Vedlegg A - Relativ densitet Prøveresultater

Unit weight of solid particles

General info :

This sheet contains the results calculated in 3 data input sheets. Two tests are performed on each specimen. The average value are calculated if the difference < 0.25 kN/m^2, if the difference > 0.25 kN/m^2 a new test are performed. Standard acceleration of gravity g=9.807m/s^2 is used.

Template : H\regneark\index\korndensitet.xlt Controlled by : GS

Responsibel : EB Date / rev.no : 2012-09-11/20

Boring	Tube	Part	Test	Depth [m]	γ_s [kN/m^3]	γ_s -average [kN/m^3]
F1					22.471	22.40
F1					22.335	
F2					22.602	22.63
F2					22.659	
F3					22.498	22.49
F3					22.479	
F4					22.368	22.29
F4					22.217	
F5					22.260	22.25
F5					22.243	
					temp-?	#VERDI!
					temp-?	
					temp-?	#VERDI!
					temp-?	
					temp-?	#VERDI!
					temp-?	
					temp-?	#VERDI!
					temp-?	
					temp-?	#VERDI!
					temp-?	
					temp-?	#VERDI!
					temp-?	
					temp-?	#VERDI!
					temp-?	

Finnfjord AS - Mikrosilikadeponi

Document No. 20120869

Date 2012-12-05

Figure No. xx.xx

Drawn by EKR

NGI

Vedlegg B - Humusinnholdet Prøveresultater

Humusinnhold
iht. *Statens Vegvesen nr. 14.445 Humusinnhold ved gløding*

Mal: H:\Regneark\INDEX\humus.xlt
Ansvarlig: EB
Dato/Rev.nr.: 2010-01-29/04
Kontrollert av: GS

Generell info: Kvantitativ bestemmelse av innhold av humus i løsmasse bestemt ved gløding av tørket prøve. Massetapet settes lik innholdet av humus, og angis i prosent av tørket prøve < 500µm før gløding (0-100%). Mengdeangivelsen relaterer seg til materiale som passerer sikt med maskevidde mindre enn 500µm, og representerer derfor ikke nødvendigvis den total prøven. Det blir gjort dobbeltanalyser, og resultatet oppgis i prosent og som ett gjennomsnitt av de to analysene. Frasiktet masse blir også oppgitt i prosent av total prøve , - hvis aktuelt.

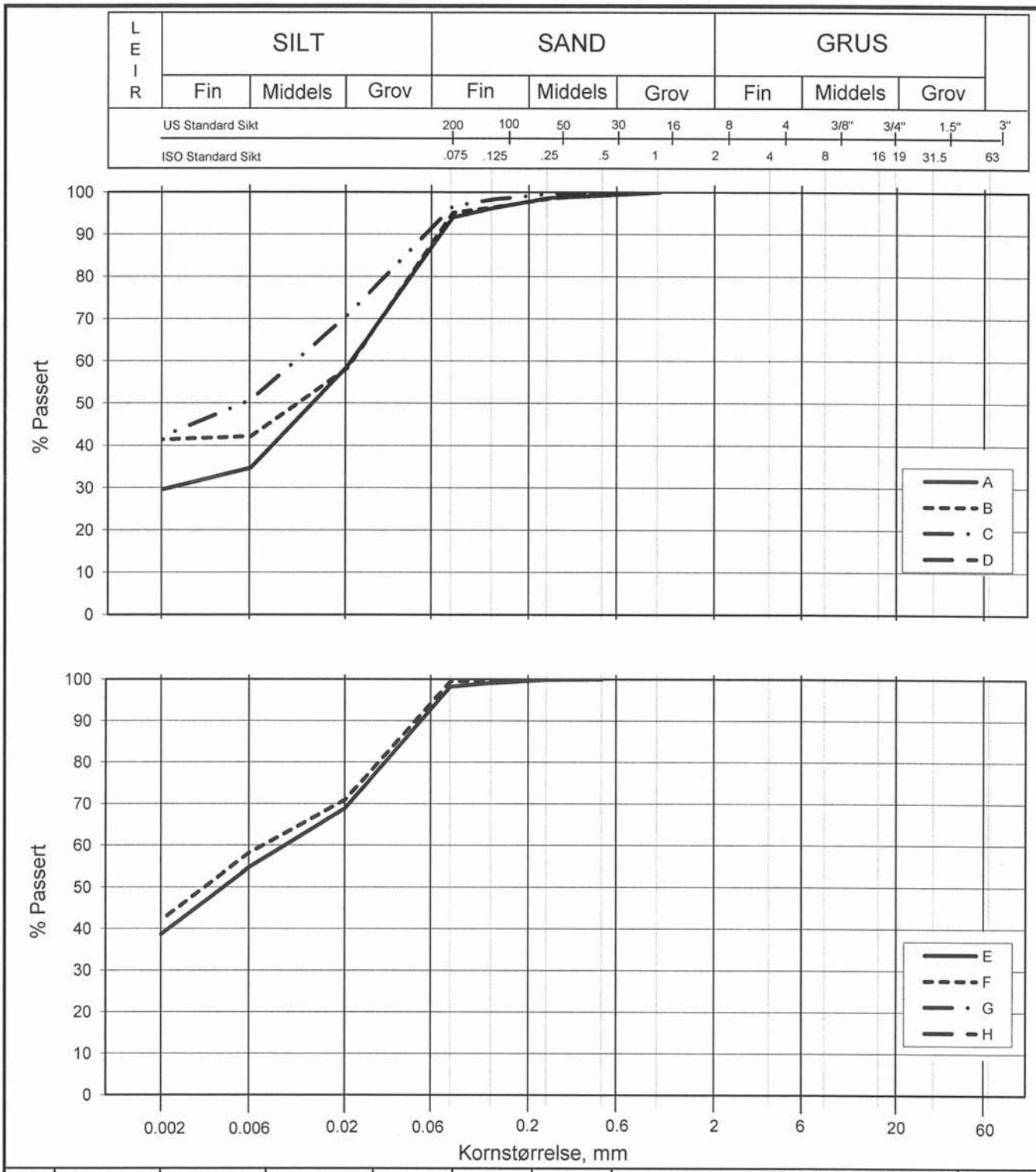
Boring	Tube	Part	Test	Dybde [m]	Frasiktet masse %	Humus test 1 [%]	Humus test 2 [%]	Humus gjennom-snitt [%]
F1						2.2	2.1	2.1

Finnfjord AS - Mikrosilikadeponi

Dokument nr.: 20120869
Dato: 2012-12-12
Figur nr.: xx.xx
Tegnet av: EKR/

NGI

Vedlegg C - Kornfordeling Prøveresultater



Kurve	Hull nr.	Prøve nr.	Dybde m	C_u (d_{60} / d_{10})	Tele gr.	Leir innh. %	Jordartsbetegnelse	Metode tørr/våt sikt
A	F1				T4	29.6	SILT, leirig	Fall
B	F2				T3	41.4	LEIRE	Fall
C	F3				T3	42.1	LEIRE	Fall
D								
E	F4				T4	38.6	LEIRE	Fall
F	F5				T3	42.0	LEIRE	Fall
G								
H								

Finnfjord AS - Mikrosilikadeponi

Kornfordelingskurver

Dokumentnr.
20120869

Dato
2012-12-06

Figurnr.
XX.XX

Tegnet av
FP/

NGI

Vedlegg D - Max/min romvekt Prøveresultater

Labjournal for max/min. dry unit weight - LJ007

General info: Labjournal LJ007 contains maximum and minimum dry unit weight determination, using prosedure LLP010. All the grey cells are filled in by the user and the results are given in red bold numbers. Mass, volume and area of the cylinders are measured once a year. See controll-card max/min equipment - KB002.

Mal: H:/regneark/index/maxmin-Lj007.xlt
Date/Rev.: 2012-01-17/13 Programansvarlig: GS

Min. dry unit weight(NGI 0550)

from controll card

Mass of cylinder:	**735,96**	g
Volume of cylinder:	**202,191**	cm^3

Mass of cylinder with specimen:

1	2	3	4	5	
875,130	874,750	874,280	873,810	874,700	[g]
			Average :	**874,534**	[g]

γ_{dmin}: **6,72 kN/m^3**

Max. dry unit weight (NGI 0551)

Method (dry or wet)	**wet 30%**	
Height of cylinder with surcharge load :	8,655	[cm]
Height of cylinder with specimen+surcharge load :	0,063	[cm]
Height of specimen:	8,592	[cm]
Area of cylinder:	20,226	[cm^2]
Volume of specimen:	173,782	[cm^3]
Mass of wet specimen and tare:		[g]
Mass of dry specimen and tare:	197,04	[g]
Mass of tare:	6,63	[g]
Water content		[%]
Mass of dry specimen:	190,41	[g]

γ_{dmax}: **10,75 kN/m^3**

Finnfjord AS - Mikrosilikadeponi

Document No. 20120869

Max./min. dry unit weight

Date 2013-01-18

Boring : F1 **Part :**

Figure No. XX.XX

Tube: **Test :**

Drawn by FP/

NGI

H:\LABDATA\2012\20120869\Rutine\[maxmin F1.xlsx]Max-min

Labjournal for max/min. dry unit weight - LJ007

General info: Labjournal LJ007 contains maximum and minimum dry unit weight determination, using prosedure LLP010. All the grey cells are filled in by the user and the results are given in red bold numbers. Mass, volume and area of the cylinders are measured once a year. See controll-card max/min equipment - KB002.

Mal: H:/regneark/index/maxmin-Lj007.xlt
Date/Rev.: 2012-01-17/13 Programansvarlig: GS

Min. dry unit weight(NGI 0550)

from controll card

Mass of cylinder:	**735,96**	g
Volume of cylinder:	**202,191**	cm^3

Mass of cylinder with specimen:

1	2	3	4	5	
872,690	873,990	873,500	873,240	873,020	[g]
			Average :	873,288	[g]

γ_{dmin}: **6,66 kN/m^3**

Max. dry unit weight (NGI 0551)

Method (dry or wet)	**wet 30%**	
Height of cylinder with surcharge load :	8,653	[cm]
Height of cylinder with specimen+surcharge load :	0,074	[cm]
Height of specimen:	8,579	[cm]
Area of cylinder:	20,226	[cm^2]
Volume of specimen:	173,519	[cm^3]
Mass of wet specimen and tare:	249,55	[g]
Mass of dry specimen and tare:	194,14	[g]
Mass of tare:	6,65	[g]
Water content	29,55	[%]
Mass of dry specimen:	187,49	[g]

γ_{dmax}: **10,60 kN/m^3**

Finnfjord AS - Mikrosilikadeponi

Document No. 20120869

Max./min. dry unit weight

Date 2013-01-18

Boring : F5 **Part :**

Figure No. XX.XX

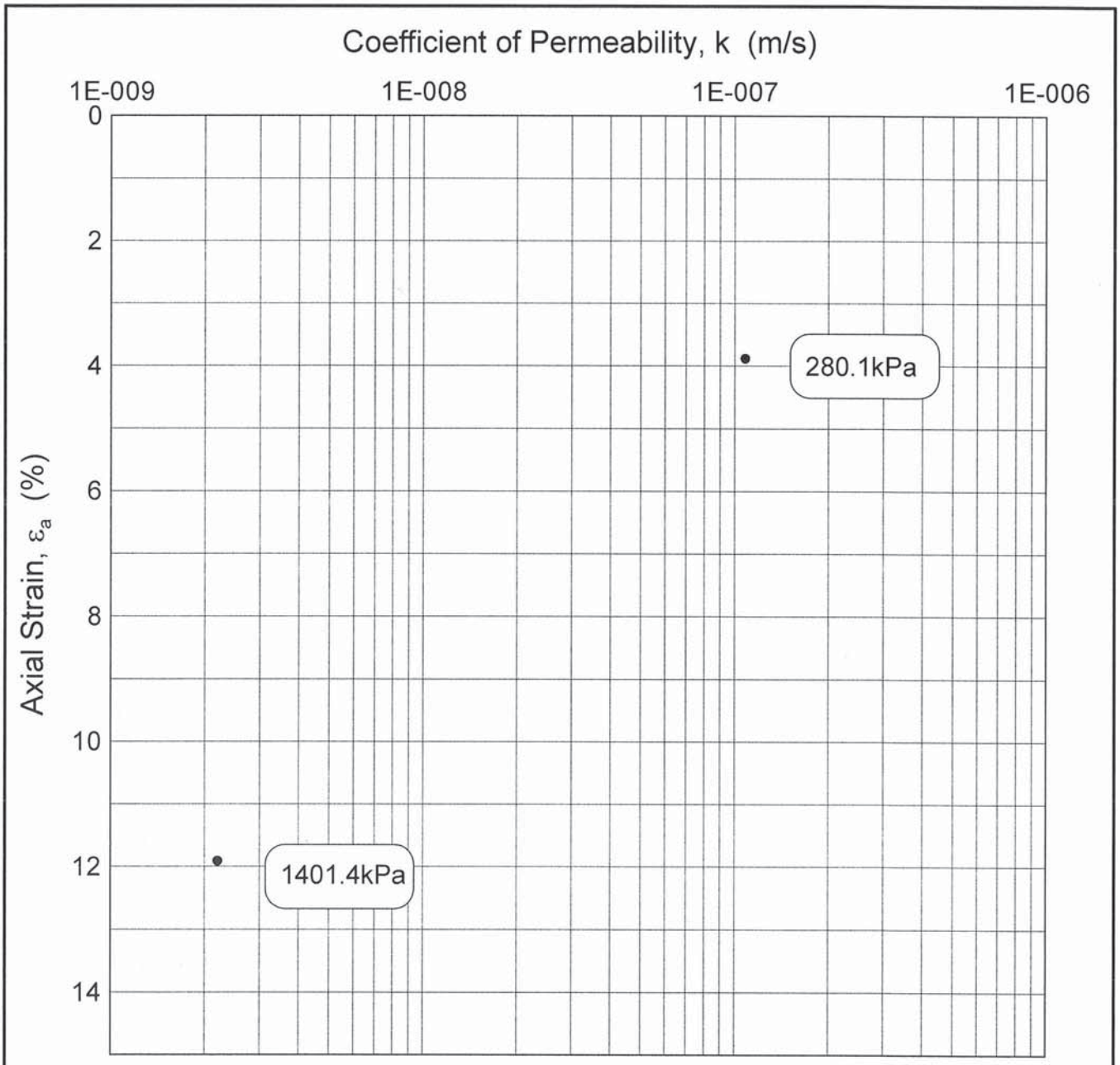
Tube: **Test :**

Drawn by FP

NGI

H:\LABDATA\2012\20120869\Rutine\[maxmin F5.xlsx]Max-min

Vedlegg E - Hydraulisk konduktivitet Prøveresultater



Dato/Rev.: 2009-09-15/3

Finnfjord AS - Mikrosilikadeponi

Dokumentnr. 20120869

Dato 2013-01-24

Ødometer test (IL, perm)

Dybde = xx.xx m

Borhull: F1 Sylinder: p_o' = xx.xx kPa

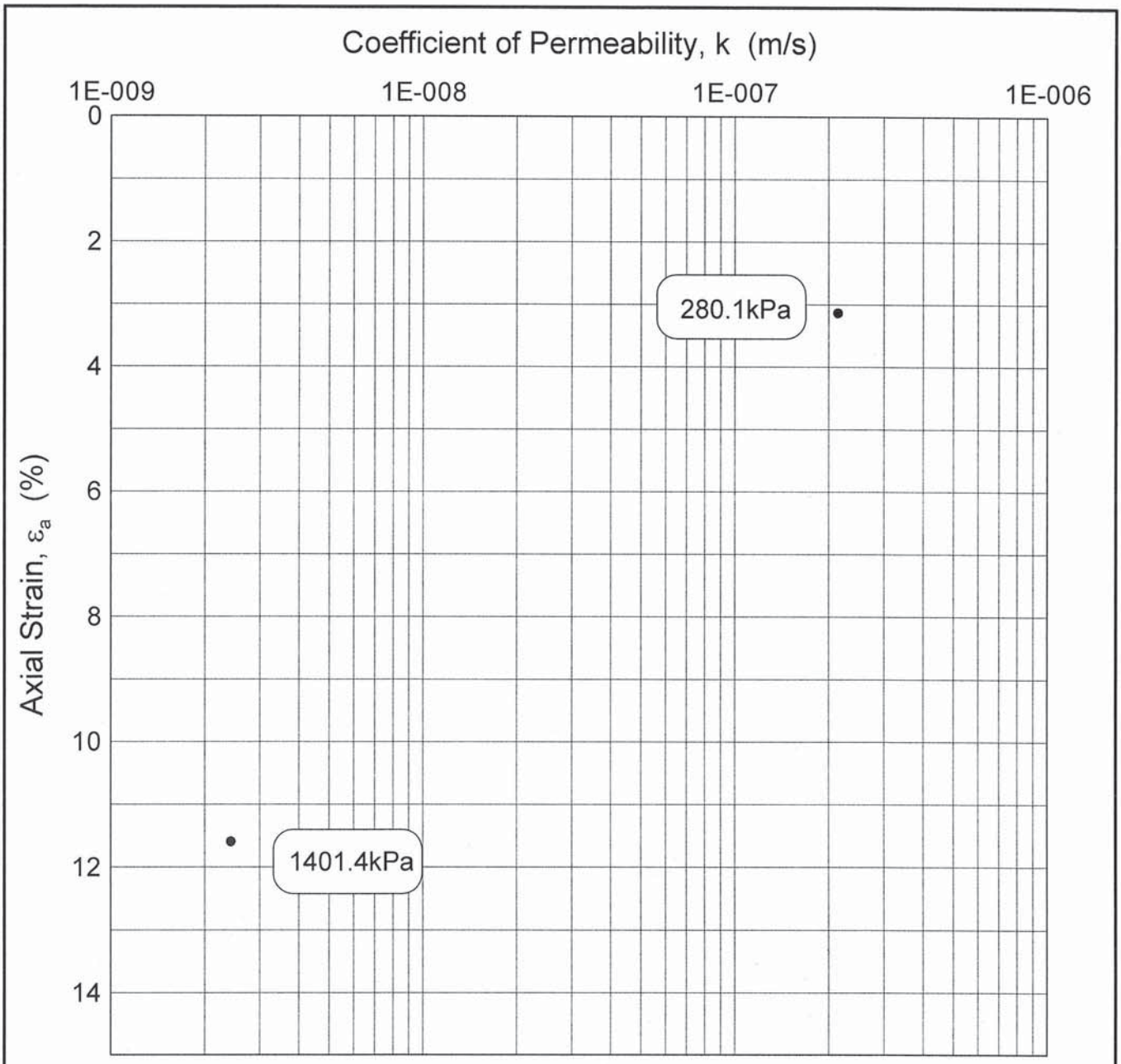
Del: Test: w_i = 30.80 %

Figurnr. xx.xx

Tegner FP

NGI

H:\LABDATA\2012\20120869\IL\PermF1_1.grf



Dato/Rev.: 2009-09-15/3

Finnfjord AS - Mikrosilikadeponi

Dokumentnr. 20120869

Ødometer test (IL, perm)

Dybde = xx.xx m

Dato 2013-01-23

Borhull: F5 Sylinder:

p_o' = xx.xx kPa

Figurnr. xx.xx

Del: Test:

w_i = 31.09 %

Tegner FP/

NGI

H:\LABDATA\2012\20120869\IL\PermF5_1.grf

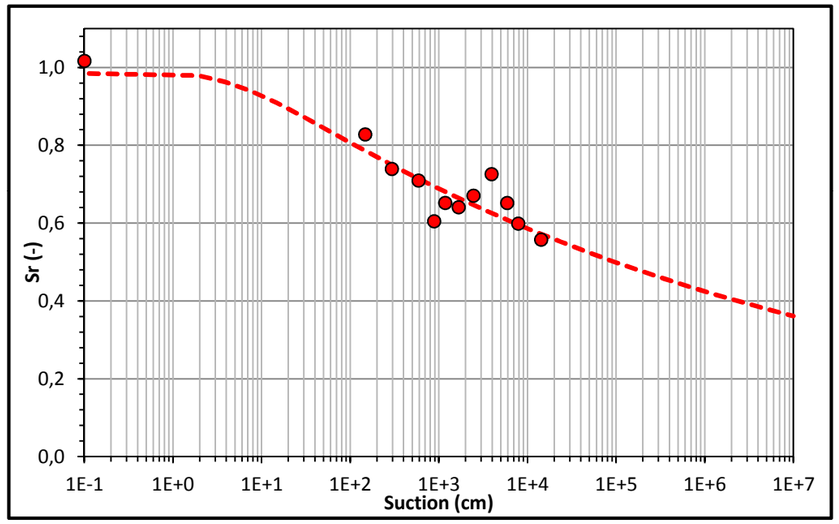
Vedlegg F - Pressure Plate Prøveresultater

Water retention curve - Pressure plate

Sample	F1
Date	09.01.13
Operator	EJW, GeÅ

G_s (g/cm^3)	2,240
Gas type	Air

Ceramic	1	2	3	4
M_i (g)	19,80	20,18	20,03	20,07
M_f (g)	19,82	20,20	19,90	20,05



	Ring	V_{ring} (cm^3)	$M_{ring+fp}$ (g)	Tare	M_t (g)	M_{t+ws} (g)	M_{t+ds} (g)	M_{r+is} (g)	e_i (-)	M_{r+fws} (g)	$S_{r,1}$ (-)
Preparation	10	35,494	18,09	T2	2,09	75,62	49,41	74,58	1,187	74,96	1,06
	33	34,307	19,18	T3	2,09	75,62	49,41	71,91	1,265	69,50	0,86
	57	34,324	19,30	T4	2,09	75,62	49,41	72,64	1,240	68,22	0,77
	55	35,414	18,07	T5	2,09	75,62	49,41	74,82	1,172	68,60	0,73
	44	34,396	19,19	T6	2,09	75,62	49,41	72,01	1,267	65,91	0,66
	6	35,640	17,89	T7	2,09	75,62	49,41	76,25	1,126	69,01	0,72
	30	34,354	19,47	T8	2,09	75,62	49,41	72,84	1,241	66,39	0,66
	56	34,577	19,30	T9	2,09	75,62	49,41	73,34	1,227	67,91	0,73
	12	35,576	17,90	T10	2,09	75,62	49,41	79,42	1,013	70,59	0,73
	48	34,562	19,61	T11	2,09	75,62	49,41	74,03	1,211	67,82	0,70
	37	35,742	18,10	T12	2,09	75,62	49,41	73,26	1,255	65,73	0,61
	28	34,565	19,36	T3	2,10	64,91	42,84	71,32	1,297	63,85	0,55

					Water content				Rests		
	Ring	Date	u_{ini} (kPa)	u_f (kPa)	Tare	M_t (g)	M_{t+sh} (g)	M_{t+ss} (g)	Tare	M_t (g)	M_{t+ss} (g)
Test	10	16.01.13	0	0	t7	2,11	56,54	37,40	t8	2,12	3,06
	33	18.01.13	15	15	t1	2,12	50,27	34,61	t2	2,12	2,99
	57	21.01.13	30	30	t1	2,13	49,45	35,58	t2	2,12	2,75
	55	23.01.13	60	60	t5	2,13	51,40	37,90	t6	2,13	2,56
	44	25.01.13	90	90	t5	2,11	46,63	34,77	t6	2,11	2,31
	6	30.01.13	120	120	t5	2,11	51,41	39,15	t6	2,11	2,43
	30	01.02.13	170	170	t5	2,11	47,99	35,92	t6	2,13	2,56
	56	04.02.13	250	250	t1	2,11	48,76	36,60	t2	2,16	3,24
	12	06.02.13	400	400	t7	2,21	54,24	41,08	t8	2,19	2,30
	48	08.02.13	600	600	t5	2,19	49,70	37,59	t6	2,19	2,38
	37	11.02.13	800	800	t7	2,17	48,87	37,04	t8	2,17	2,59
	28	13.02.13	1450	1450	t7	2,19	45,90	34,87	t8	2,19	2,38

M_s (g)	w (-)	e_f (-)	θ_w (-)
36,23	0,54	1,19	0,55
33,36	0,48	1,30	0,47
34,08	0,41	1,26	0,41
36,20	0,38	1,19	0,39
32,86	0,36	1,34	0,35
37,36	0,33	1,14	0,35
34,24	0,36	1,25	0,36
35,57	0,35	1,18	0,36
38,98	0,34	1,04	0,37
35,59	0,34	1,18	0,35
35,29	0,34	1,27	0,33
32,87	0,34	1,36	0,32

u (cm)	$S_{r,2}$ (-)
0,10	1,02
147,09	0,83
294,18	0,74
588,36	0,71
882,54	0,60
1176,72	0,65
1667,02	0,64
2451,50	0,67
3922,40	0,73
5883,60	0,65
7844,80	0,60
14218,70	0,56

Observations:
The soil became extremely difficult to remove from the ring after a pressure of 800kPa was applied.
It was very hard and compacted.

van Genuchten parameters		
θr	-	0,000
θs	-	0,547
α	m^{-1}	20,6
n (m=1-1/n)	-	1,07
R^2	-	0,90

Name of operator:
Emma Jane Wade
Geir Wold Åsli

Time period of the test: from 09.01.13 to 13.02.13

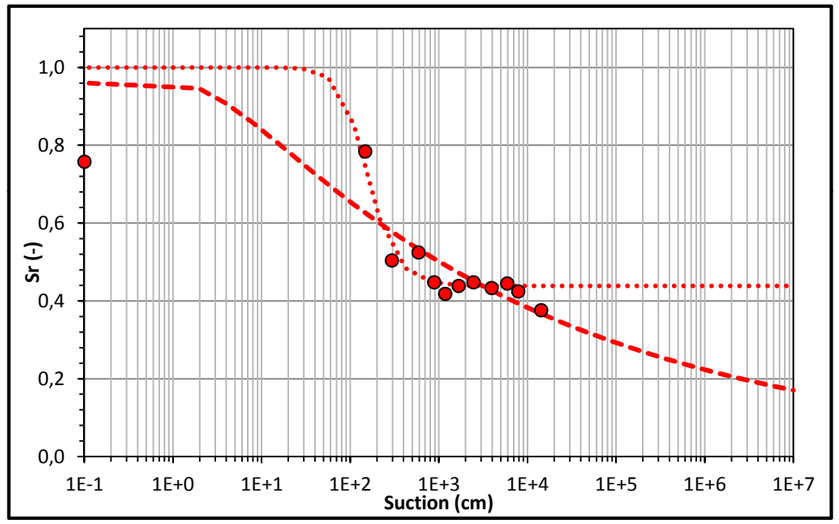
G_s	*Relative density of the grains*	M_t	*Mass of the tare*	u_{ini}	*Initial pressure applied*	e_i	*Initial void ratio*	θr	*Residual water content*
M_i	*Initial mass of the small ceramic*	M_{t+sh}	*Mass of the tare + wet soil*	u_f	*Final pressure measured*	e_f	*Final void ratio*	θs	*Saturated water content*
M_f	*Final mass of the small ceramic*	M_{t+ss}	*Mass of the tare + dry soil*	M_s	*Mass of total dry soil*	θ_w	*Volumetric water content*	α	*van Genuchten's parameter*
V_{ring}	*Volume of the ring*	M_{r+si}	*Mass of the ring + soil (t=0)*	w	*Gravimetric water content*	$S_{r,1}$	*Degree of saturation (method 1)*	n	*van Genuchten's parameter*
$M_{ring+pp}$	*Mass of the ring and the filter paper*	M_{r+shf}	*Mass of the ring + wet soil (after pressure step)*			$S_{r,2}$	*Degree of saturation (method 2)*	m	*van Genuchten's parameter*

Water retention curve - Pressure plate

Sample	F5
Date	09.01.13
Operator	EJW, GeÅ

G_s (g/cm^3)	2,225
Gas type	Air

Ceramic	1	2	3	4
M_i (g)	19,80	20,18	20,03	20,07
M_f (g)	19,82	20,20	19,90	20,05



Preparation	Ring	V_{ring} (cm^3)	$M_{ring+fp}$ (g)	Tare	M_t (g)	M_{t+ws} (g)	M_{t+ds} (g)	M_{r+is} (g)	e_i (-)	M_{r+fws} (g)	$S_{r,1}$ (-)
	41	35,784	18,25	t7	2,10	45,75	32,13	61,14	1,698	64,30	0,73
	50	34,686	19,51	t8	2,10	45,75	32,13	63,41	1,555	67,11	0,82
	20	36,049	18,12	t9	2,10	45,75	32,13	60,78	1,733	59,40	0,52
	11	36,114	18,27	t10	2,10	45,75	32,13	63,35	1,591	61,27	0,54
	17	35,708	18,10	t11	2,10	45,75	32,13	59,68	1,777	57,29	0,46
	34	34,569	19,62	t12	2,10	45,75	32,13	63,13	1,570	60,85	0,53
	1	35,875	18,24	t13	2,10	45,75	32,13	59,82	1,790	56,92	0,44
	2	35,575	18,11	t14	2,10	45,75	32,13	59,83	1,758	57,05	0,45
	38	34,345	19,48	t15	2,10	45,75	32,13	60,94	1,679	56,88	0,41
	15	35,833	18,12	t16	2,10	45,75	32,13	59,74	1,784	57,06	0,45
	49	34,352	19,44	t17	2,10	45,75	32,13	58,88	1,817	56,34	0,44
	43	35,368	17,99	t8	2,10	43,66	30,88	58,28	1,821	53,29	0,32

					Water content				Rests						
Test	Ring	Date	u_{ini} (kPa)	u_f (kPa)	Tare	M_t (g)	M_{t+sh} (g)	M_{t+ss} (g)	Tare	M_t (g)	M_{t+ss} (g)	M_s (g)	w (-)	e_f (-)	θ_w (-)	u (cm)	$S_{r,2}$ (-)
	41	16.01.13	0	0	t1	2,11	42,01	25,50	t2	2,10	4,63	25,92	0,71	2,07	0,51	0,10	0,76
	50	18.01.13	15	15	t7	2,11	47,44	31,47	t8	2,12	3,11	30,35	0,54	1,54	0,48	147,09	0,78
	20	21.01.13	30	30	t7	2,13	42,16	30,77	t8	2,13	2,61	29,12	0,40	1,75	0,32	294,18	0,50
	11	23.01.13	60	60	t7	2,14	44,27	32,75	t8	2,13	2,48	30,96	0,38	1,60	0,32	588,36	0,52
	17	25.01.13	90	90	t7	2,11	40,30	30,04	t8	2,11	2,32	28,14	0,37	1,82	0,29	882,54	0,45
	34	30.01.13	120	120	t7	2,10	40,62	31,85	t8	2,11	2,32	29,96	0,29	1,57	0,26	1176,72	0,42
	1	01.02.13	170	170	t7	2,11	39,66	29,63	t8	2,12	2,63	28,03	0,36	1,85	0,28	1667,02	0,44
	2	04.02.13	250	250	t3	2,15	40,34	30,21	t4	2,19	2,48	28,35	0,36	1,79	0,29	2451,50	0,45
	38	06.02.13	400	400	t5	2,22	38,34	29,00	t6	2,20	2,81	27,39	0,35	1,79	0,28	3922,40	0,43
	15	08.02.13	600	600	t7	2,16	40,50	30,56	t8	2,19	2,79	29,00	0,35	1,75	0,28	5883,60	0,45
	49	11.02.13	800	800	t5	2,19	37,79	28,57	t6	2,17	2,79	27,00	0,35	1,83	0,27	7844,80	0,42
	43	13.02.13	1450	1450	t5	2,19	36,87	28,02	t6	2,17	2,35	26,01	0,34	2,03	0,25	14218,70	0,38

Observations:
When lifting ring 41, some of the sample was lost due to the material being saturated.

van Genuchten parameters		
θr	-	0,277
θs	-	0,632
α	m^{-1}	0,757
n (m=1-1/n)	-	3,15
R^2	-	0,98

Name of operator:
Emma Jane Wade
Geir Wold Åsli

Time period of the test: from 09.02.13
to 13.02.13

NGI

G_s	*Relative density of the grains*	M_t	*Mass of the tare*	u_{ini}	*Initial pressure applied*	e_i	*Initial void ratio*	θr	*Residual water content*
M_i	*Initial mass of the small ceramic*	M_{t+sh}	*Mass of the tare + wet soil*	u_f	*Final pressure measured*	e_f	*Final void ratio*	θs	*Saturated water content*
M_f	*Final mass of the small ceramic*	M_{t+ss}	*Mass of the tare + dry soil*	M_s	*Mass of total dry soil*	θ_w	*Volumetric water content*	α	*van Genuchten's parameter*
V_{ring}	*Volume of the ring*	M_{r+si}	*Mass of the ring + soil (t=0)*	w	*Gravimetric water content*	$S_{r,1}$	*Degree of saturation (method 1)*	n	*van Genuchten's parameter*
$M_{ring+pp}$	*Mass of the ring and the filter paper*	M_{r+shf}	*Mass of the ring + wet soil (after pressure step)*			$S_{r,2}$	*Degree of saturation (method 2)*	m	*van Genuchten's parameter*