

THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED
(A Govt. of West Bengal Enterprise)
Bakreswar Thermal Power Project
P.O.Bk.T.P.P , Dist -Birbhum,Pin -731104

NIT No.: WBPDCCL/Tend-Adv/CC/14-15/22/BkTPP

Date:23.05.2014

Sealed tenders in two parts, Part A (for technical specification bid alongwith commercial terms & conditions) and Part B (for price bid) in duplicate are invited by the General Manager, BkTPP with same material specification for the supply of following material at BkTPP.

1. Description of Materials : As per Annexure-I
2. Earnest Money : Rs. 90,000/-
3. Cost of Tender Paper : Rs. 1,000/-
4. Sale of Tender Paper : 26.05.2014 to 13.06.2014
5. Pre-bid discussion : 17.06.2014 at 11.00 A.M.
6. Last Date of Submission of Sealed Tender Paper : 26.06.2014 up to 02.00 P.M.
7. Opening of Tender
- 7a. Part-A (for technical bid along with commercial terms & conditions) : 26.06.2014 at 03:00 P.M.
- 7b. Part-B (for price bid) : Opening date will be intimated to the successful i.e. technically accepted bidders later on.
8. Material Delivery Period : Sixteen (16) weeks from the date of the order.

[Qualifying Requirement:

1. Must be a manufacturer / distributor / dealer of the items.
2. Documents to prove the experience of the tenderers in successful execution of Purchase Order in the last five financial years they should submit Purchase Order copies for i) amount of Rs.10,00,000/- or above in single order / ii) amount of Rs.7,00,000/- each or above in two orders / iii) amount of Rs.5,00,000/- each or above in three orders. And End user's certificate or Material Receipt Note Voucher is to be submitted as supporting document for proof of execution of above Purchase Order/s.]

Detailed terms & conditions are set forth in the Tender Paper (Non - Transferable) which can be obtained from the Sr. Manager(S&P), BkTPP on application. The cost of Tender Paper is to be deposited in the Account Section, BkTPP from 10.30 AM to 01.30 PM (except Saturday, Sunday and Holiday). Tender Paper will not be issued against DD / MO / Cheque and by post. If any change or extension of due date or any corrigendum, may please visit website. The WBPDCCL reserves the right to accept or to reject any or all tender either in full or in part or to split up, if necessary without assigning any reasons whatsoever. For qualifying requirements and other details visit website www.wbpdcl.co.in

T. K. BOSE
SR.MGR(S & P) BkTPP/WBPDCCL

ANNEXURE-I

Indented items of Ref PR.13-14/11371

Sl No.	Item code	Description
1.	06C010087	Cable, Copper, 0.5 Sq.mm Dia, 4 Pair, Screened, Armoured. 600 Volt grade, 85 Deg.C rating, Stranded tinned copper conductor, HR PVC insulation, Colour coded, Twisted to form a pair, Pairs twisted to fom a unit, Units laid up. Myler taped binding, overall screened with alluminised myler tape with tinned copper drain wire, extruded HR PVC inner sheath(IS:5831), galvanized steel round wire/strip armoured, extruded FRLS PVC overall sheath.
2.	06C010007	Cable, Copper, 0.5 Sq.mm Dia, 6 Pair, Screened, Armoured. 600 Volt grade, 85 Deg.C rating, Stranded tinned copper conductor, HR PVC insulation, Colour coded, Twisted to form a pair, Pairs twisted to fom a unit, Units laid up. Myler taped binding, overall screened with alluminised myler tape with tinned copper drain wire, extruded HR PVC inner sheath(IS:5831), galvanized steel round wire/strip armoured, extruded FRLS PVC overall sheath.
3.	06C010002	Cable, Copper, 0.5 Sq.mm Dia, 12 Pair, Screened, Armoured 600 Volt grade, 85 Deg.C rating, Stranded tinned copper conductor, HR PVC insulation, Colour coded, Twisted to form a pair, Pairs twisted to fom a unit, Units laid up. Myler taped binding, overall screened with alluminised myler tape with tinned copper drain wire, extruded HR PVC inner sheath(IS:5831), galvanized steel round wire/strip armoured, extruded FRLS PVC overall sheath.
4.	06C010051	Cable, Single Core, 1.5 Sq.mm tinned Copper conductor, Flexible PVC Insulated, Grey Colour. 600V Grade, FRLS
5.	06C010034	Cable, Copper, 0.5 Sq.mm Dia, 24 Pair, Screened. Armoured. 600 Volt grade, 85 Deg.C rating, Stranded tinned copper conductor, HR PVC insulation, Colour coded, Twisted to form a pair, Pairs twisted to fom a unit, Units laid up. Myler taped binding, overall screened with alluminised myler tape with tinned copper drain wire, extruded HR PVC inner sheath(IS:5831), galvanized steel round wire/strip armoured, extruded FRLS PVC overall sheath.
6.	06C010001	Cable, Copper, 1.5 Sq.mm Dia, 2 Pair, Screened, Armoured. 600 Volt grade, 85 Deg.C rating, Stranded tinned copper conductor, HR PVC, FRLS insulation, Colour coded.
7.	04C010029	Cable,LT,Control, Copper, PVC Insulated, Steel Armoured,1.1KV Grade, 3 Core x 2.5 Sq.mm. Stranded tinned copper conductor, HR PVC, FRLS insulation, Colour coded..

Detail specification attached.

9.02.00 1100V Grade Twisted and Shielded Control Cable

Conductor of cross section 2.5 Sq.mm.

1. Reference : IS-1554,Part-1- Latest Revision
2. Conductor : Nominal 2.5 mm Sq. area, annealed, high conductivity stranded (7).
3. Insulation : PVC insulated (heavy duty, self extinguishing type), colour coded, extruded, PVC inner sheathed with overall PVC sheathing.
4. Lay : Twisted pair with 60 mm lay.
5. Shield : 2.35 mil thick combination aluminium mylar tape and 7 strand 0.51 mm Sq. coated copper drain wire. Hundred percent cover over insulated conductors.
6. General Requirements : Minimum length of single coil shall be 500 metres.
7. Armoured : Galvanised round steel wires

Durable marking shall be provided on the surface of the cable at intervals not exceeding 625 MM. Marking shall include manufacturer's name, insulating material, conductor size and voltage class.

FRLS properties of Inner and Outer sheath of all types of cables:

- a) Min. Oxygen index as per ASTM D-2863 : 29 or better when tested at 27+/- degc.
- b) Min Temperature index as per ASTM D-2863 Deg.C : 250 Deg.C at 21 Oxygen index
- c) Max. HCL emission as per IEC-754-I % : 20% by weight
- d) Max smoke density as per ASTM D-2843 % : 60%
- e) Flammability test on completed cable : Cable shall meet the test requirements as per IEC-332-I, IEEE-383 and SS-424 1475 Cl.F3

Outer sheath material shall have anti-rodent and anti termite properties.

9.04.00 INSTRUMENTATION CABLES

General Description

9.04.01 Twisted Pair Instrumentation Cable Type-A & B)

600 Volt grade, 85 Deg.C rating, instrumentation cables with stranded tinned copper conductor, HR PVC insulation, colour coded, twisted to form a pair, pairs twisted to form a unit, units laid up, mylar taped binding, overall screened with aluminised mylar tape with tinned copper drain wire, extruded HR PVC inner sheath (IS:5831), galvanised steel round wire/strip armoured as specified elsewhere in the specification & extruded FRLS PVC overall sheath.

Cable Design and Constructional Requirements

**9.04.02 600 V Grade Twisted Pair
Instrumentation Cable (Type-A)**
Conductor of cross section 0.5 Sq.mm

a) Construction

1. Conductor : Each core shall be of stranded annealed tinned copper electrolytic grade conductor of cross section 0.5 Sq.mm, generally complying to Class-5 of IS : 8130.
2. Insulation : Each core shall be provided with extruded HR. PVC insulation conforming to IS:5831, Type-C. Overall diameter of the insulated core shall be strictly limited between 1.4 mm and 1.65 mm.
3. : Every two wires (cores) twisted to form a pair, (25 to 30 lays per metre), every 4 pairs twisted together to form a unit, the units stranded in layers to form the cable.
4. : The unit shall be taped with myler tape for the purpose of binding. Necessary filler chords shall be placed in between the units and if necessary, the group of units shall be wrapped with myler tape to make a firm formation. The filler chords shall not absorb any moisture.
5. Shielding : The group shall be then shielded with aluminised myler tape to provide 100% coverage. Tape thickness shall Be minimum 0.06 mm. Taping shall be done with at least 25% overlapping. A continuous drain wire of tinned copper of diameter 0.8 mm shall also be provided under the aluminium side of the screen.
6. Inner Sheath : Cables shall be provided with extruded HR PVC inner sheath suitable for 85 Deg.C operation.
7. Armouring : Armouring applied over inner sheath, shall consist of galvanised steel strips for the cables having the dia below armour more than 13 mm and for the cables having dia below armour upto and including 13 mm armouring shall consist of galvanised round steel wires.

The armouring wire/strip shall generally conform to IS:1975.
8. Overall Sheathing : The cable shall be then sheathed with IS-5831, Type ST2 PVC (FRLS) by extrusion process. The shielding and sheathing shall be so done that it fits firmly to the cable and are easily removable without damage to the cores. Colour of sheath shall be grey. Thickness of sheath shall be as per table-6 of IS:1554 (Part-I).
9. Others : As per 1554 (Part-I).
10. Codes and Standard :
 - IPCEA S 61-402
 - ASTMD-33

Electrical Properties at 20 Deg.C

1. Conductor resistance not greater than : 40.1 Ohms/Km
2. Volume resistivity (min.) : 3.5 x 10¹⁴ Ohm-Cm at 27 Deg.C
3.5 x 10¹¹ Ohm-Cm at 85 Deg.C
3. Mutual capacitance at 0.8 KHZ not greater than : 160 nF/Km
4. Test voltage conductor to conductor, conductor to shield : 2000V (rms) for 1 min
5. Characteristic impedance at 0.8 KHZ : 310 Ohms (Nominal)
6. Voltage grade : 600 V
7. Image attenuation at 0.8 KHZ : 0.17 dB/100 m (approx.)
8. Image attention at 10 KHz : 0.56 dB/100 m (approx.)
9. Cross talk attenuation at 0.8 KHZ : 70 dB/Km. (approx.)

c) Colour Coding

The wires of pairs shall be coded by basic colours of insulating covers, which are repeated in the same sequence in every unit.

Basic colours of the pairs in a unit shall be as under :

Pair	1	2	3	4
A-wire	Blue	Grey	Green	White
b-wire	Red	Yellow	Brown	Black

The unite shall be coded by colours of rings on the insulating covers as tabulated below in order to make distinction between the wires of various units in cables. In addition, unit no. shall be embossed on each wire at 25 mm apart.

Unit	Ring Colour	Ring Group	Unit Helix
1	PINK		-
2			
3	ORANGE		-
4			
5	ORANGE		-
6			
7	ORANGE		-
8			

	VIOLET		-
9			
10			
11			
	PINK		-
12			
13			
14			
	PINK		-
15			
16			

NOTES:

1. The vertical lines under column (Ring Group) in the above table indicates number of rings at specified intervals of length (L) on the wires of the units. The specified intervals of lengths for rings may be approx. 60 mm.
2. In cables with more than 12 Unit (i.e. 48 pairs), the 13th and following units shall have coloured helices.
3. Mounting of the units starts at the innermost layer

Example : A blue colour wire coded with two pink rings together, means this wire belongs to 1st core of 1st pair of Unit 2 and these rings shall be repeated at an equal specified intervals of length.

9.04.03 600V Grade Twisted Pair Instrumentation cable (Type-B)

Conductor of cross-section 1.5 Sq.mm

a) Construction

1. Conductor : Each core shall be of stranded annealed tinned copper electrolytic grade conductor of cross-section 1.5 Sq.mm, generally complying to Class-5 of IS-8130-1984.
2. Insulation : Each core shall be provided with extruded HR PVC insulation conforming to IS:5831/1984, Type -C' and insulation thickness conforming to relevant IS/other standard.
3. : Every two wires (cores) twisted to form a pair, (20 to 30 lays per metre), every 4 pairs twisted together to form a unit, the units stranded in layers to form the cable.

4. : The unit shall be taped with myler tape for the purpose of binding. Necessary filler chords shall be placed in between the units and if necessary, the group of units shall be wrapped with myler tape to make a firm formation. The filler chords shall not absorb any moisture.
5. Shielding : The group shall be then shielded with aluminised myler tape to provide 100% coverage. Tape thickness shall be minimum 0.06 mm. Taping shall be done with at least 25% overlapping. A continuous drain wire of tinned copper of diameter 0.8 mm shall also be provided under the aluminium side of the screen.
6. Inner Sheath : Cables shall be provided with extruded HR PVC inner sheath suitable for 85 Deg.C operation.
7. Armouring : Armouring applied over inner sheath, shall consist of galvanised steel strips for the cables having the dia below armour more than 13 mm and for the cables having dia below armour upto and including 13 mm, armouring shall consist of galvanised* round steel wires.
The armouring wire/strip shall generally conform to IS:3975.
8. Overall Sheathing : The cable shall be then sheathed with IS:5831/1984 Type ST2• PVC (FRLS) by extrusion process. The shielding and sheathing shall be so done that it fits firmly to the cable and are easily removable without damage to the cores. Colour of sheath shall be grey. Thickness of sheath shall be as per table-6 of IS:1554 (Part-I)/1976.

Electrical Properties at 20 Deg.c :

1. Conductor resistance not greater than : 13.7 Ohms/Km
2. Volume resistivity (min.) : 3.5×10^{14} Ohm-Cm at 27 Deg.C
 3.5×10^{11} Ohm-Cm at 85 Deg.C
3. Mutual capacitance at 0.8 KHZ not greater than : 160 nF/Km
4. Test voltage conductor to conductor, conductor to shield : 2000V (rms) for 1 min
5. Characteristic impedance at 0.8 KHZ : 310 Ohms (Nominal)
6. Voltage grade : 600 V
7. Image attenuation at 0.8 KHZ : 0.17 dB/100 m (approx.)
8. Image attention at 10 KHz : 0.56 dB/100 m (approx.)
9. Cross talk attenuation at 0.8 KHZ : 70 dB/Km. (approx.)