

Datarapport: Kornstørrelsesfordeling, tørstof og glødetab

Laboratorieanalyser for Orbicon

Ingerlise Nørgaard



Datarapport: Kornstørrelsesfordeling, tørstof og glødetab

Laboratorieanalyser for Orbicon

Ingerlise Nørgaard

Prøvebehandling

GEUS har foretaget analyser på 40 prøver fra Horns Rev.

Ved modtagelsen af prøverne er de blevet registreret med følgende 5 kategorier:

- dato
- lokalitet
- fortløbende laboratorienummer
- rekvirent
- analysekrav

Resterende prøvemateriale bortkastes 14 dage efter afrapportering.

Horns Rev I+II Survey of food resources to common scoter at Horns Rev											
Project no. 1320900081				JECH							
Station	UTM Lat	UTM Long	Start		Depth	M	Van Veen 0,1	Sediment	Visible Ensis	Visible Spisula	Comments
			WGS 84 Lat	WGS 84 Long							
1	55092	82111	55 20.897	008 21.108		8	x	x		x	
2	552088	81496	55 20.872	008 14.946		17	x	x	x	x	
3	552084	80881	55 20.829	008 08.751		16	x	x			
4	552079	80266	55 20.782	008 02.631		18,5	x	x			
5	552074	75651	55 20.746	007 56.493		18,4	x	x	x		
6	552069	75037	55 20.702	007 50.356		22,5	x	x			
7	552419	74988	55 24.185	007 49.879		20,7	x	x			
8	552424	75604	55 24.240	007 56.033		18,6	x	x	x	x	
9	552430	80220	55 24.289	008 02.213		17	x	x		x	
10	552434	80836	55 24.327	008 08.353		15	x	x	x		More and more common scoters in the area
11	552438	81452	55 24.386	008 14.498		10,5	x	x	x	x	
12	552440	81831	55 24.377	008 18.299		7,5	x	x	x		
13	552789	81540	55 27.894	008 15.371		5,5	x	x			
14	552785	80923	55 27.851	008 09.220		10,5	x	x	x	x	Uppermost 4 cm of sediment oxygenated silted sand, beneath black reduced sediment
15	552781	80306	55 27.801	008 03.051		14,8	x	x	x	x	2 cm of siphon of Mya in the sediment sample
16	552776	75690	55 27.757	007 56.882		11,7	x	x			
17	552770	75073	55 27.689	007 50.721		8	x	x	x	x	Sediment very loose and coarse grained
18	552764	74456	55 27.645	007 44.55		20	x	x	x		Sediment coarse and loose
19	553115	73447	55 31.153	007 34.473		20,2	x	x	x	x	Sandreels, more Amphioxus and porcelain crab
20	553110	74065	55 31.104	007 40.637		16	x	x	x		
21	553117	74683	55 31.159	007 46.801		9	x	x			
22	553123	75300	55 31.227	007 53.003		27	x	x			
23	553128	75918	55 30.737	007 59.729		7,5	x	x			
24	553475	75528	55 34.751	007 55.281		12,5	x	x			
25	553469	74910	55 34.693	007 49.094		22,5	x	x			On the edge of Slugen
26	553463	74291	55 34.639	007 42.915		15	x	x	x		Scattered abundance of common scoter between St. 34 and St.26. Higher abundance about 3 km off St. 26. Numerous Ensis in fauna sample almost none in the sediment sample
27	553457	73673	55 34.569	007 36.695		13,5	x	x	x		Flere end 100 four. Sortænder sydfor linjen mellem 26 og 27
28	553449	73054	55 34.522	007 30.548		11,5	x	x	x		35 sortænder sydfor HR2, 150 SV for HR2, 5 Lomvie, 2 Marsvin/Hvidnæser net
29	553441	72436	55 34.524	007 24.330		28,5	x	x	x		Mange Lencetfisk, 1 Lomvie 5-6 Hvidnæse/(Marsvin) 2,3 km Østfor St. 29. Groft sand 2 spandfulde
30	553789	72174	55 37.888	007 21.762		24,2	x	x			1 Tobis i sedimentpr., 12 Lomvie mellem 29 og 30
31	553797	72793	55 37.963	007 27.955		17,8	x	x	x		Lomvie
32	553804	73413	55 38.038	007 34.135		17,5	x	x	x		12 Sortænder NV for HR2, 60+100 for HR2, 2 km Nv for St.33. Mere end 300 Åkm. Ål for St. 33
33	553811	74032	55 38.118	007 40.321		13,8	x	x	x		1 Spættet sæl og mere end 300 Sortænder NVV for St. 33
34	553817	74651	55 38.170	007 46.504		16	x	x	x		
35	553823	75271	55 38.250	007 52.677		17	x	x			
36	553829	75890	55 38.286	007 58.899		16	x	x	x		
37	553834	80510	55 38.337	008 05.088		7,8	x	x			
38	554166	74459	55 41.659	007 44.600		19	x	x	x		70+50 Sortænder mellem 33 og 38, Flest Vlor linjen, indtil 3,5 km fra 38
39	554159	73839	55 41.578	007 38.383		17	x	x	x		10+10 Sortænder Ø for St. 39
40	554152	73219	55 41.525	007 32.201		22	x	x	x		10+5-15+2-10 Sortænder S for linjen mellem 39 og 40. Rigtig mange et par km N for linjen, indtil 2 km Ø for St. 40

Analysemetoder

Tørvægtsbestemmelse:

Tørvægten er bestemt i % af vådvægten. Prøven er tørret ved 105 °C til konstant vægt. Analysen foretages dels ved anvendelse af DS 405.11 dels DS 204 i Vand og Miljø.

Glødetabsbestemmelse:

Det organiske indhold samt kemisk bundet vand i lermineralelementerne bestemmes ved glødetabsanalysen. Glødetabet bestemmes i vægt % af materialet tørret ved 105 °C. Analysen foretages dels ved anvendelse af DS 405.9 samt DS 204.

Kornstørrelsesfordeling:

Sigteanalyse:

Totalprøven er tørret og sigtet gennem en sigtesøjle fra 32 mm ned til 0,063 mm med ½ phi intervaller, hvilket svarer til 16 sigter. Metoden er tillempet i forhold til DS 405.9 idet der er indføjet flere sigter end der beskrives i denne standard.

Kornkurven:

Som udgangspunkt for kornkurvestørrelsesanalysen er anvendt DS 405.9. DS/EN 933-1

Resultater

I tabel 1 er listet resultaterne af vandindholdsbestemmelserne samt glødetabsbestemmelserne.

I bilag 1 er vist kornkurven for sedimentprøverne. Kornkurven viser fordeling af sand, silt og ler i prøverne. Hvis prøverne ikke opfylder DS /EN 933-1DS's krav til sedimentprøvestørrelser på mindst 200 gr. er dette noteret under Remarks.

Referencer

Standarder for Vand & Miljø. DS-Håndbog 21.2. Dansk Standardiseringsråd, 1991.

Dansk Standard DS 204. Tørstof og gløderest. Dansk Standardiseringsråd, Kbh. 1980.

Dansk Standard DS 405.9. Kornstørrelsesfordeling bestemt ved sigteanalyse. Dansk Standardiseringsråd, Kbh. 1978.

Dansk Standard DS/EN 933-1. Kornstørrelsesfordeling bestemt ved sigteanalyse. Dansk Standardiseringsråd, Kbh. 2004.

Dansk Standard DS 405.11. Vandindhold. Dansk Standardiseringsråd, Kbh. 1978.

Tabel 1

Horns Rev 2010

Orbicon

Vandindhold DS 405.11 Glødetab DS 204

Stations nr.	Dybde (m)	Glødetab	Vandindfh. %
1	8	0,65	20,29
2	17	2,20	20,25
3	16	1,04	18,29
4	18,5	1,22	18,93
5	18,4	1,43	19,51
6	22,5	0,62	18,15
7	20,7	0,62	17,46
8	18,6	0,84	20,44
9	17	1,43	21,45
10	15	0,65	18,04
11	10,5	0,77	18,69
12	7,5	0,93	20,46
13	5,5	1,27	21,64
14	10,5	1,67	21,71
15	14,8	1,26	19,14
16	11,7	0,31	17,93
17	8	0,15	13,28
18	20	1,08	16,32
19	20,2	0,33	10,84
20	16	0,34	11,10
21	9	0,24	15,89
22	27	1,68	22,13
23	7,5	0,28	18,06
24	12,5	0,46	18,62
25	22,5	1,40	19,69
26	15	0,54	17,46
27	13,5	0,38	17,84
28	11,5	0,47	18,25
29	28,5	0,32	11,60
30	24,2	0,24	4,96
31	17,8	0,24	16,77
32	17,5	0,50	20,69
33	13,8	0,34	17,21
34	16	0,62	20,15
35	17	0,52	19,28
36	16	1,29	19,67
37	8	0,75	21,48
38	19	0,61	17,12
39	17	1,45	17,45
40	22	0,84	19,05

Dec 2010

Bilag 1

Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 1 Dybde 8 m
Lab. Id: 100454
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 1,4 mm



Total Weight 123,03 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,00	0,00	100,00
2,80	-1,49	0,00	0,00	100,00
2,00	-1,00	0,00	0,00	100,00
1,40	-0,49	0,05	0,04	99,96
1,00	0,00	0,05	0,04	99,92
0,710	0,49	0,09	0,07	99,85
0,500	1,00	0,12	0,10	99,75
0,355	1,49	0,14	0,11	99,63
0,250	2,00	0,22	0,18	99,46
0,180	2,47	0,26	0,21	99,24
0,125	3,00	5,79	4,71	94,54
0,090	3,47	109,32	88,86	5,68
0,075	3,74	5,78	4,70	0,98
0,063	3,99	0,77	0,63	0,36
< 0,063	> 3,99	0,44	0,36	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

Size Class	Weight %
Silt and clay (< 0,063 mm)	0,36
Sand, fine (0,063 mm - 0,200 mm)	98,95
Sand, medium (0,2 mm - 0,6 mm)	0,49
Sand, coarse (0,6 mm - 2 mm)	0,21
Gravel (> 2 mm)	0,00
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,13	2,94
16%	84%	0,12	3,05
25%	75%	0,12	3,09
40%	60%	0,11	3,17
Median 50%	50%	0,11	3,22
75%	25%	0,10	3,36
84%	16%	0,09	3,41
90%	10%	0,09	3,45
95%	5%	0,09	3,51

Moments Statistics

Mean	3,23
Sorting	0,18
Skewness	0,04
Kurtosis	0,88
Uniformity Coefficient	1,21

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

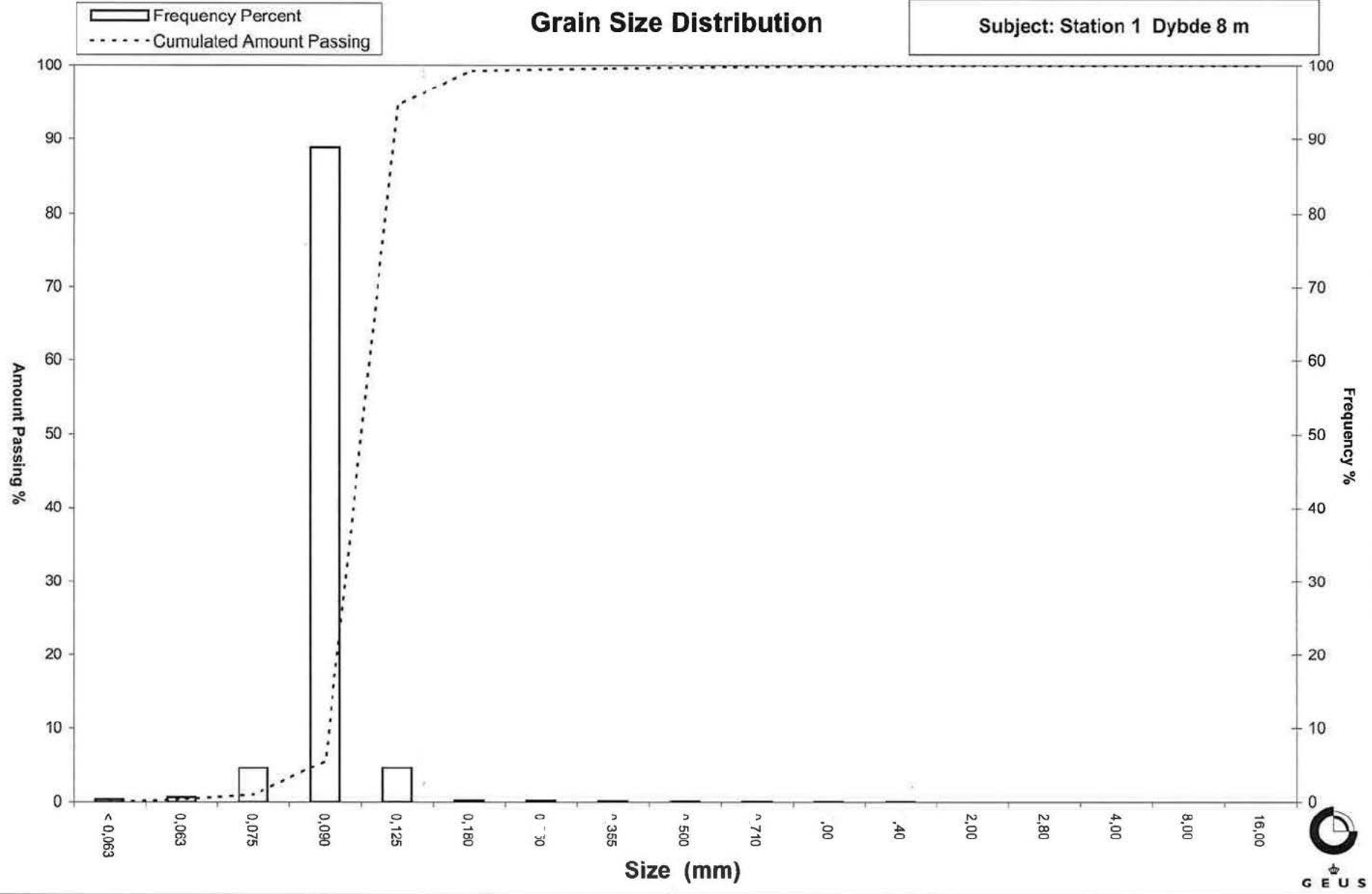
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 1 Dybde 8 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 2 Dybde 17 m
Lab. Id: 100455
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. <1,4 mm. Mat >2mm =skaller



Total Weight 135,8 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,37	0,27	99,73
2,80	-1,49	0,43	0,32	99,41
2,00	-1,00	0,35	0,26	99,15
1,40	-0,49	0,43	0,32	98,84
1,00	0,00	0,55	0,41	98,43
0,710	0,49	0,54	0,40	98,03
0,500	1,00	0,82	0,60	97,43
0,355	1,49	2,21	1,63	95,80
0,250	2,00	6,06	4,46	91,34
0,180	2,47	17,52	12,90	78,44
0,125	3,00	38,02	28,00	50,44
0,090	3,47	38,92	28,66	21,78
0,075	3,74	16,20	11,93	9,85
0,063	3,99	4,80	3,53	6,32
< 0,063	> 3,99	8,58	6,32	0,00

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	6,32
Sand, fine (0,063 mm - 0,200 mm):	75,81
Sand, medium (0,2 mm - 0,6 mm):	15,59
Sand, coarse (0,6 mm - 2 mm):	1,44
Gravel (> 2 mm):	0,85
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,34	1,57
16%	84%	0,21	2,25
25%	75%	0,17	2,53
40%	60%	0,14	2,80
Median 50%	50%	0,12	3,01
75%	25%	0,09	3,41
84%	16%	0,08	3,60
90%	10%	0,08	3,73
95%	5%	-----	-----

Moments Statistics

Mean	2,95
Sorting	-----
Skewness	-----
Kurtosis	-----
Uniformity Coefficient	1,91

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

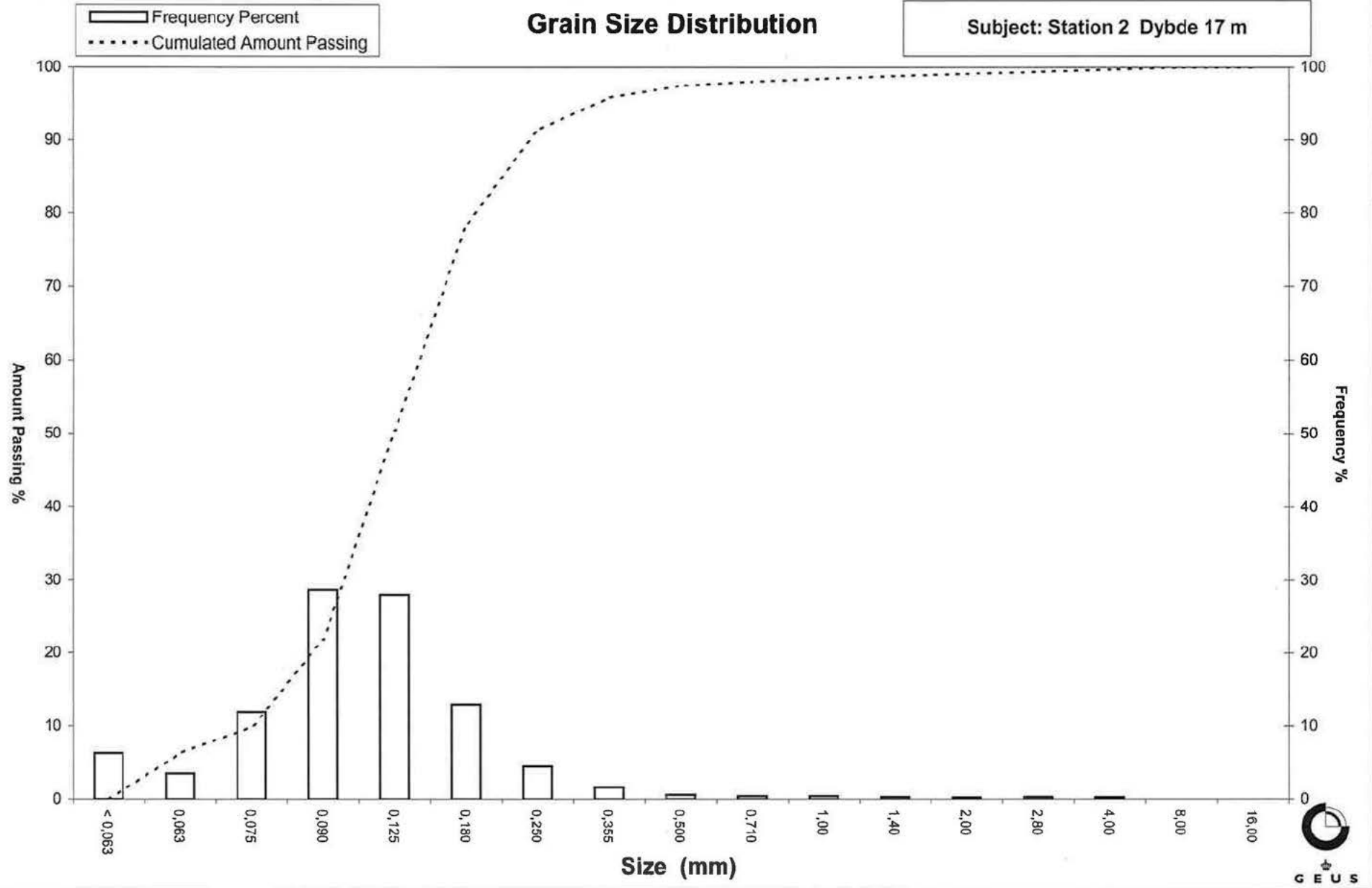
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 2 Dybde 17 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 3 Dybde 16 m
Lab. Id: 100456
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. <1,4 mm. Mat >2mm =skaller



GEUS

Total Weight 140,81 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,15	0,11	99,89
2,80	-1,49	0,22	0,16	99,74
2,00	-1,00	0,31	0,22	99,52
1,40	-0,49	0,25	0,18	99,34
1,00	0,00	0,46	0,33	99,01
0,710	0,49	0,83	0,59	98,42
0,500	1,00	1,85	1,31	97,11
0,355	1,49	4,19	2,98	94,13
0,250	2,00	12,14	8,62	85,51
0,180	2,47	32,95	23,40	62,11
0,125	3,00	67,35	47,83	14,28
0,090	3,47	16,49	11,71	2,57
0,075	3,74	1,24	0,88	1,69
0,063	3,99	0,58	0,41	1,28
< 0,063	> 3,99	1,80	1,28	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

Size Class	Weight %
Silt and clay (< 0,063 mm)	1,28
Sand, fine (0,063 mm - 0,200 mm)	67,52
Sand, medium (0,2 mm - 0,6 mm)	28,94
Sand, coarse (0,6 mm - 2 mm)	1,78
Gravel (> 2 mm)	0,48
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,40	1,33
16%	84%	0,25	2,03
25%	75%	0,22	2,19
40%	60%	0,18	2,49
Median 50%	50%	0,17	2,59
75%	25%	0,14	2,86
84%	16%	0,13	2,98
90%	10%	0,11	3,16
95%	5%	0,10	3,36

Moments Statistics

Mean	2,53
Sorting	0,55
Skewness	-0,21
Kurtosis	1,24
Uniformity Coefficient	1,58

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

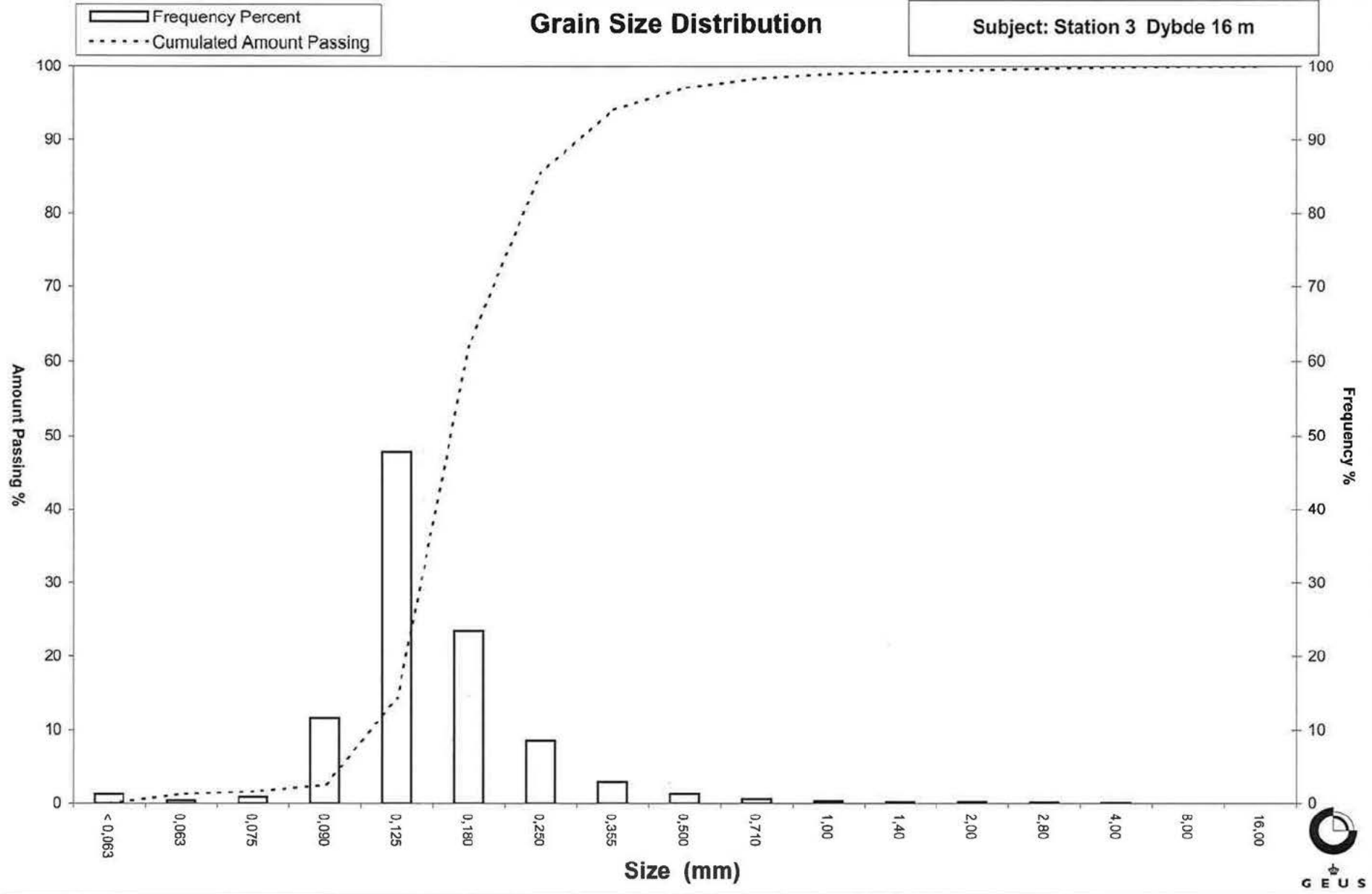
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on
 "Amount in sieve". Uniformity coefficient is based on
 "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 3 Dybde 16 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 4 Dybde 18,5 m
Lab. Id: 100457
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. <1,4 mm. Mat >2mm =skaller



Total Weight 126,45 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,08	0,06	99,94
2,80	-1,49	0,18	0,14	99,79
2,00	-1,00	0,17	0,13	99,66
1,40	-0,49	0,16	0,13	99,53
1,00	0,00	0,21	0,17	99,37
0,710	0,49	0,34	0,27	99,10
0,500	1,00	0,55	0,43	98,66
0,355	1,49	1,30	1,03	97,64
0,250	2,00	3,79	3,00	94,64
0,180	2,47	11,61	9,18	85,46
0,125	3,00	41,70	32,98	52,48
0,090	3,47	54,41	43,03	9,45
0,075	3,74	6,54	5,17	4,28
0,063	3,99	2,15	1,70	2,58
< 0,063	> 3,99	3,26	2,58	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	2,58
Sand, fine (0,063 mm - 0,200 mm):	85,50
Sand, medium (0,2 mm - 0,6 mm):	10,79
Sand, coarse (0,6 mm - 2 mm):	0,79
Gravel (> 2 mm):	0,34
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,26	1,93
16%	84%	0,18	2,49
25%	75%	0,16	2,62
40%	60%	0,14	2,86
Median 50%	50%	0,12	3,02
75%	25%	0,10	3,28
84%	16%	0,10	3,39
90%	10%	0,09	3,47
95%	5%	0,08	3,70

Moments Statistics

Mean	2,97
Sorting	0,49
Skewness	-0,21
Kurtosis	1,09
Uniformity Coefficient	1,52

The analysis is executed according to DS405.9 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

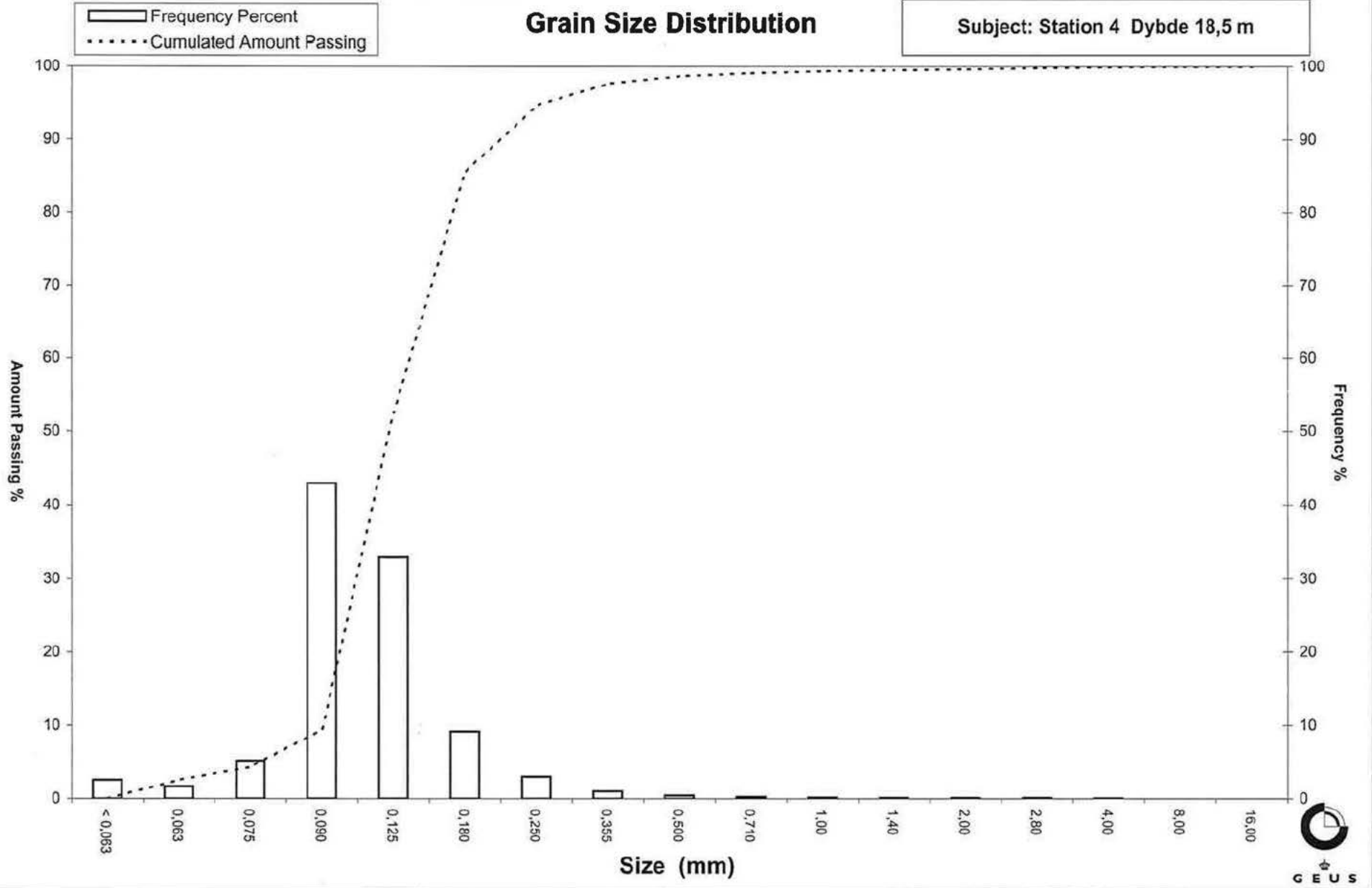
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 4 Dybde 18,5 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 5 Dybde 18,4 m
Lab. Id: 100458
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. <1,4 mm. Mat >2mm =skaller



Total Weight 124,63 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,08	0,06	99,94
2,80	-1,49	0,14	0,11	99,82
2,00	-1,00	0,19	0,15	99,67
1,40	-0,49	0,18	0,14	99,53
1,00	0,00	0,29	0,23	99,29
0,710	0,49	0,51	0,41	98,88
0,500	1,00	0,73	0,59	98,30
0,355	1,49	1,23	0,99	97,31
0,250	2,00	2,84	2,28	95,03
0,180	2,47	8,94	7,17	87,86
0,125	3,00	44,86	35,99	51,87
0,090	3,47	53,04	42,56	9,31
0,075	3,74	5,91	4,74	4,57
0,063	3,99	2,05	1,64	2,92
< 0,063	> 3,99	3,64	2,92	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	2,92
Sand, fine (0,063 mm - 0,200 mm):	86,99
Sand, medium (0,2 mm - 0,6 mm):	8,67
Sand, coarse (0,6 mm - 2 mm):	1,09
Gravel (> 2 mm):	0,33
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,25	2,00
16%	84%	0,17	2,52
25%	75%	0,16	2,64
40%	60%	0,14	2,86
Median 50%	50%	0,12	3,02
75%	25%	0,10	3,28
84%	16%	0,10	3,39
90%	10%	0,09	3,46
95%	5%	0,08	3,71

Moments Statistics

Mean	2,98
Sorting	0,48
Skewness	-0,17
Kurtosis	1,09
Uniformity Coefficient	1,52

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

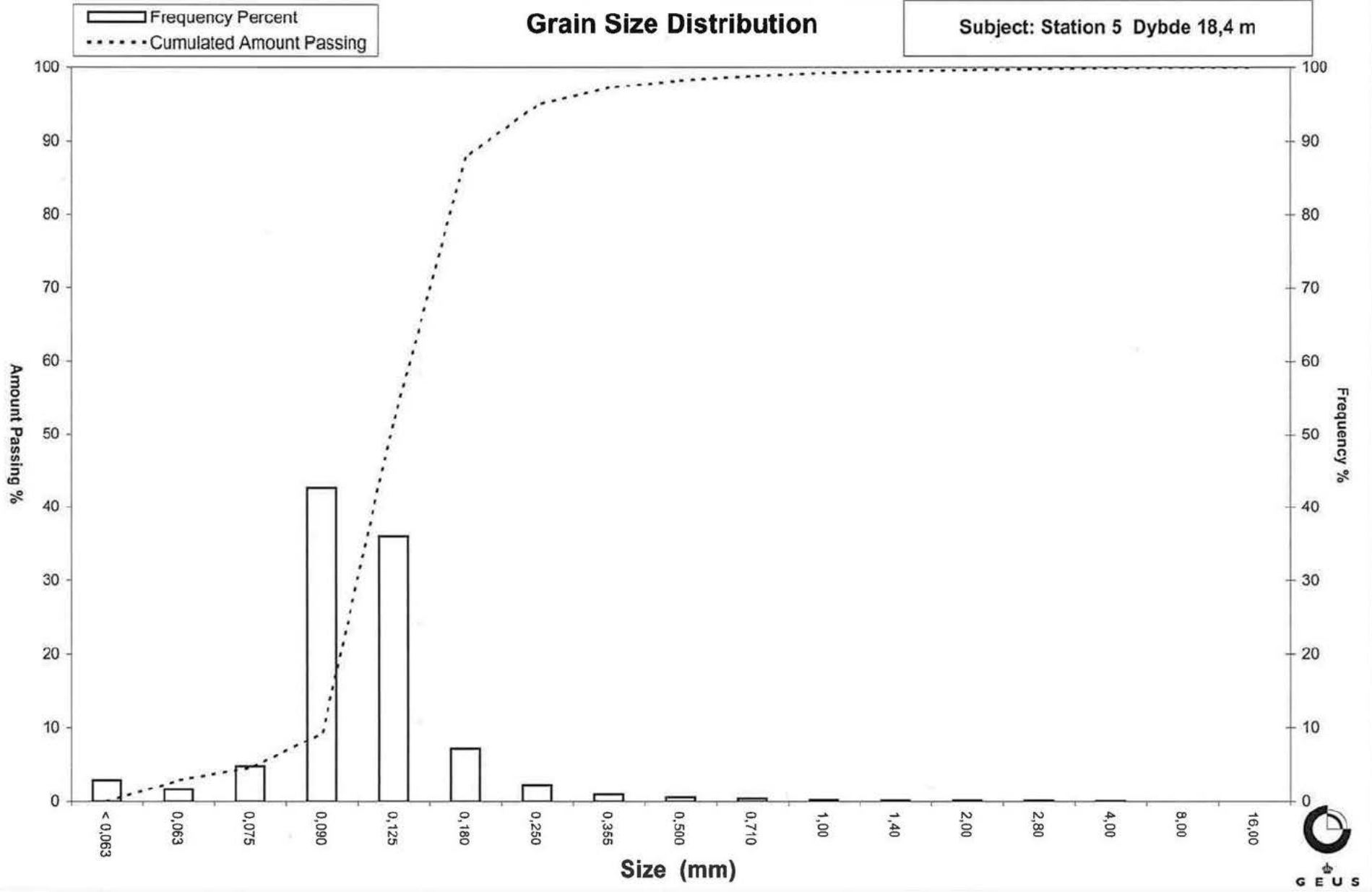
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 5 Dybde 18,4 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 6 Dybde 22,5 m
Lab. Id: 100459
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. <1,4 mm. Mat >2mm =skaller



Total Weight 119,14 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,09	0,08	99,92
2,80	-1,49	0,00	0,00	99,92
2,00	-1,00	0,10	0,08	99,84
1,40	-0,49	0,13	0,11	99,73
1,00	0,00	0,28	0,24	99,50
0,710	0,49	0,66	0,55	98,94
0,500	1,00	1,26	1,06	97,88
0,355	1,49	3,24	2,72	95,17
0,250	2,00	7,11	5,97	89,20
0,180	2,47	15,99	13,42	75,78
0,125	3,00	55,63	46,69	29,08
0,090	3,47	29,69	24,92	4,16
0,075	3,74	2,56	2,15	2,01
0,063	3,99	0,88	0,74	1,28
< 0,063	> 3,99	1,52	1,28	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

Size Class	Weight %
Silt and clay (< 0,063 mm)	1,28
Sand, fine (0,063 mm - 0,200 mm)	78,34
Sand, medium (0,2 mm - 0,6 mm)	18,78
Sand, coarse (0,6 mm - 2 mm)	1,45
Gravel (> 2 mm)	0,16
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,35	1,51
16%	84%	0,22	2,17
25%	75%	0,18	2,48
40%	60%	0,16	2,63
Median 50%	50%	0,15	2,74
75%	25%	0,12	3,07
84%	16%	0,11	3,23
90%	10%	0,10	3,35
95%	5%	0,09	3,46

Moments Statistics

Mean	2,71
Sorting	0,56
Skewness	-0,17
Kurtosis	1,36
Uniformity Coefficient	1,64

The analysis is executed according to DS405.9 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

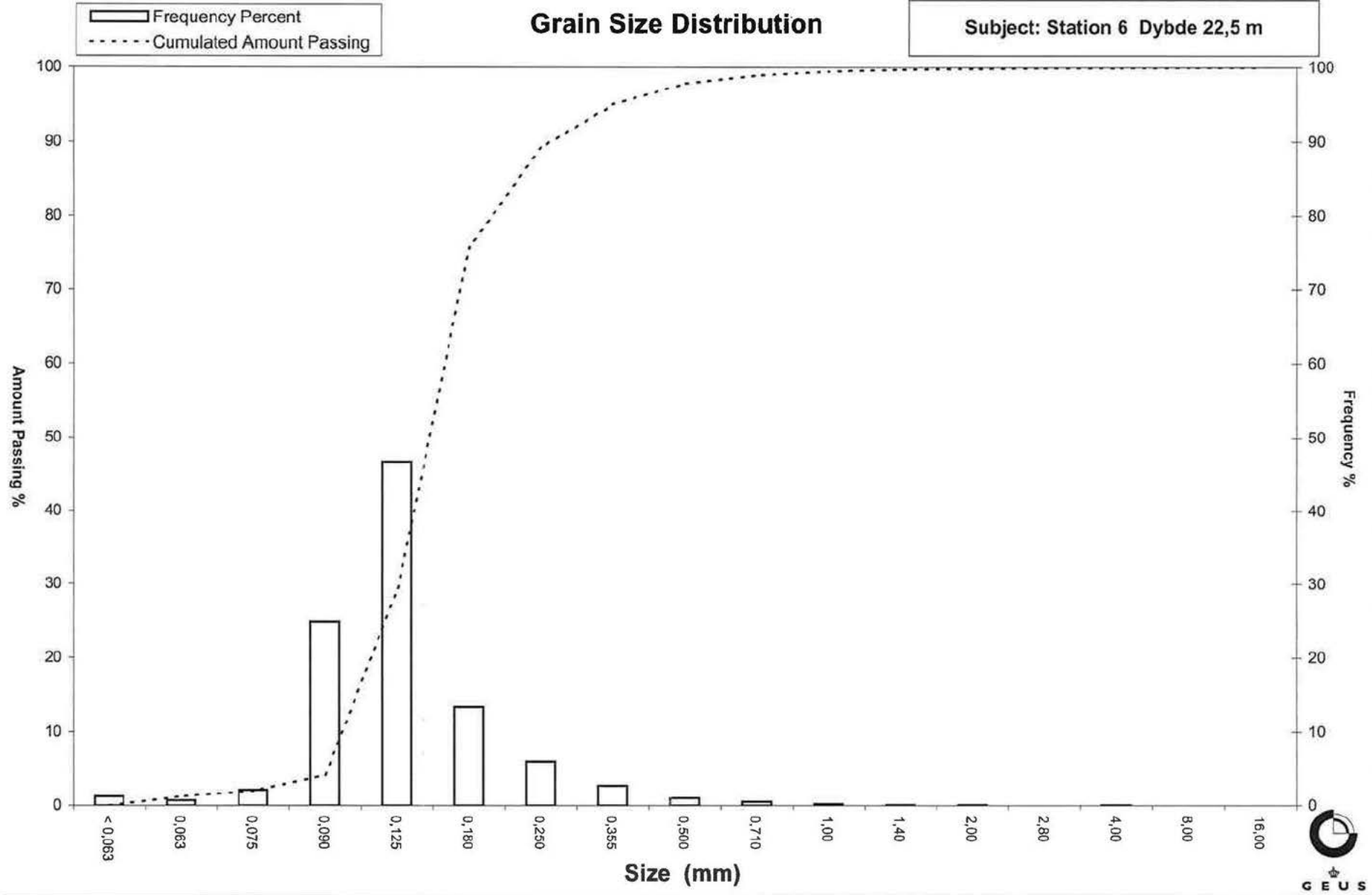
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 6 Dybde 22,5 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 7 Dybde 20,7 m
Lab. Id: 100460
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. <1,4 mm. Mat >2mm =skaller



GEUS

Total Weight 125,94 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,02	0,02	99,98
2,80	-1,49	0,06	0,05	99,94
2,00	-1,00	0,05	0,04	99,90
1,40	-0,49	0,11	0,09	99,81
1,00	0,00	0,17	0,13	99,67
0,710	0,49	0,51	0,40	99,27
0,500	1,00	1,11	0,88	98,39
0,355	1,49	3,55	2,82	95,57
0,250	2,00	8,58	6,81	88,76
0,180	2,47	30,13	23,92	64,83
0,125	3,00	65,97	52,38	12,45
0,090	3,47	12,53	9,95	2,50
0,075	3,74	1,14	0,91	1,60
0,063	3,99	0,49	0,39	1,21
< 0,063	> 3,99	1,52	1,21	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	1,21
Sand, fine (0,063 mm - 0,200 mm):	70,46
Sand, medium (0,2 mm - 0,6 mm):	27,14
Sand, coarse (0,6 mm - 2 mm):	1,09
Gravel (> 2 mm):	0,10
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,35	1,53
16%	84%	0,24	2,08
25%	75%	0,21	2,25
40%	60%	0,17	2,52
Median 50%	50%	0,16	2,60
75%	25%	0,14	2,86
84%	16%	0,13	2,96
90%	10%	0,12	3,10
95%	5%	0,10	3,34

Moments Statistics

Mean	2,55
Sorting	0,49
Skewness	-0,19
Kurtosis	1,23
Uniformity Coefficient	1,50

The analysis is executed according to DS405.9 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

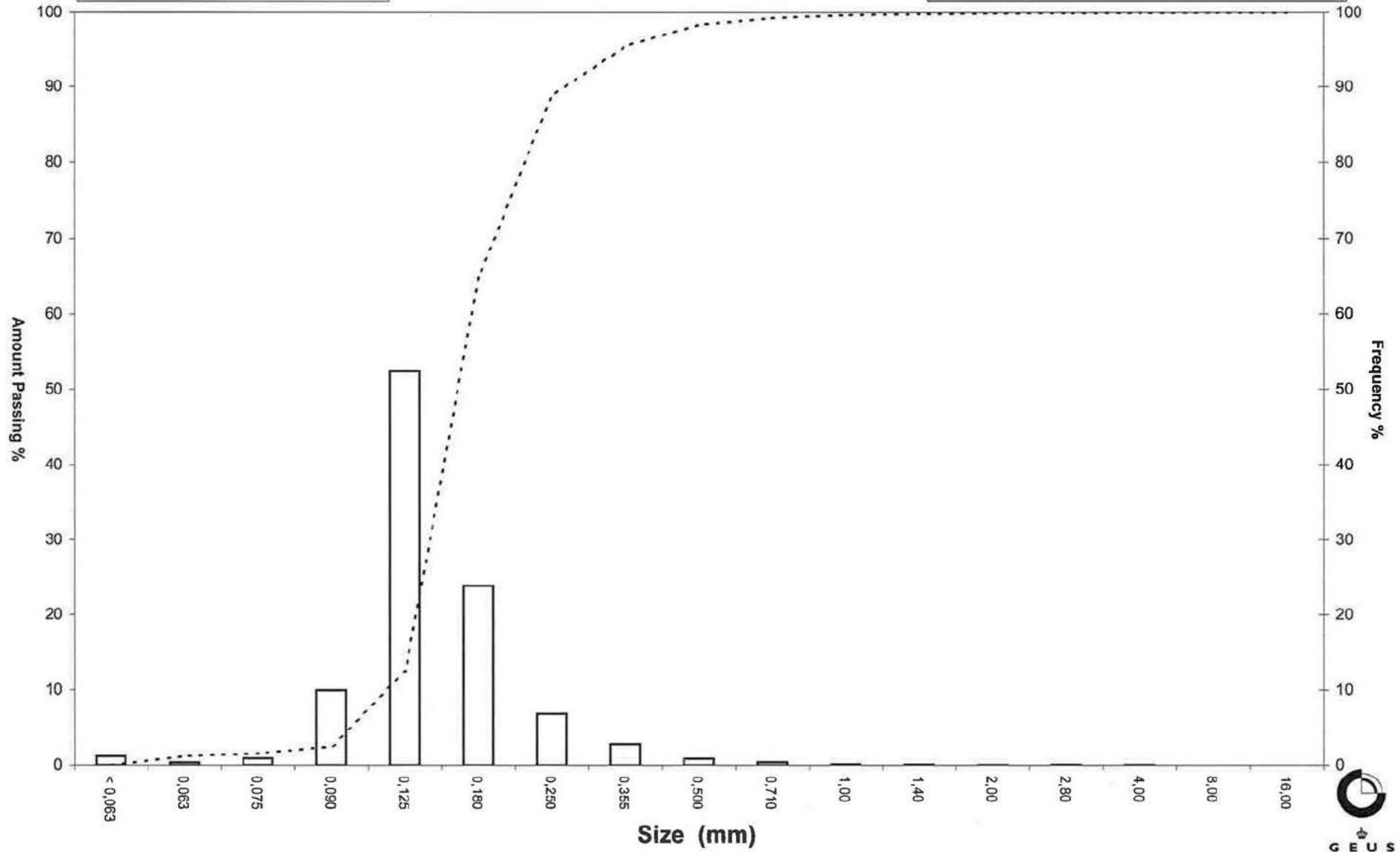
Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 7 Dybde 20,7 m

Frequency Percent
Cumulated Amount Passing



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 8 Dybde 18,6 m
Lab. Id: 100461
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. <1,4 mm.



Total Weight 103,4 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,00	0,00	100,00
2,80	-1,49	0,00	0,00	100,00
2,00	-1,00	0,04	0,04	99,96
1,40	-0,49	0,02	0,02	99,94
1,00	0,00	0,06	0,06	99,88
0,710	0,49	0,06	0,06	99,83
0,500	1,00	0,14	0,14	99,69
0,355	1,49	0,26	0,25	99,44
0,250	2,00	0,90	0,87	98,57
0,180	2,47	6,01	5,81	92,76
0,125	3,00	45,97	44,46	48,30
0,090	3,47	43,75	42,31	5,99
0,075	3,74	3,52	3,40	2,58
0,063	3,99	1,26	1,22	1,36
< 0,063	> 3,99	1,41	1,36	0,00

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	1,36
Sand, fine (0,063 mm - 0,200 mm):	93,05
Sand, medium (0,2 mm - 0,6 mm):	5,34
Sand, coarse (0,6 mm - 2 mm):	0,21
Gravel (> 2 mm):	0,04
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,21	2,27
16%	84%	0,17	2,56
25%	75%	0,16	2,66
40%	60%	0,14	2,84
Median 50%	50%	0,13	2,98
75%	25%	0,11	3,24
84%	16%	0,10	3,35
90%	10%	0,09	3,42
95%	5%	0,09	3,55

Moments Statistics

Mean	2,96
Sorting	0,39
Skewness	-0,08
Kurtosis	0,90
Uniformity Coefficient	1,49

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

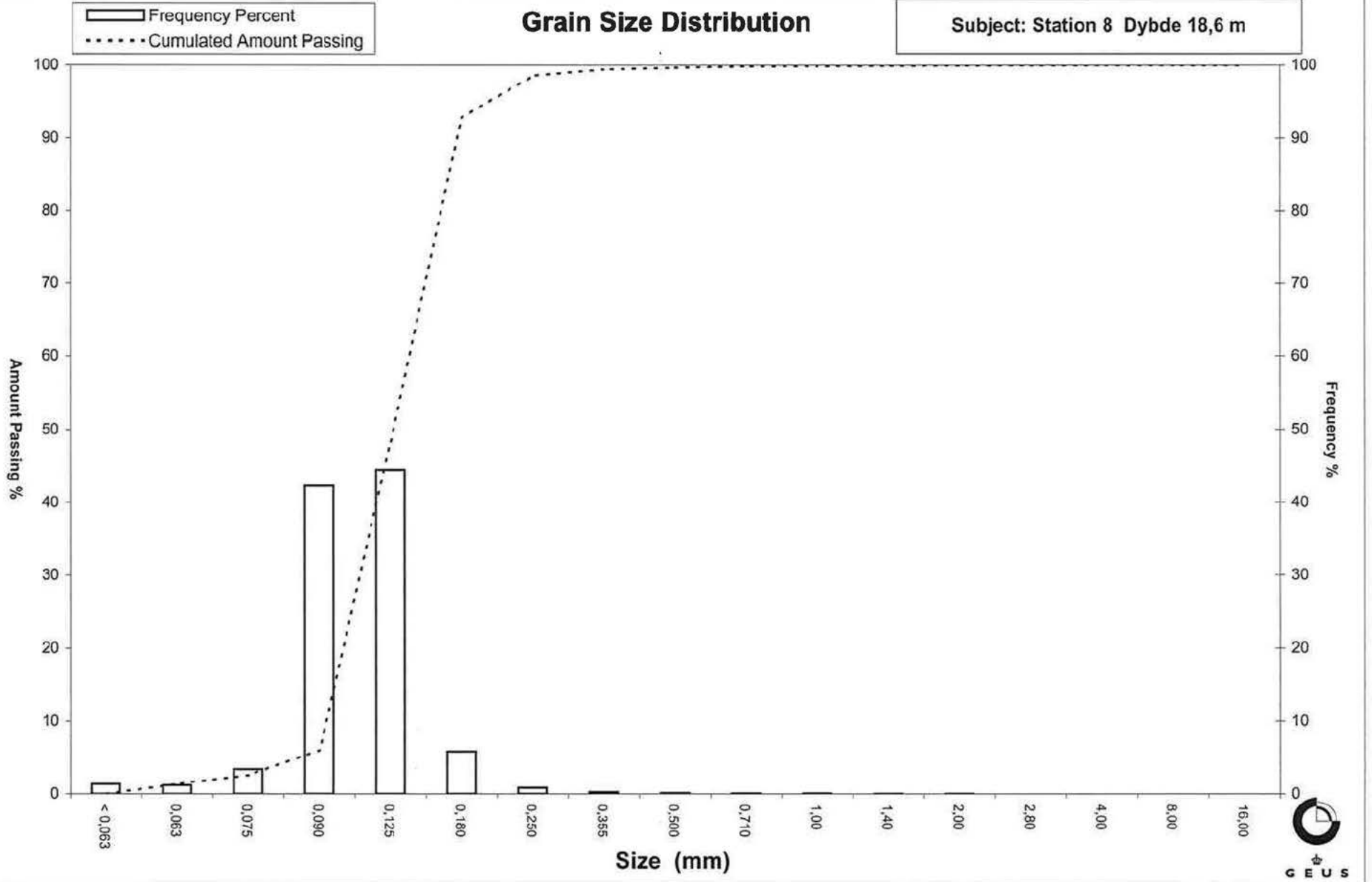
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 8 Dybde 18,6 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 9 Dybde 17 m
Lab. Id: 100462
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. <1,4 mm. Mat >1,4mm =skaller



Total Weight 144,94 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,08	0,06	99,94
2,80	-1,49	0,06	0,04	99,90
2,00	-1,00	0,09	0,06	99,84
1,40	-0,49	0,13	0,09	99,75
1,00	0,00	0,30	0,21	99,54
0,710	0,49	0,49	0,34	99,21
0,500	1,00	1,06	0,73	98,48
0,355	1,49	2,44	1,68	96,79
0,250	2,00	5,28	3,64	93,15
0,180	2,47	14,66	10,11	83,03
0,125	3,00	46,48	32,07	50,97
0,090	3,47	59,71	41,20	9,77
0,075	3,74	4,26	2,94	6,83
0,063	3,99	1,88	1,30	5,53
< 0,063	> 3,99	8,02	5,53	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	5,53
Sand, fine (0,063 mm - 0,200 mm):	80,39
Sand, medium (0,2 mm - 0,6 mm):	12,90
Sand, coarse (0,6 mm - 2 mm):	1,02
Gravel (> 2 mm):	0,16
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,30	1,72
16%	84%	0,19	2,42
25%	75%	0,17	2,59
40%	60%	0,14	2,83
Median 50%	50%	0,12	3,01
75%	25%	0,10	3,28
84%	16%	0,10	3,39
90%	10%	0,09	3,47
95%	5%	-----	-----

Moments Statistics

Mean	2,94
Sorting	-----
Skewness	-----
Kurtosis	-----
Uniformity Coefficient	1,56

The analysis is executed according to DS405.9 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

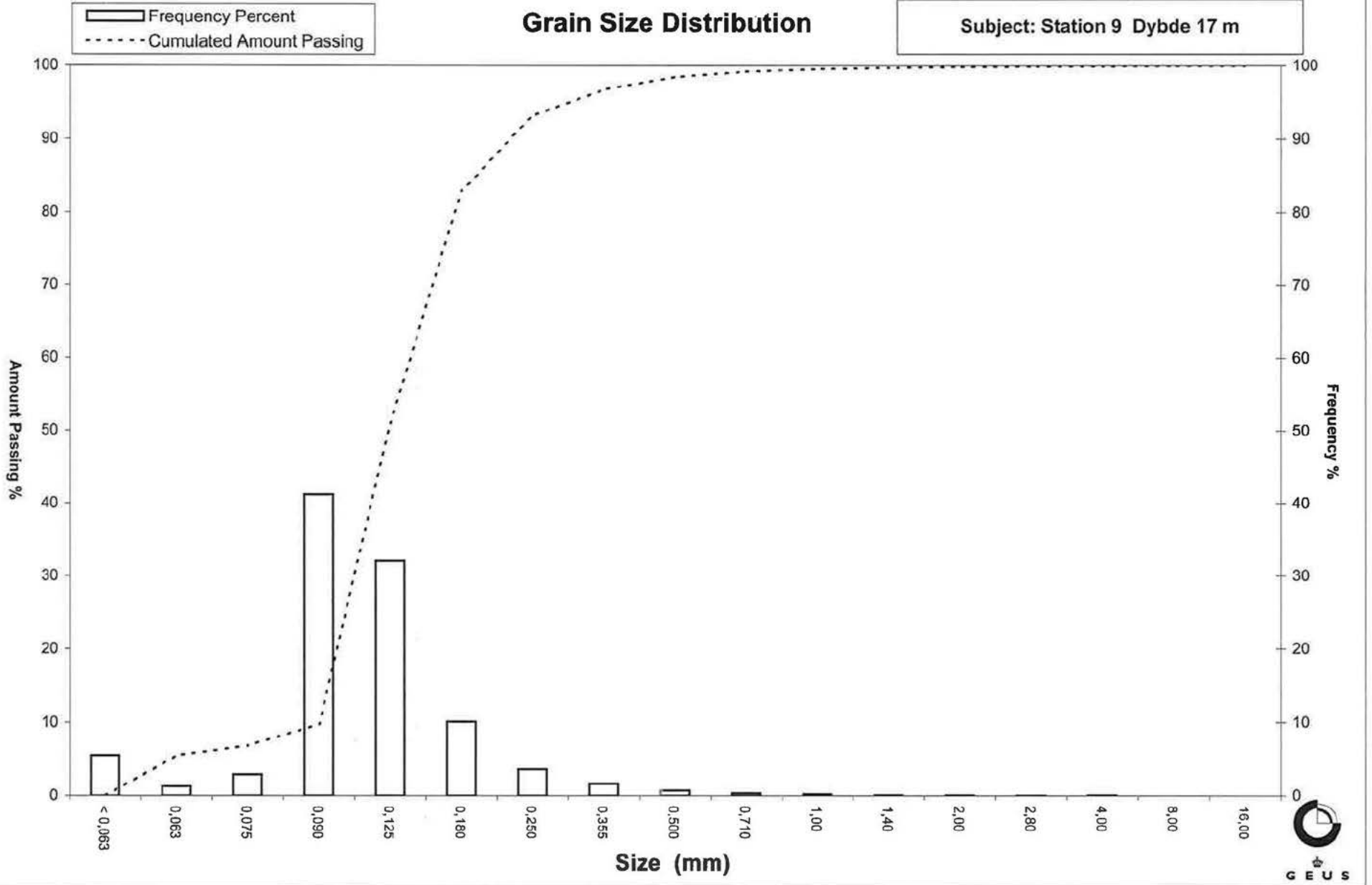
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 9 Dybde 17 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 10 Dybde 15 m
Lab. Id: 100463
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. <1,4 mm. Mat >1,0mm =skaller



Total Weight 136,59 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,04	0,03	99,97
2,80	-1,49	0,08	0,06	99,91
2,00	-1,00	0,02	0,01	99,90
1,40	-0,49	0,05	0,04	99,86
1,00	0,00	0,04	0,03	99,83
0,710	0,49	0,12	0,09	99,74
0,500	1,00	0,51	0,37	99,37
0,355	1,49	2,00	1,46	97,91
0,250	2,00	6,44	4,71	93,19
0,180	2,47	27,36	20,03	73,16
0,125	3,00	70,72	51,78	21,39
0,090	3,47	25,50	18,67	2,72
0,075	3,74	1,53	1,12	1,60
0,063	3,99	0,78	0,57	1,02
< 0,063	> 3,99	1,40	1,02	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

Size Class	Weight %
Silt and clay (< 0,063 mm)	1,02
Sand, fine (0,063 mm - 0,200 mm)	77,86
Sand, medium (0,2 mm - 0,6 mm)	20,66
Sand, coarse (0,6 mm - 2 mm)	0,35
Gravel (> 2 mm)	0,10
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,29	1,78
16%	84%	0,22	2,20
25%	75%	0,19	2,42
40%	60%	0,17	2,59
Median 50%	50%	0,16	2,69
75%	25%	0,13	2,96
84%	16%	0,11	3,12
90%	10%	0,10	3,27
95%	5%	0,09	3,41

Moments Statistics

Mean	2,67
Sorting	0,48
Skewness	-0,08
Kurtosis	1,25
Uniformity Coefficient	1,60

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

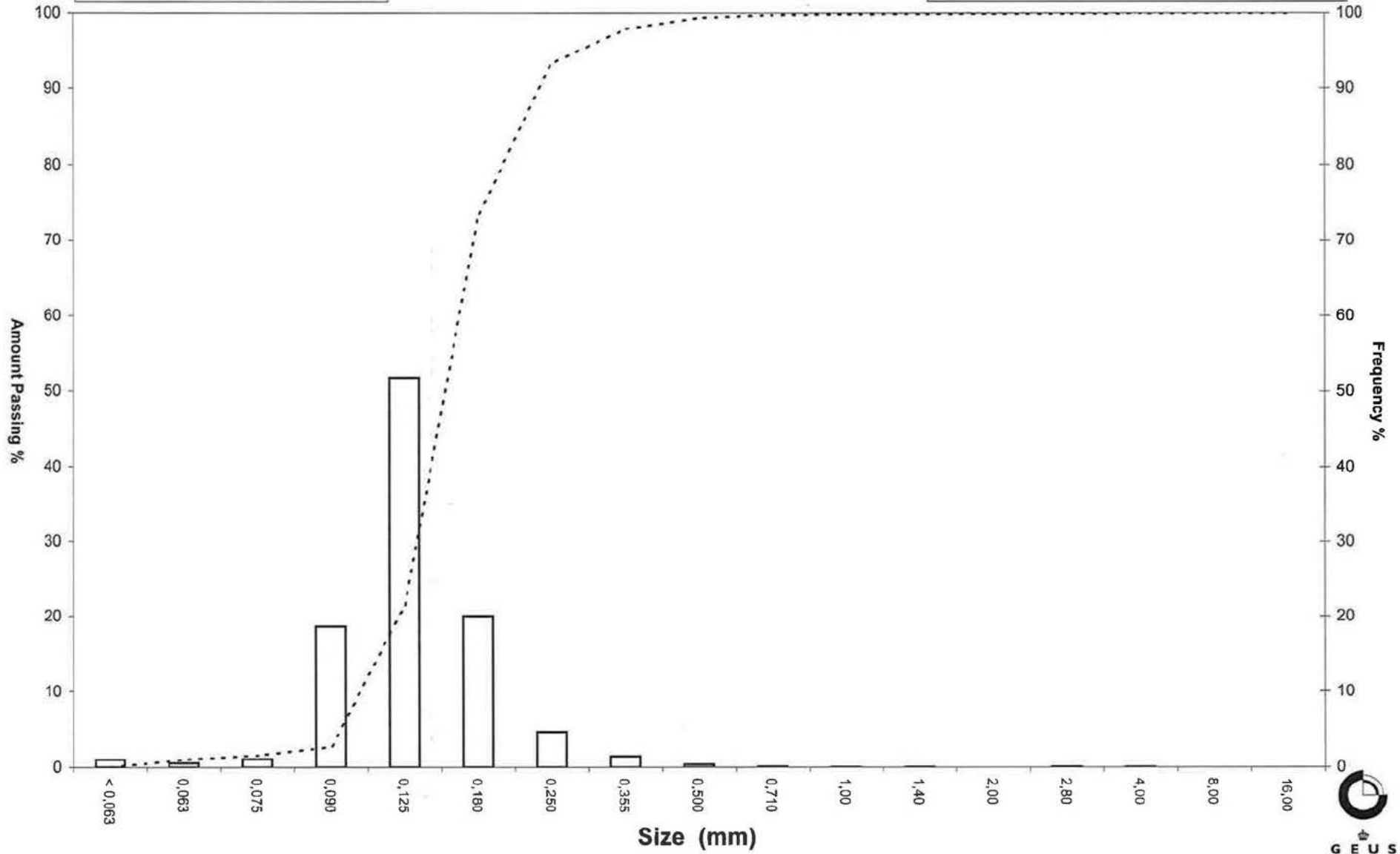
Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 10 Dybde 15 m

Frequency Percent
Cumulated Amount Passing



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 11 Dybde 10,5 m
Lab. Id: 100464
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. <1,4 mm. Mat >2mm =skaller



Total Weight 120,07 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,00	0,00	100,00
2,80	-1,49	0,05	0,04	99,96
2,00	-1,00	0,08	0,07	99,89
1,40	-0,49	0,11	0,09	99,80
1,00	0,00	0,16	0,13	99,67
0,710	0,49	0,28	0,23	99,43
0,500	1,00	0,62	0,52	98,92
0,355	1,49	2,30	1,92	97,00
0,250	2,00	8,12	6,76	90,24
0,180	2,47	17,32	14,42	75,81
0,125	3,00	55,37	46,11	29,70
0,090	3,47	30,35	25,28	4,42
0,075	3,74	3,29	2,74	1,68
0,063	3,99	0,74	0,62	1,07
< 0,063	> 3,99	1,28	1,07	0,00

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	1,07
Sand, fine (0,063 mm - 0,200 mm):	78,87
Sand, medium (0,2 mm - 0,6 mm):	19,23
Sand, coarse (0,6 mm - 2 mm):	0,73
Gravel (> 2 mm):	0,11
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,32	1,63
16%	84%	0,22	2,19
25%	75%	0,18	2,48
40%	60%	0,16	2,63
Median 50%	50%	0,15	2,74
75%	25%	0,12	3,08
84%	16%	0,11	3,24
90%	10%	0,10	3,36
95%	5%	0,09	3,46

Moments Statistics

Mean	2,72
Sorting	0,54
Skewness	-0,14
Kurtosis	1,26
Uniformity Coefficient	1,65

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the ½ phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

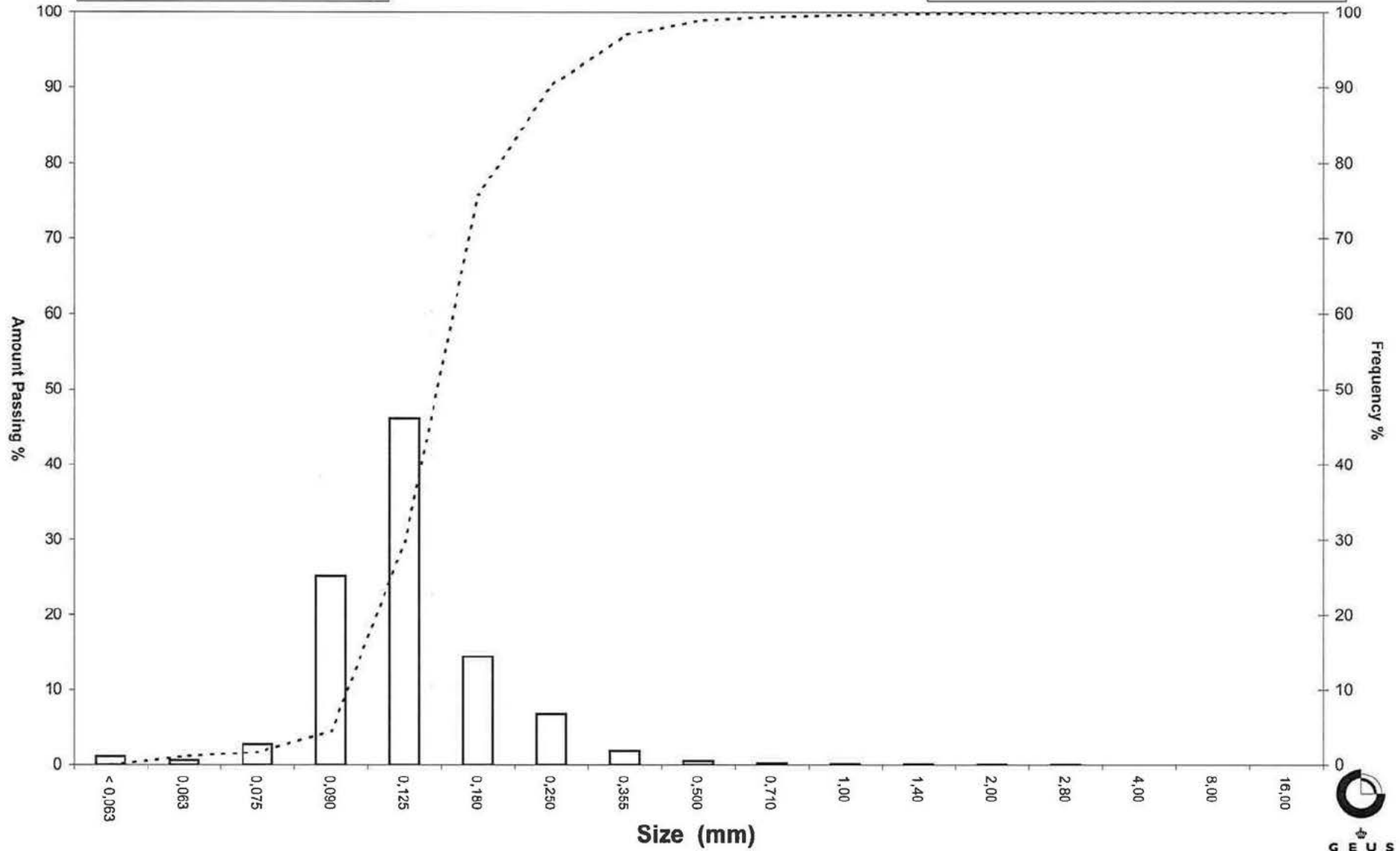
Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 11 Dybde 10,5 m

Frequency Percent
Cumulated Amount Passing



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 12 Dybde 7,5 m
Lab. Id: 100465
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. <1,4 mm. Mat >1mm =skaller



Total Weight 117,1 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,00	0,00	100,00
2,80	-1,49	0,00	0,00	100,00
2,00	-1,00	0,05	0,04	99,96
1,40	-0,49	0,07	0,06	99,90
1,00	0,00	0,08	0,07	99,83
0,710	0,49	0,11	0,09	99,74
0,500	1,00	0,09	0,08	99,66
0,355	1,49	0,12	0,10	99,56
0,250	2,00	0,18	0,15	99,40
0,180	2,47	0,39	0,33	99,07
0,125	3,00	6,01	5,13	93,94
0,090	3,47	103,13	88,07	5,87
0,075	3,74	4,69	4,01	1,86
0,063	3,99	0,83	0,71	1,15
< 0,063	> 3,99	1,35	1,15	0,00

Gravel

Sand

Sieve Analysis

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	1,15
Sand, fine (0,063 mm - 0,200 mm):	98,01
Sand, medium (0,2 mm - 0,6 mm):	0,53
Sand, coarse (0,6 mm - 2 mm):	0,26
Gravel (> 2 mm):	0,04
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,14	2,87
16%	84%	0,12	3,05
25%	75%	0,12	3,09
40%	60%	0,11	3,16
Median 50%	50%	0,11	3,22
75%	25%	0,10	3,36
84%	16%	0,09	3,41
90%	10%	0,09	3,45
95%	5%	0,09	3,53

Moments Statistics

Mean	3,22
Sorting	0,19
Skewness	0,01
Kurtosis	1,00
Uniformity Coefficient	1,22

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

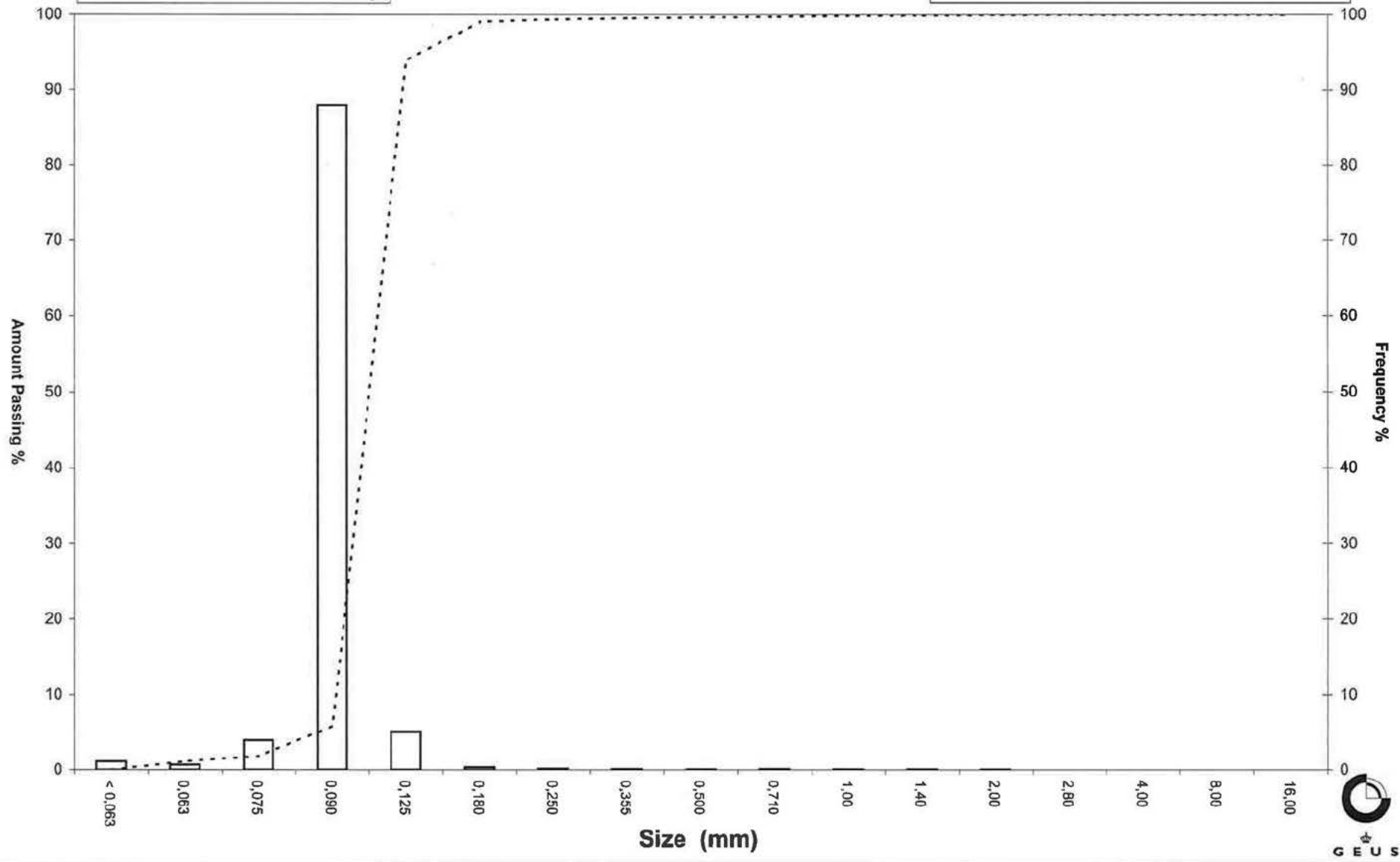
Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 12 Dybde 7,5 m

Frequency Percent
Cumulated Amount Passing



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 13 Dybde 5,5 m
Lab. Id: 100466
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. <1,4 mm. Mat >1,0mm =skaller



GEUS

Total Weight 107,63 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	
16,00	-4,00	0,85	0,79	99,21
8,00	-3,00	0,00	0,00	99,21
4,00	-2,00	0,00	0,00	99,21
2,80	-1,49	0,06	0,06	99,15
2,00	-1,00	0,17	0,16	99,00
1,40	-0,49	0,26	0,24	98,75
1,00	0,00	0,27	0,25	98,50
0,710	0,49	0,25	0,23	98,27
0,500	1,00	0,25	0,23	98,04
0,355	1,49	0,29	0,27	97,77
0,250	2,00	0,54	0,50	97,27
0,180	2,47	1,72	1,60	95,67
0,125	3,00	38,98	36,22	59,45
0,090	3,47	60,76	56,45	3,00
0,075	3,74	2,12	1,97	1,03
0,063	3,99	0,35	0,33	0,71
< 0,063	> 3,99	0,76	0,71	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	0,71
Sand, fine (0,063 mm - 0,200 mm):	95,42
Sand, medium (0,2 mm - 0,6 mm):	2,02
Sand, coarse (0,6 mm - 2 mm):	0,85
Gravel (> 2 mm):	1,00
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,18	2,48
16%	84%	0,16	2,62
25%	75%	0,15	2,75
40%	60%	0,13	2,99
Median 50%	50%	0,12	3,07
75%	25%	0,10	3,27
84%	16%	0,10	3,35
90%	10%	0,09	3,41
95%	5%	0,09	3,45

Moments Statistics

Mean	3,01
Sorting	0,33
Skewness	-0,22
Kurtosis	0,77
Uniformity Coefficient	1,33

The analysis is executed according to DS405.9 DS/EN933-1 extended by sieves to the ½ phi scale.

Size Classes and Percentiles are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

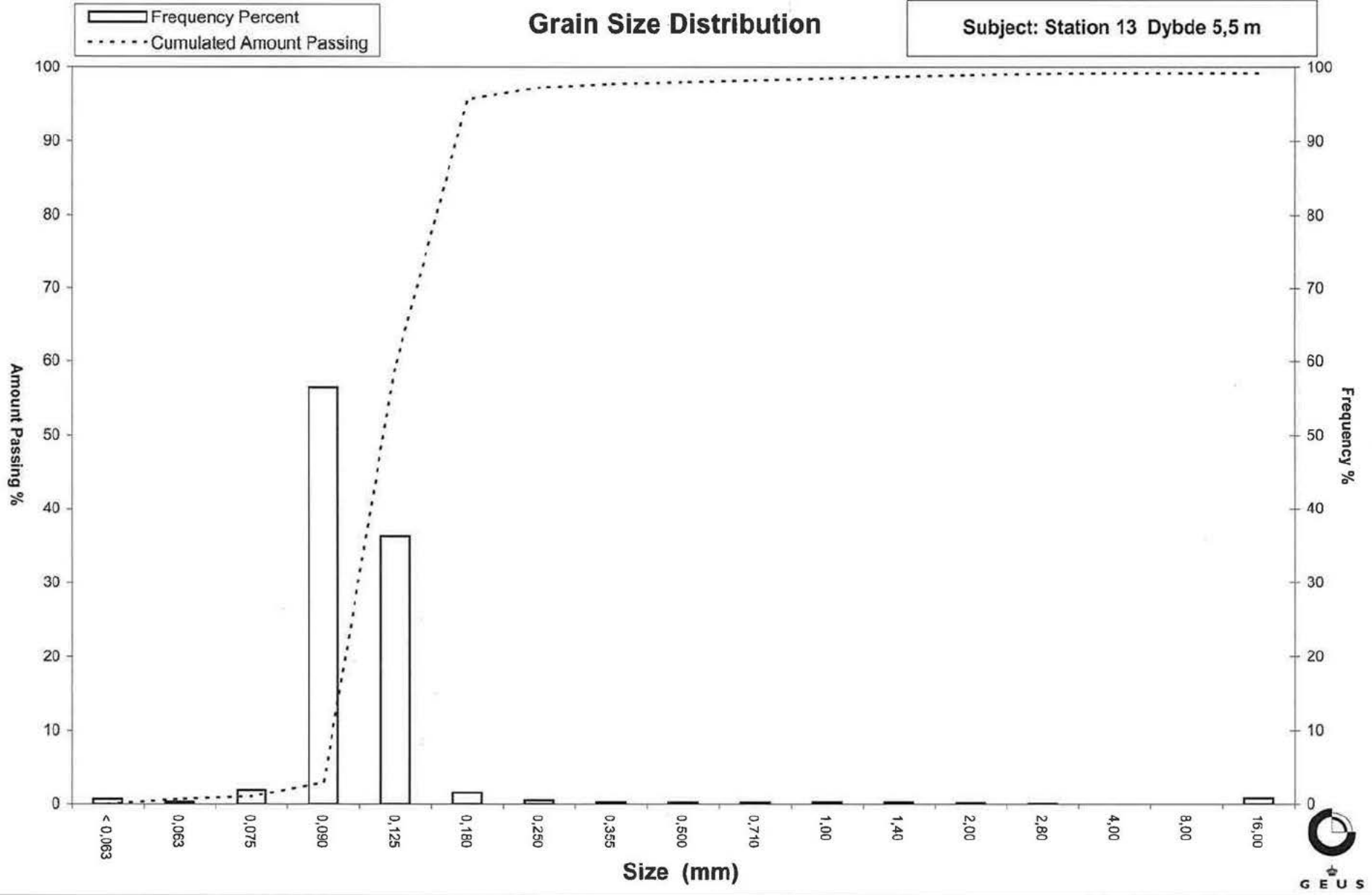
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 13 Dybde 5,5 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 14 Dybde 10,5 m
Lab. Id: 100467
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. <1,4 mm. Mat >1,4mm =skaller



Total Weight 119,39 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,14	0,12	99,88
2,80	-1,49	0,17	0,14	99,74
2,00	-1,00	0,26	0,22	99,52
1,40	-0,49	0,28	0,23	99,29
1,00	0,00	0,45	0,38	98,91
0,710	0,49	0,54	0,45	98,46
0,500	1,00	0,77	0,64	97,81
0,355	1,49	1,27	1,06	96,75
0,250	2,00	2,30	1,93	94,82
0,180	2,47	1,36	1,14	93,68
0,125	3,00	43,80	36,69	57,00
0,090	3,47	54,32	45,50	11,50
0,075	3,74	7,16	6,00	5,50
0,063	3,99	2,45	2,05	3,45
< 0,063	> 3,99	4,12	3,45	0,00

Sieve Analysis

Gravel
Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	3,45
Sand, fine (0,063 mm - 0,200 mm):	90,56
Sand, medium (0,2 mm - 0,6 mm):	4,11
Sand, coarse (0,6 mm - 2 mm):	1,40
Gravel (> 2 mm):	0,48
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,26	1,95
16%	84%	0,17	2,60
25%	75%	0,15	2,72
40%	60%	0,13	2,95
Median 50%	50%	0,12	3,06
75%	25%	0,10	3,32
84%	16%	0,09	3,42
90%	10%	0,09	3,54
95%	5%	0,07	3,79

Moments Statistics

Mean	3,03
Sorting	0,49
Skewness	-0,17
Kurtosis	1,27
Uniformity Coefficient	1,50

The analysis is executed according to DS405.9 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

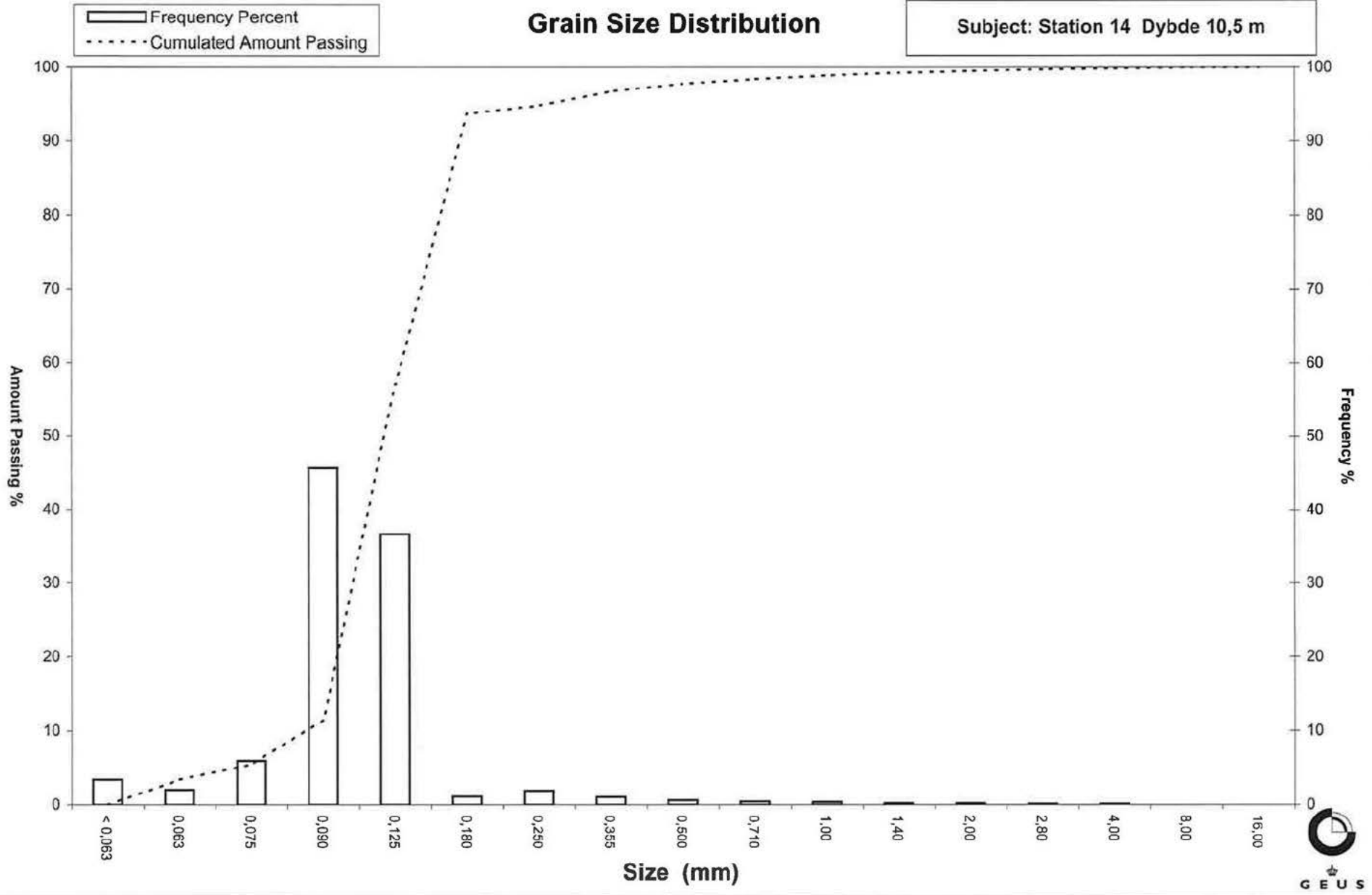
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 14 Dybde 10,5 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 15 Dybde 14,8 m
Lab. Id: 100468
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. <1,4 mm. Mat >0,50mm =skaller



Total Weight 164,77 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,00	0,00	100,00
2,80	-1,49	0,15	0,09	99,91
2,00	-1,00	0,16	0,10	99,81
1,40	-0,49	0,19	0,12	99,70
1,00	0,00	0,37	0,22	99,47
0,710	0,49	0,38	0,23	99,24
0,500	1,00	0,47	0,29	98,96
0,355	1,49	0,81	0,49	98,46
0,250	2,00	2,26	1,37	97,09
0,180	2,47	16,46	9,99	87,10
0,125	3,00	97,91	59,42	27,68
0,090	3,47	34,59	20,99	6,69
0,075	3,74	3,34	2,03	4,66
0,063	3,99	2,06	1,25	3,41
< 0,063	> 3,99	5,62	3,41	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

Size Class	Weight %
Silt and clay (< 0,063 mm)	3,41
Sand, fine (0,063 mm - 0,200 mm)	86,55
Sand, medium (0,2 mm - 0,6 mm)	9,13
Sand, coarse (0,6 mm - 2 mm)	0,72
Gravel (> 2 mm)	0,19
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,24	2,09
16%	84%	0,18	2,50
25%	75%	0,17	2,57
40%	60%	0,15	2,69
Median 50%	50%	0,15	2,78
75%	25%	0,12	3,05
84%	16%	0,11	3,24
90%	10%	0,10	3,39
95%	5%	0,08	3,69

Moments Statistics

Mean	2,84
Sorting	0,43
Skewness	0,19
Kurtosis	1,35
Uniformity Coefficient	1,62

The analysis is executed according to DS405.9 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

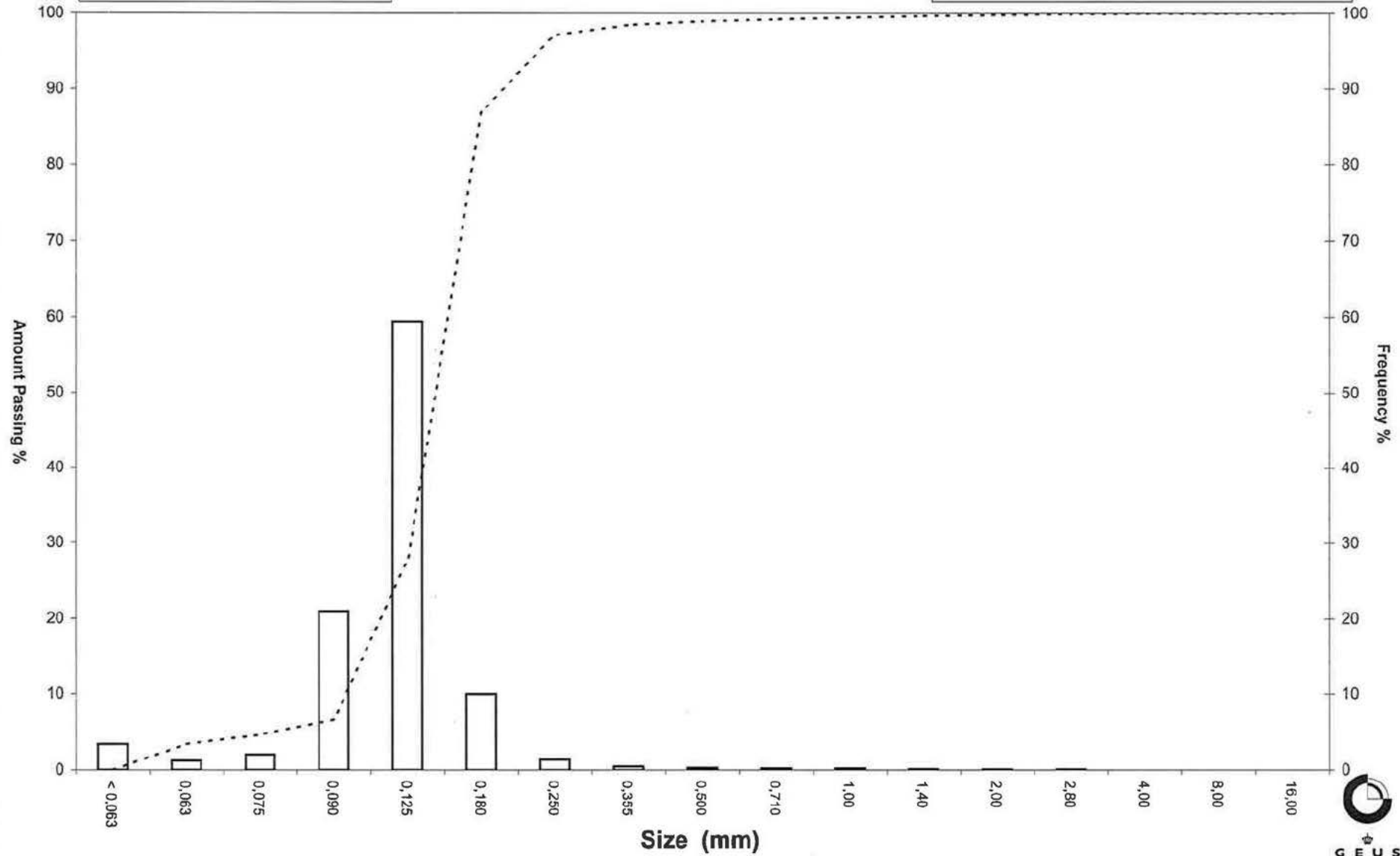
Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 15 Dybde 14,8 m

Frequency Percent
Cumulated Amount Passing



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 16 Dybde 11,7 m
Lab. Id: 100469
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 8 mm



Total Weight 214,49 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	1,11	0,52	99,48
2,80	-1,49	0,66	0,31	99,17
2,00	-1,00	0,24	0,11	99,06
1,40	-0,49	0,06	0,03	99,03
1,00	0,00	0,29	0,14	98,90
0,710	0,49	0,54	0,25	98,65
0,500	1,00	1,56	0,73	97,92
0,355	1,49	4,12	1,92	96,00
0,250	2,00	10,85	5,06	90,94
0,180	2,47	32,19	15,01	75,93
0,125	3,00	91,46	42,64	33,29
0,090	3,47	65,08	30,34	2,95
0,075	3,74	4,55	2,12	0,83
0,063	3,99	0,36	0,17	0,66
< 0,063	> 3,99	1,43	0,66	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	0,66
Sand, fine (0,063 mm - 0,200 mm):	79,56
Sand, medium (0,2 mm - 0,6 mm):	18,05
Sand, coarse (0,6 mm - 2 mm):	0,80
Gravel (> 2 mm):	0,94
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,33	1,58
16%	84%	0,22	2,20
25%	75%	0,18	2,48
40%	60%	0,16	2,65
Median 50%	50%	0,15	2,77
75%	25%	0,12	3,11
84%	16%	0,11	3,25
90%	10%	0,10	3,35
95%	5%	0,09	3,44

Moments Statistics

Mean	2,74
Sorting	0,54
Skewness	-0,18
Kurtosis	1,20
Uniformity Coefficient	1,62

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the ½ phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

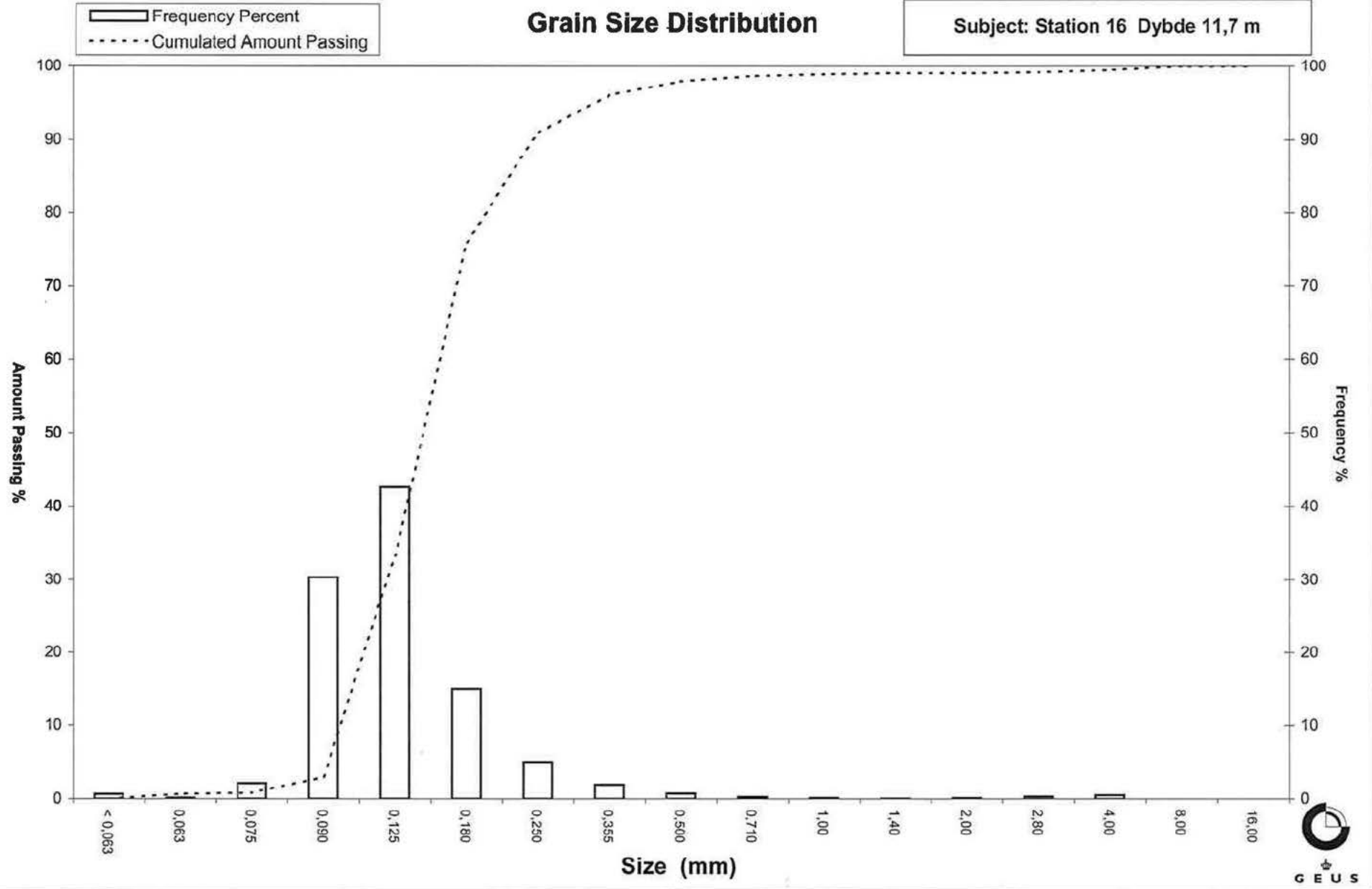
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 16 Dybde 11,7 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 17 Dybde 8 m
Lab. Id: 100470
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 8 mm



Total Weight 267,55 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	2,50	0,93	99,07
4,00	-2,00	1,28	0,48	98,59
2,80	-1,49	2,55	0,95	97,63
2,00	-1,00	1,53	0,57	97,06
1,40	-0,49	3,80	1,42	95,64
1,00	0,00	10,29	3,85	91,80
0,710	0,49	29,48	11,02	80,78
0,500	1,00	82,32	30,77	50,01
0,355	1,49	103,18	38,56	11,45
0,250	2,00	25,63	9,58	1,87
0,180	2,47	1,45	0,54	1,33
0,125	3,00	0,46	0,17	1,16
0,090	3,47	0,26	0,10	1,06
0,075	3,74	0,13	0,05	1,01
0,063	3,99	0,04	0,01	1,00
< 0,063	> 3,99	2,67	1,00	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

Size Class	Weight %
Silt and clay (< 0,063 mm)	1,00
Sand, fine (0,063 mm - 0,200 mm)	0,48
Sand, medium (0,2 mm - 0,6 mm)	63,18
Sand, coarse (0,6 mm - 2 mm)	32,40
Gravel (> 2 mm)	2,94
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	1,33	-0,41
16%	84%	0,79	0,33
25%	75%	0,67	0,58
40%	60%	0,57	0,82
Median 50%	50%	0,50	1,00
75%	25%	0,41	1,30
84%	16%	0,37	1,43
90%	10%	0,34	1,56
95%	5%	0,28	1,81

Moments Statistics

Mean	0,92
Sorting	0,61
Skewness	-0,25
Kurtosis	1,26
Uniformity Coefficient	1,68

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the ½ phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

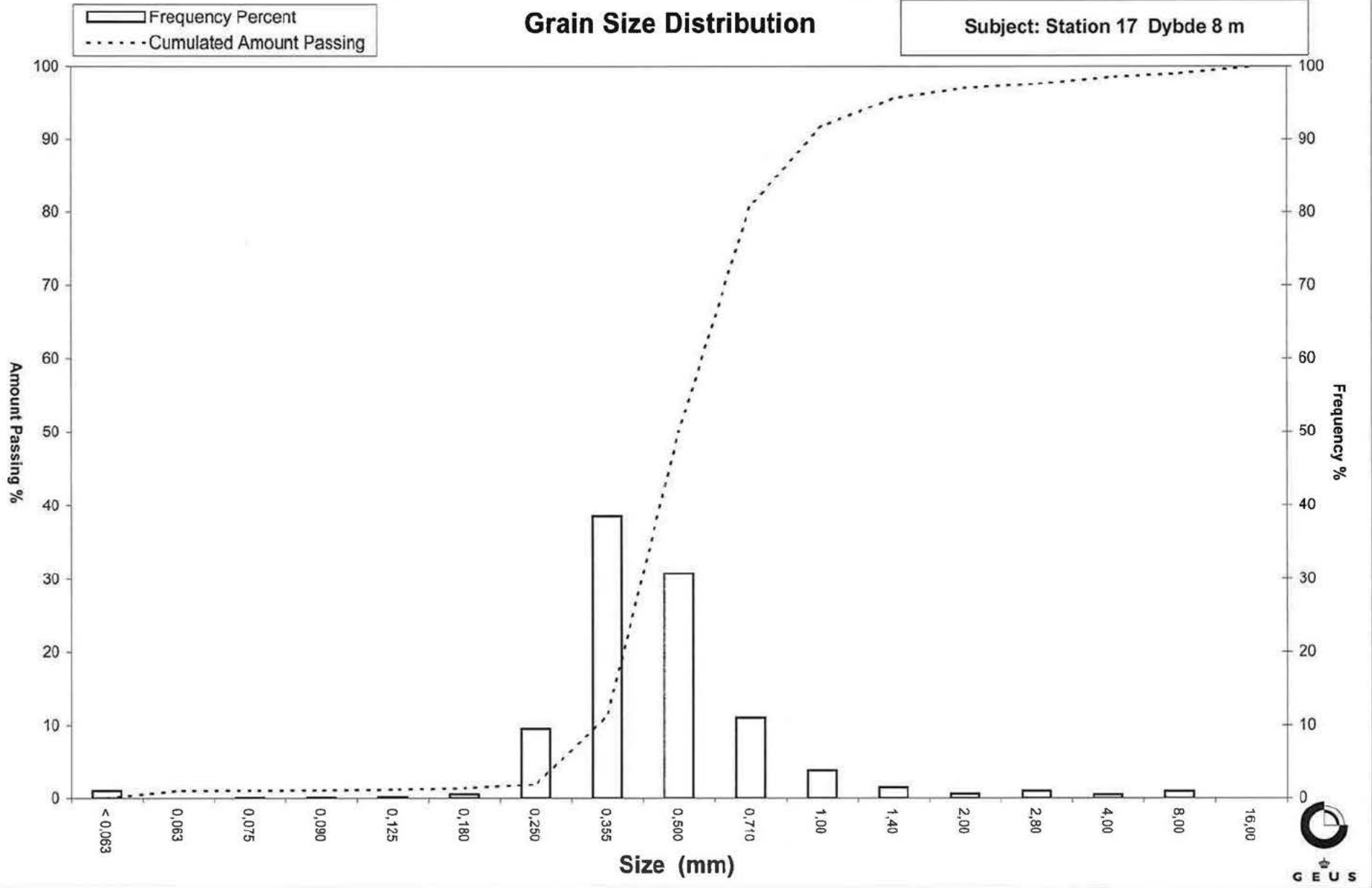
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 17 Dybde 8 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 18 Dybde 20 m
Lab. Id: 100471
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 8 mm



Total Weight 527,86 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	3,15	0,60	99,40
4,00	-2,00	4,82	0,91	98,49
2,80	-1,49	3,84	0,73	97,76
2,00	-1,00	3,72	0,70	97,06
1,40	-0,49	5,91	1,12	95,94
1,00	0,00	9,52	1,80	94,13
0,710	0,49	25,36	4,80	89,33
0,500	1,00	81,81	15,50	73,83
0,355	1,49	83,30	15,78	58,05
0,250	2,00	78,70	14,91	43,14
0,180	2,47	135,15	25,60	17,54
0,125	3,00	75,77	14,35	3,18
0,090	3,47	8,84	1,68	1,51
0,075	3,74	1,49	0,28	1,23
0,063	3,99	0,68	0,13	1,10
< 0,063	> 3,99	5,79	1,10	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

Size Class	Weight %
Silt and clay (< 0,063 mm)	1,10
Sand, fine (0,063 mm - 0,200 mm)	23,75
Sand, medium (0,2 mm - 0,6 mm)	56,36
Sand, coarse (0,6 mm - 2 mm)	15,85
Gravel (> 2 mm)	2,94
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	1,19	-0,25
16%	84%	0,64	0,65
25%	75%	0,52	0,95
40%	60%	0,37	1,42
Median 50%	50%	0,30	1,75
75%	25%	0,20	2,32
84%	16%	0,17	2,52
90%	10%	0,15	2,73
95%	5%	0,13	2,92

Moments Statistics

Mean	1,64
Sorting	0,95
Skewness	-0,21
Kurtosis	0,95
Uniformity Coefficient	2,47

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

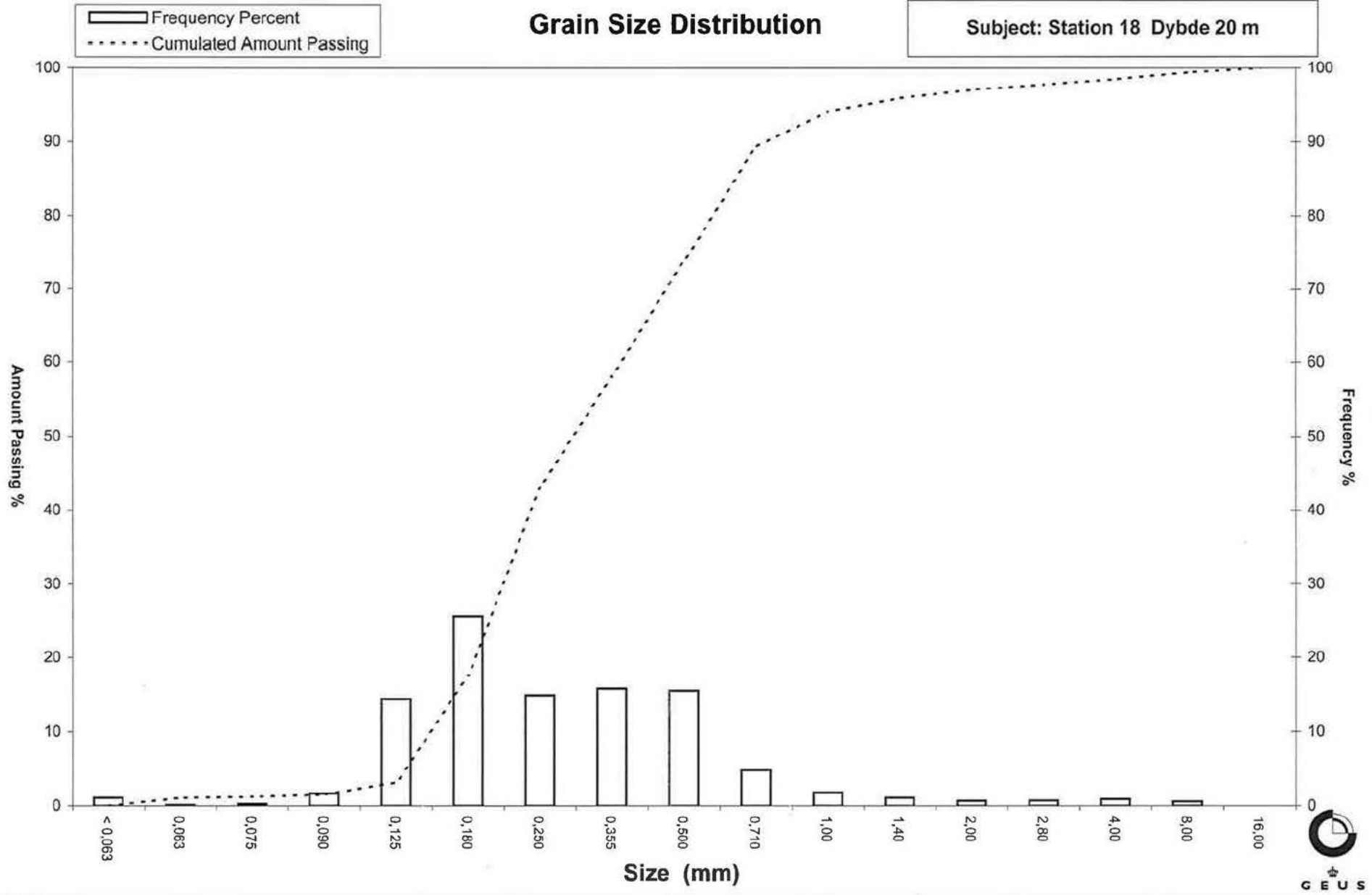
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 18 Dybde 20 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 19 Dybde 20,2 m
Lab. Id: 100472
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 8 mm



GEUS

Total Weight 305,43 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	2,18	0,71	99,29
4,00	-2,00	9,66	3,16	96,12
2,80	-1,49	6,71	2,20	93,93
2,00	-1,00	8,09	2,65	91,28
1,40	-0,49	11,92	3,90	87,38
1,00	0,00	28,93	9,47	77,90
0,710	0,49	51,24	16,78	61,13
0,500	1,00	85,58	28,02	33,11
0,355	1,49	59,87	19,60	13,51
0,250	2,00	28,43	9,31	4,20
0,180	2,47	7,49	2,45	1,75
0,125	3,00	2,64	0,86	0,89
0,090	3,47	1,00	0,33	0,56
0,075	3,74	0,28	0,09	0,47
0,063	3,99	0,11	0,04	0,43
< 0,063	> 3,99	1,31	0,43	0,00

Gravel

Sand

Sieve Analysis

Size Classes (DGF-Bulletin 1 1988)

Size Class	Weight %
Silt and clay (< 0,063 mm)	0,43
Sand, fine (0,063 mm - 0,200 mm)	2,02
Sand, medium (0,2 mm - 0,6 mm)	44,00
Sand, coarse (0,6 mm - 2 mm)	44,83
Gravel (> 2 mm)	8,72
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	3,39	-1,76
16%	84%	1,26	-0,33
25%	75%	0,95	0,07
40%	60%	0,70	0,51
Median 50%	50%	0,63	0,67
75%	25%	0,44	1,18
84%	16%	0,37	1,42
90%	10%	0,32	1,66
95%	5%	0,26	1,95

Moments Statistics

Mean	0,59
Sorting	1,00
Skewness	-0,23
Kurtosis	1,37
Uniformity Coefficient	2,22

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

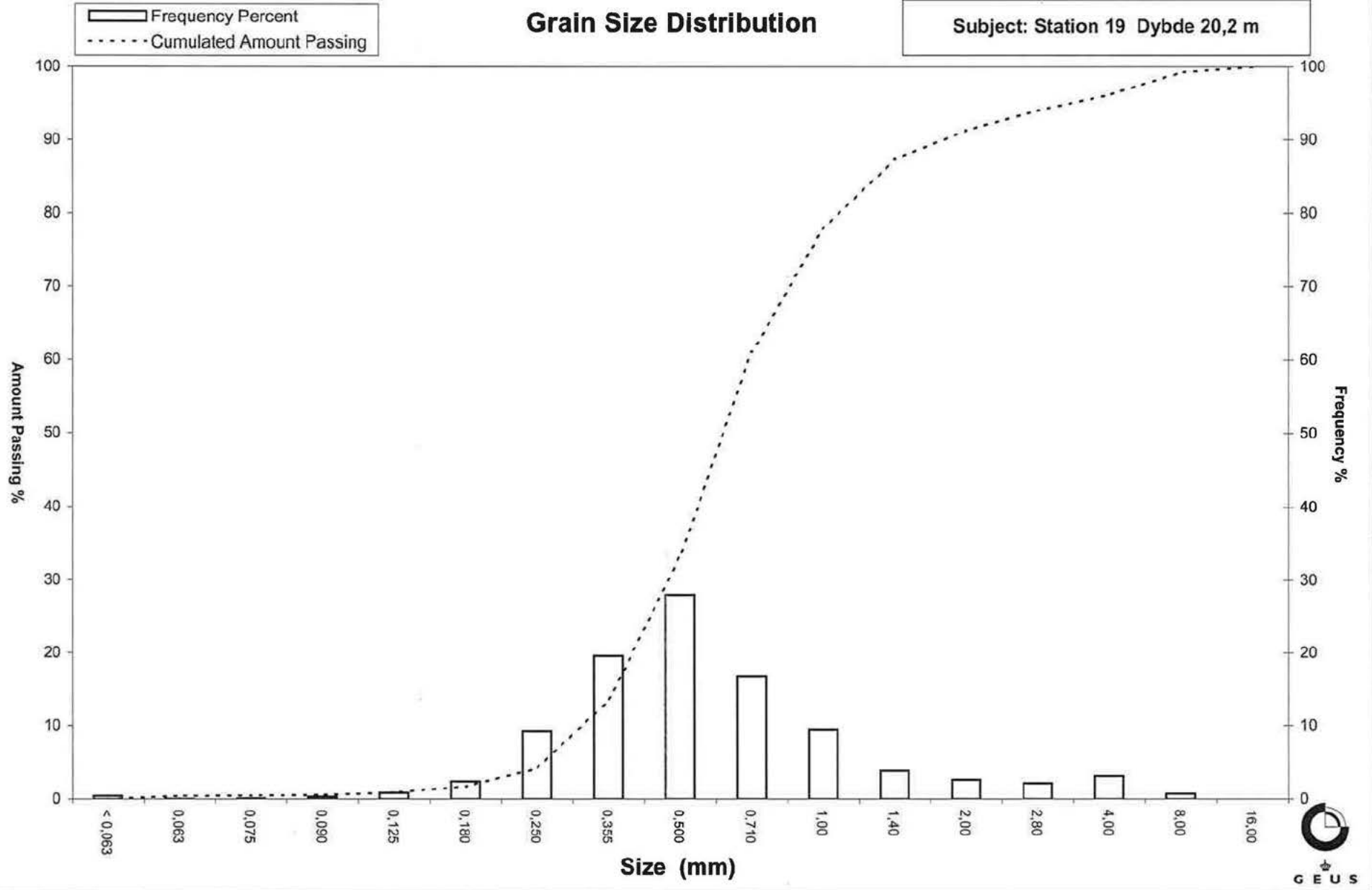
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 19 Dybde 20,2 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 20 Dybde 16 m
Lab. Id: 100473
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 8 mm



Total Weight 315,72 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	5,37	1,70	98,30
4,00	-2,00	1,47	0,47	97,83
2,80	-1,49	3,24	1,03	96,81
2,00	-1,00	16,78	5,31	91,49
1,40	-0,49	24,49	7,76	83,73
1,00	0,00	29,21	9,25	74,48
0,710	0,49	61,74	19,56	54,93
0,500	1,00	79,53	25,19	29,74
0,355	1,49	48,27	15,29	14,45
0,250	2,00	23,75	7,52	6,93
0,180	2,47	8,02	2,54	4,39
0,125	3,00	8,18	2,59	1,80
0,090	3,47	3,50	1,11	0,69
0,075	3,74	0,41	0,13	0,56
0,063	3,99	0,16	0,05	0,51
< 0,063	> 3,99	1,60	0,51	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	0,51
Sand, fine (0,063 mm - 0,200 mm):	4,60
Sand, medium (0,2 mm - 0,6 mm):	36,62
Sand, coarse (0,6 mm - 2 mm):	49,76
Gravel (> 2 mm):	8,51
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	2,53	-1,34
16%	84%	1,42	-0,51
25%	75%	1,02	-0,03
40%	60%	0,79	0,35
Median 50%	50%	0,67	0,58
75%	25%	0,46	1,14
84%	16%	0,37	1,44
90%	10%	0,29	1,77
95%	5%	0,20	2,34

Moments Statistics

Mean	0,50
Sorting	1,04
Skewness	-0,08
Kurtosis	1,29
Uniformity Coefficient	2,68

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

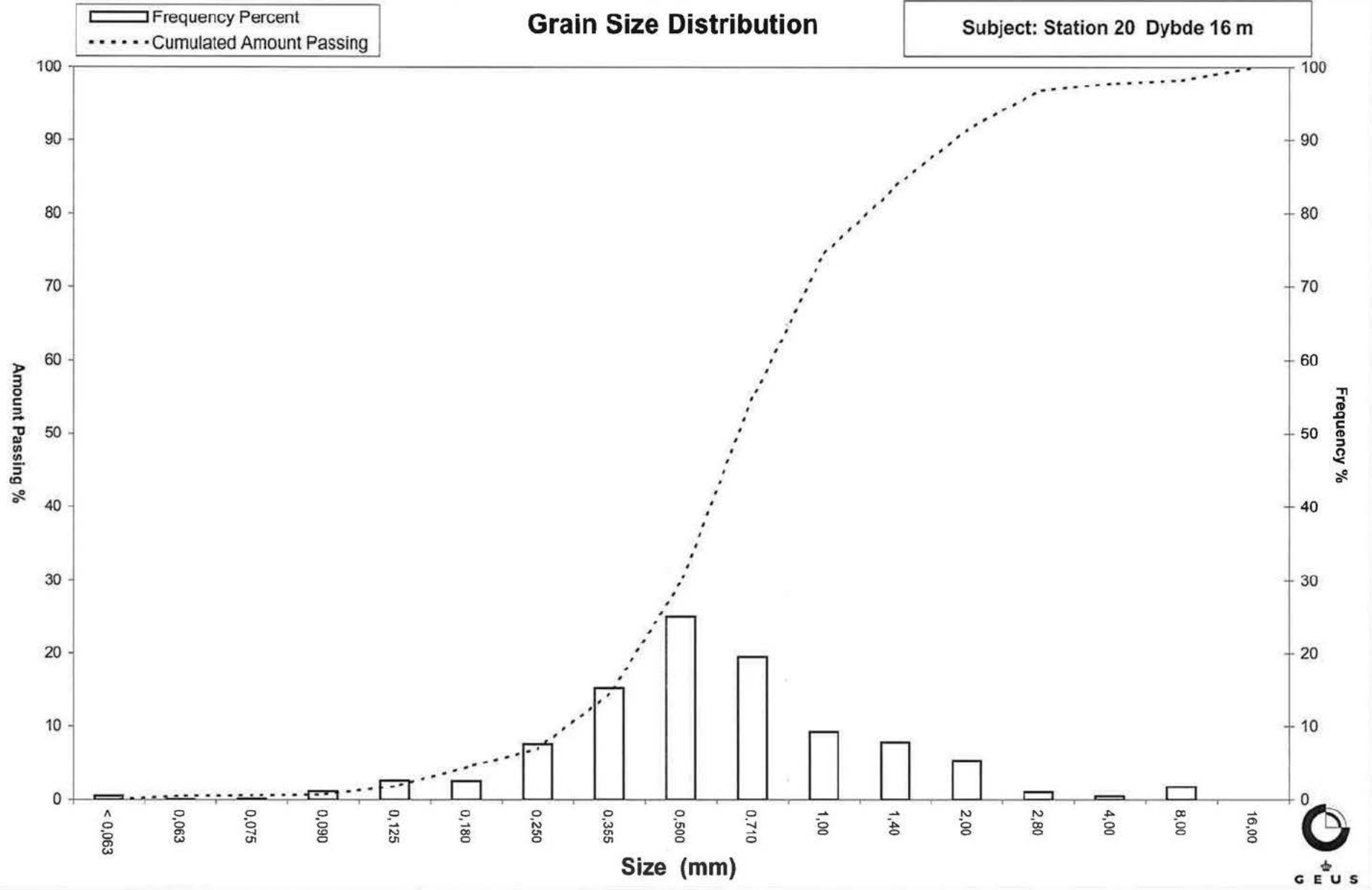
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 20 Dybde 16 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 21 Dybde 9 m
Lab. Id: 100474
Date: Januar 2011
Executed: I. Nørgaard
Remarks:



GEUS

Total Weight 151,27 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,00	0,00	100,00
2,80	-1,49	0,00	0,00	100,00
2,00	-1,00	0,00	0,00	100,00
1,40	-0,49	0,00	0,00	100,00
1,00	0,00	0,02	0,01	99,99
0,710	0,49	0,07	0,05	99,94
0,500	1,00	1,73	1,14	98,80
0,355	1,49	31,48	20,81	77,99
0,250	2,00	66,10	43,70	34,29
0,180	2,47	43,40	28,69	5,60
0,125	3,00	6,07	4,01	1,59
0,090	3,47	0,52	0,34	1,24
0,075	3,74	0,03	0,02	1,22
0,063	3,99	0,08	0,05	1,17
< 0,063	> 3,99	1,77	1,17	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	1,17
Sand, fine (0,063 mm - 0,200 mm):	12,63
Sand, medium (0,2 mm - 0,6 mm):	85,54
Sand, coarse (0,6 mm - 2 mm):	0,66
Gravel (> 2 mm):	0,00
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,47	1,08
16%	84%	0,40	1,33
25%	75%	0,35	1,52
40%	60%	0,31	1,68
Median 50%	50%	0,29	1,80
75%	25%	0,23	2,14
84%	16%	0,21	2,28
90%	10%	0,19	2,39
95%	5%	0,17	2,54

Moments Statistics

Mean	1,80
Sorting	0,46
Skewness	0,02
Kurtosis	0,98
Uniformity Coefficient	1,63

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

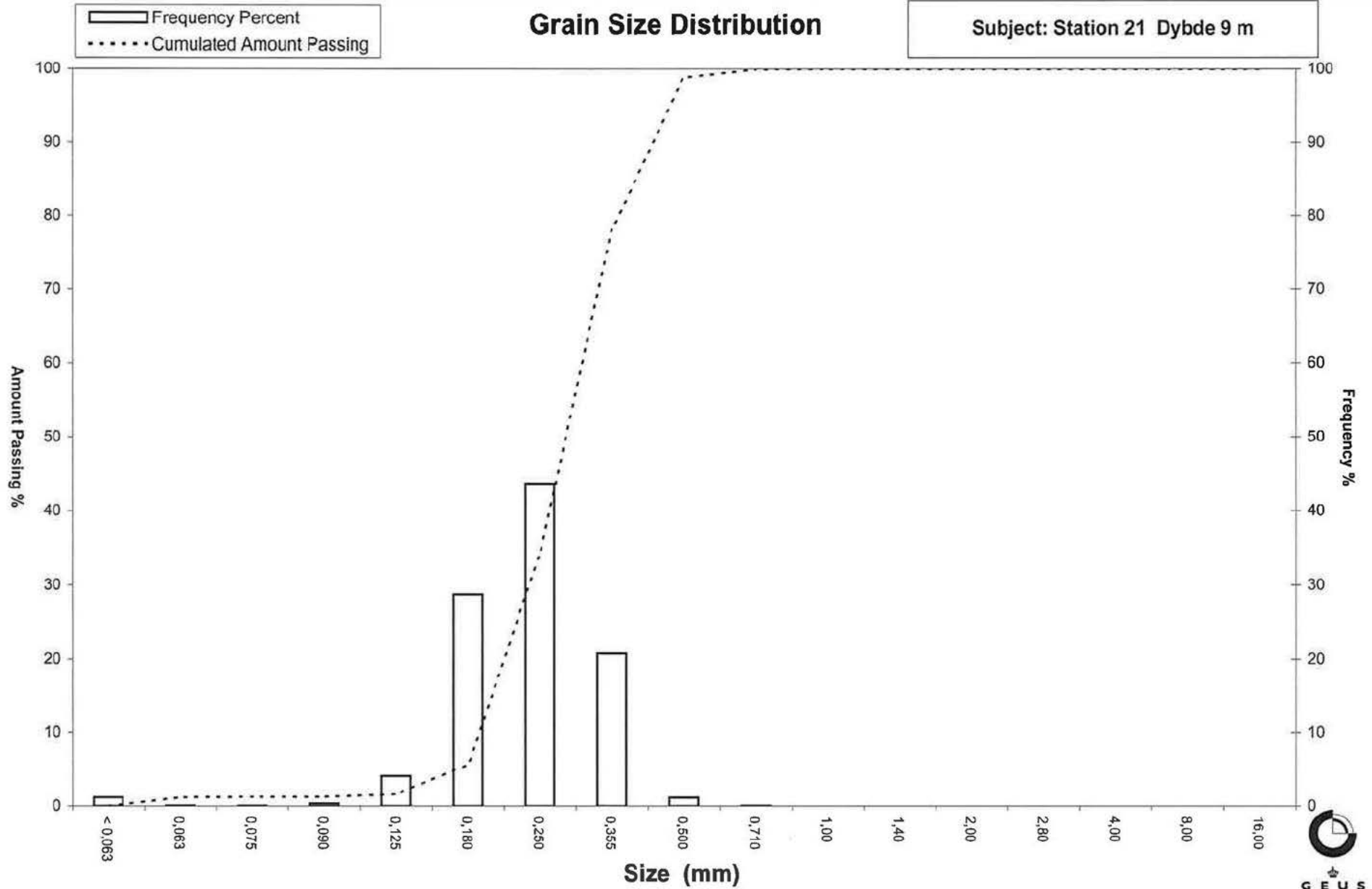
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 21 Dybde 9 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 22 Dybde 27 m
Lab. Id: 100475
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 16 mm



Total Weight 756,44 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	
16,00	-4,00	87,45	11,56	88,44
8,00	-3,00	106,56	14,09	74,35
4,00	-2,00	17,60	2,33	72,03
2,80	-1,49	7,13	0,94	71,08
2,00	-1,00	5,56	0,74	70,35
1,40	-0,49	4,30	0,57	69,78
1,00	0,00	5,29	0,70	69,08
0,710	0,49	5,50	0,73	68,35
0,500	1,00	7,73	1,02	67,33
0,355	1,49	13,47	1,78	65,55
0,250	2,00	117,79	15,57	49,98
0,180	2,47	148,79	19,67	30,31
0,125	3,00	68,65	9,08	21,23
0,090	3,47	57,08	7,55	13,69
0,075	3,74	25,38	3,35	10,33
0,063	3,99	15,25	2,02	8,32
< 0,063	> 3,99	62,91	8,32	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	8,32
Sand, fine (0,063 mm - 0,200 mm):	27,61
Sand, medium (0,2 mm - 0,6 mm):	31,89
Sand, coarse (0,6 mm - 2 mm):	2,53
Gravel (> 2 mm):	29,65
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	-----	-----
16%	84%	13,48	-3,75
25%	75%	8,37	-3,06
40%	60%	0,32	1,65
Median 50%	50%	0,25	2,00
75%	25%	0,15	2,76
84%	16%	0,10	3,31
90%	10%	0,07	3,78
95%	5%	-----	-----

Moments Statistics

Mean	0,52
Sorting	-----
Skewness	-----
Kurtosis	-----
Uniformity Coefficient	4,35

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

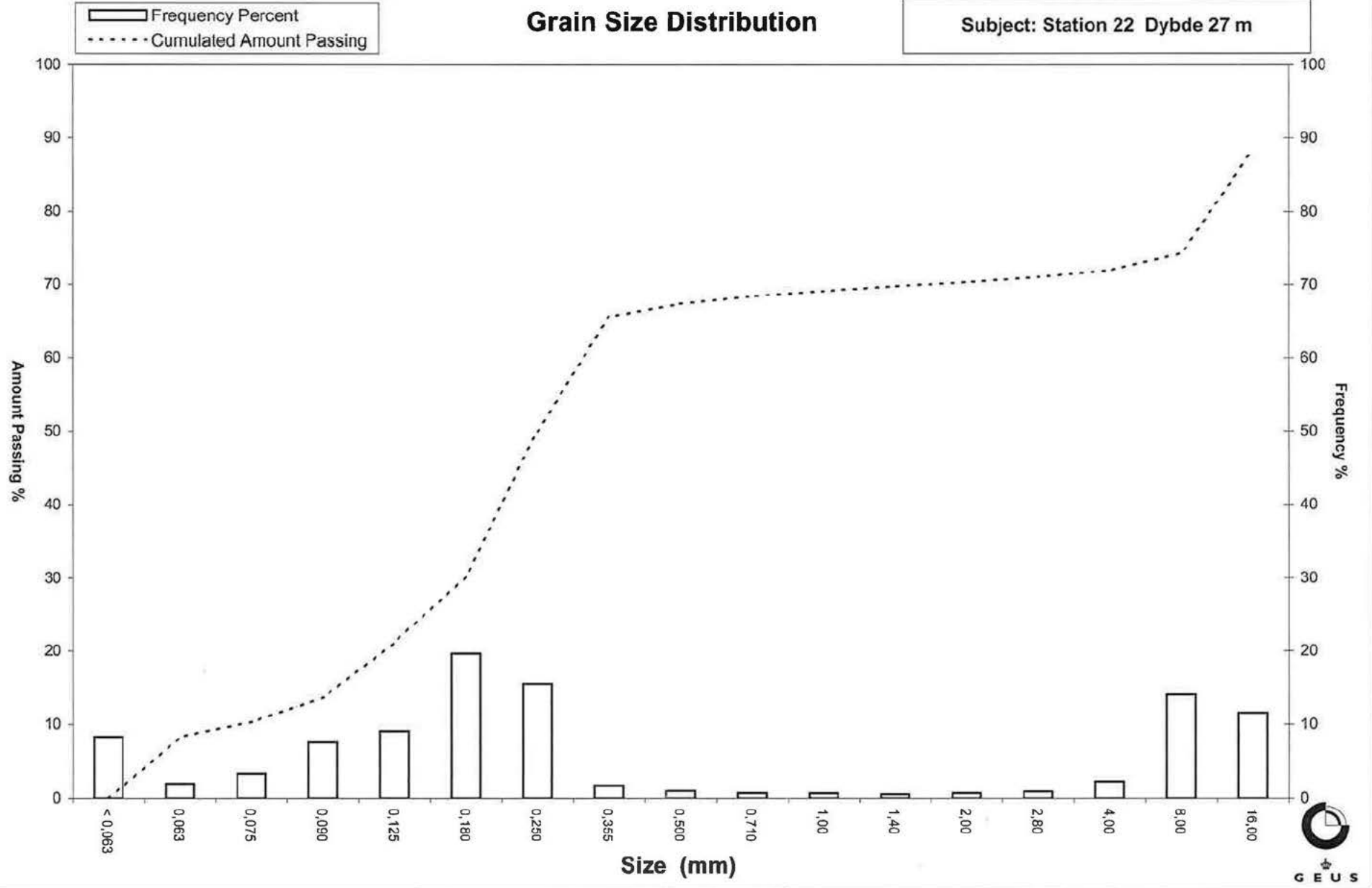
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 22 Dybde 27 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 23 Dybde 7,5 m
Lab. Id: 100476
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 1,4 mm



Total Weight 112,84 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,00	0,00	100,00
2,80	-1,49	0,00	0,00	100,00
2,00	-1,00	0,00	0,00	100,00
1,40	-0,49	0,04	0,04	99,96
1,00	0,00	0,06	0,05	99,91
0,710	0,49	0,07	0,06	99,85
0,500	1,00	0,26	0,23	99,62
0,355	1,49	4,65	4,12	95,50
0,250	2,00	28,41	25,18	70,32
0,180	2,47	63,40	56,19	14,14
0,125	3,00	14,77	13,09	1,05
0,090	3,47	0,60	0,53	0,51
0,075	3,74	0,03	0,03	0,49
0,063	3,99	0,01	0,01	0,48
< 0,063	> 3,99	0,54	0,48	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

Size Class	Weight %
Silt and clay (< 0,063 mm):	0,48
Sand, fine (0,063 mm - 0,200 mm):	29,71
Sand, medium (0,2 mm - 0,6 mm):	69,54
Sand, coarse (0,6 mm - 2 mm):	0,27
Gravel (> 2 mm):	0,00
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,35	1,50
16%	84%	0,31	1,70
25%	75%	0,27	1,89
40%	60%	0,24	2,08
Median 50%	50%	0,22	2,15
75%	25%	0,19	2,37
84%	16%	0,18	2,46
90%	10%	0,16	2,62
95%	5%	0,14	2,82

Moments Statistics

Mean	2,10
Sorting	0,39
Skewness	-0,09
Kurtosis	1,13
Uniformity Coefficient	1,46

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the ½ phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

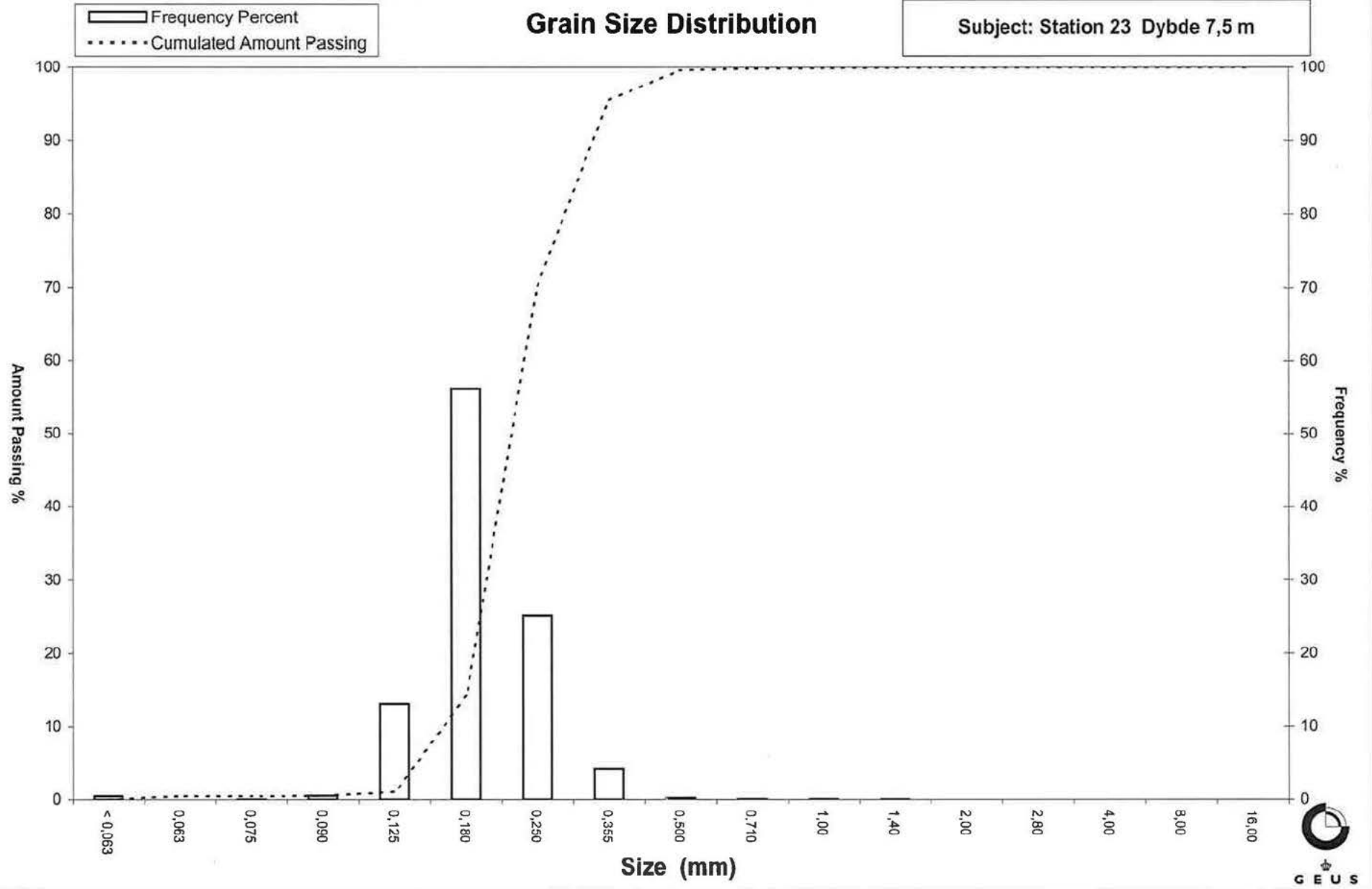
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 23 Dybde 7,5 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 24 Dybde 12,5 m
Lab. Id: 100477
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 1,4 mm



Total Weight 140,17 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,07	0,05	99,95
2,80	-1,49	0,00	0,00	99,95
2,00	-1,00	0,00	0,00	99,95
1,40	-0,49	0,14	0,10	99,85
1,00	0,00	0,07	0,05	99,80
0,710	0,49	0,08	0,06	99,74
0,500	1,00	0,33	0,24	99,51
0,355	1,49	0,79	0,56	98,94
0,250	2,00	2,91	2,08	96,87
0,180	2,47	84,92	60,58	36,28
0,125	3,00	46,60	33,25	3,04
0,090	3,47	2,33	1,66	1,38
0,075	3,74	0,24	0,17	1,21
0,063	3,99	0,14	0,10	1,11
< 0,063	> 3,99	1,55	1,11	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

Size Class	Weight %
Silt and clay (< 0,063 mm)	1,11
Sand, fine (0,063 mm - 0,200 mm)	52,49
Sand, medium (0,2 mm - 0,6 mm)	46,03
Sand, coarse (0,6 mm - 2 mm)	0,33
Gravel (> 2 mm)	0,05
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,25	2,01
16%	84%	0,24	2,09
25%	75%	0,22	2,15
40%	60%	0,21	2,27
Median 50%	50%	0,20	2,35
75%	25%	0,16	2,63
84%	16%	0,15	2,77
90%	10%	0,14	2,87
95%	5%	0,13	2,96

Moments Statistics

Mean	2,40
Sorting	0,31
Skewness	0,26
Kurtosis	0,81
Uniformity Coefficient	1,52

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

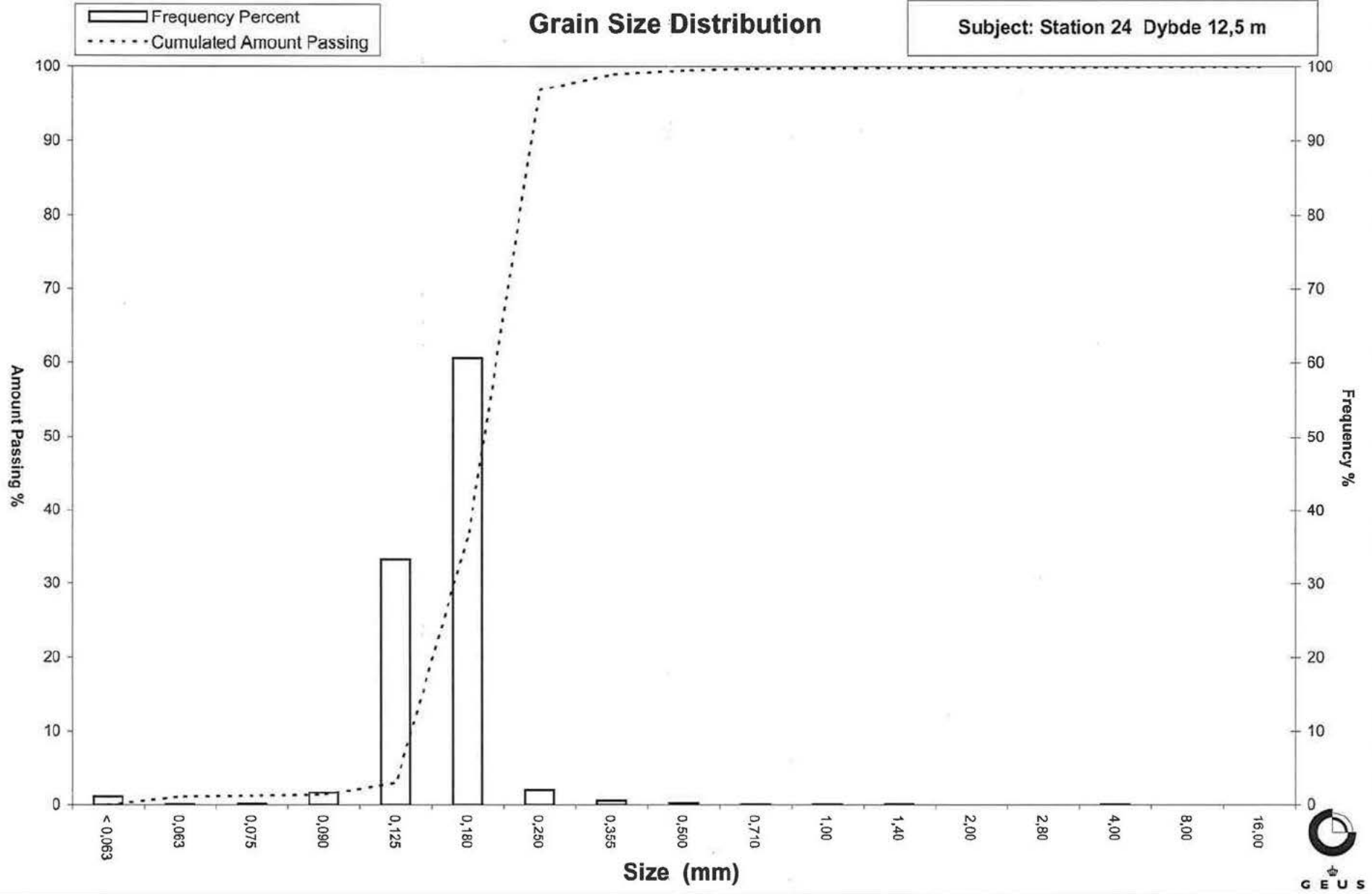
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 24 Dybde 12,5 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 25 Dybde 22,5 m
Lab. Id: 100478
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 8 mm Mat > 8 mm = skaller



Total Weight 432 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	
16,00	-4,00	7,57	1,75	98,25
8,00	-3,00	6,27	1,45	96,80
4,00	-2,00	4,09	0,95	95,85
2,80	-1,49	1,45	0,34	95,51
2,00	-1,00	1,12	0,26	95,25
1,40	-0,49	1,24	0,29	94,97
1,00	0,00	1,73	0,40	94,57
0,710	0,49	1,16	0,27	94,30
0,500	1,00	1,36	0,32	93,98
0,355	1,49	1,68	0,39	93,59
0,250	2,00	6,26	1,45	92,14
0,180	2,47	147,43	34,13	58,02
0,125	3,00	225,18	52,12	5,89
0,090	3,47	12,68	2,93	2,96
0,075	3,74	3,09	0,72	2,24
0,063	3,99	2,49	0,58	1,67
< 0,063	> 3,99	7,20	1,67	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	1,67
Sand, fine (0,063 mm - 0,200 mm):	66,10
Sand, medium (0,2 mm - 0,6 mm):	26,37
Sand, coarse (0,6 mm - 2 mm):	1,12
Gravel (> 2 mm):	4,75
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	1,47	-0,56
16%	84%	0,23	2,10
25%	75%	0,21	2,22
40%	60%	0,18	2,44
Median 50%	50%	0,17	2,54
75%	25%	0,15	2,78
84%	16%	0,14	2,88
90%	10%	0,13	2,95
95%	5%	0,11	3,13

Moments Statistics

Mean	2,51
Sorting	0,75
Skewness	-0,41
Kurtosis	2,67
Uniformity Coefficient	1,42

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

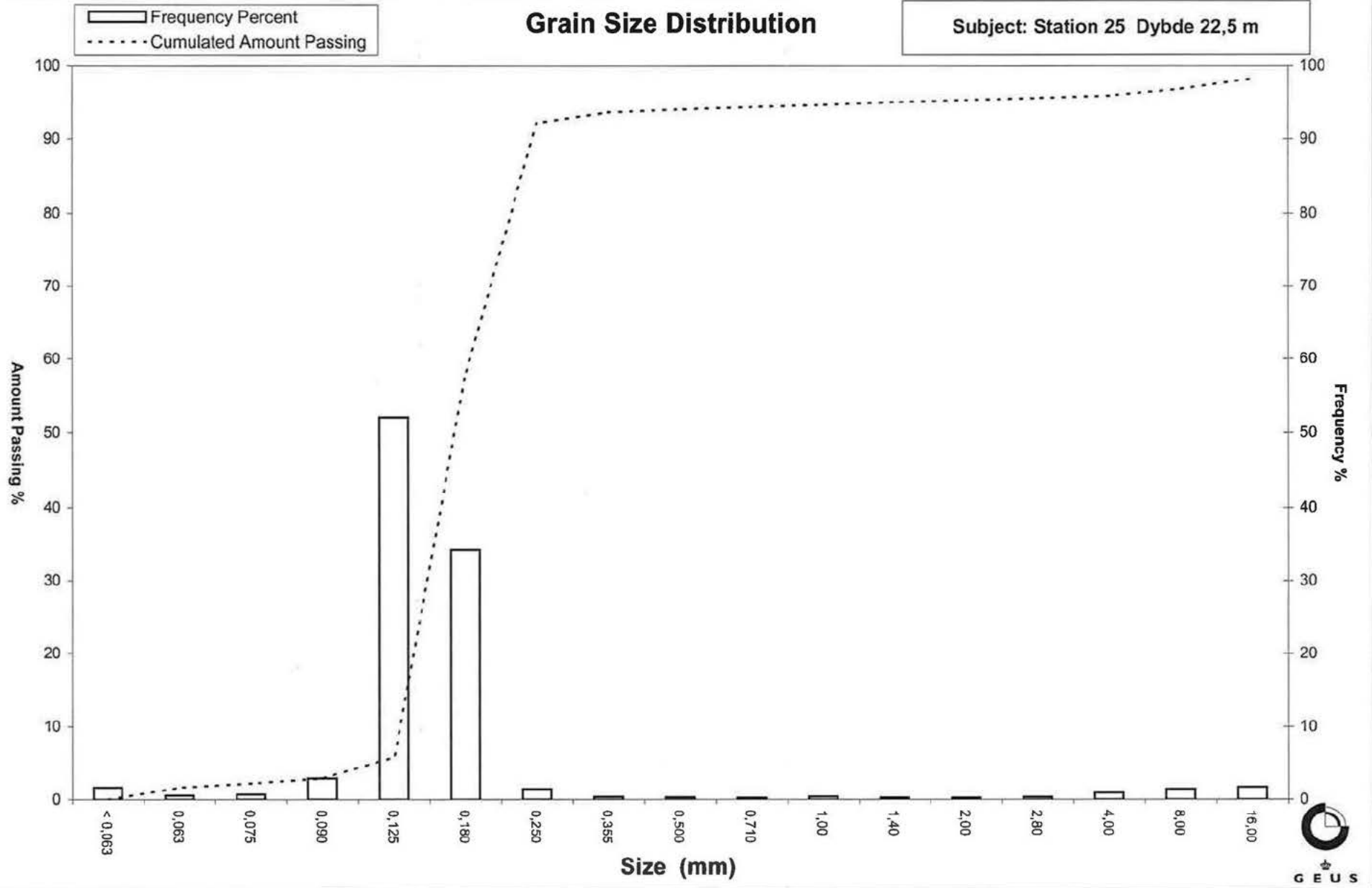
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 25 Dybde 22,5 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 26 Dybde 15 m
Lab. Id: 100479
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 1,4 mm Mat.> 1,4 skaller.



Total Weight 144,21 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,20	0,14	99,86
2,80	-1,49	0,07	0,05	99,81
2,00	-1,00	0,07	0,05	99,76
1,40	-0,49	0,11	0,08	99,69
1,00	0,00	0,11	0,08	99,61
0,710	0,49	0,31	0,21	99,40
0,500	1,00	1,23	0,85	98,54
0,355	1,49	5,76	3,99	94,55
0,250	2,00	23,03	15,97	78,58
0,180	2,47	46,58	32,30	46,28
0,125	3,00	51,12	35,45	10,83
0,090	3,47	11,96	8,29	2,54
0,075	3,74	1,39	0,96	1,57
0,063	3,99	0,62	0,43	1,14
< 0,063	> 3,99	1,65	1,14	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	1,14
Sand, fine (0,063 mm - 0,200 mm):	54,36
Sand, medium (0,2 mm - 0,6 mm):	43,44
Sand, coarse (0,6 mm - 2 mm):	0,81
Gravel (> 2 mm):	0,24
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,37	1,43
16%	84%	0,29	1,81
25%	75%	0,24	2,05
40%	60%	0,21	2,25
Median 50%	50%	0,19	2,41
75%	25%	0,15	2,77
84%	16%	0,13	2,91
90%	10%	0,12	3,04
95%	5%	0,10	3,32

Moments Statistics

Mean	2,38
Sorting	0,56
Skewness	-0,07
Kurtosis	1,07
Uniformity Coefficient	1,73

The analysis is executed according to DS405.9 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

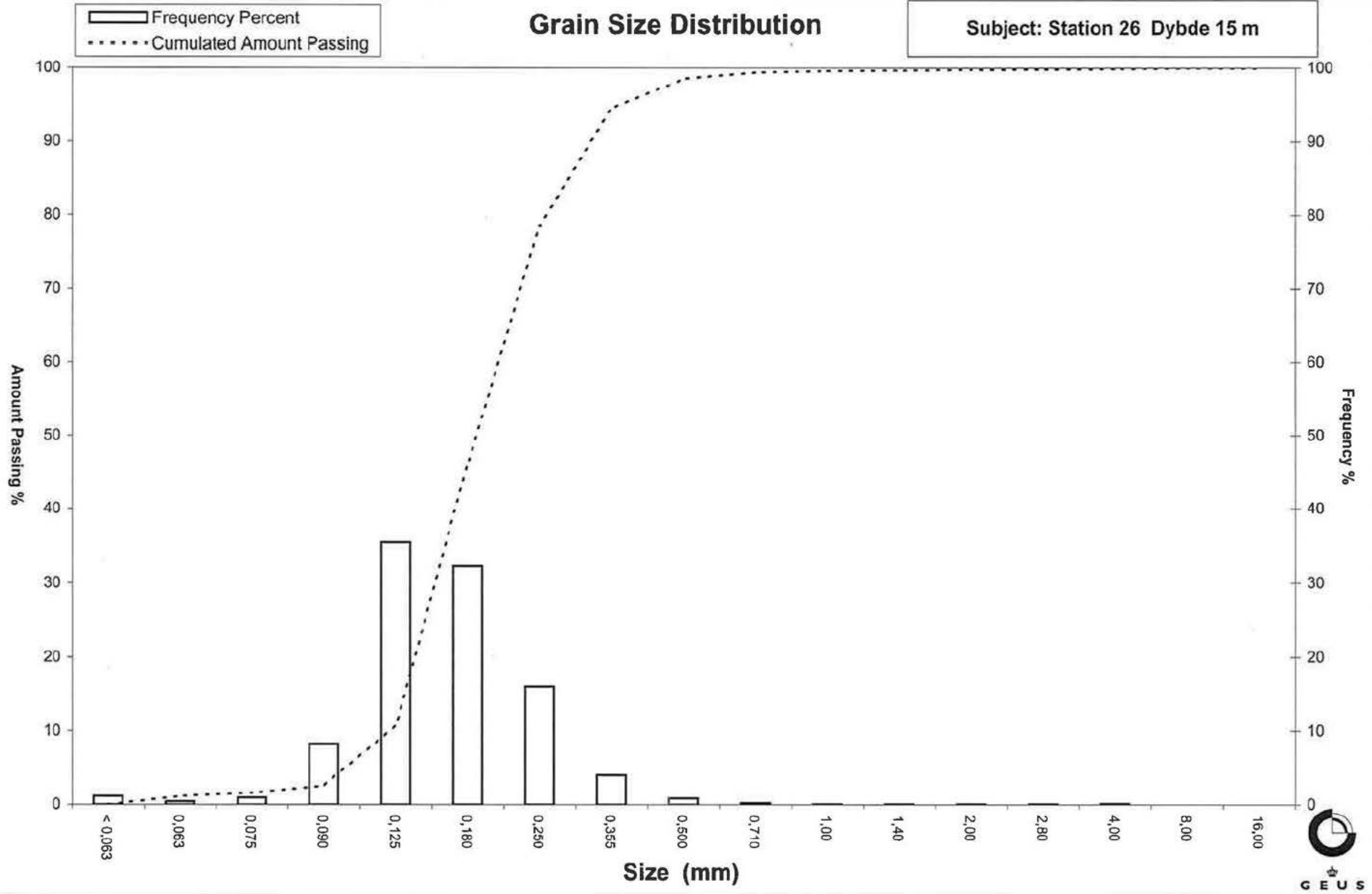
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 26 Dybde 15 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 27 Dybde 13,5 m
Lab. Id: 100480
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 8 mm Mat > 2 mm = skaller



Total Weight 204,59 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,50	0,24	99,76
2,80	-1,49	0,07	0,03	99,72
2,00	-1,00	0,04	0,02	99,70
1,40	-0,49	0,01	0,00	99,70
1,00	0,00	0,16	0,08	99,62
0,710	0,49	0,84	0,41	99,21
0,500	1,00	8,33	4,07	95,14
0,355	1,49	36,58	17,88	77,26
0,250	2,00	111,46	54,48	22,78
0,180	2,47	39,80	19,45	3,32
0,125	3,00	4,07	1,99	1,33
0,090	3,47	0,77	0,38	0,96
0,075	3,74	0,18	0,09	0,87
0,063	3,99	0,06	0,03	0,84
< 0,063	> 3,99	1,72	0,84	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	0,84
Sand, fine (0,063 mm - 0,200 mm):	8,04
Sand, medium (0,2 mm - 0,6 mm):	88,19
Sand, coarse (0,6 mm - 2 mm):	2,63
Gravel (> 2 mm):	0,30
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,50	1,00
16%	84%	0,41	1,29
25%	75%	0,35	1,51
40%	60%	0,32	1,64
Median 50%	50%	0,30	1,73
75%	25%	0,25	1,98
84%	16%	0,23	2,15
90%	10%	0,20	2,29
95%	5%	0,19	2,43

Moments Statistics

Mean	1,72
Sorting	0,43
Skewness	-0,02
Kurtosis	1,26
Uniformity Coefficient	1,58

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

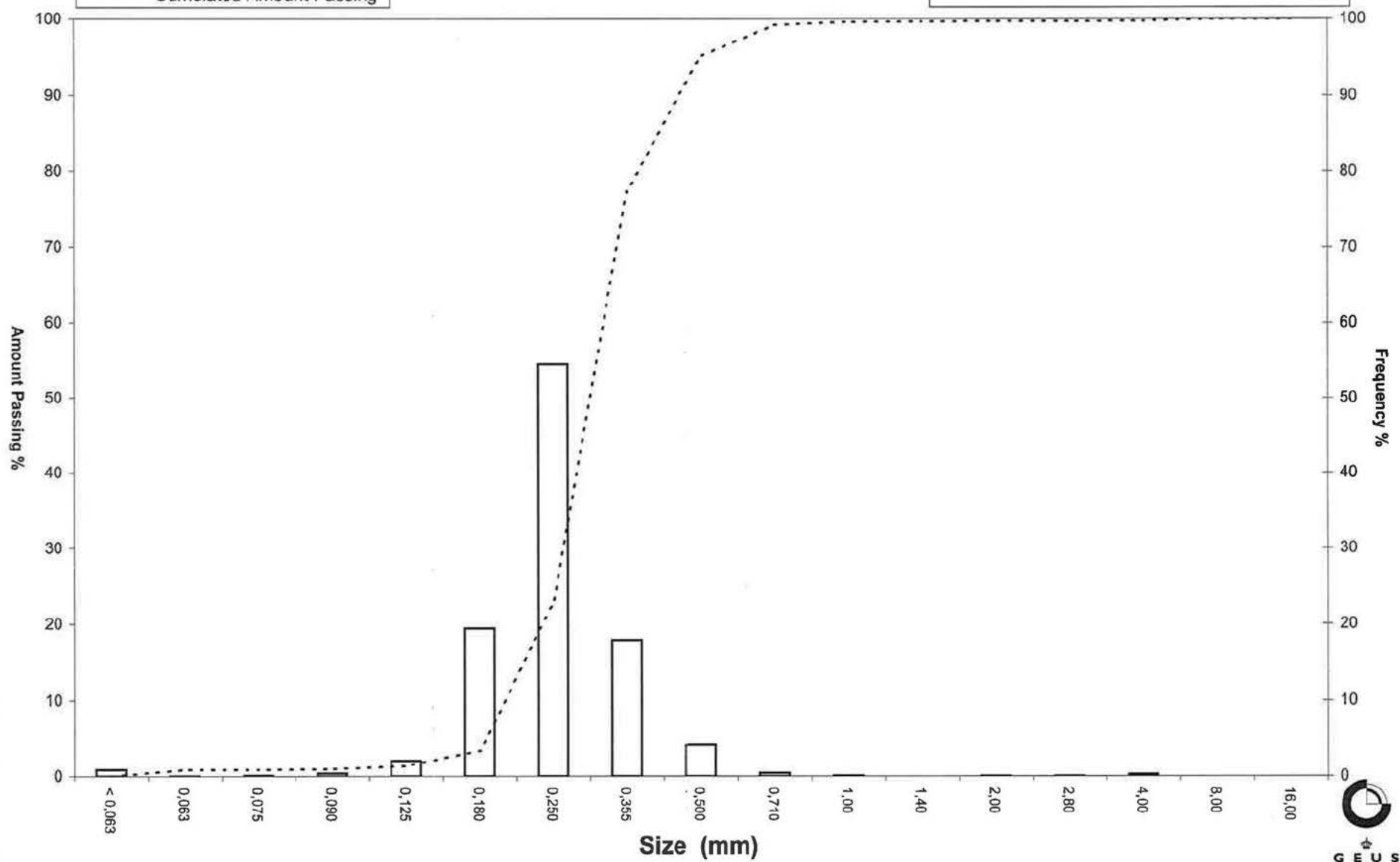
Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 27 Dybde 13,5 m

Frequency Percent
Cumulated Amount Passing



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 28 Dybde 11,5 m
Lab. Id: 100481
Date: Januar 2011
Executed: I. Nørgaard
Remarks:



Total Weight 213,5 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,00	0,00	100,00
2,80	-1,49	0,00	0,00	100,00
2,00	-1,00	0,00	0,00	100,00
1,40	-0,49	0,01	0,00	100,00
1,00	0,00	0,12	0,06	99,94
0,710	0,49	0,65	0,30	99,63
0,500	1,00	5,30	2,48	97,15
0,355	1,49	63,67	29,82	67,33
0,250	2,00	129,85	60,82	6,51
0,180	2,47	11,77	5,51	1,00
0,125	3,00	1,09	0,51	0,49
0,090	3,47	0,21	0,10	0,39
0,075	3,74	0,04	0,02	0,37
0,063	3,99	0,03	0,01	0,36
< 0,063	> 3,99	0,76	0,36	0,00

Gravel

Sand

Sieve Analysis

Size Classes (DGF-Bulletin 1 1988)

Size Class	Weight %
Silt and clay (< 0,063 mm)	0,36
Sand, fine (0,063 mm - 0,200 mm)	2,22
Sand, medium (0,2 mm - 0,6 mm)	95,76
Sand, coarse (0,6 mm - 2 mm)	1,67
Gravel (> 2 mm)	0,00
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,49	1,03
16%	84%	0,44	1,20
25%	75%	0,39	1,35
40%	60%	0,34	1,55
Median 50%	50%	0,33	1,62
75%	25%	0,28	1,83
84%	16%	0,27	1,91
90%	10%	0,26	1,97
95%	5%	0,23	2,12

Moments Statistics

Mean	1,58
Sorting	0,34
Skewness	-0,14
Kurtosis	0,93
Uniformity Coefficient	1,34

The analysis is executed according to DS405.9 DS/EN933-1 extended by sieves to the ½ phi scale.

Size Classes and Percentiles are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

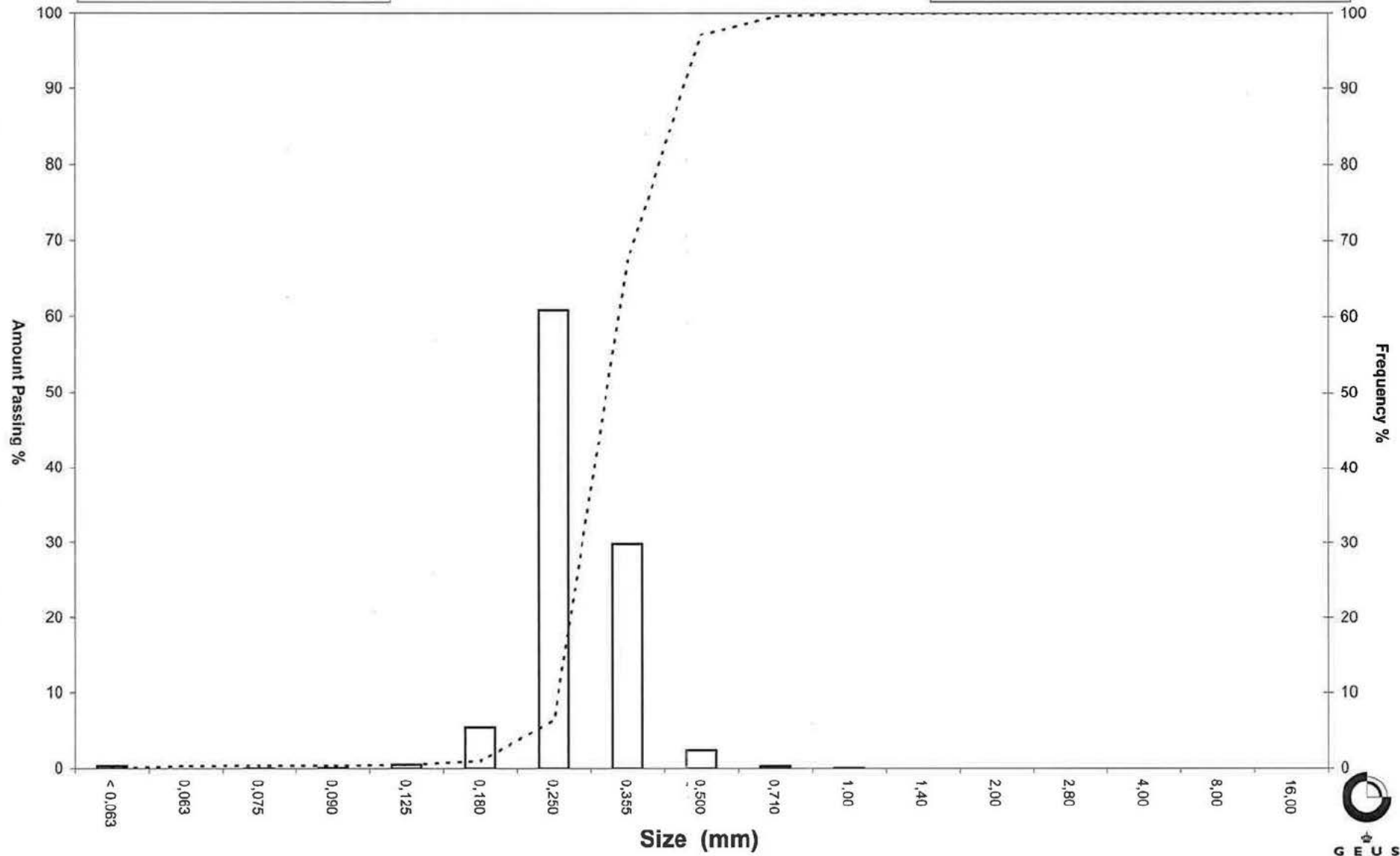
Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 28 Dybde 11,5 m

Frequency Percent
Cumulated Amount Passing



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 29 Dybde 28,5 m
Lab. Id: 100482
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 16 mm



Total Weight 636,7 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	17,57	2,76	97,24
4,00	-2,00	33,12	5,20	92,04
2,80	-1,49	37,91	5,95	86,08
2,00	-1,00	52,53	8,25	77,83
1,40	-0,49	77,00	12,09	65,74
1,00	0,00	103,67	16,28	49,46
0,710	0,49	122,42	19,23	30,23
0,500	1,00	108,15	16,99	13,24
0,355	1,49	52,77	8,29	4,96
0,250	2,00	19,49	3,06	1,90
0,180	2,47	6,87	1,08	0,82
0,125	3,00	1,61	0,25	0,56
0,090	3,47	1,09	0,17	0,39
0,075	3,74	0,39	0,06	0,33
0,063	3,99	0,26	0,04	0,29
< 0,063	> 3,99	1,85	0,29	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

Size Class	Weight %
Silt and clay (< 0,063 mm)	0,29
Sand, fine (0,063 mm - 0,200 mm)	0,83
Sand, medium (0,2 mm - 0,6 mm)	20,21
Sand, coarse (0,6 mm - 2 mm)	56,50
Gravel (> 2 mm)	22,17
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	6,28	-2,65
16%	84%	2,60	-1,38
25%	75%	1,86	-0,89
40%	60%	1,26	-0,33
Median 50%	50%	1,01	-0,02
75%	25%	0,65	0,63
84%	16%	0,53	0,90
90%	10%	0,44	1,17
95%	5%	0,36	1,49

Moments Statistics

Mean	-0,16
Sorting	1,20
Skewness	-0,23
Kurtosis	1,11
Uniformity Coefficient	2,84

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

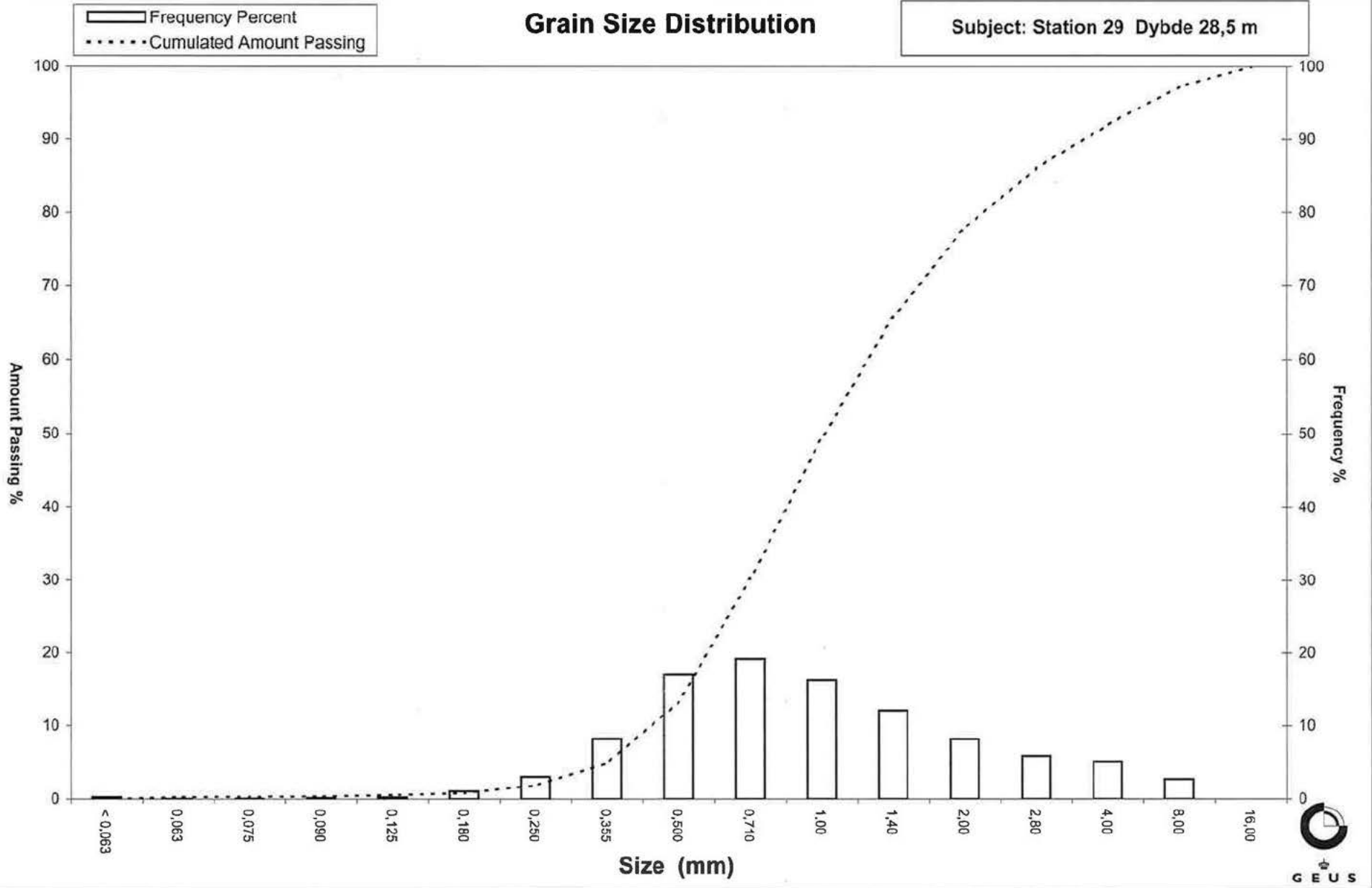
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 29 Dybde 28,5 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 30 Dybde 24,2 m
Lab. Id: 100483
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 16 mm



Total Weight 932,78 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	
16,00	-4,00	64,47	6,91	93,09
8,00	-3,00	5,26	0,56	92,52
4,00	-2,00	36,66	3,93	88,59
2,80	-1,49	65,91	7,07	81,53
2,00	-1,00	107,01	11,47	70,06
1,40	-0,49	138,83	14,88	55,17
1,00	0,00	136,42	14,63	40,55
0,710	0,49	124,31	13,33	27,22
0,500	1,00	118,68	12,72	14,50
0,355	1,49	83,93	9,00	5,50
0,250	2,00	36,64	3,93	1,57
0,180	2,47	7,47	0,80	0,77
0,125	3,00	2,10	0,23	0,54
0,090	3,47	0,47	0,05	0,49
0,075	3,74	0,21	0,02	0,47
0,063	3,99	0,17	0,02	0,45
< 0,063	> 3,99	4,22	0,45	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	0,45
Sand, fine (0,063 mm - 0,200 mm):	0,55
Sand, medium (0,2 mm - 0,6 mm):	19,56
Sand, coarse (0,6 mm - 2 mm):	49,50
Gravel (> 2 mm):	29,94
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	-----	-----
16%	84%	3,22	-1,69
25%	75%	2,34	-1,23
40%	60%	1,59	-0,67
Median 50%	50%	1,26	-0,33
75%	25%	0,67	0,57
84%	16%	0,52	0,93
90%	10%	0,43	1,23
95%	5%	0,34	1,55

Moments Statistics

Mean	-0,36
Sorting	-----
Skewness	-----
Kurtosis	-----
Uniformity Coefficient	3,73

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

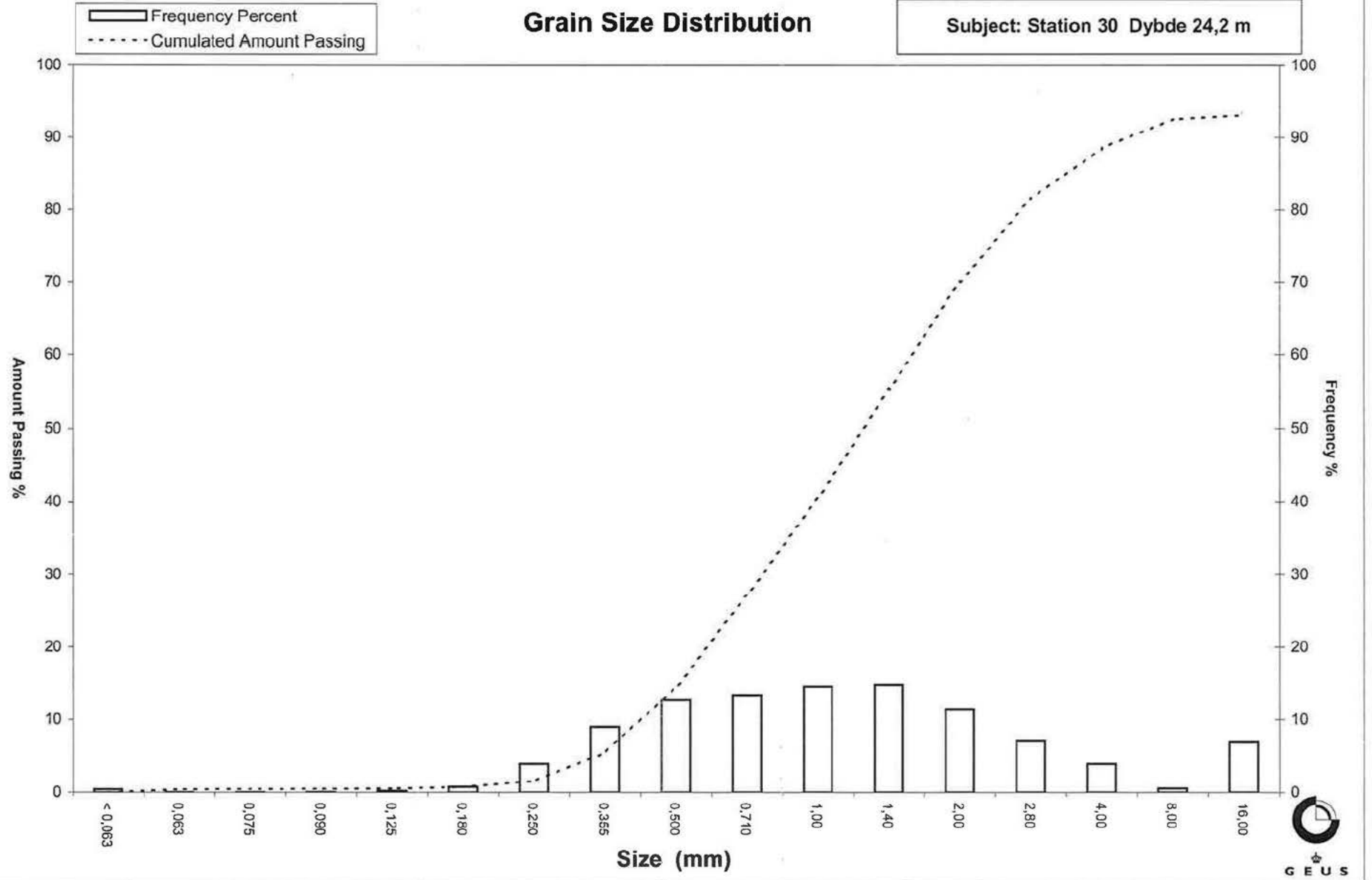
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on
 "Amount in sieve". Uniformity coefficient is based on
 "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 30 Dybde 24,2 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 31 Dybde 17,8 m
Lab. Id: 100484
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 8 mm



Total Weight 214,2 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,20	0,09	99,91
2,80	-1,49	0,21	0,10	99,81
2,00	-1,00	0,06	0,03	99,78
1,40	-0,49	0,13	0,06	99,72
1,00	0,00	2,94	1,37	98,35
0,710	0,49	11,57	5,40	92,95
0,500	1,00	37,89	17,69	75,26
0,355	1,49	75,41	35,21	40,05
0,250	2,00	69,54	32,46	7,59
0,180	2,47	13,85	6,47	1,12
0,125	3,00	1,71	0,80	0,32
0,090	3,47	0,27	0,13	0,20
0,075	3,74	0,07	0,03	0,16
0,063	3,99	0,04	0,02	0,14
< 0,063	> 3,99	0,31	0,14	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	0,14
Sand, fine (0,063 mm - 0,200 mm):	2,82
Sand, medium (0,2 mm - 0,6 mm):	80,71
Sand, coarse (0,6 mm - 2 mm):	16,10
Gravel (> 2 mm):	0,22
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	φ
Amount in sieve	Amount passing		
5%	95%	0,82	0,29
16%	84%	0,60	0,73
25%	75%	0,50	1,00
40%	60%	0,44	1,19
Median 50%	50%	0,40	1,34
75%	25%	0,31	1,71
84%	16%	0,28	1,85
90%	10%	0,26	1,96
95%	5%	0,22	2,17

Moments Statistics

Mean	1,31
Sorting	0,57
Skewness	-0,10
Kurtosis	1,10
Uniformity Coefficient	1,70

The analysis is executed according to DS405.9 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

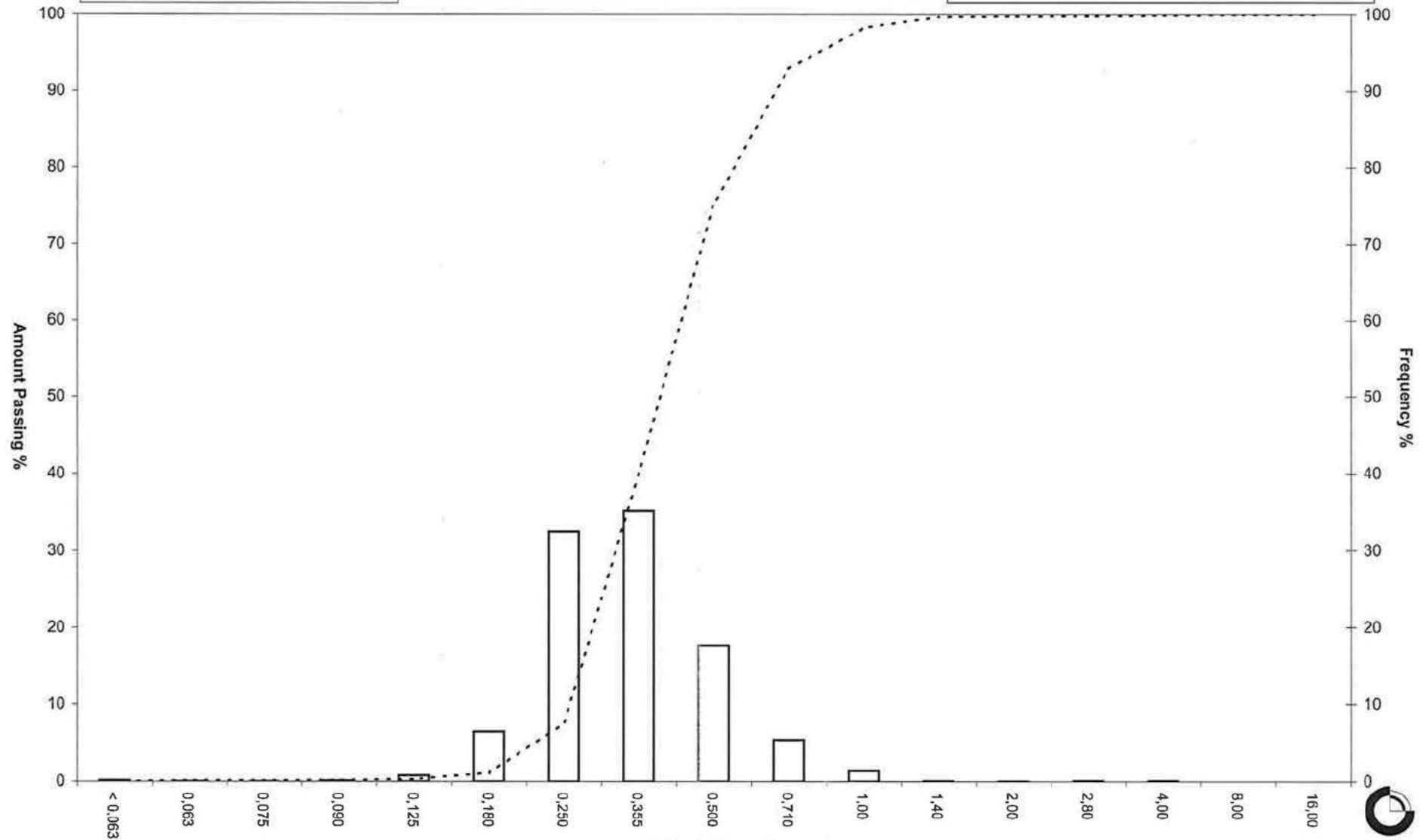
Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 31 Dybde 17,8 m

Frequency Percent
Cumulated Amount Passing



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 32 Dybde 17,5 m
Lab. Id: 100485
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 1,4 mm



Total Weight 113,77 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,00	0,00	100,00
2,80	-1,49	0,00	0,00	100,00
2,00	-1,00	0,01	0,01	99,99
1,40	-0,49	0,01	0,01	99,98
1,00	0,00	0,16	0,14	99,84
0,710	0,49	0,25	0,22	99,62
0,500	1,00	0,39	0,34	99,28
0,355	1,49	2,36	2,07	97,20
0,250	2,00	16,57	14,56	82,64
0,180	2,47	45,81	40,27	42,37
0,125	3,00	40,75	35,82	6,56
0,090	3,47	5,17	4,54	2,01
0,075	3,74	0,68	0,60	1,42
0,063	3,99	0,27	0,24	1,18
< 0,063	> 3,99	1,34	1,18	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

Size Class	Weight %
Silt and clay (< 0,063 mm)	1,18
Sand, fine (0,063 mm - 0,200 mm)	52,70
Sand, medium (0,2 mm - 0,6 mm)	45,56
Sand, coarse (0,6 mm - 2 mm)	0,55
Gravel (> 2 mm)	0,01
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,34	1,56
16%	84%	0,26	1,94
25%	75%	0,24	2,08
40%	60%	0,21	2,25
Median 50%	50%	0,19	2,37
75%	25%	0,15	2,71
84%	16%	0,14	2,84
90%	10%	0,13	2,94
95%	5%	0,11	3,15

Moments Statistics

Mean	2,39
Sorting	0,46
Skewness	0,01
Kurtosis	1,04
Uniformity Coefficient	1,62

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

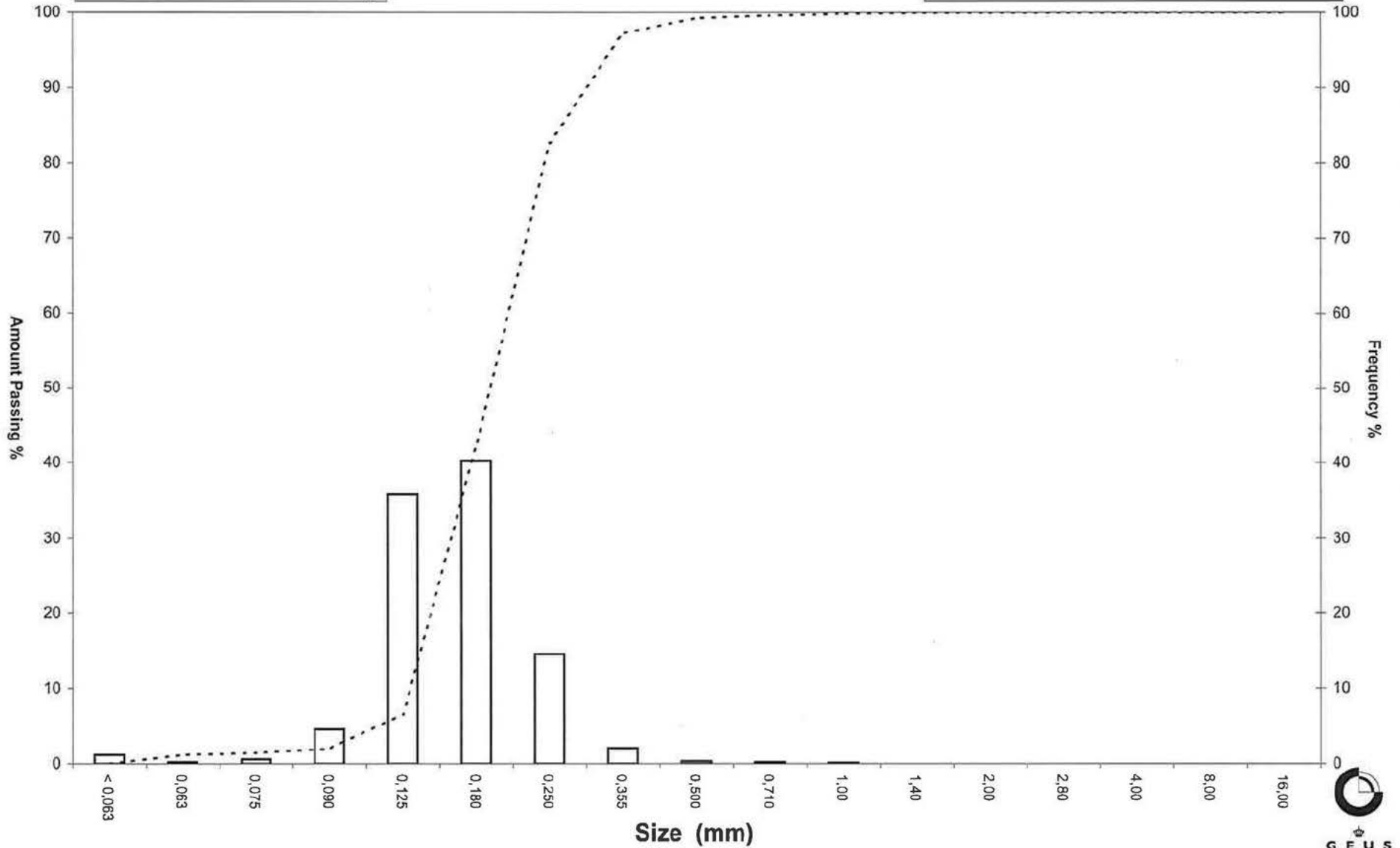
Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 32 Dybde 17,5 m

Frequency Percent
Cumulated Amount Passing



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 33 Dybde 13,8 m
Lab. Id: 100486
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 1,4 mm



Total Weight 126,4 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,00	0,00	100,00
2,80	-1,49	0,00	0,00	100,00
2,00	-1,00	0,07	0,06	99,94
1,40	-0,49	0,11	0,09	99,86
1,00	0,00	0,26	0,21	99,65
0,710	0,49	1,66	1,31	98,34
0,500	1,00	7,31	5,78	92,56
0,355	1,49	21,76	17,22	75,34
0,250	2,00	71,20	56,33	19,01
0,180	2,47	20,36	16,11	2,90
0,125	3,00	1,94	1,53	1,37
0,090	3,47	0,46	0,36	1,00
0,075	3,74	0,10	0,08	0,93
0,063	3,99	0,05	0,04	0,89
< 0,063	> 3,99	1,12	0,89	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

Size Class	Weight %
Silt and clay (< 0,063 mm)	0,89
Sand, fine (0,063 mm - 0,200 mm)	6,62
Sand, medium (0,2 mm - 0,6 mm)	87,80
Sand, coarse (0,6 mm - 2 mm)	4,64
Gravel (> 2 mm)	0,06
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,59	0,76
16%	84%	0,43	1,22
25%	75%	0,35	1,50
40%	60%	0,33	1,62
Median 50%	50%	0,31	1,70
75%	25%	0,26	1,94
84%	16%	0,24	2,08
90%	10%	0,21	2,25
95%	5%	0,19	2,40

Moments Statistics

Mean	1,67
Sorting	0,46
Skewness	-0,13
Kurtosis	1,53
Uniformity Coefficient	1,55

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the ½ phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

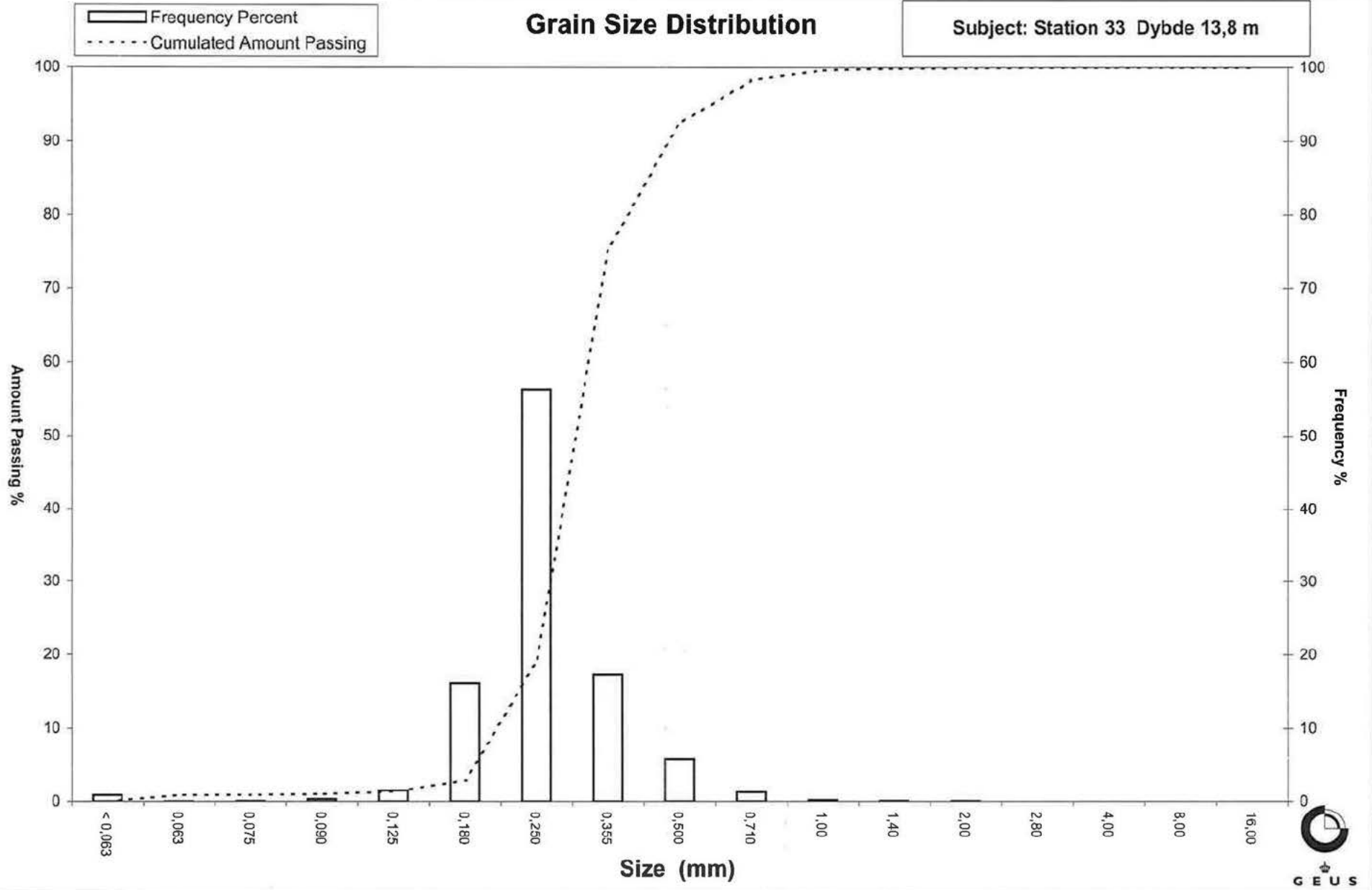
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 33 Dybde 13,8 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 34 Dybde 16 m
Lab. Id: 100487
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 1,4 mm. Mat > 2,8 mm skaller



Total Weight 133,07 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,34	0,26	99,74
4,00	-2,00	0,14	0,11	99,64
2,80	-1,49	0,01	0,01	99,63
2,00	-1,00	0,03	0,02	99,61
1,40	-0,49	0,03	0,02	99,59
1,00	0,00	0,03	0,02	99,56
0,710	0,49	0,06	0,05	99,52
0,500	1,00	0,33	0,25	99,27
0,355	1,49	3,65	2,74	96,53
0,250	2,00	21,85	16,42	80,11
0,180	2,47	55,48	41,69	38,42
0,125	3,00	44,71	33,60	4,82
0,090	3,47	4,26	3,20	1,62
0,075	3,74	0,45	0,34	1,28
0,063	3,99	0,21	0,16	1,12
< 0,063	> 3,99	1,49	1,12	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	1,12
Sand, fine (0,063 mm - 0,200 mm):	49,21
Sand, medium (0,2 mm - 0,6 mm):	49,06
Sand, coarse (0,6 mm - 2 mm):	0,22
Gravel (> 2 mm):	0,39
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,35	1,53
16%	84%	0,27	1,86
25%	75%	0,24	2,05
40%	60%	0,22	2,21
Median 50%	50%	0,20	2,33
75%	25%	0,16	2,66
84%	16%	0,14	2,80
90%	10%	0,13	2,91
95%	5%	0,13	3,00

Moments Statistics

Mean	2,33
Sorting	0,46
Skewness	-0,03
Kurtosis	0,98
Uniformity Coefficient	1,62

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

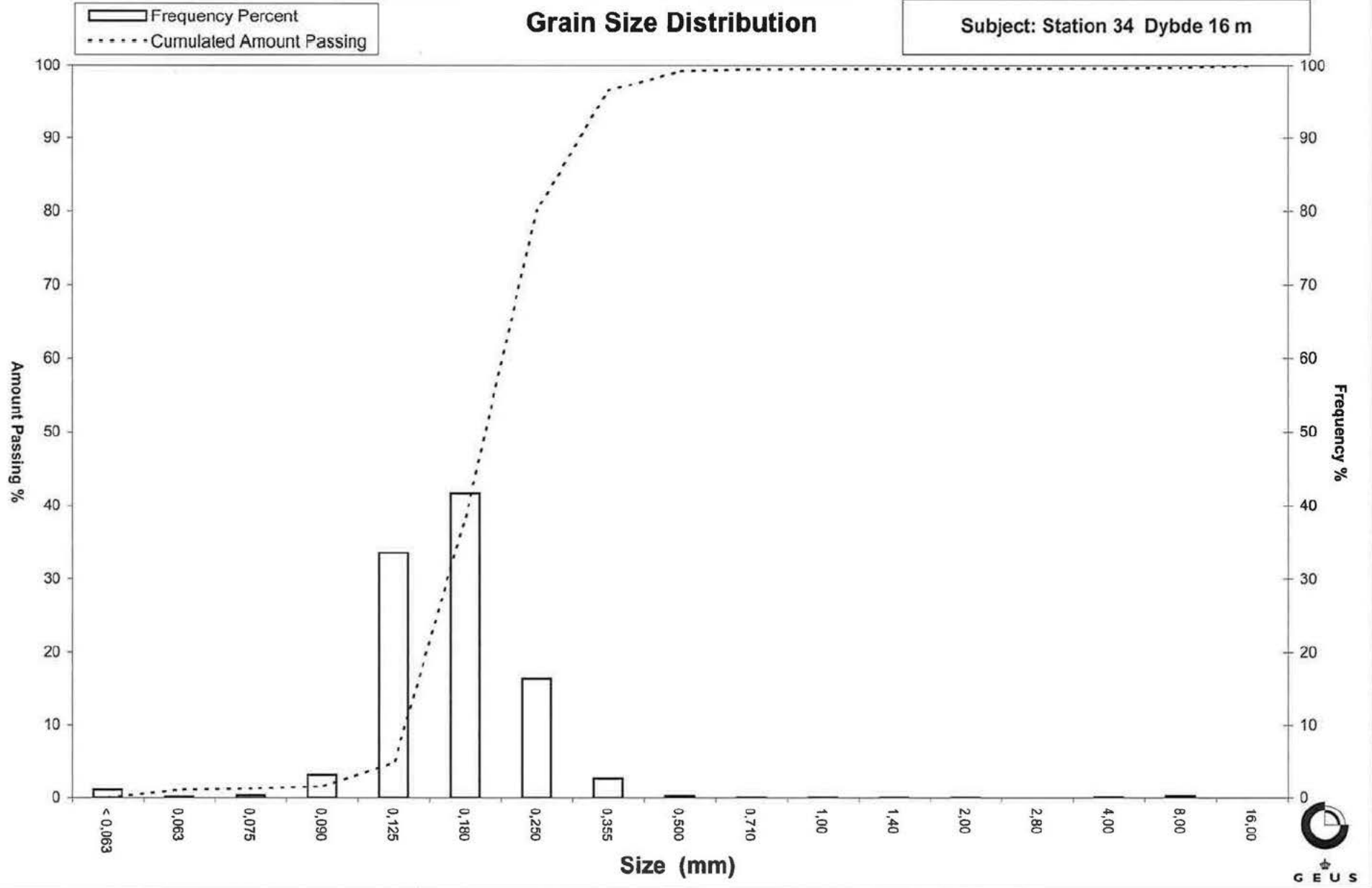
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 34 Dybde 16 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 35 Dybde 17 m
Lab. Id: 100488
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 1,4 mm Mat > 1,4mm skaller



Total Weight 131,65 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,00	0,00	100,00
2,80	-1,49	0,01	0,01	99,99
2,00	-1,00	0,05	0,04	99,95
1,40	-0,49	0,06	0,05	99,91
1,00	0,00	0,04	0,03	99,88
0,710	0,49	0,08	0,06	99,82
0,500	1,00	0,35	0,27	99,55
0,355	1,49	2,38	1,81	97,74
0,250	2,00	11,42	8,67	89,07
0,180	2,47	37,98	28,85	60,22
0,125	3,00	66,48	50,50	9,72
0,090	3,47	10,05	7,63	2,09
0,075	3,74	1,05	0,80	1,29
0,063	3,99	0,40	0,30	0,99
< 0,063	> 3,99	1,30	0,99	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	0,99
Sand, fine (0,063 mm - 0,200 mm):	67,48
Sand, medium (0,2 mm - 0,6 mm):	31,22
Sand, coarse (0,6 mm - 2 mm):	0,28
Gravel (> 2 mm):	0,05
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,32	1,64
16%	84%	0,24	2,07
25%	75%	0,22	2,21
40%	60%	0,18	2,48
Median 50%	50%	0,17	2,57
75%	25%	0,14	2,82
84%	16%	0,13	2,92
90%	10%	0,13	3,00
95%	5%	0,10	3,27

Moments Statistics

Mean	2,52
Sorting	0,46
Skewness	-0,15
Kurtosis	1,10
Uniformity Coefficient	1,43

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

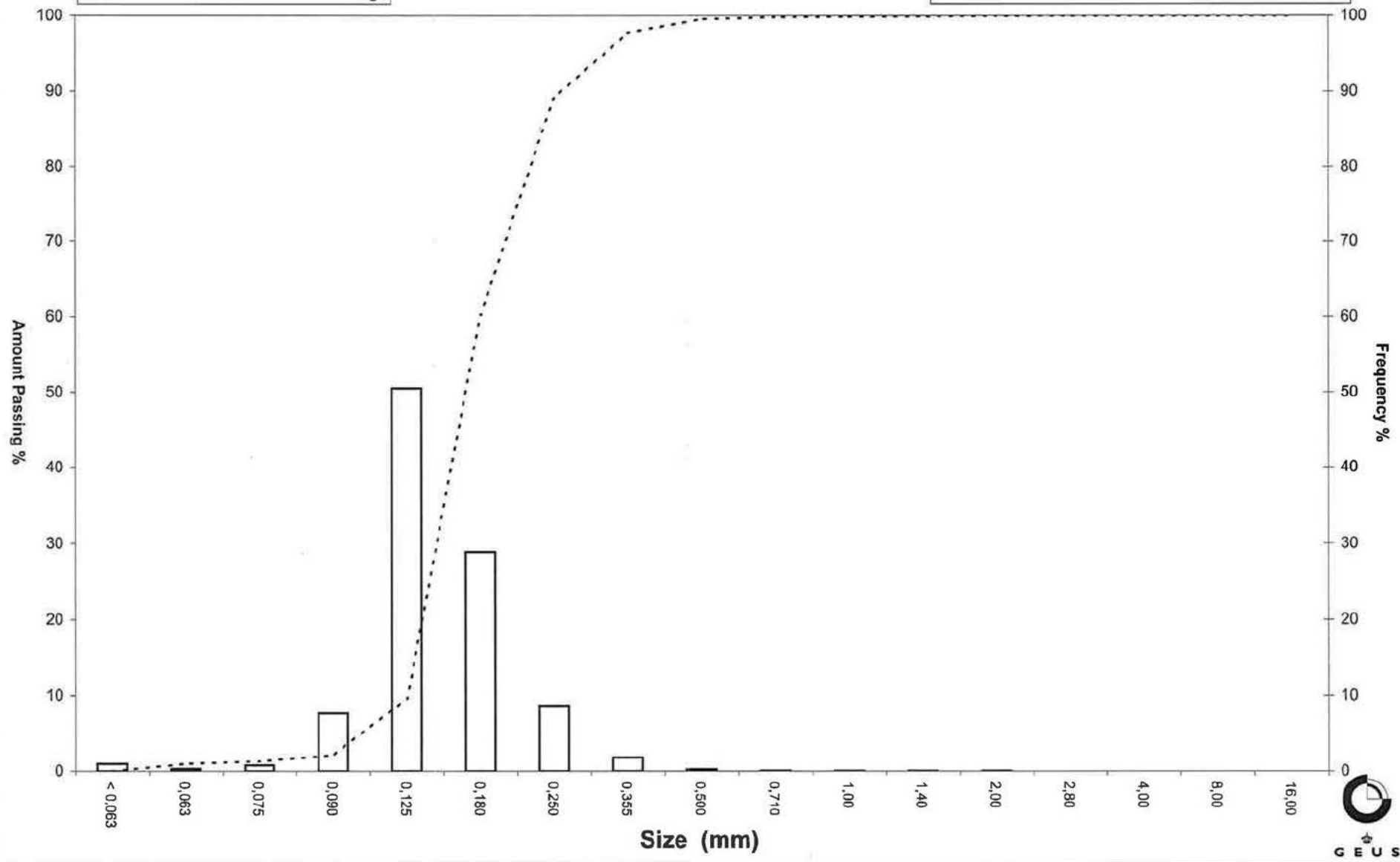
Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 35 Dybde 17 m

Frequency Percent
Cumulated Amount Passing



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 36 Dybde 16 m
Lab. Id: 100489
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 8 mm



Total Weight 200,11 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,12	0,06	99,94
2,80	-1,49	0,13	0,06	99,88
2,00	-1,00	0,14	0,07	99,81
1,40	-0,49	0,16	0,08	99,73
1,00	0,00	0,25	0,12	99,60
0,710	0,49	0,35	0,17	99,43
0,500	1,00	0,56	0,28	99,15
0,355	1,49	1,54	0,77	98,38
0,250	2,00	8,45	4,22	94,15
0,180	2,47	16,16	8,08	86,08
0,125	3,00	91,45	45,70	40,38
0,090	3,47	66,11	33,04	7,34
0,075	3,74	2,99	1,49	5,85
0,063	3,99	1,73	0,86	4,98
< 0,063	> 3,99	9,97	4,98	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	4,98
Sand, fine (0,063 mm - 0,200 mm):	83,40
Sand, medium (0,2 mm - 0,6 mm):	10,89
Sand, coarse (0,6 mm - 2 mm):	0,53
Gravel (> 2 mm):	0,19
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,27	1,88
16%	84%	0,18	2,49
25%	75%	0,17	2,58
40%	60%	0,15	2,75
Median 50%	50%	0,14	2,87
75%	25%	0,11	3,20
84%	16%	0,10	3,33
90%	10%	0,09	3,43
95%	5%	0,06	3,98

Moments Statistics

Mean	2,90
Sorting	0,53
Skewness	0,08
Kurtosis	1,40
Uniformity Coefficient	1,60

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the ½ phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

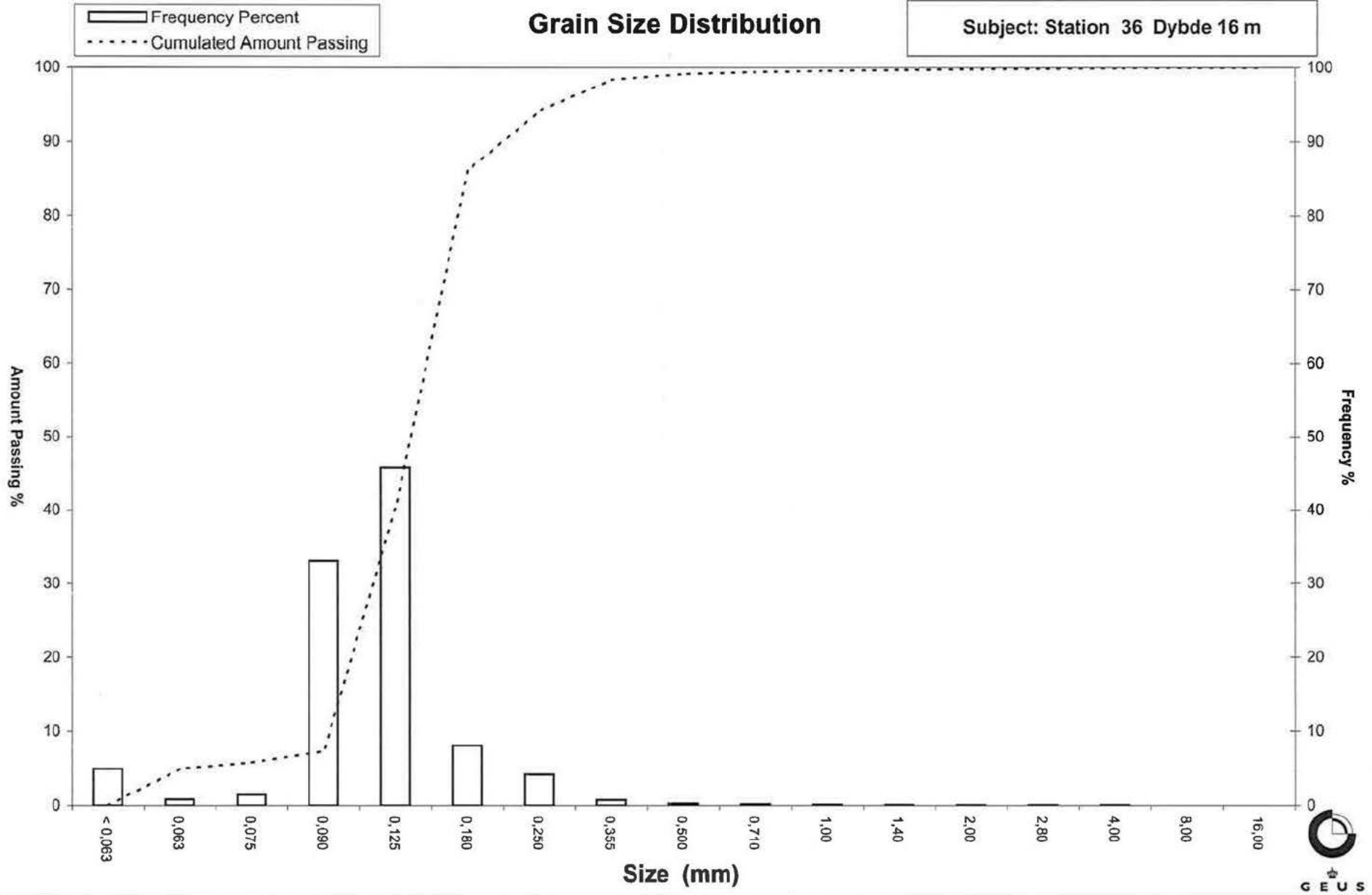
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 36 Dybde 16 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 37 Dybde 8 m
Lab. Id: 100490
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 1,4 mm



Total Weight 129,81 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,00	0,00	100,00
2,80	-1,49	0,07	0,05	99,95
2,00	-1,00	0,04	0,03	99,92
1,40	-0,49	0,03	0,02	99,89
1,00	0,00	0,06	0,05	99,85
0,710	0,49	0,04	0,03	99,82
0,500	1,00	0,10	0,08	99,74
0,355	1,49	0,09	0,07	99,67
0,250	2,00	0,28	0,22	99,45
0,180	2,47	3,84	2,96	96,49
0,125	3,00	89,98	69,32	27,18
0,090	3,47	30,26	23,31	3,87
0,075	3,74	1,61	1,24	2,63
0,063	3,99	0,59	0,45	2,17
< 0,063	> 3,99	2,82	2,17	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	2,17
Sand, fine (0,063 mm - 0,200 mm):	95,17
Sand, medium (0,2 mm - 0,6 mm):	2,43
Sand, coarse (0,6 mm - 2 mm):	0,14
Gravel (> 2 mm):	0,08
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,18	2,48
16%	84%	0,17	2,56
25%	75%	0,16	2,62
40%	60%	0,15	2,73
Median 50%	50%	0,14	2,80
75%	25%	0,12	3,04
84%	16%	0,11	3,21
90%	10%	0,10	3,33
95%	5%	0,09	3,45

Moments Statistics

Mean	2,86
Sorting	0,31
Skewness	0,28
Kurtosis	0,94
Uniformity Coefficient	1,52

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

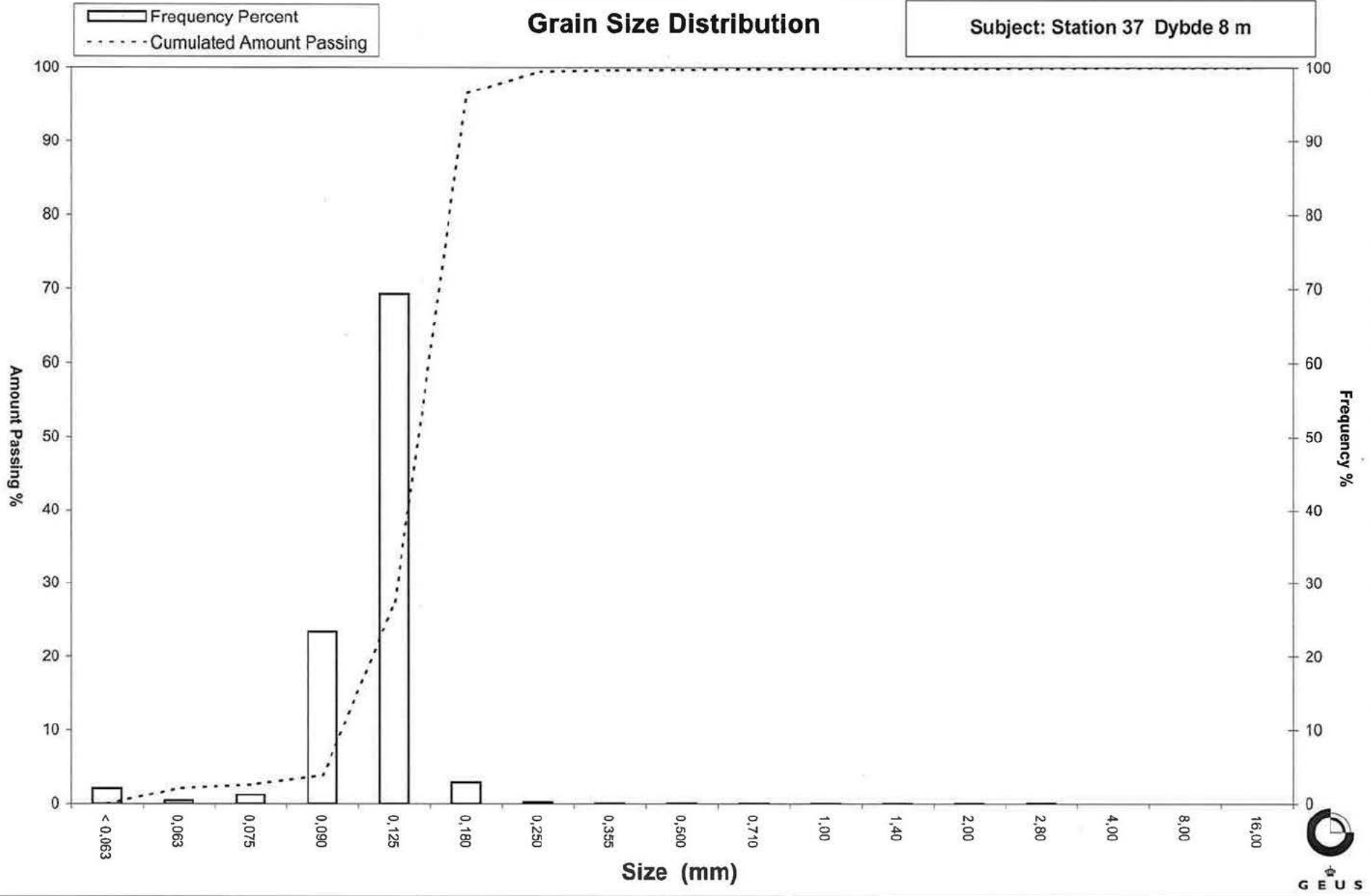
Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 37 Dybde 8 m



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 38 Dybde 19 m
Lab. Id: 100491
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 1,4 mm



Total Weight 126,58 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,00	0,00	100,00
2,80	-1,49	0,00	0,00	100,00
2,00	-1,00	0,05	0,04	99,96
1,40	-0,49	0,05	0,04	99,92
1,00	0,00	0,15	0,12	99,80
0,710	0,49	0,63	0,50	99,30
0,500	1,00	2,86	2,26	97,05
0,355	1,49	12,01	9,49	87,56
0,250	2,00	31,00	24,49	63,07
0,180	2,47	49,32	38,96	24,10
0,125	3,00	24,77	19,57	4,53
0,090	3,47	3,60	2,84	1,69
0,075	3,74	0,67	0,53	1,16
0,063	3,99	0,26	0,21	0,96
< 0,063	> 3,99	1,21	0,96	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	0,96
Sand, fine (0,063 mm - 0,200 mm):	34,28
Sand, medium (0,2 mm - 0,6 mm):	62,89
Sand, coarse (0,6 mm - 2 mm):	1,84
Gravel (> 2 mm):	0,04
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,47	1,09
16%	84%	0,34	1,56
25%	75%	0,30	1,73
40%	60%	0,24	2,03
Median 50%	50%	0,23	2,14
75%	25%	0,18	2,46
84%	16%	0,16	2,67
90%	10%	0,14	2,83
95%	5%	0,13	2,98

Moments Statistics

Mean	2,12
Sorting	0,56
Skewness	-0,08
Kurtosis	1,06
Uniformity Coefficient	1,74

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the 1/2 phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

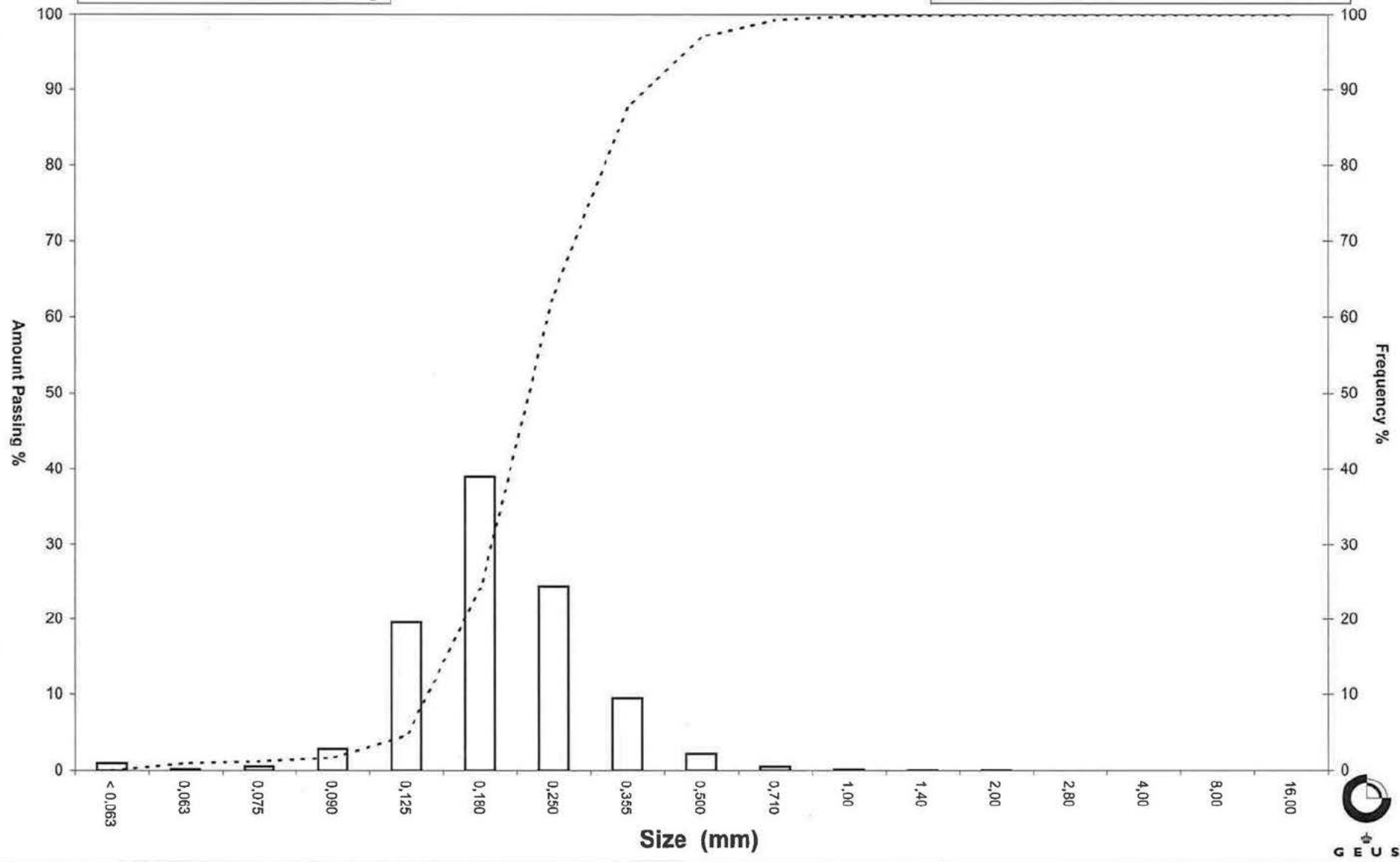
Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 38 Dybde 19 m

Frequency Percent
Cumulated Amount Passing



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 39 Dybde 17 m
Lab. Id: 100492
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 1,4 mm



Total Weight 128,15 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,00	0,00	100,00
2,80	-1,49	0,00	0,00	100,00
2,00	-1,00	0,00	0,00	100,00
1,40	-0,49	0,03	0,02	99,98
1,00	0,00	0,06	0,05	99,93
0,710	0,49	0,13	0,10	99,83
0,500	1,00	1,31	1,02	98,81
0,355	1,49	8,88	6,93	91,88
0,250	2,00	66,89	52,20	39,68
0,180	2,47	37,69	29,41	10,27
0,125	3,00	8,43	6,58	3,69
0,090	3,47	1,53	1,19	2,50
0,075	3,74	0,25	0,20	2,30
0,063	3,99	0,14	0,11	2,19
< 0,063	> 3,99	2,81	2,19	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	2,19
Sand, fine (0,063 mm - 0,200 mm):	16,48
Sand, medium (0,2 mm - 0,6 mm):	80,62
Sand, coarse (0,6 mm - 2 mm):	0,71
Gravel (> 2 mm):	0,00
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,42	1,25
16%	84%	0,34	1,56
25%	75%	0,32	1,64
40%	60%	0,29	1,78
Median 50%	50%	0,27	1,88
75%	25%	0,22	2,22
84%	16%	0,19	2,37
90%	10%	0,18	2,49
95%	5%	0,14	2,88

Moments Statistics

Mean	1,94
Sorting	0,45
Skewness	0,21
Kurtosis	1,15
Uniformity Coefficient	1,64

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the ½ phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

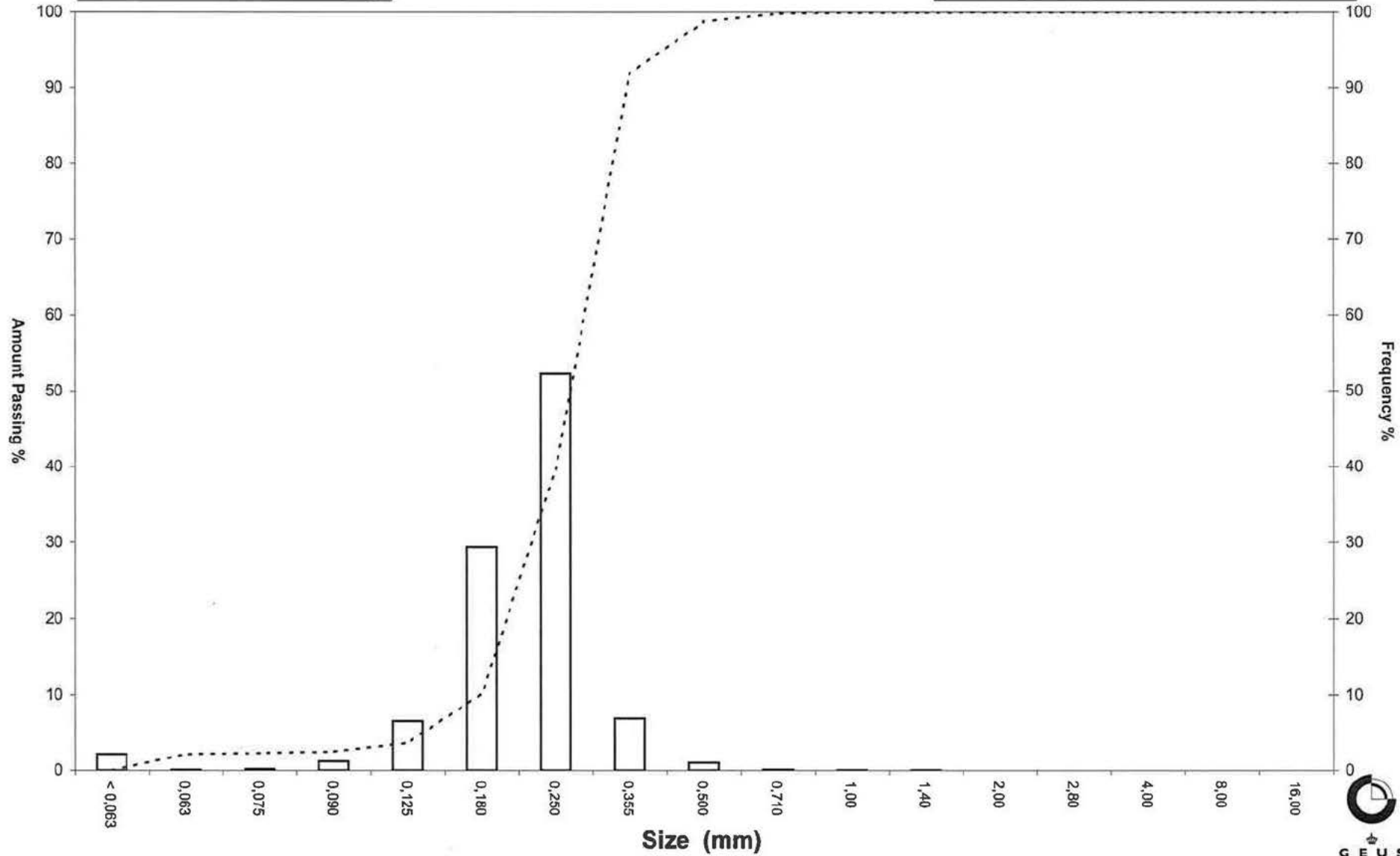
Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 39 Dybde 17 m

Frequency Percent
Cumulated Amount Passing



Grain Size Distribution

Geotechnical

Sample Id: Horns Rev 2010
Submitter: Orbicon
Subject: Station 40 Dybde 22 m
Lab. Id: 100493
Date: Januar 2011
Executed: I. Nørgaard
Remarks: For mat. < 1,4 mm



Total Weight 140,81 g

Size Fractions

Size	Size	Weight	Weight	Cumulated amount passing
mm	Φ	g	%	%
16,00	-4,00	0,00	0,00	100,00
8,00	-3,00	0,00	0,00	100,00
4,00	-2,00	0,00	0,00	100,00
2,80	-1,49	0,00	0,00	100,00
2,00	-1,00	0,00	0,00	100,00
1,40	-0,49	0,08	0,06	99,94
1,00	0,00	0,17	0,12	99,82
0,710	0,49	0,46	0,33	99,50
0,500	1,00	3,03	2,15	97,34
0,355	1,49	19,50	13,85	83,50
0,250	2,00	65,58	46,57	36,92
0,180	2,47	38,02	27,00	9,92
0,125	3,00	9,59	6,81	3,11
0,090	3,47	3,22	2,29	0,82
0,075	3,74	0,54	0,38	0,44
0,063	3,99	0,19	0,13	0,31
< 0,063	> 3,99	0,43	0,31	0,00

Sieve Analysis

Gravel

Sand

Size Classes (DGF-Bulletin 1 1988)

	Weight %
Silt and clay (< 0,063 mm):	0,31
Sand, fine (0,063 mm - 0,200 mm):	17,33
Sand, medium (0,2 mm - 0,6 mm):	80,73
Sand, coarse (0,6 mm - 2 mm):	1,63
Gravel (> 2 mm):	0,00
Sum:	100,00

Moments Measures (Folk and Wards)

Percentile	Percentile	d(mm)	Φ
Amount in sieve	Amount passing		
5%	95%	0,48	1,07
16%	84%	0,36	1,47
25%	75%	0,34	1,57
40%	60%	0,30	1,73
Median 50%	50%	0,28	1,84
75%	25%	0,22	2,19
84%	16%	0,20	2,35
90%	10%	0,18	2,47
95%	5%	0,14	2,83

Moments Statistics

Mean	1,89
Sorting	0,49
Skewness	0,15
Kurtosis	1,17
Uniformity Coefficient	1,68

The analysis is executed according to DS405.9
 DS/EN933-1 extended by sieves to the ½ phi scale.

Size Classes and Percentiles
 are found by linear interpolation

Formulas

Mean $(\phi_{16\%} + \phi_{84\%} + \phi_{50\%}) / 3$ (Folk and Ward 1957)

Sorting $(\phi_{84\%} - \phi_{16\%}) / 4 + (\phi_{95\%} - \phi_{5\%}) / 6,6$ (Folk and Ward 1957)

Kurtosis $(\phi_{95\%} - \phi_{5\%}) / (2,44 * (\phi_{75\%} - \phi_{25\%}))$ (Folk and Ward 1957)

Skewness $(\phi_{16\%} + \phi_{84\%} - 2 * \phi_{50\%}) / (2 * (\phi_{84\%} - \phi_{16\%})) + (\phi_{5\%} + \phi_{95\%} - 2 * \phi_{50\%}) / (2 * (\phi_{95\%} - \phi_{5\%}))$ (Folk and Ward 1957)

Uniformity Coefficient $(d_{60\%} / d_{10\%})$ (dgf-Bulletin 1988)

Mean, sorting, skewness and kurtosis are based on "Amount in sieve". Uniformity coefficient is based on "Amount passing".

Øster Voldgade 10 1350 København K
 Tel.: +45 38 14 20 00 Telefax: +45 38 14 20 50
 Email: GEUS@geus.dk
 www.geus.dk

Grain Size Distribution

Subject: Station 40 Dybde 22 m

Frequency Percent
Cumulated Amount Passing

