

TEMPORARY HOUSING FOR CONSTRUCTION WORKERS

SARAH GINIWALE

**DESIGN DISSERTATION
FINAL YEAR B.ARCH
A.I.K.T.C. SCHOOL OF ARCHITECTURE**

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the lines that always inspired me to keep on going

**“ the woods are lovely, dark and deep;
but I have promises to keep;
and miles to go before I sleep;
and miles to go before I sleep.”**

- Robert Frost

ACKNOWLEDGMENT

I would sincerely like to thank my guide Ar. Preeti Pansare for her constant guidance and support.

I specially thank Faizan Kazi for his presence during the process of the project. I expand my thanks to Sehrish and Pratik for their help in making the model.

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Sarah Giniwale

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PREFACE

QUESTION:

Architecture has always been viewed as a static monument, a synonym for permanence, but should it really?

HYPOTHESIS:

ARCHITECTURE NEED NOT BE STATIC AND CONSTANT.

In past, Architecture has mostly been viewed as physical structure. But that's not the case today. The terms - temporary, portability, mobility - are being related to Architecture. In today's age of constant change, temporary design have a significant role in defining architecture and spaces.

TEMPORARY DESIGN:

Temporary Architecture is the one which is function and time specific. It should uniquely fit, serve and define a purpose, with economy being the main concern. It has a symbolic kind of relationship with users and the place of its construction.

SYNOPSIS

OBJECTIVE:

To provide a livable on-site habitat for the construction workers also taking into consideration social and recreational aspects on-site. Being a mobile community, temporary and portability forms an important aspect. Exploring the possibility of achieving modules which are flexible to changing climate, locations, materials and on-site conditions.

SCOPE FOR DESIGN:

- Residence for Labours
- Cresh
- Primary Health Care Center
- Recreational Spaces:
 - Community Center
 - Mess
 - Informal Sitting Spaces
 - Market Space
- Storage Spaces
- Training Area

ASPECTS TO TAKE INTO CONSIDERATION WHILE DESIGNING:

- Maximum utilization of salvaged materials.
- Temporary Design: easy to assemble and dismantle, limited number of parts, minimization of mass, standardization of components.
- Easy portability
- Cost efficient

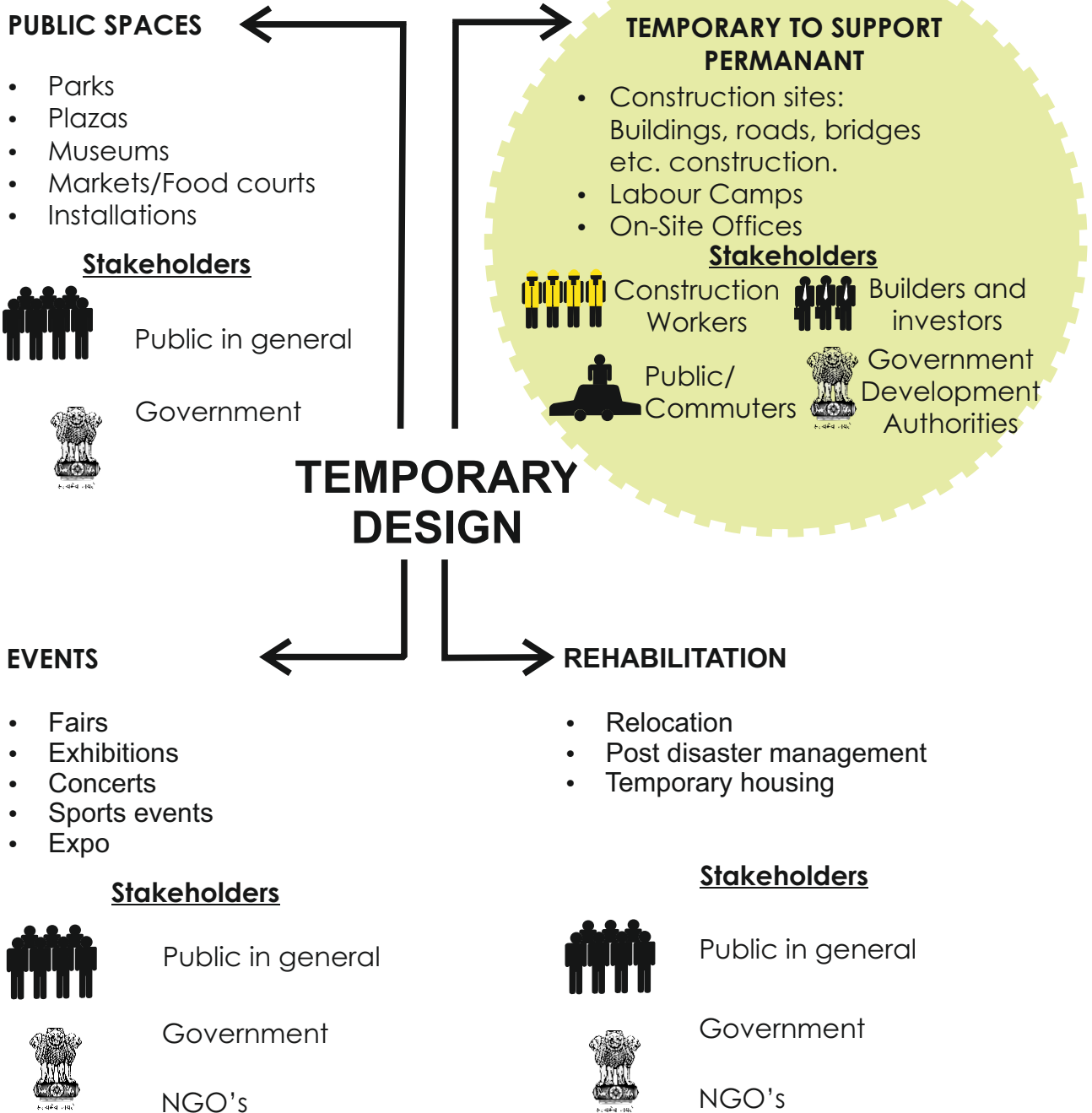
INTRODUCTION

TEMPORARY:

Temporary is defined in the Oxford English Dictionary as:
adjective

lasting for only a limited period of time; not permanent.

ASPECTS WHERE TEMPORARY DESIGNS ARE TAKEN INTO CONSIDERATION



INTRODUCTION

Construction is one of the major leading industries across the globe. In India, construction industry has seen an incredible boost in past decade. The construction industry in India is the country's second largest economic activity after agriculture.

Construction workers are the largest group of service providers. Almost 43% of urban poor are employed in building and construction industry. These poor have deplorable working conditions and work roles, which severely impact their lifestyle, health and growth potential. They live in extremely deplorable and poor infrastructure. There is a dire need for interventions to enhance the living condition of these workers

UNDERSTANDING THE HIERARCHY OF STAKEHOLDERS IN THE CONSTRUCTION INDUSTRY

In building & construction industry, builder usually does not undertake construction by oneself. Builder first selects the site (may be in consultation with architect). The architect assembles a design team of consultant engineers and other experts to design the building and specify the building systems. Builder then hires a contractor who, in turn, hires subcontractors, who take services of mason, painter and labour and others to undertake construction activities. The builder, architect and contractor work closely together to meet deadlines and budget. The contractor works with subcontractors to ensure quality standards and make sure that the building is completed within the specified time and budget.

1. Builder hires Contractor

A Builder hires a contractor, who is usually responsible for the supplying of all material, labour, equipment, engineering vehicles and tools and services necessary for the construction of the project (there is also a model in which builder gives only labour work to contractor while buys all material and supplies all equipment by oneself). To do this, it is common for the contractor to retain a construction labour force. In some cases, he subcontracts part of the work to other persons/ subcontractors that specialize in these types of work like masonry, sanitary, carpentry, painting, electrical, stone laying etc. Subcontractors put up foundation, walls, roof, electrical and plumbing systems, supply the labour etc. Occasionally, the builder commissioning the construction of the building chooses to act as the contractor. In such cases, he works directly with various subcontractors and takes on all liability for proper sequencing of the work, and dealing with the realities of construction.

All contractors in construction industry can be categorized into three types – Category 'A', Category 'B' and Category 'C' contractors. There are further subdivisions among these categories.

INTRODUCTION

a. Category A contractor

These are the contractors which undertake large projects (say above Rs. 100 cr). Such contractors comprise of both government recognised and unrecognized contractors. Different government bodies have different set of recognized contractors.

b. Category B contractor

These are contractors which undertake medium scale projects (say Rs. 1 cr to Rs. 100 cr). Such contractors also comprise of both government recognized and unrecognized contractors. These contractors cater to large private real estate developers.

c. Category C contractor

These are the contractors which have least amount of experience and capacity to undertake projects. These are typically small and mid-sized contractors which employ group of 10-100 masons, painter and labours. They start off by either pulling ex-employer's staff along with them or sourcing labour from their village.

2. Contractor hires Construction workers

The contractors/ subcontractors possess a team of mason, painter and labourers to undertake building and construction activity. Construction workers are those who work predominantly on construction sites. They are comprised of both local and migrant work force. The daily wage labour and members of specialist trade such as electricians, carpenters and plumbers are also included under the segment as workers.

INTRODUCTION

MAPPING OF HEIRARCHY IN CONSTRUCTION INDUSTRY

In building & construction industry, builder usually does not undertake construction by oneself. Builder then hires a contractor who, in turn, hires subcontractors, who take services of mason, painter and labour and others to undertake construction activities.



BUILDERS

Builders hire Contractors



CONTRACTORS

Contractors hires Sub-Contractors

Category A:

These are the contractors which undertake large projects (say above Rs. 100 cr)

Category B:

These are contractors which undertake medium scale projects (say Rs.1cr to Rs.100 cr).

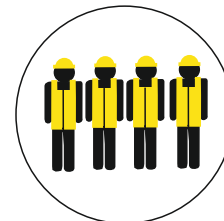
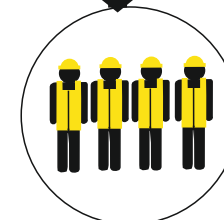
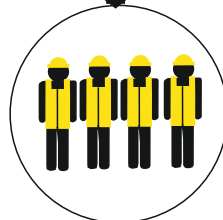
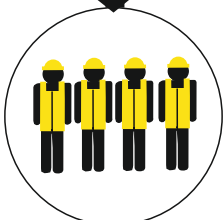
Category C:

These are the contractors which have least amount of experience and capacity to undertake projects. These are typically small and mid-sized contractors which employ group of 10-100 workers



SUB-CONTRACTORS

Sub-Contractors possess a team of masons, painters, labors.



CONSTRUCTION WORKERS

USER PROFILE

Construction is one of the major leading industries across the globe. In India, construction industry has seen an incredible boost in past decade. The construction industry in India is the country's second largest economic activity after agriculture.

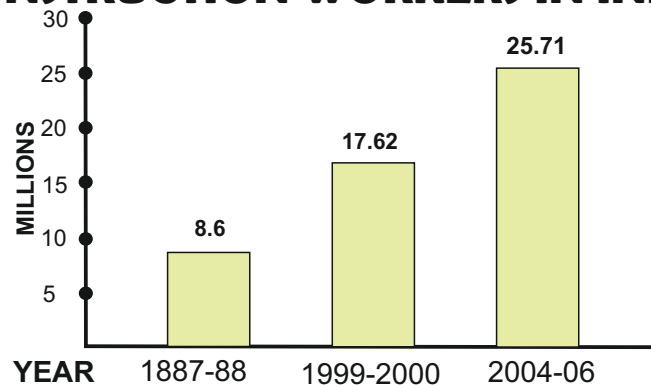
CONSTRUCTION WORKERS: WHO ARE THEY?



Construction workers are those who work predominantly on construction sites and are typically engaged in the regular aspects of the industry other than design and financing.

They are comprised of both local and migrant work force. The daily wage labour and members of specialist trade such as electricians, carpenters and plumbers are also included under the segment as workers.

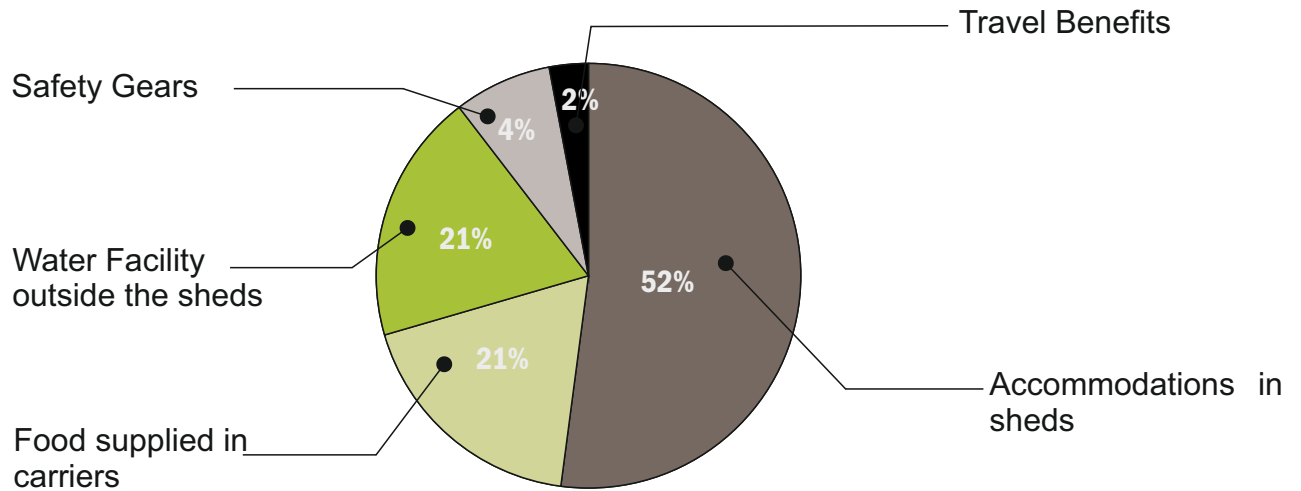
IN 2006, THERE ARE **MORE THAN 25 MILLION** CONSTRUCTION WORKERS IN INDIA



CENSUS OF CONSTRUCTION WORKERS IN INDIA

USER PROFILE

BASIC AMENITIES EXTENDED TO WORKERS IN DIFFERENT FORMS (Karnataka State)



STATISTICAL DATA

22.8% BUILDER COMPANY ARRANGE FOR ACCOMMODATION WITHIN THE SITE. 

LABOURS LIVING IN SELF CONSTRUCTED SHEDS OUTSIDE THE SITE **66%**

20.4% CONSTRUCTION SITES MAKING PROVISION FOR DRINKING WATER 

 CONSTRUCTION COMPANIES/BUILDERS MAKING PROVISION FOR FOOD FOR THE LABOURS **29.7%**

26.2% PROVISIONS FOR TOILETS AND BATHROOMS FOR THE LABOURS 

 HEALTH AND SAFETY PROVISIONS FOR THE LABOURS ON SITE **36.5%**

20.3% PROVISION OF CRECHES FOR THE LABOURER'S CHILDREN 

 CONSTRUCTION LABOURER'S CHILDREN ARE ILLITERATE.

USER PROFILE

TYPES OF CONSTRUCTION WORKERS

a. Mason

Mason is typically involved in bricklaying, tiling and laying of stone, concrete or blocks for construction of wall, floor or simply a block. Concrete finisher works with concrete, which includes placing, finishing, protecting and repairing concrete in construction projects. They are paid up to Rs. 300 a day. Masons are assisted by labourers

b. Carpenter

Carpenter performs a wide range of woodworking that includes constructing buildings, furniture, and other objects out of wood. They are paid up to Rs. 350 a day.

c. Plumber

Specializes in installing and maintaining systems used for plumbing, heating, drainage, portable (drinking) water or small sized industrial process plant piping. A Pipe fitter is someone who lays out, assembles, fabricates, maintains and repairs large-sized piping systems for industrial processes which are typically under high pressure and require metals such as carbon steel, stainless steel, and other alloys fused together through welding.

d. Plasterer

Also referred to as putty worker, puts plaster and wall putty on interior walls, before painter takes up for painting.

e. Painter

Is a construction worker who paints the walls of the building, both interior and exterior. Painters are involved in both re-painting and new painting works.

f. Steel Erector

Steel Erector installs structural steel frames of building. The components usually are prefabricated, including all welded joints.

g. Electrician

Electrician specializes in electrical wiring of buildings and related equipment. Electricians may be employed in the construction of new buildings or maintenance of existing electrical infrastructure.

h. Welder

A welder specializes in welding materials together.

i. Labour

Male labour get paid relatively more because of ability to carry heavier loads as compared to those carried by women. Men typically get paid Rs. 180 while women labourers typically get paid Rs. 150.

USER PROFILE

TYPES OF CONSTRUCTION WORKERS

Naka Workers

With growing Indian economy construction industry in housing sector in cities and upcoming urban areas is booming. A special feature of this section of the construction industry and its workers is the presence of 'Naka Markets' at street corners in prominent places in urban areas.

The institution of Naka Market consists of construction workers with diverse skills, has tremendous potential if supported by appropriate policies and organizations. A typical Naka Market is a place where construction workers assemble in the mornings. Builders and petty contractors come there and hire the workers for the day.

In city like Mumbai skilled workers get about Rs.400/- per day, less skilled one get about half this amount. But since these workers are unorganized they are often exploited by those who hire them. Their number is anybody's guess though it is reported that there are over 80 such markets in Mumbai and its suburbs.

USER PROFILE

CONCERNS OF CONSTRUCTION WORKERS

Community:

Lack of social security and benefits in terms of labor welfare measures and other provisions.

No part at community level.

Social:

Most of the construction laborers migrate to cities and metros are from poor families and are illiterate.

They become easy victim of exploitation.

Mobility:

Construction laborers are mostly laborers who migrated from different regions and states leaving their native villages in search of daily jobs.

These people in general are nomadic in their life.

They have maximum mobility because of the nature of their work.

Livelihood:

Inadequate wage structures

Gender discrimination

Housing:

The living conditions on the construction sites are generally poor.

Only few construction companies make provision of accommodation facilities to the laborers. While majority laborers have to build temporary huts by themselves near the site

Therefore, growth of slums.

Safety:

Lack of adequate accident relief equipments like helmets, hand gloves and shoes, safety belts ,protection wear etc. like safety materials and equipments to the construction laborers.

Recreation:

Lack of recreational facilities.

Lack of resting areas, restrooms, canteens etc

USER PROFILE

CONCERNS OF CONSTRUCTION WORKERS

Education:

Majority of the children wander in and around the site while their parents work on the site.

No one to look after these children to ensure better health, education and care in their tender age

Women and children:

Women get less wages.

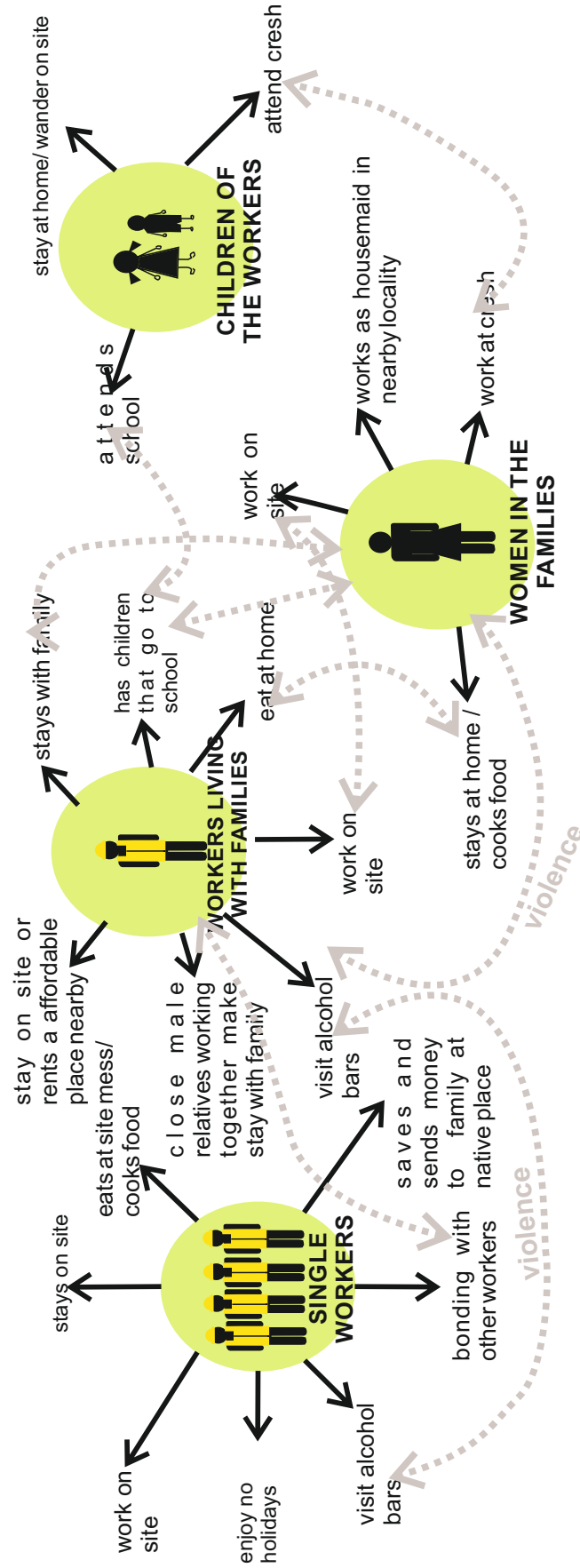
The women laborers do not get the privilege of maternity benefits.

Lack of creches for the children.

Family:

Construction laborers travel from one area of work to other area along with their families and live in a place, which is either provided by the owner of the construction company or live somewhere near the site in temporary shelters created by themselves.

USER PROFILE



ACTIVITIES MAPPING OF ALL THE USERS

STATISTICS, LAWS AND POLICIES

STATISTICS

- **The following statistical data have been taken from the following paper-Problems of Construction Labourers:A qualitative research by Prof. Dileep Kumar M.(Ex professor, Symbiosis (SCMHRD, SCDL), IIT, vSCMLD, vSBS, Pune):**
- 66.7 constructions companies consists of 100-200 laborers
- Majority construction laborers are living in Tin sheet (71.5 %),Rubber sheet shed (17.8 %) and Huts (10.7)
- Builder company arranged temporary shed to laborers (22.8 %)within the site.
- A majority percentage of laborers (66.0%) are living in self-constructed temporary sheds nearby construction sites.
- Builder made electricity provision(27.8 %)in their temporary sheds.
- A considerable percentage of laborers are having temporary sheds (71.7%)haven't any electrical provision.
- The sanitation and hygiene of the construction site and the temporary shed are very poor.(75.4 %).
- 73.8 % of sites do no have any toilets or toilets having substandard quality.
- 20.4 % of construction sites making provision for drinking water.
- A considerable percentage of laborers have to depend on various sources like Bore well (34.1 %),tanker lorry water(31.4%),public water supply(13.7%) etc
- 29 % of sites do not have any water provision or water having substandard quality for washing.
- A considerable percentage of construction laborers have to depend on other water sources for washing viz. open well (11.4 %),public water supply (44.2 %),Bore well(11.5%)etc.
- Majority construction laborers have to take open bath (63.3%),as there is no adequate provision.
- Nearly a quarter,(26.7 %) hasn't any bathroom at all.

STATISTICS, LAWS AND POLICIES

STATISTICS

- 72.2% of the companies do not pay any medical cost incurred to the laborers
- In 18.8 % of the construction companies, builders and the laborers have to meet the medical cost incurred partially.
- 64.2% construction companies pay only 50-100 rs. per day to the laborers.
- 12.8% construction companies pay 100-150 rs. per day to the laborers.
- Construction companies which pay 150 rs and more found only few percentage only (3.6%).
- 38.4% of the construction companies pay 151-200 rs. per day to the skilled laborers.
- The construction companies(30.4 %) pay only 41-60 rs per day to the unskilled laborers.
- While 7.2% companies pay 61-80 rs per day to the laborers.
- 74.2% of the construction companies are not making provision of medical leave facilities.
- 2.2 % of the construction companies provided medical leave facility to their laborers,
- While 12.3% provided medical leave to their laborers, but unofficially.
- 64.8% of the companies don't provide maternity leave facilities to their laborers.
- While considerable percentages (66.8 %) of construction companies don't provide holidays for their laborers.
- 63.5% of the companies are not making provisions of compensation benefits.
- 77.2% of companies are not making provisions of insurance benefits.
- 69.1 % of the companies are not making provisions of safety equipments and materials to their workers on construction site.
- In majority construction sites (66.2 %) labourers have to work 8 Hours having a spread of 10-11 hr a day.

STATISTICS, LAWS AND POLICIES

STATISTICS

- While some construction sites (11.6 %) laborers have to work 9 hours having a spread over of 11-12 hrs in a day.
- 70.3 % of the construction companies are not making provision of food to their laborers.
- 79.7 % of construction companies are not making provisions of Creches to the laborers' children.
- 74.2 % of construction laborers' children are illiterate. They are either at home or wandering here and there in the site when their family members engaged in work.
- While considerable proportion of laborer's family consider 'migration from one place to another as their problem to educate children (510.3%), some percentage (36.1%) economic problem to maintain the education and family.

STATISTICS, LAWS AND POLICIES

LAWS AND POLICIES RELATED TO CONSTRUCTION WORKERS

The construction workers are covered by mainly four legislations. These are:-

- a) Contract Labour (Regulation & Abolition) Act 1970.
- b) The Interstate Migrant Labour (Regulation of employment and Conditions of Service) Act 1973.
- c) Building and Construction Workers (Regulations of Employment and Conditions of Service) Act 1996, and,
- d) The Building and Other construction Workers Welfare Cess Ordinance 1996.

a) Contract Labour (Regulation & Abolition) Act 1970.

The Object of the Contract Labour Regulation and Abolition) Act, 1970 is to prevent exploitation of contract labour and also to introduce better conditions of work. A workman is deemed to be employed as Contract Labour when he is hired in connection with the work of an establishment by or through a Contractor. Contract workmen are indirect employees. Contract Labour differs from Direct Labour in terms of employment relationship with the establishment and method of wage payment. Contract Labour, by and large is not borne on pay roll nor is paid directly. The Contract Workmen are hired, supervised and remunerated by the Contractor, who in turn, is remunerated by the Establishment hiring the services of the Contractor.

b) The Interstate Migrant Labour (Regulation of employment and Conditions of Service) Act 1973.

The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979 is an Act of the Parliament of India enacted to regulate the condition of service of inter-state labourers in Indian labour law. The Act's purpose is to protect workers whose services are requisitioned outside their native states in India. Whenever an employer faces shortage of skills among the locally available workers, the act creates provision to employ better skilled workers available outside the state

c) Building and Construction Workers (Regulations of Employment and Conditions of Service) Act 1996

The Building and Other Construction Workers (Regulation and Conditions of Service) Act, 1996 (for short the BOCW Act) aims to provide for regulation of employment and conditions of service of the building and other construction workers as also their safety, health and welfare measures in every establishment which employs or employed ten or more workers. The BOCW Act exempts for the construction of residential houses for own purpose constructed with a cost not exceeding Rs. 10 Lakh. The provisions in the Act for health and safety measures for the construction workers are in conformity with International Labour Organisation convention No.167 concerning safety and health in construction sector revising the Safety Provisions (Building) Convention, 1937.

STATISTICS, LAWS AND POLICIES

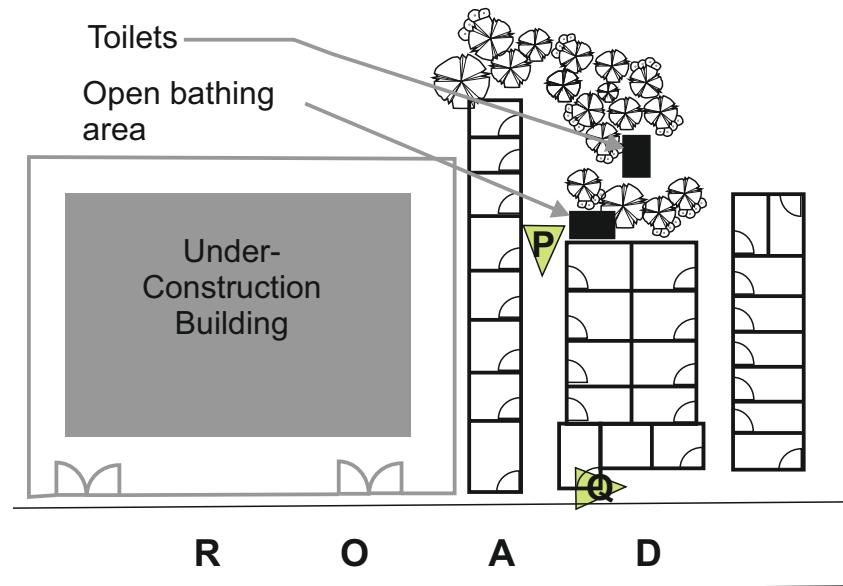
The Minimum Wages Act 1948

The Minimum Wages Act 1948 is an Act of Parliament concerning Indian labour law that sets the minimum wages that must be paid to skilled and unskilled labours. The Indian Constitution has defined a 'living wage' that is the level of income for a worker which will ensure a basic standard of living including good health, dignity, comfort, education and provide for any contingency

CASE STUDIES **LIVE**

PILOT CASE STUDY

A: PHASE 1 OF CONSTRUCTION SITE OF A RESIDENTIAL BUILDING, AT KHARGAR



SITE PLAN

● **VIEW FROM 'P'**



● **VIEW FROM 'Q'**




● **INTERIOR VIEW**



PHASE 1: When the construction of a building has just started. In such cases, the labours occupy the area within the site or the plot adjacent to the site for building their temporary sheds.


DEMOGRAPHICS

 Total number of population: **250**

 **200**  **30**  **20**

SITE DURATION : 2 - 2.5 years

FACILITIES AVAILABLE ON SITE

	
	
	
	Grocery and other shops are in precinct.
	Public transportations are accessible.
	No creche on site or near-by.
	Though the access areas are clean, there is no proper drainage disposal system
	

CASE STUDIES **LIVE**

PILOT CASE STUDY

B: PHASE 2 OF CONSTRUCTION SITE OF A RESIDENTIAL BUILDING AT KHARGAR



SHEDS INSIDE THE UNDER-CONSTRUCTION BUILDING.



OPEN BATHING AREA. WATER IS DRAINED INTO ADJACENT SITE.



INSIDE OF BUILDER'S OFFICE ON SITE

PHASE 2: When construction of slabs of the building is completed. In such cases, the labours move their sheds into the under-construction building.

DEMOGRAPHICS



Total number of population: 110



100



10



0

SITE DURATION : 1.5 - 2 years

FACILITIES AVAILABLE ON SITE



Only basic first aid kit available on site.



Grocery and other shops are in precinct.



Public transportations are accessible.



Sanitation on site is poor



CASE STUDIES LIVE

Live Case Study 1

PRE-FABRICATED HOUSING FOR CONSTRUCTION LABOURS AT WADKHAL

LOCATION



Site Plan

CASE STUDIES **LIVE**



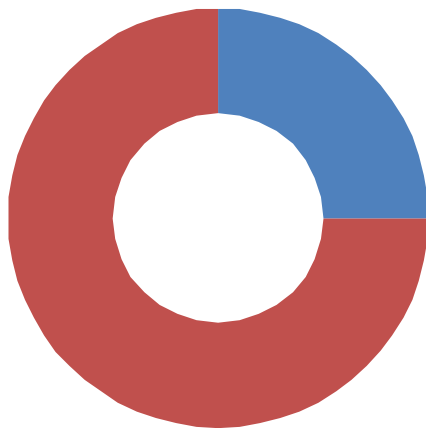
Roadside View

- Site Area: 17,500 sq.meters
- Land owned by JSW.
- Construted by L&T.
- 3-4 kms away from work site
- Building Type: Pre-Fabricated

DEMOGRAPHICS



500 Male Labourers
No Family



Capacity: 2000 people

- Occupied
- Not Occupied

Therefore,

UNDERUSED

CASE STUDIES LIVE

SERVICES



Toilets

- Toilets are located at rear side of the site.
- Total 81 toilet units of which 9 are portable.

Open Bathing Area

- No provision for hot water.
- No Buckets provided.



CASE STUDIES LIVE



The common kitchens

- The common kitchens are located just behind the housing blocks.
- Only dinner is served.
- Cooks are locals from Wadkal.
- Labourers are free to use the kitchens if they need.



Parking

- The open area behind the housing block is used as parking for buses.
- The buses commute between the working area (JSW plant) and the site

Parking

CASE STUDIES LIVE

SERVICES



Water is provided by JSW.



Storage for drinking water



Underground water tank

FACILITIES

X

✓

Only basic first aid kit available

retail or market area in vicinity

- Transportation to work-site available.
- Easy Access to public transportation

—

Hygiene on site: **GOOD**

No recreational facilities available

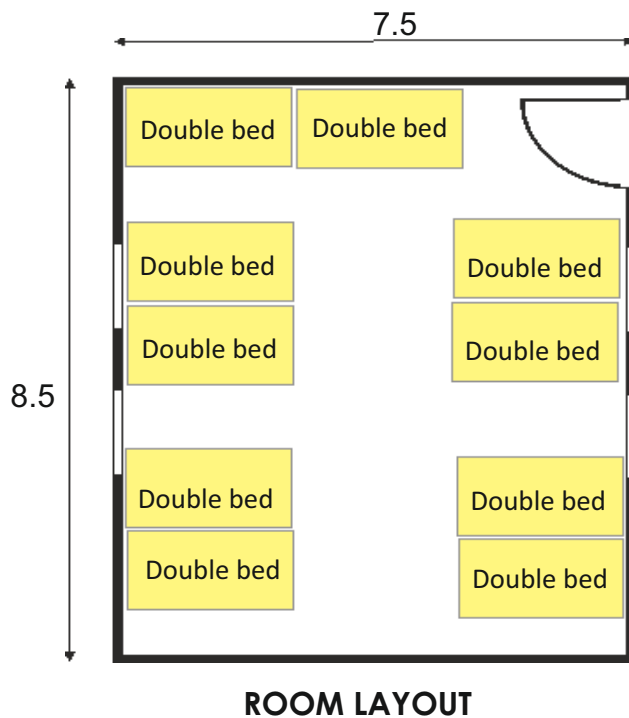
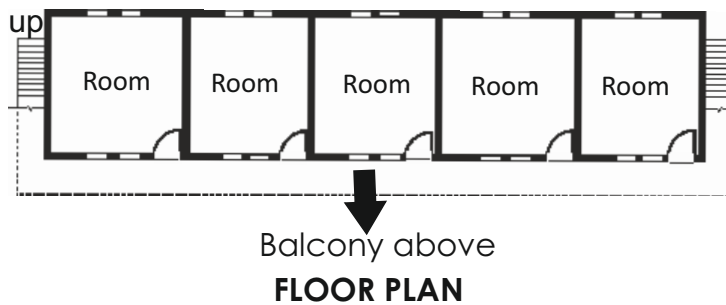


CASE STUDIES **LIVE**

Site Planning



- Of total 12 blocks on site only 10 are in working condition.
- Each block is a G+1 structure with total 10 housing units, 5 on each floor.
- Total of 100 units.
- Each unit houses 20 people.



VIEW OF INTERIOR OF ROOM

- Lack of dedicated storage units/space.
- No Electric Supply.

CASE STUDIES **LIVE**

MATERIAL

PREFABRICATED

Prefabricated fibre sheets with steel joineries

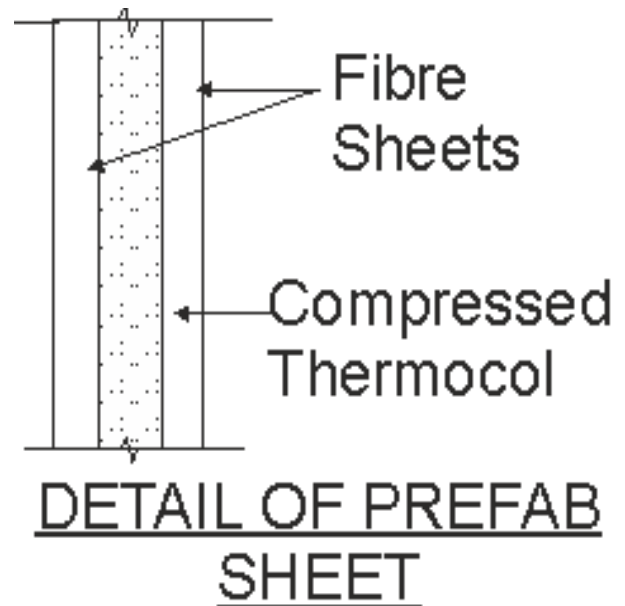
Good insulation.

Easy installation and dismantlation.

BRICKS

The Common Kitchens and Toilets are constructed in bricks

EFFICENCY: GOOD



INFERENCES.

- The Structure is **UNDERUSED**.
- **NO VEGETATION** on site.
- **NO ELECTRICITY** in rooms. Therefore the labourers move their cots outside in night.
- **NO RECREATIONAL** facilities on site.

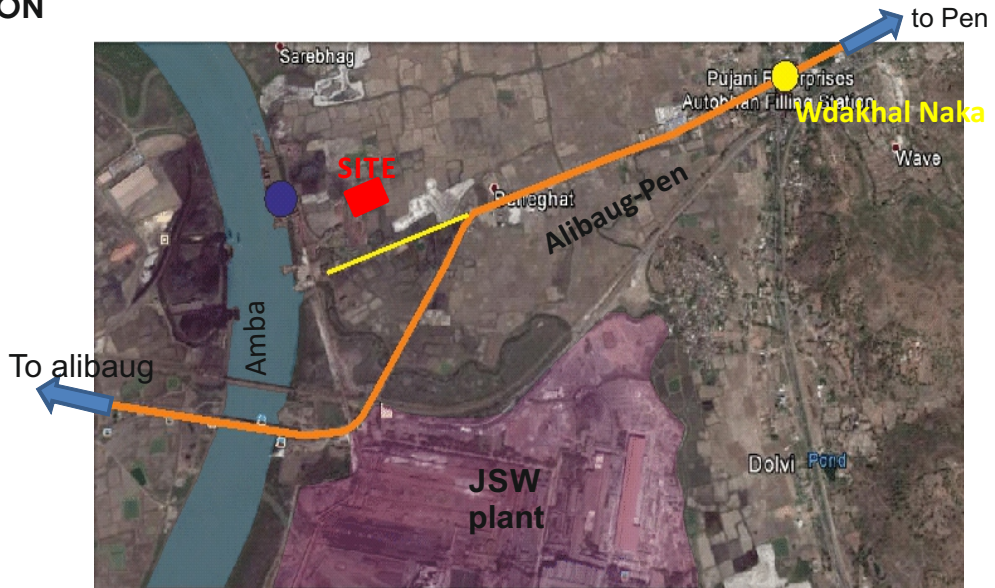
LACK of LIFE

CASE STUDIES LIVE

Live Case Study 2

Container Housing For Construction Labour at Wadkhal

LOCATION

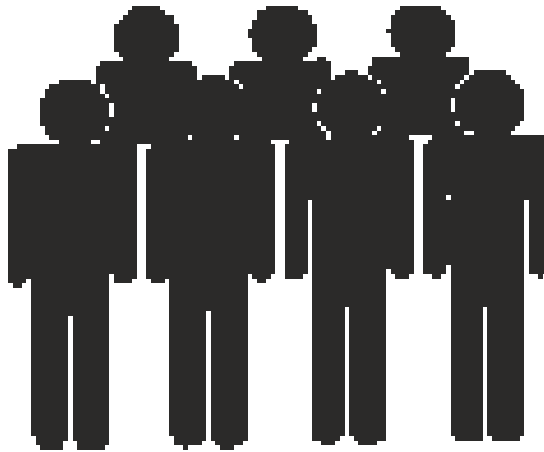


- Site Area: 16,000 sq.meters
- Land owned by JSW.
- Constructed by L&T.
- 2-3 kms away from work site
- Building Type: Container Housing



CASE STUDIES LIVE

Demographics



3000 Male Labourers

No Family

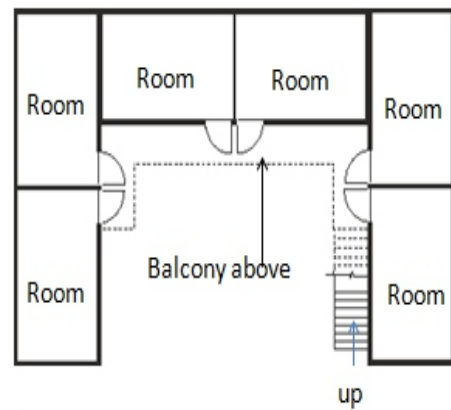
Capacity: 3870 people

Though the numbers look fair, the room sizes are not large enough to cater these number

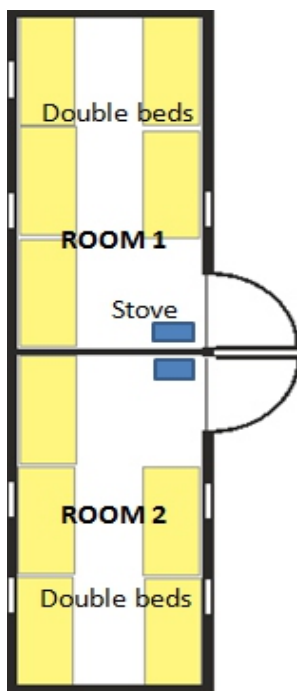
Therefore, **OVERCROWDED**

CASE STUDIES LIVE

Site Planning



- Each container is divided into two rooms
- Each block is a G+1 structure with total 6 container units, 3 on each floor.
- Total of 387 rooms
- Each container houses 20 people.



PLAN OF A CONTAINER UNIT

- The space is too small for 5 double beds.
- No space for kitchen.
- No space for storage units.
- Poor ventilation inside.
- Poor heat insulation inside.



CASE STUDIES LIVE









Services



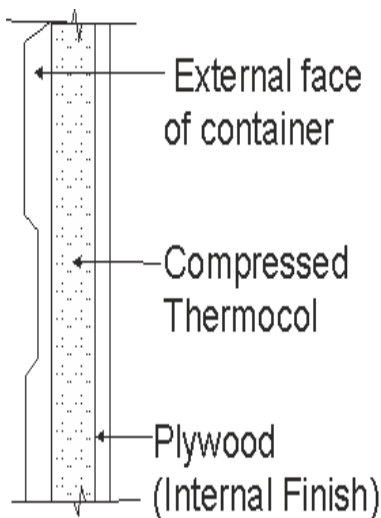
Total 60 Toilet Units.
The Number is insufficient

CASE STUDIES **LIVE**

Facilities

	✓
	✓
	Only basic first aid kit available
	✗ No retail or market area in vicinity
	<ul style="list-style-type: none"> • Transportation to work-site available. • Access point to public transportation is almost 1km away.
	—
	Hygiene on site: GOOD
	✗ No recreational facilities available

Material



SHIPPING CONTAINERS

- Poor heat insulation.
- Poor quality of natural light and ventilation inside.
- Earthing provided for each container.
- Ready to use.
- Easy installation.

EFFICENCY:
MODERATE



CASE STUDIES **LIVE**

Inferences.

- The Rooms are **OVERCROWDED**.
- **NO VEGETATION** on site.
- **POOR VENTILATION** in rooms.
- **POOR INSULATION FOR HEAT.** Better Insulating material could be used.
- **NO RECREATIONAL** facilities on site

SITE

Taking into consideration all the upcoming construction projects, the most largest was the NAINA. The large scale of this project can enable to explore the temporary nature of the design.

ABOUT NAINA

CIDCO successfully sought approvals for the proposed International Airport in Navi Mumbai from Government of Maharashtra, Ministry of Civil Aviation and Ministry of Environment & Forest, Government of India. While granting the Environmental and Coastal Regulations Zone (CRZ) clearances to the proposed Greenfield airport on 22nd November, 2010, Ministry of Environment & Forest (MoEF), Government of India, expressed concern about unplanned and haphazard development around Airport within 20 km of the airport. In pursuance of these concerns, Government of Maharashtra notified the area around the proposed airport, identified as “Navi Mumbai Airport Influence Notified Area (NAINA)” and appointed CIDCO as the Special Planning Authority (SPA) for the same.

NAINA comprises 270 revenue villages from Uran, Panvel, Karjat, Khalapur, and Pen Talukas of Raigad district and Thane Taluka of Thane district of Maharashtra. Out of which, 217 are full revenue villages. Remaining 54 are part revenue villages. Together, it has an area of approximately 56,172 ha (561sq.km).

CRITERIA FOR SELECTION:-

- Proximity to NAINA as well as Panvel (located in NAINA)
- Availability of transport network. (the existing and proposed transport network is an indicator for assessing the early potential for growth)
- Can cater the labour requirement of nearby construction sites.
- To tackle illegal land acquisition for construction of chawls.

SITE

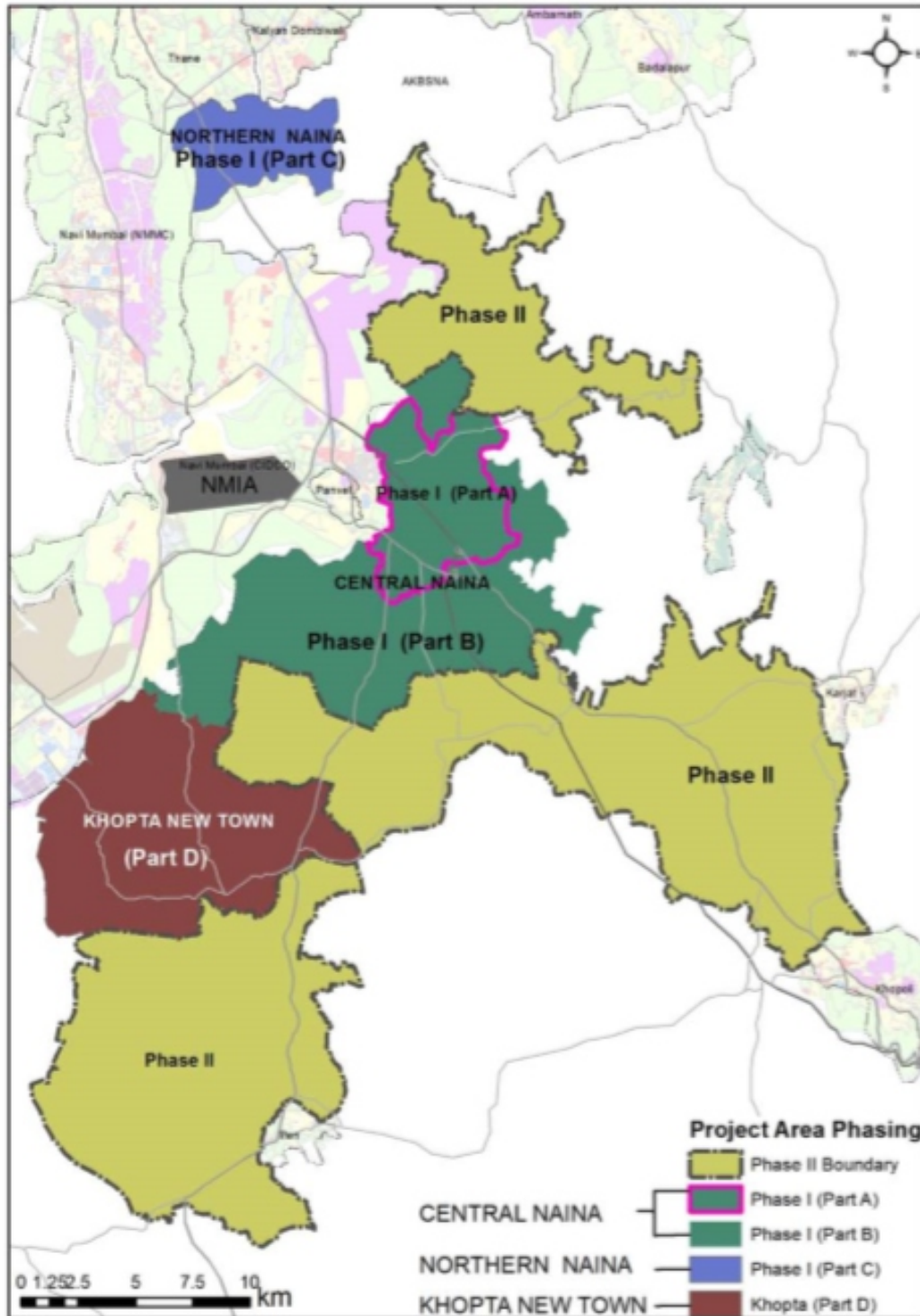


Figure 3-1: Phasing of NAINA & KNT and location of IDP

MAP SHOWING PHASING OF NAINA

SITE

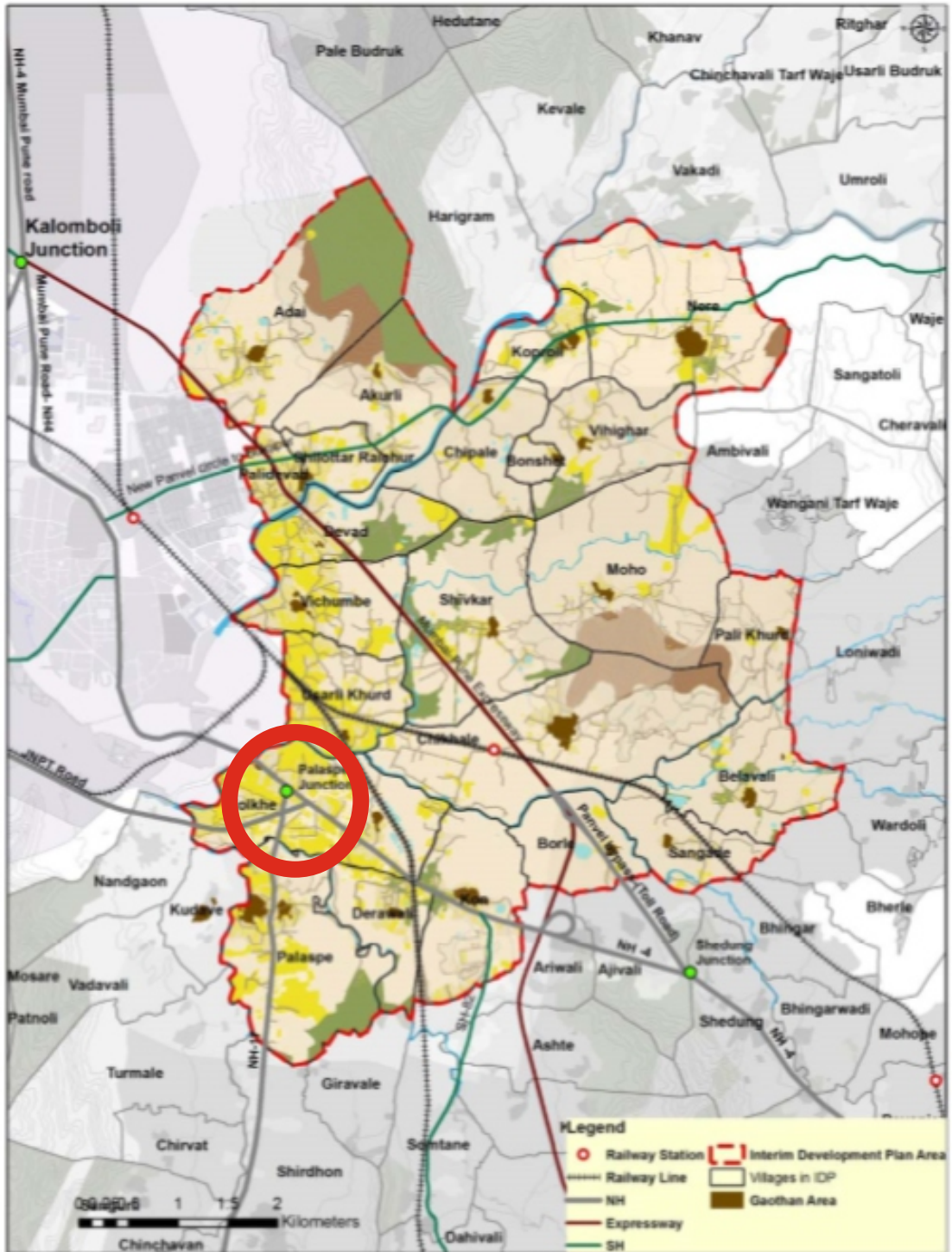
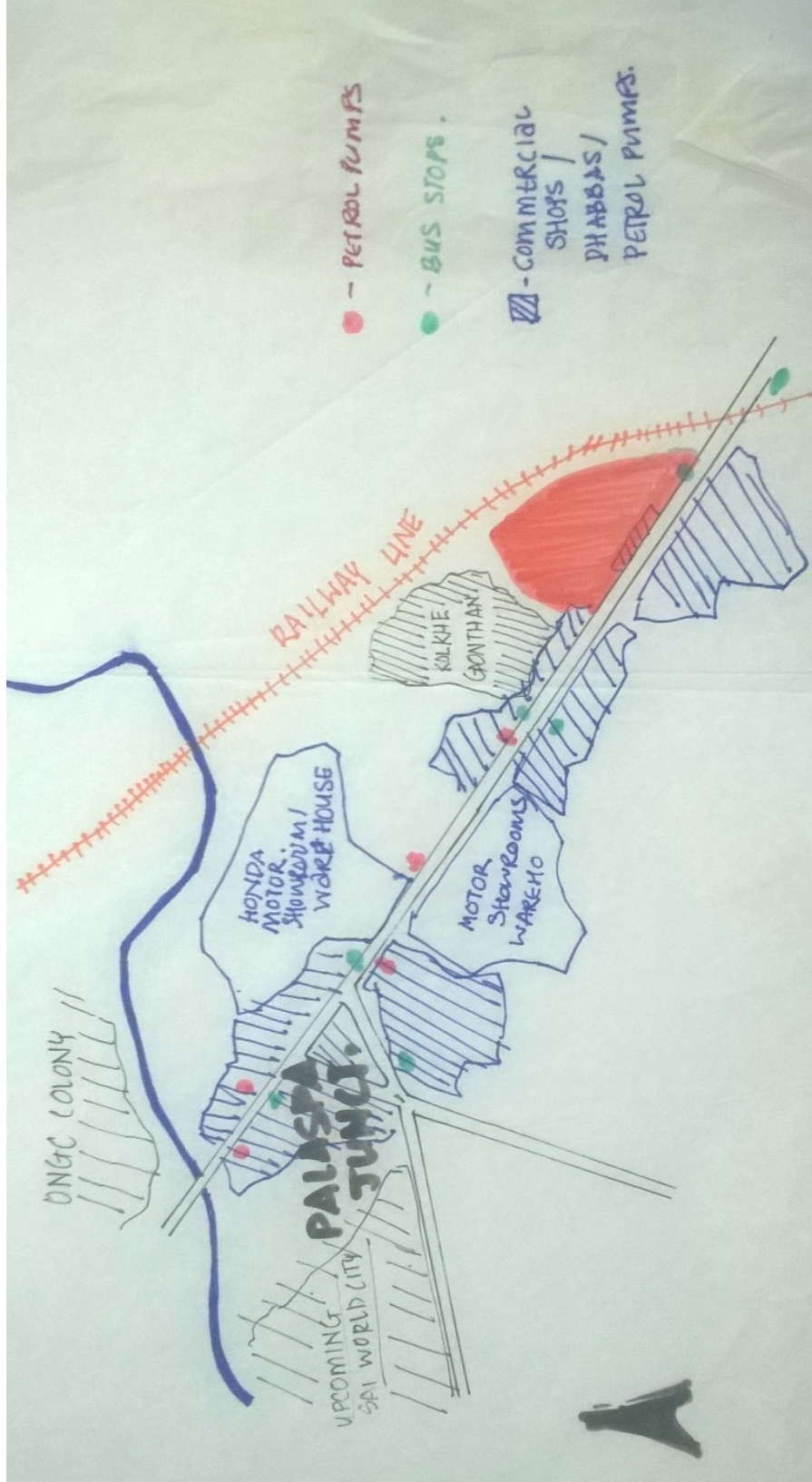


Figure 1-2: Villages covered in IDP Area

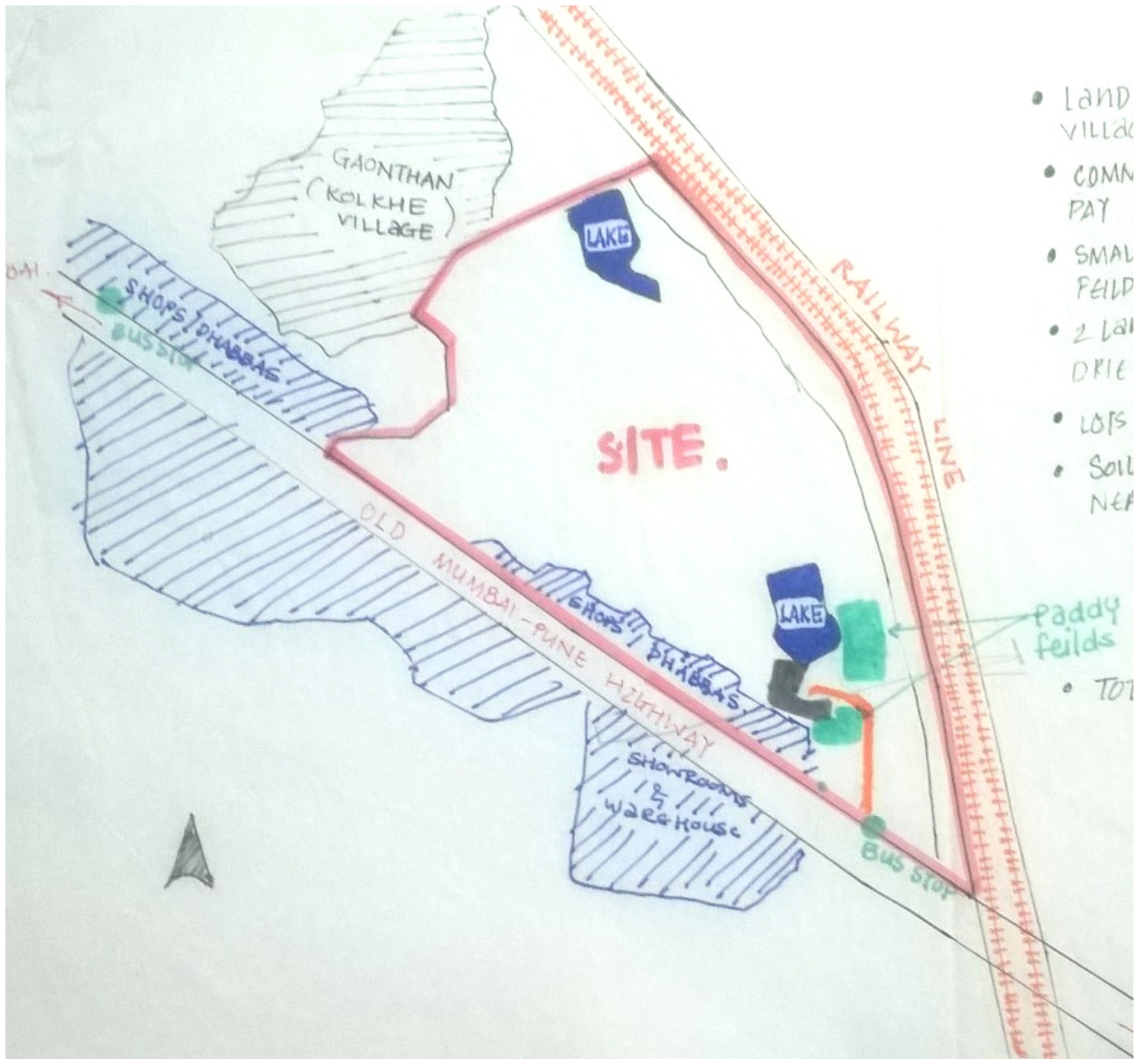
MAP OF PHASE 1 OF NAINA

SITE



LOCATION PLAN

SITE



SITE PLAN

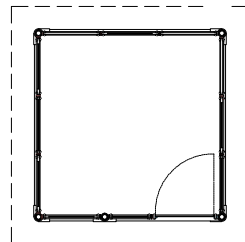
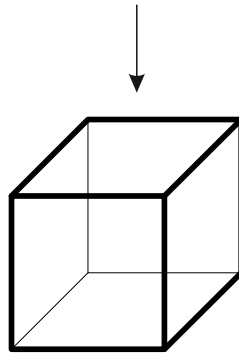
AREA STATEMENT

SPACES	AREA	No. OF SPACES	TOTAL AREA
Family occupancy room for family of two	5 sq.m		
Family occupancy room for family of four	10sq.m.		
Family occupancy room for extended	15sq.m.		
Dormitory for 10	20sq.m.		
Common Bathroom and toilets	AS PER DESIGN 1 TOILETS AND BATH PER 10 PEOPLE		
Creche (classrooms, multipurpose hall, toddler room including playpen, nappy changing tables)	200 SQ.M		
Mess (Storage, kitchen, dining space)	650 SQ.M		
Community Hall/ Kitchen	500 SQ.M		
Primary Health Care Center	150 SQ.M		
Site Manager's office + Residence	50 SQ.M		
Open/ Semi-open space for Market/retail shops	ONLY AREA ALLOCATION		
Storage	2% OF TOTAL BUILT UP		

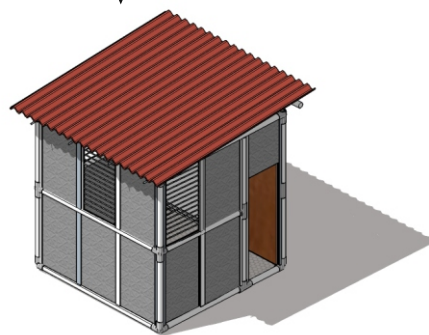
DESIGN

MODULES TYPOLOGY

MODULE 1: SINGLE UNIT



Area : 5 sq.m

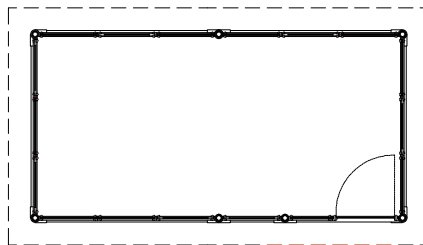
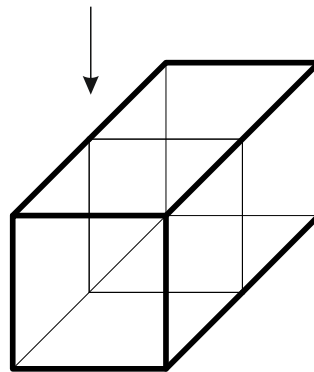


FAMILY OF 2

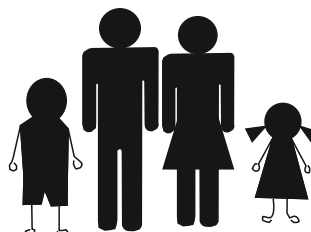
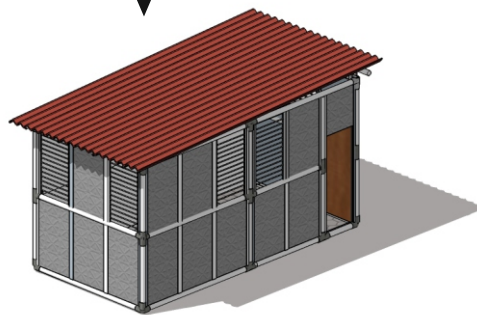
DESIGN

MODULES TYPOLOGY

MODULE 2: DOUBLE UNIT



Area : 10 sq.m

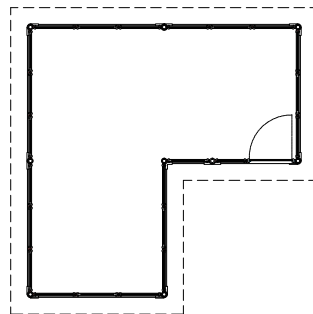
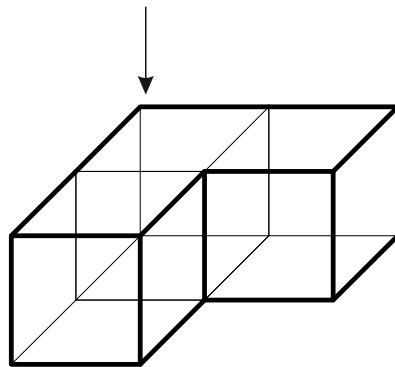


FAMILY OF 4

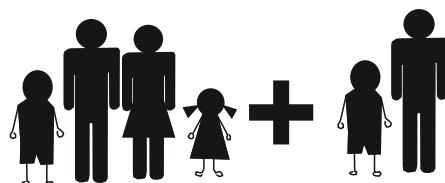
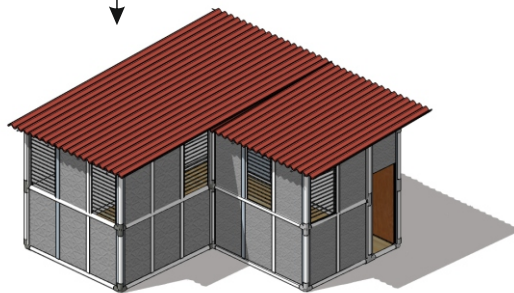
DESIGN

MODULES TYPOLOGY

MODULE 3: EXTENDED UNIT



Area : 15 sq.m

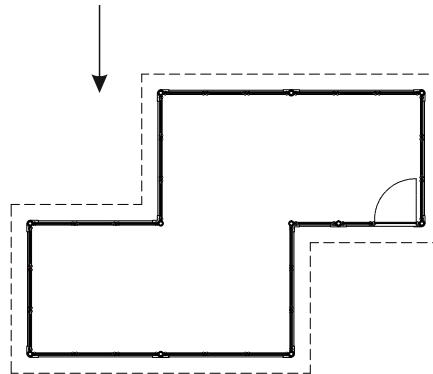
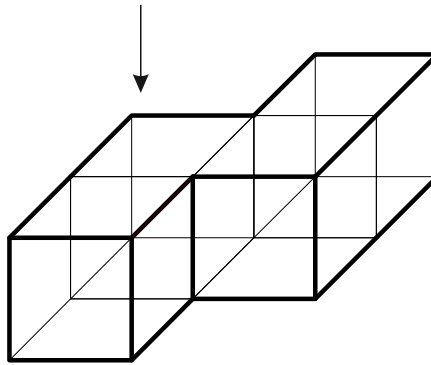


**FAMILY OF
6/7**

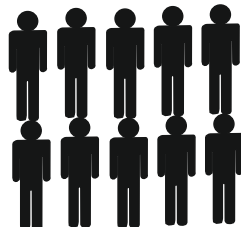
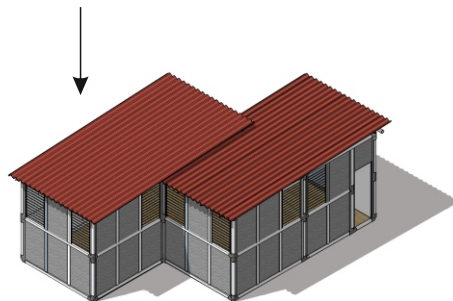
DESIGN

MODULES TYPOLOGY

MODULE 4: DORMITORY



Area : 20 sq.m

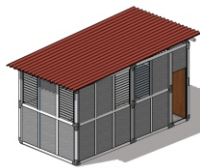


**DORMITORY
FOR 10**

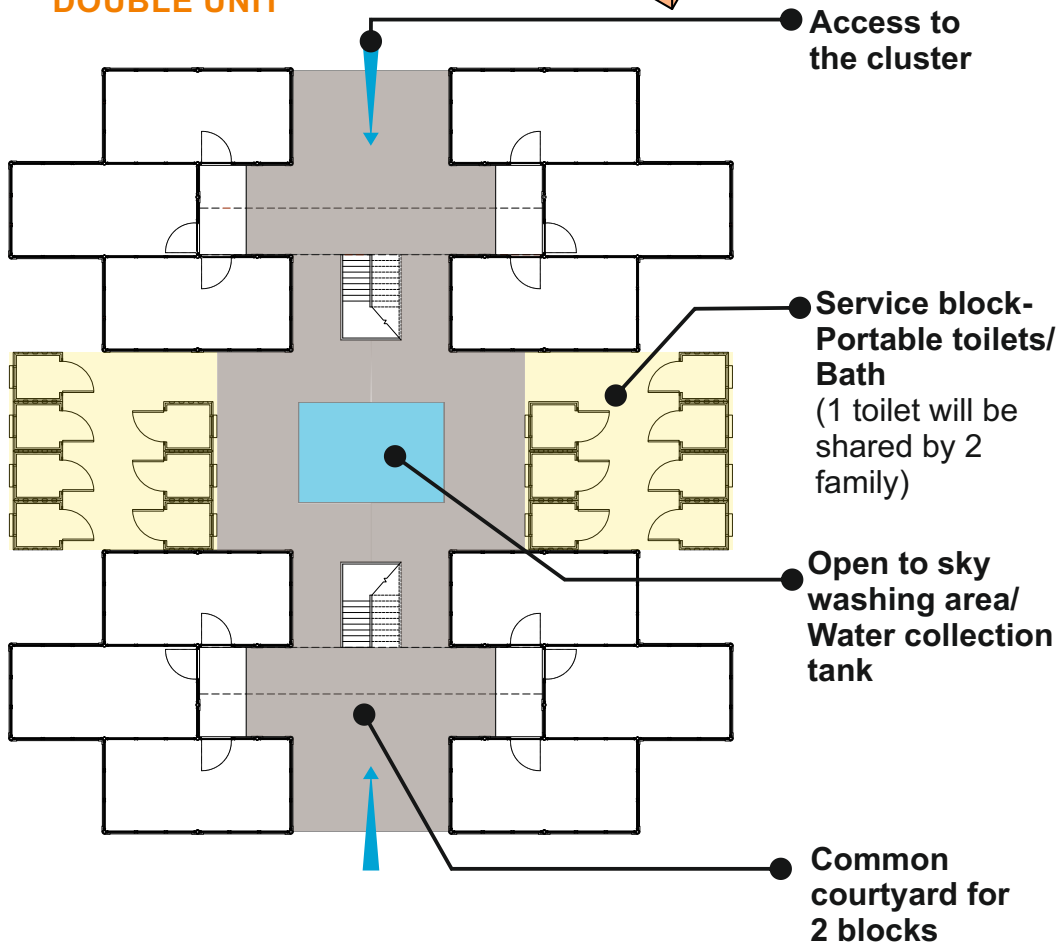
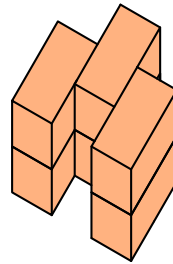
DESIGN

CLUSTER TYPOLOGY

CLUSTER TYPE A



**MODULE 2:
DOUBLE UNIT**

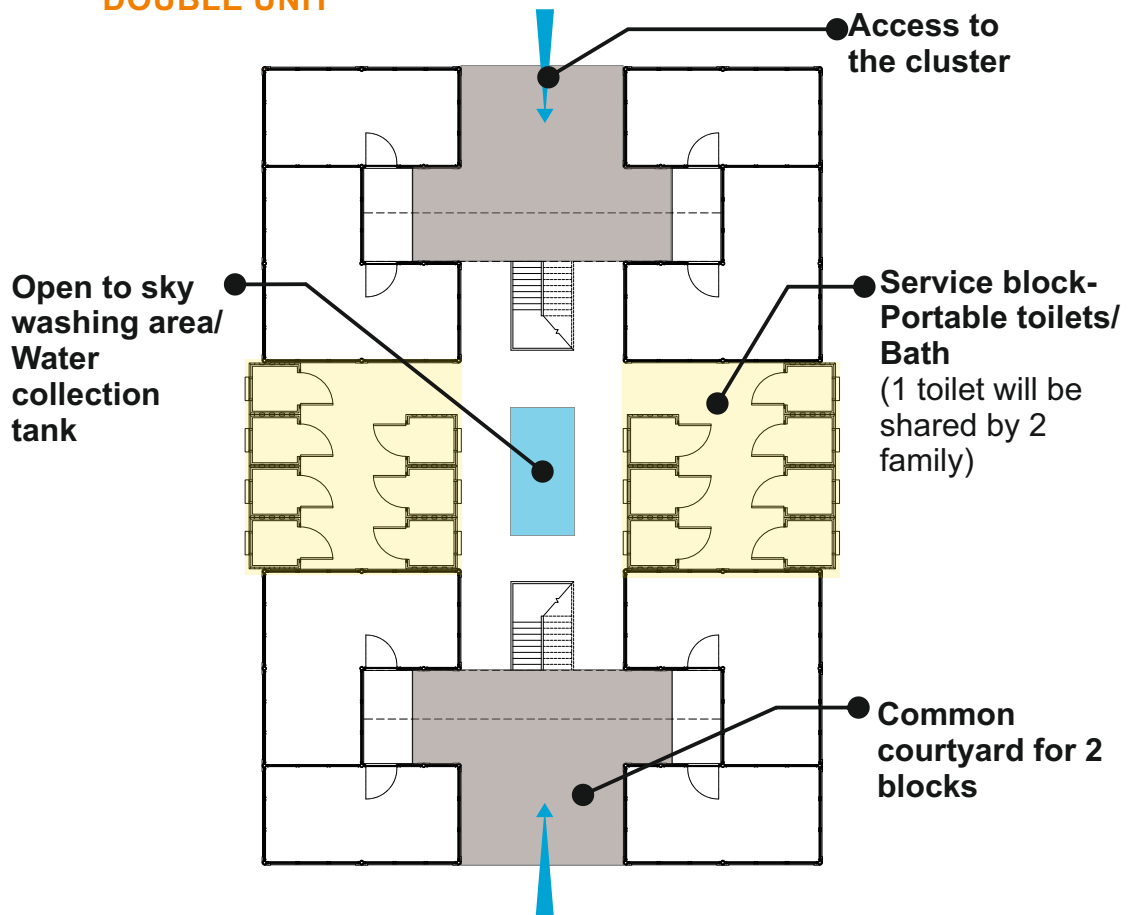


PLAN OF CLUSTER A

DESIGN

CLUSTER TYPOLOGY

CLUSTER TYPE B

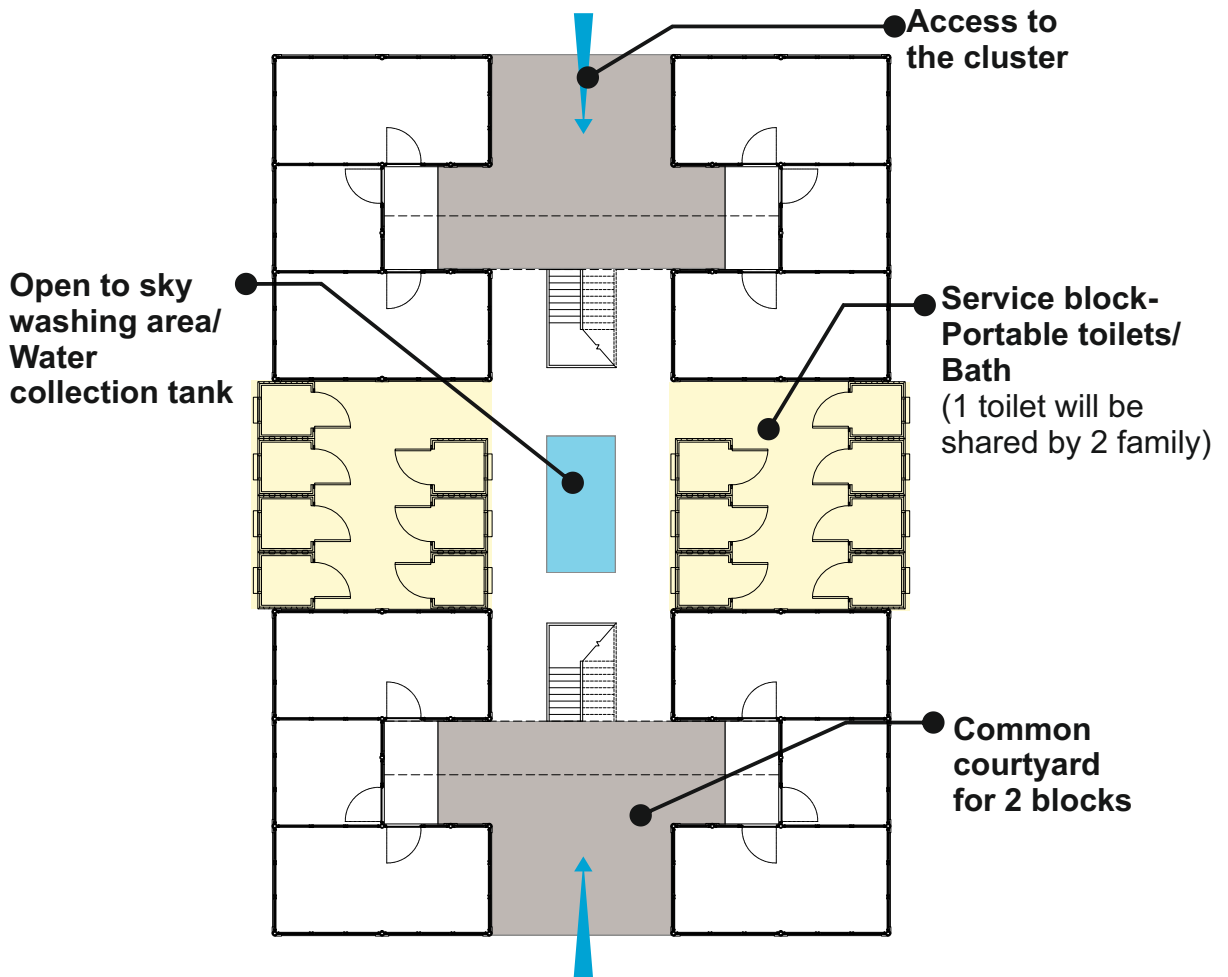
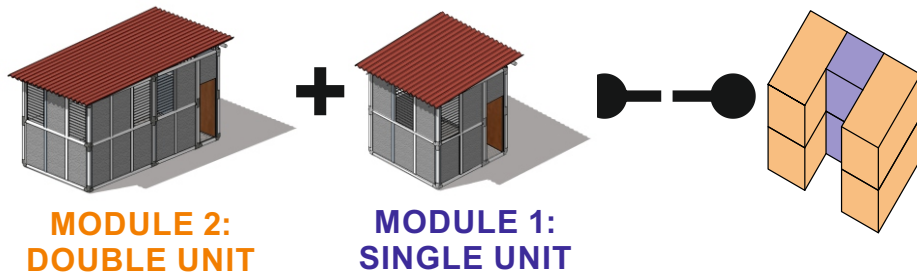


PLAN OF CLUSTER B

DESIGN

CLUSTER TYPOLOGY

CLUSTER TYPE C

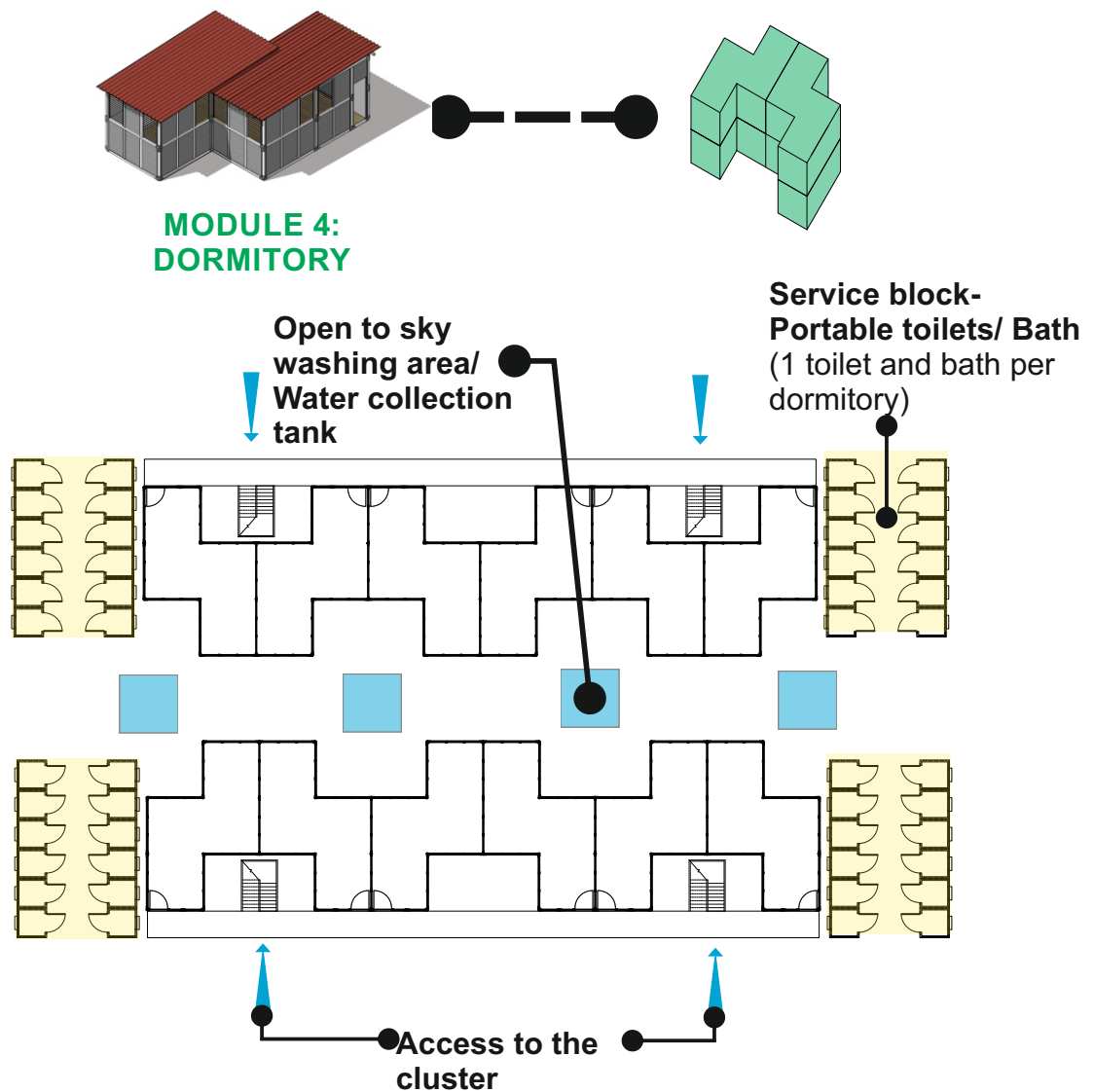


PLAN OF CLUSTER C

DESIGN

CLUSTER TYPOLOGY

CLUSTER TYPE D



PLAN OF CLUSTER D

REFERENCES

Research paper-Problems of construction labourers:A Qualitative Research by Prof.Dileep Kumar M.

Minimum wages act,1948,Government of India.

Building and Other construction workers(Regulation of Employment and Condition of Service)Act,1996,Ministry of Labour,Government of India.

www.thehindu.com

<http://www.indianmba.com>

www.indianmirror.com

<http://www.sewaresearch.org>

<http://wiego.org/informal-economy/occupational-groups/construction-workers>