

BAB VI

KESIMPULAN DAN SARAN

6.1. Kesimpulan

Berdasarkan hasil penelitian dan analisis yang telah diuraikan pada bab V, maka dapat dituliskan beberapa kesimpulan dari penelitian studi kuat lentur balok kanal C ganda dengan variasi jarak las ini, sebagai berikut :

1. Dari hasil pengujian kuat lentur baja profil kanal C ganda yang dilakukan didapatkan beban maksimum yang dapat diterima oleh tiap benda uji berbeda. Untuk balok dengan kode BC3H sebesar 1448,577 kg, balok dengan kode BC4H sebesar 1385,207 kg, sedangkan untuk balok dengan kode BC5H sebesar 1393,895 kg. Sehingga dapat disimpulkan bahwa balok dengan kode BC3H yang menggunakan variasi jarak las 3h adalah yang mampu menerima beban maksimum.
2. Dari hasil pengujian yang dilakukan jika dilihat dari beban maksimal yang dapat diterima oleh tiap benda uji, balok profil kanal C ganda dengan variasi jarak 3h adalah variasi las yang dapat menerima beban maksimal. Namun tidak ada pola tertentu dari pembebanan tiap balok. Sehingga dapat disimpulkan bahwa variasi jarak las tidak berpengaruh langsung terhadap beban maksimal yang dapat diterima balok. Ada faktor lain yang dapat mempengaruhi, mulai dari tahap persiapan sampai dengan saat pengujian berlangsung.

3. Pada penelitian kali ini besarnya momen berpengaruh terhadap tegangan lentur balok. Balok dengan kode BC4H memiliki tegangan lentur yang terbesar yaitu 121,1714 MPa.
4. Pada penelitian kali ini benda uji yang memiliki tingkat daktilitas paling tinggi adalah BC3H, karena benda uji tersebut mampu meregang paling maksimum dibandingkan benda uji yang lain.

6.2. Saran

Untuk melakukan penelitian lanjut tentang studi kuat lentur balok kanal C ganda ini, perlu diperhatikan sebagai berikut :

1. Saat proses perangkaian benda uji, sebaiknya dilaksanakan dengan sebaik-baiknya, supaya sifat dari bahan utama tidak berubah, apalagi jika perangkaian dilakukan menggunakan las.
2. Penggabungan 2 buah profil C sebaiknya diperhatikan dengan baik, supaya hasil penggabungan sebisa mungkin simetris. supaya saat dilakukan pengujian terhadap benda uji, hasil yang diharapkan menjadi maksimal.
3. Perletakan *dial gauge* dalam penelitian juga harus diperhatikan dengan baik, supaya keakuratan data pengujian semakin besar.

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DATA PENGUJIAN KUAT TARIK PROFIL C

Tebal = 2 mm Luas = 60,2 mm²
 Lebar = 30,1 mm P_0 = 106,1 mm

Beban (Kgf)	ΔP (0,01mm)	Beban (N)	Tegangan (Mpa)	Regangan ($\times 10^{-4}$)
0	0	0	0	0
100	1	980,6710	16,2902	0,9597
200	2	1961,3420	32,5804	1,9194
300	3	2942,0130	48,8706	2,8791
400	3	3922,6840	65,1609	2,8791
500	4	4903,3550	81,4511	3,8388
600	5	5884,0260	97,7413	4,7985
700	6	6864,6970	114,0315	5,7582
800	7	7845,3680	130,3217	6,7179
900	7	8826,0390	146,6119	6,7179
1000	8	9806,7100	162,9022	7,6775
1100	9	10787,3810	179,1924	8,6372
1200	11	11768,0520	195,4826	10,5566
1300	13	12748,7230	211,7728	12,4760
1400	15	13729,3940	228,0630	14,3954
1500	20	14710,0650	244,3532	19,1939
1600	22	15690,7360	260,6435	21,1132
1700	365	16671,4070	276,9337	350,2879
1800		17652,0780	293,2239	
2060		20201,8226	335,5784	

Beban Maksimum = 2060 Kgf
 Tegangan Leleh = 260,6435 MPa
 Tegangan Maksimum = 335,5784 MPa
 Regangan Leleh (koreksi) = 0,00211132
 Modulus Elastis = 125701,2516 MPa

Mengetahui,
 Ka.Lab. Struktur dan Bahan Bangunan UAJY

(Ir. Haryanto Y.W., M.T.)

**DATA PENGUJIAN STUDI KUAT LENTUR BALOK BAJA PROFIL C
GANDA
DENGAN VARIASI JARAK SAMBUNGAN LAS
3H**

BC3H

Waktu (detik)	Beban (kgf)	Defleksi (mm)
0	0.843737	0.013398
1	0.721106	0.012821
2	1.169352	0.013549
3	115.5572	0.989784
4	175.1612	1.539499
5	174.7874	1.540711
6	174.4101	1.540278
7	177.3302	1.562038
8	206.8837	1.842713
9	225.5261	2.021651
10	235.8899	2.143336
11	244.8817	2.232195
12	253.2750	2.324704
13	262.4397	2.422247
14	269.3521	2.503192
15	271.4213	2.533305
16	271.5556	2.536205
17	271.2564	2.536853
18	271.2084	2.536768
19	271.0429	2.536085
20	272.5908	2.549150
21	280.2611	2.614132
22	281.4374	2.631777
23	281.1344	2.631508
24	280.8404	2.632104
25	280.7028	2.632103
26	280.7266	2.631670
27	280.6239	2.632277
28	280.6298	2.631563
29	280.5038	2.631596
30	280.5300	2.631320
31	280.4225	2.631718
32	280.4053	2.631532
33	280.3779	2.631011
34	280.2649	2.630861

Waktu (detik)	Beban (kgf)	Defleksi (mm)
35	280.3929	2.632517
36	282.7237	2.646099
37	293.4996	2.736071
38	304.7585	2.837996
39	311.5166	2.893643
40	321.0220	2.977056
41	326.0875	3.027809
42	325.9975	3.028548
43	325.7162	3.028201
44	333.4524	3.089867
45	345.2037	3.187626
46	357.6047	3.294853
47	370.3661	3.404711
48	379.9905	3.484505
49	384.3504	3.523083
50	383.9604	3.524648
51	384.4117	3.527265
52	394.9002	3.616458
53	406.1962	3.717994
54	419.9683	3.834844
55	429.4350	3.919566
56	430.8609	3.938510
57	432.0687	3.950199
58	432.2591	3.953966
59	431.8913	3.954420
60	431.5513	3.955653
61	431.1262	3.957349
62	431.4176	3.956899
63	431.0545	3.957671
64	431.0186	3.957955
65	430.9177	3.958175
66	430.9236	3.957714
67	430.7353	3.956955
68	430.8606	3.957714
69	430.6103	3.957688
70	430.2518	3.954297
71	430.3542	3.953614
72	432.7125	3.967608
73	442.0874	4.047113
74	460.6726	4.212737
75	486.3814	4.435650
76	494.3927	4.510356
77	495.1436	4.525549
78	495.4153	4.529722
79	507.4694	4.631483
80	520.4954	4.750237
81	535.6013	4.884656

Waktu (detik)	Beban (kgf)	Defleksi (mm)
82	545.9298	4.985185
83	551.9847	5.043490
84	558.4836	5.112682
85	559.2484	5.128684
86	558.6193	5.128247
87	558.3688	5.128104
88	562.5927	5.157313
89	569.5410	5.217197
90	575.3346	5.276858
91	574.2089	5.278466
92	573.8154	5.278159
93	573.6271	5.276832
94	573.3950	5.276130
95	573.2631	5.274292
96	573.1583	5.273926
97	572.8649	5.273295
98	572.7952	5.273740
99	572.5634	5.271884
100	579.2194	5.323697
101	601.1583	5.510866
102	627.6733	5.750440
103	634.0095	5.826815
104	633.9916	5.834758
105	657.3290	6.041843
106	674.5969	6.216579
107	684.9187	6.328923
108	683.8268	6.344189
109	686.4139	6.368780
110	702.9400	6.525655
111	718.5010	6.691803
112	729.5433	6.822750
113	736.0303	6.904820
114	736.3804	6.932802
115	734.8788	6.933049
116	741.1469	6.988097
117	747.8178	7.059218
118	746.7971	7.063739
119	745.6135	7.062937
120	744.7855	7.063194
121	744.0892	7.062263
122	743.4878	7.061429
123	743.4818	7.060898
124	743.1785	7.060756
125	742.8803	7.061729
126	742.6271	7.060598
127	742.4522	7.060086
128	742.2531	7.060824

Waktu (detik)	Beban (kgf)	Defleksi (mm)
129	742.0017	7.062011
130	741.7590	7.062287
131	741.5054	7.059490
132	741.3649	7.060899
133	741.3566	7.060337
134	741.0582	7.059898
135	741.1914	7.060526
136	740.9747	7.060224
137	740.8607	7.059685
138	740.7563	7.059057
139	740.6470	7.058952
140	740.5385	7.059201
141	742.3402	7.071044
142	762.9995	7.256877
143	777.5312	7.407527
144	784.4330	7.494432
145	783.0908	7.495914
146	794.5582	7.598499
147	831.8431	7.973848
148	835.5339	8.062940
149	834.6390	8.070131
150	864.7335	8.350056
151	888.5288	8.624729
152	885.6252	8.643748
153	891.5312	8.703913
154	896.7048	8.767471
155	898.6504	8.797822
156	899.5120	8.823040
157	898.1682	8.824070
158	897.3619	8.823411
159	896.3713	8.822718
160	895.9077	8.822818
161	895.2984	8.822285
162	895.0797	8.821981
163	894.5914	8.821218
164	894.2575	8.819930
165	894.0215	8.819723
166	893.6675	8.819099
167	893.5223	8.819582
168	893.2091	8.819442
169	895.2307	8.833926
170	930.0049	9.148420
171	934.4043	9.227434
172	963.9666	9.525019
173	983.9091	9.799164
174	979.4257	9.800107
175	996.7872	9.959652

176	1013.516	10.14289
177	1022.853	10.26293
178	1031.399	10.36960
179	1037.650	10.45505
180	1034.781	10.45814
181	1038.122	10.49153
182	1039.437	10.51785
183	1037.892	10.51842
184	1036.812	10.51813
185	1035.930	10.51752
186	1035.184	10.51650
187	1034.438	10.51531
188	1033.910	10.51427
189	1033.424	10.51341
190	1033.074	10.51527
191	1032.576	10.51492
192	1034.208	10.52968
193	1062.328	10.77091
194	1094.507	11.09856
195	1095.237	11.15467
196	1142.461	11.61061
197	1145.833	11.75454
198	1148.252	11.80527
199	1174.633	12.06859
200	1184.544	12.21536
201	1187.991	12.29950
202	1187.881	12.33359
203	1184.945	12.34130
204	1185.823	12.36222
205	1195.559	12.45565
206	1199.316	12.50716
207	1202.672	12.55574
208	1202.871	12.58340
209	1200.148	12.58126
210	1198.353	12.57859
211	1196.841	12.57559
212	1195.786	12.57457
213	1194.801	12.57389
214	1194.096	12.57298
215	1193.156	12.57148
216	1192.390	12.57001
217	1191.865	12.56959
218	1191.255	12.56928
219	1190.784	12.56691
220	1190.272	12.56707
221	1189.732	12.56760
222	1189.533	12.56828
223	1189.008	12.56695
224	1189.081	12.56675

Waktu (detik)	Beban (kgf)	Defleksi (mm)
225	1200.501	12.65392
226	1232.663	12.93854
227	1229.401	12.95370
228	1232.545	12.99531
229	1246.482	13.13456
230	1253.569	13.23482
231	1263.059	13.36207
232	1271.107	13.49430
233	1272.645	13.55509
234	1291.744	13.77611
235	1304.224	13.97901
236	1302.058	14.06379
237	1311.200	14.18356
238	1330.897	14.43476
239	1337.398	14.63130
240	1331.606	14.66203
241	1347.591	14.86276
242	1347.949	14.96385
243	1340.240	14.95691
244	1335.634	14.95333
245	1332.848	14.95008
246	1330.707	14.94749
247	1329.093	14.94467
248	1327.667	14.94211
249	1326.563	14.94017
250	1325.378	14.93820
251	1324.658	14.93782
252	1323.798	14.93702
253	1323.137	14.93382
254	1322.561	14.93388
255	1322.000	14.93292
256	1321.481	14.93213
257	1320.868	14.93209
258	1320.299	14.93115
259	1320.239	14.93208
260	1351.361	15.18383
261	1376.353	15.50240
262	1377.327	15.60344
263	1395.838	15.98043
264	1402.962	16.18467
265	1404.141	16.44573
266	1396.848	16.47201
267	1420.065	16.77705
268	1414.390	16.92516
269	1403.363	16.91084
270	1412.250	17.01803
271	1433.454	17.37688

Waktu (detik)	Beban (kgf)	Defleksi (mm)
272	1419.549	17.41396
273	1441.586	17.72786
274	1431.548	17.91710
275	1427.582	17.96618
276	1448.577	18.33738
277	1431.463	18.40712
278	1437.000	18.53805
279	1446.205	18.91156
280	1432.480	18.95135
281	1446.881	19.27597
282	1432.714	19.38020
283	1421.107	19.36737
284	1434.385	19.57596
285	1424.805	19.63505
286	1430.935	19.80330
287	1418.148	19.81172
288	1412.143	19.81074
289	1432.448	20.11412
290	1420.633	20.25818
291	1407.117	20.23198
292	1400.841	20.22218
293	1397.315	20.21632
294	1395.665	20.21734
295	1393.219	20.21862
296	1390.725	20.22181
297	1388.787	20.21612
298	1387.346	20.21403
299	1386.228	20.21187
300	1384.870	20.20815
301	1383.979	20.20517
302	1383.087	20.20394
303	1382.516	20.20256
304	1381.572	20.19964
305	1380.961	20.19796
306	1380.133	20.19656
307	1379.416	20.19541
308	1378.913	20.19417
309	1378.573	20.19622
310	1393.248	20.33162
311	1417.736	20.68414
312	1404.357	20.70823
313	1417.349	21.06806
314	1394.618	21.10655
315	1385.261	21.09031
316	1380.128	21.08129
317	1376.739	21.07516
318	1374.127	21.07170

Waktu (detik)	Beban (kgf)	Defleksi (mm)
319	1372.186	21.06800
320	1370.626	21.06661
321	1369.130	21.06370
322	1367.912	21.06131
323	1366.635	21.06068
324	1365.716	21.06155
325	1364.705	21.05897
326	1363.830	21.05679
327	1362.761	21.05090
328	1361.730	21.04808
329	1361.119	21.05089
330	1360.431	21.05325
331	1359.605	21.05250
332	1359.426	21.05165
333	1358.792	21.05086
334	1358.513	21.04986
335	1358.065	21.04873
336	1357.641	21.04843
337	1357.573	21.04958
338	1356.984	21.04977
339	1356.758	21.04918
340	1356.172	21.04790
341	1355.817	21.04730
342	1355.476	21.04699
343	1355.140	21.04723
344	1354.663	21.04588
345	1354.365	21.04480
346	1354.188	21.04485
347	1353.898	21.04445
348	1353.632	21.04432
349	1353.274	21.04343
350	1352.858	21.04331
351	1352.825	21.04267
352	1352.522	21.04031
353	1352.449	21.03824
354	1351.836	21.03740
355	1351.756	21.03637
356	1351.634	21.03674
357	1351.171	21.03577
358	1351.003	21.03490
359	1350.756	21.03422
360	1350.591	21.03398
361	1350.401	21.03271
362	1349.905	21.03155
363	1349.339	21.02865
364	1349.065	21.02912
365	1348.807	21.02824

Waktu (detik)	Beban (kgf)	Defleksi (mm)
366	1369.402	21.22594
367	1387.400	21.60369
368	1394.901	21.99771
369	1374.935	22.22819
370	1366.122	22.69432
371	1359.973	22.91395
372	1341.259	23.24414
373	1338.462	23.70437
374	1317.653	23.95387
375	1295.804	24.38938
376	1292.283	24.82361
377	1264.707	25.01689
378	1261.829	25.30955
379	1243.536	25.29955
380	1236.232	25.28226
381	1231.665	25.27412
382	1228.514	25.26997
383	1225.942	25.26745
384	1224.078	25.26476
385	1222.175	25.26424
386	1221.170	25.26375
387	1219.851	25.26391
388	1218.667	25.26312
389	1217.607	25.26088
390	1216.718	25.26281
391	1215.884	25.26093
392	1214.944	25.25935
393	1214.286	25.25852
394	1213.767	25.25758
395	1212.861	25.25580
396	1212.389	25.25628
397	1211.884	25.25629
398	1211.303	25.25692
399	1210.703	25.25634

Mengetahui,
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**DATA PENGUJIAN STUDI KUAT LENTUR BALOK BAJA PROFIL C
GANDA
DENGAN VARIASI JARAK SAMBUNGAN LAS
4H**

BC4H

Waktu (detik)	Beban (kgf)	Defleksi (mm)
0	1.305569	-0.00197
1	1.279800	-0.00226
2	1.153696	-0.00202
3	1.562711	-0.00229
4	1.568863	-0.00316
5	1.316656	-0.00235
6	0.998168	-0.0026
7	1.120617	-0.00201
8	1.566975	-0.00228
9	1.217784	-0.00226
10	1.341024	-0.0019
11	1.115987	-0.00162
12	1.409011	-0.00124
13	1.200909	-0.00085
14	1.709283	-0.00055
15	4.982252	0.007925
16	25.18509	0.147894
17	77.43349	0.561487
18	122.2596	0.940801
19	124.8187	0.968076
20	135.6382	1.053338
21	169.4224	1.341124
22	203.6386	1.650808
23	231.6321	1.925899
24	241.2217	2.011465
25	244.091	2.043671
26	248.4655	2.075218
27	252.6171	2.10781
28	254.997	2.13242
29	258.0047	2.156611
30	260.4835	2.176154
31	263.5538	2.199357
32	266.7188	2.230444
33	271.0214	2.263322
34	272.0739	2.276014
35	272.1175	2.276402

Waktu (detik)	Beban (kgf)	Defleksi (mm)
36	272.0371	2.277107
37	271.4373	2.277087
38	271.6841	2.275833
39	271.5185	2.276296
40	271.6784	2.276232
41	270.8980	2.276444
42	272.0179	2.280228
43	283.1287	2.368036
44	287.1986	2.405003
45	290.7869	2.434019
46	293.2393	2.459052
47	296.2512	2.483856
48	298.6510	2.501228
49	301.6937	2.531344
50	305.6363	2.561975
51	309.6629	2.593629
52	316.3685	2.651642
53	324.6979	2.720743
54	334.2897	2.797877
55	334.8505	2.814107
56	334.8744	2.815906
57	347.6763	2.915856
58	356.5195	2.995073
59	363.9917	3.059484
60	370.9609	3.119355
61	377.0118	3.175897
62	383.0629	3.226861
63	392.3272	3.311596
64	399.9087	3.374837
65	404.7950	3.425463
66	404.5440	3.427533
67	404.5508	3.427410
68	409.5611	3.465379
69	417.1377	3.535006
70	422.9938	3.578609
71	426.6924	3.615283
72	431.0750	3.653711
73	435.1769	3.694899
74	439.5812	3.734651
75	442.5228	3.763004
76	445.7188	3.792392
77	445.9902	3.799804
78	446.3611	3.800337
79	445.6743	3.800132
80	446.1902	3.801064
81	446.5731	3.804835
82	446.9549	3.807238

83	450.3387	3.831383
84	452.0482	3.844533
85	453.7730	3.862515
86	456.3588	3.878303
87	456.4681	3.885291
88	458.6385	3.902468
89	461.8890	3.932445
90	465.1634	3.959494
91	469.5200	4.004177
92	469.5771	4.006570
93	471.1079	4.018851
94	477.6558	4.073870
95	483.7519	4.123916
96	489.1802	4.171922
97	492.6888	4.203289
98	496.1959	4.236510
99	499.8805	4.272778
100	505.0437	4.320288
101	509.5587	4.366946
102	514.1394	4.405728
103	519.6392	4.460275
104	526.3725	4.520507
105	527.2872	4.536178
106	526.1634	4.535991
107	526.7861	4.537635
108	536.0403	4.615743
109	545.8451	4.703974
110	552.4419	4.76506
111	557.5667	4.814276
112	561.2407	4.848845
113	564.2080	4.881102
114	568.0277	4.919853
115	572.8795	4.964333
116	575.0012	4.988125
117	576.9608	5.001485
118	577.8118	5.016854
119	579.0692	5.027904
120	579.9616	5.038586
121	583.2711	5.066133
122	587.7031	5.111736
123	589.9212	5.129304
124	589.9082	5.129715
125	598.8494	5.203874
126	608.3102	5.293676
127	618.8843	5.401878
128	626.1711	5.476707
129	630.7406	5.527368
130	635.7988	5.578640
131	638.9486	5.614101

Waktu (detik)	Beban (kgf)	Defleksi (mm)
132	642.8173	5.654319
133	647.7887	5.706167
134	650.6080	5.737236
135	649.7284	5.737463
136	649.0704	5.738335
137	651.3995	5.756304
138	662.9249	5.862151
139	669.0383	5.927470
140	674.4096	5.980168
141	679.1195	6.032551
142	684.2650	6.087055
143	689.1639	6.132301
144	694.2050	6.187405
145	701.2841	6.264449
146	703.7131	6.294645
147	701.7412	6.293372
148	710.9277	6.365685
149	719.1956	6.452892
150	725.5817	6.523417
151	732.1593	6.597963
152	743.1365	6.714709
153	747.5325	6.778573
154	745.4489	6.774530
155	753.5043	6.846112
156	764.7252	6.976508
157	765.7078	7.005923
158	772.9525	7.074252
159	786.1564	7.217100
160	800.5195	7.357689
161	798.9183	7.358217
162	804.0325	7.409541
163	810.2723	7.471648
164	820.8512	7.572028
165	833.4794	7.700082
166	845.9295	7.830123
167	852.2643	7.899431
168	852.6179	7.912778
169	851.8260	7.912174
170	854.7197	7.946244
171	863.8342	8.027858
172	873.1368	8.119767
173	884.6657	8.246577
174	895.1842	8.362171
175	904.2258	8.472245
176	905.2081	8.501351
177	903.0490	8.501786
178	902.6461	8.501511

Waktu (detik)	Beban (kgf)	Defleksi (mm)
179	904.0514	8.522072
180	904.9029	8.535701
181	904.3298	8.535718
182	907.5341	8.561687
183	913.7446	8.623124
184	919.8886	8.693888
185	923.5762	8.736857
186	926.0790	8.769439
187	927.7094	8.794344
188	930.1887	8.826177
189	932.2079	8.854647
190	934.4723	8.882947
191	937.4777	8.919069
192	941.3123	8.966507
193	947.1620	9.034248
194	953.2555	9.109267
195	951.5732	9.108180
196	949.7739	9.105652
197	951.9617	9.130758
198	958.538	9.195972
199	963.6637	9.256731
200	968.1288	9.314705
201	973.6471	9.378754
202	978.8549	9.447647
203	983.8322	9.511189
204	987.6424	9.566572
205	991.4016	9.618921
206	994.4689	9.671212
207	992.4075	9.668891
208	991.0290	9.665567
209	994.7274	9.695071
210	997.9758	9.738910
211	1002.331	9.792683
212	1006.130	9.841778
213	1010.360	9.901435
214	1015.352	9.962397
215	1020.461	10.03405
216	1027.328	10.12318
217	1032.401	10.18975
218	1036.828	10.24805
219	1034.535	10.24804
220	1035.501	10.25815
221	1047.974	10.36082
222	1053.570	10.42491
223	1056.563	10.46853
224	1060.361	10.50945
225	1063.826	10.55519

Waktu (detik)	Beban (kgf)	Defleksi (mm)
226	1067.316	10.58795
227	1070.406	10.62567
228	1073.264	10.65918
229	1077.043	10.70578
230	1078.850	10.74134
231	1076.250	10.73756
232	1078.702	10.75063
233	1085.209	10.80907
234	1091.368	10.87061
235	1096.397	10.92179
236	1101.073	10.98463
237	1106.168	11.04112
238	1108.782	11.08795
239	1116.154	11.16753
240	1120.818	11.23686
241	1117.199	11.23440
242	1115.627	11.22947
243	1122.426	11.29517
244	1127.722	11.35896
245	1132.172	11.41214
246	1135.301	11.45819
247	1137.074	11.49537
248	1139.136	11.52963
249	1141.285	11.56775
250	1143.690	11.60285
251	1146.727	11.64478
252	1149.625	11.69489
253	1151.011	11.73115
254	1148.021	11.72706
255	1147.940	11.73123
256	1155.643	11.79443
257	1162.475	11.87159
258	1166.196	11.92356
259	1168.638	11.97017
260	1173.913	12.03551
261	1179.742	12.10907
262	1183.370	12.16604
263	1186.947	12.21864
264	1190.287	12.27786
265	1194.338	12.33856
266	1194.774	12.36541
267	1191.527	12.36028
268	1193.553	12.38507
269	1200.281	12.45733
270	1202.531	12.49237
271	1206.745	12.55326
272	1208.782	12.58752

Waktu (detik)	Beban (kgf)	Defleksi (mm)
273	1208.663	12.60719
274	1210.493	12.63854
275	1212.540	12.67818
276	1214.747	12.70408
277	1214.487	12.72406
278	1214.883	12.74006
279	1216.394	12.76394
280	1220.057	12.80955
281	1224.736	12.86377
282	1232.358	12.95604
283	1232.837	13.00732
284	1229.499	13.00257
285	1233.328	13.04493
286	1242.489	13.14612
287	1246.644	13.21430
288	1249.374	13.27252
289	1250.951	13.31983
290	1253.808	13.37040
291	1256.382	13.42533
292	1257.236	13.46639
293	1260.826	13.52193
294	1262.797	13.56486
295	1265.495	13.61907
296	1262.379	13.62139
297	1259.476	13.61914
298	1257.423	13.61776
299	1262.109	13.65855
300	1270.399	13.74632
301	1274.454	13.80809
302	1279.692	13.88289
303	1282.912	13.95377
304	1285.292	14.00225
305	1284.123	14.02902
306	1285.114	14.06780
307	1285.188	14.09712
308	1285.693	14.12146
309	1286.080	14.14780
310	1285.773	14.16371
311	1286.662	14.18509
312	1291.539	14.24351
313	1289.263	14.24673
314	1287.273	14.24680
315	1297.894	14.34588
316	1310.869	14.50687
317	1313.360	14.60134
318	1314.223	14.67292
319	1316.312	14.74030

Waktu (detik)	Beban (kgf)	Defleksi (mm)
320	1315.777	14.78692
321	1310.560	14.78264
322	1310.832	14.79555
323	1322.168	14.92018
324	1332.698	15.08087
325	1342.194	15.27738
326	1339.271	15.38062
327	1331.836	15.36973
328	1332.540	15.39823
329	1344.657	15.54254
330	1344.049	15.60661
331	1341.625	15.62784
332	1341.528	15.66497
333	1344.916	15.72863
334	1343.405	15.75296
335	1344.684	15.79203
336	1347.651	15.85101
337	1351.029	15.91916
338	1351.236	15.97013
339	1346.061	15.96635
340	1342.718	15.95854
341	1345.601	15.99524
342	1350.590	16.06911
343	1352.962	16.11665
344	1354.042	16.15296
345	1357.614	16.22519
346	1361.709	16.29890
347	1364.232	16.38333
348	1364.962	16.44669
349	1367.408	16.53728
350	1361.800	16.54094
351	1357.272	16.53231
352	1358.891	16.56116
353	1363.708	16.63168
354	1367.667	16.70587
355	1370.889	16.78118
356	1376.856	16.89819
357	1381.107	17.03122
358	1378.796	17.12382
359	1370.015	17.11249
360	1371.173	17.14748
361	1380.149	17.28288
362	1380.059	17.36144
363	1380.899	17.44421
364	1380.471	17.50829
365	1383.270	17.61127
366	1381.762	17.68129

Waktu (detik)	Beban (kgf)	Defleksi (mm)
367	1373.534	17.67206
368	1369.474	17.66729
369	1373.335	17.72524
370	1378.765	17.81879
371	1383.892	17.93876
372	1385.207	18.06558
373	1381.980	18.15440
374	1375.956	18.21405
375	1367.221	18.20226
376	1362.705	18.19207
377	1362.971	18.20827
378	1373.356	18.33306
379	1375.772	18.43358
380	1374.261	18.51483
381	1373.705	18.60518
382	1372.451	18.69693
383	1368.345	18.75952
384	1360.193	18.76089
385	1355.492	18.75245
386	1352.572	18.74632
387	1352.607	18.75406
388	1356.771	18.81161
389	1355.433	18.82636
390	1354.421	18.83709
391	1354.615	18.86148
392	1355.434	18.88975
393	1354.569	18.90605
394	1353.894	18.91733
395	1351.540	18.91581
396	1349.781	18.91643
397	1351.255	18.94310
398	1351.245	18.95869
399	1357.098	19.03158
400	1367.924	19.19601
401	1366.580	19.31363
402	1356.124	19.30659
403	1353.186	19.30655
404	1366.435	19.49018
405	1371.354	19.73864
406	1361.034	19.88318
407	1347.224	19.86259
408	1342.350	19.85645
409	1348.571	19.93992
410	1354.533	20.08242
411	1356.094	20.22584
412	1353.120	20.36971
413	1344.190	20.41649

Waktu (detik)	Beban (kgf)	Defleksi (mm)
414	1336.977	20.43791
415	1331.186	20.42996
416	1327.743	20.42398
417	1333.043	20.48747
418	1347.402	20.73462
419	1342.733	20.96864
420	1326.244	20.99920
421	1318.849	20.98735
422	1314.257	20.98022
423	1314.088	21.00015
424	1319.348	21.07548
425	1324.423	21.19496
426	1328.213	21.37593
427	1324.576	21.53893
428	1312.859	21.60717
429	1303.421	21.60053
430	1301.142	21.61649
431	1308.337	21.74830
432	1308.536	21.88135
433	1308.855	22.05040
434	1301.768	22.18292
435	1289.170	22.18381
436	1284.382	22.18365
437	1295.871	22.36696
438	1296.259	22.59333
439	1288.786	22.75146
440	1276.624	22.80179
441	1268.518	22.79564
442	1268.301	22.82641
443	1270.533	22.90340
444	1266.611	22.91801
445	1262.961	22.92274
446	1260.693	22.92934
447	1260.092	22.94775
448	1262.199	22.99299
449	1265.678	23.06110
450	1270.774	23.18182
451	1270.521	23.29527
452	1267.754	23.41942
453	1256.735	23.42328
454	1250.890	23.41806
455	1246.902	23.41499
456	1244.168	23.41139
457	1241.947	23.41060
458	1240.107	23.40765
459	1232.145	23.41392
460	1231.399	23.41296

Waktu (detik)	Beban (kgf)	Defleksi (mm)
461	1230.812	23.41258
462	1229.876	23.41404
463	1229.526	23.41388
464	1240.343	23.51313
465	1262.233	23.84144
466	1252.945	24.04766
467	1240.158	24.03567
468	1234.409	24.03326
469	1199.667	23.79119
470	426.7047	16.97903
471	1.344618	12.66497
472	1.126222	12.64704
473	1.703740	12.64033
474	1.373129	12.63663
475	1.571666	12.63334
476	1.382145	12.63183
477	-7.743560	12.63503

Mengetahui,
Ka.Lab. Struktur dan Bahan Bangunan UAJY

(Ir. Haryanto Y.W., M.T.)

**DATA PENGUJIAN STUDI KUAT LENTUR BALOK BAJA PROFIL C
GANDA
DENGAN VARIASI JARAK SAMBUNGAN LAS
5H**

BC5H

Waktu (detik)	Beban (kgf)	Defleksi (mm)
0	11.34500	0.574407
1	51.46893	0.961386
2	145.3872	1.854401
3	198.0239	2.315752
4	197.8546	2.316592
5	197.9860	2.317561
6	202.0758	2.340886
7	213.0120	2.432804
8	220.1464	2.495933
9	225.7842	2.543888
10	232.4709	2.594173
11	241.6674	2.678378
12	251.7170	2.763672
13	262.8137	2.860577
14	266.1154	2.888031
15	265.3321	2.889015
16	265.3635	2.889990
17	274.7751	2.961178
18	292.3313	3.109367
19	308.6266	3.249298
20	322.6051	3.370408
21	330.6103	3.441794
22	330.9231	3.445051
23	332.0700	3.463217
24	343.7351	3.559324
25	356.7824	3.673954
26	369.1761	3.784699
27	383.4954	3.911896
28	395.4459	4.036003
29	395.5646	4.043579
30	395.9267	4.045319
31	408.3968	4.153261
32	428.3735	4.336791
33	443.3782	4.481803
34	456.8498	4.617637

Waktu (detik)	Beban (kgf)	Defleksi (mm)
35	457.9774	4.639209
36	457.1431	4.639358
37	460.5099	4.671071
38	475.1924	4.810683
39	490.2557	4.954192
40	505.7690	5.107122
41	516.8615	5.224246
42	515.2479	5.232812
43	517.6473	5.252241
44	535.0726	5.414991
45	550.1571	5.573133
46	564.6453	5.729955
47	572.2107	5.827171
48	570.7631	5.830444
49	574.3811	5.857564
50	585.4238	5.965160
51	595.4418	6.086103
52	604.1266	6.181493
53	614.7191	6.290528
54	623.9061	6.407297
55	624.4463	6.438452
56	623.0602	6.439354
57	623.5109	6.445126
58	631.9785	6.519003
59	639.5538	6.601165
60	648.1262	6.707017
61	655.0345	6.806511
62	661.6434	6.883195
63	668.5718	6.972835
64	672.4675	7.045250
65	670.1116	7.045736
66	675.1954	7.093282
67	692.8913	7.286577
68	709.0702	7.517583
69	717.8267	7.662392
70	716.8321	7.666372
71	719.9988	7.693216
72	730.9329	7.793576
73	740.2096	7.878620
74	747.6293	7.948038
75	753.8100	8.000875
76	759.0972	8.053901
77	764.1395	8.102424
78	771.5125	8.169287
79	775.9083	8.213933
80	774.2161	8.212491
81	776.2789	8.228085

Waktu (detik)	Beban (kgf)	Defleksi (mm)
82	785.9544	8.312343
83	793.8795	8.378041
84	799.1704	8.433354
85	804.3387	8.484230
86	809.4982	8.527159
87	819.6290	8.610926
88	824.7018	8.679435
89	822.5937	8.679112
90	828.7341	8.721705
91	840.3533	8.823443
92	848.8538	8.915398
93	855.8381	8.979030
94	863.6958	9.048227
95	872.6105	9.124706
96	874.8644	9.162748
97	874.8375	9.164933
98	884.1108	9.221823
99	893.2274	9.303270
100	905.6603	9.402350
101	916.7735	9.495692
102	925.3315	9.572708
103	931.9974	9.639995
104	930.7441	9.651347
105	929.4005	9.650431
106	938.9683	9.711762
107	951.5205	9.812014
108	961.2117	9.898909
109	972.4200	9.990736
110	981.6123	10.08072
111	982.9004	10.11603
112	979.6939	10.11352
113	982.2036	10.12696
114	992.4321	10.20629
115	1003.471	10.30497
116	1010.598	10.37260
117	1017.501	10.43848
118	1022.780	10.49417
119	1025.535	10.53901
120	1021.894	10.53734
121	1019.894	10.53496
122	1023.692	10.55064
123	1029.967	10.60024
124	1035.877	10.65634
125	1039.509	10.69547
126	1045.512	10.75583
127	1057.939	10.87244
128	1059.179	10.93731

Waktu (detik)	Beban (kgf)	Defleksi (mm)
129	1053.932	10.92924
130	1056.779	10.94330
131	1068.447	11.04147
132	1078.427	11.14226
133	1092.834	11.28872
134	1105.710	11.42859
135	1102.894	11.47363
136	1102.898	11.48354
137	1117.310	11.61484
138	1133.182	11.78635
139	1144.662	11.94072
140	1144.524	12.00679
141	1140.598	12.00677
142	1155.759	12.13637
143	1169.142	12.30447
144	1178.562	12.44523
145	1177.869	12.51920
146	1171.138	12.50931
147	1181.606	12.58115
148	1193.652	12.72674
149	1205.448	12.88712
150	1210.069	13.01867
151	1202.283	13.02036
152	1201.470	13.02147
153	1222.929	13.22781
154	1240.108	13.48629
155	1236.721	13.56489
156	1231.626	13.56343
157	1246.595	13.69180
158	1273.941	14.00238
159	1280.601	14.20406
160	1272.386	14.20784
161	1269.878	14.21193
162	1290.558	14.39566
163	1313.691	14.69235
164	1311.882	14.83080
165	1303.524	14.82673
166	1311.978	14.89595
167	1332.536	15.14494
168	1343.806	15.38796
169	1334.552	15.43953
170	1333.294	15.46292
171	1358.106	15.73445
172	1364.181	15.99469
173	1351.203	16.02206
174	1345.662	16.01552
175	1341.809	16.00881

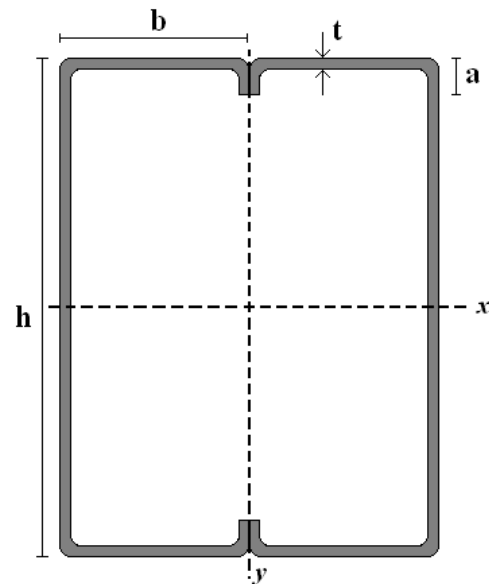
Waktu (detik)	Beban (kgf)	Defleksi (mm)
176	1349.894	16.06502
177	1370.919	16.29761
178	1377.035	16.56488
179	1362.948	16.57969
180	1364.672	16.60931
181	1387.884	16.92915
182	1382.271	17.13818
183	1369.242	17.13368
184	1367.340	17.13708
185	1384.521	17.32334
186	1392.958	17.59926
187	1378.961	17.68265
188	1370.229	17.67773
189	1366.332	17.67160
190	1379.570	17.77643
191	1393.895	18.04805
192	1386.101	18.21532
193	1373.713	18.21488
194	1367.412	18.20557
195	1372.723	18.24637
196	1384.485	18.39904
197	1385.882	18.54647
198	1385.828	18.67173
199	1379.784	18.74504
200	1370.238	18.74850
201	1365.282	18.74574
202	1362.248	18.74064
203	1359.172	18.73488
204	1357.847	18.73080
205	1356.550	18.72563
206	1360.981	18.75102
207	1376.937	18.90581
208	1383.524	19.07233
209	1385.082	19.24744
210	1372.224	19.29828
211	1363.757	19.28718
212	1365.605	19.30829
213	1382.385	19.54314
214	1381.584	19.78260
215	1365.915	19.83559
216	1356.302	19.82384
217	1368.598	19.95068
218	1375.442	20.22954
219	1363.646	20.37700
220	1351.170	20.37674
221	1344.537	20.36946
222	1345.683	20.39039

Waktu (detik)	Beban (kgf)	Defleksi (mm)
223	1360.244	20.58063
224	1359.163	20.74845
225	1354.244	20.88487
226	1343.060	20.92924
227	1335.305	20.92678
228	1340.395	20.98426
229	1353.799	21.27635
230	1343.134	21.45921
231	1328.821	21.47160
232	1325.711	21.47920
233	1342.660	21.76307
234	1334.104	22.02163
235	1317.629	22.04787
236	1313.000	22.05908
237	1330.315	22.33182
238	1320.734	22.64160
239	1302.554	22.65963
240	1295.440	22.65725
241	1300.165	22.72179
242	1313.140	23.04854
243	1298.885	23.24834
244	1284.986	23.25458
245	1278.841	23.25616
246	1275.146	23.25730
247	1272.131	23.25839
248	1269.512	23.25981
249	1266.809	23.25938
250	1264.911	23.25914
251	1264.258	23.25946
252	1262.444	23.25848
253	1261.717	23.25798
254	1260.989	23.25718
255	1259.911	23.25524
256	1259.979	23.25405
257	1259.562	23.25358

Mengetahui,
Ka.Lab. Struktur dan Bahan Bangunan UAJY

(Ir. Haryanto Y.W., M.T.)

Momen Inersia



$$\begin{aligned} a &= 7 \text{ mm} \\ b &= 35,5 \text{ mm} \\ h &= 93 \text{ mm} \\ t &= 2 \text{ mm} \end{aligned}$$

$$\begin{aligned} A &= 2 \times \{2 \cdot (7 \cdot 2) + 2 \cdot (31,5 \cdot 2) + (93 \cdot 2)\} \\ &= 680 \text{ mm}^2 \end{aligned}$$

$$x = 35,5 \text{ mm (dari kiri)}$$

$$y = 46,5 \text{ mm (dari atas)}$$

$$\begin{aligned} I_x &= \frac{1}{12} \cdot 93 \cdot 71^3 + 71 \cdot 93 \cdot 0^2 - \frac{1}{12} \cdot 89 \cdot 63^3 + 63 \cdot 89 \cdot 0^2 - \frac{1}{12} \cdot 79 \cdot 4^3 + \\ & \quad 4 \cdot 79 \cdot 0^2 \\ &= 893678,6667 \text{ mm}^4 \end{aligned}$$

$$\begin{aligned} I_y &= \frac{1}{12} \cdot 71 \cdot 93^3 + 71 \cdot 93 \cdot 0^2 - \frac{1}{12} \cdot 63 \cdot 89^3 + 63 \cdot 89 \cdot 0^2 - \frac{1}{12} \cdot 4 \cdot 79^3 + \\ & \quad 4 \cdot 79 \cdot 0^2 \\ &= 918873,6667 \text{ mm}^4 \end{aligned}$$

PELAKSANAAN PENELITIAN

Sampel Baja Profil C Sebelum Diuji



Sampel Baja Profil C Setelah Diuji Tarik



Proses Pemotongan Baja Profil C



Proses Pengelasan Kolom Baja Profil C Gabungan



Pengujian Balok Baja Profil C Gabungan
dengan Jarak Variasi Sambungan Las 3H (BC3H)



Pengujian Balok Baja Profil C Gabungan
dengan Jarak Variasi Sambungan Las 4H (BC4H)



Pengujian Balok Baja Profil C Gabungan
dengan Jarak Variasi Sambungan Las 5H (BC5H)



Posisi Pemasangan Dial pada Pengujian Balok Baja Profil C Gabungan



Benda uji setelah dilakukan pengujian



Kerusakan Benda Uji Pada Tumpuan Beban