

## C9 Final Slab Design

Refer to Appendix I for general discussion of the theory and design of composite slabs, investigation of alternative options and introduction to the composite slab design software Bondek2003.xls. Refer also to this Appendix for details of how to obtain a copy of Bondek2003.xls.

### C9.1 Slab design for the office areas

As discussed in Appendix I the 1.0 mm thickness Bondek will be adopted and a decision needs to be made regarding whether to use low ductility mesh plus additional normal ductility bars or whether to use normal ductility bars throughout. For this design example the first option using low ductility mesh and additional N10 as required will be adopted. From section B3.1, the slab span in the office areas is 2800 and the live load is 3 kPa. Fire reinforcement Detail 1 will be adopted. This avoids any requirement for bottom reinforcement.

### Typical End Span = 2800 in the Office Area

<i>Design Output</i>					
Parameter	Notation	Spans			
		Single	End	Interior	Interior (reduced thickness)
Slab thickness	D,cs (mm)		120		
Negative reinforcement	As- (mm <sup>2</sup> )		200		
Pattern of negative reinforcement		→	Pattern 1		
Concrete Cover	c (mm)		20		
Reinforcement to control shrinkage and temperature effects	Ast,cr (mm <sup>2</sup> )		SL62		
Number of props			0		
Fire reinforcement (in addition to shrinkage and negative reinforcement)	A-st,f (mm <sup>2</sup> )		110		
Anchorage Reinf.: End supports:	Aanch (mm <sup>2</sup> )		-		
(Concrete frames only) Interior supports:	Aanch (mm <sup>2</sup> )		-		

<i>Input parameters</i>			
Type of Buildings	<b>Steel-Frame,Masonry Wall</b>	Negative Reinforcement Diameter	<b>10mm</b>
Span Configuration	<b>End Spans</b>	Negative Reinforcement Grade	<b>D500N</b>
Continuous Spans	<b>More than four spans</b>	D,cs	-
Exposure Classification	<b>A1</b>	BONDEK II sheeting	<b>1 mm</b>
LI/Ls	<b>1</b>	Q live load	<b>3 kPa</b>
Deflection Limits of Composite Slabs	<b>Total &lt;L/250</b>	G superimposed dead load	<b>1kPa</b>
L,eff, mm	<b>2800</b>	Q weight of stacked materials construction stage 1	<b>4kPa</b>
Formwork Deflection Limits	<b>Visual quality not important</b>	$\psi\sigma$	<b>0.7</b>
Continuity of formwork over permanent supports	<b>Continuous</b>	$\psi\lambda$	<b>0.4</b>
Crack control for shrinkage and temperature effects	<b>Minor</b>	Fire Design	<b>Required</b>
Crack control for flexure	<b>Required</b>	Fire Resistance Periods	<b>120 min</b>
Concrete Density	<b>25kN/m3</b>	Fire Reinforcement Options	<b>Fire Detail 1</b>
f <sub>c</sub>	<b>25MPa</b>	Fire Reinforcement Diameter	<b>10mm</b>
Band beam width	-	Fire Reinforcement Grade	<b>D500N</b>
Band beam total depth	-	Shrinkage Reinforcement Grade	<b>D500L</b>



## Composite Design Example for Multistorey Steel Framed Buildings

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# Table of contents

Table of contents .....	iii
Preface .....	v
Section A: INPUT INFORMATION .....	1
A1. Client and Architectural Requirements .....	2
A2. Site Characteristics .....	4
A3. Statutory Requirements .....	5
A4. Serviceability .....	8
A5. Design Loads .....	9
A6. Materials and Systems .....	10
A7. Design Aids and Codes .....	11
Section B: CONCEPTUAL AND PRELIMINARY DESIGN .....	12
B1. Conceptual and Preliminary Design .....	13
B1.1 Consideration of alternative floor framing systems– Scheme A .....	14
B1.2 Consideration of alternative floor framing systems– Scheme B .....	15
B1.3 Framing system for horizontal loading – initial distribution of load .....	16
B1.4 Alternatives for overall distribution of horizontal load to ground .....	17
B2. Preliminary Slab Design .....	21
B3. From Alternatives to Adopted Systems .....	22
B3.1 Adopted floor framing arrangement .....	22
B3.2 Adopted framing arrangement for horizontal loading .....	23
B4. Indicative Construction Sequence and Stages .....	24
B4.1 The importance of construction stages in composite design .....	24
B4.1 Indicative construction sequence and construction stages .....	25
B4.2 Adopted construction sequence for design of erection columns .....	27
B4.3 Core construction alternatives .....	27
B4.4 Adopted construction method for the core .....	27
B5. Preliminary Sizing of Primary and Secondary Beams .....	28
B6. Plenum Requirements and Floor to Floor Height .....	30
B7. Preliminary Column Sizes and Core Wall Thickness .....	33
Section C: DETAILED DESIGN .....	35
C1. Detailed Design - Introduction .....	36
C2. Design Stages and Construction Loading .....	37
C3. Detailed Load Estimation After Completion of Construction .....	38
C3.1 Vertical loading .....	38
C3.2 Wind loading .....	39
C3.3 Seismic loading Not considered .....	40
C4. Erection Column Design .....	41
C4.1 Load distribution for erection column design .....	42
C4.2 Side Column C5 (typical of C5 to C10) .....	43
C4.3 End column C2 (typical of C2, C3, C12 and C13) .....	44
C4.4 Corner column C1 (typical of columns C1, C4, C11 and C14) .....	44
C5. Floor Beams – Construction Stage 1 .....	45
C5.1 Secondary beams Group S1(11 050, 2800) (Beams B22 – B41, B43 – 48) .....	45
C5.2 Primary beams Group P1(9800, 5725) (Beams B1, B7 to B12, B18, .....	46
B19 – 21, B49 – 51 and B42) .....	46
C5.3 Primary beams Group P2(9250, 6600) (B2, B6, B13 and B17) .....	47
C6. Floor Beams – Construction Stage 3 .....	48
C6.1 Secondary beams Group S1(11 050, 2800) (Beams B22 – 41, B43 – 48) .....	48
C6.2 Primary beams Group P1(9800, 5725) (Beams B1, B7 - B12, B18 – 21, .....	49
B49 – 51 and B42) .....	49
C6.3 Primary beams Group P2(9250, 6600) (Beams B2, B6, B13, B17) .....	49
C7 Floor Beam Design for Occupancy Loading .....	50
C7.1 Secondary beams Group S1(11 050, 2800) (Beams B19, B21, B22 - B41, .....	51
B43 – B49 and B51) .....	51



C7.2	Primary beams Group P1(9800,5725) (Beams B1, B7 to B12, B18)	58
C7.3	Primary beams group P2(9050, 6600) (Beams B2, B6, B13, B17)	63
C8.	Assessment of Dynamic Performance of Floor System	69
C8.1	Definition of the dynamic assessment process	69
C8.2	Application of the dynamic assessment process	73
C9	Final Slab Design	79
C9.1	Slab design for the office areas	79
C9.2	Slab design for the compactus areas	80
C10.	Longitudinal Shear Reinforcement Design	81
C10.1	Introduction	81
C10.2	Proprietary longitudinal shear reinforcement products	83
C10.3	Secondary beams group S1, B22 typical – longitudinal shear design	84
C10.4	Internal primary beams group P2, ( B2 typical) longitudinal shear design	85
C10.5	Primary beams P1, (B1 typical) – longitudinal shear design	87
C10.6	Perimeter beams B19 to 21 and B49 to 51	88
C11.	Floor System Design Review and Final Decisions	89
C11.1	Floor design review	89
C11.2	Final floor framing plan and deck reinforcement	90
C12.	Final Design of RC Columns	91
C13.	Detailed Design of the Core	91
C13.1	Preliminary discussion and statement of limitations of this section	91
C13.2	Basic modelling of the core using beam elements	92
C13.3	The Space Gass Analysis Model	96
C13.4	Model verification and static deflections for $W_s$	97
C13.5	Dynamic analysis for natural frequency of building	98
C13.6	Interpretation and application of stress resultants from Space Gass	100
C13.7	Further investigation of the core using a Strand7 finite element model	102
C13.8	Review of core investigations	105
C14.	Steel Connection Design	106
C14.1	Can it be built?	106
C14.2	Representative connections	108
C14.3	Web side plate connection design for $V^* = 142$ kN	108
C14.4	Flexible end plate connection for $V^* = 279$ kN	112
C14.5	B2 to core web side plate connection for $V^* = 308$ kN	113
C14.6	Column splice for a load of $N^* = 1770$ kN	114
C14.7	Column base plate for a load of $N^* = 1770$ kN	115
C15.	Web Penetrations	116
C16.	Some Final Thoughts and Disclaimers	117
Appendix I	Theory and discussion – composite slabs	119
Appendix II	Theory and discussion - composite beams	133
Appendix III	Dynamic assessment of the floor system	149
Appendix IV	Theory and discussion steel connections	163
Appendix V	Corrosion and fire protection	175

