

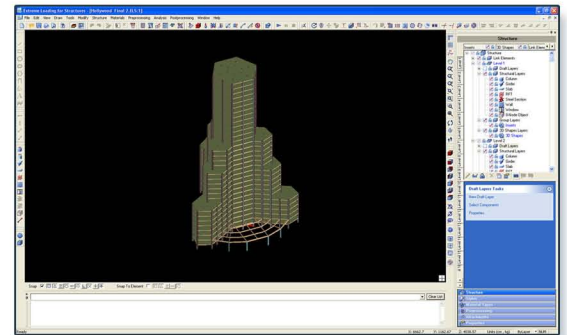
Extreme Loading[®] for Structures

Extreme Loading[®] for Structures (ELS) software allows engineers to study the true behavior of structures through the use of the Applied Element Method (AEM) and its ability to automatically track the initiation and progression of cracking, through separation, to collision and collapse.

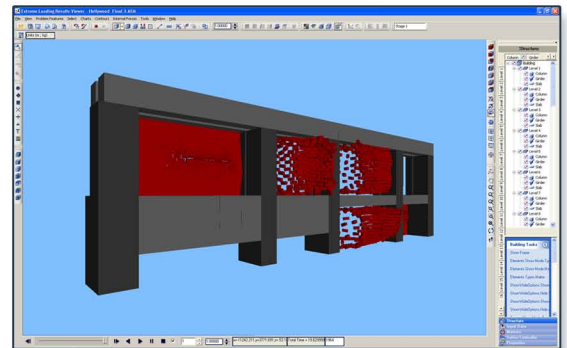
Modeling

ELS Modeler: The ELS modeler allows for the creation of structures in both 2D and 3D modes with:

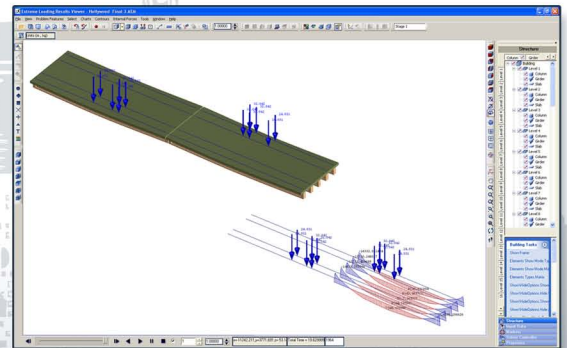
- Default and customizable styles for columns, girders, slabs, walls, windows, and reinforcement
- Industry-standard and built up steel sections
- Pre-stressed concrete
- Pre-stressed link elements
- Custom rebar and stirrups
- Link members
- Pre-defined cracks and holes
- Automatic mesh adjustment
- Linear & non-linear materials models for concrete, steel, aluminum, brick, glass, tension only, and elastic
- Data exchange:
 - Import models from 10 Commercial FEM software programs
 - Import structural components from Autodesk[®] Revit[®] Structure (2008, 2009 & 2010)** and Bentley MicroStation(*.dgn)
 - Additional import file types include *.dxf and *.stl
 - Import reference attachments from *.jpg images or single frames of *.avi movies



Modeling of a High-rise



Blast Analysis



Moving Loads (Static/Dynamic)

Loads

Loads: Various loading scenarios can be implemented in ELS 3.0 utilizing its multi-stage sequential loading:

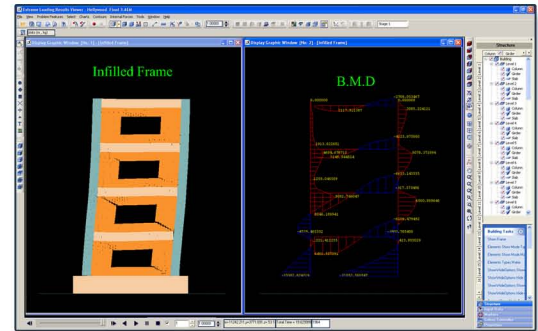
- Static Loading: concentrated, displacement, moving, uniform and hydrostatic pressure loads
- Dynamic Loading: Concentrated, displacement, moving, seismic, blast, impact, uniform and hydrostatic pressure loads
- Staged construction and deconstruction
- Initial velocity and acceleration

FEATURES 3.0

AEM Analysis

The Applied Element Method (AEM) based solver in ELS 3.0 is capable of performing a linear and non-linear analysis that follows the behavior of structures through separation, collision and collapse while taking into consideration:

- Automatic Plastic Hinge Formation
- Automatic Buckling and Post-buckling
- Automatic Crack Generation
- Automatic Separation of Elements
- Automatic Collision and Collapse

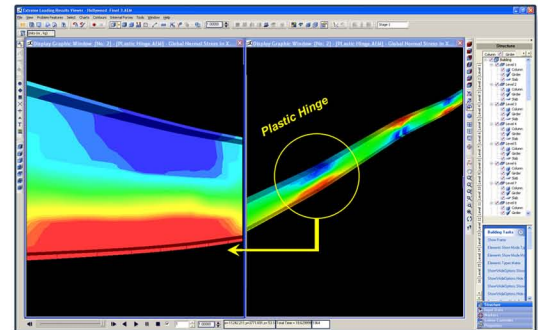


In-Filled Frame

ELS Viewer

The frame by frame output viewer allows the user to view and export presentation materials from the following options:

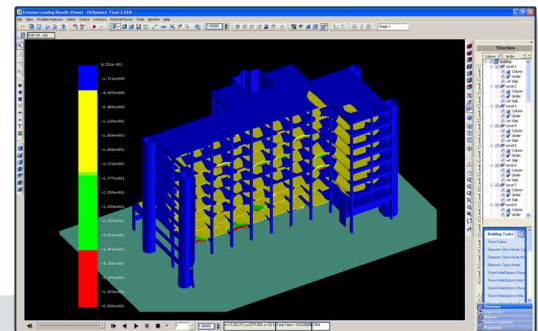
- | | |
|--|---|
| <ul style="list-style-type: none"> • Envelope diagram • Load displacement curves • Crack locations • Eigen modes • Animated stress-strain contours • Animated internal force diagrams: <ul style="list-style-type: none"> • Bending moment • Shear • Normal • Torsion | <ul style="list-style-type: none"> • Animated charts: <ul style="list-style-type: none"> • Load • Displacement • Stress • Strain • Time • Velocity • Acceleration • Export to *.avi and *.bmp |
|--|---|



Plastic Hinge

New Features

- Complete 3D modeling allows users the ability to create models more quickly and efficiently.
- Kill boundaries allow users to eliminate unwanted debris which decreases simulation time.
- Solver Controller allows the user to change the inputs as the solver runs.
- Weakening through the increased control over connection springs.
- Rigid body regions simplify creating and defining rigid connections.
- Increased connectivity to 10 commercial FEM and 2 BIM software programs.



Structural Vulnerability Assessment

Minimum System Requirements:

Microsoft® Windows 2000 Professional SP4
Intel® Pentium® III or higher
512 MB RAM
Hardware-Accelerated OpenGL® graphics card
150 MB of hard disk space

Recommended System Requirements:

Microsoft® Windows XP or Vista
Core 2 Quad processor
4 GB RAM
Hardware-Accelerated OpenGL® graphics card
80 GB of hard disk space

* Extreme Loading® for Structures and ELS are registered trademarks of Applied Science International, LLC. All other brand, product, service and feature names or trademarks are the property of their respective owners.

** Requires Additional License