

LIST OF CONTENTS

TERMS AND SYMBOLS	6
1 INTRODUCTION	10
2 CONNECTION DESIGN	11
3 COMPONENT-BASED FINITE ELEMENT METHOD	
3.1 Material model	19
3.2 Plate model and mesh convergence	21
3.3 Contacts	25
3.4 Welds	26
3.5 Bolts	29
3.6 Interaction of shear and tension in bolt	31
3.7 Preloaded bolts	33
3.8 Anchor bolt	34
3.9 Concrete block	35
3.10 Local buckling of compressed plates	38
3.11 Moment-rotation relation	40
3.12 Bending stiffness	43
3.13 Deformation capacity	46
3.14 Joints in global analyses	48
3.15 Fatigue analysis by Nominal stress method	52
4 WELDED CONNECTION	
4.1 Fillet weld in lap joint.....	54
4.2 Fillet weld in angle plate joint	59
4.3 Fillet weld in fin plate joint.....	62
4.4 Fillet weld in beam to column joint.....	66
4.5 Connection to unstiffened flanges.....	70
5 BOLTED CONNECTION	
5.1 T-stub in tension	75
5.2 Splices in shear	84
5.3 End plate minor axis connection	88
5.4 Interaction of shear and tension.....	91
5.5 Splices in shear in slip-resistant connection	96
5.6 Block shear resistance	99
5.7 End plate connection with four bolts in row	106

6	SLENDER PLATE IN COMPRESSION	
6.1	Triangular haunch	110
6.2	Column web panel in shear.....	117
6.3	Column web stiffener	121
7	HOLLOW SECTION JOINTS	
7.1	Circular hollow sections.....	125
7.2	Rectangular hollow sections	137
7.3	Plate to circular hollow section.....	147
7.4	Uniplanar T-joint between RHS brace and H/I chord	153
8	COLUMN BASE	
8.1	Open section column in compression	160
8.2	Open section column in bending to strong axis	165
8.3	Open section column in bending to weak axis	171
8.4	Hollow section column	177
9	COLUMN WEB PANEL IN SHEAR	
9.1	Welded portal frame eaves moment connection	185
9.2	Bolted portal frame eaves moment connection	193
10	PREDICTION OF STIFFNESS	
10.1	Bending stiffness of welded joint of open sections	198
10.2	Bending stiffness of bolted joint of open sections.....	201
10.3	Bending stiffness of column base	205
11	PREDICTION OF DEFORMATION CAPACITY	
11.1	Deformation capacity of welded joint of open sections.....	209
11.2	Deformation capacity of bolted joint of open sections.....	213
12	PREQUALIFIED JOINTS FOR SEISMIC APPLICATIONS	
12.1	EQUALJOINTS project	218
12.2	End plate joints	219
12.3	Welded reduced beam section joint.....	227
13	FATIGUE	
13.1	Bolted connection.....	229
13.2	Welded connection.....	235
	REFERENCES	238