



PRECAST CONCRETE ENGINEERING SOFTWARE

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PROGRAM EXECUTIVE SUMMARIES

MEMBER ANALYSIS AND DESIGN PROGRAMS

BEAM for Windows™

This highly flexible tool enables engineers to quickly and accurately design pretensioned concrete flexural members.

The program conforms to ACI 318-02 or -99, PCI Recommendations for Losses, and ACI 209 Recommendations for Volume Change and Deformation Calculations. It performs a Rational Deflection Prediction and calculations for Bearing Plates and Pads. Designs in all classes U, T, and C (ACI 318-02) are possible. Detailed partially cracked section properties are determined and utilized for class C designs as well as bilinear deflection calculations. Torsion design using ACI 318-95 (tube analogy) is included along with required suspension steel for ledges.

The program can be used to design any Double Tee, Rectangular, L- or IT- beam, hollow-core, or general shape. It handles one or two cantilevered ends, multiple harping of strands, strand debonding, multiple layers of mild steel, changes in topping thickness and openings in the top flange. Specified loads may be uniform, partially distributed, trapezoidal, concentrated, or assigned moment envelopes. Any specified mild steel is transformed for increased section properties and strand may be transformed at the user's option.

The report shows calculated values at 20 or more points along the length of the member or an abbreviated report can be selected which shortens the printout to the minimum possible length.

COMPMEM for Windows™

Compmem analyzes rectangular, T- or flanged-shaped compression members (columns or walls) subjected to known axial forces and moments. Sections may be either prestressed or mildly reinforced.

Behavior under service loads and/or design (ultimate) strength are checked for compliance with ACI-318 (2005, 2002 or 1999). Using user-entered values for C_m , β_1 and M_1/M_2 , the proper moment magnification factor for columns is calculated based on the non-sway frame equations of Sec. 10.12. The slenderness ratio (kL/r) must be less than or equal to 100.

Both design and service interaction curve values will be generated upon request.

BCAN for Windows™

The program calculates moments, shears, axial forces, deflections, and rotations for continuous, indeterminate beams or multistory columns using the direct stiffness method of analysis.

Loads may be general in nature and can include joint loads and moments, and uniform, partially distributed, trapezoidal and concentrated loads on any part of the member. One or more load cases may be specified in a single report.

LATERAL ANALYSIS AND DESIGN PROGRAMS

LATERAL3 for Windows™

Lateral3 is a powerful and general program for the 3-dimensional analysis of multistoried shear-wall systems subject to lateral forces.

The program will determine the wind or seismic forces prescribed by one of the supported codes. The selection includes IBC-2006 (Wind and Seismic by ASCE 7-05), IBC-2003 (Wind and Seismic by ASCE 7-02), IBC-2000 (Wind by ASCE 7-98); 1997 and 1994 UBC; 1996 BOCA; 1994 SBC (Wind by ASCE 7-95). User-assigned lateral forces may also be used instead of a code.

The direct stiffness method of analysis is used throughout and shear deformations are considered. Shears, moments and displacements are calculated at any desired level for all walls due to wind and seismic loads (with or without an accidental eccentricity). Additionally, the cross section of selected shear walls can be changed or stopped at specified floors.

At the user's option, the program will calculate an approximate fundamental period of vibration using the code-specified equation or Rayleigh's equation. A user-assigned period may be substituted for the calculation.

SHEARWAL for Windows™

This program aids engineers in analyzing post-tensioned or mild-reinforced shear wall sections subject to a combination of vertical loads and lateral wind and/or seismic forces.

The wall cross section may be rectangular or rectangular with pilasters (bulbs) at either or both ends.

Ultimate flexural and shear strengths are checked at the horizontal joint. Three methods of calculating shear friction at the joint are available: (1) sliding friction, (2) simplified shear friction, or (3) maximum allowable shear stress. Design (ultimate) moment is checked using strain compatibility, with the additional option of printing the bar strains.

IBC, ASCE, ACI, UBC, BOCA, SBC or user-assigned load/capacity factors may be used for both wind and seismic forces.

CONNECTION DESIGN PROGRAM

STUDS for Windows™

The program calculates pullout and shear capacity of plates with headed anchor studs, post-installed anchors expansion and undercut anchors, and hooked bolts. When a shear load and/or either a moment or perpendicular load are specified along with an effective depth and width of a bracket, the program calculates the interaction of shear and moment and provides a satisfactory/not-satisfactory assessment of the combined pullout and shear capacity.

Users may select from PCI Design Handbook, 5th Edition, PCI Design Handbook, 6th Edition, or Appendix D methods for either ACI 318-02 or ACI 318-05.