

SECTION 185

Design of track drainage systems generally

TRACK DRAINAGE

- 1** Where not shown on the Contract Drawings, drainage systems for the tracks at the locations detailed in the relevant Particular Specification shall be designed by competent Contractor's personnel to suit the particular features of the Site, and in accordance with the requirements of Railtrack Line Standard RT/CE/SI02.

The length and location of the track(s) to be drained, and any requirements to ensure compatibility with the existing drainage system, where applicable, shall be as specified in the relevant Particular Specification.

Track drainage shall be designed to collect and convey from the track and its immediate vicinity, water arising from rainfall or run off from cuttings, adjacent land or springs, and to minimise the risk of the stability of the track being affected by standing or flowing water.

A scheme drawing and details of the proposed material for the drain pipes and the proposed form of construction shall be provided with the Tender.

Details of the proposed drainage scheme shall be submitted to Railtrack for approval in principle using Form A based on the model in Appendix C.

The position, size, level and materials of construction and condition of the existing drainage systems external to Railtrack owned land to which the proposed drainage shall be connected and any other information pertinent to carrying out the design shall be determined by the Contractor.

(185.001)

Design of catchpits

- 2** Where a catchpit is proposed to be constructed within ground subject to railway variable loading, the catchpits shall be designed and the design checked as specified in the Contract to ensure that the catchpit can resist, without deformation or collapse, the Permanent Loads and where applicable the surcharge due to RU type loading acting at the underside of the sleepers as defined in BS 5400: Part 2.

A completed Certificate of Design and Checking (Form B) based on the model shown in Appendix C shall be provided for the catchpit design, a minimum 13 weeks before construction of the catchpits is programmed to commence.

Where a catchpit is produced to a standard design, evidence of the structural adequacy as detailed in the manufacturer's literature shall be acceptable, and the design check may be limited to confirmation that the catchpit design strength can resist the design loading specified above.

(185.002)

**Construction of
track drainage
generally**

- 3** Track drainage shall be constructed in accordance with Railtrack Line Standard RT/CE/SI02 as qualified or amended by the following Clauses.

Excavations for track drainage shall be carried out in accordance with Section 51: Excavations.

(185.003)

Definitions

- 4** The following definitions shall apply:

- (i) 'Collector drain' shall mean a drain designed to collect water from the surface and/or from the surrounding ground continuously along its length through open joints or perforations, and which may be laid at the surface, or below the surface of the ground. (Note - "continuously" is taken to include pipes up to 1200 mm long which afford access only at the joints).

Such drains also act as a carrier for the water collected and may additionally be connected to a separate carrier drain.

- (ii) 'Carrier drain' shall mean an impervious drain designed to carry water which is laid with joints sufficiently tight to prevent the ingress or egress of water and to prevent the ingress of fine soil particles.
- (iii) 'Catchpit' shall mean a chamber provided at intervals in the run of a piped drain to give access from the surface for cleaning out the pipe and including a sump to collect silt.
- (iv) 'Outfall' shall mean the place at which a drainage system discharges into another drainage system or watercourse.

(185.004)

Drain pipes

- 5** Pipes for track drainage systems shall be selected from and shall comply with the relevant British Standards and particular requirements specified in Table 185/1.

Table 185/1		
Material	Standard	Particular Requirements
Clayware field drains	BS 1196	
Unplasticised polyvinyl-chloride (UPVC)	BS 4660 or BS 5481	In accordance with Clause 185.006
Thermoplastic	–	In accordance with Clause 185.007
Vitrified clay	BS 65	Normal grade
Concrete	BS 5911: Part 100	Reinforced or unreinforced
	BS 5911: Part 103	Prestressed
	BS 5911: Part 114	Porous with ogee or rebated joints
Glass reinforced plastics (GRP)	BS 5480	Rated as non pressure pipes
Plastic	BS 4962	
Corrugated steel	-	In accordance with Clause 185.008

Pipes and fittings not included in Table 185/1 may be used, provided that a current British Board of Agrément certificate has been issued for the proposed usage of the pipe.

The hydraulic flow capacity of the selected pipe(s) shall be demonstrated to the Employer's Representative to be sufficient for the location and design of the drainage system.

Only one type of pipe and diameter shall be used between consecutive catchpits.

Lineside collector drains shall be constructed with either perforated pipes or open jointed non perforated pipes. Unperforated pipes to be used as collector drains shall not exceed 1200 mm nominal length.

Lineside piped carrier drains and track cross drains shall be unperforated pipe with closed joints.

(185.005)

Copyright Network Rail

**Unplasticised
polyvinyl-chloride
(UPVC) pipes**

- 6** Unplasticised polyvinyl-chloride (UPVC) pipes to be used in track drainage systems as collector drains shall be perforated with apertures in the form of slots between 1.5 mm and 2.0 mm wide and between 50 mm and 100 mm long at a spacing not exceeding 50 mm longitudinally. The minimum area of the slots per metre length of pipe shall be 3500 mm² per metre run.

The slots shall be cut normal to the axis of the pipe and regularly spaced in rows on one half of the pipe. The perforations shall not reduce the pipe stiffness by more than 5%.

UPVC pipes shall not be subject to deterioration due to exposure to sunlight between manufacture and installation in the ground, and shall be handled, stored and transported in accordance with BS 5955: Part 6.

(185.006)

**Thermoplastic
pipes**

- 7** Structured walled thermoplastic pipes to be used in track drainage shall have a current British Board of Agrément certificate for the proposed usage.

Thermoplastic pipes to be used as collector drains shall be perforated with slots between 1.5 mm and 3.5 mm wide and a and between 10 mm and 100 mm long at a longitudinal spacing not exceeding 75 mm. The minimum area of the slots per metre length shall be not less than 3500 mm² per metre run.

The slots shall be cut normal to the axis of the pipe, and regularly spaced in one half of the pipe. The perforations shall not reduce the pipe stiffness by more than 5%.

Thermoplastic pipes shall not be subject to deterioration due to exposure to sunlight between manufacture and installation in the ground, and shall be handled, stored and transported in accordance with BS 5955: Part 6.

(185.007)

**Perforated
corrugated steel
pipes**

- 8** Corrugated steel pipes for track drainage shall have a current British Board of Agrément certificate for the proposed usage and shall be manufactured from helical corrugated galvanized sheet steel minimum 1.25 mm thick complying with BS EN 10 143 grade Fe P02, coating type Z600.

(185.008)

Geotextiles

- 9** Geotextiles used in drainage systems to prevent the ingress of soil fines into chambers, pipes, channels or other fittings shall comply with Railtrack Line Standard RT/CE/S010 requirements for drainage filters.

(185.009)

Copyright Network Rail
Provided by IHS under license with Network Rail
No reproduction or networking permitted without license from IHS