Dead Loads and Idealization of Structural Members Steven Vukazich San Jose State University

## What is a Dead Load?

Dead Loads are Fixed Position Gravity Loads Examples are weights of the following:

- Ceiling,
- Flooring,
- Façade,
- Structural Members.

Found from tables of weights of building materials (usually listed in weight/unit area)

#### Construct Dead Load Table for Roof Framing



# Cross Section of Roof



# Ceiling Support Hangers from Steel Framing at New Rec Center



## Construct Dead Load Table

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Material	To metal deck	To beams (W14x22)	To girders, truss (Lines 1-3)	To columns
1-1/2" 18 gauge metal deck	2.82 (A)	2.82	2.82	2.82
Fireproofing	0.5	0.5	0.5	0.5
2" Rigid fiberglass insulation	3 (B)	3	3	3
3 ply felt tar and gravel roofing	5.5 (B)	5.5	5.5	5.5
Ceiling and Lighting	1 (B)	1	1	1
W14x22 @ 6 ft o.c.		3.7 (C)	3.7	3.7
Mechanical (plumbing, HVAC)		4	4	4
W18x50, truss			4	4
Weight of columns				1
Misc.	3	3	3	3
Total	15.82	23.52	27.52	28.52
Use	16 psf	24 psf	28 psf	29 psf

Notes:

A. From Vulcraft deck catalog.

B. From AISC steel manual "Weights of Building Materials".

C. W14x22: (22 lb/ft)/(6 ft) = 3.7 psf.

# Weights of Building Materials from AISC Manual of Steel Construction

	WEIGHTS OF BUILDING MATERIALS						
	Materials	Weight Lb. per Sq Ft	Materials	Weight Lb. per Sq Ft			
	CEILINGS Channel suspended system Lathing and plastering Acoustical fiber tile	1 See Partitions 1	PARTITIONS Clay Tile 3 in. 4 in. 6 in. 8 in	17 18 28 34			
	FLOORS Steel Deck	See Manufacturer	Gypsum Block 2 in. 3 in.	40 9½ 10½			
	Concrete-Reinforced 1 in. Stone Slag Lightweight	12½ 11½ 6 to 10	4 in. 5 in. 6 in. Wood Studs 2 × 4 12-16 in. o.c.	121/2 14 181/2 2			
	Concrete-Plain 1 in. Stone Slag Lightweight	12 11 3 to 9	Steel partitions Plaster 1 inch Cement Gypsum Lathing	4 10 5			
	Fills 1 inch Gypsum Sand Cinders	6 8 4	Metal Gypsum Board ½ in. WALLS	2 <sup>1/2</sup>			
	Finishes Terrazzo 1 in. Ceramic or Quarry Tile ¾ in. Linoleum ¼ in. Mastic ¾ in.	13 10 1 9	Brick 4 in. 8 in. 12 in. Hollow Concrete Block (Heavy Aggregate)	40 80 120			
	Hardwood ½ in. Softwood ¼ in. ROOFS	4 2½	4 in. 6 in. 8 in. 12½ in. Hollow Concrete Block	30 43 55 80			
	Corrugated steel	See Manufacturer	4 in.	21			
	3-ply ready roofing 3-ply felt and gravel 5-ply felt and gravel	1 5½ 6	6 in. 8 in. 12 in. Clay tile	30 38 55			
	Shingles Wood Asphalt Clay tile Slate ¼	$\begin{array}{c}2\\3\\9\text{ to }14\\10_g\text{ where}\end{array}$	(Load Bearing) 4 in. 6 in. 8 in. 12 in.	25 30 33 45			
	Sheathing Wood ¾ in. Gypsum 1 in.	3 4	Glass Block 4 in. Glass Block 4 in. Window, Glass, Frame & Sash	55 18 8			
	Insulation 1 in. Loose Poured Bioid	<sup>1</sup> /2 2 11/4	Structural Glass 1 in. Corrugated Cement	Manufacturer 15			
Ľ	For weights of other materials used in building construction, see pages 7-8 and 7-9						

## Deck Carries Uniform Load to Beams



## Vertical (Gravity) Load Path



# Framing at Deck Overhang



