

Laboratory Test Summary



THEKWINI SOILS LAB. CC

V.A.T. REGISTRATION NO. 4590210961.

68 Ridge Road, P.O. Box 30464,
Tollgate, DURBAN MAYVILLE, 4058
Tel : (031) 201-8992 Fax : (031) 201-7920

Job Description: DMP/Ntatshana Road
Job no.: 24058/3324
Date: 12.09.13

Lab no.		130833	130834	130835	130836	130837	130838	130839	130840	130894	
Location		IP1	IP2	IP3	IP4	IP5	IP6	IP7	IP8	IP8	
Depth		1.7-2.2	1.2-1.6	1.1-1.6	0.8-1.5	1.5-2.0	1.5-2.5	1.5-2.5	0.5-1.2	1.2-1.5	
Description		Comp. Weath.	Res.	Weath.	Res.	Comp. Weath	Tallus	Tallus	Alluvium	Alluvium	
		Granite	Granite	Granite	Granite	Granite	-	-	-	-	
Binder Material		-	-	-	-	-	-	-	-	-	
Particle Size (mm)	75			67			100		100		
	53			59			70		81	100	
	37.5			52			67		75	98	
	26.5			47			61		64	96	
	19	100		43			58		59	90	
	13.2	99		42	100		58	100	52	84	
	9.5	95	100	41	99	100	57	100	50	83	
	4.75	82	99	39	98	100	56	99	45	77	
	2	62	95	37	96	99	54	94	41	67	
	0.425	32	72	28	84	87	41	73	27	33	
	0.25	24	56	24	78	74	33	62	20	23	
	0.15	18	41	20	71	59	26	52	14	15	
	0.075	10	29	17	65	46	20	42	8	8	
	0.05	9	25	14	63	43	19	40	7	7	
	0.02	7	18	10	60	37	17	37	5	6	
	0.005	5	17	9	56	31	17	34	5	6	
0.002	5	13	8	54	26	17	31	4	6		
Soil Mortar	Coarse Sand <2.0 >0.425mm	48.9	24.7	23.5	12.5	11.9	23.4	22.6	33.9	50.4	
	Fine Sand <0.425>0.05mm	46.3	56.6	65.6	32.1	50.1	62.3	46.6	61.4	46.0	
	Silt <0.05 >0.005	2.0	6.1	4.0	6.4	10.7	1.0	4.7	1.5	0.5	
	Clay <0.005	2.8	12.6	6.9	49.1	27.2	13.3	26.2	3.2	3.1	
Atterberg Limits	Liquid Limit	21	37	30	53	40	32	37	23	22	
	Plasticity Index	4	10	9	19	15	12	13	0	0	
	Linear Shrinkage	1.3	5	5	9	8	6	7	0	0	
	Natural MC	-	-	-	-	-	-	-	-	-	
Mod AASHTO Density	Dry Density kg/m ³	2007	1851	2200	1868	1722	2033	1921	2173	2133	
	OMC	8.8	12	7.7	12.5	19.6	9.4	12.8	6.7	6.6	
CBR	100%	63	6	366	6	18	14	13	113	131	
	98%	56	5	253	5	18	13	13	84	116	
	95%	46	4	145	4	17	13	13	54	96	
	93% (Inferred)	36	4	100	3	14	6	10	38	74	
	90%	25	4	57	2	10	2	6	23	50	
	CBR Swell	0.09	3.57	0.40	4.76	1.98	1.01	2.17	0.30	0.09	
AASHTO Soil Classification		A - 1 - b (0)	A - 2 - 4 (0)	A - 2 - 4 (0)	A - 7 - 5 (13)	A - 6 (4)	A - 2 - 6 (0)	A - 6 (2)	A - 1 - a (0)	A - 1 - b (0)	
Grading Modulus TRH 14 (1985)		1.96	1.04	2.18	0.55	0.67	1.85	0.91	2.24	1.92	
		G5	>G10	G5	>G10	>G10	G10	>G10	G5	G5	

MATERIALS ANALYSIS

THEKWINI SOILS LAB. CC

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Project: DMP/Ntatshana Road

Ref no.: 24058/3324 **Lab no.:** 130833 **Borehole/Pit no.:** IP1 **Fig no.:** 0

Depth: 1.7-2.2

Grading Analysis	
Grain Size (mm)	%Passing
75	100.0
53	100.0
37.5	100.0
26.5	100.0
19	100.0
13.2	98.7
9.5	95.3
4.75	82.4
2	61.8
0.425	31.6
0.25	24.2
0.15	17.6
0.075	10.4
0.05	9.5
0.02	6.7
0.005	5.5
0.002	4.9

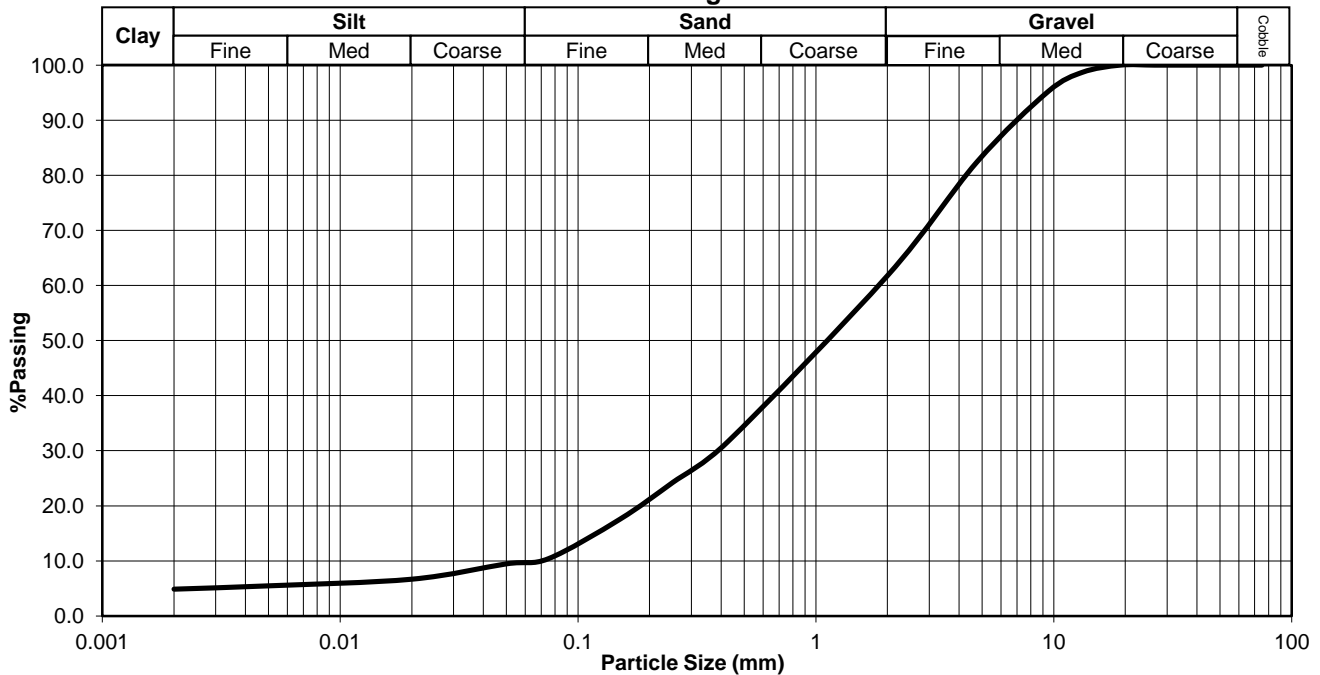
M.I.T SIZE CLASSIFICATION	
Cobble%	0.0
Gravel%	38.2
Coarse	0.0
Mediun	14.2
Fine	24.0
Sand%	52.0
Coarse	26.8
Mediun	14.0
Fine	11.1
Silt%	5.0
Coarse	3.2
Mediun	1.1
Fine	0.7
Clay%	4.9

PLASTICITY	
Liquid Limit	21
Plasticity Index	4
Linear Shrinkage	1.3

GRADING	
D10 Size (mm)	0.063
Uniformity Coefficient	29.01
Grading Modulus	1.96

CLASSIFICATION	
Potential Expansiveness	Low
Group Index	0
AASHTO Soil Classification	A - 1 - b
Unified Classification	(SW-SP)

Grading Curve



Ref no.: 24058/3324

Fig no.: 0

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Project: DMP/Ntatshana Road

Ref no.: 24058/3324 **Lab no.:** 130834 **Borehole/Pit no.:** IP2 **Fig no.:** 0

Depth: 1.2-1.6

Grading Analysis	
Grain Size (mm)	%Passing
75	100.0
53	100.0
37.5	100.0
26.5	100.0
19	100.0
13.2	100.0
9.5	100.0
4.75	99.3
2	95.5
0.425	71.8
0.25	56.0
0.15	41.2
0.075	29.1
0.05	24.8
0.02	18.5
0.005	16.8
0.002	13.3

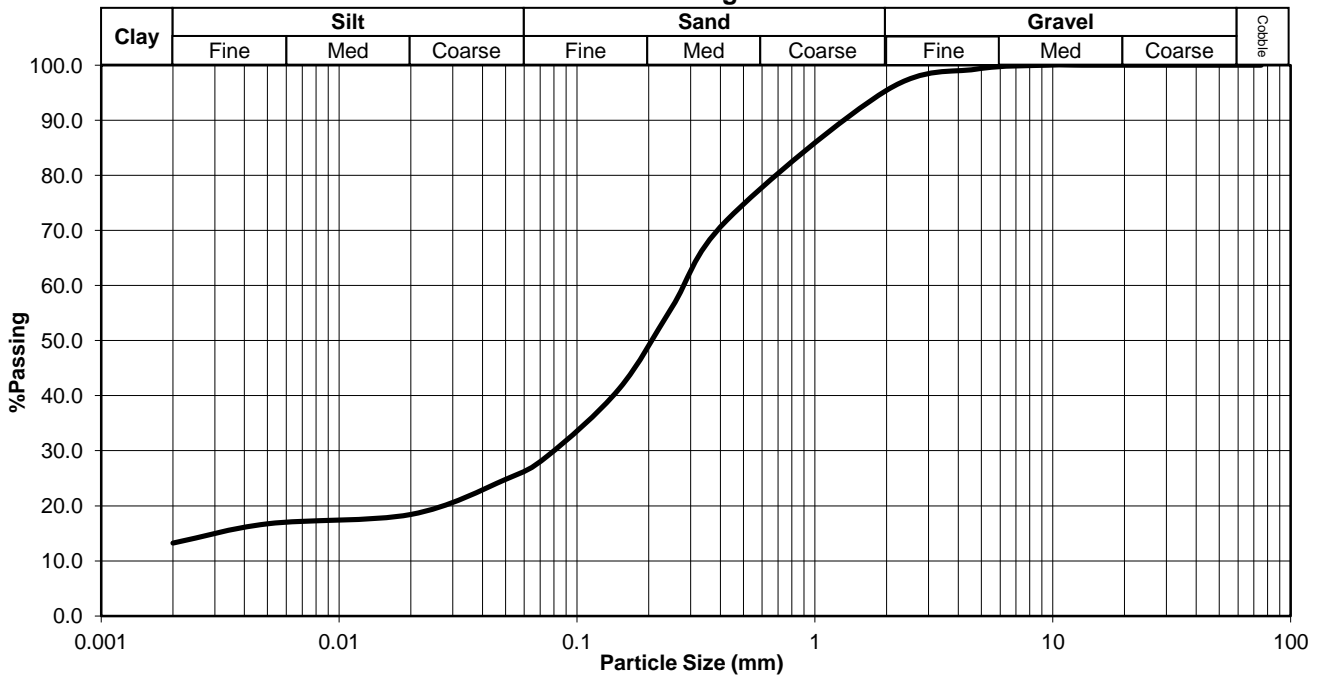
M.I.T SIZE CLASSIFICATION	
Cobble%	0.0
Gravel%	4.5
Coarse	0.0
Medium	0.5
Fine	4.0
Sand%	68.9
Coarse	21.0
Medium	25.8
Fine	22.1
Silt%	13.3
Coarse	8.1
Medium	1.6
Fine	3.6
Clay%	13.3

PLASTICITY	
Liquid Limit	37
Plasticity Index	10
Linear Shrinkage	5

GRADING	
D10 Size (mm)	<0.002
Uniformity Coefficient	NA
Grading Modulus	1.04

CLASSIFICATION	
Potential Expansiveness	Low
Group Index	0
AASHTO Soil Classification	A - 2 - 4
Unified Classification	SM

Grading Curve



Ref no.: 24058/3324

Fig no.: 0

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Project: DMP/Ntatshana Road

Ref no.: 24058/332 **Lab no.:** 130835 **Borehole/Pit no.:** IP3 **Fig no.:** -

Depth: 1.1-1.6

Grading Analysis	
Grain Size (mm)	%Passing
75	66.5
53	58.9
37.5	52.5
26.5	47.5
19	43.1
13.2	42.0
9.5	41.2
4.75	39.4
2	37.1
0.425	28.4
0.25	24.4
0.15	19.6
0.075	17.0
0.05	14.3
0.02	10.4
0.005	9.1
0.002	8.4

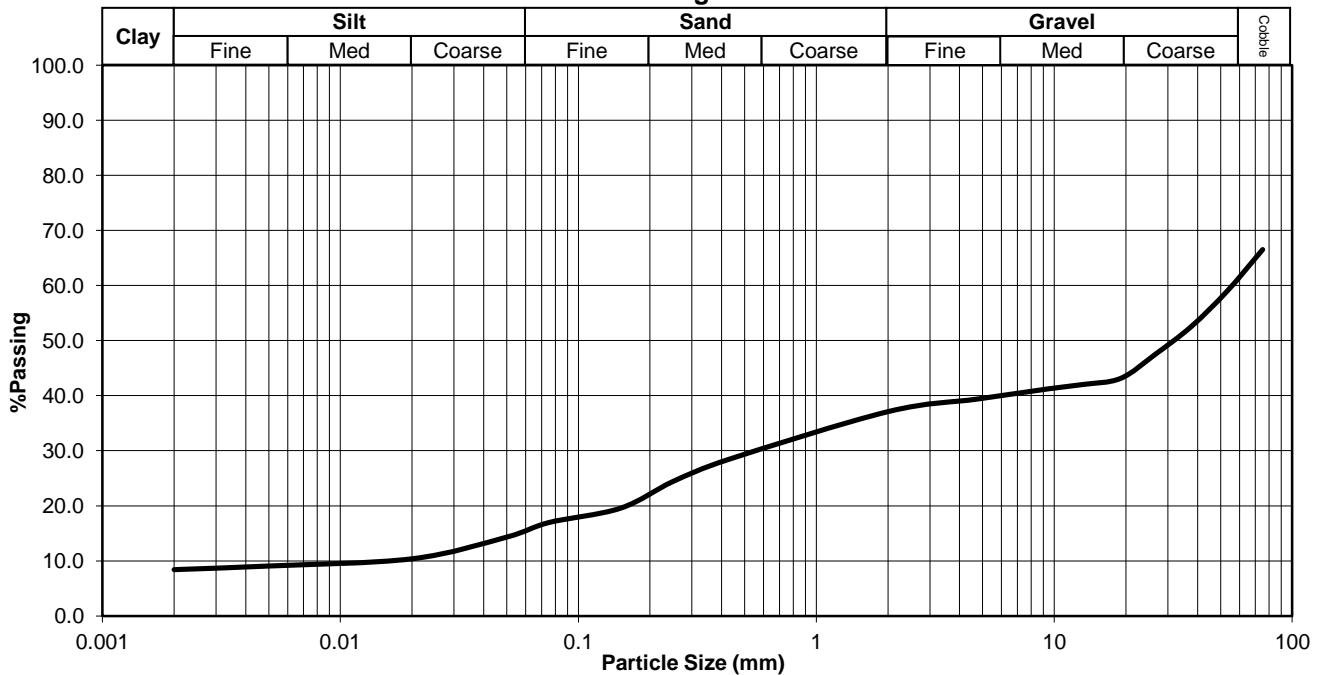
M.I.T SIZE CLASSIFICATION	
Cobble%	38.7
Gravel%	24.2
Coarse	17.6
Medium	3.8
Fine	2.8
Sand%	21.7
Coarse	7.7
Medium	7.4
Fine	6.6
Silt%	7.0
Coarse	5.0
Medium	1.2
Fine	0.7
Clay%	8.4

PLASTICITY	
Liquid Limit	30
Plasticity Index	9
Linear Shrinkage	5

GRADING	
D10 Size (mm)	0.013
Uniformity Coefficient	>99
Grading Modulus	2.18

CLASSIFICATION	
Potential Expansiveness	Low
Group Index	0
AASHTO Soil Classification	A - 2 - 4
Unified Classification	GC

Grading Curve



Ref no.: 24058/3324

Fig no.: -

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Project: DMP/Ntatshana Road

Ref no.: 24058/332 **Lab no.:** 130836 **Borehole/Pit no.:** IP4 **Fig no.:** -

Depth: 0.8-1.5

Grading Analysis	
Grain Size (mm)	%Passing
75	100.0
53	100.0
37.5	100.0
26.5	100.0
19	100.0
13.2	100.0
9.5	99.4
4.75	98.5
2	96.1
0.425	84.1
0.25	77.7
0.15	71.4
0.075	65.2
0.05	63.4
0.02	59.7
0.005	56.1
0.002	54.3

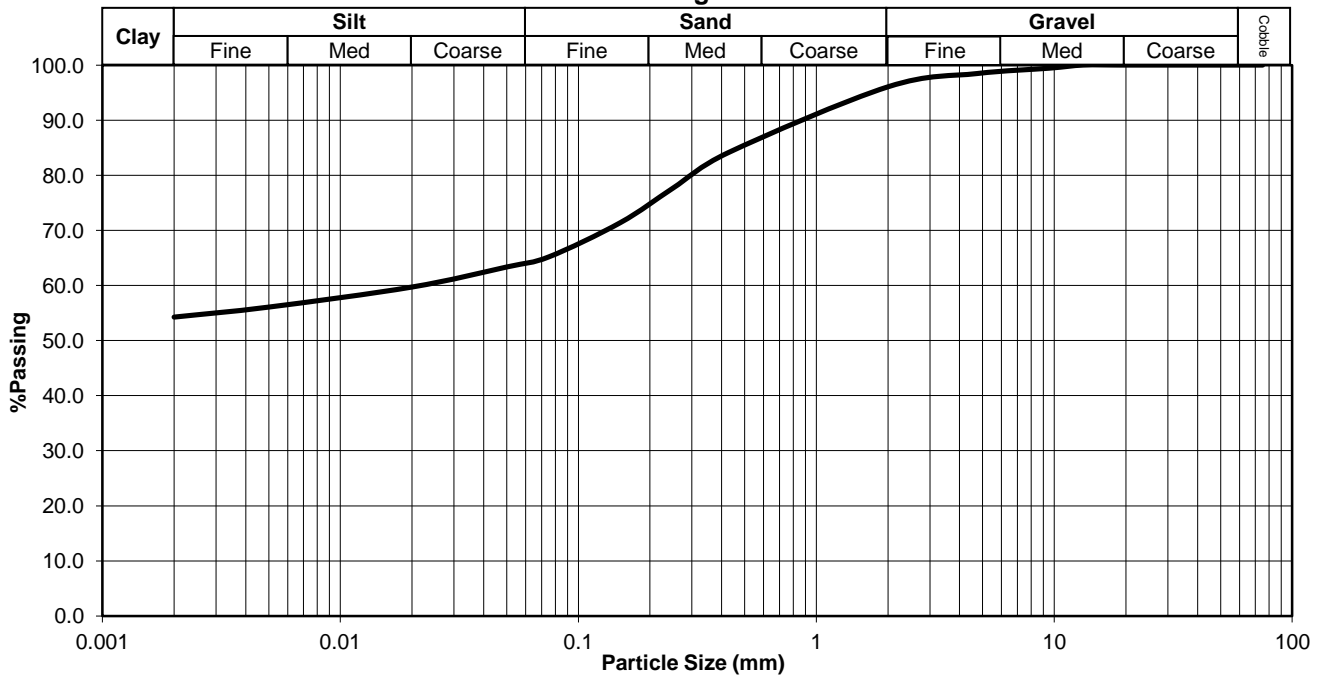
M.I.T SIZE CLASSIFICATION	
Cobble%	0.0
Gravel%	3.9
Coarse	0.0
Medium	1.3
Fine	2.7
Sand%	32.0
Coarse	10.6
Medium	10.9
Fine	10.5
Silt%	9.8
Coarse	4.4
Medium	3.4
Fine	2.1
Clay%	54.3

PLASTICITY	
Liquid Limit	53
Plasticity Index	19
Linear Shrinkage	9

GRADING	
D10 Size (mm)	<0.002
Uniformity Coefficient	NA
Grading Modulus	0.55

CLASSIFICATION	
Potential Expansiveness	Low
Group Index	13
AASHTO Soil Classification	A - 7 - 5
Unified Classification	MH or OH

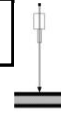
Grading Curve



Ref no.: 24058/3324

Fig no.: -

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Ref no.: 24058/332 **Lab no.:** 130837 **Borehole/Pit no.:** IP5 **Fig no.:** -

Depth: 1.5-2.0

Grading Analysis	
Grain Size (mm)	% Passing
75	100.0
53	100.0
37.5	100.0
26.5	100.0
19	100.0
13.2	100.0
9.5	100.0
4.75	99.9
2	99.3
0.425	87.5
0.25	73.9
0.15	58.6
0.075	45.9
0.05	43.1
0.02	37.4
0.005	30.9
0.002	26.2

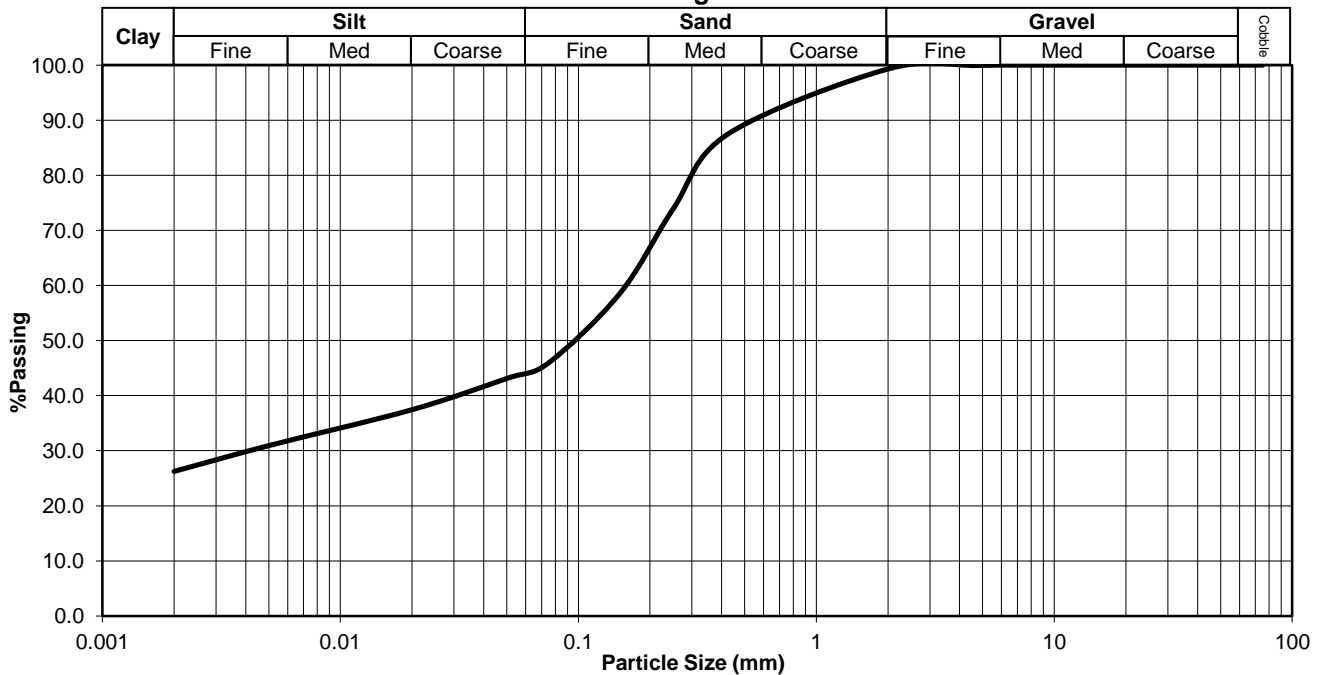
M.I.T SIZE	
CLASSIFICATION	
Cobble%	0.0
Gravel%	0.7
Coarse	0.0
Medium	0.0
Fine	0.7
Sand%	55.1
Coarse	10.5
Medium	22.5
Fine	22.0
Silt%	18.0
Coarse	6.8
Medium	6.1
Fine	5.1
Clay%	26.2

PLASTICITY	
Liquid Limit	40
Plasticity Index	15
Linear Shrinkage	8

GRADING	
D10 Size (mm)	<0.002
Uniformity Coefficient	NA
Grading Modulus	0.67

CLASSIFICATION	
Potential Expansiveness	Medium
Group Index	4
AASHTO Soil Classification	A - 6
Unified Classification	SC

Grading Curve



Ref no.: 24058/3324

Fig no.: -

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Project: DMP/Ntatshana Road

Ref no.: 24058/332 **Lab no.:** 130838 **Borehole/Pit no.:** IP6 **Fig no.:** -

Depth: 1.5-2.5

Grading Analysis	
Grain Size (mm)	%Passing
75	100.0
53	70.0
37.5	66.7
26.5	60.9
19	58.4
13.2	57.9
9.5	57.3
4.75	55.6
2	53.7
0.425	41.1
0.25	33.1
0.15	25.5
0.075	20.0
0.05	18.7
0.02	17.3
0.005	17.3
0.002	16.7

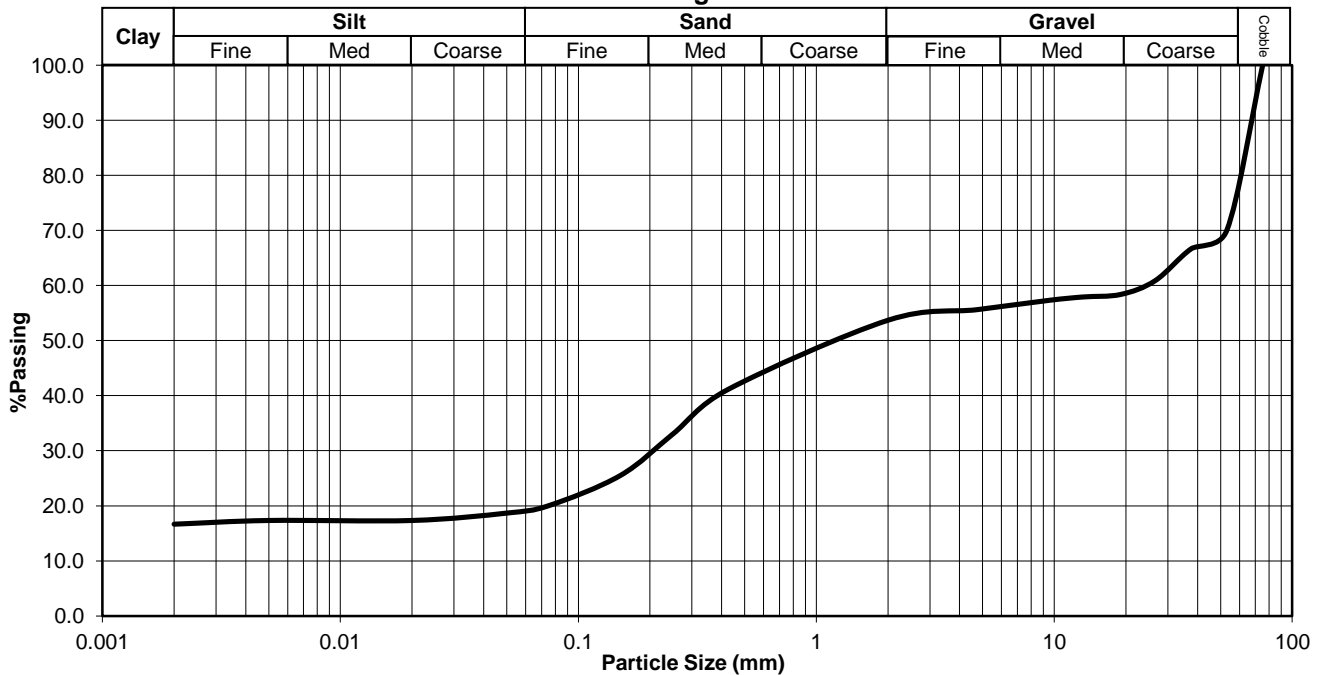
M.I.T SIZE CLASSIFICATION	
Cobble%	20.5
Gravel%	25.8
Coarse	20.8
Medium	2.6
Fine	2.4
Sand%	34.5
Coarse	11.2
Medium	13.2
Fine	10.1
Silt%	2.6
Coarse	1.9
Medium	0.0
Fine	0.7
Clay%	16.7

PLASTICITY	
Liquid Limit	32
Plasticity Index	12
Linear Shrinkage	6

GRADING	
D10 Size (mm)	<0.002
Uniformity Coefficient	NA
Grading Modulus	1.85

CLASSIFICATION	
Potential Expansiveness	Low
Group Index	0
AASHTO Soil Classification	A - 2 - 6
Unified Classification	SC

Grading Curve



Ref no.: 24058/3324

Fig no.: -

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Project: DMP/Ntatshana Road

Ref no.: 24058/332 **Lab no.:** 130839 **Borehole/Pit no.:** IP7 **Fig no.:** -

Depth: 1.5-2.5

Grading Analysis	
Grain Size (mm)	%Passing
75	100.0
53	100.0
37.5	100.0
26.5	100.0
19	100.0
13.2	100.0
9.5	99.8
4.75	98.5
2	93.9
0.425	72.7
0.25	62.0
0.15	51.6
0.075	42.5
0.05	39.9
0.02	37.2
0.005	33.8
0.002	30.8

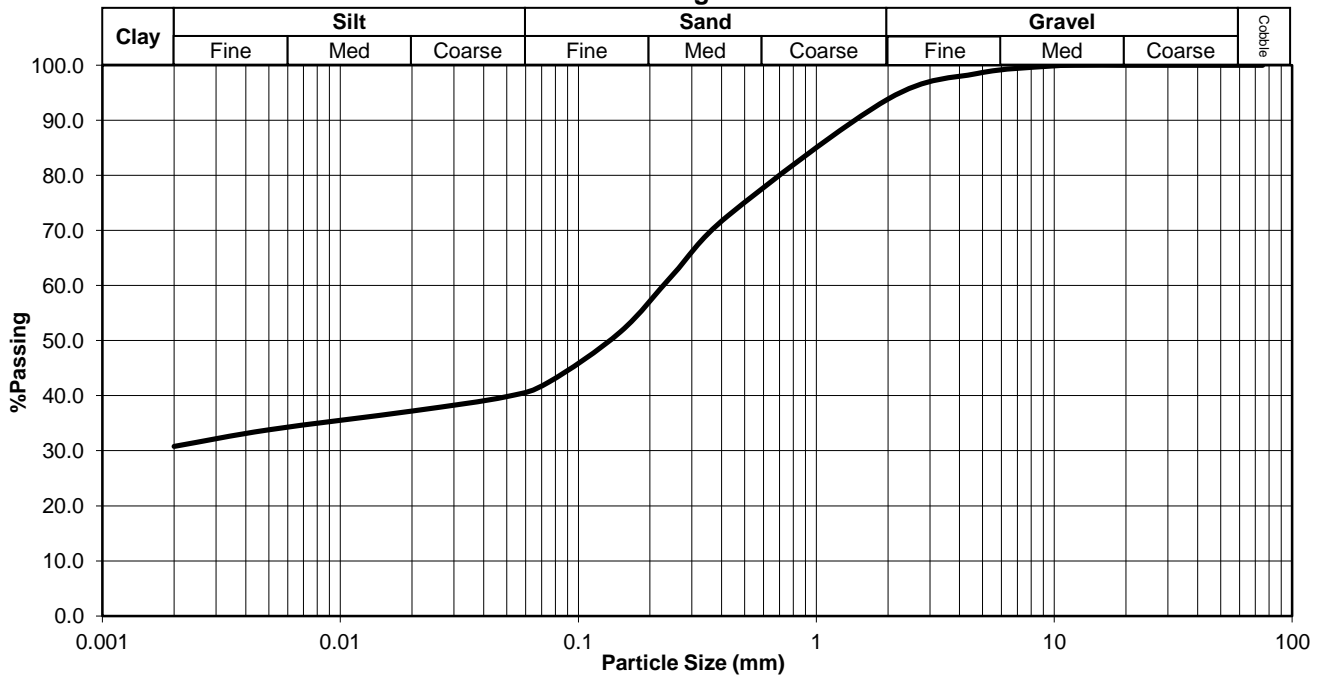
M.I.T SIZE CLASSIFICATION	
Cobble%	0.0
Gravel%	6.1
Coarse	0.0
Medium	1.1
Fine	5.0
Sand%	53.0
Coarse	18.8
Medium	18.2
Fine	15.9
Silt%	10.1
Coarse	3.7
Medium	3.2
Fine	3.2
Clay%	30.8

PLASTICITY	
Liquid Limit	37
Plasticity Index	13
Linear Shrinkage	7

GRADING	
D10 Size (mm)	<0.002
Uniformity Coefficient	NA
Grading Modulus	0.91

CLASSIFICATION	
Potential Expansiveness	Low
Group Index	2
AASHTO Soil Classification	A - 6
Unified Classification	SC

Grading Curve



Ref no.: 24058/3324

Fig no.: -

MATERIALS ANALYSIS

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Project: DMP/Ntatshana Road

Ref no.: 24058/3324 **Lab no.:** 130840 **Borehole/Pit no.:** IP8 **Fig no.:** -

Depth: 0.5-1.2

Grading Analysis	
Grain Size (mm)	%Passing
75	100.0
53	81.2
37.5	74.6
26.5	64.0
19	58.9
13.2	52.2
9.5	49.6
4.75	45.5
2	40.8
0.425	27.0
0.25	20.2
0.15	13.7
0.075	8.0
0.05	7.1
0.02	5.3
0.005	4.9
0.002	4.4

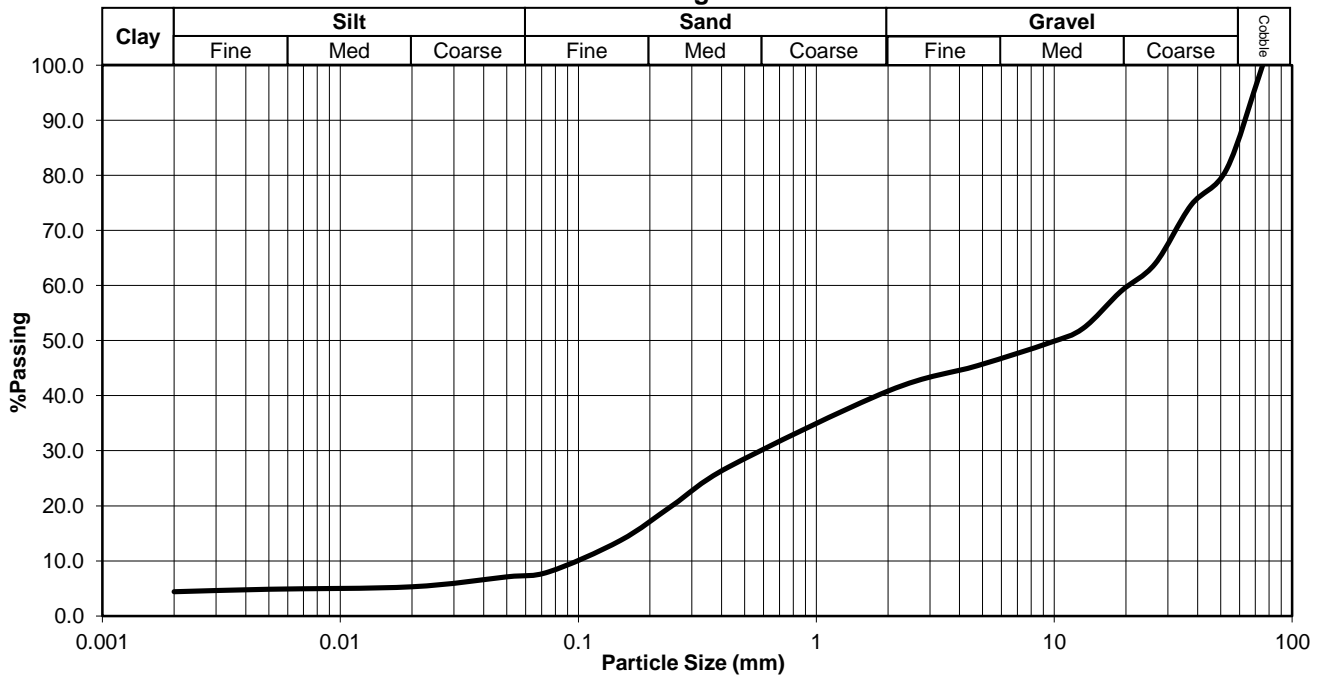
M.I.T SIZE	
CLASSIFICATION	
Cobble%	12.8
Gravel%	46.3
Coarse	27.6
Medium	13.1
Fine	5.7
Sand%	33.4
Coarse	12.3
Medium	11.6
Fine	9.5
Silt%	3.1
Coarse	2.2
Medium	0.4
Fine	0.5
Clay%	4.4

PLASTICITY	
Liquid Limit	23
Plasticity Index	0
Linear Shrinkage	0

GRADING	
D10 Size (mm)	0.096
Uniformity Coefficient	>99
Grading Modulus	2.24

CLASSIFICATION	
Potential Expansiveness	Low
Group Index	0
AASHTO Soil Classification	A - 1 - a
Unified Classification	GP - GM

Grading Curve



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Project: DMP/Ntatshana Road

Ref no.: 24058/332 **Lab no.:** 130894 **Borehole/Pit no.:** IP8 **Fig no.:** -

Depth: 1.2-1.5

Grading Analysis	
Grain Size (mm)	%Passing
75	100.0
53	100.0
37.5	98.2
26.5	95.6
19	89.9
13.2	84.3
9.5	82.8
4.75	77.4
2	66.9
0.425	33.2
0.25	22.9
0.15	15.0
0.075	8.3
0.05	7.3
0.02	6.2
0.005	6.2
0.002	6.2

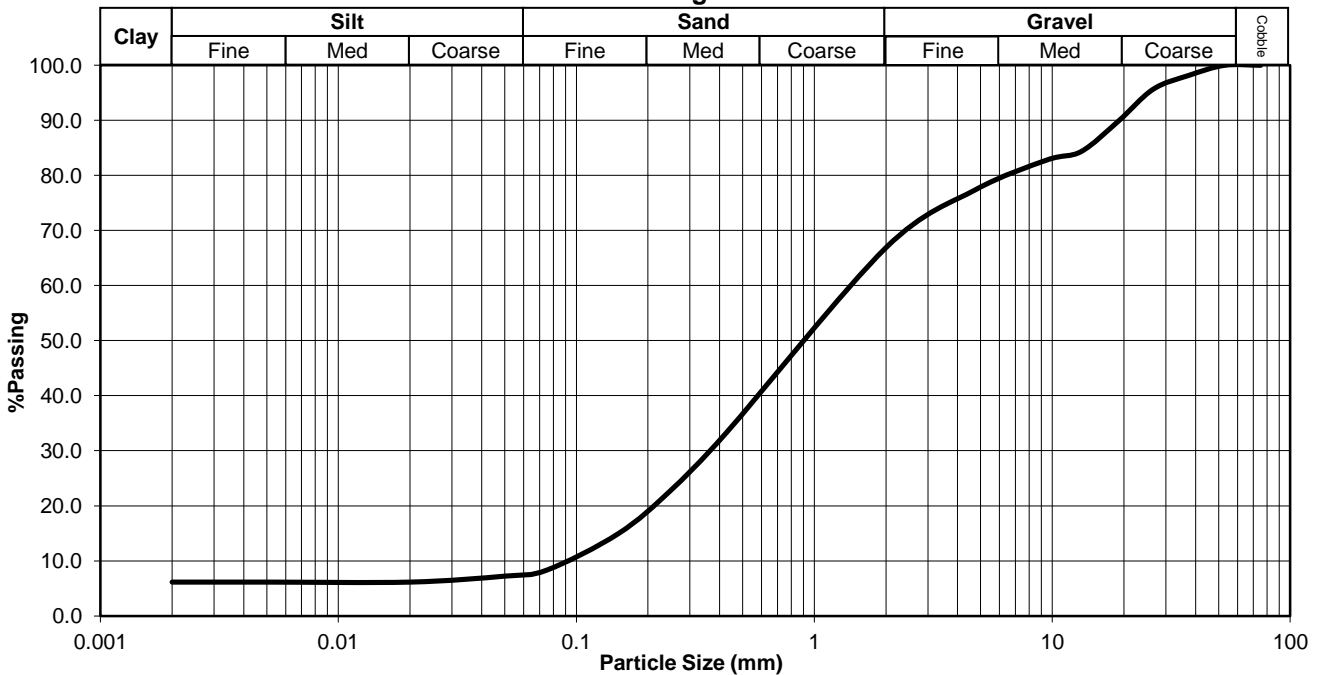
M.I.T SIZE CLASSIFICATION	
Cobble%	0.0
Gravel%	33.1
Coarse	9.3
Medium	11.9
Fine	11.9
Sand%	59.2
Coarse	30.0
Medium	18.0
Fine	11.2
Silt%	1.5
Coarse	1.5
Medium	0.0
Fine	0.0
Clay%	6.2

PLASTICITY	
Liquid Limit	22
Plasticity Index	0
Linear Shrinkage	0

GRADING	
D10 Size (mm)	0.089
Uniformity Coefficient	16.32
Grading Modulus	1.92

CLASSIFICATION	
Potential Expansiveness	Low
Group Index	0
AASHTO Soil Classification	A - 1 - b
Unified Classification	SP - SM

Grading Curve



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Fig no.: -

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Ref no.: 24058/332 **Lab no.:** - **Borehole/Pit no.:** - **Fig no.:** -

Depth: -

Grading Analysis	
Grain Size (mm)	%Passing
75	
53	
37.5	
26.5	
19	
13.2	
9.5	
4.75	
2	
0.425	
0.25	
0.15	
0.075	
0.05	
0.02	
0.005	
0.002	

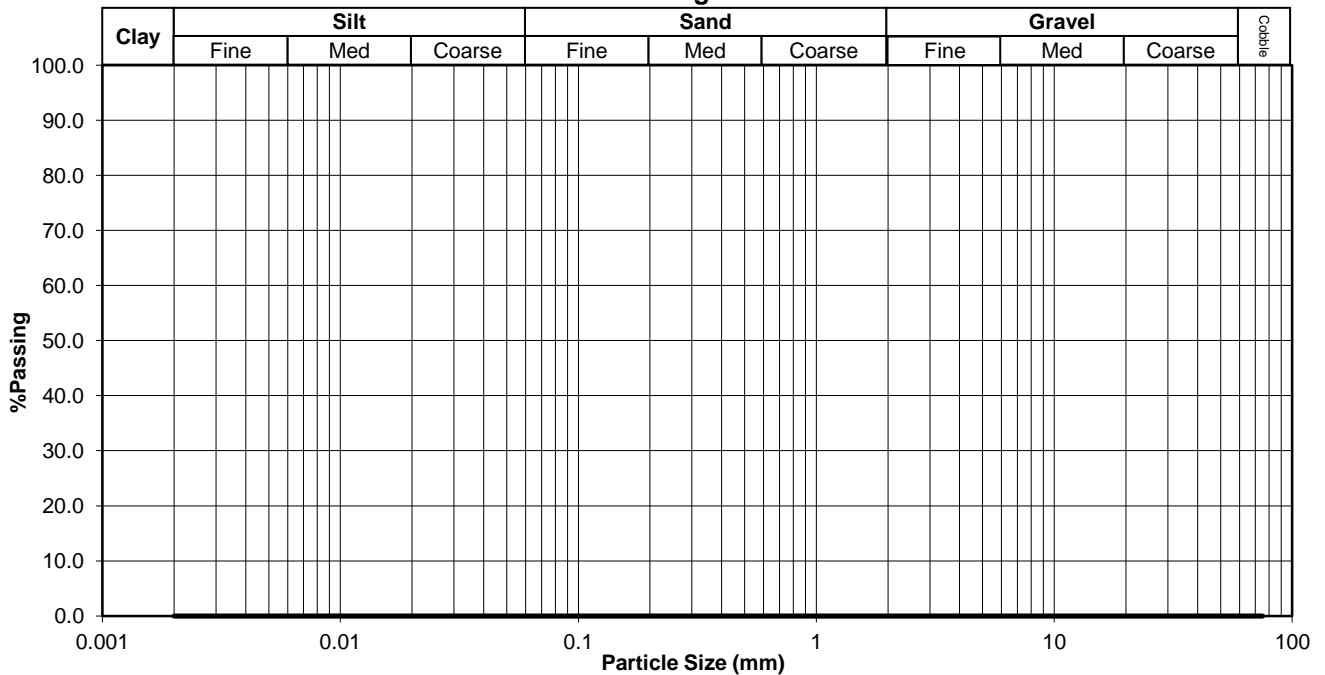
M.I.T SIZE CLASSIFICATION	
Cobble%	
Gravel%	
Coarse	
Medium	
Fine	
Sand%	
Coarse	
Medium	
Fine	
Silt%	
Coarse	
Medium	
Fine	
Clay%	

PLASTICITY	
Liquid Limit	
Plasticity Index	
Linear Shrinkage	

GRADING	
D10 Size (mm)	
Uniformity Coefficient	
Grading Modulus	

CLASSIFICATION	
Potential Expansiveness	NA
Group Index	NA
AASHTO Soil Classification	NA
Unified Classification	NA

Grading Curve



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Fig no.: -