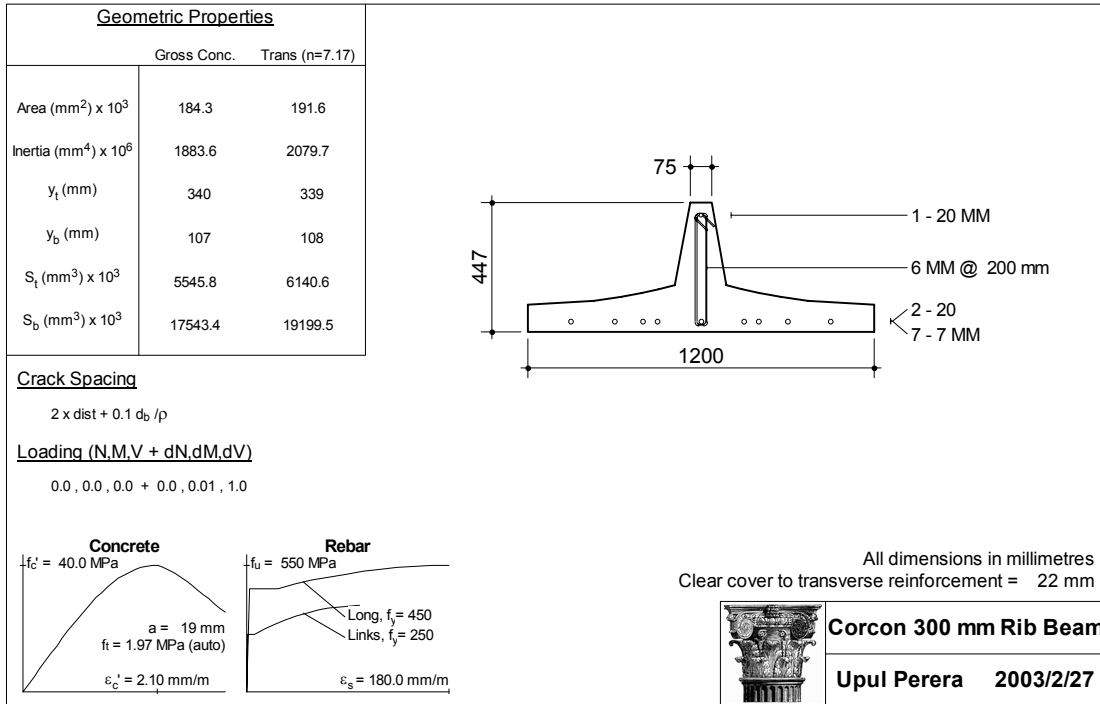
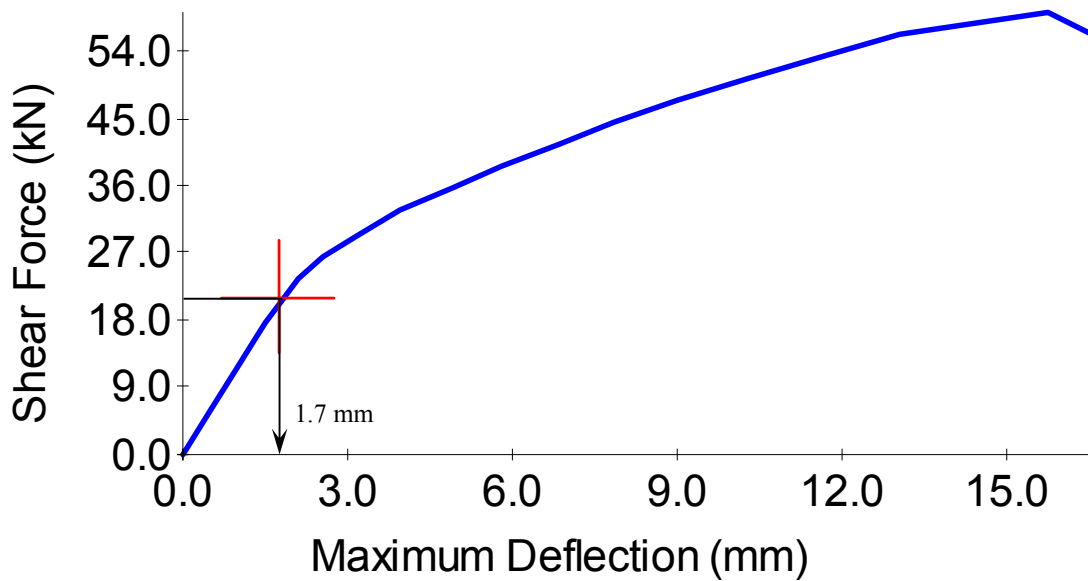


**Calculation of prescribed deformation required to creating the hogging bending moment as per the Fig.3-23.**



**Load-Max Deflection**



**RUAUMOKO INPUT FILE**  
**Four STOREY FRAME – Time History Analysis**

\* 15 seconds of excitation with a time-step of 0.01 seconds

2 0 1 0 0 0 2 0 0                   ! Control parameters PDelta Included  
 35 52 5 4 1 4 9.81 5.0 5.0 0.02 72 1.0   ! Structure parameters  
 0 10 10 0 1 10 0.7 0.1               ! Output parameters  
 0 0 0.05                               ! Iteration parameters

**NODES 1**

1 0.0 0.00 1 1 1                   ! Level 0 - Ground Level  
 2 8.4 0.00 1 1 1  
 3 18.0 0.00 1 1 1  
 4 27.6 0.00 1 1 1  
 5 37.2 0.00 1 1 1  
 6 46.8 0.00 1 1 1  
 7 55.2 0.00 1 1 1  
 8 0.0 4.20 0 0 0 9 0 0               ! Level 1  
 9 8.4 4.20 0 0 0 10 0 0  
 10 18.0 4.20 0 0 0 11 0 0  
 11 27.6 4.20 0 0 0 12 0 0  
 12 37.2 4.20 0 0 0 13 0 0  
 13 46.8 4.20 0 0 0 14 0 0  
 14 55.2 4.20 0 0 0 0 0 0  
 15 0.0 7.60 0 0 0 16 0 0             ! Level 2  
 16 8.4 7.60 0 0 0 17 0 0  
 17 18.0 7.60 0 0 0 18 0 0  
 18 27.6 7.60 0 0 0 19 0 0  
 19 37.2 7.60 0 0 0 20 0 0  
 20 46.8 7.60 0 0 0 21 0 0  
 21 55.2 7.60 0 0 0 0 0 0  
 22 0.0 11.00 0 0 0 23 0 0           ! Level 3  
 23 8.4 11.00 0 0 0 24 0 0  
 24 18.0 11.00 0 0 0 25 0 0  
 25 27.6 11.00 0 0 0 26 0 0  
 26 37.2 11.00 0 0 0 27 0 0  
 27 46.8 11.00 0 0 0 28 0 0  
 28 55.2 11.00 0 0 0 0 0 0  
 29 0.0 14.40 0 0 0 30 0 0           ! Level 4  
 30 8.4 14.40 0 0 0 31 0 0  
 31 18.0 14.40 0 0 0 32 0 0  
 32 27.6 14.40 0 0 0 33 0 0  
 33 37.2 14.40 0 0 0 34 0 0  
 34 46.8 14.40 0 0 0 35 0 0  
 35 55.2 14.40 0 0 0 0 0 0

## Appendix-D

ELEMENTS 1  
1 1 1 8 1 8 ! Column Line 1  
2 2 8 15 8 15  
3 5 15 22  
4 5 22 29  
5 1 2 9 ! Column Line 2  
6 2 9 16  
7 5 16 23  
8 5 23 30  
9 1 3 10 ! Column Line 3  
10 2 10 17  
11 5 17 24  
12 5 24 31  
13 1 4 11 4 11 ! Column Line 4  
14 2 11 18 11 18  
15 5 18 25  
16 5 25 32  
17 1 5 12 ! Column Line 5  
18 2 12 19  
19 5 19 26  
20 5 26 33  
21 1 6 13 ! Column Line 6  
22 2 13 20  
23 5 20 27  
24 5 27 34  
25 1 7 14 7 14 ! Column Line 7  
26 2 14 21  
27 5 21 28  
28 5 28 35  
29 3 8 9 8 9 ! Level 1 Beam  
30 4 9 10  
31 4 10 11  
32 4 11 12  
33 4 12 13  
34 3 13 14  
35 3 15 16 15 16 ! Level 2 Beam  
36 4 16 17  
37 4 17 18  
38 4 18 19  
39 4 19 20  
40 3 20 21  
41 3 22 23 22 23 ! Level 3 Beam  
42 4 23 24  
43 4 24 25  
44 4 25 26  
45 4 26 27

## Appendix-D

```

46 3 27 28
47 3 29 30 29 30          ! Level 4 Beam
48 4 30 31
49 4 31 32
50 4 32 33
51 4 33 34
52 3 34 35 34 35
PROPS
1 FRAME                    ! Ground floor Columns
  2 0 0 2 0 0
  3.198E7 1.33E7 0.25 0.25 0.002447 0.0 0.000 0.492
  0.02 0.02 .25 .25
  -15862.0 -9517.0 754.0 977.0 1136.0 1013.0 9148.0 0

2 FRAME                    ! All Columns above 1st Floor
  2 0 0 2 0 0
  3.198E7 1.33E7 0.25 0.25 0.002447 0.0 0.492 0.492
  0.02 0.02 .25 .25
  -15862.0 -9517.0 754.0 977.0 1136.0 1013.0 9148.0 0

3 FRAME                    ! All 8.4 m span Beams
  1 0 1 4 0 0
  3.198E7 1.33E7 0.474 0.4100 0.005039 0.0 0.25 0.25
  0.00458 0.00458 .447 .447
  -299.2 -299.2 -213.7 213.7
  2379.0 -3.1e4 400.0 -1119.0 400.0 -1119.0
  0.5 0.6 1 2

4 FRAME                    ! All 9.6 m span Beams
  1 0 1 4 0 0
  3.198E7 1.33E7 0.474 0.4100 0.005039 0.0 0.25 0.25
  0.00458 0.00458 .447 .447
  -391.0 -391.0 -244.0 244.0
  2379.0 -3.1e4 400.0 -1119.0 400.0 -1119.0
  0.5 0.6 1 2

5 FRAME                    ! All Columns above 1st Floor
  2 0 0 2 0 0
  3.198E7 1.33E7 0.25 0.25 0.00188 0.0 0.492 0.492
  0.02 0.02 .25 .25
  -13355.0 -8013.0 680.0 847.0 913.0 735.0 5827.0 0

WEIGHTS                    ! Weights not included in member self-weight
1  0.0 0.0 0.0          ! Level 0 - Ground Level
2  0.0 0.0 0.0
3  0.0 0.0 0.0
4  0.0 0.0 0.0

```

Appendix-D

5 0.0 0.0 0.0  
6 0.0 0.0 0.0  
7 0.0 0.0 0.0  
8 214.0 214.0 000.0  
9 458.0 458.0 000.0  
10 488.0 488.0 000.0  
11 488.0 488.0 000.0  
12 488.0 488.0 000.0  
13 458.0 458.0 000.0  
14 214.0 214.0 000.0  
15 214.0 214.0 000.0  
16 458.0 458.0 000.0  
17 488.0 488.0 000.0  
18 488.0 488.0 000.0  
19 488.0 488.0 000.0  
20 458.0 458.0 000.0  
21 214.0 214.0 000.0  
22 214.0 214.0 000.0  
23 458.0 458.0 000.0  
24 488.0 488.0 000.0  
25 488.0 488.0 000.0  
26 488.0 488.0 000.0  
27 458.0 458.0 000.0  
28 214.0 214.0 000.0  
29 214.0 214.0 000.0  
30 458.0 458.0 000.0  
31 488.0 488.0 000.0  
32 488.0 488.0 000.0  
33 488.0 488.0 000.0  
34 458.0 458.0 000.0  
35 214.0 214.0 000.0

! Level 1 - Ground Level

! Level 2 - Ground Level

! Level 3 - Ground Level

! Level 4 - Ground Level

LOADS

! Loads not in member initial conditions  
! i.e. transverse walls etc, columns  
! Level 0 - Ground Level

1 0.0 00.0 0.0  
2 0.0 00.0 0.0  
3 0.0 00.0 0.0  
4 0.0 00.0 0.0  
5 0.0 00.0 0.0  
6 0.0 00.0 0.0  
7 0.0 00.0 0.0  
8 0.0 00.0 0.0  
9 0.0 00.0 0.0  
10 0.0 00.0 0.0  
11 0.0 00.0 0.0  
12 0.0 00.0 0.0  
13 0.0 00.0 0.0

!Level 1

## Appendix-D

14 0.0	00.0 0.0	
15 0.0	00.0 0.0	! Level 2
16 0.0	00.0 0.0	
17 0.0	00.0 0.0	
18 0.0	00.0 0.0	
19 0.0	00.0 0.0	
20 0.0	00.0 0.0	
21 0.0	00.0 0.0	
22 0.0	00.0 0.0	! Level 3
23 0.0	00.0 0.0	
24 0.0	00.0 0.0	
25 0.0	00.0 0.0	
26 0.0	00.0 0.0	
27 0.0	00.0 0.0	
28 0.0	00.0 0.0	
29 0.0	00.0 0.0	! Level 4
30 0.0	00.0 0.0	
31 0.0	00.0 0.0	
32 0.0	00.0 0.0	
33 0.0	00.0 0.0	
34 0.0	00.0 0.0	
35 0.0	00.0 0.0	

EQUAKE

3 1 0.01 9.81 0 0 0 1

! Free Format