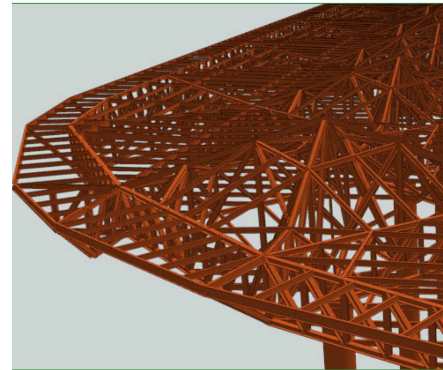
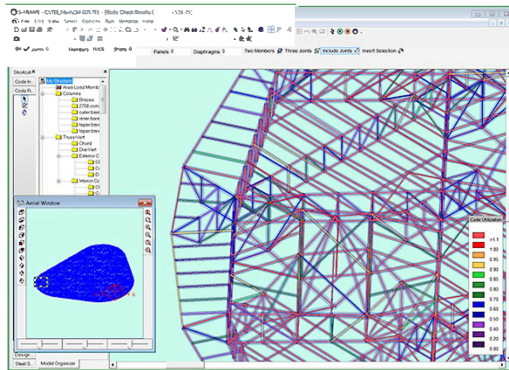




**Steel Structural Design and Optimization Solution**

Code check and auto design steel members for both strength and serviceability. Select from an extensive range of optimization criteria, design codes and constraints to satisfy your design and performance assessment needs from the preliminary to final design stages, ensuring structural safety and economy.

Comprehensive engineering reports in graphical and tabular format include design results, interactive formulas, equations, and graphics.

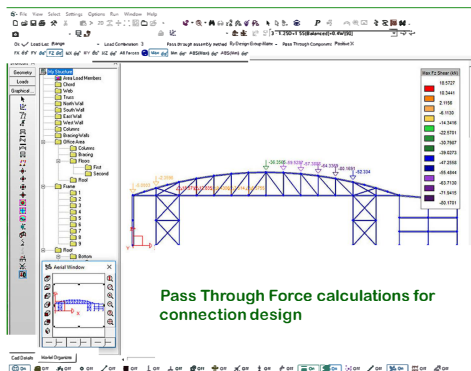
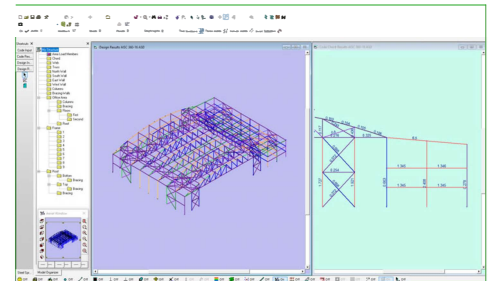


**S-STEEL Design Interface**

S-STEEL executes entirely within the S-FRAME Analysis environment supporting linear and nonlinear static, response spectrum, linear and nonlinear time history (including base and multi-support base motion), linear and non-linear moving-load analyses, and **Staged Construction**. Access all the S-FRAME Analysis features, including the powerful model management system (folder technology, selection options, shortcut tools, S-VIEW's model validation, and more.

Quickly locate and assess critical areas requiring re-design. Select specific members using multiple filtering options.

Override section sizes for all members or a subset of members and immediately see if they pass or fail the code checks, why and by how much.



**S-STEEL Design Options**

Multiple settings and options exist to meet preferences and or requirements in your design workflow , from how the design results are to be displayed, to the level of details or format of *Code Details*.

Users can instruct S-STEEL what to do when changes were made to analyzed section, before returning to S-FRAME Analysis.

# S-STEEL Design Reports

Generate company-branded, customized reports in graphical or tabular format.

Comprehensive steel design results include equations and clause references for members that pass or fail with users having the options to show as much information as possible, or only the results that are relevant to the problem in hand.

### 1. Summary of Governing Selected Members for Each Group

Member No.	Group Name	Steel Section	Governing Load Case Comb	Governing Clause	Ratio	Pass/Fail Status
127	SECTION 11	W16X26	Comb 1, 1.25D+1.5S(Balanced)+0.4W(0)	Beam-tension stability	13.576	Fail
644	SECTION 14	W18X46	Comb 1, 1.25D+1.5S(Balanced)+0.4W(0)	Biaxial Bending	2.408	Fail
597	SECTION 10	W21X62	Comb 1, 1.25D+1.5S(Balanced)+0.4W(0)	Beam-tension stability	2.327	Fail
705	SECTION 15	HSS8X8X.25	Comb 1, 1.25D+1.5S(Balanced)+0.4W(0)	Compression	2.013	Fail
975	SECTION 19	W12X22	Comb 1, 1.25D+1.5S(Balanced)+0.4W(0)	Slenderness	1.769	Fail
281	SECTION 9	W24X68	Comb 1, 1.25D+1.5S(Balanced)+0.4W(0)	Biaxial Bending	0.935	Pass
191	SECTION 2	2L6X6X.3125	Comb 1, 1.25D+1.5S(Balanced)+0.4W(0)	Slenderness	0.797	Pass
196	SECTION 1	2L4X4X.3125	Comb 1, 1.25D+1.5S(Balanced)+0.4W(0)	Slenderness	0.744	Pass
53	SECTION 12	W10X33	Comb 1, 1.25D+1.5S(Balanced)+0.4W(0)	Biaxial Bending	0.663	Pass
19	SECTION 8	2L6X4X.3125	Comb 1, 1.25D+1.5S(Balanced)+0.4W(0)	Slenderness	0.584	Pass
660	SECTION 4	W14X90	Comb 1, 1.25D+1.5S(Balanced)+0.4W(0)	Slenderness	0.487	Pass
139	SECTION 5	W14X90	Comb 1, 1.25D+1.5S(Balanced)+0.4W(0)	Slenderness	0.487	Pass
131	SECTION 17	W10X49	Comb 1, 1.25D+1.5S(Balanced)+0.4W(0)	Biaxial Bending	0.267	Pass
132	SECTION 16	W8X35	Comb 1, 1.25D+1.5S(Balanced)+0.4W(0)	Slenderness	0.236	Pass
133	SECTION 13	W8X31	Comb 1, 1.25D+1.5S(Balanced)+0.4W(0)	Biaxial Bending	0.039	Pass

### Code Details For Governing Members for Each Group

**Member: 19** S-FRAME Section is **2L6X4X.3125**  
 Member is part of group: SECTION 8  
 Note: Neglecting: axial < 1.0 kips, shear < 1.0 kips, moment < 1.0 k-ft

Load Combination 1 1.25D+1.5S(Balanced)+0.4W(0) (Unloaded)

Section classification ( $F_y=44$  ksi); Section Class = Slender

Governing geometrical slenderness ratio  $\frac{L_r}{r_x} = \frac{175}{300} = 0.584$

Clause B4, Table B4.1  
Clause D1

**Member: 53** S-FRAME Section is **W10X33**  
 Member is part of group: SECTION 12  
 Note: Neglecting: axial < 1.0 kips, shear < 1.0 kips, moment < 1.0 k-ft  
 Note: Angle Gamma is 90.0 degrees

Load Combination 1 1.25D+1.5S(Balanced)+0.4W(0) (Bending + Torsion)

Section classification ( $F_y=51$  ksi); Section Class = Non Compact

Clause B4, Table B4.1

**Member: 203** S-FRAME Section is **W24X68**  
 Member is part of group: SECTION 9  
 Note: Neglecting: axial < 1.0 kips, shear < 1.0 kips, moment < 1.0 k-ft

Load Combination 1 1.25D+1.5S(Balanced)+0.4W(0) (Bending + Torsion)

Section classification ( $F_y=51$  ksi); Section Class = Compact

Strong Axis Shear - (kips)

Strong axis shear strength check  $\frac{V_{max}}{V_{ex}/\Omega_c} = \frac{V_{max}}{0.6F_y A_w C_{v2}/\Omega_c} = \frac{14}{201} = 0.068$

Weak Axis Shear - (kips)

Weak axis shear strength check  $\frac{V_{max}}{V_{ex}/\Omega_c} = \frac{V_{max}}{0.6F_y A_w C_{v2}/\Omega_c} = \frac{1}{192} = 0.007$

Strong Axis Moment - (kips-ft)

Bending Stability Check  $\frac{M_{max}}{M_{ex}/\Omega_b} = \frac{M_{max}}{F_y Z_x/\Omega_b} = \frac{116}{159} = 0.730$

Weak Axis Moment - (kips-ft)

Weak axis section capacity in bending  $\frac{M_{max}}{M_{ex}/\Omega_b} = \frac{M_{max}}{F_y Z_x/\Omega_b} = \frac{8}{62} = 0.136$

Biaxial Flexure Interaction Check  $\frac{M_{max}}{M_{ex}/\Omega_b} + \frac{M_{max}}{M_{ey}/\Omega_b} = 0.866$

Torsion - (kips-ft)

Boundary Condition is not supported in Design Guide 9

# S-STEEL Design Codes

American  
 ASCE 10-15 (coming soon)  
 AISC 360-16  
 LRFD/ASD AISC 360-10  
 LRFD/ASD AISC 360-05  
 LRFD/ASD

Canadian  
 CSA-S16-2014  
 CSA-S16-2009

European  
 EN 1993-1:2005  
 EN 1993-1:2005/ UK Annex BS 5950:2000

Additional Regions  
 EN 1993-1:2005/ Singapore  
 Annex Hong Kong Steel 2005 & 2011  
 AS 4100-1998  
 NZS 3404:1997

# Purchasing Options

S-STEEL can be purchased as an add-on design module for S-FRAME Analysis; users must already own a license for S-FRAME Analysis (any edition).

Contact us at [s-frame.com](http://s-frame.com) to get help finding the best licensing option for your needs.