

DESIGN AND PLANNING OF AFFORDABLE INNOVATIVE GREEN SOCIAL HOUSING

(PLAIN REGION)



PUBLISHED BY-

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DESIGN AND PLANNING OF AFFORDABLE INNOVATIVE GREEN SOCIAL HOUSING (PLAIN REGION)

COMPOSED BY



DEVELOPMENT ALTERNATIVES

IN CO-OPERATION WITH



BUILDING MATERIALS & TECHNOLOGY PROMOTION COUNCIL

Over the past half century, a great rural-to-urban population shift has occurred and the process of urbanization (the concentration of people and activities into areas classified as urban) is set to continue well in this century. The high pace of social and economic development has led to the growth of urban population. Lack of infrastructure, congested traffic, environmental degradation and most prominently housing shortage have become the major issues faced by cities and towns.

The purpose of this catalogue is to introduce design standards and specifications for sustainable affordable housing in the coastal regions of India in order to facilitate the state agencies in planning and construction.

The design standards developed in this catalogue cater to three categories from the economic stand point i.e. Economically Weaker Section (EWS) with carpet area within 21-27 sq.mt, Lower Income Group-A (LIG-A) with carpet area within 28-40 sq.mt. and Lower Income Group-B (LIG-B) with carpet area within 41-60 sq.mt. in Indian plains. Besides the economic criteria, the designs are inspired from the vernacular styles of architecture suiting the geo-climatic condition and mainstream aspects of disaster resilience and low carbon construction. The proposed designs will aim to standardize spaces and sizes of various low carbon construction elements and components keeping in mind the minimum National Building Code (NBC) norms.

The designs incorporate green concepts, innovative technology and building materials including prefab technologies and provisions for rain water harvesting and water conservation technologies, plumbing, water supply sewerage system, electrification and renewable energy technologies. Design for both individual units and cluster units are part of the catalogue.

We hope these designs help state agencies and developers in mainstreaming innovative green practices in affordable housing.

Development Alternatives gratefully acknowledges the important contribution and would like to convey thanks to **Mr J.K. Prasad** and the **Building Materials and Technology Promotion Council (BMTPC)** for their great support and guidance without which it would not have been possible to develop this catalogue. They have always been very responsive in providing necessary information.

Our special thanks are extended to **Ms Ruchi Jain** and **VISTAAR ARCHITECTS** for their valuable contribution during the planning and development of technical drawings for the catalogue. Their willingness to give time so generously has been very much appreciated.

In addition to that we would like to thank and offer our sincere appreciation to all the experts and professionals from coastal areas of Andhra Pradesh for attending the workshop and for their active participation.

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1 INTRODUCTION

Introduction

Impending Housing Shortage in Urban India

India's urban population registered a decadal growth of 32 per cent rising from 285 million to 377 million between 2001 and 2011¹. It is opined that this trend is likely to persist on the back of robust economic development across the country. By 2050, 900 million people will be added to Indian cities². The rapid pace of urbanisation owing to the rural–urban migration is putting a strain on the urban infrastructure in these cities.

Growing concentrations of people in urban areas has resulted in an increase in the number of people living in slums and squatter settlements. Skyrocketing prices of land and real estate in urban areas have induced the poor and the economically weaker sections of the society to occupy marginal lands typified by poor housing stock, congestion and obsolescence. There are nearly one million households living in non-serviceable katcha houses, while over half a million households are in homeless condition³.

As urban development takes place, a growing concern for India's urban planners is the massive urban housing shortage plaguing the country. The housing shortage in the urban areas has touched 18.78 million units, where 95% of the shortage is prominent within the EWS (economically weaker sections) and LIG (lower income groups), and an estimation done on Urban Housing Shortage⁴.

Affordable Housing: A Big Challenge

Given this scenario, it becomes critical to fill the existing gaps in the country's strained urban infrastructure and in particular, housing. Primarily, it would be important to address the need in the EWS and LIG. Ten Indian States contribute to

three-fourths of the urban housing shortage⁵. Out of these states Tamil Nadu, Andhra Pradesh and West Bengal are from coastal region; Uttar Pradesh & Bihar are from central plains region. By providing affordable housing, the real estate sector can play a pivotal role in urban development of these states as well as the country⁶.

Encouraging the role of the private sector in affordable housing; that has been traditionally reviewed as the Government's responsibility, is an interesting policy movement observed recently.

Meeting affordable housing targets needs coordinated action between stakeholders from the public and private sector. The Government needs to play a proactive and facilitatory role to promote innovation and sustainability. The private sector needs to embrace low cost appropriate technology and material options that enable affordable, quality and timely delivery.

Approach to Housing Development

The broad elements of the approach of the Government of India to tackle the problem of housing the poor are: special programmes/targeted subsidy to the poor and vulnerable groups, loan assistance to governmental agencies/beneficiaries at below-market interest rate for housing through the Housing and Urban Development Corporation (HUDCO), creation of housing assets as part of employment and income generation programmes, promotion of cost-effective and eco-friendly building materials and technologies and creation of an enabling environment for private sector initiative. Apart from housing schemes at national level, there are also housing schemes being practiced at state level.

i) National Urban Housing & Habitat Policy 2007

The National Urban Housing & Habitat Policy, 2007 seeks to set in motion a process in providing 'Affordable Housing for All' particularly the Economically Weaker Sections (EWS) and Low

¹2011, *Census of India*, <http://censusindia.gov.in/2011-prov-results/indiaatglance.html>

² October 2011, *Urban Infrastructure in India*, Federation of Indian Chambers of Commerce and Industry, FICCI

³ September 2012, *Report of the Technical Urban Group (TG-12) on Urban Housing Shortage 2012-17*, Ministry of Housing and Urban Poverty Alleviation

⁴ 2012, *Report on urban housing shortage*, Ministry of Housing and Urban Poverty Alleviation, Government of India.

⁵ 2012, *Report on Bridging the Urban Housing Shortage in India*, KPMG International

⁶ *Ibid* [3]

1 INTRODUCTION

Income Group (LIG). The policy advocates measures for promotion of sustainable development of habitat in the country with a view to ensuring equitable supply of land, shelter and services at affordable prices to all sections of society. However, 'Land' and 'Colonisation' being State subjects, it is primarily the responsibility of State Governments to take follow up measures in pursuance of the policy advocacy.

ii) Jawaharlal Nehru National Urban Renewal Mission (JNNURM) 2005

It was launched in December 2005 with aim to cover construction of 1.5 m houses for urban poor during the Mission period (2005- 2012)⁷. It had two Sub-Missions:

• Basic Services for the Urban Poor (BSUP)

It seeks to provide seven entitlements/ services - security of tenure, affordable housing, water, sanitation, health, education and social security in low income segments in the 65 Mission Cities.

• The Integrated Housing and Slum Development Programme (IHSDP)

It seeks to provide the above mentioned 7 entitlements, services in towns/cities other than the Mission Cities.

iii) Rajiv Awas Yojana (2013-2022)

RAY was implemented in a mission mode to provide financial support to States/UTs/Urban Local Bodies (ULBs)/Central Government Agencies, hereafter called implementing agencies, for providing housing and improvement of basic civic infrastructure and social amenities in each selected slums. Rental and transit housing was admissible under the scheme. Operation and maintenance (O&M) of assets created under this scheme was eligible for funding.

RAY also extended financial support to States for creation of affordable housing stock through public-private partnership (PPP) under the Affordable Housing in Partnership (AHP) component of the scheme. It was applicable to "urbanized villages" inside the planning area of the city, urban homeless and pavement dwellers.

⁷ Accessed on 30th June 2014 National Building Organisation <http://nbo.nic.in/Webforms/aboutus.html>

The Rajiv Rinn Yojna 2013

A Revised Interest Subsidy Scheme was an additional instrument for addressing the housing needs of the EWS/LIG segments in urban areas. The Scheme envisaged the provision of a fixed interest subsidy of 5% (500 basis points) on interest charged on the admissible loan amount to EWS and LIG segments to enable them to buy or construct a new house or for carrying out addition (of a room/ kitchen/ toilet/ bathroom) to the existing building⁸.

iv) Interest Subsidy Scheme for Housing the Urban Poor (ISHUP) 2009

It has sought to enhance affordability of the urban poor through the provision of an interest subsidy of five per cent per annum on a loan amount of up to 1 lakh for the economically weaker sections and lower income groups in the urban areas for acquisition/construction of houses. The Government has also launched a scheme of Affordable Housing in 355 Partnership with an outlay of 5,000 crore for construction of one million houses for EWS/LIG/MIG with at least 25 per cent for EWS category⁹. The Scheme aims at partnership between various agencies/ Government / Urban Local Bodies/ developers for realizing the goal of affordable housing for all.

v) Andhra Pradesh Model: Self-help & Mutual Help

The State of Andhra Pradesh is a pioneer in India in implementing innovative housing programmes for the poor on a large scale. Though the A.P. State Housing Corporation Limited (APSHCL) was established in 1979 to formulate, promote and execute housing schemes for the weaker sections of society, the Corporation has constructed about 3.62 million houses by 31.03.2000 out of which 2.4 million are in rural areas¹⁰. It ranked first in the country in the implementation of housing for the

⁸ 2013, Report on Trend and Progress of Housing in India, National Housing Bank.

⁹ Accessed on 30th June 2014 National Building Organisation <http://nbo.nic.in/Webforms/aboutus.html>

¹⁰ Idib [9]

poor in rural areas from the year 1991–92 onwards.

Households with an annual income of Rs.13, 000 or less are eligible for sanction of houses under various schemes from 1996–97 onwards. 50% of the houses are earmarked for Scheduled Castes and Scheduled Tribes, 33% for Backward Castes, 7% for Minorities and the remaining 10% for other Economically Weaker Sections¹¹. The funding of the housing programme includes subsidy from the Government and loan from various financial institutions for the repayment of which the Government stands guarantee irrespective of the ultimate recovery from beneficiaries. Loans are mobilised from HUDCO, Life Insurance Corporation, General Insurance Corporation and Commercial Banks.

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¹¹Accessed on 30th June 2014 National Building Organisation <http://nbo.nic.in/Webforms/aboutus.html>

Context

The climate is changing. With global warming on the increase and species and their habitats on decrease, chances of ecosystem to adapt naturally are diminishing. Climate change may be one of the greatest threats facing the planet.

Impact of Construction Sector on Climate Change

The building and construction sector is a key contributor to the phenomenon to climate change. The built environment accounts for a large share of energy use (with associated greenhouse gas emissions), waste generation and use of natural resources. Areas of key concern also include production of construction materials, use and recycling, consumption of hazardous materials, integration of building materials with other infrastructure and social systems, water use and discharge, etc. The construction industry is estimated to be responsible for around 24 per cent of the total carbon emissions nationally¹². Buildings are responsible for large shares of resources use and waste generation: approximately 40 per cent of materials use, 30 per cent of solid waste generation, and 20 per cent of water use¹³. The materials and technologies used in buildings also have a significant impact on their users' health and well-being.

Impact of Climate Change on Construction Sector

Construction of buildings should be designed for future climate change. Buildings can be vulnerable to climate change. The weather related impacts like flooding, coastal erosion, subsidence, drainage systems has reflected to the requirement of new building techniques and materials to withstand adverse weather conditions which also influence the choice of site. Higher groundwater levels, higher water levels in streams and watercourses, and greater risk of storm surges along the coastline, make it pertinent to safeguard buildings against seepage and flooding.

¹² J Parikh, April 2009, CO2 emissions structure of Indian economy

¹³ July 2010, Report on Affordable Housing in the Context of Sustainable Habitat, Research done by Development Alternatives

The sheer scale of construction activities required to bridge the housing gap will place immense pressure on the environment. Current building practices are highly resource intensive. This huge volume of housing to be constructed, especially in the affordable sector can have a huge role in this direction towards lowering carbon emissions. Existing cleaner technologies could substantially reduce the ecological footprint of the housing sector. It has been seen that typically a house made using appropriate technologies has the potential to reduce at least 25 per cent of energy input itself, which can prove to be a tipping point, considering the scale of construction¹⁴.

Sustainability in Construction

There is an increasing recognition of the need for inclusion of sustainability concerns in the construction and building sector. A new chapter titled 'Approach to Sustainability' is being added to the National Building Code to provide required guidance with respect to all relevant aspects involved during planning, design, construction, operation and maintenance of buildings. The National Mission on Sustainable Habitat under the efficiency in buildings, management of solid waste and shift to public transport. Green building rating mechanisms like GRIHA and LEED are being increasingly used.

Therefore, green and sustainability aspects are often associated with higher initial cost that developers do not want to bear as the eventual benefits that pass on to the clients are not qualified and appreciated enough to justify the investment. Many stakeholders in both governments and market believe it is a concept better suited to commercial buildings and luxury high-end housing. There is also a lack of acceptance of alternate resource efficient materials and technologies from the user end. The beneficiaries often come from the construction sector, and have a high level of awareness in business as usual practices.

Integration of sustainability aspects in affordable housing can no longer be neglected. With growing

¹⁴ Ibid [13]

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Scope

Indian Central Plains Region

The Northern Plain was formed by the deposits brought in by the three major rivers (Indus, Ganga & Brahmaputra) and their tributaries.

This Northern Plain region is one of the mostly dense populated areas in the world due to its fertile soil and availability of water. All rivers of these plain are characterized by narrow channel confined within wide valley. Continuously increasing pressure of population on this plain has led to the intensification of settlement even into the valley of the river. This unplanned expansion has enhanced the damage due to flooding during high discharge period and lateral erosion during low-discharge period.

Flooding and lateral erosion are identified as fluvial hazards in the Ghaghara River area. Extensive studies have been carried out on flooding, but not much attention has been paid to the phenomenon of lateral erosion. However, it has been observed that lateral erosion is an independent fluvial hazard that operates during low-discharge period. The other disasters which prevail in these plains are earthquake, avalanches, flash floods, etc.



Figure 1 COASTAL STATES OF INDIA

Magnitude and risk of disasters are directly proportional to the sensitivity and inversely

proportional to degree of resilience of exposed community. Understanding and assessing the risk is fundamental to enhancing the resilience of coastal communities¹⁵. The scale of vulnerability changes with individuals and households as it encompasses the response to risk, coping and potential to react and withstand a disaster.

The habitat plays a vital role in these areas in terms of social well-being as well as a barrier to the effects of natural hazards and disasters.

Below are some examples of disaster that affected in the northern plains -

1. June 2013, Uttarakhand Flash Floods¹⁶

The flash floods triggered by very heavy rainfall and cloudburst in Uttarakhand on 16-17 June 2013, affected 12 out of the 13 districts in Uttarakhand.

The deluge has swept away mountainsides, villages and towns, thousands of people, animals, agricultural fields, irrigation canals, domestic water sources, dams, roads, bridges, and buildings — anything that stood in the way. A state loss of INR 30,000 million was estimated. The disaster has crippled the lives and livelihoods of a very large number of impoverished, rural people, with an estimated 20, 36,000 people affected across nearly 40,000 sq. miles area.



Figure 2: 2013 UTTARAKHAND FLASH FLOODS

¹⁵ 2007, Asian Disaster Preparedness Centre (APDC)

¹⁶ 21 Jun, 2013, The infrastructural damage caused by Uttarakhand flash floods, *The Economic Times*, <http://economictimes.indiatimes.com/slideshows/nation-world/the-infrastructural-damage-caused-by-uttarakhand-flash-floods/slideshow/20698376.cms>

2. October 2005, Kashmir Earthquake¹⁷

The earthquake was centered at Pakistan administered Kashmir near the city of muzaffarabad. It registered a moment magnitude of 7.6.

The quake destroyed 1,500 houses in Uri, affecting about 90% of the families in the town of 30,000. More than 1,100 houses had been flattened in Jammu and Kashmir. The main minaret of the Hazratbal shrine, believed to house a relic of the prophet Muhammad, suffered damage. The 200-year-old Moti Mahal fort in Poonch district, Kashmir, collapsed.

Buildings in Delhi and Amritsar experienced damage, and tremors caused panic in Gujarat. People in Uttar Pradesh, Uttaranchal, Himachal Pradesh, Rajasthan, and Madhya Pradesh felt the tremors. Over 1300 died.



Figure 3: 2005 KASHMIR EARTHQUAKES

3. August 2008, B ihar Flood¹⁸

A breach in the Kosi embankment near the Indo-Nepal border occurred on 18 August 2008. The river changed course and inundated areas which hadn't experienced floods in many decades. The

flood affected over 2.3 million people in the northern part of Bihar.

According to GoB figures, 236,632 houses were fully or partially destroyed across the districts. The estimated damage is Rs. 5,935 million. About 1800 kilometres of paved and unpaved roads and about 1100 bridges and culverts were destroyed in the floods.



Figure 4: 2008 BIHAR FLOODS

Increase of perilous construction practices has been emerged due to:

- **Improper location**
Siting of settlements on irregular terrain and loose soil can affect the overall stability of the building.
- **Faulty design**
Long walls between the column and more number of openings can make a building vulnerable to disaster.
- **Use of poor quality materials**
Use of substandard materials and materials which are less durable can also affect the strength of the building.
- **Sub- standard construction practices**
Lack of awareness about the construction practices for vulnerable area can affect the structure.
- **Non-compliance with building codes**
Design practices being practiced without following the design codes and standards will hamper the design.
- **Lack of awareness-**
- Safe construction practices

¹⁷ 13th October, 2005, *The Kashmir's Earthquake*, *The Economist*, <http://www.economist.com/node/5019793>

¹⁸ June 2010, *Bihar Kosi Flood (2008) Needs Assessment Report*, *Global Facility for Disaster Reduction & Recovery*, https://www.gfdr.org/sites/gfdr.org/files/publication/GFDRR_India_PDNA_2010_EN.pdf

- Disaster resistant practices

The quality and methodology of construction is very important. Usually the most vulnerable parts of a building are: too high and long walls, openings too close to corners, use of cut lintels and deficient bond at corners, and differential settlement due to soft soil.

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Strategic Approach

Design Considerations at Planning Stage

Design being an evolutionary process, proper implementation is very important at all stages of designing. The key factors that govern design in coastal regions include-

1. Climate Requirements

a) Thermal Comfort

The climate of coastal region being hot, dry & windy, thus for maximum cross air ventilation, openings have been provided at diagonal/ opposite walls. For this the overall form is linear in most options. Louvered ventilators have been provided for permanent ventilation.

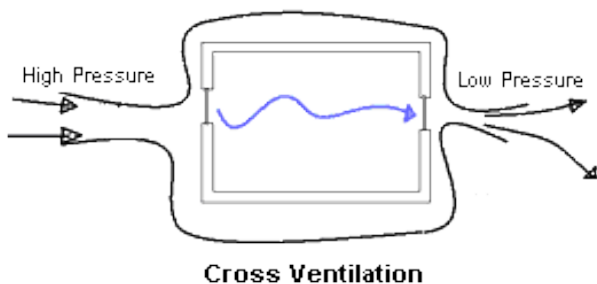


Figure 5: CROSS VENTILATION

b) To Avoid Heat Gain

Hollow/ cavity wall in most options has been induced by the rat-trap masonry bond which will provide insulation from high temperatures in summer. And for protection from direct sunlight and rain, chajjas are also incorporated in the design option. Light weight roof will also impact the overall heat gain.

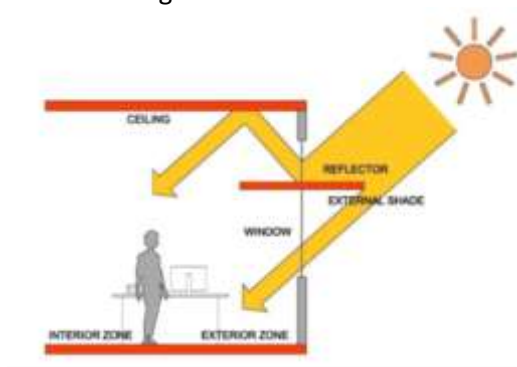


Figure 6: DAYLIGHTING

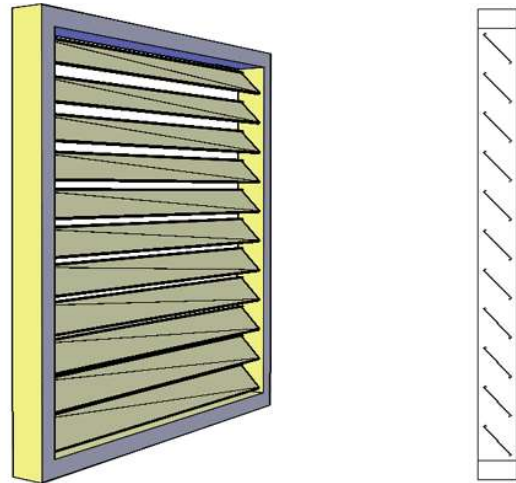


Figure 7: VENTILATION WITH LOUVERS

2. Safety Measures for Earthquake Zone and Flooding

The clustering has been done keeping in mind that minimum is the number of units in a cluster; the minimum is the overall damage and the clustering arrangement are not linear.

The most vulnerable area i.e. the openings are carefully designed such that they are not wide enough or have big panels and also they are not placed near the wall joints so that they do not harm the strength of the wall. Further, the roof of veranda is taken as a separate roof to minimise the disruption.

3. Functional Requirement

The spaces designed are optimised enough by determining the different functional and psychological aspects of the user. Also spaces have flexible usability as per the user's requirement.

4. Minimising of cost

The cost factor has been significantly lowered by minimising the use of additional architectural elements which have only aesthetic purpose, by standardisation of size of doors and windows and by use of locally available materials. Above these provisions, the one factor that counts much is that the time taken for constructing these units are comparatively lesser than traditional method of construction.

Technology Considerations at the Construction Stage

Alternate building materials, like micro-concrete roofing tiles, stabilised earth blocks are available to replace materials with a higher carbon footprint, which are traditionally used. Whereas incorporating pre-fabricated plank and joist roofing, Ferro cement pre-cast arch panels, etc. significantly lowers the construction cost.

Another aspect is the usage of industrial waste like fly ash for construction. The ecological advantages are twofold, it utilises an industrial waste and prevents the usage of potentially fertile agricultural land. Fly ash bricks remove the need for plastering. Unbaked MCR tiles are a great replacement to high energy asbestos sheeting and Mangalore tiles can save up to 46 per cent energy.

a) Foundation Design

In flood prone areas, where a building is constructed on stilts it is necessary that stilts are properly braced in both the principal directions. This will provide stability to the complete building under lateral loads. Depending on the soil type, the foundations to be used are:

- Slab or raft foundation: On soft soils. It spreads the weight over a wider area.
- Strip foundation: On varying soil.
- Stepped foundation: On sloping ground.
- Pad foundation: On firm soil
- Pile foundation: In expansive clay or alluvial soils.

b) Walling Techniques

i) Compressed Earth Blocks Wall

Earth is compressed in a manual press to form high strength blocks. Compaction of soil increases its compressive strength and hence its capacity to carry load. Resistance to water is provided by stabilising with cement or lime which increases resistance to erosion.

Soil block enable rapid construction as well as it can be made locally.



Figure 8: COMPRESSED EARTH BLOCKS

ii) FAL G Bricks

FAL G is named after its ingredients Fly Ash, Lime and Gypsum. These ingredients are dry mixed first and then mixed with water. This mixture is then hydraulically compressed in machine moulds and is left for drying for 1-2 days. It is then cured in water for 14 days, thus avoiding need for firing or steam firing of bricks.

In some places where availability of lime is not there or the prices are high, sludge lime or cement is found as suitable replacement for lime.



Figure 9: FAL G BRICKS

iii) Laterite Blocks

Laterite stone have traditionally used after directly extraction from the naturally occurring laterite sources, after which they are cut into brick-like shapes for use as walling units. Recently, there has been advancement in using laterite in the form of interlocking bricks used to construct walls without the use of cement mortar. Laterite stone is ground and filtered using a sieve, which is then mixed with 5% cement mixture and a chemical setting agent. This mixture is then machine compressed to form high density

interlocking bricks. They are manufactured in two widths of 6 inches and 8 inches; and are also available in varying lengths. Each interlocking brick has grooves and locks on its sides which can be fitted with each other to form a block wall that does not need cement mortar for bonding. These have high recyclability factor— especially in case of interlocking blocks which don't use connecting mortar is a bonus.



Figure 10: LATERITE BLOCKS

iv) Rat-trap Masonry

Usage of Rat-trap bond for wall masonry which incorporates a cavity within the 9" wall thickness reduces the brick requirement by 20 per cent per cubic meter of wall. This reduces the overall load of the superstructure on the foundation, resulting in savings due to optimised foundation design as well. Similarly, mortar requirement is reduced by 20 per cent (as compares to conventional English Bond) for a 1:4 cement-sand mortar. The exposed brickwork has led to 15 per cent of overall cost reduction.

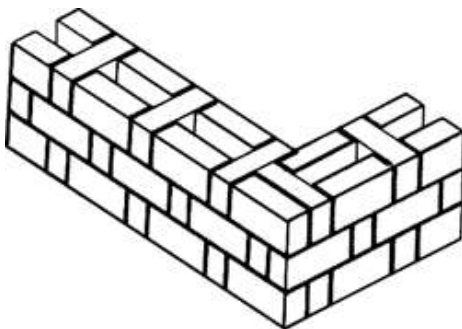


Figure 11: RAT- TRAP MASONRY BOND

c) Roofing Technique

i) Micro Concrete Tile Roofing

It is a roofing tile made of cement mortar vibrated on a table at a controlled frequency and set on mould to shape. The mortar used is a mix of concrete, fine sand, coarse sand and fine aggregate. Care is needed at all stages of production to secure quality of the tile. They provide greater flexibility with uneven under structure in comparison with A.C.C. sheets.

These tiles are water proof, fire proof and insect proof. Hence they are durable than thatch roofs. They also provide a durable, low-cost and thermally most satisfactory option than A.C.C. sheets. It can be manufactured locally with low capital investment using local materials and cement.



Figure 12: MICRO CONCRETE ROOFING TILES

ii) Pre-cast Ferro Cement Roofing Channels

A Ferro cement roof channel is a longitudinal element, semi -cylindrical shaped. It is easy to construct, uses less cement and steel than a conventional RCC roof with a corresponding reduction in self-weight and is also cheaper .During the installation process the roof channel is lifted into place and can immediately be joined together. This technique requires neither scaffolding or shuttering, nor a concrete mixer or a vibrator.

This technique consist of making a mud mould on which the Ferro cement roof channel is cast, left overnight, de-moulded within the next few days, cured and finally installed and joined at the required site.

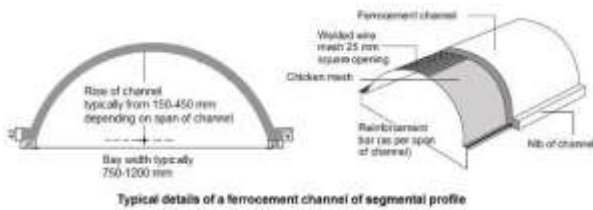


Figure 13: FERRO CEMENT ROOFING CHANNEL

iii) Filler Slab

Filler slab technology is a simple and a very innovative technology for a slab construction. This is one such cost effective roofing system which is based on the concrete portions and instead placing filler material there.

An internal cavity can be provided between the filler material which adds an extra advantage; other than cost savings and energy savings; improved thermal comfort for the interiors. Also an added advantage of lower dead weight transferred to the supporting elements and finally onto the foundation to further adds cost saving in design of these elements.

These filler materials are so placed as not to compromise the structural strength, stability and durability, resulting in replacing unwanted and non-functional tension concrete, from below and thus resulting in economy of high energy material's, consumption and considerable cost saving and decreased dead load of the slab.



Figure 14: FILLER SLAB

Light weight, inert and inexpensive materials such as low grade Mangalore tiles, Burnt Clay Bricks,

Hollow Concrete blocks, Stabilized Mud blocks/ Hollow Mud blocks, Clay pots, Coconut shells etc. can be used as filler materials. These materials are laid in the grids of steel reinforcement rods and concreting/concrete topping is done over them.

iv) Pre-cast Reinforced Cement Concrete (R.C.C.) plank and joist

This system consists of two main elements –

1. The plank which represents smaller sections of the slab and therefore of reduced thickness and reinforcement.

2. Joist which is a beam spanning across the room to provide bearing for the planks. The joist is partially precast, with the remaining portion being cast in-situ after the planks are installed.

The planks can be made in standard sizes of 0.3m x 1.5m and the joists can be 0.15m x 0.15m in size for a roof span up to 4 metres.

Plank and joist roof with three layered weather proof course have worked out to be 20 per cent cheaper than conventional RCC roof¹. Minimum of two days is required for roof construction, including finishing the assembly of prefabricated components with screed concrete, saves at least 10 man-days per house in addition to savings on scaffolding and curing period of 21 days for each house, which amounts to further construction efficiencies².



Figure 15: PRE-CAST RCC PLANK AND JOIST

v) Pre- cast arch panel system

The composite beam and panel roof is one such technique where beams and panels are pre-

fabricated and assembled in such a way that the assembly works as a single structural roofing system. Typically, the panels are placed on beams which are used along the smaller dimension of the roof and the two are joined together with connectors and in-situ concrete which binds the whole system. There are two types of panels which can be used in this system – Flat or Curved (arch profile). But here we have incorporated arch system. The thickness of panels depends on its material and its profile. Various combinations of materials for beams and panels are possible. While the beam can be made with steel, RCC or timber, the panels can be made with concrete, burnt clay bricks (or brick tiles) or stone.



Figure 16: PRE-CAST ARCH PANEL SYSTEM

d) Flooring Techniques

i) Terrazzo Tile Flooring

Terrazzo flooring is a flooring technique that combines pieces of aggregate (marble, glass or stone chips) with a cement binder. The formulation of the body mix is achieved by the careful calculation of dosages and the choice of bonding agents. This mix is then vibrated at a predetermined frequency, compacted using high pressure and then, and most importantly, all excess water and air is removed. The removal of water and air markedly reduces the porosity and the degree of absorption. This process increases enormously the mechanical-physical performance and allows for the formation of tiles. These tiles

are cost effective, long lasting, and easily replaceable with easy installation process.

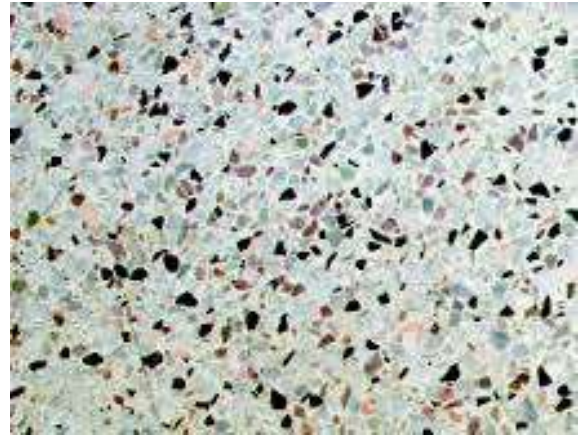


Figure 17: TERRAZZO FLOORING

ii) IPS Flooring

IPS flooring stands for Indian patent stone flooring; it is a basic type of flooring which provides good wearing properties. It is generally used for all types of floors and mix of concrete used for IPS flooring specification is 1:1.5:3 (cement, sand and stone aggregates).

As per the nature of use the flooring thickness of concrete is decided from 25 mm to 50 mm. It is laid over the concrete base (1:4:8), which is almost 3 to 4 inches thick plain cement concrete (PCC) base. For residential floor 75 mm floor thickness is sufficient.



Figure 18: IPS FLOORING

It is recommended to provide adequate slope in Plain cement concrete (PCC) in a base course as it

will not be possible to maintain slope in IPS layer due to limited thickness. Door frames should be fixed prior to flooring work

iii) Ceramic Tile Flooring

Ceramic tile flooring is a versatile architectural resource that can be employed in a variety of environments without having to worry about the constraints of water, stains and design. These are naturally resistant to the ravages of high humidity conditions and are extremely tough and are difficult to crack.



Figure 19: CERAMIC TILE FLOORING

The first and the foremost step in the manufacturing of ceramic tile floors is the formation of body slip by blending raw materials such as clay, feldspar, sand, dolomite, and quartz with 30% of water. After blending, it is grounded in a ball mill to get the body slip. Then it is put into a spray dryer and heated at high temperature. When it gets heated up, it is transformed into powder which contains moisture of about 6%. The powder is then compacted into dies through a press that operates at a pressure of several hundred pounds per square foot. The result of the pressure is a clay body, or bisque. This early stage in the ceramic tile floors manufacturing process will account for their durability later on. The bisque is now heated at high temperature by using natural gas. This removes the moisture from

the bisque. The strength and stability of the bisque (body of the ceramic tile floors) depend upon the raw materials and density.

iii) Damp Proof Membrane

The Damp Proof Membrane (DPM) must be installed in conjunction with the Damp Proof Course (DPC) in the outer walls so as to form a continuous layer. The surface should be clean and free from moisture before joining the sheets of the DPM. Overlapping of sheets by at least 4" to 6" (100 to 150 mm) with a help of a double sided butyl tape or mastic strip compound will form a continuous water proof barrier. The exposed overlap joints can then be sealed using 4" (100mm) jointing tape. If any area of the DPM is damaged during installation this should be patched by overlaying a fresh piece of DPM to cover the damaged area and to overlap by at least 6" (150mm) in all directions. Once again use double-sided mastic strip, or butyl tape to create a waterproof barrier, and then seal down the edges with jointing tape.



Figure 20: DAMP PROOF MEMBRANE

Economically Weaker Section (EWS):

The carpet area of a dwelling unit-

21-27 sqm

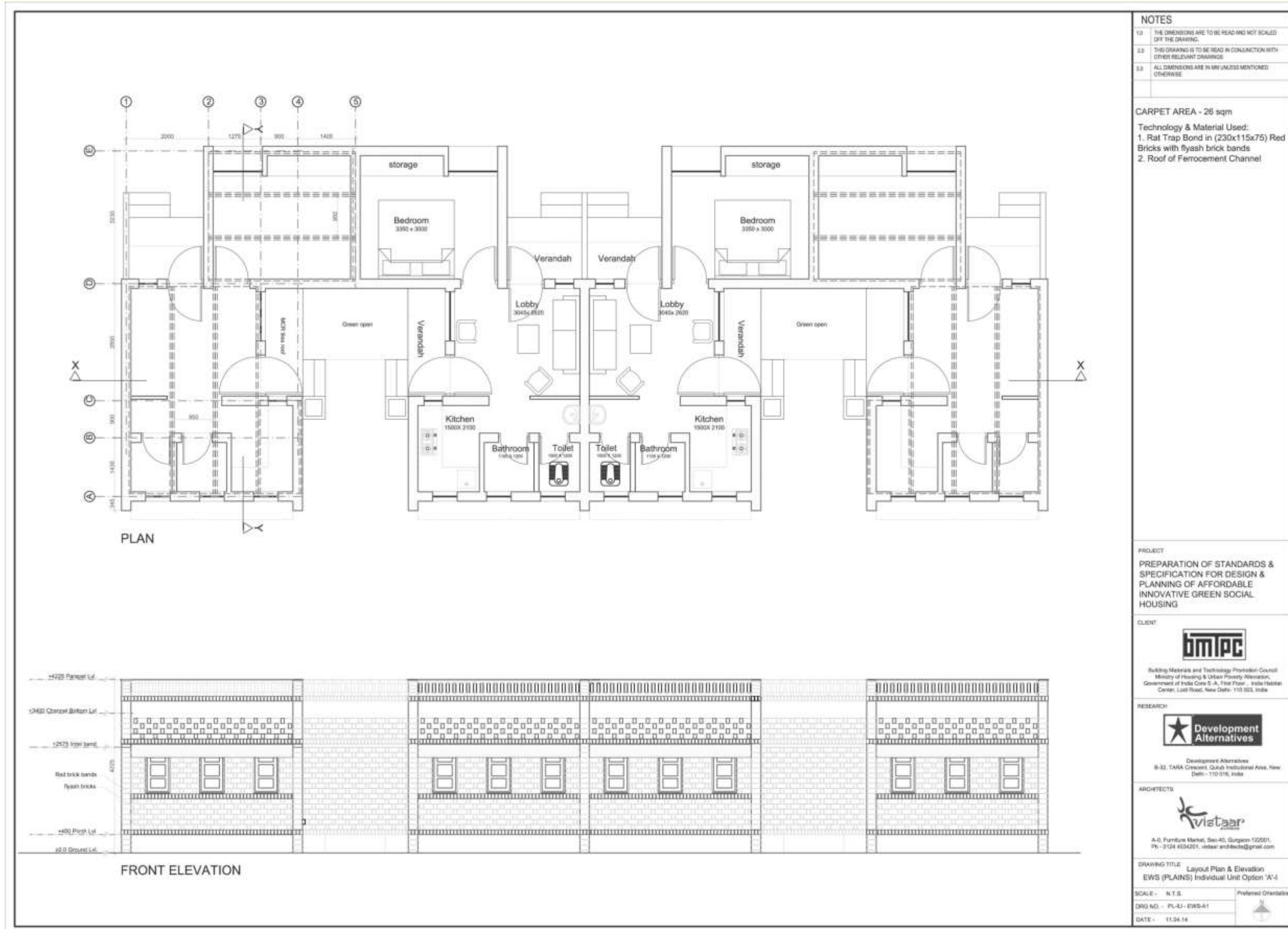
Floor Area Ratio- 1.75

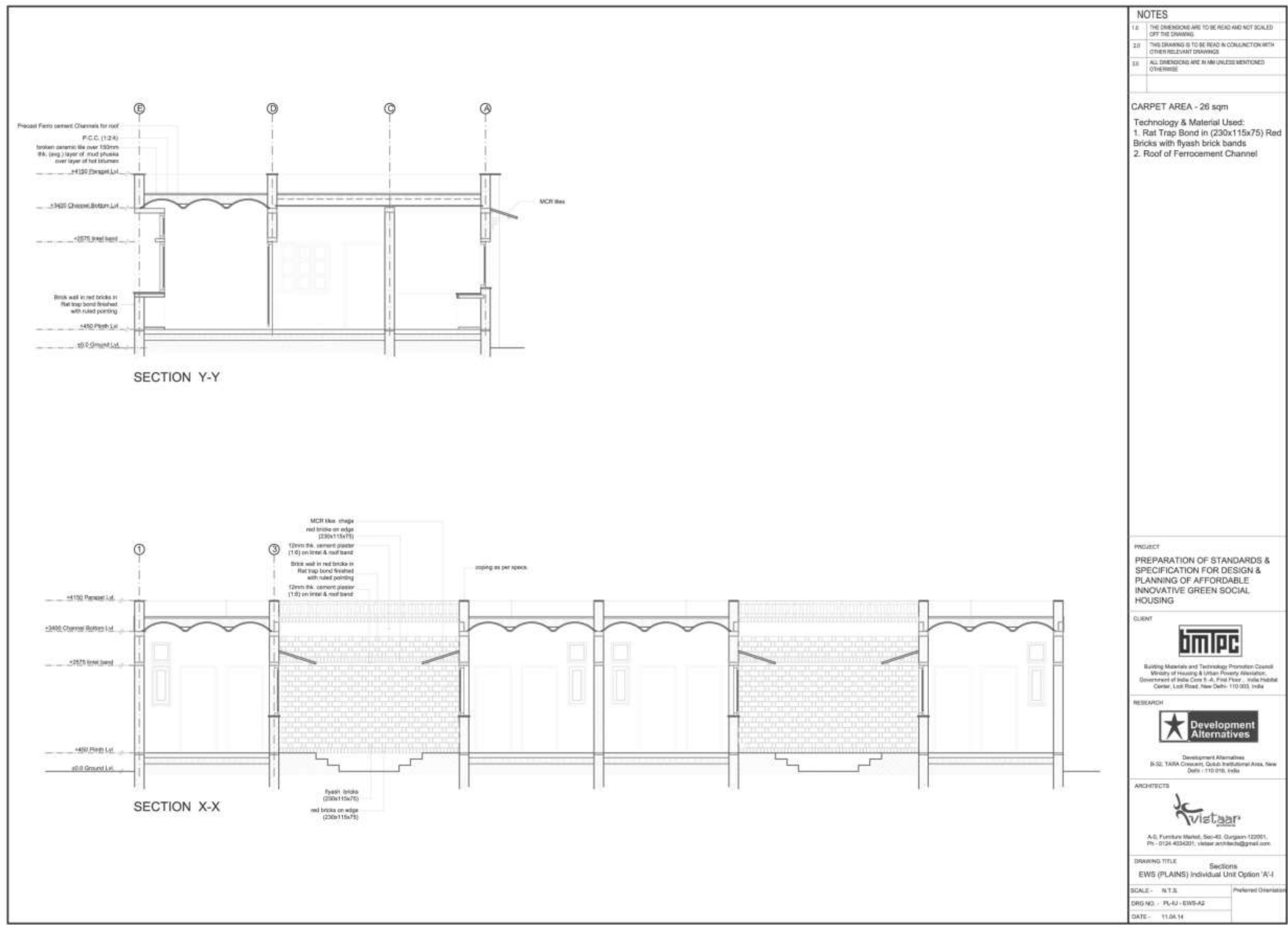
A significant proportion of space has been tailored according to the numbers and characteristic of expected residents. The housing unit is a 1 BHK typology with carpet area of 26 sqm. This housing unit is made accessible through a veranda leading to a lobby. The toilet and the bathing area are provided separately as common unit. The layout allows easily adaptable internal arrangements.

The roofing system over the unit is designed with Ferro cement channels. Brick work for the walls are done with a combination of red bricks and fly ash bricks laid in rat-trap bond finished with ruled pointing.

For disaster resilience, continuous sill and lintel band is incorporated in the design. The chajjas designed will provide barrier from direct sunlight and also from rain.

The dwelling unit is designed so as to provide a flexible, adaptable and accessible environment to the users.





5(a) EWS INDIVIDUAL UNIT OPTION-A



Figure 21: VIEW OF EWS INDIVIDUAL UNIT OPTION-A



Figure 22: STREET VIEW OF EWS INDIVIDUAL UNIT OPTION-A

5(b) EWS INDIVIDUAL UNIT OPTION-B

A significant proportion of space has been tailored according to the numbers and characteristic of expected residents. The unit is of 1 BHK typology with carpet area of 27 sqm. This housing unit is made accessible through a veranda leading to a lobby. The toilet and the bathing area are provided separately as common unit. The layout allows easily adaptable internal arrangements.

The brick masonry work for the super structure is done with a combination of Fly Ash and red bricks laid in rat- trap bond. Roofing system is composed of arch panel and beam technique which decreases the overall load on the foundation. The roofing for the veranda is done with micro concrete tiles.

For disaster resilience, continuous sill and lintel band is incorporated in the design. The chajjas designed will provide barrier from direct sunlight and also from rain.

The dwelling unit is designed so as to provide a flexible, adaptable and accessible environment to the users.

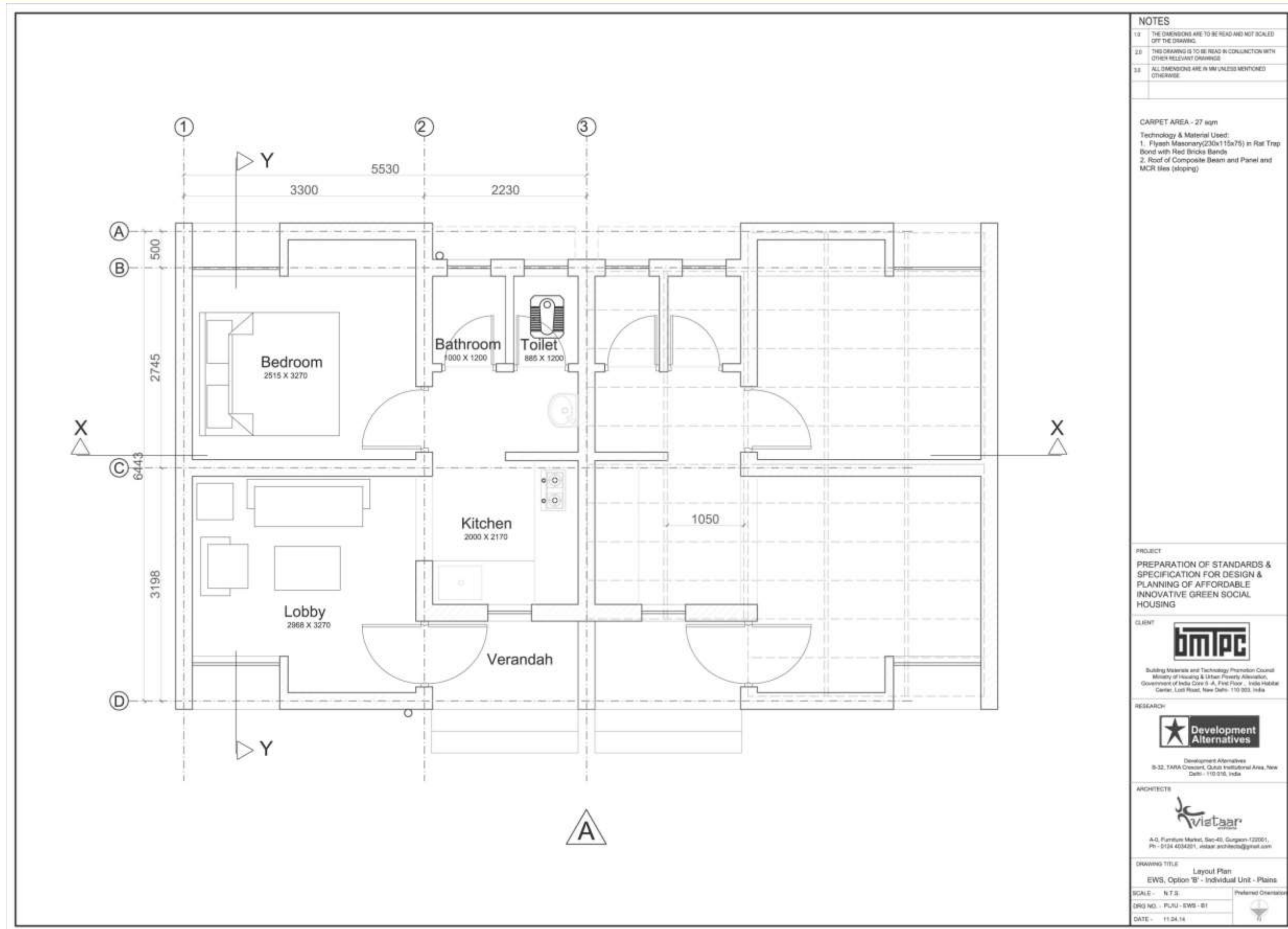






Figure 23: VIEW OF EWS INDIVIDUAL UNIT OPTION-B



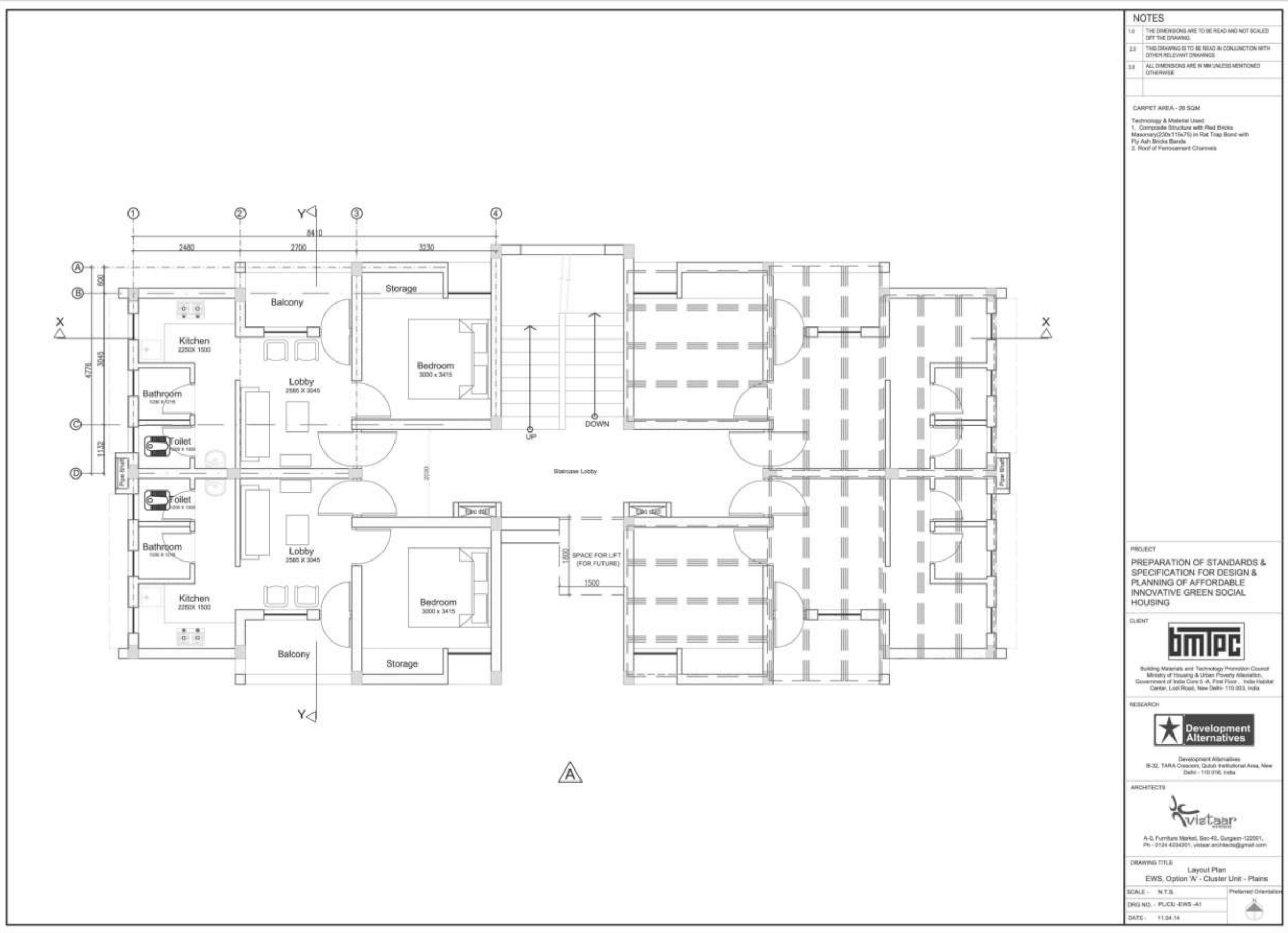
Figure 24: STREET VIEW OF EWS INDIVIDUAL UNIT OPTION-B

Cluster arrangement is done with six numbers of 1 BHK units at one level with two on each side. The carpet area for one unit is 26 sqm. A centrally accessible stairway is provided, which is approached through a 1500mm wide corridor and there is also an option for lift for future restorations. The approach to the habitable area is through a lobby which leads to bedroom and the kitchen. Each unit has been provided with balcony for proper day lighting and ventilation. Also common service ducts are designed for pipework and electrical work.

The brick masonry work for the super structure is done with fly ash bricks laid in rat-trap bond. Flooring system has been designed with pre-cast Ferro Cement channel system. The terrace surface is finished with brick tile grouting over the layer of mud phuska and hot bitumen layer of the top floor slab.

For disaster resilience, continuous sill and lintel band is incorporated in the design. The chajjas designed will provide barrier from direct sunlight and also from rain.

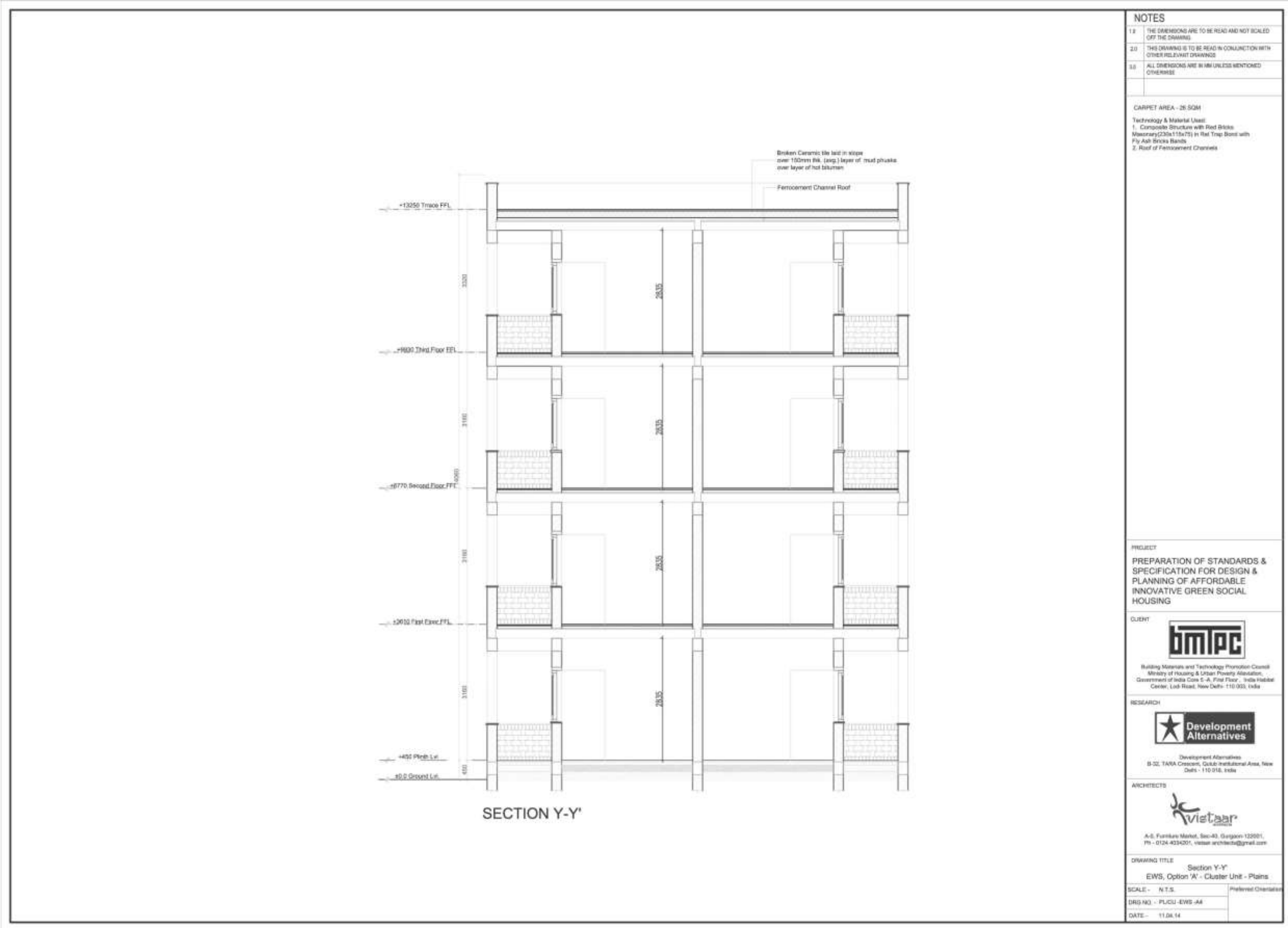
The dwelling unit is designed so as to provide a flexible, adaptable and accessible environment to the users.







NOTES		
I.E.	THE DIMENSIONS ARE TO BE READ AND NOT SCALED OFF THE DRAWING	
II.E	THIS DRAWING IS TO BE READ IN CONNECTION WITH OTHER RELEVANT DRAWINGS	
III.E	ALL DIMENSIONS ARE IN MM UNLESS MENTIONED OTHERWISE	
CARPET AREA - 26 SQM		
Technology & Material Used: 1. Composite Structure with Red Bricks Masonry(230x115x75) in Hot Trap Bond with Fly Ash Bricks Bands 2. Roof of Fascement Channels		
PROJECT		
PREPARATION OF STANDARDS & SPECIFICATION FOR DESIGN & PLANNING OF AFFORDABLE INNOVATIVE GREEN SOCIAL HOUSING		
CLIENT		
		
Building Materials and Technology Promotion Council Ministry of Housing & Urban Poverty Alleviation, Government of India, C-16, 1st Floor, - Indira Aapda Center, Lodi Road, New Delhi - 110 003, India		
RESEARCH		
		
Development Alternatives B-32, TARA Crescent, Qutub Institutional Area, New Delhi - 110 016, India		
ARCHITECTS		
		
A-6, Furniture Market, Sec-43, Gurgaon-122001, Ph - 0124 4034301, kviztaararchitects@gmail.com		
DRAWING TITLE		
Section X-X'		
EWS, Option 'A' - Cluster Unit - Plains		
SCALE -	N.T.S.	Preferred Orientation
DRG NO. -	PL/CU-EWS-43	
DATE -	11.04.14	

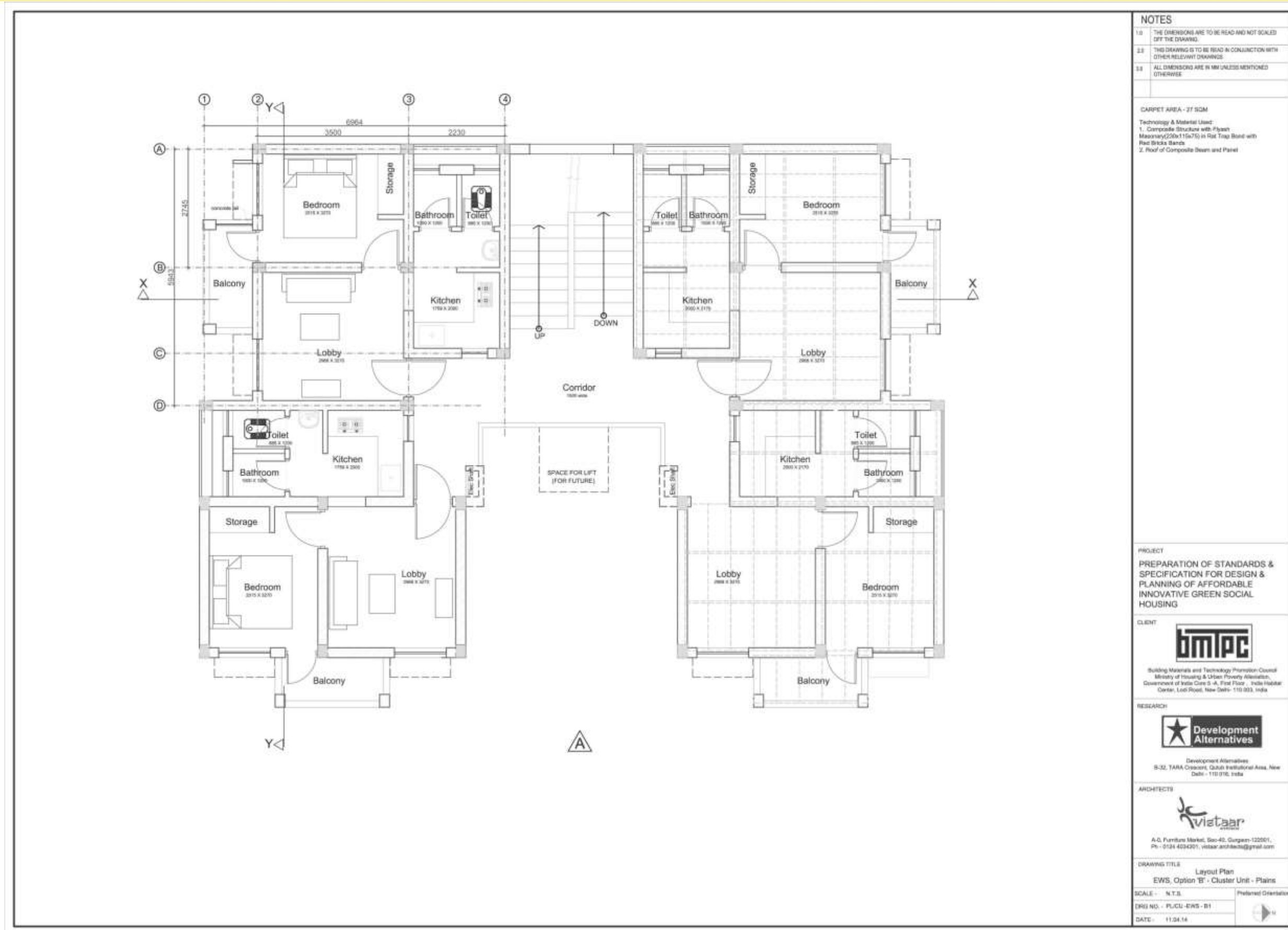


Cluster arrangement is done with six numbers of 1 BHK units at one level with two on each side. The carpet area of one unit is 27 sqm. A centrally accessible stairway is provided, which is approached through a 1500mm wide corridor and there is also an option for lift for future restorations. Approach to the habitable area is through a lobby which then leads to kitchen/utility area and to the bedroom. Each unit has been provided with balcony for proper day lighting and ventilation. Also common service ducts are designed for pipe and electrical work.

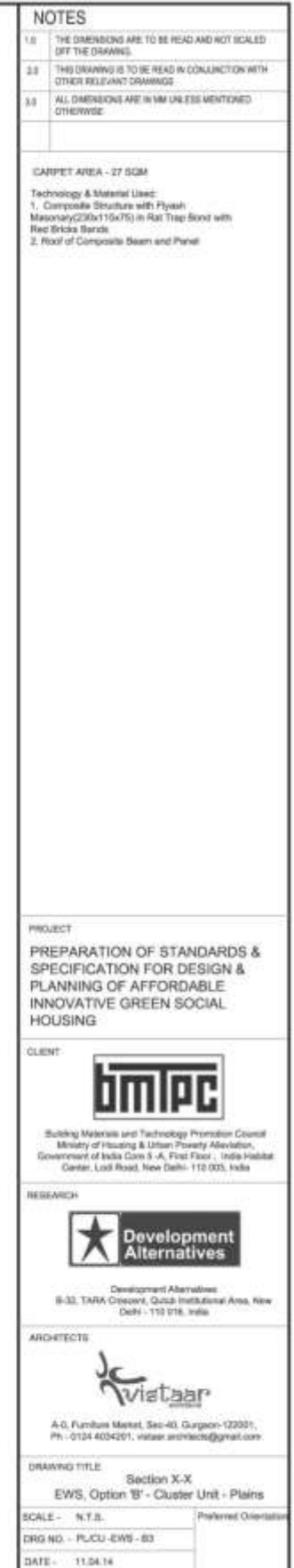
The brick masonry work for the super structure is done with a combination of Fly Ash and red bricks laid in rat-trap bond. Flooring system has been designed with pre cast arch panel system supported by beams. The terrace surface is finished with brick tile grouting over the layer of mud phuska and hot bitumen layer of the top floor slab.

For disaster resilience, continuous sill and lintel band is incorporated in the design. The chajjas designed will provide barrier from direct sunlight and also from rain.

The dwelling unit is designed so as to provide a flexible, adaptable and accessible environment to the user.









NOTES

- 1.0 THE DIMENSIONS ARE TO BE READ AND NOT SCALED OFF THE DRAWING.
- 2.0 THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWINGS.
- 3.0 ALL DIMENSIONS ARE IN MM UNLESS MENTIONED OTHERWISE.

CARPET AREA - 27 SQM

Technology & Material Used

1. Composite Structure with Plywood Masonry (230x115x75) in Rat Trap Bond with Red Bricks Baffle
2. Roof of Composite Beam and Panel

PROJECT

PREPARATION OF STANDARDS & SPECIFICATION FOR DESIGN & PLANNING OF AFFORDABLE INNOVATIVE GREEN SOCIAL HOUSING

CLIENT



Building Materials and Technology Promotion Council
Ministry of Housing & Urban Poverty Alleviation,
Government of India Core 5-A, First Floor - India Habitat
Center, Lodhi Road, New Delhi - 110 003, India

RESEARCH



Development Alternatives
B-32, TARA Crescent, Gurgaon Institutional Area, New
Delhi - 110 018, India

ARCHITECTS



A-6, Furniture Market, Sec-42, Gurgaon-122001,
Ph: 0124 4334201, vietaar.architects@gmail.com

DRAWING TITLE

Section Y-Y
EWS Option 'B' - Cluster Unit - Plains

SCALE -

N.T.S.

Preferred Orientation

DRG NO. - PLU-EWS-B4

DATE - 11.04.14

Lower Income Group-A

(LIG-A):

The carpet area of a dwelling unit-

28-40 sqm

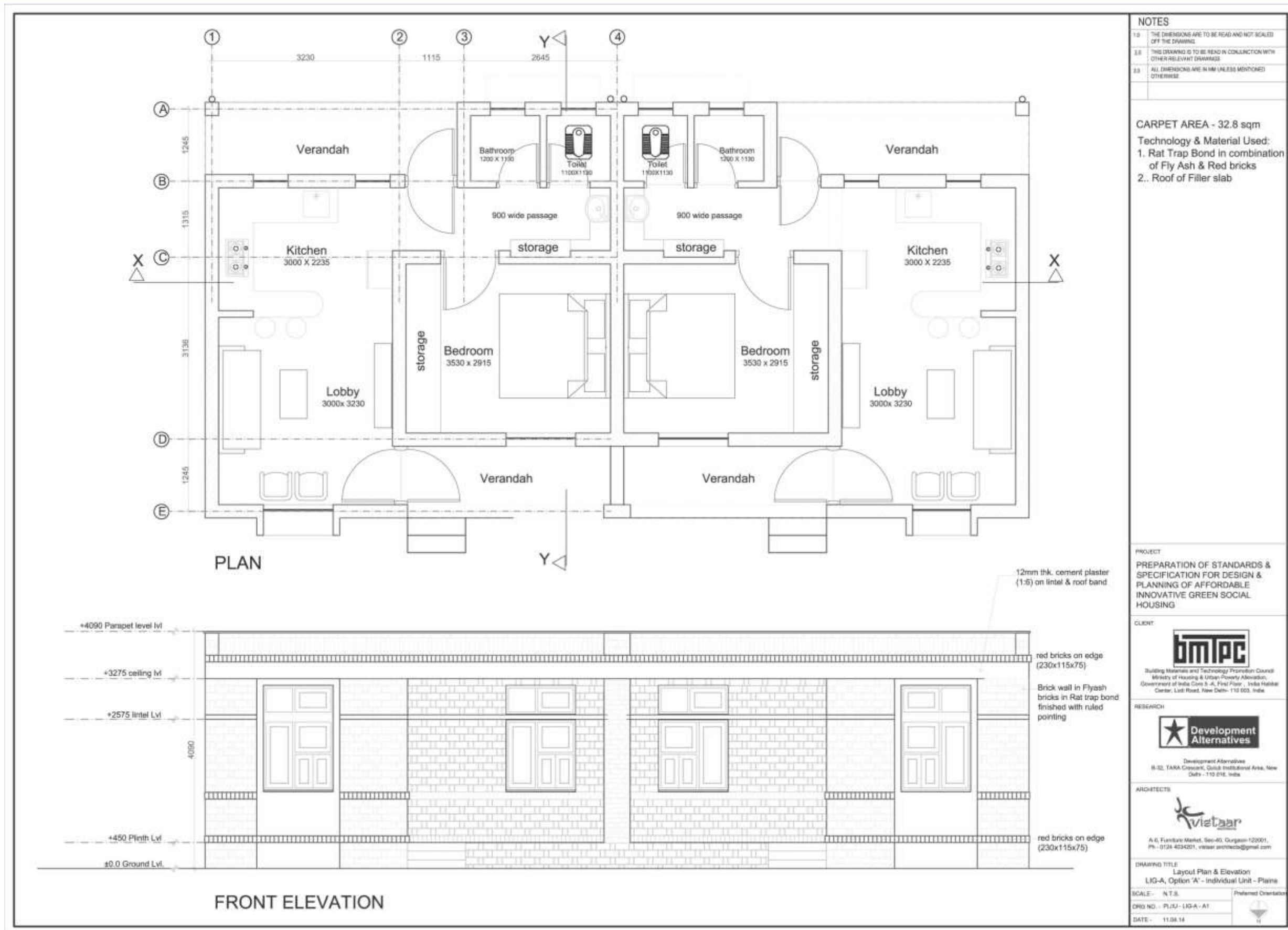
Floor Area Ratio- 1.75

A significant proportion of space has been tailored according to the numbers and characteristic of expected residents. The unit is of 1BHK typology with carpet area of 32.8 sqm. This housing unit is made accessible through a veranda leading to a lobby. The toilet and the bathing area are provided separately as common unit. The kitchen is provided with a small space for dining. The layout allows easily adaptable internal arrangements.

The super structure has been designed with Fly Ash bricks laid in rat- trap masonry bond. Roofing of the main unit is done with RCC filler slab with filler material as specified. Terrace floor is finished with brick tile over a layer of mud phuska and hot bitumen above the roof slab.

For disaster resilience, continuous sill and lintel band is incorporated in the design. The chajjas designed will provide barrier from direct sunlight and also from rain.

The dwelling unit is designed so as to provide a flexible, adaptable and accessible environment to the users.



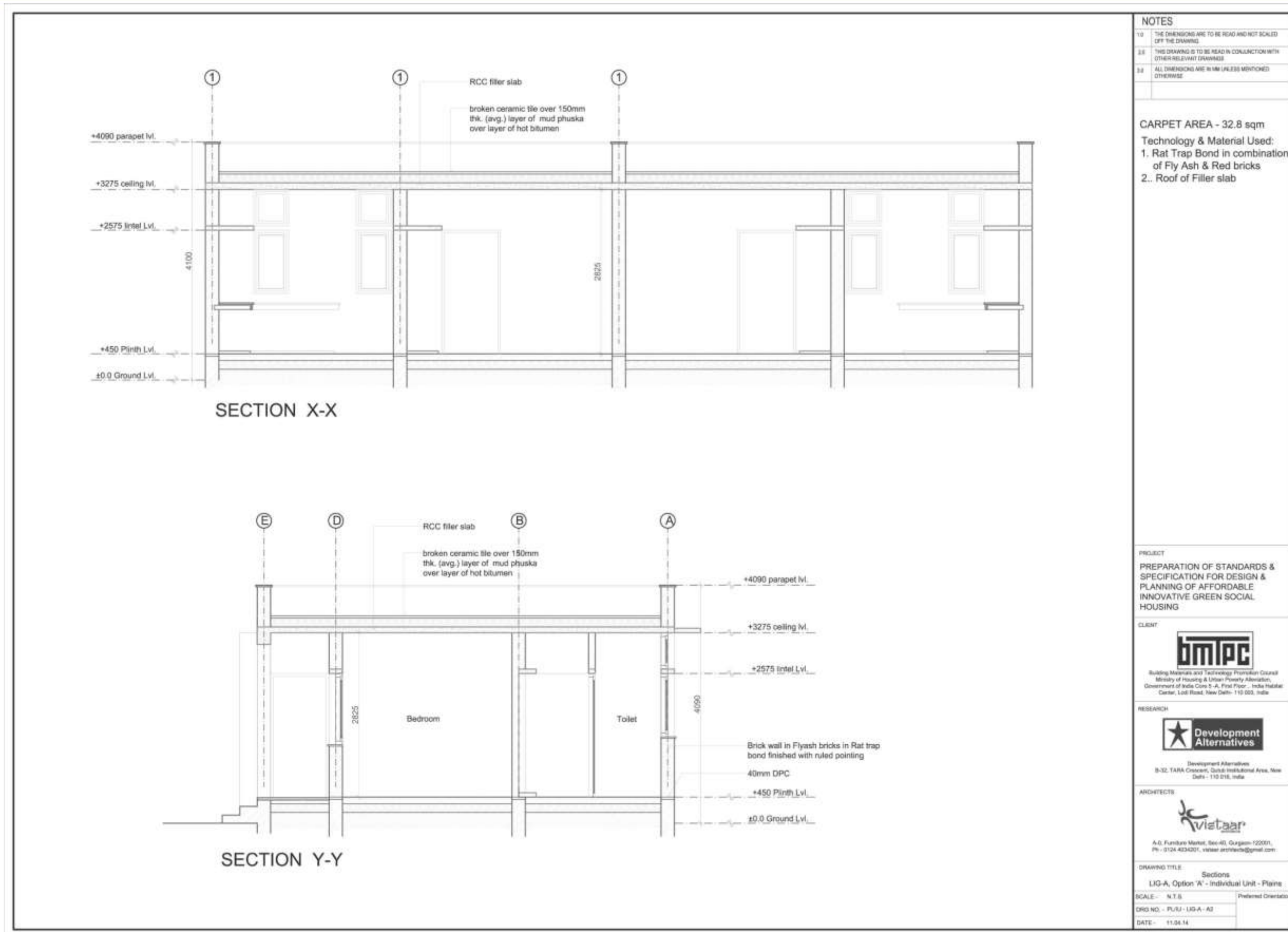




Figure 25: VIEW OF LIG-A INDIVIDUAL UNIT OPTION-A



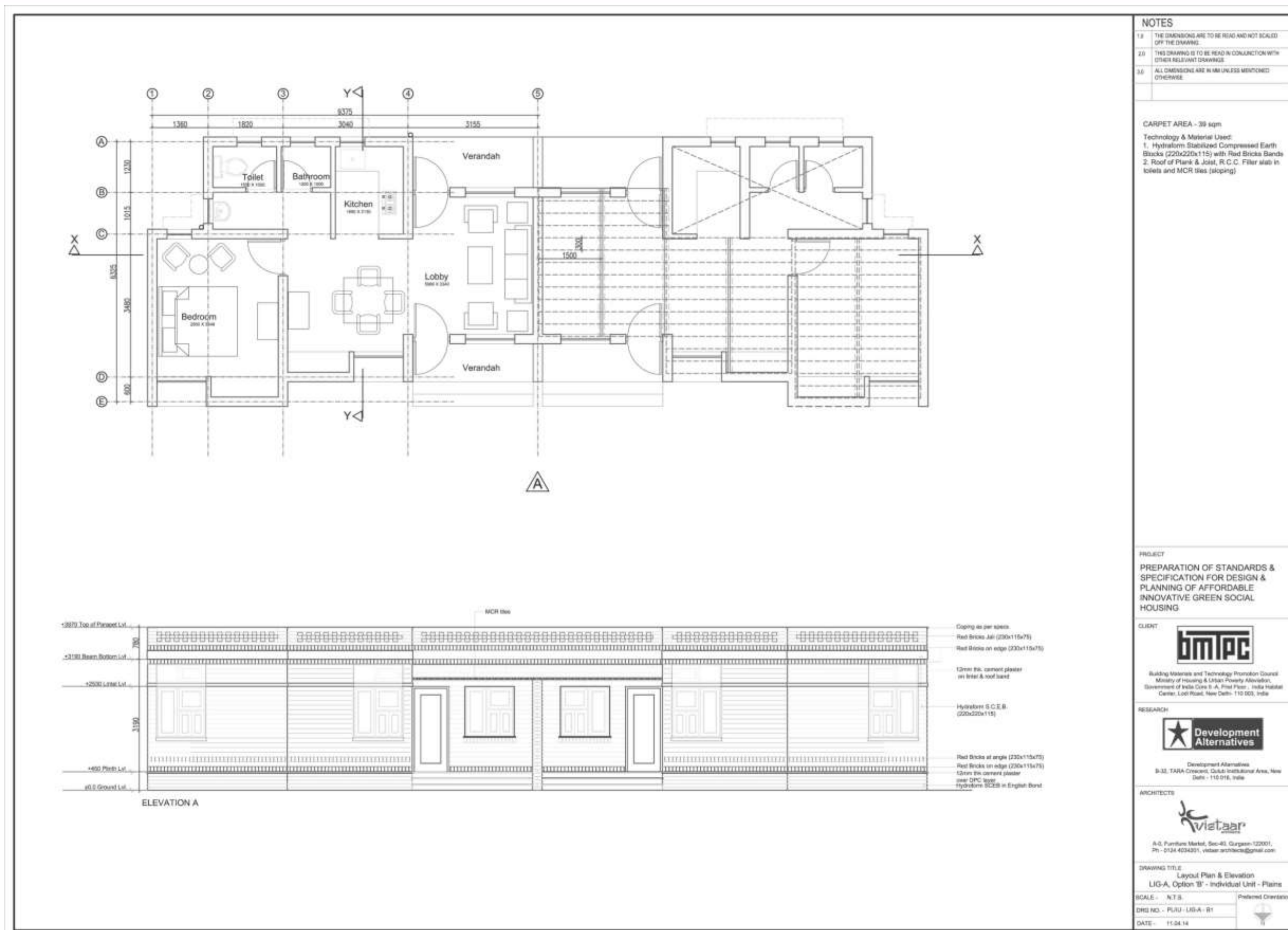
Figure 26: STREET VIEW OF LIG-A INDIVIDUAL UNIT OPTION-A

A significant proportion of space has been tailored according to the numbers and characteristic of expected residents. The unit is of 1HBK typology with carpet area of 39 sqm. This housing unit is made accessible through a veranda leading to a lobby. The toilet and the bathing area are approached through a common utility area. The kitchen is provided with a small space for dining. The layout allows easily adaptable internal arrangements.

The super structure has been designed with stabilised compressed earth blocks laid in rat- trap bond. Roofing has been done with pre cast Reinforced Cement Concrete (R.C.C.) planks and joist and Micro Concrete Roofing tile. Separate sloping roof has been designed for veranda portion with filler slab. Terrace floor is finished with brick tile over a layer of mud phuska and hot bitumen above the roof slab.

For disaster resilience, continuous sill and lintel band is incorporated in the design. The chajjas designed will provide barrier from direct sunlight and also from rain.

The dwelling unit is designed so as to provide a flexible, adaptable and accessible environment to the users.



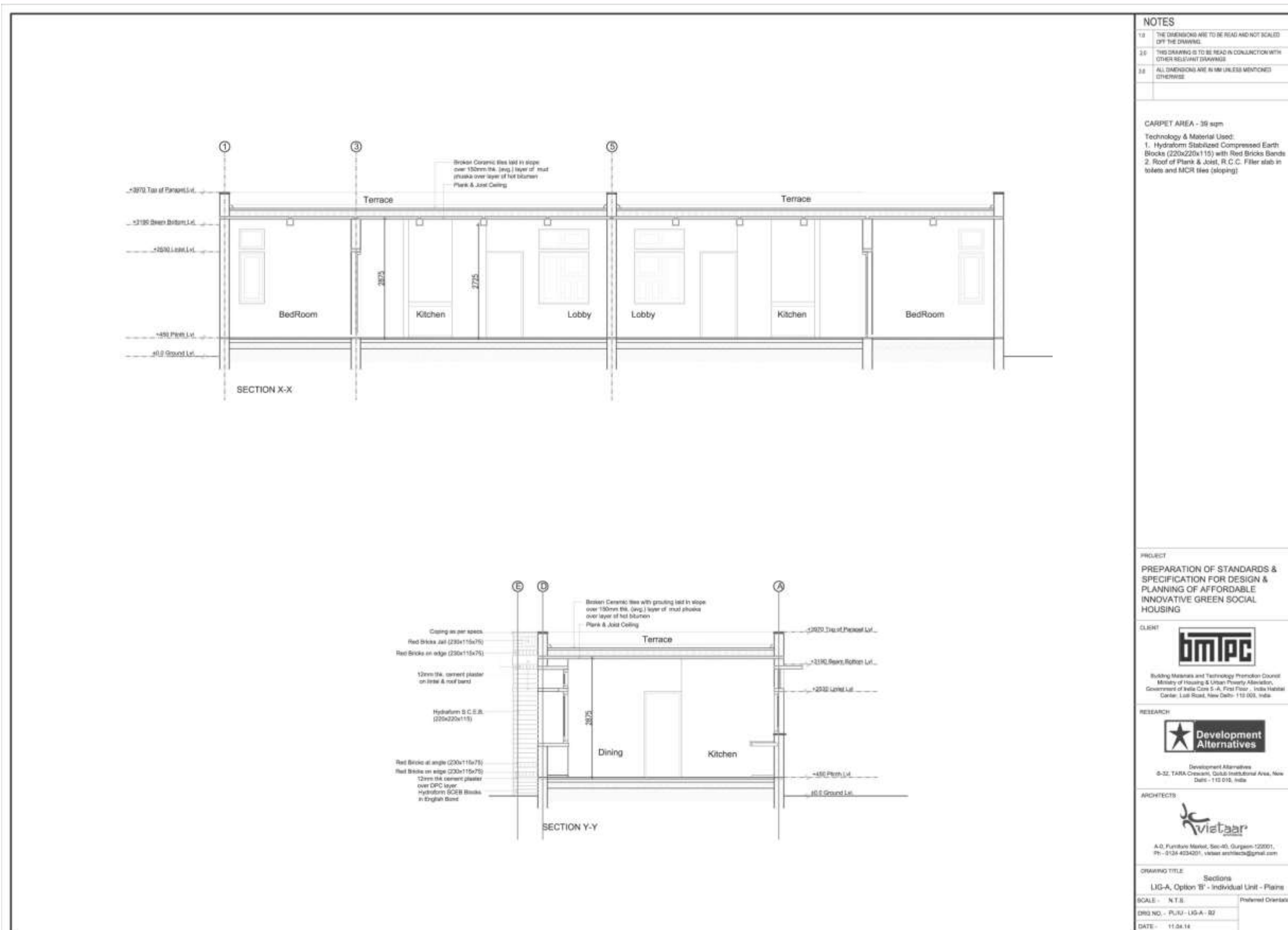




Figure 27: VIEW OF LIG-A INDIVIDUAL UNIT OPTION –B



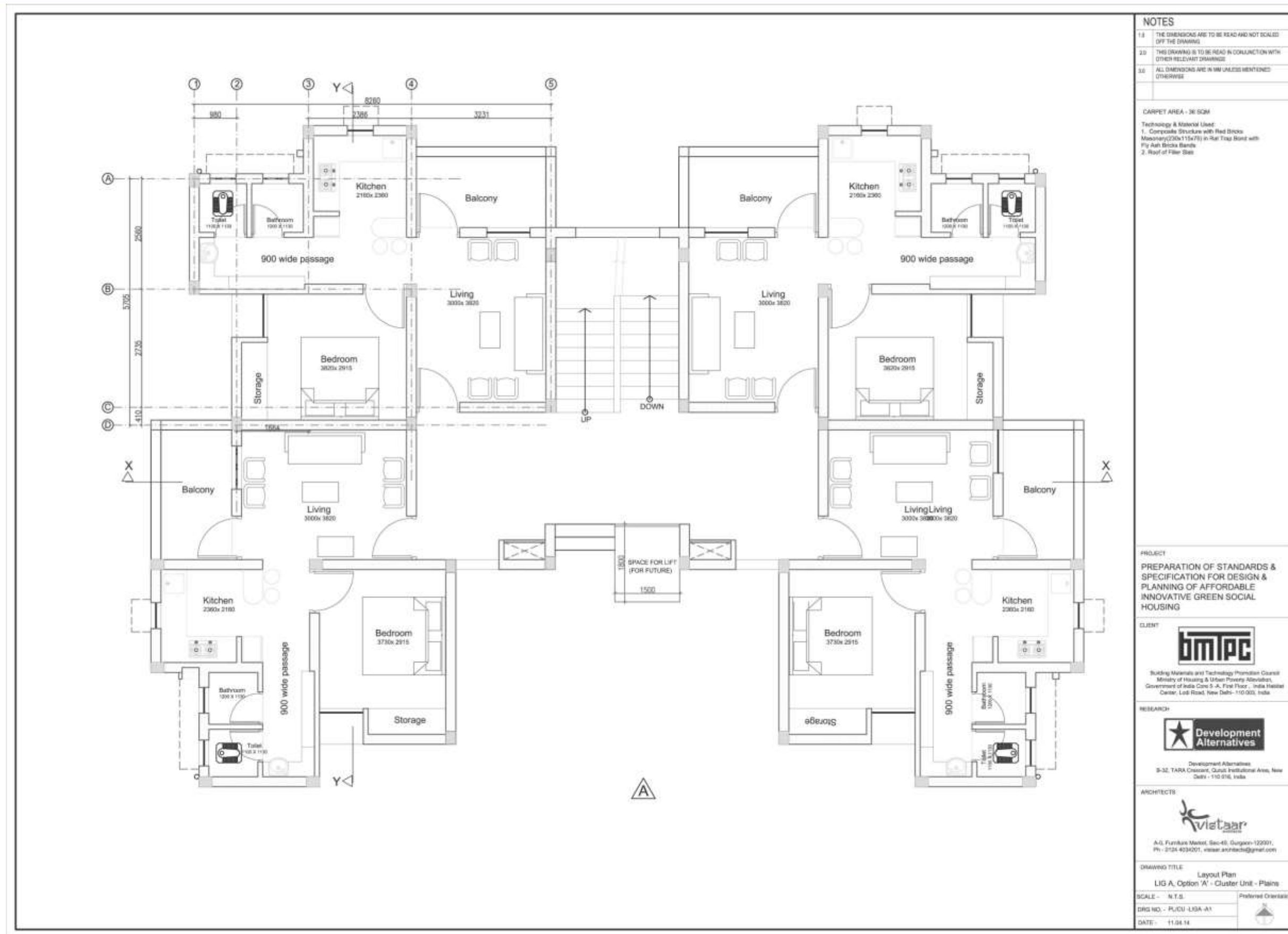
Figure 28: STREET VIEW OF LIG-A INDIVIDUAL UNIT OPTION-B

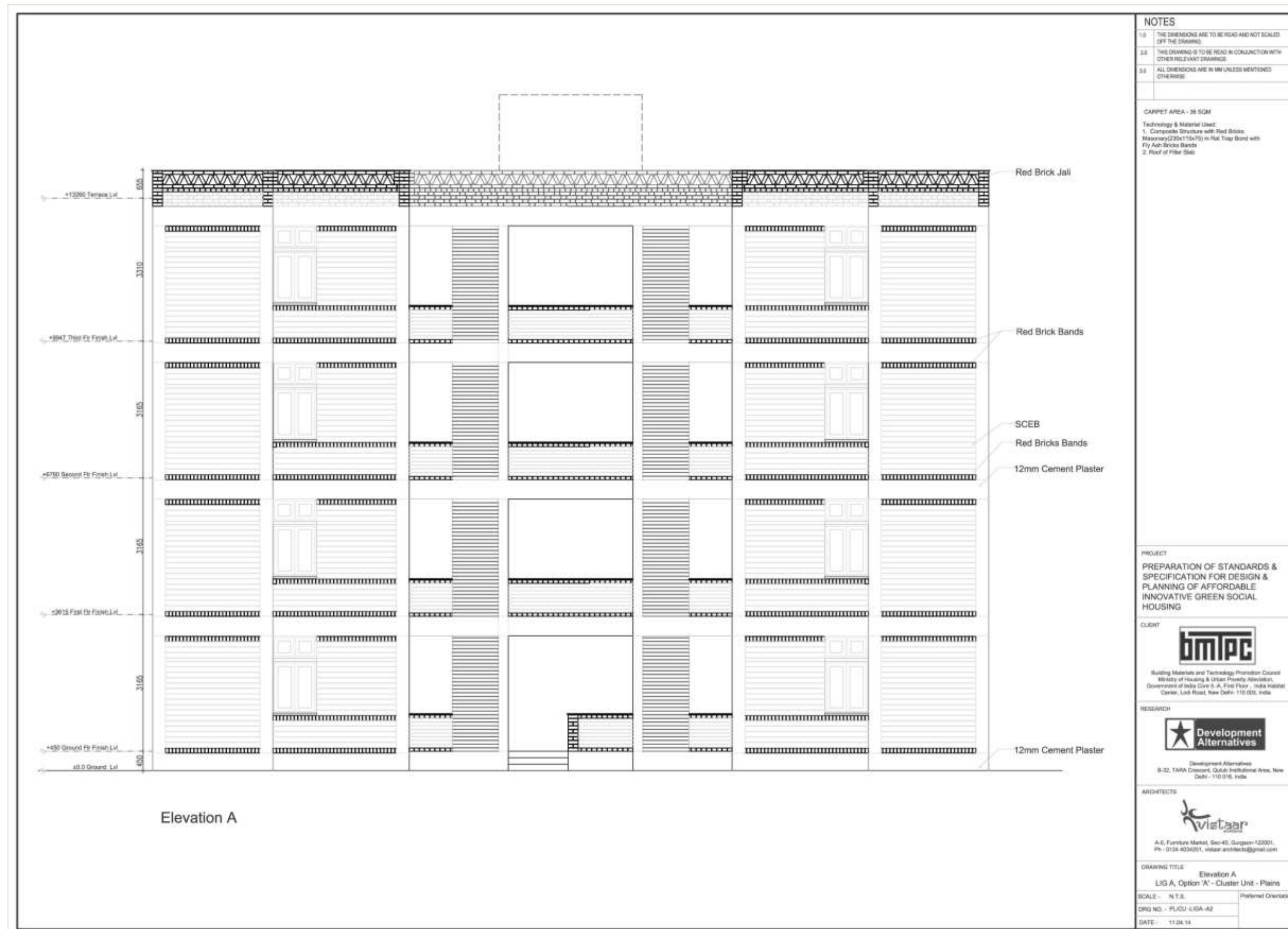
Cluster arrangement is done with four numbers of units of 1BHK typology at one level with two on each side. The carpet area of each unit is 36 sqm. A centrally accessible stairway is provided, which is approached through a common space rather than a corridor and there is also an option for lift for future restorations. The approach to the habitable area is through a lobby leading to kitchen/dining area and to bedroom. Each unit has been provided with balcony accessible through bedroom for proper day lighting and ventilation. Also common service ducts are designed for pipe and electrical work.

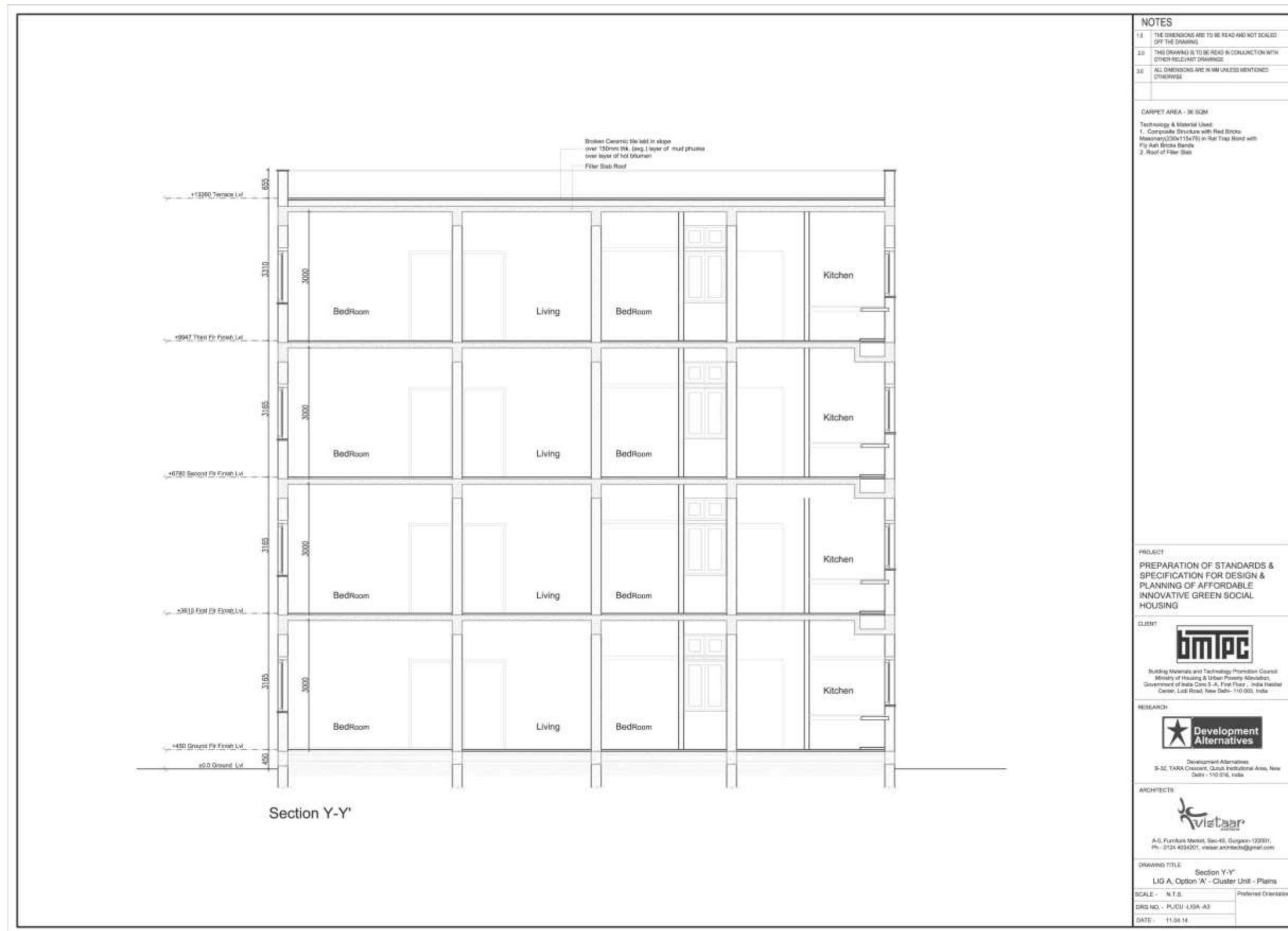
The brick masonry work for the super structure is done with Fly Ash bricks laid in rat-trap bond. Flooring is done with RCC filler slab with specified filler slab. The terrace surface is finished with brick tile grouting over the layer of mud phuska and hot bitumen layer of the top floor slab.

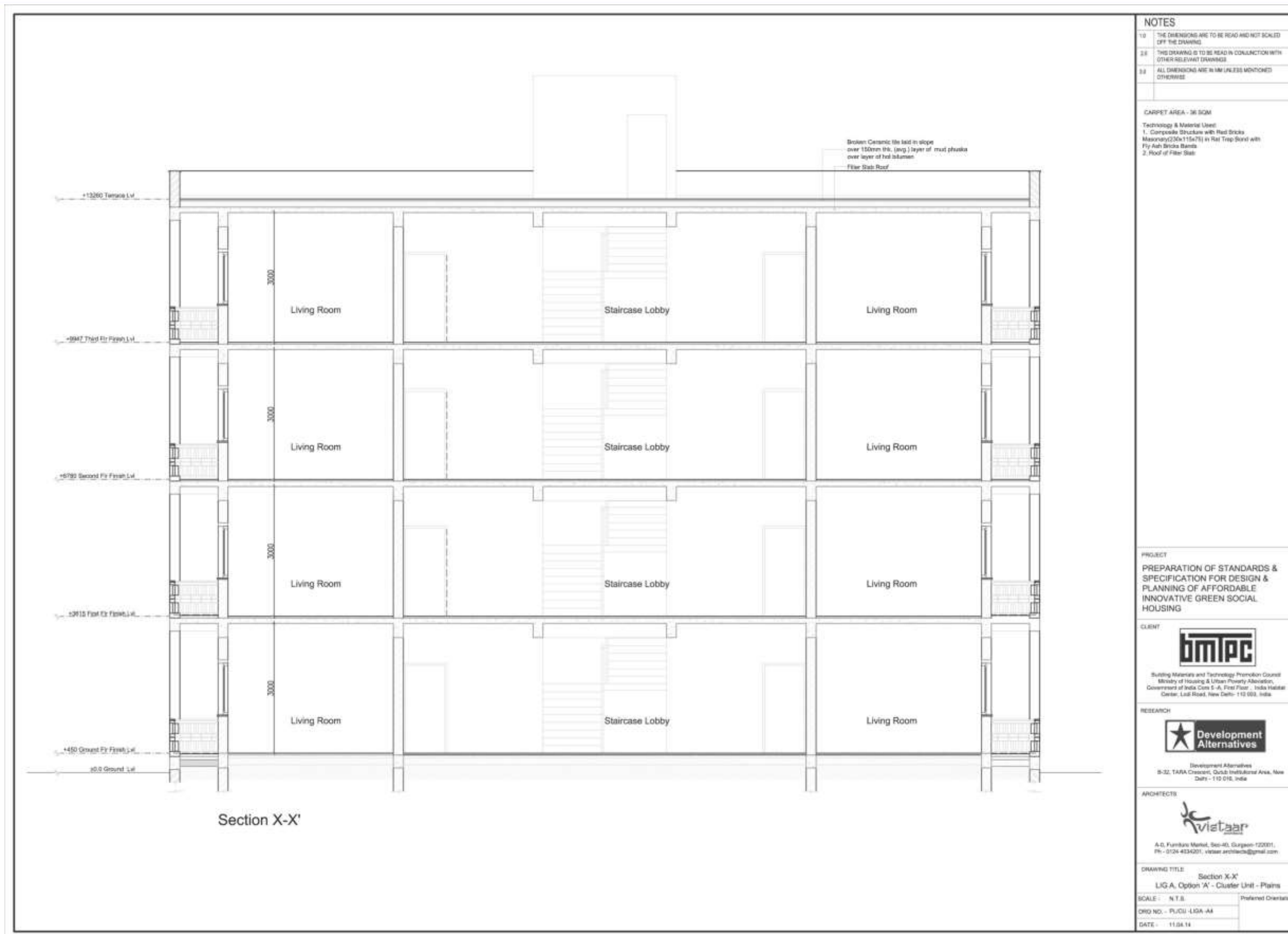
For disaster resilience, continuous sill and lintel band is incorporated in the design. The chajjas designed will provide barrier from direct sunlight and also from rain.

The dwelling unit is designed so as to provide a flexible, adaptable and accessible environment to the user.







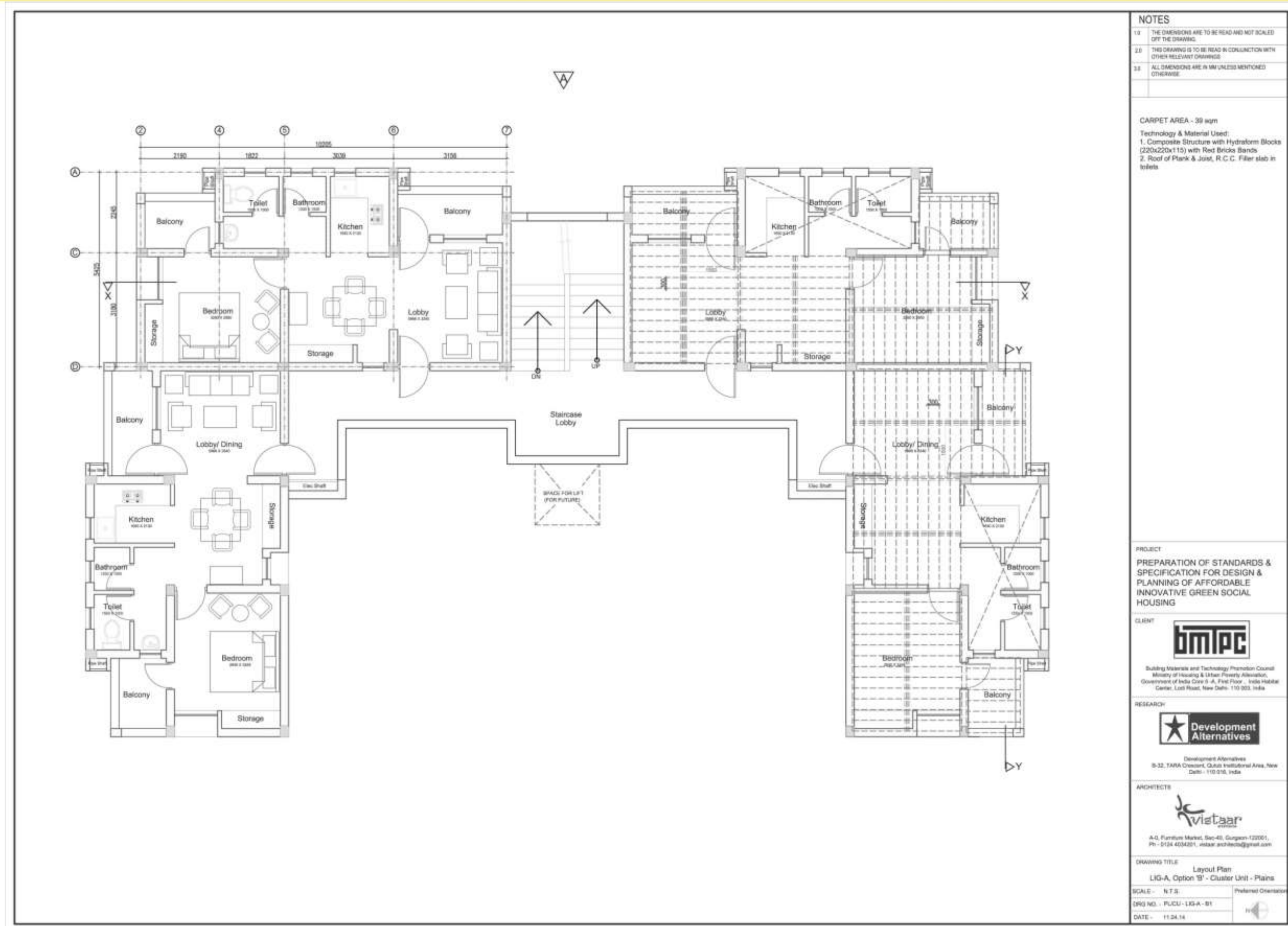


Cluster arrangement is done with four numbers of units of 1BHK typology at one level with two on each side. The carpet area of each unit is 39 sqm. A centrally accessible stairway is provided, which is approached through a common central lobby area rather than a corridor and there is also an option for lift for future restorations. The approach to the habitable area is through a lobby leading to kitchen/dining area and to bedroom. Each unit has been provided with two balconies, one accessible through bedroom and other accessible through living area for proper day lighting and ventilation. The unit has a centrally accessible dining area. Also common service ducts are designed for pipe and electrical work.

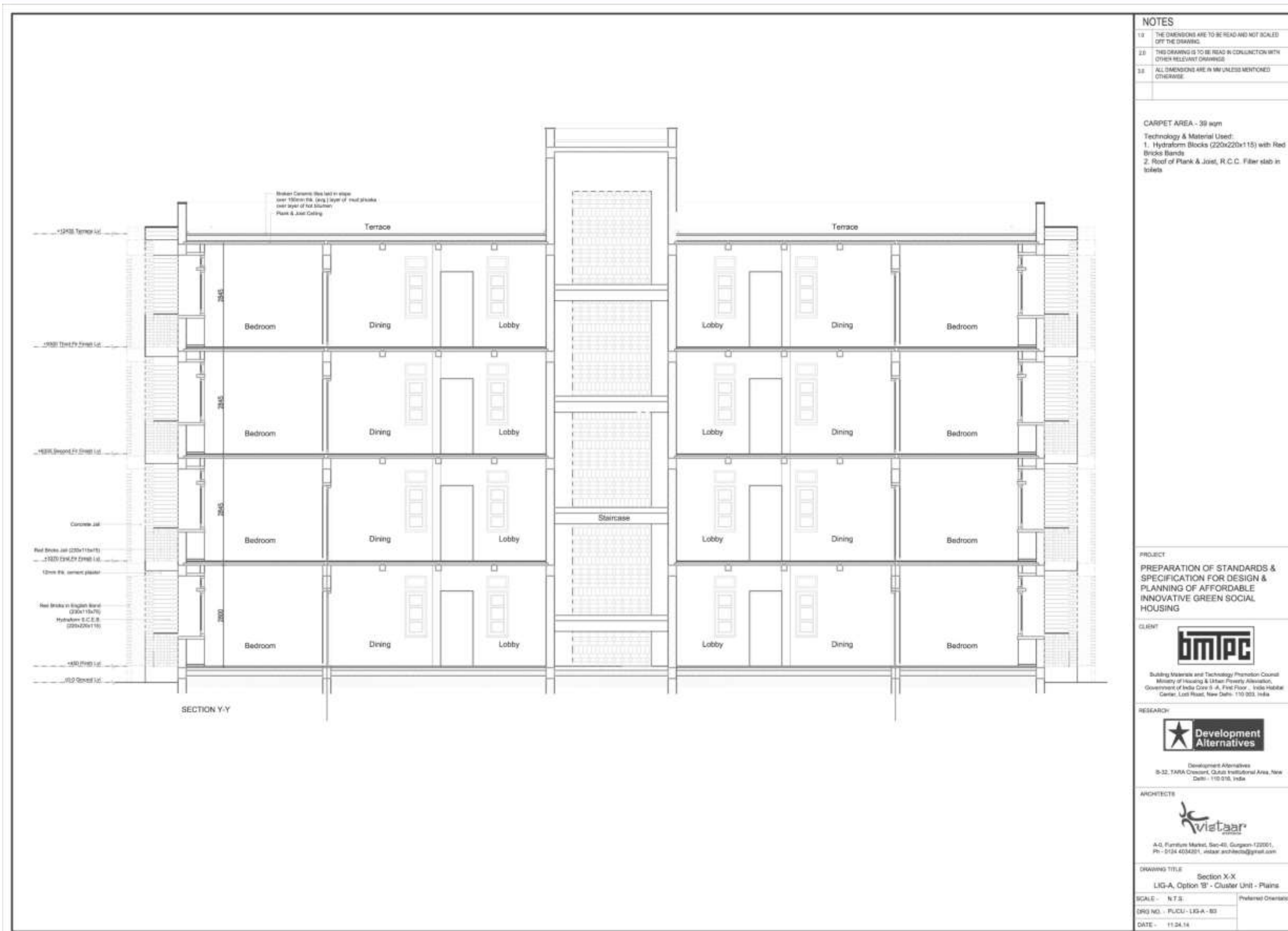
The brick masonry work for the super structure is done with hydra form stabilised compressed earth blocks laid in rat-trap bond. Flooring is done with pre cast Reinforced Cement Concrete (R.C.C.) planks and joists. The terrace surface is finished with brick tile grouting over the layer of mud huska and hot bitumen layer of the top floor slab.

For disaster resilience, continuous sill and lintel band is incorporated in the design. The chajjas designed will provide barrier from direct sunlight and also from rain.

The dwelling unit is designed so as to provide a flexible, adaptable and accessible environment to the user.









SECTION Y-Y

NOTES

1. THE DIMENSIONS ARE TO BE READ AND NOT SCALED OFF THE DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWINGS.
3. ALL DIMENSIONS ARE IN MM (UNLESS MENTIONED OTHERWISE).

CARPET AREA - 39 sqm

Technology & Material Used:

1. Hydraform Blocks (220x220x115) with Red Bricks Bands.
2. Roof of Plank & Joist, R.C.C. Filler slab in toilets.

PROJECT

PREPARATION OF STANDARDS & SPECIFICATION FOR DESIGN & PLANNING OF AFFORDABLE INNOVATIVE GREEN SOCIAL HOUSING

CLIENT



Building Materials and Technology Promotion Council
Ministry of Housing & Urban Poverty Alleviation,
Government of India Core 3 - A, First Floor - India Habitat
Center, Lod Road, New Delhi- 110 028, India

RESEARCH



Development Alternatives
H-52, TARA Crescent, Gurgaon Institutional Area, New
Delhi - 110 016, India

ARCHITECTS



A-6, Furniture Market, Sector-40, Gurgaon-122001,
Ph : 0124 4034201, vistara.architects@gmail.com

DRAWING TITLE

Section Y-Y
LIG-A, Option 'B' - Cluster Unit - Plots

SCALE

A.T.S.

DRG NO.

PLUJ - LIG-A - B4

DATE

11.06.14

Lower Income Group
(LIG-B):

The carpet area of a dwelling unit-

41-60 sqm

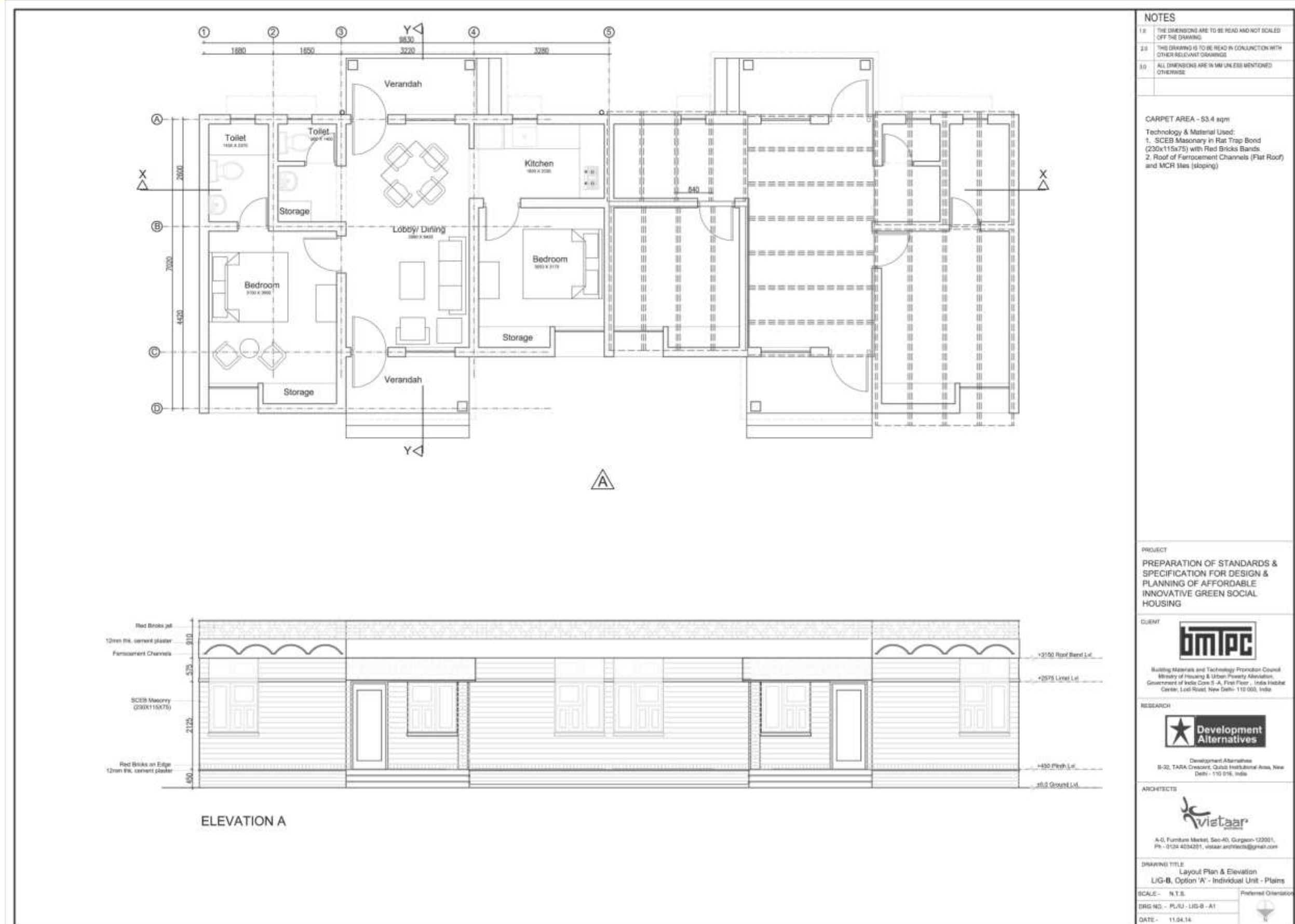
Floor Area Ratio- 1.75

A significant proportion of space has been tailored according to the numbers and characteristic of expected residents. The unit is of 2BHK typology with carpet area of 53.4 sqm. This housing unit is made accessible through a veranda leading to a lobby with dining area. The toilet and the bathing area are combined and provided one in the master bedroom and one as common. The layout allows easily adaptable internal arrangements.

The super structure is made up of hydra form stabilised compressed earth blocks laid in rat- trap bond. A combination of red brick is done to enhance the aesthetics of the unit. Roofing of the unit is done with pre cast Ferro Cement channel. The roof over the veranda is separated from the main unit and is made up of Micro Concrete Roofing tiles (MCR). The terrace floor is finished with brick tile over a layer of mud phuska and hot bitumen over the roof slab.

For disaster resilience, continuous sill and lintel band is incorporated in the design. The chajjas designed will provide barrier from direct sunlight and also from rain.

The dwelling unit is designed so as to provide a flexible, adaptable and accessible environment to the users.



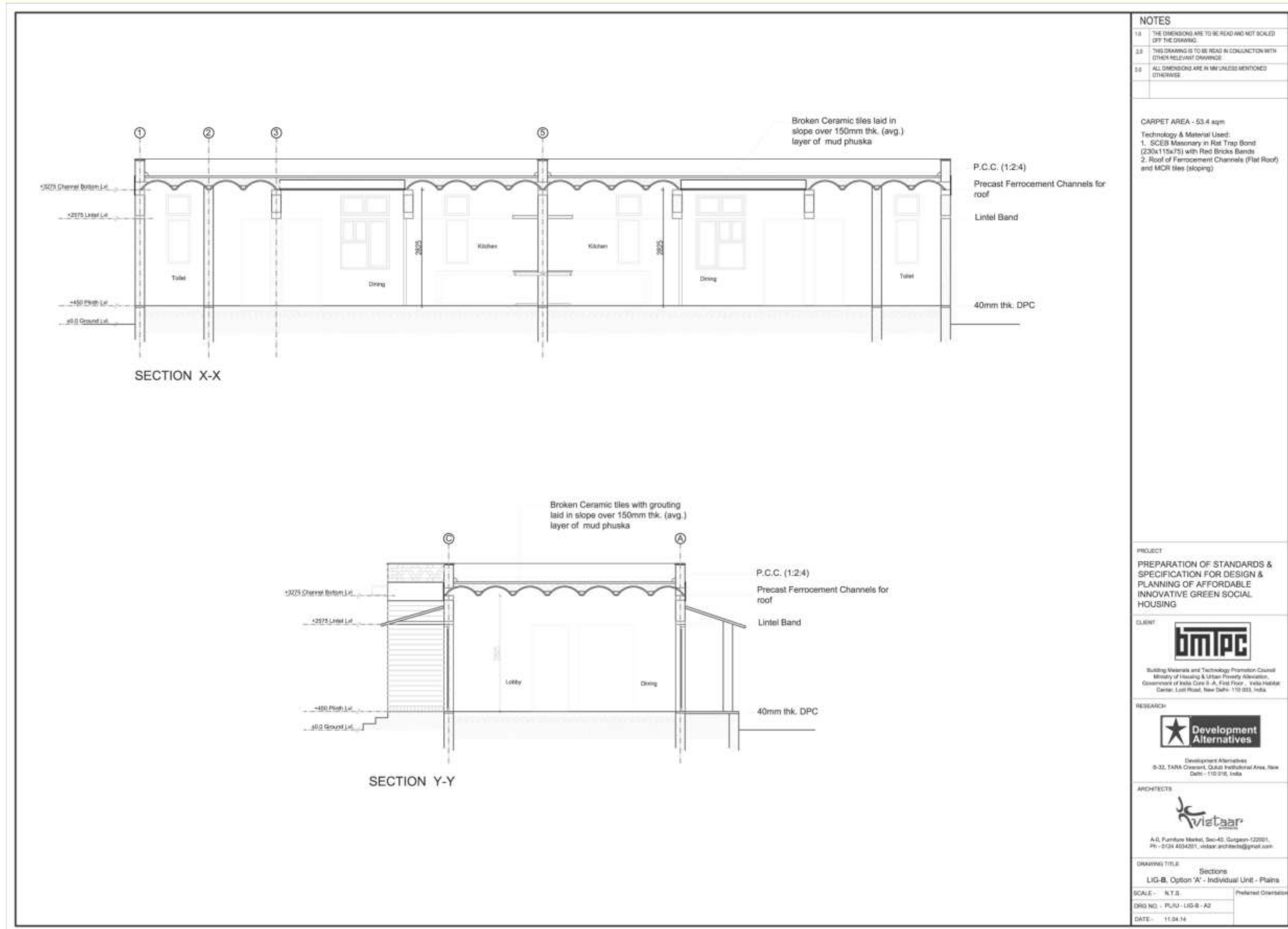




Figure 29: VIEW OF LIG-B INDIVIDUAL UNIT OPTION-A



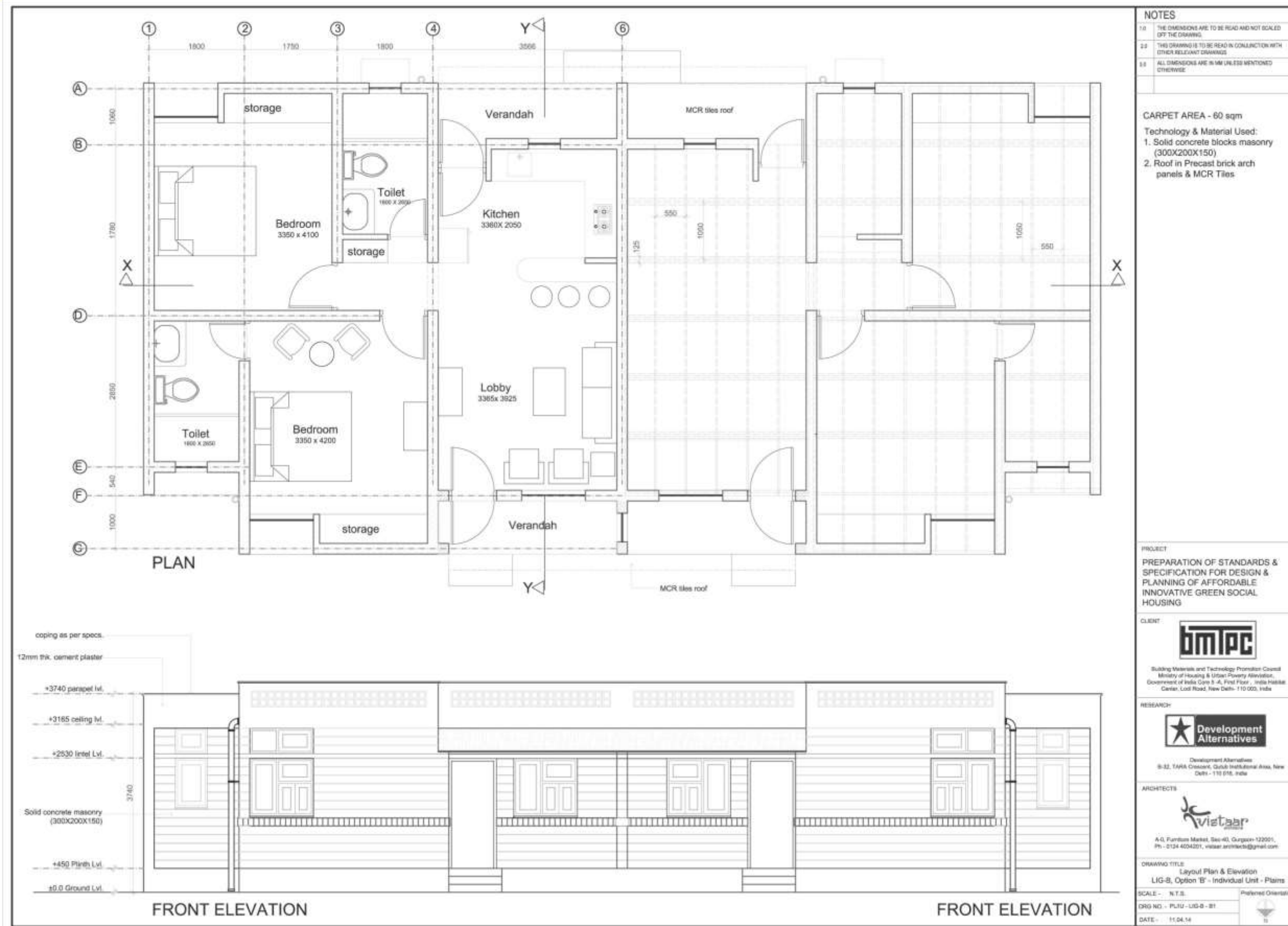
Figure 30: STREET VIEW OF LIG-B INDIVIDUAL UNIT OPTION-A

A significant proportion of space has been tailored according to the numbers and characteristic of expected residents. The housing unit is of 2BHK typology with carpet area of 60 sqm. This housing unit is made accessible through a veranda leading to a lobby with dining area. The toilet and the bathing area are combined and provided one in the master bedroom and one as common. The unit also has another veranda at its rear side. The unit is provided with permanent ventilation through the pre-fabricated louvers. The layout allows easily adaptable internal arrangements.

The super structure is made up of fly ash bricks laid in rat- trap bond. A combination of pre-cast concrete block solids is done to enhance the aesthetics of the unit. Roofing of the main unit is done with Ferro cement arch panels and over the veranda is done with Micro Concrete Roofing (MCR) tiles. The terrace floor is finished with brick tile over a layer of mud phuska and hot bitumen over the roof slab.

For disaster resilience, continuous sill and lintel band is incorporated in the design. The chajjas designed will provide barrier from direct sunlight and also from rain.

The dwelling unit is designed so as to provide a flexible, adaptable and accessible environment to the users.



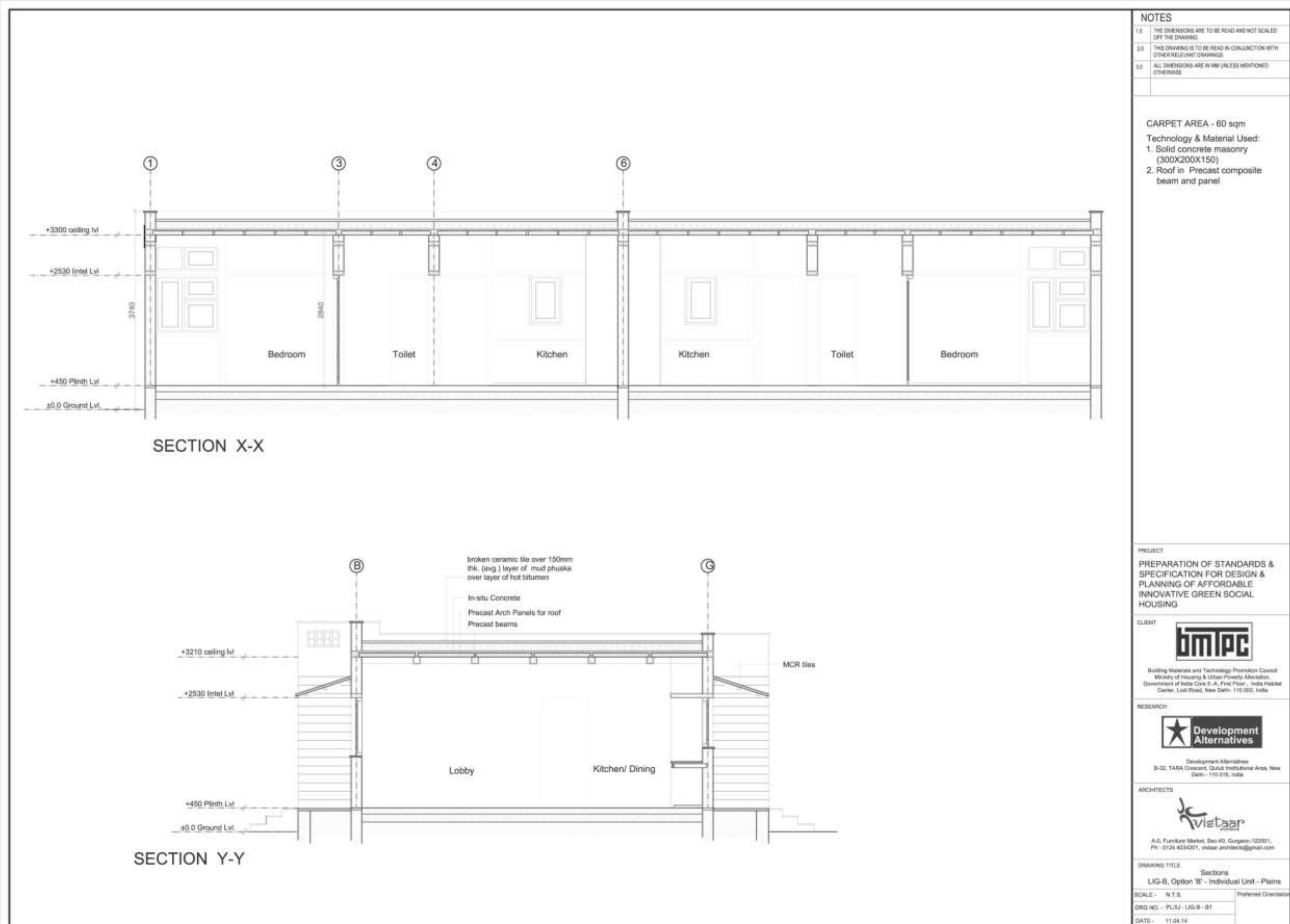




Figure 31: VIEW OF LIG-B INDIVIDUAL UNIT OPTION-B



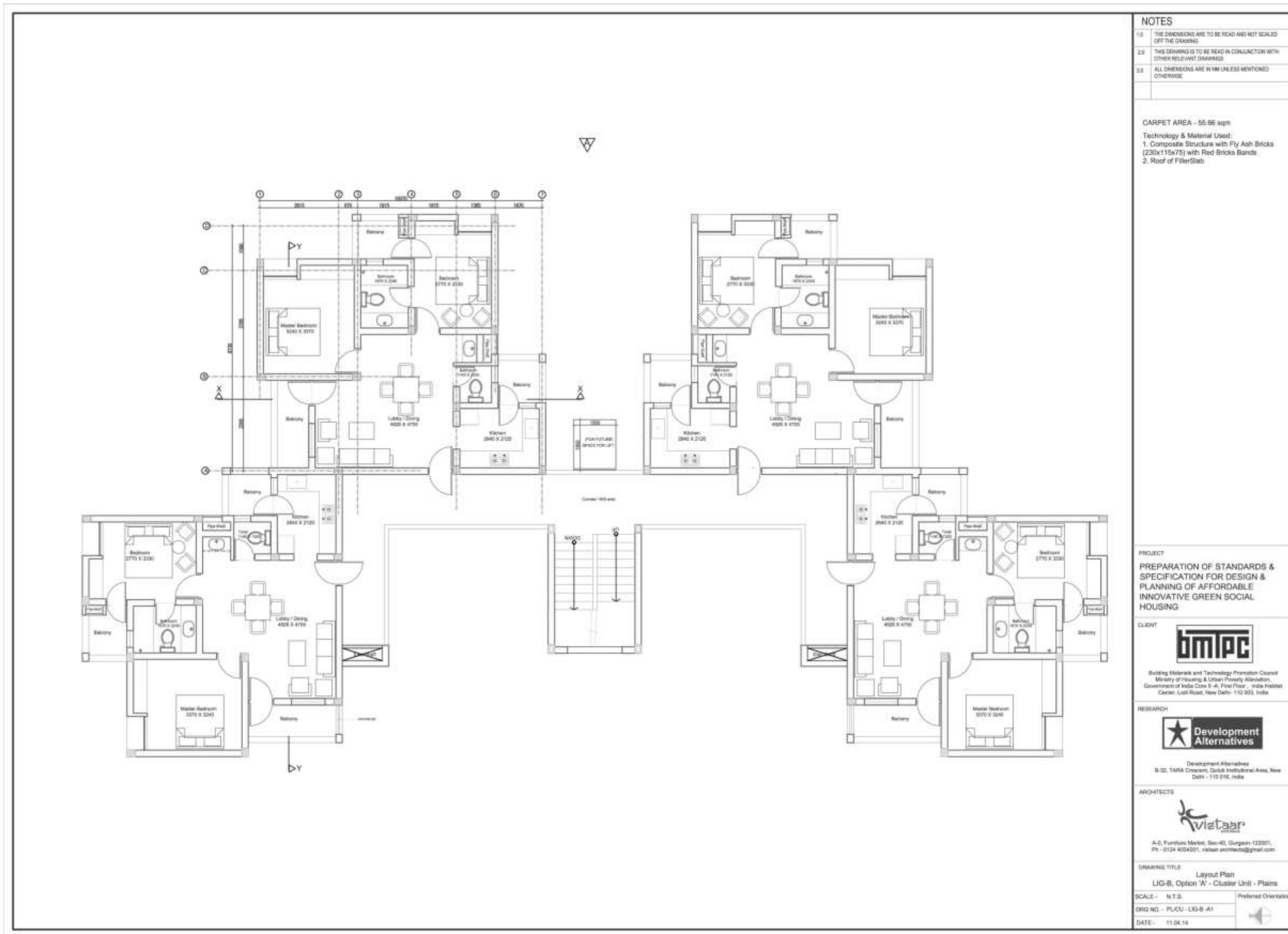
Figure 32: VIEW OF LIG-B INDIVIDUAL UNIT OPTION-B

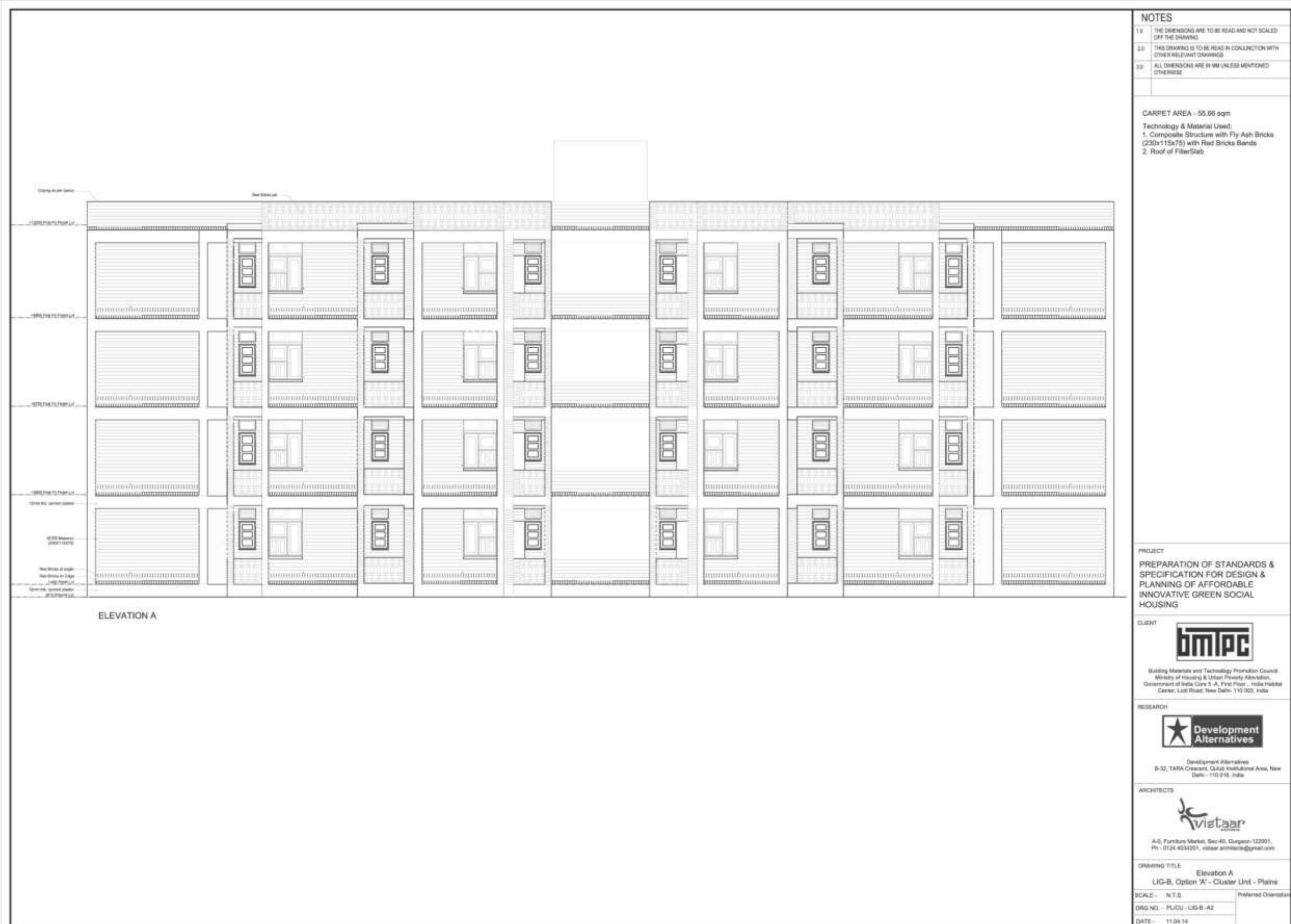
Cluster arrangement is done with four numbers of units of 2BHK typology at one level with two on each side. The carpet area of each unit is 55.66 sqm. A centrally accessible stairway is provided, which is approached through a common central lobby area rather than a corridor and there is also an option for lift for future restorations. The habitable area is approached through a lobby with dining leading to the master bedroom and bedroom at the sides. Each unit has been provided with three balconies, accessible through kitchen, living area and through bedroom for proper day lighting and ventilation. Also common service ducts are designed for pipe and electrical work.

The super structure is done with fly ash bricks laid in rat- trap bond. Flooring is done with Reinforced Cement Concrete filler slab with filler materials as specified. The terrace surface is finished with brick tile grouting over the layer of mud phuska and hot bitumen layer of the top floor slab.

For disaster resilience, continuous sill and lintel band is incorporated in the design. The chajjas designed will provide barrier from direct sunlight and also from rain.

The dwelling unit is designed so as to provide a flexible, adaptable and accessible environment to the user.





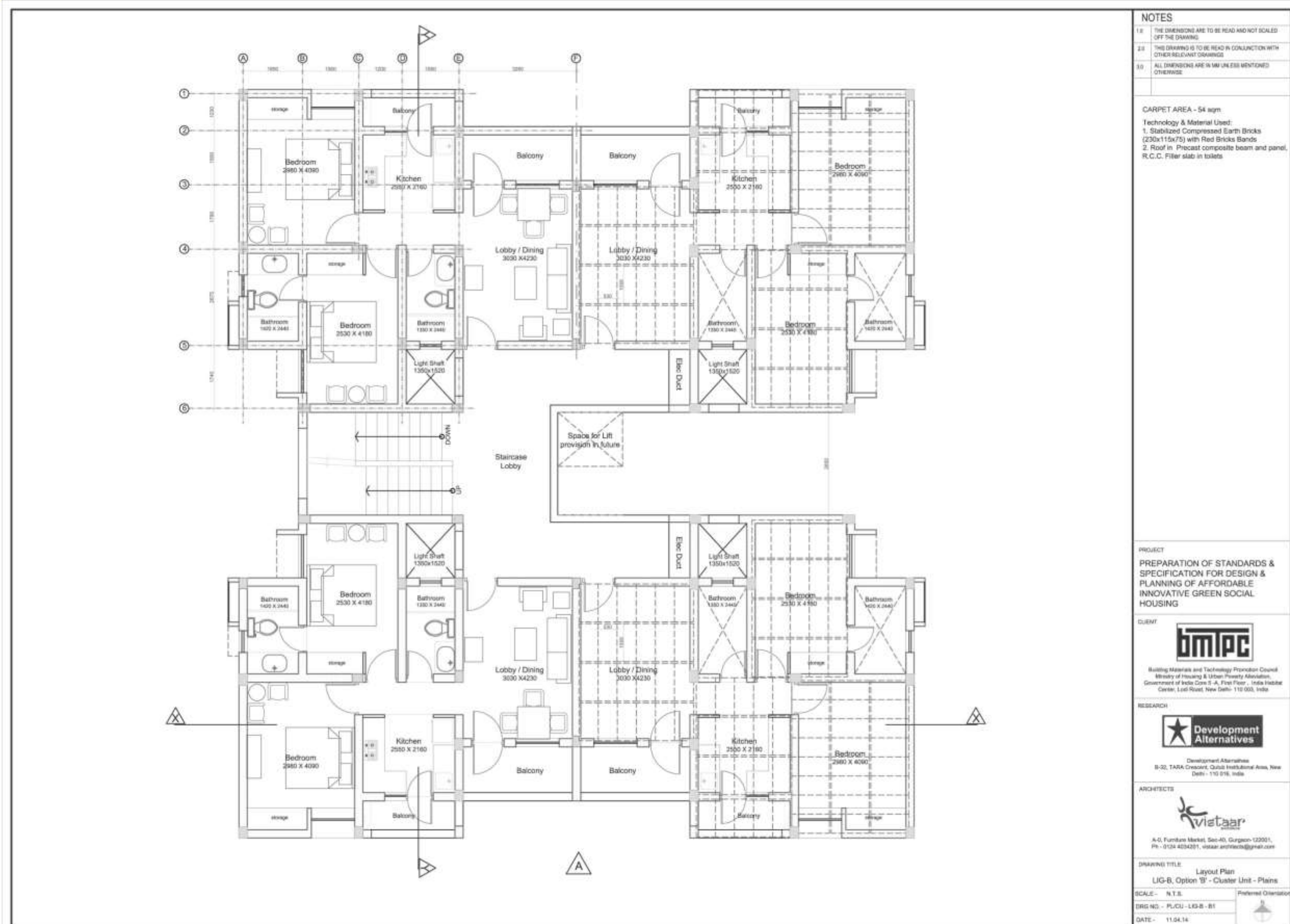


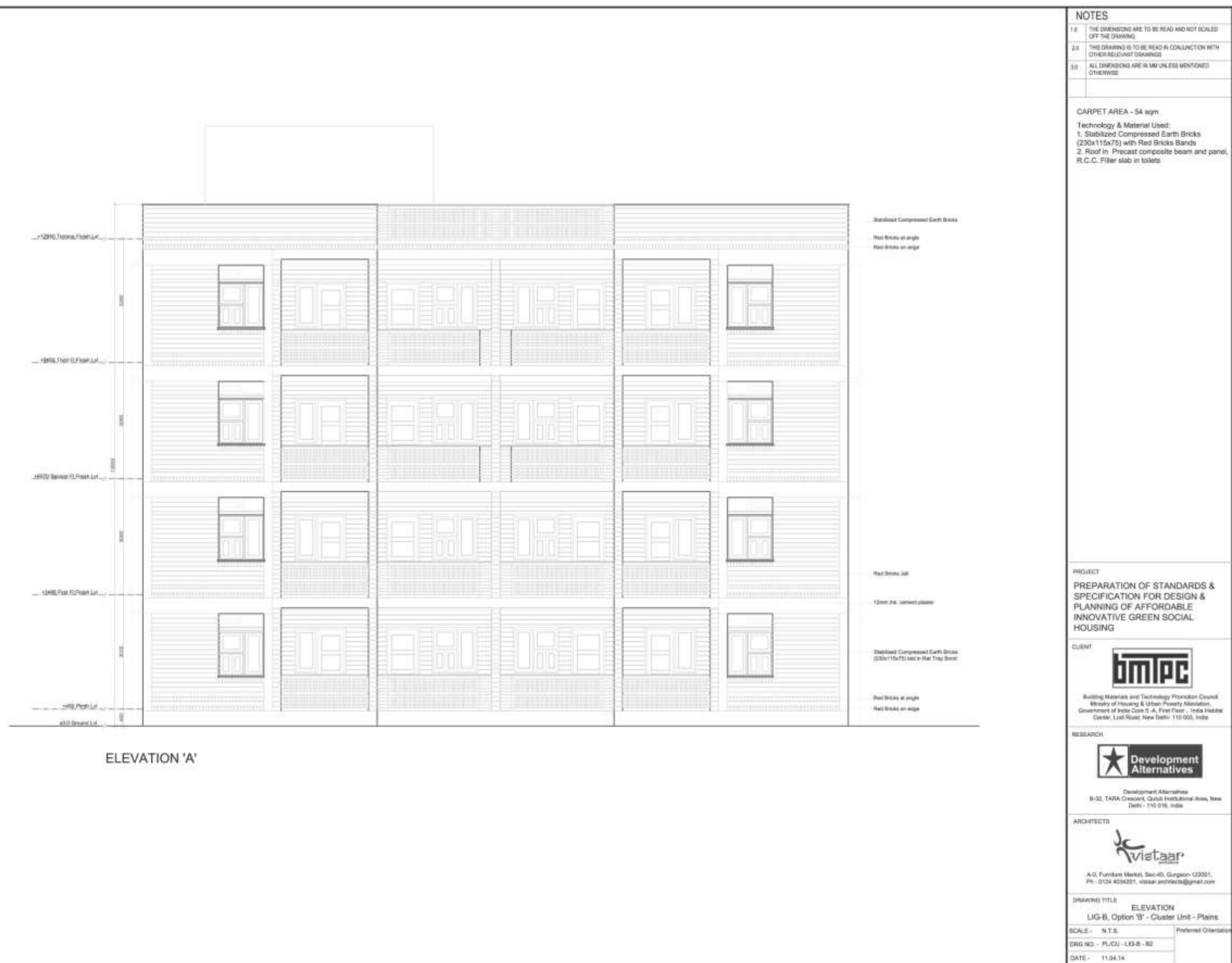
Cluster arrangement is done with four numbers of units of 2 BHK typology at one level with two on each side. The carpet area of each unit is 54 sqm. A centrally accessible stairway is provided, which is approached through a common 1500mm wide corridor and there is also an option for lift for future restorations. The habitable area is approached through a lobby with dining area leading to the master bedroom and bedroom at the front, kitchen and washroom on either side. Each unit has been provided with two balconies, accessible through kitchen and living area for proper day lighting and ventilation. Also common service ducts are designed for pipework.

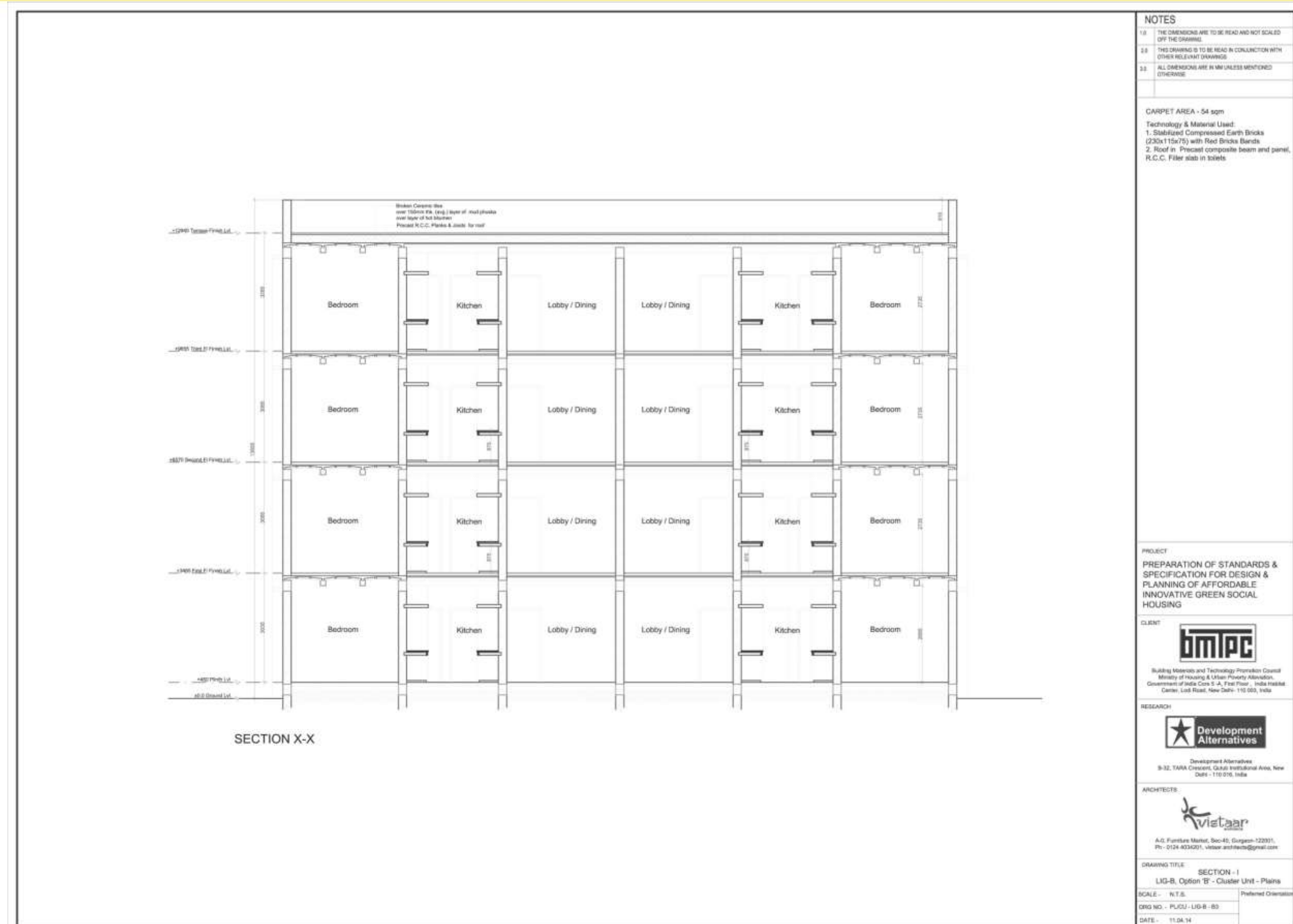
The super structure is done with a combination of stabilised compressed earth blocks laid in rat- trap bond. Flooring is done with pre cast Ferro cement arch panels supported with pre- cast beams. The terrace surface is finished with broken ceramic tiles over the layer of mud phuska and hot bitumen layer of the top floor slab.

For disaster resilience, continuous sill and lintel band is incorporated in the design. The chajjas designed will provide barrier from direct sunlight and also from rain.

The dwelling unit is designed so as to provide a flexible, adaptable and accessible environment to the user.









6(a) ANNEXURE-I (EWS-INDIVIDUAL UNIT-OPTION-A)

Summary of BOQ for E.W.S. Individual unit Option 'A' for Plains Region, using Ferrocement Channels & MCR tiles Roof and masonry in Rat trap bond using Red bricks & Fly ash bricks					
S.No.	Description	Amount (Rs.)			
A.0	Civil Works				
1.0	Foundation				
2.0	Super structure				
3.0	Wall finishes				
4.0	Flooring				
5.0	Door & Windows				
6.0	Roofing				
7.0	Miscellaneous Works				
8.0	Plumbing				
9.0	Electrical				
	Total				
Note:	1. Rain water disposal has been detailed only up to down take rain water pipe. Further disposal of rain water to be as per site situation.				
BOQ for E.W.S. Individual unit Option 'A' for Plains region, using Ferrocement Channels & MCR tiles Roof and masonry in Rat trap bond using Red bricks & Fly ash bricks					
S.No.	Item Description	Unit	Quantity	Rate	Amount (Rs.)
A.0	Civil Works				
1.0	Foundation				
1.1	Earth work in excavation	Cum			
	Earth work in foundation trenches, column pits, drains etc. (not exceeding 1.5m in width or 10 sqm on plan) after clearing of site from bushes vegetation etc., including dressing of sides and ramming of bottoms, surface preparation as per specification to receive the PCC, lift up to 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m.				
1.2	Anti-termite treatment	Sqm			
	Supplying, diluting and injecting chemical emulsion for pre-constructional anti termite treatment and creating a chemical barrier under and all-round the column pits, plinth beams, junction of wall and floor, along the external perimeter of building etc. complete				
	With chlorpyrifos/Landane E.C. 20% with 1% concentration				
1.3	Back filling of earth	Cum			
	Filling available excavated earth (Excluding rock) in trenches, plinth, sides of foundation etc. in layers not exceeding 20Cm. in depth, consolidating each deposited layer by ramming and watering, lead up to 50m. and lift up to 1.5m.				
1.4	D.P.C.	Sqm	7.95		
	Providing and laying damp proof course 40 mm thick with cement concrete 1:2:4 (1 cement :2 coarse sand: 4 graded stone aggregate 12.5 mm nominal size) and applying a coat of residual petroleum bitumen of penetration 80/100 of approved quality.				
1.5	PCC in foundation				
	(Providing) & laying in position cement concrete of specified grade including centring & shuttering complete - All work up to plinth level.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum			
b)	1:5:10 (1 cement :5 coarse sand : 10 graded stone aggregate 40mm nominal size)	Cum			
1.6	R.C.C. up to plinth level	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete including centering, shuttering complete but excluding cost of reinforcement - All work up to plinth level.				
1.7	Reinforcement up to plinth level	Kg			
	Providing & fixing Reinforcement for R.C.C. work up to plinth level as specified, including straightening, cutting, bending, placing in position and binding all complete.				
1.8	Brick work in foundation	Cum			
	Brick work with FPS bricks of class designation 75 in foundation and plinth in cement mortar 1:6 (1 cement: 6 coarse sand).				
	Total of Subhead 1.0				
2.0	Super structure				
2.1	Brick work in super structure	Cum	17.66		
	230mm thk. Brick work with Fly ash bricks (FALG bricks) conforming to class 'A' in cement mortar 1:4 (1 cement: 4 coarse sand) in super structure above plinth level including finishing in ruled pointing on the external side of wall.				
2.2	Brick work in Red Burnt Bricks	Cum	2.26		
	Brick work in FPS bricks of class designation 75 in rat trap bond in super structure above plinth level in desired pattern in cement mortar 1:4 (1 cement : 4 coarse sand)				

6(a) ANNEXURE-I (EWS-INDIVIDUAL UNIT-OPTION-A)

	including finishing in ruled pointing on the external side of wall where ever specified.				
2.3	Brick work in Parapet wall	Cum	4.00		
	Brick work with FPS bricks of class designation 75 in parapet wall in English bond in cement mortar 1:6 (1 cement : 6 coarse sand)				
2.4	115mm thk brick wall	Sqm	7.35		
	Half brick masonry with FPS bricks of class designation 75 in super structure above plinth level in cement mortar 1:6, including providing & placing in position 2 nos. 6mm dia. M.S. bars at every third course.				
2.5	Brick Jali	Sqm	1.23		
	Brick jali work in desired pattern in parapet wall with FPS bricks of class designation 75 in cement mortar 1:4				
2.6	R.C.C. in super structure	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete in lintel beams, roof bands, chajjas and counter & Loft slabs etc. in super structure including centering, shuttering complete but excluding cost of reinforcement.				
2.7	Reinforcement in super structure	Kg			
	Providing & fixing Reinforcement for R.C.C. work in lintel, chajjas and counter & Loft slabs in super structure as specified, including straightening, cutting, bending, placing in position and binding all complete.				
2.8	Plain cement concrete				
	Providing and laying plain cement concrete of specified grade as bed concrete under floor, roof slab, plinth protection, cill, coping, shelves, kitchen platform etc. screeding at roof to required slope and other locations as called for laid, consolidated and cured etc. complete as per specification and drawing.				
a)	1:4:8 (1 cement : 4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum	1.97		
	Total of Subhead 2.0				
3.0	Wall finishes				
3.1	Providing 12 mm thick cement plaster of mix 1:6 (1 cement: 6 coarse sand).	Sqm	102.18		
3.2	Lime wash	Sqm	102.18		
	Providing and applying three or more coats of white wash with lime on wall and ceiling to give an even shade including preparation of surfaces, scaffolding, mixing of indigo blue and DDL adhesive etc. complete.				
3.3	Stone Counters	Sqm	2.40		
	Providing and laying 20mm thk. Kota stone slabs on kitchen counters laid on 20mm thk. Cement mortar 1:3 (1 cement 3 coarse sand). Including rubbing and polishing complete.				
3.4	Coping	Sqm	2.05		
	Providing & fixing 20mm thk. coping of burnt clay paving tile, on window sill & parapet walls in cement mortar 1:6				
3.5	Dado	Sqm	14.73		
	Providing and laying ceramic glazed tiles of size 200x300mm in dado of uniform thickness, size, shade and pattern as approved by Architect/Project Manager laid with rich cement slurry over a bedding plaster of 12 mm thick cement mortar 1:3 (1 cement: 3 fine sand) and grouting the joints with white cement and pigment with matching shade of tile, cutting, curing etc. complete in all respects as per drawing.				
	Total of Subhead 3.0				
4.1	IPS Flooring	Sqm	24.06		
	Providing and laying 40mm thk. IPS flooring 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate) in two layers; finished with a floating coat of neat cement including cement slurry complete.				
4.2	IPS Skirting	Sqm	3.81		
	Providing and laying 18mm thk. cement plaster skirting with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement.				
4.3	Ceramic tile Flooring	Sqm	2.70		
	Providing and laying ceramic glazed tile flooring of size 300x300mm of approved make, shade and pattern as approved by Project in charge laid over 20/12 mm average thick bed of cement mortar 1:4 (1 cement : 4 coarse sand), grouting the joints with white cement and pigment to match the shade of tile including cutting, etc. complete in all respects				
4.4	Extra for addition of red oxide of iron (3.5kg per 50 kg of cement) in 40mm thk. IPS flooring	Sqm	6.02		
4.5	Sand Filling	Cum	3.61		
	Supplying and filling in plinth with sand under floors including watering, ramming,				

6(a) ANNEXURE-I (EWS-INDIVIDUAL UNIT-OPTION-A)

	consolidating, and dressing complete.				
4.6	Damp proof membrane	Sqm	24.06		
	Providing & laying 1000 Gauge polythene damp proof membrane under floor PCC				
	Total of Subhead 4.0				
5.0	Door Windows				
5.1	RCC Frame for door				
	Providing and fixing RCC Frame for door of size given below using RCC, out of section 100x50mm, with single or double rebate as required, with holdfasts, finished with enamel paint of approved colour all complete.				
a)	900 x 2125mm	Nos.	3.00		
b)	750 x 2125mm	Nos.	2.00		
5.2	RCC Frame for windows & ventilators				
	Providing and fixing RCC Frame for windows & ventilators of size given below using RCC, out of section 100x50mm, with double rebate and holdfasts, finished with enamel paint of approved colour all complete.				
a)	1200x1200mm	Nos.	2.00		
b)	600x1050mm	Nos.	3.00		
c)	450x1050mm	Nos.	2.00		
5.3	Door Shutters				
	Providing and fixing door shutter of sizes given below of any of following material as per approval by project in charge/ architect. (Note: Hardware not included in the item, to be as per selection)				
i)	Wooden panelled door shutter using local wood as per approval, 12mm thk. particle board panel including finishing with enamel paint of approved colour all complete.				
ii)	Wooden panelled door shutter using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm in panels including finishing with enamel paint of approved colour all complete.				
iii)	24 mm thick factory made PVC door shutters made of styles and rails of an uPVC hollow section of size 59x24 mm and wall thickness 2 mm (± 0.2 mm) with inbuilt edging on both sides. Complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter).				
iv)	Providing and fixing 35mm thk. ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
v)	Bamboo door shutters				
a)	800 x 2075mm	Nos.	4.00		
b)	650 x 2075mm	Nos.	2.00		
5.4	Wooden Shutters for Windows & Ventilators				
i)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing 5mm thk. clear float glass of approved make, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
ii)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
iii)	Bamboo window shutter				
a)	550x1100mm	Nos.	4.00		
b)	500x950mm	Nos.	3.00		
c)	350x950mm	Nos.	2.00		
	Total of Subhead 5.0				
6.0	Roofing				
6.1	Precast Ferro cement Channel system	Sqm	28.16		
	Providing and Laying precast Ferro cement Channels for roof as per related training and including providing & laying necessary cast in situ RCC and reinforcement as specified in structural drawings, centering & shuttering complete, excluding the cost of reinforcement.				
6.2	Concrete Filling in Channels valley	Cum	0.50		
	Providing & laying in position cement concrete (1:2:4) in valley of Ferro cement Channels including centring & shuttering complete.				
6.3	Micro Concrete Tile Roofing	Sqm	3.90		
	Providing prefabricated corrugated MCR tile roofing (pan or roman as approved) and				

6(a) ANNEXURE-I (EWS-INDIVIDUAL UNIT-OPTION-A)

	fixing the tiles to M.S. purlins with G.I wire with proper overlaps and interlocks, joints between ridge tiles on doubly pitched roofs sealed with rich cement sand mortar all complete as per approval of project manager, including providing and fixing ridge tiles, gutter, M.S. purlins, cleats/ flats/ angles, flashing and rafters as specified in structural drawings. Work to be complete in all respect including hoisting at all heights, cutting, welding, smooth grinding of all welding joints, applying derusting primer coat, three or more coats of synthetic enamel paint etc. on M.S. members.				
6.4	Ceiling plaster	Sqm	Rate only		
	Providing 10 mm thick cement plaster of mix 1:4 (1 cement: 4 coarse sand) in ceiling.				
6.5	Hot Bitumen layer	Sqm	32.36		
	Providing layer of residual type petroleum bitumen of penetration 80/100 of approved quality at 17kg per 10sqm impregnated with a coat of coarse sand layer at 60 cudm per 10sqm including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete.				
6.6	Mud phuska	Cum	5.63		
	Providing and laying 100mm thick (average) mud phuska of damped brick earth on roof laid to slope consolidated and plastered with 25mm thk. mud mortar mixed with bhusa at 35kg per cum of earth and gobri leaping with mix 1:1 (1clay: 1 cow dung).				
6.7	Brick tiles with grouting	Sqm	28.16		
	(Providing) and laying FPS Brick tiles of class designation 75 over roof grouted with cement mortar 1:3 (1 cement : 3 fine sand) mixed with 2% of integral water proofing compound by weight of cement, over a 12mm layer of cement mortar 1:3 (1 cement : 3 fine sand) and finished neat.				
6.8	Cement Gola	Rmt	28.00		
	Providing Gola in cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 10 mm nominal size) including finishing with cement mortar 1:3 (1 cement: 3 sand) as per standard design.				
	Total of Subhead 6.0				
7.0	Miscellaneous				
7.1	Making khurras 1'-6"x1'-6" with average minimum thickness of 2" cement concrete 1:2:4 over PVC sheet 1mx1mx400micron, finished with 12mm cement plaster 1:3 and a coat of neat cement rounding the edges and making and finishing the outlet complete.	Nos	2.00		
7.2	Providing and fixing 110mm dia PVC rain water pipes of approved make to withstand a test pressure of 4.0kg/sqcm. including all fittings bends, sockets, elbow, tees, clamps, Y - Junction with cover (for collecting rainwater) including testing of joints etc. complete.	Rmt	6.00		
7.3	M.S. Grill	Sqm	4.62		
	Providing and fixing in position M.S. Grill made of 10x10mm m.s. square rods fixed at 150mm avg. c/c in both directions & 25x3mm flat all around to fix the grill to window, complete including grinding, providing two coats of red oxide primer and three or more coats of synthetic enamel paint of approved colour.				
	Total of Subhead 7.0				
	Total of "A"				

6(b) ANNEXURE-II (EWS-INDIVIDUAL UNIT-OPTION-B)

Summary of BOQ for E.W.S. Individual unit Option 'B' for Plains Region, using Precast arch & panels & MCR tiles Roof and masonry in Rat trap bond using Fly ash bricks & Red bricks					
S.No.	Description	Amount (Rs.)			
A.0	Civil Works				
1.0	Foundation				
2.0	Super structure				
3.0	Wall finishes				
4.0	Flooring				
5.0	Door & Windows				
6.0	Roofing				
7.0	Miscellaneous Works				
8.0	Plumbing				
9.0	Electrical				
	Total				
Note: 1. Rain water disposal has been detailed only up to down take rain water pipe. Further disposal of rain water to be as per site situation.					
BOQ for E.W.S. Individual unit Option 'B' for Plains Region, using Precast arch & panels & MCR tiles Roof and masonry in Rat trap bond using Fly ash bricks & Red bricks					
S.No.	Item Description	Unit	Quantity	Rate	Amount (Rs.)
A.0	Civil Works				
1.0	Foundation				
1.1	Earth work in excavation	Cum			
	Earth work in foundation trenches, column pits, drains etc. (not exceeding 1.5m in width or 10 sqm on plan) after clearing of site from bushes vegetation etc., including dressing of sides and ramming of bottoms, surface preparation as per specification to receive the PCC, lift up to 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m.				
1.2	Anti-termite treatment	Sqm			
	Supplying, diluting and injecting chemical emulsion for pre-constructional anti termite treatment and creating a chemical barrier under and all-round the column pits, plinth beams, junction of wall and floor, along the external perimeter of building etc. complete				
	With chlorpyrifos/Landane E.C. 20% with 1% concentration				
1.3	Back filling of earth	Cum			
	Filling available excavated earth (Excluding rock) in trenches, plinth, sides of foundation etc. in layers not exceeding 20cm. in depth, consolidating each deposited layer by ramming and watering, lead up to 50m. and lift up to 1.5m.				
1.4	D.P.C.	Sqm	8.00		
	Providing and laying damp proof course 40 mm thick with cement concrete 1:2:4 (1 cement :2 coarse sand: 4 graded stone aggregate 12.5 mm nominal size) and applying a coat of residual petroleum bitumen of penetration 80/100 of approved quality.				
1.5	PCC in foundation				
	(Providing) & laying in position cement concrete of specified grade including centring & shuttering complete - All work up to plinth level.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum			
b)	1:5:10 (1 cement :5 coarse sand : 10 graded stone aggregate 40mm nominal size)	Cum			
1.6	R.C.C. up to plinth level	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete including centering, shuttering complete but excluding cost of reinforcement - All work up to plinth level.				
1.7	Reinforcement up to plinth level	Kg			
	Providing & fixing Reinforcement for R.C.C. work up to plinth level as specified, including straightening, cutting, bending, placing in position and binding all complete.				
1.8	Brick work in foundation	Cum			
	Brick work with FPS bricks of class designation 75 in foundation and plinth in cement mortar 1:6 (1 cement: 6 coarse sand).				
	Total of Subhead 1.0				
2.0	Super structure				
2.1	Brick work in super structure	Cum	16.33		
	230mm thk. Brick work with Fly ash bricks (FALG bricks) conforming to class 'A' in rat trap bond in cement mortar 1:4 (1 cement : 4 coarse sand) in super structure above plinth level including finishing in ruled pointing on the external side of wall.				
2.2	Brick work in Red Burnt Bricks	Cum	3.82		
	Brick work in FPS bricks of class designation 75 in rat trap bond in super structure above plinth level in desired pattern in cement mortar 1:4 (1 cement : 4 coarse sand)				

6(b) ANNEXURE-II (EWS-INDIVIDUAL UNIT-OPTION-B)

	including finishing in ruled pointing on the external side of wall where ever specified.				
2.3	Brick work in Parapet wall	Cum	1.90		
	Brick work with Fly ash bricks (FALG bricks) conforming to class 'A' in parapet wall in English bond in cement mortar 1:6 (1 cement : 6 coarse sand)				
2.4	Brick Jali	Cum	0.29		
	Brick jali work in desired pattern in parapet wall with FPS bricks of class designation 75 in cement mortar 1:4				
2.5	115mm thk brick wall	Sqm	10.36		
	Half brick masonry with Fly ash bricks (FALG bricks) conforming to class 'A' in super structure above plinth level in cement mortar 1:6, including providing & placing in position 2 nos. 6mm dia. M.S. bars at every third course.				
2.6	R.C.C. in super structure	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete in lintel beams, roof bands, chajjas and counter & Loft slabs etc. in super structure including centering, shuttering complete but excluding cost of reinforcement.				
2.7	Reinforcement in super structure	Kg			
	Providing & fixing Reinforcement for R.C.C. work in lintel, chajjas and counter & Loft slabs in super structure as specified, including straightening, cutting, bending, placing in position and binding all complete.				
2.8	Plain cement concrete				
	Providing and laying plain cement concrete of specified grade as bed concrete under floor, roof slab, plinth protection, cill, coping, shelves, kitchen platform etc. screeding at roof to required slope and other locations as called for laid, consolidated and cured etc. complete as per specification and drawing.				
a)	1:4:8 (1 cement : 4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum	2.46		
	Total of Subhead 2.0				
3.0	Wall finishes				
3.1	Providing 12 mm thick cement plaster of mix 1:6 (1 cement: 6 coarse sand).	Sqm	88.65		
3.2	Lime wash	Sqm	116.05		
	Providing and applying three or more coats of white wash with lime on wall and ceiling to give an even shade including preparation of surfaces, scaffolding, mixing of indigo blue and DDL adhesive etc. complete.				
3.3	Stone Counters	Sqm	2.10		
	Providing and laying 20mm thk. Kota stone slabs on kitchen counters laid on 20mm thk. Cement mortar 1:3 (1 cement 3 coarse sand). Including rubbing and polishing complete.				
3.4	Coping	Sqm	6.40		
	Providing & fixing 20mm thk. coping of burnt clay paving tile, on window sill & parapet walls in cement mortar 1:6				
3.5	Dado	Sqm	15.55		
	Providing and laying ceramic glazed tiles of size 200x300mm in dado of uniform thickness, size, shade and pattern as approved by Architect/Project Manager laid with rich cement slurry over a bedding plaster of 12 mm thick cement mortar 1:3 (1 cement: 3 fine sand) and grouting the joints with white cement and pigment with matching shade of tile, cutting, curing etc. complete in all respects as per drawing.				
	Total of Subhead 3.0				
4.1	IPS Flooring	Sqm	25.14		
	Providing and laying 40mm thk. IPS flooring 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate) in two layers; finished with a floating coat of neat cement including cement slurry complete.				
4.2	IPS Skirting	Sqm	2.51		
	Providing and laying 18mm thk. cement plaster skirting with cement mortar 1:3 (1 cement: 3 coarse sand) finished with a floating coat of neat cement.				
4.3	Ceramic tile Flooring	Sqm	2.26		
	Providing and laying ceramic glazed tile flooring of size 300x300mm of approved make, shade and pattern as approved by Project in charge laid over 20/12 mm average thick bed of cement mortar 1:4 (1 cement : 4 coarse sand), grouting the joints with white cement and pigment to match the shade of tile including cutting, etc. complete in all respects				
4.4	Extra for addition of red oxide of iron (3.5kg per 50 kg of cement) in 40mm thk. IPS flooring	Sqm	6.29		
4.5	Sand Filling	Cum	4.11		
	Supplying and filling in plinth with sand under floors including watering, ramming, consolidating, and dressing complete.				

6(b) ANNEXURE-II (EWS-INDIVIDUAL UNIT-OPTION-B)

4.6	Damp proof membrane	Sqm	27.40		
	Providing & laying 1000 Gauge polythene damp proof membrane under floor PCC				
	Total of Subhead 4.0				
5.0	Door Windows				
5.1	RCC Frame for door				
	Providing and fixing RCC Frame for door of size given below using RCC, out of section 100x50mm, with single or double rebate as required, with holdfasts, finished with enamel paint of approved colour all complete.				
a)	900 x 2125mm	Nos.	2.00		
b)	750 x 2125mm	Nos.	2.00		
5.2	RCC Frame for windows & Ventilators				
	Providing and fixing RCC Frame for windows & ventilators of size given below using RCC, out of section 100x50mm, with double rebate and holdfasts, finished with enamel paint of approved colour all complete.				
a)	1200x1200mm	Nos.	2.00		
b)	600x1050mm	Nos.	2.00		
c)	600x365mm	Nos.	2.00		
5.3	Door Shutters				
	Providing and fixing door shutter of sizes given below of any of following material as per approval by project in charge/ architect. (Note: Hardware not included in the item, to be as per selection)				
i)	Wooden panelled door shutter using local wood as per approval, 12mm thk. particle board panel including finishing with enamel paint of approved colour all complete.				
ii)	Wooden panelled door shutter using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm in panels including finishing with enamel paint of approved colour all complete.				
iii)	24 mm thick factory made PVC door shutters made of styles and rails of an uPVC hollow section of size 59x24 mm and wall thickness 2 mm (± 0.2 mm) with inbuilt edging on both sides. Complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter).				
iv)	Providing and fixing 35mm thk. ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
v)	Bamboo door shutters				
a)	800 x 2075mm	Nos.	3.00		
b)	650 x 2075mm	Nos.	2.00		
5.4	Window Shutters				
i)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing 5mm thk. clear float glass of approved make, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
ii)	Providing and fixing Wooden panelled shutter for window of given size using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
iii)	Bamboo window shutter				
a)	550x1100mm	Nos.	4.00		
b)	500x950mm	Nos.	2.00		
b)	500x265mm	Nos.	2.00		
	Total of Subhead 5.0				
6.0	Roofing				
6.1	Precast Arch Panel system	Sqm	34.60		
	Providing and Laying precast Arch Panels & Precast RCC Beams for roof as per related training and including providing & laying necessary cast in situ RCC and reinforcement as specified in structural drawings, centering & shuttering complete, excluding the cost of reinforcement.				
6.2	Micro Concrete Tile Roofing	Sqm	3.43		
	Providing prefabricated corrugated MCR tile roofing (pan or roman as approved) and fixing the tiles to M.S. purlins with G.I wire with proper overlaps and interlocks, joints between ridge tiles on doubly pitched roofs sealed with rich cement sand mortar all complete as per approval of project manager, including providing and fixing ridge tiles, gutter, M.S. purlins, cleats/ flats/ angles, flashing and rafters as specified in structural drawings. Work to be complete in all respect including hoisting at all				

6(b) ANNEXURE-II (EWS-INDIVIDUAL UNIT-OPTION-B)

	heights, cutting, welding, smooth grinding of all welding joints, applying derusting primer coat, three or more coats of synthetic enamel paint etc. on M.S. members.				
6.3	Ceiling plaster	Sqm	27.40		
	Providing 10 mm thick cement plaster of mix 1:4 (1 cement: 4 coarse sand) in ceiling.				
6.4	Hot Bitumen layer	Sqm	38.05		
	Providing layer of residual type petroleum bitumen of penetration 80/100 of approved quality at 17kg per 10sqm impregnated with a coat of coarse sand layer at 60 cum per 10sqm including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete.				
6.5	Mud phuska	Cum	5.48		
	Providing and laying 150mm thick (average) mud phuska of damped brick earth on roof laid to slope consolidated and plastered with 25mm thk. mud mortar mixed with bhusa at 35kg per cum of earth and gobri leaping with mix 1:1 (1clay: 1 cow dung).				
6.6	Ceramic broken tiles	Sqm	27.40		
	Providing and laying broken ceramic glazed tiles on roof including filling the gaps with cement mortar 1:4 (1cement: 4 coarse sand) mixed with 2% integral water proofing compound laid over a bed of 20mm thk cement mortar 1:4 and finished neat complete.				
6.7	Cement Gola	Rmt	23.00		
	Providing Gola in cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 10 mm nominal size) including finishing with cement mortar 1:3 (1 cement: 3 sand) as per standard design.				
	Total of Subhead 6.0				
7.0	Miscellaneous				
7.1	Making khurras 450x 450 with average minimum thickness of 50mm cement concrete 1:2:4 over PVC sheet 1mx1mx400micron, finished with 12mm cement plaster 1:3 and a coat of neat cement rounding the edges and making and finishing the outlet complete.	Nos	2.00		
7.2	Providing and fixing 110mm dia PVC rain water pipes of approved make to withstand a test pressure of 4.0kg/sqcm. including all fittings bends, sockets, elbow, tees, clamps, Y - Junction with cover (for collecting rainwater) including testing of joints etc. complete.	Rmt	6.00		
7.3	M.S. Grill	Sqm	4.70		
	Providing and fixing in position M.S. Grill made of 10x10mm m.s. square rods fixed at 150mm avg. c/c in both directions & 25x3mm flat all around to fix the grill to window, complete including grinding, providing two coats of red oxide primer and three or more coats of synthetic enamel paint of approved colour.				
7.4	Concrete jali	Sqm	1.80		
	Providing and fixing pre-fabricated Cement Concrete jali of approved pattern with cement mortar 1:4.				
	Total of Subhead 7.0				
	Total of "A"				

Summary of BOQ for Cluster unit EWS Option 'A' for Plains Region, using Precast Ferro cement channel Roof and masonry in Fly ash bricks in Rat trap Bond with Red Bricks Bands					
S.No.	Description	Amount (Rs.)			
A.0	Civil Works				
1.0	Foundation				
2.0	Super structure				
3.0	Wall finishes				
4.0	Flooring				
5.0	Door & Windows				
6.0	Roofing				
7.0	Miscellaneous				
8.0	Plumbing				
9.0	Electrical				
	Total				
Note:	1. Estimated Cost is the cost of complete cluster (16 units)				
	2. Rain water disposal has been detailed only up to down take rain water pipe. Further disposal of rain water to be as per site situation.				
BOQ for Cluster unit EWS Option 'A' for Plains Region, using Precast Ferro cement channel Roof and masonry in Fly ash bricks in Rat trap Bond with Red Bricks Bands					
S.No.	Item Description	Unit	Quantity	Rate	Amount (Rs.)
A.0	Civil Works				
1.0	Foundation				
1.1	Earth work in excavation	Cum			
	Earth work in foundation trenches, column pits, drains etc. (not exceeding 1.5m in width or 10 sqm on plan) after clearing of site from bushes vegetation etc., including dressing of sides and ramming of bottoms, surface preparation as per specification to receive the PCC, lift up to 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m.				
1.2	Anti-termite treatment				
	Supplying, diluting and injecting chemical emulsion for pre-constructional anti termite treatment and creating a chemical barrier under and all-round the column pits, plinth beams, junction of wall and floor, along the external perimeter of building etc. complete	Sqm			
	With chlorpyriphos/Landane E.C. 20% with 1% concentration				
1.3	Back filling of earth				
	Filling available excavated earth (Excluding rock) in trenches, plinth, sides of foundation etc. in layers not exceeding 20Cm. in depth, consolidating each deposited layer by ramming and watering, lead up to 50m. and lift up to 1.5m.	Cum			
1.4	PCC in foundation				
	(Providing) & laying in position cement concrete of specified grade including centring & shuttering complete - All work up to plinth level.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)				
b)	1:5:10 (1 cement :5 coarse sand : 10 graded stone aggregate 40mm nominal size)	Cum			
1.5	R.C.C. up to plinth level				
	Providing & laying in position M-20 grade of reinforced cement concrete including centering, shuttering complete but excluding cost of reinforcement - All work up to plinth level.	Cum			
1.6	Reinforcement up to plinth level				
	Providing & fixing Reinforcement for R.C.C. work up to plinth level as specified, including straightening, cutting, bending, placing in position and binding all complete.	Kg			
1.7	Brick work in foundation				
	Brick work with FPS bricks of class designation 75 in foundation and plinth in cement mortar 1:6 (1 cement: 6 coarse sand).	Cum			
	Total of Subhead 1.0				
2.0	Super structure				
2.1	Brick work in super structure		216.25		
	230mm thk. Brick work with Fly ash bricks (FALG bricks) conforming to class 'A' in rat trap bond in cement mortar 1:4 (1 cement : 4 coarse sand) in super structure above plinth level including finishing in ruled pointing on the external side of wall.	Cum			
2.2	Brick work in Red Burnt Bricks		10.01		
	Brick work in FPS bricks of class designation 75 in rat trap bond in super structure above plinth level in desired pattern in cement mortar 1:4 (1 cement : 4 coarse sand) including finishing in ruled pointing on the external side of wall where ever specified.	Cum			
2.3	Brick work in Parapet wall		20.48		
	Brick work with Fly ash bricks (FALG bricks) conforming to class 'A' in parapet wall in	Cum			

	English bond in cement mortar 1:6 (1 cement : 6 coarse sand)				
2.4	115mm thk brick wall		336.00		
	Half brick masonry with Fly ash bricks (FALG bricks) conforming to class 'A' in super structure above plinth level in cement mortar 1:6, including providing & placing in position 2 nos. 6mm dia. M.S. bars at every third course.	Sqm			
2.4	Brick Jali		10.35		
	Brick jali work in desired pattern in parapet wall with FPS bricks of class designation 75 in cement mortar 1:4	Cum			
2.5	R.C.C. in super structure				
	Providing & laying in position M-20 grade of reinforced cement concrete in lintel beams, chajjas and counter & Loft slabs etc. in super structure including centering, shuttering complete but excluding cost of reinforcement.	Cum			
2.6	Reinforcement in super structure				
	Providing & fixing Reinforcement for R.C.C. work in lintel, chajjas and counter & Loft slabs in super structure as specified, including straightening, cutting, bending, placing in position and binding all complete.	Kg			
2.7	Plain cement concrete				
	Providing and laying plain cement concrete of specified grade as bed concrete under floor, roof slab, plinth protection, cill, coping, shelves, kitchen platform etc. screeding at roof to required slope and other locations as called for laid, consolidated and cured etc. complete as per specification and drawing.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)		37.27		
	Total of Subhead 2.0				
3.0	Wall finishes				
3.1	Providing 12 mm thick cement plaster of mix 1:6 (1 cement: 6 coarse sand).		2140.00		
3.2	Lime wash		2272.00		
	Providing and applying three or more coats of white wash with lime on wall and ceiling to give an even shade including preparation of surfaces, scaffolding, mixing of indigo blue and DDL adhesive etc. complete.	Sqm			
3.3	Stone Counters		30.40		
	Providing and laying 20mm thk. Kota stone slabs on kitchen counters laid on 20mm thk. Cement mortar 1:3 (1 cement 3 coarse sand). Including rubbing and polishing complete.	Sqm			
3.4	Coping		31.94		
	Providing & fixing 20mm thk. coping of burnt clay paving tile, on window sill & parapet walls in cement mortar 1:6	Sqm			
3.5	Dado		259.44		
	Providing and laying ceramic glazed tiles of size 200x300mm in dado of uniform thickness, size, shade and pattern as approved by Architect/Project Manager laid with rich cement slurry over a bedding plaster of 12 mm thick cement mortar 1:3 (1 cement: 3 fine sand) and grouting the joints with white cement and pigment with matching shade of tile, cutting, curing etc. complete in all respects as per drawing.	Sqm			
	Total of Subhead 3.0				
4.0	Flooring				
4.1	IPS Flooring		512.40		
	Providing and laying 40mm thk. IPS flooring 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate) in two layers; finished with a floating coat of neat cement including cement slurry complete.	Sqm			
4.2	IPS Skirting		54.86		
	Providing and laying 18mm thk. cement plaster skirting & risers with cement mortar 1:3 (1 cement: 3 coarse sand) finished with a floating coat of neat cement.	Sqm			
4.3	Extra for laying IPS flooring on staircase treads not exceeding 30 cm in width, including cost of forming, nosing etc.		56.00		
4.4	Extra for addition of red oxide of iron (3.5kg per 50 kg of cement) in 40mm thk. IPS flooring		113.30		
4.5	Ceramic tile Flooring		44.80		
	Providing and laying ceramic glazed tile flooring of size 300x300mm of approved make, shade and pattern as approved by Project in charge laid over 20/12 mm average thick bed of cement mortar 1:4 (1 cement : 4 coarse sand), grouting the joints with white cement and pigment to match the shade of tile including cutting, etc. complete in all respects	Sqm			
4.6	Sand Filling		15.60		
	Supplying and filling in plinth with sand under floors including watering, ramming, consolidating, and dressing complete.	Cum			

	Total of Subhead 4.0				
5.0	Door Windows				
5.1	RCC Frame for door				
	Providing and fixing RCC Frame for door of size given below, out of section 100x50mm, with single or double rebate as required, with holdfasts, finished with enamel paint of approved colour all complete.				
a)	900x2085mm		48.00		
b)	750x2085mm	Nos.	32.00		
5.2	RCC Frame for windows & ventilators				
	Providing and fixing RCC for windows & ventilators of size given below, out of section 100x50mm, with double rebate and holdfasts, finished with enamel paint of approved colour all complete.				
a)	1200x1200 mm		32.00		
b)	600x1050 mm	Nos.	48.00		
c)	600x500 mm	Nos.	48.00		
5.3	Door Shutters				
	Providing and fixing door shutter of sizes given below of any of following material as per approval by project in charge/ architect. (Note: Hardware not included in the item, to be as per selection)				
i)	Wooden panelled door shutter using local wood as per approval, 12mm thk. particle board / M.S. jali as per requirement of panel including finishing with enamel paint of approved colour all complete.				
ii)	Wooden panelled door shutter using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm in panels including finishing with enamel paint of approved colour all complete.				
iii)	24 mm thick factory made PVC door shutters made of styles and rails of a uPVC hollow section of size 59x24 mm and wall thickness 2 mm (± 0.2 mm) with inbuilt edging on both sides. Complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter).				
iv)	Providing and fixing 35mm thk. ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
v)	Bamboo door shutters				
a)	800x2035mm	Nos.	48.00		
b)	650x2035mm	Nos.	32.00		
5.4	Window Shutters for windows & ventilators				
i)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing 5mm thk. clear float glass of approved make, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
ii)	Providing and fixing Wooden panelled shutter for windows ventilators of given size using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
iii)	Bamboo Window Shutters				
a)	550x1100 mm	Nos.	64.00		
b)	500x950 mm	Nos.	48.00		
c)	500x400 mm	Nos.	48.00		
	Total of Subhead 5.0				
6.0	Roofing				
6.1	Precast Ferro cement Channel system		592.00		
	Providing and Laying precast Ferro cement Channels for roof as per related training and including providing & laying necessary cast in situ RCC and reinforcement as specified in structural drawings, centering & shuttering complete, excluding the cost of reinforcement.	Sqm			
6.2	Concrete Filling in Channels valley		8.32		
	Providing & laying in position cement concrete (1:2:4) in valley of Ferro cement Channels including centring & shuttering complete.	Cum			
6.3	Ceiling plaster		132.00		
	Providing 10 mm thick cement plaster of mix 1:4 (1 cement: 4 coarse sand) in ceiling.	Sqm			
6.4	Sunken area filling		25.38		

	Providing and laying on sunken areas broken light weight concrete block bats of approximately 600 kg. per cum density laid, consolidated, finished smooth, including finished & grouting the top layer with water proof cement mortar with CICO or equivalent brand.	Cum			
6.5	Hot Bitumen layer		176.90		
	Providing layer of residual type petroleum bitumen of penetration 80/100 of approved quality at 17kg per 10sqm impregnated with a coat of coarse sand layer at 60 cudm per 10sqm including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete.	Sqm			
6.6	Mud phuska		33.40		
	Providing and laying 150mm thick (average) mud phuska of damped brick earth on roof laid to slope consolidated and plastered with 25mm thk. mud mortar mixed with bhusa at 35kg per cum of earth and gobri leaping with mix 1:1 (1clay: 1 cow dung).	Cum			
6.7	Ceramic broken tiles		167.00		
	Providing and laying broken ceramic glazed tiles on roof including filling the gaps with cement mortar 1:4 (1cement: 4 coarse sand) mixed with 2% integral water proofing compound laid over a bed of 20mm thk cement mortar 1:4 and finished neat complete.	Sqm			
6.7	Cement Gola		66.00		
	Providing Gola in cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 10 mm nominal size) including finishing with cement mortar 1:3 (1 cement: 3 sand) as per standard design.	Rmt			
	Total of Subhead 6.0				
7.0	Miscellaneous				
7.1	Making khurras 450x450 with average minimum thickness of 50mm cement concrete 1:2:4 over PVC sheet 1mx1mx400micron, finished with 12mm cement plaster 1:3 and a coat of neat cement rounding the edges and making and finishing the outlet complete.		8.00		
7.2	Providing and fixing 110mm dia PVC rain water pipes of approved make to withstand a test pressure of 4.0kg/sqcm. including all fittings bends, sockets, elbow, tees, clamps, Y - Junction with cover (for collecting rainwater) including testing of joints etc. complete.		104.00		
	Total of Subhead 7.0				
	Total of "A"				

6(d) ANNEXURE-IV (EWS-CLUSTER UNIT-OPTION-B)

Summary of BOQ for Cluster unit EWS Option 'B' for Plains Region, using Precast Brick Arch Panel Roof and masonry in Fly ash bricks in Rat trap Bond with Red Bricks Bands					
S.No.	Description	Amount (Rs.)			
A.0	Civil Works				
1.0	Foundation				
2.0	Super structure				
3.0	Wall finishes				
4.0	Flooring				
5.0	Door & Windows				
6.0	Roofing				
7.0	Miscellaneous				
8.0	Plumbing				
9.0	Electrical				
	Total				
Note:	1. Estimated Cost is the cost of complete cluster (16 units)				
	2. Rain water disposal has been detailed only up to down take rain water pipe. Further disposal of rain water to be as per site situation.				
BOQ for Cluster unit EWS Option 'B' for Plains Region, using Precast Brick Arch Panel Roof and masonry in Fly ash bricks in Rat trap Bond with Red Bricks Bands					
S.No.	Item Description	Unit	Quantity	Rate	Amount (Rs.)
A.0	Civil Works				
1.0	Foundation				
1.1	Earth work in excavation	Cum			
	Earth work in foundation trenches, column pits, drains etc. (not exceeding 1.5m in width or 10 sqm on plan) after clearing of site from bushes vegetation etc., including dressing of sides and ramming of bottoms, surface preparation as per specification to receive the PCC, lift up to 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m.				
1.2	Anti-termite treatment	Sqm			
	Supplying, diluting and injecting chemical emulsion for pre-constructional anti termite treatment and creating a chemical barrier under and all-round the column pits, plinth beams, junction of wall and floor, along the external perimeter of building etc. complete				
	With chlorpyrifos/Landane E.C. 20% with 1% concentration				
1.3	Back filling of earth	Cum			
	Filling available excavated earth (Excluding rock) in trenches, plinth, sides of foundation etc. in layers not exceeding 20Cm. in depth, consolidating each deposited layer by ramming and watering, lead up to 50m. and lift up to 1.5m.				
1.4	PCC in foundation				
	(Providing) & lying in position cement concrete of specified grade including centring & shuttering complete - All work up to plinth level.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum			
b)	1:5:10 (1 cement :5 coarse sand : 10 graded stone aggregate 40mm nominal size)	Cum			
1.5	R.C.C. up to plinth level	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete including centering, shuttering complete but excluding cost of reinforcement - All work up to plinth level.				
1.6	Reinforcement up to plinth level	Kg			
	Providing & fixing Reinforcement for R.C.C. work up to plinth level as specified, including straightening, cutting, bending, placing in position and binding all complete.				
1.7	Brick work in foundation	Cum			
	Brick work with FPS bricks of class designation 75 in foundation and plinth in cement mortar 1:6 (1 cement: 6 coarse sand).				
	Total of Subhead 1.0				
2.0	Super structure				
2.1	Brick work in super structure	Cum	203.91		
	230mm thk. Brick work with Fly ash bricks (FALG bricks) conforming to class 'A' in rat trap bond in cement mortar 1:4 (1 cement : 4 coarse sand) in super structure above plinth level including finishing in ruled pointing on the external side of wall.				
2.2	Brick work in Red Burnt Bricks	Cum	9.68		
	Brick work in FPS bricks of class designation 75 in rat trap bond in super structure				

6(d) ANNEXURE-IV (EWS-CLUSTER UNIT-OPTION-B)

	above plinth level in desired pattern in cement mortar 1:4 (1 cement : 4 coarse sand) including finishing in ruled pointing on the external side of wall where ever specified.				
2.3	Brick work in Parapet wall	Cum	29.76		
	Brick work with Fly ash bricks (FALG bricks) conforming to class 'A' in parapet wall in English bond in cement mortar 1:6 (1 cement : 6 coarse sand)				
2.4	115mm thk brick wall	Sqm	145.44		
	Half brick masonry with Fly ash bricks (FALG bricks) conforming to class 'A' in super structure above plinth level in cement mortar 1:6, including providing & placing in position 2 nos. 6mm dia. M.S. bars at every third course.				
2.4	Brick Jali	Cum	14.04		
	Brick jali work in desired pattern in parapet wall with FPS bricks of class designation 75 in cement mortar 1:4				
2.5	R.C.C. in super structure	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete in lintel beams, chajjas and counter & Loft slabs etc. in super structure including centering, shuttering complete but excluding cost of reinforcement.				
2.6	Reinforcement in super structure	Kg			
	Providing & fixing Reinforcement for R.C.C. work in lintel, chajjas and counter & Loft slabs in super structure as specified, including straightening, cutting, bending, placing in position and binding all complete.				
2.7	Plain cement concrete				
	Providing and laying plain cement concrete of specified grade as bed concrete under floor, roof slab, plinth protection, cill, coping, shelves, kitchen platform etc. screeding at roof to required slope and other locations as called for laid, consolidated and cured etc. complete as per specification and drawing.				
a)	1:4:8 (1 cement : 4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum	37.92		
	Total of Subhead 2.0				
3.0	Wall finishes				
3.1	Providing 12 mm thick cement plaster of mix 1:6 (1 cement: 6 coarse sand).	Sqm	2339.14		
3.2	Lime wash	Sqm	3103.54		
	Providing and applying three or more coats of white wash with lime on wall and ceiling to give an even shade including preparation of surfaces, scaffolding, mixing of indigo blue and DDL adhesive etc. complete.				
3.3	Stone Counters	Sqm	32.50		
	Providing and laying 20mm thk. Kota stone slabs on kitchen counters laid on 20mm thk. Cement mortar 1:3 (1 cement 3 coarse sand). Including rubbing and polishing complete.				
3.4	Coping	Sqm	25.92		
	Providing & fixing 20mm thk. coping of burnt clay paving tile, on window sill & parapet walls in cement mortar 1:6				
3.5	Dado	Sqm	213.12		
	Providing and laying ceramic glazed tiles of size 200x300mm in dado of uniform thickness, size, shade and pattern as approved by Architect/Project Manager laid with rich cement slurry over a bedding plaster of 12 mm thick cement mortar 1:3 (1 cement: 3 fine sand) and grouting the joints with white cement and pigment with matching shade of tile, cutting, curing etc. complete in all respects as per drawing.				
	Total of Subhead 3.0				
4.0	Flooring				
4.1	IPS Flooring	Sqm	496.64		
	Providing and laying 40mm thk. IPS flooring 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate) in two layers; finished with a floating coat of neat cement including cement slurry complete.				
4.2	IPS Skirting	Sqm	64.05		
	Providing and laying 18mm thk. cement plaster skirting & risers with cement mortar 1:3 (1 cement: 3 coarse sand) finished with a floating coat of neat cement.				
4.3	Extra for laying IPS flooring on staircase treads not exceeding 30 cm in width, including cost of forming, nosing etc.	Sqm	54.00		
4.4	Extra for addition of red oxide of iron (3.5kg per 50 kg of cement) in 40mm thk. IPS flooring	Sqm	114.56		
4.5	Ceramic tile Flooring	Sqm	47.04		
	Providing and laying ceramic glazed tile flooring of size 300x300mm of approved make, shade and pattern as approved by Project in charge laid over 20/12 mm average thick bed of cement mortar 1:4 (1 cement : 4 coarse sand), grouting the				

6(d) ANNEXURE-IV (EWS-CLUSTER UNIT-OPTION-B)

	joins with white cement and pigment to match the shade of tile including cutting, etc. complete in all respects				
4.6	Sand Filling	Cum	31.80		
	Supplying and filling in plinth with sand under floors including watering, ramming, consolidating, and dressing complete.				
	Total of Subhead 4.0				
5.0	Door Windows				
5.1	RCC Frame for door				
	Providing and fixing RCC Frame for door of size given below, out of section 100x50mm, with single or double rebate as required, with holdfasts, finished with enamel paint of approved colour all complete.				
a)	900x2085 mm	Nos.	48.00		
b)	750x2085 mm	Nos.	32.00		
5.2	RCC Frame for windows				
	Providing and fixing RCC Frame for window of size given below, out of section 100x50mm, with double rebate and holdfasts, finished with enamel paint of approved colour all complete.				
a)	1200x1200mm	Nos.	32.00		
b)	600x1050mm	Nos.	48.00		
c)	1200x385mm	Nos.	32.00		
d)	600x385mm	Nos.	48.00		
5.3	Door Shutters				
	Providing and fixing door shutter of sizes given below of any of following material as per approval by project in charge/ architect. (Note: Hardware not included in the item, to be as per selection)				
i)	Wooden panelled door shutter using local wood as per approval, 12mm thk. particle board panel including finishing with enamel paint of approved colour all complete.				
ii)	Wooden panelled door shutter using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm in panels including finishing with enamel paint of approved colour all complete.				
iii)	24 mm thick factory made PVC door shutters made of styles and rails of an uPVC hollow section of size 59x24 mm and wall thickness 2 mm (± 0.2 mm) with inbuilt edging on both sides. Complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter).				
iv)	Providing and fixing 35mm thk. ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
v)	Bamboo door shutters				
a)	800x2035mm	Nos.	64.00		
b)	650x2035mm	Nos.	32.00		
5.4	Window Shutters for windows & ventilators				
i)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing 5mm thk. clear float glass of approved make, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
a)	550x1100mm	Nos.	64.00		
b)	500x950mm	Nos.	48.00		
c)	550x285mm	Nos.	64.00		
d)	500x285mm	Nos.	48.00		
ii)	Providing and fixing Wooden panelled shutter for windows ventilators of given size using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
iii)	Bamboo Window Shutters				
a)	550x1100mm	Nos.	64.00		
b)	500x950mm	Nos.	48.00		
c)	550x285mm	Nos.	64.00		
d)	500x285mm	Nos.	48.00		
	Total of Subhead 5.0				
6.0	Roofing				

6(d) ANNEXURE-IV (EWS-CLUSTER UNIT-OPTION-B)

6.1	Precast Arch Panel system	Sqm	608.00		
	Providing and Laying precast Arch Panels & Precast RCC Beams for roof as per related training and including providing & laying necessary cast in situ RCC and reinforcement as specified in structural drawings , centering & shuttering complete, excluding the cost of reinforcement.				
6.2	Ceiling plaster	Sqm	764.40		
	Providing 10 mm thick cement plaster of mix 1:4 (1 cement: 4 coarse sand) in ceiling.				
6.3	Sunken area filling	Cum	26.40		
	Providing and laying on sunken areas broken light weight concrete block bats of approximately 600 kg. per cum density laid, consolidated, finished smooth, including finished & grouting the top layer with water proof cement mortar with CICO or equivalent brand.				
6.4	Hot Bitumen layer	Sqm	162.50		
	Providing layer of residual type petroleum bitumen of penetration 80/100 of approved quality at 17kg per 10sqm impregnated with a coat of coarse sand layer at 60 cudm per 10sqm including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete.				
6.5	Mud phuska	Cum	30.40		
	Providing and laying 150mm thick (average) mud phuska of damped brick earth on roof laid to slope consolidated and plastered with 25mm thk. mud mortar mixed with bhusa at 35kg per cum of earth and gobri leaping with mix 1:1 (1clay: 1 cow dung).				
6.6	Ceramic broken tiles	Sqm	152.00		
	Providing and laying broken ceramic glazed tiles on roof including filling the gaps with cement mortar 1:4 (1cement: 4 coarse sand) mixed with 2% integral water proofing compound laid over a bed of 20mm thk cement mortar 1:4 and finished neat complete.				
6.7	Cement Gola	Rmt	7.00		
	Providing Gola in cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 10 mm nominal size) including finishing with cement mortar 1:3 (1 cement: 3 sand) as per standard design.				
	Total of Subhead 6.0				
7.0	Miscellaneous				
7.1	Making khurras 1'-6"x1'-6" with average minimum thickness of 2" cement concrete 1:2:4 over PVC sheet 1mx1mx400micron, finished with 12mm cement plaster 1:3 and a coat of neat cement rounding the edges and making and finishing the outlet complete.	Nos	6.00		
7.2	Providing and fixing 110mm dia PVC rain water pipes of approved make to withstand a test pressure of 4.0kg/sqcm. including all fittings bends, sockets, elbow, tees, clamps, Y - Junction with cover (for collecting rainwater) including testing of joints etc. complete.	Rmt	78.00		
	Total of Subhead 7.0				
	Total of "A"				

6(d) ANNEXURE-V(LIG A-INDIVIDUAL UNIT-OPTION-A)

Summary of BOQ for LIG'A' Individual unit Option 'A' for Plains Region, using Filler slab Roof and masonry work in Fly ash bricks in combination with red bricks					
S.No.	Description	Amount (Rs.)			
A.0	Civil Works				
1.0	Foundation				
2.0	Super structure				
3.0	Wall finishes				
4.0	Flooring				
5.0	Door & Windows				
6.0	Roofing				
7.0	Miscellaneous Works				
8.0	Plumbing				
9.0	Electrical				
	Total				
Note:	1. Rain water disposal has been detailed only up to down take rain water pipe. Further disposal of rain water to be as per site situation.				
BOQ for LIG'A' Individual unit Option 'A' for Plains Region, using Filler slab Roof and masonry work in Fly ash bricks in combination with red bricks					
S.No.	Item Description	Unit	Quantity	Rate	Amount (Rs.)
A.0	Civil Works				
1.0	Foundation				
1.1	Earth work in excavation	Cum			
	Earth work in foundation trenches, column pits, drains etc. (not exceeding 1.5m in width or 10 sqm on plan) after clearing of site from bushes vegetation etc., including dressing of sides and ramming of bottoms, surface preparation as per specification to receive the PCC, lift up to 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m.				
1.2	Anti-termite treatment	Sqm			
	Supplying, diluting and injecting chemical emulsion for pre-constructional anti termite treatment and creating a chemical barrier under and all-round the column pits, plinth beams, junction of wall and floor, along the external perimeter of building etc. complete				
	With chlorpyrifos/Landane E.C. 20% with 1% concentration				
1.3	Back filling of earth	Cum			
	Filling available excavated earth (Excluding rock) in trenches, plinth, sides of foundation etc. in layers not exceeding 20Cm. in depth, consolidating each deposited layer by ramming and watering, lead up to 50m. and lift up to 1.5m.				
1.4	D.P.C.	Sqm	8.31		
	Providing and laying damp proof course 40 mm thick with cement concrete 1:2:4 (1 cement :2 coarse sand: 4 graded stone aggregate 12.5 mm nominal size) and applying a coat of residual petroleum bitumen of penetration 80/100 of approved quality.				
1.5	PCC in foundation				
	(Providing) & laying in position cement concrete of specified grade including centring & shuttering complete - All work up to plinth level.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum			
b)	1:5:10 (1 cement :5 coarse sand : 10 graded stone aggregate 40mm nominal size)	Cum			
1.6	R.C.C. up to plinth level	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete including centering, shuttering complete but excluding cost of reinforcement - All work up to plinth level.				
1.7	Reinforcement up to plinth level	Kg			
	Providing & fixing Reinforcement for R.C.C. work up to plinth level as specified, including straightening, cutting, bending, placing in position and binding all complete.				
1.8	Brick work in foundation	Cum			
	Brick work with it Fly ash bricks (FALG bricks) conforming to class 'A' in foundation and plinth in cement mortar 1:6 (1 cement: 6 coarse sand).				
	Total of Subhead 1.0				
2.0	Super structure				
2.1	Brick work in Fly ash bricks	Cum	13.44		
	230mm thk. Brick work with Fly ash bricks (FALG bricks) conforming to class 'A' in rat trap bond in cement mortar 1:4 (1 cement : 4 coarse sand) in super structure above plinth level including finishing in ruled pointing on the external side of wall.				
2.2	Brick work in Red Burnt Bricks	Cum	5.52		
	Brick work in FPS bricks of class designation 75 in super structure above plinth level				

6(d) ANNEXURE-V(LIG A-INDIVIDUAL UNIT-OPTION-A)

	in desired pattern in cement mortar 1:4 (1 cement : 4 coarse sand) including finishing in ruled pointing on the external side of wall where ever specified.				
2.3	115mm thk brick wall	Sqm	7.71		
	Half brick masonry with Fly ash bricks (FALG bricks) conforming to class 'A' in super structure above plinth level in cement mortar 1:6, including providing & placing in position 2 nos. 6mm dia. M.S. bars at every third course.				
2.4	Red Brick Jali	Cum	0.59		
	Brick jali work in desired pattern in parapet wall with FPS bricks of class designation 75 in cement mortar 1:4				
2.5	Brick work in Parapet wall	Cum	3.31		
	Brick work with Fly ash bricks (FALG bricks) conforming to class 'A' in parapet wall in English bond in cement mortar 1:6 (1 cement : 6 coarse sand)				
2.6	R.C.C. in super structure	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete in lintel beams, chajjas and counter & Loft slabs etc. in super structure including centering, shuttering complete but excluding cost of reinforcement.				
2.7	Reinforcement in super structure	Kg			
	Providing & fixing Reinforcement for R.C.C. work in lintel, chajjas and counter & Loft slabs in super structure as specified, including straightening, cutting, bending, placing in position and binding all complete.				
2.8	Plain cement concrete				
	Providing and laying plain cement concrete of specified grade as bed concrete under floor, roof slab, plinth protection, cill, coping, shelves, kitchen platform etc. screeding at roof to required slope and other locations as called for laid, consolidated and cured etc. complete as per specification and drawing.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum	2.66		
	Total of Subhead 2.0				
3.0	Wall finishes				
3.1	Providing 12 mm thick cement plaster of mix 1:6 (1 cement: 6 coarse sand).	Sqm	110.33		
3.2	Lime wash	Sqm	152.83		
	Providing and applying three or more coats of white wash with lime on wall and ceiling to give an even shade including preparation of surfaces, scaffolding, mixing of indigo blue and DDL adhesive etc. complete.				
3.3	Stone Counters	Sqm	2.15		
	Providing and laying 20mm thk. Kota stone slabs on kitchen counters laid on 20mm thk. Cement mortar 1:3 (1 cement 3 coarse sand). Including rubbing and polishing complete.				
3.4	Coping	Sqm	7.30		
	Providing & fixing 20mm thk. coping of burnt clay paving tile, on window sill & parapet walls in cement mortar 1:6				
3.5	Dado	Sqm	13.77		
	Providing and laying ceramic glazed tiles of size 200x300mm in dado of uniform thickness, size, shade and pattern as approved by Architect/Project Manager laid with rich cement slurry over a bedding plaster of 12 mm thick cement mortar 1:3 (1 cement: 3 fine sand) and grouting the joints with white cement and pigment with matching shade of tile, cutting, curing etc. complete in all respects as per drawing.				
	Total of Subhead 3.0				
4.0	Flooring				
4.1	Terrazzo Tile Flooring	Sqm	30.28		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of size up to 12mm, Light shade using white cement, laid in floors, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 20mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand)				
4.2	Paving Tiles flooring	Sqm	9.70		
	Providing & fixing 20mm thk. burnt clay paving tile flooring on 20mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand), jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete				
4.3	Terrazzo Tile Skirting	Sqm	3.24		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of size up to 12mm, Light shade using white cement, in skirting jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 12mm thick cement mortar 1:3 (1				

6(d) ANNEXURE-V(LIG A-INDIVIDUAL UNIT-OPTION-A)

	cement : 3 coarse sand)				
4.4	Ceramic tile Flooring	Sqm	2.72		
	Providing and laying ceramic glazed tile flooring of size 300x300mm of approved make, shade and pattern as approved by Project in charge laid over 20/12 mm average thick bed of cement mortar 1:4 (1 cement : 4 coarse sand), grouting the joints with white cement and pigment to match the shade of tile including cutting, etc. complete in all respects				
4.5	Sand Filling	Cum	6.38		
	Supplying and filling in plinth with sand under floors including watering, ramming, consolidating, and dressing complete.				
	Total of Subhead 4.0				
5.0	Door Windows				
5.1	RCC Frame for door				
	Providing and fixing RCC Frame for door of size given below, out of section 100x50mm, with single or double rebate as required, with holdfasts, finished with enamel paint of approved colour all complete.				
a)	900 x 2125mm	Nos.	3.00		
b)	750 x 2125mm	Nos.	2.00		
5.2	RCC Frame for windows & ventilators				
	Providing and fixing RCC Frame for windows & ventilators of size given below, out of section 100x50mm, with double rebate and holdfasts, finished with enamel paint of approved colour all complete.				
a)	1200x1200mm	Nos.	2.00		
b)	600x1050mm	Nos.	4.00		
c)	1200x500mm	Nos.	2.00		
d)	600x500mm	Nos.	4.00		
5.3	Door Shutters				
	Providing and fixing door shutter of sizes given below of any of following material as per approval by project in charge/ architect. (Note: Hardware not included in the item, to be as per selection)				
i)	Wooden panelled door shutter using local wood as per approval, 12mm thk. particle board / M.S. jali as per requirement of panel including finishing with enamel paint of approved colour all complete.				
ii)	Wooden panelled door shutter using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm in panels including finishing with enamel paint of approved colour all complete.				
iii)	24 mm thick factory made PVC door shutters made of styles and rails of an uPVC hollow section of size 59x24 mm and wall thickness 2 mm (± 0.2 mm) with inbuilt edging on both sides. Complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter).				
iv)	Providing and fixing 35mm thk. ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
v)	Bamboo door shutters				
a)	800 x 2075mm	Nos.	5.00		
b)	650 x 2075mm	Nos.	2.00		
5.4	Window Shutters for windows & ventilators				
i)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing 5mm thk. clear float glass of approved make, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
a)	550x1100mm	Nos.	4.00		
b)	500x950mm	Nos.	4.00		
c)	1100x400mm	Nos.	2.00		
d)	500x400mm	Nos.	4.00		
ii)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
iii)	Bamboo Window Shutter				
a)	550x1100mm	Nos.	4.00		

6(d) ANNEXURE-V(LIG A-INDIVIDUAL UNIT-OPTION-A)

b)	500x950mm	Nos.	4.00		
c)	1100x400mm	Nos.	2.00		
d)	500x400mm	Nos.	4.00		
	Total of Subhead 5.0				
6.0	Roofing				
6.1	Filler material for Filler slab	Sqm	52.00		
	Providing & laying as per instruction, stabilised mud blocks 50mm thk. during casting of Filler slab.				
6.3	Ceiling plaster	Sqm	42.50		
	Providing 10 mm thick cement plaster of mix 1:4 (1 cement: 4 coarse sand) in ceiling.				
6.4	Hot Bitumen layer	Sqm	49.05		
	Providing layer of residual type petroleum bitumen of penetration 80/100 of approved quality at 17kg per 10sqm impregnated with a coat of coarse sand layer at 60 cudm per 10sqm including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete.				
6.5	Mud phuska	Cum	9.00		
	Providing and laying 100mm thick (average) mud phuska of damped brick earth on roof laid to slope consolidated and plastered with 25mm thk. mud mortar mixed with bhusa at 35kg per cum of earth and gobri leaping with mix 1:1 (1clay: 1 cow dung).				
6.6	Ceramic broken tiles	Sqm	45.00		
	Providing and laying broken ceramic glazed tiles on roof including filling the gaps with cement mortar 1:4 (1cement: 4 coarse sand) mixed with 2% integral water proofing compound laid over a bed of 20mm thk cement mortar 1:4 and finished neat complete.				
6.7	Cement Gola	Rmt	27.00		
	Providing Gola in cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 10 mm nominal size) including finishing with cement mortar 1:3 (1 cement: 3 sand) as per standard design.				
	Total of Subhead 6.0				
7.0	Miscellaneous				
7.1	Making khurras 1'-6"x1'-6" with average minimum thickness of 2" cement concrete 1:2:4 over PVC sheet 1mx1mx400micron, finished with 12mm cement plaster 1:3 and a coat of neat cement rounding the edges and making and finishing the outlet complete.	Nos	2.00		
7.2	Providing and fixing 110mm dia PVC rain water pipes of approved make to withstand a test pressure of 4.0kg/sqcm. including all fittings bends, sockets, elbow, tees, clamps, Y - Junction with cover (for collecting rainwater) including testing of joints etc. complete.	Rmt	6.00		
7.3	M.S. Grill	Sqm	6.00		
	Providing and fixing in position M.S. Grill made of 10x10mm m.s. square rods fixed at 150mm avg. c/c in both directions & 25x3mm flat all around to fix the grill to window, complete including grinding, providing two coats of red oxide primer and three or more coats of synthetic enamel paint of approved colour.				
7.4	Concrete jali	Sqm	1.70		
	Providing and fixing pre-fabricated Cement Concrete jali of approved pattern with cement mortar 1:4.				
	Total of Subhead 7.0				
	Total of 'A'				

6(e) ANNEXURE-VI(LIG A-INDIVIDUAL UNIT-OPTION-B)

Summary of BOQ for LIG'A' Individual unit Option 'B' for Plains Region, using Precast Planks - Joist & Micro Concrete Tiles Roof and masonry work in Stabilised Compressed Earth Hydra form Blocks					
S.No.	Description	Amount (Rs.)			
A.0	Civil Works				
1.0	Foundation				
2.0	Super structure				
3.0	Wall finishes				
4.0	Flooring				
5.0	Door & Windows				
6.0	Roofing				
7.0	Miscellaneous Works				
8.0	Plumbing				
9.0	Electrical				
	Total				
Note:	1. Rain water disposal has been detailed only up to down take rain water pipe. Further disposal of rain water to be as per site situation.				
BOQ for LIG'A' Individual unit Option 'B' for Plains Region, using Precast Planks - Joist & Micro Concrete Tiles Roof and masonry work in Stabilised Compressed Earth Hydra form Blocks					
S.No.	Item Description	Unit	Quantity	Rate	Amount (Rs.)
A.0	Civil Works				
1.0	Foundation				
1.1	Earth work in excavation	Cum			
	Earth work in foundation trenches, column pits, drains etc. (not exceeding 1.5m in width or 10 sqm on plan) after clearing of site from bushes vegetation etc., including dressing of sides and ramming of bottoms, surface preparation as per specification to receive the PCC, lift up to 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m.				
1.2	Anti-termite treatment	Sqm			
	Supplying, diluting and injecting chemical emulsion for pre-constructional anti termite treatment and creating a chemical barrier under and all-round the column pits, plinth beams, junction of wall and floor, along the external perimeter of building etc. complete				
	With chlorpyrifos/Landane E.C. 20% with 1% concentration				
1.3	Back filling of earth	Cum			
	Filling available excavated earth (Excluding rock) in trenches, plinth, sides of foundation etc. in layers not exceeding 20Cm. in depth, consolidating each deposited layer by ramming and watering, lead up to 50m. and lift up to 1.5m.				
1.4	D.P.C.	Sqm	9.24		
	Providing and laying damp proof course 40 mm thick with cement concrete 1:2:4 (1 cement :2 coarse sand: 4 graded stone aggregate 12.5 mm nominal size) and applying a coat of residual petroleum bitumen of penetration 80/100 of approved quality.				
1.5	PCC in foundation				
	(Providing) & laying in position cement concrete of specified grade including centring & shuttering complete - All work up to plinth level.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum			
b)	1:5:10 (1 cement :5 coarse sand : 10 graded stone aggregate 40mm nominal size)	Cum			
1.6	R.C.C. up to plinth level	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete including centering, shuttering complete but excluding cost of reinforcement - All work up to plinth level.				
1.7	Reinforcement up to plinth level	Kg			
	Providing & fixing Reinforcement for R.C.C. work up to plinth level as specified, including straightening, cutting, bending, placing in position and binding all complete.				
1.8	Brick work in foundation	Cum			
	Brick work with FPS bricks of class designation 75 in foundation and plinth in cement mortar 1:6 (1 cement: 6 coarse sand).				
	Total of Subhead 1.0				
2.0	Super structure				
2.1	masonry work in super structure	Sqm	187.40		
	220mm thk. masonry work using Stabilised, Hydraulically Compressed Earth Blocks in super structure above plinth level as per the guidelines of Hydra form construction manual.				
2.2	115 thk. wall	Sqm	17.92		
	115mm thk. masonry work using Stabilised, Hydraulically Compressed Earth Blocks in super structure above plinth level as per the guidelines of Hydra form construction				

6(e) ANNEXURE-VI(LIG A-INDIVIDUAL UNIT-OPTION-B)

	manual.				
2.3	Red Brick Bands	Cum	2.24		
	Brick work in FPS bricks of class designation 75 in super structure above plinth level in desired pattern in cement mortar 1:4 (1 cement : 4 coarse sand) including finishing in ruled pointing on the external side of wall where ever specified.				
2.4	Red Brick Jali	Sqm	0.60		
	Brick jali work in desired pattern in parapet wall with FPS bricks of class designation 75 in cement mortar 1:4				
2.5	R.C.C. in super structure	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete in lintel beams, chajjas and counter & Loft slabs etc. in super structure including centering, shuttering complete but excluding cost of reinforcement.				
2.6	Reinforcement in super structure	Kg			
	Providing & fixing Reinforcement for R.C.C. work in lintel, chajjas and counter & Loft slabs in super structure as specified, including straightening, cutting, bending, placing in position and binding all complete.				
2.7	Plain cement concrete				
	Providing and laying plain cement concrete of specified grade as bed concrete under floor, roof slab, plinth protection, cill, coping, shelves, kitchen platform etc. screeding at roof to required slope and other locations as called for laid, consolidated and cured etc. complete as per specification and drawing.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum	3.48		
	Total of Subhead 2.0				
3.0	Wall finishes				
3.1	Providing 12 mm thick cement plaster of mix 1:6 (1 cement: 6 coarse sand).	Sqm	100.31		
3.2	Lime wash	Sqm	139.31		
	Providing and applying three or more coats of white wash with lime on wall and ceiling to give an even shade including preparation of surfaces, scaffolding, mixing of indigo blue and DDL adhesive etc. complete.				
3.3	Stone Counters	Sqm	3.15		
	Providing and laying 20mm thk. Kota stone slabs on kitchen counters laid on 20mm thk. Cement mortar 1:3 (1 cement 3 coarse sand). Including rubbing and polishing complete.				
3.4	Coping	Sqm	8.77		
	Providing & fixing 20mm thk. coping of burnt clay paving tile, on window sill & parapet walls in cement mortar 1:6				
3.5	Dado	Sqm	20.62		
	Providing and laying ceramic glazed tiles of size 200x300mm in dado of uniform thickness, size, shade and pattern as approved by Architect/Project Manager laid with rich cement slurry over a bedding plaster of 12 mm thick cement mortar 1:3 (1 cement: 3 fine sand) and grouting the joints with white cement and pigment with matching shade of tile, cutting, curing etc. complete in all respects as per drawing.				
	Total of Subhead 3.0				
4.0	Flooring				
4.1	Terrazzo Tile Flooring	Sqm	36.95		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of size up to 12mm, Light shade using white cement, laid in floors, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 20mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand)				
4.2	Paving Tiles flooring	Sqm	6.84		
	Providing & fixing 20mm thk. burnt clay paving tile flooring on 20mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand), jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete				
4.3	Terrazzo Tile Skirting	Sqm	5.40		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of size up to 12mm, Light shade using white cement, in skirting jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 12mm thick cement mortar 1:3 (1 cement : 3 coarse sand)				
4.4	Ceramic tile Flooring	Sqm	2.75		
	Providing and laying ceramic glazed tile flooring of size 300x300mm of approved make, shade and pattern as approved by Project in charge laid over 20/12 mm				

6(e) ANNEXURE-VI(LIG A-INDIVIDUAL UNIT-OPTION-B)

	average thick bed of cement mortar 1:4 (1 cement : 4 coarse sand), grouting the joints with white cement and pigment to match the shade of tile including cutting, etc. complete in all respects				
4.5	Sand Filling	Cum	6.32		
	Supplying and filling in plinth with sand under floors including watering, ramming, consolidating, and dressing complete.				
	Total of Subhead 4.0				
5.0	Door Windows				
5.1	RCC Frame for door				
	Providing and fixing RCC Frame for door of size given below, out of section 100x50mm, with single or double rebate as required, with holdfasts, finished with enamel paint of approved colour all complete.				
a)	900 x 2080mm	Nos.	3.00		
b)	750 x 2080mm	Nos.	2.00		
5.2	Wooden Frame for windows & ventilators				
	Providing and fixing Wooden Frame for windows & ventilators of size given below using local wood, out of section 100x50mm, with double rebate and holdfasts, finished with enamel paint of approved colour all complete.				
a)	1200x1200mm	Nos.	4.00		
b)	600x1050mm	Nos.	3.00		
c)	600x460mm	Nos.	3.00		
d)	1200x460mm	Nos.	2.00		
5.3	Door Shutters				
	Providing and fixing door shutter of sizes given below of any of following material as per approval by project in charge/ architect. (Note: Hardware not included in the item, to be as per selection)				
i)	Wooden panelled door shutter using local wood as per approval, 12mm thk. particle board / M.S. jali as per requirement of panel including finishing with enamel paint of approved colour all complete.				
ii)	Wooden panelled door shutter using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm in panels including finishing with enamel paint of approved colour all complete.				
iii)	24 mm thick factory made PVC door shutters made of styles and rails of an uPVC hollow section of size 59x24 mm and wall thickness 2 mm (± 0.2 mm) with inbuilt edging on both sides. Complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter).				
iv)	Providing and fixing 35mm thk. ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
v)	Bamboo door shutters				
a)	800 x 2030mm	Nos.	5.00		
b)	650 x 2030mm	Nos.	2.00		
5.4	Window Shutters for windows & ventilators				
i)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing 5mm thk. clear float glass of approved make, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
a)	550x1100mm	Nos.	8.00		
b)	500x950mm	Nos.	3.00		
c)	500x360mm	Nos.	3.00		
d)	1100x360mm	Nos.	2.00		
ii)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
iii)	Bamboo Window Shutters				
a)	550x1100mm	Nos.	8.00		
b)	500x950mm	Nos.	3.00		
c)	500x360mm	Nos.	3.00		
d)	1100x360mm	Nos.	2.00		
	Total of Subhead 5.0				
6.0	Roofing				

6(e) ANNEXURE-VI(LIG A-INDIVIDUAL UNIT-OPTION-B)

6.1	RCC Plank and Joist system	Sqm	42.16		
	Providing and Laying precast RCC planks and joists system for roof slab and beams as per related training and including providing & laying necessary cast in situ RCC and reinforcement as specified in structural drawings , centering & shuttering complete, excluding the cost of reinforcement.				
6.2	Micro Concrete Tile Roofing	Sqm	6.84		
	Providing prefabricated corrugated MCR tile roofing (pan or roman as approved) and fixing the tiles to M.S. purlins with G.I wire with proper overlaps and interlocks, joints between ridge tiles on doubly pitched roofs sealed with rich cement sand mortar all complete as per approval of project manager, including providing and fixing ridge tiles, gutter, M.S. purlins, cleats/ flats/ angles, flashing and rafters as specified in structural drawings. Work to be complete in all respect including hoisting at all heights, cutting, welding, smooth grinding of all welding joints, applying derusting primer coat, three or more coats of synthetic enamel paint etc. on M.S. members.				
6.3	Ceiling plaster	Sqm	39.00		
	Providing 10 mm thick cement plaster of mix 1:4 (1 cement: 4 coarse sand) in ceiling.				
6.4	Hot Bitumen layer	Sqm	56.79		
	Providing layer of residual type petroleum bitumen of penetration 80/100 of approved quality at 17kg per 10sqm impregnated with a coat of coarse sand layer at 60 cudm per 10sqm including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete.				
6.5	Mud phuska	Cum	9.88		
	Providing and laying 100mm thick (average) mud phuska of damped brick earth on roof laid to slope consolidated and plastered with 25mm thk. mud mortar mixed with bhusa at 35kg per cum of earth and gobri leaping with mix 1:1 (1clay: 1 cow dung).				
6.6	Ceramic broken tiles	Sqm	49.38		
	Providing and laying broken ceramic glazed tiles on roof including filling the gaps with cement mortar 1:4 (1cement: 4 coarse sand) mixed with 2% integral water proofing compound laid over a bed of 20mm thk cement mortar 1:4 and finished neat complete.				
6.7	Cement Gola	Rmt	49.38		
	Providing Gola in cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 10 mm nominal size) including finishing with cement mortar 1:3 (1 cement: 3 sand) as per standard design.				
	Total of Subhead 6.0				
7.0	Miscellaneous				
7.1	Making khurras 1'-6"x1'-6" with average minimum thickness of 2" cement concrete 1:2:4 over PVC sheet 1mx1mx400micron, finished with 12mm cement plaster 1:3 and a coat of neat cement rounding the edges and making and finishing the outlet complete.	Nos	2.00		
7.2	Providing and fixing 110mm dia PVC rain water pipes of approved make to withstand a test pressure of 4.0kg/sqcm. including all fittings bends, sockets, elbow, tees, clamps, Y - Junction with cover (for collecting rainwater) including testing of joints etc. complete.	Rmt	6.00		
7.3	M.S. Grill	Sqm	9.43		
	Providing and fixing in position M.S. Grill made of 10x10mm m.s. square rods fixed at 150mm avg. c/c in both directions & 25x3mm flat all around to fix the grill to window, complete including grinding, providing two coats of red oxide primer and three or more coats of synthetic enamel paint of approved colour.				
7.4	Concrete jali	Sqm	1.70		
	Providing and fixing pre-fabricated Cement Concrete jali of approved pattern with cement mortar 1:4.				
	Total of Subhead 7.0				
	Total of "A"				

6(f) ANNEXURE-VII (LIG A-CLUSTER UNIT-OPTION-B)

Summary of BOQ for Cluster unit LIG A Option 'A' for Plains Region, using Filler slab Roof and masonry in Fly ash Bricks in Rat trap bond with Red Bricks Bands					
S.No.	Description	Amount (Rs.)			
A.0	Civil Works				
1.0	Foundation				
2.0	Super structure				
3.0	Wall finishes				
4.0	Flooring				
5.0	Door & Windows				
6.0	Roofing				
7.0	Miscellaneous				
8.0	Plumbing				
9.0	Electrical				
	Total				
Note:	1. Estimated Cost is the cost of complete cluster (16 units)				
	2. Rain water disposal has been detailed only up to down take rain water pipe. Further disposal of rain water to be as per site situation.				
BOQ for Cluster unit LIG A Option 'A' for Plains Region, using Precast Planks - Joists & Filler slab Roof and masonry in Fly ash bricks with Red Bricks Bands					
S.No.	Item Description	Unit	Quantity	Rate	Amount (Rs.)
A.0	Civil Works				
1.0	Foundation				
1.1	Earth work in excavation	Cum			
	Earth work in foundation trenches, column pits, drains etc. (not exceeding 1.5m in width or 10 sqm on plan) after clearing of site from bushes vegetation etc., including dressing of sides and ramming of bottoms, surface preparation as per specification to receive the PCC, lift up to 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m.				
1.2	Anti-termite treatment	Sqm			
	Supplying, diluting and injecting chemical emulsion for pre-constructional anti termite treatment and creating a chemical barrier under and all-round the column pits, plinth beams, junction of wall and floor, along the external perimeter of building etc. complete				
	With chlorpyrifos/Landane E.C. 20% with 1% concentration				
1.3	Back filling of earth	Cum			
	Filling available excavated earth (Excluding rock) in trenches, plinth, sides of foundation etc. in layers not exceeding 20Cm. in depth, consolidating each deposited layer by ramming and watering, lead up to 50m. and lift up to 1.5m.				
1.4	PCC in foundation				
	(Providing) & laying in position cement concrete of specified grade including centring & shuttering complete - All work up to plinth level.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum			
b)	1:5:10 (1 cement :5 coarse sand : 10 graded stone aggregate 40mm nominal size)	Cum			
1.5	R.C.C. up to plinth level	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete including centering, shuttering complete but excluding cost of reinforcement - All work up to plinth level.				
1.6	Reinforcement up to plinth level	Kg			
	Providing & fixing Reinforcement for R.C.C. work up to plinth level as specified, including straightening, cutting, bending, placing in position and binding all complete.				
1.7	Brick work in foundation	Cum			
	Brick work with FPS bricks of class designation 75 in foundation and plinth in cement mortar 1:6 (1 cement: 6 coarse sand).				
	Total of Subhead 1.0				
2.0	Super structure				
2.1	Brick work in super structure	Cum	353.24		
	230mm thk. Brick work with Fly ash bricks (FALG bricks) conforming to class 'A' in rat trap bond in cement mortar 1:4 (1 cement : 4 coarse sand) in super structure above plinth level including finishing in ruled pointing on the external side of wall.				
2.2	Brick work in Red Burnt Bricks	Cum	15.57		
	Brick work in FPS bricks of class designation 75 in rat trap bond in super structure above plinth level in desired pattern in cement mortar 1:4 (1 cement : 4 coarse sand) including finishing in ruled pointing on the external side of wall where ever				

6(f) ANNEXURE-VII (LIG A-CLUSTER UNIT-OPTION-B)

	specified.				
2.3	Brick work in Parapet wall	Cum	39.22		
	Brick work with Fly ash bricks (FALG bricks) conforming to class 'A' in parapet wall in English bond in cement mortar 1:6 (1 cement : 6 coarse sand)				
2.4	115mm thk brick wall	Sqm	228.06		
	Half brick masonry with Fly ash bricks (FALG bricks) conforming to class 'A' in super structure above plinth level in cement mortar 1:6, including providing & placing in position 2 nos. 6mm dia. M.S. bars at every third course.				
2.5	Brick Jali	Sqm	4.02		
	Brick jali work in desired pattern in parapet wall with FPS bricks of class designation 75 in cement mortar 1:4				
2.6	R.C.C. in super structure	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete in lintel beams, chajjas and counter & Loft slabs etc. in super structure including centering, shuttering complete but excluding cost of reinforcement.				
2.7	Reinforcement in super structure	Kg			
	Providing & fixing Reinforcement for R.C.C. work in lintel, chajjas and counter & Loft slabs in super structure as specified, including straightening, cutting, bending, placing in position and binding all complete.				
2.8	Plain cement concrete				
	Providing and laying plain cement concrete of specified grade as bed concrete under floor, roof slab, plinth protection, cill, coping, shelves, kitchen platform etc. screeding at roof to required slope and other locations as called for laid, consolidated and cured etc. complete as per specification and drawing.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum	57.66		
	Total of Subhead 2.0				
3.0	Wall finishes				
3.1	Providing 12 mm thick cement plaster of mix 1:6 (1 cement: 6 coarse sand).	Sqm	2561.04		
3.2	Lime wash	Sqm	3321.04		
	Providing and applying three or more coats of white wash with lime on wall and ceiling to give an even shade including preparation of surfaces, scaffolding, mixing of indigo blue and DDL adhesive etc. complete.				
3.3	Stone Counters	Sqm	32.00		
	Providing and laying 20mm thk. Kota stone slabs on kitchen counters laid on 20mm thk. Cement mortar 1:3 (1 cement 3 coarse sand). Including rubbing and polishing complete.				
3.4	Coping	Sqm	43.61		
	Providing & fixing 20mm thk. coping of burnt clay paving tile, on window sill & parapet walls in cement mortar 1:6				
3.5	Dado	Sqm	355.30		
	Providing and laying ceramic glazed tiles of size 200x300mm in dado of uniform thickness, size, shade and pattern as approved by Architect/Project Manager laid with rich cement slurry over a bedding plaster of 12 mm thick cement mortar 1:3 (1 cement: 3 fine sand) and grouting the joints with white cement and pigment with matching shade of tile, cutting, curing etc. complete in all respects as per drawing.				
	Total of Subhead 3.0				
4.0	Flooring				
4.1	Terrazzo Tile Flooring	Sqm	637.00		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of size up to 12mm, Light shade using white cement, laid in floors, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 20mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand)				
4.2	Terrazzo Tile Skirting	Sqm	66.06		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of size up to 12mm, Light shade using white cement, in skirting & risers of steps, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 12mm thick cement mortar 1:3 (1 cement : 3 coarse sand)				
4.3	Extra for laying terrazzo flooring on staircase treads not exceeding 30 cm in width, including cost of forming, nosing etc.	Sqm	36.00		
4.4	Ceramic tile Flooring	Sqm	44.80		
	Providing and laying ceramic glazed tile flooring of size 300x300mm of approved make, shade and pattern as approved by Project in charge laid over 20/12 mm				

6(f) ANNEXURE-VII (LIG A-CLUSTER UNIT-OPTION-B)

	average thick bed of cement mortar 1:4 (1 cement : 4 coarse sand), grouting the joints with white cement and pigment to match the shade of tile including cutting, etc. complete in all respects				
4.5	Sand Filling	Cum	41.40		
	Supplying and filling in plinth with sand under floors including watering, ramming, consolidating, and dressing complete.				
	Total of Subhead 4.0				
5.0	Door Windows				
5.1	RCC Frame for door				
	Providing and fixing RCC Frame for door of size given below, out of section 100x50mm, with single or double rebate as required, with holdfasts, finished with enamel paint of approved colour all complete.				
a)	900x2085 mm	Nos.	48.00		
b)	750x2085 mm	Nos.	32.00		
5.2	RCC Frame for windows & ventilators				
	Providing and fixing RCC Frame for windows & ventilators of size given below, out of section 100x50mm, with double rebate and holdfasts, finished with enamel paint of approved colour all complete.				
a)	1200x1200mm	Nos.	32.00		
b)	600x1050mm	Nos.	48.00		
c)	1200x500mm	Nos.	16.00		
d)	600x 500mm	Nos.	48.00		
5.3	Door Shutters				
	Providing and fixing door shutter of sizes given below of any of following material as per approval by project in charge/ architect. (Note: Hardware not included in the item, to be as per selection)				
i)	Wooden panelled door shutter using local wood as per approval, 12mm thk. particle board / M.S. jali as per requirement of panel including finishing with enamel paint of approved colour all complete.				
ii)	Wooden panelled door shutter using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm in panels including finishing with enamel paint of approved colour all complete.				
iii)	24 mm thick factory made PVC door shutters made of styles and rails of an uPVC hollow section of size 59x24 mm and wall thickness 2 mm (± 0.2 mm) with inbuilt edging on both sides. Complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter).				
iv)	Providing and fixing 35mm thk. ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
v)	Bamboo door shutters				
a)	800x2035mm	Nos.	80.00		
b)	650x2035mm	Nos.	32.00		
5.4	Window Shutters for windows & ventilators				
i)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing 5mm thk. clear float glass of approved make, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
a)	550x1100mm	Nos.	64.00		
b)	500x950mm	Nos.	48.00		
c)	1100x400mm	Nos.	16.00		
d)	500x 400mm	Nos.	48.00		
ii)	Providing and fixing Wooden panelled shutter for windows ventilators of given size using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
iii)	Bamboo Window Shutter				
a)	550x1100mm	Nos.	64.00		
b)	500x950mm	Nos.	48.00		
c)	1100x400mm	Nos.	16.00		
d)	500x 400mm	Nos.	48.00		
	Total of Subhead 5.0				

6(f) ANNEXURE-VII (LIG A-CLUSTER UNIT-OPTION-B)

6.0	Roofing				
6.1	Filler material for Filler slab	Sqm	848.00		
	Providing & laying as per instruction, stabilised mud blocks 50mm thk. during casting of Filler slab.				
6.2	Ceiling plaster	Sqm	760.00		
	Providing 10 mm thick cement plaster of mix 1:4 (1 cement: 4 coarse sand) in ceiling.				
6.3	Sunken area filling	Cum	14.76		
	Providing and laying on sunken areas broken light weight concrete block bats of approximately 600 kg. per cum density laid, consolidated, finished smooth, including finished & grouting the top layer with water proof cement mortar with CICO or equivalent brand.				
6.4	Hot Bitumen layer	Sqm	234.80		
	Providing layer of residual type petroleum bitumen of penetration 80/100 of approved quality at 17kg per 10sqm impregnated with a coat of coarse sand layer at 60 cum per 10sqm including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete.				
6.5	Mud phuska	Cum	44.20		
	Providing and laying 150mm thick (average) mud phuska of damped brick earth on roof laid to slope consolidated and plastered with 25mm thk. mud mortar mixed with bhusa at 35kg per cum of earth and gobri leaping with mix 1:1 (1clay: 1 cow dung).				
6.6	Ceramic broken tiles	Sqm	221.00		
	Providing and laying broken ceramic glazed tiles on roof including filling the gaps with cement mortar 1:4 (1cement: 4 coarse sand) mixed with 2% integral water proofing compound laid over a bed of 20mm thk cement mortar 1:4 and finished neat complete.				
6.7	Cement Gola	Rmt	9.20		
	Providing Gola in cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 10 mm nominal size) including finishing with cement mortar 1:3 (1 cement: 3 sand) as per standard design.				
	Total of Subhead 6.0				
7.0	Miscellaneous				
7.1	Making khurras 450x450 with average minimum thickness of 50mm cement concrete 1:2:4 over PVC sheet 1mx1mx400micron, finished with 12mm cement plaster 1:3 and a coat of neat cement rounding the edges and making and finishing the outlet complete.	Nos	9.00		
7.2	Providing and fixing 110mm dia PVC rain water pipes of approved make to withstand a test pressure of 4.0kg/sqcm. including all fittings bends, sockets, elbow, tees, clamps, Y - Junction with cover (for collecting rainwater) including testing of joints etc. complete.	Rmt	117.00		
	Total of Subhead 7.0				
	Total of "A"				

6(g) ANNEXURE-VIII(LIG A-CLUSTER UNIT OPTION-B)

Summary of BOQ for Cluster unit LIG A Option 'B' for Plains Region, using Precast Planks - Joists & Filler slab Roof and masonry in Hydra form Blocks with Red Bricks Bands					
S.No.	Description	Amount (Rs.)			
A.0	Civil Works				
1.0	Foundation				
2.0	Super structure				
3.0	Wall finishes				
4.0	Flooring				
5.0	Door & Windows				
6.0	Roofing				
7.0	Miscellaneous				
8.0	Plumbing				
9.0	Electrical				
	Total				
Note:	1. Estimated Cost is the cost of complete cluster (16 units)				
	2. Rain water disposal has been detailed only up to down take rain water pipe. Further disposal of rain water to be as per site situation.				
BOQ for Cluster unit LIG A Option 'B' for Plains Region, using Precast Planks - Joists & Filler slab Roof and masonry in Hydra form Blocks with Red Bricks Bands					
S.No.	Item Description	Unit	Quantity	Rate	Amount (Rs.)
A.0	Civil Works				
1.0	Foundation				
1.1	Earth work in excavation	Cum			
	Earth work in foundation trenches, column pits, drains etc. (not exceeding 1.5m in width or 10 sqm on plan) after clearing of site from bushes vegetation etc., including dressing of sides and ramming of bottoms, surface preparation as per specification to receive the PCC, lift up to 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m.				
1.2	Anti-termite treatment	Sqm			
	Supplying, diluting and injecting chemical emulsion for pre-constructional anti termite treatment and creating a chemical barrier under and all-round the column pits, plinth beams, junction of wall and floor, along the external perimeter of building etc. complete				
	With chlorpyriphos/Landane E.C. 20% with 1% concentration				
1.3	Back filling of earth	Cum			
	Filling available excavated earth (Excluding rock) in trenches, plinth, sides of foundation etc. in layers not exceeding 20Cm. in depth, consolidating each deposited layer by ramming and watering, lead up to 50m. and lift up to 1.5m.				
1.4	PCC in foundation				
	(Providing) & lying in position cement concrete of specified grade including centring & shuttering complete - All work up to plinth level.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum			
b)	1:5:10 (1 cement :5 coarse sand : 10 graded stone aggregate 40mm nominal size)	Cum			
1.5	R.C.C. up to plinth level	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete including centering, shuttering complete but excluding cost of reinforcement - All work up to plinth level.				
1.6	Reinforcement up to plinth level	Kg			
	Providing & fixing Reinforcement for R.C.C. work up to plinth level as specified, including straightening, cutting, bending, placing in position and binding all complete.				
1.7	Brick work in foundation	Cum			
	Brick work with FPS bricks of class designation 75 in foundation and plinth in cement mortar 1:6 (1 cement: 6 coarse sand).				
	Total of Subhead 1.0				
2.0	Super structure				
2.1	masonry work in super structure	Sqm	1292.00		
	220mm thk. masonry work using Stabilised, Hydraulically Compressed Earth Blocks in super structure above plinth level as per the guidelines of Hydra form construction manual.				
2.2	115 thk. wall	Sqm	373.36		
	115mm thk. masonry work using Stabilised, Hydraulically Compressed Earth Blocks in super structure above plinth level as per the guidelines of Hydra form construction manual.				
2.3	Brick work in Red Burnt Bricks	Cum	5.79		

6(g) ANNEXURE-VIII(LIG A-CLUSTER UNIT OPTION-B)

	Brick work in FPS bricks of class designation 75 in rat trap bond in super structure above plinth level in desired pattern in cement mortar 1:4 (1 cement : 4 coarse sand) including finishing in ruled pointing on the external side of wall where ever specified.				
2.4	Brick Jali	Sqm	6.88		
	Brick jali work in desired pattern in parapet wall with FPS bricks of class designation 75 in cement mortar 1:4				
2.5	R.C.C. in super structure	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete in lintel beams, chajjas and counter & Loft slabs etc. in super structure including centering, shuttering complete but excluding cost of reinforcement.				
2.6	Reinforcement in super structure	Kg			
	Providing & fixing Reinforcement for R.C.C. work in lintel, chajjas and counter & Loft slabs in super structure as specified, including straightening, cutting, bending, placing in position and binding all complete.				
2.7	Plain cement concrete				
	Providing and laying plain cement concrete of specified grade as bed concrete under floor, roof slab, plinth protection, cill, coping, shelves, kitchen platform etc. screeding at roof to required slope and other locations as called for laid, consolidated and cured etc. complete as per specification and drawing.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum	62.03		
	Total of Subhead 2.0				
3.0	Wall finishes				
3.1	Providing 12 mm thick cement plaster of mix 1:6 (1 cement: 6 coarse sand).	Sqm	2242.00		
3.2	Lime wash	Sqm	3067.00		
	Providing and applying three or more coats of white wash with lime on wall and ceiling to give an even shade including preparation of surfaces, scaffolding, mixing of indigo blue and DDL adhesive etc. complete.				
3.3	Stone Counters	Sqm	50.40		
	Providing and laying 20mm thk. Kota stone slabs on kitchen counters laid on 20mm thk. Cement mortar 1:3 (1 cement 3 coarse sand). Including rubbing and polishing complete.				
3.4	Coping	Sqm	38.04		
	Providing & fixing 20mm thk. coping of burnt clay paving tile, on window sill & parapet walls in cement mortar 1:6				
3.5	Dado	Sqm	286.80		
	Providing and laying ceramic glazed tiles of size 200x300mm in dado of uniform thickness, size, shade and pattern as approved by Architect/Project Manager laid with rich cement slurry over a bedding plaster of 12 mm thick cement mortar 1:3 (1 cement: 3 fine sand) and grouting the joints with white cement and pigment with matching shade of tile, cutting, curing etc. complete in all respects as per drawing.				
	Total of Subhead 3.0				
4.0	Flooring				
4.1	Terrazzo Tile Flooring	Sqm	799.52		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of size up to 12mm, Light shade using white cement, laid in floors, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 20mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand)				
4.2	Terrazzo Tile Skirting	Sqm	84.62		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of size up to 12mm, Light shade using white cement, in skirting & risers of steps, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 12mm thick cement mortar 1:3 (1 cement : 3 coarse sand)				
4.3	Extra for laying terrazzo flooring on staircase treads not exceeding 30 cm in width, including cost of forming, nosing etc.	Sqm	56.00		
4.4	Ceramic tile Flooring	Sqm	43.20		
	Providing and laying ceramic glazed tile flooring of size 300x300mm of approved make, shade and pattern as approved by Project in charge laid over 20/12 mm average thick bed of cement mortar 1:4 (1 cement : 4 coarse sand), grouting the joints with white cement and pigment to match the shade of tile including cutting, etc. complete in all respects				
4.5	Sand Filling	Cum	26.94		
	Supplying and filling in plinth with sand under floors including watering, ramming,				

6(g) ANNEXURE-VIII(LIG A-CLUSTER UNIT OPTION-B)

	consolidating, and dressing complete.				
	Total of Subhead 4.0				
5.0	Door Windows				
5.1	RCC Frame for door				
	Providing and fixing RCC Frame for door of size given below, out of section 100x50mm, with single or double rebate as required, with holdfasts, finished with enamel paint of approved colour all complete.				
a)	900x2125 mm	Nos.	64.00		
b)	750x2125 mm	Nos.	32.00		
5.2	RCC Frame for windows & ventilators				
	Providing and fixing RCC Frame for windows & ventilators of size given below, out of section 100x50mm, with double rebate and holdfasts, finished with enamel paint of approved colour all complete.				
a)	1200x1200mm	Nos.	32.00		
b)	600x1050mm	Nos.	64.00		
c)	1200x345mm	Nos.	16.00		
d)	600x345mm	Nos.	70.00		
5.3	Door Shutters				
	Providing and fixing door shutter of sizes given below of any of following material as per approval by project in charge/ architect. (Note: Hardware not included in the item, to be as per selection)				
i)	Wooden panelled door shutter using local wood as per approval, 12mm thk. particle board / M.S. jali as per requirement of panel including finishing with enamel paint of approved colour all complete.				
ii)	Wooden panelled door shutter using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm in panels including finishing with enamel paint of approved colour all complete.				
iii)	24 mm thick factory made PVC door shutters made of styles and rails of an uPVC hollow section of size 59x24 mm and wall thickness 2 mm (± 0.2 mm) with inbuilt edging on both sides. Complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter).				
iv)	Providing and fixing 35mm thk. ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
v)	Bamboo door shutters				
a)	800x2075mm	Nos.	64.00		
b)	650x2075mm	Nos.	32.00		
5.4	Window Shutters for windows & ventilators				
i)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing 5mm thk. clear float glass of approved make, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
a)	550x1100mm	Nos.	32.00		
b)	500x950mm	Nos.	64.00		
c)	1100x245mm	Nos.	16.00		
d)	500x245mm	Nos.	70.00		
ii)	Providing and fixing Wooden panelled shutter for windows ventilators of given size using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
iii)	Bamboo Window Shutter				
a)	550x1100mm	Nos.	32.00		
b)	500x950mm	Nos.	64.00		
c)	1100x245mm	Nos.	16.00		
d)	500x245mm	Nos.	70.00		
	Total of Subhead 5.0				
6.0	Roofing				
6.1	RCC Plank and Joist system	Sqm	720.00		
	Providing and Laying precast RCC planks and joists system for roof slab and beams as per related training and including providing & laying necessary cast in situ RCC and reinforcement as specified in structural drawings, centering & shuttering				

6(g) ANNEXURE-VIII(LIG A-CLUSTER UNIT OPTION-B)

	complete, excluding the cost of reinforcement.				
6.2	Filler material for Filler slab	Sqm	160.00		
	Providing & laying as per instruction, stabilised mud blocks 50mm thk. during casting of Filler slab.				
6.3	Ceiling plaster	Sqm	825.20		
	Providing 10 mm thick cement plaster of mix 1:4 (1 cement : 4 coarse sand) in ceiling.				
6.4	Sunken area filling	Cum	30.00		
	Providing and laying on sunken areas broken light weight concrete block bats of approximately 600 kg. per cum density laid, consolidated, finished smooth, including finished & grouting the top layer with water proof cement mortar with CICO or equivalent brand.				
6.5	Hot Bitumen layer	Sqm	260.75		
	Providing layer of residual type petroleum bitumen of penetration 80/100 of approved quality at 17kg per 10sqm impregnated with a coat of coarse sand layer at 60 cum per 10sqm including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete.				
6.6	Mud phuska	Cum	49.00		
	Providing and laying 150mm thick (average) mud phuska of damped brick earth on roof laid to slope consolidated and plastered with 25mm thk. mud mortar mixed with bhusa at 35kg per cum of earth and gobri leaping with mix 1:1 (1 clay : 1 cow dung).				
6.7	Ceramic broken tiles	Sqm	245.00		
	Providing and laying broken ceramic glazed tiles on roof including filling the gaps with cement mortar 1:4 (1cement: 4 coarse sand) mized with 2% integral water proofing compound laid over a bed of 20mm thk cement mortar 1:4 and finished neat complete.				
6.7	Cement Gola	Rmt	105.00		
	Providing Gola in cement concrete 1:2:4 (1 cement :2 coarse sand: 4 graded stone aggregate 10 mm nominal size) including finishing with cement mortar 1:3 (1 cement : 3 sand) as per standard design.				
	Total of Subhead 6.0				
7.0	Miscellaneous				
7.1	Making khurras 450x450 with average minimum thickness of 50mm cement concrete 1:2:4 over PVC sheet 1mx1mx400micron, finished with 12mm cement plaster 1:3 and a coat of neat cement rounding the edges and making and finishing the outlet complete.	Nos	9.00		
7.2	Providing and fixing 110mm dia PVC rain water pipes of approved make to withstand a test pressure of 4.0kg/sqcm. including all fittings bends, sockets, elbow, tees, clamps, Y - Junction with cover (for collecting rainwater) including testing of joints etc. complete.	Rmt	117.00		
	Total of Subhead 7.0				
	Total of "A"				

6(h) ANNEXURE-IX (LIG B-INDIVIDUAL UNIT-OPTION-A)

Summary of BOQ for LIG'B' Individual unit Option 'A' for Plains Region, using Precast Ferrocement Channels & Micro Concrete Tiles Roof and Masonry work in Stabilised Comressed Earth Bricks					
S.No.	Description	Amount (Rs.)			
A.0	Civil Works				
1.0	Foundation				
2.0	Super structure				
3.0	Wall finishes				
4.0	Flooring				
5.0	Door & Windows				
6.0	Roofing				
7.0	Miscellaneous Works				
8.0	Plumbing				
9.0	Electrical				
	Total				
Note:	1. Rain water disposal has been detailed only up to downtake rain water pipe. Further disposal of rain water to be as per site situation.				
BOQ for LIG'B' Individual unit Option 'A' for Plains Region, using Precast Ferro cement Channels & Micro Concrete Tiles Roof and Masonry work in Stabilised Compressed Earth Bricks					
S.No.	Item Description	Unit	Quantity	Rate	Amount (Rs.)
A.0	Civil Works				
1.0	Foundation				
1.1	Earth work in excavation	Cum			
	Earth work in foundation trenches, column pits, drains etc. (not exceeding 1.5m in width or 10 sqm on plan) after clearing of site from bushes vegetation etc., including dressing of sides and ramming of bottoms, surface preparation as per specification to receive the PCC, lift up to 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m.				
1.2	Anti-termite treatment	Sqm			
	Supplying, diluting and injecting chemical emulsion for pre-constructional anti termite treatment and creating a chemical barrier under and all-round the column pits, plinth beams, junction of wall and floor, along the external perimeter of building etc. complete				
	With chlorpyriphos /Landane E.C. 20% with 1% concentration				
1.3	Back filling of earth	Cum			
	Filling available excavated earth (Excluding rock) in trenches, plinth, sides of foundation etc. in layers not exceeding 20Cm. in depth, consolidating each deposited layer by ramming and watering, lead up to 50m. and lift up to 1.5m.				
1.4	D.P.C.	Sqm	10.23		
	Providing and laying damp proof course 40 mm thick with cement concrete 1:2:4 (1 cement :2 coarse sand: 4 graded stone aggregate 12.5 mm nominal size) and applying a coat of residual petroleum bitumen of penetration 80/100 of approved quality.				
1.5	PCC in foundation				
	(Providing) & laying in position cement concrete of specified grade including centring & shuttering complete - All work up to plinth level.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum			
b)	1:5:10 (1 cement :5 coarse sand : 10 graded stone aggregate 40mm nominal size)	Cum			
1.6	R.C.C. up to plinth level	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete including centering, shuttering complete but excluding cost of reinforcement - All work up to plinth level.				
1.7	Reinforcement up to plinth level	Kg			
	Providing & fixing Reinforcement for R.C.C. work up to plinth level as specified, including straightening, cutting, bending, placing in position and binding.				
1.8	Brick work in foundation	Cum			
	Brick work with FPS bricks of class designation 75 in foundation and plinth in cement mortar 1:6 (1 cement: 6 coarse sand).				
	Total of Subhead 1.0				
2.0	Super structure				
2.1	Masonry work in super structure	Sqm	92.95		
	230mm thk. Brickwork using Stabilised, Hydraulically Compressed Earth Bricks (230115x75mm) in rat trap bond in super structure above plinth level as per the guidelines of Hydra form construction manual.				

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2.2	115 thk. wall	Sqm	6.45		
	115mm thk. Brick work using Stabilised, Hydraulically Compressed Earth Bricks in super structure above plinth level, in cement mortar 1:6, including providing & placing in position 2 nos. 6mm dia. M.S. bars at every third course, as per the guidelines of Hydra form construction manual.				
2.3	Red Brick Bands	Cum	1.04		
	Brick work in FPS bricks of class designation 75 in super structure above plinth level in desired pattern in cement mortar 1:4 (1 cement : 4 coarse sand) including finishing in ruled pointing on the external side of wall where ever specified.				
2.4	Brick work in Parapet wall	Sqm	12.43		
	Brick work with Brickwork using Stabilised, Hydraulically Compressed Earth Bricks (230x115x75mm) in parapet wall in English bond in cement mortar 1:6 (1 cement : 6 coarse sand)				
2.5	Red Brick Jali	Sqm	0.89		
	Brick jali work in desired pattern in parapet wall with FPS bricks of class designation 75 in cement mortar 1:4				
2.6	R.C.C. in super structure	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete in lintel beams, chajjas and counter & Loft slabs etc. in super structure including centering, shuttering complete but excluding cost of reinforcement.				
2.7	Reinforcement in super structure	Kg			
	Providing & fixing Reinforcement for R.C.C. work in lintel, chajjas and counter & Loft slabs in super structure as specified, including straightening, cutting, bending, placing in position and binding all complete.				
2.8	Plain cement concrete				
	Providing and laying plain cement concrete of specified grade as bed concrete under floor, roof slab, plinth protection, cill, coping, shelves, kitchen platform etc. screeding at roof to required slope and other locations as called for laid, consolidated and cured etc. complete as per specification and drawing.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum	4.10		
	Total of Subhead 2.0				
3.0	Wall finishes				
3.1	Providing 12 mm thick cement plaster of mix 1:6 (1 cement: 6 coarse sand).	Sqm	154.50		
3.2	Lime wash	Sqm	154.50		
	Providing and applying three or more coats of white wash with lime on wall and ceiling to give an even shade including preparation of surfaces, scaffolding, mixing of indigo blue and DDL adhesive etc. complete.				
3.3	Stone Counters	Sqm	2.00		
	Providing and laying 20mm thk. Kota stone slabs on kitchen counters laid on 20mm thk. Cement mortar 1:3 (1 cement 3 coarse sand). Including rubbing and polishing complete.				
3.4	Coping	Sqm	7.23		
	Providing & fixing 20mm thk. coping of burnt clay paving tile, on window sill & parapet walls in cement mortar 1:6				
3.5	Dado	Sqm	25.67		
	Providing and laying ceramic glazed tiles of size 200x300mm in dado of uniform thickness, size, shade and pattern as approved by Architect/Project Manager laid with rich cement slurry over a bedding plaster of 12 mm thick cement mortar 1:3 (1 cement: 3 fine sand) and grouting the joints with white cement and pigment with matching shade of tile, cutting, curing etc. complete in all respects as per drawing.				
	Total of Subhead 3.0				
4.0	Flooring				
4.1	Terrazzo Tile Flooring	Sqm	48.57		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of size up to 12mm, Light shade using white cement, laid in floors, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 20mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand)				
4.2	Paving Tiles flooring	Sqm	9.30		
	Providing & fixing 20mm thk. burnt clay paving tile flooring on 20mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand), jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing.				
4.3	Terrazzo Tile Skirting	Sqm	4.20		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of				

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	size up to 12mm, Light shade using white cement, in skirting jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 12mm thick cement mortar 1:3 (1 cement : 3 coarse sand)				
4.4	Ceramic tile Flooring	Sqm	4.83		
	Providing and laying ceramic glazed tile flooring of size 300x300mm of approved make, shade and pattern as approved by Project in charge laid over 20/12 mm average thick bed of cement mortar 1:4 (1 cement : 4 coarse sand), grouting the joints with white cement and pigment to match the shade of tile including cutting, etc. complete in all respects				
4.5	Sand Filling	Cum	7.95		
	Supplying and filling in plinth with sand under floors including watering, ramming, consolidating, and dressing complete.				
	Total of Subhead 4.0				
5.0	Door Windows				
5.1	RCC Frame for door				
	Providing and fixing RCC Frame for door of size given below, out of section 100x50mm, with single or double rebate as required, with holdfasts, finished with enamel paint of approved colour all complete.				
a)	900 x 2125mm	Nos.	4.00		
b)	750 x 2125mm	Nos.	2.00		
5.2	RCC Frame for windows & ventilators				
	Providing and fixing RCC Frame for windows & ventilators of size given below, out of section 100x50mm, with double rebate and holdfasts, finished with enamel paint of approved colour all complete.				
a)	1200x1200mm	Nos.	4.00		
b)	600x1050mm	Nos.	3.00		
c)	600x500mm	Nos.	3.00		
d)	1200x500mm	Nos.	2.00		
5.3	Door Shutters				
	Providing and fixing door shutter of sizes given below of any of following material as per approval by project in charge/ architect. (Note: Hardware not included in the item, to be as per selection)				
i)	Wooden panelled door shutter using local wood as per approval, 12mm thk. particle board / M.S. jali as per requirement of panel including finishing with enamel paint of approved colour all complete.				
ii)	Wooden panelled door shutter using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm in panels including finishing with enamel paint of approved colour.				
iii)	24 mm thick factory made PVC door shutters made of styles and rails of an uPVC hollow section of size 59x24 mm and wall thickness 2 mm (± 0.2 mm) with inbuilt edging on both sides. Complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter).				
iv)	Providing and fixing 35mm thk. ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
v)	Bamboo door shutters				
a)	800 x 2075mm	Nos.	6.00		
b)	650 x 2075mm	Nos.	2.00		
5.4	Window Shutters for windows & ventilators				
i)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing 5mm thk. clear float glass of approved make, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
a)	550x1100mm	Nos.	8.00		
b)	500x950mm	Nos.	3.00		
c)	500x400mm	Nos.	3.00		
d)	1100x400mm	Nos.	2.00		
ii)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				

6(h) ANNEXURE-IX (LIG B-INDIVIDUAL UNIT-OPTION-A)

iii)	Bamboo Window Shutter				
a)	550x1100mm	Nos.	8.00		
b)	500x950mm	Nos.	3.00		
c)	500x400mm	Nos.	3.00		
d)	1100x400mm	Nos.	2.00		
	Total of Subhead 5.0				
6.0	Roofing				
6.1	Precast Ferro cement Channel system	Sqm	64.00		
	Providing and Laying precast Ferro cement Channels for roof as per related training and including providing & laying necessary cast in situ RCC and reinforcement as specified in structural drawings, centering & shuttering complete, excluding the cost of reinforcement.				
6.2	Concrete Filling in Channels valley	Cum	1.00		
	Providing & laying in position cement concrete (1:2:4) in valley of Ferro cement Channels including centring & shuttering complete.				
6.3	Micro Concrete Tile Roofing	Sqm	9.30		
	Providing prefabricated corrugated MCR tile roofing (pan or roman as approved) and fixing the tiles to M.S. purlins with G.I wire with proper overlaps and interlocks, joints between ridge tiles on doubly pitched roofs sealed with rich cement sand mortar all complete as per approval of project manager, including providing and fixing ridge tiles, gutter, M.S. purlins, cleats/ flats/ angles, flashing and rafters as specified in structural drawings. Work to be complete in all respect including hoisting at all heights, cutting, welding, smooth grinding of all welding joints, applying derusting primer coat, three or more coats of synthetic enamel paint etc. on M.S. members.				
6.4	Ceiling plaster	Sqm	Rate only		
	Providing 10 mm thick cement plaster of mix 1:4 (1 cement: 4 coarse sand) in ceiling.				
6.4	Hot Bitumen layer	Sqm	60.95		
	Providing layer of residual type petroleum bitumen of penetration 80/100 of approved quality at 17kg per 10sqm impregnated with a coat of coarse sand layer at 60 cudm per 10sqm including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete.				
6.5	Mud phuska	Cum	11.20		
	Providing and laying 100mm thick (average) mud phuska of damped brick earth on roof laid to slope consolidated and plastered with 25mm thk. mud mortar mixed with bhusha at 35kg per cum of earth and gobri leaping with mix 1:1 (1clay: 1 cow dung).				
6.6	Ceramic broken tiles	Sqm	56.00		
	Providing and laying broken ceramic glazed tiles on roof including filling the gaps with cement mortar 1:4 (1cement: 4 coarse sand) mixed with 2% integral water proofing compound laid over a bed of 20mm thk cement mortar 1:4 and finished neat complete.				
6.7	Cement Gola	Rmt	33.00		
	Providing Gola in cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 10 mm nominal size) including finishing with cement mortar 1:3 (1 cement: 3 sand) as per standard design.				
	Total of Subhead 6.0				
7.0	Miscellaneous				
7.1	Making khurras 1'-6"x1'-6" with average minimum thickness of 2" cement concrete 1:2:4 over PVC sheet 1mx1mx400micron, finished with 12mm cement plaster 1:3 and a coat of neat cement rounding the edges and making and finishing the outlet complete.	Nos	2.00		
7.2	Providing and fixing 110mm dia PVC rain water pipes of approved make to withstand a test pressure of 4.0kg/sqcm. including all fittings bends, sockets, elbow, tees, clamps, Y - Junction with cover (for collecting rainwater) including testing of joints etc. complete.	Rmt	6.00		
7.3	M.S. Grill	Sqm	7.75		
	Providing and fixing in position M.S. Grill made of 10x10mm m.s. square rods fixed at 150mm avg. c/c in both directions & 25x3mm flat all around to fix the grill to window, complete including grinding, providing two coats of red oxide primer and three or more coats of synthetic enamel paint of approved colour.				
	Total of Subhead 7.0				
	Total of "A"				

6(i) ANNEXURE-X (LIG B-INDIVIDUAL UNIT-OPTION-B)

Summary of BOQ for LIG'B' Individual unit Option 'B' for Plains Region, using Precast Brick Arch Panels & Micro Concrete Tiles Roof and Masonry work in Solid Concrete Blocks					
S.No.	Description	Amount (Rs.)			
A.0	Civil Works				
1.0	Foundation				
2.0	Super structure				
3.0	Wall finishes				
4.0	Flooring				
5.0	Door & Windows				
6.0	Roofing				
7.0	Miscellaneous Works				
8.0	Plumbing				
9.0	Electrical				
	Total				
Note:	1. Rain water disposal has been detailed only up to down take rain water pipe. Further disposal of rain water to be as per site situation.				
BOQ for LIG'B' Individual unit Option 'A' for Plains Region, using Precast Brick Arch Panels & Micro Concrete Tiles Roof and Masonry work in Solid Concrete Blocks					
S.No.	Item Description	Unit	Quantity	Rate	Amount (Rs.)
A.0	Civil Works				
1.0	Foundation				
1.1	Earth work in excavation	Cum			
	Earth work in foundation trenches, column pits, drains etc. (not exceeding 1.5m in width or 10 sqm on plan) after clearing of site from bushes vegetation etc., including dressing of sides and ramming of bottoms, surface preparation as per specification to receive the PCC, lift up to 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m.				
1.2	Anti-termite treatment	Sqm			
	Supplying, diluting and injecting chemical emulsion for pre-constructional anti termite treatment and creating a chemical barrier under and all-round the column pits, plinth beams, junction of wall and floor, along the external perimeter of building etc. complete				
	With chlorpyrifos/Landane E.C. 20% with 1% concentration				
1.3	Back filling of earth	Cum			
	Filling available excavated earth (Excluding rock) in trenches, plinth, sides of foundation etc. in layers not exceeding 20Cm. in depth, consolidating each deposited layer by ramming and watering, lead up to 50m. and lift up to 1.5m.				
1.4	D.P.C.	Sqm	9.15		
	Providing and laying damp proof course 40 mm thick with cement concrete 1:2:4 (1 cement :2 coarse sand: 4 graded stone aggregate 12.5 mm nominal size) and applying a coat of residual petroleum bitumen of penetration 80/100 of approved quality.				
1.5	PCC in foundation				
	(Providing) & laying in position cement concrete of specified grade including centring & shuttering complete - All work up to plinth level.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum			
b)	1:5:10 (1 cement :5 coarse sand : 10 graded stone aggregate 40mm nominal size)	Cum			
1.6	R.C.C. up to plinth level	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete including centering, shuttering complete but excluding cost of reinforcement - All work up to plinth level.				
1.7	Reinforcement up to plinth level	Kg			
	Providing & fixing Reinforcement for R.C.C. work up to plinth level as specified, including straightening, cutting, bending, placing in position and binding all complete.				
1.8	Solid Concrete Blocks Masonry work in foundation	Cum			
	Masonry work in Solid Concrete Blocks in foundation and plinth in cement mortar 1:6 (1 cement: 6 coarse sand).				
	Total of Subhead 1.0				
2.0	Super structure				
2.1	Solid Concrete Blocks Masonry work in super structure	Nos.	2397.77		
	Masonry work in Precast Solid Concrete Blocks (300x200x150), with density not less than 1800 kg/m3, minimum average compressive strength of 5 N/mm2, in cement mortar 1:4 (1 cement : 4 coarse sand) in super structure above plinth level including finishing in ruled pointing on the external side of wall.				

6(i) ANNEXURE-X (LIG B-INDIVIDUAL UNIT-OPTION-B)

2.2	Hollow concrete Blocks Jali	Sqm	0.95		
	Masonry work in Precast Hollow Concrete Blocks with open cavity, Non-load bearing units of density between 1000-1500 kg/m ³ , minimum average compressive strength of 1.5 N/mm ² . (150x200x150) in cement mortar 1:4 (1 cement: 4 coarse sand) in parapet wall.				
2.3	Hollow concrete Blocks Masonry	Sqm	2.00		
	Masonry work in Precast Hollow Concrete Blocks (300x200x150), load bearing units with density between 1000 – 1500 kg/m ³ , minimum average compressive strength of 3 N/mm ² , in cement mortar 1:4 (1 cement : 4 coarse sand) in parapet wall.				
2.2	115 thk. wall	Sqm	8.93		
	Half brick masonry with Fly ash bricks (FALG bricks) conforming to class 'A' in super structure above plinth level in cement mortar 1:6, including providing & placing in position 2 nos. 6mm dia. M.S. bars at every third course.				
2.5	R.C.C. in super structure	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete in lintel beams, chajjas and counter & Loft slabs etc. in super structure including centering, shuttering complete but excluding cost of reinforcement.				
2.6	Reinforcement in super structure	Kg			
	Providing & fixing Reinforcement for R.C.C. work in lintel, chajjas and counter & Loft slabs in super structure as specified, including straightening, cutting, bending, placing in position and binding all complete.				
2.7	Plain cement concrete				
	Providing and laying plain cement concrete of specified grade as bed concrete under floor, roof slab, plinth protection, cill, coping, shelves, kitchen platform etc. screeding at roof to required slope and other locations as called for laid, consolidated and cured etc. complete as per specification and drawing.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum	4.77		
	Total of Subhead 2.0				
3.0	Wall finishes				
3.1	Providing 12 mm thick cement plaster of mix 1:6 (1 cement: 6 coarse sand).	Sqm	202.64		
3.2	Lime wash	Sqm	262.64		
	Providing and applying three or more coats of white wash with lime on wall and ceiling to give an even shade including preparation of surfaces, scaffolding, mixing of indigo blue and DDL adhesive etc. complete.				
3.3	Stone Counters	Sqm	5.30		
	Providing and laying 20mm thk. Kota stone slabs on kitchen counters laid on 20mm thk. Cement mortar 1:3 (1 cement 3 coarse sand). Including rubbing and polishing complete.				
3.4	Coping	Sqm	8.96		
	Providing & fixing 20mm thk. coping of burnt clay paving tile, on window sill & parapet walls in cement mortar 1:6				
3.5	Dado	Sqm	35.34		
	Providing and laying ceramic glazed tiles of size 200x300mm in dado of uniform thickness, size, shade and pattern as approved by Architect/Project Manager laid with rich cement slurry over a bedding plaster of 12 mm thick cement mortar 1:3 (1 cement: 3 fine sand) and grouting the joints with white cement and pigment with matching shade of tile, cutting, curing etc. complete in all respects as per drawing.				
	Total of Subhead 3.0				
4.0	Flooring				
4.1	Terrazzo Tile Flooring	Sqm	51.20		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of size up to 12mm, Light shade using white cement, laid in floors, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 20mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand)				
4.2	Paving Tiles flooring	Sqm	8.10		
	Providing & fixing 20mm thk. burnt clay paving tile flooring on 20mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand), jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete				
4.3	Terrazzo Tile Skirting	Sqm	4.52		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of size up to 12mm, Light shade using white cement, in skirting jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing				

6(i) ANNEXURE-X (LIG B-INDIVIDUAL UNIT-OPTION-B)

	and polishing complete with precast tiles on 12mm thick cement mortar 1:3 (1 cement : 3 coarse sand)				
4.4	Ceramic tile Flooring	Sqm	8.80		
	Providing and laying ceramic glazed tile flooring of size 300x300mm of approved make, shade and pattern as approved by Project in charge laid over 20/12 mm average thick bed of cement mortar 1:4 (1 cement : 4 coarse sand), grouting the joints with white cement and pigment to match the shade of tile including cutting, etc. complete in all respects				
4.5	Sand Filling	Cum	8.90		
	Supplying and filling in plinth with sand under floors including watering, ramming, consolidating, and dressing complete.				
	Total of Subhead 4.0				
5.0	Door Windows				
5.1	RCC Frame for door				
	Providing and fixing RCC Frame for door of size given below, out of section 100x50mm, with single or double rebate as required, with holdfasts, finished with enamel paint of approved colour all complete.				
a)	900 x 2080mm	Nos.	4.00		
b)	750 x 2080mm	Nos.	2.00		
5.2	RCC Frame for windows & ventilators				
	Providing and fixing RCC Frame for windows & ventilators of size given below, out of section 100x50mm, with double rebate and holdfasts, finished with enamel paint of approved colour all complete.				
a)	1200x1100mm	Nos.	4.00		
b)	600x950mm	Nos.	3.00		
c)	1200x475mm	Nos.	2.00		
d)	600x475mm	Nos.	2.00		
5.3	Door Shutters				
	Providing and fixing door shutter of sizes given below of any of following material as per approval by project in charge/ architect. (Note: Hardware not included in the item, to be as per selection)				
i)	Wooden panelled door shutter using local wood as per approval, 12mm thk. particle board / M.S. jali as per requirement of panel including finishing with enamel paint of approved colour all complete.				
ii)	Wooden panelled door shutter using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm in panels including finishing with enamel paint of approved colour all complete.				
iii)	24 mm thick factory made PVC door shutters made of styles and rails of an uPVC hollow section of size 59x24 mm and wall thickness 2 mm (± 0.2 mm) with inbuilt edging on both sides. Complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter).				
iv)	Providing and fixing 35mm thk. ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
v)	Bamboo door shutters				
a)	800 x 2030mm	Nos.	6.00		
b)	650 x 2030mm	Nos.	2.00		
5.4	Window Shutters for windows & ventilators				
i)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing 5mm thk. clear float glass of approved make, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
a)	550x1000mm	Nos.	8.00		
b)	500x850mm	Nos.	3.00		
c)	1100x375mm	Nos.	2.00		
d)	500x375mm	Nos.	2.00		
ii)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
iii)	Bamboo Window Shutter				

6(i) ANNEXURE-X (LIG B-INDIVIDUAL UNIT-OPTION-B)

a)	550x1000mm	Nos.	8.00		
b)	500x850mm	Nos.	3.00		
c)	1100x375mm	Nos.	2.00		
d)	500x375mm	Nos.	2.00		
	Total of Subhead 5.0				
6.0	Roofing				
6.1	Precast Arch Panel system	Sqm	70.70		
	Providing and Laying precast Arch Panels & Precast RCC Beams for roof as per related training and including providing & laying necessary cast in situ RCC and reinforcement as specified in structural drawings , centering & shuttering complete, excluding the cost of reinforcement.				
6.2	Micro Concrete Tile Roofing	Sqm	8.80		
	Providing prefabricated corrugated MCR tile roofing (pan or roman as approved) and fixing the tiles to M.S. purlins with G.I wire with proper overlaps and interlocks, joints between ridge tiles on doubly pitched roofs sealed with rich cement sand mortar all complete as per approval of project manager, including providing and fixing ridge tiles, gutter, M.S. purlins, cleats/ flats/ angles, flashing and rafters as specified in structural drawings. Work to be complete in all respect including hoisting at all heights, cutting, welding, smooth grinding of all welding joints, applying derusting primer coat, three or more coats of synthetic enamel paint etc. on M.S. members.				
6.3	Ceiling plaster	Sqm	60.00		
	Providing 10 mm thick cement plaster of mix 1:4 (1 cement: 4 coarse sand) in ceiling.				
6.4	Hot Bitumen layer	Sqm	69.66		
	Providing layer of residual type petroleum bitumen of penetration 80/100 of approved quality at 17kg per 10sqm impregnated with a coat of coarse sand layer at 60 cum per 10sqm including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete.				
6.5	Mud phuska	Cum	12.90		
	Providing and laying 100mm thick (average) mud phuska of damped brick earth on roof laid to slope consolidated and plastered with 25mm thk. mud mortar mixed with bhusa at 35kg per cum of earth and gobri leaping with mix 1:1 (1clay: 1 cow dung).				
6.6	Ceramic broken tiles	Sqm	64.50		
	Providing and laying broken ceramic glazed tiles on roof including filling the gaps with cement mortar 1:4 (1cement: 4 coarse sand) mixed with 2% integral water proofing compound laid over a bed of 20mm thk cement mortar 1:4 and finished neat complete.				
6.7	Cement Gola	Rmt	34.40		
	Providing Gola in cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 10 mm nominal size) including finishing with cement mortar 1:3 (1 cement: 3 sand) as per standard design.				
	Total of Subhead 6.0				
7.0	Miscellaneous				
7.1	Making khurras 1'-6"x1'-6" with average minimum thickness of 2" cement concrete 1:2:4 over PVC sheet 1mx1mx400micron, finished with 12mm cement plaster 1:3 and a coat of neat cement rounding the edges and making and finishing the outlet complete.	Nos	2.00		
7.2	Providing and fixing 110mm dia PVC rain water pipes of approved make to withstand a test pressure of 4.0kg/sqcm. including all fittings bends, sockets, elbow, tees, clamps, Y - Junction with cover (for collecting rainwater) including testing of joints etc. complete.	Rmt	6.00		
7.3	M.S. Grill	Sqm	6.88		
	Providing and fixing in position M.S. Grill made of 10x10mm m.s. square rods fixed at 150mm avg. c/c in both directions & 25x3mm flat all around to fix the grill to window, complete including grinding, providing two coats of red oxide primer and three or more coats of synthetic enamel paint of approved colour.				
7.4	Concrete jali	Sqm	0.54		
	Providing and fixing pre-fabricated Cement Concrete jali of approved pattern with cement mortar 1:4.				
	Total of Subhead 7.0				
	Total of "A"				

6(j) ANNEXURE-XI (LIG B-CLUSTER UNIT-OPTION-A)

Summary of BOQ for Cluster unit LIG B Option 'A' for Plains Region, using Filler slab Roof and Masonry in Fly ash bricks in Rat trap Bond with Red Bricks Bands					
S.No.	Description	Amount (Rs.)			
A.0	Civil Works				
1.0	Foundation				
2.0	Super structure				
3.0	Wall finishes				
4.0	Flooring				
5.0	Door & Windows				
6.0	Roofing				
7.0	Miscellaneous				
8.0	Plumbing				
9.0	Electrical				
	Total				
Note:	1. Estimated Cost is the cost of complete cluster (16 units)				
	2. Rain water disposal has been detailed only up to down take rain water pipe. Further disposal of rain water to be as per site situation.				
BOQ for Cluster unit LIG B Option 'A' for Plains Region, using Filler slab Roof and Masonry in Fly ash bricks in Rat trap Bond with Red Bricks Bands					
S.No.	Item Description	Unit	Quantity	Rate	Amount (Rs.)
A.0	Civil Works				
1.0	Foundation				
1.1	Earth work in excavation	Cum			
	Earth work in foundation trenches, column pits, drains etc. (not exceeding 1.5m in width or 10 sqm on plan) after clearing of site from bushes vegetation etc., including dressing of sides and ramming of bottoms, surface preparation as per specification to receive the PCC, lift up to 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m.				
1.2	Anti-termite treatment	Sqm			
	Supplying, diluting and injecting chemical emulsion for pre-constructional anti termite treatment and creating a chemical barrier under and all-round the column pits, plinth beams, junction of wall and floor, along the external perimeter of building etc. complete				
	With chlorpyriphos/Landane E.C. 20% with 1% concentration				
1.3	Back filling of earth	Cum			
	Filling available excavated earth (Excluding rock) in trenches, plinth, sides of foundation etc. in layers not exceeding 20Cm. in depth, consolidating each deposited layer by ramming and watering, lead up to 50m. and lift up to 1.5m.				
1.4	PCC in foundation				
	(Providing) & laying in position cement concrete of specified grade including centring & shuttering complete - All work up to plinth level.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum			
b)	1:5:10 (1 cement :5 coarse sand : 10 graded stone aggregate 40mm nominal size)	Cum			
1.5	R.C.C. up to plinth level	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete including centering, shuttering complete but excluding cost of reinforcement - All work up to plinth level.				
1.6	Reinforcement up to plinth level	Kg			
	Providing & fixing Reinforcement for R.C.C. work up to plinth level as specified, including straightening, cutting, bending, placing in position and binding all complete.				
1.7	Brick work in foundation	Cum			
	Brick work with FPS bricks of class designation 75 in foundation and plinth in cement mortar 1:6 (1 cement: 6 coarse sand).				
	Total of Subhead 1.0				
2.0	Super structure				
2.1	Brick work in super structure	Cum	489.50		
	230mm thk. Brick work with Fly ash bricks (FALG bricks) conforming to class 'A' in rat trap bond in cement mortar 1:4 (1 cement : 4 coarse sand) in super structure above plinth level including finishing in ruled pointing on the external side of wall.				
2.2	Brick work in Red Burnt Bricks	Cum	21.93		
	Brick work in FPS bricks of class designation 75 in rat trap bond in super structure above plinth level in desired pattern in cement mortar 1:4 (1 cement : 4 coarse sand) including finishing in ruled pointing on the external side of wall where ever specified.				
2.3	Brick work in Parapet wall	Cum	48.78		

6(j) ANNEXURE-XI (LIG B-CLUSTER UNIT-OPTION-A)

	Brick work with Fly ash bricks (FALG bricks) conforming to class 'A' in parapet wall in English bond in cement mortar 1:6 (1 cement : 6 coarse sand)				
2.4	115mm thk brick wall	Sqm	92.45		
	Half brick masonry with Fly ash bricks (FALG bricks) conforming to class 'A' in super structure above plinth level in cement mortar 1:6, including providing & placing in position 2 nos. 6mm dia. M.S. bars at every third course.				
2.4	Brick Jali	Sqm	10.92		
	Brick jali work in desired pattern in parapet wall with FPS bricks of class designation 75 in cement mortar 1:4				
2.5	R.C.C. in super structure	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete in lintel beams, chajjas and counter & Loft slabs etc. in super structure including centering, shuttering complete but excluding cost of reinforcement.				
2.6	Reinforcement in super structure	Kg			
	Providing & fixing Reinforcement for R.C.C. work in lintel, chajjas and counter & Loft slabs in super structure as specified, including straightening, cutting, bending, placing in position and binding all complete.				
2.7	Plain cement concrete				
	Providing and laying plain cement concrete of specified grade as bed concrete under floor, roof slab, plinth protection, cill, coping, shelves, kitchen platform etc. screeding at roof to required slope and other locations as called for laid, consolidated and cured etc. complete as per specification and drawing.				
a)	1:4:8 (1 cement : 4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum	43.50		
	Total of Subhead 2.0				
3.0	Wall finishes				
3.1	Providing 12 mm thick cement plaster of mix 1:6 (1 cement: 6 coarse sand).	Sqm	3110.79		
3.2	Lime wash	Sqm	4238.79		
	Providing and applying three or more coats of white wash with lime on wall and ceiling to give an even shade including preparation of surfaces, scaffolding, mixing of indigo blue and DDL adhesive etc. complete.				
3.3	Stone Counters	Sqm	43.20		
	Providing and laying 20mm thk. Kota stone slabs on kitchen counters laid on 20mm thk. Cement mortar 1:3 (1 cement 3 coarse sand). Including rubbing and polishing complete.				
3.4	Coping	Sqm	88.08		
	Providing & fixing 20mm thk. coping of burnt clay paving tile, on window sill & parapet walls in cement mortar 1:6				
3.5	Dado	Sqm	444.53		
	Providing and laying ceramic glazed tiles of size 200x300mm in dado of uniform thickness, size, shade and pattern as approved by Architect/Project Manager laid with rich cement slurry over a bedding plaster of 12 mm thick cement mortar 1:3 (1 cement: 3 fine sand) and grouting the joints with white cement and pigment with matching shade of tile, cutting, curing etc. complete in all respects as per drawing.				
	Total of Subhead 3.0				
4.0	Flooring				
4.1	Terrazzo Tile Flooring	Sqm	937.60		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of size up to 12mm, Light shade using white cement, laid in floors, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 20mm thick bed of cement mortar 1:4 (1 cement : 4 coarse sand)				
4.2	Terrazzo Tile Skirting	Sqm	76.78		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of size up to 12mm, Light shade using white cement, in skirting & steps risers jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 12mm thick cement mortar 1:3 (1 cement : 3 coarse sand)				
4.3	Extra for laying terrazzo flooring on staircase treads not exceeding 30 cm in width, including cost of forming, nosing etc.	Sqm	56.00		
4.4	Ceramic tile Flooring	Sqm	84.80		
	Providing and laying ceramic glazed tile flooring of size 300x300mm of approved make, shade and pattern as approved by Project in charge laid over 20/12 mm average thick bed of cement mortar 1:4 (1 cement : 4 coarse sand), grouting the joints with white cement and pigment to match the shade of tile including cutting, etc. complete in all respects				

6(j) ANNEXURE-XI (LIG B-CLUSTER UNIT-OPTION-A)

4.5	Sand Filling	Cum	8.40		
	Supplying and filling in plinth with sand under floors including watering, ramming, consolidating, and dressing complete.				
	Total of Subhead 4.0				
5.0	Door Windows				
5.1	RCC Frame for door				
	Providing and fixing RCC Frame for door of size given below, out of section 100x50mm, with single or double rebate as required, with holdfasts, finished with enamel paint of approved colour all complete.				
a)	900x2085mm	Nos.	64.00		
b)	750x2085 mm	Nos.	64.00		
5.2	RCC Frame for windows & ventilators				
	Providing and fixing RCC Frame for windows & ventilators of size given below, out of section 100x50mm, with double rebate and holdfasts, finished with enamel paint of approved colour all complete.				
a)	1200x1200 mm	Nos.	72.00		
b)	600x1050 mm	Nos.	72.00		
c)	1200x500 mm	Nos.	32.00		
d)	600x500 mm	Nos.	72.00		
5.3	Door Shutters				
	Providing and fixing door shutter of sizes given below of any of following material as per approval by project in charge/ architect. (Note: Hardware not included in the item, to be as per selection)				
i)	Wooden panelled door shutter using local wood as per approval, 12mm thk. particle board / M.S. jali as per requirement of panel including finishing with enamel paint of approved colour all complete.				
ii)	Wooden panelled door shutter using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm in panels including finishing with enamel paint of approved colour all complete.				
iii)	24 mm thick factory made PVC door shutters made of styles and rails of an uPVC hollow section of size 59x24 mm and wall thickness 2 mm (± 0.2 mm) with inbuilt edging on both sides. Complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter).				
iv)	Providing and fixing 35mm thk. ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
v)	Bamboo door shutters				
a)	800x2035mm	Nos.	64.00		
b)	650x2035 mm	Nos.	64.00		
5.4	Window Shutters for windows & ventilators				
i)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing 5mm thk. clear float glass of approved make, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
a)	550x1100 mm	Nos.	144.00		
b)	500x950 mm	Nos.	72.00		
c)	1100x400 mm	Nos.	32.00		
d)	500x400 mm	Nos.	72.00		
ii)	Providing and fixing Wooden panelled shutter for windows ventilators of given size using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
iii)	Bamboo Window Shutter				
a)	550x1100 mm	Nos.	144.00		
b)	500x950 mm	Nos.	72.00		
c)	1100x400 mm	Nos.	32.00		
d)	500x400 mm	Nos.	72.00		
	Total of Subhead 5.0				
6.0	Roofing				
6.1	Filler material for Filler slab	Sqm	1244.00		
	Providing & laying as per instruction, stabilised mud blocks 50mm thk. during				

6(j) ANNEXURE-XI (LIG B-CLUSTER UNIT-OPTION-A)

	casting of Filler slab.				
6.2	Ceiling plaster	Sqm	1128.00		
	Providing 10 mm thick cement plaster of mix 1:4 (1 cement: 4 coarse sand) in ceiling.				
6.3	Sunken area filling	Cum	20.88		
	Providing and laying on sunken areas broken light weight concrete block bats of approximately 600 kg. per cum density laid, consolidated, finished smooth, including finished & grouting the top layer with water proof cement mortar with CICO or equivalent brand.				
6.4	Hot Bitumen layer	Sqm	348.25		
	Providing layer of residual type petroleum bitumen of penetration 80/100 of approved quality at 17kg per 10sqm impregnated with a coat of coarse sand layer at 60 cudm per 10sqm including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete.				
6.5	Mud phuska	Cum	65.00		
	Providing and laying 150mm thick (average) mud phuska of damped brick earth on roof laid to slope consolidated and plastered with 25mm thk. mud mortar mixed with bhusa at 35kg per cum of earth and gobri leaping with mix 1:1 (1clay: 1 cow dung).				
6.6	Ceramic broken tiles	Sqm	325.00		
	Providing and laying broken ceramic glazed tiles on roof including filling the gaps with cement mortar 1:4 (1cement: 4 coarse sand) mixed with 2% integral water proofing compound laid over a bed of 20mm thk cement mortar 1:4 and finished neat complete.				
6.7	Cement Gola	Rmt	15.50		
	Providing Gola in cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 10 mm nominal size) including finishing with cement mortar 1:3 (1 cement: 3 sand) as per standard design.				
	Total of Subhead 6.0				
7.0	Miscellaneous				
7.1	Making khurras 450x450 with average minimum thickness of 50mm cement concrete 1:2:4 over PVC sheet 1mx1mx400micron, finished with 12mm cement plaster 1:3 and a coat of neat cement rounding the edges and making and finishing the outlet complete.	Nos	14.00		
7.2	Providing and fixing 110mm dia PVC rain water pipes of approved make to withstand a test pressure of 4.0kg/sqcm. including all fittings bends, sockets, elbow, tees, clamps, Y - Junction with cover (for collecting rainwater) including testing of joints etc. complete.	Rmt	182.00		
	Total of Subhead 7.0				
	Total of "A"				

6(k) ANNEXURE-XII (LIG B-CLUSTER UNIT-OPTION-B)

Summary of BOQ for Cluster unit LIG B Option 'B' for Plains Region, using Precast Brick Arch Panels & Filler slab Roof and Masonry in Rat trap bond with Stabilized Compressed Earth Bricks					
S.No.	Description	Amount (Rs.)			
A.0	Civil Works				
1.0	Foundation				
2.0	Super structure				
3.0	Wall finishes				
4.0	Flooring				
5.0	Door & Windows				
6.0	Roofing				
7.0	Miscellaneous				
8.0	Plumbing				
9.0	Electrical				
	Total				
Note:	1. Estimated Cost is the cost of complete cluster (16 units)				
	2. Rain water disposal has been detailed only up to down take rain water pipe. Further disposal of rain water to be as per site situation.				
BOQ for Cluster unit LIG B Option 'B' for Plains Region, using Precast Brick Arch Panels & Filler slab Roof and Masonry in Rat trap bond with Stabilized Compressed Earth Bricks					
S.No.	Item Description	Unit	Quantity	Rate	Amount (Rs.)
A.0	Civil Works				
1.0	Foundation				
1.1	Earth work in excavation	Cum			
	Earth work in foundation trenches, column pits, drains etc. (not exceeding 1.5m in width or 10 sqm on plan) after clearing of site from bushes vegetation etc., including dressing of sides and ramming of bottoms, surface preparation as per specification to receive the PCC, lift up to 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m.				
1.2	Anti-termite treatment	Sqm			
	Supplying, diluting and injecting chemical emulsion for pre-constructional anti termite treatment and creating a chemical barrier under and all-round the column pits, plinth beams, junction of wall and floor, along the external perimeter of building etc. complete				
	With chlorpyriphos/Landane E.C. 20% with 1% concentration				
1.3	Back filling of earth	Cum			
	Filling available excavated earth (Excluding rock) in trenches, plinth, sides of foundation etc. in layers not exceeding 20Cm. in depth, consolidating each deposited layer by ramming and watering, lead up to 50m. and lift up to 1.5m.				
1.4	PCC in foundation				
	(Providing) & laying in position cement concrete of specified grade including centring & shuttering complete - All work up to plinth level.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum			
b)	1:5:10 (1 cement :5 coarse sand : 10 graded stone aggregate 40mm nominal size)	Cum			
1.5	R.C.C. up to plinth level	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete including centering, shuttering complete but excluding cost of reinforcement - All work up to plinth level.				
1.6	Reinforcement up to plinth level	Kg			
	Providing & fixing Reinforcement for R.C.C. work up to plinth level as specified, including straightening, cutting, bending, placing in position and binding all complete.				
1.7	Brick work in foundation	Cum			
	Brick work with FPS bricks of class designation 75 in foundation and plinth in cement mortar 1:6 (1 cement: 6 coarse sand).				
	Total of Subhead 1.0				
2.0	Super structure				
2.1	Brick work in super structure	Sqm	1988.78		
	230mm thk. Brick work in Stabilised, Hydraulically Compressed Earth Bricks in rat trap bond in cement mortar 1:4 (1 cement : 4 coarse sand) in super structure above plinth level including finishing in ruled pointing on the external side of wall.				
2.2	115 thk. wall	Sqm	96.58		
	115mm thk. Brick work using Stabilised, Hydraulically Compressed Earth Bricks in super structure above plinth level, in cement mortar 1:6, including providing & placing in position 2 nos. 6mm dia. M.S. bars at every third course.				
2.3	Brick work in Red Burnt Bricks	Cum	40.42		

6(k) ANNEXURE-XII (LIG B-CLUSTER UNIT-OPTION-B)

	Brick work in FPS bricks of class designation 75 in rat trap bond in super structure above plinth level in desired pattern in cement mortar 1:4 (1 cement : 4 coarse sand) including finishing in ruled pointing on the external side of wall where ever specified.				
2.4	Brick Jali	Sqm	6.80		
	Brick jali work in desired pattern in parapet wall with FPS bricks of class designation 75 in cement mortar 1:4				
2.5	R.C.C. in super structure	Cum			
	Providing & laying in position M-20 grade of reinforced cement concrete in lintel beams, chajjas and counter & Loft slabs etc. in super structure including centering, shuttering complete but excluding cost of reinforcement.				
2.6	Reinforcement in super structure	Kg			
	Providing & fixing Reinforcement for R.C.C. work in lintel, chajjas and counter & Loft slabs in super structure as specified, including straightening, cutting, bending, placing in position and binding all complete.				
2.7	Plain cement concrete				
	Providing and laying plain cement concrete of specified grade as bed concrete under floor, roof slab, plinth protection, cill, coping, shelves, kitchen platform etc. screeding at roof to required slope and other locations as called for laid, consolidated and cured etc. complete as per specification and drawing.				
a)	1:4:8 (1 cement :4 coarse sand : 8 graded stone aggregate 40mm nominal size)	Cum	27.25		
	Total of Subhead 2.0				
3.0	Wall finishes				
3.1	Providing 12 mm thick cement plaster of mix 1:6 (1 cement: 6 coarse sand).	Sqm	2948.00		
3.2	Lime wash	Sqm	3968.00		
	Providing and applying three or more coats of white wash with lime on wall and ceiling to give an even shade including preparation of surfaces, scaffolding, mixing of indigo blue and DDL adhesive etc. complete.				
3.3	Stone Counters	Sqm	38.40		
	Providing and laying 20mm thk. Kota stone slabs on kitchen counters laid on 20mm thk. Cement mortar 1:3 (1 cement 3 coarse sand). Including rubbing and polishing complete.				
3.4	Coping	Sqm	60.34		
	Providing & fixing 20mm thk. coping of burnt clay paving tile, on window sill & parapet walls in cement mortar 1:6				
3.5	Dado	Sqm	538.30		
	Providing and laying ceramic glazed tiles of size 200x300mm in dado of uniform thickness, size, shade and pattern as approved by Architect/Project Manager laid with rich cement slurry over a bedding plaster of 12 mm thick cement mortar 1:3 (1 cement: 3 fine sand) and grouting the joints with white cement and pigment with matching shade of tile, cutting, curing etc. complete in all respects as per drawing.				
	Total of Subhead 3.0				
4.0	Flooring				
4.1	Terrazzo Tile Flooring	Sqm	945.00		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of size up to 12mm, Light shade using white cement, laid in floors, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 20mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand)				
4.2	Terrazzo Tile Skirting	Sqm	107.42		
	Providing and laying precast terrazzo tiles 22mm thick with graded marble chips of size up to 12mm, Light shade using white cement, in skirting & risers of steps, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 12mm thick cement mortar 1:3 (1 cement : 3 coarse sand)				
4.3	Extra for laying terrazzo flooring on staircase treads not exceeding 30 cm in width, including cost of forming, nosing etc.	Sqm	49.60		
4.4	Ceramic tile Flooring	Sqm	114.08		
	Providing and laying ceramic glazed tile flooring of size 300x300mm of approved make, shade and pattern as approved by Project in charge laid over 20/12 mm average thick bed of cement mortar 1:4 (1 cement : 4 coarse sand), grouting the joints with white cement and pigment to match the shade of tile including cutting, etc. complete in all respects				
4.5	Sand Filling	Cum	48.18		
	Supplying and filling in plinth with sand under floors including watering, ramming,				

6(k) ANNEXURE-XII (LIG B-CLUSTER UNIT-OPTION-B)

	consolidating, and dressing complete.				
	Total of Subhead 4.0				
5.0	Door Windows				
5.1	RCC Frame for door				
	Providing and fixing RCC Frame for door of size given below, out of section 100x50mm, with single or double rebate as required, with holdfasts, finished with enamel paint of approved colour all complete.				
a)	900x2125mm	Nos.	64.00		
b)	750x2125mm	Nos.	48.00		
5.2	RCC Frame for windows & ventilators				
	Providing and fixing RCC Frame for windows & ventilators of size given below, out of section 100x50mm, with double rebate and holdfasts, finished with enamel paint of approved colour all complete.				
a)	1200x1200	Nos.	48.00		
b)	600x1050	Nos.	48.00		
c)	1200x375	Nos.	32		
d)	600x375	Nos.	32		
5.3	Door Shutters				
	Providing and fixing door shutter of sizes given below of any of following material as per approval by project in charge/ architect. (Note: Hardware not included in the item, to be as per selection)				
i)	Wooden panelled door shutter using local wood as per approval, 12mm thk. particle board panel including finishing with enamel paint of approved colour all complete.				
ii)	Wooden panelled door shutter using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm in panels including finishing with enamel paint of approved colour all complete.				
iii)	24 mm thick factory made PVC door shutters made of styles and rails of an uPVC hollow section of size 59x24 mm and wall thickness 2 mm (± 0.2 mm) with inbuilt edging on both sides. Complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter).				
iv)	Providing and fixing 35mm thk. ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
v)	Bamboo door shutters				
a)	800x2075mm	Nos.	80.00		
b)	650x2075mm	Nos.	64.00		
5.4	Window Shutters for windows & ventilators				
i)	Providing and fixing Wooden panelled shutter for windows & ventilators of given size using local wood as per approval, including providing & fixing 5mm thk. clear float glass of approved make, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
a)	550x1100	Nos.	96.00		
b)	500x950	Nos.	48.00		
c)	1100x275	Nos.	32		
d)	500x275	Nos.	32		
ii)	Providing and fixing Wooden panelled shutter for windows ventilators of given size using local wood as per approval, including providing & fixing M.S. wire gauge of avg. width of aperture 1.4mm with wire of dia 0.63mm, finishing with enamel paint of approved colour all complete. (Note: Hardware not included in the item, to be as per selection)				
iii)	Bamboo Window Shutter				
a)	550x1100	Nos.	96.00		
b)	500x950	Nos.	48.00		
c)	1100x275	Nos.	32		
d)	500x275	Nos.	32		
	Total of Subhead 5.0				
6.0	Roofing				
6.1	Precast Arch Panel system	Sqm	749.92		
	Providing and Laying precast Arch Panels & Precast RCC Beams for roof as per related training and including providing & laying necessary cast in situ RCC and reinforcement as specified in structural drawings, centering & shuttering complete,				

6(k) ANNEXURE-XII (LIG B-CLUSTER UNIT-OPTION-B)

	excluding the cost of reinforcement.				
6.2	Filler material for Filler slab	Sqm	114.08		
	Providing & laying as per instruction, stabilised mud blocks 50mm thk. during casting of Filler slab.				
6.3	Ceiling plaster	Sqm	1020.00		
	Providing 10 mm thick cement plaster of mix 1:4 (1 cement: 4 coarse sand) in ceiling.				
6.4	Sunken area filling	Cum	25.67		
	Providing and laying on sunken areas broken light weight concrete block bats of approximately 600 kg. per cum density laid, consolidated, finished smooth, including finished & grouting the top layer with water proof cement mortar with CICO or equivalent brand.				
6.5	Hot Bitumen layer	Sqm	322.60		
	Providing layer of residual type petroleum bitumen of penetration 80/100 of approved quality at 17kg per 10sqm impregnated with a coat of coarse sand layer at 60 cum per 10sqm including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete.				
6.6	Mud phuska	Cum	61.40		
	Providing and laying 150mm thick (average) mud phuska of damped brick earth on roof laid to slope consolidated and plastered with 25mm thk. mud mortar mixed with bhusa at 35kg per cum of earth and gobri leaping with mix 1:1 (1clay: 1 cow dung).				
6.7	Ceramic broken tiles	Sqm	307.00		
	Providing and laying broken ceramic glazed tiles on roof including filling the gaps with cement mortar 1:4 (1cement: 4 coarse sand) mixed with 2% integral water proofing compound laid over a bed of 20mm thk cement mortar 1:4 and finished neat complete.				
6.7	Cement Gola	Rmt	10.40		
	Providing Gola in cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 10 mm nominal size) including finishing with cement mortar 1:3 (1 cement: 3 sand) as per standard design.				
	Total of Subhead 6.0				
7.0	Miscellaneous				
7.1	Making khurras 450x450 with average minimum thickness of 50mm cement concrete 1:2:4 over PVC sheet 1mx1mx400micron, finished with 12mm cement plaster 1:3 and a coat of neat cement rounding the edges and making and finishing the outlet complete.	Nos	13.00		
7.2	Providing and fixing 110mm dia PVC rain water pipes of approved make to withstand a test pressure of 4.0kg/sqcm. including all fittings bends, sockets, elbow, tees, clamps, Y - Junction with cover (for collecting rainwater) including testing of joints etc. complete.	Rmt	169.00		
	Total of Subhead 7.0				
	Total of "A"				

7 RATE ANALYSIS (INDIVIDUAL UNITS)

Rate Analysis Chart for Plain Region					
Individual Units					
Type	Option	Carpet Area of each Unit (in sqm.)	Total Cost (in Rs.)	Cost/sqm (in Rs.)	Construction Method Used
EWS	Option-A	26	3,91,075.85	15,041.38	Masonry: Combination of red bricks and fly ash bricks Flooring/Roofing: Ferro cement channel, MCR tiles
	Option-B	27	3,79,619.03	14,059.96	Masonry: Combination of fly ash bricks & red bricks Flooring/Roofing: Pre-cast arch panel, MCR tiles
LIG-A	Option-A	32.8	4,75,314.30	14,491.29	Masonry: Combination of fly ash bricks & red bricks Flooring/Roofing: Filler slab roof
	Option-B	39	5,49,560.91	14,091.31	Masonry: Stabilised compressed earth blocks Flooring/Roofing: Plank and joist & MCR tiles
LIG-B	Option-A	53.4	5,74,098.07	10,750.90	Masonry: Stabilised compressed earth blocks Flooring/Roofing: Pre-cast Ferro cement channels, MCR tiles
	Option-B	60	7,33,818.15	12,230.30	Masonry: solid concrete blocks Flooring/Roofing: Brick arch panel, MCR tiles

7 RATE ANALYSIS (CLUSTER UNITS)

Rate Analysis Chart for Plain Region							
Cluster Units							
Type	Option	Carpet Area of each Unit (in sqm.)	Total Cost (in Rs.)	No. of Units in the cluster (in no.s)	Cost/unit house (in Rs.)	Cost of each unit/sqm (in Rs)	Construction Method Used
EWS	Option-A	26	52,56,609.27	24	2,02,177.28	8,424.05	Masonry: Combination of fly ash bricks & red bricks Flooring/Roofing: Pre-cast Ferro cement channels
	Option-B	27	49,87,825.45	24	1,84,734.28	7,697.26	Masonry: Combination of fly ash bricks & red bricks Flooring/Roofing: Pre-cast brick arch panel roof
LIG-A	Option-A	36	66,03,099.41	16	1,83,419.43	11,463.71	Masonry: Fly ash bricks with red brick Flooring/Roofing: Plank & joist, filler slab
	Option-B	39	71,45,125.06	16	1,83,208.33	11,450.52	Masonry: Stabilised hydra form blocks with red bricks band Flooring/Roofing: Plank and joists, filler slab
LIG-B	Option-A	55.66	1,06,09,933.30	16	1,90,620.43	11,913.78	Masonry: Combination of fly ash bricks & red bricks Flooring/Roofing: Filler slab
	Option-B	54	83,84,359.81	16	1,55,265.92	9,704.12	Masonry: Stabilized compressed earth blocks Flooring/Roofing: Brick arch panel & filler slab

Affordable Housing- Individual dwelling units with a carpet area of not more than 60 sq. mt. either as a single unit or part of a building complex with multiple dwelling units.

Affordable Housing Projects- Housing projects where at least 60 per cent of the FAR/FSI is used for dwelling units of carpet area not more than 60 sq. mt. The project shall also reserve 15 per cent of the total FAR/FFSI or 35 per cent of the total number of dwelling units for EWS category.

Built up Area- It is the carpet area plus the thickness of outer walls and the balcony.

Carpet Area- The area enclosed within the walls, actual area to lay the carpet. This area does not include the thickness of the inner walls.

Chajja/Sun-Shade- A sloping or horizontal structural overhang, usually provided for protection from sun and rain or for considerations at lintel level.

Damp-Proof Course- A course consisting of some appropriate water proofing material provided to prevent penetration of dampness.

EWS House- A house or dwelling unit intended for Economically Weaker Sections with maximum built up area of 32 sq.mtr.

EWS Plot- A residential plot intended for Economically Weaker Sections having maximum plot area of 48 sq.mtr.

Floor Area Ratio (FAR) - The quotient obtained by dividing the total covered area on all floors with the area of the plot.

Foundation- That part of a structure, which is in direct contact with and meant for transmitting loads to the ground.

LIG House- A house or dwelling unit intended for low income groups with a built up area of maximum 48 sq.mtr.

LIG Plot- A residential plot intended for low income groups with a plot area of maximum 60 sq.mtr.

Masonry- An assemblage of masonry units properly bonded together with mortar.

Plinth- The portion of a structure between the surface of the surrounding ground and the surface floor, immediately above the ground.

Sustainability- It is defined as an ability or capacity of something to be maintained or to sustain itself. It's about taking what we need to live now, without jeopardising the potential for people in the future to meet their needs.

Veranda- A roofed platform along the outside of a house, level with the ground floor.

Ventilation- The supply of outside air into a building through window or other openings due to wind outside and convection effects arising from temperature, or vapour pressure differences (or both) between inside and outside of the building.

About Development Alternatives:

Ever since its inception in 1982, Development Alternatives (DA) has acted as a research and action organisation, designing and delivering eco-solutions for the poor and the marginalised.

With a deep understanding of the rural market and a strong presence in the Indian heartland, its existence has been a credible and visible one – nationally and internationally – in addressing poverty challenges in a climate-sensitive environment.

A pioneer in sustainable development and the first social enterprise in India, DA realised the necessity of establishing several associated organisations working toward distinct goals that converge on the unified ambition of regenerating the environment and creating large-scale sustainable livelihoods.

The DA Group envisions a world where every citizen can live in security, with a dignified job and an assured income. We believe that the key to achieving this is the creation of the means for sustainable livelihoods in large numbers - providing the rural poor with jobs and decent incomes, giving meaning and dignity to life, producing goods and services for local markets and preserving the environment.

About Building Material And Technology

Promotion Council (BMTPC):

In order to bridge the gap between research and development and large scale application of new building material technologies, the erstwhile Ministry of Urban Development, Government of India, had established the BUILDING MATERIALS AND TECHNOLOGY PROMOTION COUNCIL in July 1990.

The Council strives to package proven innovative technologies for the benefit of entrepreneurs interested in setting up manufacturing units in tiny, small, medium and large scale sectors.

There has been a demand for setting up such an apex institution in order to provide an interdisciplinary platform to various agencies under Central and State Governments and the private sector for scaling up proven technologies to enhance their wide-spread use and for assisting commercial production as well as systematic dissemination of appropriate technology for the benefit of the construction of appropriate technology for the benefit of the construction agencies and different sections of the population.

The Council is structured to undertake the task of the extension and application of technologies and materials developed by research institutions on the ground with the backing of financial institutions and enabling regulatory environment.

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