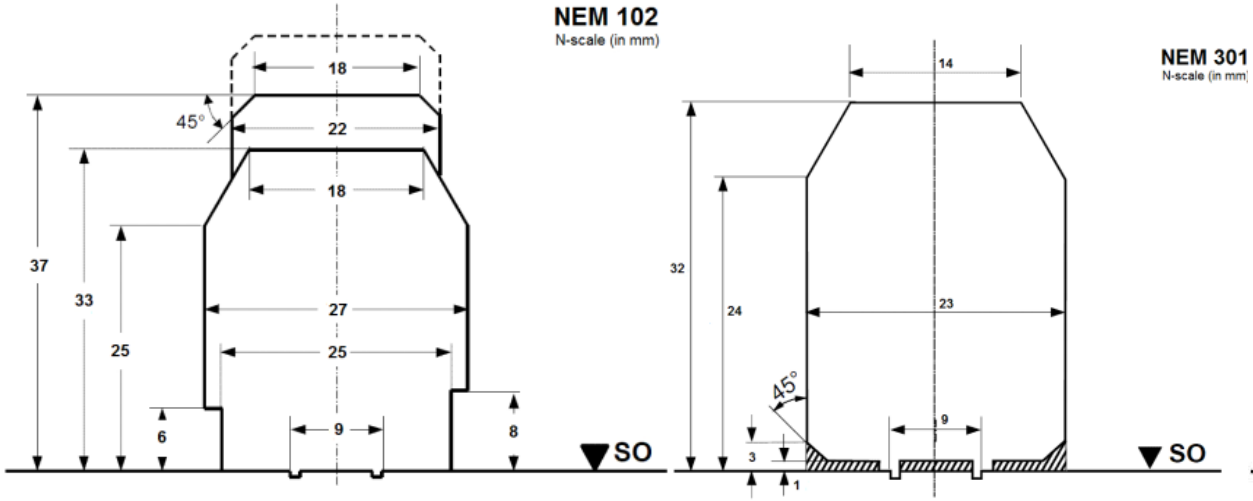
Essential MOROP NEM (European Model Railway) Standards for European N-scale (1:160)

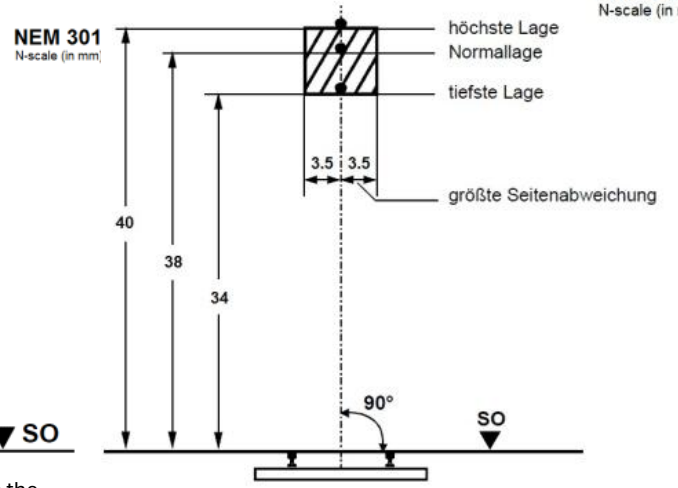
SO: Schienenoberkante (top of rail)

NEM 102
N-scale (in mm)



NEM 102 defines the structure clearance (loading gauge) for a straight track. Together with **NEM 301**, which specifies the maximum permissible vehicle dimensions (vehicle envelope), NEM 102 defines the minimum clearance required around a vehicle. This ensures that trains on adjacent tracks do not foul each other and that sufficient clearance is maintained from signals, bridge piers, platform edges, and other fixed structures.

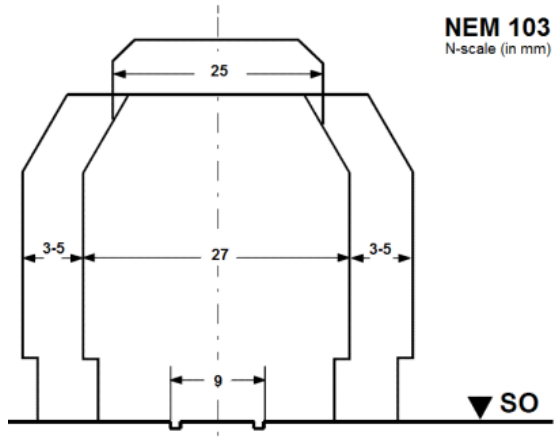
NEM 301
N-scale (in mm)



NEM 201
N-scale (in mm)

NEM 201 specifies the height of the overhead catenary above the top of rail (SO). The minimum height is 34 mm, for example beneath bridges, overpasses, or in low tunnels. On open track, the contact wire height may be increased to 40 mm. In station areas, the overhead catenary is typically installed at a height of 38 mm above the top of rail.

NEM 103
N-scale (in mm)



NEM 103 defines the structure clearance required on curved track and in transition curves. In N scale, this requires an additional 3 to 5 mm of lateral clearance, depending on the curve radius. The tighter the curve, the greater the clearance required. For sharp curves, an additional 5 mm of clearance is recommended to accommodate vehicle overhang.

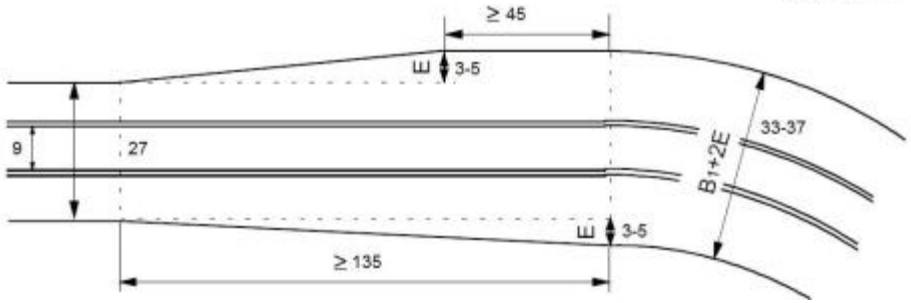
NEM 111
N-scale (in mm)

	Normalspur-Wagengruppe		
	A	B	C
zulässiger kleinster Bogenradius	198	225	270
empfohlener kleinster Bogenradius			
- für Nebengleise in Bahnhöfen	225	270	315
- für Hauptgleise auf Nebenbahnen	270	315	360
- für Hauptgleise auf Hauptbahnen	315	360	405

NEM 111 specifies the minimum curve radii for different categories of rolling stock, including locomotives, freight wagons, and passenger coaches.
The first row indicates the minimum permissible radius required for reliable operation. Using larger curve radii not only improves operational reliability but also results in a more realistic appearance of trains negotiating curves.

NEM 112 specifies the minimum track spacing between parallel tracks. On open track, the minimum distance measured from track center to track center is 25 mm. In station areas, this increases to 28 mm to provide sufficient clearance for platforms, railway staff, and operational infrastructure.
On curved track, the spacing must be increased to account for vehicle overhang. For rolling stock up to Wagon Group C, the recommended track spacing ranges from 35 mm on a 225 mm radius curve to 25 mm for curves with a radius of 550 mm or greater.
Since many model railway layouts are only 500 to 1,000 mm deep, a practical track spacing of 29 to 33 mm is widely used. This provides a good compromise between a realistic appearance, adequate clearance, and easy access to the track for maintenance and rerailing.

NEM 103
N-scale (in mm)



NEM 103 distinguishes between different standard wagon groups, as longer vehicles exhibit greater end and center overhang on curves and therefore require more lateral clearance.

- Wagon Group A: Vehicle length up to 125 mm (equivalent to 20.0 m on the prototype)
- Wagon Group B: Vehicle length up to 151 mm (equivalent to 24.16 m on the prototype)
- Wagon Group C: Vehicle length up to 170 mm (equivalent to 27.2 m on the prototype)

Source: morop.org