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भारत सरकार – रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ-226011
Government of India - Ministry of Railways
**Research Designs & Standards
Organization, LUCKNOW - 226011**

No. MC/MRT

Dated 29.04.2010

The Chief Engineer
Metro Railway
Metro Rail Bhavan
33/1-J.L. Nehru Road,
Kolkata-700071

Sub: Provisional Speed certificate for operation of 8-coach rake for Air-Conditioned Kolkata Metro coaches upto a maximum speed of 55 kmph

1. Existing 8-coach Kolkata metro rolling stock equipped with BHEL's electrics is working since 1984 for which final speed certificate for maximum speed of 55 kmph was issued vide RDSO's letter no. MC/MRT dtd. 10.10.1984.

The new rolling stock being manufactured at ICF, Chennai are also provided with similar electrics supplied by M/s BHEL as that provided in existing rolling stock except provision of inverter in place of motor-alternator set, provision of air-conditioning, pneumatic suspension in the secondary and use of automatic and semiautomatic Schaku couplers in place of electromechanical couplers.

The Air-Conditioned Metro coaches have been manufactured by ICF Chennai to ICF layout drawing nos. MRB/DMC-9-0-001 for driving motor coach, drawing no. MRB/NDMC/MC-9-0-001 for non-driving motor coach with motor compressor, drawing no. MRB/NDMC/INV-9-0-001 for non-driving motor coach with inverter and drawing no. MRB/TC-9-0-001 for trailer coach (TC) fit for operational speed of 80 KMPH. Kolkata metro coaches are fitted with bogies to ICF drg. No. MRB/DMC-0-0-001 for motor coaches and MRB/TC-0-0-001 for trailer coaches. The coaches are fitted with EP brake system and Schaku couplers.

2. Based on design features in new rolling stock and existing stock, it is certified that the Air-Conditioned Metro coaches mentioned above may provisionally be permitted to operate upto a maximum speed of 55 kmph. subject to the following conditions:

2.1 Track

- 2.1.1 The track shall be to a minimum standard of 52 Kg rail or higher on concrete block/sleeper density with M+7. In case of ballasted track minimum depth of ballast cushion below block/sleeper of 250 mm, which may consist of at least 100mm clean and the rest in caked up condition on compact and stable formation.
- 2.1.2 **Ballastless track:** Two types of ballastless track viz. M1A and M7 are available. In M1A assembly, 60kg rails are placed on 4.5mm rubber pads which in turn are supported on cast iron bearing plates. A 12mm rubber pad is placed below the cast iron bearing plate and the bottom rubber pad rests on a second pour of concrete. Bearing plate is fixed to the concrete bed by means of alloy steel anchor studs bolted into polythene inserts embedded in the concrete. Resilience is provided by triple coil spring washers. Pandrol clips fix the rails to the bearing plates. IN M7 assembly rail is laid on a continuous 10mm rubber pad under the rail resting on concrete bed. The fastening is by pandrol clips and MC1 inserts which are embedded in the concrete bed.
- 2.1.3 For track of low standard other than that mentioned above, the Chief Engineer shall decide the lower maximum permissible speed.
- 2.1.4 The maximum permissible speed on curves to be decided on the basis of the existing provisions of the Indian Railway Permanent Way Manual Reprint -2004 /Metro Railway Kolkata Permanent Way Manual.
- 2.1.5 Tunnels and other structures: The maintenance standards will be as per special maintenance manual drawn up by Metro Railway.

2.2 Bridges

- 2.2.1 The clearance refers to bridges with standard design of girders, slabs, pipe culverts, piers and abutments etc issued by RDSO for BGML, RBG and MBG-1987 standard loadings. However, the bearings of span 78.8 m (effective) designed for BGML standard loadings as per RDSO drawing no. BA-11154 should be strengthened by providing two additional anchor bolts.
- 2.2.2 Superstructures & bearings of non-standard spans including Arches and sub-structure of all bridges are to be examined under the directions of the Chief Bridge Engineer concern and certified safe by him in terms of current IRS Bridge Rules, Steel Bridge Code, Concrete Bridge Code, Arch Bridge Code, Bridge Sub-Structure and Foundations Code etc read with upto date corrections slips.

2.2.3 Metro Railways to certify adequacy of existing bridges for permitting rolling stock based on physical condition of bridges by keeping them under observations considered necessary by the Chief Bridge Engineer of Railways.

2.2.4 Location of bridges on which speed restrictions are imposed shall be notified by the Metro Railways and incorporated in the working time table.

2.2.5 This clearance is subject to the following parameters of DMC/NDMC/TC:-

(i) Axle load capacity	-	17.0 t
(ii) Maximum tractive force at rail level per axle	-	2.5 t
(iii) Maximum braking force at rail level per axle	-	1.904 t
(iv) Maximum C.G. height from rail level	-	1897 mm

2.3 Signaling

2.3.1 All necessary precautions shall be taken to ensure safety as well as other operational requirements by Kolkata Metro based on the signaling system in force on Kolkata Metro.

2.4 Traction

2.4.1 The traction is by third rail current collecting system. The third rail is mounted on insulators on one side of the track carrying 750 DC. The coach gets current by means of current collection fixed on the bogie which slides on the top face of the third rail and return path is via track rail. The current collector pressure on the third rail should be frequently checked and adjusted as indicated in the Manual. The third rail is protected by means of a special shroud made of fibre reinforced plastic to prevent fault and accidental contact.

2.4.2 In addition to the above all precautions as being observed during trial regarding electrical clearances and other parameters as prevalent at the time of trial be ensured by the concerned/Kolkata Metro.

2.5 Rolling stock

2.5.1 Before initiating the operation, CME/CEE of the Concerned Railway will certify the track worthiness and safety of the rolling stock. He will also ensure the proper maintenance of the rolling stock.

2.6 General

2.6.1 All permanent and temporary speed restrictions in force and those that may be imposed from time to time due in track, tunnels, curves, signaling and interlocking shall be observed.

3. This speed certificate is provisional only and valid upto 5 years from the date of issue or before date issuance of relevant Final Speed certificate, whichever is earlier.

DA: Nil.



(S. Mani)

Executive Director Stds. Motive Power

Copy to:-

1. Chief Electrical Engineer/Metro Railway, Kolkata
2. The Secretary (Works / Elec. Traction / Mech.), Railway Board, Rail Bhawan, New Delhi-110001.
3. General Manager(Elec./Mech.), ICF, Chennai-600 038

DA: Nil.



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Executive Director Stds. Motive Power