STRUCTURAL CALCULATIONS

FOR

Example Project

1081 Clarks Ferry Road
Ledbetter, Kentucky 42058

KSi Project Number: 22000.00

CALCULATIONS TABLE OF CONTENTS

CALCULATIONS TABLE OF CONTENTS

CALCULATIONS TABLE OF CONTENTS

CALCULATIONS TABLE OF CONTENTS

CALCULATIONS TABLE OF CONTENTS

STRUCTURE LOCATION:	1081 Clarks Ferry Road						
	Ledbetter, Kentucky 42058						
STRUCTURE LATITUDE:	37.0532	°					
STRUCTURE LONGITUDE:	-88.5255	°					
BUILDING CODE:	2018 INTERNATIONAL BUILDING CODE (ASCE/SEI 7-16)						
USE AND OCCUPANCY CLASSIFICATION	BUSINESS GROUP B						
STRUCTURE RISK CATEGORY	CATEGORY III						
VOLUME INFORMATION:	**L_{NS}**	**=**	**125.500**	**FT**			
	L_{EW}	**=**	**147.000**	**FT**			
	θ_{NS}	=	0.000	°			
	θ_{EW}	=	1.193	°			
	DIAPHRAGM LEVEL	DIAPHRAGM HEIGHT			STORY HEIGHT		
	MEAN ROOF HEIGHT	**H_{MR}**	**=**	437.500	**FT**	18.500	FT
	6th LEVEL HEIGHT	H_6	=	419.000	FT	15.000	FT
	5th LEVEL HEIGHT	H_5	=	404.000	FT	15.000	FT
	4th LEVEL HEIGHT	H_4	=	389.000	FT	15.000	FT
	3rd LEVEL HEIGHT	H_3	=	374.000	FT	15.000	FT
	2nd LEVEL HEIGHT	H_2	=	359.000	FT	19.000	FT
	BASE HEIGHT	H_0	=	340.000	FT		
	GROUND ELEVATION	H_g	=	340.000	FT		
	STRUCTURE SITE ELEVATION	G_S	=	340.000	FT		
	MAXIMUM PARAPET HEIGHT	H_{PR}	=	440.500	FT		

A) BUILDING CODE: 2018 INTERNATIONAL BUILDING CODE (ASCE/SEI 7-16)

B) CONTROLLING ROOF LOAD: ROOF SNOW LOAD

C) ATMOSPHERIC ICE LOAD: NOT APPLICABLE

D) FLOOD ZONE: ZONE AE

E) SEISMIC DESIGN CATEGORY: SDC D

SPECTRAL RESPONSE ACCELERATION: S_{DS} = 0.754

F) LOAD CASES:

D	DEAD LOAD
F	FLUID LOAD (WELL DEFINED)
T	SELF-STRAINING FORCE
H	LATERAL EARTH PRESSURE
L	LIVE LOAD
Lr	ROOF LIVE LOAD
R	RAIN LOAD
S	SNOW LOAD (BALANCED CASE)
W	WIND LOAD
E	SEISMIC LOAD
Qe	HORIZONTAL COMPONENT OF SEISMIC LOAD
Fa	FLOOD LOAD
Di	DEAD LOAD OF ICE
Wi	WIND-ON-ICE LOAD

ULTIMATE LOAD COMBINATIONS (LRFD)

USD 1. **1.4·(D + F)**

A) 1.4·(D + F)

USD 2. **1.2·(D + F + T) + 1.6·H* + 1.6·L + 0.5·(Lr or S or R)**

A) 1.2·(D + F + T) + 1.6·H* + 1.6·L + 0.5·S

B) –

USD 3a. **1.2·(D + F) + 1.0·L* + 1.6·(Lr or S or R)**

A) 1.2·(D + F) + 1.0·L* + 1.6·S

USD 3b. **1.2·(D + F) + 1.6·(Lr or S or R) ± 0.5·W**

A) 1.2·(D + F) + 1.6·S + 0.5·W

B) 1.2·(D + F) + 1.6·S - 0.5·W

USD 4. **1.2·(D + F) + 1.0·L* + 0.5·(Lr or S or R) ± 1.0·W**

A) 1.2·(D + F) + 1.0·L* + 0.5·S + 0.5·W + 1.0·Fa

B) 1.2·(D + F) + 1.0·L* + 0.5·S - 0.5·W + 1.0·Fa

C) –

D) –

USD 5. **1.2·(D + F) + 1.0·L* + 0.2·S ± 1.0·E**

A) 1.351·(D + F) + 1.0·L* + 0.2·S + (1.3 or Ωo)·Qe

B) 1.351·(D + F) + 1.0·L* + 0.2·S - (1.3 or Ωo)·Qe

USD 6. **0.9·D + 1.6·H* ± 1.0·W**

A) 0.9·D + 1.6·H* + 0.5·W + 1.0·Fa

B) 0.9·D + 1.6·H* - 0.5·W + 1.0·Fa

C) –

D) –

USD 7. **0.9·(D + F) + 1.6·H* ± 1.0·E**

A) 0.749·(D + F) + 1.6·H* + (1.3 or Ωo)·Qe

B) 0.749·(D + F) + 1.6·H* - (1.3 or Ωo)·Qe

ALLOWABLE LOAD COMBINATIONS (ASD)

ASD 1.	**1.0·(D + F)**	
	A)	1.0·(D + F)
ASD 2.	**1.0·(D + F) + 1.0·H* + 1.0·L***	
	A)	1.0·(D + F) + 1.0·H* + 1.0·L*
	B)	–
ASD 3.	**1.0·(D + F) + 1.0·H* + 1.0·(Lr or S or R)**	
	A)	1.0·(D + F) + 1.0·H* + 1.0·S
	B)	–
ASD 4.	**1.0·(D + F) + 1.0·H* + 0.75·L* + 0.75·(Lr or S or R)**	
	A)	1.0·(D + F) + 1.0·H* + 0.75·L* + 0.75·S
ASD 5a.	**1.0·(D + F) + 1.0·L* + 1.0·(Lr or S or R) ± 0.6·W**	
	A)	1.0·(D + F) + 1.0·L* + 1.0·S + 0.6·W + 0.75·Fa
	B)	1.0·(D + F) + 1.0·L* + 1.0·S - 0.6·W + 0.75·Fa
ASD 5b.	**1.0·(D + F) + 1.0·L* + 1.0·(Lr or S or R) ± 0.7·E**	
	A)	1.106·(D + F) + 1.0·L* + 1.0·S + (0.91 or 0.7·Ωo)·Qe
	B)	1.106·(D + F) + 1.0·L* + 1.0·S - (0.91 or 0.7·Ωo)·Qe
ASD 6a.	**1.0·(D + F) + 1.0·H* + 0.75·L* + 0.75·(Lr or S or R) ± 0.45·W**	
	A)	1.0·(D + F) + 1.0·H* + 0.75·L* + 0.75·S + 0.45·W + 0.75·Fa
	B)	1.0·(D + F) + 1.0·H* + 0.75·L* + 0.75·S - 0.45·W + 0.75·Fa
ASD 6b.	**1.0·(D + F) + 1.0·F + 1.0·H* + 0.75·L* + 0.75·(Lr or S or R) ± 0.525·E**	
	A)	1.079·(D + F) + 1.0·F + 1.0·H* + 0.75·L* + 0.75·S + (0.683 or 0.525·Ωo)·Qe
	B)	1.079·(D + F) + 1.0·F + 1.0·H* + 0.75·L* + 0.75·S - (0.683 or 0.525·Ωo)·Qe
ASD 7.	**0.6·D + 1.0·H* ± 0.6·W**	
	A)	0.6·D + 1.0·H* + 0.6·W + 0.75·Fa
	B)	0.6·D + 1.0·H* - 0.6·W + 0.75·Fa
	C)	–
	D)	–

ALLOWABLE LOAD COMBINATIONS (ASD)

ASD 8.		**0.6·(D + F) + 1.0·H* ± 0.7·E**
	A)	0.494·(D + F) + 1.0·H* + (0.91 or 0.7·Ωo)·Qe
	B)	0.494·(D + F) + 1.0·H* - (0.91 or 0.7·Ωo)·Qe

1. WIND DRIFT LIMIT

NORTH-SOUTH DIRECTION

$\Delta_{allow,W}$ = H_{story} / 400 = **0.0025** $\cdot H_{story}$

EAST-WEST DIRECTION

$\Delta_{allow,W}$ = H_{story} / 400 = **0.0025** $\cdot H_{story}$

2. SEISMIC DRIFT LIMIT

STRUCTURE RISK CATEGORY: CATEGORY III

SEISMIC IMPORTANCE FACTOR: I = 1.25

NORTH-SOUTH DIRECTION: $\Delta_{allow,S}$ = 0.020 $\cdot H_{story}$

BASIC SEISMIC FORCE RESISTING SYSTEM

–	(C.5) SPECIAL REINFORCED CONCRETE MOMENT FRAMES	→ Cd = 5.50
–	(C.1) STEEL SPECIAL MOMENT FRAMES	→ Cd = 5.50
–		→

CONTROLLING DEFLECTION AMPLIFICATION FACTOR → Cd = 5.50

ALLOWABLE ELASTIC DRIFT

$\delta_{allow,e}$ = $\Delta_{allow,S} \cdot I / Cd$ = 0.020·Hs·1.25 / 5.50 = **0.0045** $\cdot H_{story}$

EAST-WEST DIRECTION: $\Delta_{allow,S}$ = 0.020 $\cdot H_{story}$

BASIC SEISMIC FORCE RESISTING SYSTEM

–	(C.5) SPECIAL REINFORCED CONCRETE MOMENT FRAMES	→ Cd = 5.50
–	(C.1) STEEL SPECIAL MOMENT FRAMES	→ Cd = 5.50
–		→

CONTROLLING DEFLECTION AMPLIFICATION FACTOR → Cd = 5.50

ALLOWABLE ELASTIC DRIFT

$\delta_{allow,e}$ = $\Delta_{allow,S} \cdot I / Cd$ = 0.020·Hs·1.25 / 5.50 = **0.0045** $\cdot H_{story}$

1. ROOF LOADS - TYPICAL

ROOF LIVE LOAD	→	20.0	PSF
PARTITION LOAD	→	0.0	PSF
DEAD LOAD COMPONENTS			
– ROOFING	→	0.5	PSF
– TOPPING	→	0.0	PSF
– SLAB*	→	0.0	PSF
– DECKING*	→	2.0	PSF
– FRAMING*	→	5.0	PSF
– CEILING	→	2.0	PSF
– MECHANICAL	→	5.0	PSF
– INSULATION	→	1.0	PSF
– MISCELLANEOUS	→	0.0	PSF
– WALLS*	→	5.0	PSF

GRAVITY LOADS

DL = 0.5 PSF + 0.0 PSF + 0.0 PSF + 2.0 PSF + 5.0 PSF + 2.0 PSF + 5.0 PSF + 1.0 PSF + 0.0 PSF

DL = 15.5 PSF (8.5 PSF)*

LL = 20.0 PSF OR 300 LB

PL = 0.0 PSF

SINGLE STORY LL REDUCTION: YES (§ 4.8.2)

SEISMIC MASS LOADS

SM = 0.5 PSF + 0.0 PSF + 0.0 PSF + 2.0 PSF + 5.0 PSF + 2.0 PSF + 5.0 PSF + 1.0 PSF + 0.0 PSF + 5.0 PSF

SM = 20.5 PSF

2. ROOF LOADS - MECHANICAL

ROOF LIVE LOAD	→	20.0	PSF
PARTITION LOAD	→	0.0	PSF
DEAD LOAD COMPONENTS			
– ROOFING	→	0.5	PSF
– TOPPING	→	0.0	PSF
– SLAB*	→	0.0	PSF
– DECKING*	→	2.0	PSF
– FRAMING*	→	5.0	PSF
– CEILING	→	2.0	PSF
– MECHANICAL	→	50.0	PSF
– INSULATION	→	1.0	PSF
– MISCELLANEOUS	→	0.0	PSF
– WALLS*	→	5.0	PSF

GRAVITY LOADS

DL = 0.5 PSF + 0.0 PSF + 0.0 PSF + 2.0 PSF + 5.0 PSF + 2.0 PSF + 50.0 PSF + 1.0 PSF + 0.0 PSF

DL = 60.5 PSF (53.5 PSF)*

LL = 20.0 PSF OR 300 LB

PL = 0.0 PSF

SINGLE STORY LL REDUCTION: YES (§ 4.8.2)

SEISMIC MASS LOADS

SM = 0.5 PSF + 0.0 PSF + 0.0 PSF + 2.0 PSF + 5.0 PSF + 2.0 PSF + 50.0 PSF + 1.0 PSF + 0.0 PSF + 5.0 PSF

SM = 65.5 PSF

1. FLOOR LOADS - LOBBY (CONCRETE)

FLOOR LIVE LOAD	→	100.0	PSF
PARTITION LOAD	→	0.0	PSF
DEAD LOAD COMPONENTS			
– FLOORING	→	2.0	PSF
– TOPPING	→	0.0	PSF
– SLAB*	→	125.0	PSF
– DECKING*	→	0.0	PSF
– FRAMING*	→	0.0	PSF
– CEILING	→	2.0	PSF
– MECHANICAL	→	5.0	PSF
– INSULATION	→	0.0	PSF
– MISCELLANEOUS	→	0.0	PSF
– WALLS*	→	10.0	PSF

GRAVITY LOADS

DL = 2.0 PSF + 0.0 PSF + 125.0 PSF + 0.0 PSF + 0.0 PSF +
2.0 PSF + 5.0 PSF + 0.0 PSF + 0.0 PSF

DL = 134.0 PSF (9.0 PSF)*

LL = 100.0 PSF OR 2000 LB

PL = 0.0 PSF

SINGLE STORY LL REDUCTION: YES (§ 4.7.2)

MULTIPLE STORY LL REDUCTION: YES (§ 4.7.2)

SEISMIC MASS LOADS

SM = 2.0 PSF + 0.0 PSF + 125.0 PSF + 0.0 PSF + 0.0 PSF +
2.0 PSF + 5.0 PSF + 0.0 PSF + 0.0 PSF + 10.0 PSF

SM = 144.0 PSF

2. FLOOR LOADS - OFFICE (CONCRETE)

FLOOR LIVE LOAD	→	50.0	PSF
PARTITION LOAD	→	15.0	PSF
DEAD LOAD COMPONENTS			
– FLOORING	→	2.0	PSF
– TOPPING	→	0.0	PSF
– SLAB*	→	125.0	PSF
– DECKING*	→	0.0	PSF
– FRAMING*	→	0.0	PSF
– CEILING	→	2.0	PSF
– MECHANICAL	→	5.0	PSF
– INSULATION	→	0.0	PSF
– MISCELLANEOUS	→	0.0	PSF
– WALLS*	→	10.0	PSF

GRAVITY LOADS

DL = 2.0 PSF + 0.0 PSF + 125.0 PSF + 0.0 PSF + 0.0 PSF +
2.0 PSF + 5.0 PSF + 0.0 PSF + 0.0 PSF

DL = 134.0 PSF (9.0 PSF)*

LL = 50.0 PSF OR 2000 LB

PL = 15.0 PSF

SINGLE STORY LL REDUCTION: YES (§ 4.7.2)

MULTIPLE STORY LL REDUCTION: YES (§ 4.7.2)

SEISMIC MASS LOADS

SM = 2.0 PSF + 0.0 PSF + 125.0 PSF + 0.0 PSF + 0.0 PSF +
2.0 PSF + 5.0 PSF + 0.0 PSF + 0.0 PSF + 10.0 PSF

SM = 144.0 PSF

3. FLOOR LOADS - MECHANICAL (CONCRETE)

FLOOR LIVE LOAD	→	150.0	PSF
PARTITION LOAD	→	0.0	PSF
DEAD LOAD COMPONENTS			
– FLOORING	→	0.0	PSF
– TOPPING	→	0.0	PSF
– SLAB*	→	125.0	PSF
– DECKING*	→	0.0	PSF
– FRAMING*	→	0.0	PSF
– CEILING	→	2.0	PSF
– MECHANICAL	→	30.0	PSF
– INSULATION	→	0.0	PSF
– MISCELLANEOUS	→	0.0	PSF
– WALLS*	→	10.0	PSF

GRAVITY LOADS

DL = 0.0 PSF + 0.0 PSF + 125.0 PSF + 0.0 PSF + 0.0 PSF + 2.0 PSF + 30.0 PSF + 0.0 PSF + 0.0 PSF

DL = 157.0 PSF (32.0 PSF)*

LL = 150.0 PSF 0

PL = 0.0 PSF

SINGLE STORY LL REDUCTION: NO (§ 4.7.3)

MULTIPLE STORY LL REDUCTION: YES (§ 4.7.3)

SEISMIC MASS LOADS

SM = 0.0 PSF + 0.0 PSF + 125.0 PSF + 0.0 PSF + 0.0 PSF + 2.0 PSF + 30.0 PSF + 0.0 PSF + 0.0 PSF + 10.0 PSF

SM = 167.0 PSF

4. FLOOR LOADS - LOBBY (METAL DECK)

FLOOR LIVE LOAD	→	100.0	PSF
PARTITION LOAD	→	0.0	PSF
DEAD LOAD COMPONENTS			
– FLOORING	→	2.0	PSF
– TOPPING	→	0.0	PSF
– SLAB*	→	62.4	PSF
– DECKING*	→	2.8	PSF
– FRAMING*	→	8.0	PSF
– CEILING	→	2.0	PSF
– MECHANICAL	→	5.0	PSF
– INSULATION	→	0.0	PSF
– MISCELLANEOUS	→	0.0	PSF
– WALLS*	→	10.0	PSF

GRAVITY LOADS

DL = 2.0 PSF + 0.0 PSF + 62.4 PSF + 2.8 PSF + 8.0 PSF + 2.0 PSF + 5.0 PSF + 0.0 PSF + 0.0 PSF

DL = 82.2 PSF (9.0 PSF)*

LL = 100.0 PSF OR 1000 LB

PL = 0.0 PSF

SINGLE STORY LL REDUCTION: NO (§ 4.7.5)

MULTIPLE STORY LL REDUCTION: NO (§ 4.7.5)

SEISMIC MASS LOADS

SM = 2.0 PSF + 0.0 PSF + 62.4 PSF + 2.8 PSF + 8.0 PSF + 2.0 PSF + 5.0 PSF + 0.0 PSF + 0.0 PSF + 10.0 PSF

SM = 92.2 PSF

5. FLOOR LOADS - OFFICE (METAL DECK)

FLOOR LIVE LOAD	→	50.0	PSF
PARTITION LOAD	→	15.0	PSF
DEAD LOAD COMPONENTS			
– FLOORING	→	2.0	PSF
– TOPPING	→	0.0	PSF
– SLAB*	→	62.4	PSF
– DECKING*	→	2.8	PSF
– FRAMING*	→	8.0	PSF
– CEILING	→	2.0	PSF
– MECHANICAL	→	5.0	PSF
– INSULATION	→	0.0	PSF
– MISCELLANEOUS	→	0.0	PSF
– WALLS*	→	10.0	PSF

GRAVITY LOADS

DL = 2.0 PSF + 0.0 PSF + 62.4 PSF + 2.8 PSF + 8.0 PSF +
2.0 PSF + 5.0 PSF + 0.0 PSF + 0.0 PSF

DL = 82.2 PSF (9.0 PSF)*

LL = 50.0 PSF OR 2000 LB

PL = 15.0 PSF

SINGLE STORY LL REDUCTION: YES (§ 4.7.2)

MULTIPLE STORY LL REDUCTION: YES (§ 4.7.2)

SEISMIC MASS LOADS

SM = 2.0 PSF + 0.0 PSF + 62.4 PSF + 2.8 PSF + 8.0 PSF +
2.0 PSF + 5.0 PSF + 0.0 PSF + 0.0 PSF + 10.0 PSF

SM = 92.2 PSF

6. FLOOR LOADS - MECHANICAL (METAL DECK)

FLOOR LIVE LOAD	→	150.0	PSF
PARTITION LOAD	→	0.0	PSF
DEAD LOAD COMPONENTS			
– FLOORING	→	2.0	PSF
– TOPPING	→	0.0	PSF
– SLAB*	→	62.4	PSF
– DECKING*	→	2.8	PSF
– FRAMING*	→	8.0	PSF
– CEILING	→	2.0	PSF
– MECHANICAL	→	30.0	PSF
– INSULATION	→	0.0	PSF
– MISCELLANEOUS	→	0.0	PSF
– WALLS*	→	10.0	PSF

GRAVITY LOADS

DL = 2.0 PSF + 0.0 PSF + 62.4 PSF + 2.8 PSF + 8.0 PSF +
2.0 PSF + 30.0 PSF + 0.0 PSF + 0.0 PSF

DL = 107.2 PSF (34.0 PSF)*

LL = 150.0 PSF 0

PL = 0.0 PSF

SINGLE STORY LL REDUCTION: NO (§ 4.7.3)

MULTIPLE STORY LL REDUCTION: YES (§ 4.7.3)

SEISMIC MASS LOADS

SM = 2.0 PSF + 0.0 PSF + 62.4 PSF + 2.8 PSF + 8.0 PSF +
2.0 PSF + 30.0 PSF + 0.0 PSF + 0.0 PSF + 10.0 PSF

SM = 117.2 PSF

1.	STRUCTURE RISK CATEGORY		CATEGORY III		
2.	DESIGN RAINFALL INTENSITY	I_{DESIGN}	= 6.17	IN/HR	
3.	SECONDARY DRAIN TYPE		INTERIOR ROOF DRAINS		
	DRAIN DIAMETER	D	= 6.0	IN	
4.	PLAN AREA SERVICED BY SINGLE SECONDARY DRAIN	A_{DRAIN}	= 2306.1	FT^2	
5.	FLOW RATE OF SINGLE SECONDARY DRAIN	Q_{DRAIN}	$= 0.0104 \cdot A_{DRAIN} \cdot I_{DESIGN}$ = 148.0	GAL/MIN.	
6.	STATIC HEAD OF SECONDARY DRAIN	d_s	= 2.000	IN	
7.	HYDRAULIC HEAD OF SECONDARY DRAIN	d_h	= 1.533	IN	
8.	RAIN LOAD	R	$= 5.2 \cdot (d_s + d_h)$ = 18.37	PSF	

1.	STRUCTURE RISK CATEGORY		CATEGORY III		
	SNOW IMPORTANCE FACTOR	I	=	1.10	
2.	GROUND SNOW LOAD	P_g	=	15.00	PSF
3.	SNOW DENSITY	γ	=	$\min[0.13 \cdot P_g + 14\ PCF, 30\ PCF]$	
			=	min[0.13·15 PSF+14 PCF, 30 PCF]	
			=	15.95	PCF
4.	WIND EXPOSURE CATEGORY		EXPOSURE C		
	ROOF EXPOSURE		PARTIALLY EXPOSED		
	EXPOSURE FACTOR	C_e	=	1.00	
5.	THERMAL CONDITION		ALL OTHER STRUCTURES		
	THERMAL FACTOR	C_t	=	1.00	
6.	FLAT ROOF SNOW LOAD	P_f	=	$\max[0.7 \cdot Ce \cdot Ct \cdot I \cdot Pg\ ,\ I \cdot Pg]$	
			=	max[0.7·1.0·1.00·1.1·15 PSF , 1.1·15 PSF]	
		P_f	**=**	**16.50**	**PSF**
7.	ROOF COMPOSITION		ALL OTHER SURFACES		
	ROOF ANGLE	θ_{NS}	=	0.000	°
		θ_{EW}	=	1.193	°
	ROOF SLOPE FACTOR - NORTH-SOUTH DIRECTION	C_{sNS}	=	1.00	
	ROOF SLOPE FACTOR - EAST-WEST DIRECTION	C_{sEW}	=	1.00	
8.	SLOPED ROOF SNOW LOAD	P_s	=	$\max[C_{sNS} \cdot P_f\ ,\ C_{sEW} \cdot P_f]$	
			=	max[1.00·16.50 PSF , 1.00·16.50 PSF]	
		P_s	=	16.50	PSF
9.	RAIN-ON-SNOW SURCHARGE LOAD	P_{Rs}	=	5.00	PSF
10.	TOTAL DESIGN BALANCED SLOPED ROOF SNOW LOAD	P_{sT}	=	$P_s + P_{Rs}$	
			=	16.50 PSF + 5.00 PSF	
		P_{sT}	**=**	**21.50**	**PSF**

11.	UNBALANCED ROOF SNOW LOAD							
	NORTH-SOUTH DIRECTION							
	APPLICABILITY CRITERIA	**UNBALANCED SNOW LOAD NOT APPLICABLE**						
	RIDGE DRIFT HEIGHT	h_{dNS}	=	$0.43 \cdot (0.5 \cdot L_{NS})^{1/3} \cdot (P_g + 10\ PSF)^{1/4} - 1.5$				
			=	0.00	FT			
	WINDWARD ROOF SNOW LOAD	$\mathbf{P_{sW}}$	**=**	**0.00**	**PSF**			
	LEEWARD ROOF SNOW LOAD AT EDGE	$\mathbf{P_{sL}}$	**=**	**0.00**	**PSF**			
	LEEWARD ROOF SNOW LOAD AT RIDGE	$\mathbf{P'_{sL}}$	**=**	**0.00**	**PSF**			
	LENGTH OF RIDGE ZONE	$\mathbf{L_{sL}}$	**=**	**0.00**	**FT**			
	EAST-WEST DIRECTION							
	APPLICABILITY CRITERIA	**UNBALANCED SNOW LOAD NOT APPLICABLE**						
	RIDGE DRIFT HEIGHT	h_{dEW}	=	$0.43 \cdot (0.5 \cdot L_{EW})^{1/3} \cdot (P_g + 10\ PSF)^{1/4} - 1.5$				
			=	0.00	FT			
	WINDWARD ROOF SNOW LOAD	$\mathbf{P_{sW}}$	**=**	**0.00**	**PSF**			
	LEEWARD ROOF SNOW LOAD AT EDGE	$\mathbf{P_{sL}}$	**=**	**0.00**	**PSF**			
	LEEWARD ROOF SNOW LOAD AT RIDGE	$\mathbf{P'_{sL}}$	**=**	**0.00**	**PSF**			
	LENGTH OF RIDGE ZONE	$\mathbf{L_{sL}}$	**=**	**0.00**	**FT**			
12.	BALANCED SNOW LOAD HEIGHT	H_b	=	P_s / γ				
			=	16.50 PSF / 15.95 PCF				
			=	1.034	FT	=	12.41	IN
13.	HEIGHT LIMIT FOR DRIFT CONSIDERATION	H_o	≥	$1.2 \cdot H_b$				
			≥	$1.2 \cdot 1.034$ FT				
			≥	**1.241**	**FT**	=	**14.90**	**IN**

1. PARAPET SNOW DRIFT LOADS

A) SNOW DRIFT TYPE — PARAPET

B) HEIGHT OF OBSTRUCTION — H_o = 3.00 FT

C) CLEAR HEIGHT — H_c = $H_o - H_b$ = 3.00 FT - 1.03 FT

= 1.97 FT

D) WIND FETCH LENGTH FOR DRIFTS

UPWIND ROOF FETCH LENGTH — $\ell u1$ = 147.00 FT

E) MINIMUM FETCH LIMIT — ℓ_{min} = 20.00 FT

F) DRIFT HEIGHT IMPORTANCE FACTOR MODFIER — DM = 1.05

G) CALCULATED ANALYTICAL DRIFT HEIGHTS

UPWIND DRIFT HEIGHT — H_d = 0.75·DM·[0.43·(ℓu1)^(1/3)·(Pg+10 PSF)^(1/4) - 1.5]

= 0.75·1.05·[0.43·(147)^(1/3)·(15+10)^(1/4) - 1.5]

= 2.81 FT = 33.74 IN

H) GEOMETRY LIMITED DRIFT HEIGHT — H_d = min[Hd , Hc]

= min[2.81 FT , 1.97 FT]

= 1.97 FT = 23.59 IN

I) WIDTH OF DRIFT LOAD — W = min[4·max(Hd² / Hc , Hd) , 8·Hc]

= min[4·max(2.81 FT² / 1.97 FT , 2.81 FT) , 8·1.97 FT]

= 15.72 FT = 188.69 IN

J) MAXIMUM INTENSITY OF DRIFT LOAD — P_d = $H_d \cdot \gamma$ = 1.97 FT ·15.95 PCF

= 31.35 PSF

K) TOTAL SNOW LOAD — P_t = $P_s + P_d$ = 16.50 PSF + 31.35 PSF

P_t = 47.85 PSF

2. PARAPET SNOW DRIFT LOADS

A) SNOW DRIFT TYPE — PARAPET

B) HEIGHT OF OBSTRUCTION — H_o = 3.00 FT

C) CLEAR HEIGHT — $H_c = H_o - H_b$ = 3.00 FT - 1.03 FT

= 1.97 FT

D) WIND FETCH LENGTH FOR DRIFTS

UPWIND ROOF FETCH LENGTH — $\ell u1$ = 125.50 FT

E) MINIMUM FETCH LIMIT — ℓ_{min} = 20.00 FT

F) DRIFT HEIGHT IMPORTANCE FACTOR MODFIER — DM = 1.05

G) CALCULATED ANALYTICAL DRIFT HEIGHTS

UPWIND DRIFT HEIGHT — H_d = 0.75·DM·[0.43·(ℓu1)^(1/3)·(Pg+10 PSF)^(1/4) - 1.5]

= 0.75·1.05·[0.43·(126)^(1/3)·(15+10)^(1/4) - 1.5]

= 2.61 FT = 31.28 IN

H) GEOMETRY LIMITED DRIFT HEIGHT — H_d = min[Hd , Hc]

= min[2.61 FT , 1.97 FT]

= 1.97 FT = 23.59 IN

I) WIDTH OF DRIFT LOAD — W = min[4·max(Hd² / Hc , Hd) , 8·Hc]

= min[4·max(2.61 FT² / 1.97 FT , 2.61 FT) , 8·1.97 FT]

= 13.83 FT = 165.95 IN

J) MAXIMUM INTENSITY OF DRIFT LOAD — $P_d = H_d \cdot \gamma$ = 1.97 FT ·15.95 PCF

= 31.35 PSF

K) TOTAL SNOW LOAD — $P_t = P_s + P_d$ = 16.50 PSF + 31.35 PSF

P_t = 47.85 PSF

1.	STRUCTURE RISK CATEGORY	CATEGORY III				
2.	STRUCTURE GEOMETRY					
	MAXIMUM MEAN ROOF HEIGHT	H_{MR}	=	97.500	FT	
	MAXIMUM STRUCTURE DIMENSION (NORTH-SOUTH DIR.)	L_{NS}	=	125.500	FT	
	MAXIMUM STRUCTURE DIMENSION (EAST-WEST DIR.)	L_{EW}	=	147.000	FT	
3.	STRUCTURE SITE ELEVATION	G_S	=	340.00	FT	
4.	FLOOD ZONE DESIGNATION	ZONE AE				
5.	BASE FLOOD ELEVATION (BFE)	BFE =		341.00	FT	
6.	REQUIRED FREEBOARD	FB	=	2.00	FT	
	DESIGN FLOOD ELEVATION (DFE)	DFE =		343.00	FT	
5.	LOCAL STILL WATER DEPTH	d_s	=	$0.65 \cdot (BFE - G_S)$ =	0.650	FT
6.	FLOOD WATER TYPE	FRESH WATER				
		γ_w	=	62.4	PCF	
7.	DESIGN BREAKING WAVE HEIGHT	H_b	=	$0.78 \cdot d_s$ =	0.507	FT
8.	DESIGN FLOOD VELOCITY	V_A	=	$0.5 \cdot (32.2 \cdot d_s)^{0.5}$ =	2.287	FT/S

9. INTERIOR FLOOD CONDITIONS — NOT FLOODED

10. HYDROSTATIC VERTICAL LOADS

PLAN AREA

A_{PLAN} = 18449 FT²

VERTICAL LOAD

$F_{S-UP} = \gamma_w \cdot \min[d_S , H_{MR}] \cdot A_{PLAN}$

F_{S-UP} = 748.27 KIP

11. HYDROSTATIC LATERAL LOADS ON WALLS

$F_{STAT} = 0.5 \cdot \gamma_w \cdot d_S^2$

F_{STAT} = 0.01 KIP/FT

12. HYDRODYNAMIC LATERAL LOADS

NORTH-SOUTH DIRECTION:

$L_{EW} / \min[d_S , H_{MR}]$ = 226.2

C_{d-NS} = 2.00

$F_{d-NS} = 0.5 \cdot C_{d-NS} \cdot (\gamma_w/32.2) \cdot V_A^2 \cdot d_S \cdot L_{EW}$

F_{d-NS} = 0.97 KIP

EAST-WEST DIRECTION:

$L_{NS} / \min[d_S , H_{MR}]$ = 193.1

C_{d-EW} = 2.00

$F_{d-EW} = 0.5 \cdot C_{d-EW} \cdot (\gamma_w/32.2) \cdot V_A^2 \cdot d_S \cdot L_{NS}$

F_{d-EW} = 0.83 KIP

13. BREAKING WAVE LOAD ON WALLS

DYNAMIC PRESSURE COEFFICIENT

C_p = 3.20

NORTH-SOUTH DIRECTION:

$F_{BW-NS} = (1.1 \cdot C_p \cdot \gamma_w \cdot d_S^2 + 2.4 \cdot \gamma_w \cdot d_S^2) \cdot L_{EW}$ OR

$(1.1 \cdot C_p \cdot \gamma_w \cdot d_S^2 + 1.9 \cdot \gamma_w \cdot d_S^2) \cdot L_{EW}$

F_{BW-NS} = 0.00 KIP

EAST-WEST DIRECTION:

$F_{BW-EW} = (1.1 \cdot C_p \cdot \gamma_w \cdot d_S^2 + 2.4 \cdot \gamma_w \cdot d_S^2) \cdot L_{NS}$ OR

$(1.1 \cdot C_p \cdot \gamma_w \cdot d_S^2 + 1.9 \cdot \gamma_w \cdot d_S^2) \cdot L_{NS}$

F_{BW-EW} = 0.00 KIP

14. DEBRIS IMPACT LOADS

WEIGHT OF IMPACTING OBJECT	W =	1000.0	LB
DEPTH COEFFICIENT	C_D =	0.00	
FLOW PATH WIDTH	FLOW PATH GREATER THAN 30 FT WIDE		
BLOCKAGE COEFFICIENT	C_B =	1.00	
STRUCTURE TYPE	CONCRETE MOMENT FRAME		
MAXIMUM RESPONSE RATIO FOR IMPULSE	R_{max} =	0.34	
IMPORTANCE COEFFICIENT	C_I =	1.20	
ORIENTATION COEFFICIENT	C_O =	0.80	
STRUCTURE COEFFICIENT	C_{STR} =	0.53	

$F_i = W \cdot V \cdot C_D \cdot C_B \cdot C_{STR} =$ **0.00 KIP**

15. ESTIMATED LOCALIZED SCOUR DEPTH AT WALLS

NORTH-SOUTH DIRECTION:	S_{TOT-NS} =	$0.15 \cdot L_{EW}$ =	22.05	FT
EAST-WEST DIRECTION:	S_{TOT-EW} =	$0.15 \cdot L_{NS}$ =	18.83	FT

1.	STRUCTURE DIMENSIONS AND GEOMETRY				
	MAXIMUM MEAN ROOF HEIGHT	H_{MR} =	97.500	FT	
	MAXIMUM STRUCTURE DIMENSION (NORTH-SOUTH DIR.)	L_{NS} =	125.500	FT	
	MAXIMUM STRUCTURE DIMENSION (EAST-WEST DIR.)	L_{EW} =	147.000	FT	
	MAXIMUM ROOF SLOPE IN NORTH-SOUTH DIRECTION	θ_{NS} =	0.000	°	
	MAXIMUM ROOF SLOPE IN EAST-WEST DIRECTION	θ_{EW} =	1.193	°	
2.	STRUCTURE RISK CATEGORY	CATEGORY III			
	IMPORTANCE FACTOR	I =	1.00		
3.	ULTIMATE BASIC WIND SPEED	V_U =	113	mph	
		V_{ASD} =	88	mph	
	SERVICEABILITY WIND SPEED	V_S =	73	mph	
	WIND PRESSURE CONVERSION FACTOR	$P_S : P_U$ =	0.42		
4.	STRUCTURE TYPE	BUILDING STRUCTURE			
	WIND DIRECTIONALITY FACTOR	K_d =	0.85		
	ROOF TYPE	FLAT ROOF			
5.	ENCLOSURE CLASSIFICATION	ENCLOSED			
6.	INTERNAL PRESSURE COEFFICIENT	GC_{pi} =	+/- 0.18		
7.	EXPOSURE CATEGORY	EXPOSURE C			
8.	GUST EFFECT FACTOR				
	APPROXIMATE STRUCTURE PERIOD AND RIGIDITY				
	NORTH-SOUTH DIRECTION	T_{NS}	$\approx H_{MR} / 75$ =	1.300 sec	(FLEXIBLE)
	EAST-WEST DIRECTION	T_{EW}	$\approx H_{MR} / 75$ =	1.300 sec	(FLEXIBLE)
	CRITICAL DAMPING RATIO	β =	0.015		
	TURBULENCE INTENSITY	I_z =	0.182		
	TURBULENCE INTEGRAL LENGTH SCALE	L_z =	560.7	FT	
	MEAN HOURLY WIND SPEED	V_z =	117.6	FT/sec	

8. GUST EFFECT FACTOR (CONTINUED)

BACKGROUND RESPONSE FACTOR

NORTH-SOUTH DIRECTION

Q_{NS} = $[1 / (1+0.63 \cdot ((L_{EW}+H_{MR})/L_z)^{0.63}))]^{0.5}$ = 0.853

EAST-WEST DIRECTION

Q_{EW} = $[1 / (1+0.63 \cdot ((L_{NS}+H_{MR})/L_z)^{0.63}))]^{0.5}$ = 0.860

RESONANT RESPONSE FACTOR

NORTH-SOUTH DIRECTION

R_{NS} = $[(1/\beta) \cdot R_n \cdot R_h \cdot R_B \cdot (0.53+0.47 \cdot R_L)]^{0.5}$ = 0.363

EAST-WEST DIRECTION

R_{EW} = $[(1/\beta) \cdot R_n \cdot R_h \cdot R_B \cdot (0.53+0.47 \cdot R_L)]^{0.5}$ = 0.387

GUST EFFECT FACTOR

NORTH-SOUTH DIRECTION

$G_{f\text{-}NS}$ = FOR T_{NS} < 1.0 sec: $0.925 \cdot [(1+1.7 \cdot g_Q \cdot I_z \cdot Q_{NS}) / (1+1.7 \cdot g_v \cdot I_z)]$ or

FOR $T_{NS} \geq 1.0$ sec: $0.925 \cdot [(1+1.7 \cdot I_z \cdot (g_Q^2 \cdot Q_{NS}^2 + g_R^2 \cdot R_{NS}^2)^{0.5}) / (1+1.7 \cdot g_v \cdot I_z)]$

$G_{f\text{-}NS}$ = 0.906

EAST-WEST DIRECTION

$G_{f\text{-}EW}$ = FOR T_{EW} < 1.0 sec: $0.925 \cdot [(1+1.7 \cdot g_Q \cdot I_z \cdot Q_{EW}) / (1+1.7 \cdot g_v \cdot I_z)]$ or

FOR $T_{EW} \geq 1.0$ sec: $0.925 \cdot [(1+1.7 \cdot I_z \cdot (g_Q^2 \cdot Q_{EW}^2 + g_R^2 \cdot R_{EW}^2)^{0.5}) / (1+1.7 \cdot g_v \cdot I_z)]$

$G_{f\text{-}EW}$ = 0.916

9. GROUND ELELVATION G_s = 340.000 FT

GROUND ELELVATION FACTOR K_e = 1.00

10. TOPOGRAPHIC FEATURE TYPE FLAT TOPOGRAPHY

TOPOGRAPHIC FEATURE HEIGHT H = 100.00 FT

UPWIND HALF LENGTH OF TOPOGRAPHIC FEATURE L_h = 500.00 FT

STRUCTURE DISTANCE FROM CREST OF FEATURE x = 0.00 FT

TOPOGRAPHIC SHAPE FACTOR K_1 = $x \cdot (H / L_h)$ = 0.000

LOCATION REDUCTION FACTOR K_2 = $1 - (|x| / [\mu \cdot L_h])$ = 1.000

TOPOGRAPHIC FACTORS

$K_{3\text{-}z} = e^{(\gamma \cdot z / Lh)}$ $K_{zt} = (1 + K_1 \cdot K_2 \cdot K_3)^2$

H_P =	100.500 FT	$K_{3\text{-}P}$ =	1.000	K_{Pt} =	1.000
H_h =	**97.500 FT**	**$K_{3\text{-}h}$ =**	**1.000**	**K_{ht} =**	**1.000**
H_6 =	79.000 FT	$K_{3\text{-}6}$ =	1.000	K_{6t} =	1.000
H_5 =	64.000 FT	$K_{3\text{-}5}$ =	1.000	K_{5t} =	1.000
H_4 =	49.000 FT	$K_{3\text{-}4}$ =	1.000	K_{4t} =	1.000
H_3 =	34.000 FT	$K_{3\text{-}3}$ =	1.000	K_{3t} =	1.000
H_2 =	19.000 FT	$K_{3\text{-}2}$ =	1.000	K_{2t} =	1.000
H_0 =	0.000 FT	$K_{3\text{-}g}$ =	1.000	K_{gt} =	1.000
H_{CC} =	97.500 FT	$K_{3\text{-}CC}$ =	1.000	K_{CCt} =	1.000

11. VELOCITY PRESSURE EXPOSURE COEFFICIENTS

$K_z = 2.01 \cdot [\max(H_z, 15\ FT) / z_g]^{(2/\alpha)}$

K_P =	2.01·(100.50 FT / 900 FT)^(2 / 9.5) =	1.267
K_h =	**2.01·(97.50 FT / 900 FT)^(2 / 9.5) =**	**1.259**
K_6 =	2.01·(79.00 FT / 900 FT)^(2 / 9.5) =	1.204
K_5 =	2.01·(64.00 FT / 900 FT)^(2 / 9.5) =	1.152
K_4 =	2.01·(49.00 FT / 900 FT)^(2 / 9.5) =	1.089
K_3 =	2.01·(34.00 FT / 900 FT)^(2 / 9.5) =	1.008
K_2 =	2.01·(19.00 FT / 900 FT)^(2 / 9.5) =	0.892
K_0 =	2.01·(15.00 FT / 900 FT)^(2 / 9.5) =	0.849
K_{CC} =	**2.01·(97.50 FT / 900 FT)^(2 / 9.5) =**	**1.259**

12. VELOCITY PRESSURES

q_z = $0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot K_e \cdot V^2 \cdot I$

q_P =	$0.00256 \cdot 1.27 \cdot 1.00 \cdot 0.85 \cdot 1.00 \cdot 113^2 \cdot 1.00 =$	35.20	PSF
q_h =	**$0.00256 \cdot 1.26 \cdot 1.00 \cdot 0.85 \cdot 1.00 \cdot 113^2 \cdot 1.00 =$**	**34.98**	**PSF**
q_6 =	$0.00256 \cdot 1.20 \cdot 1.00 \cdot 0.85 \cdot 1.00 \cdot 113^2 \cdot 1.00 =$	33.46	PSF
q_5 =	$0.00256 \cdot 1.15 \cdot 1.00 \cdot 0.85 \cdot 1.00 \cdot 113^2 \cdot 1.00 =$	32.01	PSF
q_4 =	$0.00256 \cdot 1.09 \cdot 1.00 \cdot 0.85 \cdot 1.00 \cdot 113^2 \cdot 1.00 =$	30.26	PSF
q_3 =	$0.00256 \cdot 1.01 \cdot 1.00 \cdot 0.85 \cdot 1.00 \cdot 113^2 \cdot 1.00 =$	28.02	PSF
q_2 =	$0.00256 \cdot 0.89 \cdot 1.00 \cdot 0.85 \cdot 1.00 \cdot 113^2 \cdot 1.00 =$	24.79	PSF
q_0 =	$0.00256 \cdot 0.85 \cdot 1.00 \cdot 0.85 \cdot 1.00 \cdot 113^2 \cdot 1.00 =$	23.59	PSF
q_{cc} =	**$0.00256 \cdot 1.26 \cdot 1.00 \cdot 0.85 \cdot 1.00 \cdot 113^2 \cdot 1.00 =$**	**34.98**	**PSF**

13. DETERMINE PERMITTED DESIGN PROCEDURE

A)	REGULAR SHAPED STRUCTURE*	– YES
B)	NORMAL RESPONSE CHARACTERISTICS*	– YES
	NORMAL SITE LOCATION*	– YES
C)	STRUCTURE ENCLOSURE	– ENCLOSED
D)	SIMPLE DIAPHRAGM STRUCTURE	– YES (NO STRUCTURAL SEPARATIONS)
E)	LOW-RISE STRUCTURE	– NO - (H > 60 FT)
F)	PLAN ASPECT RATIO	– $0.2 \le L/B \le 5.0$
G)	STRUCTURE RIGID (ESTIMATION)	– NO (T ≈ 1.300 sec > 1.0 sec)
H)	ROOF TYPE	– FLAT ROOF
I)	STRUCTURE APPROXIMATELY SYMMETRIC	– YES
J)	EXEMPT FROM TORSIONAL LOAD CASES	– NO

GENERAL ANALYTICAL PROCEDURE (§ 27.2)	→ PERMITTED
ENCLOSED SIMPLE DIAPHRAGM PROCEDURE (§ 27.5)	→ PERMITTED (CLASS 2 BUILDING)
LOW-RISE ANALYTICAL PROCEDURE (§ 28.2)	→ NOT PERMITTED
SIMPLIFIED PROCEDURE (§ 28.5)	→ NOT PERMITTED
WIND TUNNEL PROCEDURE (§ 31.1)	→ PERMITTED

COMPONENTS AND CLADDING ULTIMATE PRESSURE TABLE

MAXIMUM MEAN ROOF HEIGHT	H_{MR}	97.500 FT
STRUCTURE DIMENSION IN NORTH-SOUTH DIRECTION	L_{NS}	125.500 FT
STRUCTURE DIMENSION IN EAST-WEST DIRECTION	L_{EW}	147.000 FT
ROOF ANGLE IN NORTH-SOUTH DIRECTION	θ_{NS}	0.000 °
ROOF ANGLE IN EAST-WEST DIRECTION	θ_{EW}	1.193 °
MAXIMUM PARAPET HEIGHT	H_p	3.000 FT
ROOF TYPE		FLAT ROOF
NORTH-SOUTH DIRECTION ASCE/SEI 7-16 TABLE SELECTOR		FLAT ROOF θ≤3° (h > 60 ft)
EAST-WEST DIRECTION ASCE/SEI 7-16 TABLE SELECTION		FLAT ROOF θ≤3° (h > 60 ft)
APPLICABLE NORTH-SOUTH ASCE/SEI 7-16 TABLE		FIGURE 30.5-1
APPLICABLE EAST-WEST ASCE/SEI 7-16 TABLE		FIGURE 30.5-1
NORTH-SOUTH DIRECTION BOUNDARY EDGE DISTANCE	a_{NS}	12.550 FT
EAST-WEST DIRECTION BOUNDARY EDGE DISTANCE	a_{EW}	12.550 FT
VELOCITY PRESSURE AT ROOF		34.98 PSF
ENCLOSURE CLASSIFICATION		ENCLOSED
INTERNAL PRESSURE COEFFICIENT		0.18

ZONE			AREA (SF)					
			10	10	25	50	100	500
ENVELOPE OF BOTH DIRECTIONS	ROOF	1	**16.00**	16.00	16.00	16.00	16.00	16.00
			-55.27	-55.27	-51.17	-48.07	-44.97	-37.78
		2	**16.00**	16.00	16.00	16.00	16.00	16.00
			-86.75	-86.75	-81.01	-76.67	-72.34	-62.26
		3	**16.00**	16.00	16.00	16.00	16.00	16.00
			-118.23	-118.23	-110.85	-105.28	-99.70	-86.75
			--	--	--	--	--	--
			--	--	--	--	--	--
			--	--	--	--	--	--
			--	--	--	--	--	--
			--	--	--	--	--	--
			--	--	--	--	--	--
	ROOF OVERHANG	1 OVHG	**16.79**	16.79	16.00	16.00	16.00	16.00
			-65.76	-65.76	-64.37	-63.32	-62.26	-41.27
		2 OVHG	**16.79**	16.79	16.00	16.00	16.00	16.00
			-86.75	-86.75	-76.92	-69.48	-62.04	-44.77
		3 OVHG	**16.79**	16.79	16.00	16.00	16.00	16.00
			-118.23	-118.23	-101.02	-88.01	-74.99	-44.77
			--	--	--	--	--	--
			--	--	--	--	--	--
			--	--	--	--	--	--
			--	--	--	--	--	--
			--	--	--	--	--	--
			--	--	--	--	--	--
	WALL	4	**37.78**	37.78	37.05	34.79	32.53	27.28
			-37.78	-37.78	-37.29	-35.78	-34.28	-30.78
		5	**37.78**	37.78	37.05	34.79	32.53	27.28
			-69.26	-69.26	-67.32	-61.29	-55.26	-41.27
	PARAPET	4P	**112.65**	112.65	106.14	99.50	92.86	77.45
			-63.36	-63.36	-62.14	-58.35	-54.56	-45.76
		5P	**144.33**	144.33	136.18	128.29	120.40	102.09
			-95.05	-95.05	-92.36	-84.02	-75.68	-56.32

MAIN WIND FORCE RESISTING SYSTEM (MWFRS) BASE DATA			
MEAN ROOF HEIGHT		H_{MR}	97.500 FT
STRUCTURE DIMENSION IN NORTH-SOUTH DIRECTION		L_{NS}	125.500 FT
STRUCTURE DIMENSION IN EAST-WEST DIRECTION		L_{EW}	147.000 FT
ROOF ANGLE IN NORTH-SOUTH DIRECTION		θ_{NS}	0.000 °
ROOF ANGLE IN EAST-WEST DIRECTION		θ_{EW}	1.193 °
VELOCITY PRESSURES	TOP OF PARAPET		35.20 PSF
	ROOF		34.98 PSF
	6th LEVEL		33.46 PSF
	5th LEVEL		32.01 PSF
	4th LEVEL		30.26 PSF
	3rd LEVEL		28.02 PSF
	2nd LEVEL		24.79 PSF
	BASE		23.59 PSF
GUST EFFECT FACTOR IN NORTH-SOUTH DIRECTION		$G_{f\text{-}NS}$	0.906
GUST EFFECT FACTOR IN EAST-WEST DIRECTION		$G_{f\text{-}EW}$	0.916
ENCLOSURE CLASSIFICATION			ENCLOSED
INTERNAL PRESSURE COEFFICIENT		GC_{pi}	0.18
NORTH-SOUTH DIRECTION ASPECT RATIOS	L_{NS}/B_{NS}		0.854
	H_{MR}/L_{NS}		0.777
EAST-WEST DIRECTION ASPECT RATIOS	L_{EW}/B_{EW}		1.171
	H_{MR}/L_{EW}		0.663

WIND PRESSURE IN NORTH-SOUTH DIRECTION						
ZONE		C_p	GC_p $+GC_{pi}$	GC_p $-GC_{pi}$	PRESSURE $+GC_{pi}$	PRESSURE $-GC_{pi}$
WINDWARD WALL	ROOF	0.800	0.905	0.545	31.66	19.06
WINDWARD WALL	6th LEVEL	0.800	0.905	0.545	30.56	17.97
WINDWARD WALL	5th LEVEL	0.800	0.905	0.545	29.51	16.91
WINDWARD WALL	4th LEVEL	0.800	0.905	0.545	28.24	15.64
WINDWARD WALL	3rd LEVEL	0.800	0.905	0.545	26.61	14.02
WINDWARD WALL	2nd LEVEL	0.800	0.905	0.545	24.27	11.68
WINDWARD WALL	BASE	0.800	0.905	0.545	23.40	10.81
LEEWARD WALL		-0.500	-0.273	-0.633	-9.55	-22.15
SIDE WALL		-0.700	-0.454	-0.814	-15.89	-28.49
WINDWARD PARAPET		1.500	1.500	1.500	52.80	52.80
LEEWARD PARAPET		-1.000	-1.000	-1.000	-35.20	-35.20
WINDWARD ROOF	0.0·H to 0.5·H	-1.181	-0.890	-1.250	-31.14	-43.74
WINDWARD ROOF	0.5·H to 1.0·H	-0.759	-0.508	-0.868	-17.78	-30.37
WINDWARD ROOF	1.0·H to 2.0·H	-0.641	-0.400	-0.760	-14.01	-26.60
WINDWARD ROOF	≥ 2.0·H	-0.581	-0.347	-0.707	-12.12	-24.71
WINDWARD ROOF	0.0·H to 0.5·H	-0.180	0.017	-0.343	0.59	-12.00
WINDWARD ROOF	0.5·H to 1.0·H	-0.180	0.017	-0.343	0.59	-12.00
WINDWARD ROOF	1.0·H to 2.0·H	-0.180	0.017	-0.343	0.59	-12.00
WINDWARD ROOF	≥ 2.0·H	-0.180	0.017	-0.343	0.59	-12.00
WINDWARD OVERHANG (ADD.)		-0.800	-0.545	-0.905	-19.06	-31.66
LEEWARD ROOF		-0.611	-0.374	-0.734	-13.07	-25.66

WIND PRESSURE IN EAST-WEST DIRECTION						
ZONE		C_p	GC_p $+GC_{pi}$	GC_p $-GC_{pi}$	PRESSURE $+GC_{pi}$	PRESSURE $-GC_{pi}$
WINDWARD WALL	ROOF	0.800	0.912	0.552	31.91	19.32
WINDWARD WALL	6th LEVEL	0.800	0.912	0.552	30.80	18.21
WINDWARD WALL	5th LEVEL	0.800	0.912	0.552	29.74	17.15
WINDWARD WALL	4th LEVEL	0.800	0.912	0.552	28.46	15.87
WINDWARD WALL	3rd LEVEL	0.800	0.912	0.552	26.82	14.23
WINDWARD WALL	2nd LEVEL	0.800	0.912	0.552	24.45	11.86
WINDWARD WALL	BASE	0.800	0.912	0.552	23.57	10.98
LEEWARD WALL		-0.466	-0.246	-0.606	-8.62	-21.21
SIDE WALL		-0.700	-0.461	-0.821	-16.12	-28.71
WINDWARD PARAPET		1.500	1.500	1.500	52.80	52.80
LEEWARD PARAPET		-1.000	-1.000	-1.000	-35.20	-35.20
WINDWARD ROOF	0.0·H to 0.5·H	-1.120	-0.846	-1.206	-29.58	-42.18
WINDWARD ROOF	0.5·H to 1.0·H	-0.790	-0.543	-0.903	-19.00	-31.59
WINDWARD ROOF	1.0·H to 2.0·H	-0.610	-0.379	-0.739	-13.24	-25.84
WINDWARD ROOF	≥ 2.0·H	-0.520	-0.296	-0.656	-10.37	-22.96
WINDWARD ROOF	0.0·H to 0.5·H	-0.180	0.015	-0.345	0.53	-12.06
WINDWARD ROOF	0.5·H to 1.0·H	-0.180	0.015	-0.345	0.53	-12.06
WINDWARD ROOF	1.0·H to 2.0·H	-0.180	0.015	-0.345	0.53	-12.06
WINDWARD ROOF	≥ 2.0·H	-0.180	0.015	-0.345	0.53	-12.06
WINDWARD OVERHANG (ADD.)		-0.800	-0.552	-0.912	-19.32	-31.91
LEEWARD ROOF		-0.565	-0.338	-0.698	-11.81	-24.40

WIND FROM NORTH DIRECTION							
VERTICAL AREA PROJECTION (SF)	DIAPHRAGM LEVEL						
	BASE	2nd LEVEL	3rd LEVEL	4th LEVEL	5th LEVEL	6th LEVEL	ROOF
WINDWARD WALL	1396.5	2499.0	2205.0	2205.0	2205.0	2462.3	1359.8
LEEWARD WALL	1396.5	2499.0	2205.0	2205.0	2205.0	2462.3	1359.8
WINDWARD PARAPET	0.0	0.0	0.0	0.0	0.0	0.0	441.0
LEEWARD PARAPET	0.0	0.0	0.0	0.0	0.0	0.0	441.0
WINDWARD ROOF 0.0·H to 0.5·H	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WINDWARD ROOF 0.5·H to 1.0·H	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WINDWARD ROOF 1.0·H to 2.0·H	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WINDWARD ROOF ≥ 2.0·H	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LEEWARD ROOF	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PRESSURE $+GC_{pi}$ (CASE 1)	46.02	84.53	79.75	83.33	86.13	98.77	94.85
PRESSURE $-GC_{pi}$ (CASE 1)	46.02	84.53	79.75	83.33	86.13	98.77	94.85
PRESSURE $+GC_{pi}$ (CASE 2)	46.02	84.53	79.75	83.33	86.13	98.77	94.85
PRESSURE $-GC_{pi}$ (CASE 2)	46.02	84.53	79.75	83.33	86.13	98.77	94.85
MINIMUM PRESSURE	22.34	39.98	35.28	35.28	35.28	39.40	28.81
MAXIMUM LATERAL FORCE (KIPS)	**46.02**	**84.53**	**79.75**	**83.33**	**86.13**	**98.77**	**94.85**

WIND FROM SOUTH DIRECTION							
VERTICAL AREA PROJECTION (SF)	DIAPHRAGM LEVEL						
	BASE	2nd LEVEL	3rd LEVEL	4th LEVEL	5th LEVEL	6th LEVEL	ROOF
WINDWARD WALL	1396.5	2499.0	2205.0	2205.0	2205.0	2462.3	1359.8
LEEWARD WALL	1396.5	2499.0	2205.0	2205.0	2205.0	2462.3	1359.8
WINDWARD PARAPET	0.0	0.0	0.0	0.0	0.0	0.0	441.0
LEEWARD PARAPET	0.0	0.0	0.0	0.0	0.0	0.0	441.0
WINDWARD ROOF 0.0·H to 0.5·H	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WINDWARD ROOF 0.5·H to 1.0·H	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WINDWARD ROOF 1.0·H to 2.0·H	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WINDWARD ROOF ≥ 2.0·H	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LEEWARD ROOF	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PRESSURE $+GC_{pi}$ (CASE 1)	46.02	84.53	79.75	83.33	86.13	98.77	94.85
PRESSURE $-GC_{pi}$ (CASE 1)	46.02	84.53	79.75	83.33	86.13	98.77	94.85
PRESSURE $+GC_{pi}$ (CASE 2)	46.02	84.53	79.75	83.33	86.13	98.77	94.85
PRESSURE $-GC_{pi}$ (CASE 2)	46.02	84.53	79.75	83.33	86.13	98.77	94.85
MINIMUM PRESSURE	22.34	39.98	35.28	35.28	35.28	39.40	28.81
MAXIMUM LATERAL FORCE (KIPS)	**46.02**	**84.53**	**79.75**	**83.33**	**86.13**	**98.77**	**94.85**

WIND FROM EAST DIRECTION							
VERTICAL AREA PROJECTION (SF)	DIAPHRAGM LEVEL						
	BASE	2nd LEVEL	3rd LEVEL	4th LEVEL	5th LEVEL	6th LEVEL	ROOF
WINDWARD WALL	1192.3	2133.5	1882.5	1882.5	1882.5	2102.1	1160.9
LEEWARD WALL	1192.3	2133.5	1882.5	1882.5	1882.5	2102.1	1160.9
WINDWARD PARAPET	0.0	0.0	0.0	0.0	0.0	0.0	376.5
LEEWARD PARAPET	0.0	0.0	0.0	0.0	0.0	0.0	376.5
WINDWARD ROOF 0.0·H to 0.5·H	0.0	0.0	0.0	0.0	0.0	0.0	127.5
WINDWARD ROOF 0.5·H to 1.0·H	0.0	0.0	0.0	0.0	0.0	0.0	127.5
WINDWARD ROOF 1.0·H to 2.0·H	0.0	0.0	0.0	0.0	0.0	0.0	129.4
WINDWARD ROOF ≥ 2.0·H	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LEEWARD ROOF	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PRESSURE $+GC_{pi}$ (CASE 1)	38.38	70.56	66.71	69.80	72.21	82.87	72.28
PRESSURE $-GC_{pi}$ (CASE 1)	38.38	70.56	66.71	69.80	72.21	82.87	67.44
PRESSURE $+GC_{pi}$ (CASE 2)	38.38	70.56	66.71	69.80	72.21	82.87	80.39
PRESSURE $-GC_{pi}$ (CASE 2)	38.38	70.56	66.71	69.80	72.21	82.87	75.55
MINIMUM PRESSURE	19.08	34.14	30.12	30.12	30.12	33.63	30.75
MAXIMUM LATERAL FORCE (KIPS)	**38.38**	**70.56**	**66.71**	**69.80**	**72.21**	**82.87**	**80.39**

WIND FROM WEST DIRECTION							
VERTICAL AREA PROJECTION (SF)	DIAPHRAGM LEVEL						
	BASE	2nd LEVEL	3rd LEVEL	4th LEVEL	5th LEVEL	6th LEVEL	ROOF
WINDWARD WALL	1192.3	2133.5	1882.5	1882.5	1882.5	2102.1	1160.9
LEEWARD WALL	1192.3	2133.5	1882.5	1882.5	1882.5	2102.1	1160.9
WINDWARD PARAPET	0.0	0.0	0.0	0.0	0.0	0.0	376.5
LEEWARD PARAPET	0.0	0.0	0.0	0.0	0.0	0.0	376.5
WINDWARD ROOF 0.0·H to 0.5·H	0.0	0.0	0.0	0.0	0.0	0.0	127.5
WINDWARD ROOF 0.5·H to 1.0·H	0.0	0.0	0.0	0.0	0.0	0.0	127.5
WINDWARD ROOF 1.0·H to 2.0·H	0.0	0.0	0.0	0.0	0.0	0.0	129.4
WINDWARD ROOF ≥ 2.0·H	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LEEWARD ROOF	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PRESSURE $+GC_{pi}$ (CASE 1)	38.38	70.56	66.71	69.80	72.21	82.87	72.28
PRESSURE $-GC_{pi}$ (CASE 1)	38.38	70.56	66.71	69.80	72.21	82.87	67.44
PRESSURE $+GC_{pi}$ (CASE 2)	38.38	70.56	66.71	69.80	72.21	82.87	80.39
PRESSURE $-GC_{pi}$ (CASE 2)	38.38	70.56	66.71	69.80	72.21	82.87	75.55
MINIMUM PRESSURE	19.08	34.14	30.12	30.12	30.12	33.63	30.75
MAXIMUM LATERAL FORCE (KIPS)	**38.38**	**70.56**	**66.71**	**69.80**	**72.21**	**82.87**	**80.39**

MAXIMUM LATERAL WIND FORCES							
MAXIMUM FORCE IN NORTH-SOUTH DIRECTION	**46.02**	**84.53**	**79.75**	**83.33**	**86.13**	**98.77**	**94.85**
MAXIMUM FORCE IN EAST-WEST DIRECTION	**38.38**	**70.56**	**66.71**	**69.80**	**72.21**	**82.87**	**80.39**

1.	SUPPORTING STRUCTURE DIMENSIONS					
	MAXIMUM MEAN ROOF HEIGHT	H_{MR}	=	97.500	FT	
	MAXIMUM STRUCTURE DIMENSION (NORTH-SOUTH DIR.)	L_{NS}	=	125.500	FT	
	MAXIMUM STRUCTURE DIMENSION (EAST-WEST DIR.)	L_{EW}	=	147.000	FT	
2.	ROOF TOP EQUIPMENT DIMENSIONS					
	EQUIPMENT HEIGHT	H_{RTU}	=	20.000	FT	
	AVERAGE HORIZONTAL DIMENSION (NORTH-SOUTH DIR.)	ℓ_{NS}	=	45.000	FT	
	AVERAGE HORIZONTAL DIMENSION (EAST-WEST DIR.)	ℓ_{EW}	=	40.000	FT	
	AVERAGE DEPTH OF PROTRUDING ELEMENTS	D'	=	0.500	FT	
3.	STRUCTURE RISK CATEGORY	CATEGORY III				
	IMPORTANCE FACTOR	I	=	1.00		
4.	ULTIMATE BASIC WIND SPEED	V_D	=	113	mph	
	SERVICEABILITY WIND SPEED	V_S	=	73	mph	
	WIND PRESSURE CONVERSION FACTOR	$P_S : P_D$	=	0.42		
5.	STRUCTURE TYPE	SQUARE ROOFTOP EQUIPMENT				
	WIND DIRECTIONALITY FACTOR	K_d	=	0.85		
6.	EXPOSURE CATEGORY	EXPOSURE C				
7.	GUST EFFECT FACTOR					
	APPROXIMATE STRUCTURE PERIOD AND RIGIDITY					
	NORTH-SOUTH DIRECTION	T_{NS}	$\approx H_C / 75$ =	1.300	sec	(FLEXIBLE)
	EAST-WEST DIRECTION	T_{EW}	$\approx H_C / 75$ =	1.300	sec	(FLEXIBLE)
	CRITICAL DAMPING RATIO	β	=	0.015		
	TURBULENCE INTENSITY	I_z	=	0.182		
	TURBULENCE INTEGRAL LENGTH SCALE	L_z	=	560.7	FT	
	MEAN HOURLY WIND SPEED	V_z	=	117.6	FT/sec	

7. GUST EFFECT FACTOR (CONTINUED)

BACKGROUND RESPONSE FACTOR

NORTH-SOUTH DIRECTION: Q_{NS} = $[1 / (1+0.63\cdot((L_{EW}+H_C)/L_z)^{0.63}))]^{0.5}$ = 0.853

EAST-WEST DIRECTION: Q_{EW} = $[1 / (1+0.63\cdot((L_{NS}+H_C)/L_z)^{0.63}))]^{0.5}$ = 0.860

RESONANT RESPONSE FACTOR

NORTH-SOUTH DIRECTION: R_{NS} = $[(1/\beta)\cdot R_n\cdot R_h\cdot R_B\cdot(0.53+0.47\cdot R_L)]^{0.5}$ = 0.363

EAST-WEST DIRECTION: R_{EW} = $[(1/\beta)\cdot R_n\cdot R_h\cdot R_B\cdot(0.53+0.47\cdot R_L)]^{0.5}$ = 0.387

GUST EFFECT FACTOR

NORTH-SOUTH DIRECTION

$G_{f\text{-}NS}$ = FOR T_{NS} < 1.0 sec: $0.925\cdot[(1+1.7\cdot g_Q\cdot I_z\cdot Q_{NS}) / (1+1.7\cdot g_v\cdot I_z)]$ or

FOR $T_{NS} \geq 1.0$ sec: $0.925\cdot[(1+1.7\cdot I_z\cdot(g_Q^2\cdot Q_{NS}^2+g_R^2\cdot R_{NS}^2)^{0.5}) / (1+1.7\cdot g_v\cdot I_z)]$

$G_{f\text{-}NS}$ = 0.906

EAST-WEST DIRECTION

$G_{f\text{-}EW}$ = FOR T_{EW} < 1.0 sec: $0.925\cdot[(1+1.7\cdot g_Q\cdot I_z\cdot Q_{EW}) / (1+1.7\cdot g_v\cdot I_z)]$ or

FOR $T_{EW} \geq 1.0$ sec: $0.925\cdot[(1+1.7\cdot I_z\cdot(g_Q^2\cdot Q_{EW}^2+g_R^2\cdot R_{EW}^2)^{0.5}) / (1+1.7\cdot g_v\cdot I_z)]$

$G_{f\text{-}EW}$ = 0.916

8. GROUND ELELVATION: G_s = 340.000 FT

GROUND ELELVATION FACTOR: K_e = 1.00

9. TOPOGRAPHIC FEATURE TYPE: FLAT TOPOGRAPHY

TOPOGRAPHIC FEATURE HEIGHT: H = 100.00 FT

UPWIND **HALF** LENGTH OF TOPOGRAPHIC FEATURE: L_h = 500.00 FT

STRUCTURE DISTANCE FROM CREST OF FEATURE: x = 0.00 FT

TOPOGRAPHIC SHAPE FACTOR: K_1 = $x\cdot(H / L_h)$ = 0.000

LOCATION REDUCTION FACTOR: K_2 = $1 - (|x| / [\mu\cdot L_h])$ = 1.000

TOPOGRAPHIC FACTORS: $K_{3\text{-}z}$ = $e^{(\gamma\cdot z / Lh)}$ K_{zt} = $(1 + K_1\cdot K_2\cdot K_3)^2$

H_h = 97.500 FT $K_{3\text{-}h}$ = 1.000 K_{ht} = 1.000

10. VELOCITY PRESSURE EXPOSURE COEFFICIENT: K_z = $2.01\cdot[\max(H_z, 15\text{ FT}) / z_g]^{(2/\alpha)}$

K_h = $2.01\cdot(97.50\text{ FT} / 900\text{ FT})^{(2 / 9.5)}$ = 1.259

11. VELOCITY PRESSURE: q_z = $0.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot K_e\cdot V^2\cdot I$

q_h = $0.00256\cdot1.26\cdot1.00\cdot0.85\cdot1.00\cdot113^2\cdot1.00$ = 34.98 PSF

ROOFTOP EQUIPMENT WIND LOADS		
SUPPORTING STRUCTURE MEAN ROOF HEIGHT	H_{MR}	97.500 FT
STRUCTURE DIMENSION IN NORTH-SOUTH DIRECTION	L_{NS}	125.500 FT
STRUCTURE DIMENSION IN EAST-WEST DIRECTION	L_{EW}	147.000 FT
ROOF TOP EQUIPMENT HEIGHT	H_C	20.000 FT
AVERAGE HORIZONTAL DIMENSION - NORTH-SOUTH	ℓ_{NS}	45.000 FT
AVERAGE HORIZONTAL DIMENSION - EAST-WEST	ℓ_{EW}	40.000 FT
AVERAGE LEAST HORIZONTAL DIMENSION	D	40.000 FT
AVERAGE DEPTH OF PROTRUDING ELEMENTS	D'	0.500 FT
STRUCTURE CROSS SECTION		SQUARE
VELOCITY PRESSURE AT CHARACTERISTIC HEIGHT	q_h	34.98 PSF
GUST EFFECT FACTOR IN NORTH-SOUTH DIRECTION	$G_{f\text{-}NS}$	0.906
GUST EFFECT FACTOR IN EAST-WEST DIRECTION	$G_{f\text{-}EW}$	0.916
STRUCTURE ASPECT RATIO - NORTH-SOUTH DIRECTION	H_{RTU} / ℓ_{EW}	0.500
STRUCTURE ASPECT RATIO - NORTH-SOUTH DIRECTION	H_{RTU} / ℓ_{NS}	0.444
SURFACE ROUGHNESS RATIO	D' / D	0.013
SURFACE ROUGHNESS CLASSIFICATION		MODERATELY SMOOTH

WIND LOADS				
DIRECTION	AREA (SF)	C_f	WIND PRESSURE	WIND LOAD
NORMAL - NORTH-SOUTH	800.0	1.300	41.21	32.97 KIP
NORMAL - EAST-WEST	900.0	1.300	41.63	37.47 KIP
DIAGONAL	1204.2	1.000	31.86	38.37 KIP

1.	STRUCTURE RISK CATEGORY		CATEGORY III			
	SEISMIC IMPORTANCE FACTOR		I	=	1.25	
2.	MAPPED MCE SPECTRAL RESPONSE ACCELERATION PARAMETERS					
	A.	SHORT PERIOD ACCELERATION PARAMETER	S_S	=	0.943	
	B.	1-SECOND PERIOD ACCELERATION PARAMETER	S_1	=	0.315	
3.	SITE CLASSIFICATION		SITE CLASS C			
4.	SITE ADJUSTMENT COEFFICIENTS					
	A.	SHORT PERIOD SITE COEFFICIENT	F_a	=	1.200	
	B.	1-SECOND PERIOD SITE COEFFICIENT	F_v	=	1.500	
5.	DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETERS					
	A.	SHORT PERIOD ACCELERATION PARAMETER	S_{DS}	=	$(2/3) \cdot F_a \cdot S_S$ =	0.754
	B.	1-SECOND PERIOD ACCELERATION PARAMETER	S_{D1}	=	$(2/3) \cdot F_v \cdot S_1$ =	0.315
6.	SEISMIC DESIGN CATEGORY		S_{DS}	→	SDC D	→ SDC D
			S_{D1}	→	SDC D	
	SDC SHORT PERIOD EXCEPTION CRITERIA		DO NOT APPLY S.D.C. EXCEPTION			
	A.	$S_1 < 0.75$	YES			
	B.	Ta FOR STRENGTH FORCES < 0.334 sec	$T_{a\,MAX}$ =		0.621	sec
	C.	T FOR DRIFT FORCES < 0.418 sec	T_{DRIFT} =		0.000	sec
	D.	Cs IS CALCULATED FROM EQUATION 12.8-2	YES			
	E.	DIAPHRAGMS ARE RIGID OR ARE FLEXIBLE	SEMI-RIGID DIAPHRAGM			
		WITH HORIZONTAL SPANS LESS THAN 40 FT				
7.	MAPPED LONG-PERIOD TRANSITION PERIOD		T_L	=	12.000	sec

8.	REDUNDANCY FACTOR		ρ	=	1.30
9.	BASIC SEISMIC FORCE RESISTING SYSTEM				
	NORTH-SOUTH DIRECTION				
	–	(C.5) SPECIAL REINFORCED CONCRETE MOMENT FRAMES	→	HEIGHT LIMIT = NO LIMIT (R = 8.00, Ωo = 3.00, Cd = 5.50)	
	–	(C.1) STEEL SPECIAL MOMENT FRAMES	→	HEIGHT LIMIT = NO LIMIT (R = 8.00, Ωo = 3.00, Cd = 5.50)	
	–		→		
	NORTH-SOUTH CONTROLLING SYSTEM VALUES		→	**R = 8.00, Ωo = 3.00, Cd = 5.50 (H.L. = NO LIMIT)**	
	EAST-WEST DIRECTION				
	–	(C.5) SPECIAL REINFORCED CONCRETE MOMENT FRAMES	→	HEIGHT LIMIT = NO LIMIT (R = 8.00, Ωo = 3.00, Cd = 5.50)	
	–	(C.1) STEEL SPECIAL MOMENT FRAMES	→	HEIGHT LIMIT = NO LIMIT (R = 8.00, Ωo = 3.00, Cd = 5.50)	
	–		→		
	EAST-WEST CONTROLLING SYSTEM VALUES		→	**R = 8.00, Ωo = 3.00, Cd = 5.50 (H.L. = NO LIMIT)**	
10.	PRELIMINARY CHECK FOR HORIZONTAL IRREGULARITIES				
A)	TORSIONAL IRREGULARITY		–	YES (TYPE 1A)	
B)	RE-ENTRANT CORNER IRREGULARITY		–	NONE	
C)	DIAPHRAGM DISCONTINUITY IRREGULARITY		–	NONE	
D)	OUT-OF-PLANE OFFSET IRREGULARITY		–	NONE	
E)	NON-PARALLEL SYSTEMS IRREGULARITY		–	NONE	
11.	PRELIMINARY CHECK FOR VERTICAL IRREGULARITIES				
A)	STIFFNESS - SOFT STORY IRREGULARITY		–	NONE	
B)	MASS IRREGULARITY		–	NONE	
C)	VERTICAL GEOMETRIC IRREGULARITY		–	NONE	
D)	IN-PLANE DISCONTINUITY IRREGULARITY		–	NONE	
E)	STRENGTH - WEAK STORY IRREGULARITY		–	NONE	

12. APPROXIMATE FUNDAMENTAL PERIOD

MAXIMUM STRUCTURE HEIGHT H_{MR} = 97.500 FT

NORTH-SOUTH DIRECTION

$T_a = C_t \cdot h^n$ = 0.020·(97.500)^0.75 = 0.621 sec

EAST-WEST DIRECTION

$T_a = C_t \cdot h^n$ = 0.020·(97.500)^0.75 = 0.621 sec

13. UPPER LIMIT OF CALCULATED PERIOD

NORTH-SOUTH DIRECTION

$T_{max} = C_u \cdot T_a$ = 1.400·0.621 sec = 0.869 sec

EAST-WEST DIRECTION

$T_{max} = C_u \cdot T_a$ = 1.400·0.621 sec = 0.869 sec

14. CALCULATED FUNDAMENTAL PERIOD

NORTH-SOUTH DIRECTION

T = 0.621 sec

EAST-WEST DIRECTION

T = 0.621 sec

15. DETERMINE PERMITTED DESIGN PROCEDURES

EQUIVALENT LATERAL FORCE ANALYSIS (§ 12.8) → NOT PERMITTED

MODAL RESPONSE SPECTRUM ANALYSIS (§ 12.9) → PERMITTED

SEISMIC RESPONSE HISTORY PROCEDURE (§ 16.1 & § 16.2) → PERMITTED

16. CALCULATE SEISMIC RESPONSE COEFFICIENTS

NORTH-SOUTH DIRECTION

C_s = Sds / (R/I) = 0.754 / (8.00/1.25) = **0.118**

C_{sMAX} = Sd1 / [T·(R/I)] = 0.315 / [0.621·(8.00/1.25)] = **0.079** → **0.079**

C_{sMIN} = max[0.044·Sds·I , 0.01] = max[0.041 , 0.010] = **0.041**

EAST-WEST DIRECTION

C_s = Sds / (R/I) = 0.754 / (8.00/1.25) = **0.118**

C_{sMAX} = Sd1 / [T·(R/I)] = 0.315 / [0.621·(8.00/1.25)] = **0.079** → **0.079**

C_{sMIN} = max[0.044·Sds·I , 0.01] = max[0.041 , 0.010] = **0.041**

17. EFFECTIVE SEISMIC WEIGHT PER LEVEL

SEISMIC WEIGHT IN LEVEL ROOF		LEVEL ELEVATION	=	97.500 FT
– ROOFING/FLOORING	→	18449 FT² · (0.5 PSF)	=	9.22 KIP
– TOPPING	→	18449 FT² · (0.0 PSF)	=	0.00 KIP
– SLAB & DECKING	→	18449 FT² · (2.0 PSF)	=	36.90 KIP
– ROOF/FLOOR FRAMING	→	18449 FT² · (5.0 PSF)	=	92.24 KIP
– CEILING	→	18449 FT² · (2.0 PSF)	=	36.90 KIP
– MECHANICAL	→	18449 FT² · (6.5 PSF)	=	119.24 KIP
– INSULATION	→	18449 FT² · (1.0 PSF)	=	18.45 KIP
– MISCELLANEOUS	→	18449 FT² · (0.0 PSF)	=	0.00 KIP
– STORAGE OR SNOW	→	18449 FT² · (0.0 PSF)	=	0.00 KIP
– EXTERIOR WALLS BELOW	→	545.0 FT·0.5·18.5 FT ·(15.0 PSF)	=	75.62 KIP
– INTERIOR WALLS BELOW	→	1090.0 FT·0.5·18.5 FT ·(12.0 PSF)	=	120.99 KIP
– PARAPETS ABOVE	→	545.0 FT · 5.0 FT ·(15.0 PSF)	=	40.88 KIP
		TOTAL W_i	=	550.43 KIP
SEISMIC WEIGHT IN LEVEL 6		LEVEL ELEVATION	=	79.000 FT
– ROOFING/FLOORING	→	18449 FT² · (2.0 PSF)	=	36.90 KIP
– TOPPING	→	18449 FT² · (0.0 PSF)	=	0.00 KIP
– SLAB & DECKING	→	18449 FT² · (65.2 PSF)	=	1202.84 KIP
– ROOF/FLOOR FRAMING	→	18449 FT² · (8.0 PSF)	=	147.59 KIP
– CEILING	→	18449 FT² · (2.0 PSF)	=	36.90 KIP
– MECHANICAL	→	18449 FT² · (9.7 PSF)	=	179.24 KIP
– INSULATION	→	18449 FT² · (0.0 PSF)	=	0.00 KIP
– MISCELLANEOUS	→	18449 FT² · (0.0 PSF)	=	0.00 KIP
– STORAGE OR SNOW	→	18449 FT² · (0.0 PSF)	=	0.00 KIP
– EXTERIOR WALLS ABOVE	→	545.0 FT·0.5·18.5 FT ·(15.0 PSF)	=	75.62 KIP
– EXTERIOR WALLS BELOW	→	545.0 FT·0.5·15.0 FT ·(15.0 PSF)	=	61.31 KIP
– INTERIOR WALLS ABOVE	→	1090.0 FT·0.5·18.5 FT ·(12.0 PSF)	=	120.99 KIP
– INTERIOR WALLS BELOW	→	1090.0 FT·0.5·15.0 FT ·(12.0 PSF)	=	98.10 KIP
		TOTAL W_i	=	1959.48 KIP

			SEISMIC WEIGHT IN LEVEL 5															LEVEL ELEVATION				=	64.000	FT						
				– ROOFING/FLOORING						→		18449 FT² · (2.0 PSF)									=	36.90	KIP						
				– TOPPING						→		18449 FT² · (0.0 PSF)									=	0.00	KIP						
				– SLAB & DECKING						→		18449 FT² · (125.0 PSF)									=	2306.06	KIP						
				– ROOF/FLOOR FRAMING						→		18449 FT² · (0.0 PSF)									=	0.00	KIP						
				– CEILING						→		18449 FT² · (2.0 PSF)									=	36.90	KIP						
				– MECHANICAL						→		18449 FT² · (9.7 PSF)									=	179.24	KIP						
				– INSULATION						→		18449 FT² · (0.0 PSF)									=	0.00	KIP						
				– MISCELLANEOUS						→		18449 FT² · (0.0 PSF)									=	0.00	KIP						
				– STORAGE OR SNOW						→		18449 FT² · (0.0 PSF)									=	0.00	KIP						
				– EXTERIOR WALLS ABOVE						→		545.0 FT·0.5·15.0 FT ·(15.0 PSF)									=	61.31	KIP						
				– EXTERIOR WALLS BELOW						→		545.0 FT·0.5·15.0 FT ·(15.0 PSF)									=	61.31	KIP						
				– INTERIOR WALLS ABOVE						→		1090.0 FT·0.5·15.0 FT ·(12.0 PSF)									=	98.10	KIP						
				– INTERIOR WALLS BELOW						→		1090.0 FT·0.5·15.0 FT ·(12.0 PSF)									=	98.10	KIP						
																		TOTAL W_i			=	2877.92	KIP						
			SEISMIC WEIGHT IN LEVEL 4															LEVEL ELEVATION				=	49.000	FT						
				– ROOFING/FLOORING						→		18449 FT² · (2.0 PSF)									=	36.90	KIP						
				– TOPPING						→		18449 FT² · (0.0 PSF)									=	0.00	KIP						
				– SLAB & DECKING						→		18449 FT² · (125.0 PSF)									=	2306.06	KIP						
				– ROOF/FLOOR FRAMING						→		18449 FT² · (0.0 PSF)									=	0.00	KIP						
				– CEILING						→		18449 FT² · (2.0 PSF)									=	36.90	KIP						
				– MECHANICAL						→		18449 FT² · (9.7 PSF)									=	179.24	KIP						
				– INSULATION						→		18449 FT² · (0.0 PSF)									=	0.00	KIP						
				– MISCELLANEOUS						→		18449 FT² · (0.0 PSF)									=	0.00	KIP						
				– STORAGE OR SNOW						→		18449 FT² · (0.0 PSF)									=	0.00	KIP						
				– EXTERIOR WALLS ABOVE						→		545.0 FT·0.5·15.0 FT ·(15.0 PSF)									=	61.31	KIP						
				– EXTERIOR WALLS BELOW						→		545.0 FT·0.5·15.0 FT ·(15.0 PSF)									=	61.31	KIP						
				– INTERIOR WALLS ABOVE						→		1090.0 FT·0.5·15.0 FT ·(12.0 PSF)									=	98.10	KIP						
				– INTERIOR WALLS BELOW						→		1090.0 FT·0.5·15.0 FT ·(12.0 PSF)									=	98.10	KIP						
																		TOTAL W_i			=	2877.92	KIP						

			SEISMIC WEIGHT IN LEVEL 3															LEVEL ELEVATION			=	34.000	FT							
				– ROOFING/FLOORING						→		18449 FT² · (2.0 PSF)									=	36.90	KIP							
				– TOPPING						→		18449 FT² · (0.0 PSF)									=	0.00	KIP							
				– SLAB & DECKING						→		18449 FT² · (125.0 PSF)									=	2306.06	KIP							
				– ROOF/FLOOR FRAMING						→		18449 FT² · (0.0 PSF)									=	0.00	KIP							
				– CEILING						→		18449 FT² · (2.0 PSF)									=	36.90	KIP							
				– MECHANICAL						→		18449 FT² · (9.7 PSF)									=	179.24	KIP							
				– INSULATION						→		18449 FT² · (0.0 PSF)									=	0.00	KIP							
				– MISCELLANEOUS						→		18449 FT² · (0.0 PSF)									=	0.00	KIP							
				– STORAGE OR SNOW						→		18449 FT² · (0.0 PSF)									=	0.00	KIP							
				– EXTERIOR WALLS ABOVE						→		545.0 FT·0.5·15.0 FT ·(15.0 PSF)									=	61.31	KIP							
				– EXTERIOR WALLS BELOW						→		545.0 FT·0.5·15.0 FT ·(15.0 PSF)									=	61.31	KIP							
				– INTERIOR WALLS ABOVE						→		1090.0 FT·0.5·15.0 FT ·(12.0 PSF)									=	98.10	KIP							
				– INTERIOR WALLS BELOW						→		1090.0 FT·0.5·15.0 FT ·(12.0 PSF)									=	98.10	KIP							
																		TOTAL W_i			=	2877.92	KIP							
			SEISMIC WEIGHT IN LEVEL 2															LEVEL ELEVATION			=	19.000	FT							
				– ROOFING/FLOORING						→		16350 FT² · (2.0 PSF)									=	32.70	KIP							
				– TOPPING						→		16350 FT² · (0.0 PSF)									=	0.00	KIP							
				– SLAB & DECKING						→		16350 FT² · (125.0 PSF)									=	2043.75	KIP							
				– ROOF/FLOOR FRAMING						→		16350 FT² · (0.0 PSF)									=	0.00	KIP							
				– CEILING						→		16350 FT² · (2.0 PSF)									=	32.70	KIP							
				– MECHANICAL						→		16350 FT² · (10.3 PSF)									=	168.75	KIP							
				– INSULATION						→		16350 FT² · (0.0 PSF)									=	0.00	KIP							
				– MISCELLANEOUS						→		16350 FT² · (0.0 PSF)									=	0.00	KIP							
				– STORAGE OR SNOW						→		16350 FT² · (0.0 PSF)									=	0.00	KIP							
				– EXTERIOR WALLS ABOVE						→		545.0 FT·0.5·15.0 FT ·(15.0 PSF)									=	61.31	KIP							
				– EXTERIOR WALLS BELOW						→		545.0 FT·0.5·19.0 FT ·(15.0 PSF)									=	77.66	KIP							
				– INTERIOR WALLS ABOVE						→		1090.0 FT·0.5·15.0 FT ·(12.0 PSF)									=	98.10	KIP							
				– INTERIOR WALLS BELOW						→		1090.0 FT·0.5·19.0 FT ·(12.0 PSF)									=	124.26	KIP							
																		TOTAL W_i			=	2639.24	KIP							

18. TOTAL EFFECTIVE SEISMIC WEIGHT

TOTAL EFFECTIVE SEISMIC WEIGHT W_T = 13782.90 KIP

19. SEISMIC BASE SHEAR

NORTH-SOUTH DIRECTION

$V_{NS} = C_s \cdot W_T = 0.079 \cdot 13782.90 \text{ KIP} = 1093.17 \text{ KIP}$

EAST-WEST DIRECTION

$V_{EW} = C_s \cdot W_T = 0.079 \cdot 13782.90 \text{ KIP} = 1093.17 \text{ KIP}$

20. ANALYSIS AND DESIGN REQUIREMENTS RESULTING FROM IRREGULARITIES

NO	A)	DESIGN ELEMENTS SUPPORTING DISCONTINUOUS LATERAL LOAD RESISTING WALLS OR FRAMES TO RESIST SEISMIC LOAD EFFECTS INCLUDING OVERSTRENGTH FACTOR (12.3.3.3)
YES	B)	DESIGN CONNECTIONS OF DIAPHRAGMS TO VERTICAL ELEMENTS AND DIAPHRAGM CONNECTIONS TO COLLECTORS TO RESIST 125% DIAPHRAGM DESIGN FORCES (12.3.3.4)
YES	C)	DESIGN COLLECTORS AND THEIR CONNECTIONS, INCLUDING CONNECTIONS TO VERTICAL ELEMENTS TO RESIST 125% DIAPHRAGM DESIGN FORCES (12.3.3.4)
NO	D)	DESIGN LATERAL LOAD RESISTING ELEMENTS AND THEIR FOUNDATIONS FOR 100% OF FORCE IN PRIMARY ANALYSIS DIRECTION AND 30% OF FORCE IN ORTHOGONAL DIRECTION (12.5.3)
YES	E)	ANALYZE STRUCTURE USING 3-D MODEL WITH TWO ORTHOGONAL LATERAL DEGREES OF FREEDOM AND ONE ROTATIONAL DEGREE OF FREEDOM ABOUT THE VERTICAL AXIS (12.7.3)
YES	F)	INCLUDE DIAPHRAGM STIFFNESS CHARACTERISTICS IN MODEL FOR DIAPHRAGMS NOT CLASSIFIED AS EITHER RIGID OR FLEXIBLE BY SECTION 12.3.1 (12.7.3)
YES	G)	DESIGN STRUCTURE FOR AMPLIFIED ACCIDENTAL TORSION MOMENT (12.8.4.3)
YES	H)	DESIGN MOMENT FRAME DRIFT NOT TO EXCEED ALLOWABLE STORY DRIFT DIVIDED BY THE REDUNDANCY FACTOR (ρ) (12.12.1)

21. STRENGTH SEISMIC MODAL RESPONSE SPECTRUM ANALYSIS SCALING - PRELIMINARY

SEISMIC IMPORTANCE FACTOR I = 1.25

NORTH-SOUTH DIRECTION: BASIC SEISMIC FORCE RESISTING SYSTEM

– (C.5) SPECIAL REINFORCED CONCRETE MOMENT FRAMES → R = 8.00

– (C.1) STEEL SPECIAL MOMENT FRAMES → R = 8.00

– →

CONTROLLING RESPONSE MODIFICATION FACTOR → R = 8.00

EAST-WEST DIRECTION: BASIC SEISMIC FORCE RESISTING SYSTEM

– (C.5) SPECIAL REINFORCED CONCRETE MOMENT FRAMES → R = 8.00

– (C.1) STEEL SPECIAL MOMENT FRAMES → R = 8.00

– →

CONTROLLING RESPONSE MODIFICATION FACTOR → R = 8.00

PRELIMINARY MODAL RESPONSE SPECTRUM SCALING FACTOR - STRENGTH

$SF_{P,NS+e}$ = (I / R) = (1.25 / 8.00) = 0.1563

$SF_{P,NS-e}$ = (I / R) = (1.25 / 8.00) = 0.1563

$SF_{P,EW+e}$ = (I / R) = (1.25 / 8.00) = 0.1563

$SF_{P,EW-e}$ = (I / R) = (1.25 / 8.00) = 0.1563

22. STRENGTH SEISMIC MODAL RESPONSE SPECTRUM ANALYSIS SCALING - FINAL

LIMITING BASE SHEAR FRACTION FOR MRSA — BSF = 1.000

EQUIVALENT LATERAL FORCE ANALYSIS - BASE SHEAR

NORTH-SOUTH DIRECTION:	$V_{ELFA,NS}$ =	1093.17 KIP
EAST-WEST DIRECTION:	$V_{ELFA,EW}$ =	1093.17 KIP

PRELIMINARY MODAL RESPONSE ANALYSIS - BASE SHEAR

NORTH-SOUTH DIRECTION (+ ECCENTRICITY):	$V_{PRSA,NS+e}$ =	1600.00 KIP
NORTH-SOUTH DIRECTION (- ECCENTRICITY):	$V_{PRSA,NS-e}$ =	1650.00 KIP
EAST-WEST DIRECTION (+ ECCENTRICITY):	$V_{PRSA,EW+e}$ =	1400.00 KIP
EAST-WEST DIRECTION (- ECCENTRICITY):	$V_{PRSA,EW-e}$ =	1500.00 KIP

DESIGN MODAL RESPONSE SPECTRUM SCALING FACTOR - STRENGTH

SF_{NS+e} =	$(I / R)\cdot\max[BSF\cdot(V_{ELFA} / V_{PRSA}) , 1.0000]$ =	$(1.25 / 8.00)\cdot\max[1.00\cdot(1093.17 / 1600.00) , 1.0000]$ =	0.1563
SF_{NS+e} =	$(I / R)\cdot\max[BSF\cdot(V_{ELFA} / V_{PRSA}) , 1.0000]$ =	$(1.25 / 8.00)\cdot\max[1.00\cdot(1093.17 / 1650.00) , 1.0000]$ =	0.1563
SF_{EW+e} =	$(I / R)\cdot\max[BSF\cdot(V_{ELFA} / V_{PRSA}) , 1.0000]$ =	$(1.25 / 8.00)\cdot\max[1.00\cdot(1093.17 / 1400.00) , 1.0000]$ =	0.1563
SF_{EW-e} =	$(I / R)\cdot\max[BSF\cdot(V_{ELFA} / V_{PRSA}) , 1.0000]$ =	$(1.25 / 8.00)\cdot\max[1.00\cdot(1093.17 / 1500.00) , 1.0000]$ =	0.1563

23. DRIFT SEISMIC MODAL RESPONSE SPECTRUM ANALYSIS SCALING - PRELIMINARY

SEISMIC IMPORTANCE FACTOR I = 1.25

NORTH-SOUTH DIRECTION: BASIC SEISMIC FORCE RESISTING SYSTEM

– (C.5) SPECIAL REINFORCED CONCRETE MOMENT FRAMES → R = 8.00

– (C.1) STEEL SPECIAL MOMENT FRAMES → R = 8.00

– →

CONTROLLING RESPONSE MODIFICATION FACTOR → R = 8.00

EAST-WEST DIRECTION: BASIC SEISMIC FORCE RESISTING SYSTEM

– (C.5) SPECIAL REINFORCED CONCRETE MOMENT FRAMES → R = 8.00

– (C.1) STEEL SPECIAL MOMENT FRAMES → R = 8.00

– →

CONTROLLING RESPONSE MODIFICATION FACTOR → R = 8.00

PRELIMINARY MODAL RESPONSE SPECTRUM SCALING FACTOR - DRIFT

$SF_{P,NS+e}$ = (I / R) = (1.25 / 8.00) = 0.1563

$SF_{P,NS-e}$ = (I / R) = (1.25 / 8.00) = 0.1563

$SF_{P,EW+e}$ = (I / R) = (1.25 / 8.00) = 0.1563

$SF_{P,EW-e}$ = (I / R) = (1.25 / 8.00) = 0.1563

24. DRIFT SEISMIC MODAL RESPONSE SPECTRUM ANALYSIS SCALING - FINAL

LIMITING BASE SHEAR FRACTION FOR MRSA — BSF = 1.000

EQUIVALENT LATERAL FORCE ANALYSIS - BASE SHEAR

NORTH-SOUTH DIRECTION:	$C_{sMIN}'\cdot W$ =	339.19 KIP
EAST-WEST DIRECTION:	$C_{sMIN}'\cdot W$ =	339.19 KIP

PRELIMINARY MODAL RESPONSE ANALYSIS - BASE SHEAR

NORTH-SOUTH DIRECTION (+ ECCENTRICITY):	$V_{PRSA,NS+e}$ =	1600.00 KIP
NORTH-SOUTH DIRECTION (- ECCENTRICITY):	$V_{PRSA,NS-e}$ =	1650.00 KIP
EAST-WEST DIRECTION (+ ECCENTRICITY):	$V_{PRSA,EW+e}$ =	1400.00 KIP
EAST-WEST DIRECTION (- ECCENTRICITY):	$V_{PRSA,EW-e}$ =	1500.00 KIP

DESIGN MODAL RESPONSE SPECTRUM SCALING FACTOR - DRIFT

SF_{NS+e} =	$(I / R)\cdot\max[BSF\cdot(V_{ELFA} / V_{PRSA}) , 1.0000]$ =	$(1.25 / 8.00)\cdot\max[1.00\cdot(1600.00 / 1600.00) , 1.0000]$ =	**0.1563**
SF_{NS+e} =	$(I / R)\cdot\max[BSF\cdot(V_{ELFA} / V_{PRSA}) , 1.0000]$ =	$(1.25 / 8.00)\cdot\max[1.00\cdot(1650.00 / 1650.00) , 1.0000]$ =	**0.1563**
SF_{EW+e} =	$(I / R)\cdot\max[BSF\cdot(V_{ELFA} / V_{PRSA}) , 1.0000]$ =	$(1.25 / 8.00)\cdot\max[1.00\cdot(1400.00 / 1400.00) , 1.0000]$ =	**0.1563**
SF_{EW-e} =	$(I / R)\cdot\max[BSF\cdot(V_{ELFA} / V_{PRSA}) , 1.0000]$ =	$(1.25 / 8.00)\cdot\max[1.00\cdot(1500.00 / 1500.00) , 1.0000]$ =	**0.1563**

VERTICAL SEISMIC FORCE DISTRIBUTION
NORTH-SOUTH DIRECTION

SEISMIC BASE SHEAR V_{NS} = 1093.17 KIP

STRUCTURE PERIOD T = 0.621 sec
PERIOD DISTRIBUTION EXPONENT k = 1.060

$\Sigma W_x \cdot h_x^k$ = 868053.09 KIP-FT

LEVEL	H_x (FT)	W_x (KIP)	C_{vx}	F_x (KIP)
ROOF	97.500	550.43	0.081	**89.07**
6	79.000	1959.48	0.232	**253.69**
5	64.000	2877.92	0.273	**298.04**
4	49.000	2877.92	0.205	**224.54**
3	34.000	2877.92	0.139	**152.41**
2	19.000	2639.24	0.069	**75.41**

VERTICAL SEISMIC FORCE DISTRIBUTION
EAST-WEST DIRECTION

SEISMIC BASE SHEAR V_{EW} = 1093.17 KIP

STRUCTURE PERIOD T= 0.621 sec
PERIOD DISTRIBUTION EXPONENT k= 1.060

$\Sigma W_x \cdot h_x^k$ = 868053.09 KIP-FT

LEVEL	H_x (FT)	W_x (KIP)	C_{vx}	F_x (KIP)
ROOF	97.500	550.43	0.081	**89.07**
6	79.000	1959.48	0.232	**253.69**
5	64.000	2877.92	0.273	**298.04**
4	49.000	2877.92	0.205	**224.54**
3	34.000	2877.92	0.139	**152.41**
2	19.000	2639.24	0.069	**75.41**

SEISMIC DIAPHRAGM DESIGN FORCES

MAXIMUM DIAPHRAGM FORCE

Fpmax = 0.4·Sds·I·Wpx = 0.4·0.754·1.25·Wpx = 0.377 $\cdot W_{px}$

MINIMUM DIAPHRAGM FORCE

Fpmin = 0.2·Sds·I·Wpx = 0.2·0.754·1.25·Wpx = 0.189 $\cdot W_{px}$

NORTH-SOUTH DIRECTION

LEVEL	W_{px} (KIP)	ΣW_{px} (KIP)	F_{px} (KIP)	ΣF_{px} (KIP)	$\Sigma F_{pi} / \Sigma W_{pi}$	θ_p	F_p (KIP)	F_p / F_{px}
ROOF	550.43	550.43	89.07	89.07	0.162	0.189	**103.81**	**1.165**
6	1959.48	2509.91	253.69	342.76	0.137	0.189	**369.56**	**1.457**
5	2877.92	5387.83	298.04	640.80	0.119	0.189	**542.78**	**1.821**
4	2877.92	8265.75	224.54	865.34	0.105	0.189	**542.78**	**2.417**
3	2877.92	11143.66	152.41	1017.76	0.091	0.189	**542.78**	**3.561**
2	2639.24	13782.90	75.41	1093.17	0.079	0.189	**497.76**	**6.600**

EAST-WEST DIRECTION

LEVEL	W_{px} (KIP)	ΣW_{px} (KIP)	F_{px} (KIP)	ΣF_{px} (KIP)	$\Sigma F_{pi} / \Sigma W_{pi}$	θ_p	F_p (KIP)	F_p / F_{px}
ROOF	550.43	550.43	89.07	89.07	0.162	0.189	**103.81**	**1.165**
6	1959.48	2509.91	253.69	342.76	0.137	0.189	**369.56**	**1.457**
5	2877.92	5387.83	298.04	640.80	0.119	0.189	**542.78**	**1.821**
4	2877.92	8265.75	224.54	865.34	0.105	0.189	**542.78**	**2.417**
3	2877.92	11143.66	152.41	1017.76	0.091	0.189	**542.78**	**3.561**
2	2639.24	13782.90	75.41	1093.17	0.079	0.189	**497.76**	**6.600**

TYPE 1 HORIZONTAL IRREGULARITY CALCULATION - NORTH-SOUTH DIRECTION

LOAD CASE	DIAP. LEVEL	DEFLECTION				DRIFT				DRIFT RATIO	IRREG. TYPE	A_x	e
		LEFT	RIGHT	AVG.	MAX.	LEFT	RIGHT	AVG.	MAX.				
LOAD CASE EQX + e	ROOF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	BASE	0.000	0.000										

LOAD CASE	DIAP. LEVEL	DEFLECTION				DRIFT				DRIFT RATIO	IRREG. TYPE	A_x	e
		LEFT	RIGHT	AVG.	MAX.	LEFT	RIGHT	AVG.	MAX.				
LOAD CASE EQX - e	ROOF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	BASE	0.000	0.000										

LOAD CASE	DIAP. LEVEL	DEFLECTION				DRIFT				DRIFT RATIO	IRREG. TYPE	A_x	e
		LEFT	RIGHT	AVG.	MAX.	LEFT	RIGHT	AVG.	MAX.				
LOAD CASE -EQX + e	ROOF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	BASE	0.000	0.000										

LOAD CASE	DIAP. LEVEL	DEFLECTION				DRIFT				DRIFT RATIO	IRREG. TYPE	A_x	e
		LEFT	RIGHT	AVG.	MAX.	LEFT	RIGHT	AVG.	MAX.				
LOAD CASE -EQX - e	ROOF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	BASE	0.000	0.000										

TYPE 1 HORIZONTAL IRREGULARITY CALCULATION - EAST-WEST DIRECTION

LOAD CASE	DIAP. LEVEL	DEFLECTION				DRIFT				DRIFT RATIO	IRREG. TYPE	A_x	e
		LEFT	RIGHT	AVG.	MAX.	LEFT	RIGHT	AVG.	MAX.				
LOAD CASE EQZ + e	ROOF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	BASE	0.000	0.000										

LOAD CASE	DIAP. LEVEL	DEFLECTION				DRIFT				DRIFT RATIO	IRREG. TYPE	A_x	e
		LEFT	RIGHT	AVG.	MAX.	LEFT	RIGHT	AVG.	MAX.				
LOAD CASE EQZ - e	ROOF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	BASE	0.000	0.000										

LOAD CASE	DIAP. LEVEL	DEFLECTION				DRIFT				DRIFT RATIO	IRREG. TYPE	A_x	e
		LEFT	RIGHT	AVG.	MAX.	LEFT	RIGHT	AVG.	MAX.				
LOAD CASE -EQZ + e	ROOF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	BASE	0.000	0.000										

LOAD CASE	DIAP. LEVEL	DEFLECTION				DRIFT				DRIFT RATIO	IRREG. TYPE	A_x	e
		LEFT	RIGHT	AVG.	MAX.	LEFT	RIGHT	AVG.	MAX.				
LOAD CASE -EQZ - e	ROOF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**	**#DIV/0!**	#DIV/0!
	BASE	0.000	0.000										

TYPE 2 HORIZONTAL IRREGULARITY CALCULATION							
DIAPHRAGM LEVEL	**DIAPHRAGM N-S DIM.**	**DIAPHRAGM E-W DIM.**	**RE-ENTRANT N-S DIM.**	**RE-ENTRANT E-W DIM.**	**N-S COR. RATIO**	**E-W COR. RATIO**	**IRREGULARITY**
ROOF	125.500	147.000	0.00	0.00	0.000	0.000	**NONE**
6	125.500	147.000	0.00	0.00	0.000	0.000	**NONE**
5	125.500	147.000	0.00	0.00	0.000	0.000	**NONE**
4	125.500	147.000	0.00	0.00	0.000	0.000	**NONE**
3	125.500	147.000	0.00	0.00	0.000	0.000	**NONE**
2	125.500	147.000	0.00	0.00	0.000	0.000	**NONE**

TYPE 3 HORIZONTAL IRREGULARITY CALCULATION						
DIAPHRAGM LEVEL	**DIAPHRAGM N-S DIM.**	**DIAPHRAGM E-W DIM.**	**GROSS AREA (FT^2)**	**OPENING AREA (FT^2)**	**OPENING RATIO**	**IRREGULARITY**
ROOF	125.500	147.000	18448.50	0.00	0.000	**NONE**
6	125.500	147.000	18448.50	0.00	0.000	**NONE**
5	125.500	147.000	18448.50	0.00	0.000	**NONE**
4	125.500	147.000	18448.50	0.00	0.000	**NONE**
3	125.500	147.000	18448.50	0.00	0.000	**NONE**
2	125.500	147.000	18448.50	0.00	0.000	**NONE**

TYPE 1 VERTICAL IRREGULARITY CALCULATION - NORTH-SOUTH DIRECTION							
LOAD CASE	**DIAPHRAGM LEVEL**	**STORY ELEVATION**	**AVG. DEFL.**	**STORY SHEAR**	**CUMULATIVE SHEAR**	**STORY STIFFNESS**	**IRREGULARITY**
LOAD CASE EQX	ROOF	97.500	0.000	89.073	89.073	#DIV/0!	**NONE**
	6	79.000	0.000	253.687	342.760	#DIV/0!	**#DIV/0!**
	5	64.000	0.000	298.041	640.801	#DIV/0!	**#DIV/0!**
	4	49.000	0.000	224.543	865.345	#DIV/0!	**#DIV/0!**
	3	34.000	0.000	152.411	1017.755	#DIV/0!	**#DIV/0!**
	2	19.000	0.000	75.415	1093.170	#DIV/0!	**#DIV/0!**
	BASE	0.000					
LOAD CASE	**DIAPHRAGM LEVEL**	**STORY ELEVATION**	**AVG. DEFL.**	**STORY SHEAR**	**CUMULATIVE SHEAR**	**STORY STIFFNESS**	**IRREGULARITY**
LOAD CASE -EQX	ROOF	97.500	0.000	89.073	89.073	#DIV/0!	**NONE**
	6	79.000	0.000	253.687	342.760	#DIV/0!	**#DIV/0!**
	5	64.000	0.000	298.041	640.801	#DIV/0!	**#DIV/0!**
	4	49.000	0.000	224.543	865.345	#DIV/0!	**#DIV/0!**
	3	34.000	0.000	152.411	1017.755	#DIV/0!	**#DIV/0!**
	2	19.000	0.000	75.415	1093.170	#DIV/0!	**#DIV/0!**
	BASE	0.000					

TYPE 1 VERTICAL IRREGULARITY CALCULATION - EAST-WEST DIRECTION							
LOAD CASE	**DIAPHRAGM LEVEL**	**STORY ELEVATION**	**AVG. DEFL.**	**STORY SHEAR**	**CUMULATIVE SHEAR**	**STORY STIFFNESS**	**IRREGULARITY**
LOAD CASE EQZ	ROOF	97.500	0.000	89.073	89.073	#DIV/0!	**NONE**
	6	79.000	0.000	253.687	342.760	#DIV/0!	**#DIV/0!**
	5	64.000	0.000	298.041	640.801	#DIV/0!	**#DIV/0!**
	4	49.000	0.000	224.543	865.345	#DIV/0!	**#DIV/0!**
	3	34.000	0.000	152.411	1017.755	#DIV/0!	**#DIV/0!**
	2	19.000	0.000	75.415	1093.170	#DIV/0!	**#DIV/0!**
	BASE	0.000					
LOAD CASE	**DIAPHRAGM LEVEL**	**STORY ELEVATION**	**AVG. DEFL.**	**STORY SHEAR**	**CUMULATIVE SHEAR**	**STORY STIFFNESS**	**IRREGULARITY**
LOAD CASE -EQZ	ROOF	97.500	0.000	89.073	89.073	#DIV/0!	**NONE**
	6	79.000	0.000	253.687	342.760	#DIV/0!	**#DIV/0!**
	5	64.000	0.000	298.041	640.801	#DIV/0!	**#DIV/0!**
	4	49.000	0.000	224.543	865.345	#DIV/0!	**#DIV/0!**
	3	34.000	0.000	152.411	1017.755	#DIV/0!	**#DIV/0!**
	2	19.000	0.000	75.415	1093.170	#DIV/0!	**#DIV/0!**
	BASE	0.000					

TYPE 1 VERTICAL IRREGULARITY CALCULATION - NORTH-SOUTH DIRECTION								
LOAD CASE	**DIAPHRAGM LEVEL**	**STORY ELEVATION**	**STORY HEIGHT**	**AVG. DEFL.**	**AVG. DRIFT**	**IDR**	**IDR RATIO**	**IRREGULARITY**
LOAD CASE EQX	ROOF	97.500	18.500	0.000	0.000	0.000		**NONE (S.N.C.)**
	6	79.000	15.000	0.000	0.000	0.000	#DIV/0!	**NONE (S.N.C.)**
	5	64.000	15.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	4	49.000	15.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	3	34.000	15.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	2	19.000	19.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	BASE	0.000						
LOAD CASE	**DIAPHRAGM LEVEL**	**STORY ELEVATION**	**STORY HEIGHT**	**AVG. DEFL.**	**AVG. DRIFT**	**IDR**	**IDR RATIO**	**IRREGULARITY**
LOAD CASE -EQX	ROOF	97.500	18.500	0.000	0.000	0.000		**NONE (S.N.C.)**
	6	79.000	15.000	0.000	0.000	0.000	#DIV/0!	**NONE (S.N.C.)**
	5	64.000	15.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	4	49.000	15.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	3	34.000	15.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	2	19.000	19.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	BASE	0.000						

TYPE 1 VERTICAL IRREGULARITY CALCULATION - EAST-WEST DIRECTION								
LOAD CASE	**DIAPHRAGM LEVEL**	**STORY ELEVATION**	**STORY HEIGHT**	**AVG. DEFL.**	**AVG. DRIFT**	**IDR**	**IDR RATIO**	**IRREGULARITY**
LOAD CASE EQZ	ROOF	97.500	18.500	0.000	0.000	0.000		**NONE (S.N.C.)**
	6	79.000	15.000	0.000	0.000	0.000	#DIV/0!	**NONE (S.N.C.)**
	5	64.000	15.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	4	49.000	15.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	3	34.000	15.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	2	19.000	19.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	BASE	0.000						
LOAD CASE	**DIAPHRAGM LEVEL**	**STORY ELEVATION**	**STORY HEIGHT**	**AVG. DEFL.**	**AVG. DRIFT**	**IDR**	**IDR RATIO**	**IRREGULARITY**
LOAD CASE -EQZ	ROOF	97.500	18.500	0.000	0.000	0.000		**NONE (S.N.C.)**
	6	79.000	15.000	0.000	0.000	0.000	#DIV/0!	**NONE (S.N.C.)**
	5	64.000	15.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	4	49.000	15.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	3	34.000	15.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	2	19.000	19.000	0.000	0.000	0.000	#DIV/0!	**#DIV/0!**
	BASE	0.000						

TYPE 2 VERTICAL IRREGULARITY CALCULATION		
DIAPHRAGM LEVEL	**W_x (KIP)**	**IRREGULARITY**
ROOF	550.43	**NONE**
6	1959.48	**NONE**
5	2877.92	**NONE**
4	2877.92	**NONE**
3	2877.92	**NONE**
2	2639.24	**NONE**

1.	REDUNDANCY FACTOR	ρ	=	1.00		
2.	SUPPORTING DIAPHRAGM TYPE	SEMI-RIGID DIAPHRAGM				
	SUPPORTING DIAPHRAGM SPAN	L_f	=	50.000	FT	
	DIAPHRAGM FLEXIBILITY AMPLIFICATION FACTOR	k_a	=	1.500		
3.	WALL ANCHORAGE HEIGHT	z	=	48.75	FT	
	MEAN ROOF HEIGHT OF STRUCTURE	H_{MR}	=	97.5	FT	
	WALL ANCHORAGE HEIGHT ADJUSTMENT FACTOR	k_w	=	0.667		
4.	WALL WEIGHT	W_{wall}	=	100.00	PSF	
5.	TRIBUTARY WALL HEIGHT ABOVE	h_{above}	=	12.000	FT	
	TRIBUTARY WALL HEIGHT BELOW	h_{below}	=	12.000	FT	
	WALL ANCHOR SPACING	s	=	4.000	FT	

6. OUT-OF-PLANE WALL FORCE

F_{pCALC} =	$0.4 \cdot S_{DS} \cdot I_e \cdot W_p$ =	0.4·0.754·1.25·100.00 PSF·(12.000 FT + 12.000 FT)·4.000 FT	=	3621 LB/ANCHOR
F_{pMIN} =	$0.1 \cdot W_p$ =	0.1·100.00 PSF·(12.000 FT + 12.000 FT)·4.000 FT	=	960 LB/ANCHOR
F_{pCALC} =	$0.4 \cdot S_{DS} \cdot k_a \cdot I_e \cdot W_p$ =	0.4·0.754·1.50·1.25·100.00 PSF·(12.000 FT + 12.000 FT)·4.000 FT	=	5432 LB/ANCHOR
F_{pMIN} =	$0.2 \cdot k_a \cdot I_e \cdot W_p$ =	0.2·1.50·1.25·100.00 PSF·(12.000 FT + 12.000 FT)·4.000 FT	=	3600 LB/ANCHOR
			Fp =	**5432 LB/ANCHOR**

1. REDUNDANCY FACTOR — ρ = 1.00

2. ARCHITECTURAL COMPONENT OR ELEMENT: INTERIOR NONSTRUCTURAL WALLS AND PARTITIONS - PLAIN (UNREINFORCED) MASONRY WALLS

COMPONENT AMPLIFICATION FACTOR — a_p = 1.00

COMPONENT RESPONSE MODIFICATION FACTOR — R_p = 1.50

3. COMPONENT IMPORTANCE FACTOR — I_p = 1.50

COMPONENT IS REQUIRED TO FUNCTION FOR LIFE-SAFETY PURPOSES AFTER AN EARTHQUAKE, INCLUDING FIRE PROTECTION SPRINKLER SYSTEMS

4. COMPONENT ATTACHMENT HEIGHT — z = 97.500 FT

MEAN ROOF HEIGHT OF STRUCTURE — H_{MR} = 97.500 FT

5. COMPONENT SEISMIC DESIGN FORCE

F_{pCALC} = $0.4 \cdot a_p \cdot S_{DS} \cdot (I_p / R_p) \cdot [1 + 2 \cdot (z/H_{MR})] \cdot W_p$ = $0.4 \cdot 1.00 \cdot 0.754 \cdot (1.50/1.50) \cdot [1 + 2 \cdot (97.50/97.50)] \cdot Wp$ = 0.905 ·Wp

F_{pMAX} = $1.6 \cdot S_{DS} \cdot I_p \cdot W_p$ = $1.6 \cdot 0.754 \cdot 1.50 \cdot Wp$ = 1.811 ·Wp

F_{pMIN} = $0.3 \cdot S_{DS} \cdot I_p \cdot W_p$ = $0.3 \cdot 0.754 \cdot 1.50 \cdot Wp$ = 0.339 ·Wp

F_p = 0.905 ·Wp

1. REDUNDANCY FACTOR ρ = 1.00

2. M.E.P. COMPONENT OR ELEMENT: AIR-SIDE HVACR COMPONENTS

COMPONENT AMPLIFICATION FACTOR a_p = 2.50

COMPONENT RESPONSE MODIFICATION FACTOR R_p = 6.00

3. COMPONENT IMPORTANCE FACTOR I_p = 1.00

ALL OTHER COMPONENTS

4. COMPONENT ATTACHMENT HEIGHT z = 97.500 FT

MEAN ROOF HEIGHT OF STRUCTURE H_{MR} = 97.500 FT

5. COMPONENT SEISMIC DESIGN FORCE

F_{pCALC} = $0.4 \cdot a_p \cdot S_{DS} \cdot (I_p / R_p) \cdot [1 + 2 \cdot (z/H_{MR})] \cdot W_p$ = $0.4 \cdot 2.50 \cdot 0.754 \cdot (1.00/6.00) \cdot [1 + 2 \cdot (97.50/97.50)] \cdot Wp$ = 0.377 ·Wp

F_{pMAX} = $1.6 \cdot S_{DS} \cdot I_p \cdot W_p$ = $1.6 \cdot 0.754 \cdot 1.00 \cdot Wp$ = 1.207 ·Wp

F_{pMIN} = $0.3 \cdot S_{DS} \cdot I_p \cdot W_p$ = $0.3 \cdot 0.754 \cdot 1.00 \cdot Wp$ = 0.226 ·Wp

F_p = 0.377 ·Wp