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Size effects in unreinforced and lightly reinforced concrete beams failing in flexure

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Reference	Referenced used for Fig. 12(a)	Test setup	Concrete/Mortar	Cylinder strength (N/mm ²)	Cube Strength (N/mm ²)	Module of rupture (N/mm ²)	Max. aggregate size (mm)	Depth (mm)	Width (mm)	Span between supports (mm)	Shear span (mm)	Notch depth (mm)	Maximum applied load (kN)
Walsh (1972)	A	Three	Concrete	23.1		5.53	12.5	76.2	75	203.2	101.6	25.4	3.66
Walsh (1972)	A	Three	Concrete	23.1		5.53	12.5	228.6	75	609.6	304.8	76.2	7.43
Walsh (1972)	A	Three	Concrete	23.1		5.53	12.5	381	75	1016	508	127.0	9.37
Walsh (1972)	A	Three	Concrete	35.4		5.68	12.5	76.2	75	203.2	101.6	25.4	3.32
Walsh (1972)	A	Three	Concrete	35.4		5.68	12.5	228.6	75	609.6	304.8	76.2	8.48
Walsh (1972)	A	Three	Concrete	35.4		5.68	12.5	381	75	1016	508	127.0	10.64
Walsh (1972)	A	Three	Concrete	14.3		3.99	12.5	76.2	75	203.2	101.6	25.4	2.55
Walsh (1972)	A	Three	Concrete	14.3		3.99	12.5	228.6	75	609.6	304.8	76.2	5.62
Walsh (1972)	A	Three	Concrete	14.3		3.99	12.5	381	75	1016	508	127.0	6.19
Walsh (1972)	A	Three	Concrete	15.7		3.98	12.5	76.2	75	203.2	101.6	25.4	2.04
Walsh (1972)	A	Three	Concrete	15.7		3.98	12.5	228.6	75	609.6	304.8	76.2	4.23
Walsh (1972)	A	Three	Concrete	15.7		3.98	12.5	381	75	1016	508	127.0	6.67
Walsh (1972)	A	Three	Concrete	46.8		7.25	12.5	76.2	75	203.2	101.6	25.4	3.59
Walsh (1972)	A	Three	Concrete	46.8		7.25	12.5	228.6	75	609.6	304.8	76.2	9.39
Walsh (1972)	A	Three	Concrete	46.8		7.25	12.5	381	75	1016	508	127.0	12.22
Walsh (1972)	A	Three	Concrete	32.8		6.28	12.5	76.2	75	203.2	101.6	25.4	3.88
Walsh (1972)	A	Three	Concrete	32.8		6.28	12.5	228.6	75	609.6	304.8	76.2	8.29
Walsh (1972)	A	Three	Concrete	32.8		6.28	12.5	381	75	1016	508	127.0	10.38
Bosco, Carpinteri and Debernadi (1990)	B	Three	Concrete		91.2		12.7	100	150	600	300		11.77
Bosco, Carpinteri and Debernadi (1990)	B	Three	Concrete		91.2		12.7	200	150	1200	600		22.56
Bosco, Carpinteri and Debernadi (1990)	B	Three	Concrete		91.2		12.7	400	150	2400	1200		40.20
Rao and Prasad (2004)	C	Three	Concrete		74.0		12.5	50	100	200	100	16.5	3.44
Rao and Prasad (2004)	C	Three	Concrete		74.0		12.5	100	100	400	200	33.0	5.75
Rao and Prasad (2004)	C	Three	Concrete		74.0		12.5	150	100	600	300	49.5	6.26
Zi, Kim and Bazant (2014)	D	Four	Concrete	33.0			6.5	30	30	90	30		1.63

Zi, Kim and Bazant (2014)	D	Four	Concrete	33.0			6.5	48	48	144	48		3.39
Zi, Kim and Bazant (2014)	D	Four	Concrete	33.0			6.5	75	75	225	75		7.95
Karikaloo, Abdalla and Xiao (2003)	E	Three	Mortar		42.3			75	100	300	150	3.8	3.98
Karikaloo, Abdalla and Xiao (2003)	E	Three	Mortar		42.3			150	100	600	300	7.5	5.63
Karikaloo, Abdalla and Xiao (2003)	E	Three	Mortar		42.3			300	100	1200	600	15.0	9.83
Karikaloo, Abdalla and Xiao (2003)	E	Three	Mortar		42.3			50	100	200	100	5.0	2.22
Karikaloo, Abdalla and Xiao (2003)	E	Three	Mortar		42.3			100	100	400	200	10.0	3.49
Karikaloo, Abdalla and Xiao (2003)	E	Three	Mortar		42.3			200	100	800	400	20.0	6.06
Karikaloo, Abdalla and Xiao (2003)	E	Three	Mortar		42.3			50	100	200	100	15.0	1.62
Karikaloo, Abdalla and Xiao (2003)	E	Three	Mortar		42.3			100	100	400	200	30.0	2.85
Karikaloo, Abdalla and Xiao (2003)	E	Three	Mortar		42.3			200	100	800	400	60.0	4.09
Karikaloo, Abdalla and Xiao (2003)	E	Three	Mortar		42.3			50	100	200	100	25.0	0.80
Karikaloo, Abdalla and Xiao (2003)	E	Three	Mortar		42.3			100	100	400	200	50.0	1.32
Karikaloo, Abdalla and Xiao (2003)	E	Three	Mortar		42.3			200	100	800	400	100.0	2.14
Karikaloo, Abdalla and Xiao (2003)	E	Three	Concrete		108.8			200	100	800	400	10.0	22.79
Karikaloo, Abdalla and Xiao (2003)	E	Three	Concrete		108.8			400	100	1600	800	20.0	36.06
Karikaloo, Abdalla and Xiao (2003)	E	Three	Concrete		108.8			100	100	400	200	10.0	10.88
Karikaloo, Abdalla and Xiao (2003)	E	Three	Concrete		108.8			200	100	800	400	20.0	17.67
Karikaloo, Abdalla and Xiao (2003)	E	Three	Concrete		108.8			400	100	1600	800	40.0	27.70
Karikaloo, Abdalla and Xiao (2003)	E	Three	Concrete		108.8			75	100	300	150	22.5	4.75
Karikaloo, Abdalla and Xiao (2003)	E	Three	Concrete		108.8			150	100	600	300	45.0	8.17
Karikaloo, Abdalla and Xiao (2003)	E	Three	Concrete		108.8			300	100	1200	600	90.0	12.66
Rao and Rao (2013)	F	Three	Concrete		33.2	3.6	4	60	80	360	180	9.0	2.32
Rao and Rao (2013)	F	Three	Concrete		33.2	3.6	4	90	80	540	270	13.5	3.24
Rao and Rao (2013)	F	Three	Concrete		33.2	3.6	4	135	80	810	405	20.3	4.49
Rao and Rao (2013)	F	Three	Concrete		33.2	3.6	4	202.5	80	1215	607.5	30.4	6.22
Rao and Rao (2013)	F	Three	Concrete		33.2	3.6	4	303.8	80	1823	911.3	45.6	8.77
Rao and Rao (2013)	F	Three	Concrete		40.4	4.2	4	60	80	360	180	18.0	1.68
Rao and Rao (2013)	F	Three	Concrete		40.4	4.2	4	90	80	540	270	27.0	2.50
Rao and Rao (2013)	F	Three	Concrete		40.4	4.2	4	135	80	810	405	40.5	3.58
Rao and Rao (2013)	F	Three	Concrete		40.4	4.2	4	202.5	80	1215	607.5	60.8	4.50
Rao and Rao (2013)	F	Three	Concrete		40.4	4.2	4	303.8	80	1823	911.3	91.1	6.33
Rao and Rao (2013)	F	Three	Concrete		26.8	3.9	4	60	80	360	180	27.0	1.22
Rao and Rao (2013)	F	Three	Concrete		26.8	3.9	4	90	80	540	270	40.5	1.60
Rao and Rao (2013)	F	Three	Concrete		26.8	3.9	4	135	80	810	405	60.8	2.18
Rao and Rao (2013)	F	Three	Concrete		26.8	3.9	4	202.5	80	1215	607.5	91.1	2.98

Rao and Rao (2013)	F	Three	Concrete		26.8	3.9	4	303.8	80	1823	911.3	136.7	3.97
Gettu, Bazant and Karr (1990)	G	Three	Concrete	85.5		11	9.5	38.1	38	95.3	47.6	12.7	1.63
Gettu, Bazant and Karr (1990)	G	Three	Concrete	85.5		11	9.5	76.2	38	190.5	95.3	25.4	2.33
Gettu, Bazant and Karr (1990)	G	Three	Concrete	85.5		11	9.5	152.4	38	381.0	190.5	50.8	3.80
Zhou, Balendran and Jeary (1998)	H	Three	Concrete		115.0		10	50	100	200.0	100.0	16.7	2.86
Zhou, Balendran and Jeary (1998)	H	Three	Concrete		115.0		10	100	100	400.0	200.0	33.3	4.57
Zhou, Balendran and Jeary (1998)	H	Three	Concrete		115.0		10	200	100	800.0	400.0	66.7	7.30
Zhou, Balendran and Jeary (1998)	H	Three	Concrete		90.0		6	50	100	200.0	100.0	16.7	1.90
Zhou, Balendran and Jeary (1998)	H	Three	Concrete		90.0		6	100	100	400.0	200.0	33.3	2.53
Zhou, Balendran and Jeary (1998)	H	Three	Concrete		90.0		6	200	100	800.0	400.0	66.7	4.00
Xu and he (1990)	I	Four	Concrete		26.0			70	35	210.0	52.5		4.14
Xu and he (1990)	I	Four	Concrete		26.0			140	70	420.0	105.0		9.31
Xu and he (1990)	I	Four	Concrete		26.0			200	100	600.0	150.0		15.25
Xu and he (1990)	I	Four	Concrete		26.0			300	150	900.0	225.0		31.07
Xu and he (1990)	I	Four	Concrete		26.0			340	170	1020	255.0		35.17
Bazant and Pfeiffer (1987)	J	Three	Concrete	34.1			13	38	38	95	47.5	6.3	1.82
Bazant and Pfeiffer (1987)	J	Three	Concrete	34.1			13	76	38	191	95.5	12.7	3.11
Bazant and Pfeiffer (1987)	J	Three	Concrete	34.1			13	152	38	381	190.5	25.3	4.64
Bazant and Pfeiffer (1987)	J	Three	Concrete	34.1			13	305	38	762	381	50.8	7.79
Bazant and Pfeiffer (1987)	J	Three	Mortar	48.4			5	38	38	95	47.5	6.3	2.23
Bazant and Pfeiffer (1987)	J	Three	Mortar	48.4			5	76	38	191	95.5	12.7	3.31
Bazant and Pfeiffer (1987)	J	Three	Mortar	48.4			5	152	38	381	190.5	25.3	4.70
Bazant and Pfeiffer (1987)	J	Three	Mortar	48.4			5	305	38	762	381	50.8	6.90
Current Investigation	K	Three	Concrete	28.2	31.0	4.03	8	50	100	300	150	12.5	1.26
Current Investigation	K	Three	Concrete	28.2	31.0	4.03	8	100	100	600	300	25.0	2.27
Current Investigation	K	Three	Concrete	28.2	31.0	4.03	8	150	100	900	450	37.5	2.85
Current Investigation	K	Three	Concrete	28.2	31.0	4.03	8	200	100	1200	600	50.0	3.21
Wright and Garwood (1952)	L	Three	Concrete	22				76.2	76.2	228.6	114.3		5.33
Wright and Garwood (1952)	L	Three	Concrete	22				102	102	305	152.5		8.88
Wright and Garwood (1952)	L	Three	Concrete	22				152	152	457	228.5		15.22
Wright and Garwood (1952)	L	Three	Concrete	22				203	203	610	305		25.32
Wright and Garwood (1952)	L	Three	Concrete	22				76.2	76.2	342.9	171.5		3.14
Wright and Garwood (1952)	L	Three	Concrete	22				102	102	457	228.5		5.79
Wright and Garwood (1952)	L	Three	Concrete	22				152	152	685.8	342.9		9.83
Wright and Garwood (1952)	L	Three	Concrete	22				76.2	76.2	457.2	228.6		2.46
Wright and Garwood (1952)	L	Three	Concrete	22				102	102	610	305		4.15

Wright and Garwood (1952)	L	Four	Concrete	22				76.2	76.2	228.6	152.4		3.11
Wright and Garwood (1952)	L	Four	Concrete	22				102	102	305	203.3		5.11
Wright and Garwood (1952)	L	Four	Concrete	22				152	152	457	304.7		10.03
Wright and Garwood (1952)	L	Four	Concrete	22				203	203	610	406.7		15.84
Wright and Garwood (1952)	L	Four	Concrete	22				76.2	76.2	342.9	228.6		2.03
Wright and Garwood (1952)	L	Four	Concrete	22				102	102	457	304.7		3.52
Wright and Garwood (1952)	L	Four	Concrete	22				152	152	685.8	457.2		6.40
Wright and Garwood (1952)	L	Four	Concrete	22				76.2	76.2	457.2	304.8		1.59
Wright and Garwood (1952)	L	Four	Concrete	22				102	102	610	406.7		2.44