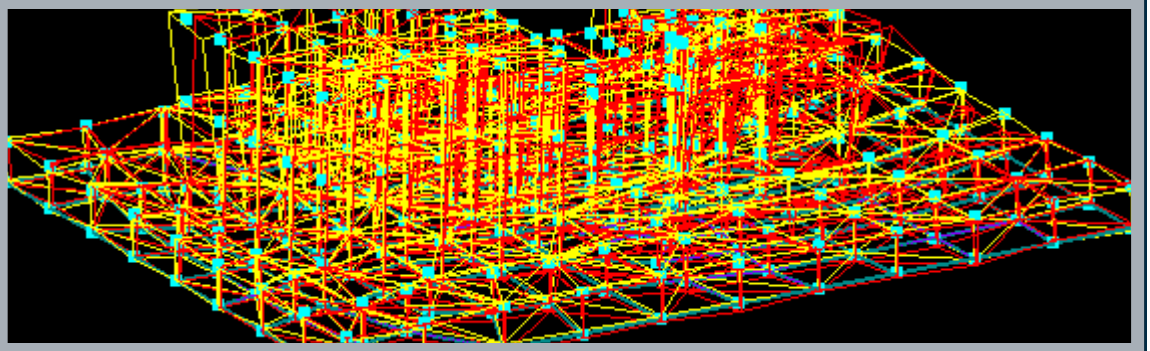
Bentley
Advancing Infrastructure

CONNECT Edition



STAAD® Foundation Advanced

Foundation Analysis and Design Software

STAAD Foundation Advanced analysis and design software addresses the building, plant, and tower industries by offering basic foundations such as isolated, combined, pile cap, and mat to specialized foundations including horizontal vessel foundations, tank annular ringwall, lateral analysis of pile/drilled pier, and state-of-the-art vibrational analysis of machine foundation. STAAD Foundation Advanced offers advanced calculation reports with to-the-scale footing sketches, graphs, and formulae with code reference along with CAD exportable detail, schedule, and general arrangement (GA) drawings.

The CONNECT Edition

The SELECT® CONNECT Edition includes SELECT CONNECT *services*, new Azure-based services that provide comprehensive ***learning, mobility,*** and ***collaboration*** benefits to every Bentley application subscriber. *Adaptive Learning Services* helps users master use of Bentley applications through CONNECT Advisor, a new in-application service that provides contextual and personalized learning. *Personal Mobility Services* provides unlimited access to Bentley apps, ensuring users have access to the right project information when and where they need it. *ProjectWise® Connection Services* allow users to securely share application and project information, to manage and resolve issues, and to create, send, and receive transmittals, submittals, and RFIs.

Integrates Common Footing Designs

The software integrates all common footing designs including isolated footings, combined footings, pile-cap arrangement and design, octagonal footings, mat foundations, vibrating machine foundation, drilled pier foundations, and guyed tower foundations. The plant foundation mode in STAAD Foundation Advanced contains vertical vessel, horizontal vessel foundations with different shapes, and configurations along with annular ring foundation for self or mechanically anchored tanks, and laterally loaded drilled pier analysis. These accurate design capabilities are powered with wizard-based input, automatic load (wind and seismic) generation and configurable load combination capabilities. A wizard-based foundation solution mode called Foundation Toolkit is available for spread footing, combined footing, pile cap, drilled pier axial analysis, and guyed tower foundations.

Optimizes Foundation Design

Currently, STAAD Foundation Advanced supports nine concrete codes: ACI 318-2005, ACI 318-2008, ACI 318-2011, BS 8110, IS-456-2000, AS 3600-2004, CSA 23.3-04, GB50007-2002 and EN 1992-1-1-2004. Load-generation capabilities include wind and seismic load as well as automatic and user-defined load combinations. PIP STC 01015 code is implemented for equipment foundation load generation. Specialized codes such as API 650 and ACI 351.3R-04 are used for advanced analysis modules. The program performs all necessary design checks for most optimized foundation design. Alternatively, STAAD Foundation Advanced provides users with the ability to check existing foundations. 3D graphics enable engineers to quickly identify and investigate displaced shapes, stress contour, soil pressure, and reinforcement layout.

Integrates Common Footing Designs

STAAD Foundation Advanced is seamlessly integrated with STAAD.Pro®, ISM (Integrated Structural Modeling) and Microsoft Excel. Any analyzed STAAD.Pro file can be imported into or exported to STAAD Foundation Advanced, while automatically bringing in all column positions (and/or plates), attached column dimensional properties, support reactions, and loads. Changes made to the column positions or loads can be re-imported to further evaluate the substructure. STAAD Foundation Advanced can import and export input data from spreadsheets and can export detailed spreadsheet output.

Finite Element Method (FEM) Analysis for Accurate and Economical Designs

STAAD Foundation Advanced designs complex foundations using its object-based modeling environment via the mat foundation module. Whether it is rectangular, complex polygonal, circular, or includes openings, STAAD Foundation Advanced can model, analyze, design, and produce drawings. The sophisticated mesh generation automatically handles holes (cut-outs) as well as inner regions with different thicknesses or soil properties. Physical loading objects can be as diversified as irregular load, circular load, quadrilateral load, line load, and point load on space. STAAD Foundation Advanced leverages 3D FEM analysis and employs an innovative technique to optimize reinforcement requirements. The program automatically detects uplift and redistributes the force. For vibrational analysis of machine foundation, STAAD Foundation Advanced generates solid elements, dynamic loads, and analysis constraints based on user input.

Includes Plan, Elevation, and Sectional Views

STAAD Foundation Advanced generates detailed drawings that include plan, elevation, and sectional views with rebar marks. Schedule drawing gives a summary table for design results. GA drawings include all the footings designed in the project to scale with grid lines and grid marks that help identify interference. Drawings can be exported to DXF or DWG formats to produce site drawings. The most popular feature is Calculation Sheet, which displays detailed output with relevant code clauses and equations. Calculation Sheet also includes dynamically generated to-the-scale plan, elevation, sectional views, soil bearing diagrams, and summary sketch.

System Requirements

Processor
Intel Pentium or AMD Athlon

Operating System
Windows 7, 8, and 10

RAM
500MB recommended

Hard Disk:
300MB free disk space
(2GB recommended)

Display:
OpenGL 3D graphics supported

Minimum Resolution:
1280 x 1024

Find out about Bentley at: www.bentley.com

Contact Bentley
1-800-BENTLEY (1-800-236-8539)
Outside the US +1 610-458-5000

Global Office Listings
www.bentley.com/contact

STAAD Foundation Advanced At-A-Glance

General Footings

- Intuitive graphical user interface; the workflow is categorized and arranged to flow from top to bottom
- Foundation project environment that includes isolated, combined, strap, pile cap, octagonal footing, mat, and rotating/reciprocating machine foundations; it connects all the modules through a global layer
- Tabbed view, navigator tree ribbon control and custom skin style
- Spreadsheet import/export integration with detailed output
- Physical mat foundation modeling environment that saves time and reduces errors by considering openings, control regions, physical beam, and column lines; provides an option for both triangular and quadrilateral plates
- Physical loading—like point load on space, irregular quadrilateral load, circular load, or line load that allows users to simulate any physical loading such as tank and wall loading
- Wizard-based simplified input for rotating/reciprocating machine foundation that creates solid elements with dynamic loading
- Seamlessly integrates with STAAD.Pro V8*i* to import/export loadings, reactions, column positions; users can import any set of analyzed plates to design; tracks changes made in STAAD.Pro V8*i* model and can merge the changes with STAAD Foundation file
- Powerful OpenGL-based graphics that help visualize output like displacements, stress on displaced shape, combined beam stress, and entities such as plates and beams in 3D for a realistic rendered view
- Automatic pile arrangement

Output

- DXF export of detailed and GA drawing
- Detailed structural drawing with customizable drawing options and labels
- Base pressure and plate stress color contours
- Step-by-step detailed calculation sheet with code clauses and equations to verify output
- To-the-scale dynamic sketches in calculation sheet
- GA drawing with grid marks to help identify interferences
- Foundation grouping for production drawing and sample calculation
- Bending moment and shear force graphs for combined footing embedded in calculation sheet for critical load case
- Printable bending moment and shear force graphs for combined footing for all load cases
- Printable capacity graphs and analysis diagrams for laterally loaded drilled pier

Analysis and Design

- Support for both flexible and rigid methods. Optimize footing dimensions
- Sophisticated FEM static analysis for mat foundation and dynamic analysis for machine foundation powered by reliable STAAD analysis engine
- Support for an unlimited number of load cases and load combinations
- User-defined reinforcing zones and blocks for optimal reinforcement distribution
- Neglects design moments below columns for mat foundation
- Slab design along any cut line to simulate manual mat design technique
- Pedestal design
- Analysis for partial uplift caused by biaxial bending for all footing types.

Design Codes

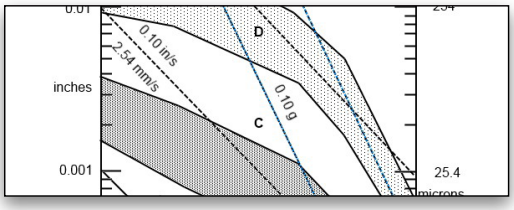
- United States
  - » ACI 318-2005
  - » ACI 318-2008
  - » ACI 318-2011
- United Kingdom - BS 8110
- India - IS 456-2000
- Australia - AS 3600-2004
- Canada - CSA A 23.3-04
- Chinese - GB50007-2002
- Euro - EN 1992-1-1-2004

Specific Features for Plant Foundations

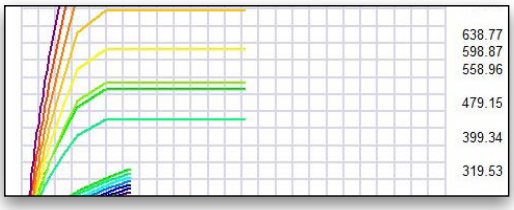
- Specific modules for the plant industry such as vertical vessel foundation, heat exchanger foundation, annular ring tank foundation and laterally loaded drilled pier analysis
- Generates load combination automatically based on several country codes such as ASCE-7 and PIP STC 01015
- Generates wind load and zip-code-based seismic load automatically based on ASCE 7, IS 875, IS 1893
- Creates different configurations of vessel foundations

Foundation Toolkit Features

- Time-saving wizard-based input for isolated footings, combined footings, pile cap arrangement and design
- Drilled axial pier module supporting API and FHWA 1999 and alternative Vesic method
- Guyed tower foundation module based on ACI 318-05



Dynamic ACI 351 charts for vibrating machine foundations



p-y curve generation for lateral analysis of drilled pier

Need a more comprehensive structural portfolio of trusted analysis and design applications?
Check out Structural Enterprise. Design in any infrastructure sector, with multiple materials, using any analysis method that is appropriate for the job. Learn more by visiting, **www.bentley.com/StructuralEnterprise**

Bentley
Advancing Infrastructure

© 2019 Bentley Systems, Incorporated. Bentley, the Bentley logo, ProjectWise, ProjectWise Connection Services, SELECT, STAAD, STAAD.Pro, and STAAD Foundation Advanced are either registered or unregistered trademarks or service marks of Bentley Systems, Incorporated or one of its direct or indirect wholly owned subsidiaries. All other trademarks are the property of their respective owners. CS14817 08/19