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Level 2

Management of Tight Clearances and Track Position

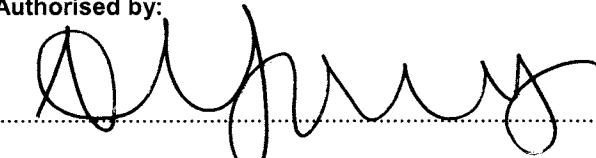
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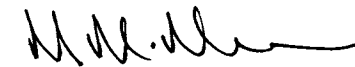
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Issue record

Issue	Date	Comments
1	December 2007	First issue
2	June 2008	Updated to reflect Phase 2A reorganisation
3	December 2010	Updated to reflect Engineering Reorganisation. Updated requirements due to increased understanding of tolerances and maintenance comments.

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 4 December 2010.

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 4 to continue to comply with the Issue of any relevant Network Rail Standards current when GRIP Stage 4 was reached and not to comply with requirements contained herein, unless the designated Standard Owner has stipulated otherwise in the accompanying Briefing Note.

Reference documentation

See in clause 2.

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1 Purpose

This document sets out the activities and control mechanisms which shall be applied across the network to define, monitor, assess, correct and advise gauge and clearances on routes to enable the safe passage of prescribed rolling stock.

2 Scope

The document is mandatory for all Network Rail routes from the 4th December 2010.

The document is a safety critical specification and defines the actions to be taken to manage the safety clearance between trains and structures and other trains. This is a relational distance (gap) and may be affected by changes to the position of the track, the structure or both.

The requirements shall be applied by any individual, group or supplier working on Network Rail infrastructure in a maintenance, renewal or new build project capacity whose worksite may affect the track adjacent to any bridge, platform, structure or tunnel

Or

Whose worksite on any bridge platform, structure or tunnel may affect the clearance to trains on an adjacent track.

Or

Whose worksite on any track may affect the clearance between trains on that track and any adjacent track.

The requirements of this specification apply to all works whether temporary or permanent and calculation of clearance dimensions shall be undertaken at any location prior to the passage of trains.

This specification does not apply to clearances to OHLE wires or structures, which are covered by GE/RT8025 Electrical Protective Provisions for Electrified Lines..

NR/L2/TRK/001	<i>Inspection and maintenance of permanent way</i>
NR/L2/TRK/2049	<i>Track Design Handbook</i>
RT/CE/S/036	<i>Management of Gauging and Clearances</i>
NR/L2/TRK/2102	<i>Design and Construction of Track</i>
NR/GN/TRK/7001/TWI2G074	<i>How to maintain slab track</i>
GE/GN8573	<i>Guidance on gauging</i>

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GC/RT5212	<i>Requirements for Defining and Maintaining Clearances</i>
NR/L3/TRK/003/TEF3034	<i>Platforms and clearance Form</i>
NR/L3/TRK/003/TEF3049	<i>Upper sector survey Form</i>
NR/L3/TRK/003/TEF3050	<i>Datum monitoring sheet</i>

3 Definitions

For the purposes of this standard, the following terms and definitions apply.

Anomaly

A clearance that is technically foul (less than or equal to zero mm, by gauge clearance analysis). Whilst it is possible that this is the result of a rogue survey point, in most cases it reflects a very tight clearance which needs early attention.

Datum Plate

An approved marker, fixed to a structure, which both provides the datum for, and records, offset data to the adjacent track.

Lower Sector

The area up to and including 1100 mm above the plane of the rails. Lower sector structures include the longitudinal (centre) girders of underbridges and platforms. See also 'upper sector'.

National Gauging Database (NGD)

A database, maintained on behalf of Network Rail (by Balfour Beatty Rail Technology Ltd), containing structure profiles and six-foot measurements with coverage over the entire UK rail network. The data is provided on DVD-ROM every two months to Network Rail and other Railway Group members. The data is used in conjunction with vehicle profiles, within analytical software (such as ClearRoute NR) to derive swept envelopes and to determine the resulting clearances.

Passing Clearance

The dimension between vehicle swept envelopes on adjacent tracks.

Platforms

All passenger platforms, currently or previously used to gain access to trains, loading and parcels docks.

Reference position

The position of the track referenced to a given datum plate.

Relative position

The position of the platform edge and other features/structures measured from the plane of the rail and recorded as "X" lateral and "Y" vertical height.

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Stepping Distance

Horizontal, vertical and diagonal measurements between static vehicle passenger steps and platform coping stone.

Structure Clearance

The dimension between vehicle swept envelopes and adjacent structures.

Swept Envelope

A cross-sectional profile taken at right angles to the track, enclosing all reasonable dynamic movements (geometry faults at Intervention limit and above may cause movements outside of the swept envelope), static deflections and overthrows of all points along the surface of the vehicle, that can reasonably be expected to occur under appropriate range of operating conditions as it sweeps past a theoretical track location. A family of swept envelopes is required to define a vehicle's dynamic behaviour on a route.

Tight Clearance

Swept envelope clearances in categories other than Normal – see Clause 5

Tight Clearance Database (TiCleD)

A Network Rail database of tight clearances on all routes, identified from the analysis of all vehicle types operating over those routes. This database is currently derived from an annual download of infrastructure data from the NGD.

Upper Sector

The area above 1100 mm above the plane of the rails. Upper sector structures include overbridges, platform awnings and tunnels. See also 'lower sector'

4 Management of Clearances and Track Position Policy

4.1 General

The relationship between the track and lineside structures, and between adjacent tracks shall be managed so that any rail vehicle using the route cannot come into contact with any lineside structure or passing rail vehicle.

Clearances between vehicle and structure may change for a number of reasons, including:

- the track moves or is moved
- the structure moves or is moved
- the type of vehicle using the track changes
- the size or suspension characteristics of vehicles using the track are amended.

The relative positions of track and structure are measured by various methods including the Structure Gauging Train, platform gauge and Lasersweep, and the Asset Information Gauging Engineers apply the profiles of the vehicles using the route to calculate the clearances. These methods are to be undertaken at a

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general frequency. Those structures with tighter clearances are manually monitored at an increased frequency.

Vehicles currently authorised to operate over any route are recorded in the Sectional Appendix. The Asset Information Gauging Engineers shall keep records of other vehicles using a route; this includes freight vehicle gauges, vehicles having temporary clearance over, proposed for, having aspirations to run over or having running rights over, a route.

The Track Maintenance Engineer is responsible for maintaining the position of track adjacent to structures, and for rectifying its position, if it is practical to do so, should clearances be tight. Through the course of maintenance the Track Maintenance Engineer may need to use available clearance in maintaining adequate track position.

Work undertaken on the track, or on adjacent structures, or adjacent tracks shall include designing and, if necessary, placing the track so that Normal clearances are obtained with the track in it's design position, if it is practical to do so.

Clearances shall be 'reset' at time of renewal to obtain Normal clearances, if these are not present.

4.2 Monitoring track position

Track position is monitored by:

- routine measuring of track position at every structure close to the track, with the exception of platforms, using the structure gauging train (the Structure Gauging Train is currently unable to measure platforms to an acceptable accuracy).
- surveying all platforms manually.
- monitoring structures with tight clearances (datum surveys) to confirm that track position remains within the tolerances in NR/L2/TRK/001/E01 and adjusting track position when out of tolerance.
- verification surveying of the 'as built' position after track or structures renewals or enhancements.

Track position shall be surveyed whenever track adjacent to platforms or structures with existing tight clearances, is moved or the structure altered.

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5 Routine monitoring of track position and clearances

5.1 General

The Asset Information Gauging Engineer team calculates the swept envelope clearances to all structures and track intervals in the National Gauging Database (NGD) every year. A summary of these clearances forms the Tight Clearance Database (TiCleD). The clearances are categorised as shown in Table 1.

Table 1 – Clearance categories			
Clearance Category	Upper Sector limits	Lower Sector limits	Passing vehicle - vehicle
Normal	≥100 mm	≥50 mm.	≥100 mm
Reduced	50 mm to 99 mm	25 mm to 49 mm	50 mm to 99 mm
Special Reduced	1 mm to 49 mm	1 mm to 24 mm	1 mm to 49 mm
Anomaly	<1 mm		

Derived from GC/RT5212 Requirements for Defining and Maintaining Clearances

Track position at all platforms, tight structures and tight track intervals shall be monitored. The current list of such structures and track intervals is available within the TiCleD database.

Should clearances change as a result of new or amended vehicles on the route, the Senior Gauging Engineer shall notify the relevant Track Maintenance Engineer of the additional structure monitoring required, if any.

5.2 Track position monitoring requirements

5.2.1 Methods of track position monitoring

The calculation of clearances requires an accurate survey of the position of the track relative to adjacent structures and tracks.