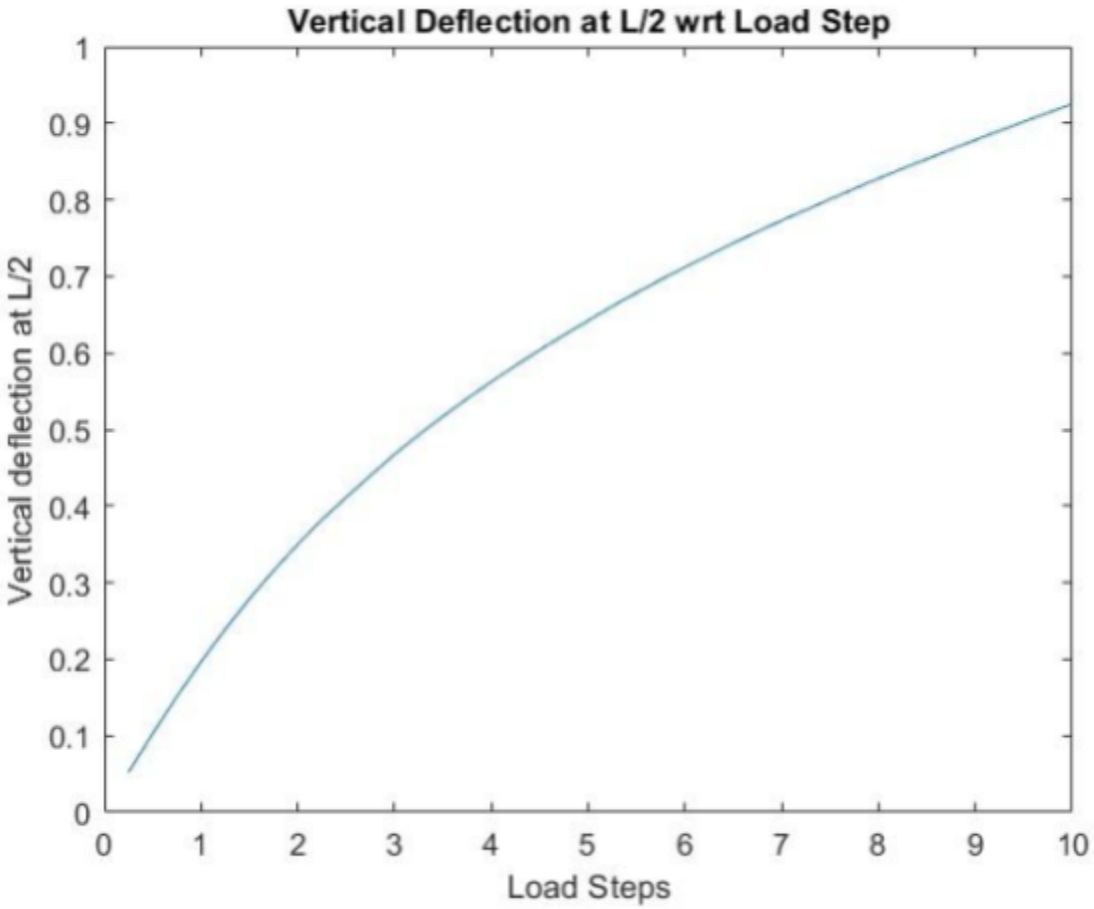
Assignment 2

Problem 5.11

Euler-Bernoulli Beam

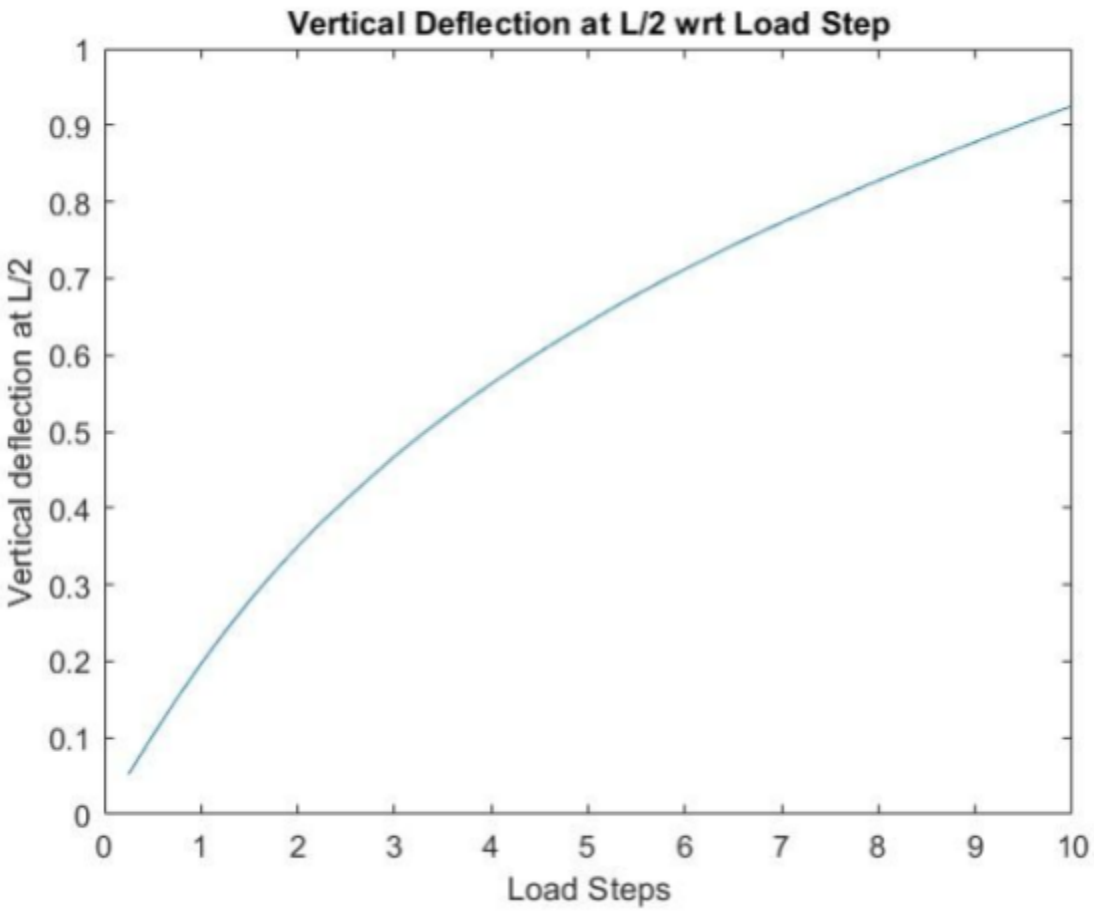
Direct Iteration

8 Linear Element solutions using **Direct Iteration**
Gama = 0.25
Table



Newton’s Iteration

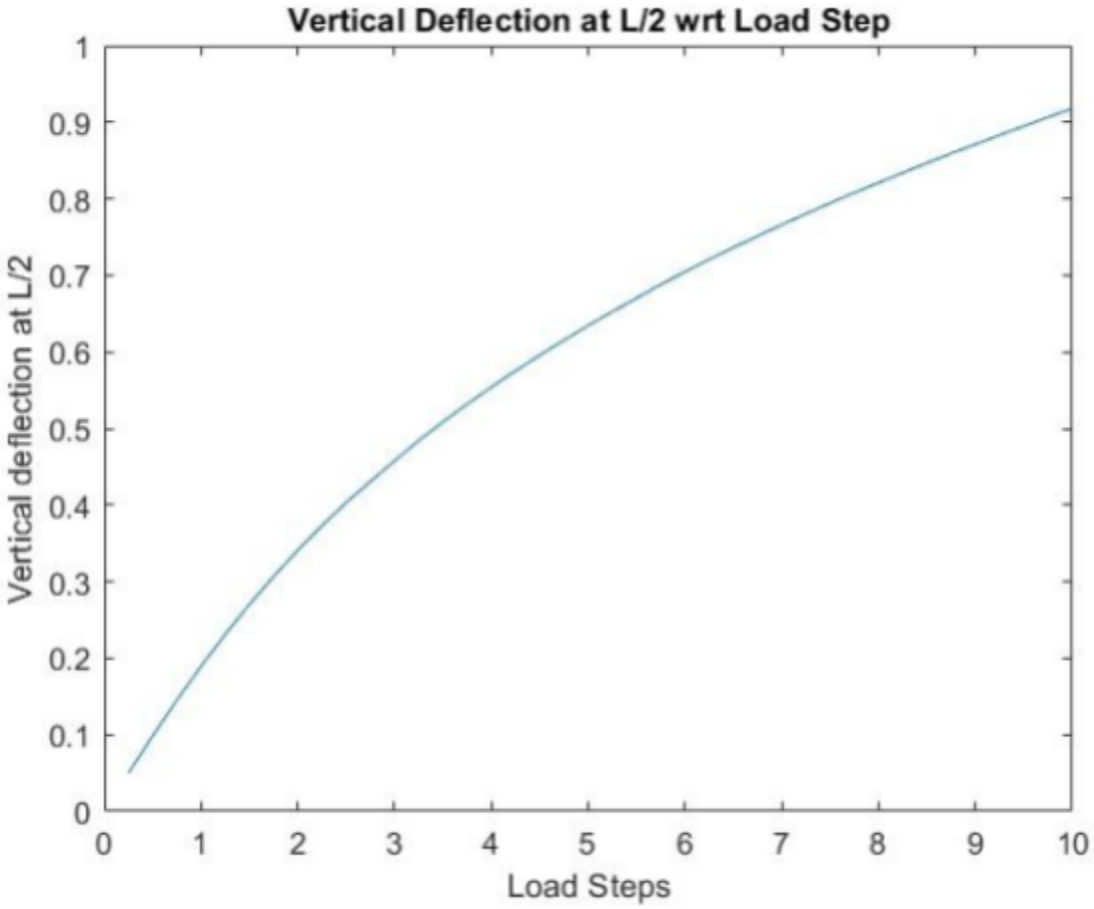
8 Linear Element using **Newton’s Iteration**
Gama = 0.25
Table



Timoshenko Beam

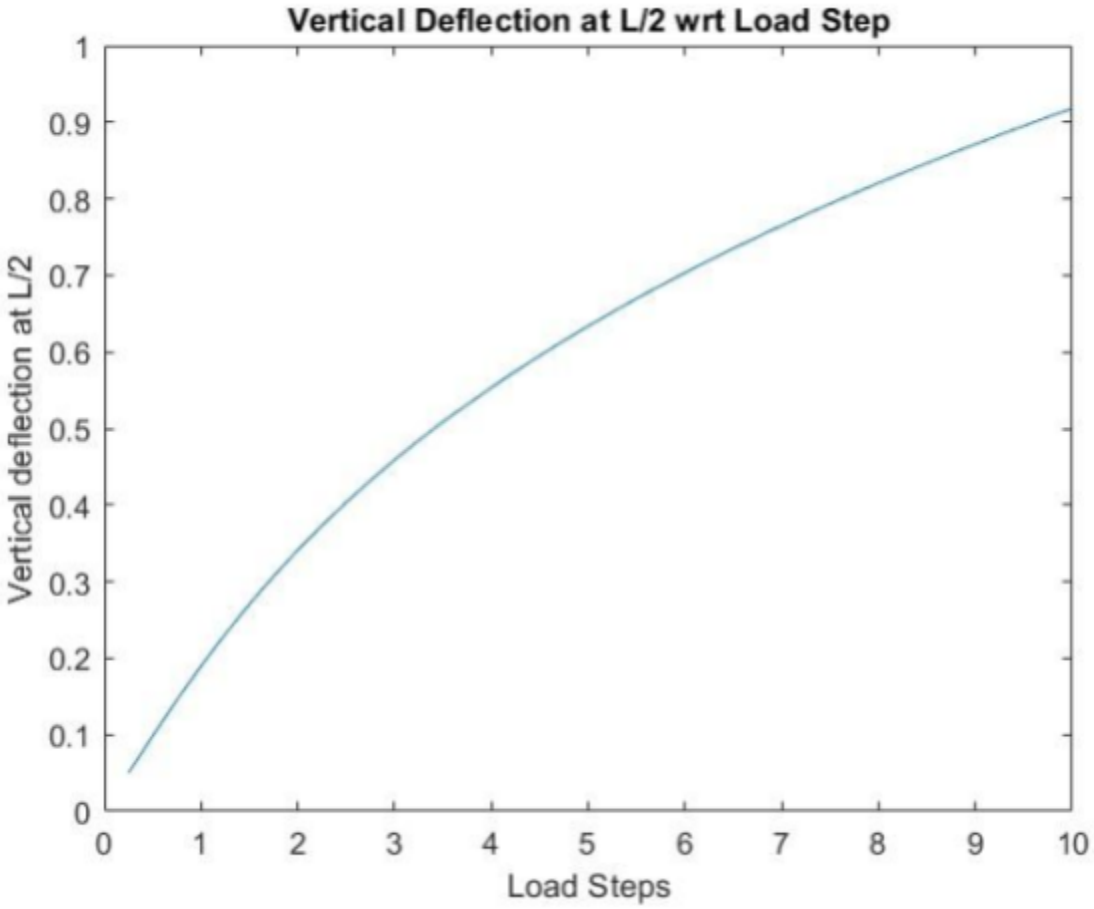
Direct Iteration

8 Linear Element using Direct Iteration
Gama = 0.25
Table



Newton’s Iteration

8 Linear Element using Newton’s Iteration
Gama = 0.25
Table



Problem 5.12

(a) Horizontal Displacement is not restricted at the free end.

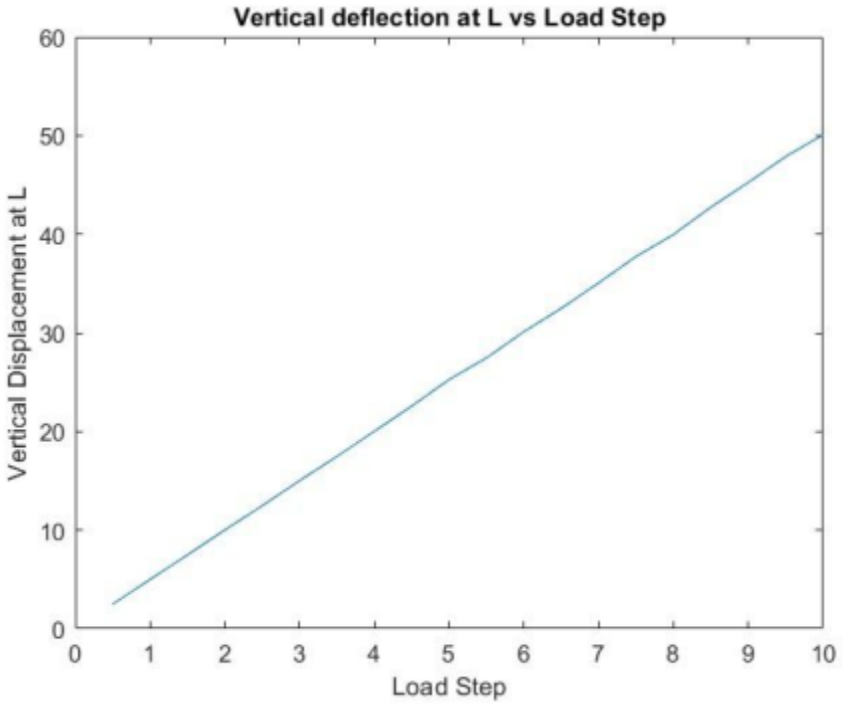
Description of inputs -

- Implemented Euler-Bernoulli Beam Theory (ie mode = 2)
- Implemented Newton's Iteration
- 8 Linear elements
- Poisson's ratio = 0.3. Still gave the input, even though not important for EBT.
- Same with Ks. Ks = 10/12
- Q is [1 0 0] and I am increasing the DP array to get the required external distributed load.

K = 0

- Gama = 0.35

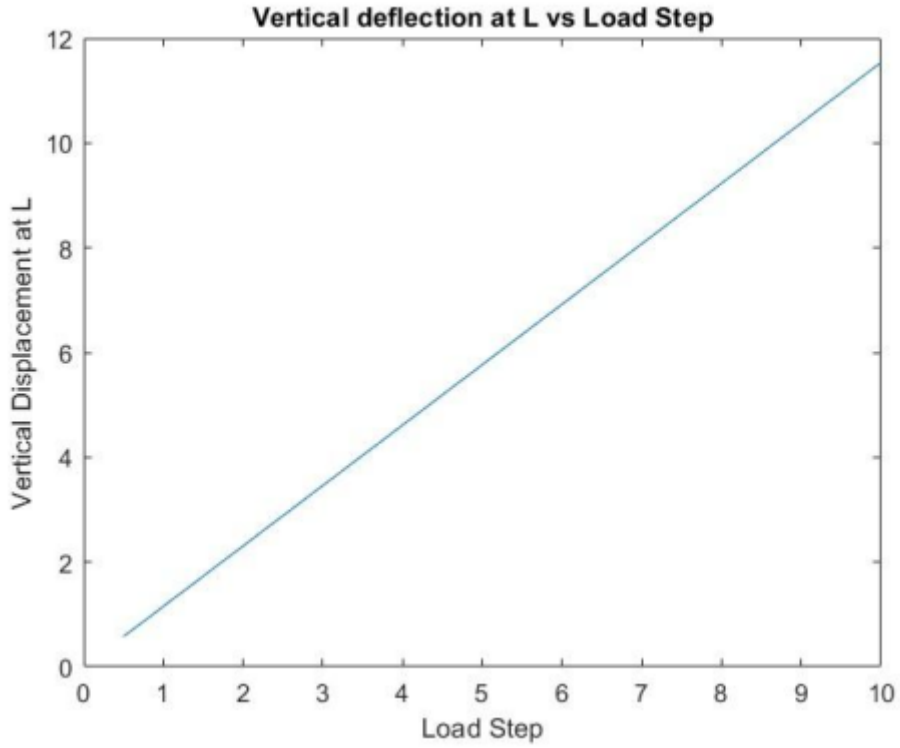
Table



K = 25

- Gama = 0.25

Table



K = 250

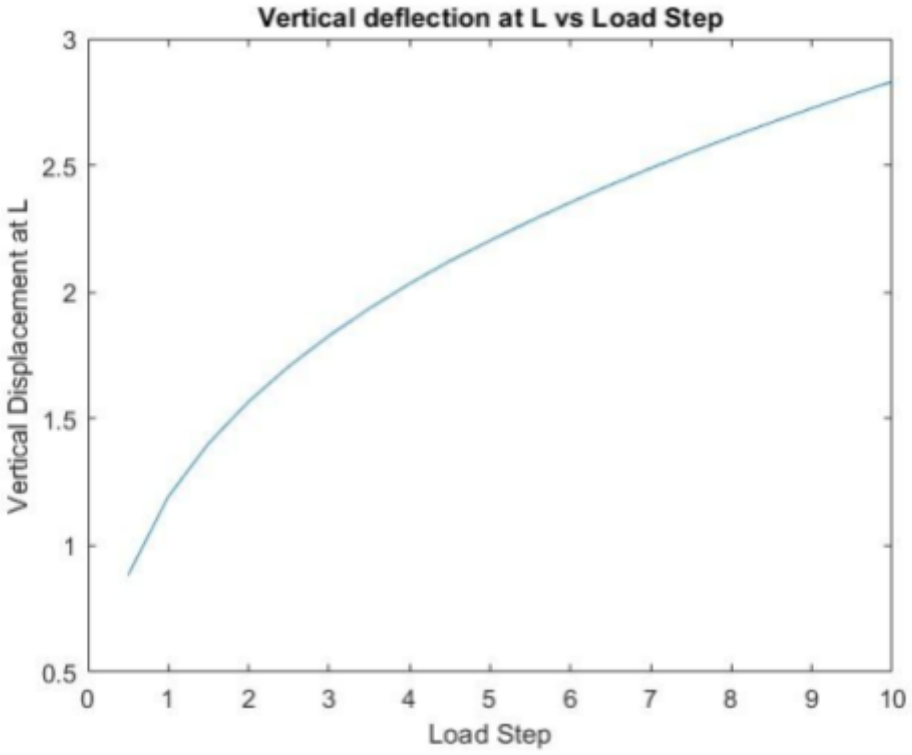
- Gama = 0.25

Table

(b) Horizontal displacement at the free end is constrained

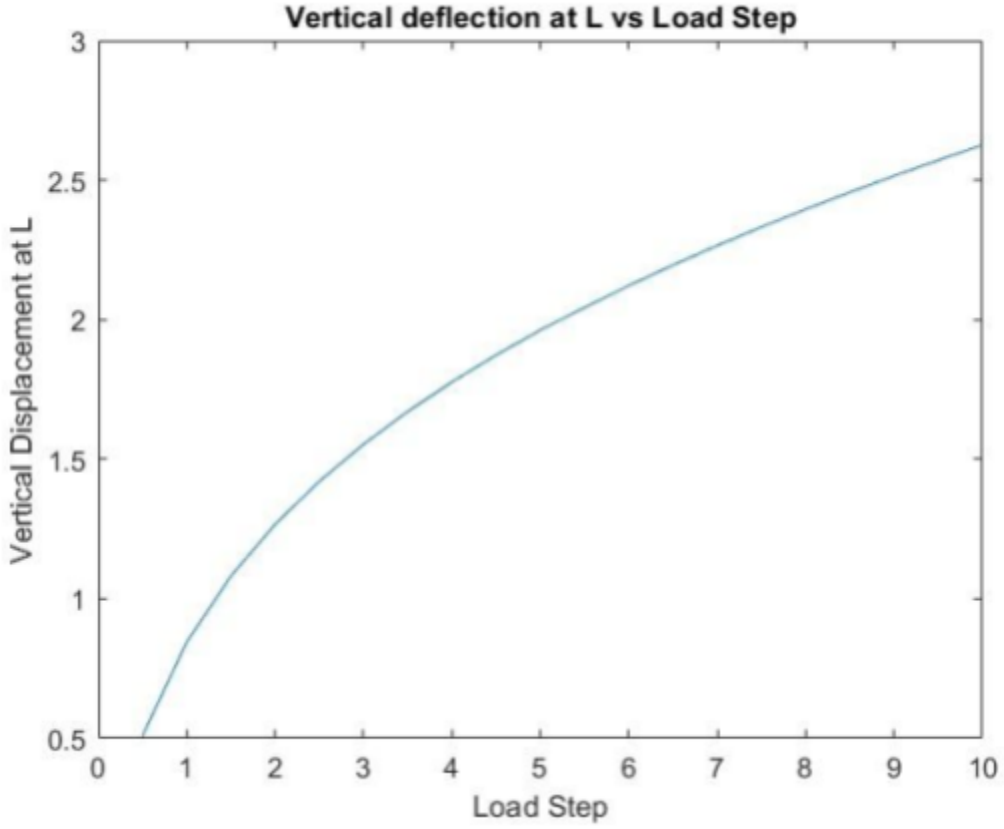
K = 0

Table



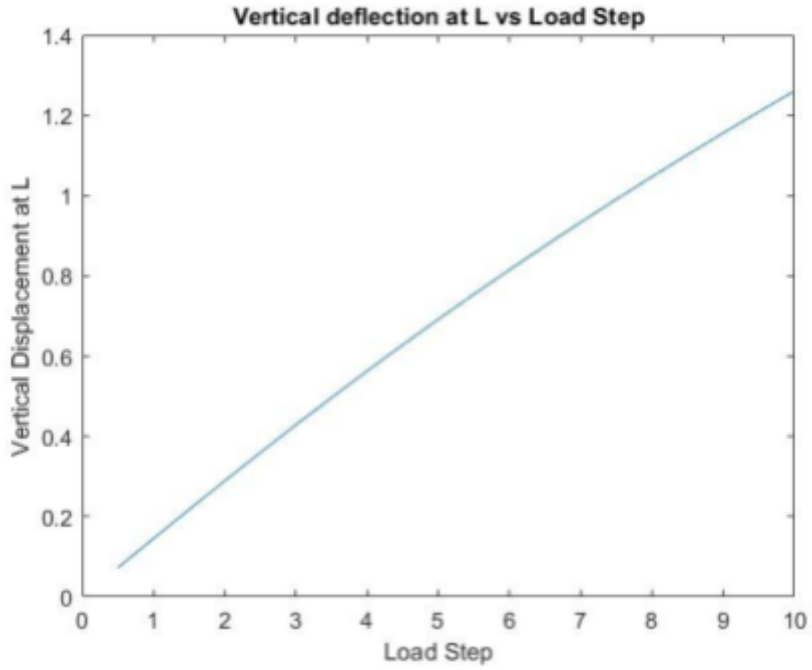
K = 25

Table


Vertical deflection at L vs Load Step
Vertical Displacement at L
Load Step
3
2.5
2
1.5
1
0.5
0
1
2
3
4
5
6
7
8
9
10

K = 250

Table


Vertical deflection at L vs Load Step
Vertical Displacement at L
Load Step
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
1
2
3
4
5
6
7
8
9
10