Annexure-I

General Technical Particulars of 132kV, 1C X 800 mm^2 XLPE Copper Cable

Sl No	Description	Unit	Details
1	Standard according to which cable has been manufactured		As per IEC 60502-2 and IEC 60840
2	Rated Voltage {U_o/U} Highest System Voltage which the cable can withstand		76/132 (145) kV 145 kV
3	Maximum Conductor temperature for continuous operation		90 ^{0}C
4	(a) Maximum short time conductor temperature with duration		250 ^{0}C
	b) Maximum allowable conductor temp. during overload		105 ^{0}C
5	Conductor Details		
	Normal Cross-Sectional Area		800 Sq mm
	Material and Grade		Plain Annealed Copper
	Shape of Conductor		Compacted stranded circular
	Diameter of Conductor		34 mm (Approx.) over tape
	No. of Strands and Diameter of each Strand		80 Approx (Complying 53 Min. as per IEC No. of Strands and Diameter of each Strand 60228) /3.70 mm (Approx.) before stranding
6	Bedding tape over the conductor		
	a) Nom. Semiconducting tape over the final conductor	mm	As per IEC
7	Conductor Screen		
	a) Material		Extruded semi conducting Compound
	b) Nominal / Min. Thickness	mm	As per IEC
	c) Nom. dielectric stress at the conductor screening	kV/mm	Indicate value with calculation as per relevant IEC
8	Insulation		
	a) Material		Extruded XLPE Compound
	b) Insulation Thickness (Nominal) / (Min.)	mm	18.0/16.2
	c) Nominal Diameter over insulation	mm	73.7
	d) Nominal dielectric stress at the insulation screen	kV/mm	Indicate value with calculation as per relevant IEC
	e) Type of manufacturing process		
9	Insulation screen		

	a)	Material		Extruded semi conducting Compound
	b)	Nominal / Min. Thickness	mm	As per IEC
	c)	Approx. diameter over insulation screen	mm	AS per IEC
10	Water Swellable Tape (Longitudinal Water sealing)			
	a)	Material		Water swellable semiconducting Tape (non-woven)
	b)	Nominal Thickness	mm	As per IEC
	c)	No. of water swellable tape	Nos.	As per IEC
	d)	Nom. Dia. below metallic lead sheath	mm	As per IEC
11	Metallic Sheath			
	a)	Material		Corrugated Aluminum sheath
	b)	Nominal / Min. Thickness /	mm	As per IEC
	c)	Nom. Dia. over metallic lead sheath	mm	As per IEC
	d)	DC Resistance of metallic screen (Lead + Copper screen combined)	Ω /km	Indicate value with calculation as per relevant IEC
12	Water Swellable Separator Tape			
	a)	Material		Water swellable semi conducting Tape (non-woven)
	b)	Nominal Thickness	mm	As per IEC
13	Metallic Cu Screen			
	a)	Material & type		Annealed plain copper round wires with copper tape in open helix
	b)	Nom. area of copper wire screen	mm^2	229.3
	c)	No of copper wires	Nos	As per requirement, submit calculation as per IEC
	d)	Nom. diameter of copper wires	mm	As per requirement, submit calculation as per IEC

Sl No	**Description**		**Unit**	**Details**
14	Earth Fault current of metallic sheath and copper screen combined			> 40 KA for one second (Calculation to be provided) (Aluminum Seath + Copper Wire Screen Combined)
15	Water Swellable Bedding Tape			
	a)	Material		Non-Conducting Water swellable Tape (non-woven tape)
	b)	Nominal Thickness	mm	As per IEC
16	Outer Sheath			
	a)	Material		Extruded HDPE Type ST-7 Compound with Anti termite and Anti rodent additives
	b)	Nominal / Min. Thickness	mm	As per IEC
	c)	Colour		Black
	d)	Test voltage at works	kV	25 kV DC for one minute

	e)	Conducting Layer on outer sheath			Yes (Graphite Coating)	
	f)	(I)	Norn. OD of completed cable	mm	As per requirement	
		(ID	Tolerance on OD	mm	+/- 2.0	
	g)	Approx., overall Weight of cable		Kg/m	As per requirement	
	h)	Embossing Details			As per requirement	
	I)	Sequential Marking			Shall be provided at every one meter	
17	Electrical Parameters of cable					
	a)	Max. D.C. Resistance of conductor at 20'C		Ω /Km	Indicate value with calculation as per relevant IEC	
	b)	Max. A.C. Resistance of conductor at 9O°C		Ω /Km	Indicate value with calculation as per relevant IEC	
	c)	Approx., equivalent star reactance per Km. of 3 phase circuit at 50 Hz		Ω /Km	Indicate value with calculation as per relevant IEC	
	d)	Norn, electrostatic capacitance per Km. of cable		pf/Km	Indicate value with calculation as per relevant IEC	
	e)	Norn. charging current at rated voltage per phase		A/Km	Indicate value with calculation as per relevant IEC	
	f)	Max. Positive and negative sequence impedance		Ω /Km	Indicate value with calculation as per relevant IEC	
	g)	Max. zero sequence impedance		Ω/Km	Indicate value with calculation as per relevant IEC	
	Description			**Unit**	**Details**	
18	Losses Per meter of cable per phase @ rated current per phase					
	a)	Conductor Losses		W/m	Indicate value with calculation as per relevant IEC	
	b)	Dielectric Losses		W/m	Indicate value with calculation as per relevant IEC	
	c)	Metallic sheath Losses		W/m	Indicate value with calculation as per relevant IEC	
	d)	Total Losses		W/m	Indicate value with calculation as per relevant IEC	
19	Maximum continuous current carrying capacity per cable when laid as per the following conditions: - at a depth of 1.5 meter from top of the cable - Ground temperature = 35°C - Soil thermal resistivity = 150°C-Cm/w - Cable laid in trefoil formation - Cross end bonding					
	a)	Directly buried In Ground		Amps.	Double Circuit	Single Circuit

				Please submit calculation	Please submit calculation
	b)	In HDPE Pipes (250 mm)	Amps.	Please submit calculation	Please submit calculation
	c)	In air © Ambient Temp. = 40°C (Shaded to sun)	Amps.	Please submit calculation	Please submit calculation
	d)	In air @ Ambient Temp. = 50°C (Shaded to sun)	Amps.	Please submit calculation	Please submit calculation
20	Induced Voltage per Km under the normal rated current		Volts/Km	Please submit calculation	
21	Test parameters as per IEC: 60840				
	a)	Impulse withstands voltage 1.2/50 micro second wave	KVp	650	
	b)	Power frequency withstand High voltage Test	KV (rms)	190 kV for 30 minutes	
	c)	Maximum partial discharge magnitude (Pc)	PC	Maximum 5 Pc Type test and 10 Pc for routine test	
	d)	Maximum Tan delta at U_o Voltage		0.001	

Sl No	Description			Unit	Details
22	Installation Parameters				
	a)	Minimum Bending Radius			20 x OD Where OD = Overall diameter of cable
	b)	Pulling eye provided on one running end per drum			Yes, pulling eye provided on one running end per drum
	c)	Safe Pulling force of the conductor when pulled by pulling eye		N/mm^2	50 Newton / mm^2
23	Details for transportation				
	a)	Standard drum length per drum (Steel Drum)		Meters	500 meters +/-2% or as per approved drum schedule
	b)	Approx., drum Dimensions		mm	
		i)	Flange (Approx.)	mm	3200
		il)	Barrel (Approx.)	mm	2000
		ill)	Traverse (Approx.)	mm	2100
	c)	Approx. Weight of cable drum with cable		Kgs.	As per requirement (Standard drum length + drum weight)
24	Approx., copper weight in the cable (Conductor + Copper screen)			Kg/m	As per requirement
25	Approx. metallic sheath weight in the cable			Kg/m	As per requirement
26	Method of sheathing Bonding				By cross bonding