

# SMAP Version 6.57 Update Note

December 5, 2008

## 1. JOINT-2D/3D

JOINT-2D/3D is the new pre-processing program generating Jointed Continuum finite element mesh given the conventional continuum SMAP Mesh Input File. Jointed Continuum analysis is similar to the discrete element analysis. For the Jointed Continuum analysis, each continuum finite element is surrounded by joint elements. The main advantages of using such joint elements are to allow slippage along the joint when reaching shear strength and debonding normal to the joint face when exceeding tensile strength.

**JOINT-2D/3D can be executed in the following order:**

### Step 1:

In the Working Directory, JOINT-2D/3D Input File "Joint.inp" should be saved. "Joint.inp" can be prepared according to the JOINT-2D/3D User's Manual.

### Step 2:

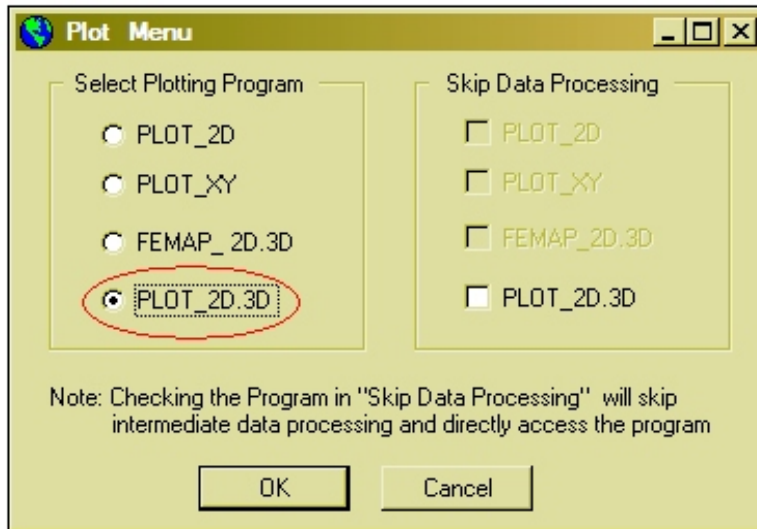
In the SMAP-2D/3D Main Menu, select Setup -> PLOT\_2D.3D and then specify the Joint Thickness greater than 0 in the "PLOT 2D.3D Setup" window.

The screenshot shows the 'PLOT 2D.3D Setup' dialog box with the following settings:

- Drawing Size:** Width of Legend Box: 5.083 Cm, Horizontal Length: 21.725 Cm, Vertical Length: 16.985 Cm.
- Printer Margines:** Left: 2.54 Cm, Top: 1.27 Cm.
- Printer Scales:** Character Size: 5, Pitch: 0.25, Plot Dimension: 1.
- Printer Line Thickness:** Doubled (selected).
- Printing Method:** DIB Method (selected).
- Printing Output:** File (selected).
- Printing Resolution:** Specified Dpi: 600.
- Compute Intersection:** No (selected).
- Intersecting Two Tunnels:** Yes (selected).
- Current Directory:** Working Directory at Setup -> General (selected).
- Show Mid Nodes for IQUAD = 1 in Card 2.1:** No (selected).
- Show New Boundary Codes for NBNODE > 0 in Card 4.4.1:** No (selected).
- Generate Jointed Block Finite Element Mesh:** Joint Thickness: 0.1 (circled in red).

**Step 3:**

In the Plot Menu, select PLOT\_2D.3D.



**Step 4:**

In the PLOT-3D, open SMAP-2D/3D Mesh File to which you want to add joint elements based on the information in the JOINT-2D/3D Input File "Joint.inp".

**Step 5:**

Generated Jointed Continuum Finite Element Mesh is saved in the Working Directory as "JointedBlock.Mes". Graphical output of the generated mesh will be shown on the PLOT-3D window.

2. Following SMAP-2D/3D example problems are included to verify the Jointed Continuum Mesh generated by JOINT-2D/3D:
  - SMAP-2D Example Problem 25:  
Plane Strain Tunnel in Jointed Continuum.
  - SMAP-3D Example Problem 24:  
Plane Strain Tunnel in Jointed Continuum.