



# འབྲུག་གློག་མེ་ལས་འཛིན།

**Bhutan Power Corporation Limited**  
(An ISO 9001:2015, ISO 14001:2015 & OHSAS 18001:2007 Certified Company)  
Registered Office, Thimphu  
Procurement Services Department  
Thimphu: Bhutan



BPC/PSD/ TD Materials/2019/07 / 202

April 08, 2019

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**Subject:** Addendum No. 1

**Reference:** Tender No: BPC/PSD/TD Materials/2019/07 dated March 23, 2019.

Dear Sir(s),

This is with reference to above-mentioned tender whereby PSD, BPC has received the queries from the bidders. With response to the queries, **the Technical Specification for Lot- 6 ADSS Cables has been changed as attached.**

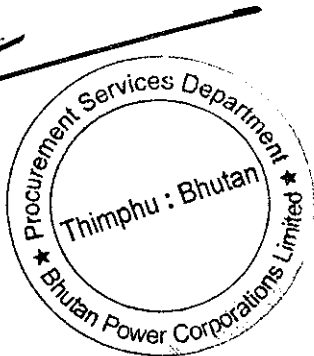
However, due to the above inclusion and additional information, no time extension shall be granted and the submission date and time shall remain the same.

Please acknowledge the receipt of this Addendum No.1.

Thanking you,

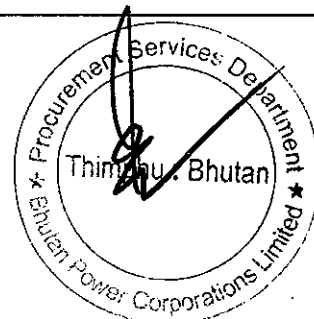
Yours sincerely,

  
(Drukchu Dorji)  
General Manager



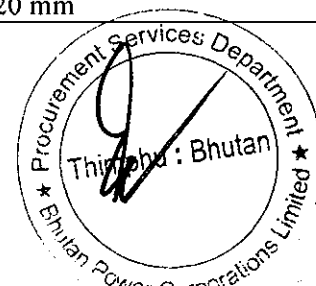
## 1. Technical particulars of 48f SM Armoured Optical Fiber Cable

1. Fiber properties			
SI.No	Characteristics	Unit	Value
1	Attenuation @ 1310 nm @1550 nm	dB/km	≤ 0.36 ≤ 0.23
2	Chromatic dispersion between 1270 - 1340 nm 1285 - 1330 nm 1550 nm 1625 nm	ps/(nm <sup>2</sup> km)	≤ 5.3 ≤ 3.5 ≤ 18 ≤ 22
3	Zero dispersion wavelength	nm	1300 to 1324
4	Zero dispersion slope	ps/(nm <sup>2</sup> km)	≤ 0.092
5	Cut off wavelength	nm	≤ 1320
6	Mode field diameter at 1310 nm	μm	9.3 ± 0.5
7	Core-clad concentricity error	μm	≤ 0.6
8	Cladding non circularity	μm	≤ 1.0%
9	Cladding diameter	μm	125 ± 1.0
10	Coating diameter	μm	245 ± 10
11	Polarization mode dispersion	ps/√km	≤ 0.20
2. Mechanical Properties			
A	Bending radius	mm	260
B	Tensile Strength	Newton	3000
3. Physical & dimensions properties			
I	Number of fibers		48F
II	Numbers of loose tubes Number of filler/Dummy Number of fiber per tube		4 2 12
III	Type of fiber		SM G652D
IV	Central strength member		FRP rod
V	Armouring details		Corrugated Steel Tape Armour
VI	Sequence of loose tubes (as per EIA/TIA 598)		Blue, Orange, Green, Brown, Filler-1 & Filler-2
VII	Inner & Outer sheath material		UV resistant (Black) polyethylene (H.D.P.E)
VIII	Inner and Outer sheath material		UV Resistant Black Polyethylene (H.D.P.E)
IX	Outer cable diameter	mm	13.8 ± 0.8
X	Cable weight	Kg/km	175 ± 20
XI	Printing on cable		1. Manufacturer name 2. Labelled "48F G652D Armoured OFC" 3. Year of manufacture 4. Labelled "BPC" 5. Sequential length marking in meter
XII	Standard length		3 km



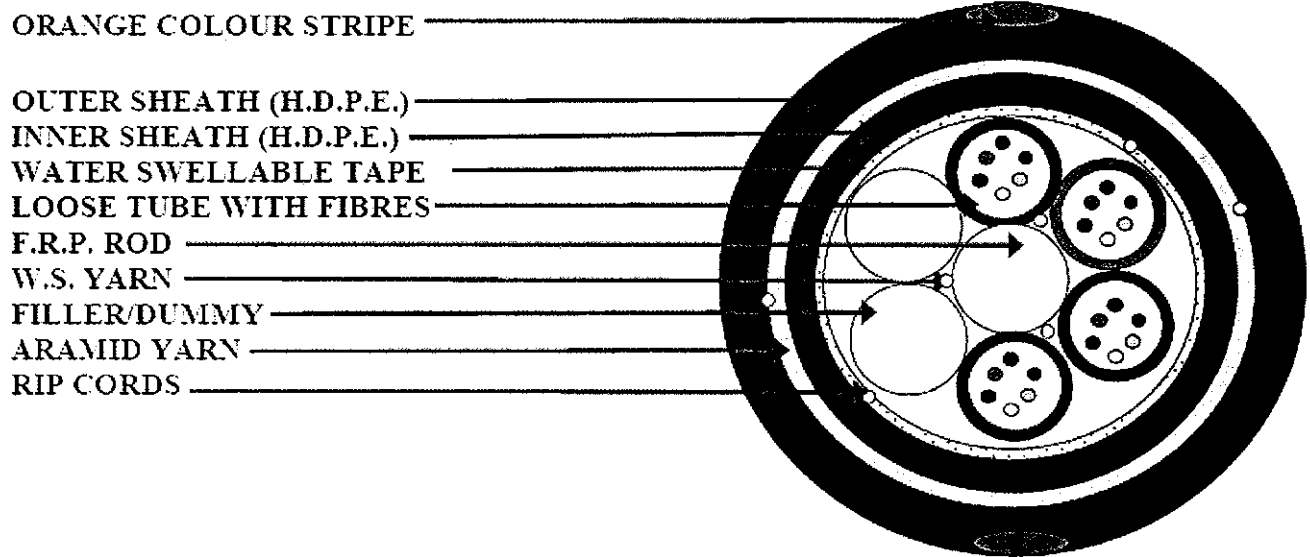
# 1. Technical particulars of 24f DWDM ADSS Optical Fiber Cable

1. Fiber properties			
Sl.No	Characteristics	Unit	Value
1	Attenuation @ 1310 nm @1550 nm	dB/km	≤ 0.36 ≤ 0.23
2	Chromatic dispersion between 1270 - 1340 nm 1285 - 1330 nm 1550 nm 1625 nm	ps/(nm <sup>2</sup> km)	≤ 5.3 ≤ 3.5 ≤ 18 ≤ 22
3	Zero dispersion wavelength	Nm	1300 to 1324
4	Zero dispersion slope	ps/(nm <sup>2</sup> km)	≤ 0.092
5	Cut off wavelength	nm	≤ 1320
6	Mode field diameter at 1310 nm	μm	9.3 ± 0.5
7	Core-clad concentricity error	μm	≤ 0.6
8	Cladding non circularity	μm	≤ 1.0%
9	Cladding diameter	μm	125 ± 1.0
10	Coating diameter	μm	245 ± 10
11	Polarization mode dispersion	ps/√km	≤ 0.20
2. Mechanical & Environmental properties			
A	Tensile Strength	KN	13.0
B	Crush resistance	Newton/100mm	2000 (200Kg load on 100x100mm plate for one minute), change in loss ≤ 0.05dB (IEC-60794-1-21-E3 standard)
C	Bending radius	mm	280 (IEC-60794-1-21-E11 standard)
B	Strain Margin	%	≤ 0.25
C	Impact Resistance	N	50, Change in loss ≤ 0.05dB (IEC-60794-1-21-E4 standard)
D	Torsion resistance	N	75, (10 cycles, ±180deg) Change in loss ≤ 0.05dB (IEC-60794-1-21-E7 standard)
E	Max. operating /installation temperature	°C	-30 to +70
3. Physical & dimensions properties			
I	Number of fibers		24F
II	Numbers of loose tubes Number of filler/Dummy Number of fiber per tube		4 2 6
III	Type of fiber		SM G652D
IV	Central strength member		FRP rod
V	Peripheral strength elements		Aramid Yarn – 12.6 kg/km
VI	Sequence of loose tubes (as per EIA/TIA 598)		Blue, Orange, Green, Brown, Filler-1 & Filler-2
VII	Inner & Outer sheath material		UV resistant (Black) polyethylene (H.D.P.E)
VIII	Inner sheath thickness	mm	≥ 1.2
IX	Outer sheath thickness	mm	≥ 2.0
X	Outer cable diameter	mm	14.8 ± 0.5 mm
XI	Cable weight	Kg/km	165 ± 20 mm



XII	Printing on cable	<ol style="list-style-type: none"> <li>1. Manufacturer name</li> <li>2. Labelled "24F G652D ADSS OFC"</li> <li>3. Year of manufacture</li> <li>4. Labelled "BPC"</li> <li>5. Sequential length marking in meter</li> <li>6. Two orange colour (UV stabilized) lines of minimum 3 mm width diametrically opposite to each other, continuous over the length of the cable shall be applied (marked) for easy identification of this cable from other cables.</li> </ol>
XIII	Standard length	3 km

**2 Cross Section diagram of ADSS cable**



**3 Color Identification of fiber in ADSS**

Color code of fiber in ADSS shall be identified referring to the following table

Typical number of fiber: 24

Fiber units	Fiber No. & color					
	1	2	3	4	5	6
Blue tube	Blue	Orange	Green	Brown	Gray	White
	7	8	9	10	11	12
Orange tube	Blue	Orange	Green	Brown	Gray	White
	13	14	15	16	17	18
Green tube	Blue	Orange	Green	Brown	Gray	White
	19	20	21	22	23	24
Brown tube	Blue	Orange	Green	Brown	Gray	White

