Contents

1	Introduction		1
		Definition of green concrete structures	1
		Life-cycle phases	2
	1.3	Readers' guide	3
2	List o	of notations	4
3	Choi	ce of functional unit	4
4	Choi	ce of environmental parameters	5
5	Comprehensive list of green concrete technologies		6
	5.1	Choice of raw materials	6
	5.2	Optimisation of mix design with respect to clinker content	8
		Production methods	8
		Check list for concrete manufacturers	11
		Recycling of demolition waste into concrete production	12
	5.5 5.6	Construction phase Uses of concrete	13 13
6	Accounting		13
0	6.1	Transportation	14
	6.2	Inventory data boundaries and examples of calculation	14
		Boundaries for inventory data	15
	6.4	Calculation of embodied CO_2	16
	6.5	LCI data for structures	16
	6.6	Optimising structures based on performance	18
		Environmental indicators based on performance	18
		Environmental indicators based on thermal performance	19
		Environmental indicators based on mechanical performance	21
7	6.7 CO ₂ uptake from carbonation		24
	Benchmark data		27
	7.1	Concrete raw materials Transportation	27 28
	7.2	Concrete plant and building site	28
8	Examples		20 29
0	8.1	Effect of cement content on CO_2 footprints of concrete structures	29
	8.2	Effect of cement content on CO_2 footprint of Japanese concrete bridge	31
	8.3	Life cycle assessment of influence of concrete mix design, reinforcement	• -
		type and bridge designs on a Danish green concrete bridge	33
	8.4	Effect of recycled concrete aggregate on a Japanese concrete tunnel lining	36
	8.5	Influence of concrete mix design	38
	8.6	Example CO ₂ uptake	40
9	Conc	lusion	41
Annex A: Background information on concrete raw materials			42
		Background information on concrete structures	45
		Background information on operation and maintenance of buildings	46
Anne	ex D:]	Background information on service life design	50
Annex E: Background information on demolition and recycling			52
Anne	ex F: F	References	54