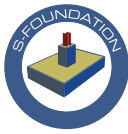
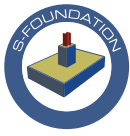


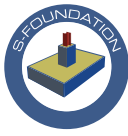
<b>Foundation Types</b>		
Isolated / Bucket / Spread Footing	✓	✓
Combined Footing	✓	✓
Continuous Footing	✓	✓
Strap Footing	✓	✓
Ring / Tank Foundation	✓	✓
Wall / Strip Footing	✓	✓
Mat / Raft / Slab on-grade Foundation	✓	✓
Pile Cap Foundations	✓	✓
Pile Foundations		✓
<b>Pile Foundations</b>		
Single and Group Piles with Standard and Custom Configurations		✓
Piles modeled as Finite Element Members with soil springs along length		✓
Solid and Hollow Piles		✓
Nonlinear Pile Soil Springs from PY (Lateral), TZ (Friction), and QZ (Bearing) curves, either user entered or calculated from soil profile		✓
Linear Pile Soil Springs		✓
Piles can have Batter in 3 directions		✓
<b>Modeling Features</b>		
Model Foundations of any shape, any number of sides, with or without holes and with any number of wall or column connections.	✓	✓
Model Wall Footings in any configuration with varying wall thicknesses, offsets, and wall strip widths	✓	✓
Wall Footings may include any number of pedestals on isolated pads connected to wall strips.	✓	✓
Creating and modifying Foundations automatically creates and updates the underlying finite element model (FEM)	✓	✓
FEM model includes members for pedestals, piles and straps, shells for pads, extra loads for soil weight and buoyancy, and soil springs	✓	✓
Adjustable FEM rigid bodies, mesh types (Quad/Tri/Mixed), quad weights, and element sizes	✓	✓
Pile Member Meshing controllable by spacing, count and soil layer		✓
Automatically generated strip integration lines, with exclusion areas, based on code requirements and pedestal locations	✓	✓
Soil Profile modeling with soil layers and water table, water table atomically updates the unit weight of soil and foundations under the table.	✓	✓
Cartesian Grids to define the entire foundation site	✓	✓
Accelerate work-flow by creating design groups with shared pedestal, base plate, pile, strap or pad definitions.	✓	✓
Vary the materials between pads, walls, pedestals, piles and straps	✓	✓
Mat Foundation Tool can automatically add column and wall connections between the superstructure and pad	✓	✓
Mat Foundation Tool can fatten the pad polygon so that it is larger than the point definition	✓	✓
<b>Analysis Features</b>		
Analysis performed using the proven S-FRAME FEASolver™ engine	✓	✓
Nonlinear Static and Linear Static Analyses	✓	✓
Adjustable Nonlinear Static Max Iterations and Load Increments	✓	✓
Sparse and Skyline Solvers	✓	✓
<b>Design Features</b>		
Design using the Rigid or Flexible (FEA) Method of foundation design	✓	✓
Design Wizards help the user optimize foundation designs quickly and efficiently	✓	✓
Design capabilities built on proven S-CONCRETE™ design Engine	✓	✓
Adjust acceptable design utilization, for both geotechnical and structural checks, on a load case and load combination basis	✓	✓
Load cases and Load Combinations can be included or excluded from geotechnical and/or structural checks	✓	✓
User adjustable Factors of Safety for Geotechnical Checks	✓	✓
Verification Scripts to show comparison between S-FOUNDATION and hand calculations, code book examples and field tests	✓	✓
Design FYIs and Diagnostic Messages	✓	✓
Design output level of details from governing objects to all code check details including code clauses	✓	✓
Design output can be organized by code check, load case or foundation	✓	✓
Design output hyperlinks help to drill down to important details	✓	✓



	Standard	Professional
<b>Design Codes</b>		
ACI 318-11	✓	✓
CSA A23.3-04	✓	✓
EN 1992-1-1:2004 Default and UK Annex	✓	✓
<b>Structural Checks - Pads</b>		
One-Way Shear	✓	✓
Flexure	✓	✓
Punching Shear - Punching column classification accounts for irregular shaped foundation edges	✓	✓
<b>Geotechnical Checks - Foundations</b>		
Soil Bearing	✓	✓
Soil Settlement		
Overturning	✓	✓
Loss of Contact (Uplift)	✓	✓
Horizontal Sliding	✓	✓
<b>Structural Checks - Pedestals</b>		
Checks performed at various sections along pedestal length	✓	✓
Axial Force vs. Moment interaction with consideration for Biaxial Bending, Biaxial Shear, Axial Force and Torsion	✓	✓
Shear and Torsion with consideration for Biaxial Bending, Biaxial Shear, Axial Force and Torsion	✓	✓
<b>Structural Checks - Piles</b>		
Axial Force at Pile Head	✓	✓
Checks performed at various sections along pile length		✓
Axial force vs. Moment interaction with consideration for Biaxial Bending, Biaxial Shear, Axial Force and Torsion at stations along piles		✓
Shear and Torsion with consideration for Biaxial Bending, Biaxial Shear, Axial Force and Torsion at stations along piles		✓
<b>Geotechnical Checks - Piles</b>		
Axial Force at Pile Head from Piles modeled as reaction springs	✓	✓
Axial Deflection from Piles modeled as reaction springs	✓	✓
Lateral Deflection from Piles modeled as reaction springs	✓	✓
Axial Force at Pile Head from Piles modeled as Members with intermediate linear or nonlinear Soil Springs		✓
Axial Deflection from Piles modeled as Members with intermediate linear or nonlinear Soil Springs		✓
Lateral Deflection from Piles modeled as Members with intermediate linear or nonlinear Soil Springs		✓
<b>Geotechnical Intermediate Calculations</b>		
Overburden Pressure	✓	✓
Total Loads including Pedestal, Pad, Pile, Soil Weight and Buoyancy	✓	✓
Soil Pressure Distributions and Eccentricities	✓	✓
Soil Corner Pressures	✓	✓
Soil Areas in Compression	✓	✓
Soil Areas experiencing Loss of Contact (Uplift)	✓	✓
Unit Weights above and below water table	✓	✓
Immediate settlement, Consolidation settlement and Effective Stress per soil layer	✓	✓
Horizontal Sliding Friction, Adhesion and Effective Passive Resistances	✓	✓
Pile Geotechnical Capacities from soil springs	✓	✓
<b>Structural Intermediate Calculations</b>		
Effective Rebar Depths	✓	✓
Steel Area	✓	✓
Punching Perimeter	✓	✓
Maximum or Average strip line demands	✓	✓
Code Required exclusion areas around pedestals	✓	✓
Code required intermediate results including concrete capacities & properties, moment & beta factors, shear theta and critical section locations	✓	✓
Maximum Axial, Tensile & Compressive Resistances for pedestals and piles	✓	✓



<b>Pile Results with Depth</b>		
Deflections		✓
Soil Resistances		✓
Internal Member Forces		✓
Internal Member Stresses		✓
Calculated PY (Lateral), TZ (Friction), and QZ (Bearing) soil curves		✓
<b>Material Quantities</b>		
Rebar Cut Lengths	✓	✓
Rebar Total Lengths	✓	✓
Concrete Volumes	✓	✓
Rebar and Concrete Weights	✓	✓
Rebar and Concrete Costs	✓	✓
<b>Graphical Display Output</b>		
Animated Deflections with option to show undeflected model	✓	✓
Code Check Utilization contour diagrams	✓	✓
Soil Bearing Pressure contour diagrams for pads	✓	✓
Rebar Zone Utilization contour diagrams for pads	✓	✓
Panel contour diagrams: Displacement, Force (Axial, Shear, Moment, Torsion), Stress, Wood Armer Moments and Steel Area Requirements	✓	✓
Strip Line diagrams: Displacement, Force (Axial, Shear, Moment, Torsion), Wood Armer Moments and Steel Area Requirements	✓	✓
Pile Member diagrams: Deflection, Soil Resistance, Force (Axial, Shear, Moment, Torsion), and Stress		✓
PY (Lateral), TZ (Friction), and QZ (Bearing) soil curve graphs and spreadsheets		✓
<b>Soil and Soil Profiles</b>		
One Layer and Multi-Layer soil profiles, with option for different backfill soil	✓	✓
Ultimate soil bearing capacity can be auto calculated for each soil layer using Hansen, Meyerhoff, Terzaghi, and Vesic geotechnical closed form solutions	✓	✓
Includes soil types with default properties based on the Unified Soil Classification System (USCS)	✓	✓
Water table effects the soil spring values, unit weights and buoyancy of foundations	✓	✓
Foundations can share or have unique Soil Profiles	✓	✓
Pad soil springs are automatically generated based on soil modulus of subgrade reaction	✓	✓
Automatically created pile soil springs based on pile diameters, depth and soil layer properties		✓
Pile soil spring interpolation of user entered linear or nonlinear springs		✓
Preview pile soil springs as you update soil properties or pile diameters		✓
<b>Reinforcement</b>		
Multiple top and bottom rebar layers	✓	✓
Uniform Rebar, Rebar Strips and Rebar Patches. Strips and Patches allow additional rebar to be added to any localized areas needing extra steel reinforcement.	✓	✓
Enter rebar as counts or spacing	✓	✓
Uniform, Strip and Patch rebar automatically define Finite Element Strip lines to create average or maximum demands	✓	✓
Rebar Strips and Patches can be added together	✓	✓
Auto calculation of Rebar Strips around pedestals using code based and user settings, and rebar patches along wall footings	✓	✓
Auto calculation of rebar patches along wall, combined and continuous footings	✓	✓
Analysis result contours, such as forces, moments, stresses and rebar utilization, make it easy to define strips and patches where they are needed	✓	✓
Rebar libraries for Canadian, American and British standard rebar sizes	✓	✓
Pad Results can viewed while defining pad properties and rebar	✓	✓
<b>Load Case and Load Combinations</b>		
Generate load cases automatically from imported S-FRAME FEA results	✓	✓
Manually define load cases and combinations using interface tools or spreadsheets	✓	✓
Substructure loads and load factors for foundation weight, soil weight and buoyancy	✓	✓
Import 3rd party spreadsheet load data or run an automation script	✓	✓



<b>Surcharge Areas and Loads</b>		
Surcharge area can be automatically generated to fit the foundations with defined holes for the pedestals	✓	✓
Option to create any user-defined surcharge area shape and holes. Surcharge Area definitions may overlap and contain holes.	✓	✓
<b>Model Management</b>		
Spreadsheets allow copy, paste, sort, filter by selected/rule/visible/folder, allow customizable column order/visibility/widths, and adapt to hide data that is not pertinent	✓	✓
Templates can be configured with initial objects and units for new files	✓	✓
Display units allow viewing data in any unit without unit converting the model	✓	✓
Model Group Folders organize the model with user defined groups or Rule Folders that automatically update folder contents	✓	✓
Property Rules and Logic Rules filter spreadsheets, hide/show/select objects, and can be applied to Rule Folders	✓	✓
Hide and Show model subsets	✓	✓
Legends to color the model by any object property	✓	✓
Labels for any object property	✓	✓
Auto-naming of pad, pile, pedestal, baseplate, strap, and walls based on dimensions, material and soil based on category, and load combinations based on load case factors	✓	✓
<b>Visualization</b>		
Isometric and plan views	✓	✓
Easily switch between views: object (real world), finite element, physical element, soil profile, rebar detail, and result	✓	✓
Soil Profile visualization with soil type legend and soil layer depth labels	✓	✓
Automatic dimension visualization	✓	✓
Spring tool to view the supported joints and linear spring stiffnesses	✓	✓
Finite Element, Physical Element and Rebar views have optional Object view overlays	✓	✓
User customizable visualization of background, colors, sizes, and what to show	✓	✓
<b>User Interface</b>		
Built in and Customizable Window Layouts allow you to configure the interface for your workflow	✓	✓
Multiple workflow support including scripting, spreadsheets, define dialogs and 3D interactive tools	✓	✓
Tool Tips and Status bar messages help explain tools and properties	✓	✓
Auto-Backups periodically back up your work	✓	✓
Videos and Tutorials, Context Sensitive Help, News page to keep up to date on Training and Releases	✓	✓
Re-mesh button automatically regenerates the FEM	✓	✓
<b>Automation and Customization</b>		
Design Wizards to Optimize Foundations	✓	✓
Automation Wizards create foundations, automatically size foundations to columns, import CSV load definitions from 3rd party software, attach footings to superstructures and more!	✓	✓
User actions are automatically recorded and can be exported into scripts for playback, or be customized further and turned into Wizards to expand core functionality	✓	✓
Create and automate your own custom work-flow/processes, saving them as Wizards to reuse or distribute throughout an organization	✓	✓
Open API and completely integrated Python scripting environment with extensive function libraries.	✓	✓
<b>Import and Export</b>		
Import S-FRAME superstructures and analysis results as input to your foundation model	✓	✓
Re-import S-FRAME superstructure results after changing loading conditions without destroying the foundation model	✓	✓
ETABS™ link imports joint reactions for foundation top load definitions from ETABS™ 9.7.4 and 2015. The superstructure is also imported for visualization purposes.	✓	✓
STAAD™ import link imports the superstructure for visualization purposes.	✓	✓
Import from any 3rd party analysis software in Excel™ or CSV file format.	✓	✓
Revit™ Link to previsualization and import from Revit™ 2015, 2016, 2017	✓	✓
Export Foundations to S-FRAME and optionally attach foundation to existing superstructure	✓	✓
<b>Reports</b>		
Comprehensive Reports (Excel, CSV, HTML and PDF) include	✓	✓
- Project information, foundation definitions, input model, code check results, intermediate calculations, material quantities	✓	✓