

Cohesion

in Parameters

- Geotechnical parameters,
- Shear strength parameters

The cohesion is a term used in describing the shear strength soils. Its definition is mainly derived from the Mohr-Coulomb failure criterion and it is used to describe the non-frictional part of the shear resistance which is independent of the normal stress. In the stress plane of Shear stress-effective normal stress, the soil cohesion is the intercept on the shear axis of the Mohr-Coulomb shear resistance line

Typical values of soil cohesion for different soils

Some typical values of soil cohesion are given below for different soil types. The soil cohesion depends strongly on the consistence, packing, and saturation condition. The values given below correspond to normally consolidated condition unless otherwise stated. These values should be used only as guideline for geotechnical problems; however, specific condition of each engineering problem often needs to be considered for an appropriate choice of geotechnical parameters.

Description	USCS	Cohesion [kPa]			Reference
		min	max	Specific value	
Well graded gravel, sandy gravel, with little or no fines	GW	-	-	0	[1],[2],[3],
Poorly graded gravel, sandy gravel, with little or no fines	GP	-	-	0	[1],[2], [3],
Silty gravels, silty sandy gravels	GM	-	-	0	[1],
Clayey gravels, clayey sandy gravels	GC	-	-	20	[1],
Well graded sands, gravelly sands, with little or no fines	SW	-	-	0	[1],[2], [3],
Poorly graded sands, gravelly sands, with little or no fines	SP	-	-	0	[1],[2], [3],
Silty sands	SM	-	-	22	[1],
Silty sands - Saturated compacted	SM	-	-	50	[3],
Silty sands - Compacted	SM	-	-	20	[3],
Clayey sands	SC	-	-	5	[1],
Clayey sands - Compacted	SC	-	-	74	[3],
Clayey sands -Saturated compacted	SC	-	-	11	[3],
Loamy sand, sandy clay Loam - compacted	SM, SC	50	75		[2],
Loamy sand, sandy clay Loam -	SM, SC	10	20		[2],

saturated					
Sand silt clay with slightly plastic fines - compacted	SM, SC	-	-	50	[3],
Sand silt clay with slightly plastic fines - saturated compacted	SM, SC	-	-	14	[3],
Inorganic silts, silty or clayey fine sands, with slight plasticity	ML	-	-	7	[1],
Inorganic silts and clayey silts - compacted	ML	-	-	67	[3],
Inorganic silts and clayey silts - saturated compacted	ML	-	-	9	[3],
Inorganic clays, silty clays, sandy clays of low plasticity	CL	-	-	4	[1],
Inorganic clays, silty clays, sandy clays of low plasticity - compacted	CL	-	-	86	[3],
Inorganic clays, silty clays, sandy clays of low plasticity - saturated compacted	CL	-	-	13	[3],
Mixture if inorganic silt and clay - compacted	ML-CL	-	-	65	[3],
Mixture if inorganic silt and clay - saturated compacted	ML-CL	-	-	22	[3],
Organic silts and organic silty clays of low plasticity	OL	-	-	5	[1],
Inorganic silts of high plasticity - compactd	MH	-	-	10	[1],
Inorganic silts of high plasticity - saturated compacted	MH	-	-	72	[3],
Inorganic silts of high plasticity	MH	-	-	20	[3],
Inorganic clays of high plasticity	CH	-	-	25	[1],
Inorganic clays of high plasticity - compacted	CH	-	-	103	[3],
Inorganic clays of high plasticity - satrated compacted	CH	-	-	11	[3],
Organic clays of high plasticity	OH	-	-	10	[1],
Loam - Compacted	ML, OL, MH, OH	60	90		[2],
Loam - Saturated	ML, OL, MH, OH	10	20		[2],
Silt Loam - Compacted	ML, OL, MH, OH	60	90		[2],
Silt Loam - Saturated	ML, OL, MH, OH	10	20		[2],
Clay Loam, Silty Clay Loam - Compaced	ML, OL, CL, MH, OH, CH	60	105		[2],

Clay Loam, Silty Clay Loam - Saturated	ML, OL, CL, MH, OH, CH	10	20		[2],
Silty clay, clay - compacted	OL, CL, OH, CH	90	105		[2],
Silty clay, clay - saturated	OL, CL, OH, CH	10	20		[2],
Peat and other highly organic soils	Pt	-	-		

REFERENCES

1. Swiss Standard SN 670 010b, Characteristic Coefficients of soils, Association of Swiss Road and Traffic Engineers
2. Minnesota Department of Transportation, Pavement Design, 2007
3. NAVFAC Design Manual 7.2 - Foundations and Earth Structures, SN 0525-LP-300-7071, REVALIDATED BY CHANGE 1 SEPTEMBER 1986

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