

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Table of Contents

<u>CURRENT LAYERS</u>	<u>3</u>
SHEET 1:	7
SHEET 2:	10
SHEET 3:	13
SHEET 4:	16
SHEET 5:	19
SHEET 6:	22
SHEET 7:	25
SHEET 8:	28
SHEET 9:	32
SHEET 10:	35
SHEET 11:	38
SHEET 12:	41
SHEET 13:	44
SHEET 14:	47
SHEET 15:	50
SHEET 16:	53
SHEET 17:	57
SHEET 18:	59
SHEET 19:	63
SHEET 20:	66
SHEET 21:	69
SHEET 22:	72
SHEET 23:	75
SHEET 24:	78
SHEET 25:	81
SHEET 26:	84
SHEET 27:	87
SHEET 28:	90
SHEET 29:	93
SHEET 30:	97
SHEET 31:	100
SHEET 32:	103
SHEET 33:	106
SHEET 34:	109
SHEET 35:	112
SHEET 36:	115
SHEET 37:	118
SHEET 38:	122
SHEET 39:	125
SHEET 40:	128
SHEET 41:	131
SHEET 42:	134
SHEET 43:	137
SHEET 44:	140
SHEET 45:	144
SHEET 46:	147

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 47:	150
SHEET 48:	153
SHEET 49:	156
SHEET 50:	159
<u>SUBGRADE LAYERS</u>	<u>171</u>
SHEET 1:	172
SHEET 2:	175
SHEET 3:	178
SHEET 4:	181
SHEET 5:	184
SHEET 6:	187
SHEET 7:	191
SHEET 8:	194
SHEET 9:	197
SHEET 10:	200
SHEET 11:	203
SHEET 12:	206
SHEET 13:	209
SHEET 14:	213
SHEET 15:	216
SHEET 16:	219
SHEET 17:	222
SHEET 18:	225
SHEET 19:	228
SHEET 20:	231
SHEET 21:	234
SHEET 22:	237
SHEET 23:	241
SHEET 24:	244
SHEET 25:	247
SHEET 26:	250
SHEET 27:	253
SHEET 28:	256
SHEET 29:	259
SHEET 30:	263
SHEET 31:	266
SHEET 32:	269
SHEET 33:	272
SHEET 34:	275
SHEET 35:	278
SHEET 36:	281
SHEET 37:	284
SHEET 38:	287
SHEET 39:	290
SHEET 40:	294
SHEET 41:	297

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

CURRENT LAYERS

PRACTICAL GUIDES FOR THE CONSTRUCTION OF ROAD EARTHWORKS.

I. CONSTRUCTION OF CURRENT LAYERS

I.1. The list of symbols used in the sheets making up the practical guides and their significance

W_{opt} – optimal compaction humidity (Proctor)

C.B.R. – Californian bearing ratio

I.C. – consistency index of soils

D_{max} – maximum dimension of the granule

EN – sand equivalent

a – alterability degree

I.P. – plasticity index

f – fragmentability degree

d – material's density in dry state

Q/S – the compaction energy defined according to the French methodology where Q is the material volume to be executed in a time unit (day, shift, hour) expressed in m³ and S – surface swept out by the compactor's drums in the selected time unit, expressed in m²

e – the thickness of the soil layer to be executed

n – the number of passes of the compactors in the same trace

P1, P2, P3 – tire compactors

V1...V5 – vibrating compactors

PD1, PD2 – “sheep's foot” compactors

th – very high humidity

h – with high humidity (humide)

m – with medium humidity (medium)

s – with reduced humidity (sec)

i – in immersed state (immerse)

The construction case index – for example:

A1(h) – R/D

Has the following significance

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A1 – earth class according to the French classification

h – earth state (very humid)

R/D – current fill (R) and cut (D) layers

I.2 List of sheets consisting of the practical guides

Sheet no.

Construction case index

Page No:

Tables for Earthworks Construction Cases

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1	A 1	(h)	—	R/D
2	A 1	(m)	—	R/D
3	A 1	(s)	—	R/D
4	A 2	(h)	—	R/D
5	A 2	(m)	—	R/D
6	A 2	(s)	—	R/D
7	A 3	(h)	—	R/D
8	A 3	(m)	—	R/D
9	A 3	(s)	—	R/D
10	A 4	(h, m, s)	—	R/D
11	B 1	(h, m, s)	—	R/D
12	B 2	(h)	—	R/D
13	B 2	(m)	—	R/D
14	B 2	(s)	—	R/D
15	B 3	(h, m, s)	—	R/D
16	B 4	(h)	—	R/D
17	B 4	(m)	—	R/D
18	B 4	(s)	—	R/D
19	B 4	(i)	—	R/D
20	B 5	(h)	—	R/D
21	B 5	(m)	—	R/D
22	B 5	(s)	—	R/D
23	B 6	(h)	—	R/D
24	B 6	(m)	—	R/D
25	B 6	(s)	—	R/D

Tables for Earthworks Construction Cases

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26	C 1 (h)	— R/D
27	C 1 (m)	— R/D
28	C 1 (s)	— R/D
29	C 2 (h)	— R/D
30	C 2 (m)	— R/D
31	C 2 (s)	— R/D
32	C 3 (h)	— R/D
33	C 3 (m)	— R/D
34	C 3 (s)	— R/D
35	D 1 (h, m, s)	— R/D
36	D 2 (h, m, s)	— R/D
37	D 3 (h, m, s)	— R/D
38	D 4 (h, m, s)	— R/D
39	E 1 (CR ₂) — h	— R/D
40	E 1 (CR ₂) — s, m	— R/D
41	E 1 (CR ₁)	— R/D
42	E 1 (CR ₃) — s, m	— R/D
43	E 1 (CR ₃) — h	— R/D
44	E 1 (CR ₃) — th	— R/D
45	E 2	— R/D
46	E 3 (MA1)	— R/D
47	E 3 (MA2)	— R/D
48	E 3 (MA3)	— R/D
49	E 3 (MA4)	— R/D
50	F	— R/D

Tables for Earthworks Construction Cases

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SHEET 1:

CONSTRUCTION CASE:

EARTHWORKS

$A_1(h) - R_D$ |
Current layers

- Nature and state of available soils**

Non-plastic dusts, loess, alluvial dusts, non-polluted fine sands, earths with porous micro-fossils, fly ashes with high humidity (h)

Geotechnical characteristics

UMIDITATE $>W_{opt} + 1$	C.B.R	I.C.	D _{max} (mm)	< 80 %	m	E.N.	a %	>2mm %	I.P.	f %	γ^d g/cm ³
< 8	-	-	< 50	> 35	-	-	-	-	< 10	-	-

- Constructive characteristics**

Due to the reduced bearing capacity, these soils are difficult to execute. Their placement in intermediary deposits is problematic since even reduced precipitations can supra-wet them *)

Tables for Earthworks Construction Cases

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Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				In thin layers
Humidity modif.			Treatment with lime, cement	Aeration
Treatment / improvement	It is advised to stop work	It is advised to stop work		
Compaction thickness			Medium layers	Thin
Compaction intensity			Light	Light
Bed thickness				
Bed protection				
Embankment height				Small or medium

Tables for Earthworks Construction Cases

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Compaction guide

INTENSITATEA COMPACTARII		TIPIUL CILINDRULUI COMPACTOR.																		
		PNEURI			VIBRATOR												PICIOR DE OAIE			
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USOARA	Q/S	0,08	0,12	0	0,05	0,105	0,11	0,095	0,165	0,165	0,18	0,18	0,20	0,20	0,20	0,20	0	0,22	0,08	0,10
	e	0,30	0,50	0	0,30	0,30	0,25	0,50	0,50	0,40	0,40	0,50	0,50	0,40	0,40	0,40	0	0,50	0,30	0,40
	n	4	4	0	3	3	3	3	3	2	2	3	3	2	2	0	2	4	4	
MEDIE	Q/S																			
	e																			
	n																			
GREA	Q/S	NOTA: *) In cazul unor umeziri excesive, lucrarile mai pot fi continute in conditiile indicate in Annex 1.3 „ Ghid pentru compactarea pământurilor la umiditate ridicată ”																		
	e																			
	n																			

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) In case of some excessive wetting, the work can be continued in the conditions indicated in Annex 1.3 "Guide for compaction of soils at high humidity"

Tables for Earthworks Construction Cases

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SHEET 2:

CONSTRUCTION CASE:

EARTHWORKS

A₁ (m) - R_D
Current layers

- **Nature and state of available soils**

Non-plastic dusts, loess, alluvial dusts, non-polluted fine sands, earths with porous micro-fossils, fly ashes with medium humidity (h)

- **Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	< 80 %	m	E.N.	a %	>2mm %	I.P.	f %	γ^d g/cm ³
< W _{opt} + 1	< 25	-	< 50	> 30	-	-	-	-	< 10	-	-
> W _{opt} - 2	> 8	-	-	-	-	-	-	-	-	-	-

- **Constructive characteristics**

Tables for Earthworks Construction Cases

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These earths can be reused but are very sensitive to weather conditions; the works can be stopped immediately either due to excessive humidity *) or due to the fast and excessive drying

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal		In thin layers
Humidity modif.			Treatment with lime, cement	Aeration
Treatment / improvement	It is advised to stop work			
Compaction thickness		Medium layers	Medium layers	Medium layers
Compaction intensity		Light	Medium	Medium
Bed thickness				
Bed protection				
Embankment height		Small or medium		Small or medium

Tables for Earthworks Construction Cases

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Compaction guide

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picioar de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Great heavy

NOTE: *) In ca-

indicated in Annex 1.3 "Guide for compaction of soils at high humidity".

Tables for Earthworks Construction Cases

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SHEET 3:

CONSTRUCTION CASE:

EARTHWORKS

$A_1(s) - R_D$ |
Current layers

- Nature and state of available soils**

Non-plastic dusts, loess, alluvial dusts, non-polluted fine sands, earths with porous micro-fossils, fly ashes with reduced or dried humidity (h)

- Geotechnical characteristics**

UMIDITATE	C.G.R	I.C.	D _{max} (mm)	< 80 %	m	E.N. %	a %	>2mm %	I.P.	f %	γ^d g/cm ³
< $W_{opt} - 2$	> 25	-	< 50	> 30	-	-	-	-	< 10	-	-

Tables for Earthworks Construction Cases

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- **Constructive characteristics**

For the execution of these soils, technical solutions are needed compensating the negative effect of reduced humidity

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	It is advised to stop work			
Compaction thickness		Thin layers	Thin layers	Medium layers
Compaction intensity		Medium	Heavy	Medium
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

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Compaction guide

INTENSITATEA COMPACTARII	PARAMETRII COMPACTARI	TIPUL CILINDRULUI COMPACTOR.																
		PNEUJRI		VIBRATOR										PIOR DE OALE				
				V1		V2		V3		V4		V5						
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b
USOARA	Q/s																	
	•																	
	n																	
MEDIE	Q/s	0,05	0,08	0,15	0,06	0,06	0,06	0,05	0,10	0,10	0,08	0,08	0,15	0,15	0,09	0,09	0,20	0,165
	e	0,30	0,40	0,50	0,30	0,30	0,25	0,25	0,40	0,40	0,30	0,30	0,50	0,50	0,30	0,30	0,50	0,50
	n	6	5	3	5	5	4	4	4	4	4	4	3	3	3	3	3	3
GREIA	Q/s	0,03	0,04	0,08	0	0	0	0	0,04	0,04	0,04	0,04	0,07	0,07	0,045	0,045	0,10	0,08
	e	0,20	0,20	0,30	0	0	0	0	0,25	0,25	0,20	0,20	0,30	0,30	0,20	0,20	0,30	0,30
	n	7	5	5	0	0	0	0	6	6	5	5	4	4	5	5	3	4

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Tables for Earthworks Construction Cases

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Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

SHEET 4:

CONSTRUCTION CASE:

EARTHWORKS

A₂(h) - R/D

Current layers

- Nature and state of available soils

Fine loamy sands, marls and slightly plastic clays, granitic sands with high humidity (h)

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	< 80 %	E.N.	a %	>2mm %	I.P.	f %	γ^d g/cm ³
> W _{opt} *2	< 5	< 1	< 50	> 35	-	-	-	< 20 > 10	-	-

Tables for Earthworks Construction Cases

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- **Constructive characteristics**

Due to the reduced bearing capacity, these soils are difficult to execute. Above a certain value* of humidity, their use in works becomes practically impossible

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				Thin layers
Humidity modif.		Treatment with lime	Treatment with lime	Aeration
Treatment / improvement	It is advised to stop work			
Compaction thickness		Medium or thin layers	Medium or thin layers	
Compaction		Light	Light	Light or

Tables for Earthworks Construction Cases

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intensity				medium
Bed thickness				
Bed protection				
Embankment height			Small	Small

Compaction guide

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR .																		
		PNEURI			VIBRATOR												PIOR DE OAB			
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USOARA	Q/s	0,06	0,09	0	0,08	0,08	0,08	0,065	0,12	0,12	0,11	0,11	0,15	0,15	0,125	0,125	0	0,165	0,10	0,12
	e	0,30	0,50	0	0,30	0,30	0,25	0,20	0,50	0,50	0,35	0,35	0,50	0,50	0,35	0,35	0	0,50	0,30	0,40
	n	5	6	0	4	4	3	3	4	4	3	3	3	3	3	3	0	3	3	3
MEDIU	Q/s	0,04	0,07	0,12	0,04	0,04	0,045	0,03	0,08	0,08	0,07	0,07	0,11	0,11	0,08	0,08	0,155	0,12	0,08	0,10
	e	0,30	0,40	0,50	0,20	0,20	0,20	0,15	0,40	0,40	0,30	0,30	0,50	0,50	0,30	0,30	0,50	0,50	0,30	0,40
	n	8	6	4	5	5	4	5	5	5	4	4	5	5	4	4	3	4	4	4
GREU	Q/s	NOTA: *) Această valoare este indicată în Anexa 13 „Ghid practic pentru compactarea pământurilor la umiditate ridicată”																		
	e																			
	n																			

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Tables for Earthworks Construction Cases

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Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

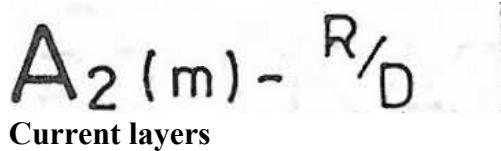
Grea = heavy

NOTE: *) This value is indicated in Annex 1.3 "Guide for compaction of soils at high humidity"

SHEET 5:

CONSTRUCTION CASE:

EARTHWORKS



- **Nature and state of available soils**

Fine loamy sands, marls and slightly plastic clays, granitic sands with medium humidity (h)

- **Geotechnical characteristics**

Tables for Earthworks Construction Cases

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UMIDITATE	C.B.R	I.C.	D _{max} (mm)	< 80 %	E.N.	a %	>2mm %	I.P.	f %	γ _d g/cm ³
< W _{opt} + 2	< 15	< 1.2	< 50	> 35	-	-	-	< 20	-	-
> W _{opt} - 2	> 5	> 1.0						> 10		

- **Constructive characteristics**

These soils can be used for the execution of embankments laid out in thin or medium layers

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal		
Humidity modif.				
Treatment / improvement	It is advised to stop work			
Compaction thickness		Medium or thin layers	Medium or thin layers	
Compaction		Medium	Medium	Heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

intensity				
Bed thickness				
Bed protection				
Embankment height		Small or medium		

Compaction guide

INTENSITATEA COMPACTATORII		TIPUL CILINDRULUI COMPACTOR.																		
		PNEURI			VIBRATOR												PIEON DE OALE			
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USOARA	Q/s																			
	•																			
	n																			
MEDIE	Q/s	0,04	0,07	0,12	0,04	0,04	0,045	0,03	0,08	0,08	0,07	0,07	0,11	0,11	0,08	0,08	0,155	0,12	0,08	0,10
	e	0,50	0,40	0,50	0,20	0,20	0,20	0,15	0,40	0,40	0,30	0,30	0,50	0,50	0,30	0,30	0,50	0,50	0,30	0,40
	n	13	6	4	5	5	4	5	5	5	4	4	5	5	4	4	3	4	4	4
GREIA	Q/s	0,02	0,04	0,06	0,02	0,02	0,025	0,02	0,04	0,04	0,04	0,04	0,06	0,06	0,045	0,045	0,09	0,065	0,05	0,08
	e	0,20	0,30	0,40	0,20	0,20	0,20	0,15	0,30	0,30	0,25	0,25	0,40	0,40	0,25	0,25	0,50	0,40	0,20	0,30
	n	10	8	7	10	10	8	8	8	8	6	6	7	7	6	6	6	6	4	5

Legend:

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

SHEET 6:

CONSTRUCTION CASE:

EARTHWORKS

$A_2(s) - \frac{R}{D}$
Current layers

- Nature and state of available soils

Fine loamy sands, marls and slightly plastic clays, granitic sands with reduced or dry humidity (s)

- Geotechnical characteristics

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

UMIDITATE	C.B.R.	I.C.	D _{max} (mm)	< 80 m	E.N. %	a %	>2mm %	I.P.	i %	γ_d g/cm ³
$\leq W_{opt}$	> 15	> 1,2	< 50	> 35	-	-	-	< 20	> 10	-

- **Constructive characteristics**

Due to the reduced humidity, these soils need a heavy compaction. Compaction of such soils at very reduced humidity is practically impossible

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment /	It is advised			

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

improvement	to stop work			
Compaction thickness		Medium or thin layers	Medium or thin layers	thin layers
Compaction intensity		Medium	Heavy	Heavy
Bed thickness				
Bed protection				
Embankment height				

Compaction guide

*) INTENSITATEA COMPACTARII	PARAMETRUL COMPACTARII	TIPUL CILINDRULUI COMPACTOR .																		ACIOR DE OAB
		PNEURI			VIBRATOR															
		V1			V2			V3			V4			V5			a	b		
P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2		
Q/s	0,02	0,04	0,06	0,02	0,02	0,025	0,02	0,04	0,04	0,04	0,04	0,06	0,06	0,045	0,045	0,09	0,065	0,05	0,06	
Q	0,20	0,30	0,40	0,20	0,20	0,20	0,15	0,30	0,30	0,25	0,25	0,40	0,40	0,25	0,25	0,50	0,40	0,20	0,30	
n	10	8	7	10	10	8	8	8	8	6	6	7	7	6	6	6	6	4	5	
Q/s	0,04	0,07	0,12	0,04	0,04	0,045	0,03	0,08	0,08	0,07	0,07	0,11	0,11	0,08	0,08	0,155	0,12	0,08	0,10	
e	0,30	0,40	0,50	0,20	0,20	0,20	0,15	0,40	0,40	0,30	0,30	0,50	0,50	0,30	0,30	0,50	0,50	0,30	0,40	
n	8	6	4	5	5	5	5	5	5	4	4	5	5	4	4	3	4	4	4	
Q/s	0	0,04	0,06	0	0	0	0	0,04	0,04	0,035	0,035	0,055	0,055	0,04	0,04	0,09	0,06	0,04	0,05	
e	0	0,20	0,30	0	0	0	0	0,20	0,20	0,15	0,15	0,30	0,30	0,20	0,20	0,30	0,30	0,20	0,30	
n	0	5	5	0	0	0	0	5	5	4	4	5	5	5	5	3	5	5	6	

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) thin layers **) thin or medium layers

SHEET 7:

CONSTRUCTION CASE:

EARTHWORKS

$A_3(h) - \frac{R}{D}$

Current layers

- **Nature and state of available soils**

Very plastic clays, marls and dusts with high humidity (h)

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- Geotechnical characteristics

UMIDITATE	C.B.R.	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P.	f %	γ_d g/cm ³
> W _{opt} +4	<3	<0,9	<50	>35	-	-	-	<50 >20	-	-

- Constructive characteristics

These soils are difficult to execute due to the reduced bearing capacity in high humidity state *) Moreover, they are very plastic and adherent. Their prior drying takes a long time and is not efficient.

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				In layers
Humidity modif.			Lime treatment	Aeration
Treatment / improvement	It is advised to stop work	It is advised to stop work *)		

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction thickness			Medium or thin layers	Medium or thin layers
Compaction intensity			Medium	Medium
Bed thickness				
Bed protection				
Embankment height				Small

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR.																		
		PNEURI			VIBRATOR										PICIOR DE OAIE					
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b		
USOARA	Q/s																			
MEDIE	e																			
MEDIE	n																			
GREA	Q/s	0,02	0,04	0,06	0	0	0	0	0,04	0,04	0,045	0,045	0,06	0,08	0,05	0,05	0,10	0,07	0,16	0,09
GREA	e	0,20	0,30	0,40	0	0	0	0	0,30	0,30	0,25	0,25	0,40	0,40	0,25	0,25	0,50	0,40	0,30	0,40
GREA	n	10	8	7	0	0	0	0	8	8	6	6	7	7	5	5	5	6	5	5
		NOTA: *) In cazul unor umeziri excesive, lucrarile mai pot fi continuat in conditiile indicate in Anexa 1.3, "Ghid pentru compactarea pominuturilor la umiditati ridicate"																		

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) In case of some excessive wetting, the work can be continued in the conditions indicated in Annex 1.3 "Guide for compaction of soils at high humidity"

SHEET 8:

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

CONSTRUCTION CASE:

EARTHWORKS

A₃ (m) - R/D

Current layers

- Nature and state of available soils**

Very plastic clays, marls and dusts with medium humidity (m)

- Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	< 80 %	m	E.N. %	a %	>2mm %	I.P.	f %	γ_d g/cm ³
<W _{opt} +4	<15	<1,3	<50	>35	-	-	-	-	<50	-	-
>W _{opt} -4	>3	>0,9							>20		

- Constructive characteristics**

Due to high plasticity of these earths, the sliding danger increases together with the embankment height even in the most favorable working conditions

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal		
Humidity modif.				
Treatment / improvement	It is advised to stop work			
Compaction thickness		Medium or thin layers	Medium or thin layers	
Compaction intensity		Medium	Heavy	Heavy
Bed thickness				
Bed protection				
Embankment height		Small or medium	Small or medium	Small or medium

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

		TIPUL CILINDRULUI COMPACTOR																		
INTENSITATEA COMPACTARI	PARAMETRII COMPACTARI	PNEURI			VIBRATOR										PICIOR DE OAIE					
					V1		V2		V3		V4		V5							
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USOARA	Q/s																			
	n																			
MEDIA	Q/s	0,02	0,04	0,06	0	0	0	0	0,04	0,04	0,045	0,045	0,06	0,06	0,05	0,05	0,10	0,07	0,06	0,09
	e	0,20	0,30	0,40	0	0	0	0	0,30	0,30	0,25	0,25	0,40	0,40	0,25	0,25	0,50	0,40	0,30	0,40
	n	10	8	7	0	0	0	0	8	8	6	6	7	7	5	5	5	6	5	4
GREA	Q/s	0	0,03	0,05	0	0	0	0	0,02	0,02	0,02	0,02	0,04	0,04	0,03	0,03	0,06	0,05	0,05	0,06
	e	0	0,20	0,30	0	0	0	0	0,20	0,20	0,15	0,15	0,30	0,30	0,20	0,20	0,30	0,30	0,20	0,30
	n	0	7	6	0	0	0	0	10	10	8	8	8	8	7	7	5	6	4	5

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 9:

CONSTRUCTION CASE:

EARTHWORKS

A₃ (s) - R_{ID}
Current layers

- Nature and state of available soils

Very plastic clays, marls and dusts with reduced or dried humidity (s)

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m	E.N. %	a %	>2mm %	I.P.	f %	γ^d g/cm ³
$\langle W_{opt} - 4 \rangle$	>15	>1,3	<50	>35	-	-	-	<50 >20	-	-

- Constructive characteristics

Due to high plasticity of these earths, the sliding danger increases together with the embankment height. The strong cohesion of this material mandates the execution of compaction in thin layers. For very low humidity, compaction is practically impossible

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei
Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction			In layers	In layers
Humidity modif.				
Treatment / improvement	It is advised to stop work			
Compaction thickness		Medium or thin layers	thin layers	thin layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness				
Bed protection				
Embankment height		Small or medium	Small or medium	Small or medium

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII PARAMETRII COMPACTARII	TIPUL CILINDRULUI COMPACTOR.																			
	PNEURI			VIBRATOR										PICIOR DE OAE						
	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2	
*) GREA **) GREAVAREA	Q/s	0	0,03	0,05	0	0	0	0	0,02	0,02	0,02	0,02	0,04	0,04	0,04	0,04	0,06	0,05	0,06	
	q	0	0,20	0,30	0	0	0	0	0,20	0,20	0,15	0,15	0,30	0,30	0,20	0,20	0,30	0,30	0,20	
	n	0			0	0	0	0												
**) GREA **) GREAVAREA	Q/s	0	0	0,03	0	0	0	0	0	0	0	0	0,02	0,02	0	0	0,04	0,025	0,03	0,04
	e	0	0	0,30	0	0	0	0	0	0	0	0	0,20	0,20	0	0	0,30	0,20	0,20	0,30
	n	0	0		0	0	0	0	0	0	0	0			0	0				
SREA	Q/s				NOTĂ: *) straturi subțiri sau medii **) straturi subțiri															
	e																			
	n																			

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oae = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) thin or medium layers **) thin layers

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 10:

CONSTRUCTION CASE:

EARTHWORKS

A₄ (h,m,s) - R/D

Current layers

- Nature and state of available soils

Very plastic clays, marls and muds. Since these soils are not normally used for works, it is not necessary or opportune to set out criteria for their state.

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m	E.N.	a %	>2mm %	I.P.	f %	γ^d g/cm ³
-	-	-	<50	>35	-	-	-	>50	-	-

- Constructive characteristics

These soils are impermeable and very plastic; any modification of humidity is extremely slow and is accompanied by important phenomena of contraction or swelling

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement		Usage not recommended		
Compaction thickness				
Compaction intensity				
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		PARAMETRUL COMPACTARI		TIPUL CILINDRULUI COMPACTOR														
				PNEURI			VIBRATOR										PICIOR DE OALE	
							V1		V2		V3		V4		V5			
P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USCARA	Q/s																	
MEDIE	Q/t																	
GREIA	n																	

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 11:

CONSTRUCTION CASE:

EARTHWORKS

$B_1(h,m,s) - R_D$

Current layers

- Nature and state of available soils

Dusty sands with high, medium, reduced or dried humidity

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P. %	f %	γ_d g/cm ³
-	-	-	<50	<12 5	>35	-	<30	-	-	-

- Constructive characteristics

Since they have a reduced content of fine parts and thus are non-plastic or slightly plastic, these soils behave like insensitive soils to water action,

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

being permeable and non-adhesive. They may have problems for site traffic especially in cases when they have a uniform granulometric composition *)

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement				
Compaction thickness	Thick layers	Thick layers	Thick layers	Thick layers
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII	PARAMETRII COMPACTARI	TIPUL CILINDRULUI COMPACTOR.												PICIOR DE OAIE						
		PNEURI			VIBRATOR															
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b						
USOARA	Q/s														PD1 \ PD2					
	p																			
	n																			
MEDIE	Q/s	0,08	0,12	0,15	0,12	0,12	0,10	0,10	0,15	0,15	0,18	0,18	0,25	0,25	0,20	0,20	0,40	0,28	0	0
	e	0,40	0,60	0,90	0,60	0,60	0,50	0,50	0,90	0,90	0,60	0,60	1,2	1,2	0,60	0,60	2,0	1,2	0	0
	n	5	5	6	5	5	5	6	6	3	3	5	5	3	3	5	4	0	0	
GREIA	Q/s	NOTA: *) Dacă permeabilitatea pe core o prezentă este suficientă de mare, aceste pământuri pot fi compactate și pe cale hidraulică.																		
	e																			
	n																			

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Medie = medium

Grea = heavy

NOTE: *) If the permeability is sufficiently high, these soils can be also hydraulically compacted.

SHEET 12:

CONSTRUCTION CASE:

EARTHWORKS

B₂ (h) - R/D

Current layers

- **Nature and state of available soils**

Loamy or slightly loamy sands with high humidity (h)

- **Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P. %	f %	γ_d g/cm ³
$>W_{opt} + 2$	<8	-	<50	5...12	<35	-	<30	-	-	-

- **Constructive characteristics**

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

These soils are very sensitive to weather conditions *). They have an “elastic” behaviour as they are easily deformed (high deflections) but are resistant to shearing. Their use in layers near the roadbed should be avoided. Their prior drying can be efficient

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				In thin layers
Humidity modif.			Sandwich with dry material	Aeration
Treatment / improvement				
Compaction thickness	Works should be stopped	Works should be stopped *)	Corresponding to the 2 materials	Thin or medium
Compaction intensity			Medium	Medium
Bed thickness				
Bed protection				
Embankment height			Small or medium	

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

SREA	MEDIE USOARA	INTENSITATEA COMPACTARII	PARAMETRII COMPACTARII	TIPUL CILINDRULUI COMPACTOR.													
				PNEURI			VIBRATOR						PICIOR DE OALE				
				P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1
	Q/s																
	n																
	Q/s	0,06	0,10	0,15	0,08	0,09	0,075	0,065	0,10	0,10	0,085	0,085	0,15	0,15	0,15	0,23	0,20
	e	0,30	0,40	0,50	0,30	0,30	0,25	0,25	0,40	0,40	0,30	0,30	0,50	0,50	0,35	0,50	0,50
	n	5	4	3	4	4	3	3	4	4	4	4	3	3	2	2	2
	Q/s	NOTA: *) în cazul unor umereziri excesive, lucrările pot fi continuat														0	0
	e	în condițiile indicate în Anexa 1.3, „Ghid pentru														0	0
	n	compactarea păminaturilor la umidități ridicate”														0	0

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) In case of excessive wetting, the works can be continued under the conditions of Annex 1.3 "Guide for compaction of high humidity soils"

SHEET 13:

CONSTRUCTION CASE:

EARTHWORKS

B₂ (m) - R_D
Current layers

- Nature and state of available soils**

Loamy or slightly loamy sands with medium humidity (m)

- Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 %	m	E.N. %	a %	>2mm %	I.P.	f %	γ^d g/cm ³
$\langle W_{opt} + 2$	>8	-	<50	5...12	<35	-	-	<30	-	-	-

- Constructive characteristics**

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

These soils are very sensitive to weather conditions. They can have deformations (high deflections) but are resistant to shearing. Their use in layers near the roadbed should be avoided.

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement				
Compaction thickness	Works should be stopped	Works should be stopped *)	Thin or medium	Thin or medium
Compaction intensity			Medium	Medium
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPUL CILINDRULUI COMPACTOR .																
		PNEURI			VIBRATOR										PIOR DE OALE			
					V1		V2		V3		V4		V5					
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b
INTENSITATEA COMPACTARII	PARAMETRII COMPACTARI																PD1	PD2
USOARA	Q/s																	
MEDIE	n																	
GREA	Q/s	0,06	0,10	0,15	0,08	0,08	0,075	0,075	0,10	0,10	0,085	0,085	0,15	0,15	0,15	0,15	0,23	0,20
	e	0,30	0,40	0,50	0,30	0,30	0,25	0,25	0,40	0,40	0,30	0,30	0,50	0,50	0,35	0,35	0,50	0,50
	n	5	4	3	4	4	3	3	4	4	4	4	3	3	2	2	2	2
	Q/s																0	0
	e																0	0
	n																0	0

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

SHEET 14:

CONSTRUCTION CASE:

EARTHWORKS

B₂ (s) - R_D

Current layers

- Nature and state of available soils**

Loamy or slightly loamy sands with reduced or dry humidity (s)

- Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P. %	f %	γ^d g/cm ³
$\leq w_{opt} - 1$, neconcluden	-	-	<50	5...12	<35	-	<30	-	-	-

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- **Constructive characteristics**

These soils are very sensitive to weather conditions. They can have elastic properties (high deflections) but are resistant to shearing. Their use in layers near the roadbed should be avoided. The negative effect of reduced humidity must be compensated by an vigorous compaction. At very low humidity, the compaction can be practically impossible

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				Wetting
Treatment / improvement				
Compaction thickness	Works should be stopped	Thin or medium	Thin or medium	
Compaction intensity		Medium	Heavy	Medium
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR.																		
		PNEURI			VIBRATOR					PILOU DE OALE										
PARAMETRII COMPACTARII	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	V1	V2	V3	V4	V5	PD1	PD2
	Q/s																			
USOARA	Q/s																			
MEDIE	Q/s																			
MEDIA USOARA	Q/s	0,06	0,10	0,15	0,08	0,08	0,075	0,075	0,10	0,10	0,085	0,085	0,15	0,15	0,15	0,15	0,23	0,20	0	0
MEDIA USOARA	e	0,30	0,40	0,50	0,30	0,30	0,25	0,25	0,40	0,40	0,30	0,30	0,50	0,50	0,35	0,35	0,50	0,50	0	0
MEDIA USOARA	n	5	4	3	4	4	3	3	4	4	4	4	3	3	2	2	2	2	0	0
MEDIA USOARA	Q/s	0,04	0,06	0,08	0,04	0,04	0,05	0,05	0,06	0,06	0,06	0,06	0,08	0,08	0,065	0,065	0,12	0,105	0	0
MEDIA USOARA	e	0,20	0,30	0,40	0,20	0,20	0,20	0,20	0,30	0,30	0,30	0,25	0,40	0,40	0,30	0,30	0,40	0,40	0	0
MEDIA USOARA	n	5	5	5	5	5	4	4	5	5	5	4	5	5	5	5	3	4	0	0
GREA	Q/s	0,04	0,06	0,08	0,04	0,04	0,05	0,05	0,06	0,06	0,06	0,06	0,08	0,08	0,065	0,065	0,12	0,105	0	0
GREA	e	0,20	0,30	0,40	0,20	0,20	0,20	0,20	0,30	0,30	0,30	0,25	0,40	0,40	0,30	0,30	0,40	0,40	0	0
GREA	n	5	5	5	5	5	4	4	5	5	5	4	5	5	5	5	3	4	0	0

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picioare de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

SHEET 15:

CONSTRUCTION CASE:

EARTHWORKS

$B_3(h,m,s) - R/D$

Current layers

- Nature and state of available soils

Dusty or slightly loamy gravels irrespective of humidity

- Geotechnical characteristics

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 %	E.N. %	a %	>2mm %	I.P. %	f %	γ ^d g/cm ³
-	-	-	<50	5...12	>25	-	>30	-	-	-

- **Constructive characteristics**

These soils have no cohesion and are permeable. They usually present a continuous granulometric composition and after compaction they become resistant to the traffic action and corrosion. They are not sensitive to water action. Can be compacted also in “dry” state *)

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement				
Compaction thickness	Medium or thick layers *)	Medium or thick layers *)	Medium or thick layers *)	

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness				
Bed protection				
Embankment height				

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII	PARAMETRUL COMPACTARII	TIPUL CILINDRULUI COMPACTOR.																		
		PNEURI			VIBRATOR												PICIOR DE OAIE			
		V1			V2			V3			V4			V5						
P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2		
USOARA	Q/s																			
	•																			
n																				
MEDIE	Q/ δ	0,08	0,12	0,19	0,12	0,12	0,10	0,10	0,15	0,15	0,18	0,18	0,25	0,25	0,20	0,20	0,40	0,28	0	0
	e	0,40	0,60	0,90	0,60	0,60	0,50	0,50	0,90	0,90	0,60	0,60	1,2	1,2	0,60	0,60	2,0	1,2	0	0
	n	5	5	5	5	5	5	6	6	3	3	5	5	3	3	.3	5	4	0	0
GREA	Q/ δ	*) NOTĂ: în cazul unor umidități foarte reduse (sub 2%) aceste pământuri pot fi compactate folosind compactori vibratori conform condițiilor indicate în Anexa 1.2 „ Ghid practic pentru compacarea pământurilor la umidități reduse”																		
	e																			
	n																			

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picioar de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

*) NOTE: In case of very reduced humidity (below 2%), these soils can be compacted using vibrating compactors according to the conditions of Annex 1.2 "Practical guide for compaction of soils of reduced humidity"

SHEET 16:

CONSTRUCTION CASE:

EARTHWORKS

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

$B_4(h) - R_D$

Current layers

- Nature and state of available soils

Loamy or slightly loamy gravels with high humidity (h)

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 %	E.N. %	a %	>2mm %	I.P.	I %	γ^d g/cm ³
>W _{opt.} +2	<8	-	<50	5...12	<25	-	>30	-	-	-

- Constructive characteristics

These soils are very sensitive to weather conditions *). They can have high deformations but are resistant to shearing. To be avoided for the execution close to the roadbed. Preliminary drying can be efficient

Execution guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				In thin layers
Humidity modif.			Sandwich with 2 dry material	Aeration
Treatment / improvement			Lime treatment	
Compaction thickness	Works stopped *)	Works stopped *)	Thin or medium layers	
Compaction intensity			Medium	Medium
Bed thickness				
Bed protection				
Embankment height			Small or medium	

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTATOR.															
		PNEURI			VIBRATOR								PICIOR DE OALE				
					V1		V2		V3		V4		V5				
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2	
USOARA	Q/s																
	e																
MEDIA	Q/s	0,06	0,10	0,15	0,08	0,08	0,075	0,075	0,10	0,10	0,085	0,085	0,15	0,15	0,15	0,23	0,20
	e	0,30	0,40	0,50	0,30	0,30	0,25	0,25	0,40	0,40	0,30	0,30	0,50	0,50	0,35	0,50	0,50
	n	5	4	3	4	4	3	3	4	4	4	4	3	3	2	2	2
GREA	Q/s	NOTA: *) In cazul unor umeziri excesive, lucrările pot fi continuată in condiții indicate în Annex 1.3 „Ghid pentru compacarea pământurilor la umidități ridicate”															
	e																
	n																

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

*) NOTE: In case of excessive wetting, the works can be continued under the conditions of Annex 1.3 "Guide for compaction of soils at high humidity"

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 17:

CONSTRUCTION CASE:

EARTHWORKS

B₄ (m) - R/D

Current layers

- Nature and state of available soils

Loamy or slightly loamy gravels with medium humidity (m)

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m	E.N. %	a %	>2mm %	I.P.	f %	γ_d g/cm ³
$\leq W_{opt} + 2$ $\geq W_{opt} - 1$	>8	-	<50	5...12	<25	-	>30	-	-	-

- Constructive characteristics

These soils are very sensitive to weather conditions. They can have high deformations under loads but are resistant to shearing. To be avoided for the execution close to the roadbed.

Execution guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement				
Compaction thickness	Works stopped *)	Works stopped *)	Thin or medium layers	
Compaction intensity			Medium	Medium
Bed thickness				
Bed protection				
Embankment height				

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR.																
		PNEURI			VIBRATOR										PICIOR DE OAIE			
PARAMETRII COMPACTARII				V1		V2		V3		V4		V5						
P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USOARA	Q/s																	
MEDIE	e																	
GREIA	n	5	4	3	4	4	3	3	4	4	4	4	3	3	2	2	2	0
	Q/s																	
	e																	
	n																	

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

SHEET 18:

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

CONSTRUCTION CASE:

EARTHWORKS

B₄ (s) - R_D

Current layers

- Nature and state of available soils

Loamy or slightly loamy gravels with reduced or dry humidity (s)

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	< 80 m %	E.N. %	a %	>2mm %	I.P.	f %	γ^d g/cm ³
$\leq W_{opt.} - 1$, inconcludent	-	-	< 50	5...12	< 25	-	> 30	-	-	-

- Constructive characteristics

These soils are very sensitive to weather conditions. They can have high deformations (deflections) under loads but are resistant to shearing. To be avoided for the execution close to the roadbed. The negative effect of the reduced humidity will have to be compensated by a vigorous compaction *)

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				Wetting
Treatment / improvement				
Compaction thickness	Works stopped *)	Thin or medium layers	Thin or medium layers	
Compaction intensity		Medium	Heavy	Medium
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII:	PARAMETRII COMPACTARII:	TIPUL CILINDRULUI COMPACTOR.														
		PNEURI			VIBRATOR						PICIOR DE OAIE					
			V1	V2	V3	V4	V5									
P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b
Q/s			*													
UZOARA																
MEDIE																
GREA																

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

*) NOTE: In case of very reduced humidity (below 2%), these soils can be compacted using vibrating compactors according to the conditions of Annex 1.2 "Practical guide for compaction of soils of reduced humidity"

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 19:

CONSTRUCTION CASE:

EARTHWORKS

B₄ (i) - R_D

Current layers

- **Nature and state of available soils**

Loamy or slightly loamy gravels extracted from deposits below water level, immersed (i)

- **Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P.	f %	γ_d g/cm ³
-	-	-	<50	5...12	<25	-	>30	-	-	-

- **Constructive characteristics**

These soils behave better than soils of B4(h) category following the extraction conditions, below water level (washing and partial elimination of fine parts and thus improvement of quality)

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Below water level with washing, draining		
Humidity modif.		By temporary depositing		
Treatment / improvement				
Compaction thickness	Thin or medium layers	Thin or medium layers	Thin or medium layers	
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII PARAMETRII COMPACTARI		TIPUL CILINDRULUI COMPACTOR.																	
		PNEURI			VIBRATOR										PICIOR DE OAIE				
					V1		V2		V3		V4		V5						
P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2	
USOARA	Q/s																		
	e																		
	n																		
MEDIE	Q/s	0,06	0,10	0,15	0,08	0,09	0,075	0,065	0,10	0,10	0,085	0,085	0,15	0,15	0,15	0,15	0,25	0,20	
	e	0,30	0,40	0,50	0,30	0,30	0,20	0,25	0,40	0,40	0,30	0,30	0,50	0,50	0,35	0,35	0,50	0,50	
	n	5	4	3	4	4	3	3	4	4	4	4	3	3	2	2	2	2	
GREA	Q/s																		
	e																		
	n																		

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei
Medie = medium
Grea = heavy

SHEET 20:

CONSTRUCTION CASE:

EARTHWORKS

B₅(h)-R/D

Current layers

- Nature and state of available soils

Very dusty sands and gravels with high humidity (h)

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P.	f %	γ_d g/cm ³
> $W_{opt} + 1$	<8	-	<50	12...35	-	-	-	<10	-	-

- Constructive characteristics

These soils have a reduced bearing capacity. The preliminary drying to make them compactable needs a long time and their storage is difficult since even reduced precipitations can saturate them again.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain	Intense evap. High temps Dry time wind
Extraction				In thin layers
Humidity modif.			Aeration	Aeration
Treatment / improvement	Works stopped	Works stopped*	Treatment with cement, ash or lime	Treatment with cement, ash or lime
Compaction thickness			Thin/medium layers	Thin/medium layers
Compaction intensity			Light	Light or medium
Bed thickness				
Bed protection				
Embankment height				Small or medium

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		PARAMETRII COMPACTARII		TIPUL CILINDRULUI COMPACTOR.																		
				PNEURI		VIBRATOR										PICIOR DE OAIE						
						V1			V2			V3			V4			V5				
P1	P2	P ₂	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2				
USOARA	Q/s	0,08	0,12	D	0,105	0,105	0,11	0,095	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0	0,20		0,08	0,10	
	e	0,30	0,30	D	0,30	0,30	0,30	0,25	0,40	0,50	0,40	0,50	0,50	0,50	0,40	0,40	0	0,30		0,30	0,40	
	n	4	3	0	3	3	3	3	2	3	2	3	3	3	2	2	0	2		4	4	
MEDIE	Q/s	0,05	0,08	D	0,06	0,06	0,06	0,06	0,10	0,10	0,08	0,20	0,15	0,15	0,09	0,09	0,20	0,165		0,05	0,07	
	e	0,30	0,40	D	0,30	0,30	0,25	0,25	0,40	0,40	0,30	0,30	0,50	0,50	0,30	0,30	0,50	0,50		0,50	0,30	
	n	6	5	0	5	5	4	4	4	4	4	2	3	3	3	3	3	3		10	4	
GREA	Q/s			*	NOTĂ: În cazul unor umeziri excesive, lucărările pot fi continuăte în condiții ne indicăte în Anexa 3.3 „Ghid practic pentru compactarea pământurilor la umidități ridicate”																	
	e																					
	n																					

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picioare de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

*) NOTE: In case of excessive wetting, the works can be continued under the conditions of Annex 1.3 "Guide for compaction of high humidity soils"

SHEET 21:

CONSTRUCTION CASE:

EARTHWORKS

$B_5 \text{ (m)} - R_D$

Current layers

- Nature and state of available soils

Very dusty sands and gravels with medium humidity (m)

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m	E.N. %	a %	>2mm %	I.P. %	f %	γ_d g/cm ³
$\leq w_{opt} + 1$	≤ 25	-	<50	12...35	-	-	-	<10	-	-
$\geq w_{opt} - 2$	> 8									

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- **Constructive characteristics**

These soils are very sensitive to weather conditions, which can cause the works to be stopped either due to the humidity excess or due to a fast and excessive drying

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal		
Humidity modif.				Wetting
Treatment / improvement	Works stopped			
Compaction thickness		Thin/medium layers	Thin/medium layers	Thin/medium layers
Compaction intensity		Light	Medium	Medium
Bed thickness				
Bed protection				
Embankment height		Small or medium		

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII PARAMETRII COMPACTARI		TIPUL CILINDRULUI COMPACTOR.																		
		PNEURI			VIBRATOR												PICIOR DE OAIE			
					V1			V2			V3			V4			V5			
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USOARA	Q/s	0,08	0,12	0	0,105	0,105	0,11	0,095	0,165	0,165	0,18	0,18	0,20	0,20	0,20	0,20	0	0,22	0,08	0,10
	e	0,30	0,50	0	0,30	0,30	0,30	0,25	0,50	0,50	0,40	0,40	0,50	0,50	0,40	0,40	0	0,50	0,30	0,40
	n	4	3	0	3	3	3	3	2	3	2	3	3	3	2	2	0	2	4	4
MEDIE	Q/s	0,05	0,08	0,15	0,06	0,06	0,06	0,06	0,10	0,10	0,08	0,08	0,15	0,15	0,09	0,09	0,20	0,165	0,05	0,07
	e	0,30	0,40	0,50	0,30	0,30	0,25	0,25	0,40	0,40	0,30	0,30	0,50	0,50	0,30	0,30	0,50	0,50	0,30	0,30
	n	6	5	3	5	5	4	4	4	4	4	4	3	3	3	3	3	3	6	4
GREIA	Q/s																			
	e																			

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Usoara = light

Medie = medium

Grea = heavy

SHEET 22:

CONSTRUCTION CASE:

EARTHWORKS

B₅(s) - R/D

Current layers

- Nature and state of available soils

Very dusty sands and gravels with reduced or dry humidity (s)

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P.	f %	γ^d g/cm ³
$\leq W_{opt} \cdot 2$	> 25	-	<50	12...35	-	-	-	<10	-	-

- Constructive characteristics

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

When executing these soils, the negative effect of the reduced humidity must be compensated by a vigorous compaction.

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction			Wetting	Wetting
Humidity modif.				
Treatment / improvement	Works stopped			
Compaction thickness		Thin/medium layers	Thin layers	Medium layers *)
Compaction intensity		Medium	Heavy	Medium
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII PARAMETRII COMPACTARI		TIPUL CILINDRULUI COMPACTOR.																		
		PNEURI			VIBRATOR										PICIOR DE OAIE					
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b		
USOARA	Q/s				*) NOTĂ: În limita umezirii															
	•																			
	n																			
MEDIE	Q/s	0,05	0,08	0,15	0,06	0,06	0,06	0,06	0,10	0,10	0,08	0,08	0,15	0,15	0,09	0,09	0,20	0,165	0,05	0,07
	e	0,30	0,40	0,50	0,30	0,30	0,25	0,25	0,40	0,40	0,30	0,30	0,50	0,50	0,30	0,30	0,50	0,50	0,30	0,30
	n	6	5	3	5	5	4	4	4	4	4	4	3	3	3	3	3	3	6	4
GREA	Q/s	0,03	0,04	0,06	0	0	0	0	0,04	0,04	0,04	0,04	0,07	0,07	0,045	0,045	0,10	0,08	0	0
	e	0,20	0,30	0,30	0	0	0	0	0,25	0,25	0,20	0,20	0,30	0,30	0,20	0,20	0,30	0,30	0	0
	n	7	8	5	0	0	0	0	6	6	5	5	4	4	4	4	3	4	0	0

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Grea = heavy

*) NOTE: Within the limit of wetting

SHEET 23:

CONSTRUCTION CASE:

EARTHWORKS

B₆(h)-R_D
Current layers

- **Nature and state of available soils**

Very loamy sands and gravels with high humidity (h)

- **Geotechnical characteristics**

UMIDITATE	C.B.R.	I.C.	D _{max} (mm)	< 80 %	E.N. %	a %	>2mm %	I.P.	f %	γ^d g/cm ³
$>W_{opt} + 2$	< 8	< 1	< 50	12...35	-	-	-	> 10	-	-

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- **Constructive characteristics**

These soils are difficult to be executed due to the reduced bearing capacity at high humidity. When the humidity is very high, the execution becomes more difficult *). Their preliminary drying needs a long time.

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				In thin layers
Humidity modif.			Sandwich with permeable mat.	Aeration
Treatment / improvement	Works stopped	Works stopped*	Treatment with lime	Treatment with lime
Compaction thickness			Thin/medium layers	Thin/medium layers
Compaction intensity			Light	Light or medium
Bed thickness				
Bed protection				
Embankment height			Small or medium	Small or medium

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		PARAMETRII COMPACTARI		TIPUL CILINDRULUI COMPACTOR.																		
				PNEURI			VIBRATOR												ACIOR DE OALE			
							V1			V2			V3			V4			V5			
P	I	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2		
USOARA	Q/s	0,08	0,12	0	0,10	0,10	0,105	0,085	0,15	0,15	0,155	0,155	0,25	0,25	0,18	0,18	0	0,28	-	0,10	0,15	
	e	0,30	0,50	0	0,30	0,30	0,30	0,25	0,50	0,50	0,40	0,40	0,50	0,50	0,40	0,40	0	0,50	-	0,37	0,40	
	n	4	4	0	3	3	3	3	3	3	3	3	2	2	2	2	0	2	-	3	3	
MEDIE	Q/s	0,05	0,08	0,12	0,05	0,05	0,05	0,045	0,09	0,09	0,075	0,075	0,12	0,12	0,10	0,10	0,20	0,18	-	0,10	0,15	
	e	0,30	0,40	0,50	0,30	0,30	0,25	0,25	0,40	0,40	0,30	0,30	0,50	0,50	0,30	0,30	0,50	0,50	-	0,30	0,40	
	n	6	5	4	6	6	5	5	4	4	4	4	4	4	3	3	3	3	-	3	3	
GREA	Q/s	*) NOTĂ: În cazul unor umidități excesive, lucrările pot fi continuăte în condițiile indicate în Anexa 1.3., „Ghid pentru compactarea pamanturilor la umidități ridicate”																				
	e																					
	n																					

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

*) NOTE: In case of excessive wetting, the works can be continued under the conditions of Annex 1.3 "Guide for compaction of high humidity soils"

SHEET 24:

CONSTRUCTION CASE:

EARTHWORKS

B₆(m) - R/D

Current layers

- Nature and state of available soils**

Very loamy sands and gravels with medium humidity (m)

- Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	< 80 %	E.N. %	a %	>2mm %	I.P. %	I %	γ_d g/cm ³
<W _{opt} +2	>8	<1,2	<50	12...35	-	-	-	>10	-	-
>W _{opt} -2		>1,0								

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- **Constructive characteristics**

These soils are sensitive to water action; influence of fine parts is significant. The presence of gravel and sand fractions makes them more sensitive, the fine fractions, which the water influences more, are reduced.

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Works stopped	Works stopped*		
Compaction thickness			Thin/medium layers	Thin/medium layers
Compaction intensity			Medium	Heavy
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR.																			
		PNEURI				VIBRATOR								ACIOR DE OALE							
PARAMETRII COMPACTARI	PNEURI	V1				V2				V3				V4				V5			
		a	b	c	d	a	b	c	d	a	b	c	d	a	b			PD1	PD2		
USOARA	Q/s	*	*) NOTĂ: În cazul unor umeziri excesive, lucrările pot fi continue în condițiile indicate în Anexa I.3. " Ghid pentru compactarea pământurilor la umidități ridicate "																		
MEDIE	n																				
GREA	Q/s	0,05	0,08	0,12	0,05	0,05	0,05	0,05	0,05	0,09	0,09	0,075	0,075	0,12	0,12	0,10	0,10	0,20	0,18	0,10	0,15
	e	0,30	0,40	0,50	0,30	0,30	0,25	0,25	0,40	0,40	0,30	0,30	0,50	0,50	0,30	0,30	0,50	0,50		0,30	0,40
	n	6	5	4	6	6	5	5	4	4	4	4	4	4	3	3	3	3	3	3	
	Q/s	0,02	0,04	0,08	0,02	0,02	0,025	0,02	0,04	0,04	0,04	0,04	0,06	0,06	0,05	0,05	0,10	0,09	0	0	
	e	0,20	0,30	0,40	0,20	0,20	0,20	0,20	0,30	0,30	0,25	0,25	0,40	0,40	0,30	0,30	0,40	0,40		0	0
	n	10	8	7	10	10	8	10	8	8	6	6	7	7	6	6	4	4	0	0	

Legend:

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

*) NOTE: In case of excessive wetting, the works can be continued under the conditions of Annex 1.3 "Guide for compaction of high humidity soils

SHEET 25:

CONSTRUCTION CASE:

EARTHWORKS

B₆ (s) - R/D
Current layers

- **Nature and state of available soils**

Very loamy sands and gravels with reduced or dry humidity (s)

- **Geotechnical characteristics**

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	< 80 m %	E.N. %	a %	> 2 mm %	I.P. %	i %	γ_d g/cm ³
$< W_{opt.} - 2$	-	> 1,2	< 50	12...35	-	-	-	> 10	-	-

- **Constructive characteristics**

The negative effect of reduced humidity of these soils must be compensated by a vigorous compaction.

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Works stopped			
Compaction thickness		Thin/medium layers *)	Thin/medium layers	Thin/medium layers
Compaction intensity		Medium	Heavy	Medium
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR.																		
		PNEURI			VIBRATOR												FLUOR DE OALE			
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USOARA	Q/s																			
	e																			
	n	*																		
MEDIE	Q/s	0,05	0,08	0,12	0,05	0,05	0,05	0,045	0,09	0,09	0,075	0,075	0,12	0,12	0,10	0,10	0,20	0,18	0,10	0,15
	e	0,30	0,40	0,50	0,30	0,30	0,25	0,25	0,40	0,40	0,30	0,30	0,50	0,50	0,30	0,30	0,50	0,50	0,30	0,40
	n	6	5	4	6	6	5	5	4	4	4	4	4	4	3	3	3	3	3	3
GREIA	Q/s	0,02	0,04	0,06	0,02	0,02	0,025	0,02	0,04	0,04	0,04	0,04	0,06	0,06	0,05	0,05	0,09	0,09	0	0
	e	0,20	0,30	0,30	0,20	0,20	0,20	0,20	0,30	0,30	0,25	0,25	0,40	0,40	0,30	0,30	0,40	0,40	0	0
	n	10	8	7	10	10	8	10	8	8	6	6	7	7	6	6	4	4	0	0

*) NOTĂ : În funcție de gradul de ușoareitate produs pe adâncime

Legend:

Intensitatea compactării = compaction intensity

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

*) NOTE: Depending on the wetting degree generated by depth

SHEET 26:

CONSTRUCTION CASE:

EARTHWORKS

$C_1(h) - R_D$

Current layers

- **Nature and state of available soils**

Clays, silex, siliceous limestone, clay balls, marine materials, alluvial rocks with high humidity (h)

- **Geotechnical characteristics**

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	< 80 m %	E.N. %	a %	> 2 mm %	I.P.	f %	γ_d g/cm ³
> W _{opt} + 4	< 3	-	< 50	10...20	-	-	-	-	-	-

- **Constructive characteristics**

These soils are difficult to execute due to the large fractions (difficulties in extraction, spreading and levelling of material in layers, obstacles during compaction etc.). Due to the practical difficulties, they should not be used to the construction of embankments.

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement				
Compaction thickness				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction intensity				
Bed thickness				
Bed protection				
Embankment height				

Compaction guide

INTENSITATEA COMPACTARII	PARAMETRUL COMPACTARI	TIPUL CILINDRULUI COMPACTOR.												
		PNEURI			VIBRATOR						ACIOR DE OARE			
		V1	V2	V3	V4	V5								
P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USOARA	Q/s													
	n													
MEDIE	Q/t													
	e													
GREA	n													
	Q/s													
	e													
	n													

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Legend:

Intensitatea compactarii = compaction intensity
Parametrii compactarii = compaction parameters
Tip cilindrului compactor = type of compacting cylinder
Pneuri = tires
Vibrator
Picior de oaie = sheep's foot
Usoara = light
Medie = medium
Grea = heavy

SHEET 27:

CONSTRUCTION CASE:

EARTHWORKS

$C_1(m) - R/D$

Current layers

- **Nature and state of available soils**

Clays, silex, siliceous limestone, clay balls, marine materials, alluvial rocks with medium humidity (m)

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	< 80 m %	E.N. %	a %	>2mm %	I.P. %	f %	γ_d g/cm ³
$< W_{opt} + 4$ $> W_{opt} - 2$	< 15 > 3	-	>50	10...20	-	-	-	-	-	-

- Constructive characteristics

These soils are difficult to execute due to the large fractions (difficulties in extraction, spreading and levelling of material in layers, obstacles during compaction etc.).

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal		
Humidity modif.				
Treatment / improvement	Works stopped	Elimination of fractions > 500 mm		

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

		depending on the Dmax of fractions		
Compaction thickness		Medium	Medium	Heavy
Compaction intensity				
Bed thickness				
Bed protection				
Embankment height		Small or medium		

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII	PARAMETRII COMPACTARII	TIPUL CILINDRULUI COMPACTOR																		
		PNEURI			VIBRATOR								PICIOR DE OAIE							
			V1		V2		V3		V4		V5									
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2				
USOARA	Q/s																			
	u																			
MEDIE	Q/s	0	0,07	0,10	0	0	0	0	0,07	0,07	0,065	0,065	0,13	0,13	0,075	0,075	0,15	0,14	0,05	0,08
	e	0	0,40	0,60	0	0	0	0	0,40	0,40	0,30	0,30	0,70	0,70	0,35	0,35	0,80	0,70	0,30	0,40
	n	0	6	6	0	0	0	0	8	6	5	5	5	5	5	5	5	6	5	
GREA	Q/s	0	0,04	0,06	0	0	0	0	0,045	0,045	0,04	0,04	0,07	0,07	0,05	0,05	0,10	0,085	0	0,05
	e	0	0,30	0,40	0	0	0	0	0,30	0,30	0,30	0,30	0,50	0,50	0,30	0,30	0,70	0,50	0	0,40
	n	0	8	7	0	0	0	0	7	7	8	8	7	7	6	6	7	6	0	8

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

SHEET 28:

CONSTRUCTION CASE:

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

EARTHWORKS

$C_1(s) - R_D$

Current layers

- Nature and state of available soils**

Clays, silex, siliceous limestone, clay balls, marine materials, alluvial rocks with reduced humidity (s)

- Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P.	f %	γ_d g/cm ³
$\langle w_{opt} - 2$	>15	-	>50	10..20	-	-	-	-	-	-

- Constructive characteristics**

These soils are difficult to execute due to the large fractions. Besides, the reduced water content necessitates a heavy compaction, which is often hard to carry out.

Execution guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal		
Humidity modif.				
Treatment / improvement	Works stopped	Elimination of fractions > 500 mm depending on the Dmax of fractions		Works stopped*
Compaction thickness		Heavy	Heavy	
Compaction intensity				
Bed thickness				
Bed protection				
Embankment height				

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR.																
		PNEURI			VIBRATOR										PICIOR DE OAIE			
					V1			V2			V3			V4		V5		
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b
USOARA	Q/s																PD1	PD2
MEDIE	Q/s																	
MEDIE	e																	
GREA	Q/s	0	0,04	0,06	0	0	0	0	0,045	0,045	0,04	0,04	0,07	0,07	0,05	0,05	0,10	0,085
	e	0	0,30	0,40	0	0	0	0	0,30	0,30	0,30	0,30	0,50	0,50	0,30	0,30	0,70	0,50
	n	0	8	7	0	0	0	0	7	7	8	8	7	7	6	6	7	6
																	0	8

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

SHEET 29:

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

CONSTRUCTION CASE:

EARTHWORKS

C₂ (h)-R/D
Current layers

- **Nature and state of available soils**

Clayish silex, clayish limestone, marine materials, rough rocks, gross alluvium with high humidity (h)

- **Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P. %	I %	γ_d g/cm ³
*)	*)	-	<250 >50	5...10	-	-	-	-	-	-

- **Constructive characteristics**

These soils have gross and fine elements and their state depends on the humidity of the fraction lower than 20 mm. This humidity is difficult to determine due to the fact that representative samples cannot be obtained for the high volumes of soils to be executed *)

Execution guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Works stopped	Works stopped		
Compaction thickness				
Compaction intensity			Medium	Medium
Bed thickness				
Bed protection				
Embankment height			Small or medium	Small or medium

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII	PARAMETRII COMPACTARII	TIPUL CILINDRULUI COMPACTOR.																	
		PNEURI			VIBRATOR						PICIOR DE OAIE								
			V1	V2	V3	V4	V5												
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2			
USOARA	Q/s																		
	•																		
	n																		
MEDIE	Q/s	0,05	0,08	0,10	0,05	0,05	0,055	0,05	0,095	0,10	0,10	0,10	0,12	0,12	0,12	0,20	0,15	0 0	
	e	0,30	0,40	0,50	0,30	0,30	0,30	0,30	0,40	0,40	0,35	0,35	0,50	0,50	0,40	0,40	0,70	0,50	0 0
	n	6	5	5	6	6	6	6	4	4	4	4	4	3	3	4	3	0 0	
GREA	Q/s	*) NOTA: In practică este dificil să se determine umiditatea fracțiunii mai mici de 20 mm sau valoarea CBR a materialului. Practic, se recomandă ca consistența fracțiunii fine să se determine aproximativ prin examinarea directă a nământurilor																	
	e	mică de 20 mm sau valoarea CBR a materialului. Practic, se recomandă ca consistența fracțiunii fine să se determine aproximativ prin examinarea directă a nământurilor																	
	n	consistența fracțiunii fine să se determine aproximativ prin examinarea directă a nământurilor																	

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

*) NOTE: In practice it is difficult to determine the humidity of the fraction smaller than 20 mm or the CBR value of the material. Practically, it is advised that the consistency of the fine fraction to be determined by a direct examination of soils.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 30:

CONSTRUCTION CASE:

EARTHWORKS

$C_2(m) - R/D$

Current layers

- Nature and state of available soils**

Clayish silex, clayish limestone, marine materials, rough rocks, gross alluvium with medium humidity (m)

- Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P.	f %	γ_d g/cm ³
*) .	*)	-	<250 >50	5...10	-	-	-	-	-	-

- Constructive characteristics**

These soils have gross and fine elements and their state depends on the humidity of the fraction lower than 20 mm. This humidity is difficult to determine due to the fact that representative samples cannot be obtained for the high volumes of soils to be executed. The consistency of the fine fraction is advised to be determined by direct examination.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei
Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Works stopped			
Compaction thickness		Thick layers	Thick layers	Thick layers
Compaction intensity		Medium	Medium	Heavy
Bed thickness				
Bed protection				
Embankment height		Small or medium		

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		PARAMETRII COMPACTARII		TIPUL CILINDRULUI COMPACTOR.																	
				PNEURI		VIBRATOR										PICIOR DE OAIE					
						V1		V2		V3		V4		V5							
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2	
USOARA	Q/s																				
	n																				
MEDIA	Q/s	0,05	0,08	0,10	0,05	0,05	0,05	0,05	0,095	0,095	0,10	0,10	0,12	0,12	0,12	0,12	0,20	0,15	0	0	
	e	0,30	0,40	0,50	0,30	0,30	0,30	0,30	0,40	0,40	0,35	0,35	0,50	0,50	0,40	0,40	0,70	0,50	0	0	
	n	6	5	5	6	6	6	6	4	4	4	4	4	4	4	4	4	3	0	0	
GREA	Q/s	0,02	0,04	0,06	0,03	0,035	0,035	0,03	0,05	0,05	0,045	0,045	0,07	0,07	0,055	0,055	0,08	0,075	0	0	
	e	0,20	0,30	0,40	0,30	0,30	0,30	0,30	0,40	0,40	0,30	0,30	0,50	0,50	0,30	0,30	0,60	0,50	0	0	
	n	10	8	7	10	10	9	10	8	8	7	7	7	7	5	5	8	7	0	0	

*) NOTA : vezi CARACTERISTICI CONSTRUCTIVE

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

*) NOTE: See constructive characteristics

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 31:

CONSTRUCTION CASE:

EARTHWORKS

$C_2(s) - R_D$

Current layers

- Nature and state of available soils

Clayish silex, clayish limestone, marine materials, rough rocks, gross alluvium with reduced or dry humidity (s)

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m	E.N. %	a %	>2mm %	I.P.	f. %	γ_d g/cm ³
*) , *)	-	-	<250 >50	5...10	-	-	-	-	-	-

- Constructive characteristics

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Due to reduced humidity of the fine fraction, the efficient action depth of compactions is significantly reduced. This negative effect should be compensated by a vigorous compaction.

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.			Wetting	Wetting
Treatment / improvement	Works stopped			
Compaction thickness		Thick layers	Thick layers	Thick layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness				
Bed protection				
Embankment height		Small or medium	Small or medium	

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR.													
		PNEURI			VIBRATOR					PICIOR DE OAIE					
PARAMETRII COMPACTARII	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2
Q/s															
e															
n															
MEDIA USOARA	Q/s	*) NOTA: Se recomanda ca evaluarea umiditatii si a consistentei fractiunii plasticide, mai mici de 20mm, sa se faca prin examinarea													
MEDIA	e														
MEDIA GREIA	n														
Q/s	0,02	0,04	0,06	0,03	0,03	0,035	0,03	0,05	0,05	0,045	0,045	0,07	0,07	0,055	0,055
e	0,20	0,30	0,40	0,30	0,30	0,30	0,40	0,40	0,40	0,30	0,30	0,50	0,50	0,30	0,60
n	10	8	7	10	10	9	10	8	8	7	7	7	7	5	8
														7	
														0	0

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Usoara = light

Medie = medium

Grea = heavy

*) NOTE: It is advised that the evaluation of humidity and consistency of the plastic fraction smaller than 20 mm to be made by direct examination.

SHEET 32:

CONSTRUCTION CASE:

EARTHWORKS

$C_3(h) - R_D$

Current layers

- Nature and state of available soils**

Clayish silex, siliceous clayish limestone, marine materials, rough rocks, gross alluvium with high humidity (h)

- Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P. %	f %	γ_d g/cm ³
*)	*)	-	>250	5...10	-	-	-	-	-	-

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- **Constructive characteristics**

These soils are difficult to be executed due to the large fragments.

*) NOTE: The consistency of the plastic fraction smaller than 20 mm should be made by direct examination.

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Works stopped	Works stopped	Elimination of fractions > 500 mm	Elimination of fractions > 500 mm
Compaction thickness			Depending on Dmax	Depending on Dmax
Compaction intensity			Medium	Medium
Bed thickness				
Bed protection				
Embankment height			Small or medium	Small or medium

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII	PARAMETRII COMPACTARI	TIPUL CILINDRULUI COMPACTOR.																
		PNEURI			VIBRATOR										PICIOR DE OAIE			
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b
USOARA	Q/s															PD1	PD2	
	n																	
MEDIE	Q/s	0	0,08	0,12	0	0	0	0	0,08	0,08	0	0	0,12	0,12	0	0	0,20	0,14
	e	0	0,40	0,60	0	0	0	0	0,40	0,40	0	0	0,20	0,20	0	0	0,80	0,70
	n	0	5	5	0	0	0	0	5	5	0	0	6	6	0	0	4	5
GREA	Q/s																	
	e																	
	n																	

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Grea = heavy

SHEET 33:

CONSTRUCTION CASE:

EARTHWORKS

$C_3(m) - R_D$

Current layers

- Nature and state of available soils**

Clayish silex, siliceous clayish limestone, marine materials, rough rocks, gross alluvium with medium humidity (m)

- Geotechnical characteristics**

UMIDITATE	C.B.R.	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P. %	f %	γ_d g/cm ³
*)	*)	*)	>250	5...10	-	-	-	-	-	-

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

• Constructive characteristics

These soils are difficult to be executed due to the large fragments.

*) NOTE: The consistency of the plastic fraction smaller than 20 mm should be made by direct examination.

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Works stopped	Elimination of fractions > 500 mm	Elimination of fractions > 500 mm	Elimination of fractions > 500 mm
Compaction thickness		Depending on Dmax	Depending on Dmax	Depending on Dmax
Compaction intensity		Medium	Medium	Heavy
Bed thickness				
Bed protection				
Embankment height		Small or medium		

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		PARAMETRII COMPACTARI		TIPUL CILINDRULUI COMPACTOR.															
				PNEURI			VIBRATOR										PILOC DE OALE		
					V1	V2	V3	V4	V5										
P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2	
USOARA	Q/s																		
MEDIE	Q/s	0,008	0,12	0	0	0	0	0,08	0,08	0	0	0,12	0,12	0	0	0,20	0,14	0	0
MEDIE	e	0,40	0,60	0	0	0	0	0,40	0,40	0	0	0,70	0,70	0	0	0,80	0,70	0	0
MEDIE	n	0,5	5	0	0	0	0	5	5	0	0	6	6	0	0	4	5	0	0
GREA	Q/s	0,005	0,08	0	0	0	0	0,06	0,06	0	0	0,10	0,10	0	0	0,12	0,15	0	0
GREA	e	0,40	0,50	0	0	0	0	0,40	0,40	0	0	0,60	0,60	0	0	0,80	0,60	0	0
GREA	n	0,8	6	0	0	0	0	7	7	0	0	6	6	0	0	7	4	0	0

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

SHEET 34:

CONSTRUCTION CASE:

EARTHWORKS

$C_3(s) - R/D$

Current layers

- **Nature and state of available soils**

Clayish silex, siliceous clayish limestone, marine materials, rough rocks, gross alluvium with reduced or dry humidity (s)

- **Geotechnical characteristics**

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

UMIDITATE	C.8.R	I.C.	D _{max} (mm)	<80 %	EN. %	>2mm %	I.P. %	I %	γ_d g/cm ³
*)	*)	*)	>250	5...10	-	-	-	-	-

- **Constructive characteristics**

These soils are difficult to be executed due to the large fragments. The reduced water content of the plastic fraction limits the influence depth of compactors. Consequently, this negative effect should be compensated by a vigorous compaction

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.			Wetting	Wetting
Treatment / improvement	Works stopped	Elimination of fractions > 500 mm	Elimination of fractions > 500 mm	Elimination of fractions > 500 mm
Compaction thickness		Depending on D _{max}	Depending on D _{max}	Depending on D _{max}
Compaction		Heavy	Heavy	Heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

intensity				
Bed thickness				
Bed protection				
Embankment height		Small or medium	Small or medium	

Compaction guide

INTENSITATEA COMPACTARII	PARAMETRUL COMPACTATORII	TIPUL CILINDRULUI COMPACTATOR:																
		PNEURI			VIBRATOR						ACIOR DE OALE							
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2		
Q/s																		
•					*													
n																		
USOARA		NOTA: Se recomanda ca consistenta si umiditatea fractiunii plasticice, mai mici de 20mm, sa se evaluateze prin examinarea directa																
MEDIE		d lărgimea platoulor																
GREU		e																
n		n																
Q/s		0	0,05	0,06	0	0	0	0	0,06	0,06	0	0	0	0,12	0,105	0	0	
e		0	0,40	0,50	0	0	0	0	0,40	0,40	0	0	0	0,80	0,60	0	0	
n		0	8	6	0	0	0	0	7	7	0	0	0	0	7	6	0	0

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

*) NOTE: It is advised that the consistency and humidity of the plastic fraction smaller than 20 mm to be assessed by direct examination.

SHEET 35:

CONSTRUCTION CASE:

EARTHWORKS

$D_1(h,m,s) - \frac{R}{D}$

Current layers

- Nature and state of available soils

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Clean alluvial sands or dune sands with high, medium or reduced humidity
(h, m, s)

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 %	E.N. %	a %	>2mm %	I.P. %	! %	γ ^d g/cm ³
-	-	-	<50	<5	-	-	<30	-	-	-

- Constructive characteristics

These soils are insensitive to water action, are permeable and non-corrosive. They can present issues for site traffic especially when they have a uniform granulometric composition. When they have a sufficiently high permeability, they are suitable for hydraulic compaction

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction thickness		Thick layers		
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness				
Bed protection				
Embankment height				

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII	PARAMETRII COMPACTARII	TIPUL CILINDRULUI COMPACTOR.																		
		PNEURI			VIBRATOR										PICIOR DE OAIE					
					V1		V2		V3		V4		V5							
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USOARA	Q/s																			
	e																			
	n																			
MEDIE	Q/s	0,08	0,12	0,15	0,12	0,12	0,10	0,10	0,15	0,15	0,18	0,18	0,25	0,25	0,20	0,20	0,40	0,28	0	0
	e	0,40	0,60	0,90	0,60	0,60	0,50	0,50	0,90	0,90	0,60	0,60	1,2	1,2	0,60	0,60	2,0	1,2	0	0
	n	5	5	6	5	5	5	5	6	6	3	3	5	5	3	3	5	4	0	0
GREA	Q/s																			
	e																			
	n																			

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

SHEET 36:

CONSTRUCTION CASE:

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

EARTHWORKS

$D_2(h,m,s) - \frac{R}{D}$

Current layers

- **Nature and state of available soils**

Clean ballasts (gravel+sand) with high, medium or reduced humidity (h, m, s)

- **Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P.	f %	γ_d g/cm ³
-	-	-	<50	<5	-	-	>30	-	-	-

- **Constructive characteristics**

These soils permeable and non-corrosive. After digging they become less erodible and able to support site traffic since they have a continuous granulometric composition. Not sensitive to water action

Execution guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement				
Compaction thickness	Thick layers	Thick layers	Thick layers	Thick layers
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness				
Bed protection				
Embankment height				

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII	PARAMETRUL COMPACTARII	TIPUL CILINDRULUI COMPACTOR.															
		PNEURI			VIBRATOR						PICIOR DE OAIE						
					V1		V2		V3		V4		V5				
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b			
USOARA	Q/s																
	•																
	n																
MEDIA	Q/s	0,07	0,10	0,12	0,10	0,10	0,09	0,09	0,12	0,12	0,115	0,115	0,20	0,20	0	0	
	e	0,30	0,60	0,70	0,50	0,50	0,40	0,40	0,70	0,70	0,50	0,50	0,90	0,90	0,50	0	0
	n	4	6	6	5	5	4	4	6	6	4	4	5	5	4	0	0
GREA	Q/s	*) NOTĂ: Pentru umidități foarte reduse (sub 2%) aceste pământuri se pot compacta conform condițiilor indicate în Anexa 1.2 „Ghid de practic pentru compactarea pământurilor la umiditate reduse”															
	e																
	n																

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

*) NOTE: In case of very reduced humidity (below 2%), these soils can be compacted using vibrating compactors according to the conditions of Annex 1.2 "Practical guide for compaction of soils of reduced humidity"

SHEET 37:

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

CONSTRUCTION CASE:

EARTHWORKS

$$D_3(h,m,s) - \frac{R}{D}$$

Current layers

- Nature and state of available soils

Clean alluvial gravels; non-evolutional stony materials with high, medium or reduced humidity (h, m, s)

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m	E.N. %	a %	>2mm %	I.P. %	f %	γ_d g/cm ³
-	-	-	>50 <250	<5	-	-	-	-	-	-

- Constructive characteristics

These soils permeable and non-corrosive and insensitive to water action. Not suitable for treatment by forced mixture in mixer. May be suitable to dry compaction *)

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement				
Compaction thickness	Thick layers	Thick layers	Thick layers	Thick layers
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII	PARAMETRII COMPACTARII	TIPUL CILINDRULUI COMPACTOR.																		
		PNEURI			VIBRATOR							PICIOR DE OAIE								
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USOARA	Q/s																			
	e																			
	n																			
MEDIE	Q/s	0,05	0,08	0,10	0,06	0,06	0	0,06	0,10	0,10	0	0	0,15	0,15	0	0	0,20	0,17	0	0
	e	0,30	0,40	0,50	0,30	0,30	0	0,30	0,40	0,40	0	0	0,70	0,70	0	0	1,0	0,70	0	0
	n	6	5	5	5	5	0	5	4	4	0	0	5	5	0	0	5	4	0	0
GREA	Q/s	*) NOTĂ: Pentru umidități foarte reduse (sub 2%) aceste pământuri																		
	e	se pot compacta conform condițiilor indicate în Anexa 1.2 „Ghid”																		
	n	practic pentru compactarea pământurilor la umidități reduse”																		

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

*) NOTE: In case of very reduced humidity (below 2%), these soils can be compacted using vibrating compactors according to the conditions of Annex 1.2 "Practical guide for compaction of soils of reduced humidity"

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 38:

CONSTRUCTION CASE:

EARTHWORKS

$D_4(h,m,s) - R/D$

Current layers

- **Nature and state of available soils**

Mixed granular soils with high, medium or reduced humidity (h, m, s)

- **Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P. %	f %	γ^d g/cm ³
-	-	-	>50 <250	<5	-	-	-	-	-	-

- **Constructive characteristics**

These soils permeable and non-corrosive. Due to the presence of large elements, they are an issue especially in terms of extraction, levelling and compaction. It is advised to eliminate the large fragments in order to assure a satisfactory compaction.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement		Elimination of large fragments		
Compaction thickness	Thick layers	Thick layers	Thick layers	Thick layers
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR.																		
		PNEURI			VIBRATOR										PICIOR DE OAIE					
PARAMETRII COMPACTARII	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2	
	Q/s																			
USOARA	Q/s																			
MEDIE	Q/s	0,008	0,012	0	0	0	0	0,10	0,10	0	0	0,15	0,15	0	0	0,2	0,17	0	0	
	e	0	0,40	0,60	0	0	0	0,50	0,50	0	0	0,70	0,70	0	0	1,0	0,70	0	0	
	n	0	5	5	0	0	0	0	5	5	0	0	5	5	0	0	5	4	0	0
GREA	Q/s	*																		
	e																			
	n																			

* NOTĂ: pentru umidități foarte reduse (sub 2%), aceste pământuri pot fi compactate, prin sectoare de încercare prealabile, dacă sănătoase pentru compacțarea uscată conform condițiilor indicate în Anexa 1.2 „Ghid practic pentru compacțarea pământurilor la umidități reduse”

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picioar de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

*) NOTE: In case of very reduced humidity (below 2%), these soils can be compacted using vibrating compactors according to the conditions of Annex 1.2 "Practical guide for compaction of soils of reduced humidity"

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 39:

CONSTRUCTION CASE:

EARTHWORKS

$E_1(CR_2) - h - \frac{R}{D}$

Current layers

- Nature and state of available soils

Chalk made up of materials with CaCO₃ content of about 95% with reduced density and high humidity (h)

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m %	EN. %	a %	>2mm %	I.P. %	f %	γ_d g/cm ³
>23	-	-	-	-	-	-	-	-	-	>1.50 <1.70

- Constructive characteristics

These soils are difficult and have problems at execution since the excessive crushing generated by the action of road equipment leads to a fine, water

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

saturated material which needs treatment. An effective decrease of humidity cannot be obtained by drainage.

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation Intense	Intense evap. High temps Dry time wind
Extraction			Frontal	Frontal
Humidity modif.			Add-up of non-evolutional materials	Add-up of non-evolutional materials
Treatment / improvement	Works stopped	Works stopped	Treatment with hydraulic binders	
Compaction thickness			Thin or medium layers	Thin or medium layers
Compaction intensity			Medium	Heavy
Bed thickness				
Bed protection				
Embankment height			Small	Small

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR:																		
		PNEURI			VIBRATOR												PICIOR DE OAIE			
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USOARA	Q/s																			
MEDIE	Q/s	0,04	0,05	0,05	0,05	0,045	0,045	0,065	0,065	0,06	0,06	0,06	0,08	0,08	0,09	0,09	0,10	0,04	0,06	
MEDIE	e	0,20	0,30	0,40	0,20	0,20	0,15	0,15	0,30	0,30	0,25	0,25	0,25	0,40	0,40	0,50	0,50	0,60	0,20	0,30
MEDIE	n	5	5	5	4	4	3	3	5	5	4	4	4	4	5	5	6	6	5	5
GREA	Q/s	0	0,04	0,05	0	0	0	0	0,05	0,05	0,04	0,04	0,04	0,06	0,06	0,07	0,07	0,07	0,08	0,09
GREA	e	0	0,30	0,40	0	0	0	0	0,30	0,30	0,25	0,25	0,25	0,40	0,40	0,50	0,50	0,60	0,30	
GREA	n	0	8	8	0	0	0	0	6	6	6	6	6	7	7	7	7	8	3	

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 40:

CONSTRUCTION CASE:

EARTHWORKS

$E_1(CR_2)-s,m-R_D$

Current layers

- Nature and state of available soils

Chalk made up of materials with CaCO₃ content of about 95% with medium or medium or reduced humidity (s, m)

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 %	m	E.N. %	a %	>2mm %	I.P.	f %	γ_d g/cm ³
<23	-	-	-	-	-	-	-	-	-	-	>1.50 <1.70

- Constructive characteristics

These materials are easy to work with but their usage in embankments necessitates the use of some adequate crushing equipment both on

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

extraction and on compaction in order to avoid operating crushing and settling.

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction			In thin layers	In thin layers
Humidity modif.				
Treatment / improvement	Works stopped			
Compaction thickness		Thin or medium layers	Thin layers	Thin or medium layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness				
Bed protection				
Embankment height		Reduced	Small or medium	Small or medium

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII	PARAMETRII COMPACTARII	TIPUL CILINDRULUI COMPACTOR.																			
		PNEURI			VIBRATOR										PICIOR DE OAIE						
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2	
USOARA	Q/s								*) straturi subfirii sau medii												
	■								**) straturi subfirii												
	n																				
GREA *)	Q/s	0	0,04	0,05	0	0	0	0	0,05	0,05	0,04	0,04	0,06	0,06	0,05	0,05	0,07	0,07	0,08	0,03	0,04
	e	0	0,30	0,40	0	0	0	0	0,30	0,30	0,25	0,25	0,40	0,40	0,35	0,35	0,50	0,50	0,60	0,20	0,30
	n	0	8	8	0	0	0	0	6	6	6	6	7	7	7	7	7	7	8	7	8
GREA **)	Q/s	0	0,04	0,05	0	0	0	0	0,04	0,04	0,04	0,04	0,06	0,06	0,05	0,05	0,07	0,07	0,08	0,03	0,04
	e	0	0,15	0,25	0	0	0	0	0,15	0,15	0,15	0,15	0,25	0,25	0,20	0,20	0,30	0,30	0,35	0,15	0,20
	n	0	4	5	0	0	0	0	4	4	4	4	4	4	4	4	4	4	4	5	5

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

*) Thin or medium layers

**) Thin layers

SHEET 41:

CONSTRUCTION CASE:

EARTHWORKS

$E_1(CR_1) - R_D$

Current layers

- **Nature and state of available soils**

Chalk made up of materials with CaCO₃ content of about 95% dense with high, medium or reduced humidity

- **Geotechnical characteristics**

UMIDITATE	C.B.R.	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P. %	f %	γ_d g/cm ³
-	-	-	-	-	-	-	-	-	-	>1,70

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- **Constructive characteristics**

These materials have a fragile structure and sometimes may contain clay. They can be easily reused when they have a continuous granularity and when the maximum grain dimension does not hinder the spreading in thin or medium layers

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Works stopped			
Compaction thickness		Thin or medium layers	Thin or medium layers	Thin or medium layers
Compaction intensity		Medium	Medium	Heavy
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII PARAMETRII COMPACTARI		TIPUL CILINDRULUI COMPACTOR.																			
		PNEURI			VIBRATOR										PILOU DE OALE						
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	a	b	PD1	PD2			
USOARA	Q/s																				
	n																				
	Q/s	0,04	0,06	0,075	0,05	0,05	0,045	0,045	0,065	0,065	0,06	0,06	0,08	0,08	0,07	0,07	0,09	0,09	0,10	0,04	0,06
MEDIE	e	0,20	0,30	0,40	0,20	0,20	0,25	0,25	0,30	0,30	0,25	0,25	0,40	0,40	0,35	0,35	0,60	0,60	0,60	0,20	0,30
	n	5	5	5	4	4	6	6	5	5	4	4	5	5	5	5	7	7	6	5	5
	GREA	Q/s	0	0,04	0,05	0	0	0	0	0,05	0,05	0,04	0,04	0,06	0,06	0,05	0,05	0,07	0,07	0,07	0,03
	e	0	0,30	0,40	0	0	0	0	0,30	0,30	0,25	0,25	0,25	0,25	0,35	0,35	0,50	0,50	0,50	0,20	0,30
	n	0	0	0	0	0	0	0	6	6	6	6	6	6	7	7	7	7	7	7	7

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

SHEET 42:

CONSTRUCTION CASE:

EARTHWORKS

$E_1(CR_3)$ -sm- R_D

Current layers

- Nature and state of available soils

Chalk made up of materials with CaCO₃ content of about 95% with reduced density and medium or reduced humidity (s, m)

- Geotechnical characteristics

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 %	E.N. %	a %	>2mm %	I.P. %	I %	γ^d g/cm ³
<20	-	-	-	-	-	-	-	-	-	<1,50

- Constructive characteristics

These materials are easy to work with but their usage in embankments necessitates the use of some adequate crushing equipment both on extraction and on compaction.

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Works stopped	Works stopped		
Compaction thickness			Thin layers	Thin layers
Compaction intensity			Heavy	Heavy
Bed thickness				
Bed protection				
Embankment height			Reduced or medium	Reduced or medium

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPUL CILINDRULUI COMPACTOR.																			
INTENSITATEA COMPACTARI	PARAMETRI COMPACTARI	PNEURI			VIBRATOR										ACIOR DE OALE						
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2	
USOARA	Q/s																				
	e																				
	n																				
MEDIE	Q/s																				
	e																				
	n																				
GREIA	Q/s	0	0,04	0,05	0	0	0	0	0,04	0,04	0,04	0,04	0,06	0,06	0,05	0,05	0,07	0,07	0,08	0,03	0,08
	e	0	0,15	0,25	0	0	0	0	0,15	0,15	0,15	0,15	0,25	0,25	0,20	0,20	0,30	0,30	0,35	0,15	0,25
	n	0	4	5	0	0	0	0	4	4	4	4	4	4	4	4	4	4	5	3	

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Legend:

Intensitatea compactarii = compaction intensity
Parametrii compactarii = compaction parameters
Tip cilindrului compactor = type of compacting cylinder
Pneuri = tires
Vibrator
Picior de oaie = sheep's foot
Usoara = light
Medie = medium
Grea = heavy

SHEET 43:

CONSTRUCTION CASE:

EARTHWORKS

$E_1(CR_3) - h - \frac{R}{D}$ |

Current layers

- Nature and state of available soils

Chalk made up of materials with CaCO₃ content of about 95% with reduced density and high humidity (h)

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	< 80 m %	E.N. %	a %	> 2 mm %	I.P.	I %	γ ^d g/cm ³
-	-	-	-	-	-	-	-	-	-	< 1,50

- Constructive characteristics

These materials can be used for the execution of embankments only after they were treated with cement, fly ashes and lime

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				In layers
Humidity modif.				
Treatment / improvement	Works stopped	Works stopped	Treatment with cement, ash and lime	Treatment with cement, ash

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

				and lime
Compaction thickness			Thin or medium layers	Thin or medium layers
Compaction intensity			Heavy	Heavy
Bed thickness				
Bed protection				
Embankment height				Small

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII			TIPUL CILINDRULUI COMPACTOR.																			
PARAMETRII COMPACTARII			PNEURI		VIBRATOR										PICIOR DE OAIE							
					V1		V2		V3		V4		V5									
			P1	P2	P3	a	b	c	d	a	b	c	d	a	b			PD1	PD2			
UŞOARA	Q/s	n																				
MEDIE	Q/s	n	0,04	0,06	0,075	0,05	0,05	0,045	0,045	0,065	0,065	0,06	0,06	0,08	0,08	0,07	0,07	0,09	0,10	0,04	0,06	
			0,20	0,30	0,40	0,20	0,20	0,15	0,15	0,30	0,30	0,25	0,25	0,40	0,40	0,35	0,35	0,50	0,50	0,60	0,20	0,30
			5	5	5	4	4	3	3	5	5	4	4	5	5	5	5	6	6	6	5	5
GREA	Q/s	n	0	0,04	0,05	0	0	0	0	0,05	0,05	0,04	0,04	0,06	0,06	0,05	0,05	0,07	0,07	0,08	0,03	0,04
			0	0,30	0,40	0	0	0	0	0,30	0,30	0,25	0,25	0,40	0,40	0,35	0,35	0,50	0,50	0,60	0,20	0,30
			0	8	8	0	0	0	0	6	6	6	6	7	7	7	7	7	8	7	8	

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

SHEET 44:

CONSTRUCTION CASE:

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

EARTHWORKS

$$E_1(CR_3)-th-\frac{R}{D}$$

Current layers

- **Nature and state of available soils**

Chalk made up of materials with CaCO₃ content of about 95% with reduced density and very high humidity (h)

- **Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P.	f %	γ ^d g/cm ³
-	-	-	-	-	-	-	-	-	-	<1.50

- **Constructive characteristics**

These materials are difficult to execute since the excessive crushing generated by the action of earthwork equipment leads to a fine saturated material with a reduced bearing capacity

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei
Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement		Usage not recommended		
Compaction thickness				
Compaction intensity				
Bed thickness				
Bed protection				
Embankment height				

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII		PARAMETRII COMPACTARII		TIPUL CILINDRULUI COMPACTOR.												
				PNEURI			VIBRATOR					PICIOR DE OAIE				
				V1			V2		V3		V4		V5			
P1	P2	P3	a	b	c	d	a	b	c	d	a	b	a	b	PD1	PD2
USOARA	Q/s															
	e															
	n															
MEDIE	Q/s															
	e															
	n															
GREA	Q/s															
	e															
	n															

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 45:

CONSTRUCTION CASE:

EARTHWORKS

E₂ - R/D
Current layers

- **Nature and state of available soils**

Materials of gross structure, fragile without clay or with little clay

- **Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m	E.N. %	a %	>2mm %	I.P.	i %	γ^d g/cm ³
-	-	-	-	-	-	-	-	-	-	-

- **Constructive characteristics**

These materials have inadequate road features. Their usage is not advised for embankments.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement		Usage not recommended		
Compaction thickness				
Compaction intensity				
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR.																	
		PNEURI			VIBRATOR						PICIOR DE OAIE								
PARAMETRII COMPACTARI	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
	Q/s																		
USOARA	n																		
	Q/s																		
	e																		
MEDIE	n																		
	Q/s																		
	e																		
GREA	n																		
	Q/s																		
	e																		

Legend:

- Intensitatea compactarii = compaction intensity
- Parametrii compactarii = compaction parameters
- Tip cilindrului compactor = type of compacting cylinder
- Pneuri = tires
- Vibrator
- Picior de oaie = sheep's foot
- Usoara = light
- Medie = medium
- Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 46:

CONSTRUCTION CASE:

EARTHWORKS

E₃(MA₁) - R/D |

Current layers

- **Nature and state of available soils**

Marls (evolutional clayish materials with high fragmentability and clay content of about 10-90%)

- **Geotechnical characteristics**

UMIDITATE	C.B.R.	I.C.	D _{max} (mm)	<80 m %	E.N.	a %	>2mm %	I.P.	I %	γ^d g/cm ³
-	-	-	-	-	-	-	-	-	230	-

- **Constructive characteristics**

These materials evolve easily to materials of classes A, B or C

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei
Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	These materials will be executed depending on their specific evolution under the conditions indicated for their respective classes and namely: Class A sheets 1-10, class B sheets 11-25, class C sheets 26-34			
Compaction thickness				
Compaction intensity				
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTĂRII	PARAMETRII COMPACTĂRII	TIPUL CILINDRULUI COMPACTOR.																
		PNEURI			VIBRATOR										PICIOR DE OAIE			
			V1	V2	V3	V4	V5											
P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USOARA	Q/s																	
MEDIE	Q/s																	
	e																	
	n																	
GREA	Q/s																	
	e																	
	n																	

Acsteia materiale se vor compacta în funcție de evoluție
lor specifică în condițiile indicate pentru clasele de
pământuri A, B sau C către care evoluază, în Fisere
mentionate mai sus.

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

These materials will be compacted depending on their specific evolution under the conditions indicated for the classes A, B or C in the above mentioned sheets.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 47:

CONSTRUCTION CASE:

EARTHWORKS

E₃ (MA₂) - R/D

Current layers

- **Nature and state of available soils**

Marls (evolutional clayish materials with reduced alterability and fragmentability and clay content of about 10-90%)

- **Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	<80 m %	E.N. %	a %	>2mm %	I.P.	i %	γ^d g/cm ³
-	-	-	-	-	-	-	-	-	-	-

- **Constructive characteristics**

These materials can be used for the execution of embankments after the fragments larger than 500 mm were eliminated beforehand

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		In layers using explosives		
Humidity modif.		Additional wetting	Fragments of Dmax >500 mm	To be eliminated
Treatment / improvement	Works stopped			
Compaction thickness				
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPUL CILINDRULUI COMPACTOR																		
		PNEURI			VIBRATOR										PICIOR DE OAIE					
					V1		V2		V3		V4		V5							
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2				
INTENSITATEA COMPACTARII	PARAMETRII COMPACTARII	Q/s																		
		n																		
USOARA	MEDIE	Q/s																		
		e																		
GREA	GREA	n																		
		Q/s	0	0	0,03	0	0	0	0	0	0,03	0,03	0	0	0,04	0,04	0,05	0	0,03	
		e	0	0	0,03	0	0	0	0	0	0,30	0,30	0	0	0,40	0,40	0,50	0	0,30	
		n	0	0	10	0	0	0	0	0	10	10	0	0	10	10	10	0	10	

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picioar de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 48:

CONSTRUCTION CASE:

EARTHWORKS

$E_3(MA_3)-R/D$

Current layers

- Nature and state of available soils

Marls (evolutional clayish materials with reduced fragmentability, very evolutional and alterable with a clay content of about 10-90%)

- Geotechnical characteristics

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	< 80 m %	E.N. %	a %	>2mm %	I.P.	f %	γ_d g/cm ³
-	-	-	-	-	-	20 50	-	-	<30	-

- Constructive characteristics

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

These materials can be used for the execution of embankments after the fragments larger than 500 mm were eliminated beforehand

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		In layers using explosives		
Humidity modif.		Additional wetting	Fragments of Dmax >500 mm	To be eliminated
Treatment / improvement	Works stopped			
Compaction thickness				
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness				
Bed protection				
Embankment height		Small or medium	Small or medium	Small or medium

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR															PICIOR DE OALE			
		PNEURI			VIBRATOR															
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	V1	V2	V3	V4	V5	
USOARA	Q/s																		PD1	PD2
MEDIE	n																			
GREIA	Q/s																			
	e																			
	n																			
	0/3	0	0	0,03	0	0	0	0	0	0	0	0,03	0,03	0	0	0,04	0,04	0,05	0	0,03
	e	0	0	0,30	0	0	0	0	0	0	0	0,30	0,30	0	0	0,40	0,40	0,50	0	0,30
	n	0	0	10	0	0	0	0	0	0	0	10	10	0	0	10	10	10	0	10

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Grea = heavy

SHEET 49:

CONSTRUCTION CASE:

EARTHWORKS

E₃ (MA₄) - R/D

Current layers

- **Nature and state of available soils**

Marls (evolutional clayish materials with reduced fragmentability, high alterability and clay content of about 10-90%)

- **Geotechnical characteristics**

UMIDITATE	C.B.R	I.C.	D _{max} (mm)	< 80 %	m	E.N. %	a %	>2mm %	I.P.	f %	γ_d g/cm ³
-	-	-	-	-	-	>50	-	-	<30	-	-

- **Constructive characteristics**

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

These materials will be used at execution of embankments only in the cases in which equipment able to assure an adequate crushing is available

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	At the execution of these materials it is advised to apply the technical conditions set out for the construction case E3(MA3)-R/D of sheet 48			
Compaction thickness				
Compaction intensity				
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPUL CILINDRULUI COMPACTOR.												FLUOR DE OALE				
		PNEURI			VIBRATOR						a			b				
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	PD1	PD2
USOARA	Q/s																	
	n																	
MEDIU	Q/s																	
	e																	
GREU	Q/s																	
	e																	
	n																	

Compactarea acestor materiale se va face în conformitate cu condițiile indicate în fișă 48 pentru coazul de construcție E₃ (MA₃) - R/n

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Compaction of these materials is made according to the conditions of sheet 48 for the construction case E3(MA3)-R/D

SHEET 50:

CONSTRUCTION CASE:

EARTHWORKS

F - R / D

Current layers

- Nature and state of available soils

Putrescible, inflammable, soluble or polluting materials

- Geotechnical characteristics

UMIDITATE	C.G.R	I.C.	D _{max} (mm)	< 80 m %	E.N. %	a %	>2mm %	I.P. %	I %	γ^d g/cm ³
-	-	-	-	-	-	-	-	-	-	-

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- **Constructive characteristics**

These materials have inadequate road features.

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Not to be used at embankments			
Compaction thickness				
Compaction intensity				
Bed thickness				
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII PARAMETRII COMPACTARI	TIPUL CILINDRULUI COMPACTOR														PLOAIE DE OALE								
	PNEURI			VIBRATOR																			
	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	V1	V2	V3	V4	V5	
USOARA	Q/s																						
MEDIE	Q/s	e																					
GREIA	Q/s	e																					

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

APPENDIX 2

PRACTICAL GUIDES FOR THE CONSTRUCTION OF ROAD EARTHWORKS.

II. CONSTRUCTION OF UPPER SUBGRADE OR IMPROVED SUBGRADE LAYERS

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

APPENDIX 2 PRACTICAL GUIDES FOR THE CONSTRUCTION OF ROAD EARTHWORKS.

II. CONSTRUCTION OF UPPER SUBGRADE OR IMPROVED SUBGRADE LAYERS

I.1. The list of symbols used in the sheets making up the practical guides and their significance

W_{opt} – optimal compaction humidity (Proctor)

C.B.R. – Californian bearing ratio

I.C. – consistency index of soils

D_{max} – maximum dimension of the granule

EN – sand equivalent

a – alterability degree

I.P. – plasticity index

f – fragmentability degree

d – material's density in dry state

Q/S – the compaction energy defined according to the French methodology where Q is the material volume to be executed in a time unit (day, shift, hour) expressed in m³ and S – surface swept out by the compactor's drums in the selected time unit, expressed in m²

e – the thickness of the soil layer to be executed

n – the number of passes of the compactors in the same trace

P₁, P₂, P₃ – tire compactors

V₁...V₅ – vibrating compactors

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

a; b; c; d – various classes of vibratory compactors , determined according the RTR methodology , as described below.)*

PD1, PD2 – “sheep’s foot” compactors

th – very high humidity

h – with high humidity (humide)

m – with medium humidity (medium)

s – with reduced humidity (sec)

i – in immersed state (immerse)

Note)* :

The main classes : a;b;c and d, of vibratory compactors, determined and recommended to be use, according the RTR methodology

The construction case index – for example:

A1(h/a) – S

Has the following significance

A1 – earth class according to the French classification

h/a – earth state (very humid)/ the type of vibratory class ”a”;

S – subgrade / improved subgrade layer current fill (R) and cut (D) layers

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

I.2 List of sheets consisting of the practical guides Construction case index

Sheet no. Construction case index

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

1	A1	(h/a)	-	S
2	A1	(h/b)	-	S
3	A1	(h/c)	-	S
4	A1	(h/d)	-	S
5	A1	(m/a)	-	S
6	A1	(m/b)	-	S
7	A1	(m/c)	-	S
8	A1	(m/d)	-	S
9	A1	(s/a)	-	S
10	A1	(s/b)	-	S
11	A1	(s/c)	-	S
12	A1	(s/d)	-	S
13	A2	(h/a)	-	S

List of sheets consisting of the practical guides (continuing)

Sheet no. Construction case index

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

14	A2	(h/b)	- S
15	A2	(h/c)	- S
16	A2	(h/d)	- S
17	A2	(m/a)	- S
18	A2	(m/b)	- S
19	A2	(m/c)	- S
20	A2	(m/d)	- S
21	A2	(s/a)	- S
22	A2	(s/b)	- S
23	A2	(s/c)	- S
24	A2	(s/d)	- S

List of sheets consisting of the practical guides (continuing)

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

25	B_1, D_1	$\frac{(h, m, s)}{a}$ $\frac{(h, m, s)}{b}$ $\frac{(h, m, s)}{c}$ $\frac{(h, m, s)}{d}$	— S
26	B_1, D_1	$\frac{(h, m, s)}{a}$ $\frac{(h, m, s)}{b}$	— S
27	B_1, D_1	$\frac{(h, m, s)}{a}$ $\frac{(h, m, s)}{b}$	— S
28	B_1, D_1	$\frac{(h, m, s)}{a}$ $\frac{(h, m, s)}{b}$	— S
29	B_2, B_4, B_6	$\frac{(h, m, s)}{a}$	— S
30	B_2, B_4, B_6	$\frac{(h, m, s)}{b, c}$	— S

List of sheets consisting of the practical guides (continuing)

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

31	B_2, B_4, B_6	$\frac{(h, m, s)}{d}$	- S
32	B_3, D_2	$\frac{(h, m, s)}{a}$	- S
33	B_3, D_2	$\frac{(h, m, s)}{b}$	- S
34	B_3, D_2	$\frac{(h, m, s)}{c}$	- S
35	B_3, D_2	$\frac{(h, m, s)}{d}$	- S
36	D_3	$\frac{(h, m, s)}{c}$	- S
37	D_3	$\frac{(h, m, s)}{b, c, d}$	- S
38	C_2	$\frac{(m, s)}{a}$	- S
39	$E_1 CR_1$	$\frac{(h, m, s)}{a}$	- S
40	$E_1 CR_1$	$\frac{(h, m, s)}{b}$	- S
41	$E_1 CR$	$\frac{(h, m, s)}{cd}$	- S

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

List of categories of soils, which are not recommended to be used at the execution of the roadbed or subgrade layers

Crt. No.	Class of earths and state according to French methodology	Remarks
1	A3 (h, m, s)	These soils are too plastic to be used at the execution of the bed or subgrade layer and has a reduced bearing capacity
2	A4 (h, m, s)	
3	B5 (h, m, s)	These soils are very sensible to weather conditions which can cause for the works to stop, either due to the humidity excess or due to a fast and excessive drying They have a reduced bearing capacity
4	D4 (h, m, s)	These materials cannot be used at bed execution due to their inadequate granulometric composition
5	C1 (h, m, s)	Due to their high content of fine pars, these soils are not advised to be used at bed execution
6	C2h	These soils do not allow the execution of a sufficient compaction due to their high humidity
7	C3 (h, m, s)	These soils cannot be used at bed execution due to the presence of large elements
8	E1 CR2 (h, m, s)	These materials are difficult to be executed
9	E1 CR3 (h, m, s, th)	These materials are difficult to be executed
10	E2 (h, m, s)	-“-
11	E3 (MA1)	-“-
12	E3 (MA2)	-“-
13	E3 (MA3)	-“-
14	E3 (MA4)	-“-
15	F	-“-

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SUBGRADE LAYERS

**HERE FOLLOWES THE SET OF SHEATS COVERING THE 41
“CONSTRUCTION CASES” OF SUBGRADE/ IMPROVED
SUBGRADE LAYERS:**

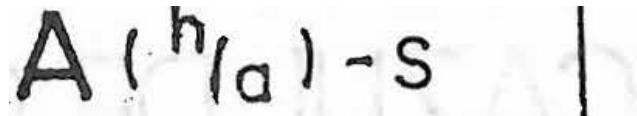
Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 1:

CONSTRUCTION CASE:

EARTHWORKS



Road bed/subgrade layer

- Nature and state of available soils

Non-plastic dusts, loess, alluvial dusts, non-polluted fine sands, earths with porous micro-fossils, fly ashes with high humidity

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 %	E.N.	a	>2mm %	I.P.	f %	f _d g/cm ³
>W _{opt} +1	<8	-	<50	>35	-	-	-	<10	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Inensitive	Inexistent

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction			In layers	In layers
Humidity modif.			Aeration	Aeration
Treatment / improvement	Work stopped	Work stopped	Treatment with binders	Treatment with binders
Compaction thickness			Thin layers	Thin layers
Compaction intensity			Heavy	Heavy
Bed thickness			~20cm	20cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPUL CILINDRULUI COMPACTOR																
		PNEURI		VIBRATOR						PICIOR DE OAE								
				V1		V2		V3		V4		V5						
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	PD1	PD2
INTENSITATEA USOARA COMPACTARI	Q/s				*) NOTĂ : Se recomandă ca utilizarea acestor părțiminturi să se facă numai în condițiile tratării lor cu licheni hidraulici (cenus, var, ciment). Alegerea modului de tratare necesită studii suplimentare de laborator și de teren.													
	e																	
	n																	
MEDIA GREIA USOARA COMPACTARI	Q/s																	
	e																	
	n																	
	Q/s	0,025	0,045	0,065	0,025	0,025	0,030	0,025	0,045	0,045	0,05	0,05	0,065	0,065	0,055	0,055	0,09	0,075
	e	0,20	0,30	0,50	0,20	0,20	0,30	0,30	0,30	0,30	0,25	0,25	0,50	0,50	0,25	0,25	0,50	0,50
	n	8	7	8	8	8	10	10	7	7	5	5	8	8	5	5	6	7
																	0	0

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oae = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

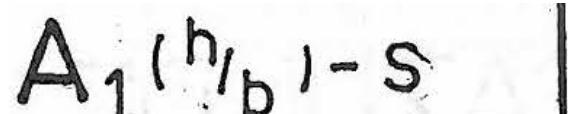
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NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 2:

CONSTRUCTION CASE:

EARTHWORKS



Road bed/subgrade layer

- **Nature and state of available soils**

Non-plastic dusts, loess, alluvial dusts, non-polluted fine sands, earths with porous micro-fossils, fly ashes with high humidity (h)

- **Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 μm %	E.N.	a	>2mm %	I.P.	f	r _d kg/cm ³)
>W _{opt} +1	<8	-	<50	>35	-	-	-	<10	-	-

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Inexistent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction			In layers	In layers
Humidity modif.			Aeration	Aeration
Treatment / improvement	Work stopped	Work stopped	Treatment with binders	Treatment with binders
Compaction thickness			Thin layers	Thin layers
Compaction intensity			Heavy	Heavy
Bed thickness			20-25cm	20-25cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPIUL CILINDRULUI COMPACTOR																	
		PNEURI			VIBRATOR										PICIOR DE OAIE				
					V1		V2		V3		V4		V5						
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2			
USOARA	Q/s	*																	
	e																		
	n																		
MEDIE	Q/s																		
	e																		
	n																		
GREIA	Q/s	0,025	0,045	0,063	0,025	0,025	0,030	0,025	0,015	0,015	0,05	0,05	0,085	0,065	0,055	0,055	0,09	0,075	
	e	0,20	0,30	0,50	0,20	0,20	0,30	0,30	0,30	0,30	0,25	0,25	0,50	0,50	0,25	0,25	0,50	0,50	
	n	8	7	8	8	8	10	10	7	7	5	5	8	8	5	5	6	7	

* NOTA : Se recomandă ca utilizarea acestor parametri să se facă numai în condițiile trotării lor cu lanturi hidraulice (benzi, var, ciment). Alegerea modului de trotare necesită studii suplimentare de laborator și de teren.

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 3:

CONSTRUCTION CASE:

EARTHWORKS

A₁ (h/c) - S

Road bed/subgrade layer

- **Nature and state of available soils**

Non-plastic dusts, loess, alluvial dusts, non-polluted fine sands, earths with porous micro-fossils, fly ashes with high humidity (h)

- **Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 μm %	E.N.	a	>2mm %	I.P.	f %	f _d (g/cm ³)
>W _{opt} +1	<8	-	<50	>35	-	-	-	<10	-	-

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Inexistent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction			In layers	In layers
Humidity modif.			Aeration	Aeration
Treatment / improvement	Work stopped	Work stopped	Treatment with binders	Treatment with binders
Compaction thickness			Medium layers	Medium layers
Compaction intensity			Heavy	Heavy
Bed thickness			35-40cm	35-40cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR																		
		PNEURI			VIBRATOR										PIOR DE OALE					
PARAMETRII COMPACTARI	P1 P2 P3 a b c d a b c d a b c d a b	V1			V2			V3			V4			V5		PIOR DE OALE				
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USOARA	Q/s	*																		
	e																			
	n																			
MEDIA	Q/s																			
	e																			
	n																			
GREA	Q/s	0,025	0,045	0,065	0,025	0,025	0,030	0,025	0,045	0,045	0,05	0,05	0,085	0,065	0,055	0,055	0,09	0,075	0	0
	e	0,20	0,30	0,50	0,20	0,20	0,30	0,30	0,30	0,30	0,25	0,25	0,50	0,50	0,25	0,25	0,50	0,50	0	0
	n	8	7	8	8	8	10	10	7	7	5	5	8	8	5	5	6	7	0	0

Legend:

Intensitatea compactării = compaction intensity

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

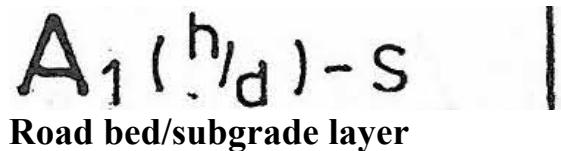
Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 4:

CONSTRUCTION CASE:

EARTHWORKS



- **Nature and state of available soils**

Non-plastic dusts, loess, alluvial dusts, non-polluted fine sands, earths with porous micro-fossils, fly ashes with high humidity (h)

- **Geotechnical characteristics**

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N. a	>2mm %	I.P.	I %	f _d (g/cm ³)
>W _{opt} +1	<8	-	<50	>35	-	-	<10	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Existent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction			In layers	In layers
Humidity modif.			Aeration	Aeration
Treatment / improvement	Work stopped	Work stopped	Treatment with binders	Treatment with binders
Compaction thickness			Thick layers	Thick layers
Compaction intensity			Heavy	Heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Bed thickness			50-70cm	50-70cm
Bed protection				
Embankment height				

Compaction guide

INTENSITATEA COMPACTARII		TIPIUL CILINDRULUI COMPACTOR																
		PARAMETRII COMPACTARII		PNEURI		VIBRATOR										PIGORDE OALE		
				V1		V2		V3		V4		V5		PD1		PD2		
USOARA	MEDIA	GREA	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2	
Q/s	*		NOTA : Se recomandă ca utilizarea acestor parametri să se facă numai în condițiile trotării lar cu lanturi hidraulici (cenusi, var, ciment). Alegerea modului de tratare necesită studii suplimentare de laborator și de teren.															
e			0,25	0,45	0,65	0,25	0,25	0,30	0,25	0,45	0,05	0,05	0,065	0,065	0,055	0,055	0,09	0,075
n			0,20	0,30	0,50	0,20	0,20	0,30	0,30	0,30	0,25	0,25	0,50	0,50	0,25	0,25	0,50	0,50
			8	7	8	8	8	10	10	7	7	5	5	8	8	5	5	
																6	7	
																0	0	

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Legend:

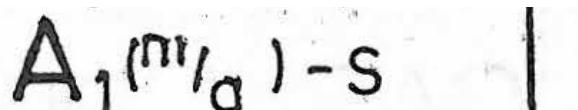
Intensitatea compactarii = compaction intensity
Parametrii compactarii = compaction parameters
Tip cilindrului compactor = type of compacting cylinder
Pneuri = tires
Vibrator
Picior de oaie = sheep's foot
Usoara = light
Medie = medium
Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 5:

CONSTRUCTION CASE:

EARTHWORKS



Road bed/subgrade layer

- **Nature and state of available soils**

Non-plastic dusts, loess, alluvial dusts, non-polluted fine sands, earths with porous micro-fossils, fly ashes with medium humidity (m)

- **Geotechnical characteristics**

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

UMIDITATE %	C.B.R.	I.C.	D max (mm)	<80 μm %	E.N.	a %	>2mm %	I.P.	f %	γd kg/cm³)
<W _{opt+1}	<25	-	<50	>35	-	-	-	<10	-	-
>W _{opt+2}	>A	-	-	-	-	-	-	-	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Insensitive	Inexistent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal	In layers	In layers
Humidity modif.			Wetting	Wetting
Treatment / improvement	Work stopped	Treatment with	Treatment with	Treatment with

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

		hydraulic binders	hydraulic binders	binders
Compaction thickness		Thin layers	Thin layers	Thin layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		~20cm	~20cm	~20cm
Bed protection				
Embankment height				

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR																	
		PNEURI			VIBRATOR								PICIOR DE OAIE						
PARAMETRII COMPACTARII	PNEURI	V1			V2			V3			V4			V5		PD1	PD2		
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b					
USOARA	Q/s				*) NOTA: Se recomandă ca utilizarea acestor pămînturi să se facă numai în condițiile tratării lor cu liganti hidraulici (var														
MEDIE	e				cenusi, ciment). Alegera modului de tratare necesită														
MEDIA	n				studii de laborator și de teren suplimentare														
GREA	Q/s	0,025	0,043	0,063	0,025	0,025	0,030	0,025	0,045	0,045	0,05	0,05	0,065	0,065	0,055	0,055	0,09	0,075	
	e	0,20	0,30	0,50	0,20	0,20	0,30	0,30	0,30	0,30	0,25	0,25	0,50	0,50	0,25	0,25	0,50	0,50	
	n	8	7	8	8	8	10	10	7	7	5	5	8	8	5	5	6	7	
																	0	0	

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

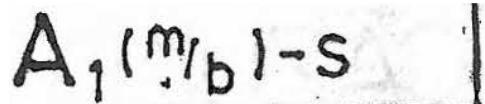
SHEET 6:

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

CONSTRUCTION CASE:

EARTHWORKS



Road bed/subgrade layer

- Nature and state of available soils

Non-plastic dusts, loess, alluvial dusts, non-polluted fine sands, earths with porous micro-fossils, fly ashes with medium humidity (m)

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D max (mm)	<80 μm %	E.N.	a %	>2mm %	I.P.	f %	γd [g/cm³]
<Wopt+1 >Wopt-2	<25 >A	-	<50	>35	-	-	-	<10	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Inexistent

Execution guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal	In layers	In layers
Humidity modif.			Wetting	Wetting
Treatment / improvement	Work stopped	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with binders
Compaction thickness		Thin layers	Thin layers	Thin layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		20-25cm	20-25cm	20-25cm
Bed protection				
Embankment height				

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR																		
		PNEURI			VIBRATOR					PICIOR DE OAIE										
PARAMETRII COMPACTARII	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2					
	Q/s	e	n	*) NOTA: Se recomandă ca utilizarea acestor pămînturi să se facă numai în condițiile tratării lor cu ligături hidraulice (var																
USOARA	Q/s	ceruză, ciment). Alegerea modului de tratare necesită studii de laborator și de teren suplimentare																		
	e																			
	n																			
MEDIE	Q/s	0,025	0,045	0,065	0,025	0,025	0,030	0,025	0,045	0,045	0,05	0,05	0,065	0,065	0,055	0,055	0,09	0,075	0	0
	e	0,20	0,30	0,50	0,20	0,20	0,30	0,30	0,30	0,30	0,25	0,25	0,50	0,50	0,25	0,25	0,50	0,50	0	0
	n	8	7	8	8	8	10	10	7	7	5	5	8	8	5	5	6	7	0	0
GREIA	Q/s	0,025	0,045	0,065	0,025	0,025	0,030	0,025	0,045	0,045	0,05	0,05	0,065	0,065	0,055	0,055	0,09	0,075	0	0
	e	0,20	0,30	0,50	0,20	0,20	0,30	0,30	0,30	0,30	0,25	0,25	0,50	0,50	0,25	0,25	0,50	0,50	0	0
	n	8	7	8	8	8	10	10	7	7	5	5	8	8	5	5	6	7	0	0

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

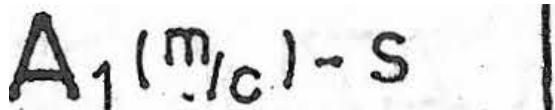
Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 7:

CONSTRUCTION CASE:

EARTHWORKS



Road bed/subgrade layer

- Nature and state of available soils

Non-plastic dusts, loess, alluvial dusts, non-polluted fine sands, earths with porous micro-fossils, fly ashes with medium humidity (m)

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 μm %	E.N.	a %	>2mm %	I.P.	f %	r _d (g/cm ³)
<W _{opt} +1	<25	-	<50	>35	-	-	-	<10	-	-
>W _{opt} +2	>A	-	-	-	-	-	-	-	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Inexistent

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal	In layers	In layers
Humidity modif.			Wetting	Wetting
Treatment / improvement	Work stopped	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with binders
Compaction thickness		Medium	Medium	Medium
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		35-40cm	35-40cm	35-40cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		PARAMETRII COMPACTARII		TIPUL CILINDRULUI COMPACTOR																PICIOR DE OAIE	
				PNEURI				VIBRATOR								PICIOR DE OAIE					
								V1		V2		V3		V4		V5					
P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2			
USOARA	MEDIA	GREAVĂ	Q/s				*	*) NOTA: Se recomandă ca utilizarea acestor pământuri să se facă numai în condițiile tratării lor cu lianti hidraulici (var													
			e					cenusi, ciment). Alegerea modului de tratare necesită studii de laborator și de teren suplimentare													
			n																		
Q/s	Q/s	Q/s	0,025	0,045	0,065	0,025	0,025	0,030	0,025	0,045	0,045	0,05	0,05	0,065	0,065	0,055	0,055	0,09	0,075	0	0
			e	0,20	0,30	0,50	0,20	0,20	0,30	0,30	0,30	0,25	0,25	0,50	0,50	0,25	0,25	0,50	0,50	0	0
			n	8	7	8	8	8	10	10	7	7	5	5	8	8	5	5	6	7	0

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 8:

CONSTRUCTION CASE:

EARTHWORKS

A₁ (m_d) - S |

Road bed/subgrade layer

- Nature and state of available soils

Non-plastic dusts, loess, alluvial dusts, non-polluted fine sands, earths with porous micro-fossils, fly ashes with medium humidity (m)

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 μm %	E.N.	a %	>2mm %	I.P.	f %	γ _d (g/cm ³)
<W _{opt+1} >W _{opt+2}	<25 >A	-	<50	>35	-	-	-	<10	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
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Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

	Good	Sensitive	Existent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal	In layers	In layers
Humidity modif.			Wetting	Wetting
Treatment / improvement	Work stopped	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with binders
Compaction thickness		Thick	Thick	Thick
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		50-70cm	50-70cm	50-70cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR																		
		PNEURI			VIBRATOR								PICIOR DE OAIE							
PARAMETRII COMPACTARI	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	V1	V2	V3	V4	V5	PD1	PD2
Q/s				*) NOTA: Se recomandă ca utilizarea acestor pământuri să se facă numai în condițiile tratării lor cu lanturi hidraulice (var cenusi, ciment). Alegera modului de tratare necesară																
e																				
n																				
USOARA MEDIE GREIA	Q/s	studii de laborator și de teren suplimentare																		
	Q/s	0,025	0,045	0,065	0,025	0,025	0,030	0,025	0,045	0,045	0,05	0,05	0,065	0,065	0,055	0,055	0,09	0,075	0	0
e	0,20	0,30	0,50	0,20	0,20	0,30	0,30	0,30	0,30	0,25	0,25	0,50	0,50	0,25	0,25	0,50	0,50	0,50	0	0
n	8	7	8	8	8	10	10	7	7	5	5	8	8	5	5	6	7	0	0	

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 9:

CONSTRUCTION CASE:

EARTHWORKS

A₁(s)_a) - S |

Road bed/subgrade layer

- **Nature and state of available soils**

Non-plastic dusts, loess, alluvial dusts, non-polluted fine sands, earths with porous micro-fossils, fly ashes with reduced humidity

- **Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 μm %	E.N.	a %	>2mm %	I.P.	I %	f g/cm ³)
<W _{opt} -2	>25	-	<50	>35	-	-	-	<10	-	-

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Insensitive	Inexistent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal	In layers	In layers
Humidity modif.			Wetting	Wetting
Treatment / improvement	Work stopped	Treatment with binders	Treatment with binders	Treatment with binders
Compaction thickness			Thin layers	Thin layers
Compaction intensity			Heavy	Heavy
Bed thickness			20-25 cm	20-25cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPUL CILINDRULUI COMPACTOR																		
		PNEURI			VIBRATOR					PICIOR DE OAIE										
		V1		V2		V3		V4		V5										
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b						
USOARA	Q/s				*) NOTA : Se recomanda utilizarea acestor pamanturi numai in conditiile trotosului lor cu harti hidraulice (cenusa, varciment)															
	e																			
	n				Alegerea modului de tratare necesita studii suplimentare de laborator si de teren.															
MEDIE	Q/s																			
	e																			
	n																			
GREU	Q/s	0,025	0,045	0,063	0,025	0,025	0,030	0,030	0,045	0,045	0,05	0,05	0,065	0,065	0,055	0,055	0,09	0,075		
	e	0,20	0,30	0,50	0,20	0,20	0,30	0,30	0,30	0,30	0,25	0,25	0,50	0,50	0,25	0,25	0,50	0,50		
	n	8	7	8	8	8	10	10	7	7	5	5	8	8	5	5	6	7		

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 10:

CONSTRUCTION CASE:

EARTHWORKS

A₁(s_{1b}) - S

Road bed/subgrade layer

- **Nature and state of available soils**

Non-plastic dusts, loess, alluvial dusts, non-polluted fine sands, earths with porous micro-fossils, fly ashes with reduced humidity (s)

- **Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N.	a %	>2mm %	I.P.	f % (g/cm ³)	Td
<W _{opt} -2	>25	-	<50	>35	-	-	-	<10	-	-

- **Platform state**

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Inexistent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal	In layers	In layers
Humidity modif.			Wetting	Wetting
Treatment / improvement	Work stopped	Treatment with binders	Treatment with binders	Treatment with binders
Compaction thickness			Thin layers	Thin layers
Compaction intensity			Heavy	Heavy
Bed thickness			20-25 cm	20-25cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPUL CILINDRULUI COMPACTOR															
		PNÉURI			VIBRATOR									PIORDEOALE			
					V1			V2			V3			V4		V5	
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2	
USQARA MEDIE	Q/s				*) NOTA : Se recomandă utilizarea acestor pămînturi numai în condiții de tratării lor cu lantii hidraulici (cenus, var, ciment)												
	e																
	n				Alegerea modului de tratare necesită studii suplimentare de laborator și de teren.												
GREIA GREIA	Q/s	0,025	0,045	0,065	0,025	0,025	0,030	0,030	0,045	0,05	0,05	0,065	0,065	0,055	0,055	0,09	0,075
	e	0,20	0,30	0,50	0,20	0,20	0,30	0,30	0,30	0,25	0,25	0,50	0,50	0,25	0,25	0,50	0,50
	n	8	7	8	8	8	10	10	7	7	5	5	8	8	5	5	6
																0	0

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 11:

CONSTRUCTION CASE:

EARTHWORKS

A₁ ' s_{lc}) - S |

Road bed/subgrade layer

- Nature and state of available soils

Non-plastic dusts, loess, alluvial dusts, non-polluted fine sands, earths with porous micro-fossils, fly ashes with reduced humidity (s)

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 Mm %	E.N.	a %	>2mm %	I.P.	f %	Td (g/cm ³)
<W _{opt} -2	>25	-	<50	>35	-	-	-	<10	-	-

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- **Platform state**

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Existent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal	In layers	In layers
Humidity modif.			Wetting	Wetting
Treatment / improvement	Work stopped	Treatment with binders	Treatment with binders	Treatment with binders
Compaction thickness			Medium layers	Medium layers
Compaction intensity			Heavy	Heavy
Bed thickness			35-40cm	35-40cm

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Bed protection				
Embankment height				

Compaction guide

Legend:

Intensitatea compactării = compaction intensity

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

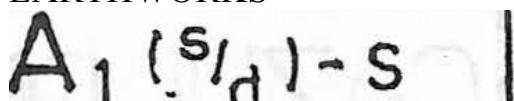
Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 12:

CONSTRUCTION CASE:

EARTHWORKS



Road bed/subgrade layer

- **Nature and state of available soils**

Non-plastic dusts, loess, alluvial dusts, non-polluted fine sands, earths with porous micro-fossils, fly ashes with reduced humidity (s)

- **Geotechnical characteristics**

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N.	a	>2mm %	I.P.	I %	Td (g/cm ³)
<W _{opt} -2	>25	-	<50	>35	-	-	-	<10	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Existent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal	In layers	In layers
Humidity modif.			Wetting	Wetting
Treatment / improvement	Work stopped	Treatment with	Treatment with binders	Treatment with

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

		binders		binders
Compaction thickness			Thick layers	Thick layers
Compaction intensity			Heavy	Heavy
Bed thickness			50-70cm	50-70cm
Bed protection				
Embankment height				

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR																		
		PNEURI			VIBRATOR						PICIOR DE OAIE									
PARAMETRII COMPACTARII	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2					
	Q/s			*	NOTA : Se recomanda utilizarea acestor pamanturi numai in conditiile tratarii lor cu lantii hidraulici (cenusa, var, ciment)															
USOARA	e				Alegerea modului de tratare necesita studii suplimentare de laborator si de teren.															
MEDIE	n																			
GREA	Q/s	0,025	0,045	0,065	0,025	0,025	0,030	0,030	0,045	0,045	0,05	0,05	0,065	0,065	0,055	0,055	0,09	0,075	0	0
	e	0,20	0,30	0,50	0,20	0,20	0,30	0,30	0,30	0,30	0,25	0,25	0,50	0,50	0,25	0,25	0,50	0,50	0	0
	n	8	7	8	8	8	10	10	7	7	5	5	8	8	5	5	6	7	0	0

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 13:

CONSTRUCTION CASE:

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

EARTHWORKS

A₁(^{h/a}) - S |

Road bed/subgrade layer

- Nature and state of available soils**

Fine loamy sands, marls and slightly plastic clays, granitic sands with high humidity (h)

- Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N.	a %	>2mm %	I.P.	f %	γ _d (g/cm ³)
>W _{opt} +2	<5	<1	<50	>35	-	-	-	10...20	-	-

- Platform state**

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Insensitive	Inexistent

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction			In layers	In layers
Humidity modif.			Aeration	Aeration
Treatment / improvement	Work stopped	Treatment with cement, lime, ash	Treatment with cement, lime, ash	Treatment with cement, lime, ash
Compaction thickness		Thin layers	Thin layers	Thin layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		~20cm	~20cm	~20cm
Bed protection				
Embankment height				

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII		PARAMETRII COMPACTARII		TIPUL CILINDRULUI COMPACTOR																		
				PNEURI				VIBRATOR										PICIOR DE OAIE				
						V1		V2		V3		V4		V5								
		P1	P2	P3	a	b	c	d	a	b	c	d	c	b	c	d	a	b	PD1	PD2		
USOARA	Q/s			*	NOTĂ: Se recomandă utilizarea acestor pămînturi numai în condiții de tracțiune cu lanturi hidraulice (var, ciment, cenușă, etc.).																	
MEDIA	Q/s	Alegerea modului de tratare necesită studii suplimentare de laborator și de teren.																				
GREA	Q/s	0,020	0,025	0,035	0,020	0,025	0,020	0,035	0,035	0,035	0,035	0,055	0,055	0,040	0,040	0,080	0,060		0,040	0,050		
	e	0,20	0,30	0,40	0,20	0,20	0,15	0,30	0,30	0,25	0,25	0,40	0,40	0,25	0,25	0,50	0,40		0,20	0,30		
	n	10	7	7	10	10	8	8	9	9	7	7	7	7	6	6	6	7		5	6	

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 14:

CONSTRUCTION CASE:

EARTHWORKS

A₁(h/b)-S

Road bed/subgrade layer

- Nature and state of available soils

Fine loamy sands, marls and slightly plastic clays, granitic sands with high humidity (h)

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N.	a %	>2mm %	I.P.	f % (g/cm ³)	r _d
>W _{opt} +2	<5	<1	<50	>35	-	-	-	10...20	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Inexistent

Execution guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction			In layers	In layers
Humidity modif.				Aeration
Treatment / improvement	Work stopped	Treatment with cement, lime, ash	Treatment with cement, lime, ash	Treatment with cement, lime, ash
Compaction thickness		Thin layers	Thin layers	Thin layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		20-25cm	20-25cm	20-25cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPUL CILINDRULUI COMPACTOR																
		PNEURI			VIBRATOR										PICIOR DE OAIE			
					V1		V2		V3		V4		V5					
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2		
USOARA	COMPACTARI	Q/s	*															
MEDIA	COMPACTARI	Q/s																
GREA	COMPACTARI	Q/s																

*) NOTA: Se recomanda utilizarea acestor pământuri numai în
e conditiile tratăriilor cu lianti hidraulici (var, ciment, cenușă).
n Alegerea modului de tratare necesită studii suplimentare de
laborator și de teren.

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 15:

CONSTRUCTION CASE:

EARTHWORKS

A₂(h/c) - S |

Road bed/subgrade layer

- Nature and state of available soils**

Fine loamy sands, marls and slightly plastic clays, granitic sands with high humidity (h)

- Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N.	a %	>2mm %	I.P.	f % (g/cm ³)	r _d
>W _{opt} +2	<5	<1	<50	>35	-	-	-	10...20	-	-

- Platform state**

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Existential

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction			In layers	In layers
Humidity modif.				Aeration
Treatment / improvement	Work stopped	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness		Medium layers	Medium layers	Medium layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		35-40cm	35-40cm	35-40cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPUL CILINDRULUI COMPACTOR																			
		PNEURI			VIBRATOR						PICIOR DE OAIE										
				V1	V2	V3	V4	V5													
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b							
INTENSITATEA USOARA	PARAMETRII COMPACTARI	Q/s			*																
		e																			
		n																			
MEDIA		Q/s																			
		e																			
		n																			
GREA		Q/s	0,020	0,030	0,050	0,020	0,020	0,025	0,030	0,035	0,035	0,035	0,040	0,040	0,080	0,080	0,040	0,050			
		e	0,20	0,30	0,40	0,20	0,20	0,20	0,30	0,30	0,25	0,25	0,40	0,40	0,25	0,25	0,50	0,40	0,20	0,30	
		n	10	7	7	10	10	8	8	9	9	7	7	7	7	6	6	6	7	5	6

NOTA: Se recomanda utilizarea acestor pampinturi numai in conditiile tratorilor cu lantii hidraulici (var, ciment, cenusi). Alegerea modului de trator necesita studii suplimentare de laborator si de teren.

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 16:

CONSTRUCTION CASE:

EARTHWORKS

A₂(h_d) - S |

Road bed/subgrade layer

- Nature and state of available soils**

Fine loamy sands, marls and slightly plastic clays, granitic sands with high humidity (h)

- Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 μm %	E.N.	a	>2mm %	I.P.	f % (g/cm ³)	f _d
>W _{opt} +2	<5	<1	<50	>35	-	-	-	10...20	-	-

- Platform state**

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
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Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

	Reduced	Sensitive	Existent
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Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain	Intense evap. High temps
Extraction			In layers	In layers
Humidity modif.				Aeration
Treatment / improvement	Work stopped	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness		Thick layers	Thick layers	Thick layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		50-70cm	50-70cm	50-70cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

GREA	MEDIA	USOARA	INTENSITATEA COMPACTARII	PARAMETRII COMPACTARI	TIPUL CILINDRULUI COMPACTOR														PICIOR DE OAIE				
					PNEURI		VIBRATOR																
							V1		V2		V3		V4		V5								
P	P	P	P	P	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2				
Q/s	e	e	e	e	*) NOTĂ: Se recomandă utilizarea acestor pământuri numai în condițiile tratăriilor cu lianti hidraulici (var, ciment, cenușă).																		
Q/s	n	n	n	n	Alegerea modului de tratare necesită studii suplimentare de laborator și de teren.																		
Q/s	e	e	e	e	0,020	0,021	0,023	0,025	0,020	0,022	0,025	0,029	0,033	0,035	0,035	0,035	0,040	0,040	0,080	0,060	0,040	0,050	
	e	e	e	e	0,20	0,20	0,40	0,40	0,20	0,20	0,20	0,30	0,30	0,25	0,25	0,40	0,40	0,25	0,25	0,50	0,40	0,20	0,30
	n	n	n	n	10	7	7	10	10	8	8	9	9	7	7	7	7	6	6	6	7	5	6

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 17:

CONSTRUCTION CASE:

EARTHWORKS

A₂ (m/a)-S

Road bed/subgrade layer

- Nature and state of available soils**

Fine loamy sands, marls and slightly plastic clays, granitic sands with medium humidity (m)

- Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 M _{fin} %	E.N.	a	>2 mm %	I.P.	f %	f _d (g/cm ³)
<W _{opt} +2	5....15	1....1,2	<50	>35	-	-	-	10....20	-	-
>W _{opt} -2										

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Insensitive	Inexistent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal	-	-
Humidity modif.			-	Wetting
Treatment / improvement	Work stopped	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness		Thin layers	Thin layers	Thin layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		~20cm	~20cm	~20cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

GREU MEDIA USOARA	INTENSITATEA COMPACTARII PARAMETRII COMPACTARI	TIPUL CILINDRULUI COMPACTOR														PICIOR DE OAIE PD1 PD2				
		PNEURI			VIBRATOR						PICIOR DE OAIE									
			V1	V2		V3	V4	V5		a	b	c	d	a	b					
Q/s	*	P1	P2	P3	a	b	c	d	a	b	c	d	c	b	a	b	PD1 0,060	PD2 0,040		
e																	0,050			
n																	0,20	0,30		
Q/s		0,020	0,023	0,035	0,020	0,020	0,025	0,020	0,035	0,035	0,035	0,055	0,055	0,040	0,040	0,080				
e		0,20	0,30	0,40	0,20	0,20	0,20	0,15	0,30	0,30	0,25	0,25	0,40	0,40	0,25	0,25	0,50	0,40	0,40	
n		10	7	7	10	10	8	8	9	9	7	7	7	7	6	6	6	7	5	6

*) NOTĂ: Se recomandă utilizarea acestor pământuri numai în
certaine condiții de tratare și lor suportă hidraulici (var, ciment, cenușă, etc.).
n Alegerea modului de tratare necesită studii suplimentare de
laborator și de teren.

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 18:

CONSTRUCTION CASE:

EARTHWORKS

A₂ (m/b) - S |

Road bed/subgrade layer

- Nature and state of available soils**

Fine loamy sands, marls and slightly plastic clays, granitic sands with medium humidity (m)

- Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 μm %	E.N.	a %	>2mm %	I.P.	f %	f _d (g/cm ³)
<W _{opt} +2	5...15	1...1,2	<50	>35	-	-	-	10...20	-	-
>W _{opt} -2										

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Inexistent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal		
Humidity modif.			Wetting	Wetting
Treatment / improvement	Work stopped	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness		Thin layers	Thin layers	Thin layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		20-25cm	20-25cm	20-25cm
Bed protection				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Embankment height				
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Compaction guide

GREAVARE	INTENSITATEA COMPACTARII	PARAMETRII COMPACTARII	TIPUL CILINDRULUI COMPACTOR															PIICIOR DE OALE	
			PNEURI			VIBRATOR									PIICIOR DE OALE				
						V1			V2			V3			V4		V5		
P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2	
Q/s			*) NOTA: Se recomanda utilizarea acestor parametrii numai in																
e			cohortiile traseilor cu lianti hidraulici (var, ciment, cenusis).																
n			Alegerea modului de lucru necesita studii suplimentare de																
Q/s			laborator si de teren.																
e																			
n																			
Q/s	0,020	0,030	0,035	0,020	0,020	0,025	0,025	0,030	0,035	0,035	0,035	0,035	0,035	0,040	0,060	0,080	0,050	0,040	0,050
e	0,20	0,30	0,40	0,20	0,20	0,20	0,30	0,30	0,25	0,25	0,40	0,40	0,25	0,25	0,50	0,40	0,20	0,30	
n	10	7	7	10	10	8	8	9	9	7	7	7	7	6	6	6	7	5	8

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 19:

CONSTRUCTION CASE:

EARTHWORKS

A₂ (m_C) - S |
Road bed/subgrade layer

- Nature and state of available soils**

Fine loamy sands, marls and slightly plastic clays, granitic sands with medium humidity (m)

- Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N.	a %	>2 mm %	I.P.	f %	γ _d (g/cm ³)
<W _{opt} +2	5...15	1...1,2	<50	>35	-	-	-	10...20	-	-
>W _{opt} -2										

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- **Platform state**

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Existent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal		
Humidity modif.				Wetting
Treatment / improvement	Work stopped	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness		Medium layers	Medium layers	Medium layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		35-40cm	35-40cm	35-40cm
Bed protection				
Embankment				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

height				
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Compaction guide

INTENSITATEA USOAREI COMPACTARI		TIPUL CILINDRULUI COMPACTOR																	
		PNEURI				VIBRATOR								PIICIOR DE OALE					
PARAMETRI COMPACTARI	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
	D s e	*	NOTA: Se recomanda utilizarea acestor pomininturi numai in conditiile rotitorilor cu lanturi hidraulice (var, ciment, cenusii).																
MEDIE	Q/s	Alegerea modului de tracere necesita studii suplimentare de laborator si de teren.																	
GREA	Q/s	0,020	0,035	0,055	0,020	0,020	0,025	0,025	0,035	0,035	0,035	0,035	0,055	0,060	0,060	0,080	0,060	0,040	0,050
	e	0,20	0,30	0,40	0,20	0,20	0,20	0,30	0,30	0,25	0,25	0,40	0,40	0,25	0,25	0,50	0,40	0,20	0,30
	n	10	7	7	10	10	8	8	9	9	7	7	7	6	6	6	7	5	8

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 20:

CONSTRUCTION CASE:

EARTHWORKS

A₂ (m/d) - S

Road bed/subgrade layer

- **Nature and state of available soils**

Fine loamy sands, marls and slightly plastic clays, granitic sands with medium humidity (m)

- **Geotechnical characteristics**

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N.	a %	>2mm %	I.P.	f %	f _d (g/cm ³)
>W _{opt} +2	<5	<1	<50	>35	-	-	-	10...20	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Reduced	Sensitive	Existent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal		
Humidity modif.			Wetting	Wetting
Treatment / improvement	Work stopped	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness		Thick layers	Thick layers	Thick layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		50-70cm	50-70cm	50-70cm

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Bed protection				
Embankment height				

Compaction guide

GREA MEDIA	USOARA MEDIA	INTENSITATEA COMPACTARII P8	TIPUL CILINDRULUI COMPACTOR														
			PARAMETRI COMPACTARI			VIBRATOR										PICIOR DE OALE	
			PNEURI	V1	V2	V3	V4	V5	PD1	PD2							
D s			P1 P2 P3	a b c d	a b c d	a b c d	a b c d	a b									
e																	
n																	
Q/s																	
e																	
n																	
Q/s	0,21 0,23 0,25 0,20 0,20 0,25 0,25 0,30 0,30 0,35 0,35 0,35 0,35 0,35 0,40 0,40 0,40														0,040	0,050	
e	0,20 0,20 0,40 0,20 0,20 0,20 0,20 0,30 0,30 0,25 0,25 0,40 0,40 0,25 0,25 0,50 0,40														0,20	0,30	
n	10 7 7 10 10 8 8 9 9 7 7 7 7 6 6 6 7														5	6	

*) NOTĂ: Se recomandă utilizarea acestor pămînturi numai în condițiile trotărilor cu lianț hidraulic (var, ciment, cenușă). Alegerea modului de tratare necesită studii suplimentare de laborator și de teren.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

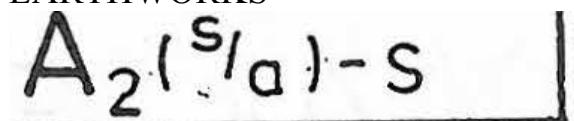
Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 21:

CONSTRUCTION CASE:

EARTHWORKS



Road bed/subgrade layer

- Nature and state of available soils

Fine loamy sands, marls and slightly plastic clays, granitic sands with reduced humidity (s)

- Geotechnical characteristics

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N.	a %	>2mm %	I.P.	f %	Td kg/cm ³
<W _{opt} -2	>15	>1,2	<50	>35	-	-	-	10...20	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Insensitive	Inexistent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal	-	-
Humidity modif.			-	Wetting
Treatment / improvement	Work stopped	Treatment with lime, cement	Treatment with lime, cement	Treatment with lime, cement
Compaction thickness		Thin layers	Thin layers	Thin layers

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		~20cm	~20cm	~20cm
Bed protection				
Embankment height				

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII	PARAMETRII COMPACTARII	TIPUL CILINDRULUI COMPACTOR																		
		PNEURI				VIBRATOR								PICIOR DE OAIE						
				V1		V2		V3		V4		V5								
		P1	P2	P3	a	b	c	d	a	b	c	d	c	b	a	b	PD1	PD2		
USOARA	Q/s			*	*) NOTĂ: Se recomandă utilizarea acestor pământuri numai în condițiile trătorii lor cu lanturi hidraulice (var, ciment, cenuși, etc.).															
MEDIE	e																			
GREA	n				Alegerea modului de tratare necesită studii suplimentare de laborator și de teren.															
	Q/s	0,020	0,025	0,035	0,020	0,020	0,025	0,020	0,035	0,035	0,035	0,055	0,055	0,060	0,040	0,060	0,040	0,050		
	e	0,20	0,30	0,40	0,20	0,20	0,20	0,15	0,30	0,30	0,25	0,25	0,40	0,40	0,25	0,25	0,50	0,40	0,20	0,30
	n	10	7	7	10	10	8	8	9	9	7	7	7	7	6	6	6	7	5	6

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 22:

CONSTRUCTION CASE:

EARTHWORKS

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

A₂(^s/_b) - S

Road bed/subgrade layer

- Nature and state of available soils**

Fine loamy sands, marls and slightly plastic clays, granitic sands with reduced humidity (s)

- Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 μm %	E.N.	a %	>2mm %	I.P.	f %	f _d (g/cm ³)
<W _{opt} -2	>15	>1,2	<50	>35	-	-	-	10...20	-	-

- Platform state**

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Inexistent

Execution guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal		
Humidity modif.			Wetting	Wetting
Treatment / improvement	Work stopped	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness		Thin layers	Thin layers	Thin layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		20-25cm	20-25cm	20-25cm
Bed protection				
Embankment height				

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII		PARAMETRII COMPACTARII		TIPUL CILINDRULUI COMPACTOR																		
				PNEURI		VIBRATOR										PICIOR DE OAIE						
USOARA	MEDIA			V1		V2		V3		V4		V5										
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2		
		Q/s			*				*													
GREAVARE		NOTĂ: Se recomandă utilizarea acestor pămînturi numai în e conditiile tratărilor cu lianti hidraulici (var, ciment, cenuși).																				
Q/s		0,20	0,23	0,25	0,20	0,20	0,25	0,25	0,39	0,35	0,35	0,35	0,05	0,05	0,040	0,040	0,080	0,060	0,040	0,050		
e		0,20	0,20	0,40	0,20	0,20	0,20	0,30	0,30	0,25	0,25	0,40	0,40	0,25	0,25	0,50	0,50	0,40	0,20	0,30		
n		10	7	7	10	10	8	8	9	9	7	7	7	7	6	6	6	7	5	6		

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactator = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

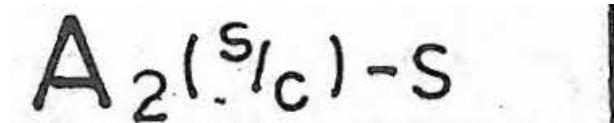
Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 23:

CONSTRUCTION CASE:

EARTHWORKS



Road bed/subgrade layer

- Nature and state of available soils

Fine loamy sands, marls and slightly plastic clays, granitic sands with reduced humidity (s)

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N.	a %	>2mm %	I.P.	f %	r _d (g/cm ³)
<W _{opt} -2	>15	>1,2	<50	>35	-	-	-	10...20	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Existential

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal		
Humidity modif.				Wetting
Treatment / improvement	Work stopped	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness		Medium layers	Medium layers	Medium layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		35-40cm	35-40cm	35-40cm
Bed protection				
Embankment height				

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Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR																	
		PNEURI			VIBRATOR						PICIOR DE OAIE								
USOARA	MEDIA	GREA	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2		
			Q/s	*															
			e																
n																			
*) NOTA: Se recomanda utilizarea acestor pomininturi numai in conditiile roturilor cu lianti hidraulici (var, ciment, cenusii).																			
Alegerea modului de tratare necesita studii suplimentare de laborator si de teren.																			
Q/s			0,020	0,030	0,050	0,020	0,020	0,025	0,025	0,030	0,035	0,035	0,035	0,050	0,040	0,040	0,080		
e			0,20	0,30	0,40	0,20	0,20	0,20	0,30	0,30	0,25	0,25	0,40	0,40	0,25	0,25	0,50	0,40	
n			10	7	7	10	10	8	8	9	9	7	7	7	7	6	6		
																5	8		

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 24:

CONSTRUCTION CASE:

EARTHWORKS

A₂(s/d) - S

Road bed/subgrade layer

- Nature and state of available soils**

Fine loamy sands, marls and slightly plastic clays, granitic sands with reduced humidity (s)

- Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N.	a %	>2 mm %	I.P.	f %	r _d (g/cm ³)
<W _{opt} -2	>15	>1,2	<50	>35	-	-	-	10...20	-	-

- Platform state**

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
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Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

	Reduced	Sensitive	Existent
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Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction		Frontal		
Humidity modif.			Wetting	Wetting
Treatment / improvement	Work stopped	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness		Thick layers	Thick layers	Thick layers
Compaction intensity		Heavy	Heavy	Heavy
Bed thickness		50-70cm	50-70cm	50-70cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPUL CILINDRULUI COMPACTOR																	
		PNEURI			VIBRATOR						PICIOR DE OAIE								
				V1	V2	V3	V4	V5											
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2			
USOARA	Q/s				*														
	e																		
	n																		
MEDIE	Q/s																		
	e																		
	n																		
GREA	Q/s	0,021	0,023	0,025	0,020	0,025	0,025	0,035	0,035	0,035	0,035	0,035	0,040	0,040	0,080	0,040	0,050		
	e	0,20	0,30	0,40	0,20	0,20	0,20	0,30	0,30	0,25	0,25	0,40	0,40	0,25	0,25	0,50	0,40	0,20	0,30
	n	10	7	7	10	10	8	8	9	9	7	7	7	7	6	6	6	7	5

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders (ashes, lime, cement). The selection of treatment way needs additional laboratory and site surveys.

SHEET 25:

CONSTRUCTION CASE:

EARTHWORKS

B₁, D₁($\frac{h,m,s}{a}$) - S |

Road bed/subgrade layer

- **Nature and state of available soils**

B1: Dusty sands with high, medium, reduced or dried humidity

D1: Clean alluvial sands or dune sands with high, medium or reduced humidity (h, m, s)

- **Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80) mm %	E.N.	a	>2mm %	I.P.	f %	Td (g/cm ³)
8, n,	-	-	<50 <50	5...12 <5	<35 -	-	<30 <30	-	-	-

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Insensitive	Inexistent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness	Thin layers	Thin layers	Thin layers	Thin layers
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness	~20cm	~20cm	~20cm	~20cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR													
		PNEURI			VIBRATOR							PICIOR DE OAIE			
PARAMETRII COMPACTARI	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2
	Q/s	*	NOTĂ: Se recomandă utilizarea acestor parametrii numai în condițiile de tractare a terenelor cu hârtie hidrografică. Alegerea modului de tratare necesită studii de laborator și de teren adecvate.												
USOARA	Q/s	0,60	0,70	0,69	0,65	0,65	0,60	0,60	0,785	0,85	0,80	0,80	0,10	0,10	0,090
	e	0,35	0,50	0,70	0,40	0,40	0,35	0,35	0,55	0,55	0,40	0,40	0,70	0,70	0,50
	n	6	7	7	6	6	6	6	5	5	7	7	6	6	0
MEDIE	Q/s														0,011
	e														0
	n														0
GREIA	Q/s														0
	e														0
	n														0

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picioară de oaie = sheep's foot

Usoara = light

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders. The selection of treatment way needs additional laboratory and site surveys.

SHEET 26:

CONSTRUCTION CASE:

EARTHWORKS

B₁, D₁ ($\frac{h,m,s}{b}$) - S

Road bed/subgrade layer

- Nature and state of available soils

B1: Dusty sands with high, medium, reduced or dried humidity

D1: Clean alluvial sands or dune sands with high, medium or reduced humidity (h, m, s)

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80,km %	E.N.	a	>2mm %	I.P.	f %	T _d (g/cm ³)
-	-	-	<50 <50	5...12 <5	<35	-	<30 <30	-	-	-
n,	-	-								

- Platform state

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Inexistent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness	Medium layers	Medium layers	Medium layers	Medium layers
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness	20-25cm	20-25cm	20-25cm	20-25cm
Bed protection				
Embankment				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

height				
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Compaction guide

INTENSITATEA USOARA COMPACTARI	PARAMETRI COMPACTARI	TIPUL CILINDRULUI COMPACTOR												PICIOR DE OALE	
		PNEURI		VIBRATOR											
		V1	V2	V3	V4	V5									
P1	P2	P3	a	b	c	d	a	b	c	d	a	b		PD1	PD2
Q/s	*	NOTA: Se recomandă utilizarea acestor părțimări numai în condițiile de tratării lor cu hârti hidraulici. Alegerea modului de tratare necesită studii de laborator și de teren adecvate.													
MEDIE															
Q/s	0,60	0,70	0,63	0,65	0,65	0,60	0,60	0,65	0,85	0,80	0,80	0,10	0,10	0,90	0,90
e	0,35	0,50	0,70	0,40	0,40	0,35	0,35	0,55	0,55	0,40	0,40	0,70	0,70	0,50	0,50
n	6	7	7	6	6	6	6	6	5	5	7	7	6	6	0
GREA															
Q/s															
e															
n															

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders. The selection of treatment way needs additional laboratory and site surveys.

SHEET 27:

CONSTRUCTION CASE:

EARTHWORKS

B₁, D₁ (h.m.s) - S |

Road bed/subgrade layer

- **Nature and state of available soils**

B1: Dusty sands with high, medium, reduced or dried humidity

D1: Clean alluvial sands or dune sands with high, medium or reduced humidity (h, m, s)

- **Geotechnical characteristics**

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80µm %	E.N.	a %	>2mm %	I.P.	f %	Td kg/cm ³)
8, n,	-	-	<50 <50	5...12 <5	<35	-	<30 <30	-	-	-
	-	-								

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Existent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness	Medium layers	Medium layers	Medium layers	Medium layers
Compaction intensity	Medium	Medium	Medium	Medium

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Bed thickness	35-40cm	35-40cm	35-40cm	35-40cm
Bed protection				
Embankment height				

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA USOARA PARAMETRII COMPACTARI	PARAMETRII COMPACTARI	TIPUL CILINDRULUI COMPACTOR																
		PNEURI		VIBRATOR										PICIOR DE OAIE				
				V1		V2		V3		V4		V5						
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2		
Q/s	*	*) NOTĂ: Se recomandă utilizarea acestor pământuri numai în condițiile tratării lor cu hânti hidraulici. Alegerea modului de tratare necesită studii de laborator și de teren adecvate.																
MEDIE	USOARA	Q/s	0,60	0,70	0,69	0,65	0,65	0,60	0,60	0,85	0,85	0,80	0,80	0,10	0,10	0,090	0,090	0 0,011 0 0
		e	0,35	0,50	0,70	0,40	0,40	0,35	0,35	0,55	0,55	0,40	0,40	0,70	0,70	0,50	0,50	0 0,70 0 0
		n	6	7	7	6	6	6	6	5	5	7	7	6	6	0 6	0 0	
GREA	USOARA	Q/s																
		e																
		n																

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders. The selection of treatment way needs additional laboratory and site surveys.

SHEET 28:

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

CONSTRUCTION CASE:

EARTHWORKS

B₁, D₁ ($\frac{h,m,s}{d}$) - S

Road bed/subgrade layer

- Nature and state of available soils

B1: Dusty sands with high, medium, reduced or dried humidity

D1: Clean alluvial sands or dune sands with high, medium or reduced humidity (h, m, s)

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 μm %	E.N.	a	>2mm %	I.P.	f %	f _d (g/cm ³)
-	-	-	<50	5...12	<35	-	<30	-	-	-
-	-	-	<50	<5	-	-	<30	-	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Reduced	Sensitive	Existent

Execution guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness	Medium layers	Medium layers	Medium layers	Medium layers
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness	50-70cm	50-70cm	50-70cm	50-70cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPUL CILINDRULUI COMPACTOR														
		PNEURI		VIBRATOR										PICIOR DE OAIE		
				V1		V2		V3		V4		V5				
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USOARA	Q/s	*														
	e															
	n															
MEDIE	Q/s	0,060	0,070	0,063	0,063	0,063	0,060	0,060	0,085	0,085	0,080	0,080	0,010	0,010	0,090	0,011
	e	0,35	0,50	0,70	0,40	0,40	0,35	0,35	0,55	0,40	0,40	0,70	0,70	0,50	0,50	0,70
	n	6	7	7	6	6	6	6	6	5	5	7	7	6	6	0
GREA	Q/s															
	e															
	n															

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with hydraulic binders. The selection of treatment way needs additional laboratory and site surveys.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

CONSTRUCTION CASE:

EARTHWORKS

B₂ B₄ B₆ (hms)-S

Road bed/subgrade layer

- Nature and state of available soils

B2: Loamy or slightly loamy sands with high, medium or reduced humidity (h, m, s)

B4: Loamy or slightly loamy gravels irrespective of state

B6: Loamy sands and gravels irrespective of state

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N.	a %	>2mm %	I.P.	f %	f _d (g/cm ³)
B ₂	-	-	-	<50	5...12	<35	-	<30	-	-
B ₄	-	-	-	<50	5...12	>25	-	>30	>10	-
B ₆	-	-	-	<50	5...12	<35	-	<30	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Insensitive	Inexistent

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.			Wetting	Wetting
Treatment / improvement	Treatment with hydraulic binders *)	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness	Thin or medium layers	Thin or medium layers	Thin or medium layers	Thin or medium layers
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness	20-25cm	20-25cm	20-25cm	20-25cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII - (B ₂ +B ₄) - MEDIE	PARAMETRII COMPACTARII PNEURI	TIPUL CILINDRULUI COMPACTOR																			
		PNEURI				VIBRATOR										PICIOR DE OAIE					
		V1		V2		V3		V4		V5											
P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2			
Q/s	0,035	0,055	0,070	0,035	0,035	0,040	0,035	0,055	0,055	0,050	0,050	0,070	0,070	0,060	0,10	0,080	0	0			
e	0,20	0,30	0,40	0,20	0,20	0,20	0,20	0,30	0,25	0,25	0,40	0,40	0,40	0,30	0,30	0,40	0,40	0	0		
n	6	5	6	6	6	5	6	5	5	5	8	6	6	5	5	4	5	0	0		
Q/s	0,02	0,04	0,055	0,020	0,020	0,025	0,020	0,04	0,040	0,040	0,040	0,035	0,055	0,050	0,050	0,085	0,065	0	0		
e	0,20	0,30	0,40	0,20	0,20	0,20	0,20	0,30	0,30	0,25	0,25	0,40	0,40	0,30	0,30	0,40	0,40	0	0		
n	10	8	7	10	10	8	10	8	8	8	6	7	7	6	6	5	5	0	0		
Q/s	*) NOTĂ: Se recomandă utilizarea acestor pământuri numai în condițiile tratării lor cu var sau ciment (numai cu var pentru cele din clasa B ₆). Alegerea modului de tratare necesită studii de laborator și de teren adecvate.																				
e	tratării lor cu var sau ciment (numai cu var pentru cele din clasa B ₆). Alegerea modului de tratare necesită studii de laborator și de teren adecvate.																				
n	modului de tratare necesită studii de laborator și de teren adecvate.																				

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactator = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with lime or cement (only with lime for those of B₆ class). The selection of treatment way needs additional laboratory and site surveys.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 30:

CONSTRUCTION CASE:

EARTHWORKS

B₂ B₄ B₆ (hms) - s |

Road bed/subgrade layer

- Nature and state of available soils**

B2: Loamy or slightly loamy sands with high, medium or reduced humidity (h, m, s)

B4: Loamy or slightly loamy gravels irrespective of state

B6: Loamy sands and gravels irrespective of state

- Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N.	a %	>2mm %	I.P.	f %	f _d (g/cm ³)
B ₂	-	-	<50	5...12	<35	-	<30	-	-	-
B ₄	-	-	<50	5...12	>25	-	>30	>10	-	-
B ₆	-	-	<50	5...12	-	-	-	-	-	-

- Platform state**

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Inexistent (D) Existential (C)

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness	Thin or medium layers	Thin or medium layers	Thin or medium layers	Thin or medium layers
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness	35-40cm	35-40cm	35-40cm	35-40cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPUL CILINDRULUI COMPACTOR																			
		PNEURI		VIBRATOR														PICIOR DE OAIE			
				V1				V2				V3				V4				V5	
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2	
$\frac{(B_2 + B_4)}{2}$ MEDIE	Q/s	0,035	0,055	0,070	0,035	0,040	0,035	0,055	0,055	0,050	0,050	0,070	0,070	0,060	0,060	0,10	0,080		0	0	
	e	0,20	0,30	0,40	0,20	0,20	0,20	0,20	0,30	0,25	0,25	0,40	0,40	0,40	0,30	0,30	0,40	0,40		0	0
	n	6	5	6	6	6	5	6	5	5	5	8	6	6	5	5	4	5		0	0
(B_6) MEDIE	Q/s	0,02	0,04	0,055	0,020	0,020	0,025	0,020	0,040	0,040	0,040	0,040	0,035	0,055	0,050	0,050	0,085	0,065		0	0
	e	0,20	0,30	0,40	0,20	0,20	0,20	0,20	0,30	0,30	0,25	0,40	0,40	0,30	0,30	0,40	0,40	0,40		0	0
	n	10	8	7	10	10	8	10	8	8	8	6	7	7	6	6	5	5		0	0
		Q/s *) NOTĂ: Se recomandă utilizarea acestor pomicinturi numai în condițiile tratării lor cu var sau ciment (numai cu var pentru cele din clasa B6). Alegerea modului de tratare necesită studii de laborator și de teren adecvate.																			
		e																			
		n																			

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactator = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) It is advised to use these soils only under the conditions of their treatment with lime or cement (only with lime for those of B6 class). The selection of treatment way needs additional laboratory and site surveys.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 31:

CONSTRUCTION CASE:

EARTHWORKS

B₂B₄B₆($\frac{hms}{d}$) - S

Road bed/subgrade layer

- Nature and state of available soils

B2: Loamy or slightly loamy sands with high, medium or reduced humidity (h, m, s)

B4: Loamy or slightly loamy gravels irrespective of state

B6: Loamy sands and gravels irrespective of state

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 Mm %	E.N.	a %	>2mm %	I.P.	f % (g/cm ³)	Td
B ₂	-	-	<50	5...12	<35	-	<30	-	-	-
B ₄	-	-	<50	5...12	>25	-	>30	>10	-	-
B ₆	-	-	<60	5...12	-	-	-	-	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

			water
	Reduced	Sensitive	Existent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders	Treatment with hydraulic binders
Compaction thickness	Thin or medium layers	Thin or medium layers	Thin or medium layers	Thin or medium layers
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness	50-70cm	50-70cm	50-70cm	50-70cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII {B ₂ +B ₄ } MEDIE		TIPUL CILINDRULUI COMPACTOR																		
		PNEURI			VIBRATOR												PICIOR DE OAE			
					V1			V2			V3			V4			V5			
P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2		
Q/s	0,035	0,055	0,070	0,035	0,040	0,035	0,055	0,055	0,050	0,050	0,070	0,060	0,060	0,10	0,080	0	0			
e	0,20	0,30	0,40	0,20	0,20	0,20	0,30	0,25	0,25	0,40	0,40	0,40	0,30	0,30	0,40	0,40	0	0		
n	6	5	6	6	6	5	6	5	5	5	8	6	6	5	5	4	5	0	0	
Q/s	0,02	0,04	0,055	0,020	0,020	0,025	0,020	0,040	0,040	0,040	0,035	0,055	0,050	0,050	0,085	0,065	0	0		
e	0,20	0,30	0,40	0,20	0,20	0,20	0,30	0,30	0,25	0,25	0,40	0,40	0,30	0,30	0,40	0,40	0	0		
n	10	8	7	10	10	8	10	8	8	8	6	7	7	6	6	5	5	0	0	
Q/s	*) NOTĂ: Se recomandă utilizarea acestor pământuri numai în condițiile tratării lor cu var sau ciment (humor) cu var pentru cele din clasa B ₆). Alegerea modului de tratare necesită studii de laborator și de teren adecvate.																			
e																				
n																				

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oae = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

NOTE: *) It is advised to use these soils only under the conditions of their treatment with lime or cement (only with lime for those of B6 class). The selection of treatment way needs additional laboratory and site surveys.

SHEET 32:

CONSTRUCTION CASE:

EARTHWORKS

B₃ D₂ ($\frac{h,m,s}{a}$) - S

Road bed/subgrade layer

- Nature and state of available soils

B3: Dusty or slightly loamy gravels irrespective of humidity

D2: Clean ballasts (gravel+sand) irrespective of humidity

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 Mm %	E.N.	a %	>2mm %	I.P.	f %	γ _d (g/cm ³)
B ₃	-	-	<50	5...12	>25	-	>30	-	-	-
D ₂	-	-	<50	<5	-	-	>30	-	-	-

- Platform state

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Insensitive	Inexistent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement				
Compaction thickness	Thin layers	Thin layers	Thin layers	Thin layers
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness	Depending on the bed	Role: equalization formation,	Traffic	
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

INTENSITATEA COMPACTARII		TIPUL CILINDRULUI COMPACTOR																		PIOTOR DE OAIE		
		PNEURI			VIBRATOR																	
PARAMETRII COMPACTARII	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2			
	Q/s																					
	e																					
USOARA	n																					
	Q/s	0,060	0,08	0,10	0,070	0,070	0,070	0,090	0,090	0,080	0,080	0,13	0,13	0,10	0,10	0	0,145	0	0			
	e	0,30	0,50	0,70	0,40	0,40	0,35	0,35	0,55	0,55	0,40	0,40	0,80	0,80	0,50	0,50	0	0,80	0	0		
MEDIE	n	5	6	7	6	6	5	5	6	6	5	5	6	6	5	5	0	6	0	0		
	Q/s																					
	e																					
GREIA	n																					
	Q/s																					
	e																					

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 33:

CONSTRUCTION CASE:

EARTHWORKS

B₃D₂($\frac{h,m,s}{b}$) - S

Road bed/subgrade layer

- Nature and state of available soils**

B3: Dusty or slightly loamy gravels irrespective of humidity

D2: Clean ballasts (gravel+sand) irrespective of humidity

- Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80Mm %	E.N. a	>2mm %	I.P.	I %	f _d (g/cm ³)
B ₃	-	-	<50	5...12	>25	-	>30	-	-
D ₂	-	-	<50	55	-	-	>30	-	-

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Inexistent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Treatment with hydraulic binders or	Provision of anti-contamination	Geotextile materials	
Compaction thickness		Thick layers *)	Medium **)	Thin ***)
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness	60-80cm*)	30-60cm**)	20-30cm***)	
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

PARAMETRII COMPACTARI		TIPUL CILINDRULUI COMPACTOR																	
		PNEURI			VIBRATOR										PICIOR DE OAIE				
			V1	V2	V3	V4	V5												
NETRATARE MEDIE MEDIU	P	P1 P2 P3	a b c d	a b c d	a b c d	a b c d	a b c d	a b								PD1	PD2		
	Q/s	0,060 0,080 0,10	0,070 0,070 0,070	0,09 0,09 0,050	0,050 0,050 0,050	0,13 0,13 0,10	0,10 0,10 0	0,145								0	0		
	e	0,30 0,30 0,30	0,40 0,40 0,35	0,35 0,35 0,35	0,40 0,40 0,40	0,80 0,80 0,50	0,50 0,50 0	0,80								0	0		
TRATARE MEDIE MEDIE	n	5 6 7 6 6 5 5	6 6 5 5 6 6 5 5 5 5 0	6 6 5 5 6 6 6 6 6 6 0	6											0	0		
	Q/s	0,055 0,070 0,083	0,060 0,060 0,055	0,055 0,055 0,075	0,075 0,075 0,070	0,070 0,070 0,070	0,070 0,070 0,070	0,11								0	0		
	e	0,30 0,45 0,60	0,35 0,35 0,30	0,30 0,30 0,45	0,45 0,45 0,35	0,35 0,35 0,60	0,60 0,60 0,45	0,45 0,45 0	0,60							0	0		
GREA MEDIA	n	5 6 7 6 6 5 5	6 6 5 5 6 6 5 5 6 6 6 6 0	5												0	0		
	Q/s	NOTE: *) în cazul pământurilor netratate cu lianti																	
	e	**) în cazul straturilor din materiale netratate dor prevăzute la bază																	
	n	cu geotextile anticontaminante.																	
		***) în cazul materialelor tratate cu lianti hidraulici.																	

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Usoara = light

Medie = medium

Grea = heavy

NOTES: *) In case of soils untreated with binders

**) In case of layers of untreated materials but provided at the base with anti-contamination geotextiles

***) In case of materials treated with hydraulic binders

SHEET 34:

CONSTRUCTION CASE:

EARTHWORKS

B₃D₂($\frac{h,m,s}{c}$) - S

Road bed/subgrade layer

- Nature and state of available soils

B3: Dusty or slightly loamy gravels irrespective of humidity

D2: Clean ballasts (gravel+sand) irrespective of humidity

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D max (mm)	<80 mm %	E.N.	a %	>2mm %	I.P.	I %	Td (g/cm ³)
B ₃	-	-	<50	5...12	>25	-	>30	-	-	-
D ₂	-	-	<50	<5	-	-	>30	-	-	-

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Existent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Treatment with hydraulic binders or	Provision of anti-contamination	Geotextile materials	
Compaction thickness		Thick layers *)	Or Medium **) layers	
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness	60-80cm*) or	30-60cm**))		
Bed protection				
Embankment				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

height				
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Compaction guide

NETRATARE MEDIU COMPACTARI		TIPUL CILINDRULUI COMPACTOR																			
		PNEURI				VIBRATOR								PICIOR DE OAIE							
		PARAMETRI COMPACTARI				V1		V2		V3		V4		V5							
TRATARE MEDIU	NETRATARE MEDIU COMPACTARI	P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2	
NETRATARE MEDIU	Q/s	0,06	0,08	0,10	0,070	0,070	0,070	0,09	0,09	0,050	0,050	0,13	0,13	0,10	0,10	0	0,145		0	0	
	e	0,30	0,50	0,10	0,40	0,40	0,35	0,35	0,55	0,55	0,40	0,40	0,80	0,80	0,50	0,50	0	0,80		0	0
	n	5	6	7	6	6	5	5	6	6	5	5	6	6	5	5	5	0	6	0	0
TRATARE MEDIU	Q/s	0,055	0,070	0,085	0,060	0,060	0,055	0,055	0,075	0,075	0,070	0,070	0,10	0,10	0,080	0,080	0	0,11		0	0
	e	0,30	0,45	0,60	0,35	0,35	0,30	0,30	0,45	0,45	0,35	0,35	0,60	0,60	0,45	0,45	0	0,60		0	0
	n	5	6	7	6	6	5	5	6	6	5	5	6	6	6	6	6	0	5	0	0
GREAVĂ	Q/s	NOTE: *) în cazul pământurilor netratate cu lantări																			
	e	**) în cazul straturilor din materiale netratate dor prevăzute la bază																			
	n	cu geotextile anticontaminante.																			
***) în cazul materialelor tratate cu lantări hidraulici.																					

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Usoara = light

Medie = medium

Grea = heavy

NOTES: These soils can be used without treatment with binders

*) In case of soils untreated with binders

**) In case of layers of untreated materials but provided at the base with anti-contamination geotextiles

SHEET 35:

CONSTRUCTION CASE:

EARTHWORKS

B₃-D₂(^{h.m.s}_d)-S |

Road bed/subgrade layer

- **Nature and state of available soils**

B3: Dusty or slightly loamy gravels irrespective of humidity

D2: Clean ballasts (gravel+sand) irrespective of humidity

- **Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N.	a %	>2mm %	I.P.	f %	r _d (g/cm ³)
B ₃	-	-	<50	5...12	>25	-	>30	-	-	-
D ₂	-	-	<50	<5	-	-	>30	-	-	-

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Reduced	Sensitive	Existent

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Treatment with hydraulic binders or	Provision of anti-contamination	Geotextile materials	
Compaction thickness		Thick layers *)	Or Medium **) layers	
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness	60-80cm*) or	30-60cm**))		
Bed protection				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Embankment height				
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Compaction guide

TRATARE MEDIU		TIPUL CILINDRULUI COMPACTOR												PIGORDE OALE						
		PNEURI			VIBRATOR						PIGORDE OALE									
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1	PD2
NETRATARE MEDIU	Q/s	0,06	0,08	0,10	0,070	0,070	0,070	0,070	0,09	0,09	0,050	0,050	0,13	0,13	0,10	0,10	0	0,145	0	0
	e	0,30	0,50	0,70	0,40	0,40	0,35	0,35	0,55	0,55	0,40	0,40	0,80	0,80	0,50	0,50	0	0,80	0	0
	n	5	6	7	6	6	5	5	6	6	5	5	5	5	0	6		0	0	
TRATARE MEDIU	Q/s	0,055	0,070	0,085	0,060	0,060	0,055	0,055	0,075	0,075	0,070	0,070	0,10	0,10	0,080	0,080	0	0,11	0	0
	e	0,30	0,45	0,60	0,35	0,35	0,30	0,30	0,45	0,45	0,35	0,35	0,60	0,60	0,45	0,45	0	0,60	0	0
	n	5	6	7	6	6	5	5	6	6	5	5	6	6	6	6	0	5	0	0
GREU	Q/s	NOTE: *) în cazul pământurilor netratate cu liguri																		
	e	**) în cazul structurilor din materiale netratate dar prevăzute la bază																		
	n	cu geotextile anticontaminante.																		
****) în cazul materialelor tratate cu lianti hidraulici.																				

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTES: These soils can be used without treatment with binders

*) In case of soils untreated with binders

**) In case of layers of untreated materials but provided at the base with anti-contamination geotextiles

SHEET 36:

CONSTRUCTION CASE:

EARTHWORKS

D₃ (h.m.s) - S |

Road bed/subgrade layer

- Nature and state of available soils**

Clean alluvial gravels; non-evolitional stony materials with high, medium or reduced humidity (h, m, s)

- Geotechnical characteristics**

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N.	a %	>2mm %	I.P.	f %	γ_d (g/cm ³)
-	-	-	>50 <250	<5	-	-	-	-	-	-

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Insensitive	

Execution guide

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Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement				
Compaction thickness	Minimum	Thickness	Depending on	Dmax
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness		20-30mm		
Bed protection				
Embankment				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

height				
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Compaction guide

GREA MEDIA	USOARA INTENSITATEA COMPACTARII	PARAMETRII COMPACTARII	TIPUL CILINDRULUI COMPACTOR												PIORDE DAIE PD1 PD2			
			PNEURI			VIBRATOR												
			V1	V2	V3	V4	V5											
P1	P2	P3	a	b	c	d	a	b	c	d	a	b	c	d	a	b	PD1 PD2	
Q/s																		
e																		
n																		
Q/s	0,040	0,033	0,050	0,049	0,045	0	0,045	0,070	0,070	0	0	0,11	0,11	0	0	0,14	0,12	0 0
e	0,30	0,40	0,50	0,30	0,30	0	0,30	0,40	0,40	0	0	0,60	0,60	0	0	0,80	0,60	0 0
n	8	6	6	7	7	0	7	6	6	0	0	5	5	0	0	6	5	0 0
Q/s																		
e																		
n																		

Legend:

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

SHEET 37:

CONSTRUCTION CASE:

EARTHWORKS

$D_3(\frac{h,m,s}{b,c,d}) - S$

Road bed/subgrade layer

- **Nature and state of available soils**

Clean alluvial gravels; non-evolutional stony materials with high, medium or reduced humidity (h, m, s)

- **Geotechnical characteristics**

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 mm %	E.N.	a	>2mm %	I.P.	f %	γ _d (g/cm ³)
-	-	-	>50 <250	<5	-	-	-	-	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good or medium Reduced	Sensitive Insensitive	

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment /	With or	Without	Anti-	Geotextiles

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

improvement			contamination	
Compaction thickness	Thick *)	Or medium **)	Layers	
Compaction intensity	Medium	Medium	Medium	Medium
Bed thickness	60-80cm *)	Or	30-40cm **)	
Bed protection				
Embankment height				

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

INTENSITATEA COMPACTARII	PARAMETRII COMPACTARII	TIPUL CILINDRULUI COMPACTOR																	
		PNEURI			VIBRATOR						PICIOR DE OAIE								
			V1	V2	V3	V4	V5												
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2			
USOARA	Q/s																		
USOARA	e																		
USOARA	n																		
MEDIE	Q/s	0,040	0,065	0,080	0,045	0,045	0	0,045	0,070	0,070	0	0,011	0,011	0	0	0,12	0	0	
MEDIE	e	0,30	0,40	0,50	0,30	0,30	0	0,30	0,40	0,40	0	0,060	0,060	0	0	0,80	0,60	0	0
MEDIE	n	8	6	6	7	7	0	7	6	6	0	0,5	0,5	0	0	8	5	0	0
GREA	Q/s	NOTĂ: Alegerea uneia din cele două soluții se face pe criterii economice.																	
GREA	e	*) se aplică în cazul cind nu se prevăd geotextile anticontaminante																	
GREA	n	**) se aplică în cazul utilizării geotextilelor																	

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

***) NOTE: Selection of one of the two solutions is made based on economic criteria

*) applied when anti-contamination geotextiles are not provided

**) applied in case of geotextiles

SHEET 38:

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

CONSTRUCTION CASE:

EARTHWORKS

$C_2(\frac{m,s}{a}) - S$

Road bed/subgrade layer

- Nature and state of available soils

Clayish silex, siliceous clayish limestone, marine materials, rough rocks, gross alluvium with medium or reduced humidity (m, s)

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 μm %	E.N.	a %	>2mm %	I.P.	f %	T _d (g/cm ³)
-	-	-	<250 >50	5...10	-	-	-	-	-	-

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Inexistent

Execution guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.			Wetting	Wetting
Treatment / improvement	Work stopped	Protection of	Surface	(impermeabilization)
Compaction thickness		Medium	Medium	Medium
Compaction intensity		Medium	Medium	Medium
Bed thickness		40-50cm	40-50cm	40-50cm
Bed protection				
Embankment height				

Compaction guide

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

		TIPUL CILINDRULUI COMPACTOR																	
		PNEURI		VIBRATOR										PICIOR DE OAE					
				V1		V2		V3		V4		V5							
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2			
USOARA	Q/s																		
	e																		
	n																		
MEDIE	Q/s	0,020	0,035	0,055	0,030	0,030	0,035	0,050	0,050	0,045	0,045	0,065	0,065	0,050	0,050	0,075	0,075		
	e	0,20	0,30	0,40	0,30	0,30	0,30	0,40	0,40	0,30	0,30	0,50	0,50	0,30	0,30	0,60	0,50		
	n	10	9	7	10	10	9	9	8	8	7	7	8	8	6	6	8	7	0
GREA	Q/s	*) NOTA: Aceste pământuri pot fi utilizate la execuția patului sau de stratului de formă numai cu condiția impermeabilizării suprafetei după execuție.																	
	e																		
	n																		

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oae = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) These soils can be used at the execution of the bed or subgrade layer only after impermeabilization of the surface after execution.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

CONSTRUCTION CASE:

EARTHWORKS

$E_1[CR_1(\frac{h.m.s}{d})]-S$

Road bed/subgrade layer

- Nature and state of available soils

Chalk made up of materials with CaCO₃ content of about 95% with high, medium or reduced humidity (h, m, s)

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 Mm %	E.N.	o %	>2mm %	I.P.	f % (g/cm ³)	r _d
-	-	-	-	-	-	-	-	-	-	>1,70

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Good	Sensitive	Inexistent

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei
Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Work stopped	Work stopped	Treatment with binders	Treatment with binders
Compaction thickness			Thin layers	Thin layers
Compaction intensity			Medium	Heavy
Bed thickness			25-30cm	25-30cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPUL CILINDRULUI COMPACTOR															
		PNEURI		VIBRATOR										PICIOR DE OAIE			
				V1		V2		V3		V4		V5					
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b		PD1	PD2
USOARA	Q/s	*) NOTA: Aceste pământuri se pot utiliza la execuția patului sau stratului de formă, numai în condițiile tratării lor cu lianti hidraulici															
	e	0,04	0,06	0,075	0,05	0,045	0,045	0,065	0,065	0,06	0,06	0,08	0,08	0,07	0,07	0,09	0,09
	n	3	5	5	4	4	6	6	5	5	4	4	5	5	5	7	7
MEDIE	Q/s	0,04	0,06	0,075	0,05	0,045	0,045	0,065	0,065	0,06	0,06	0,08	0,08	0,07	0,07	0,09	0,10
	e	0,20	0,30	0,40	0,20	0,20	0,25	0,25	0,30	0,30	0,25	0,25	0,40	0,40	0,35	0,35	0,60
	n	5	5	5	4	4	6	6	5	5	4	4	5	5	5	7	7
GREA	Q/s	0,04	0,05	0	0	0	0	0,05	0,05	0,04	0,04	0,06	0,06	0,05	0,05	0,07	0,07
	e	0	0,30	0,40	0	0	0	0	0,30	0,30	0,25	0,25	0,25	0,25	0,35	0,35	0,50
	n	0	8	8	0	0	0	0	6	6	6	6	6	6	7	7	7

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

NOTE: *) These soils can be used at the execution of the bed or subgrade layer only after their treatment with hydraulic binders.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

SHEET 40:

CONSTRUCTION CASE:

EARTHWORKS

$E_1 [CR_1(\frac{h.m.s}{b})] - S$

Road bed/subgrade layer

- Nature and state of available soils

Chalk made up of materials with CaCO₃ content of about 95% with high, medium or reduced humidity (h, m, s)

- Geotechnical characteristics

UMIDITATE %	C.B.R.	I.C.	D _{max} (mm)	<80 μm %	E.N.	o %	>2mm %	I.P.	f % (g/cm ³)	r _d
-	-	-	-	-	-	-	-	-	-	>1,70

- Platform state

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
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Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

	Good	Sensitive	Existent
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Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Work stopped	Work stopped	Treatment with binders	Treatment with binders
Compaction thickness			Medium layers	Medium layers
Compaction intensity			Medium	Medium
Bed thickness			40-45 cm	40-45cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPUL CILINDRULUI COMPACTOR														
		PNEURI		VIBRATOR										PICIOR DE OAIE		
				V1		V2		V3		V4		V5				
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2
USOARA	Q/s	*	NOTA: Aceste pământuri se pot utiliza la execuția patului sau a stratului de formă, numai în condițiile tratării lor cu ușoară hidraulică.													
	e	0,20	0,30	0,40	0,20	0,20	0,25	0,25	0,30	0,30	0,25	0,25	0,40	0,40	0,35	0,35
	n	5	5	5	4	4	6	6	5	5	4	4	5	5	5	5
MEDIE	Q/s	0,04	0,06	0,075	0,05	0,045	0,045	0,065	0,065	0,06	0,06	0,08	0,08	0,07	0,07	0,09
	e	0,20	0,30	0,40	0,20	0,20	0,25	0,25	0,30	0,30	0,25	0,25	0,40	0,40	0,35	0,35
	n	5	5	5	4	4	6	6	5	5	4	4	5	5	5	5
GREIA	Q/s	0,04	0,05	0	0	0	0	0,05	0,05	0,04	0,04	0,06	0,06	0,05	0,05	0,07
	e	0	0,30	0,40	0	0	0	0	0,30	0,30	0,25	0,25	0,25	0,25	0,35	0,35
	n	0	8	8	0	0	0	0	6	6	6	6	6	6	7	7

Legend:

Intensitatea compactării = compaction intensity

Parametrii compactării = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

NOTE: *) These soils can be used at the execution of the bed or subgrade layer only after their treatment with hydraulic binders.

SHEET 41:

CONSTRUCTION CASE:

EARTHWORKS

$E_1 [CR_1(\frac{h.m.s}{c.d})] - S$

Road bed/subgrade layer

- **Nature and state of available soils**

Chalk made up of materials with CaCO₃ content of about 95% with high, medium or reduced humidity (h, m, s)

- **Geotechnical characteristics**

UMIDITATE %	C.S.R.	I.C.	D _{max} (mm)	<80 Mm %	E.N.	o %	>2mm %	I.P.	f %	γ _d (g/cm ³)
-	-	-	-	-	-	-	-	-	-	>1,70

- **Platform state**

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Road profile	Bearing capacity	Sensitivity to water action	Wetting risk from underground water
	Reduced	-	-

Execution guide

Recommendations related to the execution of earths	Weather conditions			
	Long term torrential or moderate rain	Short term moderate or light rain	Without rain Without evaporation	Intense evap. High temps Dry time wind
Extraction				
Humidity modif.				
Treatment / improvement	Work stopped	Work stopped	Treatment with binders	Treatment with binders
Compaction thickness			Thick layers	Thick layers
Compaction intensity			Medium	Medium
Bed thickness			50-70cm	50-70cm
Bed protection				
Embankment height				

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

Compaction guide

		TIPUL CILINDRULUI COMPACTOR																
		PNEURI		VIBRATOR										PICIOR DE OAIE				
INTENSITATEA USOARA COMPACTARI	PARAMETRII COMPACTARI			V1		V2		V3		V4		V5						
		P1	P2	P3	a	b	c	d	a	b	c	d	a	b	PD1	PD2		
D/s	*	NOTA: Aceste pământuri se pot utiliza la execuția patului sau a stratului de formă, numai în condițiile tratării lor cu vînturi hidraulice																
e		0,04	0,06	0,075	0,05	0,05	0,045	0,045	0,065	0,065	0,06	0,06	0,08	0,08	0,07	0,07	0,09	0,09
n		0,20	0,30	0,40	0,20	0,20	0,25	0,25	0,30	0,30	0,25	0,25	0,40	0,40	0,35	0,35	0,60	0,60
MEDIE		5	5	5	4	4	6	6	5	5	4	4	5	5	5	5	7	7
GREA		0,04	0,05	0	0	0	0	0,05	0,05	0,04	0,04	0,06	0,06	0,05	0,05	0,07	0,07	0,07
		0,30	0,40	0	0	0	0	0,30	0,30	0,25	0,25	0,25	0,25	0,35	0,35	0,50	0,50	0,20
		0	8	8	0	0	0	0	6	6	6	6	6	6	7	7	7	7

Legend:

Intensitatea compactarii = compaction intensity

Parametrii compactarii = compaction parameters

Tip cilindrului compactor = type of compacting cylinder

Pneuri = tires

Vibrator

Picior de oaie = sheep's foot

Usoara = light

Medie = medium

Grea = heavy

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei

NOTE: *) These soils can be used at the execution of the bed or subgrade layer only after their treatment with hydraulic binders.

ABOUT THE AUTHORS :



Radu Andrei is a graduate of The Institute of Constructions Bucharest and an Emeritus Professor of Civil Engineering with the Technical University “Gh. Asachi” of Iasi, in Romania. Throughout his career, he managed important road projects in this country and abroad and performed national and international road research, also acting as an UN Expert, with the UN/ECE -Transport Division from Geneva (1980-1985 for developing Technical Specifications for the construction of the Trans-European North South Motorway-TEM project. Acting as a Romanian researcher, he brought significant contributions to the development of the Strategic Highway Research Program -SHRP, in the frame of National Academy of Sciences, from Washington DC, USA, (1992/1993). For a period of ten years, he served as Technical Director of the Romanian Centre for Road Studies & Informatics CESTRIN, and since 1994 year, he is working with the Technical University "Gh. Asachi "Iasi, Faculty of Civil Engineering. As a recognized specialist and expert in the field of roads he acted as a representative of Romania in various international organizations, such as: Permanent International Association for Road Congresses -PIARC, TRB Technical Committee / Data Analysis -DWAG/ USA (1995- 2004), Technical Committee COST- Transport & Urban Development Brussels (2000- 2010), the Executive Board of the European Forum of Road Research Laboratory -FEHRL (1995-2002). Currently he is a

Tables for Earthworks Construction Cases

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Adi Andrei is a senior data scientist, computer engineer, technology innovator, and social entrepreneur with over 25 years of experience in USA, Japan, and Europe. He received multiple patents and awards for his work with NASA, Unilever, Philips, British Gas and others. From very early on Adi has been at the forefront of technological innovation. While getting his MSc in Engineering Science from Louisiana State University he developed QPAVE, the first real-time asphalt production analysis and monitoring system using the Superapave specification, which adopted for use by the Louisiana DOT.

During his career as a Data Scientist, he was instrumental in the development of the first commercial E-Ink screen for Philips/Sony, building customer behaviour models for Unilever, identifying unusual patterns in airplane flight-recorder data for NASA, and was featured in UK tech media for the launch of the Boiler IQ product by British Gas. He also led multiple teams of data scientists and engineers, and managed Data organizations. As CEO of Technosophics Ltd (<https://www.technosophics.com>), Adi continues developing new cutting edge technologies, as well as providing consulting services, and serving on the board of advisors for multiple technology companies.

Tables for Earthworks Construction Cases

Radu Andrei Adi Andrei