

Barkham Solar Farm

Drainage & SuDS Strategy

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Revision: P02

Issue Date: 30 September 2024

Land to north and south of Barkham Ride, RG40 4PL

Rev	Description	Issued by	Checked	Date
P01	Draft Issue	CRR	MS	27/09/24
P02	Updated to suit Equans Comments	CRR	MM	30/09/24

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1 Introduction

1.1 Project Overview

Curtins have been appointed by Equans to produce this Drainage Strategy Document to assist with the discharge of Planning conditions for the proposed Solar Farm development at Barkham Ride. The specific condition is Condition 20 and is included below.

'Prior to the commencement of the development hereby permitted, a detailed Drainage Strategy shall be submitted to and approved in writing by the Local Planning Authority. The Strategy shall be supported by evidence of ground conditions and modelling of the scheme to demonstrate it is technically feasible and will protect existing assets at St James Church and retain existing water flows and levels within the moat around Church Cottages, Where applicable, it should demonstrate that it adheres to the NPPF, Non-statutory technical Standards for Sustainable Drainage, Building Regulation H and local policy. The drainage scheme shall be carried out in accordance with the approved details. Where surface water requires disposal offsite the applicant must provide evidence of consent to discharge/connect through 3rd party land or to their network/system/ watercourse.'

Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material derivation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

1.2 Site Location

The site is located within existing grassland to the north and south of Barkham Ride. The site is approximately 1km south of Barkham Town Centre with the grid reference X-478398, Y-166070.



Figure 1-1: Site Location Plan

1.3 Site Description

The site currently consists of open fields/grassland separated by a series of treelines and drainage ditches. The site has an area of approximately 52ha and can be accessed via the Barkham Ride highway which crosses through the centre of the site.

A topographical survey has been carried out, included in **Appendix A**, and shows the site to generally fall from south to north and from east to west. With a high point of 64.54mAOD in the southeast section of the site and a low point of 50.17mAOD in the northwest corner of the site.

1.4 Project Proposal

The project proposal is for the construction of a new solar farm with associated substations/inverter compounds. The proposed works also include the installation of two new access junctions for the site off of Barkham Ride and a network of new haul roads to allow vehicular access to the different areas of the site.

It is assumed there will be no demolition works, there may be minor changes to site levels to suit the new haul road design. The haul road design can be seen in **Appendix B**, on the site as part of the proposed works. It has also been assumed that there will be no change in the impermeable areas of the site as part of the proposed works.

The proposed site layout can be found in **Appendix C**.

2 Planning and Policy Considerations

2.1 National Planning Policy Requirements

2.1.1 National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG)

In recent years, the Government and local Councils have placed increased priority on the need for developers to take full account of the risks of their development at all stages of the planning process. The National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG) identify how the issue of flooding is dealt with through the planning process and with the creation of a site-specific Flood Risk Assessment (FRA) for sites over 1ha in area or in Flood Zones 2 & 3.

2.1.2 DEFRA – Sustainable Drainage Systems

The Department for Environment, Food and Rural Affairs (DEFRA) national standards for sustainable drainage systems provide technical guidance on the design, construction and maintenance of Sustainable Drainage Systems (SuDS).

2.2 Local Planning Policy Requirements

2.2.1 Wokingham Adopted Core Strategy Development Plan (January 2010)

The Council has produced the Core Strategy to set out where development will occur within the borough to 2026, taking account of the health, well-being and quality of life of our residents. The Core Strategy includes policies about everything from homes, shops, offices and factories to libraries, schools and health & leisure facilities.

2.2.2 Wokingham Borough Level 1 Strategic Flood Risk Assessment (May 2023)

This report provides a comprehensive and robust evidence base on flood risk issues to support the review and update of the Wokingham Borough Council's planning policies. The review process is known as the Local Plan Update (LPU). This report uses the best available information, including input from key stakeholders. This Level 1 Strategic Flood Risk Assessment (SFRA) for Wokingham Borough Council (WBC) was prepared to replace and update the previous Level 1 SFRA produced by WSP and published in 2020. The SFRA assesses additional land promoted to WBC for potential development, changes to the proposed development sites within the borough, and changes in national planning policy and guidance, including the update to the National Planning Policy Framework (NPPF) in July 2021, the update to the Planning Practice Guidance (PPG) in August 2022, and the updates to the EA climate change guidance in July 2021 and May 2022.

2.2.3 Flood Risk Management Strategy (April 2015)

The Strategy focuses on local flood risk sources and explains how Wokingham Borough Council will ensure flood risk is managed in an integrated and effective way. The Strategy provides a single consistent reference point for flood risk management in the Borough.

3 Flood Risk Summary

A detailed site-specific Flood Risk Assessment (FRA) has been written for this site by WSP (Wokingham-WKH-2021-BARKHAM SOLAR FARM). The FRA outlines the existing flood risk posed to the site, as well as evaluating how the proposed development will affect these risks. The FRA is included in **Appendix D**.

4 Existing Drainage

4.1 Public Sewerage

Due to the existing nature of the site being undeveloped, it is assumed no existing surface or foul water sewerage serves the development site. Survey works carried out on the site also did not identify any sewerage. No publicly adopted drainage runs are shown on Thames Water asset plans either.

4.2 Private Drainage

Due to the existing nature of the site being undeveloped, no existing surface or foul water sewers are serving the development site.

There are several drainage ditches on the site in which flows are to be retained as per existing during and following the development of the site. These ditches flow from west to east across the site. One of the ditches, noted as a drainage moat on the Topographical Survey feeds into a drainage moat that continues around the nearby Church buildings located to the east of the site. It is important that the flows through the moat are maintained to continue to support the downstream drainage from the site.

5 Proposed Drainage Strategy

5.1 General

The proposed drainage strategy does not look to change the drainage regime of the site. As there are currently no areas of hardstanding, water landing on the site will infiltrate to the ground and be picked up partially by the drainage ditches across the site.

As the majority of the site is occupied by PV panels that are installed on soft landscaping, rainfall landing on these will still be allowed to infiltrate either in or near the existing location. The proposed access roads and footways around the site are proposed to be installed with a permeable build-up, allowing water to drain as before.

There will be five small substations installed in different locations on the site. These will each provide a very small increase in impermeable area. It is proposed to drain these areas via individual new piped surface water networks which will discharge into the existing drainage ditches on the site.

The proposed drainage strategy general arrangement drawings are included in **Appendix E** of this report.

5.2 Surface Water

In line with the Drainage Hierarchy, surface water runoff from a site should endeavour to be controlled as close to the source as possible. Discharge from the site should be via one of the methods detailed in **Table 1**, in descending priority;

Table 1: Discharge Opportunities

London Sustainable Drainage Hierarchy	Site Specific Application
Store rainwater for later use	Rainwater harvesting is not suitable for this type of development. There are limited impermeable areas and no proposed planting/development for the stored rainwater to serve.
Use infiltration techniques, such as porous surfaces in non-clay areas	It is proposed for the site to drain via infiltration as per existing.
Attenuate rainwater in ponds or open water features for gradual release	Due to the very minimal increase in impermeable areas (from the substations only) attenuation via the use of a pond or open water features is not deemed suitable for this development.
Attenuate rainwater by storing it in tanks or sealed water features for gradual release	Due to the very minimal increase in impermeable areas (from the substations only), attenuation tanks are not deemed suitable or necessary for this development.
Discharge rainwater directly to a watercourse	It is proposed that the existing drainage ditches running through the site be maintained and reused as part of the development.

London Sustainable Drainage Hierarchy	Site Specific Application
	This will require the installation of culverts in places to ensure flow is maintained through the proposed road networks. Runoff from the substations is to be discharged via gravity directly into the existing drainage ditches on site. Due to the very minimal new impermeable areas from the substations and the very low risk of contamination arising from these areas, this has been deemed the most suitable and efficient way of draining the site.
Discharge rainwater to a surface water sewer/drain	It is proposed to discharge via infiltration and existing drainage ditches, hence discharging to a surface water sewer or drain has not been considered further in this report.
Discharge rainwater to a combined sewer	It is proposed to discharge via infiltration and existing drainage ditches, hence discharging to a combined water sewer or drain has not been considered further in this report.

5.2.1 Proposed Site Discharge

It is proposed for the site to discharge as per existing following the completion of the solar farm. This is mainly via infiltration with excess surface water being collected via drainage ditches within the site.

The very minimal increase in impermeable areas from the proposed substation units is to be discharged via new piped networks directly into the drainage ditches.

Based on the proposed roof area of the substations being 58m². A simple hydraulic network has shown that the maximum flow rate during a 1 in 100 year + 40% Climate Change event would be 3.7l/s.

Based on the large site area of 52ha it would not be expected for these additional flows to increase flood risk or the ditches on or downstream of the proposed development site.

5.2.2 Attenuation

It is not proposed to install any forms of attenuation in the proposed drainage design.

5.2.3 Sustainable Drainage Systems

Developments should utilise sustainable drainage systems (SuDS) unless there are practical reasons for not doing so. As mentioned previously, the design should aim to reduce run-off rates and ensure that run-off is managed as close to its source as possible as per the drainage hierarchy (see Table 1).

The SuDS Hierarchy sets out the preferred method of discharging and managing water from a development site and aims to highlight why each item has been utilised or discounted.

Table 2 analyses the SuDS hierarchy and the appropriate techniques with a specific focus on this project.

Table 2: SuDS Opportunities

SuDS Technique	Site Specific Analysis
Rainwater Harvesting	Due to the limited impermeable/roof area as part of the proposed development, and the limited need for the re-use of rainwater on-site, rainwater harvesting has not been deemed suitable for this development.
Living or Roofs/Areas	There are no suitable roof areas for living roofs to be utilized in this development.
Basins and Ponds	Due to the lack of attenuation requirements in the proposed drainage design, basins or ponds have not been deemed suitable for this development.
Filter Strips and Swales	Filter strips and swales have not been deemed suitable for this development. The risk of contamination for the development is very low and there are no attenuation requirements.
Infiltration Devices	It is proposed for the new roads serving the development to be permeable construction and drain directly to the ground. The areas serving the PV panels will infiltrate as per existing.
Permeable Surfaces	The proposed roads will consist of permeable surfaces.
Tanked Systems	No tanked systems are being proposed in the drainage design.

5.2.4 Flood Exceedance

In the event the proposed drainage is exceeded there would likely be localised flooding around the substation units. Flood water would flow overground from here towards the drainage ditches and away from the site.

Based on the topographical survey levels generally fall towards the northwest corner of the site. Beyond this point is further grassland separating the site from nearby infrastructure. The FRA explains that the site has very low to high risk of flooding from surface water due to a major overland flow route crossing the site, in the event of exceedance flood water would be expected to follow the route of the nearby watercourses and would flow to the north and west away from the site and nearby properties.

5.3 Foul Water

There are no foul drainage requirements as part of the proposed development.

6 General Maintenance

It is assumed that all drainage within the site will be maintained as a private network. A suitable maintenance strategy will be included within handover documentation by the contractor once final details and suppliers have been chosen for the individual drainage elements. This strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.

An Operation and Maintenance Manual of the proposed drainage features is included in **Appendix F** of this report.

7 Conclusions and Recommendations

This report is intended to provide further details on the design of the drainage systems for the proposed redevelopment of Barkham Solar Farm and to act as additional information in support of the planning application. The conclusions to be drawn from this report are as follows:

- A detailed FRA has been carried out for the site by WSP. The report shows the majority of the site lies within Flood Zone 1 with a small area to the north of the site located within Flood Zone 2.
- It is proposed for the majority of the site to drain via infiltration as existing.
- The new roads being installed to allow vehicular access to the site will be fully permeable and are to infiltrate directly to the ground.
- The site is served by existing drainage ditches. As the site is to mostly drain as per existing with minimal increase in impermeable areas it is expected the flow into and through the existing drainage ditches will remain unchanged by the proposed works.
- There are several substations and containers to be located in various locations throughout the site. It is proposed for these to be drained via new piped networks and discharged to the existing drainage ditches on site.
- There are no foul drainage requirements as part of the proposed development.
- There is no risk of contamination due to the minimal increase in impermeable areas.

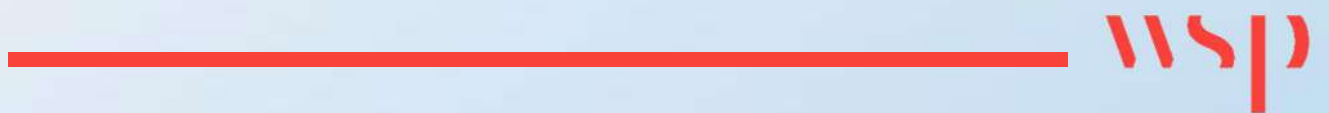
8 Appendices

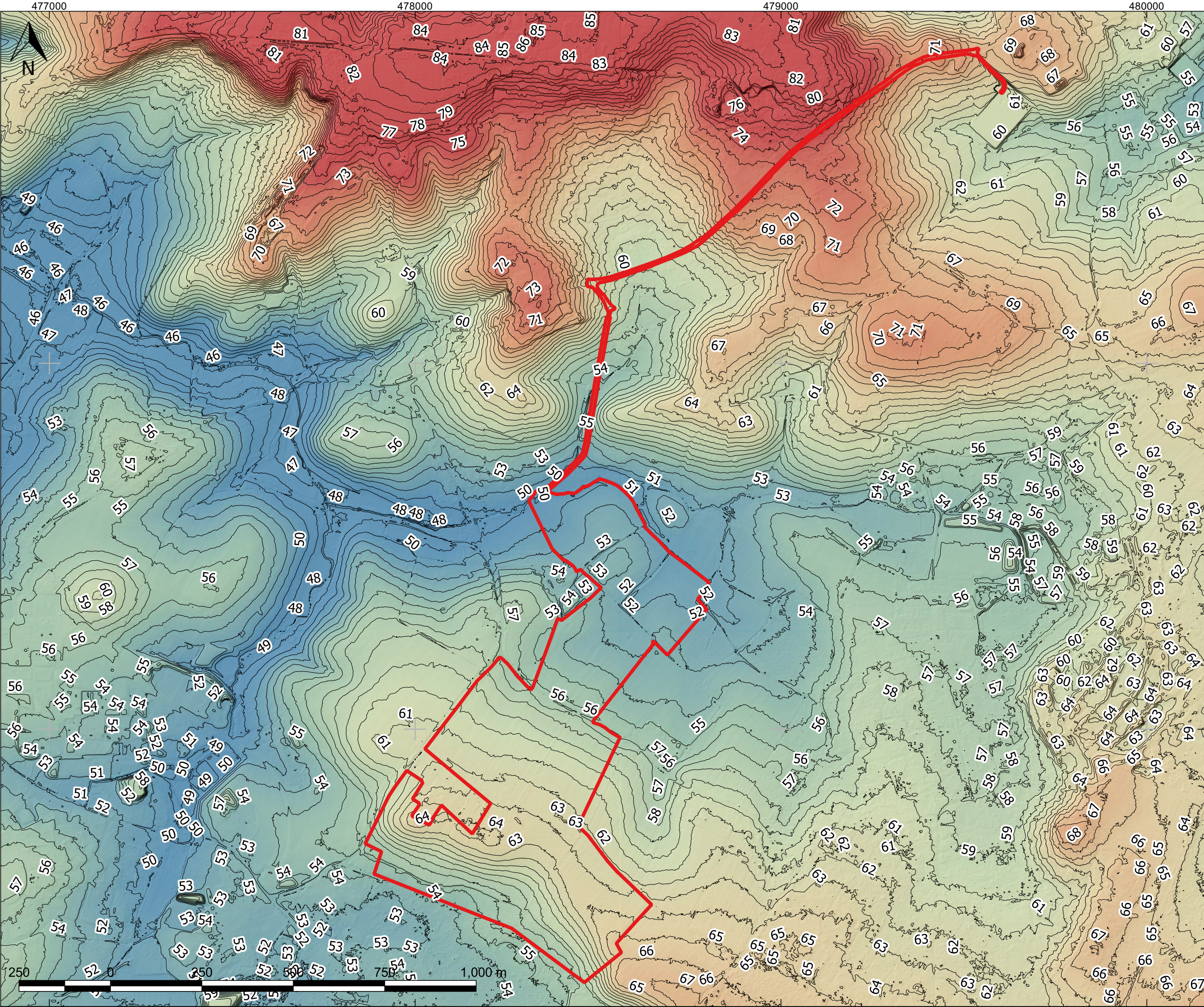
- 8.1 A – Topographical Survey
- 8.2 B – Haul Road Design
- 8.3 C – Proposed Site Layout
- 8.4 D – WSP Flood Risk Assessment
- 8.5 E – Proposed Drainage General Arrangement Drawings
- 8.6 F – Operations and Maintenance Manual

A – Topographical Survey

Appendix B

TOPOGRAPHIC PLAN AND SURVEY





KEY:

Site Boundary

Existing Ground Levels (mAOD)

	≤ 50
	50-55
	55-60
	60-65
	65-70
	≥70

A	09/03/21	JD	FIRST ISSUE		JG	GH
REV	DATE	DRW	DESCRIPTION		CHK	APP

STATUS:

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WOKINGHAM BOROUGH COUNCIL

ARCHITECT:

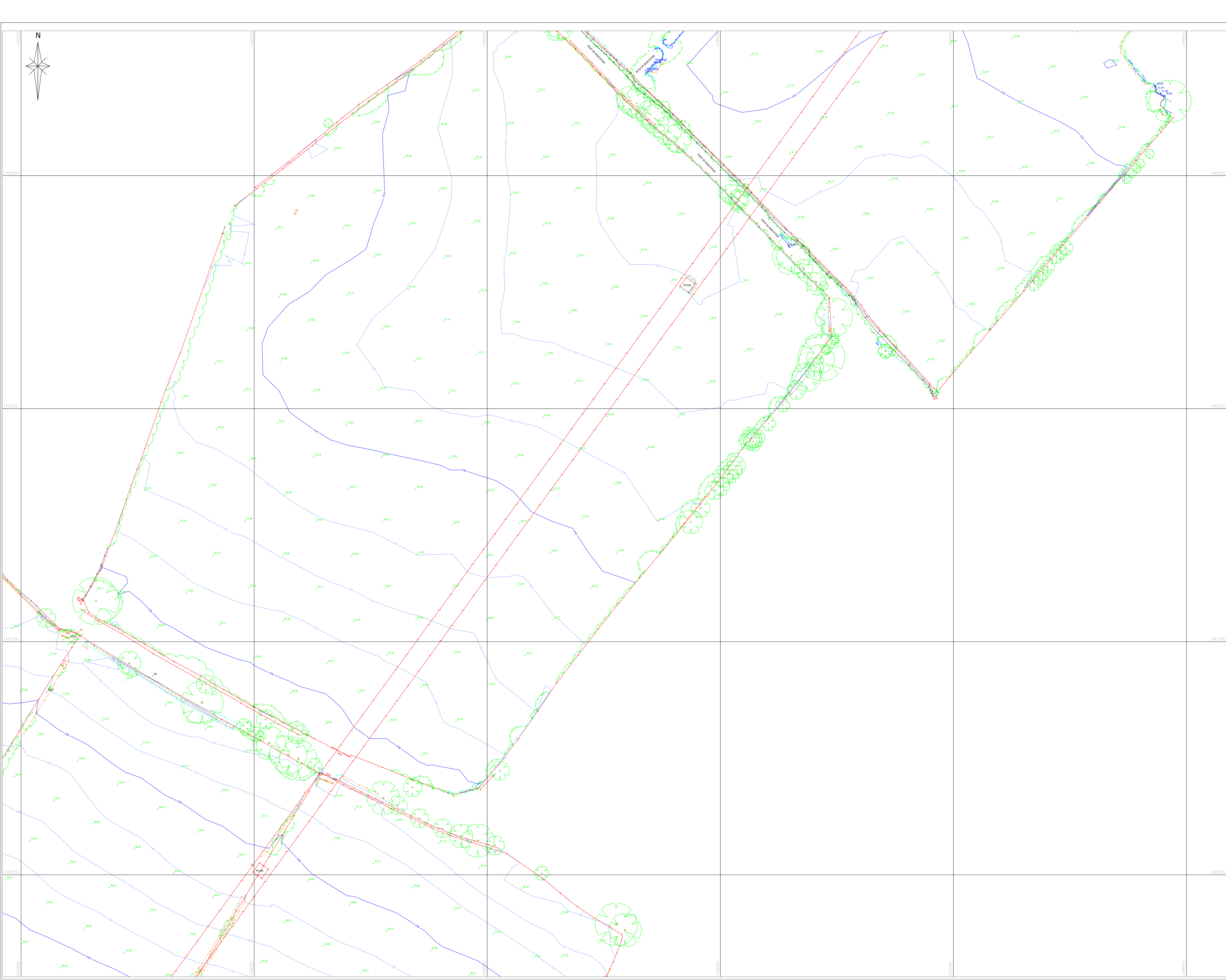
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BARKHAM FARMS

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PROJECT No: 70074897	DRAWING No: 4897-TOP-001	REV: A



NOTES

Grid: Local Grid orientated to OS Grid (OSTN15)
Datum: Ordnance Survey Datum (OSGM15)
Site centred about station RH01
Site Centred Local Scale Factor: 1.000000
Surveyed using Trimble GNSS and Total Station equipment

SURVEY LEGEND	
	Buildings
	Box (Outline)
	Edge of Concrete (Bottom)
	Edge of Concrete (Top)
	Batter (Bottom)
	Edge of Concrete
	Electricity Trans Line
	Edge of Metal
	Edge of Path
	TEXT
	Batter (Top)
	Fence (Unspecified)
	Fence (Close Boarded)
	Fence (Concrete)
	Fence (Solid Metal)
	Fence (Post and Wire)
	Fence (Rail)
	Fence (Wooden Rail)
	Edge of Grass
	Hedge/line Left
	Levels (Streambed)
	Edge of Stream
	Shrubline Right
	Tank
	Tank
	Treeline
	Treeline (Trunk Right)
	Cover Outline (General)
	Cover Outline (Gully)
	Wall
	Pylon
	Gate
	Pipe (Top)
	Spot Level (Concrete)
	Spot Level (Earth)
	Spot Level (Grass)
	Trees
	Electricity Pole
	Post
	Road Sign (Point)
	Stay
	Telephone (Poles)

REV.	DETAILS	DRN	CHKD	DATE

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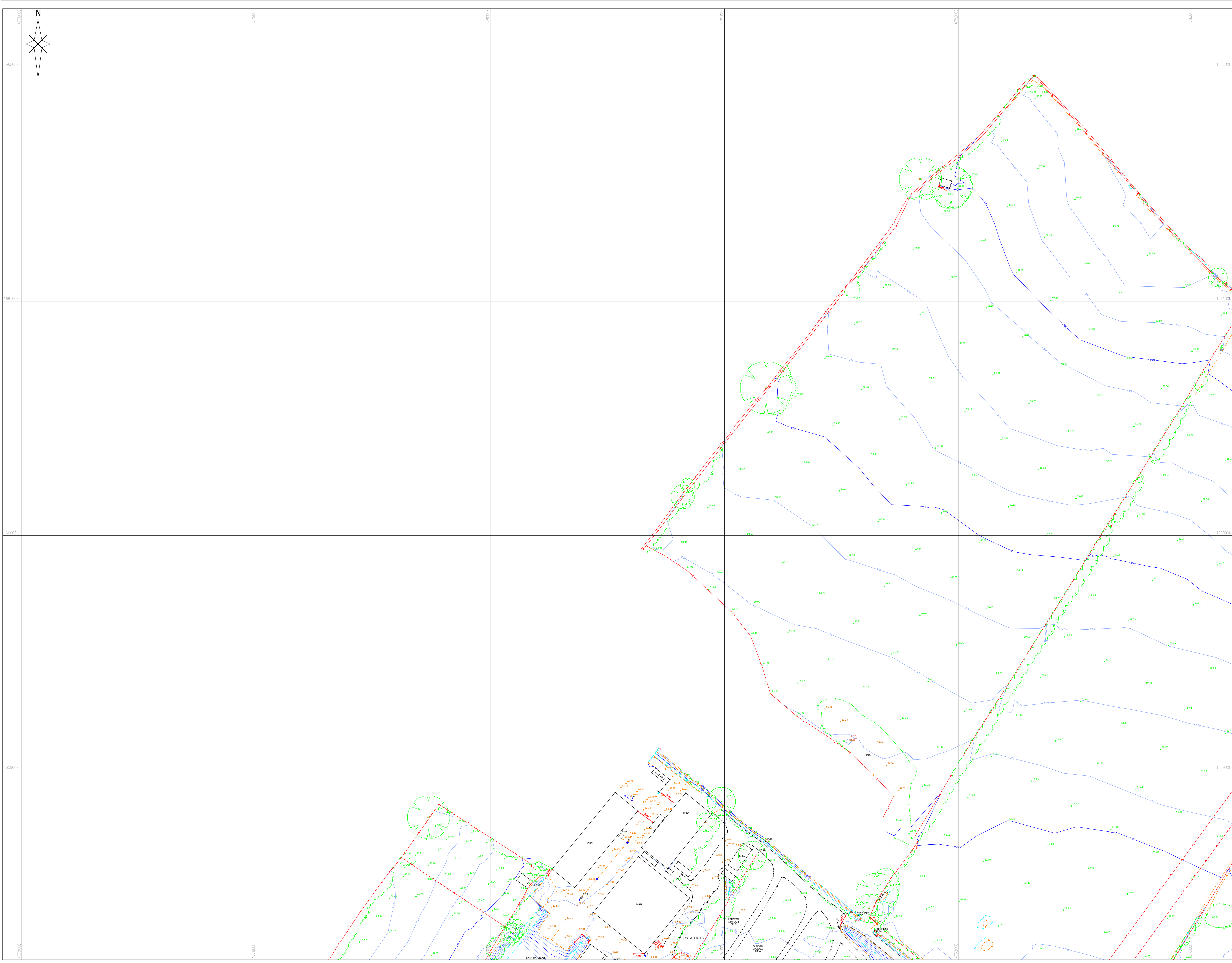
Project / Drawing Title

BARKHAM FARMS
WOKINGHAM BOROUGH COUNCIL

Scale	1:500	Size	A0	Date	02/12/2020
Drawn By	LS	Checked By	RH	Approved By	CS

Drawing Name / Number

TOPOGRAPHICAL SURVEY
AS AT NOVEMBER 2020
70074897-WSP-TOPO-01
SHEET 2 OF 6



NOTES
Grid: Local Grid orientated to OS Grid (OSTN15)
Datum: Ordnance Survey Datum (OSGM415)
Site centred about station RH45
Site Centred Local Scale Factor: 1.000000
Surveyed using Trimble GNSS and Total Station equipment

- SURVEY LEGEND
- Buildings
 - Box (Outline)
 - Edge of Concrete (Bottom)
 - Edge of Concrete (Top)
 - Batter (Bottom)
 - Edge of Concrete
 - Electricity Trans Line
 - Edge of Metal
 - Edge of Path
 - TEXT
 - Batter (Top)
 - Fence (Unspecified)
 - Fence (Close Boarded)
 - Fence (Concrete)
 - Fence (Solid Metal)
 - Fence (Post and Wire)
 - Fence (Rail)
 - Fence (Wooden Rail)
 - Edge of Grass
 - Hedge/Line Left
 - Levels (Streambed)
 - Edge of Stream
 - Shrubline Right
 - Tank
 - Treeline
 - Treeline (Trunks Right)
 - Cover Outline (General)
 - Cover Outline (Gully)
 - Wall
 - Pylon
 - Gate
 - Pipe (Top)
 - Spot Level (Concrete)
 - Spot Level (Earth)
 - Spot Level (Grass)
 - Trees
 - Electricity Pole
 - Post
 - Road Sign (Point)
 - Stay
 - Telephone (Poles)

REV.	DETAILS	DRN	CHKD	DATE

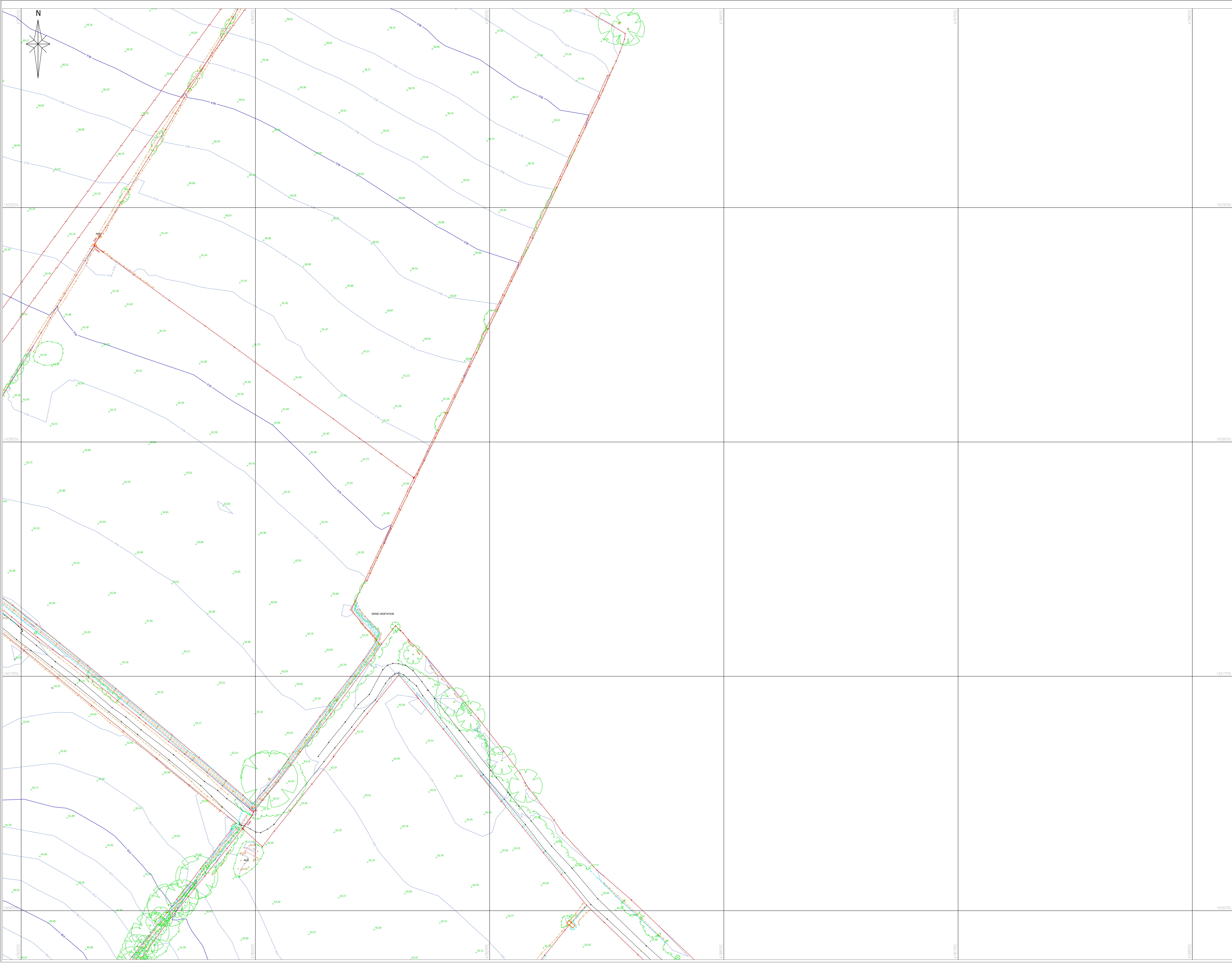
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Project / Drawing Title
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Drawn By LS	Checked By RH	Approved By CS

Drawing Name / Number
**TOPOGRAPHICAL SURVEY
AS AT NOVEMBER 2020
70074897-WSP-TOPO-01
SHEET 3 OF 6**



NOTES
Grid: Local Grid orientated to OS Grid (OSTN15)
Datum: Ordnance Survey Datum (OSGM15)
Site centred about station RH01
Site Centred Local Scale Factor: 1.0000000
Surveyed using Trimble GNSS and Total Station equipment

SURVEY LEGEND	
	Buildings
	Box (Outline)
	Edge of Concrete (Bottom)
	Edge of Concrete (Top)
	Batter (Bottom)
	Edge of Concrete
	Electricity Trans Line
	Edge of Metal
	Edge of Path
	TEXT
	Batter (Top)
	Fence (Unspecified)
	Fence (Close Boarded)
	Fence (Concrete)
	Fence (Solid Metal)
	Fence (Post and Wire)
	Fence (Rail)
	Fence (Wooden Rail)
	Edge of Grass
	Hedge/line Left
	Levels (Streambed)
	Edge of Stream
	Shrubline Right
	Tank
	Treeline
	Treeline (Trunks Right)
	Cover Outline (General)
	Cover Outline (Gully)
	Wall
	Pylon
	Gate
	Pipe (Top)
	Spot Level (Concrete)
	Spot Level (Earth)
	Spot Level (Grass)
	Trees
	Electricity Pole
	Post
	Road Sign (Point)
	Stay
	Telephone (Poles)

REV.	DETAILS	DRN	CHKD	DATE

STATIONS			
SURVEY STATIONS			
Name	Easting	Northing	Height
PH01	47848.797	355040.233	55.467
PH02	478326.329	355077.613	51.563
PH03	47802.417	355027.385	51.545
PH04	478207.213	355036.403	52.728
PH05	478703.004	355055.003	51.543
PH06	47822.574	355031.003	51.544
PH07	478113.324	355033.622	51.546
PH08	478212.464	355032.756	51.546
PH09	478026.133	355026.266	55.004
PH10	478213.255	355045.638	51.546
PH11	478026.133	355045.638	51.546
PH12	478026.133	355045.638	51.546
PH13	478026.133	355045.638	51.546
PH14	478026.133	355045.638	51.546
PH15	478026.133	355045.638	51.546
PH16	478026.133	355045.638	51.546
PH17	478026.133	355045.638	51.546
PH18	478026.133	355045.638	51.546
PH19	478026.133	355045.638	51.546
PH20	478026.133	355045.638	51.546
PH21	478026.133	355045.638	51.546
PH22	478026.133	355045.638	51.546
PH23	478026.133	355045.638	51.546
PH24	478026.133	355045.638	51.546
PH25	478026.133	355045.638	51.546
PH26	478026.133	355045.638	51.546
PH27	478026.133	355045.638	51.546
PH28	478026.133	355045.638	51.546
PH29	478026.133	355045.638	51.546
PH30	478026.133	355045.638	51.546
PH31	478026.133	355045.638	51.546
PH32	478026.133	355045.638	51.546
PH33	478026.133	355045.638	51.546
PH34	478026.133	355045.638	51.546
PH35	478026.133	355045.638	51.546
PH36	478026.133	355045.638	51.546
PH37	478026.133	355045.638	51.546
PH38	478026.133	355045.638	51.546
PH39	478026.133	355045.638	51.546
PH40	478026.133	355045.638	51.546
PH41	478026.133	355045.638	51.546
PH42	478026.133	355045.638	51.546
PH43	478026.133	355045.638	51.546
PH44	478026.133	355045.638	51.546
PH45	478026.133	355045.638	51.546
PH46	478026.133	355045.638	51.546
PH47	478026.133	355045.638	51.546
PH48	478026.133	355045.638	51.546
PH49	478026.133	355045.638	51.546
PH50	478026.133	355045.638	51.546
PH51	478026.133	355045.638	51.546
PH52	478026.133	355045.638	51.546
PH53	478026.133	355045.638	51.546
PH54	478026.133	355045.638	51.546
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PH72	478026.133	355045.638	51.546
PH73	478026.133	355045.638	51.546
PH74	478026.133	355045.638	51.546
PH75	478026.133	355045.638	51.546
PH76	478026.133	355045.638	51.546
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PH95	478026.133	355045.638	51.546
PH96	478026.133	355045.638	51.546
PH97	478026.133	355045.638	51.546
PH98	478026.133	355045.638	51.546
PH99	478026.133	355045.638	51.546
PH100	478026.133	355045.638	51.546

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wsp.com

Project / Drawing Title

**BARKHAM FARMS
WOKINGHAM BOROUGH COUNCIL**

Scale 1:500	Size A0	Date 02/12/2020
Drawn By LS	Checked By RH	Approved By CS

Drawing Name / Number
**TOPOGRAPHICAL SURVEY
AS AT NOVEMBER 2020
70074897-WSP-TOPO-01
SHEET 4 OF 6**



NOTES
Grid: Local Grid orientated to OS Grid (OSTN15)
Datum: Ordnance Survey Datum (OSGM415)
Site centred about station RH01 1.000000
Surveyed using Trimble GNSS and Total Station equipment

- SURVEY LEGEND
- Buildings
 - Box (Outline)
 - Edge of Concrete (Bottom)
 - Edge of Concrete (Top)
 - Batter (Bottom)
 - Edge of Concrete
 - Electricity Trans Line
 - Edge of Metal
 - Edge of Path
 - TEXT
 - Batter (Top)
 - Fence (Unspecified)
 - Fence (Close Boarded)
 - Fence (Concrete)
 - Fence (Solid Metal)
 - Fence (Post and Wire)
 - Fence (Rail)
 - Fence (Wooden Rail)
 - Edge of Grass
 - Hedge/Line Left
 - Levels (Streambed)
 - Edge of Stream
 - Shrubline Right
 - Tank
 - Treeline
 - Treeline (Trunks Right)
 - Cover Outline (General)
 - Cover Outline (Gully)
 - Wall
 - Pylon
 - Gate
 - Pipe (Top)
 - Spot Level (Concrete)
 - Spot Level (Earth)
 - Spot Level (Grass)
 - Trees
 - Electricity Pole
 - Post
 - Road Sign (Point)
 - Stay
 - Telephone (Poles)

REV.	DETAILS	DRN	CHKD	DATE

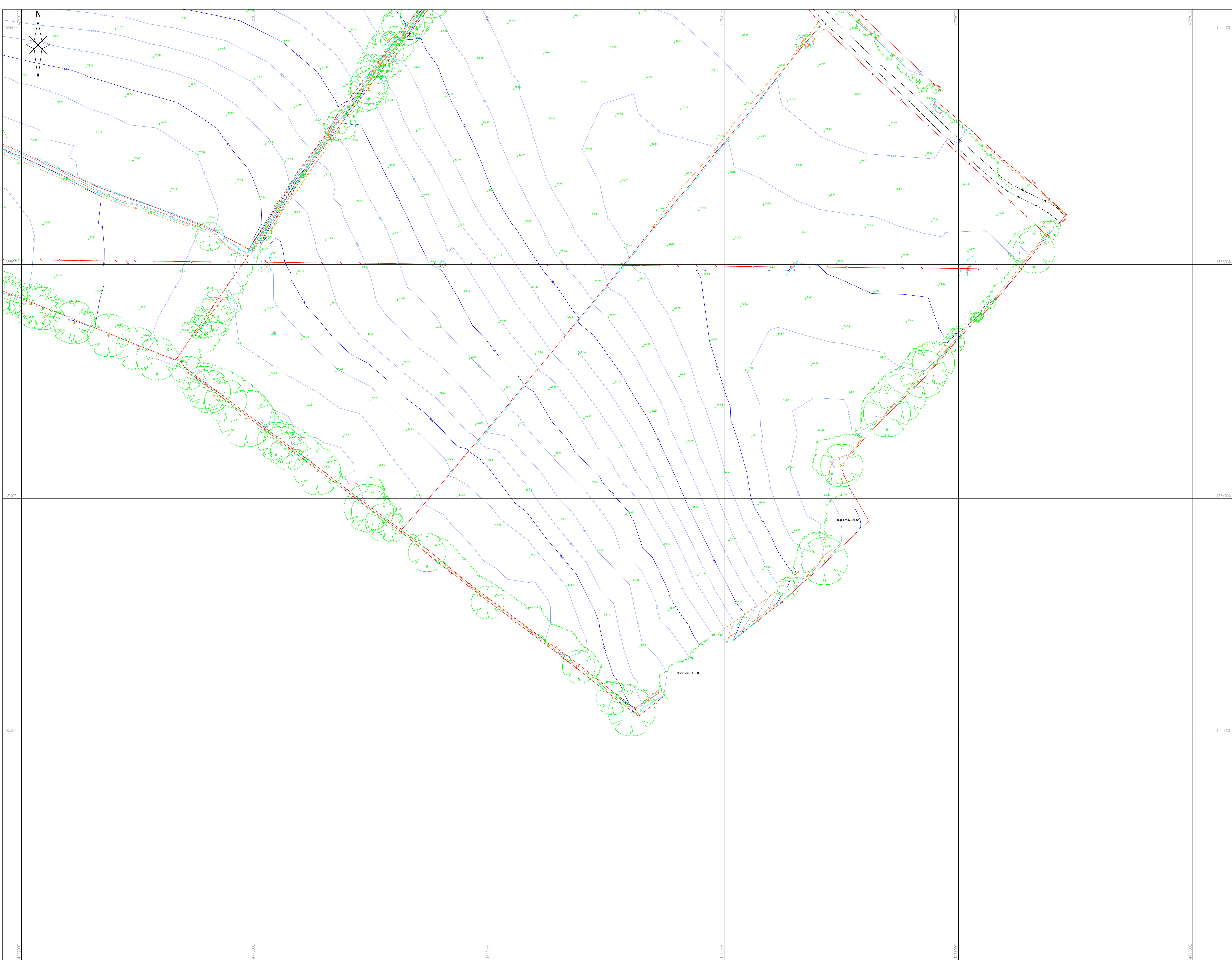
STATIONS			
SURVEY STATIONS			
Name	Easting	Northing	Height
PH01	47848.79	56862.23	56.407
PH02	47838.39	56977.61	56.501
PH03	47835.47	56955.38	56.545
PH04	47827.23	56758.40	56.728
PH05	47873.04	56855.00	56.342
PH06	47811.83	56751.03	56.394
PH07	47813.324	56811.62	57.048
PH08	47812.464	56957.74	56.898
PH09	47806.13	56904.28	56.694
PH10	47821.25	56945.63	56.885
PH11	47822.58	56945.63	56.885
PH12	47822.58	56945.63	56.885
PH13	47822.58	56945.63	56.885
PH14	47822.58	56945.63	56.885
PH15	47822.58	56945.63	56.885
PH16	47822.58	56945.63	56.885
PH17	47822.58	56945.63	56.885
PH18	47822.58	56945.63	56.885
PH19	47822.58	56945.63	56.885
PH20	47822.58	56945.63	56.885
PH21	47822.58	56945.63	56.885
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PH23	47822.58	56945.63	56.885
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PH25	47822.58	56945.63	56.885
PH26	47822.58	56945.63	56.885
PH27	47822.58	56945.63	56.885
PH28	47822.58	56945.63	56.885
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PH30	47822.58	56945.63	56.885
PH31	47822.58	56945.63	56.885
PH32	47822.58	56945.63	56.885
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PH34	47822.58	56945.63	56.885
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PH95	47822.58	56945.63	56.885
PH96	47822.58	56945.63	56.885
PH97	47822.58	56945.63	56.885
PH98	47822.58	56945.63	56.885
PH99	47822.58	56945.63	56.885
PH100	47822.58	56945.63	56.885



Project / Drawing Title
**BARKHAM FARMS
WOKINGHAM BOROUGH COUNCIL**

Scale	1:500	Size	A0	Date	02/12/2020
Drawn By	LS	Checked By	RH	Approved By	CS

Drawing Name / Number
**TOPOGRAPHICAL SURVEY
AS AT NOVEMBER 2020
70074897-WSP-TOPO-01
SHEET 5 OF 6**

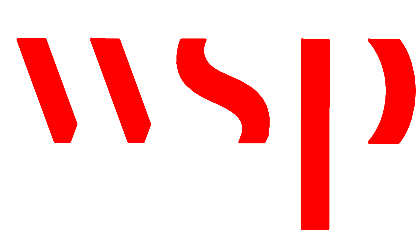


NOTES
Grid: Local Grid orientated to OS Grid (OSTN15)
Datum: Ordnance Survey Datum (OSGM415)
Site centred about station RH45
Site Centred Local Scale Factor: 1.000000
Surveyed using Trimble GNSS and Total Station equipment

SURVEY LEGEND	
Box	Buildings
Box Outline	Box Outline
Edge of Concrete (Bottom)	Edge of Concrete (Bottom)
Edge of Concrete (Top)	Edge of Concrete (Top)
Batter (Bottom)	Batter (Bottom)
Edge of Concrete	Edge of Concrete
Electricity Trans Line	Electricity Trans Line
Edge of Metal	Edge of Metal
Edge of Path	Edge of Path
TEXT	TEXT
Batter (Top)	Batter (Top)
Fence (Unspecified)	Fence (Unspecified)
Fence (Close Boarded)	Fence (Close Boarded)
Fence (Concrete)	Fence (Concrete)
Fence (Solid Metal)	Fence (Solid Metal)
Fence (Post and Wire)	Fence (Post and Wire)
Fence (Rail)	Fence (Rail)
Fence (Wooden Rail)	Fence (Wooden Rail)
Edge of Grass	Edge of Grass
Hedge Line Left	Hedge Line Left
Levels (Streambed)	Levels (Streambed)
Edge of Stream	Edge of Stream
Shrubline Right	Shrubline Right
Tank	Tank
Treeline	Treeline
Treeline (Trunk Right)	Treeline (Trunk Right)
Cover Outline (General)	Cover Outline (General)
Cover Outline (Gully)	Cover Outline (Gully)
Wall	Wall
Pylon	Pylon
Gate	Gate
Pipe (Tap)	Pipe (Tap)
Spot Level (Concrete)	Spot Level (Concrete)
Spot Level (Earth)	Spot Level (Earth)
Spot Level (Grass)	Spot Level (Grass)
Tree	Tree
Electricity Pole	Electricity Pole
Post	Post
Road Sign (Point)	Road Sign (Point)
Stay	Stay
Telephone (Poles)	Telephone (Poles)

REV.	DETAILS	DRN	CHKD	DATE

STATIONS			
SURVEY STATIONS			
Name	Easting	Northing	Height
PH41	478448.797	355040.233	54.407
PH42	478328.329	355077.613	54.503
PH43	478303.477	355075.305	54.545
PH46	478207.213	355758.403	53.728
PH47	478070.504	355050.007	54.163
PH48	478113.324	356101.622	53.748
PH49	478121.044	355975.756	54.288
PH49	478036.133	355028.286	54.004
PH50	478213.126	355040.638	54.085
PH51	478103.594	356111.094	53.533
PH52	478047.477	356111.077	53.073
PH53	478448.705	356021.816	53.071
PH54	478441.119	355758.468	53.379



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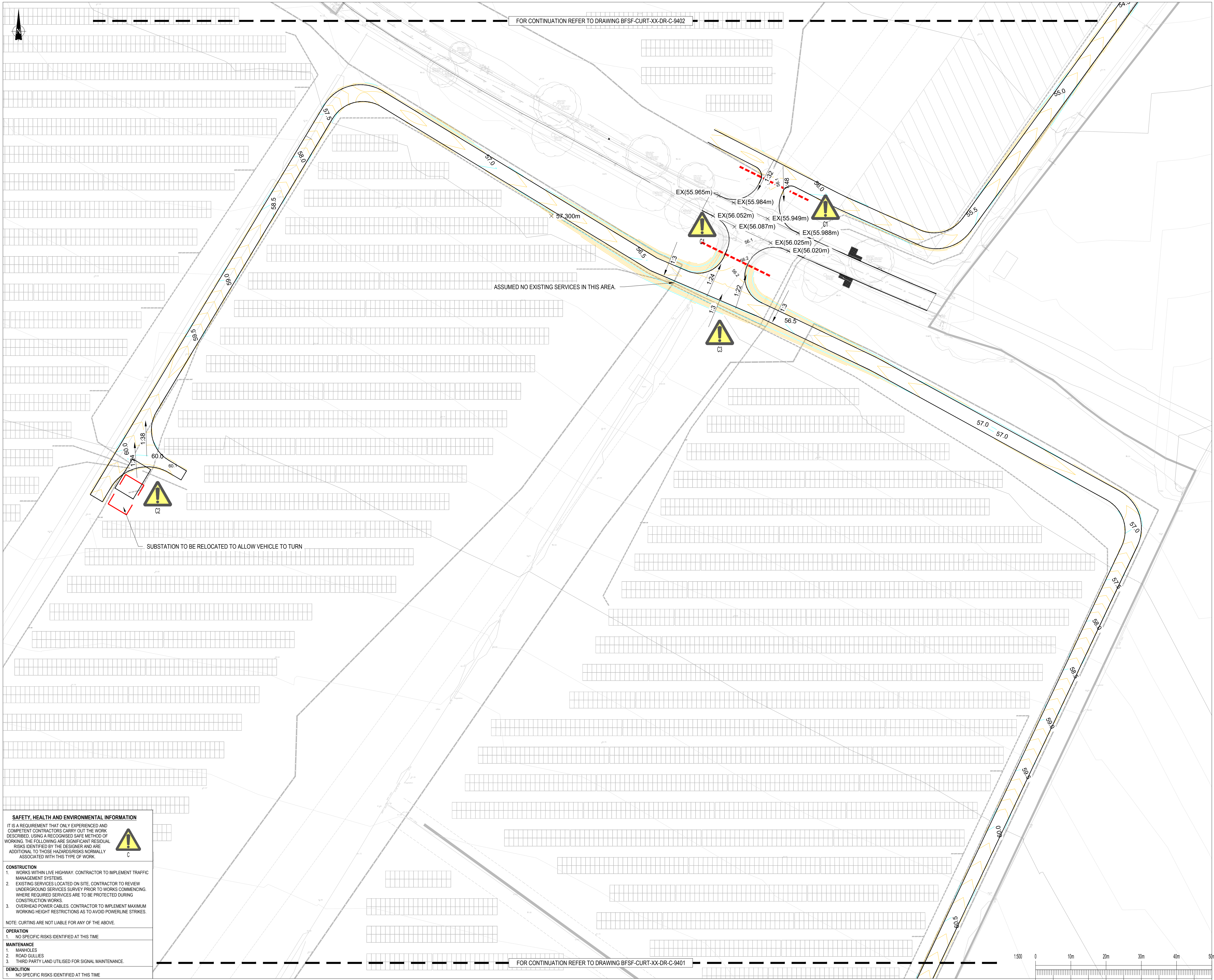
Project / Drawing Title

BARKHAM FARMS
WOKINGHAM BOROUGH COUNCIL

Scale	1:500	Size	A0	Date	02/12/2020
Drawn By	LS	Checked By	RH	Approved By	CS

Drawing Name / Number
TOPOGRAPHICAL SURVEY
AS AT NOVEMBER 2020
70074897-WSP-TOPO-01
SHEET 6 OF 6

B – Haul Road Design



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
IT IS A REQUIREMENT THAT ONLY EXPERIENCED AND COMPETENT CONTRACTORS CARRY OUT THE WORK DESCRIBED, USING A RECOGNISED SAFE METHOD OF WORKING. THE FOLLOWING ARE SIGNIFICANT RESIDUAL RISKS IDENTIFIED BY THE DESIGNER AND ARE ADDITIONAL TO THOSE HAZARD RISKS NORMALLY ASSOCIATED WITH THIS TYPE OF WORK.


C

CONSTRUCTION
1. WORKS WITHIN LIVE HIGHWAY. CONTRACTOR TO IMPLEMENT TRAFFIC MANAGEMENT SYSTEMS.
2. EXISTING SERVICES LOCATED ON SITE. CONTRACTOR TO REVIEW UNDERGROUND SERVICES SURVEY PRIOR TO WORKS COMMENCING. WHERE REQUIRED SERVICES ARE TO BE PROTECTED DURING CONSTRUCTION WORKS.
3. OVERHEAD POWER CABLES. CONTRACTOR TO IMPLEMENT MAXIMUM WORKING HEIGHT RESTRICTIONS AS TO AVOID POWERLINE STRIKES.

NOTE: CURTINS ARE NOT LIABLE FOR ANY OF THE ABOVE.

OPERATION
1. NO SPECIFIC RISKS IDENTIFIED AT THIS TIME.

MAINTENANCE
1. MANHOLES
2. ROAD GULLIES
3. THIRD PARTY LAND UTILISED FOR SIGNAL MAINTENANCE.

DEMOLITION
1. NO SPECIFIC RISKS IDENTIFIED AT THIS TIME.

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.

2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.

3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

4. FOR GENERAL NOTES REFER TO DRAWING.

5. TOPOGRAPHICAL SURVEY RECEIVED FROM EQUANS. DRAWING REF 230633-CAT-XX-XX-M3-G-00001

6. LANDSCAPE LAYOUT RECEIVED FROM EQUANS. DRAWING REF BFSF-DETR-ZZ-DR-XX-0001 REV P02

KEY

—

SITE BOUNDARY

× EX(50.000)

EXISTING LEVELS

× 50.000

PROPOSED LEVELS

—

MAJOR CONTOUR (0.1m INTERVALS)

—

MINOR CONTOUR (0.5m INTERVALS)

—

EXISTING CONTOURS

P02	UPDATED ISSUE	27/09/24	EB	MS
P01	DRAFT ISSUE	13/09/24	EB	MM
Rev:	Description:	Date:	By:	Chkd:

Curtins

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Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kendal • Leeds • Liverpool • London • Manchester • Nottingham

Status:

SUITABLE FOR AUTHORIZATION

S4

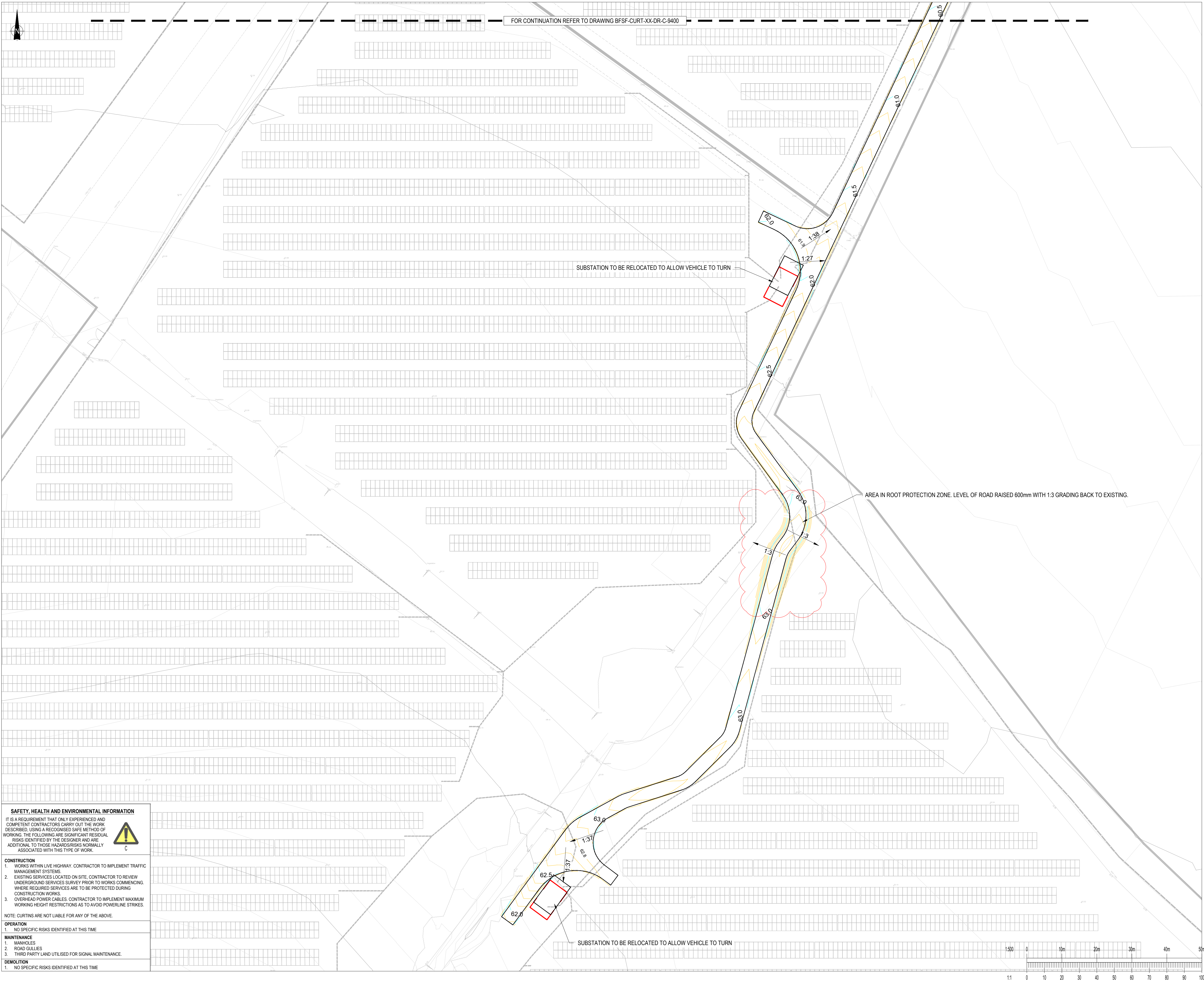
Project:

BARKHAM SOLAR FARM

Dwg Title:

HAUL ROAD PROPOSED LEVELS
SHEET 1

Drawn By	Designed By	Checked By	
EB	EB	MM	
Project No	Date	Scales @ A1	
	13/09/24	1:500	
Project Code - Originator - Function - Spatial - Form - Discipline - Number			Revision
BFSF-CURT- XX - DR- C - 9400			P02



GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
- FOR GENERAL NOTES REFER TO DRAWING.
- TOPOGRAPHICAL SURVEY RECEIVED FROM EQUANS. DRAWING REF 230633-CAT-XX-XX-M3-G-00001
- LANDSCAPE LAYOUT RECEIVED FROM EQUANS. DRAWING REF BFSF-DETR-ZZ-DR-XX-0001 REV P02

KEY	
—	SITE BOUNDARY
× EX(50.000)	EXISTING LEVELS
× 50.000	PROPOSED LEVELS
—	MAJOR CONTOUR (0.1m INTERVALS)
—	MINOR CONTOUR (0.5m INTERVALS)
—	EXISTING CONTOURS

P02	UPDATED ISSUE	27/09/24	EB	MS
P01	DRAFT ISSUE	13/09/24	EB	MM
Rev:	Description:	Date:	By:	Chkd:

Curtins

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Status: **SUITABLE FOR AUTHORIZATION** **S4**

Project: **BARKHAM SOLAR FARM**

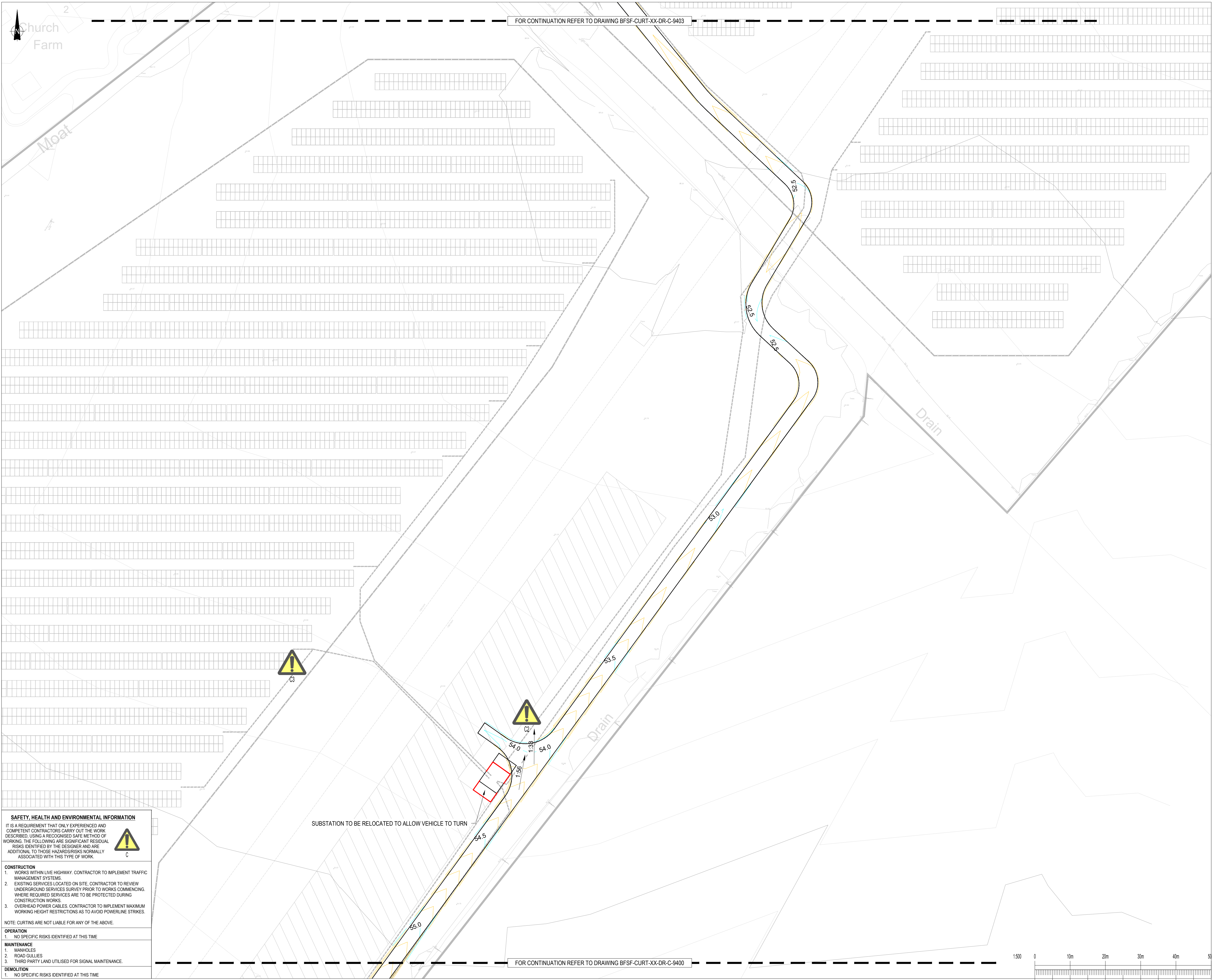
Dwg Title:

**HAUL ROAD PROPOSED LEVELS
SHEET 2**

Drawn By EB	Designed By EB	Checked By MM
Project No	Date 13/09/24	Scales @ A1 1:500
Project Code - Originator - Function - Spatial - Form - Discipline - Number		
Revision		

BFSF-CURT- XX - DR- C - 9401

P02



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
IT IS A REQUIREMENT THAT ONLY EXPERIENCED AND COMPETENT CONTRACTORS CARRY OUT THE WORK DESCRIBED, USING A RECOGNISED SAFE METHOD OF WORKING. THE FOLLOWING ARE SIGNIFICANT RESIDUAL RISKS IDENTIFIED BY THE DESIGNER AND ARE ADDITIONAL TO THOSE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THIS TYPE OF WORK.

C

CONSTRUCTION
1. WORKS WITHIN LIVE HIGHWAY. CONTRACTOR TO IMPLEMENT TRAFFIC MANAGEMENT SYSTEMS.
2. EXISTING SERVICES LOCATED ON SITE. CONTRACTOR TO REVIEW UNDERGROUND SERVICES SURVEY PRIOR TO WORKS COMMENCING. WHERE REQUIRED SERVICES ARE TO BE PROTECTED DURING CONSTRUCTION WORKS.
3. OVERHEAD POWER CABLES. CONTRACTOR TO IMPLEMENT MAXIMUM WORKING HEIGHT RESTRICTIONS AS TO AVOID POWERLINE STRIKES.

NOTE: CURTINS ARE NOT LIABLE FOR ANY OF THE ABOVE.

OPERATION
1. NO SPECIFIC RISKS IDENTIFIED AT THIS TIME.

MAINTENANCE
1. MANHOLES
2. ROAD GULLIES
3. THIRD PARTY LAND UTILISED FOR SIGNAL MAINTENANCE.

DEMOLITION
1. NO SPECIFIC RISKS IDENTIFIED AT THIS TIME.

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.

2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.

3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

4. FOR GENERAL NOTES REFER TO DRAWING.

5. TOPOGRAPHICAL SURVEY RECEIVED FROM EQUANS. DRAWING REF 230633-CAT-XX-XX-M3-G-00001

6. LANDSCAPE LAYOUT RECEIVED FROM EQUANS. DRAWING REF BFSF-DETR-ZZ-DR-XX-0001 REV P02

KEY

× EX(50.000)

× 50.000

SITE BOUNDARY

EXISTING LEVELS

PROPOSED LEVELS

MAJOR CONTOUR (0.1m INTERVALS)

MINOR CONTOUR (0.5m INTERVALS)

EXISTING CONTOURS

P02	UPDATED ISSUE	27/09/24	EB	MS
P01	DRAFT ISSUE	13/09/24	EB	MM
Rev:	Description:	Date:	By:	Chkd:

Curtins

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Civils & Structures • Transport Planning • Environmental • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer
Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kendal • Leeds • Liverpool • London • Manchester • Nottingham

Status:

SUITABLE FOR AUTHORIZATION

S4

Project:

BARKHAM SOLAR FARM

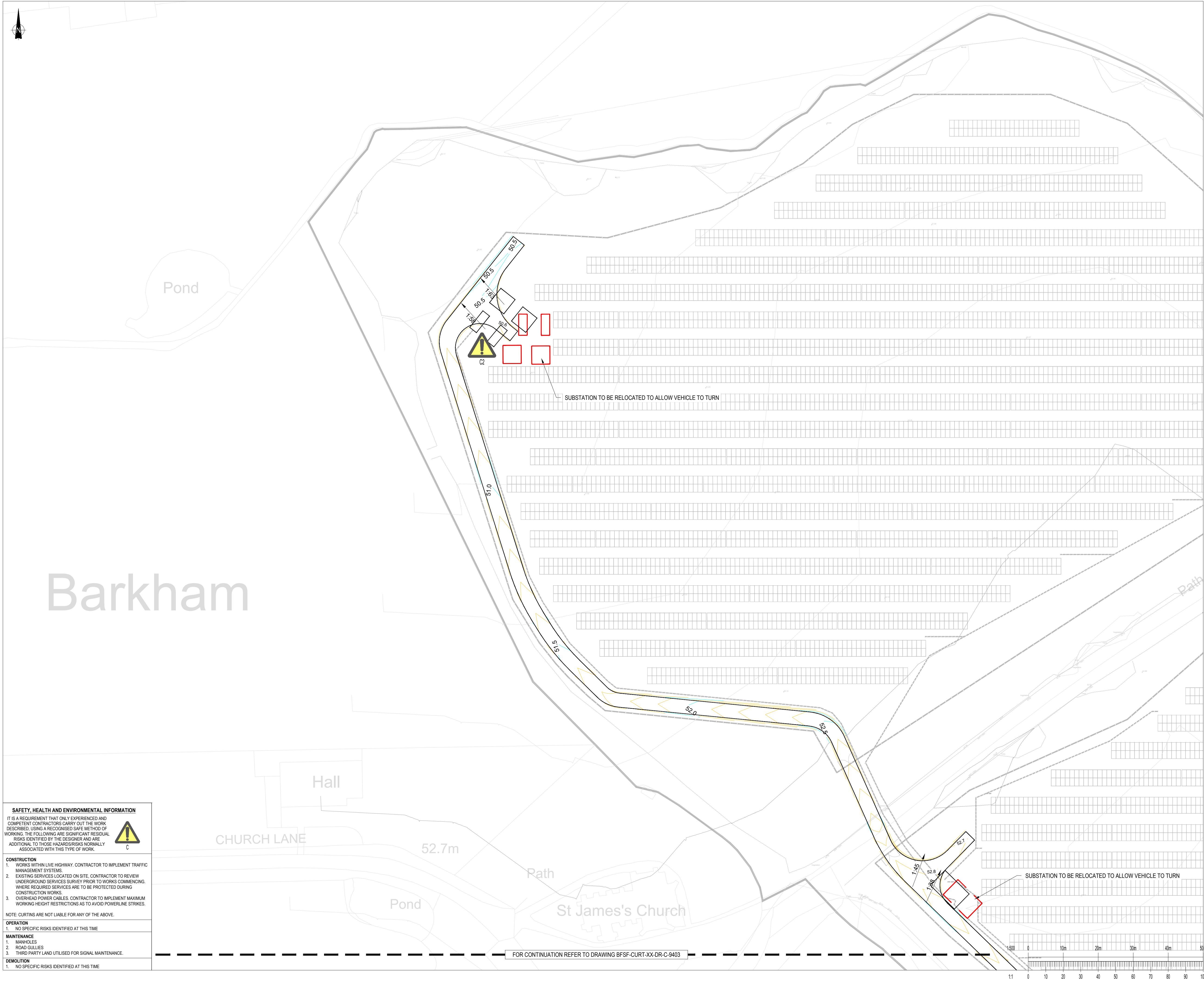
Dwg Title:

HAUL ROAD PROPOSED LEVELS
SHEET 3

Drawn By EB	Designed By EB	Checked By MM	
Project No	Date 13/09/24	Scales @ A1 1:500	
Project Code - Originator - Function - Spatial - Form - Discipline - Number			Revision

BFSF-CURT- XX - DR- C -9402

P02



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IT IS A REQUIREMENT THAT ONLY EXPERIENCED AND COMPETENT CONTRACTORS CARRY OUT THE WORK DESCRIBED, USING A RECOGNISED SAFE METHOD OF WORKING. THE FOLLOWING ARE SIGNIFICANT RESIDUAL RISKS IDENTIFIED BY THE DESIGNER AND ARE ADDITIONAL TO THOSE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THIS TYPE OF WORK.

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C

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KEY

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× EX(50.000)

EXISTING LEVELS

× 50.000

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Status:

SUITABLE FOR AUTHORIZATION

S4

Project:

BARKHAM SOLAR FARM

Dwg Title:

HAUL ROAD PROPOSED LEVELS
SHEET 5

Drawn By	Designed By	Checked By	
EB	EB	MM	
Project No	Date	Scales @ A1	
	13/09/24	1:500	
Project Code - Originator - Function - Spatial - Form - Discipline - Number			Revision
BFSF-CURT- XX - DR- C - 9404			P02

C – Proposed Site Layout