

Ref:	NR/L2/TRK/1054
Issue:	5
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Level 2

Inspection, maintenance and repair procedures for cast, welded and fabricated crossings in the track

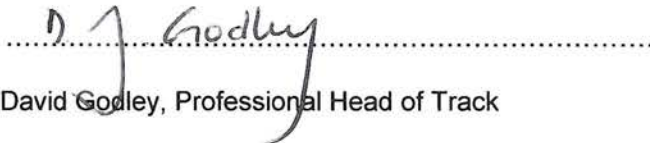
Endorsement and Authorisation

Endorsed by:



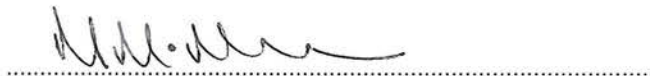
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User information

This Network Rail standard contains colour-coding according to the following Red–Amber–Green classification.

Red requirements – No deviations, could stop the railway

- **Red requirements shall** always be complied with and achieved.
- Red requirements shall be presented in a red box **with the word “shall” or expressed as a direct instruction**.
- Accountability for the efficacy of red requirements lies with the Professional Head/Standard Owner.
- Red requirements are monitored for compliance.
- Corrective actions shall be enforced if deviations are discovered through functional checks (e.g. engineering verification visits, audit or Operations Self-Assurance).

Amber requirements – Controlled deviations, approved risk analysis and mitigation

- **Amber requirements shall** be complied with unless deviation has been approved in advance.
- Amber requirements shall be presented with an amber sidebar **and with the word “shall” or expressed as a direct instruction**.
- Accountability for the efficacy of these requirements lies with the Professional Head/Standard Owner, or their nominated Delegated Authority.
- Amber requirements are monitored for compliance.
- Deviations **may** be permitted. Deviations are approved by the Standard Owner or through existing Delegated Authority arrangements.
- Corrective actions shall be enforced if **non-approved** deviations are discovered through functional checks (e.g. engineering verification visits, audit or Operations Self-Assurance).

Green – Guidance

- Guidance is based on good practice. Guidance represents supporting information to help achieve **Red** and **Amber** requirements.
- Guidance shall be presented with a dotted green sidebar **and with the word “should” (usually in notes) or as a direct instruction**.
- Guidance is **not mandatory** and is not monitored for compliance.
- Alternative solutions may be used. Alternative solutions do not need to be formally approved.
- Decisions made by a competent person to use alternative solutions should be backed up by appropriate evidence or documentation.

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Issue record

Issue	Date	Comments
1	August 1996	First issue (as RT/CE/S/054)
2	August 2003	Minor change – inspection frequencies to be as per RT/CE/S/103.
3	March 2012	Renumbered from NR/SP/TRK/054. Major rewrite to include revised inspection requirements, new instructions for weld repair and application of new minimum action codes (MACs)
4	June 2012	Changes to Red-Amber-Green classification
5	September 2014	No change to technical content but reissued to clarify requirements and include existing Derogations and National TNCs in a single document

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 31st October 2014.

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 3 (Option Selection) to continue to comply with the issue of any relevant Network Rail standards current when GRIP Stage 3 was completed and not to comply with requirements contained herein, unless stipulated otherwise in the scope of this standard.

Reference documentation

NR/L2/TRK/001, *Inspection and maintenance of permanent way*

NR/L2/TRK/0132, *Maintenance Arc Welding of Rails, Switches and Crossings*

NR/L3/TRK/003/TEF3031, *Cast Crossing Inspection Report*

NR/L3/TRK/003/TEF3054, *Switches and Crossings Weld Repair/Replacement Form*

NR/L3/TRK/003/TEF3070, *Crossing Monitoring Report*

NR/GN/TRK/7001/TWI2S021, *How to recognise types of crossing*

NR/SP/TRK/055, *Rail Testing: Ultrasonic Procedures*

RT/CE/S/056, *Rail Testing: Non-Ultrasonic Procedures*

RT/CE/S/057, *Rail Failure Handbook*

RT/CE/S/063, *Serviceable switches and crossings*

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1 Purpose

The majority of defects and wear detected in crossings are repairable if detected at an early enough stage. The identification and timely rectification of crossing wear, or associated track condition issues, will reduce the risk of crossing failure or premature replacement.

The early detection of a crack in all steel grades is paramount.

The benefits of this standard are the early identification and rectification of defects which, when discovered in a timely manner, will prevent costly replacement of crossings. Risks of crossing failure will also be reduced as a result.

This Network Rail standard specifies the requirements for the inspection and identification of defects and wear in crossings. The specification now includes guidance for maintenance arc weld repair with appropriate minimum actions and also gives details of minimum actions to be taken when significant defects are discovered.

This standard is intended to be read in conjunction with other standards concerning the inspection and rectification of defects in crossings.

2 Scope

This standard is for the inspection and identification of defects and wear in cast austenitic manganese steel (AMS) and Bainitic steel crossings in running lines of Network Rail infrastructure. It defines minimum actions and rectification timescales for defects identified with crossings.

This standard also describes the assessment for wear and batter for normal grade crossing types. The Route Asset Manager (Track) will set additional requirements based on route criticality.

Further information on the various types of steel is given in Appendix A.

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3 Definitions

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

3.1 Cast crossings

cast crossing

crossing that is produced from steel cast in a mould using either AMS or Bainitic steel. These crossings come in the following forms.

fish-plated cast monobloc

crossings where the individual constituents (vees, wing rails, legs, etc.) are cast together as one piece and attached to the plain rail using a fish-plated connection

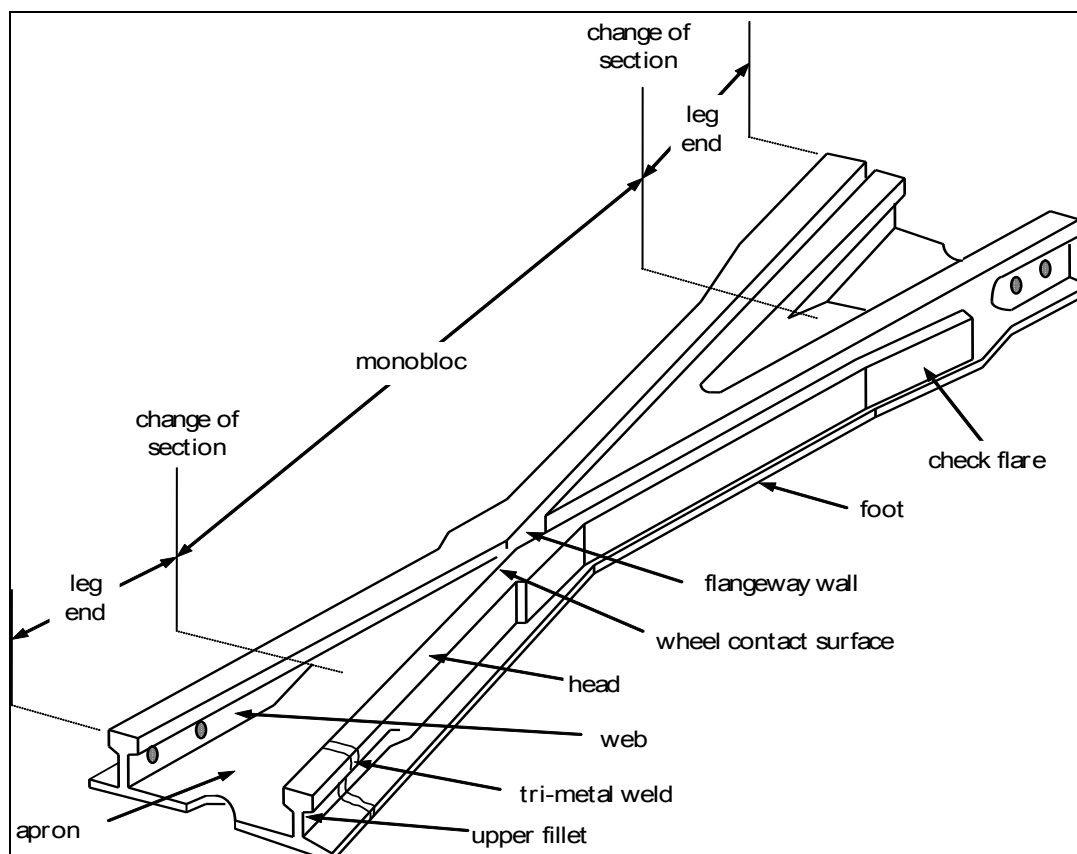


Figure 1 – Parts of a fish-plated cast monobloc

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welded cast monobloc

crossings where the components (vees, wing rails, legs, etc.) are cast as one piece. The structure is made weldable into CWR by the incorporation of flash butt welded leg end extensions using stainless steel inserts



Figure 2 – Welded cast monobloc

cast centre block

crossings where the nose(s) and throat (knuckle) are cast as one piece. The leg end extensions are attached by flash butt welding and the non-load carrying wing rails by multiple groove locking (MGL) pins, tension-controlled bolts or similar devices



Figure 3 – Cast centre block

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3.2 Semi-fabricated crossings

common crossings with either an electro-slag welded vee, machined nose block, or cast vee to which the wing rails are attached by means of bolts or MGL pins. These crossings come in the following forms.

cast vee

crossing in which a cast nose-piece is flash butt welded to pearlitic rail legs and to which the wing rails are attached by MGL pins, tension-controlled bolts or similar devices. An obtuse version of this design is also available. This consists of two cast point rails with welded-on point rail extensions and bolted-on wing and check rails.



Figure 4 – Cast vee

machined nose block

crossing where the vee is mechanically manufactured from a low alloy wrought steel block, which is machined and subsequently heat treated. Pearlitic rail leg ends are flash butt welded to the vee. Distance blocks are also welded directly onto the vee prior to attaching wing rails by means of MGL pins, tension-controlled bolts or similar devices (note identification label on the spacing block)

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Figure 5 – Machined nose block

electro-slag welded vee
crossing which is manufactured from two machined pearlitic rails and an insert bar, which is then electro-slag welded together and the finished vee machined to profile. Wing rails are then attached by means of tension-controlled bolts or similar devices



Figure 6 – Electro-slag welded vee