

LAMPIRAN

Lampiran 1 Pengujian Gradasi Agregat

Jenis Pengujian : Pemeriksaan analisis gradasi agregat halus
 Bahan : Pasir Progo
 Asal : Sungai Progo
 Diperiksa : 14 Desember 2018

Tabel 1. Hasil pemeriksaan gradasi butiran agregat halus *sample 1*

Ukuran	Lubang Ayakan (mm)	Berat tertahan (gram)	Berat tertahan (%)	Berat tertahan komulatif (%)	Berat lolos komulatif (%)
No. 4	4,75	0	0	0	100
No. 8	2,36	25	2,5	2,5	97,5
No. 16	1,18	147	14,7	17,2	82,8
No. 30	0,6	280	28,0	45,2	54,8
No. 50	0,3	246	24,6	69,8	30,2
No. 100	0,15	205	20,5	90,3	9,7
Pan		97	9,7	100	0
Total		1000	100	325	

Analisis hitungan:

a. Contoh saringan no.8

$$\begin{aligned}
 \text{Persen berat tertahan} &= \frac{\text{Berat Tertahan}}{\text{Total}} \times 100\% \\
 &= \frac{25}{1000} \times 100\% \\
 &= 2,5\%
 \end{aligned}$$

b. Contoh saringan no.8

$$\begin{aligned}
 \text{Persen berat tertahan komulatif} &= \% \text{berat tertahan no.4} + \% \text{berat tertahan no.8} \\
 &= 0 + 2,5 \\
 &= 2,5\%
 \end{aligned}$$

c. Komulatif contoh saringan no.16

$$\begin{aligned}
 \text{Persen berat lolos komulatif} &= \% \text{berat lolos komulatif No.4} - \% \text{berat tertahan} \\
 &\quad \text{komulatif No.8} \\
 &= 100 - 2,5
 \end{aligned}$$

$$= 97,5\%$$

d. Modulus halus butir (MHB) $= \frac{\text{jumlah berat tertahan komulatif}}{100}$

$$= \frac{225}{100}$$

$$= 2,25\%$$

Tabel 2. Hasil pemeriksaan gradasi butiran agregat halus *sample 2*

Ukuran	Lubang Ayakan (mm)	Berat tertahan (gram)	Berat tertahan (%)	Berat tertahan komulatif (%)	Berat lolos komulatif (%)
No. 4	4,75	0	0	0	100
No. 8	2,36	39	3.9	3.9	96.1
No. 16	1,18	152	15.2	19.1	80.9
No. 30	0,6	273	27.3	46.4	53.6
No. 50	0,3	215	21.5	67.9	32.1
No. 100	0,15	197	19.7	87.6	12.4
Pan		124	12.4	100	0
Total		1000	100	324.9	

Analisis hitungan:

a. Contoh saringan no.8

Persen berat tertahan $= \frac{\text{Berat Tertahan}}{\text{Total}} \times 100\%$

$$= \frac{39}{1000} \times 100\%$$

$$= 3,9\%$$

b. Contoh saringan no.8

Persen berat tertahan komulatif = %berat tertahan no.4 + % berat tertahan no.8

$$= 0 + 3,9$$

$$= 3,9\%$$

c. Komulatif contoh saringan no.8

Persen berat lolos komulatif = % berat lolos komulatif No.4 - % berat tertahan komulatif No.8

$$= 100 - 3,9$$

$$= 96,1\%$$

d. Modulus halus butir (MHB) $= \frac{\text{jumlah berat tertahan komulatif}}{100}$

$$= \frac{224,9}{100}$$

$$= 2,25\%$$

Tabel 3. Hasil pemeriksaan gradasi butiran agregat halus *sample 3*

Ukuran	Lubang Ayakan (mm)	Berat tertahan (gram)	Berat tertahan (%)	Berat tertahan kumulatif (%)	Berat lolos kumulatif (%)
No. 4	4,75	0	0	0	100
No. 8	2,36	30.5	3.05	3.05	96.95
No. 16	1,18	116.5	11.65	14.7	85.3
No. 30	0,6	280	28	42.7	57.3
No. 50	0,3	352.5	35.25	77.95	22.05
No. 100	0,15	192.5	19.25	97.2	2.8
Pan		28	2.8	100	0
Total		1000	100	335.6	

Analisis hitungan:

a. Contoh saringan no.8

$$\text{Persen berat tertahan} = \frac{\text{Berat Tertahan}}{\text{Total}} \times 100\%$$

$$= \frac{30,5}{1000} \times 100\%$$

$$= 3,05\%$$

b. Contoh saringan no.8

$$\text{Persen berat tertahan kumulatif} = \% \text{ berat tertahan no.4} + \% \text{ berat tertahan no.8}$$

$$= 0 + 3,05$$

$$= 3,05\%$$

c. Kumulatif contoh saringan no.8

$$\text{Persen berat lolos kumulatif} = \% \text{ berat lolos kumulatif No.4} - \% \text{ berat tertahan kumulatif No.8}$$

$$= 100 - 3,05$$

$$= 96,95\%$$

d. Modulus halus butir (MHB)

$$= \frac{\text{jumlah berat tertahan kumulatif}}{100}$$

$$= \frac{236}{100}$$

$$= 2,36\%$$

Lampiran 2 Pengujian Kadar Lumpur Agregat halus

Jenis Pengujian : Pemeriksaan kadar lumpur agregat halus
 Bahan : Pasir Progo
 Asal : Sungai progo
 Diperiksa : 21 Desember 2018

Tabel 1. Hasil pemeriksaan kadar lumpur agregat halus

Uraian	Satuan	Benda Uji		
		1	2	3
Berat pasir kering tungku sebelum dicuci (W1)	gr	500	500	500
Berat Pasir kering tungku setelah dicuci+nampan (W2)	gr	765	602	611
Berat nampan (W3)	gr	285	127	126
Berat pasir kering tungku setelah dicuci (W4)	%	480	475	485
Kadar lumpur	%	4	5	3
Rata-rata	%	4		

Analisis hitungan:

- a. Berat pasir kering tungku setelah dicuci (W4) = $W2 - W3$
 Contoh benda uji 1 = $765 - 285$
 = 480
- b. Kadar lumpur = $\frac{W1 - W4}{W1} \times 100\%$
 Contoh benda uji 1 = $\frac{500 - 480}{500} \times 100\%$
 = 4%
- c. Rata-rata kadar lumpur = $\frac{KL1 + KL2 + KL3}{3} \times 100\%$
 = $\frac{4 + 5 + 3}{3} \times 100\%$
 = 4%

Lampiran 3 Pengujian Kadar Air Agregat Halus

Jenis Pengujian : Pemeriksaan kadar air agregat halus
 Bahan : Pasir Progo
 Asal : Sungai Progo
 Diperiksa : 22 Februari 2019

Tabel 1. Hasil pemeriksaan kadar air agregat halus

Uraian	Benda Uji			
	Satuan	1	2	3
Berat Wadah (W1)	gram	126	299	283
Berat wadah + Berat isi pasir (W2)	gram	1126	1299	1283
Berat wadah + Berat isi pasir keluar oven (W3)	gram	1105	1280	1265
Berat Air (W4)	gram	21	19	18
kadar air	%	2.150	1.940	1.830
Rata - rata	%	1.970		

Analisis hitungan:

a. Berat air = $W2 - W3$

Contoh benda uji 1 = $1126 - 1105$
 = 21 gr

b. Kadar air = $\frac{W4}{W3 - W1} \times 100\%$

Contoh benda uji 1 = $\frac{21}{1105 - 126} \times 100\%$
 = 2,150%

c. Kadar air rata-rata = $\frac{KA1 + KA2 + KA3}{3}$

= $\frac{2,15 + 1,94 + 1,83}{3}$

= 1,970%

Lampiran 4 Pengujian Berat Jenis dan Penyerapan Air Agregat Halus

Jenis Pengujian : Pemeriksaan berat jenis dan penyerapan air agregat halus
 Bahan : Pasir Progo
 Asal : Sungai Progo
 Diperiksa : 17 Desember 2018

Tabel 1. Data pemeriksaan berat jenis agregat halus

Uraian	Satuan	Benda Uji		
		1	2	3
Berat pikno berisi pasir dan air (Bt)	gram	1089	1076	1081
Berat pasir setelah kering (Bk)	gram	489	488	482
Berat pikno berisi air (B)	gram	773	767	773
Berat pasir keadaan jenuh kering muka (SSD)	gram	500	500	500

Tabel 2. Hasil pemeriksaan berat jenis agregat halus

Uraian	Satuan	Benda Uji			Rata-rata
		1	2	3	
Berat jenis curah		2.658	2.555	2.510	2.797
Berat jenis jenuh kering muka		2.717	2.618	2.604	2.825
Berat jenis tampak		2.827	2.726	2.770	2.878
Penyerapan air agregat halus	%	2.249	2.459	3.734	2,814

Analisis Hitungan:

- a. Berat jenis curah
$$= \frac{Bk}{B+SSD-Bt}$$

 Contoh benda uji 1
$$= \frac{489}{773+500-1089}$$

$$= 2,658$$
- b. Berat jenis jenuh kering muka
$$= \frac{500}{B+SSD-Bt}$$

 Contoh benda uji 1
$$= \frac{500}{773+500-1089}$$

$$= 2,717$$
- c. Berat jenis tampak
$$= \frac{Bk}{B+Bk-Bt}$$

 Contoh benda uji 1
$$= \frac{489}{773+489-1089}$$

$$= 2,827$$
- d. Penyerapan air agregat kasar
$$= \frac{SSD-Bk}{Bk} \times 100\%$$

$$\begin{aligned}\text{Contoh benda uji 1} &= \frac{500-489}{489} \times 100\% \\ &= 2,249\%\end{aligned}$$

$$\begin{aligned}\text{e. Berat jenis jenuh kering muka rata-rata} &= \frac{SSD1+SSD2+SSD\#}{3} \\ &= \frac{2,717+2,618+2,604}{3} \\ &= 2,646\end{aligned}$$

Lampiran 5 Pengujian Berat Satuan Agregat Halus

Jenis Pengujian : Pemeriksaan berat satuan agregat halus
 Bahan : Pasir Progo
 Asal : Sungai Progo
 Diperiksa : 19 Desember 2018

Tabel 1. Hasil pemeriksaan berat satuan agregat halus

Uraian	Satuan	Benda Uji		
		1	2	3
Berat bejana kosong (B1)	gr	10160	10160	10160
Berat bejana kosong +pasir	gr	19240	19185	19420
Berat satuan	gr/cm ³	1.713	1.703	1.747
Rata - rata	gr/cm ³	1.721		

Analisis hitungan:

a. Bejana: $d = 15 \text{ cm}$

$h = 30 \text{ cm}$

$$\begin{aligned}
 \text{b. Volume bejana kosong} &= \frac{1}{4} \pi r^2 t \\
 &= \frac{1}{4} \pi \times 15^2 \times 30 \\
 &= 5301 \text{ cm}^3
 \end{aligned}$$

$$\begin{aligned}
 \text{c. Berat satuan } (B_{sat}) &= \frac{B_2 - B_1}{Volume} \\
 \text{Contoh benda uji 1} &= \frac{19240 - 10160}{5301}
 \end{aligned}$$

$$= 1,713 \text{ gr/cm}^3$$

$$\begin{aligned}
 \text{d. Berat satuan rata-rata} &= \frac{B_{1sat} + B_{2sat} + B_{3sat}}{3} \\
 &= \frac{1,713 + 1,703 + 1,747}{3} \\
 &= 1,721 \text{ gr/cm}^3
 \end{aligned}$$

Lampiran 6 Pengujian Keausan Agregat Kasar

Jenis Pengujian : Pemeriksaan keausan (los angeles) agregat kasar
 Bahan : Kerikil Clereng
 Asal : Clereng
 Diperiksa : 21 Desember 2018

Tabel 1. Pemeriksaan keausan agregat kasar

Uraian	Satuan	Benda Uji		
		1	2	3
Berat sebelum pengujian los angeles (B1)	gram	5000	5000	5000
Berat sesudah pengujian los angeles (B2)	gram	3280	3490	3300
Keausan	%	34,40	30,20	34,00
Keausan rata-rata	%	32,87		

Analisis Hitungan:

a. Keausan $= \frac{B1-B2}{B1} \times 100\%$
 Contoh benda uji 1 $= \frac{5000-3280}{5000} \times 100\%$
 $= 34,40\%$

b. Keausan rata-rata $= \frac{Keausan1+Keausan2+Keausan3}{3}$
 $= \frac{34,40+30,20+34,00}{3}$
 $= 32,87\%$

Lampiran 7 Pengujian Kadar Lumpur Agregat Kasar

Jenis Pengujian : Pemeriksaan kadar lumpur agregat kasar
 Bahan : Kerikil
 Asal : Clereng
 Diperiksa : 21 Desember 2018

Tabel 1. Hasil pemeriksaan kadar lumpur agregat halus

Uraian	Satuan	Benda Uji		
		1	2	3
Berat wadah + Pasir setelah dioven pertama (W1)	gr	5235	5230	5425
Berat wadah + Pasir setelah dioven pertama (W2)	gr	4980	4945	5185
Kandungan air (W3 = W1-W2)	gr	255	285	240
Kadar lumpur	%	4,87	5,45	4,42
Rata-rata	%	4,91		

Analisis hitungan:

- a. Kandungan air $= B1 - B2$
 Contoh benda uji 1 $= 5235 - 4980$
 $= 255$
- b. Kadar lumpur $= \frac{B1-B2}{B1} \times 100\%$
 Contoh benda uji 1 $= \frac{2535-4980}{2535} \times 100\%$
 $= 4,87\%$
- c. Rata-rata kadar lumpur $= \frac{KL1+KL2+KL3}{3} \times 100\%$
 $= \frac{4,87+5,45+4,42}{3} \times 100\%$
 $= 4,91\%$

Lampiran 8 Pengujian Kadar Air Agregat Kasar

Jenis Pengujian : Pemeriksaan kadar air agregat kasar

Bahan : Kerikil Clereng

Asal : Clereng

Diperiksa : 22 Februari 2019

Uraian	Satuan	Benda Uji		
		1	2	3
Berat pasir keadaan jenuh kering muka (B_1)	gram	3000	3000	3000
Berat pasir keadaan kering tungku (B_2)	gram	2889	2894	2883
Kadar air	%	3.70	3.53	3.90
Kadar air rata-rata	%	3.71		

Analisis Hitungan:

$$a. \text{ Kadar air} = \frac{B_1 - B_2}{B_1} \times 100\%$$

$$\begin{aligned} \text{Contoh benda uji 1} &= \frac{3000 - 2889}{3000} \times 100\% \\ &= 3,70\% \end{aligned}$$

$$\begin{aligned} b. \text{ Kadar air rata-rata} &= \frac{\text{Benda uji 1} + \text{Benda uji 2} + \text{Benda uji 3}}{3} \\ &= \frac{3,70\% + 3,53\% + 3,90\%}{3} \\ &= 3,71\% \end{aligned}$$

Lampiran 9 Pengujian Berat Jenis dan Penyerapan Air Agregat Kasar

Jenis Pengujian : Pemeriksaan berat jenis dan penyerapan air agregat kasar
 Bahan : Kerikil Clereng
 Asal : Clereng
 Diperiksa : 21 Desember 2018

Tabel 1. Hasil pemeriksaan berat jenis dan penyerapan air agregat kasar

Uraian	Satuan	Benda Uji		
		1	2	3
Berat kerikil setelah dikeringkan (Bk)	gram	3000	3000	3000
Berat kerikil didalam air (Ba)	gram	1882	1891	1891
Berat kerikil keadaan jenuh (Bj)	gram	3086	3087	3081

Tabel 2. Hasil pemeriksaan berat jenis dan penyerapan air agregat kasar

Uraian	Satuan	Benda Uji			Rata-rata
		1	2	3	
Berat jenis curah		2.492	2.508	2.521	2.507
Berat jenis kering muka		2.563	2.581	2.589	2.578
Berat jenis tampak		2.683	2.705	2.705	2.698
Penyerapan air agregat kasar	%	2.867	2.900	2.700	2.822
Berat kerikil jenuh rata-rata	gram	3084.667			
Penyerapan air agregat kasar	%	2.822			

Analisis hitungan:

- a. Berat jenis curah $= \frac{Bk}{Bj - Ba}$
 Contoh benda uji 1 $= \frac{3000}{3086 - 1882}$
 $= 2,492$
- b. Berat jenis kering muka $= \frac{Bj}{Bj - Ba}$
 Contoh benda uji 1 $= \frac{3086}{3086 - 1882}$
 $= 2,563$
- c. Berat jenis tampak $= \frac{Bk}{Bk - Ba}$
 Contoh benda uji 1 $= \frac{5000}{5000 - 1882}$
 $= 2,683$
- d. Penyerapan air agregat kasar $= \frac{Bj - Bk}{Bk} \times 100\%$

$$\begin{aligned}
 \text{Contoh benda uji 1} &= \frac{3086-3000}{3000} \times 100\% \\
 &= 2,867\% \\
 \text{e. Beart jenis jenuh rata-rata} &= \frac{B \text{ jenis 1} + B \text{ jenis 2} + B \text{ jenis jenuh 3}}{3} \\
 &= \frac{3086+3087+3081}{3} \\
 &= 3084,667 \\
 \text{f. Penyerapan air rata-rata AK} &= \frac{P.\text{air AK 1} + P.\text{air AK 2} + P.\text{air AK 3}}{3} \\
 &= \frac{2,867+2,900+2,700}{3} \\
 &= 2,822
 \end{aligned}$$

Lampiran 10 Pengujian Berat Satuan Agregat Kasar

Jenis Pengujian : Pemeriksaan berat satuan agregat kasar
 Bahan : Kerikil Clereng
 Asal : Clereng
 Diperiksa : 19 Desember 2018

Tabel 1. Hasil pemeriksaan berat satuan agregat kasar

Uraian	Satuan	Benda Uji		
		1	2	3
Berat bejana kosong (B1)	gr	10160	10160	10160
Berat bejana kosong +kerikil (B2)	gr	18120	18340	18360
Berat satuan	gr/cm ³	1.502	1.543	1.547
Rata - rata	gr/cm ³	1.531		

Analisi hitungan:

a. Bejana: $d = 15 \text{ cm}$

$h = 30 \text{ cm}$

$$\begin{aligned} \text{b. Volume bejana kosong} &= \frac{1}{4} \pi r^2 t \\ &= \frac{1}{4} \pi \times 15^2 \times 30 \\ &= 5301 \text{ cm}^3 \end{aligned}$$

$$\begin{aligned} \text{c. Berat satuan } (B_{sat}) &= \frac{B_2 - B_1}{Volume} \\ \text{Contoh benda uji 1} &= \frac{18120 - 10160}{5301} \\ &= 1,502 \text{ gr/cm}^3 \end{aligned}$$

$$\begin{aligned} \text{d. Berat satuan rata-rata} &= \frac{B_{1sat} + B_{2sat} + B_{3sat}}{3} \\ &= \frac{1,502 + 1,543 + 1,547}{3} \\ &= 1,531 \text{ gr/cm}^3 \end{aligned}$$

Lampiran 11 Alat Pemeriksaan Bahan Penyusun Beton.



Gambar 1 Timbangan.



Gambar 2 Kaliper.



Gambar 3 Saringan.



Gambar 4 Timbangan dalam air.

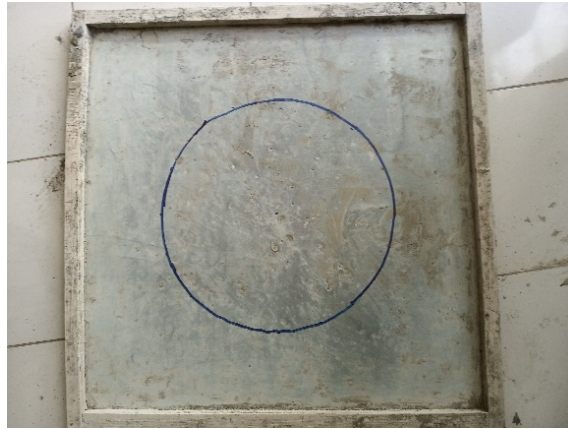


Gambar 5 Mesin *los angeles*.



Gambar 6 *Erlenmeyer*.

Lampiran 12 Alat Pemeriksaan Sifat Segar Beton.



Gambar 1 Meja sebar T50.



Gambar 2 Kerucut abrams.



Gambar 3 Alat pengujian *v-funnel*.



Gambar 4 Alat pengujian *l-box*.

Lampiran 13 Alat Pembuatan Benda Uji

Gambar 1 *Concrete mixer.*

Gambar 2 silinder.



Gambar 3 cetok.



Gambar 7 Gelas ukur 1000 ml.

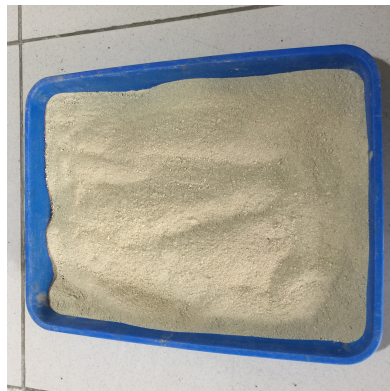


Gambar 8 Nampan.



Gambar 9 *Compression machine test.*

Lampiran 14 Bahan Penyusun Beton

Gambar 1 Semen *holcim power max*.Gambar 2 *Zeolite*.

Gambar 3 Kerikil Agregat kasar (kerikil clereng).



Gambar 4 Agregat halus (pasir progo).



Gambar 5 Air.



Gambar 6 *Superplasticizer (Sikament LN)*.



Gambar 7 *Nylon*.

Lampiran 15 Proses Pengujian beton Segar (*Fresh Properties*)



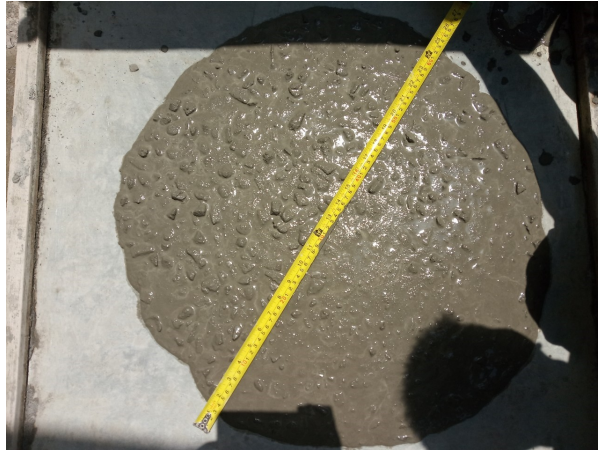
Gambar 1 Pengujain meja sebar T50.



Gambar 2 Pengujian *v-funnel*.



Gambar 3 Pengujian *l-box*.



Gambar 4 Pengujian *slump flow*.

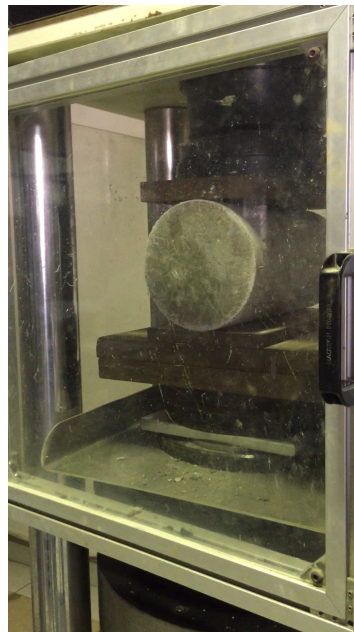
Lampiran 16 Proses Pengujian Kuat Tarik Belah



Gambar 1 Pengukuran diameter benda uji silinder.



Gambar 2 Pengukuran tinggi benda uji silinder.



Gambar 3 Pengujian kuat tarik belah beton.



Gambar 4 Beton setelah dilakukan uji tarik belah.



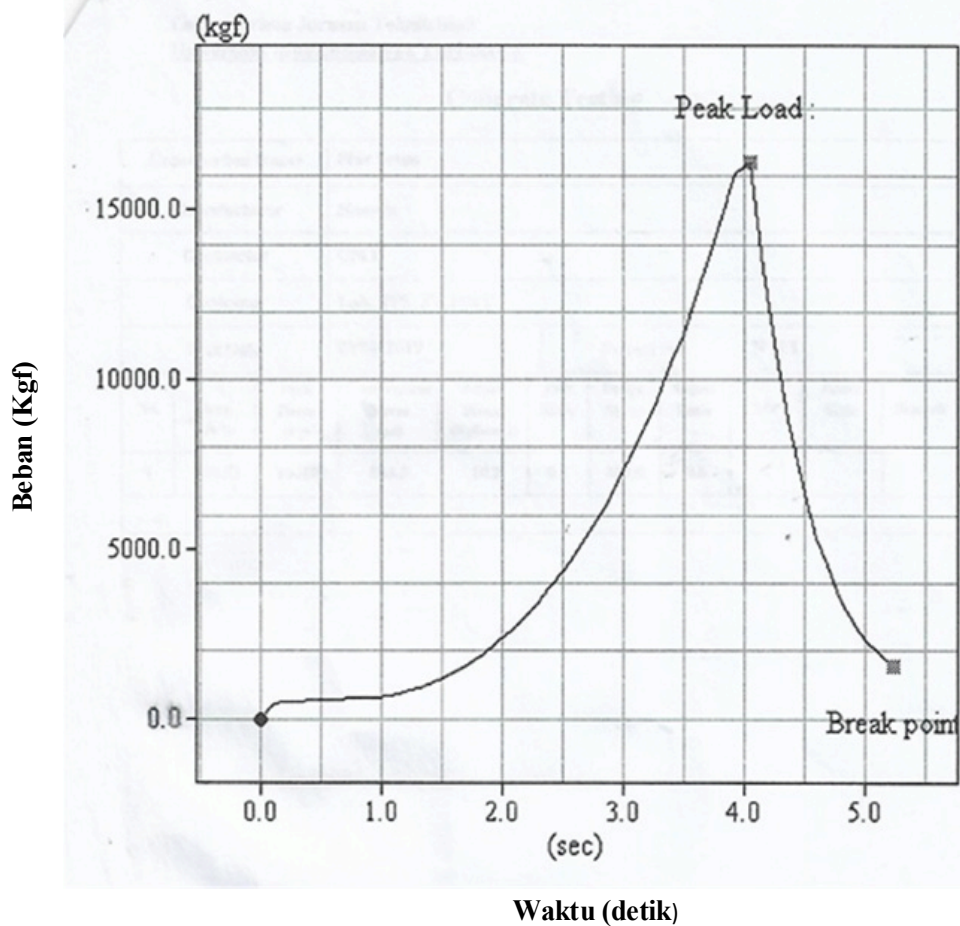
Gambar 5 Beton setelah dilakukan uji tarik belah pada benda uji normal.

Lampiran 17 Hasil Pengujian Kuat Tarik Belah Beton

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Concrete Testing

Construction Name		Slidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		03/08/2019			Report No.			N 7/ 1		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	660.52	16410	353.3	14.2	0.5	300.0	0.6	7		

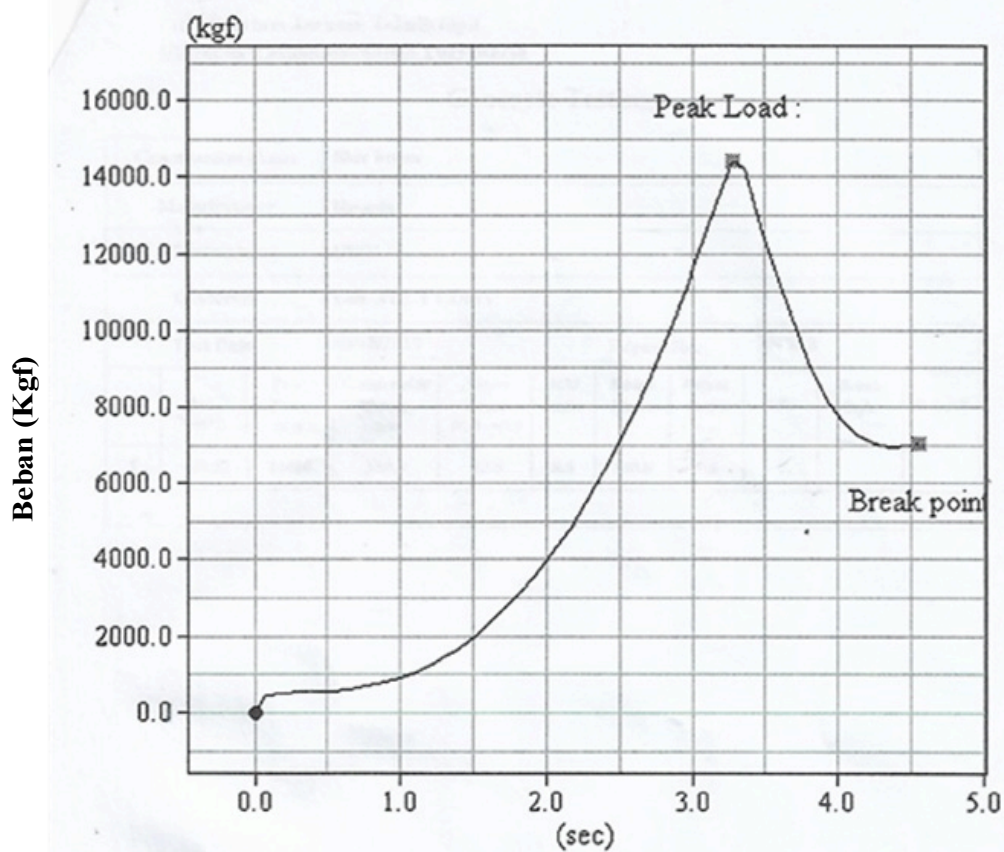


Gambar 1 Hubungan beban dan waktu benda uji TB0%Zt.1 (7).

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Concrete Testing

Construction Name		Slidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		03/08/2019			Report No.			N 7/ 2		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	660.52	14410	310.3	12.5	0.5	300.0	0.6	7		



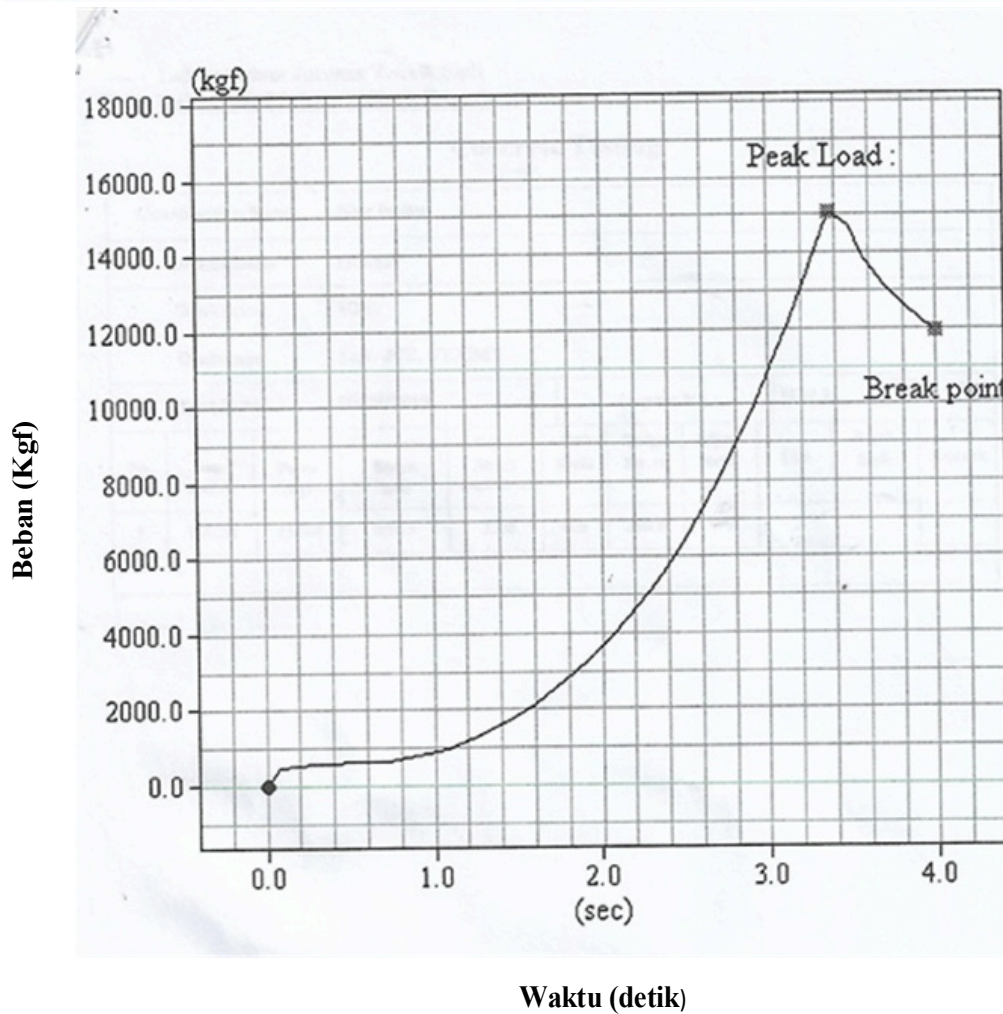
Waktu (detik)

Gambar 2 Hubungan beban dan waktu benda uji TB0%Zt.2 (7).

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Concrete Testing

Construction Name		Slidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		03/08/2019			Report No.			N 7/ 3		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	660.52	15060	324.3	13.0	0.5	300.0	0.6	7		

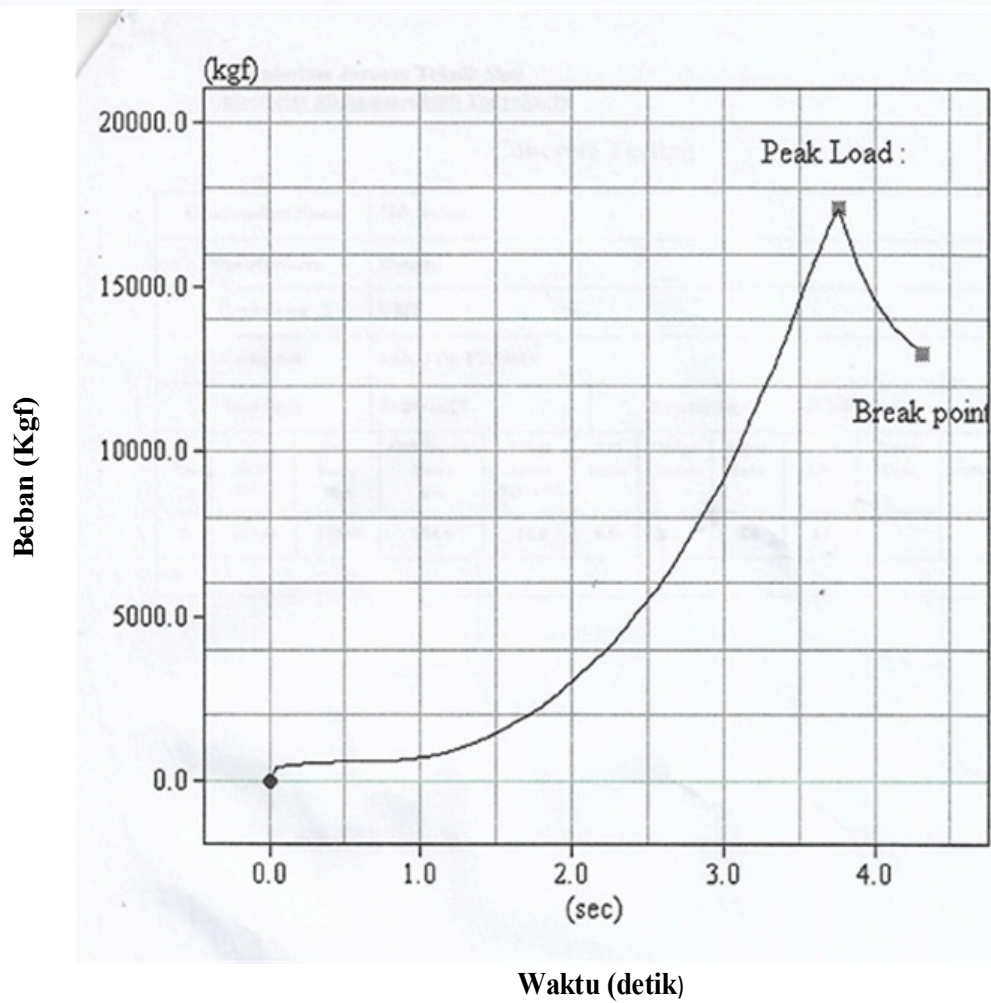


Gambar 3 Hubungan beba dan waktu beda uji TB0%Zt.3 (7).

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Concrete Testing

Construction Name		Sldr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		03/08/2019			Report No.			N 14/ 1		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	697.46	17390	354.6	14.0	0.5	300.0	0.6	14		

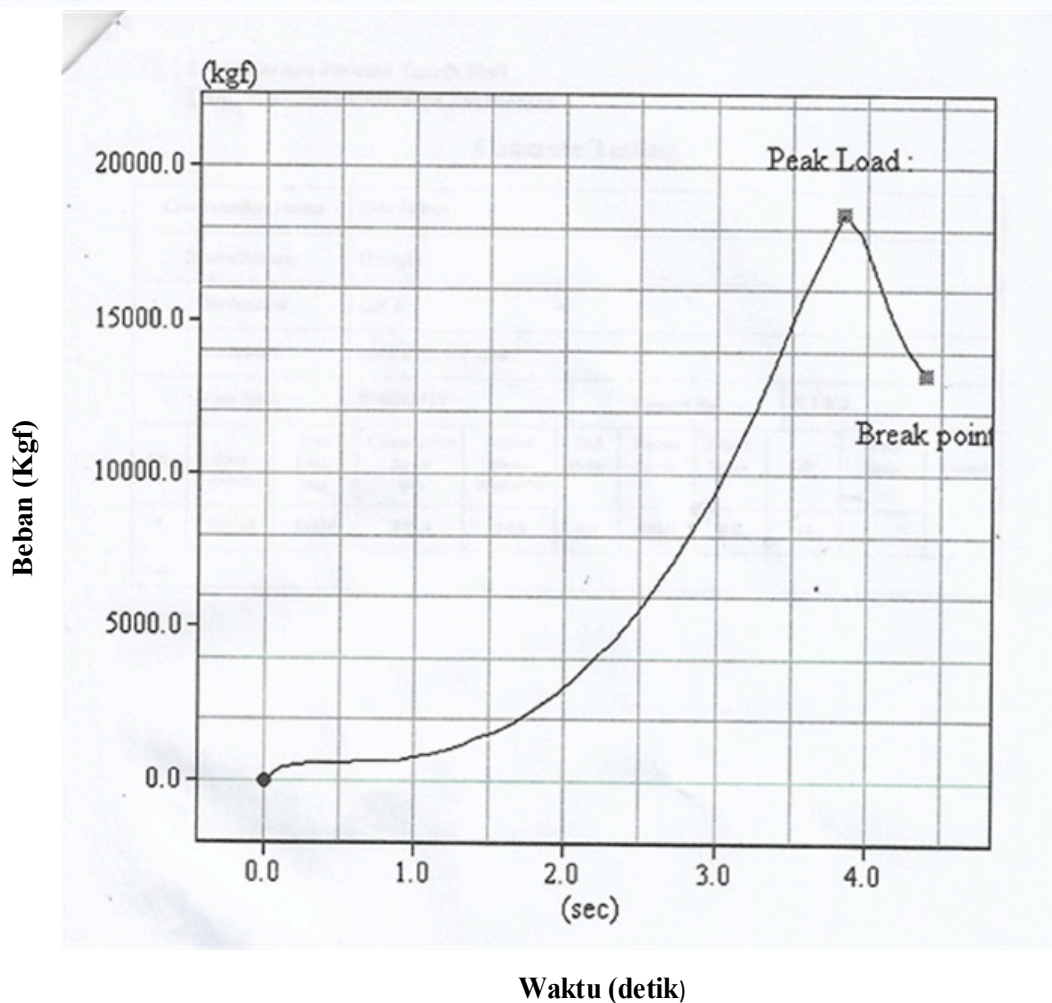


Gambar 4 Hubungan beban dan waktu benda uji TB0%Zt.1 (14).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Slidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		03/08/2019			Report No.			N 14/ 2		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	707.80	18480	371.3	14.8	0.5	300.0	0.6	14		

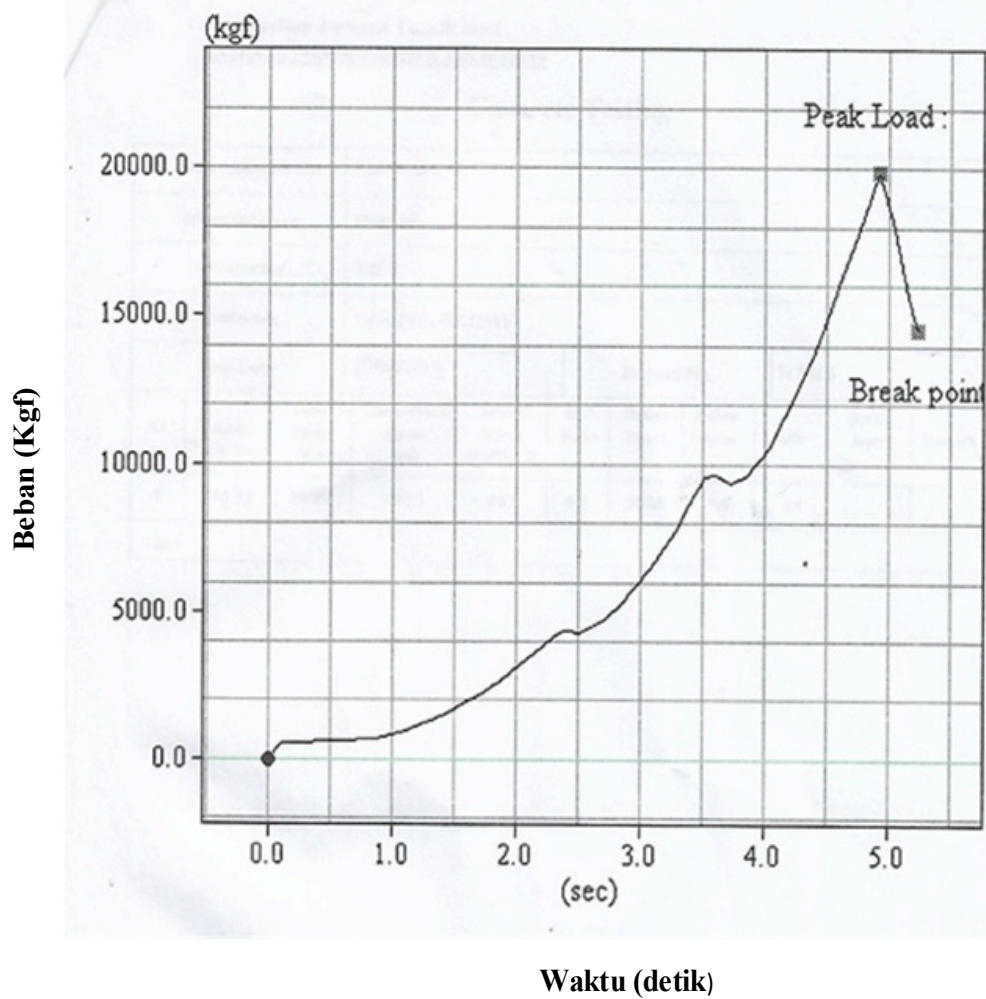


Gambar 5 Hubungan beban dan waktu benda uji belah TB0%Zt.2 (14).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Slidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		03/08/2019			Report No.			N 14/3		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	705.92	19860	400.1	15.8	0.5	300.0	0.6	14		

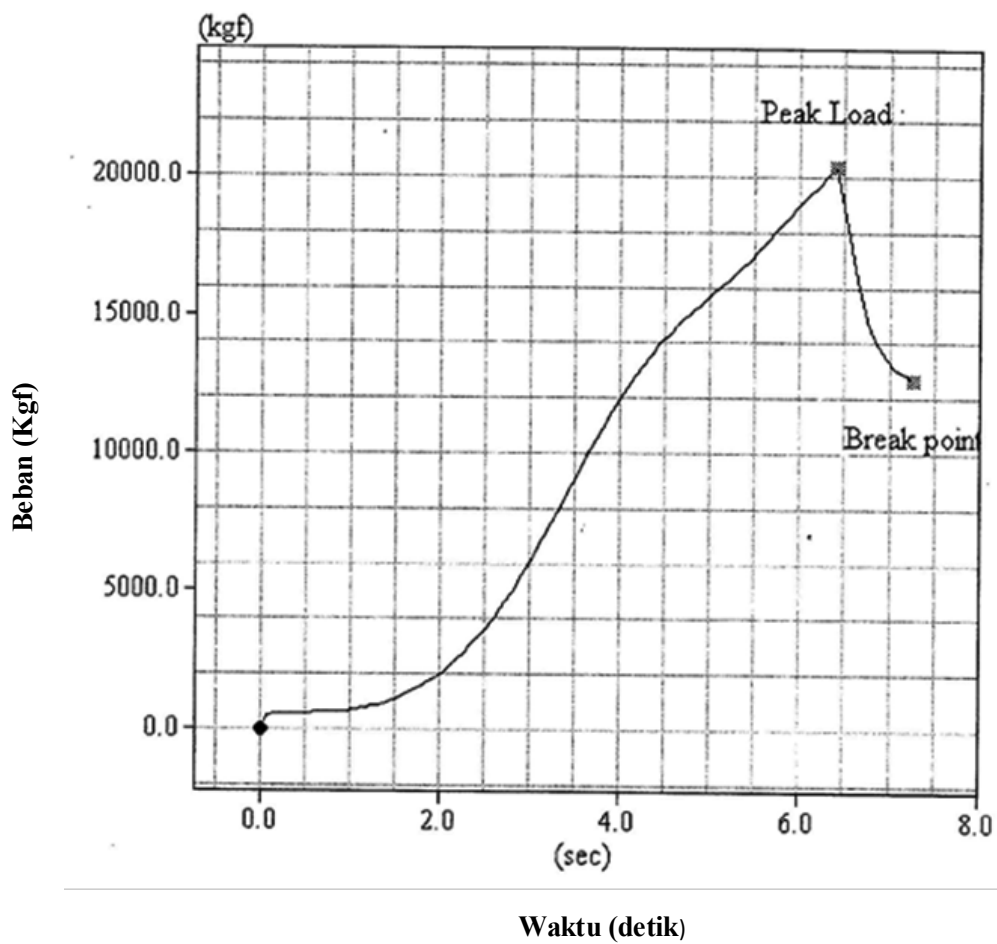


Gambar 6 Hubungan beban dan waktu benda uji TB0%Zt.3 (14).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Sldr Btn								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		03/18/2019			Report No.			N 1		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	672.88	20340	429.9	17.2	0.5	300.0	0.6	28		

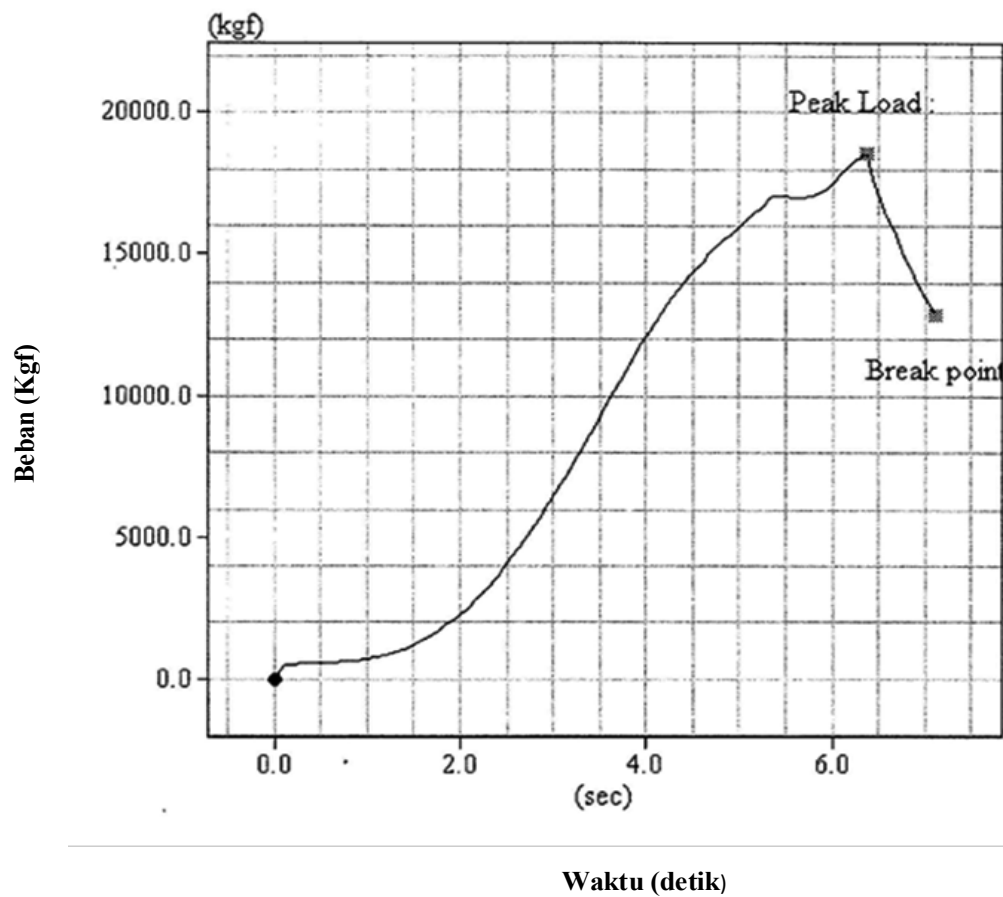


Gambar 7 Hubungan beban dan waktu benda uji TB0%Zt.1 (28).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Slidr Btn								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		03/18/2019			Report No.			N 2		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	684.42	18550	385.5	15.3	0.5	300.0	0.6	28		

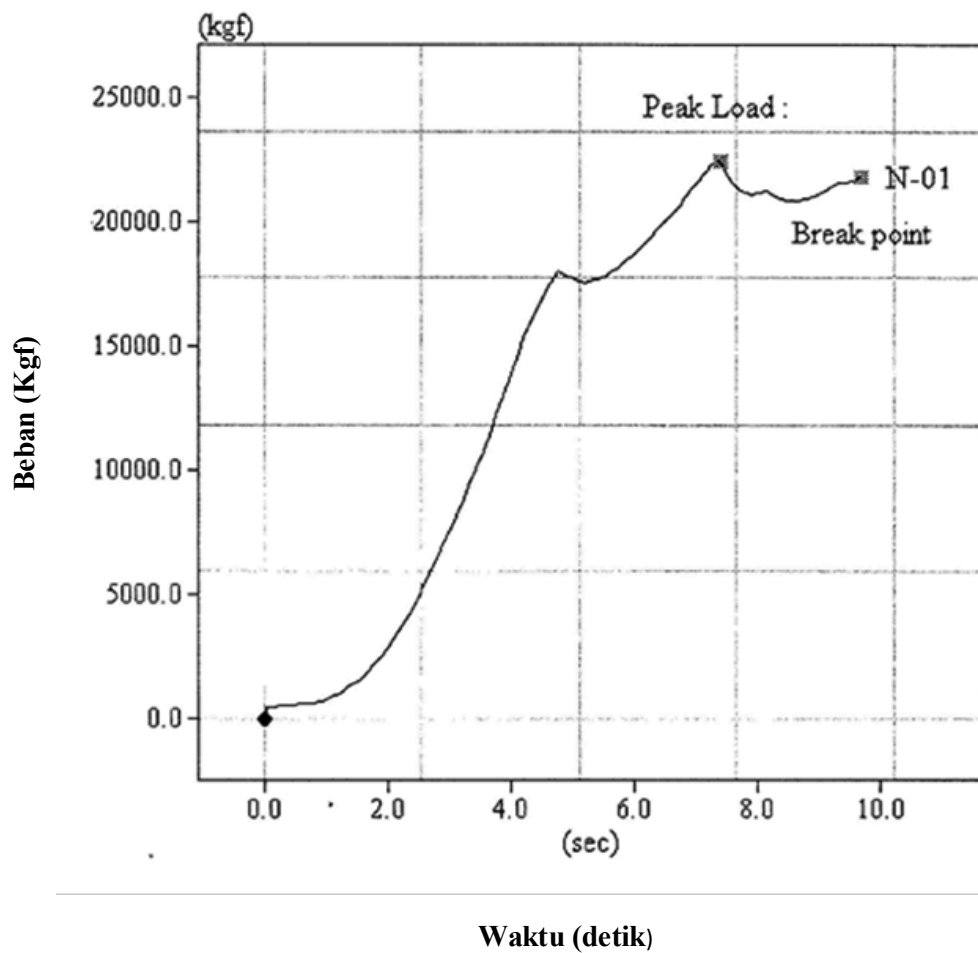


Gambar 8 Hubungan beban dan waktu benda uji TB0%Zt.2 (28).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Slidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/9/2019				Report No.		N		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	701.21	22440	455.1	18.0	0.5	300.0	0.6	28		

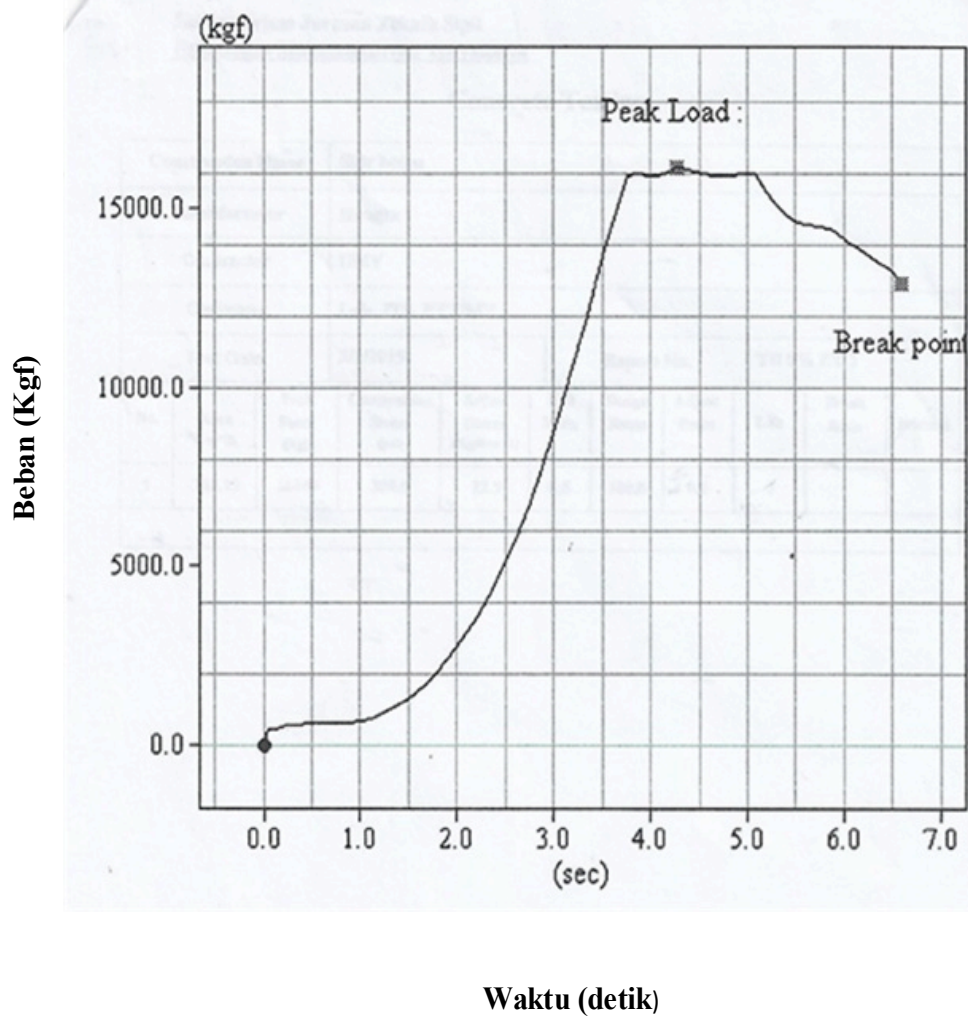


Gambar 9 Hubungan beban dan waktu benda uji TB0%Zt.3 (28).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Sldr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/1/2019			Report No.			TB 5% ZT 1		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	702.15	16140	326.9	12.9	0.5	300.0	0.6	7		

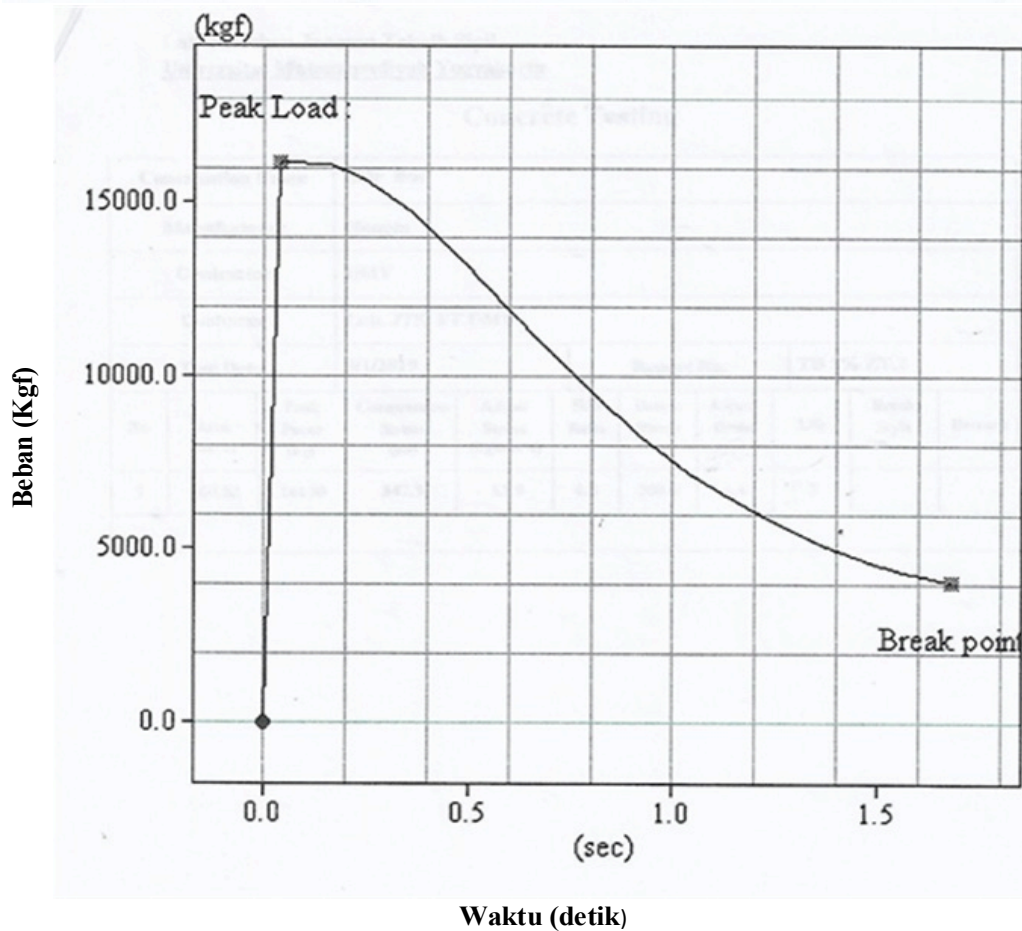


Gambar 10 Hubungan beban dan waktu TB5%Zt.1 (7).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Slidr Btm								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/1/2019			Report No.			TB 5% ZT.2		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	660.52	16130	347.3	13.9	0.5	300.0	0.6	7		

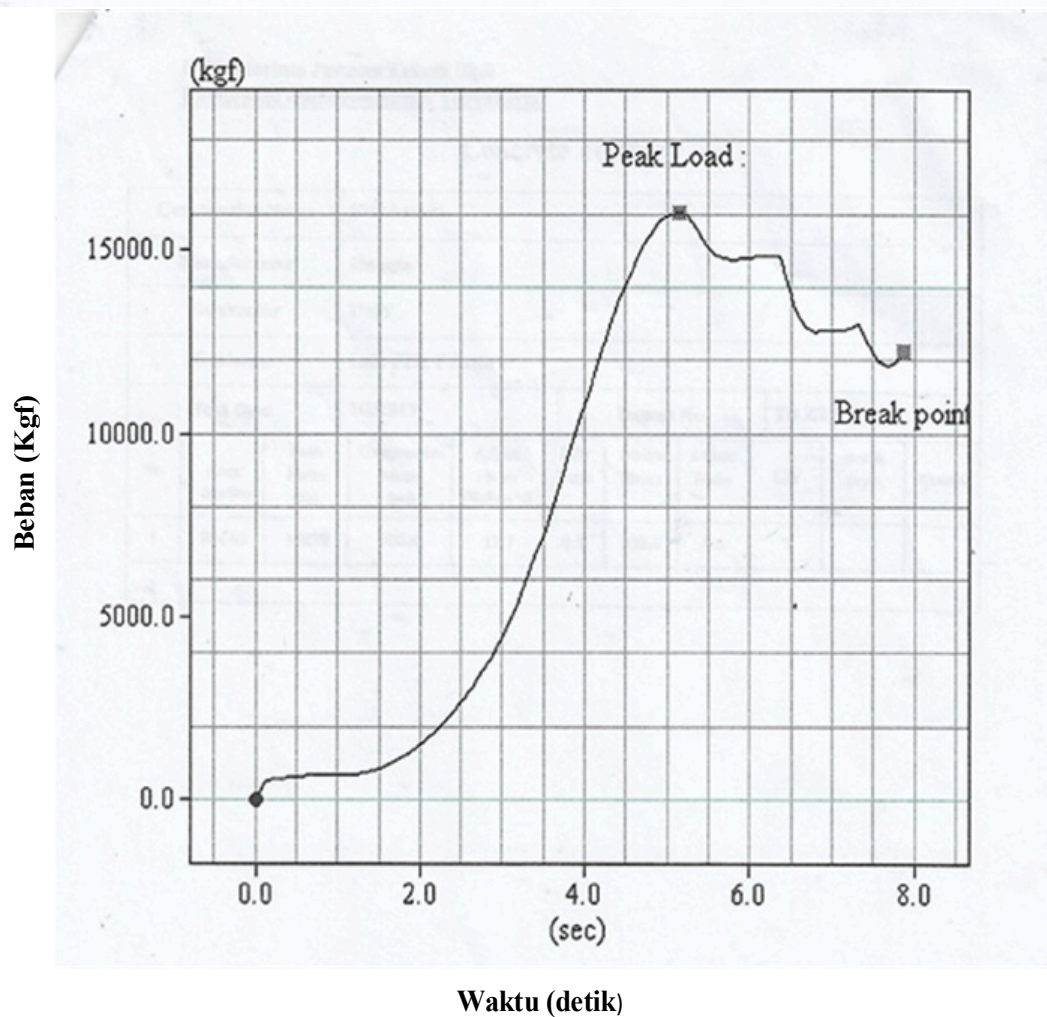


Gambar 11 Hubungan beban dan waktu benda uji TB5%Zt.2 (7).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Slidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/1/2019			Report No.			TB ZT 5% 3		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	704.03	16020	323.6	12.7	0.5	300.0	0.6	7		

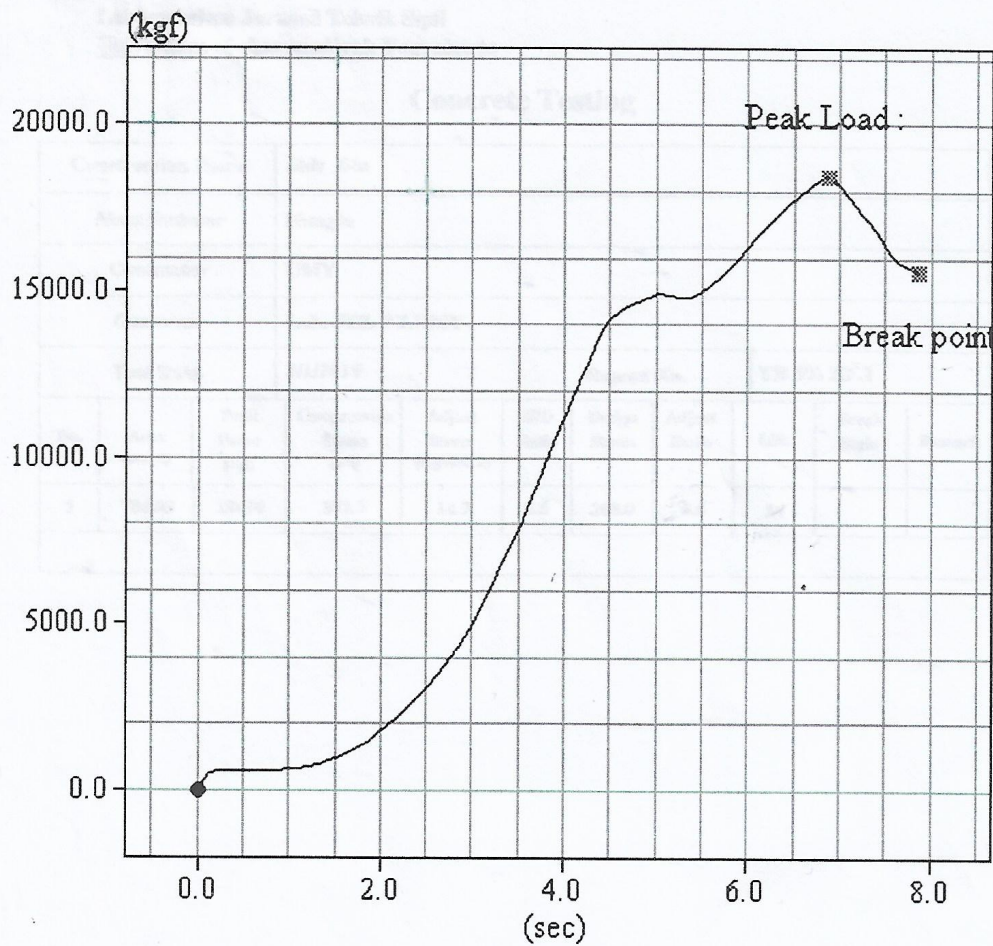


Gambar 12 Hubungan beban dan waktu TB5%Zt.3 (7).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Sldr Bta								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/1/2019			Report No.			TB 5% ZT.1		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	704.03	18430	372.3	14.7	0.5	300.0	0.6	14		

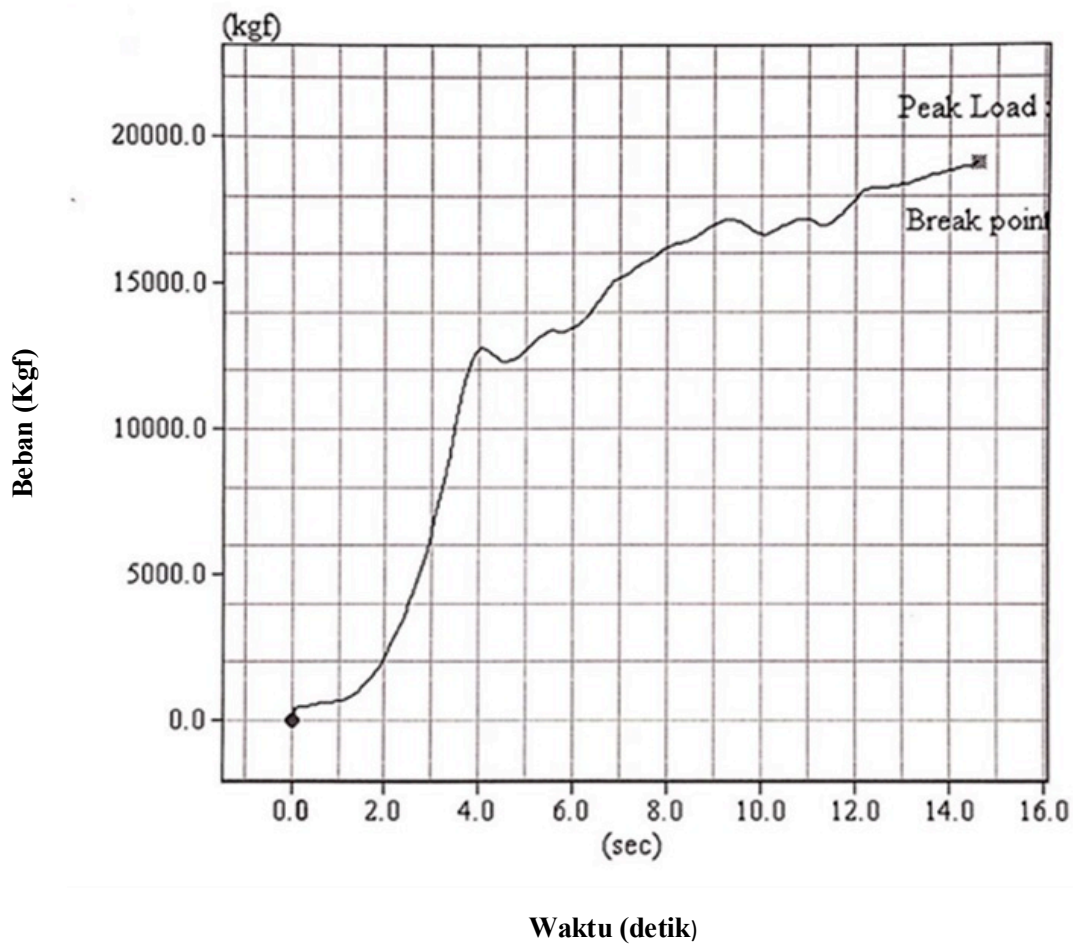


Gambar 13 Hasil pengujian kuat tarik belah TB5%Zt.1 (14).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Slidr Btn								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/1/2019			Report No.			TB 5% ZT.2		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	706.86	19100	384.3	15.1	0.5	300.0	0.6	14		

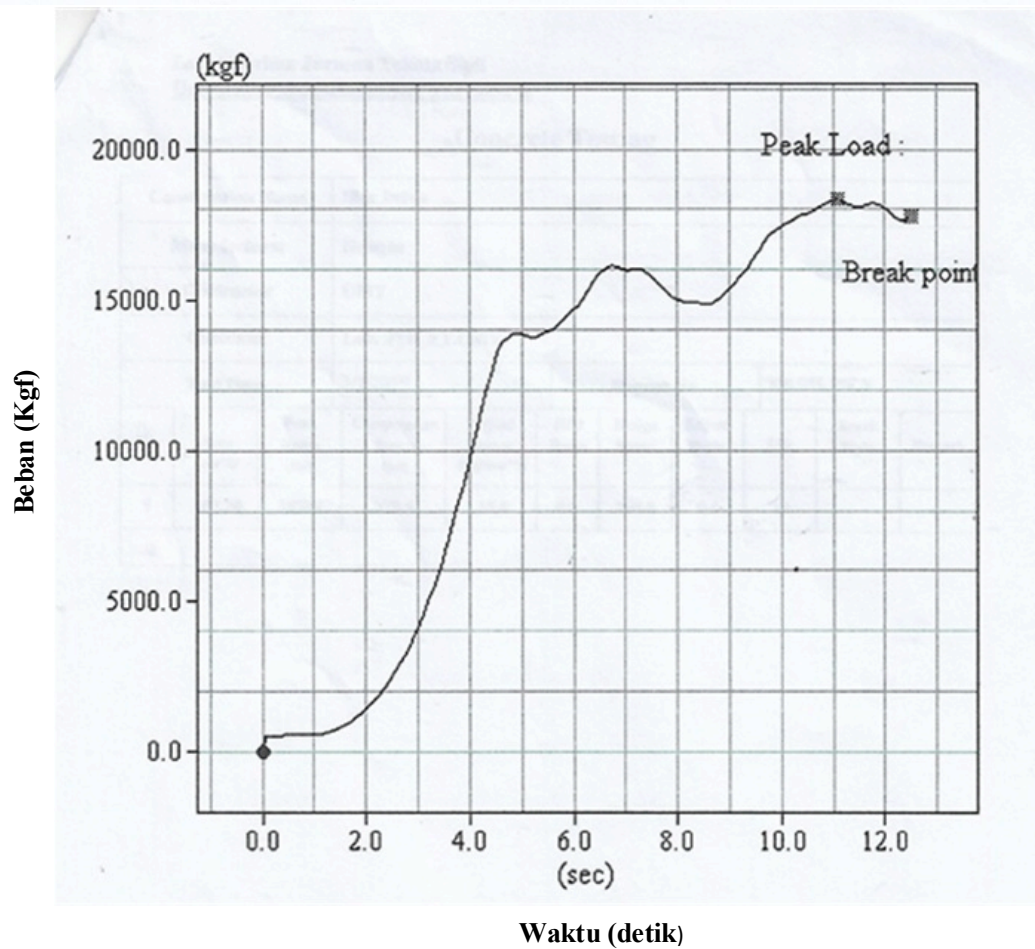


Gambar 14 Hubungan beban dan waktu benda uji TB5%Zt.2 (14).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Slidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/1/2019			Report No.			TB5% ZT.3		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	687.20	18330	379.4	15.0	0.5	300.0	0.6	14		

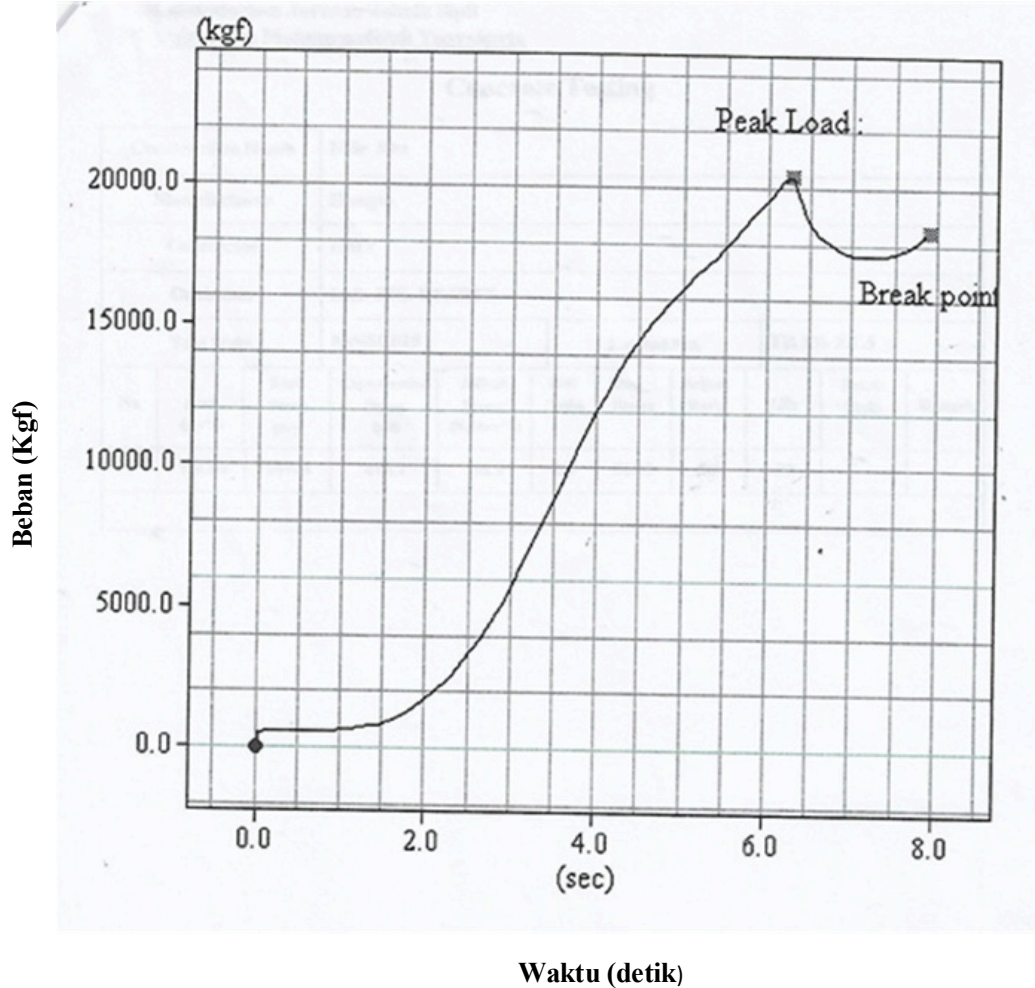


Gambar 15 Hubungan beban dan waktu beda uji TB5%Zt.3 (14).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Sidr Bta								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		03/08/2019			Report No.			TB 5% ZT.1		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	701.68	20410	413.7	16.3	0.5	300.0	0.6	28		

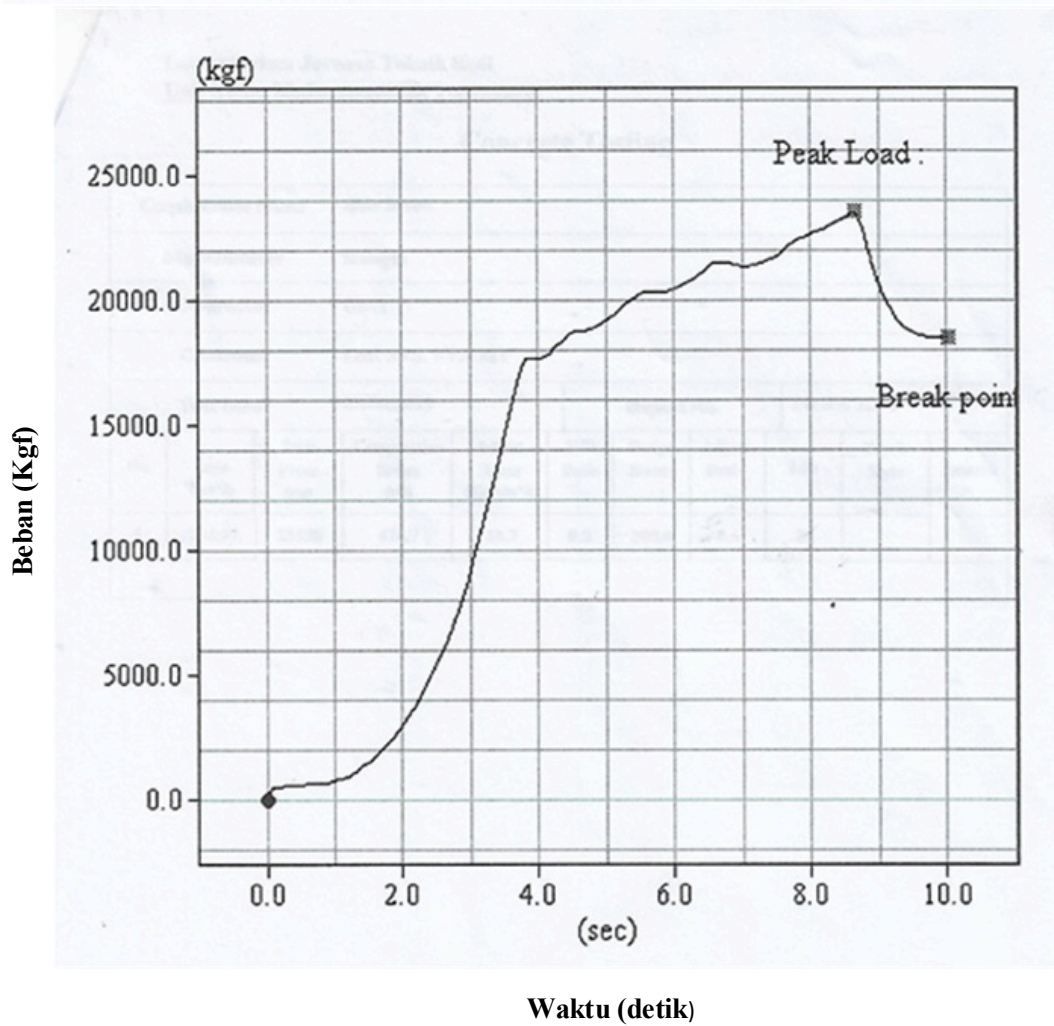


Gambar 16 Hubungan beban dan waktu benda uji TB5%Zt.1 (28).

**Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta**

Concrete Testing

Construction Name		Sidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		03/08/2019			Report No.			TB 5% ZT 2		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	704.97	23530	474.7	18.7	0.5	300.0	0.6	28		

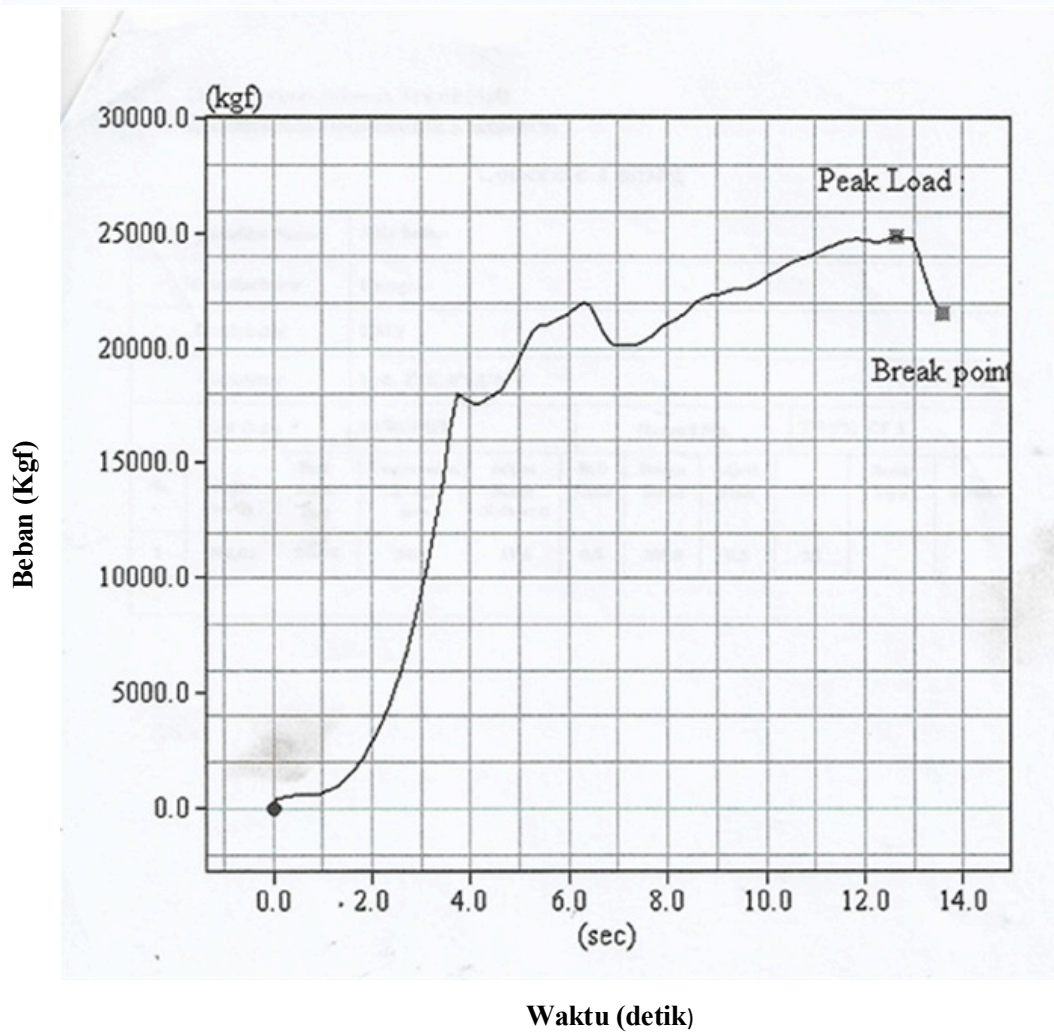


Gambar 17 Hubungan beban dan waktu benda uji TB5%Zt.2 (28).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Sidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		03/08/2019			Report No.			TB 5% ZT 3		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	704.03	24870	502.4	19.8	0.5	300.0	0.6	28		

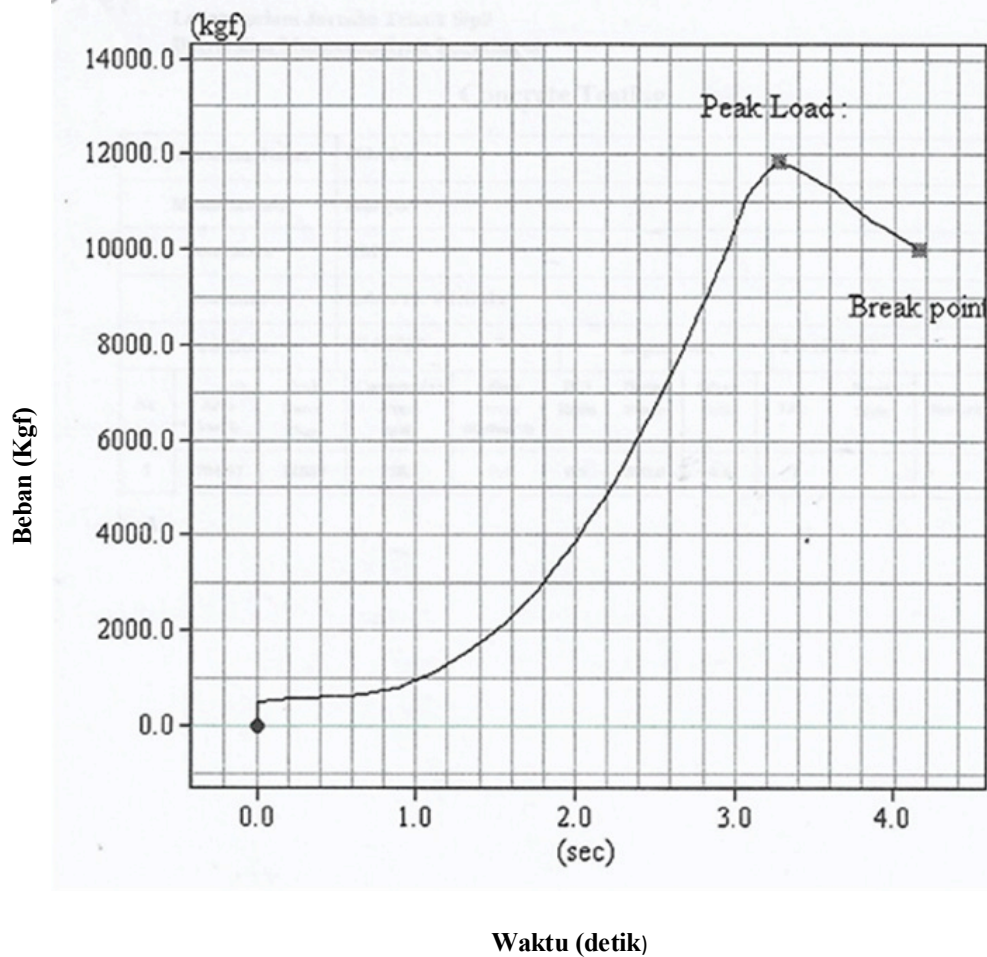


Gambar 18 Hubungan beban dan waktu benta uji TB5%Zt.3 (28).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Slidr Bin								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/14/2019			Report No.			TB 10% ZT		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	704.97	11830	238.7	9.4	0.5	300.0	0.6	7		

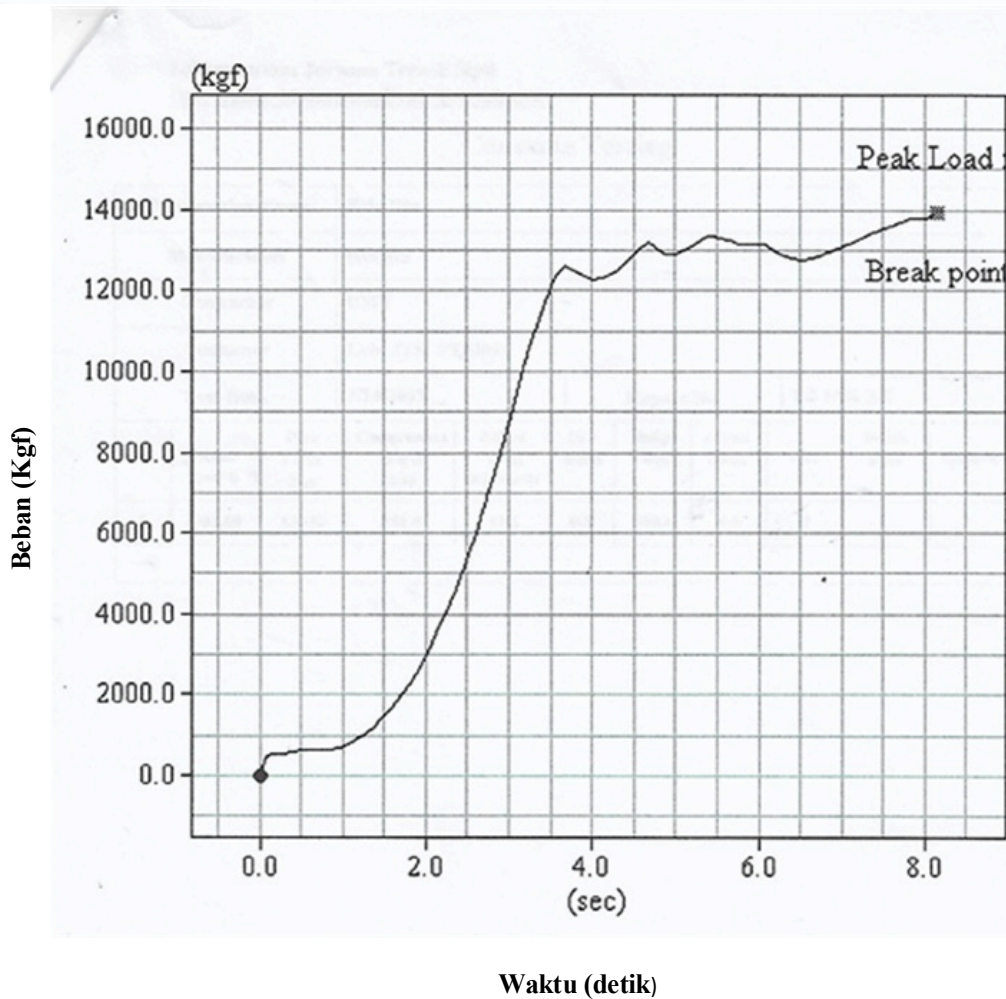


Gambar 19 Hubungan beban dan waktu benda uji TB10%Zt.1 (7).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Sldr Btn								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/14/2019			Report No.			TB 10% ZT		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	703.09	13920	281.6	11.1	0.5	300.0	0.6	7		

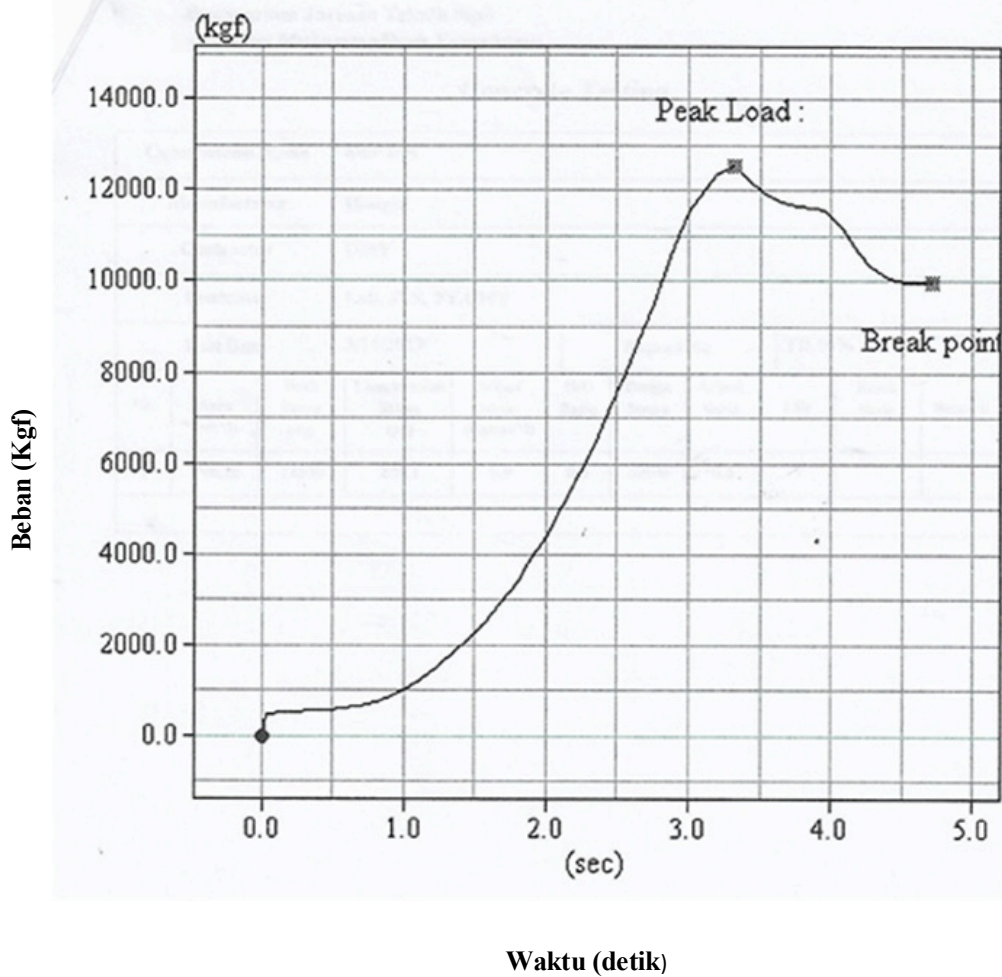


Gambar 20 Hubungan beban dan waktu benda uji TB10%Zt.2 (7).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Sldr Btn								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/14/2019			Report No.			TB 10% ZT		
No.	Arca (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	706.86	12530	252.1	9.9	0.5	300.0	0.6	7		

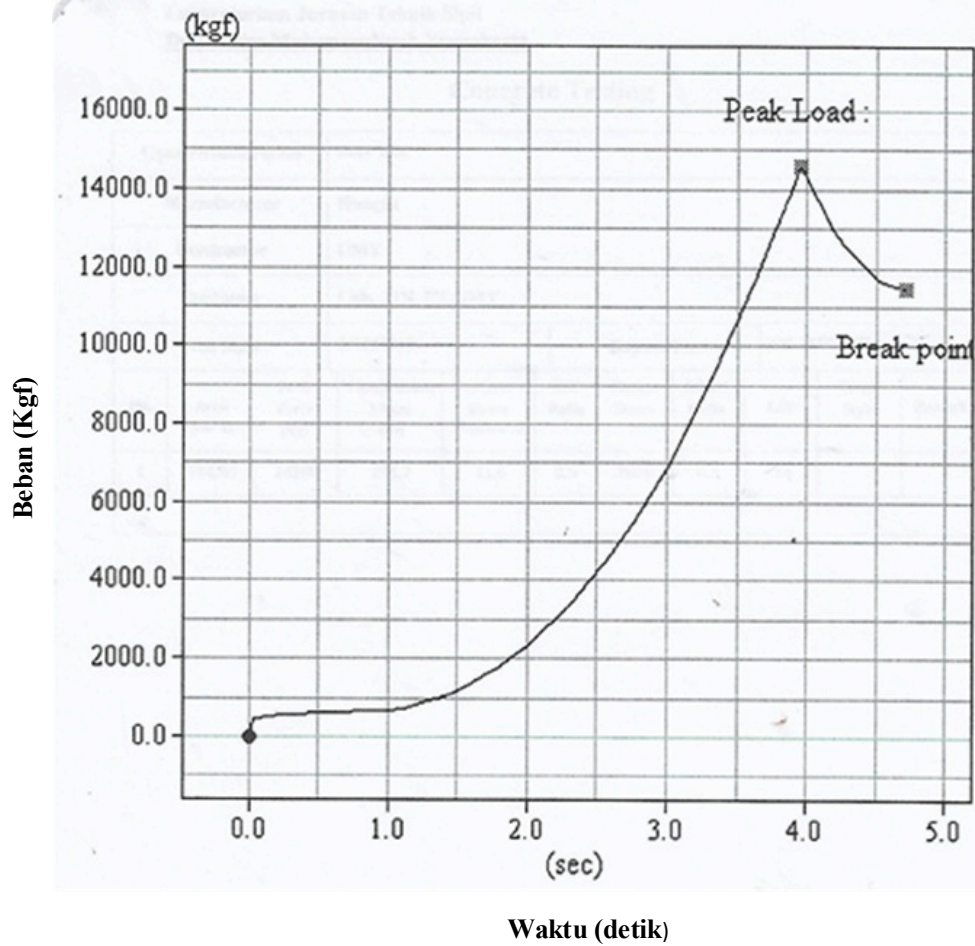


Gambar 21 Hubungan beban dan waktu benda uji TB10%Zt.3 (7).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Sldr Btn								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/13/2019				Report No.			TB 10% ZT	
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	704.03	14590	294.7	11.6	0.5	300.0	0.6	14		

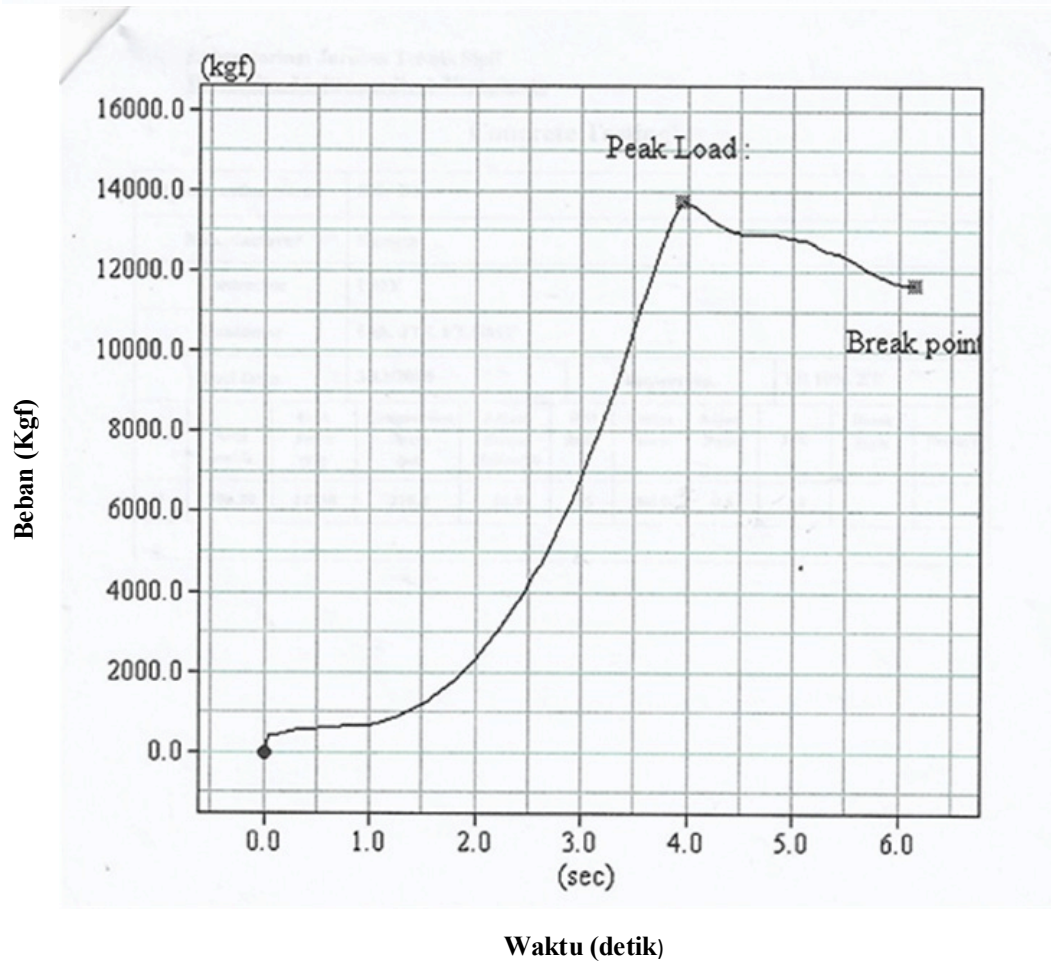


Gambar 22 Hubungan beban dan waktu benda uji TB10%Zt.1 (14).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Sidr Bta								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/13/2019			Report No.			TB 10% ZT		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	706.39	13730	276.4	10.9	0.5	300.0	0.6	14		

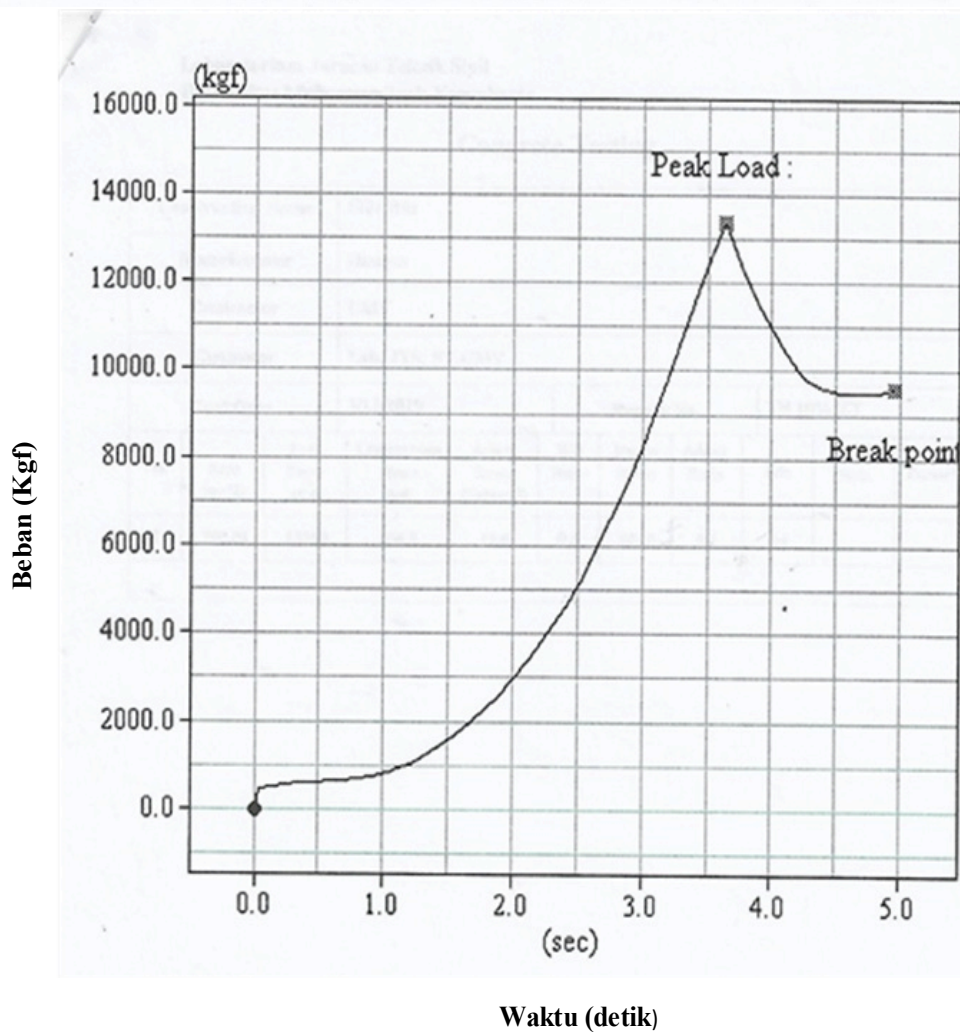


Gambar 23 Hubungan beban dan waktu benda uji TB10%Zt.2 (14).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Sldr Bin								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/13/2019			Report No.			TB 10% ZT		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	706.86	13360	268.8	10.6	0.5	300.0	0.6	14		

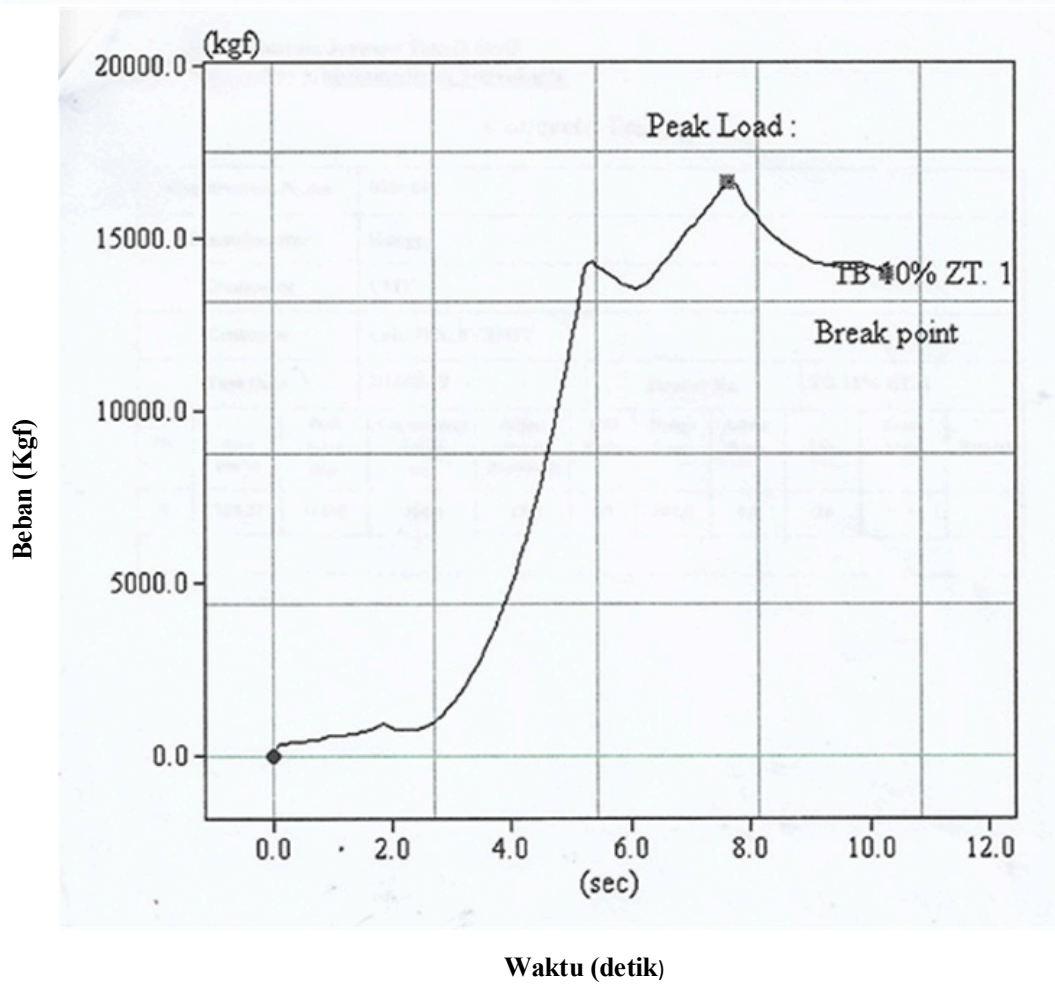


Gambar 24 Hubungan beban dan waktu benda uji TB10%Zt.3 (14).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Slidr bta								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		2/15/2019			Report No.			TB 10% ZT. 1		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	708.27	16650	334.3	13.2	0.5	300.0	0.6	28		

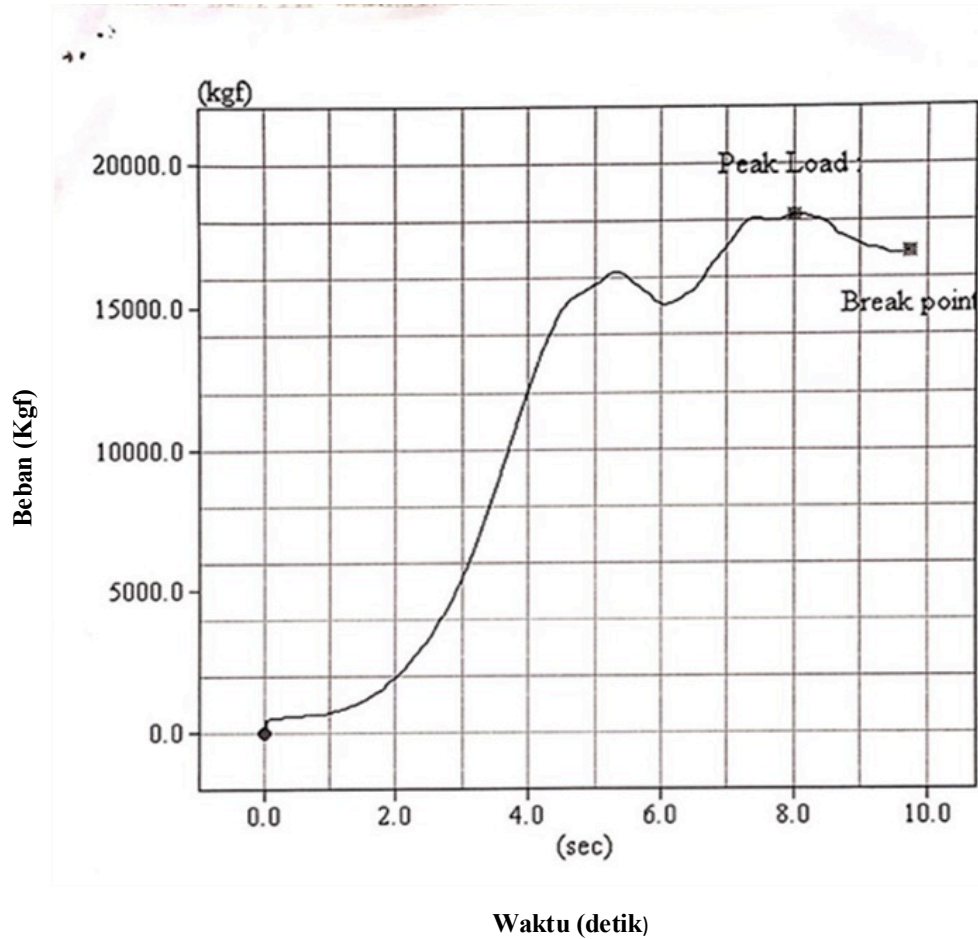


Gambar 25 Hubungan beban dan waktu benda uji TB10%Zt.1 (28).

Laboratorium Jurusan Teknik Sipil
Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Slidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		2/15/2019			Report No.			TB 10% ZT. 2		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	700.28	18190	369.4	14.6	0.5	300.0	0.6	28		

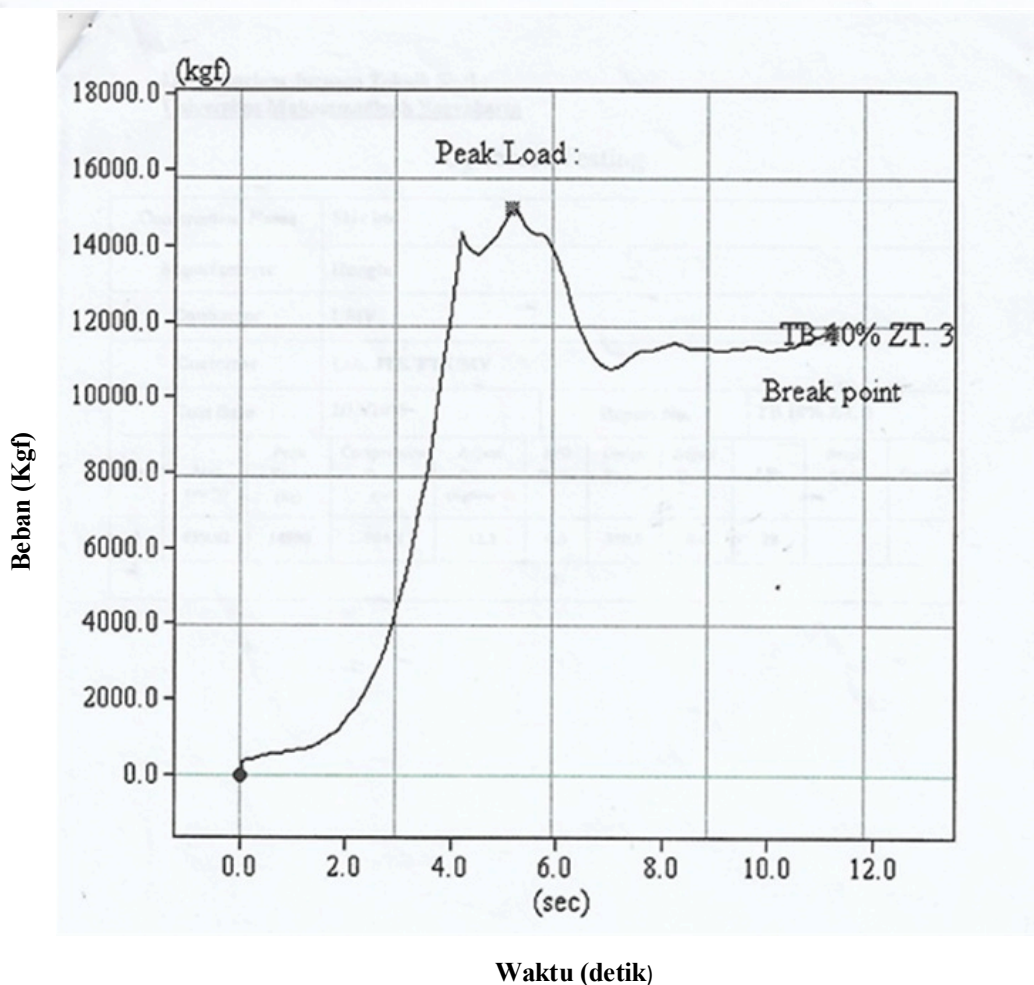


Gambar 26 Hubungan beban dan waktu benda uji TB10%Zt.2 (28).

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Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Slidr btm								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		2/15/2019			Report No.			TB 10% ZT. 3		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	699.81	14980	304.4	12.1	0.5	300.0	0.6	28		

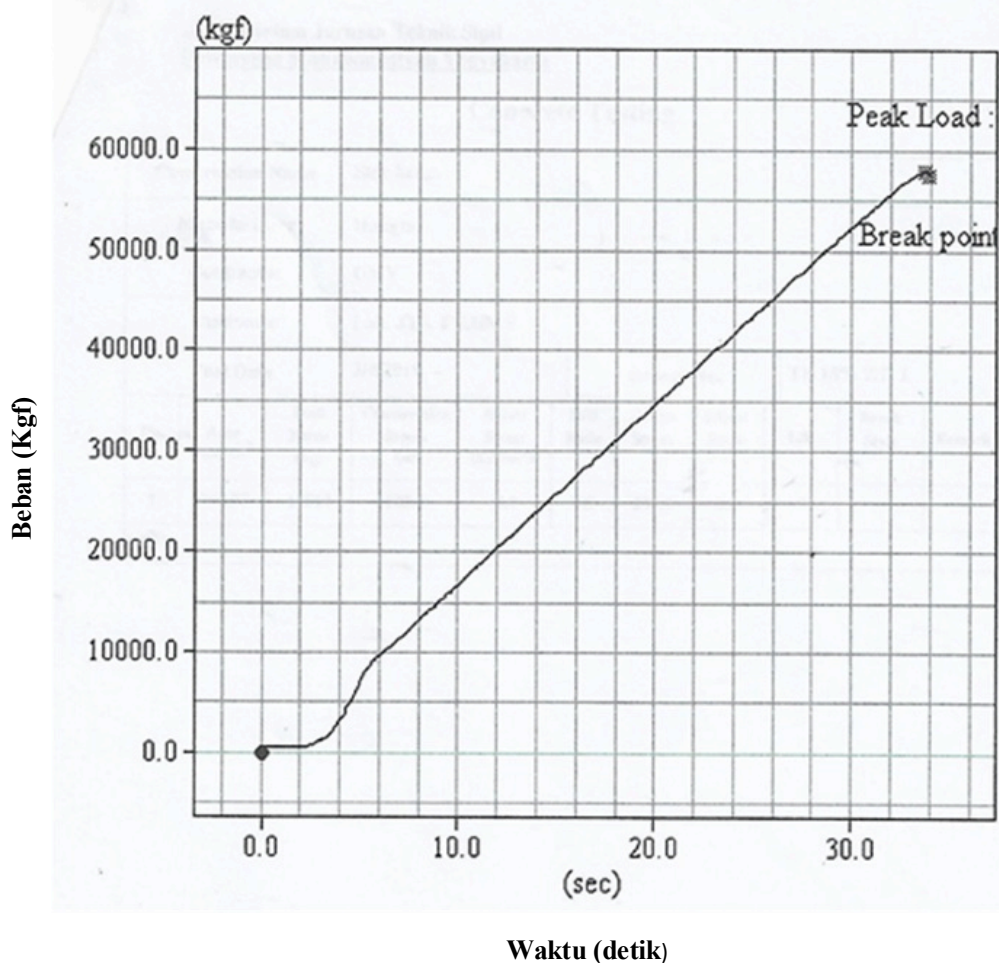


Gambar 27 Hubungan beban dan waktu benda uji belah TB10%Zt.3 (28).

Laboratorium Jurusan Teknik Sipil
 Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Slidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/9/2019			Report No.			TB 15% ZT. 1		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	704.97	11010	222.1	8.7	0.5	300.0	0.6	7		

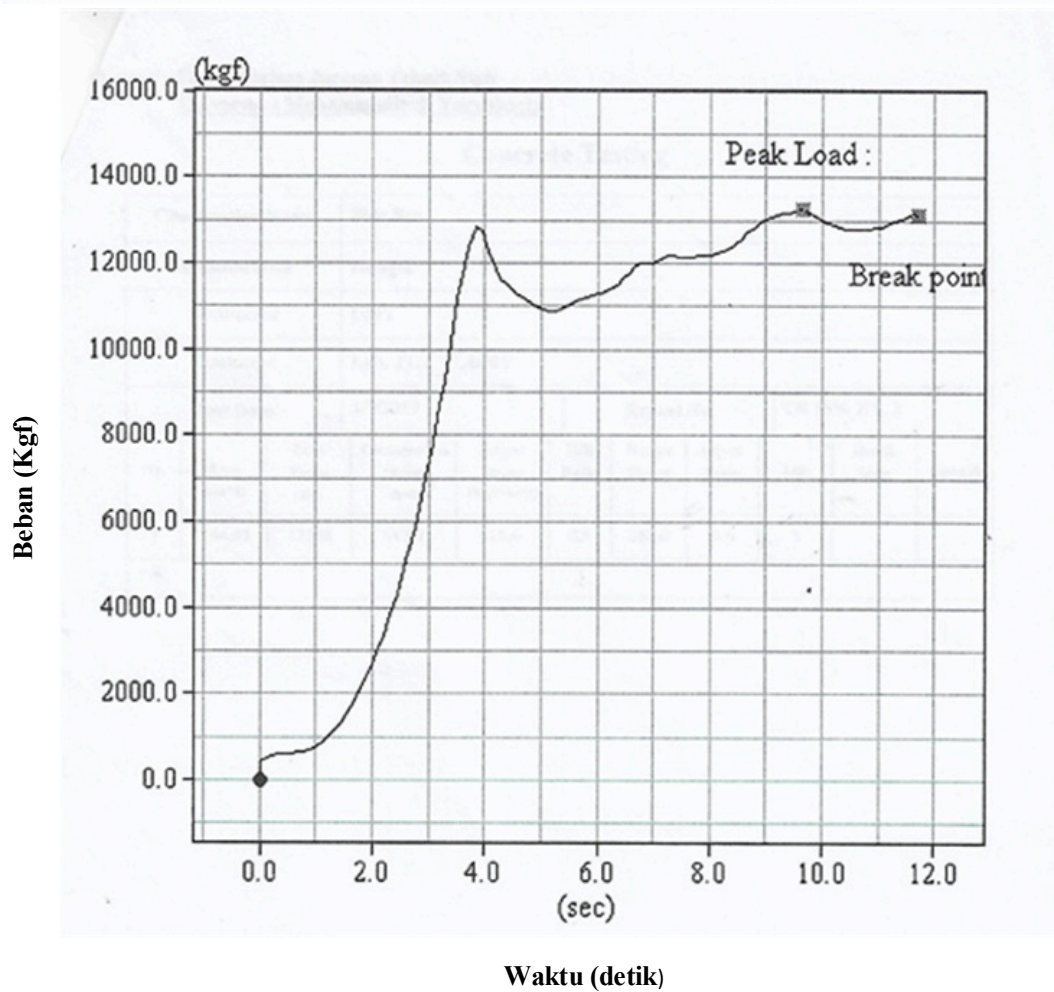


Gambar 28 Hubungan beban dan waktu benda uji TB15%Zt.1 (7).

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Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Sldr Btm								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/9/2019			Report No.			TB 15% ZT. 2		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	704.03	13250	267.7	10.6	0.5	300.0	0.6	7		

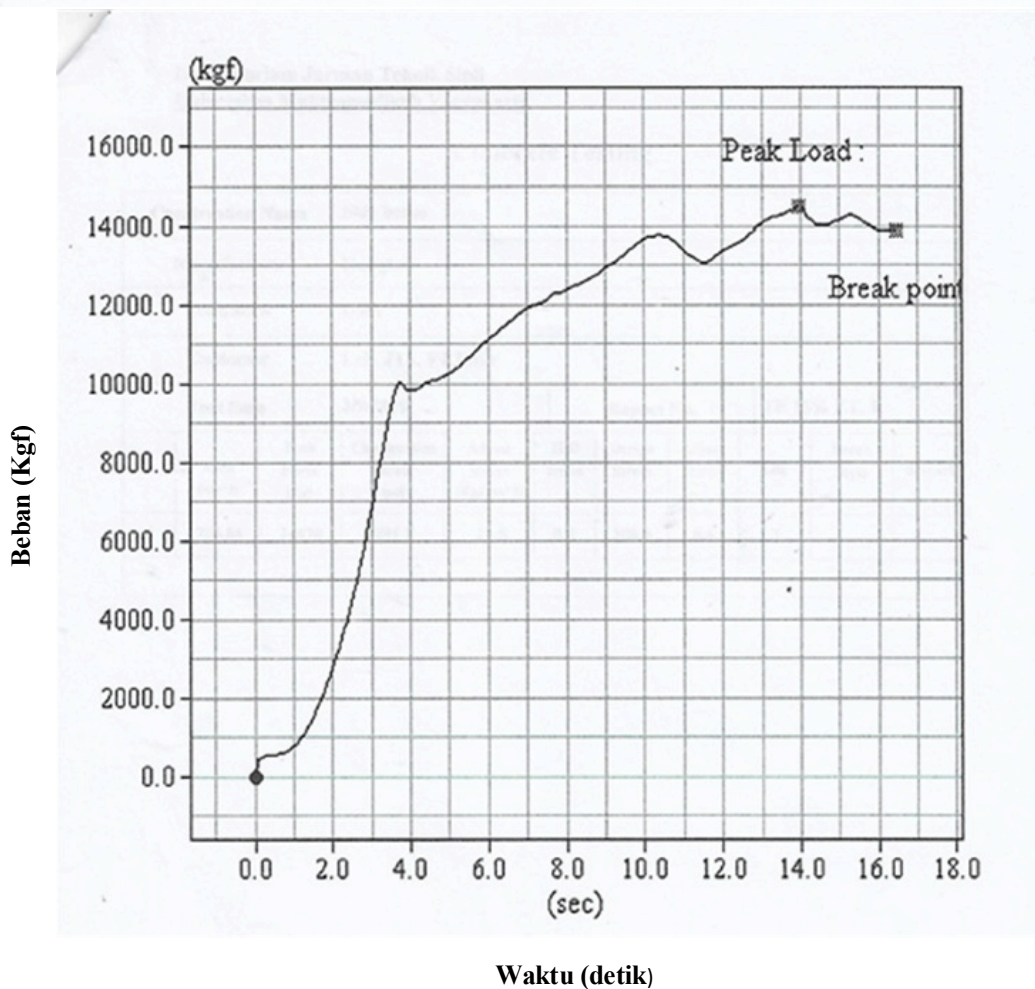


Gambar 29 Hubungan beban dan waktu benda uji TB15%Zt.2 (7).

Laboratorium Jurusan Teknik Sipil
 Universitas Muhammadiyah Yogyakarta

Concrete Testing

Construction Name		Sidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/9/2019			Report No.			TB 15% ZT. 3		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	706.86	14470	291.2	11.5	0.5	300.0	0.6	7		

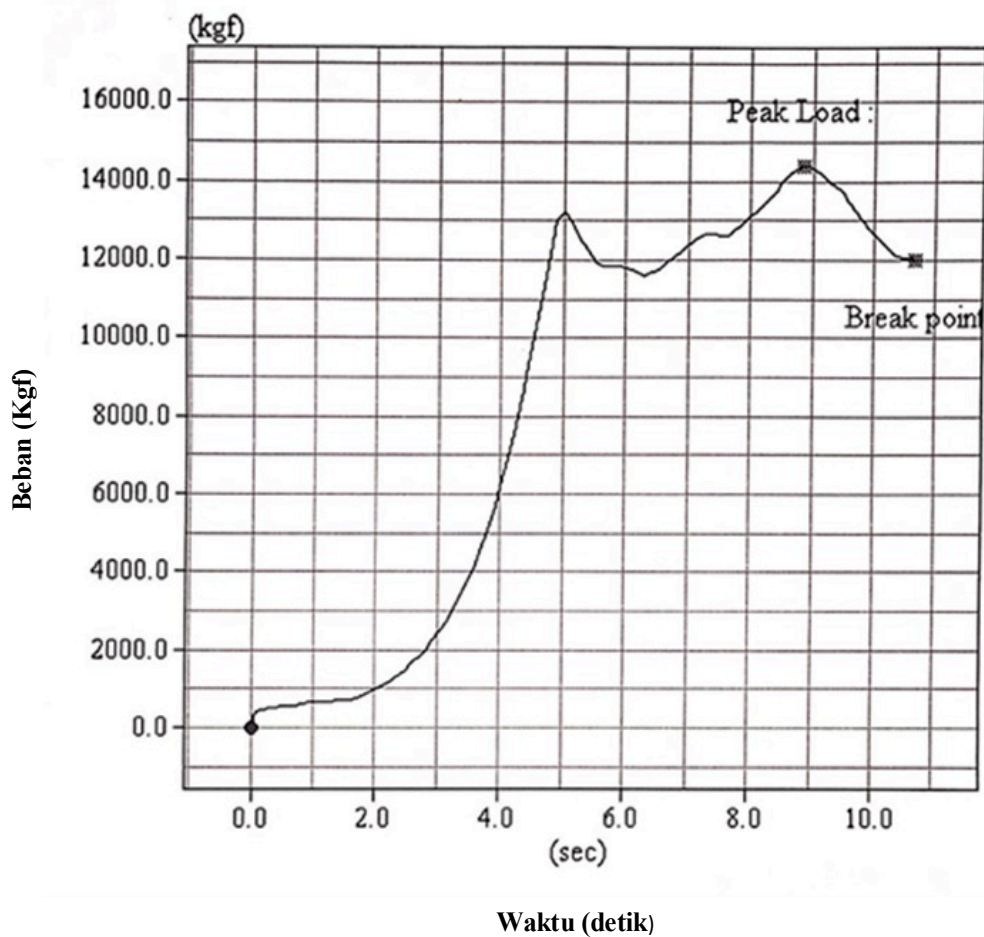


Gambar 30 Hubungan beban dan waktu benda uji TB15%Zt.3 (7).

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Concrete Testing

Construction Name		Slidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		2/22/2019			Report No.			TB 15% ZT. 1 belah		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	706.86	14370	289.1	11.4	0.5	300.0	0.6	14		

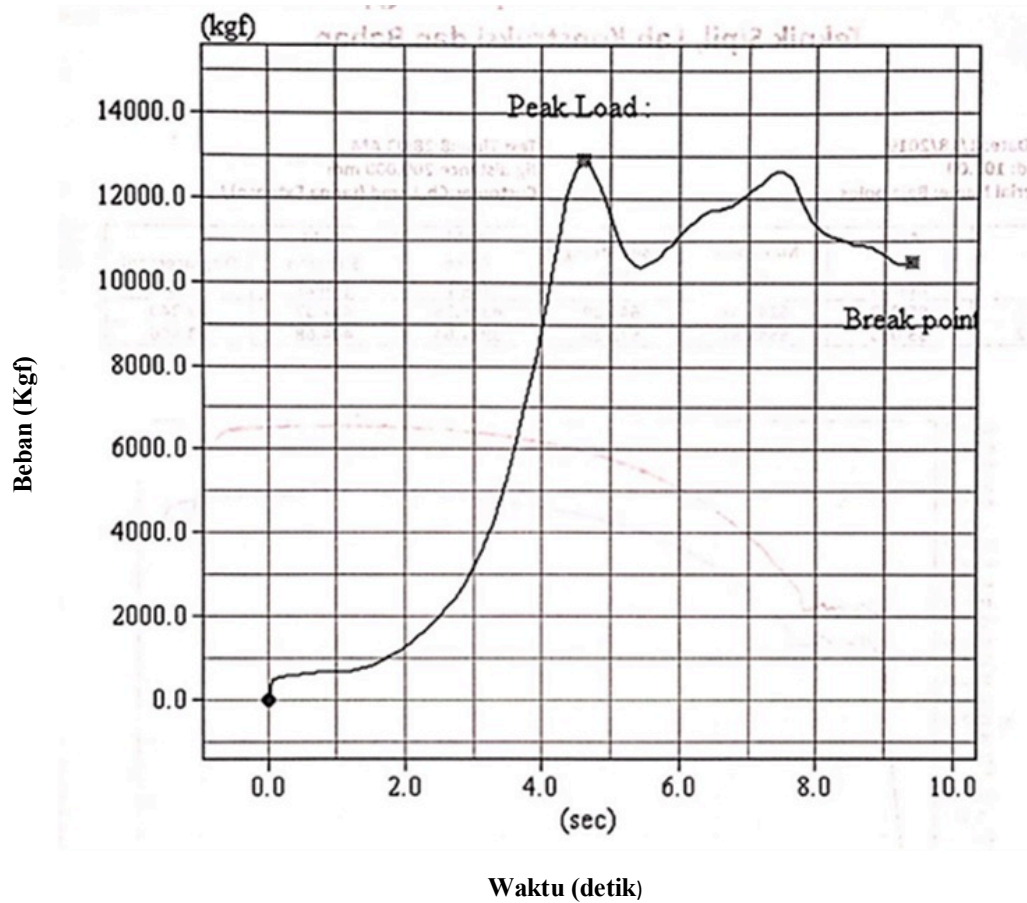


Gambar 31 Hubungan beban dan waktu benda uji TB15%Zt.1 (14).

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Concrete Testing

Construction Name		Slidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		2/22/2019			Report No.			TB 15% ZT. 2 belah		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	678.87	12890	270.1	10.7	0.5	300.0	0.6	14		

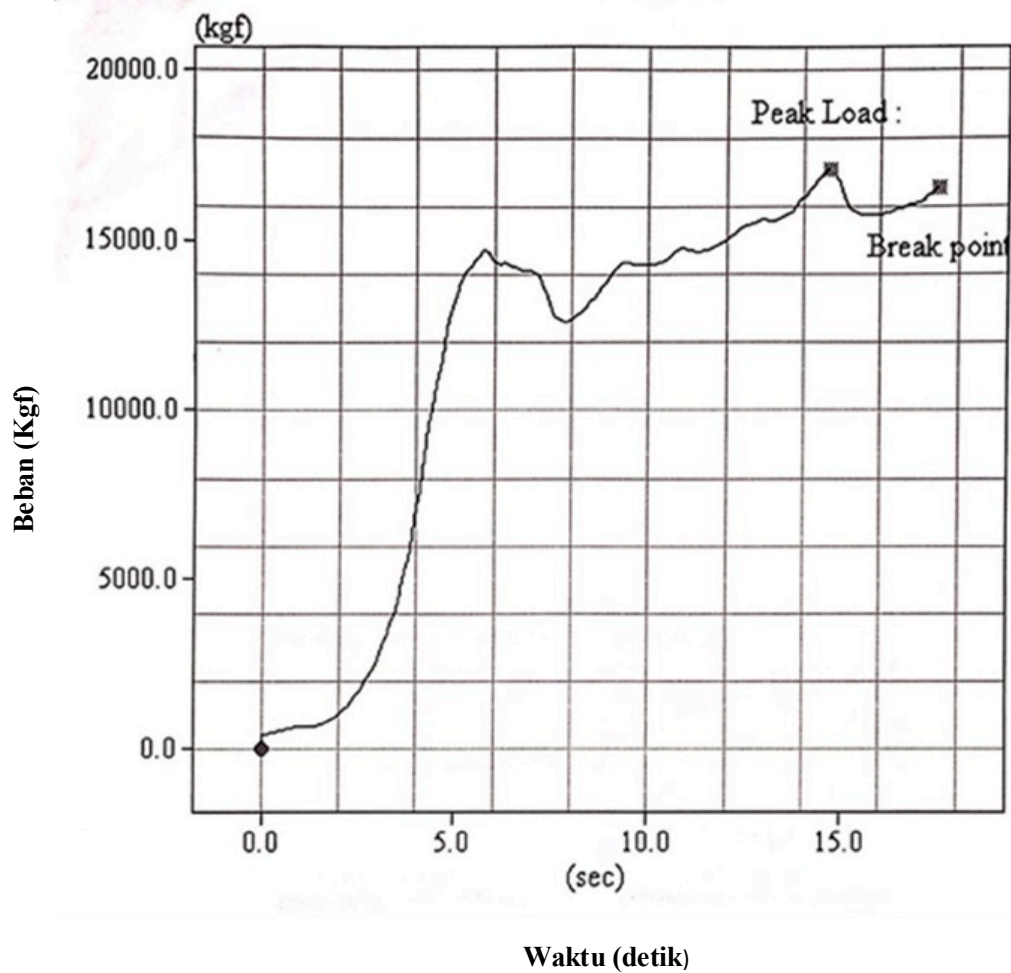


Gambar 32 Hubungan beban dan waktu benda uji TB15%Zt.2 (14).

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Concrete Testing

Construction Name		Slidr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		2/22/2019			Report No.			TB 15% ZT. 3 belah		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	697.46	17080	348.3	13.7	0.5	300.0	0.6	14		

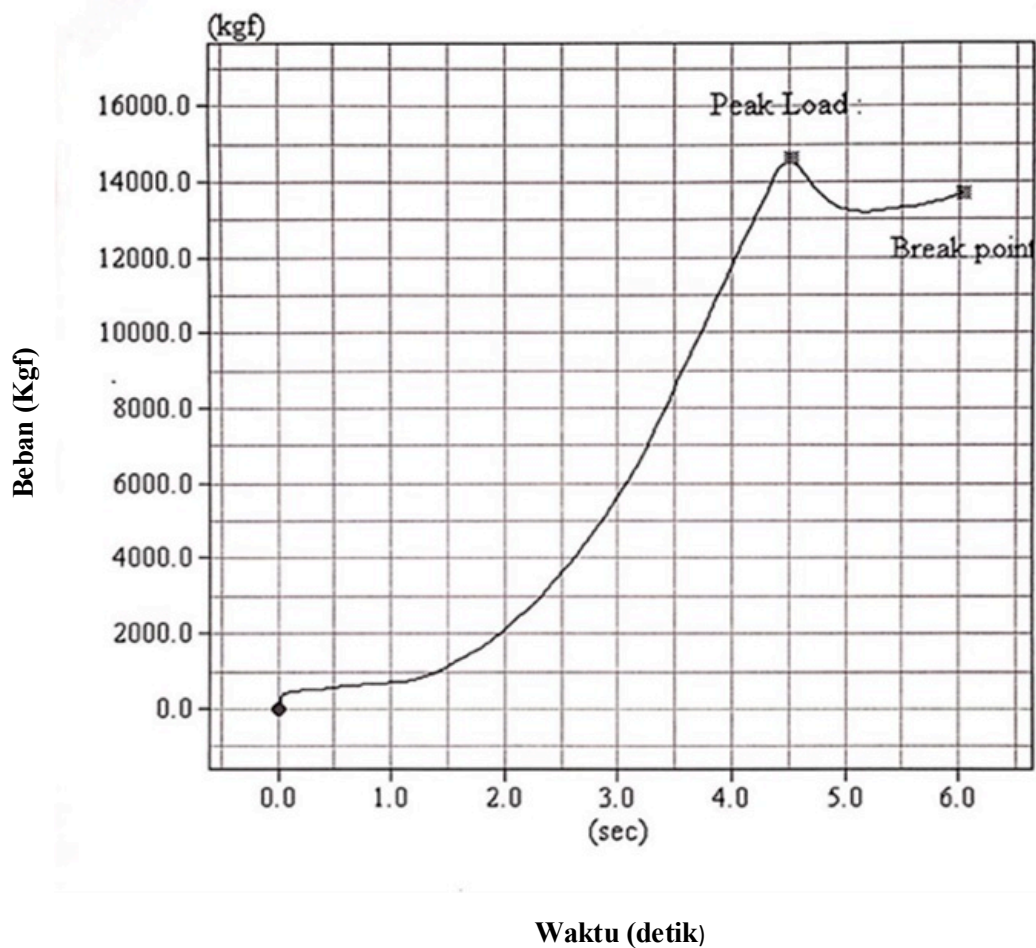


Gambar 33 Hubungan beban dan waktu benda uji TB15%Zt.3 (14).

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Concrete Testing

Construction Name		Slidr Btn								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/9/2019			Report No.			TB 15% ZT. 1		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	706.86	14600	293.8	11.6	0.5	300.0	0.6	28		

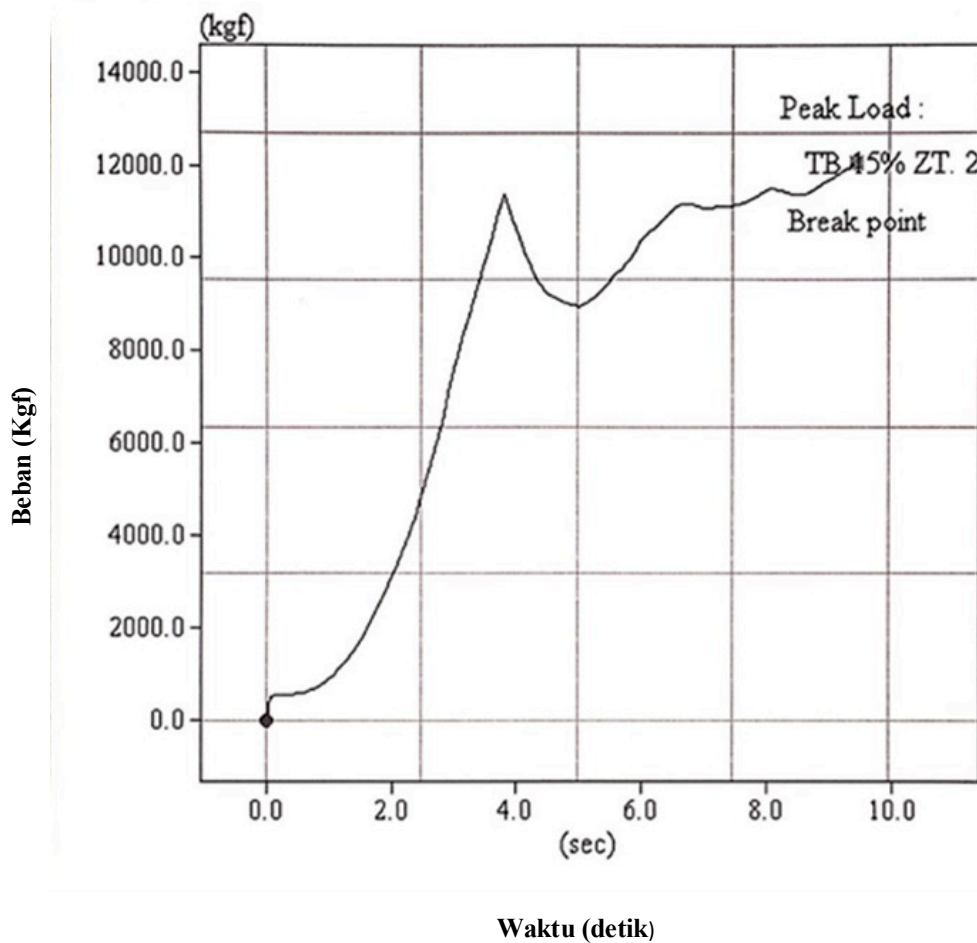


Gambar 34 Hubungan beban dan waktu benda uji TB15%Zt.1 (28).

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Concrete Testing

Construction Name		Sldr beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/9/2019			Report No.			TB 15% ZT. 2		
No.	Arca (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	708.27	12050	242.0	9.6	0.5	300.0	0.6	28		

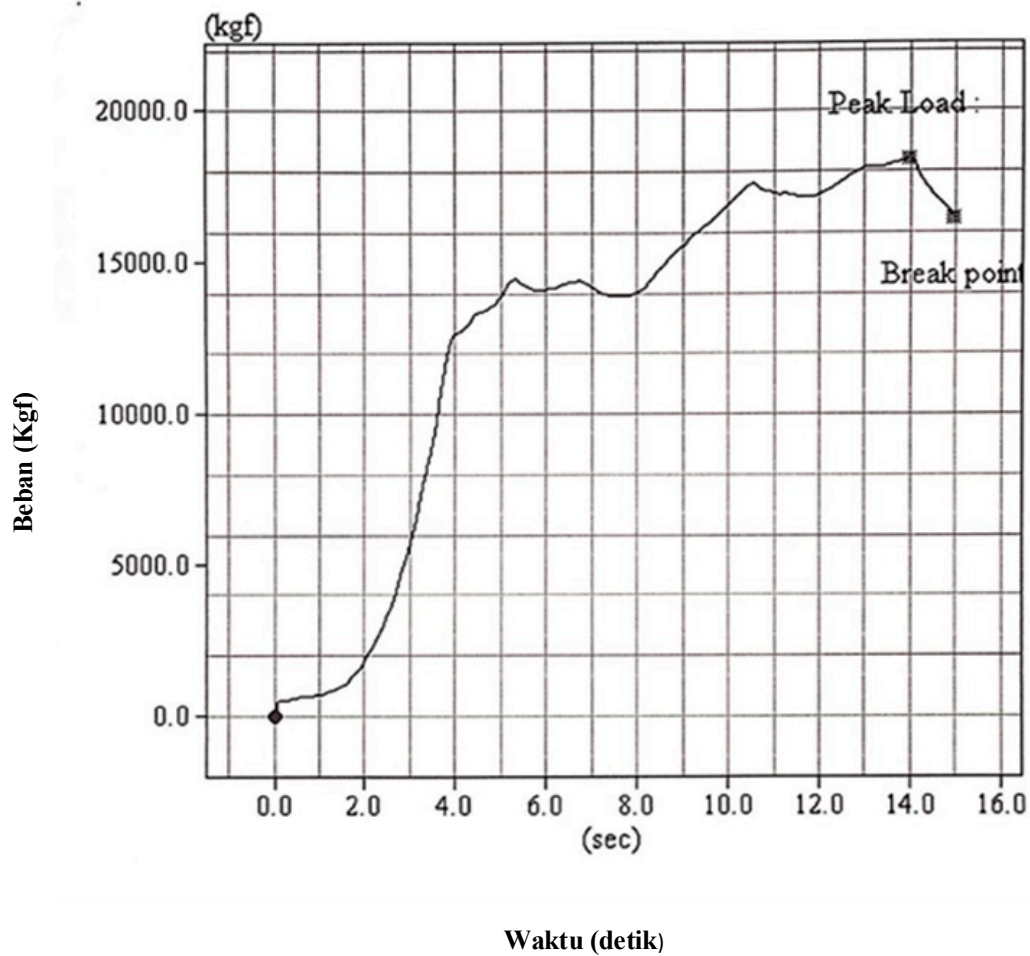


Gambar 35 Hubungan beban dan waktu benda uji TB15%Zt.2 (28).

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Concrete Testing

Construction Name		Sldr btn								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		3/9/2019			Report No.			TB 15% ZT. 3		
No.	Area (cm ²)	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm ²)	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	704.97	18370	370.6	14.6	0.5	300.0	0.6	28		



Gambar 36 Hubungan beban dan waktu benda uji belah TB15%Zt.3 (28).