

**BANGABANDHU TEXTILE ENGINEERING COLLEGE  
(BTEC)**

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Seminar II

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**Abstract**

The intention of this report is to make the readers understand the overall methodology followed by the designer for "Bangabandhu Textile Engineering College" at Kalihati, Tangail. The site for this project covers an area of approximately 8 acre authorized by the Government of Bangladesh. The entire design procedure started with the revised program followed by site analysis and relevant case studies. Incorporating the facts of program, case studies and site analysis, the design has been developed considering the conceptual background, volumetric and formal expression study through study models. Finally, the report concludes with an outcome of a design reflecting the core theme by incorporating the works of 12weeks.

### **Acknowledgement**

With gratitude, I would like to thank the mentors who have compassionately supported me with their advise, patience and encouragement throughout the entire design semester that facilitated the development of this project.

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Very special thanks to my class friends for their helpful attitudes and my family for consistent devotion & support.

**Introduction**

Any educational institute acts as a training ground with an aim to form & foster human relationship. There remains the specific curriculum that guides a student shaping own self with the influence of knowledge within this period of time. The student life appears as most memorable time of one's life where the process of learning plays a vital role.

Textile Engineering College is such a training ground attempting to build future Textile Engineers of the nation. Since, enriched on this very basic need, there remain huge potentials for the country minimizing poverty through earning foreign exchange on exporting textile goods.

With this dignified aim and aspiration, the college campus has been designed that echo the very basic essence of Textiles i.e. 'weaving & knitting' that integrate the campus at every level fostering human relationship. Integration among spaces incorporated by functional needs has been prioritized on planning and finalizing level on the entire campus.

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## **CHAPTER 01**

### **PROJECT SPECIFICATION**

1.1\_\_Background of the Project

1.2\_\_Project Specification

1.3\_\_Site

1.4\_\_Objective of the project

1.5\_\_Program



### **1.1 Background of the Project**

Bangabandhu Textile Engineering College, to be recognized as BTEC is proposed by the Government of Bangladesh in the site of Kalihati, Tangail. To expand the textile engineering knowledge & technology among young generation to flourish its potentials among exporting goods, Government has taken this initiative to house this college on the site, famous for the "Tangail Saree" production among the region.

This college is to create opportunities for the students completed Diploma from government accredited Textile Institute, as to acquire B.Sc Engineering Degree within designed program.

## **1.2 Project Specification**

Name: Bangabandhu Textile Engineering College (BTEC)

Client: Government of Bangladesh

Site area: 8 acre

Site location: Kalihati, Tangail

Budget: 28 crore 40 lakh

### **1.3 Site**

The site is within the largest sub district of Tangail district known as Kalihati. The site is divided by a canal from “Jhinal” river; a branch from the Jamuna River meets with the main river on far northern end.



Fig- 01: Map of Tangail district

Source: [www.google.com](http://www.google.com)

#### **1.4 Objective of the project**

The project on the selected site is best suited to accommodate the relevant functions of BTEC.

The canal, the bamboo trees and sloping ground of the setting is inspiring to create a space for the future textile engineers intended to accentuate the potential of textile field as to build a better Bangladesh through exporting quality products.

The play of texture, color, weaving and knitting process of textiles has the potential to echo the spaces with architectural vocabulary best suited for the entire compound.

### **1.5 Program**

#### **Estimated number of Users for BTEC**

User	Population
Students	320
Teachers	64
Demonstrators	24
Staffs	24
Helping hands	30
<b>Subtotal</b>	<b>462</b>

#### **Estimated Functional area for UTILITIES**

Function	Area(ft <sup>2</sup> )	Quantity	Total Area(ft <sup>2</sup> )
Electrical substation	30' x 40'	1	1200
Water treatment plant	20' x 40'	1	800
Water pumping station	15' x 20'	1	300
Steam generation plant	20' x 20'	1	400
Security barrack	50' x 50'	1	2500
<b>Subtotal</b>			<b>5200</b>

**Estimated Functional area for AUXILIARY functions**

Function	Area(ft <sup>2</sup> )	Quantity	Total Area(ft <sup>2</sup> )
Library	50' x 70'	1	3500
Gym(locker+shower+wc)	100' x 200'	1	20000
Cafeteria (+kitchen)	100' x 160'	1	16000
Student's common room	30' x 30'	2	1800
Prayer room	10' x 20'	2	400
Auditorium	100' x 120'	1	12000
Amphitheatre		1	
shaheed minar		1	
<b>Subtotal</b>			<b>53700</b>

**Estimated Functional area for ADMINISTRATION block**

Function	Area(ft <sup>2</sup> )	Quantity	Total Area(ft <sup>2</sup> )
Lounge	30' x 30'	1	900
Account section	30' x 90'	1	2700
Register's office	20' x 20'	1	400
Deputy Register's office	10' x 15'	1	150
Assistant Register's office	10' x 15'	1	150
Director finance	20' x 20'	1	400
Director planning	20' x 20'	1	400
Deputy Director planning	10' x 15'	1	150
2 <sup>nd</sup> Officer	10' x 15'	2	150
Technical computer room	20' x 25'	1	500



Principal's room	20' x 30'	1	600
Assistant Principal's room	20' x 20'	1	400
Store room	10' x 15'	1	150
Toilet	7' x 10'	2	140
<b>Subtotal</b>			<b>7190</b>

**Estimated Functional area for LAB block**

Function	Area(ft <sup>2</sup> )	Quantity	Total Area(ft <sup>2</sup> )
Jute processing lab	40' x 60'	1	2400
Electronics lab	20' x 30'	1	600
Testing lab	30' x 40'	1	1200
Computer lab	20' x 30'	1	600
Garment's lab	30' x 40'	1	1200
Garments cad cam lab	20' x 30'	1	600
Wet processing lab	40' x 60'	1	2400
Physics lab	30' x 40'	1	1200
Chemistry lab	20' x 30'	1	600
Cotton processing lab	40' x 60'	1	2400
Mechanical workshop	40' x 60'	1	2400
Knitting lab	30' x 40'	1	1200
Demonstrator's room	10' x 15'	12	1800
Toilet(M/F)	10' x 20'	2	400
<b>Subtotal</b>			<b>19000</b>

**Estimated Functional area for ACADEMIC block**

Function	Area(ft <sup>2</sup> )	Quantity	Total Area(ft <sup>2</sup> )
lobby/lounge	20' x 20'	1	400
Academic office	20' x 20'	1	400
Medical officer	10' x 15'	1	150
Office superintend	15' x 20'	1	300
Teacher's room(total)	50' x 50'	1	2500
Teacher's common room	30' x 30'	1	900
Tea preparation area	10' x 10'	1	100
Teacher's Toilet	8' x 12'	2	200
Conference room	20' x 30'	1	600
Student counseling room	10' x 20'	1	200
Stationary+record room	10' x 10'	1	100
Store room	10' x 10'	1	100
Classroom	30' x 30'	16	900
Student's Toilet	10' x 20'	2	400
Debate room	20' x 30'	1	600
Fashion studio	40' x 40'	1	1600
Exhibition space			
<b>Subtotal</b>			<b>22950</b>



## **CHAPTER 02**

### **SITE APPRAISAL**

2.1\_\_Site consideration

2.2\_\_Social background

2.3\_\_Built form transformation over time

2.4\_\_SWOT analysis

## 2.1 Site consideration

The site located at Kalihati, Tangail is surrounded by bare cultivated lands and few temporary huts of the local dwellers. Environmental consideration of the site includes the orientation of the sun, direction of seasonal & regular wind flow as well as the precipitation rate of various seasons.



Fig- 02: Sun path and monsoon wind flow on the site

Source: Author

It is seen that the site on the south side has the main road which will generate noise as well dust, hence a buffer of plantation is required that both climatically supports as protection from glare. The north side with diffuse daylight and quite zone gives opportunity to provide the quite functional spaces over there. West to East side gives a direction towards the canal running on the eastern side of the site. The west side of the site is segregated from its nearby dwelling huts by its thick plantation. This side is as well a quite zone that's more suitable for placing utility services such that, water treatment plant, water pumping station, electrical substation etc.

The microclimate of the site enhanced fresh air through purifying by the canal as well by the thick plantation all over.

Site and its surrounding plan reveal the topography of the site over time. The site is divided by the canal from Jhinai River which meets with the main river flow i.e. Jamuna both on its western and northern end.



Fig-03: Road network and topography of the site

Source: Author

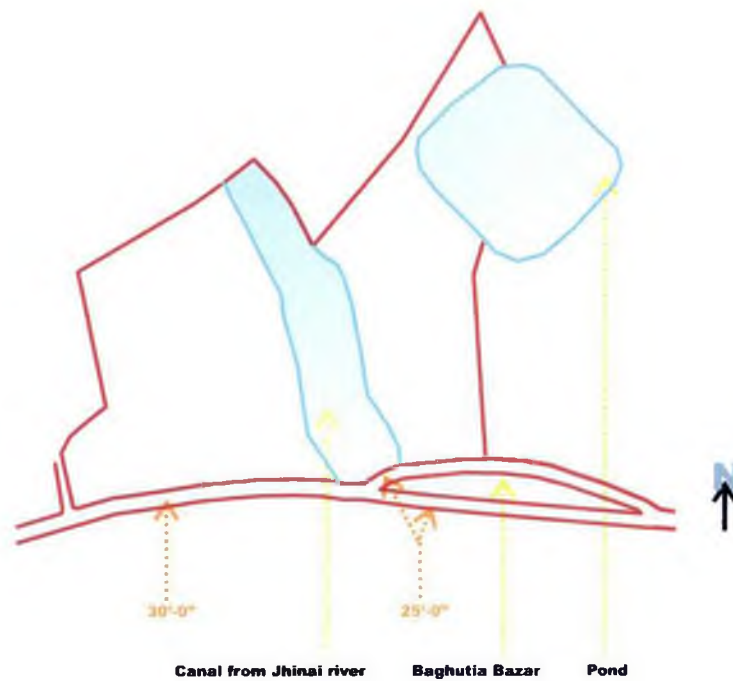


Fig - 04: Existing site condition

Source: Author





The main road on south side



The existing site



The canal on the site



Enormous bamboo plants

Fig 05, 06, 07, 08: Different views of the site

Source: Author

## **2.2 Social background**

Tangail district is recently developing though majority of its land is being used for cultivation. This district is well known for its -

- Tangail Tanter Saree
- Household utensils made of bell metal
- Sheetal Pati (Hinganagar & Kalihati Village)
- Bananas (Modhupur gor)
- Jackfruit (Modhupur, Ghatail)
- Porabari Cham-Cham
- Madhupur Pineapple
- An old tree named Tomal at Gupta Brindaban, Ghatail

Besides weaving there are some brass, pottery and bamboo and cane industries in the district.

Tangail is the home of the weavers of world famous "Tangail Saree" a handloom saree made of both cotton and silk thread having hand worked butti design or all over flowery design or contemporary art motif appreciated, bought, and used by women's & girls of Bangladesh and Indian origin living all over the world. As Cottage industries Tangail sari is most famous at home and abroad.

In this district, the Main Rivers are JAMUNA, DHALESHWARI, Jhenai, Bangshi, Lohajang, Turag, whereas main occupations are Agriculture 49.53%, fishing 1.05%, agricultural laborer 17.28%, wage laborer 2.53%, weaving 1.68%, industry 1.71%, commerce 9.56%, transport 2.14%, service 6.67%, others 7.85%. Main exports of the district include Jute, pineapple, banana, sugarcane and sari. There are 3865 mosques, 735 temples, 44 churches and two Buddhist temples, one place of pilgrimage and four tombs in the entire Tangail district under Dhaka division.



### 2.3 Built form transformation over time

Tangail is enriched with heritage of many Mughal built forms and Jaminder baaris , which are left ignored mostly. These built forms echo the spirit of the place with their vibrant quality of color, texture and play of forms as time passed through. It is pathetic to see that over time, the transformation of the built forms in this locality is turning towards the same way as Dhaka city, crowded and green area barely seen.



Fig- 09: Built form transformation till date

Source: [www.googleearth.com](http://www.googleearth.com)

## **2.4 SWOT analysis**

### **Strength:**

- Flood protection by canals & rivers
- Enormous green area with balanced eco-system
- Adequate land area for the project
- Availability of bamboo plants
- No vehicular congestion
- Free from air or sound pollution

### **Weakness:**

- Approaching main road adjacent to the site too narrow, approximately 30'-0"
- Land depressed from the main road
- Illegal land acquisition
- Lack of street light and security at night
- Very low population density
- No pedestrian road along the road

### **Opportunity:**

- Availability of local materials
- Heritage: Hand woven saree and "sheetal paati"(mat made of bamboo)
- Passive cooling and heating
- Earth hugging built forms
- Iconic built form of the area

**Threat:**

- Lack of security
- Unplanned zoning surrounds
- Lack of facilities like shopping malls, recreation parks etc.

The overall SWOT analysis of the site remarks the potential of the site for the intended project. It also assures the factors to be considered with due priority not to agitate the overall space achievement throughout the entire process of developing the project.



## **CHAPTER 03**

### **CASE STUDIES**

3.1\_\_Bangladesh Textile Engineering University (BTEU)

3.2\_\_Textile Research Institute & Engineering School

3.3\_\_East West University (New campus)

### **3.1 Bangladesh University of Textiles**

**Location:** Tejgaon, Dhaka

**Site area:** Approximately 10 acre

**Objective:**

- To understand the zoning and functional relationship of the Textile Engineering College
- To understand the functional requirements and occupancy ratio
- How the spaces must be designed for natural ventilation due to long span of different labs
- The need of integration among spaces of different modules
- Importance of landscape integration within the built forms to break the monotony of heavy machineries oriented works



Fig-10: Site plan of the Bangladesh University of Textiles

Source: [www.googleearth.com](http://www.googleearth.com)

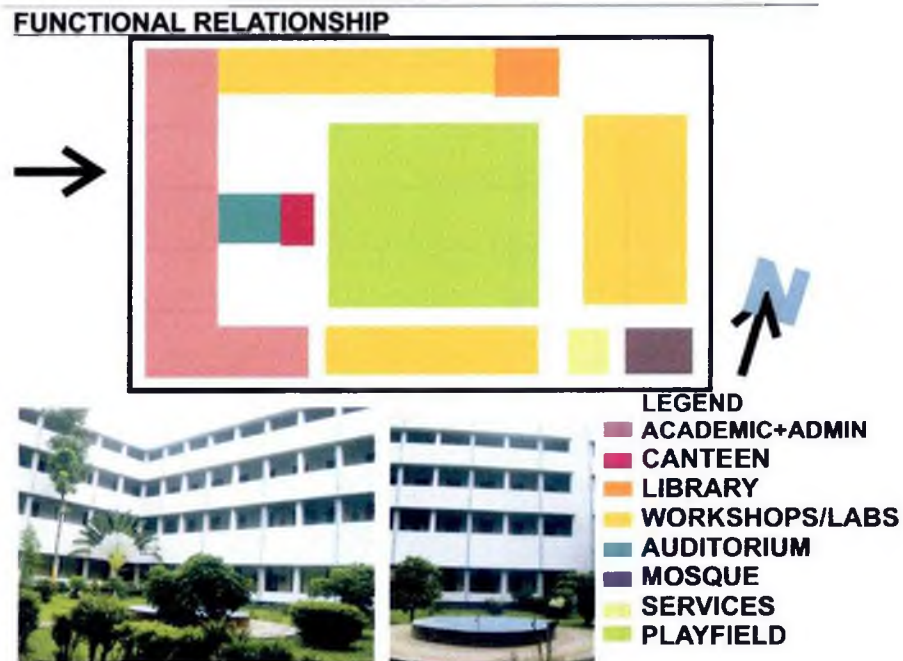


Fig-11: Functional relationship and zoning

Source: Author

**Total user :456****Total no. Of students= 320****Total no of teachers= 40****Total no of demonstrators= 16**

FUNCTION	AREA(ft <sup>2</sup> )	FLOOR(S)	TOTAL AREA(ft <sup>2</sup> )
ACADEMIC CUM ADMIN BLOCK	21700	4	86800
AUDITORIUM	6500	1	6500
STUDENT'S SANGSHAD	1000	1	1000
JUTE PROCESSING LAB	11800	3	35400
WET PROCESSING LAB	15000	1	15000
COTTON LAB	25000	1	25000
MECHANICAL WORKSHOP	3000	3	9000
MOSQUE	2000	1	2000

Fig-12 : Functional requirement and occupancy load

Source: Bangladesh University of Textiles

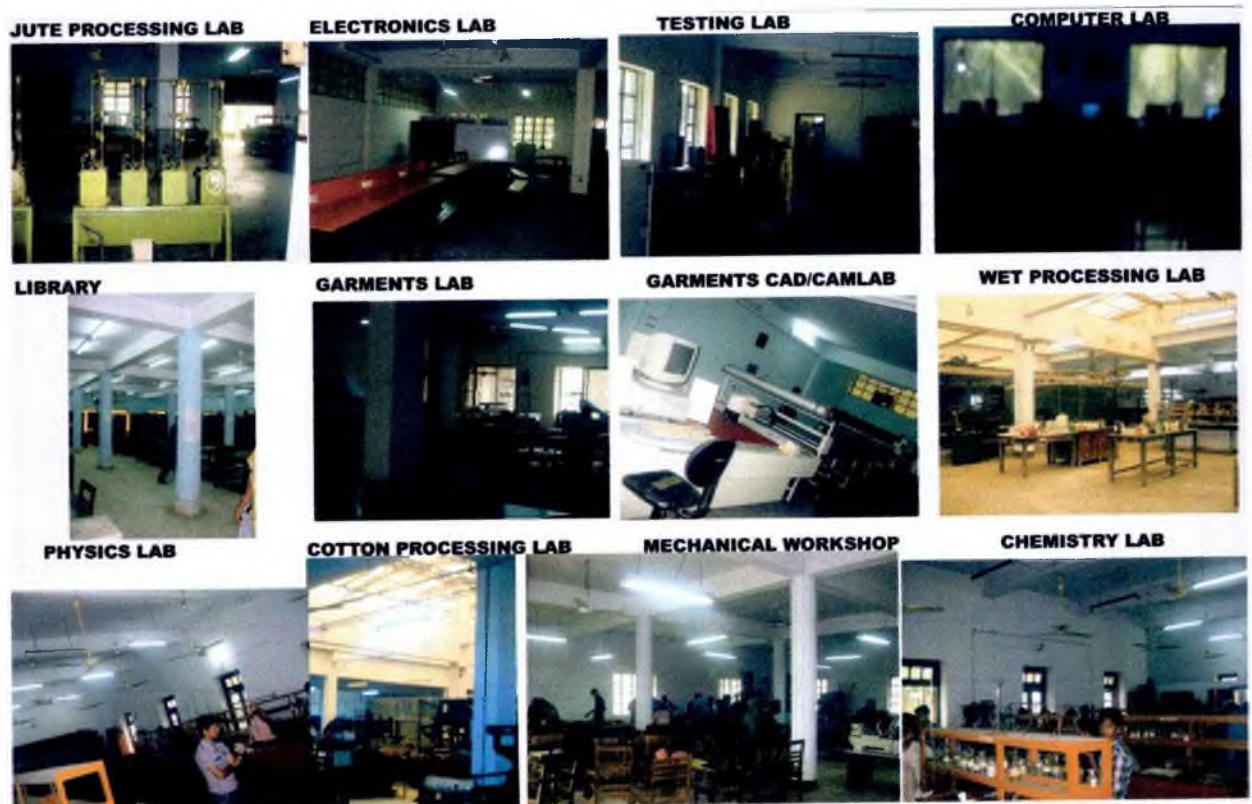


Fig-13: Different labs and their space quality

Source: Author



**Analysis & Findings:**

- The academic campus area has been studied thoroughly as to have clear idea of the relationship among functional spaces of the required area. The zoning, facilities needed and space requirements has been listed for better understanding.
- The central playfield is surrounded by labs and classrooms though the interior classroom and lab conditions are not satisfactory at all. It is not the fault of master planning, rather individual building treatment that separates the positive factors of environs keep away from inside the built forms.
- The labs are the most significant part of the Textile engineering Education that provides clear understanding of the theoretical knowledge. Students spend most of their time in these labs with interaction among students and teachers. Each lab is providing demonstrator's room and storage for the lab works.
- The labs are not well ventilated and lighted mostly. Some elements have been tried out to improve these factors recently. Suffocating condition prevails for most of the labs being deep in length and not properly designed.
- Thick columns have not been used to sustain the large spans of the labs for visual connections, rather more number of columns are seen. The openings are not designed well enough to provide fresh air and light from outside playfield area adjacent to the ground floor labs.
- Overall space allocation of this campus is not integrated and exhibition spaces are left alone. Positive is the master plan holding the play field amidst with clear zoning of the functional areas.

### **3.2 Textile Research Institute & Engineering School**

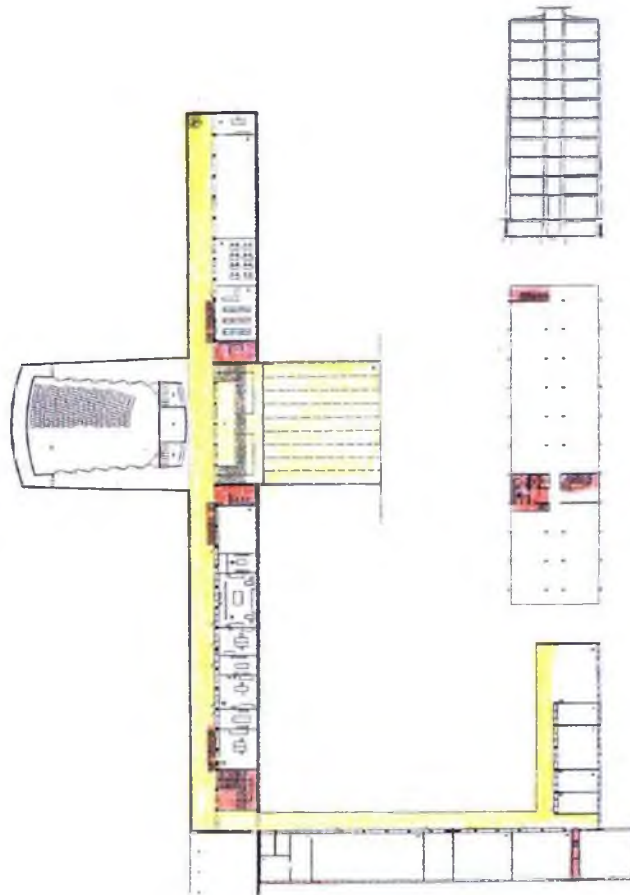
Location: Krefeld, Germany

Architect: Bernhard PFAU, DUSSELDORF

Date of completion: 1958

#### **Objective:**

- To understand the zoning and functional relationship of the Textile Engineering College
- To understand the functional requirements and occupancy ratio
- The need of integration among spaces of different modules
- Importance of landscape integration within the built forms to break the monotony of heavy machineries oriented works
- The necessity of natural light among lab works due to work pattern
- The necessity of privacy and noise barrier of the campus from traffic road



Typical floor plan



View of the main entrance



Main entrance detail

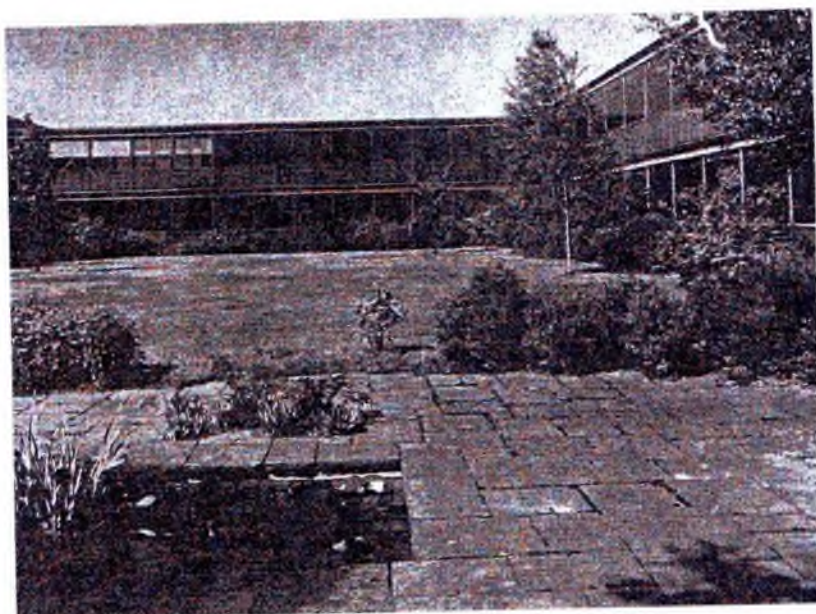
Fig- 14, 15, 16: Different parts of the Textile Research Institute & Engineering School

Source: School Buildings2 <sup>1</sup>

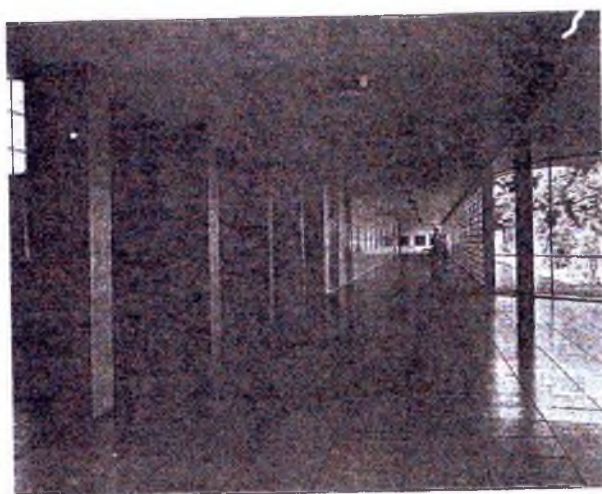




Detail of Facade



View of subsidiary wings, from the garden court



The common corridor



View after entry

Fig- 17, 18, 19, 20 : Different parts of the Textile Research Institute & Engineering School

Source: School Buildings2 <sup>1</sup>



**Analysis & Findings:**

- The academic campus area has been studied thoroughly as to have clear idea of the relationship among functional spaces of the required area. The zoning, facilities needed and space requirements has been listed for better understanding.
- The garden court is surrounded by labs and classrooms for better ventilation and natural lighting.
- The labs are the most significant part of the Textile engineering Education that provides clear understanding of the theoretical knowledge. Students spend most of their time in these labs with interaction among students and teachers. These labs are separated from classroom blocks for their structural reason of long span, which causes lack of integration with classrooms.
- Overall space allocation of this campus has been tried out to merge with nature by introducing courts as to break the monotony of machinery-oriented works.

### **3.3 East West University (New campus)**

**Architect:** Bashirul Haq

**Location:** Aftabnagar, Dhaka

**Total built area:** 4589600 sft

**Year of completion:** November, 2011

#### **Objective:**

- Climatic consideration in shaping building envelope
- Zoning and space quality for a campus
- Building massing and achieving legibility of building function



Fig-21: Floor plans and zoning of different functional areas

Source: Bashirul Haq & Associates



Fig- 22: Massing of different parts of the university

Author: Source: Bashirul Haq & Associates



**Analysis & Findings:**

- Local material 'Brick' has been used for facade treatment with cavity wall for protection from heat gain
- Zoning has been done as per public, semi-public and private areas
- Massing of the building allows the northern breeze to bounce over the courtyard that acts as a nucleus of the entire campus as well functionally
- Formal treatment on facade makes the built form legible as an Educational Institute.

## **CHAPTER 04**

### **PROGRAM**

- 4.1\_\_ Introduction
- 4.2\_\_Diagram: Relationship among major functions
- 4.3\_\_Administrative
- 4.4\_\_Academic
- 4.5\_\_Classrooms & Labs
- 4.6\_\_Library
- 4.7\_\_Recreational facilities
- 4.8\_\_Campus ancillary facilities
- 4.9\_\_Summary

#### **4.1 Introduction**

The total program of this project comprises some major functions regarding- Administrative, Academic, Library, Recreation facilities and Campus ancillary facilities.

The program was primarily provided by the Government authority based on the requirement. The given program has been further questioned, rationalized and modified as per the demand of this project.

The intended programs of the college have been arranged within 5 different blocks that are connected through the circulation corridors.

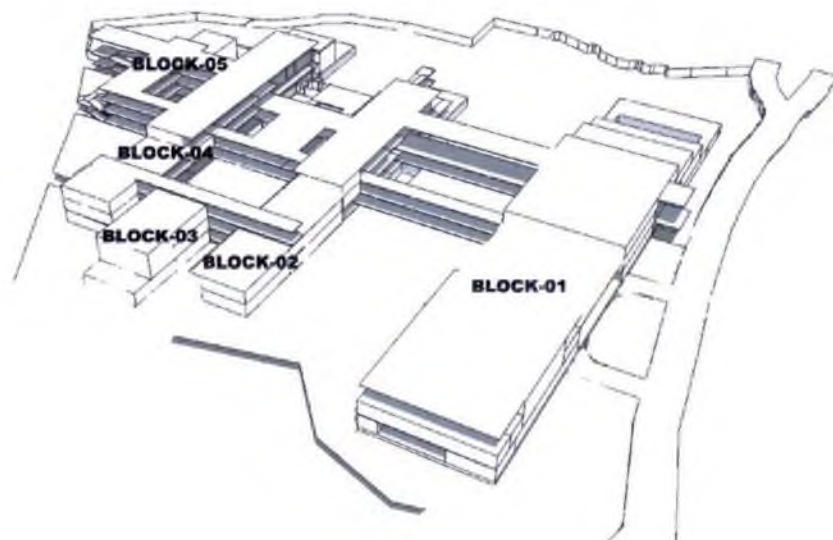


Fig 23: The entire campus label of Blocks

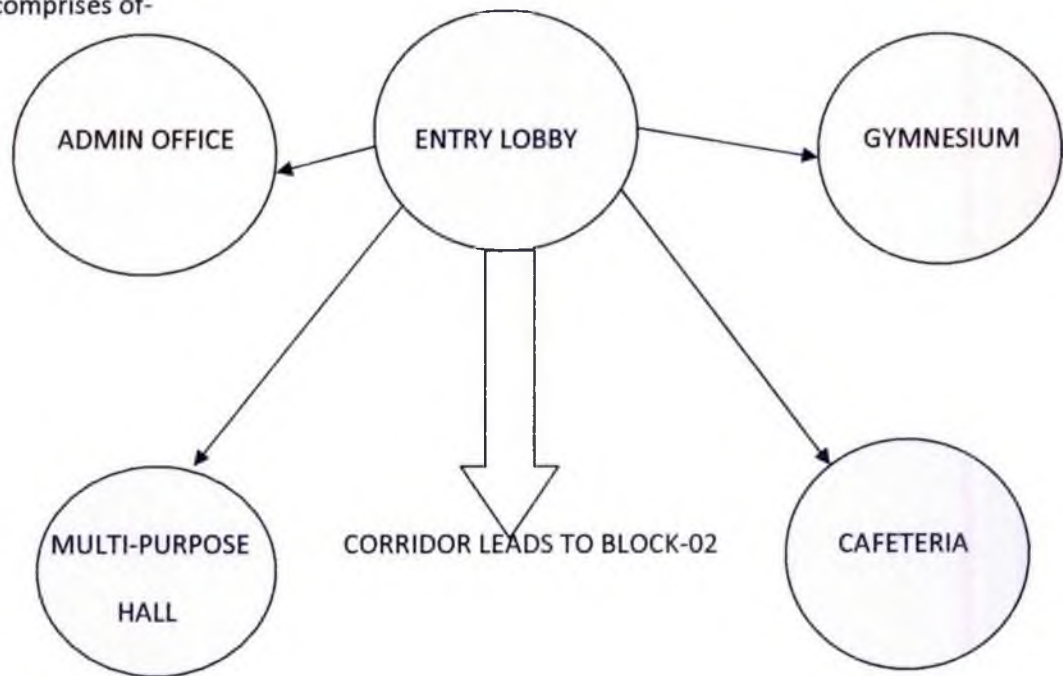
Source: Author

#### 4.2 Diagram: Relationship among major functions

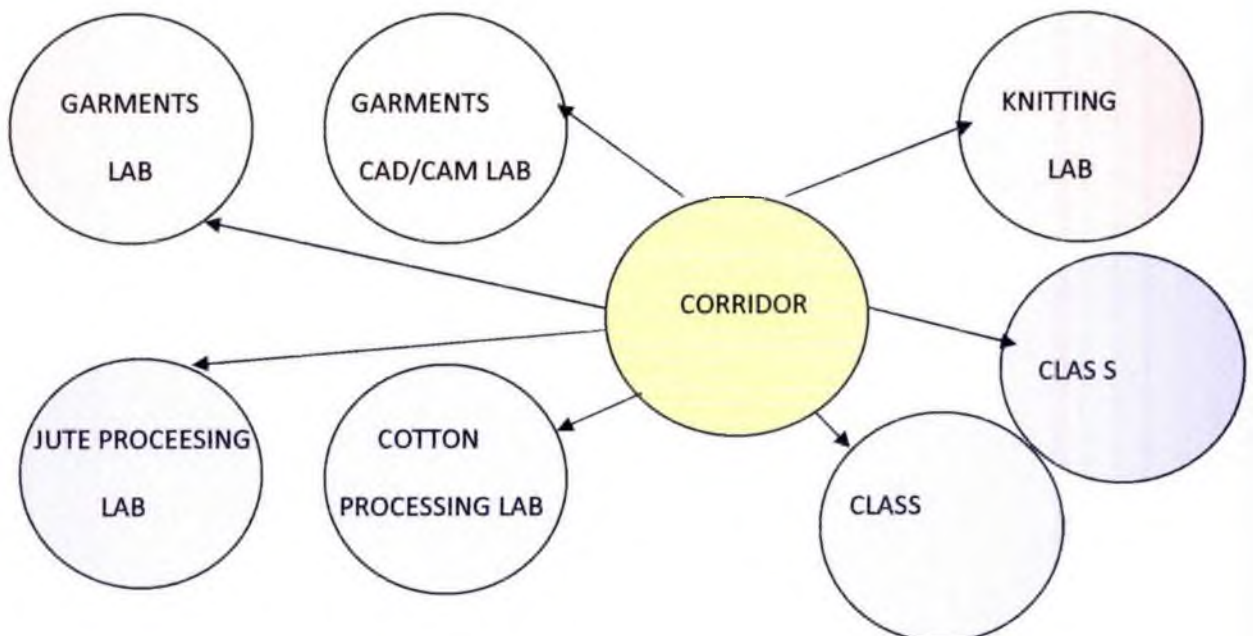
Legend

○ Ground floor ○ 1<sup>st</sup> floor  
 ● 2<sup>nd</sup> floor ● 3<sup>rd</sup> floor

BLOCK-01 comprises of-

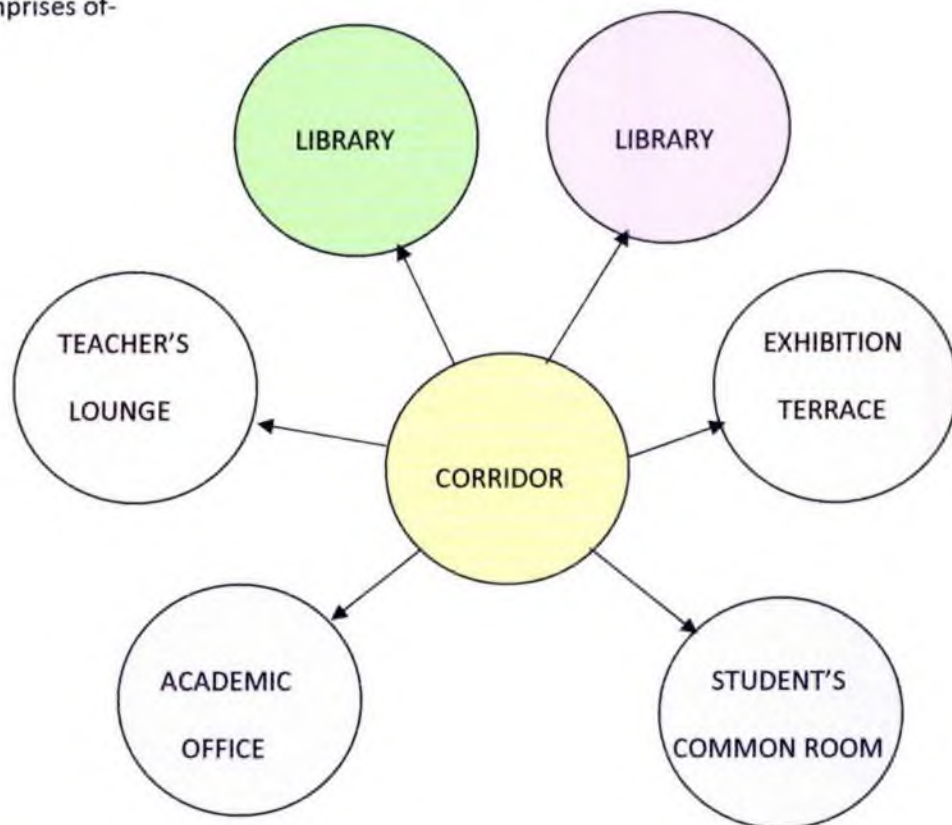


BLOCK-02 comprises of-

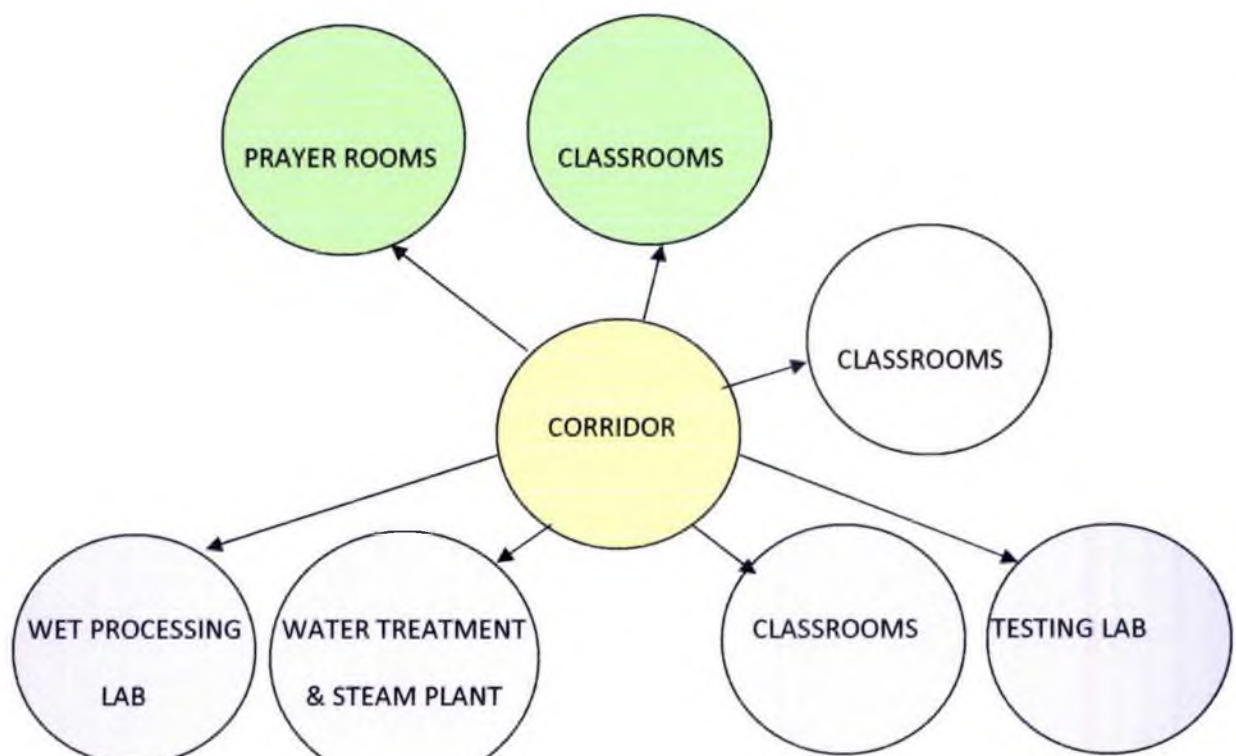




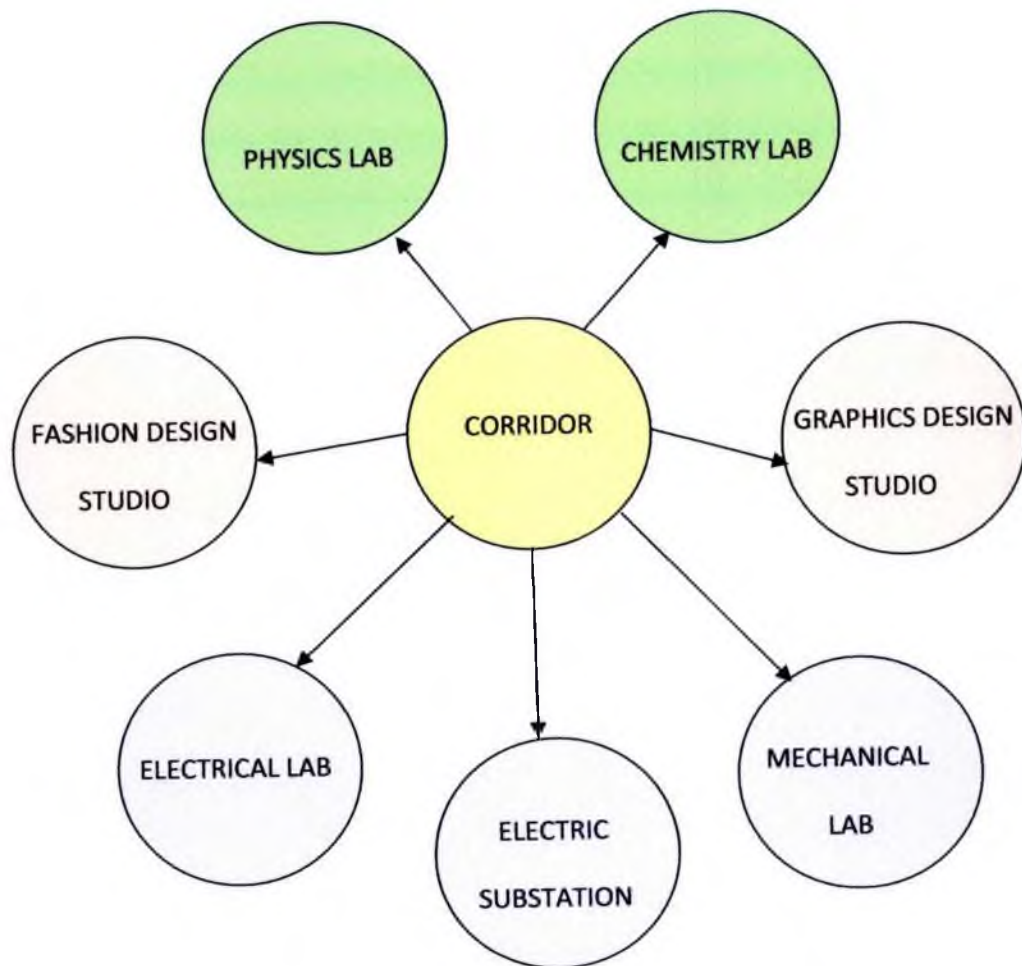
**BLOCK-03** comprises of-



**BLOCK-04** comprises of-



**BLOCK-05** comprises of-



### **4.3 Administrative**

Administration section comprises space for-

- Registrar office - 750sft
- Accounts section-600sft
- Planning department-450sft
- Financial department- 600sft
- Technical control room-300sft

Functional area + circulation area + waiting area = 2700 + 810 + 2500 = 6010 sft

The administration section is housed in Block-01 which is the entry block since the functions are more of public interest due to tuition fees, information providing etc. Administration section controls the entire educational framework of the college; hence it is necessary for the functions to be allocated close to the public zone of the college campus.

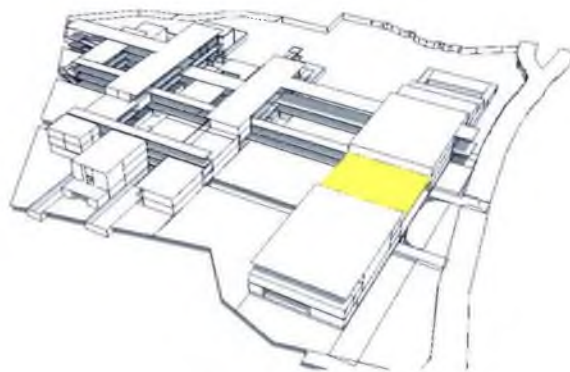


Fig 24: Location of Administration zone in Block- 01

Source: Author

#### **4.4 Academic**

Academic section comprises space for-

- Principal- 500 sft
- Assistant Principal- 300sft
- Academic office- 400sft
- Office super- 300sft
- Stationary& Record room- 100sft
- Conference room- 400sft
- Student counseling room- 200sft
- Store room- 100sft
- Tea prep+ Helping hand-200sft
- Teachers lounge- 2200 sft

Functional area + circulation area =  $(3250 + 2850)$  sft = 6100sft

The academic section is placed on the middle block of the campus, i.e. Block- 03 for ease of movement and control of the entire campus.

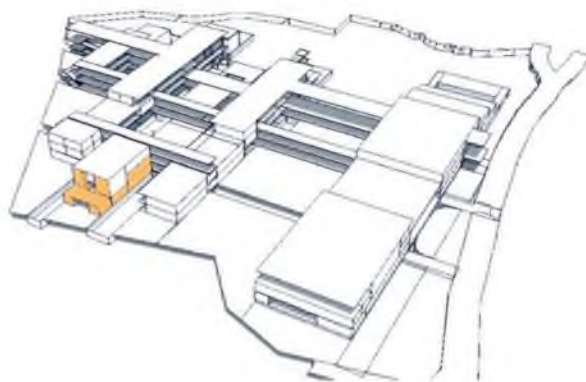


Fig 25: Location of Academic zone in Block- 03

Source: Author



#### **4.5 Classrooms & Labs**

Classroom area (each): 25'-0" X 30'-0" = 750sft (including lockers)

Total number of class rooms: 15

Total area allocated for classrooms = 11250sft (including lockers)

There remain 12 different Labs in this Textile Engineering College such as-

1. Jute processing Lab: 50'-0" X 60'-0" = 3000sft
2. Cotton processing Lab: 40'-0" X 60'-0" = 2400sft
3. Knitting Lab: 30'-0" X 40'-0" = 1200sft
4. Garments Lab: 30'-0" X 40'-0" = 1200sft
5. Garments CAD/CAM Lab: 20'-0" X 30'-0" = 600sft
6. Wet processing Lab: 40'-0" X 60'-0" = 2400sft
7. Testing Lab: 30'-0" X 40'-0" = 1200sft
8. Electronics Lab: 20'-0" X 30'-0" = 600sft
9. Physics Lab : 30'-0" X 40'-0" = 1200sft
10. Chemistry Lab: 20'-0" X 30'-0" = 600sft
11. Computer Lab: 30'-0" X 60'-0" = 1800sft
12. Mechanical Workshop: 40'-0" X 60'-0" = 2400sft

Total area allocated for Labs = 18600sft

The classrooms and labs have been arranged into Block-2, 4 & 5 together rather on separate zoning. This assures the significance of both practical & theoretical learning simultaneously. Size of classrooms assure teacher, student ratio as such teachers can communicate with each & every students efficiently.

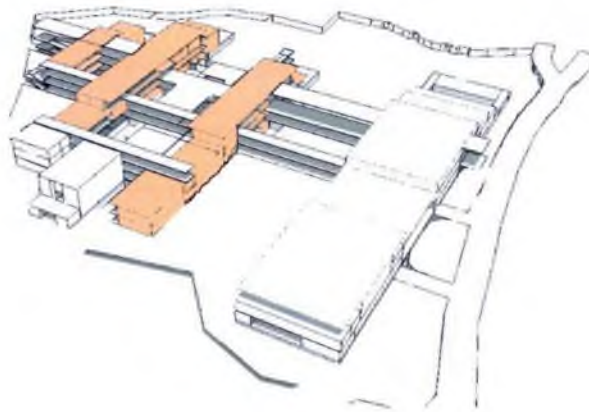


Fig 26: Location of Class rooms & Labs in Block- 03, 04 & 05

Source: Author

#### **4.6 Library**

The library of the entire campus has been housed in Block-03; which is the central block among 5 total blocks. It is housed within 2<sup>nd</sup> and 3<sup>rd</sup> floor taking total area of 8200sft. This library acts as a resource centre providing resources other than only books for advanced learning.

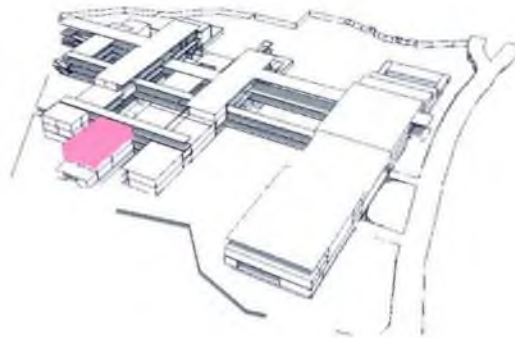


Fig 27: Location of the Library in Block-03

Source: Author

#### **4.7 Recreational facilities**

Recreational facilities comprises of-

Multi-purpose Hall: 14500sft

Gymnasium: 10500sft

Cafeteria: 9000sft (including kitchen & outdoor sitting)

Student's common room: 1800sft

Debate club: 1000sft

Amphitheatre (open to sky): 9500sft

Total area for Recreational facilities: 46300sft

The area allocated for recreational facilities of the campus is as such that can meet the demand of the locality to some extent. Since, the surrounding residential areas lack recreational spaces that can be mitigated through using the campus after the academic curriculum gets end.

This can keep the campus robust as well earn revenues through renting multi-purpose, gymnasium etc. Rather keeping the college campus a dead zone after classes end, inviting the public who lacks breathing space in this region while encouraging about importance of textile engineering field in context of Bangladesh is a scope to explore.

Hence, these facilities have been provided in the nearest block to the road which is Block-01, that ensures privacy for the students while meeting the academic programs on those areas.

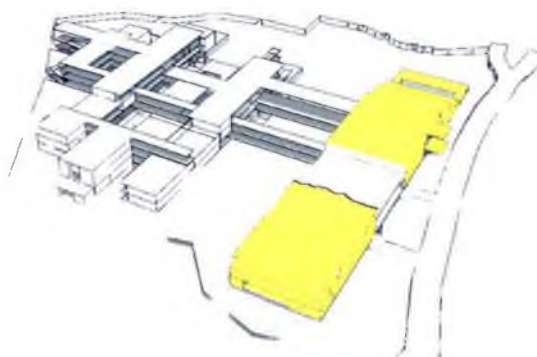


Fig 28: Location of recreational facilities in Block-01



#### 4.8 Campus ancillary facilities

Among ancillary facilities, the need includes-

- 1200sft Electrical substation: 30'-0" X 40'-0" =
- 150sft Water pumping station: 10'-0" X 15'-0" =
- 800sft Water treatment plant: 20'-0" X 40'-0" =
- 250sft Steam generation plant: 10'-0" X 25'-0" =

Rather segregating the supporting functions, incorporating them to the relevant major functions has been followed for efficiency.

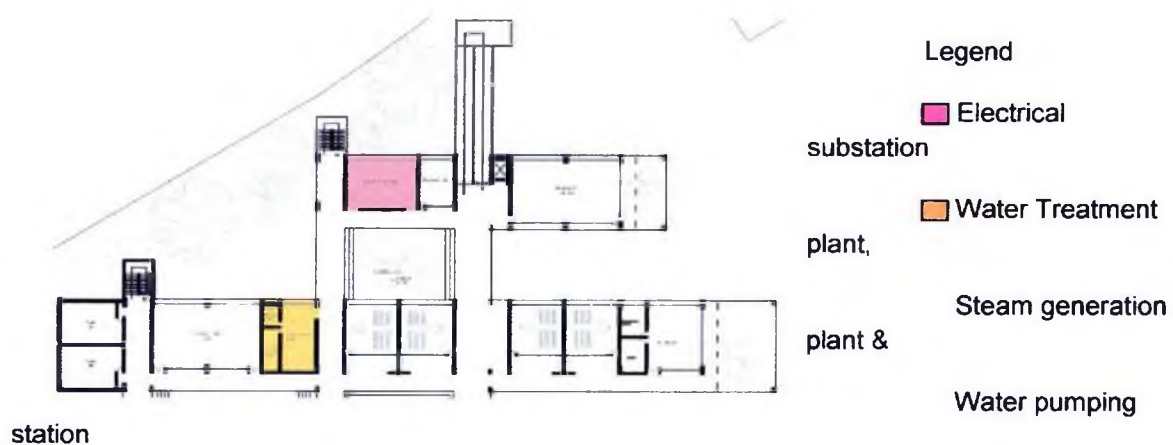


Fig 29: Location of ancillary functions in Block-04 & 05

Source: Author

The position of water treatment plants has been as such the wastages out of the processes can be managed through the rear space kept inaccessible for the students.

#### **4.9 Summary**

The functional areas has been arranged as such to fulfill the requirements of the Textile Engineering College while enhancing the efficiency and management of the overall system.

## CHAPTER 05

### CONCEPTUAL STAGE & DESIGN DEVELOPMENT

5.1\_\_ Introduction

5.2\_\_ Conceptual study

5.3\_\_ Dev I

5.4\_\_ Dev II

5.5\_\_ Dev III

5.6\_\_ Dev IV

5.7\_\_ Dev V

5.8\_\_ Dev VI

5.9\_\_ Dev VII

5.10\_\_ Summary



### **5.1 Introduction**

The design, from its conceptual stage gets shape through continuous modification to adjust itself with the ground, the functional requirements and peripheral issues. The development phases are accordingly described, where each of them adds value on enriching the ultimate design state tried to achieve through this process.

## 5.2 Conceptual study

The initial conceptual ideas begins with-

- Textiles as basic human need: Protection, comfort and screening of environs
- Textiles as play of colors, motifs, textures
- Textile begins with the basic process "Weaving" & "Knitting" of yarns

For the site itself, adds ingredients for beginning the design-

- Serene site with water channels and lush green: passive cooling, earth-hugging built form
- Renowned site for Taater saari and Sheetal pati (made of bamboo)

The design of the college campus through further study was initiated with the notion:

"Together we stand, divided we fall"

Alike each yarn integrating the rest of others on a weaving and knitting process, the design attempted to weave the different parts of the campus while knitting the serene setting within.



Fig-30: The basic weaving pattern



Fig-31: A sample of local textile (warp-Silk, weft-Jute)

Source: 'Exportable handloom products of Bengal' <sup>2</sup>

#### Integration among-

- Landscape
- Circulation
- Functional spaces

#### By means of-

- Water body(the existing canal on the site)
- Plantation
- Terrace
- Courtyards
- Bridge/pathways
- View corridors
- Skylights
- Circulation (vertical & horizontal)

### 5.3 Dev I

The basic weaving pattern through study came up with the basic themes for transformation into campus planning and massing of the built forms such that-

- plan simple ,where section and elevation is achieved through continuous connection
- Alternative layers of connections (yarns)
- Overlapping and interlocking connections to form the whole

On this phase of development, carrying out the concept into an efficient college campus required exercises to explore how best to suit the concept into a buildable state.

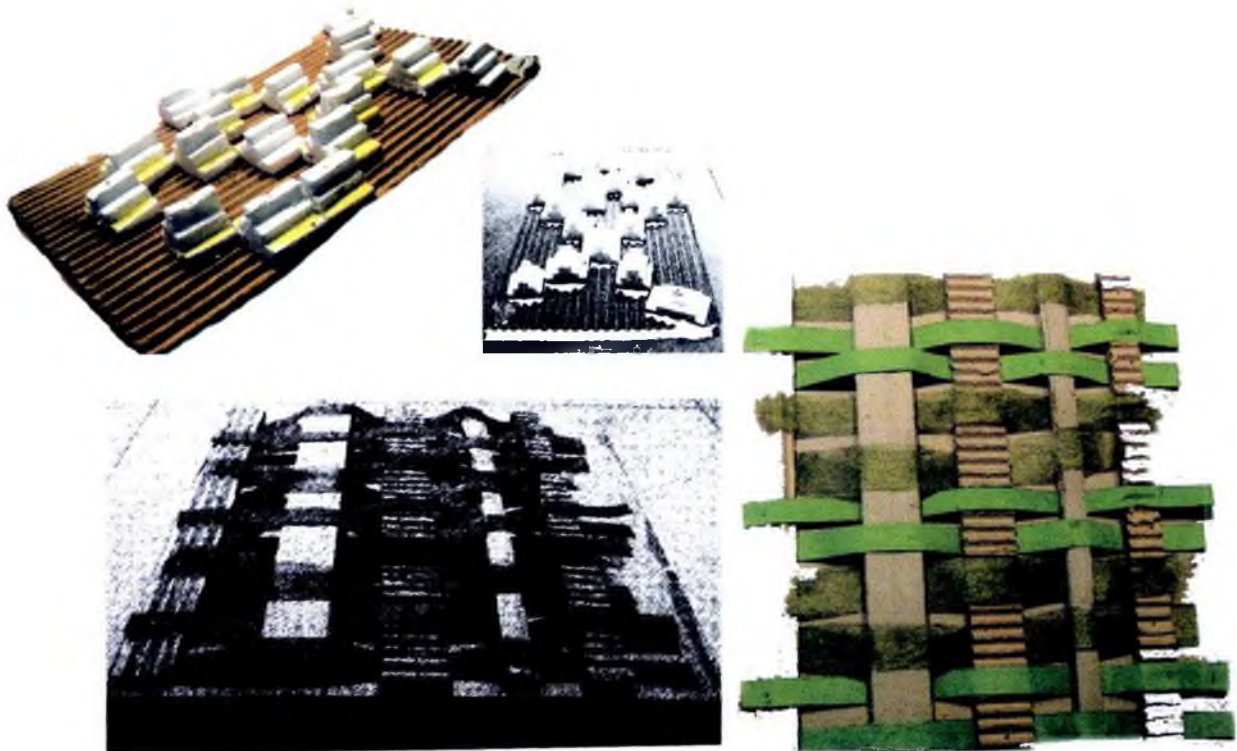


Fig-32, 33, 34, 35 : Exploring the formal expression of basic weaving pattern

Source: Author



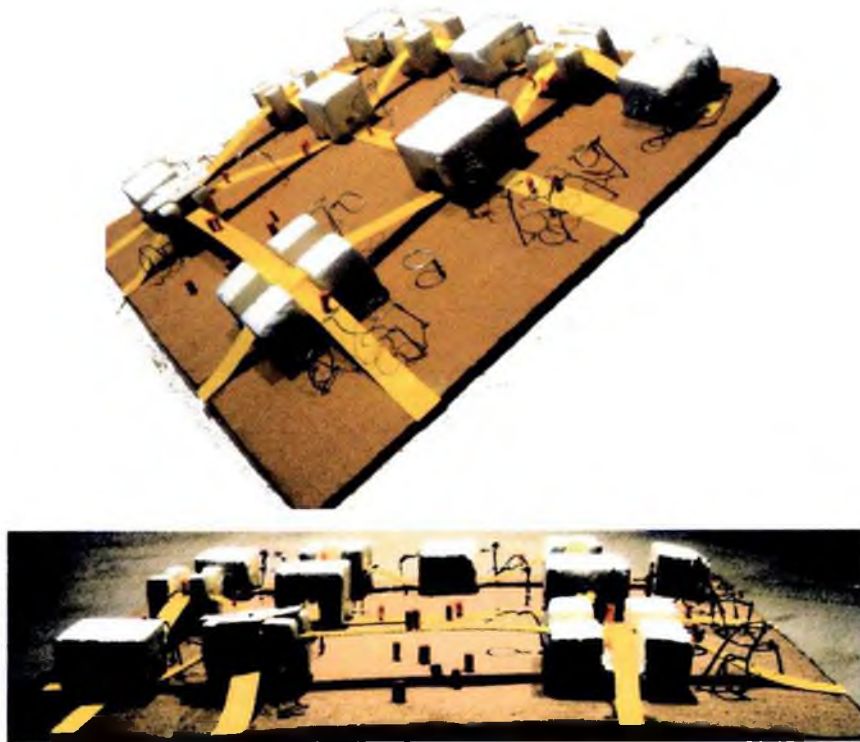


Fig-36, 37: Exploring the formal expression of basic weaving pattern

Source: Author

The exercises carried out to establish and clear understanding of the advantages and disadvantages on expressing the conceptual theme into functional spaces for the college campus.

#### 5.4 Dev II

On analyzing the formal expressions of weaving pattern, one option was tried out focusing on the complex pattern of weaving while observing at an angle of 180degree.



Fig-38: Plan of initial stage of zoning

Source: Author



Fig-39, 40: Study model of phase-02

Source: Author

Through this phase the simplicity and bold functional formation of basic weaving pattern was understood. Further development carried out through more simplified pattern that would not create functional and circulation complexities like this one.

### **5.5 Dev III**

In this phase more simple, formal and transparent orientation of massing was explored. Here, to transform the concept into formal expression, more exercises were carried out those results in an integrated form with the site as well as functional requirements.



Fig-41: Exploring the formal expression of basic weaving pattern

Source: Author



Fig-42: Formal expression of concept into zonal plan

Source: Author



## 5.6 Dev IV

The simple plan begins with its functional establishment, when the consideration of overall massing took place.

The basic unit of the college is classrooms where, for a Textile Engineering College the Labs have major significance. Through study it reveals the need of skylight for the labs with increasing depth where continuous windows cannot help much.



Fig-43: Comparing Lab without and with skylight on BTEU

(Bangladesh Textile Engineering University, Tejgaon, Dhaka)

Source: Author

Hence, the importance of provision for skylight into lab blocks were established and the massing of the college decided to be staggering in form that allows skylight for the lab blocks as well keeps a harmony to the adjacent canal running along the site. Integration among different blocks was thought to be carried out by view corridors as well.



Fig-44: Transformation of conceptual plan into formal massing

Source: Author

## 5.7 Dev V

This phase of development carried out by the final zoning among major functions. As well maintaining the connections among different blocks through circulation, as knitting both indoor & outdoor was a major consideration to break the monotony of machinery –oriented lab works.

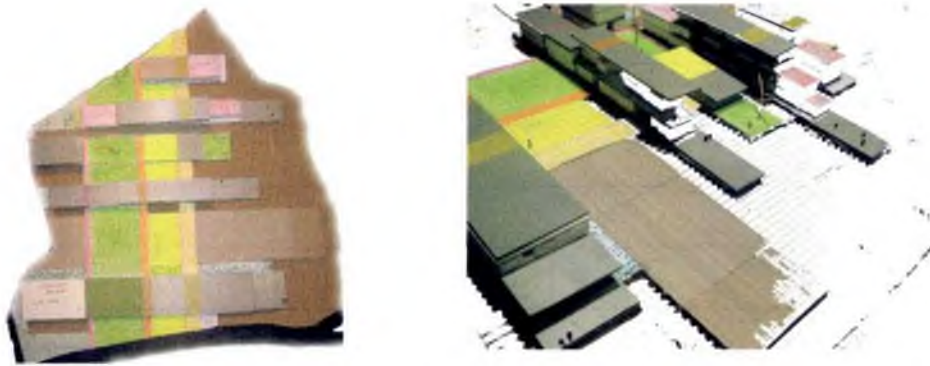


Fig-45, 46: Transformation of formal massing into schematic form

Source: Author

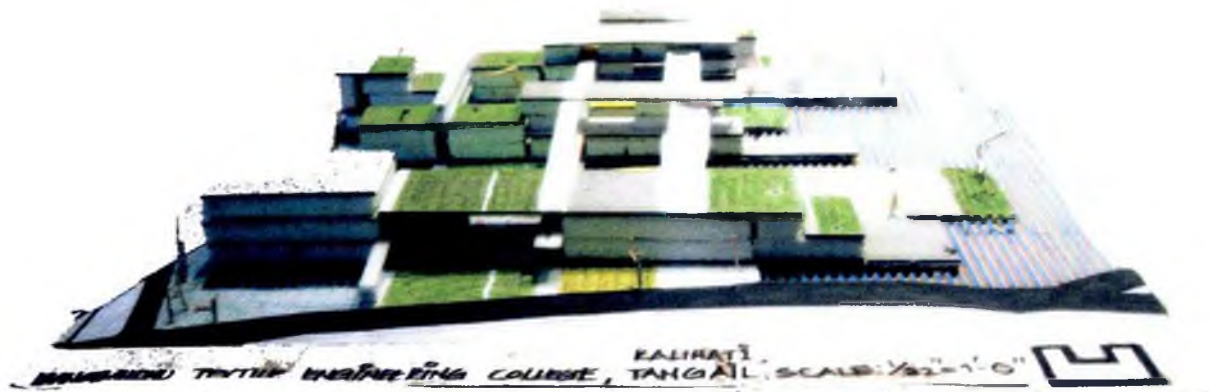


Fig-47: Establishing connectors within the schematic massing

Source: Author



## **5.8 Dev VI**

This phase initiated with the shadow pattern study on extreme cases to check if the desired pattern is achieved through the massing formation. Knitting the indoor & outdoor spaces throughout the campus as well carried out by sketchy ideas.

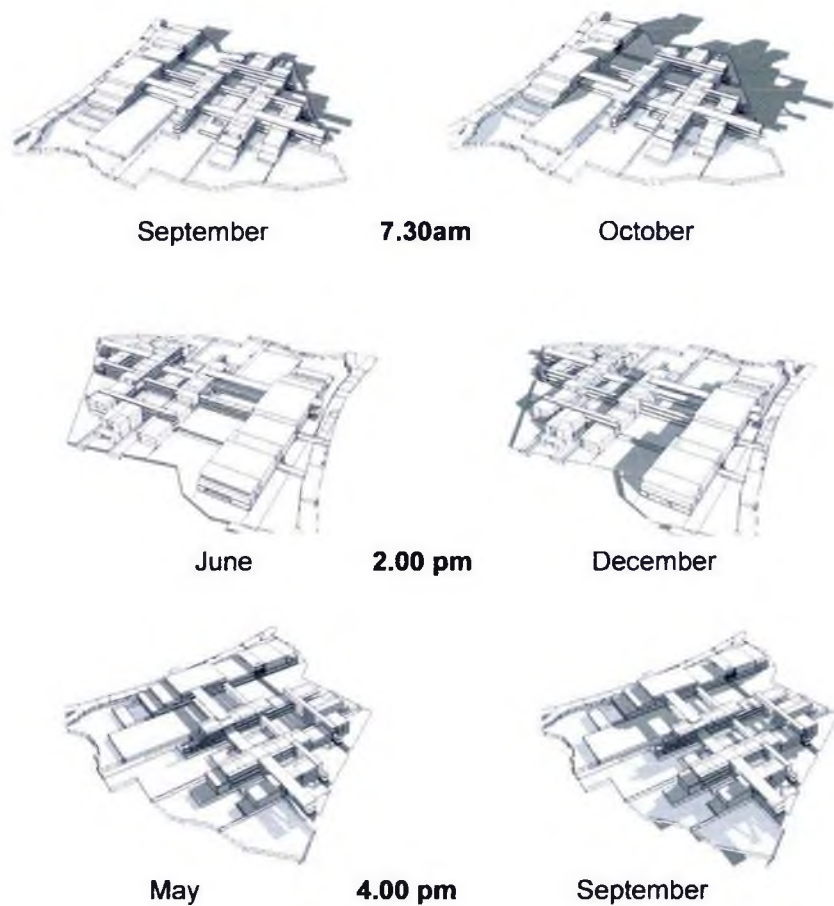
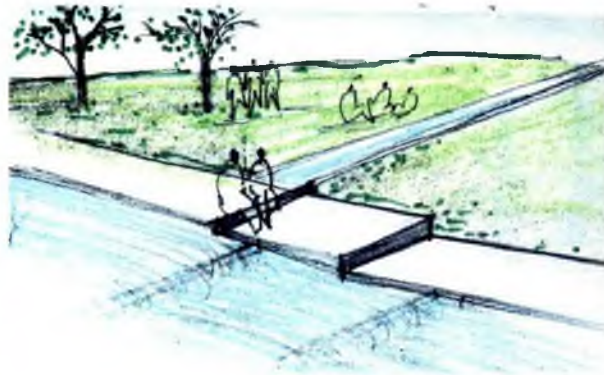
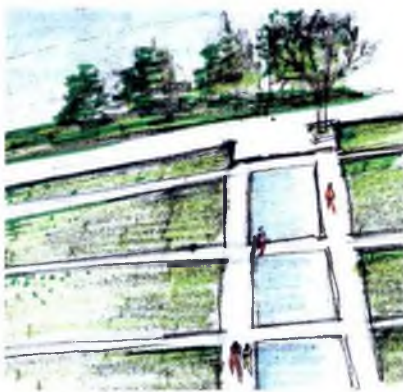


Fig-48: Shadow pattern study

Source: Author



Connecting the land with the running canal within the campus



Enhancing the knitting of landscape elements by space formation



Indoor to outdoor relationship on cafeteria

Fig- 49, 50, 51, 52: Sketches of the knitting space formation

Source: Author



### 5.9 Dev VII

Knitting the indoor and outdoor spaces to make the campus woven within its setting, options were tried out to achieve the best suited solution according the functional need.

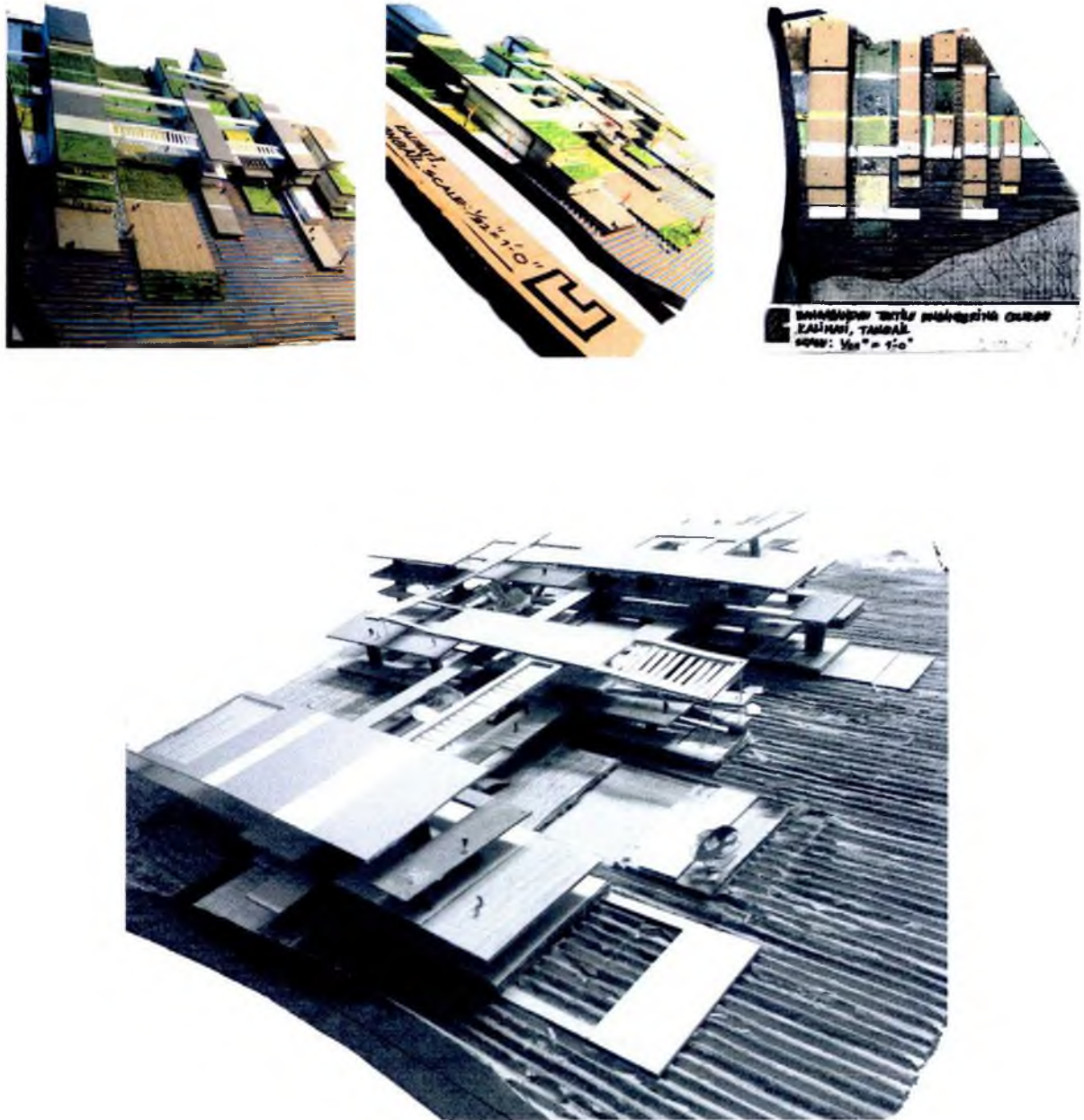


Fig-53, 54, 55, 56: Establishing the knitting space formation

Source: Author

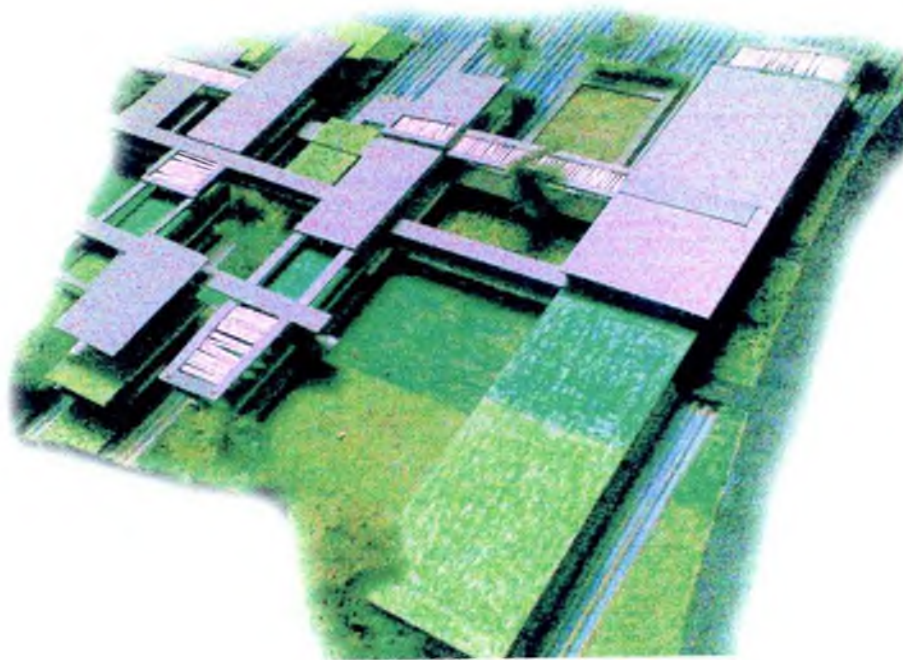


Fig-57, 58, 59: The total campus massing on final phase

Source: Author

### **5.10 Summary**

To echo the very basic essence of Textiles, i.e. weaving & knitting, the studies have been followed that results in a campus, deeply rooted to its surrounding. Through the consistent development phases, the college campus gradually gets into the shape that is woven within its indoor & outdoor spaces where human relationship forms & fosters.



## **FINAL DESIGN**

6.1\_\_Plans

6.2\_\_Elevations

6.3\_\_Sections

6.4\_\_Perspective views

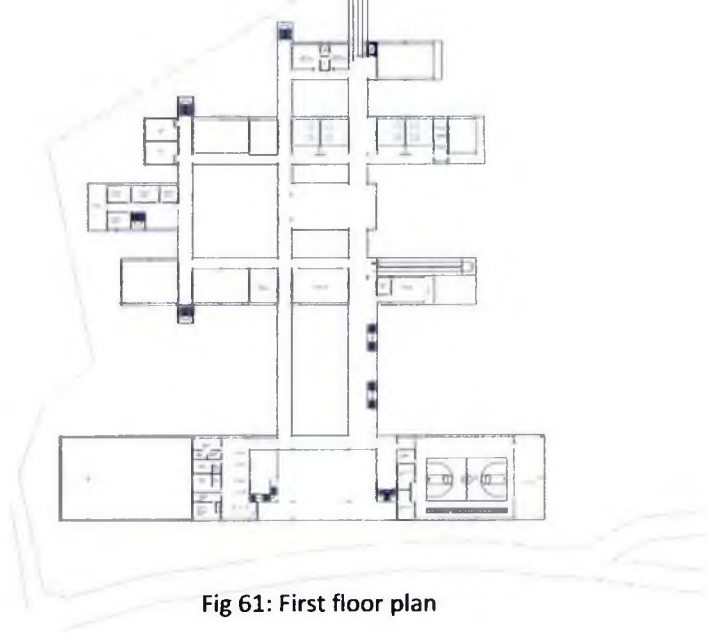
6.5\_\_Photographs of model

6.6\_\_Summary



Fig 60: Ground floor plan on the entire campus

Source: Author



**Fig 61: First floor plan**

**Source: Author**



**Fig 62: Second floor plan**

**Source: Author**



Fig 63: Third floor plan

Source: Author



Fig 64: Roof plan

Source: Author

## **6.2 Elevations**



Fig 65: South Elevation

Source: Author



Fig 66: East Elevation

Source: Author



Fig 67: North Elevation

Source: Author



Fig 68: West Elevation

Source: Author



### **6.3 Sections**



Fig 69: Section through the entry block facing South

Source: Author



Fig 70: Longitudinal section of the entire campus facing the eastern canal

Source: Author



Fig 71: Cross-section through the library block

Source: Author

### **6.3 Perspective views**



Fig 72: The Entry to the college campus

Source: Author



Fig 73: The Playfield between block-01 and 02

Source: Author





Fig 74: The Amphitheatre between block-01 and 02

Source: Author



Fig 75: Looking towards the court between block-01 and 02 from the amphitheatre

Source: Author



Fig 76: The central courtyard

Source: Author



Fig 77: Looking towards the canal from the Labs (block-04 & 05)

Source: Author





Fig 78: The bridge ways act as interactive zone knitting human relationship

Source: Author



Fig 79: Each bridge ways ended up by vertical circulation enhancing vertical knitting continuance

Source: Author



## 6.5 Photographs of model

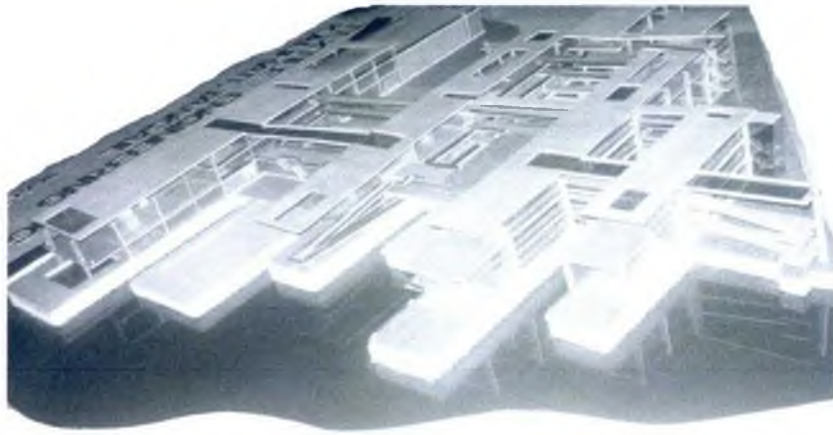


Fig 80: Looking towards the eastern canal

Source: Author

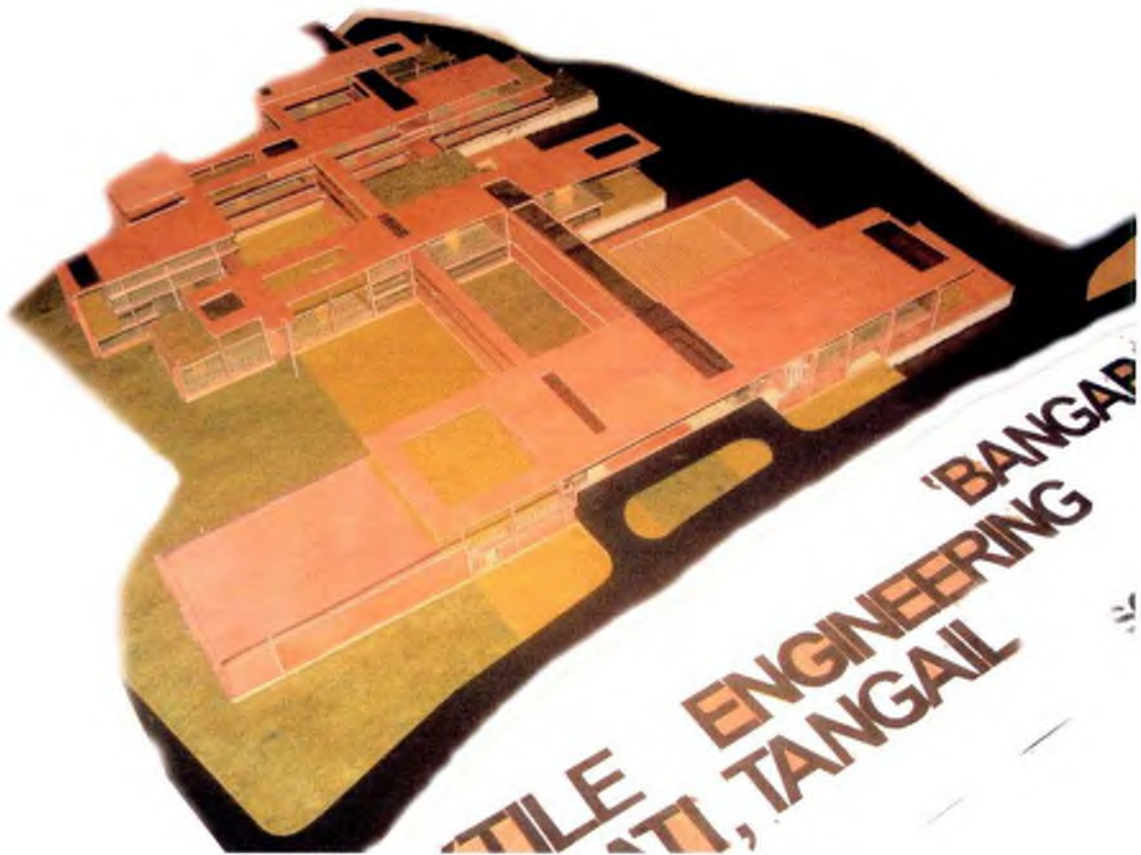


Fig 81: The entire campus of the Textile Engineering College

Source: Author

## **6.6 Summary**

This chapter illustrates the final design state over 11 weeks development from a very basic concept of “Knitting & weaving” for the campus design. The drawings are provided as such to have an overall idea about the finally achieved design for the Textile Engineer College campus at Kalihati, Tangail.

## **CONCLUSION**

The campus for the Textile engineering education at Kalihati, Tangail has been designed not only to serve the students, rather the community as well. Though the site is surrounded by marshy lands, in near future it is expected converted into residential zone, when this campus would act as a robust breathing space for the community while enhancing proper educational environment through building the future of tomorrow within its simple, yet integrated space formation amidst the natural serenity.

## **References**

1 *School Building 2* by Karl Otto, page-74 to 77

2 *Exportable Handloom Products of East Bengal* by Ministry of Handloom & Textiles  
Government of East Bengal



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