 Chapter 8.4	1.1	Chapter 8.4.2		Chapter 8.4	.3	Chapter 8.4.4	Chapter 8.4.	5	Chapter 8.4.6					
boundary		Homogeneity	γ of the layer	Water		Organic, organo- technic or mineral layer	Layer bound	daries	Wind deposition	Coarse frag and remnar		-up cemente	ed layers	
		consisting of different parts	Layer composed of several strata of alluvial sediments or of tephra		Soil water status		Distinctness of the layer's lower boundary	-		Coarse fragr	nents			
		Described parts, by exposed area [%] (if all: write 100)								abundance, by volume				Size and shape class 4
 										·				

For cells coloured in brown, a code is required. For cells coloured in green, figures or free text are required.

The percentage refers to the exposed area, to the volume or to another reference explained in Annex 1. Unless stated otherwise in Annex 1, it refers to the fine earth and to the whole layer (not to a fraction of the layer). Do not leave cells empty. If a characteristic is not applicable, write NA. If there is a characteristic, which you did not investigate, write NI.

(NA is also used if a type 2, size class 2 etc. is not present. NI is also used if a type 2, size class 2 etc. is neglected because of little importance.)

You may prepare your individual short version using the excel file provided in Annex 5. If you are sure that in the area of your soil survey certain characteristics cannot occur, you may hide the respective columns.

Citation: IUSS Working Group WRB. 2022. World Reference Base for Soil Resources. 4th edition. Annex 4. International Union of Soil Sciences (IUSS), Vienna, Austria.

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Number of the layer								Remnants of	broken-up c	emented laye	ers				Free large pores between coarse fragments, by volume [%]
	and shape	stage of size and shape	stage of size and shape	class 4	of size and shape class 1, by volume	shape class 3, by volume	of size and shape class	abundance, by volume			Size and shape class of remnants cemented by cementing agent 1	shape class of remnants cemented by cementing	of remnants cemented by cementing agent 1, by	Abundance of remnants cemented by cementing agent 2, by volume [%]	



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	Chapter 8.4.	8																Chapter 8	
Number of the layer	Artefacts																	class	Subclass of the texture classes sand and loamy sand
	abundance,	Black carbon, by	Type 1 (dominant)	Type 2	Type 3	Type 4	Type 5	Size class of type 1	Size class of type 2	Size class of type 3	Size class of type 4	of type 5	of type 1,	of type 2,	of type 3,	Abundance of type 4, by volume	of type 5,		
	[%]	exposed area [%]											[%]	[%]	[%]	[%]	[%]		

Chapter 8.4	4.10												
Structure	netrability for ro	ots and siz	o classos aro	only reporte	d for addred	ates and artificia	al structural elem	ionts)					
	on of the Soil De				a loi aggregi			iento.)					
	-level structure												
	d-level structure				el structure.)								
First-level s	structure												
Type 1 (doi	minant)							Type 2					
	Abundance of	Grade		Size class			Abundance of		Abundance of			Abundance of	
	type 1, by		for roots	1 (dominant)			size class 2,		type 2, by	for roots		size class 1,	
 	volume [%]			(dominant)		by volume [%]	by volume [%]		volume [%]	 	(dominant)	 by volume [%]	by volume [%]

Number of the layer																
										rel structure e by volume of	the respec	tive first-level	structure)			
	Туре 3								Туре 1.1 (с							
	Туре	Abundance of type 3, by volume [%]	Grade	Penetrability for roots	Size class 1 (dominant)	2	Abundance of size class 1, by volume [%]	size class 2,		Abundance of type 1.1, by volume [%]	Grade	Penetrability for roots	Size class 1 (dominant)	2	size class 1,	Abundance of size class 2, by volume [%]
																
						T						T				
						 										

Number of the layer	r															
									Third-level (percentag	structure e by volume of	the respec	tive second-le	vel structure)		
	Type 1.2								Туре 1.1.1							
	Туре	Abundance of Gi type 1.2, by volume [%]	rade	Penetrability for roots	Size class 1 (dominant)	Size class 2	size class 1,	Abundance of size class 2, by volume [%]		Abundance of type 1.1.1, by volume [%]		Penetrability for roots	Size class 1 (dominant)	Size class 2	Abundance of size class 1, by volume [%]	size class 2,

		Chapter 8	.4.12											Chapter 8.4.	13		
Number of the layer		Non-matr	ix pores											Cracks			
	Wedge- shaped aggregates tilted between ≥	Type 1 (d	ominant)		Type 2			Туре 3			Type 4			Persistence	Continuity	Average width [mm]	Abundanc [number o cracks]
		Туре	Dominant size class	Abundance	Туре	Dominant size class	Abundance	Туре	Dominant size class	Abundance	Туре	Dominant size class	Abundance				
																	·

	Chapter 8.4	14	Chapter 8.4.1	17								Chapter 8.	4.18			Chapter 8.4.	.19	
Number of the layer	Stress feati	ires	Matrix colou	r									ons of darke nd lighter-co arts			Lithogenic [·]	variegate	S
	of pressure faces [%, see 8.4.14]	of slickensides	Colour 1 (dor	ninant)		Colour 2			Colour 3			textured	vertical tongues of coarser-	•	Horizontal area covered [%]	Colour 1 (do	minant)	
			Munsell moist	Munsell dry	Exposed area [%]		Munsell dry	Exposed area [%]		Munsell dry	area [%]	width of ≥ 0.5 cm, by exposed area [%]	parts with a horizontal extension of ≥ 1 cm, by exposed area [%]	10% of the exposed area [cm]		Munsell moist		Exposed area [%]

							Chapter 8.4.2										
Number of the layer							Redoximorpl	hic features									
	Colour 2			Colour 3			Colour 1 (don	ninant)						Colour 2			
		Size class	Exposed area [%]	Munsell moist	Size class	Exposed area [%]	moist	Munsell dry (only if reducti- morphic)	Substance	Size class 1 (dominant)	class 2	Cementation class	Exposed area [%]	Munsell moist	Munsell dry (only if reducti- morphic)	Substance	Size class 1 (dominant)
										 		·					
										 		·			 		

Number of the layer				Colour 3				 				dance, by e	xposed area	a [%]			Abundance of cemented oximorphic features, by volume [%]
	Size class 2	Cementation class	Exposed area [%]	Munsell moist	Munsell dry (only if reducti- morphic)	Substance	Location	class 2	Cementation class	area [%]	morphic:	morphic:	oxi- morphic: random		reducti- morphic: outer	reducti- morphic: random	

		Chapter 8.4.22						Chapter 8.4.2							Chapter 8.4	
Number of the layer	rH value	Initial weathering	Coatings a	nd bridges				Ribbon-like a	ccumulatio	ons					Carbonates	\$
		Abundance, by exposed area [%]	of clay coatings	bridges [%, see 8.4.23]	matter coatings and oxide coatings (report only	of cracked coatings	of uncoated sand and coarse silt grains [%,	Substance(s)	Number	Combined thickness [cm]	lf Iamellae: Texture	Abundance of clay coatings	of clay bridges [%, see 8.4.23]	Combined thickness within 50 cm of the upper limit	Content in t	Retarded
					if matrix colour value ≤ 3)		see 8.4.23]							of the uppermost lamella		reaction
			+													
			+							+						
			+							+						
			+							+						
										<u>_</u>						<u> </u>
										_						
			+							_						

									Chapter 8.4	.26	Chapter 8.4.	.27					Chapter 8.4.28
Number of the layer									Gypsum		Secondary	silica					Readily soluble salts
	Secondary (to be repor in the soil w according t	rted vater status	moist or we	et,					(only in layers with little readily	Secondary gypsum: Total abundance, by exposed	Type 1 (dominant)		(only DN	of type 2	abundance, by exposed	of DN and FC with size ≥ 1 cm, by	EC _{SE} [dS m ⁻¹]
	Type 1 (dominant)		Туре 3	Type 4	Abundance type 1 [%, see 8.4.25]	Abundance type 2 [%, see 8.4.25]	Abundance type 3 [%, see 8.4.25]	Abundance type 4 [%, see 8.4.25]	salts)	area [%]							

	4.29	Chapter 8.4.3														Chapter 8.4.32		
													Surface crusts			Continuity of hard materials and cemented layers		
Potentiometric pH measurement				Cementing agents			resistance	resistance	Susceptibility for cementation	Manner of failure		resistance	agent 1	Sealing agent 2	agent 3	occupied by the fractures	between the	
Measured value	Solution and mixing ratio		Agent 1 (dominant)	Agent 2	Agent 3												fractures [cm]	
	Field pH Potentiome measurem Measured	Field pH Potentiometric pH measurement Measured Solution value and mixing	Field pH Consistence Potentiometric pH Cementation, measurement by volume [%] Measured Solution value and mixing	Field pH Consistence Potentiometric pH Cementation, Cementing agents measurement by volume [%] Measured value Solution and mixing	Field pH Consistence Potentiometric pH Cementation, by volume measurement by volume [%] Agent 1 Measured Solution value and mixing (dominant)	Field pH Consistence Potentiometric pH Cementation, Cementing measurement by volume [%] agents Measured Solution and (dominant) mixing Agent 1	Field pH Consistence Potentiometric pH Cementation, by volume agents Cementation class Measured value Solution and mixing Agent 1 (dominant) Agent 2 Agent 3	Field pH Consistence Potentiometric pH measurement Cementation, by volume agents Cementation class Rupture resistance class Measured value Solution and mixing Agent 1 (dominant) Agent 2 Agent 3 Agent 3	Field pH Consistence Potentiometric pH measurement Cementation, by volume agents Cementation class Rupture resistance class Rupture resistance class, moist Measured value Solution and mixing Agent 1 (dominant) Agent 2 Agent 3 Agent 3	Field pH Consistence Potentiometric pH measurement Cementation, by volume agents Cementation class Rupture resistance class, moist Rupture resistance class, dry Susceptibility for cementation Measured value Solution and mixing Agent 1 (dominant) Agent 2 Agent 3 Agent 3 Image: Cementation resistance class, moist Image: Cementation resistance class, moist Susceptibility for cementation	Field pH Consistence Potentiometric pH measurement Cementation, by volume [%] Cementing agents Cementation Rupture class Rupture resistance class, moist Susceptibility for cementation Manner of failure Measured value Solution and mixing Agent 1 (dominant) Agent 2 (dominant) Agent 3 Agent 3 Image: Cementation Rupture resistance class, moist Susceptibility resistance class, dry Manner of for cementation	Field pH Consistence Potentiometric pH measurement Cementation, by volume agents Cementation class Rupture resistance class, moist Susceptibility for cementation for cementation for class, dry Manner of for cementation for cementation for class, dry Plasticity Measured value Solution and mixing Agent 1 (dominant) Agent 2 Agent 3 Image: Cementation of class Image: Cementatio	Field pH Consistence Potentiometric pH measurement Cementation, by volume agents Cementing agents Cementation class Rupture resistance class, moist Susceptibility for cementation for cementation for class, dry Plasticity penetration for class, dry Penetration for class, dry Measured value Solution and mixing Agent 1 (dominant) Agent 2 Agent 3 Agent 3 Image: Cement 3 and class Image	Field pH Consistence Surface cm Potentiometric pH measurement Cementation, log agents Cementation class Rupture resistance class, moist Susceptibility for cementation for class, dry Manner of failure Plasticity Penetration sealing agent 1 (dominant) Measured value Solution wixing Agent 1 (dominant) Agent 2 Agent 3 Agent 3 Image: Cement and mixing Image: Cement and mixing <t< td=""><td>Field pH Consistence Surface crusts Potentiometric pH measurement Cementation, by volume agents Cementation class Rupture resistance class, moist Susceptibility for cementation for class, dry Manner of failure Plasticity resistance agent 1 (dominant) Sealing agent 2 Measured value Solution and mixing Agent 1 (dominant) Agent 2 Agent 3 Image: Agent 3 Imagent 3 Imagent 3</td><td>Field pH Consistence Surface crusts Potentiometric pH measurement Cementation, by volume agents Cementation class Rupture resistance class, dry Susceptibility for cementation for class, dry Plasticity for cementation for class Plasticity for cementation for class, dry Plasticity for cementation for class Plasticity for cementation for class, dry Plasticity for cementation for class Plasticity for cementation for class, dry Plasticity for cementation for class Plasticity for cementation for cementation for class Plasticity for cementation for cementation for class Plasticity for cementation for class Plasticity for cementation for cementation for class Plasticity for cementation for class Plasticity for cementation for class Plasticity for cementation for</td><td>Field pH Consistence Surface crusts Continuit materials cemented cementation Cementation Cementation Rupture cemented cementation Susceptibility for cementation for cementation for cementation cementation Penetration cemented cemented cemented cemented cementation Continuit materials cemented cemented cemented cemented cemented cemented cementation Susceptibility for cementation for cementation Penetration fealure Penetration cemented cemented cemented cementation Volume cemented cemented cementation Volume cementation Volume</td></t<>	Field pH Consistence Surface crusts Potentiometric pH measurement Cementation, by volume agents Cementation class Rupture resistance class, moist Susceptibility for cementation for class, dry Manner of failure Plasticity resistance agent 1 (dominant) Sealing agent 2 Measured value Solution and mixing Agent 1 (dominant) Agent 2 Agent 3 Image: Agent 3 Imagent 3 Imagent 3	Field pH Consistence Surface crusts Potentiometric pH measurement Cementation, by volume agents Cementation class Rupture resistance class, dry Susceptibility for cementation for class, dry Plasticity for cementation for class Plasticity for cementation for class, dry Plasticity for cementation for class Plasticity for cementation for class, dry Plasticity for cementation for class Plasticity for cementation for class, dry Plasticity for cementation for class Plasticity for cementation for cementation for class Plasticity for cementation for cementation for class Plasticity for cementation for class Plasticity for cementation for cementation for class Plasticity for cementation for class Plasticity for cementation for class Plasticity for cementation for	Field pH Consistence Surface crusts Continuit materials cemented cementation Cementation Cementation Rupture cemented cementation Susceptibility for cementation for cementation for cementation cementation Penetration cemented cemented cemented cemented cementation Continuit materials cemented cemented cemented cemented cemented cemented cementation Susceptibility for cementation for cementation Penetration fealure Penetration cemented cemented cemented cementation Volume cemented cemented cementation Volume	

	Chapter 8.4.33 Chapter 8.4.34									Chapter 8.4.35 Chapter 8.4.36									
	Volcanic gla andic chara		Permafrost	features						Bulk densi	ity	Soil organic carbon (C _{org})							
	Abundance of volcanic glasses in the sand and coarse silt fraction	and NaF field test								Packing density	Bulk density	Organic carbon content [%]		Natural accumulations of organic matter					
			Feature 1 (dominant)	Feature 2	Feature 3	Abundance feature 1, by exposed area [%]	feature 2, by exposed	feature 3,				min.	max.	Type 1 (dominant)	Type 2	Туре 3	type 1, by exposed	Abundance type 2, by exposed area [%]	
												+							
						L		L	<u> </u>	L	L	<u> </u>	J	<u> </u>			L		

terations				
Chapter 8.4.39 Human alterations				
Additions of human-transported natural material				
	Material 3	Abundance material 1, by volume [%]		
	aterial	aterial Material 2 Material 3		

									Chapter 8.4.40	Horizon designation									
Number of the layer									Parent	rent Degree of decomposition in organic layers and presence of dead									
							In-situ altera	ations	Soil aggregate formation after additions or after in-situ alterations			Subdivision of the Oa horizon	Dead natura						
	Abundance material 2, by volume [%]	Abundance material 3, by volume [%]	Texture	MS: Carbonate content	MS: C _{org} content	MS: C _{org} content	Type 1 (dominant)	Туре 2					Type 1 (dominant)		Abundance type 1, by volume [%]	type 2, by			
					min.	max.													
														·····					