

**CHAPTER 3: DESIGN AND PERFORMANCE REQUIREMENTS****3.1 Scope**

3.1.1 This chapter outlines the broad design and performance requirements of the rolling stock, details of track structure, power supply system, climatic and environmental conditions, and signalling & telecommunication systems.

**3.2 Proven Design**

3.2.1 The Contractor shall develop the design based on this specification and on sound proven and reliable engineering practices. The design details shall be submitted with technical data and calculations to the Engineer for review and acceptance.

3.2.2 The rolling stock, including all sub-systems and equipment shall be of proven design. Sub-systems and equipment offered in this tender shall have been in use and have established their performance reliability on a mass rapid transit system or suburban e.m.u.'s in revenue service over a period of two years or more. Where similar equipment or sub-systems of a different rating are already proven in service, then the design shall be based on such equipments. In case this stipulation is not fulfilled the tenderer shall furnish sufficient information to prove the basic soundness and reliability of the offered subsystem.

3.2.3 Propulsion system is the heart of Rolling Stock and the performance of rolling stock largely depend upon reliable performance of propulsion system. Technology for three phase drive using VVVF control IGBTs is fairly new and has made rapid strides in its development. To ensure that a reliable system is offered, it is necessary that the manufacturer of this system has got atleast 10 years experience in this field with atleast 5 years outside his home country. To support this requirement, the Tenderer shall furnish names of various railway systems to which the technology has been applied, the total service logged and certificates from the user on reliability of the equipment.

3.2.4 Vendors for important sub-system/equipments in the existing 'RS1', 'RS6' and 'RS13' type fleet have been listed in Appendix TG. The contractor is expected to comply to the list to the extent possible. The vendor in the present tender have to be necessarily the same for the critical system/equipments as indicated in the 'proposed vendor/sub vendor' column of Appendix TG. For the others, the contractor could include the names of alternative vendors in the same column. However these new vendors can only be considered with prior approval of the Engineer. Appendix TG duly filled shall be submitted with the bid.

3.2.5 The overall performance of the tenderer (all members in case of JV/Consortium separately) shall be examined for all the ongoing Rolling Stock Works awarded by DMRC/ any other Metro Organization (100% owned by Govt.) of value more than 40% of NIT cost of work and also for all the completed Rolling Stock Works awarded by DMRC / any other Metro Organization (100% owned by Govt.) within last one year (from the last day of the previous month of tender submission), of value more than 40% of NIT cost of work executed either individually or in a JV/Consortium. The tenderer shall provide list of all such works in the prescribed Performa given in Appendix FT-18 of the Form of Tender. The tenderer (all members in case of JV/Consortium separately) may either submit satisfactory performance certificate issued by the Client / Employer for the works or give an undertaking regarding satisfactory performance of the work with respect to completion of work/execution of work (ongoing works) failing which their tender submission shall not be evaluated and the tenderer shall be considered non-responsive and non-compliant to the tender conditions. In case of non-submission of either satisfactory performance certificate from client / employer or undertaking of satisfactory performance of any of the above work, the performance of such work shall be treated as unsatisfactory while evaluating the overall performance of tenderer in terms of Note (b) of Appendix FT-18. In case of performance certificate issued by the client, same should not be older than three month (from the last day of the previous month of tender submission for the ongoing works.

**3.3 Basic Design Philosophy & Requirements**

3.3.1 The design philosophy should meet the following criteria: