



TRANSMISSION CORPORATION OF TELANGANA LIMITED

(Website: www.tstransco.in CIN No: U40102TG2014SGC094248)

From
The Chief Engineer /P&MM,
Room No.-207, B-Block,
TSTRANSCO,
VidyutSoudha,
Hyderabad – 500 082.

To
M/s. Siemens Limited,
CRP Works,
Thane Belapur Road,
Airoli, Kalwa,
Navi Mumbai – 400 601.

P.O.No. 259-PMM/2018/CE/P&MM/SE/P&MM/DE31/F. TSPMM31-40/2017(OLTE)/
D.No. 350 /18, dt. 31 -12-2018.

Sirs,

Sub:- TSTRANSCO - P&MM – Telecom - Specn.no.TSPMM31-40/2017 – Supply,
Erection, Commissioning of OLTE and associated equipment - Detailed Purchase
Order - Issued - Reg.

Ref:- 1. Tender Specification No.TSPMM31-40/2017
2. Your offer on e- platform against Specification No. TSPMM31-40/2017
3. LOI.No.CE/P&MM /SE/P&MM/DE-31/F.TSPMM31-40/2017(OLTE)/
D.No.177/18, Dt.31-08-2018.
4. Your LOI acknowledgement vide Lr.EM/Oppt-AEMA-1L3SUVE/Order_Ack
Dt:31.08.2018.
5. Lr.No.CE/P&MM/SE/P&MM/DE31/F.No.TSPMM31-40/2017/D.No.346/18,
Dt.22-12-2018.

I, acting for and on behalf of and by the order and direction of TRANSMISSION CORPORATION OF TELANGANA LTD., (herein after called the "TSTRANSCO" or "the purchaser") accept your offer, vide ref. 2nd cited, for Supply, Erection & Commissioning of OLTE and associated equipment for revised quantities, as per the provision for quantity variation vide clause 34 (Section III, GTC) of tender specification, at an evaluated total package cost of **Rs.9,62,25,770.00** (Rupees Nine Crores Sixty Two Lakhs Twenty Five Thousand Seven Hundred and Seventy only) as indicated below and the details are in Annexure-1 (Schedule of Prices).

1) SCOPE OF CONTRACT:

This contract relates to the Supply, Erection & Commissioning of OLTE and associated equipment detailed under clause (2) below and covers design, manufacture, testing before dispatch, delivery F.O.R. destination.

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- 2) **SCHEDULE OF MATERIALS AND PRICES:** Supply, Erection & Commissioning of OLTE & Associated equipment (inclusive of Freight, Insurance, Packing & Forwarding and GST) detailed in annexure.

Sl.No	Description	Total Amount (in Rs.)
1	Supply, Erection & Commissioning of the OLTE & associated equipment including all Taxes. (Details in Annexure-1)	9,62,25,770.00
	Total Package value	9,62,25,770.00
	(Rupees Nine Crores Sixty Two Lakhs Twenty Five Thousand Seven Hundred and Seventy only)	

- 2.1 The Prices accepted above are FIRM during the process of the contract and until the warranty period is completed.
- 2.2 The prices accepted are inclusive of Freight, Insurance, Packing & Forwarding and GST.
- 2.3 The above prices are inclusive of unloading charges at destination stores.
- 2.4 M/s. Siemens Limited is responsible for all the Taxes applicable on this contract.
- 2.5 Income Tax, other taxes if any, will only be towards the supplier's account and would be recovered from the supplier bills for arranging payment as directed by the concerned department.
- 2.6 **STATUTORY VARIATION:** It is responsibility of bidder to consider the correct rates of the duties and taxes leviable on the equipment/material/work at the time of bidding. After considering the correct rates of duties and taxes only the bidder shall quote the prices.

Any variation up or down in statutory levy or new levies introduced after tender calling date under this specification will be to the account of TSTransco, provided in cases where delivery schedule is not adhered to by the contractor/manufacturer and there are upward variation/revision after the agreed delivered date, the contractor/manufacturer will bear the impact of such levies and if there is downward variation/revision, the TSTransco will be given credit to the effect.

In case of bought out items statutory variation shall not be applicable on that taxes and duties. For this purpose, bought out items means the material/equipment not manufactured by the bidder i.e. statutory variation will be applicable on taxes and duties involving direct transaction between bidder and TSTransco only and not for the taxes and duties between the bidder and his sub vendors.

- 2.7 The purchaser reserves the right to vary the order quantity by ± 50 % during execution of the contract.

- 3) **DELIVERY:** Delivery of the equipment, shall be completed within THREE (3) months from the date of issue of Letter of Intent (LOI) and Erection & Commissioning of the equipment shall be completed within ONE month from the date of intimation from TSTransco for the line Sections/Substations, which are ready.
- 4) **FREIGHT & TRANSIT INSURANCE:** Insurance shall be arranged by the supplier to cover transit risks and 45 days storage cover at site. The insurance shall be in an amount equal to 100% FADS value of equipment on all-risks basis. The policy shall have a provision for extension to cover further storage if necessary at destination stores/site at TSTransco cost.
- 5) **DESPATCH INSTRUCTIONS:** The Dispatch instructions for the equipment will be issued separately after inspection.

The details of consignee, paying officer and other officers will be furnished along with dispatch instructions, while approving the Inspection/Test Certificates.

6) **PERFORMANCE SECURITY:**

- 6.1 The supplier shall furnish to the purchaser the performance security in the name of **The Chief Engineer/P&MM, TSTransco, VidyutSoudha, Hyderabad-82**, for an amount equal to 10% of the total contract value i.e. for an amount of **Rs. 96,22,577/-** for proper fulfillment of the contract, shall include the warranty period and completion of performance obligations including warranty obligations. The performance security shall cover 60 days beyond the date of completion of performance obligations including warranty obligations.
- 6.2 The performance security shall be executed in accordance with the clause (6) shall be furnished on a stamp paper of value Rs.100/-. The B.G shall be extended if required suitably, in accordance with the provisions of Clause (38) of specification.
- 6.3 In the event of any correction of defects or replacement of defective material during the warranty period, the warranty for the corrected / replaced material shall have to be extended to a further period of 12 months and the Performance Bank Guarantee for proportionate value shall have to be extended 60 days over and above the extended warranty period.

The proceeds of the performance security shall be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to fulfill its obligations under the Contract.

- 6.4 The performance security shall be...
 - a). A bank guarantee issued by a scheduled bank not acceptable to the Purchaser, in the form provided in the bidding documents. The Bank guarantees may be obtained from the state Bank of India or Nationalized Banks.

- b). A banker's Cheque or crossed DD or Pay Order payable at the Head quarter of the Purchaser in favor of the Purchaser drawn on any scheduled bank/ state Bank of India or Nationalized Banks.

7) TERMS OF PAYMENT:-

- i) a) 80% payment towards the equipment cost will be arranged within 45 days for the material/equipment supplied in complete shape subject to their delivery as per the schedule of work and on its receipt in good condition at the destination / stores (i.e., from check measurement date in Form-13), on prorata basis against the submission of the following documents.

- i) Form 13
- ii) Contractor's detailed invoice
- iii) Detailed Challan Acknowledged by Consignee
- iv) Manufacturer's/Supplier's Warranty Certificates
- v) Approved Test Certificates
- vi) Copy of Insurance Policy Certificate
- vii) Copy of Acceptance Letter of Performance Security issued by Purchaser

One additional copy each of the above and delivery challan shall be sent to the consignees. Copies of the above documents shall be sent to the Chief Engineer/ P&MM/TSTransco, VidyutSoudha, Hyderabad-82 immediately after delivering the materials at the destination stores.

- b) 10% payment towards equipment cost will be made after erection of equipment/ material on prorata basis against the submission of invoice.
- c) Balance 10% payment towards equipment cost will be made along with the total erection & commissioning charges after commissioning of equipment / material duly certified by concerned Divisional Engineer/Telecom on prorata basis against the submission of invoice.
- ii) The Supplier Bank details are as detailed below for RTGS payment (Real Time Gross Settlement).

1	Vendor Name	M/s Siemens Limited,
2	Complete Address	M/s. Siemens Limited, CRP Works, Thane Belapur Road, Airoli, Kalwa, Navi Mumbai – 400 601.
3	Name of the Bank	Deutsche Bank
4	Branch Address	FORT, Mumbai
5	Branch Code	002
6	City	MUMBAI
7	Account No.	0000786000
8	MICR Code	400200002
9	IFSC No.	DEUT0784BBY
10	Income Tax PAN No.	AAACS0764L

The Bank details as above are final and shall not be revoked under any circumstances. The Bank Charges if any will be made to the account of M/s. Siemens Limited and will be recovered from the bill amount per each disbursement on LOA raised by unit officers.

No interest will be payable in case the payment is delayed for whatever reason.

The Banker charges involved if any in establishing and operating the Cheque / Bills shall be to your account.

- iii) If the supplier has received any over-payments by mistake or if any amounts are due to the TSTransco due to any other reason, when it is not possible to recover such amounts under this contract, the TSTransco reserves the right to collect the same from any other amounts and / or Bank guarantees given by you due to or with the TSTransco.
- iv) The supplier should invariably submit Inspection/test certificates and other documents that the purchaser specifies, before dispatch is made so that they can be checked and approved well before it is dispatched and due for payment.
- v) When the supplier does not at any time, fulfill his obligations in replacing / rectifying etc. of the damaged / defective materials in part or whole, promptly to the satisfaction of the TSTransco Officers, the TSTransco reserves the right not to accept the bills against subsequent dispatches made by the supplier and only the supplier will be responsible for any demurrages, wharf ages or damage occurring to the consignments so dispatched.
- 8) **CURRENCY OF PAYMENT:** All payments will be made in non-convertible Indian Rupees.
- 9) **WARRANTY:** The equipment shall be guaranteed for satisfactory performance for a period of 18 months from the date of check measurement in form-13 i.e receipt of material/equipment in the departmental stores/site in good condition.

During this period, if the equipment is found defective it shall be replaced or repaired by you free of all costs to the TSTRANSCO within 30 days, which shall in no circumstances be more than the delivery period indicated in this order.

In the event of any correction of defects or replacement of defective material during the warranty period, the warranty for the corrected / replaced material shall be extended to a further period of 12 months and the Performance Bank Guarantee for proportionate value shall be extended 60 days over and above the extended warranty period.

The proceeds of the performance security shall be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to fulfill its obligations under the Contract.

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- 10) **RESPONSIBILITY OF THE SUPPLIER FOR LOSS OR DAMAGE:** The supplier is responsible for the safe delivery of the goods in good condition at the destination stores. He should acquaint himself of the conditions prevailing for handling and transport of the goods to the destination and shall include and provide for security and protective packing of the goods so as to avoid damage in transit.
- 11) **PACKING:** The supplier shall provide such packing of the Materials / equipment as is required to prevent their damage or deterioration during transit to their final destination, as indicated technical specification. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Materials / equipment final destination and the absence of heavy handling facilities at all points in transit.
- 12) **INSPECTION:** The accredited representative of the TSTransco have access to you or your sub-contractor's works at any time during the working hours for the purpose of inspecting the materials during manufacture of the plant and equipment and testing, and may select samples from the materials going into the plant and equipment. You shall on such occasions provide proper and adequate facilities for testing the selected samples at any time. The final acceptance tests and routine tests shall be conducted in the presence of TSTransco's representative who will be deputed for the purpose.
- The program of inspection is to be intimated to the TSTransco with 15 days prior notice for acceptance tests. The goods shall not be dispatched until such inspection is conducted or waived in writing and followed by dispatch clearance communicated by the purchaser in writing.
- 13) **TESTS AND CERTIFICATES:** Three copies of the test certificates containing the results of all the tests including acceptance and routine tests carried out shall be forwarded to Chief Engineer/P&MM and got approved before the presentation of the bills for payment.
- The manufacturer's test certificates shall be submitted immediately after the acceptance tests are conducted and got approved before the equipment is dispatched.
- 14) **GUARANTEED TECHNICAL PARTICULARS:** The Guaranteed Technical Particulars are enclosed in the annexure – 2(A,B,C,D,E,F & G).
- 15) **DRAWINGS:** The Drawings are approved vide Lr.No.CE/P&MM/SE/P&MM/ DE31/ F.No.TSPMM31-40/2017/D.No. 346 /18, Dt.22-12-2018
- 16) **GENERAL CONDITIONS OF CONTRACT:** Except in so far as it is provided otherwise in this contract, you shall abide by the terms and conditions indicated in the Tender specification No. TSPMM31-40/2017 which includes the TSTransco's General Terms and Conditions of contract' enclosed to the ref (1). "Except as specifically accepted in this order, the terms and conditions mentioned in your quotation under reference are not accepted".

- 17) **RISK:** The risk in the property is entirely yours till the goods are received in good condition at destination stores as certified by the consignee.
- 18) **PENALTY FOR DELAY IN SUPPLIES:** The time for and the dates for delivery mentioned in the contract will be deemed to be the essence of the contract. Subject to force majeure clause No.19, if the supplier fails to deliver any or all of the Materials / equipment or fails to perform the services within the period (s) specified in the Contract, the purchaser will, without prejudice to its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to 0.5% per week on the undelivered portion subject to a maximum of 5% of the total value of the contract. Once the maximum is reached the Purchaser may consider termination of the contract.

The check measurement date in form-13 i.e., date of receipt of materials at destination stores in good condition will be taken as the date of delivery. Materials / Equipment which are not of acceptable quality or are not conforming to the specification would be deemed to be not delivered. For penalty, the number of days would be rounded off to the nearest week and penalty calculated accordingly.

The penalty specified above will be levied and would be adjusted against subsequent pending bills.

- 19) **FORCE MAJEURE:** The Supplier will not be liable for forfeiture of its performance security, penalty for late delivery, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

For purposes of this clause, "Force Majeure" means an event beyond the control of the supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not restricted to, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

If a Force Majeure situation arises, the supplier will promptly notify the Purchaser in writing of such condition and the cause thereof. Unless or otherwise directed by the Purchaser in writing, the Supplier will continue to perform its obligations under the Contract as far as is reasonable in practice, and will seek all reasonable alternative means for performance not prevented by the Force Majeure event.

No price variance will be allowed during the period of force majeure.

- 20) **CORRESPONDANCE:** Your acknowledgement to this order and any correspondence, general or technical in nature shall be addressed to the Chief Engineer/P&MM, TSTransco, VidyutSoudha, Hyderabad-500082.

All correspondence regarding dispatch and payment shall be addressed to the consignee under intimation to the Chief Engineer/P&MM, VidyutSoudha, Hyderabad-82.

- 21) COMPLETENESS OF CONTRACT:** All minor accessories that are normally necessary for satisfactory and efficient operation of the equipment shall be supplied by you free of cost to the TSTransco, whether these are specifically mentioned or not in the specification, your tender schedules or in this Purchase Order and the equipment shall be complete in itself.
- 22) OPERATION AND MAINTENANCE MANUALS:** One set of Manuals consisting of operating instructions and programming schedules and approved drawings for each of the equipment shall be supplied in the package along with respective equipment's at the time of dispatch. They shall contain clear instructions on erection, commissioning and maintenance for the guidance of operating staff. Any items requiring the special attention of the Operation Engineer shall be highlighted.
- 23) CONTRACT AMENDMENTS:** No variation in or modification of the terms of the contract will be made except by written amendment by the Purchaser and accepted by the supplier
- 24) TERMINATION FOR DEFAULT:**
- 24.1** The purchaser, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Supplier, may terminate this Contract in whole or in part:
- i. If the supplier fails to deliver any or all of the Materials / equipment within the period(s) specified in the Contract, or within any extension thereof granted by the Purchaser.
 - ii. If the supplier fails to perform any other obligations under the contract.
 - iii. If the supplier, in the judgment of the purchaser has engaged in corrupt or Fraudulent practices in competing for or in executing the contract.
- 24.2** In the event the purchaser terminates the contract in whole or in part, the purchaser may procure, upon such terms and in such manner, as it deems appropriate, materials/equipment or services similar to those undelivered, and the supplier will be liable to the purchaser for any excess costs for such similar materials/equipment or services. However, the supplier will continue performance of the contract to the extent not terminated.
- 25) TERMINATION FOR INSOLVENCY:**
- The Purchaser may at any time terminate the contract by giving written notice to the Supplier if the Supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the supplier, provided that such termination will not prejudice or not affect any right of action or remedy, which was accrued or will accrue thereafter to the Purchaser.

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26) TERMINATION FOR CONVENIENCE:

(a) The Purchaser, by written notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination will specify the termination is for the Purchaser's convenience, the extent to which performance of the supplier under the Contract is terminated and date upon which termination becomes effective.

(b) However the materials/equipment those are complete and ready for shipment within Thirty (30) days after the supplier's receipt of notice of termination will be accepted by the purchaser at the contract terms and prices.

27) JURISDICTION: All and any dispute or differences arising out of or touching this order will be decided by the courts or tribunals situated in Hyderabad or Secunderabad only. No suit or other legal proceedings will be instituted elsewhere.

28) ACKNOWLEDGEMENT: Please acknowledge this order soon on its receipt by returning the extra copy of the order enclosed, duly signing it with date in token of acceptance.

Yours faithfully,

Sd/-

Chief Engineer/P&MM

(Acting for and on behalf of TSTRANSCO)

Encl.:1). Annexure-1 (Schedule of Prices)

2). Annexure-2 (GTPs)

"WE ACCEPT THE TERMS AND CONDITIONS STIPULATED IN THIS P.O."

Signature of the Contractor with seal

Copy to:

The Executive Director/Finance/ TSTransco/Vidyut Soudha/Hyderabad.

The Pay Officer/TS TRANSCO/Vidyut Soudha/ Hyderabad

The SAO/ P&A/ TSTransco/Vidyut Soudha/Hyderabad.

The FA&CCA/ACCOUNTS/TSTransco/Vidyut Soudha/Hyderabad.

The Chief Engineer/Telecom/TSTransco/Vidyut Soudha/Hyderabad

The SE/OMC/Metro-Central /Hyderabad /TSTransco/NIMS GIS/Erramanjil/Hyderabad.

The SAO/OMC /Metro Central/ TSTransco/NIMS/ Hyd.

The Superintending Engineer/Telecom/TSTransco /132/33KVSS Opp. to Court Jagityala road, Karimnagar-500501.

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TheSuperintending Engineer/Telecom/Metro/TSTransco/132KVSS Chilakalaguda/ Hyderabad
 TheSuperintending Engineer/Telecom/TSTransco / 220KV SS/ Mulugu Road / Warangal
 TheSuperintending Engineer/Telecom/Rural/TSTransco / GTS Colony/ Erragadda/Hyderabad
 The Superintending Engineer/OMC/Sangareddy ----- (Through e-mail)
 The Superintending Engineer/OMC/Mahaboobnagar ----- (Through e-mail)
 The Superintending Engineer/OMC/Nalgonda ----- (Through e-mail)
 The Superintending Engineer/400 KV/Construction/Metro/Hyderabad ----- (Through e-mail)
 The Superintending Engineer/OMC/Metro-West/Hyderabad ----- (Through e-mail)
 The Superintending Engineer/OMC/Karimnagar ----- (Through e-mail)
 The Superintending Engineer/OMC/Nizamabad ----- (Through e-mail)
 The Superintending Engineer/OMC/Warangal ----- (Through e-mail)
 The Superintending Engineer/OMC/Khammam ----- (Through e-mail)
 The Divisional Engineer/Telecom/Metro/Narayanaguda GIS/Hyd----- (Through e-mail)
 The Divisional Engineer/Telecom/Erragadda/Hyderabad ----- (Through e-mail)
 The Divisional Engineer/Telecom/Sanagareddy/Mint Compound/Hyd ----- (Through e-mail)
 The Divisional Engineer/Telecom/132KVSS/Mettuguda /Mahaboobnagar ---- (Through e-mail)
 The Divisional Engineer/Telecom/Nalgonda ----- (Through e-mail)
 The Divisional Engineer/Telecom/132KVSS /Ellandu Road /Khammam ----- (Through e-mail)
 The Divisional Engineer/Telecom/220KVSS/Mulugu Road/Warangal ----- (Through e-mail)
 The Divisional Engineer/Telecom/Nizamabad ----- (Through e-mail)
 The Divisional Engineer/Telecom/Adilabad ----- (Through e-mail)
 The Divisional Engineer/Telecom/Karimnagar ----- (Through e-mail)
 The Divisional Engineer/Transmission Stores/ TSTransco/ Erragadda/GTS Colony/ Hyderabad
 The Asst. Div. Engineer./Transmission Stores/220KV SS/Shapurnagar/Hyd. ----- (Through mail)

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Tender Specification No.: TSPMM31-40/2017

Annexure-1 (Schedule of Prices) to PO.No. , Dt.: .12.2018

(All financial figures are in Indian Rupees)

Sl. No	Description	UO M	Total Qty	Units Ex-work price	Unit Freight charges	Unit Insurance charges	Unit Packing & Forwarding charges	Unit Erection & Commissioning charges	GST@18 % on Unit Ex-works+F+I + P&F+E&C	Unit landed Price with taxes	Total landed price inclusive of all taxes
1	Supply, Erection & Commissioning of Three directional Managed Synchronous Digital Hierarchy (SDH) type, Long Haul that can drive up to 100 KM in one direction, short Haul that can drive up to 60 KM in another two directions, STM-4 OLTE with Primary Multiplexer.	Nos.	1	722915.00	8675.00	361.00	0.00	64106.00	143290.26	939347.26	939347.26
2	Supply, Erection & Commissioning of Two directional Managed Synchronous Digital Hierarchy (SDH) type, Long Haul which can drive up to 180 km in both directions STM-4 OLTE with Primary Multiplexer.	Nos.	3	1715340.00	20584.00	858.00	0.00	64106.00	324159.84	2125047.84	6375143.52
	Supply of Mandatory spare set for Long Haul OLTE equipment and MUX equipment (One module for each type)	Set	1	266253.00	3195.00	133.00	0.00	0.00	48524.58	318105.58	318105.58
3	Supply, Erection & Commissioning of Two directional Managed Synchronous Digital Hierarchy (SDH) type, Long Haul which can drive up to 120 km in both directions, STM-4 OLTE with Primary Multiplexer.	Nos.	1	713237.00	8559.00	357.00	0.00	64106.00	141526.62	927785.62	927785.62
	Supply of Mandatory spare set for Long Haul OLTE equipment and MUX equipment (One module for each type)	Set	1	219656.00	2636.00	110.00	0.00	0.00	40032.36	262434.36	262434.36
4	Supply, Erection & Commissioning of Two directional Managed Synchronous Digital Hierarchy (SDH) type, Long Haul which can drive up to 100 km in both directions, STM-4 OLTE with Primary Multiplexer.	Nos.	13	713237.00	8559.00	357.00	0.00	64106.00	141526.62	927785.62	12061213.06
	Supply of Mandatory spare set for Long Haul OLTE equipment and MUX equipment (One module for each type)	Set	7	219656.00	2636.00	110.00	0.00	0.00	40032.36	262434.36	1837040.52
5	Supply, Erection & Commissioning of Two directional Managed Synchronous Digital Hierarchy (SDH) type, short Haul which can drive up to 60 km in both directions, STM-4 OLTE with Primary Multiplexer.	Nos.	34	677035.00	8124.00	339.00	0.00	64106.00	134928.72	884532.72	30074112.48
	Supply of Mandatory spare set for short Haul OLTE equipment and MUX equipment (One module for each type)	Set	15	219656.00	2636.00	110.00	0.00	0.00	40032.36	262434.36	3936515.40

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6	Supply, Erection & Commissioning of Two directional Managed Synchronous Digital Hierarchy(SDH) type, Long Haul and Short Haul that can drive up to 100 KM in one direction and 60 km in another direction, STM-4 OLTE with Primary Multiplexer.	Nos.	1	695136.00	8342.00	348.00	0.00	64106.00	138227.76	906159.76	906159.76
	Supply of Mandatory spare set for Long Haul OLTE equipment and MUX equipment (One module for each type).	Set	1	219656.00	2636.00	110.00	0.00	0.00	40032.36	262434.36	262434.36
7	Supply, Erection & Commissioning of Two directional short haul PDH type 8 Mbps capacity OLTE equipment with primary MUX and MDF	Nos.	7	231572.00	2779.00	116.00	0.00	64106.00	53743.14	352316.14	2466212.98
	Supply of Mandatory spare set of PDH OLTE and MUX (One module for each type)	Set	3	109312.00	1312.00	55.00	0.00	0.00	19922.22	130601.22	391803.66
8	Supply of L4.1 SFP(up to 50KM)	Nos	36	13889.00	167.00	7.00	0.00	0.00	2531.34	16594.34	597396.24
9	Supply of L4.2 SFP(up to 80km)	Nos.	18	19033.00	228.00	10.00	0.00	0.00	3468.78	22739.78	409316.04
10	Supply of L4.2e SFP (up to 100km)	Nos.	6	22940.00	275.00	11.00	0.00	0.00	4180.68	27406.68	164440.08
11	Supply of V4.2 SFP (up to 120km)	Nos.	2	22940.00	275.00	11.00	0.00	0.00	4180.68	27406.68	54813.36
12	Supply of Patch cards (LC to FC/PC) type 10mtrs length	Nos.	66	399.00	5.00	1.00	0.00	0.00	72.90	477.90	31541.40
13	Supply, Erection & Commissioning of Digital Protection Signaling Equipment with 8 Commands and equipped in separate (Rack/Panel)	Nos.	110	221338.00	2656.00	111.00	0.00	9813.00	42105.24	276023.24	30362556.40
	Supply of Spare set of Digital tele protection equipment (One module for each type) .	Set	20	97491.00	1170.00	49.00	0.00	0.00	17767.80	116477.80	2329556.00
14	Supply of Laptop PC for configuration of remote OLTE,MUX, Digital Tele protection equipment with necessary software	Nos.	11	51236.00	615.00	26.00	0.00	0.00	9337.86	61214.86	673363.46
15	Supply of 4 1/2 digit true rms Digital multimeter	Nos.	20	22772.00	273.00	11.00	0.00	0.00	4150.08	27206.08	544121.60
16	Supply of Medium size tool kit consisting of 1) Screw driver set with detachable bits(Tap aria) 2) Spanner set 3) Cutting Plier 4) Nose Plier 5) Wire stripper 6) 25 Watts Soldering Iron (Sold ran) 7) 50 Watt Soldering Iron (Sold ran) 8) Crimping Tool 4/6/8 pin 9) 3 1/2 Digital Multimeter along with briefcase	Nos.	20	12570.00	151.00	6.00	0.00	0.00	2290.86	15017.86	300357.20
Total (Rs.):										96225770.34	
Or Say:										9,62,25,770.00	

(Rupees Nine Crores Sixty Two Lakhs Twenty Five Thousand Seven Hundred and Seventy only)

Sd/-

Chief Engineer/P&MM

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ANNEXURE-2

A) GUARANTEED TECHNICAL PARTICULARS for OPTICAL LINE TERMINATION EQUIPMENT (OLTE) SDH STM-4			
Manufacturer: ECI Model: NPT 1030 +0 Ext 2U			
S.No	Technical parameter	Unit	Particulars
1	Capacity Aggregate Bit-rate(STM-4): STM-4 Ports: FE 10/100 Ports: E1 ports	Mbps	15G Cross connect Capability – 622 8 STM-4s 16 FE 63 E1s
2	Protection OLTE = 1:1 APS E-1 Ports = 1:N APS STM-1 Ports = 1:1 APS STM-4 Ports = 1:1 APS	Yes / No	1+1 MSP, SNCP (I/N) protection is supported 1:N (N=2) for E1 is supported through Extension unit.
3	Unprotected System Gain for BER 10 ⁻¹⁰ :	db	Specified at 10 ⁻¹⁰ S4.1: 12, L4.1/L4.2: 24
4	1+1 APS System Gain for BER 10 ⁻¹⁰	dB	Specified at 10-10 S4.1: 12, L4.1/L4.2: 24
5	MTBF Unprotected: 1+1 APS Protected:	Hours	15 Years 15 Years
6	Code Format:		Optical signals: NRZ 2 Mbit: HDB3
OPTICAL TRANSMITTER			
7	Source (LED or Laser)		Laser
8	Source wavelength:	nm	S4.1 : OTR4_S3: 1274 – 1356nm L4.1 : OTR4_L3: 1300 – 1325nm L4.2 : OTR4_L5: 1480 – 1580nm V5 : OTR4_V5 : 1550nm
9	Source spectral width:	nm	S4.1 : OTR4_S3: 2.5 (RMS) L4.1 : OTR4_L3: 1 (-20dB) L4.2 : OTR4_L5: 1 (-20dB) V5 : OTR4_V5: 1 (-20dB)
10	Mean launched power Maximum: Nominal: End of Life:	dBm	Max Min(EOL) S4.1 : OTR4_S3: -8 -15 L4.1 : OTR4_L3: 2 -3 L4.2 : OTR4_L5: 2 -3 V5 : OTR4_V5: 4 2 OM_LVM (Amplifier) : 20.5 0
11	Launch power during safety power-down due to fibre break:	dBm	As per G.958.
12	Stability (nominal power variation due to temperature and/or biasing): Eye Pattern complies to G.957.	+/- Yes/No	The Eye Pattern complies to G.957.
13	Source rise time: Eye Pattern complies to G.957.	Yes/No	As per ITU-T G.957
14	Source estimated life span:	hours	>5,00,000 hours

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15	Source extinction ratio:		As per ITU-T G.957
16	Low power alarm threshold: field adjustable?	dBm	Available and configurable from GUI of the Equipment.
OPTICAL RECEIVER			
17	Nominal receive signal strength: End of Life:	dBm	S4.1 : OTR4_S3: -28 L4.1 : OTR4_L3: -28 L4.2 : OTR4_L5: -28 V5 : OTR4_V5: -36.5 EOL Values
18	Receiver Threshold BER 10-6: BER 10-10:	dBm	Specified at 10-12 (Back to Back) S4.1 : OTR4_S3: -28 L4.1 : OTR4_L3: -28 L4.2 : OTR4_L5: -28 V5 : OTR4_V5: -36.5 EOL Values
19	Receiver overload limit:	dBm	S4.1 : OTR4_S3: -8 L4.1 : OTR4_L3: -8 L4.2 : OTR4_L5: -8 V5 : OTR4_V5: -8
20	Spectral Bandwidth (3 dB point):	nm	S4.1 : OTR4_S3: 2.5 (RMS) L4.1 : OTR4_L3: 1 (-20dB) L4.2 : OTR4_L5: 1 (-20dB) V5 : OTR4_V5: 1 (-20dB)
21	Digital Bandwidth:	Mbps	622
22	Signal-to-noise @ center wavelength: @ 3 dB points:		NA
23	AGC range:		Valid from the minimum receiver sensitivity to overload range
VoIP Telephony System			
24	Omnibus calling available? Describe:	Yes/No	Yes
25	Selected station calling available? Describe:	Yes/No	Yes Any station in the Order wire section can be called using station numbers
26	Signaling protocols	Yes/No	Yes. SIP & H.323
27	LAN Interface: RJ-45 10BaseT/100BaseT Full/Half Duplex	Yes/No	Yes
28	3-way conference	Yes/No	Yes
29	Call Transfer and forward	Yes/No	Yes
30	Call Waiting	Yes/No	Yes
31	Caller ID Display	Yes/No	Yes
32	Are Service channel requirements specified in section 2.2.1.3 met?	Yes/No	Yes

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Voice Channels			
33	Are Service channel requirements specified in section 2.2.1.3 met?	Yes/No	Yes
34	No. of VF Channels:	ea	1
35	Pass band:	KHz	0.3kHz to 3.4 kHz
36	Subscriber side interface:		2 Wire, DTMF
37	Input & output level	dBm	Same as Tx/Rx Level
38	Idle channel noise	dBmOp	-69 dBmOp
39	Distortion:		> 34 dB (As per ITU-T G.712)
Data and Supervisory Channels			
40	No of data channels:	ea	2
41	Interfaces/Connectors:		V.11/DB9 Connector (RS232)
42	Data rates:	Kbps	64
ELECTRICAL/ OPTICAL INPUT/OUTPUT INTERFACES			
43	List ITU-T Standards in compliance with:		G.703, G.704, G.783, G.825, G.707, G.957, G.958 and all relevant ITU-T Standards.
44	Tributary bit rate (nominal):	Mbit/s	E1 (2Mbps) FE (10/100Mbps)
45	Tolerance in bit rate:	ppm	2Mbit/s +/- 50ppm
46	Line code:		2 Mbit/s: HDB3
47	No. of ports per card:		E1(PE1_63) : 63 ports per card E1(PME1_21B): 21 ports per card Ethernet (MPoE_12G): 12 ports per card Ethernet (DMGE4_L2) : 4 ports per card
48	Impedance of coax cable used for electrical Input/Output port:	Ω	75 ohm
49	Type of connector		Electrical E1: LFH 120 Ohm Balanced Ethernet 10/100 Mbps : RJ45 Optical Interface: LC on equipment side
50	Spare cable pairs?		Yes
51	Input jitter acceptance	UI (p-p)	SDH: ITU-T G.825 As per Standards 2 Mbit/s:ITU-T G.823
52	Maximum output jitter in the absence of i/p jitter	UI (p-p)	In compliance with ITU-T G.813, G.783 and G.824
53	Jitter transfer characteristic:		In compliance with ITU-T G.783, G.823 and G.824
OUTPUT PORT			
54	Line impedance balanced: unbalanced:	Ω	120 ohm 75 ohm

55	Test load impedance (Unbalanced):	Ω	75 ohm
56	Peak pulse amplitude (nominal " tolerance):	V dc	2 Mbit/s: 120 Ohm: 3.00+/- 10%
57	Pulse width (nominal " tolerance):	ns	2 Mbit/s: 244
58	Ratio of +ve & -ve pulses at the center of a pulse interval		2 and 34 Mbit/s: 0.95 to 1.05
59	Ratio of width of +ve & -ve pulses at nominal half amplitude		2 and 34 Mbit/s: 0.95 to 1.05
60	Maximum insertion loss	dB	< 0.5 dB
INPUT PORT			
61	Attenuation Char. of inter-connecting cable for digital signal presented at input port		2 Mbit/s: 6dB @ 1.024 MHz
62	Return loss (at 1.024 MHz)	dB	As per G.703
63	Admissible i/p signal attenuation	dB	2 Mbit/s: 6dB @ 1,024 MHz
64	Cable loss Equalization Range	dB	2 Mbit/s: 6dB @ 1,024 MHz
65	Maximum insertion loss	dB	2 Mbit/s: 6dB @ 1,024 MHz
66	List the type of Protection Schemes supported by the Equipment		1+1MSP, SNCP(I/N)
67	Discuss the proposed protection scheme and compare it with other schemes described in ITU-T G.841		SNCP and MSP protection scheme is proposed for STM-4 links.
68	Switching modes available Auto? Manual? Remote/network management?	Yes/No	Yes Yes Yes
69	Switching priority:		SDH Alarms SNC: Clear forced switch signal fail signal degrade manual switch
70	Tx switchover & switchback criteria:		SDH Alarms: SNC/I: LOP, LOS, LOF and AIS SNC/N: LOP, LOS, LOF, AIS and Signal Degraded
71	Rx switchover & switchback criteria:		Alarms: SDH SNC/I: LOP, LOS, LOF and AIS SNC/N: LOP, LOS, LOF, AIS and Signal Degraded
72	Inbuilt Mux (if applicable) switchover & switchback criteria:		NA
73	Switch option mode & status indicators:		The following commands are supported: Lock out of protection Forced switch Manual switch Clear

74	Switching Time Nominal: Maximum:		Typically < 32ms 50ms
Alarms			
75	List all alarms supported by Equipment:		As per ITU-T G.774, G.783, G.784
MECHANICAL AND ENVIRONMENTAL PARAMETERS			
76	Number of Sub-Racks (including DC/DC converters, O/W muldem etc.) required for Unprotected Terminal: 1:1 Protected Terminal:	Ea	One Sub-rack and one expansion chassis for equipment and it can be mounted on 19" rack.
77	Sub-Rack Dimensions (H*W*D):	mm	44.4 mm x 440 mm x 243 mm 88.9 mm x 443.4 mm x 243 mm
78	Sub-Rack Weight:	Kg	13 Kg Fully loaded (main + expansion chassis) 3 Kg Unequipped
79	Sub-Rack mounting options:		19"ETSI rack.
80	Sub-Rack clearance requirements Top * Bottom * Sides Front Access: Rear Access:	M	Top : 30-50mm for cables Side : Not required Bottom : Not required Front Access: Clearance of 600mm required Rear Access: not required
81	Sub-Rack colour and finish		Color : Grey Finish : Textured finish, powder coated
82	Cabinet options available 19" ETSI? Slim rack? Others (specify)? Whether Truncated Cabinet Available?	Yes/No Yes/No Yes/No Yes/No	Yes No N/A Yes.
83	Protection Class (IP Class):		As per IP55
84	Rack Colour and Finish:		Siemens Gray
85	Temperature range Guaranteed performance: Operation without damage: Storage/ transport:	EC	-25 to 60 degrees -40 to 70 degrees -40 to 70 degrees
86	Relative humidity Minimum: Maximum:	%	5% 95%
87	Altitude Installed: Transport/storage:	M	3000 10000
88	Describe Ventilation requirements:		Louvers and perforations with Ventilation hoods
89	Describe dust proofing provisions:		As per IP55

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B) GUARANTEED TECHNICAL PARTICULARS for Power Supply Unit (dc/dc Converter)			
Manufacturer: ECI Model #: INF_30B			
S.No	Technical parameter	Unit	Particulars
1	Nominal supply voltage:	Vdc	-48V DC
2	Guaranteed performance:	Vdc	-40 to -70
3	Polarity:	+/-	Negative
4	Whether 220 Vac mains operation capability inbuilt		yes
5	List derived DC voltages:	V dc	Minus 48 VDC is derived from power plant of customer, and from thereon, it is fed to Power Supply Cards of equipment, which also works on -48VDC
6	Total power consumption (Fully equipped incl. service channels) Unprotected terminal: 1+1 Protected terminal:	Watt	360 W for NPT1030
7	1+1 APS protection provided?	Yes/No	Yes
8	MTBF of power supply unit:	Hours	159 years
9	Ultimate power delivery capacity	Watt	250 for Base- NPT1030B 150 for Expansion-NPT1030E
10	Are the following protections provided?		
	Over Voltage?	Yes/No	yes
	Under Voltage?		yes
	Over Load?		yes
	Reverse Polarity?		yes
	Other (specify)?		
11	Whether proposed equipment has distributed Power Supply?	Yes/No	No
12	Provide AC & DC power supply requirement for each of the proposed equipment.	Watt	230 W for NPT1030 130W for NPT1030
	Expected life of Equipment	Years	15 Years (Based on MTBF)
Patch Cards			
1	Length	M	15 m
2	Service Loop	M	0.5 m
3	Insertion Loss	dB	0.5dB
4	Return Loss	dB	>40 dB
5	Connector Type		LC

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C) GUARANTEED TECHNICAL PARTICULARS for Primary Multiplexers (PDH)		
Manufacturer: ECI Model: NPT 1030 +0 Ext 2U		
S.No	Technical parameter	Particulars:
1	List of core (common) cards/modules:	3U shelf with back panel, PSU card, OAM card ,Management card and SM_10E card.
2	List Subscriber Line Units (SLU) available:	SM_FXS_8E SM_EM_24W_6E SM_V24E
3	List VF interfaces available:	SM_FXS_8E : 8 ports SM_EM_24W_6E : 18 Ports SM_V24E : 4 Ports
4	List of Asynchronous and Synchronous Data interfaces available:	V.24 / G.703 / V.35 / V.36 / RS422 / RS449 / V.11
5	List of ISDN interfaces available:	Basic Rate ISDN card
6	No. of plug-in slots available:	Each SM_10E card supports Three Daughter cards hence total 9 cards are supported.
7	Can any SLU be inserted in any card slot?	Yes
8	Can any channel be assigned any time slot?	Yes
9	Is Sub-Channel data Multiplexer module available as per technical specifications?	Yes
10	Inbuilt redundancies and protection switching options for common units Channel Banks: Drop & Inserts:	PSU, Controller and Clock redundancies Yes Yes
11	Describe E1 port Automatic Protection Scheme (APS) options: Channel Banks: Drop & Inserts:	 Yes Yes
12	MTBF (Basic Unit with typical voice and data application configuration):	15 Years
13	In-service insertion of cards/units?	Yes
14	List Synchronization Modes available:	Internal, E1 recovered, External 75ohm TTL and 2Mbps BITS clock
15	Can the Channel Bank multiplexer be reconfigured to be a Drop & Insert? If so, describe including: Cards to be replaced: Slots available for SLUs:	Yes None 9
16	Can the Drop & Insert multiplexer be reconfigured to be a Channel Bank? If so, describe including: Cards to be replaced: Slots available for SLUs:	Yes None 9
17	<u>Describe software programmable functions:</u> System firmware / software can be programmed through central EMS or LCT.	
18	ITU-T Standards Complied with:	ITU-T G.703, G.704, G.823, G.732, G.711, G.712

Electrical Input/Output Interfaces			
19	Bit Rate Tolerance	Ppm	± 50 ppm
20	E1 Port I/O Impedance:	Ω	120Ω balanced / 75Ω unbalanced (configurable)
21	E1 Port I/O Connector:		DB-25 Female (DB-25 to open ended E1 cable is provided)
22	Input jitter acceptance 100 Hz to 10 KHz: 10 KHz to 800 KHz:	UI (p-p)	<0.05 UI
23	Maximum output jitter in the absence of i/p jitter 100 Hz to 10 KHz: 10 KHz to 800 KHz:	UI (p-p)	<0.05 UI (in the frequency range of 20Hz to 100 KHz)
24	Jitter transfer characteristic:		As per ITU (CCITT) G.823
Output Port			
25	Line impedance:	Ω	120 / 75
26	Test load impedance (Unbalanced):	Ω	75
27	Peak pulse amplitude: (nominal tolerance)	V dc	3.0 V ± 0.3 V for 120 Ohms 2.37 V ± 0.237 V for 75 Ohms
28	Pulse width: (nominal tolerance)	Ns	244 ± 25
29	Ratio of +ve & -ve pulses at the center of a pulse interval:		± 0.3 V for 120 Ohms ± 0.237 V for 75 Ohms
30	Ratio of width of +ve & -ve pulses at nominal half amplitude:		0.95 to 1.05
31	Maximum insertion loss:	dB	As per G.703 and G.704
Input Port			
32	Attenuation Char. of inter-connecting cable for digital signal presented at input port		As per G.703 and G.704
33	Return loss (at 1.024 MHz)	dB	18dB
34	Admissible i/p signal attenuation	dB	As per G.703 and G.704
35	Cable loss Equalization Range	dB	As per G.703 and G.704
36	Maximum insertion loss	dB	As per G.703 and G.704
37	List and describe "Dry-Contact" Monitor and Control I/O points: 1 Dry-Contact Alarm relay Type C, for alarm status monitoring		
38	List and describe local and remote diagnostics: E1 Alarms, Mapping / Un-mapping, Clock settings/Status		
39	Describe provisions for Telecommunication Network Management functions: SNMP V-2, NMS (over the TCP/IP network)		
40	Is framing Structure as per ITU-T Standards?	YES/No	Yes
41	Sampling Rate Tolerance:	KHz	8000 Samples / sec
42	Encoding format: Binary digits/sample: Encoding law: No. of quantization levels:		64Kbps (for voice channels) As per G.711, G.712 As per G.711, G.712
43	Companding law:		A-Law (for voice channels)

44	Overload Capacity:	dBmo	+3.14
SIGNALLING			
Time Slot 16			
45	In compliance with G.712 for allocation of Time Slot 16?	Yes/No	Yes
46	Signalling system:		E1 R2 CAS
47	Signalling distortion:		As per ITU-T Recommendation G.712
48	Scanning Frequency:		2.048 Mhz
E & M Signalling			
49	E & M Signalling Types supported:		Types V
50	Maximum current in E wire:		23mA
51	Maximum resistance to Earth for M wire detection:		1000 Ohms
Loop Signalling			
52	Dial pulse speeds:		Upto 20 pps (nominal 10 pps)
53	Make-break ratio:		60:40
54	Ringing voltage: Frequency:	V ac Hz	75 VRMS / 85 VRMS – user selectable 16 / 20 / 25/ 50 Hz – user selectable
55	Nominal supply voltage:	Vdc	-48V DC
56	Power supply variation Guaranteed performance: Operation without damage:	Vdc	-40V to -60V DC -36 V to -72V
POWER SUPPLY UNIT (INF_30B)			
57	Polarity:		Negative
58	Optioned for 220 V ac?	Yes/No	Yes
59	List derived DC voltages:	V dc	-48 V
60	Total power consumption at 48 Vdc (Full load):	Watt	Less than 150 Watts under full load
61	1+1 APS protection provided?		Yes
62	MTBF of power supply unit:	Hours	159 Years
63	Ultimate power delivery capacity:	Watt	150 Watt
64	Are the following protections provided: Over Voltage: Under Voltage: Over Load: Reverse Polarity: Others (specify):		Yes Yes Yes Short circuit protection
65	<u>Describe monitoring and control provisions:</u>		-48V DC Input power Indication and output power indication
MECHANICAL AND ENVIRONMENTAL PARAMETERS			
65	Number of chassis (including DC/DC converters, O/W muldem etc.) required for Unprotected Terminal: 1:1 Protected Terminal:	each	1 1
66	Chassis Dimensions (L*W*H):	mm	44.4 mm x 440 mm x 243 mm 88.9 mm x 443.4 mm x 243 mm
67	Chassis Weight:	Kg	13 Kg

68	Chassis clearance requirements Top * Bottom * Sides: Front Access: Rear Access:	mm	Top: 30-50mm for cables Side: Not required Bottom: Not required Front Access: Clearance of 600mm required
69	Chassis colour and finish		Color : Grey Finish : Textured finish, powder coated
70	Rack options available 19" ETSI? Slim rack? Others (specify)?		Standard 19 Inch. DIN Rack
71	Protection Class (IP Class):		IP 55
72	Rack Colour and Finish:		Color: Grey Finish : Textured finish, powder coated
73	Temperature range Guaranteed performance: Operation without damage: Storage/ transport:	°C	-25 °C to + 70 °C +21 °C +60 °C -40 °C to 70 °C
74	Relative humidity Minimum: Maximum:	%	0 95
75	Altitude Installed: Transport/storage:	m	As per ETS 300 019 Class 3.2 As per ETS 300 019 Class 1.2 / As per ETS 300 019 Class 2.3
76	Describe Ventilation requirements:		Room cooled to a constant temperature of 70 °F (21 °C).
77	Describe dust proofing provisions:		Dry, static-free and Dust-Free Environment.
78	Electromagnetic compatibility (List standards & severity levels)		EMC FCC Part 15 Class 2
79	No. of VF channels per card:		8
80	List Signalling type(s) options: (with variants)		R2 CAS (Q.421, E&M, Custom - User Programmable)
81	If multiple signalling types Strappable? Programmable?		Programmable, Q.421, E&M and CAS Custom (User Programmable)
82	Dialling modes supported:		Pulse Dialing Upto 20 pps (nominal 10 pps) DTMF Dialing
83	Describe ringing arrangements:		User selectable 17/20/25/50 Hz
84	I/P level Minimum: Maximum:	DBm	-30dB +1.14dB
85	O/P level Minimum: Maximum:	DBm	18dB gain – relative to input level +3.2dB
86	Adjustability steps:	DB	0 to 8
87	Nominal impedance:	Ω+ pF	600 ohms
88	Return loss 0.3 to 3.4 KHz:	DB	20 dB (for 4 wire) - 300-3400Hz 12dB (for 2 wire) - 300-600Hz 15dB (for 2 wire) - 600-3400 Hz
89	Idle Channel Noise:	DBmo	≤ - 65dB
90	Cross talk 0.3 to 3.4 KHz:	DBmo	≤ - 65dB
91	Application Areas:		Voice and Data

92	<u>Software controllable features & operating parameters:</u>		
93	Synchronous or Asynchronous?		Both types data interface available
94	List Data Interfaces supported: Code Number	ITU-T & EIA	Asynchronous: RS232, RS485 Synchronous: Co-directional G.703, V.35 / V.36 / RS422 / V.11 / 10BaseT.
LOW-SPEED DATA SUBSCRIBER LINE UNIT PARAMETERS			
95	Connectors:		RJ-11
96	List Bit rate options:	Kbit/s	50bps to 19.2 Kbps
97	Are bit rate options Strappable? Programmable?	Yes/No	Automatic setting Transparent
98	Number of channels per module: (Complete for dataplex SLI only)		8
99	Maximum distance from DTE:		Depending upon data rates and cable quality
100	Describe provisions for extending the above distance limit:		Depending upon data rates and cable quality

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D) GUARANTEED TECHNICAL PARTICULARS for Digital Protection Coupler		
S.No	Technical parameter	Particulars
1	Name of manufacturer	Siemens AG,Germany
2	Model	SWT3000
3	Type	Frequency shift keying
4	Tech document Details (operation, maintenance and instruction manuals etc.)	Available
5	Number of Command input	8 (Eight) 1 No. Green LED for each Input contact
6	Command input voltage	250V DC
7	Whether programmable Pulse suppression I/P filer available?	Yes
8	Number of Command output	8 (Eight) 1 No. RED LED for each Output contact
9	Command output Contact type	NO, Potential free contact Rating: Switching Power-250 W/250VA Switching Voltage-AC/DC 250 V Switching Current-AC/DC 1.5 A
10	Command output switching voltage max	250 V DC
11	Command output insulation withstand voltage	AC 3 KV
12	Whether command prolongation time adjustable ?	Adjustable
13	Alarm output contact	Change over Potential free contact C-NO, NC Rating: Switching Power-300 W/1000VA Carry Current-AC/DC 5 A
14	Alarm output switching voltage max	250 V DC
15	Communication interface	G.703 .6 75 ohms/120 ohms Port speed 2 Mbps
16	Transmission Time	$t \leq 5$ ms
17	Power supply	redundant 48 V DC Power supply +ve grounded (-20% /+15%)
18	Power consumption	Approx 30 W
19	Visual Indication for healthiness/ abnormalities of the equipment	Available
20	Electromagnetic Compatibility	As per IEC 61000-4-2
21	Security, dependability and transmission time	As per IEC 61000-4-1
22	Dimensions H x W x D	132x482.6(19 inch)x240mm
23	Weight	Approx 5 kg
24	Possible to install in 19" Possible Standard rack	Possible

25	Equipment Management	Using Standard PC/Laptop
26	Trip counter	External Counters in the form of Android display to be provided to view the counter, event log and alarm.
27	Event recorder	Inbuilt which can be read using standard PC/Laptop
28	Maximum number of events that can be stored	8000
29	Degree of Protection	IP 20
30	Operating Temperature range	-5 °C to + 55 °C
31	Humidity	Relative Humidity 5% to 95% Absolute Humidity 29 g/m ³ No condensation

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E) GUARANTEED TECHNICAL PARTICULARS FOR LAPTOP		
Sl.No.	Technical parameter	Particulars
1	Manufacturer	DELL
2	Model	Dell Latitude 3590 CTO
3	Processor	Intel Core i3-7020U Processor (Dual Core, 3M Cache, 2.3GHZ, 15W)
4	RAM	4GB, 1x4GB, DDR4 Memory
5	Graphics Card	Inter® HD Graphics 620
6	Internal Auxiliary Memory	2.5" 500GB SATA 7200 RPM Hard Drive
7	Internal Optical Drive	External: CUS, DVD ±RW, 9.5, EX-T, WW
8	Network Connection	1 Inter Dual Band wireless AC 8265 (802.11ac) 2x2 + Bluetooth 4.2
9	Screen	15.6" FHD(1920x1080) Non-Touch Anti-Glare, Camera & Microphone, WLAN/WWAN Capable.
10	Keyboard	Single Pointing Back list English International Keyboard.
11	Mouse	Kit-Dell Optical Mouse- MS116 – Black S&P
12	Webcam	Non-Touch WLAN LCD Cover with HD Camera
13	Interfaces	Intel 10/100 Mbps Ethernet
14	Power Supply	Power Cord for 3-pin Adapter (IND)
15	Warranty	3 Years
16	Windows	Windows 10
17	Antivirus	Yes
18	Bag pack	Dell Urban Backpack.

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F) GUARANTEED TECHNICAL PARTICULARS FOR 4 1/2 DIGIT HAND HELD MULTIMETER		
Sl. No.	Technical parameter	Particulars
1.	Manufacturer Name	MOTWANE
2.	Suppliers Name	M/s. Siemens Limited
3.	Make & Type	MOTWANE & M 402
4.	Scale	4 ½ Digit
5.	Count display	40,000 Counts with LCD Display
6.	DC voltage accuracy	$\pm(0.05\%+8)$ to $\pm(0.1\%+8)$
7.	AC voltage accuracy	$\pm(0.04\%+30)$ to $\pm(8\%+80)$
8.	Ohm accuracy	$\pm(0.05\%+10)$ to $\pm(1.5\%+50)$
9.	Frequency response	AC Voltage Frequency response is up to 100 KHz
10.	<u>Ranges</u>	
	i. DC voltage:	400mV to 1000V
	ii. AC voltage:	400mV to 1000V
	iii. AC & DC current:	400mA to 10A
	iv. Resistance:	400 Ω to 40M Ω
	v. Capacitance:	40nf to 40 mf
11.	Weight	450g. approx..
12.	Dimensions (WxHxD)	(94 X 205 X 36 mm approx.)
13.	Whether over load protection provided	Yes
14.	Whether capable of indicating automatic Polarity and Low battery	Yes
15.	Whether accessories provided	Yes

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G) GUARANTEED TECHNICAL PARTICULARS FOR NMS (Network Management System)		
Sl. No.	Technical parameter	Particulars
1	Manufacturer Name	DELL/HP
2	Suppliers Name	M/s. Siemens Limited
3	Processor	P-IV, dual core with 2.8 GHz and HT technology
4	RAM	4 GB, 1X4GB, DDR4 Memory.
5	Graphics Card	Inter® HD Graphics 620
6	Internal Auxiliary Memory	2.5" 500GB SATA 7200 RPM Hard Drive
7	Internal Optical Drive	External: CUS, DVD \pm RW, 9.5, EX-T, WW
8	Network Connection	4 Nos. of USB ports in front side one serial port
9	Screen	19" TFT color monitor
10	Keyboard	Multimedia Keyboard.
11	Mouse	Kit-Dell Optical Mouse- MS116 – Black S&P
12	Webcam	Non-Touch WLAN LCD Cover with HD Camera
13	Interfaces	Intel 10/100 Mbps Ethernet
14	Power Supply	Power Cord for 3-pin Adapter (IND)
15	Warranty	3 Years
16	Windows	Windows 10
17	Antivirus	Yes
18	Bag pack	Dell Urban Backpack.

Sd/-

Chief Engineer/P&MM