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Lampiran 1 Analisa Kekuatan Tekan & Modulus Elastisitas

PERHITUNGAN KEKUATAN TEKAN & MODULUS ELASTISITAS ANALISIS												
Variasi Substitusi HHF	Nomor Sampel	Panjang (L)	Diameter (D)	L/D	Faktor Koreksi L/D	Faktor Koreksi Diameter	Luas Bidang (A)	Massa Benda Uji	Gaya Tekan	Berat Isi	Kekuatan Tekan	Modulus Elastisitas Analisis (N/mm2)
		mm	mm				mm^2	kg	kN	kg/m^3	N/mm^2	
0%	S1	200	100	2	1	1.04	7853.98	3.66	218.32	2330.03	**28.91**	25270.66
	S2	200	100	2	1	1.04	7853.98	3.69	226.70	2345.94	**30.02**	25751.23
	S3	200	100	2	1	1.04	7853.98	3.65	222.80	2323.66	**29.50**	25528.84
	RATA-RATA							**3.67**	**222.61**	**2333.21**	**29.48**	**25516.91**
1%	S1	200	100	2	1	1.04	7853.98	3.68	217.41	2342.76	**28.79**	25218.10
	S2	200	100	2	1	1.04	7853.98	3.59	206.32	2285.46	**27.32**	24566.20
	S3	200	100	2	1	1.04	7853.98	3.64	206.31	2317.30	**27.32**	24565.77
	RATA-RATA							**3.64**	**210.01**	**2315.17**	**27.81**	**24783.35**
2%	S1	200	100	2	1	1.04	7853.98	3.64	230.01	2317.30	**30.46**	25938.25
	S2	200	100	2	1	1.04	7853.98	3.57	217.74	2269.55	**28.83**	25237.15
	S3	200	100	2	1	1.04	7853.98	3.57	209.62	2272.73	**27.76**	24761.74
	RATA-RATA							**3.59**	**219.12**	**2286.53**	**29.02**	**25312.38**
	S1	200	100	2	1	1.04	7853.98	3.53	195.82	2247.27	**25.93**	23933.18
	S2	200	100	2	1	1.04	7853.98	3.59	197.35	2285.46	**26.13**	24026.36
	S3	200	100	2	1	1.04	7853.98	3.57	188.62	2272.73	**24.98**	23489.18
	RATA-RATA							**3.56**	**193.93**	**2268.49**	**25.68**	**23816.24**

Lampiran 2 Analisa Kekuatan Tarik Belah

PERHITUNGAN KEKUATAN TARIK BELAH BETON							
Variasi Substitusi HHF	Nomor Sampel	Panjang (L)	Diameter (D)	Massa Benda Uji	Beban (P)	Berat Isi	Kekuatan Tarik Belah
		mm	mm	kg	kN	kg/m^3	N/mm^2
0%	S1	200	100	3.74	131.28	2377.77	**4.18**
	S2	200	100	3.72	116.28	2368.23	**3.70**
	S3	200	100	3.63	125.61	2307.75	**4.00**
		RATA-RATA		**3.69**	**124.39**	**2351.25**	**3.96**
1%	S1	200	100	3.58	102.62	2279.10	**3.27**
	S2	200	100	3.60	91.63	2288.65	**2.92**
	S3	200	100	3.60	117.61	2291.83	**3.74**
	RATA-RATA			**3.59**	**103.95**	**2286.53**	**3.31**
2%	S1	200	100	3.59	116.28	2285.46	**3.70**
	S2	200	100	3.50	101.96	2228.17	**3.25**
	S3	200	100	3.65	130.61	2323.66	**4.16**
	RATA-RATA			**3.58**	**116.28**	**2279.10**	**3.70**
3%	S1	200	100	3.53	102.97	2247.27	**3.28**
	S2	200	100	3.55	87.63	2260.00	**2.79**
	S3	200	100	3.57	100.63	2272.73	**3.20**
	RATA-RATA			**3.55**	**97.08**	**2260.00**	**3.09**

Lampiran 3 Analisa Kekuatan Lentur

PERHITUNGAN KEKUATAN LENTUR BETON								
Variasi Substitusi HHF	**Nomor Sampel**	**Panjang**	**Lebar (b)**	**Tinggi (h)**	**Jarak 2 perletakan (L)**	**Volume**	**Beban (P)**	**Kekuatan Lentur**
		mm	**mm**	**mm**	**mm**	**m^3**	**kN**	**N/mm^2**
0%	S1	400	100	100	300	0.004	21.99	**6.60**
	S2	400	100	100	300	0.004	21.32	**6.40**
	S3	400	100	100	300	0.004	22.39	**6.72**
		RATA-RATA					**21.90**	**6.57**
1%	S1	400	100	100	300	0.004	18.26	**5.48**
	S2	400	100	100	300	0.004	21.99	**6.60**
	S3	400	100	100	300	0.004	20.26	**6.08**
	RATA-RATA						**20.17**	**6.05**
2%	S1	400	100	100	300	0.004	19.33	**5.80**
	S2	400	100	100	300	0.004	20.53	**6.16**
	S3	400	100	100	300	0.004	23.06	**6.92**
	RATA-RATA						**20.97**	**6.29**
3%	S1	400	100	100	300	0.004	16.53	**4.96**
	S2	400	100	100	300	0.004	16.53	**4.96**
	S3	400	100	100	300	0.004	19.33	**5.80**
	RATA-RATA						**17.46**	**5.24**

Lampiran 4 Pembacaan Beban dan Perpindahan Beton H-0%

0% SAMPEL 1	
Beban	**Perpindahan**
kN	**mm**
0.00	0.00000
9.79	0.00500
15.69	0.01000
53.65	0.05000
93.12	0.10000
120.45	0.15000
149.60	0.20000
177.40	0.25000
196.50	0.30000
204.24	0.35000
215.79	0.40000
218.32	0.42500
217.01	0.45000
212.57	0.50000
205.00	0.55000
195.77	0.60000
177.79	0.65000
152.22	0.70000
125.37	0.75000

0% SAMPEL 2	
Beban	**Perpindahan**
kN	**mm**
0.00	0.00000
1.33	0.00500
9.17	0.01000
39.95	0.05000
81.15	0.10000
126.17	0.15000
172.75	0.20000
200.84	0.25000
210.23	0.30000
218.74	0.35000
225.12	0.40000
226.70	0.42500
225.76	0.45000
223.92	0.50000
211.58	0.55000
197.49	0.60000
182.80	0.65000
162.26	0.70000
140.95	0.75000

0% SAMPEL 3	
Beban	**Perpindahan**
kN	**mm**
0.00	0.00000
5.95	0.00500
13.04	0.01000
33.02	0.05000
97.21	0.10000
137.50	0.15000
162.69	0.20000
185.00	0.25000
208.74	0.30000
219.33	0.35000
222.44	0.40000
222.80	0.42500
219.59	0.45000
214.44	0.50000
208.32	0.55000
203.93	0.60000
190.33	0.65000
172.34	0.70000
143.29	0.75000

Lampiran 5 Pembacaan Beban dan Perpindahan Beton H-1%

1% S1	
Beban	**Perpindahan**
kN	**mm**
0.00	0.00000
9.23	0.00500
10.65	0.01000
20.31	0.02500
39.36	0.05000
62.59	0.07500
90.44	0.10000
115.20	0.12500
125.27	0.15000
135.51	0.16000
155.26	0.20000
174.41	0.25000
189.28	0.30000
203.15	0.35000
214.97	0.40000
215.75	0.45000
217.41	0.50000
216.80	0.55000
210.00	0.60000
205.00	0.65000
200.00	0.70000
197.00	0.75000
195.00	0.80000
	0.85000
	0.90000

1% S2	
Beban	**Perpindahan**
kN	**mm**
0.00	0.00000
12.47	0.00500
17.10	0.01000
31.56	0.02500
55.22	0.05000
74.48	0.07500
92.43	0.10000
103.69	0.12500
113.68	0.15000
120.34	0.17500
138.24	0.20000
155.87	0.25000
173.39	0.30000
191.90	0.35000
198.33	0.40000
205.64	0.45000
204.65	0.50000
206.32	0.55000
182.12	0.60000
176.47	0.65000
171.39	0.70000
163.70	0.75000
152.29	0.80000
143.19	0.85000
130.00	0.90000

1% S3	
Beban	**Perpindahan**
kN	**mm**
0.00	0.00000
0.33	0.00500
9.51	0.01000
16.34	0.02500
34.00	0.05000
59.81	0.07500
94.14	0.10000
128.90	0.12500
141.48	0.15000
151.49	0.17500
159.47	0.20000
172.33	0.25000
185.74	0.30000
197.29	0.35000
202.25	0.40000
206.31	0.45000
200.47	0.50000
194.01	0.55000
184.99	0.60000
178.30	0.65000
174.26	0.70000
174.26	0.70000
163.45	0.80000
150.55	0.85000
137.10	0.90000

Lampiran 6 Pembacaan Beban dan Perpindahan Beton H-2%

2% S1	
Beban	**Perpindahan**
kN	**mm**
0.00	0.00000
7.21	0.00500
13.79	0.01000
31.13	0.02500
57.03	0.05000
79.63	0.07500
100.91	0.10000
120.91	0.12500
139.48	0.15000
156.11	0.17500
170.53	0.20000
193.57	0.25000
209.39	0.30000
219.12	0.35000
225.12	0.40000
228.47	0.45000
229.41	0.50000
230.01	0.55000
229.41	0.60000
228.81	0.65000
226.76	0.70000
218.61	0.75000
190.31	0.80000
165.10	0.85000
	0.90000

2% S2	
Beban	**Perpindahan**
kN	**mm**
0.00	0.00000
2.91	0.00500
5.82	0.01000
37.96	0.02500
53.69	0.05000
71.78	0.07500
88.00	0.10000
108.10	0.12500
127.34	0.15000
147.72	0.17500
163.03	0.20000
185.79	0.25000
196.90	0.30000
206.73	0.35000
217.74	0.40000
217.67	0.45000
217.67	0.50000
217.67	0.50000
217.50	0.60000
207.24	0.65000
200.00	0.70000
190.00	0.75000
180.00	0.80000
170.00	0.85000
160.00	0.90000

2% S3	
Beban	**Perpindahan**
kN	**mm**
0.00	0.00000
4.98	0.00500
10.20	0.01000
23.81	0.02500
48.85	0.05000
70.57	0.07500
89.81	0.10000
108.04	0.12500
123.82	0.15000
136.25	0.17500
146.78	0.20000
165.78	0.25000
180.17	0.30000
191.77	0.35000
200.66	0.40000
207.17	0.45000
209.02	0.50000
209.62	0.55000
206.93	0.60000
200.59	0.65000
192.40	0.70000
184.59	0.75000
176.31	0.80000
168.24	0.85000
160.00	0.90000

Lampiran 7 Pembacaan Beban dan Perpindahan Beton H-3%

3% S1	
Beban	**Perpindahan**
kN	**mm**
0.00	0.00000
4.94	0.00500
11.34	0.01000
22.44	0.02500
45.02	0.05000
65.15	0.07500
85.42	0.10000
101.37	0.12500
116.85	0.15000
129.23	0.17500
141.54	0.20000
160.80	0.25000
175.33	0.30000
184.64	0.35000
191.18	0.40000
194.26	0.45000
195.82	0.50000
194.05	0.55000
185.69	0.60000
177.39	0.65000
167.94	0.70000
157.13	0.75000
145.24	0.80000
136.12	0.85000
123.91	0.90000

3% S2	
Beban	**Perpindahan**
kN	**mm**
0.00	0.00000
4.36	0.00500
6.88	0.01000
20.27	0.02500
41.26	0.05000
60.94	0.07500
80.27	0.10000
100.13	0.12500
117.78	0.15000
134.13	0.17500
149.02	0.20000
171.84	0.25000
186.18	0.30000
193.14	0.35000
196.28	0.40000
197.35	0.45000
184.92	0.50000
168.49	0.55000
159.92	0.60000
148.04	0.65000
133.61	0.70000
116.44	0.75000
105.72	0.80000
95.00	0.85000
85.00	0.90000

3% S3	
Beban	**Perpindahan**
kN	**mm**
0.00	0.00000
7.23	0.00500
14.12	0.01000
32.53	0.02500
52.20	0.05000
68.59	0.07500
83.01	0.10000
96.58	0.12500
109.62	0.15000
122.08	0.17500
134.66	0.20000
154.68	0.25000
170.52	0.30000
181.45	0.35000
188.62	0.40000
183.13	0.45000
152.52	0.50000
134.45	0.55000
120.02	0.60000
108.30	0.65000
96.00	0.70000
88.00	0.75000
80.00	0.80000
70.00	0.85000
60.00	0.90000