

**“UTTAR HARYANA BIJLI VITRAN NIGAM LIMITED (UHBVN)
OFFICE” Building at Plot No. I-P3 & I-P4, Sector 14, Panchkula**



ECBC Compliance Report

Submitted By:
**ECBC Cell, Haryana New and Renewable
Energy Development Agency (HAREDA)
Haryana State Designated Agency (HSDA)
Akshay Urja Bhawan, Plot No-1, Sector 17,
Panchkula, Haryana 134109**

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Summary

Whole Building Performance Method has been used to show compliance of the project with ECBC.

Input Parameter	Baseline	Proposed	Units
Wall material	As per ECBC	200 mm Tric-Eco wall	
Wall U-value	0.114	0.018	Btu/hrsqt F
Roof material	As per ECBC	20 mm Heat resistance Tiles + 40 mm Cement Screed+ 100 mm Insulation (XPS) + 75 mm PCC In slope+ 150mm RCC Slab	
Roof U-value	0.218	0.045	Btu/hrsqt F
Glazing U Value	0.528	0.264	Btu/hrsqt F
SHGC	0.27	0.27	
Window Shading	No	As per Architectural Drawings	
Cooling Sizing Ratio	1.25	1	
Heating Sizing Ratio	1.15	1	
HVAC System	VRF with DOAS sys	Screw chiller with VAV sys	
HVAC System Efficiency (EER)	3.02	5.77	
Lighting Power Density calculation (As per space function method- ECBC §6.3.2)			
Office	0.78	0.53	W/ ft ²
External	0.88	0.79	W/ ft ²
Zone Cooling set point	75	75	deg F
Zone Heating set point	70	70	deg F
Basement vent load	24.95	24.95	KW

Project achieves energy saving of 42.9% when compared with ECBC baseline case. Thereby, project is meeting the ECBC compliance by 'Whole Building Performance' approach.

Description	Energy Consumption/ Generation
Proposed case energy consumption (kWh)	913092
Base case energy consumption (kWh)	1598845
Savings %	42.9%
Base case EPI (kWh/Sq.m./Annum)	75.2
Proposed case EPI (kWh/Sq.m./Annum)	43.0
EPI ratio	0.57
ECBC Level	SuperECBC

Introduction

UTTAR HARYANA BIJLI VITRAN NIGAM LIMITED (UHBVN) OFFICE Building at Plot No. I-P3 & I-P4, Sector 14, Panchkula is an under-construction office type building that is under a composite climate zone.

Building Floor Plan



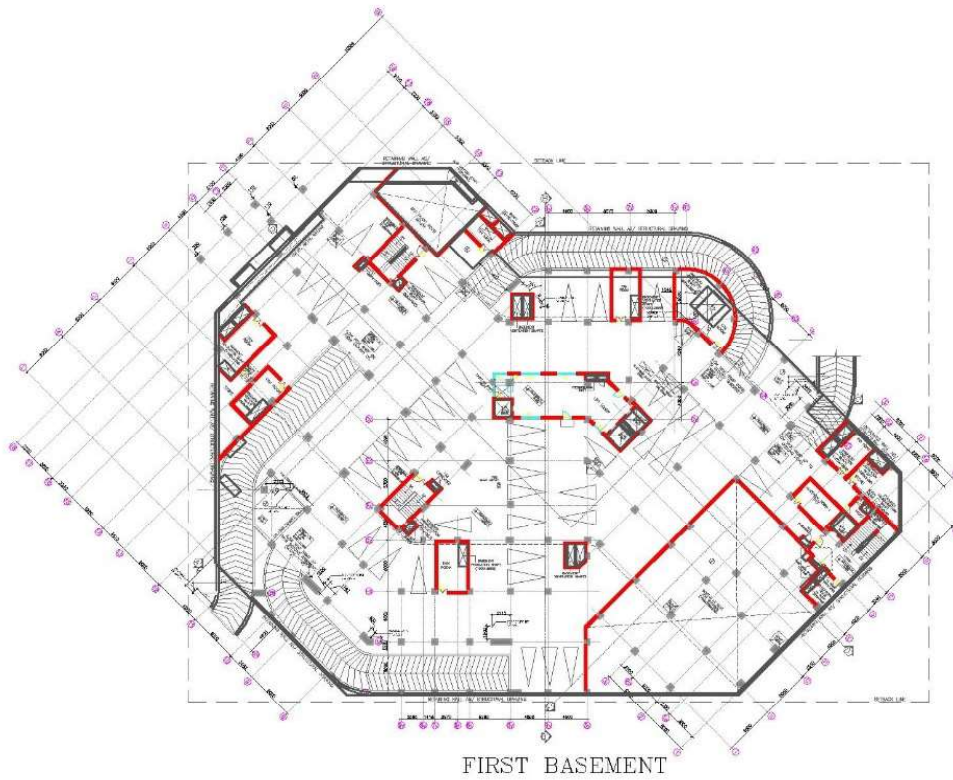


Figure 1: Basement plan

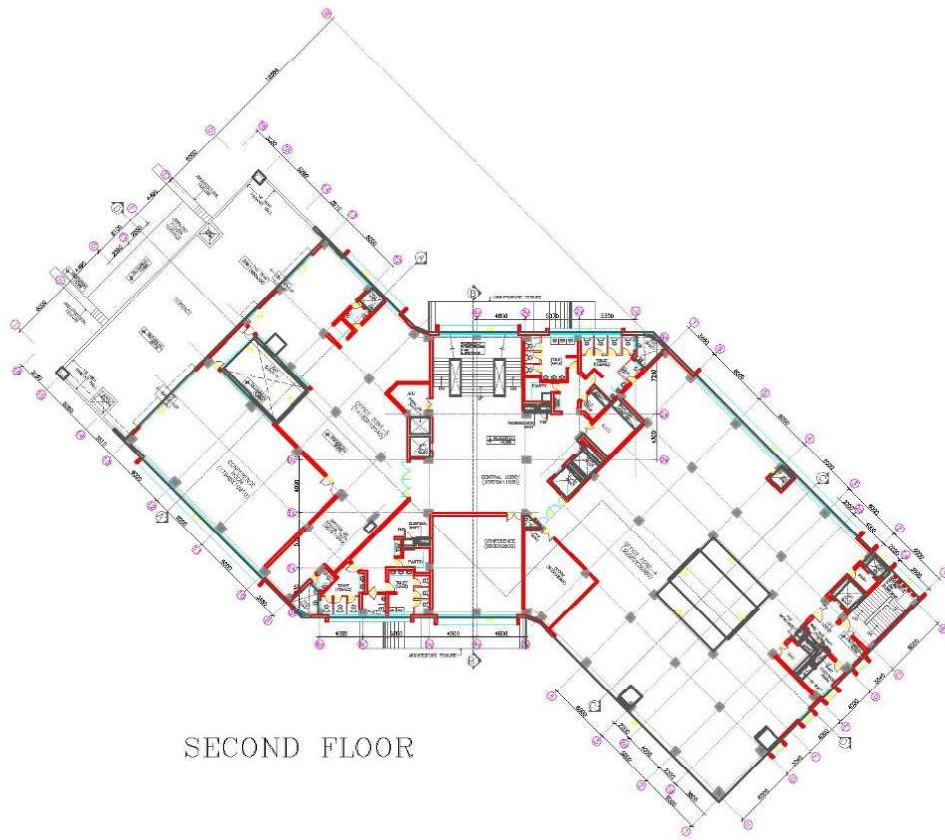


Figure 4: Second floor plan

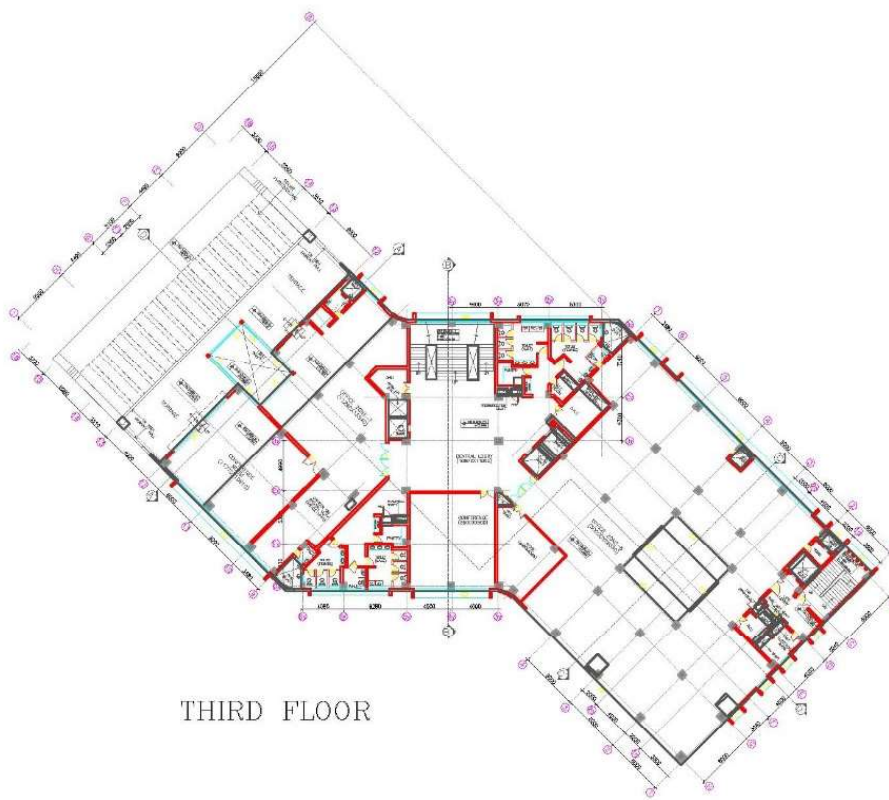
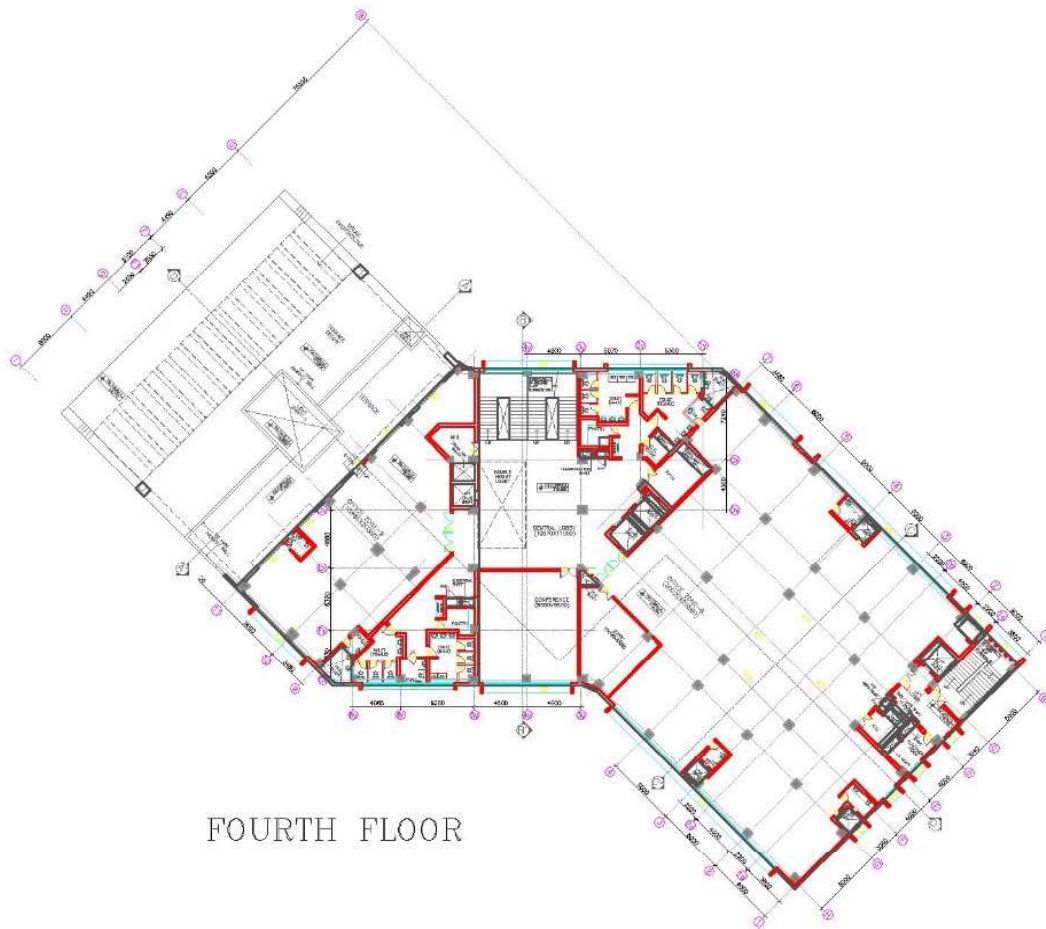
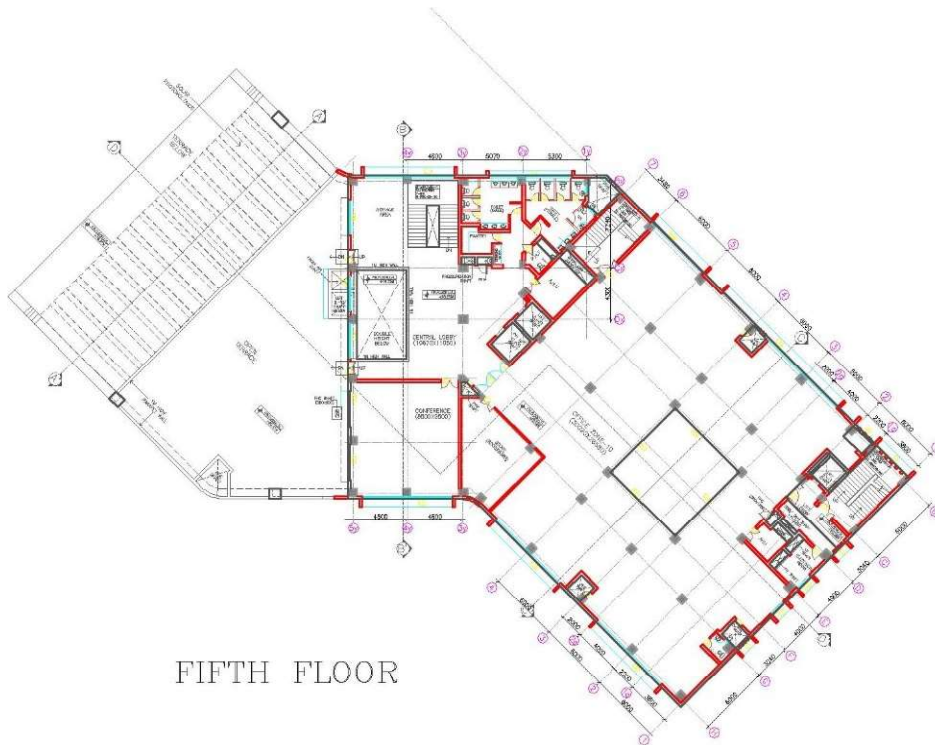


Figure 5: Third floor plan



FOURTH FLOOR

Figure 6: fourth floor plan



FIFTH FLOOR

Figure 7: Fifth floor

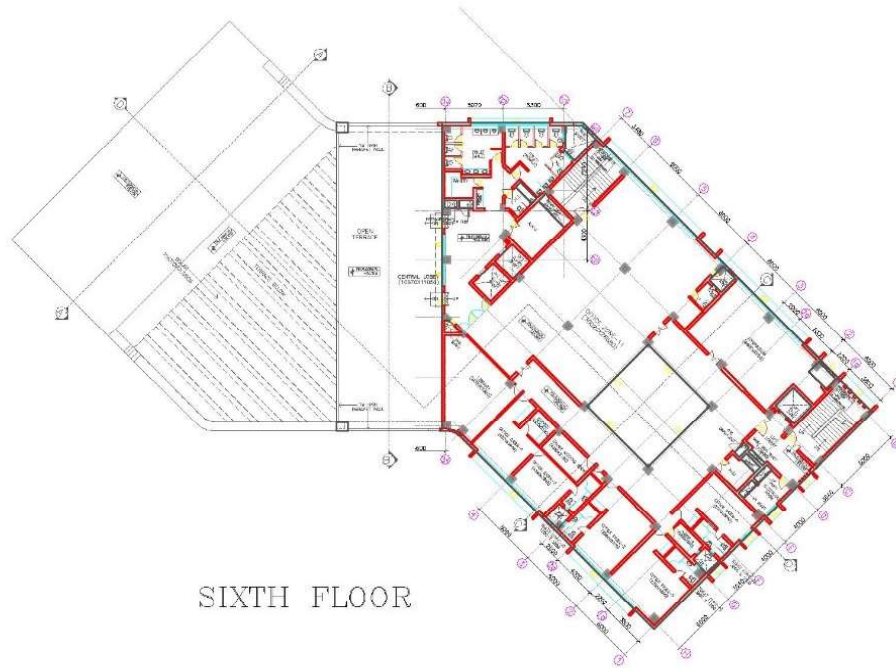


Figure 8: Sixth floor

Building Schedules

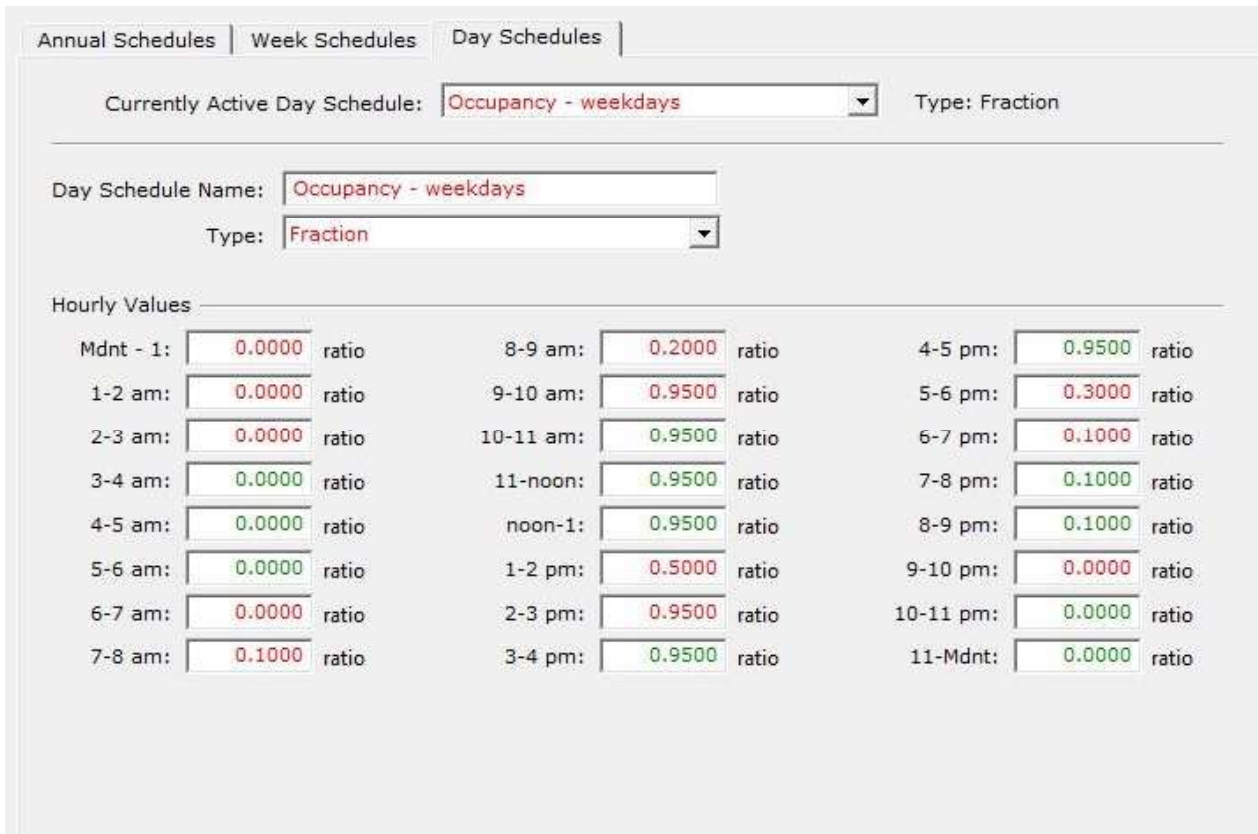


Figure 9: Office occupancy weekdays

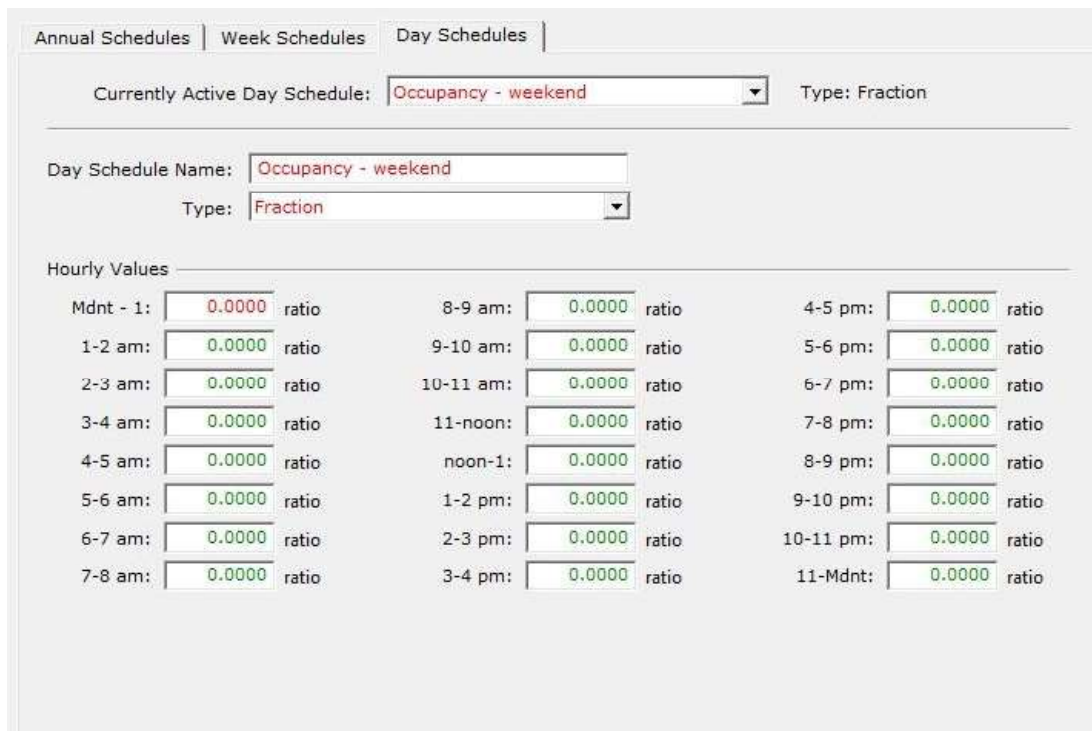


Figure 10: Office occupancy weekend

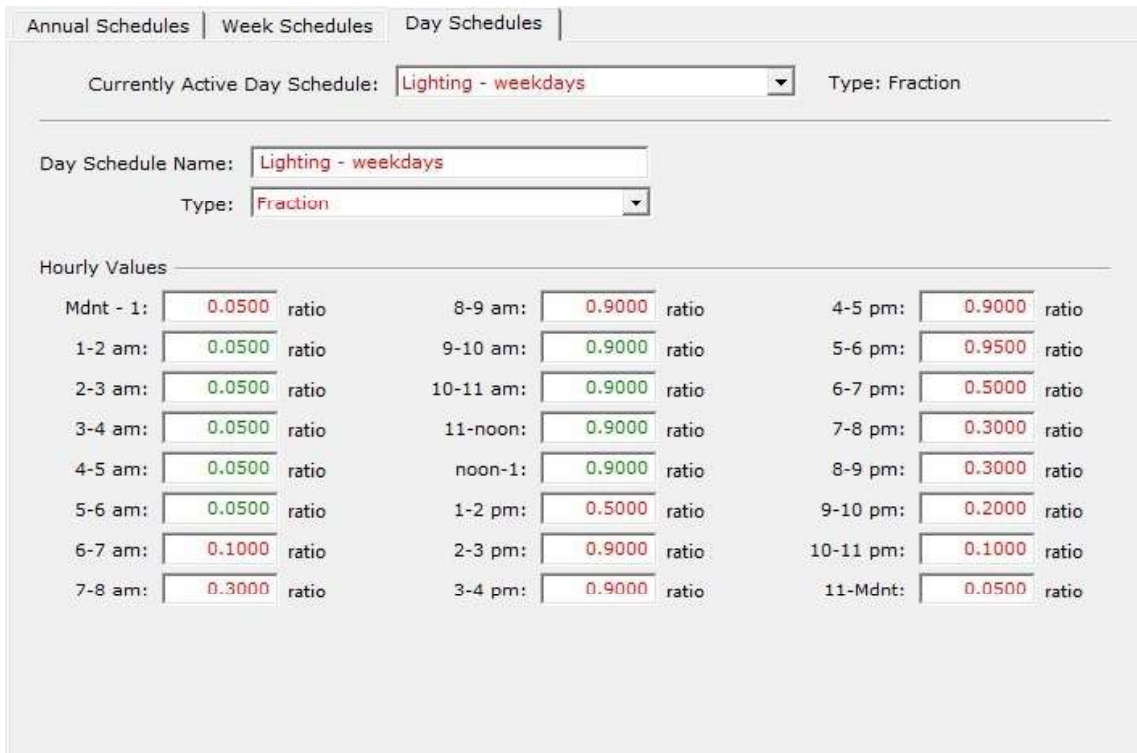


Figure 11: Office lighting weekdays

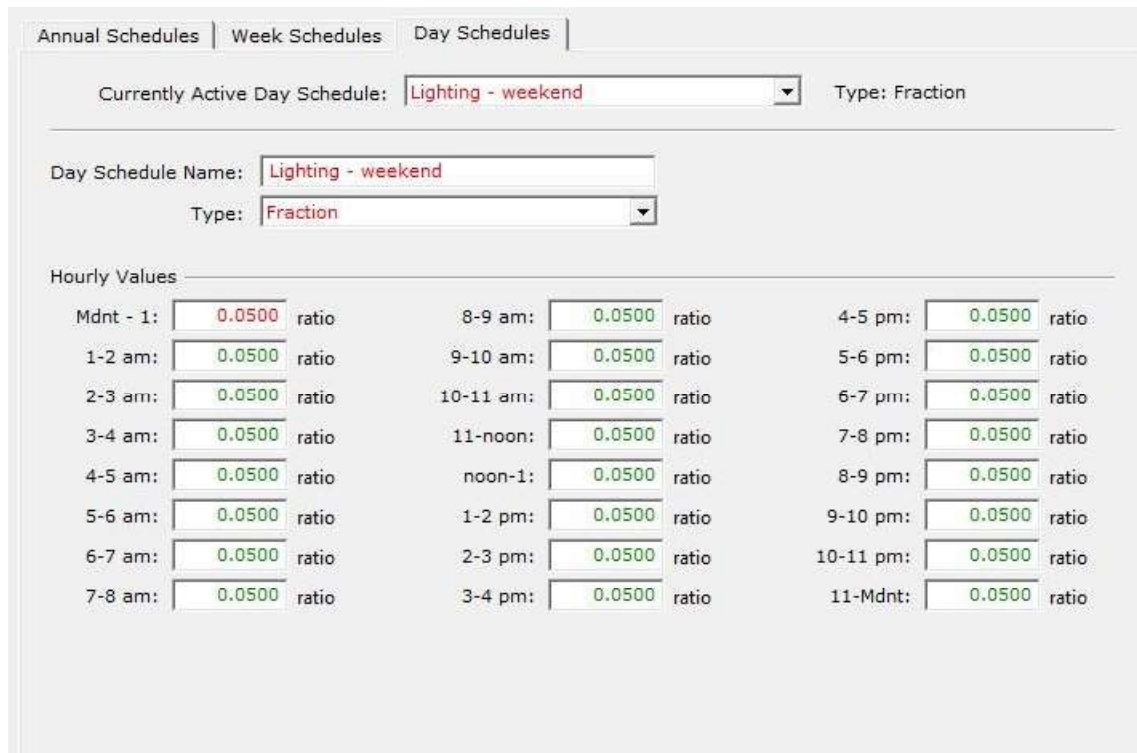


Figure 12: Office lighting weekend

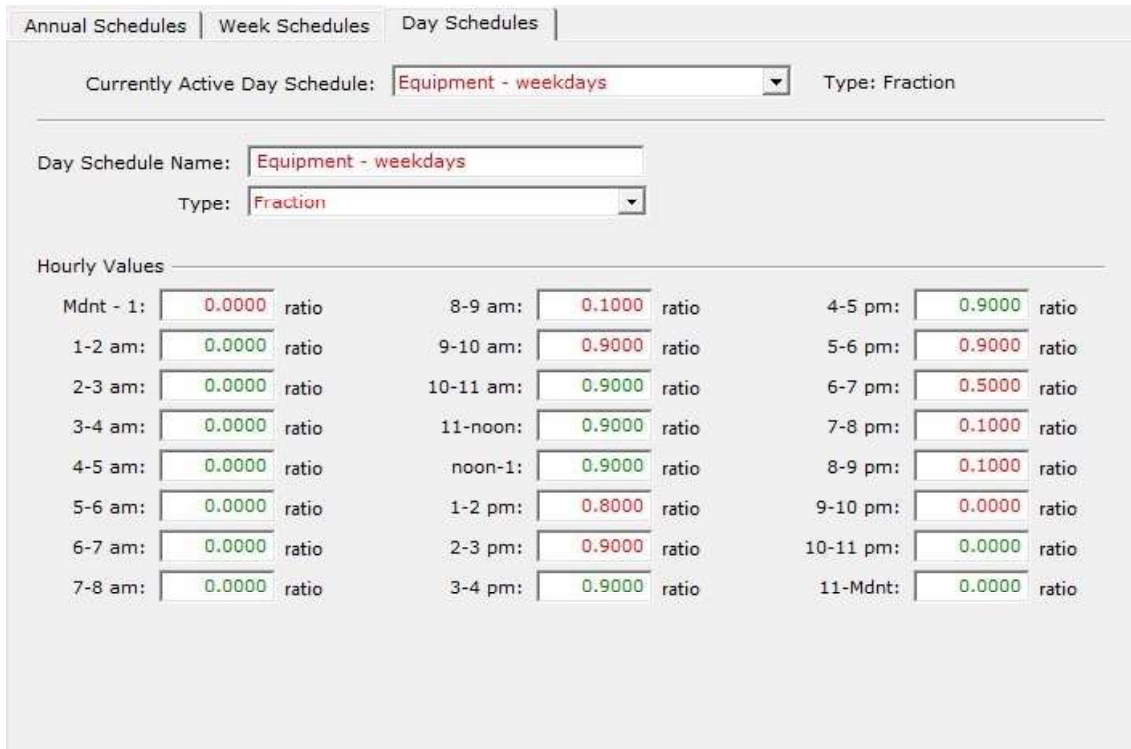


Figure 13: Office equipment weekdays

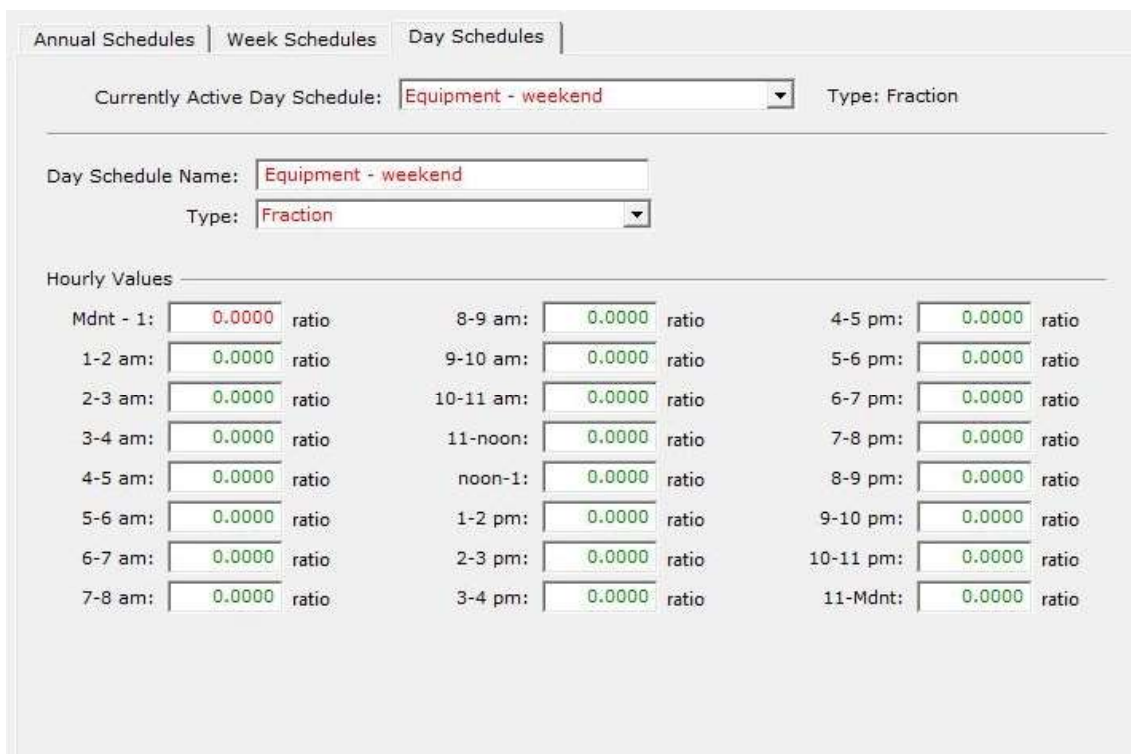


Figure 14: Office equipment weekend

Annual Schedules | Week Schedules | Day Schedules |

Currently Active Day Schedule: **Fan - weekdays** Type: On/Off

Day Schedule Name: **Fan - weekdays**
 Type: **On/Off**

Hourly Values

Mdnt - 1:	<input type="text" value="0"/>	8-9 am:	<input type="text" value="1"/>	4-5 pm:	<input type="text" value="1"/>
1-2 am:	<input type="text" value="0"/>	9-10 am:	<input type="text" value="1"/>	5-6 pm:	<input type="text" value="1"/>
2-3 am:	<input type="text" value="0"/>	10-11 am:	<input type="text" value="1"/>	6-7 pm:	<input type="text" value="0"/>
3-4 am:	<input type="text" value="0"/>	11-noon:	<input type="text" value="1"/>	7-8 pm:	<input type="text" value="0"/>
4-5 am:	<input type="text" value="0"/>	noon-1:	<input type="text" value="1"/>	8-9 pm:	<input type="text" value="0"/>
5-6 am:	<input type="text" value="0"/>	1-2 pm:	<input type="text" value="1"/>	9-10 pm:	<input type="text" value="0"/>
6-7 am:	<input type="text" value="0"/>	2-3 pm:	<input type="text" value="1"/>	10-11 pm:	<input type="text" value="0"/>
7-8 am:	<input type="text" value="0"/>	3-4 pm:	<input type="text" value="1"/>	11-Mdnt:	<input type="text" value="0"/>

Figure 15: HVAC Fan weekdays

Annual Schedules | Week Schedules | Day Schedules |

Currently Active Day Schedule: **Fan - weekend** Type: On/Off

Day Schedule Name: **Fan - weekend**
 Type: **On/Off**

Hourly Values

Mdnt - 1:	<input type="text" value="0"/>	8-9 am:	<input type="text" value="0"/>	4-5 pm:	<input type="text" value="0"/>
1-2 am:	<input type="text" value="0"/>	9-10 am:	<input type="text" value="0"/>	5-6 pm:	<input type="text" value="0"/>
2-3 am:	<input type="text" value="0"/>	10-11 am:	<input type="text" value="0"/>	6-7 pm:	<input type="text" value="0"/>
3-4 am:	<input type="text" value="0"/>	11-noon:	<input type="text" value="0"/>	7-8 pm:	<input type="text" value="0"/>
4-5 am:	<input type="text" value="0"/>	noon-1:	<input type="text" value="0"/>	8-9 pm:	<input type="text" value="0"/>
5-6 am:	<input type="text" value="0"/>	1-2 pm:	<input type="text" value="0"/>	9-10 pm:	<input type="text" value="0"/>
6-7 am:	<input type="text" value="0"/>	2-3 pm:	<input type="text" value="0"/>	10-11 pm:	<input type="text" value="0"/>
7-8 am:	<input type="text" value="0"/>	3-4 pm:	<input type="text" value="0"/>	11-Mdnt:	<input type="text" value="0"/>

Figure 16: HVAC Fan weekend

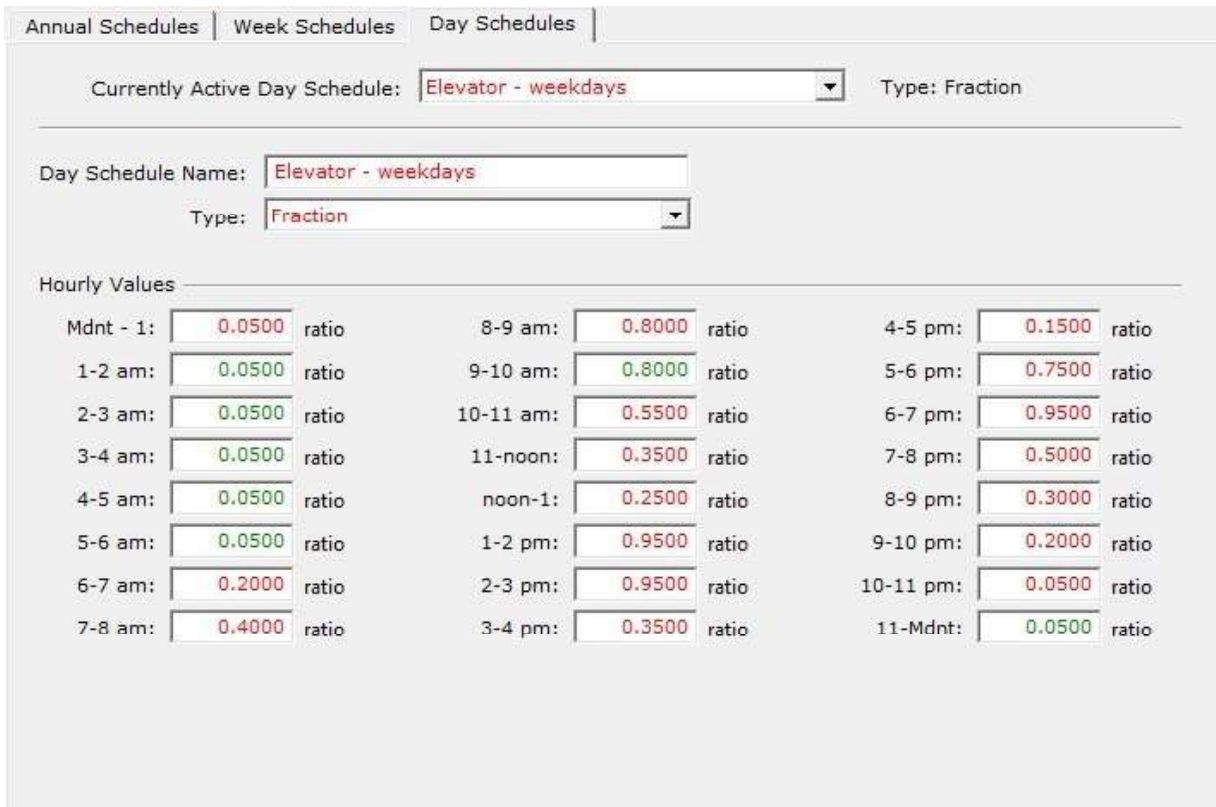


Figure 17: Elevator weekdays

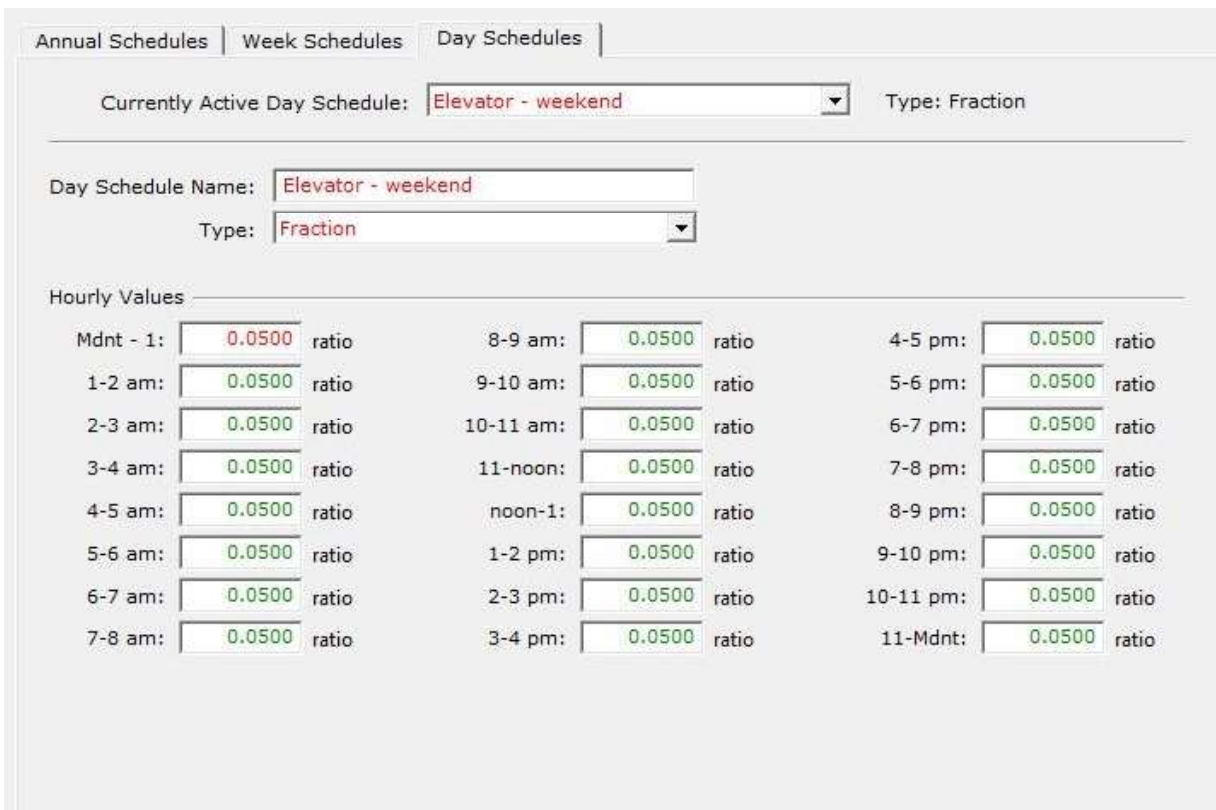


Figure 18: Elevator weekend

Annual Schedules | Week Schedules | Day Schedules

Currently Active Day Schedule: **Basement lighting - weekdays** Type: Fraction

Day Schedule Name: **Basement lighting - weekdays**
 Type: **Fraction**

Hourly Values

Mdnt - 1:	0.0500 ratio	8-9 am:	1.0000 ratio	4-5 pm:	1.0000 ratio
1-2 am:	0.0500 ratio	9-10 am:	1.0000 ratio	5-6 pm:	1.0000 ratio
2-3 am:	0.0500 ratio	10-11 am:	1.0000 ratio	6-7 pm:	1.0000 ratio
3-4 am:	0.0500 ratio	11-noon:	1.0000 ratio	7-8 pm:	1.0000 ratio
4-5 am:	0.0500 ratio	noon-1:	1.0000 ratio	8-9 pm:	0.0500 ratio
5-6 am:	0.0500 ratio	1-2 pm:	1.0000 ratio	9-10 pm:	0.0500 ratio
6-7 am:	0.0500 ratio	2-3 pm:	1.0000 ratio	10-11 pm:	0.0500 ratio
7-8 am:	0.0500 ratio	3-4 pm:	1.0000 ratio	11-Mdnt:	0.0500 ratio

Figure 19: Basement lighting weekdays

Annual Schedules | Week Schedules | Day Schedules

Currently Active Day Schedule: **Basement lighting - weekend** Type: Fraction

Day Schedule Name: **Basement lighting - weekend**
 Type: **Fraction**

Hourly Values

Mdnt - 1:	0.0500 ratio	8-9 am:	0.0500 ratio	4-5 pm:	0.0500 ratio
1-2 am:	0.0500 ratio	9-10 am:	0.0500 ratio	5-6 pm:	0.0500 ratio
2-3 am:	0.0500 ratio	10-11 am:	0.0500 ratio	6-7 pm:	0.0500 ratio
3-4 am:	0.0500 ratio	11-noon:	0.0500 ratio	7-8 pm:	0.0500 ratio
4-5 am:	0.0500 ratio	noon-1:	0.0500 ratio	8-9 pm:	0.0500 ratio
5-6 am:	0.0500 ratio	1-2 pm:	0.0500 ratio	9-10 pm:	0.0500 ratio
6-7 am:	0.0500 ratio	2-3 pm:	0.0500 ratio	10-11 pm:	0.0500 ratio
7-8 am:	0.0500 ratio	3-4 pm:	0.0500 ratio	11-Mdnt:	0.0500 ratio

Figure 20: Basement lighting weekend

Annual Schedules | Week Schedules | Day Schedules

Currently Active Day Schedule: **Basement ventilation - weekdays** Type: Fraction

Day Schedule Name: **Basement ventilation - weekdays**
 Type: **Fraction**

Hourly Values

Mdnt - 1:	0.0000 ratio	8-9 am:	1.0000 ratio	4-5 pm:	1.0000 ratio
1-2 am:	0.0000 ratio	9-10 am:	1.0000 ratio	5-6 pm:	1.0000 ratio
2-3 am:	0.0000 ratio	10-11 am:	1.0000 ratio	6-7 pm:	0.0000 ratio
3-4 am:	0.0000 ratio	11-noon:	1.0000 ratio	7-8 pm:	0.0000 ratio
4-5 am:	0.0000 ratio	noon-1:	1.0000 ratio	8-9 pm:	0.0000 ratio
5-6 am:	0.0000 ratio	1-2 pm:	1.0000 ratio	9-10 pm:	0.0000 ratio
6-7 am:	0.0000 ratio	2-3 pm:	1.0000 ratio	10-11 pm:	0.0000 ratio
7-8 am:	0.0000 ratio	3-4 pm:	1.0000 ratio	11-Mdnt:	0.0000 ratio

Figure 21: Basement vent weekdays

Annual Schedules | Week Schedules | Day Schedules

Currently Active Day Schedule: **Basement ventilation - weekend** Type: Fraction

Day Schedule Name: **Basement ventilation - weekend**
 Type: **Fraction**

Hourly Values

Mdnt - 1:	0.0000 ratio	8-9 am:	0.0000 ratio	4-5 pm:	0.0000 ratio
1-2 am:	0.0000 ratio	9-10 am:	0.0000 ratio	5-6 pm:	0.0000 ratio
2-3 am:	0.0000 ratio	10-11 am:	0.0000 ratio	6-7 pm:	0.0000 ratio
3-4 am:	0.0000 ratio	11-noon:	0.0000 ratio	7-8 pm:	0.0000 ratio
4-5 am:	0.0000 ratio	noon-1:	0.0000 ratio	8-9 pm:	0.0000 ratio
5-6 am:	0.0000 ratio	1-2 pm:	0.0000 ratio	9-10 pm:	0.0000 ratio
6-7 am:	0.0000 ratio	2-3 pm:	0.0000 ratio	10-11 pm:	0.0000 ratio
7-8 am:	0.0000 ratio	3-4 pm:	0.0000 ratio	11-Mdnt:	0.0000 ratio

Figure 22: Basement vent weekend

Envelope Detailed Specification

Table 1: Building envelope properties

Component	Category	Input Parameter	Base case	Proposed
Envelope	Wall	Material	As per ECBC	200 mm Tric-Eco Wall
		U-value (Btu/hrsqt F)	0.114	0.018
	Roof	Material	As per ECBC	150 mm RCC
		U-value (Btu/hrsqt F)	0.218	0.045
	Glass	U-value (Btu/hrsqt F)	0.528	0.264
		SHGC	0.27	0.27
		Shading Coefficient	0.31	0.32
		VLT	-	49%

Table 1 above lists the building envelope properties used for WBP method for Proposed Development

Table 2: U-Value calculation - Building envelope

Wall Composition –Tric Eco Wall				
Item	Thickness (mm)	Thickness (Inch)	R Value per inch (hr.sq.ft. °F/Btu)	R Value (hr.sq.ft. °F/Btu)
External Air				0.25
Tric-Eco Wall	200	7.87	6.87	54.07
Internal Air				0.68
Total R Value				55
U Value (Btu/hr.ft².°F)				0.018

ROOF ASSEMBLY				
Particulars	Thickness (mm)	Thickness (Inch)	R Value per inch (hr.sq.ft. °F/Btu)	R Value (hr.sq.ft. °F/Btu)
External Air				0.25
Heat resistance Tiles	20	0.787	0.2	0.16
Cement Screed	40	1.57	0.4	0.63
Insulation (XPS)	100	3.94	0.3	3.63
PCC In slope	75	2.95	2.4	7.1
RCC Slab	150	5.9	1.6	9.5
Internal Air				0.92
Total R Value				22.2
U Value (Btu/hr.ft².°F)				0.045

HVAC (Heating, Ventilation & Air-conditioning)

The ventilation system has been modeled in accordance with the requirement of §5.2.1 of the code. CFM and load calculation has been summary sheet has been attached in Annexure 1.

Table 3: Zone cooling & heating set point

Component	Category	Input Parameter	Base case	Proposed
HVAC	Specification	System	VRF with DOAS sys	Screw chiller with VAV sys
		Efficiency (EER)	3.02	5.77
	Operation	Schedule	As per ECBC 2017	
	Temperature	Cooling set point (°F)	75	
		Heating set point (°F)	70	

Lighting

Table 4: LPD level as per ECBC

Lighting Power Density calculation (As per space function method- ECBC §6.3.5)			
Space	Baseline case	Propose case	Unit
Office	0.78	0.53	W/ ft ²
External	0.88	0.79	W/ ft ²

Electrical Power

3.1.10. Transformer

The maximum total losses of the proposed transformer at 100% loading and 50% loading has been determined as per ECBC 2017 Table 7-2. Additional metering class current transformers (CTs) and potential transformers (PTs) shall be provided. Voltage drop for feeders shall not exceed 2% at design load. Voltage drop for branch circuit shall not exceed 3% at design load.

3.1.11. Motors (type, efficiency)

IE-4 High Efficiency Motors has been recommended as per ECBC 2017 Section 7.2.2 and shall be followed.

3.1.12. Diesel generator sets

BEE 5 Star Rated Diesel Generator sets have been recommended as per ECBC 2017 Section 7.2.3 and shall be followed.

3.1.13. Check metering and monitoring

Permanently installed electric meter to record demand (kW), energy (kWh), and total power factor (kVARH) has been recommended as per ECBC 2017 Section 7.2.4 and shall be followed. Additionally, sub-meters for HVAC system, Interior and Exterior Lighting and Plug loads shall also be provided.

3.1.14. Power factor correction

APFC panel shall be installed for Power Factor Correction of 0.99. Dry (MPPH type) automatic power factor improvement capacitor banks, 400/430 Volts shall conform to IS-2834-1964 (Amended to date). All the units shall be connected in parallel for each block by means of solid copper bars.

3.1.15. Power distribution system

Power cabling shall be sized so that the distribution losses do not exceed 1% of the total power usage as recommended in ECBC 2017 Section 7.2.6. All cables are XLPE as IS: 7098 for power current carrying capacity so the losses are minimum.

3.1.16. Uninterruptable Power Supply (UPS)

Energy Efficient UPS system with minimum efficiency of 93.8% at 100% loading is being installed for Emergency lighting, Fire alarm and security systems.

Energy Performance Analysis

The proposed building is considered operating throughout the day. The following table indicates the operating hours and diversity factors considered for the building.

Table 5: Operation schedule considered

Component	Category	Input Parameter	Base case	Proposed
Occupancy & Equipment	Equipment	All spaces (W/sqft)	1.0	
	Operation	Equipment Schedule	As per Section 9.6 of ECBC 2017	
		Occupancy Schedule	As per Section 9.6 of ECBC 2017	

Table 6: Summary of Unmet hours

Baseline case	Cool Unmet hour	75
	Heat Unmet hour	0
Proposed case	Cool Unmet hour	3
	Heat Unmet hour	0

Table 7: Summary of total tonnage and Sq. ft. per TR

	Total tonnage	Sq. ft. per TR
Proposed case	260	337
Baseline case	751	116

Summary of Renewable Energy generation of the project:

A dedicated REGZ equivalent to at least 25 % of roof area or area required for generation of energy equivalent to 1% of total peak demand or connected load of the building, whichever is less, shall be provided in all buildings.

Total peak demand of the building = 465.25 KW

Therefore, 1% of peak demand = $(465.25 \times 0.01) = 4.65$ kW

But project has proposed to install **60 kW** PV system = $(60/465.25) \times 100\% = 12.9\%$ of total peak demand.

Solar PV generation calculation has been attached in Annexure 2.

Building View:

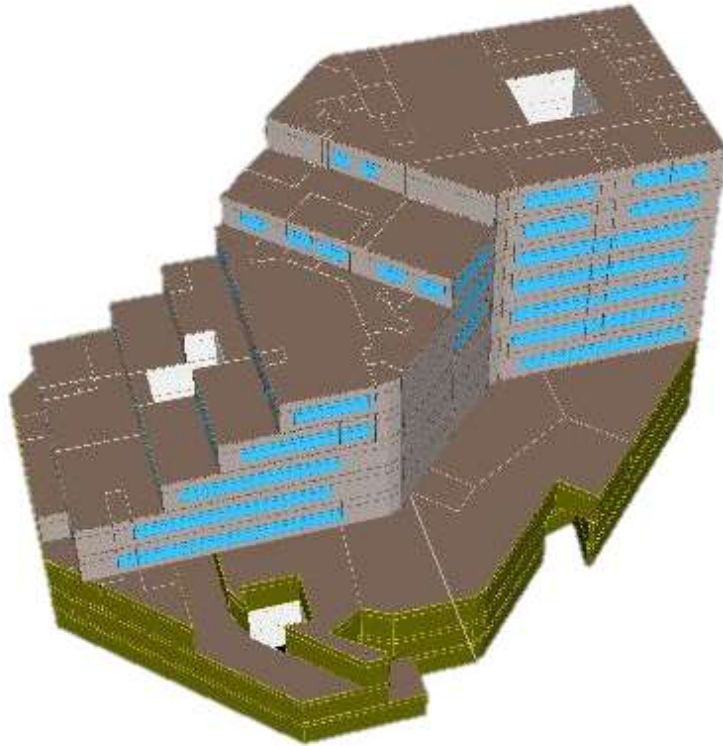


Figure 23 : 3D Front view – UHBVN building

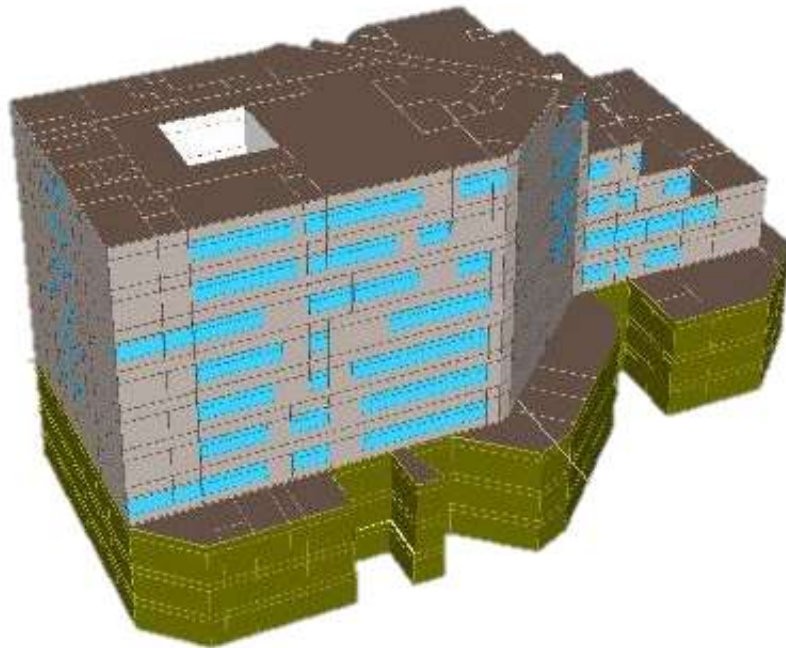


Figure 24: 3D rear view – UHBVN building

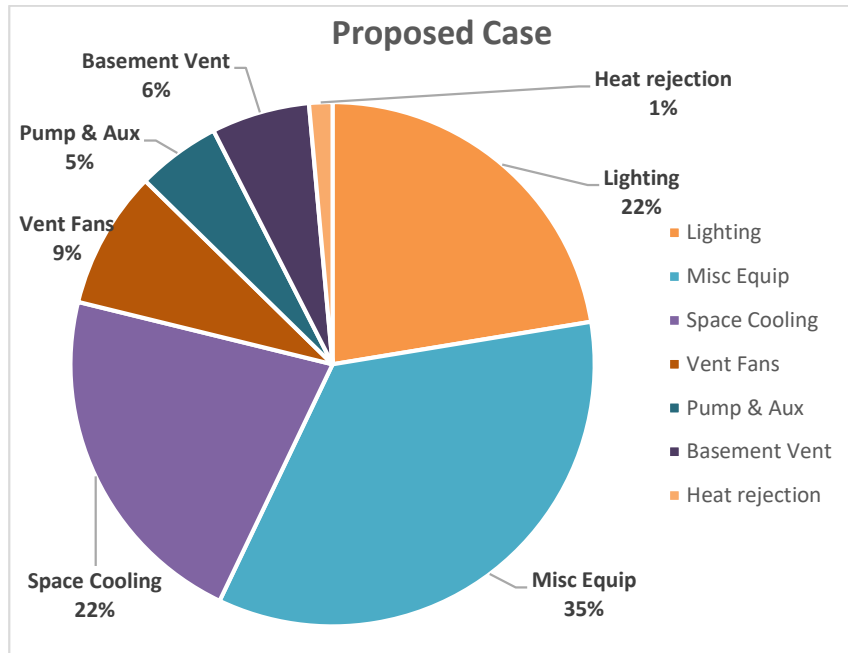


Figure 25: Proposed Energy End Use Characterization

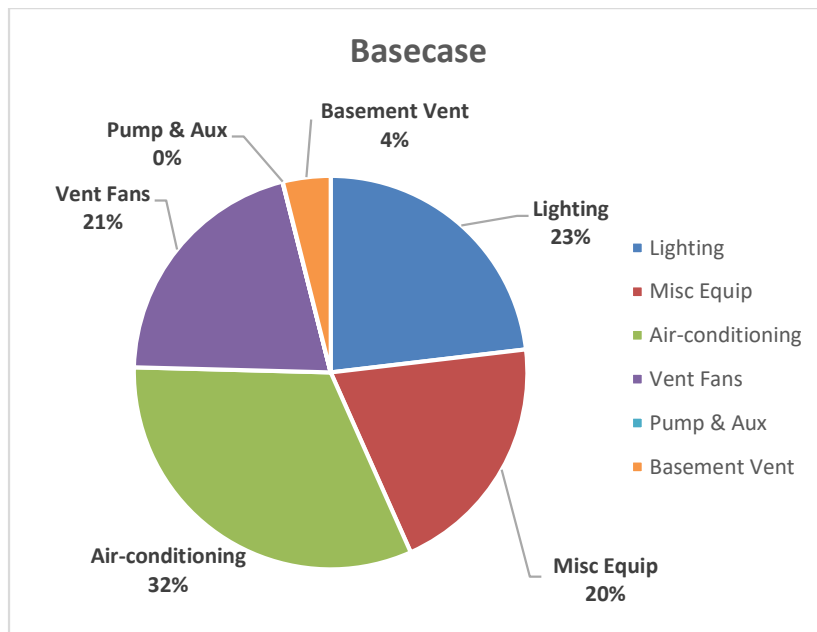


Figure 26: Base case Energy End Use Characterization

Overall Energy Consumption

Table 8: Overall Energy consumption in kWh (without basement and external lighting consumption)

DESCRIPTION	UNITS	LIGHTS	MISC EQUIP	Air-conditioning	Pump & Aux	VENT FANS	Heat rejection	TOTAL
PROPOSED	KWH	231726	336183	210287	50477	66155	14189	913092
BASE - 0 DEG	KWH	408310	336183	501612	208	315757	-	1562070
BASE - 90 DEG	KWH	408310	336183	520619	208	361570	-	1626890
BASE - 180 DEG	KWH	408310	336183	532486	208	347709	-	1624896
BASE - 270 DEG	KWH	408310	336183	519961	208	316861	-	1581523
BASE - AVG	KWH	408310	336183	518669.5	208	335474.3	-	1598845
ENERGY / COST SAVINGS		43.2%	0%	58.3%	-	80.3%	-	42.9%

From the above table following parameters are analyzed, proposed case energy consumption of the project is estimated to be **913092** kWh, which is less than the base case energy consumption i.e., **1598845** kWh.

Therefore, the project achieves an energy saving of 42.9% when compared with the ECBC baseline case. Thereby, the project is meeting the ECBC compliance by the 'Whole Building Performance' approach.

e-Quest Output Screenshots

Commercial Building

Baseline 0 degree

Demo Project - UHBVN DOE-2.2-50a 4/04/2023 12:42:54 BDL RUN 1

REPORT- BEPU Building Utility Performance WEATHER FILE- EPW Hissar,Haryana,I

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM 1 ELECTRICITY													
KWH	408310.	0.	336183.	4621.	496991.	0.	208.	315757.	0.	0.	0.	133152.	1695223.
EM 2 ELECTRICITY													
KWH	0.	0.	229695.	0.	0.	0.	0.	65120.	0.	0.	0.	0.	294816.
FMI NATURAL-GAS THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

TOTAL ELECTRICITY 1990039. KWH 27.473 KWH /SQFT-YR GROSS-AREA 27.473 KWH /SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.86
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
 HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 75
 HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 0

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

Baseline 90 degree

Demo Project - UHBVN DOE-2.2-50a 4/04/2023 12:05:48 BDL RUN 1

REPORT- BEPU Building Utility Performance WEATHER FILE- EPW Hissar,Haryana,I

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM 1 ELECTRICITY													
KWH	408310.	0.	336183.	7602.	513017.	0.	208.	361570.	0.	0.	0.	133152.	1760043.
EM 2 ELECTRICITY													
KWH	0.	0.	229695.	0.	0.	0.	0.	65120.	0.	0.	0.	0.	294816.
FMI NATURAL-GAS THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

TOTAL ELECTRICITY 2054859. KWH 28.368 KWH /SQFT-YR GROSS-AREA 28.368 KWH /SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 1.61
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
 HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 141
 HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 0

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

Baseline 180 degree

Demo Project - UHBVN DOE-2.2-50a 4/04/2023 13:13:02 BDL RUN 1

REPORT- BEPU Building Utility Performance WEATHER FILE- EPW Hissar,Haryana,I

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM 1 ELECTRICITY													
KWH	408310.	0.	336183.	4713.	527773.	0.	208.	347709.	0.	0.	0.	133152.	1758050.
EM 2 ELECTRICITY													
KWH	0.	0.	229695.	0.	0.	0.	0.	65120.	0.	0.	0.	0.	294816.
FM1 NATURAL-GAS THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL ELECTRICITY			2052866. KWH	28.340 KWH /SQFT-YR GROSS-AREA			28.340 KWH /SQFT-YR NET-AREA						
PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.23													
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00													
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 20													
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 0													
NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.													

Baseline 270 degree

Demo Project - UHBVN DOE-2.2-50a 4/04/2023 15:24:05 BDL RUN 1

REPORT- BEPU Building Utility Performance WEATHER FILE- EPW Hissar,Haryana,I

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM 1 ELECTRICITY													
KWH	408310.	0.	336183.	3503.	516458.	0.	208.	316861.	0.	0.	0.	133152.	1714676.
EM 2 ELECTRICITY													
KWH	0.	0.	229695.	0.	0.	0.	0.	65120.	0.	0.	0.	0.	294816.
FM1 NATURAL-GAS THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL ELECTRICITY			2009492. KWH	27.742 KWH /SQFT-YR GROSS-AREA			27.742 KWH /SQFT-YR NET-AREA						
PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.00													
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00													
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 0													
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 0													
NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.													

Proposed Case

Demo Project - UHBVN DOE-2.2-50a 4/10/2023 10:38:52 BDL RUN 1

REPORT- BEPU Building Utility Performance

WEATHER FILE- EPW Hissar, Haryana, I

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM 1 ELECTRICITY													
KWH	231726.	0.	336183.	0.	214362.	14189.	50477.	66155.	0.	0.	0.	119136.	1032229.
EM 2 ELECTRICITY													
KWH	0.	0.	229695.	0.	0.	0.	0.	58608.	0.	0.	0.	0.	288304.
FM1 NATURAL-GAS													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

TOTAL ELECTRICITY 1320532. KWH 18.230 KWH /SQFT-YR GROSS-AREA 18.230 KWH /SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.03
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 5.80
 HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 3
 HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 0

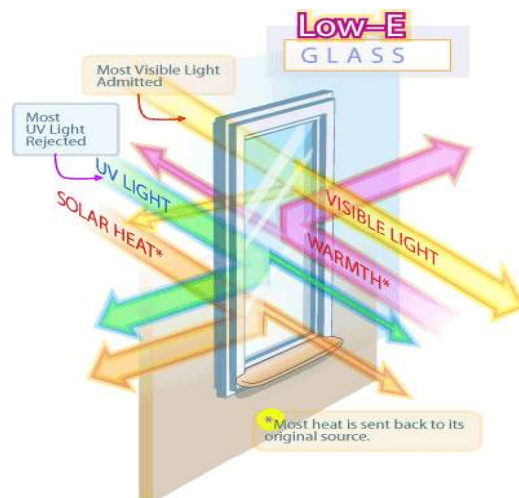
NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

Daylight Analysis

Introduction

The commitment 4.2.3 of ECBC 2017 for ECBC Compliance Building is checked by computer simulation analysis. In the computer analysis method, the daylight analysis is done by creating a model in Design Builder and then simulating it further. A summary of daylight calculations is provided in Table 11. The simulation tool and UDI analysis image of each floor plate are attached below.

Daylight is a natural source of light, which meets all the requirements of good lighting while enhancing user efficiency and productivity. In India, daylight is available in plenty and can be used for satisfactory indoor illumination during the day. Daylighting plays a crucial role in developing comfortable indoor environmental quality. It reduces the need for electric lighting of building interiors, resulting in decreased energy use. Daylight penetration inside the living space depends entirely on the building design, i.e., the orientation, internal space arrangement, distribution of openings, size and shape of the openings, shading design and glazing properties, and soon.



For achieving utmost benefit of day lighting within a living space, the glass should be chosen in such a way that it allows maximum penetration of daylight to provide visual comfort to the inhabitants without producing glare. In addition to that, the glass should also restrict the heat of the sun from entering the space thereby reducing the cooling load of the space.

Objective

The prime intent of the criterion is to ensure connectivity between the interior and the exterior environment, by providing adequate day lighting within the living spaces. The analysis would help in:

- Optimizing the type of glass used
- Assessing the availability of daylight in living areas and finalizing the credit points as per the new buildings criteria.

Methodology-

In the computer analysis method, the daylight analysis is done by creating a model and then performing Analysis in Design Builder software. For day lighting analysis, the following design values have been considered during this process:

1. The model is designed considering that the sky is clear.
2. The day lighting simulation is done on a work plane of 800 mm height from finish floor level.

Executive Summary-

Project Name	UHBVN Building, Panchkula
Project Type	Office Building
Location	Panchkula
Climate Type	Composite
Daylighted Area (%)	66.2 %
Simulation Tool Used	Design Builder

Daylight Analysis

The commitment 4.2.3 of ECBC 2017 for Compliance Building is checked by computer simulation Analysis. In the computer analysis method, the daylight analysis is done by creating a model and then performing Analysis in Design Builder software. A summary of daylight calculations is provided in the table below. The simulation tool and UDI Analysis image of each floor plate are attached below.

Table 9: Daylight Calculation

Floor Description	UDI
Ground Floor	64.6 %
First Floor	67.6 %
Second Floor	65.6 %
Third Floor	66.4 %
Fourth Floor	64.9 %
Fifth Floor	65.9 %
Sixth Floor	69.1 %
Total UDI of the Project	66.2 %
SuperECBC recommendation for building category	60 %

Design Builder Daylight Simulation Screenshots

Simulated results:

Untitled, UHBVN

Illuminance
 Annual daylighting

Block	Zone	Floor Area (m2)	sDA Area in Range (m2)	sDA Area in Range (%)	ASE Area in Range (m2)	ASE Area in Range (%)	UDI Area in Range (m2)	UDI Area in Range (%)
Ground floor	Zone 1	1583.136	853.173	53.891	1254.420	79.236	1023.343	64.640
First floor	Zone 1	1550.110	850.332	54.856	1221.007	78.769	1048.543	67.643
Second floor	Zone 1	1450.557	849.848	58.588	1101.782	75.956	952.280	65.649
Third floor	Zone 1	1283.935	772.176	60.141	957.734	74.594	851.995	66.358
Fourth floor	Zone 1	1042.545	668.778	64.149	740.800	71.057	677.009	64.938
Fifth floor	Zone 1	889.416	658.231	74.007	606.753	68.219	585.804	65.864
Sixth floor	Zone 1	714.746	603.359	84.416	450.305	63.002	493.742	69.079
Total		8514.445	5255.897	61.729	6332.801	74.377	5632.717	66.155

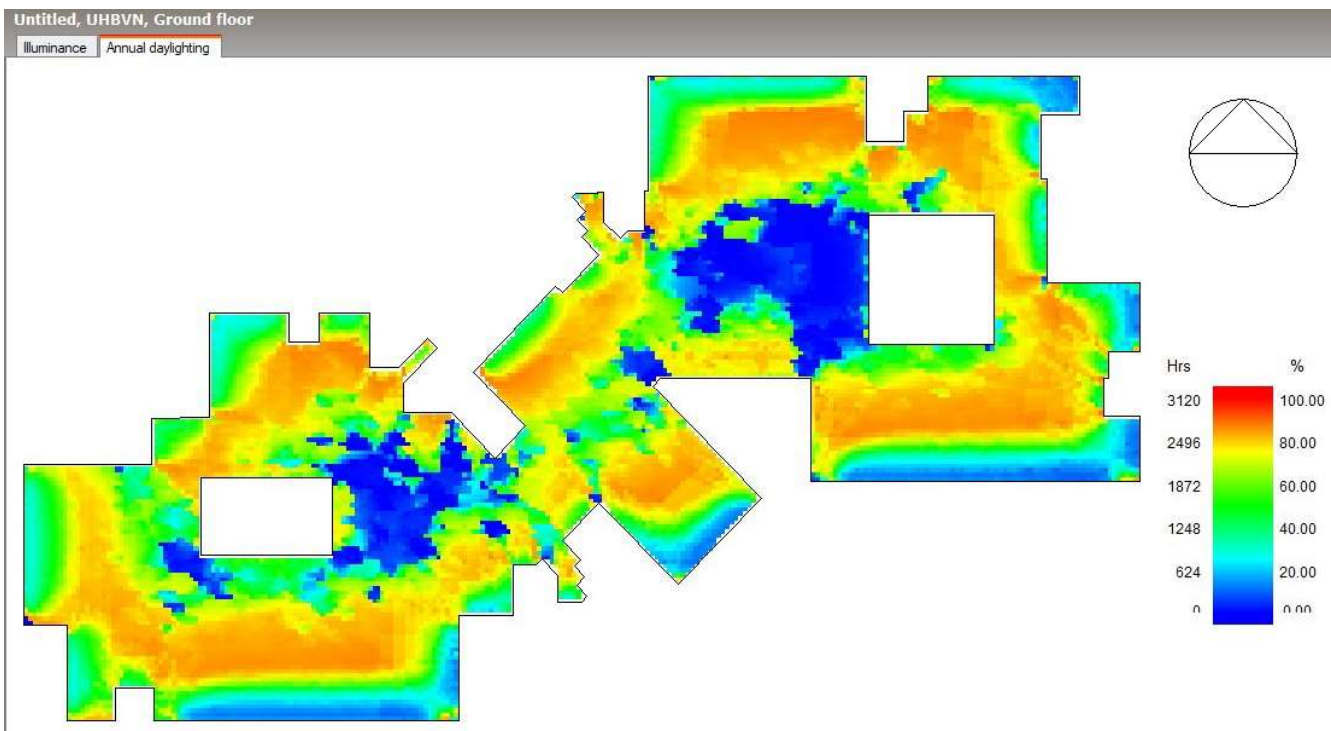


Figure 27: Ground Floor

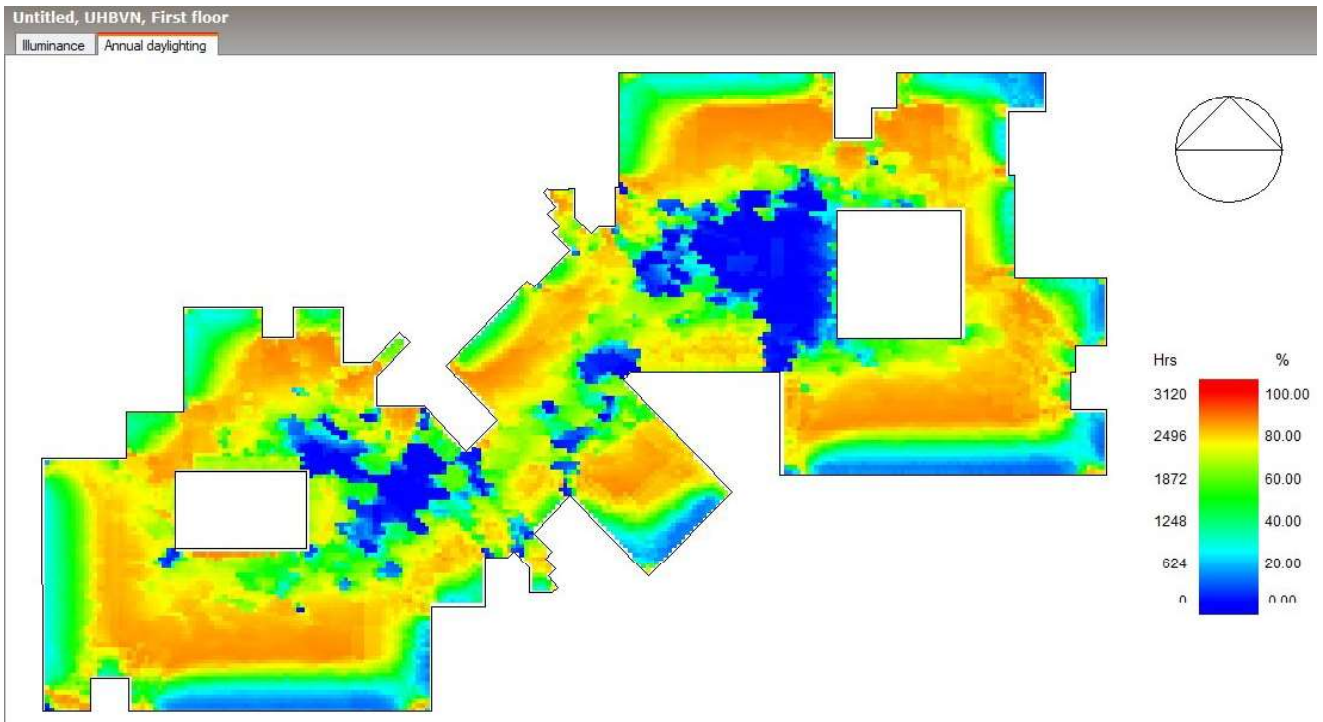


Figure 28: First Floor

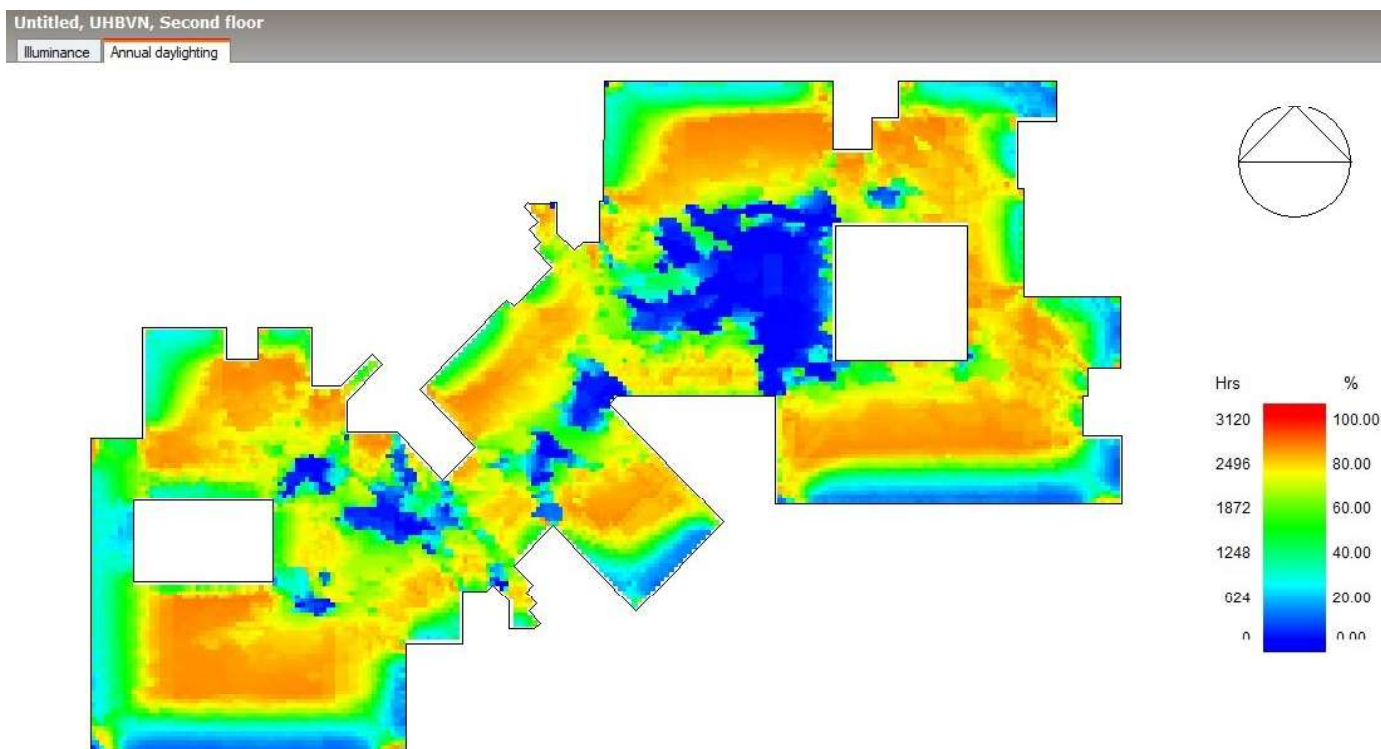


Figure 29: Second Floor

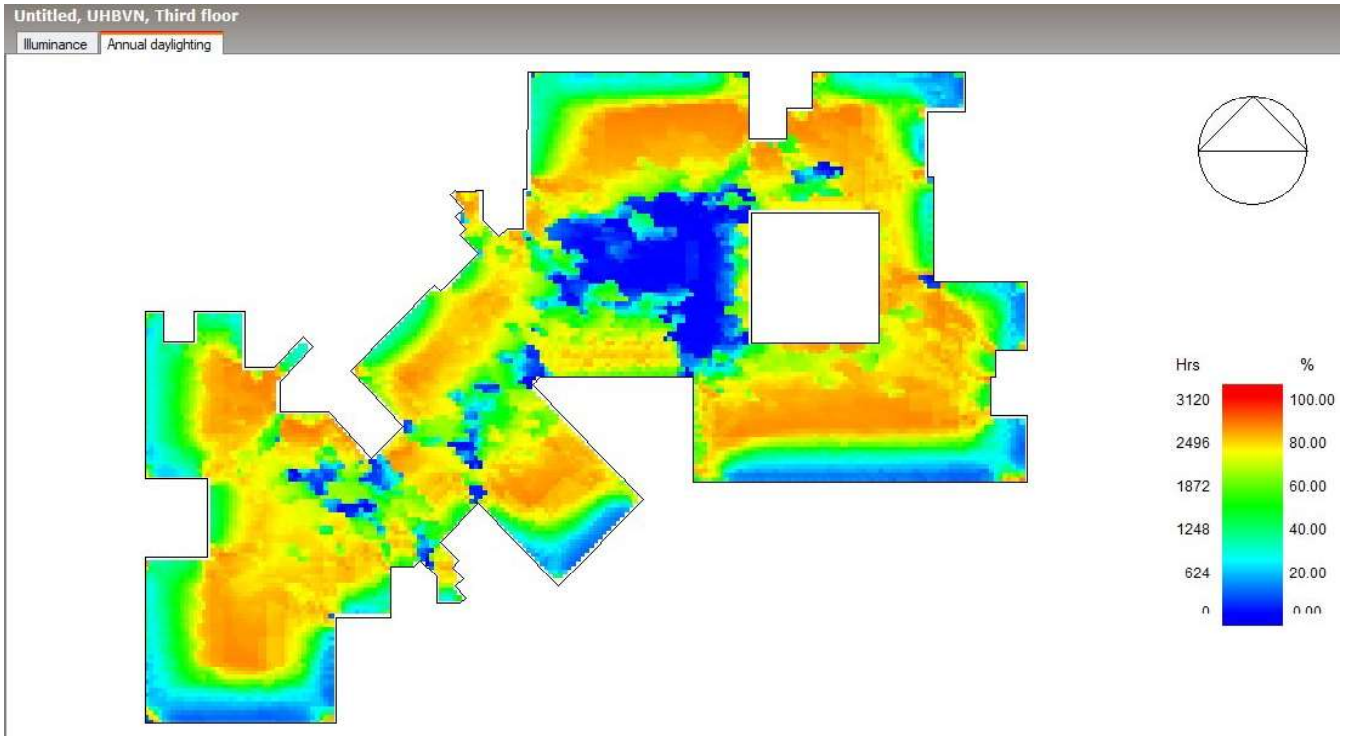


Figure 30: Third Floor

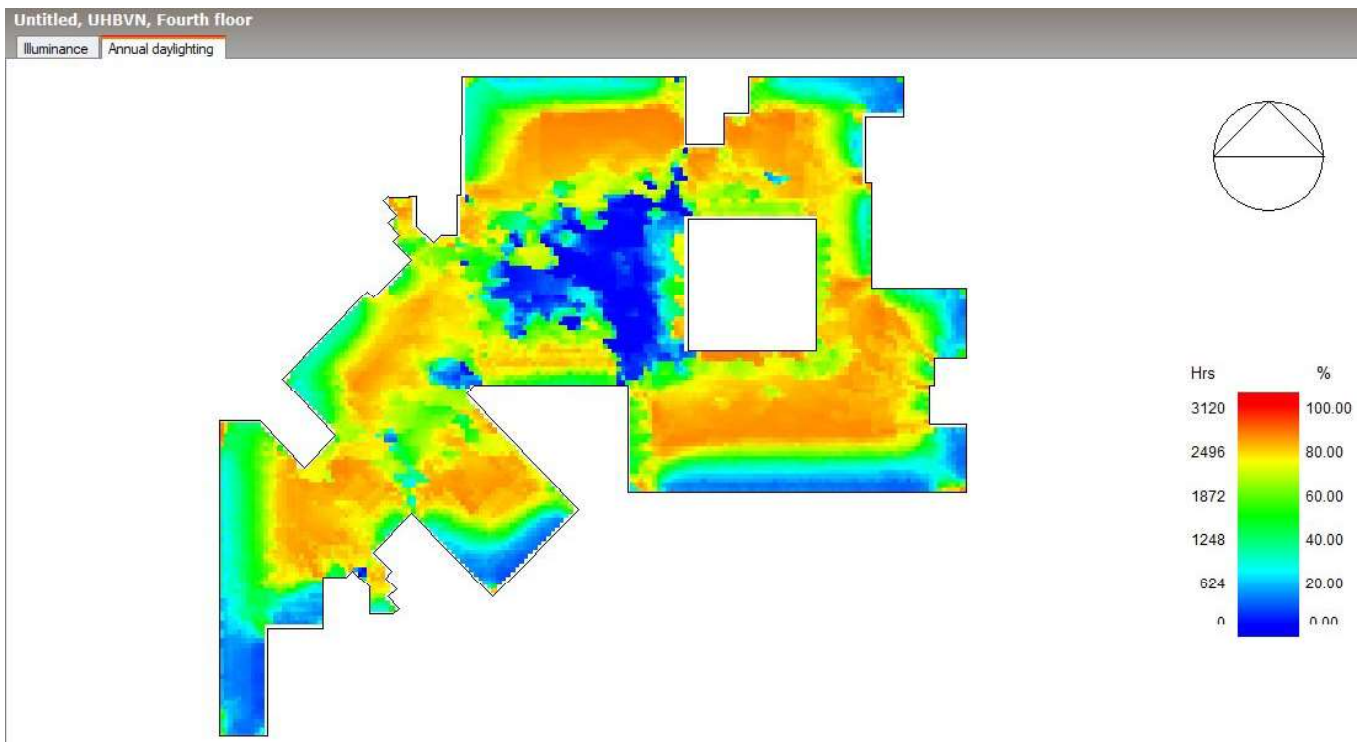


Figure 31: Fourth Floor

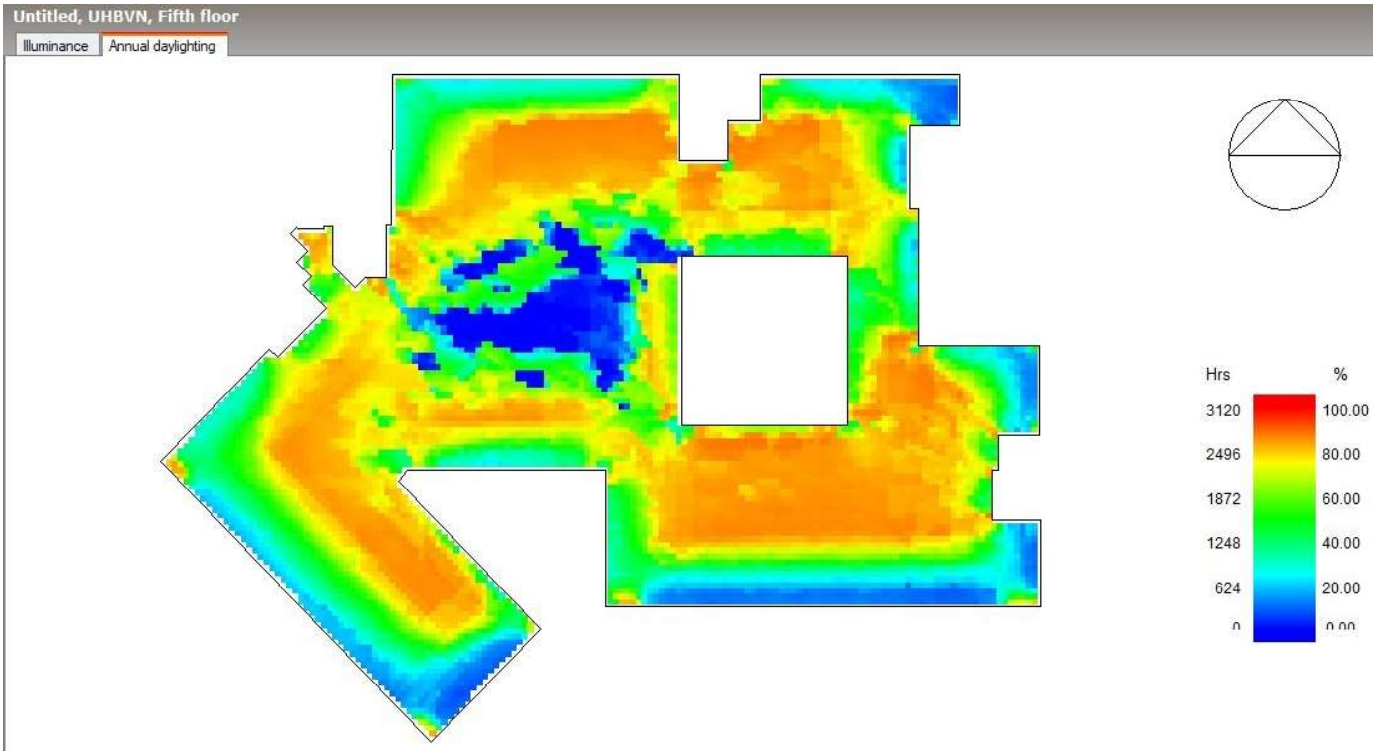


Figure 32: Fifth Floor

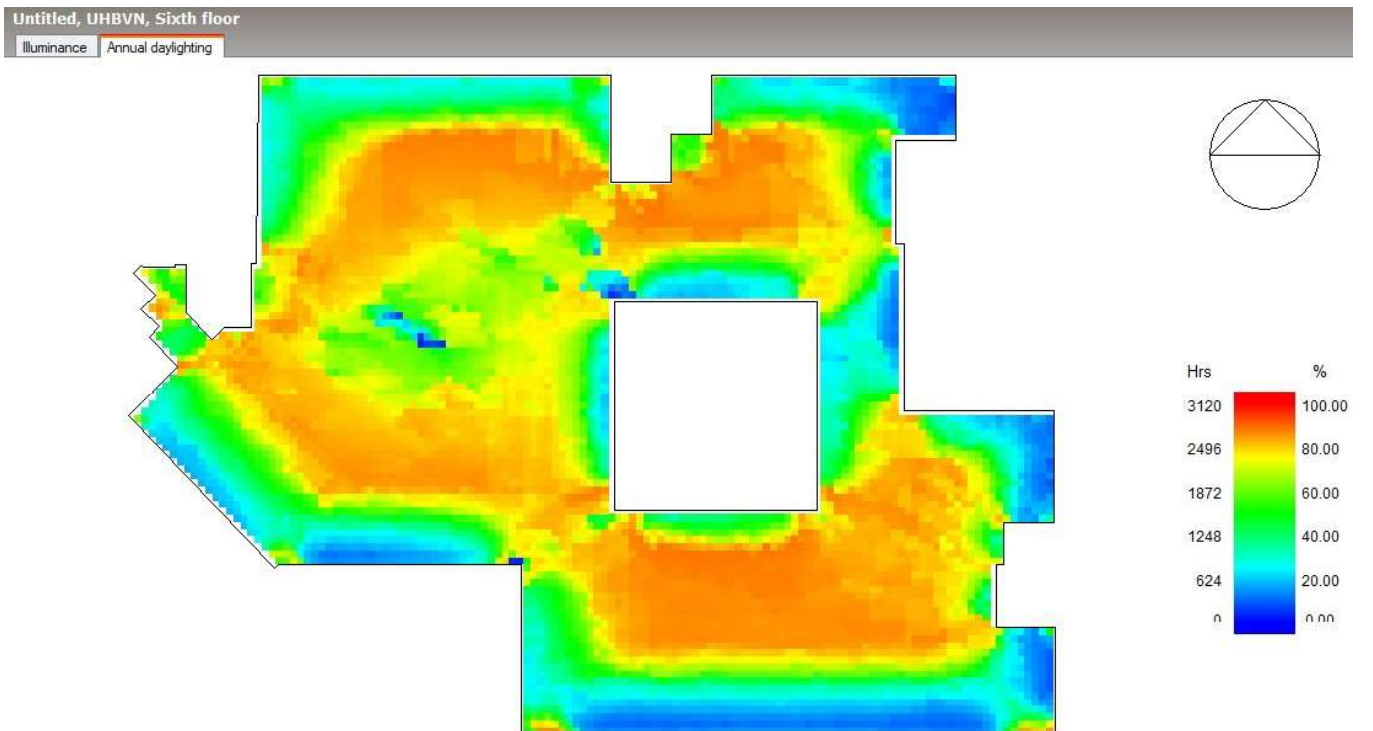


Figure 33: Sixth Floor

Cost Analysis:

For the increased energy performance of the building, energy efficient materials were used in the building which are not conventionally used. Cost comparison analysis was done for the building systems coming under the scope of ECBC for both the baseline and proposed buildings. The total investment in the conventional building is not available for the building systems coming under the scope of ECBC. There is no incremental cost for ECBC compliant buildings.

Table 10: Cost Analysis:

Cost Feasibility Analysis – UHBVN Office Building, Sector 14, Panchkula						
S. No.	Particulars	Quantity	Unit	Rate	Total Amount (Rs)	Difference (lacs)
1	Red Brick wall assembly					
	1. Outside plaster 12 mm	1644.70	Cu.ft			
	2. External Red Brick wall 230 mm	31523.36	Cu.ft			
	3. Inside Cement Plaster 12 mm	1644.70	Cu.ft			
	3. Roof	84520.00	Sq.ft			
	Wall area from Ground to Top Floor					
	Total Wall Area	41786.00	Sq.ft			
	Total Window area	10612.00	Sq.ft			
	Red Brick Wall	892.11	cum	3818	3,406,079.96	
	Cost of 230 mm Eco Tric wall	892.11	sqm	3573	3,187,512.76	
	Extra cost for wall				-218,567.21	
	No Insulation provided	0	sqm		0.00	
	Total increment cost of Wall Assembly		INR		-218,567.21	-218,567.21
2	RCC Roof Work					
	<u>Note:</u> For Both case RCC slab has been taken so no extra cost will be incremented					
	Basecase: RCC roof Slab 150 mm	7855.02	cum	3950	31027323.42	
	Proposed Case: RCC roof Slab 150 mm	7855.02	cum	3950	31,027,323.42	
	Total increment cost of roof Assembly		INR		0.00	0.00
3	Glass Work in windows					
	Basecase: Single glazed vision panels in UPVC frame	986.25	sqm	1004	990190.33	
	Proposed Case: DGU having 6mm thick solar glass on external side	986.25	sqm	2237	2206230.86	
	Total increment cost Window Glazing Assembly		INR		1216040.52	1216040.52
4	HVAC					
	Base case- VRF with DOAS sys 3.02	751.00	ton	53000.00	39803000.00	
	Propose case- Screw chiller with VAV sys 5.77	260.00	ton	56000.00	14560000.00	
	Cost Saving in HVAC System		INR		-25243000.00	-25243000.00
5	Lighting					

	Basecase: Lighting Load	11000	Nos	1800	19800000	
	Proposedcase: Lighting Load	9000	Nos	1800	16200000	
	Cost Saving in Lighting System		INR		-3600000	-3600000.00
5	Roof Top Solar PV Panel 25% of roof area or 1% of Peak Demand or Connected Load					
		60	kW	48042	2,882,520.00	2,882,520.00
6	Occupancy control in all toilets and rooms except common areas (Approx) as per drawing	10	Nos.	3090	30900.00	30900.00
	Total cost		INR			-
						24,932,106.69
	Add 10% for miscellaneous items					-2493210.67
	Total					-27425317.35
	Add GST @ 12%					-3291038.08
	Total additional cost for ECBC compliance		INR			-30716355.44

S.no	Case	Kwh/Year
1	Base Case	1797117
2	Proposed Case	1076647
3	Renewable Energy Generation Zone	86919
Total Annual Energy Savings		720470
Total Saving in Cost (Rupees) @8.5		6123995
Payback Period (Years)		-2.3

ECBC Compliance Forms

ECBC Compliance Forms are placed at Annexure -4.

Appendix:

- Annexure 1 : Ventilation CFM and load calculation
- Annexure 2 : Solar PV generation calculation sheet from snapshot.
- Annexure 3 : Cut sheets
- Annexure 4 : Compliance Forms

Abbreviations

AAC	Autoclaved Aerated Concrete	mps	Meters Per Second
ACTI	Cooling Tower Institute	ODP	Ozone Depletion Potential
ANSI	American National Standards Institute	PCC	Pozzolana Cement Concrete
ASHRAE	American Society of Heating, Refrigerating And Air-Conditioning Engineers	PCM	Phase Change Material
DEVap	Desiccant Enhanced Evaporative Air-Conditioning	PMV	Pulse Modulating Valve
ECBC	Energy Conservation Building Code	PUF	Polyurethane Foam
EEV	Electronic Expansion Valve	RCC	Reinforced Cement Concrete
GPM	Gallons Per Minute	TRIC	Thermally Resistant Insulated Concrete
GWP	Global Warming Potential	TXV	Thermostatic Expansion Valve
HR	Heat Recovery	VAV	Variable Air Volume
HVAC	Heating, Ventilation And Air Conditioning	VRF	Variable Refrigerant Flow
LCCA	Life Cycle Cost Analysis	VRV	Variable Refrigerant Volume
LDAC	Liquid-Desiccant Air Conditioner	wg	Water Gauge

Annexures

Annexure 1 : Ventilation CFM and load calculation

Baseline case

System & Zone Name	System Type Principal Zone Activity	Type*	Design Flow			Design Ventilation			Design Capacity				Hrs Outside ThrI-Range				
			Area sqft	Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool Btuh/sf	Heat Btuh/sf	Cool Hrs	Heat Hrs
E1 Sys1 (MZS) (G)	Pkqd Var Vol Var Temp	d	15,119	20,976	1.39	88%	859	4%	0.057	7.2	56	271	375	44.4	71.1	1	0
... E1 South Perim Zn (G.S1)	Office (Open Plan) (45%)	U	46	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 WSW Perim Zn (G.WSW2)	Office (Open Plan) (33%)	U	1,387	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C3)	Office (Open Plan) (33%)	U	29	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 NW Perim Zn (G.NW4)	Office (Open Plan) (33%)	U	274	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C5)	Office (Open Plan) (33%)	U	113	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 NW Perim Zn (G.NW8)	Office (Open Plan) (33%)	U	306	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 North Perim Zn (G.N7)	Office (Open Plan) (33%)	U	287	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 North Perim Zn (G.N8)	Office (Open Plan) (45%)	U	31	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 NNW Perim Zn (G.NNW9)	Office (Open Plan) (33%)	U	116	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C10)	Office (Open Plan) (33%)	U	127	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C11)	Office (Open Plan) (33%)	U	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 North Perim Zn (G.N12)	Office (Open Plan) (45%)	C	2,668	2,703	1.01	6%	152	6%	0.057	10.0	8	322	326	37.2	65.9	1	0
... E1 South Perim Zn (G.S13)	Office (Open Plan) (45%)	S	2,758	4,294	1.56	100%	157	4%	0.057	10.0	13	210	326	57.2	80.5	0	0
... E1 South Perim Zn (G.S14)	Office (Open Plan) (33%)	U	269	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 SSE Perim Zn (G.SSE15)	Office (Open Plan) (45%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C16)	Office (Open Plan) (33%)	U	23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C17)	Office (Open Plan) (33%)	U	80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 SE Perim Zn (G.SE18)	Office (Open Plan) (45%)	U	652	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 SE Perim Zn (G.SE19)	Office (Open Plan) (45%)	S	3,029	2,544	0.84	100%	172	7%	0.057	10.0	9	389	326	30.9	61.2	0	0
... E1 Core Zn (G.C20)	Office (Open Plan) (33%)	U	23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C21)	Office (Open Plan) (33%)	U	80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 NW Perim Zn (G.NW22)	Office (Open Plan) (33%)	U	634	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 NW Perim Zn (G.NW23)	Office (Open Plan) (33%)	U	583	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 NNW Perim Zn (G.NNW24)	Office (Open Plan) (45%)	U	73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C25)	Office (Open Plan) (33%)	U	61	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C26)	Office (Open Plan) (33%)	U	204	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C27)	Office (Open Plan) (33%)	U	152	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C28)	Office (Open Plan) (33%)	U	479	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C29)	Office (Open Plan) (33%)	U	22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 East Perim Zn (G.E30)	Office (Open Plan) (33%)	U	91	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 SSE Perim Zn (G.SSE31)	Office (Open Plan) (45%)	S	2,903	4,379	1.51	100%	165	4%	0.057	10.0	13	216	326	55.5	79.2	0	0
... E1 Core Zn (G.C32)	Office (Open Plan) (33%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 East Perim Zn (G.E33)	Office (Open Plan) (33%)	U	299	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C34)	Office (Open Plan) (33%)	U	16	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C35)	Office (Open Plan) (33%)	U	40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C36)	Office (Open Plan) (33%)	U	10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C37)	Office (Open Plan) (33%)	U	92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 North Perim Zn (G.N38)	Office (Open Plan) (33%)	U	131	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 ENE Perim Zn (G.ENE39)	Office (Open Plan) (33%)	U	327	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 North Perim Zn (G.N40)	Office (Open Plan) (33%)	U	85	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 North Perim Zn (G.N41)	Office (Open Plan) (45%)	S	3,762	4,321	1.15	100%	214	5%	0.057	10.0	13	284	326	42.2	69.5	0	0
Sum of Zones				18,240							56					0%	0%
Sum of Zones / System Total				87%							100%						

System & Zone Name	System Type Principal Zone Activity	Type*	Design Flow			Design Ventilation			Design Capacity				Hrs Outside Thr-Range				
			Area sqft	Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool Btuh/sf	Heat Btuh/sf	Cool Hrs	Heat Hrs
E2 Sys2 (MZS) (G)	Pkgd Var Vol Var Temp	d	16,900	69,784	4.13	96%	1,903	3%	0.113	16.2	179	94	390	127.0	213.1	47	116
... E2 South Perim Zn (G.S1)	Office (Open Plan) (34%)	U	86	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 SSE Perim Zn (G.SSE2)	Office (Open Plan) (34%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 West Perim Zn (G.W3)	Office (Open Plan) (34%)	U	76	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C4)	Office (Open Plan) (34%)	U	33	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 North Perim Zn (G.N5)	Office (Open Plan) (34%)	U	279	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 NW Perim Zn (G.NW6)	Office (Open Plan) (44%)	C	405	2,818	6.96	2%	45	2%	0.111	20.0	8	50	346	241.4	302.1	0	96
... E2 North Perim Zn (G.N7)	Office (Open Plan) (34%)	U	131	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 SSW Perim Zn (G.SSW8)	Office (Open Plan) (44%)	S	3,640	19,253	5.29	100%	404	2%	0.111	20.0	56	65	346	183.5	257.0	0	20
... E2 NW Perim Zn (G.NW9)	Office (Open Plan) (44%)	S	3,405	18,858	5.54	100%	378	2%	0.111	20.0	55	62	346	192.1	283.7	0	0
... E2 Core Zn (G.C10)	Office (Open Plan) (34%)	U	127	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C11)	Office (Open Plan) (34%)	U	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 NW Perim Zn (G.NW12)	Office (Open Plan) (34%)	U	645	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C13)	Office (Open Plan) (34%)	U	23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C14)	Office (Open Plan) (34%)	U	80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C15)	Office (Open Plan) (34%)	U	81	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 NW Perim Zn (G.NW16)	Office (Open Plan) (34%)	U	582	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 NNW Perim Zn (G.NNW17)	Office (Open Plan) (44%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C18)	Office (Open Plan) (34%)	U	204	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C19)	Office (Open Plan) (34%)	U	152	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 SE Perim Zn (G.SE20)	Office (Open Plan) (34%)	U	517	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C21)	Office (Open Plan) (34%)	U	80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C22)	Office (Open Plan) (34%)	U	23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 SE Perim Zn (G.SE23)	Office (Open Plan) (44%)	S	916	2,821	3.08	100%	127	5%	0.139	25.0	8	112	346	106.8	197.4	46	0
... E2 Core Zn (G.C24)	Office (Open Plan) (34%)	U	22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C25)	Office (Open Plan) (44%)	U	479	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 South Perim Zn (G.S26)	Office (Open Plan) (34%)	U	45	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 East Perim Zn (G.E27)	Office (Open Plan) (34%)	U	92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 SSE Perim Zn (G.SSE28)	Office (Open Plan) (44%)	S	5,102	10,547	2.07	100%	567	5%	0.111	20.0	30	167	346	71.7	170.0	1	0
... E2 East Perim Zn (G.E29)	Office (Open Plan) (34%)	U	107	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C30)	Office (Open Plan) (34%)	U	40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C31)	Office (Open Plan) (34%)	U	10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C32)	Office (Open Plan) (34%)	U	16	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C33)	Office (Open Plan) (34%)	U	92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 East Perim Zn (G.E34)	Office (Open Plan) (34%)	U	201	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C35)	Office (Open Plan) (34%)	U	73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 North Perim Zn (G.N36)	Office (Open Plan) (34%)	U	86	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 ENE Perim Zn (G.ENE37)	Office (Open Plan) (34%)	U	318	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 North Perim Zn (G.N38)	Office (Open Plan) (34%)	U	130	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 North Perim Zn (G.N39)	Office (Open Plan) (44%)	S	3,433	7,593	2.21	100%	381	5%	0.111	20.0	22	156	346	76.7	173.9	0	0
Sum of Zones				81,890							179					2%	4%
Sum of Zones / System Total				89%							100%						

System & Zone Name	System Type Principal Zone Activity	Type*	Ret Zn	Design Flow			Design Ventilation			Design Capacity				Hrs Outside Thr-Range		Cool Hrs	Heat Hrs	
				Area sqft	Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool Btuh/sf			Heat Btuh/sf
E5 Sys3 (MZS) (G)	Pkgd Var Vol Var Temp	d		11,819	53,983	4.57	88%	1,078	2%	0.087	13.7	135	87	400	137.2	214.2	30	89
... E5 West Perim Zn (G.W1)	Office (Open Plan) (31%)	U		47	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 WSW Perim Zn (G.WSW2)	Office (Open Plan) (45%)	C		2,366	16,427	6.94	1%	114	1%	0.048	10.0	46	51	355	234.9	312.2	0	66
... E5 SSE Perim Zn (G.SSE3)	Office (Open Plan) (31%)	U		73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 SE Perim Zn (G.SE4)	Office (Open Plan) (31%)	U		517	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C5)	Office (Open Plan) (31%)	U		80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C6)	Office (Open Plan) (31%)	U		23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C7)	Office (Open Plan) (31%)	U		127	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C8)	Office (Open Plan) (31%)	U		100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 NW Perim Zn (G.NW9)	Office (Open Plan) (45%)	U		644	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C10)	Office (Open Plan) (31%)	U		23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C11)	Office (Open Plan) (31%)	U		80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 NW Perim Zn (G.NW12)	Office (Open Plan) (31%)	U		583	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 NNW Perim Zn (G.NNW13)	Office (Open Plan) (31%)	U		73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C14)	Office (Open Plan) (31%)	U		81	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C15)	Office (Open Plan) (31%)	U		203	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C16)	Office (Open Plan) (31%)	U		153	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 SE Perim Zn (G.SE17)	Office (Open Plan) (45%)	S		918	4,043	4.41	100%	89	2%	0.097	20.0	11	81	355	149.0	243.7	24	0
... E5 Core Zn (G.C18)	Office (Open Plan) (31%)	U		22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C19)	Office (Open Plan) (31%)	U		480	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C20)	Office (Open Plan) (45%)	S		1,927	9,790	5.08	100%	186	2%	0.097	20.0	28	70	355	171.9	261.9	8	3
... E5 South Perim Zn (G.S21)	Office (Open Plan) (31%)	U		90	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 East Perim Zn (G.E22)	Office (Open Plan) (31%)	U		99	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 SSE Perim Zn (G.SSE23)	Office (Open Plan) (45%)	S		3,841	10,502	2.73	100%	371	4%	0.097	20.0	30	130	355	92.5	198.6	0	0
... E5 East Perim Zn (G.E24)	Office (Open Plan) (31%)	U		107	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C25)	Office (Open Plan) (31%)	U		40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C26)	Office (Open Plan) (31%)	U		26	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C27)	Office (Open Plan) (31%)	U		91	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 East Perim Zn (G.E28)	Office (Open Plan) (31%)	U		201	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C29)	Office (Open Plan) (31%)	U		72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 North Perim Zn (G.N30)	Office (Open Plan) (31%)	U		85	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 ENE Perim Zn (G.ENE31)	Office (Open Plan) (31%)	U		318	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 North Perim Zn (G.N32)	Office (Open Plan) (31%)	U		82	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 North Perim Zn (G.N33)	Office (Open Plan) (45%)	S		2,768	7,167	2.59	100%	268	4%	0.097	20.0	20	137	355	87.6	194.6	0	0
Sum of Zones					47,929							135					1%	3%
Sum of Zones / System Total					89%							100%						

System & Zone Name	System Type Principal Zone Activity	Type*	Ret Zn	Design Flow			Design Ventilation			Design Capacity				Hrs Outside Thr-Range		Cool Hrs	Heat Hrs	
				Area sqft	Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool Btuh/sf			Heat Btuh/sf
E3 Sys4 (MZS) (G)	Pkgd Var Vol Var Temp	d		14,893	52,249	3.51	72%	1,709	3%	0.115	16.4	133	112	393	107.2	177.7	83	3
... E3 SSW Perim Zn (G.SSW1)	Office (Open Plan) (46%)	S		2,196	10,157	4.63	100%	252	2%	0.115	20.0	30	74	340	163.2	220.6	0	3
... E3 West Perim Zn (G.W2)	Office (Open Plan) (46%)	U		85	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 North Perim Zn (G.N3)	Corridor (43%)	U		99	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 WNW Perim Zn (G.WNW4)	Office (Open Plan) (46%)	C		3,147	12,961	4.12	3%	361	3%	0.115	20.0	38	83	340	149.3	208.9	0	0
... E3 Core Zn (G.C5)	Corridor (43%)	U		100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C6)	Corridor (43%)	U		127	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 NW Perim Zn (G.NW7)	Office (Open Plan) (46%)	U		645	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 SSE Perim Zn (G.SSE8)	Corridor (43%)	U		72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 SE Perim Zn (G.SE9)	Corridor (43%)	U		518	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C10)	Corridor (43%)	U		80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C11)	Corridor (43%)	U		23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 SE Perim Zn (G.SE12)	Office (Open Plan) (46%)	S		917	2,479	2.70	100%	105	4%	0.115	20.0	7	126	340	95.4	166.7	44	0
... E3 Core Zn (G.C13)	Corridor (43%)	U		479	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C14)	Corridor (43%)	U		22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 South Perim Zn (G.S15)	Corridor (43%)	U		45	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 East Perim Zn (G.E16)	Corridor (43%)	U		92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 NW Perim Zn (G.NW17)	Corridor (43%)	U		582	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 NNW Perim Zn (G.NNW18)	Corridor (43%)	U		73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C19)	Corridor (43%)	U		80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C20)	Corridor (43%)	U		23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C21)	Corridor (43%)	U		61	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C22)	Corridor (43%)	U		203	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Zone Name	Activity	Type	Area	Supply	Supply	Min	OSA	OSA	OSA	OSA	Cool	Cool	Cool	Cool	Heat	Heat	
E3 Core Zn (G.C23)	Corridor (43%)	U	152	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
E3 SSE Perim Zn (G.SSE24)	Office (Open Plan) (46%)	S	4,851	9,711	2.00	100%	556	6%	0.115	20.0	29	170	340	70.6	149.7	2	0
E3 East Perim Zn (G.E25)	Corridor (43%)	U	107	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
E3 Core Zn (G.C26)	Corridor (43%)	U	40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
E3 Core Zn (G.C27)	Corridor (43%)	U	25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
E3 Core Zn (G.C28)	Corridor (43%)	U	91	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
E3 East Perim Zn (G.E29)	Corridor (43%)	U	201	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
E3 ENE Perim Zn (G.ENE30)	Corridor (43%)	U	318	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
E3 Core Zn (G.C31)	Corridor (43%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
E3 North Perim Zn (G.N32)	Corridor (43%)	U	85	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
E3 North Perim Zn (G.N33)	Office (Open Plan) (46%)	S	3,783	9,933	2.63	100%	434	4%	0.115	20.0	29	130	340	92.6	166.6	17	0
E3 North Perim Zn (G.N34)	Office (Open Plan) (46%)	U	36	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Sum of Zones				45,240							133					2%	0%
Sum of Zones / System Total				87%							100%						

System & Zone Name	System Type	Type*	Area sqft	Design Flow			Design Ventilation			Design Capacity				Hrs Outside Thr-Range			
				Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool Btuh/sf	Heat Btuh/sf	Cool Hrs	Heat Hrs
E4 Sys5 (MZS) (G)	Pkgd Var Vol Var Temp	d	13,448	43,249	3.22	82%	1,561	4%	0.116	16.2	119	113	363	106.4	174.8	15	1
E4 SW Perim Zn (G.SW1)	Office (Open Plan) (47%)	C	1,453	7,584	5.20	2%	169	2%	0.116	20.0	22	65	337	185.4	234.7	0	1
E4 WNW Perim Zn (G.WNW2)	Corridor (43%)	U	110	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 Core Zn (G.C3)	Corridor (43%)	U	127	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 Core Zn (G.C4)	Corridor (43%)	U	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 West Perim Zn (G.W5)	Office (Open Plan) (47%)	S	2,448	11,883	4.85	100%	284	2%	0.116	20.0	35	89	337	172.9	225.3	0	0
E4 SSE Perim Zn (G.SSE9)	Corridor (43%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 SE Perim Zn (G.SE7)	Corridor (43%)	U	518	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 Core Zn (G.C8)	Corridor (43%)	U	80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 Core Zn (G.C9)	Corridor (43%)	U	23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 SE Perim Zn (G.SE10)	Office (Open Plan) (47%)	S	916	2,590	2.83	100%	106	4%	0.116	20.0	8	119	337	100.7	170.6	13	0
E4 Core Zn (G.C11)	Corridor (43%)	U	479	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 Core Zn (G.C12)	Corridor (43%)	U	22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 NW Perim Zn (G.NW13)	Office (Open Plan) (47%)	U	645	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 Core Zn (G.C14)	Corridor (43%)	U	23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 Core Zn (G.C15)	Corridor (43%)	U	80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 Core Zn (G.C16)	Corridor (43%)	U	61	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 NNW Perim Zn (G.NNW17)	Corridor (43%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 NW Perim Zn (G.NW18)	Corridor (43%)	U	562	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 Core Zn (G.C19)	Corridor (43%)	U	204	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 Core Zn (G.C20)	Corridor (43%)	U	152	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 South Perim Zn (G.S21)	Corridor (43%)	U	45	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 SSE Perim Zn (G.SSE22)	Office (Open Plan) (47%)	S	4,849	9,053	1.87	100%	563	6%	0.116	20.0	27	180	337	66.5	144.6	0	0
E4 East Perim Zn (G.E23)	Corridor (43%)	U	92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 East Perim Zn (G.E24)	Corridor (43%)	U	107	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 Core Zn (G.C25)	Corridor (43%)	U	39	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 Core Zn (G.C26)	Corridor (43%)	U	26	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 Core Zn (G.C27)	Corridor (43%)	U	92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 East Perim Zn (G.E28)	Corridor (43%)	U	201	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 Core Zn (G.C29)	Corridor (43%)	U	73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 ENE Perim Zn (G.ENE30)	Corridor (43%)	U	318	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 North Perim Zn (G.N31)	Corridor (43%)	U	86	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E4 North Perim Zn (G.N32)	Office (Open Plan) (47%)	S	3,782	9,067	2.40	100%	439	5%	0.116	20.0	27	141	337	85.4	158.9	2	0
E4 North Perim Zn (G.N33)	Corridor (43%)	U	36	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sum of Zones				40,156							119					1%	0%
Sum of Zones / System Total				93%							100%						

System & Zone Name	System Type Principal Zone Activity	Type* Ret Zn	Design Flow			Design Ventilation			Design Capacity				Hrs Outside Thr-Range				
			Area sqft	Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool Btu/h/sf	Heat Btu/h/sf	Cool Hrs	Heat Hrs
E6 Sys6 (MZ5) (G)	Pkgd Var Vol Var Temp	d	9,429	31,045	3.29	82%	1,017	3%	0.108	14.9	91	104	341	115.8	191.2	25	190
... E6 South Perim Zn (G.S1)	Office (Open Plan) (47%)	C	991	5,773	5.83	1%	58	1%	0.058	10.0	17	58	340	205.6	259.9	0	62
... E6 Core Zn (G.C2)	Corridor (38%)	U	479	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C3)	Corridor (38%)	U	22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 SW Perim Zn (G.SW4)	Office (Open Plan) (47%)	S	398	2,176	5.83	100%	22	1%	0.058	10.0	8	80	340	198.7	254.6	0	88
... E6 NW Perim Zn (G.NW5)	Corridor (38%)	U	279	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C6)	Corridor (38%)	U	23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C7)	Corridor (38%)	U	80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C8)	Corridor (38%)	U	61	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C9)	Corridor (38%)	U	204	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 NW Perim Zn (G.NW10)	Corridor (38%)	U	584	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 North Perim Zn (G.N11)	Corridor (38%)	U	269	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 NNW Perim Zn (G.NNW12)	Corridor (38%)	U	73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C13)	Corridor (38%)	U	154	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 WSW Perim Zn (G.WSW14)	Office (Open Plan) (47%)	S	1,606	7,280	4.53	100%	187	3%	0.116	20.0	21	75	340	160.0	225.0	9	42
... E6 South Perim Zn (G.S15)	Corridor (38%)	U	46	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 East Perim Zn (G.E16)	Corridor (38%)	U	83	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C17)	Corridor (38%)	U	28	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 East Perim Zn (G.E18)	Corridor (38%)	U	107	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C19)	Corridor (38%)	U	40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C20)	Corridor (38%)	U	92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 East Perim Zn (G.E21)	Corridor (38%)	U	201	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C22)	Corridor (38%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 ENE Perim Zn (G.ENE23)	Corridor (38%)	U	318	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 North Perim Zn (G.N24)	Corridor (38%)	U	86	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 North Perim Zn (G.N25)	Corridor (38%)	U	36	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 SSE Perim Zn (G.SSE26)	Office (Open Plan) (47%)	S	2,932	8,324	2.84	100%	341	4%	0.116	20.0	24	120	340	100.2	179.3	16	0
... E6 North Perim Zn (G.N27)	Office (Open Plan) (47%)	S	3,514	7,388	2.10	100%	409	6%	0.116	20.0	22	162	340	74.2	159.4	0	0
Sum of Zones	...	...	...	30,940	...	...	...	...	...	...	91	...	...	...	...	1%	7%
Sum of Zones / System Total	...	...	...	100%	...	...	...	...	...	...	100%	...	...	...	...	...	...

System & Zone Name	System Type Principal Zone Activity	Type* Ret Zn	Design Flow			Design Ventilation			Design Capacity				Hrs Outside Thr-Range				
			Area sqft	Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool Btu/h/sf	Heat Btu/h/sf	Cool Hrs	Heat Hrs
E7 Sys7 (MZ5) (G)	Pkgd Var Vol Var Temp	d	5,815	11,892	2.05	92%	621	5%	0.107	13.5	38	155	318	77.8	122.3	128	176
... E7 SSW Perim Zn (G.SSW1)	Office (Open Plan) (52%)	C	479	978	2.04	5%	51	5%	0.107	20.0	3	157	320	76.6	121.5	23	9
... E7 SW Perim Zn (G.SW2)	Corridor (29%)	U	22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 South Perim Zn (G.S3)	Office (Open Plan) (52%)	S	460	1,519	3.30	100%	49	3%	0.107	20.0	5	97	320	123.9	155.6	4	5
... E7 Core Zn (G.C4)	Corridor (29%)	U	76	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C5)	Corridor (29%)	U	126	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C6)	Corridor (29%)	U	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 South Perim Zn (G.S7)	Corridor (29%)	U	31	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 South Perim Zn (G.S8)	Corridor (29%)	U	150	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 South Perim Zn (G.S9)	Office (Open Plan) (52%)	S	358	1,028	2.87	100%	38	4%	0.107	20.0	3	111	320	107.7	144.0	17	9
... E7 SE Perim Zn (G.SE10)	Office (Open Plan) (52%)	S	351	1,043	2.97	100%	38	4%	0.107	20.0	3	108	320	111.4	146.6	0	0
... E7 East Perim Zn (G.E11)	Corridor (29%)	U	82	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 East Perim Zn (G.E12)	Corridor (29%)	U	83	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 East Perim Zn (G.E13)	Corridor (29%)	U	82	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 East Perim Zn (G.E14)	Office (Open Plan) (52%)	S	267	607	2.27	100%	29	5%	0.107	20.0	2	141	320	85.3	127.9	22	0
... E7 East Perim Zn (G.E15)	Corridor (29%)	U	107	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C16)	Corridor (29%)	U	26	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C17)	Corridor (29%)	U	92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C18)	Corridor (29%)	U	40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 East Perim Zn (G.E19)	Office (Open Plan) (52%)	S	200	308	1.54	100%	21	7%	0.107	20.0	1	207	320	57.9	108.1	19	0
... E7 ENE Perim Zn (G.ENE20)	Corridor (29%)	U	318	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C21)	Corridor (29%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 North Perim Zn (G.N22)	Corridor (29%)	U	85	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

... E7 North Perim Zn (G.N23)	Office (Open Plan) (52%)	S	693	1,567	2.26	100%	74	5%	0.107	20.0	5	141	320	84.9	127.5	40	151
... E7 North Perim Zn (G.N24)	Corridor (29%)	U	91	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C25)	Corridor (29%)	U	1,306	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C26)	Corridor (29%)	U	23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 SW Perim Zn (G.SW27)	Corridor (29%)	U	80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C28)	Corridor (29%)	U	81	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C29)	Corridor (29%)	U	152	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C30)	Corridor (29%)	U	203	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 North Perim Zn (G.N31)	Corridor (29%)	U	269	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 NNW Perim Zn (G.NNW32)	Corridor (29%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 WNW Perim Zn (G.WNW33)	Office (Open Plan) (52%)	U	583	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 NW Perim Zn (G.NW34)	Office (Open Plan) (52%)	S	3,007	4,975	1.85	100%	321	8%	0.107	20.0	16	193	320	82.1	111.1	3	2
Sum of Zones	...	...	...	12,026	...	...	...	...	...	...	38	...	...	...	...	5%	7%
Sum of Zones / System Total	...	...	...	101%	...	...	...	...	...	...	100%	...	...	...	...	...	...

Project Totals		Type*	Design Flow			Design Ventilation			Design Capacity				Throttling Range			
System & Zone Name	System Type Principal Zone Activity	Ret Zn	Area sqft	Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool Btuh/sf	Heat Btuh/sf	Hrs Outside Thr1-Range
Sum of SYSTEMs		...	87,423	283,176	3.24	81%	8,698	3%	0.099	7.2	751	116	377	103.0	171.1	3%
Sum of ZONES		256,419	2.93	...	...	...	...	...	751	...	...	...	...	...
Sum of Zones / System Total		91%	...	...	...	...	...	...	100%	...	...	...	...	...

* Return Types: ... 'P' = Plenum Return ... 'D' = Ducted Return ... 'd' = Direct return ... (Plenum Zones are not shown on this report)
 * Zone Types: ... 'C' = Conditioned Zone ... 'U' = Unconditioned Zone ... 'S' = Slave Zone ... (conditioned but no t-stat)

Proposed case

System & Zone Name	System Type Principal Zone Activity	Type* Ret Zn	Design Flow			Design Ventilation			Design Capacity				Hrs Outside Thri-Range		Cool Hrs	Heat Hrs	
			Area sqft	Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool Btuh/sf			Heat Btuh/sf
F1 Sys1 (M7S) (G)	Variable Air Volume	D	15,119	10,500	0.69	16%	1,718	16%	0.114	14.3	37	405	281	29.7	5.6	39	0
... E1 South Perim Zn (G.S1)	Office (Open Plan) (45%)	U	46	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 WSW Perim Zn (G.WSW2)	Office (Open Plan) (33%)	U	1,387	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C3)	Office (Open Plan) (33%)	U	29	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 NW Perim Zn (G.NW4)	Office (Open Plan) (33%)	U	274	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C5)	Office (Open Plan) (33%)	U	113	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 NW Perim Zn (G.NW6)	Office (Open Plan) (33%)	U	306	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 North Perim Zn (G.N7)	Office (Open Plan) (33%)	U	287	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 North Perim Zn (G.N8)	Office (Open Plan) (45%)	U	31	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 NNW Perim Zn (G.NNW9)	Office (Open Plan) (33%)	U	116	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C10)	Office (Open Plan) (33%)	U	127	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C11)	Office (Open Plan) (33%)	U	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 North Perim Zn (G.N12)	Office (Open Plan) (45%)	C	2,668	1,850	0.69	16%	303	16%	0.114	20.0	7	405	281	29.6	5.6	9	0
... E1 South Perim Zn (G.S13)	Office (Open Plan) (45%)	C	2,758	2,300	0.83	14%	313	14%	0.114	20.0	8	337	281	36.8	6.8	4	0
... E1 South Perim Zn (G.S14)	Office (Open Plan) (33%)	U	269	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 SSE Perim Zn (G.SSE15)	Office (Open Plan) (45%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C16)	Office (Open Plan) (33%)	U	23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C17)	Office (Open Plan) (33%)	U	80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 SE Perim Zn (G.SE18)	Office (Open Plan) (45%)	U	652	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 SE Perim Zn (G.SE19)	Office (Open Plan) (45%)	C	3,029	1,700	0.56	20%	344	20%	0.114	20.0	6	501	281	24.0	4.5	6	0
... E1 Core Zn (G.C20)	Office (Open Plan) (33%)	U	23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C21)	Office (Open Plan) (33%)	U	80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 NW Perim Zn (G.NW22)	Office (Open Plan) (33%)	U	634	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 NW Perim Zn (G.NW23)	Office (Open Plan) (33%)	U	583	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 NNW Perim Zn (G.NNW24)	Office (Open Plan) (45%)	U	73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C25)	Office (Open Plan) (33%)	U	81	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C26)	Office (Open Plan) (33%)	U	204	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C27)	Office (Open Plan) (33%)	U	152	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C28)	Office (Open Plan) (33%)	U	479	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C29)	Office (Open Plan) (33%)	U	22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 East Perim Zn (G.E30)	Office (Open Plan) (33%)	U	91	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 SSE Perim Zn (G.SSE31)	Office (Open Plan) (45%)	C	2,903	2,150	0.74	15%	330	15%	0.114	20.0	8	379	281	31.6	6.0	9	0
... E1 Core Zn (G.C32)	Office (Open Plan) (33%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 East Perim Zn (G.E33)	Office (Open Plan) (33%)	U	299	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C34)	Office (Open Plan) (33%)	U	16	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C35)	Office (Open Plan) (33%)	U	40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C36)	Office (Open Plan) (33%)	U	10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 Core Zn (G.C37)	Office (Open Plan) (33%)	U	92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 North Perim Zn (G.N38)	Office (Open Plan) (33%)	U	131	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 ENE Perim Zn (G.ENE39)	Office (Open Plan) (33%)	U	327	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 North Perim Zn (G.N40)	Office (Open Plan) (33%)	U	85	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E1 North Perim Zn (G.N41)	Office (Open Plan) (45%)	C	3,782	2,500	0.66	17%	427	17%	0.114	20.0	9	423	281	28.4	5.4	11	0
Sum of Zones	...	...	...	10,500	...	...	...	...	...	...	37	...	...	...	...	1%	0%
Sum of Zones / System Total	...	...	...	100%	...	...	...	...	...	...	100%	...	...	...	...	...	...

System & Zone Name	System Type Principal Zone Activity	Type*	Design Flow			Design Ventilation			Design Capacity				Hrs Outside Thr-Range				
			Area sqft	Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool Btuh/sf	Heat Btuh/sf	Cool Hrs	Heat Hrs
E2 Sys2 (MZS) (G)	Variable Air Volume	D	16,900	13,800	0.82	14%	1,878	14%	0.111	16.0	47	358	292	33.5	6.6	227	11
... E2 South Perim Zn (G.S1)	Office (Open Plan) (34%)	U	86	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 SSE Perim Zn (G.SSE2)	Office (Open Plan) (34%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 West Perim Zn (G.W3)	Office (Open Plan) (34%)	U	76	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C4)	Office (Open Plan) (34%)	U	33	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 North Perim Zn (G.N5)	Office (Open Plan) (34%)	U	279	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 NW Perim Zn (G.NW6)	Office (Open Plan) (44%)	C	405	800	1.98	6%	45	6%	0.111	20.0	3	148	292	81.2	16.0	0	11
... E2 North Perim Zn (G.N7)	Office (Open Plan) (34%)	U	131	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 SSW Perim Zn (G.SSW6)	Office (Open Plan) (44%)	C	3,640	3,200	0.88	13%	404	13%	0.111	20.0	11	332	292	36.1	7.1	65	0
... E2 NW Perim Zn (G.NW9)	Office (Open Plan) (44%)	C	3,405	3,100	0.91	12%	378	12%	0.111	20.0	11	321	292	37.4	7.4	53	0
... E2 Core Zn (G.C10)	Office (Open Plan) (34%)	U	127	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C11)	Office (Open Plan) (34%)	U	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 NW Perim Zn (G.NW12)	Office (Open Plan) (34%)	U	645	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C13)	Office (Open Plan) (34%)	U	23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C14)	Office (Open Plan) (34%)	U	80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C15)	Office (Open Plan) (34%)	U	81	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 NW Perim Zn (G.NW16)	Office (Open Plan) (34%)	U	582	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 NNW Perim Zn (G.NNW17)	Office (Open Plan) (44%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C18)	Office (Open Plan) (34%)	U	204	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C19)	Office (Open Plan) (34%)	U	152	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 SE Perim Zn (G.SE20)	Office (Open Plan) (34%)	U	517	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C21)	Office (Open Plan) (34%)	U	80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C22)	Office (Open Plan) (34%)	U	23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 SE Perim Zn (G.SE23)	Office (Open Plan) (44%)	C	916	600	0.66	17%	102	17%	0.111	20.0	2	446	292	26.9	5.3	0	0
... E2 Core Zn (G.C24)	Office (Open Plan) (34%)	U	22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C25)	Office (Open Plan) (44%)	U	479	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 South Perim Zn (G.S26)	Office (Open Plan) (34%)	U	45	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 East Perim Zn (G.E27)	Office (Open Plan) (34%)	U	92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 SSE Perim Zn (G.SSE28)	Office (Open Plan) (44%)	C	5,102	3,400	0.67	17%	567	17%	0.111	20.0	12	438	292	27.4	5.4	64	0
... E2 East Perim Zn (G.E29)	Office (Open Plan) (34%)	U	107	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C30)	Office (Open Plan) (34%)	U	40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C31)	Office (Open Plan) (34%)	U	10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C32)	Office (Open Plan) (34%)	U	16	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C33)	Office (Open Plan) (34%)	U	92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 East Perim Zn (G.E34)	Office (Open Plan) (34%)	U	201	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 Core Zn (G.C35)	Office (Open Plan) (34%)	U	73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 North Perim Zn (G.N36)	Office (Open Plan) (34%)	U	86	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 ENE Perim Zn (G.ENE37)	Office (Open Plan) (34%)	U	318	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 North Perim Zn (G.N38)	Office (Open Plan) (34%)	U	130	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E2 North Perim Zn (G.N39)	Office (Open Plan) (44%)	C	3,433	2,700	0.79	14%	381	14%	0.111	20.0	9	371	292	32.3	6.4	45	0
Sum of Zones	...	...	...	13,800	...	...	...	...	...	...	47	...	...	...	...	9%	0%
Sum of Zones / System Total	...	...	...	100%	...	...	...	...	...	...	100%	...	...	...	...	...	...

System & Zone Name	System Type Principal Zone Activity	Type*	Ret Zn	Design Flow			Design Ventilation			Design Capacity				Hrs Outside ThrI-Range				
				Area sqft	Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool BtuH/sf	Heat BtuH/sf	Cool Hrs	Heat Hrs
E5 Sys3 (MZS) (G)	Variable Air Volume	D		11,819	10,850	0.92	11%	1,142	11%	0.097	15.2	36	326	299	36.9	7.4	172	0
... E5 West Perim Zn (G.W1)	Office (Open Plan) (31%)	U		47	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 WSW Perim Zn (G.WSW2)	Office (Open Plan) (45%)	C		2,366	2,700	1.14	8%	229	8%	0.097	20.0	9	262	299	45.8	9.2	28	0
... E5 SSE Perim Zn (G.SSE3)	Office (Open Plan) (31%)	U		73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 SE Perim Zn (G.SE4)	Office (Open Plan) (31%)	U		517	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C5)	Office (Open Plan) (31%)	U		80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C6)	Office (Open Plan) (31%)	U		23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C7)	Office (Open Plan) (31%)	U		127	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C8)	Office (Open Plan) (31%)	U		100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 NW Perim Zn (G.NW9)	Office (Open Plan) (45%)	U		844	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C10)	Office (Open Plan) (31%)	U		23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C11)	Office (Open Plan) (31%)	U		80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 NW Perim Zn (G.NW12)	Office (Open Plan) (31%)	U		583	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 NNW Perim Zn (G.NNW13)	Office (Open Plan) (31%)	U		73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C14)	Office (Open Plan) (31%)	U		81	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C15)	Office (Open Plan) (31%)	U		203	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C16)	Office (Open Plan) (31%)	U		153	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 SE Perim Zn (G.SE17)	Office (Open Plan) (45%)	C		918	1,500	1.63	8%	89	8%	0.097	20.0	5	183	299	65.6	13.2	0	0
... E5 Core Zn (G.C18)	Office (Open Plan) (31%)	U		22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C19)	Office (Open Plan) (31%)	U		480	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C20)	Office (Open Plan) (45%)	C		1,927	1,950	1.01	10%	186	10%	0.097	20.0	7	295	299	40.8	8.2	20	0
... E5 South Perim Zn (G.S21)	Office (Open Plan) (31%)	U		90	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 East Perim Zn (G.E22)	Office (Open Plan) (31%)	U		99	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 SSE Perim Zn (G.SSE23)	Office (Open Plan) (45%)	C		3,841	2,500	0.65	15%	371	15%	0.097	20.0	8	459	299	26.1	5.3	85	0
... E5 East Perim Zn (G.E24)	Office (Open Plan) (31%)	U		107	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C25)	Office (Open Plan) (31%)	U		40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C26)	Office (Open Plan) (31%)	U		26	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C27)	Office (Open Plan) (31%)	U		91	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 East Perim Zn (G.E28)	Office (Open Plan) (31%)	U		201	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 Core Zn (G.C29)	Office (Open Plan) (31%)	U		72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 North Perim Zn (G.N30)	Office (Open Plan) (31%)	U		86	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 ENE Perim Zn (G.ENE31)	Office (Open Plan) (31%)	U		318	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 North Perim Zn (G.N32)	Office (Open Plan) (31%)	U		82	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E5 North Perim Zn (G.N33)	Office (Open Plan) (45%)	C		2,768	2,200	0.79	12%	288	12%	0.097	20.0	7	376	299	31.9	6.4	39	0
Sum of Zones					10,850							36					7%	0%
Sum of Zones / System Total					100%							100%						

System & Zone Name	System Type Principal Zone Activity	Type*	Ret Zn	Design Flow			Design Ventilation			Design Capacity				Hrs Outside ThrI-Range				
				Area sqft	Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool BtuH/sf	Heat BtuH/sf	Cool Hrs	Heat Hrs
E3 Sys4 (MZS) (G)	Variable Air Volume	D		14,893	12,200	0.82	14%	1,709	14%	0.115	16.4	42	356	291	33.7	6.6	133	0
... E3 SSW Perim Zn (G.SSW1)	Office (Open Plan) (46%)	C		2,195	2,500	1.14	10%	252	10%	0.115	20.0	9	256	291	46.9	9.2	15	0
... E3 West Perim Zn (G.W2)	Office (Open Plan) (46%)	U		85	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 North Perim Zn (G.N3)	Corridor (43%)	U		99	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 WNW Perim Zn (G.WNW4)	Office (Open Plan) (46%)	C		3,147	2,750	0.87	13%	381	13%	0.115	20.0	9	333	291	36.0	7.1	51	0
... E3 Core Zn (G.C5)	Corridor (43%)	U		100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C6)	Corridor (43%)	U		127	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 NW Perim Zn (G.NW7)	Office (Open Plan) (46%)	U		845	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 SSE Perim Zn (G.SSE8)	Corridor (43%)	U		72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 SE Perim Zn (G.SE9)	Corridor (43%)	U		518	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C10)	Corridor (43%)	U		80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C11)	Corridor (43%)	U		23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 SE Perim Zn (G.SE12)	Office (Open Plan) (46%)	C		917	650	0.71	16%	105	16%	0.115	20.0	2	411	291	29.2	5.7	0	0
... E3 Core Zn (G.C13)	Corridor (43%)	U		479	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C14)	Corridor (43%)	U		22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 South Perim Zn (G.S15)	Corridor (43%)	U		45	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 East Perim Zn (G.E18)	Corridor (43%)	U		92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 NW Perim Zn (G.NW17)	Corridor (43%)	U		582	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 NNW Perim Zn (G.NNW18)	Corridor (43%)	U		73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C19)	Corridor (43%)	U		80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C20)	Corridor (43%)	U		23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C21)	Corridor (43%)	U		61	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C22)	Corridor (43%)	U		203	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

System & Zone Name	System Type	Principal Zone Activity	Type*	Ret Zn	Area sqft	Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool Btuh/sf	Heat Btuh/sf	Cool Hrs	Heat Hrs
... E3 Core Zn (G.C23)	Corridor (43%)		U		152	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 SSE Perim Zn (G.SSE24)	Office (Open Plan) (46%)		C		4,851	3,600	0.74	15%	556	15%	0.115	20.0	12	392	291	30.6	6.0	35	0
... E3 East Perim Zn (G.E25)	Corridor (43%)		U		107	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C26)	Corridor (43%)		U		40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C27)	Corridor (43%)		U		26	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C28)	Corridor (43%)		U		91	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 East Perim Zn (G.E29)	Corridor (43%)		U		201	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 ENE Perim Zn (G.ENE30)	Corridor (43%)		U		318	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 Core Zn (G.C31)	Corridor (43%)		U		72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 North Perim Zn (G.N32)	Corridor (43%)		U		86	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E3 North Perim Zn (G.N33)	Office (Open Plan) (46%)		C		3,783	2,700	0.71	16%	434	16%	0.115	20.0	9	408	291	29.4	5.8	32	0
... E3 North Perim Zn (G.N34)	Office (Open Plan) (46%)		U		36	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sum of Zones						12,200							42					5%	0%
Sum of Zones / System Total						100%							100%						

System & Zone Name	System Type	Principal Zone Activity	Type*	Ret Zn	Area sqft	Design Flow		Design Ventilation			Design Capacity				Hrs Outside Thr-Range				
						Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool Btuh/sf	Heat Btuh/sf	Cool Hrs	Heat Hrs
E4 Sys5 (MZS) (G)	Variable Air Volume		D		13,448	11,700	0.87	13%	1,561	13%	0.116	16.2	40	336	293	35.7	7.0	130	0
... E4 SW Perim Zn (G.SW1)	Office (Open Plan) (47%)		C		1,463	1,750	1.20	10%	169	10%	0.116	20.0	6	243	293	49.4	9.8	13	0
... E4 WNW Perim Zn (G.WNW2)	Corridor (43%)		U		110	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 Core Zn (G.C3)	Corridor (43%)		U		127	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 Core Zn (G.C4)	Corridor (43%)		U		100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 West Perim Zn (G.W5)	Office (Open Plan) (47%)		C		2,448	2,500	1.02	11%	284	11%	0.116	20.0	9	288	293	41.9	8.3	27	0
... E4 SSE Perim Zn (G.SSE5)	Corridor (43%)		U		72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 SE Perim Zn (G.SE7)	Corridor (43%)		U		518	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 Core Zn (G.C8)	Corridor (43%)		U		80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 Core Zn (G.C9)	Corridor (43%)		U		23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 SE Perim Zn (G.SE10)	Office (Open Plan) (47%)		C		916	1,100	1.20	10%	106	10%	0.116	20.0	4	244	293	49.3	9.7	1	0
... E4 Core Zn (G.C11)	Corridor (43%)		U		479	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 Core Zn (G.C12)	Corridor (43%)		U		22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 NW Perim Zn (G.NW13)	Office (Open Plan) (47%)		U		645	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 Core Zn (G.C14)	Corridor (43%)		U		23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 Core Zn (G.C15)	Corridor (43%)		U		80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 Core Zn (G.C16)	Corridor (43%)		U		61	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 NNW Perim Zn (G.NNW17)	Corridor (43%)		U		72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 NW Perim Zn (G.NW18)	Corridor (43%)		U		582	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 Core Zn (G.C19)	Corridor (43%)		U		204	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 Core Zn (G.C20)	Corridor (43%)		U		152	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 South Perim Zn (G.S21)	Corridor (43%)		U		45	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 SSE Perim Zn (G.SSE22)	Office (Open Plan) (47%)		C		4,849	3,600	0.74	16%	563	16%	0.116	20.0	12	394	293	30.5	6.0	62	0
... E4 East Perim Zn (G.E23)	Corridor (43%)		U		92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 East Perim Zn (G.E24)	Corridor (43%)		U		107	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 Core Zn (G.C25)	Corridor (43%)		U		39	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 Core Zn (G.C26)	Corridor (43%)		U		26	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 Core Zn (G.C27)	Corridor (43%)		U		92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 East Perim Zn (G.E28)	Corridor (43%)		U		201	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 Core Zn (G.C29)	Corridor (43%)		U		73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 ENE Perim Zn (G.ENE30)	Corridor (43%)		U		318	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 North Perim Zn (G.N31)	Corridor (43%)		U		86	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E4 North Perim Zn (G.N32)	Office (Open Plan) (47%)		C		3,782	2,750	0.73	16%	439	16%	0.116	20.0	9	402	293	29.8	5.9	27	0
... E4 North Perim Zn (G.N33)	Corridor (43%)		U		36	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sum of Zones						11,700							40					5%	0%
Sum of Zones / System Total						100%							100%						

System & Zone Name	System Type Principal Zone Activity	Type*	Ret Zn	Design Flow			Design Ventilation			Design Capacity				Hrs Outside Thr-Range				
				Area sqft	Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool BtuH/sf	Heat BtuH/sf	Cool Hrs	Heat Hrs
E6 Sys6 (MZS) (G)	Variable Air Volume	D		9,429	9,020	0.96	12%	1,097	12%	0.116	16.1	31	309	295	38.9	7.7	80	1
... E6 South Perim Zn (G.S1)	Office (Open Plan) (47%)	C		991	1,500	1.51	8%	115	8%	0.116	20.0	5	195	295	61.6	12.3	9	1
... E6 Core Zn (G.C2)	Corridor (38%)	U		479	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C3)	Corridor (38%)	U		22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 SW Perim Zn (G.SW4)	Office (Open Plan) (47%)	C		388	670	1.73	7%	45	7%	0.116	20.0	2	170	295	70.5	14.0	0	0
... E6 NW Perim Zn (G.NW5)	Corridor (38%)	U		279	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C6)	Corridor (38%)	U		23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C7)	Corridor (38%)	U		80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C8)	Corridor (38%)	U		61	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C9)	Corridor (38%)	U		204	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 NW Perim Zn (G.NW10)	Corridor (38%)	U		584	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 North Perim Zn (G.N11)	Corridor (38%)	U		269	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 NNW Perim Zn (G.NNW12)	Corridor (38%)	U		73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C13)	Corridor (38%)	U		154	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 WSW Perim Zn (G.WSW14)	Office (Open Plan) (47%)	C		1,606	1,800	1.12	10%	187	10%	0.116	20.0	6	263	295	45.6	9.1	32	0
... E6 South Perim Zn (G.S15)	Corridor (38%)	U		48	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 East Perim Zn (G.E16)	Corridor (38%)	U		83	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C17)	Corridor (38%)	U		26	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 East Perim Zn (G.E18)	Corridor (38%)	U		107	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C19)	Corridor (38%)	U		40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C20)	Corridor (38%)	U		92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 East Perim Zn (G.E21)	Corridor (38%)	U		201	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 Core Zn (G.C22)	Corridor (38%)	U		72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 ENE Perim Zn (G.ENE23)	Corridor (38%)	U		318	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 North Perim Zn (G.N24)	Corridor (38%)	U		86	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 North Perim Zn (G.N25)	Corridor (38%)	U		36	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E6 SSE Perim Zn (G.SSE26)	Office (Open Plan) (47%)	C		2,932	2,450	0.84	14%	341	14%	0.116	20.0	8	353	295	34.0	6.8	13	0
... E6 North Perim Zn (G.N27)	Office (Open Plan) (47%)	C		3,514	2,600	0.74	16%	409	16%	0.116	20.0	9	399	295	30.1	6.0	26	0
Sum of Zones	...	...	...	...	9,020	...	...	...	...	...	...	31	...	...	...	...	3%	0%
Sum of Zones / System Total	...	...	...	...	100%	...	...	...	...	...	...	100%	...	...	...	...	...	...

System & Zone Name	System Type Principal Zone Activity	Type*	Ret Zn	Design Flow			Design Ventilation			Design Capacity				Hrs Outside Thr-Range				
				Area sqft	Supply cfm	Supply cfm/sf	Min Flow	OSA cfm	OSA %	OSA cfm/sf	OSA cfm/per	Cool tons	Cool sf/ton	Cool cfm/ton	Cool BtuH/sf	Heat BtuH/sf	Cool Hrs	Heat Hrs
E7 Sys7 (MZS) (G)	Variable Air Volume	D		5,815	8,000	1.39	8%	621	8%	0.107	13.5	26	221	306	54.3	11.2	71	4
... E7 SSW Perim Zn (G.SSW1)	Office (Open Plan) (52%)	C		479	650	1.36	8%	51	8%	0.107	20.0	2	226	306	53.2	11.0	0	0
... E7 SW Perim Zn (G.SW2)	Corridor (29%)	U		22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 South Perim Zn (G.S3)	Office (Open Plan) (52%)	C		460	910	1.98	5%	49	5%	0.107	20.0	3	155	306	77.5	16.0	0	0
... E7 Core Zn (G.C4)	Corridor (29%)	U		76	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C5)	Corridor (29%)	U		126	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C6)	Corridor (29%)	U		17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 South Perim Zn (G.S7)	Corridor (29%)	U		31	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 South Perim Zn (G.S8)	Corridor (29%)	U		150	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 South Perim Zn (G.S9)	Office (Open Plan) (52%)	C		358	750	2.09	5%	38	5%	0.107	20.0	2	148	306	82.1	17.0	0	0
... E7 SE Perim Zn (G.SE10)	Office (Open Plan) (52%)	C		351	740	2.11	5%	38	5%	0.107	20.0	2	145	306	82.5	17.1	0	0
... E7 East Perim Zn (G.E11)	Corridor (29%)	U		82	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 East Perim Zn (G.E12)	Corridor (29%)	U		83	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 East Perim Zn (G.E13)	Corridor (29%)	U		82	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 East Perim Zn (G.E14)	Office (Open Plan) (52%)	C		267	810	3.03	4%	29	4%	0.107	20.0	3	101	306	118.9	24.6	0	0
... E7 East Perim Zn (G.E15)	Corridor (29%)	U		107	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C16)	Corridor (29%)	U		26	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C17)	Corridor (29%)	U		92	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 Core Zn (G.C18)	Corridor (29%)	U		40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
... E7 East Perim Zn (G.E19)	Office (Open Plan) (52%)	C		200	450	2.26	5%	21	5%	0.107	20.0	1	136	306	88.4	18.3	3	0

... E7 ENE Perim Zn (G.ENE20)	Corridor (29%)	U	318	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
... E7 Core Zn (G.C21)	Corridor (29%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
... E7 North Perim Zn (G.N22)	Corridor (29%)	U	85	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
... E7 North Perim Zn (G.N23)	Office (Open Plan) (52%)	C	693	900	1.30	8%	74	8%	0.107	20.0	3	236	306	50.9	10.5	21	4		
... E7 North Perim Zn (G.N24)	Corridor (29%)	U	91	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
... E7 Core Zn (G.C25)	Corridor (29%)	U	1,306	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
... E7 Core Zn (G.C26)	Corridor (29%)	U	23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
... E7 SW Perim Zn (G.SW27)	Corridor (29%)	U	80	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
... E7 Core Zn (G.C28)	Corridor (29%)	U	61	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
... E7 Core Zn (G.C29)	Corridor (29%)	U	152	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
... E7 Core Zn (G.C30)	Corridor (29%)	U	203	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
... E7 North Perim Zn (G.N31)	Corridor (29%)	U	269	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
... E7 NNW Perim Zn (G.NNW32)	Corridor (29%)	U	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
... E7 WNW Perim Zn (G.WNW33)	Office (Open Plan) (52%)	U	583	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
... E7 NW Perim Zn (G.NW34)	Office (Open Plan) (52%)	C	3,007	2,850	0.95	11%	321	11%	0.107	20.0	9	323	306	37.1	7.7	47	0		
Sum of Zones	8,060	26	3%	0%
Sum of Zones / System Total	100%	100%

Annexure 2 : Solar PV generation calculation sheet from snapshot

PVWatts® Calculator


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RESOURCE DATA
SYSTEM INFO
RESULTS



RESULTS

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86,919 kWh/Year*



Go to system info

Month	Solar Radiation (kWh / m ² / day)	AC Energy (kWh)	Value (\$)
January	4.17	5,869	N/A
February	5.55	6,827	N/A
March	6.42	8,295	N/A
April	6.86	8,396	N/A
May	6.50	8,115	N/A
June	5.86	7,228	N/A
July	5.26	6,932	N/A
August	5.56	7,463	N/A
September	6.09	7,847	N/A
October	5.64	7,482	N/A
November	4.69	6,177	N/A
December	4.45	6,288	N/A
Annual	5.59	86,919	0

Annexure 3 : Cut Sheets

6.1 Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in:

6.1.1 Cement mortar 1:4 (1 cement : 4 coarse sand)

Code	Description	Unit	Quantity	Rate ₹	Amount ₹
	Details of cost for 1 cum MATERIAL				
2602	Common burnt clay F.P.S. (non modular) bricks class designation 7.5	1000 Nos	0.494	4500.00	2223.00
2201	Carriage of Bricks	1000 Nos	0.494	276.72	136.70
	Cement mortar 1 : 4 (1 cement : 4 coarse sand)				
3.9	Rate as per item No 3.9 of SH: Mortar	cum	0.25	4010.35	1002.59
9999	Sundries	L.S.	2.73	2.00	5.46
	LABOUR				
0123	Mason (brick layer) 1st class	day	0.36	738.00	265.68
0124	Mason (brick layer) 2nd class	day	0.36	679.00	244.44
0115	Coolie	day	1.37	558.00	764.46
0101	Bhisti	day	0.20	617.00	123.40
	TOTAL				4765.73 W
	Add 1 % Water charges on "W"				47.66
	TOTAL				4813.38 X
	Add GST on "X" (multiplying factor 0.1405)				676.28
	TOTAL				5489.66 Y
	Add 15% CPOH on "Y"				823.45
	TOTAL				6313.11 Z
	Add Cess @ 1% on "Z"				63.13
	Cost of 1 Cum.				6376.25
	Say				6376.25

6.1.2 Cement mortar 1:6 (1 cement : 6 coarse sand)

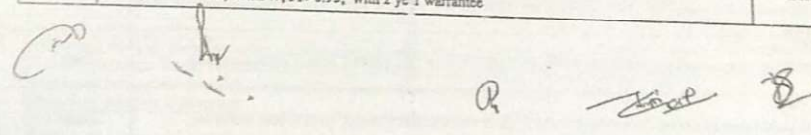
Code	Description	Unit	Quantity	Rate ₹	Amount ₹
	Details of cost for 1 cum MATERIAL				
2602	Common burnt clay F.P.S. (non modular) bricks class designation 7.5	1000 Nos	0.494	4500.00	2223.00
2201	Carriage of Bricks	1000 Nos	0.494	276.72	136.70
	Cement mortar 1 : 6 (1 cement : 6 coarse sand) (Rate as per item No 3.11)				
3.11	Rate as per Item No.3.11 of SH: Mortar	cum	0.25	3356.15	839.04
9999	Sundries	L.S.	2.73	2.00	5.46
	LABOUR				
0123	Mason (brick layer) 1st class	day	0.36	738.00	265.68
0124	Mason (brick layer) 2nd class	day	0.36	679.00	244.44
0115	Coolie	day	1.37	558.00	764.46

- 6.47 Providing and laying autoclaved aerated cement blocks masonry with 150mm/230mm/300 mm thick AAC blocks in super structure above plinth level up to floor V level with RCC band at sill level and lintel level with approved block laying polymer modified adhesive mortar all complete as per direction of Engineer-in-Charge. (The payment of RCC band and reinforcement shall be made for seperately).**

Code	Description	Unit	Quantity	Rate ₹	Amount ₹
	Details of cost for 1 cum. MATERIAL				
8655	Autoclaved areated cement (AAC) blocks	cum	1.00	2600.00	2600.00
0357	Polymer modified adhesive mortar	Kg	30.00	15.00	450.00
9999	Sundries	L.S.	2.73	2.00	5.46
	LABOUR				
0123	Mason (brick layer) 1 st class	day	0.36	738.00	265.68
0124	Mason (brick layer) 2nd class	day	0.36	679.00	244.44
0115	Coolie	day	1.37	558.00	764.46
	Extra labour element required for lifting of materials (above floor two level upto floor five level) (0.75x 1.50 = 1.13)				
0115	Coolie	day	1.13	558.00	630.54
	TOTAL				4960.58 W
	Add 1 % Water charges on "W"				49.61
	TOTAL				5010.19 X
	Add GST on "X" (multiplying factor 0.1405)				703.93
	TOTAL				5714.12 Y
	Add 15% CPOH on "Y"				857.12
	TOTAL				6571.23 Z
	Add Cess @ 1% on "Z"				65.71
	Cost of 1 cum				6636.95
	Say				6636.95

Code No.	Description	Unit	Rate ₹
8308	PPR Union 32 mm	each	137.20
8309	PPR Union 40 mm	each	184.80
8310	PPR Union 50 mm	each	352.80
8311	PPR Union 63 mm	each	483.60
8312	PPR Union 75 mm	each	933.00
8500	Water for jetting / blowback	1000 litre	1500.00
8501	Polymer modified cementation coating	kg	140.00
8502	Fibre glass cloth	sqm	25.00
8504	Multi surface paint	litre	255.00
8505	Acrylic exterior paint	litre	170.00
8506	Premium Acrylic exterior paint	litre	180.00
8507	Textured exterior paint	litre	240.00
8508	Primer for cement paint	litre	79.00
8509	Special Primer (C.W.)	litre	140.00
8510	Metal Primer (U.G.)	litre	90.00
8511	Fibre reinforced elastomeric liquid water proofing membrane	litre	198.69
8512	Cementitious water proofing coating with elastic polymers	kg	189.13
8513	Acrylic modified resin based texture	kg	36.00
8514	40 mm long S.S screws with plastic rawl plugs	100	40.00
8515	Galavanised MS 8 mm outer diameter M-6 dash fastener 50mm long	each	31.00
8516	ZMB 60/equivalent	kg	105.00
8517	ZMB thinner	litre	205.00
8518	Zycoprime / equivalent	litre	210.00
8519	Zycosil / equivalent	litre	1800.00
8520	Elastobar / equivalent	kg	300.00
8552	Mineral fibre beveled tegular edged ceiling tiles 595 x595mm,16 mm thick	sqm	830.00
8553	Mineral fibre beveled tegular edged ceiling tiles 595 x595mm,16 mm thick with bio-block conforming to ISO 5 (class 100) specifications.	sqm	920.00
8554	Mineral fiber beveled tegular edged ceiling tiles 595 x595mm,20 mm thick.	sqm	1040.00
8555	G.I main runner 15 x32 mm of 3000 mm length, 0.33 mm thick	each	185.00
8556	G.I cross-T 15 x32 mm of 1200 mm length, 0.33 mm thick	each	78.00
8557	G.I cross-T 15 x32 mm of 600 mm length, 0.33 mm thick	each	35.00
8558	G.I hanger rod 6mm dia fully threaded upto 1000 mm length	each	26.00
8559	Stainless steel U Channel of size (50x25x2mm)	metre	160.00
8560	Non staining water resistant clear silicon	metre	65.00
8561	Extruded polystyrene rigid insulation board 50 mm thick	sqm	525.00
8562	Expanded Polystyrene insulation board 120 mm thick confirming to IS 4671-1984, Fire retardant property self-extinguishing type as per EN 13501-1	sqm	800.00
8563	15 mm thick, light weight, integral densified micro look edged,false ceiling tiles of size 595x595 mm.	sqm	720.00
8564	15 mm thick, light weight,fully perforated square/butt edge integral densified,false ceiling tiles of size 595x595 mm.	sqm	900.00
8565	Galavanised MS hanger rod 6 mm dia MS fully threaded up to 1000mm length	each	26.00
8566	Powder coated steel section main-T ceiling sections 15x42x0.40 mm (3000 mm long)	each	235.00
8567	Galvanized mild steel perimeter wall angle 22x19x0.40 mm (3000mm long)	each	115.00

Schedule Item No	Common Specification	Unit	Complete Rate	Labour Rate
1416	Supply and fixing of Recess/pendent mounting having 1' X 4' Size 36 to 46 Watt seamlessly integrated LED luminaire with acrylic sheet diffuser and integral electronic driver, .Complete in all respect.			
	CAT-AAA 3960-5060 system lumens, 110lm/W, PF>0.95, THD <10% at full, CR>80, with 5 years warrantee	Each	6200	122
	CAT-AA 3600-4600 system lumens, 100lm/W, PF>0.95, THD <10% at full, CR>80, with 3 year warrantee.	Each	4290	122
	CAT-A 3220-4140 system lumens, 90lm/W, PF>0.95, THD <20% at full, CR>80, with 2 year warrantee	Each	2200	122
1417	Supply & fixing of water tight oblong 10 watt LED Bulkhead luminaire having die cast housing with driver set confirming to IP65 and above protection, .Complete in all respect.			
	CAT-AAA 1100 system lumens, 110lm/W, PF>0.95, with 5 years warrantee	Each	1400	122
	CAT-AA 1000 system lumens, 100lm/W, PF>0.95, with 3 year warrantee.	Each	1250	122
	CAT-A 900 system lumens, 90lm/W, PF>0.95, with 2 year warrantee	Each	-	-
1417(A)	Supply and fixing of Single LED light wall bracket 3 to 6 Watt on matching M.D.F.E.G Board base etc. complete in all respect.			
	CAT-AAA 330-660 system lumens, 110lm/W, PF>0.95, with 5 years warrantee	Each	2600	82
	CAT-AA 300-600 system lumens, 100lm/W, PF>0.95, with 3 year warrantee.	Each	-	-
	CAT-A 270-540 system lumens, 90lm/W, PF>0.95, with 2 year warrantee	Each	-	-
1418	Supply and fixing of Surface/Pendent mounting 20 Watt LED Surface Mounting weather proof Luminaire with PC Housing and opal finish cover confirming to IP65 Complete in all respect.			
	CAT-AAA 2200 system lumens, 110lm/W, PF>0.95, with 5 years warrantee	Each	2030	122
	CAT-AA 2000 system lumens, 100lm/W, PF>0.95, with 3 year warrantee.	Each	-	-
	CAT-A 1800 system lumens, 90lm/W, PF>0.95, with 2 year warrantee	Each	-	-
1418(A)	Supply and fixing of Surface/Pendent mounting 40 Watt LED Surface Mounting weather proof Luminaire with PC Housing and opal finish cover confirming to IP65 .Complete in all respect.			
	CAT-AAA 4400 system lumens, 110lm/W, PF>0.95, with 5 years warrantee	Each	2290	122
	CAT-AA 4000 system lumens, 100lm/W, PF>0.95, with 3 year warrantee.	Each	-	-
	CAT-A 3600 system lumens, 90lm/W, PF>0.95, with 2 year warrantee	Each	-	-



 (अभय शंकर श्रीवास्तव)

 मुख्या अधिकारी (वि०/या०)

 लो०/वि०/या०

 28/11/24

 (सफा रोल)

 अधीक्षण अधिकारी

 लो०/वि०/या०

 लो०/वि०/या०

3/

 (अभय शंकर श्रीवास्तव)

 मुख्या अधिकारी (वि०/या०)


 लो०/वि०/या०

 28/11/24

BILL OF QUANTITIES - NON HARYANA PWD SCHEDULES ITEMS						
S. No	Non HSR / CPWD DSR 2014 item	Description of item	Unit	Quantity	Rate	Amount
1		2	3	4	5	6.00
37	MP SOR 12.18	Providing and Fixing of sky lights consisting of 16mm thick Multi cell/tight cell Polycarbonate Panel System of approved colour, 16 mm thick (minimum) having uniform in color with an integral Tight-Cell core constructed not to exceed 4mmx4mm in a cross section. Vertical Standing Seam manufactured at both sides of the panel. Snap-on connector to interlock the panels shall have a grip-lock double tooth locking mechanism to ensure maximum uplift capability and shall be of same color as that of panel. Panel shall be factory sealed/end welded panels with additional End-cap/Aluminium U-Profile (mill finish) for ends. Panel shall be co-extruded with special anti glare compound and UV protected. The full system shall be fitted on MS purlins perpendicular to direction of sheeting with purlin spacing as specified by Manufacturer. The rate includes cost of all the operations, labour and all materials and tests (as applicable) involved such as bolts nuts and screws etc. and labour for cutting bending to required profile, necessary scaffolding, hoisting in position etc. for proper completion of the work etc. complete as per specification drawings and direction of Engineer in charge. Finished surface area of roofing fixed over steel tubular structure shall be measured for payment. MS tubular frame work shall be measured separately for payment.	sqm	88.00	3,546.00	312,048.00
37.00	16 RR	Providing and laying matt finished vitrified tiles of size 100x100x16mm having water absorption less than 0.5% and conforming to IS: 15622 of approved make in all colours and shades in out door floors such as footpath, court yard multi models etc., laid on 20mm thick base of cement mortar 1:4 (1cement : 4 coarse sand) in all shapes & patterns including grouting the joints with white cement mixed with matching pigments etc. complete as direction of Engineer-in-Charge.	sqm	731.07	1,474.20	1,077,743.39
38.00	21.1.1.1	Providing and supplying aluminium extruded tubular and other aluminium sections for louvers as per the architectural drawings and approved shop drawings, the aluminium quality as per grade 6063 T5 or T6 as per BS 1474, including anodising coating AC 15 microns conforming to AAMA 2604 of required colour and shade as approved by the Engineer-in-Charge. (The item includes cost of material such as cleats, sleeves, screws etc. necessary for fabrication of extruded aluminium frame work. Nothing extra shall be paid on this account).	kg	10,746.00	348.50	3,744,981.00
SUB TOTAL CPWD SOR 2014 ITEMS						48,218,601.96
NON SOR ITEMS -CIVIL						
39	NS-AR01	Providing & fixing in position, 200 mm thick 3D wall panels(factory made and machine made of 2.5 mm dia G.I. wire mesh with 50 mm pitch on both faces of the wall. Both the meshes are to be kept at 120, 135 mm gap and connected by the zig zag G.I. wire of 3mm dia at alternate row by welding (between an angle of 50-70 degree and the connecting wire must be welded at an average distance of 100 mm). The gap between the mesh to be filled with 100 mm thick EPS of density not less than 16 kg/cum and faces are finished by applying the layer of 50 mm thick cement mortar 1:3 (1 cement :3 coarse sand(coarse and may contain some stone chips (not more than 40%) of size less than 6mm)) with the help of shotcreting equipment etc at a pressure of not less than 1 bar complete as per the direction of the Engineer in charge and both surfaces finished with trowel in place of brick wall. (Ar)	sqm	1,484.00	3,212.80	4,767,795.20
40	NS-AR02	Extra for cutting hole for light fixtures i/c framing.	sqm	326.00	86.30	28,133.80
41	NS-AR03	Providing and fixing beveled edge mirror of superior glass (of approved quality) complete with 12 mm thick BWR plywood ground fixed to wooden cleats with C.P. brass screws and washers complete.(ref -AOR)	sqm	119.97	2,524.00	302,804.28
42	NS-AR05	Providing and fixing Dorma make floor spring BIS 75V EN 1-4 in doors with top pivot, bottom pivot and stainless steel cover plate i/c cutting of glass for patch fittings, cutting and repairing of floor. (AR)	each	10.00	19,414.70	194,147.00

BILL OF QUANTITIES - NON HARYANA PWD SCHEDULES ITEMS						
S. No	Non HSR / CPWD DSR 2014 Item	Description of item	Unit	Quantity	Rate	Amount
1						6.00
43	NS-AR06	Providing and laying one layer of Extruded polystyrene insulation board 100mm thickness of 32 to 35 kg cubic meter density (Foamular) , with shiplap joint at all levels, as shown in drawing. (A)	sqm	1,864.40	1,634.15	3,046,709.26
44	NS-AR07	Providing and fixing antistatic carpet roll 22 OZ weight per sqm as per approved sample laid with adhesive and protected with polythene till handover. (price Rs. 100 per sqft plus tax)	sqm	292.69	1,451.00	424,693.19
45	NS-AR08	Providing and fixing one layer of Extruded polystyrene insulation board 75mm thickness of 32 to 35 kg cubic meter density (Foamular) , with shiplap joint in partitions at all levels, fixed to existing framing as shown in drawing. (AR)	sqm	850.00	1,253.00	1,065,050.00
46	NS-AR09	Extra (DGU having) for 6mm thick solar glass on external side with properties having SHGC 0.32, and VLT having 59% and U value of 1.5 w/m2degK in place of HSR item 17.104 with 6mm glass shall have U value < 1.8, solar factor <0.35 light transmission> 49%	sqm	1,487.00	2,237.00	3,326,419.00
47	NS-AR10	Providing and fixing 50mm thick Glass Reinforced Concrete (G.R.C) Screens in approved size, pattern, design, thickness and color of M/S Unistone make or equivalent. The Screens should be made from '53 grade' White Portland Cement manufactured by 'JK Cement' or equivalent, Quartz, Fine Silica Sand, Alkali Resistant Glass Fiber manufactured by 'Saint Gobain' or equivalent, Super Plasticizers manufactured by 'BASF' or equivalent, Polymers manufactured by 'BASF' or equivalent and U.V resistant Synthetic inorganic pigments should be used for pigmentation manufactured by 'BAYFERROX (Germany)' or equivalent. The material casting should take place in Synthetic Rubber / FRP Mould manufactured by 'Reckli' or equivalent. The fixing of Screens should be 'Dry fixing' i.e. to be done with Stainless Steel (SS - 304) 'L' shaped Clamps, dash fasteners and pins	sqm	70.26	8,056.70	566,063.74
48	NS-AR11R	Supplying and applying 1.14 mm EPDM rubbergard membrane in horizontal surface waterproofing of roof consisting of 1st layer of with 200 gsm geotextile membrane on bottom, laying EPDM membrane as second layer jointed with quick seam tape, quick seam primer for jointing, form flash, adhesive, top layer 200 GSM geotextile i/c overlap, complete as per manufacturer's specifications, testing of waterproofing for 48 hrs.	sqm	3,386.93	1,123.70	3,805,893.24
		Technical parametefers FIRESTONE RubberGard: MATERIAL: 1.14 mm thick non reinforced vulcanized EPDM RUBBERGARD meeting ASTM D 4637 requirement. The sheet should be as large as possible but not less than 6m unspliced width. Weight - 1.4 kg per sqm, Tensile strength - > 9 N/ mm², Elongation - > 300 %, Tear resistance - > 35kN/m, Brittleness point - < -45 ° C, Water absorption - < 2 % Provide EPDM membrane, splice tape, primer and bonding adhesive that are FM approved . Identify materials with FM Approvals markings. All the materials used should be from the same manufacturer.				

4/29/2020 Gmail - Quotation for the systems

 ECBC Cell Uttar Pradesh <ecbc.uttarpradesh@gmail.com>

Quotation for the systems

Ambience Solutions <callupambience@yahoo.com> Wed, Apr 29, 2020 at 5:49 PM
 Reply-To: Ambience Solutions <callupambience@yahoo.com>
 To: ECBC Cell Uttar Pradesh <ecbc.uttarpradesh@gmail.com>


Dear Raj,
 Please find attached.

regards

Sameer Srivastava
B.E.(Hons.),Chartered Engineer
GRIHA-Certified Professional
For Green Habitats
ISHRAE- Certified Professional
For Clean Room Design
President-ISHRAE (Lucknow SubChapter)
 Ambience Solutions
 MM-310, Sector-D
 Aliganj, Lucknow-226024
 # 9838501380
 Solutions for HVAC , Green Buildings &
 Indoor Environmental Quality

"Adopt the Pace of Nature, Her Secret is Patience"

[Quoted text hidden]

 **Costs per Tr.xls**
 23K

	A	B	C	D	E
0					
1	S.no	Equipment	Minimum EER at Full Load (Cooling Mode)	Minimum COP at Full Load (Cooling Mode)	Rate per Tr. (W.O. Tax)
2	1	VRF System	3.02		53000.00
3	2	VRF System	3.65		59000.00
4					
5	3	Water Cooled Chiller-Centrifugal Type (< 150 Tr.)		5.4	56000.00
6	4	Water Cooled Chiller-Centrifugal Type (150 Tr. To 300 Tr.)		6.1	60000.00
7	5	Water Cooled Chiller-Centrifugal Type (> 300 Tr.)		6.3	70000.00
8					

Annexure 4: Compliance Forms

Whole Building Performance Method Compliance Form

Haryana Energy Conservation Building Code WBP Compliance Form

Project Info	Project Address: "UTTAR HARYANA BIJLI VITRAN NIGAM LIMITED (UHBVN) OFFICE" Building at Plot No. I-P3 & I-P4, Sector 14, Panchkula	Date
		For Building Department Use
	Project Built-up Area [m ²]: 22198.9	
	Project Above-grade Area [m ²]: 11846.6	
	Project Conditioned Area [m ²]: 8124.8	
	Applicant Name and Address:	
	Project Climatic Zone: Composite	

Building Classification	<input type="checkbox"/> Hospitality	<input checked="" type="checkbox"/> Business
	<input type="checkbox"/> HealthCare	<input type="checkbox"/> Educational
	<input type="checkbox"/> Assembly	<input type="checkbox"/> Shopping Complex

Project Description	<input checked="" type="checkbox"/> New Building	<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration
	<input type="checkbox"/> Self-occupied	<input type="checkbox"/> Core and Shell	<input type="checkbox"/> Mixed-Use
Compliance is sought for Energy efficiency level	<input type="radio"/> ECBC Compliant	<input type="radio"/> ECBC+ Compliant	<input checked="" type="radio"/> SuperECBC Compliant
EPI Ratio			0.57

The following information is necessary to check a building permit application for compliance with the Whole Building Performance Method requirements in the Haryana Energy Conservation Building Code.

Applicability			Code Section	Component	Information Required	Location on Plans	Building Department Notes
Yes	No	N/A					
Whole Building Performance Method							
✓			9.1	General			
✓			9.1.2	Compliance	As per specified in the code		
✓			9.1.3	Annual Energy Use	As per specified in the code		
✓			9.1.4	Trade off Limited to Building Permit	As per specified in the code		
✓			9.1.5	Documentation Requirements	As per specified in the code		
✓			9.2	Mandatory Provisions			
✓			4	Building Envelope			
✓			4.2	Mandatory Requirement	As per specified in the code		

✓			5	Comfort System and Controls		
✓			5.2	Mandatory Requirement	As per specified in the code	
✓			6	Lighting and Controls		
✓			6.2	Mandatory Requirement	As per specified in the code	
✓			7	Electrical & Renewable Energy System		
✓			7.2	Mandatory Requirement	As per specified in the code	
✓			9.3	Simulation Requirements	As per specified in the code, Bureau of Energy Efficiency Approved Software for Demonstrating Compliance with ECBC in Table 14-1	
✓			9.4	WBP Compliance Report	As per HECBC Section 9.0	