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Business Process Document

Telecoms Lineside Copper Cable Enclosures

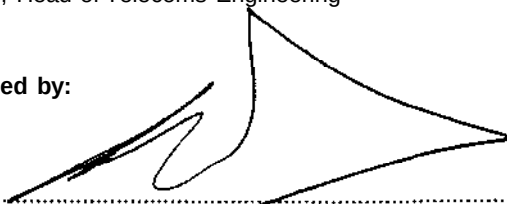
Endorsement & Authorisation

Endorsed by:



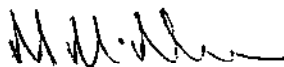
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Issue record

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Implementation

This specification shall be implemented from 3rd June 2006.

Compliance

This Network Rail Specification is mandatory and must be complied with by Network Rail and its Contractors from 3rd June 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 designated Head of Telecoms has stipulated otherwise in the accompanying Briefing Note.

Where the Head of Telecoms 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).

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1 Purpose

To specify the core requirements for non-climate controlled, non power fed lineside telecom copper cable enclosures. The primary function of these enclosures is to accommodate copper cable terminations, and as such the enclosures may be in the form of cabinets or small distribution boxes mounted on their associated posts.

2 Scope

This Product Specification mandates the basic requirements for an enclosure.

Individual projects may have specific requirements that the enclosures must fulfil. This may include the copper termination practice, cable termination capacity and whether there is a need for the cabinets to accommodate line powered equipment. The sponsoring projects shall mandate on the Suppliers all other required characteristics and properties of the enclosures which are not included in this specification.

The technical requirements for powered, lineside cabinets to house active telecommunications equipment are specified in Network Rail Product Specification [NR/PS/TEL/00028](#).

3 Reference documentation

GE/RC8505	Recommendations for the Fire Safety of Materials at Operational Premises
NR/SP/CIV/003	Technical Approval of Design, Construction and Maintenance of Civil Engineering Infrastructure.
NR/GN/SIG/11821	Siting Requirements For Lineside Apparatus Housings.
NR/PS/SIG/00005	Railway Signalling Cable.
NR/PS/TEL/00015	Unit Twin Copper Telecommunications Cable
NR/PS/TEL/00028	Controlled Climate Trackside Housing for Telecoms Equipment.
NR/SP/ACC/029	Product Acceptance
BS 3900	Methods of Test For Paints
BS 5852	Fire tests for furniture
BS 7671	Requirements for electrical installations. IEE Wiring Regulations.
BS EN 60529	Specification for degrees of protection provided by enclosures. IP rating.
LPS1175	Loss Prevention Standard
	Specification for testing and classifying the burglary resistance of building components, strong points and security enclosures
IEC 68-2-14	Basic Environmental Testing Procedures Part 2: Test N-Change of temperature.
IEC 60068-2-30	Environmental Testing: Test Db-Damp Heat, Cyclic (12+12 Hour Cycle)

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4 Definitions

Backmount

Mechanical means for installing the copper termination modules within the enclosure.

BOP

Box-On-Post. A lineside copper cable distribution enclosure without climate control, providing an accommodation for terminating low pair count main telecom cables, tail cables and jumpers.

Cabinet

A lineside copper cable distribution enclosure without climate control, providing an accommodation for terminating main telecom cables, tail cables and jumpers.

Climatic control

Means by which the environment is actively monitored and maintained within a specified set of parameters

Drop Height

With an object suspended, the drop height is the vertical distance between the object's lowest point to the plane of impact.

Enclosure

A generic term used to include both lineside cabinet and lineside Box-On-Post.

IP Rating

A coding system to indicate the degrees of protection provided by an enclosure against access to hazardous parts, ingress of solid foreign objects, ingress of water and to give additional information in connection with such protection.

Line powered

Power to equipment accommodated within an enclosure which is delivered over copper pairs in the main telecom cable.

Main Telecom cable

A twisted pair cable to [NR/PS/TEL/00015](#). A main telecom cable normally consists of more than two pairs.

Sponsoring Project

The project which is sponsoring the enclosure through the Product Acceptance process.

Tail cable

A twisted pair cable to [NR/PS/TEL/00015](#). A low pair count telecom cable. Typically 2-pairs which connects a service such as a Signal Post Telephone to a main telecom cable.

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Jumper

Short length of wires to provide circuit continuity between cables within in an enclosure. Usually provided as a pair.

UV

Ultra Violet

ZHLS

Zero Halogen Low Smoke

5 Introduction

The primary function of an enclosure is to provide an environment in which copper termination modules may be installed, so that main telecom cables and tail cables can be terminated at the trackside. Network Rail employs a wide range of copper terminating practices, all with their individual range of electrical and mechanical characteristics. As such, each type of enclosure must provide the minimum internal environmental conditions necessary for the chosen copper termination practice to function without gradual degradation over time.

6 Enclosure Types

Two types of enclosures are covered by this specification. The cabinet and the BOP.

A BOP is envisaged as a cheaper complete solution compared to a cabinet. It shall only be used to accommodate low pair count main telecom cables with a small number of tail cables and in areas with low risks of vandalism.

Where these two key factors are not met, a cabinet shall be used.

7 Approval of Enclosures

Proposed enclosures must follow product approval in accordance with [NR/SP/ACC/029](#)-Product Acceptance.

8 Service Life

The design and the construction of the enclosure shall provide more than 25 years service within the railway environment.

9 Installations

The design of the enclosure shall enable lineside installations to comply with [NR/GN/SIG/11821](#)- Siting Requirements For Lineside Apparatus Housings. The installation or the constructions of the enclosures' bases at lineside shall comply with [NR/SP/CIV/003](#)-Technical Approval of Design-Construction and Maintenance of Civil Engineering Infrastructure.

9.1 Base For Cabinets

9.1.1 Preferred Base

Cabinets shall preferably be compatible with mounting on a pre-cast concrete base to British Rail drawing BRS-SC32-Base Concrete For Small Apparatus Case, issue D. See Appendix A - BRS-SC 32 pre-Cast Concrete Base. The BRS-SC 32 base is suitable for cabinets with a nominal height of up to 1850mm.

9.1.2 Alternate Base

The Suppliers may submit proposals for cabinets which are not compatible with the BRS-SC 32 base for Network Rail's consideration. As part of the submissions, the suppliers shall include detailed engineering drawings together with loading and fixture specifications for the bases. Such submissions will only be considered if they are accompanied with written agreements for Network Rail to use the base designs without cost, without time limit and without any restrictions on the nature of their use.

9.2 For BOPs

BOPs are designed to be mounted on posts. The suppliers submitting BOP proposals for Network Rail's consideration shall include details of the posts.

If the posts are designed to be secured onto bases, full engineering drawings of the bases together with loading and fixture specifications must also be submitted to Network Rail for consideration. Such submissions will only be considered if they are accompanied by written agreements for Network Rail to use the base designs without cost, without time limit and without any restrictions on the nature of their use.

Where the posts are designed to be installed directly into the ground, full installation instructions shall be submitted to Network Rail as part of the BOP proposals. The installation instructions must take account of the ground properties. Railway lineside generally consists of made-up ground ranging from predominately soil to predominately ballast. There are also areas where the lineside ground is solid rock.

9.3 Wall Mounting Kit For BOPs

Although the BOPs are intended to be installed onto their associated posts, suppliers may submit proposals of wall mounting kits for the BOPs to Network Rail for consideration.

10 Physical Protection Provided By the Enclosures

The materials and the design of the enclosure shall protect the enclosure's contents against the natural elements, site pollutants, vandal activities and prevent access to rodents.

10.1 Environmental Conditions

The enclosures may be installed at any location within Network Rail's infrastructure. As such the enclosures shall be designed to work within various relative humidity levels with irregular periods of exposure to sunlight, rain, wind, snow and railway pollutants in all possible combinations and intensities without any reduction in the designed service life. Refer to Table 10-1 for other performance factors required of the enclosures.

Parameter	Value	Unit
External Temperature Range	-20 to +60	°C
Maximum External Relative Humidity	100	%
Maximum Vibration Amplitude (with frequency range)	0.125 from 0Hz to 50H 0.025 from 50Hz to 100Hz	mm

Table 10-1: Summary of Other Railway Environmental Factors.

10.2 Vandal Activities

The enclosures shall comply with the testing requirements for a security rating classification 2 in accordance with Loss Prevention Standard LPS 1175. In addition the design and construction of the enclosure shall;

- Prevent any lever of sufficient strength from being inserted between the door and the superstructure.
- Not have complete hinges or their fixtures visible externally.

10.3 Rodent Prevention.

The design and construction of the enclosures shall prevent rodent entry.

11 Material Performance and Requirements

11.1 Railway Pollutants and Corrosive Agents

The suppliers shall demonstrate to Network Rail that the materials used in the construction of the enclosures are suitable for the railway environment with its exposure to air-borne, liquid and solid pollutants. Constant and irregular exposure to combinations of pollutants shall not degrade the enclosures' designed service life.

11.2 Fire Performance

The materials shall not support combustion and shall be self extinguishing upon removal of the fire source. The Suppliers shall demonstrate to Network Rail that the materials which the enclosures are made from comply with the requirements of GE/RC 8505-Recommendations For The Fire Safety Of Materials At Operational Premises. For the purpose of interpreting GE/RC 8505, cabinets and BOPs (with their associated posts) shall be classified as "Non-Upholstered Panel Furniture".

Materials used for enclosures designed to be installed within sub-surface stations and their connecting tunnels shall be ZHLS and shall meet the requirements of GE/RC 8505-Non-upholstered Panel Furniture, for "Sub-Surface Stations".

Material used for enclosures designed for installations elsewhere shall comply with the requirements of GE/RC 8505-Non-upholstered Panel Furniture, for "Surface Stations etc", with the following amendments;

- a) Fire propagation-BS 476: Part 6. Fire propagation index shall be $I \leq 12$ and $i_1 \leq 6$.
- b) Surface flame spread-BS 476: Part 7. Materials shall be compliant with class 1 requirements with zero flame spread. Compliance with class 1 requirements applies to all sizes of enclosures and BOPS (and associated posts). Note 2 regarding the test not being applicable for aggregated exposed area in a location $< 5\text{m}^2$ shall be ignored.

11.3 Chemical Reaction with Cable Sheath Materials

The Supplier shall demonstrate to Network Rail that the enclosures' materials do not react with or otherwise degrade the materials used for cable sheaths on cable specified by [NR/PS/TEL/00015](#)-Unit Twin Copper Telecommunications Cable, and [NR/PS/SIG/00005](#)-Railway Signalling Cable.

11.4 Environmental Stress Resistance

The enclosure shall be resilient to environmental stress cracking and irregular UV exposure throughout the designed service life.