
spBeam v3.10 - Updated January 2010

Enhancements:

1. Adjusted ACI 318-08 metric factors for concrete shear capacity and minimum shear reinforcement calculations.
2. Revised minimum shear requirements for special members per ACI 318-08.
3. Revised normal weight concrete limit in development length calculations per ACI 318-08.
4. Revised lambda factors for lightweight concrete.
5. Improved development length calculations for structural semi-low density concrete for CSA code.
6. Revised Manual and Help documentation to increase accessibility and enhance description of program features.

Resolved Issues:

1. Exceeding combined M-V-T capacity of bottom bars in certain design cases.
2. Column reaction equal to zero for systems that include lateral loads and moment redistribution.
3. Applying default load combinations when switching design codes and no load cases are defined.
4. Applying default load combinations when switching design codes and SELF and/or DEAD load cases are not defined.
5. Providing results for combined shear and torsion in investigation mode.

spBeam v3.00 – Upgraded April 2009

Code Features:

1. Added support for ACI 318-08 design standard in English and Metric units.
2. Added further support for CSA A23.3-04 floor systems with beams.
3. Updated Lambda factor calculations for lightweight concrete for consistency with latest standards and other StructurePoint programs.
4. Updated calculations for the following issues:
 - a. Minimum slab thickness limits in joist construction
 - b. Minimum slab thickness for lightweight concrete construction
 - c. Minimum beam/one-way slab thickness
 - d. Minimum shear strength and reinforcement to address size effect of special members in ACI and CSA standards
5. Introduced unified treatment of effect of slab bands and beams in the transverse direction.

6. Incorporated new formulas for development and splice length in both English and Metric units.
7. Enhanced checking of structural integrity reinforcement and detailing requirements intended to mitigate the potential progressive collapse.

Enhancements:

1. Provided easier and faster access to software manual directly from the Help menu.
2. Improved shear and torsion capacity charts, various dialog windows, bar spacing requirements and significant digits for redistribution coefficients and development length constants.
3. Renamed pcaBeam, also formerly known as ADOSS, as **spBeam** to better relate and support the registered trade name of the publisher, StructurePoint, formerly PCA's Engineering Software Group.

Resolved Issues:

1. Corrected display of calculated axial forces and moments for circular columns modeled over beams.
2. Eliminated the occurrence of SELF load case in the span table

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pcaBeam v2.51 – Updated January 2009

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Resolved Issues:

7. Editorial corrections in Startup Defaults dialog box and text output

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pcaBeam v2.50 – Upgraded December 2008

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Code Features:

1. Added support for CSA A23.3-04 design standard

Enhancements:

1. Added SNOW load by default in load cases and load combinations
2. Provided capability to add and remove self weight from both ultimate and service load combinations
3. Included self weight and live load patterns in text report

4. Included live load pattern selection and an option to display load units in graphical load view
5. Provided capability to copy a set of stirrups from left side of a beam to the right
6. Provided capability to modify location of first stirrup
7. Improved placement of stirrup segments
8. Improved calculation of additional width due to stirrup bend
9. Improved calculations of distance from extreme compression fiber to centroid of longitudinal tension reinforcement in Design and Investigation modes
10. Reported segmental reinforcement requirements
11. Allowed one flexure bar in joist beams
12. Flagged flexural reinforcement if provided steel area in design mode exceeds maximum allowable
13. Added a warning and a flag for deep beams to indicate that additional design and reinforcement detailing is required
14. Provided capability to start design from the maximum bar size rather than minimum
15. Included rib spacing validation for joist slabs
16. Clarified input parameters for ribs
17. Updated and enhanced manual

Resolved Issues:

1. Corrected overestimated stirrup material take-off
2. Increased accuracy of self weight calculations for metric unit system
3. Self-weight is now included in load combination results for column axial forces
4. Corrected minimum slab thickness for slabs with transverse beams on discontinued edge per CSA code
5. Corrected integrity reinforcement calculations per CSA standard by using specified rather than factored loads
6. Eliminated Memory Allocation Error happening during flexure investigation of a failed design
7. Resolved Memory Allocation Error shown for systems with transverse beams extending beyond end cantilevers
8. Corrected load patterning for shear forces
9. Eliminated Memory Allocation Error happening randomly for beams with moment redistribution
10. Corrected minimum reinforcement calculations for beams with flanges in tension per CSA A23.3-94 standard
11. Corrected bottom reinforcement selection issue resulting in one bar (instead of two) that extends to the support in some cases
12. Supplemented maximum spacing limit requirements for one-way slabs to include provision 7.6.5 per ACI 318
13. Removed inadvertent flagging of torsion results occurring occasionally in torsion section of design results
14. Corrected axial forces and moments report to include results for circular columns

15. Resolved issue with inadvertent very small positive bending moments occurring intermittently on cantilevers
16. Corrected issue with values of lambda factor for long-term displacements for some sections with compressive reinforcement
17. Corrected bar development length for flexure design per CSA standard
18. Corrected weight of bar #15 in CSA G30.18 bar set
19. Corrected location of critical section for positive bending moments not to approach span ends closer than face of supports
20. Adjusted location of critical section for one-way shear in slabs supported by transverse beams
21. Removed error checking for support width in one-way systems
22. Resolved issue in Torsion Capacity view for mixed systems with beams and one-way slabs
23. Eliminated overlapping of Frame and Engineer labels in printout

12-15-2006 pcaBeam v2.00

New Features:

24. Supports ACI 318-05
25. Includes calculation of long-term deflections

Enhancements:

1. Check for Updates command is added
2. The installation file is digitally signed by pcaStructurePoint
3. If all network license tokens are in use a warning message is now displayed
4. Improved reactions report
5. Properties of cracked sections are now reported
6. Flexural capacity now increases gradually over the development length of reinforcing bars
7. Side cover can be modified
8. Distance between bar layers can be modified
9. Number of stirrup legs in the design mode can be controlled
10. Steel requirements for structural integrity are now implemented
11. 80 (previously 40) character long descriptions are now allowed in General Info
12. Consistent coordinate system for loads and displacements is now introduced with axis Z pointing downward

Note: This may require changing the sign of prescribed displacement if they were entered into the data file using pcaSlab/pcaBeam v1.5x

Resolved Issues:

1. Incomplete data resetting from previous solution
2. Overestimated reinforcement bar lengths

3. Incorrect bar spacing for top reinforcement
4. Effective width and one tenth of span length are not taken into account for bar spacing in one way systems
5. Incorrect value of concrete modulus of rupture for the CSA standard when imported from ADOSS files
6. Incorrect values of column and shear forces for point loads located very close to a support
7. Reversed signs of support loads
8. Shear capacity jump in case of the first stirrup having zero area
9. Freezing of the program in some situations e.g.
 - (a) displaying combined shear and torsion capacity diagram for some models
10. Top reinforcement selection for a simple beam with no negative moments
11. Incorrect moment capacity display in cases with no bars and no moments
12. Double support loads shown in load view
13. Incorrect reporting of solution options in the input echo
14. Problems with file association for slb files in Windows environment
15. Glitches in the Input Wizard
16. Calculation of flexural capacity $f_y = 87$ ksi and above
17. Slight overestimation of flexural capacity for CSA
18. Neglecting effective width when calculating flexural capacity
19. Neglecting bottom continuous bars in material takeoff for some models
20. Using slab cover for flexural capacity of a beam
21. Reporting bars covering the whole span as short bars (long should be reported)
22. Calculating capacity as if only one layer was used when flexure design results in two layers of bars
23. Converting two layers of bars to one layer when switching from design to investigation mode
24. Not taking stirrup diameter into account when calculating bar spacing in beams
25. Issues related to calculations of effective moment of inertia for cracked members
26. Default max bar spacing for CSA increased to 500mm from 450mm
27. Excessive reinforcement for one-way slabs due incorrect calculation of minimum spacing per CSA crack control requirements

pcaBeam v1.51 - 01-12-2006

Enhancements:

1. pcaBeam can now import PCA-Beam v1.0x data files. See “Notes on PCA-Beam v1.0x data file import” below.
2. Maximum bar spacing in beams and one-way slabs now takes into account crack control requirements.

Resolved issues:

1. Issue of missing longitudinal torsional reinforcement details for some specific design parameters has been resolved.
2. Setting moment redistribution factors larger than 0 for cantilevers by copying redistribution factors from internal supports or by adding and removing spans has been disabled.
3. If the CSA code is selected, then the automatically calculated value of the concrete rupture modulus now defaults to $0.5 \cdot f_r$. However, if the full value has to be used, as for one-way slabs, then the default value has to be manually overwritten by the user.
4. For CSA code the minimum area of flexural reinforcement in beams is now correctly calculated based on the depth of the member instead of the effective depth (as for ACI).
5. Load combination numbers are no longer switched for M-ve and M+ve in the text output under Segmental Moment and Shear – Envelopes.
6. Overflow error in torsion design for load cases with no live load has been eliminated.
7. A “#” character can now be safely used in the text input fields. However, it is still not allowed to start a text input with “###”.
8. In investigation of punching shear, pcsBeam now uses the provided steel diameter and cover rather than assuming these values from design parameters.
9. pcaBeam icon is now correctly displayed under Add/Remove Programs in the Control Panel of the Windows system

Notes on PCA-Beam v1.0x data file import:

1. PCA-Beam v1.0x supported ACI 318-89 and CSA A23.3-84 standards which are not supported in pcaBeam. By default pcaBeam will assume ACI 318-99 or CSA A23.3-94 standards respectively.
2. PCA-Beam v1.0x allowed cantilevers with zero dimensions. However, they are not allowed in pcaBeam, so a warning will be displayed when such cantilevers are imported. They will have to be then removed or their dimensions will have to be corrected before the analysis can be preformed.
3. The center segment of a three-lapped top continuous bar entered in PCA-Beam v1.0x will be ignored if its size does not match any of the right or left segments. This is because pcaBeam does support lapped bars and it does support top discontinuous bars.
4. The first stirrup in the span will be moved 3in [75mm] away from the face of the column (below) regardless of the first stirrup location set in PCA-Beam v1.0x. This is due to fixed location of the first stirrup assumed in pcaBeam.
5. PCA-Beam v1.0x load cases including lateral loads consist of two patterns: Left-to-Right and Right-to-Left. In pcaBeam, these two patterns will be converted to two separate load cases: Lat-L and Lat-R.

6. Due to slightly different input validation rules in pcaBeam and PCA-Beam v1.0x, it may happen that a valid PCA-Beam file will not run in pcaBeam. Similarly, it is also possible that files that failed in PCA-Beam v1.0x will run in pcaBeam.

pcaBeam v1.50 - 07-07-2005

License file for pcaBeam versions 1.0x will not work with this release. This release is considered an upgrade and requires obtaining a new license code.

pcaBeam is now a limited version of pcaSlab v1.50 program. It includes the following features:

1. Analysis, design and investigation of beams and one-way slab systems
2. Torsion analysis and design of beams (equilibrium and compatibility)
3. Moment redistribution
4. Improved licensing including:
 - multiple entries (each on a separate line) are allowed in the lshost.txt to achieve license server redundancy
 - LAN keyword can be specified in the lshost.txt file to instruct the license manager to search for a license in the local area network (within the same subnet)
 - complete licensing information displayed in the About box
5. User interface enhancements including:
 - font selection is available for the text and the graphical output
 - reinforcement labels can now be rotated to fit better in the graphical output
 - reinforcement lengths are now be displayed in the graphical output
 - load factors can now be automatically reset when the code selection changes
6. Enhanced documentation including:
 - context sensitive Help
 - reformatted and updated manual