भारत कोकिंग कोल लिमिटेड
(A Subsidiary of Coal India Limited)
सामग्री प्रबंधन विभाग
पंजीकृत कार्यालय: कोयला भवन , कोयला नगर
धनबाद-826005, CIN :U10101JH1972GOI000918
कमर्शियल ब्लॉक L-III , कोयला भवन , कोयला नगर
धनबाद-826005 (फैक्स- 0326-2230183)
ईमेल:gmmm@bccl.gov.in,वैबसाइट:www.bccl.gov.in

BHARAT COKING COAL LIMITED
(A Subsidiary of Coal India Limited)
Regt. Off: Koyla Bhawan,Koyla Nagar
Dhanbad-826005
CIN:U10101JH1972GOI000918
Materials Management Department
Commercial Block L-III , Koyla Bhawan
Koyla NagarDhanban-826005
(Fax No- 0326-2230183)
Email.Id:gmmm@bccl.gov.in
Website:www.bccl.gov.in

Contract No. BCCL/PUR/315007/ MAN RIDING SYSTEMS /15-16 /02/172 Date:23.11.2015

To
M/S A.P.HEAVY MACHINERY AND ENGINEERING LTD.
KRISHNA DIST. ANDHRA PRADESH
KONDAPALLI-521228,

BY: Regd. Post
PAN No-AABCA8915A

SUB: SUPPLY, INSTALLATION AND COMMISSIONING OF TWO (2) CHAIR LIFT TYPE MAN RIDING SYSTEMS FOR MEN TRANSPORTATION AT MOONIDIH UNDERGROUND MINE, ON TURNKEY BASIS

REF: i) Our E-Tender No. BCCL/PUR/315007/ MAN RIDING SYSTEMS /15-16 / 02 DATE- 13.04.2015 FLOATED IN COALINDIA PORTAL(Tender ID: 2015_BCCL_10697_1), Cover – I opened on 28.05.2015 and Cover – II opened on 20.08.2015
ii) Your bid no. 28872 on coalindia portal and subsequent reply to shortfall fall documents on coalindia portal

Dear Sirs,

With reference to the above, we are pleased to place an order on you for Supply, installation and commissioning of two (2) Chair lift type Man riding systems for men transportation at Moonidih underground mine, on turnkey basis at the following rates, as per scope of supply, services, schedule of requirement, technical specification, other technical details , drawing, Scope of Work , Special terms and conditions & Conditions of contract attached at Annexure-A to Annexure-A-III, as per the terms and conditions given hereunder along with general terms and conditions of NIT

1. DETAILS AND BREAKUP OF CONTRACT VALUE:

	850m Long Manriding system	650m Long Manriding System
Basic	2,23,69,000.00	2,03,10,000.00
Rate of excise duty	12.5%	12.5%
Value of Excise duty	27,96,125.00	25,38,750.00
CST/JVAT	2%(CST)	2%(CST)
Value of CST/JVAT	5,03,302.50	4,56,975.00
Civil & Structural Work charges including Materials required for this work	5,00,000.00	5,00,000.00

Rate of Service Tax on Civil & Structural Work,	5.6%	5.6%
Value of service tax	28,000.00	28,000.00
Installation & Commissioning Charges of the Man-riding System	15,00,000.00	14,00,000.00
Rate of Service Tax on Installation & Commissioning Charges	14%	14%
Value of service tax	2,10,000.00	1,96,000.00
Total Landed Cost	Rs.2,79,06,427.50	Rs.2,54,29,725.00
Total Landed cost of two sets (Round off)	**Rs.5,33,36,152.00**	

(Rs. Five Crore Thirty Three Lakhs Thirty Six Thousand One hundred Fifty Two Only)

2.FIRM RATES: The above rates shall remain firm during the period of contract.

3.EXCISE DUTY: ED including cess shall be payable extra at actual against documentary evidence as legally leviable with in the stipulated delivery period .You being registered with central excise you shall submit the excise invoice (indicating therein all excise registration details) at the time of supply of materials alongwith the supply documents enabling BCCL to avail input credit, if applicable, as per provisions of CENVAT. The present/offered rate is @12.50%,the impact of which has been incorporated as above.

4.SALES TAX/SERVICE TAX: CST shall be payable extra,as applicable at the time of delivery within the stipulated delivery period.The present/offered rate is @2% against form "C" ,the impact of which has been incorporated as above. The offered Service tax rate of 14% is applicable. The same shall be payable extra at actuals at the rate legally applicable within the stipulated delivery period.

5.WORK COMPLETION PERIOD: The complete work (from supply to commissioning) is to be executed within a time period of 12 (twelve) months from the date of issue of order for both the man-riding systems. The works for both the man-riding systems are to be carried out simultaneously and completed within the scheduled time. However, earlier completion of contract will be appreciated.

6.PAYMENT TERMS:

i) For supply of each complete set of the equipment with accessories:

70% of the total price the equipment and accessories shall be paid within thirty (30) days after receipt and acceptance of the complete set at site or from the date of receipt of bill/ invoice,whichever is later. 20% of the total price of the equipment and accessories shall be paid paid within thirty (30) days after issuing of 'Taking over certificate'. Remaining 10% of the total price of the equipment and accessories shall be paid after completion of warrantee period.

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ii)For installation, commissioning of the man-riding system and Civil & structural works:

On installation and successfully commissioning of each set of man-riding system at site, 90% of the value of the work shall be paid paid within thirty (30) days after issuing of 'Taking over certificate'. Remaining 10% of the value of work shall be paid after completion of warrantee period.

7.CONSIGNEE : Regional Stores ,WJ Area of BCCL , Dhanbad.

8.WARRANTY/GUARRANTY:

A) The contractor shall warrant that the equipment, material, accessories will be new and in accordance with the contract documents and be free from defects in material and workmanship for a period of twelve(12) calendar months commencing from the date of issue of taking over certificate. The contractor's liability shall be limited to the replacement of any defective part in the equipment of his own manufacture or those of his sub-contractors or any supply items, under normal use and arising solely form faulty design, materials, and/or workmanship provided always that such defective parts are repairable at the site and are not in the meantime essential in the commercial use of the manriding system. Such replaced defective parts shall be returned to the contractor unless otherwise arranged. No repairs or replacements shall normally be carried out by the engineer when the manriding system is under the supervision of the contractor's supervisory engineers.
During the warrantee period proper maintenance of the system installed, spares and consumables required for satisfactory operation of the system shall be provided by the contractor. The cost toward maintenance, spares and consumables are deemed to be included in the contact price.

B)REPLACEMENT OF DEFECTIVE PARTS AND MATERIALS: If during the progress of the works the engineer shall decide and inform in writing to the contractor, that the contractor has manufactured any manriding system or part of the system unsound or imperfect or has furnished any system inferior than the quality specified, the contractor on receiving details of such defects or deficiencies shall at his own expense within seven (7) days of his receiving the notice, or otherwise, within such time as may be reasonably necessary for making it good, proceed to alter, reconstruct or remove such work and furnish fresh equipment up to the standards of the specifications. In case the contractor fails to do so, the Engineer may on giving the contractor seven (7) days notice in writing of his intentions to do so, proceed to remove the portion of the works so complained of and, at the cost of the contractor, perform all such work or furnish all such equipment provided that nothing in this clause shall be deemed to deprive the owner of or affect any rights under the contract which the owner may otherwise have in respect of such defects and deficiencies. The contractor's full and extreme liability under this clause shall be satisfied by the payments to the owner of the extra cost, of such replacement procured, including erection, as provided for in the contract, such extra cost being the ascertained difference between the price paid by the owner for such replacements and the contract price portion for such defective plant and repayments of any sum paid by the owner to the contractor in respect of such defective plant. Should the owner not so replace the defective plant, the contractor's extreme liability under this clause shall be limited to repayment of all sums paid by the owner under the contract for such defective plant.

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9.PAYING AUTHORITY: HOD(F)MM,Bharat Coking Coal Limited, Koyla Bhawan, Koyla Nagar, Dhanbad (Jharkhand) 826005

10. SECURITY DEPOSIT: Exempted being PSU.

11.PERFORMANCE BANK GUARANTEE (PBG)-PBG (in the prescribed format enclosed) on non-judicial stamp paper from a schedule/Nationalized Bank in India valid for three months beyond the expiry of Guarantee/Warranty period of the contract(ie valid for 12 months from the date of successful installation/commissioning of the system) for 10% value of the contract ie for Rs. 53,33,616.00(Rupees Fifty Three Lakhs Thirty Three Thousand Six Hundred and sixteen only) for satisfactory performance of the contract shall have to be submitted to MM Division,BCCL,Koyla Bhawan on or before commencement of supply/ installation/commissioning.

12.LIQUIDATED DAMAGE(LD) CLAUSE:

In the event of failure to deliver the equipment/stores within the stipulated date/period to effect supply 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, Bharat Coking Coal Ltd., shall be entitled at its option either to enforce the following:

a) To recover from you as agreed liquidated damages, a sum of 0.5%(Half Percent) of the price of any stores which you have 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) and where felt necessary by BCCL it may be increased up to 15 %..

b) To cancel the supply order or a portion thereof, and if so desired to purchase the stores at the risk and expenses of the defaulting supplier and also/or

c) To purchase elsewhere after notice to you ie defaulting supplier on the account and at the risk of the defaulting supplier, the equipment/stores not supplied or others of similar description without canceling the supply order in respect of the consignment not yet due for supply/or

d) To extend the period of delivery with or without liquidated damages as may be considered fit and proper. The liquidated damages if imposed, shall not be more than the agreed liquidated damages referred to in Clause (a) above except in case of force majeure condition.

e) Whenever under this contract any sum of money is recoverable from and payable by the supplier, Bharat Coking Coal Ltd., 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. You shall pay to Bharat Coking Coal Ltd., the balance amount on demand of the remaining balance. The supplier shall not be entitled for any gain on any such purchase.

f) To forfeit the security deposit fully or in part

13.Force Majeure Conditions - If the execution of the Contract / Supply Order is delayed beyond the period stipulated in the Contract / Supply Order as a result of hostilities, declaration of embargo or blockade or flood, acts of nature or any other contingency beyond the supplier's control due to act of God, then BCCL may allow such additional time by extending the delivery

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period as is considered justified by the circumstances of the case and its decision shall be final. In case additional time is granted by BCCL for execution of the Contract / Supply Order, the Contract / Supply Order shall be read and understood as if it had contained from its inception the delivery date as extended.

a) The contractor will advise, in the event of his having to resort to this clause, by a registered letter, duly certified by the local chamber of commerce, or statutory authorities, the beginning and end of the causes of the delay, within 15 days of the occurrence and cession of such force majeure conditions. In the event of delay lasting out of force majeure, BCCL will reserve the right to cancel the contract, and provisions governing termination of contract as stated in the bid documents will apply.
b) For delay arising out of Force majeure, the contractor will not claim the extension in completion date for a period exceeding the period of delay attributable to the causes of force majeure and neither BCCL nor the contractor shall be liable to pay extra cost provided it is mutually established that the force majeure conditions did actually exist.
c) If any of the force majeure conditions exist in the place of operation of contractor even in the time of submission of bid, he will categorically specify them in his bid, and state whether they have been taken in to consideration in their quotation.

14.PRICE FALL CLAUSE - The price charged for the Stores / Equipment supplied against the order, shall in no event exceed the lowest price at which the contractor shall sell or offer to sell the Stores / Equipment of identical description to its any other customer during the pendency of the Contract / Supply Order. If the contractor at any time during the pendency of the Contract / Supply Order sells or offers to sell such stores to any customer, at a price lower than the price stipulated in the Contract / Supply Order placed by BCCL, the contractor shall forthwith notify to BCCL such reduction in sale price of stores / equipment supplied after such reduction coming into force shall stand correspondingly reduced.

15.INSPECTION AND TESTS:

i)The purchaser or its authorised representative shall have the right to inspect and/or to test the goods to confirm their conformity to the contract. The purchaser shall notify the supplier in writing of the identity of any representative retained for these purposes.
ii) The inspections and tests may be conducted on the premises of the supplier or its sub-contractors), at point of delivery and/or at the goods final destination when conducted on the premises of the supplier or its subcontractor(s), all reasonable facilities and assistance, including access to drawings and production date, shall be furnished to the inspectors at no charge to the purchaser.
iii)Should any inspected or tested Goods fail to conform to the specifications, the purchaser may reject them and the supplier shall either replace the rejected goods or make all alternatives necessary to meet specification requirements free of cost to the Purchaser.
iv) The Purchaser's right to inspect, test and, where necessary, reject the goods after the Goods arrival in the Purchaser's country shall in no way be limited or waived by reason of the Goods having previously been inspected, tested and passed by the Purchaser or its representatives prior to the Goods shipment from the country of origin.

v)Materials are subject to inspection by the purchaser before dispatch.The materials may also be subject to stage inspection by a third party nominated by BCCL for the purpose. Final inspection shall, however, be carried out at the consignee's end.

v)Materials are subject to inspection by the purchaser before dispatch.The materials may also be subject to stage inspection by a third party nominated by BCCL for the purpose. Final inspection shall, however, be carried out at the consignee's end.

vi)Nothing in these documents shall in any way release the supplier from any warranty or other obligations under this contract.

vii)The purchaser shall, at its discretion, have the right to test the ordered material in a Government Test House or in a test house nominated by the purchaser. In case of failure of the material after testing, the cost of tests as well as of the material shall have to be borne by the supplier.

Final Inspection at destination site shall be arranged by the consignee within one week from the date of receipt of the material. Supplier's technical representative must be available at the time of inspection.(Also refer clause no.48 of Annexure A-IV)

All disputes will have jurisdiction of Dhanbad Court & Jharkhand High Court only.

ALL OTHER REMAINING COMMERCIAL TERMS & CONDITIONS AND TECHNICAL SPECIFICATIONS ALONG WITH SCOPE OF SUPPLY WILL STRICTLY BE AS PER OUR NIT AS CONFIRMED IN YOUR OFFER, SHORTFALL DOCUMENTS AND YOUR SUBSEQUENT LETTERS.

N.B:- This purchase order/ contract is issued with the approval of the Competent Authority.

Enclosure:

ANNEXURE A - TECHNICAL DETAILS AND SPECIFICATIONS

ANNEXURE A-I - TECHNICAL DETAILS UPLOADED BY THE FIRM WITH OFFER, LIST OF MAJOR CONSTRUCTION EQUIPMENTS,LIST OF TOOLS FOR CHAIRLIST SYSTEM, LIST OF SPARES DURING WARRANTY PERIOD,, QUESTIONARRIE UPLOADED BY FIRM AND CALCULATIONS IN SUPPORT OF POWER REQUIREMENT AND ROPE DIAMETER UPLOADED BY THE FIRM WITH OFFER as ACCEPTED TECHNICALLY.

ANNEXURE A-II - SCOPE OF WORK, TIME SCHEDULE AND PERFOMANCE GUARRANTEE

ANNEXURE A-III - TERMS AND CONDITIONS OF CONTRACT

APPENDIX I: FORMAT FOR PBG

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Yours faithfully,

(Nadeem Khan)
Assistant Manager(MM)

(A.D.Santhish)
Chief Manager(MM)
For & on behalf of Bharat Coking Coal Ltd.

INDENT/BUDGET REFERENCE:

Indent reference	Budget Certification reference.
MMD IR Regn no.315007 dated 13.04.2015	BC vide BCCL/C&B/CAP/REG. PN-42/SN-27/EBC NO.14 DATED 10.11.15 UNDER HEAD P&M(SAFETY) FOR RS.2,33,26,152.00 AND BCCL/C&B/CAP/REG.PN-42/SN-28/EBC NO.15 DATED 10.11.15 UNDER HEAD P&M(SAFETY) FOR RS.3,00,00,000.00EFC NO.5 AND 6 DATED 16.11.15 FOR RS.2, 33, 36,152.00 AND RS.3,00,00,000.00 RESPECTIVELY.

Copy:

1. GM(E&M)I/C,Koyla Bhawan
2. GM(F),MM,Koyla Bhawan.
3. GM(WJ Area)
4. Depot Officer, WJ Area
5. GM(MM)CIL/CCL/SECL/ECL/NCL/WCL/MCL/NECL
6. .MM(Tech Cell), MM Div, Koyla Bhawan
7. MF/Office Copy.
8. Shri Naresh Chaturvedi,IAS(Retd.),CL-14, Sector-II, Salt Lake, Kolkata – 700091

AM(MM)

Chief Manager(MM)

ANNEXURE-A
TECHNICAL DETAILS AND SPECIFICATIONS

1.0 GENERAL MINE INFORMATION

1.1 MINE LOCATION

Moonidih Underground Project is situated in Dhanbad district of Jharkhand. This mine is located in the south central part of Jharia Coalfield. The mine is under Western Jharia Area of Bharat Coking Coal Ltd., a subsidiary of Coal India Ltd. (CIL). This mine lies between Latitude 23°42'47" and 23°45'42" N and Longitude 86°19'21" and 86°22'26" E. The nearest railway station is Dhanbad which is about 11Km away and the nearest airport is Ranchi at a distance of about 180 Km. The mine is around 2 Km from Dhanbad-Chas section of the NH-32. The total area of the project is 14.6 Sq. Km.

1.2 TECHNICAL DATA

This mine was designed in early 1960's by Polish Consultants under a Technical Collaboration for horizon mining system to produce coking coal from seams XVIII to XV bottom up to a depth of 500 m for a production capacity of 2.1 mty. This Project was opened in 1967 with two shafts. The infrastructural facilities for production are fully developed including pit head washery. The mine has achieved till date a maximum production level of 1.2 MTY.

Powered support longwall technology and related development machinery are planned to be introduced in the development of trunk roadways and panels as well as full extraction of panels in XVI Top seam. As such suitable man riding systems will be required in this seam for speedy transportation of workers to the longwall face.

The depth of the XVI seam (combination of XVI (T), XVI (B) and XVI (Comb.)) present in this mine is given below:

Sl. No	Name of the seam	Depth Range (m)
1	XVI (T)	230-780
2	XVI (B)	240-790

The grade of coal produced from this mine is Washery Grade – II. The mine is of Degree-III gassiness. The capacity of the main mine fan is 80-140m3 per second. The incubation period for coal seams at Moonidih Project varies from 9 to 10 months. The geological reserve of this seam (more than 1.2m thickness) in Moonidih Project is given below:

(Reserve in Million Tonnes)

Seam	Coal zone	Coal in Coal+Jhama zone	Indicated	Total
XVI (T)	17.38	4.73	0.69	22.8
XVI (B)	12.81	0.56	0.56	13.93
XVI (Comb)	3.93	2.03	-	5.96

1.3 METHOD OF WORK

Extraction of panels by longwall method of mining with PSLW sets and development with road headers are done in this mine.

1.4 MINE ENTRIES

Moonidih Underground Project has been opened by two shafts namely Shaft no. 1 and Shaft no. 2 situated 80m apart. From these shafts, 4 horizons have been opened at 220m, 280m, 400m and 500m depths. At each of these horizons, cross cuts have been driven to intersect the seams. Presently 220m & 280m horizons are closed and 400 m & 500 m horizons are being utilized, 400 m is being used as production horizon.

1.5 IMMEDIATE ROOF AND FLOOR

The nature of immediate roof and floor rock of the XVI seam is given in the table below

SEAM	Roof rock	Floor rock
XVI (T)	Generally intercalation of shale and sandstone but at few	Generally intercalation of shale and sandstone but at few places

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	places carbonaceous shale	carbonaceous shale.
XVI (B)	Generally sandstone but at few places intercalation of shale and sandstone	Generally intercalation of shale and sandstone but at places varies to sandstone.
XVI (Comb)	Intercalation of shale and sandstone	Intercalation of shale and sandstone

2.0 TECHNICAL SPECIFICATION OF CHAIRLIFT SYSTEMS

2.1 BROAD TECHNICAL PARAMETERS

The main technical parameters and **minimum requirements** of the proposed man riding systems to be installed at Moonidih Underground Project are as follows:-

Sl. No.	Parameter	First System (Chair lift)	Second System (Chair lift)
1	Roadway length where the system will be installed	850m	650m
2.	Length for which the system will be designed	850m	650m
3.	Maximum gradient of incline/roadway	1 in 6	1 in 100
4.	Range of speed *	1.0 - 3.0 m/sec*	1.0 - 3.0 m/sec*
5.	System track gauge	900 mm	900 mm
6.	Distance between roller stations	15 m (Max.)	15 m (Max.)
7.	Distance between two chairs	Around 15 m	Around 15 m
8	Required man riding capacity in one direction	200 persons/ shift	200 persons/ shift
9	Return sheave diameter	To suit the system gauge of 900mm and rope diameter and as per DGMS stipulations	
10	Rope diameter (minimum)	16 mm	16 mm
11	Rope safety factor	More than 10	More than 10

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12	Minimum nos of chairs required	150	100
13	Stretcher type arrangement	3 sets	3sets
14	Drive power (minimum)	55kW	55kW
15	Type	Endless	Endless
16	Number of boarding/alighting stations	To suit the requirement of the mine	
17	Degree of gassiness	III	

*NOTE - * The maximum speed to be as per DGMS guideline/permission*

2.2 TECHNICAL SPECIFICATION

2.2.1 GENERAL

The chairlift system shall be consist of manriding chairs held on an endless rope, roller stations at regular intervals, a drive station, a return sheave (pulley) and boarding and alighting stations.

The chairs shall be of detachable type and held on the rope by positive friction. The rope will be guided and supported by roller stations at intervals not exceeding 15m. The man riding chairs will be attached with the rope at suitable intervals at the boarding station by the persons availing the system.

2.2.2 DRIVE STATION

The drive stations of the man riding systems shall be installed at the places given below:

(As shown in Drg. No. HQ/ UMD/ 000334).

- 850m long man riding system – Near loco lateral at the start of haulage dip
- 650m long man riding system – Near starting of side gallery of 14A panel

The drive unit will pull the rope at a suitable speed for continuous operation. The type of drive may be of electro-hydraulic type. The system should be fail-safe. The fluid used in the power pack shall be fire resistant type approved by DGMS. The drive pulley/sheave shall be firmly secured in order to resist the forces upon breaking load of the rope. The system should have the facility of being switched on and off by one or more main switches or by pull chord switches in the transport section. The speed of the chair shall be regulated by an adjusting lever at the

drive-end in order to limit the transport speed at the desired level. The minimum power of drive units for both the man riding system are given in the table below:

Sl. No	Name of the System	Power
1	850m long man riding system	55 kW, 550V
2	650m long man riding system	55 kW, 550 V

2.2.3 BRAKES

The drive shall be fitted with at least two types of brakes, a service brake and an emergency brake. In case of power failure or any kind of electrical fault, the brakes shall be applied automatically. Braking arrangements shall be of fail-safe type. The brakes shall be capable of holding the drive pulley stationary when the maximum torque is applied by the drive motor on either direction.

2.2.4 ROPE

The rope shall have a breaking load of at least 10 times more than the maximum static load. The rope shall be galvanised and should have a long life in normal use.

The rope shall conform to the Indian Standard for aerial ropeway and the relevant provisions of Coal Mines Regulations, 1957. The minimum diameter of the rope should be 16mm. The rope type should be Engineering Round Strand 6/7 (Fibre Core).

2.2.5 BOARDING AND ALIGHTING STATION

The alighting and boarding stations shall be made of welded steel sections with a longitudinal design ensuring a reliable system of uncoupling of the chairs and thereupon of the chairs being picked up by the rail in the transition area from rope to rail and vice-versa. The number of boarding and alighting stations required should fulfill the requirements of the mine.

2.2.6 REVERSING / RETURN STATION

The reversing/return station and tensioning column with internal tensioning weight shall be installed at the down-hill end. It shall be installed on support rails to adjust the tensioning

distance required for the counterweight.

The counterweight shall be such as to ensure the necessary rope tension in the system and shall serve to compensate for varying loads. Counter weights for tensioning arrangement shall be of modular design and made of cast iron blocks. The return pulley shall be firmly secured to resist forces limited to breaking load of the rope.

The rope guiding pulleys shall be provided at the reversing or return station to maintain proper separation between the ropes. Replaceable rubber lining should be provided on the rope pulley to ensure low wear during operation of the chairlift system.

2.2.7 CHAIR & ROLLER STATIONS

The detachable chairs shall be taken from the depository and shall be manually placed on embarking rail. The chair shall then be released for travel by pulling a trigger (release mechanism). It will accelerate on small rollers along a steel tube. At the end of the tube the chair should achieve the same speed as the moving rope and placed on the rope. The chair will be transported on the rope by a holding device offering positive friction connection between the rope and holding device. These holding devices are extremely wear-resistant and easily replaceable. The next chair shall not be engaged with the rope until the previous one has reached a minimum distance from the mounting station as indicated in the "Technical Parameters". At the time of alighting, the chair carrying the person shall smoothly leave the rope and glide over an inclined rail slowly and thereby come to standstill position.

Rollers on the holding device should ensure safe transition from the mounting rail to the rope at the end of the transport section and also from the rope to the dismounting rail.

The chair shall be made of tubular steel or equivalent material and shall have a minimum carrying capacity of around 100 kg. The spring mounted saddle shall be of wear-resistant type and easy to remove. Suitable foot support of width around 320 mm is to be provided. The height of the chair shall be around 1600 mm and the minimum clearances from side and floor shall be provided as per the DGMS guidelines and approval.

The rope will be supported by roller stations at intervals as indicated in the "Technical Parameters". The roller stations will be fixed in the roof with suitable roof bolts wherever the roof is competent. Where the roof is weak the roller stations will be anchored to girders suitably

fixed either to the side walls or to goal post supports.

2.2.8 AUDIBLE ALARM AND PULL-CORD SYSTEM

Audible alarms will be installed at intervals of 50 m along the roadway of the chairlift system. At the time of starting of the chairlift system, a warning signal is to be emitted by the audible alarms for at least 20 seconds. In case of fault in the transport section, the system shall be provided with emergency tripping facility by means of a pull-cord connected with a switch. The chairlift system should stop immediately if the pull-cord is pulled at any point. The pull chord switches shall be installed at intervals of 50 m. The rope of the pull cord switch shall be made of standard galvanized iron wire of 3 mm diameter with PVC coating on it.

2.2.9 SAFETY DEVICES

As specified by the DGMS, the following safety devices shall be provided:

i) An over speed protection device
ii) Device to prevent backward movement of the system
iii) Over travel limit switches at the ends of the run so as to stop the system if any chair passes such limits
iv) Over stretch device shall be incorporated to stop the system in the event of rope stretch beyond a preset limit or on snapping of the rope
v) Rope speed indicator in the chair lift engine room
vi) Pull cord switches installed in the roadway so that the system can be stopped from any point.

Additional safety devices shall be provided as and when required by the Director General of Mine Safety, Dhanbad.

2.2.10 ELECTRICAL

2.2.10.1 Electric motor

Suitable foot/flange mounted FLP, TEFC, heavy-duty, continuous rated with frequent start stop in quick succession type squirrel cage induction motor/s to meet the power requirement of drive unit shall be provided. kW rating of the motor shall have a margin of 10 % over the requirement and the motor power shall not be less than as mentioned in the table under

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Clause 2.2.2. The motor/s should be able to run in a dusty and humid environment, at an ambient temperature of 45°C and the degree of protection should conform to IP44 and IP55. The motor/s should conform to IS: 325 (latest) or equivalent international standard with class "F" insulation. The motor shall have high starting torque, and suitable to operate at 550 V ±10%, 50 Hz. The earthing system shall be restricted neutral type conforming to IS: 3043 (latest). The FLP enclosure of the motor and the cable entry boxes shall conform to IS/IEC 60079

2.2.10.2 Other electrical apparatus

The motor control centers shall be FLP type and complete with suitable starters and protections like overload, single phasing, short circuit, earth leakage, etc. and suitable for operating at 550V ±10%, 50 Hz, neutral earth, solid grounding system power supply system. The cable entry for motor control centers shall be through FLP type cable entry boxes.

The chairlift man riding system should be provided with pre-start warning device like audio visual alarm on each drive unit, return unit and intermediate station. The system should also be provided with push button station for emergency start/stop arrangement. The limit switch for the counter weight shall be provided with the return unit.

All the electrical equipment and fittings shall conform to relevant provisions of IS/IEC 60079 for FLP enclosure & intrinsically safe control units and also conform to Indian Electricity rules,1956; Coal Mines Regulation,1957 as amended and applicable to coal mines in India.

2.2.10.3 Lighting, Signaling & Telecommunication Arrangement

Proper lighting arrangement shall be provided in the roadway and also in the boarding and alighting stations. Warning signs shall be placed at the approach end of the alighting station with final "GET OFF" sign. All the signs are reflective type and should be electrically illuminated.

Pull cord switches shall be provided along the ropeway alignment at suitable intervals throughout the gallery. Proper signaling arrangement shall be provided in case of emergency stop and restart of the system. The signaling arrangement shall be such that signals can be passed from any point along the roadway.A suitable telecommunication system shall be installed at each station.

2.2.11 SPECIAL ARRANGEMENT

In addition to normal chairlift manriding facility, the system shall also be provided with transportation arrangement for injured personnel. A stretcher type special arrangement suitable for this purpose should be provided with the system.

2.2.12 STANDARDS/ QUALITY OF EQUIPMENT/ MACHINERY

All equipment and spares shall be designed and manufactured according to the following norms/rules and standards:-

- Electrical - Indian Standards / IEC code / Indian Electricity Rules 1956/ Coal mines regulation 1957 / Related DGMS Circulars
- Mechanical - Indian Standards/ Coal mines regulation 1957/ Related DGMS Circulars.
- Standards currently in force in the country of manufacturer of the equipment and spares shall be applied, provided that they are similar or superior to the standards mentioned above.
- All measurements, dimensions, weights, etc. of equipment and spares shall be indicated in SI units.

3.0 CIVIL AND STRUCTURAL WORK:

3.1 Concreting

Cement-concrete shall be either ordinary or controlled and in grades designated as M-20, as specified in IS: 456.

Cement used shall be ordinary Portland cement conforming to IS: 269. Only fresh cement shall be used. Epoxy based compound may be used under watery condition if required.

Coarse stone aggregates shall consist of uncoated, hard, strong, dense and durable pieces of crushed stone and shall be free from undesirable matter like disintegrated stones, soft, flaky or elongated particles, salt, alkali, vegetable matter or other deleterious substances.

Sand shall consist of siliceous material having hard, strong, durable, uncoated particles, free from undesirable amounts of dust, lumps, soft or flaky particles or other deleterious substances.

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3.2 Fabrication of structural steel works

All steel materials shall comply with the IS: 2062 specifications. All workmanship and finish shall be of the best quality and shall conform to the best-approved method of fabrication. All materials shall be finished straight and shall be machined true and square where so specified. All holes and edges shall be free of burrs. Shearing and chipping shall be neatly and accurately done and all portions of work exposed to view shall be neatly finished. Shop connections shall be by welding and should maintain required quality. All welds shall be done as per IS provisions. No weld cracks/ defects will be allowed. Residual stresses should be relieved after welding.

All exposed structural steel, unless otherwise surface protected, shall be first painted with at least one coat of red oxide primer of approved quality after thoroughly cleaning all such parts of dirt, rust, scales, greases, oils and other foreign materials by wire brushing, scraping or sand blasting, and the same shall be inspected and approved by the Engineer for painting. Afterwards, the above parts shall be finished with two coats of protective paint. The quality of the finish paint shall be as per Indian or equivalent International standard and of the colour as approved by the Engineer.

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Assistant Manager(MM) Chief Manager(MM)

ANNEXURE –A-III

PREAMBLE, SCOPE OF WORK, PERFORMANCE TIME SCHEDULE, SUB-CONTRACTOR/ SUB-VENDOR AND SUB-CONTRACTOR/ SUB-VENDOR

1.0 PREAMBLE

Bharat Coking Coal Limited (BCCL) intends to install two nos Chair Lift type Manriding systems for men transportation at underground coal mine of Moonidih underground project. One man riding system (850m) is to be installed along Haulage Dip in XVI Top seam and the other man riding system (650m) is to be installed in side gallery of D14A panel in XVI Top seam of the underground mine.

The work to be executed by the contractor (from supply to commissioning) on turnkey basis within 12 months fulfilling all the safety requirements of Directorate General of Mine Safety, India and all its associated regulations and circulars.

2.0:SCOPE OF WORK

The scope of work vide this document is to execute the work of "Supply, installation, and commissioning of Chair Lift type Manriding systems on turnkey basis at Moonidih project, BCCL." The detailed scope of work is as follows.

a) Supply of two complete sets of Chair Lift type Manriding system including chairs & stretcher type arrangements. Each system shall be capable to transport 200 persons (one way) for each shift.

b) Installation of Manriding systems in all respect. The Contractor shall construct all the civil foundations required for the equipment installation including supply of the materials required.

c) Supply and installations of all structural steel works such as goal post, cross beams, roof bolting, cable hanger etc.

d) Supply and installations of all electrical including transmission, lighting, signaling, communication etc. BCCL will provide electric supply at one point for each manriding system near the places of drive head.

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e) Supply of four sets (two sets for each system) of tools and instruments (including special tools and tackles, tools for rope splicing) required for assembly, dis-assembly and normal maintenance / repair of equipment.

f) Supply / erection of any other items / equipments /materials which are required for the successful running and commissioning of the Manriding systems.

g) Provide all safety requirements for safe, smooth and successful running of the Manriding systems.

h) Successful Trial run and Commissioning of the Manriding systems.

i) Provide Training to the Engineering personnel of the owner to acquaint them with operation and maintenance of equipment. Underground workers should also be trained to be acquainted with the Manriding system and to use it safely.

j) Provide maintenance including supply of Spares & Consumables required for smooth operation of both the manriding systems during the warranty period.

k) **DGMS approval:** As the electrical apparatus, hydraulic components, other equipment, and materials of construction, of the chairlift system shall be operated in an underground mine, it shall be the sole responsibility of the contractor/ equipment manufacturer to obtain permission and approval certificate(s) from the Director General of Mines Safety, Dhanbad, India for its use in underground coal mines before supply of equipment. This shall also apply to the linkage equipment offered as a part of system. The contractor shall submit the approval certificate along with the bid.

After installation and commissioning, it will also be the responsibility of successful contractor to satisfy all the DGMS requirements and obtain final approval of DGMS for use the manriding systems in underground coal mine.

l) to ensure post warranty availability of spares and services for smooth operation & maintenance of man riding systems for entire service life of the equipment.

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i) The contract shall be executed on turnkey basis. The Contractor shall furnish all, but not limited to, equipment and accessories materials, services and transportation to complete this work. The work shall have to be completed and operative in all details. **Any item of work or material which may not have been specifically mentioned but incidental to or necessary for completing the works shall be provided by the contractor without any additional charge to the Company.** The contractor shall also supply and / or erect the addition or modification as will be agreed upon in writing after mutual discussions with Company's representatives.

ii) The required minimum width and height of the proposed manriding roadways (with normal support) shall be made available by BCCL. Extra supports required for installation of the Manriding systems shall be provided by the Contractor.

iii) The Contractor shall supply the following design, drawings & manual alongwith the supply:

a) System engineering design showing part number & items,

b) G.A & detailed engineering designs and drawings of all civil foundations and structural included in the system,

c) G.A & detailed engineering designs and drawings of all individual units of chairlift system (Mechanical, Electrical, Communication),

d) Six sets (3 sets for each system) of Instruction Manuals with regard to proper use, care, operation and scheduled maintenance of the equipment.

iv) All the safety measures as per Mines Act and all statutory laws / circulars issued by Directorate General of Mine Safety, India must be strictly followed by the contractor during execution of the work.

v) You shall also adhere to all relevant codes and practices, environmental protection acts, electricity rules etc.

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vi) The provision of all labour, materials, constructional part, temporary works and everything, whether of a temporary or permanent nature, required for the completion of works, shall be deemed to be included in the Scope of Work.

vii) The Engineer or his representative may, on his own, instruct the Contractor to use or not to use additional / special arrangement for any part of the work, if he feels it necessary to do so.

3.0 PERFORMANCE

i) The Contractor, after successful trial run and commissioning, will have to ensure the performance of the systems and other conditions as laid down in the tender document for fulfillment of designed capacity of the systems in respect of persons to be carried per hour safely without any disturbances.

The contractor shall also ensure **90% availability** for each system (365 days) for performance guarantee.

The availability will be calculated as per the following formula:

$$\text{Percentage availability} = \frac{A - M}{A} \times 100$$

Where,

A = Total available time in Hrs i.e, No of days in year X 24

M = m +d

m = Maintenance time in Hrs

d = Break downtime in Hrs

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Availability during guarantee period of any system below 90% will attract penalty @ 2% of total cost of that system for each l% fall in Availability from 90%. In case, Availability falls below 85%, equipment will not be accepted and total cost of the system is to be refunded by the contractor to BCCL.

The downtime for schedule maintenance, if any, should be specified and should not exceed 10 % of the shift time. The scheduled maintenance should not be scheduled during peak time of its use.

4.0 TIME SCHEDULE

The complete work is to be executed within a time period of **12 (twelve) months** from the date of issue of this order. The work shall be done by the Contractor with due consideration for economy, safety, functional and architecture utilities of the Manriding system. Full attention should be given to each element of work so that the Manriding systems are commissioned in due time.

The works for both the man-riding systems are to be carried out simultaneously and completed within the scheduled time. Incase both the man-riding systems are not able to be supplied simultaneously, the priority of supply shall be as per BCCL choice.

The contractor shall submit a detailed work-schedule. The work-schedule should be approved by the Company.

5.0 EMPLOYMENT OF LOCAL LABOUR

Contractors are to employ, to the extent possible, local project affected people and pay wages not less than the applicable minimum wages.

6.0 SUB-CONTRACTOR/ SUB-VENDOR

6.1 The contract agreement will specify items of supply or services for which the contractor proposes to engage Sub-Contractor/Sub-Vendor. The contractor may from time to time propose any addition or deletion from any such list and will submit the proposals in this regard to the Engineer in Charge/Designated Officer in Charge for approval well in advance so as not to impede the progress of work. Such approval of the Engineer in Charge/Designated Officer will

not relieve the contractor from any of his obligation, duties and responsibilities under the contract.

6.2 If a contractor submits his bid, qualifies and does not get the contract because of his not being the lowest, he will be prohibited from working as a sub-contractor for the contractor who is executing the work.

23/11/15

Assistant Manager(MM)

23/11/15

Chief Manager(MM)

ANNEXURE-A-IV
TERMS AND CONDITIONS OF CONTRACT

1.0 :DEFINITIONS

i. The word "Company" or "Employer" or "Owner" or "BCCL" wherever occurs in the document, means the Bharat Coking Coal Limited, Dhanbad, represented at head quarter of the company by the General Manager (MM) or his authorized representative or any other officer specially deputed for the purpose.

ii. The word "Engineer" or "Engineer in-charge" wherever occurs, means the authorized representative or any other officer specially deputed by the Company for the purpose of contract.

iii. The word "Contractor"/"Contractors" or "Manufacturer" wherever occurs means the successful Bidder/Bidders who has/have deposited the necessary Earnest Money and has/have been given written intimation about the acceptance of tender/issue of work order and shall include legal representative of such individual or persons composing a firm or a company or the successors and permitted assignees of such individual, firm or company, as the case may be.

iv. "The Site" shall mean the site of the contract work including land and any building and erections thereon and any other land allotted by the company for contractor's use in the performance of the contract.

v. The term "sub-contractor", as employed herein, includes those having a direct contract with contractor either on piece rate, items rate, time rate or on any other basis and it includes one who furnishes work to a special design according to the plans or specifications of this work but does not include one who merely supplied materials.

vi. "Consulting Engineer"/"Consultant" shall mean any firm or person duly appointed as such from time to time by the owner.

vii. 'Accepting Authority' shall mean the management of the company and includes an authorized representative of the company or any other person or body of persons empowered in this behalf by the company.

viii. A 'Day' shall mean a day of 24 hours from midnight to midnight.

ix. Engineer/ Engineer-in-charge/ Designated Officer-in-charge who is of an appropriate seniority will be responsible for supervising and administering the contract, certifying

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payment due to the contractor, valuing variations to the contract, awarding extension of time and valuing compensation events. Engineer/ Engineer-in-charge/ Designated Officer-in-charge may further appoint his representatives i.e. another person / Project Manager or any other competent person and notify to the contractor who is directly responsible for supervising the work being executed at the site, on his behalf under the delegation of powers of the company. However, overall responsibility, as far as the contract is concerned will be that of the Engineer/Engineer-in-charge/ Designated Officer-in-charge.

x. The 'contract' shall mean the notice inviting tender, the tender as accepted by the company and the formal agreement executed between the company and the contractor together with the documents referred to therein including conditions of contract, special conditions, if any, specifications, designs & drawings including those to be submitted during progress of work, scope of work, billing schedule/schedule of quantities with rates and amounts and issue of this work order.

xi. The 'works' shall mean and include the supply and furnishing of equipment, labour and the services in accordance with the contract or parts thereof as the case may be and shall also include all extra or additional, altered or substituted works or any work of emergent nature, which in the opinion of the Engineer, become necessary during the progress of the works to obviate any risk or accident or failure or become necessary for security.

xii. "Specification" shall mean the technical specifications forming a part of the contract and such other schedules and drawings as may be mutually agreed upon.

xiii. "Contract price" shall mean the total sum for which tender is accepted by the company/ total cost as indicated in this work order.

xiv. 'Written Notice' shall mean a notice or communication in writing and shall be deemed to have been duly served if delivered in person to the individual or to a member of the firm or to an office of the contractor /Company for whom it is intended, or if delivered at or sent by registered mail to the last business address known to him who gives the notice.

xv. "Letter of Acceptance" of the tender shall mean the official notice issued by the company notifying the contractor that his tender has been accepted i.e. order has been issued.

xvi. "Date of Contract" shall mean the date on which both the parties have signed the contract agreement.

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xvii. "Manufacturer's Works or Contractor's Works" shall mean the place of work used by the Manufacturer, the Contractor, their collaborators or sub-contractors for the performance of the works.

xviii. "Inspector" shall mean the Owner or any person nominated by the Owner from time to time, to inspect the equipment stores or Works under the contract and/or the duly authorised representative of the owner.

xix. When the words "Approved", "Subject to Approval", "Satisfactory", "Equal to", "Proper", "Requested", "As directed", "Where directed", "When directed", "Determined by", "Accepted", "Permitted", or words and phrases of like import are used, the approval, judgment, direction etc. is understood to be a function of the Owner/Engineer/Engineer-in-charge.

xx. "Test of Completion" shall mean such tests as prescribed in the contract to be performed by the contractor before the Works is taken over by the Owner.

xxi. "Start-up" shall mean the time period required to bring the equipment / system covered under the Contract from an inactive condition, when installation is essentially complete, to the state ready for trial operation. The start-up shall include preliminary inspection and check up of equipment and supporting sub-systems; initial operation of the complete equipment/ system covered under the Contract to obtain necessary pre-trial operation data, perform calibration and corrective action; shut down inspection and adjustment prior to the trial operation period.

xxii. "Initial operation" shall mean the first integral operation of the complete equipment covered under the contract with sub-systems and supporting equipment in service.

xxiii. "Trial operation", "Reliability test", "Trial Run", "Complete Test", shall mean the operation after "Start-up" during which the whole system under the contract is checked under the full load condition or in real working situation. The length of the Trial Operation shall be as determined by the Engineer, unless otherwise specified elsewhere in the Contract.

xxiv. "Commercial Operation" shall mean the condition of operation in which the complete system covered under the contract, after successfully completion of trial run and commissioning, is officially declared by the Contractor to be available for continuous operation at different loads upto and including rated capacity. Such declaration by the Contractor however, shall not relieve or prejudice any of the contractor's obligations under this contract.

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xxv. "Final Acceptance / Taking over" shall mean the owner's written acceptance of the works performed under the contract, after successful completion of trial run and commissioning.

xxvi. "Guarantee Period / Warrantee Period" shall mean the one year period after taking over the system and commencement of "Commercial Operation" during which the contractor shall remain liable for maintenance, repair or replacement of any defective part of the works performed under the contract.

xxvii. "Drawings"/ "Plans" shall mean all:

a) drawings furnished by the owner/consultant as a basis for proposals,

b) supplementary drawings furnished by the Owner/Consultant to clarify and to define in greater detail the intent of the contract,

c) drawings submitted by the contractor with his proposal provided such drawings are acceptable to the Owner/Consultant,

d) drawings furnished by the Owner/Consultant to the Contractor during the progress of the work, and

e) engineering data and drawings submitted by the Contractor during the progress of the work provided such drawings are acceptable to the Engineer.

xxviii. "Codes" shall mean the following, including the latest amendments, and/or replacements, if any:

(a) Standards of Bureau of Indian Standards relevant to the works under the contract and their specifications.

(b) Other internationally approved Standards and/or rules and regulations touching the subject matter of the contract.

A.S.M.E. Test codes.

A.I.E.E. Test codes.

American Society of Materials Testing Codes.

Indian Electricity Act and Rules and Regulations made thereunder.

Indian Explosive Act and Rules and Regulations made there under.

Indian Petroleum Act and Rules and Regulations made there under.

Indian Mines Act and Rules and Regulations made there under.

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(c) Any other laws, rules, regulations and Acts applicable in the country with respect to labour, safety, compensation, insurance etc.

xxix. Words importing singular only shall also include the plural and vice-versa where the context so requires.

xxx. Words importing "Person" shall include firms, companies, corporations, and associations or bodies of individuals, whether incorporated or not.

xxxi. Terms and expressions, not defined herein, shall have the same meaning as are assigned to them in the Indian Sale of Goods Act, failing that in the Indian Contract Act, and failing that in the General Clauses Act.

xxxii. "Commissioning" the plant/project shall mean completion of Manriding systems in all respects including successful trial run and ready for commercial operation.

xxxiii. "Government Approval" shall mean all permits, licenses, authorizations, consents, clearances, decrees, waivers, privileges, approval from and filling with government instrumentalities necessary for the development, construction and operation of the plant/project.

xxxiv. "Month" shall mean a calendar month according to the Gregorian calendar.

xxxv. "Bank Guarantee" shall mean the Bank Guarantee to be provided by the contractor to Bharat Coking Coal Limited, Dhanbad.

2.0: CONTRACT DOCUMENTS

2.1 After acceptance of tender/ issue of work order the Contractor shall be deemed to have carefully examined all Contract Document to his satisfaction. If he shall have any doubt as to the meaning of any portion of the Contract Documents, he shall before signing the Contract, set forth the particulars thereof, and submit them to the Owner in writing in order that such doubt may be removed. The Owner will provide such clarifications as may be necessary in writing to the Contractor. Any information otherwise obtained from the Owner or the Engineer shall not in any way relieve the Contractor of his responsibility to fulfill his obligations under the Contract.

2.2 The laws applicable to this contract shall be the laws in force in India. Court of Dhanbad shall have exclusive jurisdiction in all matters arising under this contract.

3.0 PERFORMANCE GUARANTEE / PERFORMANCE SECURITY DEPOSIT: The format is enclosed as Appendix – I.

4.0 ASSIGNMENT AND SUBLETTING OF CONTRACT

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4.1 The contractor may, after informing the Engineer-in-charge and getting his written approval, assign or sub-let the contract or any part thereof other than for raw materials, minor detail, auxiliary works or any part of the plant for which makes are identified in the contract. Supplies of any part of the equipment not identified in the contract or any change in the identified supplier shall be subject to approval by the engineer. The experience list of the equipment vendors under consideration by the contractor for this contract shall be furnished to the engineer for approval prior to procurement of all such items/equipments. Such assignment sub-letting shall not relieve the contractor from any obligation, duty or responsibility under the contract. Any assignment as above without prior written approval of engineer shall be void.

4.2 For components/ equipment procured by the contractors for the purposes of the contract, after obtaining the written approval of the owner, the contractor's purchase specification and enquiries shall call for quality plans to be submitted by the suppliers alongwith their proposals. The quality plans called for from the vendors shall set out, during the various stages of manufacture and installation, the quality practices and procedures followed by the vendor's quality control organization, the relevant reference documents/standards used, acceptance level, inspection documentation raised etc. Such quality plans of the successful vendor shall be discussed and finalised in consultation with the engineer and shall form a part of the purchase order/ contract between the contractor and the vendor. Within 3 weeks of the release of the same purchase order/contracts for such bought out items/components, a copy of the same without price details but together with detailed purchase specifications, quality plans and delivery conditions shall be furnished to the engineer by the contractor.

5.0 PATENT RIGHTS AND ROYALTIES

5.1 Royalties and fees for patent covering materials, articles, apparatus, devices, equipment or processes used in the works shall be deemed to have been included in the contract price. The contractor shall satisfy all demands that may be made at any time for such royalties or fees and he alone shall be liable for any damages or claims for patent infringements and shall keep the owner indemnified in that regard. The contractor shall, at his own cost and expense, defend all suits or proceedings that may be instituted for alleged infringement of any patent involved in the works, and in case of an award of damages, the contractor shall pay for such award. In the event of any suit or other proceedings instituted against the owner, the same shall be defended

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at the cost and expenses of the contractor who shall also satisfy/comply any decree, order or award made against the owner. But it shall be understood that no such machine, plant, work, material or thing has been used by the owner for any purpose or any manner other than that for which they have been furnished and installed by the contractor and specified under these specifications. Final payment to the contractor by the owner will not be made while any such suit or claim remains unsettled. In the event any apparatus or equipment, or any other matter thereof furnished by the contractor, is in such suit or proceedings held to constitute infringement, and its use is enjoined, the contractor shall at his option and at his own expense, either procure for the owner, the right to continue use of said apparatus, equipment or part thereof, replace it with non-infringing apparatus or equipment or modify it, so it becomes non-infringing.

6.0 TIME – THE ESSENCE OF CONTRACT

The Contractor will take all necessary action to perform his obligations under the contract. However the Employer keeps his right to terminate the Contract by giving a written notice to do so, if the delays are more than the period as per the provisions in "Liquidated damages for delay in completion".

7.0 CONTRACT PRICE

The prices quoted by the contractor in his bid as may be agreed before signing of the contract, for the entire scope of the work including furnishing and erection of equipment covered under the specifications and documents and shall be treated as the contract price.

8.0 CHANGED QUANTITY

The owner reserves the right to vary the quantities of items or groups of items to be ordered as specified in the accompanying technical specifications, as may be necessary during the execution of the contract, but such variations unless otherwise specified in the accompanying technical specifications shall be limited to plus or minus twenty percent (20%) of the original quantity ordered.

9.0 DEDUCTIONS FROM CONTRACT PRICE

All costs, damages or expenses which the owner may have paid, for which under the contract the contractor is liable, will be claimed by the owner. All such claims shall be billed by the owner

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to the contractor regularly as and when they fall due. Such bills shall be supported by appropriate and certified vouchers or explanations, to enable the contractor to properly identify such claims. Such claims shall be paid by the contractor within fifteen (15) days of the receipt of the corresponding bills and if not paid by the contractor within the said period, the owner may then deduct the amount, from any moneys due or becoming due by him to the contractor under the contract or may be recovered by actions of law or otherwise, if the contractor fails to satisfy the owner of such claims.

10.0 CONTRACT PRICE ADJUSTMENT

Contract price shall remain firm without any escalation during the entire Contract period.

11.0 PACKING, FORWARDING AND SHIPMENT

11.1 The contractor, wherever applicable, shall after proper painting, pack and crate all equipments in such a manner as to protect them from deterioration and damage during transportation to the site and storage at the site till the time of erection. The contractor shall be held responsible for all damages due to improper packing and transportation.

11.2 The contractor shall notify the owner the expected date of arrival of the equipment at the site for the information of the owner.

11.3 The contractor shall further be responsible for making all necessary arrangements for loading, unloading and other handling right from his works upto the site and also till the equipment is erected, tested and commissioned. He shall be solely responsible for proper storage and safe custody of all equipment.

12.0 DEMURRAGE WHARFAGE, ETC

All demurrage, wharfage and other expenses incurred due to delayed clearance of the material or any other reason shall be to the account of the contractor.

13.0 INSURANCE

13.1 The contractor shall arrange, secure and maintain insurance as may be necessary and for all such amounts to protect his interests and the interests of the owner, against all risks as detailed herein in the joint names of the Owner and the Contractor with the condition that payments against all claims shall be payable by insurers to the owner as elaborated at clause 13.5. All premiums and other charges of the said insurance policies shall be paid by the contractor. The form and the limit of such insurance, as defined herein together with the under-writer thereof in

each case shall be acceptable to the owner. However irrespective of such acceptance, the responsibility to maintain adequate insurance coverage on comprehensive all risks basis at all time during the period of contract shall be that of the contractor alone. The contractor's failure in this regard shall not relieve him of any of his contractual responsibilities and obligations.

13.2 Any loss of damage to the equipment, during handling, transporting, storage and erection, till such time the plant is taken over by the owner, shall be to the account of the contractor. The contractor shall be responsible for preferring of all claims and make good for the damage or loss by way of repairs and /or replacement of the portion of the works damaged or lost. The transfer of title shall not in any way relieve the contractor of the above responsibilities during the period of the contract. The contractor shall provide the owner with a copy of all insurance policies and documents taken out by him in pursuance of the contract. Such copies of document shall be submitted to the owner immediately after such insurance coverage. The contractor shall also inform the owner in writing at least sixty (60) days in advance regarding the expiry, cancellation and/or change in any of such documents and ensure revalidation/renewal, etc. as may be necessary well in time.

13.3 The risk that are to be covered under the insurance shall include, but not be limited to, the loss or damage in transit, theft, pilferage, riot, civil commotion, weather conditions, accidents of all kinds, fire etc. The scope of such insurance shall cover the entire value of the works from time to time.

13.4 All costs on account of insurance liabilities covered under the contract will be on contractor's account and will be included in contract price. However, the owner may from time to time during the pendency of the contract, ask the contractor in writing to limit the insurance coverage risks and in such a case, the parties to the contract will agree for a mutual settlement for reduction in contract price to the extent of reduced premium amounts.

13.5 All insurance claims, payable by the insurers, shall be paid to the Owner which shall be released to the contractor in installments as may be certified by the Engineer for the purpose of rebuilding or replacement or repair of the works and/or goods destroyed or damaged for which payment was received from the insurers.

14.0 LIABILITY FOR ACCIDENTS AND DAMAGES

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14.1 The company (BCCL) will not be responsible for any accident during work to any workman / staff or any one who is assigned job by the Contractor.

14.2 Under the contract, the contractor shall be responsible for loss or damage to the plant until the plant is taken over in accordance with Clause 50.0 of Chapter IV, Conditions of Contract.

15.0 LIQUIDATED DAMAGES FOR DELAY IN COMPLETION

15.1 If the contractor fails to maintain the required progress in terms of the agreed time and progress chart or to complete the work and clear the site on or before the date of completion of contract or extended date of completion, he shall without prejudice to any other right or remedy available under the law to the company on account of such breach, pay as compensation/Liquidated Damages @ half percent (1/2 %) of the contract price per week of delay. The aggregate of such compensation / compensations shall not exceed ten percent (10%) of the contract price. This will also apply to items or group of items for which separate period of completion has been specified. The amount of compensation may be adjusted or set off against any sum payable to the contractor under this or any other contract with the company.

15.1.1 The company, if, satisfied that the works can be completed by the contractor within a reasonable time after the specified time of completion, may allow further extension of time as its discretion with or without the levy of L.D. In the event of extension granted being with L.D, the company will be entitled without prejudice to any other right or remedy available in that behalf, to recover from the contractor as agreed damages equivalent to half percent (1/2%) of the contract value of the works for each week or part of the week subject to a ceiling of ten percent (10%) of the contract price.

15.1.2 The company, if not satisfied that the works can be completed by the contractor and in the event of failure on the part of the contractor to complete work within further extension of time allowed as aforesaid, shall be entitled, without prejudice to any other right, or remedy available in that behalf, to rescind the contract.

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15.1.3 The company, if not satisfied with the progress of the contract and in the event of the failure of the contractor to recoup the delays in the mutually agreed time frame, shall be entitled to terminate the contract.

15.1.4 In the event of such termination of the contract as described in clauses 15.1.2 or 15.1.3 or both, the company, shall be entitled to recover L.D up to ten percent (10%) of the contract value and forfeit the Performance security deposit made by the contractor besides getting the work completed by other means at the risk and cost of the contractor.

15.2 The company may waive the payment of compensation (liquidated damages), depending upon merit of the case, on request received from the contractor if the entire work is completed within the date as specified in the contract or as validly extended without stipulating any penalty.

16.0 CONTRACTOR'S DEFAULT

16.1 If the contractor neglect to execute the works with due diligence and expedition or refuse or neglect to comply with any reasonable orders given to him, in writing by the engineer in connection with the works or shall contravene the provisions of the contract, the owner may give notice in writing to the contractor to make good the failure, neglect or contravention complained of. If the contractor fail to comply with the notice within thirty (30) days from the date of service thereof, then and in such case the owner shall be at liberty to employ other workmen and forthwith execute such part of the works as the contractor may have neglected to do or if the owner shall think fit, it shall be lawful for him, without prejudice to any other right he may have under the contract, to take the works wholly or in part thereof and in that event the owner shall have free use of all contractor's equipment that may have been at the time on the site in connection with the works without being responsible to the contractor for fair wear and tear thereof and to the exclusion of any right of the contractor over the same, and the owner shall be entitled to retain and apply any balance which may otherwise be due on the

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contract by him to the contractor, or such part thereof as may be necessary, the payment of the cost of executing the said part of the works or of completing the works as the case may be. If the cost of completing the works or executing a part thereof as aforesaid shall exceed the balance due to the contractor, the contractor shall pay such excess. Such payment of excess amount shall be independent of the liquidated damages for delay which the contractor shall have to pay if the completion of work is delayed.

16.2 In addition, such action by the owner as aforesaid shall not relieve the contractor of his liability to pay liquidated damages for delay in completion of works as defined in clause 15.0 of this section.

16.3 The termination of the contract under this clause shall not entitle the contractor to reduce the value of the performance bank guarantee nor the time thereof. The performance guarantee shall be valid for the full value and for the full period of the contract including guarantee period.

16.4 If the contractor fails to complete the work and the order is cancelled, the amount due to him on account of work executed by him, if payable, shall be paid to him only after due recoveries as per the provisions of the contract and that too after alternative arrangements to complete the work has been made.

17.0 FORCE MAJEURE

17.1 Force majeure is herein defined as any cause which is beyond the control of the contractor or the owner as the case may be which they could not foresee or with a reasonable amount of diligence could not have foreseen and which substantially affect the performance of the contract, such as:

1. natural phenomena, including but not limited to floods, draughts, earthquakes and epidemics.
2. acts of any government, including but not limited to war, declared or undeclared, priorities, quarantines, embargoes.

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Provided either party shall within fifteen (15) days from the occurrence of such a cause notify the other in writing of such causes.

17 .2 a) The Contractor will advise, in the event of his having resort to this clause by a registered letter duly certified by the local chamber of commerce or statutory authorities, the beginning and end of the cause of delay, within fifteen days of the occurrence and cessation of such Force Majeure condition. In the event of delay, lasting over two months, if arising out of Force Majeure, the contract may be terminated at the discretion of the company.

b) For delays arising out of Force Majeure, the contractor will not claim extension in completion date for a period exceeding the period of delay attributable to the causes of Force Majeure and neither company nor the contractor shall be liable to pay any extra cost (like increase in rates, remobilization advance, idle charges for labour and machinery etc.). Provided it is mutually established that the Fore Majeure conditions did actually exist.

a) If any of the Force Majeure conditions exists in the place of operation of the contractor even at the time of submission of bid he will categorically specify them in his bid and state whether they have been taken into consideration in their quotations.

17.3 The contractor or the owner shall not be liable for delays in performing his obligations resulting from any Force Majeure cause as referred to and/or defined above. The date of completion will, subject to hereinafter provided, be extended by a reasonable time even though such cause may occur after contractor's performance of his obligations has been delayed for other causes.

18.0 DELAY BY OWNER OR HIS AUTHORISED AGENT

18.1 In case the contractor's performance is delayed due to any act of omission on the part of the owner or his authorised agents. then the contractor shall be given due extension of time for the completion of the works, to the extent such omission on the part of the owner has caused delay

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in the contractor's performance of his work. Regarding reasonableness or otherwise of the extension of time, the decision of the engineer shall be final.

18.2 In addition, the contractor shall be entitled to claim demonstrable and reasonable compensation if such delays have resulted in any increase in the cost of work. The owner shall examine the justification for such a request for claim, and if satisfied, the extent of compensation shall be mutually agreed depending upon the circumstances at the time of such an occurrence.

18.3 Any delay in finalisation of mutual agreement in regard to any of the contractor's claim/compensation against any act of omission on the part of the owners or his authorised agents should not result in any work stoppage/further delay on the part of the contractor.

19.0 EXTENSION OF DATE OF COMPLETION

19.1 On happening of any events causing delay as stated hereinafter, the contractor shall intimate immediately in writing the Engineer-in-charge:

a) due to any reasons defined as Force Majeure

b) non-availability of stores which are the responsibility of the owner to supply

c) non-availability or breakdown of facilities to be made available or made available by the owner

d) delay on the part of the contractors or tradesmen engaged by the owner not forming part of the contract, holding up further progress of the work

e) non-availability of working drawings / work programme in time, which are to be made available by the company during progress of the work

f) any other causes which, at the sole discretion of the company is beyond the control of the contractor.

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19.2 A "Hindrance Register" shall be maintained by both the Company and the Contractor at site to record the various hindrances, as mentioned above encountered during the course of execution.

19.3 The contractor may request the company in writing for extension of time within 14 days of happening of such event causing delay stating also, if practicable, the period for which extension is desired. The company may, considering the eligibility of the request, give a fair and reasonable extension of time for completion of the work. Such extension shall be communicated to the contractor in writing by the company through the Engineer-in-charge within 1 month of the date of receipt of such request. The contractor shall however use his best efforts to prevent or make good the delay by putting his endeavors constantly as may be reasonably required of him to the satisfaction of the Engineer-in-charge.

~~19.4 Provisional extension of time may also be granted by the Engineer-in-charge during the course of execution, on written request for extension of time within 15 (fifteen) days of happening of such events as stated above, reserving the company's right to impose/waive liquidated damages at the time of granting final extension of time as per contract agreement.~~

19.5 When the period fixed for the completion of the contract is about to expire, the question of extension of the contract may be considered at the instance of the Contractor or the Company or the both. The extension will have to be by party's agreement, expressed or implied.

~~19.6 In case the Contractor does not apply for grant of extension of time within 15 (fifteen) days of hindrance occurring in execution of the work and the Company wants to continue with the work beyond the stipulated date of completion for reason of the work having been hindered, the Engineer-in-charge at his sole discretion can grant provisional extension of time even in the absence of application from the Contractor. Such extension of time granted by the Engineer-in-charge is valid provided the Contractor accepts the same either expressly or implied by actions before and subsequent to the date of completion. Such extension of time shall be without prejudice to Company's right to levy compensation under the relevant clause of contract.~~

20.0 TERMINATION, SUSPENSION, CANCELLATION & FORECLOSURE OF CONTRACT

20.1 The owner shall, in addition to other remedial steps to be taken as provided in the conditions of contract, be entitled to cancel the contract in full or in part, if the contractor

a. makes default in proceeding with the works with due diligence and continues to do so even after a notice in writing from the Engineer-in-charge, then on the expiry of the period as specified in the notice

or

b. commits default/breach in complying with any of the terms and conditions of the contract and does not remedy it or fails to take effective steps for the remedy to the satisfaction of the Engineer-in-charge, then on the expiry of the period as may be specified by the Engineer-in-charge in a notice in writing

or

c. fails to complete the work or items of work with individual dates of completion, on or before the date/dates of completion or as extended by the company, then on the expiry of the period as may be specified by the Engineer-in-charge in a notice in writing

or

d. shall offer or give or agree to give any person in the service of the company or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for act/acts of favour in relation to the obtaining or execution of this or any other contract for the company.

or

e. shall try to obtain a contract with the company by way of ring tendering or other non-bonafide method of competitive tendering.

or

f. Transfers, sublets, assigns the entire work or any portion there of without the prior approval in writing from the Engineer-in-charge. The Engineer-in-charge may be giving a written notice, cancel the whole contract or portion of it in default.

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20.2 The owner shall in occurrence of such an event give fifteen (15) days notice in writing to the contractor of his decision to do so.

20.3 The contractor upon receipt of such notice shall discontinue the work on the date and to the extent specified in the notice, make all reasonable efforts to obtain cancellation of all orders and contracts to the extent they are related to the work terminated and terms satisfactory to the owner, stop all further sub-contracting or purchasing activity related to the work terminated, and assist the owner in maintenance, protection, and disposition of the works acquired under the contract by the owner.

20.4 The contract shall stand terminated under the following circumstances unless the owner is satisfied that the legal representatives of the individual contractor or of the proprietor of the proprietary concern and in the case of partnership the surviving partners, are capable of carrying out and completing the contract and the owner shall in any way not be liable to payment of any compensation to the estate of deceased contractor and/or to the surviving partners of the contractor's firm on account of the termination of the contract:

a. If the contractor being an individual in the case of proprietary concern or in the case of a partnership firm any of its partners is declared insolvent under the provisions of insolvency act for the time being in force, or makes any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors amounting to proceedings for liquidation or composition under any insolvency act.

b. In the case of the contractor being a company, its affairs are under liquidation either by a resolution passed by the company or by an order of court, not being a voluntary liquidation proceedings for the purpose of amalgamation or reorganisation, or a receiver or manager is appointed by the court on the application by the debenture holders of the company, if any.

c. If the contractor shall suffer an execution being levied on his/their goods, estates and allow it to be continued for a period of 21 days.

d. On death of the contractor being a proprietary concern or of any of the partners in the case of a partnership concern and the company is not satisfied that the legal

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representative of the deceased proprietor on the other surviving partners of the partnership concern are capable of carrying out and completing the contract. The decision of the company in this respect shall be final and binding which is to be intimated in writing to the legal representative or to the partnership concern.

20.5 If the contractor is an individual or a proprietary concern and the individual or the proprietor dies and if the contractor is a partnership concern and one of the partners dies, then unless the owner is satisfied that the legal/representatives of the individual contractor or of the proprietor of the proprietary concern and in the case of partnership the surviving partners, are capable of carrying out and completing the contract the owner shall be entitled to cancel the contract as to its incomplete part without being in any way liable to payment of any compensation to the estate of deceased contractor and/or to the surviving partners of the contractor's firm on account of the cancellation of the contract.

The decision of the owner that the legal representative of the deceased contractor or surviving partners of the contractor's firm cannot carry out and complete the contract shall be final and binding on the parties. In the event of such cancellation the owner shall not hold the estate of the deceased contractor and/or the surviving partners of the estate of the deceased contractor and/or the surviving partners of the contractor's firm liable to damages for not completing the contract.

20.6 On cancellation of the contract or on termination of the contract, the Engineer-in-charge shall have powers:

a. to take possession of the site and any materials, constructional plant, implements, stores, etc. thereon.

b. to carry out the incomplete work by any means at the risk of the contractor.

c. to determine the amount to be recovered from the contractor for completing the remaining work or in the event the remaining work is not to be completed the loss/damage suffered, if any, by the company after giving credit for the value of the work executed by the contractor up to the time of termination/cancellation less on a/c payments made till date and value of contractor's materials, plant, equipment, etc. taken possession of after termination/cancellation

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d. to recover the amount determined as above, if any, from any moneys due to the contractor or any account or under any other contract and in the event of any shortfall, the contractor shall be called upon to pay the same on demand.

The need for determination of the amount of recovery of any extra cost/expenditure or of any loss/damage suffered by the company shall not however arise in the case of termination of the contract for death/demise of the contractor as stated in 20.4(d).

20.7 Suspension of work – The company shall have power to suspend the progress of the work or any part thereof and the Engineer-in-charge may direct the contractor in writing to suspend the work, for such period and in such manner as may be specified therein, on account of any default on the part of the contractor, or for proper execution of the work for reasons other than any default on the part of the contractor, or on ground of safety of the work or part thereof, in the event of suspension for reason other than any default on the part of the contractor, extension of time shall be allowed by the company equal to the period of such suspension. Any necessary and demonstrable costs incurred by the contractor as a result of such suspension of the works will be paid by the owner, provided such costs are substantiated to the satisfaction of the Engineer. The owner shall not be responsible for any liabilities if suspension or delay is due to some default on the part of the contractor or his sub-contractor.

The work shall, through the stipulated of contract, be carried out with all due diligence on the part of the contractor. In the event of termination or suspension of the contract, on account of default on the part of the contractor, as narrated herein before, the Performance security deposit and other dues of this work or any other work done under this company shall be forfeited and brought under the absolute disposal of the company provided, that the amount so forfeited shall not exceed 10% of the contract value.

20.8 Foreclosure of contract in full or in part – If at any time after acceptance of the tender/ issue of work order, the company decides to abandon or reduce the scope of the work for any reason whatsoever the company, through its Engineer-in-charge, shall give notice in writing to that

effect to the contractor. In the event of abandonment/reduction in the scope of work, the company shall be liable

a. to pay the contractor at the contract rates full amount for works executed and measured at site up to the date of such abandonment/reduction in the work.

b. To pay reasonable amount assessed and certified by the Engineer of the expenditure incurred, if any, by the contractor on preliminary works at site e.g. temporary access roads, temporary construction for labour and staff quarters, office accommodation, storage of materials, water storage tanks and supply for the work including supply to labour /staff quarters, office, etc.

c. To pay for the materials brought to site or to be delivered at site, which the contractor is legally liable to pay, for the purpose of consumption in works carried out or were to be carried out but for the foreclosure, including the cost of purchase and transportation and cost of delivery of such materials. The materials to be taken over by the company should be in good condition and the company may allow at its discretion the contractor to retain the materials in full or part if so desired by him and to be transported by the contractor from site to his place.

d. To take back the materials issued by the company but remaining unused, if any, in the work on the date of abandonment/reduction in the work, at the original issued price less allowance for any deterioration or damage caused while in custody of the contractor.

e. To pay for the transportation of tools and plants of the contractor from site to contractor's place or to any other destination, whichever is less.

The contractor shall, if required by the Engineer-in-charge, furnishes to him books of accounts, papers, relevant documents as may be necessary to enable the Engineer-in-charge to assess the amount payable in terms of para 20.8 (b), (c) and (e) above, the contractor shall not have any claim for compensation whatsoever either for abandonment or for reduction in the scope of work, other than those as specified above.

21.0 NO WAIVER OF RIGHTS

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Neither the inspection by the owner or the engineer or any of their officials, employees or agents nor any order by the owner or the engineer for payment of money or any payment for or acceptance of, the whole or any part of the works by the owner or the engineer, nor any extension of time, nor any possession taken by the engineer shall operate as a waiver of any provision of the contract, or of any power herein reserved to the owner, or any right to damages herein provided, nor shall any waiver of any breach in the contract be held to be a waiver of any other or subsequent breach.

22.0 **CERTIFICATE NOT TO AFFECT RIGHT OF OWNER AND LIABILITY OF CONTRACTOR**

No interim payment certificate of the engineer, nor any sum paid on account, by the owner, nor any extension of time for execution of the works granted by the engineer shall affect or prejudice the rights of the owner against the contractor or relieve the contractor of his obligations for the due performance of the contract, or be interpreted as approval of the works done or of the equipment furnished and no certificate shall create liability for the owner to pay for alterations, amendments, variations or additional works not ordered, in writing, by the engineer or discharge the liability of the contractor for the payment of damages whether due, ascertained, or certified or not, or any sum against the payment of which he is bound to indemnify the owner, nor shall any such certificate nor the acceptance by him of any sum paid on account or otherwise affect of prejudice the rights of the contractor against the owner.

23.0 **GRAFTS AND COMMISSIONS ETC.**

Any graft, commission, gift or advantage given, promised or offered by or on behalf of the contractor or his partner, agent, officers, director, employee or servant or any one of his or their behalf in relation to the obtaining or to the execution of this or any other contract with the owner, shall, in addition to any criminal liability which it may incur, subject the contractor to the cancellation of this and all other contracts and also to payment of any loss or damage to the owner resulting from any cancellation. The owner shall then be entitled to deduct the amount so payable from any money otherwise due to the contractor under the contract.

24.0 **LANGUAGE AND MEASURES**

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All documents pertaining to the contract including specifications, schedules notices, correspondence, operating and maintenance instructions, drawings or any other writing shall be written in English language. The SI system of measurement shall be used exclusively in the contract.

25.0RELEASE OF INFORMATION

The contractor shall not communicate or use in advertising, publicity, sales releases or in any other medium, photographs or other reproduction of the works under this contract, or descriptions of the site, dimensions, quantity, quality or other information, concerning the works unless prior written permission has been obtained from the owner.

26.0 CONSTRUCTION OF THE CONTRACT

26.1 The contract shall in all respects be construed and governed accordingly to Indian Laws.

26.2 It is clearly understood that the total consideration for the contract(s) has been broken up into various components only for the convenience of payment of advance under the contract (s) and for the measurement of deviations or modifications under the contract (s).

27.0 COMPLETION OF CONTRACT

Unless otherwise terminated under the provisions of any other relevant clause, this contract shall be deemed to have been completed at the expiration of the guarantee period as provided for under the clause titled 'Guarantee' in this section.

28.0 ENFORCEMENT OF TERMS

The failure of either party to enforce at any time of the provisions of this contract or any rights in respect thereto or to exercise any option herein provided, shall in no way be construed to be a waiver of such provisions, rights or options or in any way to affect the validity of the contract.

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The exercise by either party of any of its rights herein shall not preclude or prejudice either party from exercising the same or any other right it may have hereunder.

29.0 ENGINEER'S DECISION

29.1 In respect of all matters which are left to the decision of the engineer including the granting or with holding of the certificates, the engineer shall, if required to do so by the contractor give in writing a decision thereon.

29.2 If in the opinion of the contractor, a decision made by the engineer is not in accordance with the meaning and intent of the contract, the contractor may file with the engineer within fifteen (15) days after receipt of the decision, a written objection to the decision. Failure to file an objection within the allotted time will be considered as acceptance of the engineer's decision and the decision shall become final and binding.

29.3 The engineer's decision and the filling of the written objection thereto shall be a condition precedent to the right to any legal proceedings. It is the intent of the agreement that there shall be no delay in the execution of the works and the decision of the engineer as rendered shall be promptly observed.

30.0 CO-OPERATION WITH OTHER CONTRACTORS AND CONSULTING ENGINEERS

The contractor shall agree to co-operate with the owner's other contractors and consulting engineers and freely exchange with them such technical information as is necessary to obtain the most efficient and economical design and to avoid unnecessary duplication of efforts. The Engineer shall be provided with three copies of all correspondence addressed by the contractor to other sub-contractors and consulting engineers in respect of such exchange of technical information.

31.0 TRAINING OF OWNER'S PERSONNEL

31.1 The contractor shall undertake to train without any additional cost, engineering personnel selected and sent by the owner at the works of the contractor to acquaint with operation and maintenance of the equipment. The period and the nature of training for the individual personnel shall be agreed upon mutually between the contractor and the owner. These engineering personnel shall be given special training in the shops where the equipment will be manufactured and/or their collaborator's works and where possible, in any other plant where such equipment manufactured by the contractor or his collaborator is under installation or test to enable those personnel to become familiar with the equipment being furnished by the

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contractor. In addition to that, underground workers should be trained to be acquainted with the manriding system and to use it safely.

31.2 Cost of training is deemed to have been included in the price quoted/ contract price. However, all traveling and living expenses for the engineering personnel to be trained during the total period of training will be borne by the owner. These engineering personnel while undergoing training shall be responsible to the contractor for discipline.

31.3 In the event of the owner, for any reason, failing to avail of the training facilities, he shall not be entitled for any rebate whatsoever on this account..

32.0 POWER TO VARY OR OMIT WORK

32.1 No alterations, amendments, omissions, suspensions or variations of the works (hereinafter referred to as 'Variation') under the contract as detailed in the contract documents, shall be made by the contractor except as directed in writing by the Engineer, but the Engineer shall have full power subject to the provision hereinafter contained from time to time during the execution of the contract, by notice in writing, to instruct the contractor to make such variation without prejudice to the contract. The contractor shall carry out such variation and be bound by the same conditions as far as applicable as though the said variation occurred in the contract documents. If any suggested variation would, in the opinion of the contractor, if carried out, prevent him from fulfilling any of his obligations or guarantees under the contract, he shall notify the Engineer thereof in writing and the Engineer shall decide forthwith, whether or not the same shall be carried out and if the Engineer confirm his instructions, contractor's obligations and guarantees shall be modified to such an extent as may be mutually agreed. Any agreed difference in cost occasioned by any such variation shall be added to or deducted from the contract price as the case may be.

32.2 In the event of the Engineer requiring any variation, such reasonable and proper notice shall be given to the contractor to enable him to work his arrangements accordingly, and in cases where goods or materials are already prepared or any design, drawings of pattern made or work done requires to be altered, a reasonable and agreed sum in respect there of shall be paid to the contractor.

32.3 In any case in which the contractor has received instructions from the engineer as to the requirement of carrying out the altered or additional substituted work which either then or later on, will in the opinion of the contractor, involve a claim for additional payments, the contractor

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shall immediately and in no case later than thirty (30) days, after receipt of the instructions aforesaid and before carrying out the instructions, advise the engineer to that effect. But the Engineer shall not become liable for the payment of any charges in respect of any such variations, unless the instructions for the performance of the same shall be confirmed in writing by the Engineer.

32.4 If any variation in the works, results in reduction of contract price, the parties shall, agree, in writing, so to the extent of any change in the price, before in contractor proceeds with the change.

32.5 In all the above cases, in the event of a disagreement as to the reasonableness of the said sum, the decision of the Engineer shall prevail.

32.6 Notwithstanding anything stated above in this clause, the Engineer shall have the full power to instruct the contractor, in writing, during the execution of the contract, to vary to quantities of the items or groups of items. The contractor shall carry out such variations and be bound by the same conditions, as though the said variations occurred in the contract documents. However, the contract price shall be adjusted at the rates and the prices provided for the original quantities in the contract.

33.0 GUARANTEE

33.1 The contractor shall warrant that the equipment, material, accessories will be new and in accordance with the contract documents and be free from defects in material and workmanship for a period of twelve(12) calendar months commencing from the date of issue of taking over certificate. The contractor's liability shall be limited to the replacement of any defective part in the equipment of his own manufacture or those of his sub-contractors or any supply items, under normal use and arising solely form faulty design, materials, and/or workmanship provided always that such defective parts are repairable at the site and are not in the meantime essential in the commercial use of the manriding system. Such replaced defective parts shall be returned to the contractor unless otherwise arranged. No repairs or replacements shall normally be carried out by the engineer when the manriding system is under the supervision of the contractor's supervisory engineers.

33.2 During the warrantee period proper maintenance of the system installed, spares and consumables required for satisfactory operation of the system shall be provided by the

contractor. The cost toward maintenance, spares and consumables are deemed to be included in the contact price.

34.0 REPLACEMENT OF DEFECTIVE PARTS AND MATERIALS

34.1 If during the progress of the works the engineer shall decide and inform in writing to the contractor, that the contractor has manufactured any manriding system or part of the system unsound or imperfect or has furnished any system inferior than the quality specified, the contractor on receiving details of such defects or deficiencies shall at his own expense within seven (7) days of his receiving the notice, or otherwise, within such time as may be reasonably necessary for making it good, proceed to alter, reconstruct or remove such work and furnish fresh equipment up to the standards of the specifications. In case the contractor fails to do so, the Engineer may on giving the contractor seven (7) days notice in writing of his intentions to do so, proceed to remove the portion of the works so complained of and, at the cost of the contractor, perform all such work or furnish all such equipment provided that nothing in this clause shall be deemed to deprive the owner of or affect any rights under the contract which the owner may otherwise have in respect of such defects and deficiencies.

34.2 The contractor's full and extreme liability under this clause shall be satisfied by the payments to the owner of the extra cost, of such replacement procured, including erection, as provided for in the contract, such extra cost being the ascertained difference between the price paid by the owner for such replacements and the contract price portion for such defective plant and repayments of any sum paid by the owner to the contractor in respect of such defective plant. Should the owner not so replace the defective plant, the contractor's extreme liability under this clause shall be limited to repayment of all sums paid by the owner under the contract for such defective plant.

35.0 DEFENCE OF SUITS

If any action in court is brought against the owner or engineer or an officer or agent of the owner for the failure or neglect on the part of the contractor to perform any acts, matters, covenants or things under the contract, or for damage or injury caused by the alleged omission or negligence on the part of the contractor, his agents, representatives or his sub-contractors, workmen, suppliers or employees, the contractor shall in all such cases indemnify and keep the owner, and the engineer and/or his representative, harmless from all losses, damages, expenses or decrees arising of such action.

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36.0 LIMITATIONS OF LIABILITIES

The final payment by the owner in pursuance of the contract shall mean the release of the contractor from all his liabilities under the contract. Such final payment shall be made only at the end of the guarantee period as detailed in clause 33 above and till such time as the contractual liabilities and responsibilities of the contractor, shall prevail. All other payments made under the contract shall be treated as on account payments.

37.0 *MARGINAL NOTES*

The marginal notes to any clause of the contract shall not affect or control the construction of such clause.

38.0 TAXES, PERMITS & LICENCES

The contractor shall be liable and pay all-Indian taxes, duties, levies, lawfully assessed against the owner or the contractor in pursuance of the contract. Taxes should be shown separately as per 'form of price bid'. In addition the contractor shall be responsible for payment of all Indian duties, levies and taxes lawfully assessed against the contractor for his personal income and property only. This clause shall be read in conjunction with clause 12.3 of section Instruction to contractor

39.0 PROGRESS REPORTS

During the various stages of the works in the pursuance of the contract, the contractor shall at his own cost submit periodic progress reports as may be reasonably required by the engineer with such materials as charts, net-works, photographs, test certificates, etc. such progress report shall be in the form and size as may be required by the Engineer and shall be submitted in at least three (3) copies.

40.0 LONG TERM AVAILABILITY OF SPARES

40.1 You shall guarantee the long term availability of spares to the owner for the full life of the equipment covered under the contract. You shall guarantee that before going out of production of spare parts of the equipment covered under the contract, he shall give the owner at least twelve (12) months advance notice so that the latter may order his bulk requirement of spares, if he so desires. The same provision will also be applicable to sub-contractor. Further, in case of discontinuance of manufacture of any spares by the contractor or his sub-contractors the contractor will provide the owner two years in advance, with full manufacturing drawings,

material specifications and technical information required by the owner for the purpose of manufacture of such items.

40.2 Further, in case of discontinuance of supply of spares by the contractor or his sub-contractors the contractor will provide the owner with full information for replacement of such spares with other equivalent makes, if so required by the owner.

40.3 You shall provide the owner with a "directory" of his sub-contractors giving the addresses and other particulars of his sub-contractors. The owner, if he so desires, shall have the right to procure the spares directly from sub-contractors.

40.4 Notwithstanding anything stated elsewhere in the bid documents, the prices of all spares which may be procured to cover long term requirements beyond the one (1) year warrantee period will be generally in accordance with the mutually agreed prices.

40.5 You will indicate in advance the delivery period of the items of spares, which the owner may procure in accordance with the sub-clause 40.4. In case of emergency requirements of spares, You would make every effort to expedite the manufacture and delivery of such spares on the basis of mutually agreed time schedule.

40.6 The procedure specified in clause 40.4 and 40.5 shall apply for future procurement of items included in stand by spare list, mandatory spares lists, optional spares list and special tools, plants and equipment list, if any, specified in the bid documents.

40.7 The Contractor shall indemnify the owner for the availability of long time spares as per the terms and conditions laid down above in clause 40.1 to clause 40.6.

41.0 PAYMENT

41.1 The payment to the contractor for the performance of the works under the contract will be made by the owner as per the guidelines and conditions specified herein. All payments made during the contract shall be on account payments only. The final payment will be made on completion of all the works and on fulfillment by the contractor of all his liabilities under the contract.

41.2 CURRENCY OF PAYMENT

All payments under the contract shall be in Indian Rupees only.

41.3 DUE DATES FOR PAYMENT

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The owner will make progressive payments as and when the payments are due as per the terms of payment set forth in clause no. 41.6. Payment will become due and payable by the owner within thirty (30) days from the date of receipt of contractor's bill/ invoice/ debit note by the owner, provided the documents submitted are complete in all respects.

41.4 ~~PAYMENT SCHEDULE~~

~~The contractor shall prepare and submit to the Engineer for approval, a break-up of the contract price. This contract price break-up shall be inter linked with the agreed detailed PERT network of the contractor setting forth his starting and completion dates for the various key phases of works prepared as per condition of this section. Any payment under the contract shall be made only after the contractor's price break-up is approved by the Engineer. The aggregate sum of the contractor's price break-up shall be equal to the lump sum contract price.~~

41.5 MODE OF PAYMENT

The payment due on supply of equipment & accessories and their installation shall be made direct to you. All the payments shall be made through electronic mode.

41.6 **TERMS OF PAYMENTS**

The terms of payment for supply and installation of Chair lift type Manriding system and associated works are detailed herein.

i) **For supply of each complete set of the equipment with accessories:**

70% of the total price the equipment and accessories shall be paid after receipt and acceptance of the complete set at site. **20%** of the total price of the equipment and accessories shall be paid after issuing of 'Taking over certificate'. Remaining **10%** of the total price of the equipment and accessories shall be paid after completion of warrantee period.

i) **For installation, commissioning of the man-riding system and Civil & structural works:**

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On installation and successfully commissioning of each set of man-riding system at site, **90%** of the value of the work shall be paid after issuing of 'Taking over certificate'. Remaining **10%** of the value of work shall be paid after completion of warrantee period.

42.0 SETTLEMENT OF DISPUTES

It is incumbent upon you to avoid litigation and disputes during the course of execution. However, if such disputes take place between the contractor and the department, effort shall be made first to settle the disputes at the company level.

You should make request in writing to the Engineer for settlement of such disputes/claims within 30 (thirty) days of arising of the cause of dispute/claim failing which no disputes/ claims of the contractor shall be entertained by the company.

If differences still persist, the settlement of the dispute with Govt. Agencies shall be dealt with as per the guidelines issued by Ministry of Finance, Govt. of India in this regard. In case of parties other than Govt. Agencies, the redressal of the dispute may be sought in the Court of Law.

43.0 TAXES ON WORKS

All taxes, levies, cess, royalties, whether central, state, local, etc. pertaining to the contract are payable during the entire period of contract, shall be to the contractor / contractors account and shall be deemed to have been included in the contracted rate for the work to be executed by the contractor. The company shall not be liable for any taxes or levies etc. whatsoever in connection with this contract. However all taxes shall be shown separately as per 'form of price bid'.

The company reserves the right to deduct/withhold any amount towards taxes levies etc. and to deal with such amount in terms of the provisions of the Statute or in terms of the direction of any statutory authority and the company shall only provide with certificates towards such deduction and shall not be responsible for any reason whatsoever.

The Contractor would raise invoice in such a way that BCCL will be able to avail CENVAT credit, JVAT credit, Concessional Central Sales Tax as per rule of relevant Tax Law.

44.0 VARIATION IN THE TAXES

Statutory variation due to increase in taxes, duties, levies etc. by Govt. (Central or State or

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Local) as on last date of submission of bid with the taxes, duties, levies etc. during the manufacture/ works/supply, as the case may be, shall be borne by the owner. Similarly decrease in taxes, duties, levies etc. shall be returned/deducted to/by the owner. Variation in taxes will be decided by the Company in accordance with rate of variation in taxes declared by the Government and not as per the taxes quoted by you.

Service tax will be paid as extra including in the cases of Reverse Charge Mechanism in which it has to be deposited directly to the Service Tax Department. CENVAT Credit is to be availed by the paying authority as per rule on the basis of Cenvatable Invoice disclosing the Service Tax component separately. After award of work, the Contractor shall mention the service tax registration no., rate and amount in a separate bill.

45.0 **MOBILISATION ADVANCE**

No mobilization advance shall be given to the contractor.

46.0 **PRICE VARIATION CLAUSE:**

The contract price shall remain firm without any price variation due to escalation, except the statutory increase/decrease in taxes and duties such as excise duty, sales tax, import duty etc.

47.0 **FIRST FILL OF CONSUMABLE OILS AND LUBRICANTS**

All the first fill of consumable such as oils, lubricants and essential chemicals etc., which will be required to put the equipment into successful trial operation shall be furnished by the contractor.

48.0 **INSPECTION, TESTING AND INSPECTION CERTIFICATE**

48.1 The Engineer, his duly authorised representative and /or outside inspection agency acting on behalf of the owner shall have at all reasonable times access to the contractor's premises or works and shall have the power at all reasonable times to inspect and examine the materials and workmanship of the works during its manufacture or installation and if part of the works is being manufactured or assembled at other premises or works, the contractor shall obtain permission for the engineer and for his duly authorised representative to inspect as if the works were manufactured or assembled on the contractor's own premises or works.

48.2 The contractor shall give the Engineer/ Inspector fifteen (15) days written notice of any material being ready for testing. Such tests shall be to the contractor's account except for the expenses of the Inspector. The Engineer/ Inspector, unless witnessing of the tests is virtually waived, will attend such tests within fifteen (15) days of the date on which the equipment is notified as being ready for test/inspection, failing which the contractor may proceed with the test which shall be deemed to have been made in the Inspector's presence and he shall forthwith forward to the Inspector duly certified copies of tests in triplicate.

48.3 The Engineer or Inspector shall within fifteen (15) days from the date of inspection as defined herein give notice in writing to the contractor, of any objection to any drawings and all or any equipment and workmanship which in his opinion is not in accordance with the contract. The contractor shall give due consideration to such objections and shall either make the modifications that may be necessary to meet the said objections or shall confirm in writing to the Engineer/Inspector giving reasons therein, that no modifications are necessary to comply with the contract.

48.4 When the factory tests have been completed at the contractor's or sub-contractor's works, the Engineer/Inspector shall issue a certificate to this effect within fifteen (15) days after completion of tests but if the tests are not witnessed by the Engineer/inspector, the certificate shall be issued within fifteen (15) days of the receipt of the contractor's test certificate by the Engineer/Inspector. Failure of the Engineer/Inspector to issue such a certificate shall not prevent the contractor from proceeding with the works. The completion of these tests or the issue of the certificate shall not bind the owner to accept the equipment should it on further tests after installation be found not to comply with the contract.

48.5 In all cases where the contract provides for tests whether at the premises or works of the contractor or of any sub-contractor, the contractor, except where otherwise specified, shall provide free of charge such items as labour, materials, electricity, fuel, water, stores, apparatus and instruments as may be reasonably demanded by the Engineer/inspector or his duly authorized representative to carry out effectively such tests of the equipment in accordance with the contract and shall give facilities to the Engineer/inspector or his duly authorized representative to accomplish testing.

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48.6 The inspection by Engineer and issue of Inspection Certificate thereon shall in no way limit the liabilities and responsibilities of the contractor in respect of the agreed quality of the equipment.

49.0 TEST

49.1 Start-up

49.1.1 On completion of installation of the equipment and before start-up, each item of the equipment shall be thoroughly cleaned and then inspected jointly by the Engineer and the contractor for correctness and completeness of installation and acceptability of start-up, leading to initial pre-commissioning tests at site. The list of pre-commissioning tests to be performed shall be as mutually agreed.

49.1.2 You shall be responsible for carrying out all the pre-commissioning tests. On completion of inspection, checking and after the pre-commissioning tests are satisfactorily over, the complete equipment shall be placed on initial operation during which period the complete equipment shall be operated integral with sub-systems and supporting equipment as a complete plant referred hereinafter as plant.

49.2 Trial Operation

49.2.1 The plant shall then be on trial operation during which period all necessary adjustments shall be made while operating over the full-load range enabling the plant to be made ready for commissioning.

49.2.2 The duration of trial operation of the complete equipment /system shall be fourteen (14) days out of which at least seventy two (72) hours shall be continuous operation on full load or any other duration as may be agreed to, between the engineer and the contractor. The trial operation shall be considered successful, provided that each item of the equipment can operate continuously at the specified operating characteristics, for the period of trial operation. For any failure, trial run should be repeated.

49.2.3 For the period of trial operation, the time of operation with any load shall be counted. Minor interruption not exceeding one (1) hours at a time, caused during the continuous operation

shall not affect the total duration of trial operation. However, if in the opinion of the engineer, the interruption is long, the trial operation shall be prolonged for the period of interruption.

49.2.4 A trial operation report comprising of observations and recordings of various parameters to be measured in respect of the above trial operation shall be prepared by the contractor. This report, besides recording the details of the various observations during trial run, shall also include the dates of start and finish of the trial operation and shall be signed by the representatives of both the parties. The report shall have sheets, recording all the details of interruptions occurred, adjustments made and any minor repairs done during the trial operation. Based on the observations, necessary modifications/repairs to the plant shall be carried out by the contractor to the full satisfaction of the engineer to enable the later to accord permission for Commissioning.

50.0 TAKING OVER

Upon successful completion of all the tests to be performed at site on equipment furnished and installed by the contractor, after successful trial run and commissioning of **both the man-riding system**, and after obtaining final approval from DGMS the engineer shall issue to the contractor a **'Taking over certificate'** as a proof of the final acceptance of the equipment. Such certificate shall not unreasonably be withheld nor will be engineer delay the issuance thereof, on account of minor omissions or defects which do not affect the commercial operation and/or cause any serious risk to the equipment. Such certificate shall not relieve the contractor of any of his obligations which otherwise survive by the terms and conditions of the contract after issuance of such certificate.

51.0 DGMS APPROVAL

Apart from using DGMS approved components in Power pack/ Motor, starter/VSD, signaling, communication, lighting systems and in hydraulic systems, the complete man riding system should be approved by DGMS for use in UG coal mines. You shall be the sole responsible to obtain above DGMS approvals before supply of the Man riding system.

Subsequently after installation and commissioning, it will also be the responsibility of contractor to satisfy all the DGMS requirements without any extra cost to BCCL and obtain final approval of DGMS.

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52.0 FACILITIES TO BE PROVIDED BY THE OWNER

52.1 Space

You shall advise the owner within thirty (30) days from the date of acceptance of the letter award, about his exact requirement of space for his office, storage area, pre-assembly and fabrication areas, residential area etc. The above requirement shall be reviewed by the engineer and space will be allotted to the contractor for construction of his temporary structures like office, storage sheds, labour and staff colony and other utilities etc. for his own as well as his sub-contractor's use.

52.2 Electricity

You shall submit to the engineer within thirty (30) days from the date of acceptance of the award letter, his electrical power requirements, You shall be provided with supply of electricity for the purposes of the contract, at one point at surface in the project site and at one point for each manriding system near the drive heads. You shall make his own further distribution arrangement including transformer. All temporary / permanent wiring must comply with relevant regulations and will be subject to engineer's inspection and approval before connection to supply. Power supply for residential area shall also be provided at one point. You shall be charged for the power supplied at work site and residential area at prevalent rate of power supplied by Jharkhand State Electricity Board.

52.3 Water

Supply of water will be made available for the construction purposes at an agreed single point at surface. And further distribution will be the your responsibility.

23/11/15

Assistant Manager(MM)

23/11/15

Chief Manager(MM)

Appendix-I

FORMAT OF PERFORMANCE BANK GUARANTEE

1. Messers ---------- a company having Regd. Office /its office at ---------- ----------hereinafter called the Seller has entered into a Contract No.---------- ----------dt.----------(hereinafter called the said Contract) with Bharat Coking Coal Limited having its Regd. Office (address to tbe given.....(hereinafter called , the Purchaser) to supply equipment on the terms and conditions in the said Contract.

It has been agreed that hundred percentage(100%) payment of the value of the equipment will be made to the seller in the terms of the said Contract on the seller furnishing to the Purchaser a Bank Guarantee for the sum of ---------- equivalent to 10 % of the value of each equipment and accessories dispatched by the seller as security for the due and faithful performance of the terms of the said contract and against any loss or damage caused to or would be caused to or suffered by the purchaser by reason of any of the terms or conditions contained in the said contract.

The---------- Bank having its office at ---------- has at the request of seller agreed to give the guarantee herein after contained.

2. We,---------- (Name of the Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demur merely on a demand from the purchaser stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the purchaser by reason of any breach by the said seller of any of the terms or conditions contained in the said contract or by reason of the seller's failure to perform the said contract. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. We shall not withhold the payment on the ground that the seller has disputed its liability to pay or has disputed the quantum of the amount or that any arbitration proceeding or legal proceeding is pending between purchase and the seller regarding the claim. However , our liability under this guarantee shall be restricted to an amount not exceeding ----------.

3. We,---------- (Name of the Bank) further agree that the guarantee herein contained shall come into force from the date hereof and shall remain in full force and effect during the period of the said contract and that it shall continue to be enforceable till all the dues of the purchase under or by virtue of the said contract have been fully paid and its claim satisfied or purchase certified that the terms and conditions of the said contract have been fully and properly carried out by the said seller and accordingly discharged the guarantee .Unless a demand or claim under this guarantee is made on us in writing on or before the ----------(date to be given----------period of contract + 90 days from the date of Bank Guarantee) we shall be discharged from all liability under this guarantee thereafter.

4. We., (Name of the Bank) further agree with the purchaser ,that the purchaser , shall have the fullest liberty without our consent and without affecting in any manner no obligations hereunder to vary any of the terms and conditions of the said contract or to extend time of performance by the said seller(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the purchaser , against the said seller and to forbear or enforce any of the terms and conditions relating to the said contract and we shall not be relived from our liability by reason or any such variation or extension being granted to the said seller or for any forbearance act or omission on the part of the purchaser , or any indulgence by the purchaser to the said seller by any such matter or thing whatsoever which under the law relating to sureties would be for this provision have effect of an relieving us. The Bank further agrees that in case this guarantee is required for a longer period and it is not extended by the bank beyond the period specified above , the bank shall pay to this purchaser the said sum of ---------- or such lesser sum as may than be due the purchaser and as the purchaser may demand.

5. We ,---------- (Name of the Bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the purchaser , in writing.

6. The Bank has under its constitution power to give this guarantee and Mr.----------Manager , who has signed it on behalf of the Bank has authority to do so.

7. This Bank Guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.

[In case the BGs are from outstation branch of Dhanbad then BG shall be encashable at Dhanbad/Kolkata branch of issuing bank with address and location of the said branch at Dhanbad/Kolkata will be as under :

Name of the Bank :
Name of the Branch :
Location & address :

The BG shall be subject to the jurisdiction of the Civil courts Dhanbad District only.]

Date---------- Day of ----------20

For ---------- Bank

Signature of the authorised person
for and on behalf of the Bank
Emp. Code.

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ANNEXURE-A-1 (28 Pages)

ANDHRA PRADESH HEAVY MACHINERY & ENGINEERING LIMITED

APHMEL/MKTG/1444/2015

TECHNICAL SPECIFICATIONS OF MANRIDING CHAIR LIFT SYSTEM

1.0 TECHNICAL PARAMETERS OF CHAIR LIFT SYSTEM

1.1 Mine/Location/Length /Gradient:

Mine	Location	Length	Gradient
Moonidih Mine	1 St. System	850 Mtrs. Long	1 in 6
Moonidih Mine	2 nd. System	650 Mtrs. Long	1 in 100

1.2	Distance between 2 chairs (Max)	:	15 Mtrs.
1.3	Distance between 2 Roller stations (Max)	:	15 Mtrs (Max.)
1.4	Man Riding Capacity in one direction	:	200 Persons/Shift
1.5	Traveling speed	:	From 1 to around 3 Mtrs./Sec. (Designed) 1.75 Mtrs/Sec (DGMS Approved)
1.6	Type of drive	:	Electro-Hydraulic
1.7	Diameter of the drive unit sheave	:	1.5 Mtr (approx)
1.8	Motor KW	:	75 KW for both Systems
1.9	Voltage system available at site	:	550 V, 3 Ph, 50 Hz
1.10	Rope diameter	:	16mm
1.11	Rope type & construction	:	Lengthslay, 6-Strand, 7 - Wire, RHL
1.12	Minimum braking force	:	167 KN
1.13	Rope weight	:	915 g/m
1.14	Rope safety factor	:	17.96- (1st.System) 386 - (2nd. System)
1.15	Return Sheave Diameter	:	900 mm

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2.0 DESCRIPTION OF CHAIR LIFT SYSTEM:

2.1 The chair lift system for men transport will be an endless haulage system driven by Electro-mechanical / hydraulic power pack incorporating complete safety devices as necessary for transporting men in underground mines.

2.2 The system will consist of a drive unit arrangement, return station, rope guiding pulleys with fittings and electricals.

2.3 The drive unit arrangement for electro-hydraulic drive, will comprise of an Electro-Hydraulic power pack and a high torque hydraulic motor directly connected with the driving pulley

2.4 The device will be equipped with built in automatic brake system

2.5 The speed of the rope will be adjustable from 0 to approximately 3 M/Sec. at maximum.

2.6 The return end installation will comprise of a roof suspended / Pedestal mounted system fitted with return pulley and suitable rope tensioning arrangement.

2.7 Detachable chairs will be provided which can be easily engaged with and disengaged from the wire rope at the embarking and disembarking station. Arrangement of the chairs will be capable of negotiating up to 18 deg. Inclination.

2.8 The embarking station will be specifically designed taking into consideration all safety precautions. At the starting point the chair will be engaged on an inclined rail and when a lever mechanism is operated the chair along with person shall slowly glide to catch the running rope. At the time of disembarking the chair carrying the person will smoothly leave the rope and glide over inclined rails slowly and there hy comes to stand still position. Provision will be made to prevent running back of the chair to the rope

2.9 The rope will be properly guided and its tension correctly controlled with the help of different types and sizes of pulleys installed at intervals over the entire length of the system.

2.10 The Man riding chair lift system will be monitored by an operator at the driving station. The system will be such that, it can be switched off by an emergency stop switch situated in the push button station at the driving station. There will be number of pull cord switches with pull cord wire along the entire length of installation and by using any one of these switches the system can be stopped. For additional safety measure 2 switches will be provided in the guide path of the counter weight in order to stop the system whenever the counter weight crosses the top or bottom limits. For better communication and co-ordination control between the drive station and return unit area a telephone communication system will be provided in the installation.

2.11 Brake System

Service brake: Operating brake for the drive unit will be built in the hydraulic system, which will be reliable and shall be able to lock the drive sheave even under unbalanced system loads actuated by chair lift when Electrical motor is ON

Parking/Emergency brake: For parking and emergency braking, a spring activated hydraulically released (fail safe type) brake with changeable and adjustable brake pads will be provided. In case of hydraulic failure, the springs will actuate the brake and stop the drive sheave. The brake will be modifiable for clockwise or anti clockwise rotation of the drive sheave.

3.0 Drive unit assembly & Station: This will consist of the following.

3.1 Chair lift drive unit made of strong frame of steel, consisting of drive sheave driven by high torque hydraulic motor and provided with the brake system as specified at Sl. No. 2.11 and complete with rope speed indicator with working hour meter etc. as required for smooth, efficient and safe operation of the system. The drive unit will be mounted on robust/ rigid base frame made of heavy steel sections.

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3.2 Hydraulic Power Pack consisting of a suitable Hydraulic pump with seals compatible with the Fire resistant fluid and mineral oil, directly driven by adequately rated squirrel cage induction motor, complete with fluid cooler , fluid tank, brake control set, temperature level and pressure control, set of high pressure hoses, control set for rope speed with zero position control switch etc.

3.3 Horizontal pulley double with suitable liner.

3.4 Embarking rail with start device.

3.5 Manually operated feeder

3.6 Disembarking rail with Running Back stop device

3.7 Support for embarking and disembarking rail

3.8 Support for wing

3.9 Holding device for embarking and disembarking rail

3.10 Depression pulley, single cranked with suitable liner

3.11 Carrying pulley, single with suitable liner.

3.12 Depression pulley, double with suitable liner.

3.13 Carrying pulley, double with suitable liner

3.14 Suspension tube with flange

3.15 Universal clamp

3.16 Steel support beam

3.17 The whole drive unit shall be surrounded with easily removable mesh panels.

3.2.0 Return unit Assly. & Station : This will consist of the following

3.2.1 Embarking rail with start device.

3.2.2 Manually operated feeder

3.2.3 Disembarking rail with Running Back stop device

3.2.4 Support for embarking and disembarking rail

3.2.5 Support for wing

3.2.6 Holding device for embarking and disembarking rail

3.2.7 Depression pulley single cranked with suitable liner.

3.2.8 Carrying pulley, single with suitable liner.

3.2.9 Twin carrying pulley, double with suitable liner.

3.2.10 Twin depression pulley, double with suitable liner

3.2.11 Suspension tube with flange

3.2.12 Universal clamp

3.2.13 Return station

3.2.14 Tensioning unit

3.2.15 Tensioning tower complete with counter weight

3.2.16 Steel support beam

3.2.17 Rail section

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3.3.0	**Gate Way System:**
3.3.1	Carrying pulley, double with suitable liner
3.3.2	Depression pulley, double cranked with suitable liner
3.3.3	Twin carrying pulley, double with suitable liner
3.3.4	Twin depression pulley, double with suitable liner
3.3.5	Suspension tube
3.3.6	Universal clamp
3.3.7	Holding device to attach emergency pull cord switch
3.3.8	Holding device to attach emergency stop pull wire
3.3.9	Roof bolts
3.3.10	Chair (should be comfortable in shape and size)
3.3.11	Suspension with rollers for chair and stretcher
3.3.12	Stretcher for underground mines as per NIT
3.3.13	Special Chair lift wire rope

3.5.0 **Electricals: FLP** Electricals will be provided as per NIT

The electric system consisting of the following main parts

3.5.1	**Electric Motor**
3.5.2	Electric control system complete with isolator, motor starter with all protections against earth leakage, single phasing/phase sequence, short circuit, Over and Under Voltage and instruments viz. Ammeter, Volt meter, etc.
3.5.3	Pull cord switch system for emergency stop of the drive unit at an interval of 45 Mtrs.
3.5.4	Start / stop push button station for the operator.
3.5.5	Telephone communication for drive station and Return Station
3.5.6	Cables for control indication, lighting and communication system.

4.0.0 **BRIEF SPECIFICATIONS OF ELECTRICALS :**

4.1.0 **Motor**

4.1.1	Rating in KW	: **75 KW (For Both Systems)**
4.1.2	Speed	: 1500 RPM (Synchronous)
4.1.3	Type	: FLP
4.1.4	Class of duty	: Continuous i.e. S-1 as per IS:325-1996 with latest amendment
4.1.5	Type of starting	: Star - Delta Starting
4.1.6	Class of insulation	: Class F with class B temperature rise limit

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4.1.7	Type of enclosure	:	TEFC
4.1.8	NFLP / FLP	:	FLP
4.1.9	Degree of protection for enclosure	:	IP-55 of IS:4691-1985
4.1.10	ENCLOSURE	:	FLP
4.1.11	Mounting of motor	:	Horizontal foot mounted or flange mounted
4.1.12	Cable entry	:	Suitable for PVC DWA cable
4.1.13	Standards to which the motor	:	IS:325-1996
4.2.0	(a) Motor starter:		
4.2.1	Type	:	Star- Delta, Air break type, Electromagnetically operated
4.2.2	Voltage	:	550 V, 3 Ph, 50 Hz
4.2.3.0	Construction	:	
4.2.3.1	Shall be in two compartments	:	Yes
4.2.3.2	One will house through going bus bars and isolator	:	Yes
4.2.3.3	2 nd will house contactor and protective devices	:	Yes
4.2.3.4	Door of the 2nd house compartment shall have inter locking with isolator	:	Yes
4.2.4.0	Type of enclosure (FLP/NFLP)	:	FLP
4.2.4.1	Degree of protection for enclosure	:	IP- 55 of IS: 13947(Part-I)
4.2.4.2	The FLP enclosure	:	FLP

4.2.3	Utilization category of starter	:	AC-3 of IS:13947(Part-4/Sec.1)- 1993
4.2.4	Nominal current rating of contactors (for AC-3 duty) the full load current of motor	:	Not less than 2.0 times
4.2.5	Operating limits of contactor	:	70% to 110% of coil voltage
4.2.6	Acceptable make of contactors	:	SIEMENS/L&T/BCH/ ANDREW YULE/C&S
4.2.7	Protections	:	
4.2.7.1	Over load protection	:	Thermal Over load Relay
	- Current setting range	:	80% to 120%
4.2.7.2	Earth leakage protection	:	CBCT operated, non self resetting type sensitive earth leakage relay with test/reset and indication facility
	- Current setting range	:	50 mA-300 mA (Max.) in steps of 50 mA
	- Time delay setting range	:	0 – 1 Sec. (Approx.) in steps of 0.1 sec (Min. 10 steps)
	- Operating voltage of relay	:	Preferably 110 V
4.2.7.3	Short circuit protection	:	HRC Fuses
4.2.7.4	Single phasing/Ph. Seq. protection	:	Current operated relay
4.2.7.5	Instruments	:	Amp. Meter of suitable range
4.2.7.6	Cable entry	:	Suitable for PVC DWA Cable both for I/C and O/G

4.2.3	Utilization category of starter	:	AC-3 of IS:13947(Part-4/Sec.1)- 1993
4.2.4	Nominal current rating of contactors (for AC-3 duty) the full load current of motor	:	Not less than 2.0 times
4.2.5	Operating limits of contactor	:	70% to 110% of coil voltage
4.2.6	Acceptable make of contactors	:	SIEMENS/L&T/BCH/ ANDREW YULE/C&S
4.2.7	Protections	:	
4.2.7.1	Over load protection	:	Thermal Over load Relay
	- Current setting range	:	80% to 120%
4.2.7.2	Earth leakage protection	:	CBCT operated, non self resetting type sensitive earth leakage relay with test/reset and indication facility
	- Current setting range	:	50 mA-300 mA (Max.) in steps of 50 mA
	- Time delay setting range	:	0 – 1 Sec. (Approx.) in steps of 0.1 sec (Min. 10 steps)
	- Operating voltage of relay	:	Preferably 110 V
4.2.7.3	Short circuit protection	:	HRC Fuses
4.2.7.4	Single phasing/Ph. Seq. protection	:	Current operated relay
4.2.7.5	Instruments	:	Amp. Meter of suitable range
4.2.7.6	Cable entry	:	Suitable for PVC DWA Cable both for I/C and O/G

4.2.7.7	Mounting	:	Skid mounted/Foot mounted
4.2.7.8	Rating of Starter	:	200Amps
4.2.7.9	Standards to which the starter conform	:	IS:13947(Part-4/Sec.1)-1993

4.3.0 Other Control Equipment

4.3.1 DGMS approved FLP Pre-Start Warning Device having Audible Alarm

4.3.2 FLP push button station provided with emergency stop and ON/OFF arrangement for chair lift system located at drive unit.

4.3.3 FLP pull cord switches shall be provided along with rope way alignment each at an interval of 45 mtr throughout the gallery for emergency stop of the drive unit. Suitable Pull cord wire is also in the scope of supply.

4.3.4 FLP limit switches for counter weight at return unit area

4.3.5 Emergency stop switch (FLP) at return station.

4.4.0 Lighting system

4.4.1 Suitable 110 V lighting system will be provided at Drive unit and Return unit and along the Road way

4.4.2 Each Luminaries shall be provided with 110 V,AC, 23/26 Watt CFL

4.4.3 FLP Lighting Transformers of 550 V/110 V AC, 5 KVA Rating

4.4.4 Lighting cable to be used will be DGMS approved, PVCDWA, copper mining type cable.

4.5.0 Safety Devices :

4.51 Over Speed Trip Device, Device to prevent back ward movement, Over travel Limit Switch, Over Stretch Device, Rope Speed Indicator, Pull Cord Switches along the Road Way

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LIST OF MAJOR CONSTRUCTION EQUIPMENT AS PER CL. 1.8 AND 4 E and 4 T

Sl. No.	Equipment type and Capacity	Make and model	Minimum Number
1	Coal Drilling Machine	Reputed Make	One
2	Drill Panel	DGMS Approved make	One
3	Chain Pulley Block – 5 Ton	Reputed make	One
4	Rope Tightner	Reputed maker	One

LIST OF ADDITIONAL CONSTRUCTION EQUIPMENT IF ANY AS PER CL. 1.9

Sl. No.	Equipment to be purchased new – type and capacity	Make and Model	Delivery period	Number
	NOT REQUIRED			

for A P HEAVY MACHINERY & ENGG LTD

SR.MANAGER (MARKETING)

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TECHNICAL DATA OF CHAIRLIFT SYSTEM – MOONIDIH MINE 2nd-BCCL

1. Length of Installation	=	650Mtrs
2. Maximum Inclination	=	0.57°
3. Distance between two Chairs	=	15 Mtrs
4. Distance between two pulley stations	=	15 Mtrs.
5. Man riding capacity	=	720 persons/hour
6. Diameter of Drive unit Sheave	=	1500mm
7. Required pulling force at the Drive	=	2.23KN
8. Traveling speed	=	3.0m/sec
9. Required Power	=	9.0KW
10. Rope Diameter	=	16mm
11. Minimum Breaking Force	=	167 KN
12. Rope Weight	=	0.915 Kg/m
13. Rope safety Factor	=	386
14. Required rope pretension	=	2.25KN

CALCULATION OF SLOPE FORCES (FH1 - FH4)

F1 & F3 are the forces acting in the direction from the drive station to the return unit. F2 & F4 are the forces acting in the direction from the return unit to the drive unit.

Weight per person = 100Kg
Weight per Chair = 13Kg

S.No.	Length (m)	Inclination	Curve	Slope force by Persons F1 (N)	F2 (N)	Chairs F3 (N)	F4 (N)
1	650	0.57°	0 °	382.57		49.73	
	650			382.57	0	49.73	0
				FH1	FH2	FH3	FH4

MANRIDING CAPACITY

Traveling speed (V) = 3 m/sec =10,800 m/hour
Distance between two Chairs = 15 m
Man riding capacity per hour = 10,800/15= 720 persons

CALCULATION OF REQUIRED ROPE PULLING FORCE (FH, FR)

Resulting in the slope force from Persons and Chairs (FH).FH stands for the combined slope forces in the rope on either side.
FH = FH1+FH3 =382.57+49.73 =**432.30 N**

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Resulting in the rolling resistance of pulleys on either side (FR)

Total Length of Installation	L = 650 m
Distance between two pulley stations	LR=15 m
Sum of angles of all horizontal curves	α H= 0°
Sum of angles of all vertical curves	α V= 4°
Rolling resistance of each pulley station	ξ G= 19.6 N
Rolling resistance due to rope deviation of 3°(Curves, Synclines, anticlines)	ξ K= 39.2 N

$$FR = \frac{\xi G \times L}{LR} + \xi K \frac{(\alpha H + \alpha V)}{3} = 901.60\ N$$

CALCULATION OF REQUIRED DRIVE UNIT DATA (FZ, PA, PE)

Required pulling force FZ

FZ = FH1 + FH2 + FH3 + FH4 + 2 x FR

=382.57+0+49.73 +0+2X901.60= 2235.50 N

Required output of Drive Unit PA

Traveling speed V = 3 m/sec

$$PA = \frac{FZ \times V}{g \times 102} = 6.7\ KW$$

Required input of Drive Unit PE (Output of the Electric Motor)

Efficiency of Drive Unit ξ =75% =PA/ ξ = 6.7/ 0.75 = 8.9 KW

Rope safety factor (S.F)

Minimum rope breaking force=167 KN

S.F = 167 / FH = 386

Required Rope Pretension (SV)

Wrapping angle of the rope on the drive sheave α = 3.14 rad
Friction factor on the lining on the Drive Sheave μ = 0.25
Safety factor against slipping s = 1.2

$$SV = FZ \times \frac{1}{e^{\mu\alpha} - 1} \times s = 2255\ N$$

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TECHNICAL DATA OF CHAIRLIFT SYSTEM – MOONIDIH MINE 1St-BCCL

1. Length of Installation	=	850Mtrs
2. Maximum Inclination	=	9.46°
3. Distance between two Chairs	=	15 Mtrs
4. Distance between two pulley stations	=	15 Mtrs.
5. Man riding capacity	=	720 persons/hour
6. Diameter of Drive unit Sheave	=	1500mm
7. Required pulling force at the Drive	=	11.62KN
8. Traveling speed	=	3.0m/sec
9. Required Power	=	46.44KW
10. Rope Diameter	=	16mm
11. Minimum Breaking Force	=	167 KN
12. Rope Weight	=	0.915 Kg/m
13. Rope safety Factor	=	17.96
14. Required rope pretension	=	11.7KN

CALCULATION OF SLOPE FORCES (FH1 - FH4)

F1 & F3 are the forces acting in the direction from the drive station to the return unit. F2 & F4 are the forces acting in the direction from the return unit to the drive unit.

Weight per person = 100Kg
Weight per Chair = 13Kg

S.No.	Length (m)	Inclination	Curve	Slope force by Persons F1 (N)	F2 (N)	Chairs F3 (N)	F4 (N)
1	850	9.46°	0 °	8225.00		1069.25	
	850			8225.00	0	1069.25	0
				FH1	FH2	FH3	FH4

MANRIDING CAPACITY

Traveling speed (V) = 3 m/sec =10,800 m/hour
Distance between two Chairs = 15 *m*
Man riding capacity per hour = 10,800/15= 720 persons

CALCULATION OF REQUIRED ROPE PULLING FORCE (FH, FR)

Resulting in the slope force from Persons and Chairs (FH).FH stands for the combined slope forces in the rope on either side.
FH = FH1+FH3 =8225.00+1069.25 =9294.25 N

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Resulting in the rolling resistance of pulleys on either side (FR)

Total Length of Installation	L = 850 m
Distance between two pulley stations	LR=15 m
Sum of angles of all horizontal curves	α H= 0°
Sum of angles of all vertical curves	α V= 4°
Rolling resistance of each pulley station	ξ G= 19.6 N
Rolling resistance due to rope deviation of 3°(Curves, Synclines, anticlines)	ξ K= 39.2 N

$$FR = \frac{\xi G \times L}{LR} + \xi K \frac{(\alpha H + \alpha V)}{3} = \mathbf{1162.90\ N}$$

CALCULATION OF REQUIRED DRIVE UNIT DATA (FZ, PA, PE)

Required pulling force FZ

FZ = FH1 + FH2 + FH3 + FH4 + 2 x FR

=8225.00+0+1069.25 +0+2X1162.90= 11620.05N

Required output of Drive Unit PA

Traveling speed V = 3 m/sec

$$PA = \frac{FZ \times V}{g \times 102} = 34.83\ KW$$

Required input of Drive Unit PE (Output of the Electric Motor)

Efficiency of Drive Unit ξ =75% =PA/ ξ = 34.83/ 0.75 = **46.44 KW**

Rope safety factor (S.F)

Minimum rope breaking force=167 KN

S.F = 167 / FH = **17.96**

Required Rope Pretension (SV)

Wrapping angle of the rope on the drive sheave α = 3.14 rad
Friction factor on the lining on the Drive Sheave μ = 0.25
Safety factor against slipping s = 1.2

$$SV = FZ \times \frac{e^{\mu\alpha}}{e^{\mu\alpha} - 1} \times s = \mathbf{11717\ N}$$

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ANDHRA PRADESH HEAVY MACHINERY & ENGINEERING LIMITED

LIST OF SPARES FOR MAN RIDING CHAIR LIFT SYSTEM REQUIRED DURING WARRANTY PERIOD(1st. System)

SL. No.	Description	Part No	Qty. Nos.
1	Liner for Carrying pulley	780002134	100
2	Liner for Depression Pulley	780002104	50
3	Return line Filter Element	056905012	2
4	Pressure line Filter Element for Boost Pump	056905010	2
5	Lining for Suspension with 4 Rollers	780002172	300
6	Bearing for Suspension with 4 Rollers	051304083	75
7	Bearing for Pulley	051304042	75
8	D U Bush for Chair	053811913	100
9	Lining for Return Wheel	052103398	1
10	Seat for Chair	059745000	75
11	Suspension with four Roller	780002166	25
12	Drive Sheave Lining	780002195 & 780002196	1 Set
13	Taper Roller Bearing Top	051308069	1
14	Taper Roller Bearing Bottom	051308061	1
15	Brake Liner	780002189	1Set
16	Carrying Pulley Double	780002130	2
17	Depression Pulley Double Cranked	780002100	2
18	Twin Carrying Pulley Double	780002145	1
19	Twin Depression Pulley Double	780002115	1
20	FLP pull Cord Switch	058123128	4
21	I.S.Page Phone	058138001	2

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ANDHRA PRADESH HEAVY MACHINERY & ENGINEERING LIMITED

LIST OF SPARES FOR MAN RIDING CHAIR LIFT SYSTEM REQUIRED DURING WARRANTY PERIOD(second System)

SL. No.	Description	Part No	Qty. Nos.
1	Liner for Carrying pulley	780002134	90
2	Liner for Depression Pulley	780002104	40
3	Return line Filter Element	056905012	2
4	Pressure line Filter Element for Boost Pump	056905010	2
5	Lining for Suspension with 4 Rollers	780002172	250
6	Bearing for Suspension with 4 Rollers	051304083	70
7	Bearing for Pulley	051304042	70
8	D U Bush for Chair	053811913	90
9	Lining for Return Wheel	052103398	1
10	Seat for Chair	059745000	70
11	Suspension with four Roller	780002166	20
12	Drive Sheave Lining	780002195 & 780002196	1 Set
13	Taper Roller Bearing Top	051308069	1
14	Taper Roller Bearing Bottom	051308061	1
15	Brake Liner	780002189	1Set
16	Carrying Pulley Double	780002130	2
17	Depression Pulley Double Cranked	780002100	2
18	Twin Carrying Pulley Double	780002145	1
19	Twin Depression Pulley Double	780002115	1
20	FLP pull Cord Switch	058123128	4
21	I.S.Page Phone	058138001	2

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CHAIR LIFT SYSTEM–LIST OF TOOLS

SL NO	DESCRIPTION	QUANTITY
1	Spanner Set sizes – (6 to 22)	1 Set.
2	Spanner D.E – sizes(27-32)	1 No.
3	Spanner – size(41)	1 No.
4	Spanner – size(50)	1 No.
5	Pipe Wrench – size(350 mm)	1 No.
6	Claw Hammer	1 No.
7	Screw Driver – size(7or 8)	1 No.
8	ScrewDriver Set (Interchangeable)	1 No.
9	Tester	1 No.
10	Insulation Tape	1 No.
11	Paper Cutter	1 No.
12	Screw Spanner	1 No.
13	Pipe Wrench – size(8")	1 No.
14	Steel Measuring Tape – (3m)	1 No.
15	Allen Key Set	1 No.
16	Allen Key size(12)	1 No.
17	Allen Key size(14)	1 No.
18	Ring Spanner –size (24/27)	1 No.
19	Cutting Plier	1 No.
20	Ring Spanner –size (18/19)	1 No.

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for A P HEAVY MACHINERY & ENGG LTD

SR.MANAGER (MARKETING)

A.P. HEAVY MACHINERY & ENGG. LTD. KONDAPALLI

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ANNEXURE –A- I

A. QUESTIONNAIRE TO BE FILLED IN & SUBMITTED BY THE BIDDER WITH TECHNICAL PART OF THE BID (1 st. SYSTEM)

1.0 GENERAL		
1.1	Make of Chairlift man riding system	APHMEL
1.2	Maximum speed of the System (m/sec)	3.0 Mtrs./Sec.
1.3	Average speed (m/sec)	1.75 Mtrs./Sec.(DGMS Approved Speed)
1.4	Distance between roller stations (m)	15 Mtrs.
1.5	Distance between two chairs (m)	15 Mtrs.
1.6	Gauge (mm)	900 mm
1.7	Maximum men transport capacity (per hour)	720
1.8	Average man transport capacity (per hour)	420
1.9	Diameter of drive unit sheave (mm)	1500 mm
1.10	Diameter of return sheave (mm)	900 mm
1.11	Drive power (kW)	75 KW
1.12	Time to be taken to transport 200 persons in one direction	36.6 Min.
1.13	No. of rope turns on drive sheave	one
1.14	Lining materials on drive/return sheaves	PU and PB for Drive Wheel and NBR for Return Wheel
2.0 Rope		
2.1	Make	Any DGMS approved Make
2.2	Diameter of the rope (mm)	16 mm
2.3	Length of the rope	1850 mtrs.
2.4	Rope specification and type	Lengthslay, 6–Strand, 7 - Wire, RHL
2.5	Rope breaking force (KN)	167 KN
2.6	Rope safety factor as per calculation	17.96
2.7	Relevant Indian Standard	IS: 1855
3.0 Drive Station		
3.1	Type:	Frame Mounted

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3.2	If Hydraulic, pressure (kg/cm^2). oil type, characteristics of hydraulic motor	Max. Pr. - 450 bar., working pr.-210 bar, Oil- HFDU-68, Radial Piston type with case rotating Hydraulic Motor
3.3	Dimensions: Length..(mm) Height..(mm) Width..(mm)	Length - 2350 mm Height - 625 mm Width- 940 mm
3.4	Whether suitable guards/fencing provided around moving units	Yes
3.5	Types of painting used	Synthatic Enamel
3.6	Rope speed indicator provided or not	Yes provided
4.0 Bed frame		
4.1	Type of construction	Structural Steel Frame
4.2	Whether single piece	Yes
4.3	Whether driver's platform provided	Not Required
5.0 Shafts		
5.1	Type of steel used in manufacturing	C40, IS: 1570
5.2	Details of heat treatment done	Not Required
6.0 Gearing (If used)		
6.1	Type of gearing used and the gearing ratio	NOT APPLICABLE
6.2	No. of hours per day for which continuous operation designed	NOT APPLICABLE
6.3	Type of lubrication provided	NOT APPLICABLE
6.4	Total designed running life (in hours)	NOT APPLICABLE
6.5	Service factor considered	NOT APPLICABLE
7.0 Bearing		
7.1	Type and specifications	SRDG Ball bearing
7.2	Make	Reputed make
7.3	Total life on continuous load design (hours)	Depends on System maintenance
7.4	Lubrication arrangement	Greasing
8.0 Brakes		
8.1	Type	Fail Safe
8.2	Braking Torque	224 KN
8.3	Hydraulically/ Mechanically operated	Hydraulically
8.4	Location of brakes	At Drive Unit

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9.0 Intermediate Roller Station		
9.1	Details of Rollers	Not Applicable
9.2	Bearing Details	Not Applicable
9.3	Material of the Shaft	Not Applicable
9.4	Lubrication Details	Not Applicable
10.0 Chairs		
10.1	Constructional Details	Pipe Material
10.2	Material of the Seat	Rexene
10.3	Details of Lining Material	Rubber
10.4	Clearances adopted (mm)	NOT APPLICABLE
10.5	No. of Chairs	150 Nos.
10.6	No. of stretcher type special arrangement	3 Nos.
11.0 Electrical Motor		
11.1	Make	Any DGMS Approved Make
11.2	Type of Motor & Mounting	Foot Cum Flange Mounted
11.3	Enclosure Protection & DGMS approval	IP : 55 & DGMS approved
11.4	Foundation Details	Foot Cum Flange
11.5	Motor Rating (kW)	75 KW
11.6	Insulation Type	Class "F"
11.7	Relevant Test certificates as per IS:325	
12.0 Motor Starter		
12.1	Make	Any DGMS Approved make
12.2	Type	Skid mounted
12.3	Enclosure & DGMS approval	DGMS Approved
12.4	Rating	200 Amps
12.5	Material and utilization category	Copper & AC 3
12.6	Protection provided	ELR/OLR/SPP/UV/OV
12.7	Relevant Test certificates as per IS:13947	As per IS
13.0 Lighting Transformer		
13.1	Make /Brand	Any DGMS Approved make
13.2	Rating	5 KVA
13.3	Voltage ratio	550 V/110 V

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13.4	Quantity	2 Nos.
13.5	DGMS approval	DGMS Approved
13.6	BIS (FLP enclosure IS:2148)	BIS Certified
13.7	Approximate Weight in kg.	500 Kg.
14.0	**Audio Visual Alarm**	
14.1	Make /Brand	Any DGMS Approved make
14.2	Type / Model	As per manufacturers Standard
14.3	Sound in db	As per manufacturer Standard
14.4	Quantity	17 Nos.
15.0	**Pull Cord Switch**	
15.1	Make /Brand	Any DGMS Approved make
15.2	Type / Model	As per manufacturers Standard
15.3	Voltage	550 Volts
15.4	DGMS approval	DGMS approved
15.5	Quantity	17 Nos.
16.0	**Limit Switch**	
16.1	Make /Brand	Any DGMS Approved make
16.2	Type / Model	As per manufacturers Standard
16.3	Voltage	550 Volts
16.4	DGMS approval	DGMS Approved
16.5	Quantity	2 Nos.
17.0	**Telephone Instrument**	
17.1	Make /Brand	Any DGMS Approved make
17.2	DGMS approval	DGMS Approved
17.3	Type / Model	As per manufacturers Standard
17.4	Capacity	As per manufacturers Standard
17.5	Quantity	4 Nos.
18.0	**Lighting Cable**	
18.1	Make /Brand	Any DGMS Approved make
18.2	DGMS approval	DGMS Approved
18.3	Type / Model	Mining Type
18.4	Capacity	1100 Volts

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18.5	Quantity	900 Mtrs.
19.0	**Control Cable**	
19.1	Make /Brand	Any DGMS Approved Make
19.2	DGMS approval	DGMS Approved
19.3	Type / Model	Mining Type
19.4	Capacity	1100 Volts
19.5	Quantity	900 Mtrs.
20.0	**Telephone Cable**	
20.1	Make /Brand	Any DGMS Approved Make
20.2	DGMS approval	DGMS Approved
20.3	Type / Model	Mining Type
20.4	Capacity	1100 Volts
20.5	Quantity	900 Mtrs.
21.0	**VSD (In case of Electro-mechanical Drive)**	
21.1	Make	Not Applicable
21.2	Output capacity (kVA)	Not Applicable
21.3	Motor Power output (kW)	Not Applicable
21.4	Rated output Current (Amp)	Not Applicable
21.5	Overload capacity (%)	Not Applicable
21.6	Output frequency	Not Applicable
21.7	DGMS approval	Not Applicable
21.8	Relevant Indian Standard	Not Applicable
22.0	**Power Pack (In case of Electro-hydraulic Drive)**	
22.1	Make	Reputed make
22.2	State volumetric requirement of hydraulic power pack (litres/min)	250 ltrs./min.
22.3	State operating pressure of power pack (kg/cm2)	200 Kg/cm^2
22.4	State type of pump	Axial Piston Pump
22.5	State number of pumps required (including standby)	Two - (Main Pump and Boost Pump)
22.6	Capacity of each pump (litres/min)	260.58
22.7	Working pressure of pump (kg/cm2)	200 Kg/cm^2
22.8	Maximum operating pressure of pump (kg/cm2)	210 Kg/cm^2
22.9	Electric motor power (kW)	75 KW

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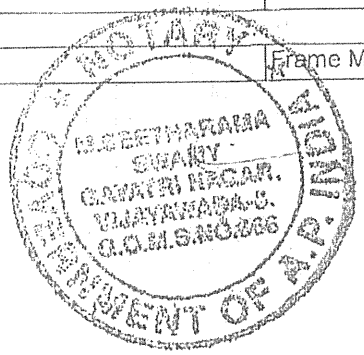
22.10	Number of hydraulic reservoir tanks	One
22.11	Total reservoir capacity (litres)	200 ltrs.
22.12 22.13 22.14	List size and quantity of filters on the power pack	Two - Pressure Line Filter, Return Line Filter
22.15	List protection devices fitted to the power pack	Temp. High, Low Pressure, High Pressure, Filter Clogged, Oil Level low, High Pressure cut off
	DGMS approval	Yes Will be provided
	Relevant Indian Standard	Not Applicable
24.0 Electrical Equipment		
24.1 24.2	Whether all the Electrical equipment proposed is flameproof and intrinsically safe	Yes
24.3	Whether all the Electrical equipment proposed has been approved by DGMS	Yes
	Whether all the Electrical equipment proposed complies with the relevant Indian / suitable international specifications.	Yes
25.0	**Safety Devices Provided (details to be given) – Over Speed Protection, Device to prevent back ward movement, Over travel limits, Over Stretch Device, Rope Speed indicator, Pull Cord Switch**	
26.0 Calculation in support of power requirement and rope diameter (to be provided) --- Yes		
27.0	**General arrangement drawings (to be provided)--- Yes**	

ANNEXURE –A- I

A. QUESTIONNAIRE TO BE FILLED IN & SUBMITTED BY THE BIDDER WITH TECHNICAL PART OF THE BID(2 nd. System)

1.0 GENERAL		
1.1	Make of Chairlift man riding system	APHMEL
1.2	Maximum speed of the System (m/sec)	3.0 Mtrs./Sec.
1.3	Average speed (m/sec)	1.75 Mtrs./Sec.(DGMS Approved Speed)
1.4	Distance between roller stations (m)	15 Mtrs.
1.5	Distance between two chairs (m)	15 Mtrs.
1.6	Gauge (mm)	900 mm
1.7	Maximum men transport capacity (per hour)	720
1.8	Average man transport capacity (per hour)	420
1.9	Diameter of drive unit sheave (mm)	1500 mm
1.10	Diameter of return sheave (mm)	900 mm
1.11	Drive power (kW)	75 KW
1.12	Time to be taken to transport 200 persons in one direction	34.6 min.
1.13	No. of rope turns on drive sheave	one
1.14	Lining materials on drive/return sheaves	PU and PB for Drive Wheel and NBR for Return Wheel
2.0 Rope		
2.1	Make	Any DGMS approved Make
2.2	Diameter of the rope (mm)	16 mm
2.3	Length of the rope	1450 mtrs.
2.4	Rope specification and type	Lengthslay, 6–Strand, 7 - Wire, RHL
2.5	Rope breaking force (kN)	167 KN
2.6	Rope safety factor as per calculation	386
2.7	Relevant Indian Standard	IS: 1855
3.0 Drive Station		
3.1	Type:	Frame Mounted



3.2	If Hydraulic, pressure (kg/cm^2), oil type, characteristics of hydraulic motor	Max. Pr. - 450 bar., working pr.-210 bar, Oil- HFDU-68, Radial Piston type with case rotating Hydraulic Motor
3.3	*Dimensions:* Length..(mm) Height..(mm) Width..(mm)	Length - 2350 mm Height - 625 mm Width- 940 mm
3.4	Whether suitable guards/fencing provided around moving units	Yes
3.5	Types of painting used	Synthatic Enamel
3.6	Rope speed indicator provided or not	Yes provided
4.0 Bed frame		
4.1	Type of construction	Structural Steel Frame
4.2	Whether single piece	Yes
4.3	Whether driver's platform provided	Not Required
5.0 Shafts		
5.1	Type of steel used in manufacturing	C40, IS: 1570
5.2	*Details of heat treatment done*	*Not Required*
6.0 Gearing (If used)		
6.1	Type of gearing used and the gearing ratio	NOT APPLICABLE
6.2	No. of hours per day for which continuous operation designed	NOT APPLICABLE
6.3	Type of lubrication provided	NOT APPLICABLE
6.4	Total designed running life (in hours)	NOT APPLICABLE
6.5	Service factor considered	NOT APPLICABLE
7.0 Bearing		
7.1	Type and specifications	SRDG Ball bearing
7.2	Make	Reputed make
7.3	Total life on continuous load design (hours)	Depends on System maintenance
7.4	Lubrication arrangement	Greasing
8.0 Brakes		
8.1	Type	Fail Safe
8.2	Braking Torque	224 KN
8.3	Hydraulically/ Mechanically operated	Hydraulically
8.4	Location of brakes	At Drive Unit

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9.0 Intermediate Roller Station		
9.1	Details of Rollers	Not Applicable
9.2	Bearing Details	Not Applicable
9.3	Material of the Shaft	Not Applicable
9.4	Lubrication Details	Not Applicable
10.0 Chairs		
10.1	Constructional Details	Pipe Material
10.2	Material of the Seat	Rexene
10.3	Details of Lining Material	Rubber
10.4	Clearances adopted (mm)	NOT APPLICABLE
10.5	No. of Chairs	100 Nos.
10.6	No. of stretcher type special arrangement	3 Nos.
11.0 Electrical Motor		
11.1	Make	Any DGMS Approved Make
11.2	Type of Motor & Mounting	Foot Cum Flange Mounted
11.3	Enclosure Protection & DGMS approval	IP : 55 & DGMS approved
11.4	Foundation Details	Foot Cum Flange
11.5	Motor Rating (kW)	75 KW
11.6	Insulation Type	Class "F"
11.7	Relevant Test certificates as per IS:325	
12.0 Motor Starter		
12.1	Make	Any DGMS Approved make
12.2	Type	Skid mounted
12.3	Enclosure & DGMS approval	DGMS Approved
12.4	Rating	200 Amps
12.5	Material and utilization category	Copper & AC 3
12.6	Protection provided	ELR/OLR/SPP/UV/OV
12.7	Relevant Test certificates as per IS:13947	As per IS
13.0 Lighting Transformer		
13.1	Make /Brand	Any DGMS Approved make
13.2	Rating	5 KVA
13.3	Voltage ratio	550 V/110 V

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13.4	Quantity	2 Nos.
13.5	DGMS approval	DGMS Approved
13.6	BIS (FLP enclosure IS:2148)	BIS Certified
13.7	Approximate Weight in kg.	500 Kg.
14.0	**Audio Visual Alarm**	
14.1	Make /Brand	Any DGMS Approved make
14.2	Type / Model	As per manufacturers Standard
14.3	Sound in db	As per manufacturer Standard
14.4	Quantity	13 Nos.
15.0	**Pull Cord Switch**	
15.1	Make /Brand	Any DGMS Approved make
15.2	Type / Model	As per manufacturers Standard
15.3	Voltage	550 Volts
15.4	DGMS approval	DGMS approved
15.5	Quantity	13 Nos.
16.0	**Limit Switch**	
16.1	Make /Brand	Any DGMS Approved make
16.2	Type / Model	As per manufacturers Standard
16.3	Voltage	550 Volts
16.4	DGMS approval	DGMS Approved
16.5	Quantity	2 Nos.
17.0	**Telephone Instrument**	
17.1	Make /Brand	Any DGMS Approved make
17.2	DGMS approval	DGMS Approved
17.3	Type / Model	As per manufacturers Standard
17.4	Capacity	As per manufacturers Standard
17.5	Quantity	3 Nos.
18.0	**Lighting Cable**	
18.1	Make /Brand	Any DGMS Approved make
18.2	DGMS approval	DGMS Approved
18.3	Type / Model	Mining Type
18.4	Capacity	1100 Volts

18.5	Quantity	700 Mtrs.
19.0	**Control Cable**	
19.1	Make /Brand	Any DGMS Approved Make
19.2	DGMS approval	DGMS Approved
19.3	Type / Model	Mining Type
19.4	Capacity	1100 Volts
19.5	Quantity	700 Mtrs.
20.0	**Telephone Cable**	
20.1	Make /Brand	Any DGMS Approved Make
20.2	DGMS approval	DGMS Approved
20.3	Type / Model	Mining Type
20.4	Capacity	1100 Volts
20.5	Quantity	700 Mtrs.
21.0	**VSD (In case of Electro-mechanical Drive)**	
21.1	Make	Not Applicable
21.2	Output capacity (kVA)	Not Applicable
21.3	Motor Power output (kW)	Not Applicable
21.4	Rated output Current (Amp)	Not Applicable
21.5	Overload capacity (%)	Not Applicable
21.6	Output frequency	Not Applicable
21.7	DGMS approval	Not Applicable
21.8	Relevant Indian Standard	Not Applicable
22.0	**Power Pack (In case of Electro-hydraulic Drive)**	
22.1	Make	Reputed make
22.2	State volumetric requirement of hydraulic power pack (litres/min)	250 ltrs./min.
22.3	State operating pressure of power pack (kg/cm2)	200 Kg/cm^2
22.4	State type of pump	Axial Piston Pump
22.5	State number of pumps required (including standby)	Two - (Main Pump and Boost Pump)
22.6	Capacity of each pump (litres/min)	260,58
22.7	Working pressure of pump (kg/cm2)	200 Kg/cm^2
22.8	Maximum operating pressure of pump (kg/cm2)	210 Kg/cm^2
22.9	Electric motor power (kW)	75 KW

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22.10	Number of hydraulic reservoir tanks	One
22.11	Total reservoir capacity (litres)	200 ltrs.
22.12 22.13 22.14	List size and quantity of filters on the power pack	Two - Pressure Line Filter, Return Line Filter
22.15	List protection devices fitted to the power pack	Temp. High, Low Pressure, High Pressure, Filter Clogged, Oil level low, High Pressure cut off
	DGMS approval	Yes Will be provided
	Relevant Indian Standard	Not Applicable
24.0 Electrical Equipment		
24.1 24.2	Whether all the Electrical equipment proposed is flameproof and intrinsically safe	Yes
24.3	Whether all the Electrical equipment proposed has been approved by DGMS	Yes
	Whether all the Electrical equipment proposed complies with the relevant Indian / suitable international specifications.	Yes
25.0	**Safety Devices Provided (details to be given) – Over Speed Protection, Device to prevent back ward movement, Over travel limits, Over Stretch Device, Rope Speed indicator, Pull Cord Switch**	
26.0 Calculation in support of power requirement and rope diameter (to be provided) --- Yes		
27.0	**General arrangement drawings (to be provided)--- Yes**	

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