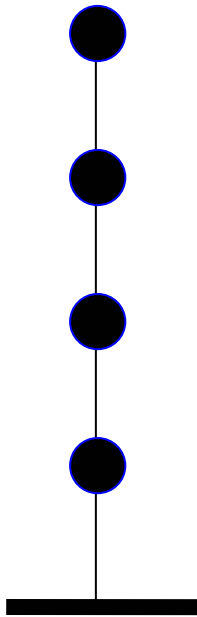# SAMPLE BUILDING MDOF4F-1 :
4-STORY MDOF MODEL WITH ELASTIC STIFFNESS

4-Story MDOF (Multi-Degree of Freedom) model with elastic stiffness
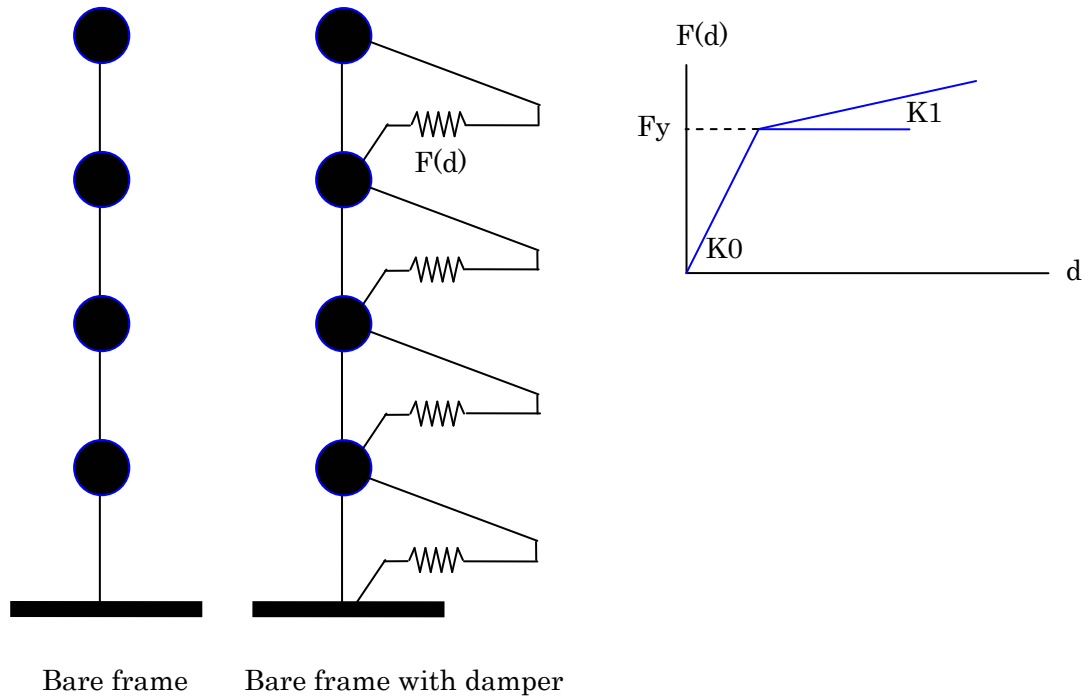

Bare frame

	W (kN)	H (mm)	K (kN/mm)
4	4894	4000	62.7
3	3669	4000	72.9
2	3691	4000	91.0
1	3762	6000	56.2

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

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

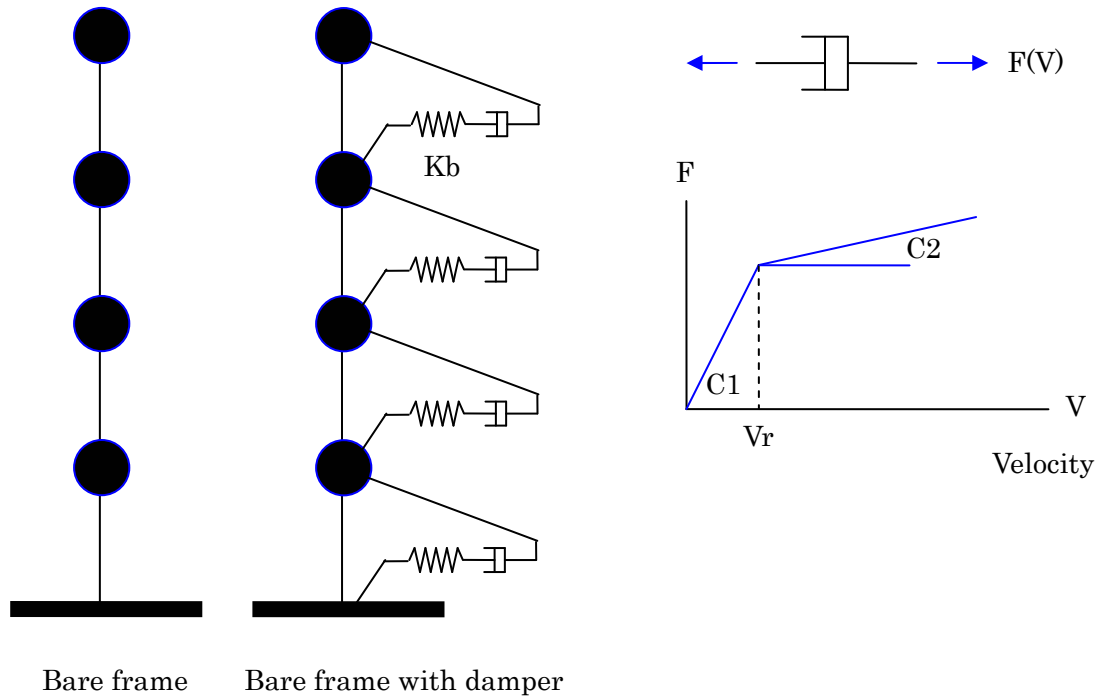4-Story MDOF (Multi-Degree of Freedom) model with steel damper

Bare frame   Bare frame with damper

	W (kN)	H (mm)	K (kN/mm)	K0 (kN/mm)	Fy (kN)	K1/K0
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

SAMPLE BUILDING MDOF4F-3 :
4-STORY MDOF MODEL WITH OIL DAMPER

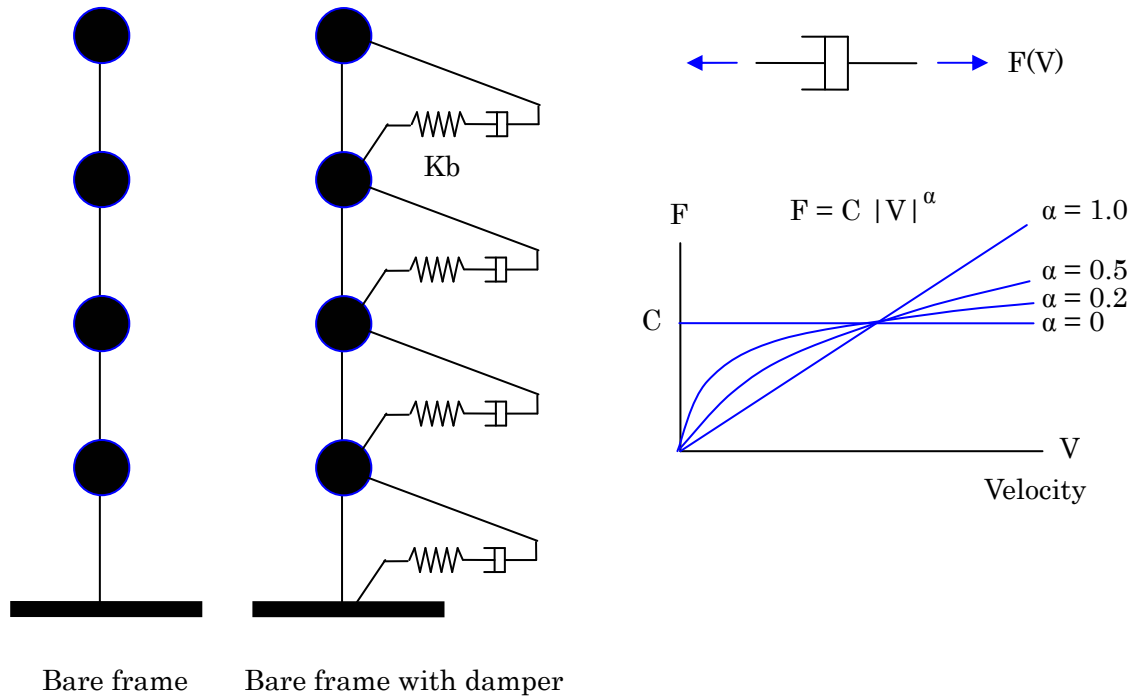4-Story MDOF (Multi-Degree of Freedom) model with oil damper

Bare frame   Bare frame with damper

	W (kN)	H (mm)	K (kN/mm)	Kb (kN/mm)	C1 (kN*s/mm)	C2/C1	Vr (mm/s)
4	4894	4000	62.7	182.3	24.5	0.02	62.8
3	3669	4000	72.9	211.9	28.5	0.02	62.8
2	3691	4000	91.0	264.7	35.6	0.02	62.8
1	3762	6000	56.2	163.4	22.0	0.02	94

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

Kb: brace stiffness, C1, C2: damping coefficient, Vr: release velocity

SAMPLE BUILDING MDOF4F-4 :
4-STORY MDOF MODEL WITH VISCOUS DAMPER

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

$$F = C \, |V|^{\alpha}$$

Bare frame   Bare frame with damper

	W (kN)	H (mm)	K (kN/mm)	Kb (kN/mm)	C1 (kN*s/mm)	α
4	4894	4000	62.7	182.3	24.5	0.02
3	3669	4000	72.9	211.9	28.5	0.02
2	3691	4000	91.0	264.7	35.6	0.02
1	3762	6000	56.2	163.4	22.0	0.02

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

Kb: brace stiffness, C: damping coefficient, α: exponent

Reference

1) Design and Construction Manual for Passive Response Control Structure (2nd Edition), Japan Society of Seismic Isolation, 2005 (in Japanese)