

# STRUCTURAL DESIGN WORKSHEET

- **Design loads** must be shown on construction documents:

Floor area use	live load shown
_____	_____ PSF
_____	_____ PSF
_____	_____ PSF
_____	_____ PSF
Are live load reductions used? _____	

Building is in \_\_\_\_\_ county

Ground snow load  $P_g =$  \_\_\_\_\_ PSF (1608.2)

Snow load importance factor  $I_s =$  \_\_\_\_\_ (1608.3.3)

Snow load exposure factor  $C_e =$  \_\_\_\_\_ (1608.3.1)

Sloped roof/flat roof factor  $C_s =$  \_\_\_\_\_ (1608.4)

Roof thermal factor  $C_t =$  \_\_\_\_\_ (1608.3.2)

**Roof snow load** from the above ground snow times adjustments is \_\_\_\_\_ PSF =  $P_g 0.7(I_s)C_e(C_s)C_t$

Unbalanced or sliding or drifting snow locations and amounts are clearly shown on plans and calculations (1608.6 to 1608.9).

Impact or concentrated load locations & amounts are shown on plans and in calculations (1607).

- **Wind** load resistance design method used? *ASCE 7* or *IBC 1609.6 Simplified for Low Rise*

Amount of openings on each side are: North \_\_\_\_\_ East \_\_\_\_\_ South \_\_\_\_\_ West \_\_\_\_\_

Amount exterior wall on each side are: North \_\_\_\_\_ East \_\_\_\_\_ South \_\_\_\_\_ West \_\_\_\_\_

Is building Open, Partially Enclosed, or Enclosed? \_\_\_\_\_ Worst case is \_\_\_\_\_% openings

Width of end zone = \_\_\_\_\_ feet edge strip calculation = \_\_\_\_\_

### Coefficients used

$C_f$	Windward Wall		Leeward Wall		Windward Roof		Leeward Roof	
	End zone	Interior zone	End zone	Interior zone	End zone	Interior zone	End zone	Interior zone
<b>MWFR</b>								
<b>S</b>								
Components & Cladding								

Wind load importance factor ( $I_w$ ) = \_\_\_\_\_

Building use is importance category \_\_\_\_\_

Exposure terrain is \_\_\_\_\_

North \_\_\_\_\_

$K_z =$  \_\_\_\_\_

category terrain is \_\_\_\_\_

East \_\_\_\_\_

$K_z =$  \_\_\_\_\_

terrain is \_\_\_\_\_

South \_\_\_\_\_

$K_z =$  \_\_\_\_\_

terrain is \_\_\_\_\_

West \_\_\_\_\_

$K_z =$  \_\_\_\_\_

Gust effect factor  $G =$  \_\_\_\_\_

Wind directionality factor  $K_d =$  \_\_\_\_\_

**Earthquake design data:**

Spectral response coefficients  $S_{DS}$ \_\_\_\_\_ &  $S_{D1}$ \_\_\_\_\_ (1615.1)

Seismic use group Category\_\_\_\_\_ (1616.2) Site Class\_\_\_\_\_ (1615.1.5)

Seismic Design Category\_\_\_\_\_ (1616.3)

• **Soil & Foundation** design data:

Allowable load bearing value of soil \_\_\_\_\_ PSF (1804) Presumptive or tested? (circle one)

Soil report is *provided* or soil report is *needed* (1802.6) to verify design.

Frost protection minimum depth of footings is met (1805.2.1).

Slope protection or setback is met for footings (1805.3).

Footing design & construction of permitted materials is met (1805.4).

Piles or piers meet all general requirements (1807.2.8 to 1811).

Thickness & height of foundation wall supporting unbalanced backfill (1805.5.1.2) \_\_\_\_\_.

• **Concrete** strength specified \_\_\_\_\_psi Designed per ACI 318? *Yes* or *No* (circle one)

• **Masonry** properties [material, thickness, and type (hollow or solid)] \_\_\_\_\_

Lateral supports of masonry wall (2109.4)\_\_\_\_\_ mortar type \_\_\_\_\_

Masonry veneers bonding with wall ties meets spacing & materials? (2109.6.3.1)

Anchorage of masonry to structural elements (roof or floor to masonry) adequate? (2109.7)

Details of bearing on masonry or of masonry bearing on other materials (type & size needed).

If using engineered masonry, then complete masonry calculations are to be submitted. (2107 & 2108)

**Fireplaces** (2111) materials, construction, and exterior air (2111.16) requirements met.

Masonry **Chimneys** (2113) materials, construction, lining, and termination requirements met.

Flue area (2113.15 & 2113.16), multiple flues (2113.14), chimney clearances, and locations of fireblocking (2111.14 & 2113.20) are met.

- **Steel**

Construction design? *LRFD* (load & resistance factor) or *ASD* (allowable stress) or *AISC-HSS*

- Steel joists (2206) follow SJI specifications showing series, bearing conditions, and bracing.
- Welding (2208) and bolting (2209) details followed are noted on plans or in specifications.
- Tables 2211.1(1)&(2) steel studs shear wall values are met.

- **Wood Construction**

*Yes or No*

- Wood construction quality and labeling of materials used shown on plans as required (2303).
- Computations for sizing is based on net dimensions, not nominal member sizes (2304.2).
- Wall, floor & roof framing meets provisions of Section 2308 unless a design is specified.
- Sheathing Table 2304.6.1 (wall) and floor & roof Tables 2304.7(1), (2), (3), (4)&(5) are met.
- Follow fastener schedule 2304.9.1 for minimum number & size of nails (staples allowed).
- Heavy timber connections are properly detailed on the plans (2304.10).
- Decay and/or termite protection where required for wood (2304.11).

Uses *conventional light-frame construction* method of Section 2308, while meeting all seven limitations:

- maximum 3 stories
- maximum 10' floor-to-floor height
- average dead load < 15 PSF
- floor live load does not exceed 40 PSF
- ground snow load does not exceed 50 PSF
- trusses do not span over 40' between supports
- seismic category D building meets Section 2308.12.6 limits.

Limitations of wood shear walls & diaphragms to resist wind, seismic & other lateral loads meet:

- Principals of mechanics (2305.1.1).
- Boundary elements [chord & collector framing] (2305.1.2).
- Openings in shear panels (2305.1.3).
- Positive shear panel connections provided (2305.1.4).
- Exception met permitting wood assembly to resist horizontal seismic forces from masonry.
- Deflection is considered in wood diaphragm designs (2305.2).
- Shear panel construction

Diaphragm aspect ratio (length to width) of horizontal or sloped diaphragm is \_\_\_\_ (Table 2305.2.3).

Diaphragm aspect ratio (length to width) of shear wall diaphragm is \_\_\_\_ (Table 2305.3.3).

- Shear wall width (2305.3.5) is measured between overturning restraints (2305.3.6) in load path.
- Shear wall openings clearly show force transfer around openings (2305.3.7.1) or not (2305.3.7.2).
- Summing of shear capacities has been limited per section 2305.3.8 (or an exception specified).
- Using Load and Resistance Factor design in accordance with ASCE 16? (2307)

Section 2306 Allowable Stress Design special provisions are as follows:

- Table 2306.2.1 values were substituted for 1.15 repetitive member factor for 16"o.c. 2x studs.
- Shear capacities of Table 2306.3.1 may be increased by 40% in wind design only (2306.3.1).
- Panel sheathing joints in shear walls shall occur over studs or blocking (2306.4).
- Shear capacities of Table 2306.4.1 may be increased by 40% in wind design only (2306.4.1).
- Particleboard shear walls attachment and allowable values designed per Table 2306.4.3.
- Fiberboard shear walls attachment and allowable values designed per Table 2308.9.3(4).
- Gypsum board or lath & plaster shear wall design values per Table 2306.4.5 (& Chapter 25 construction).