

The following information is associated with Network Rail Standard:

[NR/L3/CIV/140/190N](#)

Additional Content Access

Click the links below to access non PDF related content associated with this standard.

Word Documents

- [NR/L3/CIV/140/190N](#)

If you have any questions, or need assistance, please contact [IHS Support](#)

Information accessed via the links above is the property of the Copyright holder

IHS Additional Content Page

RAILTRACK PLC

**MODEL CLAUSES FOR SPECIFYING
CIVIL ENGINEERING WORKS**

SECTIONS 190 - 191
External Service Ducts and Cable
Troughing

ISSUE NO. 1 REVISION C

RT/CE/C/008/190N
Page 1 of 19

Date: 29 February 1996

Submitted by: Keith Ross
Structures Standards Engineer
Civil Engineering Directorate
King's Cross

Approved by: Model Clauses (Civil Engineering)
Committee by correspondence

Signature:
for Director, Civil Engineering

John Horsler
Civil Engineer, Structures Compliance
Chairman Model Clauses (Civil Engineering)
Committee

Amendments

Amendments and additions since the previous issue are marked by a vertical line in the right hand margin.

© Railtrack PLC 1997

This document is the property of Railtrack PLC. It shall not be reproduced in whole or in part without the written permission of the publisher for use external to Railtrack.

Published by

Director Civil Engineering,
Railtrack PLC,
Eastside Offices
Kings Cross Station,
London N1 9AP

Controlled document

No:.....

SECTIONS 190 AND 191 EXTERNAL SERVICE DUCTS AND CABLE TROUGHING

SECTION CONTENTS Page

This table of contents does not form part of the Specification

NOTES TO SPECIFIER	<i>190.1</i>	<i>Scope of the Section</i>	3
	<i>190.2</i>	<i>Director, Electrical Engineering and Control Systems requirements generally</i>	3
	<i>190.3</i>	<i>Excavations</i>	4
	<i>190.4</i>	<i>Iron and steel ducts</i>	4
	<i>190.5</i>	<i>Concrete cable troughing</i>	4

SPECIFICATION CLAUSES

SECTION 190

DUCTS

190.001	Service duct routes generally	5
190.002	Location of ducts generally	6
190.003	Materials for ducts	6
190.004	Jointing ducts	7
190.005	High density polyethylene ducts	7
190.006	Duct undertrack crossings	7
190.007	Construction of undertrack crossings	8
190.008	Thrust and reception pits	9
190.009	Slab track	9
190.010	Duct routes through stations	9
190.011	Duct routes entering buildings	9
190.012	Ducts crossings under roadways	10
190.013	Cable draw pits	10
190.014	Laying in, jointing, bedding and surround to ducts	11
190.015	Conduit plugs and draw wires	12
190.016	Marking of the route	13
190.017	Records	13

SECTION 191

CABLE TROUGHING

191.001	Precast concrete cable troughing	14
191.002	Cable troughing installation generally	14
191.003	Marking of buried cable troughing routes	15
191.004	Cable troughing installation at buffers	15
191.005	Cable troughing installation in sidings	16
191.006	Existing troughing cable routes in platforms	16
191.007	Cable troughing installation in walkways	16
191.008	Buried cable troughing at accommodation crossings etc.	16
191.009	Buried cable troughing at catch points	17
191.010	Requirements at cable draw pits and for joint bays	17

REFERENCES

<i>British Standards</i>	18
<i>Railway Group Standards</i>	18
<i>Railtrack Line Standards</i>	19
<i>Other Publications</i>	19

SECTIONS 190 AND 191

EXTERNAL SERVICE DUCTS AND CABLE TROUGHING

NOTES TO SPECIFIER:

These notes do not form part of the Specification.

**Scope of the
Section**

190.1 This Section of the Model Clauses may be used to provide Specification Clauses for protected cable routes for:

- (i) signalling and telecommunication cabling,
- (ii) electrical traction supply,
- (iii) LV power.

It is not intended to be used for cables laid directly on the ground, such as signalling tail cables, or traction supply track feeder cables which lie or are within a duct placed on ballast.

**Director, Electrical
Engineering &
Control Systems
(EE&CS)
requirements
generally**

190.2 Prior to April 1994, provision of cable routes was the responsibility of three BR Directors, Signalling and Telecommunications, Mechanical and Electrical Engineering, and for Building Services, Civil Engineering, and accordingly three separate specifications were determined.

These Model Clauses have been determined for EE&CS, and are an attempt to provide a single specification for cable route infrastructure. However, the separate specifications still exist and it is possible that a conflict between this document and the other published standards could be found by a Specifier whilst writing a Contract Specification.

A working party is to be formed to review all existing specifications to produce a single specification with representatives from :

*Civil Engineering
Powertrack (for HV traction supply and LV Power)
EE&CS (Signalling)
EE&CS (Telecommunications)*

In the interim, should a Specifier find any inconsistencies or conflicts, should seek advice from the Zone Engineer responsible for electrification or signalling infrastructure as appropriate, and should also advise:

*Structures Standards Engineer
Civil Engineering Directorate
Room 218, Eastside Offices
King's Cross Station
London N1 9AP*

*Tel: 0171-465 9223
Fax: 0171-465 9210*

Excavations

190.3 Excavations and backfilling for cable duct routes should be in accordance with Section 51: Excavations from which the applicable Model Clauses should be selected.

Iron and steel ducts **190.4** *For ductile iron and steel ducts, consideration should be given to anti-corrosion protection requirements such as galvanising, bitumastic paint, concrete encasement or cathodic protection using sacrificial anodes, and a Clause included in the appropriate section of the Contract Specification.*

Such ducts are not recommended for undertrack crossings without such protection, or where electrical interference could cause corrosion problems.

Where iron or steel ducts are considered suitable for an undertrack crossing, the Zone Engineer responsible for signalling infrastructure should be consulted to confirm that such ducts will not cause any problems with track circuits.

Iron and steel ducts should not be used for direct current traction cables or for single core high voltage distribution cables.

**Concrete cable
troughing** **190.5** *Requirements for the manufacture of concrete cable troughing should be in accordance with Section 80: Structural Concrete.*

EXTERNAL SERVICE DUCTS AND CABLE TROUGHING

SECTION 190

DUCTS

Service ducts routes generally

190.001
!C!

Except where shown otherwise on the Contract Drawings, **!CHECK!** the number, type and size of ducts shall be determined by the Contractor.

Ducts shall have a smooth internal bore, and shall be free from sharp edges at duct ends.

Ducts shall be a size and type suitable for the cables to be installed without damage. The minimum internal diameter of the duct as applicable to cable type shall be 1.5 times the diameter of the cable or group of cables subject to the minimum duct diameters in Table 190/1.

Table 190/1		
Cable usage designation	Cable type	Minimum duct diameter
A B	High voltage distribution Direct current (d.c.) traction	150 mm
C D E	Signalling Telecommunication Low voltage distribution	100 mm

NOTE TO SPECIFIER

The Scope of the Work specified in the Contract should define the cable type(s) that will be installed within the route, and whether the construction of the cable route and installation of the cable will be separate or combined contracts.

!C! Except where otherwise specified on the Contract Drawings, **!CHECK!** the number of ducts to be provided shall include spare ducts as detailed in Table 109/2.

Table 190/2			
Number of ducts required	≤ 3	4 - 10	≥ 11
Number of spare ducts to be provided	1	2	3

Only one type of duct shall be used between consecutive cable draw pits.

!C! Where cable routes are required to cross railway tracks, the cables shall be taken through an undertrack crossing in accordance with Clause 190.006, **!CHECK!** except when: