



LABORATORIUM MEKANIKA TANAH
JURUSAN TEKNIK SIPIL
FAKULTAS TEKNIK SIPIL DAN PERENCANAAN
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PENGUJIAN PEMADATAN TANAH
ASTM D - 698 - 70

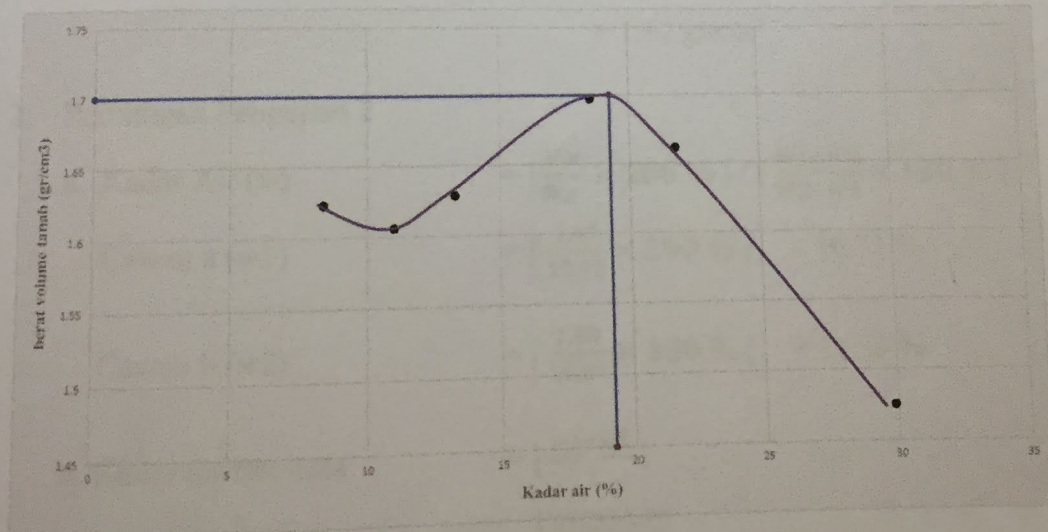
Proyek : Tugas Akhir
 Lokasi : Desa Klangkapan I, Marguluweh, Seyegan, Kabupaten Sleman
 Dikerjakan : Ronaldo Fajriansyah
 Tanggal : 30 November 2017
 Sampel : Tanah Asli Sampel 1

Mold		
Berat	gram	1850
Diameter	cm	10.16
Tinggi	cm	11.5
Volume	cm ³	932.34

		Penambahan Air					
		2000	2000	2000	2000	2000	2000
berat sampel tanah	gram	2000	2000	2000	2000	2000	2000
kadar air mula-mula	%	8.39	8.39	8.39	8.39	8.39	8.39
penambahan air	ml	0	50	100	150	200	250

		Berat volume tanah y					
		0 ml	50 ml	100 ml	200 ml	300 ml	400 ml
no sampel							
berat cetakan + tanah basah	gram	3490	3512	3570	3725	3736	3636
berat tanah basah	gram	1640	1662	1720	1875	1886	1786
berat volume tanah basah	gram/cm ³	1.76	1.78	1.84	2.01	2.02	1.92

		Kadar air tanah											
		1		2		3		4		5		6	
		a	b	a	b	a	b	a	b	a	b	a	b
no.cawan													
berat cawan	gram	8.94	8.90	8.94	9.31	13.28	9.25	12.79	12.85	9.29	12.99	9.19	9.20
berat cawan + tanah basah	gram	31.19	30.02	24.13	28.02	23.99	20.36	27.33	25.77	25.42	36.72	32.78	33.68
berat cawan + tanah kering	gram	29.72	28.15	22.66	26.12	22.75	19.04	25.11	23.71	22.34	32.78	27.21	28.20
berat air	gram	1.47	1.87	1.47	1.90	1.24	1.32	2.22	2.06	3.08	3.94	5.57	5.48
berat tanah kering	gram	20.78	19.25	13.72	16.81	9.47	9.79	12.32	10.86	13.05	19.79	18.02	19.00
kadar air	%	7.07	9.71	10.71	11.30	13.09	13.48	18.02	18.97	23.60	19.91	30.91	28.84
kadar air rata-rata	%	8.39		11.01		13.29		18.49		21.76		29.88	
berat volume tanah kering	gram/cm ³	1.62		1.61		1.63		1.70		1.66		1.47	



Berat Volume kering Maksimum	1.70	gr/cm ³
Kadar Air Optimum (%)	19.25	%

Diperiksa Oleh :

(Ir. Akhmad Marzuko, M.T.)

Perhitungan Pengujian Pematatan (Proktor Standar)

1. Perhitngan Pengujian 1

$$\text{a. Kadar Air (w)} = \left[\frac{W_w}{W_s} \times 100 \% \right] / \left[\frac{W_2 - W_3}{W_3 - W_1} \times 100 \% \right]$$

$$\text{Cawan a (w1)} = \left[\frac{1,47}{20,78} \times 100 \% \right] = 7,07 \%$$

$$\text{Cawan b (w2)} = \left[\frac{1,87}{19,25} \times 100 \% \right] = 9,71 \%$$

$$\text{b. Kadar air rata-rata} = \left[\frac{w_1 + w_2}{2} \right]$$

$$= \frac{7,07 + 9,71}{2}$$

$$= 8,39 \%$$

$$\begin{aligned} \text{c. Berat volume tanah basah} \quad \gamma &= \frac{W_2 - W_1}{V_o} \\ &= \frac{3490 - 1640}{932,34} \\ &= 1,76 \text{ gr/cm}^3 \end{aligned}$$

$$\begin{aligned} \text{d. Berat volume tanah kering } (\gamma_d) &= \frac{\gamma}{1 + w} \\ &= \frac{1,76}{1 + 0,0839} \\ &= 1,62 \text{ gr/cm}^3 \end{aligned}$$

2. Perhitngan Pengujian 2

$$\text{a. Kadar Air (w)} = \left[\frac{W_w}{W_s} \times 100 \% \right] / \left[\frac{W_2 - W_3}{W_3 - W_1} \times 100 \% \right]$$

$$\text{Cawan a (w1)} = \left[\frac{1,47}{13,72} \times 100 \% \right] = 10,71 \%$$

$$\text{Cawan b (w2)} = \left[\frac{1,90}{16,81} \times 100 \% \right] = 11,30 \%$$

$$\text{b. Kadar air rata-rata} = \left[\frac{w_1 + w_2}{2} \right]$$

$$= \frac{10,71 + 11,30}{2}$$

$$= 11,01 \%$$

$$\begin{aligned}
 \text{c. Berat volume tanah basah} \quad \gamma &= \frac{W_2 - W_1}{V_o} \\
 &= \frac{3512 - 1662}{932,34} \\
 &= 1,78 \text{ gr/cm}^3
 \end{aligned}$$

$$\begin{aligned}
 \text{d. Berat volume tanah kering } (\gamma_d) &= \frac{\gamma}{1+w} \\
 &= \frac{1,78}{1+0,1101} \\
 &= 1,61 \text{ gr/cm}^3
 \end{aligned}$$

3. Perhitungan Pengujian 3

$$\text{a. Kadar Air } (w) = \left[\frac{W_w}{W_s} \times 100 \% \right] / \left[\frac{W_2 - W_3}{W_3 - W_1} \times 100 \% \right]$$

$$\text{Cawan a } (w_1) = \left[\frac{1,24}{9,47} \times 100 \% \right] = 13,09 \%$$

$$\text{Cawan b } (w_2) = \left[\frac{1,32}{9,79} \times 100 \% \right] = 13,48 \%$$

$$\begin{aligned}
 \text{b. Kadar air rata-rata} &= \left[\frac{w_1 + w_2}{2} \right] \\
 &= \frac{13,09 + 13,48}{2} \\
 &= 13,29 \%
 \end{aligned}$$

$$\begin{aligned}
 \text{c. Berat volume tanah basah} \quad \gamma &= \frac{W_2 - W_1}{V_o} \\
 &= \frac{3570 - 1720}{932,34} \\
 &= 1,84 \text{ gr/cm}^3
 \end{aligned}$$

$$\begin{aligned}
 \text{d. Berat volume tanah kering } (\gamma_d) &= \frac{\gamma}{1+w} \\
 &= \frac{1,84}{1+0,1329} \\
 &= 1,63 \text{ gr/cm}^3
 \end{aligned}$$

4. Perhitngan Pengujian 4

$$\text{a. Kadar Air (w)} = \left[\frac{W_w}{W_s} \times 100 \% \right] / \left[\frac{W_2 - W_3}{W_3 - W_1} \times 100 \% \right]$$

$$\text{Cawan a (w1)} = \left[\frac{2,22}{12,32} \times 100 \% \right] = 18,02 \%$$

$$\text{Cawan b (w2)} = \left[\frac{2,06}{10,86} \times 100 \% \right] = 18,97 \%$$

$$\text{b. Kadar air rata-rata} = \left[\frac{w_1 + w_2}{2} \right]$$

$$= \frac{18,02 + 18,97}{2}$$

$$= 18,49 \%$$

$$\text{c. Berat volume tanah basah} \quad \gamma = \frac{W_2 - W_1}{V_o}$$

$$= \frac{3725 - 1875}{932,34}$$

$$= 2,01 \text{ gr/cm}^3$$

$$\text{d. Berat volume tanah kering } (\gamma_d) = \frac{\gamma}{1 + w}$$

$$= \frac{2,01}{1 + 0,201}$$

$$= 1,70 \text{ gr/cm}^3$$

5. Perhitngan Pengujian 5

$$\text{a. Kadar Air (w)} = \left[\frac{W_w}{W_s} \times 100 \% \right] / \left[\frac{W_2 - W_3}{W_3 - W_1} \times 100 \% \right]$$

$$\text{Cawan a (w1)} = \left[\frac{3,08}{13,05} \times 100 \% \right] = 23,60 \%$$

$$\text{Cawan b (w2)} = \left[\frac{3,94}{19,79} \times 100 \% \right] = 19,91 \%$$

$$\text{b. Kadar air rata-rata} = \left[\frac{w_1 + w_2}{2} \right]$$

$$= \frac{23,60 + 19,91}{2}$$

$$= 21,76 \%$$

c. Berat volume tanah basah

$$\gamma = \frac{W_2 - W_1}{V_o}$$

$$= \frac{3736 - 1886}{932,34}$$

$$= 2,02 \text{ gr/cm}^3$$

d. Berat volume tanah kering (γ_d)

$$= \frac{\gamma}{1+w}$$

$$= \frac{2,02}{1+0,2176}$$

$$= 1,66 \text{ gr/cm}^3$$

6. Perhitngan Pengujian 6

a. Kadar Air (w)

$$= \left[\frac{W_w}{W_s} \times 100 \% \right] / \left[\frac{W_2 - W_3}{W_3 - W_1} \times 100 \% \right]$$

Cawan a (w_1)

$$= \left[\frac{5,57}{18,02} \times 100 \% \right] = 30,91 \%$$

Cawan b (w_2)

$$= \left[\frac{5,48}{19,00} \times 100 \% \right] = 28,88 \%$$

b. Kadar air rata-rata

$$= \left[\frac{w_1 + w_2}{2} \right]$$

$$= \frac{30,91 + 28,88}{2}$$

$$= 29,88 \%$$

c. Berat volume tanah basah

$$\gamma = \frac{W_2 - W_1}{V_o}$$

$$= \frac{3636 - 1786}{932,34}$$

$$= 1,92 \text{ gr/cm}^3$$

d. Berat volume tanah kering (γ_d)

$$= \frac{\gamma}{1+w}$$

$$= \frac{1,92}{1+0,2988}$$

$$= 1,47 \text{ gr/cm}^3$$