



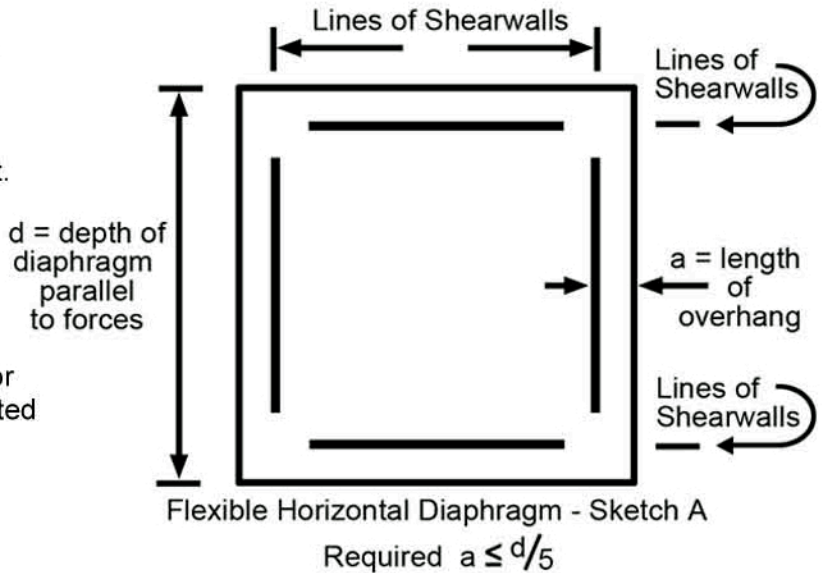
Building and Safety Division • Public Information

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EARTHQUAKE DESIGN FACTORS BY USING ALTERNATIVE STRUCTURAL DESIGN CRITERIA FOR SIMPLE BEARING WALL SYSTEMS WITH FLEXIBLE DIAPHRAGMS PER CBC 2007 SECTION 1613.1 AND ASCE7-05 SECTION 12.14.8.1

LIMITATIONS TO USE THE FACTORS

- Occupancy Category I or II.
- Site Class D (Stiff Soil Profile).
- Structure maximum three stories in height.
- Structure shall have at least two lines of Shearwalls in each of two major axis directions. Sketch A.
- Overhang beyond the outside line of shearwall shall be $a \leq d/5$. Sketch A.
- System irregularities caused by in-plane or out-plane offsets of shearwalls are permitted in two-story building when designed by amplified factor of 2.5.



ASSUMPTIONS

- $S_s = 1.5$
- $F_a = 1.4$
- $S_{DS} = 2/3 \times F_a \times S_s = 1.4$
- $F = 1$ for One Story
 $F = 1.1$ for Two Story
 $F = 1.2$ for Three Story
- $R = 6.5$ Light Frame Wood Shearwall
- $D =$ Dead Load
- $W =$ Effective Seismic Weight
- $E =$ Seismic Load Effect
- $E_h = V =$ Seismic Base Shear (See table below)
- $E_v =$ Vertical Seismic Load $= .2 S_{DS} D$ (Strength Design)
- $E_v =$ Vertical Seismic Load $= .14 S_{DS} D$ (Allowable Stress Design)

SEISMIC LOAD FORMULAS

Seismic Load $E = E_h + E_v$ Equation 12.14-3 per ASCE 7-05 Section 12.14.3.1.

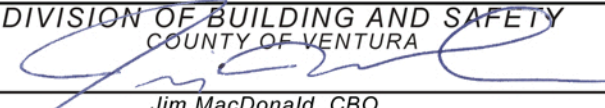
Use Load Combinations: ASCE 7-05 Section 12.14.3.1.3

SEISMIC BASE SHEAR

STORIES	STRENGTH DESIGN	ALLOWABLE STRESS DESIGN
	$V = \frac{F S_{DS} W}{R}$	$V = \frac{F S_{DS} W}{1.4R}$
One Story	$V = .22W$	$V = .16W$
Two Story	$V = .24W$	$V = .17W$
Three Story	$V = .26W$	$V = .18W$

NOTES:

- All anchor bolts shall be $\frac{1}{2}$ " diameter per CBC Section 2308.6.
- Increase in shear force due to redundancy is not required.
- Check shearwalls for overturning per load combination code section noted above.
- Check diaphragms per ASCE 7-05 Section 12.14.8.3.1.
- For allowable shear values for wood structural panel (plywood), use the attached County of Ventura modified Table 2306.4.1.1.

DIVISION OF BUILDING AND SAFETY COUNTY OF VENTURA  BUILDING OFFICIAL _____ Jim MacDonald, CBO		B & S STD Revised	B-34 Page 1 of 1 January 2008
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