



FORSES IN THE ROPES									
8. Maximum permissible tension in the track rope - $T_{Tmax}=T'_{T}/n$, kN				239,0	>	234,65	Calculated maximum tension in the track rope		
8.1. Factor of safety			$n=$	3,0	<	3,06	Calculated minimum safety factor		
8.2. Modulus of elasticity of the rope, kN/mm ²			$E_k=$	160					
8.3. Coefficient of linear elongation of steel			$\varepsilon=$	0,000011					
9. Maximum permissible tension in the hauling rope - $T_{Zmax}=T'_{Z}/n$, kN				71,0	>	60,9	Calculated maximum tension in the hauling rope		
9.1. Factor of safety				4,0	<	4,67	Calculated minimum safety factor		
9.2. Accepted minimum force in the hauling rope (600÷800)q _z , daN	1080	1440		1500		3,10	Calculated maximum cohesion between hauling rope and bull wheel		
10. Maximum permissible tension in the hoist rope, kN				29,27	>	27,48	Calculated maximum tension in the hoisting rope		
10.1. Factor of safety: при D/d=30 - n=5,5; D/d=35 - n=5,0; D/d=40 - n=4,5				5,5	<	5,86	Calculated minimum safety factor		

8..2019	CABLE CRANE Lankan_Makari		
7-St1	L-Section Calculations A-B		
DESIGN DATA			
1. Horizontal distances			
1.1. Between the anchor points of the track rope, m			821,41
1.2. Between the supporting points of the rope near to the anchor points, m			
2. Vertical distance			
2.1. Between the anchor points of the track rope, m			280,65
2.2. Between the supporting points of the rope near to the anchor points, m			
3. Carriage - number of wheels			
			4x4
3.1. Trolley weight, kg			1250
3.2. Hoist beam weight, kg			1400
3.3. Weight of Carriage & Bucked assembly, kg		Q ₁ =	2650
3.4. Payload, kg		Q ₂ =	3500
3.5. Total Weight, kg		Q=	6150
4. Track rope - number / diameter, mm			
			2 30
4.1. Construction - spiral strand			1x61(24/18/12/6/1)
4.2. Grade, N/mm ²			1570
4.3. Metal section, mm ²		F _T =	530
4.4. Calculated breaking strength of the rope, kN		T _T =	797
4.5. Real breaking strength of the rope, kN α=	0,9	T' _T =	717
4.6. Linear mass of the rope, kg / m		q _T =	4,45
5. Hauling rope - Diameter, mm			
			22
5.1. Construction			6x19
5.2. Grade, N/mm ²			1770
5.3. Metal section, mm ²		F _Z =	277
5.4. Linear mass of the rope, kg / m		q _Z =	1,80
5.5. Calculated breaking strength of the rope, kN		T _Z =	490
5.6. Real breaking strength of the rope, kN	0,85	T' _Z =	284
6. Hoist Rope - Diameter, mm			
			16
6.1. Construction - 6x36 (1+7+7+7+14)=216 телове и Faber cord			6x19
6.2. Grade, N/mm ²			1770
6.3. Metal section, mm ²			126
6.4. Linear mass of the rope, kg / m			1,07
6.5. Calculated breaking force of the rope, kN			223,0
6.6. Actual breaking force of the rope, kN	0,85		161,0
7. Friction coefficient			
7.1. Average along the trace			0,16
7.2. For calculation of the loading of the towers			0,20
7.3. For the moving of the Carriage and for turn back wheel Ø 1600			0,01
7.4. For the hauling rope on the rollers of the towers			0,015
7.5. For the hoisting rope on the rollers in the hanger and hook			0,02

CLIENT: Makari Gad Hydro Electric Project, Nepal - Providing Cable Cranes / Material Ropeways from Power House to In-Take				
Designed by Patchilov Petar	Checked by Patchilov Velitchko	Approved by	Date: 09.06.2019	Scale 1:1000
BROD Patchilov		TITLE L-profile, Section A-B		
22 Petko Karavelov boul., 62A, 1408 Sofia, Bulgaria		DRAWING NUMBER		Sheet 1