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RAILTRACK PLC

**MODEL CLAUSES FOR SPECIFYING
CIVIL ENGINEERING WORKS**

**SECTION 21
Aerial Survey**

ISSUE NO. 1 REVISION A

**RT/CE/C/008/021N
Page 1 of 16**

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Committee on 8 October 1996

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for Director, Civil Engineering

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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 21

AERIAL SURVEY

SECTION CONTENTS

Page

This table of contents does not form part of the Specification

NOTES TO SPECIFIER

21.1	Scope of the survey and summary of requirements	3
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SPECIFICATION CLAUSES

SECTION 21

AERIAL SURVEY

21.001	Sites to be photographed and surveyed	4
21.002	Aerial photography generally	4
21.003	Scale of photography	4
21.004	Type of photography	4
21.005	Copyright, ownership and storage of film negatives	4
21.006	Camera and focal length	5
21.007	Calibration	5
21.008	Photographic coverage	5
21.009	Flying conditions	6
21.010	Metric quality of negatives	6
21.011	Image quality of negatives	6
21.012	Documentation and annotation	7
21.013	Products to be provided by the Contractor	7
21.014	Control including photocontrol	9
21.015	Photomosaics	9
21.016	Location and design of permanent ground markers (P.G.M.s)	9
21.017	Horizontal control net and connections to Ordnance Survey control stations	10
21.018	Accuracy and adjustment of horizontal control	10
21.019	Vertical control and connections to Ordnance Survey bench marks	11
21.020	Accuracy and adjustment of vertical control	11
21.021	Digital mapping	11
21.022	Accuracy of digital mapping	12
21.023	Height datum	12
21.024	Details to be shown on the drawings	13
21.025	Three dimensional strings and spot heights	14
21.026	Field completion and ground verification	15

REFERENCES

	Railtrack Line Standards	16
--	--------------------------	----

SECTION 21

AERIAL SURVEY

NOTES TO SPECIFIER:

These notes do not form part of the Specification.

Scope of the survey and summary of requirements

21.1

This Section specifies the requirements for continuous stereoscopic aerial photography of the railway infrastructure that should be suitable for photogrammetric mapping at a scale 1:200 by panchromatic aerial photography flown at about 1:2000 scale with a FMC camera with 152 mm lens.

The survey should use permanent marked ground control and provide digital mapping plotted at 1:500 scale to be used for ground survey and for site verification.

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

The Specification requires horizontal and vertical control including permanent ground model and photocontrol to be established and tied to Ordnance Survey Control points and bench marks.

Aerial photography and control should to be undertaken concurrently by signalisation or photopoint identification as appropriate. A cost-effective combination of global positioning systems (GPS), conventional survey control and aerial triangulation methods should meet the requirements for accuracy delivery and cost, but alternative methods may be proposed.

Digital mapping is specified to be produced by photogrammetric methods without field verification. Should field completion be required to be carried out in the same Contract, the requirements of Section 22: Land and Trackwork Surveys should be added.

It has been assumed in compiling these Model clauses that verification of field data will be carried out by Railtrack using the RTIA maintenance contractor, and that field data will be returned to the Contractor for adding to drawings and digital ground model. If this is not the case, and field verification is required to be carried out by the Contractor, the relevant Clause will need to be amended accordingly.

SECTION 21

AERIAL SURVEY

Sites to be photographed and surveyed

21.001
!!

The route and location of Sites to be photographed and surveyed are defined on the Contract Drawings.**!!CHECK!**

The area to be surveyed is generally within the Railtrack property boundary, except where the tracks do not abut earthworks or structures adjacent to the property boundary, the survey limit shall be 3.0 metres from the outer rail of the tracks. At level crossings the limit of the survey shall be 100 metres from the barriers unless shown otherwise on the Contract Drawings.**!!CHECK!**

!!

Locations and the extent of each Site to be digitally mapped are as indicated on the Contract Drawings.**!!CHECK!** The precise extent of each Site to be mapped will be defined after the aerial photography has been flown. Individual areas may be increased or reduced in size without varying the total area to be mapped.

!!

(21.001)

Aerial photography generally

21.002
!!

The route to be photographed follows existing railway lines from to via
.

Continuous stereoscopic photography shall be carried out to cover the existing railway tracks and adjoining land extending a minimum of 100 metres on both sides of the centre line of the main tracks.

In addition, a number of sites along the route shall be covered by stereoscopic aerial photography to the extent indicated on Contract Drawings.**!!CHECK!**

!!

(21.002)

Scale of photography

21.003
!!

The nominal scale of the photography shall be 1:2000.**!!CHECK!**

(21.003)

Type of photography

21.004

Panchromatic aerial film shall be used, coated on a stable base.

(21.004)

Copyright, ownership and storage of film negatives

21.005

All films exposed during the aerial photography shall become the property and copyright of Railtrack.

The original film negatives shall be retained by the Contractor until required by Railtrack and shall not be disposed of, or reproduced without the written consent of Railtrack. The original film negatives shall be delivered to Railtrack on written request.

(21.005)

Camera and focal length

21.006

The camera shall be a 230 x 230 mm format metric survey camera with forward image movement compensation, fitted with a lens designed to give a residual radial distortion not exceeding 5 micrometres within 130 millimetres of the principal point.

The camera lens shall have a nominal focal length of 152 mm.

(21.006)