

**STANDARD  
SPECIFICATIONS  
OF  
METRO NEO**

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**GOVERNMENT OF INDIA  
MINISTRY OF HOUSING AND URBAN AFFAIRS**

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## 1. Introduction

- 1.1. The metro rail system being developed at present is of high capacity which is required for bigger cities with very high ridership and Peak Hour Peak Direction Traffic (PHPDT). Seeing the success of metro rail projects in the country, several other cities with lower projection of ridership and PHPDT are also aspiring for metro rail system. This document describes specifications for such a system named Metro Neo which will be at much lesser cost, rail guided, rubber tyred electric coaches powered by overhead traction system running on a road slab (elevated/at-grade). 'Metroneo' would also act as feeder system to high capacity Metro. In addition to less capital cost, the operation and maintenance cost of Metroneo would also be less making the system more viable.
- 1.2. The Metroneo system for which the standards are appended below would be suitable for mass transit corridors having a PHPDT upto 8000 with AW3 loading

## 2. Standard Specifications of Metro Neo

### 2.1 Civil Structure: At-grade Metro neo System:

- 2.1.1. The alignment shall be decided after a thorough study and considering various factors eg; availability of Right of Way (RoW), speed, conflict with road traffic, safety and cost.
- 2.1.2. The Metroneo system shall have dedicated path separating the road traffic with Metroneo lane. For segregation with road traffic, continuous plinth /fencing/kerb shall be provided.
- 2.1.3. The Right-of-Way (RoW) for Metroneo system shall be 8.0 meter for both UP & DN lane combined. Metroneo lane shall be suitably designed & constructed to accommodate guidance system and considering the duty cycle of operation of Metroneo on dedicated path.
- 2.1.4. In case the road width does not permit, At-grade single lane Metroneo system can be provided on a particular road and other lane can be provided on a parallel road. The road width occupied by At-grade single lane Metroneo system shall be 4 meter.
- 2.1.5. Platform width shall be of minimum 1.12 meter for side platform and shall be of minimum 4 meter for island platform.
- 2.1.6. Platforms may be planned in a staggered manner in alternate side for Up and Down lanes to reduce the actual road space.
- 2.1.7. The Metroneo stations shall be simplified/limited to the platform area only and no room shall be provided. The equipment shall be provided in the cabinet,

mounted suitably at the platform or in underground container below the platform with required access and ventilation.

- 2.1.8. Lighting, Passenger Information System, CCTV, Automatic Ticket Vending Machine, Add Value Machine, Ticket Validator, Signage etc. at stations shall be provided bare minimum and where necessary. AFC gates, Platform screen doors, X-ray baggage scanner and DFMD are not needed at the Metroneo stations.
- 2.1.9. Metroneo platform roof can be optimized to 1/3<sup>rd</sup> of platform length instead of providing roof in the entire platform length.
- 2.1.10. Accessibility to Metroneo station shall be made free flowing, convenient and safe by implementation of accessibility plan for the area around the station. Accessibility plan shall include properly designed pedestrian crossing with mandatory traffic calming measures & signage/signal, improvement in footpaths and area around the stations, last mile connectivity etc. The accessibility plan should not lead to bigger stations.

## 2.2 Civil Structure: Elevated Metro neo System

- 2.2.1 Elevated alignment shall be decided after a thorough study and considering various factors eg; availability of Right of Way, speed, conflict with road traffic, safety and cost.
- 2.2.2 Road space occupied at the median shall be maximum 2.2 m for piers including crash barrier.
- 2.2.3 Edge to edge width of viaduct shall be 8 meter maximum. A vertical clearance of minimum 5.5 meter as per road specification for road vehicle under the viaduct shall be provided. Viaduct shall be the safe place in case of any emergency.
- 2.2.4 Platform width shall be of minimum 1.12 meter for side platform and shall be of minimum 4 meter for island platform.
- 2.2.5 Metroneo platform roof can be optimized to 1/3<sup>rd</sup> of platform length instead of providing roof in the entire platform length.
- 2.2.6 Elevated Metroneo platform shall be simple, open and for serving the functional requirement of exchange of passenger between platform and vehicle. Bare minimum facilities eg; Lighting, CCTV, Public information system etc shall be provided on the platform.
- 2.2.7 Ticket Validators, if planned at stations, shall be provided at Platform. Ticketing equipment eg; Automatic Ticket Vending Machine, Add Value Machine etc shall be provided under/near the staircase. AFC gates, Platform screen doors, X-ray baggage scanner and DFMD are not needed at the Metroneo stations.
- 2.2.8 The entry/exit to the platform shall be directly through staircase from ground level. The concourse shall not be provided.
- 2.2.9 Lifts for disabled/old shall be provided. Provisions of escalators in the stations shall be generally avoided. Escalators shall only be provided at such stations where there is absolute necessity.

- 2.2.10 Foot-over-bridge (FOB) or underpass shall be generally avoided except at some stations under exceptional scenario. For crossing the city roads under the elevated platform, properly designed pedestrian crossing with traffic calming measures & signage/signal shall be provided mandatorily.
- 2.2.11 Accessibility to Metroneo station shall be made free flowing, convenient and safe by implementation of accessibility plan for the area around the station. Accessibility plan shall include improvement area around the stations, properly designed pedestrian crossing with mandatory traffic calming measures & signage/signal, improvement in footpaths last mile connectivity etc. The accessibility plan should not lead to bigger stations. The space below/near the staircases can be used for locating ATM/AVM, facilities for staff/passenger etc.
- 2.2.12 Necessary arrangement may be provided for preventing the access to platform during the non revenue hours.

## 2.3 Rail Guidance

- 2.3.1 Kerb Rail Guidance/Centre Rail Guidance shall be used for Metroneo system.
- 2.3.2 Deleted

## 2.4 Rolling Stock

- 2.4.1 The rolling stock shall be on rubber tyre running on road slab (elevated or at grade)
- 2.4.2 The configuration of Metroneo Rolling Stock may be single coach of around 12 meter length or two articulated coaches of around 18 meter length or three articulated coaches of around 24 meter length depending upon PHPDT. The lengths mentioned in this para are approximate, based upon the products available & for guidance. Actual length may vary.
- 2.4.3 Number of additional articulated coach may be decided by the respective cities based on PHPDT.
- 2.4.4 The width of coach body shall be around 2.55 meter.
- 2.4.5 The floor height shall be low of about 300-350 mm.
- 2.4.6 The average axle load of Metroneo coaches shall be around 10 Ton.
- 2.4.7 The turning radius of the Metroneo rolling stock shall be decided by implementing agency based on local requirement and availability of technology.
- 2.4.8 The car structure material shall be Stainless steel/Aluminum. Designed life of the Rolling Stock shall be 30 years minimum.
- 2.4.9 The gradient may be decided by implementing agency based on local requirement and availability of technology. The design may be optimized considering the alignment and city's geographic conditions.
- 2.4.10 The Metroneo rolling stock shall be provided with Kerb Rail/Centre Rail guidance system.

- 2.4.11 These electric coaches shall have sufficient battery capacity to run up to 20 km without OHE power. Metro/City authorities can decide the battery design and sizing based on site requirement. The rolling stock shall also have energy regeneration system during braking.
- 2.4.12 Coaches shall be designed for a speed which shall be within purview of MoHUA.
- 2.4.13 The rolling stock shall be provided with coupler on either end for coupling and shunting in case of faults on the mid sections, a suitable shunter shall couple with the coach and shift coach to depots.
- 2.4.14 These electric coaches should be capable of travelling in elevated, at grade and tunnel section.
- 2.4.15 Safety of passengers inside the electric coaches should be ensured during the event of breaking of contact wire and falling on roof of coaches.
- 2.4.16 Safety certified obstruction detection system shall be provided.
- 2.4.17 The evacuation system in coaches shall be side evacuation in between both the carriageways. Adequate space shall be available on the median (on at-grade or on viaduct) for passenger movement.

## 2.5 Traction and Power Supply System

- 2.5.1 Traction system for Metroneo shall be 750 Volt DC OHE with overhead twin, positive & negative contact wires placed in parallel.
- 2.5.2 The power supply for Traction Sub Station (TSS) shall be availed from the city's electric power supply authority at HT voltage level (11/22/33 kV/as available) at planned locations as per design requirement. The provision of feed extension from adjacent TSS in case of failure shall be implemented. Receiving Substation (RSS) and captive ring main network of 33kv shall not be required.
- 2.5.3 TSS shall be located at suitable locations and could be installed in a small building, or under the viaduct at median or in container etc. No specific room at station will be required.
- 2.5.4 SCADA for control and monitoring of Traction Power Supply and OHE shall be implemented.
- 2.5.5 Design and Implementation shall ensure to avoid any possibility of parting of OHE and suitable protection shall be provided to take care of parting of OHE.
- 2.5.6 Auxiliary Power supply for station general lightings, lifts/escalators etc. shall be taken at 415V from directly from city electric power supply authority.
- 2.5.7 As Metroneo rolling stock are hybrid with battery, in depot minimum OHE (for the requirement of testing of rolling stock etc.) shall be implemented.
- 2.5.8 All safety standards/guidelines may be followed and close monitoring of system shall be ensured.

## 2.6 Signaling System

- 2.6.1 Metro Neo shall be equipped with suitable Automatic Train Protection (ATP) system with anti-collision feature and pre-defined speed limit and operation shall be monitored by central control. The traffic light signal at interchange/terminal/crossover shall be provided along with marker board, speed limit signage, buffer stop signage.

## **2.7 Telecom**

- 2.7.1 Radio based communication between driver and control room shall be provided.
- 2.7.2 A fiber optic based communication system for CCTV surveillance, Public Information, Data Communication, Master Clock etc. shall be provided.

## **2.8 Automatic Fare Collection (AFC)**

- 2.8.1 Ticketing system shall be based on National Common Mobility Card (NCCM), QR code and any other innovative ticketing system. Metroneo stations shall generally be unattended and Automatic Ticket Vending Machine (TVM), Add Value Machine (AVM) etc. shall be provided at the stations.
- 2.8.2 No AFC gates shall be installed at Metroneo stations. The ticket validator shall be installed in the Metroneo Coaches or on the platforms.
- 2.8.3 With random checking, heavy penalty shall be levied on the passengers without a valid ticket in the system.

## **2.9 Maintenance Depot, Operation Control Centre and Others**

- 2.9.1 The maintenance and stabling or more facilities for coaches can be done in one depot depending on the site requirement. Additional depot can be planned for stabling purposes and cleaning facilities only.
- 2.9.2 As Metroneo rolling stock are hybrid with battery, in depot minimum OHE (for the requirement of testing of rolling stock etc. ) shall be implemented.
- 2.9.3 Integrated operation control centre (OCC) shall be provided and OCC shall be simple with bare minimum facilities.

## **2.10 Security**

- 2.10.1 X-ray baggage scanner and DFMD are not needed in the Metroneo stations.
- 2.10.2 CCTV surveillance system shall be deployed at stations as well as in Metroneo Rolling Stocks.

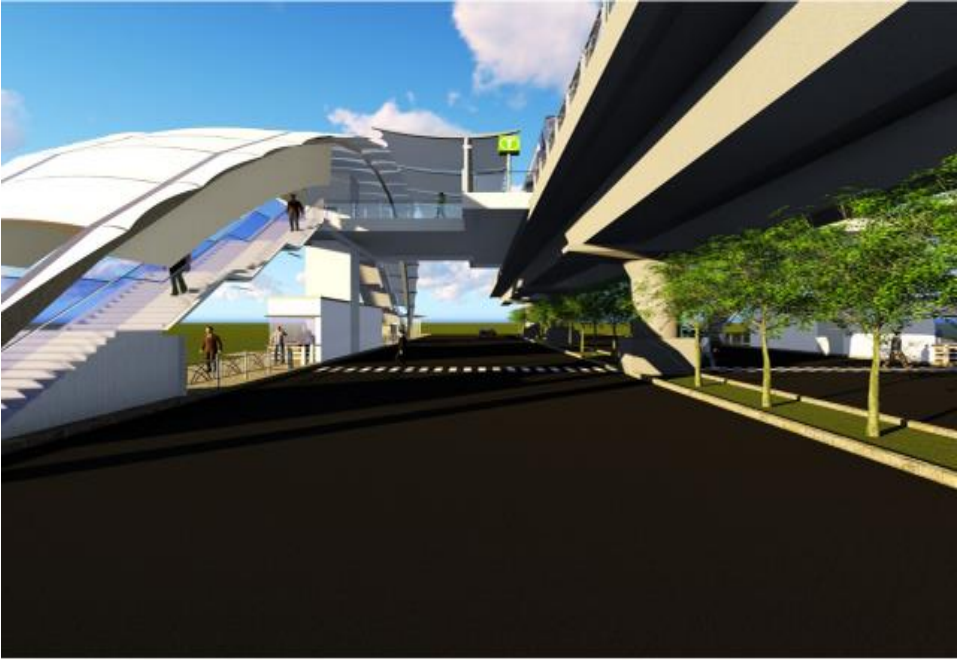
### 3. NOTE:

- 3.1 The above are broad standards of Metroneo. Detailing, wherever required should be done within the ambit of above standards by Metroneo implementing agencies as per requirement of the city during the time of implementation.
- 3.2 Any deviation from the above standards shall require prior approval of Ministry of Housing and Urban Affairs and Ministry of Railways.
- 3.3 The standard specification for Metroneo shall be reviewed periodically based on the experience gained while executing the Metroneo projects.



4. Representative Picture of Metroneo Elevated Station

Pictures for reference only, actual implementation may vary.





**END OF THE REPORT**