

Documents required for Rolling Stock - (Rolling Stock - Electrical)

1. Technical specification on rolling stock covering its electrical sub systems for information:
2. Following Design Calculations to be furnished for records sake: -
 - (i) Adhesion calculation
 - (ii) Gear pinions, analysis of stresses, selection of bearing, gear case and transmission assembly
 - (iii) Tractive and braking effort vs speed curves showing balancing speed.
 - (iv) Curves of efficiency, power factor, frequency, slip as a function of speed.
 - (v) Traction Motor performance curves.
 - (vi) Harmonic calculations.
3. Following drawings to be furnished for information: -
 - (i) Schematic diagram of power, dynamic braking, control and auxiliary circuits including multiple operations.
 - (ii) Tractive effort transmission diagram.
 - (iii) Brake system schematic diagram.
 - (iv) Drawing showing mounting arrangement of traction motor.
 - (v) Motor suspension arrangement.
 - (vi) Power converter cooling arrangement.
 - (vii) General arrangement for wheel slip detection and correction system.
 - (viii) Drawings for pantograph/third rail current collector.
 - (ix) Air Conditioning arrangement.
4. EMI/EMC compatibility, test plan & results.
5. Simulation results for TE, BE, Performance curves for rolling stock for identified section of Metro.
6. Details of electrical protection system of metro unit, various equipment and their sub-assemblies.
7. Safety plan and standards followed and references for proof of major assemblies and sub-assemblies.
8. Design details of cables, relays, switchboards, earthing, lighting arrestors, TCMS with interfacing documents, Converter and Auxiliary Converter, Battery including load calculations
9. Detail list of Sub Documents of annexure B as per On-Line Portal:

S.No.	Doc. No.	Description	TYPE
1	B.0	Summary Sheet(All the parameters are mandatory to be filled)	Form
2	B.1	Technical Specification on Rolling Stock covering pantograph/current collector, main transformer/High Speed Circuit Breaker(HSCB), VCB, traction motor, traction converter/Inverter	PDF

3	B.3	Technical Specification on Rolling Stock covering Auxiliary Supply System and Battery Charger, Battery, HVAC, TCMS, Cables.	PDF
4	B.4	Technical Specification on Rolling Stock covering Relay, Earthing Concept, Surge Arrester, PT, CT.	PDF
5	B.5	Design Calculations of Adhesion, Gear pinions, Analysis of stresses, Selection of bearing, Gear case and transmission assembly Tractive and braking effort vs speed curves showing Balancing Speed, Curves of efficiency, power factor, frequency, slip as function of speed Traction motor performance curve, Harmonic calculation	PDF
6	B.6	Drawings	PDF
7	B.6.1	Schematic diagram of power, dynamic braking control & auxiliary circuits including multiple operations	PDF
8	B.6.2	Tractive Effort Transmission diagram.	PDF
9	B.6.3	Brake system schematic diagram.	PDF
10	B.6.4	Drawing for Mounting arrangement of traction motor.	PDF
11	B.6.5	Motor suspension arrangement.	PDF
12	B.6.6	Power converter cooling arrangement.	PDF
13	B.6.7	General arrangement for wheel slip detection and correction system.	PDF
14	B.6.8	Drawings for Third Rail Current Collector if any.	PDF
15	B.6.9	Electrical control drawings of all systems.	PDF
16	B.7	EMI/EMC compatibility, test plan & results	PDF
17	B.7.1	EMI/EMC test plan	PDF
18	B.7.2	EMI/EMC test results	PDF
19	B.8	Simulation results for TE, BE, Performance curves for rolling stock for identified section of Metro	PDF
20	B.9	Details of electrical protection system of Metro unit, various equipments and their sub- assemblies	PDF
21	B.10	Safety plan and standards followed and references for provenness of major assemblies and sub-assemblies.	PDF
22	B.11	Dynamometer car test report	PDF
23	B.12	SIL certificate of TCMS, Cable type test report, Climatic chamber test report	PDF



Gaurav Mathur
ED/PS&EMU



Anubhav Agrawal
Dir/Elect/UTHS

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