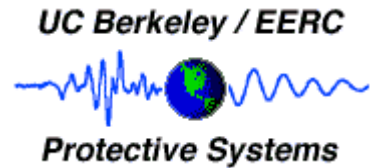


Structures Incorporating Tuned Mass Dampers



This list of applications of tuned mass dampers has been developed by the Protective Systems Research Group of the Earthquake Engineering Research Center at the University of California at Berkeley. The list extends through 1994. It is based upon a similar list by J.D. Holmes*. We welcome any comments or additions to this list so that we can keep it up to date.

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Worldwide Applications of Tuned Mass Dampers				
Name and type of structure	City/Country	Type and number of dampers	Date of installation (approx.)	Other information (natural frequencies, effective damper mass etc.)
PASSIVE TUNED MASS DAMPERS				
CN TowerTV antenna (553m)	Toronto, Canada	passive tuned mass damper	1973	-
John Hancock Building (244m)	Boston, USA	passive tuned mass dampers (2)	1977	0.14 Hz 2 x 300t damping ratio: 4%
City Corp Center (high-rise building) (278m)	New York, USA	passive tuned mass damper	1978	0.16Hz 370t damping ratio: no TMD~1% with TMD~4%
Sydney Tower (305 m)	Sydney, Australia	passive tuned mass damper (pendulum type)	1980/1	0.10, 0.50 Hz 220 t
Al Khobar 2 chimnies (120 m)	Saudi Arabia	passive tuned mass damper	1982	0.44 Hz 7t

Ruwais Utilities chimney	Abu Dhabi	passive tuned mass damper	1982	0.49 Hz 10t
Deutsche Bundespost cooling tower (278 m)	Nornberg, Germany	passive tuned mass damper	1982	0.67 Hz 1.5t
Yanbu Cement Plant chimney (81 m)	Saudi Arabia	passive tuned mass damper	1984	0.49 Hz 10t
Hydro-Quebec wind generator	Canada	passive tuned mass damper	1985	0.7-1.2 Hz 18t
Chiba Port Tower (125m)	Chiba, Japan	2 passive tuned mass dampers	1986	0.43-0.44 Hz 10, 15t
Pylon, Aratsu Bridge (cable-stayed)	Japan	passive tuned mass damper	1987	-
Pylon, Yokohama Bay Bridge (cable-stayed)	Yokohama, Japan	passive tuned mass damper	1988	-
Bin Quasim Thermal Power Station (70 m)	Pakistan	passive tuned mass damper	1988	0.99 Hz 4.5 t
Tiwest Rutile Plant chimney (43 m)	Australia	passive tuned mass damper	1989	0.92 Hz 0.5t
Fukuoka Tower (151 m)	Fukuoka, Japan	2 passive tuned mass dampers	1989	0.31-0.33 Hz 25, 30 t
Higashiyama Sky Tower (134 m)	Nagoya, Japan	passive tuned mass damper	1989	0.49-0.55 Hz 20t
Pylon, Bannaguru Bridge (cable-stayed)	Japan	passive tuned mass damper	1990	-
Crystal Tower (157 m)	Osaka, Japan	2 passive tuned mass dampers	1990	0.24-0.28 Hz 180, 360 t
Huis Ten Bosch Domtoren	Nagasaki, Japan	passive tuned mass damper	1990	0.65-0.67 Hz 7.8t

Hibikiryokuchi Sky Tower (135 m)	Kitakyushu, Japan	passive tuned mass damper	1991	-
HKW chimney (120m)	Frankfurt, Germany	passive tuned mass damper	1992	0.86 Hz 10t
BASF chimney (100 m)	Antwerp, Belgium	passive tuned mass damper	1992	0.34 Hz 8.5 t
Siemens power station (70 m)	Killingholme, UK	passive tuned mass damper	1992	0.88 Hz 7t
Rokko island P & G (117 m)	Kobe, Japan	passive tuned mass damper (pendulum type)	1993	0.33- 0.62 Hz 270 t
Chifley Tower (209 m)	Sydney, Australia	passive tuned mass damper (pendulum type)	1993	400 t
Al Taweeiah chimney (70m)	Abu Dhabi	passive tuned mass damper	1993	1.4Hz 1.35 t
Akita Tower (112 m)	Akita, Japan	passive tuned mass damper	1994	0.41 Hz
ACTIVE MASS DAMPERS				
Sendagaya INTES Office Building (58 m)	Tokyo, Japan	2 active mass dampers	1991	0.59 Hz 72t
ORC 2000 Symbol Tower (188 m)	Osaka, Japan	2 active tuned mass dampers	1992	0.21 Hz 200 t
Kansai International Airport	Osaka, Japan	2 active tuned mass dampers (inverted pendulum)	1993	0.8 Hz 10t
Yokohama Landmark Tower (296 m)	Yokohama, Japan	2 active tuned mass dampers	1993	0.185 Hz 340 t
C Office Tower (130 m)	Tokyo, Japan	active mass damper	1993	0.34 Hz 200 t
KS Project (121 m)	Kanazawa, Japan	active mass damper	1993	100t

MKD8 Higarigaoka Office Building (100 m)	Tokyo, Japan	active mass damper (pendulum)	1993	0.44 Hz
Riverside Sumida (133m)	Tokyo, Japan	2 active mass dampers	1994	0.29 Hz 30t
Act City Office Building (213 m)	Hamamatsa, Japan	active/passive tuned mass damper	1994	0.21 Hz 180 t
Shinjuku Park Tower (227 m)	Tokyo, Japan	3 active tuned mass dampers	1994	330 t
TUNED LIQUID DAMPERS				
Nagasaki Airport Tower (42 m)	Nagasaki, Japan	25 tuned liquid damper (circular sloshing type)	1987	1.07 Hz 1 t (approx.) (temporary installation)
Yokohama Marine Tower (105 m)	Yokohama, Japan	39 tuned liquid damper (circular sloshing type)	1987	0.55 Hz 1.6t
Gold Tower (136 m)	Udatsu, Japan	16 tuned liquid dampers (rectangular unidirectional type)	1988	0.42 Hz 9.6t
Shin-Yokohama Prince Hotel (149m)	Yokohama, Japan	30 tuned liquid dampers (circular sloshing type)	1991	0.31 Hz 83.5t
Mount Wellington Broadcasting Tower (lattice tower, 104 m)	Hobart, Australia	80 tuned liquid dampers (circular sloshing type)	1992	0.7 Hz 0.6t
TYG Building (159 m)	Atsugi, Japan	720 tuned liquid dampers (double donut type)	1992	0.53 Hz 18.2 t
Narita Airport Tower (87 m)	Narita, Japan	tuned liquid dampers (circular sloshing type)	1993	1.3 Hz 16.5 t + floating particles
Haneda Airport Tower (178 m)	Tokyo, Japan	tuned liquid dampers (circular sloshing type)	1993	0.77 Hz 21t