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सामग्री सूची संख्या को अधिकृतित करता है ।  SUPERSEDES INVENTORY NO.		<div>COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bhamt Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company</div> <div>स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो ना किया जाए ।</div> <div>SPECIFICATION OF PROJECT DETAILS AND GENERAL CONDITIONS OF BOPs FOR (4X100 MW) KOTESHWAR HEP</div>						
हस्ताक्षर एवं दिनांक SIGN & DATE						नाम NAME	दिनांक एवं हस्ताक्षर SIGN. & DATE	
					अनुवादक TRANSLATED BY			
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						जांचकर्ता Checked by		P.K.GARG	


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<div>1. SCOPE OF CONTRACT</div> <div>1. 1 SUPPLY OF GOODS AND SERVICES REQUIRED</div> <div>a) Supply of goods</div> <div>i) Design, manufacture, assembly, testing at manufacturer’s works before despatch, packing, supply and delivery of specified goods, General Spares, Mandatory spares etc. as detailed / listed in Technical Specifications.</div> <div>ii) Marine transportation upto the port-of-entry for imported portion of the Goods.</div> <div>iii) Insurance from the warehouse of the Contractor (manufacturer’s warehouse shall be deemed to be the warehouse of the Contractor ) upto the Port of Entry in India.</div> <div>b) Services</div> <div>i) Custom Clearance, Handling and Receipt of goods at port of entry in India for imported portion of the contracted Goods.</div> <div>ii) Handling, loading, unloading, in-land transportation of the goods from port-of –entry in India (for imported goods ) and from Bidder’s works in India (for indigenous goods ) up to Project site. (In-land transport for supplies is in BHEL scope. Transport for erection tools etc is not in BHEL scope).</div> <div>(iii) Receipt, storage and preservation of the goods in stores and at site, loading, unloading, local transportation and other associated activities. (This is in BHEL scope).</div> <div>(iv)a. Transit insurance of the goods from port of entry in India (for imported goods) and from contractor” works in India (for indigeneous goods) upto project site. (MCE policy by BHEL).</div> <div>(iv)b. Insurance for the period (other than involved in transportation) upto the erection, testing &amp; commissioning and handing over of the works to the owner. (MCE policy by BHEL).</div> <div>(v) Erection, Testing and Commissioning of the equipment and their operation and maintenance and other associated activities till satisfactorily handing over of the same to the Owner.</div> <div>(vi) Providing expert personnel for the services to be performed at site.</div> <div>(vii) Deputation of owner’s Engineers for inspection and testing.</div>							
		निर्माणकर्ता Worked by		B.M.SOOD			
		जांचकर्ता Checked by		P.K.GARG			


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COPYRIGHT AND CONFIDENTIAL  The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company		(viii) Training of Owner's engineers & staff at site.					
		<b>c) Incidentals</b> Any other goods and services etc. not specifically mentioned but which are incidental – for completeness of equipment and for services starting from supply to satisfactory erection and commissioning. It shall be construed that these incidentals are part of the relevant goods and services mentioned above.					
स्वत्वाधिकार एवं गोपनीय  इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रलेख एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।		<b>NOTE :</b> In case of any contradiction between the requirements in this specification or General Technical specification (GTS) / particular technical specification (PTS), the requirements given in GTS / PTS will be binding.					
		<b>2. GENERAL INFORMATION</b> Koteshwar Hydro Electric Project is an integral part of Tehri Hydro Power Complex comprising of Tehri Dam and Hydro power Plant (HPP), Tehri Pumped Storage Plant (PSP) and Koteshwar HEP. Installed capacity of Koteshwar HEP is 400 MW (4 x 100). The power house shall have 4 (four) generating units 111MVA (100MW) capacity and maximum output of 116.5MVA (105MW) continuously, 0.9 power factor lagging three phase star connected. 50Hz, 13.8KV generation voltage and 142.86 rpm rated speed. The generation voltage of 13.8KV will be stepped up to 420KV through generator transformers which in turn is connected to 420KV outdoor switchyard equipment. One generator shall be connected to one three phase 420KV generator transformer. The power generated shall be evacuated through two nos. 420KV outgoing transmission lines connected to pooling station at Koteshwar. Four (4) nos. generator transformers 117MVA, 13.8/420KV and one (1) no. service station transformer 2.5MVA, 13.8/11KV are located on top roof of power house.					
हस्ताक्षर एवं दिनांक SIGN & DATE		<b>2.1 LOCATION OF THE PROJECT</b> The work site of Koteshwar dam is near the village Paindaras on river Bhagirathi in District Tehri Garhwal of Uttranchal., The geographical location of the site is between Latitude 300 30' - 320 30'N & Longitude 780 30' - 790 00'E. The work site is approximately 135 Km from Dehradun, 105 Km from Rishikesh and 22 Km from Tehri. Nearest Railway Station from work - site is Rishikesh.					
		<b>2.1.1 ACCESS TO PROJECT</b> Metalled double lane road exists from Rishikesh to Tehri Town via Narendra Nagar and Chamba and being improved & upgraded to allow the transportation of packages upto 200MT of 10M x 4M x 4.3M (LxBxH). Though the road is an all weather road, its temporary blockage, due to hill slides during rains or and due to widening of road being in progress can not be ruled out and all weather road exists from Tehri to Koteshwar Project site which is about 22Km long.					
सामग्री सूची संख्या INVENTORY NO.		<b>2.1.2 CLIMATIC CONDITIONS OF POWER HOUSE</b> The climatic conditions prevailing at power house site are given below:					
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COPYRIGHT AND CONFIDENTIAL  The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company		<p><b>Temperature Data</b></p> <p>i) Maximum Air Temperature (June) 50<sup>o</sup> C 45<sup>o</sup> C (Rev.-01)</p> <p>ii) Minimum Air Temperature (Jan.) 2<sup>o</sup> C</p> <p>iii) Maximum river water temperature 25<sup>o</sup> C (during June-July)</p> <p><b>Rainfall Data</b></p> <p>i) No. of months of tropical monsoon conditions 4</p> <p>ii) Average annual rainfall 774 mm</p> <p>iii) Average no. of rainy days in a year 120</p> <p>iv) Occurrence of fog conditions Yes</p> <p>v) Humidity 90%</p> <p><b>Wind data</b></p> <p>i) Maximum wind velocity 160 kmph</p> <p><b>PRESENT STATUS OF PROJECT</b></p> <p>Access road to project site is available</p> <p>Major infrastructure to start the project activities has been established.</p> <p>For construction of dam, a diversion tunnel is constructed.</p> <p><b>2.1.3 SITE VISIT</b></p> <p>The Bidder is strongly advised to visit and examine the site of works and its surroundings and obtain for himself on his own responsibility all information that may be necessary before preparing the bid and entering into a Contract . The cost of visiting the site shall be at Bidder's own expense. The Owner will assist interested Bidder to see &amp; inspect the site of works.Once the Bidder has submitted his Bid , it shall be assumed that he has fully familiarised himself with the site conditions.</p> <p><b>2.2 STANDARDS</b></p> <p>The goods supplied under this Contract shall conform to the standards mentioned in the Technical Specifications and when no applicable standard is mentioned to the authoritative standard appropriate to the Goods of country of origin, such standards shall be the latest issued by the concerned institution.</p> <p><b>2.3 PATENT RIGHTS</b></p> <p>The Contractor indemnifies the Owner against all actions, suits, claims, demands, costs, charges and expenses arising from or incurred by reason of any infringement for any letters, patent designs, trade mark or name, copy right or other protected rights in respect of any machine, plant, work, material, things or system or method of using, fixing, working or arrangement used or fixed or supplied by the Contractor. All royalties and other similar payments which may have to be paid for the use of such</p>																					
								हस्ताक्षर एवं दिनांक SIGN & DATE		सामग्री सूची संख्या INVENTORY NO.		REV. NO.		<table><tr><td>निर्माणकर्ता</td><td></td><td></td><td></td></tr><tr><td>Worked by</td><td>B.M.SOOD</td><td></td><td></td></tr><tr><td>जांचकर्ता</td><td>P.K.GARG</td><td></td><td></td></tr><tr><td>Checked by</td><td></td><td></td><td></td></tr></table>		निर्माणकर्ता				Worked by	B.M.SOOD		
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		5.		Power & Control Cable	The bidder must have designed, manufactured, supplied HT (11 KV or above) XLPE power cables and LT power and control cables and must have successfully executed atleast two cabling contracts of erection, testing and commissioning of power and control cables on cable trays / racks and buried in ground for a length of 2 KM minimum for a power plant or substation or industrial complex which should be in successful operation for at least (2) years as on the date of bid opening .						
		6.		Unit, Station Service & Other Auxiliary Transformer and 415 V Switchgear	The bidder must have designed, manufactured, supplied, erected, tested and commissioned / provided supervision of erection, testing and commissioning of 415 V switchgear of bus bar capacity of 1000 Amp. Or more with minimum 50 KA short circuit current rating for 1 second atleast at three different locations which are in satisfactory operation for a minimum period of (3) years.						
		7.		Elevator	The bidder must have designed, manufactured, supplied, erected, tested and commissioned elevator of 500 kg capacity and speed range 0.5 m/s to 1.0 m/s covering a lift of 10 meters at five different locations which are in in successful operation for last (5) years.						
		8.		Air Conditioning & Ventilation System	The bidder must have designed, manufactured, supplied, erected, tested and commissioned ventilation system with a minimum discharge capacity of 2 lac cubic meter per hour in two underground / surface power houses / an industry / commercial establishments and these must be in successful operation for at least two years after commissioning.						
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COPYRIGHT AND CONFIDENTIAL  The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company		<p>Packing case size and weight shall take into consideration, where appropriate, the remoteness of the goods' final destination and the absence of heavy handling facilities at all points in transit. The Contractor shall be responsible for all losses and damages caused or occasioned by any defect in packing and replace the same without any cost to Owner whatsoever.</p> <p>The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract and any subsequent instructions issued by the Owner.</p> <p><b>5. DELIVERY AND DOCUMENTS</b></p> <p>Time is the essence of the Contract. Delivery of the Goods shall be made by the Contractor in accordance with specified Schedule .</p> <p>Contractor shall not despatch any equipment until necessary tests have been performed and certificate of inspection and material despatch clearance certificate have been issued by the Owner.</p> <p>The Contractor shall attempt to arrange despatches so that consignments do not reach site during monsoon period i.e. June to October of every year without affecting contractual obligations.</p> <p><b>In case of goods imported from abroad</b></p> <p>(i) The despatch documents for the goods on shipment giving details as required hereinafter shall be furnished by the Contractor to the Owner. The covering letter enclosing despatch documents shall be addressed to Executive Director (Contracts) and copies endorsed to other concerned officials of the Owner . Any change in furnishing supply of despatch documents to the Owner by Contractor shall be notified and he will make due changes in this regard.</p> <p>The Contractor shall furnish all relevant despatch document to the Owner immediately after shipment of consignment enabling him to pay customs duty in time .</p> <p>Any wharfage/demurrage /penalty , if levied on account of non fulfillment of contractual obligation /documentation shall be to Contractor's account.</p> <p>(ii) Custom clearance of goods at Port-of -Entry in India, handling in the dock , further transportation to stores/site, receipt and custody thereof are, as required under this Contract shall be the responsibility of the Contractor himself .The Contractor shall also furnish copies of despatch documents to his own Organisation or agent(s) in India as necessary for the purpose.</p> <p>The Contractor shall within three days from the day of shipment notify the Owner and the Insurance Company by telex/fax/ cable, the full details of the shipments including Contract number, description of</p>					
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COPYRIGHT AND CONFIDENTIAL  The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company		<p>Goods, quantity, the vessel, the bill of lading, the no. and date of loading, date of shipment, port of discharge and invoice value etc..</p> <p><b>In case of locally supplied goods</b></p> <p>In case of Goods supplied from within India, the Contractor on despatch, shall notify the Owner and the Insurance Company by fax/cable /telex within two days of despatch, the full details of the despatch including Contract number, description of Goods, quantity , RR number and date/ GR number &amp; date of despatch with name of transporter and invoice value etc. Immediately on despatch of Goods, the Contractor shall forward to the Owner, the required despatch documents with a copy of each document forwarded to the Insurance Company.</p> <p>Delivery of goods shall be co-ordinated with Erection Schedule of the plant which will be mutually agreed between the owner and the contractor.</p> <p><b>5.1 INCIDENTAL SERVICES</b></p> <p>The Contractor at his cost shall be required to provide any or all of the following services :</p> <ul style="list-style-type: none"><li>(a) Performance and supervision of on site assembly and/or start-up of the supplied Goods,</li><li>(b) Furnishing of tools required for assembly, and/or maintenance of the supplied Goods ,</li><li>(c) Furnishing of detailed operation and maintenance manual for each appropriate unit of the supplied Goods .</li></ul> <p><b>5.2 SPARE PARTS</b></p> <ul style="list-style-type: none"><li>(i) The Contractor shall carry sufficient inventories to assure Ex-stock supply of consumable spares such as gaskets, plugs, washers, bolts, etc.. Other spare parts and components shall be supplied as promptly as possible but in any case within six months of placement of order even after completion of contract against establishment of letter of credit within three months of placement of order.</li><li>(ii) The Contractor shall supply mandatory spares as specified in the technical specifications.</li><li>(iii) <b>The warranty period for the spares shall be for the period of twelve months from the date of receipt or 18 months from the date of shipment.</b></li></ul> <p>In the event of termination of production of the spare parts, the Contractor shall be responsible :</p>					
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COPYRIGHT AND CONFIDENTIAL  The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company		<p>(i) To give advance notification to the Owner of the pending termination in sufficient time to permit the Owner to procure the needed requirements and</p> <p>(ii) Following such termination to furnish at no cost to the Owner the blue prints drawings in A3 size and specifications of the spare parts, as and when requested.</p> <p><b>6. DEFECTS AFTER TAKING OVER</b></p> <p><b>6.1 DEFECTS LIABILITY PERIOD</b></p> <p>In these conditions the expression ``Defects Liability Period"shall mean a period of twelve months from the date of erection and commissioning and taking over of the respective generating units. OR thirty six months from the date of receipt of last consignment at site, which ever is earlier. In case of taking over of the respective generating units, the first unit should have been taken over alongwith all the common auxiliaries &amp; services required for the complete commissioning of the project.</p> <p><b>6.1.1 MAKING GOOD DEFECTS</b></p> <p>The Contractor shall be responsible for making good any defect in or damage to any part of the works which may appear or occur during the Defects Liability Period and which arises from either :</p> <p>a) any defect in materials, workmanship or design.</p> <p>b) any act or omission of the Contractor during the Defects Liability period.</p> <p>The Contractor shall make good the defect or damage as soon as practicable and at his own cost.</p> <p><b>6.1.2 NOTICE OF DEFECTS</b></p> <p>If any such defect appears or damage occurs, the Engineer in-Charge of owner shall forthwith notify the Contractor thereof. However, delay or failure of the Engineer-in-Charge in notifying shall not relieve the Contractor from his liability for remedying the defects at his own cost.</p> <p><b>6.1.3 EXTENSION OF DEFECTS LIABILITY PERIOD</b></p> <p>The provisions of this clause shall apply to all replacements or renewals carried out by the contractor as if the replacements and renewals had been taken over on the date they were completed.</p> <p>The Defects Liability period for the works shall be extended by a period equal to the period during which the works can not be used by reasons of a defect or damage. If only a part of the works is affected, the Defects Liability Period shall be extended only for that part.</p> <p><b>6.1.4 FAILURE TO REMEDY DEFECTS</b></p> <p>If the Contractor fails to remedy a defect or damage within a reasonable time, the Engineer-in-charge may fix a final time for remedying the defect or damage.</p> <p>If the Contractor fails to do so, the Engineer-in-Charge may :</p> <p>a) carry out the work himself or by others at the Contractor's risk and cost. The costs actually incurred by the Engineer in Charge in</p>					
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COPYRIGHT AND CONFIDENTIAL  The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company		<p>remedying the defect or damage shall be recovered from any money due or which may become due to the Contractor , but the Contractor shall have no responsibility for such work, or</p> <p>b) require the Contractor to grant the Owner a reasonable reduction in the Contract price to be agreed. In case of disagreement, such reduction as decided by the Owner shall be final, or</p> <p>c) If the defect or damage is such that the Owner has been deprived of substantially the whole of the benefit of the works or a part thereof, it may terminate the Contract in respect of such parts of the works as can not be put to the intended use. The Owner shall be entitled to recover all sums paid in respect of such parts of the works together with the cost of dismantling the same, clearing the site and returning the affected equipment to the Contractor or otherwise disposing it off in consultation with the Contractor.</p> <p><b>6.1.5 REMOVAL OF DEFECTIVE WORK</b></p> <p>If the defect or damage is such that repairs can not be expeditiously carried out on the site , the Contractor may, with the consent of the Engineer-in-Charge and after furnishing a proper security acceptable to the Owner in case the item is paid for, remove from the site , for the purposes of repair, any part of the works which is defective or damaged.</p> <p><b>6.1.6 FURTHER TESTS ON COMPLETION</b></p> <p>If the replacements or renewals are such that they may affect the performance of the works, the Engineer-in-Charge may request that the Tests on completion be repeated to the extent necessary without any cost to the owner. The request shall be made by notice within thirty days after the replacement or renewal.</p> <p><b>6.1.7 RIGHT OF ACCESS</b></p> <p>Until the final certificate of payment has been issued, the Contractor shall have the right of access to all parts of the works and to records of the working and performance of the works.</p> <p>Such right of access shall be during the Owner's normal working hours at the Contractor's risk and cost. Access shall also be granted to any duly authorised representative of the Contractor, whose name has been communicated in writing to the Engineer-in-Charge.</p> <p>Subject to the Engineer-in-Charge's approval, the Contractor may also, at his own risk and cost, make any tests which he considers desirable.</p> <p><b>6.1.8 CONTRACTOR TO SEARCH</b></p> <p>The Contractor shall , if required by the Engineer-in-Charge in writing, search for the cause of any defect, under the direction of the Engineer-in-Charge. Unless the defect is one for which the Contractor is liable under this clause, the cost of the work carried out by the Contractor in searching for the cause of the defect shall be determined by the Engineer-in-Charge and added to the Contract price.</p>													
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		<b>6.2.1 A LIABILITY FOR LATENT DEFECTS</b> The Contractor at his cost shall be liable and responsible to make good the latent defects, if any, in the works that may come to notice or are discovered during a period of 5 (five) years from the date of issue of the Defects liability certificate. The Contractor shall repair or replace the works in which latent defects are noticed or are discovered, failing which the Owner may carry out such repair or replacement at the risk and cost of the Contractor and the Owner's certificate regarding the costs incurred shall be final and binding on the Contractor who shall pay such costs to the Owner within 30 (thirty) days of demand by the Owner. The Contractor shall provide a corporate guarantee to the Owner in form and content acceptable to the Owner covering Contractor's obligations under this clause, before release of final payment under this Contract.					
		<b>6.2.2 EXCLUSIVE REMEDIES</b> The Owner's remedies under this clause shall be in place of and to the exclusion of any other remedy in relation to defects whatsoever.					
		<b>7. TAKING OVER</b> <b>I) TAKING OVER</b> The works shall be taken over by the Owner when they have been completed in accordance with the Contract, except in minor respects that do not affect the use of the works for their intended purpose, have passed the final acceptance tests as specified in Technical Specification and a Taking Over Certificate has been issued. Where any part of the works is taken over separately from the works, the Defects Liability period for that part shall commence on the date it was taken over.					
		<b>II) TAKING OVER CERTIFICATE</b> The Contractor may apply to the Engineer-in-Charge for a Taking Over Certificate not earlier than fourteen days before the works will, in the Contractor's opinion, be complete and ready for taking over under sub-clause (i) of this clause.					
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सामग्री सूची संख्या INVENTORY NO.				जांचकर्ता Checked by		P.K.GARG	


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सामग्री सूची संख्या को अधिकृतित करता है । SUPERSEDES INVENTORY NO.						पृष्ठ का  Page 15 of 19	
COPYRIGHT AND CONFIDENTIAL  The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company		<p>The Engineer-in-Charge shall, within thirty days after the receipt of the Contractor's application either :</p> <p>a) issue the Taking Over Certificate to the Contractor stating the date on which the works were complete and ready for taking over, or</p> <p>b) reject the application giving his reasons and specifying the work required to be done by the Contractor to enable the Taking over Certificate to be issued.</p> <p>If the works are divided by the Contract into sections, the Contractor shall be entitled to apply for separate Taking Over Certificates for each such section.</p> <p><b>III) USE BEFORE TAKING OVER</b></p> <p>The THDC will not use any part of the works unless a taking Over Certificate has been issued in respect thereof.</p> <p>If, nevertheless, THDC uses any part of the works, that part which is used shall be deemed to have been taken over at the date of such use. The Engineer-in-Charge shall, on request of the Contractor, issue a Taking Over Certificate accordingly. If THDC uses any part of the works before taking over, the Contractor shall be given the earliest opportunity of taking such steps as may be necessary to carry out the Tests on completion.</p> <p>The works shall not be deemed to have been taken over if they are not substantially in accordance with the Contract.</p> <p>The provisions set out above shall apply as if the part had been taken over on the date it was taken into use.</p> <p><b>8. DRAWINGS</b></p> <p>After the award of Contract the Contractor &amp; Purchaser / Owner will hold design co-ordination meetings to finalise steps to be taken to implement the Contract including procedure for submission of drawings, design details and approval thereof in such a manner and procedures which would bring out workable solution to step by step process. At least fifteen copies of the complete design calculations and drawings for any part of the work shall be submitted by the Contractor for approval at least ninety days prior to the date on which such drawings are required to ensure that the work is carried out in accordance with the approved programme of work. The Engineer-In-Charge D&amp;E Deptt. shall accord and convey the approval to the drawings, if found in order, within thirty days from the receipt of the drawings from the Contractor.</p> <p>Otherwise he shall apprise the Contractor of his comments on such design calculations and drawings within the 30 days from the receipt of the drawings from the contractor.</p>					
स्वत्वाधिकार एवं गोपनीय  इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रलेख एवं अप्रलेख रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।		हस्ताक्षर एवं दिनांक SIGN & DATE		सामग्री सूची संख्या INVENTORY NO.		REV. NO.	
						निर्माणकर्ता Worked by B.M.SOOD	
						जांचकर्ता Checked by P.K.GARG	

9C दर्तांक एवम् हस्ताक्षर SIGN & DATE				उत्पाद मानक  PRODUCT STANDARD		HT 12103	
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COPYRIGHT AND CONFIDENTIAL  The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company		<p>Where such comments are communicated to the Contractor, the Contractor shall be bound to ensure that modified design, taking into account of the comments, are submitted in fifteen (15) copies to the</p> <p>Engineer-in-Charge D&amp;E Deptt. within fifteen days of receipt of the comments. Similar course of action, as aforesaid, shall be taken by the Engineer-in-Charge D&amp;E Deptt. on the modified designs. On approval of drawings/design processes/design calculation etc. the Contractor will furnish fifteen (15) copies of approved drawings within 10 days of such approval.</p> <p>Notwithstanding the approval of the Engineer-in-Charge D&amp;E Deptt. to the Contractor's design and drawings, the Contractor shall be responsible for the stability of works in accordance with the provisions of the Contract and the approval accorded shall not absolve him of his responsi- bility for the safety of the structure.</p> <p>One copy of the approved drawings shall be kept by the Contractor at the site and the same shall , at all reasonable times, be available for inspection and use by THDC and by the Contractor.</p> <p>The Engineer-in-Charge shall, however, have full power and authority to modify, from time to time, during the progress of works, the drawings approved previously , as shall be necessary for the purpose of proper and adequate execution and completion of works. The Contractor, shall carry out and be bound by such modification.</p> <p>Before the works are taken over in accordance with the Contract, the Contractor shall supply twenty (20) nos. Operation and Maintenance Manuals together with fifteen (15) nos.drawings of the works as completed. The drawings shall be furnished generally in A0 size. However, the drawings for part items shall be furnished in A3 Size. <b>One set of reproducible ( on polyester film) for all the drawings shall be submitted by the contractor .</b> These shall be in such detail as will enable the THDC to operate, maintain, adjust and repair all parts of the works. Unless otherwise agreed, the works shall not be considered to be completed for the purposes of taking over until such manuals and drawings have been supplied to the THDC at contractor's cost.</p> <p>The THDC's drawings, specifications and other information to the Contractor shall remain the property of the THDC. They shall not be used, copied or communicated to a third party by the Contractor .</p> <p>The Contractor shall be responsible for any errors or omissions in the Contractor's drawings unless they are due to errors in THDC's specifications, drawings or other written information supplied by the THDC .Errors, if any, noticed by the Contractor in the THDC's drawings, specifications and other information shall, however be promptly pointed out by the Contractor to the THDC. Approval by the Engineer-in-Charge</p>					
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		हस्ताक्षर एवं दिनांक SIGN & DATE		सामग्री सूची संख्या INVENTORY NO.		REV. NO.		<table><tr><td>निर्माणकर्ता Worked by</td><td>B.M.SOOD</td><td></td><td></td></tr><tr><td>जांचकर्ता Checked by</td><td>P.K.GARG</td><td></td><td></td></tr></table>		निर्माणकर्ता Worked by	B.M.SOOD			जांचकर्ता Checked by	P.K.GARG
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COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company		PARTICULAR TECHNICAL SPECIFICATION FOR ELEVATOR									
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						अनुवादक TRANSLATED BY					
TSX						निर्माणकर्ता WORKED BY		B.M.SOOD		16.03.07	
QAX		S.S.CHAUHAN		16.03.07		जांचकर्ता CHECKED BY		P.K.GARG		16.03.07	
सहमत विभाग AGREED DEPTT.		नाम NAME		दिनांक एवं हस्ताक्षर DATE & SIGNATURE		पर्यवेक्षणकर्ता SUPERVISED BY		A.K.JAIN		16.03.07	
सामग्री सूची संख्या INVENTORY NO.		Supercedes Old Spec. Under Same Number				स्वीकृति APPROVED : A.K.JAIN Dated				GR.NO .	
REV. NO. 01						निर्माण : PREPARED PED		ज़ारी : ISSUED TSX		दिनांक : DATE	
DATE 16.03.07											


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सामग्री सूची संख्या SUPERSEDES को अधिकारित करता है   INVENTORY NO.	<p><b>1.6 ADDITIONAL SPECIAL REQUIREMENTS TO ELEVATORS</b></p> <p>The passenger elevators are intended for serving the person and for possible transportation of small size parts of the equipment. The size of elevator car shall be so selected that it fits in the hoistway provided and shall be designed for the capacity mentioned in the technical data. Similarly, goods elevator is intended for serving the goods and for possible transportation of personnel, if required.</p>																											
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	<p><b>1.6.2 EACH ELEVATOR CAR SHALL CONSIST OF</b></p> <ul style="list-style-type: none"> <li>a) Welded steel framework</li> <li>b) Wainscot</li> <li>c) Automatic doors</li> <li>d) Exhaust ventilation system</li> <li>e) Lighting system</li> <li>f) Car operating panel</li> </ul>																											
	<p><b>1.6.3. EACH ELEVATOR MACHINE SHALL CONSIST OF</b></p> <ul style="list-style-type: none"> <li>a) Winch as alternate gear with A C induction motor with high starting torque and low starting current with VVVF type controller</li> <li>b) Winch frame</li> <li>c) Winch bedplate (frame) resting on elastic rubber pads and struttred into rubber pads</li> <li>d) Control cabinets with thyristor converters</li> <li>e) Speed limits</li> <li>f) Catchers</li> <li>g) Hoist ropes</li> <li>h) Counterweight of pig iron or steel</li> <li>i) Sheaves for hoisting ropes</li> </ul>																											
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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES समझी सूची संख्या को अधिकारित करता है। INVENTORY NO.	<p><b>1.6.4. EACH WINCH SHALL CONSIST OF</b></p> <ul style="list-style-type: none"> <li>a) Alternate gear with Cable governing sheave</li> <li>b) Electric magnetic brake</li> <li>c) Bearing</li> <li>d) Fan</li> </ul> <p><b>1.6.5 EACH ELEVATOR HOIST WAY SHALL INCLUDE</b></p> <ul style="list-style-type: none"> <li>i. Guide rails for elevator car and counter weight</li> <li>ii. Counterweights with guide shoes and stop blocks</li> <li>iii. Steel splice plates for guide rails</li> <li>iv. Spring buffers</li> <li>v. All fixing materials require to fix rails, brackets, equipments including nut and bolts</li> </ul> <p>Elevator hoisting winches shall be <b>equipped with manual control feature</b> in case of electric motor failure or interruptions in power supply.</p> <p><b>For passenger elevators, the car entrance shall be arranged on one side, the counterweight - on the opposite side. For goods elevator, counterweight shall preferably be on the side of the car.</b></p> <p>The automatic car doors and landing doors shall be arranged on one side of the elevator including all sole plates and fastening bolts required.</p> <p>The hoist way landing doors shall be equipped with electromechanical interlocks.</p> <p>Maximum acceleration (slowing down) of car travel in descending and slowing down at normal speed shall be <b>2 m/sec<sup>2</sup></b>. Maximum acceleration on slowing down at operation of the "stop" button shall not exceed <b>3 m/sec<sup>2</sup></b>.</p> <p>The elevators shall be equipped with such safety devices as bumpers, catchers, speed limits etc. <b>The hoisting cables shall be from one cable drum.</b> The car safety gear shall be of smooth speed braking type.</p> <p><b>The elevator control system shall be equipped with a push-button station for starting and controlling the elevator from the machine room. The elevators shall be equipped with push-button stations for control from the car.</b></p>			
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स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत की इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रयोग एवं प्रसारण के बिना किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए।	हस्ताक्षर एवं दिनांक SIGN & DATE				
सामग्री सूची संख्या INVENTORY NO.	REV. NO. <b>01</b>	निर्माणकर्ता Worked by जांचकर्ता Checked by	B.M.SOOD P.K.GARG		


दनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक <b>PRODUCT STANDARD</b>		HT 12105	
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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<p> <b>All control systems, except of the call systems, shall be equipped with “stop” buttons.</b>          Switches for car and hoistway lighting shall be arranged in the machine room.          Earthing system shall conform to Indian Electricity Rules 1956 and latest edition of IS:3043. <b>All metal parts of the elevators that may become live due to insulation failure shall be securely grounded as specified by applicable standards. The following elements shall be grounded:</b> </p> <ul style="list-style-type: none"> <li>i. Hoist way metalwork.</li> <li>ii. Guides of car.</li> <li>iii. Guides of counterweight.</li> <li>iv. Electric motor enclosure.</li> <li>v. Limit switch enclosure.</li> <li>vi. Framework of contact panel.</li> <li>vii. Framework of panel attachment.</li> <li>viii. Framework of entry knife switch.</li> <li>ix. Enclosure of entry knife switch.</li> <li>x. Enclosure of fuses.</li> <li>xi. Enclosure of calling push-button station at each landing.</li> <li>xii. Enclosure of hoist way door interlock at each landing.</li> <li>xiii. Enclosure of car push-button station</li> <li>xiv. Enclosure of floor switch at each landing.</li> <li>xv. Car frame.</li> <li>xvi. Enclosure of magnetic shifter.</li> <li>xvii. Enclosure of control circuit switch in elevator pit.</li> <li>xviii. Enclosure of catcher contact.</li> <li>xix. Enclosure of under-floor contact.</li> <li>xx. Enclosure of cable slack monitoring contact.</li> <li>xxi. Enclosure of car door contact.</li> <li>xxii. Magnetic conductor of sensing device.</li> <li>xxiii. Wiring rigid steel conduits, flexible metal conduits shielding of suspended cables.</li> <li>xxiv. Metal sheathing of insulating conduits.</li> <li>xxv. Metal sheathing of wiring.</li> <li>xxvi. Metal sheathing and armour of cables and other metal structures related to installation of electrical equipment.</li> <li>xxvii. Any other item as per supplier's standard practice.</li> </ul> <p>           The winch shall operate free of excessive vibration and high noise level..            The electric motor shall operate free of excessive heating. <b>The noise level in hoist shaft and car should preferably not exceed 60 dB as per IS:1950-1962.</b> </p>			
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COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.		<p><b>1.6.6 AUTOMATIC RESCUE DEVICE (ARD)</b></p> <p>All the elevators shall be provided with an automatic rescue device. In the event of failure of power supply, the automatic rescue device shall bring the elevator to nearest landing and facilitate the rescue of the passenger / goods in the elevator. The ARD shall operate on D.C. supply (dry maintenance free batteries) and shall continuously monitor the normal power supply.</p> <p>The ARD shall bring the elevator to nearest landing, open the door and park the elevator there until the normal supply is restored and then reverts the elevator to normal operation. In case of controller failure, phase failure and tripping of motor due to over load, the ARD shall be actuated by switching off the supply manually for rescue operation. <b>Dry maintenance free battery required for ARD shall be in supplier's scope of work.</b></p>																											
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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<b>1.8 TECHNICAL DATA</b> <b>A. DAM SPILLWAY PASSENGER ELEVATORS ( ES-1 and ES-2 )</b>					
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		01	Rated load, mass	408.0 Kg.			
		02	No of passenger	6 Nos.			
		03	Rated car speed	0.7-1.0 m / sec.			
		04	Car dimension – inside				
			1) Clear width	≈ 1100 mm	Dim. A as per IS:14665 ( Part-1 / Table-2)		
			2) Clear depth	≈ 1000 mm	Dim. B as per IS:14665 ( Part-1 / Table-2)		
			3) Clear height	≈ 2150 mm			
		05	Size of well / shaft	≈ 1900 X 1700 mm	Dim . C as per IS:14665 ( Part-1 / Table-2) Dim . D as per IS:14665 ( Part-1 / Table-2)		
		06	Size of landing doors				
			1) Clear height	≈ 2150 mm			
			2) Clear width	≈ 700 mm	Dim .E as per IS:14665 ( Part-1 / Table-2)		
		07	No. of Landings ( ES-1 )				
			1) Landing “E”	E.L. 614.5 m	Drg.TH-KOT-TD-DS-26/38		
			2) Landing “D”	E.L. 602.5 m	-- DO --		
			3) Landing “C”	E.L. 590.5 m	-- DO --		
			4) Landing “B”	E.L. 578.65 m	-- DO --		
			5) Landing “A”	E.L. 572.2 m	-- DO --		
			No. of Landings ( ES-2 )				
			1) Landing “T”	E.L 575.55 m	Drg.TH-KOT-TD-DS-26/39		
			2) Landing “S”	E.L 547.95 m	-- DO --		
			3) Landing “R”	E.L 523.65 m	-- DO --		
		08	Overhead	≈ 4.25 m			
			M/C room elevation for ES-1	EI+619.00 m	Top of M/C Room Floor		
			M/C room elevation for ES-2	EI+580.05 m	Top of M/C Room Floor		
		हस्ताक्षर एवं दिनांक SIGN & DATE	REV. NO.				
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### C. POWER HOUSE PASSENGER ELEVATOR (M2 NEAR SERVICE BAY )

S.NO.	Description	Value	Drg. No. / Remark
01.	Rated load, mass	1,088.0 Kg.	
02.	No. of passenger	16	
03.	Rated car speed	0.7 – 1.0 m / sec.	
04.	Car dimension - inside		.
	1) Clear width	≈ 2000 mm	Dim. A as per IS:14665 ( Part-1 / Table-1)
	2) Clear depth	≈ 1300 mm	Dim. B as per IS:14665 ( Part-1 / Table-1)
	3) Clear height	≈ 2200 – 2300 mm	Bidder to decide


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<b>2.0 PURCHASER / OWNER'S SCOPE</b> The purchaser / owner shall provide the following : <ol style="list-style-type: none"> <li>1. A hoist way including pit of required depth and machine room over the lift well.</li> <li>2. RCC stair case / Passages to approach machine room.</li> <li>3. Power supply 415 V ±10 % AC,3 phase 4 wire, 50 ± 5 % HZ feeder incomer at one point in each machine room. Termination of this supply feeder along with necessary protection devices(clause 1.6.1. (h)) shall be in the scope of supplier of elevators.</li> </ol>																																																																																																									
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COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत भारती इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रयोग एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।		<p><b>3.0 WORK TO BE DONE BY THE SUPPLIER INCLUDING ERECTION AND COMMISSIONING</b></p> <ol style="list-style-type: none"> <li>To provide scaffolding in the hoist way required for erection of lift and earthing and other associated activities..</li> <li>To carry out civil work, such as any modification, rectification, chipping in the foundations and making good the pocket/cut out in wall ceiling for car, counter weight, rail bracket ,hall buttons, indicators and laying of sills in positions or any other work required for smooth operation and commissioning of lifts.</li> <li>To provide and fix necessary items required for fixing lift drive machine in machine room as per clause no. 1.6.3 and buffer support channels and monkey ladder in pit(if required), requirements of conduits, inserts etc.</li> <li>To provide &amp; fix mono-rail hoisting arrangement in machine room ceiling for hoisting of equipment during erection &amp; maintenance.</li> <li>All subsequent electrical systems and hoist way and pit lighting.</li> <li>Switches of suitable capacity for car and hoist way lighting shall be arranged in the machine room.</li> <li>A three-pin plug socket with switch of capacity 5A, 230V AC each for a hand lamp shall be fitted on the roof top of the lift cars for use by persons working thereon for maintenance purpose.</li> <li>One socket outlet and switch of capacity 5 A and 15 A shall be provided in machine room.</li> <li>Earthing up to nearest earth point.</li> <li>One socket outlet and switch of capacity 5 A ,230 V AC shall be provided in the pit.</li> <li>Sill angle and fascia to be provided.</li> </ol>			
हस्ताक्षर एवं दिनांक SIGN & DATE	The supplier shall execute all the work required to complete lift work not specifically mentioned here but otherwise required for completion of job and satisfactory operation of the lift.				
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सामग्री सूची संख्या को अधिकारित करता है । SUPERSEDES INVENTORY NO.	<p> <b>7.0 PAINTING REQUIREMENTS FOR ELEVATORS</b>  <b>( Epoxy resin paints are to be used.)</b>  <b>The Supplier is responsible for preparation and submission of specifications on painting for the owner's approval.</b> The Specifications on painting shall keep in view conditions of operation of the elevators and be in compliance with the paint manufacturer's instructions on physical characteristics and workability of the materials selected for painting and shall conform also to the methods of surface treatment, instructions on application, mixing, safety and storage, etc. as may be recommended by manufacturer. The Specifications shall cover as well the special requirements for repairing in-field the shop-painted surfaces that may be damaged and for painting the connections when in erection.</p> <p>           The supplier shall submit the coated samples together with the approved specifications for each type of painting. <b>Final colour of all equipment shall be approved by the owner. All Channels and Guide rails shall be epoxy painted in black colour.</b> </p> <p>           The paint shall be manufactured by well-known manufacturer, delivered in the manufacturer's sealed cans, stored under cover and used within the guaranteed time and by the method as may be recommended by the manufacturer of paint.         </p> <p>           When preparing the surfaces for painting, all oil, paraffin, grease and dirt shall be cleaned with a piece of clean cloth wetted in mineral solvent. After cleaning by the solvent all metal splashes (because of welding), slag, burrs, rust, mill scales and other foreign substances shall be removed by sand-blasting (grit-blasting method). Special care shall be given to cleaning the corners. If after the sand blasting defects such as brunt-on sand, sharpened cracks etc. are detected, the same shall be removed before painting.         </p> <p>           After being treated by sand blasting the surface shall be blown off by compressed air free of oil and moisture. All surfaces intended for painting shall be dry and clean before and during painting. Should rust appear or the surface becomes dirty in between cleaning and painting it shall be necessary to repeat cleaning. All paints after being applied shall form the adequate film and smooth even surface. The paint shall be carefully mixed, strained and be of uniform consistency during work execution. The paint should not be applied if:         </p>																
<div> <div> <b>स्वत्वाधिकार एवं गोपनीय</b>            इस प्रलेख में दी गई सूचना भारत की इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रदर्शन एवं प्रकाशन बिना इसकी लिखित अनुमति के किये जाने से कानूनन रोक है।            The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company         </div> <div> <b>कॉपीराइट एंड कॉन्फिडेंटियल</b>            The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company         </div> </div>																	
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सामग्री सूची संख्या को अधिकृत करता है । SUPERSEDES INVENTORY NO.	<div> <ul style="list-style-type: none"> <li>• The temperature of metal or ambient air is below 10<sup>0</sup>C</li> <li>• The temperature of metal is in excess of 50<sup>0</sup> C</li> <li>• Humidity is above 90% or</li> <li>• Rain is anticipated before the painted surfaces become dry</li> <li>•</li> </ul> <p>Each paint layer shall be protected during drying from any possible condensation or contamination by foreign particles. Painting shall be made by brushes or airless spraying. Each layer shall be uniform and free of down flows, deviations and other defects. The time intervals between the next paint layer application may be directed by the manufacturer.</p> <p>Paints shall be applied in such manner that the layer thickness on any section shall not be less than that mentioned in the approved specifications on painting. The surfaces which are not to be painted but located on the contact with the surfaces to be painted shall be duly protected from painting. The sections with damaged paint shall be made good in compliance with the approved specifications on painting.</p> <p>In view of fire-hazard and toxicity of painting materials the Supplier shall take the proper measures to prevent unhealthy conditions and hazard during painting.</p> <p><b>Bronze, copper, machined steel surface, stainless steel surfaces, friction and rolling surfaces, hoisting wire ropes shall not be painted.</b></p> <p>After cleaning the surfaces which are not to be painted, shall be coated with the approved conservative for protection against mechanical damages and corrosion during transportation and storage. Conservative coating shall be removed after completion of installation of the elevators at the Site.</p> <p>Fasteners (pins, bolts, nuts) which are not used shall be greased and packed into moisture-proof paper or otherwise protected.</p> <p>All the parts which are likely to get rusted, due to exposure of weather should be epoxy painted. The detail of painting system to be followed for various items are given below :</p> </div>				
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स्वाधिकार एवं गोपनीय

इस प्रलेख में दी गई सूचना भारत भारती इलेक्ट्रिकल्स की संपत्ति है इसका प्रयोग एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।

दनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक <b>PRODUCT STANDARD</b>		<b>HT 12105</b>																									
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सामग्री सूची संख्या SUPERSEDES INVENTORY NO.	3. Frames, coverplates, pipes and tubes, and miscellaneous steel parts not especially mentioned Hot-dip-galvanized as specified in Section 2.10.6.3 and de-grease before painting Intermediate Coat : 1 x micaceous iron oxide paint, 2-components Base : epoxy resin 1 x 80 Finish Coat : 1 x topcoat, 2-component Base: epoxy resin 1 x 50 Total, incl. zinc 200																												
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हस्ताक्षर एवं दिनांक SIGN & DATE	8.0 DESIGN AND CONSTRUCTION 8.1 CAR FRAME The car frame to support the car platform and enclosure shall be made of structural steel, which shall be sufficiently rigid to withstand operation of the safety gear without permanent deformation to the car frame. The frame shall be equipped with suitable T-guides conforming to IS-1173-1978 mounted underneath the car platform to stop the car whenever excessive speed is attained. The car frame should have at least 4 (four) replaceable guide shoes with renewable lining or set of rolling guides provided two at the top and two at the bottom. 8.2 LIFT CAR The elevator car shall be enclosed on all sides by means of car body and door, which shall open towards the landings. <b>The elevators car body shall be made up of stainless steel. The car doors shall also be of stainless steel.</b> A solid roof capable of supporting two persons, i.e. 2x80 kg shall be provided. The car flooring shall be with 3 mm thick PVC tiles ( scratch resistant) for passenger elevator and chequered aluminium sheet for goods elevator. The lift cars shall be fitted with fluorescent light, which shall be left burning during the whole time the lift is available for use.																												
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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<p>The lift car shall be provided with adequate ventilation and a fan. To permit switching off the power supply to the lift without switching off the fan and light, a separate circuit with control in machine room shall be provided for fan and light. <b>Ventilation openings shall be provided in the car enclosure wall above 1.8m level and below 0.3m level or as per supplier's standard practice. The total area of openings shall be not less than 0.035 sq. meter for each sq. meter area of the car floor divided suitably between the top and the bottom levels.</b> Any opening provided for a ventilating fan may be regarded as forming part of the ventilation area in that part of the car in which it is fitted.</p> <p>The car enclosure and doors (car door as well as landing doors), including their tracks of every lift car shall withstand a thrust of 345 N applied normally at any point without permanent deformation.</p> <p><b>Lift cars platforms shall be of framed construction and designed on the basis of rated loads evenly distributed. The minimum factor of safety shall be 5 for steel and 8 for timber.</b></p> <p>Glass shall not be used in the lift car except for the following purposes :</p> <ol style="list-style-type: none"> <li>As covers for certificates.</li> <li>For lighting fixtures;</li> <li>For appliances used in connection with the operation of car</li> <li>For vision panels &amp; mirrors</li> </ol> <p><b>Car operating panels of the lift shall be provided with emergency stopping device operated by a switch in the car and it shall be clearly marked in red. In addition an alarm button, yellow in colour, shall be provided on the car operating panel.</b></p> <p>A load plate giving the rated load of the lift shall be fitted in each lift car in a conspicuous position. The rated load shall be given in person and kilograms.</p>											
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COPYRIGHT AND CONFIDENTIAL  <small>The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company</small>		<p><b>8.3 CAR DOORS</b></p> <p>Centre opening (for passenger elevators) or side opening (for goods elevator) sliding stainless steel doors shall have clear opening as per technical data. <b>The car door shall be power operated with A.C. VVVF controller</b> and equipped with an electric contact which shall prevent the movement of the car and the circuit shall not be completed until the leading edges of opening door are within 50 mm of contact of each other. The contacts shall be opened positively, independently of gravity. The electric contact shall be situated or protected so as to be reasonably inaccessible from inside the car.</p> <p>The car doors shall be provided with automatic sensitive re-opening arrangement (continuous monitor) on the moving edges, which are likely to come in contact with person / goods entering or coming out of the car. The operating mechanism for the car doors shall operate with a force not exceeding 123N. The leading edges of car doors shall be provided with a soft and fire resistant material. Vision window of size 100 x 100 mm with glass cover shall be provided in car door.</p> <p>Car doors shall be guided at top and bottom.</p> <p>Hangers and tracks for car doors together with their fixing shall be of adequate strength and rigidity. Measures shall be provided to prevent all the car doors from jumping the tracks and suitable stops shall be provided to prevent the hanger carriage from leaving the end of track. Car doors including their track shall withstand a thrust of 345N applied normally at any point without permanent deformation.</p>																											
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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<p><b>8.4 LANDING DOORS</b></p> <p><b>Centre opening (for passenger elevator) or side opening (for goods elevator) sliding stainless steel door</b> shall have clear opening as per technical data. The landing door will be mechanically connected with the car door through a coupler and operated through the car door operator. The drive shall be ACVVVF drive. It shall prevent the movement of the car and the circuit shall not be completed until the leading edge of opening door are within 50 mm of contact of each other.</p> <p>Landing doors shall be guided at top and bottom.</p> <p>Vision window of size 150 x 150 mm with glass cover shall be provided at the same location of the vision window of the car door.</p> <p>Means shall be provided to prevent hangers for all landing sliding doors from jumping the tracks or jamming and suitable stops shall be provided to prevent the hanger carriage from leaving the end of the track. Following signals shall be provided at different landings.</p> <ul style="list-style-type: none"> <li>i) Hall buttons with up-down arrows at all floors (Luminous).</li> <li>ii) Hall/Car position/direction indicator.</li> </ul> <p><b>8.5 DOOR OPERATION FOR CAR DOOR AND LANDING DOORS</b></p> <p>The car doors and landing doors, shall be mechanically connected and shall open and close simultaneously. <b>There shall be interlocking between car and the car doors as well as landing doors, i.e. the car should not move until all the landing doors &amp; car doors are locked in close position.</b> Necessary switch should be provided in the elevator machine room to control the operation of car doors. Car and landing doors should open only when the car has reached at the landing. <b>It should be possible to open the car doors and landing doors from out side with special key in case of emergency.</b></p> <p>The doors shall be power operated with electronic control mechanism. The mechanism shall open the doors automatically when the car arrives at a landing and then close the doors after a lapse of time interval automatically. Provision shall be there to reverse motion of the doors or hold them open.</p> <p>Infra red light curtain safety device shall be provided which when touched by a person or object while the car door is closing should operate the mechanism to open the car doors and the landing doors to open position and the door should remain open until completion of predetermined interval and then close the doors automatically. The operating mechanism for the car and landing doors shall operate with a force not exceeding 123 N.</p>			
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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<div> <div> <b>8.6 COUNTER WEIGHTS</b> <p>All counterweight sections shall be carried in a structural steel frame and shall be secured by at least two tie rods passing through holes in all the sections. <b>The factor of safety of counterweight sections of wrought iron and steel shall not be less than five.</b></p> <p>All counterweights shall be of metal and shall travel between rigid guide rails. Counterweights shall withstand the effect of buffer impact.</p> <p>At least four replaceable guide shoes with renewable linings or set of roller guides shall be provided, two numbers at the top and two numbers on each side of car and counterweight. For goods elevator, sliding guide shoes shall be used as per IS:14665(Part-2/Sec.-1).</p> <p>The guide shoes of counterweight shall be fixed and adjusted so that the play in the direction of the width of counterweight does not exceed 5 mm.</p> </div> <div> <b>8.7 BUFFERS</b> <p>Suitable spring buffers conforming to IS-14665 (Part-4)-2000 shall be provided for smooth stoppage of car and counterweights at the extreme limit of travel. <b>Buffers shall be mounted on steel channels. These channels will extent between both the car and counterweight guide rails.</b> The buffers shall be located symmetrically with reference to the vertical centre line of the car frame within a tolerance of 50 mm. The stroke of the spring buffers shall be at least 100 mm.</p> <p><b>Spring buffers shall be capable of supporting, without being compressed solid, a static load requirement to two times the weight of car plus its rated load for car buffers, and two times the weight of counter-weight for counter weight buffers.</b></p> <p><b>Buffers shall compress solid with a static load of three times the weight of car and its rated load for car buffers, and three times the weight of counterweight for counter weight buffers.</b> Vendor shall inform the loading data of lift well bottom floor for civil design during bid submission.</p> </div> </div>																											
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सामग्री सूची संख्या को अधिकारित करता है । SUPERSEDES INVENTORY NO.	<div> <div> <p><b>8.8 SAFETY GEARS</b></p> <p>Elevators shall be provided with one or more suitable car safety devices <b>(number and type to be clearly specified in the offer)</b> attached to the lift car frame and placed beneath the car. The safety devices shall be capable of stopping and sustaining the elevator car with full rated load in the car at governor tripping speed.</p> <p><b>All elevators are to be equipped with an over speed governor device which operates to apply the safety gear in the event of the speed of lift car in the descending direction exceeding a predetermined limit.</b></p> <p>The application of safety devices shall not cause the car platform to become out of level in excess of 3 cm/m measured in any direction.</p> <p>When safety gear is applied, no decrease in tension of the governor rope or motion of the car in descending direction shall release the safety gear.</p> <p>When a safety gear comes into operation, it shall automatically open the operating circuits, but it should be possible for a responsible person to release the safety gear; after a thorough inspection of the equipment and after taking any necessary precautions, by reversing the direction of the motion of the machine or by any other equally suitable means.</p> <p>Safety gear shall operate to stop and sustain the car in the event of failure of suspension ropes, or in the event of the lift car exceeding a predetermined maximum over speed in the descending direction.</p> <p>Safety gear shall operate positively and mechanically independent of any springs used in its construction and its application shall be to both guide rails, equally and simultaneously. <b>Rope used for the safety gear shall have independent pulleys running on independent shafts. All the bearings used in the safety gear and of the safety operating mechanism shall be of corrosion resistant or electroplated/coated with a corrosion resistant material.</b></p> <p><b>Car &amp; counterweight safety devices shall be actuated by separate governors.</b> Provision shall be made to cause the application of counterweight safety gear, but at not more than 10% in excess of that at which the lift car safety gear applies.</p> </div> <div> <p><b>8.8 SAFETY GEARS</b></p> <p>Elevators shall be provided with one or more suitable car safety devices <b>(number and type to be clearly specified in the offer)</b> attached to the lift car frame and placed beneath the car. The safety devices shall be capable of stopping and sustaining the elevator car with full rated load in the car at governor tripping speed.</p> <p><b>All elevators are to be equipped with an over speed governor device which operates to apply the safety gear in the event of the speed of lift car in the descending direction exceeding a predetermined limit.</b></p> <p>The application of safety devices shall not cause the car platform to become out of level in excess of 3 cm/m measured in any direction.</p> <p>When safety gear is applied, no decrease in tension of the governor rope or motion of the car in descending direction shall release the safety gear.</p> <p>When a safety gear comes into operation, it shall automatically open the operating circuits, but it should be possible for a responsible person to release the safety gear; after a thorough inspection of the equipment and after taking any necessary precautions, by reversing the direction of the motion of the machine or by any other equally suitable means.</p> <p>Safety gear shall operate to stop and sustain the car in the event of failure of suspension ropes, or in the event of the lift car exceeding a predetermined maximum over speed in the descending direction.</p> <p>Safety gear shall operate positively and mechanically independent of any springs used in its construction and its application shall be to both guide rails, equally and simultaneously. <b>Rope used for the safety gear shall have independent pulleys running on independent shafts. All the bearings used in the safety gear and of the safety operating mechanism shall be of corrosion resistant or electroplated/coated with a corrosion resistant material.</b></p> <p><b>Car &amp; counterweight safety devices shall be actuated by separate governors.</b> Provision shall be made to cause the application of counterweight safety gear, but at not more than 10% in excess of that at which the lift car safety gear applies.</p> </div> </div>																												
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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<div> <div> <b>8.9 GOVERNORS</b> <p>The governors shall be placed where they are not struck by the lift car or the counterweight in the event of over-run.</p> <p><b>The governors shall operate the safety gear at a speed of either 140% of rated speed or 0.88 m/sec, whichever is higher. The minimum governor tripping speed shall be 115% of the rated speed.</b></p> <p>Governor shall be marked with its tripping speed in m/sec.</p> <p><b>Any governor for a counterweight safety gear shall be adjusted to trip at a speed greater than, but not more than 10% above the tripping speed of the car governor.</b></p> <p>Governor gears shall have self lubricating bearings which do not require frequent attention.</p> <p><b>Governor ropes shall be not less than 8 mm in diameter and shall be of iron, steel or phosphor bronze and of suitable construction.</b> Governor rope shall run clear of the governor jaws during normal operation of the lift.</p> <p>Governor jaws and their mounting shall be so designed that any cutting, tearing or deformation of the rope resulting from their application shall not prevent the proper functioning of the safety gear.</p> <p>The arc of contact made by the governor rope and the governor sheave shall, in conjunction with the rope tensions device, provide sufficient tractive effort to cause proper operation of the governor.</p> </div> <div> <b>8.10 GUIDE RAILS</b> <p>Car and counterweight guide rails shall be of steel T-section as per IS-1173-1978 having adequate section modulus, moment of inertia and sectional area to withstand the forces resulting from the application of the car or counterweight safety devices.</p> <p><b>In no case, round guide rails and cast guide rails shall be used.</b> Guide rails both for the car and the counterweight should have their working surface machined and should be continuous throughout the entire travel having adequate strength to ensure that deflection of guide rails is not more than 5 mm under normal operation.</p> <p>Guide rails should be of sufficient length so that car or counterweight shoes does not run off the guide rails.</p> </div> </div>			
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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<p><b>SIZE OF SHEAVES AND PULLEYS</b></p> <p>The diameter of sheave of pulley shall be not less than that obtained from the following:</p> <table border="0"> <tr> <td>Class of rope</td> <td>Diameter of Sheave or Pulley</td> </tr> <tr> <td>Round Strand:</td> <td></td> </tr> <tr> <td>6x19 (12/6/1)</td> <td>D(2.95 S + 37) with</td> </tr> <tr> <td>6x19 (12/6/1) plus 6 filler wires</td> <td>a minimum of 40 D</td> </tr> <tr> <td>8x19 (12/6/1) plus 6 filler wires</td> <td></td> </tr> <tr> <td>8x19 (9/9/1) scale</td> <td></td> </tr> </table> <p>Note: D = diameter of rope in cm, and S = rope speed in m/s</p> <p><b>8.12 SHAFT FILLETS AND KEYS</b></p> <p>A fillet shall be provided at any point of change in the diameter of driving machine shafts and sheave shafts to prevent excessive stress concentrations in the shafts. Shafts which support sheaves, gears, couplings and other members and which transmit torque, shall be provided with tight fitting keys.</p> <p><b>8.13 ELEVATOR MACHINE</b></p> <p><b>The machine shall be alternate geared, variable voltage variable frequency controlled and placed directly above the hoist way.</b> No friction gearing, belt, chain, clutch or chain driven system shall be used for connecting the main driving gear to the traction sheaves.</p> <p>The AC self-lubricating motor shall be suitable for elevator use with high starting torque and low starting current. <b>The 3-phase induction motor should comply with IS:8151.</b></p> <p>The motor of each elevator machine or the warm shaft shall be arranged so as to provide <b>hand-winding facilities</b> and shall be suitably marked for the direction of up and down travel of the car. <b>Class of protection of elevator motors and control panel shall be as per applicable Indian standards.</b></p> <p>Resilient anti-vibration mountings of suitable design shall be provided to minimize vibration transmission to the building structure.</p>				Class of rope	Diameter of Sheave or Pulley	Round Strand:		6x19 (12/6/1)	D(2.95 S + 37) with	6x19 (12/6/1) plus 6 filler wires	a minimum of 40 D	8x19 (12/6/1) plus 6 filler wires		8x19 (9/9/1) scale	
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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<p>The car and counterweight ends of the suspension ropes shall be fastened by clipped return loops. The fastenings shall be capable of sustaining a load not less than 80 percent of the minimum braking strength of the suspension ropes.</p> <p>Loops shall be lined with proper thimble eyes or equal protections, and shall not bear directly on their fixings.</p> <p><b>A data plate indicating the following shall be fixed on the cross head of the car frame:</b></p> <ul style="list-style-type: none"> <li>a) Diameter of rope.</li> <li>b) Number of ropes, and</li> <li>c) Manufacturer's rated breaking strength of rope in kilograms.</li> </ul> <p><b>12.0 LOCKING DEVICE FOR LANDING DOORS</b></p> <p>Each landing door shall be fitted with a locking device which shall comply with the following requirements:</p> <ul style="list-style-type: none"> <li>a) It shall not be possible to open the landing door from the landing side until the car is within that particular landing zone. Provision shall be made for opening of the door in case of emergency by means of a special key.</li> <li>b) It shall not be possible for the car to be started or kept in motion unless all the landing doors are closed and locked except when the car is coming to a stop at a landing within the leveling zone.</li> </ul> <p>The electrical and mechanical parts of all locking devices shall be of substantial design and construction. The removal of any inspection cover or covers shall not effect the operation of a device. All locking device shall be fixed securely to the enclosure by suitable means.</p> <p>The locking devices for landing doors shall be so designed that the lock contact is not closed until the door is closed, and the circuit shall not be completed until the leading edges of the opening door are within 50 mm contact of each other.</p>			
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सामग्री सूची संख्या को अधिकारित करता है । SUPERSEDES INVENTORY NO.	<p>Any spring used in the locking device shall be in compression and properly supported. The failure of a spring shall not render the lock unsafe.</p> <p>Contact shall be of solid type pivoted, hinged or sliding and of sturdy construction.</p> <p>Provision shall be made on the elevator operated from the car and landings to prevent the opening of any landing door when the car is passing that zone in response to a call from another landing.</p> <p>The conduit carrying the conductors to the lock contact boxes shall be fixed securely to the boxes and shall maintain electrical and mechanical continuity. The levers operating the mechanical part of the locking device shall be protected from interference from the landing side of the lift enclosure.</p> <p>Locking devices used with multiple panel doors shall lock all panels of the doors or only one panel provided that the interconnecting mechanisms of door panels is so arranged that the locking of one will prevent the movement of all panels, notwithstanding the breakage of chain or rope used for interlocking the panels.</p>																
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.		<p><b>13.0 CONTROLLERS AND OPERATING DEVICES</b></p> <p>A manually operated mains disconnecting switch shall be supplied and installed in the main circuit cables of the elevator machines. This switch shall be placed close to and visible from the machine it controls.</p> <p>When metal to metal contacts are used on the controller switches, for opening the main circuits, or for stopping the main circuits, or for stopping an elevator machine, <b>at least two independent current breaks shall be incorporated in the design.</b> In the event of an earth fault with any door open, the elevator shall not work.</p> <p>Operation of spring or springs in tension or the completion of another electric circuit shall not depend upon to break the circuit to stop the elevator at terminal landings.</p> <p>The interruption of the electrical circuit shall stop and shall prevent the movement of the car.</p>															
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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<p><b>Inherent protection for phase reversal of A.C. motor shall be provided</b> to avoid elevator driving machines motor to be operated in the wrong direction.</p> <p>Control system shall not depend upon the completion or maintenance of electrical circuit for the interruption of power supply to the elevator motor and the application of machine brake to stop the car:</p> <ol style="list-style-type: none"> <li>At the terminal floor or</li> <li>When the emergency stop switch or other safety device is operated.</li> </ol> <p>All control circuits shall be protected by fuses/MCBs or otherwise protected against faults or overloads, independently of the main circuits. The voltage of any controller operating circuit shall not exceed the low voltage of 250 volts as defined in the latest provisions of IE Rules. The control circuit shall be suitably protected independently of the main circuit and it shall be so arranged that an earth fault or open circuit shall not create an unsafe condition.</p> <p>Controllers operated by hand ropes, levers or similar devices shall not be permitted.</p> <p>All elevators shall conform to the following requirements:</p> <ol style="list-style-type: none"> <li>It shall not be possible to start the elevator car under normal operation unless every landing door and car door is in the closed position.</li> <li>The landing push buttons shall be inoperative during the whole time an occupied elevator car is in use. The landing push buttons shall remain inoperative until the person or persons, using the elevator, have vacated the car and the landing door has been again closed, except that with the collective control, the push button may be utilized for this purpose provided they do not in any way interfere with the direction of current journey and that provision shall be made for a reasonable time lag between the stopping of the car and its being restarted.</li> </ol>				
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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<p>When the control and facilities for inspection are fitted on top of car it shall be so ensured that when in use:</p> <ol style="list-style-type: none"> <li>It is not possible to control the car from any other position;</li> <li>The car shall not move until all safety devices are in and remain in safe position</li> <li>An emergency switch with the positions marked thus "STOP" and "RUN" (or "TEST SLOW"), shall be provided in this control station. When the switch is in "STOP" position it shall not be possible to move the car.</li> </ol> <p>An emergency stop switch may also be fitted on the top of every car for use by persons working thereon.</p>															
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.		<p><b>14.0 TERMINAL STOPPING AND FINAL LIMIT SWITCHES</b></p> <p>The elevator shall be provided with upper and lower normal terminal limit switches arranged to stop the car automatically within the limits of top car clearance and bottom run by (over travel) from any speed attained in normal operation. Such limit switches shall act independently of the operating device, the ultimate or final limit switches and the buffers.</p> <p>Normal terminal limit switches shall be fitted in the elevator car or in the elevator hoist way or in the machine room, and such switches shall be brought into operation by the movement of the elevator car.</p> <p>In case terminal limit switches are situated in the machine room, they shall be mounted on and operated by stopping device mechanically connected to and driven by the car without depending upon friction as a driving means. An automatic safety switch shall be provided to stop the machine, should the tape, chain, rope or other similar device mechanically connecting the stopping device to the car, fails.</p> <p>Provided that when the floor controlling or selector of an automatically operated elevator is driven in accordance with this requirement, the floor stopping contacts for each terminal floor may serve as normal terminal floor stopping devices.</p>															
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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<p><b>15.0 ULTIMATE OR FINAL LIMIT SWITCHES</b></p> <p>The elevator shall be provided with ultimate or final limit switches arranged to stop the car automatically within the top and bottom clearances independently of the normal operating device and the terminal limit switches. The switch shall open before the buffers are engaged.</p> <p>Ultimate or final limit switches shall act to prevent movement of the car under power in both directions of travel and shall, after operating, remain open until the car has been moved by a hand winding to a position within the limits of normal travel.</p> <p>Ultimate or final limit switch shall not be mounted on the car and shall be operated by the movement of the car in the elevator hoistway.</p> <p>Ultimate or final limit switches shall not control the same switches on the controller as those controlled by the normal terminal limit switches unless two or more separate and independent switches are provided, two of which shall be closed to complete the motor and brake circuit in each direction of travel. When the ultimate or final limit switches control the same switch or switches on the controller as the operating device or the terminal limit switches, they shall be connected in the control circuit on the opposite side to the terminal limit switches.</p> <p>Ultimate limit switches designed to open the main circuit of the motor may control the same switch or switches on the controller as those controlled by the terminal limit switches, but when such ultimate limit switches are employed on direct current power supplies, they shall be provided with additional contacts to control the brake circuits. All ultimate or final limit switches shall be of enclosed type and shall be securely mounted. The contacts of all such switches shall be opened positively and mechanically by the movement of the car.</p>			
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सामग्री सूची संख्या INVENTORY NO.		<div> <div> <b>TERMINAL BUFFERS</b> </div> <div> <p>Suitable spring buffers shall be installed mounted on sheet channels as a means of stopping the car.</p> </div> </div>											
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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<p><b>INTERLOCKING</b></p> <p>Adequate interlocking is to be provided so that the car shall not move if the landing doors are even partially open and also the lift is over loaded.</p> <p><b>CAR SAFETY AND GOVERNOR</b></p> <p>The car safety shall be provided to stop the car whenever excessive descending speed is attained.</p> <p><b>18. EMERGENCY ALARM, INTERCOM AND TELEPHONE</b></p> <p>The elevator cars shall be provided with an emergency alarm which shall be operative from the car and audible outside the elevator hoistway. The car shall be fitted with an alarm push button which will be wired to terminal box in the elevator well at a suitable floor by the supplier. This alarm bell shall be supplied by the supplier and should be fixed in a position to be specified by the owner in control room and wired to the terminal box by the supplier.</p> <p>All the elevator cars shall be provided with an intercom. The machine room of elevator, control room of power house/control structure and lift car shall be inter connected with this intercom by the supplier.</p> <p>In addition to emergency alarm and intercom, an automatic telephone shall be provided by the owner (THDC) in the car. The elevator maker shall provide a telephone cabinet for installation of this telephone in the car.</p> <p>The lift manufacturer shall install the following signals/appliances:</p> <ol style="list-style-type: none"> <li>Battery operated alarm bell and emergency light.</li> <li>Fireman's switch.</li> <li>Intercom in the car, machine room and control room of power house/control structure.</li> </ol> <p><b>19. LEVELING ACCURACY</b></p> <p>The elevator car shall stop at landing with car sill fairly in level with the landing sill. The difference in levels shall not exceed <math>\pm 5</math> mm.</p>																											
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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<p>All the earthing shall be carried as per IS-3043-1987 and also in conformity with latest provision of Indian Electricity rules.</p> <p>Terminal for the earthing of the frame of the motor, the winding machine, the frame of the control panels, the cases and covers of switches and similar electric appliances which normally carry the main current shall be of <b>at least 10 mm diameter bolts, stud or screw. The cross-sectional area of copper earthing conductor shall be at least half that of the largest current-carrying conductor subject to an upper limit of 65 mm sq.</b></p> <p>The terminal for the earthing of the metallic cases and covers of door interlocks, door contacts, call and control buttons, stop buttons, car switches, limit switches, junction boxes and similar electrical fittings which normally carry only the control current shall be <b>at least equivalent to a 5 mm dia brass screw</b>, such terminal being one specially provided for this purpose and the earth conductor shall be at least equivalent to a 7/0.750 mm conductor.</p> <p>All exposed metal parts of electrical apparatus installed on the lift car shall be sufficiently bonded and earthed.</p> <p>Switchgear for controlling lift power system should be characterized by its high duty cycle <b>and high rupturing capacity of 50KA for 1 second.</b> Switchgear must be robust enough and shall be so designed as to withstand the high duty cycle and high rupturing capacity introduced during operation of the lift.</p> <p>Power wiring between the controller and main board and controller to various landings shall be done in MS conduits conforming to IS and specification to electrical works.</p> <p>Looping system of wiring shall be used and wiring shall not be joined. Where joints are unavoidable, they shall be made through approved mechanical connectors with prior permission of the Owner/Purchaser. No reduction in the strands is permitted at termination.</p>			
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स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत भारती इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रयोग एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।	हस्ताक्षर एवं दिनांक SIGN & DATE				
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सामग्री सूची संख्या को अधिकांशित करता है । SUPERSEDES INVENTORY NO.	<p>All multi-core trailing cable to be used shall satisfy the requirement of relevant standards. The length of the cable shall be adequate to prevent any strain due to movement of car. All cables so tagged for easy identification. Trailing cables shall be so suspended, anchored and run that the strain on individual cable conductor shall be reduced to a minimum and the cables are free from contact with the car, counter weight , guides, shaft/well sides etc. No intermediate jointing shall be permissible in the trailing cable.</p>				
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company		<p><b>22. ESSENTIAL REQUIREMENTS</b></p> <p><b>22.1 QUITE OPERATION OF ELEVATOR</b></p> <p>Every precaution shall be taken to ensure quite operation of elevator doors and machinery. The insulating of the elevator machine and any motor generator from the floor by rubber cushions or by other suitable means to prevent transmission of most of the noise shall be provided.</p> <p><b>22.2 CONFORMITY WITH LIFTS ACT AND RULES</b></p> <p>The installation shall be carried out in conformity with Lifts Act and Rules there under, wherever they are in force.</p> <p><b>22.3 CONFORMITY WITH INDIAN ELECTRICITY ACT &amp; RULES</b></p> <p>All electrical works in connection with installation of electric lifts shall be carried out in accordance with the provisions of the Indian Electricity Act, 1910 and the latest provisions of the Indian Electricity Rules and shall also comply with provisions of IS:732-1963.</p> <p><b>22.4 CONFORMITY WITH INDIAN STANDARDS</b></p> <p>The elevator shall conform to IS:14665-2000 unless otherwise specified in this specification. All materials, fittings, appliances, etc. used in electrical installation shall conform to Indian Standard specifications wherever these exist. In case of materials for which Indian Standard specifications do not exist, the materials shall be approved by the owner.</p> <p><b>22.5 CONFORMITY WITH FIRE REGULATIONS</b></p> <p>The installation shall be carried out in conformity with the local fire regulations and rules there under wherever they are in force.</p>			
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32	Transistors all types	2 sets															
33	Printed circuit boards	1 set															
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.		<p><b>28.2 GENERAL SPARES</b></p> <p>At least following general items <u>for each elevator</u>, as per the provisions of general technical specifications HT 12102 clause 3.1.1 shall be supplied :</p> <p><b>(a) Wear and Tear items :</b></p> <ol style="list-style-type: none"> <li>1. Wearing parts of coupling - 2 no. complete set</li> <li>2. Packing and seals for rotating shafts - 2 no. complete set</li> <li>3. Roller bearings for rotating shafts - 2 no. complete set</li> </ol> <p><b>(b) Customary Spare items :</b></p> <p>(X no. of Qty. to be supplied as per formula given below)</p> <ol style="list-style-type: none"> <li>1. Motor starter, contacts for feeder switches</li> <li>2. Buffer Spring</li> </ol> <p>The quantity "X" which shall be furnished is a function of the number "N" of supplied "Assemblies" identical in type and size.</p> <table> <tr> <td><math>N &lt; 3</math></td> <td><math>X = 1</math></td> </tr> <tr> <td><math>N &gt; 3 \text{ \&amp; } N &lt; 10</math></td> <td><math>X = 2</math></td> </tr> <tr> <td><math>N &gt; 10</math></td> <td><math>X = N/10 + 1</math>, rounded-up to the next whole number</td> </tr> </table> <p><b>(c) Other Spares :</b></p> <ol style="list-style-type: none"> <li>1. Shall provide 5% but at least two pieces of all bolts, screws, nuts, washers, spanner rings and cotters.</li> <li>2. Deliver 5% of the quantity of painting material, but at least one litre, in new sealed containers, for later repair work.</li> </ol>				$N < 3$	$X = 1$	$N > 3 \text{ \& } N < 10$	$X = 2$	$N > 10$	$X = N/10 + 1$ , rounded-up to the next whole number						
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			जांचकर्ता Checked by	P.K.GARG													


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				पृष्ठ का <b>Page 48 of 73</b>																																	
सामग्री सूची संख्या को अधिकांशित करता है । SUPERSEDES INVENTORY NO.	<div> <div> <b>28.3</b> <b>RECOMMENDED SPARE PARTS</b> <p>             The spare parts which are recommended( for five years of trouble free operation) by the Tenderer for purchase in addition to the specified spare parts shall be submitted in the format given below. The purchase of any or all of the recommended spare parts will be at the option of the Owner .The additional sheets may be added if required.           </p> <table border="1"> <thead> <tr> <th>S.NO.</th> <th>DESCRIPTION</th> <th>PCS</th> <th>PRICE/PCS</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> </div> <div> <b>28.4</b> <b>COMMISSIONING SPARES</b> <p>             The bidder shall supply commissioning spares for the complete scope of supply which are required for erection, commissioning &amp; start-up. A list of all commissioning spares to be supplied shall be submitted alongwith the bid offer. If any other commissioning spare is required during this period, same shall be arranged by the bidder without affecting the project schedules &amp; with no commercial implication on purchaser / owner.           </p> </div> <div> <b>29.0</b> <b>TOOLS</b> <p>             Following tools shall be provided :           </p> </div> <div> <b>29.1</b> <p>Tools listed in general technical specification HT 12101 clause 2.4.9 . A list of such tools shall be furnished with the bid.</p> </div> <div> <b>29.2</b> <p>One set of all necessary tools required for regular maintenance, testing and repair.</p> </div> </div>					S.NO.	DESCRIPTION	PCS	PRICE/PCS																												
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स्वाधिकार एवं गोपनीय


इस प्रलेख में दी गई सूचना भारत भारती इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रयोग एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।


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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<p><b>29.3</b> The following tools should also be provided for maintenance of the elevators:          ( Common for all the elevator)</p> <ul style="list-style-type: none"> <li>a) Isolated tongs, voltage indicators</li> <li>b) Tools with isolated handles</li> <li>c) Rubber gloves, rubber boots, rubber mats, isolating supports</li> <li>d) Temporary ground</li> <li>e) Movable railings, isolating caps and jumpers</li> <li>f) Protective goggles, tarpaulin gloves, safety belts, safety ropes, protective helmets, etc.</li> <li>g) Grease gun, if applicable</li> </ul> <p><b>30.0 WORK SCHEDULE</b></p> <p>The bidder shall submit the work schedule, in terms of months from the date of award, as per following activities to meet the delivery schedule as mentioned in the purchase inquiry / purchase order.</p> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Completion period from P.O. date</th> </tr> </thead> <tbody> <tr> <td>Design &amp; Engineering</td> <td>---- Months</td> </tr> <tr> <td>Manufacturing</td> <td>---- Months</td> </tr> <tr> <td>Tests at works</td> <td>---- Months</td> </tr> <tr> <td>Delivery at site</td> <td>---- Months</td> </tr> <tr> <td>Erection, testing &amp; commissioning</td> <td>---- Months</td> </tr> </tbody> </table> <p><b>31.0 SCHEDULE OF DEVIATIONS</b></p> <p>The bidders are advised to make themselves fully aware of the complete system and equipment details as mentioned in technical specifications and tender drawings. Clarifications required, if any, shall be obtained well in advance before submission of the bid.</p> <p>A schedule of deviation (Annexure-I) is to be submitted along with the bid. All the deviations related to requirements mentioned in this particular technical specification shall be declared with the bid submission. In case, there are no deviations, a nil report should be submitted. Non submission of nil report shall be deemed as there are no deviations.</p>				Sl. No.	Completion period from P.O. date	Design & Engineering	---- Months	Manufacturing	---- Months	Tests at works	---- Months	Delivery at site	---- Months	Erection, testing & commissioning	---- Months
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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<p>Except the deviations, mentioned in Annexure-I all other requirements covered under these specification/standard will be assumed and treated as fully agreed and complied by the bidder/contractor.</p> <p>In Annexure-I, under the column 'Differential cost', value in rupee should be mentioned. This is required in case the deviation is withdrawn by the bidder and original tender requirement is agreed during the pre-award discussions / clarifications. The " + " sign of values will mean that purchaser has to add the cost in total cost of bid as quoted by the bidder. The " - " sign of value will mean that purchaser has to subtract the cost from the total cost of bid as quoted by the bidder. If no sign is mentioned, it will be assumed as " + ".</p>			
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.		<p><b>32.0 BOUGHT OUT ITEMS</b></p> <p>The bought out items which are purchased from outside sources and used / mounted as it is, shall be procured from standard suppliers. A list of all such items with proposed make shall be submitted with bid offer. A list of BHEL approved and recommended suppliers for few items is given in Annexure-IV.</p> <p><b>33.0 LIST OF ANNEXURES</b></p> <p>Annexure – I : Schedule of deviations          Annexure – II : Data sheet of Elevator          Annexure – III : Price schedule          Annexure – IV : List of bought-out materials with BHEL approved makes</p> <p><b>34.0 LIST OF DRAWINGS</b></p> <p>Following drawings are enclosed with purchase enquiry and are referred in this specification :</p> <p>i. TH-KOT-TD-DS-26          ii. TH-KOT-TD-DS-38          iii. TH-KOT-TD-DS-39          iv. SK-515851</p>			
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सामग्री सूची संख्या को अधिकृत करता है । SUPERSEDES INVENTORY NO.	<b>36.0. LIST OF REFERRED STANDARDS</b> The following BIS standards and codes of practice with up to date amendments shall apply to the equipment and the work covered by this contract.				
<b>स्वत्वाधिकार एवं गोपनीय</b> इस प्रलेख में दी गई सूचना भारत की इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रदर्शन एवं प्रकाशन बिना लिखित अनुमति के बिना कम्पनी के हित में हानिकारक हो न किया जाए । COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company		1) IS: 14665-2000 Part 1 -- Electric traction lift – Outline dimension Part 2 -- Electric traction lift – Code of practice for installation, Operation and maintenance Section 1 - Passenger and goods lift Section 2 - Service lifts Part 3 -- Electric traction lift – Safety rules Section 1 - Passenger and goods lift Section 2 - Service lifts Part 4 -- Electric traction lift – Components Section 1 – Lift buffers Section 2 - Lift guide rails guide shoes Section 3 - Lift car frame, car , counter weights and suspension Section 4 - Lift safety gears and governors Section 5 - Lift returning cam Section 6 - Lift doors and locking device and contacts Section 7 - Lift machine and brakes Section 8 - Lift wire ropes Section 9 - Controller and operating devices for lifts Part-5 Electric traction lift – Inspection manual  2) IS: 8151-1976 -- Single speed three- phase induction motor for driving lifts 3) IS: 732-1989 -- Code of practice for electrical wiring installations 4) IS:1173-1978 -- Specification for hot rolled and slit steel tee bars 5) IS: 1363(Part-1)-2002 -- Hexagonal head bolts 6) IS: 1554(part-1)1988 -- Specification for PVC insulated(Heavy duty) electric cable 7) IS :1893-1984 -- Criteria for earthquake resistant design of structure 8) IS: 1950 – 1962 -- Code of practice for sound insulation of non industrial building			
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COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.		<p><b>37.0 QUALIFICATION REQUIREMENT (QR)</b></p> <p>“The bidder must have <b>designed, manufactured, supplied, erected, tested and commissioned</b> elevator of <b>500 kg</b> capacity and speed range <b>0.5 m/s to 1.0 m/s</b> covering a lift of <b>10 metres</b> at <b>five different locations</b> which are in <b>successful operation for last (5) five years.</b>”</p> <p>Bidder who meets the above qualification requirement, must submit all the relevant documents in support of above for obtaining vendor approval from Owner(THDC), in case not yet approved. The end user certificates clearly indicating the each and every aspect of QR and other relevant documents like test reports, list of references, company profile, manufacturing and testing facilities available at works etc. should be submitted in a separate envelope marked – “Part-1 : Documents in support of QR”. For bidders who satisfy the above QR and are accepted by THDC, processing of Part-2 (Technical) and Part-3 (Financial) of their bid will be done by BHEL subsequently. <b>A summary of QR requirement should also be submitted in the format given in Annexure-V.</b></p>																					
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सामग्री सूची संख्या को अधिकारित करता है । SUPERSEDES INVENTORY NO.	<div> <div> <p><b>39.0      <u>GUARANTEE</u></b></p> <p>Guarantee clause for main supply and spares shall be as per the purchase inquiry instructions.</p> </div> <div> <p><b>40.0      <u>MAINTENANCE CHARGES</u></b></p> <p>If required after expiry of guarantee period, annual maintenance charges shall be quoted for two possible cases :</p> <ol style="list-style-type: none"> <li>Maintenance charges + replaced parts / spares etc. all inclusive</li> <li>Maintenance charges alone without cost of replaced parts / spares. Cost of replaced parts / Spares shall be as per actuals.</li> </ol> </div> <div> <p><b>41.0      <u>TRAINING AND INSTRUCTION OF OWNER'S PERSONNEL</u></b></p> <p>Quality training is to be imparted to concerned persons, to be nominated by owner / purchaser, at site to train them in all the aspects of operation and day-to-day maintenance of the various equipments. All necessary literature and logistics shall also be given to trainees at site during on the job and class room training. In addition to this, if required by owner, two persons each from mechanical &amp; electrical section shall be deputed at suppliers work for training in design and manufacturing area.</p> </div> <div> <p><b>42.0.      <u>STATUTORY APPROVAL</u></b></p> <p>The contractor shall submit the required applications, drawings, etc. to the corporation, lift inspector, electrical inspector, factory inspector &amp; / or any other statutory authority and obtain their approval, licences &amp;/or sanctions. Final completion certificate shall be obtained by the contractor from all statutory authorities to enable the elevators to be commissioned for utilisation. The contractor shall be responsible for all fees etc. to be paid to the various authorities in this respect. The work shall not be deemed to have been completed until the above approval, certificates etc. have been obtained by the contractor.</p> </div> <div> <p><b>43.0      <u>STORAGE</u></b></p> <p>Bidder shall submit the details of storage facilities which they require at site for their equipment if the unit is to be stored at site for next 12 to 18 months after dispatch from manufacturer's works.</p> </div> </div>				
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<b>स्वत्वाधिकार एवं गोपनीय</b> इस प्रस्ताव में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रस्ताव एवं अवलोकन इस से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए। COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company		a. All the drawings and documents as listed in clause 47.1 b. Detailed drawings of the equipment layout which shall include separate drawings of all important components / parts of the equipment clearly showing details and Arrangement of the elevator with particular reference to main dimension of the elevator hoist way, car, counterweight, guides and landing doors. The drawings shall be sufficient to furnish a complete understanding of the design and working of the equipment and shall contain all necessary information required for installation and maintenance. c. Design calculations for strength / design of the equipment. d. Car emergency exit details. e. Hoisting machine and safety brake. f. Access, assembly and maintenance space for lifting machine in the machine room. g. All necessary technical details and plans. h. Type test certificates / records i. Records of all shop testing and inspection of equipment. j. Erection and installation sequence and procedures. k. Instruction manuals for operation & maintenance (O&M manual) and safety precautions of the equipment. These manuals shall include O&M manuals of bought out items also, annexed as separate sections. l. General arrangement drawing with BOM m. Quality Assurance plan for approval of THDC / purchaser. n. Field test records / certificates / reports.			
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		REV. NO.  <b>01</b>	निर्माणकर्ता Worked by जांचकर्ता Checked by	B.M.SOOD P.K.GARG	


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ITEM	DESIGNATION	Lift (ES-1)	Lift (ES-2)	Lift (M3)	Lift (M2)
12.	Construction, design and finish of:				
	i) Car frame				
	ii) Car body work				
	iii) Car ceiling				
	iv) Car floor				
	v) Light fittings				
	vi) Ventilation				
	vii) Car and landing doors				
	viii) Push and indicator fittings				
13.	Car entrance				
	a) size and type of doors				
	b) operation of door				
14.	Landing entrance:				
	a) size and type of doors				
	b) operation				
15.	Power supply requirement:				
	i) Voltage				
	ii) no. of phases				
	iii) frequency				
	iv) power required				


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			b) No. of core					
			c) Conductor quality					
			d) Voltage grade					
			e) Number of cables used for:					
			i) Control					
			ii) Power supply					
			iii) Telephone					
			iv) For lighting					
		23.	Controller:					
			i) Make					
			ii) Type					
			iii) Working voltage					
			iv) Type of protection against over load					
			v) Type of contacts					
			vi) Type of time delay mechanism used					
			vii) Insulation material used for control panel					
		24.	Guides for elevator car					
			i) No. of guides					
			ii) Type of guides					
		सामग्री सूची संख्या INVENTORY NO.	हस्ताक्षर एवं दिनांक SIGN & DATE	REV. NO. <b>01</b>		निर्माणकर्ता Worked by B.M.SOOD		
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			iii) Sectional dimensions				
			iv) Weight in kg/m				
		25.	Guides for counter weight				
			i) No. of guides				
			ii) Type of guides				
			iii) Sectional dimensions				
			iv) Weight in kg/m				
		26.	Total weight of elevator car without pay load				
		27.	Counter weight				
			i) Type				
			ii) Total weight				
		28.	Heaviest equipment to be lifted:				
			i) Name				
			ii) Size (LXWXH)				
			iii) Weight in kg				
		29.	Circuit breaker isolators:				
			i) Make				
			ii) Type				
			iii) Current rating				
हस्ताक्षर एवं दिनांक SIGN & DATE							
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		B.M.SOOD P.K.GARG				


ITEM	DESIGNATION	Lift (ES-1)	Lift (ES-2)	Lift (M3)	Lift (M2)
	iv) Interrupting duty				
	v) Max. Breaking capacity				
	vi) Operating voltage of tripping/closing coil				
30.	Stopping devices:				
	i) Normal type & operation				
	ii) Final type & operation				
31.	Car operating motor:				
	i) Type				
	ii) Capacity				
	iii) Voltage				
	iv) Insulation class				
	v) D.C./A.C. operated				
	vi) Speed in rpm.				
	vi) Enclosure				
	viii) Full load current				
	ix) Temperature rise at full load				
	x) Efficiency at full load				
	xi) Full load starting current				


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			xii) Starting Torque				
			xiii) Type of breaker				
		32.	Governors				
			i) Type				
			ii) Tripping Speed				
		33.	Brakes				
			i) Type				
			ii) Capacity				
			iii) Voltage				
		34.	Type of terminal switches				
		35.	Type of limit switches				
		36.	Type of buffer, if spring type:				
			i) Dia of spring in mm				
			ii) Maximum compression under extreme condition				
			iii) Number of spring coils				
		37.	Top car clearance required				
		38.	Bottom car clearance required				
		39.	Counter weight clearance required				
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	(A)	Supply part								
	1.	Lift (Complete scope except below mentioned items)	1.1	No.	1	1	1	1	Qty.	Unit price (U/P)
	2.	Mono rail hoist	1.1	No.	1	1	1	1	Qty.	Unit price (U/P)
	3.	Mandatory spares	1.1 28.1	Set	1	1	1	1	Qty.	List #
	4.	Commissioning spares	1.1 28.4	Set	1 (common for all the elevators)				List #	
	5.	General Spares as per clause 28.2	-	Set	1	1	1	1	Qty.	List #
	6.	Transportation Charges of above (1-5) from works to site / storage	44	-						
	7.	Total of (A) (1-6)								
	हस्ताक्षर एवं दिनांक SIGN & DATE									
सामग्री सूची संख्या INVENTORY NO.	REV. NO. <b>01</b>				निर्माणकर्ता Worked by जांचकर्ता Checked by		B.M.SOOD P.K.GARG			

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सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY NO.	<b>Annexure-IV</b> <b>LIST OF BHEL APPROVED AND RECOMMENDED MAKE (FOR BOUGHT OUT ITEMS)</b>						
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		1	HRC Fuse	BCH / Siemens / L&T / GE Power				
		2	Switchgear	BCH / Siemens / L&T / GE Power				
		3	Relay & Contactors	L&T / Jyoti / Siemens / GE Power				
		4	Control Cables & Power cables	Delton / Elkay Telelinks / Universal / Reliance Engineers / Havels / KE industries / NICCO / Paramount				
		5	Terminal Blocks	Elmax / Phonix / Wago				
		6	Cable Gland	Power Engg. Co / North British Engg. Corporation / Jindal Electronics				
		7	Exhaust fans with louver having bird screen	GEC				
		8	G.I. Wire	Modi or equivalent				
		9	G.I.Strip and earthing material	Indiana / Bharati or equivalent				
		10	AC VVVF Drives	Schneider / L&T – Yaskawa / ABB				
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		Sl. No.	Particulars	Ref.-1	Ref.-2	Ref.-3	Ref.-4	Ref.-5
		1	Name of Site					
		2	Address of site					
		3	Contact-Name, Ph. No.					
		4	Elevator Capacity					
		5	Speed (m/s)					
		6	Lift (mtr.)					
		7	Date of Commissioning					
		8	Designed By					
		9	Manufactured By					
		10	E&C and Testing By					
11	Date of issue of End User Certificate (It should be after five years from date of commissioning)							
हस्ताक्षर एवं दिनांक SIGN & DATE	REV. NO. <b>01</b>	निर्माणकर्ता Worked by जांचकर्ता Checked by		B.M.SOOD P.K.GARG				