

CHAPTER 4 'Research Methods'

Name ¹	Name in Dutch	Abbreviation	Higher rank name in Dutch	
Clay	zeer zware klei	ZK	zware klei	klei
Silty clay	matig zware klei	MK		
Silty clay loam/clay loam	lichte klei	LK		
Clay loam/sandy clay loam	zware zavel	ZZI	lichte zavel	zavel
Sandy loam	matig lichte zavel	MZI		
Loamy sand	zeer lichte zavel	LZI		
Sandy loam	zeer sterk lemig zand	(U)LZ	lemig zand	zand
Sandy loam	sterk lemig zand	(M)LZ		
Loamy sand	zwak lemig zand	(I)LZ		
Sand	leemarm zand	Z		
Silt loam	zware siltige leem	(Z)SL	siltige leem	leem
Silt	lichte siltige leem	(L)SL		
Silt loam	zware zandige leem	(Z)L	zandige leem	
Silt loam	lichte zandige leem	(L)L		

¹approximate equivalent according to U.S.D.A. nomenclature

Figure 4.2 Texture classification of clastic sediments, consisting of a mixture of sand, silt and clay (after Verbraeck 1984).

Name	Name in Dutch	Abbreviation
Peat	veen *	V3
Sandy peat	zandig veen **	ZV
Clayey peat	kleilig veen **	V2
Peaty sand	venig zand **	VZ
Peaty clay	venige klei **	V1
Strongly humic	humusrijk	H2
Very humic	zeer humeus	H1
Humic	matig humeus	H1
Slightly humic	matig humusarm	H0
Slightly humic	zeer humusarm	H0
Slightly humic	uiterst humusarm	H0

* no subdivision of texture according to Figure 4.2

** no further subdivision of texture according to Figure 4.2

*** subdivision of texture according to Figure 4.2

Figure 4.3 Classification of samples by their weight percentage of organic material. After De Bakker & Schelling (1966).

Table 4.1 Classification of grain size of sand and gravel. After Verbraeck (1984).

M50 (µm)	Name	Name in Dutch	Abbreviation	
50 - 105 µm	Extremely fine sand	uiterst fijn zand		UFZ
105 - 150 µm	Very fine sand	zeer fijn zand	fijn zand	ZFZ
150 - 210 µm	Fine sand	matig fijn zand		FZ
210 - 420 µm	Medium sand	matig grof zand	grof zand	MZ
420 - 2000 µm	Coarse / very coarse sand	grof tot zeer grof zand		
M50 (mm)	Name	Name in Dutch	Abbreviation	
2 - 5 mm	Very fine gravel	zeer fijn grind		ZFG
5 - 16 mm	Fine gravel	fijn grind		FG
16 - 64 mm	Coarse gravel	grof grind		GG
Smallest diameter (cm)	Name	Name in Dutch	Abbreviation	
6,4 - 10 cm	Stone	steen		ST
10 - 50 cm	Rock	kei		KEI
> 50 cm	Block	blok		BLOK

Table 4.2 Classification by gravel content. After Verbraeck (1984).

percent	Name	Name (in Dutch)	Abbreviation	Higher rank name (Dutch)
0-10	Slightly gravelly sand	iets grindhoudend zand	IGHZ	grindhoudend zand
10-20	Gravelly sand	matig grindhoudend zand	MGHZ	
20-50	Strongly gravelly sand	sterk grindhoudend zand	SGHZ	
50-80	Strongly sandy gravel	sterk zandhoudend grind	SZHG	zandhoudend grind
80-90	Sandy gravel	matig zandhoudend grind	MZHG	
90-100	Slightly sandy gravel	iets zandhoudend grind	IZHG	

Table 4.3 Other sample characteristics

Organic remains		Color		Oxydation	
r = riet	reed	wi = wit	white	o = oxydatie	oxydized (brownish)
h = hout	wood	ro = rood	red	or = oxydatie/reductie	oxydized / reduced
z = zegge	sedge	or = oranje	orange	r = reductie	reduced (greyish)
v = veenmos	Sphagnum	zw = zwart	black		
plr= plantenresten	plant remains	gr = grijs	grey		
els	alder	br = bruin	brown		
beuk	beech	ge = geel	yellow		
eik	oak	gn = groen	green		
wilg	willow	bl = blauw	blue		
		d = donker	dark		
		l = licht	light		
Calcium carbonate content		Iron content		Sample (M)	
0 = geen	< 0.5 %	0 = weinig	little oxydized iron	M1...10 monsters 1..10	Samples taken
1 = weinig	0.5 - 2 %	1 = matig	some oxydized iron		
2 = veel	> 2 %	2 = veel	much oxydized iron		
Ikl = Vegetation horizon		Groundwater (GW)		Remarks (unlimited)	
+ = goed ontwikkeld	clearly visible	GHG = gemiddeld hoogste GW	highest GW-level	P = fosfor	Phosfor
- = zwak ontwikkeld	faint	GW = actuele GW	actual GW level	ger = geroerd	reworked soil
		GLG = gemiddeld laagste GW	lowest GW level (averages)	oph = opgehoogd	raised
				? = onzeker	uncertain
				c = concreties	nodules
				+ = veel	much
				- = weinig	little
				Sch = schelpen	shells / shell remains
				wrsl = waarschijnlijk	probably
				# = begin/eind guts	begin/end of gauging
				gm = geen monster	no sample retrieved
				end = einde boring	deepest point reached

Table 4.4 Lithostratigraphic or lithogenetic units (STRAT) used in the core descriptions

Lithostratigraphic or lithogenetic units (STRAT)	
P	Middle and Lower Pleistocene formations
Df	Drente Formation, glaciofluvial deposits
Td	Twente Formation, coversand
Tp	Twente Formation, fluvioperiglacial deposits
To	Twente Formation, organic deposits
TD	Twente Formation, Delwijnen Member; eolian river dune deposits
Kb	Kreftenheye Formation; channel deposits
Kwk	Kreftenheye Formation; Wijchen Layer; floodbasin deposits or levee deposits
KWr	Kreftenheye Formation; Wijchen Layer; residual channel deposits and peat
Bb	Betuwe Formation; channel deposits
Bo	Betuwe Formation; natural levee deposits
Br	Betuwe Formation; residual channel deposits
Bk	Betuwe Formation; floodbasin deposits
Bc	Betuwe Formation; crevasse splay deposits
Bd	Betuwe Formation; dike breach deposits
Vg	Broek Formation; gytja
Vr	Broek Formation; Phragmites peat
Vz	Broek Formation; Carex peat
Vb	Broek Formation; Wood peat
Vo	Broek Formation; undifferentiated
WDb	Westland Formation, Duinkerke (=Dunkirk) deposits, channel deposits
WDk	Westland Formation, Duinkerke (=Dunkirk) deposits, floodbasin and natural levee deposits
WCb	Westland Formation, Calais deposits, channel deposits
WCk	Westland Formation, Calais deposits, floodbasin and natural levee deposits