

PDAS Appendix F – Flood Risk Assessment and Drainage Strategy

Part 2 of 2





- Site Boundary
- Deer / Stock Fencing
(see Drawing 3223-01-11)
- Proposed Native Species Woodland
- Proposed Native Species Hedgerow
- Proposed Hedgerow Tree
- Grazing Pasture
- Species Diverse Grassland
- Access Track
- Proposed Managed Rewilding
- Existing Vegetation (illustrative)
- Existing Hedgerows (illustrative)

0344 8700 007
axis.co.uk



Client

Green Switch Capital Ltd

Project

Grove Farm Solar

Drawing Title

Landscape Proposals

Scale

1:5000 @A3

Date

July 2023

Dwg no

3223-01-13

Status

Planning

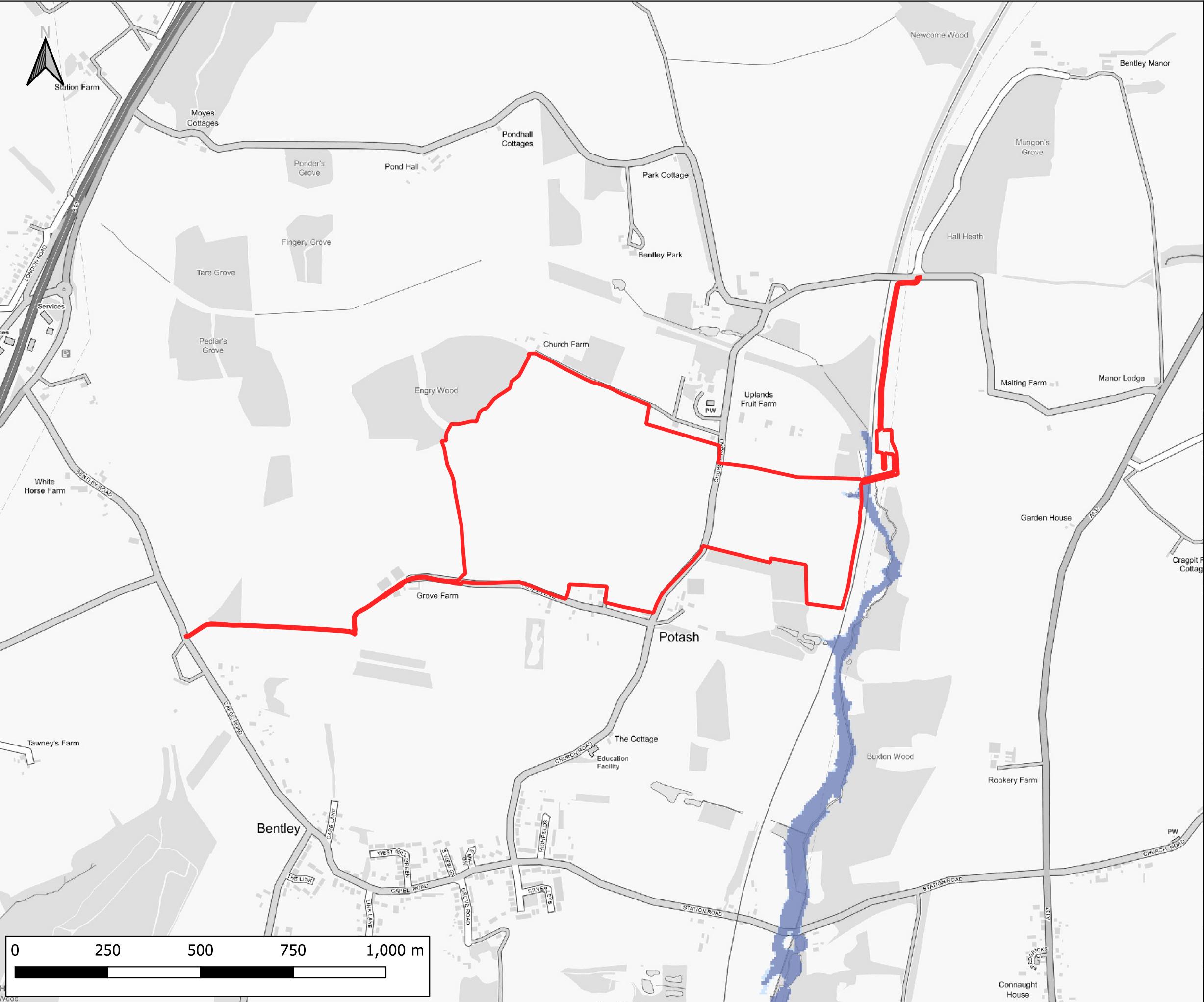
Drawn Checked

TR PR

Rev



Appendix E EA Flood Maps



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- Main Rivers
- Flood Defences
- Reduction in Risk of Flooding from Rivers and Sea
- Flood Storage Areas
- Flood Zone 3
- Flood Zone 2
- Flood Zone 1

Capel St Mary
Bentley
Ipswich
St Bergholt

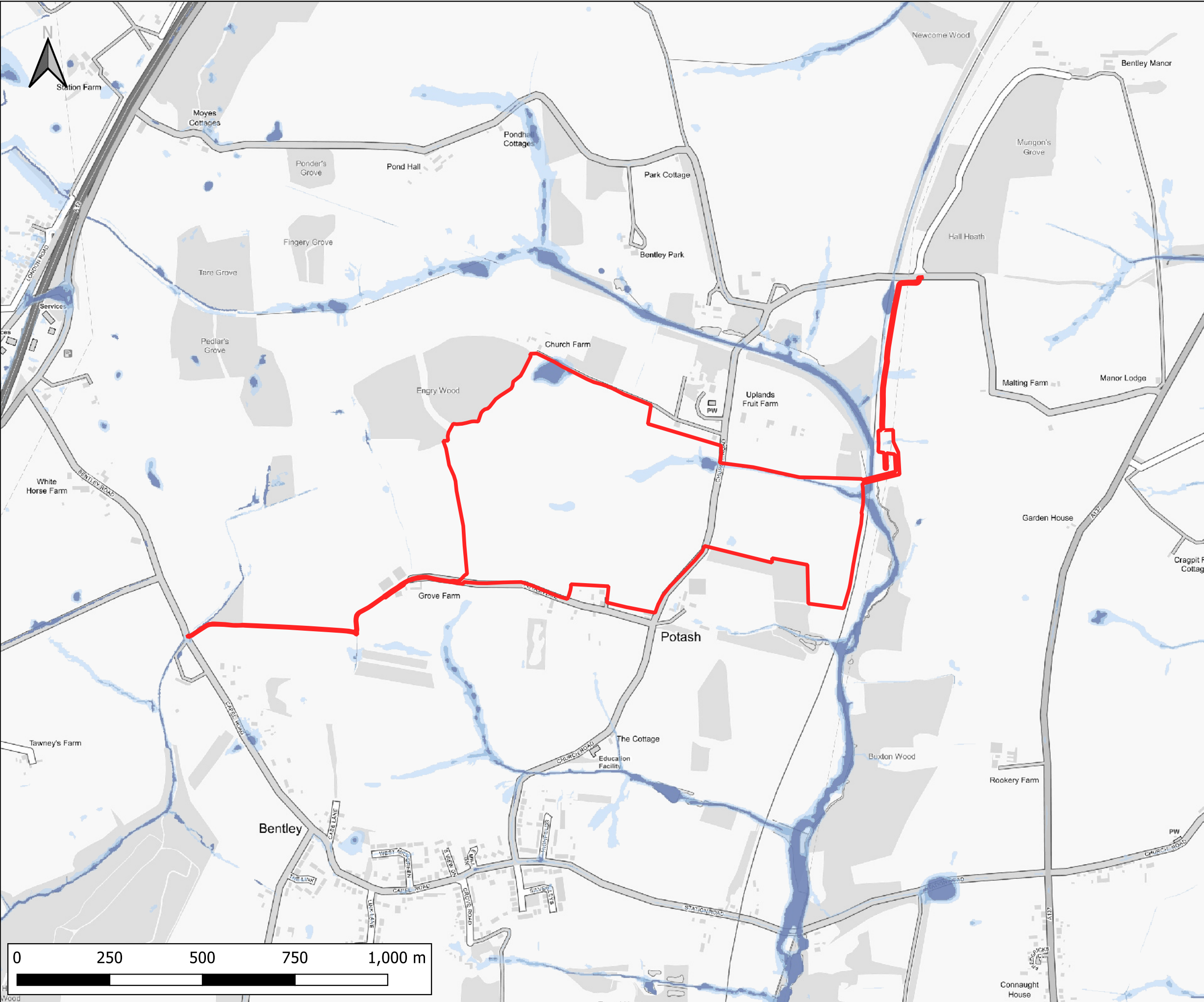
CLIENT:
Axis P.E.D Ltd

waterco
www.waterco.co.uk

SCHEME:
Grove Farm, Ipswich

PLOT TITLE:
EA Flood Map for Planning
Data accessed August 2023

PLOT STATUS: FINAL		DATE: 21-08-2023	
DRAWN: RM	CHECKED: JR	APPROVED: AW	PLOT SCALE AT A3: 1:10000
PLOT NAME: 14716_EA_FMP			REVISION: -



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND


Site Boundary

Flood Risk from Surface Water

- High
- Medium
- Low

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SCHEME:

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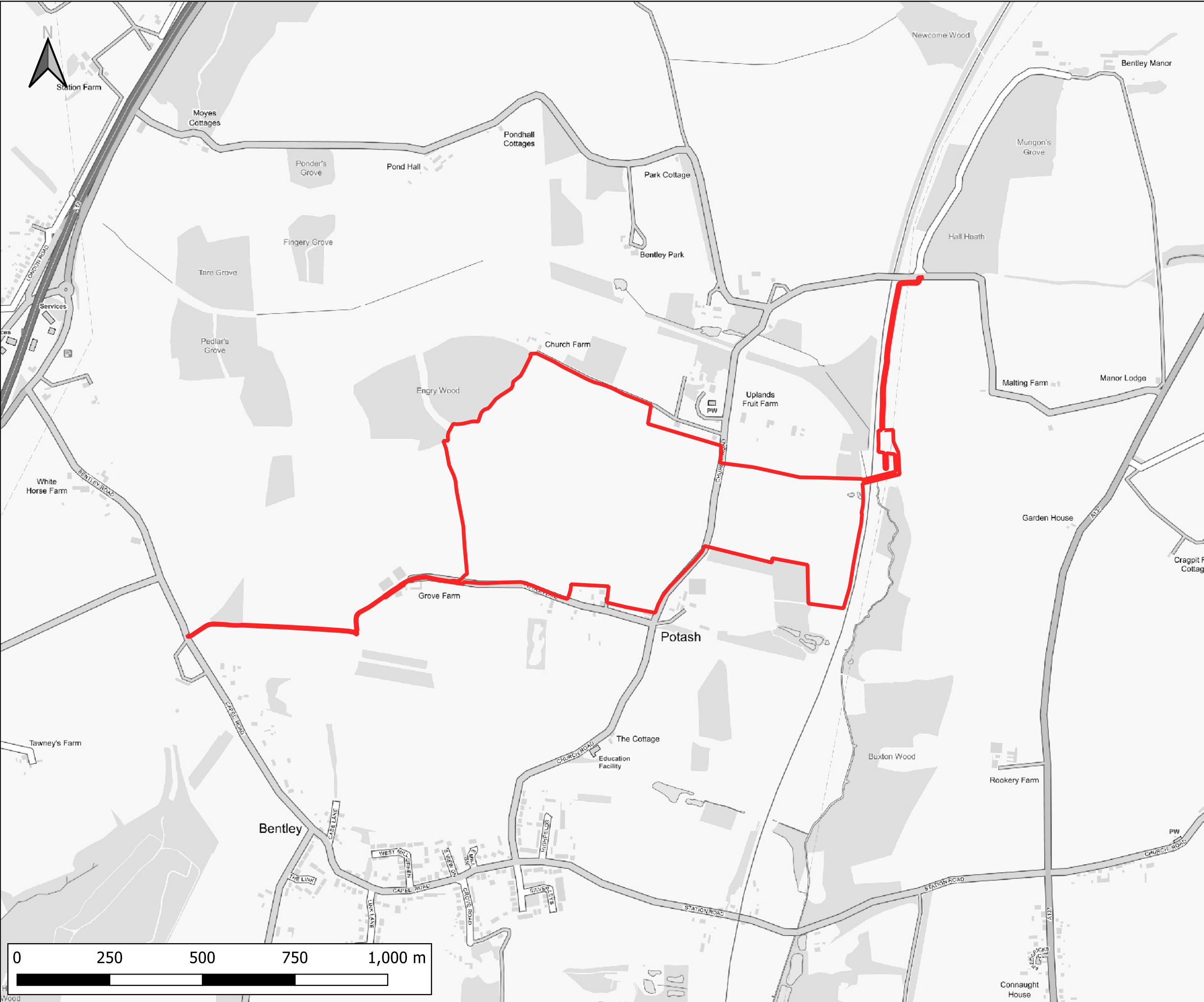
PLOT TITLE:

EA Flood Risk from Surface Water
Data accessed August 2023

PLOT STATUS:		FINAL		DATE:	21-08-2023
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DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
RM	JR	AW	1:10000

PLOT NAME:	REVISION:
14716_EA_Flood_Risk_from_Surface_Water	-



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- When river levels are normal
- When there is also flooding from rivers

CLIENT:

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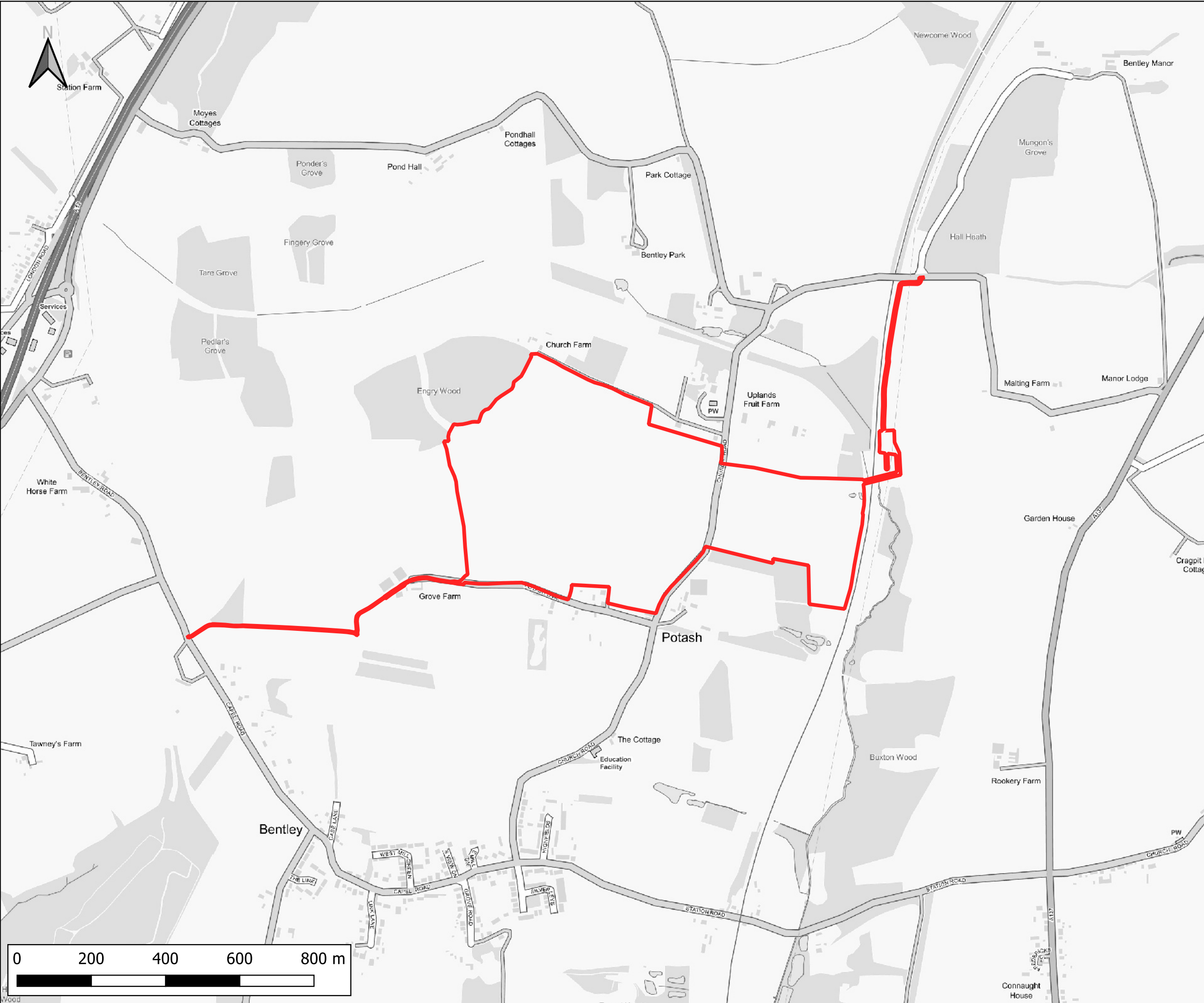
SCHEME:

Grove Farm, Ipswich

PLOT TITLE:

EA Flood Risk from Reservoirs
Data accessed August 2023

PLOT STATUS:		FINAL		DATE:	21-08-2023
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:		
RM	JR	AW	1:10000		
PLOT NAME:					REVISION:
14716_EA_Flood_Risk_from_Reservoirs					-



Notes:

1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

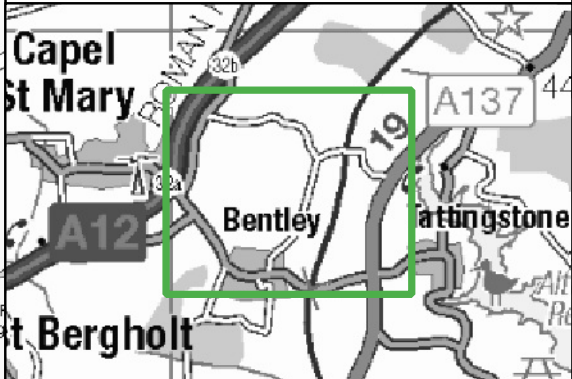
2) The Historic Flood Map is a GIS layer showing the maximum extent of individual Recorded Flood Outlines from river, the sea and groundwater springs that meet a set criteria. It shows areas of land that have previously been subject to flooding in England. This excludes flooding from surface water, except in areas where it is impossible to determine whether the source is fluvial or surface water but the dominant source is fluvial.

3) If an area is not covered by the Historic Flood Map it does not mean that the area has never flooded, only that the EA do not currently have records of flooding in this area that meet the criteria for inclusion.

4) The Historic Flood Map takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding. It will include flood extents that may have been affected by overtopping, breaches or blockages.

LEGEND

- Site Boundary
- Historic Flood Map



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SCHEME:			
Grove Farm, Ipswich			
PLOT TITLE:			
EA Historic Flood Risk Data accessed August 2023			
PLOT STATUS:			DATE:
FINAL			21-08-2023
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
RM	JR	AW	1:10000
PLOT NAME:			REVISION:
14716_EA_Historic_Flood_Risk			-

Appendix F LLFA Correspondence

Standing Advice – Solar Panels (PV) and Solar Farms

Introduction

Suffolk County Council as Lead Local Flood Authority (LLFA) has identified the need for additional guidance and clarification in relation to planning application for Solar Panels (PV) and Solar Farms relating to flood risk and surface water drainage. This builds on principles established by Solar Arrays which have formed part of Nationally Strategic Infrastructure Projects and neighbouring counties flood risk and SuDS guidance with respect to solar arrays.

Flood Risk

It is generally accepted that PV panels and the associated auxiliary buildings/structures have a limited impact on flood risk due to their comparatively small footprint and lack of ground contacting surfaces. However, it does not mean that this does not need to be fully considered. The LLFA will still expect a site-specific flood risk assessment (FRA) to be submitted with every PV application that is more than 1 hectare in size or is in a flood risk area. If the site is within a area at risk of flooding, the flood risk sequential and exception test maybe applied by the local planning authority.

There are several flood risks that need to be assessed, including.

- Fluvial (river)/ Tidal (sea)
- Pluvial (surface water)
- Reservoir
- Groundwater
- Foul/Sewer Flooding

The FRA should include reference to any historical flood instances that have been recorded.

For flood incident records, please contact the lead local flood authority by emailing them floods@suffolk.gov.uk .

If you need assistance with understanding what is required this is the current guidance [Flood risk assessments if you're applying for planning permission - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/flood-risk-assessments-if-youre-applying-for-planning-permission) .

Surface Water Drainage

The density, height and number of PV panels will dictate the type of surface water management system that is required by the LLFA.

This can be done by utilising perimeter swales or filter strips every 5th row of PV panels.

Auxiliary buildings, depending on where they are located, and their plan area can normally have the surface water drainage design/built in accordance with Building Regulations Part H. However, a surface water drainage strategy utilising SuDS principles may be required if the LLFA believe this is necessary depending on the site.

Below Panel Maintenance

As below the panel will normally be laid to grass or pastureland, the type of maintenance will vary depending on how the ground below and around the panels is to be utilised.

Grass

If the area is to be laid to grass, it is recommended that a seed mix is used which provides a ratio of approximately 80/20% grass/wildflower seeds to allow for biodiversity enhancement/net gain. The management of this area should then be carried out in accordance with a management plan that focuses on the target species that are to benefit of the grass and wildflower areas, such as invertebrates and birds. Careful consideration shall be given to the use of wheeled machinery to avoid soil compaction.

Pastureland

If the area below the panels is to be used for pastureland or grazing land, consideration should be given to

- Choice of species of grazing stock (usually sheep)
- Density of livestock stocking (this would usually be expected to be at a low density)
- Intensity of grazing (intermittent conservation grazing would usually be expected)
- Avoidance of soil compaction caused by grazing

Surface Water Flow Routes

Existing flood flow routes or blue corridors should be maintained.

Ordinary Watercourses

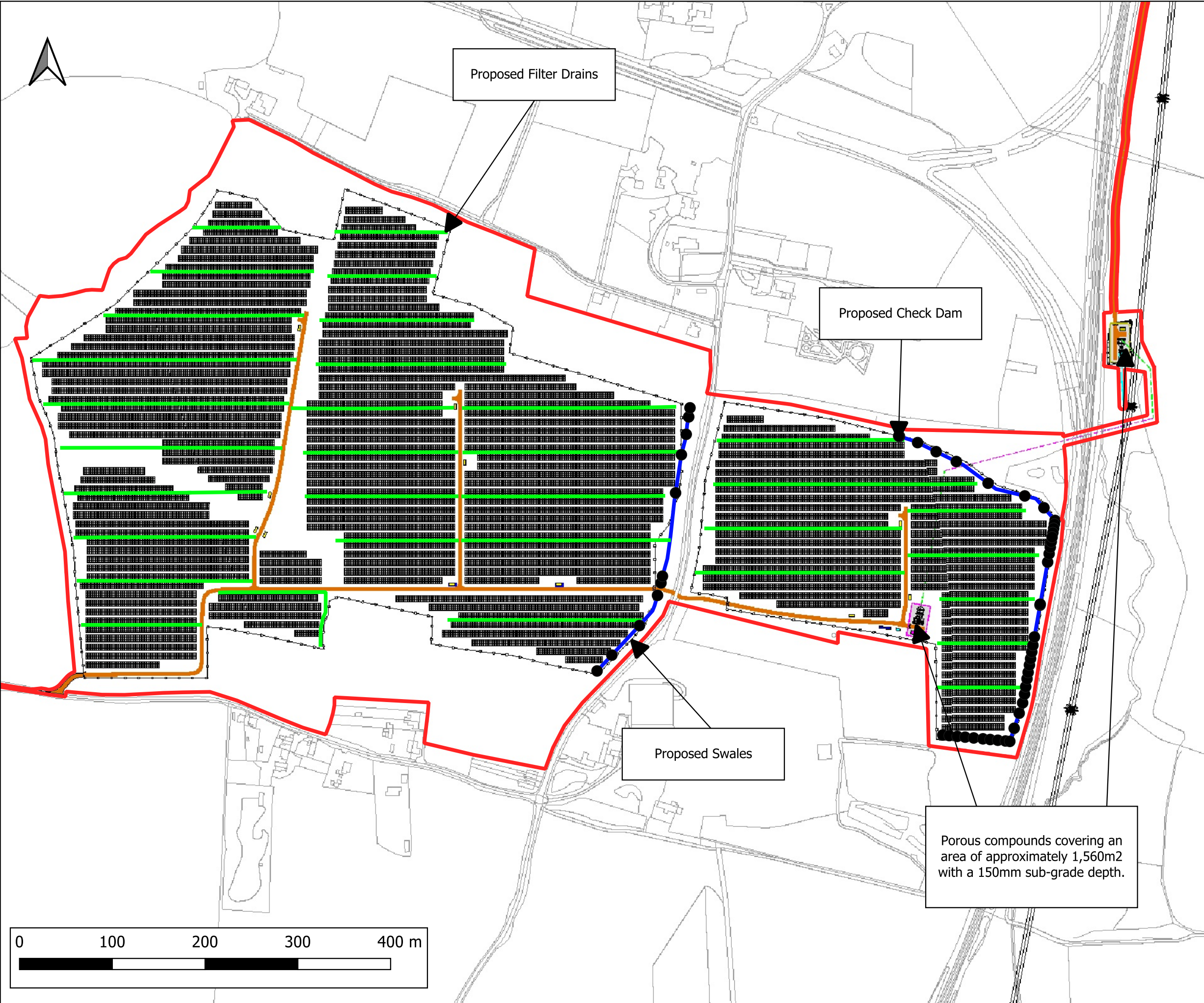
If you want to do works to a watercourse in Suffolk, it is likely that you will need to be granted consent by either SCC LLFA, an Internal Drainage Board, or the Environment Agency.

Main rivers are the responsibility of the Environment Agency, and [applications to work on main rivers](#) must be submitted to them. You can [use this map](#) created by the Environment Agency to find out whether or not the application in question is on a main watercourse.

The responsibility to manage flood risk from ordinary watercourses (streams and ditches, etc) in Suffolk rests with us, as the Lead Local Flood Authority (LLFA). Therefore, anyone who intends to carry out works in, over, under or near an ordinary watercourse in Suffolk must contact us to obtain Land Drainage Consent before starting the work. The reason for this is to ensure that any works do not endanger life or property by increasing the risk of flooding, or cause harm to the water environment.

More details can be found [here](#)

Appendix G Concept Drainage Sketch



Notes:
1) This sketch has not been subject to formal checks or approvals. Its validity and use must therefore be limited to discussion and information purposes only.
2) Unless otherwise noted the risks associated with this proposal are not considered to be extra ordinary and within the remit of an experienced and competent contractor.
3) All dimensions in millimetres and all levels in metres above ordnance datum unless shown otherwise.
4) This drawing is an amendment of the 'General Arrangements Plan' (drawing no. 3223-01-03) provided by the Client. This drawing provides a concept only and is not intended for detailed design.

LEGEND

- Site Boundary
- Proposed Swales
- Proposed Filter Drains
- Proposed Check Dam

CLIENT:			
Axis P.E.D Ltd			
 www.waterco.co.uk			
SCHEME:			
Grove Farm, Ipswich			
PLOT TITLE:			
Concept Drainage Sketch			
PLOT STATUS:			DATE:
SKETCH			23-08-2023
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
RM	JR	AW	1:4000
PLOT NAME:			REVISION:
14716_Concept_Drainage_Sketch			-

Appendix H Maintenance Schedules

Operation and Maintenance Requirements for Swale

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as Required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swales treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseed	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oil or petrol residues using safe standard practices	As required

Ref. Table 17.1 CIRIA C753 'The SuDS Manual'

The maintenance requirements detailed above are to be undertaken by the site owner.

Name :

Position :

Date :

Signed on behalf of the site owner :

Operation and Maintenance Requirements for Filter Drains

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Monthly (or as required)
	Inspect filter drain surface, inlet / outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment devices	Six monthly, or as required
Occasional maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (e.g. NJUG, 2007 or BS 3998:2010)	As required
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforated pipework of blockages	As required

Ref. Table 16.1, CIRIA C753 'The SuDS Manual'

The maintenance requirements detailed above are to be undertaken by the site owner.

Name :

Position :

Date :

Signed on behalf of the site owner :

Operation and Maintenance Requirements for Permeable Paving

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and move contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level or the paving	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Inspect for evidence of poor operation and / or weed growth – if required, take remedial action	Three-monthly, 48hr after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Ref. Table 20.15, CIRIA C753 'The SuDS Manual'

The maintenance requirements detailed above are to be undertaken by the site owner.

Name :

Position :

Date :

Signed on behalf of the site owner :

Appendix I Concept Designer's Risk Assessment

Project:	Grove Farm, Ipswich
Client:	Axis P.E.D Ltd
Report Reference:	14716 - FRA & Drainage Strategy

Project No:	14716
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Prepared by:	Ryan Moore BSc (Hons)	Date:	21/08/2023
Checked by:	Jessica Roberts BSc (Hons) MCIWEM	Date:	22/08/2023
Reviewed by:	Aled Williams BSc (Hons) MCIWEM C.WEM	Date:	25/08/2023

Requirement:

The Construction (Design and Management) Regulations 2015 (CDM 2015) place an obligation on the Designer to take all reasonable steps to provide, with the design, sufficient information about the design, construction or maintenance of the structure, to adequately assist the client, other designers and contractors to comply with their duties under CDM. The Designer has undertaken this assessment to identify any extra-ordinary risks, or those that would not be expected on this particular project by an experienced and competent Contractor. The aim is to avoid needless paperwork and bureaucracy and ensure the assessment is project specific, relevant and proportionate to the risk.

DRA Summary

Each of the following risk areas has been considered using the question below. Is a risk present which is considered to be **extra-ordinary or unexpected** in this instance?

If **YES** - A detailed risk assessment is required at design stage

If **UNKNOWN** - Insufficient information has been provided at concept design stage and the risks are unknown. Further consideration must be given at design stage(s)

If **NO** - No further action is required.

Hazard Ref.	Risk Areas	YES, UNKNOWN or NO	Comments
1	Ground Conditions	Unknown	To be considered at detailed design stage.
2	Hazardous Environment	Unknown	To be considered at detailed design stage.
3	Existing Working Environment	Unknown	The site comprises undeveloped agricultural land
4	Existing Services	Unknown	To be considered at detailed design stage.
5	Proximity to Other Structure(s)	Unknown	Church Road runs through the centre of the site.
6	Near Waterbody / flood risk	No	Unnamed watercourse located approximately 65m east of the site.
7	Proximity to Other Activities	Unknown	Farm to the south-west.
8	Sequence of Construction	Unknown	To be considered at detailed design stage.
9	Access	Unknown	Access to the site is provided from Church Road.
10	Interfaces	Unknown	To be considered at detailed design stage.
11	Confined Space Working	Unknown	To be considered at detailed design stage.
12	Maintenance Considerations	Unknown	To be considered at detailed design stage.
13	Working at Height	Unknown	To be considered at detailed design stage.
14	Steep Slopes	No	Site slopes from 41.72m AOD in the west to 31.01m AOD in the east.
15	Demolition / Refurbishment / Repair	No	To be considered at detailed design stage.
16	Welfare	Unknown	To be considered at detailed design stage.
17	Occupational Health	Unknown	To be considered at detailed design stage.
18	Environmental Issues	Unknown	To be considered at detailed design stage.
19	Other Significant Hazards not Identified Above	Unknown	To be considered at detailed design stage.
20	Residual Risk to Future Users	Unknown	To be considered at detailed design stage.