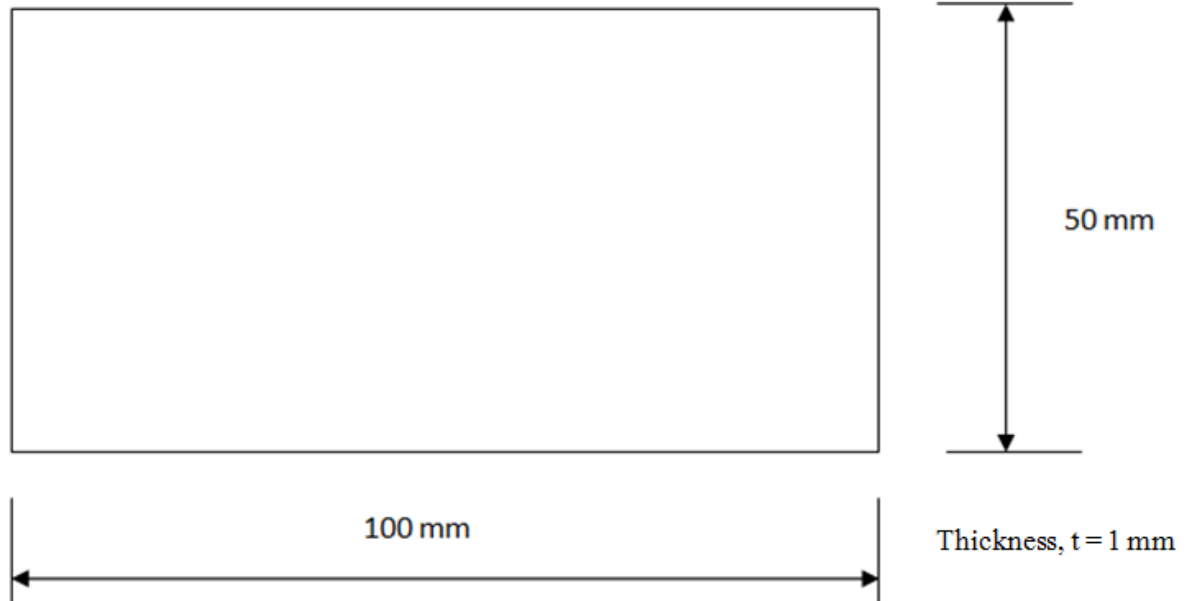


RANDOM RESPONSE ANALYSIS OF A RECTANGULAR CANTILEVER PLATE



PROCEDURE

1. Create Keypoints

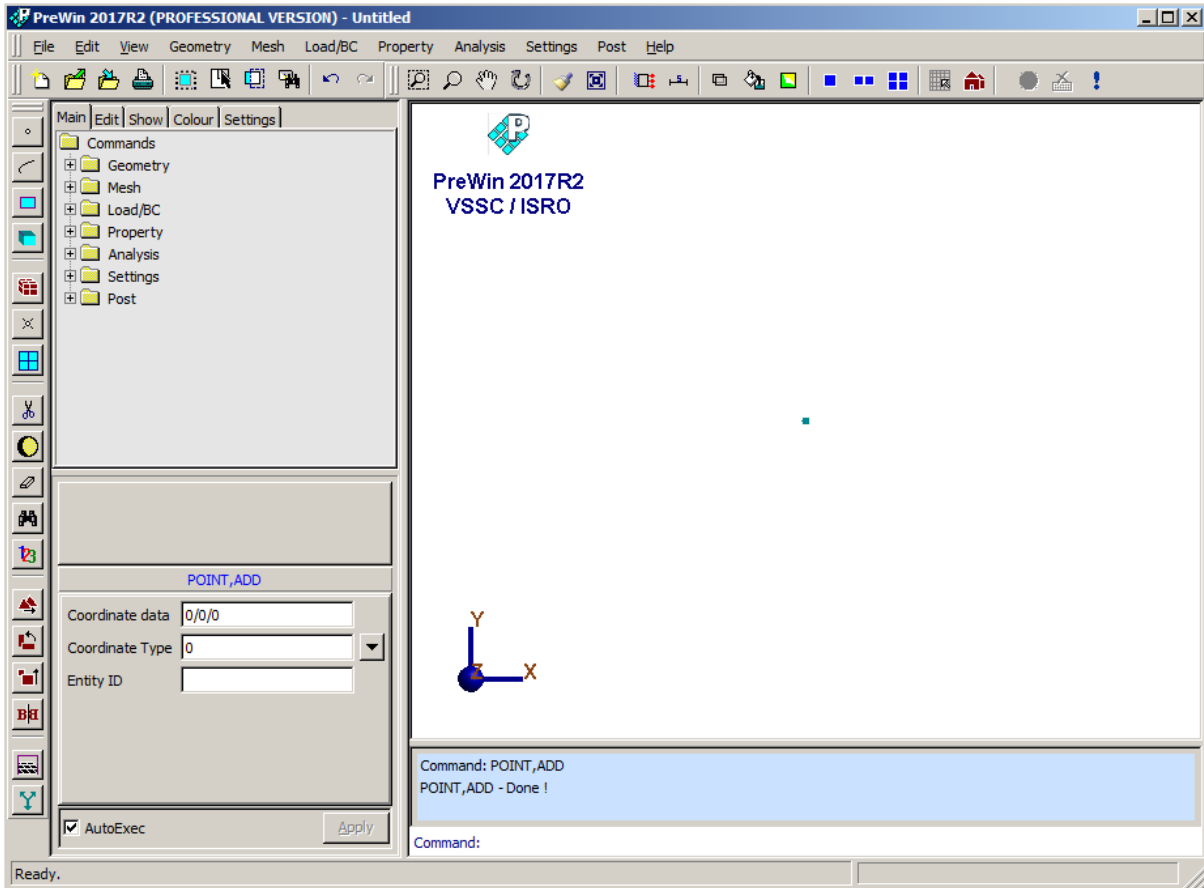
Command : POINT,ADD

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

Parameters :

POINT,ADD	
Coordinate data	0/0/0
Coordinate Type	0
Entity ID	

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



Similarly create key points at (100/50/0)

2. Create Surface

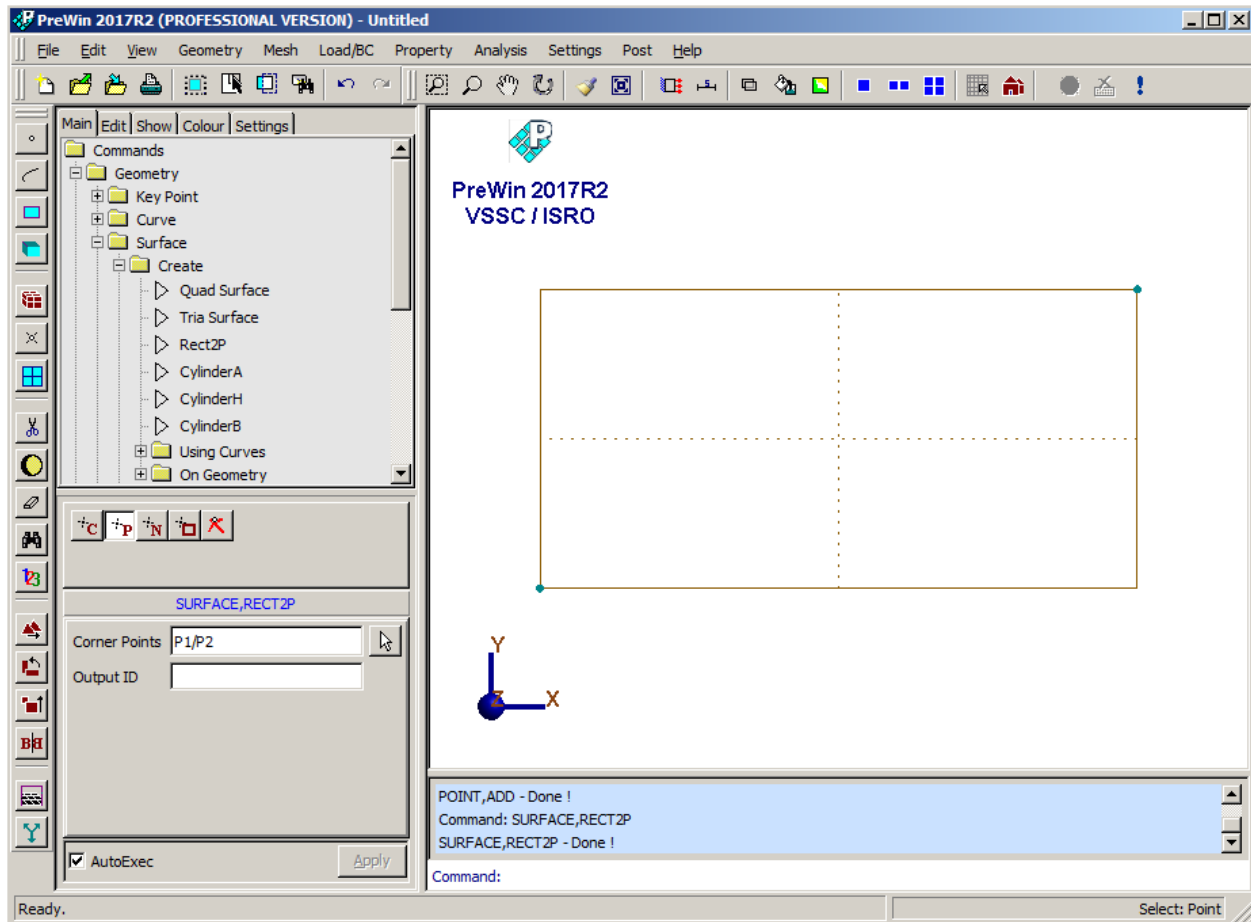
Command : SURFACE,RECT2P

Menu : Geometry → Surface → Create → Rect2P

Parameters :

SURFACE,RECT2P	
Corner Points	P1/P2
Output ID	

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

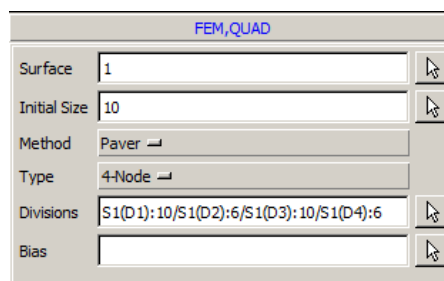


3. Generate mesh

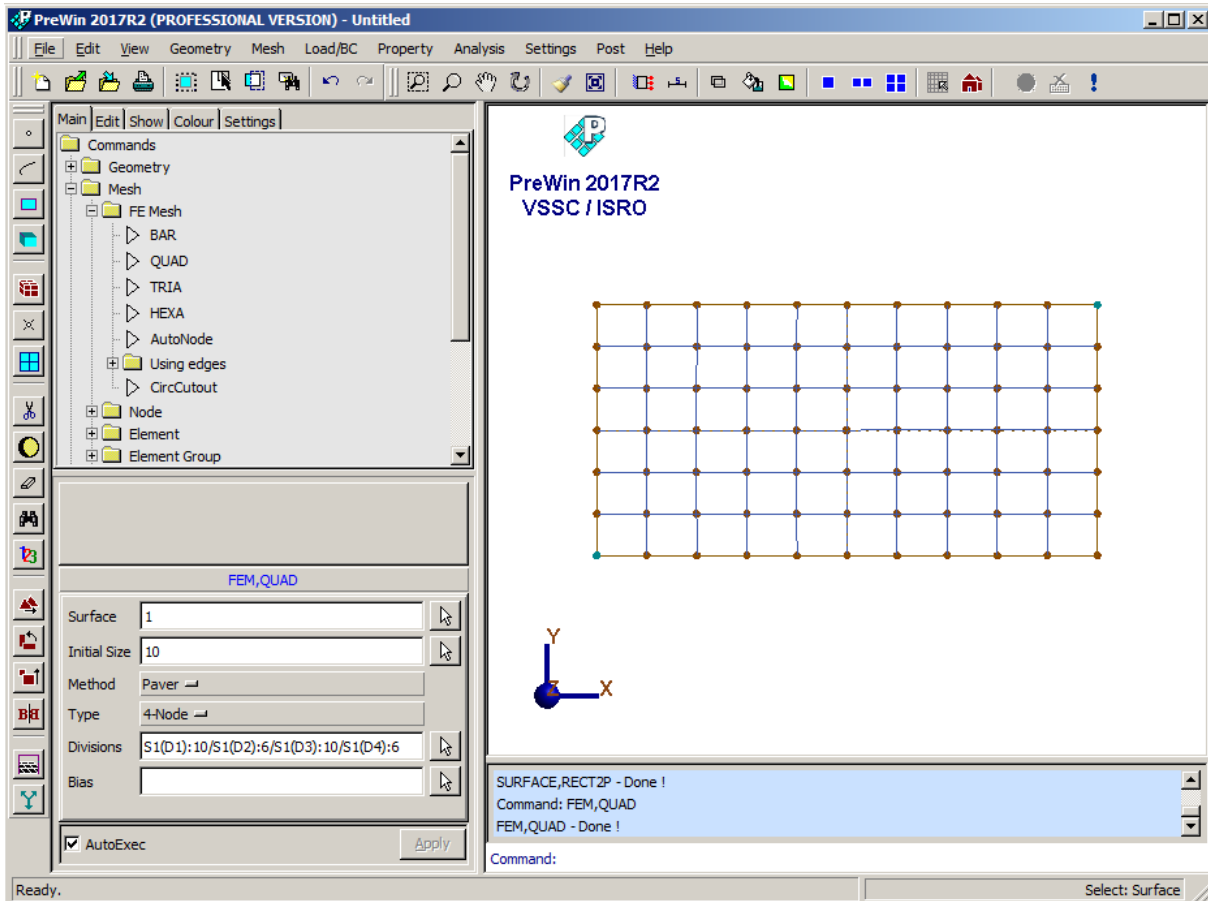
Command : FEM,QUAD

Menu : Mesh → FE Mesh → QUAD

Parameters :



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

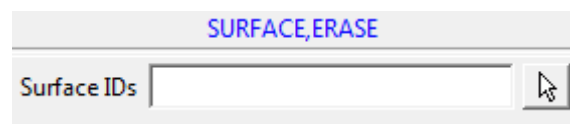


4. Erase Surface

Command : SURFACE,ERASE

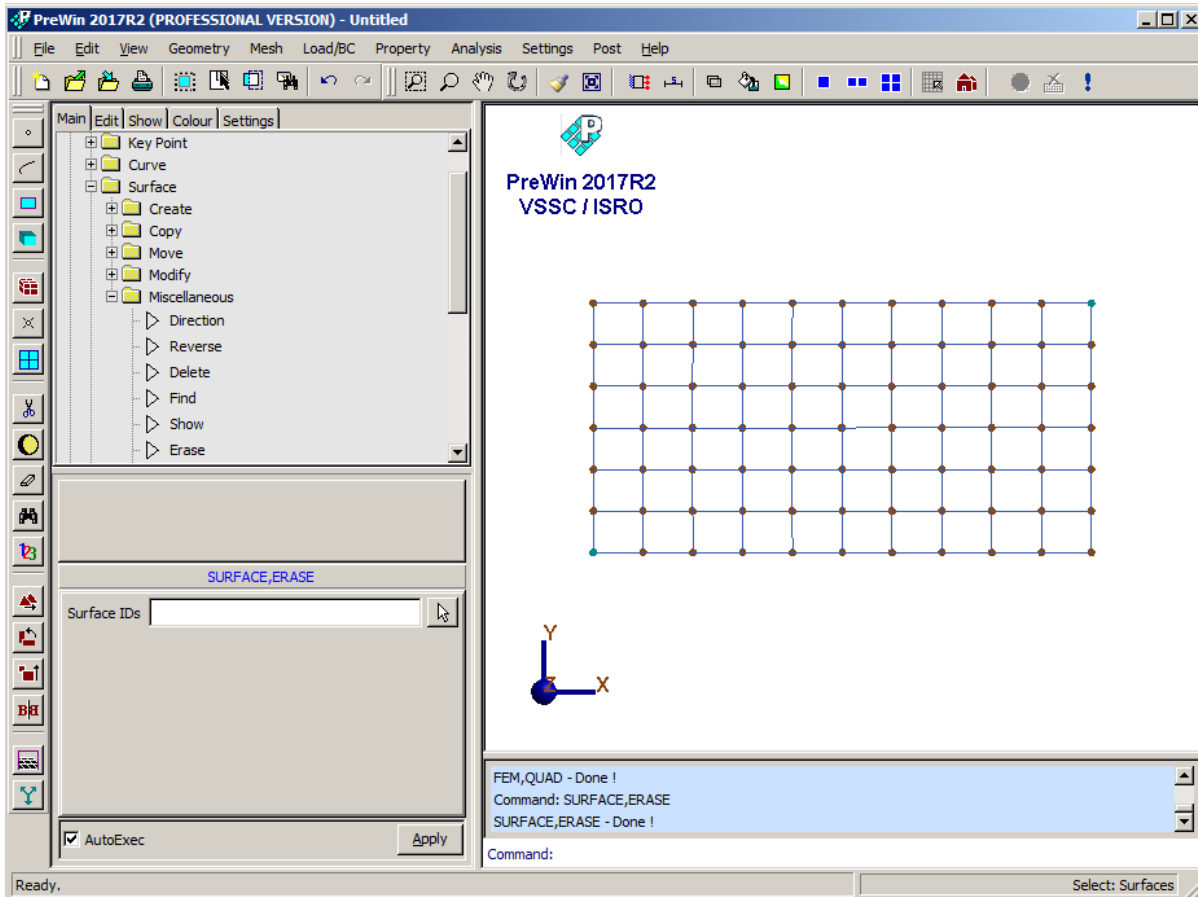
Menu : Geometry → Curve → Miscellaneous → Erase

Parameters :



Type in the surface ID or pick the surface after clicking the arrow in the surface ID box

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



5. Apply Boundary Condition

Command : BC,ADD

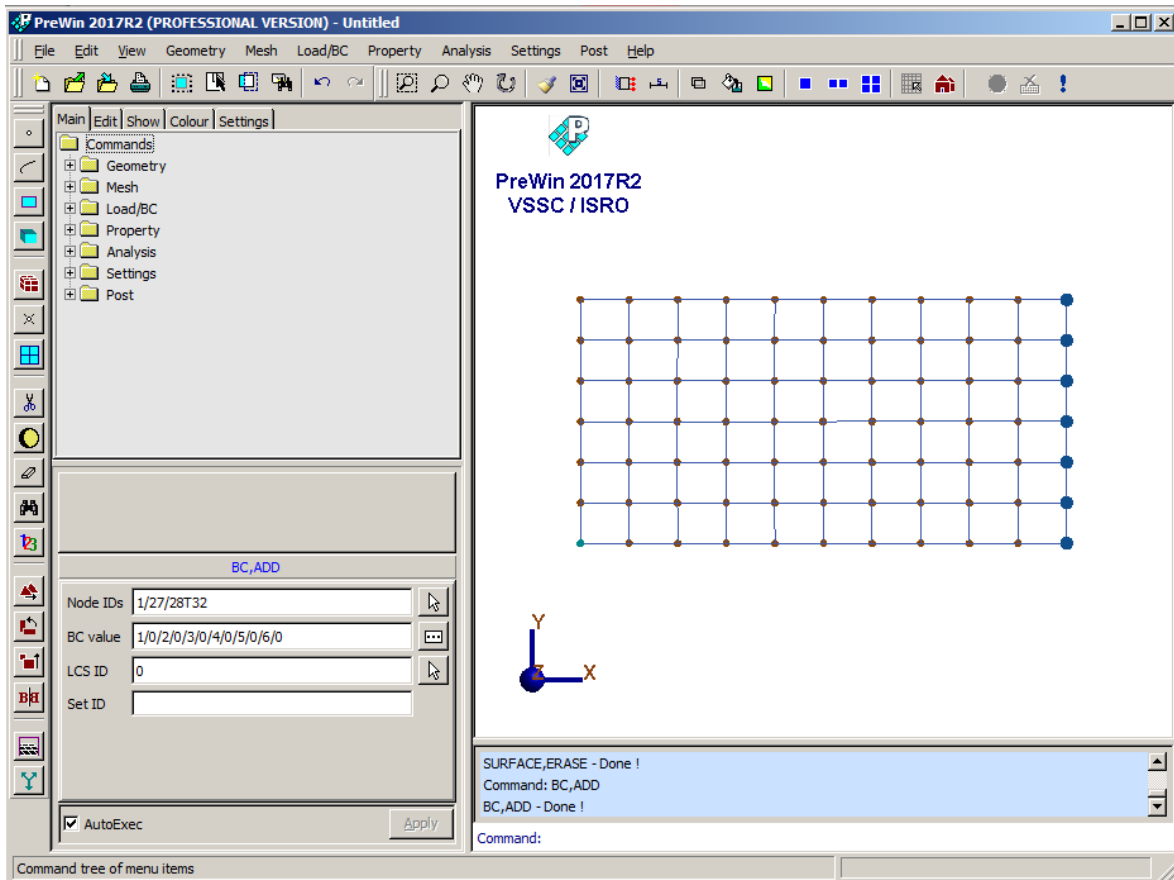
Menu : Load/BC → Displacement BC → Add

Parameters :

BC,EDIT	
Node IDs	1/27/28T32
BC value	1/0/2/0/3/0/4/0/5/0/6/0
LCS ID	0

BC	
Translation	
<input checked="" type="checkbox"/> Ux	0
<input checked="" type="checkbox"/> Uy	0
<input checked="" type="checkbox"/> Uz	0
Rotation	
<input checked="" type="checkbox"/> Rx	0
<input checked="" type="checkbox"/> Ry	0
<input checked="" type="checkbox"/> Rz	0
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>	

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

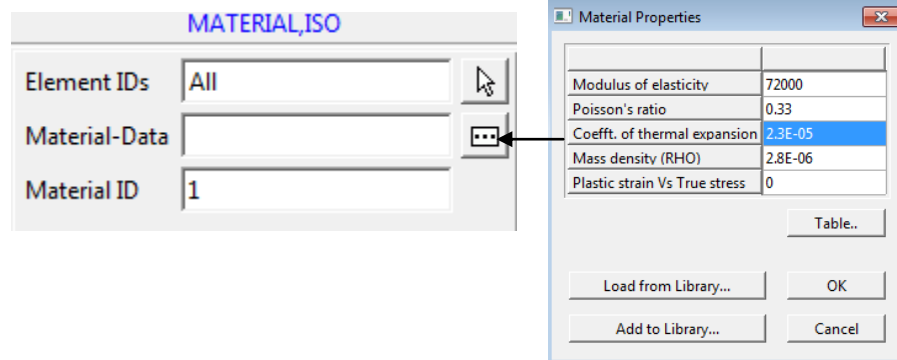


6. Apply Material Property

Command : MATERIAL,ISO

Menu : Property → Material → Isotropic → Add

Parameters :



Material property can be load from library or can be typed in.

7. Apply Thickness

Command : THICKNESS,ADD

Menu : Property → Physical → Thickness → Add

Parameters :

THICKNESS,ADD	
Element IDs	All
Thickness	1
Set ID	

8. Set Analysis Type

Command : ANTYPE,SET

Menu : Analysis → Analysis Type

Parameters :

ANTYPE,SET	
Analysis Type	Random Response

9. Set Analysis Option

Command : ANOPTION,SET

Menu : Analysis → Analysis Option

Parameters :

ANOPTION,SET	
Linear Solver	MultiFrontal
Eigen Solver	Lanczos
Pre-stress File	

10. Set Random Response General Data

Command : RANDGEN,ADD

Menu : Analysis → Random Response → General → Add

Parameters :

RANDGEN,ADD	
Response Extraction	Auto ↕
No. of modes	20
Node List	All
Start Frequency	1
Maximum Frequency	500
Finer Increment	0.1
Coarser Increment	1
Mass Option	Consistent ↕
Stress Option	Yes ↕

11. Create Damping Data

Command : RNDEXPLICITDAMP,ADD

Menu : Analysis → Random Response → Damping → Add

Parameters:

RNDEXPLICITDAMP,ADD	
Damping factors	

Frequency(Hz)	Factor	
1	0.02	
20	0.02	

12. Set Base Excitation Data

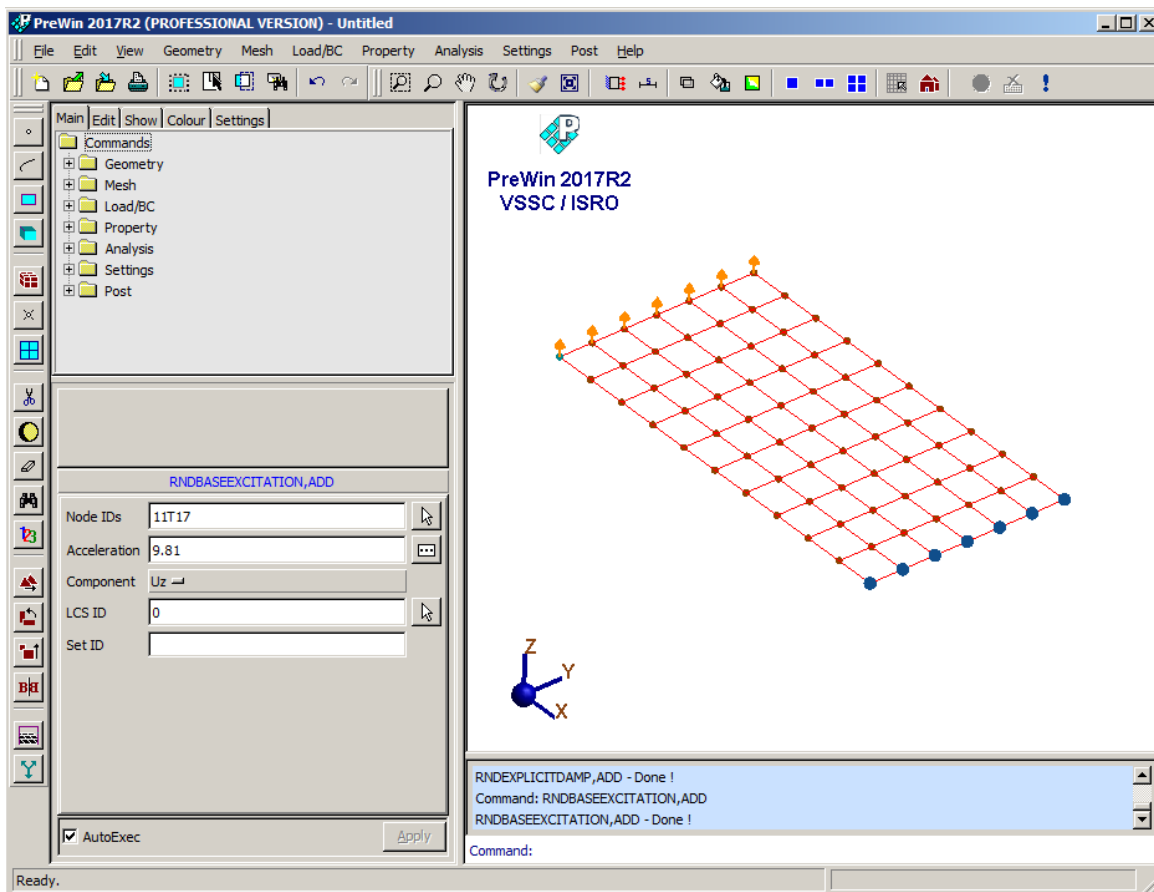
Command : RNDBASEEXCITATION,ADD

Menu : Analysis → Random Response → Base Excitation → Add

Parameters:

RNDBASEEXCITATION,ADD	
Node IDs	11T17
Acceleration	9.81
Component	Uz
LCS ID	0
Set ID	

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

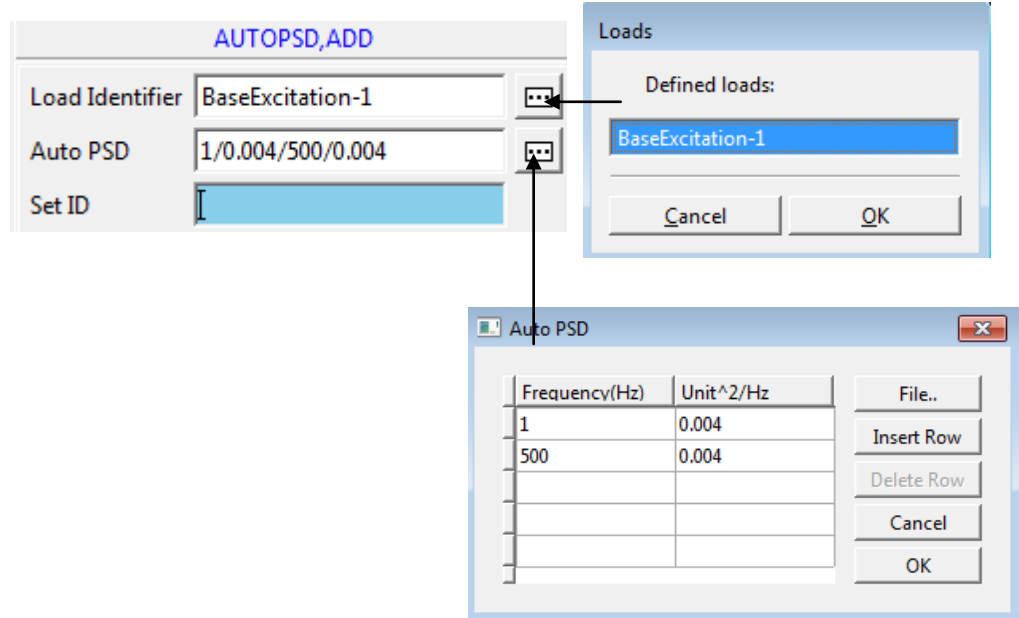


13. Create Auto PSD Data

Command : AUTOPSD,ADD

Menu : Analysis → Random Response → Auto PSD → Add

Parameters:



*Select Base Excitation-1 load from Load identifier dialog box.

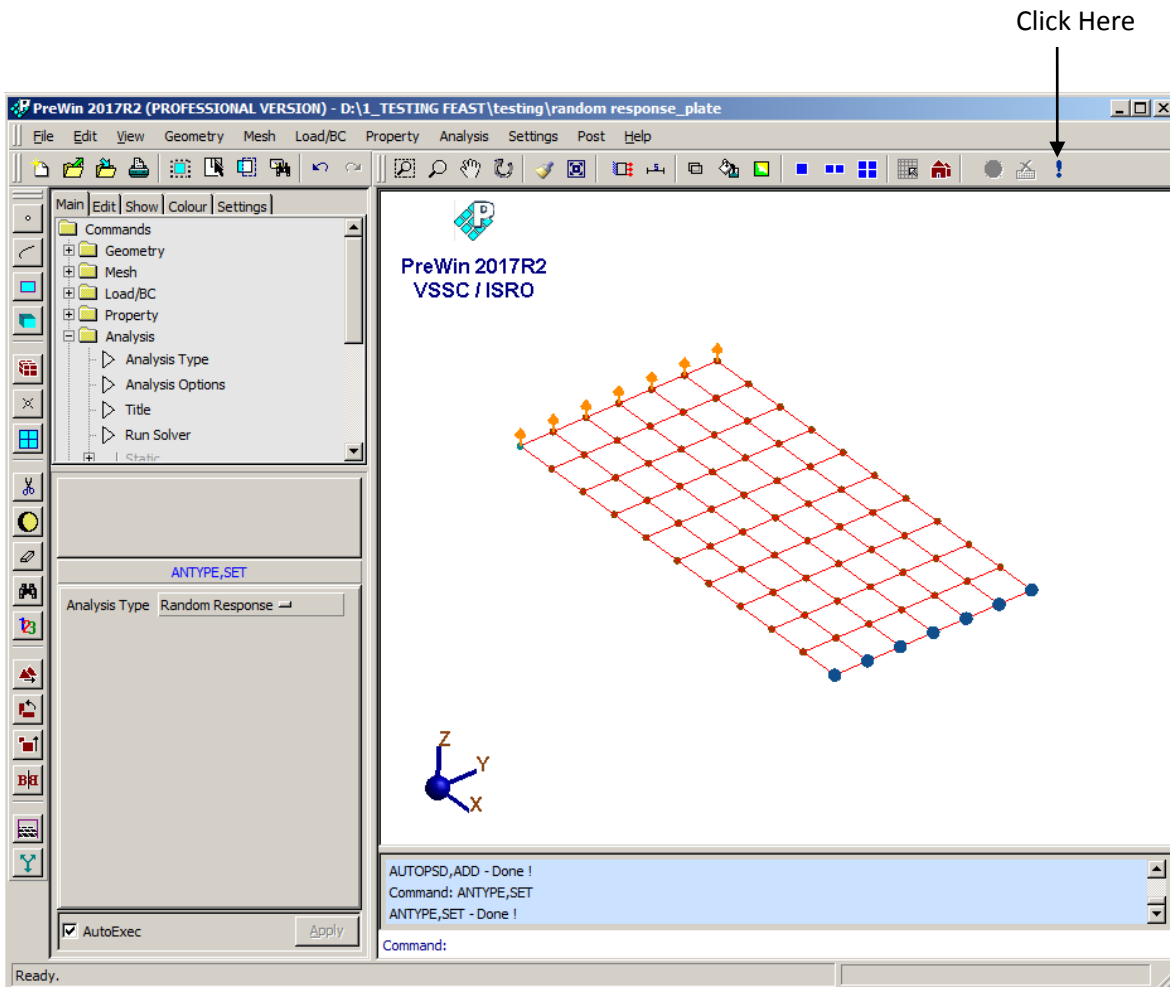
*Enter PSD value in Auto PSD dialog box and click ok.

14. Save the project model

Menu : File → Save

15. Submit the job in to FEAST

Menu: Analysis → Run Solver



16. Perform Post Processing

i) Frequency vs. acceleration plot

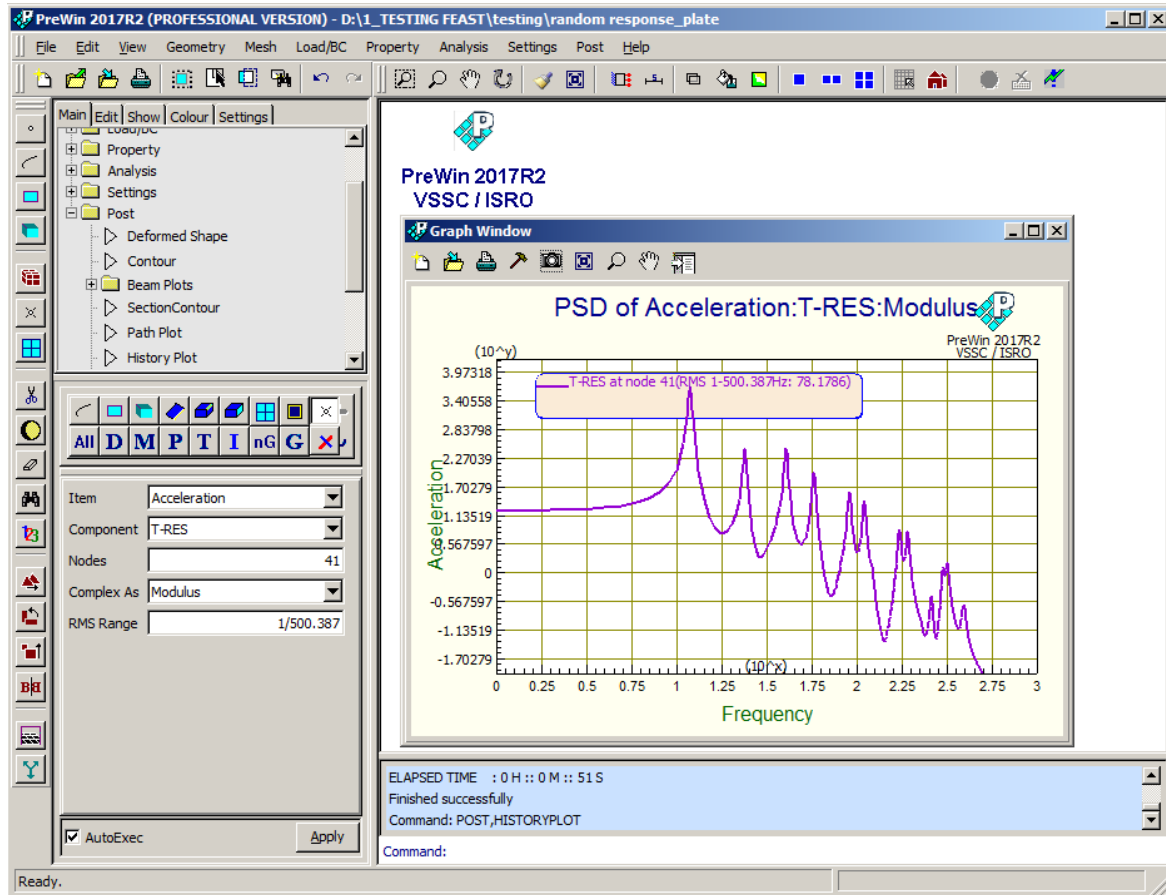
Command : POST,HISTORYPLOT

Menu : Post → History Plot

Parameters:

Item	Acceleration
Component	T-RES
Nodes	41
Complex As	Modulus
RMS Range	1/500.421

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



*Likewise you can plot graph for Frequency vs. displacement and Frequency vs. velocity.

Output can be seen in *.OUT file