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Lampiran 1. Campuran beton 1m^3 100% pasir pada fas. 0.45

LABORATORIUM STRUKTUR DAN BAHAN
DEPARTEMEN TEKNIK SIPIL FAKULTAS TEKNIK
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Jl. Poros Malino KM. 06 Bontomarannu, Gowa

CONCRETE TRIAL MIX DESIGN, FAS =0. 45

I. DESKRIPSI MATERIAL — Specific Gravity

- Semen — **3.15** *Semen Bosowa OPC*
- Air — **1.000**
- Admixture (Viscocrete 1003 by SIKA) — **1.07** *(Water Reducing and High Flow)*
- Pasir/Agregat Halus — **2.404** **pasir 100%**
- Batu Pecah/Agregat Kasar G.$_{1-2}$ — **2.657**

II. MIX DESIGN

- Ukuran Maksimum Agregat — **20** mm
- Water Cement Ratio (W/C) — **45** %
- Sand Aggregate Ratio (S/A) — **0.38**
- Target Slump — **12.0** cm
- Unit Water Content — **175.00** kg/1-m3
- Air Content — **4.00** %
- Dosage of Admixture — **0.50** % by Weight of Cement

III. PERHITUNGAN KOMPOSISI BETON (KONDISI SSD)

Bahan Campuran Beton	Satuan Berat 1 m^3			
	Volume, m3		Berat, kg (kondisi SSD)	
Air	175.00 / (1.000 × 1000)	0.175		175.00
Semen	388.89 / (3.15 × 1000)	0.123	175.00 / 45%	388.89
Admixture	1.94 / (1.07 × 1000)	0.002	388.89 × 0.50%	1.94
Udara		0.04		
Total Mortar	0.338	0.338		
Total Aggregates	1.000 - 0.338	0.662		
Agregat Halus	0.662 × 37.97%	0.251	0.251 × 2.404 × 1000	603.88
Agregat Kasar				
G.20 $_{10\sim20mm}$	(0.662 - 0.251) × 62.03%	0.410	0.410 × 2.657 × 1000	1090.34
Total		**1.000**		**2258.10**

IV. KOREKSI CAMPURAN UNTUK KONDISI LAPANGAN

Case	Slump, cm	Kandungan Udara, %	W/C, %	S/A, %	Satuan Berat, kg/m3				
					Air kg	Semen kg	Agregat Halus kg	Aggregates Kasar kg	Admixture, ltr
1	**12.0**	**4.00**	**45**	**37.97**	**175.00**	**388.89**	**603.88**	**1090.34**	**1.94**
Air bebas dalam agregat			%				6.38	2.25	
							0.67	4.46	
			kg		6.64		32.40	-25.75	
Koreksi Batch dalam berat, kg					**181.64**	**388.89**	**571.48**	**1116.09**	**1.94**
Satuan berat, kg					0.47	1.00	1.47	2.87	
Koreksi Batch dalam volume, lt					**181.64**	**123.46**	**237.74**	**420.02**	**1.83**
Satuan volume, lt					1.47	1.00	1.93	3.40	
Trial Batch (3 silinder ϕ10x20), kg		0.006 m3			**1.03**	**2.20**	**3.23**	**6.31**	**0.01**
Trial Batch (10 silinder ϕ10x20), kg		0.019 m3			**3.42**	**7.33**	**10.77**	**21.04**	**0.04**

Makassar, Januari 2020
a.n. Kepala Lab. Struktur dan Bahan

Dr.Eng.A.Arwin Amiruddin,S.T.,M.T.

Lampiran 2. Campuran beton 1m^3 50 % slag nikel pada fas. 0.45

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CONCRETE TRIAL MIX DESIGN, FAS =0. 45

I. DESKRIPSI MATERIAL — Specific Gravity

- Semen — **3.15** *Semen Bosowa OPC*
- Air — **1.000**
- Admixture (ViscoCrete 3115N) — **1.05** *(Water Reducing and High Flow)*
- Pasir/Agregat Halus — **2.869** **pasir 50% + slag 50%**
- Batu Pecah/Agregat Kasar G_{1-2} — **2.657**

II. MIX DESIGN

- Ukuran Maksimum Agregat — **20** mm
- Water Cement Ratio (W/C) — **45** %
- Sand Aggregate Ratio (S/A) — **0.46**
- Target Slump — **12.0** cm
- Unit Water Content — **175.00** kg/1-m3
- Air Content — **4.00** %
- Dosage of Admixture — **0.50** % by Weight of Cement

III. PERHITUNGAN KOMPOSISI BETON (KONDISI SSD)

Bahan Campuran Beton	Satuan Berat 1 m^3			
	Volume, m3		Berat, kg (kondisi SSD)	
Air	175.00 / (1.000 × 1000)	0.175		175.00
Semen	388.89 / (3.15 × 1000)	0.123	175.00 / 45%	388.89
Admixture	1.94 / (1.05 × 1000)	0.002	388.89 × 0.50%	1.94
Udara		0.04		
Total Mortar	0.338	0.338		
Total Aggregates	1.000 - 0.338	0.662		
Agregat Halus	0.662 × 46.47%	0.307	0.307 × 2.869 × 1000	881.95
Agregat Kasar				
$G.20_{10\sim20mm}$	(0.662 - 0.307) × 53.53%	0.354	0.354 × 2.657 × 1000	940.90
Total		**1.000**		**2386.74**

IV. KOREKSI CAMPURAN UNTUK KONDISI LAPANGAN

Case	Slump, cm	Kandungan Udara, %	W/C, %	S/A, %	Satuan Berat, kg/m3				
					Air kg	Semen kg	Agregat Halus kg	Aggregates Kasar kg	Admixture, ltr
1	**12.0**	**4.00**	**45**	**46.47**	**175.00**	**388.89**	**881.95**	**940.90**	**1.94**
Air bebas dalam agregat			%				3.39	2.25	
							0.67	4.46	
			kg		0.95		23.17	-22.23	
Koreksi Batch dalam berat, kg					**175.95**	**388.89**	**858.78**	**963.13**	**1.94**
Satuan berat, kg					0.45	1.00	2.21	2.48	
Koreksi Batch dalam volume, lt					**175.95**	**123.46**	**299.37**	**362.46**	**1.85**
Satuan volume, lt					1.43	1.00	2.42	2.94	
Trial Batch (3 silinder ϕ10x20), kg			0.006 m3		**0.99**	**2.20**	**4.86**	**5.45**	**0.01**
Trial Batch (10 silinder ϕ10x20), kg			0.019 m3		**3.32**	**7.33**	**16.19**	**18.15**	**0.04**

Makassar, Januari 2020
a.n. Kepala Lab. Struktur dan Bahan

Dr.Eng.A.Arwin Amiruddin,S.T.,M.T.

Lampiran 3. Campuran beton 1m^3 100% pasir pada fas. 0.25

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CONCRETE TRIAL MIX DESIGN, FAS =0. 25

I. DESKRIPSI MATERIAL — Specific Gravity

- Semen — **3.15** *Semen Bosowa OPC*
- Air — **1.000**
- Admixture (Viscocrete 1003 by SIKA) — **1.07** *(Water Reducing and High Flow)*
- Pasir/Agregat Halus — **2.404** **pasir 100%**
- Batu Pecah/Agregat Kasar $G._{1-2}$ — **2.657**

II. MIX DESIGN

- Ukuran Maksimum Agregat — **20** mm
- Water Cement Ratio (W/C) — **25** %
- Sand Aggregate Ratio (S/A) — **0.38**
- Target Slump — **12.0** cm
- Unit Water Content — **175.00** kg/1-m3
- Air Content — **4.00** %
- Dosage of Admixture — **0.50** % by Weight of Cement

III. PERHITUNGAN KOMPOSISI BETON (KONDISI SSD)

Bahan Campuran Beton	Satuan Berat 1 m^3			
	Volume, m3		Berat, kg (kondisi SSD)	
Air	175.00 / (1.000 × 1000)	0.175		175.00
Semen	700.00 / (3.15 × 1000)	0.222	175.00 / 25%	700.00
Admixture	3.50 / (1.07 × 1000)	0.003	700.00 × 0.50%	3.50
Udara		0.04		
Total Mortar	0.437	0.437		
Total Aggregates	1.000 - 0.437	0.563		
Agregat Halus	0.563 × 37.97%	0.214	0.214 × 2.404 × 1000	513.72
Agregat Kasar				
$G.20_{10\sim20mm}$	(0.563 - 0.214) × 62.03%	0.349	0.349 × 2.657 × 1000	927.56
Total		**1.000**		**2316.28**

IV. KOREKSI CAMPURAN UNTUK KONDISI LAPANGAN

Case	Slump, cm	Kandungan Udara, %	W/C, %	S/A, %	Satuan Berat, kg/m3				
					Air kg	Semen kg	Agregat Halus kg	Aggregates Kasar kg	Admixture, ltr
1	**12.0**	**4.00**	**25**	**37.97**	**175.00**	**700.00**	**513.72**	**927.56**	**3.50**
Air bebas dalam agregat			%				6.38	2.25	
							0.67	4.46	
			kg		5.65		27.56	-21.91	
Koreksi Batch dalam berat, kg					**180.65**	**700.00**	**486.16**	**949.46**	**3.50**
Satuan berat, kg					0.26	1.00	0.69	1.36	
Koreksi Batch dalam volume, lt					**180.65**	**222.22**	**202.24**	**357.32**	**3.29**
Satuan volume, lt					0.81	1.00	0.91	1.61	
Trial Batch (3 silinder ϕ10x20), kg			0.006 m3		**1.02**	**3.96**	**2.75**	**5.37**	**0.02**
Trial Batch (10 silinder ϕ10x20), kg			0.019 m3		**3.41**	**13.19**	**9.16**	**17.90**	**0.07**

Makassar, Januari 2020
a.n. Kepala Lab. Struktur dan Bahan

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Lampiran 4. Campuran beton 1m^3 50 % slag nikel pada fas. 0.25

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CONCRETE TRIAL MIX DESIGN, FAS =0. 25

I. DESKRIPSI MATERIAL Specific Gravity

- Semen **3.15** *Semen Bosowa OPC*
- Air **1.000**
- Admixture (ViscoCrete 3115N by Sika) **1.05** *(Water Reducing and High Flow)*
- Pasir/Agregat Halus **2.869** **pasir 50% + slag 50%**
- Batu Pecah/Agregat Kasar G.$_{1-2}$ **2.657**

II. MIX DESIGN

- Ukuran Maksimum Agregat **20** mm
- Water Cement Ratio (W/C) **25** %
- Sand Aggregate Ratio (S/A) **0.46**
- Target Slump **12.0** cm
- Unit Water Content **175.00** kg/1-m3
- Air Content **4.00** %
- Dosage of Admixture **0.50** % by Weight of Cement

III. PERHITUNGAN KOMPOSISI BETON (KONDISI SSD)

Bahan Campuran Beton	Satuan Berat 1 m^3			
	Volume, m3		Berat, kg (kondisi SSD)	
Air	175.00 / (1.000 × 1000)	0.175		175.00
Semen	700.00 / (3.15 × 1000)	0.222	175.00 / 25%	700.00
Admixture	3.50 / (1.05 × 1000)	0.003	700.00 × 0.50%	3.50
Udara		0.04		
Total Mortar	0.437	0.437		
Total Aggregates	1.000 - 0.429	0.563		
Agregat Halus	0.563 × 46.47%	0.262	0.262 × 2.869 × 1000	750.28
Agregat Kasar				
G.20 $_{10\sim20mm}$	(0.563 - 0.262) × 53.53%	0.301	0.301 × 2.657 × 1000	800.43
Total		**1.000**		**2425.71**

IV. KOREKSI CAMPURAN UNTUK KONDISI LAPANGAN

Case	Slump, cm	Kandungan Udara, %	W/C, %	S/A, %	Satuan Berat, kg/m3				
					Air kg	Semen kg	Agregat Halus kg	Aggregates Kasar kg	Admixture, ltr
1	**12.0**	**4.00**	**25**	**46.47**	**175.00**	**700.00**	**750.28**	**800.43**	**3.50**
Air bebas dalam agregat			%				3.39	2.25	
							0.67	4.46	
			kg		0.81		19.71	-18.91	
Koreksi Batch dalam berat, kg					**175.81**	**700.00**	**730.57**	**819.34**	**3.50**
Satuan berat, kg					0.25	1.00	1.04	1.17	
Koreksi Batch dalam volume, lt					**175.81**	**222.22**	**254.68**	**308.34**	**3.33**
Satuan volume, lt					0.79	1.00	1.15	1.39	
Trial Batch (3 silinder ϕ10x20), kg		0.006 m3			**0.99**	**3.96**	**4.13**	**4.63**	**0.02**
Trial Batch (10 silinder ϕ10x20), kg		0.019 m3			**3.31**	**13.19**	**13.77**	**15.44**	**0.07**

Makassar, Januari 2020
a.n. Kepala Lab. Struktur dan Bahan

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Lampiran 5. Kuat tekan beton OPC-pasir pada fas. 0,45

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PENGUJIAN KUAT TEKAN SILINDER

ASTM C39/C39M-01

Dikirim Oleh :	Syamsul Bahri Ahmad
Kode Sampel :	**0.45-OPC-PASIR**
Sampel :	Silinder diameter 100 mm tinggi 200 mm
Luas Penampang :	7854 mm^2

No.	Tanggal		Umur	Berat Isi	Beban	Kuat Tekan	Kuat Tekan
	Cor	Uji	(hari)	(Kg/m^3)	(KN)	(N/mm^2)	(Mpa)
1	3-Feb-20	6-Feb-20	3	2349	92.97	11.837	11.48
2				2355	96.40	12.274	
3				2330	92.76	11.811	
4				2410	78.42	9.984	
5		10-Feb-20	7	2413	132.38	16.855	16.40
6				2440	125.71	16.006	
7				2460	130.36	16.597	
8				2525	126.92	16.160	
9		2-Mar-20	28	2346	158.45	20.174	21.42
10				2359	155.21	19.762	
11				2397	158.04	20.123	
12				2346	188.56	24.008	
13				2362	180.88	23.031	
14		1-Jul-20	180	2384	292.24	37.209	32.19
15				2301	215.44	27.431	
16				2317	245.35	31.239	
17				2384	287.39	36.591	
18				2400	223.52	28.460	

Lampiran 6. Kuat tekan beton OPC-50GNS pada fas. 0,45

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PENGUJIAN KUAT TEKAN SILINDER

ASTM C39/C39M-01

Dikirim Oleh : Syamsul Bahri Ahmad
Kode Sampel : **0.45-OPC-50GNS**
Sampel : Silinder diameter 100 mm tinggi 200 mm
Luas Penampang : 7854 mm^2

No.	Tanggal		Umur	Berat Isi	Beban	Kuat Tekan	f'cm
	Cor	Uji	(hari)	(Kg/m^3)	(KN)	(N/mm2)	(N/mm2)
1	17-Jan-20	20-Jan-20	3	2467	186.74	23.777	17.99
2				2492	91.96	11.708	
3				2515	150.77	19.196	
4				2432	135.81	17.292	
5		24-Jan-20	7	2486	180.88	23.031	20.06
6				2518	131.57	16.752	
7				2489	197.25	25.115	
8				2553	120.65	15.362	
9		14-Feb-20	28	2499	215.64	27.456	29.33
10				2476	243.94	31.059	
11				2521	225.75	28.743	
12				2486	252.63	32.166	
13				2505	213.82	27.225	
14		16-Jul-20	180	2384	287.79	36.643	37.39
15				2301	267.58	34.070	
16				2317	338.32	43.076	
17				2384	258.69	32.937	
18				2400	316.09	40.245	

Lampiran 7. Kuat tekan beton 15FA-50GNS pada fas. 0,45

LABORATORIUM STRUKTUR DAN BAHAN
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Jl. Poros Malino KM. 06 Bontomarannu, Gowa

PENGUJIAN KUAT TEKAN SILINDER

ASTM C39/C39M-01

Dikirim Oleh :	Syamsul Bahri Ahmad
Kode Sampel :	**0.45-15FA-50GNS**
Sampel :	Silinder diameter 100 mm tinggi 200 mm
Luas Penampang :	7854 mm^2

No.	Tanggal		Umur	Berat Isi	Beban	Kuat Tekan Langsung	Kuat Tekan
	Cor	Uji	(hari)	(Kg/m^3)	(KN)	(N/mm^2)	Rata-rata
1	21-Jan-20	24-Jan-20	3	2476	122.88	15.645	16.24
2				2511	118.43	15.079	
3				2489	150.97	19.222	
4				2521	117.83	15.002	
5		28-Jan-20	7	2473	128.94	16.417	18.33
6				2435	163.10	20.766	
7				2483	132.78	16.906	
8				2448	151.17	19.248	
9		18-Feb-20	28	2499	210.99	26.865	29.49
10				2476	262.53	33.426	
11				2534	187.55	23.880	
12				2486	239.49	30.493	
13				2521	257.48	32.783	
14		20-Jul-20	180	2518	299.92	38.187	34.39
15				2454	271.62	34.584	
16				2470	272.43	34.687	
17				2521	212.61	27.070	
18				2508	293.86	37.415	

Lampiran 8. Kuat tekan beton 30FA-50GNS pada fas. 0,45

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PENGUJIAN KUAT TEKAN SILINDER

ASTM C39/C39M-01

Dikirim Oleh :	Syamsul Bahri Ahmad	
Kode Sampel :	**0.45-30FA-50GNS**	
Sampel :	Silinder diameter 100 mm tinggi 200 mm	
Luas Penampang	7854	mm^2

No.	Tanggal		Umur	Berat Isi	Beban	Kuat Tekan Langsung	Kuat Tekan
	Cor	Uji	(hari)	(Kg/m^3)	(KN)	(N/mm^2)	Rata-rata
1	23-Jan-20	26-Jan-20	3	2473	82.26	10.473	10.46
2				2521	91.75	11.683	
3				2559	65.28	8.312	
4				2432	89.33	11.374	
5		30-Jan-20	7	2531	142.28	18.116	14.60
6				2508	118.63	15.105	
7				2352	64.77	8.247	
8				2464	133.08	16.945	
9		20-Feb-20	28	2466	230.60	29.361	28.64
10				2521	192.00	24.446	
11				2478	178.05	22.670	
12				2465	222.31	28.306	
13				0	254.85	32.449	
14		22-Jul-20	180	0.00	274.86	34.996	29.44
15				0.00	199.27	25.372	
16				0.00	202.91	25.835	
17				0.00	215.84	27.482	
18				0.00	194.42	24.755	

Lampiran 9. Kuat tekan beton OPC-pasir pada fas. 0,25

LABORATORIUM STRUKTUR DAN BAHAN
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Jl. Poros Malino KM. 06 Bontomarannu, Gowa

PENGUJIAN KUAT TEKAN SILINDER

ASTM C39/C39M-01

Dikirim Oleh : Syamsul Bahri Ahmad
Kode Sampel : **0.25-OPC-PASIR**
Sampel : Silinder diameter 100 mm tinggi 200 mm
uas Penampang 7854 mm^2

No.	Tanggal		Umur	Berat Isi	Luas Penampang	Beban	Kuat Tekan Langsung	Kuat Tekan rata-rata
	Cor	Uji	(hari)	(Kg/m^3)	(mm^2)	(KN)	(N/mm^2)	(N/mm2)
1	26-Jan-20	29-Jan-20	3	2400	7854	170.17	21.667	25.62
2				2413		199.68	25.424	
3				2422		178.25	22.696	
4				2438		256.87	32.706	
5		2-Feb-20	7	2451		280.11	35.665	34.80
6				2429		267.38	34.044	
7				2499		230.40	29.335	
8				2422		315.28	40.143	
9		23-Feb-20	28	2397		400.97	51.053	48.60
10				2381		372.68	47.451	
11				2419		349.23	44.466	
12				2413		418.35	53.266	
13				2416		367.42	46.782	
14		25-Jul-20	180	2438		358.12	45.598	54.34
15				2441		410.27	52.237	
16				2403		500.00	63.662	
17				2429		452.30	57.589	
18				2419		413.10	52.597	

Lampiran 10. Kuat tekan beton OPC-50GNS pada fas. 0,25

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PENGUJIAN KUAT TEKAN SILINDER

ASTM C39/C39M-01

Dikirim Oleh :	Syamsul Bahri Ahmad
Kode Sampel :	**0.25-OPC-50GNS**
Sampel :	Silinder diameter 100 mm tinggi 200 mm
Luas Penampang :	7854 mm^2

No.	Tanggal		Umur	Berat Isi	Beban	Kuat Tekan Langsung	Kuat Tekan
	Cor	Uji	(hari)	(Kg/m^3)	(KN)	(N/mm^2)	Rata-rata
1	28-Jan-20	31-Jan-20	3	2464	281.53	35.845	33.64
2				2483	247.98	31.574	
3				2476	296.69	37.775	
4				2556	230.60	29.361	
5		4-Feb-20	7	2492	288.00	36.669	36.99
6				2515	300.32	38.238	
7				2467	288.20	36.694	
8				2464	285.57	36.360	
9		25-Feb-20	28	2397	421.99	53.729	53.14
10				2381	410.67	52.288	
11				2413	364.59	46.421	
12				2416	414.71	52.803	
				2416	474.94	60.471	
14		27-Jul-20	180	2438	453.11	57.692	54.00
15				2441	515.36	65.618	
16				2403	370.65	47.193	
				2429	362.17	46.112	
17				2419	419.16	53.369	

Lampiran 11. Kuat tekan beton 15FA-50GNS pada fas. 0,25

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PENGUJIAN KUAT TEKAN SILINDER

ASTM C39/C39M-01

Dikirim Oleh : Syamsul Bahri Ahmad
Kode Sampel **0.25-15FA-50GNS**
Sampel : Silinder diameter 100 mm tinggi 200 mm
ıas Penampang 7854 mm^2

No.	Tanggal		Umur (hari)	Berat Isi (Kg/m^3)	Beban (KN)	Kuat Tekan Langsung (N/mm^2)	Kuat Tekan Rata-rata
	Cor	Uji					
1	30-Jan-20	2-Feb-20	3	2467	319.73	40.709	32.36
2				2492	263.54	33.555	
3				2457	261.32	33.272	
4				2483	171.99	21.898	
5		6-Feb-20	7	2484	272.43	34.687	34.46
6				2436	273.44	34.816	
7				2417	315.48	40.168	
8				2408	221.10	28.151	
9		27-Feb-20	28	2457	360.15	45.855	49.45
10				2531	384.40	48.943	
11				2546	459.58	58.515	
				2531	344.79	43.899	
13				2575	392.89	50.024	
14		29-Jul-20	90	2432	400.57	51.002	52.90
15				2450	384.40	48.943	
16				2438	479.79	61.089	
17				2501	379.14	48.274	
18				2459	433.31	55.170	

Lampiran 12. Kuat tekan beton 30FA-50GNS pada fas. 0,25

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PENGUJIAN KUAT TEKAN SILINDER

ASTM C39/C39M-01

Dikirim Oleh : Syamsul Bahri Ahmad
Kode Sampel **0.25-30FA-50GNS**
Sampel : Silinder diameter 100 mm tinggi 200 mm
ıas Penampang 7854 mm^2

No.	Tanggal		Umur	Berat Isi	Beban	Kuat Tekan Langsung	Kuat Tekan
	Cor	Uji	(hari)	(Kg/m^3)	(KN)	(N/mm^2)	(Mpa)
1	31-Jan-20	3-Feb-20	3	2483	261.92	33.349	25.35
2				2515	193.61	24.652	
3				2531	119.04	15.156	
4				2413	221.71	28.228	
5		7-Feb-20	7	2476	300.73	38.290	38.05
6				2518	331.04	42.150	
7				2492	272.43	34.687	
8				2527	291.23	37.080	
9		28-Feb-20	28	2450	365.80	46.576	51.46
10				2455	405.42	51.619	
11				2456	394.50	50.230	
				2464	440.58	56.097	
12				2464	414.71	52.803	
14		30-Jul-20	180	2456	463.22	58.979	57.33
15				2546	453.92	57.795	
16				2486	523.44	66.647	
17				2496	357.72	45.546	
18				2489	453.11	57.692	

Lampiran 13. Penyerapan (sorptivity) beton OPC-pasir pada fas. 0,45

LABORATORIUM STRUKTUR DAN BAHAN
DEPARTEMEN TEKNIK SIPIL FAKULTAS TEKNIK
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Sampel	:	**0.45-OPC-pasir**	
Umur	:	28 hari	
Diameter	:	100	mm
Tinggi	:	50	mm
Luas	:	7854	mm^2

Tabel .DATA HASIL PENGUJIAN SORPTIVITI BETON BERDASARKAN ASTM 1585-04

No.	Waktu,T		√T	Massa (gr)				ΔM	I
	hari	detik		Sampel 2	Sampel 4	Sampel 5	Rata-rata	(gr)	(mm)
1		0	0	866.80	918.30	864.10	883.07	0.00	0.00
2		60	7.75	870.00	920.10	866.80	885.63	2.57	0.33
3		300	17.32	871.90	921.30	868.10	887.10	4.03	0.51
4		600	24.49	873.40	922.40	869.40	888.40	5.33	0.68
5		1200	34.64	875.50	923.90	871.10	890.17	7.10	0.90
6		1800	42.43	877.60	925.60	872.90	892.03	8.97	1.14
7		3600	60.00	882.00	929.30	877.00	896.10	13.03	1.66
8		7200	84.85	888.60	935.00	882.50	902.03	18.97	2.41
9		10800	103.92	890.70	937.90	887.10	905.23	22.17	2.82
10		14400	120.00	893.00	939.50	889.90	907.47	24.40	3.11
11		18000	134.16	894.10	942.10	892.10	909.43	26.37	3.36
12		21600	146.97	896.70	945.20	894.20	912.03	28.97	3.69
13	1	92220	303.68	915.50	964.30	906.50	928.77	45.70	5.82
14	2	193200	439.55	916.50	966.00	907.90	930.13	47.07	5.99
15	3	268500	518.17	917.50	966.90	908.40	930.93	47.87	6.09
16	5	432000	657.27	918.40	967.90	909.30	931.87	48.80	6.21
17	6	527580	726.35	918.50	968.00	909.50	932.00	48.93	6.23
18	7	622200	788.80	918.60	968.10	909.60	932.10	49.03	6.24
19	8	691200	831.38	918.70	968.40	909.70	932.27	49.20	6.26

Lampiran 14. Penyerapan (sorptivity) beton OPC-50GNS pada fas. 0,45

LABORATORIUM STRUKTUR DAN BAHAN
DEPARTEMEN TEKNIK SIPIL FAKULTAS TEKNIK
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Sampel	:	**0.45-OPC-50GNS**	
Umur	:	28	hari
Diameter	:	100	mm
Tinggi	:	50	mm
Luas	:	7854	mm^2

Tabel .DATA HASIL PENGUJIAN SORPTIVITI BETON BERDASARKAN ASTM 1585-04

No.	Waktu,T		√T	Massa (gr)				ΔM	I
	hari	detik		Sampel 1	Sampel 2	Sampel 3	Rata-rata	(gr)	(mm)
1		0	0	931.60	908.20	877.50	905.77	0.00	0.00
2		60	7.75	934.00	909.70	880.30	908.00	2.23	0.28
3		300	17.32	935.40	910.70	881.90	909.33	3.57	0.45
4		600	24.49	936.50	911.50	883.00	910.33	4.57	0.58
5		1200	34.64	938.40	912.60	884.90	911.97	6.20	0.79
6		1800	42.43	940.50	914.00	887.10	913.87	8.10	1.03
7		3600	60.00	943.40	916.10	890.10	916.53	10.77	1.37
8		7200	84.85	947.50	919.00	894.10	920.20	14.43	1.84
9		10800	103.92	950.90	921.70	897.10	923.23	17.47	2.22
10		14400	120.00	953.60	924.70	900.60	926.30	20.53	2.61
11		18000	134.16	956.20	926.30	903.40	928.63	22.87	2.91
12		21600	146.97	958.00	927.80	905.20	930.33	24.57	3.13
1	1	92220	303.68	975.00	948.70	923.50	949.07	43.30	5.51
2	2	193200	439.55	975.80	951.40	923.80	950.33	44.57	5.67
3	3	268500	518.17	976.00	951.90	924.20	950.70	44.93	5.72
4	5	432000	657.27	976.30	952.00	924.60	950.97	45.20	5.76
5	6	527580	726.35	976.70	952.90	925.20	951.60	45.83	5.84
6	7	622200	788.80	976.80	952.90	925.10	951.60	45.83	5.84
7	8	691200	831.38	977.00	953.00	925.20	951.73	45.97	5.85

Lampiran 15. Kuat tekan beton 15FA-50GNS pada fas. 0,45

LABORATORIUM STRUKTUR DAN BAHAN
DEPARTEMEN TEKNIK SIPIL FAKULTAS TEKNIK
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Sampel	:	**0.45-15FA-50GNS**	
Umur	:	28 hari	
Diameter	:	100	mm
Tinggi	:	50	mm
Luas	:	7854	mm^2

Tabel .DATA HASIL PENGUJIAN SORPTIVITI BETON BERDASARKAN ASTM 1585-04

No.	Waktu,T		√T	Massa (gr)				ΔM	I
	hari	detik		Sampel 1	Sampel 2	Sampel 3	Rata-rata	(gr)	(mm)
1		0	0	888.30	890.80	886.80	888.63	0.00	0.00
2		60	7.75	890.10	891.50	887.50	889.70	1.07	0.14
3		300	17.32	891.50	892.40	890.20	891.37	2.73	0.35
4		600	24.49	893.20	896.10	891.60	893.63	5.00	0.64
5		1200	34.64	895.70	898.10	893.60	895.80	7.17	0.91
6		1800	42.43	897.00	899.70	895.30	897.33	8.70	1.11
7		3600	60.00	900.20	903.00	898.60	900.60	11.97	1.52
8		7200	84.85	904.80	907.90	903.10	905.27	16.63	2.12
9		10800	103.92	907.60	910.50	905.80	907.97	19.33	2.46
10		14400	120.00	911.70	913.00	908.20	910.97	22.33	2.84
11		18000	134.16	915.90	917.00	910.70	914.53	25.90	3.30
12		21600	146.97	918.20	920.00	913.20	917.13	28.50	3.63
13	1	92220	303.68	932.90	938.20	934.10	935.07	46.43	5.91
14	2	193200	439.55	933.60	939.00	935.00	935.87	47.23	6.01
15	3	268500	518.17	934.30	939.20	935.30	936.27	47.63	6.06
16	5	432000	657.27	934.40	940.10	936.00	936.83	48.20	6.14
17	6	527580	726.35	934.90	940.30	936.10	937.10	48.47	6.17
18	7	622200	788.80	935.10	940.40	936.30	937.27	48.63	6.19
19	8	691200	831.38	935.20	940.50	936.50	937.40	48.77	6.21

Lampiran 16. Kuat tekan beton 30FA-50GNS pada fas. 0,45

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DEPARTEMEN TEKNIK SIPIL FAKULTAS TEKNIK
UNIVERSITAS HASANUDDIN
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Sampel	:	**0.45-30FA-50GNS**	
Umur	:	28 hari	
Diameter	:	100	mm
Tinggi	:	50	mm
Luas penampan	:	7854	mm^2

Tabel .DATA HASIL PENGUJIAN SORPTIVITI BETON BERDASARKAN ASTM 1585-04

No.	Waktu,T		√T	Massa (gr)				ΔM	I
	hari ke-	detik		Sampel 1	Sampel 2	Sampel 3	Rata-rata	(gr)	(mm)
1		0	0	897.7	891.20	891.20	893.37	0.00	0.00
2		60	7.75	899.7	893.00	893.70	895.47	2.10	0.27
3		300	17.32	900	895.00	895.30	896.77	3.40	0.43
4		600	24.49	902.5	896.10	896.80	898.47	5.10	0.65
5		1200	34.64	903.8	897.90	898.80	900.17	6.80	0.87
6		1800	42.43	905.5	899.40	900.80	901.90	8.53	1.09
7		3600	60.00	909.7	903.90	904.40	906.00	12.63	1.61
8		7200	84.85	914.6	909.20	909.60	911.13	17.77	2.26
9		10800	103.92	918	911.10	912.30	913.80	20.43	2.60
10		14400	120.00	920.7	915.40	916.30	917.47	24.10	3.07
11		18000	134.16	923.2	918.00	918.20	919.80	26.43	3.37
12		21600	146.97	925	920.40	921.00	922.13	28.77	3.66
13	1	92220	303.68	943	935.20	937.50	938.57	45.20	5.76
14	2	193200	439.55	943.8	935.80	938.10	939.23	45.87	5.84
15	3	268500	518.17	944.1	936.20	938.60	939.63	46.27	5.89
16	5	432000	657.27	944.3	936.40	938.90	939.87	46.50	5.92
17	6	527580	726.35	944.8	936.70	939.20	940.23	46.87	5.97
18	7	622200	788.80	945	936.90	939.50	940.47	47.10	6.00
19	8	691200	831.38	945	937.00	939.60	940.53	47.17	6.01

Lampiran 17. Penyerapan (sorptivity) beton OPC-pasir pada fas. 0,25

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Sampel	:	**0.25-OPC-PASIR**	
Umur	:	28 hari	
Diameter	:	100	mm
Tinggi	:	50	mm
Luas	:	7854	mm^2

Tabel .DATA HASIL PENGUJIAN SORPTIVITI BETON BERDASARKAN ASTM 1585-04

No.	Waktu,T		√T	Massa (gr)				ΔM	I
	hari	detik		Sampel 2	Sampel 3	Sampel 4	Rata-rata	(gr)	(mm)
1		0	0	857.50	856.40	781.70	831.87	0.00	0.00
2		60	7.75	858.70	858.20	783.20	833.37	1.50	0.19
3		300	17.32	860.30	859.50	784.60	834.80	2.93	0.37
4		600	24.49	861.10	860.30	785.50	835.63	3.77	0.48
5		1200	34.64	862.70	861.90	787.30	837.30	5.43	0.69
6		1800	42.43	863.80	862.90	788.60	838.43	6.57	0.84
7		3600	60.00	866.40	864.70	790.00	840.37	8.50	1.08
8		7200	84.85	868.10	867.30	792.70	842.70	10.83	1.38
9		10800	103.92	872.30	871.00	796.60	846.63	14.77	1.88
10		14400	120.00	874.10	872.50	798.30	848.30	16.43	2.09
11		18000	134.16	875.30	872.90	799.10	849.10	17.23	2.19
12		21600	146.97	876.50	874.00	800.50	850.33	18.47	2.35
	1	92220	303.68	891.70	888.80	812.10	864.20	32.33	4.12
	2	193200	439.55	892.80	889.20	814.90	865.63	33.77	4.30
	3	268500	518.17	892.70	890.40	815.30	866.13	34.27	4.36
	5	432000	657.27	892.90	891.00	816.50	866.80	34.93	4.45
	6	527580	726.35	893.50	891.40	816.30	867.07	35.20	4.48
	7	622200	788.80	893.70	892.60	816.70	867.67	35.80	4.56
	8	691200	831.38	894.40	892.30	817.20	867.97	36.10	4.60

Lampiran 18. Penyerapan (sorptivity) beton OPC-50GNS pada fas. 0,25

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Sampel	:	**0.25-OPC-50GNS**	
Umur	:	28	hari
Diameter	:	100	mm
Tinggi	:	50	mm
Luas	:	7854	mm^2

Tabel .DATA HASIL PENGUJIAN SORPTIVITI BETON BERDASARKAN ASTM 1585-04

No.	Waktu,T (detik)		√T	Massa (gr)				ΔM	I
				Sampel 1	Sampel 2	Sampel 3	Rata-rata	(gr)	(mm)
1	Awal	0	0	900.00	892.00	905.40	899.13	0.00	0.00
2	60	60	7.75	900.40	892.60	906.00	899.67	0.53	0.07
3	300	360	18.97	901.60	893.60	907.00	900.73	1.60	0.20
4	600	960	30.98	903.00	895.20	908.00	902.07	2.93	0.37
5	1200	2160	46.48	904.40	897.00	910.40	903.93	4.80	0.61
6	1800	3960	62.93	906.20	898.80	911.20	905.40	6.27	0.80
7	3600	7560	86.95	908.60	901.40	913.60	907.87	8.73	1.11
8	3600	11160	105.64	910.60	903.20	915.60	909.80	10.67	1.36
9	3600	14760	121.49	912.00	904.80	917.40	911.40	12.27	1.56
10	3600	18360	135.50	913.40	906.20	919.00	912.87	13.73	1.75
11	3600	21960	148.19	914.80	907.40	920.20	914.13	15.00	1.91
12	3600	25560	159.87	915.80	908.60	921.60	915.33	16.20	2.06
13	3600	29160	170.76	917.20	909.90	922.80	916.63	17.50	2.23
14	79200	108360	329.18	930.20	923.40	938.00	930.53	31.40	4.00
15	97200	205560	453.39	937.80	931.40	944.00	937.73	38.60	4.91
16	100800	306360	553.50	941.00	933.20	945.00	939.73	40.60	5.17
17	99000	405360	636.68	941.80	933.60	945.40	940.27	41.13	5.24
18	86400	491760	701.26	942.40	933.60	945.60	940.53	41.40	5.27
19	86400	578160	760.37	942.80	933.80	945.80	940.80	41.67	5.31

Lampiran 19. Penyerapan (sorptivity) beton 15FA-50GNS pada fas. 0,25

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Sampel	:	**0.25-15FA-50GNS**	
Umur	:	28	hari
Diameter	:	100	mm
Tinggi	:	50	mm
Luas Penamp	:	7854	mm^2

Tabel .DATA HASIL PENGUJIAN SORPTIVITI BETON BERDASARKAN ASTM 1585-04

No.	Waktu,T (detik)		√T	Massa (gr)				ΔM	I
				Sampel 1	Sampel 2	Sampel 3	Rata-rata	(gr)	(mm)
1	Awal	0	0	861.80	940.20	880.80	894.27	0.00	0.00
2	60	60	7.75	862.00	941.00	881.40	894.80	0.53	0.07
3	300	360	18.97	864.20	942.60	883.00	896.60	2.33	0.30
4	600	960	30.98	866.80	944.40	884.20	898.47	4.20	0.53
5	1200	2160	46.48	868.00	946.20	886.20	900.13	5.87	0.75
6	1800	3960	62.93	869.80	948.20	888.40	902.13	7.87	1.00
7	3600	7560	86.95	872.40	951.60	890.40	904.80	10.53	1.34
8	3600	11160	105.64	874.80	954.00	893.60	907.47	13.20	1.68
9	3600	14760	121.49	876.00	955.00	895.40	908.80	14.53	1.85
10	3600	18360	135.50	878.20	956.40	897.40	910.67	16.40	2.09
11	3600	21960	148.19	879.60	958.20	898.80	912.20	17.93	2.28
12	3600	25560	159.87	880.80	959.40	900.40	913.53	19.27	2.45
13	3600	29160	170.76	882.20	960.40	901.80	914.80	20.53	2.61
14	79200	108360	329.18	892.20	975.00	917.00	928.07	33.80	4.30
15	97200	205560	453.39	901.20	982.20	924.20	935.87	41.60	5.30
16	100800	306360	553.50	901.80	983.00	925.60	936.80	42.53	5.42
17	99000	405360	636.68	902.00	983.20	925.60	936.93	42.67	5.43
18	86400	491760	701.26	902.40	983.40	926.20	937.33	43.07	5.48
19	86400	578160	760.37	902.80	983.60	926.40	937.60	43.33	5.52

Lampiran 20. Penyerapan (sorptivity) beton 30FA-50GNS pada fas. 0,25

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Sampel	:	**0.25-30FA-50GNS**	
Umur	:	28 hari	
Diameter	:	100	mm
Tinggi	:	50	mm
Luas	:	7854	mm^2

Tabel .DATA HASIL PENGUJIAN SORPTIVITI BETON BERDASARKAN ASTM 1585-04

No.	Waktu,T		√T	Massa (gr)				ΔM	I
	hari	detik		Sampel 1	Sampel 2	Sampel 3	Rata-rata	(gr)	(mm)
1		0	0	929.60	929.90	899.90	919.80	0.00	0.00
2		60	7.75	930.60	931.20	900.70	920.83	1.03	0.13
3		300	17.32	931.70	932.40	901.50	921.87	2.07	0.26
4		600	24.49	932.40	932.90	901.90	922.40	2.60	0.33
5		1200	34.64	933.60	933.40	903.10	923.37	3.57	0.45
6		1800	42.43	934.90	934.10	904.00	924.33	4.53	0.58
7		3600	60.00	937.10	936.20	906.00	926.43	6.63	0.84
8		7200	84.85	940.90	940.50	909.60	930.33	10.53	1.34
9		10800	103.92	942.10	943.50	911.00	932.20	12.40	1.58
10		14400	120.00	943.50	944.70	912.50	933.57	13.77	1.75
11		18000	134.16	944.40	945.40	914.10	934.63	14.83	1.89
12		21600	146.97	946.10	947.10	916.20	936.47	16.67	2.12
13	1	92220	303.68	957.50	958.50	926.80	947.60	27.80	3.54
14	2	193200	439.55	966.10	968.10	935.30	956.50	36.70	4.67
15	3	268500	518.17	968.00	970.40	937.90	958.77	38.97	4.96
16	5	432000	657.27	969.30	971.60	938.40	959.77	39.97	5.09
17	6	527580	726.35	969.40	971.90	938.50	959.93	40.13	5.11
18	7	622200	788.80	969.60	972.30	938.60	960.17	40.37	5.14
19	8	691200	831.38	969.90	972.40	938.70	960.33	40.53	5.16

Lampiran 21. Porositas beton OPC-pasir pada fas.0,45 umur 28 hari

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Porositas Beton Berdasarkan ASTM C642-02

PENGUJIAN	Satuan	Sampel				
0.45-OPC-PASIR		1	2	3	4	5
Berat Kering Oven (A)	gr	902.8	935.4	857.6	876.4	911.2
Berat SSD Setelah Perendaman (B)	gr	956.7	987	906.2	925.5	963
Berat SSD Setelah Direbus (C)	gr	958.93	989.8	908.42	927.62	967.75
Berat Dalam Air (D)	gr	547.86	568.27	520.67	533.65	550.54
Penyerapan Setelah Direndam	gr	5.63	5.23	5.36	5.31	5.38
Penyerapan Setelah Direndam Dan Direbus	%	5.85	5.50	5.59	5.52	5.84
Berat Jenis Kering (g_1)	gr/cm^3	2.20	2.22	2.21	2.22	2.18
Berat Jenis Setelah Direndam	gr/cm^3	2.33	2.34	2.34	2.35	2.31
Berat Jenis Setelah Direndam dan Direbus	gr/cm^3	2.33	2.35	2.34	2.35	2.32
Berat Jenis Semu	gr/cm^3	2.54	2.55	2.55	2.56	2.53
Volume Rongga Permeabel	%	13.65	12.91	13.11	13.00	13.55
POROSITAS RATA-RATA	%	13.24				

Lampiran 22. Porositas beton OPC-50GNS pada fas.0,45 umur 28 hari

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Tabel 6. Porositas Beton Berdasarkan ASTM C642-02

PENGUJIAN	Satuan	Sampel				
0.45-OPC-50GNS		1	2	3	4	5
Berat Kering Oven (A)	gr	883.6	795.7	892.6	868.9	917.6
Berat SSD Setelah Perendaman (B)	gr	933.3	838.9	939.3	914.3	966.3
Berat SSD Setelah Direbus (C)	gr	936.17	842.26	942.84	917.46	969.77
Berat Dalam Air (D)	gr	551.54	493.54	556.17	539.52	572.76
Penyerapan Setelah Direndam	gr	5.33	5.15	4.97	4.97	5.04
Penyerapan Setelah Direndam Dan Direbus	%	5.62	5.53	5.33	5.29	5.38
Berat Jenis Kering (g_1)	gr/cm^3	2.30	2.28	2.31	2.30	2.31
Berat Jenis Setelah Direndam	gr/cm^3	2.43	2.41	2.43	2.42	2.43
Berat Jenis Setelah Direndam dan Direbus	gr/cm^3	2.43	2.42	2.44	2.43	2.44
Berat Jenis Semu	gr/cm^3	2.66	2.63	2.65	2.64	2.66
Volume Rongga Permeabel	%	13.67	13.35	12.99	12.85	13.14
POROSITAS RATA-RATA	%	13.20				

Lampiran 23. Porositas beton 15FA-50GNS pada fas.0,45 umur 28 hari

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Porositas Beton Berdasarkan ASTM C642-02

PENGUJIAN	Satuan	Sampel				
0.45-15FA-50GNS		1	2	3	4	5
Berat Kering Oven (A)	gr	876.5	929.7	892.2	917.5	891.3
Berat SSD Setelah Perendaman (B)	gr	922	977.9	939.3	965.3	938.4
Berat SSD Setelah Direbus (C)	gr	925.57	982.41	942.84	968.74	941.93
Berat Dalam Air (D)	gr	549.11	577.09	559.11	574.88	557.38
Penyerapan Setelah Direndam	gr	4.93	4.93	5.01	4.95	5.02
Penyerapan Setelah Direndam Dan Direbus	%	5.30	5.37	5.37	5.29	5.38
is Kering (g_1)	gr/cm^3	2.33	2.29	2.33	2.33	2.32
Berat Jenis Setelah Direndam	gr/cm^3	2.45	2.41	2.45	2.45	2.44
Berat Jenis Setelah Direndam dan Direbus	gr/cm^3	2.46	2.42	2.46	2.46	2.45
Berat Jenis Semu	gr/cm^3	2.68	2.64	2.68	2.68	2.67
Volume Rongga Permeabel	%	13.03	13.00	13.20	13.01	13.17
POROSITAS RATA-RATA	%	13.08				

Lampiran 24. Porositas beton 30FA-50GNS pada fas.0,45 umur 28 hari

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itas Beton Berdasarkan ASTM C642-02

PENGUJIAN	Satuan	Sampel				
0.45-30FA-50GNS		1	2	3	4	5
Berat Kering Oven (A)	gr	937.6	847.9	892.6	909.8	911
Berat SSD Setelah Perendaman (B)	gr	987.3	891.6	936.5	957.4	959.3
Berat SSD Setelah Direbus (C)	gr	990.9	894.76	940.42	960.77	962.6
Berat Dalam Air (D)	gr	574.88	532.14	559.64	569.49	572.02
Penyerapan Setelah Direndam	gr	5.03	4.90	4.69	4.97	5.03
Penyerapan Setelah Direndam Dan Direbus	%	5.38	5.24	5.08	5.31	5.36
Jenis Kering (g_1)	gr/cm^3	2.25	2.34	2.34	2.33	2.33
Berat Jenis Setelah Direndam	gr/cm^3	2.37	2.46	2.46	2.45	2.46
Berat Jenis Setelah Direndam dan Direbus	gr/cm^3	2.38	2.47	2.47	2.46	2.46
Berat Jenis Semu	gr/cm^3	2.58	2.69	2.68	2.67	2.69
Volume Rongga Permeabel	%	12.81	12.92	12.56	13.03	13.21
POROSITAS RATA-RATA	%	12.91				

Lampiran 25. Porositas beton OPC-pasir pada fas.0,25 umur 28 hari

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ositas Beton Berdasarkan ASTM C642-02

PENGUJIAN	Satuan	Sampel				
0.25-OPC-PASIR		1	2	3	4	5
Berat Kering Oven (A)	gr	851.7	842.3	877.9	852.8	888.8
Berat SSD Setelah Perendaman (B)	gr	892.8	880.7	917.2	894.3	932.5
Berat SSD Setelah Direbus (C)	gr	893.87	881.83	917.77	894.88	933.76
Berat Dalam Air (D)	gr	514.39	509.52	531.29	515.27	536.4
Penyerapan Setelah Direndam	gr	4.60	4.36	4.28	4.64	4.69
Penyerapan Setelah Direndam Dan Direbus	%	4.72	4.48	4.34	4.70	4.81
t Jenis Kering (g_1)	gr/cm^3	2.24	2.26	2.27	2.25	2.24
Berat Jenis Setelah Direndam	gr/cm^3	2.35	2.37	2.37	2.36	2.35
Berat Jenis Setelah Direndam dan Direbus	gr/cm^3	2.36	2.37	2.37	2.36	2.35
Berat Jenis Semu	gr/cm^3	2.52	2.53	2.53	2.53	2.52
Volume Rongga Permeabel	%	11.11	10.62	10.32	11.09	11.31
POROSITAS RATA-RATA	%	10.89				

Lampiran 26. Porositas beton OPC-50GNS pada fas.0,25 umur 28 hari

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ositas Beton Berdasarkan ASTM C642-02

PENGUJIAN	Satuan	Sampel				
0.25-OPC-GNS		1	2	3	4	5
Berat Kering Oven (A)	gr	939.5	895	891.9	903.4	943.3
Berat SSD Setelah Perendaman (B)	gr	971.4	927.2	923.6	935.8	976.4
Berat SSD Setelah Direbus (C)	gr	971.79	927.34	923.49	935.7	976.51
Berat Dalam Air (D)	gr	574.9	550.15	550.78	555.53	582.26
Penyerapan Setelah Direndam	gr	3.28	3.47	3.43	3.46	3.39
Penyerapan Setelah Direndam Dan Direbus	%	3.32	3.49	3.42	3.45	3.40
t Jenis Kering (g_1)	gr/cm^3	2.37	2.37	2.39	2.38	2.39
Berat Jenis Setelah Direndam	gr/cm^3	2.45	2.46	2.48	2.46	2.48
Berat Jenis Setelah Direndam dan Direbus	gr/cm^3	2.45	2.46	2.48	2.46	2.48
Berat Jenis Semu	gr/cm^3	2.58	2.60	2.61	2.60	2.61
Volume Rongga Permeabel	%	8.14	8.57	8.48	8.50	8.42
POROSITAS RATA-RATA	%	8.42				

Lampiran 27. Porositas beton 15FA-50GNS pada fas.0,25 umur 28 hari

LABORATORIUM STRUKTUR DAN BAHAN
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sitas Beton Berdasarkan ASTM C642-02

PENGUJIAN	Satuan	Sampel				
0.25-15FA-50GNS		1	2	3	4	5
Berat Kering Oven (A)	gr	940.7	892	978.2	940	922.3
Berat SSD Setelah Perendaman (B)	gr	970	919.5	1010.2	971.5	954.3
Berat SSD Setelah Direbus (C)	gr	968.72	919.1	1010.1	971.78	954.34
Berat Dalam Air (D)	gr	574.85	547.04	598.32	574.62	564.56
Penyerapan Setelah Direndam	gr	3.02	2.99	3.17	3.24	3.35
Penyerapan Setelah Direndam Dan Direbus	%	2.89	2.95	3.16	3.27	3.36
t Jenis Kering (g_1)	gr/cm^3	2.39	2.40	2.38	2.37	2.37
Berat Jenis Setelah Direndam	gr/cm^3	2.46	2.47	2.45	2.45	2.45
Berat Jenis Setelah Direndam dan Direbus	gr/cm^3	2.46	2.47	2.45	2.45	2.45
Berat Jenis Semu	gr/cm^3	2.57	2.59	2.58	2.57	2.58
Volume Rongga Permeabel	%	7.11	7.28	7.75	8.00	8.22
POROSITAS RATA-RATA	%	7.67				

Lampiran 28. Porositas beton 30FA-50GNS pada fas.0,25 umur 28 hari

LABORATORIUM STRUKTUR DAN BAHAN
DEPARTEMEN TEKNIK SIPIL FAKULTAS TEKNIK
UNIVERSITAS HASANUDDIN
Jl. Poros Malino KM. 06 Bontomarannu, Gowa

l 6. Porositas Beton Berdasarkan ASTM C642-02

PENGUJIAN	Satuan	Sampel				
0.25-30FA-50GNS		1	2	3	4	5
Berat Kering Oven (A)	gr	932.7	928.4	943.3	935.2	930.6
Berat SSD Setelah Perendaman (B)	gr	961.8	956.2	970.1	961.9	956.2
Berat SSD Setelah Direbus (C)	gr	964.54	958.74	973.42	963.8	959.21
Berat Dalam Air (D)	gr	570.78	567.67	576.93	568.13	568.45
Penyerapan Setelah Direndam	gr	3.03	2.91	2.76	2.78	2.68
Penyerapan Setelah Direndam Dan Direbus	%	3.30	3.16	3.09	2.97	2.98
t Jenis Kering (g_1)	gr/cm^3	2.37	2.37	2.38	2.36	2.38
Berat Jenis Setelah Direndam	gr/cm^3	2.44	2.45	2.45	2.43	2.45
Berat Jenis Setelah Direndam dan Direbus	gr/cm^3	2.45	2.45	2.46	2.44	2.45
Berat Jenis Semu	gr/cm^3	2.58	2.57	2.57	2.55	2.57
Volume Rongga Permeabel	%	8.09	7.76	7.60	7.23	7.32
POROSITAS RATA-RATA	%	7.60				

Lampiran 29. Penetrasi klorida beton OPC-pasir fas.0,25 dan 28 hari

LABORATORIUM STRUKTUR DAN BAHAN
DEPARTEMEN TEKNIK SIPIL
UNIVERSITAS HASANUDDIN

Sampel	:	**OPC-PASIR-fas 0.25**	
Penelitian Disertasi	:	24 Oktober 2020	
Umur	:	28	hari
Diameter (mm)	:	100	mm
Tinggi (mm	:	50	mm
Temperatur awal	:	30	^{o}C
Temperatur akhir	:	31	^{o}C

DATA HASIL PENGUJIAN PENETRASI KLORIDA BERDASARKAN NT BUILD 492

Sampel	Awal	30	60	90	120	150	180	210	240	270	300	330	360
1	0.035	0.035	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05
2	0.04	0.05	0.04	0.045	0.045	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06
HASIL PERHITUNGAN													
Q1-35v (coulombs)	0.035	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.1	0.1	0.1	0.1	0.05
Q2-35v (coulombs)	0.04	0.1	0.08	0.09	0.09	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.06
$Q_{rata\text{-}rata,}$ (coulombs)	987.75												
$Q_{rata\text{-}rata,\ 60\ V}$(coulombs)	**1693**												

Lampiran 30. Penetrasi klorida beton OPC-50GNS fas.0,25 dan 28 hari

LABORATORIUM STRUKTUR DAN BAHAN
DEPARTEMEN TEKNIK SIPIL
UNIVERSITAS HASANUDDIN

Sampel	:	**OPC-50GNS-fas 0,25**	
Tanggal terima	:	3-Nov-20	
Umur	:	28	hari
Diameter (mm)	:	100	mm
Tinggi (mm	:	50	mm
Temperatur awal	:	29	^{o}C
Temparatur akhir	:	29	^{o}C

DATA HASIL PENGUJIAN PENETRASI KLORIDA

Sampel	Awal	30	60	90	120	150	180	210	240	270	300	330	360
1	0.05	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.03	0.03	0.04	0.04
2	0.059	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.05
3	0.06	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.05
HASIL PERHITUNGAN													
Q1,30v (coulombs)	0.05	0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.06	0.06	0.08	0.04
Q2,30v(coulombs)	0.059	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.08	0.08	0.1	0.1	0.05
Q3,30v(coulombs)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.08	0.08	0.08	0.1	0.05
$Q_{rata\text{-}rata,\ 30\ V}$ (coulombs)	740.7												
$Q_{rata\text{-}rata,\ 60\ V}$(coulombs)	**1481**												

Lampiran 31. Penetrasi klorida beton 15FA-50GNS fas.0,25 dan 28 hari

LABORATORIUM STRUKTUR DAN BAHAN
DEPARTEMEN TEKNIK SIPIL
UNIVERSITAS HASANUDDIN

Sampel	:	**15FA-50GNS-fas 0,25**	
Tanggal terima	:	8-Nov-20	
Umur	:	28	hari
Diameter (mm)	:	100	mm
Tinggi (mm	:	50	mm
Temperatur awal	:	28	^{o}C
Temparatur akhir	:	28	^{o}C

DATA HASIL PENGUJIAN PENETRASI KLORIDA

Sampel	Awal	30	60	90	120	150	180	210	240	270	300	330	360
1	0.05	0.02	0.02	0.03	0.03	0.04	0.04	0.04	0.05	0.05	0.04	0.04	0.04
2	0.06	0.03	0.03	0.03	0.035	0.035	0.04	0.04	0.04	0.05	0.05	0.05	0.05
3	0.045	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04
HASIL PERHITUNGAN													
Q1,30v (coulombs)	0.05	0.04	0.04	0.06	0.06	0.08	0.08	0.08	0.1	0.1	0.08	0.08	0.04
Q2,30v (coulombs)	0.06	0.06	0.06	0.06	0.07	0.07	0.08	0.08	0.08	0.1	0.1	0.1	0.05
Q3,30v (coulombs)	0.045	0.04	0.04	0.04	0.04	0.06	0.06	0.06	0.08	0.08	0.08	0.08	0.04
$Q_{rata\text{-}rata,}$ (coulombs)	781.5												
$Q_{rata\text{-}rata,\ 60\ v}$(coulombs)	**1563**												

Lampiran 32. Penetrasi klorida beton 30FA-50GNS fas.0,25 dan 28 hari

LABORATORIUM STRUKTUR DAN BAHAN
DEPARTEMEN TEKNIK SIPIL
UNIVERSITAS HASANUDDIN

Sampel	:	**30FA-50GNS-fas 0,25**	
Tanggal terima	:	11-Nov-20	
Umur	:	28	hari
Diameter (mm)	:	100	mm
Tinggi (mm	:	50	mm
Temperatur awal	:	28	^{o}C
Temparatur akhir	:	29	^{o}C

DATA HASIL PENGUJIAN PENETRASI KLORIDA

Sampel	Awal	30	60	90	120	150	180	210	240	270	300	330	360
1	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.04	0.04	0.03	0.03	0.03	0.03
2	0.05	0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.04	0.04	0.04	0.04	0.04
3	0.055	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04
HASIL PERHITUNGAN													
Q1,30v (coulombs)	0.04	0.08	0.08	0.06	0.06	0.06	0.06	0.08	0.08	0.06	0.06	0.06	0.03
Q2,30v (coulombs)	0.05	0.06	0.06	0.06	0.08	0.08	0.1	0.1	0.08	0.08	0.08	0.08	0.04
Q3,30v (coulombs)	0.055	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.08	0.04
$Q_{rata\text{-}rata,}$ (coulombs)	760.5												
$Q_{rata\text{-}rata,\ 60\ v}$(coulombs)	**1521**												