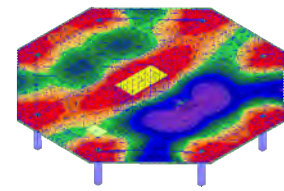




# S-FRAME®



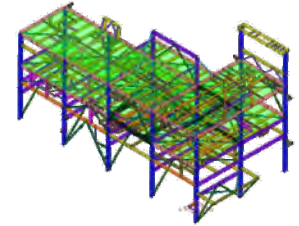
Concrete Slabs

## All editions of S-FRAME® include:

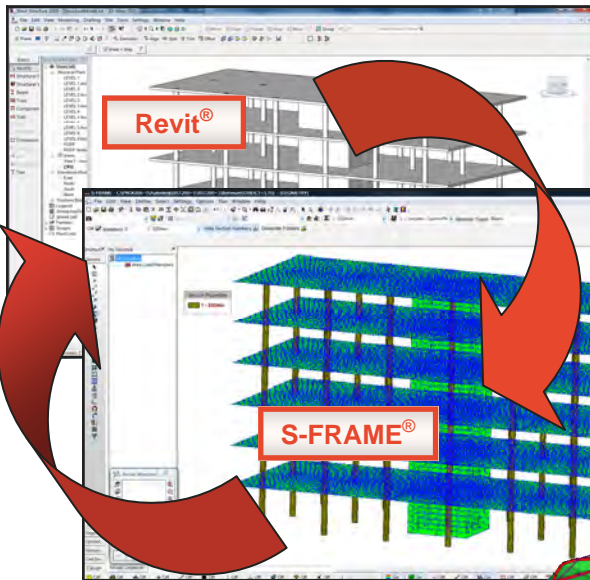
- Powerful model management – simple user-defined grouping of input and output into folders.
- New Direct Analysis Method (DM): S-FRAME now supports the rigorous second-order analysis required by the new AISC 360-10 specification that accounts for both P-Δ and P-δ effects. Notional loads are calculated and applied at each beam-column intersection for all gravity load 'strength' combination and for non-gravity load 'strength' combinations that exceed B2 deflection limits. Both axial and flexural stiffness are automatically reduced to account for out-of-plumbness and  $\tau_b$  can optionally be computed accounting for residual stresses by further reducing the flexural stiffness of all 'Lateral Force Resisting Members'. S-FRAME performs all these calculations in a single analysis run; no need for multiple runs!
- Strip and wall integration lines for automatic calculation and easy output of FE modeled slab, beam, or shear wall sectional forces, which can be exported to sectional design and detailing software like S-CONCRETE.
- Physical member modeling giving a wide range of benefits including a simplified model, better results assessment, a simplified set of member design criteria, and better integration with drawing and fabrication tools like TEKLA® Structures and Autodesk® Revit® (bi-directional link).
- Powerful FE concrete slab design capabilities supporting numerous building standards.
- Staged construction analysis allows 4D analysis of structures with discrete changes over time.
- Wind load generator in accordance with API Specification 4F:2008.



Bridges

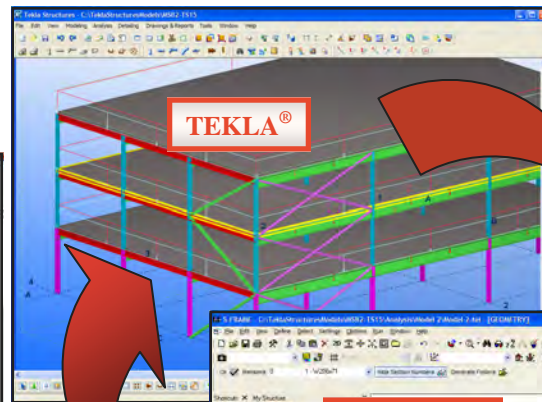


Industrial Buildings



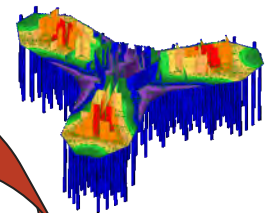
Revit®

S-FRAME®



TEKLA®

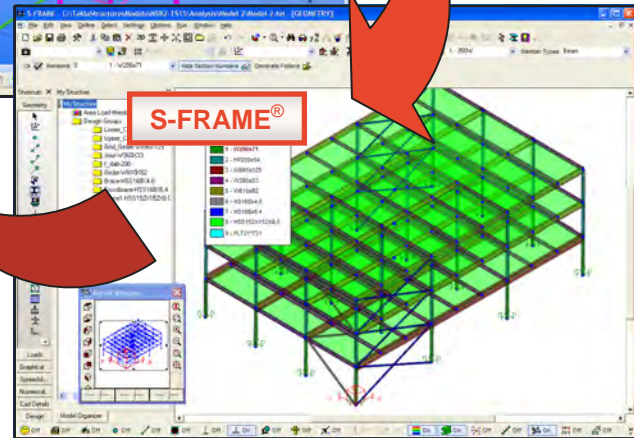
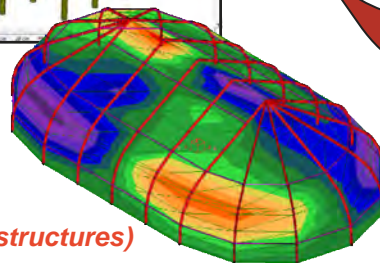
S-FRAME®



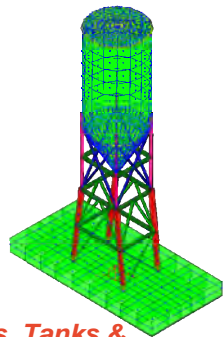
Foundations

Automatic Mesh Generator  
Ensures Connectivity  
Between Slabs & Walls

Tents (fabric structures)



- Automatic one-way (short, long, or in any direction) or two-way area load distribution.
- User defined coordinate system – Cartesian, cylindrical, spherical to aid in the modeling process.
- New Pier Element tool for the grouping of wall integration lines to produce a “pier”.
- New Continuous Member tools for the assembly of Physical Members from existing analytical members or the disassembly of Physical Members into analytical members.
- Integrated Structural Steel Design using S-STEEL and Reinforced Concrete Design using S-CONCRETE.
- Response spectrum curve generators for NBCC 2005, IBC 2006, and ASCE 7-05.
- SPARSE analysis engine (potentially orders of magnitude faster than previous versions) including support for the 64-bit operating system and multi-core processors which for the analysis of very large models.



Silos, Tanks & Cylinders



# S-FRAME®

## Standard Edition

- Support for rigid offsets.
- Beam, truss, linear spring and inactive elements.
- 3 and 4 node plate, membrane and shell elements.
- Simple creation of panels (and holes) with automatic meshing and loading options.
- Rigid and flexible diaphragm modeling.
- Powerful load-combination methods

## Professional Edition

(in addition to the Standard Edition features)

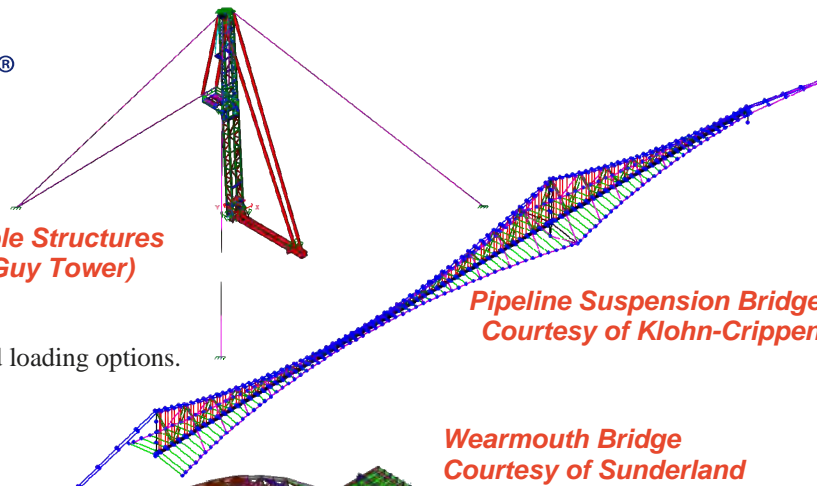
- Supports the rigorous second-order DM analysis required by the new AISC 360-10 specification that accounts for both P-Δ and P-δ effects
- Buckling analysis.
- Stressed and unstressed vibration (eigenvalue) analysis.
- Mode shape/deflection animation.
- P-Delta (2 cycle iterative) analysis.
- Time history analysis:
  - constant or variable time step; import time history data.
  - multi-support base motion.
  - force or acceleration & time history functions.
  - automatic response charts and automatic response spectrum.
- Moving load analysis:
  - multiple loads on multiple lanes and lanes may follow any 3D path.
  - influence line diagrams.
  - definable vehicle patterns.
- Response spectrum analysis:
  - equivalent static force procedure (ESFP) for NBCC 2005, IBC 2006
  - equivalent lateral forces (ELF) for ASCE 7-05.
  - option to scale to code base shear (ESFP/ELF).
  - five different modal combination methods including CQC and SRSS.
  - spectra can be saved for reuse and merged.
  - torsional sensitivity evaluation and accidental torsion calculations.

## Enterprise Edition

(in addition to the Professional Edition features)

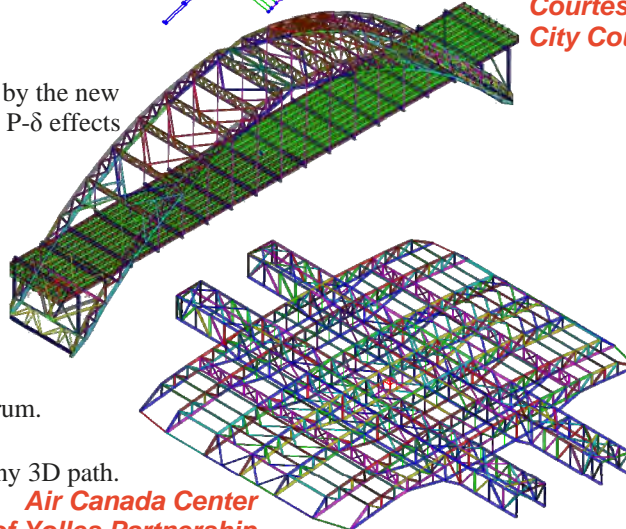
- Advanced non-linear static and time history analyses using full Newton-Raphson iterative solver with incremental loading.
- Supports both linear and nonlinear Base Motion Time History and Multi-Support Base Motion Time History analysis with the ability to combine dynamic load cases with static load cases.
- True cable, tension/compression only elements
- Non-linear moving load analysis.
- New Link-beam element.
- Staged construction (4D analysis with discrete increments in time).
- Non-linear ground springs supporting hook and gap characteristics.
- Sophisticated 3 and 4 node elements participate fully in P-Delta and non-linear analysis.

*Cable Structures  
(Guy Tower)*

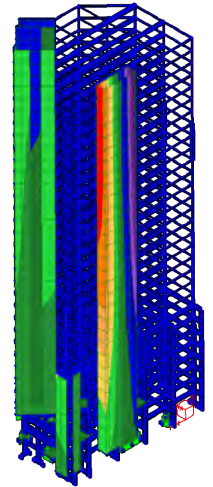


*Pipeline Suspension Bridge  
Courtesy of Klohn-Crippen*

*Wearmouth Bridge  
Courtesy of Sunderland  
City Council*

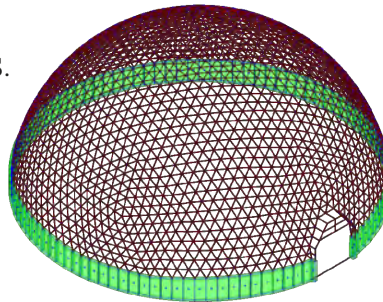


*Air Canada Center  
Courtesy of Yolles Partnership*

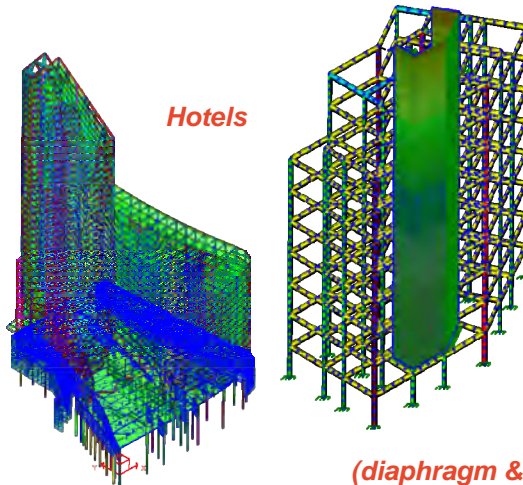


*High Rise Building  
Courtesy of W.S. Atkins Ltd.*

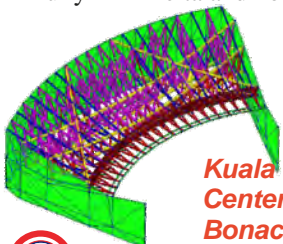
*Domes*



*Hotels*



*Skyscrapers  
(diaphragm & shear wall modeling)*



*Kuala Lumpur Convention  
Center — Courtesy of The  
Bonacci Group*

