

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

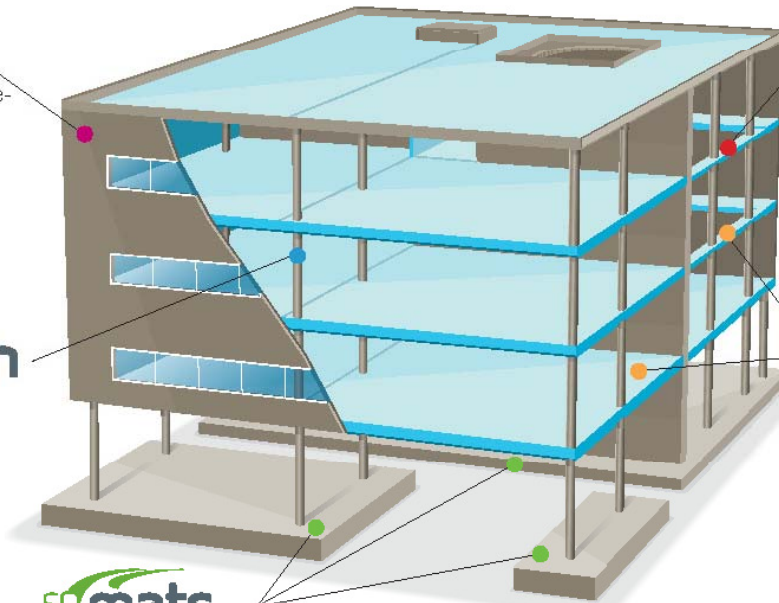
Finite element analysis & design of reinforced concrete foundations, combined footings or slabs on grade

sp beam

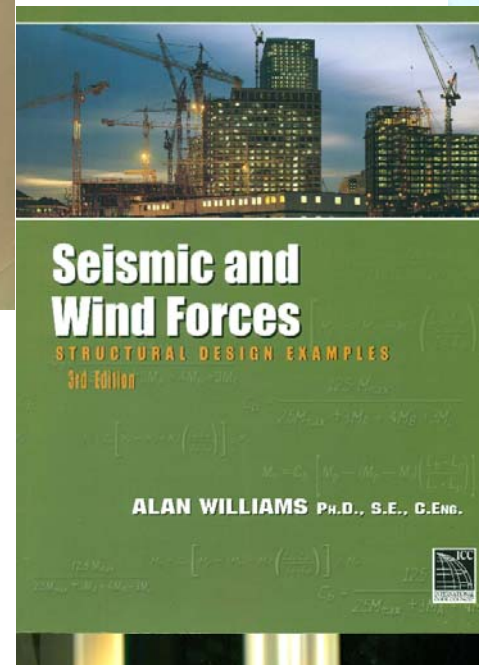
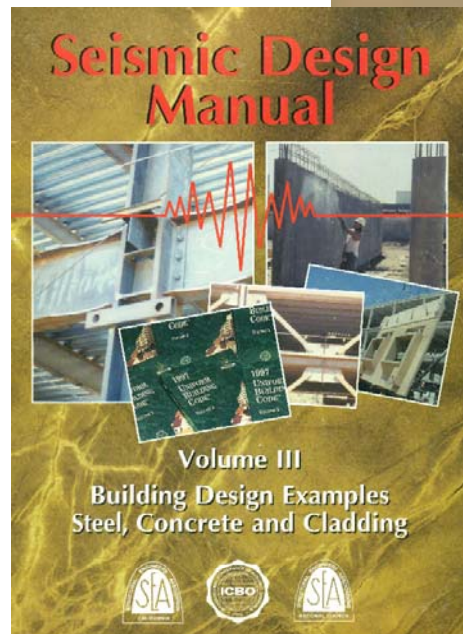
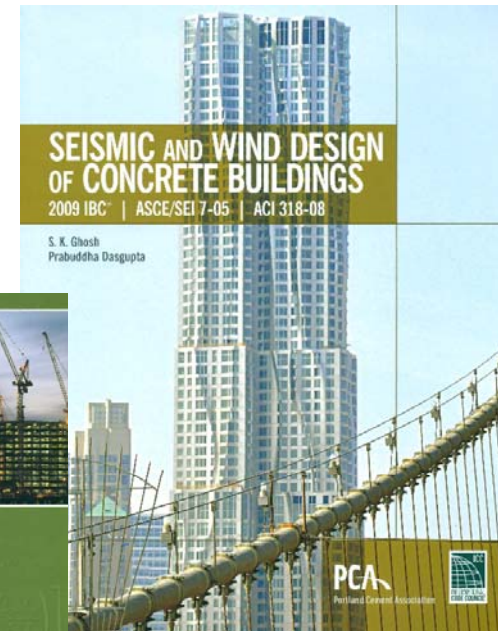
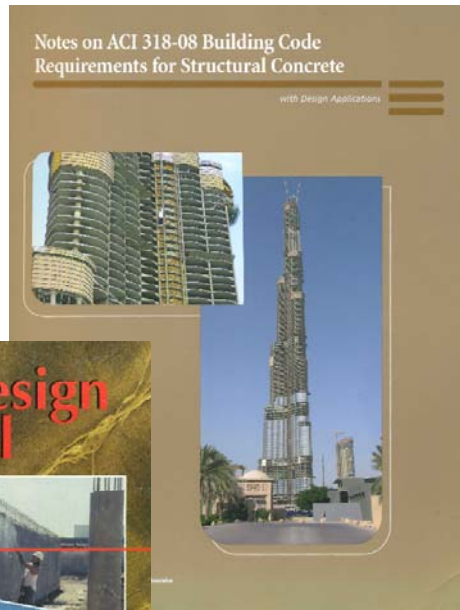
Analysis, design & investigation of reinforced concrete beams & one-way slab systems

sp slab

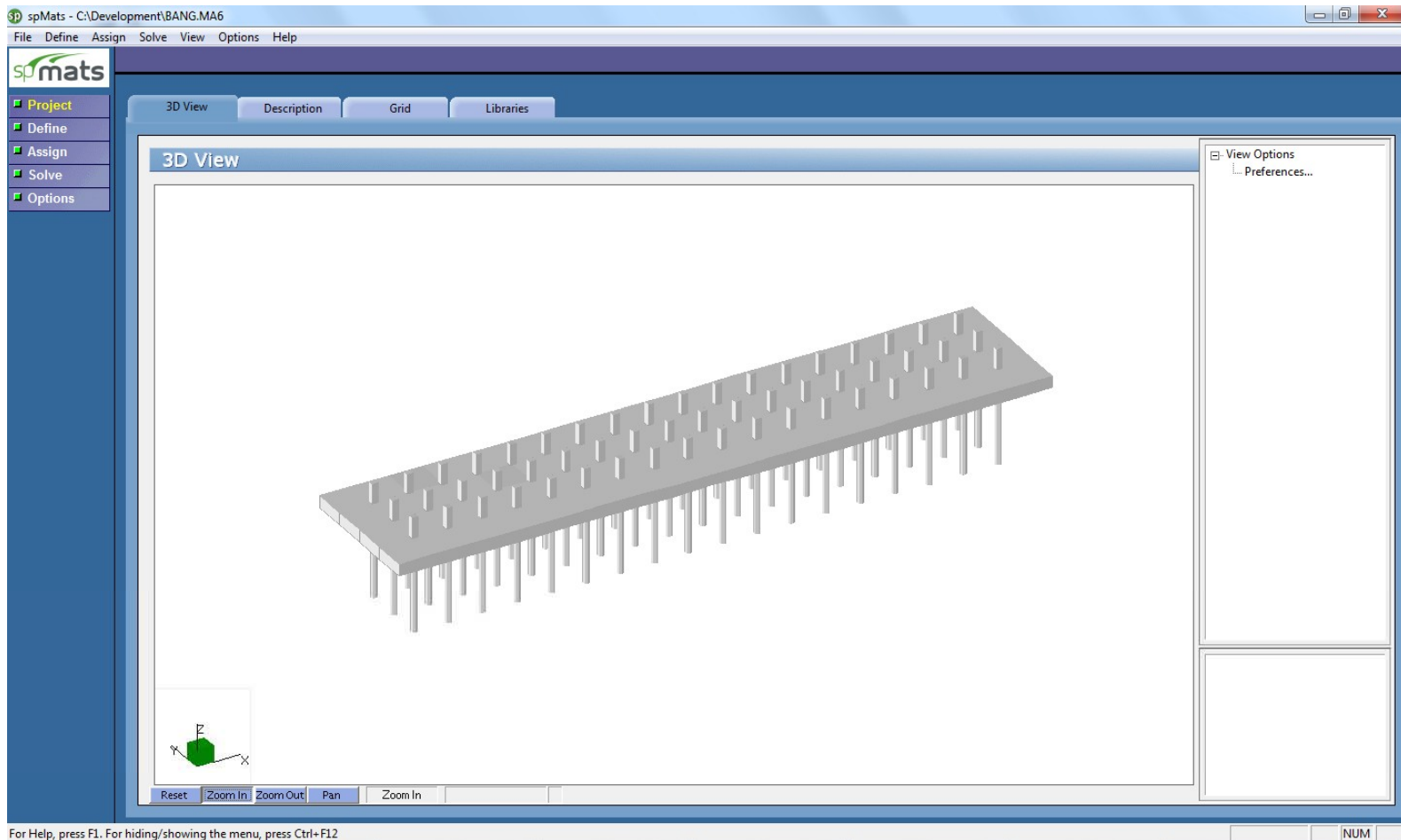
Analysis, design & investigation of reinforced concrete beams & slab systems



The Industry Standard



sp mats



Meshing



sp Mats - c:\program files\structurepoint\sp mats\examples\example2.ma7, (Modified)

File Define Assign Solve View Options Help

Project
Define
Assign
Solve
Options

3D View Description Grid Libraries

Grid

Define...
Description...
Set Up...
Generate...
Reset...
Preferences
X Grid
Y Grid

Grid Setup

Grid Direction
 X Direction Y Direction

Edit Gridlines
Coordinate (ft) Add

| Number | Coordinate |
|--------|------------|
| [1] | 0.000 ft |
| [2] | 2.000 ft |
| [3] | 4.000 ft |
| [4] | 6.000 ft |
| [5] | 8.000 ft |
| [6] | 10.000 ft |
| [7] | 12.000 ft |
| [8] | 14.000 ft |
| [9] | 16.000 ft |

Delete
Modify
Copy
Reset

OK Cancel

DoubleClick for Setup

Reset Zoom In Zoom Out Pan Normal View X = 92.86, Y = 29.91 ft

Modified NUM

Define Properties



Project Define Assign Solve Options

Properties Restraints Loads Load Combinations

Soil

Label Subgrade modulus (ksf) Allowable pres.(ksf)

Soil1 50 6

| Label | Subgrade Modulus - ks | Allowable Pressure - |
|-------|-----------------------|----------------------|
| Soil1 | 50.0000 | 6.00 |
| Soil2 | 75.0000 | 8.00 |

Add Delete Modify

- Thickness
 - Thick1
 - Thick2
- Soil
 - Soil1
 - Soil2
- Concrete
 - Conc1
- Reinforcement
 - Steel1
- Design Parameters
 - DC_1
- Column Dimensions
 - Column1

File Define Assign Solve View Options Help

sp mats

Project Define Assign Solve Options

Properties Restraints Loads Load Combinations

Design Parameters

Label Min. Reinf. Ratio (% of Ag) X-Dir Y-Dir

DC_1 0.18 Top Cover 3.25 3.5 in

Bottom Cover 3.25 3.5 in

| Label | Ratio | Top Cover X | Top Cover Y | Bottom Cover X | Bottom Cover Y |
|-------|--------|-------------|-------------|----------------|----------------|
| DC_1 | 0.18.. | 3.2500 | 3.5000 | 3.2500 | 3.5000 |

Add Delete Modify

- Thickness
 - Thick1
 - Thick2
- Soil
 - Soil1
 - Soil2
- Concrete
 - Conc1
- Reinforcement
 - Steel1
- Design Parameters
 - DC_1
- Column Dimensions
 - COL1

Restraints



File Define Assign Solve View Options Help

sp mats

Project Define Assign Solve Options

Properties Restraints Loads Load Combinations

Piles

Label: Pile 1 Spring Constant (k/ft): 776.177

| Label | Type | Dim a | Dim b | Dim c | Dim d | Length | Spring Constant |
|--------|-------|---------|--------|--------|--------|---------|-----------------|
| Pile 1 | Round | 20.0000 | 0.0000 | 0.0000 | 0.0000 | 15.0000 | 776.1774 |


Buttons: Add, Edit

Add/Edit Pile

Label: Pile 1

Pile Type: Round

Pile Dimensions: Diameter d (in): 20, Length (ft): 15



Pile Material: Concrete, Mod. Elasticity (k/si): 3156, Select Soil: Soil1

Buttons: OK, Cancel

Nodal Springs
Slaved Nodes
WallRx1
Piles
Pile 1

Modified NUM

For Help, press F1. For hiding/showing the menu, press Ctrl+F12

Defining Loads



Project | Define | Assign | Solve | Options

Properties | Restraints | Loads | Load Combinations

Loads - Concentrated

Label: PD1 Pz (kips): -50 Mx (k-ft): 0 My (k-ft): 0 Load Case: A

| Label | Pz | Mx | My | Case |
|-------|----------|--------|--------|------|
| PD1 | -50.0000 | 0.0000 | 0.0000 | A |
| PD2 | -47.0000 | 0.0000 | 0.0000 | A |
| PD3 | -94.0000 | 0.0000 | 0.0000 | A |

Buttons: Add, Delete, Modify

- Concentrated
 - PD1
 - PD2
 - PD3
 - PL1
 - PL2
 - PL3
 - PW1
 - PW2
 - PW3
 - PW4
 - Surface

Project | Define | Assign | Solve | Options

Properties | Restraints | Loads | Load Combinations

Load Combinations

Label: S1 Save Results: Level: Service

Case A: 1 Case B: 1 Case C: 0 Case D: 0 Case E: 0 Case F: 0

| Label | A | B | C | D | E | F | Level | Save |
|-------|------|------|------|------|------|------|---------|------|
| S1 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | Service | Yes |
| S2 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | Service | Yes |
| S3 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | Service | Yes |

Buttons: Add, Delete, Modify, Options...

- Service
 - S1
 - S2
 - S3
- Ultimate

Assign



spMats - c:\program files\structurepoint\spmats\examples\additional\slab with opening.ma7, (Modified)

File Define Assign Solve View Options Help

Project
Define
Assign
Solve
Options

Properties Restraints Loads

Grid

Thickness
T1
T2
T3
T4

Soil
S1

Concrete
C1

Reinforcement
R1

Design Parameters
DC_1
Column Dimensions

Label T1
Value 12.0000 in

Reset Zoom In Zoom Out Pan Normal View X = 29.00, Y = -4.47 ft

For Help, press F1. For hiding/showing the menu, press Ctrl+F12

Modified NUM

Solution



Run Solver View Results View Contours Reports

Solver

Maximum number of iterations:

Maximum allowed displacement (in):

Minimum contact area (%):

Mat uplift occurs for positive nodal displacement exceeding (in):

Compute required reinforcement based on:

 Maximum moment within an element

 Average moment within an element

Run Solver View Results View Contours Reports

Reports

Print to:

Input Echo:

 Title Page Nodes Definitions Elements

Nodes:

 All From: To:

Elements:

 All From: To:

Combinations:

 All

Results:

 Force Vector

 Displacement Vector

 Punching Shear

Ultimate:

 Element Nodal Moments

Service:

 Spring/Pile Disp & Reaction

 Element Disp & Pressure

Envelopes:

 Nodal Displacements

 Spring/Pile Disp & Reaction

 Element Disp & Pressure

 Element Top Moment

Element Bot Moment

 Design Moment & Steel-Top

 Design Moment & Steel-Bot

Run Solver View Results View Contours Reports

View Results

Data range:

 Display all results Only from to:

Envelope - Design Moment & Steel - Bot

C5b - ELEMENT BOTTOM DESIGN MOMENT AND REINFORCEMENT:

Units --> Moment (kip-ft/ft), As (in²/ft)

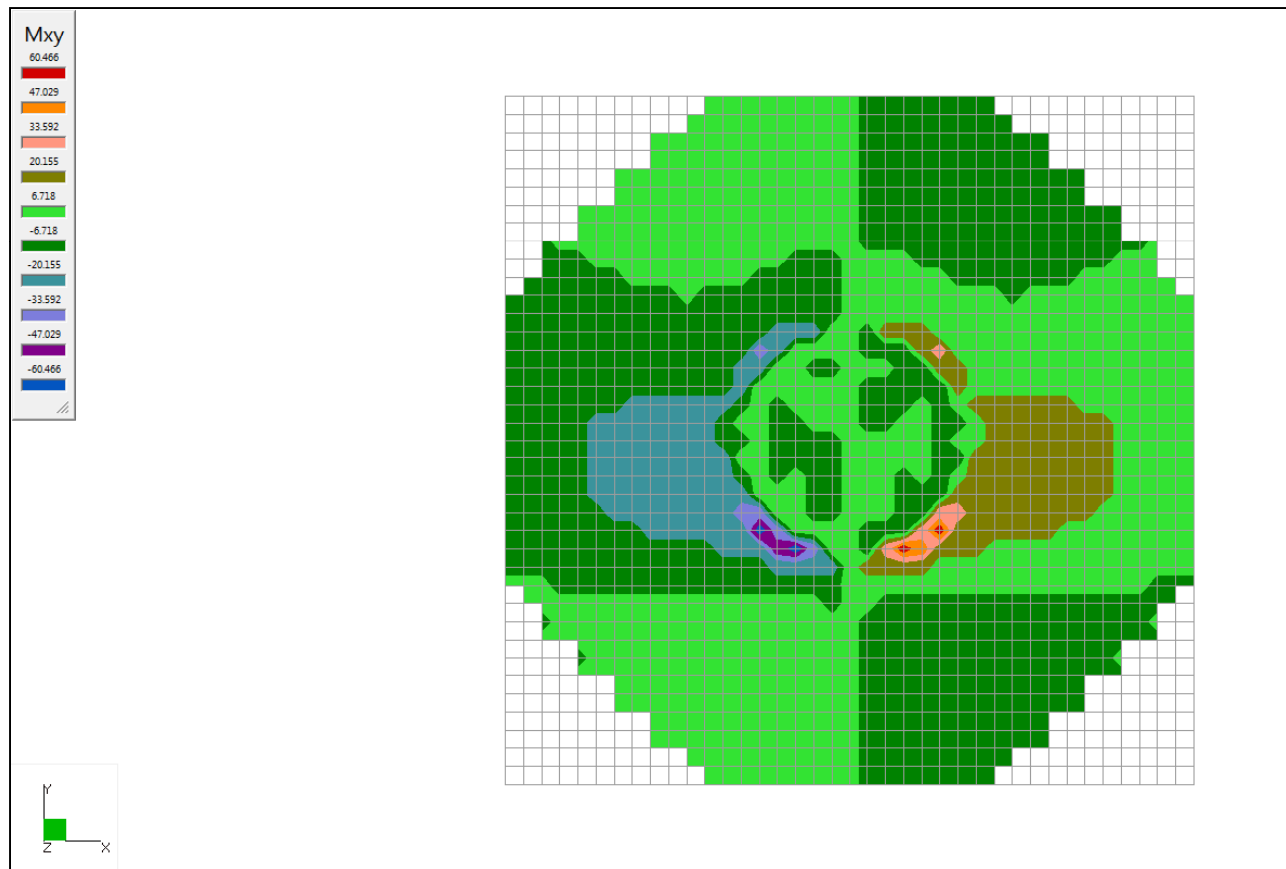
Flags --> [m] Minimum controls. [x] Exceeds maximum. [*] Cannot...

| Elem | Node | Ld | Comb. | Max. M(ux) | As(xx) | Node | Ld | Comb. | Max. M(uy) |
|------|------|----|-------|------------|--------|------|----|-------|------------|
| 1 | 26 | U2 | | -33.59 | 0.518m | 26 | U2 | | -35.39... |
| 2 | 26 | U5 | | -38.21 | 0.518m | 26 | U5 | | -41.09... |
| 3 | 3 | U5 | | -13.51 | 0.518m | 27 | U2 | | -21.81... |
| 4 | 4 | U5 | | -1.70 | 0.518m | 28 | U5 | | -16.88... |
| 5 | 6 | - | | 0.00 | 0.518m | 5 | U5 | | -12.33... |
| 6 | 6 | - | | 0.00 | 0.518m | 6 | U5 | | -9.84... |
| 7 | 7 | - | | 0.00 | 0.518m | 7 | U5 | | -8.61... |

Envelope

- Nodal Displacements
- Spring/Pile Disp & Reaction
- Element Disp & Pressure
- Element Top Moment
- Element Bot Moment
- Design Moment & Steel - Top
- Design Moment & Steel - Bot
- Solver Messages
- Service
 - Force Vector
 - Displacement Vector
 - Spring/Pile Disp & Reaction
 - Element Disp & Pressure
 - Punching Shear
- Ultimate
 - Force Vector
 - Displacement Vector
 - Element Nodal Moments
 - Punching Shear

Contours





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