Appendices for:
Comprehensive experimental database and analysis of circular concrete-filled double-skin tube stub columns: A review

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Appendix

Enclosed Table 1 Summary of CFDST models

specimen	H (mm)	D_o (mm)	t_o (mm)	f_{syo} (MPa)	D_i (mm)	t_i (mm)	f_{syi} (MPa)	f_c' (MPa)	N_u (kN)	Refs.
A1-1	229.00	74.80	1.03	486.00	62.00	1.00	470.00	58.60	283.00	Wei et al.
A1-2	229.00	74.70	0.97	486.00	62.00	0.94	470.00	58.60	285.00	[1]
A2-1	229.00	75.40	1.29	486.00	62.70	1.23	470.00	58.60	348.00	
A2-2	229.00	75.20	1.19	486.00	62.40	1.20	470.00	58.60	348.00	
A3-1	229.00	76.30	1.78	486.00	62.00	1.00	470.00	58.60	395.00	
A3-2	229.00	76.30	1.74	512.00	62.00	0.94	470.00	58.60	395.00	
B1-1	229.00	81.00	0.90	524.00	62.00	1.00	470.00	58.60	330.00	
B1-2	229.00	81.00	0.87	524.00	62.00	0.94	470.00	58.60	335.00	
B2-1	229.00	81.50	1.11	524.00	62.70	1.14	470.00	58.60	386.00	
B2-2	229.00	81.50	1.14	524.00	62.20	1.13	470.00	58.60	395.00	
C1-1	229.00	87.40	0.99	428.00	61.80	0.87	452.00	58.60	378.00	
C1-2	229.00	87.30	0.94	428.00	61.60	0.88	452.00	58.60	385.00	
C2-1	229.00	87.90	1.26	428.00	61.40	0.89	452.00	58.60	432.00	
C2-2	229.00	87.90	1.17	444.00	61.20	0.85	452.00	58.60	408.00	
D1-1	229.00	99.70	0.59	409.00	80.30	0.55	474.00	58.60	283.00	
D2-1	229.00	99.90	0.69	409.00	86.80	0.61	444.00	58.60	299.00	
D3-1	229.00	99.90	0.71	409.00	80.50	0.67	474.00	58.60	357.00	
D4-1	229.00	99.90	0.70	409.00	74.00	0.62	512.00	58.60	380.00	
D5-1	229.00	99.80	0.66	409.00	61.40	0.55	432.00	58.60	443.00	
D6-1	229.00	101.70	1.61	409.00	61.50	0.56	432.00	58.60	644.00	
E1-1	229.00	88.80	1.55	286.00	63.50	1.16	216.00	58.60	357.00	
E2-1	229.00	101.40	1.56	255.00	63.40	1.15	216.00	58.60	477.00	
E3-1	229.00	101.50	1.65	255.00	76.10	1.19	235.00	58.60	417.00	
E4-1	229.00	114.30	1.64	262.00	63.50	1.12	216.00	58.60	598.00	
E5-1	229.00	114.30	1.64	262.00	76.10	1.14	235.00	58.60	551.00	
E6-1	229.00	114.30	1.64	262.00	88.90	1.56	286.00	58.60	524.00	

C4-36-0.18-5-1	572.10	190.60	5.15	346.90	34.00	3.08	348.20	37.50	2718.00	Yan and Zhao [4]
C4-36-0.18-5-2	572.10	190.50	5.13	346.90	33.90	3.10	348.20	37.50	2724.00	
C4-36-0.31-5-1	572.10	190.50	5.15	346.90	59.60	3.32	342.10	37.50	2718.00	
C4-36-0.31-5-2	572.10	188.20	5.04	346.90	59.10	3.28	342.10	37.50	2482.00	
C4-36-0.53-5-1	572.10	190.70	5.11	346.90	101.60	4.03	345.80	37.50	2626.00	
C4-36-0.53-5-2	572.10	189.20	5.08	346.90	101.20	4.05	345.80	37.50	2462.00	
C9-36-0.18-5-1	572.10	188.90	5.09	464.00	33.70	3.09	348.20	37.50	3182.00	
C9-36-0.18-5-2	572.10	188.90	5.12	464.00	33.50	3.06	348.20	37.50	3232.00	
C9-36-0.31-5-1	572.10	191.00	5.15	464.00	59.40	3.31	342.10	37.50	3286.00	
C9-36-0.31-5-2	572.10	190.10	5.11	464.00	59.10	3.29	342.10	37.50	3242.00	
C9-36-0.53-5-1	572.10	190.70	5.15	464.00	101.10	4.10	345.80	37.50	3082.00	
C9-36-0.53-5-2	572.10	190.70	5.09	464.00	100.90	4.07	345.80	37.50	3192.00	
C4-24-0.31-5-1	572.10	190.40	5.15	346.90	59.90	3.33	342.10	29.00	2460.00	
C4-24-0.31-5-2	572.10	190.00	5.11	346.90	59.10	3.31	342.10	29.00	2494.00	
C4-36-0.31-5-1	572.10	189.10	5.10	346.90	59.40	3.35	342.10	37.50	2623.00	
C4-36-0.31-5-2	572.10	190.10	5.07	346.90	59.70	3.35	342.10	37.50	2588.00	
C4-48-0.31-5-1	572.10	189.90	5.12	346.90	58.90	3.31	342.10	51.00	2950.00	
C4-48-0.31-5-2	572.10	188.60	5.08	346.90	58.90	3.33	342.10	51.00	3026.00	
C4-36-0.31-4-1	572.10	190.30	4.26	336.80	59.40	3.36	342.10	37.50	2376.00	
C4-36-0.31-4-2	572.10	190.10	4.21	336.80	59.30	3.30	342.10	37.50	2406.00	
C4-36-0.31-5-1	572.10	189.70	5.12	346.90	59.50	3.32	342.10	37.50	2611.00	

C4-36-0.31-5-2	572.10	188.80	5.08	346.90	59.50	3.31	342.10	37.50	2579.00	
C4-36-0.31-6-1	572.10	189.10	6.77	327.30	59.70	3.34	342.10	37.50	2894.00	
C4-36-0.31-6-2	572.10	188.60	6.73	327.30	59.80	3.33	342.10	37.50	2928.00	
Aa-0.8	1500.00	538.00	3.76	253.80	418.00	5.63	296.30	56.10	8949.70	Yang et al. [11]
Aa-0.85	1500.00	538.00	3.76	253.80	449.00	5.63	296.30	56.10	7924.70	
Aa-0.9	1500.00	538.00	3.76	253.80	477.00	5.63	296.30	56.10	6036.70	
Ab-0.8	1500.00	538.00	3.76	253.80	418.00	5.63	296.30	39.07	7896.60	
Ab-0.85	1500.00	538.00	3.76	253.80	449.00	5.63	296.30	39.07	6735.20	
Ab-0.9	1500.00	538.00	3.76	253.80	477.00	5.63	296.30	39.07	5966.80	
Bb-0.8	1500.00	538.00	5.63	296.30	420.00	5.63	296.30	39.07	8864.00	
Bb-0.85	1500.00	538.00	5.63	296.30	448.00	5.63	296.30	39.07	8068.00	
Bb-0.9	1500.00	538.00	5.63	296.30	473.00	5.63	296.30	39.07	6774.00	
1-1-2	343.00	114.30	5.85	455.00	60.30	2.52	396.00	36.35	1421.54	Ekmekyapar and Hasan [12]
2-1-2	343.00	114.30	5.85	455.00	60.30	5.77	310.00	36.35	1574.26	
1-1-1	343.00	114.30	2.73	285.00	60.30	2.52	396.00	36.35	734.60	
2-1-1	343.00	114.30	2.73	285.00	60.30	5.77	310.00	36.35	913.07	
1-2-2	343.00	114.30	5.85	455.00	60.30	2.52	396.00	63.16	1505.67	
2-2-2	343.00	114.30	5.85	455.00	60.30	5.77	310.00	63.16	1666.41	
1-2-1	343.00	114.30	2.73	285.00	60.30	2.52	396.00	63.16	899.21	
2-2-1	343.00	114.30	2.73	285.00	60.30	5.77	310.00	63.16	1088.06	
C4-46-0.26-3.7-1	496.00	165.20	3.68	357.70	42.50	3.19	409.80	53.70	2060.00	Yan et al. [13]

C4-46-0.26-3.7-2	496.00	164.90	3.69	357.70	42.70	3.20	409.80	53.70	2003.00
C4-83-0.26-3.7-1	496.00	165.00	3.68	357.70	42.60	3.21	409.80	90.70	2423.00
C4-83-0.26-3.7-2	496.00	165.10	3.70	357.70	42.70	3.19	409.80	90.70	2446.00
C4-130-0.26-3.7-1	496.00	164.80	3.69	357.70	42.60	3.20	409.80	141.00	3068.00
C4-130-0.26-3.7-2	496.00	164.90	3.69	357.70	42.50	3.20	409.80	141.00	3110.00
C4-46-0.46-3.7-1	496.00	165.00	3.70	357.70	76.00	2.80	385.60	53.70	1831.00
C4-46-0.46-3.7-2	496.00	165.00	3.70	357.70	76.20	2.79	385.60	53.70	1876.00
C4-83-0.46-3.7-1	496.00	165.10	3.67	357.70	76.10	2.81	385.60	90.70	2174.00
C4-83-0.46-3.7-2	496.00	165.20	3.69	357.70	76.40	2.80	385.60	90.70	2202.00
C4-130-0.46-3.7-1	496.00	164.80	3.68	357.70	76.30	2.80	385.60	141.00	2732.00
C4-130-0.46-3.7-2	496.00	164.70	3.71	357.70	76.10	2.78	385.60	141.00	2736.00
C4-46-0.46-6.0-1	496.00	165.30	5.96	347.00	76.10	2.79	385.60	53.70	2183.00
C4-46-0.46-6.0-2	496.00	165.00	5.99	347.00	76.20	2.81	385.60	53.70	2203.00
C4-83-0.46-6.0-1	496.00	164.90	6.01	347.00	75.90	2.80	385.60	90.70	2666.00

C4-83-0.46-6.0-2	496.00	164.80	6.00	347.00	75.80	2.80	385.60	90.70	2631.00	
C4-130-0.46-3.7-1	496.00	164.90	6.01	347.00	76.00	2.81	385.60	141.00	3110.00	
C4-130-0.46-3.7-2	496.00	164.80	6.00	347.00	76.10	2.78	385.60	141.00	3032.00	
C4-46-0.46-6.0-1	496.00	165.20	5.95	428.60	76.10	2.79	385.60	53.70	2645.00	
C4-46-0.46-6.0-2	496.00	165.00	5.96	428.60	76.00	2.79	385.60	53.70	2601.00	
C4-83-0.46-6.0-1	496.00	165.00	5.99	428.60	75.80	2.80	385.60	90.70	2971.00	
C4-83-0.46-6.0-2	496.00	165.00	6.01	428.60	75.90	2.78	385.60	90.70	2911.00	
C4-130-0.46-3.7-1	496.00	165.10	5.94	428.60	75.90	2.80	385.60	141.00	3322.00	
C4-130-0.46-3.7-2	496.00	164.90	6.02	428.60	76.10	2.80	385.60	141.00	3304.00	
C1-1	1068.00	356.00	5.50	618.00	219.00	3.30	356.00	36.20	7242.00	Li and Cai [14]
C1-2	1068.00	356.00	5.50	618.00	219.00	3.30	356.00	36.20	7159.00	
C2-1*	1068.00	356.00	5.50	618.00	168.00	3.30	357.00	36.20	6917.00	
C2-2	1068.00	356.00	5.50	618.00	168.00	3.30	357.00	36.20	8516.00	
c10-375	450.00	158.00	0.90	221.00	38.00	0.90	221.00	18.70	635.00	Uenaka et al. [15]
c10-750	450.00	159.00	0.90	221.00	76.00	0.90	221.00	18.70	540.00	
c10-1125	450.00	159.00	0.90	221.00	114.00	0.90	221.00	18.70	378.30	
c16-375	450.00	158.00	1.50	308.00	39.00	1.50	308.00	18.70	851.60	
c16-750	450.00	158.00	1.50	308.00	77.00	1.50	308.00	18.70	728.10	
c16-1125	450.00	158.00	1.50	308.00	114.00	1.50	308.00	18.70	589.00	
c23-375	450.00	158.00	2.14	286.00	40.00	2.14	286.00	18.70	968.20	

c23-750	450.00	158.00	2.14	286.00	77.00	2.14	286.00	18.70	879.10	
c23-1125	450.00	157.00	2.14	286.00	115.00	2.14	286.00	18.70	703.60	
C1-1	1050.00	350.00	3.82	439.30	231.00	2.92	396.50	42.14	5499.00	Li et al. [16]
C1-2	1050.00	350.00	3.82	439.30	231.00	2.92	396.50	42.14	5396.00	
cc2a	540.00	180.00	3.00	275.90	48.00	3.00	396.10	37.09	1790.00	Tao et al. [17]
cc2b	540.00	180.00	3.00	275.90	48.00	3.00	396.10	37.09	1791.00	
cc3a	540.00	180.00	3.00	275.90	88.00	3.00	370.20	37.09	1648.00	
cc3b	540.00	180.00	3.00	275.90	88.00	3.00	370.20	37.09	1650.00	
cc4a	540.00	180.00	3.00	275.90	140.00	3.00	342.00	37.09	1435.00	
cc4b	540.00	180.00	3.00	275.90	140.00	3.00	342.00	37.09	1358.00	
cc5a	342.00	114.00	3.00	294.50	58.00	3.00	374.50	37.09	904.00	
cc5b	342.00	114.00	3.00	294.50	58.00	3.00	374.50	37.09	898.00	
cc6a	720.00	240.00	3.00	275.90	114.00	3.00	294.50	37.09	2421.00	
cc6b	720.00	240.00	3.00	275.90	114.00	3.00	294.50	37.09	2460.00	
cc7a	900.00	300.00	3.00	275.90	165.00	3.00	320.50	37.09	3331.00	
cc7b	900.00	300.00	3.00	275.90	165.00	3.00	320.50	37.09	3266.00	
O1I1	400.00	114.30	6.00	454.00	48.30	2.90	425.00	52.93	1665.00	Zhao et al. [18]
O2I1	400.00	114.30	4.80	416.00	48.30	2.90	425.00	52.93	1441.00	
O3I1	400.00	114.30	3.60	453.00	48.30	2.90	425.00	52.93	1243.00	
O4I1	400.00	114.30	3.20	430.00	48.30	2.90	425.00	52.93	1145.00	
O5I2	400.00	165.10	3.50	433.00	101.60	3.30	394.00	52.93	1629.00	
O6I2	500.00	165.10	3.00	395.00	101.60	3.20	394.00	52.93	1613.00	
O7I2	500.00	163.80	2.35	395.00	101.60	3.20	394.00	52.93	1487.00	

O8I2	500.00	163.00	1.95	395.00	101.60	3.20	394.00	52.93	1328.00	
O9I2	500.00	162.50	1.70	395.00	101.60	3.20	394.00	52.93	1236.00	
1-W0-0	343.00	114.30	2.73	285.00	60.30	2.56	380.00	38.09	758.61	Hasan and
2-W0-0	343.00	114.30	5.85	455.00	60.30	4.71	435.00	38.09	1622.25	Ekmekyapar [19]
C1C7	400.00	114.50	5.90	454.00	48.40	2.80	425.00	52.93	1415.00	Zhao et al. [20]
C2C7	400.00	114.60	4.70	416.00	48.40	2.80	425.00	52.93	1380.00	
C3C7	400.00	114.40	3.50	453.00	48.40	2.80	425.00	52.93	1210.00	
C4C7	400.00	114.20	3.00	430.00	48.40	2.80	425.00	52.93	1110.00	
C5C8	400.00	165.10	3.50	433.00	101.80	3.10	410.00	52.93	1705.00	
C6C8	400.00	165.30	2.90	395.00	101.80	3.10	410.00	52.93	1605.00	
DS-06-2-2-C	1100.00	300.00	4.00	291.60	180.00	2.00	291.60	27.90	2750.00	Lin and Tsai [21]
DS-06-4-2-C	1100.00	300.00	2.00	291.60	180.00	2.00	291.60	27.90	2311.00	
GC1-1	420.00	140.00	2.50	307.00	114.00	2.00	321.00	39.78	755.00	Li et al. [23]
GC1-2	420.00	140.00	2.50	307.00	114.00	2.00	321.00	39.78	701.30	
GC2-1	420.00	140.00	2.50	307.00	76.00	1.60	429.00	39.78	941.70	
GC2-2	420.00	140.00	2.50	307.00	76.00	1.60	429.00	39.78	928.10	
GCL-1	700.00	450.00	8.00	365.00	400.00	8.00	363.00	43.12	8906.00	
GCL-2	700.00	450.00	8.00	365.00	400.00	8.00	363.00	43.12	8773.70	
0-1-1-1	343.00	114.30	2.74	355.00	60.30	2.52	396.00	32.37	789.42	Ekmekyapar et al. [24]
0-1-1-2	343.00	114.30	6.11	535.00	60.30	2.52	396.00	32.37	1681.98	
0-2-1-1	343.00	114.30	2.74	355.00	60.30	5.77	310.00	32.37	969.16	
0-2-1-2	343.00	114.30	6.11	535.00	60.30	5.77	310.00	32.37	1823.35	
0-1-2-1	343.00	114.30	2.74	355.00	60.30	2.52	396.00	57.73	914.32	
0-1-2-2	343.00	114.30	6.11	535.00	60.30	2.52	396.00	57.73	1752.89	
0-2-2-1	343.00	114.30	2.74	355.00	60.30	5.77	310.00	57.73	1068.06	

0-2-2-2	343.00	114.30	6.11	535.00	60.30	5.77	310.00	57.73	1889.69	
R-1	420.00	140.00	2.99	371.00	60.00	2.00	369.00	51.45	1487.00	Li et al. [25]
R-2	420.00	140.00	2.99	371.00	60.00	2.00	369.00	51.45	1542.00	
R-3	420.00	140.00	2.99	371.00	60.00	2.00	369.00	51.45	1538.00	
1	400.00	160.00	1.00	220.00	37.00	1.00	220.00	23.60	635.00	Chen and
2	400.00	160.00	1.00	220.00	75.00	1.00	220.00	23.60	540.00	Hai [26]
3	400.00	160.00	1.00	220.00	112.00	1.00	220.00	23.60	378.00	
4	400.00	160.00	1.50	255.00	37.00	1.50	255.00	23.60	851.00	
5	400.00	160.00	1.50	255.00	75.00	1.50	255.00	23.60	728.00	
6	400.00	160.00	1.50	255.00	112.00	1.50	255.00	23.60	589.00	
7	400.00	160.00	2.10	300.00	37.00	2.10	300.00	23.60	968.00	
8	400.00	160.00	2.10	300.00	75.00	2.10	300.00	23.60	879.00	
9	400.00	160.00	2.10	300.00	112.00	2.10	300.00	23.60	703.00	
SS1	500.00	168.00	6.00	394.00	63.00	4.00	357.00	46.25	2431.00	Zhang et al. [29]
SS2	500.00	168.00	6.00	394.00	95.00	4.00	357.00	46.25	2405.00	

Enclosed Table 2 Summary of CFDSST models

specimen	H (m)	D_o (mm)	t_o (m)	f_{syo} (MPa)	D_i (mm)	t_i (mm)	f_{syi} (MPa)	f_c' (MPa)	N_u (kN)	Ref.
AC140×3-HC22×4-C40	350.00	140.20	2.92	300.00	22.10	4.09	794.00	40.50	1410.00	Wang et al. [27]
AC140×3-HC22×4-C80	350.00	140.20	2.91	300.00	22.10	4.10	794.00	79.90	1845.00	
AC140×3-HC22×4-C120	350.00	140.20	2.89	300.00	22.10	4.08	794.00	115.60	2321.00	
AC140×3-HC32×6-C40*	350.00	140.30	2.89	300.00	32.00	5.48	619.00	40.50	1423.00	
AC140×3-HC32×6-C80	350.00	140.20	2.92	300.00	31.90	5.27	619.00	79.90	2012.00	
AC140×3-HC32×6-C120	350.00	140.10	2.91	300.00	31.90	5.36	619.00	115.60	2537.00	
AC140×3-HC38×8-C40*	350.00	140.10	2.91	300.00	38.10	7.63	433.00	40.50	1626.00	
AC140×3-HC38×8-C80	350.00	140.10	2.90	300.00	38.00	7.51	433.00	79.90	2083.00	

AC140×3-HC38×8-C120	350.00	140.20	2.90	300.00	37.90	7.39	433.00	115.60	2500.00	
AC140×3-HC55×11-C40*	350.00	140.20	2.90	300.00	55.10	10.62	739.00	40.50	2543.00	
AC140×3-HC55×11-C80	350.00	140.10	2.90	300.00	55.20	10.76	739.00	79.90	2775.00	
AC140×3-HC89×4-C40*	350.00	140.10	2.87	300.00	89.00	3.89	1029.00	40.50	2025.00	
AC140×3-HC89×4-C80	350.00	140.10	2.86	300.00	89.10	3.91	1029.00	79.90	2107.00	
AC140×3-HC89×4-C120	350.00	140.20	2.88	300.00	89.10	3.91	1029.00	115.60	2195.00	
AC165×3-HC22×4-C40	413.00	165.30	2.94	276.00	22.00	4.14	794.00	40.50	1750.00	
AC165×3-HC22×4-C80	413.00	165.20	2.94	276.00	22.10	4.09	794.00	79.90	2413.00	
AC165×3-HC22×4-C120	413.00	165.30	2.94	276.00	22.10	4.04	794.00	115.60	2911.00	
AC165×3-HC32×6-C40	413.00	165.30	2.93	276.00	31.90	5.35	619.00	40.50	1943.00	
AC165×3-HC32×6-C40R	413.00	165.30	2.94	276.00	31.90	5.39	619.00	79.90	1891.00	
AC165×3-HC32×6-C80	413.00	165.30	2.94	276.00	31.80	5.25	619.00	115.60	2550.00	
AC165×3-HC89×4-C40	413.00	165.50	2.92	276.00	89.00	3.92	1029.00	40.50	2375.00	
AC165×3-HC89×4-C80	413.00	165.40	2.91	276.00	89.10	3.91	1029.00	79.90	2580.00	
AC165×3-HC89×4-C120	413.00	165.20	2.92	276.00	88.90	3.88	1029.00	115.60	2671.00	
C1-1	660.00	220.00	3.62	380.60	159.00	3.72	319.60	55.11	2537.00	Han et al. [28]
C1-2	660.00	220.00	3.62	381.60	159.00	3.72	320.60	55.11	2566.00	
C2-1	660.00	220.00	3.62	382.60	106.00	3.72	321.60	55.11	3436.00	
C2-2	660.00	220.00	3.62	383.60	106.00	3.72	322.60	55.11	3506.00	
SC1	500.00	168.00	6.00	320.00	0.00	0.00	0.00	41.04	3030.00	Zhang et al. [29]
SC2	500.00	168.00	6.00	320.00	48.00	4.00	357.00	41.04	2908.00	

SC3	500.00	168.00	6.00	320.00	63.00	4.00	357.00	41.04	2504.00	
SC4	500.00	168.00	6.00	320.00	95.00	4.00	357.00	41.04	2389.00	
SC5	500.00	168.00	6.00	320.00	80.00	4.00	357.00	41.04	2570.00	
SC6	500.00	168.00	6.00	320.00	80.00	4.00	357.00	41.04	2629.00	
SC7	500.00	168.00	6.00	320.00	80.00	4.00	357.00	33.54	2849.00	
SC8	500.00	168.00	5.00	320.00	80.00	4.00	357.00	44.68	2457.00	
SC9	500.00	168.00	8.00	320.00	80.00	4.00	357.00	48.94	3266.00	
SC10	500.00	168.00	12.00	320.00	80.00	4.00	357.00	41.04	4000.00	
101×1.6-50×1.6-D	300.00	101.80	1.70	253.30	49.60	1.53	376.50	31.58	583.00	Li et al. [30]
101×1.6-50×3-D	300.00	101.80	1.70	253.30	50.90	3.07	228.90	31.58	634.00	
101×3-50×1.6-D	300.00	101.90	2.79	226.00	49.60	1.53	376.50	31.58	593.00	
101×3-50×3-D	300.00	101.90	2.79	226.00	50.90	3.07	228.90	31.58	681.00	
114×3-50×1.6-D	350.00	114.10	2.79	281.20	46.00	1.53	376.50	31.58	804.00	
114×3-50×3-D	350.00	114.10	2.79	281.20	46.00	3.07	228.90	31.58	902.00	
152×1.6-50×1.6-D	450.00	152.60	1.60	314.50	49.60	1.53	376.50	31.58	1055.00	
152×1.6-76×1.6-D	450.00	152.60	1.60	314.50	76.20	1.66	389.90	31.58	997.00	
152×1.6-101×1.6-D	450.00	152.60	1.60	314.50	101.80	1.70	353.30	31.58	825.00	
152×1.6-101×3-D	450.00	152.60	1.60	314.50	101.90	2.79	226.00	31.58	882.00	
168×3-50×1.6-D	450.00	168.40	3.22	281.50	49.60	1.53	376.50	31.58	1569.00	
168×3-76×1.6-D	450.00	168.40	3.22	281.50	76.20	1.66	398.90	31.58	1470.00	
168×3-89×3-D	450.00	168.40	3.22	281.50	89.20	3.22	259.20	31.58	1464.00	

168×3-101×1.6-D	450.00	168.40	3.22	281.50	101.80	1.70	353.30	31.58	1332.00
168×3-101×3-D	450.00	168.40	3.22	281.50	101.90	2.79	226.00	31.58	1354.00
168×3-114×3-D	450.00	168.40	3.22	281.50	114.10	2.79	281.20	31.58	1319.00
203×2-50×3-D	400.00	202.70	1.99	304.00	50.90	3.07	228.90	31.58	1653.00
203×2-76×1.6-D	400.00	202.70	1.99	304.00	76.20	1.66	398.90	31.58	1658.00
203×2-101×3-D	400.00	202.70	1.99	304.00	101.90	2.79	226.00	31.58	1625.00
203×2-152×1.6-D	400.00	202.70	1.99	304.00	152.60	1.60	314.50	31.58	1142.00

Enclosed Table 3 Forecast model formula

references	formula	limit		
		f_{yo} (MPa)	f_{yi} (MPa)	cross section slenderness ratio
Yan and Zhao [4]	$P_{u,Yan} = A_o f_{yo} + (1+\eta_c) A_c f_c + A_{si} f_{yi}$ $\eta_c = (1.2 - 0.5\chi^2)\left(\frac{t_o}{D_o}\right)^{0.76} \frac{f_{yo}}{f_c}$	–	–	–
ACI 318 [6]	$P_{ACI} = A_o f_{yo} + 0.85 A_c f_c + A_{si} f_{yi}$	–	≥17.2	$\frac{D_o}{t_o} \le \sqrt{8\frac{E_o}{\sigma_y}}$
Yan et al. [10]	$N_u = 0.94 f_{syo} A_{os} + A_{sc} f_{cc} + f_{syi} A_{is}$ $f_{cc} = f_c + 2.2\lambda f_c^{0.3} \sigma_{ru}^{0.81}$ $\sigma_{ru} = -\frac{2\sigma_{o\theta,m} t_o}{D_o - 2t_o}$ $\sigma_{o\theta,m} = 1.045 f_{syo}$ η $= (1-\chi^2)\frac{2t_o}{D_o - 2t_o}\frac{f_{syo}}{f_c}$ $\lambda_{CFDST} = \begin{cases} 0.6\eta^{0.51}, & 0 \le \eta < 2.731 \\ 1.0, & 2.731 \le \eta \le 7.457 \end{cases}$	–	–	–
Uenaka et al. [15]	$P_{u,Uenaka} = \left(2.86 - 2.59\frac{d}{D}\right) f_{so} A_{so} + f_c A_c + A_{si} f_{si}$ $\left(0.2 < \frac{d}{D} < 0.7\right)$	–	–	–
Han et al. [28]	$P_{u,Han} = \left[C_1 \chi^2 f_{yo} + C_2(1.14 + 1.02\xi) f_{ck}\right](A_{so} + A_{sc}) + A_{si} f_{si}$ $C_1 = \frac{\alpha}{1+\alpha}$, $C_2 = \frac{1+\alpha_n}{1+\alpha}$, $\alpha = \frac{A_{so}}{A_{sc}}$, $\alpha_n = \frac{A_{so}}{A_{c,nominal}}$, $\xi = \frac{\alpha_n f_{yo}}{f_{ck}}$	–	–	–
Hassanein and Kharoob [35]	$P_{u,Hassanein} = \begin{cases} \left(1 + 0.3\Omega\frac{\zeta}{1+\zeta}\right)\left(f_{yo} A_{so} + f'_{cc} A_c\right) + f_{yi} A_{si} & D_o/t_o \le 150 \\ A_o f_{yo} + 0.85 A_c f_c + f_{yi} A_{si} & D_o/t_o > 150 \end{cases}$ $\zeta = \alpha\frac{f_{yo}}{f_{ck}}$, $\alpha = \frac{A_{yo}}{A_c}$, $\Omega = \frac{A_c}{(A_c + A_k)}$, $f'_{cc} = \gamma_c f'_c + 4.1 f'_{rp.ss}$	–	–	–

EC4 [36]	$P_{EC4} = \eta_\alpha A_o f_{syo} + A_c f_c \left(1 + \eta_c \frac{t_o f_{syo}}{D_o f_c}\right) + A_i f_{syi}$ $\eta_\alpha = 0.25(3 + 2\overline{\lambda}) \le 1.0$, $\eta_c = 4.9 - 18.5\overline{\lambda} + 17\overline{\lambda}^2 \ge 0$ $\overline{\lambda} = \sqrt{\frac{N_{pl,Rk}}{N_{cr}}}$ $N_{pl,Rk} = A_a f_{yd} + 0.85 A_c f_{cd} + A_s f_{sd}$, $EI_{eff} = E_a I_a + 0.6 E_c I_c + E_s I_s$	235–460	20–50	$\frac{D_o}{t_o} \le 90\frac{235}{\sigma_y}$
		230–400	25–65	$\frac{D_o}{t_o}\frac{\sigma_y}{235} \le 82$
AS 5100 [37] AISC 360 [38]	$P_{AISC/AS} = \begin{cases} A_{so} f_{yo} + 0.95 A_c f_c + A_{si} f_{yi} & \text{(Compact)} \\ P_y + \frac{P_p - P_y}{(\lambda_r - \lambda_p)^2}(\lambda_r - \lambda)^2 + A_{si} f_{yi} & \text{(Noncompact)} \\ A_{so} f_{cr} + 0.7 A_c f_c + A_{si} f_{yi} & \text{(Slender)} \end{cases}$ $f_{cr} = \frac{0.72 f_{yo}}{\left[\left(\frac{D_o}{t_o}\right)\left(\frac{f_{yo}}{E_{so}}\right)\right]^{0.2}}$ $P_p = A_{so} f_{yo} + 0.95 A_c f_c + A_{si} f_{yi}$, $P_y = A_{so} f_{yo} + 0.7 A_c f_c + A_{si} f_{yi}$	≤525	21–70	$\frac{D_o}{t_o} \le \lambda_p = \frac{0.15 E_o}{f_y}$ (Compact) $\frac{0.15 E_o}{f_y} = \lambda_p \le \frac{D_o}{t_o} \le \lambda_r = \frac{0.19 E_o}{f_y}$ (Noncompact) $\frac{0.19 E_o}{f_y} = \lambda_r \le \frac{D_o}{t_o} \le \frac{0.31 E_o}{f_y}$ (Slender)
Hassanein et al. [39]	$P_{u,Hassanein} = \gamma_{se} f_{sye} A_{se} + (\gamma_c f_c' + 4.1 f'_{rp.ss}) A_{sc} + \gamma_{si} A_{si} f_{si}$ $f'_{rp} = \begin{cases} 1.4 t_e (\nu_e - \nu_s) f_{sye}/(D - 2t_e) & for\ D/t_e \le 47 \\ (0.006241 - 0.0000357 D/t_e) f_{sye} & for\ 47 < D/t_e \le 150 \end{cases}$ $\gamma_{se} = 1.62(D/t_e)^{-0.1}$ and $\gamma_{si} = 1.458(d/t_i)^{-0.1}$ $(0.9 \le \gamma_s \le 1.1)$ $\gamma_c = \begin{cases} 1.85 D_c^{-0.135}\ (D_c = D - 2t_e) & \text{by Hasssanein et al. [35]} \\ 1.85 t_c^{-0.135}\ \left(t_c = \frac{D}{2} - t_e - \frac{d}{2}\right) & \text{by Liang et al. [52]} \end{cases}$ (0.85 $\le \gamma_c \le 1.0$) $\nu_e = 0.2312 + 0.3582\nu'_e - 0.1524\left(\frac{f_{ck}}{f_{sy}}\right) + 4.843\nu'_e\left(\frac{f_{ck}}{f_{sy}}\right) - 9.169\left(\frac{f_{ck}}{f_{sy}}\right)^2$ $\nu'_e = 0.881 \times 10^{-6}\left(\frac{D}{t}\right)^3 - 2.58 \times 10^{-4}\left(\frac{D}{t}\right)^2 + 1.953 \times 10^{-2}\left(\frac{D}{t}\right) + 0.4011$	–	–	–

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