Instruction to create STERA3D data (MDOF model)

SAMPLE BUILDING MDOF4F-2 : 4-STORY MDOF MODEL WITH STEEL DAMPER

4-Story MDOF (Multi-Degree of Freedom) model with steel damper



Bare frame Bare frame with damper

	W	Н	K	K0	Fy	K1/K0
	(kN)	(mm)	(kN/mm)	(kN/mm)	(kN)	
4	4894	4000	62.7	277.2	1848	0.02
3	3669	4000	72.9	447.3	2982	0.02
2	3691	4000	91.0	513.9	3426	0.02
1	3762	6000	56.2	410.3	4103	0.02

W: floor weight, H: story height, K: story stiffness

K0: initial stiffness of steel damper, Fy: yielding strength of steel damper

1. Run "STERA 3D.exe"



2. "Option" \rightarrow "Structure"





3. Set damper elements for Bare Frame

Go upper floor and set data until 4F.





4. Set damper elements for Steel Dampers

5. Set damper properties for Bare Frame



6. Set damper properties for Steel Dampers

STERA 3D - Stera1.stera	
[1] click damper button	(V) Help(H)
[~] ↓ PLAN □ □ □ □ → = ÷ ≈ ⊠ ☆ □ □ ● → Unit: mm 5000 0	Damper Editor
	Type Type D1 D2 D2 D2 D3 D4 D5 D6 C Elastic C Hysteresis C Viscous D4 C Viscous C Viscous
	D15 D16 Bilinear Hysteresis Copy PROPERTY K0 4103 ADD OK Stiffness ratio Force (kN) K1 / K0 0.02 Fy 4103
Ready	Height(mm) 4000 4F ок [5] set data of damper properties ок

7. Modal analysis

STERA 3D - Stera1.stera	
File(F) Pattern(P) Member(M) [3] click "1" for 1st	mode vibration
PLAN Response Setting	
0 1 2 3 4 5 6	Ime = 0.00 sec Period = 0.427 sec Amp 1.00
STATIC LOAD	
Direction Distribution Target Drift	
X 🗸 1: Ai 🖌 1/50 🗸	[4] natural period of 1 st mode
1000 View 1: Drift - Shear Relation	
EARTHQUAKE	
File Name Power	
0File (X) 1.0	
File (Y) 1.0	
File (Z) 1.0	
0	
View 1: input Earthquake Ground Motion	[1] click "Actual Size" button
MOVIE	
File	[2] click "Analyze" button
RESPONSE	
Mode C Static C Earthquake	
	₄⁵ ⊶ạ×ơῦ!▶॥■ ≪ ♥ ■ ,
Ready	
	[5] start vibration of 1 st mode

8. Earthquake response analysis

🚯 STERA 3D - Stera1.stera	
File(F) Pattern(P) Member(M) Option(O) View(V) Help(H)	
PLAN Response Setting	
□ T ≈ + = +	
Unit: mm 0 1 2 3 4 5 6	Time = 8.70 sec
Direction Distribution Target Drift	
[1] click "File(x)" and sele	ect an earthquake file 🛛 💛
ARTHQUAKE	
File Name Power	
U File (X) Elcentro40EW 1.0	*
File (Y) 1.0	ļ
File (Z) 1.0	
0 View 1: Input Eathquake Ground Motion	V - And All Manully Marth with 1 gal
View 1. mpd. 20 million of card motion	v all all transfer to the
MOVIE	0.0 gal
File	
DESPONSE	[2] start calculation of earthquake response
C Mode C Statio & Eathquake	- 15.0 sec
Ready	

9. Save data of earthquake response analysis



Time history of response (story drift, shear force, displacement, acceleration) will be stored in "response_structure.txt".