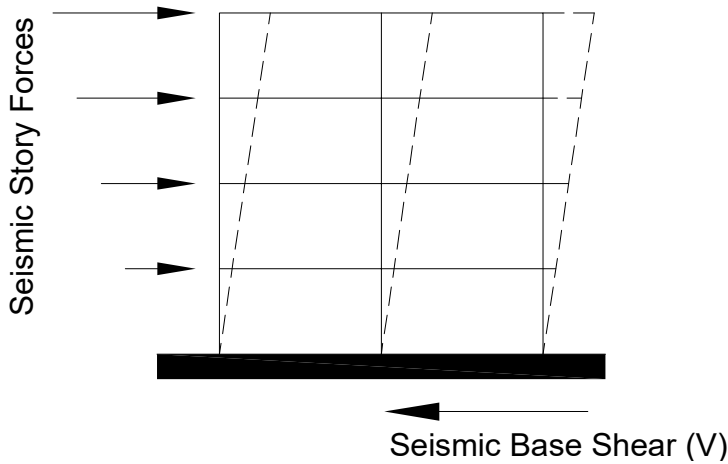




Calculation of Seismic Base Shear as per ASCE/SEI 7-10 Chapter 11



Site Parameters

(According to Cl.11.4.2 of ASCE/SEI 7),

Site Class: SEL("ASCE/Site_Cl"; ID;) = A

Mapped Acceleration Parameters

(According to Cl.11.4.1 of ASCE/SEI 7),

At Short Period, $S_s = 1.50$

At 1 Second Period, $S_1 = 0.50$

Site Coefficient at Short Period, $F_a = 1.00$

Site Coefficient at 1 Second Period, $F_v = 1.30$

Spectral Response Acceleration Parameters

(According to Cl.11.4.3 of ASCE/SEI 7),

Spectral Response Acceleration at Short Period, $S_{MS} = F_a * S_s = 1.50$

Spectral Response Acceleration at 1 Second Period, $S_{M1} = F_v * S_1 = 0.65$

Design Spectral Acceleration Parameters

(According to Cl.11.4.4 of ASCE/SEI 7),

Design Spectral Acceleration Parameter at Short Period, $S_{DS} = 2/3 * S_{MS} = 1.00$

Design Spectral Acceleration Parameter at 1 Second period, $S_{D1} = 2/3 * S_{M1} = 0.43$

Risk Category

Risk Category (According to Table 1.5-1 of ASCE/SEI 7),

RI_CAT= SEL("ASCE/Risk_Cat"; ID;) = I

Importance Factor (According to Table 1.5-12 of ASCE/SEI 7),

$I_e = TAB("ASCE/Ie"; Ie; RI_CAT=RI_CAT) = 1.00$

Fundamental Period:

(According to Cl.12.8.2 of ASCE/SEI 7),

Type of Structure, STR= SEL("ACI/Ct&X" ;STR;) = All other structural systems



Building Period Parameter, $C_t =$	$TAB(_ACI/Ct\&X";Ct;STR=STR;)$	=	0.020
Building Period Parameter, $x =$	$TAB(_ACI/Ct\&X";X;STR=STR;)$	=	0.750
Structure Height, $h_n =$			66.00 ft
Approximate Fundamental Period, $T_a =$	$C_t * h_n^x$	=	0.46 sec
Building fundamental period, $T =$	T_a	=	0.46 sec
Long-period transition period, $T_L =$			2.00

Seismic Response Coefficient

(According to Cl.12.8.1.1 of ASCE/SEI 7)

Response Modification Coefficient (According to Table 12.2-1), $R =$ 3.25

Calculated Seismic Response Coefficient, $C_{s,c} = \frac{S_{DS}}{R/I_e} = 0.3077$

Maximum Seismic Response Coefficient, $C_{s,max1} = \frac{S_{D1}}{T*(R/I_e)} = 0.2876$

Maximum Seismic Response Coefficient, $C_{s,max2} = \frac{S_{D1} * T_L}{T^2 * (R/I_e)} = 1.2505$

Maximum Seismic Response Coefficient, $C_{s,max} = IF(T > T_L; C_{s,max2}; C_{s,max1}) = 0.2876$

Minimum Seismic Response Coefficient, $C_{s,min} = 0.044 * S_{DS} * I_e = 0.0440$

Seismic Response Coefficient $C_s = IF(C_{s,c} \geq C_{s,min}; MIN(C_{s,c}; C_{s,max}); C_{s,min}) = 0.2876$

Seismic Base Shear

(According to Cl.12.8.1 of ASCE/SEI 7),

Effective Seismic Weight of Structure, $W =$ 1305.00 kips

Seismic Base Shear $V = C_s * W = 375.32$ kips

Calculation Summary

Seismic Base Shear $V = C_s * W = 375.32$ kips