CONDUCTION:

WALLS:	Wall	U	A	DETD		Q
	South	0.034	6924	11	U x A x DETD =	5066.952
	North	0.034	5825	8	U x A x DETD =	4124.064
	East	0.034	13548	18	U x A x DETD =	4237.488
	West	0.034	15162	18	U x A x DETD =	3564.9
						-16993.4

DOOR:	South	0.400	84	11	U x A x DETD =	-369.6
	North	0.400	126	8	U x A x DETD =	-403.2
	East	0.400	42	18	U x A x DETD =	-302.4
	West	0.400	384	18	U x A x DETD =	-2764.8
						-3840

GLASS:	Wall	U	A	DCLF		Q
	South	0.150	5828	18	U x A x DCLF =	15735.6
	North	0.150	8756	11	U x A x DCLF =	14447.4
	East	0.150	12635	38	U x A x DCLF =	72019.5
	West	0.150	16048	38	U x A x DCLF =	91473.6
						-193676.1

ROOF:	α	0.9				
	I	262				
	to	83.7				
	ho	3				
	te	155.30				
		U	A	ΔT		Q
		0.034	25410	80.300	U x A xΔT =	-69374.38

TOTAL CONDUCTION:	-280413.5

CONVECTION:

INFILTRATION (sensible)					
ACH	Volume		ΔT		Q
0.460	1438589	ti-to=	-8.7	ACHxVxΔTx1.08/60	-103630.2

VENTILATION (sensible)				
CFM		ΔT		Q
17.000	ti-to=	-8.7	CFMxΔTx1.08	-159.732

LATENT (Ventilation & Infiltration)				
CFM	Wi-Wo	ΔW		Q
17.000		0.0032	4842 x ΔW x CFM =	-263.4048

TOTAL CONVECTION:	-104053.3

RADIATION:

	SHGF	SHGC	A	SC		Q
North	38	0.370	5828	0.15	SHGFxSHGCxAxSC=	12291.252
South	95	0.370	8756	0.15		46166.01
East	41	0.370	12635	0.15		28750.943
West	41	0.370	16048	0.15		36517.224
					TOTAL RADIATION:	-123725.4

Qtotal = cooling load =	-508192.2

AC unit size =

Use -33.8795 ton AC unit BtUxEFFICIENCY/12000

0.800

Approximate Space Sizes for Major Heating and Cooling Equipment

237,416	Floor area served ft²
350	Cooling capacity in tons (Mcal/sec)
**1150	Total Space for boiler room and chilled water plant in ft²
450	Space for cooling towers in ft²

Typical dimenstions of single-packaged units in feet and inches

25'-0"	Length
7'-3"	Width
4'-11"	Height
150,000	Cooling air volume in CFM
150	Area of main supply or return ducts in ft²
250	Area of branch supply or return ducts in ft²
6000	Area of fan rooms in ft²
600	Area of fresh air louvers in ft²
500	Area of exhaust air louvers in ft²

** Our boiler is part of our helicopter turbine engine cogeneration system and is located on the roof of Level 9.

†† Our M.E. also told us that our helicopter turbine engine cogeneration system would decrease the size of our Mechanical Rooms in our building.

Mech. Calculations

CLARKESPOSITO ARCHITECTURE

Consultants

Structural Engineer
Hollee Becker

Mechanical Engineer
Matthew Setzekorn

Electrical Engineer
Jim Stadelman

Aeronautic Specialist
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Contract Information

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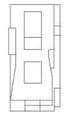
College of Architecture & Environmental Design

Client

BOEING

Key Plan



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Chkd by: Harker
Sheet Title: Mech. Calcs

M-002