

**CERTIFICATE, COMPLIANCE FORM, REPORT,  
DRAWINGS & SPECIFICATION  
ON  
ENERGY CONSERVATION BUILDING CODE**

IBN BATTUTA HOSTEL at CHITKARA UNIVERSITY



**HIGH  
PERFORMANCE  
BUILDINGS**

**By**

**Ar. Pritpal Singh Ahluwalia**

**ECBC Design Professional Empanelled With BEE And PEDDA**

**IGBC Accredited Professional**

**GRIHA Certified Professional**

**WALIA CREATIVE ARCHITECTS**

**#1507, Sector 69, Mohali (Tricity Chandigarh)**

**#46 A, Passy Road, Patiala**

**9815136084**

**Form No. C**

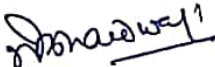
**Certificate from ECBC Expert / Design Professional on Completion of Construction for Punjab ECBC Compliant Building Certificate**

I Ar. Pritpal Singh Ahluwalia being an authorised ECBC Expert / Design Professional having Registration No. 13412 hereby state I have verified all the energy conservation measures and have inspected the construction documents, compliance forms, check-lists, submitted on the completion of building in respect of the various elements of the components referred to the proposed Punjab Energy Conservation Building Code (Punjab ECBC) compliant building of **Ibn Battuta Hostel in the premises of for Chitkara University at Vill. Jhansla State of Punjab** and certify that:-

- a. All the mandatory provision are complying with the requirements of Punjab ECBC. The works have been implemented as per the requirements covered under the Punjab Energy Conservation Building Code (Punjab ECBC) to the best of my satisfaction. The details of the various components/system completed as per Punjab ECBC are enlisted in Annexure 1.
- b. A list of energy conservation measures taken during the construction of the building are enclosed in Annexure-2. The detailed report with compliance of requirements of Punjab ECBC is placed at Annexure-3.
- c. The building meets the requirements of the Punjab ECBC compliant building and is also fit for occupancy for which it has been constructed. (Hostel taken ans No star Hotel Naturally ventilated )
- d. All the professional skill, diligence and care has been taken in verifying the construction documents and compliance forms in respect of the various elements of the components covered under the Punjab ECBC and contents are a true representation of the facts and meets the requirements of Punjab ECBC.

The check-list is completed and duly signed and sealed by the undersigned is enclosed.

Date:- 03-01-2024

  
Signature

Building Owner/Applicant



Signature

Name of the ECBC Expert / Design Professional  
Registration no. with SEAL

**Ar. PRITPAL SINGH AHLUWALIA**  
ECBC Design Professionals  
PEDA Empanelled  
**WALIA CREATIVE ARCHITECTS**  
# 1507, Sector-69, Mohall M:9815136084

**Enclosures:**

- Annexure 1 - Punjab ECBC Compliance Forms (Summary + Checklists)
- Annexure 2 - List of Energy Conservation Measures
- Annexure-3 - ECBC Compliance Report at Completion stage (including Simulation report, if applicable)
- Annexure-4 - Certificate of BEE Empanelled ECBC Expert/Design Professional
- Annexure 5 Comparison Summary at Design Stage and Completion Stage

# PROJECT DATA REQUIREMENTS FOR PUNJAB ECBC COMPLIANT BUILDING

Following are the list of documents required for the compliance of Punjab ECBC at completion stage:

S.No.	Project Requirements	Annexure
<input checked="" type="checkbox"/>	ECBC Compliance Forms (including Summary & Checklist) (Form-1 to Form-9)	Annexure- 1
<input checked="" type="checkbox"/>	List of Energy Conservation Measures (ECMs) incorporated at Construction Stage	Annexure- 2
<input checked="" type="checkbox"/>	ECBC Compliance Report (including Whole Building Energy Simulation report, if applicable)	Annexure-3
<input checked="" type="checkbox"/>	Certificate of BEE Empaneled ECBC Expert/Design Professionals or BEE Certified ECBC Master Trainers	Annexure-4

L.P.D Calculation

Annexure 5

DRAWINGS

Annexure 6

## Punjab ECBC Compliance Forms

## Form 1 - Envelope Summary

<b>Envelope Summary</b>
The Punjab Energy Conservation Code Compliance Forms

<b>Project Info</b>	Project Address - Ibn Battuta Hostel for Chitkara University at Vill. Jhansla		Date - 03-01-2024	
	(H.B.No.262) & Vill. Fatehpur Garhi (H.B. No 263) Tehsil Rajpura Distt. Patiala (Punjab).		For Building Department Use	
	Applicant Name- Sanjeev Bhardwaj Project Manager-Infrastructure for Chitkara University			
	Applicant Address- As Above			
	Applicant Phone-			
<b>Project Description</b>	<input checked="" type="checkbox"/> New Building	<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration	<input type="checkbox"/> Change of Use

IN CAMPUS

<b>Compliance option</b>	<input type="checkbox"/> Prescriptive	<input type="checkbox"/> Envelope Trade off (Appendix D)	<input checked="" type="checkbox"/> Whole Building
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	<input type="checkbox"/> Hospital, hotel, call center (24 hour)		<input type="checkbox"/> Other building types (daytime)		
<b>Vertical Fenestration Area Calculations</b>	Total Vertical Fenestration Area (rough opening)	divided by	Gross exterior wall area	times 100 equals	%vertical fenestration
<small>Note: Vertical fenestration area cannot exceed 40% of the gross wall area for prescriptive option</small>	1144.1	÷	8103.56	×100	14.12 %
<b>Skylight Area Calculation</b>	Total Skylight Area (rough opening)	divided by	Gross exterior wall area	times 100 equals	%vertical fenestration
<small>Note: Skylight area cannot exceed 5% of the gross roof area for prescriptive compliance</small>		÷		×100	NILL

Hospital, hotel, call center (24 hour)		As per report attached	Other building type (daytime)	
<b>OPAQUE ASSEMBLY</b>			<b>OPAQUE ASSEMBLY</b>	
<i>Roof</i> value	Minimum Insulation R-		<i>Roof</i> value	Minimum Insulation R-
<i>Wall</i> value	Minimum Insulation R-		<i>Wall</i> value	Minimum Insulation R-
<b>FENESTRATION</b>			<b>FENESTRATION</b>	
<i>Vertical</i>			<i>Vertical</i>	
	Maximum U-factor			Maximum U-factor
	Maximum SHGC (or SC)			Maximum SHGC (or SC)
<i>Overhang (yes or no)</i>			<i>Overhang (yes or no)</i>	
	If yes, enter Projection Factor			If yes, enter Projection Factor
<i>Side fins (yes or no)</i>			<i>Side fins (yes or no)</i>	
	If yes, enter Projection Factor			If yes, enter Projection Factor
<i>Skylight</i>			<i>Skylight</i>	
	Maximum U-factor			Maximum U-factor
	Maximum SHGC (or SC)			Maximum SHGC (or SC)

Owner/s

ECBC Experts / Design Professional

  
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**Form 2 - Building Permit Plans Checklist**


<b>Building Permit Plans Checklist</b>	<b>Envelope Checklist</b>
The Punjab Energy Conservation Code Compliance Forms	

<b>Project Address-</b> Ibn Battuta Hostel for Chitkara University at Vill. Jhansla (H.B.No.262) & Vill. Fatehpur Garhi (H.B. No. 263) Tehsil Rajpura Distt. Patiala (Punjab).					<b>Date-</b> 03-01-2024
The following information is necessary to check a building permit application for compliance with the building envelop requirements in The Punjab Energy Conservation Building Code.					
Applicability (yes, no, n.a.)	Code Section	Component	Information required	Location on Plans	Building Departments Notes
<b>MANDATORY PROVISIONS (section 4.2)</b>					
	4.2.1	Fenestration rating			
	4.2.1.1	U-factor	Specify whether per 4.2.1.1 or default in Appendix C		
	4.2.1.1	SHGC	Specify whether per 4.2.1.2 or default in Appendix C		
	4.2.1.1	Air Leakage	Specify leakage rates	N.A.	
	4.2.2	Opaque U factors	Specify whether per default in Appendix C or ASHRAE		
	4.2.3	Bldg. envelop sealing	Indicate sealing, caulking, gasketing, and weather stripping		
<b>PRESCRIPTIVE COMPLIANCE OPTION (section 4.3)</b> <span style="float: right; font-size: 1.2em;">NOT APPLICABLE</span>					
	4.3.1	Roofs	Indicate R-values on roof sections		
	4.3.2	Cool roof	Indicate minimum reflectance and emittance on plans		
	4.3.3	Roof	Indicate R-values on wall sections		
	4.3.4	Vertical fenestration	1) Indicate U-factors on fenestration schedule. Indicate if values are rated or default. If values are default, then specify frame type, glazing layers, gap width, low-e 2) Indicate SHGC or SC on fenestration schedule. Indicate if values are rated or default 3) Indicate if overhangs or side fins are used for compliance purposes. If so, provide projection factor calculation.		

			4.3.5	Skylights	1) Indicate U-factors on fenestration schedule. Indicate if values are rated or default. If values are default, then specify frame type, glazing layers, gap width, low-e 2) Indicate SHGC or SC on fenestration schedule. Indicate if values are rated or default		
<b>BUILDING ENVELOPE TRADE-OFF OPTION (section 4.4)</b>					<b>NOT APPLICABLE</b>		
					Provide Calculations		
					Whole Building Simulation Report Attached.		

Owner/s

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**Form 3 - Mechanical Summary**

<p><b>Mechanical Summary</b> The Punjab Energy Conservation Code Compliance Forms</p>
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Project Info	Project Address:- Ibn Battuta Hostel for Chitkara University at Vill. Jhansla (H.B.No.262) & Vill. Fatehpur Garhi (H.B. No263) Tehsil Rajpura Distt. Patiala (Punjab).		Date-03-01-2024
	Applicant Name:- Sanjeev Bhardwaj Project Manager-Infrastructure for Chitkara University.		For Building Department Use
	Applicant Address:-		
	Applicant Phone:-		
	Project Description Briefly describe mechanical system type and features. <input type="checkbox"/> Includes Plans		
Compliance option	<input type="checkbox"/> Simple	<input type="checkbox"/> Prescriptive	<input type="checkbox"/> Whole Building
Equipment Schedules	The following information is required to be incorporated with the mechanical equipment schedules on the plans. For projects without plans, fill in the required information below		

<b>Cooling Equipment Schedule</b>								
NOT APPLICABLE								
Equipment ID	Brand Name	Model No	Capacity kW	Total L/s	OSA CFM or Econo?	SEER or EER	IPLV	Location
<b>Heating Equipment Schedule</b>								
NOT APPLICABLE								
Equipment ID	Brand Name	Model No	Capacity kW	Total L/s	OSA CFM or Econo?	SEER or EER	IPLV	Location



<b>Fan Equipment Schedule</b>								
Equipment ID	Brand Name	Model No	Capacity kW	Total L/s	OSA CFM or Econo	SEER or EER	IPLV	Location

Owner/s

ECBC Experts / Design Professional

  
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**Form 4 - Mechanical Permit Checklist**

<b>Mechanical Permit Checklist</b>	<b>Mechanical Checklist</b>
The Punjab Energy Conservation Code Compliance Forms	

<b>Project Address-</b> Ibn Battuta Hostel for Chitkara University at Vill. Jhansla (H.B.No.262) & Vill. Fatehpur Garhi (H.B. No. 263) Tehsil Rajpura Distt. Patiala (Punjab).	<b>Date-</b> 03-01-2024
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The following information is necessary to check a building permit application for compliance with the mechanical requirements in The Punjab Energy Conservation Building Code.

Applicability (yes, no, n.a.)	Code Section	Component	Information required	Location on Plans	Building Dept. Notes
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**HEATING, VENTILATION, AND AIR CONDITION (Chapter 5)**  
**MANDATORY PROVISIONS (Section 5.2)** Not Applicable

	5.2.2	Equipment efficiency	Provide equipment schedule with type, capacity, efficiency		
	5.2.4	Controls			
	5.2.4.1	Time clocks	Indicate thermostat with night setback, 3 different day types and 2-hour manual override		
	5.2.4.2	Temp. & dead band	Indicate temperature control with 3°C dead band minimum		
	5.2.4.3	Clg. tower, fluid cooler	Indicate two-speed motor, pony motor, or variable speed drive to control the fans		
	5.2.5.1	Piping & ductwork	Indicate sealing, caulking, gasketing, and weather stripping		
	5.2.5.1	Piping insulation	Indicate R-value of insulation		
	5.2.5.1	Ductwork insulation	Indicate R-value of insulation		
	5.2.5.1	Ductwork sealing	Specify sealing types and locations		
	5.2.6	System balancing	Specify system balancing		

**PRESCRIPTIVE COMPLIANCE OPTION (Section 5.3)** NOT APPLICABLE

	5.3		Indicate whether project is complying with Punjab ECBC Prescriptive Option OR with ASHRAE Standard 90.1-2004		
	5.3.1	Economizer			
	5.3.1.1	Air economizer	Indicate 100% capability on schedule		

		5.3.1.2	Integrated operation	Indicate capability for partial cooling		
		5.3.1.3	Field testing	Specify tests		
		5.3.2	Variable flow hydronic			
		5.3.2.1	Pump flow rates	Indicate variable flow capacity on schedules		
		5.3.2.2	Isolation valves	Indicate two-way automatic isolation valves		
		5.3.2.3	Variable speed drive	Indicate variable speed drive		


**SERVICE WATER HEATING AND PUMPING (Chapter 6)**

		6.2.1	Solar Water Heating	provide calculations to justify capacity to meet 20% threshold	Refer 3.1.4 of Appendix -3	
		6.2.2	Equipment efficiency	Provide equipment schedule with type, capacity, efficiency		
		6.2.4	Piping insulation	Indicate R-value of insulation		
		6.2.5	Heat traps	Indicate heat trap on drawings or provide manufacturers specifications to show that equipment has internal heat trap		

		6.2.6	Pool covers	Provide vapor retardant cover for pools	N/A	
		6.2.6	Pool over 32° C	Provide R-2.1 insulation	N/A	

Owner/s

ECBC Experts / Design Professional

  
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**Form 5 - Lighting Summary**

<p><b>Lighting Summary</b> The Punjab Energy Conservation Code Compliance Forms</p>
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<b>Project Info</b>	Project Address- Ibn Battuta Hostel for Chitkara University at Vill. Jhansla (H.B.No.262) & Vill. Fatehpur Garhi (H.B. No263) Tehsil Rajpura Distt. Patiala (Punjab).			Date- 03-01-2024	
	Applicant Name:- Sanjeev Bhardwaj Project Manager- Infrastructure for Chitkara University.			For Building Department Use	
	Applicant Address:-				
	Applicant Phone:-				
	<b>Project Description</b>	<input checked="" type="checkbox"/> New Building	<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration	<input type="checkbox"/> Change of Use
<b>Compliance option</b>	<input checked="" type="checkbox"/> Prescriptive	<input type="checkbox"/> System Analysis			
<b>Alteration Exceptions</b> (check box, if appropriate)	<input type="checkbox"/> Less than 50% of the fixtures are new and installed lighting wattage is not being increased				
<b>Maximum Allowed Lighting Wattage (Interior, section 7.3)</b>					
Location (floor/room no.)	Occupancy description	Allowed Watt/m <sup>2</sup>	Area in m <sup>2</sup>	Allowed x area	
Building Area	HOSTEL	9.5w/m <sup>2</sup>			
Method.	Taken as NO STAR HOTEL				
** Document all exceptions Total allowed Watts					
<b>Proposed Lighting Wattage (Interior)</b> <i>Refer Annexure - 5</i>					
Location (floor/room no.)	Fixture Description	Number of Fixtures	Watts/fixture	Watts Proposed	
Total Proposed Watts may not exceed Total Allowed Watts for Interior Total Proposed Watts					
<b>Maximum Allowed Lighting Wattage (Exterior, Section 7.4)</b>					
Location	Description	Allowed Watts/m <sup>2</sup>	Area in m <sup>2</sup> (or lm for perimeter)	Allowed watts x m <sup>2</sup> (or x lm)	

Total Allowed Watts				
Proposed Lighting Wattage (Exterior) <i>Annexure 5</i>				
Location	Fixture Description	Number of fixtures	Watts /fixture	Watts proposed

Total Proposed Watts may not exceed Total Allowed Watts for Interior Watts	Total Proposed	
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Owner/s

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**Form 6 - Lighting Permit Checklist**


<b>Lighting Permit Checklist</b>	<b>Lighting Checklist</b>
The Punjab Energy Conservation Code Compliance Forms	

<b>Project Address</b> Ibn Battuta Hostel for Chitkara University at Vill. Jhansla (H.B.No.262) & Vill. Fatehpur Garhi (H.B. No. 263) Tehsil Rajpura Distt. Patiala (Punjab).					<b>Date-</b> 03-01-2024	
The following information is necessary to check a building permit application for compliance with the lighting requirements in The Punjab Energy Conservation Building Code.						
Applicability (yes, no, n.a.)	Code section	Component	Information required	Location on Plans	Building Dept. Notes	
<b>LIGHTING (Chapter 7)</b>						
<b>MANDATORY PROVISIONS (Section 7.2)</b>						
	7.2.1	Lighting Controls				
	7.2.1.1	Automatic shut off	Indicate automatic shutoff locations or occupancy sensors	N/A		
	7.2.1.2	Space Control	Provide schedule with type, indicate locations	6		
	7.2.1.3	Daylight Zones	Provide schedule with type and features, indicate locations	Annexure		
	7.2.1.4	Ext. Lighting Control	Indicate photo sensor or astronomical time switch			
	7.2.1.5	Additional Controls	Provide schedule with type, indicate locations			
	7.2.2	Signage/ Advertising signage	Indicate 5 watts maximum	N/A		
	7.2.3	Exterior building grounds lighting	Indicate minimum efficacy of 60 lumens/Watt	N/A		
<b>PRESCRIPTIVE INTERIOR LIGHTING POWER COMPLIANCE OPTION (Section 7.3)</b>						
	7.3		Indicate whether project is complying with the Building Area Method (7.3.1) or the Space Function Method (7.3.2)			
	7.3.2	Building Area Method	Provide lighting schedule with wattage of lamp and ballast and number of fixtures. Document all exceptions	Annexure 5		
	7.3.3	Space function method	Provide lighting schedule with wattage of lamp and ballast and number of fixtures. Document all exceptions	NA		

			7.3.4.1	Luminarie Wattage	Indicate on plans		
<b>PRESCRIPTIVE EXTERIOR LIGHTING POWER COMPLIANCE OPTIONS (Section 7.3.5)</b>							
			7.3.5	Exterior Lighting Power	Provide lighting schedule with wattage of lamp and ballast and number of fixtures. Document all exceptions.		
<b>ELECTRICAL POWER (Chapter 8) MANDATORY PROVISIONS (Section 8.2)</b>							
			8.2.1	Transformers	Provide schedule with transformers losses	N/A	
			8.2.2	Motor efficiency	Provide equipment schedule with motor capacity efficiency	N/A	
			8.2.3	Power factor correction	Provide schedule with power factor correction		
			8.2.4	Check metering	Provide check metering and monitoring	N/A	

Owner/s

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**Form 7 - Whole Building Performance Method Compliance Report**

Project Name	IBN Battuta Hostel		Date	03-01-2024	
Project Address	Vill. Jhansla (H.B.No.262) & Vill. Fatehpur Garhi (H.B. No. 263) Tehsil Rajpura Distt. Patiala		Telephone		
Designer of record					
Contact Person	9463438910 sh. Sanjeev Bhatnagar				
City:	Rajpura				
Weather Data:	AMRITSAR				
Climatic Zone:	COMPOSITE				
Total Conditioned Area(sqft)	Total Unconditioned		Total Floor Area (sqft)		
	Area(sqft)		159101.22	Sqft.	
Advisory Message					
			Proposed	Standard	Difference
			Design	Design	
Number of hours of heating loads unmet( system /plant)					
Number of hours of cooling loads (system/plant)					
Number of warnings					
Number of errors					
Number of defaults					
Additional building Information					
Number of floors	G + 9				
Simulation program	E-quest				
<p align="center">Comparison of Input Parameters in proposed design and standard design <i>Refer the Report attached</i></p>					
Building element	Proposed Design Input		Standard design Input		
Envelop					
Above Grade Wall construction(s)					



Below grade construction		
Roof construction		
Exterior Floor construction		
Slab-on-grade construction		
Window to gross wall ratio		
Fenestration types(s)		
Fenestration Assembly U-factor		
Fenestration Assembly SHGC		
Fenestration Visual light transmittance		
Fixed Shading devices		
Automated movable shading devices		
Electrical system & process loads		
Ambient light power density and lighting design description		
Process lighting		
Lighting occupant sensor controls		
Day lighting controls		
Receptacle equipment		

Elevators or escalators		
Re-refrigeration equipment		
Other process loads		
Mechanical and plumbing systems		
HVAC systems	Variable air volume	Constant air volume
Design supply air temperature differential		
Fan Control		

Fan Power		
Economizer Control		
Demand control ventilation		
Unitary Equipment cooling efficiency		
Unitary Equipment heating efficiency		
Chiller type, capacity and efficiency		
Cooling tower		
Boiler efficiency		
Chilled water loop and Pump parameters		
Condenser water loop and Pump parameters		
Hot water loop and pump parameters		
Domestic Hot Water pump parameters		

Owner/s

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Form 8 – End Use Summary

Standard design – End Use Summary											
End Use	Energy type	0° rotation		90° rotation		180° rotation		270° rotation		Average	
		Energy (Kwh)	Peak (kW)	Energy (Kwh)	Peak (kW)	Energy (Kwh)	Peak (kW)	Energy (Kwh)	Peak (kW)	Energy (Kwh)	Peak (kW)
Interior lighting											
Interior Lighting (process)	Elec										
Exterior lighting											
Space Heating (Fuel 1)	Natural gas										
Space Heating (Fuel 2)	Elec										
Space cooling	Elec										
Pumps	Elec										
Heat rejection	Elec										
Fans Interior	Elec										
Fans Parking Garage	Elec										
Service Water Heating (Fuel 1)	Natural gas										
Service Water Heating (Fuel 2)	Elec										
Receptacle Equipment	Elec										
Refrigeration (Food, etc.)	Elec										

Attached  
 Report  
 the  
 Refer

Cooking commercial, (Fuel 1)	Elec										
Cooking commercial, (Fuel 2)	Elec										
Elevators and escalators	Elec										
Other process	Elec										
Total building consumption / demand	Elec										
Total process energy	Elec										

Owner/s

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**Form 9 – Energy Summary by End Use**

Energy Summary by End Use						
	Proposed Design			Standard Design		
	Energy Type	Energy (kWh)	Peak (kW)	Energy (kWh)	Peak (kW)	Energy (%)
Interior Light (Ambient)	Elec.	.				
Interior Lighting (Process)	Elec.	Refer the Report Attached				
Exterior Lighting	Elec.					
Space Heating (Fuel 1)	Natural gas					
Space Heating (Fuel 2)	Elec.	/				
Space cooling	Elec.					
Pumps	Elec.					
Heat Rejection	Elec.					
Fans-Interior	Elec.	N A				
Fans-Parking Garage	Elec.					
Service Water Heating (Fuel 1)	Natural gas	/				
Service Water Heating (Fuel 2)	Elec.					
Receptacle equipment	Elec.	/				
Refrigeration (food, etc.)	Elec.					
Cooking (commercial, Fuel 1)	Natural gas	N A				
Cooking (commercial, Fuel 2)	Elec.					
Elevators and escalators	Elec.	/				
Other process	Elec.					
Total building consumption	→			Refer the Report Attached		

Owner/s

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## Comparison Summary – Design Stage vs Completion Stage

**PUNJAB ECBC PERFORMA****BUILDING ENVELOPE**

<b>MANDATORY REQUIREMENTS</b>	<b>AT DESIGN STAGE</b> (Tick Yes if compliant and No if non compliant)	<b>AT COMPLETION STAGE</b> (Tick Yes if compliant and No if non compliant)	<b>REMARKS</b>
<b>FENESTRATIONS</b>			
a) Fenestrations			
- U-Factor for overall fenestration ISO 15099 certified	✓ Yes No	Yes No	
- SHGC for overall fenestration ISO 15099 certified	✓ Yes No	Yes No	
b) Overhangs/ Fins	✓ Yes No	Yes No	
c) Air Leakage			
	<b>NOT APPLICABLE</b>		
- For glazed swinging/revolving doors not to exceed 5.0 l/s-m <sup>2</sup>	✓ Yes No	Yes No	
- For other fenestration and doors not exceed 2.0 l/s-m <sup>2</sup>	Yes No	Yes No	
<b>OPAQUE CONSTRUCTION</b>			
a) Default U-factors for opaque construction should be ISO 15099 certified	✓ Yes No	✓ Yes No	
<b>BUILDING ENVELOPE SEALING</b>			
	<b>NOT APPLICABLE</b>		
a) Sealing of joints around fenestration and door frames	Yes No	Yes No	
b) Sealing of openings between Walls & Foundations and between walls and roofs and wall panels	Yes No	Yes No	

c) Sealing of openings at penetrations of utility services (Roofs, walls and floors)	Yes No	Yes No	
d) Ducts, plenums and other openings in building envelope (if any)	Yes No	Yes No	REMARKS
<b>PRESCRIPTIVE REQUIREMENTS</b>	<b>AT DESIGN STAGE</b> (Tick Yes if compliant and No if non compliant)	<b>AT COMPLETION STAGE</b> (Tick Yes if compliant and No if non compliant)	

PRESCRIPTIVE WBM

ROOFS			
a) U-factor for 24-hour use buildings be greater than equal to 0.26 W/m <sup>2</sup> -° C	<input checked="" type="checkbox"/> Yes No	Yes No	
b) Minimum R-value for 24-hour use buildings less than or equal to 3.5 m <sup>2</sup> -° C /W	<input checked="" type="checkbox"/> Yes No	Yes No	
c) U-factor for daytime use building or other buildings types be greater than or equal to 0.409 W/m <sup>2</sup> -° C	<input checked="" type="checkbox"/> Yes No	Yes No	
d) Minimum R-value of insulation for daytime or other buildings types be less than or equal to 2.1 m <sup>2</sup> -° C /W	<input checked="" type="checkbox"/> Yes No	Yes No	
e) For sloped roofs less than 20 degrees have an initial solar reflectance of more than 0.7 and initial emittance of more than 0.75	<input checked="" type="checkbox"/> Yes <del>No</del> N/A	Yes No	

OPAQUE WALLS			
a) U-factor for 24-hour use buildings be greater than equal to 0.440 W/m <sup>2</sup> -° C.	<input checked="" type="checkbox"/> Yes No	Yes No	
b) Minimum R-value for 24-hour use buildings less than or equal to 2.10 m <sup>2</sup> -° C /W.	<input checked="" type="checkbox"/> Yes No	Yes No	

c) U-factor for daytime use building or other buildings types be great than or equal to 0.440 W/m <sup>2</sup> -° C.	<input checked="" type="checkbox"/> Yes No	Yes No	
d) Minimum R-value of insulation for daytime or other buildings types be less than or equal to 2.10 m <sup>2</sup> -° C /W.	<input checked="" type="checkbox"/> Yes No	Yes No	
<b>VERTICAL FENESTRATION</b>			
a) Maximum U-factor for WWR less than 40% should be 3.30 W/m <sup>2</sup> -° C.	<input checked="" type="checkbox"/> Yes No	Yes No	
b) Maximum SHGC for WWR less than 40% should be 0.25.	<input checked="" type="checkbox"/> Yes No	Yes No	
c) Maximum U-factor for WWR between 40% & 60% should be 3.30 W/m <sup>2</sup> -° C.	<input checked="" type="checkbox"/> Yes No	Yes No	
d) Maximum SHGC for WWR between 40% & 60% should be 0.20.	<input checked="" type="checkbox"/> Yes No	Yes No	
e) Minimum VLT requirements as per the defined WWR complying ECBC.	<input checked="" type="checkbox"/> Yes No	Yes No	
f) Skylight area be limited to maximum 5% of gross roof area.	<input checked="" type="checkbox"/> Yes No N.A	Yes No	
<b>WHOLE BUILDING SIMULATION METHOD</b>	<b>AT DESIGN STAGE</b> (Tick Yes if compliant and No if non-compliant)	<b>AT COMPLETION STAGE</b> (Tick Yes if compliant and No if non-compliant)	<b>REMARKS</b>

<b>VERTICAL FENESTRATIONS</b>	<b>PRESCRIPTIVE</b>	<b>WBM</b>	
a) EPF of proposed design less than standard design.	Yes No	<input checked="" type="checkbox"/> Yes No	



## PUNJAB ECBC PERFORMA

### HEATING, VENTILATION AND AIR-CONDITIONING

MANDATORY REQUIREMENTS	AT DESIGN STAGE <small>(Tick Yes if compliant and No if non- compliant)</small>	AT COMPLETI ON STAGE <small>(Tick Yes if compliant and No if non compliant)</small>	REMARKS
<b>NATURAL VENTILATION</b>			
d) Shall comply with the NBC criteria	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>MINIMUM EQUIPMENT EFFICIENCIES</b>			
b) Cooling equipment is meeting or exceeding the minimum COP and IPLV values as per different chillers equipment class for Punjab ECBC	Yes No <b>N.A</b>	Yes No	<b>N.A</b>
c) Boilers requirement shall comply with requirements of IS 13980	Yes No	Yes No	<b>N.A</b>
d) Unitary AC's and Split air AC's shall comply with the IS 1391 (Part 1) & (Part-2) respectively.	Yes No	Yes No	<b>N.A</b>
e) All the ceiling fans, wall mounted fans, pedestal fans and exhaust fans are labeled with minimum BEE 3 star rating.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>CONTROLS</b>			
e) All mechanical cooling and heating systems controlled by a time clock which can start and stop the system under different schedules for 3 different day types and capable of retaining programming and time setting during loss of power for at least 10hours	Yes No	Yes No	<b>N.A</b>
e) Units providing both heating and cooling equipment be temperature controlled.	Yes No	Yes No	<b>N.A</b>
f) Cooling towers and Closed circuit fluid coolers have either 2 speed motors or variable speed drives controlling the fans	Yes No	Yes No	<b>N.A</b>

g) Door gaps or closure provided in all AC rooms.	Yes No	Yes No	N/A
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h) Temperature sensors located in the zone or return air path for controlling the supply of cooling energy to each zone.	Yes No	Yes No	N/A
<b>PIPING &amp; DUCTWORK</b>			
a) Piping for heating systems with design operating temperature greater than 60° C have at least R-4 insulation i.e., R 0.70	Yes No	Yes No	N/A
b) Piping for heating systems with design operating temperature less than 60° C but greater than 40° C and piping for cooling have at least R-2 insulation i.e., R 0.35.	Yes No	Yes No	N/A.
c) Insulation of the pipes exposed to weather with insulating material or paints.	Yes No	Yes No	N/A.

d) Ductwork insulation			
- For exterior/ventilated attic/unventilated attic without roof insulation duct locations have Supply ducts R-value of 1.4m <sup>2</sup> C/W and Return ducts R-value of 0.6m <sup>2</sup> C/W.	Yes No	Yes No	N/A
- For unventilated attic with roof insulation/Unconditioned Space shall have Supply Ducts R-value of 0.6m <sup>2</sup> C/W.	Yes No	Yes No	N/A
<b>SYSTEM BALANCING</b>			
a) Written balance report to the owner for HVAC systems serving zones with total conditioned area exceeding 500m <sup>2</sup> (5000sq.ft.)	Yes No	Yes No	N/A

b) Air system balancing for fans with fan system of power greater than 0.75KW (1HP) and to reduce throttling losses	Yes No	Yes No	N.A
c) Hydronic System Balancing by adjustment of pump speed or reduction in impeller size for pumps with pump motor greater than 7.5KW (10HP) and to reduce throttling losses.	Yes No	Yes No	N.A
<b>CONDENSERS</b>			
a) Condensers are located as such the heat sink is free of interference from heat discharge by devices located in adjoining spaces and/or outdoor units especially of unit room AC's located in	Yes No	Yes No	N.A

shaded and ventilated area close to indoor unit.			
b) Centralized Cooling water system use treated water or soft water for condensers and chilled water systems.	Yes No	Yes No	N.A
<b>MANDATORY REQUIREMENTS</b>	<b>AT DESIGN STAGE</b> (Tick Yes if compliant and No if non-compliant)	<b>AT COMPLETION STAGE</b> (Tick Yes if compliant and No if non-compliant)	<b>REMARKS</b>

<b>ECONOMIZERS</b>			
a) For air side economizers individual cooling fan systems shall have design supply capacity over 1200 l/s (2500cfm) and total mechanical cooling capacity over 22kW (6.3tons).	Yes No	Yes No	N.A.
<b>VARIABLE FLOW HYDRONIC SYSTEMS</b>			

<p>a) Chilled or hot water system designed for the variable fluid flow and capable of reducing the pump flow rate not more than 50% of the design flow rate or minimum flow required by the equipment manufacturer for proper operation of chillers or boilers.</p>	<p>Yes No</p>	<p>Yes No</p>	<p>N.A</p>
<p>b) Water cooled AC's or Heat Pump units with a pump motor greater than or equal to 3.7KW(5HP) have 2 way automatic isolation valves on each unit interlocked with compressor to shutoff condenser.</p>	<p>Yes No</p>	<p>Yes No</p>	<p>N.A</p>

## PUNJAB ECBC PERFORMA

### SERVICE HOT WATER AND PUMPING

MANDATORY REQUIREMENTS	AT DESIGN STAGE (Tick Yes if compliant and No if non-compliant)	AT COMPLETION STAGE (Tick Yes if compliant and No if non-compliant)	REMARKS
<b>SOLAR WATER HEATING</b>			
Residential facilities, hotels and hospitals with centralized systems have solar water heating for 1/5th (20%) of the design capacity.	<input checked="" type="checkbox"/> Yes    No	<input checked="" type="checkbox"/> Yes    No  22%	

EQUIPMENT EFFICIENCY			
a) Solar water heater meets the performance level as mentioned in IS 13129 Part (1&2)	<input checked="" type="checkbox"/> Yes    No	<input checked="" type="checkbox"/> Yes    No	
b) Gas instantaneous Water heaters meets the performance level mentioned in IS 15558 with above 80% efficiency.	Yes    No	Yes    No	N.A
c) Electric water heater meets the performance level mentioned in IS 2082.	<input checked="" type="checkbox"/> Yes    No	<input checked="" type="checkbox"/> Yes    No	

SUPPLEMENTARY WATER HEATING SYSTEM			
f) Designed to maximize energy efficiency of the system with maximum heat recovery from hot discharge system like condensers of AC units.	Yes    No	Yes    No	N.A
g) Use of gas fired heaters and electrical heaters.	Yes    No	Yes    No	N.A
<b>PIPING INSULATION</b>			

a) All hot water systems including storage tanks, pipelines insulated have R-4 insulation with R value of 0.70 for design operating temperature of greater than 60° C	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
h) All hot water systems including storage tanks, pipelines insulated have R-2 insulation with R value of 0.35 for design operating temperature of less than 60° C and greater than 40° C	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>HEAT TRAPS</b>			
a) On both the inlet and outlet piping as close as practical to the storage tanks	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>SWIMMING POOLS</b>			
i) Pools provided with vapor-retardant pool cover on or at the water surface. j) Pools heated to more than 32 have pool cover with minimum insulation Value of R-2.1 (R-12)	Yes	Yes	N/A
	No	No	
	Yes	Yes	
	No	No	

## PUNJAB ECBC PERFORMA

### LIGHTING SYSTEMS

MANDATORY REQUIREMENTS	AT DESIGN STAGE (Tick Yes if compliant and No if non-compliant)	AT COMPLETION STAGE (Tick Yes if compliant and No if non-compliant)	REMARKS
<b>LIGHTING CONTROL</b>			
a) Automatic Lighting Shutoff			
- Interior lighting systems in buildings larger than 500m <sup>2</sup> equipped with automatic control device.	Yes No	Yes No	N.A
- All office areas (less than 30m <sup>2</sup> ), conference & meeting rooms, school classrooms, and all storage spaces equipped with occupancy sensors.	Yes No	Yes No	N.A
b) Space Control			
- Each space enclosed by ceiling-height partitions shall have at least 1 control device to independently to control the general lighting within the space.	<input checked="" type="checkbox"/> Yes No	<input checked="" type="checkbox"/> Yes No	
- Control a maximum of 250m <sup>2</sup> for a space less than or equal to 1000m <sup>2</sup> and a maximum of 1000m <sup>2</sup> for space greater than 1000m <sup>2</sup> .	Yes No	Yes No	
c) Control in day lighted areas			
- Areas greater than 25m <sup>2</sup> equipped with a manual or automatic Control i.e., capable of reducing light output of luminaries by at least 50%	<input checked="" type="checkbox"/> Yes No	<input checked="" type="checkbox"/> Yes No	
- Areas greater than 25m <sup>2</sup> equipped with a manual or automatic Controls only the luminaries located entirely within the day lighted Area.	<input checked="" type="checkbox"/> Yes No	<input checked="" type="checkbox"/> Yes No	

d) Exterior Lighting Control			
- Lighting for all the exterior applications be controlled by photo Sensor or astronomical time switch that is capable of automatically turning off the exterior lighting when not required	Yes No	Yes No	N.A

e) Additional Control			
- Display/Accent Lighting for greater than 300m2 area have separate control device	Yes No	Yes No	N.A
- Case Lighting for display purposes for area greater than 300m2 Equipped with	Yes No	Yes No	N.A
- Master control device provided at hotel and motel guest rooms Or suites at the main entry that controls permanently installed Luminaries and switched receptacles.	<input checked="" type="checkbox"/> Yes No	<input checked="" type="checkbox"/> Yes No	
- Task lighting permanently installed under shelf or under cabinet accompanied by control device readily accessible and located so the occupant can see control.	<input checked="" type="checkbox"/> Yes No	<input checked="" type="checkbox"/> Yes No	
- Lighting for non-visual applications as for plant growth and food Warming, equipped with separate control device	Yes No	Yes No	N.A
- Lighting for sale or demonstrations in lighting education equipped with a separate control device accessible only to authorized personnel	Yes No	Yes No	N.A
<b>SIGNAGE/ADVERTISING SIGNAGE</b>			
a) Internally-Illuminated exit signs or other signage's LPD not to exceed 5W/sq.ft. Externally-illuminated signage's LPD not to exceed 2.5W/sq.ft. or option for LEDs usage.	Yes No	Yes No	



EXTERIOR BUILDING GROUNDS LIGHTING			
a) Lighting for exterior building grounds operating at greater than 100W is accompanied by a lamp of efficacy 60lumen/W or LED type unless controlled by motion sensor.	Yes	No	Yes No N.A

PRESCRIPTIVE REQUIREMENTS	AT DESIGN STAGE (Tick Yes if compliant and No if non compliant)	AT COMPLETION STAGE (Tick Yes if compliant and No if non compliant)	REMARKS
<b>INTERIOR LIGHTING POWER</b>			
a) Installed interior lighting power for a building separately metered or Permitted portion of building include all power used luminaries Lamps, ballasts, current regulators & control devices and not Exceeding the LP allowance as per Building area method & Space Function method.	Yes	No	Yes No
<b>BUILDING AREA METHOD</b>			
a) The interior lighting power allowance complies with the building area method in W as per the different building area type with their respective LPD's (W/m <sup>2</sup> ) as defined in Punjab ECBC	<input checked="" type="checkbox"/> Yes	No	<input checked="" type="checkbox"/> Yes No
<b>SPACE FUNCTION METHOD</b>			
a) The interior lighting power allowance complies with the space function method in W as per the different space functions/areas with their respective LPD's (W/m <sup>2</sup> ) as defined in Punjab ECBC	Yes	No	Yes No N.A
<b>INSTALLED INTERIOR LIGHTING POWER</b>			
a) All the luminaries, ballast, lighting tracks and flexible lighting systems are labeled with the respective luminaries wattage.	Yes	No	Yes No

<b>EXTERIOR LIGHTING POWER</b>			
a) For building exterior lighting application connected lighting power Not exceed the specified lighting power limits as described in Punjab ECBC.	<input checked="" type="checkbox"/> Yes    No	<input checked="" type="checkbox"/> Yes    No	
<b>LIGHTING TYPE AND EFFICIENCY</b>			
a) All the lightings type have minimum BEE 3 star rating or above	<input checked="" type="checkbox"/> Yes    No	<input checked="" type="checkbox"/> Yes    No	

## PUNJAB ECBC PERFORMA

### ELECTRICAL

MANDATORY REQUIREMENTS	AT DESIGN STAGE (Tick Yes if compliant and No if non- compliant)	AT COMPLETI ON STAGE (Tick Yes if compliant and No if non- compliant)	REMARKS
<b>TRANSFORMERS</b>			
a) Maximum Allowable Power Transformer Losses			
- Minimizes the total of its initial cost in addition to the present value of the cost of its total lost energy while serving its estimated loads during its respective life span.	Yes No	Yes No	N.A
- Complies with the provisions of clause 3.1.4.6.	Yes No	Yes No	N.A
b) Measurement and Reporting of Transformer Losses			
- Measurement of losses be carried out using calibrated digital meters of class 0.5 or better accuracy and certified by the manufacturer.	Yes No	Yes No	
- Transformers of capacity 500kVA and above be equipped with additional metering class current transformers (CTs) and potential transformers (PTs).	Yes No	Yes No	
<b>ENERGY EFFICIENT MOTORS</b>			
a) All permanently wired motors of 0.375 kW or more expected to operate more than 1,500 hours per year shall have minimum acceptable nominal full load efficiency not less than IS12615	Yes No	Yes No	N.A

b) All permanently wired polyphaser motors of 50 kW or more expected to operate more than 500 hours per year shall have minimum acceptable nominal full load efficiency not less than IS12615	Yes No	Yes No	
c) Motors of horsepower differing from table shall have efficiency greater than next	Yes No	Yes No	

listed kW motor.			
d) Motor horsepower rating shall not exceed 20% of calculated maximum load being served.	Yes No	Yes No	
e) Motor nameplates list the nominal full load motor efficiencies and the full load power factor.	Yes No	Yes No	
f) Proper rewinding practices for rewind motors.	Yes No	Yes No	
g) Motor efficiency certificates kept on record. New efficiency test shall be performed and recorded post rewinding.	Yes No	Yes No	
h) All motors and pump sets shall comply with the provisions of clause 3.1.4.6.	Yes No	Yes No	

<b>POWER FACTOR CORRECTION</b>			
		N/A	
a) All electricity supplies exceeding 100A, 3 phases shall maintain power factor between 0.95 lag, unity at the point of connection	Yes No	Yes No	
<b>CHECK - METERING AND MONITORING</b>			

<p>b) Service exceeding 120 kVA have permanently installed electrical metering to record demand(kVA), energy(kWh) and total power factor. It shall display current (in each phase and neutral), voltage (between phases and each phase and neutral), total harmonic distortion(THD) as a % of the current.</p>	<p>Yes No</p>	<p>Yes No</p>	
<p>c) Service not exceeding 120kVA but over 65kVA shall have permanently installed electric metering to record demand (Kw), energy (kWh) and total power factor (or kVARh)</p>	<p>Yes No</p>	<p>Yes No</p>	
<p><b>POWER DISTRIBUTION SYSTEMS</b></p>			
<p>a) Power cabling adequately sized as to maintain distribution losses below or equal to 1% of total power usage. Record of design calculations be maintained.</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Certified from Electrical Engineer R.SUTD</p>

## Annexure- 2

- More than 20% of the total hot water design capacity if above grade floor area is through solar water heating equipment.
- LED Lights are being used
- 5 star / BLDC fans are used in the hostel block

\* For more details refer the report

# MINSULATE MANUFACTURING COMPANY

Address Plot No. M.9.10, 4th Phase, Adityapur Industrial Area, Ghatnana

Ph: (0657) 2200434.

1 77 754 1923810 E-Mail: info@minsulate.com, minsulturnmanufacturing@yahoo.com

## DATA SHEET - RESIN BONDED SLAB FOR APPROVAL

Client Name: Shri Ambika Enterprises

Project Name: NA

Project No. & Date: NA

Manufacturer: MINSULATE MANUFACTURING COMPANY, JAMSHEDPUR

Spec. No.: As Per IS 8183-93

	<b>Material</b>	<b>Resin Bonded Slab</b>
		Conforming to IS 8183: 1993 (Latest Addition)
1	Matress Size ( In mm )	1.0 Mtr X 0.50 Mtr ( Tolerance 0.5% (Length & Width)
2	Bulk Density	48Kg/m <sup>3</sup> , Tolerance + 15%
3	Thickness 25 mm to 100 mm & (Tolerance-2 mm & +6mm )	Thermal Conductivity Conforming to IS:8183/93-
4	Group-III	
	Mean Temp (DegC)	Thermal Conductivity (mW/cm degC)
	100                      0.52 200    0.73	
	300	0.95
6	Service Temp. (Heat Resistance)	Up to 550°C
	Chloride Content	0.01% Max
8	S Content	
	5(10) Micron      5% Max. as per IS:8183 250 Micron	
	15% Max. as per IS:8183	
9	Sulphur Content	0.6% Max
10	Moisture Content (Weight Loss)	2.0% Max
	Moisture Absorption (Weight Gain)	2.0% Max
	Incombustibility % Loss	5.0% Max
13	Resistance to Vibration	1.0% Max
11	Resistance to Jolting	3.0% Max
	Recovery After Compression	90.0% Min ( Recovery of Material Thickness Must be 90% Min after Pressing 75% to its Original Thickness)
16	Alkalinity (PH)	7-10
17	Oil Content #	0.3% Max. by weight
18	Total Carbon Content #	0.3% Max. by Weight
19	Settlement #	Nil
		Fully Handable Without any Lumps Formation and Disintegration of Material.
20	Handability #	However Being the Fibrous Resilience Material, Need to be Handle With Care
21	Packing & Marking and Other Material Packed in 1-IDPE Bags with Following Marking-Project Name, Density, Size (Length & Width), Thickness, Number of Pieces, Batch Number & Caution Note-Always Store Under Covered Shed Raised Platforms	

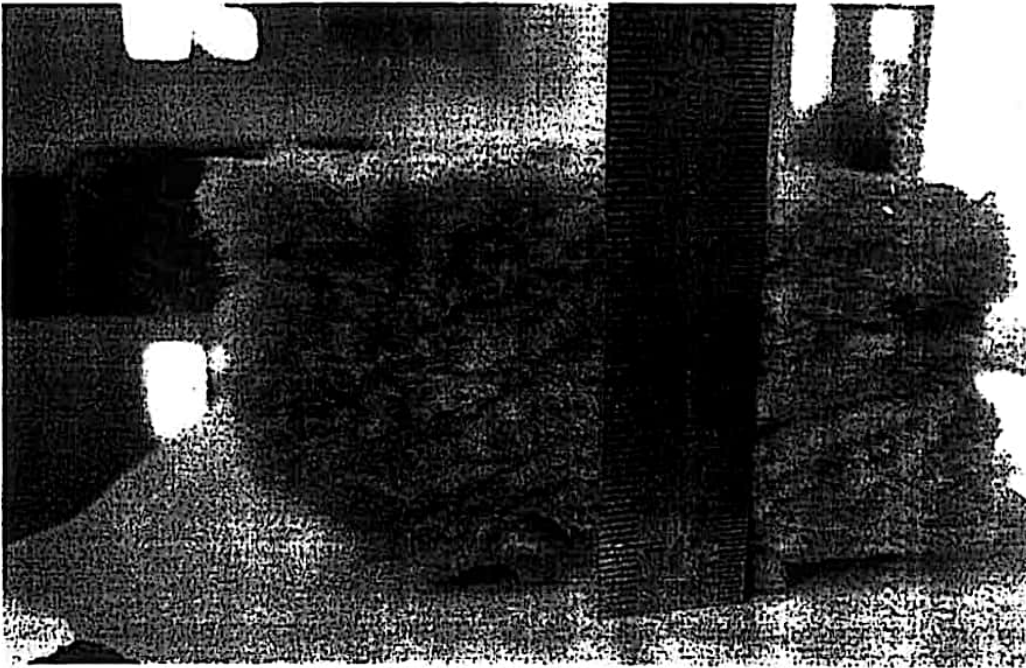
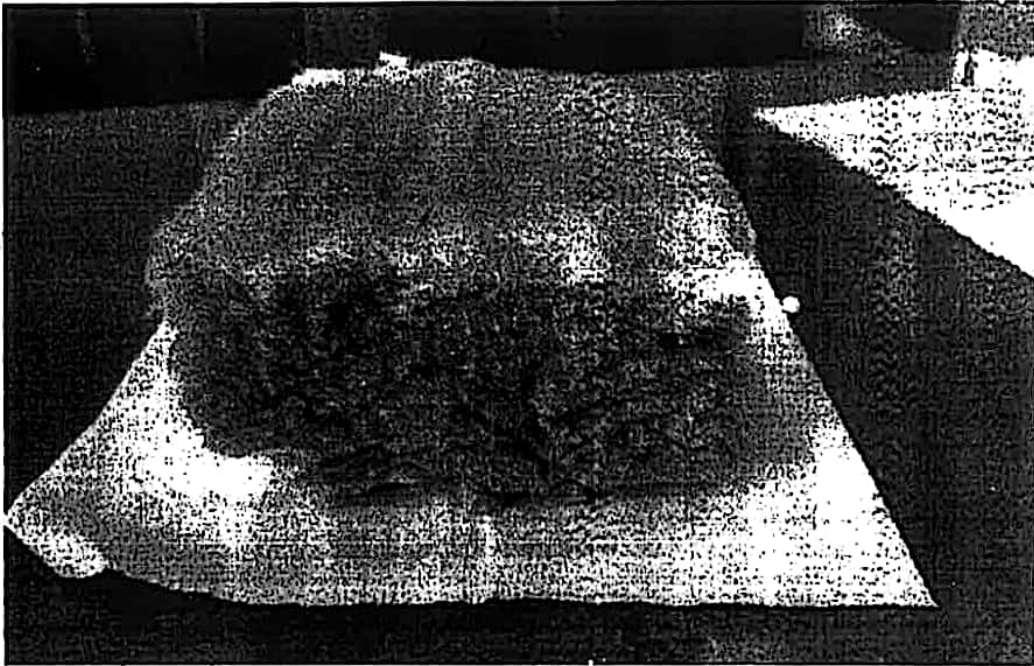
NOTE: However these test are not required in Power Equipment Application, Since Handability, Oil Content, Total Carbon Content are not described in IS: No Testing Procedure is available for settlement test in IS:3144

Supplied By:- Approved By:-

For Mins  
  
 J. G. Jaiswal  
 Manufacturing Company



# Insulation Material







## NORTHSUN SOLAR CORPORATION

SUPPLIERS OF SOLAR POWERED PLANTS, SOLAR WATER HEATING SYSTEMS,  
 SOLAR INVERTERS, SOLAR STREET LIGHTS & OTHER APPLIES  
 100 INDUSTRIAL AREA, CHENNAI, TAMIL NADU  
 INDIA - 600 025  
 TEL: 044-25054444, 25054445, 25054446, 25054447  
 FAX: 044-25054448, 25054449  
 WEBSITE: [www.northsun.co.in](http://www.northsun.co.in)  
 EMAIL: [northsun@rediffmail.com](mailto:northsun@rediffmail.com)

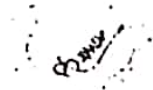
### TECHNICAL SPECIFICATION SOLCHROME FLAT PLATE SOLAR COLLECTOR

SIZE : 2040MM X 1040MM X 100MM ±10MM

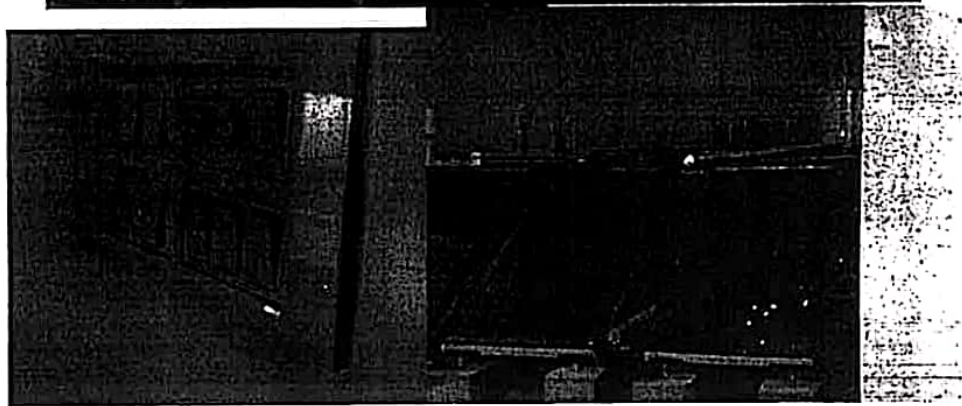
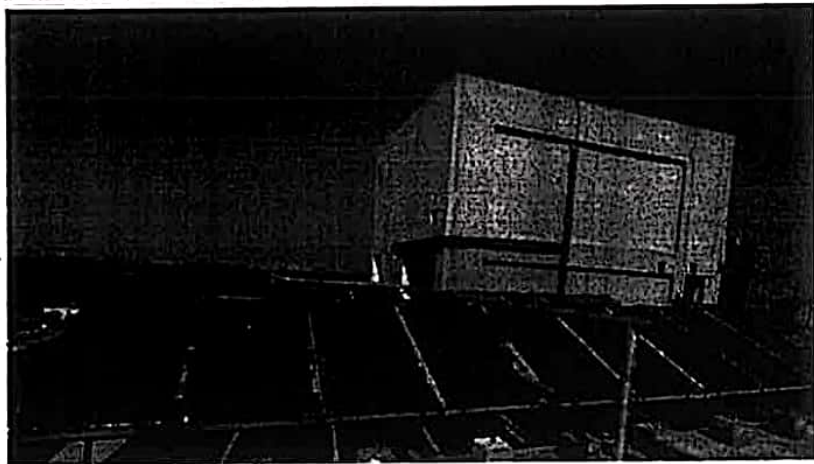
- |    |                                |   |   |
|----|--------------------------------|---|---|
| 1. | TYPE OF COLLECTOR/CAPACITY     | : | <b>100LTRS/FLAT PLATE COLLECTOR.</b>                            |
| 2. | COLLECTOR DIMENSION            | : | LENGTH : 2040MM<br>WIDTH : 1040MM<br>HEIGHT : 100MM ± 10MM      |
| 3. | ABSORBER AREA                  | : | 2 SQ. MTRS.   |
| 4. | NUMBER OF FINS & TUBES         | : | 09 NOS.   |
| 5. | (I) ABSORBER COATING           | : | SOLCHROME SOLAR<br>SELECTIVE COATINGS WITH<br>NICKEL UNDER COAT |
|    | (II) EMISSIVITY                | : | 96% ± 2%  |
|    | (III) ABSORBER SHEET THICKNESS | : | 12% ± 2%  |
|    | (IV) ABSORBER SHEET THICKNESS  | : | 0.10MM  |
|    | (V) COPPER RISERS              | : | 09 NOS.   |
|    | (VI) RISER THICKNESS           | : | 0.45MM  |
|    | (VII) RISER O.D.               | : | 12.7MM  |
|    | (VIII) COPPER HEADER           | : | 02 NOS  |
|    | (I) HEADER THICKNESS           | : | 0.60MM  |
|    | (II) HEADER O.D.               | : | 25.4MM  |
| 6. | COLLECTOR BOX MATERIAL         | : | POWDER COATED<br>ALUMINUM CHANNEL.                              |
|    | (I) SIZE                       | : | 100MM (±10mm)X 25MM 25MM  |
|    | (II) THICKNESS                 | : | 1.4MM   |
|    | (III) BACK SHEET ALUMINIUM     | : | 0.46MM  |
| 7. | INSULATION MATERIAL            | : |   |
|    | (I) MATERIAL                   | : | ROCKWOOL.   |

- (II) THICKNESS OF BOTTOM INSULATION : 50MM
- (III) THICKNESS OF SIDE INSULATION : 25MM
- (IV) DENSITY : 48 KG. /M3
  
- 8. INSULATION COVER
  - (I) THICKNESS : ALUMINUM FOIL (.02MM)
  
- 9. DETAILS OF GLAZING MATERIAL :
  - (I) MATERIAL : TEXTURE GLASS
  - (II) THICKNESS : 3.2MM
  - (III) TRANSMISSIVITY : 92%
  - (IV) SEALING : U-TYPE EPDM RUBBER
  
- 10. HEADER INLET / OUTLET : BRASS FLANGE
  
- 11. TEST PRESSURE : 6 KG. /SQ. CMS
  
- 12. CERTIFICATION : IS : 12933-(Pt-1)

For: Northsun Solar Corporation



(Authorized Signatory)





CUPB/Infra/021-A/2023-24  
Dated- 23 Dec 2023

Ar. Pritpal Singh Ahluwalia  
Principal Architect/WCA  
Walia Creative Architects  
#1507, Sector -69, S.A.S. Nagar Mohali, Punjab  
Contact- 9815136084

**Sub: - Appointment to issue an ECBC compliance report of Punjab ECBC for the Hostel Project Ibn Battuta Hostel at Chitkara university at Vill. Jhansla (H. B. No.262) & Vill. Fatehpur Garhi (H.B. No. 263) Tehsil- Rajpura. District- Patiala. (Punjab).**

Dear Sir,

Reference to the above said subject, Our institution is developing a Hostel Block under the name and title of "Ibn Battuta Hostel" at Chitkara university, Punjab Campus at Vill. Jhansla (H.B. No.262 ) & Vill. Fatehpur Garhi (H.B.No. 263) Tehsil- Rajpura, District -Patiala (Punjab).

We are pleased to extend this formal appointment letter to you in relation to the completion of Hostel Block titled "IBN BATTUTA HOSTEL Chitkara University at Vill. Jhansi(H. B. NO. 262) & Vill. Fatehpur Garhi (H.B. NO. 263) Tehsil Rajpura District Patiala."

As you had prepared ECBC compliance report in prescriptive method at the time of design stage, since all the specifications were not finalized at that time, now at completion stage we had finalized our construction and worked according to that.

Considering this, we kindly request your assistance in preparing the ECBC Compliance Certificate with the Whole Building Performance method for completion stage.

Thanking You

(Sanjeev Bhardwaj)  
Project Manager- Infrastructure  
For Chitkara University, Punjab



University Campus  
Chandigarh - Patiala National Highway (NH-7)  
Punjab - 140 401, T +91.1762.507084  
Fax +91.172.507085  
Administrative Office  
Saraswati Kendra, SCO 160 - 161  
Sector 9-C, Chandigarh - 160009  
T +91.172 4090900


[www.chitkara.edu.in](http://www.chitkara.edu.in)



**CERTIFICATE**

I, Kulbir Singh S/o Sh. Mohan Singh, hereby certify that I am Executive Engineer- Electricity Department working with Chitkara University, Punjab. I have been actively involved in overseeing the installation of all wirings and power cables within the hostel block named IBN BATTUTA HOSTEL at Chitkara University at Vill. Jhansla (H. B. NO. 262) & Vill. Fatehpur Garhi (H.B. NO. 263) Tehsil-Rajpura, District-Patiala, Punjab. I further affirm that the sizing of power cables has been conducted with precision to guarantee that distribution losses do not exceed 3% of the total power usage and it is ECBC compliant, also all records are maintained by my Office.

I take full responsibility for the accuracy of this certification and assert that all actions taken during the installation process.

  
(Kulbir Singh)  
XEN- Electricity  
For Chitkara University, Punjab

Executive Engineer  
Chitkara University, Punjab  
Chandigarh - Patiala National Highway,  
Tehsil Rajpura, Distt. Patiala  
(Punjab) 150011 India

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e-Stamp

Certificate No. : IN-PB17291238811499V  
 Certificate Issued Date : 07-Jul-2023 03:08 PM  
 Certificate Issued By : pbritbatu  
 Account Reference : NEWIMPACC (SV)/ pb7006804/ RAJPURA/ PB-PT  
 Unique Doc. Reference : SUBIN-PBPB700680436055686911921V  
 Purchased by : ARUN VATSYAYAN  
 Description of Document : Article 4 Affidavit  
 Property Description : NOT APPLICABLE  
 Area of Property : Not Applicable  
 Consideration Price (Rs.) : 0  
 (Zero)  
 First Party : CHITKARA UNIVERSITY PUNJAB  
 Second Party : NOT APPLICABLE  
 Stamp Duty Paid By : CHITKARA UNIVERSITY PUNJAB  
 Stamp Duty Amount(Rs.) : 100  
 (One Hundred only)  
 Social Infrastructure Cess(Rs.) : 0  
 (Zero)  
 Total Stamp Duty Amount(Rs.) : 100  
 (One Hundred only)

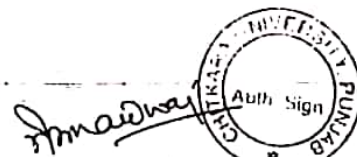


अरुन वर्मा

Affidavit

I Sanjeev Bhardwaj (Project Manager Infrastructure Chitkara University) here by as self and on behalf of Chitkara University Situated at Vill. Jhansla (H.B. No. 262) & Vill. Fatehpur Garhi (H B No. 263) Tehsil Rajpura Distt. Patiala (Punjab) as authorized signatory solemnly declare and affirm as under:-

0001033495



1. That university is developing Hostel "IBN BATTUTA HOSTEL" at Chitkara University at Vill. Jhansi(H. B. NO. 262) & Vill. Fatehpur Garhi (H.B. NO. 263) Tehsil Rajpura District Patiala.
2. That we had consulted with all stake holders and we understand the technical terms and provisions of this affidavit.
3. That we had shared proposed dwg. Format drawing to Ar. Pritpal Singh Ahluwalia
4. That we had prepared ECBC compliance report in prescriptive method at the time of design stage all specifications were not finalized at that time but now we have done the construction and shared the actual specification to Ar. Pritpal Singh Ahluwalia now at completion stage we have prepared ECBC compliance through Whole Building Simulation Method.
5. That The Building shall remain naturally ventilated


## Warning

"The contents of this certificate can be verified and authenticated online by any members of the public at [www.sholee-stamp.com](http://www.sholee-stamp.com) or at any of the collection center address displayed at [www.sholee-stamp.com](http://www.sholee-stamp.com) free of cost."

"Any alteration to this certificate renders it invalid. Use of an altered certificate without all the security features could constitute a criminal offence."

"This document contains security features like coloured background with Geometric Flexible patterns and Subtle Logo images. Complex ornamental design borders, Anti-copy text, the appearance of micro printing, digital watermarks and other Overt and Covert features."

6. That We will maintain all required specification as per ECBC norms of following but not restricted to this only

- SRI paint .
- Solar water heating equipment .
- LPD of the areas as per the reports attached.
- All fans installed will be BLDC / 5 star rated fans.
- All Controls devices as per PECBC.
- And all other concerns like equipment efficiency etc will be maintained as per the report attached.

7. That the electricity supply to the block is from existing electric grid which was established before 2016 and having connections of various blocks. And we are interested to get the ECBC compliance of this block only

8. That Power cabling adequately sized as to maintain distribution losses below or equal to 3% of total power usage. Record of design calculations be maintained and certificate will be provided by our electrical engineer.

9. That all motors are as per PECBC norms and we will maintain Proper rewinding practices for rewound motors. Motor efficiency certificates kept on record. New efficiency test shall be performed and recorded post rewinding.

10. That Service not exceeding 120kVA but over 65kVA shall have permanently installed electric metering to record demand (Kw), energy (kWh) and total power factor (or kVARh) and Service exceeding 120 kVA have permanently installed electrical metering to record demand(kVA), energy(kWh) and total power factor. It shall display current (in each phase and neutral), voltage (between phases and each phase and neutral), total harmonic distortion(THD) as a % of the current

11. That in case any matter above is found incorrect we will be responsible for it and indemnify PEDAs and Ar Pritpal Singh Ahluwalia against any action for issuing of ECBC certificate if information given by me is found incorrect.

Deponent

Place:

Dated:

Chitkara University, Punjab  
23/04/2024  
Auth. Sign.

Signature

*[Handwritten Signature]*

Verification:

I further declare that the above stated facts are true and correct to the best of my knowledge and belief and no part of its false and nothing has been concealed there in.

Deponent

Place:

Dated:

Chitkara University, Punjab  
23/04/2024

Signature

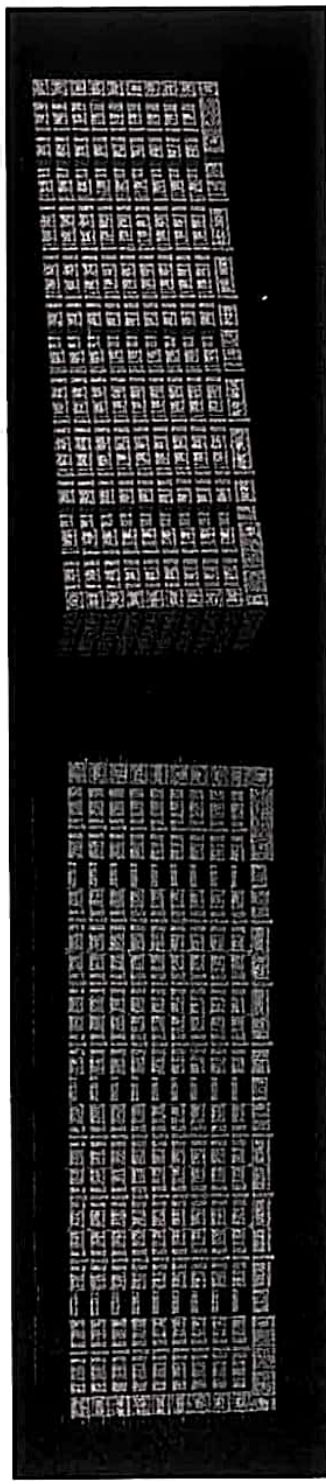
*[Handwritten Signature]*

Attested As Identified

Notary Public  
RAJASTHAN Govt. of India

23-1-24





IBN BATTUTA HOSTEL, CHITKARA UNIVERSITY  
 TEHSIL RAJPURA,  
 DISTRICT PATIALA

**IBN BATTUTA HOSTEL,  
 CHITKARA UNIVERSITY AT VILL.  
 JHANSI (H.B.NO.262) & VILL.  
 FATEHPUR GARHI (H.B. NO.  
 263) TEHSIL RAJPURA DISTRICT  
 PATIALA.**

*Towards Compliance of*

**Energy Conservation Building Code-2017**

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**1 EXECUTIVE SUMMARY**

Building Consist of G+9 floors

**Building Name** IBN BATTUTA

**Building Type** HOSTEL  
**Location** AT CHITKARA UNIVERSITY

**Climatic Zone** Composite  
**Built-up Area** 16484.5 Sq.Mt

**ECBC compliance achieved** ECBC-2017

**Energy Consumption- (Baseline Case), kWh/ year** 1066600

**Energy Consumption Proposed Case, kWh/ year** 745100

**Energy Saving Achieved** 30.1 %

**EPI (Baseline Case), kWh/m<sup>2</sup>/year** 64.7

**EPI (Proposed Case), kWh/m<sup>2</sup>/year** 45.3

**EPI Ratio** 0.70

The Hostel IBN BATTUTA is built up in At Chitkara University At Vill. Jhansi, Tehsil Rajpura, District Patiala

- ❖ The project comprises of ground plus Nine floor for the building in above grade area and the building is naturally ventilated.

The total built up area of the project is around 16484.5 SqMt m2. The project is now at completion stage and the project had implement all the measures which will make the building to comply with ECBC. The project is going for ECBC compliance through Whole Building Simulation Approach. The project will use LED lights and required solar heat water system.

## 2 WHOLE BUILDING PERFORMANCE: ENERGY MODELING AND SIMULATION

### 2.1 SUMMARY

The whole building simulation software performs hourly simulation in an approved software and derives the estimated energy consumption for a given building. Energy conservation measures may be applied in addition to the mandatory requirement to achieve an improved performance over ECBC baseline. This method gives the necessary flexibility to the owner over the prescriptive requirement and enables the possibility of a trade off in efficiency for different building elements.

### 2.2 DESCRIPTION ENERGY MODELLING SOFTWARE

The software used for the analysis of the building's energy performance is eQUEST Version 3.65. In line with the requirements outlined in ECBC, the software is a program based on DOE-2.2 simulation engine and has the capabilities to model the following:

- 8760 hours per year
- Hourly variations in occupancy, interior loads, Service Hot Water, defined separately for weekdays, holidays and weekends.
- Multiple thermal zones
- Part load performance curves for mechanical equipment
- Air side economizers with integrated control

f) Perform design load calculations to determine required Hot water equipment capacities and air and water flow rates in accordance with ECBC standards for both proposed case and baseline models.

g) Perform simulation using a representative weather file specific to a location

## 2.3 BUILDING MODEL DESCRIPTION

### 2.3.1 Model details

The project has gone for ECBC compliance through whole building simulation approach and it has achieved 36.6% energy savings compared to standard ECBC model with an EPI 64.7 (Baseline Case) of & EPI ratio of 0.70 for Hostel IBN BAITUTA block. Baseline model stands for a standard benchmark with which the actual case proposed model is compared. The baseline model has the inputs as per ECBC instead of actual as in the proposed case. The Model is then simulated by using an appropriate weather file of the project location. As per ECBC guideline the baseline model is simulated for the four directions on the basis of parametric runs for 0, 90, 180 & 270 degrees. The average of the parametric runs is being taken into consideration for the final energy consumption.

### 2.4 WEATHER FILE

The project building is situated in Chitkara University At Vill. Jhansi, Tehsil Rajpura, District Patiala. Which comes under composite climate zone. Envelope parameters for Baseline model have been selected as per the composite climate zone.

Weather file used for simulation is of Amritsar, Punjab. Same weather file has been used for both Baseline and Proposed models.

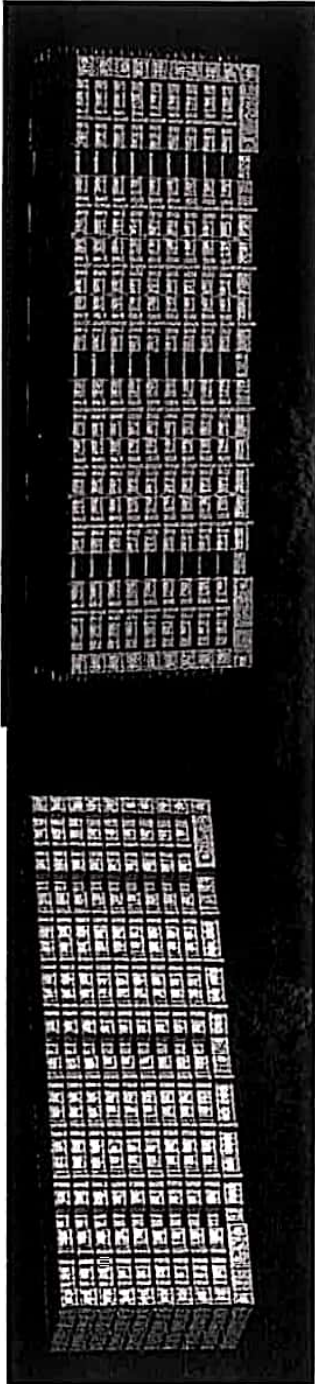


Figure 1 3D View (Proposed Case) of Hostel IBN BATTUTA Block

### 3 SUMMARY OF ECBC COMPLIANCE

Occupant / Owner shall be responsible for the compliance of all the ECBC provision as per the PECBC and including but not restricted to the Affidavit / undertaking issued by the Promoter.

#### 3.1 MANDATORY PROVISIONS UNDER ECBC

##### 3.1.1 U-Factors and Solar Heat Gain Coefficient

U-factors are determined for the overall fenestration product (including the sash and frame) in accordance with ISO-15099, by an accredited independent laboratory, and labeled and certified by the manufacturer or other responsible party.

##### 3.1.2 Air Leakage

This section is exempted as the building is naturally ventilated.

##### 3.1.3 Building Envelope Sealing

This section is exempted as the building is naturally ventilated.

### 3.1.4 Service Hot Water

The building contains 1100 occupancy .As per the affidavit given by promoter, Assuming a person will require 36 Liter of hot water per day, 39600 Liters of total hot water will be required per day. To comply with the Code for no star Hotels. At least 20% of hot water design capacity should have solar water heating equipment installed for baseline case i.e 7,920 L. Provided 22% of hot water design capacity have solar water heating equipment installed for proposed case i.e 9,000 L.

As per standard 135L Water is required per person.

Out of 130L - 40L Used for Flushing

90L used for domestic Purpose

Out of 90L Domestic Water 60% i.e 54L is used as cold water

40% i.e 36L is used as hot water

Hot water requirement calculation

HOT WATER REQUIREMENT CALCULATIONS		
OCCUPANCY	Building Energy Consumption	
OCCUPANCY	HOT WATER REQ/PERSON/DAY	TOTAL WATER REQ (L)
1100	36	39,600
SOLAR HOT WATER REQ/PERSON/DAY (MINIMUM REQUIRED)		
	SOLAR HOT WATER /PERSON/DAY	TOTAL WATER REQ (L)
20% OF THE TOTAL HOT WATER (36L) REQ/PERSON/DAY	7.2	7,920



SOLAR HOT WATER REQ/PERSON/DAY (PROVIDED)	
22% OF THE TOTAL HOT WATER (36L) REQ/PERSON/DAY	TOTAL WATER (L)
8.1	9,000

\*90 Collectors of 100L are provided for solar hot water service according to affidavit hence compliance.

#### 4 ENERGY MODEL PARAMETERS- ACTUAL CASE

##### 4.1 BUILDING OPAQUE ENVELOPE- ACTUAL CASE

Wall & roof U- Value calculations are as given below:

Type	Layer	Layer Thickness (mm)	L/1000	Thermal Conductivity (K)-W/mK	Resistance (L/K)	Reference
Proposed Wall	External Surface Resistance Air				0.040	ECBC User guide
	Cement Plaster (Exterior)	12	0.012	1.208	0.010	ECBC-2017
	Bricks Wall	230	0.230	0.811	0.284	NBC-2016
	Cement:Plaster	10	0.01	1.208	0.008	ECBC-2017
	Surface Film Resistance (Rsi)				0.17	ECBC User guide
Total Resistance (sqm K/W)					0.512	
Total U- Value (W/m <sup>2</sup> K)					1.96	

Type	LAYER	THICKNESS (L) (mm)	L/1000	Thermal Conductivity (K-W/mK)	RESISTANCE (L/k)	Reference
Proposed Roof	External Surface Resistance				0.04	ECBC USER GUIDE
	RCC SLAB	15	0.015	0.298	0.094	NBC-2016
	Mud Pluska	50	0.05	0.519	0.096	NBC-2016
	BRICK TILE	38	0.038	0.099	0.048	NBC-2016
	Internal Surface Resistance				0.17	ECBC USER GUIDE
<b>Total Resistance (sqm K/W)</b>					<b>0.44</b>	
<b>Total U- Value (W/m<sup>2</sup> K)</b>					<b>2.2</b>	

Table 2 Opaque envelope specification- Wall & Roof U- value Calculation

4.1.1 Window wall ratio

The project has designed and the overall Window Wall Ratio is coming out to be in case of Hostel IBN BATTUTA is 14.7 %.

4.1.2 Glazing Recommendation- Actual Case

Table 3 Glazing Specification

The project team will use Clear Glass unit on all the Facades. The recommended glass details for the project as per below table.

GLAZING ASSEMBLY	Specification	
	U- Value	SHGC
Glazing Type	U- factor for front facade 5.6 W/m <sup>2</sup> K	For all Facade - 0.84

#### 4.2 COMFORT SYSTEMS AND CONTROLS- ACTUAL CASE

##### 4.2.1 Mandatory ECBC requirements

##### 4.2.1.1 Natural Ventilation

The project team has design the building following all the necessary provisions of NBC 2016 including the design guidelines for Natural Ventilation.

##### 4.2.1.2 Minimum equipment efficiencies

The project is meeting all the minimum equipment efficiency norms under ECBC for non-air-conditioned building and all spaces maintain the air changes per hour as per the national building code.

5 star rated / BLDC fans are used in the project

##### 4.2.1.3 Controls

The project is meeting all the necessary controls required for natural ventilated building as per the NBC - 2016

#### 4.2.1.4 Air Changes Per Hour As Per The NBC 2016

Supply of fresh air to provide oxygen for the human body for elimination of waste products and to maintain carbon dioxide concentration in the air within safe limits rarely calls for special attention as enough outside air for this purpose normally enters the areas of occupancy through crevices and other openings.

Inlet openings in the buildings has been well distributed and located on the windward side at a low level, and outlet openings should be located on the leeward side. Inlet and outlet openings at high levels to clear the top air at that level without producing air movement at the level of occupancy.

Air Changes per Hours details		
S.no	Descriptions	Air change per Hours
1	Assembly rooms	04 to 08
2	Bakeries	20 to 30
3	Banks/building societie	06 to 10
4	Bathrooms	10 to 12
5	Cafes and coffee bars	08 to 12
6	Canteen	9 to 12
7	Conference rooms	08 to 12
8	Laundries	10 to 30
9	Corridors	5 to 10
10	Bedrooms	2 to 4

### 4.3 LIGHTING

#### 4.3.1 Mandatory requirement

#### 4.3.1.1 Automatic Controls

Astronomical time switch which will be provided for exterior lighting if applicable.

#### 4.3.2 Exterior lighting detail

The team will ensure that the lighting fixtures of greater than 100W shall have minimum efficacy of 90lm/W. and all Exterior lighting have power limits according to PECBC table 6-7. Further detail of exterior lighting is attached in annexure 5.

#### 4.3.3 Lighting Power Density - Actual Case

The lighting power density for the actual case has been taken as per the actual case. Lighting has been taken as per the building area method. The lighting has been taken 3.62 W/Sqmt for interior spaces and 0.85 W/Sqmt for exterior surfaces. Project team has installed the LED lights to maintain the desired LPD.

Refer the Annexure attached for LPD Calculation.

Further, for natural daylighting the project is achieving 31.83% of daylight area of the above grade floor area. Moreover, project has on glazing most of the facade of the building which helps to achieve more daylight for the interior spaces of the building.

### 4.4 ELECTRICAL

#### 4.4.1 Transformer

Connection is from a already existing transformer which is installed in central grid long back and promoter has given the affidavit to do the ECBC compliance of this hence exempted.

#### 4.4.2 Motors (type, efficiency)

The motors better than IE-2, IS 12615 rated motors are to be installed wherever required according to affidavit.

#### 4.4.3 Power distribution system

Project will install cables of adequate size to maintain the internal power distribution losses at max 3%.

Consent of Electrical Engineer attached.

4.4.4 Equipment:

Equipment details are not provided thereby it has been assumed as 0.250 W/ft<sup>2</sup>. It has been kept as same in both the proposed as well as baseline case. The running schedules for the proposed as well as baseline is also same in both the cases.

5 ENERGY MODEL PARAMETERS- BASELINE CASE

5.1 BUILDING OPAQUE ENVELOPE- BASELINE CASE

Envelope Parameter's	Proposed Case	Baseline Case
Roof Assembly	0.385 Btu/h.ft <sup>2</sup> .degF Or 2.2 W/m <sup>2</sup> K	U-factor of 0.035 Btu/h.ft <sup>2</sup> .degF. Or 0.2 W/m <sup>2</sup> K
Wall Assembly	0.343 Btu/h.ft <sup>2</sup> .degF Or 1.96 W/m <sup>2</sup> K	U-factor of 0.07 Btu/h.ft <sup>2</sup> .degF Or 0.4 W/m <sup>2</sup> K (aga)
Glass Construction (SHGC)	For other Facade - 0.84	SHGC Glass North- 0.50 SHGC Glass- Non-North- 0.27
Glass Construction U- value	U-factor for all facade 1 Btu/h.ft <sup>2</sup> .degF. Or 5.6 W/m <sup>2</sup> K	U- Factor 0.53 Btu/h.ft <sup>2</sup> .degF. Or 3 W/m <sup>2</sup> K- For all the Façade
Window Wall Ratio (WWR)	As per drawings	As per drawings
Lighting Power Density	3.62 W/m <sup>2</sup> or 0.31 W/ft <sup>2</sup> (Interior Spaces)	9.5 W/m <sup>2</sup> or 0.88 W/ft <sup>2</sup>
Fresh Air	As per NBC	As per NBC

Table 4 Summary of the Building Components

5.2 LIGHTING- BASELINE CASE

The Baseline case has considered lighting power density as per Table 6-1 of Section 6.3.2 of ECBC. The lighting power density of the baseline case has been taken as for Business Building from Table 6-1 which is 9.5 W/m<sup>2</sup> or 0.88 W/ft<sup>2</sup>.

### 6 ENERGY CONSUMPTION ANALYSIS:

#### 6.1 PROPOSED CASE:

The Proposed model is designed in eQUEST 3.65 with its various parameters like Occupancy, lighting etc. The total annual Electric Energy Consumption for the proposed case is 745100 kWh for Hostel IBN BATTUTA

#### 6.2 BASELINE CASE:

The Baseline case model is strictly in accordance with the ECBC "Whole Building Performance Method". Based on the energy simulation results, it is observed that the average annual electric consumption is 1066600 kWh.

#### 6.3 SAVINGS CALCULATIONS:

End Use	Proposed Building Energy Consumption		Baseline Building Energy Consumption	
	Energy Type	Proposed Energy kWh	Baseline Energy kWh	
TOTAL CONSUMPTION	Electricity	745100	1066600	
EPI Proposed Case (kWh/year/m <sup>2</sup> )		45.3		
EPI Ratio		0.70		

Compliance Achieved	EEBC Compliance-Yes

Table 8 Savings Summary



**6.4 SAVINGS ANALYSIS**

The total energy consumption of the baseline case is 1066600 kWh whereas the total energy consumption of the proposed case is 745100 kWh in Hostel IBN BATTUTA Block. Which leads to a total savings of around 30.1 % for the Hostel IBN BATTUTA Block building.

END OF REPORT



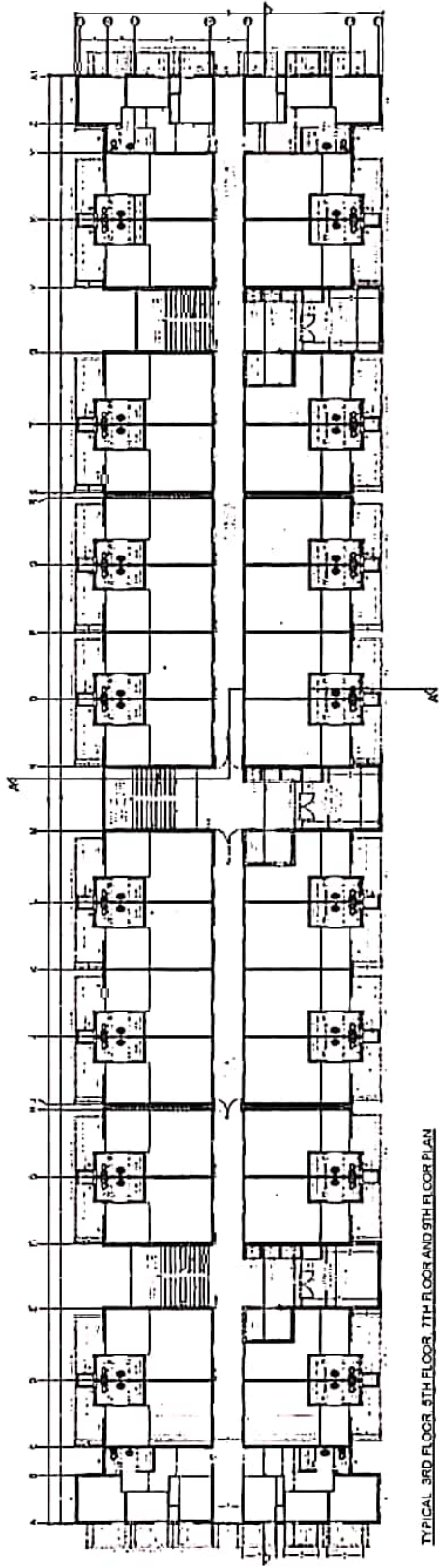
**Wall Window Ratio of IBN Battuta Hostel for Chitkara University at Vill. Jhansla (H.B. No. 262) & Vill. Fatehpur Garhi (H.B. No. 263) Teh. Rajpura, Distt. Patiala.**

<b>WWR Calculation</b>			
Floors	Perimeter of Pline According To drawings (m)	Height (m)	Area (m <sup>2</sup> )
Ground Floor	246.59	3.45	850.74
First Floor	287.37	2.84	816.13
3,5,7 & 9 Floors	279.24	2.84	3172.17
2,4,6 & 8 Floors	287.37	2.84	3264.52
<b>Total</b>			<b>8103.56</b>

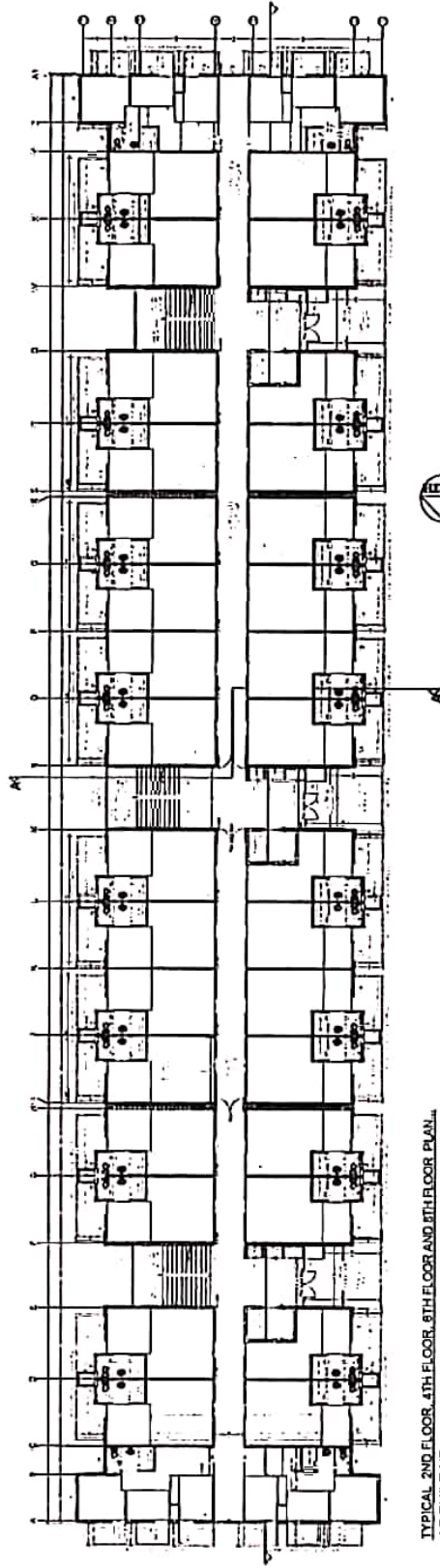
<b>Windows</b>					
Windows	No.	L (M)	H (M)	Area (Sq.m.)	Total Area (Sq.m.)
<b>All Floors</b>					
W1	2	5	1.68	8.40	16.8
W2	19	1.80	1.68	3.02	57.5
W3	1	1.84	1.68	3.09	3.1
W4	2	2.68	1.68	4.50	9.0
W5	2	2	1.68	3.36	6.7
W6	2	1.36	1.68	2.28	4.6
W7	6	1.1	1.68	1.85	11.1
W8	36	2.04	1.68	3.43	123.4
W9	145	1.36	1.68	2.28	331.3
W10	54	1.68	1.68	2.82	152.4
W11	58	1.38	1.68	2.32	134.5
W12	9	1.28	1.68	2.15	19.4
W13	36	1.12	1.68	1.88	67.7
W14	36	1.13	1.68	1.90	68.3
W15	36	0.638	1.68	1.07	38.6
W16	18	1.84	1.68	3.09	55.6
W17	18	1.46	1.68	2.45	44.2
<b>Total</b>					<b>1144.1</b>

<b>WWR</b>					
1144.1	/	8103.56	x100	=	14.12%

PLANNING SHOWING DAYLIGHT AREA OF BUILDING PLANS FOR CHITKARA UNIVERSITY AT VILL.  
 JHANSLA (H. B. NO.262 ) & VILL.FATEHPUR GARHI (H.B. NO. 263 ) TEHSIL RAJPURA. DISTRICT PATIALA.



TYPICAL 3RD FLOOR, 4TH FLOOR AND 5TH FLOOR PLAN  
 AS BUILT-UP



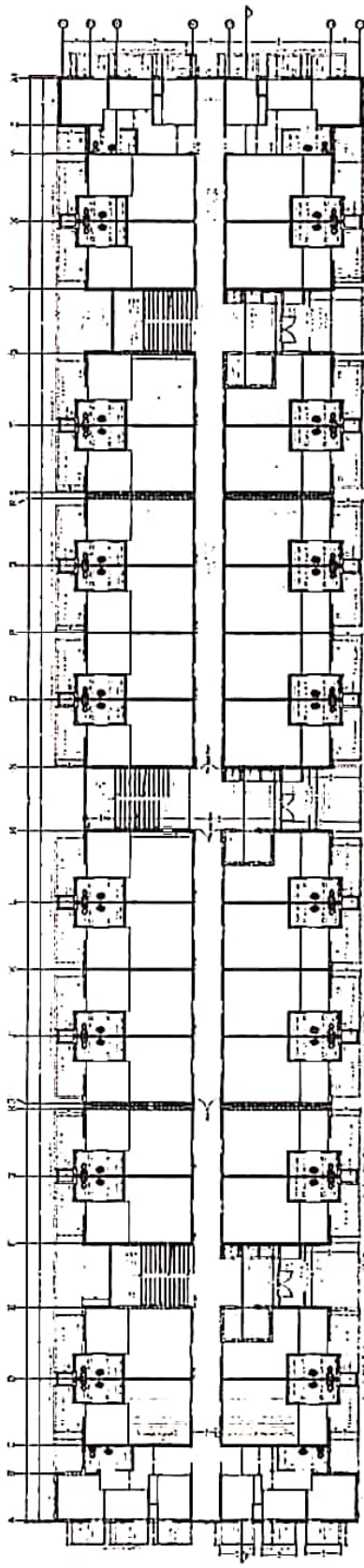
TYPICAL 2ND FLOOR, 4TH FLOOR, 5TH FLOOR AND 6TH FLOOR PLAN  
 AS BUILT-UP

REGULAR OCCUPIED AREA=  +

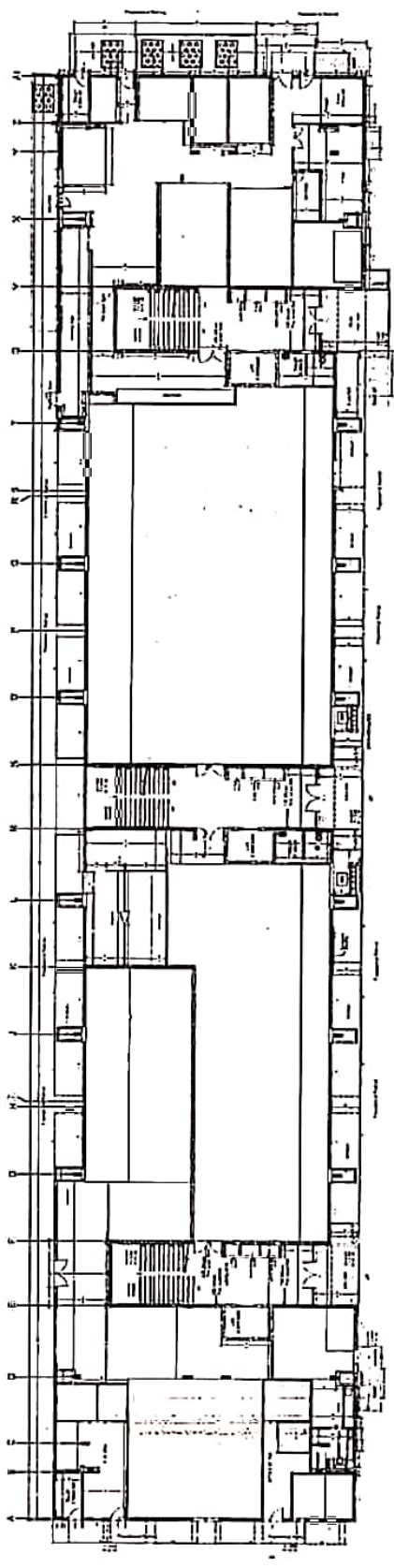
DAY LIGHT AREA=

**WALLIA**  
**ARCHITECTS**  
 CREATIVE ARCHITECTS  
 Urban designer, Int. designer, Value, Project, Consultant  
 418A, PASSY ROAD, PATIALA / 141001, SEC-48, MOHALLI  
 MOB:91368840175-9120512, E:Walliaarchitect@gmail.com

PLANNING SHOWING DAYLIGHT AREA OF BUILDING PLANS FOR CHITKARA UNIVERSITY AT VILL.  
 JHANSLA (H. B. NO.262 ) & VILL.FATEHPUR GARHI (H.B. NO. 263 )TEHSIL RAJPURA. DISTRICT PATIALA.



FIRST FLOOR PLAN  
 AS BUILT-UP



GROUND FLOOR PLAN  
 AS BUILT-UP

REGULAR OCCUPIED AREA=  +

DAY LIGHT AREA=



**WALIA ARCHITECTS**  
 CREATIVE ARCHITECTS  
 Urban designer , Int. designer , Valuer , Project Consultant  
 #16A, PASSY ROAD, PATIALA / #1507, SEC-6D, MOHALI  
 #8881516094 0175-5120512, E-Mail:waliaarchitect@gmail.com

## ANNEXURE -4



**PUNJAB  
ENERGY DEVELOPMENT  
AGENCY**  
(A Punjab Govt. Undertaking)

No. : 13412

Dated : 10/12/19

Ar. Pritpal Singh Ahluwalia,  
Walia Creative Architects  
46-A, Passy Road  
Patiala

**Subject: Empanelment of ECBC Design Professional for Implementation of ECBC in the state of Punjab.**

Sir

This has reference to your EOI application submitted to PEDA due on 20.08 2019 for Empanelment of ECBC Design Professional for Implementation of ECBC in the state of Punjab

We are pleased to inform you that you have been shortlisted for empanelment as ECBC Design Professional to provide technical support to the buildings which would be ECBC compliant including compliance checks with the minimum energy efficiency levels as per the latest Energy Conservation Building Code and ECBC Rules / Notifications issued by the Govt. of Punjab from time to time. ECBC Design Professional will facilitate to owner / applicant for making the building ECBC Compliant. The empanelment shall be only for the state of Punjab for a period of three years from the date of issue of this letter, subject to yearly review and renewal by PEDA. The brief terms & conditions of ECBC Design Professional are as follows:

- The empanelment of ECBC Design Professional shall be liable for cancellation in case of non-performance or violation of any of the terms & conditions of empanelment by the professional
- The empanelled ECBC Design Professionals shall be obliged to submit yearly work report by 10<sup>th</sup> December every year pertaining to their overall activity including relevant work done by them privately or under any other schemes anywhere in the country
- The empanelled ECBC Design Professionals shall respond to all or any bids, RFPs, RFQs, tenders or quotations invited in the field of energy conservation and energy efficiency in the state
- The empanelled ECBC Design Professionals may themselves identify and motivate prospective clients for undertaking projects for mandatory use of ECBC Compliance in new commercial buildings
- The empanelled ECBC Design Professional shall abide by the terms & conditions of the ECBC Compliance guidelines issued by PEDA or BEE or concerned building approval authorities
- The empanelled ECBC Design Professional shall be required to participate in all the meetings / workshops convened by PEDA / BEE / Authorities
- Other terms & conditions shall be applicable as mentioned in the EOI document for empanelment of ECBC Design Professional in the state of Punjab.

Yours sincerely,

  
JOINT DIRECTOR

### SOLAR PASSIVE COMPLEX

PLOT NO 1-2, SECTOR 33-D CHANDIGARH (U.T.) - 160 034 Tel : 0172-2663328 2663382  
Fax : 0172-2662865 E-mail : [peda@ecbc.gov.in](mailto:peda@ecbc.gov.in) Website : <http://www.peda.gov.in>

**PEDA WORKING TOWARDS A SUSTAINABLE ENERGY FUTURE**

IBN BATTUTA HOSTEL									
ANNEXURE-5									
LPD-Interior Area									
Sr. No.	Floor	Room	Description	Watts	Quantity	Total Wattage	Floor Wise Total Wattage	Floor Wise Sq. m Area	Remarks
1	G.F	Common & Mess Area	LED Tube Fitting 4'	24	19	456	1790	1566.33	
			LED Lamp	14	64	896			
			LED Lamp	9	10	90			
			LED Ceilling Light 3"	7	24	168	5641	1397.99	
			LED Ceilling Light 6"	15	12	180			
2	1st	101-136	LED Tube Fitting 4'	24	131	3144	5641	1397.99	
			LED Tube Fitting 2'	11	227	2497			
3	2nd	201-236	LED Tube Fitting 4'	24	131	3144	5641	1490.9	
			LED Tube Fitting 2'	11	227	2497			
4	3rd	301-336	LED Tube Fitting 4'	24	131	3144	5641	1397.99	
			LED Tube Fitting 2'	11	227	2497			
5	4th	401-436	LED Tube Fitting 4'	24	131	3144	5641	1490.9	
			LED Tube Fitting 2'	11	227	2497			
6	5th	501-536	LED Tube Fitting 4'	24	131	3144	5641	1397.99	
			LED Tube Fitting 2'	11	227	2497			
7	6th	601-636	LED Tube Fitting 4'	24	131	3144	5641	1490.9	
			LED Tube Fitting 2'	11	227	2497			
8	7th	701-736	LED Tube Fitting 4'	24	131	3144	5641	1397.99	
			LED Tube Fitting 2'	11	227	2497			
9	8th	801-836	LED Tube Fitting 4'	24	131	3144	5641	1490.9	
			LED Tube Fitting 2'	11	227	2497			
10	9th	901-936	LED Tube Fitting 4'	24	131	3144	5641	1397.99	
			LED Tube Fitting 2'	11	227	2497			
<b>Total Load</b>						<b>52559</b>	<b>52559</b>	<b>14519.88</b>	

Total Wattage	52559
Interior gross lighted carpet area	14519.88
Total LPD	3.62

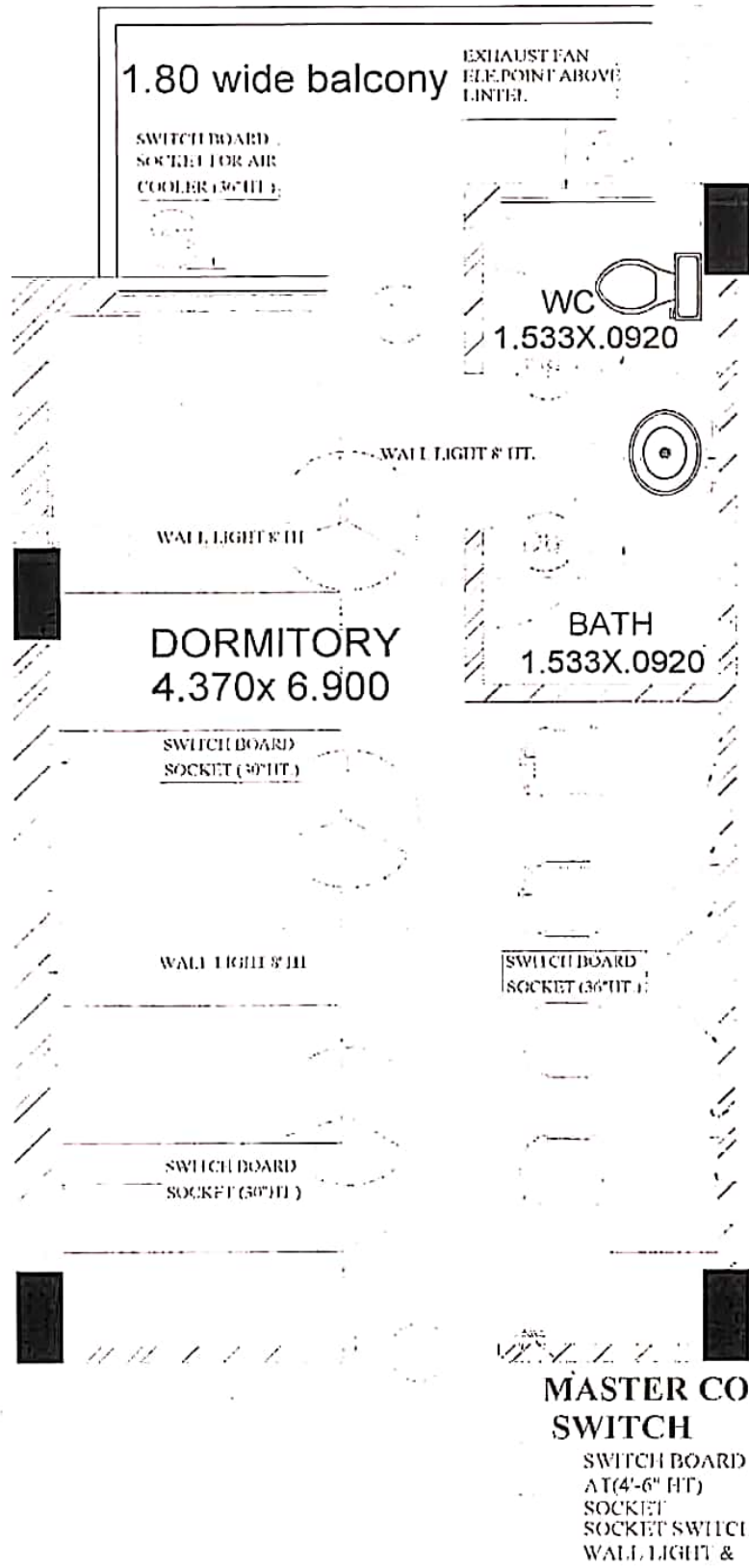
IBN BATTUTA HOSTEL								
Sr. No.	Floor	Room	Description	Watts	Quantity	Floor Wise Total Wattage	Floor Area SQM Area	Remarks
1	1st	Refuge Area	LED Tube Fitting 4'	24	9	144	294.51.	
		101-136	LED Lamp	5	44	220		
2	2nd	201-236	LED Lamp	5	44	220	262.52	
3	3rd	301-336	LED Lamp	5	44	220	294.51	
4	4th	401-436	LED Lamp	5	44	220	262.52	
5	5th	504-536	LED Lamp	5	44	220	294.51	
6	6th	604-636	LED Lamp	5	44	220	262.52	
7	7th	701-736	LED Lamp	5	44	220	294.51	
8	8th	801-836	LED Lamp	5	44	220	262.52	
9	9th	901-936	LED Lamp	5	44	220	262.52	
Total Load						2124	2490.64	

Total Wattage	2124
Exterior gross lighted carpet area	2490.64
Total LPD	0.85

## IBN BATTUTA Hostel

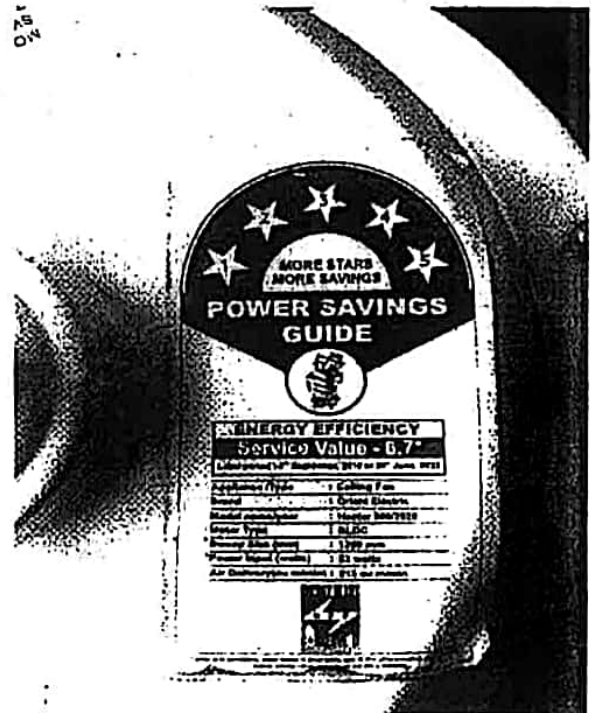
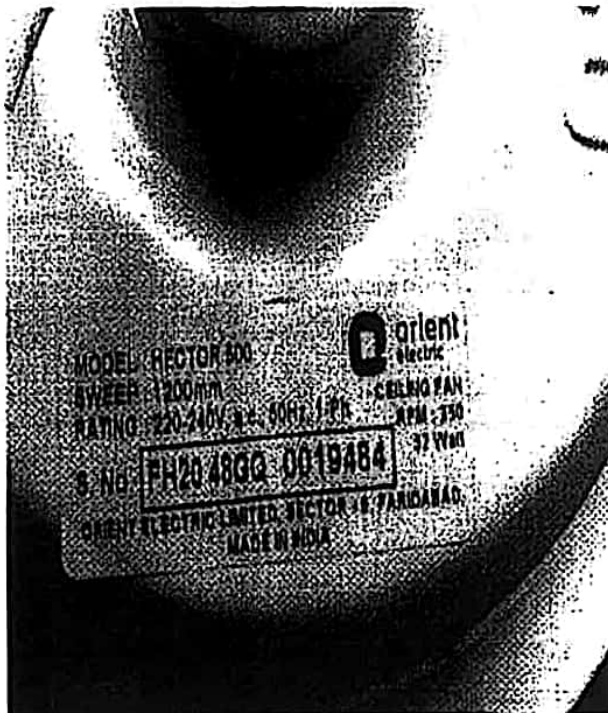
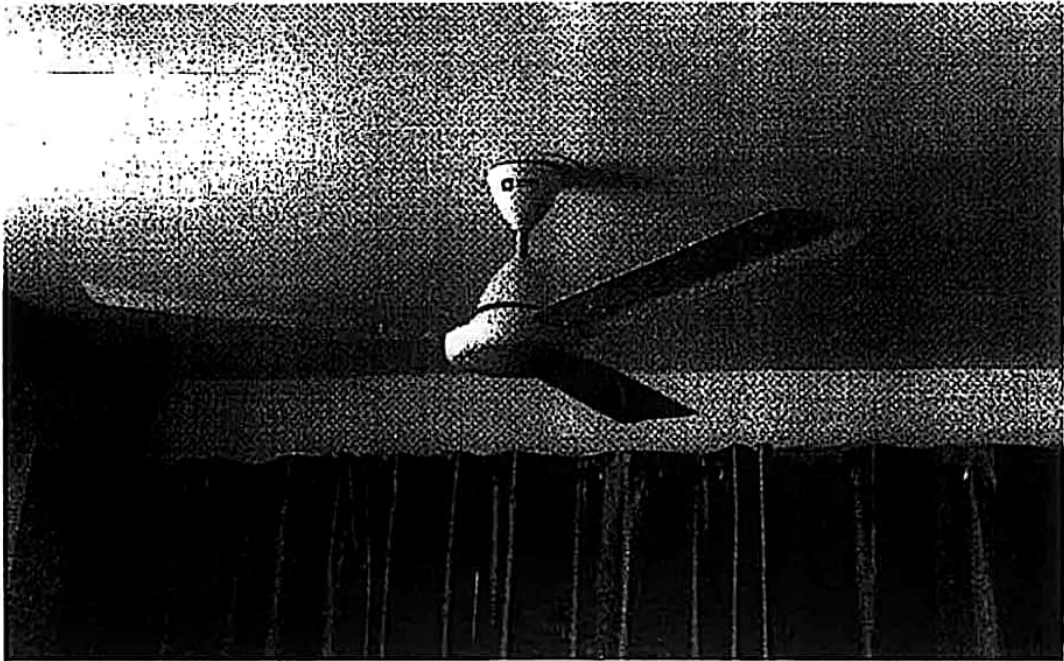
### Ceiling Fan's

Sr. No.	Floor	Room	Description	Watts	Quantity	Total Wattage	Kilowatt	Remarks
1	1st	101-136	Ceiling Fan 48"	32	103	3296	3.296	
			Ceiling Fan 36"	50	12	600	0.6	
2	2nd	201-236	Ceiling Fan 48"	32	103	3296	3.296	
			Ceiling Fan 36"	50	12	600	0.6	
3	3rd	301-336	Ceiling Fan 48"	50	103	5150	5.15	
			Ceiling Fan 36"	50	12	600	0.6	
4	4th	401-436	Ceiling Fan 48"	50	103	5150	5.15	
			Ceiling Fan 36"	50	12	600	0.6	
5	5th	501-536	Ceiling Fan 48"	50	103	5150	5.15	
			Ceiling Fan 36"	50	12	600	0.6	
6	6th	601-636	Ceiling Fan 48"	50	103	5150	5.15	
			Ceiling Fan 36"	50	12	600	0.6	
7	7th	701-736	Ceiling Fan 48"	50	103	5150	5.15	
			Ceiling Fan 36"	50	12	600	0.6	
8	8th	801-836	Ceiling Fan 48"	50	103	5150	5.15	
			Ceiling Fan 36"	50	12	600	0.6	
9	9th	901-936	Ceiling Fan 48"	50	103	5150	5.15	
			Ceiling Fan 36"	50	12	600	0.6	
<b>Total Load</b>						<b>48042</b>	<b>48.042</b>	

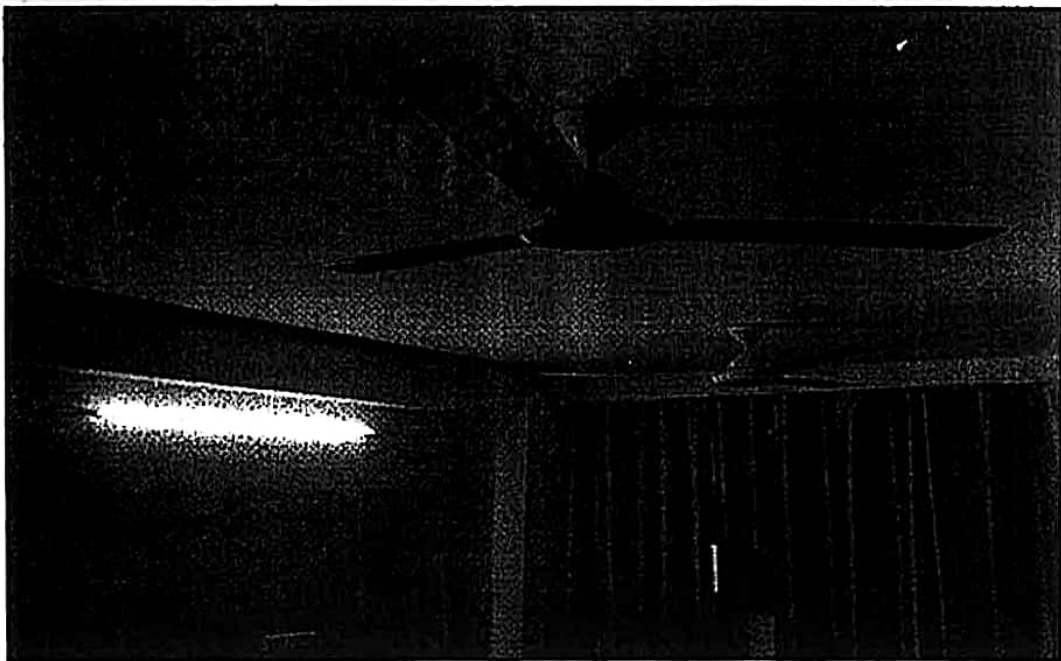




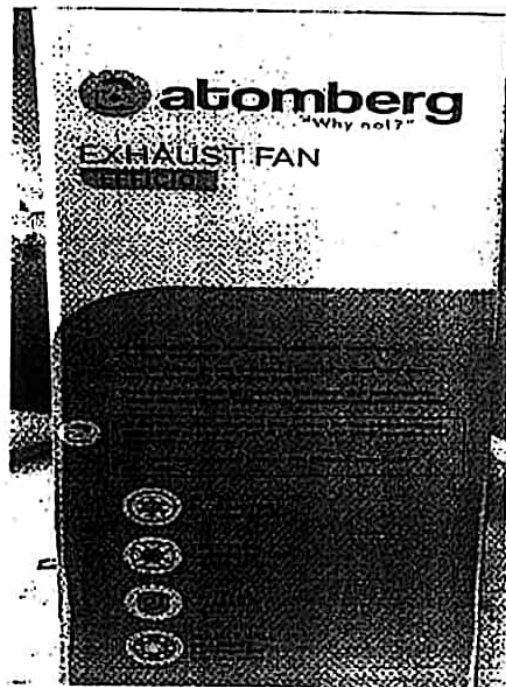
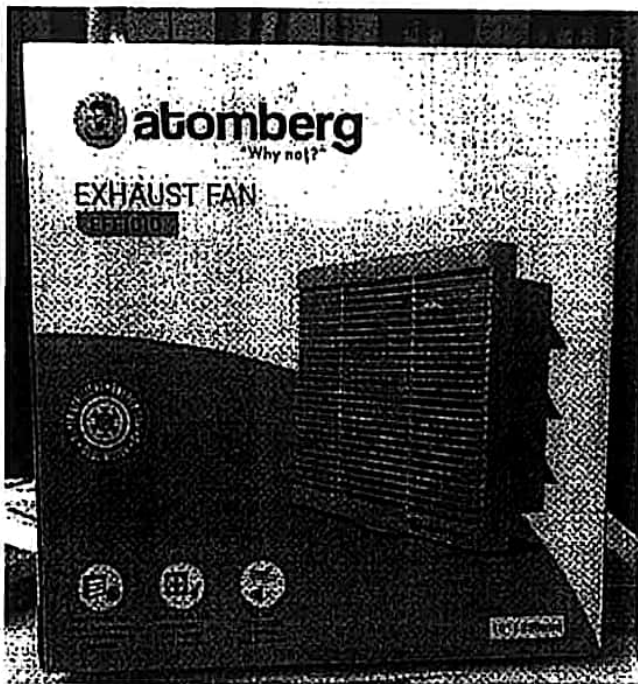
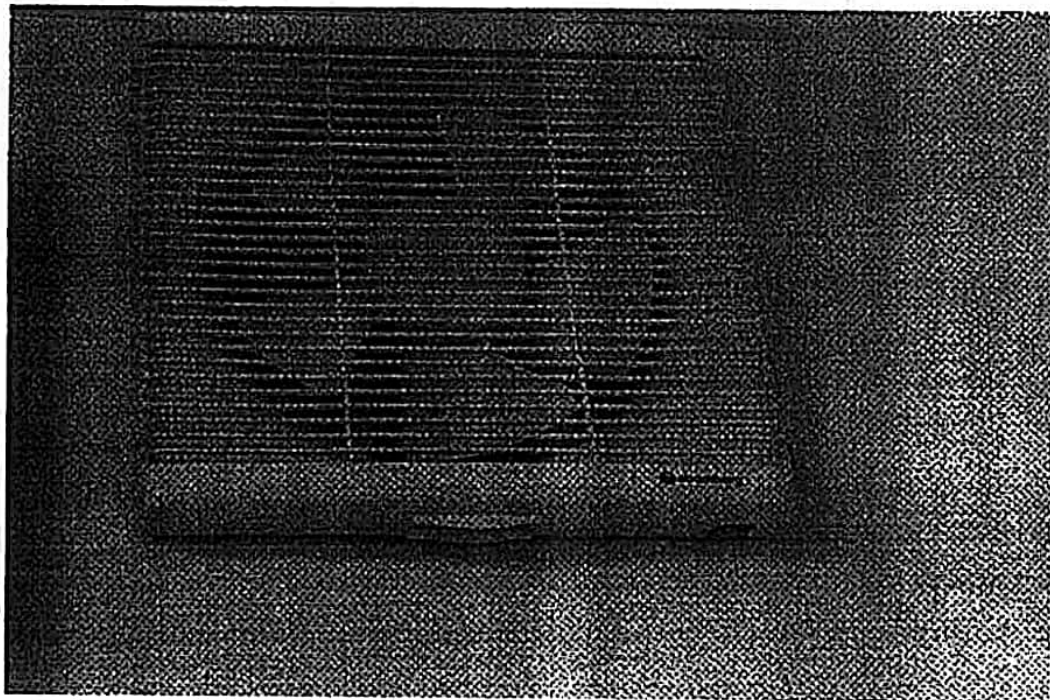
# Ceiling Fan



LED Tube Fitting 4'



# Exhaust Fan BLDC



REVISED: 11/17/2014  
 AT: VILLAGGIO PANORAMA  
 10000 PINEVIEW VILLAGE  
 10000 PINEVIEW VILLAGE  
 10000 PINEVIEW VILLAGE  
 10000 PINEVIEW VILLAGE

Lot #	Area (S.F.)	Area (Acres)	Notes
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98	10000	0.23	
99	10000	0.23	
100	10000	0.23	

**TOTAL AREA = 63.45755 ACRE**  
**= 2,568,962 SQ. FT.**  
**= 276,421,878 SFT.**

**TOTAL AREA OF PAVED DRIVEWAYS**  
**= 1,000,000 SQ. FT.**  
**PERMISSIBLE CITY (CITY) = 1,000,000 SQ. FT.**

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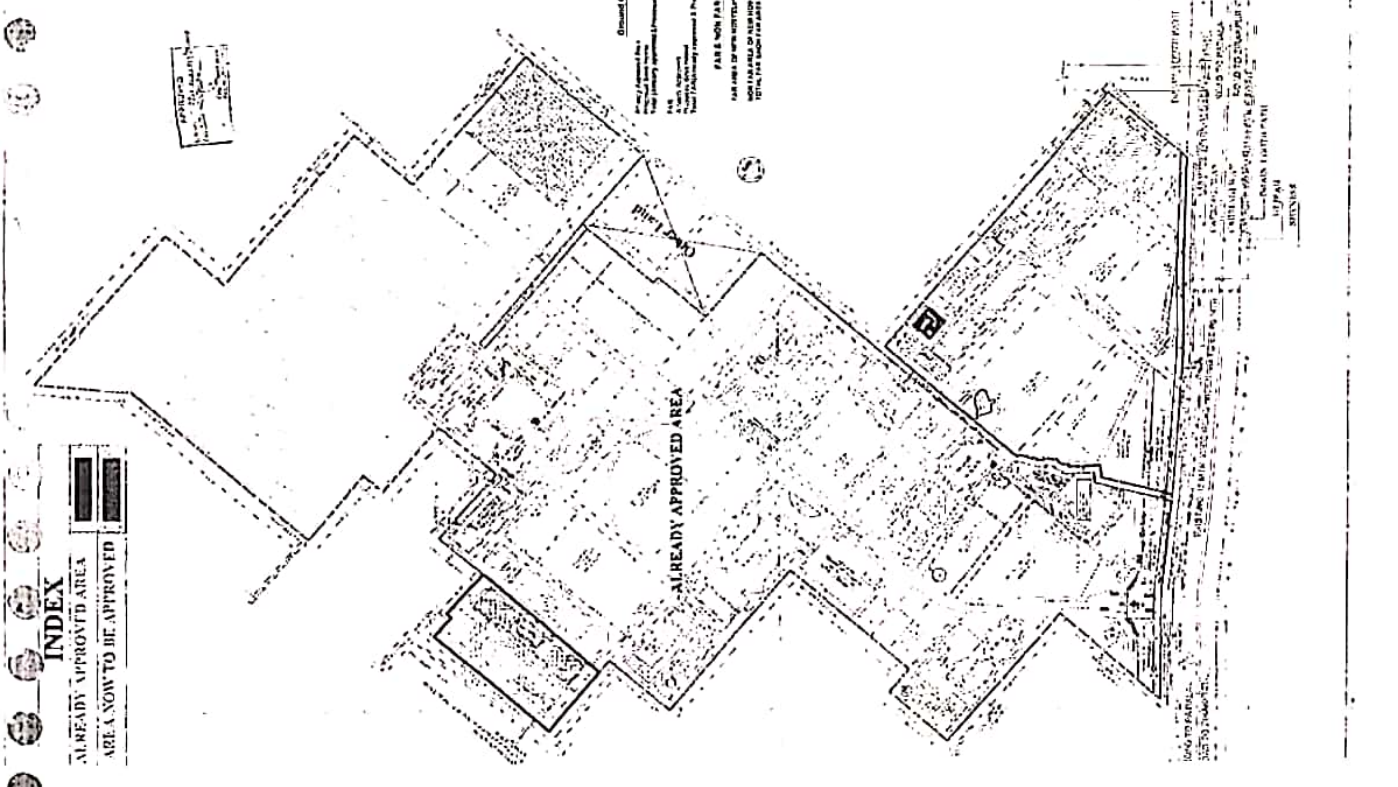
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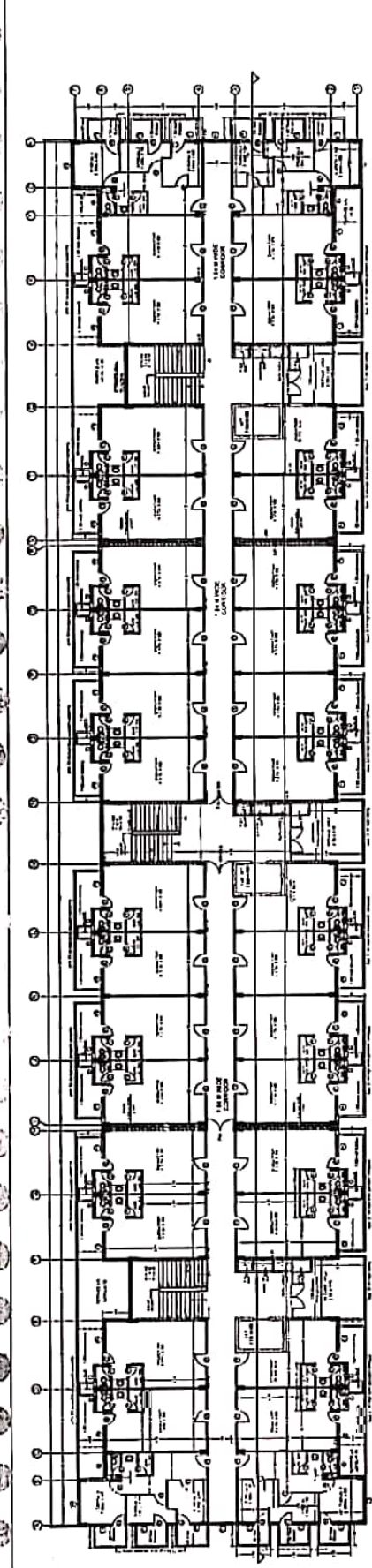
**PERMISSIBLE CITY (CITY) = 1,000,000 SQ. FT.**  
**PERMISSIBLE CITY (CITY) = 1,000,000 SQ. FT.**



**INDEX**  
 ALREADY APPROVED AREA  
 AREA NOW TO BE APPROVED

Lot #	Area (S.F.)	Area (Acres)	Notes
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**Warby-Design**  
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 10000 PINEVIEW VILLAGE



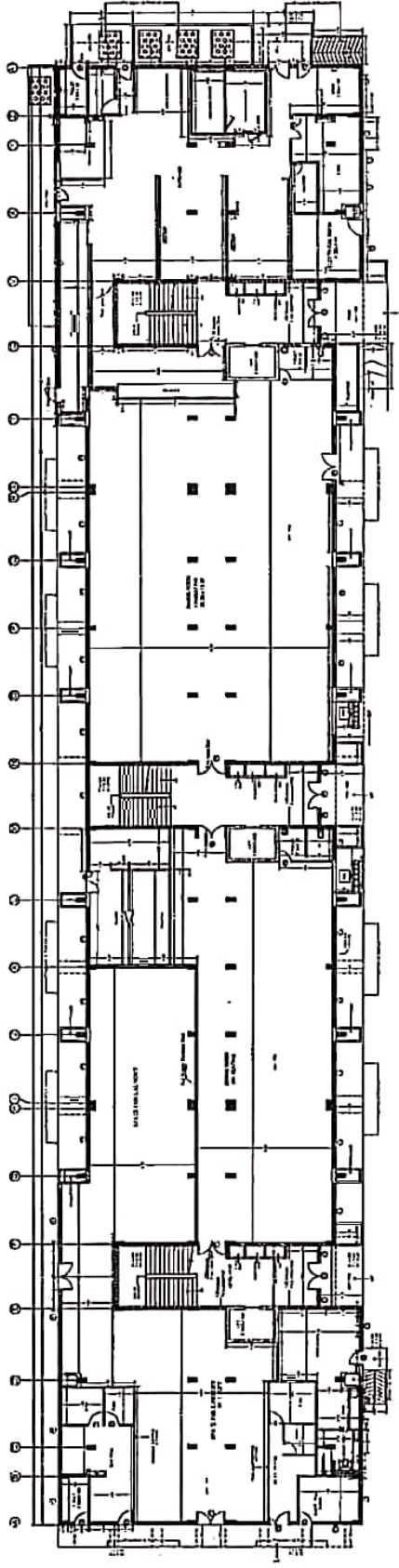
**SCHEDULE OF JOINERY**  
GENERAL SCHEDULE (General Item)

Sl. No.	Description	Qty	Unit	Rate	Amount
1	WOODEN DOOR	12	NO.	110	1320
2	WOODEN WINDOW	24	NO.	120	2880
3	WOODEN SHUTTER	12	NO.	110	1320
4	WOODEN PARTITION	12	NO.	110	1320
5	WOODEN CASE	12	NO.	110	1320
6	WOODEN STAIR	12	NO.	110	1320
7	WOODEN BENCH	12	NO.	110	1320
8	WOODEN TABLE	12	NO.	110	1320
9	WOODEN CHAIR	12	NO.	110	1320
10	WOODEN BED	12	NO.	110	1320
11	WOODEN CUPBOARD	12	NO.	110	1320
12	WOODEN DRAWER	12	NO.	110	1320
13	WOODEN SHED	12	NO.	110	1320
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23	WOODEN SHED	12	NO.	110	1320
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63	WOODEN SHED	12	NO.	110	1320
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96	WOODEN SHED	12	NO.	110	1320
97	WOODEN SHED	12	NO.	110	1320
98	WOODEN SHED	12	NO.	110	1320
99	WOODEN SHED	12	NO.	110	1320
100	WOODEN SHED	12	NO.	110	1320

**SCHEDULE OF JOINERY**  
GENERAL SCHEDULE (General Item)

Sl. No.	Description	Qty	Unit	Rate	Amount
1	WOODEN DOOR	12	NO.	110	1320
2	WOODEN WINDOW	24	NO.	120	2880
3	WOODEN SHUTTER	12	NO.	110	1320
4	WOODEN PARTITION	12	NO.	110	1320
5	WOODEN CASE	12	NO.	110	1320
6	WOODEN STAIR	12	NO.	110	1320
7	WOODEN BENCH	12	NO.	110	1320
8	WOODEN TABLE	12	NO.	110	1320
9	WOODEN CHAIR	12	NO.	110	1320
10	WOODEN BED	12	NO.	110	1320
11	WOODEN CUPBOARD	12	NO.	110	1320
12	WOODEN DRAWER	12	NO.	110	1320
13	WOODEN SHED	12	NO.	110	1320
14	WOODEN SHED	12	NO.	110	1320
15	WOODEN SHED	12	NO.	110	1320
16	WOODEN SHED	12	NO.	110	1320
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24	WOODEN SHED	12	NO.	110	1320
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27	WOODEN SHED	12	NO.	110	1320
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40	WOODEN SHED	12	NO.	110	1320
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98	WOODEN SHED	12	NO.	110	1320
99	WOODEN SHED	12	NO.	110	1320
100	WOODEN SHED	12	NO.	110	1320

FIRST FLOOR PLAN  
AS BUILT-UP



GROUND FLOOR PLAN  
AS BUILT-UP

**PROJECT:**  
BUILDING PLANS FOR CHITKARA UNIVERSITY AT  
VILL. JHANSI, H. B. NO. 262, & WILL FATEHPUR GARHI  
(H.B. NO. 263) TEHSIL RAJAPURA, DISTRICT PATIALA.

**NOTES:**  
1. All dimensions are in meters unless otherwise specified.  
2. All work is to be done in accordance with the latest specifications.  
3. No work is to be done until the previous work is approved by the architect.  
4. The contractor shall be responsible for obtaining all necessary permits and approvals.  
5. The contractor shall be responsible for the safety of all workers and the public.

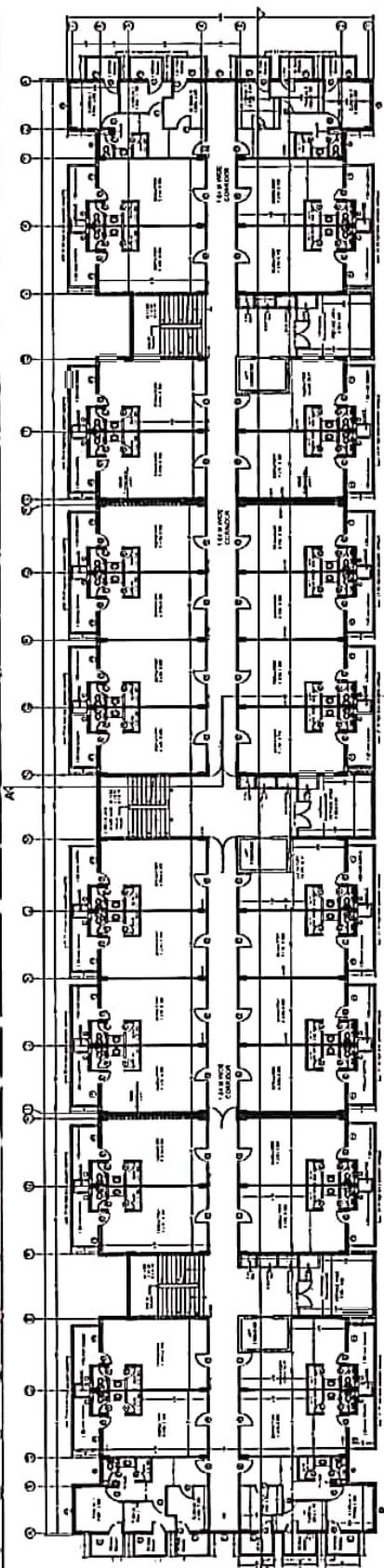
**IBN BATTUTA COMPLETION DRAWING  
HOSTEL**

**SCALE:** 1/100  
**DATE:** 2024

**ISSUED BY:** ARCHITECT

**TRAINING TITLE:** ARCHITECTURE  
**SCALE:** 1/100  
**DATE:** 2024

**ILLUMON**  
ARCHITECTURE & INTERIORS  
ADDRESS: # 11, SECTOR-14, ROHTA, HARYANA  
PHONE: 97731-2345678



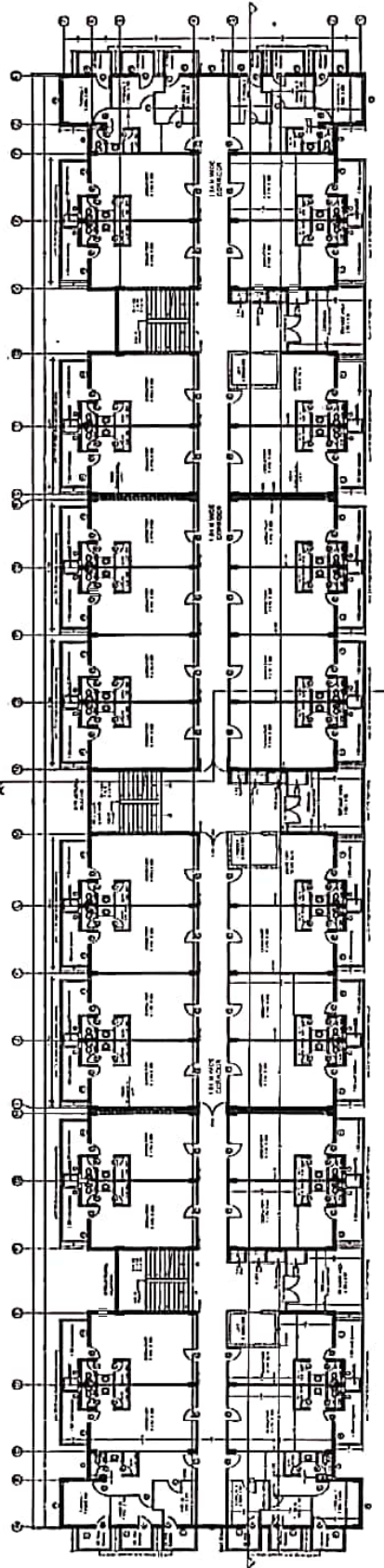
TYPICAL 3RD FLOOR, 5TH FLOOR, 7TH FLOOR AND 8TH FLOOR PLAN  
AS BUILT-UP

SCHEDULE OF JOINERY

Sl. No.	Particulars	Unit	Qty	Rate	Amount
1	WOODEN DOOR	SQ. FT.	10	150	1500
2	WOODEN WINDOW	SQ. FT.	20	100	2000
3	WOODEN PARTITION	SQ. FT.	50	50	2500
4	WOODEN SHUTTER	SQ. FT.	15	100	1500
5	WOODEN CASE	SQ. FT.	10	100	1000
6	WOODEN BENCH	SQ. FT.	5	100	500
7	WOODEN TABLE	SQ. FT.	5	100	500
8	WOODEN CHAIR	SQ. FT.	5	100	500
9	WOODEN BED	SQ. FT.	5	100	500
10	WOODEN CUPBOARD	SQ. FT.	5	100	500
11	WOODEN ALMOYANI	SQ. FT.	5	100	500
12	WOODEN RACK	SQ. FT.	5	100	500
13	WOODEN SHELF	SQ. FT.	5	100	500
14	WOODEN CABINET	SQ. FT.	5	100	500
15	WOODEN DRAWER	SQ. FT.	5	100	500
16	WOODEN DOOR	SQ. FT.	10	150	1500
17	WOODEN WINDOW	SQ. FT.	20	100	2000
18	WOODEN PARTITION	SQ. FT.	50	50	2500
19	WOODEN SHUTTER	SQ. FT.	15	100	1500
20	WOODEN CASE	SQ. FT.	10	100	1000
21	WOODEN BENCH	SQ. FT.	5	100	500
22	WOODEN TABLE	SQ. FT.	5	100	500
23	WOODEN CHAIR	SQ. FT.	5	100	500
24	WOODEN BED	SQ. FT.	5	100	500
25	WOODEN CUPBOARD	SQ. FT.	5	100	500
26	WOODEN ALMOYANI	SQ. FT.	5	100	500
27	WOODEN RACK	SQ. FT.	5	100	500
28	WOODEN SHELF	SQ. FT.	5	100	500
29	WOODEN CABINET	SQ. FT.	5	100	500
30	WOODEN DRAWER	SQ. FT.	5	100	500
31	WOODEN DOOR	SQ. FT.	10	150	1500
32	WOODEN WINDOW	SQ. FT.	20	100	2000
33	WOODEN PARTITION	SQ. FT.	50	50	2500
34	WOODEN SHUTTER	SQ. FT.	15	100	1500
35	WOODEN CASE	SQ. FT.	10	100	1000
36	WOODEN BENCH	SQ. FT.	5	100	500
37	WOODEN TABLE	SQ. FT.	5	100	500
38	WOODEN CHAIR	SQ. FT.	5	100	500
39	WOODEN BED	SQ. FT.	5	100	500
40	WOODEN CUPBOARD	SQ. FT.	5	100	500
41	WOODEN ALMOYANI	SQ. FT.	5	100	500
42	WOODEN RACK	SQ. FT.	5	100	500
43	WOODEN SHELF	SQ. FT.	5	100	500
44	WOODEN CABINET	SQ. FT.	5	100	500
45	WOODEN DRAWER	SQ. FT.	5	100	500
46	WOODEN DOOR	SQ. FT.	10	150	1500
47	WOODEN WINDOW	SQ. FT.	20	100	2000
48	WOODEN PARTITION	SQ. FT.	50	50	2500
49	WOODEN SHUTTER	SQ. FT.	15	100	1500
50	WOODEN CASE	SQ. FT.	10	100	1000
51	WOODEN BENCH	SQ. FT.	5	100	500
52	WOODEN TABLE	SQ. FT.	5	100	500
53	WOODEN CHAIR	SQ. FT.	5	100	500
54	WOODEN BED	SQ. FT.	5	100	500
55	WOODEN CUPBOARD	SQ. FT.	5	100	500
56	WOODEN ALMOYANI	SQ. FT.	5	100	500
57	WOODEN RACK	SQ. FT.	5	100	500
58	WOODEN SHELF	SQ. FT.	5	100	500
59	WOODEN CABINET	SQ. FT.	5	100	500
60	WOODEN DRAWER	SQ. FT.	5	100	500
61	WOODEN DOOR	SQ. FT.	10	150	1500
62	WOODEN WINDOW	SQ. FT.	20	100	2000
63	WOODEN PARTITION	SQ. FT.	50	50	2500
64	WOODEN SHUTTER	SQ. FT.	15	100	1500
65	WOODEN CASE	SQ. FT.	10	100	1000
66	WOODEN BENCH	SQ. FT.	5	100	500
67	WOODEN TABLE	SQ. FT.	5	100	500
68	WOODEN CHAIR	SQ. FT.	5	100	500
69	WOODEN BED	SQ. FT.	5	100	500
70	WOODEN CUPBOARD	SQ. FT.	5	100	500
71	WOODEN ALMOYANI	SQ. FT.	5	100	500
72	WOODEN RACK	SQ. FT.	5	100	500
73	WOODEN SHELF	SQ. FT.	5	100	500
74	WOODEN CABINET	SQ. FT.	5	100	500
75	WOODEN DRAWER	SQ. FT.	5	100	500
76	WOODEN DOOR	SQ. FT.	10	150	1500
77	WOODEN WINDOW	SQ. FT.	20	100	2000
78	WOODEN PARTITION	SQ. FT.	50	50	2500
79	WOODEN SHUTTER	SQ. FT.	15	100	1500
80	WOODEN CASE	SQ. FT.	10	100	1000
81	WOODEN BENCH	SQ. FT.	5	100	500
82	WOODEN TABLE	SQ. FT.	5	100	500
83	WOODEN CHAIR	SQ. FT.	5	100	500
84	WOODEN BED	SQ. FT.	5	100	500
85	WOODEN CUPBOARD	SQ. FT.	5	100	500
86	WOODEN ALMOYANI	SQ. FT.	5	100	500
87	WOODEN RACK	SQ. FT.	5	100	500
88	WOODEN SHELF	SQ. FT.	5	100	500
89	WOODEN CABINET	SQ. FT.	5	100	500
90	WOODEN DRAWER	SQ. FT.	5	100	500
91	WOODEN DOOR	SQ. FT.	10	150	1500
92	WOODEN WINDOW	SQ. FT.	20	100	2000
93	WOODEN PARTITION	SQ. FT.	50	50	2500
94	WOODEN SHUTTER	SQ. FT.	15	100	1500
95	WOODEN CASE	SQ. FT.	10	100	1000
96	WOODEN BENCH	SQ. FT.	5	100	500
97	WOODEN TABLE	SQ. FT.	5	100	500
98	WOODEN CHAIR	SQ. FT.	5	100	500
99	WOODEN BED	SQ. FT.	5	100	500
100	WOODEN CUPBOARD	SQ. FT.	5	100	500

SCHEDULE OF PAINTWORK

Sl. No.	Particulars	Unit	Qty	Rate	Amount
1	PAINT WORK	SQ. FT.	100	100	10000
2	PAINT WORK	SQ. FT.	200	100	20000
3	PAINT WORK	SQ. FT.	300	100	30000
4	PAINT WORK	SQ. FT.	400	100	40000
5	PAINT WORK	SQ. FT.	500	100	50000
6	PAINT WORK	SQ. FT.	600	100	60000
7	PAINT WORK	SQ. FT.	700	100	70000
8	PAINT WORK	SQ. FT.	800	100	80000
9	PAINT WORK	SQ. FT.	900	100	90000
10	PAINT WORK	SQ. FT.	1000	100	100000
11	PAINT WORK	SQ. FT.	1100	100	110000
12	PAINT WORK	SQ. FT.	1200	100	120000
13	PAINT WORK	SQ. FT.	1300	100	130000
14	PAINT WORK	SQ. FT.	1400	100	140000
15	PAINT WORK	SQ. FT.	1500	100	150000
16	PAINT WORK	SQ. FT.	1600	100	160000
17	PAINT WORK	SQ. FT.	1700	100	170000
18	PAINT WORK	SQ. FT.	1800	100	180000
19	PAINT WORK	SQ. FT.	1900	100	190000
20	PAINT WORK	SQ. FT.	2000	100	200000
21	PAINT WORK	SQ. FT.	2100	100	210000
22	PAINT WORK	SQ. FT.	2200	100	220000
23	PAINT WORK	SQ. FT.	2300	100	230000
24	PAINT WORK	SQ. FT.	2400	100	240000
25	PAINT WORK	SQ. FT.	2500	100	250000
26	PAINT WORK	SQ. FT.	2600	100	260000
27	PAINT WORK	SQ. FT.	2700	100	270000
28	PAINT WORK	SQ. FT.	2800	100	280000
29	PAINT WORK	SQ. FT.	2900	100	290000
30	PAINT WORK	SQ. FT.	3000	100	300000
31	PAINT WORK	SQ. FT.	3100	100	310000
32	PAINT WORK	SQ. FT.	3200	100	320000
33	PAINT WORK	SQ. FT.	3300	100	330000
34	PAINT WORK	SQ. FT.	3400	100	340000
35	PAINT WORK	SQ. FT.	3500	100	350000
36	PAINT WORK	SQ. FT.	3600	100	360000
37	PAINT WORK	SQ. FT.	3700	100	370000
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39	PAINT WORK	SQ. FT.	3900	100	390000
40	PAINT WORK	SQ. FT.	4000	100	400000
41	PAINT WORK	SQ. FT.	4100	100	410000
42	PAINT WORK	SQ. FT.	4200	100	420000
43	PAINT WORK	SQ. FT.	4300	100	430000
44	PAINT WORK	SQ. FT.	4400	100	440000
45	PAINT WORK	SQ. FT.	4500	100	450000
46	PAINT WORK	SQ. FT.	4600	100	460000
47	PAINT WORK	SQ. FT.	4700	100	470000
48	PAINT WORK	SQ. FT.	4800	100	480000
49	PAINT WORK	SQ. FT.	4900	100	490000
50	PAINT WORK	SQ. FT.	5000	100	500000



TYPICAL 2ND FLOOR, 4TH FLOOR, 6TH FLOOR AND 8TH FLOOR PLAN  
AS BUILT-UP

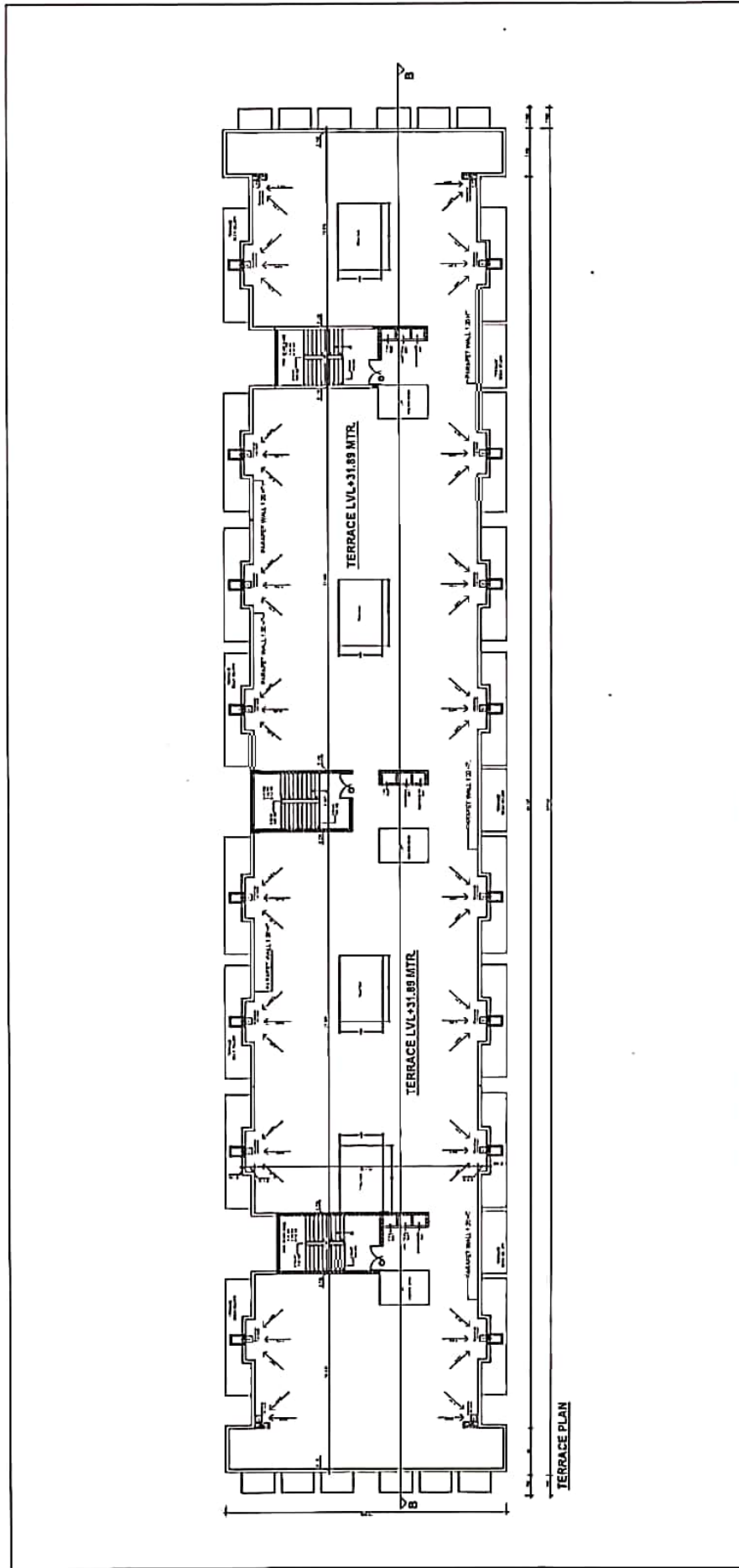
PROJECT:  
BUILDING PLANS FOR CHITKARA UNIVERSITY AT  
VILL. JHANSI (H. B. NO. 262) & VILL. FATEHPUR GARHI  
(H.B. NO. 263) TEHSIL RAJPURA, DISTRICT PATIALA.

IBN BATTUTA COMPLETION  
DRAWING

ARCHITECT:  
GENERAL SERVICE  
107/PAKISTAN TOWN, DELHI

SCALE: 1/200  
DATE: 19/11/2011  
PAGE NO. 2

DRAWING TITLE:  
IBN BATTUTA  
COMPLETION  
DRAWING  
ARCHITECT:  
GENERAL SERVICE  
107/PAKISTAN TOWN, DELHI  
PHONE: 011-2611-4692  
FAX: 011-2611-4693  
WWW.GSARCHITECT.COM



TERRACE PLAN

<p><b>PROJECT:</b> BUILDING PLANS FOR CHITKARA UNIVERSITY AT VILL. JHANSLA (H. B. NO. 262 ) &amp; VILL. FATEHPUR GARHI (H.B. NO. 253 ) TEHSIL RAJPURA, DISTRICT PATIALA.</p>	<p><b>NOTES:-</b> 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED. 2. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST CODES OF PRACTICE. 3. ALL MATERIALS TO BE USED SHALL BE OF THE BEST QUALITY. 4. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS OF THE CLIENT.</p>	<p><b>IBN BATTUTA HOSTEL</b></p>	<p><b>COMPLETION DRAWING</b></p>	<p><b>ARCHITECT</b></p>	<p><b>SCALE:</b> 1:100</p> <p><b>DATE:</b> 24/11/2017</p>	<p><b>DRAWING TITLE:</b> TERRACE PLAN</p>	<p><b>IBN BY Design</b> ARCHITECTS INTERIOR DESIGNERS PROJECT CONSULTANTS ADDRESS: # 66, SECTOR 14, CHANDigarh PHONE: 0172-432066, 748292 E-mail: ibnbydesign@gmail.com</p>
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**PROJECT:**

BUILDING PLANS FOR CHITKARA  
UNIVERSITY AT VILL. JHANSILA  
(H.B. NO. 262) & VILL. F  
ATEHPUR GARH (H.B. NO. 263)  
TEHSIL RAIPUR,  
DISTRICT PATINA

IBN BATTUTA  
HOSTEL

**COMPLETION DRAWING:-**

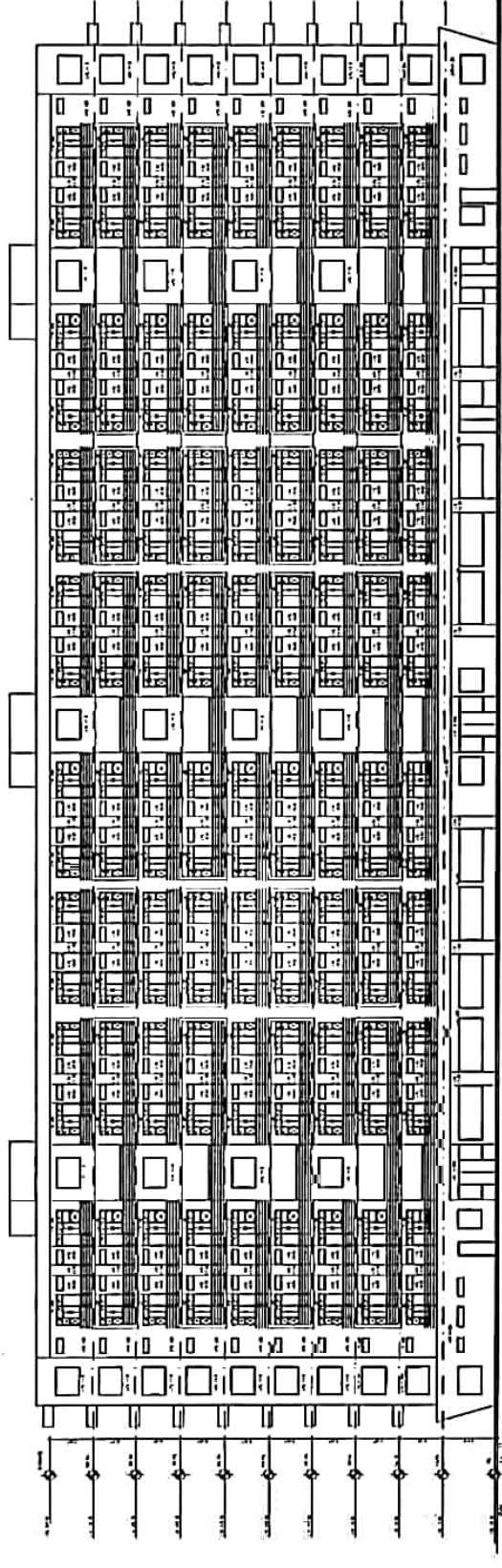
**NOTES:-**

- 1. The drawing is prepared in accordance with the latest provisions of the Indian Standards Code of Practice for Structural Steelwork.
- 2. The drawing is prepared in accordance with the latest provisions of the Indian Standards Code of Practice for Reinforced Concrete.
- 3. The drawing is prepared in accordance with the latest provisions of the Indian Standards Code of Practice for Masonry.
- 4. The drawing is prepared in accordance with the latest provisions of the Indian Standards Code of Practice for Timber Work.
- 5. The drawing is prepared in accordance with the latest provisions of the Indian Standards Code of Practice for Earth Retention.
- 6. The drawing is prepared in accordance with the latest provisions of the Indian Standards Code of Practice for Foundations.
- 7. The drawing is prepared in accordance with the latest provisions of the Indian Standards Code of Practice for Roofs.
- 8. The drawing is prepared in accordance with the latest provisions of the Indian Standards Code of Practice for Stairs.
- 9. The drawing is prepared in accordance with the latest provisions of the Indian Standards Code of Practice for Lifts.
- 10. The drawing is prepared in accordance with the latest provisions of the Indian Standards Code of Practice for Electrical.
- 11. The drawing is prepared in accordance with the latest provisions of the Indian Standards Code of Practice for Plumbing.
- 12. The drawing is prepared in accordance with the latest provisions of the Indian Standards Code of Practice for Fire Protection.
- 13. The drawing is prepared in accordance with the latest provisions of the Indian Standards Code of Practice for Safety.
- 14. The drawing is prepared in accordance with the latest provisions of the Indian Standards Code of Practice for Accessibility.
- 15. The drawing is prepared in accordance with the latest provisions of the Indian Standards Code of Practice for Sustainability.

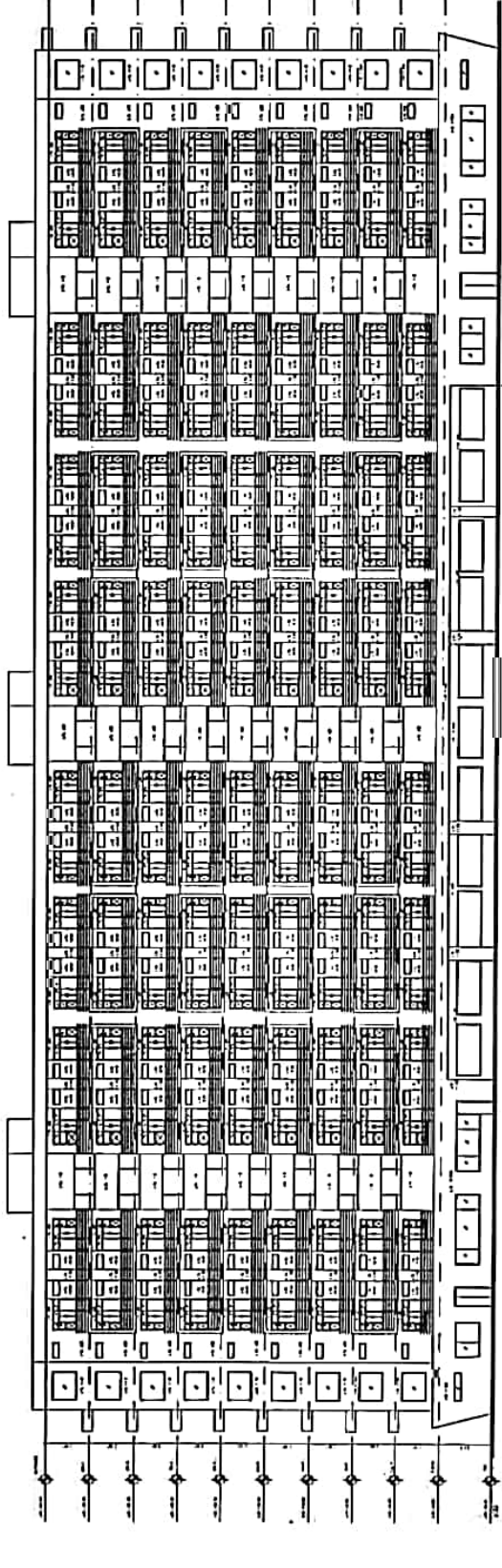
SCALE: 1/4" = 1'-0"

DATE: 10/10/2023

**IBN BY DESIGN**  
ARCHITECTS & ENGINEERS  
PLOT NO. 10, SECTOR 10, GATEWAY GREEN,  
GURGAON, HARYANA, INDIA  
PHONE: 011-26101111 | 011-26101112  
WWW.IBNBYDESIGN.COM



FRONT ELEVATION



REAR ELEVATION



**PROJECT:**  
 BUILDING PLANS FOR CHIKARA  
 UNIVERSITY AT VILL. JHANSIA  
 (H.B. NO 262) & VILL. F  
 ATEPUR GARH(H.B. NO. 263)  
 TE-SIL BAUPURA,  
 DISTRICT PATIALA

**IBN BAITUTA  
 HOSTEL**

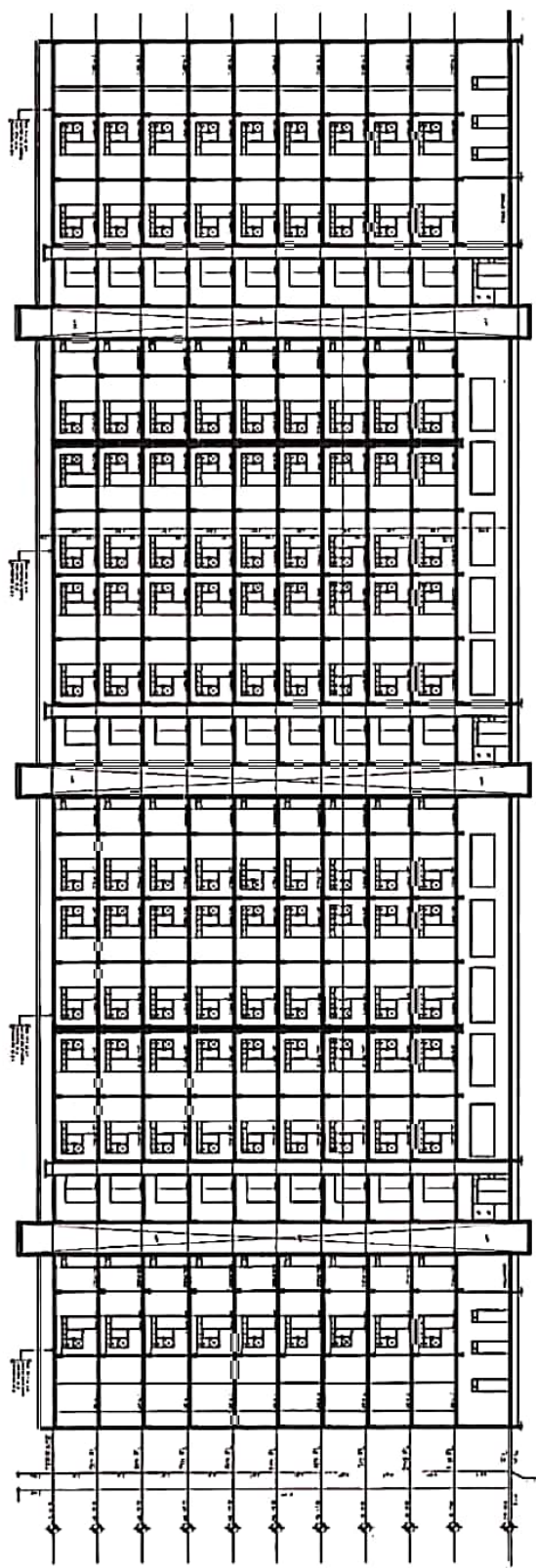
**COMPLETION DRAWING-**

1. The drawings are to be prepared for your project.  
 2. All dimensions are in meters unless otherwise specified.  
 3. All work is to be done in accordance with the  
 specifications of the Government of Punjab.  
 4. The drawings are to be prepared in accordance with the  
 specifications of the Government of Punjab.

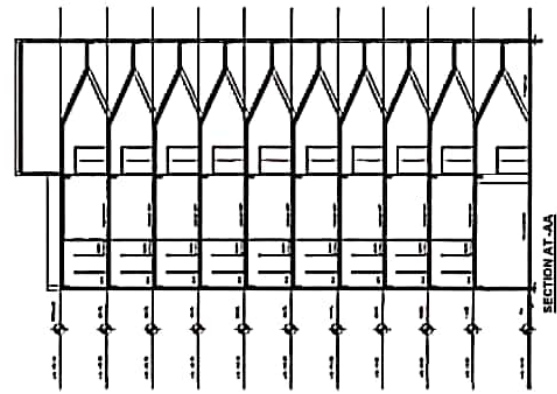
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 BY: [Signature]

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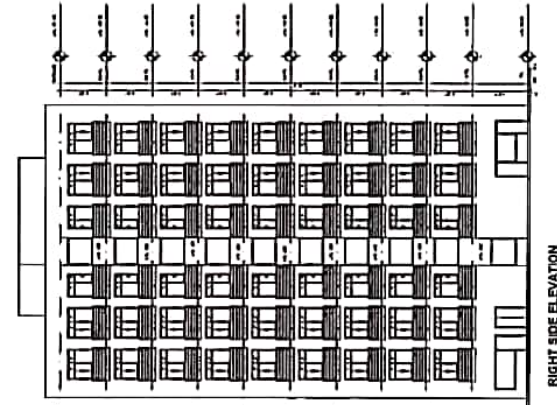
Architect: **ArchiDesign**  
 101, Sector 17, Gurgaon, Haryana  
 India | Phone: +91 98113 43434



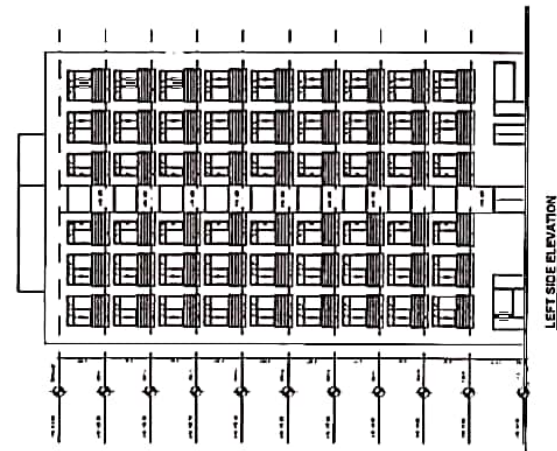
SECTION AT-BB



SECTION AT-AA



RIGHT SIDE ELEVATION



LEFT SIDE ELEVATION

