RCDC (SACD) V8.0.0

Release Notes

RCDC V8.0.0 is here with new features enhancing the design and addition of new codes. The newly introduced features are:

No	Module	Description
1	General	ACI 318M-2014
2	General	ACI_224R-01 – Crack-Width Check For ACI 318M-2011 And ACI 318M-2014 Codes
3	Column & Wall	Boundary Element Wall – Qualification- Minor Direction Moment Ignored
4	Column & Wall	Ductile column-Joint Check Logic Enhancement
5	General	RCDC 64 Bit
6	General	RCDC- CONNECT Edition
7	General	RCDC CONNECT Licensing
8	General	Enhancements and Modifications
9	General	Defects

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General	ACI 318M-2014

The ACI 318M-2014 has been added to the RCDC. Both ACI 318M-2011 and ACI 318M-2014 codes will be available.

General	ACI_224R-01 – Crack-Width Check for ACI 318M-2011 And ACI 318M-2014 Codes

Crack-Width check will be available for ACI 318M-2011 and ACI 318M-2014 codes. This check will be available for all elements. i.e. Column, beam, Footing, Pile-cap and Slab.

Crack Width check is performed based on Frosch Equation as per clause (1-2) of ACI 224.1R-07. The Stress Limit is checked based on conditions in Clause 10.6.4 (ACI: 318M -2011) & Table R 24.5.2.1 (ACI: 318M -2014).

$$w = 2\frac{f_s}{E_s}\beta\sqrt{d_c^2 + \left(\frac{s}{2}\right)^2} \qquad (1\text{-}2)$$

Column & Wall	Boundary Element Wall – Qualification- Minor Direction Moment Ignored

For stress calculation to qualify the Boundary element for Ductile wall, the effect of Axial force and major direction moment have been considered. The effect of Minor direction moment has been ignored.

1. This is applicable to IS 456 + Is 13920-2016, IS 456 + Is 13920-1993, ACI 318M-2011 and ACI 318M-2014 codes.

Check For Requirement Of Boundary Element

Check For Maximum Compressive Stress

Having maxstress in between level's (4.2m - 16.258m)

At level (4.2m)

Load Combination	=	[6] : 1.5 (LOAD 1: LOAD CASE 1) +1.5 (LOAD 3: LOAD CASE 3 EQ-X)
Maximum Stress	=	7.57
0.2 x Fck	=	5

Maximum Stress in Wall > 0.2 x Fck

Hence Boundary Element is applicable

At level (4.2m)

Load Combination	=	[6] : 1.5 (LOAD 1: LOAD CASE 1) +1.5 (LOAD 3: LOAD CASE 3 EQ-X)
Maximum Stress	=	7.57
0.15 x Fck	=	3.75

Maximum Stress in Wall > 0.15 x Fck

Hence Boundary Element is applicable

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Column & Wall — Ductile column-Joint Check Logic Enhancement

The existing Logic of performing Joint checks (Flexural and Shear) has been enhanced. This is applicable to IS 456+IS 13920-2016, ACI 318M-2011 and ACI 318M-2014 codes.

The Flexure capacity check at joint, considers the beams and columns at that node. It checks the capacity of bottom and top column at a joint with respect to capacity of beams. Hence, to finalize the design of column between two levels, one needs to perform the flexure check at bottom and top joints. This becomes iterative process, as design of lower column affects design of upper column. The design logic has been enhanced to iterate and optimize the column design including the joint check.

General — RCDC 64 Bit

RCDC is now upgraded to 64bit operating system. the Performance of the software will improve with 64bit version. The time required to read data and design for bigger analysis files will get reduced.

General — RCDC- CONNECT Edition

RCDC is compatible to CONNECT edition.

RCDC is upgraded to connect edition which includes following,

- Connection Client
- Connect Advisor
- Connect Project
- License Configuration

Note: The Connect edition is applicable to only STAAD-RCDC users.

General — RCDC CONNECT Licensing

CONNECT Licensing:
This product version utilizes CONNECT Licensing, which is not supported by SELECT activation key(s). **CONNECT Licensing** features new behaviour to enhance users organization's user administration and security with mandatory user sign-in via CONNECTION Client to access the application. If user have already signed in to the CONNECTION Client, user have met this prerequisite. If user have not, please refer to the **Administrator's Resource Center** and/or contact your administrator for assistance in the registration and sign-in process.

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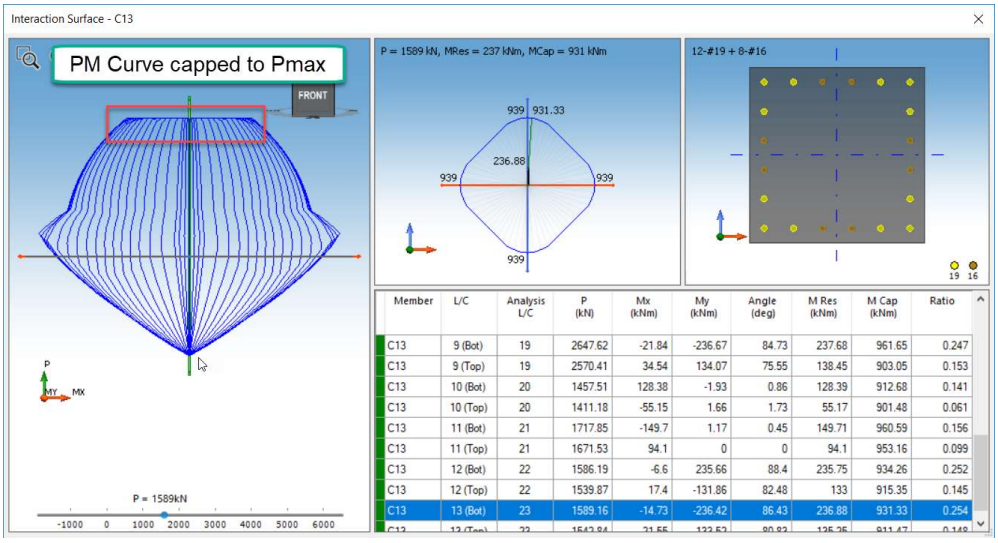
General Enhancements and Modifications

- Sample Files location has been changed to C:\Users\Public\Documents\RCDC. Sample files are now available for all codes. i.e. IS, ACI, Euro and BS.
  Also, the Sample files for STAAD, RAM and E-tabs have been updated and added.

- ACI 318M-2011 has been updated with following enhancements,
  - Pmax check is added in column design and PM curves are updated with Pmax value.



Member	L/C	Analysis L/C	P (kN)	Mx (kNm)	My (kNm)	Angle (deg)	M Res (kNm)	M Cap (kNm)	Ratio
C13	9 (Bot)	19	2647.62	-21.84	-236.67	84.73	237.68	961.65	0.247
C13	9 (Top)	19	2570.41	34.54	134.07	75.55	138.45	903.05	0.153
C13	10 (Bot)	20	1457.51	128.38	-1.93	0.86	128.39	912.68	0.141
C13	10 (Top)	20	1411.18	-55.15	1.66	1.73	55.17	901.48	0.061
C13	11 (Bot)	21	1717.85	-149.7	1.17	0.45	149.71	960.59	0.156
C13	11 (Top)	21	1671.53	94.1	0	0	94.1	953.16	0.099
C13	12 (Bot)	22	1586.19	-6.6	235.66	88.4	235.75	934.26	0.252
C13	12 (Top)	22	1539.87	17.4	-131.86	82.48	133	915.35	0.145
C13	13 (Bot)	23	1589.16	-14.73	-236.42	86.43	236.88	931.33	0.254

  - For Compression members where provided cross section area is larger than the required area, the minimum % reinforcement is calculated on the reduced cross section area but not less than half the total cross section area.
    This is not applicable to Special moment frames and special walls.
    Note: Currently it is not implemented for Non-ductile walls in RCDC.

  - For story Non-Sway condition, the actual slenderness value is capped to 40.

    (b) for compression members braced against side-sway when:

    $$\frac{k\ell_u}{r} \le 34 - 12(M_1/M_2) \le 40 \qquad (10\text{-}7)$$

  - In column and wall design, moment due to slenderness effect is now capped to 1.4 times the first order moment.

  - Beam design with axial and biaxial moment, cracking torque formula has been updated.

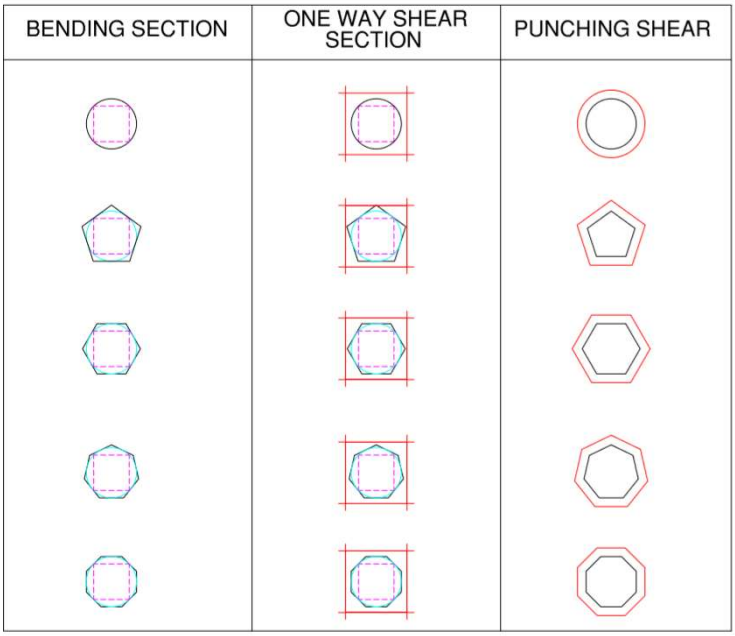
Nonprestressed member subjected to axial force	$0.083\lambda\sqrt{f_c'}\left(\frac{A_{cp}^2}{p_{cp}}\right)\sqrt{1+\frac{N_u}{0.33A_g\lambda\sqrt{f_c'}}}$

- While computing the value of P for Sway Calculation, the value of P considered from that load combination where ΣPu should be associated with the lateral load case in which Pu is the greatest.

General Defects

- Support ID – 2666,2744
  Punching Perimeter, One-way and Bending Moment section location updated for circular and Odd Shaped column in IS, ACI, Euro and BS codes.

  Below are the images of Circular and Polygon shaped column showing punching perimeter and One-way and Bending Moment section location considered in design.
  Bending section : Pink dotted line indicates size of section considered for bending
  One-way Shear : Pink dotted line indicates size of section considered for One way shear and Red line indicates section location
  Two way shear : Red line indicates punching perimeter



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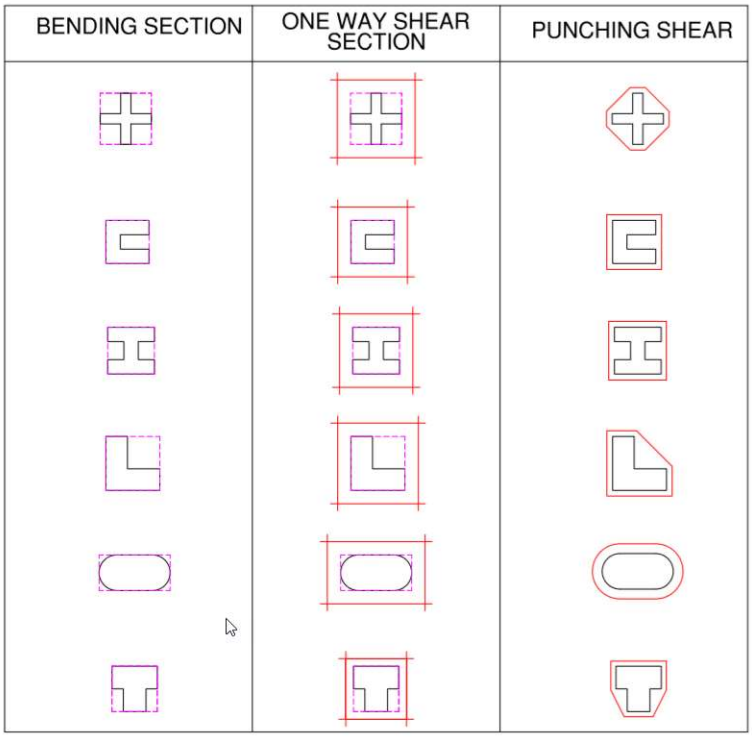
Below are the images of Odd Shaped column showing punching perimeter and One-way and Bending Moment section location considered in design.



- Support ID – 2903
  Beam Span issue has been resolved
    - When one beam considt of more than one members in analysis file, the clear span was shown in elevation drawings was wrong. The same has been updated with correct length.
- Support ID – 2756
  Slab BBS clear span to be considered for all curtailment calculations.
- Support ID – 2921, 2951,2929
  Out of memory issue has been resolved for high rise building.
- Support ID – 2898
  Wall design with Boundary element check error resolve
- Support ID – 2883
  Beam elevation generation issue resolved
- Support ID – 2936
  Wall ductile link calculation report
- Support ID – 2956
  One-way slab BBS detailing issue
- Support ID – 2769
  Shear-wall reading issue