

**TF ASSOCIATES HVAC Consultancy Services**

R1

DATE : 04-12-23

COOLING AND HEATING LOAD ESTIMATION FOR SUMMER & MONSOON

OUTSIDE CONDITIONS

Project TACO BELL  
 Address T1 AIRPORT  
 Architects ARCH THINK STUDIO  
 Space BOH AREA  
 Floor FIFTH  
 Block

Summer  
 Monsoon

110F DB 75F WB  
 95F DB 83F WB

INSIDE CONDITIONS

75.2F DB 55% RH  
 FRESH AIR REPLENISHMENT  
 AS PER ASHARE NORMS  
 TOTAL HT F\CEILING HT  
 15.0'

Size 650 Sft x ht 15 ft 9750 Cu.ft

ITEM	AREA	SUN GAIN SUMMER	OR Δ t MONSOON	FACTOR	BTUs/HOUR SUMMER	MONSOON
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01. SOLAR GAIN

Glass N		14	11	0.56	0	0
Glass E		12	11	0.56	0	0
Glass S		12	13	0.56	0	0
Glass W		164	165	0.56	0	0
Glass NW		123	100	0.56	0	0
Glass SW		100	127	0.56	0	0
Glass NE		12	11	0.56	0	0
Glass SE		12	11	0.56	0	0
Sky Light		123	107	0.9	0	0

02. TRANS. GAIN

Wall N		21	6	0.32	0	0
Wall E		35	20	0.32	0	0
Wall S		33	18	0.32	0	0
Wall W		29	14	0.32	0	0
Wall NW		23	8	0.32	0	0
Wall SW		31	16	0.32	0	0
Wall NE		27	12	0.32	0	0
Wall SE		35	20	0.32	0	0
All Glass						
Single	0	35	20	1.13	0	0
Partn Glass		25	10	1.13	0	0
Partn.Wall (Toilet/Pantry)		18	6	0.4	0	0
Partn.Wall (Lift & Shaft)		28	12	0.4	0	0
Partn.Wall (Corridor)	395	26	13	0.4	4108	2054
Roof	650	52	37	0.16	5408	3848
Floor	650	26	11	0.4	6760	2860
Ceiling		20	12	0.4	0	0

03. INFILTRATION AND OUTSIDE AIR

Infiltration (Cfm)	35	20		1.08	0	0
Outside Air (Cfm)	35	20	0.1	1.08	0	0

04. INTERNAL HEAT GAIN

People	15	pax		205	3075	3075
Equipment	13.996	kw		3413	47768	47768
Light (flu)	1.5	watts	650	1	3.413	3328
Light (inc)		watts	650		3.413	0
Appliances	15	sft		560	8400	8400
Meals		pax		30	0	0

ROOM SENSIBLE HEAT GAIN SUB TOTAL 78847 71333

Supply	Supply	Fan Motor	Total	
Duct	Duct	5.50%	12.5%	
Heat Gain 3%	Leakage Loss 4%			
Add 7.5% on above sub total	Summer	78847	0.075	5914
	Monsoon	71333	0.075	5350

05. TOTAL ROOM SENSIBLE HEAT 84761 76683

06. **LATENT HEAT GAIN**

INFILTRATION AND OUTSIDE AIR

Infiltration (Cfm)					0.68	0	0
Outside Air (Cfm)	0	10	88.5	0.1	0.68	0	0
		gr/lb	gr/lb				

INTERNAL HEAT GAIN

People	15	pax		505		7575	7575
Appliances	15	sft		140		2100	2100
Meals	0	pax		30		0	0

ROOM LATENT HEAT GAIN SUB TOTAL 9675      9675

Supply	Loss	Total
Duct	Infiltration 3.5%	0
Leakage Loss 4%		

Add 7.5% on above sub total	Summer	9675	0.075	726
	Monsoon	9675	0.075	726

07. TOTAL ROOM LATENT HEAT 10401      10401

08. **ROOM TOTAL HEAT** **95161      87084**

	Summer	Monsoon
SENSIBLE HEAT FACTOR	0.891	0.881
INDICATED ADP	55	55
SELECTED ADP	56	56
DEHUMIDIFIED RISE	17.28	17.28

09. **DEHUMIDIFIED CFM** **4542      4109**

10. **RETURN AIR HEAT GAIN**

01. **SOLAR GAIN**

Glass N	14	11	0.24	0	0
Glass E	12	11	0.24	0	0
Glass S	12	13	0.24	0	0
Glass W	164	165	0.24	0	0
Glass NW	123	100	0.24	0	0
Glass SW	100	127	0.24	0	0
Glass NE	12	11	0.24	0	0
Glass SE	12	11	0.24	0	0
Glass N (B/O)	14	11	0	0	0
Glass E (B/O)	12	11	0	0	0
Glass W (B/O)	164	165	0	0	0
Glass NE (B/O)	12	11	0	0	0
Sky Light	123	107	0.9	0	0

02. **TRANS. GAIN**

Wall N	24	9	0.32	0	0
Wall E	38	23	0.32	0	0
Wall S	36	21	0.32	0	0
Wall W	32	17	0.32	0	0
Wall NW	26	11	0.32	0	0
Wall SW	34	19	0.32	0	0
Wall NE	30	15	0.32	0	0
Wall SE	38	23	0.32	0	0
All Glass					
Double	0	38	23	0.28	0
Exposed B/o Double G	0	38	23	0.1	0
Partn Glass		28	13	1.13	0
Partn.Wall (Toilet/Pantry)		17	9	0.4	0
Partn.Wall (Lift & Shaft)		30	14	0.4	0
Partn.Wall (Tenant Space)		24	10	0.4	0
Roof		55	40	0.16	0
Ceiling		31	16	0.4	0

RETURN AIR HEAT GAIN SUB TOTAL 0      0

Add 12.5% on above sub total	Summer	0	0.125		0		
	Monsoon	0	0.125				0
11.	<b>TOTAL RETURN AIR HEAT GAIN</b>				<b>0</b>		<b>0</b>
12.	<b>OUTSIDE AIR HEAT GAIN</b>						
Sensible	0	38	23	0.9	1.08	0	0
Latent	0	10	88.5	0.9	0.68	0	0
13.	ROOM TOTAL HEAT				95161		87084
14.	GRAND TOTAL HEAT SUB TOTAL				95161		87084

Return duct/ Space Heat Gain 2 %	Return Duct/ Space Leakage Loss 3%	Total '5%
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Add 5% on above sub total	Summer	95161	0.05		4758		
	Monsoon	87084	0.05				4354
15.	GRAND TOTAL HEAT				99919		91438
16.	<b>AC LOAD IN TR</b>				<b>8.3</b>		<b>7.6</b>

17. **EQUIPMENT SELECTION :**

18. <b>CHECK FIGURES :</b>	SUMMER	MONSOON
SFT/TR	<b>78.1</b>	<b>85.3</b>
CFM/SFT	<b>7.0</b>	<b>6.3</b>

19. **ASSUMPTIONS/REMARKS**

**REVISIONS**

No.	Date	Revision Details	By
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