

NBCC load combinations

Factored load combinations to NBCC 2020, with the governing maximum and minimum.

Inputs

Symbol	Value	Unit	Description
D	100		Dead
L	50		Live
S	30		Snow
W	−40		Wind, negative for uplift
E	0		Earthquake
H	0		Lateral earth / hydrostatic
P	0		Prestress / permanent
T	0		Temperature / shrinkage
occupancy	Standard		Occupancy, for the live footnote
limit _{states}	ULS and SLS		Limit states

Results

Quantity	Description	Value	Unit
$\Sigma_{\max}$	Governing maximum factored effect	230	
$\Sigma_{\min}$	Governing minimum factored effect	49	
n	Active combinations	19	

Derivation

$$\begin{aligned}
 \Sigma_{\max} &= 1.25 \cdot D + 1.5 \cdot L + 1 \cdot S + 0 \cdot W + 0 \cdot E + 0 \cdot H + 0 \cdot P + 0 \cdot T \\
 &= 1.25 \cdot 100 + 1.5 \cdot 50 + 1 \cdot 30 + 0 \cdot (-40) + 0 \cdot 0 + 0 \cdot 0 + 0 \cdot 0 + 0 \cdot 0 \\
 &= 230
 \end{aligned}$$

$$\begin{aligned}
 \Sigma_{\min} &= 0.9 \cdot D + 0 \cdot L + 0.5 \cdot S + 1.4 \cdot W + 0 \cdot E + 0 \cdot H + 0 \cdot P + 0 \cdot T \\
 &= 0.9 \cdot 100 + 0 \cdot 50 + 0.5 \cdot 30 + 1.4 \cdot (-40) + 0 \cdot 0 + 0 \cdot 0 + 0 \cdot 0 + 0 \cdot 0 \\
 &= 49
 \end{aligned}$$

$$n = 19$$

Active combinations, after dropping and collapsing

$$\text{basis} = 0$$

Enumeration basis | ULS and SLS | standard occupancy