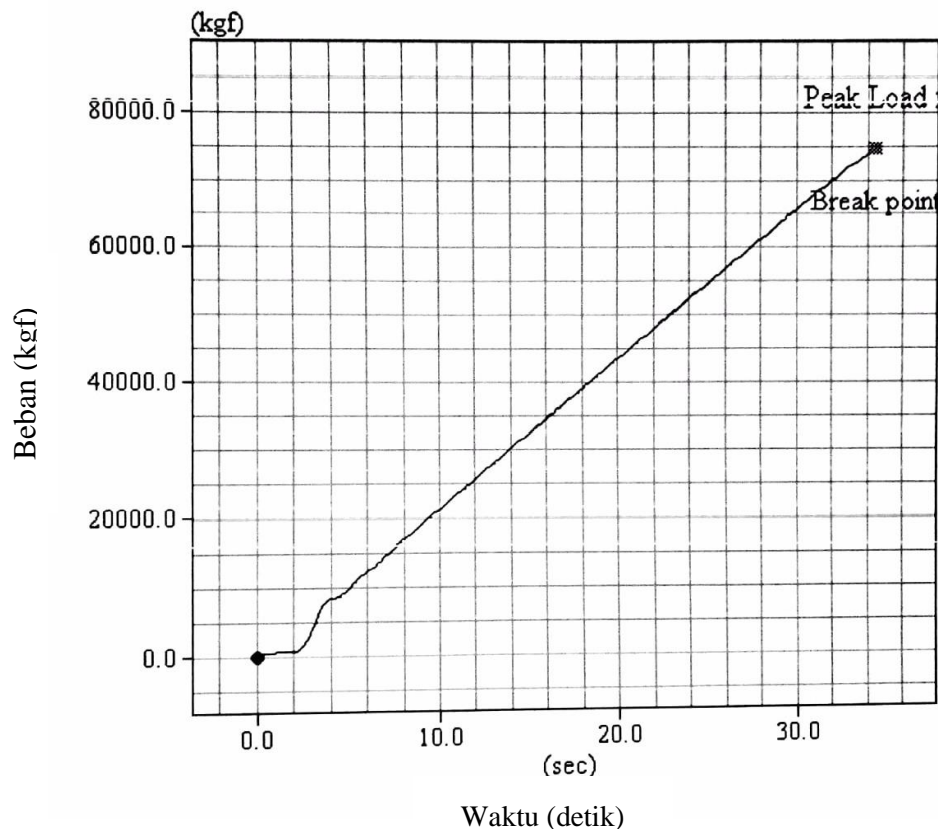




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### Concrete Testing

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>3/6/2018</b>			<b>Report No.</b>			<b>TA 3</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	223.05	74530	4752.4	334.8	1.2	400.0	1.0	28		



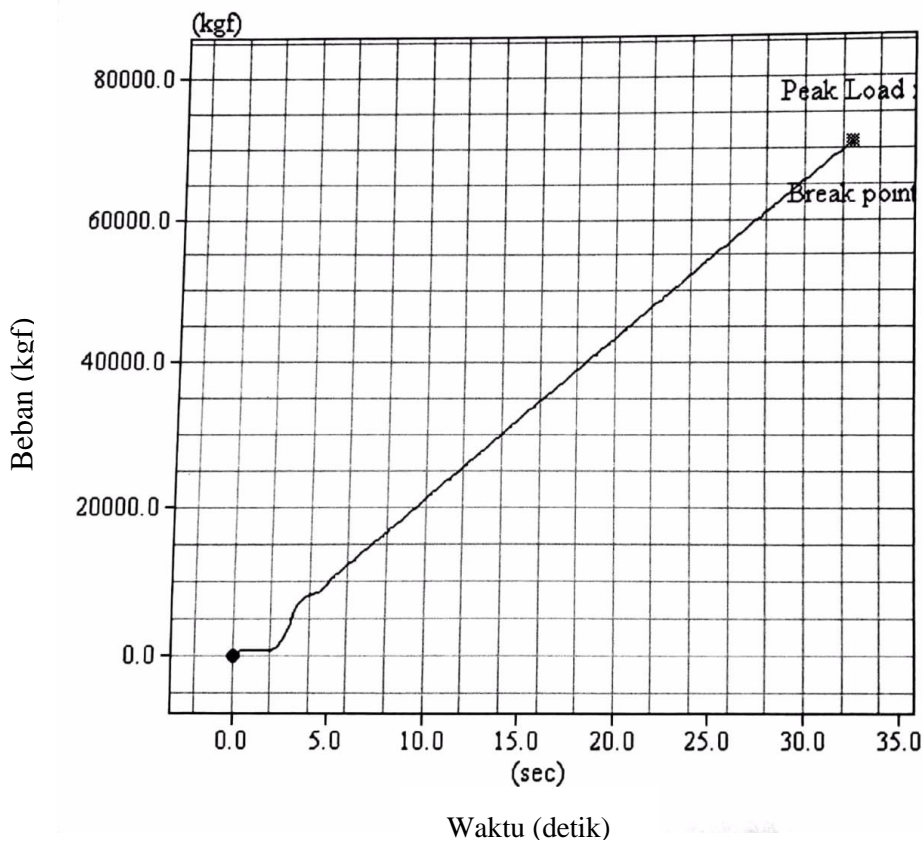
Gambar 1. Kuat tekan beton benda uji TA 3



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**Concrete Testing**

<b>Constrution Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>3/6/2018</b>			<b>Report No.</b>			<b>TA 4</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
<b>1</b>	<b>222.60</b>	<b>70830</b>	<b>4525.6</b>	<b>318.8</b>	<b>1.2</b>	<b>400.0</b>	<b>1.0</b>	<b>28</b>		



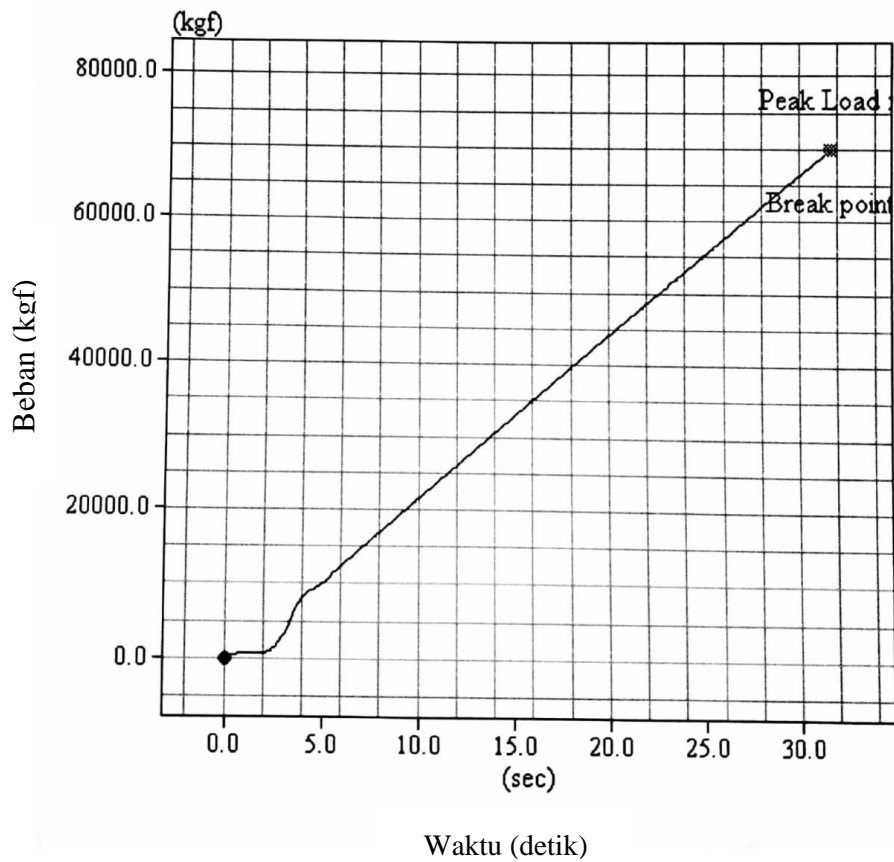
Gambar 2. Kuat tekan beton benda uji TA 4



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Concrete Testing

<b>Constrution Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>3/6/2018</b>			<b>Report No.</b>			<b>TA 5</b>		
<b>No.</b>	<b>Area (cm<sup>2</sup>)</b>	<b>Peak Force (Kg)</b>	<b>Compression Stress (psi)</b>	<b>Adjust Stress (Kg/cm<sup>2</sup>)</b>	<b>H/D Ratio</b>	<b>Design Stress</b>	<b>Adjust Ratio</b>	<b>Life</b>	<b>Break Style</b>	<b>Remark</b>
1	225.45	69860	4407.2	310.5	1.2	400.0	1.0	28		



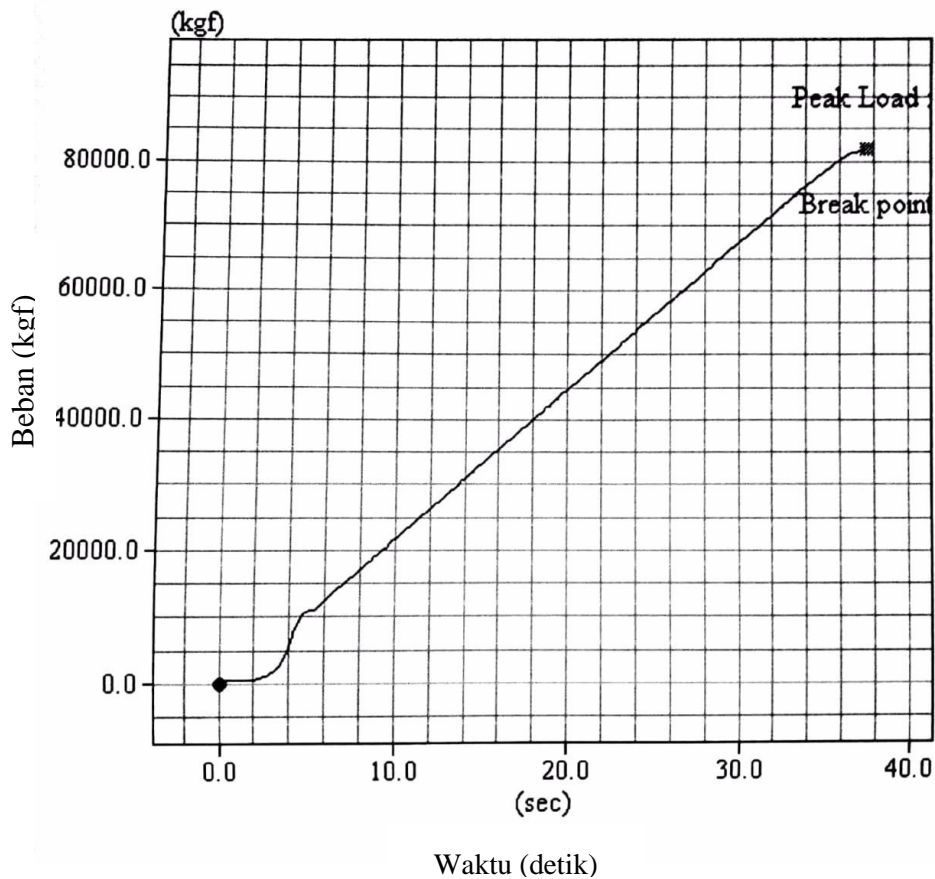
Gambar 3. Kuat tekan beton benda uji TA 5



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### Concrete Testing

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>3/6/2018</b>			<b>Report No.</b>			<b>TA 9</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kgf/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
<b>1</b>	<b>228.45</b>	<b>81850</b>	<b>5095.8</b>	<b>359.0</b>	<b>1.2</b>	<b>400.0</b>	<b>1.0</b>	<b>28</b>		



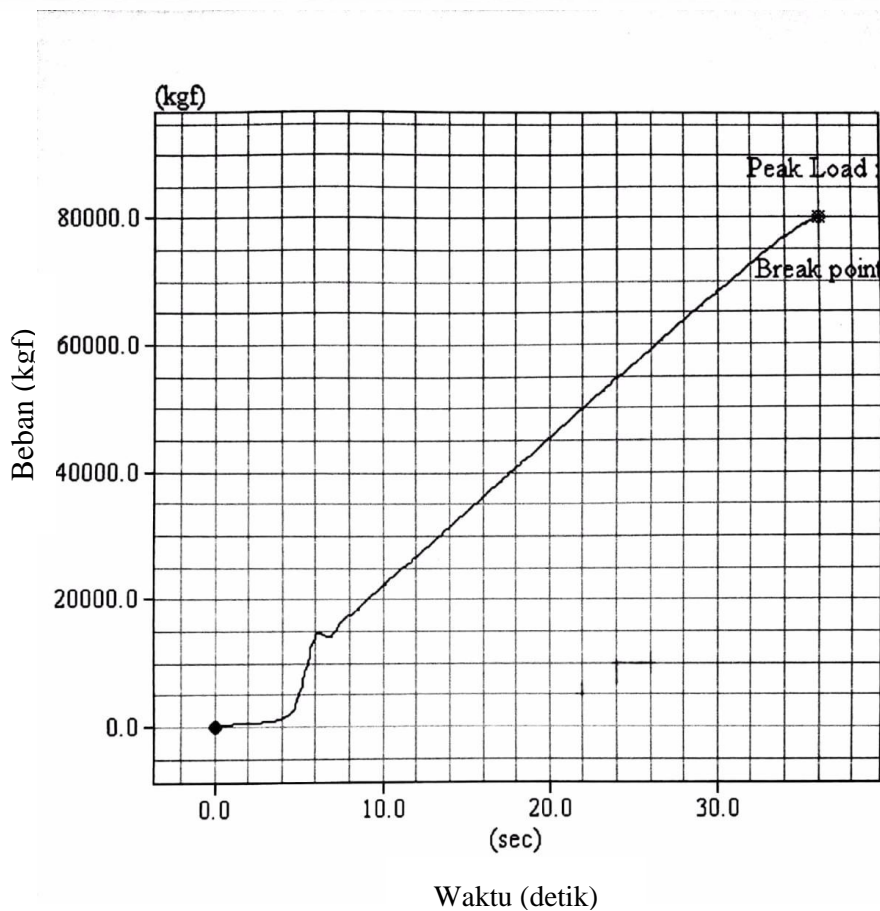
Gambar 4. Kuat tekan beton benda uji TA 9



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>3/6/2018</b>			<b>Report No.</b>			<b>TA 10</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	232.20	80040	4902.6	345.4	1.2	400.0	1.0	28		



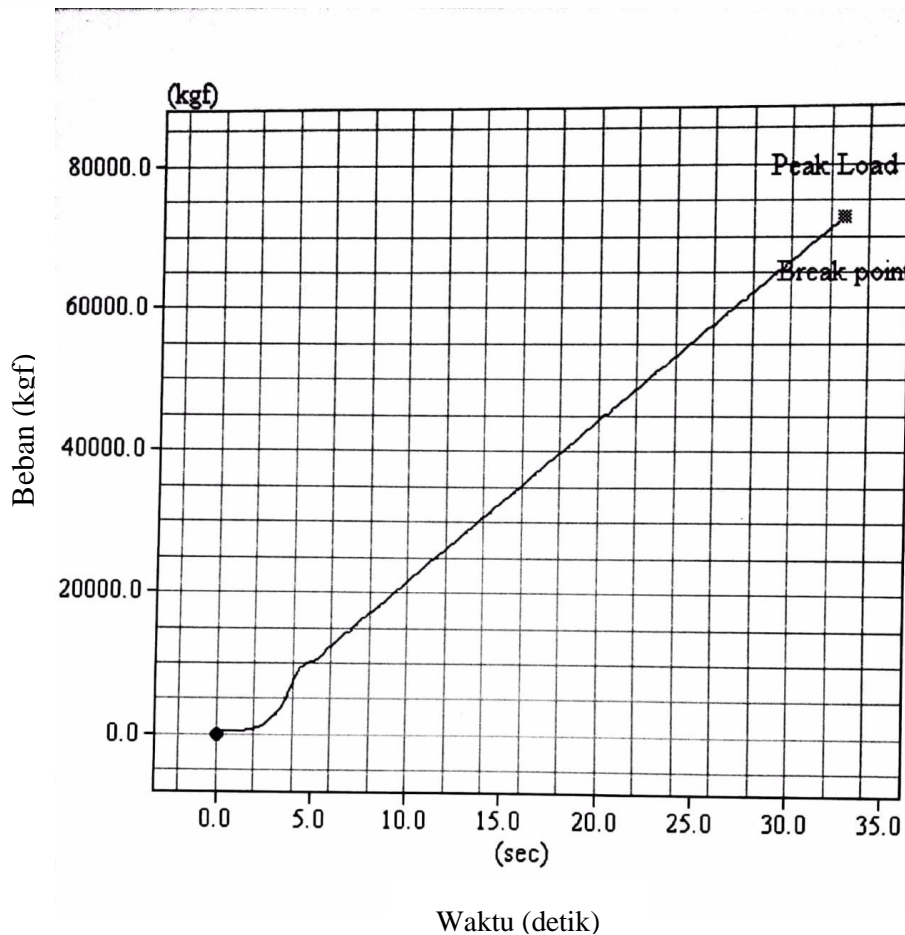
Gambar 5. Kuat tekan beton benda uji TA 10



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Concrete Testing

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>3/7/2018</b>				<b>Report No.</b>			<b>TA 11</b>	
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	226.80	72620	4554.0	320.8	1.2	400.0	1.0	28		



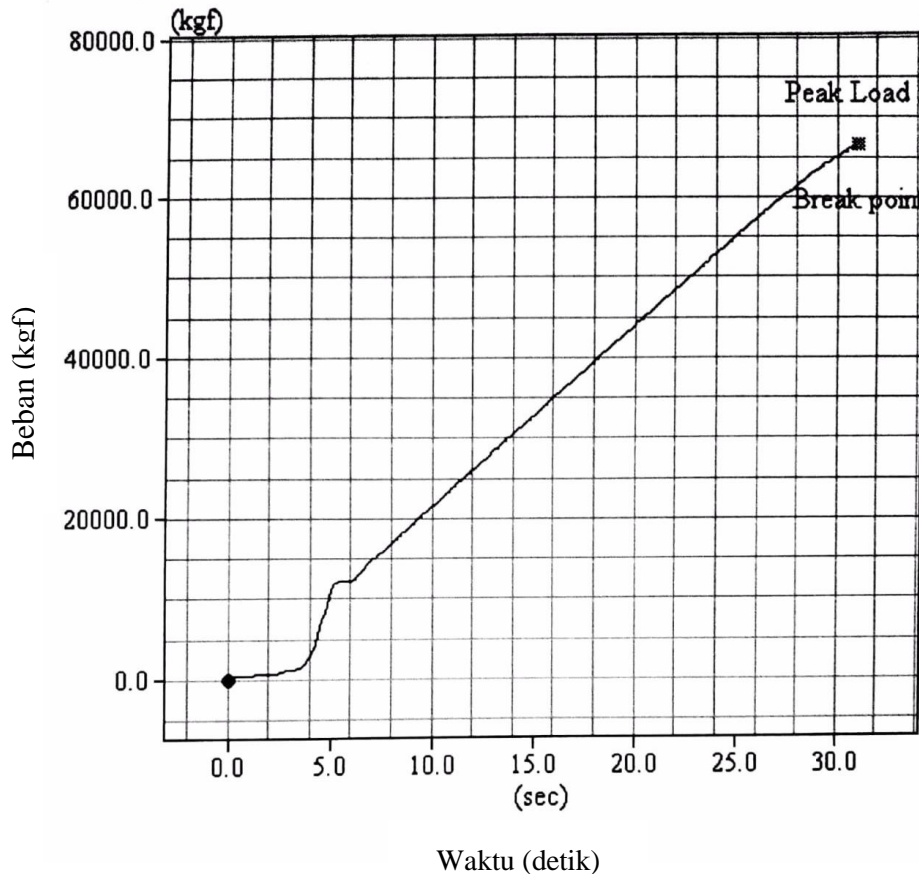
Gambar 6. Kuat tekan beton benda uji TA 11



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>3/7/2018</b>			<b>Report No.</b>			<b>TA 18</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	225.45	66450	4192.1	295.3	1.2	400.0	1.0	28		



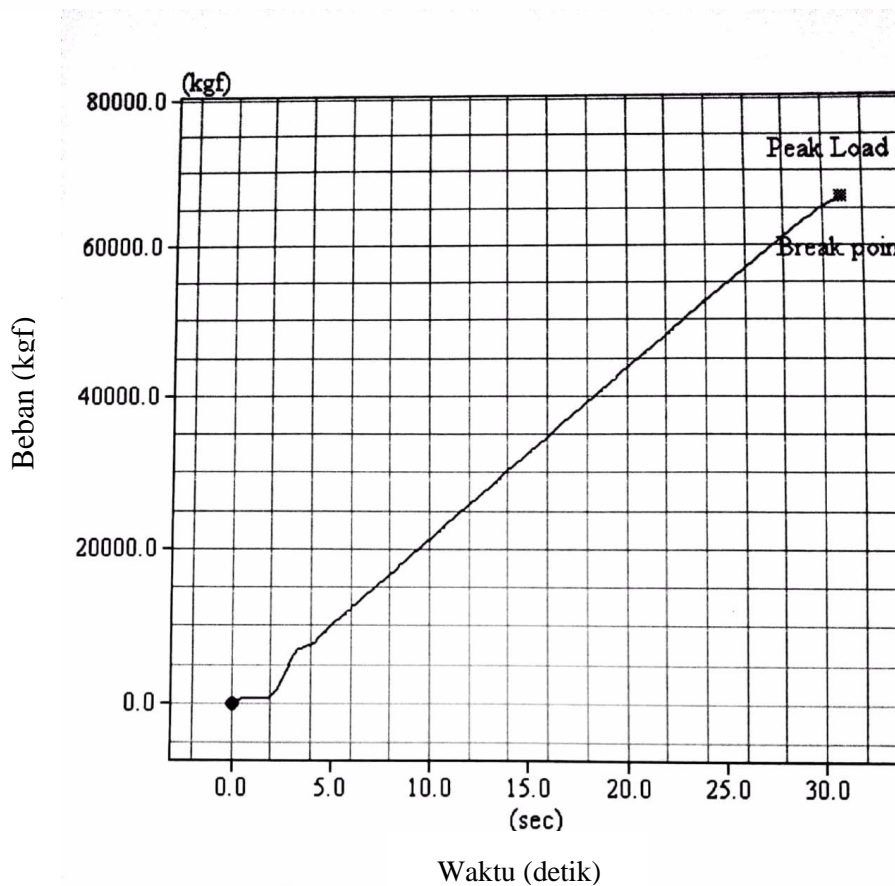
Gambar 7. Kuat tekan beton benda uji TA 18



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>3/7/2018</b>			<b>Report No.</b>			<b>TA 19</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	223.65	66460	4226.4	297.8	1.2	400.0	1.0	28		



Gambar 8. Kuat tekan beton benda uji TA 19

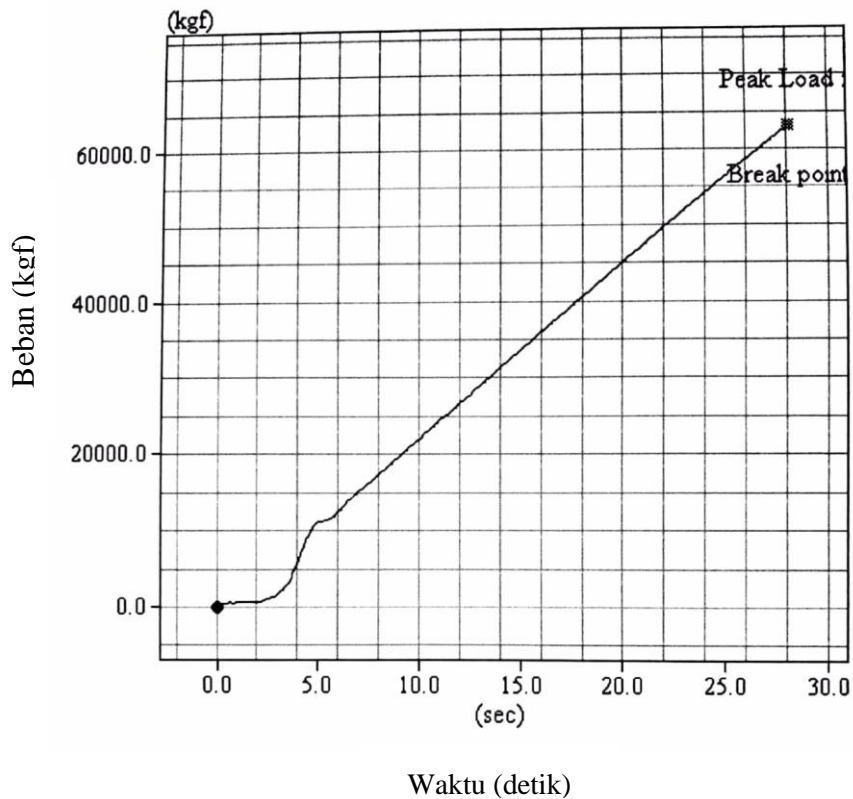




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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>3/7/2018</b>			<b>Report No.</b>			<b>TA 20</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kgf/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	231.15	63030	3878.2	273.2	1.2	400.0	1.0	28		



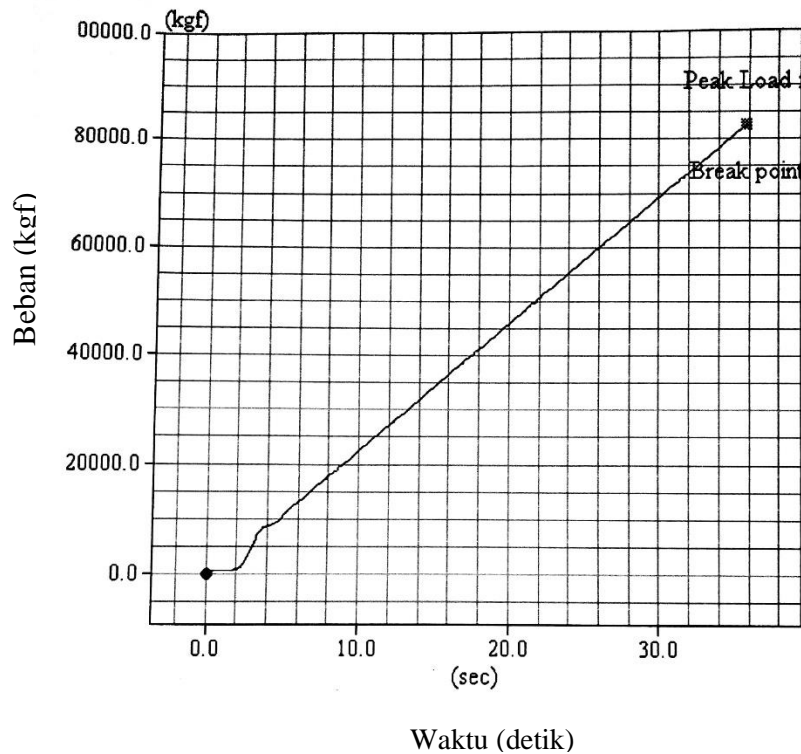
Gambar 9. Kuat tekan beton benda uji TA 20



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**Concrete Testing**

<b>Constrution Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>03/26/2018</b>			<b>Report No.</b>			<b>TA 30</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	234.08	82630	5020.6	353.00	1.0	300.0		28		



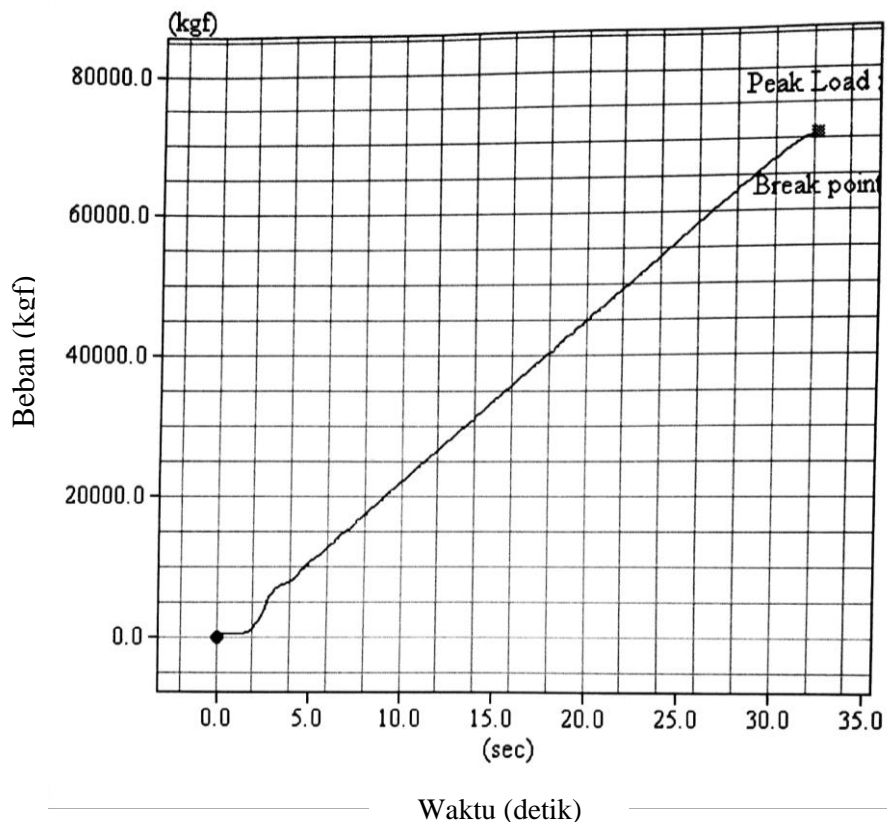
Gambar 10. Kuat tekan beton benda uji TA 30



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>03/26/2018</b>			<b>Report No.</b>			<b>TA 31</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kgf/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	229.32	70780	4389.9	308.65	1.0	300.0		28		



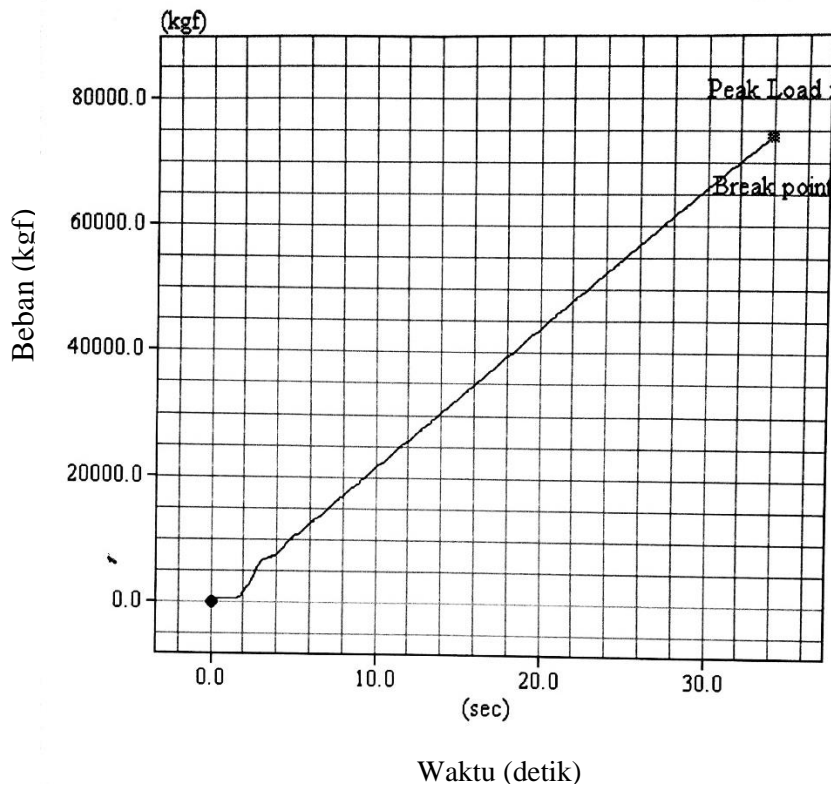
Gambar 11. Kuat tekan beton benda uji TA 31



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>03/26/2018</b>			<b>Report No.</b>			<b>TA 32</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	223.50	74100	4715.4	331, 54	1.0	300.0		28		



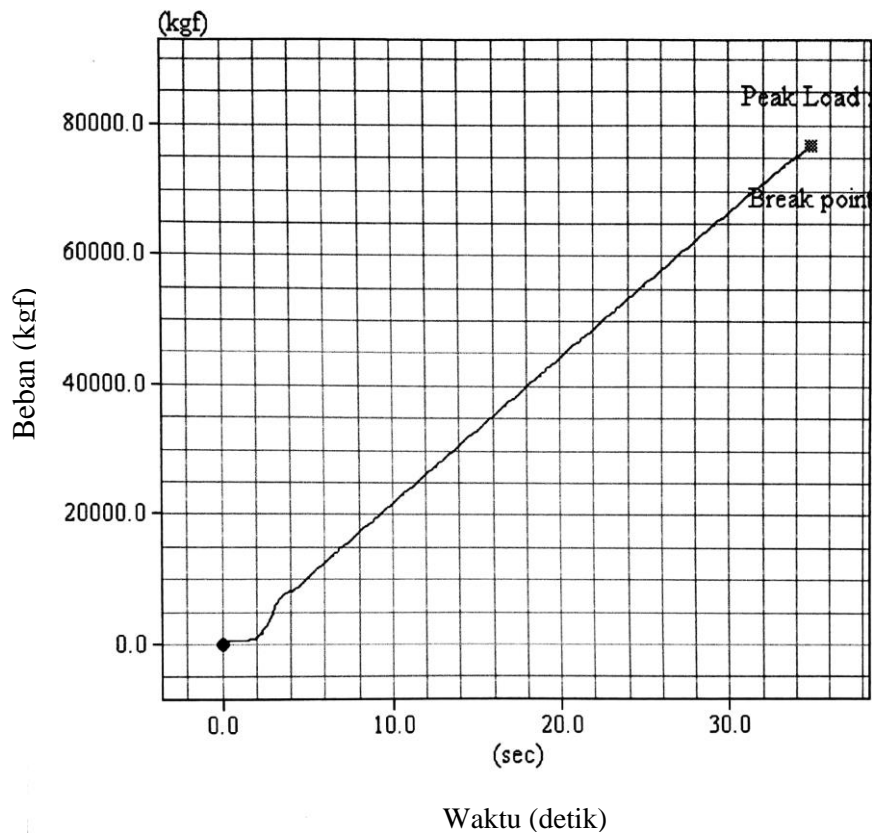
Gambar 12. Kuat tekan beton benda uji TA 32



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Concrete Testing

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>03/26/2018</b>			<b>Report No.</b>			<b>TA 39</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	226.50	76850	4825.7	339.29	1.0	300.0		28		



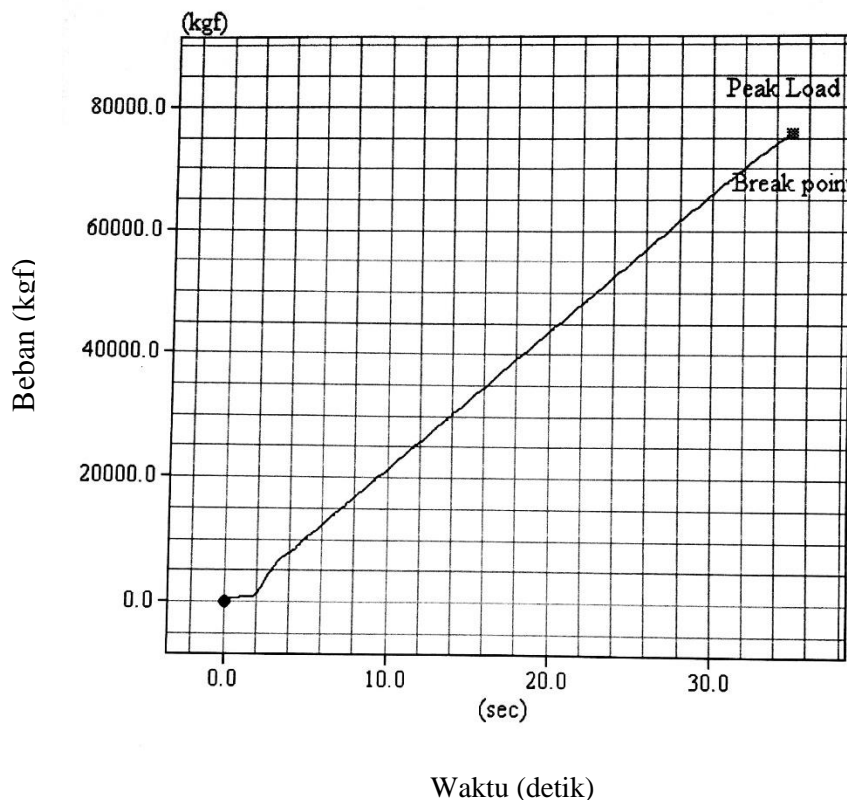
Gambar 13. Kuat tekan beton benda uji TA 39



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>03/26/2018</b>			<b>Report No.</b>			<b>TA 40</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	223.50	75590	4810.3	338.21	1.0	300.0		28		



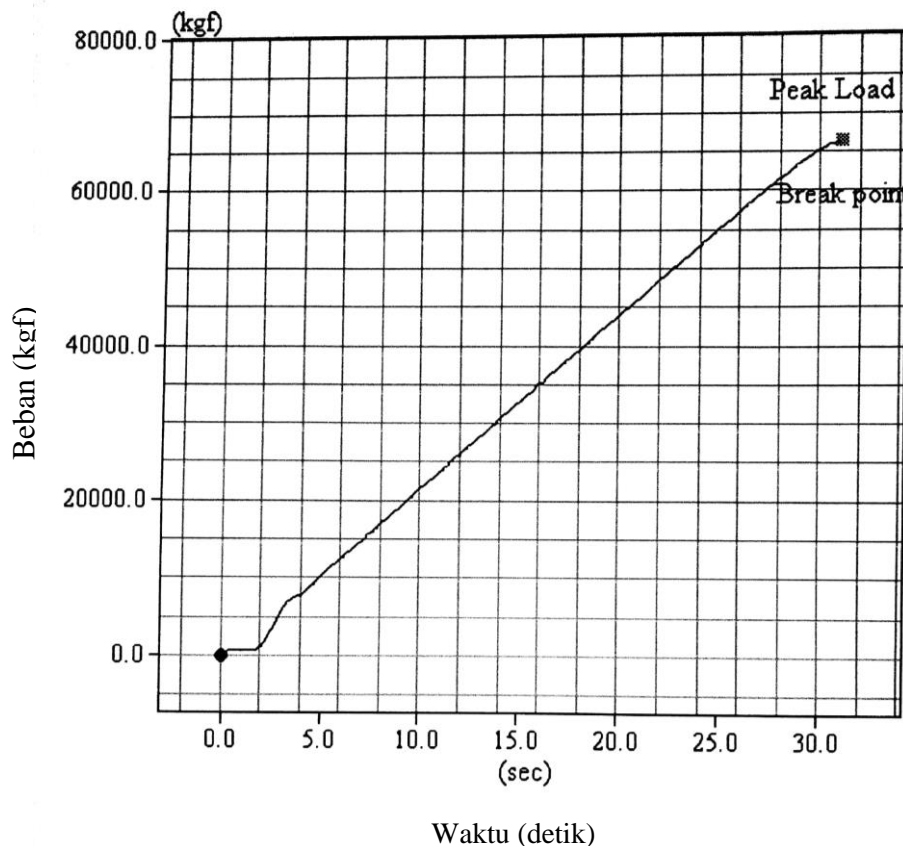
Gambar 14. Kuat tekan beton benda uji TA 40



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Concrete Testing

<b>Construction Name</b>		<b>Kubus Beton</b>									
<b>Manufacturer</b>		<b>Hungta</b>									
<b>Contractor</b>		<b>UMY</b>									
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>									
<b>Test Date</b>		<b>03/26/2018</b>				<b>Report No.</b>			<b>TA 41</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark	
1	225.00	66350	4194.1	294.89	1.0	300.0		28			



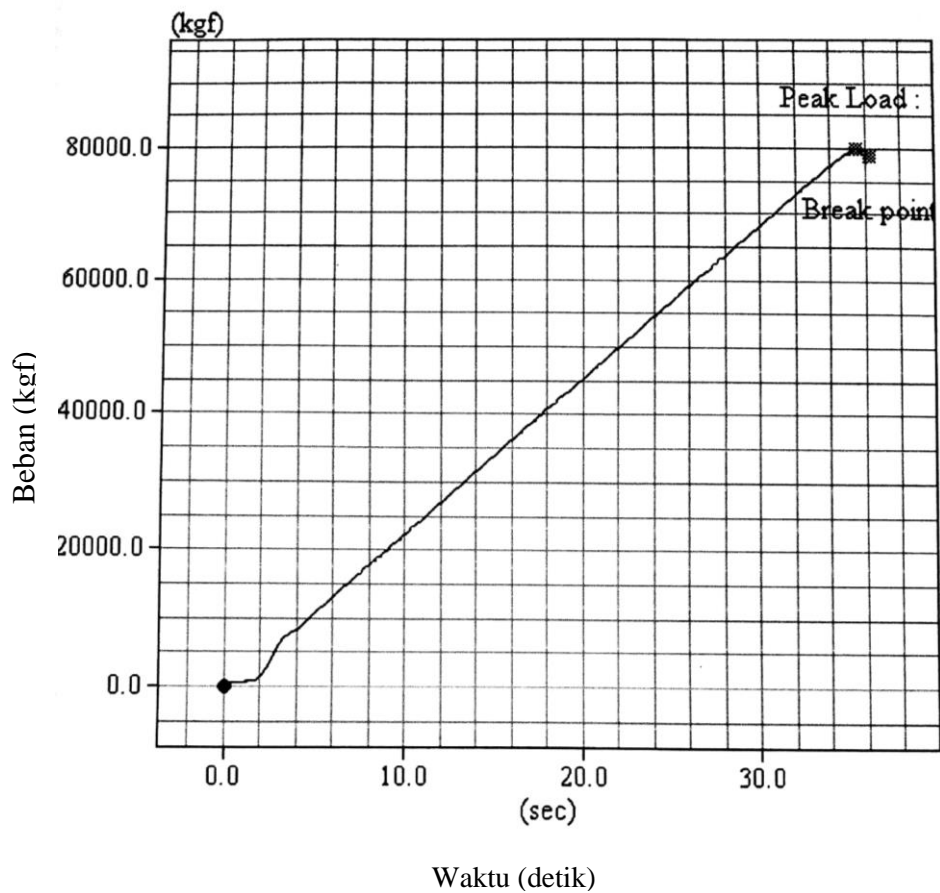
Gambar 15. Kuat tekan beton benda uji TA 41



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**Concrete Testing**

<b>Constrution Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>3/27/2018</b>			<b>Report No.</b>			<b>TA 46</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kgf/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	231.03	79900	4918.8	345.5	1.0	300.0	1.0	28		



Gambar 16. Kuat tekan beton benda uji TA 46

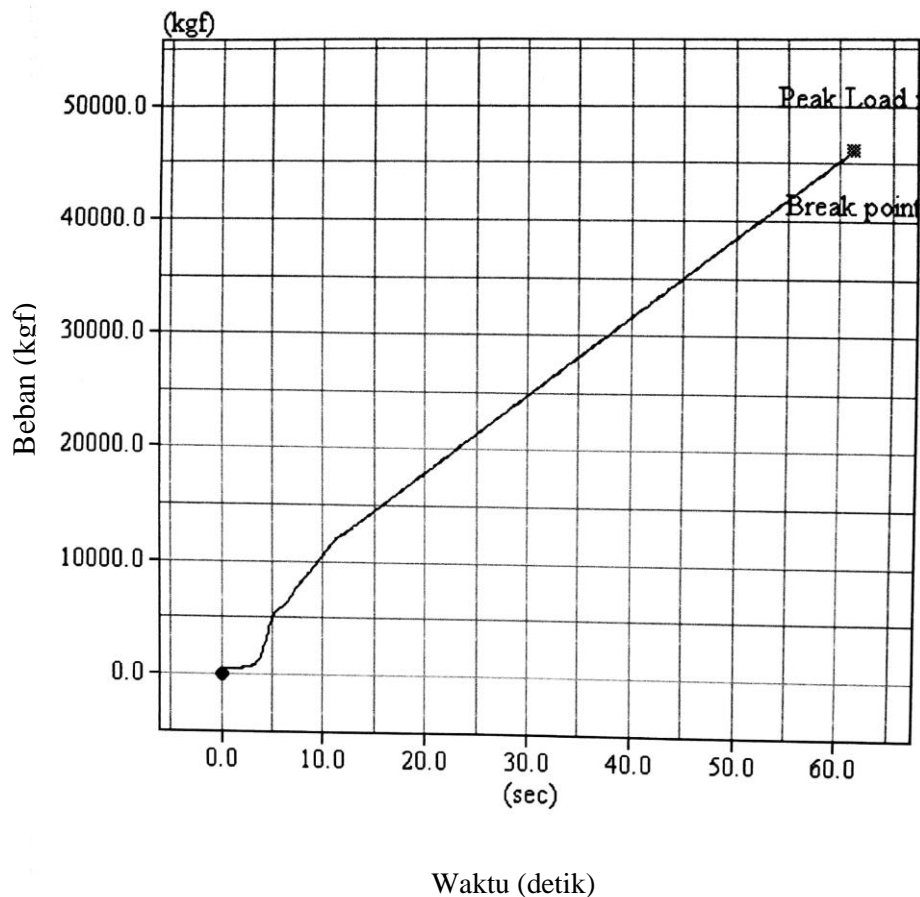




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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>3/27/2018</b>			<b>Report No.</b>			<b>TA 47</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kgf/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	227.97	46130	2878.0	202.1	1.0	300.0	1.0	28		
2	227.97	520	32.4	2.3	1.0	300.0	1.0	28		



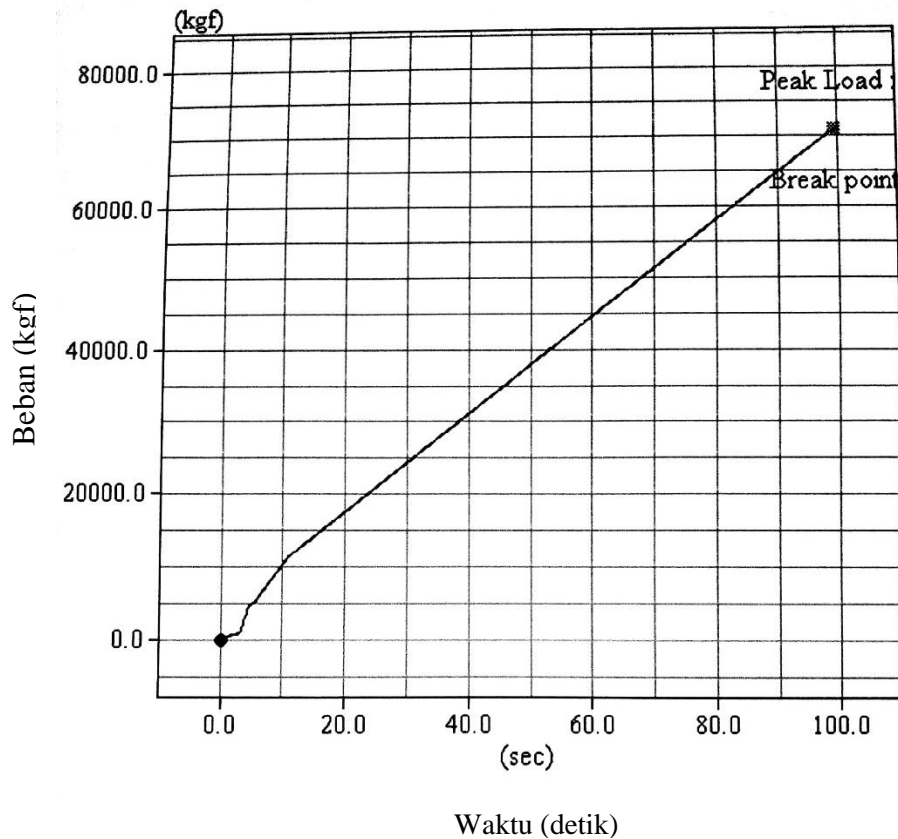
Gambar 17. Kuat tekan beton benda uji TA 47



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>3/27/2018</b>			<b>Report No.</b>			<b>TA 48</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	225.00	70970	4486.2	315.1	1.0	300.0	1.0	28		



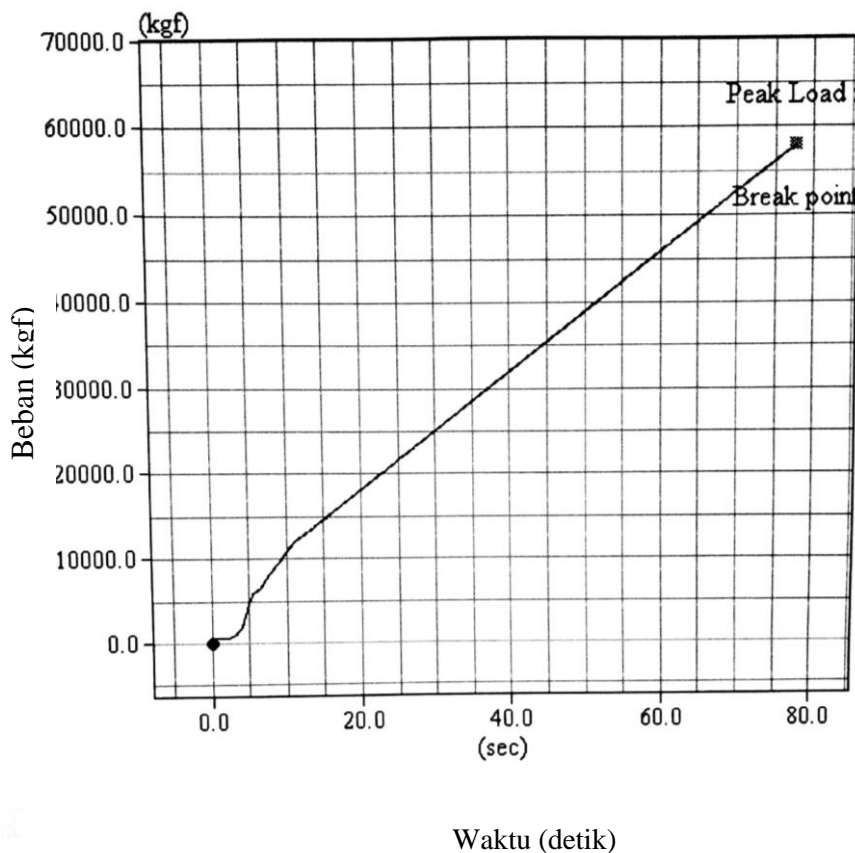
Gambar 18. Kuat tekan beton benda uji TA 48



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Concrete Testing

<b>Constrution Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>3/27/2018</b>			<b>Report No.</b>			<b>TA 55</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	231.03	57960	3568.1	250.6	1.0	300.0	1.0	28		



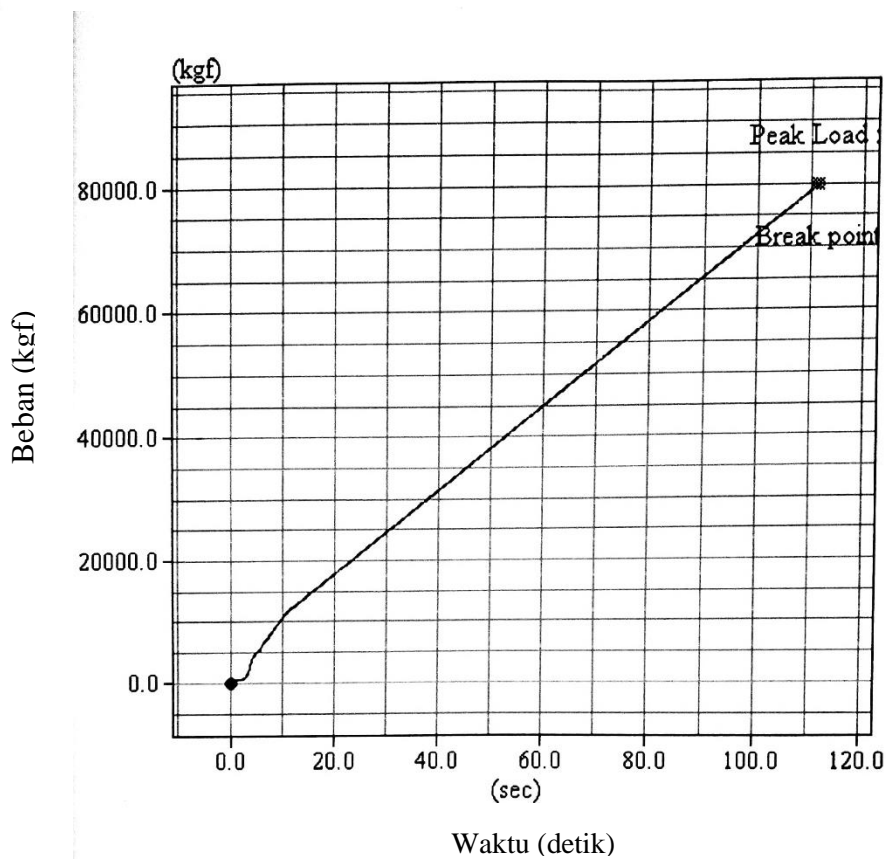
Gambar 19. Kuat tekan beton benda uji TA 55



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Concrete Testing

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>3/27/2018</b>			<b>Report No.</b>			<b>TA 56</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	226.44	79770	5010.4	351.9	1.0	300.0	1.0	28		



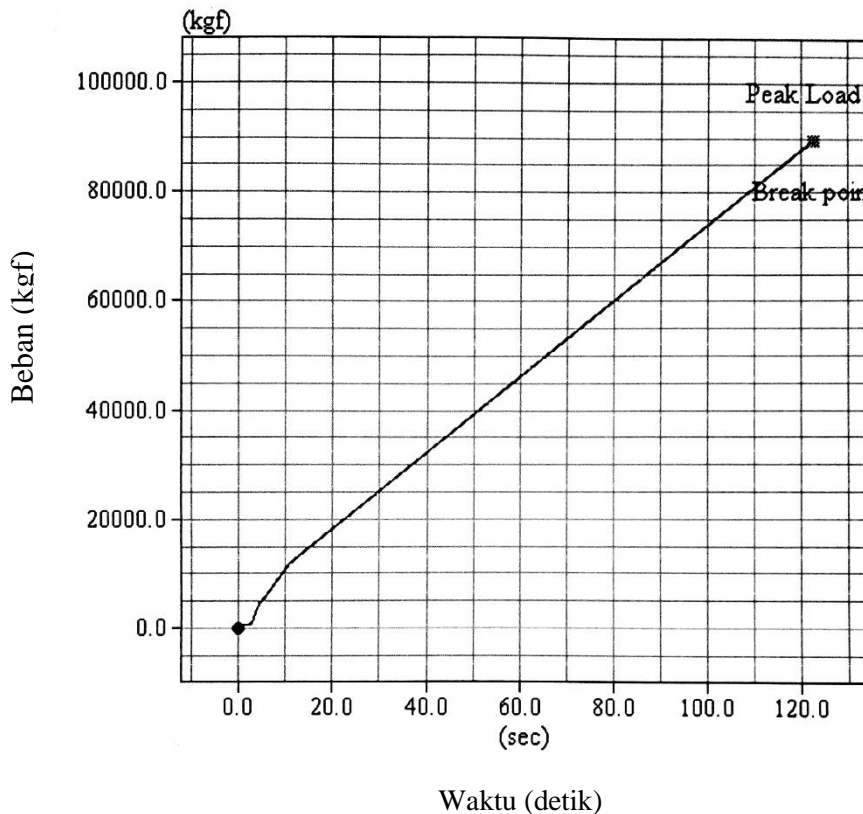
Gambar 20. Kuat tekan beton benda uji TA 56



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Concrete Testing

<b>Construction Name</b>		Kubus Beton								
<b>Manufacturer</b>		Hungta								
<b>Contractor</b>		UMY								
<b>Customer</b>		Lab. JTS. FT.UMY								
<b>Test Date</b>		3/27/2018			<b>Report No.</b>			TA 57		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	232.65	89460	5469.0	384.1	1.0	300.0	1.0	28		



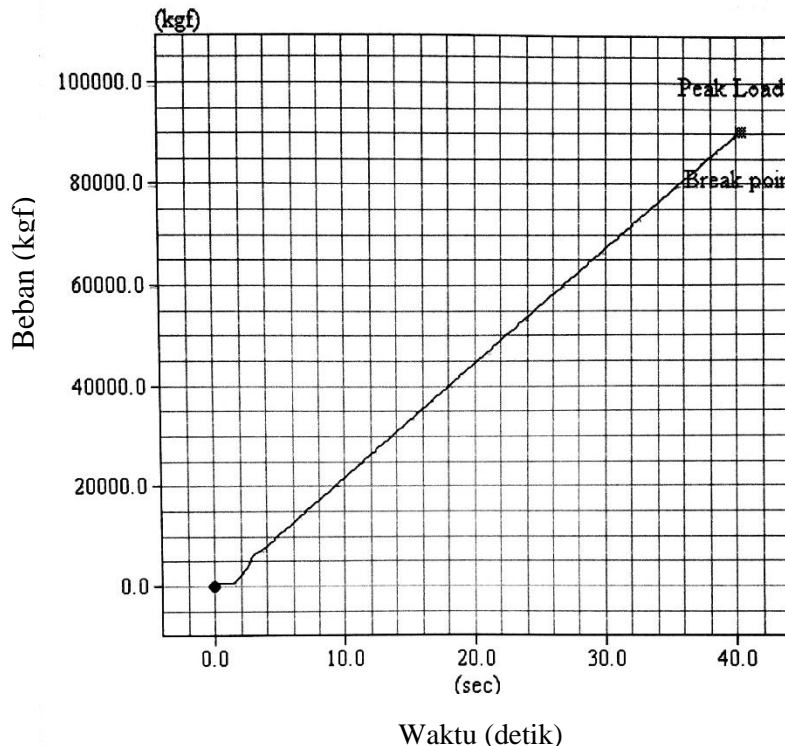
Gambar 21. Kuat tekan beton benda uji TA 57



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Concrete Testing

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/2/2018</b>			<b>Report No.</b>			<b>TA. 64</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	227.25	90270	5649.7	394.23	1.0	300.0		28		



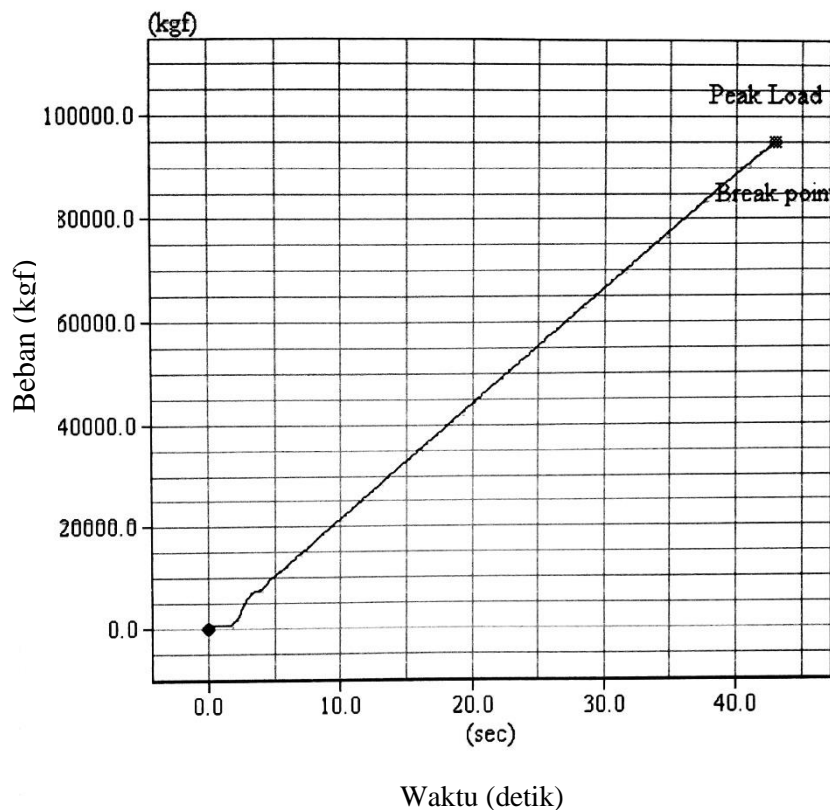
Gambar 22. Kuat tekan beton benda uji TA 64



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/2/2018</b>			<b>Report No.</b>			<b>TA. 65</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	225.00	94810	5993.1	421.38	1.0	300.0		28		



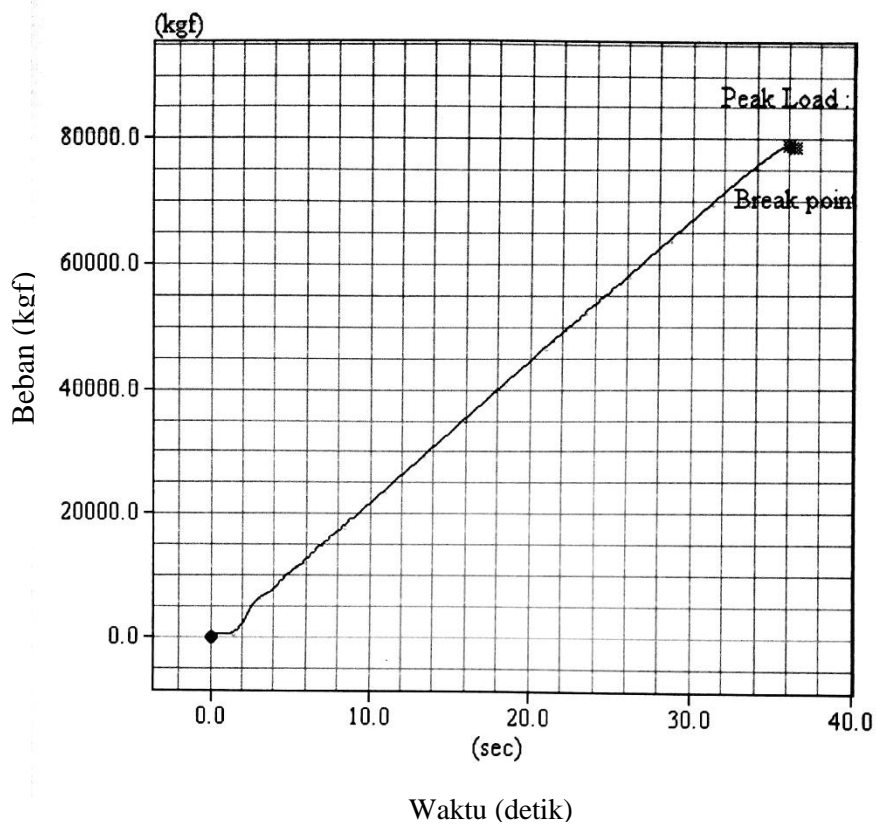
Gambar 23. Kuat tekan beton benda uji TA 65



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/2/2018</b>			<b>Report No.</b>			<b>TA. 66</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	227.25	78880	4936.8	347.11	1.0	300.0		28		



Gambar 24. Kuat tekan beton benda uji TA 66

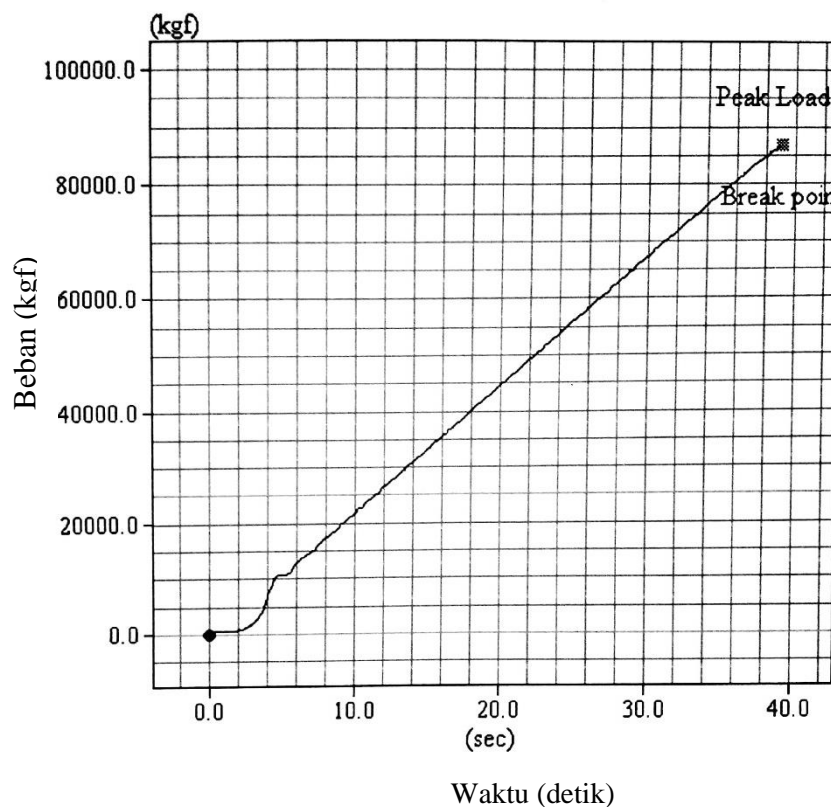




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Concrete Testing

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/2/2018</b>				<b>Report No.</b>			<b>TA. 73</b>	
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kgf/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	228.00	86710	5409.0	380.31	1.0	300.0		28		



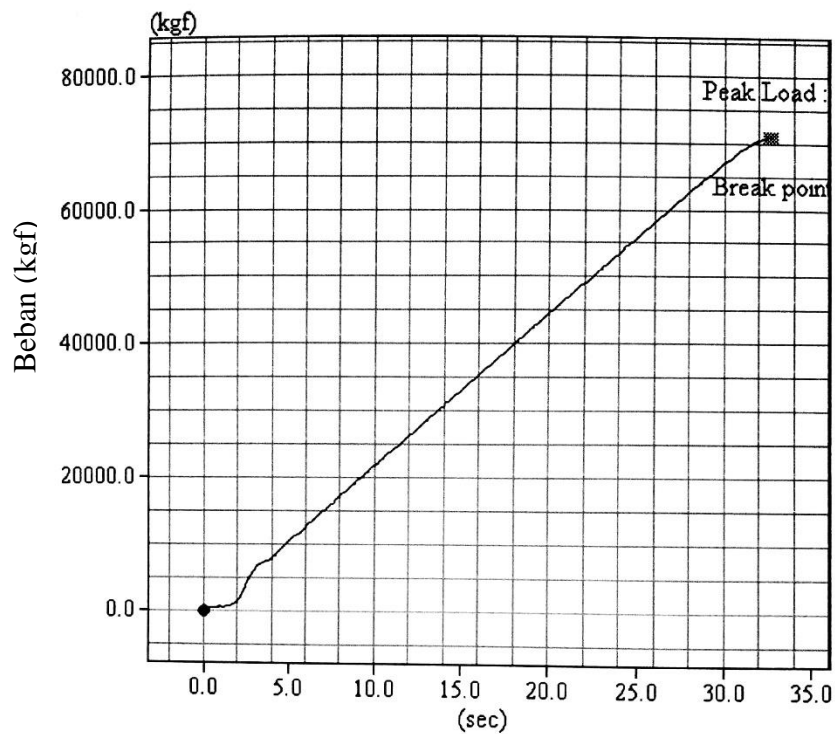
Gambar 25. Kuat tekan beton benda uji TA 73



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**Concrete Testing**

<b>Construstion Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/2/2018</b>			<b>Report No.</b>			<b>TA. 74</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kgf/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	227.25	70820	4432.4	311.64	1.0	300.0		28		



Waktu (detik)

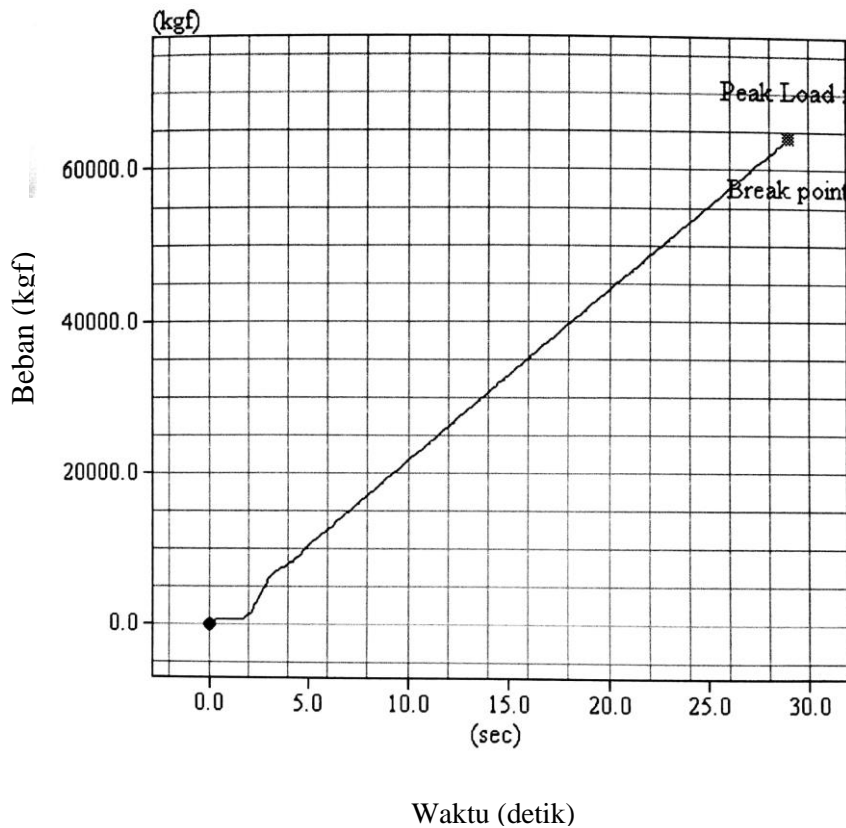
Gambar 26. Kuat tekan beton benda uji TA 74



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**Concrete Testing**

<b>Constrution Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/2/2018</b>			<b>Report No.</b>			<b>TA. 75</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	225.00	64120	4053.2	284.98	1.0	300.0		28		



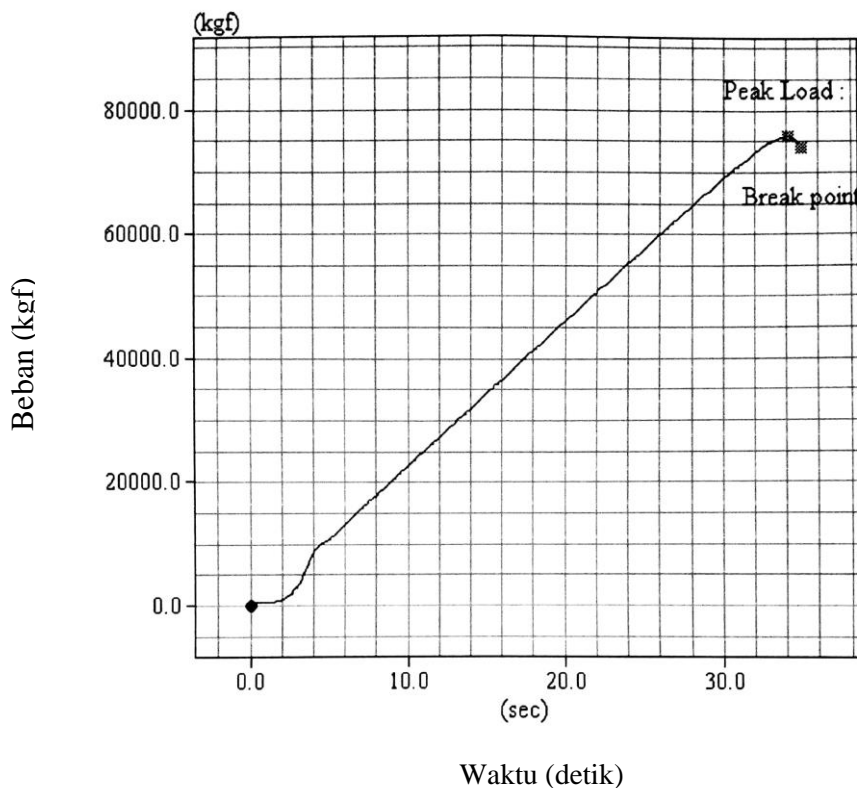
Gambar 27. Kuat tekan beton benda uji TA 74



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/12/2018</b>			<b>Report No.</b>			<b>TAA 55</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	233.31	75780	4619.6		1.0	300.0		7		



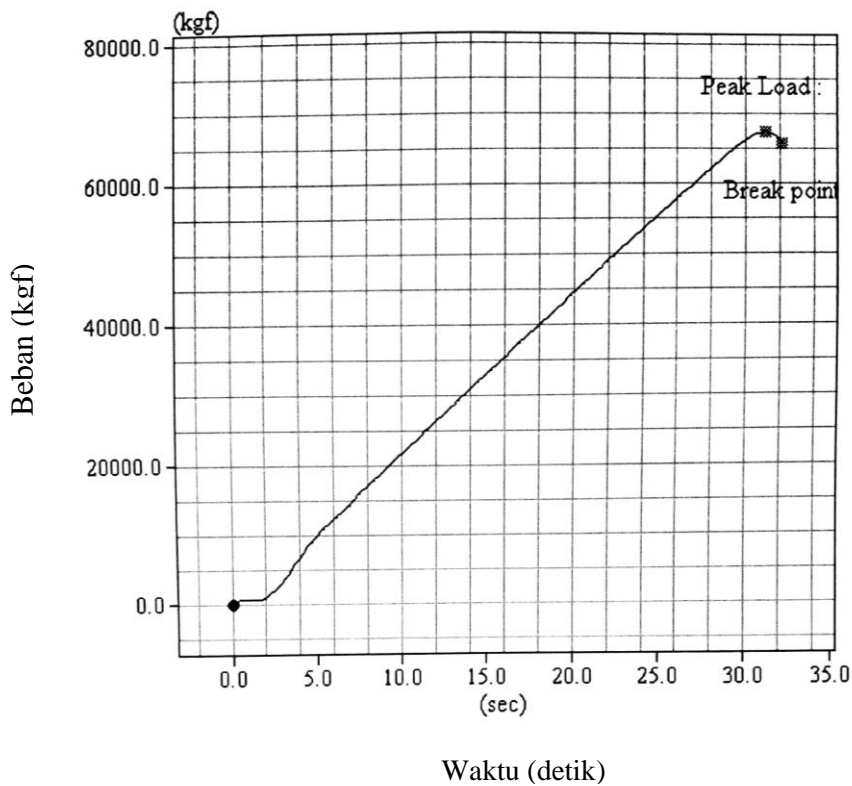
Gambar 28. Kuat tekan beton benda uji TA 55



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/12/2018</b>			<b>Report No.</b>			<b>TAA 56</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kgf/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	226.48	67310	4227.0		1.0	300.0		7		



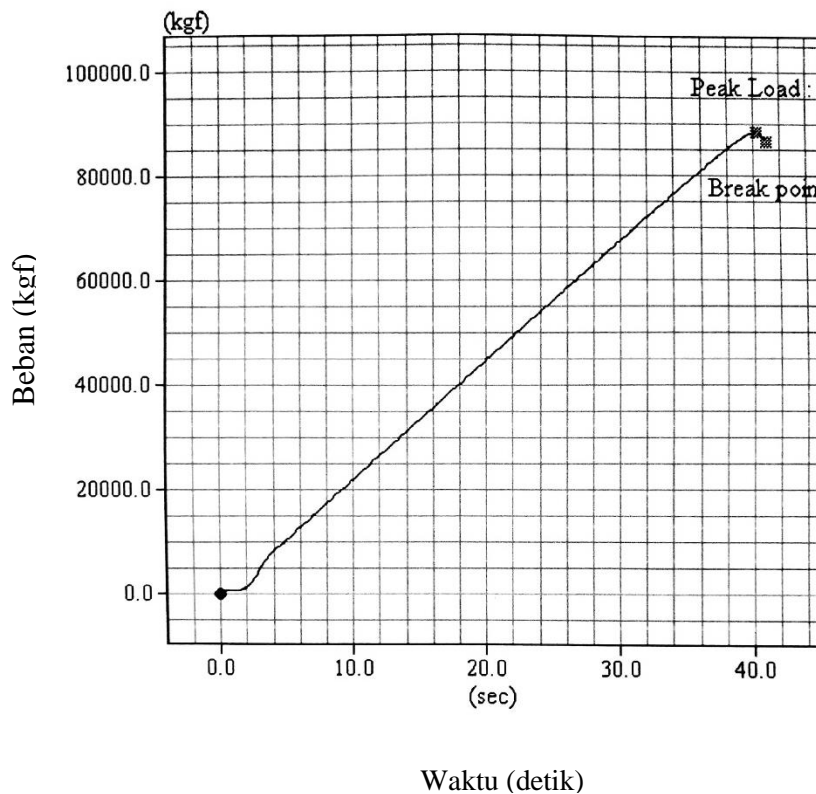
Gambar 29. Kuat tekan beton benda uji TA 56



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		4/12/2018			<b>Report No.</b>			TAA 57		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	227.25	88280	5525.0		1.0	300.0		7		



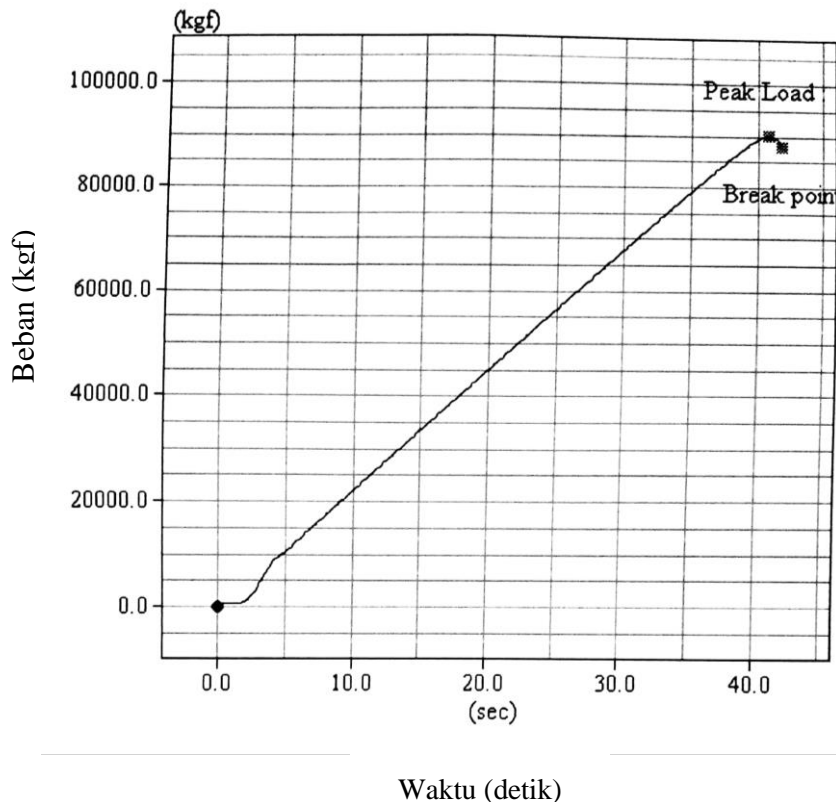
Gambar 30. Kuat tekan beton benda uji TA 57



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**Concrete Testing**

<b>Constrution Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/12/2018</b>			<b>Report No.</b>			<b>TAA 64</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	228.46	90060	5606.8		1.0	300.0		7		



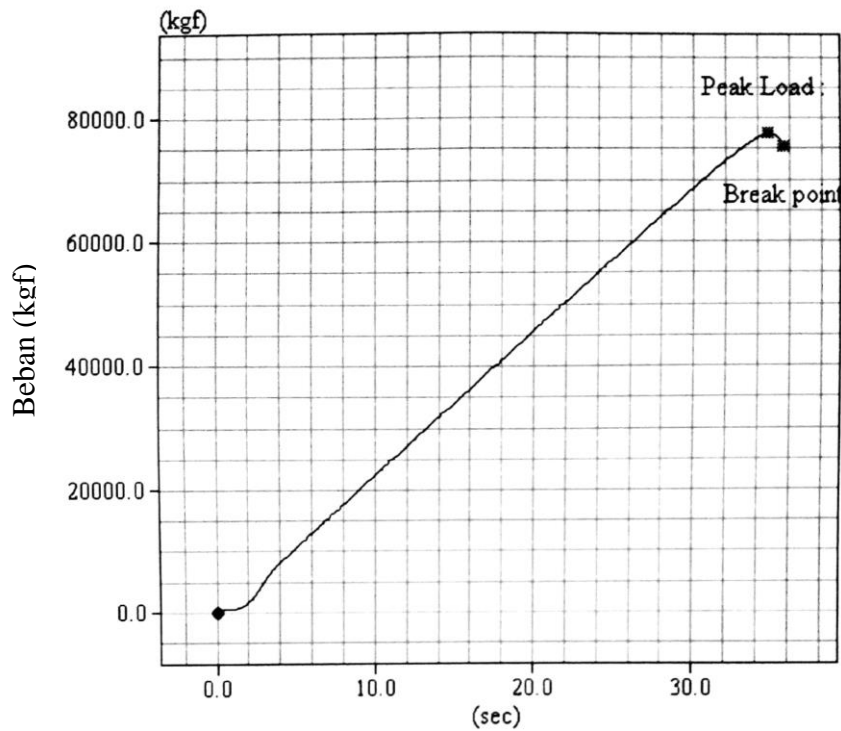
Gambar 31. Kuat tekan beton benda uji TA 64



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<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>04/12/2018</b>			<b>Report No.</b>			<b>TAA 65</b>		
<b>No.</b>	<b>Area (cm<sup>2</sup>)</b>	<b>Peak Force (Kg)</b>	<b>Compression Stress (psi)</b>	<b>Adjust Stress (Kgf/cm<sup>2</sup>)</b>	<b>H/D Ratio</b>	<b>Design Stress</b>	<b>Adjust Ratio</b>	<b>Life</b>	<b>Break Style</b>	<b>Remark</b>
<b>1</b>	<b>232.56</b>	<b>77500</b>	<b>4739.7</b>		<b>1.0</b>	<b>300.0</b>		<b>7</b>		



Waktu (detik)

Gambar 32. Kuat tekan beton benda uji TA 65.

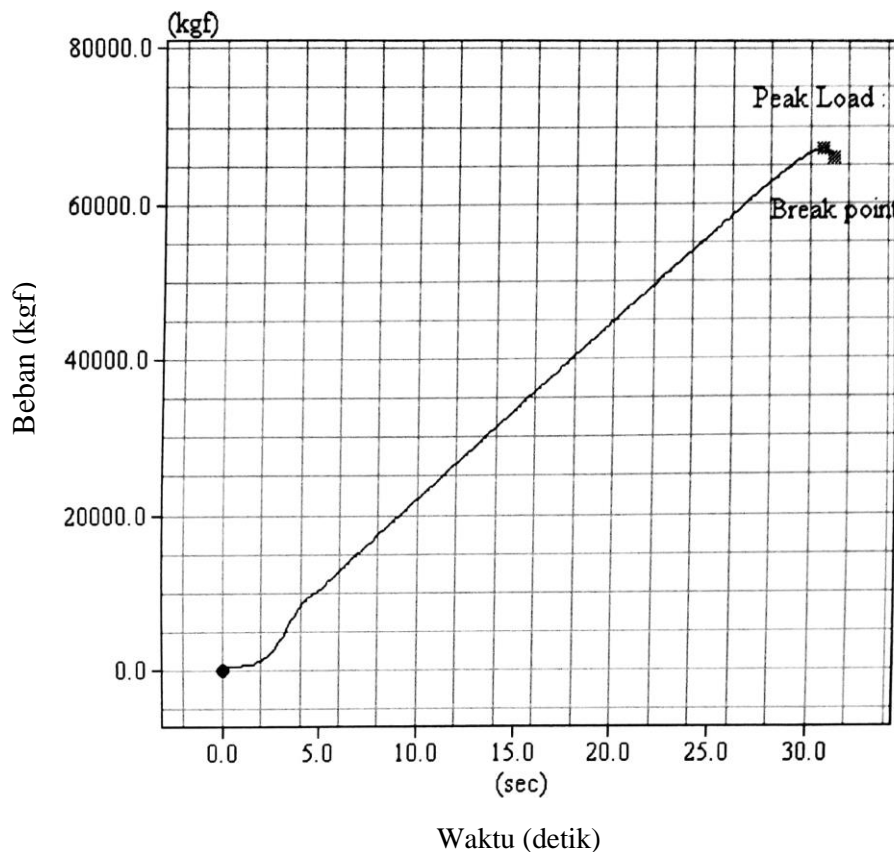




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<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>04/12/2018</b>			<b>Report No.</b>			<b>TAA 66</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	228.01	66970	4177.5		1.0	300.0		7		



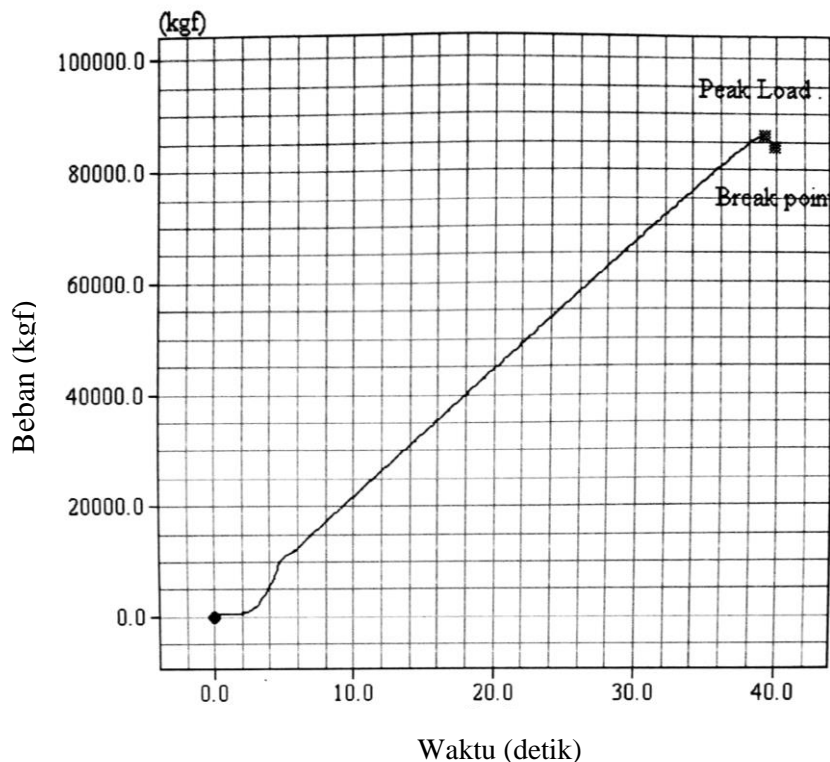
Gambar 33. Kuat tekan beton benda uji TA 66.



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Concrete Testing

Construction Name		Kubus Beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		4/19/2018			Report No.			TAA 73		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	227.25	86010	5382.9		1.0	300.0		14		



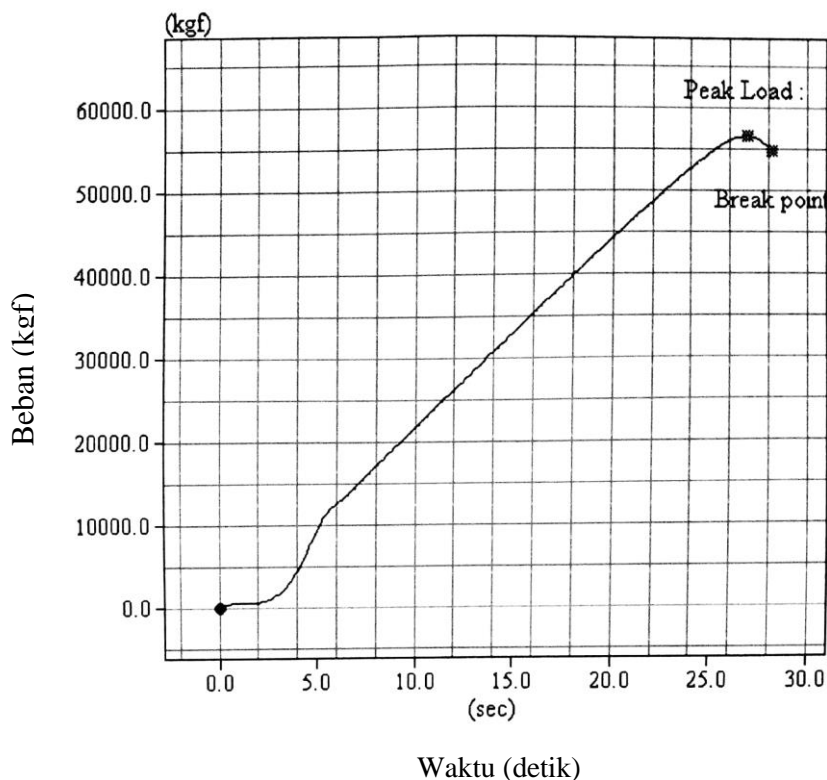
Gambar 34. Kuat tekan beton benda uji TA 73.



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Concrete Testing

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/19/2018</b>			<b>Report No.</b>			<b>TAA 74</b>		
<b>No.</b>	<b>Area (cm<sup>2</sup>)</b>	<b>Peak Force (Kg)</b>	<b>Compression Stress (psi)</b>	<b>Adjust Stress (Kg/cm<sup>2</sup>)</b>	<b>H/D Ratio</b>	<b>Design Stress</b>	<b>Adjust Ratio</b>	<b>Life</b>	<b>Break Style</b>	<b>Remark</b>
<b>1</b>	<b>227.56</b>	<b>56490</b>	<b>3530.7</b>		<b>1.0</b>	<b>300.0</b>		<b>14</b>		



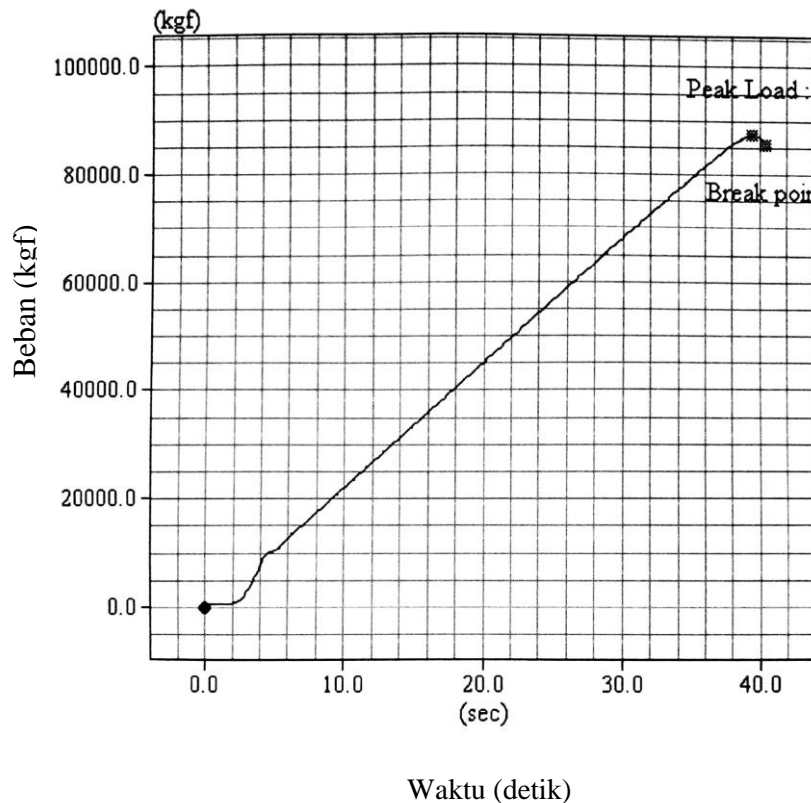
Gambar 35. Kuat tekan beton benda uji TA 74.



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Concrete Testing

Construction Name		Kubus Beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		4/19/2018			Report No.			TAA 75		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	229.67	87330	5408.0		1.0	300.0		14		



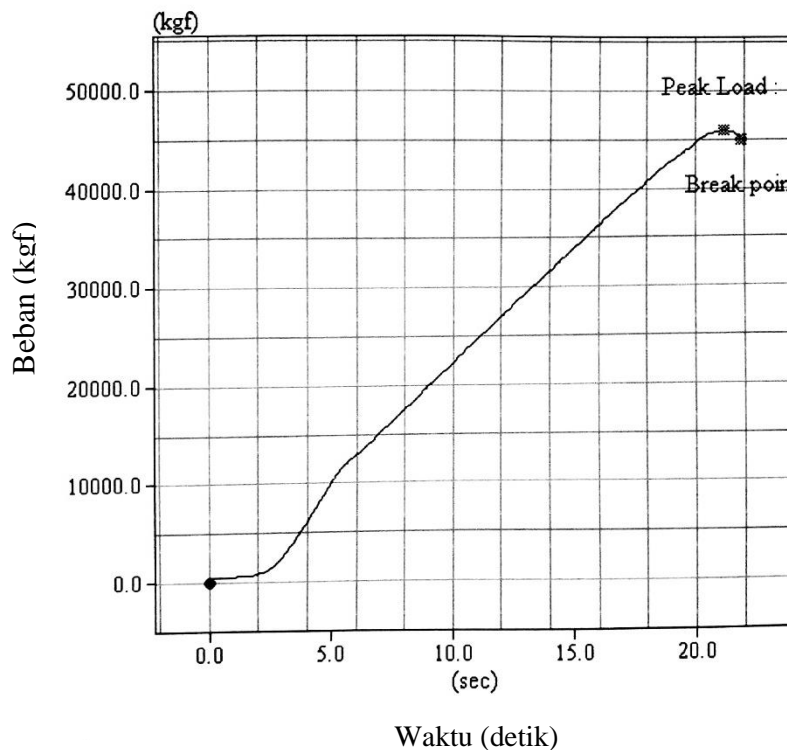
Gambar 36. Kuat tekan beton benda uji TA 75.



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>04/12/2018</b>			<b>Report No.</b>			<b>TAA 30</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
<b>1</b>	<b>233.29</b>	<b>45870</b>	<b>2796.4</b>		<b>1.0</b>	<b>300.0</b>		<b>14</b>		



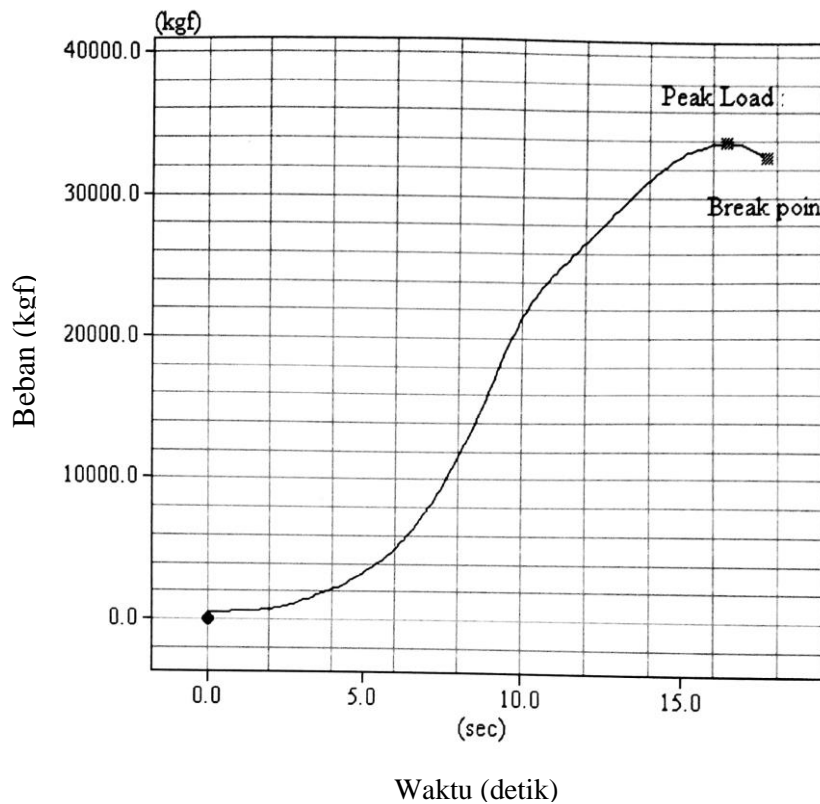
Gambar 37. Kuat tekan beton benda uji TA 30.



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<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>04/12/2018</b>			<b>Report No.</b>			<b>TAA 31</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	234.82	33860	2050.8		1.0	300.0		14		



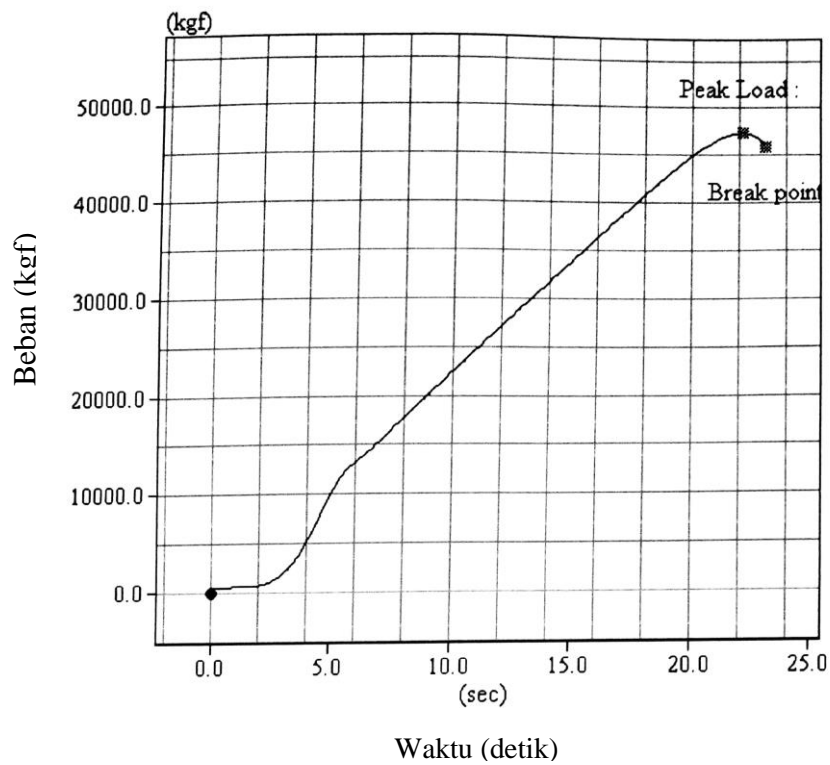
Gambar 38. Kuat tekan beton benda uji TA 31.



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/12/2018</b>			<b>Report No.</b>			<b>TAA 32</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
<b>1</b>	<b>232.56</b>	<b>47340</b>	<b>2895.2</b>		<b>1.0</b>	<b>300.0</b>		<b>14</b>		



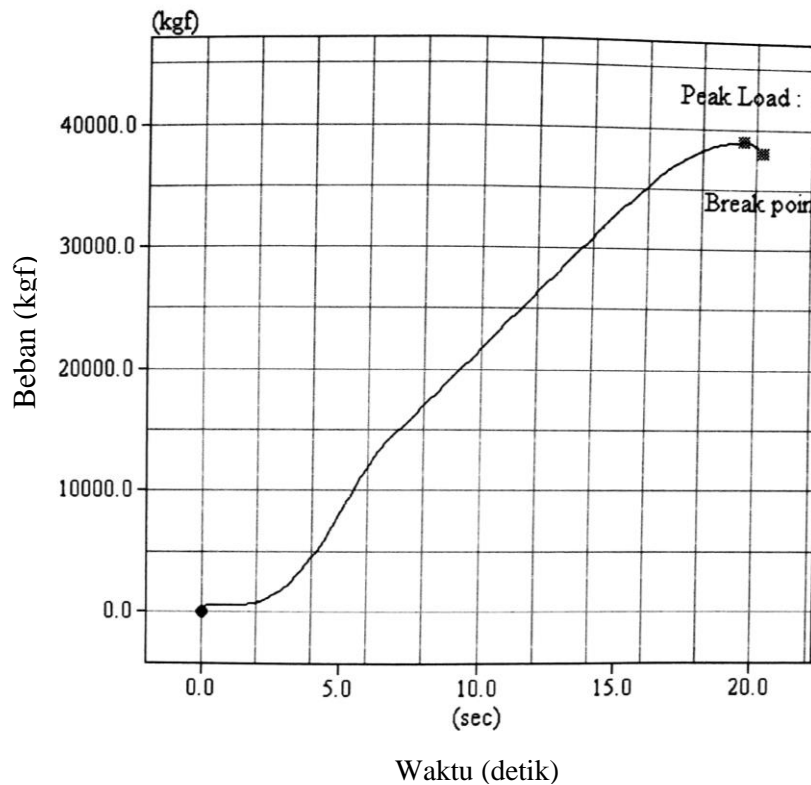
Gambar 39. Kuat tekan beton benda uji TA 32.



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<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/19/2018</b>			<b>Report No.</b>			<b>TAA 39</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	229.98	38930	2407.6		1.0	300.0		14		



Gambar 40. Kuat tekan beton benda uji TA 39.

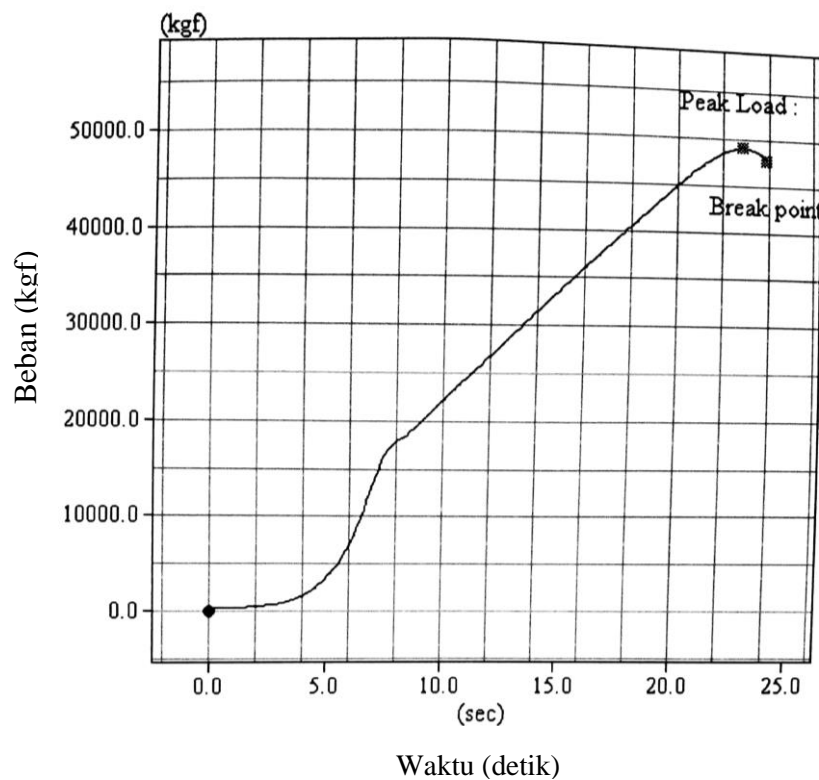




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<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		4/19/2018			<b>Report No.</b>			TAA 40		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kgf/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	232.55	49070	3001.1		1.0	300.0		14		



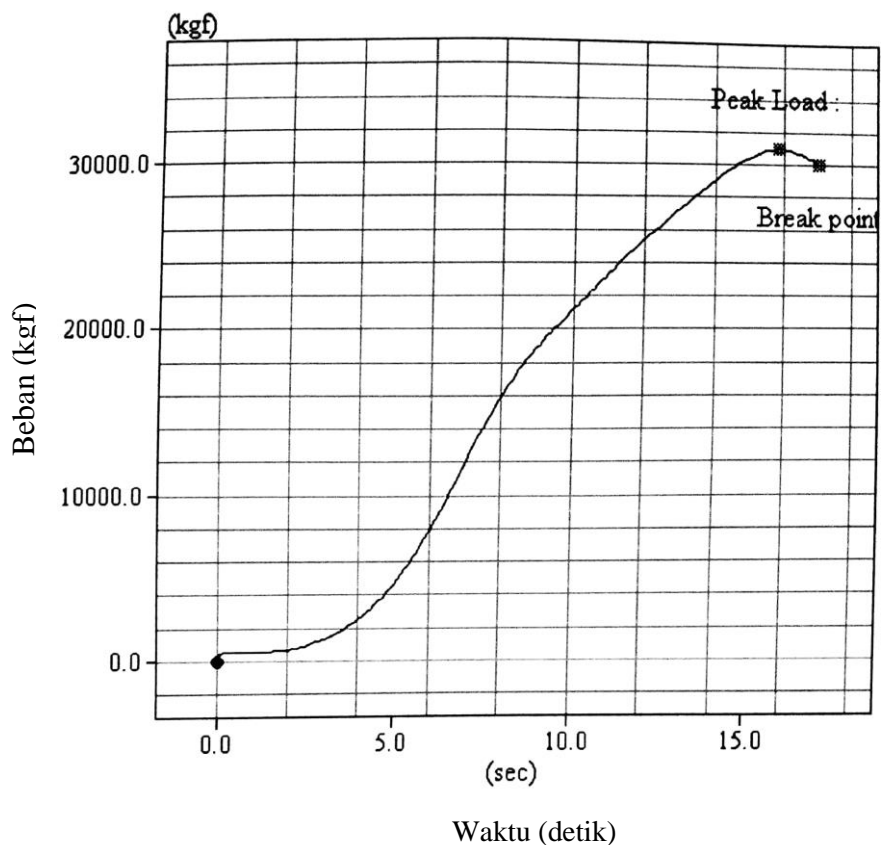
Gambar 41. Kuat tekan beton benda uji TA 40.



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/19/2018</b>			<b>Report No.</b>			<b>TAA 41</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	228.31	30970	1929.3		1.0	300.0		14		



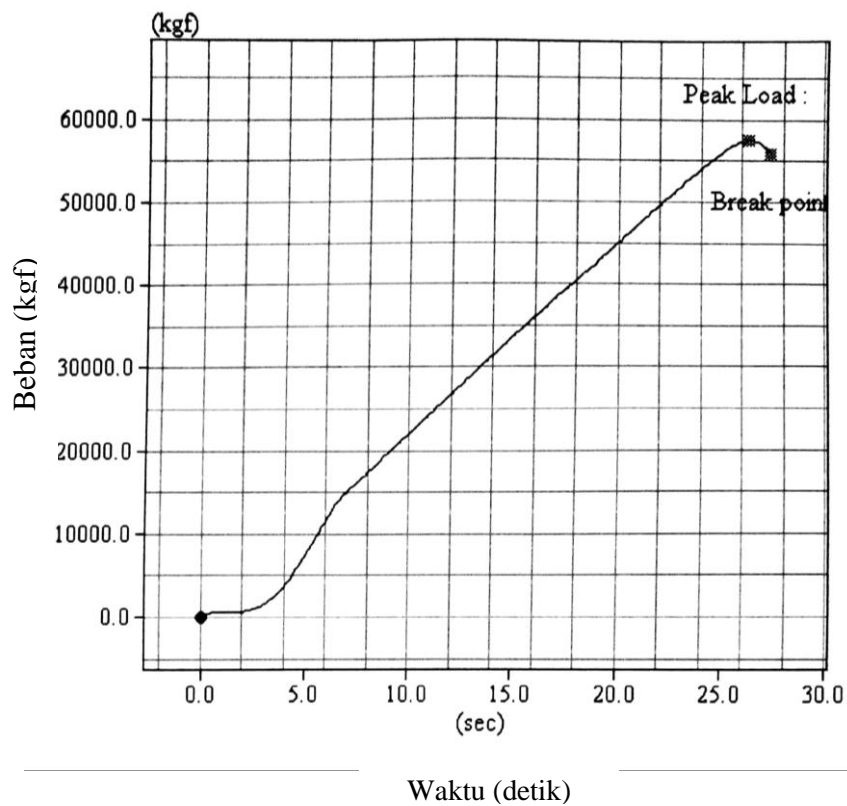
Gambar 42. Kuat tekan beton benda uji TA 41.



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/19/2018</b>			<b>Report No.</b>			<b>TAA 46</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	231.79	57460	3525.7		1.0	300.0		14		



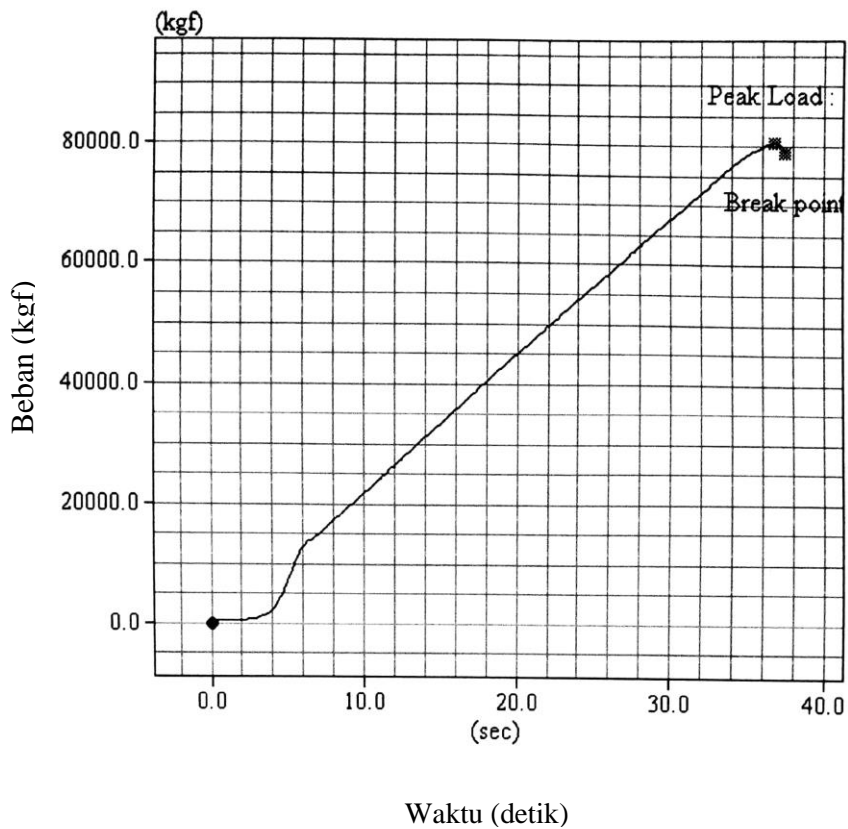
Gambar 43. Kuat tekan beton benda uji TA 46.



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/19/2018</b>			<b>Report No.</b>			<b>TAA 47</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	228.76	80550	5007.9		1.0	300.0		14		



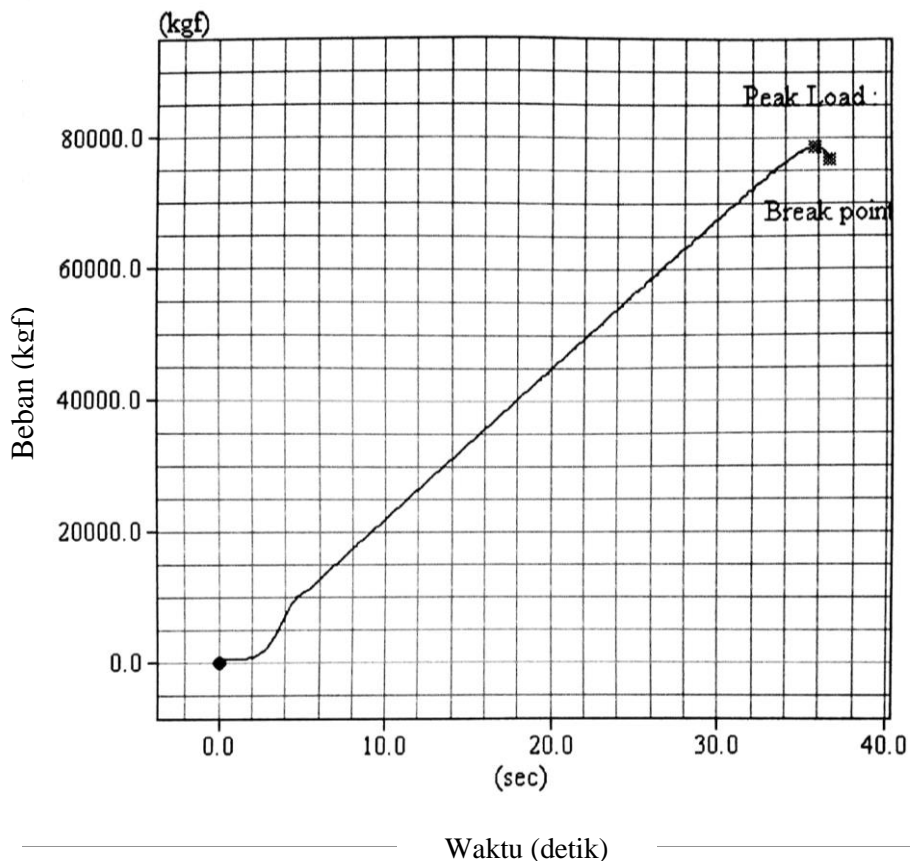
Gambar 44. Kuat tekan beton benda uji TA 47.



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/19/2018</b>			<b>Report No.</b>			<b>TAA 48</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	228.46	78570	4891.3		1.0	300.0		14		



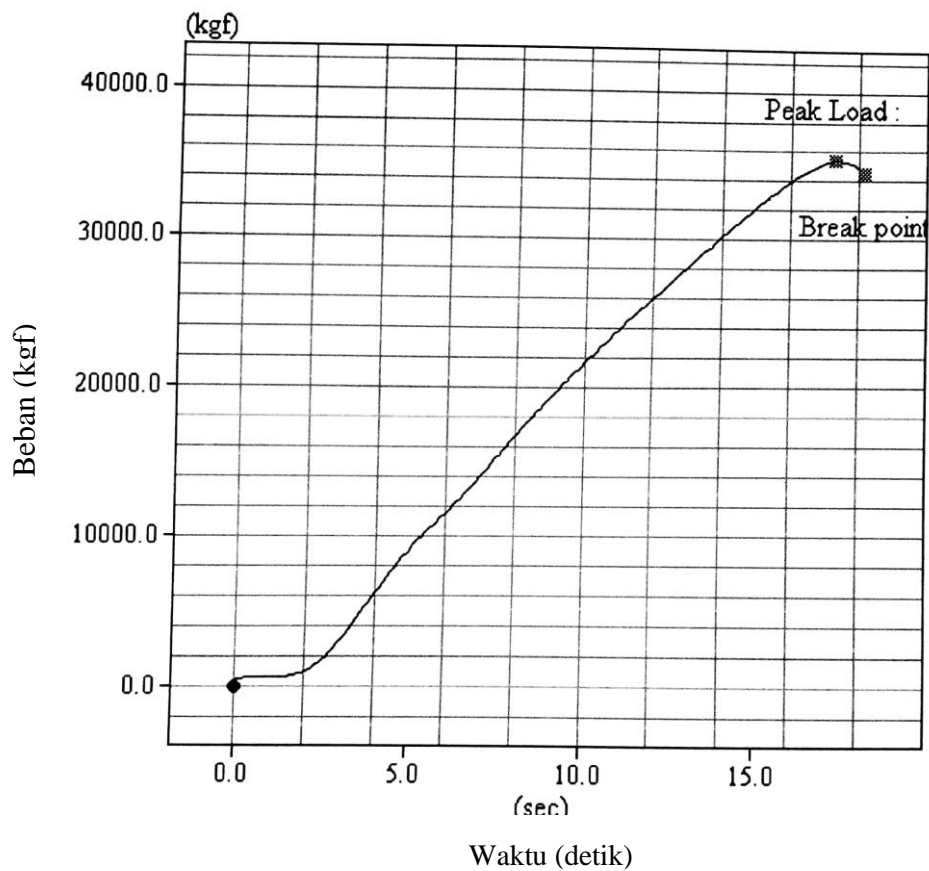
Gambar 45. Kuat tekan beton benda uji TA 48.



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/25/2018</b>			<b>Report No.</b>			<b>TAA 20</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	231.00	35390	2179.0		1.0	300.0		28		



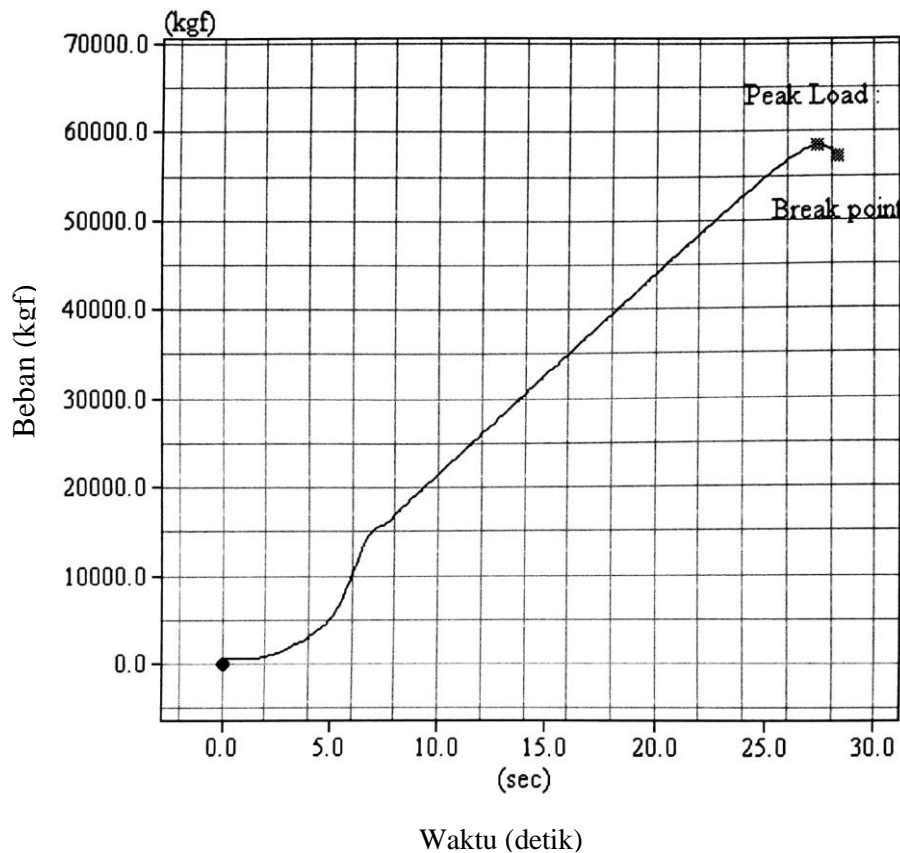
Gambar 46. Kuat tekan beton benda uji TA 20.



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Concrete Testing

Construction Name		Kubus Beton								
Manufacturer		Hungta								
Contractor		UMY								
Customer		Lab. JTS. FT.UMY								
Test Date		4/25/2018			Report No.			TAA 19		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	223.95	58370	3707.0		1.0	300.0		28		



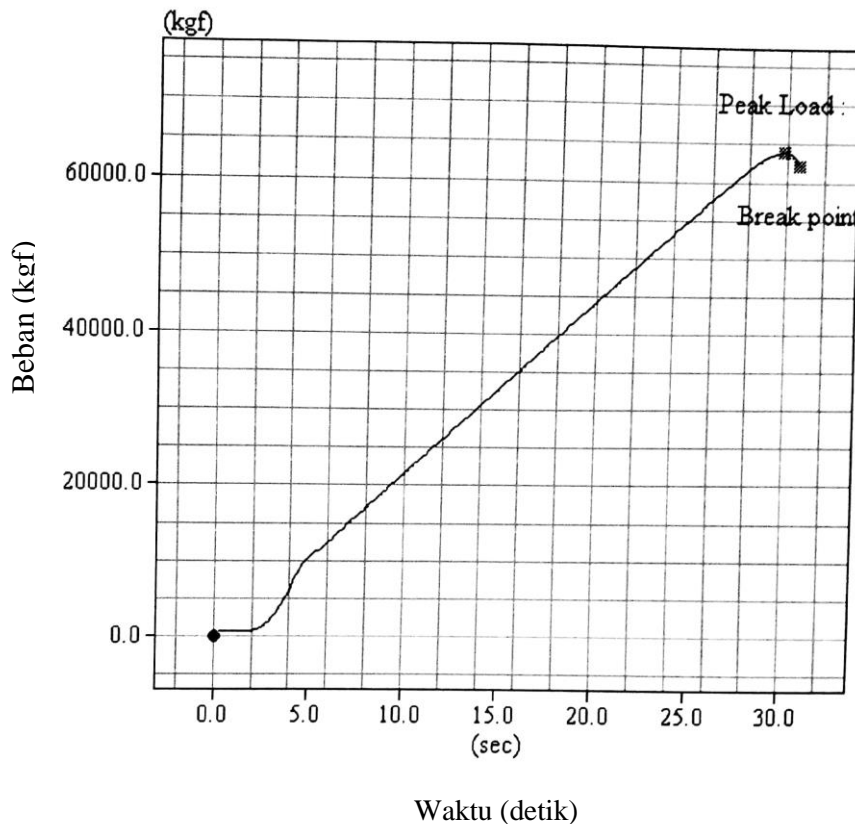
Gambar 47. Kuat tekan beton benda uji TA 19.



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/25/2018</b>			<b>Report No.</b>			<b>TAA 18</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	225.00	63900	4039.2		1.0	300.0		28		



Gambar 48. Kuat tekan beton benda uji TA 18.

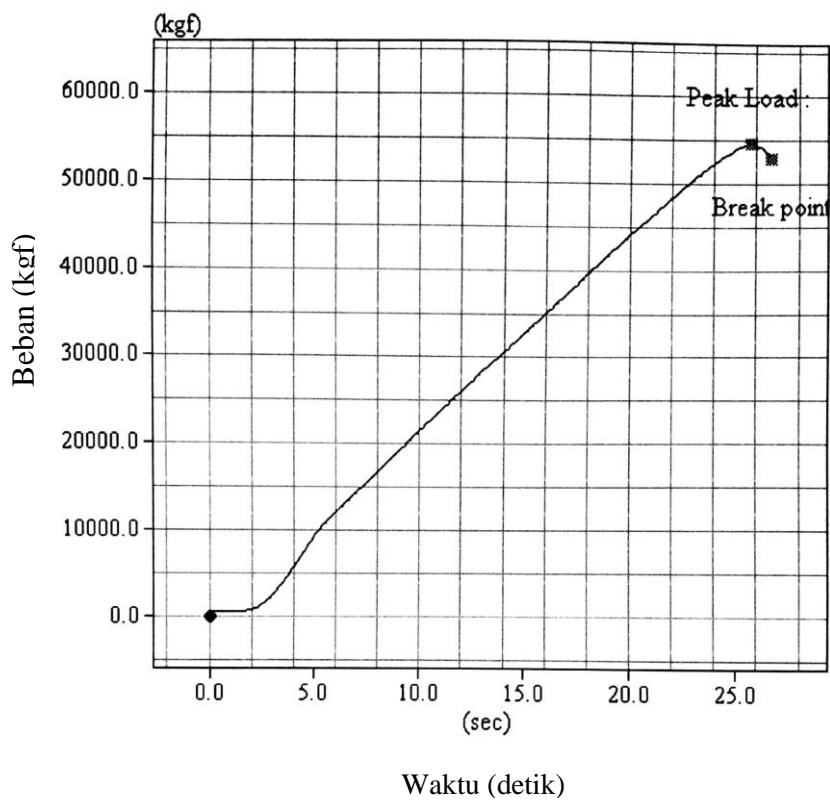




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### Concrete Testing

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/25/2018</b>			<b>Report No.</b>			<b>TAA 11</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	226.80	54540	3420.2		1.0	300.0		28		



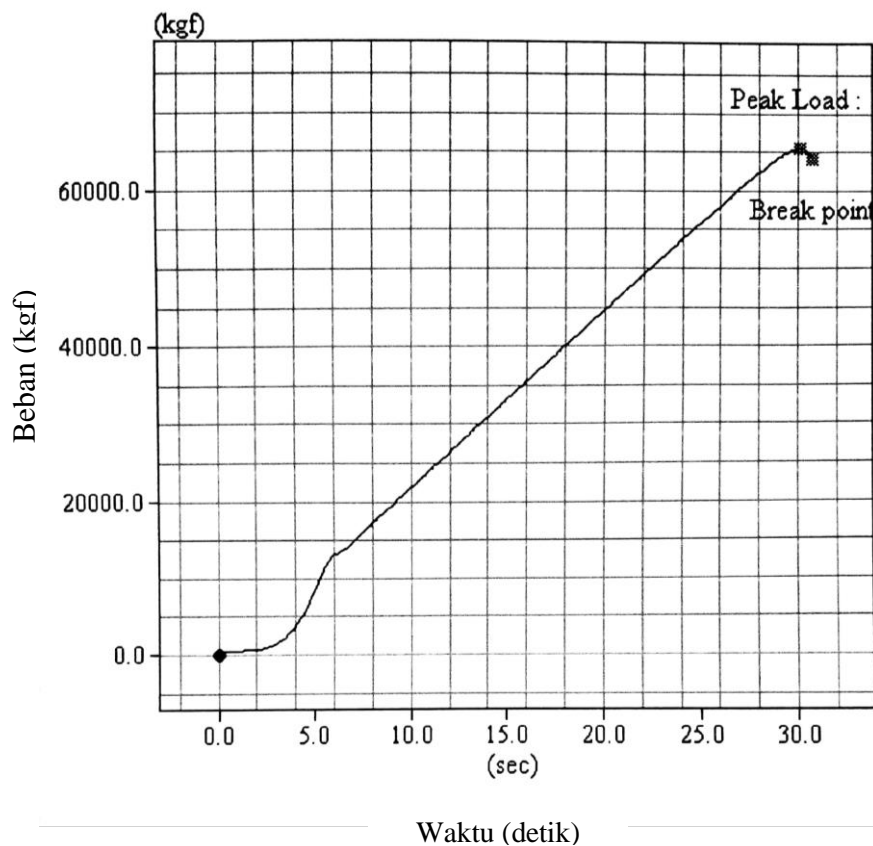
Gambar 49. Kuat tekan beton benda uji TA 11.



**Laboratorium Jurusan Teknik Sipil  
 Universitas Muhammadiyah Yogyakarta**

**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/25/2018</b>			<b>Report No.</b>			<b>TAA 10</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	227.55	65460	4091.5		1.0	300.0		28		



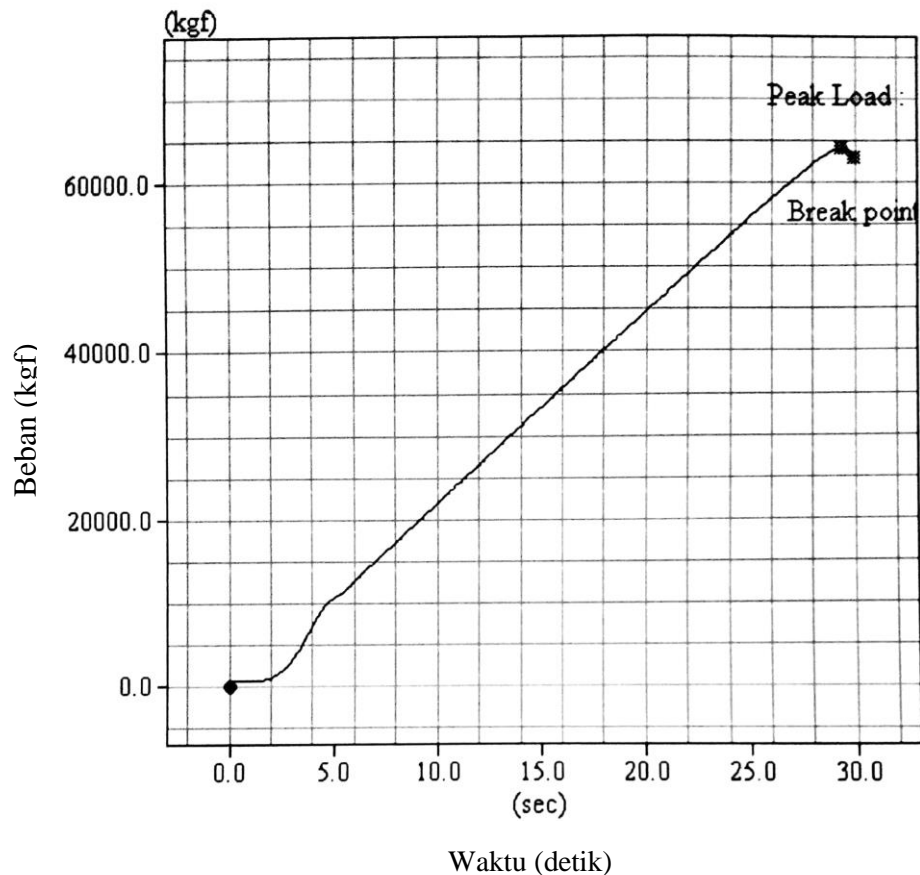
Gambar 50. Kuat tekan beton benda uji TA 10.



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Concrete Testing

<b>Construction Name</b>		Kubus Beton								
<b>Manufacturer</b>		Hungta								
<b>Contractor</b>		UMY								
<b>Customer</b>		Lab. JTS. FT.UMY								
<b>Test Date</b>		4/25/2018			<b>Report No.</b>			TAA 9		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	228.00	64060	3996.1		1.0	300.0		28		



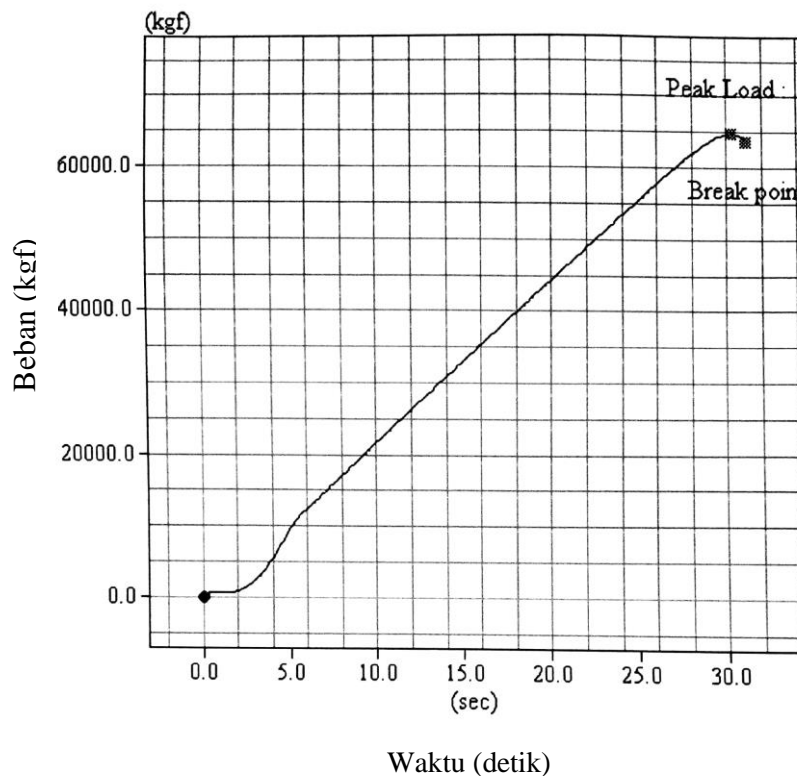
Gambar 51. Kuat tekan beton benda uji TA 9.



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**Concrete Testing**

<b>Construction Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/25/2018</b>			<b>Report No.</b>			<b>TAA 5</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	225.75	64740	4078.7		1.0	300.0		28		



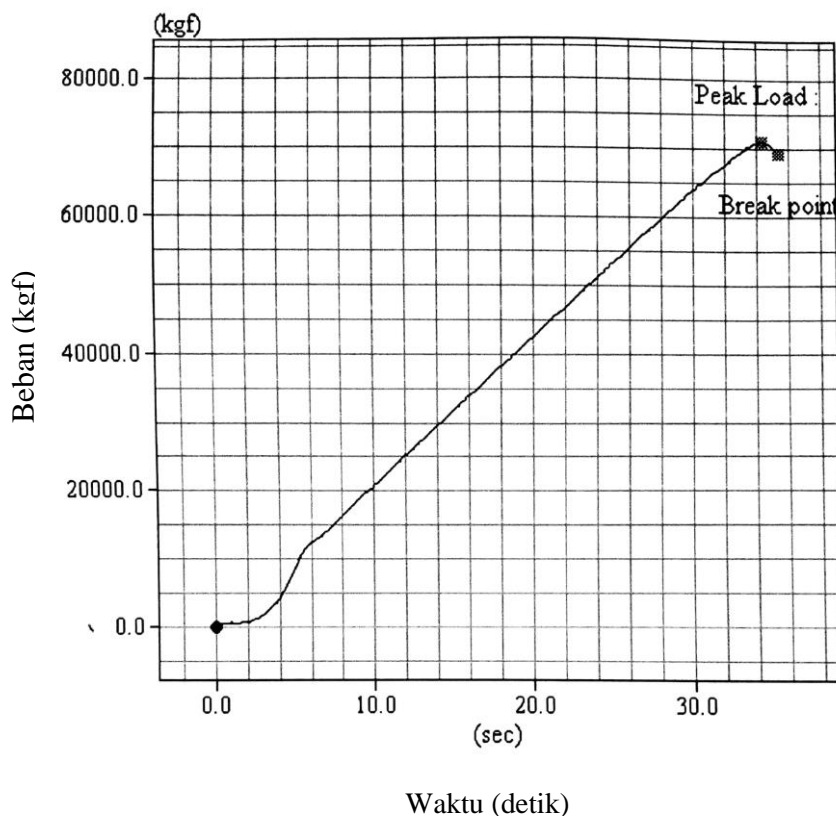
Gambar 52. Kuat tekan beton benda uji TA 5.



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**Concrete Testing**

<b>Constrution Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/25/2018</b>			<b>Report No.</b>			<b>TAA 4</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kg/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	216.75	70990	4658.2		1.0	300.0		28		



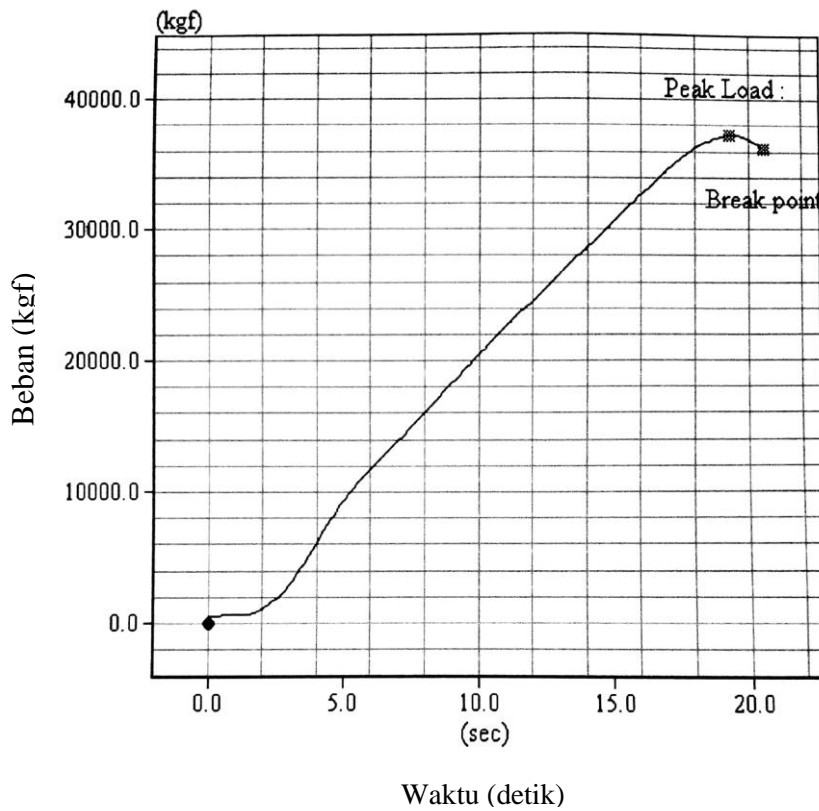
Gambar 53. Kuat tekan beton benda uji TA 4.



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Concrete Testing

<b>Constrution Name</b>		<b>Kubus Beton</b>								
<b>Manufacturer</b>		<b>Hungta</b>								
<b>Contractor</b>		<b>UMY</b>								
<b>Customer</b>		<b>Lab. JTS. FT.UMY</b>								
<b>Test Date</b>		<b>4/25/2018</b>			<b>Report No.</b>			<b>TAA 3</b>		
No.	Area (cm <sup>2</sup> )	Peak Force (Kg)	Compression Stress (psi)	Adjust Stress (Kgf/cm <sup>2</sup> )	H/D Ratio	Design Stress	Adjust Ratio	Life	Break Style	Remark
1	217.50	37230	2434.5		1.0	300.0		28		



Gambar 54. Kuat tekan beton benda uji TA 3.



**PENGUJIAN PENELITIAN TUGAS AKHIR**  
**AGREGAT HALUS**

Jenis Pengujian : Pemeriksaan gradasi besar butiran agregat halus

Bahan : Pasir

Asal : Sungai Progo

Diperiksa : 10 Februari 2018

Tabel 1 Hasil pemeriksaan gradasi butiran agregat halus

Ukuran	Lubang Ayakan (mm)	Berat Tertahan (gram)	Persen Berat Tertahan (%)	Persen berat Tertahan Kumulatif (%)	Persen Berat Lolos Kumulatif (%)
No.4	4.8	0	0	0	100
No.8	2.4	71	7.1	7.1	92.9
No.16	1.2	187	18.7	25.8	74.2
No.30	0.6	380	38	63.8	36.2
No.50	0.3	305	30.5	94.3	5.7
No.100	0.15	40	4	98.3	1.7
Pan		17	1.7	100	0
Total		1000	100	389.3	Daerah 2

Analisis hitungan:

a. Contoh saringan no.8

$$\begin{aligned}\text{Persen berat tertahan} &= \frac{\text{Berat Tertahan}}{\text{Total}} \times 100\% \\ &= \frac{71}{1000} \times 100\% \\ &= 7,1 \%\end{aligned}$$

b. Contoh saringan no.8

$$\begin{aligned}\text{Persen berat tertahan kumulatif} &= \text{Persen berat tertahan no.4} + \text{Persen berat tertahan no.8} \\ &= 0,00 + 7,1 = 7,1 \%\end{aligned}$$

c. Komulatih contoh saringan no.8

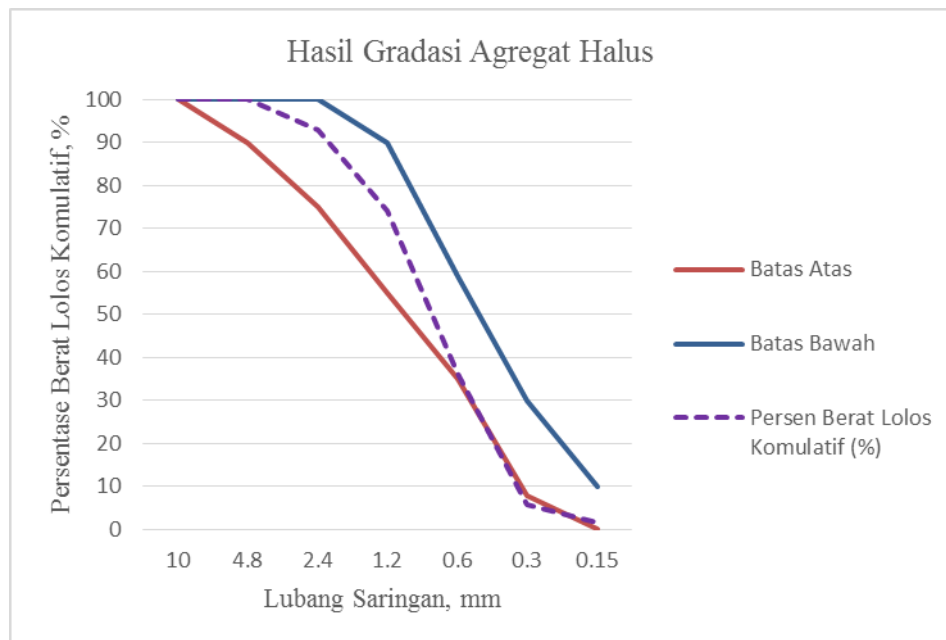
$$\begin{aligned}\text{Persen berat lolos kumulatif} &= 100 - \text{Persen berat tertahan} \\ &= 100 - 7,1 = 92,9 \%\end{aligned}$$



d. Modulus halus butir (MHB)

$$\begin{aligned} \text{MHB} &= \text{jumlah berat tertahan komulatif} / 100 \\ &= 389,30/100 = 3,89\% \end{aligned}$$

Berdasarkan hasil pengujian gradasi pasir yang dilakukan di Laboratorium Teknik Sipil Universitas Muhammadiyah Yogyakarta didapatkan hasil berdasarkan tabel grafik kekasaran pasir masuk pada daerah 2 dengan nilai Modulus Halus Butir (MHB) adalah 3,89 %.



Grafik hubungan ukuran saringan dengan persen lolos saringan





**PENGUJIAN PENELITIAN TUGAS AKHIR**  
**AGREGAT HALUS**

Jenis Pengujian : Pemeriksaan kadar air agregat halus

Bahan : Pasir

Asal : Sungai Progo

Diperiksa : 08 Februari 2018 s/d 09 Februari 2018

Tabel 4 Hasil pemeriksaan kadar air agregat halus

Uraian	Sampel									Satuan
	1	2	3	4	5	6	7	8	9	
Berat sebelum dioven	1000	1000	1000	1000	1000	1000	1000	1000	1000	gr
Berat sesudah dioven	963	977	962	981	949	978	983	979	955	gr
Kadar air	3.70	2.30	3.80	1.90	5.10	2.20	1.70	2.10	4.50	%

Analisis hitungan:

a. Berat air = Berat sebelum dioven – Berat sesudah dioven  
Contoh benda uji 1 = 1000 – 963  
= 37 gr

b. Kadar Air =  $\frac{\text{Berat air}}{\text{Berat sebelum dioven}} \times 100\%$   
Contoh benda uji 1 =  $\frac{37}{1000} \times 100\%$   
= 3,7 %

c. Kadar air rata-rata =  $\frac{KA1+KA2+KA3+KA4+KA5+KA6+KA7+KA8+KA9}{9}$   
=  $\frac{3,7+2,3+3,8+1,9+5,1+2,2+1,7+2,1+4,5}{9}$   
= 3,03 %



**PENGUJIAN PENELITIAN TUGAS AKHIR**  
**AGREGAT HALUS**

Jenis Pengujian : Pemeriksaan berat jenis dan penyerapan air agregat halus

Bahan : Pasir

Asal : Sungai Progo

Diperiksa : 09 Februari 2018 s/d 12 Februari 2018

Tabel 5 Hasil Pemeriksaan berat jenis dan penyerapan air agregat halus

Uraian	Sampel									Satuan
	1	2	3	4	5	6	7	8	9	
Bt	1088	1077	1068	1081	1074	1087	1080	1065	1079	gram
Bk	458	473	435	473	438	461	440	438	447	gram
B	757	767	771	757	767	771	757	767	771	gram
SSD	500	500	500	500	500	500	500	500	500	gram

Contoh perhitungan menggunakan benda uji 1

a. Berat jenis curah

$$\begin{aligned} &= \frac{Bk}{B+500 - Bt} \\ &= \frac{458}{757+500 - 1088} \\ &= 2,71 \end{aligned}$$

b. Berat jenis jenuh kering muka

$$\begin{aligned} &= \frac{500}{B+500 - Bt} \\ &= \frac{500}{757+500 - 1088} \\ &= 2,96 \end{aligned}$$



c. Berat jenis tampak

$$= \frac{B_k}{B+B_k-B_t}$$

$$= \frac{467}{757+458-1088}$$

$$= 3,61$$

d. Berat jenis jenuh kering muka rata-rata

$$= \frac{\sum \text{Berat jenis jenuh kering muka}}{3}$$

$$= \frac{2,96 + 2,63 + 2,46 + 2,84 + 2,59 + 2,72 + 2,82 + 2,48 + 2,60}{9}$$

$$= 2,68$$

e. Penyerapan air agregat

$$= \frac{(500 - B_k)}{B_k} \times 100 \%$$

$$= \frac{(500 - 458)}{458} \times 100 \%$$

$$= 9,17 \%$$

f. Penyerapan air agregat rata-rata

$$= \frac{\sum \text{Penyerapan air agregat}}{3}$$

$$= \frac{9,17 + 5,71 + 14,94 + 5,71 + 14,16 + 8,46 + 13,64 + 14,16 + 11,86}{9}$$

$$= 10,87 \%$$



Tabel 8. Hasil analisis

Uraian	Sampel									Satuan
	1	2	3	4	5	6	7	8	9	
Berat Jenis Curah	2.71	2.49	2.14	2.69	2.27	2.51	2.49	2.17	2.33	
Berat jenis jenuh kering muka	2.96	2.63	2.46	2.84	2.59	2.72	2.82	2.48	2.60	
Berat jenis tampak	3.61	2.90	3.15	3.17	3.34	3.18	3.76	3.13	3.22	
Penyerapan air agregat halus	9.17	5.71	14.94	5.71	14.16	8.46	13.64	14.16	11.86	%
Berat jenis jenuh kering muka rata2	2.68									
Penyerapan air agregat halus rata2	10.87									%



**PENGUJIAN PENELITIAN TUGAS AKHIR**  
**AGREGAT HALUS**

Jenis Pengujian : Pemeriksaan berat satuan agregat halus

Bahan : Pasir

Asal : Sungai Progo

Diperiksa : 7 Februari 2018

Tabel 1 Hasil pemeriksaan berat satuan agregat halus

Uraian	Nilai	Satuan
Panjang sisi cetakan kubus (S)	15	cm
Berat cetakan kubus (A)	9950	gram
Berat cetakan kubus + pasir (B)	14900	gram

Analisis hitungan:

a. Volume kubus

$$\text{Volume} = S^3$$

$$\text{Volume} = 15 \times 15 \times 15$$

$$\text{Volume} = 3375 \text{ cm}^3$$

b. Berat satuan agregat halus

$$\text{Berat satuan agr halus} = \frac{B-A}{\text{volume}}$$

$$\text{Berat satuan agr halus} = \frac{14900 - 9950}{3375}$$

$$\text{Berat satuan agr halus} = 1,47 \text{ gram/cm}^3$$



**PENGUJIAN PENELITIAN TUGAS AKHIR**  
**AGREGAT HALUS**

Jenis Pengujian : Pemeriksaan kadar lumpur agregat halus

Bahan : Pasir

Asal : Sungai Progo

Diperiksa : 07 Februari 2018 s/d 08 Februari 2018

Tabel 1. Data Pengujian

Uraian	Sampel								
	1	2	3	4	5	6	7	8	9
Berat pasir kering tungku sebelum dicuci ( $W_1$ ), gram	500	500	500	500	500	500	500	500	500
Berat pasir kering tungku setelah dicuci + nampan ( $W_2$ ), gram	765.8	761.1	759.6	758.7	766.3	771.2	764.8	765	758.4
Berat nampan ( $W_3$ ), gram	288.7	288.3	284.5	287.5	288.4	285.8	288.3	285.9	288.6

Contoh analisis perhitungan menggunakan benda uji 1

- a. Berat pasir kering tungku setelah dicuci ( $W_4$ )

$$W_4 = W_2 - W_3$$

$$W_4 = 765,8 - 288,7$$

$$W_4 = 477,1 \text{ gram}$$

- b. Kadar butir lolos ayakan No. 200

$$\text{Kadar lumpur} = \frac{(W_1 - W_4)}{W_1} \times 100 \%$$



$$\text{Kadar lumpur} = \frac{(500 - 477,1)}{500} \times 100 \%$$

$$\text{Kadar lumpur} = 4,58 \%$$

c. Rata-rata kadar lumpur

$$\text{Kadar lumpur rerata} = \frac{\sum \text{kadar lumpur}}{9}$$

$$\text{Kadar lumpur rerata} = \frac{4,58 + 5,44 + 4,98 + 5,76 + 4,42 + 2,92 + 4,7 + 4,18 + 6,04}{9}$$

$$\text{Kadar lumpur rerata} = 4,78 \%$$

Tabel 2. Hasil analisis

Uraian	Sampel								
	1	2	3	4	5	6	7	8	9
Kadar lumpur, %	4,58	5,44	4,98	5,76	4,42	2,92	4,7	4,18	6,04
Kadar lumpur rata-rata, %	4,78								



**PENGUJIAN PENELITIAN TUGAS AKHIR**  
**AGREGAT KASAR**

Jenis Pengujian : Pemeriksaan kadar air agregat kasar

Bahan : Kerikil Clereng

Asal : Kulon Progo

Diperiksa : 08 Februari 2018 s/d 09 Februari 2018

Tabel 1 Hasil pemeriksaan kadar air agregat halus

Uraian	Sampel									Satuan
	1	2	3	4	5	6	7	8	9	
Berat sebelum dioven	1500	1500	1500	1500	1500	1500	1500	1500	1500	gram
Berat sesudah dioven	1474	1466	1483	1481	1469	1477	1458	1468	1476	gram
Kadar air	1.73	2.27	1.13	1.27	2.07	1.53	2.80	2.13	1.60	%

Analisis hitungan:

a. Berat air = Berat sebelum dioven – Berat sesudah dioven  
 Contoh benda uji 1 = 1500 – 1474  
 = 36 gr

b. Kadar Air =  $\frac{\text{Berat air}}{\text{Berat sebelum dioven}} \times 100\%$   
 Contoh benda uji 1 =  $\frac{36}{1500} \times 100\%$   
 = 1,73 %

c. Kadar air rata-rata =  $\frac{KA1+KA2+KA3+KA4+KA5+KA6+KA7+KA8+KA9}{9}$   
 =  $\frac{1,73+2,27+1,13+1,27+2,07+1,53+2,8+2,13+1,6}{9}$   
 = 1,84 %





**PENGUJIAN PENELITIAN TUGAS AKHIR**  
**AGREGAT KASAR**

Jenis Pengujian : Pemeriksaan berat jenis dan penyerapan air agregat kasar

Bahan : Kerikil Clereng

Asal : Kulon Progo

Diperiksa : 09 Februari 2018 s/d 12 Februari 2018

Uraian	Sampel									Satuan
	1	2	3	4	5	6	7	8	9	
Bk	1515	1535	1519	1495	1488	1508	1492	1510	1522	gram
Ba	959	963	955	946	940	950	947	959	964	gram
Bj	1565	1565	1537	1525	1515	1533	1515	1530	1542	gram

Contoh perhitungan menggunakan benda uji 1

a. Berat jenis curah

$$\begin{aligned} &= \frac{Bk}{Bj - Ba} \\ &= \frac{1515}{1565 - 959} \\ &= 2,5 \end{aligned}$$

b. Berat jenis jenuh kering muka

$$\begin{aligned} &= \frac{Bj}{Bj - Ba} \\ &= \frac{1565}{1565 - 959} \\ &= 2,58 \end{aligned}$$

c. Berat jenis tampak

$$\begin{aligned} &= \frac{Bk}{Bk - Ba} \\ &= \frac{1515}{1515 - 959} \\ &= 2,72 \end{aligned}$$



d. Berat jenis jenuh kering muka rata-rata

$$= \frac{\sum \text{Berat jenis jenuh kering muka}}{9}$$

$$= \frac{2,58+2,60+2,64+2,63+2,63+2,63+2,67+2,68+2,67}{9}$$

$$= 2,64$$

e. Penyerapan air agregat

$$= \frac{(B_j - B_k)}{B_k} \times 100 \%$$

$$= \frac{(1565 - 1515)}{1515} \times 100 \%$$

$$= 3,30 \%$$

f. Penyerapan air agregat rata-rata

$$= \frac{\sum \text{Penyerapan air agregat}}{9}$$

$$= \frac{3,30+1,95+1,18+2,01+1,81+1,66+1,54+1,32+1,31}{9}$$

$$= 1,79 \%$$

Tabel 8. Hasil analisis

Uraian	Sampel									Satuan
	1	2	3	4	5	6	7	8	9	
Berat jenis curah	2.50	2.55	2.61	2.58	2.59	2.59	2.63	2.64	2.63	
Berat jenis jenuh kering muka	2.58	2.60	2.64	2.63	2.63	2.63	2.67	2.68	2.67	
Berat jenis tampak	2.72	2.68	2.69	2.72	2.72	2.70	2.74	2.74	2.73	
Penyerapan air agregat kasar	3.30	1.95	1.18	2.01	1.81	1.66	1.54	1.32	1.31	%
Berat jenis jenuh kering muka rata <sup>2</sup>	2.64									
Penyerapan air agregat kasar rata <sup>2</sup>	1.79									%



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**PENGUJIAN PENELITIAN TUGAS AKHIR**  
**AGREGAT KASAR**

Jenis Pengujian : Pemeriksaan berat satuan agregat kasar

Bahan : Kerikil

Asal : Kulon Progo, Yogyakarta

Diperiksa : 7 Februari 2018

Tabel 1 Hasil pemeriksaan berat satuan agregat halus

Uraian	Nilai	Satuan
Panjang sisi cetakan kubus (S)	15	cm
Berat cetakan kubus (A)	9950	gram
Berat cetakan kubus + kerikil (B)	14850	gram

Analisis hitungan:

a. Volume kubus

$$\text{Volume} = S^3$$

$$\text{Volume} = 15 \times 15 \times 15$$

$$\text{Volume} = 3375 \text{ cm}^3$$

b. Berat satuan agregat kasar

$$\text{Berat satuan agr kasar} = \frac{B-A}{\text{volume}}$$

$$\text{Berat satuan agr kasar} = \frac{14850-9950}{3375}$$

$$\text{Berat satuan agr kasar} = 1,45 \text{ gram/cm}^3$$



**PENGUJIAN PENELITIAN TUGAS AKHIR**  
**AGREGAT KASAR**

Jenis Pengujian : Pemeriksaan kadar lumpur agregat kasar

Bahan : Kerikil Clereng

Asal : Kulon Progo

Diperiksa : 07 Februari 2018 s/d 08 Februari 2018

Tabel 1 Hasil pemeriksaan kadar lumpur agregat halus

Uraian	Sampel								
	1	2	3	4	5	6	7	8	9
Berat pasir kering tungku sebelum dicuci ( $W_1$ ), gram	5000	5000	5000	5000	5000	5000	5000	5000	5000
Berat pasir kering tungku setelah dicuci + nampan ( $W_2$ ), gram	5138	5129	5133	5141	5144	5127	5131	5145	5135
Berat nampan ( $W_3$ ), gram	226	225.8	226.2	225.9	226.2	226	226	225.9	225.6

Contoh analisis perhitungan menggunakan benda uji 1

- a. Berat pasir kering tungku setelah dicuci ( $W_4$ )

$$W_4 = W_2 - W_3$$

$$W_4 = 5138 - 226$$

$$W_4 = 4912 \text{ gram}$$

- b. Kadar butir lolos ayakan No. 200

$$\text{Kadar lumpur} = \frac{(W_1 - W_4)}{W_1} \times 100 \%$$

$$\text{Kadar lumpur} = \frac{(5000 - 4912)}{5000} \times 100 \%$$

$$\text{Kadar lumpur} = 1,76 \%$$



c. Rata-rata kadar lumpur

$$\text{Kadar lumpur rerata} = \frac{\sum \text{kadar lumpur}}{9}$$

$$\text{Kadar lumpur rerata} = \frac{1,76+1,94+1,86+1,70+1,64+1,98+1,90+1,62+1,81}{9}$$

$$\text{Kadar lumpur rerata} = 1,80 \%$$

Tabel 2. Hasil analisis

Uraian	Sampel								
	1	2	3	4	5	6	7	8	9
Kadar lumpur, %	1.76	1.94	1.86	1.70	1.64	1.98	1.90	1.62	1.81
Kadar lumpur rata-rata, %	1,80								



**PENGUJIAN PENELITIAN TUGAS AKHIR**  
**AGREGAT KASAR**

Jenis Pengujian : Pemeriksaan keausan agregat kasar

Bahan : Kerikil Clereng

Asal : Kulon Progo

Diperiksa : 07 Februari 2018 s/d 08 Februari 2018

Tabel 1 Pemeriksaan keausan agregat kasar

Uraian	Benda Uji									Satuan
	1	2	3	4	5	6	7	8	9	
Berat sebelum masuk mesin (B1)	5000	5000	5000	5000	5000	5000	5000	5000	5000	gram
Berat setelah masuk mesin (B2)	3200	4050	4150	4000	4000	3850	4450	4450	4350	gram
Keausan	36	19	17	20	20	23	11	11	13	%
Keausan rata-rata	18.89									%

Analisis hitungan:

$$a. \text{ Keausan} = \frac{B1-B2}{B1} \times 100\%$$

$$\begin{aligned} \text{Contoh benda uji 1} &= \frac{5000-3200}{5000} \times 100\% \\ &= 36\% \end{aligned}$$

$$b. \text{ Keausan rata-rata} = \frac{\sum \text{Keausan}}{9}$$

$$\begin{aligned} &= \frac{36+19+17+20+20+23+11+11+13}{9} \\ &= 18,89\% \end{aligned}$$



**K. PERENCANAAN *MIX DESIGN* BETON BERDASARKAN  
SNI 03-2834-2000**

Tabel 22. Hasil *mix design*

No	Uraian	Tabel/ Grafik/ Perhitungan	Nilai
1	Kuat tekan yang disyaratkan (benda uji kubus), $f'_c$	Ditetapkan	30 MPa pada 28 hari
2	Nilai tambah (margin), M		8,5 MPa
3	Kekuatan rata-rata yang ditargetkan, $F_{cr}$	$f'_c + M$	$30 + 8,5 = 38,5$ MPa
4	Jenis semen	Ditetapkan	
5	Jenis agregat : - Kasar - Halus	Ditetapkan Ditetapkan	Batu pecah Alami
6	Faktor air semen bebas : - $FAS_1$ - $FAS_2$ Digunakan FAS terkecil	Tabel 2, Grafik 1 Tabel 4	0,47 0,60 0,47 (dipilih yang terkecil)
8	<i>Slump</i>	Ditetapkan	7,5 – 15 cm
9	Ukuran agregat maksimum	Ditetapkan	20 mm
10	Kadar air bebas : - Agregat alami (Wh) - Agregat batu pecah (Wk) Kadar air yang digunakan, $W_{air}$	Tabel 3 Tabel 3 $0,67 W_h + 0,33 W_k$	$195 \text{ kg/m}^3$ $225 \text{ kg/m}^3$ $205 \text{ kg/m}^3$
11	Kadar semen, $W_{semen}$	$W_{air} : FAS$	$426,875 \text{ kg/m}^3$
12	Berat jenis agregat : - Agregat halus - Agregat kasar	Diketahui Diketahui	2,68 2,64



Tabel 22. Hasil *mix design* (Lanjutan)

No	Uraian	Tabel/ Grafik/ Perhitungan	Nilai
13	Kebutuhan agregat : - Daerah gradasi pasir - Persen pasir terhadap agregat gabungan (P) - Persen kerikil terhadap agregat gabungan (K)	Grafik 4  Grafik 14  100 % - 35 %	Daerah gradasi no.2 41 % 59 %
14	Berat jenis agregat gabungan	Perhitungan : (P x Bj agr halus) + (K x Bj agr kasar)	2,65
15	Berat jenis beton, $W_{beton}$	Grafik 16	2385 kg/m <sup>3</sup>
16	Kebutuhan agregat campuran, $W_{agr}$	$W_{beton} - W_{air} - W_{semen}$	1743,83 kg/m <sup>3</sup>
17	Kebutuhan agregat : - Agregat halus, $W_{pasir}$ - Agregat kasar, $W_{kerikil}$	$W_{agr} \times P$ $W_{agr} \times K$	714,97 kg/m <sup>3</sup> 1028,86 kg/m <sup>3</sup>
18	Proporsi campuran :		
	Untuk 1 m <sup>3</sup>		
	Semen (kg)	Air (liter)	Pasir (kg)
	436,17	205	714,97
	Untuk 1 kubus beton		
	Semen (kg)	Air (ml)	Pasir (kg)
	1,619	0,761	2,654
			Kerikil (kg)
			3,82





**Alat pemeriksaan bahan susun beton:**



Gambar 1 Timbangan *Elektrikal*



Gambar 2 Timbangan dalam air



Gambar 3 *Kaliper*



Gambar 4 *Elenmeyer*



Gambar 5 Saringan ASTM



Gambar 6 Mesin *Los Angeles*



**Alat pembuatan benda uji:**



Gambar 7 Mixer concrete



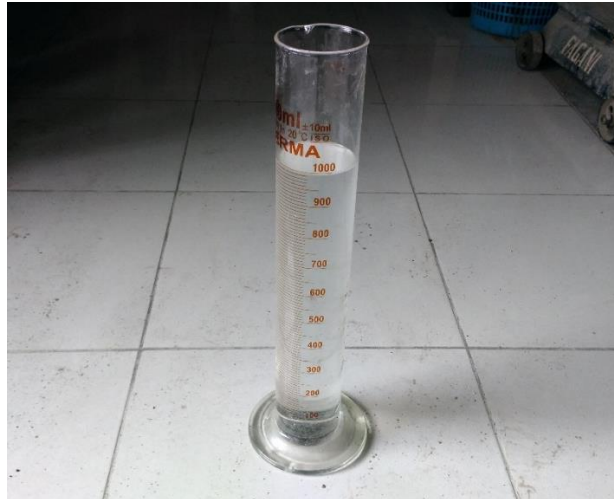
Gambar 8 Cetakan Kubus



Gambar 9 Cetok dan mistar



Gambar 10 Nampan



Gambar 11 Gelas ukur 1000 ml



Gambar 12 Kerucut Abrams



Gambar 13 Alat Pengujian *slump*



Gambar 14 Oven



Gambar 15 Alat Injeksi



*Gambar 16 Compression Machine Test*



*Gambar 17 Electric sieve shaker machine.*



**Bahan susun beton:**



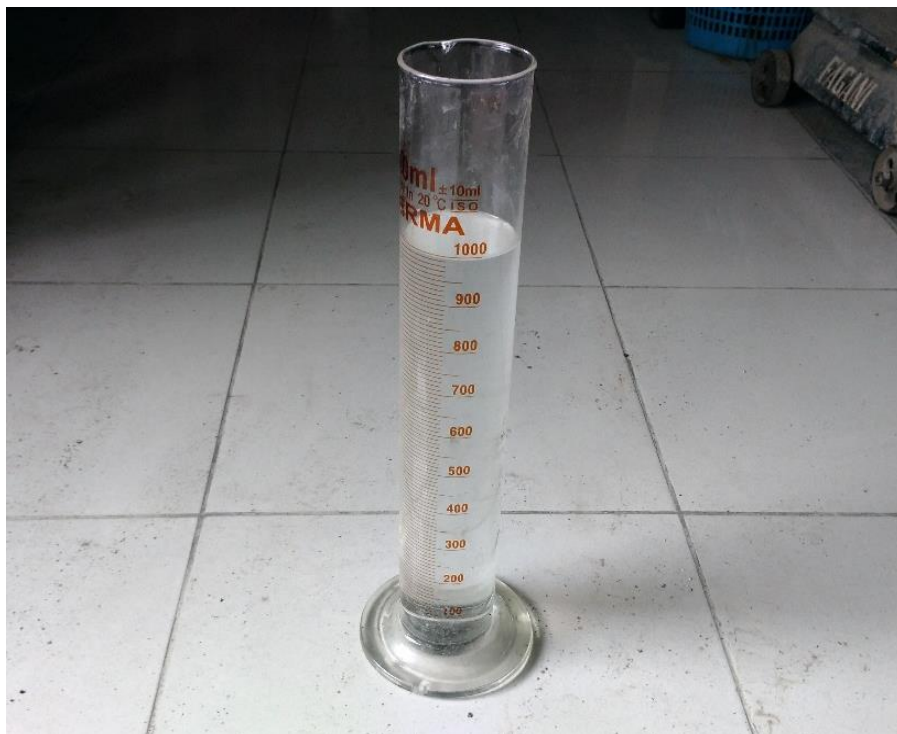
Gambar 18 Semen Gresik (PCC)



Gambar 19 Agregat halus (Pasir Progo)



Gambar 20 Agregat kasar (kerikil)



Gambar 21 Air





Gambar 22 Semen *Grout*



**Proses pengujian beton kondisi segar (*fresh properties*):**



Gambar 23 Persiapan Bahan



Gambar 24 Pengujian *Slump*



Gambar 25 Penuangan Beton Segar



**Proses pengujian kuat tekan:**



Gambar 26 kuat tekan sebelum digrouting



Gambar 27 Hasil setelah diuji tekan



Gambar 28 Perbaikan beton



Gambar 29 Benda uji setelah digrouting



Gambar 30 Benda uji setelah diuji kuat tekan