

Composite beam design and Construction loads

When composite beam design is performed, the program automatically creates 3 types of load combinations based on specific design code

- Strength load checks: (Assumes composite action)
- Final deflection checks: (Assumes composite action)
- Construction load cases (Assumes non-composite action, wet concrete with bare steel)

The check using the construction load combinations is performed only if the beam is un-shored, which is the common case. This is also the program's default option and can be changed via overwrites. The load cases involved in construction load combinations can be reviewed in the design manuals documentation for the specific code. In general, any load pattern defined as Dead will be included in the construction load combination plus a Construction load pattern.

Define Load Patterns

Loads

Load	Type	Self Weight Multiplier	Auto Lateral Load
Const	Construction	0	
DLSUP	Dead	1	
LIVEREDUCE	Super Dead	0	
LIVEROOF	Live	0	
LIVEUNREDUCED	Reducible Live	0	
EQXP	Roof Live	0	
EQXN	Notional	0	ASCE 7-05
EQYP	Seismic	0	ASCE 7-05
EQYN	Seismic (Drift)	0	ASCE 7-05
	Wind	0	ASCE 7-05
	Snow	0	
	Construction		
	Other		

Click To:

Add New Load

Modify Load

Modify Lateral Load...

Delete Load

OK Cancel

Make sure you define a Construction load pattern and assign construction loads most design codes require them, but ETABS does not automatically create them. This is extremely important since in some cases it governs design. The program will show details and checks for the Construction case via design details.

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AISC 360-10 Composite Beam Details

License #*1WLUC5F2FTHCMGE

Story: Story4

Beam B35

Length: 24 ft Trib. Area: 192 ft²

Location: X= 36 ft Y= 56 ft

8 0.75 in Ø studs

A992Fy50

W10X33

No camber

Composite Deck Properties

	Deck	Cover (in)	w _c (pcf)	f _c (ksi)	Ribs	b _{eff} (in)	E _c (S) (ksi)	E _c (D) (ksi)	E _c (V) (ksi)
Left, Right	Deck1	5	150	4	⊥	36	3605	3605	4867

Loading (DCmpC2 combo)

	Constr.	Dead	SDL	Live NR	Factored
Line Load (kip/ft) 0 ft→24 ft	0.200	0.701	0.000	0.000	1.162

Loading (DCmpS1 combo)

	Constr.	Dead	SDL	Live NR	Factored
Line Load (kip/ft) 0 ft→24 ft	0.200	0.701	0.000	0.000	0.982

End Reactions

	Constr.	Dead	SDL	Live NR	Combo	Factored
I end (kip)	-2.400	8.417	0.000	0.000	DCmpC2	13.941
J end (kip)	2.400	8.417	0.000	0.000	DCmpC2	13.941

Strength Checks

	Combo	Factored	Design	Ratio	Pass
Shear at Ends (kip)	DCmpS1	11.784	72.732	0.162	✓
Construction Bending (kip-ft)	DCmpC2	83.6445	145.5000	0.575	✓
Positive Bending (kip-ft)	DCmpS1	70.7053	145.5000	0.486	✓

Constructability and Serviceability Checks

	Actual	Allowable	Ratio	Pass
Shear Studs Distribution	8	46	0.174	✓
Constr. Dead Defl. (in)	1.05	No Limit	N/A	N/A
Post-concrete Defl. (in)	0	1.2	0.000	✓