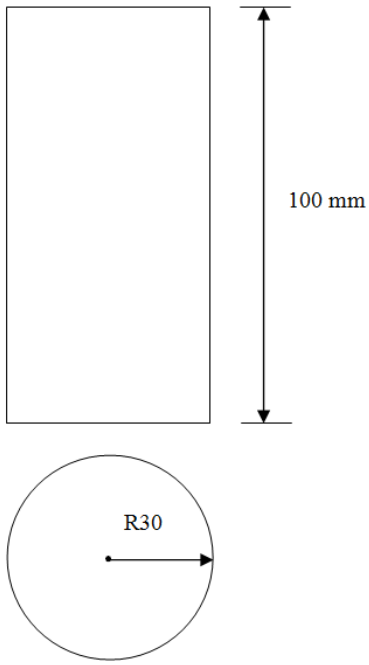
FREQUENCY RESPONSE ANALYSIS OF A BASE EXCITED CYLLINDRICAL COLUMN



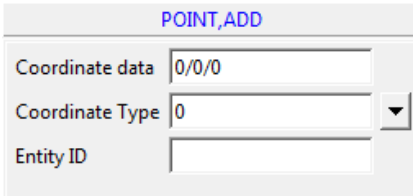
PROCEDURE

1. **Create Keypoints**

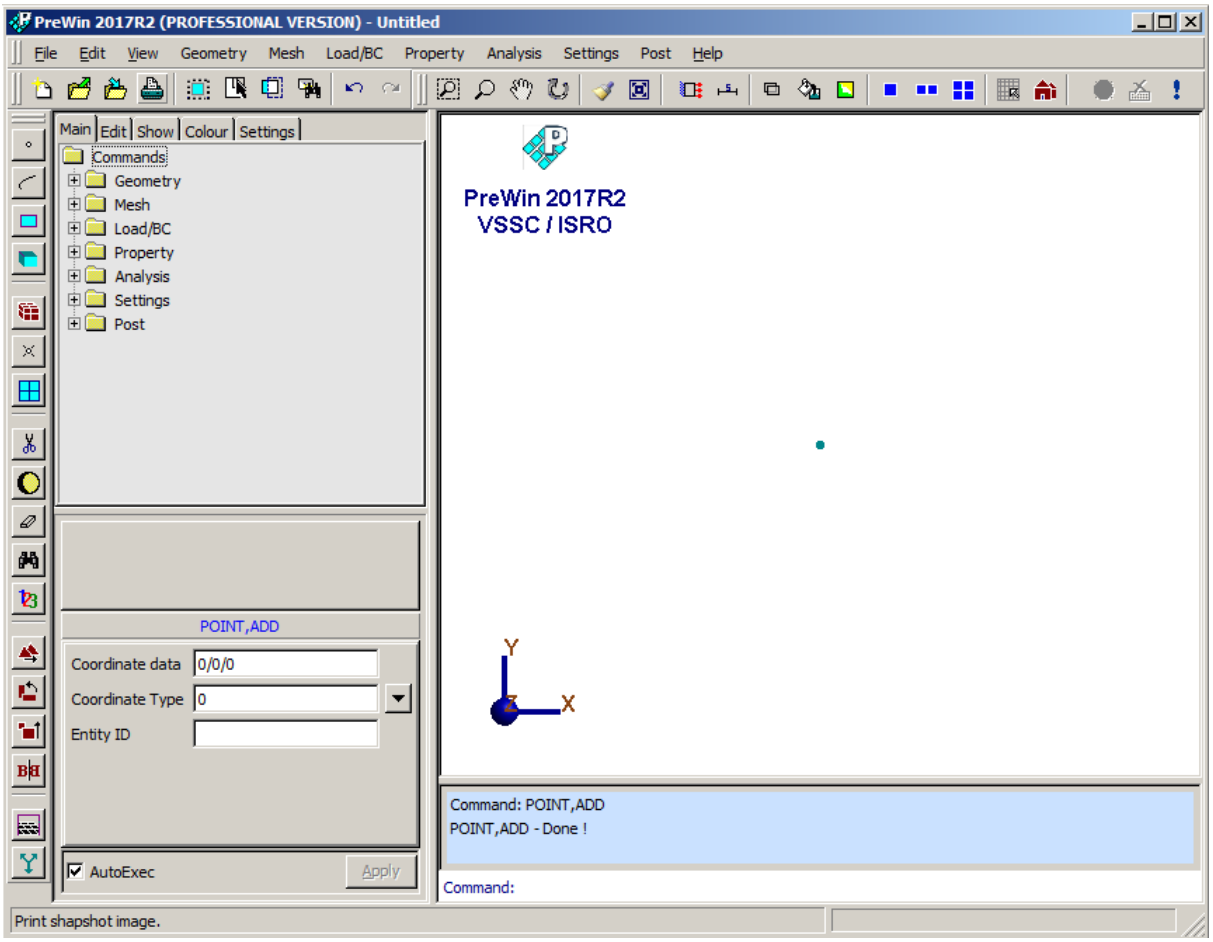
   Command : POINT,ADD

   Menu : Geometry → Keypoint → Create → By X/Y/Z

   Parameters :



At the end of the operation your screen should look like this.



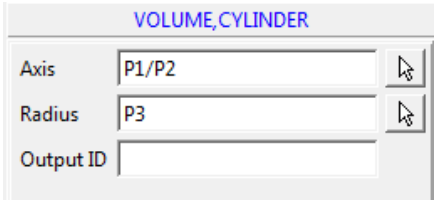
Similarly create key points at (0/100/0) and (30/0/0)

2. Create Cylindrical Volume

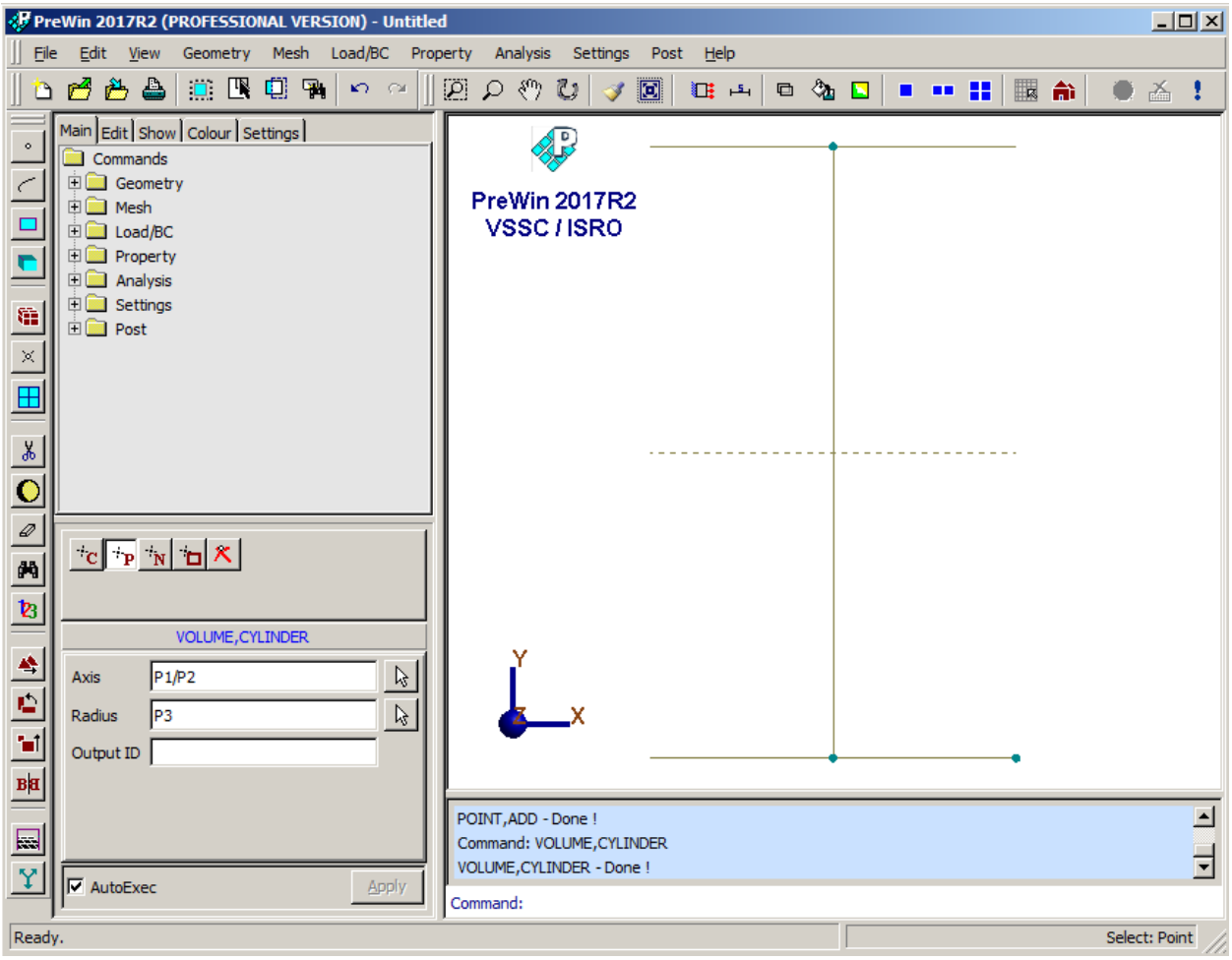
Command : VOLUME,CYLINDER

Menu : Geometry → Volume → Create → Cylinder

Parameters :



At the end of the operation your screen should look like this.

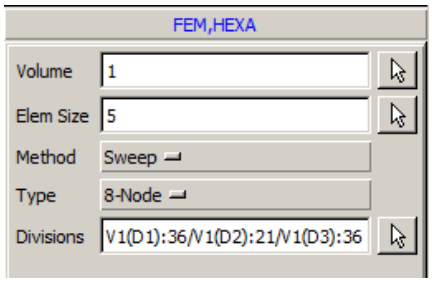


3. Generate mesh

Command : FEM, HEXASWEPT

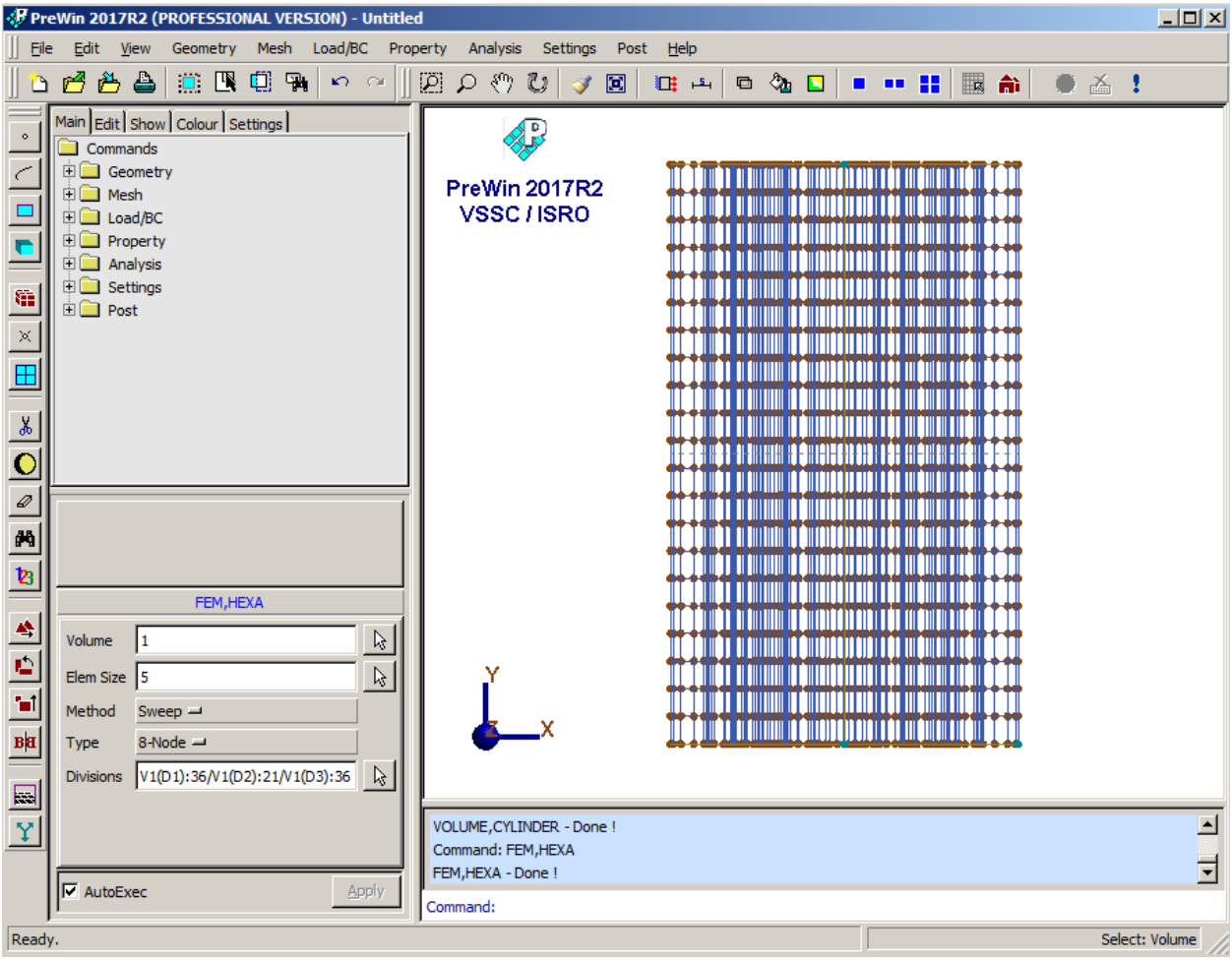
Menu : Mesh → FE Mesh → HEXASwept

Parameters :



Element size can be entered manually or by clicking two points on the geometry edge. Then click on the 'Divisions' command box, so that node divisions will be displayed on the geometry. You can increase or decrease the number of divisions by left clicking or right clicking respectively.

At the end of the operation your screen should look like this.

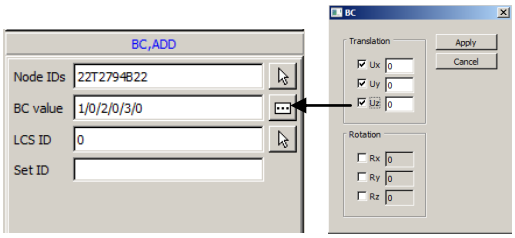


4. Apply Boundary Condition

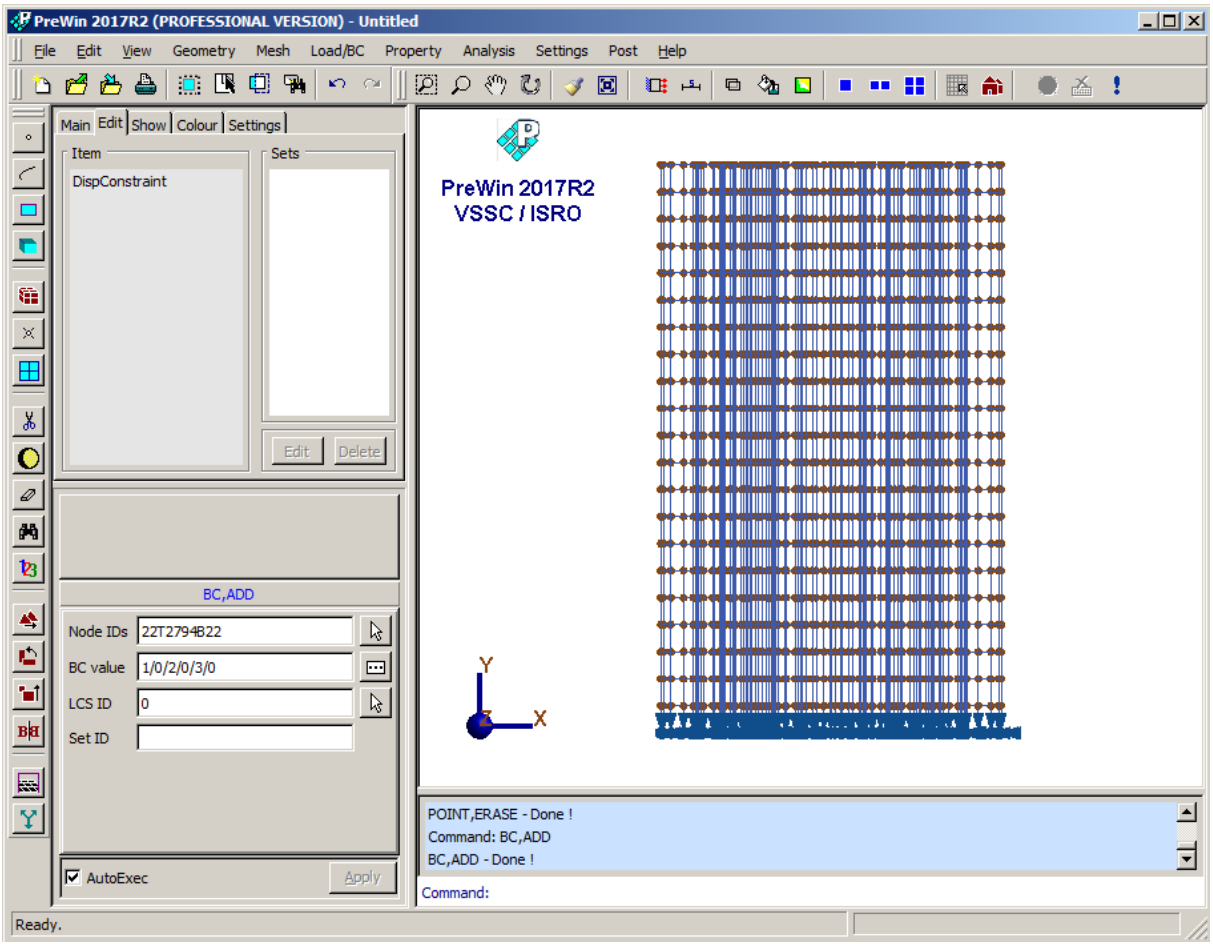
Command : BC,ADD

Menu : Load/BC → Displacement BC → Add

Parameters :



At the end of the operation your screen should look like this.

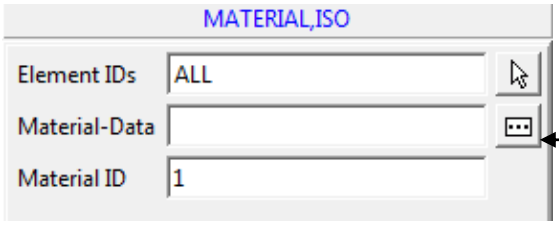


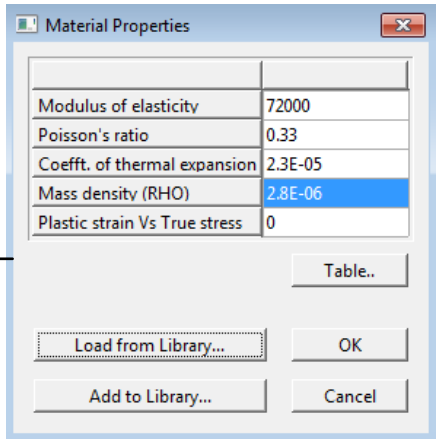
5. Apply Material Property

Command : MATERIAL,ISO

Menu : Property → Material → Isotropic → Add

Parameters :





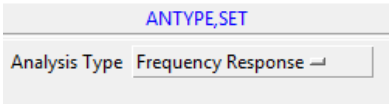
You can enter the material data from 'Load from Library' option or you can manually type in the required data.

6. Set Analysis Type

Command : ANTYPE,SET

Menu : Analysis → Analysis Type

Parameters :

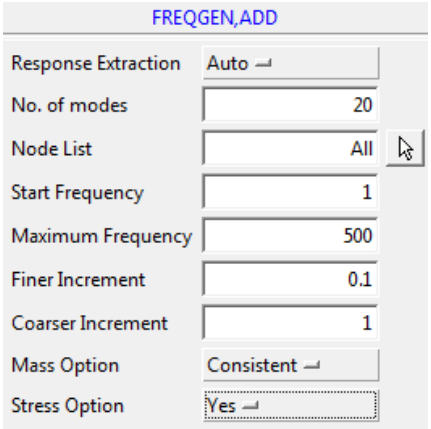


7. Set Frequency Response General Data

Command : FREQGEN,ADD

Menu : Analysis → Frequency Response → General → Add

Parameters :

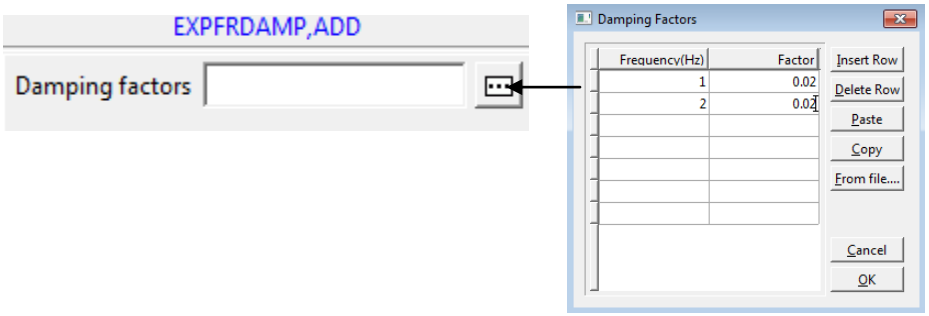


8. Create Damping Data

Command : EXPFRDAMP,ADD

Menu : Analysis → Frequency Response → Damping→ Add

Parameters :

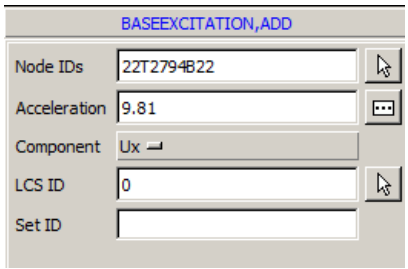


9. Set Base Excitation Data

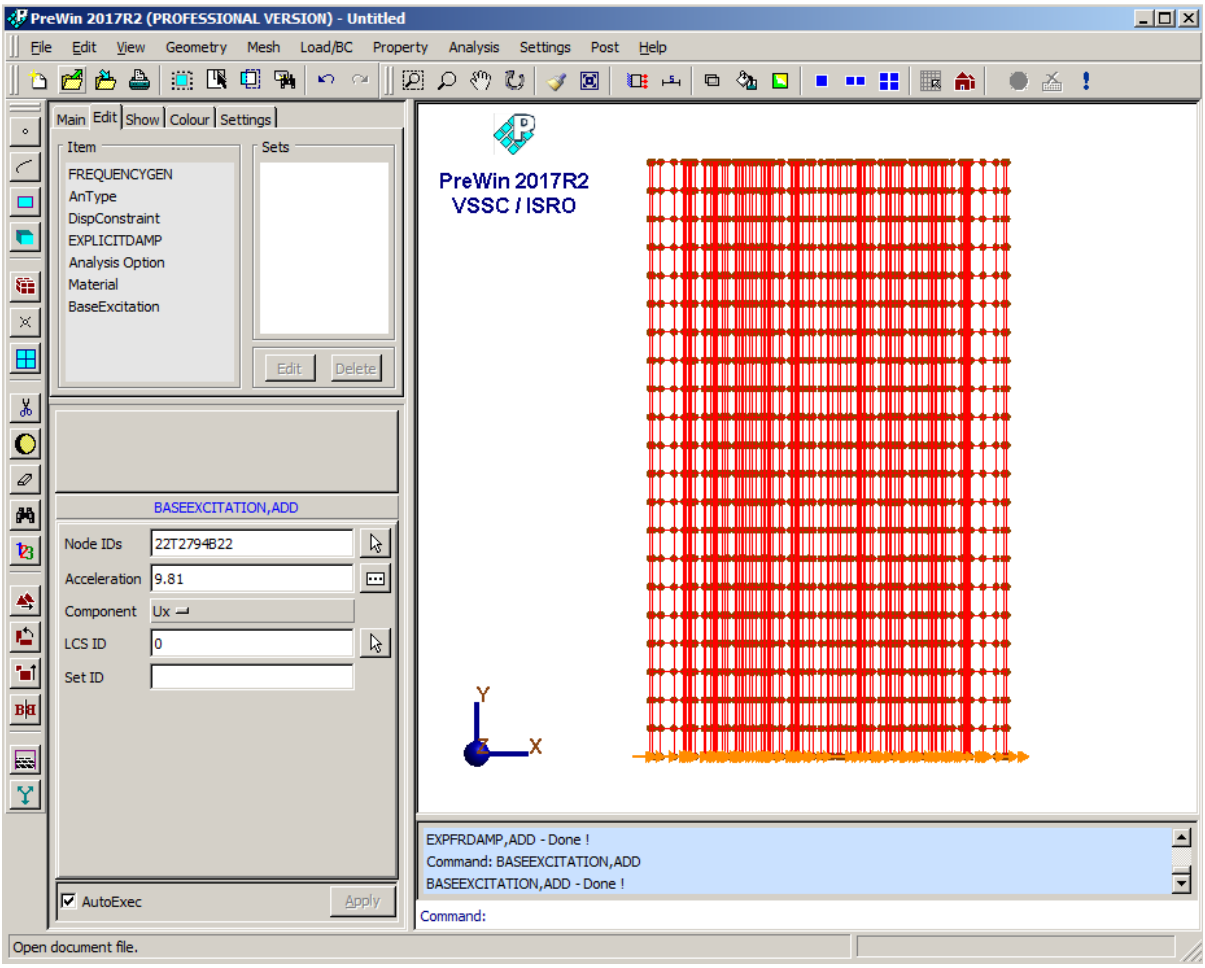
Command : BASEEXCITATION,ADD

Menu : Analysis → Frequency Response → Base Excitation→ Add

Parameters :



At the end of the operation your screen should look like this.

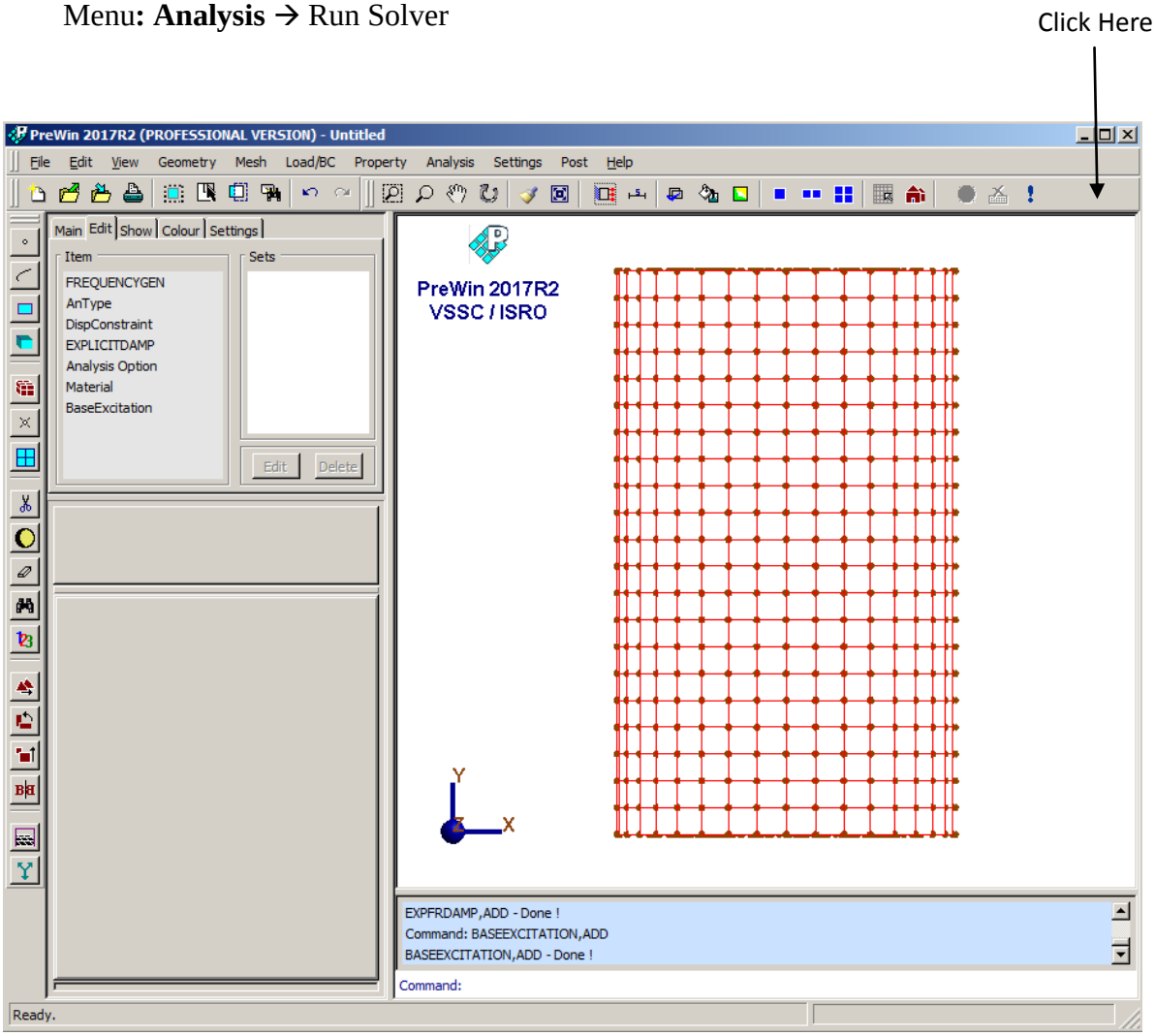


10. Save the project model

Menu : File → Save

11. Submit the job in to FEAST

Menu**: Analysis** → Run Solver



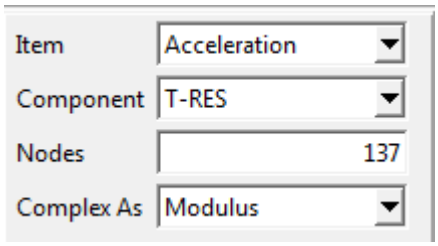
12. Perform Post Processing

i) Graph plots for displacement/ veleocity/ acceleration

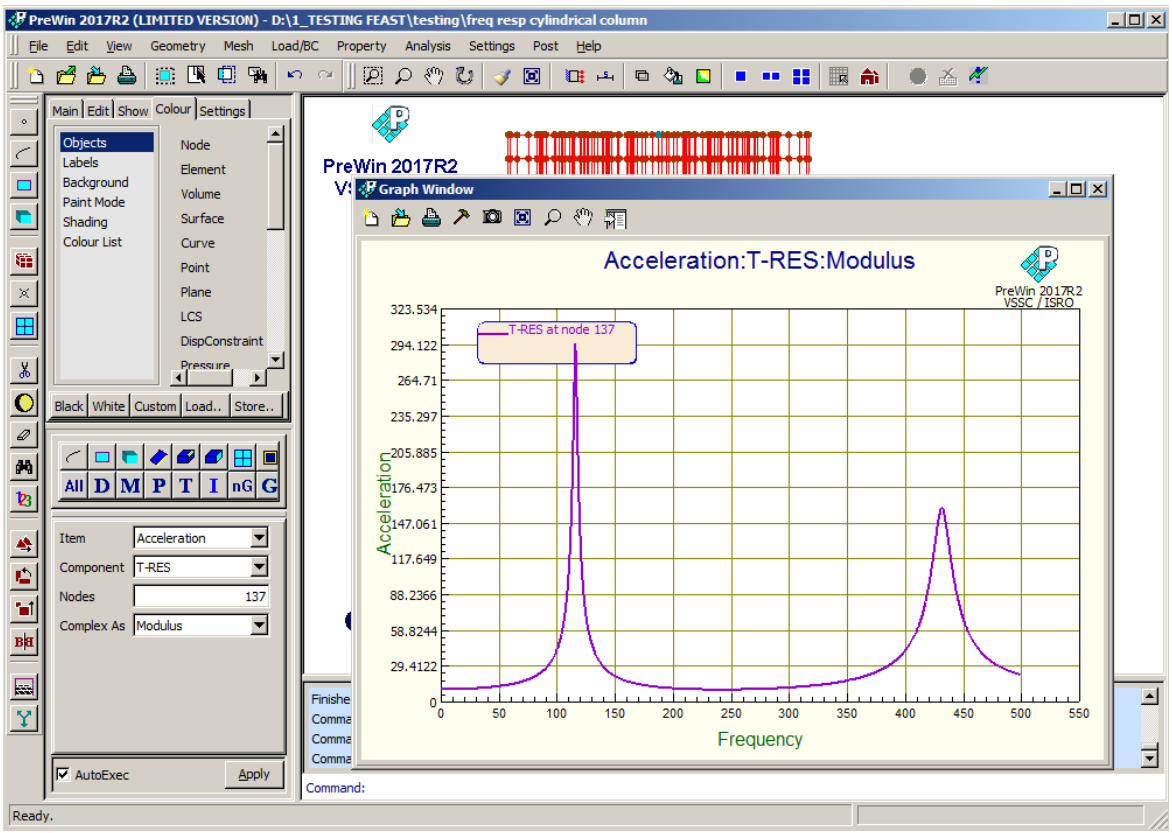
Command : POST,HISTORYPLOT

Menu : Post → History Plot

Parameters:



At the end of the operation your screen should look like this.

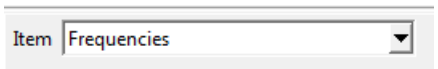


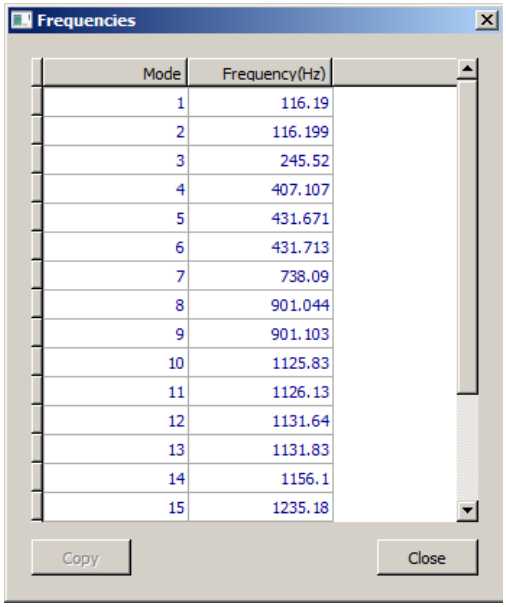
ii) To check natural frequencies

Command : POST,VIEWRESULT

Menu : Post → View Result

Parameters:





Mode	Frequency(Hz)
1	116.19
2	116.199
3	245.52
4	407.107
5	431.671
6	431.713
7	738.09
8	901.044
9	901.103
10	1125.83
11	1126.13
12	1131.64
13	1131.83
14	1156.1
15	1235.18

iii) Output can be seen in *.OUT file