

# Structure Point

CONCRETE SOFTWARE SOLUTIONS

sp slab

sp column

sp mats

sp beam

sp frame

sp wall

Work quickly.  
Work simply.  
Work accurately.

## StructurePoint's Productivity Suite of powerful software tools for reinforced concrete analysis & design

**sp wall**

Finite element analysis & design of reinforced, precast ICF & tilt-up concrete walls

**sp column**

Design & investigation of rectangular, round & irregularly shaped concrete column sections

**sp mats**

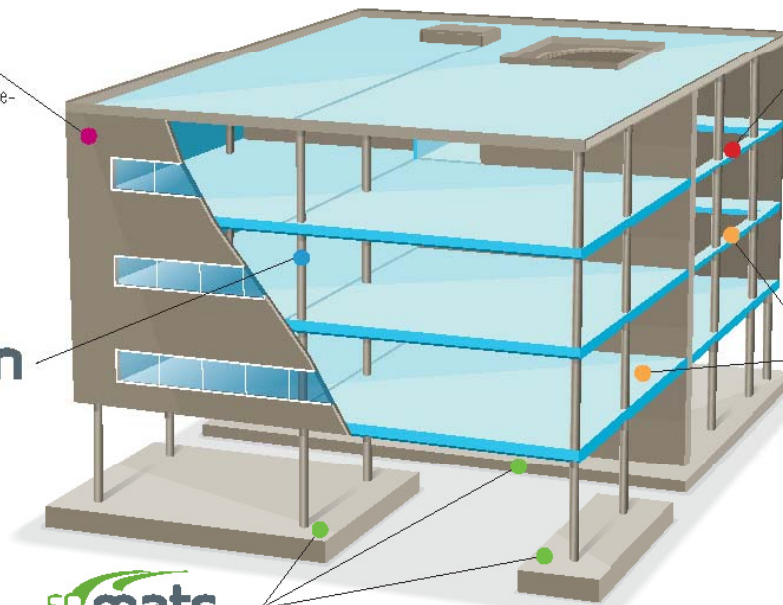
Finite element analysis & design of reinforced concrete foundations, combined footings or slabs on grade

**sp beam**

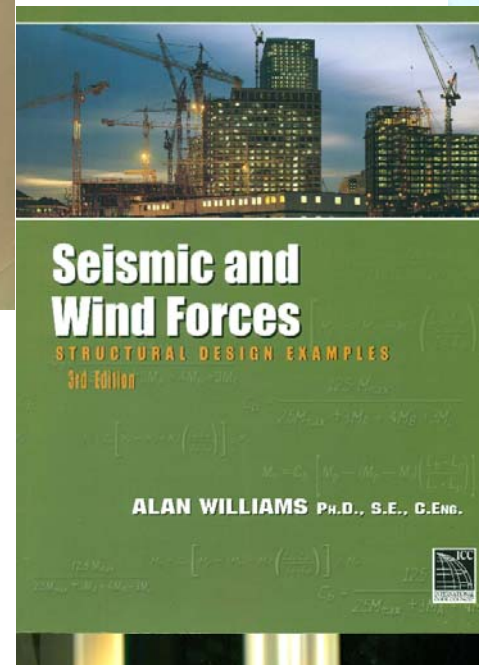
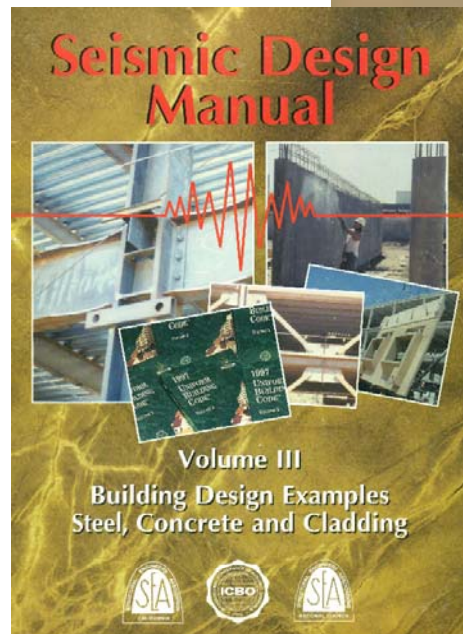
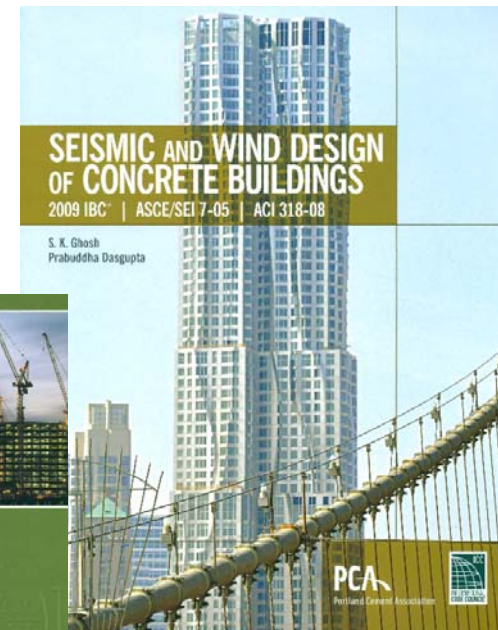
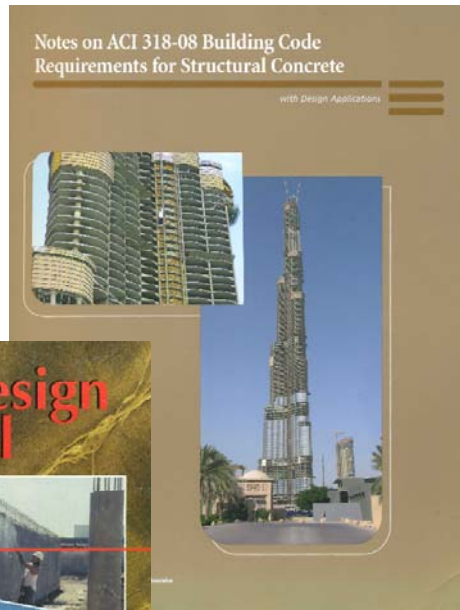
Analysis, design & investigation of reinforced concrete beams & one-way slab systems

**sp slab**

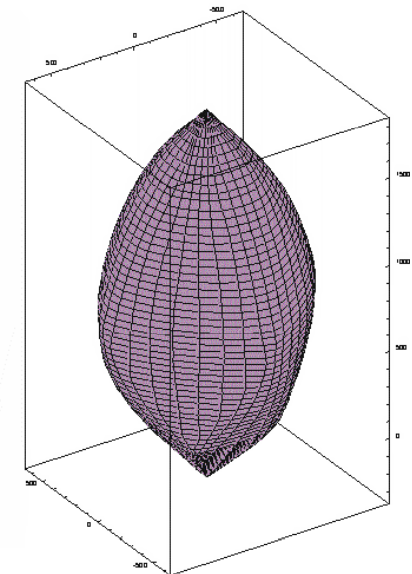
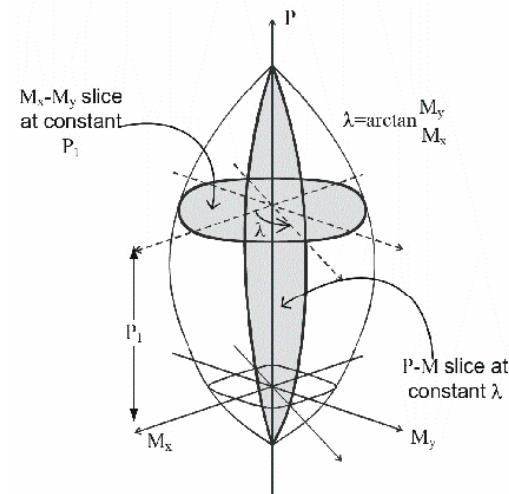
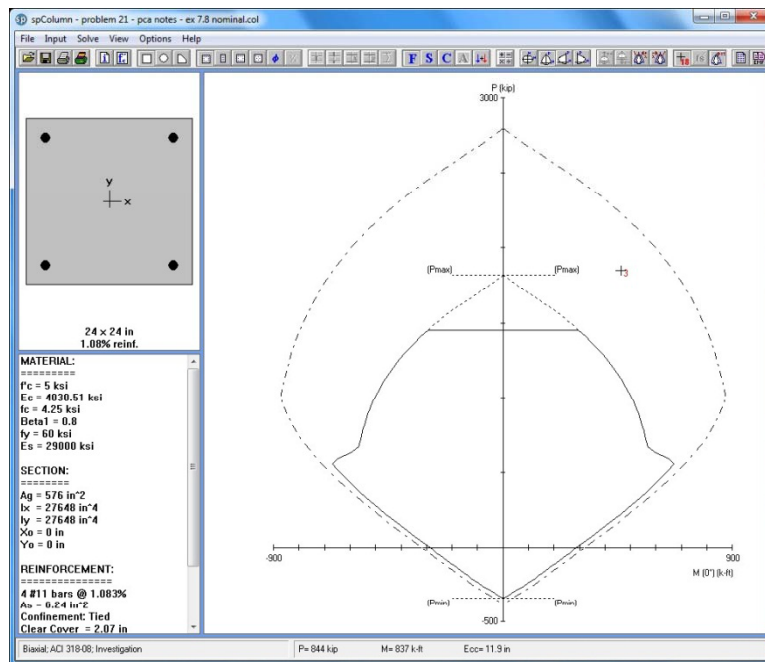
Analysis, design & investigation of reinforced concrete beams & slab systems



# The Industry Standard



- Design and investigation of rectangular, round, or irregular concrete sections including slenderness effects



# Options



- **Codes:** ACI 318-11/08/05/02  
CSA A23.3-04/94
- **Units:** English or Metric
- **Run Axis:** X, Y or Biaxial
- **Run Options:** Design or Investigation
- **Slenderness:** Yes or No

General Information

Labels  
Project:  
Column: Engineer:

Units  
 English  
 Metric

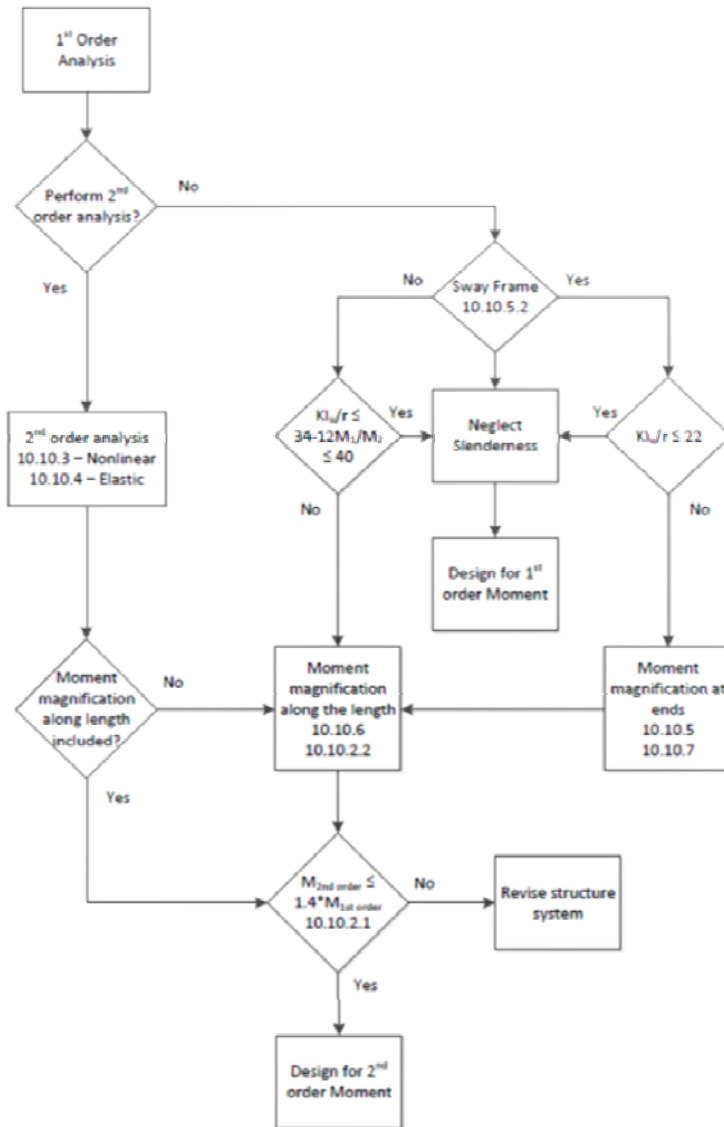
Run Option  
 Investigation  
 Design

Run Axis  
 About X-Axis  
 About Y-Axis  
 Biaxial

Design Code  
 ACI 318-11  
 ACI 318-08  
 ACI 318-05  
 ACI 318-02  
 CSA A23.3-04  
 CSA A23.3-94

Consider slenderness?  Yes  No

OK Cancel



# Slenderness

## Design Column

Slenderness related to the column being considered

The 'Design Column' dialog box is split into two panes for X and Y axes. Each pane includes a 'Clear height' field (16 ft), radio buttons for 'Nonsway frame' and 'Sway frame' (Sway frame is selected), and 'Sway criteria' with fields for (Sum Pc)/(Pc) and (Sum Pu)/(Pu). There are also checkboxes for '2nd order effects along length'. Below these are 'Effective length factors' with radio buttons for 'Compute k' factors and 'Input k' factors, and fields for k(in) and k(e).

## Beams

Slenderness related to beams

The 'X-Beams (perpendicular to X)' dialog box has a 'Beam Location' section with radio buttons for 'Above Left', 'Above Right', 'Below Left', and 'Below Right'. Below is a 'Beam Above Left' section with a 'No beam specified' checkbox and a 'Copy From Beam Right' button. It also contains fields for 'Span (c/c)', 'Width', 'Depth', 'f'c', 'Ec', and 'Inertia'.

## Columns Above and Below

Slenderness related to columns above and below the design column

The 'Columns Above and Below' dialog box has two panes: 'Column Above' and 'Column Below'. Each pane has a 'No column specified' checkbox and fields for 'Height (c/c)', 'Width (along X)', 'Depth (along Y)', 'Concrete, f'c', and 'Ec'. There are 'Copy to Column Below' and 'Copy to Column Above' buttons at the bottom.

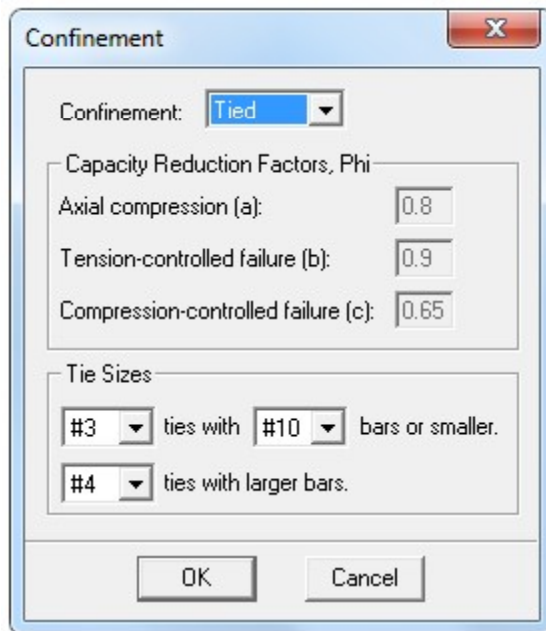
## Factors

Factors that affect slenderness calculations

The 'Slenderness Factors' dialog box has radio buttons for 'Code defaults' and 'User-defined'. It includes a 'Stiffness reduction factor' field (0.75) and a 'Cracked-section coefficients' section with fields for 'Beams (clb)' (0.35) and 'Columns (clc)' (0.7).

# Reinforcement Options

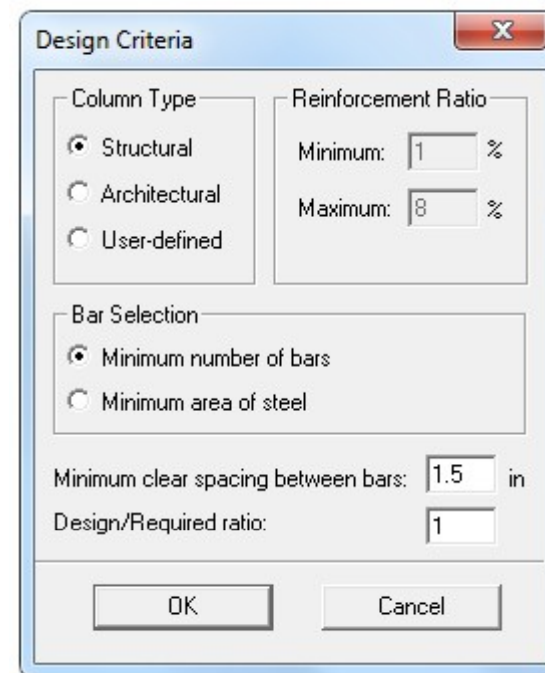
## ■ Confinement



Confinement dialog box settings:

- Confinement: Tied
- Capacity Reduction Factors, Phi:
  - Axial compression (a): 0.8
  - Tension-controlled failure (b): 0.9
  - Compression-controlled failure (c): 0.65
- Tie Sizes:
  - #3 ties with #10 bars or smaller.
  - #4 ties with larger bars.

## ■ Design Criteria



Design Criteria dialog box settings:

- Column Type:
  - Structural
  - Architectural
  - User-defined
- Reinforcement Ratio:
  - Minimum: 1 %
  - Maximum: 8 %
- Bar Selection:
  - Minimum number of bars
  - Minimum area of steel
- Minimum clear spacing between bars: 1.5 in
- Design/Required ratio: 1



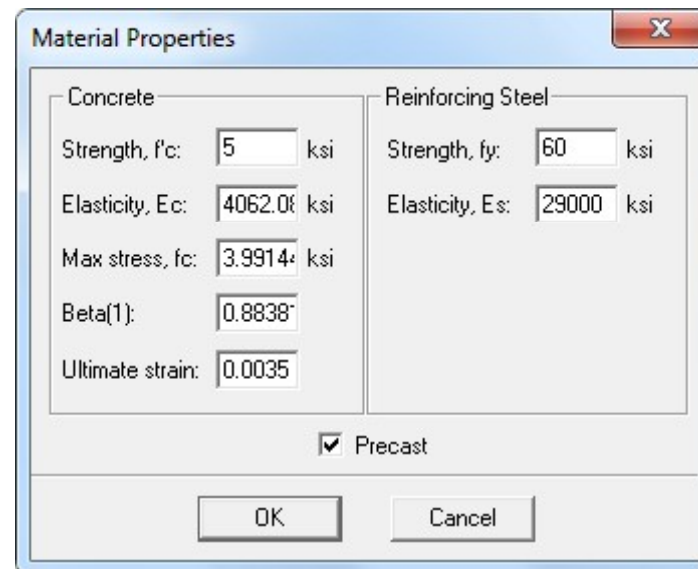
# Material Properties

## ■ Concrete:

$f'_c$ ,  $E_c$ ,  $f_c$ ,  $\beta_1$ , and  $\epsilon_c$

## ■ Steel:

$f_y$  and  $E_s$



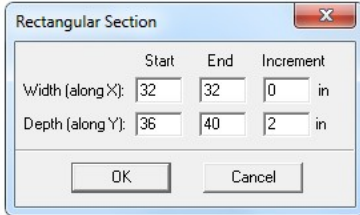
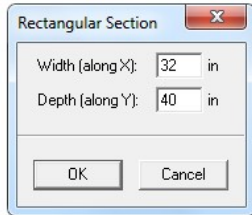
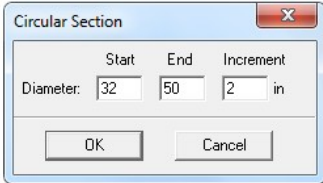
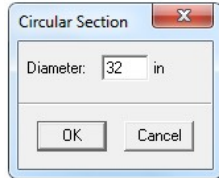
The image shows a software dialog box titled "Material Properties". It is divided into two main sections: "Concrete" and "Reinforcing Steel".

Concrete	Reinforcing Steel
Strength, $f'_c$ : 5 ksi	Strength, $f_y$ : 60 ksi
Elasticity, $E_c$ : 4062.08 ksi	Elasticity, $E_s$ : 29000 ksi
Max stress, $f_c$ : 3.9914 ksi	
Beta(1): 0.8838	
Ultimate strain: 0.0035	

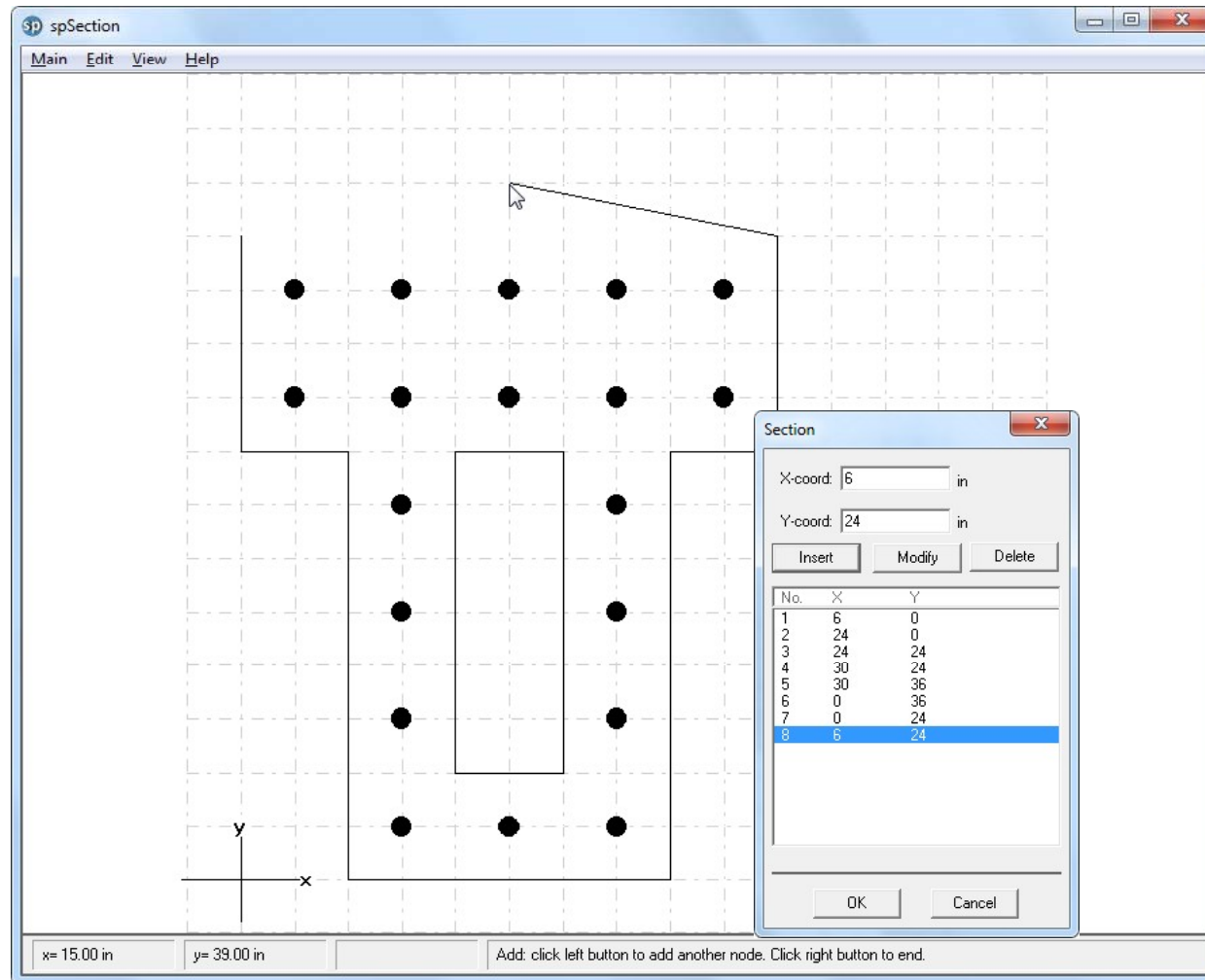
At the bottom of the dialog, there is a checked checkbox labeled "Precast". Below the checkbox are two buttons: "OK" and "Cancel".

Precast (CSA only)

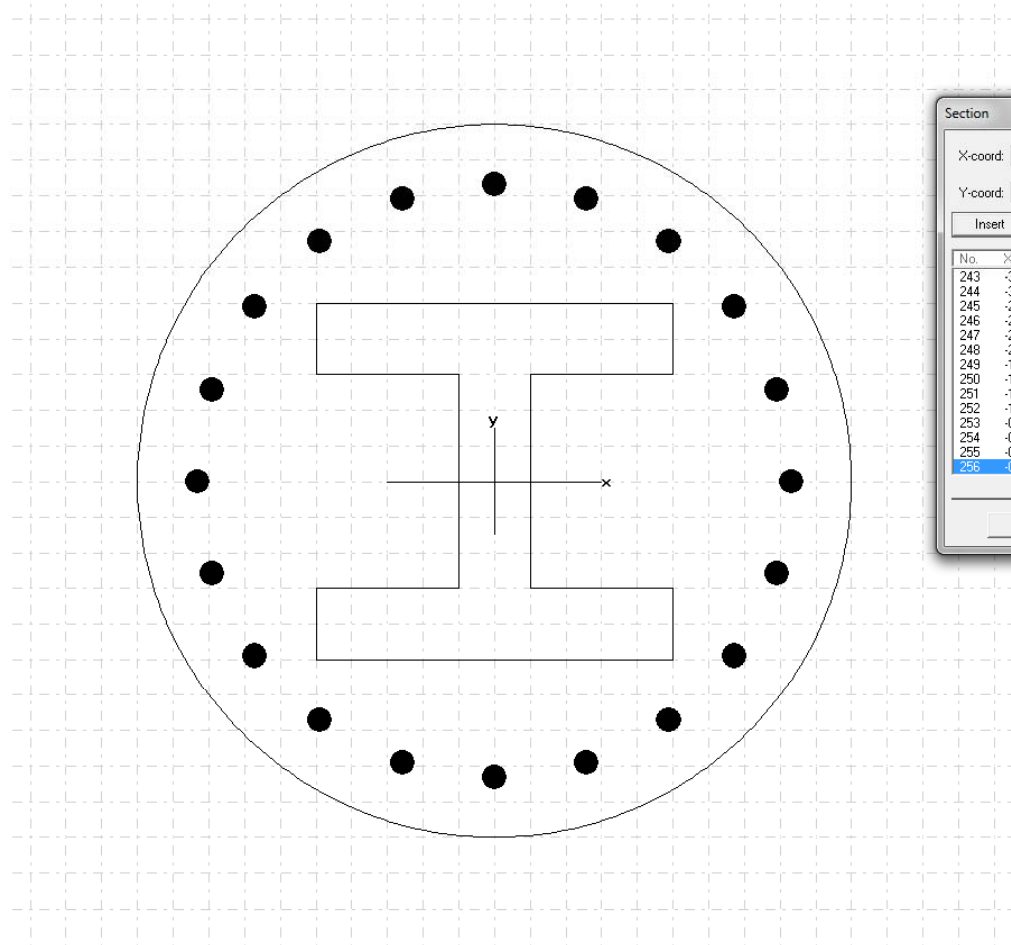
# Section

	Design	Investigation
<input type="checkbox"/> <b>Rectangular:</b>	 <p>Rectangular Section dialog box for Design mode. Fields: Width (along X): 32, 32, 0 in; Depth (along Y): 36, 40, 2 in.</p>	 <p>Rectangular Section dialog box for Investigation mode. Fields: Width (along X): 32 in; Depth (along Y): 40 in.</p>
<input checked="" type="checkbox"/> <b>Circular:</b>	 <p>Circular Section dialog box for Design mode. Fields: Diameter: 32, 50, 2 in.</p>	 <p>Circular Section dialog box for Investigation mode. Field: Diameter: 32 in.</p>
<input type="checkbox"/> <b>Irregular:</b>		<ul style="list-style-type: none"><li>• Irregular Section Editor</li><li>• Import Geometry</li></ul>

# Irregular Sections



# Irregular Sections



Section

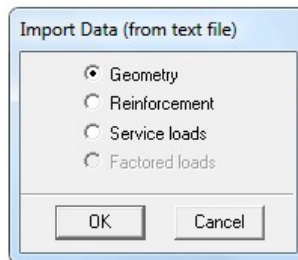
X-coord: 0.245413 in  
Y-coord: 9.99699 in

Insert Modify Delete

No.	X	Y
243	-3.3689	9.41544
244	-3.13682	9.49528
245	-2.90285	9.5694
246	-2.66713	9.63776
247	-2.4298	9.70031
248	-2.19101	9.75702
249	-1.9509	9.80785
250	-1.70962	9.85278
251	-1.46731	9.89176
252	-1.22411	9.9248
253	-0.980172	9.95185
254	-0.735646	9.9729
255	-0.490677	9.98795
256	0.245413	9.99699

OK Cancel

# Irregular Sections



### Geometry Data:

```

No_Of_Section_Nodes
Xs1 Ys1
Xs2 Ys2
.
.
.
Xsn Ysn
No_Of_Opening_Nodes
Xo1 Yo1
Xo2 Yo2
.
.
.
Xon Yon
    
```

Templates.xls [Read-Only] [Compatibility Mode] - Microsoft Excel

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D5 fx 30

1 Input Output


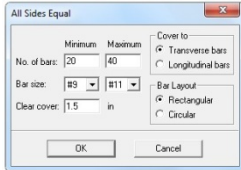


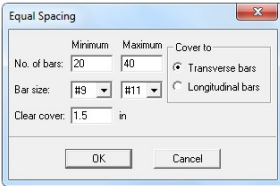
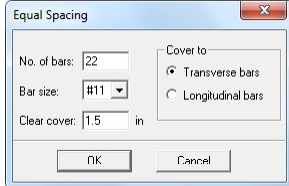


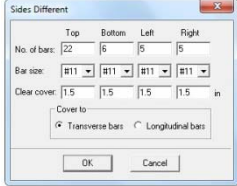

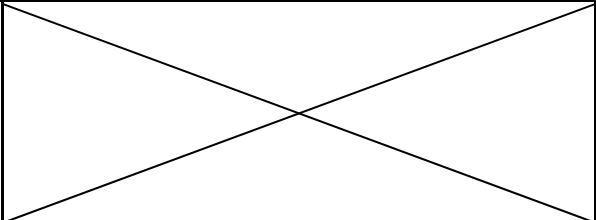
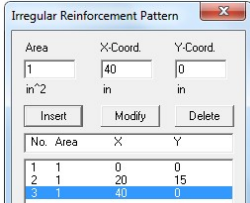
2 Notes: 1. No units are used. It is the user's responsibility to maintain the consistency of units 2. Diagram scales are fixed. They may be changed if ne  
3. Do not delete or move output data cells. Otherwise the exported data might be incorrect.

5 Center-to-Center Width in X: 30  
6 Height in Y: 38  
7 Reinforcement Ring Diameter: 33  
8 Left Reinforcement Area per bar: 0.5  
9 Right Reinforcement Area per bar: 0.5

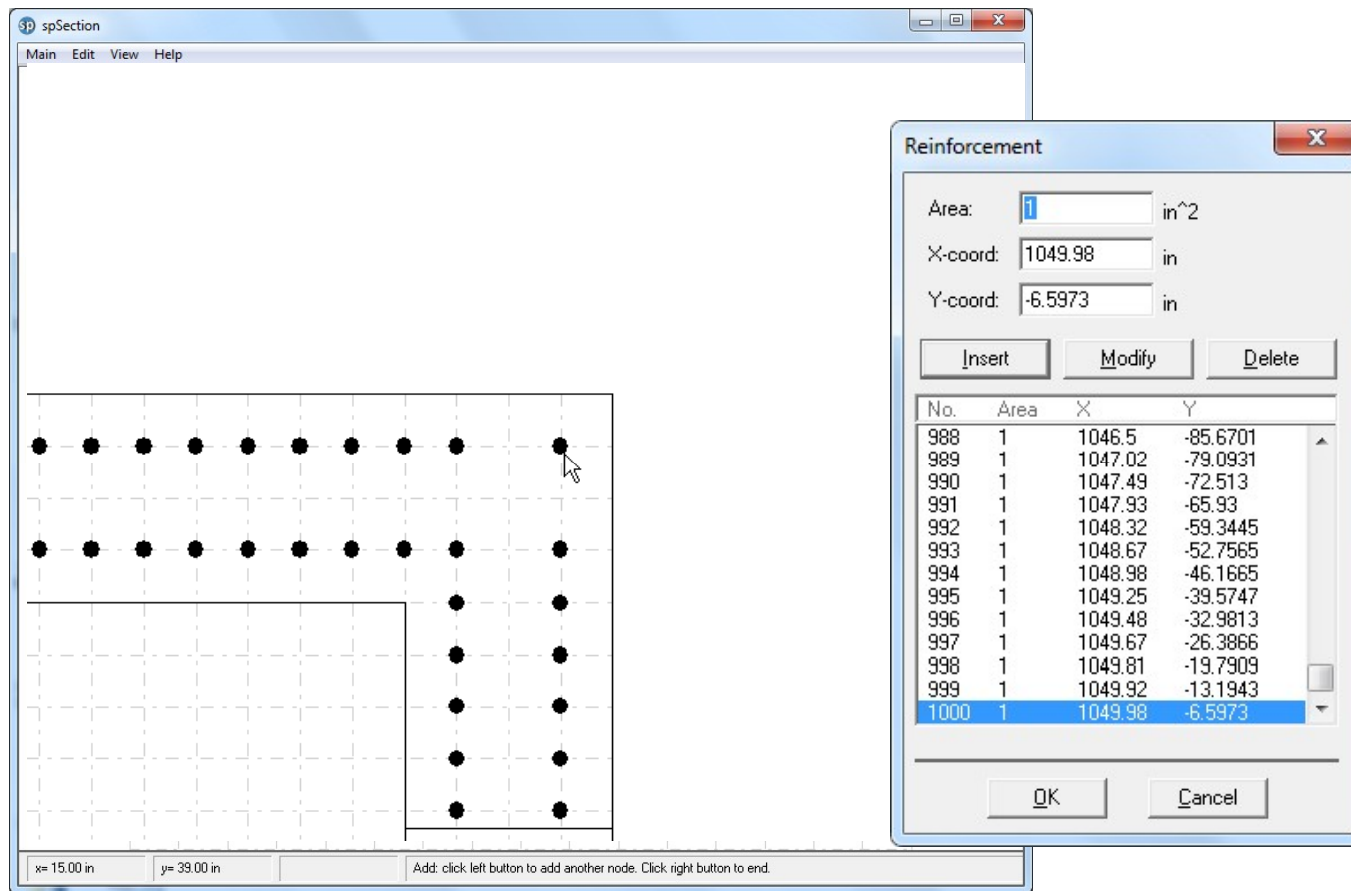
Export Geometry  
Export Reinforcement

Geometry					
Degree	Radian	x-base	y-base	X	Y
0.000	0.000	19.000	0.000	34.000	0.000
10.000	0.175	18.711	3.299	33.711	3.299
20.000	0.349	17.854	6.498	32.854	6.498
30.000	0.524	16.454	9.500	31.454	9.500
40.000	0.698	14.555	12.213	29.555	12.213
50.000	0.873	12.213	14.555	27.213	14.555
60.000	1.047	9.500	16.454	24.500	16.454
70.000	1.222	6.498	17.854	21.498	17.854
80.000	1.396	3.299	18.711	18.299	18.711
90.000	1.571	0.000	19.000	15.000	19.000
90.000	1.571	0.000	19.000	-15.000	19.000
100.000	1.745	-3.299	18.711	-18.299	18.711
110.000	1.920	-6.498	17.854	-21.498	17.854
120.000	2.094	-9.500	16.454	-24.500	16.454
130.000	2.269	-12.213	14.555	-27.213	14.555
140.000	2.443	-14.555	12.213	-29.555	12.213
150.000	2.618	-16.454	9.500	-31.454	9.500
160.000	2.793	-17.854	6.498	-32.854	6.498
170.000	2.967	-18.711	3.299	-33.711	3.299
180.000	3.142	-19.000	0.000	-34.000	0.000
190.000	3.316	-18.711	-3.299	-33.711	-3.299
200.000	3.491	-17.854	-6.498	-32.854	-6.498
210.000	3.665	-16.455	-9.500	-31.455	-9.500
220.000	3.840	-14.555	-12.213	-29.555	-12.213
230.000	4.014	-12.213	-14.555	-27.213	-14.555
240.000	4.189	-9.500	-16.454	-24.500	-16.454
250.000	4.363	-6.498	-17.854	-21.498	-17.854
260.000	4.538	-3.299	-18.711	-18.299	-18.711
270.000	4.712	0.000	-19.000	-15.000	-19.000

# Reinforcement

	Design	Investigation
 <b>All Sides Equal:</b>		
 <b>Equal Spacing:</b>		
 <b>Sides Different:</b>		
 <b>Irregular:</b>		

# Irregular Reinforcement



The screenshot displays the spSection software interface. The main window shows a grid of reinforcement nodes forming an irregular shape. A dialog box titled "Reinforcement" is open, showing the properties for a selected node (No. 1000).

Reinforcement Dialog Box Fields:

- Area: 1 in<sup>2</sup>
- X-coord: 1049.98 in
- Y-coord: -6.5973 in

Buttons: Insert, Modify, Delete, OK, Cancel

No.	Area	X	Y
988	1	1046.5	-85.6701
989	1	1047.02	-79.0931
990	1	1047.49	-72.513
991	1	1047.93	-65.93
992	1	1048.32	-59.3445
993	1	1048.67	-52.7565
994	1	1048.98	-46.1665
995	1	1049.25	-39.5747
996	1	1049.48	-32.9813
997	1	1049.67	-26.3866
998	1	1049.81	-19.7909
999	1	1049.92	-13.1943
1000	1	1049.98	-6.5973

Status Bar: x= 15.00 in y= 39.00 in Add: click left button to add another node. Click right button to end.

# Irregular Reinforcement

Import Data (from text file)

Geometry  
 Reinforcement  
 Service loads  
 Factored loads

OK Cancel

## Reinforcement Data:

No\_Of\_Bars  
 A1 X1 Y1  
 .  
 .  
 An Xn Yn

Templates.xls [Read-Only] [Compatibility Mode] - Microsoft Excel

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L28    fx    =J28-\$D\$6/2

Notes: 1. No units are used. It is the user's responsibility to maintain the consistency of units. 2. Diagram scales are fixed. They may be c  
 3. Do not delete or move output data cells. Otherwise the exported data might be incorrect.

Center-to-Center Width in X:	40	Export Geometry
Height in Y:	30	Export Reinforcement
Reinforcement Ring Diameter:	25	
Reinforcement Area per Bar:	0.5	

Geometry					
Degree	Radian	x-base	y-base	X	Y
0.000	0.000	15.000	0.000	35.000	0.000
10.000	0.175	14.772	2.605	34.772	2.605
20.000	0.349	14.095	5.130	34.095	5.130
30.000	0.524	12.990	7.500	32.990	7.500
40.000	0.698	11.491	9.642	31.491	9.642
50.000	0.873	9.642	11.491	29.642	11.491
60.000	1.047	7.500	12.990	27.500	12.990
70.000	1.222	5.130	14.095	25.130	14.095
80.000	1.396	2.605	14.772	22.605	14.772
90.000	1.571	0.000	15.000	20.000	15.000
90.000	1.571	0.000	15.000	-20.000	15.000
100.000	1.745	-2.605	14.772	-22.605	14.772
110.000	1.920	-5.130	14.095	-25.130	14.095
120.000	2.094	-7.500	12.990	-27.500	12.990
130.000	2.269	-9.642	11.491	-29.642	11.491
140.000	2.443	-11.491	9.642	-31.491	9.642
150.000	2.618	-12.990	7.500	-32.990	7.500
160.000	2.793	-14.095	5.130	-34.095	5.130
170.000	2.967	-14.772	2.605	-34.772	2.605
180.000	3.142	-15.000	0.000	-35.000	0.000
190.000	3.316	-14.772	-2.605	-34.772	-2.605
200.000	3.491	-14.095	-5.130	-34.095	-5.130
210.000	3.665	-12.990	-7.500	-32.990	-7.500
220.000	3.840	-11.491	-9.642	-31.491	-9.642
230.000	4.014	-9.642	-11.491	-29.642	-11.491
240.000	4.189	-7.500	-12.990	-27.500	-12.990
250.000	4.363	-5.130	-14.095	-25.130	-14.095

Ready



# Loads

## F Factored Loads

Import Data (from text file)

- Geometry
- Reinforcement
- Service loads
- Factored loads

OK Cancel

Factored Loads

Load	X-Moment (kip)	Y-Moment (kip-ft)
120	582	0

Insert Modify Delete

No.	P	Mx	My
18	-780	1048.8	0
19	790	885	0
20	790	-1656	0
21	480	458	0
22	480	-942	0
23	190	129	0
24	190	-132	0
25	-120	-288	0
26	-120	582	0

OK Cancel

## S Service Loads

Mandatory for slenderness

Import Data (from text file)

- Geometry
- Reinforcement
- Service loads
- Factored loads

OK Cancel

Service Loads

	Top	Bot	Top	Bot	Sustained Load (%)
Dead	200	100	200		
Live	250	287	654		
Wind	600	873	768		
EQ	300	378	762		
Snow	0	0	0		

Insert Modify Delete

No IP, Mat, Mob, Myt, Myb for each case

OK Cancel

## A Axial Loads

Uniaxial, short column investigation only

Axial Loads

Initial load (kip)	Final load (kip)	Increment (kip)
-120	582	0

Insert Modify Delete

No.	Initial	Final	Inc
18	-780	1048.8	0
19	790	885	0
20	790	-1656	0
21	480	458	0
22	480	-942	0
23	190	129	0
24	190	-132	0
25	-120	-288	0
26	-120	582	0

OK Cancel

## +/- Load Factors

For service loads only

Load Combinations

Dead	Live	Wind	EQ	Snow
0.8	0	0	-1	0

Insert Modify Delete Defaults

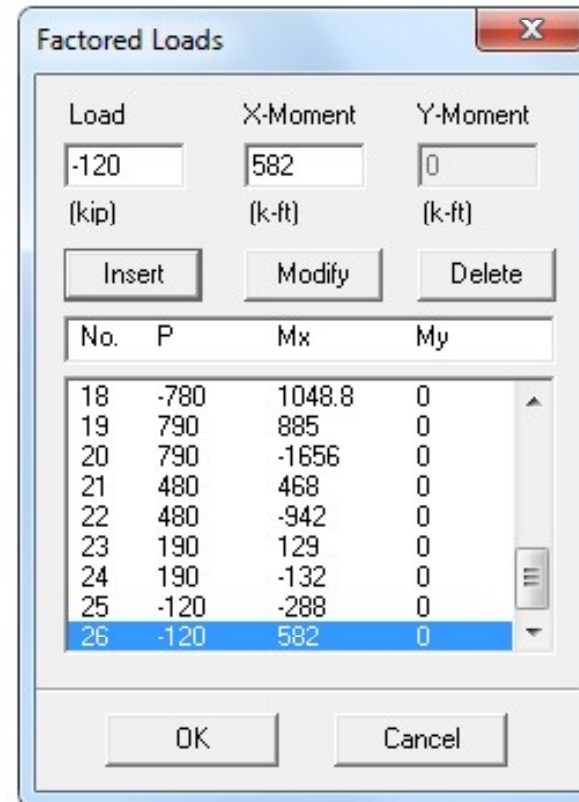
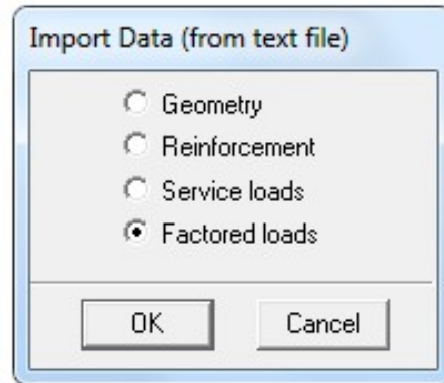
Combo	Dead	Live	Wind	EQ	Snow
U1	1.4	0	0	0	0
U2	1.2	1.6	0	0	0
U3	1.2	1	0	0	0
U4	1.2	0	0.8	0	0
U5	1.2	1	1.6	0	0
U6	0.9	0	1.6	0	0
U7	1.2	0	-0.8	0	0
U8	1.2	1	-1.6	0	0
U9	0.9	0	-1.6	0	0
U10	1.2	1	0	1	0
U11	0.9	0	0	1	0
U12	1.2	1	0	-1	0
U13	0.9	0	0	-1	0

## C Control Point

Investigation Only

$$\phi P_{n,max} / 0.85 \quad \left| \quad \phi P_{n,max} \right. \quad \left. \vphantom{\phi P_{n,max}} \right| \quad f_s = 0.0 \quad \left| \quad f_s = f_y / 2 \quad \left| \quad \vphantom{f_s} \right| \quad \varepsilon_s = f_y / E_s \quad \left| \quad \vphantom{\varepsilon_s} \right| \quad \varepsilon_s = 0.005 \quad \left| \quad \vphantom{\varepsilon_s} \right| \quad P = 0 \quad \left| \quad \phi P_{n,min}$$

# Factored Loads



# Service Loads

Service Loads

	Axial Load (kip)	X-Moments (k-ft)		Y-Moments (k-ft)		Sustained Load (%)
		@ Top	@ Bot	@ Top	@ Bot	
Dead:	200	100	200	0	0	
Live:	250	387	654	0	0	
Wind:	600	873	768	0	0	
EQ:	300	378	762	0	0	
Snow:	0	0	0	0	0	

Buttons: Insert, Modify, Delete

No. [P, Mx, My, Myb] for each case

1. D | 200, 100, 200, 0, 0 | L | 250, 387, 654, 0, 0 | W | 600, 873, 768, 0, 0 | E | 300

Buttons: OK, Cancel

Import Data (from text file)

- Geometry
- Reinforcement
- Service loads
- Factored loads

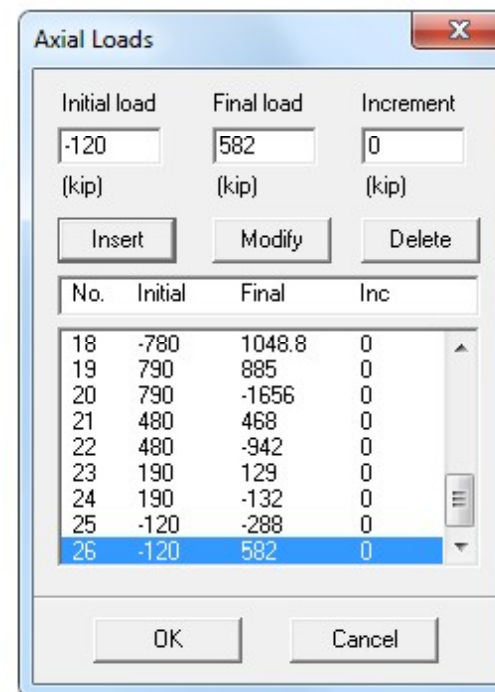
Buttons: OK, Cancel

Load Combinations

	Dead	Live	Wind	EQ	Snow
	0.9	0	0	-1	0
Buttons: Insert, Modify, Delete, Defaults					
Combo	Dead	Live	Wind	EQ	Snow
U1	1.4	0	0	0	0
U2	1.2	1.6	0	0	0
U3	1.2	1	0	0	0
U4	1.2	0	0.8	0	0
U5	1.2	1	1.6	0	0
U6	0.9	0	1.6	0	0
U7	1.2	0	-0.8	0	0
U8	1.2	1	-1.6	0	0
U9	0.9	0	-1.6	0	0
U10	1.2	1	0	1	0
U11	0.9	0	0	1	0
U12	1.2	1	0	-1	0
U13	0.9	0	0	-1	0

# Axial Loads

- For non-slender uniaxial loading only

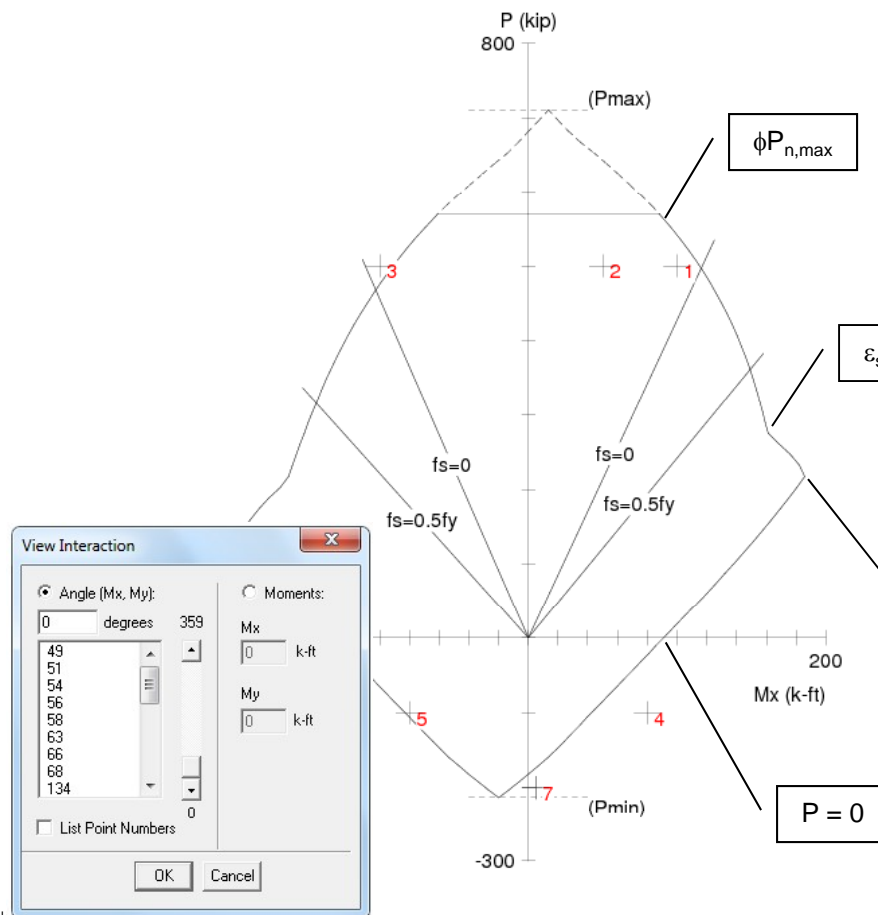


The dialog box titled "Axial Loads" contains three input fields for "Initial load", "Final load", and "Increment", each with a unit of "(kip)". Below these fields are "Insert", "Modify", and "Delete" buttons. A table lists axial load data for various elements, with the last row (No. 26) highlighted in blue. The table has columns for "No.", "Initial", "Final", and "Inc".

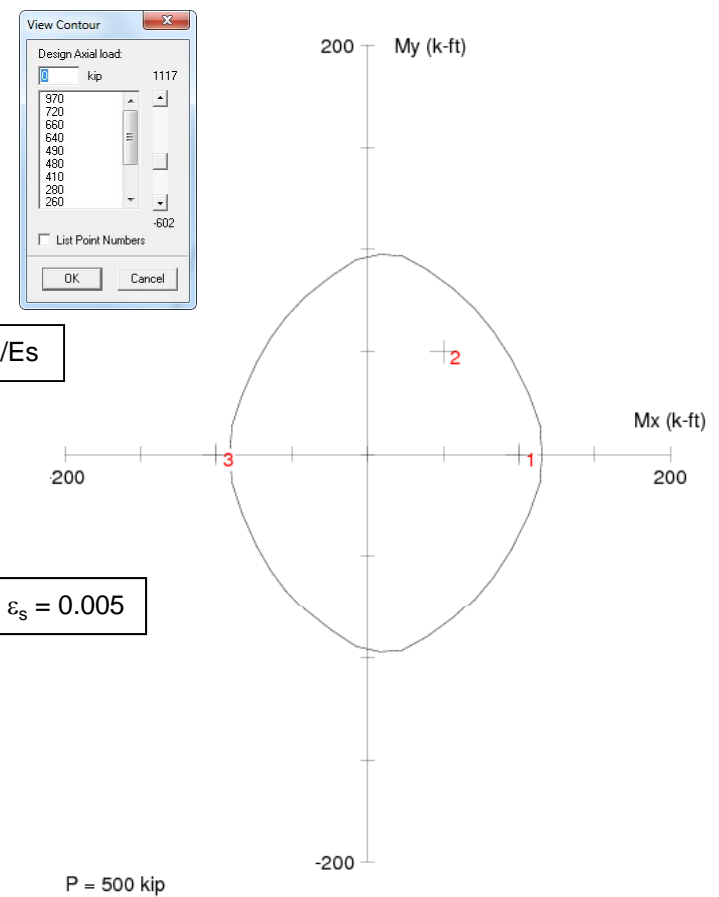
No.	Initial	Final	Inc
18	-780	1048.8	0
19	790	885	0
20	790	-1656	0
21	480	468	0
22	480	-942	0
23	190	129	0
24	190	-132	0
25	-120	-288	0
26	-120	582	0

# Graphical Results

P-M Diagram

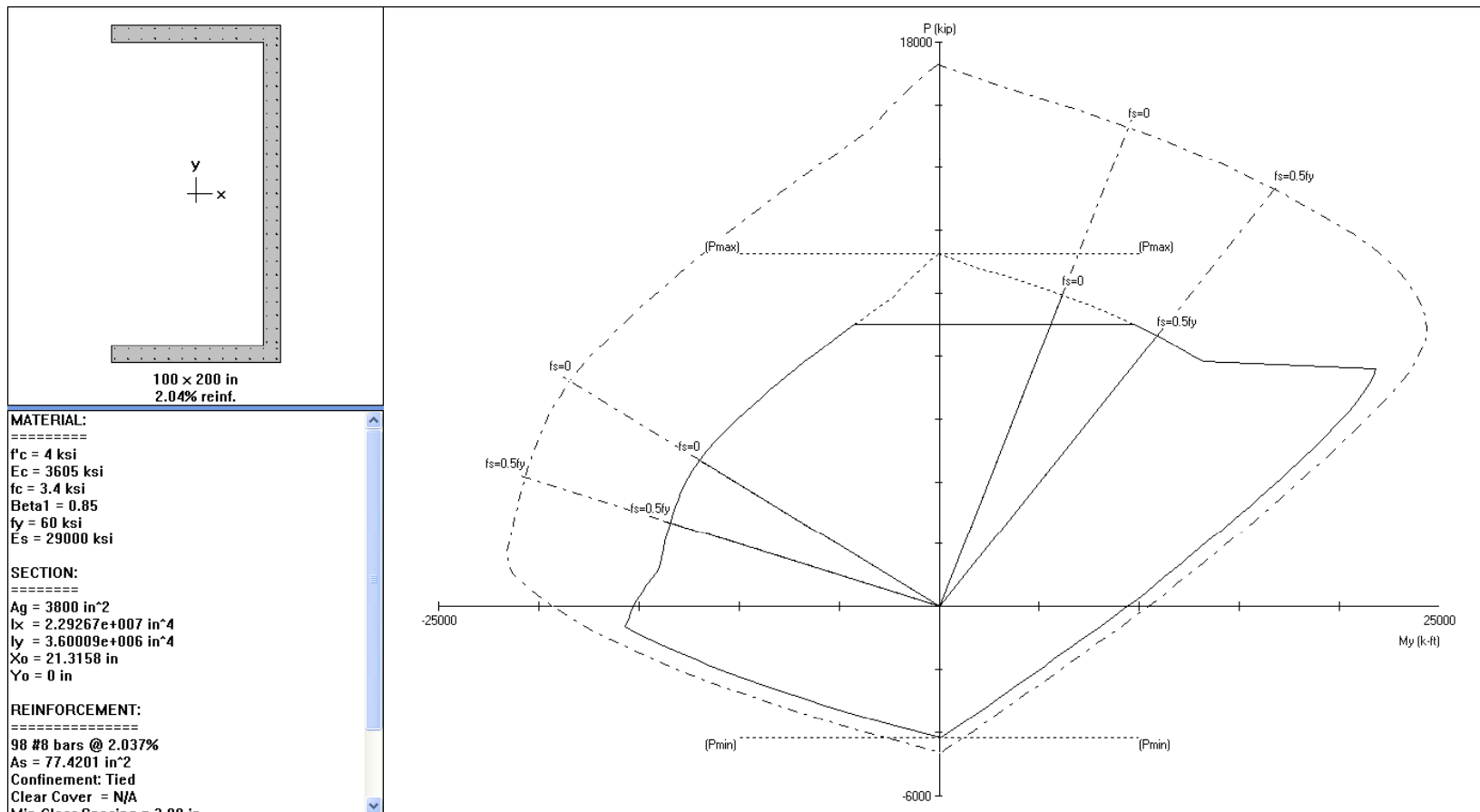


Mx-My Diagram

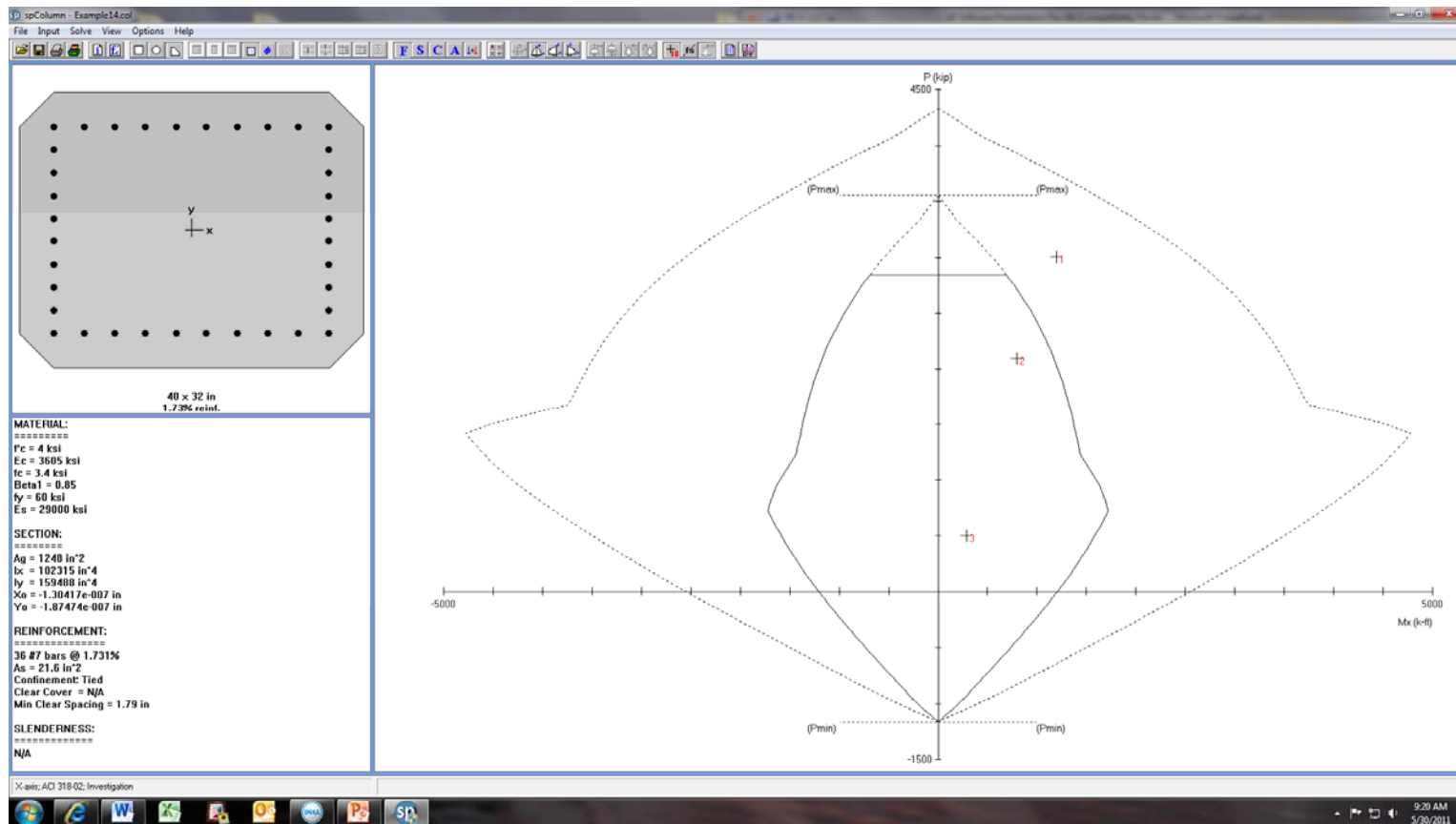


# Graphical Results

## Nominal Interaction Diagram



# Superimposing Diagrams



# Text Results



## Factored Loads and Moments with Corresponding Capacities:

NOTE. Each loading combination includes the following cases.  
 First line - at column top  
 Second line - at column bottom

No.	Combo	Load kip	Pu kip	Mux k-ft	Muy k-ft	PhiMnx k-ft	PhiMny k-ft	PhiMn/Mu	NA depth in	Dt depth in	eps_t	Phi
1	1 U1	280.00	280.00	49.00	61.60	244.58	307.47	4.991	11.75	24.43	0.00325	0.751
2			280.00	-218.40	-47.60	-301.43	-65.70	1.380	14.59	27.22	0.00260	0.695
3	1 U2	640.00	640.00	78.80	124.80	136.96	216.90	1.738	19.64	25.51	0.00090	0.650
4			640.00	-254.40	-60.00	-236.04	-55.67	0.928	19.64	27.25	0.00116	0.650 #
5	1 U3	490.00	490.00	65.00	97.80	162.03	243.79	2.493	16.99	26.14	0.00161	0.650
6			490.00	-229.20	-52.80	-264.31	-60.89	1.153	17.41	27.21	0.00169	0.650
7	1 U4	480.00	480.00	62.80	122.40	130.13	253.63	2.072	17.13	26.88	0.00171	0.650
8			480.00	-223.20	-85.60	-260.09	-99.75	1.165	17.25	27.13	0.00172	0.650
9	1 U5	970.00	970.00	106.60	237.00							
10			970.00	-301.20	-142.40							
11	1 U6	660.00	660.00	73.10	178.80	91.75	224.43	1.255	20.32	26.80	0.00096	0.650
12			660.00	-212.40	-120.20	-215.58	-122.00	1.015	20.12	25.80	0.00085	0.650
13	1 U7	0.00	0.00	21.20	-16.80	306.46	-242.85	14.456	7.18	23.47	0.00683	0.900
14			0.00	-151.20	4.00	-356.79	9.44	2.360	10.56	27.05	0.00468	0.873
15	1 U8	10.00	10.00	23.40	-41.40	192.49	-340.56	8.226	8.82	25.44	0.00565	0.900
16			10.00	-157.20	36.80	-356.94	83.56	2.271	10.43	27.09	0.00480	0.883

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 Licensed to: StructurePoint. License ID: 00000-0000000-4-28191-28191  
 C:\Program Files (x86)\StructurePoint\spColumn\Examples\Example11.col

Page 6  
 05/30/11  
 09:33 AM

17	1 U9	-300.00	-300.00	-10.10	-99.60	-26.22	-258.59	2.596	6.14	26.94	0.01018	0.900
18			-300.00	-68.40	59.00	-173.75	149.87	2.540	4.21	23.25	0.01358	0.900
19	1 U10	720.00	720.00	99.00	134.80	136.31	185.60	1.377	20.61	24.06	0.00050	0.650
20			720.00	-285.20	-117.80	-206.40	-85.25	0.724	21.63	26.38	0.00066	0.650 #
21	1 U11	410.00	410.00	65.50	76.60	211.57	247.42	3.230	14.49	24.28	0.00203	0.650
22			410.00	-196.40	-95.60	-263.84	-128.43	1.343	16.20	26.93	0.00199	0.650
23	1 U12	260.00	260.00	31.00	60.80	158.09	310.06	5.100	13.33	26.59	0.00299	0.729
24			260.00	-173.20	12.20	-306.78	21.61	1.771	14.31	27.07	0.00267	0.702
25	1 U13	-50.00	-50.00	-2.50	2.60	-253.86	264.02	101.545	6.48	23.25	0.00777	0.900
26			-50.00	-84.40	34.40	-337.08	137.39	3.994	8.80	26.19	0.00595	0.900

# Section capacity exceeded. Revise column!  
 Pmax = 893.93 kip

\*\*\* End of output \*\*\*



# Batch Mode



```
C:\Windows\system32\cmd.exe

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example01.col"
/dxf /emf:all /iad /cti /csv

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example02.col"
/dxf /emf:all /iad /cti /csv

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example03.col"
/dxf /emf:all /iad /cti /csv

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example04.col"
/dxf /emf:all /iad /cti /csv /stru

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example05.col"
/dxf /emf:all /iad /cti /csv /stru

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example06.col"
/dxf /emf:all /iad /cti /csv

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example08.col"
/dxf /emf:all /iad /cti /csv

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example09.col"
/dxf /emf:all /iad /cti /csv

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example10.col"
/dxf /emf:all /iad /cti /csv

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example11.col"
/dxf /emf:all /iad /cti /csv

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example12.col"
/dxf /emf:all /iad /cti /csv

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example13.col"
/dxf /emf:all /iad /cti /csv

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example14.col"
/dxf /emf:all /iad /cti /csv

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example15.col"
/dxf /emf:all /iad /cti /csv

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example16.col"
/dxf /emf:all /iad /cti /csv

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example17.col"
/dxf /emf:all /iad /cti /csv

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example18.col"
/dxf /emf:all /iad /cti /csv

C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example19.col"
/dxf /emf:all /iad /cti /csv

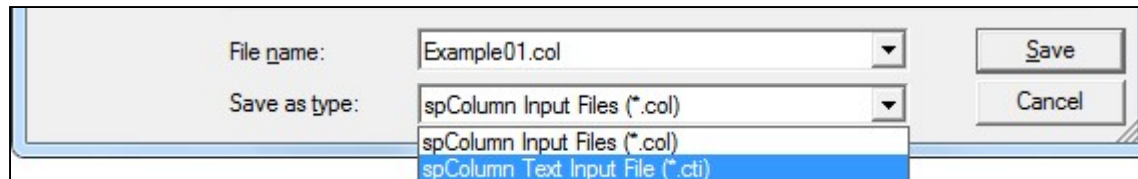
C:\Program Files\StructurePoint\spColumn>spColumn.exe /i:"Examples\example20.col"
/dxf /emf:all /iad /cti /csv /stru
```

```
Examples.bat - Notepad

File Edit Format View Help

spColumn.exe /i:"Examples\example01.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example02.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example03.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example04.col" /dxf /emf:all /iad /cti /csv /stru
spColumn.exe /i:"Examples\example05.col" /dxf /emf:all /iad /cti /csv /stru
spColumn.exe /i:"Examples\example06.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example07.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example08.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example09.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example10.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example11.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example12.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example13.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example14.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example15.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example16.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example17.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example18.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example19.col" /dxf /emf:all /iad /cti /csv
spColumn.exe /i:"Examples\example20.col" /dxf /emf:all /iad /cti /csv /stru
```

# CTI Files



```
example01.cti - Notepad
File Edit Format View Help
#spColumn Text Input (CTI) File
[spColumn Version]
4.600
[Project]
spColumn Manual Example 1
[Column ID]
PCANotes 6.4
[Engineer]
SP
[Investigation Run Flag]
15
[Design Run Flag]
9
[Slenderness Flag]
0
[User options]
0,0,4,0,0,0,0,0,0,0,0,0,2,-1,0,-1,4,2,0,5,0,0,0.000000,0,0,13
[Irregular options]
-2,0,0,1,0.790000,50.000000,50.000000,-50.000000,-50.000000,0.000000,0.000000,5.000000,5.000000
[Ties]
0,1,7
[Investigation Reinforcement]
4,2,0,0,5,5,5,5,1.500000,1.500000,1.500000,1.500000
[Design Reinforcement]
0,0,0,0,0,0,0,0,0.000000,0.000000,0.000000,0.000000
```



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