

問題：一長方形板，在底端夾持固定，試分析自由振動之前十個自然頻率。

題元素切割：等分為 4 個元素。

條件：

$W = 10 \text{ m}$; $L = 20 \text{ m}$; $t = 1 \text{ m}$; $E = 3.0 \times 10^{11} \text{ N/m}^2$; Poisson's ratio = 0.3; Density = 7900 kg/m^3

The system of SI units is chosen.



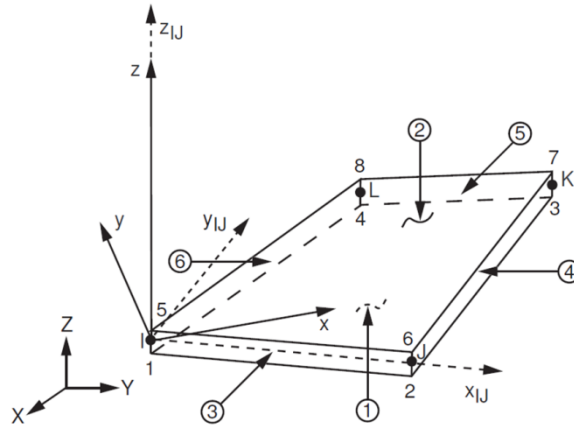
- Ansys had no build-in unit system
- The unit must be consistent.

Table 2-1 Consistent units.

Quantity	SI	SI (mm)	US Unit (ft)	US Unit (inch)
Length	m	mm	ft	in
Force	N	N	lbf	lbf
Mass	kg	tonne (10^3 kg)	slug	$\text{lbf s}^2/\text{in}$
Time	s	s	s	s
Stress	$\text{Pa (N/m}^2\text{)}$	$\text{MPa (N/mm}^2\text{)}$	lbf/ft^2	$\text{psi (lbf/in}^2\text{)}$
Energy	J	$\text{mJ (}10^{-3}\text{ J)}$	ft lbf	in lbf
Density	kg/m^3	tonne/mm^3	slug/ft^3	$\text{lbf s}^2/\text{in}^4$

SHELL63

Elastic Shell



x_{IJ} = Element x-axis if ESYS is not supplied.

x = Element x-axis if ESYS is supplied.

Element Name	SHELL63
Nodes	I, J, K, L
Degrees of Freedom	UX, UY, UZ, ROTX, ROTY, ROTZ
Real Constants	TK(I), TK(J), TK(K), TK(L), EFS, THETA, RMI, CTOP, CBOT, ..., ADMSUA, etc.
Material Properties	EX, NUXY, GXY, ALPX, DENS, DAMP, etc.
Surface Loads	Pressure face 1, face 2, face 3, face 4, face 5, face 6
Body Loads	Temperature -- T(1), T(2), T(3), T(4), T(5), T(6), T(7), T(8)
Special Features	Stress stiffening, Large deflection, etc.
KEYOPT(1)	0 -- Bending and membrane stiffness 1 -- Membrane stiffness only 2 -- Bending stiffness only
KEYOPT(3)	Key for inclusion of extra displacement shapes
KEYOPT(5)	Key for element solution
etc.	

/POST1
SET, LIST
FINISH