
16	Add 20% plumbing &Sanitory work		0.20			Rs 278,585.81
17	Add 20% Electrification		0.20			Rs 278,585.81
	GRAND TOTAL					Rs 2,061,534.96
					SAY	**Rs2,061,500.00**
	RUPEES TWENTY LAKHS SIXTY ONE THOUSAND FIVE HUNDRED ONLY.					

8.1.6 Electrical Design 1

STREET LIGHTING

STREETLIGHTING

The rate of highway accidents and facilities that occur during night driving is considerably higher than during day driving. Poor night visibility is one of the main causes of accident during nights. Highway lighting is particularly more important at intersections, bridge site, level crossings and place where there is restriction of traffic to movements.

Lighting on rural roads has yet not become common, evidently due to the cost consideration and less number of pedestrians and other slow traffic using the facility at night.

The main purpose of highway lighting is to reduce the uncertain of information. As long as the uncertain exists, the possible alternate decision cannot be fully evaluated.

❖ **Factors that influence night visibilityare:**

- Size ofobject
- Brightness ofobject
- Amount of distribution of light flux from thelamp
- Glare on the eyes of thedriver

❖ **Design factors for highway lighting:**

1. Lamps
2. contrast
3. Luminaries distribution oflight
4. Spacing of lightingunits
5. Height of overhang ofmounting
6. Lightinglayouts

❖ **BENEFITS OF HIGHWAYLIGHTING**

- Due to proper street lighting, the police can do better patrol during night and their job becomeseasy.
- It is a major source of beautification ofprojects.
- Reduction in accidents duringnight.
- It gives a pleasant atmosphere duringnight.

1. Lamps

The filament lamps are widely used as their initial cost is low.

- The lamps commonly used for highway lightning are:
  - I. Tungsten filament lamps
  - II. Sodium vapour lamps
  - III. Fluorescent lamps
  - IV. Mercury vapour lamps

2. **Contrast**

- Discrimination of differences of brightness between an object and
- its background
- Luminaries distribution of light
- It is necessary to have proper distribution of light.
- It should be aimed to achieve the following purposes.
- It should cover the pavement b/w the kerbs.
- It should make prominent the signs and other objects on theroad.
- .It should produce maximum uniformity of pavementbrightness.

3. **Height of overhang of mounting**

- Distribution of light, shadow, and glare depends on mounting
- height.(Ht. 6 to 10 m)

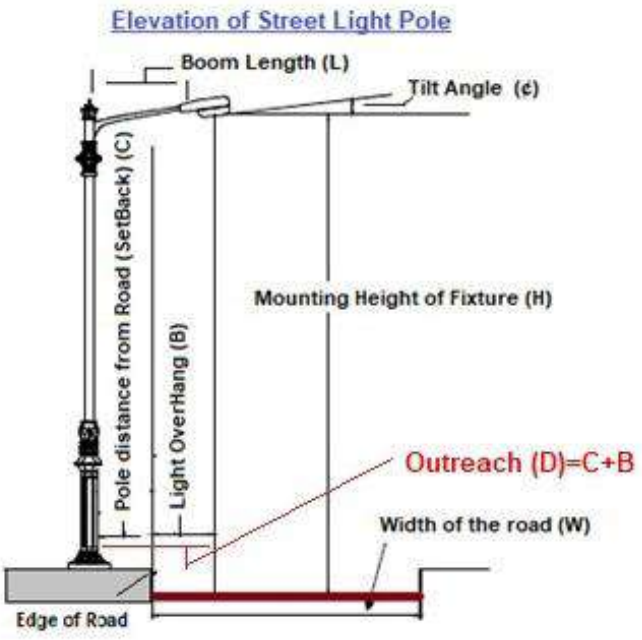


Figure 8.1.6.1 Details of street Pole

4. Lateral placement

The lighting poles should not be installed very close to pavement edge, because in that case, the capacity of the road way decreased and free movement of traffic is obstructed

5. Lighting layouts

Various types of layouts adopted for lightning poles on streets.

I. Single side lightning
II. Both side lightning
III. Both side lightning-staggered
IV. Central lightning

Solar Street Light:

A renewable resource is a natural resource which a replenish with the passage of time , Either through biological process or other naturally recurring process. They are part of earth's natural environment and the largest components of its ecosphere. They may be the source of power for renewable energy. They biofuel, biomass, geothermal, hydroelectricity, solar energy, tidal power, wave power, wind power etc.

Street lighting is an essential requirement in any place of a habitat for effective night activities on and around streets. They help business near the streets like tea shop, grocery shop, vegetable shop etc. and also facilitates traffic in villages particularly, they are extremely useful as most of the traffic consists of pedestrians, cyclists, bullock casts, tractors, etc. and business is low profile with small shops having illumination inside the shop only.It is therefore desirable to have such street lighting system which is sturdy,
durable, sufficiently bright, considerably independent and cost effective in terms of both installation and maintenance

Solar Street Lights are tested alternative to regular electric lights. They meet most of the requirements of an ideal street lighting. To make them more economical technological changes in bulbs and batteries need to be studied in greater detail.

Recent development in CFL (compact fluorescent lamp) & LED (light emitting diode) lighting has obliterated the use of incandescent bulbs even in regular use. Buying a simple light bulb is not so simple anymore. As technology has advanced and environmental awareness has increased, energy efficiency has become a paramount concern. It is common knowledge that choosing the right bulb could drastically reduce your power bills and positively affect the environment, but which one should be chosen? Understanding the differences between CFL, and LED light bulbs will make choosing a bulb simple. Incandescent bulbs are already out of competition due to very high electricity consumption.

There are two key terms pertaining to light bulbs: watts and lumens. A watt refers to the amount of energy required to power a bulb. With incandescent bulbs, the number of watts has become synonymous with the level of brightness, even though a watt really does not tell anything more than the amount of power necessary to light the bulb. Lumens, on the other hand, indicate the actual amount of light emitted by the bulb. For example, a typical incandescent 40W light bulb draws 40 watts of power and provides about 400 lumens of brightness. A CFL requires 9-13 watts and an LED light bulb uses 6-7 watts to provide the same amount of lumens.

EVALUATION OF VARIOUS OPTIONS:

1. CFLLamps:

Compact Fluorescent Lamps work by passing electricity through mercury vapour, which in turn produces ultraviolet light. The ultraviolet light is then absorbed by a phosphor coating inside the lamp, causing it to glow, or fluoresce. While the heat generated by fluorescent lamps is much less than its incandescent counterpart, energy is still lost in generating the ultraviolet light a converting this light into visible light. If the lamp breaks exposure to hazardous mercury can occur. Lifetime varies from 1,200 hours to 20,000 hours for compact fluorescent lamp

2. LED Lamps:

LED lamps are based on the semiconductor diode. When the diode is forward biased, electrons are able to recombine with holes and energy is released in the form of light. They usually comprise of clusters of LEDs in a suitable housing. They come in different shapes, including the standard light bulb shape with a large Spot LED lamps are also available in the well known PAR20, PAR30 and

PAR38 shapes. The distinct advantage of LED lies in their close working environment like stage, where the LED can be used safely due to less heat generated and cool touch. Being monochromatic, colored lights can be used without need of colored sheets. They are also useful due to instant lighting, no effect of weather, etc.

Figure 8.1.6.2 CFL Fitting &EdisonLmps

Light Output	Light Emitting Diodes (LEDs)	Compact Fluorescents (CFLs)
Lumens	**Watts**	**Watts**
450	4-5	9-13
800	6-8	13-15
1,100	9-13	18-25
1,600	16-20	23-30
2,600	25-28	30-55

Table 8.11 COMPARISION BETWEEN CFL & LED

OUTCOME OF COMPARISON:

From the above table it can be easily deducted that LED is more suitable alternative for providing solar street lighting, especially in villages, where maintenance is ratherdifficult

Some samples and specification of common LED bulbs:

Figure 8.1.6.3 Types of LED

Solar Street Light Luminaire	**LED 9 Watt - 13 Watt**	**CFL 18watt- 22 Watt**
Luminary Body	**Aluminum Die Cast**	**Plastic**
Battery	**Monocrystal 12 V ,42Amp**	
System Operating Voltage	**12v Dc**	
Led Used	**1w to 3w**	
Led	**SEOUL Semiconductor / OSRAM / CREE**	
Protections	**Provided Against Over Charge, Deep Discharge, Current Reverse Flow**	
No. Of Lumens Output	**320 Lumens + 5% Per Led**	
Driver Circuit Efficiey	**Above 90%**	
Hours Of Operations	**As Per Specification**	
Load Disconnect	**11.2 v 0.2 (Battery Voltage)**	
Load Reconnect	**12.5 v 0.2 (Battery Voltage)**	
Indicator	**Green LED- Charging Mode**	**Red LED- Low Battery**
Pole	**MS Paint/Powder Coating/ GI Pole with Corrosion Resistant**	
Module Mounting	**Ms Frame with Corrosion Resistant**	
Battery Box	**Ms Sheet /Plastic**	
Accessories	**As per requirement**	
Solar Street Light Luminaire	**LED 9 Watt - 13 Watt**	**CFL 18watt- 22 Watt**
Luminary Body	**Aluminum Die Cast**	**Plastic**
Battery	**Monocrystal 12 V ,42Amp**	
System, Operating Voltage	**12v Dc**	
Led Used	**1w to 3w**	
Led	**SEOUL Semiconductor / OSRAM / CREE**	
Protections	**Provided Against Over Charge, Deep Discharge, Current Reverse Flow**	
No. Of Lumens Output	**320 Lumens + 5% Per Led**	
Driver,CircuitEfficiey	**Above 90%**	
Hours Of Operations	**As Per Specification**	
Load Disconnect	**11.2 v 0.2 (Battery Voltage)**	
Load Reconnect	**12.5 v 0.2 (Battery Voltage)**	
Indicator	**Green LED- Charging Mode**	**Red LED- Low Battery**
Pole	**MS Paint/Powder Coating/ GI Pole with Corrosion Resistant**	

Module Mounting	**Ms Frame with Corrosion Resistant**
Battery Box	**Ms Sheet /Plastic**
Accessories	**As per requirement**

DESIGN OF STREET LIGHTING (Manual mehtod)

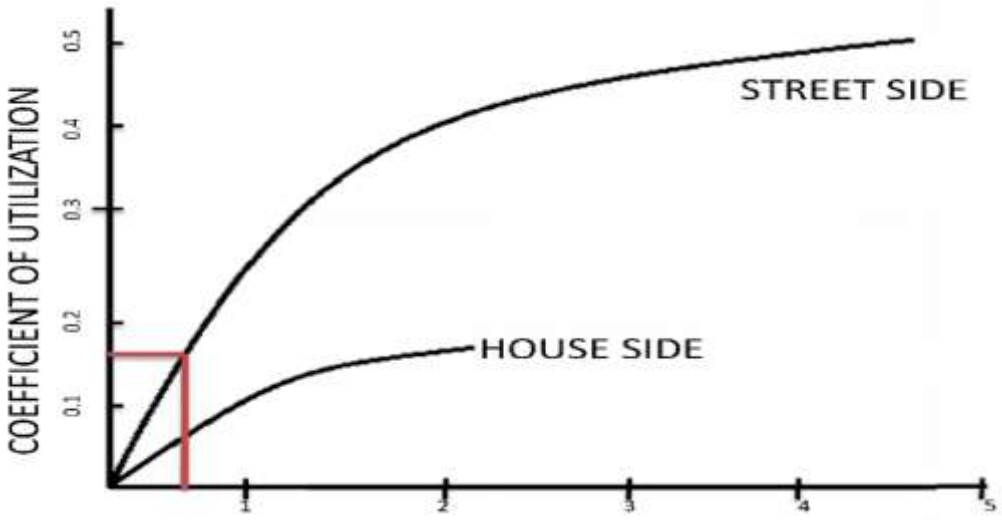
CONSIDERATION

Stretch	1 km.
Road width	7 mt.
Lux	5 lumen / sq.mt.
Maintenance factor	0.8
Lumen	7000
Mounting height	8 mt.

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,



$$\textbf{RATIO} = \frac{\textbf{\textit{WIDTH OF AREA}}}{\textbf{\textit{MOUNTING HEIGHT}}}$$

$$\text{Ratio} = \frac{7}{8} = 0.872$$

Figure 8.1.6.4 Chart of Coefficient of utilization

Using 0.7 value of ratio we got the coefficient of utilization is 0.24

STEP-2 Calculates distance between each street lightpole:

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 7m.
- Pole detail: the height of pole is 8m.
- Luminaries of each pole: wattage of luminaries is 30-Watt.
- Lamp output (LL) is 7000 lumens.
- 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) IS0.8.

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

- Here, CU is calculate show in above figure…

Pavement width/ mounting height =7/8

= 0.24 Approx. **So, cu is = 0.24**

- Spacing between each pole =7000*0.24*0.8/5*7
  = 38.4 m
  = 38 m Approx.

spacing between each pole is 38 m approx.
There for total numbers of solar street lights required are 26 for 1km stretch of road

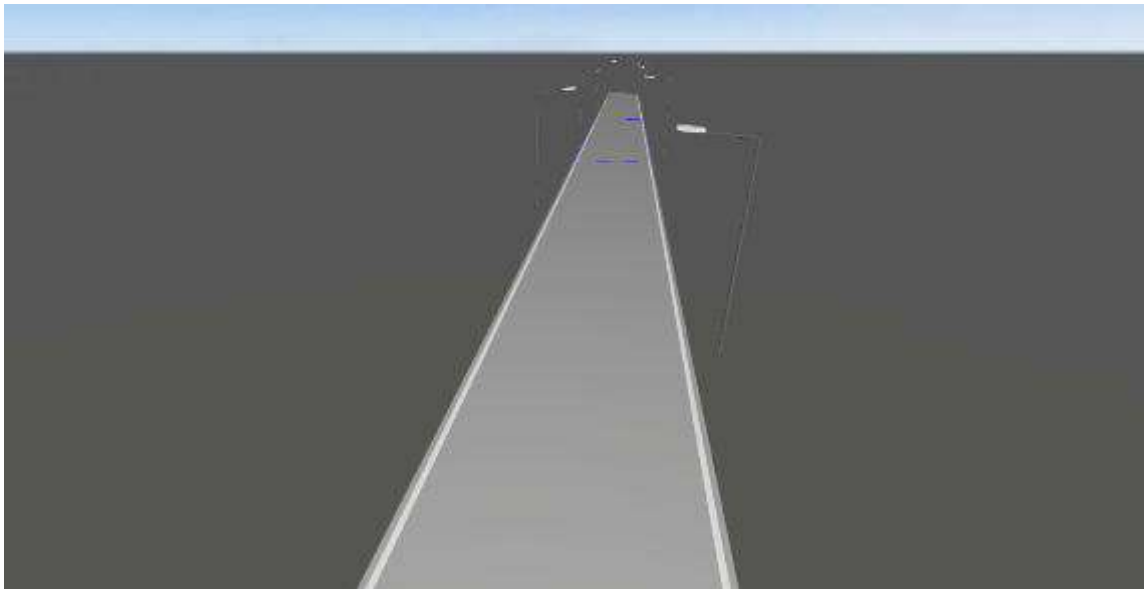


Figure 8.1.6.5 3D view of Street Light

QUANTITY ESTIMATION OF STREET LIGHTING

One solar street light set consists of,

1. LEDLamp
2. Solarplate
3. Battery

TYPE 1

S.S.L.:

Power and type of Lamp: 11W LED LIGHT

Cost of one solar street light set at current price is Appx. Rs. 23,625/-

Total number of SSL required = 26
Total Cost = Number of LED street lights x Cost of one set of SSL
= Rs. 26 x 23,625

= **Rs. 614250/-**

TYPE 2 S.S.L.:

Power and type of Lamp: 20W LEDLIGHT

Cost of one solar street light set at current price is Appx. Rs. 33,600/-

Total number of SSL required =26

Total Cost = Number of LED street lights x Cost of one set of SSL Total Cost
=Rs. 26 X 33,600

=**Rs. 873600/-**

TOTAL ESTIMATED COST OF STREET LIGHTING:

Cost for Type-1 SSL + cost for Type-2 SSL

= Rs.6,14,250 +8,73,600

= **Rs. 14,87,850/-**

DESIGN LIFE: 25year

INSTALLATON COST: Appx.

Rs. 14,87,850 /-

MAINTENANCE: Solar plate to be replaced after 25 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 preventcorrosion.

8.2 Reason for Students Recommending this Design

Sr. No.	Name of Design	Reason for Recommendation of patriculer design
1.	**Public Toilets & Baths**	As per village survey & GAP analysis there is an requirement of this design.
2.	**Anganwadi**	As Existing Anganwadi building is in the campus of primary school building thats why we need to design a new Anganwadi building. To make more big campus of existing primary school building
3.	**Primary & Secondary School**	As per GAP analysis there is an requirement of this designand the secondary school is currently running in leesed based building.existingprimary school's some classis are made of industrial shead. And less classis aer available to compencete the intake of students, that's why we have to design this whole Primary & Secondary school.
4.	**Vegetable Market**	As per village survey & GAP analysis and there is no Vegetable market that's why we need to design this Vegitable market.
5.	**Bank**	As per village survey & GAP analysis and to make step toward smart village there is an requirement of this design.
6.	**Street Lighting**	As per village survey there isnostreet light on the roads so there is requirement of this design.

Table 8.12Reason for Students Recommending this Design

8.3 About designs Suggestions / Benefit of thevillagers

Sr. No.	Name of Design	Designs Benefit to the Villagers
1.	**Public Toilets & Baths**	For better sanitation in village and it will directly affect the helth of village dwellers by this design • It improves the surroundings of village. • It improves the helth of village dwellers. Etc.
2.	**Anganwadi**	More smart, efficient and more functioning space in new building.
3.	**Primary & Secondary School**	More smart, efficient and more functioning space in new building.
4.	**Vegetable Market**	It will benefit all the local venders of villages to sell their vegetables in new village market.
5.	**Bank**	There is no any bank of ATM in village by designing bank we are making vllage smarter and it will directly helpful to village dwellers.
6.	**Street Lighting**	By providing street light it will make more secure environment for village dvellers and in night movement and transportation is possible by this design.

Table 8.13 About designs Suggestions / Benefit of thevillagers

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

In this part of project, we have proposed some basic facelites through our sustainable, physicale and smart village designs in our allocated village after commpleating all surveys and site visites we have proposed our best designs in this part.

In Part-II of this project we are going to inprove some of basic aminites in villave that is at precent is not good or not inugh efficient or not useful to current scenario of village. By this Part-I designs now we have ouremore widepresepective to devlope the village in acoarding to make it smart village by providing missing infrastructures.

According to UDPFI norms we are going to provide some facelites that is at precent is not available in Kalatalav village like, Physicaleinfrastuctre including Solid waste Mangement, Water supply in village etc. and in Social infrastructure including some Community Hall, Recrational club, socio cultural center etc. in Recreational Facilites we can design Joggers park, Redevlopment of existing pond of kalatalav village.

In future scope we would be study other different urban amenities that would be sustainable in rural areas of bhavnagar.

The village is now on the path of becoming smart village by oure given designs but the villagers have to maintain the given fcilites by them self. To make this possible we are going to give them smart design and smatre technology to maintain infrastructers, by this we are closer to give them good living standerds. And make it good model village for its surrounding villages.

By performing this project we are able to reduce the pressure on the urban area. As well as this amenities are very much helpful for overall development of the village.

According to UDPFI norms, lacking in Basic amenities, Smart Amenities can be suggested for Part-II Basic Amenities: Rainwater Harvesting, Water supply system, Under ground water storage tank, Over head water storage tank, Bus Stand, Solid Waste Management, Public Garden, etc.

Smart Amenities: Free Wi-Fi in village, Solar Rooftop installation, Smart Landscape planning for good environmental development in the vicinity of village etc.

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-Mantrishri 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.:**	180213106010	**(1) Name**	JAGDISHKUMAR H. PARMAR
Kalatalav		**(2) Enrollment No.:**	180213106018	**(2) Name**	MALAY B. VALA

Problem Definition and Design Details			
Sr. No.	**Problem Definition**	**Capacity (mention unit)**	**Estimated cost (in Rs.)**
Design - 1	Public Toilet & Bath	At a time 24 Persons can use it	21,25,000
Design - 2	Anganwadi	30 kids	9,11,950
Design - 3	Primary & Secondary School	11 class rooms, 1 library, 1 computer lab & 1 general lab	74,23,300
Design - 4	Vegetable Market	15 stalls	14,11,350
Design - 5	Bank	Equivalent to any village bank	20,61,500
Design - 6	Street Lighting	26 SSL	14,87,850

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 Karamchand Gandhiji that "*The true India lives in the village.*"

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34. SOFTEWRS USED: for drawings Auto-CAD 2013, for Rendering 3ds Max 2017 and for estimation Microsoft Excel.

12. Annexure attachment

12.1 Survey form of Ideal Village Scanned copy attachment inthe report for Part-I

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:	Koliyak
Name of Taluka:	Bhavnagar.
Name of District:	Bhavnagar.
Name of Institute:	
Nodal Officer Name & Contact Detail:	
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Solanki Jagdishbhai M. (Sarpanch)
Date of Survey:	

1. **Demographical Detail:**

Sr. No.	Census	Population	Male	Female	Total House Holds
i)	2001	2422	-	-	600
ii)	2011	4724	-	-	750

2. **Geographical Detail:**

Sr. No.	Description	Information/Detail
i)	Area of Village (Approx.) (In Hector) Coordinates for Location:	21.98 (Hector) 2261.33 guntha
	Forest Area (In hect.)	65.60 hector.
	Agricultural Land Area (In hect.)	13.39 hector
	Residential Area (In hect.)	16.28 hector.
	Other Area (In hect.)	1.54 hector. (Padtar Land)
	Water bodies	0.77 hector.
	Nearest Town with Distance:	Bhavnagar - 26 KMS.

3. Occupational Details:

Name of Three Major Occupation groups in Village	1. Farmers
	2. Labours
	3.

4. Physical Infrastructure Facilities:

Sr. No.	Descriptions	Detail	Adequate	Inadequate	Remarks
A.	**Main Source of Drinking water**				
	• Tap Water (Treated/ Untreated)	Treated	✓		
	• RO Water	-		✓	
	• Well (Covered/ Uncovered)	covered & Uncovered	✓		
	• Hand pumps	-		✓	
	• Tube well/ Borehole	4-Nos.	✓		1-Panchayat 3-privet.
	• River/ Canal/ Spring/ Lake/ Pond	-	✓		River - Maleshwari pond - yes canal - Shetrunj- (Daba - Kanth)
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	✓		
	Underground Sump	Capacity:	✓		
Suggestions if any:					
C.	**Drainage Facility**				
	Available (Yes/ No)	yes			
Suggestions if any:					
D.	**Type of Drainage**				
	Closed/ Open	closed	✓		
	If Open than Pucca / Kutchcha	-			
	Whether drain water is discharged directly in to Water bodies/ Sewer plants	Direct discharged in water bodies			
Suggestions if any:					

Gujarat Technological University, Ahmedabad, Gujarat

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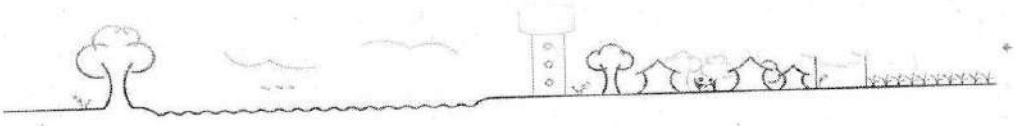
E.	Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM				
	Village approach road		✓		All weather
	Main road	Bituminous	✓		
	Internal streets	Block paved	✓		
	Nearest NH/SH/MDR/ODR Dist. in kms.	SH-37	✓		passes through Koliyak
Suggestions if any:					

F.	Transport Facility				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	No - 35 kms		✓	
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	Yes - not in good condition		✓	
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)	Auto, Jeep, Chhakda, private vehicles etc.	✓		
Suggestions if any:					

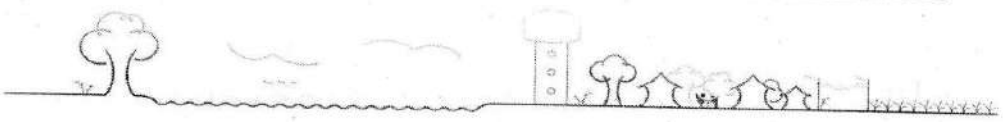
G.	Electricity Distribution				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	more than 6 hrs.	✓		
	Power supply for Domestic Use	more than 6 hrs	✓		
	Power supply for Agricultural Use	8 hrs.		✓	Khetiwadi (in farm lands)
	Power supply for Commercial Use	-	✓		
	Road/ Street Lights	Available		✓	not in working condition



	Electrification in Government Buildings/ Schools/ Hospitals	Avilable	✓		
	Renewable Energy Source Facilities (Y/ N)	NO		✓	
	LED Facilities	NO		✓	
Suggestions if any:					
H.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	Yes	✓		1 nos
	Location Condition	Near gram panchayat			good
	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)	River, Canal Tube well	✓		
Suggestions if any:					
J.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	90%. 10%.			

5. **Social Infrastructural Facilities:**

Sr. No.	Descriptions	Information/ Detail	Adequate	Inadequate	Remarks



K.	**Health Facilities:**				
	Sub center/ PHC/ CHC /Government Hospital/ Child welfare & Maternity Homes (If Yes than specify No. of Beds) Condition:	Government Hospital	✓		25-Bed good condition
	Private Clinic/Private Hospital/ Nursing Home	Yes			5-Nos.
	If any of the above Facility is not available in village than approx. distance from village: .....kms.				
Suggestions if any:					
L.	**Education Facilities:**				
	Aaganwadi/ Play group	Yes	✓		4-Nos
	Primary School	Yes	✓		5-Nos.
	Secondary school	Yes	✓		1-Nos.
	Higher sec. School	Yes	✓		1-Nos.
	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: 24....kms.				
Suggestions if any:					
M.	**Socio- Culture Facilities**				
	Community Hall (With or without TV) Location:	No.		✓	

	Condition:				
	Public Library (With daily newspaper supply: Y/N) Location: Condition:	NO		✓	
	Public Garden Location: Condition:	NO		✓	
	Village Pond Location: Condition:	NO		✓	
	Recreation Center Location: Condition:	Nishkalank Mahadev Temple 3 kms	✓		
	Cinema/ Video Hall Location: Condition:	NO		✓	
	Assembly Polling Station Location: Condition:	NO		✓	
	Birth & Death Registration Office Location: Condition:	Yes Grampanchayat ✓ good			
If any of the above Facility is not available in village than approx. distance from village: .....kms.					
Suggestions if any:					
N.	**Other Facilities**				
	Post-office	Yes	✓		in good Condition
	Telecommunication Network/ STD booth	Yes	✓		

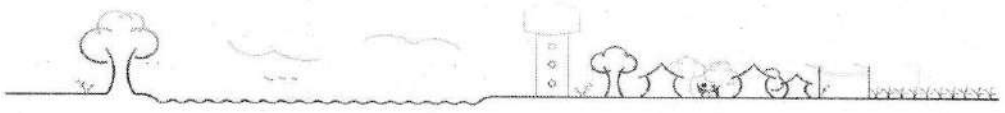
	General Market	Yes	✓		
	Shops (Public Distribution System)	Yes	✓		
	Panchayat Building	Yes	✓		
	Pharmacy/Medical Shop	Yes	✓		
	Bank & ATM Facility	Yes	✓		
	Agriculture Co-operative Society	NO		✓	
	Milk Co-operative Soc.	Yes	✓		
	Small Scale Industries	NO		✓	
	Internet Cafes/ Common Service Center/Wi Fi	Yes	✓		
	Other Facility	–			
Suggestions if any:					

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

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

7. **Data Collection From Village**

Village Base Map Available: Hard Copy/Soft Copy	



12.2 Survey form of Smart Village Scanned copy attachmentin the report for Part-I

Techno Economic Survey

Vishwakarma Yojana: Phase VIII

SMART VILLAGE SURVEY

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

Name of District:	Bhavnagar.
Name of Taluka:	Bhavnagar.
Name of Village:	Budhel.
Name of Institute:	GEC. Bhavnagar
Nodal Officer Name & Contact Detail:	
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Grampanchayat Member. - Aayushmansinh Vala. - Kuldeepsinh Mori.
Date of Survey:	20/11/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	7760	3974	3786	1355

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	1182.51
2.	Forest Area (In hect.)	0.00
3.	Agricultural Land Area (In hect.)	881.30
4.	Residential Area (In hect.)	260.25
5.	Other Area (In hect.)	0
6.	Distance to the nearest railway station (in kilometers):	18 kms. Bhavnagar.

7.	Name of Nearest Town with Distance:	10 kms Bhavnagar.
8.	Distance to the nearest bus station (in kilometers):	2 Budhel Bustop.
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. Labourers 2. Farmers. 3. Industrial workers.
Major crops grown in the village:	1. Cotton 2. Sesame 3. Bajarey. / Millet

IV. PHYSICAL INFRASTRUCTURE FACILITIES:

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

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Techno Economic Survey

Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:		Yes	
	Underground Sump	Capacity:		Yes	
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1 2 B. OPEN WITH OUTLET C. OPEN WITHOUT OUTLET	closed piped	yes		
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	WBM/RCC	✓		
	Main road	RCC	✓		
	Internal streets	Block paved	✓		
	Nearest NH/SH/MDR/ODR Dist. in kms.	03 KMS	✓		NH-51
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	18 KMS		✓	
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)		✓		
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)		✓		Auto / Jeep / Local Bus / City Bus
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	>6 Hrs	✓		

	Power supply for Domestic Use	> 6 Hrs	✓		
	Power supply for Agricultural Use	2 6 Hrs	✓		
	Power supply for Commercial Use	> 6 Hrs	✓		
	Road/ Street Lights		✓		
	Electrification in Government Buildings/ Schools/ Hospitals		✓		
	Renewable Energy Source Facilities (Y/ N)		✓		Solar street light
	LED Facilities		✓		
Suggestions if any:					
G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.	3	✓		
	Location Condition	good			
	Community Toilet (With bath/ without bath facilities)			✓	
	Solid & liquid waste Disposal system available			✓	
	Any facility for Waste collection from road		✓		
Suggestions if any:					
H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL OTHER (SPECIFY)		✓ ✓ ✓		
Suggestions if any:					
I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	90 % 10 %			

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			✓	
	If any of the above Facility is not available in village than approx. distance from village: ..10....kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group		✓		
	Primary School		✓		
	Secondary school		✓		
	Higher sec. School		✓		
	ITI college/ vocational Training Center			✓	
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities			✓	
	If any of the above Facility is not available in village than approx. distance from village: 10....kms.				

Suggestions if any:

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

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

Suggestions if any:

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

	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries			✓	
	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)				

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

VII. DATA COLLECTION FROM VILLAGE

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

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

Sr. No.	Descriptions	Information/ Detail	Remarks

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

IX. Smart Village / Heritage Details

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

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

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

12.3 Survey form of Allocated Village Scanned copyattachment in the report forPart-I

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:	Bhavnagar
Name of Village:	Kalatalav
Name of Institute:	GEC. Bhavnagar
Nodal Officer Name & Contact Detail:	Proff. V.S. Dave
Respondent Name: (Sarpanch/ Panchayat Member/ Teacher/ Gram Sevak/ Aaganwadi worker/Village dweller)	Shri. Vatsal Dave (Talati Mantri) Shrimati Valiben Parmar (Sarpanch)
Date of Survey:	23/10/2020

I. DEMOGRAPHICAL DETAIL:

Sr. No.	Census	Population	Male	Female	Total Number of House Holds
1.	2001				
2.	2011	3854	2278	1576	989

II. GEOGRAPHICAL DETAIL:

Sr. No.	Description	Information/Detail
1.	Area of Village (Approx.) (In Hector)Coordinates for Location:	4794.90
2.	Forest Area (In hect.)	0.00
3.	Agricultural Land Area (In hect.)	12.5
4.	Residential Area (In hect.)	1270.5
5.	Other Area (In hect.)	4.5
6.	Distance to the nearest railway station (in kilometers):	28. KM Bhavnagar terminus Railway station Bhavnagar.

7.	Name of Nearest Town with Distance:	15-20 KMS - Bhavnagar.
8.	Distance to the nearest bus station (in kilometers):	15-20 KMS - Bhavnagar.
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. House-Hold Industries
	2. Labour
	3. Fisher Man

Major crops grown in the village:	1. Cotton
	2. Sorghum
	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			✓	
2.	**DUG WELL** Protected Well Un Protected Well			✓	
3.	**WATER FROM SPRING** Protected Spring Unprotected Spring Rainwater Tanker Truck Cart With Small Tank		✓		water supplyed by Tanker.
4.	**SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/** Irrigation Channel Bottled Water Hand Pump			✓	

	Other(Specify)Lake/ Pond		✓		
Suggestions if any:					
B.	**Water Tank Facility**				
	Overhead Tank	Capacity:	0	✓	
	Underground Sump	Capacity:	0	✓	
Suggestions if any:					
C.	**The Type of Drainage Facility**				
	A. UNDERGROUND DRAINAGE 1		✓		
Suggestions if any:					
D.	**Road Network :All Weather/ Kutchha (Gravel)/ Black Topped pucca/ WBM**				
	Village approach road	RCC Road	✓		
	Main road	RCC Road	✓		
	Internal streets	RCC Road	✓		RCC and CC Blocks
	Nearest NH/SH/MDR/ODR Dist. in kms.	Black Topped Road	✓		Samesh Bypass (SH) 05 KMS
Suggestions if any:					
E.	**Transport Facility**				
	Railway Station (Y/N) (If No than Nearest Rly Station---Kms)	12 KMS		✓	
	Bus station (Y/N) Condition: (If No than Nearest Bus Station---Kms)	15-20 KMS		✓	
	Local Transportation (Auto/ Jeep/Chhakda/ Private Vehicles/ Other)		✓		Local transportation Auto Rikshows
Suggestions if any:					
F.	**Electricity Distribution**				
	(Y/N) Govt./ Private (Less than 6 hrs./ More Than 6 hrs)	> 6 Hrs.	✓		Govt.

	Power supply for Domestic Use	> 6 Hrs	✓		Govt.
	Power supply for Agricultural Use	< 6 Hrs.	✓		Govt.
	Power supply for Commercial Use			✓	
	Road/ Street Lights		✓	✓	No street lights
	Electrification in Government Buildings/ Schools/ Hospitals	> 6 Hrs.	✓		
	Renewable Energy Source Facilities (Y/ N)		✓		
	LED Facilities			✓	

Suggestions if any:

G.	**Sanitation Facility**				
	Public Latrine Blocks If available than Nos.			✓	
	Location Condition				
	Community Toilet (With bath/ without bath facilities)			✓	
	Solid & liquid waste Disposal system available			✓	
	Any facility for Waste collection from road			✓	

Suggestions if any:

H.	**Main Source of Irrigation Facility:**				
	TANK/POND STREAM/RIVER CANAL WELL TUBE WELL OTHER (SPECIFY)	pond	✓		

Suggestions if any:

I.	**Housing Condition:**				
	Kutchha/Pucca (Approx. ratio)	90% 10%			

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			✓	
	If any of the above Facility is not available in village than approx. distance from village: ..25...kms.				
Suggestions if any:					
K.	**Education Facilities:**				
	Aaganwadi/ Play group		✓		In school Cupus
	Primary School		✓		Less Class rooms
	Secondary school		✓		Running in leased
	Higher sec. School		✓		Building.
	ITI college/ vocational Training Center			✓	
	Art, Commerce& Science /Polytechnic/ Engineering/ Medical/ Management/ other college facilities			✓	

	If any of the above Facility is not available in village than approx. distance from village: 25 kms.
Suggestions if any:	

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

If any of the above Facility is not available in village than approx. distance from village: 25 kms.

Suggestions if any:

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

	Credit Cooperative Society Agricultural Cooperative Society Milk Cooperative Society Fishermen's Cooperative Society Computer Kiosk/ e-chaupal / Mills / Small Scale Industries	Milk co-operative Society	In the village	✓	
	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)				✓

VI. SUSTAINABLE /GREEN INFRASTRUCTURE FACILITIES:

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

VII. DATA COLLECTION FROM VILLAGE

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

VIII. ADDITIONAL INFORMATION/ REQUIREMENT:

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

IX. Smart Village / Heritage Details

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

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
કાળાતળાવ

સરપચ
કાળાતળાવ ગ્રામ પંચાયત
તા જિ ભાવનગર

12.4 Gap Analysis of the AllocatedVillage

VILLAGE GAP Analysis

Village Facilities	Planning Commission/UDP FI Norms	Village Name:	kalatalav		
		Population:			3854
		Existing	Required as per Norms	Smart Village/ Cities / Heritage Future Projection Design	Gap
Social Infrastructure Facilities					
Education					
Anganwadi	Each or Per 2500 population	1	1.54		-0.54
Primary School	Each Per 2500 population	1	1.54		-0.54
Secondary School	Per 7,500 population	1	1		0
Higher Secondary School	Per 15,000 Population	0	1		-1
College	Per 125,000 Population	0	1		-1
Tech. Training Institute	Per 100000 Population	0	1		-1
Agriculture Research Centre	Per 100000 Population	0	1		-1
Skill Development Center	Per 100000 Population	0	1		-1
Health Facility					
Govt/Panchyat Dispensary or Sub PHC or Health Centre	Each Village	1	1		0
Primary Health & Child Health Center	Per 20,000 population	0	1		-1
Child Welfare and Maternity Home	Per 10,000 population	0	1		-1
Multispeciality Hospital	Per 100000 Population	0	1		-1
Public Latrines	1 for 50 families (if toilet is not there in home, specially for slum pockets & kutcha house)	0	19.78		19.78
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)			√		
Over Head Tank	1/3 of Total Demand		√		
U/G Sump	2/3 of Total Demand		√		
Drainage Network - Open		√			
Drainage Network - Cover			√		
Waste Management System			√		
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	0	1		-1
Post Office	Per 10,000 population	0	1		-1
Gram Panchayat Building	Each individual/group panchayat	1	0		1
APMC	Per 100000 Population	0	0		0
Fire Station	Per 100000 Population	0	0		0
Public Garden	Per village	0	1		-1
Police post	Per 40,000Population	0	0		0
Shopping Mall					
Electrical Design					
Electricity Network		Adequate	Inadequate		
			√		
Any Smart Village Facility					
Technology					
		ESR cap	0		
		Sump cap	0		
		Lat	0		

Table 12.1Gap Analysis of the allocated village

12.5 Summary Details of All the Villages Designs in Table formPart-I

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	Skill development center
			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

Table No.12.2Summary Details of All the Villages Designs in Part-I

12.6 Drawings (If, required, A1, A2, A3 design is not visiblethen Only)

12.7 Summary of GoodPhotographs

Allocated Village:Kalatalav, Bhavnagar.

Panchayat Office

KalatalavPrimary School

KalatalavPrimary School

KalatalavPrimary School

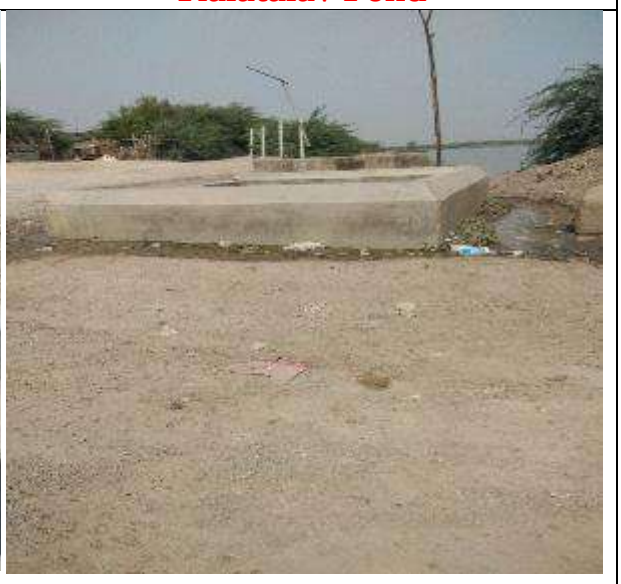
KalatalavPrimary School

Anganwadi

Kalatalav Pond Tank

Kalatalav Pond

KalatalavAveda



Kalatalavwater tank

KalatalavInternal Streets

KalatalavAproach Road

KalatalavAproach Road

KalatalavAproach Road

Funeral Place Kalatalav

Funeral Place Kalatalav

U.G. WATER SUPM

HOUSE WATER STORAGE

AVEDA

TRANSPORTING OF WATER

PACCA MAKAN

MILK CO.OP. SOCIETY

NIRMA COMPNY PVT.LTD.(VIEW FROM KALATALAV)

Figure 12.7 Summary of Good Photos

12.8 Village Interaction with sarpanch Report with the photograph

Fig.12.8 Photo with Talatimantri Shri. And Srapanch Shri. Of Kaltalav Village of Bhavnagar.

By following and respecting the Govt.'s COVID-19 Guidelines, On the date of **13th October 2020** atKalatalav Panchayat office we have carried out the **Techno Economic Survey** with **SarpanchShrimati.Valiben Parmar Ma'am,Talatimantrishri. Shri. Vatsal Dave Sir**, and Other **Panchayat Members,Village dwellers**hasremained present to give their feedback.

We explained how the development of Kalatalav village is possible. We presented our study work under this project. We explained theme of Vishwakarma Yojana, various benefits of village development and issues prevailing in villages. We explained various designs under Physical infrastructure, Social infrastructure and Socio-Cultural facilities such as Internal Street Road, Solid waste management, Community toilet, Bus stand &other.

Village dwellers shared difrentproblems faced by them before this project implementation while designing such a facilities, we gave various methods and techniques of such facilities with proposed design.

The presentation was very helpful to understand what village dwellers actualy needs in the village and what amenities to be designed at village level for the overall development of Kalatalav 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

ઓફિસ - કાળાતળાવ
ગ્રામ પંચાયત
તાલુકા - ભાવનગર
જીલ્લા - ભાવનગર
તા.

પ્રમાણપત્ર

આથી આ પ્રમાણપત્ર આપવામાં આવે છે કે સરકારી ઈજનેરી કોલેજ, ભાવનગર ના વિદ્યાર્થીઓ (પરમાર ભગીરથકુમાર અને) તથા (મહેશ બી. વાળા) દ્વારા વિશ્વકર્મા પ્રોજેક્ટ અંતર્ગત ગામની મુલાકાત આવેલ, આ ઈજનેરિંગ છાત્રો દ્વારા જુદા જુદા સર્વે કરવામાં આવેલ હતા. તેમાં મુખ્યત્વે વસ્તી ગણતરી, સ્થાન ભાવનાની મા-હિતી કરવામાં આવેલ જે બાબતનું આ પ્રમાણપત્ર આપવામાં આવે છે.

સહી :-
સરપંચ શ્રી કાળાતળાવ ભાવનગર
ગ્રામ પંચાયત કચેરી

સહી :- તલાટી કમ મંત્રી
તલાટી શ્રી કાળાતળાવ ભાવનગર

પાલાભાઈ
સરપંચ
કાળાતળાવ ગ્રામ પંચાયત
તા. જિ. ભાવનગર

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

RAIN WATER HARVESTING

What Is Rain Water Harvesting?

Rainwater harvesting is collecting the run-off from a structure or other impervious surface in order to store it for later use. Traditionally, this involves harvesting the rain from a roof. The rain will collect in gutters that channel the water into downspouts and then into some sort of storage vessel. Rainwater collection systems can be as simple as collecting rain in a rain barrel or as elaborate as harvesting rainwater into large cisterns to supply your entire household demand.

The idea of rainwater harvesting usually conjures up images of an old farm cistern or thoughts of developing countries. The reality is that rainwater harvesting is becoming a viable alternative for supplying our households and businesses with water. It's not just for the farm anymore! There are many countries such as Germany and Australia where rainwater harvesting is a norm. Due to the green building movement, you will be seeing rainwater harvesting systems become more popular here in America.

The collection of rainwater is known by many names throughout the world. It ranges from rainwater collection to rainwater harvesting to rainwater catchment. In addition, terms such as roof water collection or rooftop water collection is also used in other countries.

We believe that rainwater harvesting is a viable technology in an urban setting. All that is necessary to take advantage of this resource is to capture the free water falling on your roof and direct it to a rainwater storage tank. By doing this, you can take control of your water supply and replace all or at least a substantial portion of your water needs. Rainwater harvesting systems can be configured to supply your whole house and/or your landscape needs.

What Are The Benefits Of Rainwater Collection?

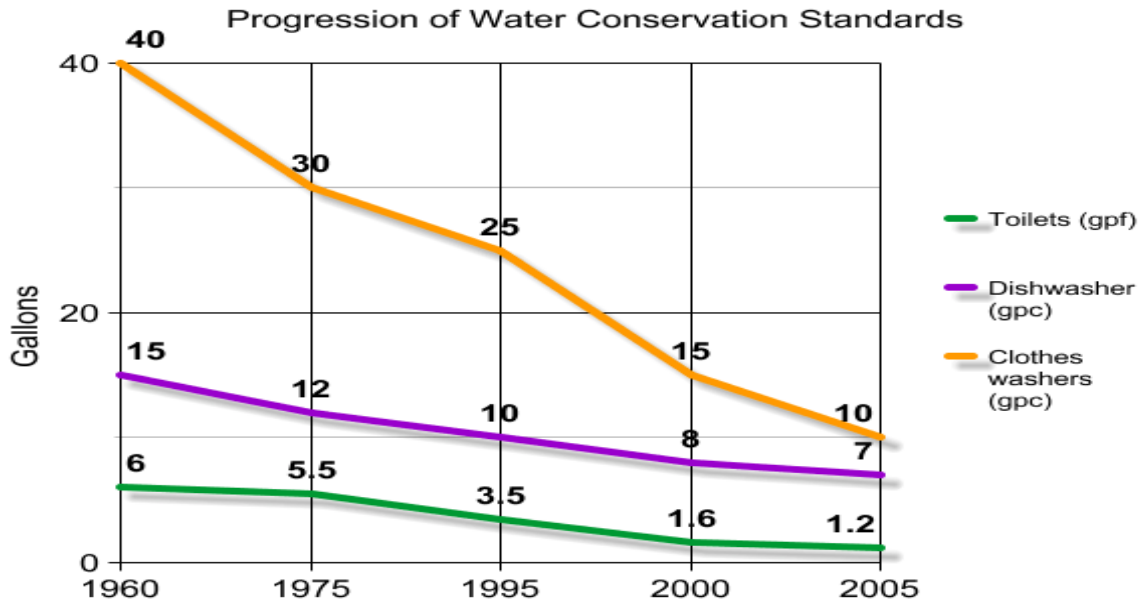
- Rainwater is a relatively clean and absolutely free source of water
- You have total control over your water supply (ideal for cities with water restrictions)
- It is socially acceptable and environmentally responsible
- It promotes self-sufficiency and helps conserve water
- Rainwater is better for landscape plants and gardens because it is not chlorinated
- It reduces stormwater runoff from homes and businesses
- It can solve the drainage problems on your property while providing you with free water
- It uses simple technologies that are inexpensive and easy to maintain
- It can be used as a main source of water or as a backup source to wells and municipal water
- The system can be easily retrofitted to an existing structure or built during new home construction
- System are very flexible and can be modular in nature, allowing expansion, reconfiguration, or relocation, if necessary
- It can provide an excellent back-up source of water for emergencies

Why Is Rainwater Harvesting Important?

Rainwater harvesting is important for several reasons but one of the biggest is the fact that we are tapping out water conservation gains inside our homes so we need to start looking outdoors for more opportunities.The following graph shows the gains that have been achieved with our indoor water fixtures through the combination of governmental standards and innovation by fixture companies. As you can see, we don't have much more room to go in terms of achieving more efficiency gains with our indoor fixtures. What's next… the 0.2 gallon per flush toilet? Probably not!
This phenomenon is known as the law of diminishing returns. So where will the next revolution in water conservation take place? We believe we offer services in the areas where this revolution will take place.

What Are the Uses of Collected Rainwater?

You can essentially use rainwater anywhere you use tap water. The idea of using drinking water to flush our toilets and water our lawns is wasteful and irresponsible, especially in light of population growth and water shortages across the country. Rainwater collection is a technique to green your home and to lessen your environmental footprint.There are basically three areas where rainwater can be used:



- Irrigation use
- Indoor, non-potable use
- Whole house, potable use

Here are some ideas for specific uses of rainwater:
Hand water your lawn and garden

- Connect rainwater collection system to irrigation/sprinkler system
- Wash your vehicles
- Wash your pets
- Refill your swimming pool
- Replace the use of tap water with rainwater to wash your driveways and sidewalks (if you don't use a broom)
- Use it for all indoor non-potable fixtures (toilets and clothes washer)
- Use it for all potable needs when properly filtered and disinfected
- Use it for industrial processes instead of municipally treated water

.**DESIGN OF RAIN WATER HARVESTING**

- The amount of rainfall that you can collect is governed by the following formula:

Roof Area (ft^2) X Precipitation Amount (inch) X 0.623 = Amount Collected (gallons)

- To calculate the amount of rainwater you can collect, you need to know your annual average precipitation for your area.

Sample calculation for quantity of water which can be harvested:

Average rainfall in Kalatalav village…….25.9 inches (749.3mm)
Area of roof catchment……...1076.39 sq ft (100 sq mt)

Roof Area (ft^2) X Precipitation Amount (inch) X 0.623 = Amount Collected (gallons)

- 1076.39 X 25.9 X 0.623 = **17368.31 GALLONS (65,739.05 litres)**

Rain water endowment of the area = **65,739.05 LITRES**

The total amount of water i.e., received in the form of rainfall over an area is called the rain water endowment of the area. Out of this the amount that can be effectively harvested called the rainwater harvesting potential.

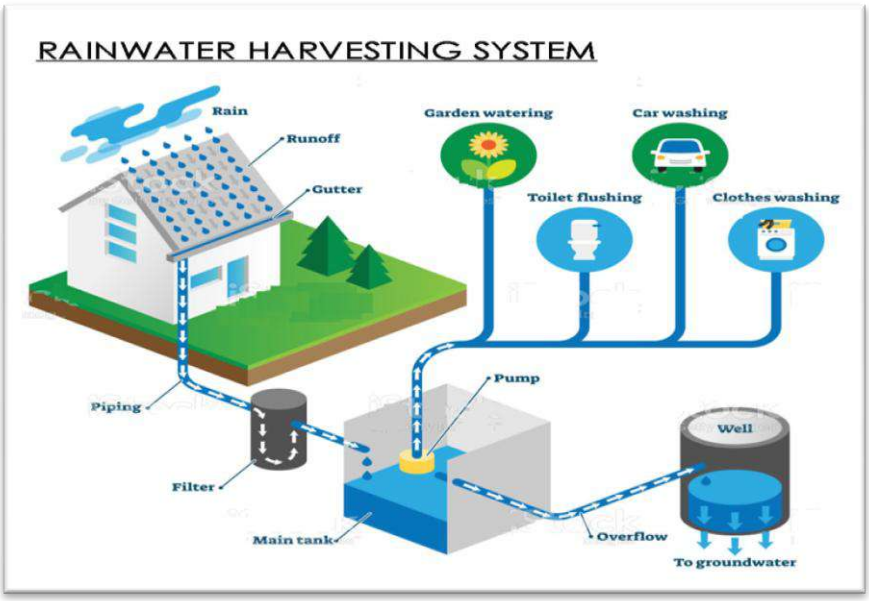
Sample calculation for effectively harvested water from total rainfall:

1. Consider roof catchment is having tile finish so coefficient for roof surface can be adopted as 0.85
2. Another constant coefficient for evaporation, spillages and first flush wastage can be considered as 0.80 (for all Situations)

- **Statistically and approximately only effectively harvested water quantity may be considered as**

= Rain water endowment of that area x 0.80 x surface efficient
= 65,739.05x 0.80 x 0.85
=**52,591.24 litres**

 This volume is about twice the annual drinking water requirement of 5-member family. The average drinking water is required per person per day is 10 litres.



Different Methods To Collect Rainwater:

The only thing that differs in the following methods is the scale of the system. They all follow the same principles but differ on aesthetics and actual water conservation effectiveness. Click the pictures for a closer look.

1. RAIN BARRELS

This method is the most common and one that many people are familiar with. This involves installing a barrel at a gutter downspout to collect rainwater. The actual barrel may be a recycled barrel or a new commercially available rain barrel.

Pros:

- Easily implemented by anyone at any residence
- Barrels are readily available in your community or at various stores & websites
- Barrels don't take up much space so they can fit into any situation

Cons:

- Capacity is generally only 50 to 100 gallons
- Easily overflows and wastes collection opportunities

2. "DRY" SYSTEM

This method is a variation of a rain barrel set-up, but it involves a larger storage volume. Essentially, the collection pipe "dry's" after each rain event since it empties directly into the top of thetank.

Pros:

Can store a large amount of rainwater

Great for climates where rainfall happenswith infrequent, larger storm eventsCan be inexpensive to implementLess complicated system so maintenance is easier

Cons:

The storage tank must be located next to your house

3. "WET" SYSTEM

This method involves locating the collection pipes underground in order to connect multiple downspouts from different gutters. The rainwater will fill the underground piping and the water will rise in the vertical pipes until it spills into the tank. The downspouts and underground collection piping must have water-tight connections. The elevation of the tank inlet must be below the lowest gutter on the house.

Pros:

- The ability to collect from your entire collection surface
- The ability to collect from multiple gutters and downspouts
- The tank can be located away from your house

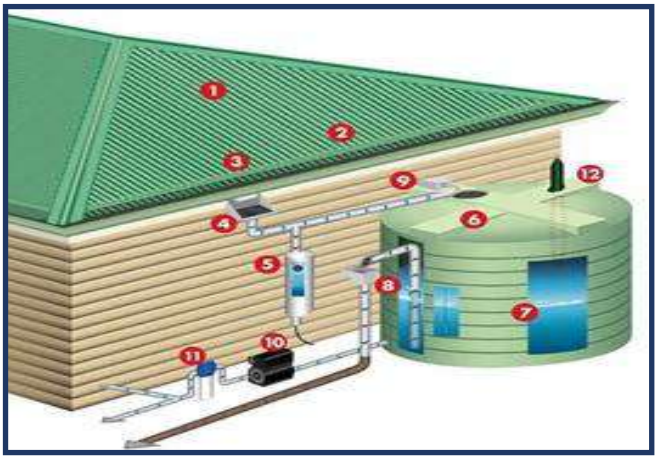
Cons:

- More expensive to implement due to underground piping

Sufficient difference between gutters and tank inlet must be available

How Do I Create A Complete Rainwater Collection System?

The image below shows a complete rainwater collection system. While some of the components shown are absolutely necessary, not all of the components listed are required. Although, all of these components will help create a harvesting system that is highly functional and nearly maintenance-free



1. It all starts with your **ROOF SURFACE**. Nearly all roof surfaces are fine for rainwater harvesting.
2. Your gutters should have some sort of **GUTTER PROTECTION SCREENIN**G in order to keep large debris from entering the gutters.
3. You can collect rainwater from any type and shape of **GUTTER**. You do not need a special gutter for harvesting rainwater.
4. An additional filtration opportunity is with the installation of a **RAIN HEAD** (downspout filter) that allows for a bit of self-cleaning filtration options.
5. A **FIRST-FLUSH DIVERTER** helps to prevent the first flush of contaminated rainwater from entering the tank.
6. Another rainwater filtration opportunity is with a **TANK SCREEN** that is installed on the tank entry point. It also helps to keep mosquitoes and pests out.
7. **RAINWATER TANKS** come in all sorts of sizes and materials. .
8. Install an **INSECT PROOF FLAP VALVE** on the end of the overflow pipe to keep mosquitoes and pests out.
9. An **AUTO-FILL SYSTEM** can be installed to keep a minimum amount of water in the tank at all times. This is very important for rainwater tanks that are connected to automatic irrigation systems in order to prevent the pump from running dry.
10. Select a **PUMP SYSTEM** to provide pressurized rainwater to distribute the rainwater easier or to connect to an inground irrigation system.
11. Install an **IRRIGATION FILTE**R inline after the pump in order to catch any large debris that may have gotten through the pump.
12. A **WATER LEVEL INDICATOR** can be helpful with monitoring the water usage from the tank. Those are available in simple gauge tank options along with wireless digital options.

Design of System Components

By now, it is clear that a rooftop catchment system has three main components, viz. a roof, a guttering and first flush device and a storage tank.

(a) Roof : The roof should be smooth, made of non-toxic substances and sufficiently large to fill the tank with the available rainfall conditions. Existing roofs of houses and public buildings can be used for a rooftop catchment system. In some cases enlarged or additional roofed structures can be built.

(b) Guttering and first-flush device : Guttering is intended to protect the building by collecting the water running off the roof and direct it, via a down pipe, to the storage tank. Gutters should have a uniform slope of 0.5 percent large enough to collect the heavy runoff from high-intensity rain.

With all roof catchment tanks, the first rainwater running off the roof should be discarded. This helps keep the water potable because this first flush of rainwater contains large quantities of leaves and bird droppings. The importance of such first flush devices became clear from a study undertaken in Malaysia. The study showed how the faecal coliform count in runoff water was reduced from 4 to 60

per litre to zero, as the first five litres of runoff washed a roof measuring 15 m^2.

(c) Tank : Water tanks using ferrocement technology come in different designs with volumes ranging between 2 and 200 m^3. For example, a freestanding cylindrical tank can be built in sizes between 10 and 30 m^3, while a capacity of upto 200 m^3 is possible with sub-surface covered tanks. The latter is most economical when the capacity exceeds 50 m^3.

The principles of construction of ferrocement tanks involving the use of a corrugated iron moulds are widely adopted (see Figure A-2.1 of Appendix-II). An alternate design avoiding framework involves erecting a circular frame made of welded-mesh bars spaced at 15 cm and covered with chicked wire mesh (2.5 cm gauge) onto a reinforced concrete base. This is then covered on the outside with sacks or cloth and two coats of a 1.5 cm layer of mortar (1 part cement, 3 parts sand) plastered along the inner walls to produce the tank wall. Two further coats of plaster are added, one on the outside after removing the sacks and one on the inside to provide a tank wall thickness of 5 cm. A waterproof coat of just cement and water is then added to the tank's inner wall.

When the wall is complete, a wooden frame is constructed inside the tank to support the metal template made from old oil drums, which forms the mould for the domed roof. The roof is also reinforced with weld-mesh and chicken wire. For quality, the floor, walls and the roof need to be cured by moistening their surface for at least a week. This should start immediately after each component is ready.

Management and Maintenance

Roof top catchment tanks, like all water supply systems, demand periodic management and maintenance to ensure a reliable and high quality water supply. If the various components of the system are not regularly cleaned, water use is not properly managed, problems are not identified or necessary repairs not performed, the roof catchment system will cease to provide reliable, good quality supplies.

On the following page is a rough timetable of maintenance and management requirements that gives a basis for monitoring checks.

1. During the rainy season, the whole system (roof catchment, gutters, pipes, screens, first-flush and overflow) should be checked before and after each rain and preferably cleaned after every dry period exceeding a month.
2. At the end of the dry season and just before the first shower of rain is anticipated, the storage tank should be scrubbed and flushed of all sediment and debris (the tank should be re-filled afterwards with a few centimetres of clean water to prevent cracking). Ensure timely service (before the first rains are due) of all tank features, including replacement of all worn screens and servicing of the outlet tap or hand pump.

Water Use Management

Control over the quantity of water abstracted from the tank is important to optimise water use. Water use should be managed so that the supply is sufficient to last through the dry season. Failure to do so will mean exhausting all the stored water. In effect it will mean going back to where the user began, i.e. trekking long distances for poor quality water. On the other hand, underutilization of the water source due to severe rationing may leave the user dissatisfied with the level of the service provided.

TANKA/ KUND/ KUNDI

Tanka is generally circular in shape and is constructed in stone masonry in 1:3 cement-sand mortar. While small Tankas of 3 to 4.22 m diameter and about 21-59 cum capacity are built by individual households, larger ones of 6 m diameter and 200 cum capacity are built for the village communities. In both these cases the depth is kept equal to the diameter. The catchment of the Tanka is treated in a variety of ways to increase the rain water collection. The commonly used materials are murrum, coal ash, gravel, pond silt, Bentonite, soil-cement mix, lime concrete, sodium carbonate etc. Because of the

constraints of availability of large open areas around the Tanka and the unit cost of treatment, a circular strip of land of 12 m width around the Tanka is usually treated, the slope of which is kept as 3% i.e. a fall of 3 cm in a length of 1 m. This provides bulk of the requisite amount of water to fill the Tanka. Remaining water is received from the natural catchment outside the treated area. Reference Tables and Design Example for Tanka are given in Appendix-III.

Site Selection

Tanka of about 21 cum capacity for an individual household should preferably be built in front of the house in an open area of about 10 m x 10 m size. Since the rainwater from this area is to be collected in the Tanka, the area should be such that human activity and cattle grazing may be prevented during the monsoon season to prevent pollution of water.
For community Tanka of about 200 cum capacity the size of the open area should be at least
30 m × 30 m.
In both the cases the land surface should be firm and sandy with gentle slope of about 3 % i.e. with a fall of 3 cm in 1 metre length.

Site Preparation

The selected area should be cleared of all vegetation i.e. grass, shrubs, bushes etc. A circle of 10 m diameter in case of the household tanka and 30 m diameter in case of community tanka should be drawn to mark the rain-water-collection area (catchment area).
In case of the smaller Tanka the catchment area should be suitably dressed to provide an inward slope of 3 cm in 1 metre length towards the centre.
For the community Tanka, the desired slope can be provided even in one direction i.e. in the general direction of the natural ground slope. In this case entry of rain water into the Tanka is ensured by building a semi-circular earthen bund at the lower end of the catchment area.

Planning and Design Criteria

1. *Water Requirement*

A Tanka of 21 cum capacity is usually adequate to meet the minimum drinking water requirements of a family of 6 persons for one year. Community Tankas, however, have only a supplemental role since these can only partially meet the requirements depending upon the size of the community and the availability of land for constructing the Tankas. Viewed in this light, water requirement of the community is not necessarily a governing criterion for design of a Tanka scheme. Instead, conservation of available water and its proper distribution and use are of crucial importance.

2. *Water Availability*

(a) Untreated Catchment

Some part of the rainwater is lost due to evaporation and seepage into the ground. This loss varies with the amount of rainfall. For low rainfall the losses are high and for high rainfall these are low.

(b) Treated Catchment

Volume of rain water that can be collected from a treated catchment around the Tanka can be worked out from the Table A-3.2 of Appendix-III.

3. *Structural Design*

For 21 cum capacity (see Figure 6.4)

WaterRequirementandGrossStorage

Unless otherwise prescribed for an area, following general guidelines may be used todetermine the water requirements of a village community and the gross storage capacity ofthepond.
Irrigation:Provideabout0.67-hectaremeterofcapacityforahectareofirrigation

Animal needs:Provideatthefollowingrates:
Beef cattle: 54-68litres/day
Dairy Cows: (drinking + bran needs) 158 litres/ day
Sheep: 9 litres/ day
Domestic water need: 40litresperheadperday
Fish Culture: ensure about 1.85 depth to provide proper temperature environment.

Abstract Sheet:

Itemno	Descriptionof Item	QTY.	Unit	SOR(InRs.)	EstimatedAmount(InRs.)
1.	Excavationforfoundation	149.7	Cmt	86.00	12874.20
2.	Providingandlayingcementconcrete 1:2:4	10.87	Cmt	3100.00	33697.00
3.	Brickwork	20.34	Cmt	3000.00	61020.00
4.	15mm thick cementplaster in single coat on rough	142.61	Smt	150.00	21391.50
5.	Providingcementvata	29.05	Rmt	19.00	551.95
6.	ProvidingI.S.I.T.M.TBarsFe.500 steel reinforcement	115.79	Kg	45.00	5210.55
7.	Providing&layingordinarycementConcrete1:1.5:3	1.39	Cmt	5590.00	7770.10
8.	C.I.ManholecoverSize0.6x0.6 m	1.00	No.	500.00	500.00
9.	Providing&fixingHandpump.	1.00	No.	600.00	600.00
10.	Providing&fixingtowallceiling and floor UPVC/SWRsoil waste pipe	19.00	Rmt.	250.00	4750.00
11.	Valve of75mmdia.P.V.C. pipe	5.00	No.	250.00	1250.00
12.	FiltrationChamberofsize0.6x0.75mx .45m	1.00	No.	4000.00	4000.00
13.	Undergroundpercolationwell to recharge water as perapproveddrawing	1.00	No.	14000.00	14000.00
Total Amount in Rs.					**1,62,398.00 Rs.**
				Say	**1,62,400.00 Rs.**

13.1.2 Civil Design 2

GROUND SERVICE RESORVOIER

(UNDER GRIUND WATER SUMP)

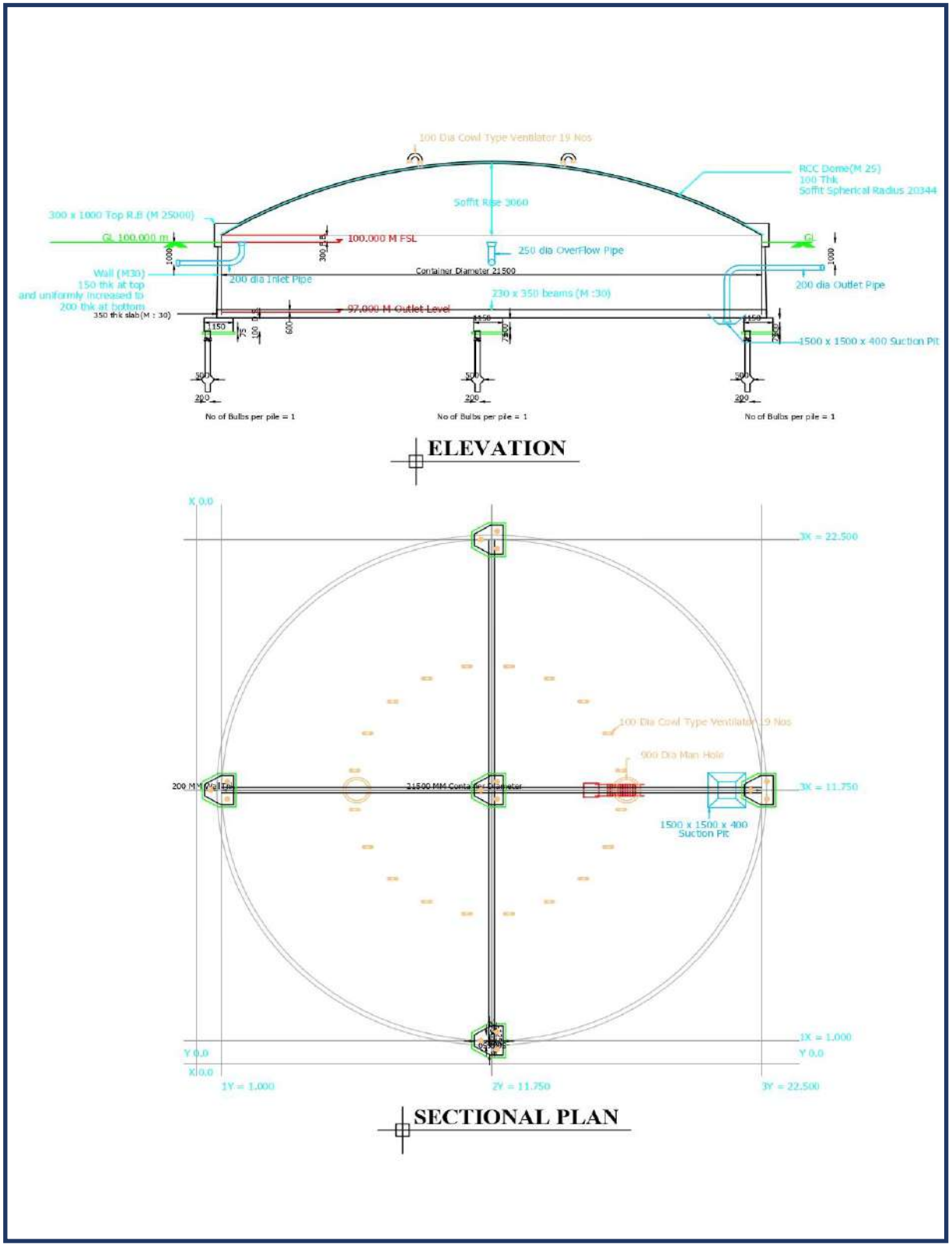


Figure 13.1.2.1. Elevation and section of GSR

QUANTITY SHEET OF GROUND SERVICE RESORVOIER							
SR. NO.	DISCRIPTION	NOS.	Length (L)	Width (W)	Depth (H)	Total	Unit
1	Exc Ordinary Soil	-	-	-	-	1484.10	cu.mt.
2	PCC	-	-	-		43.37	cu.mt.
3	Concrete-M15	-	-	-		42.29	cu.mt.
4	Concrete-M25	-	-	-		59.80	cu.mt.
5	Concrete-M30	-	-	-		109.73	cu.mt.
6	Steel-Fe250	-	-	-		1960.17	Kg.
7	Steel-Fe415	-	-	-		6210.71	Kg.
8	Steel-Fe500	-	-	-		3285.17	Kg.

SR. NO.	ITEM	QTY.	UNIT	RATE	PER	TOTAL
1	Item No.1 Excavation for foundation/pipe trenches in Ordinary Soil including removing the excavated material upto 50 m and lifts as below, stacking and spreading as directed by Enginner-in-Charge, normal dewatering, preparing the bed for foundation and excluding backfilling etc., complete					
	a) For depth 0.0 to 1.5 m	650.60	cu.mt.	35.00	cu.mt.	22771.14
	b) For depth 1.5 to 3.0 m	650.60	cu.mt.	35.00	cu.mt.	22771.14
	c) For depth 3.0 to 4.5 m	182.89	cu.mt.	35.00	cu.mt.	6401.07
2	Item No.2 Providing and casting in situ mass cement concrete in grade M100 (approx. corresponding to prop 1:3:6) using granite, quartzite trapmetal of size 12mm to 25mm incl.consolidation, curing etc. complete (a)PCC	43.37	cu.mt.	1850	cu.mt.	80241.17
3	Item No.2 Providing and casting in situ mass cement concrete in grade M100 (approx. corresponding to prop 1:3:6) using granite, quartzite trapmetal of size 12mm to 25mm incl.consolidation, curing etc. complete (a) Piles with Pile Cap	42.29	cu.mt.	2000	cu.mt.	84577.95
4	Item No.4 Providing and casting in situ C.C in grade M25 using granite, quartzite trapmetal of size 12mm to 20mm and 6mm to 12mm incl. scaffolding, centering, formwork, needle vibrated consolidation, curing and hydraulic testing etc. complete(excl. cost of reinforcement)					
	a) Top Dome	39.25	cu.mt.	2650.00	cu.mt.	104020.33

	b) Dome Beam	**20.55**	**cu.mt.**	**2650.00**	**cu.mt.**	**54446.95**
5	Item No.5 Providing and casting in situ C.C in grade M30 using granite, quartzite trapmetal of size 12mm to 20mm and 6mm to 12mm incl. scaffolding, centering, formwork, needle vibrated consolidation, curing and hydraulic testing etc. complete (excl. cost of reinforcement)					
	a) Cylindrical Wall	**28.84**	**cu.mt.**	**2650.00**	**cu.mt.**	**76420.23**
	a) Cylindrical Wall	**80.89**	**cu.mt.**	**2650.00**	**cu.mt.**	**214368.42**
6	Item No.6 Supplying, Cutting, bending, binding and placing in position Fe250 grade steel as per plan and design and as per IS 2503 incl. cost of steel and binding wire for reservoirs only incl. lift upto 6 mt. height using deformed bars confirning to IS 1786. (a) Below 3.00 m	**1960.17**	**Kg.**	**21.00**	**Kg.**	**41163.64**
7	Item No.7 Supplying, Cutting, bending, binding and placing in position Fe415 grade steel as per plan and design and as per IS 2503 incl. cost of steel and binding wire for reservoirs only incl. lift upto 6 mt. height using deformed bars confirning to IS 1786.					
	a) Below 3.00 m	**3384.34**	**Kg.**	**21.00**	**Kg.**	**71071.23**
	b) 3.00 m - 6.00 m	**2826.36**	**Kg.**	**21.00**	**Kg.**	**63593.20**
8	Item No.8 Supplying, Cutting, bending, binding and placing in position Fe500 grade steel as per plan and design and as per IS 2503 incl. cost of steel and binding wire for reservoirs only incl. lift upto 6 mt. height using deformed bars confirning to IS 1786					
	a) Below 3.00 m	**3384.34**	**Kg.**	**21.00**	**Kg.**	**71071.23**
	a) Below 3.00 m	**2826.36**	**Kg.**	**21.00**	**Kg.**	**63593.20**
						910834.94
					SAY	**911000.00**
	RUPEES NINE LAKHS ELEVEN THOUSAND ONLY					

13.1.3 Civil Design 3

ELEVATED SERVICE RESORVOIER

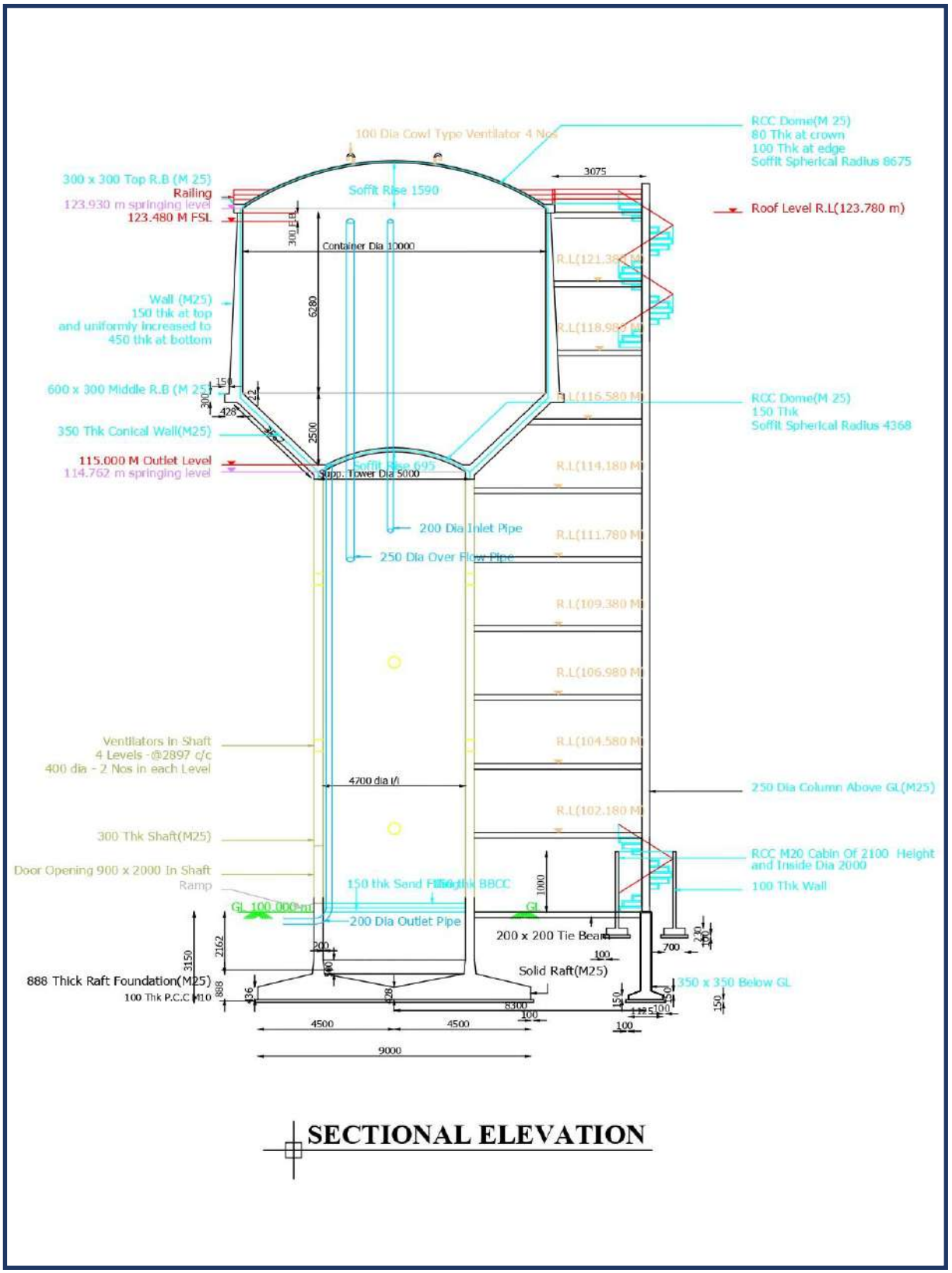


Figure 13.1.3.1 Sectional Elevation

QUANTITY SHEET OF ELEVATED SERVICE RESORVOIER							
SR. NO.	DISCRIPTION	NOS.	Length (L)	Width (W)	Depth (H)	Total	Unit
1	Exc Ordinary Soil	-	-	-	-	261.95	cu.mt.
2	PCC	-	-	-		7.36	cu.mt.
3	Concrete-M20	-	-	-		1.75	cu.mt.
4	Concrete-M25	-	-	-		238.59	cu.mt.
5	Steel-Fe250	-	-	-		38.738	Kg.
6	Steel-Fe415	-	-	-		13246.23	Kg.

ABSTRACT SHEET OF ELEVATED SERVICE RESORVOIER						
SR. NO.	ITEM	QTY.	UNIT	RATE	PER	TOTAL
1	Item No.1 Excavation for foundation/pipe trenches in Ordinary Soil including removing the excavated material upto 50 m and lifts as below, stacking and spreading as directed by Enginner-in-Charge, normal dewatering, preparing the bed for foundation and excluding backfilling etc., complete					
	a) For depth 0.0 to 1.5 m	123.835	cu.mt.	35.00	cu.mt.	4334.23
	b) For depth 1.5 to 3.0 m	118.70	cu.mt.	35.00	cu.mt.	4154.60
	c) For depth 3.0 to 4.5 m	19.41	cu.mt.	35.00	cu.mt.	679.46
2	Item No.2 Providing and casting in situ mass cement concrete in grade M100 (approx. corresponding to prop 1:3:6) using granite, quartzite trapmetal of size 12mm to 25mm incl.consolidation, curing etc. complete (a)PCC	7.36	cu.mt.	1850	cu.mt.	13616.71
3	Item No.3 Providing and casting in situ C.C in grade M20 using granite, quartzite trapmetal of size 12mm to 20mm and 6mm to 12mm incl. scaffolding, centering, formwork, needle vibrated consolidation, curing and hydraulic testing etc. complete(excl. cost of reinforcement)					
	a) Roof Beam	0.407	cu.mt.	2650	cu.mt.	1078.55
	b) Bottom Beam	1.344	cu.mt.	2650	cu.mt.	3561.60
4	Item No.4 Providing and casting in situ C.C in grade M25 using granite, quartzite trapmetal of size 12mm to 20mm and 6mm to 12mm incl. scaffolding, centering, formwork, needle vibrated consolidation, curing and hydraulic testing etc.					
	a) Top Dome	7.77	cu.mt.	2650.00	cu.mt.	20594.84

	b) Dome Beam	**2.91**	**cu.mt.**	**2650.00**	**cu.mt.**	**7717.48**
	(c) Middle Ring Beam	**5.99**	**cu.mt.**	**2650.00**	**cu.mt.**	**15884.52**
	d) Conical Shell	**29.08**	**cu.mt.**	**2650.00**	**cu.mt.**	**77073.52**
	e) Bottom Dome	**2.81**	**cu.mt.**	**2650.00**	**cu.mt.**	**7460.80**
	f) Bottom Beam	**2.33**	**cu.mt.**	**2650.00**	**cu.mt.**	**6168.99**
	g) Cylindrical Wall	**58.23**	**cu.mt.**	**2650.00**	**cu.mt.**	**154297.64**
	h) Columns	**1.66**	**cu.mt.**	**2000.00**	**cu.mt.**	**3317.60**
	i) Shaft	**81.22**	**cu.mt.**	**2650.00**	**cu.mt.**	**215240.42**
	j) Solid Raft	**46.58**	**cu.mt.**	**2650.00**	**cu.mt.**	**123440.63**
5	Item No.5 Supplying, Cutting, bending, binding and placing in position Fe250 grade steel as per plan and design and as per IS 2503 incl. cost of steel and binding wire for reservoirs only incl. lift upto 6 mt. height using deformed bars confirning to IS 1786					
	(a) 3.00 m - 6.00 m	**7.41**	**Kg.**	**21.00**	**Kg.**	**155.66**
	b) Above 15.00 m	**31.32**	**Kg.**	**21.00**	**Kg.**	**657.83**
6	Item No.6 Supplying, Cutting, bending, binding and placing in position Fe415 grade steel as per plan and design and as per IS 2503 incl. cost of steel and binding wire for reservoirs only incl. lift upto 6 mt. height using deformed bars confirning to IS 1786.					
	a) Below 3.00 m	**1463.14**	**Kg.**	**21.00**	**Kg.**	**30725.93**
	b) 3.00 m - 6.00 m	**22.37**	**Kg.**	**22.50**	**Kg.**	**503.39**
	c) 6.00 m - 9.00 m	**3104.89**	**Kg.**	**21.00**	**Kg.**	**65202.77**
	d) Above 15.00 m	**8655.82**	**Kg.**	**19.00**	**Kg.**	**164460.61**
						998303.44
					SAY	**998350.00**
	RUPEES NINE LAKHS EIGHT THOUSAND THREE HUNDRED FIFTY ONLY					

13.1.4 Civil Design 4

WATER SUPPLY DISTRIBUTION SYSTEM

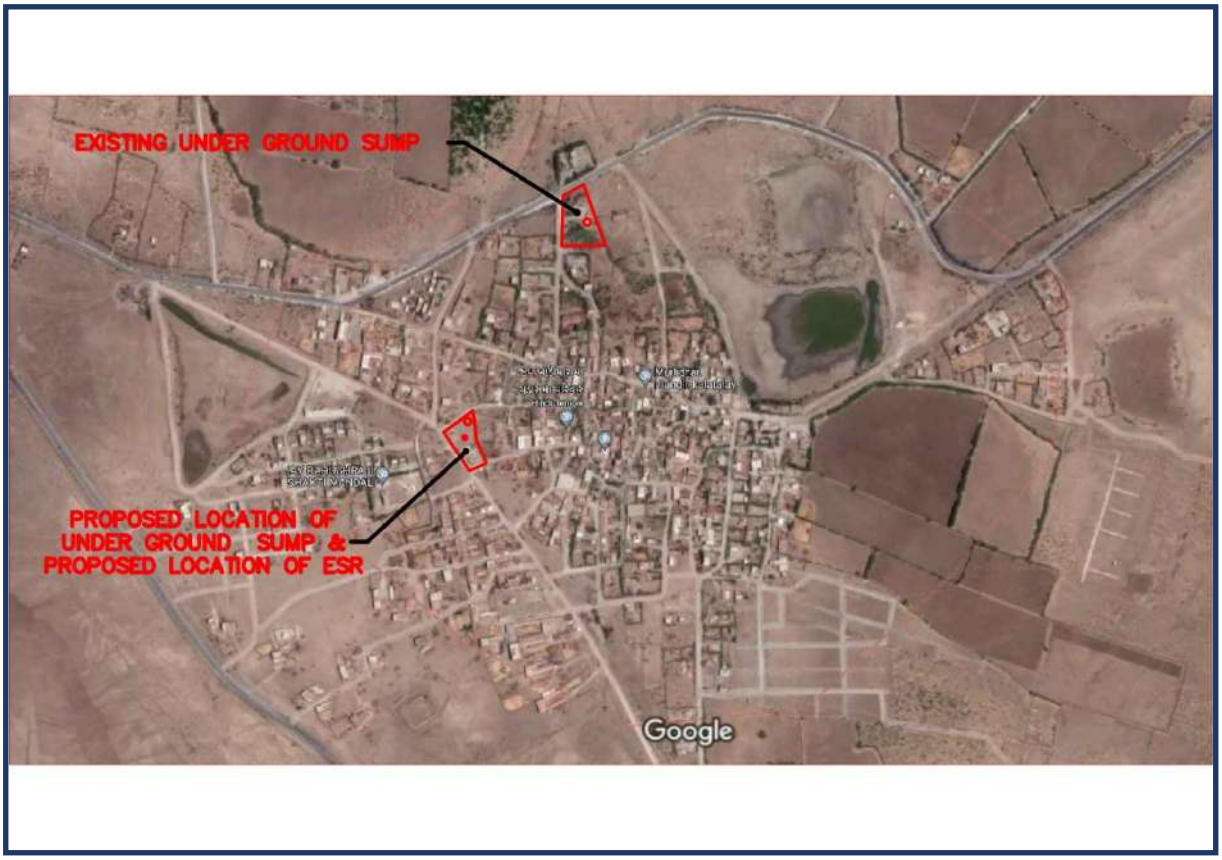


Figure 13.1.4.1. Proposed and existing location plan of U.G. sump and ESR.

Figure 13.1.4.2. Proposed schematic layout plan of watersupply distribution system.

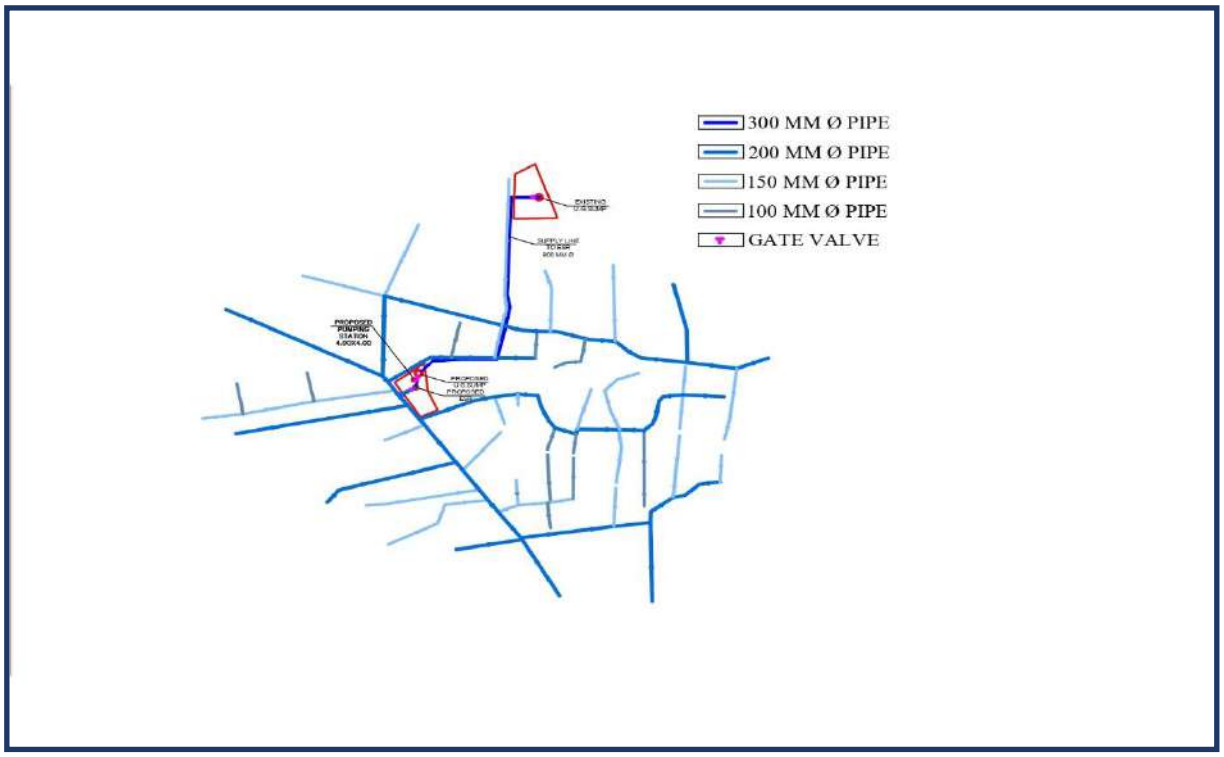


Figure 13.1.4.3. Proposed design of watersupply distribution system.

ESTIMATE OF WATER SUPPLY DISTRIBUTION SYSTEM

As per GWSSB SOR 2019-20 the rate of water supply distribution system including materials (i.e.HDPE pipes, Sluice valve, butterfly valves etc.fixtures and fastening) andlaboure costis

2500.00 Rs./Run.mt. of pipe line.

Estimated length of pipes = 2500mt. X 2500.00Rs./Run.mt length

=62,50,000.00/-

13.1.5 Civil Design 5

ZINGA UCHER KENDRA

1. DESIGN OF PRAWN FARMING AND STORAGE

1.1 Introduction

Prawn framing is a risky business for new entrepreneurs and for those that do not have experience in aqua farming sectors. However, it is recommended to start a small-scale business that can fetch a lot of knowledge and information about repairing prawns. The environmental conditions at the farm location play a crucial role in the success or failure of prawn farming business. Weather, soli, and water conditions plays an important role in the prawn farming industry. With advanced technology include intensification of prawn culture operation, increase in prawn density, proper aeration methods, providing formulated feed, and water quality management, etc. There are two types of prawn farming, freshwater prawn farming, and saltwater prawn farming. Commercial fresh water farming can be done in tropical and sub-tropical climatic regions having reservoirs, lakes, irrigation ditches, rivers, pond, and other natural water resources. Saltwater prawn farming can be done in regions that are nearby to sea waters or coastal regions.

The demand for freshwater and saltwater prawn is high in local and world market. The consumer demand in the world market is always growing consistently. Countries having large coastal regions are taking advantages of this business. The availability of suitable sites and good water quality maintenance can be successful with decent profits by having a proper prawn rearing business plan and proper marketing strategies.

1.2 How many types of prawn species are there?

There are many types of prawn species are available around the world. Cultured prawns are mostly edible while some of the saltwater varieties are not edible. Freshwater prawns are big in size compared to the marine and brackish water grew species. Some of the prawn varieties that are found worldwide are northern prawns (P, aztecus), redspotted prawn (P. brasiliensis), crystal prawn (P. brevirostris), oriental prawn (P. chinensis), brown tiger prawn (P. paulensis), blue prawn (P. stylirostris), pink prawn (P. notialis), and more.

1.3 Prawn Varieties for Farming

Many prawn varieties do not fetch good market values. Some of the larger size ones are raised in farms. A farmer should consider various factors before choosing which species of prawn he should culture. Some the in-demand market species are:

1. Indian White prawn
2. Giant Freshwater
3. Giant Tiger Prawn
4. Kuruma prawn
5. Pacific white prawn

1. Indian White Prawn:

This species are farmed in the coastal regions of India, Iran, Middleast, and eastern coastal regions of Africa. They grow to a length of 20 to 22 cm long. The species thrive well in sandy mud soil with a depth of 2 to 90m deep. The life span of those species is 18 months and 120 to 145 days culture period. Its edible meat weight is comparatively high to its toral weight as the exoskeleton is slightly thin. The yield can be about 10 to 20 tons/hacters/year.

2. Giant Tiger Prawn:

Is also known as black tiger prawn. This species is commonly found wild in the Indian and pacific oceans, most of the tiger prawn farming is carried out in eastern countries coastal regions. This is the largest species growing up to 30 to 35 cm in length. White spot disease is the major drawback for this species as it easily gets succumbs and difficult to breed in captivity.

1.4 Why Prawn Farming Business

Prawn can be reared in aquaculture, fish farms, backyard water, pond, tanks, and in all-natural water available resources places. Prawn farming comes to harvest in six months, and prawn farming is a profitable business idea giving a huge profitable business idea giving a huge profit margin. Prawn consumption demand is always prawn consumption demand is always high; successful prawn farming can fill a part of the market demand to make you financially successful prawn farming can fill a part of the market demand to make you financially successful. Consumption of prawn provides protein, key nutrients, minerals, and lows in calories.

1.5 Prawn Farming Practices

Soil Quality: Soil quality is an important component in prawn farming. Soil with heavy metal content, acid-sulfate soils, Ph level less than 5 should be avoided. Sandy area require high investment along with operational cost. Clayey loamy soils are good for prawn farming and also with rich organic matter help in the production of benthic blue algae and also involve less capital investment. Clayey soil with rich organic matter help in the production of benthic blue algae and plankton production that forms the food for prawn. Ideal soil should have pH value (7 to 8), organic carbon (1.5 to 2.5%), soil nitrogen (50 to 75 mg per 100 g soil), soil phosphorous content (4 to 6 mg per 100 g soil), calcium carbonate (>5%), and soil electrical conductivity (>4 mmhos / cm)

Water Quality: One of the most important i for prawn farming is good quality water. A farmer site should consider the sources of water availability during different seasons, its quality, and quantity.

Sr. No.	Water Parameters	Optimal Level
1.	Temperature	28 ℃ - 33 ℃
2.	Transparency	25-45 cm
3.	pH	5-7
4.	Oxygen Levels	5-7 ppm
5.	Salinity	15-25 ppt
6.	Alkalinity	200 ppm
7.	Phosphorous	0.1-0.2 ppm
8.	Nitrite	<0.01 ppm
9.	Nitrate	<0.03 ppm

10.	Ammonia	<0.01 ppm
11.	Cadmium	<0.01 ppm
12.	Chromium	<0.1 ppm
13.	Copper	<0.025 ppm
14.	Lead	<0.1 ppm
15.	Mercury	<0.0001 ppm
16.	Zinc	<0.1 ppm

Prawn Live Body Weight	Feed Rate @ body weight % / day
2-3	7.0-8.0
3-5	505-7.0
5-10	4.5-5.5
10-15	3.8-4.5
15-20	3.2-3.8
20-30	2.5-3.2
30-40	2.1-2.5

Table no. 13.2 Water Quality

Table no. 13.3 Prawn Live Body Weight

1.7 Prawn Diseases, Prevention, and Control:

The most dreaded thing for prawn farmers is prawn diseases. Prawn are affected by microorganisms like viruses, fungi, bacteria, parasites and algal toxins. The causes of diseases in prawn could be nutritional deficiency, poor water condition, and environmental pollutants

1.8 Prawn Farming- Market Potential:

According to Indian statistics, the brackish water area that is highly suitable for prawn farming in India is estimated to be 11.90 lac ha. Having such vast brackish water resources and only such vast brackish water resources and only 14% is used for prawn farming. Yet, India stands 2nd largest producer of prawns after China. Therefore, there is a huge opportunity in this segment of aquaculture expansion. Aquaculture is growing at an annual growth rate of 6.5%, giving a scope to become a major area of business exploration. India has a large coastline with large inland water bodies along with favorable climatic conditions. Aquaculture production is more cost-effective compared with agriculture/animal husbandry production. More effective in feed to end-product conversion both in natural and controlled farming.

1.9 Pond Management:

There is no particular design for prawn ponds. The pond design is made on the basis of physical and economic condition along with optimum and carrying of smooth functional works. Water depth in the pond is maintained at 50 to100cm height level, while water level farming. 20% to 30% of water is exchange every 7 to 10 days and in the first 30 days of the culture period, avoid water exchange. Depending on the stocking density and the water, deteriorating rate, water exchange should be taken up. Oxygen in water levels has to be maintained maximum. Aeration of water levels is maintained by using paddlewheel aerators. About two paddle wheels are required for a hectors and aerations works has to be conducted four to six hours in a day. A couple of laborers are kept for regular culture operations such as monitoring the quality of water, soil, animal health, and feed intake. Additional unskilled laborers are required at the time of pond preparation, harvest, and post-harvest operation on a daily basis. Moat countries practice three types of prawn culture

1. Traditional or Extensive Farming:

In this type, the pond may not be in regular size and shape, mostly more than 1.5 hectares in size. The bottom of the pond need not be leveled, but free from tree stumps and any other plants. Ponds are

constructed in a way that they are filled with gravity flow. In extensive prawn farms, the stocking density is maintained at one to five pieces per square meter and is partially harvested.

2. Semi-Intensive Farming:

In this type, the ponds are about one to one and a half hectares in size. The ponds are constructed with earth walls (or dikes) to hold water about 100 to 150 cm deep. Stocking of animals is done at 10 to 15 prawns per square meter with fresh diets or wit supplementary feeds or in some cases both. Harvesting is usually carried out after 100 to 120 days after stocking.

3. Intensive Farming:

In this type, the ponds are lesser in size about half to one hectare with pond water depth of about 150 to 200 cm deep. In these types, water aeration plays to be maintained with strong aeration. Feeding is carried four to six times on a daily basis, this is because of the high stock density of about 30 to 60 prawns per square meter.

1.10 How much does it cost to start prawn farming in a hectare?

In prawn farming, feeding, digging, and equipment are the main sources of investments. The capital investment amount also depends on the amount of seed you are going to farm. On an average, the investments can be anywhere from 7 to 12 lakhs that include seed, feed, equipment and medicines. The farmer should have equipment such as water aerator sets, pumps, and generator that is mandatory in this culture. To reduce the capital investment, some farmers get this equipment for lease/rent. It takes about 4 to 5 lakhs to dig and prepare a hectare pond

The main risk factor in prawn farming is virus and WSD, proper pond maintenance and medicine availability is very important and medicine availability is very important. On a successful crop, at the time of harvest, a farmer can make profits twice or thrice on the investment. The sale price of the harvest is based on the number of prawns per kilogram, the lesser the count, more is the selling price. Depending on the current market rate, on an average with a count of 40 kg a farmer can make about 13 to 15 lakh per crop.

1.11 Cost and Profits in Prawn Farming/Economic of Prawn Farming /Prawn Farming Project Report.

1. Fixed Capital investment Cost on Hatchery:

Sr.	Particulars	Cost. Rs
1.	Broodstock Pond 2. Nos	1,08,000/-
2.	Larva Rearing Tank 12. Nos	1,15,000/-
3.	Hatchery shed 10x6 m	2,35,000/-
4.	Water storage tank	46,000/-
5.	PVC drainage piping	21,000/-
6.	Aerator set 5hp, 2. Nos	1,50,000/-
7.	Water pump sets 2 hp, 2. Nos	30,000/-
8.	Generator	65,000/-
9.	Electrical Installation	25,000/-
10.	Borewell	45,000/-
Total Fixed Capital Investment		**8,40,000/-**

Table no. 13.4 Fixed Capital investment Cost on Hatchery

2. Operational Cost of Hatchery:

Sr. No.	Particulars	Cost. Rs
1.	Chemical and organic fertilizer	7,500/-
2.	Broodstocks development	50,000/-
3.	Pumping and aeration charges	15,000/-

4.	Pelleted feed and artemia @ Rs. 4000/kg	2,20,000/-
5.	Seawater transportation	27,500/-
6.	Fuel and electricity	35,000/-
7.	Refrigerator	25,000/-
8.	Salaries and wages	1,90,000/-
9.	miscellaneous	30,000/-
Total Operational Investment		**6,00,000/-**

Table no. 13.5 Operational Cost of Hatchery

3. Total Cost on Hatchery:

Sr.no.	Particulars	Cost. Rs
1.	Operational Cost	6,00,000/-
2.	Deprecation on fixed cost @10%/ year	84,000/-
3.	Interest on fixed investment @ %/ year	1,26,000/-
Total cost		**8,10,000/-**

Table no. 13.6 Total Cost on Hatchery

4. Income on Hatchery:

Sr.no.	Particulars	Cost. Rs
1.	Sale of seed @ Rs. 500/1000	10,00,000/-
Net Income (Sale – Total Cost)		**1,90,000/-**

Table no. 13.7 Income on Hatchery:

5. Operational Cost of Freshwater Prawn Farming in Semi-Intensive Culture

Sr. No.	Particulars	Cost. Rs
1.	Chemical and organic fertilizer	7,500/-
2.	Prawn seed 30,000/ ha @ Rs.600 per 1000	18,000/-
3.	Formulated pellet feed	40,000/-
4.	Laborer wages per annum	57,600/-
5.	Laborer wages at harvesting	6,000/-
6.	Fuel and electricity	3,500/-
7.	Miscellaneous	5,000/-
Total Operational Investment		**1,37,600/-**

Table no. 13.8 Operational Cost of Freshwater Prawn Farming in Semi-Intensive Culture

6. Total Cost on Freshwater Prawn Farming:

Sr. No.	Particulars	Cost. Rs
1.	Operational cost	1,37,600/-
2.	Depreciation on fixed cost @ 10/ year	13,760/
3.	Interest on fixed investment @ 15%/ year	20,640/-
Total cost		**1,72,000/-**

Table no.13.8-a Total Cost on Freshwater Prawn Farming

7. Income on Freshwater Farming:

Sr. No.	Particulars	Cost. Rs
1.	Sale of big size prawn 450 kg @ Rs 550/kg	2,47,500/-

2.	Sale of small size prawn 90 kg @ Rs 200/kg	18,000/-
Net Income (Total Sale – Total Cost)		**93,500/-**

Table no : 13.9 Income on Freshwater Farming

1.12 Central Government Subsidies and Schemes for Prawn Farming:

To strength the food security and to utilize the vast natural resources such as reservoirs, lakes, tanks, canal, ponds, and other, water bodies having immense scope for development and production of aquaculture to generate employment opportunities and earn foreign exchange. The central government undertook the objectives of improving the socio-economic status aqua-farmers by launching a centrally sponsored aqua- farmers by launching scheme on "development of Inland Fisheries and Aquaculture" under macro-management during the 10th plan. Development of freshwater and brackish water aquaculture are the components approved. Assistance can be provided for construction of new ponds, renovation of ponds and tanks, aerators, pumps, the establishment of fresh water prawn seed hatchery, purchase of vehicles, and more. More information can be obtained from the department of fisheries and aquaculture at the office for rate of assistance and other benefits

1.13 Layout:

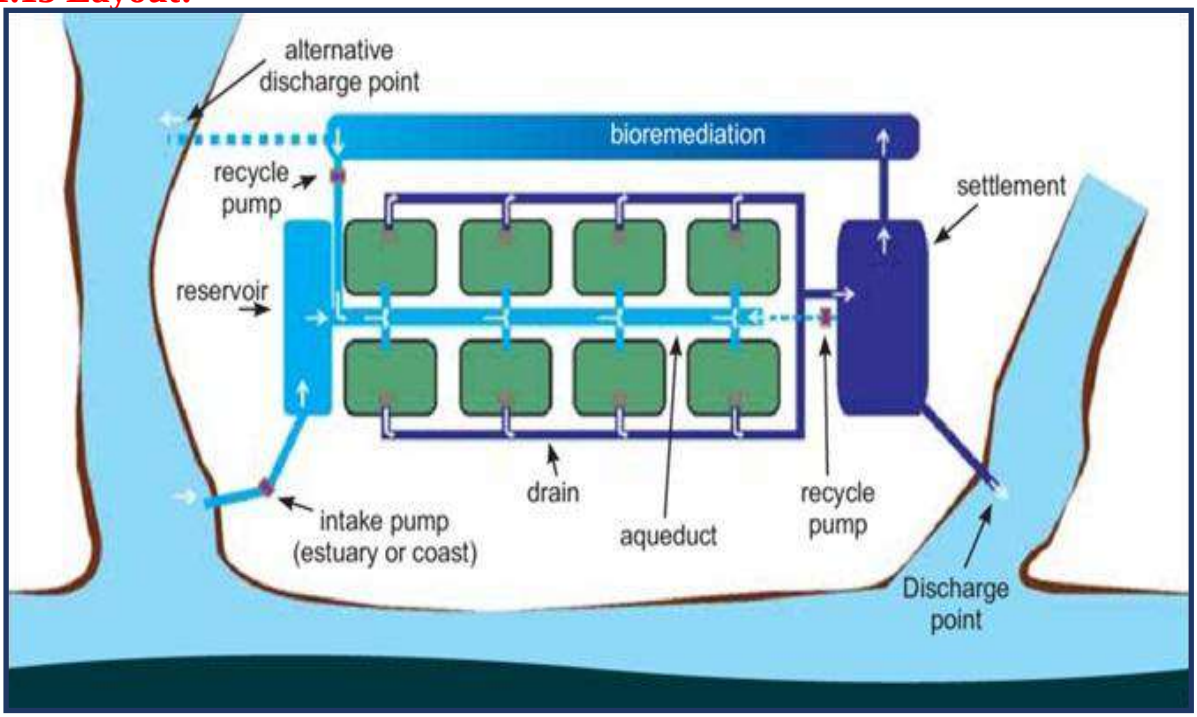


Figure 13.1.5.1. Layout plan of zingaucherkendra

13.1.6 Civil Design 6

SKILLDEVELOPEMET CENTER

Figure 13.1.6.1. 3D View of Skill Development center

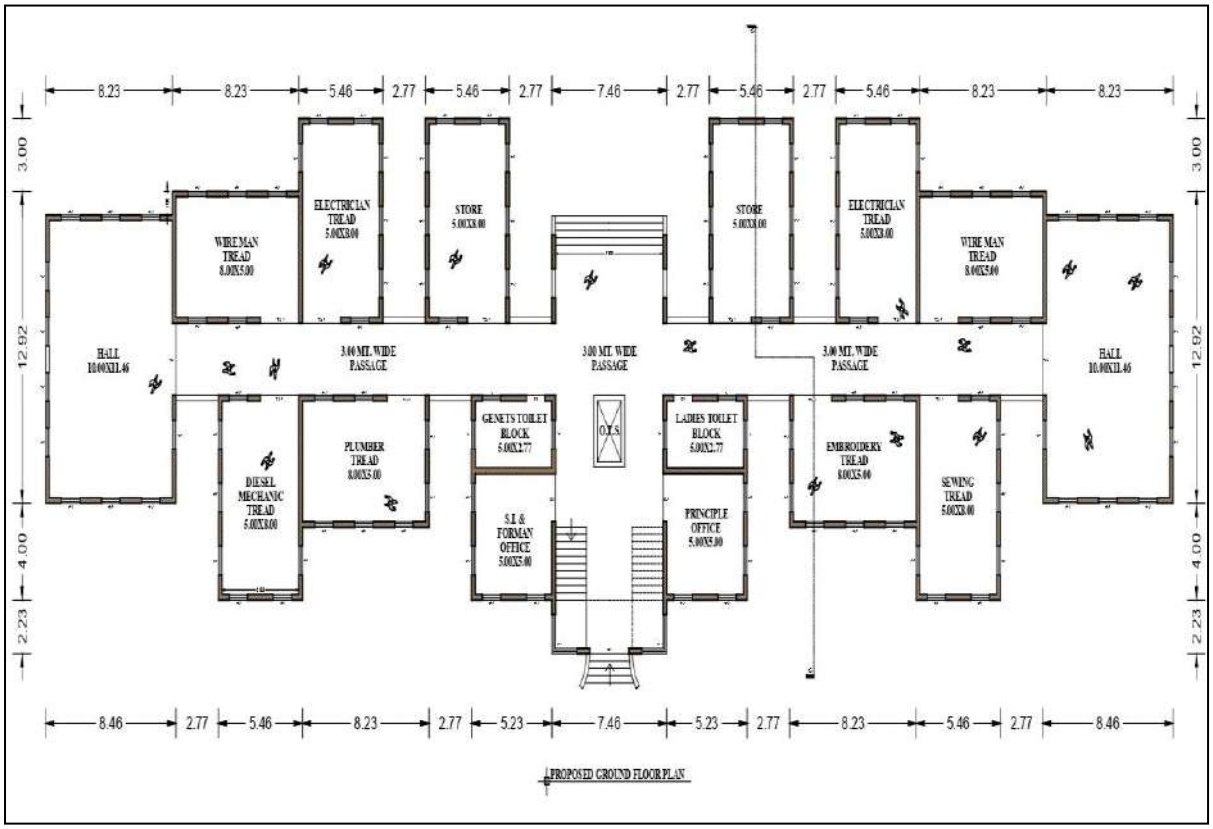


Figure 13.1.6.2.Plan of Skill Development center

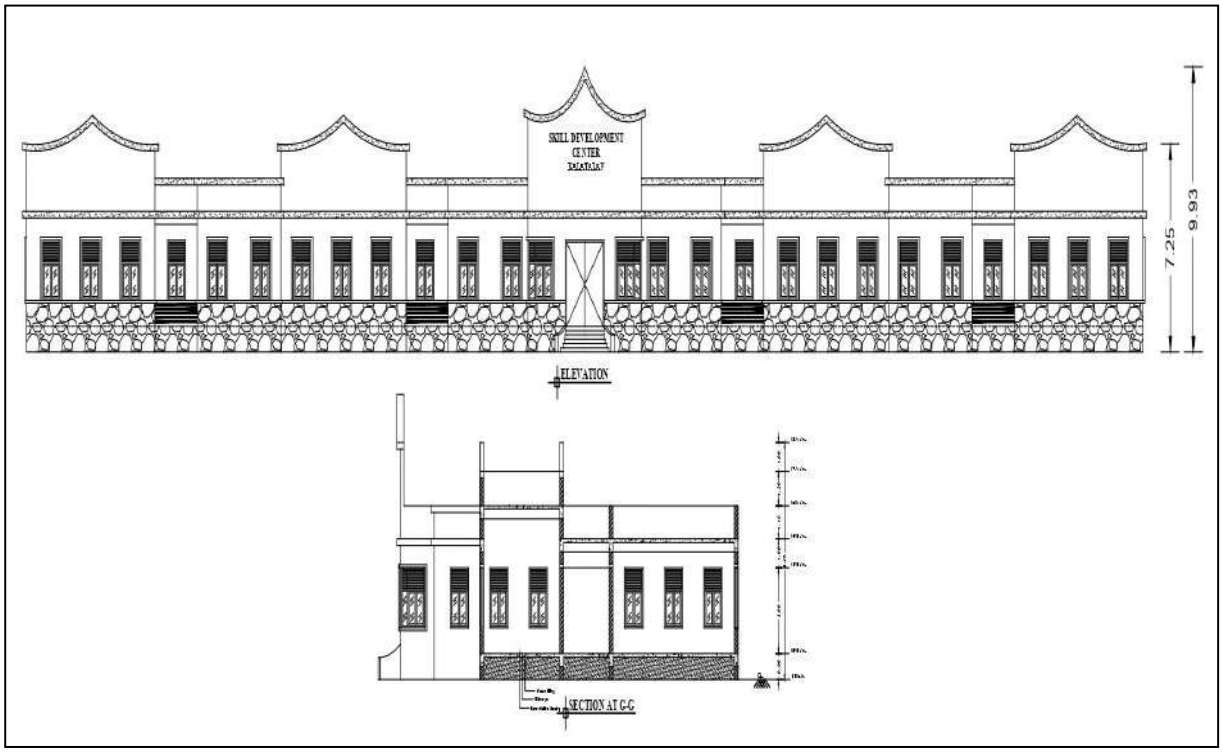


Figure 13.1.6.2.Elevation & Section of Skill Development center

QUANTITY SHEET OF SKILL DEVELOPMENT CENTER							
SR. NO.	**DISCRIPTION**	**NOS.**	**Length (L)**	**Width (W)**	**Depth (H)**	**Total**	**Unit**
1	**Excavation in foundation**						
	Total excavaion					**1198.08**	**cu.mt.**
2	**P.C.C. In Foundation**						
	Total P.C.C.					**119.81**	**cu.mt.**
3	**Brick masonry**						
	Net brick masonry in super structure					**908.78**	cu.mt.
4	**RCC work**						
	Total concrete work					**293.05**	**cu.mt.**
5	**D.P.C. on plinth beam**						
	total D.P.C. on plinth beam					**88.79**	**sq..mt.**
6	**Internal plaster**						
	Total Internal plaster					**2542.55**	**sq.mt.**
7	**External plaster including parapet inside plaster**						
	Total external plaster					**1463.49**	**sq.mt.**
8	**Tiles work**						
	TOTAL FLOOR AREA					**1026.08**	**sq.mt.**
9	**Alumium doors & windows & steel door**						
	Total area of Alumium doors & windows					**217.40**	**sq.mt.**
10	**Total intermalColor work**						
	Internal Color work same as internal plaster work					**2542.55**	**sq.mt.**
11	**Total ExtermalColor work**						
	External color work same as external plaster work					**1463.49**	**sq.mt.**
12	**Quantity of Steel**						
	asuming(HYSD & MILD STELL) 1.2% steel of 1cu.mt. concrete work	lumpsum				**34506.27**	**kg.**
13	**Safety grill and elevation pipes**					**5000.00**	**kg.**

ABSTRACT SHEET OF SKILL DEVELOPMENT CENTER						
SR.NO.	**DISCRIPTION**	**QTY.**	**PER**	**RATE**	**PER**	**TOTAL AMOUNT**
1	Excavation for foundation upto 1.5 m depth includingExcavation 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.(A)Loose or soft soil sr.no.1, Item coad.04B00 1A, tem no.as per NBO.0, SOR PAGE.NO.41(R & B SOR 2015-16 Bhavnagar)	1198.08	CU. MT.	119.00	CU. MT.	Rs 1,42,571.52
2	PCC : Providing and laying cement concrete 1:3:6 (1-Cement : 3-coarse sand : 6- hand broken stone aggregates 40mm nominal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth (upto 10 ton) sr.no.5, Item coad.5003,Item no.as per NBO.5.3.2,SOR PAGE.NO.47(R & B SOR 2015-16 Bhavnagar)	119.81	CU. MT.	2255.00	CU. MT.	Rs 2,70,171.55
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 1:6 (1- Cement :6 - fine sand)(A) Modular (upto 10 ton. sr.no.7,Item coad.06002 A,Item no.as per NBO.6.13,SOR PAGE.NO.68 (R & B SOR 2015-16 Bhavnagar)	908.78	CU. MT.	3114.00	CU. MT.	Rs 28,29,940.92
4	RCC WORK: Providing and laying ordinary cement concrete 1:2:4 (1-Cement 2- coarse sand : 4- graded stone aggregates 20mm nominal size) exposed work with curing etc. complete including the cost of formwork but excluding the cost of reinforsement for R.C.C work in (iv)Footing having more than 15 cm. thicknes sr.no.100, Item coad.05028 D,Item no.as per NBO.0,SOR PAGE.NO.59 (R & B SOR 2015-16 Bhavnagar)	293.05	CU. MT.	3800.00	CU. MT.	Rs 11,13,590.00
5	2cm (3/4") thick damp proof course with cement and approved coarse sand 1:2 with and including water proofing materials as ordered by the Engineer in charge in the proportion as specified by the manufacturers including supply of all material, labour and T&P etc. required for proper completion of the work including proper curing and shuttering as necessary.	88.79	SQ. MT.	200.00	SQ. MT.	Rs 17,758.00

6	INTERNAL PLASTER : Providing 15mm thick cement plaster in single coat on Rough (Similar)side of 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, sr.no.4, Item coad.17002 A, Item no.as per NBO.17.6 SOR PAGE.NO.132 (R & B SOR 2015-16 Bhavnagar)	2542.55	SQ. MT.	117.00	SQ. MT.	Rs 2,97,478.35
7	EXTERNAL : 20 mm thick sand faced cement plaster on walls. At all heights above ground level consisting of 12 mm thick backing coat of C.M. 1:3 (1 cement : 3 sand) and 8 mm thick finishing coat of C.M. 1:1 (1 cement : 1 sand) etc. complete. sr.no.9, Item coad.17003 B, item no.as per NBO.17.25, SOR PAGE.NO.133 (R & B SOR 2015-16 Bhavnagar)	1463.49	SQ. MT.	150.00	SQ. MT.	Rs 2,19,523.50
8	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. (upto10 ton) sr.no.19, Item coad.14008 C, Item no.as per NBO.14.29(C1) SOR PAGE.NO.121 (R & B SOR 2015-16 Bhavnagar)	1026.08	SQ. MT.	761.00	SQ. MT.	Rs 7,80,846.88
9	Providing and laying coloured glazed tiles of the size 300mm x 200 mm x 8 mm / 300 mm x 450 mm x 8 mm in skirting, risers of steps and dedo on 10 mm. thick cement plaster 1:3 (1 cement : 3 coarse sand) & jointed with white cement slurry. sr.no.38,Item coad.14036, SOR PAGE.NO.125 (R & B SOR 2015-16 Bhavnagar)	50.00	SQ. MT.	891.00	SQ. MT.	Rs 44,550.00
10	Aluminium doors and windowsProviding and fixing extruded aluminum window having extruded aluminum Colour anodized section frame complete for window. sr.no.19 item coad.11026, (R & B SOR 2015-16 Bhavnagar)	217.40	SQ. MT.	3500.00	SQ. MT.	Rs 7,60,900.00
11	Applying two coats of primerofbapproved brand and manufacture on new wall surface to give an even shade including thoroughly brushing thesurface free from mortar dropping and other foreign matter and sand papered smooth.sr.no.35 Item coad.19035, Item no.as per NBO.- SOR PAGE.NO.141 (R & B SOR 2015-16 Bhavnagar)	2542.55	SQ. MT.	47.00	SQ. MT.	Rs 1,19,499.85

12	Finishing wall with weather proof exterior emulsion paint on wall surface (two coats)etc complete sr.no.34 Item coad.19031, Item no.as per NBO.- SOR PAGE.NO.141 (R & B SOR 2015-16 Bhavnagar)	1463.05	SQ. MT.	72.00	SQ. MT.	Rs 1,05,339.53
13	Iron fabrication work for iron steel truss including cuttig welding placing on site with 1 coat of primer & 2 coat of industrial oil paint etc complete	5000.00	Kg.	85.00	Kg.	Rs 4,25,000.00
	TOTAL					Rs 71,27,170.10
14	Add 1% contigenceies		0.01			Rs 71,271.70
15	Add 3% Work charged establishment		0.03			Rs 2,13,815.10
16	Add 3% plumbing &Sanitory work		0.03			Rs 2,13,815.10
17	Add 3% Electrification		0.03			Rs 2,13,815.10
18	Add 15% full furnishing		0.15			Rs 10,69,075.51
	GRAND TOTAL					Rs 89,08,962.62
				SAY		**Rs 89,09,000.00**
RUPEES EIGHTI NINE LAKH NINE THOUSAND THREE HUNDRED ONLY.						

13.2Reason for Students Recommending this Design

- In part-2 of Vishwakarma yojana we have tried to focused on solve water related problems. The bulk of the world's water use is for agriculture, industry, and electricity. The most common water uses include: Drinking and Household Needs. Recreation. So we have design **Rainwater harvesting system, Underground water sump, Elevated storage reservoir, water supply distribution system** to meet the need of water.
  There seems to be no end to the drinking water crisis in the KALATALAV village. It is only becoming worse with every passing day. Most of the the hand pumps installed in the district have run dry due to the depletion of groundwater level. The women of the village have to walk more than two km daily to bring drinking water.
  - Reason to provide **Skills Training Institutions** provides skill training to the urban poor so that they can set up self-employment ventures or secure salaried ... provide a comparative cost advantage and competitiveness to the economy. Another objective is to increase the income of urban poor by encouraging them to be a part of courses that can provide salaried employment and or self-employment opportunities which will eventually lead to better living standards.
- Reason to provide **Prawn Farming** (ZingaUcher Kendra) play a vital role in providing food and provide employment or nutritional security. However, the Prawn farming sector has been strongly opposed by environmental groups on many occasions, not only in India but in many other countries around the globe.

13.3About designs Suggestions / Benefit of the villagers

Sr.No.	Name of Design	Benefit of the villagers
1.	Rain Water Harvesting	Collected rainwater can supplement other water sources when they become scarce or are of low quality like brackish groundwater or polluted surface water in the rainy season. It also provides a good alternative and replacement in times of drought or when the water table drops and wells go dry.
2.	Underground Water Sump/ GSR.	fluctuations in demand can be cared for from the storage in the reservoir instead A reservoir constructed at a high elevation remote from the center of distribution will provide a higher initial pressure than a reservoir at a lower elevation at a less distance.
3.	Elevated Storage Reservoir	Rustproof and leak-proof. Hygienic and suitable for potable water. Computerised design for excellent strength.
4.	Water Supply Distribution System	distribution of water at least to points easily accessible to the majority of the people and ... in health benefits as rural water-supply programmes.
5.	ZingaUcher Kendra (Prawn Farming)	providing food and provide better living standards, employment or nutritional security, provide salaried employment.
6.	Skill Development center	self-employment,better living standards, provide salaried employment, increase the income of urban poor by encouraging them.

Table no : 13.12 About designs Suggestions / Benefit of the villagers

14. Technical Options with Case Studies
(EXPLAIN ALL TOPIC AND FOR MINIMUM ONE TOPIC EXPLAIN NEW CONCEPT, DESIGN, PROTOTYPE MODEL WITH ACTUAL COST ESTIMATION)
14.1 Civil Engineering
14.1.1 Advanced Earthquake Resistant

Earthquake Resistant Design Techniques for Buildings and Structures Among the most important advanced techniques of earthquake resistant design and construction are:

- Base Isolation
- Energy Dissipation Devices

Base Isolation: Base isolated structure is supported by a series of bearing pads which are placed between the building and the building's foundation. (See Figure 1.) A variety of different types of base isolation bearing pads have now been developed. The bearing is very stiff and strong in the vertical direction, but flexible in the horizontal direction.

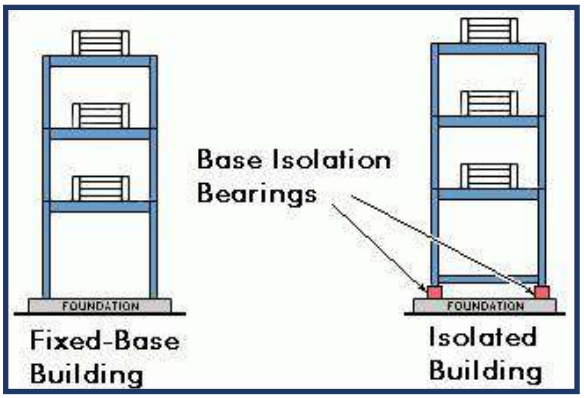


Figure 14.1.1.1: Base-Isolated and Fixed-Base Buildings

Earthquake Generated Forces

To get a basic idea of how base isolation works, examine Figure 2. This shows an earthquake acting on both a base-isolated building and a conventional, fixed-base, building. As a result of an earthquake, the ground beneath each building begins to move. In Figure 2, it is shown moving to the left. Each building responds with movement which tends toward the right. The building undergoes displacement towards the right.

The building's displacement in the direction opposite the ground motion is actually due to inertia. The inertial forces acting on a building are the most important of all those generated during an earthquak. It is important to know that the inertial forces which the building undergoes are proportional to the building's acceleration during ground motion. It is also important to realize that buildings don't actually shift in only one direction. Because of the complex nature of earthquake ground motion, the building actually tends to vibrate back and forth in varying directions.

14.1.2 Seismic Retrofitting of Buildings

Seismic Retrofitting Techniques for Concrete Structures:

Seismic Retrofitting Techniques are required for concrete constructions which are vulnerable to damage and failures by seismic forces. In the past thirty years, moderate to severe earthquakes occurs around the world every year. Such events lead to damage to the concrete structures as well as failures. Thus the aim is to Focus on a few specific procedures which may improve the practice for the evaluation of seismic vulnerability of existing reinforced concrete buildings of more importance and for their seismic retrofitting by means of various innovative techniques such as base isolation and mass reduction. So Seismic Retrofitting is a collection of mitigation technique for Earthquake engineering. It is of utmost importance for historic monuments, areas prone to severe earthquakes and tall or expensive structures. **Keywords:** Retrofitting, Base Isolation, Retrofitting Techniques, Jacketing, Earthquake Resistance

1. Introduction to Seismic Retrofitting Techniques:

- Earthquake creates great devastation in terms of life, money and failures of structures.
- Upgrading of certain building systems (existing structures) to make them more resistant to seismic activity (earthquake resistance) is really of more importance.
- Structures can be (a) Earthquake damaged, (b) Earthquake vulnerable
- Retrofitting proves to be a better economic consideration and immediate shelter to problems rather than replacement of building

1.1 Seismic Retrofitting of Concrete Structures:

Definition: It is the modification of existing structures to make them more resistant to seismic activity, ground motion, or soil failure due to earthquakes. The retrofit techniques are also applicable for other natural hazards such as tropical cyclones, tornadoes, and severe winds from thunderstorms

1.2 Need for Seismic Retrofitting:

- To ensure the safety and security of a building, employees, structure functionality, machinery and inventory
- Essential to reduce hazard and losses from non-structural elements.
- predominantly concerned with structural improvement to reduce seismic hazard.
- Important buildings must be strengthened whose services are assumed to be essential just after an earthquake like hospitals.

1.3 Problems faced by Structural Engineers are:

Lack of standards for retrofitting methods – Effectiveness of each methods varies a lot depending upon parameters like type of structures, material condition, amount of damage etc.,

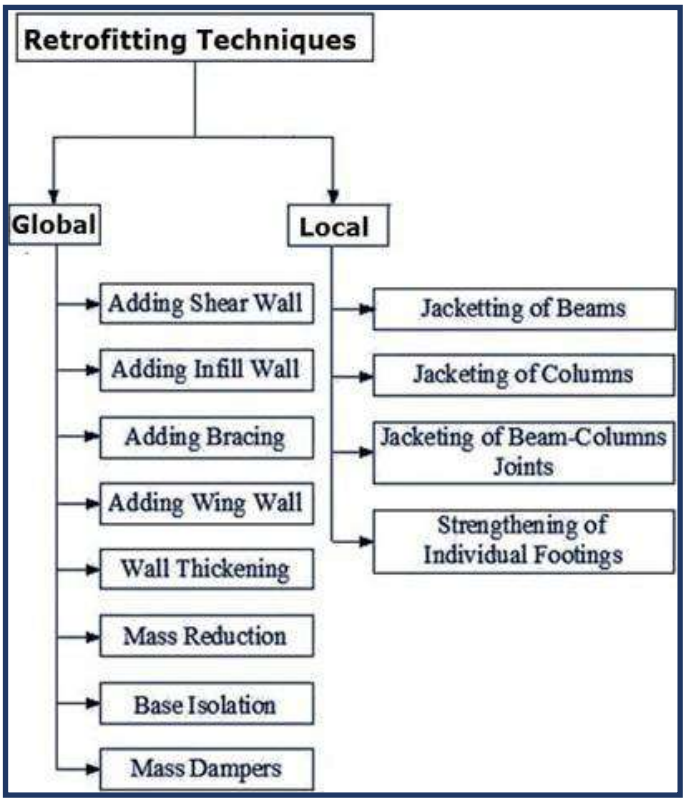


Fig 14.1.1.2: Retrofitting Techniques for Reinforced Concrete Structures

14.1.3 Case Study:

Seismic Analysis Using NDT Techniques a Case Study on Commercial Building, Mumbai

Abstract

Tata press building is a G+ 3 story structure located at Prabhadevi, Mumbai. This building was constructed in 1970's. Earlier the building was used as a printing press and now as a Head office for ICICI Lombard. The structure has a flat slab system with internal circular columns and rectangular column beam frame arrangement on the periphery. This building was reaching its design life and was observed to be heavily distressed. Structural audits and other tests were carried out to know the actual condition of the building. The building is currently undergoing repairs.

This study aims at estimating the total amount of distresses in the building, in depth knowledge of the tests carried out to understand the condition of structural members, interpretation of the results, methodology of repairs suggested to increase the strength and durability of the building. Remedial measures, additions and alterations to be made in the building to make it structurally sound and making sure it fulfills the criteria of latest IS codes for seismic behavior.

Pre repair and post repair analysis using Etabs. A structural model based on the inputs and test results is developed in Etabs for predicting the seismic behavior of the building. Various repair and retrofitting methods are discussed in this study and the best suited ones were used for the repair works. The methods suggested are easy, simple economically feasible and efficient. A comparative study of behavior of building before repairs and post repairs is also presented in this case study.

Keywords— Repair; Retrofitting; NDT; Seismic Analysis

INTRODUCTION

Reinforced Concrete Has Been Used As A Construction Material Since A Century. For The Past 50 To 60 Years Reinforced Concrete Is Being Widely Used In India. We Have Been Extensively Using Concrete For The Construction Of Buildings, Stadiums, Bridges As Infrastructural Assets. Keeping Them In Working Condition And Maintaining Their Functionality Is Need Of The Hour.

Unlike Other Materials Even Concrete Undergoes Deterioration And It Is Considered To Be A Natural Phenomenon. And This Phenomenon Is Generally Due To Chemical Attack, Alkali Aggregate Reaction, Embedded Metals, Due To Overloading, Fire Or Seismic Forces.

These reasons of deteriorations DUE TO DESIGN ERROR AND AGEING and detailing can be reanalyzed. The entire process is divided into 3R's repair, rehabilitation and retroFITTING. Terms Repair, Rehabilitation and Retrofitting are explained in brief below:

A. Repair: Repair deals with the architectural aspects of the building and its functionality. Its main purpose is to make services working as early as possible. However repair does not deal with the structural strength parameters nor has a role in strengthening of structural members. Hence considering its durability is important and has been discussed in further chapter.

B. Rehabilitation: Rehabilitation of a structure involves the upgrading or changing of purpose of, its use, design goals or regulatory requirements. Rehabilitation is cheaper for improvements in building than demolishing or reconstructing a new building in the space available.

C. Retrofitting: The engineering which involves in modifying the existing buildings for structural behavior without hampering its basic intent of use is termed as retrofitting. It is necessary to improve the performance of structures facing loss of strength due to degradation or which have crossed their anticipated lifespan. The realization of retrofitting depends on the authentic causes and measures adopted to prevent its further deterioration. This development includes retrofit, repair, reconstruction

and renovation wherever required. A proper load path has to be analyzed by a structural engineer and a decision has to be taken if any additional member like shear walls, etc needs to be added.

Origin of Deterioration: 1. Drying Shrinkage 2. Temperature stresses 3. Absorption of moisture by concrete 4. Corrosion of reinforcement. 5. Aggressive action of chemical 6. Weathering action 7. Poor design or Errors in design 8. Errors in earlier repairs 9. Overloading 10. External influences such as earthquake, wind, fire, cyclones etc.

D. Repair Methodologies The decision on method of repair can be taken only after economical and technical evaluations considering the likely service life after repairs. After the preliminary investigations, evaluation of extent of distress is done a proper repair methodology is to be developed. This methodology should include available methods of repair and materials for repair works. Following are the type of repair methodologies which are commonly used.

Grouting or crack repair. Firstly the holes are drilled in structure in line of cracks and also around hollow spots. These holes can be staggered for long length of cracks. Hole spacing can be modified as per site requirements. G.I. pipes (12to20mm diax200mm) with PVC nozzles or one end threaded are fixed in the holes with rich cement mortar. All the cracks around pipes are sealed with cement mortar.

Polymer treatment. This method of repair is similar to that of patch repairs. In polymer treatment method a special type of concrete is used which consists of polymers such as resins etc.

Water proofing Waterproofing is a similar process as like normal new waterproofing. But during the repair works the old waterproofing layers are removed and the surface is cleaned and made ready for new layer of waterproofing. Generally the waterproofing has a life of 10 years the process of waterproofing has to repeat.

ShotcreteShotcrete method consists of two process i.e dry process and wet process. In the dry process the cement and moist aggregate are mixed and then placed into the device and sprayed. The water wets the other ingredients as the mixture is jetted from the nozzle at high velocity on the surface which is to be shotcrete. In the wet-mix process, all raw materials are first mixed to produce mortar or concrete. The mortar or concrete is then placed into device. The material is forced through a delivery hose to the nozzle where compressed air is injected to increase velocity.

RCC Jacketing. RCC jacketing is one of the prominent methods used to increase the stiffness of the member. Increase in stiffness further facilitates increase in the strength of the member. If columns in a building are slender then jacketing prevents buckling of members. Repair work and design for strengthening are based on interaction between new and old work. Plate bonding and jacketing are common methods for strengthening of structural members.

Fiber wrap Technique. Although reinforced concrete and masonry buildings are being constructed worldwide, there are large numbers of concrete structures that deteriorate and become unsafe. In most of the the cases the buildings designed as load bearings ones cannot resist the seismic forces and can lead to hazardous circumstances and distress in members. The use of advanced composite fibre-wrap is the new technique in the emerging market of structural rehabilitation industry. There are various types of fibres used viz : glass, aramid and carbon. This process is carried out by preparing surface, applying primer, applying saturant and then laying of sheets. This is one of the safe, easy and inexpensive methods of repair.

E. Methodology

- Firstly the reconnaissance survey was made to get a rough idea about the distress in the building.
- It was observed that a large amount of slabs were covered with false ceilings and hence noting the visual observations was restricted.
- After vacating the entire building the false floor and ceilings were removed.
- A detailed report of the structural audit was made and the building was observed to be heavily

damaged.
• In the structural audit report a few Non Destructive tests were suggested to know the severity of distress.
• The Non-destructive tests carried out were UPSV, Rebound hammer, carbonation, Half-cell potentiometer and core tests.
• After analyzing the test results the average strength of the concrete was found which was lesser than the mix design at the time of casting.
• An Etabs model was made considering the present strength of concrete and as per the physical dimensions of beams and columns.
• The model was analyzed for earthquake and wind forces.
• The repair methodology was decided based upon the model results and visual observations.
• Post repair nondestructive tests were performed to check the achieved strength after repair works.
• An Etabs model of achieved strength of concrete was made along with the alterations of structural members made in the repair process. This model was checked to see if the desired results and structural safety of the structure was achieved.

Discussions
• It has been observed that nondestructive tests help a lot in evaluating the present condition of the building although the results vary by 15 to 20 %.
• Using software for analysis of structure for the achieved concrete strengths facilitates the ease in assessment of the effects of distress on the structural behavior.
• Post repair NDT helps in understanding whether the desired strengths are achieved and also in estimating the extended design life.
• Software analysis helps in assessing seismic behavior of the building and in deciding the retrofitting methods.
.• Repairs should always be done for the type of the usage of a building.
• More economical, easy and efficient repair methodologies are to be discovered for cutting down the repair time and also to nullify the probability of vacating the place for repair works.
• Such studies help in understanding the concrete properties, types of distress, structural behavior in distressed condition, wear and tear of structural members under various loads, Repair methodologies and selection of materials, Behavior of building under seismic loads and retrofitting options for the same, Interpretation of NDT results.

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

Sr. no.	Design name	Period	Amount expenditure	Benefit
1.	Public Toilet & Bath	With in 1 year	21,25,000/-	Improvement in sanitation facilites in village.
2.	Anganwadi	With in 1 year	9,11,950/-	Better education at LKG level.
3.	Primary & Secondary School	With in 1 year	74,23,300/-	Better education facelites in school.
4.	Vegetable Market	Immediately	14,11,350/-	Fresh vegitable, frutes and agricural product. locally avilabe at market
5.	Bank	With in 1 year	20,61,500/-	Fast finantial transactions in village
6.	Street Lighting	Immediately	14,87,850/-	Good visibility and safety at night in village.
7.	Rain Water Harvesting	Immediately	1,62,400/-	To store rain water at milimilastic cost
8.	Underground Water Sump/ GSR.	With in 1 year	9,11,000/-	To store extra rain water and to supply water to ESR.
9.	Elevated Storage Reservoir/ESR	With in 1 year	9,98,350/-	To store water at high elevation and supply water to dwelling units.
10.	Water Supply Distribution System	With in 1 year	62,50,000/-	Good quality of water available at the door step
11.	ZingaUcher Kendra (Prawn Farming)	With in 1 year	12,03,600/-	To develop the fisheries business.
12.	Skill Development center	With in 1 year	89,09000/-	To improve the technical skills of surrounding villages and kalatalav dwellers

Table no. 15.1 Period, Amount Expenditure and Benefit

16. Survey By Interviewing With TalatiAnd/Or Sarpanch

Gujarat Technological University, Ahmedabad, Gujarat

Vishwakarma Yojana: Phase VIII
Survey with Interviewing

SURVEY BY INTERVIEWING WITH TALATI AND/OR SARPANCH

Vishwakarma Yojana: Phase VIII

ALLOCATED VILLAGE SURVEY

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

CHAPTER- 16

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

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

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

17.Irrigation / Agriculture ActivitesAndAgro Industry, Altenate Technics And Solution

Modern agricultural technology adoption and its importance:

Agriculture remains to be a great player in the generation of revenue and a source of food for many people all over the world. Over the past years, this sector has seen a lot of changes and advancement in the different farming approaches and techniques. For example, nowadays, there is the use of inorganic fertilizer, the consumption of reduced amounts of pesticides, the use of different tractors and machinery. The availability of such inputs has seen the need for the use of natural resources and process with aim of improving agricultural output and reducing costs. The use of modern technology in agriculture comes with a lot of benefits. Read this article to get a glimpse of what the importance of the adoption of modern technology in agriculture.

Technology adoption in Agriculture:

Technology in agriculture can be used in different aspects of agriculture such as the application of herbicide, pesticide, fertilizer, and improved seed. Over the years, technology has proved to be extremely useful in the agricultural sector. Presently, farmers are able to grow crops in areas where they were thought could not grow, but this is only possible through agricultural biotechnology. For example, genetic engineering has made it possible to introduce certain trains into other genes of crops or animals. Such engineering boosts the resistance of the crops to pests and droughts. Through technology, farmers are in a position to electrify every process for efficiency and improved production.

There has been a limitation on how to speed the process of modern technological adoption in agriculture. This can be attributed to the fact that speeding up this concept involves a lot of knowledge and the understanding of some of the elements that influence the decision of farmers to adopt modern technology in farming. Institutional, social and economic are some of the factors that influence how fast or slow agricultural technologies are adopted. The land size, cost and benefits of technology, are some of the economic factors that determine the rate of agricultural technology adoption. Farmers' education level, age, social groupings, and gender are some of the social factors that influence the probability of a farmer to adopt modern agricultural technologies.

Small scale farmers face both internal and external challenges as far as the adoption of modern agricultural technologies is concerned. This aspect accounts for the slow rate at which such technologies are adopted. Regardless of the challenges, what matters is whether modern technology has any value in the agricultural sector. The following section highlights the significance of modern technology in agriculture.

Use of Technology in Agriculture:

There are various uses of technology in agriculture including the following.

- **Farm machines**

One of the challenges that farmers face nowadays is the need to satisfy labour. There is an increasing cost of labour, which calls for better approaches to ensure less cost on labour. The introduction of combined harvesters and planters simplifies the process. Production and time are some of the important elements in agriculture. It is important, therefore, to plant early, harvest in time, as well as ensure that the yield is stored within the right time. The use of modern technology in agriculture ensures that farmers grow vast food within the shortest time possible.

GPS technology has been used in the development of autopilot sprayers and tractors that do not require any driver. Such technology is important in agriculture in that it promotes better and more efficient farming practices. For example, the autopilot tractors and sprayers are equipped with tracking systems that eliminates human error and, in the end, save on fuel and equipment.

- **Crop sensors**

Effective application of fertilizers and pesticides remains to be a big challenge in agriculture especially when it comes to the determination of what fertilizer works best for different plans, when to apply, as well as what quantities. The use of crop sensors can make it easy for farmers to effectively apply fertilizers and pesticides just as much as the crops need. Variable rate technology becomes useful in such cases. Such technology gives you the opportunity to sense how your plants are feeling and subsequently help you reduce the probability of leaching or surface runoff. Crop's sensors are designed in a manner that they dictate to the application machinery the amount of the resource that a given crop needs, and at what time.

- **Use of GPS in fields documentation**

GPS is becoming a common technology in agriculture. For example, modern agriculture involves the use of GPS to document the status of the farmland. Through the GPS, it is easy to determine and document the yields from a given farm, as well as record the application rates. Such technologies are useful in that the farmers can rely on the collected and recorded data for reference when making any decisions. The recommendable documentation technology is the yield map, which can be used to offer a summary of entire year's activities. Such maps are highly useful as they can give a wide range of information about just anything such as the status of the drainage system in your field.

- **Biotechnology**

Biotechnology is also referred to as genetic engineering and the process of improving the genes of a given crop. In most cases, genetic engineering is carried out to increase the resistance of certain crops to farm inputs such the application of herbicides. Through biotechnology, farmers can plant on areas that were otherwise considered dry or deserts. Reduced farm inputs implies that the farmer as well saves on the cost of farm resources.

Modern agricultural technology hopes to achieve among others, two important goals – profitable economy and better output. It is therefore, important to be careful with the goals and objectives that you set aiming upon the implementation of different technologies in agriculture. Some of the aspects that you should look at include how to apply and organize fertilizer, irrigation, theatre, intensive tillage, monoculture, and the application of other resources. However, in order to achieve these goals, farmers need to understand the concept of modern farming and the use of technology.

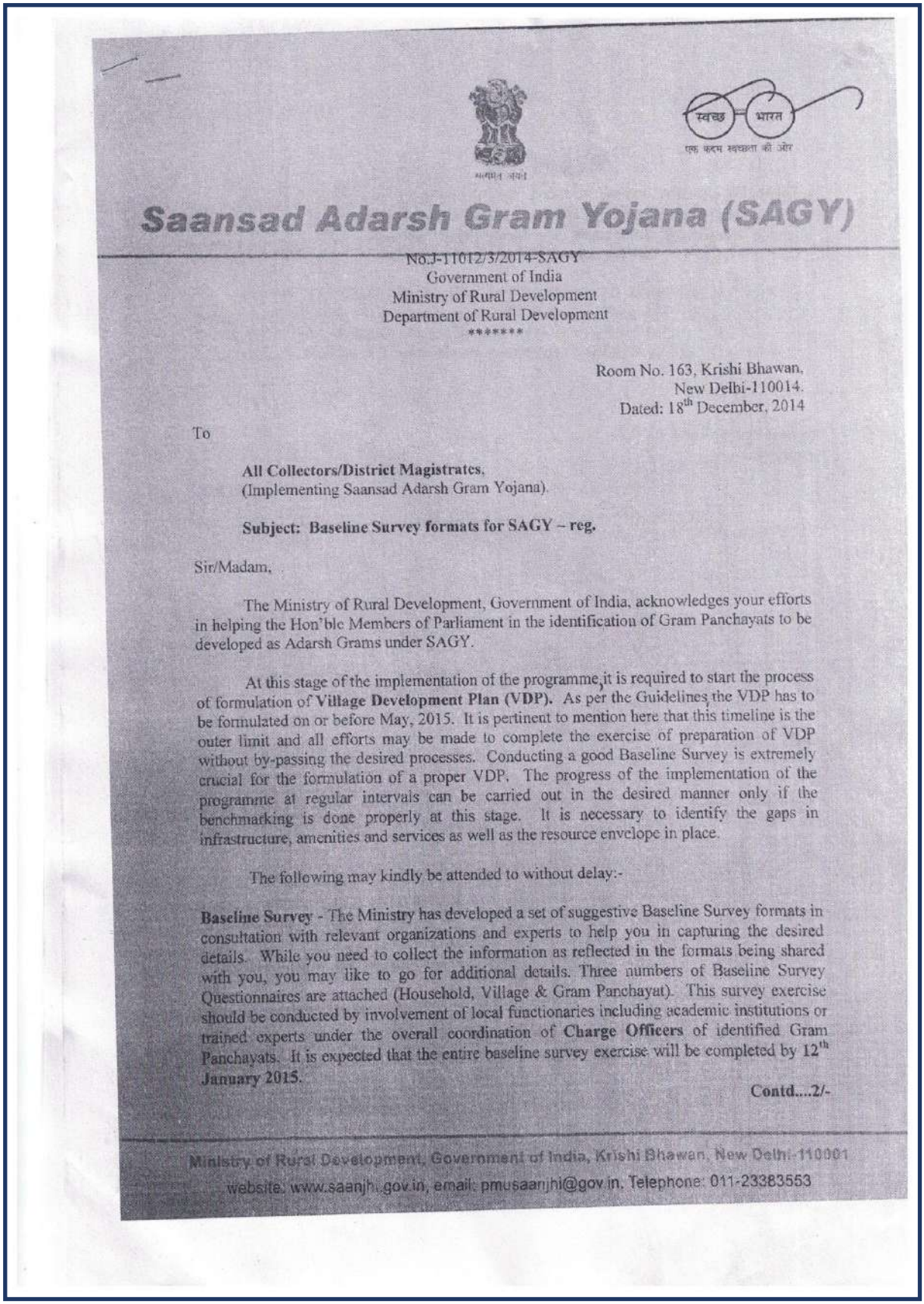
18. Social Activities – Any Activates Planned By Students e.g Teaching Learning activities, awareness camp, business idea for SELF HELP GROUP OR ANY OTHER

In this pandemic time we did not have much time for any social gathering for anyteching or learning activities time, if that would possible we would love to do that but due to COVID-19 pandamic. by respecting our state and national guidelines we have doned some other activity like,

- We distributed masks and other preventive materials in the village to reduce the spread of virus.
- Information flyers about vaccination from health department were distributed in the village.
- Cleaning of school premises with the help of some of volunteer students.
- Tree plantation in SCHOOL BUILDING and PANCHAYAT BUILDING.
- Posters precentation at Pandit Dindayal Upadhyay ration shop of KALATALAV village regarding Covid-19 information and awareness in villagers.

By above social activities we give some baisic information about covid to overcome this pendemic. In some scale level and by tree plantation we expect it would be helpful to over come water scarecity in up coming years, and it will influence the village dwellers to plant some more trees in village.

19. <<ALLOCATED VILLAG E>> SAGY Questionnaire Survey form with the Sarpanch Signature (Scanned copy attachment in the soft copy report and Original copy in hardbound report)



स्वच्छ भारत
एक कदम स्वच्छता की ओर

Saansad Adarsh Gram Yojana (SAGY)

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

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

To

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

Subject: Baseline Survey formats for SAGY – reg.

Sir/Madam,

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

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

The following may kindly be attended to without delay:-

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

Contd....2/-

Ministry of Rural Development, Government of India, Krishi Bhawan, New Delhi-110001
website: www.saanjh.gov.in, email: pmusaanjhi@gov.in, Telephone: 011-23383553

-2-

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

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

(Aparajita Sarangi)
Joint Secretary
19/12/14

Copy to:

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

SAANSAD ADARSH GRAM YOJANA (SAGY) Baseline Household Survey Questionnaire

Village: KALATALAV Gram Panchayat: KALATALAV Ward No. –

Block: – District: BHAVNAGAR

State: GUJARAT S Constituency:

1. Family Identity and Size

Name of Head of Household	SANJAYBHAI PARMAR						Male/ Female	M
SECC Survey ID:	–	Family Size	5	Over 18	3	to 18	2	Under 6	–

2. Category & Entitlement Details (Tick as appropriate)

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

2. Adults (above 18 years)

Name	Age	Sex M/F/O	Disability Status Y/N	Marital Status[3]	Education Status[4]	Adhaar Card (Y/ N)	Bank A/C (Y/N)	Social Security Pension[5]
SANJAY BHAI	52	M	N	Y	–	Y	Y	–
GEETA BEN	29	F	N	Y	–	Y	Y	–
YESH	15	M	N	N	9TH	Y	Y	–
ANKA	12	F	N	N	6TH	Y	Y	–

3. Children from 6 years and up to 18 years

Name	Age	Sex M/F/O	Disability Y/N	Marital Code*	Level of Education: Code#	Going to School /College (Y/N)	Current Class	Computer Literate Y/N
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–

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: 2
Type: Kutcha / Semi Pucca / Pucca	
Toilet: Private / Community / Open Defecation	
Drainage linked to House: Covered / Open / None	
Waste Collection System	Door Step / Common Point / No Collection System
Homestead Land: Yes / No	Kitchen Garden : Yes / No
Compost Pit: Individual/ Group/ None	Biogas Plant: Individual/ Group/ None

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

Source of Water		Distance
Piped Water at Home	Yes / No	–
Community Water Tap	Yes / No	
Hand Pump (Public / Private)	Yes / No	2
Open Well(Public / Private)	Yes / No	2
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	–	–
Sorghum	–	–
Sesame	–	–

17. Livestock Numbers

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

18. What games do Children Play
Cricket, kho-kho etc.

19. Do children play musical instrument (mention)

Schedule Filled By: Village dwellers
Principal Respondent:
Date of Survey: 15/06/2021

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: KALATALAV

b. Block: –

c. District: BHAVNAGAR

d. State: Gujarat

e. Lok Sabha Constituency: Bhavnagar Rural –

f. Number of Wards in the Gram Panchayat: 1

g. Number of Villages in the Gram Panchayat: 2

h. Names of Villages:
Kheakhatli and NARMAD

Demographic Information

Number of Households 989 Total Population 3854 Male 2278 Female 1576

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)	N	25 KM
f.	Nearest Bank with CBS Facility	N	25 KM
g.	Nearest ATM	N	25 KM
h.	Nearest Primary School	Y	–
i.	Nearest Middle School	Y	–
j.	Nearest Secondary School	Y	–
k.	Nearest Higher Secondary School / +2 College	N	25 KM
l.	Nearest Graduate College	N	25 KM
m	Nearest ITI / Polytechnic Centre	N	25 KM
n	Kisan Seva Kendra	N	25 KM

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	Y	-
p	Nearest Agro Service Centre	Y	-
p	MSP based Government Procurement Centre	N	-
q	Milk Cooperative /Collection Centre	Y	-
r	Veterinary Care Centre	Y	-
s	Ayurveda Centre	N	15 KM
t	E – Seva Kendra	N	15 KM
u	Bus Stop	N	15 KM
v	Railway Station	N	15 KM
w	Library	N	15 KM
x	Common Service Centre	N	15 KM

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: 1

b. Number of villages without Angan Wadi Centres 0

Names of such villages: -

c. Schools (Number)

Primary Private: - Primary Govt.: 1

Middle Private: - Middle Govt.: 1

Secondary Private: - Secondary Govt.: 1

Higher Secondary Private: - Higher Secondary Govt: 1

VI. Public Distribution System

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

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 NO Not Covered YES	KALATALAV, NARMAD KHETAKHATLI	–
b.	Hand Pump Coverage in Villages:	Covered NO Not Covered NO	–	KALATALAV NARMAD KHETAKHATLI
c.	Coverage under Covered Drains:	Covered YES Not Covered NO	KALATALAV	NARMAD KHETAKHATLI
d.	Coverage under Open Drains:	Covered YES Not Covered NO	KALATALAV	–
e.	Villages with Household Electricity Connection (Numbers)	Connected YES Not Connected NO	KALATALAV NARMAD KHETAKHATLI	–

VIII. Land and Irrigation

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

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

Saansad Adarsh Gram Yojana (SAGY) Panchayat Details Survey Questionnaire

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

IX. Parameters relating to Households & Institutions

		Number
a)	Number of eligible Households for pension (old age, widow, disability)	-
b)	Number of Households receiving pension (old age, widow, disability)	-
c)	Number of eligible Households who are not receiving pension	-
d)	Number of Households eligible for Ration Card	-
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	100 - 150
i)	Number of Job Card holders who completed 100 days of work during 2013-14	-
j)	Number of shops selling alcohol	0
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	0
q)	Number of Households headed by physically handicapped persons	0
r)	Total number of Persons with Disability in the village	0
s)	Number of SHGs	-
t)	Number of active SHGs	-
u)	Number of SHG Federations	-
v)	Number of Youth Clubs	-
w)	Number of Bharat Nirman Volunteers	-

Name and Signature of Surveyor and Respondent'

JAGDISH PARMAR MAHAM VALIA Surveyor	ગામતળાવ ગ્રામ પંચાયત PRI Respondent (Preferably Gram Panchayat Chairperson)	(7) Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	15/06/2021 Date of Survey

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

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

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	N	15 KM
m	Common Service Centre	N	15 KM
n	Veterinary Care Centre	Y	5 KM

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: 3

PANCHAYAT KACHERI TO SMASHAN

iii. Drinking Water Facilities

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

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

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

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

b. Coverage under Open Drains: 1 *(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: MAIN ROAD TO TALAV

vi. Sports Facilities in the Village

a.Number of Play Grounds in the Village (minimum size 200 square meters): 1

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

vii. Education, ICDS

a. Number of Anganwadi Centres: 1

c. Schools (Number)

Primary Private: – Primary Govt.: 1

Middle Private: – Middle Govt.: 1

Secondary Private: – Secondary Govt.: 1

Higher Secondary Private: – Higher Secondary Govt: 1

2

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	N	15 KM
m	Common Service Centre	N	15 KM
n	Veterinary Care Centre	Y	5 KM

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: 3 PANCHAYAT KACHERI TO SMASHAN

iii. Drinking Water Facilities

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

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

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

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

b. Coverage under Open Drains: 1 (~~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: MAIN ROAD TO TALAV

vi. Sports Facilities in the Village

a.Number of Play Grounds in the Village (minimum size 200 square meters): 1

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

vii. Education, ICDS

a. Number of Anganwadi Centres: 1

c. Schools (Number)

Primary Private: – Primary Govt.: 1

Middle Private: – Middle Govt.: 1

Secondary Private: – Secondary Govt.: 1

Higher Secondary Private: – Higher Secondary Govt: 1

2

SAANSAD ADARSH GRAM YOJANA (SAGY) Village Details Survey Questionnaire

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

ix. Entitlement Related Parameters		
1	Number of active Job Card holders under MGNREGA	0
2	Number of active Job Card holders who have completed 100 days of work	-
3	Number of shops selling alcohol	0
4	Number of BPL families	-
5	Number of landless households	-
6	Number of IAY beneficiaries	-
7	Number of FRA beneficiaries	-
8	Number of common sanitation complexes	0
9	Number of SHGs	0
10	Number of active SHGs	0
11	Existence of SHG Federation in the Village (Yes / No)	NO
12	Number of Youth Clubs	0
13	Number of Bharat Nirman Volunteers	0

Name and Signature of Surveyor and Respondent'

Surveyor	PRI Respondent (Preferably a ward member from a ward that is fully or partially covered under the Village)	Official Respondent (Preferably seniormost Government official in the Gram Panchayat)	Date of Survey
	તલાટી કમ મંત્રી સરપંચ કાળાતળાવ ગ્રામ પંચાયત તા જિ ભાવનગર		

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

Gmail

jagdish parmar <jagdishparmar2828@gmail.com>

Development scenario of Kalatalav village, Ta.-Bhavnagar, Dist.-Bhavnagar.

1 message

jagdish parmar <jagdishparmar2828@gmail.com> Tue, Oct 5, 2021 at 1:34 PM
To: collector-bav@gujarat.gov.in, ddo-bav@gujarat.gov.in

Respected Sir/Madam

We are students of Government Engineering College, Vidhyanagar, Bhavnagar affiliated to Gujarat Technological University-GTU. GTU has been assigned to Vishwakarma Yojanaa-VIII in which students survey various villages and Designs various amenities To Deliver it to them making them ideal for living better life as per requirements & village problem statements.

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

Village : Kalatalav		**Population: 3854(As of Census 2011)**
Key Issue	**Remark**	**Design Given**
Water Scarcity	Water storage capacity of the existing UG is not enough and there is no water supply/distribution system to supply water to households. Water can't be bored due to salinity of groundwater.	· Rain Water Harvesting system · Ground water storage reservoir-GSR · Elevated service reservoir-ESR · Water supply system
Toilet	There is no public toilets and baths For village dwellers.	· Public toilets and baths
Education	In the village no higher secondary school and primary school is lie in kachha makan, no adequate space for Anganwadi	· Primary & secondary school · Anganwadi
Community Place	In the village there is no any market for local vegetable venders	· Vegetable market
Social infrastructure	No any banking facility, no night security	· Bank · Street lighting

Sr. no.	Design name	Period	Amount expenditure	Benefit
1.	Public Toilet & Bath	With in 1 year	21,25,000/-	Improvement in sanitation facilities in the village.
2.	Anganwadi	With in 1 year	9,11,950/-	Better education at LKG level.
3.	Primary & Secondary School	With in 1 year	74,23,300/-	Better education facilities in school.
4.	Vegetable Market	Immediately	14,11,350/-	Fresh vegetables, fruits and agricultural products. locally available at market

5.	Bank	With in 1 year	20,61,500/-	Fast financial transactions in village
6.	Street Lighting	Immediately	14,87,850/-	Good visibility and safety at night in the village.
7.	Rain Water Harvesting	Immediately	1,62,400/-	To store rainwater at milimilastic cost
8.	Underground Water Sump/ GSR.	With in 1 year	9,11,000/-	To store extra rain water and to supply water to ESR.
9.	Elevated Storage Reservoir/ESR	With in 1 year	9,98,350/-	To store water at high elevation and supply water to dwelling units.
10.	Water Supply Distribution System	With in 1 year	62,50,000/-	Good quality of water available at the door step
11.	Zinga Ucher Kendra (Prawn Farming)	With in 1 year	12,03,600/-	To develop the fisheries business.
12.	Skill Development center	With in 1 year	89,09000/-	To improve the technical skills of surrounding villages and kalatalav dwellers

Please find herewith attached,

1. Detailed Project Report Of Kalatalav Village

Best Regards,
Jagdishkumar H. Parmar & Maly B. Vala
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KALATALV_VY_2020-21_FINAL_DPR.pdf
10577K

21. Comprehensive report for the entire village

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

The project work started with the basic data collection, survey work and it progressed through meeting with headman, Talati-cum-Mantri shri and the gap analysis was later framed and 12 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. 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 Shampara 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.So we tried to give some ideas of development for our allocated village KALATALAV, in this process were thankful to many people who helped us.