Flood Risk Assessment

Proposed Residential Development

Land South Of Birch Avenue, Bacton, Suffolk, IP14 4NT

Mid Suffolk planning Ref: DC/21/03292 Suffolk

1.0 Introduction

1.1 Amazi Consulting Ltd has been instructed by Bellway Homes Ltd Eastern Counties to prepare this Flood Risk Assessment (FRA) associated with the proposed residential development at land south of Birch Avenue, Bacton, Suffolk IP14 4NT. The Ordnance Survey (OS) grid reference for the centre of the site is approximately 605660 mE, 266960 mN.

1.2 This FRA has been prepared in accordance with National Planning Policy Framework (NPPF), July 2021, and its accompanying gov.uk Planning Practice Guidance (PPG): *Flood Risk and Coastal Change* (2016). It is expected that this report will be reviewed by the relevant flood risk authorities as part of a planning application. The development will be for full planning permission. This report focuses upon flood risks to the site. The site surface water drainage is being assesses separately by Infrastructure Design Ltd (Project ref: 1061).

1.3 The development previously received outline planning permission as part of application DC/18/05514. This previous application was accompanied by a Flood Risk Assessment undertaken by EPS (UK18.401 3B May 2018), which did not identify and significant flood risks at the site.

1.4 This FRA report has been prepared for the sole use of Bellway Homes Ltd Eastern Counties and its contents cannot be copied or relied upon by others except as noted above, without the written authority of Amazi Consulting Ltd.

2 The Development

2.1 The location of this 4.78 hectare (ha) greenfield (arable) site is shown on Figure 2.1.

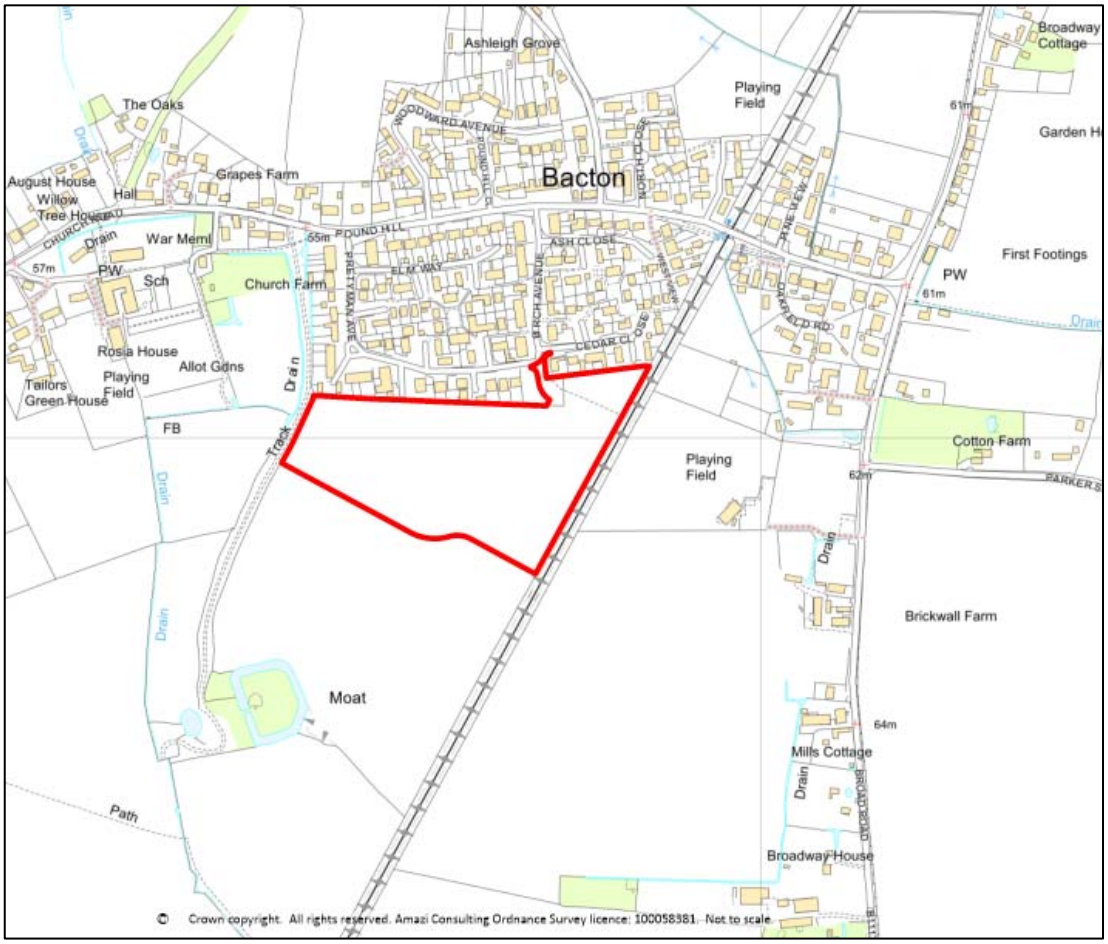


Figure 2.1 - Site location

2.2 The proposed development comprises 85 residential units, a new community centre and associated infrastructure. The proposed layout is shown on the attached drawing BW233EC_PL-03_A Detailed.

2.3 The existing site use is *less vulnerable* and the proposed is classified as *more vulnerable* and in accordance with Table 2 of the NPPF Planning Practice Guidance (Reference ID: 7-066-20140306).

2.4 The minimum proposed finished floor level is 57.75 mAOD – refer to design drawings by Infrastructure Design Ltd.

2.5 The attached survey (21536ea) relates to OS GPS datum and the site ground levels vary from 56.71 mAOD at the west boundary to 61.78 mAOD at the east boundary.

2.6 Figure 2.2 shows topography in the local area. Figure 2.3 shows topography nearer the site.

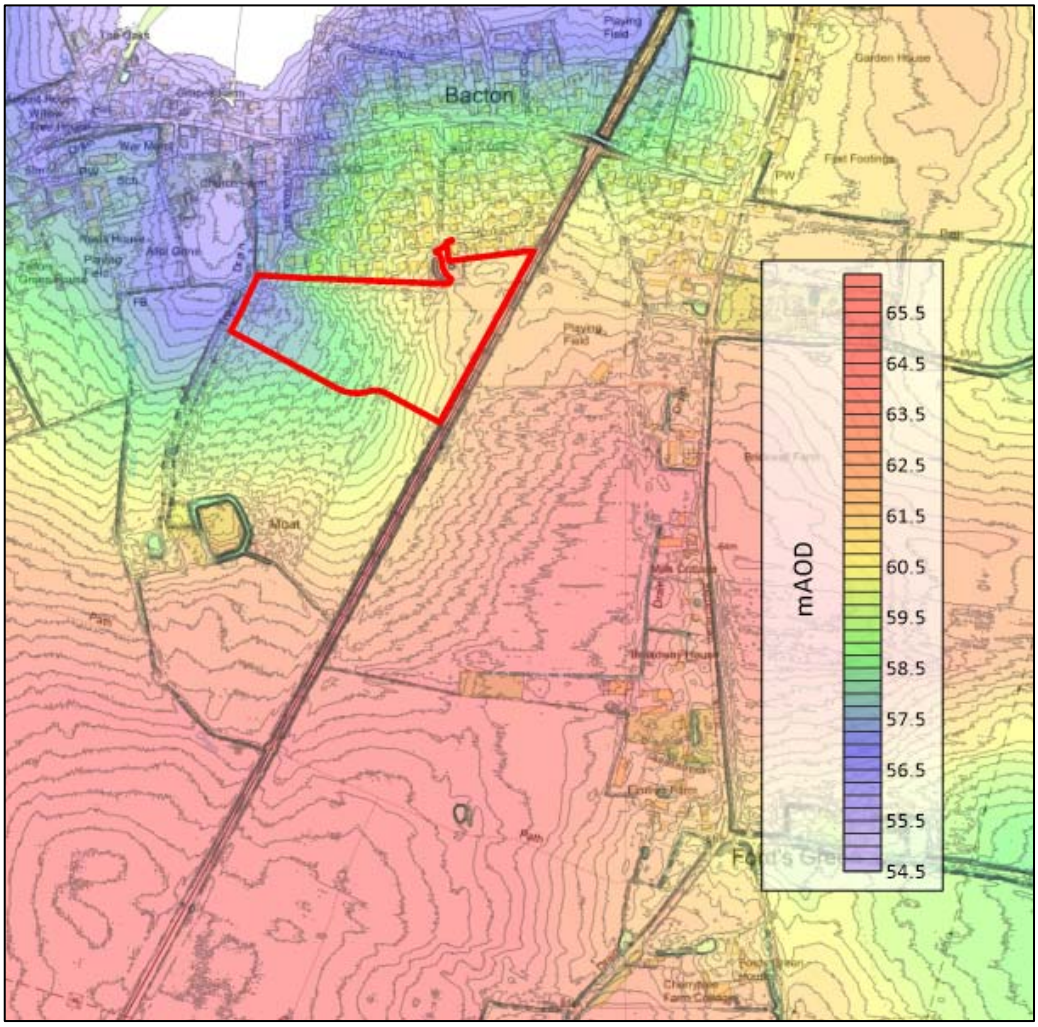


Figure 2.2 - Local contours

(Source: lidar TM06ne_DTM_1m.tif, downloaded 09 August 2021)

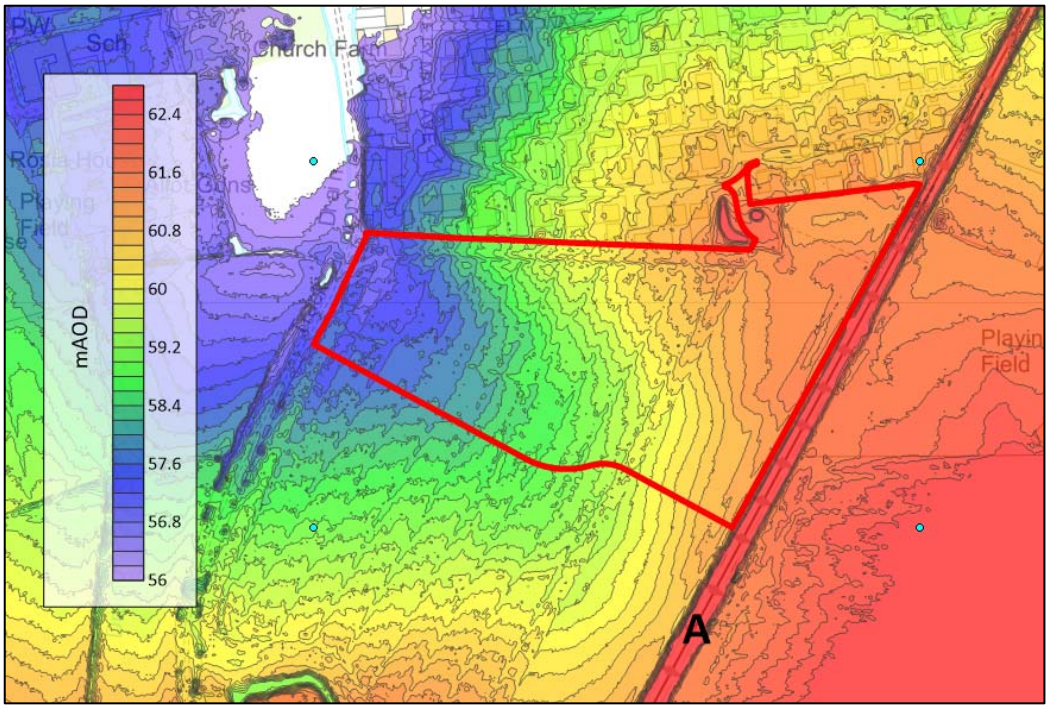


Figure 2.3 -Contours near site

(Source: lidar TM06ne_DTM_1m.tif, downloaded 09 August 2021)

3 Flood Zones

3.1 As indicated in Figure 3.1, the site is located fully within flood zone 1*, the area at low risk of flooding from significant watercourses. Residential development at this site is therefore considered 'appropriate' in accordance Table 3 of the NPPF Planning Practice Guidance (Reference ID: 7-067-20140306).

* Refer to attached NPPF Table

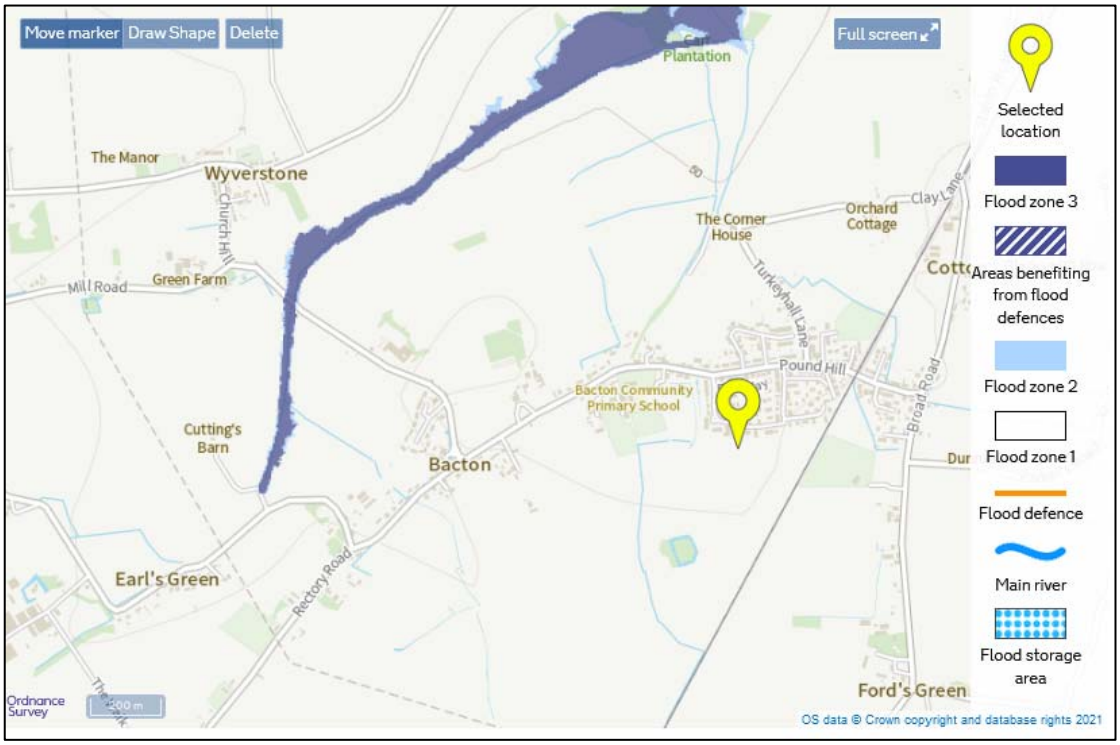


Figure 3.1 - Flood zones for planning

(Source: https://flood-map-for-planning.service.gov.uk/confirm-location?easting=605770&northing=267171&placeOrPostcode=IP14%204NT, 10 August 2021)

4 Surface Water Flooding

4.1 The Government's *risk of flooding from surface water* mapping is shown in Figure 4.1. This does not indicate any high or medium risk of flooding on site. There is an area of low flood risk in the west part of the site.

4.2 The flood extents on Figure 4.1 may be approximate only since the modelling that derived this mapping would not have included the beneficial conveyance function provided by small watercourses. The Risk of Flooding from Surface Water mapping is accompanied by the statement that it:

'should not be taken as definitive mapping of flood risk from these as the conveyance effect of ordinary watercourses or drainage channels is not explicitly modelled. Also, structures (such as bridges, culverts and weirs) and flood risk management infrastructure (such as defences) are not represented.'

4.3 As indicated on Figure 4.2 and the site topographical survey, there is a watercourse along the site's west boundary which is not shown on the OS mapping. It is assumed this continues north of the site and connects to the watercourse system on the OS mapping.

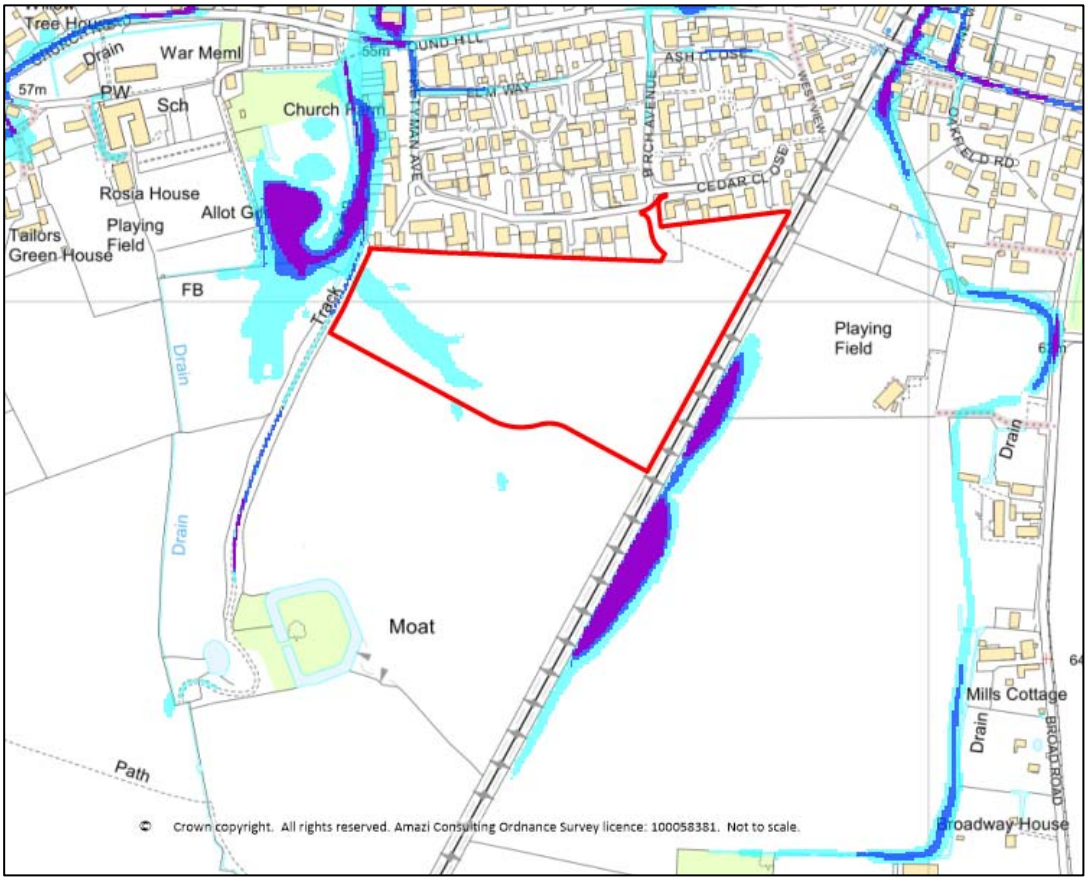


Figure 4.1 – Risk of flooding from surface water

(Source: RoFW_TM06_Extent_1in1000.shp, RoFW_TM06_Extent_1in100.shp, RoFW_TM06_Extent_1in30.shp, downloaded 09 August 2021)

High ⇨ *1:30 year return period,* ***Medium*** ⇨ *1:100 year return period,* *Low* ⇨ *1:1,000 year return period*

4.4 Figure 4.3 shows the likely extent of the surface water catchments near to the site. The outline of topographical sub-catchments are in orange, and theoretical flow paths* are blue lines. This indicates that the flow path for the land east of the railway is northwards and not towards the site. Figure 2.3 confirms that the railway line is upon a raised embankment. At location A the railway is raised by approximately 2.3 m above the low point at the toe of the east of the embankment, and approximately 3.3 m above the toe of the west slope.

*These are theoretical only and do not include the effects of drainage systems or localised topographical features (kerbs, buildings, drainage systems etc.) The width of the flow path will vary.

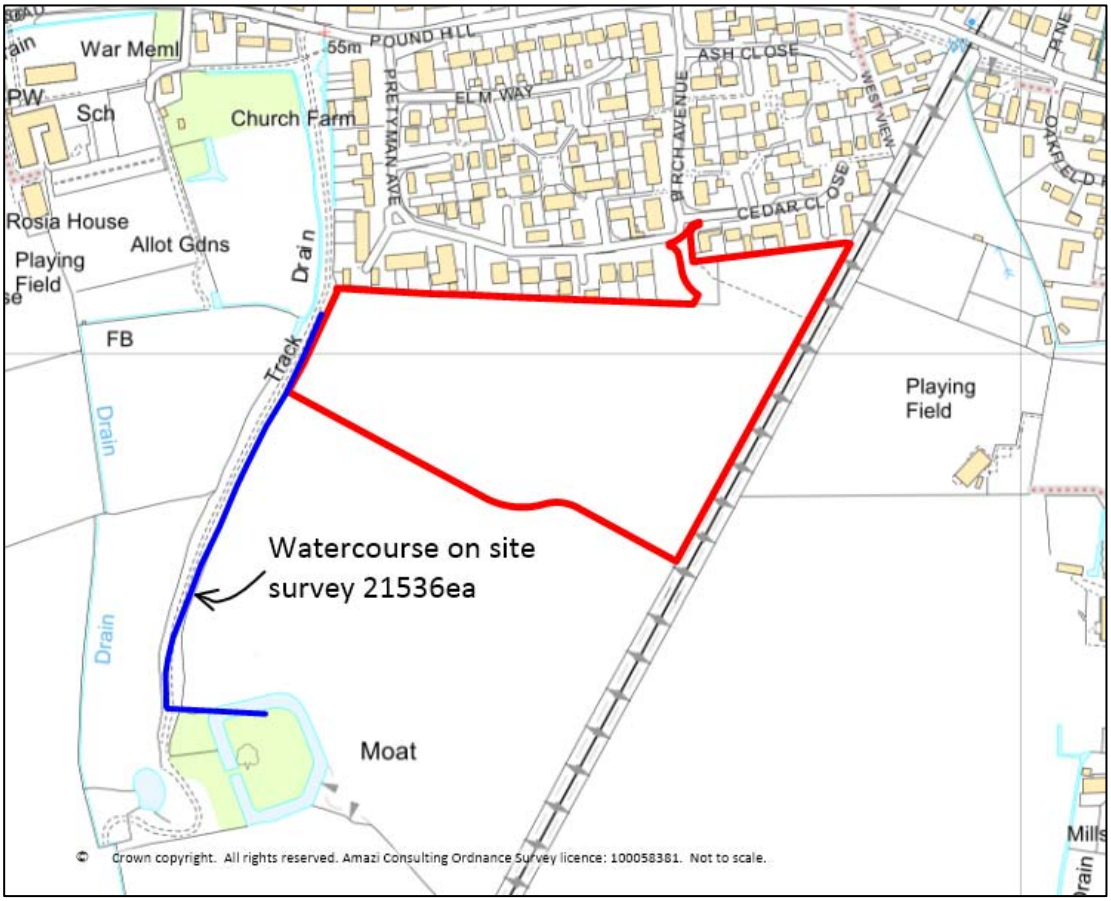


Figure 4.2 - Watercourses

4.5 The topographical survey and OS mapping do not indicate a watercourse/flow route under the railway embankment from east to west. This does not mean that one does not exist though, or there may be a toe drain to the railway embankment. There is a possibility that there is a piped system which conveys flow past, or through the site. There is no open watercourse east to west through the site. Figure 4.5 illustrates the likely contours east of the railway line compared to the flood map outlines. This confirms an overland flow route northwards, with the railway well above the area at risk of flooding. The flood depths in Figure 4.6 are significantly below the height of the railway embankment.

4.6 The mapping in Figure 4.4 has not been attributed to a specific return period, but indicates how the only flood risk at the site is very shallow flooding within the plough lines. We have not included a flow route from east of the railway line, so the catchment comprises just the site itself and some of the field to the south.

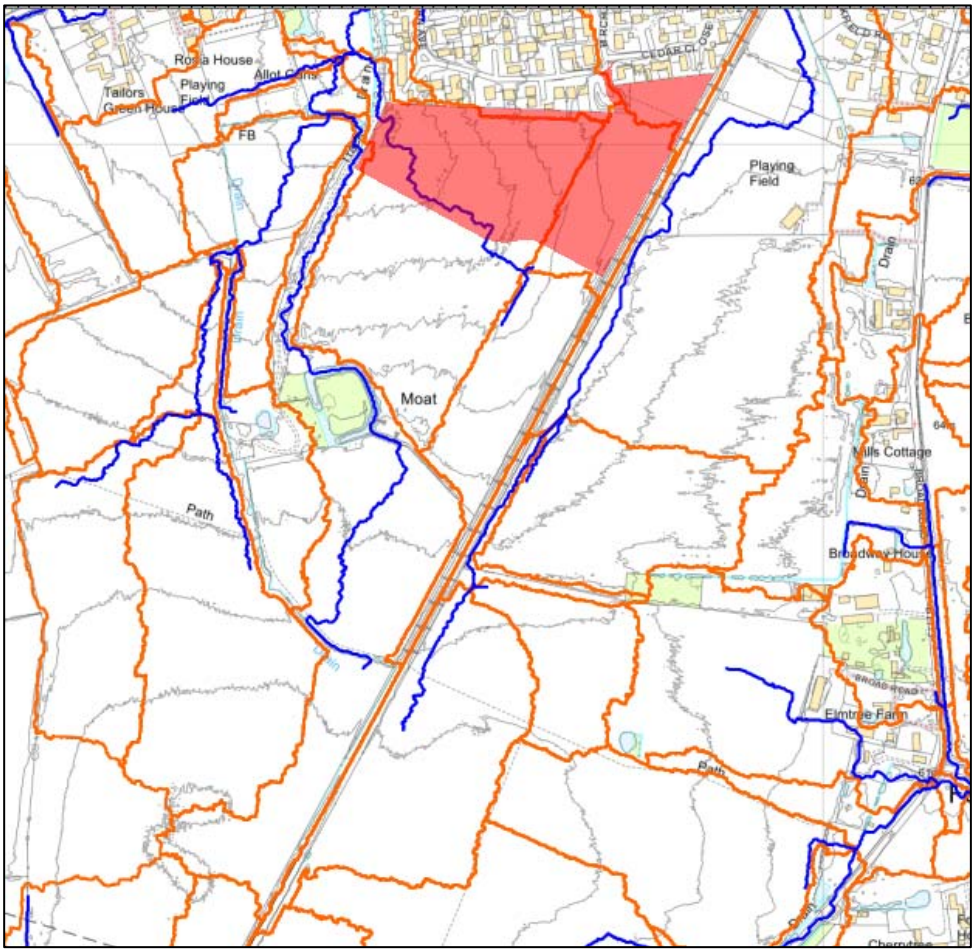


Figure 4.3 - Watersheds

(Source: lidar TM26sw_DTM_1m.tif, downloaded 30 July 2021)

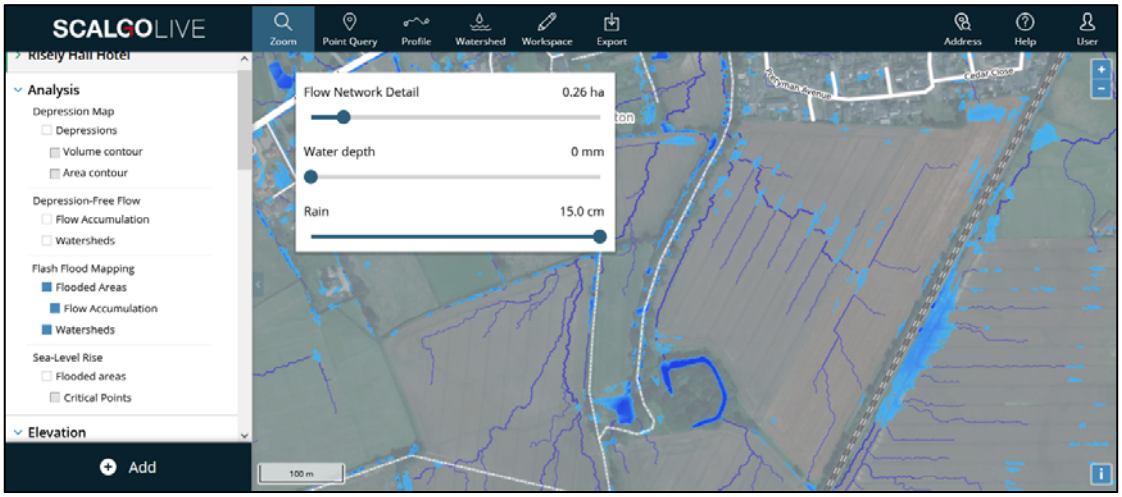


Figure 4.4 - Scalco mapping

(Source: https://scalgo.com/live, July 2021)

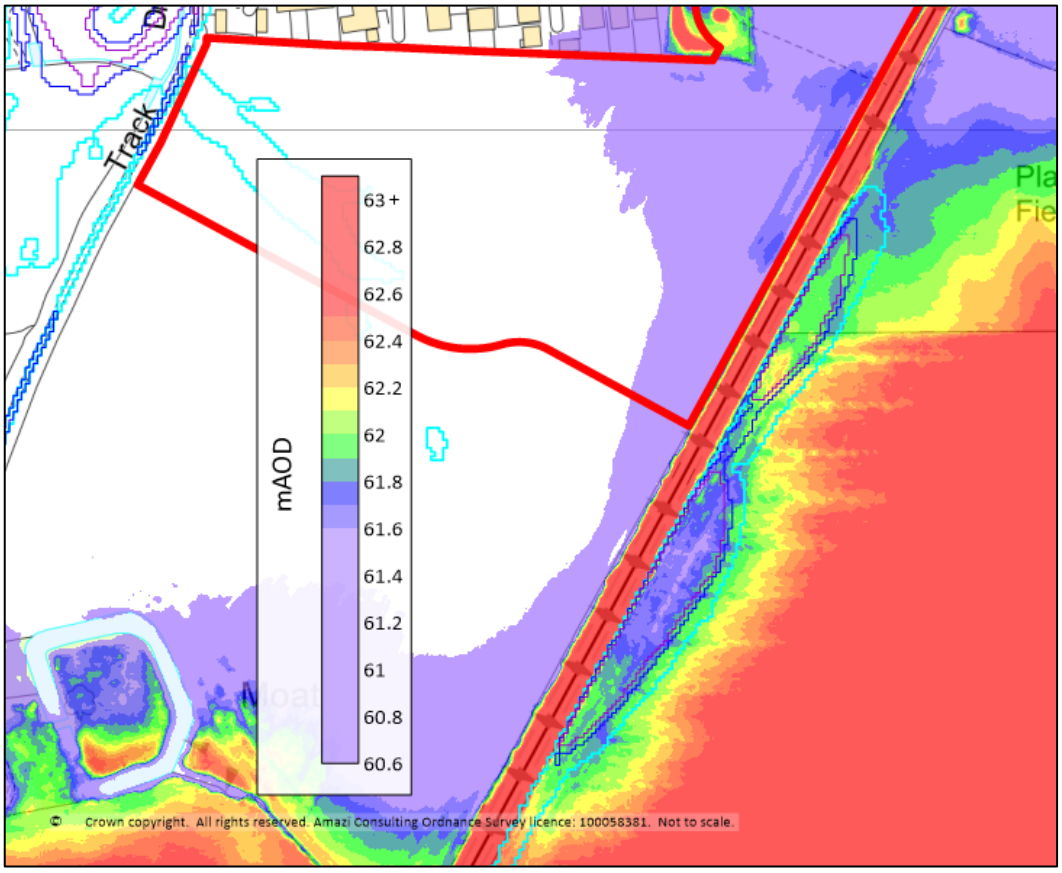


Figure 4.5 - Ground contours east of railway line

(Source: lidar TM06ne_DTM_1m.tif, downloaded 09 August 2021)

4.7 Figure 4.6 shows that even in the extreme, 1:1,000 year event, the maximum flood depth on site may only reach up to 0.15 m. The site is a large contributor to this flow and once developed will benefit from a surface water drainage system and specifically designed exceedance routes. The site layout does not include units in the lowest area at the west of the site. Also, the proposed properties will have footings/floor levels raised at least 150 mm above surrounding land and ground levels should not slope towards properties, especially where there are level thresholds.

4.8 We have no knowledge of any past flooding at the site.

4.9 Other advice and information on preparing for flooding is available from the following websites:

National Flood Forum booklet:
https://nationalfloodforum.org.uk/about-flooding/preparing/checklist-action-plan/

Suffolk County Council: https://www.suffolkresilience.com/
and https://www.suffolk.gov.uk/roads-and-transport/flooding-and-drainage/
(Surface water flooding)

4.10 There is a risk of flooding on the footpath north west of the site. It is not safe to walk, cycle or drive through flood water. It may be fast flowing, contain debris, be contaminated or hide unseen dangers.

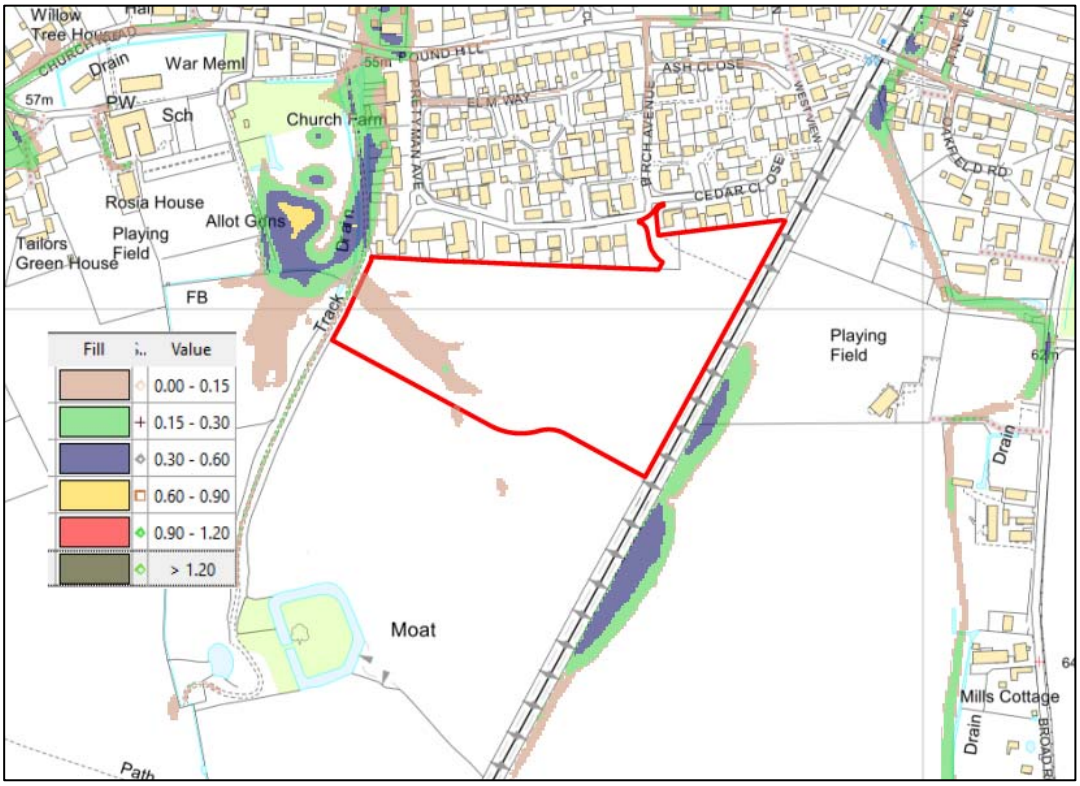


Figure 4.6 – Risk of flooding from surface water – 1:1,000 - max depth

(Source: RoFW_TM06_Depth_1in1,000.shp, downloaded 09 August 2021)

4.11 This report has been undertaken as a desk study and relies upon nationally produced Government flood data. This flood data is currently the best available for assessing flood risks at the site. There is always the risk, however small, that flooding could be different to that assessed.

5 Groundwater

5.1 Figure 5.1 identifies the risk of groundwater flooding across the development. The site and its surroundings are all at NEGLIGIBLE RISK: *There is a negligible risk of groundwater flooding in this area and any groundwater flooding incidence has a chance of less than 1% annual probability of occurrence.*

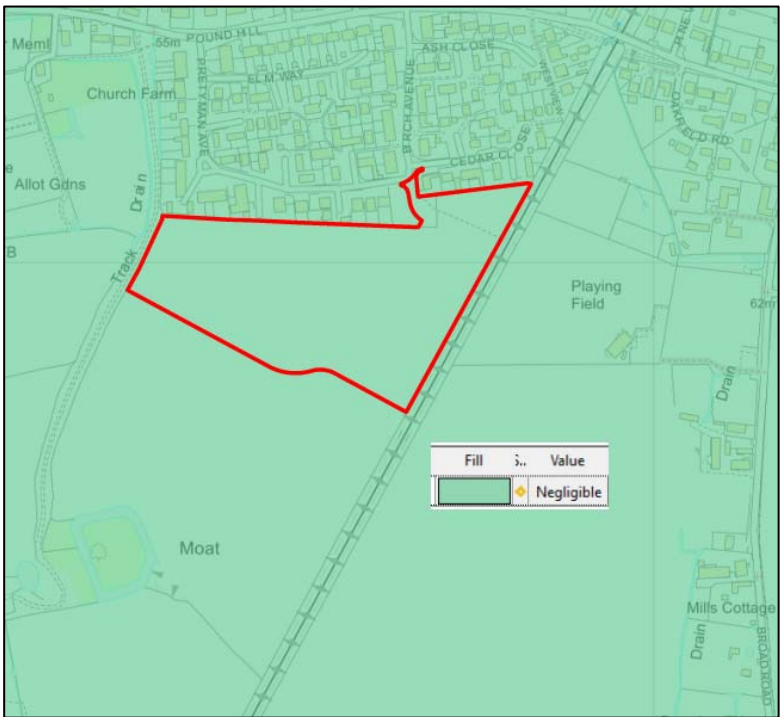


Figure 5.1 - Groundwater flood risk

(Source: Geosmart GW5 (v2.1), 11 June 2020)

6 Summary

6.1 The proposed development comprises 85 residential units, a new community centre and associated infrastructure on the existing 4.78 ha greenfield site.

6.2 The development site is fully within flood zone 1, the area at low risk of river flooding.

6.3 The site is not at high or medium risk of surface water flooding. There is a low risk of surface water flooding on parts of the west of the site, but it seems this may include possibly flows from east of the railway line for which there appears to be no open conveyance system (meaning there is no apparent mechanism for water east of the railway to transfer onto the site).

6.4 The site is at negligible risk of groundwater flooding.

Prepared by Leigh Parratt
BEng (Hons) CEng MICE CWEM MCIWEM PCHEP FHEA

Attachments

- BW233EC_PL-03_A Detailed Development Layout
- Topographical survey 21506, March 2018
- NPPF (National Planning Policy Framework) PPG (Planning Practice Guidance) flood risk and coastal change, Table 1

JCN DESIGN & PLANNING

Legend

26	Private Plot Number
26	Afforable Plot Number
●	Affordable Housing
	2.5n x 5m parking space
Vp	Visitor Parking
6	Allocated parking space
	3.5m Acoustic Fencing
	1.8m high brick wall
	1.8m high close board fence
	1.8m high larch lap fence
	1.0m high Estate railings
	1.2m high Timber post & rail fence
	1.8m high close board gate
	Public Footpath
	CPM890 - CLAIMS

Bellway

Bellway Homes Limited
(Eastern Counties)
3 Percy Road
Huntingdon
Cambridgeshire
PE29 6SZ
Tel - 01480 425200

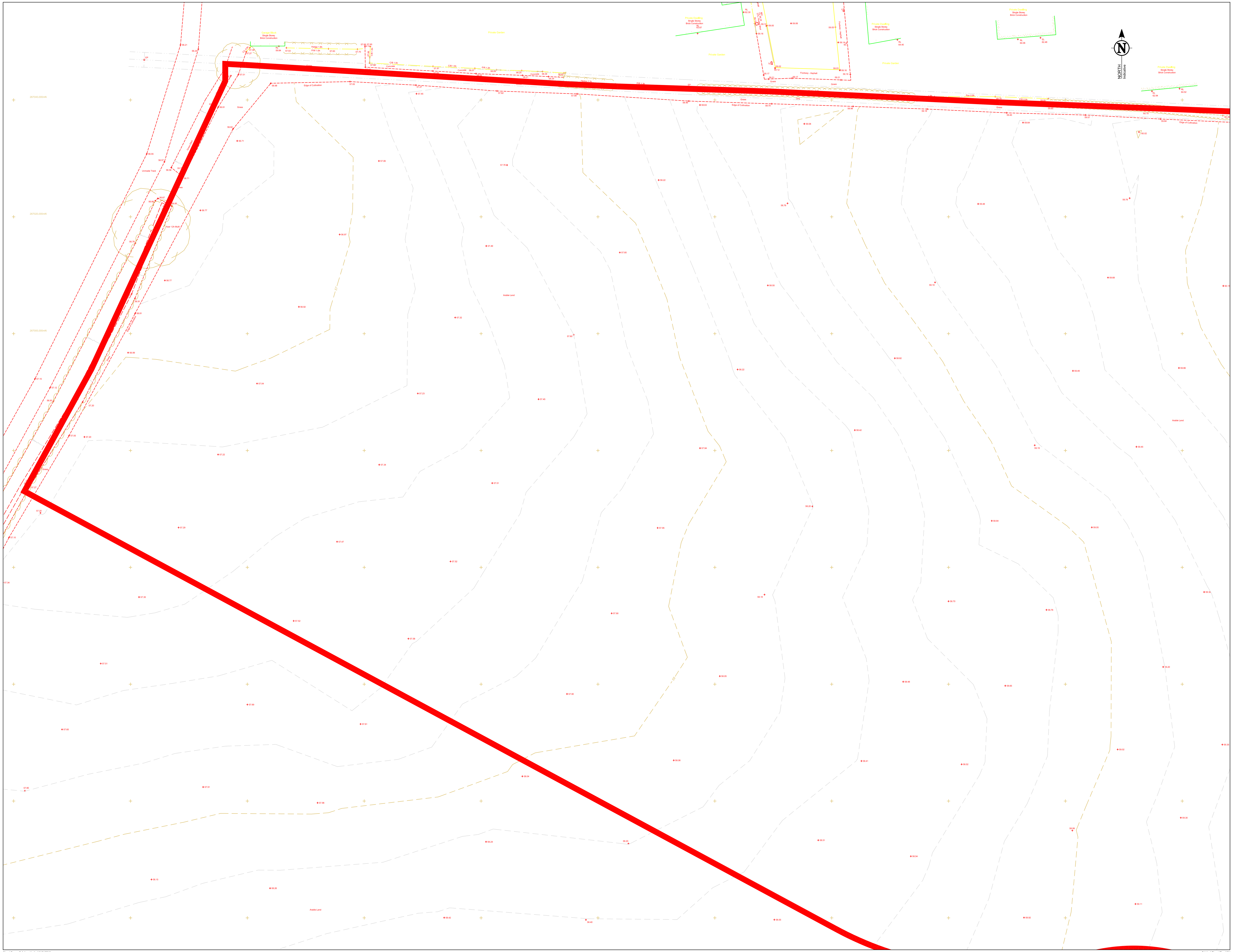
Project:-
Land off Birch Avenue, Bacton

Description:-
Detailed Development Layout

Date:-
Jan 2021

Drawing Scale:-
1-500 @ A0

Drawing number:-
BW233EC_PL-03_A Detailed



TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

ABBREVIATIONS & SYMBOLS

AH	Arch Head Height	FH	Fire Hydrant	RSJ	Rolled Steel Joist
AR	Assumed Route	FBD	Floor Board Direction	SI	Sign Post
AV	Air Valve	FH	Fire Hydrant	SP	Arch Spring Point Height
BB	Belisha Beacon	FL	Floor Level	SV	Stop Valve
BH	Bore Hole	FP	Flag Pole	SW	Surface Water
BL	Bed Level	FW	Foul Water	SY	Stay
BO	Bollard	GG	Gully Grate	Tac	Tactile Paving
BrP	Brace Post	GV	Gas Valve	TC	Telecom Cover
BS	Bus Stop	HH	Head Height	TH	Trial Pit
BU	Bush	IC	Inspection Cover	THL	Threshold Level
B/W	Barbed Wire Fence	IL	Invert Level	TL	Traffic Light
BX	Box (Utilities)	I/R	Iron Railings	ToW	Top of Wall
C/B	Close Board Fence	KO	Kerb Outlet	TP	Telegraph Pole
CH	Cill Height	LP	Lamp Post	TV	Cable TV Cover
CL	Cover Level	MH	Manhole	UB	Universal Beam
C/L	Chain Link Fence	MP	Marker Post	UC	Unknown Cover
C-Lev	Ceiling Level	NB	Name Board	UK	Unknown Tree
Col	Column	OHL	Overhead Line (approx)	USB	Under Side Beam
C/P	Chestnut Paling Fence	Pan	Panel Fence	UTL	Unable To Lift
CR	Cable Riser	PB	Post Box	VP	Vent Pipe
DC	Drainage Channel	PM	Parking Meter	WB	Waste Bin
DH	Door Head Height	PO	Post	WH	Weep Hole
DP	Down Pipe	P/R	Post & Rail Fence	WL	Water Level
DR	Drain	P/W	Post & Wire Fence	WM	Water Meter
EL	Eaves Level	P/Wall	Partition Wall	WO	Wash Out
EP	Electric Pole	RE	Rodding Eye	(x.xx)	Floor to Ceiling Height
ER	Earth Rod	RL	Ridge Level		
ET	EP+Transformer	RP	Reflector Post	(x.xx)F/C	Floor to False Ceiling Ht
FB	Flower Bed	RS	Road Sign		
FBD	Floor Board Direction	RSD	Roller Shutter Door	△	Survey Control Station

DRAWING NOTE

Topographical Surveys

Trees are drawn to scale showing the average canopy spread. Descriptions and heights should be used as a guide only.

All building names, descriptions, number of storeys, construction type including roof line details are indicative only and taken externally from ground level.

All below ground details including drainage, voids and services have been identified from above ground and therefore all details relating to these features including; sizes, depth, description etc will be approximate only. All critical dimensions and connections should be checked and verified prior to starting work.

Detail, services and features may not have been surveyed if obstructed or not reasonably visible at the time of the survey.

Measured Building Surveys

Measurements to internal walls are taken to the wall finishes at approx 1m above the floor level and the wall assumed to be vertical.

Cill heights are measured as floor to the cill and head heights are measured from cill to the top of window.

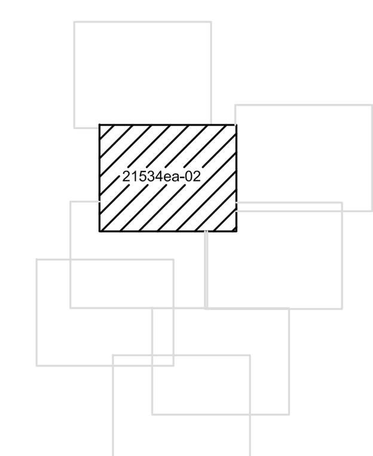
General

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work. Any errors or discrepancies must be notified to Survey Solutions immediately.

The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The survey control listed is only to be used for topographical surveys at the stated scale. All control must be checked and verified prior to use.

Do not scale from this drawing.



CONTROL CO-ORDINATES

STATIONS	EASTINGS	NORTHINGS	LEVEL	DESCRIPTION
GCP1	605690.029	266977.467	59.901	Peg & Nail
ST01	605761.251	267123.067	60.476	PK Nail
ST02	605752.893	267086.981	61.046	PK Nail
ST03	605753.254	267047.887	63.306	Peg & Nail
ST04	605697.596	266956.384	59.857	Peg & Nail
ST05	605645.127	266851.415	59.412	Peg & Nail
ST06	605570.784	267214.359	56.360	PK Nail
ST07	605538.737	267211.343	55.614	PK Nail
ST08	605502.708	267225.586	55.103	PK Nail

SURVEY GRID AND LEVEL DATUM

The coordinate system established for this survey is related to Ordnance Survey (OS) national grid at a single point using Smartnet, then orientated to grid north with a scale factor of 1.000.

The level datum established for this survey is related to Ordnance Survey (OS) using GPS Smartnet.

To avoid discrepancies any coordinated data used in conjunction with this survey must be derived directly from this control data.

REV	DESCRIPTION	DRAWN	APPR	DATE
A	Additonal Survey Information	DNF	JIA	6/4/2018

SURVEY SOLUTIONS

Ipswich Coventry Yeovil Norwich Perth Nottingham Brentwood

Tel No: 0845 0405 969 Fax No: 0845 0405 970
www.survey-solutions.co.uk enquiries@survey-solutions.co.uk

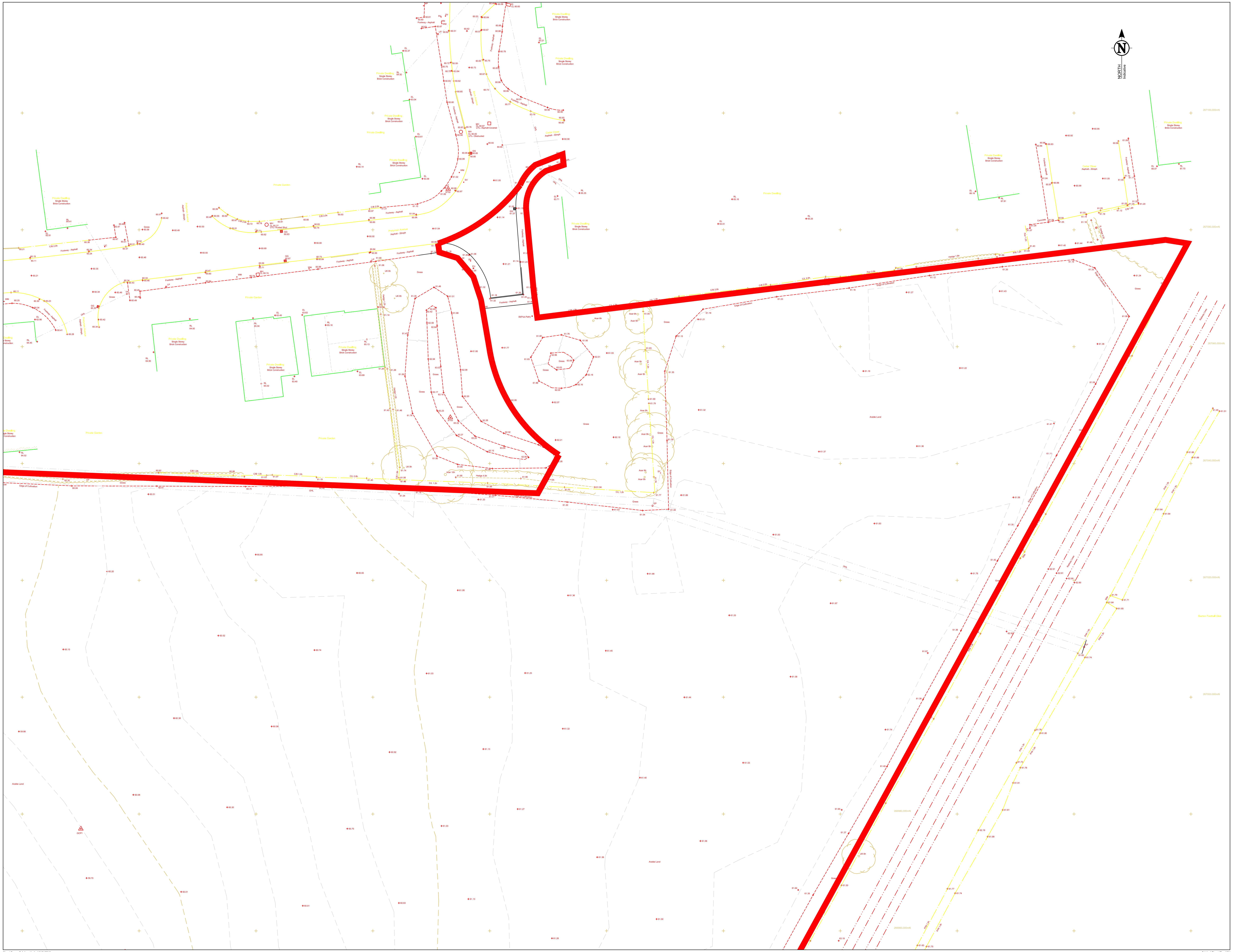
LAND SURVEYING BUILDING SURVEYING UNDERGROUND SURVEYING

PROJECT TITLE
PRETYMAN AVENUE,
BACTON, IP14 4NY.

DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 2 of 8

CLIENT				SCALE
ESCO DEVELOPMENTS LTD				1:200
SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATUS
MG	20/03/2018	KJS	JIA	FINAL
DRAWING NUMBER			REVISION	ISSUE DATE
21536ea-02			A	23/03/2018

Original Sheet Size A0H



TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

ABBREVIATIONS & SYMBOLS

AH	Arch Head Height	FH	Fire Hydrant	RSJ	Rolled Steel Joist
AR	Assumed Route	FBD	Floor Board Direction	SI	Sign Post
AV	Air Valve	FH	Fire Hydrant	SP	Arch Spring Point Height
BB	Belisha Beacon	FL	Floor Level	SV	Stop Valve
BH	Bore Hole	FP	Flag Pole	SW	Surface Water
BL	Bed Level	FW	Foul Water	SY	Stay
BO	Bollard	GG	Gully Grate	Tac	Tactile Paving
BrP	Brace Post	GV	Gas Valve	TC	Telecom Cover
BS	Bus Stop	HH	Head Height	TH	Trial Pit
BU	Bush	IC	Inspection Cover	THL	Threshold Level
B/W	Barbed Wire Fence	IL	Invert Level	TL	Traffic Light
BX	Box (Utilities)	I/R	Iron Railings	ToW	Top of Wall
C/B	Close Board Fence	KO	Kerb Outlet	TP	Telegraph Pole
CH	Cill Height	LP	Lamp Post	TV	Cable TV Cover
CL	Cover Level	MH	Manhole	UB	Universal Beam
C/L	Chain Link Fence	MP	Marker Post	UC	Unknown Cover
C-Lev	Ceiling Level	NB	Name Board	UK	Unknown Tree
Col	Column	OHL	Overhead Line (approx)	USB	Under Side Beam
C/P	Chestnut Paling Fence	Pan	Panel Fence	UTL	Unable To Lift
CR	Cable Riser	PB	Post Box	VP	Vent Pipe
DC	Drainage Channel	PM	Parking Meter	WB	Waste Bin
DH	Door Head Height	PO	Post	WH	Weep Hole
DP	Down Pipe	P/R	Post & Rail Fence	WL	Water Level
DR	Drain	P/W	Post & Wire Fence	WM	Water Meter
EL	Eaves Level	P/Wall	Partition Wall	WO	Wash Out
EP	Electric Pole	RE	Rodding Eye		Floor to Ceiling Height
ER	Earth Rod	RL	Ridge Level		
ET	EP+Transformer	RP	Reflector Post	F/C	Floor to False Ceiling Ht
FB	Flower Bed	RS	Road Sign		
FBD	Floor Board Direction	RSD	Roller Shutter Door		Survey Control Station

DRAWING NOTE

Topographical Surveys

Trees are drawn to scale showing the average canopy spread. Descriptions and heights should be used as a guide only.

All building names, descriptions, number of storeys, construction type including roof line details are indicative only and taken externally from ground level.

All below ground details including drainage, voids and services have been identified from above ground and therefore all details relating to these features including; sizes, depth, description etc will be approximate only. All critical dimensions and connections should be checked and verified prior to starting work.

Detail, services and features may not have been surveyed if obstructed or not reasonably visible at the time of the survey.

Measured Building Surveys

Measurements to internal walls are taken to the wall finishes at approx 1m above the floor level and the wall assumed to be vertical.

Cill heights are measured as floor to the cill and head heights are measured from cill to the top of window.

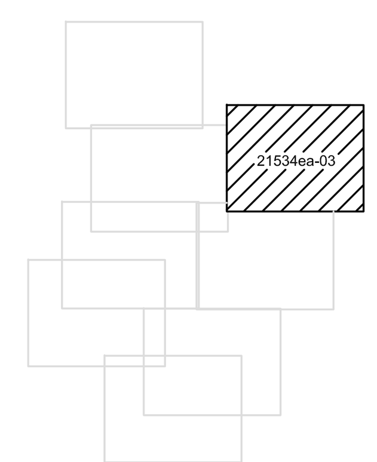
General

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work. Any errors or discrepancies must be notified to Survey Solutions immediately.

The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The survey control listed is only to be used for topographical surveys at the stated scale. All control must be checked and verified prior to use.

Do not scale from this drawing.



CONTROL CO-ORDINATES

STATIONS	EASTINGS	NORTHINGS	LEVEL	DESCRIPTION
GCP1	605690.029	266977.467	59.901	Peg & Nail
ST01	605761.251	267123.067	60.476	PK Nail
ST02	605752.893	267086.981	61.046	PK Nail
ST03	605753.254	267047.887	63.306	Peg & Nail
ST04	605697.596	266956.384	59.857	Peg & Nail
ST05	605645.127	266851.415	59.412	Peg & Nail
ST06	605570.784	267214.359	56.360	PK Nail
ST07	605538.737	267211.343	55.614	PK Nail
ST08	605502.708	267225.586	55.103	PK Nail

SURVEY GRID AND LEVEL DATUM

The coordinate system established for this survey is related to Ordnance Survey (OS) national grid at a single point using Smartnet, then orientated to grid north with a scale factor of 1.000.

The level datum established for this survey is related to Ordnance Survey (OS) using GPS Smartnet.

To avoid discrepancies any coordinated data used in conjunction with this survey must be derived directly from this control data.

REV	DESCRIPTION	DRAWN	APPR	DATE
A	Additonal Survey Information	DNF	JIA	6/4/2018

SURVEY SOLUTIONS

Ipswich Coventry Yeovil Norwich Perth Nottingham Brentwood

Tel No: 0845 0405 969 Fax No: 0845 0405 970
www.survey-solutions.co.uk enquiries@survey-solutions.co.uk

LAND SURVEYING BUILDING SURVEYING UNDERGROUND SURVEYING

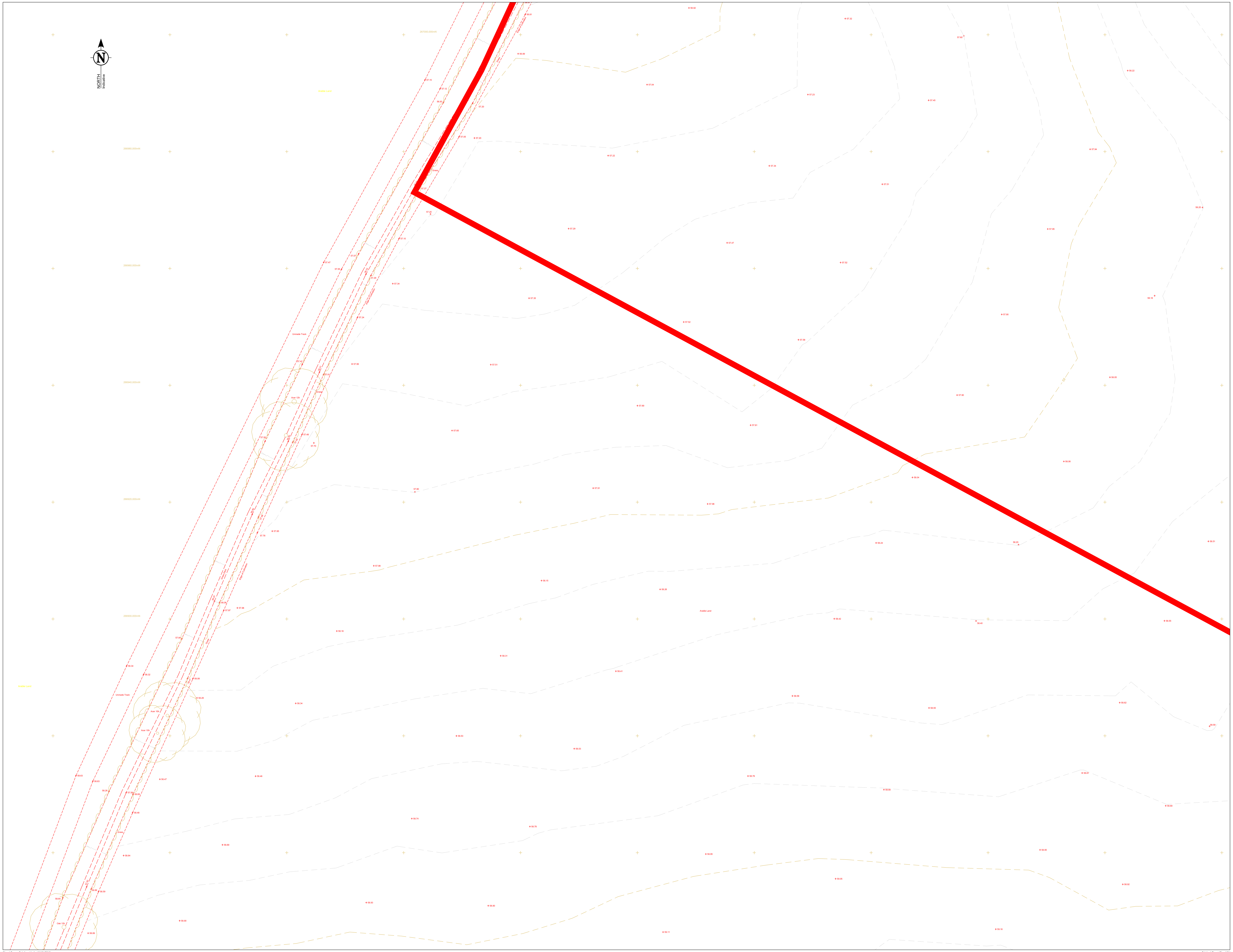
PROJECT TITLE
PRETYMAN AVENUE,
BACTON, IP14 4NY.

DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 3 of 8

CLIENT				SCALE
ESCO DEVELOPMENTS LTD				1:200
SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATUS
MG	20/03/2018	KJS	JIA	FINAL
DRAWING NUMBER			REVISION	ISSUE DATE
21536ea-03			A	23/03/2018

Original Sheet Size A0H


266940.000
266920.000
266900.000
266880.000
266860.000
266840.000
59.46
59.99
60.29
60.65
61.79
61.49
63.27
61.37
60.98
61.65
61.80
59.02
59.35
61.33
61.55
59.79
60.14
60.44
Edge of Cultivation
UK 7h Multi
61.08
60.75
P/W 1.3h
P/W 1.3h
59.30
61.17
UK 7h
61.38
61.75
61.80
59.68
60.06
60.34
Railway Lines
Grass
63.38
60.98
60.66
61.80
61.15
P/W 1.3h
59.11
60.00
60.31
61.33
Arable Land
59.45
UK 9h Multi
61.65
60.63
60.93
61.11
59.07
59.96
60.25
P/W 1.3h
61.20
59.42
60.95
61.72
60.90
60.55
63.52
59.85
Oak 9h
60.14
61.10
59.37
60.89
61.63
63.57
60.88
Edge of Cultivation
60.42
61
59.76
60.03
63.61
61.08
61.45
Oak 12h
59.27
60.77
60.33
60.83
59.66
59.94
60.94
61.11
61.35
P/W 1.3h
UK 12h
60.26
60.70
60.89
63.71
P/W 1.3h
59.73
UK 12h
60
61.10
61.37
59.99
Arable Land
Arable Land
60.81
60.99
Grass
60.20
60.58
Pipe 0.3Ø
60.02
60.41
Railway Lines



©Land Survey Solutions Limited 01/01/2010

Original Sheet Size A0H

TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

ABBREVIATIONS & SYMBOLS

AH	Arch Head Height	FH	Fire Hydrant	RSJ	Rolled Steel Joist
AR	Assumed Route	FBD	Floor Board Direction	SI	Sign Post
AV	Air Valve	FH	Fire Hydrant	SP	Arch Spring Point Height
BB	Belisha Beacon	FL	Floor Level	SV	Stop Valve
BH	Bore Hole	FP	Flag Pole	SW	Surface Water
BL	Bed Level	FW	Foul Water	SY	Stay
BO	Bollard	GG	Gully Grate	Tac	Tactile Paving
BrP	Brace Post	GV	Gas Valve	TC	Telecom Cover
BS	Bus Stop	HH	Head Height	TH	Trial Pit
BU	Bush	IC	Inspection Cover	THL	Threshold Level
B/W	Barbed Wire Fence	IL	Invert Level	TL	Traffic Light
BX	Box (Utilities)	I/R	Iron Railings	ToW	Top of Wall
C/B	Close Board Fence	KO	Kerb Outlet	TP	Telegraph Pole
CH	Cill Height	LP	Lamp Post	TV	Cable TV Cover
CL	Cover Level	MH	Manhole	UB	Universal Beam
C/L	Chain Link Fence	MP	Marker Post	UC	Unknown Cover
C-Lev	Ceiling Level	NB	Name Board	UK	Unknown Tree
Col	Column	OHL	Overhead Line (approx)	USB	Under Side Beam
C/P	Chestnut Paling Fence	Pan	Panel Fence	UTL	Unable To Lift
CR	Cable Riser	PB	Post Box	VP	Vent Pipe
DC	Drainage Channel	PM	Parking Meter	WB	Waste Bin
DH	Door Head Height	PO	Post	WH	Weep Hole
DP	Down Pipe	P/R	Post & Rail Fence	WL	Water Level
DR	Drain	P/W	Post & Wire Fence	WM	Water Meter
EL	Eaves Level	P/Wall	Partition Wall	WO	Wash Out
EP	Electric Pole	RE	Rodding Eye	(x.xx)	Floor to Ceiling Height
ER	Earth Rod	RL	Ridge Level		
ET	EP+Transformer	RP	Reflector Post	(x.xx)F/C	Floor to False Ceiling Ht
FB	Flower Bed	RS	Road Sign		
FBD	Floor Board Direction	RSD	Roller Shutter Door	△	Survey Control Station

DRAWING NOTE

Topographical Surveys

Trees are drawn to scale showing the average canopy spread. Descriptions and heights should be used as a guide only.

All building names, descriptions, number of storeys, construction type including roof line details are indicative only and taken externally from ground level.

All below ground details including drainage, voids and services have been identified from above ground and therefore all details relating to these features including; sizes, depth, description etc will be approximate only. All critical dimensions and connections should be checked and verified prior to starting work.

Detail, services and features may not have been surveyed if obstructed or not reasonably visible at the time of the survey.

Measured Building Surveys

Measurements to internal walls are taken to the wall finishes at approx 1m above the floor level and the wall assumed to be vertical.

Cill heights are measured as floor to the cill and head heights are measured from cill to the top of window.

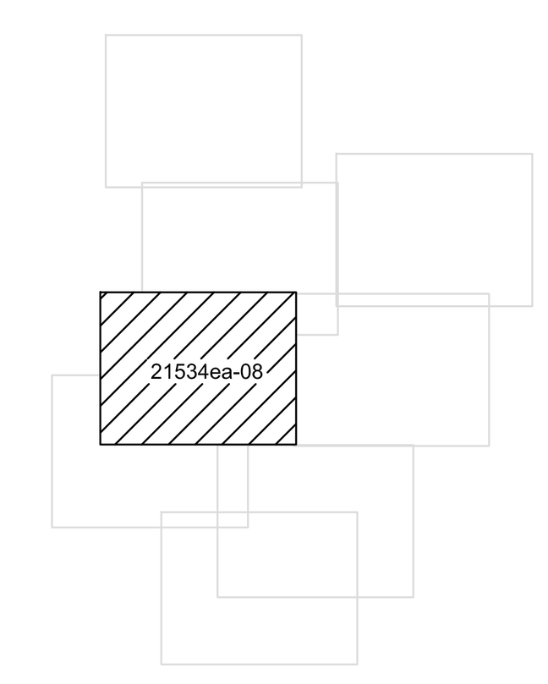
General

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work. Any errors or discrepancies must be notified to Survey Solutions immediately.

The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The survey control listed is only to be used for topographical surveys at the stated scale. All control must be checked and verified prior to use.

Do not scale from this drawing.



CONTROL CO-ORDINATES

STATIONS	EASTINGS	NORTHINGS	LEVEL	DESCRIPTION
GCP1	605690.029	266977.467	59.901	Peg & Nail
ST01	605761.251	267123.067	60.476	PK Nail
ST02	605752.893	267086.981	61.046	PK Nail
ST03	605753.254	267047.887	63.306	Peg & Nail
ST04	605697.596	266956.384	59.857	Peg & Nail
ST05	605645.127	266851.415	59.412	Peg & Nail
ST06	605570.784	267214.359	56.360	PK Nail
ST07	605538.737	267211.343	55.614	PK Nail
ST08	605502.708	267225.586	55.103	PK Nail

SURVEY GRID AND LEVEL DATUM

The coordinate system established for this survey is related to Ordnance Survey (OS) national grid at a single point using Smartnet, then orientated to grid north with a scale factor of 1.000.

The level datum established for this survey is related to Ordnance Survey (OS) using GPS Smartnet.

To avoid discrepancies any coordinated data used in conjunction with this survey must be derived directly from this control data.

REV	DESCRIPTION	DRAWN	APPR	DATE

SURVEY SOLUTIONS

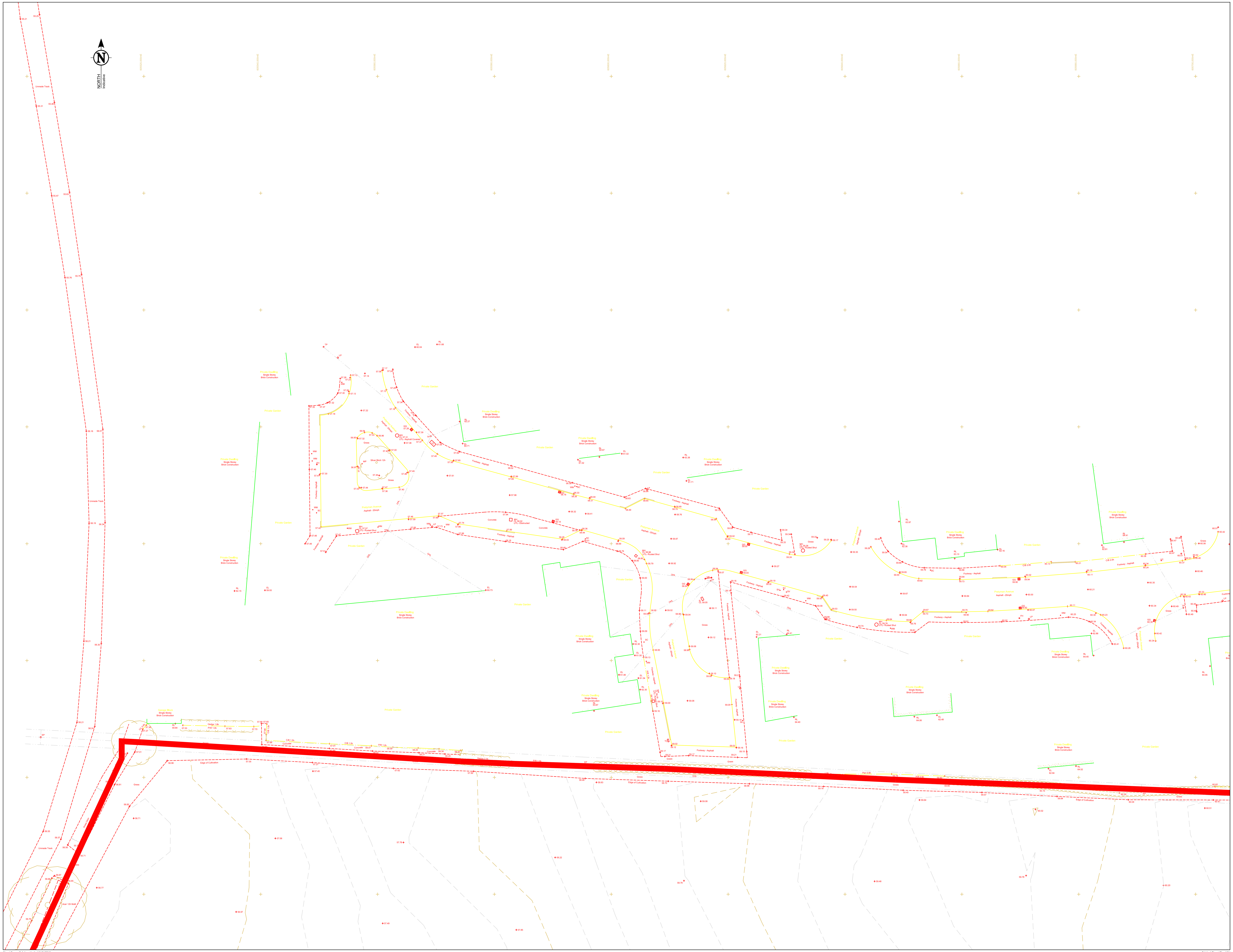
Ipswich Coventry Yeovil Norwich Perth Nottingham Brentwood

Tel No: 0845 0405 969
www.survey-solutions.co.uk

Fax No: 0845 0405 970
enquiries@survey-solutions.co.uk

LAND SURVEYING BUILDING SURVEYING UNDERGROUND SURVEYING

PROJECT TITLE PRETYMAN AVENUE, BACTON, IP14 4NY.				
DRAWING DETAIL TOPOGRAPHICAL SURVEY Sheet 8 of 8				
CLIENT ESCO DEVELOPMENTS LTD				SCALE 1:200
SURVEYOR MG	SURVEY DATE 20/03/2018	CHECKED BY KJS	APPROVED BY JIA	DWG STATUS FINAL
DRAWING NUMBER 21536ea-08			REVISION	ISSUE DATE 23/03/2018



©Land Survey Solutions Limited 01/01/2010

Original Sheet Size A0H

TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

ABBREVIATIONS & SYMBOLS

AH	Arch Head Height	FH	Fire Hydrant	RSJ	Rolled Steel Joist
AR	Assumed Route	FBD	Floor Board Direction	SI	Sign Post
AV	Air Valve	FH	Fire Hydrant	SP	Arch Spring Point Height
BB	Belisha Beacon	FL	Floor Level	SV	Stop Valve
BH	Bore Hole	FP	Flag Pole	SW	Surface Water
BL	Bed Level	FW	Foul Water	SY	Stay
BO	Bollard	GG	Gully Grate	Tac	Tactile Paving
BrP	Brace Post	GV	Gas Valve	TC	Telecom Cover
BS	Bus Stop	HH	Head Height	TH	Trial Pit
BU	Bush	IC	Inspection Cover	THL	Threshold Level
B/W	Barbed Wire Fence	IL	Invert Level	TL	Traffic Light
BX	Box (Utilities)	I/R	Iron Railings	ToW	Top of Wall
C/B	Close Board Fence	KO	Kerb Outlet	TP	Telegraph Pole
CH	Cill Height	LP	Lamp Post	TV	Cable TV Cover
CL	Cover Level	MH	Manhole	UB	Universal Beam
C/L	Chain Link Fence	MP	Marker Post	UC	Unknown Cover
C-Lev	Ceiling Level	NB	Name Board	UK	Unknown Tree
Col	Column	OHL	Overhead Line (approx)	USB	Under Side Beam
C/P	Chestnut Paling Fence	Pan	Panel Fence	UTL	Unable To Lift
CR	Cable Riser	PB	Post Box	VP	Vent Pipe
DC	Drainage Channel	PM	Parking Meter	WB	Waste Bin
DH	Door Head Height	PO	Post	WH	Weep Hole
DP	Down Pipe	P/R	Post & Rail Fence	WL	Water Level
DR	Drain	P/W	Post & Wire Fence	WM	Water Meter
EL	Eaves Level	P/Wall	Partition Wall	WO	Wash Out
EP	Electric Pole	RE	Rodding Eye	(x.xx)	Floor to Ceiling Height
ER	Earth Rod	RL	Ridge Level		
ET	EP+Transformer	RP	Reflector Post	(x.xx) F/C	Floor to False Ceiling Ht
FB	Flower Bed	RS	Road Sign		
FBD	Floor Board Direction	RSD	Roller Shutter Door	△	Survey Control Station

DRAWING NOTE

Topographical Surveys

Trees are drawn to scale showing the average canopy spread. Descriptions and heights should be used as a guide only.

All building names, descriptions, number of storeys, construction type including roof line details are indicative only and taken externally from ground level.

All below ground details including drainage, voids and services have been identified from above ground and therefore all details relating to these features including; sizes, depth, description etc will be approximate only. All critical dimensions and connections should be checked and verified prior to starting work.

Detail, services and features may not have been surveyed if obstructed or not reasonably visible at the time of the survey.

Measured Building Surveys

Measurements to internal walls are taken to the wall finishes at approx 1m above the floor level and the wall assumed to be vertical.

Cill heights are measured as floor to the cill and head heights are measured from cill to the top of window.

General

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work. Any errors or discrepancies must be notified to Survey Solutions immediately.

The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The survey control listed is only to be used for topographical surveys at the stated scale. All control must be checked and verified prior to use.

Do not scale from this drawing.

CONTROL CO-ORDINATES

STATIONS	EASTINGS	NORTHINGS	LEVEL	DESCRIPTION
GCP1	605690.029	266977.467	59.901	Peg & Nail
ST01	605761.251	267123.067	60.476	PK Nail
ST02	605752.893	267086.981	61.046	PK Nail
ST03	605753.254	267047.887	63.306	Peg & Nail
ST04	605697.596	266956.384	59.857	Peg & Nail
ST05	605645.127	266851.415	59.412	Peg & Nail
ST06	605570.784	267214.359	56.360	PK Nail
ST07	605538.737	267211.343	55.614	PK Nail
ST08	605502.708	267225.586	55.103	PK Nail

SURVEY GRID AND LEVEL DATUM

The coordinate system established for this survey is related to Ordnance Survey (OS) national grid at a single point using Smartnet, then orientated to grid north with a scale factor of 1.000.

The level datum established for this survey is related to Ordnance Survey (OS) using GPS Smartnet.

To avoid discrepancies any coordinated data used in conjunction with this survey must be derived directly from this control data.

REV	DESCRIPTION	DRAWN	APPR	DATE
A	Additonal Survey Information	DNF	JIA	6/4/2018

SURVEY SOLUTIONS

Ipswich Coventry Yeovil Norwich Perth Nottingham Brentwood

Tel No: 0845 0405 969 Fax No: 0845 0405 970
www.survey-solutions.co.uk enquiries@survey-solutions.co.uk

LAND SURVEYING BUILDING SURVEYING UNDERGROUND SURVEYING

PROJECT TITLE
PRETYMAN AVENUE,
BACTON, IP14 4NY.

DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 8 of 8

CLIENT				SCALE
ESCO DEVELOPMENTS LTD				1:200
SURVEYOR: MG	SURVEY DATE: 20/03/2018	CHECKED BY: CPJ	APPROVED BY: JIA	DWG STATUS: FINAL
DRAWING NUMBER: 21536ea-09			REVISION: A	ISSUE DATE: 23/03/2018

TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

ABBREVIATIONS & SYMBOLS

AH	Arch Head Height	FH	Fire Hydrant	RSJ	Rolled Steel Joist
AR	Assumed Route	FBD	Floor Board Direction	SI	Sign Post
AV	Air Valve	FH	Fire Hydrant	SP	Arch Spring Point Height
BB	Belisha Beacon	FL	Floor Level	SV	Stop Valve
BH	Bore Hole	FP	Flag Pole	SW	Surface Water
BL	Bed Level	FW	Foul Water	SY	Stay
BO	Bollard	GG	Gully Grate	Tac	Tactile Paving
BrP	Brace Post	GV	Gas Valve	TC	Telecom Cover
BS	Bus Stop	HH	Head Height	TH	Trial Pit
BU	Bush	IC	Inspection Cover	THL	Threshold Level
B/W	Barbed Wire Fence	IL	Invert Level	TL	Traffic Light
BX	Box (Utilities)	I/R	Iron Railings	ToW	Top of Wall
C/B	Close Board Fence	KO	Kerb Outlet	TP	Telegraph Pole
CH	Cill Height	LP	Lamp Post	TV	Cable TV Cover
CL	Cover Level	MH	Manhole	UB	Universal Beam
C/L	Chain Link Fence	MP	Marker Post	UC	Unknown Cover
C-Lev	Ceiling Level	NB	Name Board	UK	Unknown Tree
Col	Column	OHL	Overhead Line (approx)	USB	Under Side Beam
C/P	Chestnut Paling Fence	Pan	Panel Fence	UTL	Unable To Lift
CR	Cable Riser	PB	Post Box	VP	Vent Pipe
DC	Drainage Channel	PM	Parking Meter	WB	Waste Bin
DH	Door Head Height	PO	Post	WH	Weep Hole
DP	Down Pipe	P/R	Post & Rail Fence	WL	Water Level
DR	Drain	P/W	Post & Wire Fence	WM	Water Meter
EL	Eaves Level	P/Wall	Partition Wall	WO	Wash Out
EP	Electric Pole	RE	Rodding Eye	(X.XX)	Floor to Ceiling Height
ER	Earth Rod	RL	Ridge Level		
ET	EP+Transformer	RP	Reflector Post	(X.XX) F/C	Floor to False Ceiling Ht
FB	Flower Bed	RS	Road Sign		
FBD	Floor Board Direction	RSD	Roller Shutter Door	(triangle)	Survey Control Station

DRAWING NOTE

Topographical Surveys

Trees are drawn to scale showing the average canopy spread. Descriptions and heights should be used as a guide only.

All building names, descriptions, number of storeys, construction type including roof line details are indicative only and taken externally from ground level.

All below ground details including drainage, voids and services have been identified from above ground and therefore all details relating to these features including; sizes, depth, description etc will be approximate only. All critical dimensions and connections should be checked and verified prior to starting work.

Detail, services and features may not have been surveyed if obstructed or not reasonably visible at the time of the survey.

Measured Building Surveys

Measurements to internal walls are taken to the wall finishes at approx 1m above the floor level and the wall assumed to be vertical.

Cill heights are measured as floor to the cill and head heights are measured from cill to the top of window.

General

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work. Any errors or discrepancies must be notified to Survey Solutions immediately.

The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The survey control listed is only to be used for topographical surveys at the stated scale. All control must be checked and verified prior to use.

Do not scale from this drawing.

21534ea-10

CONTROL CO-ORDINATES

STATIONS	EASTINGS	NORTHINGS	LEVEL	DESCRIPTION
GCP1	605690.029	266977.467	59.901	Peg & Nail
ST01	605761.251	267123.067	60.476	PK Nail
ST02	605752.893	267086.981	61.046	PK Nail
ST03	605753.254	267047.887	63.306	Peg & Nail
ST04	605697.596	266956.384	59.857	Peg & Nail
ST05	605645.127	266851.415	59.412	Peg & Nail
ST06	605570.784	267214.359	56.360	PK Nail
ST07	605538.737	267211.343	55.614	PK Nail
ST08	605502.708	267225.586	55.103	PK Nail

SURVEY GRID AND LEVEL DATUM

The coordinate system established for this survey is related to Ordnance Survey (OS) national grid at a single point using Smartnet, then orientated to grid north with a scale factor of 1.000.

The level datum established for this survey is related to Ordnance Survey (OS) using GPS Smartnet.

To avoid discrepancies any coordinated data used in conjunction with this survey must be derived directly from this control data.

REV	DESCRIPTION	DRAWN	APPR	DATE
A	Additonal Survey Information	DNF	JIA	6/4/2018

SURVEY SOLUTIONS

Ipswich Coventry Yeovil Norwich Perth Nottingham Brentwood

Tel No: 0845 0405 969 Fax No: 0845 0405 970
www.survey-solutions.co.uk enquiries@survey-solutions.co.uk

LAND SURVEYING BUILDING SURVEYING UNDERGROUND SURVEYING

PROJECT TITLE PRETYMAN AVENUE, BACTON, IP14 4NY.				
DRAWING DETAIL TOPOGRAPHICAL SURVEY Sheet 8 of 8				
CLIENT ESCO DEVELOPMENTS LTD				SCALE 1:200
SURVEYOR MG	SURVEY DATE 20/03/2018	CHECKED BY CPJ	APPROVED BY JIA	DWG STATUS FINAL
DRAWING NUMBER 21536ea-10			REVISION A	ISSUE DATE 23/03/2018

Original Sheet Size A0H

Table 1: Flood Zones

These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's Flood Map for Planning (Rivers and Sea), available on the Environment Agency's web site, as indicated in the table below.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.(Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the Strategic Flood Risk Assessment when considering location and potential future flood risks to developments and land uses.

Paragraph: 065 Reference ID: 7-065-20140306

Revision date: 06 03 2014

www.amazi.co.uk

cover photography: Lindsey Wakelin