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Discussion: Shear strength of reinforced concrete dapped-end beams using mechanism analysis

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This paper (Yang *et al.* (2011)) has made a significant contribution to the shear strength prediction of reinforced concrete dapped-end beams. The contributors read the paper with great interest. However, some ratios of measured and predicted shear strength in Table 1 and Figure 8 are incorrect. The mean, standard deviation and coefficient of variation of the ratios of measured and predicted shear strength using strut-and-tie model based on ACI 318-05 (ACI, 2005) are corrected as 2·01, 1·45 and 0·72, respectively.

Authors' reply

The authors would like to thank the contributors for their valuable comments. As pointed out by the contributors, there are errors in the ratios between test results and predictions using strut-and-tie model based on ACI 318-05 listed in Table 1 and Figure 8 of the original paper. Corrected values are presented here in Table 2 and Figure 12.

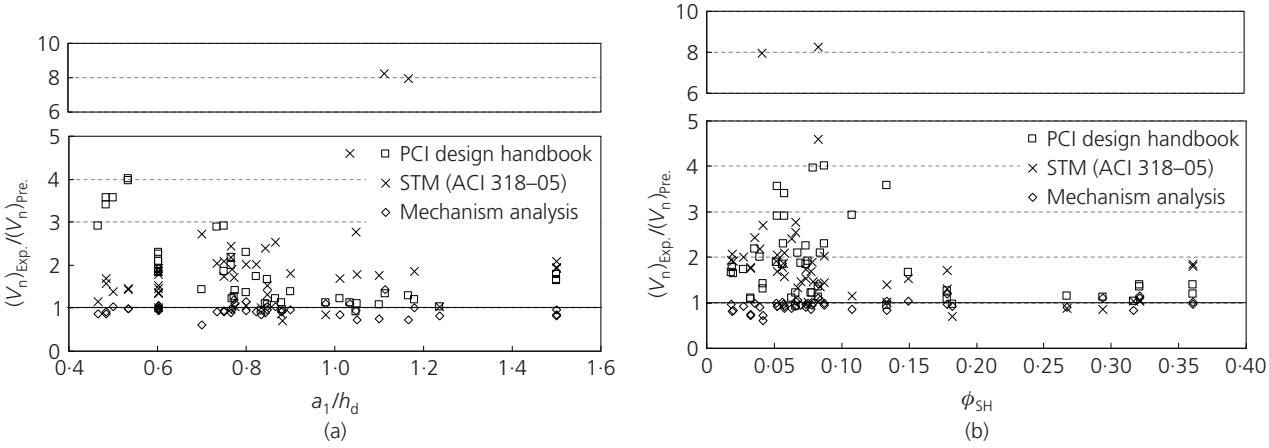

Figure 12. Comparison of test results with proposed models: (a) effective shear span-to-nib depth ratio a_1/h_d: (b) hanger reinforcement index ϕ_{SH}

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Researcher	Specimen	f_c': MPa	b: mm	h: mm	h_d: mm	a_0: mm	a/h	a_1/h_d	ϕ_{SH}	ϕ_s	ϕ_v	ϕ_h	ϕ_N	V_n: kN				$(V_n)_{Exp.}/(V_n)_{pre.}$		
														Exp.	PCI	STM	Mech. anal.	PCI	STM	Mech. anal.
Mattock and Chan (1979)	1A	34	127	610	305	114	0·8	0·6	0·074	0·026	0·000	0·011	0·000	144	64	94	147	2·25	1·53	0·98
	1B	31	127	610	305	114	0·8	0·6	0·084	0·099	0·000	0·025	0·056	191	91	141	182	2·10	1·35	1·05
	2A	33	127	610	305	114	0·8	0·6	0·051	0·040	0·000	0·023	0·000	178	94	93	179	1·90	1·92	1·00
	2B	31	127	610	305	114	0·8	0·6	0·056	0·098	0·000	0·025	0·047	169	92	95	166	1·84	1·78	1·02
	3A	37	127	610	305	114	0·8	0·6	0·057	0·035	0·000	0·020	0·000	216	94	116	225	2·30	1·86	0·96
	3B	32	127	610	305	114	0·8	0·6	0·069	0·102	0·000	0·025	0·051	177	95	121	188	1·86	1·46	0·94
	4A	32	127	610	305	114	1·3	0·6	0·068	0·041	0·000	0·023	0·000	189	90	142	177	2·10	1·33	1·07
	4B	29	127	610	305	114	1·3	0·6	0·075	0·109	0·000	0·026	0·055	177	92	174	179	1·92	1·02	0·99
Lu *et al.* (2003)	1	34	200	600	300	80	0·7	0·5	0·134	0·097	0·000	0·026	0·000	561	157	403	540	3·57	1·39	1·04
	2	63	200	600	300	80	0·7	0·5	0·087	0·053	0·000	0·014	0·000	705	176	490	711	4·01	1·44	0·99
	3	69	200	600	300	80	0·7	0·5	0·079	0·048	0·000	0·013	0·000	713	180	490	727	3·96	1·46	0·98
	4	34	200	600	300	160	0·9	0·8	0·087	0·097	0·000	0·026	0·000	360	157	178	380	2·29	2·02	0·95
	5	63	200	600	300	160	0·9	0·8	0·058	0·053	0·000	0·014	0·000	513	176	245	549	2·91	2·09	0·93
	6	69	200	600	300	160	0·9	0·7	0·052	0·048	0·000	0·013	0·000	521	180	255	562	2·89	2·04	0·93
	7	34	200	600	300	80	0·7	0·5	0·108	0·065	0·000	0·026	0·000	458	157	401	529	2·92	1·14	0·87
	8	63	200	600	300	80	0·7	0·5	0·058	0·035	0·000	0·014	0·000	599	176	381	684	3·40	1·57	0·88
	9	69	200	600	300	80	0·7	0·5	0·052	0·032	0·000	0·013	0·000	642	180	381	700	3·57	1·69	0·92
	10	34	200	600	300	160	0·9	0·8	0·073	0·065	0·000	0·026	0·000	291	157	167	320	1·85	1·74	0·91
	11	63	200	600	300	160	0·9	0·8	0·040	0·035	0·000	0·014	0·000	351	176	161	392	1·99	2·18	0·90
	12	69	200	600	300	160	0·9	0·8	0·036	0·032	0·000	0·013	0·000	392	180	161	394	2·18	2·43	0·99

(*continued*)

Wang *et al.*	B1·11	11	214	370	170	75	1·3	0·9	0·182	0·118	0·049	0·000	0·000	59	61	85	63	0·97	0·69	0·93
(2005)	B1·12	11	214	370	164	75	1·2	0·8	0·027	0·118	0·049	0·000	0·000	42	24	21	46	1·73	2·01	0·91
	B1·21[a]	11	220	370	190	75	1·3	1·2	0·316	0·122	0·050	0·000	0·000	65	62	63	79	1·04	1·03	0·83
	B1·22	11	220	370	160	75	1·1	1·0	0·078	0·122	0·050	0·000	0·000	73	60	43	86	1·23	1·70	0·85
	B2·11	13	150	300	150	75	0·8	0·7	0·041	0·180	0·074	0·000	0·000	35	24	13	58	1·42	2·71	0·60
	B2·12	13	150	300	150	75	0·8	1·2	0·041	0·180	0·074	0·000	0·000	32	24	4	44	1·30	7·94	0·72
	B2·21	13	150	300	150	75	0·8	1·0	0·083	0·180	0·074	0·000	0·000	55	49	12	50	1·13	4·60	1·11
	B2·22	13	150	300	150	75	0·8	1·1	0·083	0·180	0·074	0·000	0·000	66	49	8	46	1·35	8·23	1·42
	B2·31[a]	13	150	300	150	75	0·8	0·9	0·360	0·180	0·074	0·000	0·000	76	55	42	79	1·39	1·80	0·96
	B2·32[a]	13	150	300	150	75	0·8	1·2	0·360	0·180	0·074	0·000	0·000	65	55	35	65	1·19	1·86	1·01
	B3·11	18	150	315	160	75	1·0	0·8	0·063	0·124	0·051	0·000	0·000	60	54	25	68	1·11	2·40	0·88
	B3·12	18	150	315	160	75	1·0	0·8	0·078	0·124	0·051	0·000	0·000	70	57	37	73	1·22	1·89	0·95
	B3·21	18	150	300	150	75	1·0	0·9	0·066	0·130	0·053	0·000	0·000	66	54	26	64	1·22	2·54	1·04
	B3·22	18	150	300	150	75	1·0	1·0	0·066	0·130	0·053	0·000	0·000	50	54	18	54	0·93	2·78	0·93
	B3·31	16	150	305	150	75	1·0	0·8	0·133	0·145	0·059	0·000	0·000	52	55	52	63	0·94	1·00	0·83
	B3·32	16	150	305	150	75	1·0	0·9	0·267	0·145	0·059	0·000	0·000	63	55	72	70	1·14	0·88	0·91
	B3·41	16	150	310	100	75	1·0	1·1	0·033	0·142	0·058	0·000	0·000	27	24	15	37	1·10	1·79	0·73
	B3·42	16	150	310	100	75	1·0	1·1	0·033	0·142	0·058	0·000	0·000	26	24	15	35	1·08	1·76	0·75
	B3·51[a]	16	150	305	155	75	1·0	0·8	0·321	0·145	0·059	0·000	0·000	79	56	76	71	1·40	1·04	1·11
	B3·52[a]	16	150	305	150	75	1·0	0·8	0·321	0·145	0·059	0·000	0·000	75	55	71	65	1·35	1·06	1·16
	B3·61	15	150	300	150	75	1·0	1·0	0·294	0·155	0·063	0·000	0·000	63	56	74	58	1·13	0·85	1·10
	B3·62	15	150	300	150	75	1·0	0·8	0·149	0·155	0·063	0·000	0·000	93	56	61	91	1·66	1·52	1·03
	B3·71[a]	15	150	300	150	75	1·0	0·8	0·178	0·155	0·063	0·063	0·000	90	84	69	92	1·07	1·30	0·97
	B3·72[a]	15	150	300	150	75	1·0	0·8	0·178	0·155	0·063	0·063	0·000	116	92	68	97	1·26	1·71	1·20
Taher	Group I-0	24	200	300	150	200	2·2	1·5	0·019	0·03	0·019	0·031	0·000	37·5	21	18	45·7	1·79	2·08	0·95
(2005)	Group III-0	25	200	300	150	200	2·2	1·5	0·019	0·03	0·019	0·000	0·000	35	21	18	36·1	1·67	1·94	0·13
	Group IV-0	24	200	300	150	200	2·2	1·5	0·019	0·03	0·000	0·031	0·000	34·5	21	18	41·0	1·64	1·92	0·14
Mean																		1·84	2·01	0·95
Standard deviation																		0·83	1·45	0·13
Coefficient of variation																		0·45	0·72	0·14

Note: [a] indicates specimens having 45° bent-up shear reinforcement at the interface between nib and full depth of beam.

Table 2. Comparison of measured and predicted shear capacities of dapped-end beams