Rev A

Drawing Number 5127130/ATK/HW01/ML/DR/D/0104

Status S5

DO NOT SCALE

A3

0 10 100

TOPOGRAPHICAL SURVEY EXTENTS

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS
CONSTRUCTION
(ENTER 'NONE' IF APPLICABLE)
MAINTENANCE/CLEANING
(ENTER 'NONE' IF APPLICABLE)
USE
(ENTER 'NONE' IF APPLICABLE)
DECOMMISSIONING/DEMOLITION
(ENTER 'NONE' IF APPLICABLE)

Stat	Rev	Purpose of Issue	Date	Auth
S2	P1	FOR COMMENT		

Rev	Description	By	Date	Chk'd	Auth
A	ORIGINAL ISSUE	SEE	TITLE	BLOCK	

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Consulting Engineers,
Threadneedle House
9–10 Market Road
Chelmsford, Essex, England,
CM1 1XA

Tel: (01245) 245245
Fax: (01245) 345010
www.atkinsglobal.com

Client: Transport for London

Project: OPTIONS FEASIBILITY STUDY ON THE A23/A232 FIVEWAYS SCHEME

Title: TOPOGRAPHICAL SURVEY EXTENTS

Sheet Size	Original Scale	Designed/Drawn	Checked	Authorised
A3	AS SHOWN	CW Date 13/12/13	SRH Date 13/12/13	SRH Date 13/12/13

Status	Drawing Number	Rev
S5	5127130/ATK/HW01/ML/DR/D/0103	A

File: 5127130_ATK_HW01_TG_DR_D_0104.dwg
Date: Dec 19, 2013 - 2:41pm Plotted by: kosk7445

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ATKINS
Highways & Transportation
SURVEY AND MAPPING
CHELMSFORD

Survey Manager Neil Gamble Telephone 01245 245215

Summary Specification for Topographical Surveys

Full Specification available on request

1	**Project**	A23/A232 Fiveways Feasibility Options Study							
2	**Client**	Transport for London							
3	**Contact + Telephone**								
4	**Purpose of survey**	Detailed Highways Design							
5	**Client Supplied Data**	Location plan		Survey extent	✓	Specification			
6	**Nominal scale 1:**	500	✓	200		100		50	
7	**Plan Grid**	National Grid Airy's projection (GPS obs)		OS related local grid - flat earth (GPS obs)	✓	Best fit onto OS mapping		Existing control	
								Arbitrary grid	
8	**Level Datum**	New OS datum (GPS obs)	✓	Old OS datum bench marks		Existing control		Arbitrary datum	
9	**Primary Survey Control**	Witness diagrams	✓	Earth anchors		Pegs and nails			
10	**Road Markings**	White lines		Yellow lines		All road markings	✓	Traffic loops	✓
11	**Digital Ground Model Spec.**	Top quality DGM e.g. where road is barrel shaped, 4 or 5 level strings would be surveyed to define ground accurately	✓	Quick spec – e.g. roads shown by 3 level strings only - centre line & channels		M'ways and dual carriageways - level strings along lane dividers, gradient break lines and edge of tarmac		Alternative specifications welcome, please call to discuss	
12	**Trees**	Foliage lines	✓	Trunks and canopies to scale	✓	Minimum trunk diameter: 0.15m	✓	Tree schedule: species, trunk, canopy, height	
13	**Underground Services**	Inspection covers only		Sewer invert levels, pipes and sizes	✓	Obtain and plot service records from Stat Companies		Detect & survey cables & pipes on site by radiodetection	
14	**Create and Plot Sections:**	Long sections (specifiy below)		Cross sections (specifiy below)					
15	**Plots and Report**	Paper plots of final drawings		Number of copies required		Survey report		Number of copies required	
16	**Digital Data**	MX (MOSS)	✓	Autocad 3D dwg	✓	Autocad 2D dwg with levels		Autocad 2D dwg	
17	**Deliverable Media**	Email		Post		CD	✓	Adobe pdf	

Further details

ACCURACY AND DEFINITION OF THE D.G.M.

1 Recorded Points

The level and co-ordinates of recorded points shall be correct to within the following r.m.s.e. tolerances when checked from the nearest Survey Control Point.

Scale	"Hard Areas"		"Soft Areas"	
	Vertical	Horizontal	Vertical	Horizontal
1/200	+/- 3mm	+/- 17mm	+/- 30mm	+/- 80mm
1/500	+/- 4mm	+/- 20mm	+/- 50mm	+/- 100mm

2 Spacing of recorded points

The spacing of points along 3D strings shall be such that the vertical and horizontal distances between the straight line joining adjacent points on the string and any point along the actual ground feature shall not exceed the following r.m.s.e. tolerances:

Scale	"Hard Areas"		"Soft Areas"	
	Vertical	Horizontal	Vertical	Horizontal
1/200	+/- 8mm	+/- 50mm	+/- 40mm	+/- 150mm
1/500	+/- 10mm	+/- 100mm	+/- 50mm	+/- 200mm

The maximum spacing along each string is 10 metres at 1/200 and 15 metres at 1/500.

3 Spacing of strings

The spacing and configuration of 3D strings between feature lines and gradient break lines shall be such that the vertical difference between the actual ground level of any point and the level of that point interpolated from the model by option SECTION of the Bentley MX programmes with a secondary interpolation tolerance of 30m shall not exceed the following r.m.s.e. tolerances:

Scale	"Hard Areas"	"Soft Areas"
	Vertical	Vertical
1/200	+/- 18mm	+/- 150mm
1/500	+/- 20mm	+/- 200mm

The maximum spacing between strings is 10 metres at 1/200 and 15 metres at 1/500.

4 Root Mean Square Errors

1. The r.m.s.e. are related to checks on representative dimensions or levels.
2. The following conditions should be satisfied:-
   a) At least 67% of all readings must be correct to or better than the r.m.s.e.
   b) At least 90% of all readings must be correct to or better than 1.65 times the r.m.s.e.
   c) All readings must be correct to or better than 3 times the r.m.s.e.