ETABS MATE

Concrete Structure Detailing Software

New Update

VERSION 1.3.590

ETABS MATE

Concrete Structure Detailing Software

ETABS MATE version **1.3.590**

with a lot of New Advanced Features

- Compatibility with ETABS 21 and all previous versions of the software.
- Automatic calculation of Joint Shear Ratio based on Detailing Rebar and ACI 318-2019.
- Displaying calculation details of Jont Shear ratio by clicking on each Joint.
- Providing a printable report of the calculation details for Joint Shear ratio
- Ability to configure calculation parameters for automatic Joint Shear ratio calculating.
- Easy definition of console and edge beams in Joint Shear ratio calculation.
- Capability to identify the High-Shear Beams of structure according to ACI 318-2019.
- Calculation of specific ties for portion of beams that identified as High-Shear beams.
- Calculation of specific ties at the location of beam typical bar splice in special moment frame.
- Ability to define diameter, spacing and number of crossties separately for ends and middle of beam.
- Adding a user interface to view and edit information of structure stories.
- Ability to define and edit the Groups for Similar Stories of the structure.
- Addition the object selection modes: single story, all stories, and similar stories.
- Insert schematic ties image that indicating the number of tie legs in beam drawings.
- Adding a user interface to define or edit the grid line informations of project.
- Changes to the software's user interface for improved user convenience.
- Improvement of certain software procedures and algorithms.

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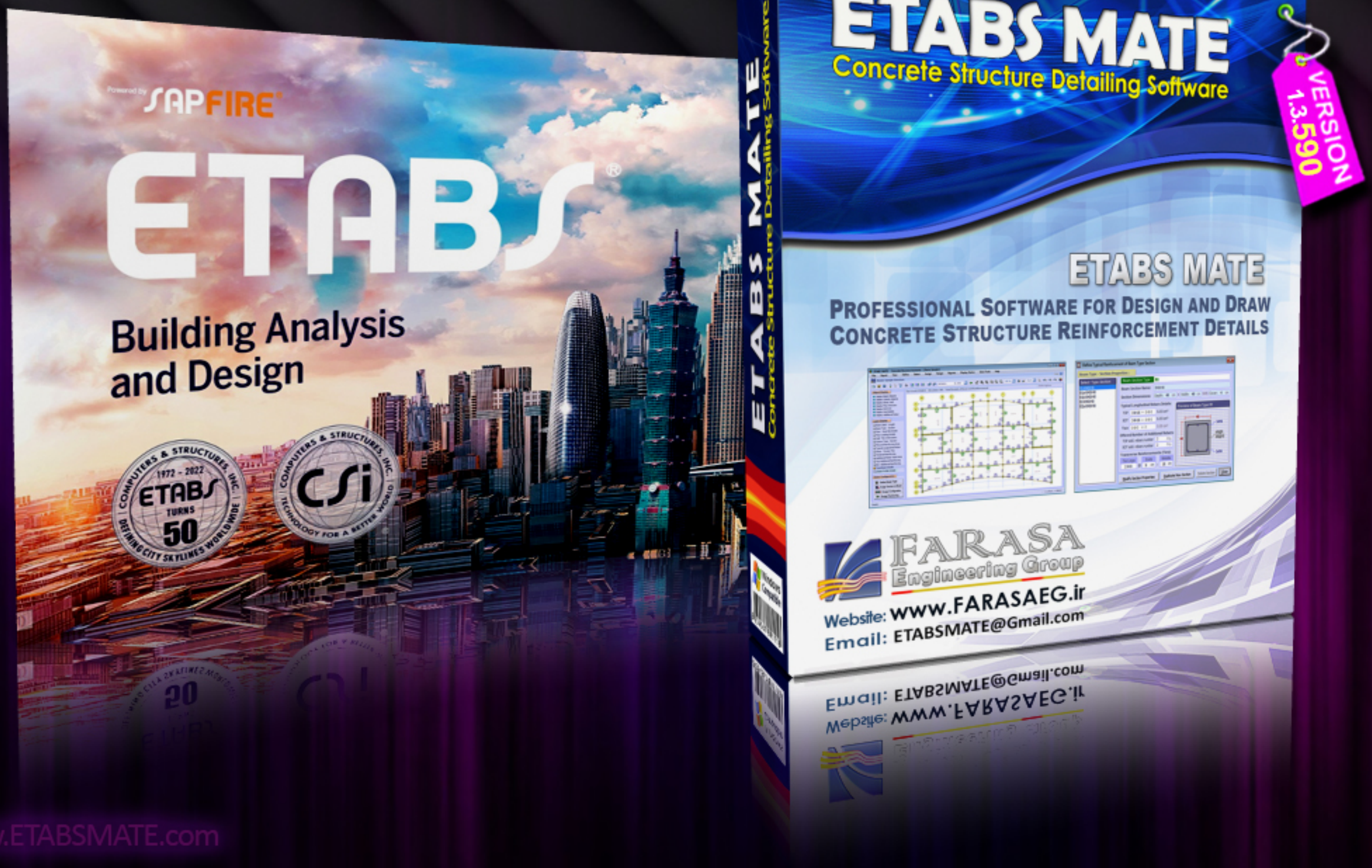
Compatibility with ETABS 21
and all previous versions of ETABS



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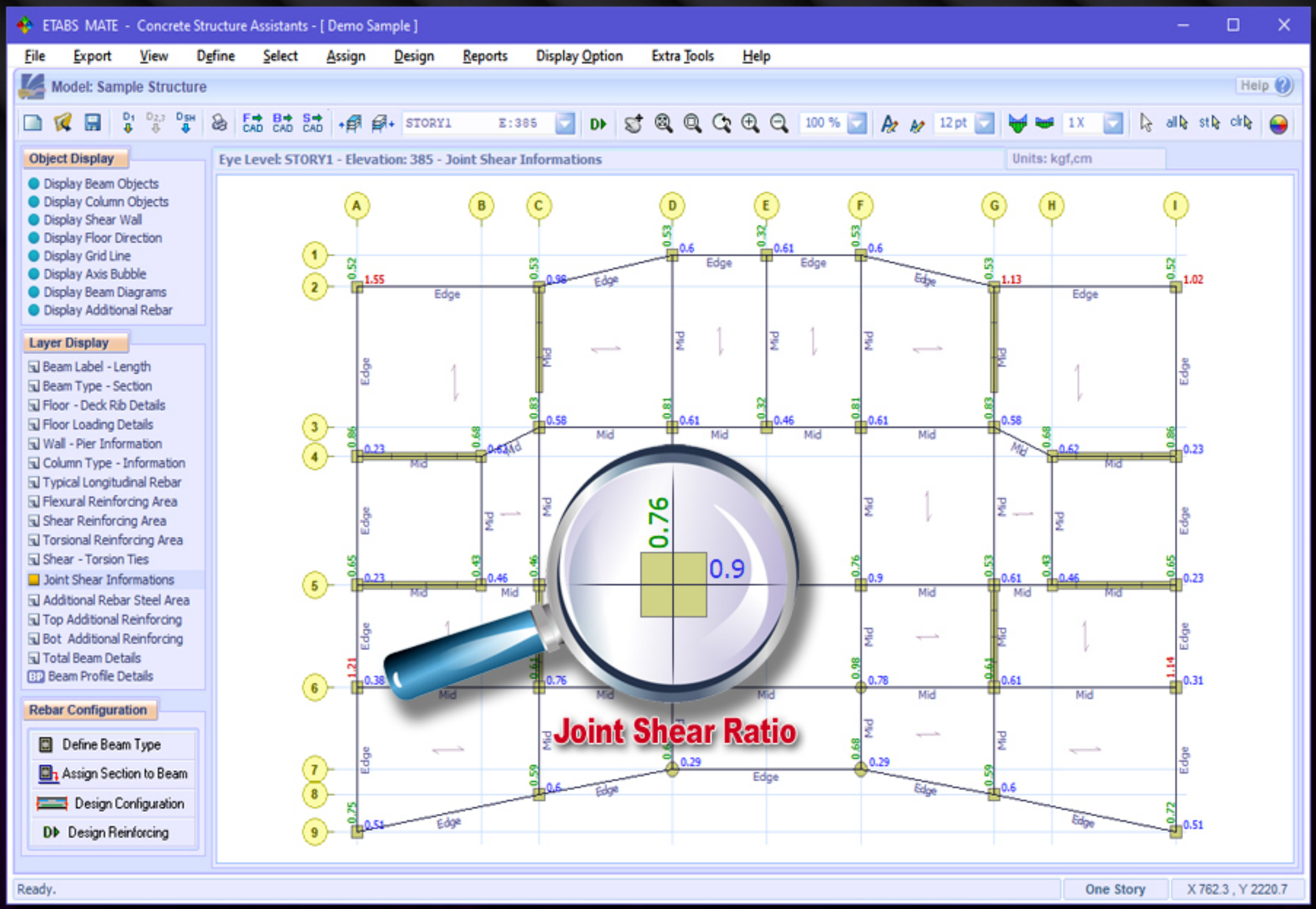
Calculation of the Joint Shear Ratio based on ACI318-2019



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View details of Joint Shear calculations by clicking on any joint

ETABS MATE - Joint Shear Calculation Details

Joint Shear Information

Calculation Config

The Joint Shear Calculation Details in Direction 2

»» General Information of the Studied Joint:
Column Lable: C180 Story: ST1, Elevation: -842 Cm
X Cordinate = 1097.5 Cm, Y Cordinate = -1753.8 Cm
Joint Shear Calculation Direction: 2 (Blue)

»» General Information of Project:
Type of the Earthquake Resistance: Special Moment Frame
Fy = 4000 Kgf/Cm², f'c = 200 Kgf/Cm²
Alfa = 1.25, Phi = 0.85

»» Columns Informations:
#Bot Column Lable: C180 Section: C90104428
Column Height: 368 Cm Angle: 60°
Section Height: 100 Cm Section Width: 90 Cm

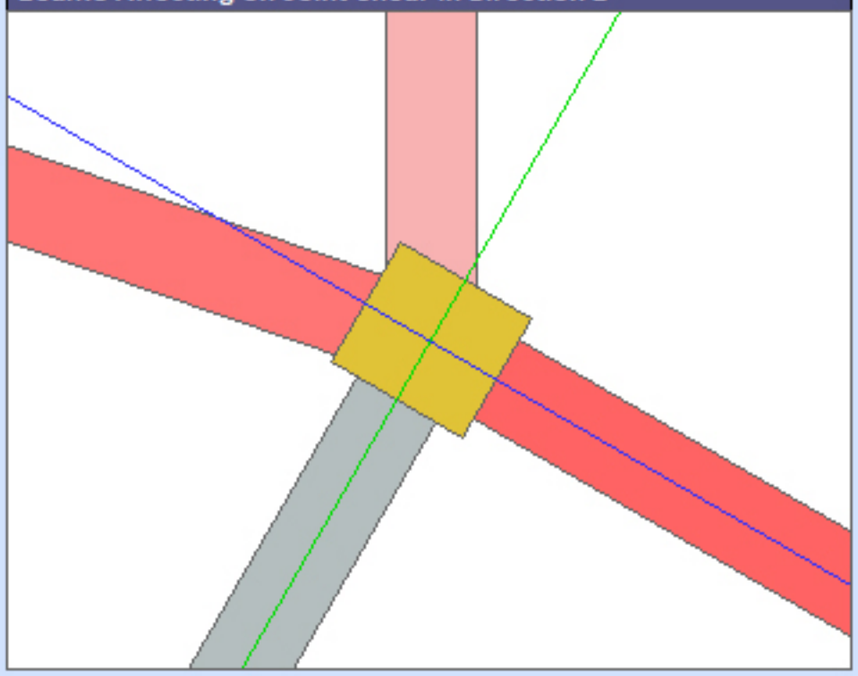
#Top Column Lable: C180 Section: C90104428
Column Height: 306 Cm Angle: 60°
Section Height: 100 Cm Section Width: 90 Cm

»» Connected Beam Number: 4
#1. Label: B479, Section: B6031, Angle=330°, Cantilever: No
Direction of Connection to Column: Parallel, Position:Middle
Section.Height: 31 Cm, Section.Width: 60 Cm
Ast.TYP.Top: 8.04 Cm², Ast.TYP.Bot: 8.04 Cm²
Ast.ADD.Top: 0 Cm², Ast.ADD.Bot: 0 Cm²
Ast.TOT.Top: 8.04 Cm², Ast.TOT.Bot: 8.04 Cm²

#2. Label: B480, Section: B6031, Angle=160.92°, Cantilever: No
Direction of Connection to Column: Diagonal, Position:Middle
Section.Height: 31 Cm, Section.Width: 60 Cm
Ast.TYP.Top: 8.04 Cm², Ast.TYP.Bot: 8.04 Cm²
Ast.ADD.Top: 0 Cm², Ast.ADD.Bot: 0 Cm²
Ast.TOT.Top: 8.04 Cm², Ast.TOT.Bot: 8.04 Cm²

#3. Label: B484, Section: B6031, Angle=240°, Cantilever: No
Direction of Connection to Column: Perpendicular, Position:Middle

Beams Affecting on Joint Shear in Direction 2



Direction 1 | Direction 2

Joint Shear Ratio = 0.24

Below Column Height: 368 Cm, Above Column Height: 306 Cm
Column Continuity Condition: True
Beam Continuity Condition: True
Joint Confinement Condition: False
Effective Joint Area (Aj) = 9000 Cm²
Vt = 109852.96, Vcol= 9372.24, Vu= Vt-Vcol =100480.73 kgf
(Phi)Vn =0.85 * 487728.82 = 414569.49 kgf

Save as Text File | Print Report | Close

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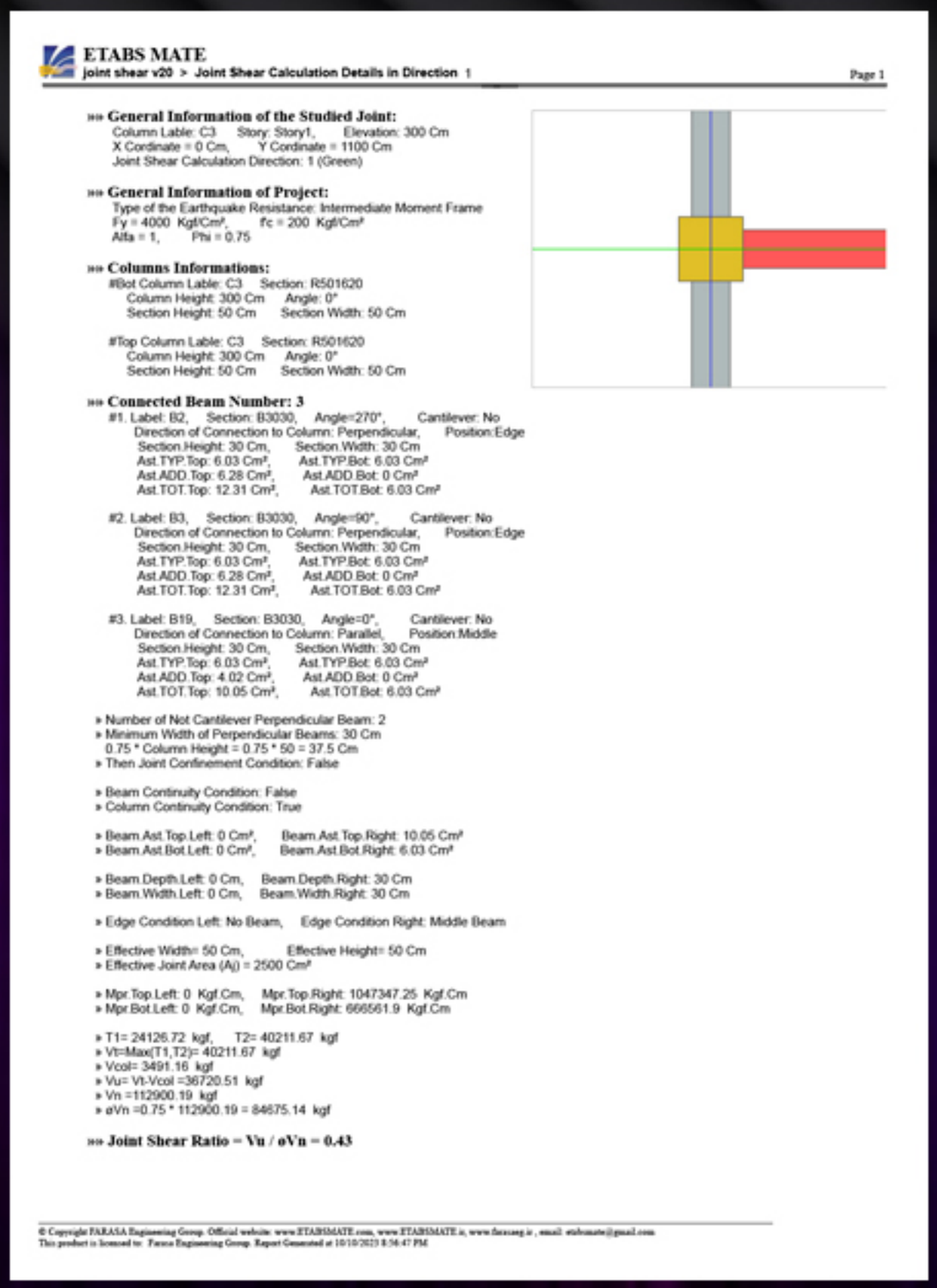
Providing a printable detail report of Joint Shear calculation



ETABS MATE

joint shear v20 > Joint Shear Calculation Details in Direction 1 — Page 1

»» **General Information of the Studied Joint:**
Column Lable: C3 Story: Story1, Elevation: 300 Cm
X Cordinate = 0 Cm, Y Cordinate = 1100 Cm
Joint Shear Calculation Direction: 1 (Green)

»» **General Information of Project:**
Type of the Earthquake Resistance: Intermediate Moment Frame
Fy = 4000 Kgf/Cm², f'c = 200 Kgf/Cm²
Alfa = 1, Phi = 0.75

»» **Columns Informations:**
#Bot Column Lable: C3 Section: R501620
Column Height: 300 Cm Angle: 0°
Section Height: 50 Cm Section Width: 50 Cm

#Top Column Lable: C3 Section: R501620
Column Height: 300 Cm Angle: 0°
Section Height: 50 Cm Section Width: 50 Cm

»» **Connected Beam Number: 3**
#1. Label: B2, Section: B3030, Angle=270°, Cantilever: No
Direction of Connection to Column: Perpendicular, Position:Edge
Section.Height: 30 Cm, Section.Width: 30 Cm
Ast.TYP.Top: 6.03 Cm², Ast.TYP.Bot: 6.03 Cm²
Ast.ADD.Top: 6.28 Cm², Ast.ADD.Bot: 0 Cm²
Ast.TOT.Top: 12.31 Cm², Ast.TOT.Bot: 6.03 Cm²

#2. Label: B3, Section: B3030, Angle=90°, Cantilever: No
Direction of Connection to Column: Perpendicular, Position:Edge
Section.Height: 30 Cm, Section.Width: 30 Cm
Ast.TYP.Top: 6.03 Cm², Ast.TYP.Bot: 6.03 Cm²
Ast.ADD.Top: 6.28 Cm², Ast.ADD.Bot: 0 Cm²
Ast.TOT.Top: 12.31 Cm², Ast.TOT.Bot: 6.03 Cm²

#3. Label: B19, Section: B3030, Angle=0°, Cantilever: No
Direction of Connection to Column: Parallel, Position:Middle
Section.Height: 30 Cm, Section.Width: 30 Cm
Ast.TYP.Top: 6.03 Cm², Ast.TYP.Bot: 6.03 Cm²
Ast.ADD.Top: 4.02 Cm², Ast.ADD.Bot: 0 Cm²
Ast.TOT.Top: 10.05 Cm², Ast.TOT.Bot: 6.03 Cm²

» Number of Not Cantilever Perpendicular Beam: 2
» Minimum Width of Perpendicular Beams: 30 Cm
0.75 * Column Height = 0.75 * 50 = 37.5 Cm
» Then Joint Confinement Condition: False

» Beam Continuity Condition: False
» Column Continuity Condition: True

» Beam.Ast.Top.Left: 0 Cm², Beam.Ast.Top.Right: 10.05 Cm²
» Beam.Ast.Bot.Left: 0 Cm², Beam.Ast.Bot.Right: 6.03 Cm²

» Beam.Depth.Left: 0 Cm, Beam.Depth.Right: 30 Cm
» Beam.Width.Left: 0 Cm, Beam.Width.Right: 30 Cm

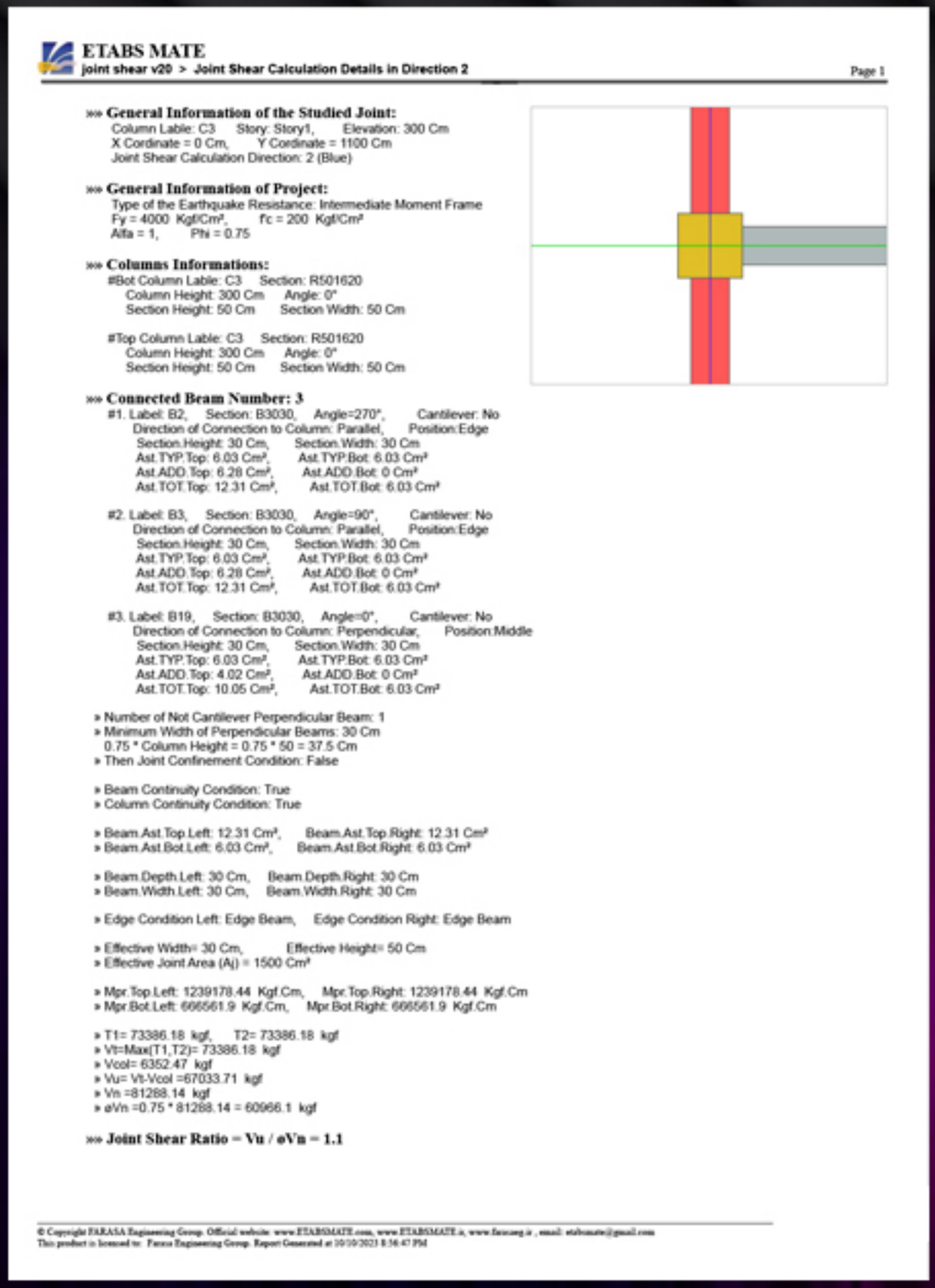
» Edge Condition Left: No Beam, Edge Condition Right: Middle Beam

» Effective Width= 50 Cm, Effective Height= 50 Cm
» Effective Joint Area (Aj) = 2500 Cm²

» Mpr.Top.Left: 0 Kgf.Cm, Mpr.Top.Right: 1047347.25 Kgf.Cm
» Mpr.Bot.Left: 0 Kgf.Cm, Mpr.Bot.Right: 666561.9 Kgf.Cm

» T1= 24126.72 kgf, T2= 40211.67 kgf
» Vt=Max(T1,T2)= 40211.67 kgf
» Vcol= 3491.16 kgf
» Vu= Vt-Vcol =36720.51 kgf
» Vn =112900.19 kgf
» øVn =0.75 * 112900.19 = 84675.14 kgf

»» **Joint Shear Ratio = Vu / øVn = 0.43**



ETABS MATE

joint shear v20 > Joint Shear Calculation Details in Direction 2 — Page 1

»» **General Information of the Studied Joint:**
Column Lable: C3 Story: Story1, Elevation: 300 Cm
X Cordinate = 0 Cm, Y Cordinate = 1100 Cm
Joint Shear Calculation Direction: 2 (Blue)

»» **General Information of Project:**
Type of the Earthquake Resistance: Intermediate Moment Frame
Fy = 4000 Kgf/Cm², f'c = 200 Kgf/Cm²
Alfa = 1, Phi = 0.75

»» **Columns Informations:**
#Bot Column Lable: C3 Section: R501620
Column Height: 300 Cm Angle: 0°
Section Height: 50 Cm Section Width: 50 Cm

#Top Column Lable: C3 Section: R501620
Column Height: 300 Cm Angle: 0°
Section Height: 50 Cm Section Width: 50 Cm

»» **Connected Beam Number: 3**
#1. Label: B2, Section: B3030, Angle=270°, Cantilever: No
Direction of Connection to Column: Parallel, Position:Edge
Section.Height: 30 Cm, Section.Width: 30 Cm
Ast.TYP.Top: 6.03 Cm², Ast.TYP.Bot: 6.03 Cm²
Ast.ADD.Top: 6.28 Cm², Ast.ADD.Bot: 0 Cm²
Ast.TOT.Top: 12.31 Cm², Ast.TOT.Bot: 6.03 Cm²

#2. Label: B3, Section: B3030, Angle=90°, Cantilever: No
Direction of Connection to Column: Parallel, Position:Edge
Section.Height: 30 Cm, Section.Width: 30 Cm
Ast.TYP.Top: 6.03 Cm², Ast.TYP.Bot: 6.03 Cm²
Ast.ADD.Top: 6.28 Cm², Ast.ADD.Bot: 0 Cm²
Ast.TOT.Top: 12.31 Cm², Ast.TOT.Bot: 6.03 Cm²

#3. Label: B19, Section: B3030, Angle=0°, Cantilever: No
Direction of Connection to Column: Perpendicular, Position:Middle
Section.Height: 30 Cm, Section.Width: 30 Cm
Ast.TYP.Top: 6.03 Cm², Ast.TYP.Bot: 6.03 Cm²
Ast.ADD.Top: 4.02 Cm², Ast.ADD.Bot: 0 Cm²
Ast.TOT.Top: 10.05 Cm², Ast.TOT.Bot: 6.03 Cm²

» Number of Not Cantilever Perpendicular Beam: 1
» Minimum Width of Perpendicular Beams: 30 Cm
0.75 * Column Height = 0.75 * 50 = 37.5 Cm
» Then Joint Confinement Condition: False

» Beam Continuity Condition: True
» Column Continuity Condition: True

» Beam.Ast.Top.Left: 12.31 Cm², Beam.Ast.Top.Right: 12.31 Cm²
» Beam.Ast.Bot.Left: 6.03 Cm², Beam.Ast.Bot.Right: 6.03 Cm²

» Beam.Depth.Left: 30 Cm, Beam.Depth.Right: 30 Cm
» Beam.Width.Left: 30 Cm, Beam.Width.Right: 30 Cm

» Edge Condition Left: Edge Beam, Edge Condition Right: Edge Beam

» Effective Width= 30 Cm, Effective Height= 50 Cm
» Effective Joint Area (Aj) = 1500 Cm²

» Mpr.Top.Left: 1239178.44 Kgf.Cm, Mpr.Top.Right: 1239178.44 Kgf.Cm
» Mpr.Bot.Left: 666561.9 Kgf.Cm, Mpr.Bot.Right: 666561.9 Kgf.Cm

» T1= 73386.18 kgf, T2= 73386.18 kgf
» Vt=Max(T1,T2)= 73386.18 kgf
» Vcol= 6352.47 kgf
» Vu= Vt-Vcol =67033.71 kgf
» Vn =81288.14 kgf
» øVn =0.75 * 81288.14 = 60966.1 kgf

»» **Joint Shear Ratio = Vu / øVn = 1.1**

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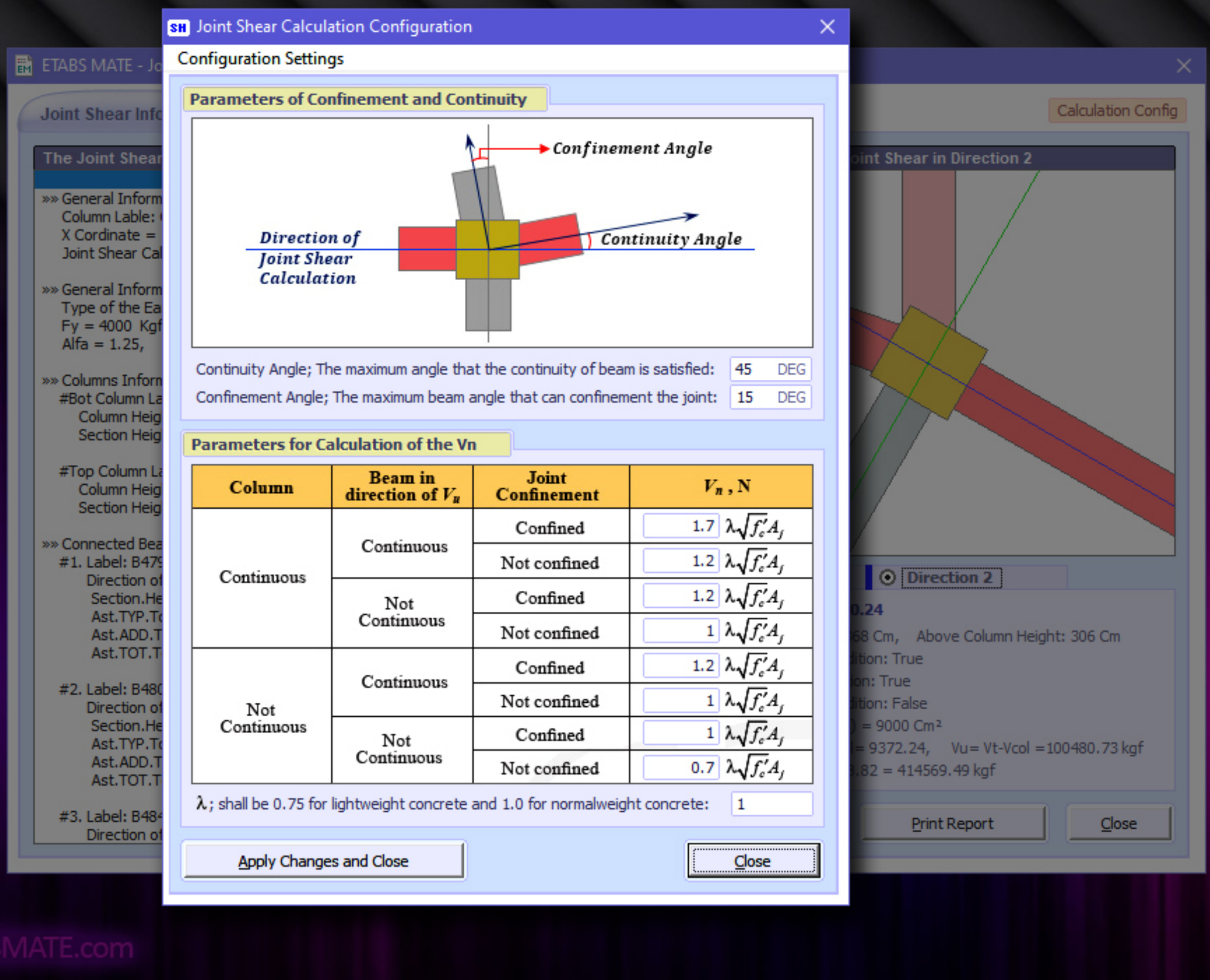
Ability to configure parameters of Joint Shear calculation by software



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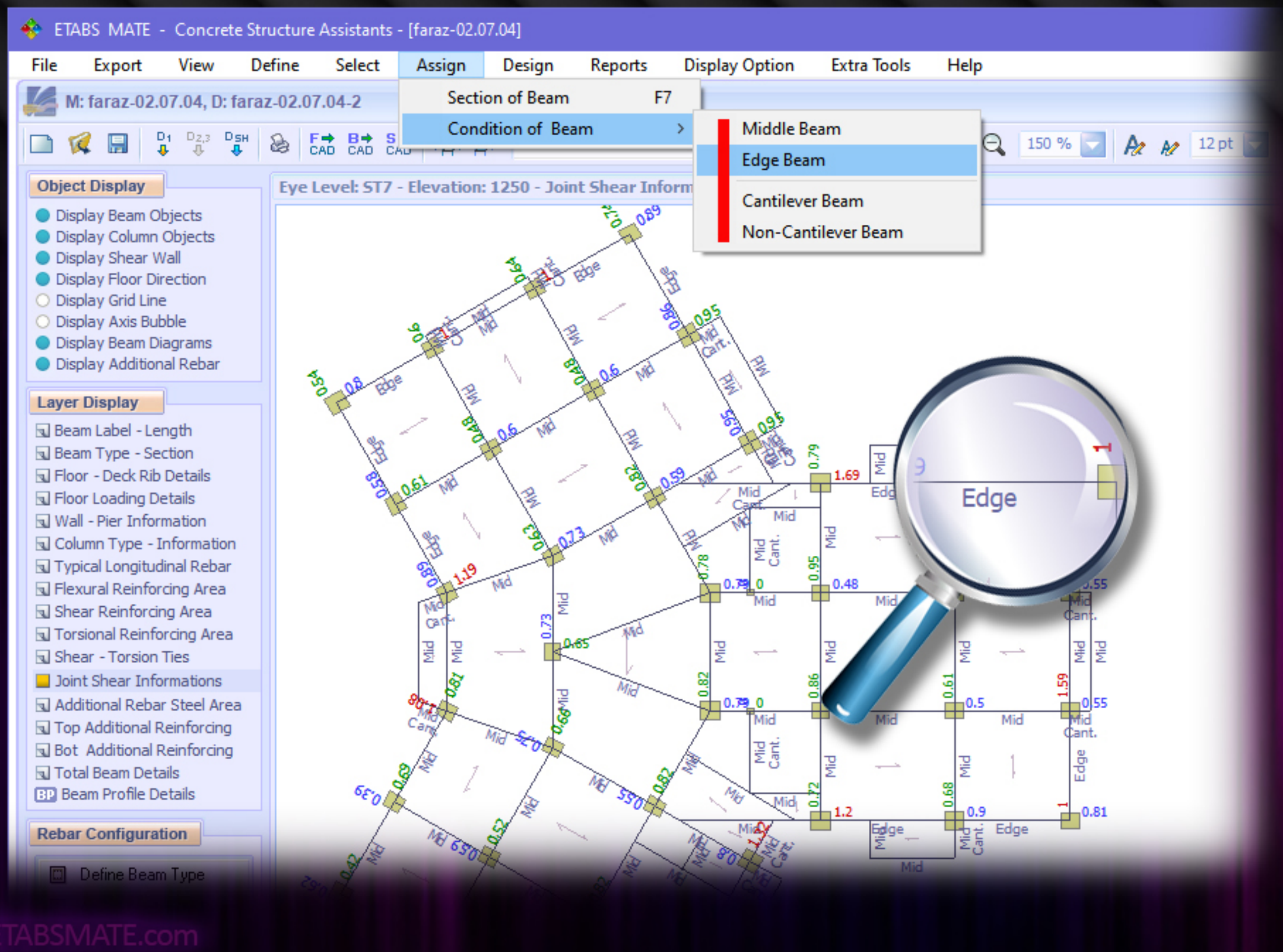
Ability to define cantilever and edge beams for Joint Shear calculation



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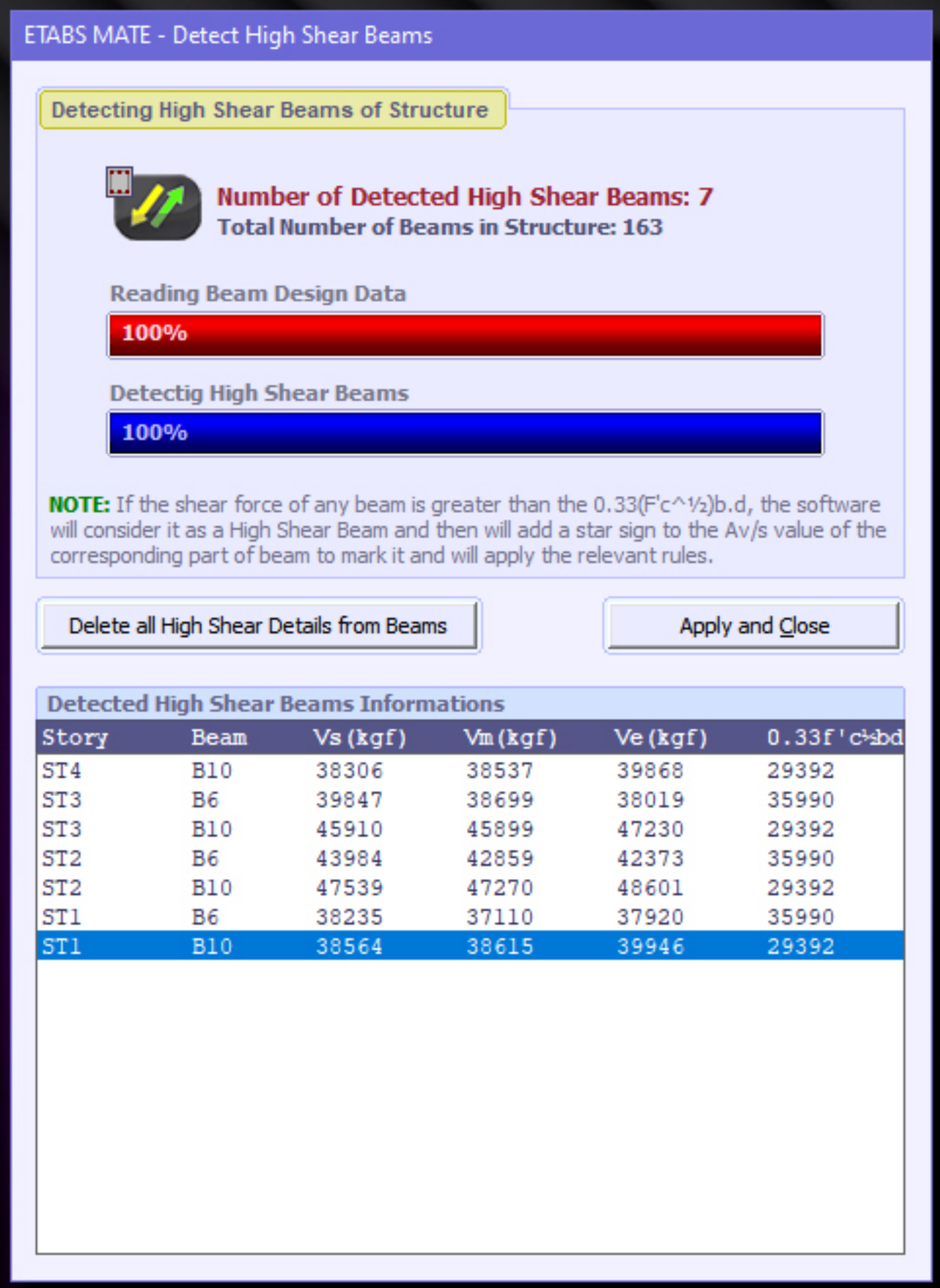
Detection of High-Shear beams of Structure in based on ACI318-2019



Story	Beam	Vs (kgf)	Vm (kgf)	Ve (kgf)	0.33f'c½bd
ST4	B10	38306	38537	39868	29392
ST3	B6	39847	38699	38019	35990
ST3	B10	45910	45899	47230	29392
ST2	B6	43984	42859	42373	35990
ST2	B10	47539	47270	48601	29392
ST1	B6	38235	37110	37920	35990
ST1	B10	38564	38615	39946	29392

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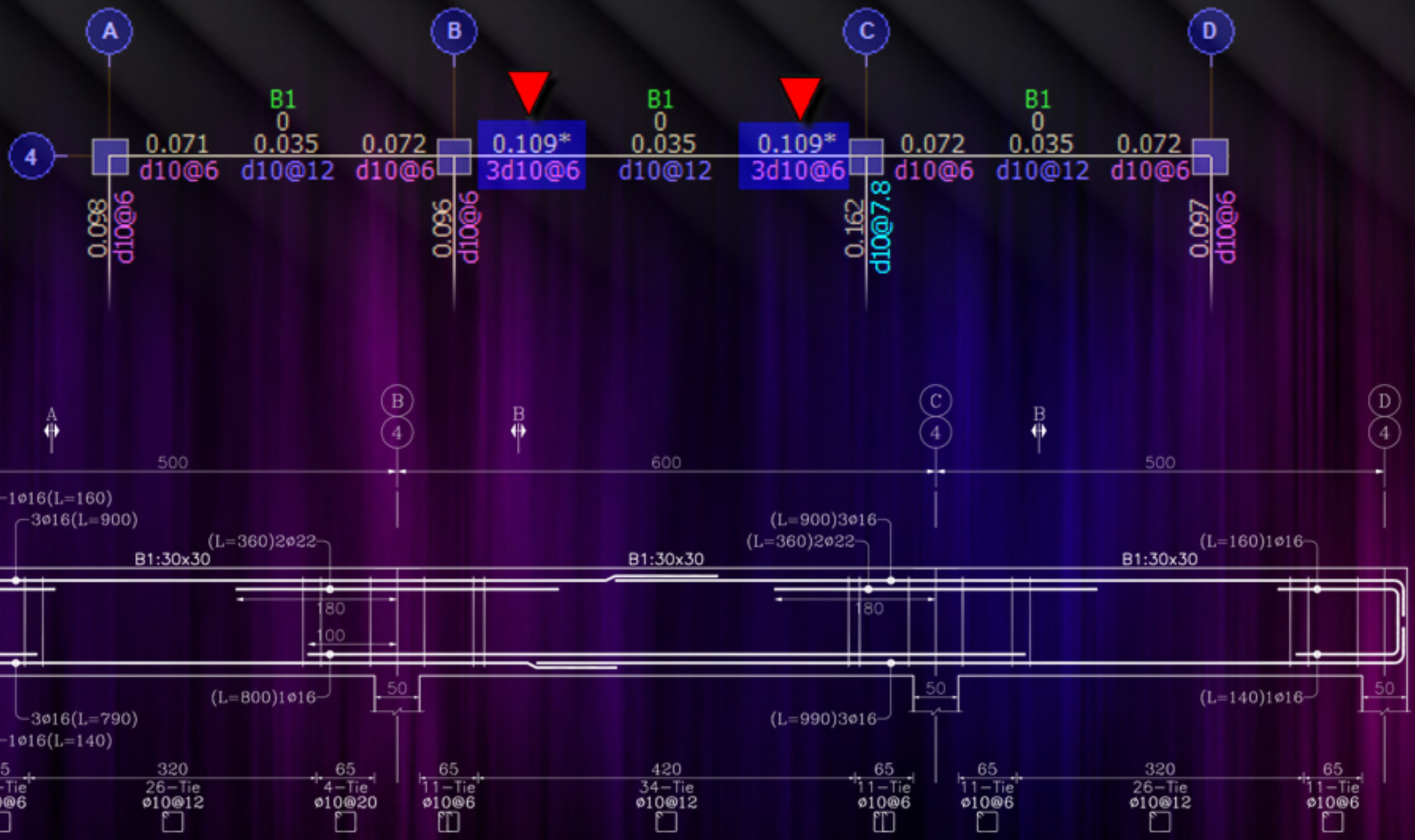
Calculation of transverse bars details for High-Shear Beams based on ACI 318-2019



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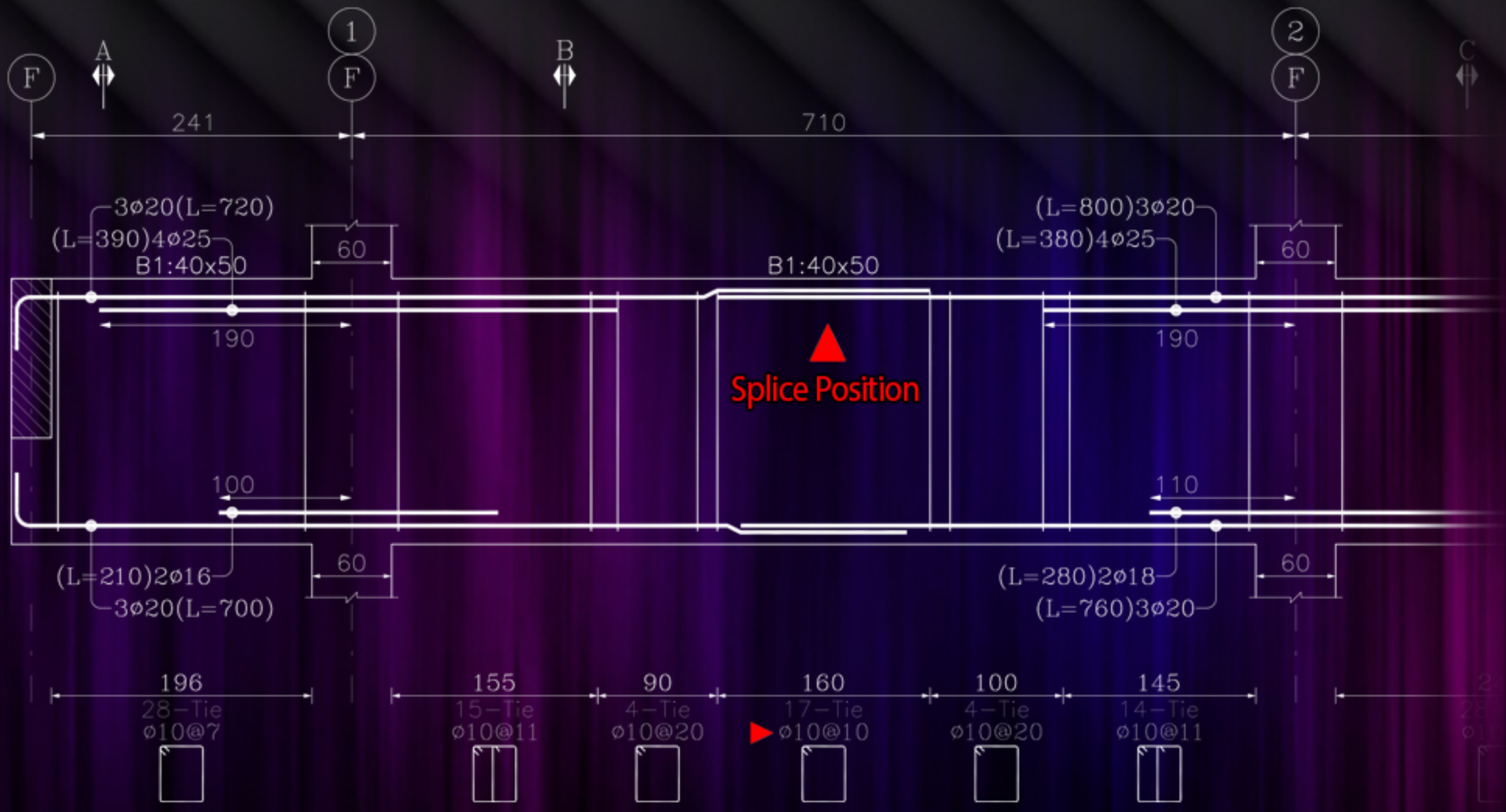
Insert Special Ties at the Splice Positon of the Typical Rebars in Special Moment Frame



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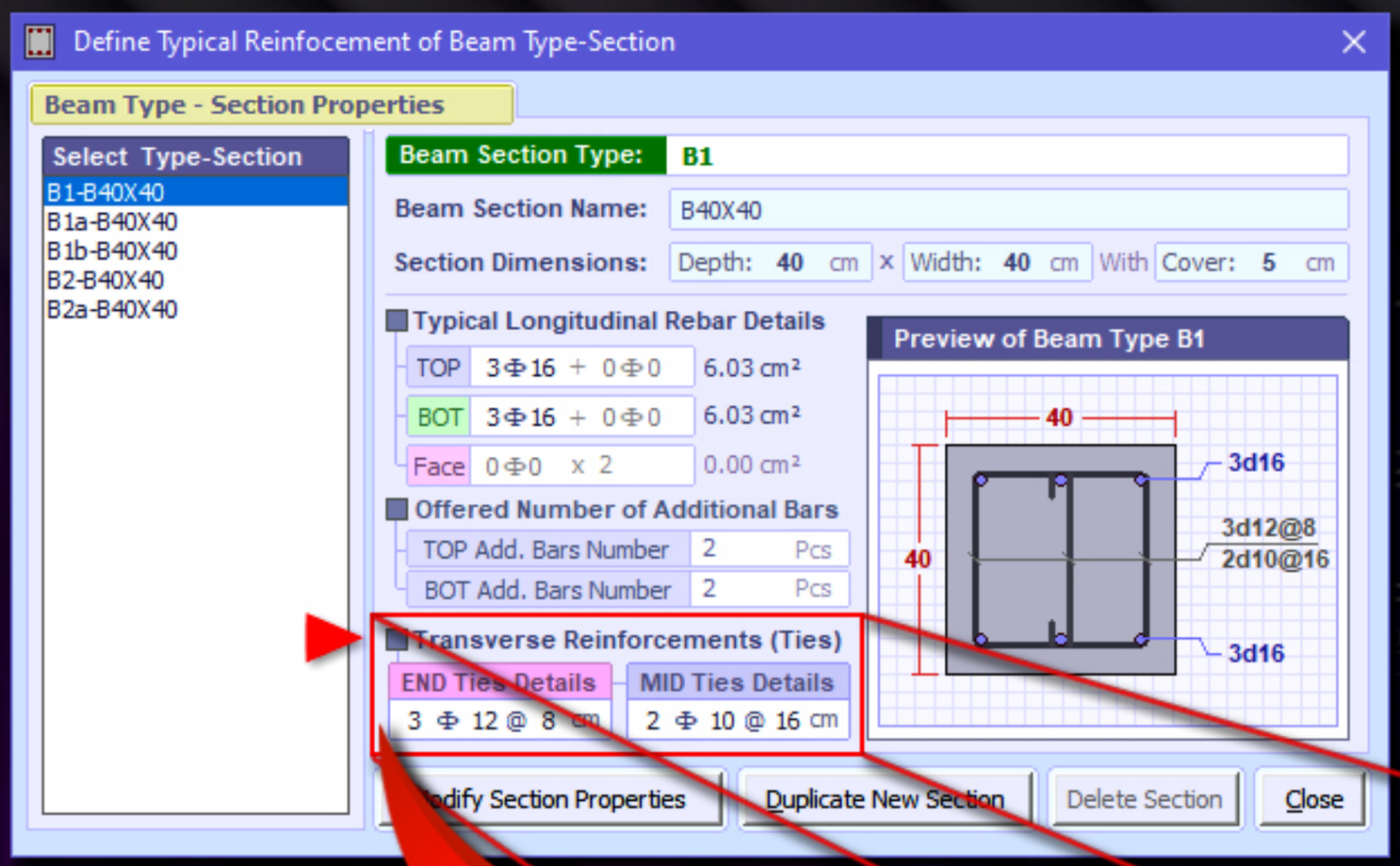
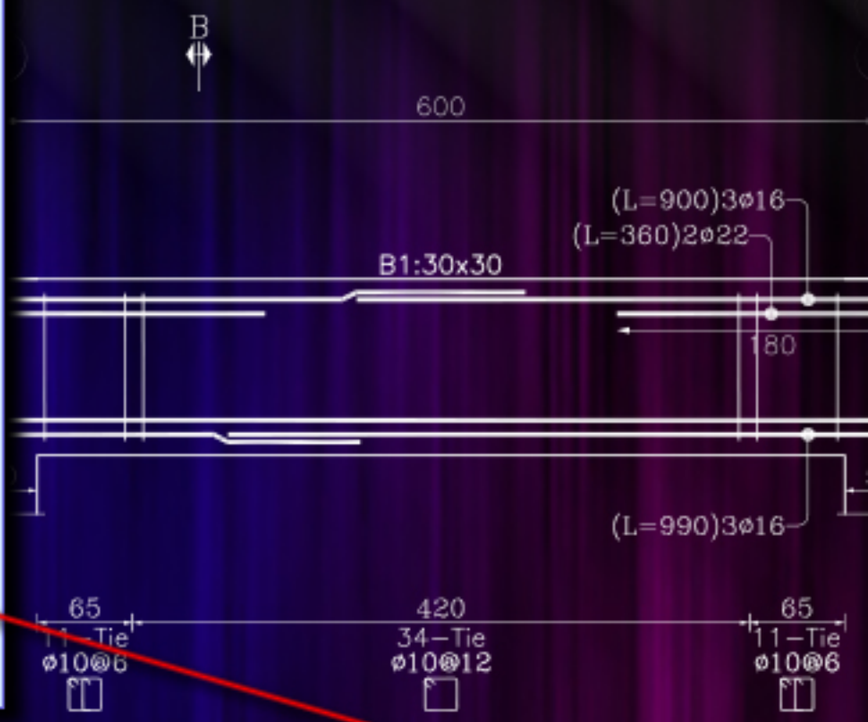
Ability to define diameter, spacing and number of crossties separately for ends and middle of beam





Transverse Reinforcements (Ties)

END Ties Details	MID Ties Details
3 Φ 12 @ 8 cm	2 Φ 10 @ 16 cm

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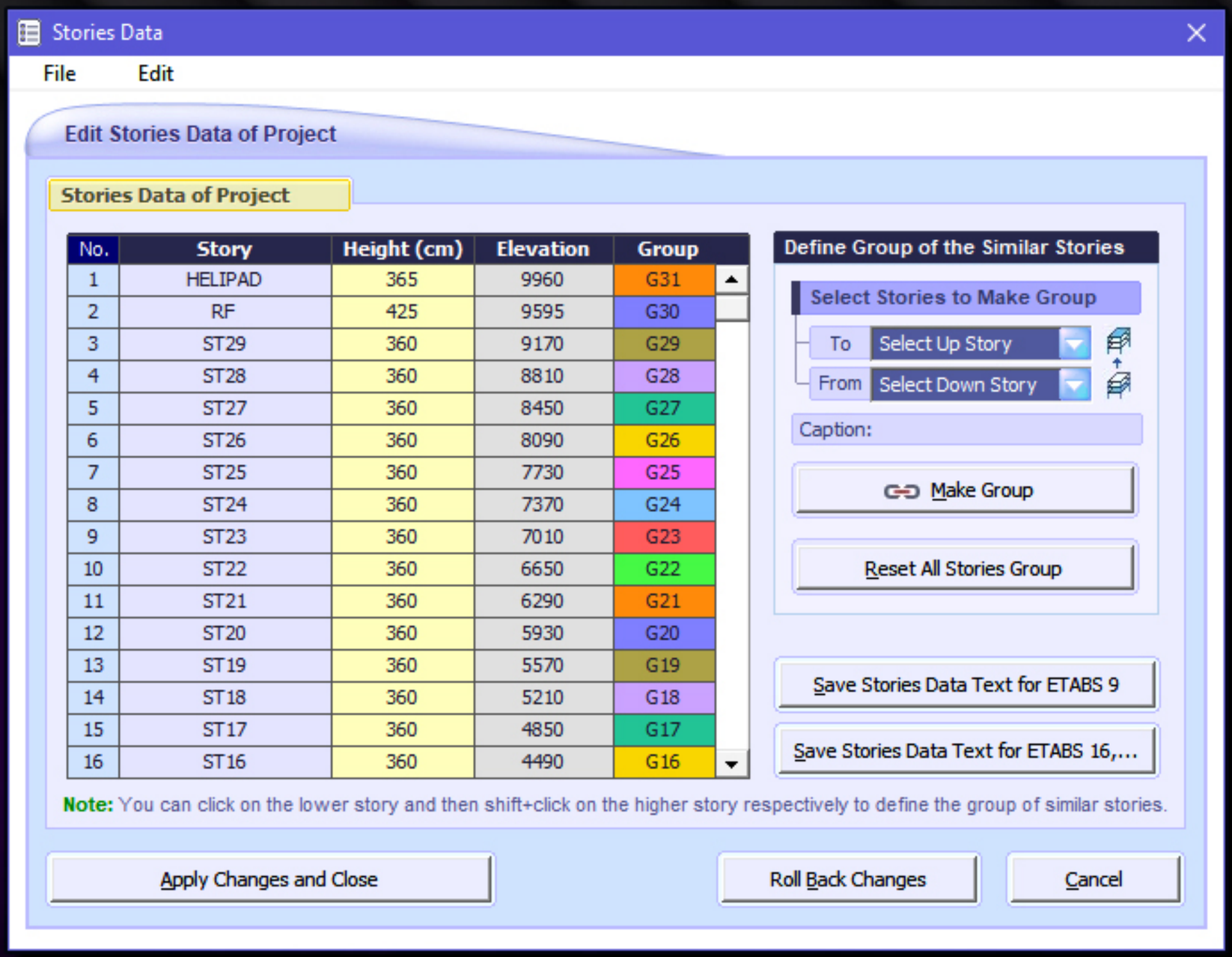
View and edit the informations of the Stories of the structure



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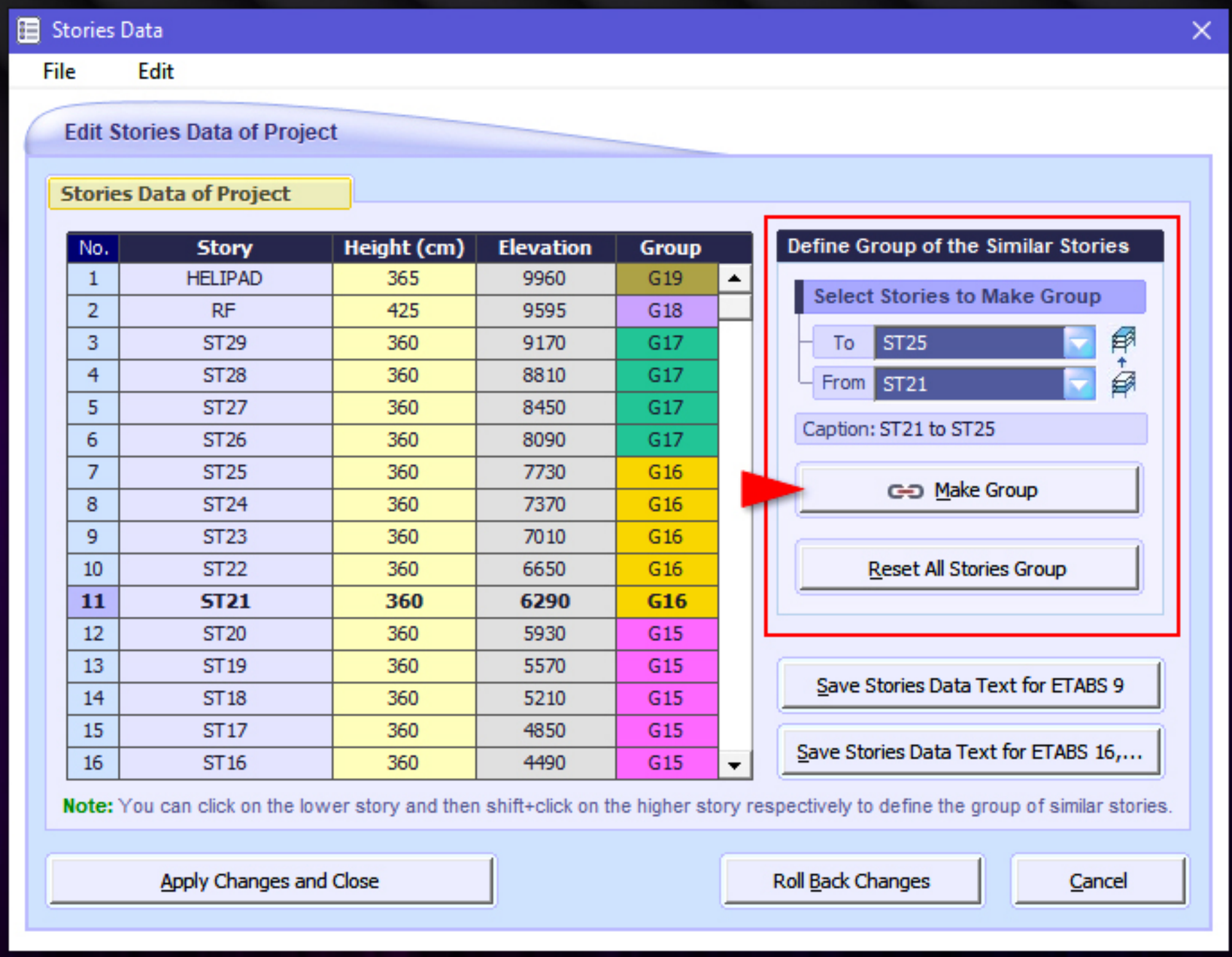
Ability to define Groups for the Similar Stories of the structure



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Addition the object selection modes:

One Story, All Stories, Similar Stories

ETABS MATE - Concrete Structur)4]

File Export View Define Design Reports Display Option Extra Tools Help

M: faraz-02.07.04, D: faraz-02.(SPECIAL Selected: 30pcs Help

ST6 E:890 120 % 12 pt 1 X all st clr

Object Display

- Display Axis Bubble
- Display Beam Diagrams
- Display Additional Rebar

Layer Display

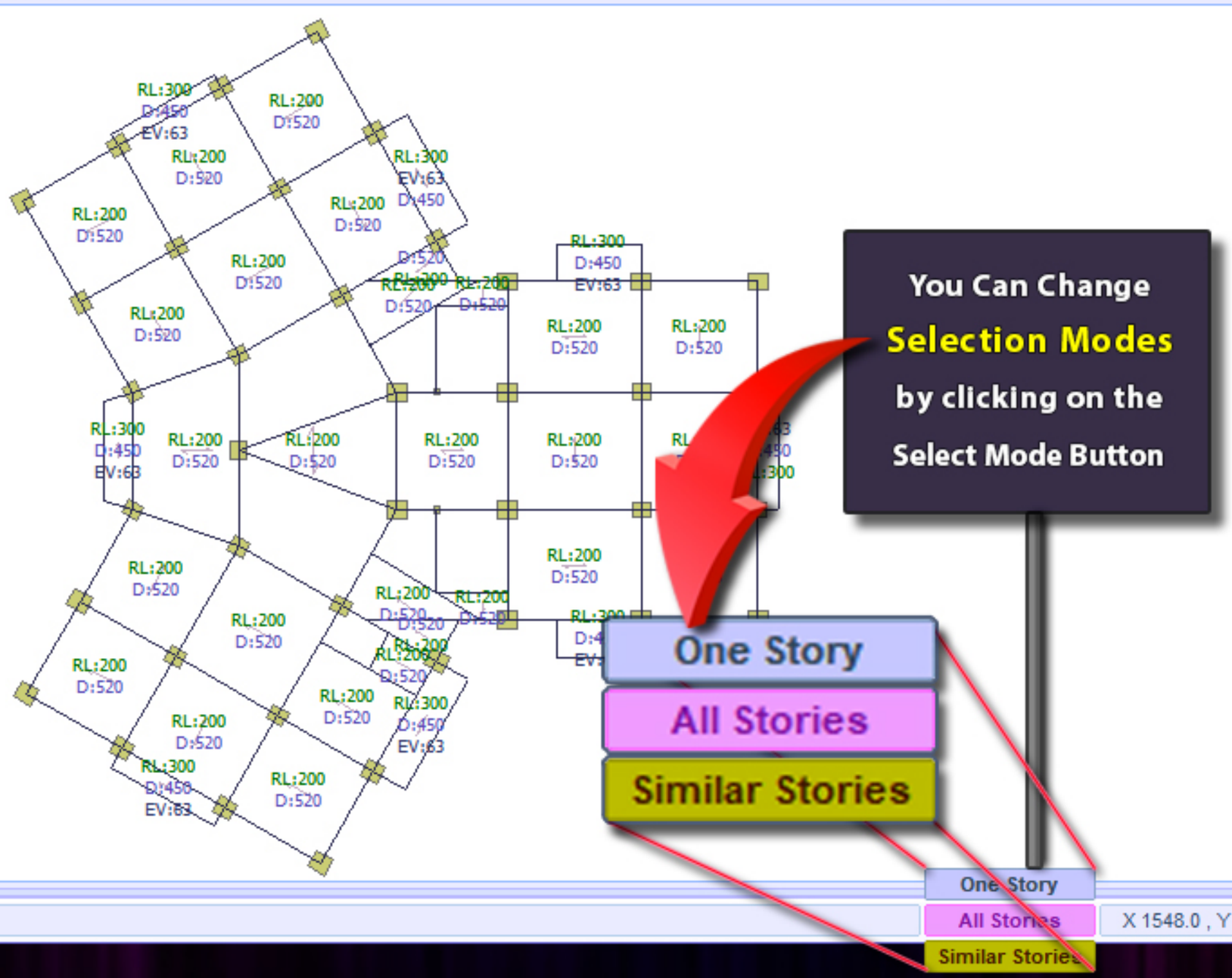
- Beam Label - Length
- Beam Type - Section
- Floor - Deck Rib Details
- Floor Loading Details
- Wall - Pier Information
- Column Type - Information
- Typical Longitudinal Rebar
- Flexural Reinforcing Area
- Shear Reinforcing Area
- Torsional Reinforcing Area
- Shear - Torsion Ties
- Joint Shear Informations
- Additional Rebar Steel Area
- Top Additional Reinforcing
- Bot Additional Reinforcing
- Total Beam Details
- Beam Profile Details

Rebar Configuration

- Define Beam Type
- Assign Section to Beam
- Design Configuration
- Design Reinforcing

Eye90 - Floor Uniform Loading Details (kg/m²)

Units: kgf,cm



Ready.

X 1548.0 , Y -238.2

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User interface for viewing and editing the Project Grid Lines Data

GRID Lines Data

File Edit Sort and Relable Grid Lines

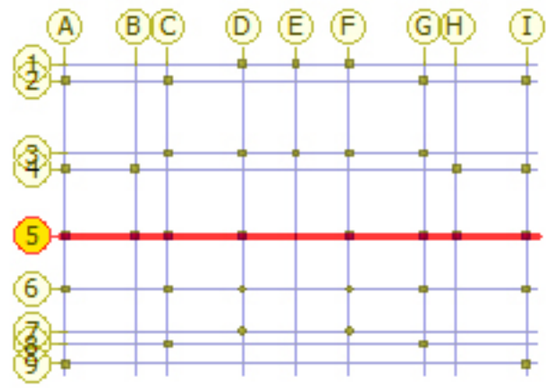
Edit Project Grid Lines Data

Project Grid Lines Data

X Direction Grid Lines		
No.	GRID ID	X Ordinate (cm)
1	A	-140
2	B	320
3	C	535
4	D	1030
5	E	1380
6	F	1730
7	G	2225
8	H	2440
9	I	2900
10		
11		
12		
13		
14		
15		

Y Direction Grid Lines		
No.	GRID ID	Y Ordinate (cm)
1	9	0
2	8	130
3	7	215
4	6	495
5	5	845
6	4	1285
7	3	1385
8	2	1865
9	1	1975
10		
11		
12		
13		
14		
15		

Project Grid Lines Preview



Delete Selected Grid Line

Insert Grid Line Before Selected Row

Regenerate Grid Lines Automatically

Apply Changes and Close

Roll Back Changes

Cancel

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Generating and sorting the Grid Lines of project automaticlly

GRID Lines Data

File Edit Sort and Relable Grid Lines

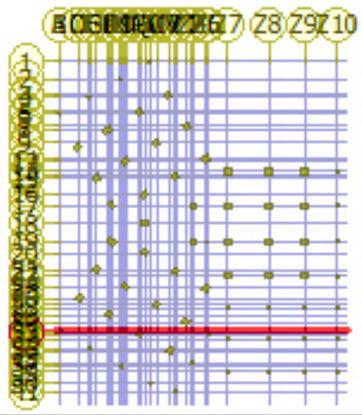
Edit Project Grid Lines Data

Project Grid Lines Data

X Direction Grid Lines		
No.	GRID ID	X Ordinate (cm)
13	M	712.1
14	N	775
15	O	782.5
16	P	1004.6
17	Q	1024.6
18	R	1097.5
19	S	1178.9
20	T	1197.1
21	U	1294.6
22	V	1302.1
23	W	1489.6
24	X	1509.6
25	Y	1603.2
26	Z	1617.1
27	Z1	1779.6

Y Direction Grid Lines		
No.	GRID ID	Y Ordinate (cm)
2	40	-3901.3
3	39	-3708.4
4	38	-3621.3
5	37	-3567.8
6	36	-3360.1
7	35	-3321.3
8	34	-3163.4
9	33	-3100.2
10	32	-3080.1
11	31	-3041.3
12	30	-2892.4
13	29	-2780.1
14	28	-2653.4
15	27	-2612.4
16	26	-2500.1

Project Grid Lines Preview



Delete Selected Grid Line

Insert Grid Line Before Selected Row

Regenerate Grid Lines Automatically

Apply Changes and Close

Roll Back Changes

Cancel

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Insert schematic ties image that indicating the number of tie legs in beam drawings