Cable Signalling Works Test Specification

Includes:	All new or existing signalling lineside, tail, power, data and internal cables. Reed FDM cables.
Excludes:	Single core track circuit cables connected directly to the running rail.
Related Test Specifications:	None.
Related Standards:	NR/PS/SIG/00005 (Railway Signalling Cable), NR/GN/SIG/11213 (Signalling Cable Equivalent Sizes). NR/L2/SIG/30027 (Plug Couplers for Connection of Cables to Lineside Signalling Equipment) Note: all relevant Technical Instructions and Notice Boards are to be checked for new instructions.
Related Design details:	Scheme plan, Loc area plan, REB/Location drawings.
Recording of Testing:	Completion of tests shall be by application of the Check Marks and recording of values on Test Copy diagrams, by recording of values on the appropriate record card, and by signing the appropriate test certificate.
Pre-requisites:	Cables installed in their final position, terminated and isolated from other equipment.

Warning
High voltage test sets used present a shock related injury to staff.

General
This test specification is formed of the following sections, which correlate to the competency levels identified in NR/L2/SIG/30014/B410 for this type of equipment or testing.

1. Inspection.
2. Wire Count.
3. Cable Continuity & Insulation Tests.

General definitions of terms are given in NR/L2/SIG/30014, however terms specific to this specification are defined in the last section of this specification.

Tests on multiple cable sections that are through connected shall be tested as though they were a single cable provided that continuity and insulation resistances are satisfactory. Any anomaly shall result in the cable being broken down into individual sections to identify the fault.

Tests on existing lineside cables need only to be applied to spare cores provided that there is a sufficient number available. If insufficient spares are available then working circuits shall be disconnected to make up the difference.
2 to 10c = 2 spares, 10 to 21c = 3 spares and greater than 21c = 4 spares.

Completion of testing of cables shall be summarised on the Master Cable Test Certificate NR/L2/SIG/30014/TC3-01. The use of the Cable Test Record Form NR/L2/SIG/30014/TC3-02 is not mandated.

Documents
Document Sharing Hub
Copyright Network Rail
Provided by IHS under license with Network Rail
No reproduction or networking permitted without license from IHS
Licensee=Weston Williamson/5989497001, User=sam, albett
Not for Resale, 03/27/2016 19:16:26 MDT
Full document details: NR NR-L2-SIG-30014-D120-TS3- 2014

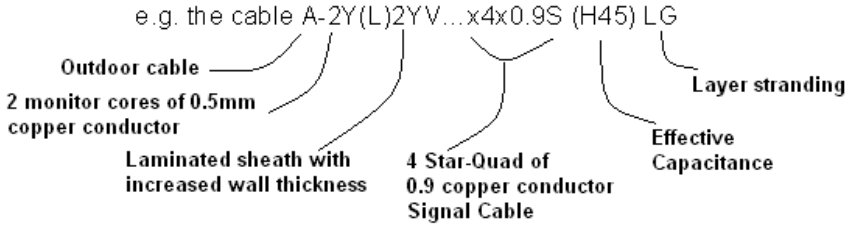
1. INSPECTION

1.1. *CHECK* for *CORRECT TYPE*

1.1.1. *Check* that the Network Rail cable is of the correct type, see tables below and that the size is as required by the design.

Cable	Description
ZHLS	Zero Halogen Low Smoke
EPR	Ethylene Polypropylene Rubber
HDPCP	Heavy Duty PolyChloroPrene
Type A	Cables with stranded conductor cores, insulated with flame retardant ZHLS (A1 single) (A2 sheathed) (A3 multi-core)
Type B	Cables with stranded conductor cores, insulated with EPR inner and HDPCP sheath (B1 single) (B2 multi core) (12c / 6 twisted pair 0.75mm special available)
Type C	Single or multi-core cable as per type B but with flexible conductors
Type D	As per type B but with additional fire performance
Type E	As per type C but with additional fire performance

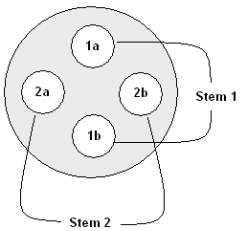
1.1.2. *Check* that the Siemens European style single strand cable is of the correct type.

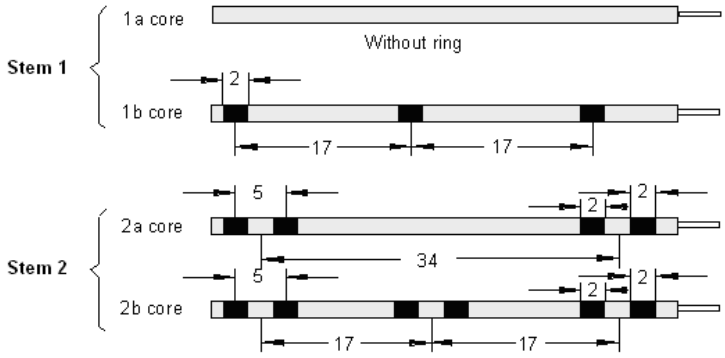


Code	Meaning	Code	Meaning
A	Outdoor cable	D	Copper wire concentric screen
AJ	Outdoor cable with anti-inductive protection	S	Signal cable
(L)2Y	Laminated sheath(A1 tape + PE)	LG	Layer stranding
(L)2YV	Laminated sheath with increased wall thickness	H45 / 95	Effective capacitance
B	Steel tape armour	RKZ	Reductions factor

1.1.3. *Check* that the Siemens European style Axle Counter cable is of the correct type

Individual quads are identified as:





Documents
Document Sharing Hub
Copyright Network Rail
Provided by IHS under license with Network Rail
No reproduction or networking permitted without license from IHS
Licensee=Weston Williamson/5989497001, User=sam, albett
Not for Resale, 03/27/2016 19:16:26 MDT
Full document details: NR NR-L2-SIG-30014-D120-TS3- 2014

1.2. *CHECK* for *DAMAGE*

1.2.1. Visually *Check* the cable for signs of damage.

1.2.2. *Check* for safe Insulation; the cable is either new or cable sheaths and cores are not suffering from 'wet' or 'dry' insulation defects.

1.3. *CHECK* for *CORRECT LABELLING*.

1.3.1. Check labelling is as specified.

1.3.2. Additionally, for Interconnect Plug Coupler cables, *Record* the cable manufacturer's unique cable serial identity on the Test Copy, and / or Cable Test Record Form.

1.4. *Check* for correct Installation and security.

1.4.1. *Check* the cable moisture barrier is complete and shrunk down.

1.4.2. *Check* that the cable is clamped and supported in the appropriate manner.

1.5. *Check* Plug Couplers.

1.5.1. *Check* the Keying of the plug coupler to the design requirements.
Note: Keying of plug couplers shall be accomplished by no less than 4 types of integral key and keyway of plug and receptacle.

1.5.2. *Check* for security:

- Correct mating of the connector.
  Note: This shall be achieved by alignment markers and / or the 'detent' click when the bayonet fixing locates behind the wear pins at the end of its travel.
- Padlock.
  Note: achieved by normal or long shank 221 padlock.
- End caps or Dummy plug fitted.
  Note: Dust caps are supplied for transport and storage purposes only. If the coupler is to be left disconnected at the lineside then an end cap or dummy plug with an IP rating of 67 is required.

1.6. *Check* Preformed (moulded) cables.

1.6.1. *Check* the cable for *CORRECT TYPE* including any required colour code.

1.6.2. *Check* for security (electrical connection):
Note recessed moulded cables require back nuts / packing to provide metal to metal connection and prevent the insert being pulled through the moulding on tightening lock nuts

1.6.3. *Check* for security (mechanical connection)
Note *Check* that the stud thread protrudes by a minimum of 1 full turn through the nut.

1.7. *Check* cables run to correct position, this may be achieved by hand trace or continuity test.

2. WIRE COUNT

2.1. *WIRE COUNT* the cable and *check* that cable cores are : -

2.1.1. terminated sequentially or by colour code when no other marking is required, or

2.1.2. terminated out of sequence but in the correct order according to the design when a bead marker shall then be applied to each cable core.

Documents
Document Sharing Hub
Copyright Network Rail
Provided by IHS under license with Network Rail
No reproduction or networking permitted without license from IHS
Licensee=Weston Williamson/5989497001, User=sam, albett
Not for Resale, 03/27/2016 19:16:26 MDT
Full document details: NR NR-L2-SIG-30014-D120-TS3- 2014