

CENTRAL COALFIELDS LIMITED
A Miniratna Category I Company
(A Subsidiary of Coal India Limited)
MATERIALS MANAGEMENT DEPARTMENT
DARBHANGA HOUSE: RANCHI 834 001 (JHARKHAND) INDIA
(PBX) 2360726, 2360687 CGM (MM) - 2360716
FAX (91) 0651-2360257 EMAIL: hodmm@ccl.gov.in

Item Category	Firm Category	Tender Category
MISCELLANEOUS ITEMS	Govt. Undertaking	Advertised tender (Domestic)(Manual).

CONTRACT

No. 000012314-204

BY REGD. POST

Dated: 18.02.2013

BY REGISTERED POST/FAX/EMAIL

To,
M/s. TELECOMMUNICATIONS CONSULTANT INDIA LIMITED,
(A GOVT. OF INDIA ENTERPRISE)
4TH FLOOR, TCIL BHAVAN, GREATER KAILASH – I
NEW DELHI – 110048
E-MAIL ID: sanjeeva.tcil@gmail.com / sanjeeva@tcil-india.com

FAX NO. : 011- 26242313.

Sub: Conclusion of contract for Turnkey Project for setting up WAN in CCL on RENTAL BASIS for 5 Years.

Ref: (i) This office Advertised tender (Domestic)(Manual) no. CMM (P)/II/CCL/Turnkey Project for setting up WAN in CCL / 2012 (ADVERTISEMENT No. 29/2012 -13 ; SL.No. 109) Due & Opened on 07/11/2012 for Turnkey Project for setting up WAN in CCL on RENTAL BASIS for 5 years & subsequent letters dtd. 15/11/2012, 1/12/2012 & 20/12/2012.

(ii) Your offer no. TCIL/2012-13/S&T/CIL Dtd. 05/11/2012 & subsequent letters dtd. 20/11/2012, 22/11/2012, 24/11/2012 & 6/12/2012.

Dear Sir,

We are pleased to notify our acceptance of your above referred offer for conclusion of contract for Turnkey Project for setting up WAN in CCL on RENTAL BASIS for 5 Years with following terms & conditions:-

1. Scope of Supply:

Sl. No.	Description	Unit	Qty	Without Tax				With Tax
		(UoM)		Unit OTC	Unit MR (Inclusive)	Unit Total	Total	Total
			a	b	c	d=b+c*60	e=d*a	f= (e+e*12.36%)
Tier-I: As per BOM								
1	ILS 10 Mbps – HQ	Nos	1.00	20,000.00	51,523.73	3,111,423.80	3,111,423.80	3,495,995.78
2	MPLS LINK - 10 Mbps at CCL HQ	Nos	1.00	30,000.00	15,290.55	947,433.00	947,433.00	1,064,535.72
3 (a)	MPLS LINK - 2 Mbps at all Area Offices, Central Units & Regional Stores	Nos	27.00	23,592.59	9,139.60	571,968.59	15,443,151.93	17,351,925.51
3 (b)	Routers for MPLS (Including Installation, Maintenance and 5 Years Support)	Nos	27.00	21,082.89	7,027.63	442,740.69	11,953,998.63	13,431,512.86
4	Hardware & Software for CCL HQ			0.00	0.00	0.00	0.00	0.00
a	Core Switch (Including Installation, Maintenance and 5 Years Support)	Nos	2.00	586,470.51	195,490.17	12,315,880.71	24,631,761.42	27,676,247.13
b	Router for 10 Mbps Internet LL (Including Installation, Maintenance and 5 Years Support)	Nos	2.00	82,683.93	27,561.31	1,736,362.53	3,472,725.06	3,901,953.88
c	NMS with LCD Monitor(52 inch) & Heavy Duty Printers(Laser) (Including Installation, Maintenance and 5 Years Support)	Nos	2.00	726,000.00	248,105.78	15,612,346.80	31,224,693.60	35,084,065.73

d	Firewall / UTM (Including Installation, Maintenance and 5 Years Support)	Nos	2.00	194,693.07	64,897.69	4,088,554.47	8,177,108.94	9,187,799.60
e	Core Router for MPLS (Including Installation, Maintenance and 5 Years Support)	Nos	2.00	304,338.29	101,446.10	6,391,104.29	12,782,208.58	14,362,089.56
5	LAN - 20 points at all the Area Offices, Central Units & Regional Stores along with 2 nos. of Layer 2 managed 24 port Switch, 915 mtrs of Cat 6 wiring, I/O Boxes, I/O patch cords, patch panels, Racks etc including maintenance for 5 years (Including Installation, Maintenance and 5 Years Support)	Nos	27.00	24,824.21	8,274.74	521,308.61	14,075,332.47	15,815,043.56
6	Fibre Optic cable laying along with jointing where ever required including maintenance for 5 years (Rate per meter length)	Nos	0.00	0.00	0.00	0.00	0.00	0.00
7	1 KVA Online UPS with 2 hrs battery backup along with maintenance for 5 years	Nos	27.00	7,291.29	2,613.83	164,121.09	4,431,269.43	4,978,974.33
8	Earthing System along with maintenance for 5 years	Nos	27.00	3,141.19	1,047.06	65,964.79	1,781,049.33	2,001,187.03
9	Redundancy Link at all the locations	Nos	26.00	55837.5	18,612.50	1,172,587.50	30,487,275.00	34,255,502.19
SUBTOTAL							162,519,431.19	182,606,832.89
Tier-II: As per BOM								
1	MPLS Link - 512 Kbps where ever feasible in the list as at Annexure 2 along with Router/Switch as reqd.	Nos	0.00	0.00	0.00	0.00	0.00	0.00
2	Point to Point Radio/ Point to Multi Point Radio links - 20 Mbps to all Units from respective Area Office (Wherever air distance is more than 1 Km) along with Router/Switch as required.	Nos	134.00	33,211.57	11,070.52	697,442.77	93,457,331.18	105,008,657.31
3	VSAT with BW of 512 Kbps on sharing Satellite BW of 1:4 along with Router/ Switch as required. (Includes VSAT Eqpt lease charges, LF/WPC Charges as applicable and Satellite BW Charges Up link/Down link)	Nos	14.00	75,050.00	25,816.89	1,624,063.40	22,736,887.60	25,547,166.91
4	WI FI LAN where ever feasible along with Interface cards for PC	Nos	0.00	0.00	0.00	0.00	0.00	0.00
5	LAN -5 points at all the Project Offices & Other Units along with Layer 2 managed 24 port switch, 305 mtrs of Cat 6 wiring, I/O boxes, I/O patch cords, patch panels, Racks etc including maintenance for 5 years	Nos	56.00	12,688.51	4,229.50	266,458.51	14,921,676.56	16,765,995.78
6	1 KVA Online UPS with 2 hrs battery backup along with maintenance for 5 years	Nos	148.00	7,339.84	2,446.61	154,136.44	22,812,193.12	25,631,780.19
7	Earthing System along with maintenance for 5 years	Nos	148.00	2,949.97	983.32	61,949.17	9,168,477.16	10,301,700.94
SUBTOTAL							163,096,565.62	183,255,301.13
TOTAL							325,615,996.81	365,862,134.02

Contd.../-3

(Rs. Thirty Six Crores, Fifty Eight Lacs, Sixty Two Thousand and One Hundred Thirty Four Only)

[N.B. : Detailed Technical Specification and Make / Model of items /equipments accepted by CCL to be used in CCL WAN is enclosed as Annexure – “A” duly signed by GM(System) & GM(E&T)].

Other terms & conditions are as follows;

1.0 The essence of the Turnkey Project for setting up WAN in CCL is the successful implementation and maintenance of the project in time and the project implementer should give utmost importance to this aspect throughout the project life cycle and henceforth, **you will be called "Project Implementer"**.

2.0 Performance Security:

10% of the contract amount should be submitted within 15 days of installation & commissioning of entire project by the successful bidder in any of the form given below:

- A bank guarantee in the form given in the bid document as per CCL format.
- Demand Draft drawn in favour of Central Coalfields Limited on any scheduled bank payable at its branch at Ranchi. The performance security deposited in the form of Bank Guarantee shall be duly discharged and returned to the contractor on successful completion of the contract. The performance security deposit in the form of Demand Draft will be refunded at the time of completion / termination of the contract. If the performance security is provided by the successful bidder in the form of Bank Guarantee, same shall be issued by any Nationalised Bank. The said Performance guarantee shall be valid for tenure of five year & three months i.e. till the conclusion of the contract.

The Performance Bank Guarantee shall be released after expiry of validity period if no claim is pending.

3.0 Duration of Contract:

3.1 The contract shall come into force from the date of commissioning and shall remain in force up to 60 months.

3.2 Rental quoted should be firm without escalation.

3.3 On expiry of the aforesaid period as per clause 3.1, the contract terminates unless it is renewed upon by the customer's request in writing for such further period and on such terms and conditions as are mutually agreed upon. A prior written notice of 3 months shall be given by the customer of his intension to renew the contract.

4.0 The equipments/components being used should be brand new. No refurbished/old equipments shall be used.

5.1 The turnkey project for setting up WAN in CCL has been divided into 4 groups as follows:-

- Group A: CCL (HQ), Central Units, CCL Sales Office, Kolkata
- Group B: NK & Piparwar Area
- Group C: Dhori, Kathara and B&K Area
- Group D: Argada, Barka-Sayal, CRS/CS, Rajrappa, Kuju & Hazaribagh Area

5.2 Posting of one engineer at CCL (HQ) Ranchi for Group A, one engineer at NK Area, Dakra for Group B, one engineer at B & K Area, Kargali for Group C and one engineer each at MRS, Ramgarh & Kuju Area, Kuju for Group D of Turnkey Project for setting up WAN in CCL (i.e. five engineers) would be **mandatory** on all working days to look after preventive and corrective maintenance exclusively for CCL. For managing maintenance/breakdowns of CCL Kolkata, there must be Project Implementer's office with qualified manpower, office infrastructure, telephone facilities, sufficient spare stock etc., at Kolkata. The qualification & experience requirement for engineer to be posted at above said places should be as follows:

- Degree/Diploma in engineering having certification of CCNA or equivalent.
- Experience certificate of handling such projects at least for one year
- He should be able to sort out both hardware & software related problems / breakdowns of the Project.

Contd..../-4

5.3 Project Implementer's responsibility for maintenance shall be for the entire Turnkey Project (including each & every item) for setting up WAN in CCL.

6.0 JURISDICTION:

The Court at Ranchi in Jharkhand State only will have the jurisdiction to deal with and decide any legal matter or dispute whatsoever arising out of our contract.

7.0 Delivery, Installation, Commissioning & Integration:

7.1 The supply, installation, commissioning and Integration of Turnkey Project of CCL HQ., Central Units & CCL Sales Office Kolkata (Group A) (Tier I WAN) for setting up WAN in CCL must be completed within twelve weeks from the date of conclusion of contract. This includes LAN at all the Area Offices and Central Units, Connectivity of existing Servers located at Area Offices, CCL Sales Office Kolkata & Central and Regional Stores.

7.2 The supply, installation, commissioning and Integration of Turnkey Project of NK & Piparwar Area (Group B) (Tier II WAN) for setting up WAN in CCL must be completed within eight weeks after the completion of Group A work (i.e. twelve weeks from the date of conclusion of contract).

7.3 The supply, installation, commissioning and Integration of Turnkey Project of Dhori, Kathara and B & K Area (Group C) (Tier II WAN) for setting up WAN in CCL must be completed within eight weeks after the completion of Group A work (i.e. twelve weeks from the date of conclusion of contract). Group B & C work will be done parallelly.

7.4 The supply, installation, commissioning and Integration of Turnkey Project for Argada, Barkasayal, CRS/CS, Rajrappa, Kuju & Hazaribagh Area (Group D) (Tier II WAN) for setting up WAN in CCL must be completed within twelve weeks after the completion of Group A work,(i.e. twelve weeks from the date of conclusion of contract). Group B, C & D work will be done parallelly.

7.5 Project Implementer can simultaneously execute the jobs as at 7.1 to 7.4. Total Completion Time for the entire project shall be 24 weeks from the date of conclusion of contract.

7.6 The necessary clearance certificates from WPC, SACFA or any other statutory authority are must for the project commissioning.

7.7 Penalty: If execution of the project (supply, installation, commissioning & Integration) is delayed, LD will be imposed as indicated under LD clause. LD will be calculated as per clause 7.5.

7.8 Deliverables: One copy of all User manuals (hard & [OR] soft copy) will be supplied for all software along with any other technical literatures/leaflets for Communication items. Step by step Configuration procedure of Different Managed Switches, Routers, Servers, Firewall/UTM, Wireless Equipments, etc. is to be submitted. Further Step by step Integration procedure of existing servers, if any, is also to be submitted.

8.0 LIQUIDATED DAMAGES (LD) FOR DELAY IN COMPLETION:

@ 0.5% of the entire project cost per week or part thereof as stated in clause 7.5 subject to a maximum limit of 10% of the entire project cost.

9.0 Force Majeure: Project Implementer shall not be liable for damages for failure to perform maintenance obligations if the failure results from Force majeure situations like natural calamities viz Floods, Earthquakes & General Strikes, Riots, Civil Commotions and also refusal of Government/Statutory bodies to grant permission necessary to carry out any portion of the work. CCL will bear the actual compensation to the extent of repair / maintenance / replacement only.

10.0 Payment Terms:

a. 80% of one time charge (OTC) will be made within 21 days from the date of submission of clear and acceptable bills /invoices (in triplicate) after delivery of all items of each group [as stated in clause 5.1 of turnkey project] for setting up WAN in CCL.

b. The challan (in triplicate) of items [as stated in (a) above] for each group [as stated in clause 5.1] should be duly signed by the designated project coordinators of each group.

c. Balance 20% payment for one time charge (OTC) will be made within 21 days from the date of submission of clear & acceptable bills/invoices (in triplicate) after successful commissioning of the project as stated in clause 7.1 to 7.5, duly certified by the project coordinators of each group [as stated in clause 5.1] and further certified by the Chief Project Coordinators located at CCL HQ. Names/Posts/Designations of the Project Coordinators and Chief Project Coordinators will be communicated by GM(Systems) & GM(E&T) within 30 days from the date of conclusion of contract.

d. For clearance of WPC & SACFA or any statutory authority, project will be treated as conditionally commissioned without these clearances and till such clearances are obtained, 5% from the MR (Monthly Rental) bills will be deducted / retained (which will be released with the submission of such

- clearances). In case of any penalty/fine imposed by any statutory authority for non-availability/non-submission of WPC (Wireless Planning Commission)/SACFA (Standard Advisory Committee on Radio Frequency Application) clearance certificate(s) during the contract period, the liability of such penalty/fine would devolve on the service provider/project implementer. On the happening of such a contingency, the penalty/fine would be recovered from such provider/project implementer.
- e. The monthly rental (MR) of any group or turnkey project as whole can only be started after final commissioning of entire turnkey project and Bank Guarantee submission as per clause 2.0.
 - f. The monthly rental bill in triplicate shall be raised after the end of each month and the same shall be paid within 21 days of receipt and acceptance thereof. The said payment will be made on the basis of Performance Certificate (in duplicate) duly certified by the designated Project Coordinators of each group [as stated in clause 5.1] and further certified by the designated Chief Project Coordinators located at CCL HQ.
 - g. M/s. Bharati Airtel Limited will raise their invoices for MPLS, ILS & VSAT for MPLS, ILS & VSAT which is mentioned in "SI No.1,2 and 3(a) in Tier I" and "SI No. 1 & 3 in Tier II" directly in the name of CCL and will be sent through TCIL to CCL and payments will be made to TCIL or M/s. Bharati Airtel Limited for MPLS, ILS & VSAT which is mentioned in "SI No.1,2 and 3(a) in Tier I" and "SI No. 1 & 3 in Tier II", **as per Statutory requirement / Govt. directives issued from time to time.**
 - h. One time charge (OTC) should not be more than 3 months rental charge and this limit is applicable only for items covered under both OTC and MR (Monthly Rental). This limit of 3 months rental charge is not applicable to the Project as a whole.
 - i. Materials, Antenna Cable/Radio Frequency Cable, Accessories etc. dedicated Earthing for communication/equipments, Surge & Lightning arrestor, Aviation Lamp, Wiring material for aviation lamp, Masts, VSAT & its accessories (except VSAT-HUB-Router), Networking items under Passive Components, NMS (Network Management Software) and all services pertaining to trenching, Laying, jointing etc. will be covered under OTC only. The maintenance / replacement (if needed) of above items for the entire period of contract (5 years) is the Project Implementer's scope of work.
 - j. **Price Fall Clause:** Till the completion of delivery, if the suppliers supply the items of identical description as that of CCL to any customer, the OTC and rental charges in such occasion(s) should not be lower than those of the items supplied/to be supplied to CCL.
 - k. If at any time, till the completion of delivery, there is reduction in price/rental charges due to any reason whatsoever, the benefit (of such reduction) is to be passed on to CCL.
 - l. After the expiry of rental period, project implementer will be entitled to take back all the items except those items covered solely under OTC (one time charge).
 - m. After the expiry of rental period, CCL would have the option to extend the contract on mutually agreed terms & conditions. For such extension(s) intimation would be given by CCL 3 months in advance.
 - n. Future requirement within contract period, if any, will be charged as per the item rate defined in the conclusion of contract and would be applicable for the entire contract period i.e. 5 year.

11.0 Paying Authority: General Manager (F-HQ), CCL, Darbhanga House, Ranchi.

12.0 Inspection, Testing and Commissioning:

- (i) Inspection will be carried out by the designated Project coordinators of each group and final clearance would be given by the Chief Project coordinators located at CCL HQ.
- (ii) The Routers, Switches, Firewall/UTM, Wireless equipment and other networking items and different softwares etc. are to be installed in consultation with the designated Project Coordinators of each group. In the case of any difference of opinion/ambiguity, the final opinion/decision of the Chief Project Coordinator, CCL HQ shall prevail.
- (iii) Existing Servers and PCs will be connected to LAN & WAN and the same will be tested in the presence of the designated Chief Project Coordinator, CCL HQ by logging into the server & connecting from Server to the client (user) and vice versa
- (iv) The Turnkey Project for setting up WAN in CCL will be deemed to be commissioned after testing/executing the system software/Services satisfactorily and login to existing servers at HQ and also integration of these servers with existing Server at areas for one week. The necessary clearance certificates from WPC (Wireless Planning Commission if required) SACFA (Standing Advisory Committee on Radio Frequency Allocation if required) or any other statutory authority are required for the WAN Project Commissioning.

13.0 Tax clause:

1. Tax Deduction at Source (TDS): Income tax TDS shall be applicable under relevant provisions of Income Tax Act 1961 on payment of One Time Charge (OTC) as well as Monthly rent.
2. The Bill /Invoice raised for One Time Charge (OTC) as well as Monthly rent payable should contain all the information as required under Rule 4A of Service Tax Rule 1994. The invoice must be serially numbered and must contain the following information:-
 - The name, address and the registration number of service provider.
 - The name and address of the person receiving the taxable service (i.e. CCL)
 - Description, classification and value of taxable service provided or to be provided.
 - The service tax payable thereon.
3. The credit of Service Tax/CENVAT will be dealt as per existing laws & acts and as prevailing at the time of payment of such Service TAX.

14.0 Limitation of Liability:

- 14.1 Notwithstanding anything to the Contrary in the Agreement or any other document, the aggregate liability of the vendor for any damage shall be limited to the Contract Price.
- 14.2 In no event, neither party shall be liable to the other party for any indirect, special, punitive, consequential or incidental damages including without limitation, loss of revenue, profits, business, goodwill, anticipated savings or data or third party claims.
- 14.3 NO Director or official or employee of Owner or Vendor shall in any way be personally bound or liable for the acts or obligations of the Owner or Vendor under the Agreement or answerable for any default or omission in the observance or performance of the acts, matters or things which are herein contained.
- 14.4 The Vendor shall not be entitled to any increase on the scheduled rates or any other rights or claims whatsoever by reason of any representation, explanation, statement or alleged understanding, promise or guarantees given or to have been given to him by any person.

15.0 Transportations of goods from Consignee's office to individual Area Office/Regional Store/Central Unit locations are the responsibility of Project Implementer and he will have to bear the cost involved. However the respective E & T In-Charge of Area will coordinate for smooth execution / installation / Implementation/ Integration of the turnkey project of their areas.

15.1 Other active/passive hardwares not mentioned but required will be considered under scope of supply.

16.0 Maintenance and Regulation of Rentals:

- a. Project Implementer assures a minimum availability (Uptime) of 99% for each group of the said project. The uptime/downtime will be estimated separately for each group. In case of MPLS leased line connectivity, uptime/downtime will be estimated with CCL (HQ), Area Office, Central Units, Regional Stores & CCL Sales Office Kolkata(i.e. Tier I WAN).
- b. Turnkey Project downtime will be reckoned round the clock (24 X 7). Maximum Grace Period to attend the call will be 4 hours. For e.g. if the down time starts at 12.00 hours on a day and extends up to 11.00 hours the following working day, the downtime would be calculated as below:

First day: from 12.00 hrs to 12.00 hrs (i.e. 12.00 hrs).

Second day: from 12.00 hrs to 11.00 hrs (i.e. 11.00 hrs).

Total downtime: (23 – 4) hours = 19 hrs

- c. Turnkey Project Availability in % =

$$\frac{(\text{No of working days in the month} \times 24) - (\text{Downtime hours during the month})}{(\text{No of working days in the month} \times 24)} \times 100$$

- Note: 1. Availability shall be calculated on monthly basis.
2. Preventive maintenance is to be carried out on mutually agreed time.
3. No. of working days in the month will be calculated as per the no. of working days in a calendar month.

- d. In case availability of Turnkey Project for falls below 99%, the monthly rental charges payable by CCL will be reduced by ONE percent for each One percent reduction in availability, e.g. 4% reduction for 95% availability. However, no monthly rental will be payable for availability below 80%.

If the availability goes below 80% continuously for 3 months, an amount equal to monthly rental charge will be deducted as penalty in 4th month from Project Implementer's Performance Security.

If the availability still goes below 80% in 4th, 5th & 6th month, the deduction of an amount equal to monthly rental charge from Project Implementer's Performance Security as penalty will continue till 6th month.

Again if the availability further goes below 80% in 7th month, CCL is free to forfeit remaining Project Implementer's Performance Security and the rental contract will be terminated.

- e. Uptime will be for the entire components of Turnkey Project for each group, i.e. in case, any of the components of each group is out of order then the affected group will be considered to be under breakdown.
- f. No bonus or additional sums shall be payable if the availability is more than 99%.
- g. It shall be the responsibility of the Project Implementer to make necessary adjustments and / or repairs to keep the systems as per specification in good working condition.
- h. If the machine down time is anticipated to continue over to the next 5 working days, the defective System / Components shall be replaced by a suitable System / Components of the same or higher configuration.
- i. CCL shall be responsible for ensuring proper use of the system, its management and supervision by qualified trained personnel.
- j. The monthly rental quoted should be firm without escalation during the entire project life cycle, which is in no case less than 5 years. During the rental period, adjustments towards change in statutory taxes and duties like Service tax etc may be made by CCL subject to production of documentary evidence regarding such changes.
- k. Any equipment found broken, defective, mal-functioning, under-functioning will have to be repaired/replaced by the Project Implementer at no extra cost to CCL during the entire project life cycle.
- l. It shall be the responsibility of the project implementer to make necessary adjustments and/or repairs/maintenance to keep the Turnkey Project for setting up WAN in CCL as per specification / requirement in proper and satisfactory working condition.
- m. The Project Implementer & CCL will decide the periodicity of maintenance and it should not be less than once in a month.
- n. The Project Implementer should assure that all breakdown calls be attended at the earliest but not more than 12 hours and will endeavor to keep all the components of Turnkey Project for setting up WAN in CCL in fully operational condition.
- o. Project Implementer's responsibility for maintenance shall be the maintenance / replacement of each and every spares / components including Battery in case of UPS, for entire rental period (i.e. 5 years or 60 months).

17.0. Consignee Particulars:

For CCL (HQ), Central Units & CCL Sales Office Kolkata group (Group A):	For NK & Piparwar Area group (Group B):
The GM (E&T), Central Coalfields Ltd, Darbhanga House, Ranchi-834 001	CMM (Stores), NK Regional Store, Dakra
For Argada, Barkasayal, CRS/CS, Rajrappa, Kuju & Hazaribagh Area group (Group D):	For Dhor, Kathara and B & K Area group (Group C):
CMM (Stores), Barkakana Central Store, Barkakana	CMM (Stores), B & K Regional Store, Jarangdih

18.0 Training:

Supplier will provide the following trainings:

- a. The tenderer shall arrange for training to CCL's personnel at CCL's premises. The training shall be for 2 working days and include training materials sufficient for 10 participants each in 3 batches. The training shall cover all aspects of proposed networking equipments, Network management, Network administration and troubleshooting. The details shall be discussed mutually and agreed upon.
- b. Training on advance Network maintenance and administration shall be arranged by the tenderer at Tenderer's premises/tenderer's designated place or at the respective OEM designated place (In India or in abroad) for 4-personnel of CCL for 5 working days incase at the tenderer premises/tenderer's designated place or 2 days at each of the OEM designated place. All the travel, lodging & boarding expenses for the training at Tenderer's premises/tenderer's designated place or at the respective OEM designated place (In India or in abroad) will be borne by the tenderer/ OEM.

19.0 Price Certificate:

Please certify on the body of each and every bill that the prices charged are same as applicable to all other Govt. Dept./Undertakings including DGS&D.

20.0 Order Acceptance:

Two copies of the order are being enclosed. One copy of the order may please be returned duly stamped and signed within 07 days from the date of supply order as a token of acknowledgement and acceptance of the contract

All terms & conditions are as per NIT since the same has been accepted by the firm and as per Annexure 'V' enclosed.

- Enclosure:**
- (i) Annexure-A : Detail technical specification and Make / Model of items / equipments accepted by CCL to be used in CCL WAN is enclosed as Annexure – “A” duly signed by GM(System) & GM(E&T).
 - (ii) Annexure-1 & 2 : Location Details/Coordinates
 - (iii) Performance Bank Guarantee FORMAT
 - (iv) Terms & conditions - Annexure 'V'

Yours faithfully,
for & on behalf of CENTRAL COALFIELDS LIMITED

(A.K.Dutta)
CHIEF MANAGER (MM)(P-II)

(A.K.Thakur)
CHIEF MANAGER (MM)(P-III)

Copy forwarded to :-

- 1.The General Manager (Systems)/GM(E&T): To communicate the Names/Posts/designations of the Project coordinators and Chief Project coordinators to M/s. TCIL within 30 days from the date of issue of this contract.
- 2.GM(S&IC),CCL HQ, Ranchi.
3. CTS to CMD, CCL HQ, Ranchi.
4. TS to D(T)(O)/D(P)/D(F), CCL.HQ, Ranchi.
5. The GM(Finance.), CCL HQ, Ranchi.
- 6 The CMM (Stores), Central Stores, Barkakana / NK Regional Store, Dakra/ B & K Regional Store, Jarangdih,
7. The Area Finance Manager, CRS/CS, Barkakana / NK, Dakra/ B & K, Kargali
8. MIS Cell.
9. The ES to GM (MM), CCL, Ranchi.
- 10.The independent external monitors nominated for implementation of the Integrity pact for this contract are:
 - 1.Sri C.S. Samal, IAS (Retd.), CA-193, Sector-1, Bidhan Nagar,Kolkata-700064.
 - 2.Sri N.R.Banerjee, IAS (Retd.), Flat No.121, Shriniketan,CGHS Plot No.1, Sector 7, Dwarka,New Delhi-110075
11. Indent Registration No : NIL

This is issued with the approval of CCL(Board) in the 393rd (No.1 of 2013) meeting held at Ranchi On 2/2/2013 and fund certified by GM (Fin), CCL for Rs. 9.00 Crores under the head “WAN” against Revenue Budget 2012-13 vide No.CP/CCL/1052/12-13 dated 06/02/2013.

(A.K.Dutta)
CHIEF MANAGER (MM)(P-II)

(A.K.Thakur)
CHIEF MANAGER (MM)(P-III)

Detailed Technical Specifications

(with make & model)

ACTIVE DEVICES:

CORE SWITCH (HQ) : Juniper EX 8208

A. Architecture:

1. Chassis based Architecture with minimum 4 payload slot.
2. Layer 3 Core Switch
3. Switching bandwidth should be 350 Gbps or higher
4. Forwarding rate of 64 byte packet required atleast 250 Mpps
5. Multiple VLAN for better segmentation for network traffic (support for 2000 active VLAN)

B. Standard supported:

1. Redundant CPU, power supply and fan from day 1
 - a. IEEE 802.1 p prioritization with min. eight priority queue
 - b. IEEE 802.3 x flow control
 - c. IEEE 802.3 ad link aggregation
 - d. Q in Q tunneling

C. Management and Interfaces:

1. Web based management, Telnet / SN MPV1/V2/V3/Console/R MON
2. Rack Mountable with rack mounting hardware
3. 24 x 10/100/1000 Base interfaces
4. 24 X 1000 Base X (to be quoted with appropriate type and no. of transceivers)
5. Should support 10 G interface

D. Routing and Security:

1. Static, RIP-1 and RIP-2, OSPF, BGP4 from Day 1
2. Should support 802.1 x user authentication, web based authentication and MAC based authentication
3. Should support for IPV6
4. Should support SSHv2 and SNMPv3 allowing secure access to switch
5. MAC address table size of 32000 entries or higher
6. Standard IEEE Q.S features and Converged network having data, voice and video application running on same network.

E. Compatibility & Transition

1. Compatible patch chord / panels with fibre optic termination
2. Smooth transition from old core switches to new one with all network configuration & management.

INTERNET ROUTER (HQ): Juniper J 6350

A. Architecture

1. Architecture should be single chassis based and modular so that there is flexibility to use the appropriate choice of Interfaces as and when required.
2. Should support atleast 4 interface slot to accommodate the current requirement as well as for future expansion
3. Capability of facilitating data, voice and video services Router should be equipped with complete security suite (IPSEC VPN/Network Admission Control) with hardware Encryption Card.
4. Should have adequate RAM and FLASH memory (minimum 256 MB RAM and 128 MB Flash Memory) for all features of the Router to function without any performance degradation.
5. Router throughput should be 300 Kpps or more with 64 bytes packet size.

B. Interface Requirement:

1. 2 x 10/100/1000 Base T interface (layer 3 Ethernet)
2. 4 x 10/100 interfaces (layer 3 Ethernet)

C. Protocols:

1. Should support Routing protocols like RIP Ver 1 & 2, OSPF Ver 2(RFC 2328), BGP4 (RFC 1771) IS (RFC 1195) from day 1
2. Multi cast Routing support through PIM
3. Should have full IPv6 features from day 1
4. Should have standard IEEE layer 3 protocols IPv6 traffic
5. Should have MPLS features with software / license upgrade

D. Performance:

1. Should support high performance traffic forwarding minimum 300 Kpps with concurrent features
2. Should support variety of interfaces like V.35 Sync serial (2 Mbps), EI, ISDN-BRI, FXO/FXS for remote office aggregation
3. Should hardware based encryption / Compression with IPSE throughput.

E. Security:

1. Access lists based on Network address, Mask, Protocol type and socket Type, Access list violation logging and Accounting
2. Support for MD-5 route Authentication for RIP, OSPF, IS-IS and BGP
3. Support for SNMPv3 authentication, SSHv2
4. VPN support, VPN Encryption
5. IEEE 802.1x support for MAC address authentication

F. QoS Features:

1. A class based scheduling/queuing mechanism
2. Resource Reservation protocol, Internet group management protocol, Traffic conditioning, congestion management
3. Low latency queuing, Policy based routing

G. Management:

1. Should support web based management, CLI, Telnet and SNMPv3, secure shell for secure connectivity, standard
2. Router management and access feature

H. High Availability:

1. Power Redundancy
2. Error checking & correction of memory
3. USB Flash Memory
4. Temperature monitoring fans

CORE ROUTER (HQ): Juniper M 7i

A. Architecture:

1. The architecture should be based on high performance CPU with Convergence of routing, switching, voice and security
2. Router should be a single box configuration and modular so that required interfaces can be used as per requirement
3. Should be single chassis configuration. Each WAN interface slot should accommodate a combination of Sync Serial 2 MB, EI, EIG703, ISDN BRI/PRI, E3 and STM-I and other data WAN Cards
4. Capability of providing data, voice and video services. Router should be equipped with complete security suite (IPSEG VPN) with hardware Encryption Card
5. Should have adequate RAM and FIASH memory (minimum 256 MB RAM and 128 MB Flash Memory)for all features of the router to function without any performance degradation
6. Router shall support upto 150 Mbps of Hardware based encryption through put and support minimum 1000 tunnel from day 1.

B. Performance / Forwarding Rate: Min 1 Mpps

C. Interface Requirement:

1. 2 x 10/100/1000 Base T interface (Layer 3 Ethernet)
2. 4 x 10/100 Base T interface (Layer 3 Ethernet)

D. Software:

1. The Router shall support following WAN protocols PPP as per RFC 1661, Multilink PPP, ISDN, Frame Relay
2. Router shall support following IP Routing protocols RIP version 1 & 2, OSPFv2, BGP4, IS-IS, Multicast Routing support through PIM from day 1
3. Support for NAT as per RFC 1631, Port address Translation support
4. IEEE 802.IQ based VLAN tagging
5. Should have RIPng and OSPFv3 for IPv6 from day 1

E. Protocols:

1. Router should be MPLS ready with (i) MPLS Diff-Serv Aware Traffic Engineering (ii) MPLS level distribution (iii)MPLS Egress Net flow Accounting (iv) MPLS QOS (Diff-Serv Tunnel mode Support)
2. Router should be IPv6 ready from day I
3. Secure services management - To support SSHv2 and SNMPv3 protocols to encrypt the management session

F. Security:

1. Access list based on Network address, Mask protocol type and socket type
2. MD5 Route Authentication as RFC 1321, controlled SNMP Access SNMP V-2 with MD 5 authentication
3. VPN support for IP Security (IPSec), AES, 3DES, DES and MPLS
4. VPN Encryption – Equipped for hardware accelerated Encryption with more than 150 Mbps performance
5. Router shall support Network Management through SNMP, RMON support, MIBI&II, software upgrade through FTP or TFTP, TELNET Client and Server. Router should have integrated web interface (GUI)
- 6.

G. High Availability:

1. Power Redundancy – Equipped with internal redundant Power supply
2. Error checking & correction memory
3. USB Flash Memory
4. Temperature monitoring fuse

H. QoS and Multimedia:

1. Aclans based scheduling / queuing mechanism
2. Congestion management
3. RSVP – Resource Reservation Protocol
4. Should support policy based routing
5. Router should support multi-services Voice/Fax/Data integration.

ROUTER TYPE-II (AOs , Stores & POs) Juniper J 2320

A. Architecture:

1. Should be chassis based and modular architecture for scalability and should be single box configuration
2. Should have support for hardware based IP SEC VPN
3. Should have adequate RAM and FIASH memory (minimum 256 MB RAM and 128 MB Flash Memory) for all features of Router to function without any performance degradation
4. Should support at least 1 Interface slot to accommodate the current requirement (1 x 10/100 Base T Ethernet Interfaces + 1 x 2Mbps V.35 Interface) as well as the future expansion
5. Router should support AC/DC power supply
6. Router throughput should be 100 Kpps with 64 bite packet size

B. Interface Requirement:

1. 3 x 10/100 Base T interface (layer 3 Ethernet)
2. 1 x 2Mbps V.35 Interface
3. 1 free slot

C. Performance:

1. Should support high performance traffic forwarding (forwarding rate minimum 100 Kpps) with concurrent features like Security, Voice enabled
2. Should support variety of interfaces like V.35 Sync serial (2 Mbps) Async serial, E1, G.703, ISDN-BRI, FXO/FXS for remote office aggregation
3. Should hardware based encryption / compression with IPSEC through put of 30 Mbps
4. Support for high density Ethernet Switch Cards (4 port/8 port) for remote offices to avoid additional switches
5. Should support 3 G module for connectivity and also should support external popular 3 G modem via USB port.

D. High Availability:

1. Should support redundant connection to LAN
2. Should support Non-stop forwarding for fast re-convergence of routing protocols
3. Should support boot option like booting from TFTP Server Network node
4. Should support link aggregation using LACP as per IEEE 802.3 ad
5. Should support VRRP or equivalent.

E. Protocols:

1. Should support routing protocols like RIP Ver.1 and 2, OSPF Ver.2, BGP4, IS-IS from Day 1
2. Multicast routing protocols support IG MPv1, v2 PIM-SM and PIM – DM
3. Should support IPv6 features like DHCPv6, IPv6 QoS, IPv6 Multicast support, Bi-directional PIM Multicast VPN, PIM SSM, IPv6 PIMv2 Spares mode, IPv6 PIMv2 source specific multicast
4. Should have RIPng and OSPFv3 for IPv6
5. Should have MPLS features MPLS VPN, series (NAT, FW,IPSec) Diff Serv Tunnel mode, Diff Serv-Aware (TE, Inter AS VPNs)
6. Signalling – RSVP, Full IPv6 features

F. QoS Services:

1. Policy based routing, IP precedence, DSCP, MPLS exp bits
2. Congestion Management
3. Traffic Conditioning

G. Security Features:

1. Support for GRE Tunneling, NAT, L2TP Tunneling
2. Support for SNMPv3, authentication, SSHv2
3. IEEE 802.1 x support for MAC address authentication

H. Management:

1. Shall have support for Web based management, CLI, Telnet and SNMPv3
2. Shall support secure shell for secure connectivity

3. Shall support out of band management through console and external modem for remote management.

ACCESS SWITCH (AOs, POs, Stores & Weighbridges): Juniper EX 2200

A. Architecture:

1. The switch should have 24 x 10/100/1000 Base T Interfaces with 4 x 1000 Base X Interfaces
2. Should have at least 48 Gbps switching fabric
3. MAC address table of 8000 entries minimum
4. The switch should be 19" Rack Mountable

B. High Availability:

1. Should support IEEE 802.3 ad link Aggregation Control Protocol
2. Should support IEEE 802.1s Multiple spanning Tree Protocol
3. Should support redundant Power Supply

C. Layer 2 features:

1. Should support IEEE 802.1Q and 256 VLAN simultaneously
2. Should support GARP VLAN Registration Protocol allowing automatic leaving and dynamic assignment of VLANs
3. Should support jumbo frames on Gigabit ports
4. Should support static IP routing
5. Should support IPV6 (RFC & - 1981,2373, 2460, 2462 and 2463) and MLD Snooping VI (IPV4) and (IPV6)

D. Security:

1. Should support port security and MAC address lock out
2. Should support Access Control lists (ACLs) to provide IP layer 3 filtering based on source/destination IP address/subnet and source/destination TCP/UDP port
3. VLAN based ACL (VACL)
4. Port based ACL (PACL)

E. QoS:

1. Layer 2 QoS
2. Hardware queues per port :8

F. Manageability:

1. Should support sFlow /netFlow for traffic monitoring
2. Should support mirroring
3. Should support command authorization leveraging RADIUS to link a custom list of CLI commands to individual network administrator's Login
4. Should support Multiple configuration files
5. Should support SNMPv1, v2 & v3

VSAT: Gilat SkyEdge

Sl. No.	Description	Specifications
	Indoor Unit (IDU)	
1	In-Route	Min.192 Kbps expandable to maximum of 1 Mbps without any modification
2	Modulation	QPSK/OQPSK with Turbo/GMSK or any other modulation without sacrificing performance
3	In Route Access scheme	MFTDMA
4	Bit Error rate	Better than 1×10^{-7}
5	OUTROUTE	
6	Outroute Data Rate	Upto 40 Mbps
7	Outroute Format	DVB-S/S2 (with LDPC coding)/MPEG 2 transport Format stream (ISO/IEC 13818)/OFDM (without any performance degrade)
8	Modulation	8PSK
9	Bit Rate Error(BER)	Better than 1×10^{-10}
10	Physical Interface	
11	No.of Ethernet ports	One
12	Port Speed	10 /100 Mbps
13	Data Transport protocols acceleration	TCP/IP and UDP, TCP
14	Other Essential Features	
15	The UDI shall support	Packet Filtering, TCP spoofing
16		QoS on both inbound and outbound, GRE tunneling, IPSec for Data Security, VRRP mode
17	Access Scheme on Inbound	Guaranteed Bandwidth, BOD, CIR, Slotted Aloha, Mix of these
	Out Door Unit (ODU)	
1	BUC Power Output	Minimum 2.0 Watts Power or above

2	Transmit (Output) frequency	13.75 GHz to 14.5 GHz
3	Receive (Input) frequency	L Band
4	DC power requirement	From IDU
	LNB	
1	Receive Frequency	10.95 to 12.75 GHz
Sl. No	Description	Specification
2	Output Frequency	L Band
3	DC power requirement	From IDU
	Antenna	
1	Antenna Size (Diameter)	Minimum 1.2 meters. To be deployed as per the actual site requirement.
2	Mount Type	Non-Penetrating mount, Elevation over Azimuth
3	Type of Feed	Offset feed
4	Operating Frequency	13.75 to 14.5 GHz
5	Tx Gain (Mid Band)	43.0dBi
6	Rx Gain (Mid Band)	41.5 dBi
7	Antenna Adjustment Range	In Azimuth - 0 to 90 degree Continuous
8		In Elevation – 5 to 90 degree Continuous
9	Wind condition	a) Operational – 80 Kmph
10		b) Survival – 200 Kmph
11	Reflector Material	Made of SMC material or any other equivalent material
12	VSWR	1.3:1 Max
13	Cross Polarization	-30 dB Max (With 1 dB Contour)
14	Environmental specification of ODU	
15	Temperature Range	-5 to + 50 C (operating)

16		-20 to + 70 C (storage)
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Radio Equipment : Wiborne CAP-5015D,CAP-5024N,CAP-520N & WAP-520N

Sl. No.	Specification
1	High Performance Radios that provides carrier class performance
2	The radio will be in band of 5.8 GHz (delicensed)
3	Greater flexibility and huge cost savings to the user
4	OFDM radio capable of delivering bandwidth up to 50 Mbps and working to a very long distance of more than 40 Km
6	Compliant to IEEE802.1 1a/b/g/n standards
7	MMDS (Microwave Multipoint distribution system Architecture
8	Configurable in Router and Bridge modes
9	Support for various traffic - Voice, Video, Data (VPN)
10	SNMP based local and remote management

Channel Bandwidth – 10/20/40 MHz

Physical Interfaces - Ethernet Interfaces

Diagonstic / Management Port

IP Networking features like bridging, 802.1 Q VLAN support

Latency should be <2ms

Network Management System (NMS): CA Infrastructural Management

Sl.No.	Technical Specification
	NMS features

1.	NMS should have sufficient licence to manage all proposed Active networking devices with 25% scalability support
2	The operator would need to provide for NMS/ any other software in order to monitor the different service levels.
3	NMS should offer intelligent automatic discovery of network device to create topology views of the network, including a detailed inventory of the network
4	NMS should provide network response and availability information for LAN network
6	All the devices and the associated links should be continuously monitored by the NMS and the alarms/alerts will be provided in case of failure of any devices/link
7	Networking monitoring shall be based on SNMP, which is basically server-client architecture.
8	All network components shall be configured to alert the centralized NMS server via SNMP incase of any event, so as to reflect real status of all network components and links across LAN
9	Additionally whenever there is any network component failure, the NMS should log all the faults in the event window with a timestamp, event description or event details, component affected, etc.
10	The NMS should collect raw data and store the same in a database repository. The database should be integral part of EMS/NMS and not separate entity
11	The offered solution should be able to manage all network devices (Wired, Wireless, Security etc) in the network and should be scalable
12	Supplied NMS should monitor and discover all the networking device and give profile based access to NMS console as per the requirement
13	The reporting engine should generate the reports based on the data collected, and help user in accessing these graphical reports using standard Web browser or any standard browser etc such as Internet Explorer or Mozilla
14	The NMS should be able to create his / or her customized reports based, such as on basis of certain objects or for any time period of the choice
15	Should be able to view Reports in a number of formats, including .pdf and.xls, and can be sent automatically via email, or scheduled to run on a set schedule
16	The system must be capable of automatically discovering manageable elements connected to the network and maping the connectivity between elements, including port-level connectivity
17	The solution should have the capability to discover Layer2 & Layer3 Devices & connectivity
18	The system must provide visualization tools to display network topology and device to device connectivity. The system must also be able to document since the last update, connectivity changes that were discovered
19	The state of the network components on the topology map shall be represented by a unique color scheme, such as Red to denote device 'Critical' or unavailable and

	Green to indicate that the device is working fine.
20	The system must provide a real time business services Dash board that will allow the viewing of the current health of network elements and servers (that are procured by the operator). This shall be inclusive of real time graphical reports
21	The NMS should be able to detect the number of active and faulty links and other devices on the network at any time
22	NMS should be able to accept traps and alarms from the devices & display appropriate message on NMS console
23	NMS should allow management support for new devices added to the network
24	Real-time link Status, performance monitoring, configuration management and reporting
25	Must include ability to manage QoS
26	Must include ability to create, manage and re-configure VLANs
27	The NMS should have the capability to notify status change, an event, or a problem on a server or network equipment by sending a message as an e-mail or triggers the message is a problem, NMS shall take appropriate actions to correct the problem.
28	The NMS can forward or help in generating Trouble tickets in 'Help Desk' system automatically
29	The NMS shall have suitable mechanism to ensure the integrity of the data stored
30	Should enable the network administrator to perform centralized management on configuration files and software files, perform backup, restoration and batch update of configuration files, and software / firmware backups and upgrades
31	Should store and track different versions of device configuration and can compare and determine changes of configuration files
32	Should have effective policy based control of network security and quality of service (QoS) across an organization's network infrastructure.

Firewall / UTM for CCL HQ: FortiGate FG-600C

Sl.No.	Specifications
1	Appliance based Firewall
2	Should have minimum 8 nos. of 10/100/1000 Mbps Ethernet interfaces

3	Operating system should be based on real time, secure, embedded operating system
4	Should support atleast 5,00,000 concurrent sessions
5	Should be a per device license and not user/IP based license
6	Number of concurrent IP Sec tunnels supported by the device should be minimum 1000 VPN tunnels
7	Should have support inbuilt for IPSEC VPNs should support DES, 3 DES and AES (128, 192, 256)
8	Should support Internal DHCP server and DHCP relay over VPN
10	Should support management of the box through HTTPS as well as SSH along with console access.
11	Should support SNMP , v2c and v3
12	Should support dynamic NAT as well as one-to-one NAT
13	Should provide minimum 8 Gbps firewall throughput and 1.5 Gbps IPSEC VPN throughput and also 3 Gbps IPS throughput
14	The firewall should be able to support high availability and dynamic load balancing for data going through the firewall (active-active). There should be no extra license cost for HA.
15	Should support the following VPN clients, native IPsec, L2TP/IPsec,GRE
16	Should support VRRP
17	Should support dual appliance active-active/ active-standby pairing and automatic configuration synchronization between the two appliances
18	Should support Dual WAN links in active-active load-balancing pair/active-standby fail-over pair
19	Should support authentication through RADIUS and /or TACACS+server

20	Should provide the option to configure traffic shaping on a per policy basis for specific application/specific networks and should be able to define Committed access rates(CAR)
21	The appliance should support VLAN tagging (IEEE802.1q) and should support vlans on all interfaces and minimum of 1024 VLAN should be supported
22	Should support RIPv1, RIPv2, RIPv6, OSPFv2, OSPFv3, BGP from Day 1
23	Should support IP multicast routing PIM-DM/SM, IG MPv1,2 and 3
24	Should support IPv6, TCPv6, UDPv6, Ping, Telenet6, NAT-PT, IPv6 Tunnel, ICM Pv6
25	Should be able to log denied traffic details
26	Should provide gateway antivirus functionality with capability to scan HTTP, FTP, SMTP, POP3 protocols. The Antivirus throughput should be minimum 1 Gbps
27	Application layer gateway support for FTP, SMTP, HTTP, RTSP, H323 and SIP
28	Should provide User-based Web HTTP URL filtering via keyword, wildcard and regular matching
29	Should provide Custom SMTP mail subject/content/attachment filtering via keyword and wildcard matching
30	Should support Java/Active-X detection and blocking
31	Should provide free of cost signatures for 5 years for URL filtering, AntiSpyware, IPS

VSAT-HUB-ROUTER (Optional): Not Required

Sl. No.	Specifications
A.	Architecture
1.	Should be chassis based & modular architecture for scalability and should be a single box configuration for ease of management

2.	Should support at least 1 interface slot to accommodate the current requirement as well as for the future expansion
3.	Should have support for hardware based IPSEC VPN Encryption card
4.	Should have minimum of 256 MB of RAM and 128 MB of Flash Memory
5.	Router should support AC/DC power supply
B.	Interface Requirements
1.	3 x 10/100 Base T interface
2.	1 Free slot
3.	1 x 2 Mbps V.35 interfaces
C.	Performance
1.	Should support high performance traffic forwarding with concurrent features like Security, Voice enabled
2.	Should support variety of interfaces like V.35 Sync Serial (2 Mbps), Asy Serial, E1 G.703, Ch-E1 for remote office aggregation
3.	Should equipped with performance enhancement through hardware base encryption / compression module with IPSEC throughput of 150-200 mbps
4.	Should support at least 300 Kbps forwarding performance
6.	Should have capabilities to support high volume internal/external
D	High Availability
1.	Should be equipped with redundant power supply and connection to LA
2.	Should support Non-Stop forwarding for fast re-convergence of routing protocols
3.	Should support boot options like booting from TFTP server, Network no.
4.	Should support multiple storage of multiple images and configurations
5.	Should support link aggregation using LACP as per IEEE 802.3ad
6.	Should support VRRP or equivalent
E.	Protocol Support
1.	Should support Routing protocols like RIP ver.1 & 2, OSPF v3r.2, BGP4 IS-IS
2.	Multicast routing protocols support:IGMPv1, v2(RFC 2236), PIM-SM(RFC2362) and PIM-DM, M-BGP
3.	Should have IPv6 features: DHCPv6, IPV6 QoS, IPV6 Multicast support, Bi-directional PIM, Multicast VPN, PIM SSM (Source Specific Multicast), IPV6 PIM v2 Spares Mode, IPV6 PIMv2 Source-Specific Multicast
4	Should have RIPng and OSPFv3 for IPv6
5	Should have MPLS Features: MPLS VPN, Services (NAT, FW, IPsec... DiffServ Tunnel Modes, MPLS TE, DiffServ-Aware TE, Inter-AS VPNs).
7	Support for Circuit Emulation over IP to carry PBX traffic or legacy protocols in their native form.
F	QoS Features
1	Classification and Marking : Policy based routing, IP Prfedecence, DSCP MPLS exp bits
2	Congestion Management: WRED, Priority queuing, Class based weight fair queuing
3	Traffic Conditioning: Committed Access Rate/Rate limiting
4	Signalling : RSVP
5	Link efficiency mechanisms: cRTP, LFI, MLPPP
6	Per VLAN QoS. Time Based Shaping and Policing for QoS
7	Shall support Classifiers for Intelligent Application Identification
G.	Security Features
1	Support for GRE Tunneling, NAT, L2TP tunneling
2	Firewall, IPS and support for SSL VPN(internal / external). Support for customized IPS signatures
3	Support for tunnel less VPNs for very high scalability with support for routing protocols and multicast traffic
4	Support for MD-5 route authentication for RIP, OSPF, IS-IS and BGP
5	Shall support multi-level of access

6	Support for SNMPv3 authentication, SSHv2
7	AAA support using Radius and/or TACACS
8	Support for PAP and CHAP authentication for P-to-P links
9	Support for DoS prevention through TCP intercept & DDoS protection
10	Multiple privilege level authentications for console and telnet access through Local database or through an external AAA Server
11	Time based & Dynamic ACLs for controlled forwarding based on time and day for offices
12	IEEE 802.1x support for MAC address authentication
H	Multi-media support:
1	Should support bandwidth optimization features internally / externally like voice Activity Detection, Silence Suppression, Echo cancellation
I	Management:
1	Shall have support for Web based management, CLI, Telnet and SNMP
2	Shall support secure Shell for secure connectivity
3	Shall support out of band management through Console and external modem for remote management
J	Standards and Certifications
1	UL/IEC/EN 60950-1

Fiber Optic Components : Molex

Fiber Cable – The fiber Cable should be Single/multimode.It will be 4/6 Core with Steel Tape Armored, Direct burial type, Core dia – 50/125 micron should support 550 Mtrs for full duplex 1000 Mbps Bandwidth (1000SX) **(AFOUN006OM2)**

Patch Panels – All the Patch Panels should be filled up with required no. of Couplers (as detailed in the Bill of Material) and the Panels should be ready for Rack mounting. The Patch Panel Material and Couplers must be as per ISO/IEC standard and must support the respective bandwidth as mentioned above. **(17.C102G + 3 X 106167-0110 + AFR-00174)**

Patch Cords– All the Patch Cords should be Multimode and with Proper connectors at one end which is suitable with the Switch Fiber Ports. SC type connectors. Patch Cords must be Factory Crimped and Tested as per Standards mentioned above. **(91.99.822.00300 / 91.9L.872.00300)**

Connectors- All the Connectors should be Multimode must be complied with the ISO / IEC. All connectors must be SC type. **(91.30.531.00B00)**

UTP Cable (Cat 6) (Each box contains 305 Mtrs of cable): Molex CAA-00076

- Should comply TIA/EIA 568-B Category 6 cable specifications
- Should have characteristic impedance of 100 +/- 15 ohms with a resistance imbalance of 5% max.
- Should have 4 twisted pairs separated by internal polymer spine.
- Should have conductor diameter of 0.56 +/- 0.005 mm (23 AWG)
- Should have an insulation thickness of 0.22 +/- 0.03 mm.
- Should have outer diameter of 6.0 +/- 0.4 mm.
- Should be able to operate at a temperature of 75 °C (max).

UTP Jack/Patch Panel (Cat 6): Molex PID-00141

- Should comply with above Cat 6 UTP Cable.
- Should be 19", rack-mountable.
- Should support operating life of minimum 200 re terminations.
- Should have front & back port identification labels and mounting hardware.

Information Outlet (Single/Quadruple) with Surface Mount Box (Cat 6): Molex KSJ-00018-02 + WSY-00012-02 +BLACK BOX / 4 X KSJ-00018-02 + WSY-00014-02 + BLACK BOX

- Should comply ISO 11801 E Cat 6 specifications.
- Should support operating life of minimum 200 terminations.
- Should support insulation resistance > 100 Megaohms.
- Should support propagation delay < 2.5 ns (from 1 MHz to 250 MHz)

UTP Patch Cord (Cat 6): Molex PCD-02001-OE / PCD-02003-OE

- Should match Cat 6 level performance and support backward compatibility with existing Cat5/Cat5E systems.
- Should have unshielded 4 pair stranded cable.
- Same patch cord (same specifications) should be provided in 2 lengths (1 Mtr /3 Ft. & 2 Mtrs. /7 Ft.)

Wall / Floor Mount Network Enclosure (Rack): VALRACK 101-9-6-5(9U)/202-24-6-8(24U)

- Should have lockable, front glass door, Rear MS Steel door (with 24 U Rack only).

- Should have a min. depth of 500 mm and 19" width (for 9 U Rack) (Wall Mount) & a minimum depth of 800 mm & width of 600 mm (for 24U Rack)(Floor Mount)
- Should include 19" width cable manager of height 1U (1 No. Cable Manager
- Should include 1 no. AC Mains channel (6x5A) (horizontal) of 1U height (9 U Rack) and vertical AC Mains channel (8x5A) (for 24 U Rack)
- Should include 1 no. Fan Tray with 2 nos.230V AC 90 CFM Fan for 24 U Rack.
- Should include mounting hardware (1 Packet each for 9U Racks) and (2 Packets for 24U Rack) (Each packet contains min. 20 nos. screws).
- 24 U Rack should be supplied with Castor and Brake.

1 KVA online UPS with 2 hour backup: Uniline GLX/Maxi 1000VA / EATON E series DX (EDX 1000HXL)

1.VA Rating : 1 K VA

- (a) Inverter technology : IGBT BASED PWM TECHNOLOGY.
- (b) Noise level : Less than 45 dB.
- (c) Operating Temperature : 0° to 40° C
- (d) Humidity : 10% - 90% Non condensing
- (e) Harmonic Distortion : Less than < 3% for linear load & Less than < 5% for non linear load.
- (f) Output Waveform : Sinusoidal
- (g) Cold Start Feature : Should be provided
- (h) Generator compatibility : Should be provided even with genset having distorted wave form & frequency fluctuations (more than 45 Hz)
- (i) Default Software : UNIX Bundled;
Optional S/w: Windows XP
- (j) RS 232 Port (SNMP): 1 No.
- (k) Product compliance to CE, ISO 9000 and IEC 62040-1

2. UPS INPUT :

- (a) Input Voltage : 160V AC to 280V AC.
- (b) Input Frequency Range : 50 Hz \pm 10 %
- (c) Input over voltage protection : Should be provided
- (d) Input under voltage protection : Should be provided

3. UPS OUTPUT :

- (a) Output Voltage : 230 V AC single phase
- (b) Regulation : 230V AC \pm 2%
- (c) Output frequency : 50.0Hz \pm 0.2Hz DSP controlled
- (d) Transient response : \pm 10% with 100% load of P.F 0.8%
- (e) Load Power Factor : 0.7 Lagging
- (f) Short circuit protection : should be provided.
- (g) Output over voltage protection : should be provided.
- (h) Output under voltage protection : should be provided.
- (i) Efficiency : Better than 85%.
- (j) Battery low : UPS should shut down.
- (k) Over load : UPS should shut down .
- (l) Manual by pass switch : should be provided.
- (m) Indicators :
 - I) Mains On
 - II) Battery Charging
 - III) Battery Low
 - IV) Invertor On
 - V) Output Low & High Voltage
 - VI) UPS overload
 - VII) UPS on by pass

(n) Digital Metering :

- a) AC Input/Output Voltage
- b) AC Input/Output Current
- c) Battery Charge/Discharge Current or Battery Capacity
- d) Battery Charging Voltage
- e) Frequency Input/Output

(o) Alarms (Audible) : Mains failure

Battery low

Overload

(p) Sealed Maintenance Free (SMF) Battery :

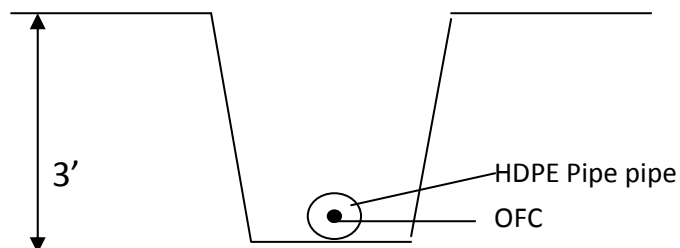
- I) 12 V - 42 AH X 10 Nos. (5040 VAH) or equivalent / higher VAH for 1 KVA
- II) Placed on Battery rack made of Mild Steel.

52" LCD TV: Philips/Samsung/Sharp BDL5231V/LN52B630/PN-E521

Heavy Duty Laser Printer: HP/Brother CP4020/HL-2130

ANNEXURE-D

OPTICAL FIBRE TRENCH LAYOUT

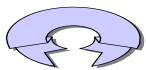


Note:

Wherever road crossing, concrete cutting is there, the vendor has to repair the road / concrete with cement, sand & chip stones with proper levelling to bring it proper condition. The trenching is to be done as per the sketch in Annexure - D.

CONSTRUCTION / INSTALLATION LAYOUT & SPECIFICATION OF SPECIAL TYPE OF EXCHANGE EARTHING

1. The basic part of This special type of earthing system is NCE (Negatively charged electron) Processor which is used in Lightning Cancellation System. Mainly NCE Processor is made of selected combination of multi-metals and it is a very good to get approximately zero error connectivity with the local soil. NCE Processor used in this special type of earthing to maintain the earth resistance value within the limit with a tolerance of $\pm 10\%$ throughout the year and in all type of soils.



In this earthing system NCE processors are used as main earthing ELECTRODES and its connectivity develops 3 TIMES FASTER ACTION OF SURGE PROTECTIVE SYSTEMS & UNITS COMPARED TO OTHER EARTHINGS.

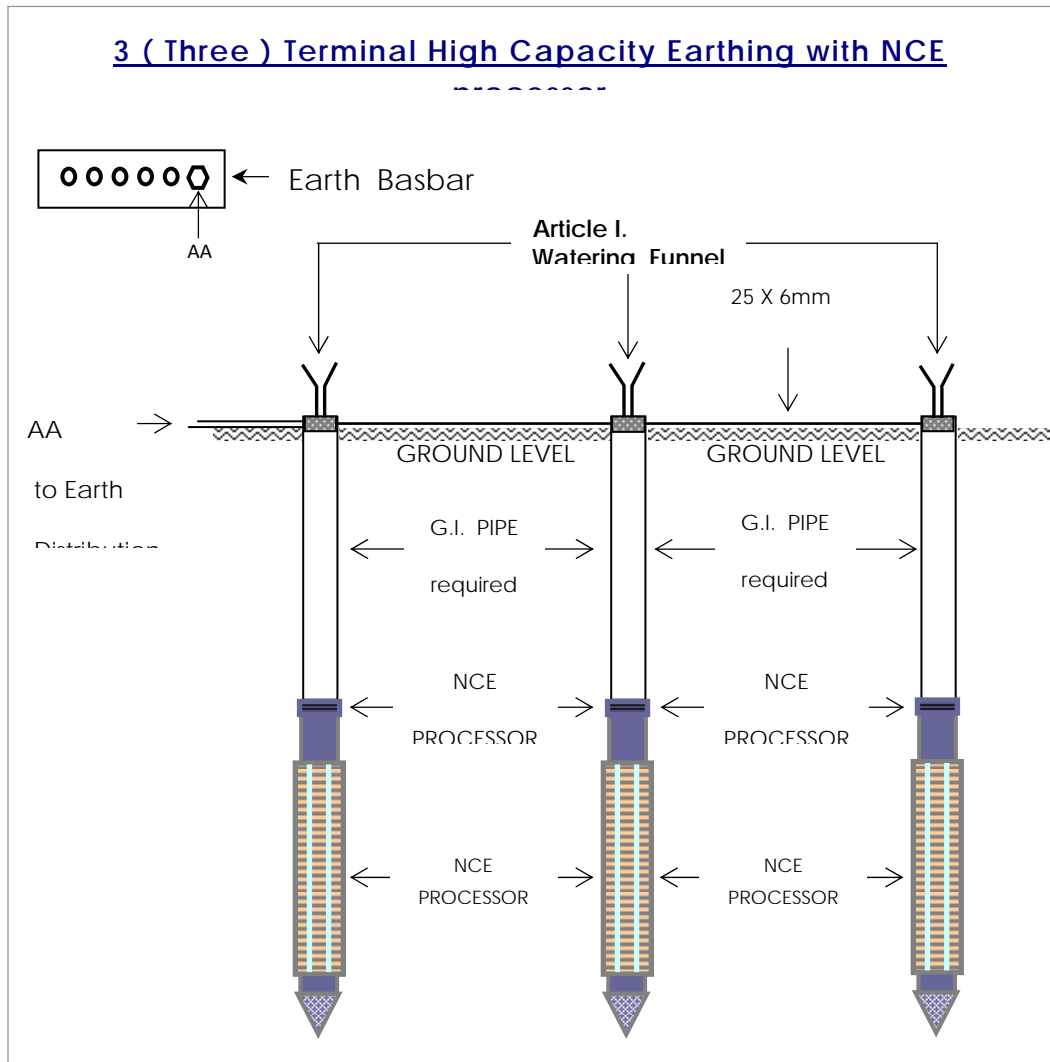
2. 35 sq. mm. X 2 Copper Cable is used to connect Constructed Earth Terminals with earth distribution

Basbar fitted in the Power room.

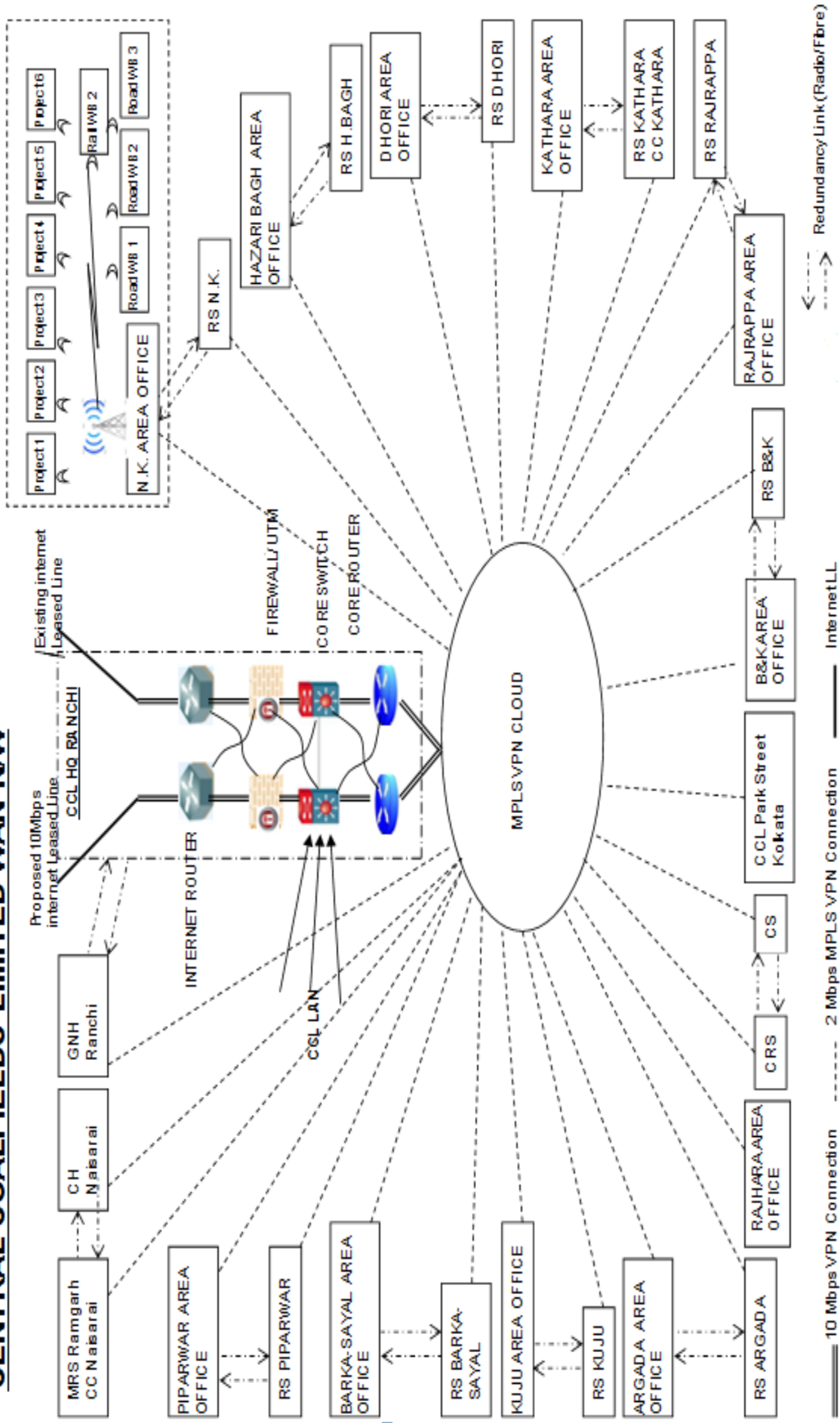
3. NCE Processor is inserted into the local soil by boring / drilling method and connected with 37/40 mm. ϕ

G.I. pipe of required length as per condition of the local soil.

4. The value of Earth Resistance is less than equal to 1 ohm.



CENTRAL COALFIELDS LIMITED WAN NW



Annexure - 1

Sl.No.	Location	Latitude	Longitude	HSL
1	CCL HQ, Ranchi	23.38136	85.32299	704 mtr
2	Gandhi Nagar Hospital	23.40854	85.32063	648.8 mtr
3	Central Hospital,Naisarai	23.647741	85.509727	227 mtr
4	Mines Rescue Station,Ramgarh	23.645075	85.509979	223 mtr
5	Central Stores ,Barkakana	23.373182	85.27347	337 mtr
6	Central Repair Shop,Barkakana	23.373182	85.27347	337 mtr
7	Argada Area Office	23.655771	85.433067	261 mtr
8	Regional Stores, Argada Area	23.687816	85.3663	383.9mtr
9	Barka Sayal Area Office	23.680866	85.325592	299 mtr
10	Regional Stores ,Barka sayal Area	23.675566	85.3509	346.9mtr
11	Kuju Area Office	23.718176	85.503319	550 mtr
12	Regional Stores ,Kuju Area	23.738133	85.514066	411.0mtr
13	Hazaribagh Area Office	23.85354	85.44102	349 mtr
14	Regional Stores, Hazaribagh Area	23.815292	85.536179	322mtr
15	Rajrappa Area Office	23.591667	85.675903	232 mtr
16	Regional Stores, Rajrappa Area	23.627605	85.686325	227mtr
17	Bokaro & Kargali Area	23.767796	85.971947	122 mtr
18	Regional Stores, B&K Area	23.769823	85.916222	121mtr
19	Kathara Area Office	23.768293	85.892181	143 mtr
20	Regional Stores, Kathara	23.769823	85.916222	121 mtr
21	Dhori Area Office	23.766624	85.98555	130 mtr
22	Regional Stores, Dhori Area	23.7847	86.0165	202mtr

23	North Karanpura Area Office	23.675625	85.024261	331 mtr
24	Regional Stores, N.K. Area	23.678333	85.02475	465.1mtr
25	Piparwar Area Office	23.703552	85.051971	330 mtr
26	Regional Stores, Piparwar Area	23.735283	85.04905	426.3mtr
27	Rajhara Area Office	23.6887	85.0644	434.0mtr
28	CCL Office, Park Street, Kolkata *	22.552196	88.351021	

Annexure – 2

<u>ARGADA AREA</u>				
Sl.No.	Location	Latitude	Longitude	HSL
1	Argada UG Office	23.645416	85.449936	300mtr
2	Sirka OC	23.645554	85.442284	239 mtr
3	Sirka UG	23.64545	85.425016	351.7mtr
4	Gidi A	23.677946	85.362	240 mtr
5	Gidi C	23.706596	85.382225	273 mtr
6	Religara	23.684282	85.682416	210 mtr
7	Gidi Washery	23.68741	85.362709	242 mtr
8	AFM Office, Argada	Near (150mtr) to Argada		UG Office

9	Gidi C Rd.WB	23.706633	85.380866	387.4mtr
10	Religara Rd.WB	23.67995	85.378666	353mtr
11	Sirka Rd.WB	23.652466	85.425816	358.4mtr
12	Argada Rd.WB	23.65745	85.454116	358.3mtr
13	Gidi Washery Rd.WB	23.6798	85.36435	363.6mtr
14	Gidi Washery Rd.WB	23.684683	85.3635	371.7mtr
15	Gidi Washery Rd.WB	23.68955	85.364283	372mtr
16	Sirka CHP RI.WB	23.652433	85.4322	352.3mtr
17	Gidi A RI WB	23.687166	85.364533	372.2mtr
18	Gidi Washery RI.WB	23.689216	85.363983	377.7mtr

<u>BARKA SAYAL AREA</u>				
1	Urimari UG & OC	23.691423	85.301582	252 mtr
2	Birsa OC	23.693674	85.30159	257 mtr
3	Bhurkunda OC & UG	23.660261	85.367676	271 mtr
4	Sayal D UG & Central Saunda UG	23.673796	85.34259	252 mtr
5	Saunda D UG	23.66048	85.342979	244 mtr
6	AFM Office, Barka-sayal	23.681666	85.32785	382mtr
7	Bhurkunda Rd.WB,	23.65705	85.363416	378mtr
8	Central Saunda Rd. WB	23.676466	85.341916	350.4mtr
9	Saunda Rd.WB	23.673316	85.351483	351.1mtr
10	K K More Rd.WB	23.682116	85.33175	374.7mtr
11	Sayal D Rd.WB	23.681866	85.3264	382.2mtr
12	Urimari Rd.WB	23.6951	85.305766	355.6mtr
13	Bhurkunda RI.WB	23.654783	85.361933	375.4mtr

14	Patratu RI.WB	23.668933	85.30365	370.9mtr
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Annexure – 2

<u>BOKARO & KARGALI AREA</u>				
Sl.No.	Location	Latitude	Longitude	HSL
1	Kargali OC & UG	23.770468	85.973145	119 mtr
2	Bokaro OC	23.78876	85.94331	128 mtr
3	Khasmahal OC & KSP Ph II UG	23.798325	85.914276	213 mtr
4	Giridih	24.1566	86.2897	
5	Kargali Washery	23.772549	85.976173	123 mtr
6	Khasmahal Rd.WB,	23.789959	85.923729	160 mtr
7	Kargali Washery Rd.WB	23.771865	85.978163	136 mtr
8	Kargali Washery Rd.WB	23.770231	85.972947	122 mtr
9	Giridih Rd.WB	24.1497	86.3061	
10	Jarangdih Siding Rd.WB	23.770832	85.914764	122 mtr
11	Karo Rd.WB	23.794098	85.974487	134 mtr
12	Giridih Rd.WB	24.1569	86.2888	
13	Khasmahal Rd.WB	23.789959	85.923729	160 mtr
14	Kargali Washery RI. WB	23.771069	85.978073	132 mtr
15	Giridih RI.WB	24.1575	86.3125	

<u>DHOR AREA</u>				
1	Amla	23.7772	86.0034	173mtr
2	Dhori East U.G P.O	23.7707	86.0025	165 mtr
3	SDQ 1 (Kalyani)	23.8138	86.0227	155 mtr
4	SDQ 3 (Tarmi)	23.7698	86.0485	204 mtr
5	Dhori Khas UG	23.781	86.0096	209 mtr
6	AFM Office Dhori Area	23.7666	85.9853	128mtr
7	SDQ 1 Rd.WB1	23.7665	86.0309	162 mtr
8	SDQ 1 Rd.WB2	23.7591	86.0375	162 mtr
9	SDQ 3 Rd.WB	23.7571	86.0523	156 mtr
10	Dhori East Rd.WB	23.7707	86.0025	165 mtr
11	Amla Rd.WB	23.7693	85.9984	177 mtr
12	Tarmi(Karipani) Rd.WB	23.7745	86.0363	173 mtr
13	Amla Siding Rd.WB	23.7708	85.9953	182 mtr
14	SDQ 3 Makoli Tarmi Rd WB	23.7825	86.022	192 mtr
15	Dhori/Amla Siding RI.WB	23.7664	85.9987	167 mtr
16	Tarmi RI.WB	23.757	86.0557	163 mtr
17	Sel. Dhori (CHP)RI.WB	23.7665	86.0309	162 mtr

Annexure – 2

<u>HAZARIBAGH AREA</u>				
Sl.No.	Location	Latitude	Longitude	HSL

1	Jharkhand OC	23.973531	85.607033	231 mtr
2	Tapin OC	23.843349	85.462181	326 mtr
3	Parej(E) OC	23.813427	85.534401	320 mtr
4	Kedla OC & UG	23.786192	85.59082	297 mtr
5	Kedla Washery	23.817667	85.56958	241 mtr
6	Kedla OC Rd.WB	23.788809	85.579071	285 mtr
7	Tapin South Rd.WB	23.848764	85.463585	343 mtr
8	Tapin North Rd.WB	23.835671	85.501526	325 mtr
9	Parej East Rd.WB	23.813879	85.532364	319 mtr
10	Jharkhand Rd.WB	23.796932	85.6063	217 mtr
11	Kedla Washery Rd.WB	23.818659	85.571587	244 mtr
12	Kedla Washery Rd.WB	23.816	85.572075	234 mtr

<u>KATHARA AREA</u>				
1	Kathara OC	23.771477	85.885567	159 mtr
2	Govindpur UG/Ph II OC	23.793114	85.873535	128 mtr
3	Jarangdih OC & UG	23.767748	85.907013	121 mtr
4	Swang UG	23.797844	85.84803	158 mtr
5	Kathara Washery	23.751814	85.873329	128 mtr
6	Swang Washery	23.791664	85.851289	152 mtr
7	Kathara Washery Rd.WB	23.751801	85.87332	126 mtr
8	Swang Washery Rd.WB	23.795902	85.849464	156 mtr
9	Swang Washery Rd.WB	23.794968	85.849449	156 mtr
10	Govindpur Rd.WB	23.793142	85.873536	128 mtr
11	Jarangdih FB Rd.WB	23.770832	85.917464	122 mtr
12	Jarangdih Rd.WB	23.769823	85.916222	121 mtr

13	Asnapani Rd.WB	23.764828	85.89917	118 mtr
14	Kathara Washery Rd.WB	23.75428	85.868538	151 mtr
15	Jarangdih Siding Rd.WB	23.770832	85.914764	124 mtr
16	Jarangdih Siding Rd.WB	23.770832	85.914764	124 mtr
17	Kathara Washery CC RI.WB	23.753389	85.870865	127 mtr
18	Swang Washery CC RI. WB	23.792229	85.850961	152 mtr
19	Jarangdih RI.WB	23.769823	85.916222	121 mtr

Annexure – 2

<u>KUJU AREA</u>				
Sl.No.	Location	Latitude	Longitude	HSL
1	Kuju UG	23.739784	85.511497	300 mtr
2	Pundi P.O	23.780825	85.304204	
3	Topa UG & OC	23.732899	85.481364	322 mtr
4	Pindra UG	23.738657	85.46012	
5	Karma	23.651133	85.567703	
6	Sarubera UG & OC	23.757372	85.562775	246 mtr
7	IWSP/Kuju Siding Office	23.7375	85.546416	407.8 mtr
8	A.S.M. Office	23.713816	85.5126	420.3mtr
9	Sarubera Rd.WB	23.750383	85.5589	384.1mtr

10	Ara Rd W.B	23.73545	85.537833	417.4mtr
11	Ara FB Rd.WB	23.742383	85.5574	409.2mtr
12	Topa Rd.WB	23.731233	85.4811	434.2mtr
13	Karma Rd.WB	23.651133	85.567703	
14	Kuju Hesagada Rd. WB	23.75605	85.503833	381.4 mtr
15	Pundi Rd.WB	23.761433	85.50615	396.8mtr
16	NR Siding RI.WB	23.728633	85.572883	407.7mtr
17	Chainpur RI.WB	23.72915	85.5803	409.8mtr
<u>NORTH KARANPURA AREA</u>				
Sl.No.	Location	Latitude	Longitude	HSL
1	Churi UG	23.685307	85.037315	341 mtr
2	Dakra OC	23.667034	85.017138	326 mtr
3	KDH OC	23.675756	85.014618	321 mtr
4	Rohini OC	23.683969	85.98175	342 mtr
5	Purnadih OC	23.683969	85.98175	342 mtr
6	A.S.M. Office	23.676116	85.024666	453.7mtr
7	Monet CHP KDH Rd.WB	23.6799	85.008083	429.2mtr
8	Rohini Rd.WB	23.68255	84.985766	439.2mtr
9	Churi OC Rd.WB	23.656833	85.021783	450mtr
10	MGME RI.WB	23.652383	84.939683	469.4mtr
11	KD(Old) RI.WB	23.652366	85.009883	460.2mtr
12	KD (New) RI.WB	23.67365	85.0134	444.9mtr
13	KD(H)N Rd.WB	23.679916	85.008033	425mtr

Annexure – 2

<u>PIPARWAR AREA</u>				
Sl.No.	Location	Latitude	Longitude	HSL
1	Ashoka OC	23.713255	85.047783	308 mtr
2	Ray Bachra UG	23.696667	85.06749	312 mtr
3	Piparwar OC & CHP/ CPP	23.736015	85.050095	426mtr
4	Kalyanpur Rd.WB	23.753533	85.0468	431.4mtr
5	Piparwar CPP1 Rd.WB	23.056133	85.056066	420.3mtr
6	Piparwar CPP II Rd.WB	23.056133	85.056066	420.3mtr
7	Piparwar Mine Ph I Rd.WB	23.726083	85.054333	421.3mtr
8	Piparwar Mine Des I Rd.WB	23.726266	85.05613	416.1mtr
9	Piparwar Mine Des II Rd.WB	23.726266	85.05613	416.1mtr
10	Ashoka I Rd.WB	23.7197	85.0285	430.7mtr
11	Ashoka II Rd.WB	23.719683	85.028833	428.5mtr

12	Ray RI.WB	23.683533	85.064316	432.1mtr
13	RCM Siding RI.WB	23.6764	85.05645	432.8mtr

<u>RAJRAPPA AREA</u>				
1	Rajrappa Washery	23.61738	85.688828	223 mtr
2	Rajrappa Rd.WB	23.595125	85.680969	223 mtr
3	Rajrappa Washery Rd.WB	23.621031	85.684921	237 mtr
4	Rajrappa Washery Rd.WB	23.621031	85.684921	237 mtr
5	Rajrappa Washery RI.WB	23.620779	85.690132	196mtr

<u>RAJHARA AREA</u>				
1	Rajhara OC *	24.169778	84.04119	
2	Rajhara Rd.WB *	23.80914	84.845438	
3	Tetariakhar O/C *	23.80914	84.845438	
4	Tetariakhar Rd.WB *	23.80914	84.845438	
5	Tori Siding RI.WB *	23.681355	84.740982	

* Data taken from Google Maps.