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RAILTRACK PLC

**MODEL CLAUSES FOR SPECIFYING
CIVIL ENGINEERING WORKS**

SECTION 22
Land and Trackwork Surveys

ISSUE NO. 1 REVISION A

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Page 1 of 18

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Committee on 8 October 1996

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Amendments

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

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SECTION 22

LAND AND TRACKWORK SURVEYS

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SECTION 22

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SECTION 22

LAND AND TRACKWORK SURVEYS

NOTES TO SPECIFIER:

These notes do not form part of the Specification.

Purpose

22.1 The purpose of this Section of the Model Clauses is to provide a Specification for large scale surveys for the production of plans of scale 1:500 or larger (1:200; 1:100; 1:50; etc.). In conjunction with Section 25: Presentation of Survey Data and Information, this Section defines the products to be delivered rather than the survey methods to be used.

Where specialist survey work may be required for a survey such as surveys requiring underwater or abseiling techniques, a separate Specification specifying such requirements should be produced.

Scope of the Section

22.2 This Section provides a specification for a ground survey with site verification of electrification masts, signal and point numbers etc and other details.

All survey data and mapping should be related to Ordnance Survey National Grid but plotted to true scale and to Ordnance Survey Newlyn level datum.

Permanent marked ground control and digital mapping is specified for plotting 1:200 scale for use in the production of design drawings. The area to be surveyed should be adequate to provide all the necessary information required for the production of such drawings.

The length of the survey for S&C should include at least 100 metres of plain line at either end of the S&C to ensure that the horizontal and vertical alignments may be correctly designed to run into the existing.

For level crossing surveys, the minimum that should be specified is 40 metres on both sides of the level crossing along the road approaches upto and including the fence lines along the road and 50 metres along the tracks on both sides of the crossings.

Survey methods

22.3 The choice of the most efficient survey method should be left to the Contractor unless there are particular reasons to define the survey method.

Site clearance

22.4 Where it is anticipated that site clearance will be necessary, the Scope Clause in the Model Form of Tender should identify such locations, and the Contract Specification should include relevant Clauses from Section 40: Demolition or Sections 255 - 257: Management of Lineside Vegetation as applicable to the extent of clearance required.

Condensed Specification

22.5 The following listing gives a quick reference specification sheet for small and straightforward schemes and assumes that the requirement for the Contractor to establish plan control at a density to achieve the specified accuracy is used. Further guidance should be taken from the Section for clarification of headings.

Subject	Clause	Choices
Project information		

Client		
Contact+Telephone		
End Product	Hard copy plans	Digital Data
Survey Summary	SURVEY EXTENT	Location Plan Proposals Plan
Scale(s) 1:	50 100 200 500 Other (Specify)	
Plan Control Grid	Arbitrary Grid Site Grid Local	based on Ordnance Survey
Level Datum	O.S. Datum Site Datum	Arbitrary Datum
Detail Survey	<u>Boundaries</u> Outline Full Detail	
	<u>Running Rails</u> Single rail each road, design in second.	
	All rails including check and guard rails	
	<u>Trackside Details</u>	
	All features each side up to and including outer cess line	
	All features each side within 3 metres of running edges (RE) track	
	All features each side including earthwork profile	
	All features each side up to operational boundary	
	Other	
	<u>Trackside Furniture</u>	
	Platform edges, signals, cables & track crossings up to 3 metres of RE	
	All train operating equipment & passenger/goods facilities	
	Other	
Trees	Foliage lines Trunks over 150 mm diameter	All trees
Height Control	Spot heights Contours (Road section spacing)	
U/ground Services	Cover position Cover level Invert/pipe size	
Building - External	Outline Full footprint Eaves/ridge	Elevations
Building - Internal	Ground floor All floors roof	Sections
Accuracy (mm)	OS Grid ± 150 (from 1/1250 map) ± 20 (OS Trig Point)	
	Site Grid Pegs ± 20 ± 10	
	Ground Distance Measurement ± 75 (inexact) ± 10 (Normal) Track	
	Measurement ± 10 (Preliminary) ± 5 (Scheme) ± 1 (Detail Drawing)	
	Alignments ± 10 (EDM Prelim) ± 5 (Scheme) ± 1 (Detail Drawing)	
	Levels ± 20 (Earthworks) ± 10 (Scheme) ± 3 (Track Design)	
Plan Reproduction	Final Contract Drawings Proof Plots Survey Report	
Digital Data	Moss 3D-DXF 2D-DXF 2D-DGN	Other
Computer Media	3½ "disk 5¼ " disk DAT Other	
Remarks		

SECTION 22

LAND AND TRACKWORK SURVEYS

Survey control generally

22.001

Survey control shall be established by the Contractor at a density sufficient to achieve the specified accuracy.

All surveys shall be in SI metric units, and shall be co-ordinated by northings and eastings referenced to Ordnance Survey National Grid. **!C!** **!CHECK!**

(22.001)

Permanent ground markers

22.002

Permanent ground markers (P.G.M.) intended for survey control shall be constructed at all control stations and primary and subsidiary traverse stations and shall be placed in stable and protected locations out of trafficked areas and suitable for frequent access and possible use for future setting out. Where practicable, P.G.M.s shall not be located within 3.0 metres of any rail. P.G.M.s may also be used as bench marks.

Where a preferred marker location is away from the main survey area, or outside the Railtrack boundary in private lands, the Contractor shall agree the marker location with the land owner before such markers are installed.

For string line survey pegs, the taping offset dimension shall not exceed 5.0 metres without triangulation to the pegs, and string line pegs shall be placed not more than 2.0 metres from the nearest rail. Unmarked pegs shall not be left so as to constitute a tripping hazard.

Where possible ground markers shall be positioned at a density of at least two stations per hectare in open ground, and at approximately 100 metres intervals for longitudinal trackwork surveys. The distance between permanent ground markers may be increased in open locations, but the interval used shall allow for survey closure to the specified accuracy utilising the survey equipment proposed by the Contractor.

New instrument stations shall be established either by conventional traversing or by GPS baselines between adjacent stations. Each instrument station shall be visible from and connected to at least two other survey stations.

New instrument stations shall be established to better than $\pm$ (3 mm + one part in 30,000) horizontally and $\pm$ (3 mm + 3 mm /km) vertically relative to the nearest P.G.M.

Domed brass rivets of suitable design shall be placed in permanent structures by drilling and fixing with an epoxy resin compound or internal clamping device. Earth anchors and ground markers shall be used in open ground. Other designs for survey stations may be used subject to prior agreement by the Employer's Representative.