

Letter of instruction

Information for users

The following document:

NR/SP/ELP/21104
Issue 2

has had changes made to it, most recently, with effect from **28 March 2014**.

Instructions for use

It is essential that you first read and understand each letter of instruction pertaining to the standard before proceeding to use the standard. You must then apply the requirements of each letter to the standard.

NR/BS/LI/328	Issue 1	28 March 2014	Proceed to letter ►
NR/SP/ELP/21104	Issue 2	01 April 2006	Proceed to standard ►

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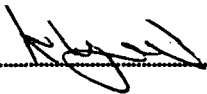
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Issue	2
Date	April 2006

Business Process Document

Design and installation of electric track equipment for d.c. electrified lines

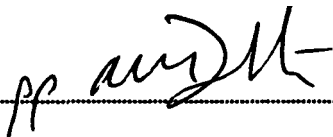
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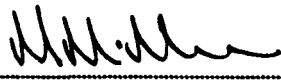
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Issue record

Issue	Date	Comments
2	April 2006	Re-issued as a SAF3 Business Process Document (<i>formerly RT/E/S/21104</i>)

Implementation

1 April 2006

Compliance

This Network Rail specification is mandatory and must be complied with by Network Rail and its contractors from 1 April 2006

When this specification is implemented, it is permissible for all projects, which have formally completed GRIP Level 4 to continue to comply with the Issue of any relevant Network Rail standards current when GRIP Level 4 was reached and not to comply with requirements contained herein unless the head of electrification and plant has stipulated otherwise in the accompanying briefing note.

Where the head of electrification and plant has specified that all projects will comply with the requirements, specific authority not to comply can be sought in the usual manner using the appropriate non-compliance authority processes described in Network Rail standard, [NR/SP/STP/045](#) *Managing the process for non-compliance authority* (formerly RT/LS/P/045).

Disclaimer

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Supply

Copies of documents are available electronically, within Network Rail's organisation. Hard copies of this document will be available to Network Rail employees on request to the document controller and to other organisations from IHS Technical Indexes (01344 404409)

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1 Purpose

This specification states the requirements for the design, manufacture, installation and testing of electric track equipment, including conductor rail and negative bonding, for use on the existing third rail d.c. traction system areas and where extensions are proposed.

The document is to be read in conjunction with the associated guidance notes and the relevant procurement specification.

2 Scope

This specification includes the electric track equipment requirements for Network Rail, direct current, third rail electrified railway systems and includes the requirements of high current and standard current applications.

3 Reference documentation

For the purpose of this specification the following definitions shall apply:

NR/SP/ELP/27224	Network Rail Business Process Document – Installation of Cable Routes, Cable Laying, Testing and Jointing on Cable Routes Forming Part of the Traction Distribution System
NR/SP/TRK/135	Network Rail Business Process Document – Flash - Welded Rails: Depot Welded Strings (formerly RT/CE/S/001)
NR/SP/TRK/130	Network Rail Business Process Document – Flash - Welded Rails: Site Welded Strings (formerly RT/CE/S/130)
NR/SP/TRK/008	Network Rail Business Process Document – Saw and disc cutting and drilling of rails
NR/SP/ELP/21101	Network Rail Business Process Document – Track cable for D.C. Electrified Lines
NR/SP/ELP/21131	Network Rail Business Process Document – Warning signs and notices for A.C. and D.C. Electrified Lines
EN ISO 9001	Model for quality assurance in design, development, production, installation and servicing
BS 7865	Steel electrical conductor rail for railway motive power supply

4 Definitions

For the purpose of this specification the following definitions shall apply:

Bond Head	A steel sleeve attached to the end of a bond and welded to a running rail to form an electrical connection.
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British Standard	A standard published by the British Standards Institution. Its alphanumeric identity is prefixed by BS.
Electric Track Equipment	Equipment associated with the railway track used for the transmission and return of electrical current for traction purposes.
Electric Track Equipment Drawings	A series of Network Rail Drawings prefixed by an alphanumeric identity RT/ETE which detail information related to the Electric Track Equipment. These are commonly referred to as ETE Drawings.
Electric Train	One powered vehicle or any combination of powered and non-powered vehicles operating on Network Rail controlled infrastructure.
Equipment	Equipment including all component parts and accessories.
European Standard	A standard published by the European Committee for Standardisation or by the European Committee for Electrotechnical Standardisation. Its alphanumeric identity is prefixed by EN.
High current traction system	A d.c. system capable of supplying trains with a sustained peak total traction current of 6.5 kA and above.
International Standard	A standard published by the International Electrotechnical Commission. Its alphanumeric identity is prefixed by IEC.
Procurement Specification	The contract specific Network Rail documentation, such as, Invitation to Tender or Technical Workslope.
Standard current traction systems.	A d.c. system capable of supplying trains with a sustained peak total traction current below 6.5 kA.

5 General clauses

5.1 Safety, legislation and regulations etc

Measures shall be taken to ensure the safety of persons concerned in the installation, operation, maintenance, repair and eventual disposal of the electric track equipment. All apparatus and connections for the safe and satisfactory operation, control and protection of the electric track equipment shall be provided whether or not specifically mentioned.

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The electric track equipment shall comply with the requirements of all relevant statutory acts, rules, regulations or orders, including:

-) Health and Safety at Work Act, 1974;
-) Electricity at Work Regulations, 1989;
-) Construction (Design and Management) Regulations, 1994;
-) Railways (Safety Case) Regulations, 1994;
-) Electromagnetic Compatibility (EMC) regulations;
-) Control of Substances Hazardous to Health Regulations, 1988.

For substances falling within these regulations the supplier shall provide a risk assessment covering the life of the electric track equipment and its eventual disposal. Materials containing asbestos, chlorinated fluorocarbons (CFCs) or polychlorinated biphenyls, (PCBs) shall not be used.

This information is not necessarily exhaustive and does not modify the legal obligations of the supplier.

The supplier shall provide recommendations for training in safe operation and maintenance of the electric track equipment

5.2 Design, manufacture and workmanship

The electric track equipment shall be designed and manufactured in accordance with best practice, taking cognisance of the system in which it will operate. All material shall be of the quality and of the type most suitable for working under the conditions specified for the full service life of the equipment.

The supplier shall provide a safety case for electric track equipment with novel or innovative features not previously used within the railway environment. The safety case shall quantify any additional risks and indicate how these risks are controlled.

5.3 Spare parts and consumables

The supplier shall make recommendations to the purchaser for holdings of spare parts and consumables based on estimated replacement rates and delivery periods to ensure that the electric track equipment complies with this specification throughout its specified service life. The supplier shall indicate the extent of commonality with equipment previously supplied.

5.4 Instruction manual

The supplier shall produce a comprehensive and specific instruction manual covering all aspects of installation, operation, maintenance and eventual disposal of the electric track equipment, and shall supply the number of copies stated in the procurement specification. The manual shall provide guidance to enable all work to be carried out safely and efficiently. The manual shall contain only relevant information and shall include:

- a) a description of the construction, installation, functioning and rating of electric track equipment;
- b) operating instructions, including safety and isolation procedures;
- c) routine maintenance requirements, including any special precautions, fault finding and major overhaul procedures and periodicity;
- d) full details of recommended adjustments and settings for the equipment and its protective devices where appropriate;
- e) instructions for eventual disposal of the equipment including safety and handling precautions;
- f) drawings, illustrations and data enabling all component parts to be readily identified and to allow procurement for replacement purposes;
- g) the drawings listed in clause entitled 'Drawings';
- h) a list of locations and associated serial numbers.

The manual shall be of loose leaf design with at least four retaining rings and with oil resistant hard covers. It shall be of A4 size and include drawings reduced to A3 or A4 size. Drawings reduced in size shall remain clearly legible. The purchaser may accept drawings larger than A3 subject to suitable, clearly labelled protective drawing storage folders being provided for inclusion in the manual.

Three copies of the draft manual shall be submitted to the purchaser not later than the end of the third quarter of the period between the contract date and scheduled delivery date and in sufficient time to enable any modifications to be incorporated and the full quantity of final copies to be available prior to delivery of the electric track equipment.

Before the purchaser takes over full responsibility for the equipment, for example, at the expiry of the maintenance period, any necessary modifications shall be made and sufficient copies provided to the purchaser for incorporating into the full quantity of manuals supplied.

5.5 Delivery

The electric track equipment shall be suitably prepared to withstand, without damage or deterioration, the method of transport to site, cramage, storage and positioning stated in the procurement specification. The electric track equipment shall be protected, as necessary, against the weather. The destination for delivery shall be as stated in the procurement specification.

Any factor which may affect the onward delivery to a final site (e.g. dimensions and weight limits) shall be subject to agreement between the supplier and the purchaser.

6 Compliance with standards

6.1 European, International and British Standards etc

The electric track equipment shall comply with relevant European Standards whether or not reference is made to them.

In the absence of European Standards, International Standards or national standards having currency within the European Community shall apply subject to the prior agreement of the purchaser.

The editions of standards current at the date of tender shall apply.

6.2 Specific equipment standards

Steel conductor rails shall be designed, manufactured and tested at works in accordance with British Standard [BS 7865](#).

7 Performance requirements

7.1 General

The conductor rail shall be positioned with its centre line nominally 405 mm from the adjacent running rail gauge face and its top surface nominally 76 mm above it.

The rail and other associated electric track equipment shall provide a reliable, and where practicable, continuous, top contact, current collection system fit for its intended purpose and rating when connected into the system described in clause 2 and as may be supplemented in the procurement specification.

All components of the electric track equipment shall be capable of withstanding without deleterious effects, the appropriate current ratings given in Appendix 'B'.

The electric track equipment shall be complete with all items, including connecting cables, cable lugs, fixings, labels etc.