

NATIONAL CENTRE FOR BIOLOGICAL SCIENCES  
**TATA INSTITUTE OF FUNDAMENTAL RESEARCH**  
GKVK Campus, Bellary Road, Bangalore – 560 065



**Supply, Laying and End termination of 3.5Core x 300Sqmm  
Armoured Aluminium Conductor cable at NCBS Campus, GKVK  
Bangalore**

**TENDER DOCUMENT**

**SCIENTIFIC ENGINEERING & MAINTENANCE DIVISION  
2017**

**Tender notice No: NCBS/ELECTRICAL/E-IN-C/TR - 135/2017.**

NATIONAL CENTRE FOR BIOLOGICAL SCIENCES  
**TATA INSTITUTE OF FUNDAMENTAL RESEARCH**  
GKVK Campus, Bellary Road, Bangalore – 560 065

**NATIONAL CENTRE FOR BIOLOGICAL SCIENCES**

Tata Institute of Fundamental Research  
GKVK Campus, Bellary Road, Bangalore - 560 065.  
Phone: 23666001/02 Fax: 23636662

**Tender notice No: NCBS/ELECTRICAL/E-IN-C/TR -135/2017.**

1. NAME OF THE WORK : Supply, Laying and End termination of 3.5 Core x 300Sqmm Armoured Aluminium Conductor cable, at NCBS- Regarding Electrical works
2. ESTIMATE VALUE PUT TO TENDER : Rs.58.43 Lakhs
3. EARNEST MONEY DEPOSIT : Rs.1,16,860.00
4. COST OF TENDER DOCUMENT : Rs. 1000.00
5. SALE PERIOD : 13/02/2017 to 23/02/2017
6. TIME & DUE DATE OF RECEIPT : Up to 14:00 Hrs On: 02/03/2017
7. TIME & DATE OF OPENING : After 15:00 Hrs On: 02/03/2017

SOLD TO : \_\_\_\_\_ RECEIPT NO: \_\_\_\_\_ DATE: \_\_\_\_\_  
\_\_\_\_\_ FOR A SUM OF Rs. \_\_\_\_\_ TOWARDS  
\_\_\_\_\_ THE COST OF TENDER DOCUMENT.

SIGNATURE OF ISSUING OFFICER:

DESIGNATION:

**NATIONAL CENTRE FOR BIOLOGICAL SCIENCES**  
**Tata institute of Fundamental Research**  
**GKVK Campus, Bellary Road, Bangalore-560 065**

**Name of Work: Supply, Laying and End termination of 3.5Core x 300Sq.mm  
Armoured Aluminium Conductor cable at NCBS Campus,  
GKVK Bangalore**

**INDEX**

Section	TITLE	PAGE No.
Section-I	Notice inviting Tender	4 - 8
Section-II	Specification for LT cable laying works	9- 14
Section-III	Schedule of Drawings	15
Section-IV	Schedule of Quantities- BOQ	16-18

## **NATIONAL CENTRE FOR BIOLOGICAL SCIENCES**

Tata Institute of Fundamental Research  
GKVK Campus, Bellary Road, Bangalore - 560 065.  
Phone: 23666001/02 Fax: 23636662

### **SECTION I- NOTICE INVITING TENDER**

#### **NIT NO. NCBS/ELECTRICAL/E-IN-C/Tr-135/2017**

1. Separate sealed item rate tenders are invited in Single Bid System on behalf of Centre Director, NCBS and will be received in the office of the Electrical Maintenance, NCBS from experienced Class-I Electrical Contractors who have done similar type of work with proven technical and financial capabilities in CPWD, State PWD, Railways, Military Engineering Services, DOS & DAE for the following work:

<b>Sl. No.</b>	<b>Description</b>	<b>Approx. Cost (Rs.)</b>	<b>EMD (Rs.)</b>	<b>Period</b>	<b>Cost of tender Documents (Rs.)</b>
1.	Supply, Laying and End termination of 3.5Core x 300 Sq.mm Armoured Aluminium Conductor LT cable at NCBS Campus, GKVK Bangalore.	58.43 Lakhs	1,16,860.00	3 weeks	1000.00

2. The period of contract shall commence immediately and work shall be completed within three week time from the date of Work Order.
3. The contractor should have experience is similar kind of works i.e Electrical works.
4. Tender Documents consisting of drawings, complete specifications, schedule of quantities for various items of works to be done and set of conditions of contract to be complied with by the tenderers whose tender may be accepted can be obtained from the office of Electrical Maintenance, NCBS on any working day between 10.00 Hours to 16.00 Hours on payment of amount mentioned in para 1 (non refundable) from 13/02/2017 to 23/02/2017. However, who are willing to download tender document from NCBS website and CPPP, are required to enclose tender fee as mentioned in para 1 (non refundable) in the form of DD drawn on or before 23/02/2017 (i.e. DD date) in favour of "National Centre for Biological Sciences", Bangalore. **The Tender document received without Tender fee, shall be liable for rejection.**

5. Contractors, whose tender is accepted shall have to deposit Performance Guarantee at 5% of tendered value.
6. As we do not follow enlistment, it is preferred to specify eligibility of entire of having executed one of following in last 7 years.
  - (i) Three similar works each of value not less than 40% of estimated cost i.e. Rs.23,37,200/- (OR) Two similar works each of value not less than 60% of estimated cost i.e. Rs.35,05,800.00/- (OR) One similar work of value not less than 80% of estimated cost i.e. Rs. 46,74,400/-.
  - (ii) One Completed work of any nature (either part of (i) or a separate one) costing not less than the amount equal to 40% of the estimated cost put to tender i.e. Rs.23,37,200/- with some Central Government Department / State Government Department/ Central Autonomous Body/ State Autonomous Body / Central Public Sector Undertaking / State Public Sector Undertaking / City Development Authority / State Government and published in the Central / State Gazette.

Note: The value of executed works shall be brought to correct costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to the last date of receipt of application for tender.

7. **Tenders should be submitted in a sealed cloth lined cover superscribing the name of work, NIT number and name of Tenderer.** The tenders with any deviation with respect to departmental conditions/stipulations are liable for rejection. The tender shall contain the EMD in the approved format, in the tender document issued by Department. The tender shall be submitted in the printed format issued by NCBS with schedule of quantity. Bids with any other document / with deviation condition / over all rebate / Conditional rebate etc., shall be liable for rejection.
8. If any tenderer withdraws his Tender after the price bid is opened within the validity period or makes any modifications in the terms and conditions of the Tender which are not acceptable to the Department, then the NCBS shall without prejudice to any/or other right or remedy be at liberty to forfeit 50% (Fifty Percent) of the earnest money absolutely.

**Application for Tender document along with following is compulsory:**

- (i) In case of registered contractors currently valid registration certificate in appropriate class if available.
- (ii) Latest work done certificates with respect to work experience.
- (iii) Letter of authority, in case the application is through authorized person, Application without the above documents are liable for rejection.

The NCBS reserves the right to reject any application for issue of tender papers without assigning any reason.

9. As said above Tender which should always be placed in sealed covers superscribed with the name of work (as given in Para I) will be received by NCBS upto 14.00Hrs on 02/03/2017 and will be opened by Head SE&M or his authorized representatives at NCBS on the same day i.e on 02/03/2017 at 15.00 Hours in the presence of the tenderers or their representative who would like to be present.

10. Tenders are to be on the printed form of the NCBS, which can be obtained on payment of the cost of documents mentioned above in cash/DD of scheduled bank drawn in favour of National Centre for Biological Sciences, Bangalore. The Contractors shall quote rates in figure as well as in words and /or amounts quoted by them. The amount for each item shall be worked out and requisite total given. All corrections shall be attested by the dated initials of the Tenderer. **Tenders with correction of rate/amount with correction fluid are liable for rejection.** The contractors not tendering for this work after the purchase of the Tender documents must return the Tender documents and drawings within 15days of the due of receipt of the Tender. However, the cost of the Tender documents will not be refunded.

11. Tenders not accompanied by the following are liable to be summarily rejected.

- (i) **Earnest Money Deposit** through a Crossed Demand Draft and Bank Guarantee by approved Scheduled Bank in prescribed form in favour of **“National Centre for Biological Sciences, Bangalore”**.

- (ii) In case of Contractors in the approved list of PWD, CPWD or MES, evidence showing the appropriate and eligible class to which they belong.
  - (iii) Proof of technical and organizational competence to execute the work of above nature and magnitude.
  - (iv) Latest work experience certificate with respect to execution of similar works issued by client (in case of Government, autonomous bodies and institutions the certificate shall be issued an officer not below the rank of Executive Engineer or equivalent).
12. The Contractors whose tender/s is/are accepted will be required to furnish Security Deposit (including the Earnest Money Deposit) and Performance Guarantee for the due fulfillment of the contract/s as per details in clause 1 of the conditions of Contract.
13. The acceptance of the Tender will rest with the Centre Director, NCBS who does not bind himself to accept the lowest or any other Tender. No reasons will be furnished for the acceptance or rejection of any tender.
14. Canvassing in connection with Tender will result in disqualification.
15. The tender accepting authority reserves the option to give price preference to the offers from public sector units over those from other tenderers in accordance with the policies of the Government from time to time.
16. Any tender which does not fulfill any of the prescribed conditions will be liable for rejection.
17. NCBS reserves the right to alter the scope/or reduce quantum of work before issue of work order and the **Tenderer** shall not have any claim what so ever on this account.
18. Rates quoted by the Contractor in item rate Tender in figures and words shall be accurately filled in so that there is no discrepancy in the rates written in figures and words. However, if any discrepancy is found, the rates which correspond with the amount worked out by the Contractor shall be taken as correct.
19. If the amount of an item is not worked out by the Contractor or if it does not correspond with the rate written either in figures or words, then the rate quoted by the Contractor in words shall be taken as correct.

20. Where the rates quoted by the Contractor in figures and in words tally but the amount is not worked out correctly the rate quoted by the Contractor will be taken as correct and not the amount.
21. In case rates are quoted only in words or only in figures, then the rate quoted will be considered and amount will be worked out accordingly.
22. In the event no rate has been quoted for any item / items, leaving space both in figure(s), word(s) and amount blank, it will be presumed that the contractor has included the cost of this / these item(s) in other items and rate for such item(s) will be considered as zero and will be required to be executed accordingly.
23. Deployment of adequate number of work force and machineries to ensure completion of the work within the stipulated time schedule should be ensured.

Note: Refer our website [www.ncbs.res.in](http://www.ncbs.res.in) / Central Public Procurement Portal : <http://eprocure.gov.in/cppp> for more details of the said tender

**Sd/-  
Head SE&M**



## **SECTION II: SPECIFICATION FOR LT CABLE LAYING WORKS**

### **1. Scope:**

This specification is intended to cover the requirements of installation and energising of 1.1kV grade, XLPE, LT power cables including joining of cables.

### **2. Standards:**

The power cable and its fixing accessories shall comply with the latest relevant Indian Standards and National Electrical Code.

### **3. Laying of LT Cables:**

#### **3-a General:**

3.1.0 Before the commencement of cable laying, it shall be ensured by the Engineer-In-Charge that only ISI marked cables are used. It shall be the responsibility of the contractor to check the soundness and correctness of the size of the cable while taking delivery of the cable from stores. Any defect noticed shall be brought to the notice of the issuing authorities immediately. If any defect is noticed after the cable is laid or during the process of laying, it shall be brought to the notice of the Engineer-In-Charge and upon his satisfaction, that the cable is not damaged due to bad handling it will be the entire responsibility of the contractor to retrieve the cable already laid and return the defective cable to store and take length of the cable from the store and relay the same.

3.1.1 The material such as bricks, sand, cable route markers of best quality as approved by the Engineer-In-Charge only shall be used for cable laying works.

3.1.2 The contractor shall provide all the necessary labour, tools, plants and other requisites at his own cost for carrying out pumping of water and removing of water from trenches if anywhere required.

3.1.3 Installation shall be carried out in a neat, workman like manner by skilled, experienced and competent workman in accordance with standard practices.

3.1.4 While laying the cable care shall be taken to avoid formation of kinks and also damage to the cable. In the case of cable bends, the minimum bending radius should be 12D (D- Outer Diameter of the cable).

3.1.5 A cable loop of about five meters length and as directed by the Engineer-In-Charge shall be provided at the following locations.

- a) Near the termination points
- b) Near to the straight through joint

3.1.6 The method of cable laying and routing of cables, shall in every case be as directed by the Engineer-In-Charge.

3.1.7 Whenever cable passes through hume pipes/GI embeded across the wall in a building both the ends of the pipe shall be suitable sealed.

3.1.8 Identification tags indicating the size of the cable and feeder designation shall be securely attached at both ends of the cable. Such tags shall also be attached to the cable at intervals of 250 Mtrs. The materials of the tag shall be of either 12SWC GI sheet or plastic. In case of plastic, the details have to be engraved and incase of GI sheet, the details should be punched. Cable route markers shall be provided at the intervals of 50 M with a premium of one number route marker. The details of the route markers shall be as per the drawing NCBS/ELECT/CAB/01. At the locations of straight through joints, necessary joint-markers shall be provided.

3.1.9 When cable runs vertically, it shall be clamped on mild steel flats or angle iron fixed on walls are spaced at such intervals as to prevent buckling of the cables. All steel work shall be painted with a coat of red oxide and thereafter finished with suitable anti-corrosive paints.

3.1.10. As per site conditions, minimum 650meter of single run is required, hence it is compulsory to supply and lay 650mtr of single run without any joint. However, tenderer shall visit the site and can get actual measurement before executing the work. As per site conditions, if any straight through joints are required, it should be approved by Engr-in-charge.

## **3.2 Cables laid in ground**

3.2.1 The bottom layer cables shall be laid at a minimum depth of 1.0 M(refer drawing no.NCBS/ELECT/CAB/17/01-LT cable laying) when laid in ground. When cable pass through roads, nallahs etc, they must be protected by either hume pipe or GI pipe of suitable dimensions.

3.2.2 Excavations of trenches shall be carried out as indicated in the drawing NCBS/ELECT/CAB/17/01.The width of the trench at the bottom shall be 0.4M for one cable. In case the total number of cables laid in the trenches is more than one, then the width shall be such that the spacing between the cables is maintained as shown in the drawing NCBS/ELECT/CAB/17/01. Before the cable is laid in the trench the bottom of the trench shall be cleared from stones and other sharp materials and filled with sand layers of 75mm, as shown in the drawing.

3.2.3 While removing the cable from the drum, it shall be ensured that the cable drum is supported on suitable jacks and the drum is rotated to unwind the cable from the drum. The cable should never be pulled while unwinding from the drum. It shall be ensured that the cables are run over the wooden rollers placed in the trench at intervals no exceeding 2 M.

3.2.4 After placing the cables in the trench, the sides and top of the cable shall be covered with bricks as indicated in the drawing.

After placing brick, the trench shall be filled in layers ensuring that each layer is well jammed by spraying water and consolidated. The extra earth shall be removed from the place of trench and deposited at a place as directed by the Engineer-In-Charge.

## **3.3 Cables laid in build up trench:**

3.3.1 Before the commencement of cable laying the cable trench shall be cleaned properly. Cable shall be laid as explained in item 3.2. Cable shall be properly clamped to the cable supports which are provided in the cable trench. The method of clamping shall suit the size of the cable and the cable supports, as directed by the Engineer-In-Charge.

Care shall be taken while removing and replacing the trench cover slab. It is the responsibility of the contractor to make good any damaged trench covers.

### **3.4 Cable terminations and straight through joints:**

3.4.1 All cable joining materials such as straight through joint boxes, cable compound, cable lugs, insulation tapes etc. shall be best quality and as approved by the Engineer-In-Charge.

3.4.2 Cable glands for strip armoured cables shall include a suitable armour clamp for receiving and securely attaching the armouring of the cable in a manner such that no movement of the armour occurs when the assembly is subjected to tension forces.

The cable gland shall not impose on the armouring a bending radius not less than the diameter of the cable. The clamping ring shall be solid and of adequate strength.

Provision shall be made for attachment of an external earthing bond between the metallic covering of the cable and the metallic structure of the apparatus to which the cable box is attached.

### **3.5 Sealing boxes**

3.5.1 A sealing box, irrespective of the class of insulation of the cable for which it is intended, shall be so designed that it may be filled with compound after connecting the cables specially in flame proof/hazardous areas.

3.5.2 All parts and connection for attaching the armouring, wiping or clamping the metallic sheath in a sealing box, shall be easily accessible. This may be achieved by splitting the box or by providing a suitable cover or other such means.

3.5.3 The joints in the box shall prevent leakage of the compound.

3.5.4 Provision shall be made to ensure that the cores of the cable are efficiently scaled to prevent moisture penetrating along the strands or the cable conductors.

3.5.5 The sealing box shall be provided with compound filling orifices with suitable covers of plugs of size that will permit easy pouring of the compound.

In all case where screwed plugs are used, one or more air vents shall be provided to ensure complete expulsion of air and total filling of the box with compound.

3.5.6 The box shall be of sufficient length to allow the manipulation of the insulated cover without damage to them or to the insulation.

3.5.7 A sealing box intended to be attached directly to the apparatus shall be designed such that the box together with the connected cable may be detached from the apparatus without disturbing the sealing compound.

3.5.8 Cable sealing and dividing boxes intended for use in the flame proof areas shall comply additionally with the relevant requirements of IS 2148-1968.

#### **4.0 Testing**

Once cable is laid, following test shall be conducted in the presence of Engineer-In-Charge, before energizing the cable:

- i) Insulation resistance test
- ii) Continuity and conductor resistance test.
- iii) Earth test
- iv) High voltage test

Tests conducted shall be as per Indian Standards and National Electrical Code.

#### **5. Recommend makes of materials for Electrical works**

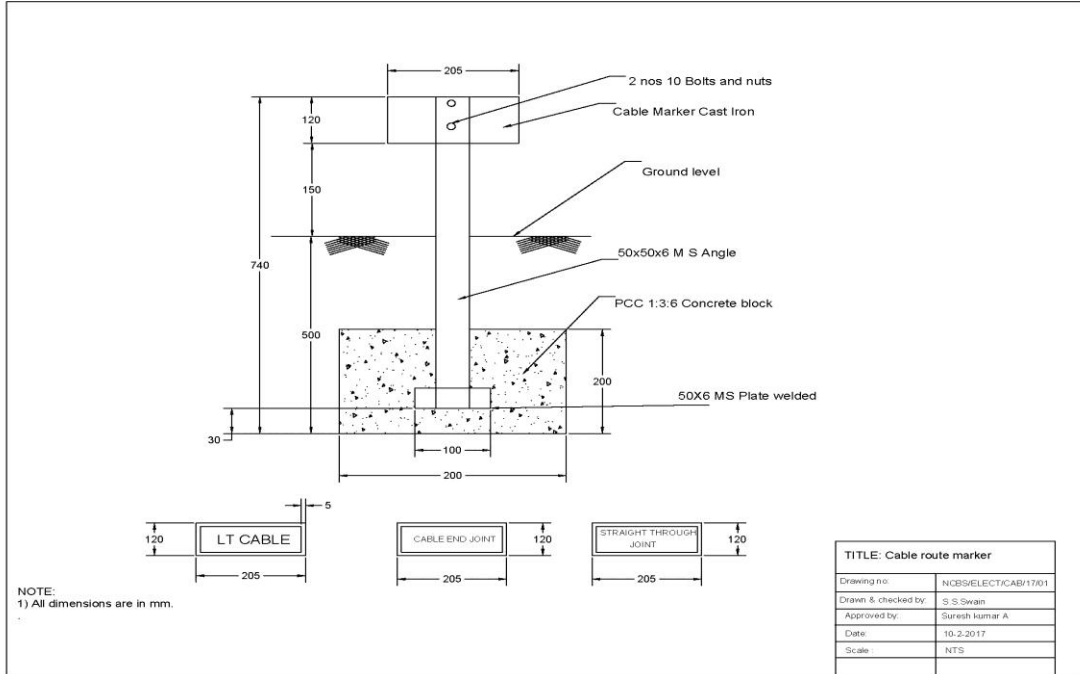
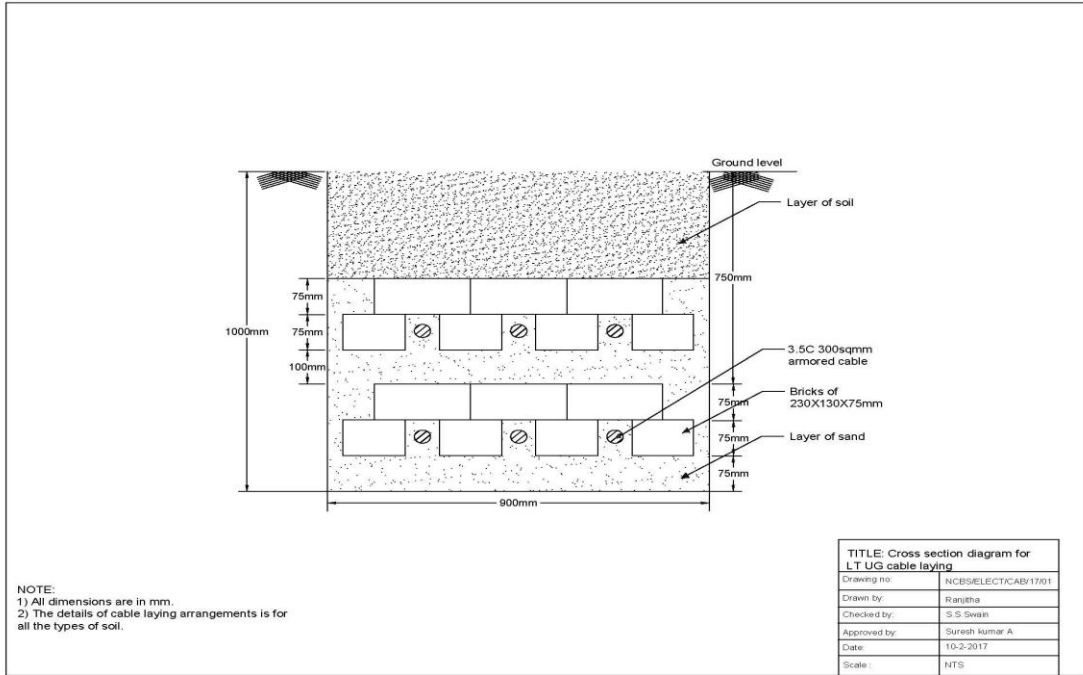
<b>Sr.no</b>	<b>Material</b>	<b>Make</b>
1	LT cable	Finolex / Havells
2	Gland	Dowells/Polycab
3	Heavy duty Lugs	Dowells/Polycab

6 Certify that I/We have gone through the General Conditions of Contract, Special Conditions and detailed specifications for the works kept in the office of Electrical Engineer, NCBS. We agree to abide by the same and aware that these are part of the tender document.

We also understood that the items described in BOQ are to be read in conjunction with the above specifications and quoted our rates accordingly.

Signature of the Tenderer

### SECTION- III: SCHEDULE OF DRAWINGS



Signature of the Tenderer

**NATIONAL CENTRE FOR BIOLOGICAL SCIENCES  
TATA INSTITUTE OF FUNDAMENTAL RESEARCH**

**Name of the work - Supply, Laying and End termination of 3.5Core x 300Sqmm Armoured Aluminium Conductor cable at NCBS Campus, GKVK Bangalore**

**SECTION IV: SECDDLE OF QUANTITY**

<b>Sr. no</b>	<b>Description</b>	<b>unit</b>	<b>Qty</b>	<b>Rate (in Figures &amp; words)</b>	<b>Total</b>
	<b>LT cables:-</b>				
1	Supply of 1.1kV grade, 3.5 Core, XLPE insulated, and overall sheathed, stranded aluminum conductor, flat steel strip/wire armored cables conforming to IS:7098/part I (with latest amendments) and for following size. The cable shall bear ISI certification mark.				
a	3-1/2 Core x 300 Sq.mm	Mtrs	3900		
<b>2</b>	<b>LT Cable laying charges</b>				
a	Laying of 3.5 core, 1.1kV grade XLPE cables, armored aluminum conductor cables in ground, in all kind of soil, below ground level including transportation of cable of site, excavation, refilling with sand and baked bricks on top and sides and providing cable route/joint markers complete as per specifications and as per drawing no. NCBS/ELET/CAB/17/01				
	Laying of 6 nos. of cables, 3.5core, 300 Sq.mm (Note: 6 nos. of cable measured as a single run).	Mtrs	700		
b	Laying of 3.5 core, 1.1kV grade, XLPE cables armored aluminum conductor cable in existing trench/on cable tray, on wall/floor/ceiling/above false ceiling/below false floor/existing hume pipe/existing HDPE pipe including transportation of cable to site, removing of trench/false ceiling/false flooring covers and reclosing the covers after laying the cables in good condition with supply of all necessary materials such as brackets, clamps, MS spaces complete as required and as directed by EIC.				
	Laying of 6 nos. of cables, 3.5core, 300 Sq.mm (Note:6 nos. of cable measured as a single run)	Mtrs	100		



Sr. no	Description	unit	Qty	Rate (in Figures & words)	Total
<b>3</b>	<b>End terminations of LT cables:</b>				
a	Providing end terminations for 3.5 core, 1.1 kV grade XLPE insulated armoured, Aluminium conductor cables including supply of cable gland, lugs, neoprene bushes and other materials and tolls required complete with terminal connections, earthing of glands and as required and as directed by Engineer-in-charge.				
	3.5 core x 300 Sq.mm cables with aluminium conductor	each	12		
<b>4</b>	<b>Straight through joints of LT cables:</b>				
a	Providing straight through cable joints for 3.5 core, 300Sqmm, 1.1.kV XLPE insulated, Aluminium conductor armoured cables including supply of epoxy based straight through jointing kit, sealing putty, lugs and other materials required, excavation and refilling of earth if necessary complete as required and as directed by Engineer-in-charge.	each	6		
<b>5</b>	<b>Hume pipe for road crossing</b>				
	Supply and laying of following hume pipe with collars confirming to IS: 458 (with latest amendments) for road crossing including excavation and refilling of earth, drawing cables through the pipe as required.				
a	150 mm dia	Mtrs	16		
b	300 mm dia	Mtrs	20		
<b>6</b>	<b>HDPE pipe for cable laying</b>				
a	Supply and laying of 150mm inner dia sizes of High Density Poly Ethylene (HDPE) double wall corrugated pipe confirming to IS:14930 part-II(with latest amendments) for road crossing including excavation and refilling of earth complete as required.	Mtrs	30		

Sr. no	Description	unit	Qty	Rate (in Figures & words)	Total
7	Dismantling stone slab flooring laid in cement mortar including removal of mortar, stacking of serviceable material and disposal of unserviceable materials out of the campus	Sqmtr	130		
8	Laying of 16 to 18mm thick dismantled stone (under item 1 above ) laid over a bed of 20mm thick cement mortar 1:6 and cement slurry at the rate of 4.4kg/sq.m for bedding and jointing including grouting the joints with pigments to match the shade of the slabs, finishing to required level, curing, cleaning, mopping, etc; complete all as per specifications at all heights in all floors.	Sqmtr	130		
9	Removing ,stacking, and refixing of existing Grass paver blocks of size 600x400x80mm along the cable lines to lay new cable work etc,. Complete as per directions of the Engineer-in-Charge	Sqmtr	1000		
10	Cutting full grout macadam (FGM) road surfaces including W.B.M and soling and making good the same inclusive of cost of supplying of bitumen and extra quantities of granite stone metal, gravel, etc; and re-rolling etc; complete all as directed by Engr-in-charge.	Sqmtr	10		
<b>Total</b>					
<b>Note: The Contractor shall quote their rates in this schedule of quantity. Submission of tender in any other format is liable for rejection.</b>					

Total amount in words:

Signature of the Contractor

Date :

Address: