





























































































		Instructor: Dr. C.E.		
Equivalent Static Fo	rce (NBCC)			
	1995 NBCC	2005 NBCC		
Base response spectrum	v - amplitude S - shape	S <sub>a</sub> Based on UHRS		
Site Conditions	<b>F</b> Independent of T	<b>F</b> <sub>a</sub> or <b>F</b> <sub>v</sub> Depends on T and S <sub>a</sub>		
Importance of Structure	I	l <sub>e</sub>		
Inelastic Response	<b>R/U</b> Implied overstrength	R <sub>d</sub> R₀ Explicit Overstrength		
MDOF Forces from higher modes	Increase S in long periods	M <sub>v</sub> Calibrated to dyn. analysis		
MDOF Distribution of forces	<b>F</b> <sub>t</sub> Higher force in top story	<b>F</b> <sub>t</sub> Same as 1995		
MDOF Overturning forces	J	J Revised for UHS		





Design shears structural types – first mode.	in a be located in	uilding o N Vancou	of two ver and	different Montreal
Structure type	Period T <sub>1</sub>	Modal weight	S <sub>a</sub> (T <sub>1</sub> ) g	Base shear
Vancouver Shear cantilever Flexural cantilever	1.50 1.50	.811W .616W	.256 .256	.208W .158W
Montreal Shear cantilever Flexural cantilever	1.50 1.50	.811W .616W	.073 .073	.059W .045W
	Seismic Design (	of Multistorey Con	crete Structures	<u> </u>





















Derivation of R <sub>o</sub> for Concrete Structures					In	structor: I	Dr. C.E. Ventura
	Calcu	lation o	fp				
Type of SFRS	R size	R o	R vield	R sh	R mech	Ro	NBCC Ro
Ductile moment-resisting frames	1.05	1.18	1.05	1.25	1.05	1.71	1.7
Moderately ductile moment-resisting frames	1.05	1.18	1.05	1.10	1.00	1.43	1.4
Moment-resisting frames with conventional construction	1.05	1.18	1.05	1.00	1.00	1.30	1.3
Ductile coupled walls	1.05	1.18	1.05	1.25	1.05	1.71	1.7
Ductile partially coupled walls	1.05	1.18	1.05	1.25	1.05	1.71	1.7
Ductile shear walls	1.05	1.18	1.05	1.25	1.00	1.63	1.6
Ductric shear waris		1 1 2	1.05	1.10	1.00	1.43	1.4
Moderately ductile shear walls	1.05	1.10	1.05				

## Seismic Design of Multistorey Concrete Structures

No. 62

					Instructor: Dr. C.E. Ventu
	R factors for Concrete S	tructur	es		
	System	Cat.	R <sub>d</sub>	R。	R <sub>d</sub> R <sub>o</sub>
	Moment Resisting Frames	D MD	4.0 2.5	1.7 1.4	6.8 3.5
	Coupled walls	D D <sup>(1)</sup>	4.0 3.5	1.7 1.7	6.8 6.0
1	Shear walls	D MD	3.5 2.0	1.6 1.4	5.6 2.8
	Conventional constr. <sup>(2)</sup>	-	1.5	1.3	2.0
	<sup>(1)</sup> Ductile partially coupled <sup>(2)</sup> Structures designed in ad	wall ccordar	nce with C	SA-A23.3	Cl. 1-20
	Seisn	nic Design o	of Multistorey	Concrete Struct	turesNo.





