

Inputs Glossary

Every input used by the calculator: meaning, units, where it's used in the math, default behavior if blank, and a spot to paste your source links from Inputs!E.

Geometry

Variable	Meaning	Units	Used in	Default / If blank	Source / Link
span_ft	Beam clear span between supports	ft	$V_{max}=w \cdot L/2;$ $M_{max}=wL^2/8$ (unit-consistent form)	Required	(paste Inputs!E link)
tributary_width_ft	Deck width feeding this beam	ft	$w = q \times \text{tributary width}$	Required	
beam_b_in	Beam width (thickness)	in	$S=b d^2/6; I=b d^3/12; f_v=1.5V/(bd)$	Required	
beam_d_in	Beam depth	in	S, I, f_v	Required	
post_unsupported_height_in	Clear, unbraced height of the post	in	Column slenderness L_e/r ; Euler P_{crit}	Needed only if doing post axial check	
post_base_bearing_area_in2	Beam-seat bearing area at support (contact area under beam end or seat plate)	in ²	$f_{bearing}=R/A_{bearing}$ vs $F_{cL'}$	Required for bearing check	

Material Allowables (ASD)

Variable	Meaning	Units	Used in	Default / If blank	Source / Link
Fb_prime	Allowable bending stress	psi	Check: $f_b \leq F_b'$	Required	
Fv_prime	Allowable shear stress	psi	Check: $f_v \leq F_v'$	Required	
Fc_perp_prime	Allowable compression \perp to grain	psi	Check: $f_{bearing} \leq F_{c\perp}'$	Required for bearing check	
E	Modulus of elasticity	psi	Deflection $\Delta = 5wL^4/(384EI)$; Euler buckling	Required for deflection/column	
Fc_axis_prime	Allowable compression \parallel to grain (post)	psi	$P_{allow} = \min(F_c' \cdot A, 0.3P_{crit})$	If blank \rightarrow column check skipped	

Loads

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q = DL + SL + LL [psf]; w = q × tributary width [plf]
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Variable	Meaning	Units	Used in	Default / If blank	Source / Link
DL_psf	Dead load (deck self-weight)	psf	q, then w	Required	
SL_psf	Snow load	psf	q, then w	Required (or 0)	
LL_psf	Live load (use & occupancy)	psf	q, then w	If blank $\rightarrow 0$	
deflection_limit_ratio	Serviceability limit (e.g., 240)	—	Limit = $L_{in}/ratio$	If blank $\rightarrow 240$	

Post Section (for Axial Check)

Variable	Meaning	Units	Used in	Default / If blank	Source / Link
post_section_b_in	Post width	in	$A=b \cdot d$; $I=b \cdot d^3/12$; $r=\sqrt{I/A}$	If blank \rightarrow column check skipped	

Variable	Meaning	Units	Used in	Default / If blank	Source / Link
post_section_d_in	Post depth	in	A, I, r	If blank → column check skipped	

Lateral Behavior Flags (Qualitative)

Variable	Meaning	Units	Used in	Default / If blank	Source / Link
has_knee_braces	Post-beam knee braces present?	yes/no	Sets "needs_top_moment_or_bracing" flag	If blank → No	
has_moment_top_connector	Top connection has moment restraint?	yes/no	Same flag as above	If blank → No	
has_hold_downs_or_shear_base	Base anchorage/hold-down present?	yes/no	Sets "needs_base_anchorage" flag	If blank → No	

These do not change numbers; they toggle advisory messages in results.

Connectors & Wind/Uplift

Variable	Meaning	Units	Used in	Default / If blank	Source / Link
top_connector_model	Chosen top connector (optional)	text	Verification vs published capacities (download/uplift/lateral/moment)	If blank → auto-select from table	
base_connector_model	Chosen base connector (optional)	text	Verification vs published capacities (shear/uplift)	If blank → auto-select from table	
roof_uplift_psf	Net uplift pressure on roof/cover	psf	Uplift demand = roof_uplift_psf × uplift_area_per_post_ft2	If blank → 0	

Variable	Meaning	Units	Used in	Default / If blank	Source / Link
uplift_area_per_post_ft2	Tributary roof area per post	ft ²	Used with roof_uplift_psf	If blank → 0	

Lateral Line Load & Wind-on-Wall

If lateral_line_load_plf is given: lateral per post $\approx w_{lat} \times \text{span} / 2$. Else if wind_wall_psf & height given: $w_{lat} = \text{wind_wall_psf} \times \text{exposed_height_ft}$.

Variable	Meaning	Units	Used in	Default / If blank	Source / Link
lateral_line_load_plf	Applied lateral line load on beam/wall	plf	Top/base connector lateral; footing sliding	If blank → use wind_wall_psf × height if provided; else 0	
wind_wall_psf	Wall design wind pressure	psf	$w_{lat} = \text{wind_wall_psf} \times \text{exposed_height_ft}$	If blank → ignored unless lateral_line_load_plf given	
exposed_height_ft	Exposed wall height for wind	ft	Computes w_{lat} with wind_wall_psf	If blank → ignored unless wind_wall_psf given	
post_to_beam_arm_in	Lever arm from post centerline to line of action (top moment)	in	Top connector moment = lateral × arm	If blank → 0 (no top moment)	

Footing & Site Parameters (Per Post Checks)

Variable	Meaning	Units	Used in	Default / If blank	Source / Link
soil_bearing_capacity_psf	Allowable soil bearing pressure	psf	Bearing: $q_{actual} = V_{struct} / A_{ftg} \leq q_{allow}/SF$	Required for bearing check	

Variable	Meaning	Units	Used in	Default / If blank	Source / Link
soil_unit_weight_pcf	Soil unit weight (backfill)	pcf	$W_{\text{overburden}} = \text{Area} \times \text{cover depth} \times \gamma_{\text{soil}}$	If blank → 120 pcf	
concrete_unit_weight_pcf	Concrete unit weight	pcf	$W_{\text{footing}} = \text{Volume} \times \gamma_{\text{conc}}$	If blank → 150 pcf	
base_friction_coeff_mu	Friction coefficient at base	—	$R_{\text{slide}} = (\mu \times V_{\text{eff}})/SF$	If blank → 0.5	
SF_bearing	Safety factor for soil bearing	—	$q_{\text{allow,eff}} = q_{\text{allow}} / SF_{\text{bearing}}$	If blank → 1.0	
SF_sliding	Safety factor for sliding	—	$R_{\text{slide}} = \mu V_{\text{eff}} / SF_{\text{sliding}}$	If blank → 1.5	
SF_uplift	Safety factor for uplift	—	$R_{\text{uplift}} = (W_{\text{footing}} + W_{\text{overburden}} + \text{credit})/SF_{\text{uplift}}$	If blank → 1.5	
credit_connector_uplift_lb	Uplift capacity credited to connector	lb	Added to uplift resistance at footing	If blank → 0	
include_soil_overburden	Include soil weight over footing?	yes/no	Controls $W_{\text{overburden}}$ term	If blank → No	
footing_length_in	Footing length (plan)	in	Footing area & volume	Required for footing checks	
footing_width_in	Footing width (plan)	in	Footing area & volume	Required for footing checks	
footing_thickness_in	Footing thickness	in	Footing volume & weight	Required for footing checks	

Variable	Meaning	Units	Used in	Default / If blank	Source / Link
footing_depth_below_grade_in	Soil cover depth above footing	in	Overburden weight (if included)	Optional (only if overburden is included)	
post_self_weight_lb	Self-weight of the post (added to vertical)	lb	V_struct = Reaction(post) + post_self_weight	If blank → 0	

Verification Map (What uses what)

$q = DL + SL + LL \rightarrow w = q \cdot \text{trib_width} \rightarrow V_{\max} = wL/2, M_{\max} = wL^2/8 \rightarrow$
 $f_b = M/S \leq F_b'; f_v = 1.5V/(bd) \leq F_v'; f_{bearing} = R/A \leq F_{c\perp}; \Delta = 5wL^4/(384EI) \leq L/\text{ratio};$
 Column: A, I, r, Le $\rightarrow P_{crit} \approx \pi^2 EA/\text{slender}^2 \rightarrow P_{allow} = \min(F_c'A, 0.3P_{crit})$.

For detailed derivations and PASS/CHECK examples, see your companion page "Beam & Post Calculation Check".

[Inputs Glossary](#) • Matches variables read by the tool • Paste your sources into the rightmost column.