

LGED TRAINING COMPLEX

GAZIPUR

BY

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A thesis submitted to the Department of Architecture in partial fulfilment of
the requirements for the degree of
Bachelor of Architecture

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Declaration

It is hereby declared that.

1. The thesis submitted is my/our own original work while completing degree at Brac University.
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3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
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ABSTRACT:

In view of the remarkable economic growth that Bangladesh has achieved, it can be expected that the demand for rural infrastructural projects will further increase.

For the pressing need, various stakeholders are to be considered for being trained by LGED. Evidently this includes LGED and LGI staff, but also the beneficiaries of LGED projects, contractors, consultants, and certainly the workforce.

This is to be seen in the context of a fast-changing environment for the construction sector, also in rural areas. Since they do not have any central training complex, this will accommodate all the training programs under one complex covering all the divisional and regional training facilities of LGED.

The main demand of the project was to design the project in such a manner that the construction skill centre zone encourages local workers to attend the practical training courses willingly. They would get a rural courtyard type environment, open yards to have practical training. study says that local labour & workers prefer practical training rather than indoor classes and seminars.

This paper seeks to establish how the architectural design of LGED Training Complex can be used to fulfil the demand of the LGED inhouse training facilities while providing the best suitable environment for all its users.

Keywords: training, skill-training, infrastructure, construction

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Table of Contents

Declaration.....	ii
Approval	iii
ABSTRACT:	iv
ACKNOWLEDGEMENT:	v
CHAPTER 01: INTRODUCTION.....	1
1.1 Project Background	1
1.2 Project Rationale.....	2
1.3 Project Brief	3
1.4 Problem Statement.....	3
1.5 Aims and Objectives	4
1.6 Tentative programs.....	5
CHAPTER 02: LITERATURE REVIEW	7
2.1 Definition of Training Centre:	7
2.2 Why LGED Need a Training Centre:	8
2.3 Project Background:.....	9
2.3.1 National and International Development Plans:.....	9
2.3.2 Sustainable Development Goals:	10
2.3.3 7th Five-Year-Plan:	11
2.4 Training Related Policies:	11
2.5 Human Resource Development:	12
CHAPTER 03: SITE APPRAISAL.....	16

3.1 Background	16
3.2 Historical Development of the Site	18
3.3 Land-use Pattern of the Surroundings	18
3.4 Accessibility and Connectivity	20
3.5 Green Space	21
3.6 Swot Analysis of Site	22
CHAPTER 04: CASE STUDIES	23
4.1 PALACE OF SCHOOL CHILDREN, KAZAKHSTAN	23
4.1.1 Environment and Micro- Climate:	24
4.1.2 Form and Function:	25
4.1.3 Horizontal and vertical circulation:	28
4.1.4 Structural Details:	31
4.1.5 Parking details and Standard:	32
4.2 UNIVERSITY OF MPUMALANGA	33
4.2.1 Programs & Zoning:	34
4.2.2 Materials:	36
4.3 FRIENDSHIP CENTER, GAIBANDHA	37
4.3.1 Construction:	38
4.3.2 Design Considerations:	39
CHAPTER 5: PROGRAM ANALYSIS	46
5.1 Program Analysis:	46

Area Calculation:	49
5.2 Design Consideration:	50
CHAPTER 6: DESIGN SUGGESTIONS.....	53
6.1 Concept:	53
6.2 Form Development:	55
6.3 Zoning:	56
6.4 Floor Plans:.....	57
6.5 Elevations & Sections:.....	60
6.6 Perspectives:	62
CHAPTER 7: CONCLUSION.....	66
REFERENCES:	67

LGED TRAINING COMPLEX, GAZIPUR

CHAPTER 01: INTRODUCTION

1.1 Project Background

1.2 Project Rationale

1.3 Project Brief

1.4 Problem Statement

1.5 Aims and Objectives.

1.6 Tentative programs

1.1 Project Background

Local Government Engineering Department (LGED) is one the largest engineering agencies of the country. It began its journey in 60s as Rural Works Program and with the passage of time its activities expanded from remotest corner of the country up to the cities.

Role of LGED in strengthening of rural economy through development of rural transportation and improvement of rural markets and growth centers are visible across the country. Contribution of these infrastructures are enormous in achieving the ever-increasing national growth. People living in rural areas now have the access to metaled roads within two kilometers while the rural infrastructures play pivotal role in the improvement of lifestyle and reducing poverty.

This Project is to be seen in the context of the demand for improved in-house training facilities within LGED, as well as the need to address the lack of skilled workforce within Bangladesh.

There is indeed a pressing need to preserve institutional memory within LGED; to increase competence of staff to meet present-day and future standards; and to be able to face the technical developments in construction.

1.2 Project Rationale

In 2016 a workshop at LGED was organized trying to come up with suggestions for the future HR development. Although still vague, it confirmed that capacity building and training required more attention, to avoid the risk of LGED slowly losing its expertise and cooperative memory. This potentially represents a serious loss of what was painfully built up in the past. A report by the BIDS clearly demonstrates that only an estimated 25% of the needed technical skills training facilities for workforce in the construction sector are covered within Bangladesh. This seriously hampers the construction sector as whole, but also LGED managed projects.

In this context it was decided to consider the establishment and upgrade of adequate training centers within LGED: to realize a Central Training Centre (CTC) in Gazipur.

LGED develops infrastructure database, maps, technical specifications, manual etc. required for development projects. Regular training courses conducted by LGED for enhancing skill of its own employees, members of the Local Government Institutions and other stakeholders.

Besides, LGED extending technical assistance to Local Government Institutions. Required technical assistance is also provided to various ministries.

Therefore, especially during the start-up period, LGED will have to consider contracting external consultants, trainers and staff as well beside the in-house trainers.

1.3 Project Brief

This ‘LGED TRAINING CENTER COMPLEX’ Project is to be seen in the context of the pressing demand for improved in-house training facilities within LGED, as well as the need to address the lack of skilled workforce. There is indeed a pressing need to preserve cooperative memory within LGED, but also to increase competence to meet present-day and future standards and to be able to face the technical developments in construction, to a lesser extent for rural infrastructure.

The client of this project is the ‘Ministry of Local Government, Rural Development & Cooperatives / Local Government Division’ (LGED).

Project Name: LGED Training Complex

Location: Rajendrapur, Gazipur

Client: ‘Ministry of Local Government, Rural Development & Cooperatives / Local Government Division’ (LGED)

Site area: 13 Acres (566280 square feet)

1.4 Problem Statement

In the near future, considering that Bangladesh will become a middle-income country in the next few years, it can be expected that external Official Development Aid (ODA) will decrease, putting more stress on Government funding. Moreover, in view of the remarkable

economic growth that Bangladesh has achieved, it can be expected that the demand for rural infrastructural projects will further increase, especially in the context of National Goal of becoming a developed nation by 2041 and the present Government's thrust on rural areas with the concept of "My Village-My Town".

For the project, considering the mandate of LGED, various stakeholders are to be considered for being trained by LGED. Evidently this includes LGED and LGI staff, but also the beneficiaries of LGED projects, contractors, consultants, and certainly the workforce.

This is to be seen in the context of a fast-changing environment for the construction sector, also in rural areas.

1.5 Aims and Objectives

LGED needs to invest considerably in new training facilities. Moreover, it became clear that such capacity building efforts require full-time devoted professionals, capable of planning, designing and implementing effective training programs.

The identified training needs for LGED staff are:

- (1) Introduce a "Mandatory Training Course for Career Progression"
- (2) LGED staff need to be trained in such areas where their competency gaps are highest

- (3) Contract highly competent consultants and/or establish a resource pool for designing, planning and performing training
- (4) Use modular training courses, where the approach should be interactive & participatory
- (5) Incorporate attitudinal issues in training
- (6) Cover all LGED employees regarding ICT literacy and ICT use
- (7) Identify the weaknesses of the non-LGED staff within the agreed Target Group (LGI & workforce), considering present technological and other developments, considering cross cutting issues such as climate change, gender, etc.
- (8) Specify knowledge & skills gap as per category. Regarding LGED staff and especially the training staff
- (9) Formulate requirements for new/improved LGED facilities for all levels of training, incl. supporting infrastructure and equipment.
- (10) Assess the need for supporting facilities such library, laboratories, IT infrastructure, recreation, restaurants, mosque, required accommodations for trainees ETC.

1.6 Tentative programs

Training /Academic:

- classroom
- faculty room
- multipurpose hall
- library
- computer lab
- laboratory
- toilets

Administration:

- directors office
- deputy directors office
- general office
- conference room
- reception
- toilets (for office & reception)

Health facility:

- doctors chamber
- nursing facility
- toilets

Residential:

- trainees accommodation
- trainers accommodation
- guest accommodation
- administrative staff accommodation

1. Director's residence**2. Directors' residence****3. Senior staff****4. Junior staff**

- dining hall
- lounge
- kitchen
- laundry
- toilets

Recreational:

- swimming pool
- gymnasium
- indoor games
- outdoor games
- toilets

Utility and services:

- security and surveillance
- fire control room
- guard room
- waste
- water
- parking
- roads, walkways

CHAPTER 02: LITERATURE REVIEW

2.1 Definition of Training Centre

2.2 Why LGED Need a Training Centre

2.3 Project Background

2.3.1 National and International Development Plans

2.3.2 Sustainable Development Goals

2.3.3 7th Five-Year-Plan

2.4 Training Related Policies

2.5 Human Resource Development

2.1 Definition of Training Centre:

A place where people undergo skills training for work. Personal and professional skills are developed in the training center and through secondments.

Training is teaching, or developing in oneself or others, any skills and knowledge or fitness that relate to specific useful competencies. Training has specific goals of improving one's capability, capacity, productivity, and performance. *(Kathleen, 2007)*

Training may continue beyond initial competence to maintain, upgrade and update skills throughout working life. People within some professions and occupations may refer to this sort of training as professional development. *(Tsang,1997)*

2.2 Why LGED Need a Training Centre:

This Training Centre is to be seen in the context of the demand for improved in-house training facilities within LGED, as well as the need to address the lack of skilled workforce within Bangladesh. There is indeed a pressing need to preserve institutional memory within LGED; to increase competence of staff to meet present-day and future standards; and to be able to face the technical developments in construction. *(Lapidaire ,2019)*

In this context it was decided to consider the establishment and upgrade of adequate training centers within LGED.

For the project, considering the mandate of LGED, various stakeholders are to be considered for being trained by LGED. Evidently this includes LGED and LGI staff, but also the beneficiaries of LGED projects, contractors, consultants, and certainly the workforce. This is to be seen in the context of a fast-changing environment for the construction sector, also in rural areas. The rising wage rates and increasing production costs are causing entrepreneurs to move to relatively more capital-intensive production processes. Specific technological changes have started to emerge in the building sector, also in rural areas.

It is also clear that to meet future requirements, LGED needs to invest considerably in new training facilities. Moreover, it became clear that such capacity building efforts require full-time devoted professionals, capable of planning, designing, and implementing effective training programs. On the other hand, construction skills development training within LGED should be research-based and field experience oriented. Ensuring “World Class” quality of works and aligning LGED’s plans, programs, projects and activities with national development perspectives are two major challenges for LGED.

LGED has available suitable land in Gazipur which they own, are to be considered for the central training complex.

(Feasibility Study Report for Establishment of Central Training Centre (CTC), Divisional Training Centres (DTC) And Construction Skill Training Centres (CSTC) In LGED, 2019)

2.3 Project Background:

Hereunder we will discuss the overall background in terms of national development plans that are of relevance to this training and human resource development project in LGED.

2.3.1 National and International Development Plans:

Bangladesh in its quest to become a developed nation and fulfilling its aspirations of the Liberation War of Independence of 1971, has opted primarily for **Five Year Plans**. Starting in 1972 the first issue of such development plan concentrated on rebuilding a war-ravaged country. Over the years, with the help of foreign aid and technical assistance from development partners Bangladesh has been able to turn around the label of being the “Bottomless Basket” (as labelled by Henry Kissinger) it was considered in the 1970s, into one of fastest growing regional economies. This has been made possible by a strong macro-economic framework, conducive policies, committed political vision and an enterprising, as well as hard working population.

LGED played a crucial role in building and maintaining the so much needed infrastructures, especially in the rural areas. This certainly has helped to facilitate this growth. As a result, Bangladesh crossed the threshold of middle-income group of countries in 2017. The World Bank has recognized that the country has already stepped one level higher, to become an upper middle-income country by 2021.

Evidently this very impressive growth comes together with a fast-changing socio-economic environment, in which the economic models, mainly based on cheap labour, must be revised and diversified. In this context Bangladesh has formulated the following main development plans.

(Feasibility Study Report for Establishment of Central Training Centre (CTC), Divisional Training Centres (DTCs) AND CONSTRUCTION SKILL TRAINING Centres (CSTCs) In LGED, 2019)

2.3.2 Sustainable Development Goals:

In order to monitor the achievement of the SDGs, the General Economics Division of the Planning Commission has drawn up a Mapping of Ministries by Targets in the Implementation of SDGs aligned with the 7th Five-Year Plan. This clearly confirms the Ministry's responsibilities for achieving targets of SDGS. The controlling Ministry of LGED, the Local Division is formally linked up with Goals 6, 7, 8, 9 and 11 of SGDs. Moreover, "SDG Focal Points" have been installed in different Ministries and Divisions to keep track of progress and draw up Action Plans. The General Economics Division has come up with Voluntary National Reviews to follow-up on the progress so far.

(GED, Planning Commission (2012) Perspective Plan of Bangladesh (2010-2021): Making Vision 2021 a Reality, p.10)

2.3.3 7th Five-Year-Plan:

Regarding LGED, the 7th Five-Year Plan set out certain strategic priorities. These in particular concern the upgrading and maintaining of the busy upazilla level roads, with a view of linking up these roads with railways and waterways, to allow multimodal transportation. Thus, rural level roads are seen as a support to the economic development in the rural areas. Thus, the plan focuses on improving Rural Growth Centers to ensure integration of road and waterways development facilitating rural transport and stimulating rural business centers. (www.lged.gov.bd, 2018)

2.4 Training Related Policies:

At a national level, the Government of Bangladesh formulated and circulated the “Public Administration Training Policy 2003”. This policy recognizes that training is one of the major instruments for human resource development. Having realized the importance of training as an effective means for human resource development, the Government has declared its firm commitment to gearing up and orienting training activities in order to enhance administrative and management capacity, augment productivity in all sectors, alleviate poverty, reduce unemployment and achieve sustainable and balanced development.

The policy further mentions that the training institutions operating in the public sector, such as the LGED Training Unit, need to be technology based, result-oriented and market responsive aiming at building professionalism of public servants at different levels. The overall goal is to create an efficient and innovative, responsive, and accountable, honest, and committed public

service system able to meet the challenges of the 21st century. Indeed, for improving the performance of the public service, training is a major intervention. It has the potential to bring about a new administrative culture able to coop with the rapidly changing technology; the impact of globalization; and pressure of the free market economy. Training will be used as one of the important tools to implement the national visions, as reflected in the various policies, plans and programs of the Government. It will be used for promotion of administrative efficiency, higher productivity, and optimal utilization of human resources for the greater welfare of the citizens.

(Training Needs Analysis Report By LGED, Table-G.05, Annex 7)

(Feasibility Study for the Realization of Training Centers for LGED, 2019)

2.5 Human Resource Development:

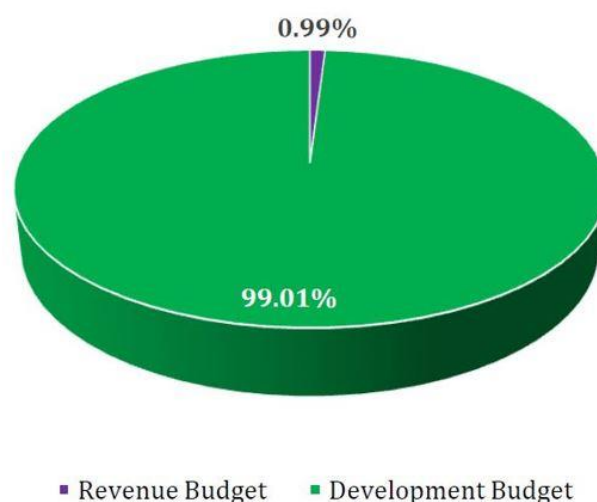
The Local Government Engineering Department (LGED) is a public sector organization under the Local Government Division (LGD) of the Ministry of Local Government, Rural Development and Cooperatives (MLGR&C). The principal mandate of LGED is to plan, develop and maintain rural and urban infrastructure, small-scale water resources infrastructure and social safety net or livelihood development projects/programs, to boost the rural and urban economy, as well as improve the livelihood of rural-urban people of the country.

(www.lged.gov.bd, 2018)

The training courses of LGED are funded from the Revenue (Government) Budget as well as Development Budget. Most interestingly, only 0.99% of the LGED's last 10 training was

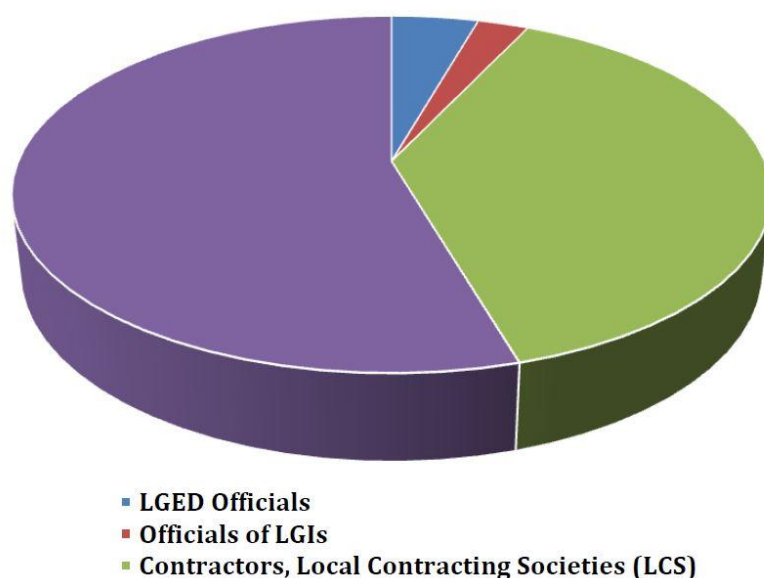
funded from revenue budget while the rest 99.01% were supported by development budget [Fig.2.1].

Fig 2.1 Ten Years' Average Training Man-days of LGED
under Revenue and Development Budgets 2008-09 to 2017-18



The courses under revenue budget are conducted for LGED officers and staff, while LGED officers and staff, LGI representatives, project personnel, contractors, beneficiaries and other 24 stakeholders participate in development project funded training programs. LGED Training Statistics shows that the revenue budget for training has been very steadily but very slowly increasing over the last 10 years while the development budget is highly fluctuating. (LGED Training Statistics, 2017-2018)

Fig 2.2: Category wise Distribution of last 10 Years Average Training Man-days (%) of LGED: 2008-09 to 2017-18



All this makes it more difficult for LGED to maintain its competence and cooperate memory, allowing it to adequately react to the new developments and challenges of today. This stresses the need for renewed attention for capacity development of LGED staff, and training. Indeed, an effective approach is to invest in human resources.

Considering the mandate of LGED, it is clear that various stakeholders are to be considered for being trained by LGED. Evidently this includes LGED- and LGIs'' staff, but also the

beneficiaries of LGED projects, contractors, consultants, and even the workforce. LGED training is performed both in-house as in external institutes and organizations.

(LGED Training Statistics, 2017-2018)

This was confirmed in a World Bank Study of June 2009 “Operational Risk Assessment (ORA) for LGED in Bangladesh”.

The main objective of the capacity building and training within LGED are to create, enhance and develop adequate in-house human resource capacity for achieving the envisaged socio-economic development goals earmarked for LGED.

Apart from in-house training, LGED collaborates with other training and capacity building institutions, such as the Bangladesh Public Administration Training Centre (BPATC), the Bangladesh University of Engineering & Technology (BUET), the Bangladesh Academy for Rural Development (BARD), the Rural Development Academy (RDA) and other specialized training institutes/centers.

(Feasibility Study for the Realization of Training Centers for LGED, 2019)

CHAPTER 03: SITE APPRAISAL

3.1 Background

3.2 Historical Development of the Site

3.3 Land-use Pattern of the Surroundings

3.4 Accessibility and Connectivity

3.5 Green Space

3.6 Swot Analysis of Site

3.1 Background

Project Name: LGED Training Complex

Location: Rajendrapur, Gazipur

Client: ‘Ministry of Local Government, Rural Development & Cooperatives / Local Government Division’ (LGED)

Site area: 13 Acres (566280 square feet)

The site for the project is located at Rajendrapur, Gazipur, which is within very close vicinity of the Dhaka city. The site is marked in the attached map. The landmark of the site is the BRAC CDM which is situated just opposite side of the project site.



Figure 1: Satellite view of the site (source: Author 2020)

The site proposed by LGED authorities for the construction of the Central Training Centre (CTC) is located at the village Gojariapara, Ward 22, Post Office Vawal Mirzapur Bazar, Gazipur Sadar Upazila and Gazipur Zila. The site is accessible by road from Dhaka. As per survey drawings obtained, the site measures around 13 acres with few existing structures and roads.

The irregular shaped site is elongated in the North-South direction. The site can be accessed by road from the Dhaka-Mymensingh highway. The site is surrounded by farmlands, homesteads, institutional and industrial establishments. The BRAC Centre for Development Management is located across the approach road on the North of the site. Electricity is available at the site and water supply is from deep well. The site is secured with a boundary wall with two access gates, one on the primary road on the North and the other on the secondary road on the East.

3.2 Historical Development of the Site

The site area was originally perceived as Agricultural lands but after the expansion of growth centers, it has become a mixed- used area along the highway. The site falls Ward 22, Post Office Vawal Mirzapur Bazar which consists of surrounding various types of buildings. The area exhibits an admixture of variety of land uses of rural character. This area has been developed as spatial growth of rural character comprising housing, commerce, industries, intuition and services. The area has a good accessibility from the main highway.

3.3 Land-use Pattern of the Surroundings

The land around the site is mostly mixed-use lands at present. The site is surrounded by farmlands, homesteads, institutional and industrial establishments. To its north, there are BRAC CDM. There is a shalbon just adjacent to the west side of the site. In the east of the site, there is a pharmaceutical industry named Pharmacia. South part of the site is covered with one storied tin shaded residential structures. The maps below show the existing pattern of the site surroundings.

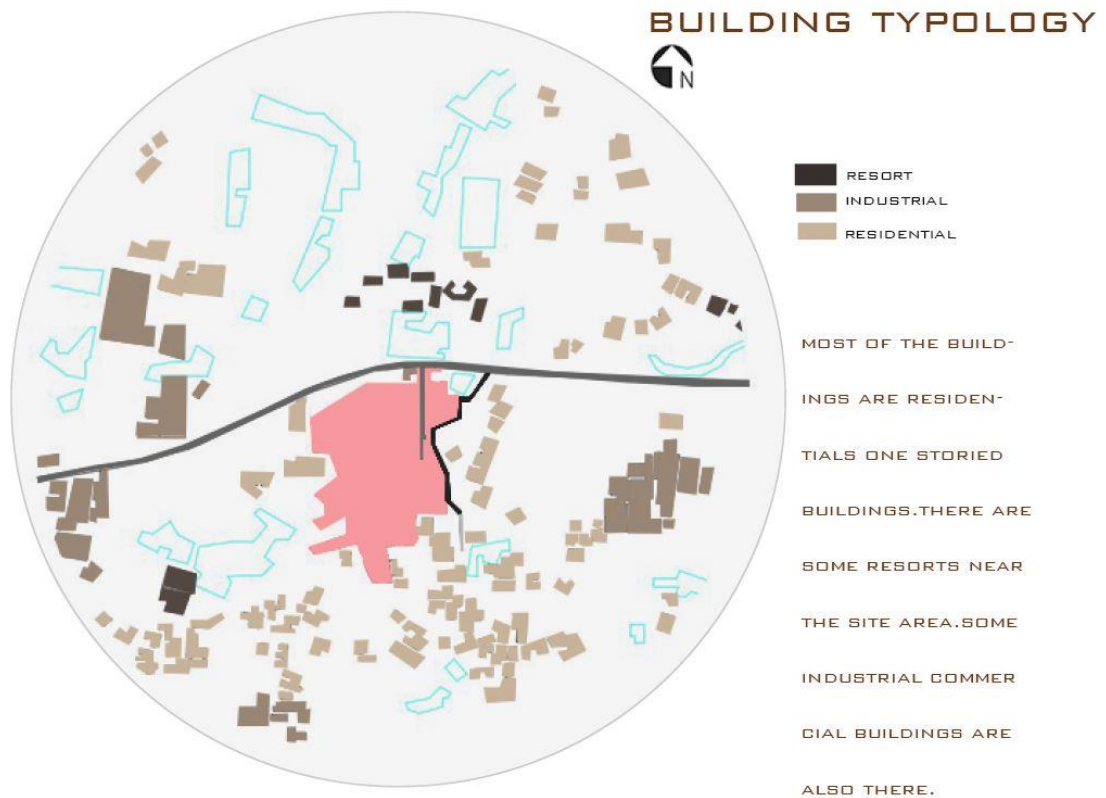


Figure 2: Existing Land Use Map; Source: Author,2020

3.4 Accessibility and Connectivity

The site is directly accessible by road from Dhaka. The irregular shaped site is elongated in the North-South direction. The site can be accessed by road from the Dhaka-Mymensingh highway.

The site has internal roads and a pedestrian surrounding the boundary that helps people to walk inside the site.

Internal road is 5.5 m, secondary road is 3 m, primary road is 5.5 m (Pakka road). following map showing existing roads.

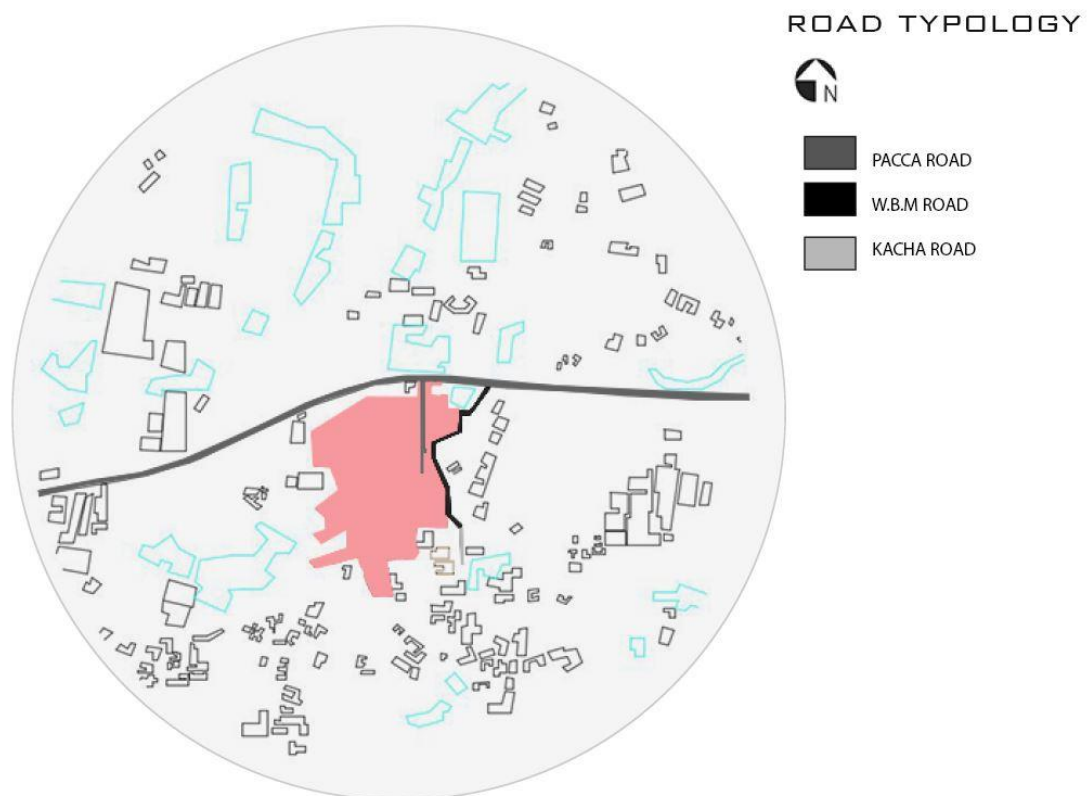


Figure 3: Road typology Map; Source: Author,2020

3.5 Green Space

Since the site is situated in sub urb area, the area is still covered with greeneries.

The site itself are full of open green spaces and big trees. There is even a very large existing paddy field inside the site area. There is a shalbon situated right after the site area. The following map shows the current green space of the site.

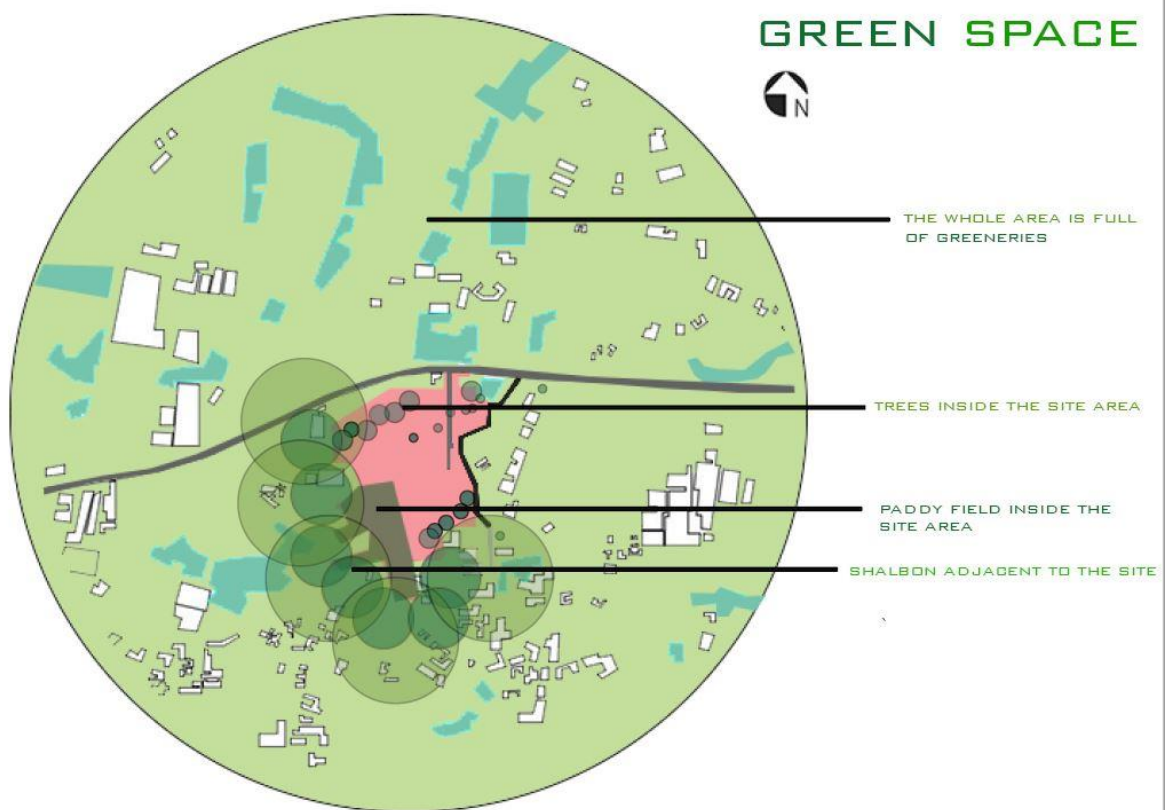


Figure 4: Green Space Map; Source: Author,2020

3.6 Swot Analysis of Site

Strength

- Strong road connection from main highway road
- Large shalbon area on the west side.
- The environment is still very refreshing because of the greeneries.
- very near from Dhaka city.

Weakness

- some industrial structures are there which can create pollution.
- Lacks security
- Lack of streetlights on road

Opportunities

- Increase in urban sprawl
- Encourage more urban growth
- Development here can increase scopes in other unplanned and enjoyable

Facilities

Threat

- unethical deforestation is happening for private use.
- If not taken care properly, the development may not be proper
- Transportation is a problem since our country does not have adequate public transport services

CHAPTER 04: CASE STUDIES

It is important to study existing projects of similar programs and criteria before beginning to design a project. This is because these existing, functioning projects will help in understanding the quality of spaces, zoning, functions and distribution of the programs accurately.

Two international projects and one national local project which has similar functions and programs have been chosen for case study.

4.1 PALACE OF SCHOOL CHILDREN, KAZAKHSTAN

Architect: Studio 44 Architects

Location: Bauyrzhan Momysuly Avenue, Astana, Kazakhstan

Site Area: 2,01,285.12 sqft

Built Area: 3,72,000 sqft

Proposed Youth Centre Capacity: 10,000 people

Rationale: To analyze functionally the growth and skill development activities that facilitate the youth.



Figure 4.1: Palace of School Children; Source: ARCHDAILY

4.1.1 Environment and Micro- Climate:

The climate in Kazakhstan is typically continental, cold winters and hot summers. For Astana, in January, the daily average maximum temperatures are -9°C with the average minimum -19°C , while in June the average maximum is 26°C with a minimum of 12°C . So, buildings need to be designed in accordance with this heavily alternating climate.



Figure 4.2: Satellite Image of Site, Source: Google Earth

The structure has several openings for natural light during all seasons. The giant disc has openings and skylights providing natural light inside the building, into a central atrium space. The structure is enveloped in curtain walls to resist infiltration of cold air during harsh winters. The patterns on the exterior façade cuts direct light during sunny days.

4.1.2 Form and Function:

The design of the Palace provides allusions for both Supremacist composition and also for local traditions of dwelling construction that is highlighted in the slogan for the project “*Khan Shangyrak. Shelter for the youth*”.

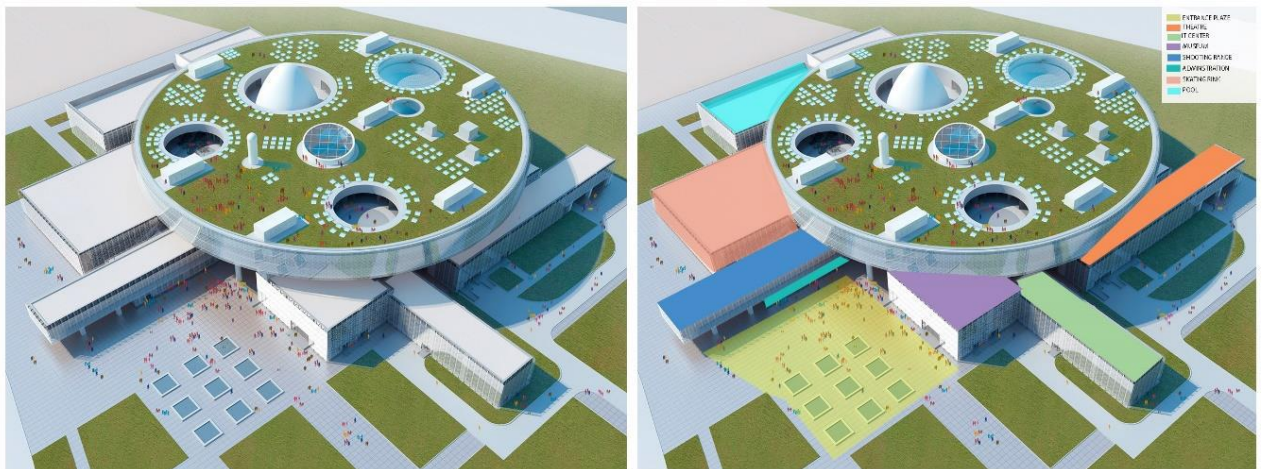


Figure 4.3: Axonometric View, Source: Arch Daily, Author

The sacral element of a Kazakh traditional dwelling, which is Shangryak is reinterpreted as a cylinder 25 ft in height and 512 ft in diameter. The giant disc has openings and skylights providing natural light inside the building, into a central atrium space. It covers stepped compositions of rectangular “boxes” each containing a functional element – skating rink, museum, shooting gallery, theater, etc. Inside the disc accommodates various hobby groups, clubs, and departments of the youth center, while the flat green roof of the building is interpreted as a walking and panoramic-view platform, simulating step landscape in the center of a high-rise city.

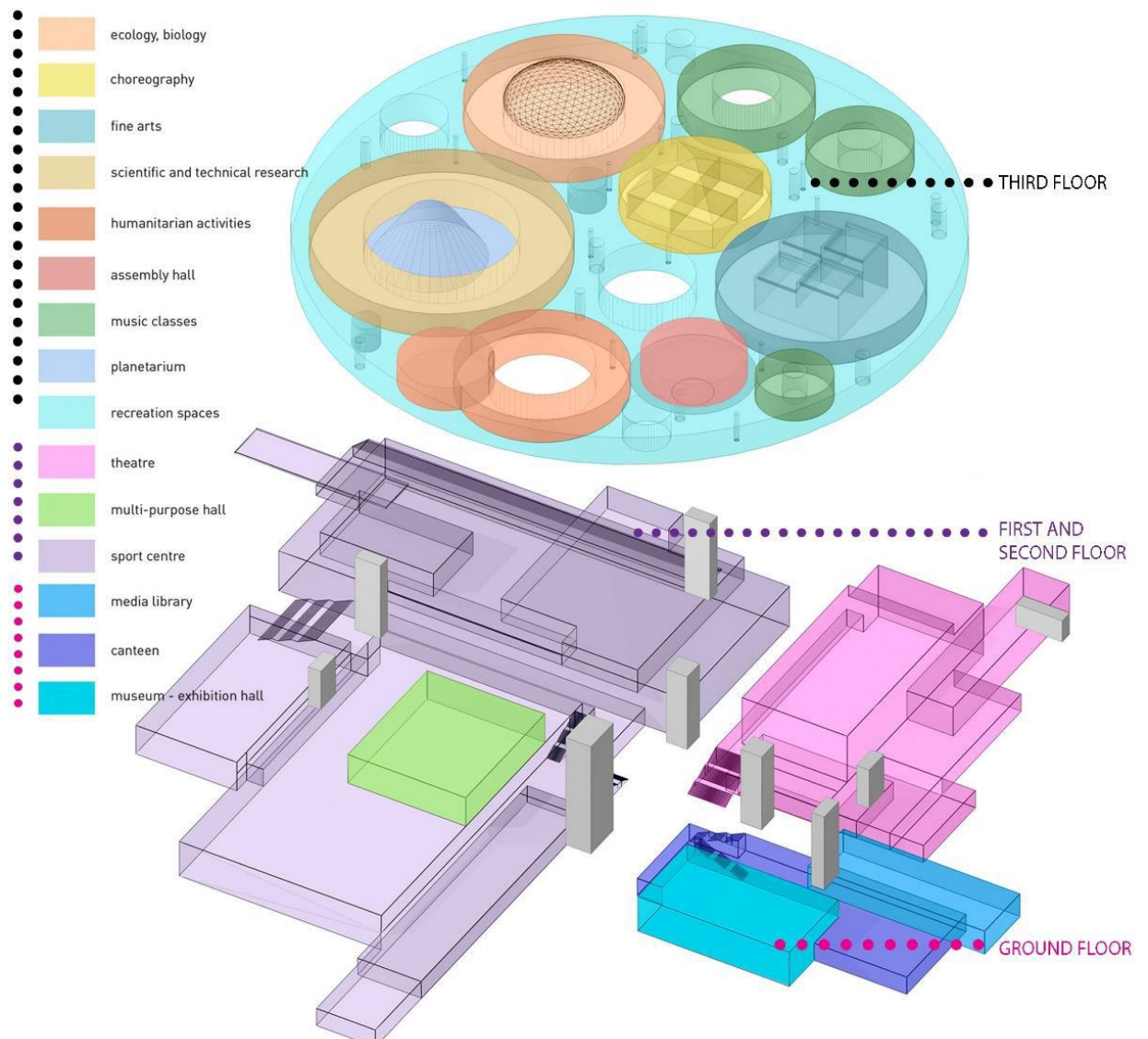


Figure 4.4: Functional Zoning, Source: Author, Arch daily

4.1.3 Horizontal and vertical circulation:

The horizontal circulation is lobby centric. The entrance opens up in a open to sky lobby space that connects the functions in the peripheral zones. The primary circulation path breaks into tertiary paths leading to different functions and their sub-functions. The vertical circulation comprises of stairways, lifts and fire exits. The main vertical circulation is in the central lobby.

Six elevators serve the center accommodating 1000 people. The stairways are mostly in the central lobby, others facilitate their functions, e.g., the skating rink has stairways to access the upper spectator seats in a double height space. There are multiple fire stairs designed in closer proximity due to functional needs.

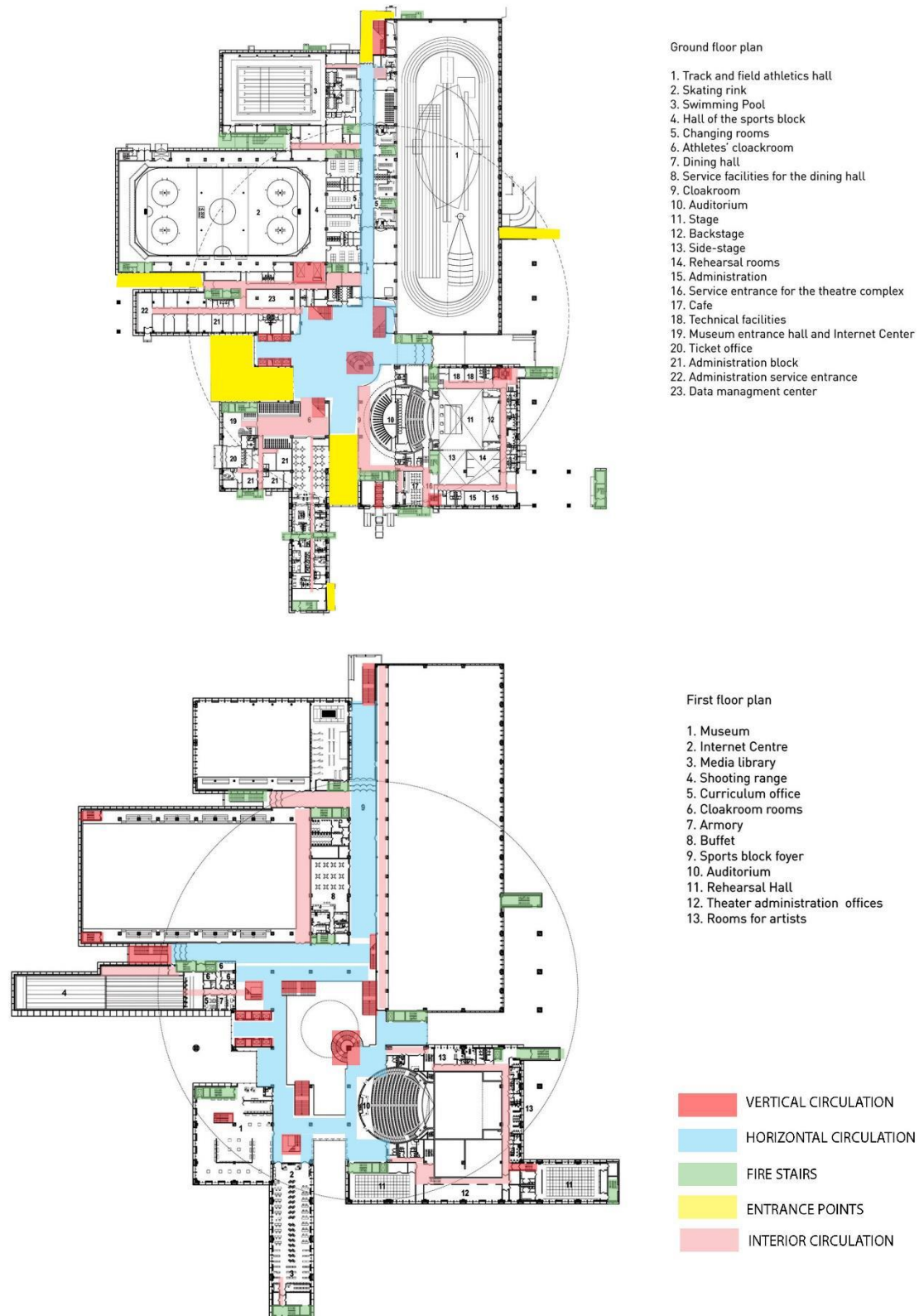
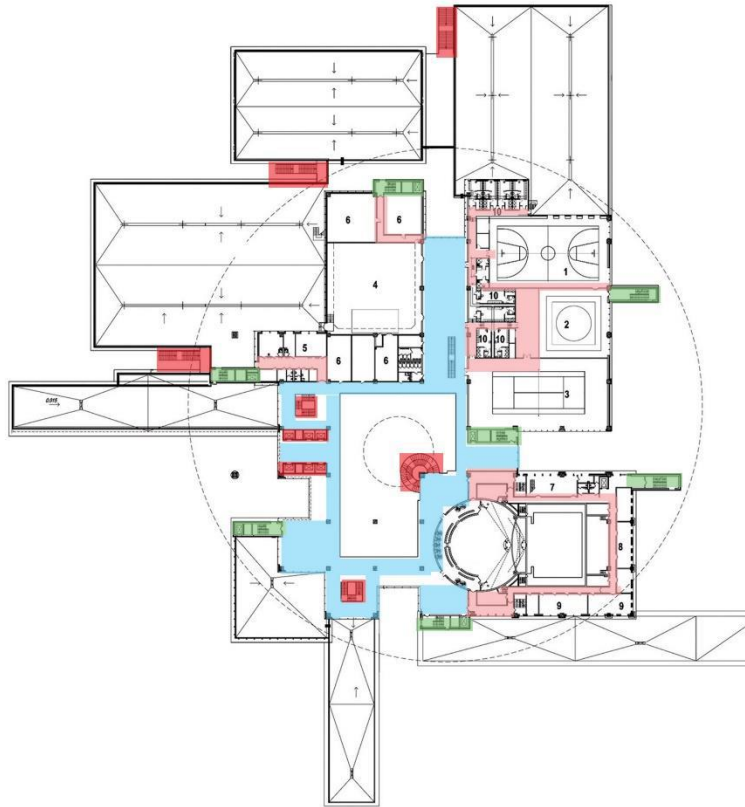
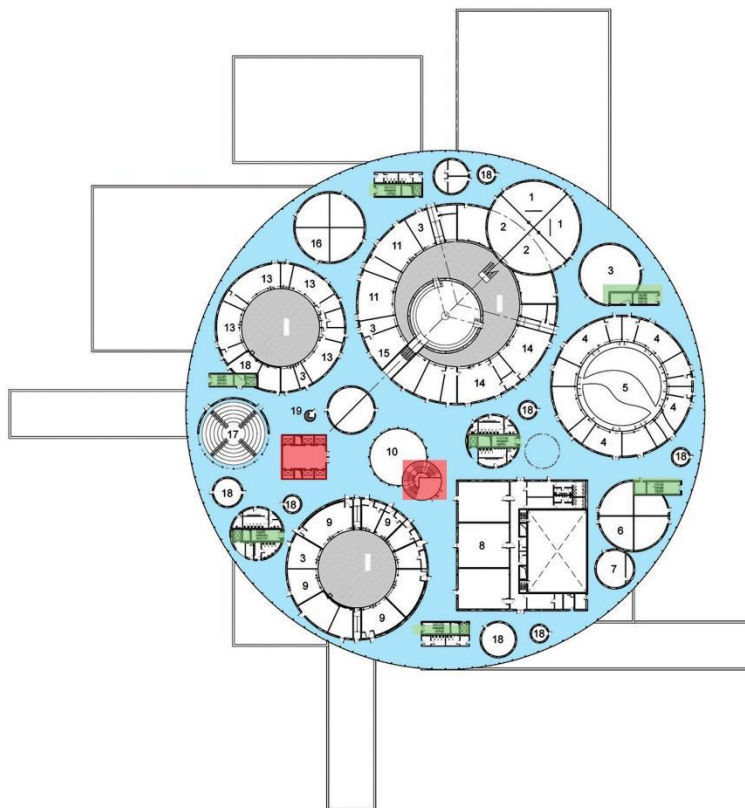


Figure 4.5: Circulation Diagram of Ground Floor and First Floor; Source: Author, Arch daily



Second floor plan

1. Basketball Hall
2. Wrestling Hall
3. Tennis Court
4. Multi-purpose hall
5. Medical and Recovery Center
6. Technical facilities
7. Painting workshop
8. Stage props storage
9. Workshops



Third floor plan

1. Theatre Studio
2. Curriculum office
3. Teachers' room
4. Biology club
5. Winter Garden
6. Art Studio
7. Sculpture studio
8. Ballet Studio
9. Musical club
10. Chess club
11. Physics and astronomy classrooms
12. Planetarium
13. Science and engineering club
14. Technology classrooms
15. Photo studio
16. Auditorium for lectures and seminars
17. Forum auditorium
18. Technical facilities
19. Entrance to the observatory

- VERTICAL CIRCULATION
- HORIZONTAL CIRCULATION
- FIRE STAIRS
- ENTRANCE POINTS
- INTERIOR CIRCULATION

Figure 4.6: Circulation Diagram of Second and Third Floor; Source: Author, Arch daily

4.1.4 Structural Details:



Figure 4.7: Images; Source: Arch Daily

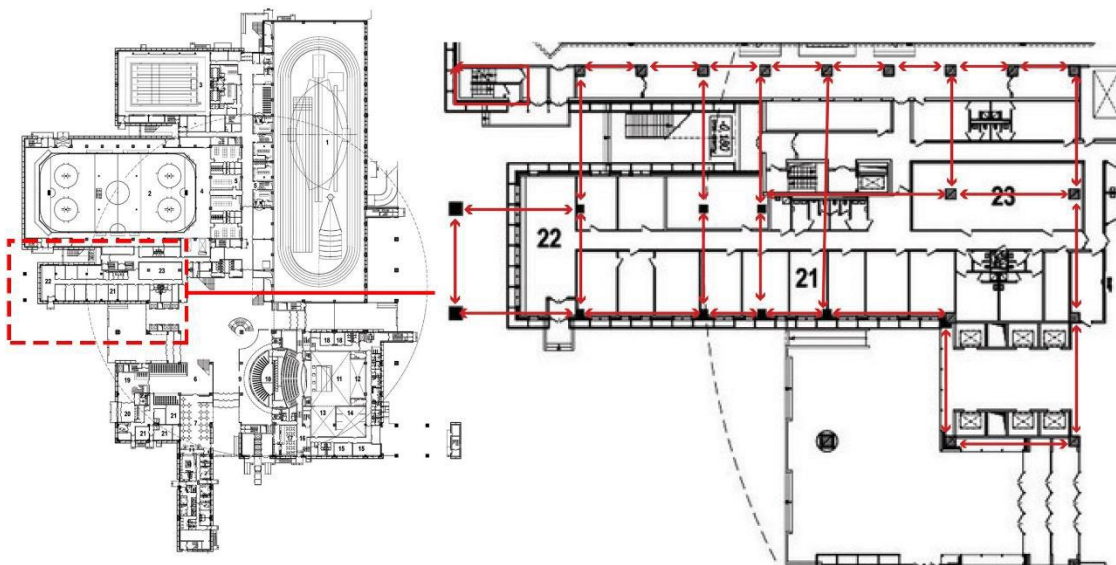


Figure 4.8: Structural system: Beam and Column System

Column-beam have been used in the structure. Danpalon roofing system has been used for its light-weight structure and excellent thermal performance. It brings in skylight and is suitable for a wide range of weather conditions. The facades are made of aluminum curtain walls giving maximum transparency and thermal insulation. The interiors are mostly clad in porcelain tiles.

4.1.5 Parking details and Standard:

For a center that caters 1000 people at a time, open car parks are allocated for 250 cars in 7000 sqm area. An open space parking lot with no obstructions might be able to park one car per 32 square meters. But according to the designed area, each car gets only 28 sqm per parking spot. In this study, the parking space is mostly used as plaza in warm weather and as a fulltime parking during winter.

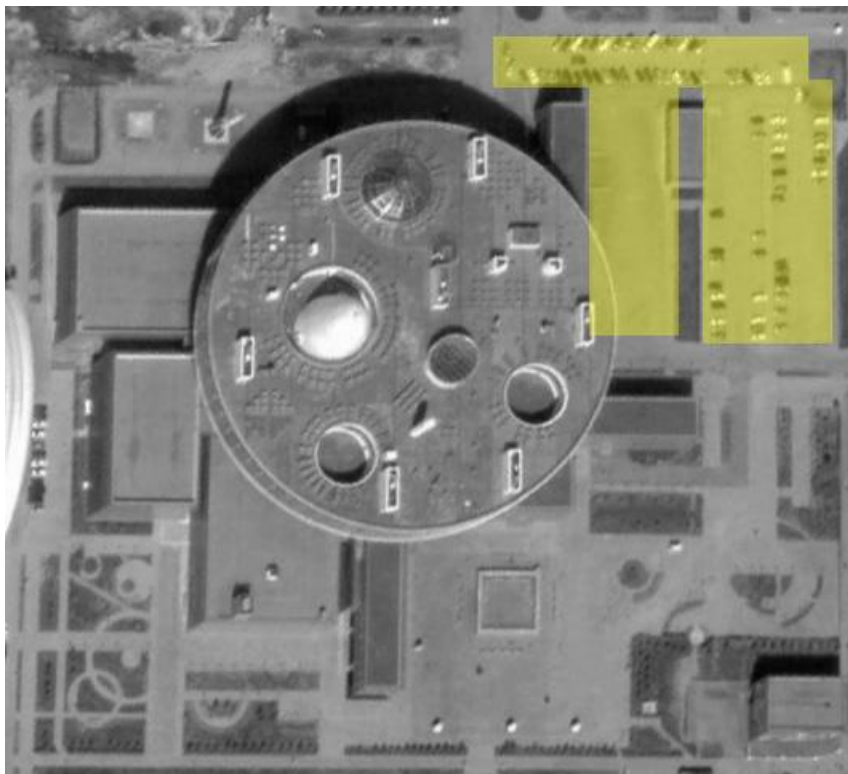


Figure 4.9: Parking Marked

4.2 UNIVERSITY OF MPUMALANGA



Figure 4.10: Approach to the Hall of the University. Source: Tristan McLaren, 2018

This is also not an institute for training but is an institution that provides education. Just like this educational institution also has the common functions like, classrooms, laboratories, multipurpose halls, dormitories etc.

University of Mpumalanga is based in Mbombela, South Africa. It was established in 2014, initially accommodating a modest intake of one hundred and forty students. This university mainly offers agriculture-based courses and along with those, they also offer a Diploma in Hospitality Management.

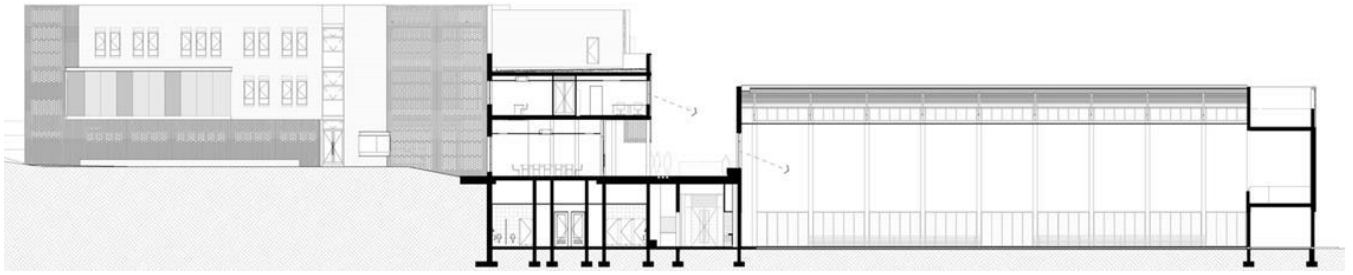


Figure 4.11: Sections shows the difference in height due to contour. Source: ArchDaily.com

4.2.1 Programs & Zoning:

This is a small university and is one out of the two newest universities of Africa. The design of this project is topography guided - steeply sloped. The massing is placed in such a way that at places the building is two storied and four-five stories somewhere else.

The design of this project is such that the student residences and other public facilities are nearby to each other function. This connection is created by a promenade route which is a deck that follows its way through the trees.

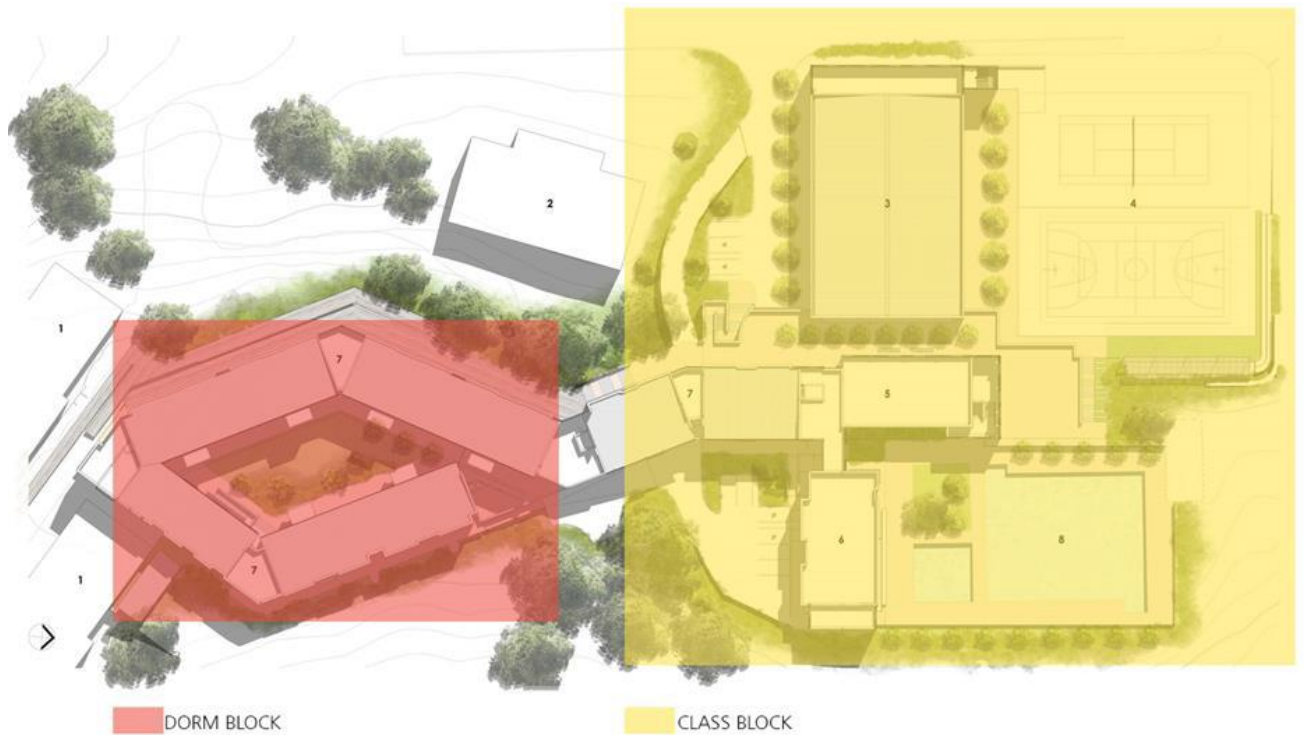


Figure 4.12: Functional Zoning of the blocks. Source: ArchDaily.com (edited by Author)

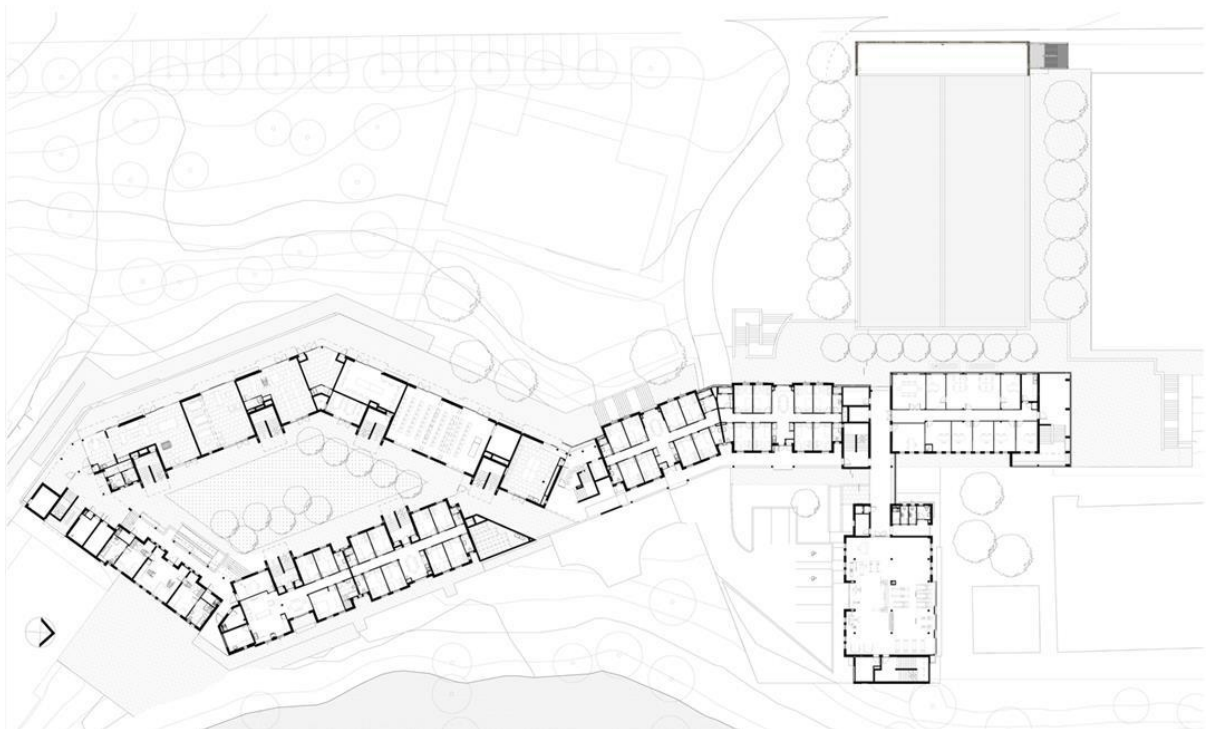


Figure 4.13: Plan shows the connection between the blocks. Source: ArchDaily.com

4.2.2 Materials:

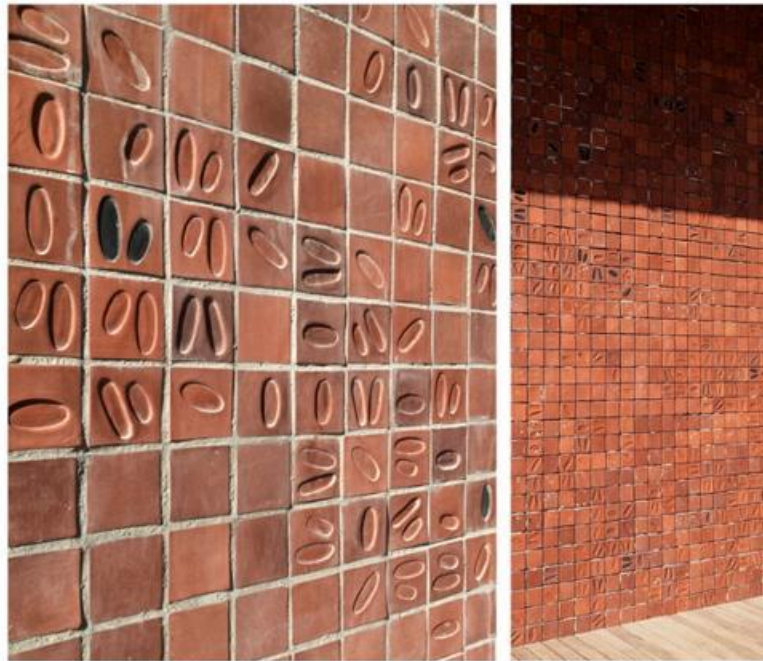


Figure 4.14: Terracotta Mosaic. Source: ArchDaily.com

The material and the natural colors and textures used here reflects that of the Mpumalanga landscape. “The building has a sense of growing out of landscape with the core material being a local clay face brick.” Punctured brickwork creates ‘*jaali*’ like screening that shield the facade against direct sunlight, allowing or cross ventilation while maintaining privacy and security. To have more local essence in the design, public art is also introduced along the promenade through a series of personalized terracotta mosaic tile feature walls by a local artist.



Figure 4.15: Local colors and materials are used here. Source: Tristan McLaren, 2018

4.3 FRIENDSHIP CENTER, GAIBANDHA

Country of origin: Bangladesh

Location: Gaibandha, Bangladesh

Client: Friendship NGO

Architect: Kashef Mahboob Chowdhury/Urbana

Design: 2008-2010

Size: Site area: 9'210 m²; Built area: 2'897 m²

Completed: 2011

This is located near the Brahma-Jamuna River, the Friendship Centre is a training facility for a non-government organization in the flatlands of rural, northern Bangladesh.



Figure 4.16: Friendship Center, Gaibandha

A rural training center inspired by one of the country's oldest urban archaeological sites. The Centre was created to train staff of an NGO working with people inhabiting nearby chars, or riverine islands. Offices, a library, meeting rooms, and prayer and tea rooms are included in pavilion-like buildings surrounded by courts and pools. The Centre is also rented out for meetings, training, and conferences for income generation.

4.3.1 Construction:

The local hand-made brick construction has been inspired by the monastic aesthetic of the 3rd century BC ruins of Mahasthangahr, the earliest urban archaeological site yet found in Bangladesh. Structural elements are of reinforced concrete and finishes also include timber and stone. The naturally ventilated structures have green roofs. The Centre is in an agricultural area susceptible to flooding and earthquakes, and whose low-bearing soil has a low bearing

capacity. As a result, an embankment has been constructed with a water run-off pumping facility. Constructed and finished primarily of one material - local hand-made bricks - the spaces are woven out pavilions, courtyards, pools and greens, corridors, and shadow.

As in construction, so in conception, the complex of the center rises and exists as echo of ruins, alive with the memory of the remains of Mahasthan.



Figure 4.17: Friendship Center, Gaibandha

4.3.2 Design Considerations:

- Located in rural Gaibandha where agriculture is predominant, the project's roofscape merges with its environment.
- The design relies on natural ventilation and cooling, being facilitated by courtyards and pools and the earth covering on roof.

- Constructed and finished primarily of local hand-made bricks, the concept of simplicity reflects a monastic feel

- Luxury of light and shadows, economy and generosity of small spaces, joy of movement and discovery in the bare and the essential is what makes this gathering space a refuge for some of the poorest population. (Figure 4.18)



Figure 4.18: plenty of natural light and air

- The access to the building from the earthen bundh is organized via two entrance stairs at opposite ends. The program is then organized around a series of pavilions, courtyards and reflecting pools (Figure 4.19)



Figure 4.19: Access to the building from the earthen bundh is organised via two entrance stairs at opposite ends.

- Cross-ventilation is taken advantage of right through the building – from the layout of the rooms and courtyards to the detailing of the doors and windows, the building is kept cool with passive airflow. (Figure 4.20)



Figure 4.20: Cross-ventilation is taken advantage of right through the building

- Classrooms can be used by Friendship organization to train their staff, to hold meetings. They can also be used as conference rooms and are kept cool by natural cross ventilation (Figure 4.21)



Figure 4.21: Classrooms used for training.

-Through training locals, Friendship's goal is enabling these vulnerable communities to improve their living conditions in many aspects: health, nutrition, education, disaster management, infrastructure development, good governance, and sustainable economic development

- Dining room, another space that brings people together (Figure 4.22)



Figure 4.22: common spaces

- Initially Friendship's work was in the same geographic region, but as they expanded, they needed to provide accommodation for the trainees for the duration of the workshops. (Figure 4.23)



Figure 4.23: Accommodation for trainees

- The green cover of the earthen rooftops acts as insulators and absorbs rainwater. (Figure 2.24)



Figure 4.24: green roof

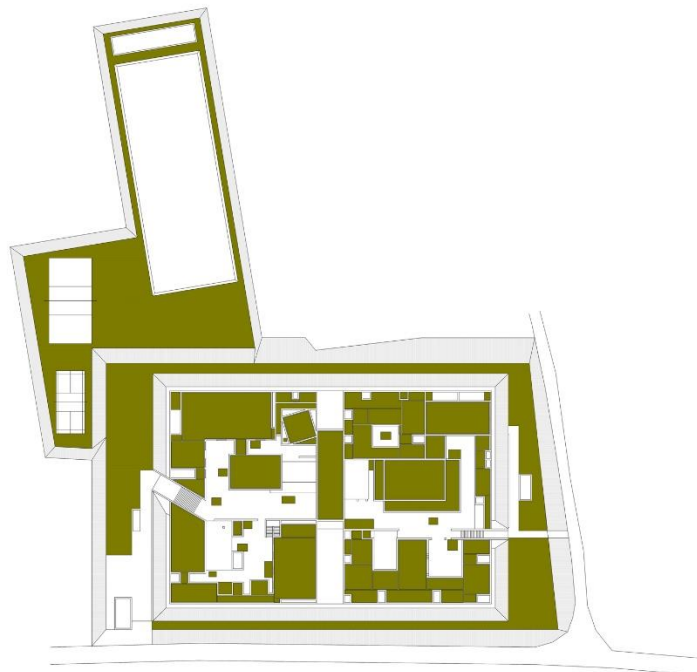


Figure 4.25: roof plan

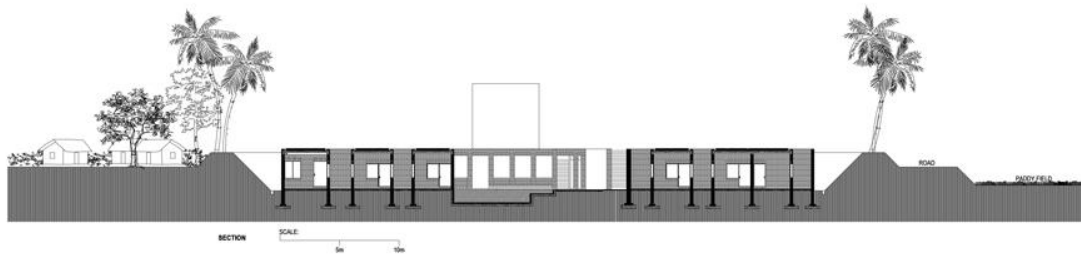


Figure 4.26: sectional view of the training center

This Award-winning Friendship Centre brings hope to char people. The NGO brings a ray of sunshine to the lives of people through many training programs it offers at its Friendship Centre in the Gaibandha district. The NGO is getting accolades from the world over for its astounding architectural beauty.

CHAPTER 5: PROGRAM ANALYSIS

5.1 Program Analysis:

The client of this project is the Local Government Engineering Department (LGED) which is one the largest engineering agencies of the country.

There was a detailed program list given by the Local Government Engineering Department (LGED).

Through interviewing the principal of the institute, it was clearly understood that the main facilities of this complex will be training and accommodation. Also got to know what type of classrooms and how many of them this institute requires along with the other recreation facilities. Analysing all the tentative programs those can be divided into following blocks:

- Training /Academic**
- **Administrative**
- **Residential**
- **Recreational**
- **Utility and services**

Training /Academic:

- classrooms
- faculty rooms
- multipurpose hall
- library
- computer lab
- laboratory
- toilets

Their main aim of this complex is to give training to their in-house LGED staffs. So, the classrooms are the main requirement of the institute, they will need faculty rooms, libraries to collect essential reading materials, computer labs and laboratories as supporting academic facilities. A multipurpose hall will be effective as there might be various seminar, fairs, conference, public forums which can be easily held in the multipurpose hall rather than in an auditorium with fixed sitting system.

Administrative:

- director's office
- deputy director's office
- general office
- conference room
- reception
- toilets (for office & reception)

There will be a block of administration consisting of separate director's office with attached toilet, deputy director's office with attached toilet, general office and a reception area having enough toilets for both staffs and visitors.

There will be a conference room in this zone because the directorial, staffs, visitors might need to do meetings in a regular basis.

Health facility:

- doctors chamber
- nursing facility
- toilets

I would suggest having the health facilities near administrative block as there will not be any big medical Center, rather than it will have facilities to give emergency medical treatment or fast aid. And if it is located near administrative zone, they can easily look after if anyone need emergency transfer to better hospital or not and take necessary steps.

Residential:

- trainees accommodation
- trainers accommodation
- guest accommodation
- administrative staff accommodation

The trainer's and trainee's accommodation administrative staff accommodation can be arranged in a same block.

1.Directors residence**2.D. directors' residence**

But director & D. director will have separate designed residences.

3.Senior staff**4.Junior staff**

Separate accommodation system for senior staffs and junior staffs will be there accordingly.

- dining hall
- lounge
- kitchen
- laundry
- toilets

These facilities will be served as common public space. All can use the dining area having separate sitting arrangement and designated space. A central kitchen will serve all staffs and visitors. Same goes for laundry and lounge.

Recreational:

- swimming pool
- gymnasium
- indoor games
- outdoor games
- toilets

These are proposed by the client for recreational purpose since the trainees or trainers can get bored after attending training sessions and most of them will do trainings for multiple days. So, they need enough recreational facilities for their leisure period.

I would like to add some open spaces with sitting arrangements where they can play outdoor games or can arrange outdoor evening events or simply sit and enjoy greeneries.

Utility and services:

- security and surveillance
- fire control room
- guard room
- waste
- water
- parking
- roads, walkways

These programs are also essential for proper maintenance of the training complex.

Area Calculation:

Sl. No.	Function	Area in sqm
1	Administration	732
2	Academic	2,142
3	Lounge + Health Facility	500
4	Dining + Multipurpose	900
5	Shop/Salon + Indoor Games	498
6	Dormitory for Trainees and Trainers	3,701
7	Staff Dormitory	508
8	Staff Dormitory (Lower Level)	542
9	Director's Residence	223
10	Deputy Director's Residence	168
11	Mosque	586
12	Material Storage	179
13	Guard Room & Surveillance	85
14	Generator & Substation + Fire Control	172
15	Covered Parking + Vehicle Repair	517
11	Deep Tube Well, Pump Room and Overhead Water Tank	40
TOTAL		11,493 SQM (123709.622 SQFT)

5.2 Design Consideration:



Figure 5.1: design consideration, source: author,2021

- construction skill open yard

can make workshop area-

with shared courtyard.

- individual courtyards leading to big

public courtyard used as exhibition-

space or public seminar.

- courtyards will play important role

in skill construction training.

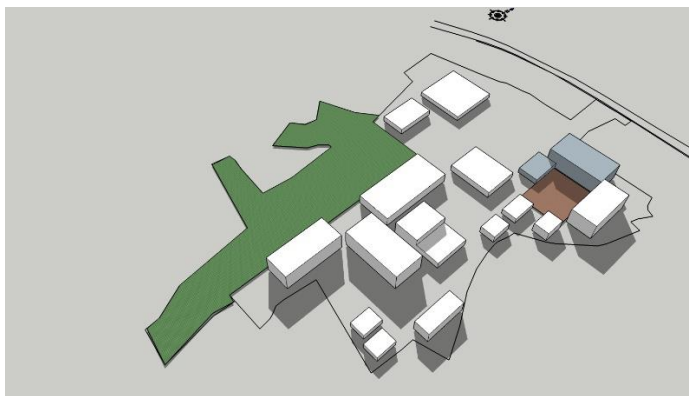
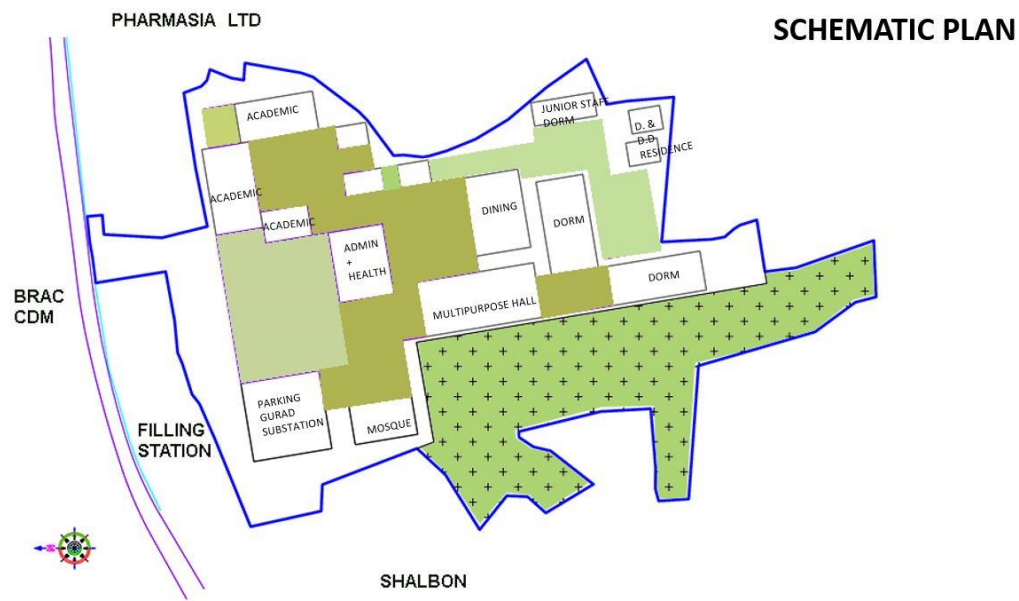
- essence of rural

environment to the skill workers

- spatial connectivity and

openness

- ensuring natural ventilation



SCHEMATIC MASS MODEL

Figure 5.2: zoning & schematic planning, source: author,2021

CHAPTER 6: DESIGN SUGGESTIONS

6.1 Concept:

The previous chapters help building the design approach for the project. Design considerations begin with the understanding of the site. The site is analyzed through important areas which includes physical attributes, topography, climatic aspects of site.

The design approach for the training complex began with existing site condition and existing features and also the need of the client.

The main demand of the project was to design the project in such a manner that the construction skill center zone encourages local workers to attend the practical training courses willingly. They would get a rural courtyard type environment, open yards to have practical training. study says that local labor & workers prefer practical training rather than indoor classes and seminars.



Figure 6.1: conceptual sketches, source: author, 2021

6.2 Form Development:

That is why the main design approach was to build the forms following staggering character & create internal small courtyards and open spaces. It also helps to keep the existing big trees in the new design. The green open spaces and full of big trees would give the trainees & trainers a rural-refreshed environment away from the city life.

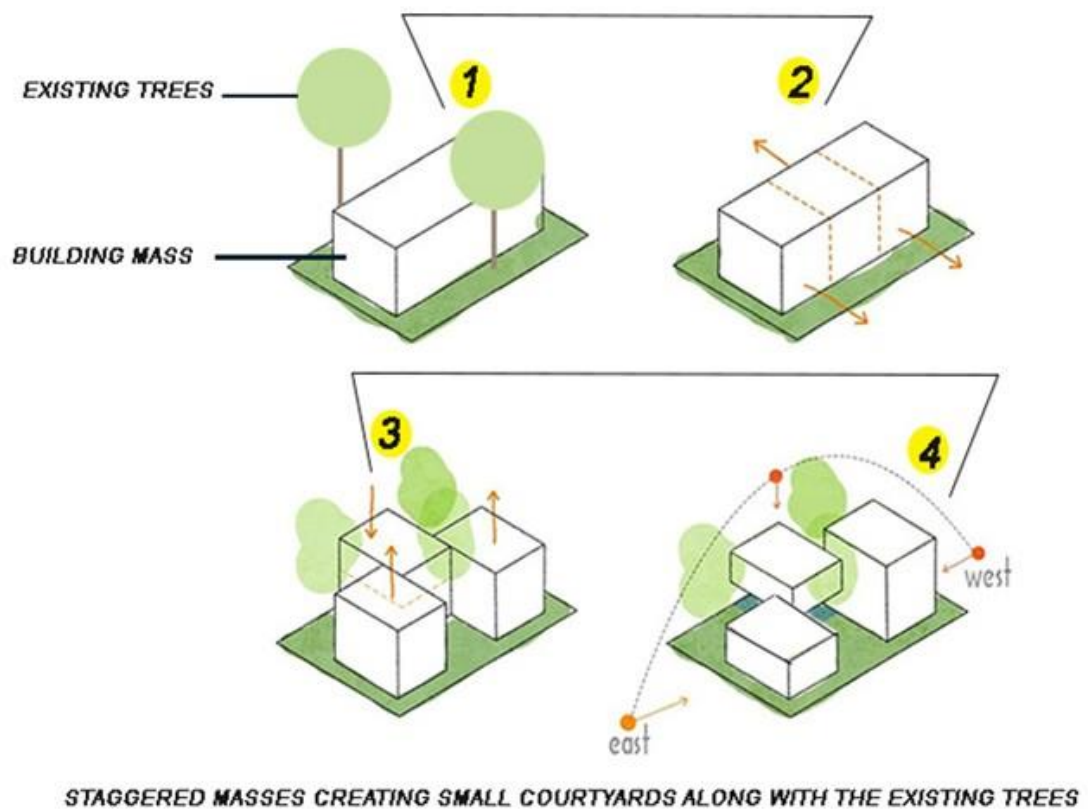


Figure 6.2: form development diagram, source: author,2021

6.3 Zoning:

After entering from north, admin and training block are there, after that going forward to the south we get the café in the middle, multipurpose hall block in the west, towards west corner there will be residential block, in the end towards south, dormitory block is situated.



Figure 6.3: zoning by block, source: author, 2021

6.4 Floor Plans:

Ground Floor Plan:

In the ground floor level, we get the general admin room, a health check-up room, construction skill training zone, regular classrooms, cafeteria beside a central water body, multipurpose hall, which has a different entry exit way, so that people who will come only to attend programs do not need to enter the main complex. The two residences are also situated in the ground level. The dormitory also starts from ground floor having attached washrooms.



Figure 6.4: ground floor plan, source: author, 2021

First Floor Plan:

On the first floor, the admin block continues with a seminar room, separate office rooms for director and deputy director, there is a terrace area beside the admin block. Only the regular classroom zone continues along with teacher's room and IT room. The female prayer space is on the first floor. Dormitory zone continues on the first floor as well.

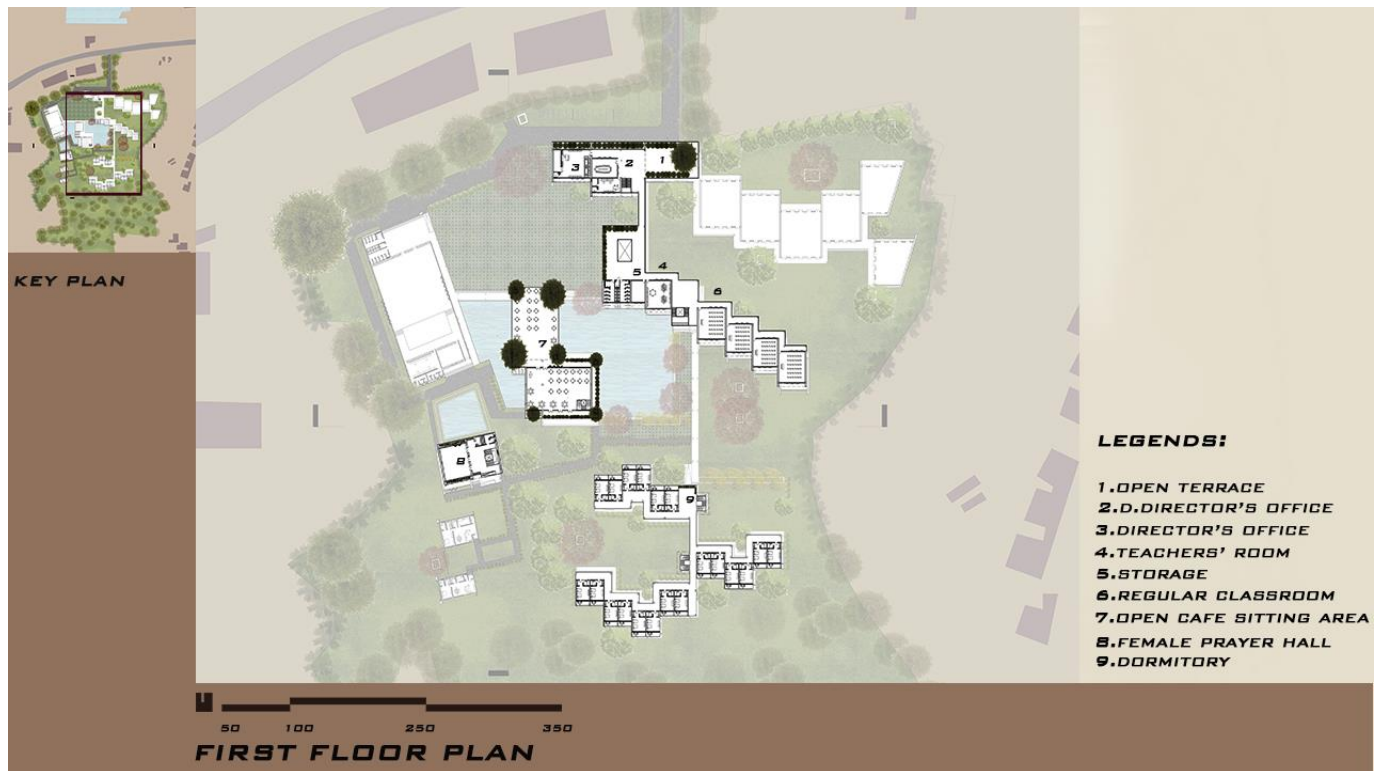


Figure 6.5: first floor plan, source: author,2021

Second Floor Plan: Only the dormitory block continues to the second floor.

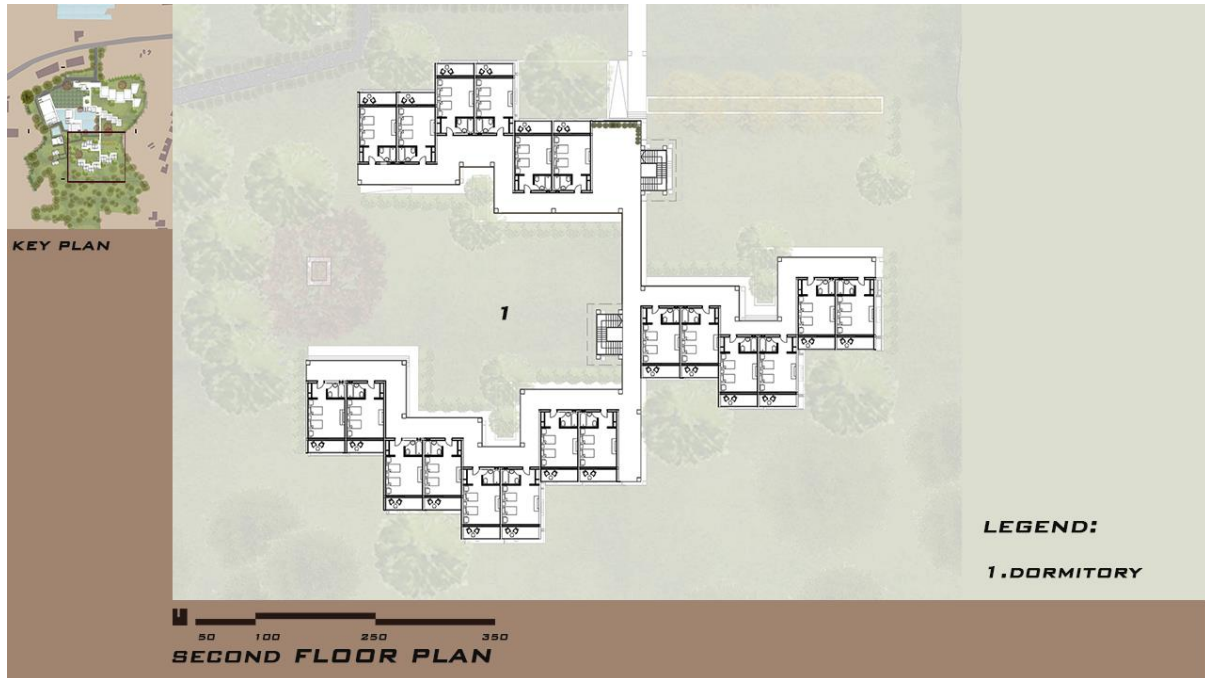


Figure 6.6: second floor plan, source: author,2021



Figure 6.7: roof plan, source: author,2021

6.5 Elevations & Sections:





6.6 Perspectives:



Figure 6.8: 3D arial view, source: author,2021



Figure 6.9: front view of admin block, source: author,2021



Figure 6.10: prayer hall block, source: author,2021



Figure 6.11: dormitory view from south, source: author,2021



Figure 6.12: classroom corridor view, source: author,2021



Figure 6.13: building entrance view, source: author,2021.

CHAPTER 7: CONCLUSION

This project examines architectural and sub urb design issues relating to architectural form and design within Gazipur regional context.

As for the central training complex, the physical facilities of the center will comprise of administrative, academic, residential, and recreational facilities. Thus, not only orientation programs or certificate giving ceremonies can be attended by other people as just the trainees and trainers but can also be used by the regional or divisional offices for other official programs and events.

Good training people (trainers and staff) interested to work for the training departments in LGED appear to be scarce. People seem to be more attracted to work as regular staff in LGED, rather than in the training departments.

Beside the regular training programs of LGED, this skill training zone, in turn may motivate the larger workforce to apply for practical training. The local laborer will be highly benefitted through this project of LGED. Thus, local workforce of our country will be stronger than before. LGED has been and is still considered a beacon of quality and reliability, able to realize nation-building projects. This training complex will help to continue their contribution towards the country's economical and infrastructural growth.

REFERENCES:

1. IR. JOHANNES LAPIDAIRE -Team Leader (2019): Feasibility Study For Establishment Of Central Training Centre (CTC), Divisional Training Centres (DTC) And Construction Skill Training Centres (CSTC) In Local Government Engineering Department.
2. DR. RIZWAN KHAIR -Deputy Team Leader (2019): Feasibility Study For Establishment Of Central Training Centre (CTC), Divisional Training Centres (DTC) And Construction Skill Training Centres (CSTC) In Local Government Engineering Department.
3. www.lged.gov.bd
4. <https://www.voced.edu.au/content/ngv%3A45836>
5. <https://www.emerald.com/insight/content/doi/10.1108/01437729710169292/full/html>
6. <https://www.devex.com/organizations/local-government-engineering-department-lged-bangladesh-22547>
7. <https://www.developmentaid.org/#!/donors/view/45929/lged-local-government-engineering-department>
8. <http://oldweb.lged.gov.bd/LGEDAboutUS.aspx>
9. https://en.wikipedia.org/wiki/Local_Government_Engineering_Department
10. <https://www.lged.gov.bd/site/page/81b45e52-910a-4dd6-aa2e-71cc978e9778/->

11. <https://www.lged.gov.bd/site/organogram/0e64fafd-7d9c-4592-90c9-058d20590cb0/->
12. <https://www.lged.gov.bd/site/page/602c531f-acf4-4aab-a358-bb80acdc3356/->
13. <https://www.lged.gov.bd/site/page/3e418392-17e4-42cc-8063-9f5ba96b5115/->
14. <https://www.lged.gov.bd/site/page/1c70b480-3c54-401f-91d7-f76c870a8875/->
15. <https://www.tandfonline.com/doi/abs/10.1080/23322373.2016.1206804>
16. <https://www.lged.gov.bd/site/page/6f07246f-ee2b-497f-adf2-de540b2b49eb/->
17. <http://dro.deakin.edu.au/view/DU:30051063>
18. <https://www.wbdg.org/building-types/education-facilities/training-facility>
19. <https://education.vermont.gov/sites/aoe/files/documents/edu-school-construction-planning-guide-for-technical-education-centers.pdf>