







# Grouping Factors For Cables Laid Direct In The Ground

Three Single Core Cables In trefoil and laid flat touching horizontal formation (average values)							
							
		← Spacing →			← Spacing →		
No of circuits	Spacing of circuits						
	Touching						
		Trefoil	Flat	0.15m*	0.3m	0.45m	0.6m
600/1000 volt cables	2	0.77	0.80	0.82	0.88	0.90	0.93
	3	0.65	0.68	0.72	0.79	0.83	0.87
	4	0.59	0.63	0.67	0.75	0.81	0.85
	5	0.55	0.58	0.63	0.72	0.78	0.83
	6	0.52	0.56	0.60	0.70	0.77	0.82
1900/3300 to 12700/22000 volt cables	2	0.78	0.80	0.81	0.85	0.88	0.90
	3	0.66	0.68	0.71	0.76	0.80	0.83
	4	0.59	0.62	0.65	0.72	0.76	0.80
	5	0.55	0.58	0.61	0.68	0.73	0.77
	6	0.52	0.55	0.58	0.66	0.72	0.76
19000/33000 volt cables	2	0.79	0.81	0.81	0.85	0.88	0.90
	3	0.67	0.70	0.71	0.76	0.80	0.83
	4	0.62	0.65	0.65	0.72	0.76	0.80
	5	0.57	0.60	0.60	0.68	0.73	0.77
	6	0.54	0.57	0.57	0.66	0.72	0.76

\* This configuration at 0.15m spacing, may not be practical for the larger size cables.

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# Grouping Factors For Cables Laid Direct In The Ground

Multi-Core Cables In horizontal formation (average values)						
	No of cables in group	Spacing of circuits				
		Touching	0.15m	0.3m	0.45m	0.6m
<b>600/1000 volt cables</b>	2	0.81	0.87	0.91	0.93	0.94
	3	0.70	0.78	0.84	0.87	0.90
	4	0.63	0.74	0.81	0.86	0.89
	5	0.59	0.70	0.78	0.83	0.87
	6	0.55	0.67	0.76	0.82	0.86
<b>1900/3300 to 12700/22000 volt cables</b>	2	0.80	0.85	0.89	0.90	0.92
	3	0.68	0.75	0.80	0.84	0.86
	4	0.62	0.70	0.77	0.80	0.84
	5	0.57	0.66	0.73	0.78	0.81
	6	0.55	0.63	0.71	0.76	0.80
<b>19000/33000 volt cables</b>	2	0.80	0.83	0.87	0.89	0.91
	3	0.70	0.73	0.78	0.82	0.85
	4	0.64	0.68	0.74	0.78	0.82
	5	0.59	0.63	0.70	0.75	0.79
	6	0.56	0.60	0.68	0.74	0.78

# Ratings Factors For Depth Of Laying And Thermal Resistivity Of Soil For Cables Laid Direct In Ground

## Rating factors for Depth of Laying

(to centre of cable or trefoil group of cables)

Depth of laying m	600/1000 volt cables			1900/3300 volt to 19000/33000 volt cables	
	up to 50mm <sup>2</sup>	70 - 300mm <sup>2</sup>	above 300mm <sup>2</sup>	up to 300mm <sup>2</sup> above	300mm <sup>2</sup>
0.50	1.00	1.00	1.00	-	-
0.60	0.99	0.98	0.97	-	-
0.80	0.97	0.96	0.94	1.00	1.00
1.00	0.95	0.93	0.92	0.98	0.97
1.25	0.94	0.92	0.89	0.96	0.95
1.50	0.93	0.90	0.87	0.95	0.93
1.75	0.92	0.89	0.86	0.94	0.91
2.00	0.91	0.88	0.86	0.92	0.89
2.50	0.90	0.87	0.84	0.91	0.88
3.00 or more	0.89	0.85	0.82	0.90	0.86

## Rating Factors for Variation on Thermal Resistivity of Soil

Size of Cables mm <sup>2</sup>	Thermal resistivity of soil in °C m/W					
	0.8	0.9	1.0	1.5	2.0	2.5
<b>Single Core</b>						
up to 150mm <sup>2</sup>	1.15	1.11	1.06	0.91	0.81	0.73
185 - 300mm <sup>2</sup>	1.17	1.12	1.07	0.90	0.80	0.72
Above 300mm <sup>2</sup>	1.17	1.12	1.07	0.90	0.79	0.71
<b>Multi-Core</b>						
up to 16mm <sup>2</sup>	1.09	1.06	1.04	0.93	0.84	0.77
25 - 150mm <sup>2</sup>	1.12	1.09	1.05	0.92	0.82	0.77
Above 150mm <sup>2</sup>	1.14	1.10	1.06	0.92	0.81	0.74

# Grouping Factors For Cables In Single Way Ducts

Three Single Core Cables  
 In trefoil single way ducts, horizontal formation (average values)



	No of circuits	Spacing of circuits		
		Touching	0.45m	0.6m
<b>600/1000 volt cables</b>	2	0.86	0.90	0.93
	3	0.77	0.83	0.87
	4	0.73	0.81	0.85
	5	0.70	0.78	0.83
	6	0.68	0.77	0.82
<b>1900/3300 to 12700/22000 volt cables</b>	2	0.85	0.88	0.90
	3	0.75	0.80	0.83
	4	0.70	0.76	0.80
	5	0.67	0.73	0.77
	6	0.64	0.71	0.76
<b>19000/33000 volt cables</b>	2	0.85	0.88	0.90
	3	0.76	0.80	0.83
	4	0.71	0.76	0.80
	5	0.67	0.73	0.77
	6	0.65	0.71	0.76

# Grouping Factors For Cables In Single Way Ducts

Multi-Core Cables In single way ducts, horizontal formation (average values)					
	No of ducts in group	Spacing of circuits			
		Touching	0.3m	0.45m	0.6m
<b>600/1000 volt cables</b>	2	0.90	0.93	0.95	0.96
	3	0.82	0.87	0.90	0.93
	4	0.78	0.85	0.89	0.91
	5	0.75	0.82	0.87	0.90
	6	0.72	0.81	0.86	0.90
<b>1900/3300 to 12700/22000 volt cables</b>	2	0.88	0.91	0.93	0.94
	3	0.80	0.84	0.87	0.89
	4	0.75	0.81	0.84	0.87
	5	0.71	0.77	0.82	0.85
	6	0.69	0.75	0.80	0.84
<b>19000/33000 volt cables</b>	2	0.87	0.89	0.92	0.93
	3	0.78	0.82	0.85	0.87
	4	0.73	0.78	0.82	0.85
	5	0.69	0.75	0.79	0.83
	6	0.67	0.73	0.78	0.82

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# Rating Factors For Depth Of Laying And Thermal Resistivity Of Soil For Cables In Single Way Ducts

Rating Factors for Depth of Laying  
(to centre of duct)

Depth of laying m	600/1000 volt cables		1900/3300 volt to 19000/33000 volt cables	
	Single Core	Multi-Core	Single Core	Multi-Core
0.50	1.00	1.00	-	-
0.60	0.98	0.99	-	-
0.80	0.95	0.97	1.00	1.00
1.00	0.93	0.96	0.98	0.99
1.25	0.90	0.95	0.95	0.97
1.50	0.89	0.94	0.93	0.96
1.75	0.88	0.94	0.92	0.95
2.00	0.87	0.93	0.90	0.94
2.00	0.87	0.93	0.89	0.93
3.00 or more	0.85	0.91	0.88	0.92

Rating factors for variation on Thermal Resistivity of Soil

Size of Cables mm <sup>2</sup>	Thermal resistivity of soil in °C m/W					
	0.8	0.9	1.0	1.5	2.0	2.5
<b>Single Core</b>						
up to 150mm <sup>2</sup>	1.08	1.06	1.04	0.94	0.86	0.80
185 - 300mm <sup>2</sup>	1.10	1.07	1.04	0.93	0.85	0.78
Above 300mm <sup>2</sup>	1.11	1.08	1.05	0.93	0.83	0.76
<b>Multi-Core</b>						
up to 16mm <sup>2</sup>	1.03	1.02	1.02	0.97	0.91	0.87
25 - 150mm <sup>2</sup>	1.05	1.03	1.02	0.95	0.89	0.83
Above 150mm <sup>2</sup>	1.07	1.05	1.03	0.94	0.86	0.81