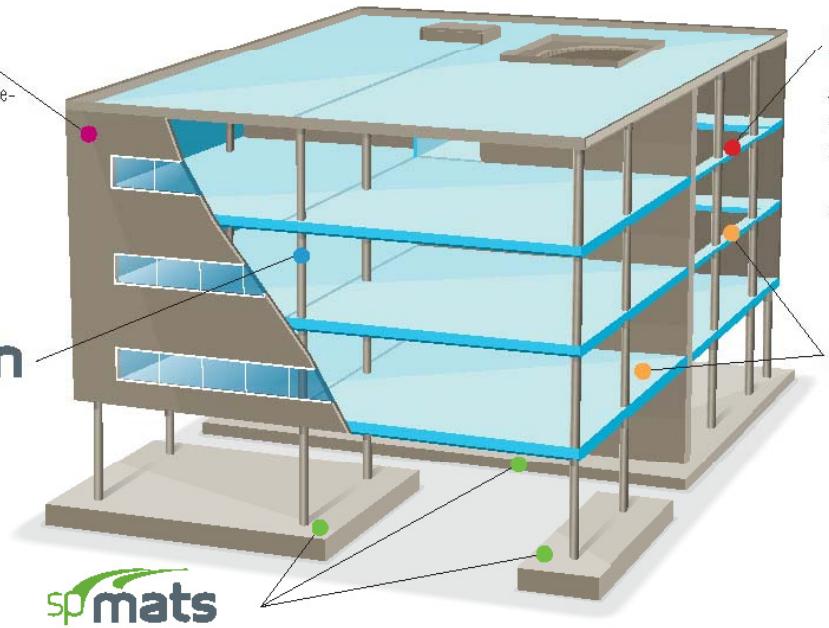
# StructurePoint

CONCRETE SOFTWARE SOLUTIONS

Work quickly.
Work simply.
Work accurately.

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



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

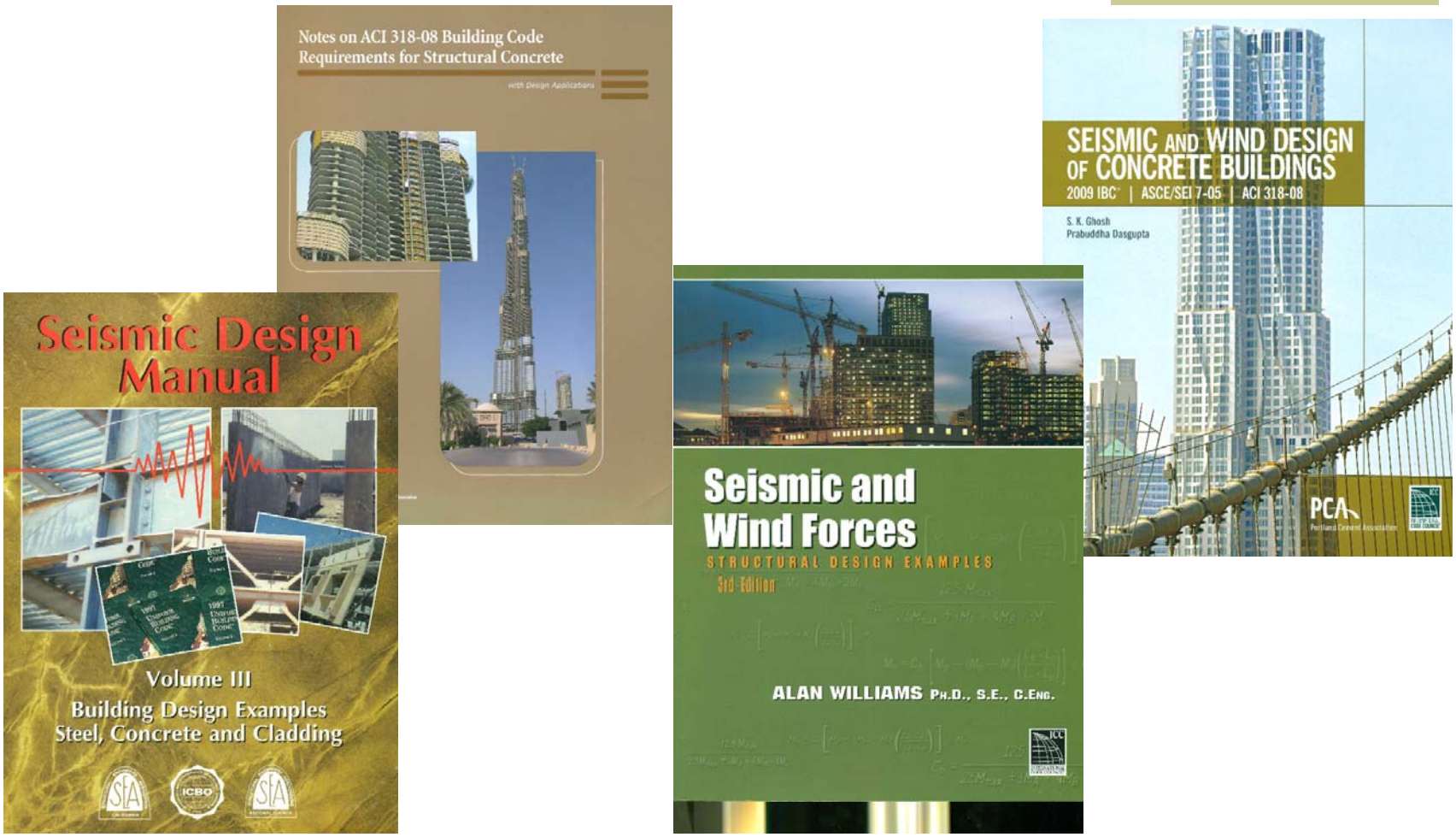
**spbeam**
Analysis, design & investigation of reinforced concrete beams & one-way slab systems

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

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

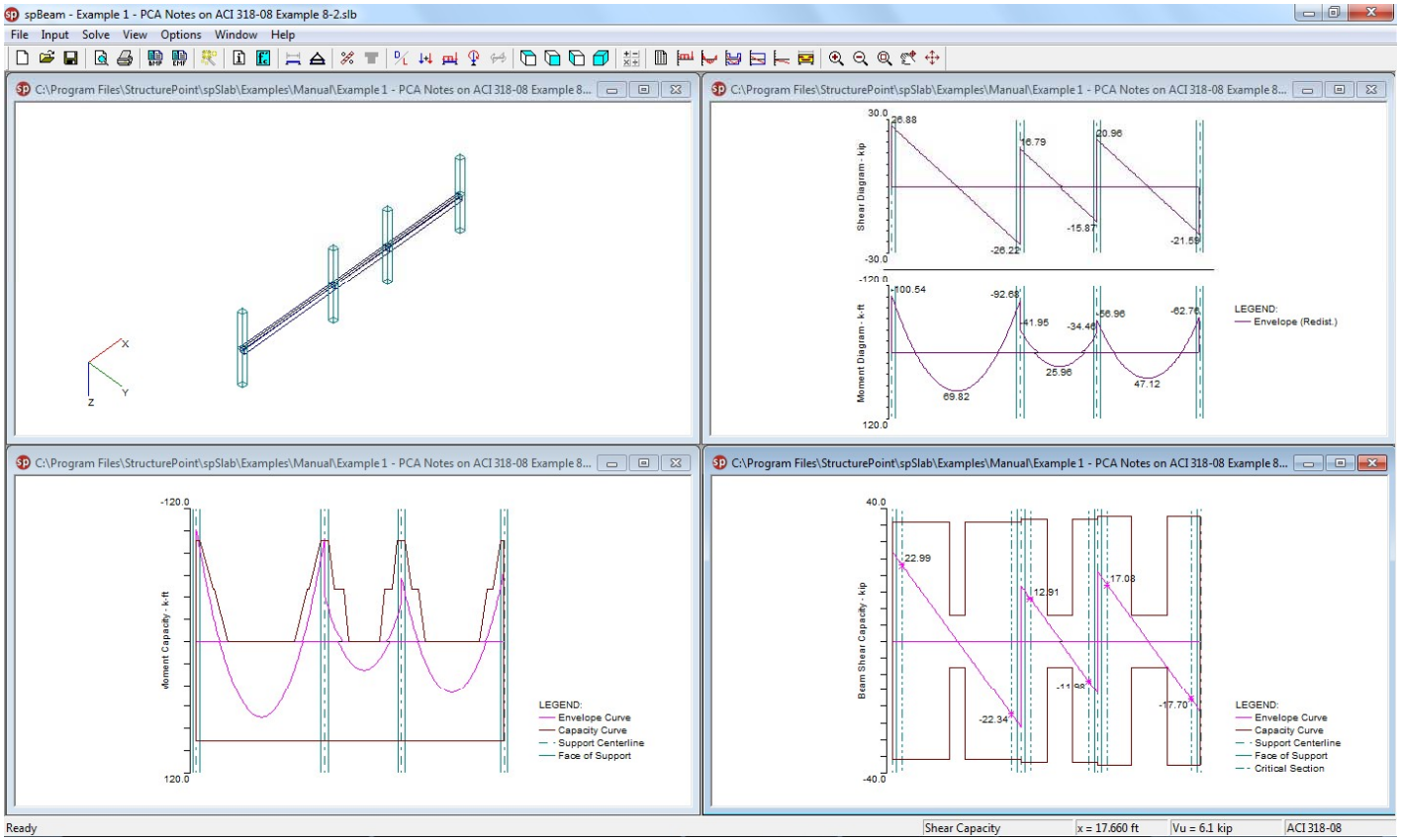
**spmats**
Finite element analysis & design of reinforced concrete foundations, combined footings or slabs on grade

# The Industry Standard

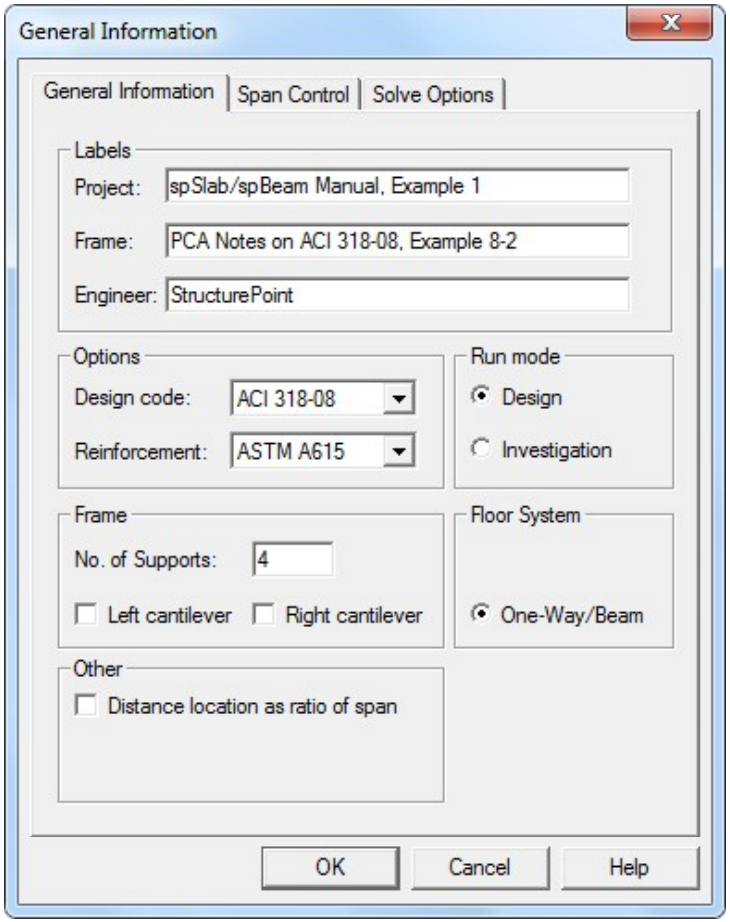


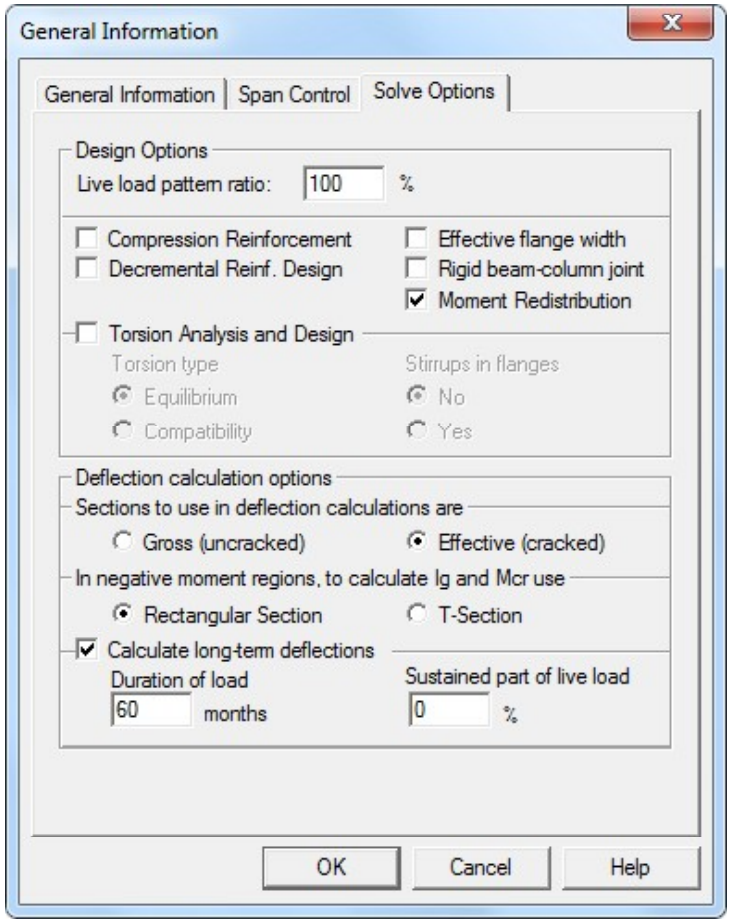
spbeam

- Analysis, design, and investigation of R/C beams and one-way slab systems



# Options


General Information
General Information
Span Control
Solve Options
Labels
Project:
spSlab/spBeam Manual, Example 1
Frame:
PCA Notes on ACI 318-08, Example 8-2
Engineer:
StructurePoint
Options
Design code:
ACI 318-08
Reinforcement:
ASTM A615
Run mode
Design
Investigation
Frame
No. of Supports:
4
Left cantilever
Right cantilever
Floor System
One-Way/Beam
Other
Distance location as ratio of span
OK
Cancel
Help


General Information
General Information
Span Control
Solve Options
Design Options
Live load pattern ratio:
100
%
Compression Reinforcement
Decremental Reinf. Design
Effective flange width
Rigid beam-column joint
Moment Redistribution
Torsion Analysis and Design
Torsion type
Equilibrium
Compatibility
Stirrups in flanges
No
Yes
Deflection calculation options
Sections to use in deflection calculations are
Gross (uncracked)
Effective (cracked)
In negative moment regions, to calculate Ig and Mcr use
Rectangular Section
T-Section
Calculate long-term deflections
Duration of load
60
months
Sustained part of live load
0
%
OK
Cancel
Help

# Moment Redistribution

For ACI 318-08, 05, and 02

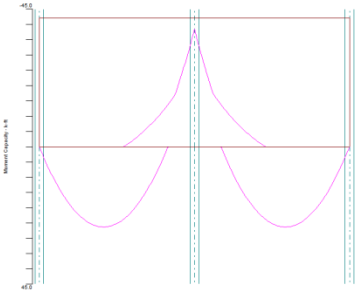
$$\delta = \begin{matrix} 0, \ if\ \varepsilon_t < 0.0075 \\ 1000\varepsilon_t, \ if\ \varepsilon_t \geq 0.0075 \end{matrix} \text{ or}$$

For ACI 318-99

$$\delta = \begin{matrix} 0, \ if\ (\rho - \rho') > 0.5\rho_b \\ 20\left(\frac{\rho-\rho'}{\rho_b}\right), \ if\ (\rho - \rho') \leq 0.5\rho_b \end{matrix} \text{ or}$$

For CSA A23.3

$$\delta = 30 - 50\frac{c}{d}$$

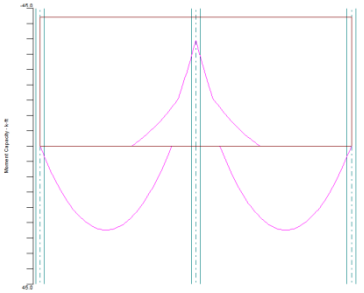


Top Reinforcement

Units: Width (ft), Mmax (k-ft), Xmax (ft), As (in^2), Sp (in)

| Span | Zone | Width | Mmax | Xmax | AsPrime | AsMin | AsMax | SpReq | AsReq | Bars | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Left | 2.08 | 0.00 | 0.667 | 0.000 | 0.000 | 1.056 | 9.792 | 0.000 | 3-#5 | *5 |
| | Middle | 2.08 | 3.70 | 15.400 | 0.000 | 0.094 | 1.056 | 9.792 | 0.071 | 3-#5 | *3 *5 |
| | Right | 2.08 | 33.18 | 23.333 | 0.000 | 0.195 | 1.056 | 9.792 | 0.706 | 3-#5 | |
| 2 | Left | 2.08 | 33.18 | 0.667 | 0.000 | 0.195 | 1.056 | 9.792 | 0.706 | 3-#5 | |
| | Middle | 2.08 | 3.70 | 8.600 | 0.000 | 0.094 | 1.056 | 9.792 | 0.071 | 3-#5 | *3 *5 |
| | Right | 2.08 | 0.00 | 23.333 | 0.000 | 0.000 | 1.056 | 9.792 | 0.000 | 3-#5 | *5 |

NOTES:
*3 - Design governed by minimum reinforcement.
*5 - Number of bars governed by maximum allowable spacing.



Moment Redistribution Factors

Units: Org.Mu (k-ft)

| Supp | Side | Calculated Org.Mu | Calculated Iter.# | Calculated EpsilonT | Calculated Factor[%] | User Limit[%] | Applied Factor[%] |
|---|---|---|---|---|---|---|---|
| 1 | Right | 0.00 | 0 | 0.00000 | 0.00 | 0.00 | 0.00 |
| 2 | Left | 33.18 | 5 | 0.00998 | 9.98 | 10.00 | 9.98 |
| 2 | Right | 33.18 | 5 | 0.00998 | 9.98 | 10.00 | 9.98 |
| 3 | Left | 0.00 | 0 | 0.00000 | 0.00 | 0.00 | 0.00 |

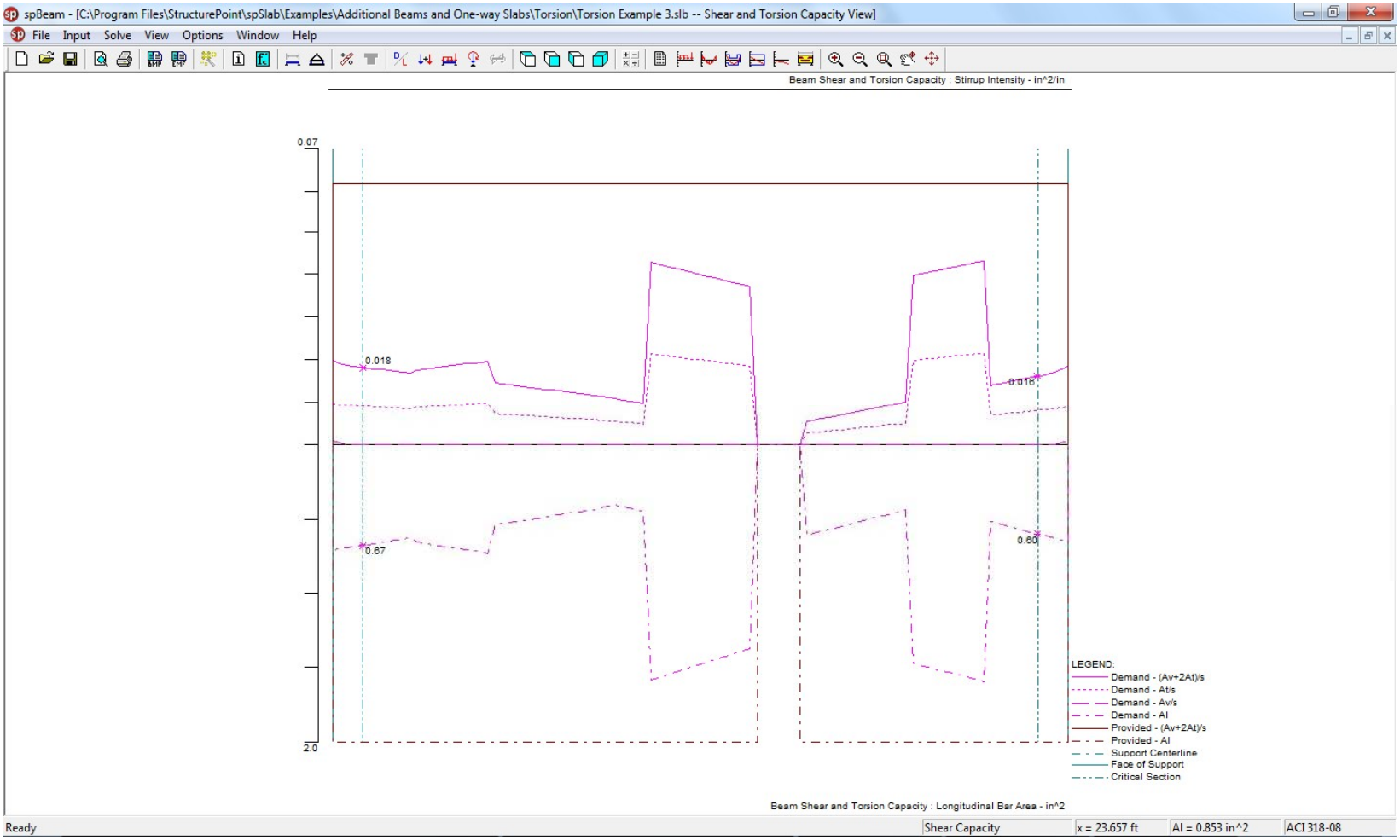
Top Reinforcement

Units: Width (ft), Mmax (k-ft), Xmax (ft), As (in^2), Sp (in)

| Span | Zone | Width | Mmax | Xmax | AsPrime | AsMin | AsMax | SpReq | AsReq | Bars | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Left | 2.08 | 0.00 | 0.667 | 0.000 | 0.000 | 1.056 | 9.792 | 0.000 | 3-#5 | *5 |
| | Middle | 2.08 | 2.01 | 15.400 | 0.000 | 0.082 | 1.056 | 9.792 | 0.038 | 3-#5 | *3 *5 |
| | Right | 2.08 | 29.46 | 23.333 | 0.000 | 0.195 | 1.056 | 9.792 | 0.618 | 3-#5 | *5 |
| 2 | Left | 2.08 | 29.46 | 0.667 | 0.000 | 0.195 | 1.056 | 9.792 | 0.618 | 3-#5 | *5 |
| | Middle | 2.08 | 2.01 | 8.600 | 0.000 | 0.082 | 1.056 | 9.792 | 0.038 | 3-#5 | *3 *5 |
| | Right | 2.08 | 0.00 | 23.333 | 0.000 | 0.000 | 1.056 | 9.792 | 0.000 | 3-#5 | *5 |

NOTES:
*3 - Design governed by minimum reinforcement.
*5 - Number of bars governed by maximum allowable spacing.

# Shear and Torsion



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