



WESTERN COALFIELDS LIMITED
(A SUBSISIARY OF Coal India Limited)

MATERIALS MANAGEMENT WING, COAL ESTATE, CIVIL LINES, NAGPUR - 440 001.
PHONE : PBX : 0712-2611381, 2510691 Extn : 5606, 5861, Fax : 0712-2510284

Supply Order No.11100112520185

DT: 08.12. 2020

SUPPLY ORDER

To,
M/s Vishwa Industrial Company Limited
Anand Sojitra Roa62A, Hazra Road,
Kolkata - 700019, West Bengal

Vendor Code: 129005
Vendor Category: MSE
vishwa@vishwagroup.net

Dear Sir,

- Sub : Formal Order for supply of Complete Belt Conveyors
Ref : 1. WCL Tender Enquiry no: WCL-hq-Pur-yvr-ra-e042-2020-21 (tender id: 2020_WCL_175088_1) opened on 13.07.2020 (F.N. E-222423)
2. Your offer / Bid ID number: 536509 and subsequent submission of shortfall / confirmatory documents
3. Your letter no VICL/WCL/2020-21/170 dt 21.10.2020
4. Your email dated 08.12.2020 enclosing letter no nil dt 07.12.2020

This has reference to above. We are pleased to place Formal Order on you for the supply of Complete Belt Conveyors at the rates, following terms and conditions given and General terms and conditions of supply:-

NIT SI No.	Description	Ordered Qty (sets)	FOR Destination Price (Rs)	Extended value Rs.
1	Belt Conveyor complete TB-1; 1200 mm, 470 mtrs length, as per detailed technical specifications enclosed Material Code: 22877990018	1 set	1,53,13,992.00	1,53,13,992.00
3	Belt Conveyor complete TB-3; 1200 mm, 700 mtrs length, as per detailed technical specifications enclosed Material Code: 22836990018	1 set	1,45,78,000.00	1,45,78,000.00
4	Belt Conveyor complete TB-4; 1200 mm, 700 mtrs length, as per detailed technical specifications enclosed Material Code: 22836990018	1 set	1,45,78,000.00	1,45,78,000.00
	Sub-Total of FOR Destination prices of Equipment			4,44,69,992.00
	GST extra @ 18% on FOR Destination prices of equipment			80,04,598.56
	Total value of order before availing ITC on GST			5,24,74,590.56

Total value: Rs. 5,24,74,590.56 (Rupees Five crores twenty four lakhs seventy four thousand five hundred ninety and paise fifty six only)

The Salient terms and condition of the order shall be as under:

1. Price: The Prices are FIRM on FOR Destination basis inclusive of packing & forwarding charges, Freight and transit insurance upto destination. Safe arrival of the consignment at destination shall be your responsibility.
2. GST: GST shall be paid at actual against documentary evidence as applicable at the time of Dispatch within the stipulated delivery period. The current rate of GST applicable on equipment is 18%. Input Tax Credit benefit shall be availed by the consignee, for which you should submit GST Complaint Invoice. You have to comply with the terms and conditions of GST Act/ Rules such as issuance of Tax Invoices, ensure payment of GST and enabling mechanism to facilitate Input Tax credit by WCL. You should upload the Tax Invoices/ Debit Note/ Credit Note in GST Portal, make payment of GST and file returns in time, as prescribed under GST Act and Rule to facilitate WCL to avail Input Tax Credit (ITC) as per eligibility under GST. In case WCL is unable to avail ITC or any liability arises to WCL due to failure on the part of you to comply the above provisions, the entire amount including Interest (If any) borne by WCL shall be recovered from you.

Signature
Signature

Signature *Signature*

1/157

3. Delivery: Delivery to be completed within 6 months from the date of placement of supply order, to be reckoned from 7th day of order date. No material to be supplied without delivery extension. Request for extension of delivery period to be made within the schedule delivery period. Even if the materials are unloaded at the Stores, the same shall be at the risk and cost of the supplier and shall not be accepted unless the supplier has obtained the extension of delivery period.

Grace Period: A grace period of 25% of original delivery period or 21 days, whichever is earlier, unless specifically disallowed will be applicable.

Where supplies are made within the grace period, there is no necessity for any extension in delivery period and the paying authorities shall make payment without any amendment to the contract delivery period. No liquidated damages are leviable in respect of supplies made within the grace period. The extra expenditure, the purchaser may have to incur on account of increase/fresh imposition of GST/CST/VAT, Excise/Customs Duty etc. which takes place within the above grace period will also not be recoverable from the suppliers.

The grace period is allowed as a matter of grace and is not intended to operate as extension of the delivery period and the same will be available only for deliveries and not for offering stores for inspection (in cases of pre-dispatch inspections) which should be made within the original delivery period or the re-fixed date of delivery.

If the stores are tendered for pre-dispatch inspection within the original delivery period stipulated in the contract and the firm delivers the stores within the grace period, the purchaser is bound to accept the stores even though the inspection was completed after the delivery date.

The grace period will only apply to the original contract delivery period/refixed delivery period and will not be applicable once an extension of delivery has been granted.

In case of scheduled delivery period, grace period shall be limited to 25% of original delivery period or 21 days, whichever is earlier, irrespective of delay in particular phase of delivery

4. Guarantee / Warranty: You shall give a warranty of satisfactory performance of the complete conveyor set for a period of 12 months from the date of commissioning or 18 months from the date of receipt and acceptance of material by the WCL.

5. Performance Bank Guarantee: Performance Bank Guarantee: You will have to submit the Bank Guarantee for Rs.52,47,460.00 (Rupees fifty two lakhs forty seven thousand four hundred and sixty only) towards the satisfactory performance during the guarantee / warranty period. The BG shall remain valid for a period 15 months from the date of supply / installation and commissioning. The release of the Performance Bank guarantee(s) after above indicated period, shall be subject to satisfactory performance of the equipment/ items during the warranty period and fulfilment of contractual obligations failing which, action for further extension or encashment of PBG, as deemed suitable shall be taken. The Performance Bank Guarantee shall be released after expiry of validity period, if no claim is pending. Bank Guarantee should be as per format enclosed at Annexure C and as per details indicated in clause no 9.

6. Inspection: Pre-despatch Inspection: (Also refer clause no 8 and 11.H of Technical specifications): The belt conveyors will be inspected by WCL's representative/third party inspection agency at manufacturer's works before dispatch of the equipment to ascertain the conformity of the conveyors to supply order specifications, relevant ISS, and type test certificates. Testing of assemblies/components, wherever required will be carried out by the inspector as per the relevant standards and supply order. The manufacturer shall make available to the inspector, the required test facilities with necessary support for conducting the tests.

The manufacturer shall make available to the inspector the following documents during the inspection.

(a) Copies of relevant ISS.

(b) All records of quality checks as per QAP

(c) Dimensional/manufacturing drawings of different assemblies/components of the conveyors.

(d) Invoices in respect of purchase of raw-materials viz. steel, bearings, tubes (for rollers) etc, and bought out items.

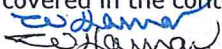
(e) Manufacturer's test certificates in respect of raw-materials and bought out items.

F-Copies of type test certificates from Govt./Govt. approved test house, for contactors used in the starters as per IS:13947(Part-4/Sec.1)-1993.

Final Inspection of the consignment shall be carried out at the destination stores, which will be arranged by the consignee on receipt of stores

7. Payment Terms:

i) 80% value of the equipment and consumable spares and consumables for first 12 months of warranty period from the date of commissioning of the equipment and 100% taxes and duties and other charges excluding erection & commissioning charges shall be made within 21 days after receipt and acceptance of materials at site at the consignee's end and submission and Acceptance of Performance Bank Guarantee valid till 3 months after the completion of 12 months period from the date of commissioning of all the equipment covered in the contract.





2/157

ii) Balance 20% payment including erection & commissioning charges shall be made after successful completion of erection, testing, commissioning and final acceptance of the equipment (along with the accessories) upon presentation of successful commissioning certificate, signed by Staff Officer of the technical department of the area / Area General Manager of WCL, where the equipment has been deployed and confirmation of receipt of DRR in respect of spares and consumables for first 12 months of warranty period (if any) from the date of commissioning of the equipment by the paying authority.

8. Security Deposit: You are required to submit the Security Deposit. Security Deposit shall be for an amount of three per cent of the total landed value of the contract including all taxes, duties & other costs and charges, without considering the Input Tax Credit (ITC) against GST i.e. for Rs.15,74,238.00 (Rupees fifteen lakhs seventy four thousand two hundred thirty eight only). The Security Deposit shall be in the form of a Bank Demand Draft or in the form of a Bank Guarantee as per format enclosed as Annexure-B from a RBI Scheduled Bank in India (on a non-judicial stamp paper) as per clause no 9 within 15 days from date of notification of award or placement of order.

The Security Deposit shall be in the same currency in which contract is to be signed / Supply order issued.

In case of equipment, SDBG shall not be individual equipment wise. However, multiple Bank Guarantees for Security Deposit shall be permissible provided value of all the SDBGs totals to 10% of the contract value, and all are submitted simultaneously within the specified time schedule and all of them are in the same prescribed format of SDBG without linking to any particular equipment.

The SDBG shall remain valid up to 3 months after completion of supplies and acceptance of materials by the consignee in case of supply of Materials and in case of contracts for equipment involving installation and commissioning, 3 months after the supply and commissioning of all the equipment covered in the contract.

Security Deposit will be released within 30 days after completion of supplies and acceptance of material by the consignee in case of supply contract or after successful commissioning and on receipt of confirmation of Performance Bank Guarantee (s) for all the equipment covered in the contract in case of contracts for equipment and all those items/ goods involving installation and commissioning and PBG.

Security Deposit may be converted into Performance Bank Guarantee (PBG) wherever PBG is required at the option of the supplier. At the time of conversion of security money into PBG, it should be ensured that the amount of PBG should not be less than 10% of landed value of order. Wherever Security Deposit is converted into PBG, the operation of such SDBG/ Performance BG shall be guided by the Performance Bank Guarantee clause.

If you fails to deposit the security deposit within 15 (fifteen) days from date of notification of award/ placement of order, another opportunity shall be given to them for submission of Security Deposit within next 15 days. If you still fails to deposit the security deposit within the extended period but executes the supplies within scheduled delivery period, the submission of Security Deposit shall be waived, as the purpose of submission of SD is fulfilled.

If you fail to deposit the SD within the extended period and no supplies are made, the order shall be cancelled and the case shall be processed to order elsewhere at firm's risk and cost. Moreover, the firm's performance is to be kept recorded for future dealings with them. Further, if during execution of the contract, the firm fails to extend the Bank Guarantee for Security Deposit, suitably as required, the same shall be recorded as unsatisfactory performance for future dealings apart from taking any other penal action as may be deemed fit by WCL.

In cases where the you will not submit the security deposit even within the extended period for SD submission but has supplied the materials either in full or in part after the extended period for SD submission, the SD shall be deducted from the first bill or in case of insufficient amount from subsequent bill(s) of the supplier till the full SD amount is deducted. Further, **a penalty equivalent to 0.5%** (half percent) of SD amount for delay of each week or part thereof (period of delay is to be calculated from the 31st day from the date of notification of award/ placement of order to the date of receipt of full SD/ deduction of full SD) shall be levied subject to a maximum of 10% of the contract value.

Note: For unsatisfactory performance and / or contractual failure, the security money shall be forfeited.

9 Bank Guarantee towards SDBG / PBG

For arriving at the value for Bank Guarantee to be submitted, the order value will be arrived at by adding all the Taxes & Duties applicable to the Free Delivery at Site Price of the materials on order as applicable on the date of opening of price bid.

The bank guarantee issued by the banker of the firm shall be operational for all purposes at Nagpur branch (Maharashtra).

The Bank Guarantee issued by the issuing bank on behalf of the supplier in the favour of Western Coalfields Ltd shall be in paper form as well as issued under "Structured financial messaging system". The details of beneficiary for issue of BG under SFMS platform is furnished below:

Name of beneficiary and details	
Name	Western Coalfields Ltd

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3/15/1

Order no 11100112520185 dt 08.12.20 for supply of Complete Belt Conveyors; M/s Vishwa Industrial Co Ltd

Area	Head Quarter
Bank A/c No: / Cust ID of beneficiary	Current Account no: 005905018053; Customer Id:556096497; ICICI Bank Ltd, Commercial Banking, 9C/A & 9C/B, Ground Floor, Shriram Towers, LIC Square, Nagpur 440001, Maharashtra
IFSC code	ICIC0000059
Bank Manager Name & Ph no:	UJJWAL KITE: Ph n: 0712-6627389
BG ADVISING MESSAGE – 760COV / 767COV via SFMS	
Field Number	Particulars
7035	ICICI0000059
7037	WCL556096497

The original bank guarantee issued by the issuing bank shall be sent by the issuing bank to the following address by Registered post / Speed Post to " General Manager (MM) I/c, Materials Management Wing, Western Coalfields Limited, HQ, Coal Estate, Civil Lines, Nagpur – 440001, Maharashtra" by **Registered Post/AD**.

Any extension / amendments to the BG shall be done following the same procedure as above.

For ready reference and updation of BG in WCL portal , it is necessary that BG issuing / amending bank send the BG advise in the form of message format 760COV /767COV via SFMS (Structured Financial Messaging System) as provided by RBI.

In the event of BG issuing / amending bank not sending the message 760COV /767COV or committing any error while capturing the details at least in the above mentioned field, BG confirmation through online portal would not be updated if issuing bank does not adhere to advisory, WCL will not be responsible

The above particulars are to be incorporated by the issuing bank properly while issuing BG under SFMS mode to avoid any problem in future.

Original bank Guarantee issued by the Issuing Bank shall be sent by the Issuing Bank to concerned Department/Area by Registered/ Speed Post.

The beneficiary's bank/advising bank shall send a copy of advice received under SFMS mode to concerned Area/HQ through e-mail at their e-mail id and provide print out of the said message from advising bank with seal and signature, to the Finance Dept, of concerned Area/HQ. For this purpose, each Area/HQ shall provide their e-mail ID to the Advising/Beneficiary Bank.

Under SFMS, extension/subsequent amendments to the BG can be done following the same procedure as stated above.

For encashment, the BG shall be placed directly before the issuing bank at Nagpur Branch.

10. Consignee & Allocation:- GSTIN no 23AAACW1578L1Z4 (for areas in Madhya Pradesh State)

Qty	Area	Project	POSTAL ADDRESS OF THE CONSIGNEE
3 sets	Pathakhera	Tawa – II	The Depot Officer, Regional Stores, Western Coalfields Limited, Pathakhera Area, PO : Pathakhera, Distt: Betul (M.P) Pin: - 460449

11. Paying Authority: General Manager (Finance), Western Coalfields Limited, Coal Estate, Civil Lines, Nagpur - 440 001 for the equipment.

12. EFT Details :- (bank mandate submitted by you along with the offer is at Annexure "E")

Name of the Bank	Punjab National Bank (United Bank of India)
Branch & Location	Hazra Road Branch, Kolkata 700026
Account Number	0108250073714
Nature of Account	Cash Credit
IFS CODE of the Branch	UTBI0HAZ115

13. Mode of dispatch: All the stores securely packed are to be dispatched by road transport to the consignee on Freight paid basis.

14. Liquidated Damages clause: In the event of failure to deliver or dispatch the equipment/stores within the stipulated date/period in accordance with the terms and conditions and the specifications mentioned in the supply order and in the event of breach of any of the terms and conditions mentioned in the supply order, the Purchaser shall have the right:

- (a) To recover from the successful bidder as agreed liquidated damages, a sum not less than 0.5% (Half Percent) of the price of any equipment/ stores which the successful tenderer has not been able to supply as aforesaid for each week or part of a week during which the delivery of such stores may be in arrears limited to 10% (Ten Percent) of the total contract value, or

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4/157

- (b) To purchase elsewhere after due notice to the successful tenderer on the account and at the risk of the defaulting supplier, the equipment/stores not supplied or others of similar description without cancelling the supply order in respect of the consignment not yet due for supply, or
- (c) To cancel the supply order or a portion thereof, and if so desired to purchase the equipment/ stores at the risk and cost of the defaulting supplier and also,
- (d) To extend the period of delivery with or without penalty as may be considered fit and proper. The penalty, if imposed, shall not be more than the agreed liquidated damages referred to in clause (a) above.
- (e) To forfeit the security deposit full or in part.
- (f) Whenever under this contract any sum of money is recoverable from and payable by the supplier, the Purchaser shall be entitled to recover such sum by appropriating in part or in whole by deducting any sum or which at any time thereafter may become due to the successful tenderer in this or any other contract. Should this sum be not sufficient to recover the full amount recoverable, the successful tenderer shall pay the Purchaser on demand the remaining balance. The supplier shall not be entitled to any gain on any such purchase.

For the purpose of the calculation of the liquidated damages amount, the basic Free Delivery at Site price shall be considered. Taxes and duties shall not be taken into account for calculation of LD. However, when prices indicated in the order are inclusive of taxes and duties, such prices will be taken for calculation of Liquidated Damages.

15. SUBMISSION OF BILLS:

a. **For claiming 80% payment for equipment & 100% payment of 1st year Spares**, following documents are to be submitted along with original bills as per terms of the supply order to the consignee.

- (i) Pre-receipted and stamped GST compliant Invoice as per GST rules and Act indicating HSN code
- (ii) Packing list in original list giving details of bill of materials, if applicable. (Invoice should be strictly as per GST rule 2017), if applicable.
- (iii) Consignment note / RR/ LR in original.
- (iv) Warranty / Guarantee certificate, if applicable.
- (v) Manufacturer's test certificate, if applicable.
- (vi) DGMS / BIS / Pre dispatch inspection certificates / any other document, if required as per the contract.
- (vii) Price Certificate and Price Fall Certificate
- (viii) Any other document indicated elsewhere in the order & specifications

b. **For Claiming 20% payment of Equipment** and the following documents are to be submitted


- (i) Pre-receipted and stamped bill for 20% payment.
- (ii) Commissioning Certificate from the respective Area General Manager / Staff Officer (Excv) of area
- (iii) Any other document indicated elsewhere in the order

16. Force Majeure Clause: If at any time, during the continuance of this contract, the performance in whole or in part by either party of any obligation under this contract shall be prevented or delayed by reason of any wars or revolutions, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes, lockouts, freight embargoes or act of God (hereinafter referred to "events") provided, notice of the happening of any such event is given by either party to the other within 21 days from the date of occurrence thereof neither party shall by reason of such event, be entitled to terminate this contract nor shall either party have any claim for damages against the other in respect of such non-performance or delay in performance, and deliveries under the contract shall be resumed as soon as practicable after such event has come to an end or ceased to exist, provide further that if the performance in whole or part or any obligation under this contract is prevented or delayed by reason of any such event for a period exceeding 60 days, either party may at its option terminate the contract provided also that if the contract is terminated under this clause, the purchaser shall be at liberty to take over from the contractor at a price to be fixed by the CIL / Subsidiary Company, which shall be final, all unused, un damaged and acceptable materials, bought out components and stores in course of manufacture in the possession of the contractor at the time of such termination or such portion thereof as the purchaser may deem fit excepting such materials, bought out components and stores as the contractor may with the concurrence of the purchaser elect to retain."

17. Lowest Price Certificate: You have undertaken that the prices quoted by them for the offered items are the lowest prices as applicable to any other Organization / Ministry / Department of the Govt, of India or Coal India Ltd. and /or its Subsidiaries or other PSU or any other private organization and also to submit the certificate as under:

"This is to certify that the prices quoted by us for the offered items are the lowest prices as applicable to any other Organization / Ministry / Department of the Govt. of India or Coal India Ltd. and /or its Subsidiaries or other PSU or any other private organization".

18. Price Fall Clause: "You have undertaken that you have not offered to supply / supplied / is not supplying same or similar product / systems or sub systems at a price lower than that offered in the present bid in respect of any Organization / Ministry / Department of the Govt, of India or Coal India Ltd. and /or its





5/15/

Order no 11100112520185 dt 08.12.20 for supply of Complete Belt Conveyors; M/s Vishwa Industrial Co Ltd

Subsidiaries or other P S U or any other private organization during the currency of the contract and if it is found at any stage that same or similar product / systems or sub systems was supplied by the bidder to any Organization / Ministry / Department of the Govt. of India or Coal India Ltd. and /or its Subsidiaries or other PSU or any other private organization at a lower price during the currency of the contract, then that very price will be applicable to the present case and the difference in the cost would be refunded by the bidder to buyer, if the contract has already been concluded.

- (i) The currency of contract will mean the period till completion of supply.
- (ii) It shall be responsibility of the supplier to inform the purchaser of offer to supply / supply of the similar /ordered item (s) at a lower rate to any Organization / Ministry / Department of the Govt, of India or Coal India Ltd. and /or its Subsidiaries or other PSU or any other private organization during the currency of the contract.
- (iii) The supplier shall submit a certificate along with the bill(s) that it has not offered to supply / supplied the similar /ordered item (s) at a lower rate to any Organization / Ministry / Department of the Govt, of India or Coal India Ltd. and /or its Subsidiaries or other PSU or any other private organization. "

19. Risk Purchase Clause: In the event of failure of the supplier to deliver or dispatch the stores within the stipulated date/period of the supply order or in the event of breach of any of the terms and conditions mentioned in the supply order/ contract, WCL shall have the right to purchase the stores from elsewhere after due notice to the defaulting supplier at the risk and cost of the defaulting supplier. The cost as per risk purchase exercise shall be recovered from the Earnest Money Deposit/ Security Deposit/ Performance Security of the supplier and/or bills submitted by the supplier against the same contract or any other contract pending in the same Subsidiary Co. and/or in any other Subsidiary Companies / CIL.

Risk Purchase Action shall be initiated as a last resort, if the supplier has failed to deliver despite having been given adequate and proper notice to discharge its obligations and under any of the following conditions:

- a) When the supplier fails to deliver the materials even after extending the delivery period.
- b) When the supplier fails to respond to purchaser's request for supply of the materials and fails to provide any genuine and bonafide reason for the delay in supply.
- c) When the supplier breaches any of the terms and conditions of the supply order/ contract and as a result fails to execute the order satisfactorily.

20. Manufacturing certificate: As the order is being placed on the basis of consideration that you are a manufacturer of the ordered material, you will have to provide a certificate to the following effect on the body of each bill.

"Certified that the items supplied and included in this bill/ invoice are of your own make and have been actually manufactured in your works situated at _____ (address of the factory)

21. Integrity Pact: Integrity Pact as per format (Annexure E of the NIT) signed and furnished by you along with the offer shall remain valid and applicable for this contract.

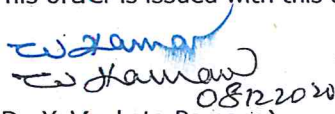
The name of the IEM for this tender are:


Dr. (Ms) Nivedita Haran, 23, IFS Vilas, P-6, Builders Area, Greater Noida 201310
Shri A.K.Mohapatra, Qrs no B-5/9, Unit - 9, Bhoi Nagar, Bhubaneswar 751022

22. Settlement of Disputes through Court of Law of Competent Jurisdiction: The Courts in whose territorial jurisdiction the place from where Tenders / contract is being issued is located i.e. Nagpur shall be competent to deal with any matter arising out of this NIT / resultant purchase Order/Contract. Therefore any disputes/claims arising out of the NIT with bidders or arising out of the contract entered into with the suppliers will be subject to the jurisdiction of the Nagpur court of law

Unless otherwise specified above, the purchase order shall also be governed by the terms and conditions given in the General terms and conditions enclosed.

This order is issued with this acceptance. Kindly acknowledge the receipt of this order.


(Dr. Y. Venkata Ramana)
Chief Manager (MM)

Yours faithfully

(K.S.R. Divakar)
Chief Manager (MM)

Enclosures: -

Annexure-A : Scope of supply, Technical specifications and literature submitted by you with the offer

Annexure-B: Security Deposit Bank Guarantee format

Annexure-C: Performance Bank Guarantee format

Annexure-D: General Conditions of the Contract

6/157

Annexure-E: Bank Mandate

Copy to :

1. GM(E&M) HOD, WCL(HQ), Nagpur
2. AGM / SO(E&M)/SO(MM)/AFM/Depot Officer, WCL, Pathakhera
3. GM(CP)/ GM(Fin.) I/c -1 / GM(Fin) I/c-II/ GM(P&P) , WCL Hq., Nagpur
4. RD, CMPDIL, RI IV, Nagpur
5. GM(MM), CIL, SECL, MCL, CCL, BCCL, ECL, NCL
6. TS to DT(P&P), WCL, Nagpur
7. Chief Manager (MM/Admn.), WCL(HQ) - The Landed value of the order is Rs. 5,24,74,590.56
8. IEM, Dr. (Ms) Nivedita Haran, 23, IFS Vilas, P-6, Builders Area, Greater Noida 201310
9. IEM, Shri A.K.Mohapatra, Qrs no B-5/9, Unit - 9, Bhoi Nagar, Bhubaneswar 751022

This is issued with the approval of Director (Tech) P&P (approved on 13.11.2020)

Indent details: Ind/19-20/3660/00114 dt 09.10.19 for 6 sets of Belt Conveyors for Tawa project, Pathakhera
Budget Reference: (**Capital**): WCL/CAP/OPM/2020-21/12/59/55 Dated, 04.12.2020 for Rs.7,50,01,127/-


08/12/2020
Chief Manager(MM) P-III

 
Chief Manager(MM) P- I

Detailed Technical Specifications for Belt Conveyors complete

Specification Parameter	Value
Sl. No.1 : (NIT Sl. no 1): Troughed Belt Conveyor complete for use in coal mines TB- 1 1-A-1200mm, 470 Mtrs: 1 set	
B-Total length of conveyor in Mtrs :470	
C-Belt speed in M/Sec.: 2.30	
D-Power Rating in K.W.: 2x150(min.)	
E-Take up travel in Mtrs: 12 (approx)	
F-Spacing between two Pullcord switches; 50 Mtrs	
G-Spacing between two sway switches: 100 Mtrs	
H-Conveyor width in mm (Belt width): 1200	
I-Drive configuration: DOUBLE TANDAM with equalizing gears	
J-Type of enclosure for all electricals – NFLP	
i-Motors and Starters -NFLP	
ii-Pullcord switch, Sway switch, Pre-start Audio-visual warning alarm & Electricals of Wiper cum dust collector: FLP	
K-Drum width : 1400mm	
L-PARAMETERS	
1-Make of motor:	MARATHON.
2-Motor K.W. Rating:	2X150
3-Frame size of motor	VFSE315L
4-Make of VFD starter (item no 1)	ABB/DANFOSS (VFD Starter)
5-Make of contactors [Government/Government approved test house tested make).	L&T
6-K.W. Rating of starter	2X150 KW
7-Make of Pull cord switches	EEC
8-Make of Belt Sway switches	EEC
9-Make of Pre-start Audio-visual warning alarm	EEC
10-K.W. Rating of Gearbox	250 KW
11-No. of stages in Gearbox :	3 STAGE
12-Make of gearbox:	VISHWA
13-Model of gearbox:	T1120
14-Type of anti roll back device:	SPRAG CLUTCH TYPE
15-Make of Fluid coupling	PREMIUM/FLUIDOMAT
16-Model of Fluid coupling	AFC80
17-Make of Output coupling	VISHWA
18-Model of Output coupling	VGC90
19-Drive Drum Dia: (Min. 800mm)	800 MM
M-SCOPE OF SUPPLY: FOR EACH SET OF CONVEYOR	
M.1-DISCHARGE DRUM with discharge jib- 1set	
M.2-DRIVE HEAD ASSEMBLY consisting of below mentioned components as per specification provided.	
i-Drive head frame; 1 No.	
ii-Drive Pulley with shaft, Bearings and Bearing Blocks :2 Sets.	
iii-Gear Box; 2No.	

E. J. Heman
E. J. Heman

[Signature]

8/15/

iv-Motor: 2 No.
v-Fluid coupling: 2No.
vi-Out put coupling: 2No.
vii--Anti roll back device: 2 No.
viii-Starter : 1No.
ix-Belt scraper: 1No.
M.3-TAIL END ASSEMBLY consisting of below mentioned components .
a-Return Pulley with shaft, Bearings and Bearing Blocks :1 Set.
b-Tail end structure: 1 Set
c- Wiper cum dust collector:1 set
M.4-(HORIZONTAL) TAKE UP ASSEMBLY consisting of below mentioned components .
a-Take up Pulley with shaft, Bearings and Bearing Blocks :1 Set.
b-Bend/diversion Pulley with shaft, Bearings and Bearing Blocks :2 Sets.
c-Take up trolly: 1 Set .
d-Take up structure: 1 Set
e-Hand operated winches: 2 Nos.
f-V-type plough scraper on return belt before take up : 1 No.
M.5-INTERMEDIATE STRUCTURE consisting of below mentioned components
a-Stringers: 314 nos.
b-Brackets for carrying idlers(Top rollers) ; 392 Nos.
c- Brackets for impact idlers(rollers); 6 Nos.
d- Brackets for transition idlers(Rollers): 6 Nos.
e-Stools cum Idler brackets for return idlers (Bottom rollers) : 157 Nos.
f-Carrying idlers(Top & Transition rollers):1194 Nos.
g-Return idlers(Bottom rollers): 157 Nos.
h-Impact idlers(Rollers): 18 Nos.
i-Decking plates as specified at Sr.No.7.7; 15 Mtrs.(in pcs of 1.5 mtrs each)
j-Skirt plates as specified at Sr.No.7.8: 1 set of 2 Nos(1 left & 1 right).
k-Protective guards/fences as specified at Sr.No.7.9:
i- coupling guards.: 2 nos
ii-Tail end drum fencing covering all sides except belt entry side; 1 set
iii-Take up drum fencing covering all sides except belt entry side; 1 set
M.6-ACCESSORIES
a-Pull cord switches in Nos:9
b-Belt Sway switches in Nos. : 5
c-Pre-start Audio-visual warning alarm in Nos : 5
Sl. No.2 : (NIT Sl. no 3): Troughed Belt Conveyor complete for use in coal mines TB-3
3-A-1200mm, 700 Mtrs: 1 set
B-Total length of conveyor in Mtrs :700
C-Belt speed in M/Sec.: 2.30
D-Power Rating in K.W.: 2x110(min.)
E-Take up travel in Mtrs: 18 (approx)
F-Spacing between two Pullcord switches; 50 Mtrs
G-Spacing between two sway switches: 100 Mtrs
H-Conveyor width in mm (Belt width): 1200
I-Drive configuration: DOUBLE TANDAM with equalizing gears

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9/15/1

Order no 11100112520185 dt 08.12.20 for supply of Complete Belt Conveyors; M/s Vishwa Industrial Co Ltd

J-Type of enclosure for All electricals -FLP	
K-Drum width : 1400mm	
L-PARAMETERS	
1-Make of motor:	MARATHON
2-Motor K.W. Rating:	2X110 KW
3-Frame size of motor	KF315M
4-Make of starter	PRABHU/VOLGA
5-Make of contactors [Government/ Government approved test house tested make).	L&T
6-K.W. Rating of starter	2X110 KW
7-Make of Pull cord switches	EEC
8-Make of Belt Sway switches	EEC
9-Make of Pre-start Audio-visual warning alarm	EEC
10-K.W. Rating of Gearbox	180 KW
11-No. of stages in Gearbox :	3 Stage
12-Make of gearbox:	VISHWA
13-Model of gearbox:	T1090
14-Type of anti roll back device:	SPRAG CLUTCH TYPE
15-Make of Fluid coupling	PREMIUM/FLUIDOMAT
16-Model of Fluid coupling	AFC71
17-Make of Output coupling	VISHWA
18-Model of Output coupling	VGC80
19-Drive Drum Dia: (Min. 800mm)	800 MM
M-SCOPE OF SUPPLY: FOR EACH SET OF CONVEYOR	
M.1-DISCHARGE DRUM with discharge jib- 1set	
M.2-DRIVE HEAD ASSEMBLY consisting of below mentioned components as per specification provided.	
i-Drive head frame; 1 No.	
ii-Drive Pulley with shaft, Bearings and Bearing Blocks :2 Sets.	
iii-Gear Box; 2No.	
iv-Motor: 2 No.	
v-Fluid coupling: 2No.	
vi-Out put coupling: 2No..	
vii--Anti roll back device: 2 Nos.	
viii-Starter : 1No.	
ix-Belt scraper: 1No.	
M.3-TAIL END ASSEMBLY consisting of below mentioned components .	
a-Return Pulley with shaft, Bearings and Bearing Blocks :1 Set.	
b-Tail end structure: 1 Set	
c-Wiper cum dust collector: 1 set	
M.4-(HORIZONTAL)TAKE UP ASSEMBLY consisting of below mentioned components .	
a-Take up Pulley with shaft, Bearings and Bearing Blocks :1 Set.	
b-Bend/diversion Pulley with shaft, Bearings and Bearing Blocks :2 Sets.	
c-Take up trolly: 1 Set	
d-Take up structure: 1 Set	

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50/157

e-Hand operated winches: 2 Nos.	
f-V-type plough scraper on return belt before take up : 1 No.	
M.5-INTERMEDIATE STRUCTURE consisting of below mentioned components	
a-Stringers: 468 nos.	
b-Brackets for carrying idlers(Top rollers) : 583 Nos.	
c- Brackets for impact idlers(rollers): 6 Nos.	
d- Brackets for transition idlers(Rollers): 6 Nos.	
e-Stools cum Idler brackets for return idlers (Bottom rollers) : 233 Nos.	
f-Carrying idlers(Top & Transition rollers): 1767 Nos.	
g-Return idlers(Bottom rollers): 233 Nos.	
h-Impact idlers(Rollers): 18 Nos.	
i-Decking plates as specified at Sr.No.7.7; 15 Mtrs.(in pcs of 1.5 mtrs each)	
j-Skirt plates as specified at Sr.No.7.8: 1 set of 2 Nos(1 left and 1 right).	
k-Protective guards/fences as specified at Sr.No.7.9:	
i- coupling guards.: 2 nos	
ii-Tail end drum fencing covering all sides except belt entry side; 1 set	
iii-Take up drum fencing covering all sides except belt entry side; 1 set,	
M.6-ACCESSORIES	
a-Pull cord switches in Nos:14	
b-Belt Sway switches in Nos. : 7	
c-Pre-start Audio-visual warning alarm in Nos : 7	
Sl. No.3 : (NIT Sl. no-4): Troughed Belt Conveyor complete for use in coal mines TB-4	
4-A-1200mm, 700 Mtrs: 1 set	
B-Total length of conveyor in Mtrs :700	
C-Belt speed in M/Sec.: 2.30	
D-Power Rating in K.W.: 2x110(min.)	
E-Take up travel in Mtrs: 18 (approx)	
F-Spacing between two Pullcord switches; 50 Mtrs	
G-Spacing between two sway switches: 100 Mtrs	
H-Conveyor width in mm (Belt width): 1200	
I-Drive configuration: DOUBLE TANDAM with equalizing gears	
J-Type of enclosure for All electricals -FLP	
K-Drum width : 1400mm	
L-PARAMETERS	
1-Make of motor:	MARATHON.
2-Motor K.W. Rating:	2X110 KW
3-Frame size of motor	KF315M
4-Make of starter	PRABHU/VOLGA
5-Make of contactors [Government/ Government approved test house tested make).	L&T
6-K.W. Rating of starter	2X110 KW
7-Make of Pull cord switches	EEC
8-Make of Belt Sway switches	EEC
9-Make of Pre-start Audio-visual warning alarm	EEC

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Order no 11100112520185 dt 08.12.20 for supply of Complete Belt Conveyors; M/s Vishwa Industrial Co Ltd

10-K.W. Rating of Gearbox.	180 KW
11-No. of stages in Gearbox :	3 Stage
12-Make of gearbox:	VISHWA
13-Model of gearbox:	T1090
14-Type of anti roll back device:	SPRAG CLUTCH TYPE
15-Make of Fluid coupling	PREMIUM/FLUIDOMAT
16-Model of Fluid coupling	AFC71
17-Make of Output coupling	VISHWA
18-Model of Output coupling	VGC80
19-Drive Drum Dia: (Min. 800mm)	800 MM
N-SCOPE OF SUPPLY: FOR EACH SET OF CONVEYOR	
N.1-DISCHARGE DRUM with discharge jib- 1set	
N.2-DRIVE HEAD ASSEMBLY consisting of below mentioned components as per specification provided.	
i-Drive head frame; 1 No.	
ii-Drive Pulley with shaft, Bearings and Bearing Blocks :2 Sets.	
iii-Gear Box; 2No.	
iv-Motor: 2 No.	
v-Fluid coupling: 2No.	
vi-Out put coupling: 2No.	
vii--Anti roll back device: 2 Nos.	
viii-Starter : 1No.	
ix-Belt scraper: 1No.	
N.3-TAIL END ASSEMBLY consisting of below mentioned components .	
a-Return Pulley with shaft, Bearings and Bearing Blocks :1 Set.	
b-Tail end structure: 1 Set	
c-Wiper cum dust collector: 1 set	
N.4-(HORIZONTAL)TAKE UP ASSEMBLY consisting of below mentioned components .	
a-Take up Pulley with shaft, Bearings and Bearing Blocks :1 Set.	
b-Bend/diversion Pulley with shaft, Bearings and Bearing Blocks :2 Sets.	
c-Take up trolley: 1 Set	
d-Take up structure: 1 Set	
e-Hand operated winches: 2 Nos.	
f-V-type plough scraper on return belt before take up : 1 No.	
N.5-INTERMEDIATE STRUCTURE consisting of below mentioned components	
a-Stringers: 468 nos.	
b-Brackets for carrying idlers(Top rollers) : 583 Nos.	
c- Brackets for impact idlers(rollers): 6 Nos.	
d- Brackets for transition idlers(Rollers): 6 Nos.	
e-Stools cum Idler brackets for return idlers (Bottom rollers) : 233 Nos.	
f-Carrying idlers(Top & Transition rollers): 1767 Nos.	
g-Return idlers(Bottom rollers): 233 Nos.	
h-Impact idlers(Rollers): 18 Nos.	
i-Decking plates as specified at Sr.No.7.7; 15 Mtrs.(in pcs of 1.5 mtrs each)	

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12/15/1

j-Skirt plates as specified at Sr.No.7.8: 1 set of 2 Nos(1 left and 1 right).
k-Protective guards/fences as specified at Sr.No.7.9: i- coupling guards.: 2 nos ii-Tail end drum fencing covering all sides except belt entry side; 1 set iii-Take up drum fencing covering all sides except belt entry side; 1 set
N.6-ACCESSORIES
a-Pull cord switches in Nos:14
b-Belt Sway switches in Nos. : 7
c-Pre-start Audio-visual warning alarm in Nos : 7
COMMON TECHNICAL PARAMETERS
4-SERVICE CONDITIONS :
i-Place of installation: coal mines
ii-Duty: Continuous (24 hrs/day)
iii-Maximum ambient air temperature: 45 deg.C.
iv-Relative humidity (max): 98.00%
vi-Environment: Dusty (mostly coal dust)
5-GENERAL REQUIREMENTS :
i-Flexibility -The design of the drive head and other equipment shall be flexible so that they can be adopted to different mine conditions.
ii-High reliability -The conveyors will have to be well designed and precision manufactured so that a trouble free service with a minimum of maintenance is guaranteed.
6.0-DETAILED SPECIFICATIONS :
6.1-DRIVE HEAD ASSEMBLY.:
a-Drive Head Frame: Shall be made of heavy structural steel sections
6.2-DRIVE, TAILEND, DISCHARGE PULLEY & SHAFT :
A-Drum Dia: 800 mm (Min.)
C-Shell thickness: 16 mm
D-Dia of Shaft at bearing seating: 140mm
E-Shaft material; C-40 as per IS:1570
F-Drive Drum Dia: 800 mm
6.3-SNUB PULLEY & SHAFT :
A-Drum dia: 630mm
C-Shell thickness: 12 mm
D-Dia of shaft at bearing seating: 125 mm
E-Wrap angle for snub drive: Not less than 210 deg.
6.4-BEARING BLOCKS :
A-Material of construction: Cast steel
B-Type: Heavy duty
C-Bearings: Heavy duty self aligning spherical roller bearings.
6.5-GEAR BOXES :
A-Type of gear box: Helical
B-Mounting: Foot mounted
C-Service factor : 1.6 over motor rating
D-Cooling: Natural
6.6-FLUID COUPLING :
A-Type of fluid coupling: Suitable for use in Coal Mines
B-Material of Body: Full Steel Body fluid coupling
C-Operating fluid: Fire resistant fluid
6.7-OUT PUT COUPLING :
A-Type of coupling: Geared or Resiliant
B-Service factor for selection: 1.25 over motor rating

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6.8-MOTORS :
A--Type: Sq. Cage Induction
B-Operating voltage system: 550V, \pm 6%, 3 Ph, 50 Hz
C-Minimum starting torque: 2 times full load torque
D-Motor RPM (Syn.): 1500
E-Continuous duty as per IS:12615-2011
F-Type of starting: VFD for Item No.1 & STAR-DELTA for Item no. 3 & 4
G-Class of insulation: Class F, temp. rise limited to Class B
H- Mounting of motor: Foot mounted (B3 as per IS:2253-74)
I-Cable Entry: Suitable for PVCDWA mining cable of required size.
6.9-STARTER :
6.9.1.-For Item No. 1 : VFD (Specification at Cl. No. 12.0)
6.9.2.-For item 3 & 4:
A-Type: STAR-DELTA
B-Voltage system: 550V, \pm 6%, 3 Ph, 50 Hz
D-Mounting: Skid mounted
E-Utilization category: AC3 of IS:13947 (Part 4/Sec.1)-1993
G-Nominal current rating of contactors (for AC-3 duty): Not less than 2.0 times the full load current of motor.
H-Operating limits of contactor: as per IS:13947. However, the drop out voltage shall not be more than 50% of rated control voltage.
J-Starter construction shall be in two compartments
(i) -One shall house through going bus bars and off load isolator of minimum rating 300 Amp.
(ii) -Second shall house contactors and protective device
(iii)-Door of Second compartment shall be interlocked with isolator in such a way that the door can be opened only when the isolator is in 'OFF' position.
(iv)-Cable terminal boxes with sealing boxes shall be provided for both incoming and out going terminals suitable for PVC DWA mining cables of required size.
(v)-Through going terminals of bus bar shall be provided with bus trunking box with blanking cover.
(vi)-Four nos. auxiliary terminals (4x2) with terminals box and cable sealing boxes suitable for Twin core 2.5 Sq.mm PVC SWA cable shall be provided for sequence starting, pull cord switch and pre-start alarm circuits.
(vii)-Over load protection:
a-Magnetic overload relay with oil dash pot type time lag in combination with thermal relay
b-Range of current adjustment: 75% to 100%
(viii)- Earth leakage protection:
(a) -CBCT operated, non self resetting type sensitive earth leakage relay with test/reset and indication facility.
(b)- Current setting range: Dual range, with following ranges
(a) 50mA – 300mA In steps of 50 mA
(b) 0.5 A – 2 A in steps of 0.5 A with provision to block range (b) when the range is not required.
(c) -Time delay setting range: 0-1 Sec. In steps of 0.1 Sec.
(ix)-Short circuit protection: HRC fuses of suitable rating
(x)-Instruments: Amp. Meter of suitable range
(xi)-Standard specifications : IS:13947 (Part 4/Sec.1)-1993
(xii)-Suitable provision shall be made in the starter for sequence starting interlock with other starter with timer
(xiii)-The starter shall have provision for interlocking with pull cord switches, belt sway switches , Audio-Visual alarm and limit switches at tail end .
6.10-DELIVERY JIB ASSEMBLY :
A-STRUCTURE Made of heavy structural sections, cantilever supported, bolted to Drive head frame.
B-Length of Jib: 3 Mtrs
C-Discharge pulley and shaft: as specified at cl.no.6.2

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14/151

D-Bearing blocks as cl.no.6.4
6.11-BELT SCRAPER :
A-Type of belt scraper: Counterweighed/spring loaded.
B-Rubber strip dimensions: 10mm thick x 100 mm wide
C-Rubber strip shall be fixed to the scraper by means of slotted holes to facilitate easy adjustment.
6.12-TAIL END ASSEMBLY :
A-Structure: Shall be made of heavy structural sections
B-Tail pulley and shafts: Same as clause No.6.2
C-Bearing blocks: Same as clause No. 6.4
D-Minimum ground clearance below tail pulley: 300 mm
6.13-BELT SCRAPER ON RETURN BELT BEFORE TAIL DRUM :
A-Type of Belt Scraper: V-type plough scraper
B-Angle of V: 60 deg.
6.14-WIPER CUM DUST COLLECTOR :A wiper cum dust collector trolley shall be provided at the tail end as per DGMS(Tech) Circular No.4 dated 11.05.2004,
6.15-TAKE UP ASSEMBLY :
A-Type of Take up: Horizontal, winch operated
B-Structure of trolley and trolley guide: Suitable structural sections
C-Take up Pulley, diversion pulley and shafts: Same as clause No.6.3
D-Bearing blocks: Same as clause No. 6.4
E-Operation: Manual
7.0-INTERMEDIATE STRUCTURES :
7.1-STRINGERS:
A-Stringer length: 3 meters
B-Stringer section: ISMC 125 mm x 65 mm
C-Connecting bracing: Not required
D-Size of fasteners: M-16
7.2-STOOLS :
A-Height of stool: 600 mm
B-Stool section: ISMC 125 mm x 65 mm
C-Steel section to be used for bracing for stools: ISA 50 mm x 50 mm x 6 mm
D-Size of fasteners: M-16
E-Thickness of base plate: 10 mm
7.3-CARRYING IDLER SETS :
A-Spacing: 1.5 M
B-Troughing angle: 30 deg.
C-Forward tilt of side idlers: 2 deg (max.)
D-Steel section to be used for idler frame (transome): ISA 75 mm x 75 mm x 8 mm
E-Steel section to be used for idler brackets: M.S. flat 65 mm x 10 mm or ISLC 75 mm x 40 mm
F-Carrying idler: Shall conform to enclosed Specification No.139071.
G-Thickness of mounting base plate: 10 mm
H-Provision for belt Alignment: Mounting base plates shall be provided with slotted holes to facilitate belt Alignment.
I-Size of fasteners: M-16
7.4-RETURN IDLERS :
A-Spacing:3 M
B-Brackets: Shall be welded to stools or stringers
C-Thickness of plate used for brackets: 10 mm
D-Return idler: as per enclosed Specification No.139071.

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15/151

7.5-IMPACT IDLER SETS :
A-Location: In the loading section at tail end
B-Spacing: 0.5 M
C-No. of idler Sets: 4 sets
D-Impact idler roller: as per enclosed Specification No.139071.
7.6-TRANSITION IDLER SETS :
A-Location: At delivery jib and Tail end
B-No. of idler Sets: 3 Sets
C-Troughing angles: 5 deg., 10 deg., 20 deg.
7.7-DECKING PLATES :
A-Thickness of plate: Not less than 2.5 mm
B-Location: At drive head, loop take up and loading section
Total length: Sufficient to cover the above sections
7.8-SKIRT PLATES :
A-Location: For loading section on both sides of belt
B-Thickness of plate: Not less than 6 mm 3 Meters (Min.)
C-Length: 3 Meters (Min.)
D-Height of plate: Not less than 450 mm above belt
E-Rubber strip dimensions: 10mm thick x 100 mm wide
F-Rubber strips shall be fixed to the skirt plate by means of slotted holes to facilitate easy adjustment
7.9-PROTECTIVE GUARDS/FENCES : Suitable protective guards/Fencing shall be provided at all rotating parts at drive head, discharge point, tail end etc.
7.10-ACCESSORIES :
A-PULL CORD SWITCHES :
I-Type of switch: Manual reset type
II-Enclosure: FLP
III-Pull rope: Stranded and PVC sheathed
B-BELT SWAY SWITCHES :
I-Type of switch: Auto reset type
II-Enclosure: FLP
C-AUDIO-VISUAL ALARM :
I-Type: Audio Visual alarm with pre-start warning (compact unit)
II-Enclosure: FLP
8.0-PRE-DESPATCH INSPECTION AND TESTS :
8.1-The belt conveyors will be inspected by WCL's representative/third party inspection agency at manufacturer's works before dispatch of the equipment to ascertain the conformity of the conveyors to supply order specifications, relevant ISS, and type test certificates.
8.2-Testing of assemblies/components, wherever required will be carried out by the inspector as per the relevant standards and supply order. The manufacturer shall make available to the inspector, the required test facilities with necessary support for conducting the tests.
8.3-The manufacturer shall make available to the inspector the following documents during the inspection.
(a) Copies of relevant ISS.
(b) All records of quality checks as per QAP.
(c) Dimensional/manufacturing drawings of different assemblies/components of the conveyors.
(d) Invoices in respect of purchase of raw-materials viz. steel, bearings, tubes (for rollers) etc, and bought out items.
(e) Manufacturer's test certificates in respect of raw-materials and bought out items.
F-Copies of type test certificates from Govt./Govt. approved test house, for contactors used in the starters as per IS:13947(Part-4/Sec.1)-1993.

9.0. SPECIFICATION OF ROLLERS/ IDLERS FOR THE CONVEYOR

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16/157

A-BASIC PARAMETER :
1-Type of roller: Drop in type, greased for life (Maintenance free)
2-Friction co-efficient: Not more than 0.015
3-Run out/Eccentricity: As per clause 4.5 of IS:8598
B-DIMENSIONAL DETAILS :
1-Top Roller (Troughing roller): As per the drawing given in Annex-I.
2-Bottom Roller (Return roller): As per the drawing given in Annex-I.
3-Impact roller: As per the drawing given in Annex-II.
C-MATERIALS & CONSTRUCTIONAL DETAILS :
1-Barrel/ Tube: Material of barrel: Steel tube conforming to grade yst 210 of IS:9295-1983.
2-Boring of the pipe: The pipe shall be bored on double ended boring machine, capable of simultaneous boring of both ends in a single setting to maintain coaxiality.
3-Bearing housing: Material of bearing: housing Pressed sheet metal housing drawn in CRCA sheets of extra deep drawing quality.
4-Nominal thickness of CRCA sheet: 3.15 mm (Min)
5-Wall thickness of housing after stamping and machining: Not less than 2.5 mm
6-Machining Tolerance for housing: The housing shall be finished to M7 (Min.) as per IS:919 for accommodating the outer race of the bearing.
7-Welding of bearing housing: The bearing housings shall be welded to the pipe by twin head MIG/MAG (CO ₂) welding machine capable of welding the housing at both ends simultaneously in a single setting.
8-Shaft
a-Material of shaft: Carbon steel conforming to C-40 of IS:1570 or En-8A of BS:970.
b-Machining tolerance of shaft: The shaft shall be machined and ground to J6 (Min.) as per IS:919 at bearing seatings, maintaining coaxiality of both ends.
c-Shaft ends: Type 'A' as per IS:8598-1987.
9-Bearings/Type of bearings: Seize resistant ball bearing. Note : For rollers of shaft dia above 30 mm; single row deep groove ball bearing of C3 clearance is also acceptable.
10-Lubrication: Lithium based grease with a worked penetration of 220-250, class 3.
11-Sealing Note : The sealing is to be done for the life time of the bearing.:
a-Type of seal Non contact, Multi Lip labyrinth seal
b-Material of seal Neoprene, Nylon-6 or any other better material
c-Back / Inner seal Nilon-6 or any other suitable material
d-Dust seal and rain cap Suitable material
e-Assembly of roller The bearings and seals shall be press fitted on the roller.
f-Rubber rings for impact roller: Shore hardness of rubber 50-60 deg. on shore 'A' scale.
D-PAINTING :The surface of the rollers shall be cleaned properly, removing rust, oil film etc. and one coat of anti rust paint to be given. Over this another coat of good quality paint of smoke grey colour shall be given.
E-IDENTIFICATION MARKING :Manufacturer's name/trade mark, month and year of manufacturer shall be permanently and legibly marked on the roller, by etching/ embossing which should last for the life of roller.
F-TESTING :
1-The tests shall be conducted on completed rollers at appropriate frequencies in the production batch.
2-Friction co-efficient test
3-Dimensional check up and Run out / eccentricity test
4-Dust sealing test
5-Water proofness test
G-GUARANTEE : Complete roller shall be guaranteed for a working life not less than 15000 hours.
H-PRE-DESPATCH INSPECTION :
1-The rollers will be inspected by WCL's representative/third party inspection agency at the manufacturer's works before dispatch of the consignments to ascertain the conformity of the rollers to supply order specifications and relevant ISS.

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2-The manufacturer shall make available to the inspector, the required test facilities with necessary support for conducting the inspection and tests as per the order specifications and relevant ISS.
3-Samples for the tests will be drawn from the lots (size wise) by random sampling methods. The sample size for the tests will be as follows :-
I-TESTS SAMPLES
1-Dimensional check up including measurement & run out/eccentricity: 8 Nos. rollers to be tested.
2-Friction co-efficient: Not more than 0.015: 2 Nos. rollers to be tested.
3-Dust penetration and measurement of dia of shaft (at middle) and thickness of tube and bearing housing etc.: 4 Nos. rollers to be tested.
4-Water penetration: 3 Nos. rollers to be tested.
5-The manufacturer shall make available to the inspector the following documents during the inspection :-
I-Copy of supply order
II-Copies of relevant ISS
III-Test methods
IV-Works test certificates
V-Invoices in respect of purchase of bearings, tubes and bars (for shaft) etc.
VI-Manufacturer's test certificates in respect of raw materials.
J-DOCUMENTS TO BE SUBMITTED WITH CONSIGNMENT :
1-Pre-despatch inspection and test report.
2-General arrangement/assembly drawing of the roller showing distinctly the tube, shaft, bearing housing, bearings, seals etc.
10.0. SPECIFICATION OF VFD STARTER
A-TECHNICAL PARAMETER OF VFD:
A.1-Degree of protection - IP 54
A.2-Utilization category of Starter- AC-3
A.3-Type of Starter- VFD
A.4-Voltage system: 550V, $\pm 6\%$, 3 Ph, 50 Hz.
A.5-Type of enclosure - NFLP
A.6-Output Voltage - 0-100% of supply voltage.
A.7-Output Overvoltage modulation 15% extra voltage at output by over modulation.
A.8-Control Method - Both scalar (V/f Control) & Flux Sensorless vector control methods should be possible. Closed loop of speed and torque with encoder feedback should also be possible with option feedback card.
A.9-Output Power - Drive should be dual rated and suitable for both Constant torque (CT) as well as Variable torque (VT) loads.
A.10-Overload Capacity - 100% continuous & 150% for 60secs repeated every 10 minutes
A.11-Transient Overload Capacity - 175% for 0.5secs (CT) & 125% for 0.5secs (VT).
A.12-Input Harmonic Mitigation - Should have this as a standard feature with in-built two limbed DC reactor.
A.13-Cabling distance (Inv to motor) - Should be capable of supporting 200m of unshielded cable and 150m of shielded cable without the need for an external output reactor.
A.14-Power Circuit cooling - For drive >90KW capacities the heat sink assembly should have a duct cooling arrangement in which the cooling air entry and hot air exit points can be either bottom/top or rear/rear. With this arrangement, in addition to imparting flexibility for cooling circuit design, it is also possible to exhaust the hot air from the inverter directly out of the control room without adding to the heat load,
A.15-Efficiency - Minimum overall drive efficiency should be $\geq 97\%$ at 100% load.
A.16-Ambient operating temperature - 45°C as standard without derating.
A.17-Environmental conditions - Drives should be suitable for maximum 95% RH and withstanding up to 1.0g acceleration.
A.18-POWER CIRCUIT DESIGN: The output power circuit shall consist of fast switching IGBT's which can switch power at 16 KHz with minimum on-state losses. The inverter bridge shall consist of single IGBT's in the power circuit. For higher capacities, the inverter circuit shall have a modular construction with parallel connected bridges. Across the entire power range, it will be preferable to restrict the variety of IGBT's to have a minimum spare parts count and reduce inventory carrying costs.

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Signature

198/157

A.19-COOLING :The power circuit, consisting of input rectifier and inverter, shall be mounted on a common heat sink assembly with a specially designed cooling fan mounted on it for efficient cooling. The fan shall run only when required (inverter on load or heat sink temperature exceeds a specified value). The entire assembly should be ducted on the rear with an IP-55 seal between the power and control cooling circuits. This arrangement will ensure that there is no ingress of contaminants into the control circuits. The duct arrangement shall have the flexibility. It should be possible to mount the panel housing the inverter flush with the wall by providing a rear cooling arrangement for the power circuit using an external ducting arrangement. This arrangement will ensure that there is no additional load on the existing cooling circuits in the room housing the drive panel.

A.20-ENCLOSURE DESIGN :With the IP-55 module enclosures, it should be possible for the user to have module design with Switch Disconnecter and line fuses built in as a power option. This will eliminate the need for constructing an extra panel for housing the switchgear items.

A.21-SUITABILITY FOR LONG CABLING DISTANCES: The switching pattern of the IGBT's should be such as to reduce the dv/dt stress on the drive motor (soft switching). It should be therefore possible to connect the drive motor to the VFD with a cabling distance of up to 200 mtr. of armored cable without exceeding the peak voltage & dv/dt figure of 1000V/ μ s at the motor terminals.

A.22-INPUT HARMONIC MITIGATION: The Inverter module should connect to a power system without additional harmonic mitigation devices to keep the ITHD level to an acceptable value, restricted to 40-45 % (depending upon the fault level on the supply side) at 100% inverter load.

A.23: It should have 3 contactor DOL by pass arrangement in case of failure of VFD.

B.0-CONTROL FEATURES: The drive should have the following features:

B.1- Operation in speed/torque open loop or closed loop.

B.2- Built in process PID Controller.

B.3- Programmable acceleration & deceleration times, setting range 0.01-3000secs.

B.4- Motorized Potentiometer with programmable digital inputs for "Speed Increase" and "Speed Decrease" functions.

B.5- Control of electro-mechanical brake by sensing if drive has developed adequate torque before brake release is effected. This feature allows the drive to become part of the safety system in hoisting applications.

B.6- Facility for connecting quadrature type HTL encoder for closed loop control of speed and torque.

B.7- Four programmable skip frequency points for avoiding mechanical resonance in loads which are prone to this phenomenon.

B.8- Provision for programming 8 references through DI's with 4 ramps (linear or S Curve).

B.9- Controlled deceleration in the event of excessive regeneration through braking chopper and resistor.

B.10- Programmable security functions in the event of speed reference loss. Should be programmable for the following functions- drive running at the last set speed prior to loss of reference, maximum frequency, minimum frequency and preset frequency.

B.11- Flux or AC braking for decelerating drive motor without having to use resistive braking with chopper.

B.12- DC Injection braking with programmable value for torque and duration. This feature is useful for holding applications which do not require a large braking torque and for preheating the motor windings.

B.13- Programmable Automatic Restart after an alarm condition has occurred.

B.14- Automatic Energy Optimization function to adjust the drive motor terminal voltage at reduced loads (typically ? 50%) so as to minimize the reactive current and effect power savings. This feature is especially useful for centrifugal pumps and fans.

B.15- Temperature controlled heat sink cooling fan for conserving power when drive is not running.

B.16- In the event of mains failure, the drive should be programmable to realize the following functions- Controlled deceleration to zero speed, flying restart in the event of mains restoration or kinetic backup utilizing the load mechanical energy.

B.17- Over modulation at the output at base frequency-this feature produces up to 15% more voltage at the output when full voltage is reached at the base frequency.

B.18- Programmable anti-resonance filter to take care of current hunting during running.

B.19- Programmable thresholds for warning and alarm for the following parameters- current, frequency, speed reference, torque and speed.

Vishwanath
V. Jagan

[Signature]

19/151

B.20- Logic Controller for programming specific customer sequences and actions without the need for an external PLC. An application which needs 10 I/O's or less should be implementable within the drive controller.

C.0-PROTECTIONS: The following protections should be available in the drive as standard:

C.1-Programmable Electronic Thermal Overload feature for protecting the drive motor against thermal overloads when operating at variable speed. The feature should also take into account the type of cooling of the drive motor (TEFC or force cooled).

C.2-Over temperature protection with 2 Nos. sensors-one on the heat sink and the other on the Power Board.

C.3-Protection against output short-circuit, phase to ground and motor phase current unbalance.

C.4-Protection against brake resistor overloading.

C.5-Automatically adjust the ramp rate during acceleration and deceleration to limit the motor current and DC bus voltage respectively.

C.6-DC Over voltage resulting from excessive regeneration from the load, and DC Under voltage resulting from loss of phase or phase unbalance.

C.7-Protection against earth faults by the provision of CT's in all three output phases.

C.8-Programmable choice of drive behavior in case of mains failure.

D.0-PROGRAMMING, COMMISSIONING & DIAGNOSTICS: The drive must have the following features as standard:

D.1. Automatic Motor Adaption-The drive controller must have an adaptive function to measure the motor equivalent circuit parameters at standstill condition. This is necessary to avoid decoupling the motor from the load.

D.2. Fault Diagnostics- All drive faults should be recorded with time stamp and stored in a stack memory along with the main significant values. The drive is provided with internal test procedures to test the main boards. All faults are displayed in plain text in the user's language.

D.3. Hot pluggable graphics interface with multiline display and user friendly keypad, with parameters displayed in plain language of the user's choice. It should be possible to display up to 5 parameters simultaneously. Storage of drive configuration parameters as well as transfer to other drives (Copy function) should be possible. Online availability of the instruction manual would be an added advantage. This will make the operator interface very user friendly.

D.4. Drive Parameter setup- Should be programmable via the Local Control Panel (LCP or Graphics Display) or the dedicated USB Port. The use of LCP should be password protected and access to the drive parameters via the LCP or communication bus or both should be blocked. The LCP should have the following keys as standard- Run Remote, Run Local, Stop and Reset. It should be possible to disable each key individually to prevent the operator from changing the location of operation or put it in stop mode.

D.5. Control Terminals- They should be spring loaded to ensure positive and reliable connection.

E.0-POWER & CONTROL OPTIONS

E.1.-Operation in speed/torque open loop or closed loop.

E.2-General Purpose I/O Module with 3DI, 2DO, 2AI & 1AO.

E.3-Relay Module with 3 extra relay outputs.

E.4-Encoder Module for connecting incremental encoder, Sincos encoder with hyper face & with EIA-422 Interface.

E.5-Resolver Module for position control.

E.6-Profibus DP V1 Interface for fast and efficient communication.

E.7-Device Net Interface.

E.8-Can Open & Ethernet Interface Modules.

F.0-IN ADDITION, THE FOLLOWING POWER OPTIONS should be available

F.1- Harmonic Filters for reducing input ITHD to 10% and 5% respectively. They should be effective in reducing THD at varying loads and on power systems which have unbalance and voltage distortion.

F.2- du/dt filters for reducing the voltage stress on the drive motor due to the PWM waveform and long cabling distances.

Signature

Signature

20/157

F.3- Sine Wave filters for generating a sinusoidal voltage at the motor terminals, reducing bearing currents in large motors and acoustic noise from motor. This feature is especially useful for existing non-VFD grade motors which are designed for a low insulation voltage and require a sinusoidal voltage at the terminals. It also enables the user to use longer lengths of motor cable (up to 1000m) without damaging the motor insulation.

F.4- Brake resistors for dissipating motor kinetic energy during chopper braking. The chopper should be built into the Inverter module and should provide braking torque of 50% of rated motor torque at minimum.

G.0-DRIVE CONSTRUCTION STANDARDS - The drive must conform to the following standards:

G.1- EMC

1-Emission - IEC55011, IEC61000-6-1/2, IEC61000-6-3/4, IEC61800-3

2-Immunity IEC61000-4-2, IEC61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC61000-4-6,

G.2-ENVIRONMENT STANDARDS

1-Vibration - Acceleration- 1g RMS, Frequency-18-1000Hz random, in all three directions for a duration of 2 hours, as per CEI 68-2-34/35/36.

2-Relative Humidity - 95% maximum without condensation as per IEC 721-3-3 Class 3K3.

H.0-INSTALLATION, TESTING & COMMISSIONING :

H.1-The supplier shall be required to depute qualified, trained and competent service engineers and technicians to supervise assembly, installation, field testing, commissioning and trial runs of the VFD.

H.2-The testing of the system shall be at its maximum rating under the mine operating conditions as specified to the satisfaction of the user.

I.0-TRAINING OF OPERATORS & MAINTENANCE PERSONNEL : After commissioning of the VFD training shall be provided at the site to the operators/technicians of WCL in operation, maintenance and repair of various assemblies used in the system at free of cost.

13-Performance Bank Guarantee: Performance bank guarantee to the extent of 10% of the value of the equipment which shall be kept valid for a period of 18 months from the date of supply of the equipment. The bank guarantee shall be initially valid for 18 months from the date of the supply and will be released or extended on the merit of the case. PBG shall be released after expiry of warranty period & receipt of NO CLAIM certificate from user i.e. GM(E&M)/HOD WCL.

14-GUARANTEE/WARRANTY: The supplier shall give a warranty of satisfactory performance of the complete conveyor set for a period of 12 months from the date of commissioning or 18 months from the date of receipt and acceptance of material by the WCL.

15.0-DOCUMENTS TO BE SUBMITTED ALONG WITH SUPPLY :

15.1-Self attested copy of valid DGMS approval for the offered All FLP electricals

15.2-Self attested copy of valid BIS Licence IS/IEC-60079-11:2006 for FLP Electricals.

15.3-Notary attested copies of type test certificates from Govt./Govt. Approved test house, for contactors used in the starters.

15.4-Self attested copy of IS:12615-2011 for the motors supplied with conveyor.

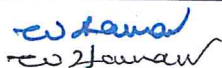
15.5-General arrangement/assembly drawings of Belt Conveyor showing all the dimensions and weights.

15.6-General arrangement/ assembly drawing of the roller showing distinctly the tube, shaft, bearing housing, bearing seals etc.

15.7-Maintenance and parts catalogues of the equipment and including all the bought-outs.

15.8-Pre-despatch inspection report.

15.9-Technical leaflets/literature in respect of all the equipment including all the bought-outs.



Chief Manager(MM) P-III



10/12/2020
Chief Manager(MM) P-I

21/151

