

Seismically Isolated Building and Devices Data-sheet

Building name	Inagi-Hospital		Completion date	March, 1998
			Architect	Kyodo Architects & Associates
Structural designer	Tokyo-Kenchiku Struc Engs, Kyodo Struc Engs		Construction Co.	Kajima Corporation
Building site	Inagi city, Japan		Eaves height	35.81m
Usage	Hospital		Structure	Steel reinforced concrete
Number of floors	6FL,B1FL		Structural type	Moment frame w/ bearing wall
Total floor area	18,518m ²		Foundation	Pile foundation
Building area	4,480m ²			
Features of structure *1				
a. Base isolation system with natural elastomeric isolator, lead plugs(LRB) and steel dampers				
Control devices				
84 isolators, 42 dampers				
Target performance				
Building				
Excitation *2	Earthquake			
Input level *3	Maximum velocity 25 cm/s			Maximum velocity 50 cm/s
Max. stress	Short-term allowable stress			Short-term allowable stress
Base shear coefficient	0.15(B1F)			0.15(B1F)
Max. story drift	1/1000			1/1000
Max. acceleration	300cm/s ² (Operations room) ,300 cm/s ² (Sick room)			
Isolator				
Max. bearing stress *4	-			12 N/mm ² compression
				-
Shear deformation and strain	15 cm (100 %)			30 cm (200 %)
Vertical deformation	-			-
Damper				
	-			
Verification of performance				
Building				
Modeling	Discrete mass model (Elastic linear)			
Analysis method	Dynamic response analysis (Time history analysis)			
Seismic wave	El Centro NS 1940, Taft EW 1952, Hachinohe NS 1968, BCJ-L2			
Excitation *2	Earthquake L-1			Earthquake L-2
Input level *3	Maximum velocity 25 cm/s			Maximum velocity 50 cm/s
Max. stress	Less than allowable stress			Less than allowable stress
Base shear coefficient	0.07			0.11
Max. story drift	1/2490			1/1780
Max. deformation of top	-			-
Max. acceleration	138 cm/s ²			190 cm/s ²
Isolator				
Max. bearing stress *4	-			-
				-
Shear deformation and strain	10cm (67 %)			25cm (167%)
Vertical deformation	-			-
Damper				
	-			

Reference: "menshin", No.16, JSSI

"Building Letter", 1996.3, BCJ

*1 If retrofit, fill in completion date of original construction

*2 Fill in kinds of excitation, such as Earthquake, Wind, etc.

*3 Fill in according to the practice in each country.

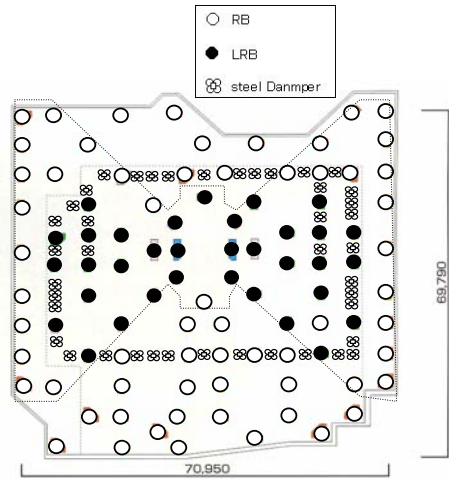
*4 Fill in max. stress of permanent and during earthquake

Abbreviation:

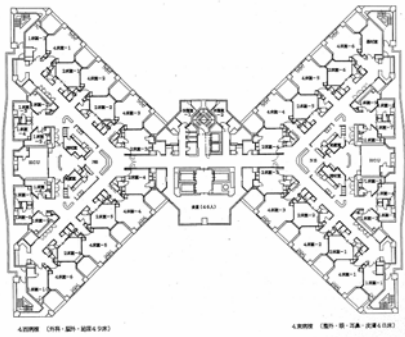
Isolator:	Damper:
NRB: Natural Rubber Bearing	SD: Steel Damper
LRB: Lead Rubber Bearing	LD: Lead Damper
HDR: High Damping Rubber Bearing	OD: Oil Damper
SLD: Slider	VD: Viscous Damper
RBB: Rotating Ball Bearing	FD: Friction Damper



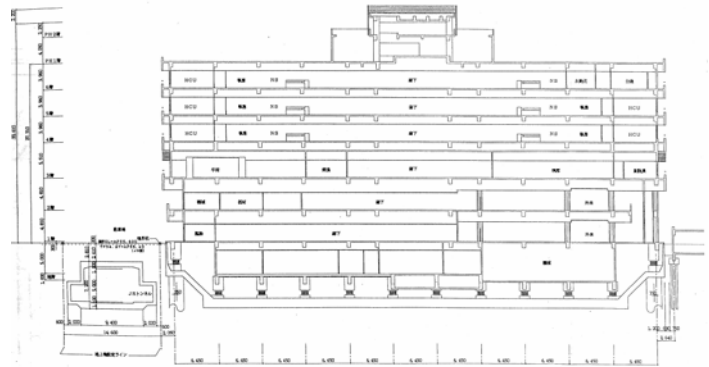
Photo of building



Location of isolators and dampers



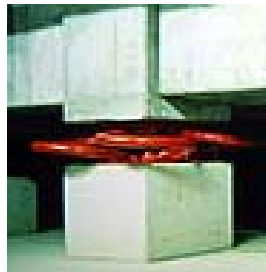
Plan



Elevation



isolator



steel damper

Lead plug

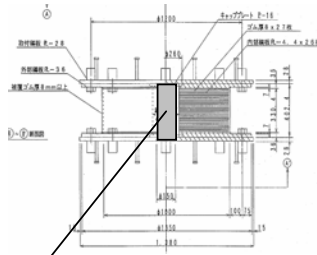


Figure of isolator

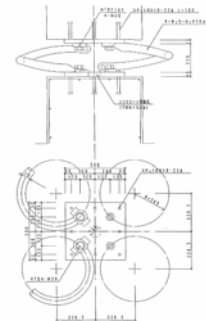
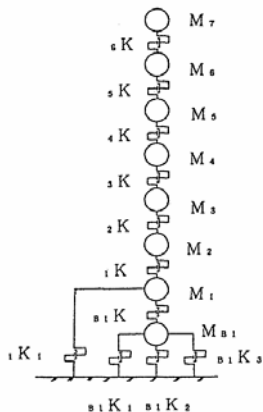
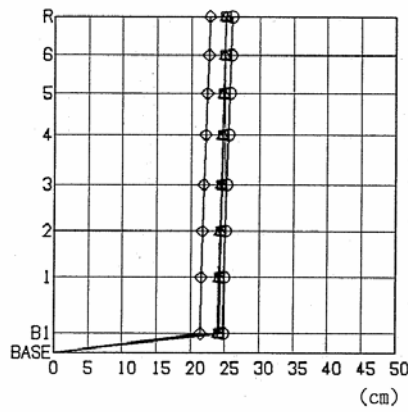


Figure of steel damper

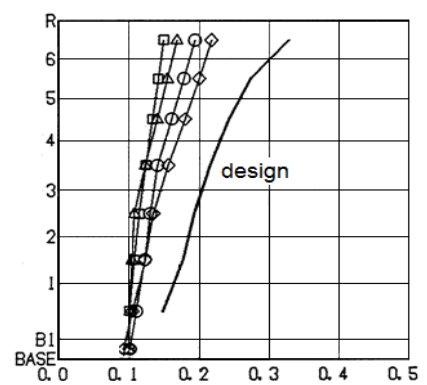
Photo of device



Analytical model



Shear deformation (V=50cm/s)



Story shear coefficient (V=50cm/s)