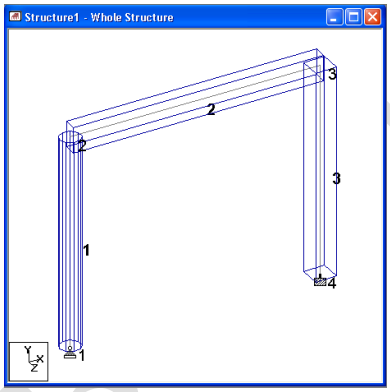
STAAD Pro Solution Steps

Methods of Analysis:

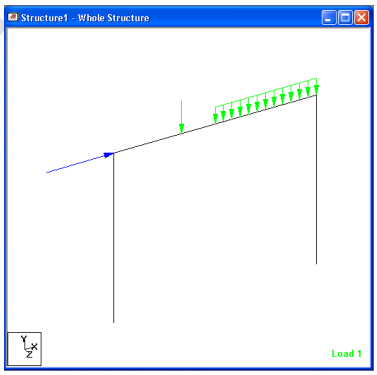
A- Edit Commands Lines Method

B- Graphical Method

1. Modeling



2.Loading



3.Analyzing :

- Elastic Analysis
- P-Delta Analysis
- Buckling Analysis
- Cable Analysis

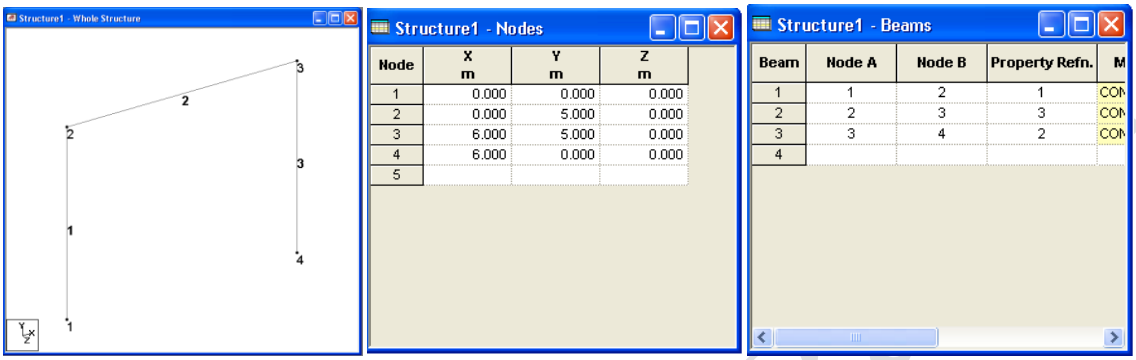
4.Reading Results :

- Tables results
- Graphical results

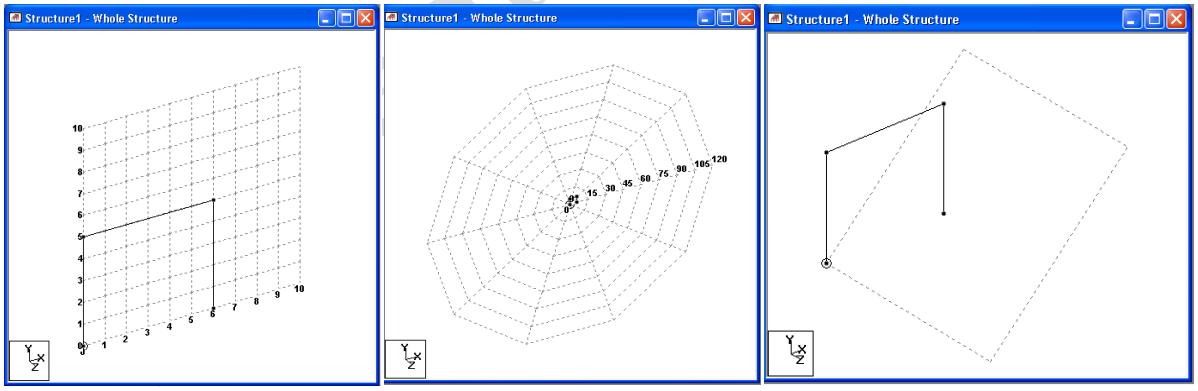
1.Modeling

A. Geometrical Layout :

i. Tables :



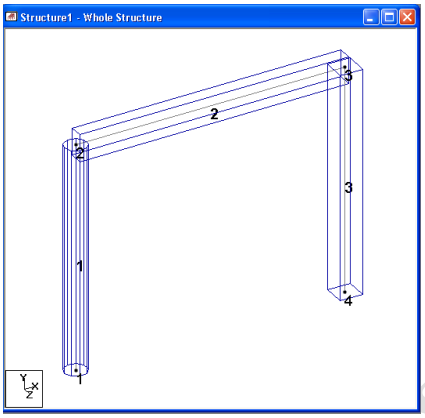
ii. Grid (Linear, Radial, Irregular) - Snap Node/Beam 



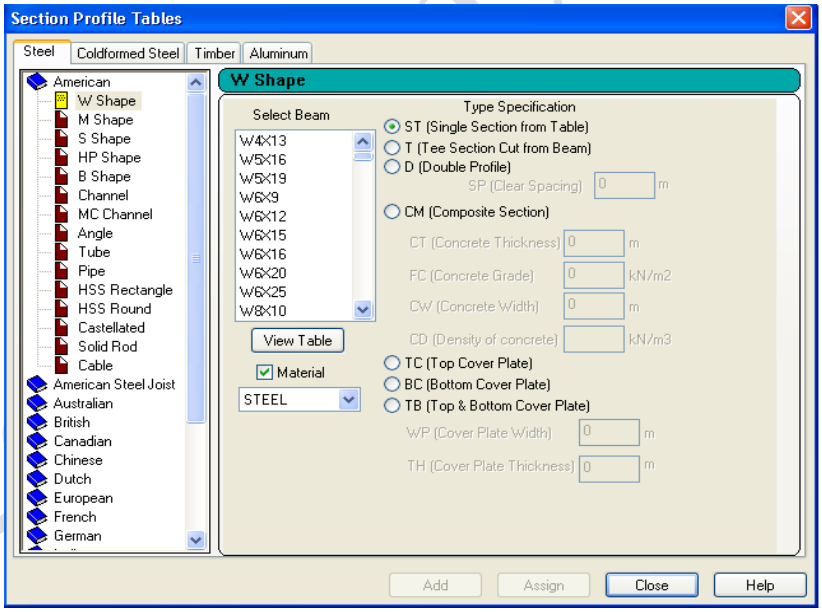
Linear	Radial	Irregular

B. Cross Sections :

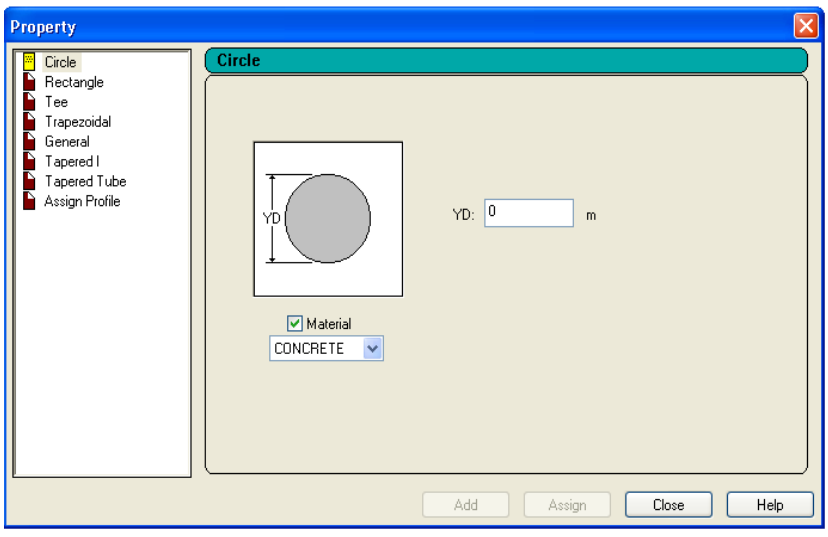
(step1-Define section → step2 – Assign section)



Steel sections



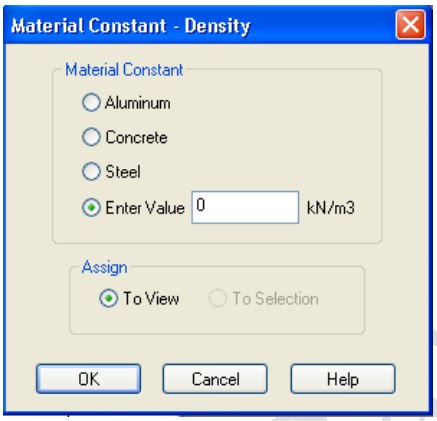
Define Sections (concrete)



C. Material Constants :

(step1-Define Material → step2 – Assign Material)

i. Density



ii. Elasticity

iii. Poisson's Ratio

iv. Alpha (Coefficient of Thermal Expansion) of the materials

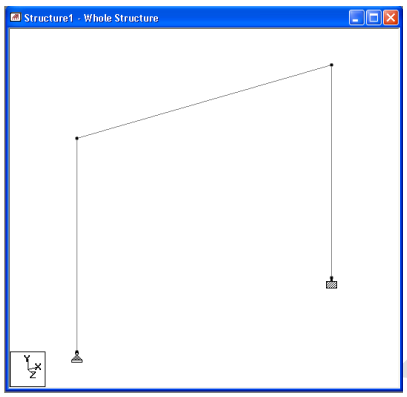
Default Material Constants :

Structure1 - Materials

Name	E kN/mm2	Poisson's Ratio	Density kg/m3	Alpha @/°K
STEEL	205.000	300E-3	7833.413	12E-6
ALUMINUM	68.948	330E-3	2712.631	23E-6
CONCRETE	21.718	170E-3	2402.616	10E-6

D. Supports :

(step1-Define Supports → step2 – Assign Supports)



i. Fixed (restrained in all 6 degrees of freedom)

ii. Pinned (restrained in all three translational degrees of freedom and free in the 3 rotational degrees of freedom)

iii. Fixed But (create various types of roller, hinge and spring supports with specified restrained degrees of freedom)

iv. Enforced (same as a Fixed support except that the restrained degrees of freedom are defined in terms of being stiff springs)

v. Enforced But (same as the "Enforced" support except that we have a choice on the degrees of freedom we wish to restrain)

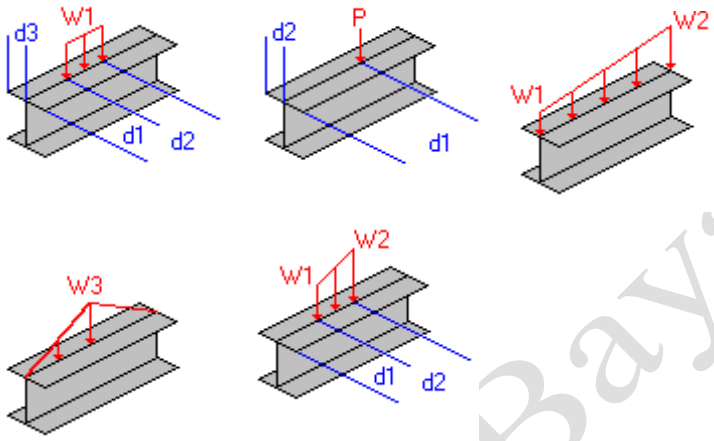
vi. Multi Linear Spring (allows the user to model the support type for which the resistance offered to external loads varies with the extent of deformation of the support node)

vii. Foundation (create spring supports for independent footings and mat foundations)

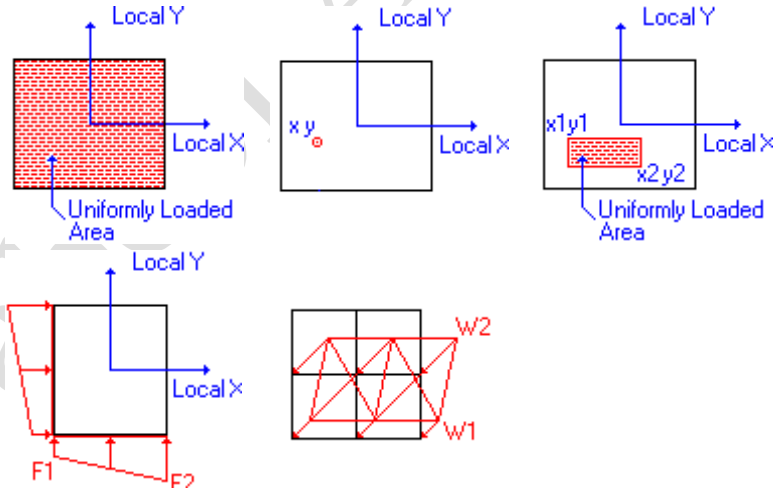
viii. Inclined (create supports that offer restraints in an axis system that is inclined with respect to the global axis system)

2.Loading

i. Self weight
ii. Nodal Load
iii. Member load

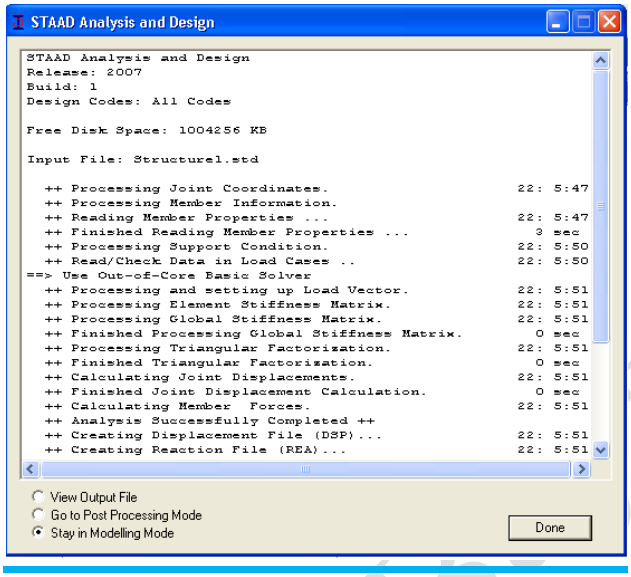


iv. Area Load
v. Floor Load
vi. Plate Loads



vii. Temperature Load
viii. Seismic Load
ix. Wind Load
x. ……..

3.Analyzing



4.Reading Results

i. Tables result

Structure1 - Node Displacements:

All | Summary

Node	L/C	Horizontal X mm	Vertical Y mm	Horizontal Z mm	Resultant mm	Rotational rX rad	rY rad	rZ rad
1	1 DL	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	2 LL	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	3 WL	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	4 DL+LL+WL	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	1 DL	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	2 LL	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	3 WL	0.000	0.000	0.000	0.000	0.000	0.000	-0.000
	4 DL+LL+WL	0.000	0.000	0.000	0.000	0.000	0.000	-0.000
3	1 DL	-0.181	-0.025	0.000	0.183	0.000	0.000	-0.000
	2 LL	-0.044	-0.004	0.000	0.045	0.000	0.000	-0.000

Structure1 - Support Reactions:

All | Summary | Envelope

Node	L/C	Horizontal Fx kN	Vertical Fy kN	Horizontal Fz kN	Moment Mx kNm	My kNm	Mz kNm
2	1 DL	2.372	35.551	0.000	0.000	0.000	0.000
	2 LL	0.692	4.127	0.000	0.000	0.000	0.000
	3 WL	-1.473	-2.703	0.000	0.000	0.000	0.000
	4 DL+LL+WL	1.891	45.482	0.000	0.000	0.000	0.000
5	1 DL	-2.372	40.444	0.000	0.000	0.000	0.491
	2 LL	-0.692	3.873	0.000	0.000	0.000	0.264
	3 WL	-6.527	2.703	0.000	0.000	0.000	15.783
	4 DL+LL+WL	-13.091	58.513	0.000	0.000	0.000	23.109

Structure1 - Beam End Forces:

All | Summary | Envelope

Beam	L/C	Node	Fx kN	Fy kN	Fz kN	Mx kNm	My kNm	Mz kNm
1	1 DL	2	35.551	-2.372	0.000	0.000	0.000	0.000
		3	-17.046	2.372	0.000	0.000	0.000	-9.487
	2 LL	2	4.127	-0.692	0.000	0.000	0.000	-0.000
		3	-4.127	0.692	0.000	0.000	0.000	-2.768
	3 WL	2	-2.703	1.473	0.000	0.000	0.000	-0.000
		3	2.703	-1.473	0.000	0.000	0.000	5.894
	4 DL+LL+WL	2	45.482	-1.891	0.000	0.000	0.000	-0.000
		3	-23.275	1.891	0.000	0.000	0.000	-7.562
2	1 DL	3	2.372	17.046	0.000	0.000	0.000	9.487
		4	-2.372	16.882	0.000	0.000	0.000	-8.996
	2 LL	3	0.692	4.127	0.000	0.000	0.000	2.768
		4	-0.692	3.873	0.000	0.000	0.000	-2.504

Structure1 - Beam Force Detail:

All | Max Axial Forces | Max Bending Moments | Max Shear Forces

Beam	L/C	Dist m	Fx kN	Fy kN	Fz kN	Mx kNm	My kNm	Mz kNm
1	1 DL	0.000	35.551	-2.372	0.000	0.000	0.000	0.000
		1.000	30.925	-2.372	0.000	0.000	0.000	2.372
		2.000	26.299	-2.372	0.000	0.000	0.000	4.743
		3.000	21.673	-2.372	0.000	0.000	0.000	7.115
		4.000	17.046	-2.372	0.000	0.000	0.000	9.487
	2 LL	0.000	4.127	-0.692	0.000	0.000	0.000	-0.000
		1.000	4.127	-0.692	0.000	0.000	0.000	0.692
		2.000	4.127	-0.692	0.000	0.000	0.000	1.384
		3.000	4.127	-0.692	0.000	0.000	0.000	2.076
		4.000	4.127	-0.692	0.000	0.000	0.000	2.768
	3 WL	0.000	-2.703	1.473	0.000	0.000	0.000	-0.000
		1.000	-2.703	1.473	0.000	0.000	0.000	-1.473

ii. Graphical Results