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Lampiran 1. Hasil pengujian berat isi, kadar air dan berat jenis tanah ekspansif

PEMERIKSAAN BERAT ISI TANAH				
Proyek :	Disertasi		Sampel : Ring road 2	
Lokasi :	Ring road 2 Kota Manado		Dikerjakan : Denny Pinasang	
Tanggal :	1 November 2019		Diperiksa : Promotor&co Promotor	
	Ring No.		1	2
	Berat tanah + ring	gram	459.38	460.18
	Berat ring	gram	191.31	191.31
	Diameter ring	cm	4.75	4.75
	Tinggi ring	cm	9.50	9.50
	Volume ring	cm <sup>3</sup>	168.41	168.41
	Berat tanah	gram	268.07	268.87
	Berat isi tanah	gr/cm <sup>3</sup>	1.592	1.596
			1.59	

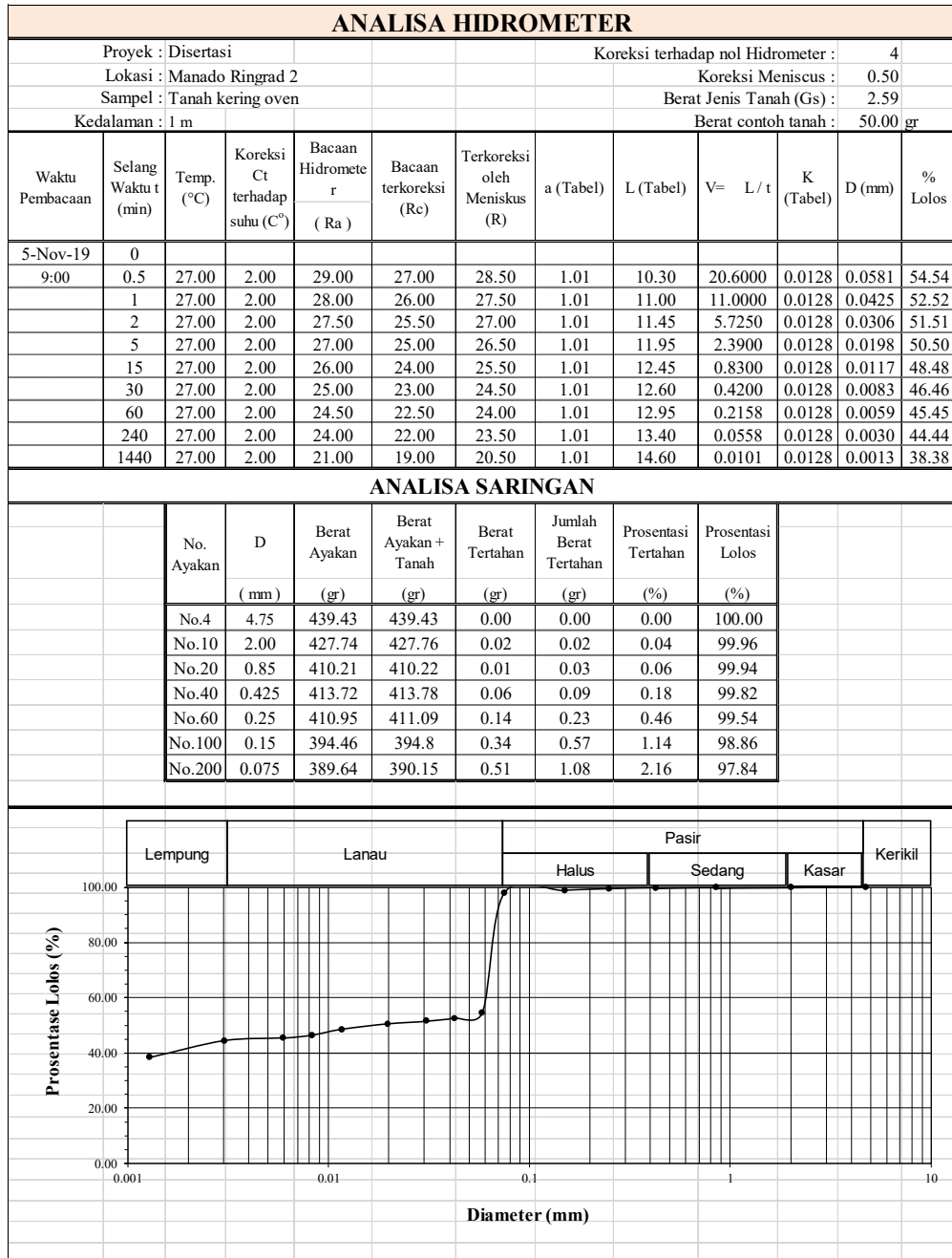
PEMERIKSAAN KADAR AIR				
				(ASTM D 2216)
Pekerjaan :	Disertasi		Sampel : Tanah ekspansif	
Lokasi :	Manado Ringrad 2		Dikerjakan : Denny Pinasang	
Tanggal :	1 November 2019		Diperiksa : Promotor&co Promotor	
	No. Cawan		21	22
	Berat tanah basah + cawan	(gr)	374.65	355.14
	Berat tanah kering + cawan	(gr)	258.49	246.71
	Berat air	(gr)	116.16	108.43
	Berat cawan	(gr)	66.13	66.57
	Berat tanah kering	(gr)	192.36	180.14
	Kadar air	(%)	60.39	60.19
	<b>Kadar air rata-rata (%)</b>		<b>60.29</b>	

PEMERIKSAAN BERAT JENIS (Gs)				
				(ASTM D 854)
Pekerjaan :	Disertasi		Sampel : Tanah ekspansif	
Lokasi :	Manado Ringrad 2		Dikerjakan : Denny Pinasang	
Tanggal :	7 November 2019		Diperiksa : Promotor&co Promotor	
	No. piknometer		3	4
	Berat piknometer	W <sub>1</sub> (gram)	35.76	28.78
	Berat piknometer + tanah kering	W <sub>2</sub> (gram)	74.08	63.27
	Berat tanah kering	W <sub>s</sub> = W <sub>2</sub> - W <sub>1</sub> (gram)	38.32	34.49
	Berat piknometer + tanah kering + air	W <sub>3</sub> (gram)	159.16	149.93
	Berat piknometer + air	W <sub>4</sub> (gram)	135.73	128.90
	Temperatur	(°C)	28.00	28.00
	Faktor koreksi temperatur	(K)	0.9992	0.9992
	Berat piknometer + air terkoreksi	(W <sub>5</sub> )	135.62	128.80
	Berat jenis tanah	W <sub>s</sub> / [(W <sub>5</sub> - W <sub>1</sub> ) - (W <sub>3</sub> - W <sub>2</sub> )]	2.592	2.582
	Berat jenis tanah rata-rata (Gs)		2.59	

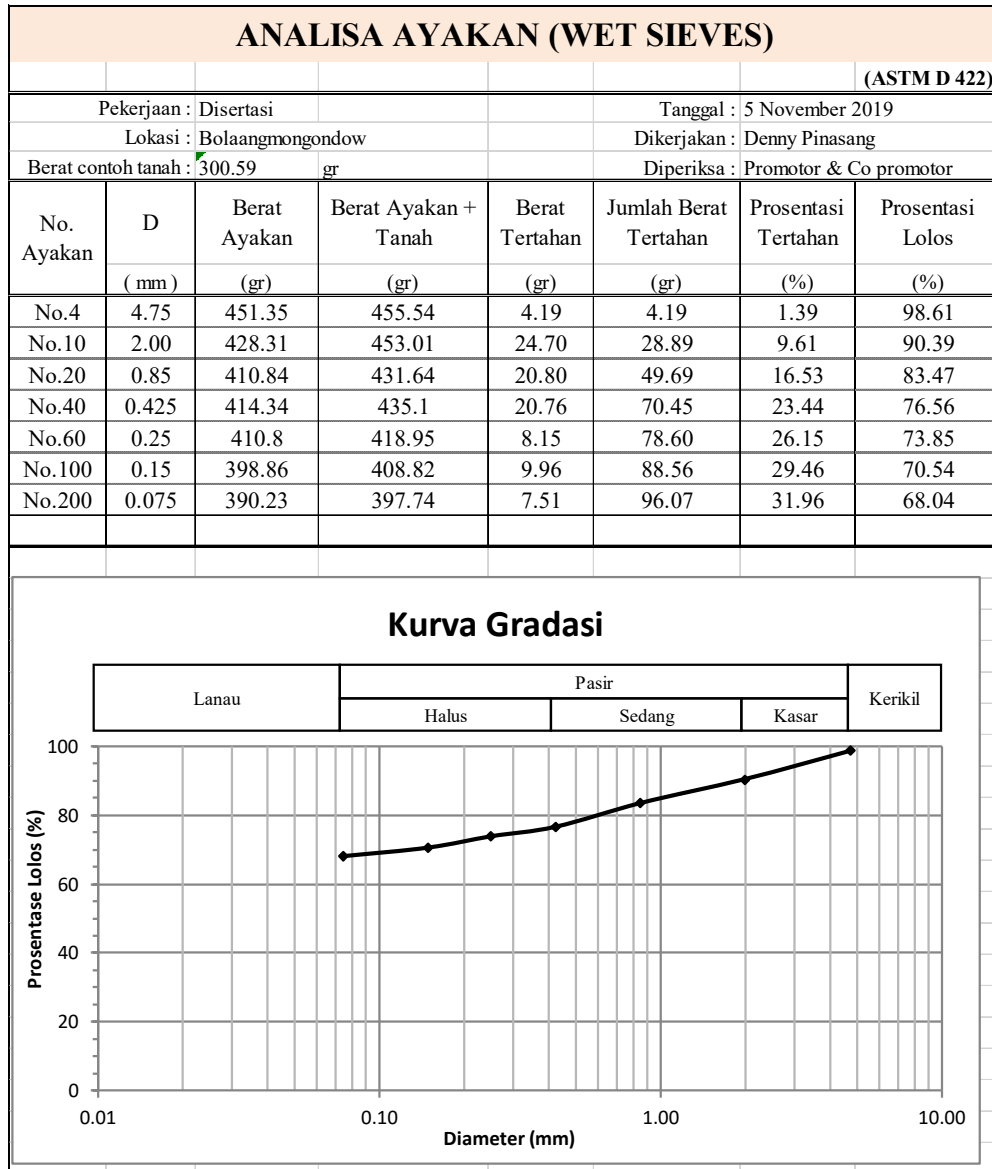
Lampiran 2. Hasil pengujian Batas-batas Atterberg dan *linear shrinkage*

<b>PEMERIKSAAN ATTERBERG LIMITS</b>					
<b>(BS 1377:1975, Test 2-C, Test 3, Test 5)</b>					
Pekerjaan : Disertasi			Tanggal : 5 November 2019		
Lokasi : Ring road 2 Kota Manado			Dikerjakan : Denny Pinasang		
Sampel : Ring road 2			Diperiksa : Promotor&co Promotor		
			<b>Batas Cair (LL)</b>	<b>Batas Plastis (PL)</b>	
No. Container			12	5	6
Berat tanah basah + cont.		(gr)	104.48	76.79	75.58
Berat tanah kering + cont.		(gr)	84.93	72.51	72.04
Berat container		(gr)	66.36	62.53	63.92
Berat tanah kering		(gr)	18.57	9.98	8.12
Berat air		(gr)	19.55	4.28	3.54
Kadar air, w		(%)	105.28	42.89	43.60
Kadar air rata-rata		(%)		42.89	
Jumlah ketukan, N			26		
Factor For Casagrande One-Point Liquid Limit Test (from BS 1377:1975, Test 2.C)					
Number of Blows	Factor	Number of Blows	Factor	Number of Blows	Factor
15	0.95	22	0.99	29	1.01
16	0.96	23	0.99	30	1.02
17	0.96	24	0.99	31	1.02
18	0.97	25	1.00	32	1.02
19	0.97	26	1.00	33	1.02
20	0.98	27	1.01	34	1.03
21	0.98	28	1.01	35	1.03
<b>Batas Susut (LS)</b>					
Mould			A		
Panjang Sampel Basah (L <sub>o</sub> )		(mm)	250		
Panjang Sampel Kering (L <sub>D</sub> )		(mm)	198		
Linear Shrinkage (LS)		(%)	20.80		
Liquid Limit (LL) =		105.28 %			
Plastic Limit (PL) =		42.89 %			
Plasticity Index (PI) =		62.39 %			
Linear Shrinkage (LS) =		20.80 %			

Lampiran 3. Hasil pengujian analisa hydrometer tanah ekspansif



Lampiran 4. Hasil pengujian analisa ayakan kapur



Lampiran 5. Hasil pengujian berat jenis kapur

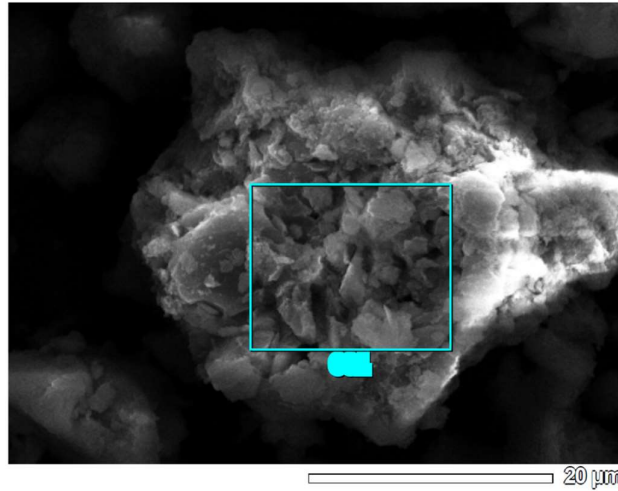
<b>PEMERIKSAAN BERAT JENIS (Gs)</b>				
				(ASTM D 854)
Pekerjaan :	Disertasi	Sampel :	Kapur	
Lokasi :	Bolaangmongondow Timur	Dikerjakan :	Denny Pinasang	
Tanggal :	6 November 2019	Diperiksa :	Promotor & Co Promotor	
	No. piknometer		4	5
	Berat piknometer	$W_1$ (gram)	33.45	33.96
	Berat piknometer + tanah kering	$W_2$ (gram)	48.27	47.07
	Berat tanah kering	$W_s = W_2 - W_1$ (gram)	14.82	13.11
	Berat piknometer + tanah kering + air	$W_3$ (gram)	142.93	142.27
	Berat piknometer + air	$W_4$ (gram)	134.31	134.70
	Temperatur	(°C)	27.00	27.00
	Faktor koreksi temperatur	(K)	0.9995	0.9995
	Berat piknometer + air terkoreksi	( $W_5$ )	134.24	134.63
	Berat jenis tanah	$W_s / [(W_5 - W_1) - (W_3 - W_2)]$	2.416	2.396
	Berat jenis tanah rata-rata (Gs)		2.41	



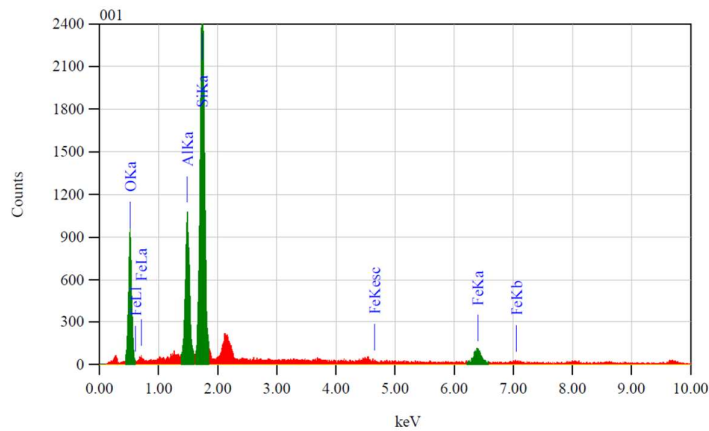
Lampiran 6. Hasil pengujian SEM EDX tanah ekspansif

**Tanah -01**

1/1



Title	: IMG1
Instrument	: 6510(LA)
Volt	: 20.00 kV
Mag.	: x 2,500
Date	: 2020/12/23
Pixel	: 512 x 384



Acquisition Parameter	
Instrument	: 6510(LA)
Acc. Voltage	: 20.0 kV
Probe Current	: 1.00000 nA
PHA mode	: T3
Real Time	: 33.99 sec
Live Time	: 30.00 sec
Dead Time	: 11 %
Counting Rate	: 2331 cps
Energy Range	: 0 - 20 keV

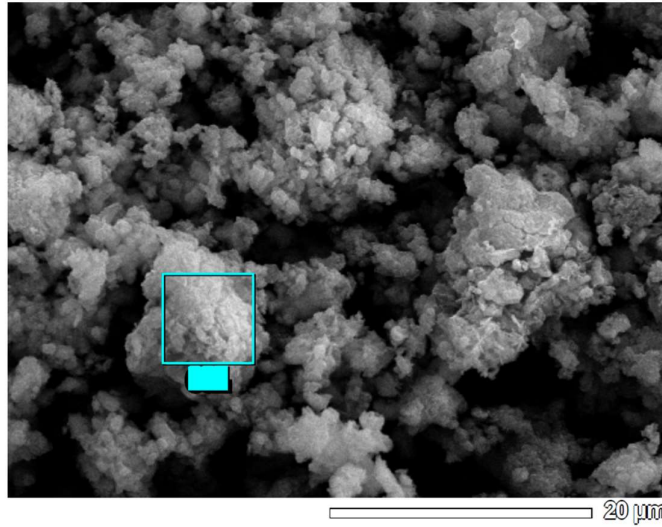
ZAF Method Standardless Quantitative Analysis  
Fitting Coefficient : 0.5656

Element	(keV)	Mass%	Error%	Atom%	Compound	Mass%	Cation	K
O K	0.525	43.23	0.87	58.34				47.8384
Al K	1.486	12.80	0.52	10.25				11.5428
Si K	1.739	37.74	0.60	29.01				33.8277
Fe K	6.398	6.22	1.76	2.41				6.7911
Total		100.00		100.00				

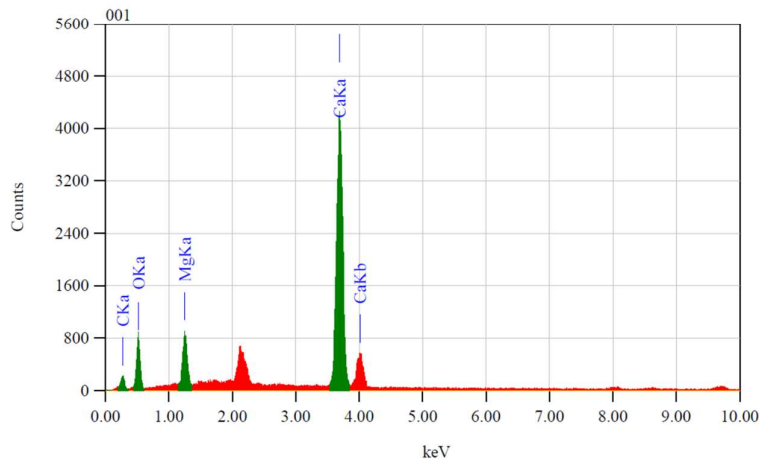
Lampiran 7. Hasil pengujian SEM EDX kapur

**Kapur -01**

1/1



Title	: IMG1
Instrument	: 6510 (LA)
Volt	: 20.00 kV
Mag.	: x 2,500
Date	: 2020/12/23
Pixel	: 512 x 384

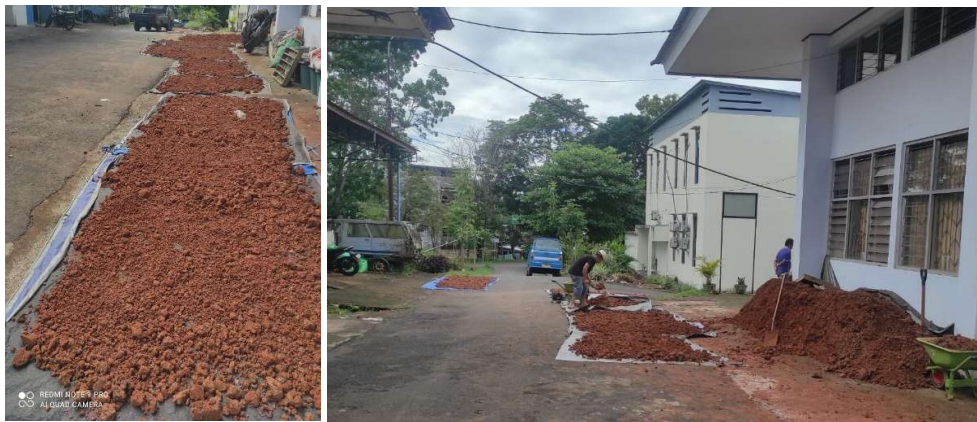


Acquisition Parameter	
Instrument	: 6510 (LA)
Acc. Voltage	: 20.0 kV
Probe Current	: 1.00000 nA
PHA mode	: T3
Real Time	: 37.93 sec
Live Time	: 30.00 sec
Dead Time	: 20 %
Counting Rate	: 4397 cps
Energy Range	: 0 - 20 keV

ZAF Method Standardless Quantitative Analysis  
Fitting Coefficient : 0.5459

Element	(keV)	Mass%	Error%	Atom%	Compound	Mass%	Cation	K
C	0.277	3.90	0.26	7.04				2.0787
O	0.525	47.45	1.67	64.23				23.1337
Mg	1.253	6.95	0.49	6.20				5.2373
Ca	3.690	41.70	0.51	22.53				69.5503
Total		100.00		100.00				

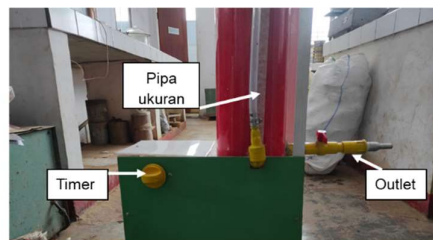
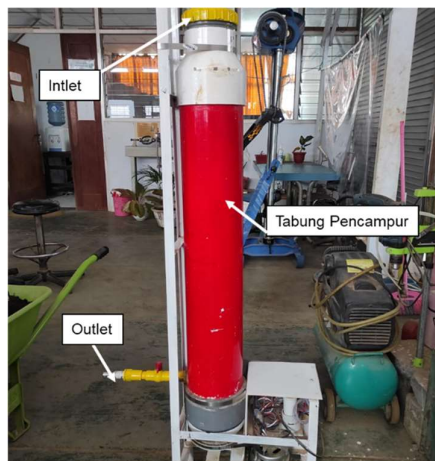
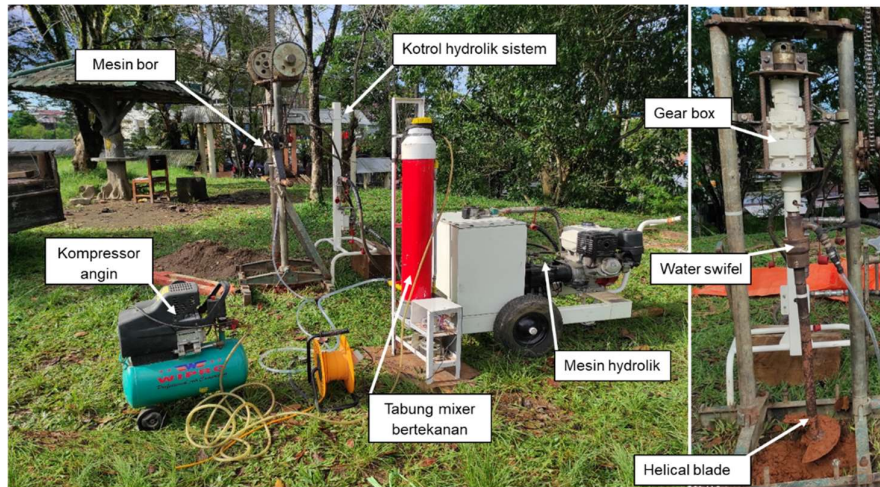
Lampiran 8. Dokumentasi pengambilan sampel dilapangan



Lampiran 9. Dokumentasi pengujian di laboratorium



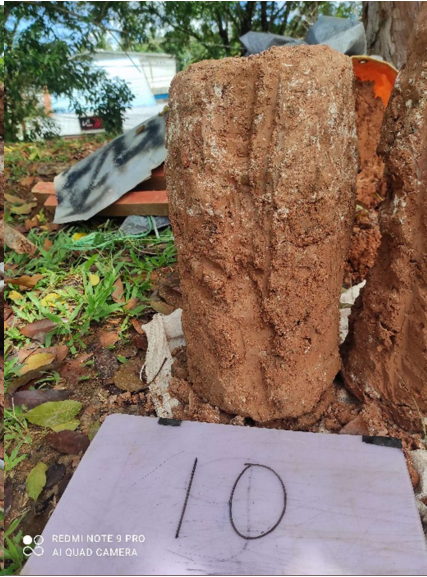
Lampiran 10. Dokumentasi alat shallow mixing



Lampiran 11. Dokumentasi pengujian test alat shallow mixing



Lampiran 12. Dokumentasi hasil test alat shallow mixing



Lampiran 13. Dokumentasi pengujian pada bak uji dengan alat shallow mixing





Lampiran 14. Dokumentasi pengujian pada bak uji dengan alat shallow mixing



Lampiran 15. Dokumentasi pengujian kolom kapur pada bak uji dengan alat shallow mixing



Lampiran 16. Dokumentasi pengujian beban pada bak uji dengan alat shallow mixing

