



### **S-STEEL R11, an S-FRAME integrated steel design solution, is used to detail and optimization steel structures based on multiple user-defined constraints : weight, surface area, architectural, fabrication constraints and more.**

- S-STEEL R11 executes entirely within S-FRAME Analysis, allowing users to take full advantage of S-FRAME's powerful GUI features (folder technology, selection options, shortcut tools and more). *New in R11*
- **Support for Composite Beam Design, featuring:** *New in R11*
  - CSA S16-14, CSA S16-09 and AISC 360-10 LRFD/ASD
  - Partial or full composite sections
  - Shored and Unshored Construction
  - Parallel and Perpendicular Ribs
  - Interior and Exterior Beams
  - Shrinkage and Creep
  - Continuous composite beams with both positive and negative moments
  - Numerous metal deck configurations and multiple concrete properties
  - Short and long term deflection checks accounting for camber
  - Automatic calculations for "stud-capacity" and "number of studs required" per shear span
- Code check for both strength and serviceability. Serviceability checks include comprehensive deflection criteria and an option to consider camber.
- Code check or automatic redesign options for strength and span deflection for all or part of a structure.
- Support for American, Canadian, British, European and other international section sizes.
- Calculation of Pass Through Forces used in steel connection design. *New in R11.1*
- Design/Code Check is now supported for S-FRAME's Stage Construction analysis.
- Member grouping for realistic design results – making certain members continuous as required.
- Graphical results display allows for quick assessment of critical areas requiring re-design.
- Span deflection limits can support both interior and cantilever beams. *New in R11*
- Two options for assigning span deflection limits – either on a member basis or on a load case basis. *New in R11.1*
- User defined constraints for accurate design criteria and optimization.
- Least weight, cost, depth and surface area design criteria.
- Material listing for weight, surface area and costs.
- Plate girder design. Tapered plate girder design check.
- Links to 3D steel detailing systems.
- Code relaxation available for more conservative designs.
- Design and/or code check physical member models, eliminating the need to further define continuous lengths from the analysis model.
- Support for linear static, response spectrum, linear and nonlinear time history (including base and multi-support base motion), linear and non-linear moving load analyses, and the new staged construction module.
- Unparalleled quality and flexibility of printed results with a complete breakdown of code results for members that pass or fail.
- Full clause references to codes of practice.
- AISC Design Guide 25, Frame Design Using Web-Tapered Members. *New in R11.1*

#### **Supported Design Codes**

AISC 360-10 & 360-05 LRFD/ASD

AISC ASD 89, AISC LRFD 94

CSA-S16-2001, 2009 and 2014

CSA-S16.1-M94 *New in R11.1*

EC3 2005 Singapore Annex *New in R11.1*

EC3:2005

BS 5950:1990 & 2000

AS 4100-1998

NZS 3404:1997

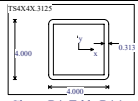
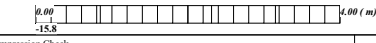
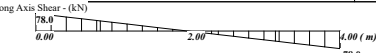
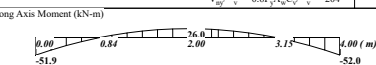
Hong Kong Steel 2005, 2011 *New in R11*

#### **S-PAD™ can be accessed from within S-STEEL™ (as Scratch Pad) or as a standalone application**

- This simple spreadsheet-like interface leverages S-STEEL's powerful steel-design capabilities to perform optimal design refinement. Ideal as a standalone application to investigate just one or a group of steel sections within a model. Featuring code checking and auto-design to multiple design codes for both strength and serviceability.



**No Blackbox Solutions**  
Detailed, Output with Code Equations & Clause References

<b>Your Company</b> Your Address City, Province/State Phone Number		<b>Code Details</b> Project: S-FRAME to S-STEEL Structure: Sample Filename: C:\Users\Mathew\Documents\Development\Tutorial\S-STEEL_Databases\R11\CISC\TEL Engineer: S-FRAME Software		Page: 1 Date: 2/18/2013
<b>Member: 33</b> Member is part of group: SECTION 4 Note: Neglecting: axial < 1.0 kN, shear < 1.0 kN, moment < 1.0 kNm		S-FRAME Section is TS4X4X.3125 		Clause B4, Table B4.1 Clause E2
<b>Load Case 3 Vertical Distributed Load (Bending + Compression)</b>				
Section classification ( $F_y = 51$ ksi): $k_y L_r / r_y = \frac{106}{200} = 0.531$		Section Class = <b>Compact</b>		
Governing geometrical slenderness ratio $k_y L_r / r_y = 106/200 = 0.531$		$k_x L_r / r_x = 106/200 = 0.531$		
Axial Load - (kN) 		Compression Check $\frac{P_u}{\phi_c A_g} = \frac{16}{255} = 0.062$		Clause E3-2
Strong Axis Shear - (kN) 		Strong axis shear strength check $\frac{V_u}{\phi_v A_w} = \frac{78}{204} = 0.383$		Clause G2-1
Strong Axis Moment (kN-m) 		Strong axis section capacity in bending $\frac{M_u}{\phi_b M_n} = \frac{52}{20} = 2.556$		Clause F7-1 > 1.00: FAIL
Flexure and Compression Interaction Check $B_1 = 1.03$		$\frac{P_u}{2\phi_c A_g} + \frac{B_1 M_u}{\phi_b M_n} = 2.671$		Clause H1-1b > 1.00: FAIL
Design Code: AISC 360-10 ASD Steel Table : American (AISC) Analysis Program: S-FRAME (Linear static analysis)		<b>S-STEEL</b> Version 11.00.6 © Copyright 1995-2013, S-FRAME Software Inc.		

**Automatic Summaries of Governing Members and Steel Quantities**

<b>Your Company</b> Your Address City, Province/State Phone Number		<b>Key Code Check Results</b> Project: S-FRAME to S-STEEL Structure: Sample Filename: C:\Users\Mathew\Documents\Development\Tutorial\S-STEEL_Databases\R11\CISC\TEL Engineer: S-FRAME Software		Page: 1 Date: 2/18/2013		
<b>1. Summary of Governing Selected Members for Each Group</b>						
Member No.	Group Name	Steel Section	Governing Load Case/Comb	Governing Clause	Ratio	Pass/Fail Status
73	SECTION 1	W410X74	Case 2, Lateral Point Load	Beam-tension strength	1.14	Fail
9	SECTION 4	W360X64	Case 2, Lateral Point Load	Beam-column stability	1.021	Fail
74	SECTION 2	W410X60	Case 2, Lateral Point Load	Beam-tension strength	0.694	Pass
75	SECTION 3	W410X46	Case 3, Vertical Distributed Load	Beam-column stability	0.575	Pass
38	SECTION 5	W360X39	Case 3, Vertical Distributed Load	Slenderness	0.484	Pass
<b>2. Summary of Quantities</b>						
By Section	Steel Section	Length (m)	Weight (kg)	Surface Area (m <sup>2</sup> )	Cost (\$)	
	W360X64	8.000	512	12	0.00	
	W360X39	8.000	312	10	0.00	
	W410X74	3.000	222	5	0.00	
	W410X60	3.000	180	5	0.00	
	W410X46	3.000	138	4	0.00	
	<b>Totals=</b>	<b>25</b>	<b>1364</b>	<b>35</b>	<b>0.00</b>	
Design Code: CAN/CSA S16-2001 Steel Table : Canadian (CISC) Analysis Program: S-FRAME (Linear static analysis)					<b>S-STEEL</b> Version 11.00.6 © Copyright 1995-2013, S-FRAME Software Inc.	

**Use Scratch-PAD within S-STEEL or the standalone S-PAD to quickly code check or size/optimize a member**

**S-STEEL is fully integrated within S-FRAME Analysis for seamless steel member design and optimization in the S-FRAME GUI**

