



TELECOMMUNICATION MASTS

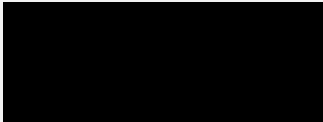
Phoenix Park, Nelson's Lane, Wokingham

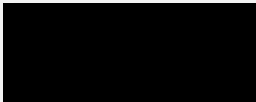
FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY

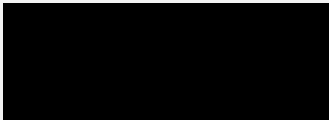
Project No	25-248-60
Revision No	02
Issue date	05/06/25

Control Sheet

This report has been prepared by Calibro Consultants Ltd for the sole benefit and use of the Client. Calibro Consultants Ltd offer no liability for the information contained within the report to any third party.

Prepared by	Signature	Date
Patrick Goodey BSc MSc Head of Flood Risk & Hydrology		05/06/2025

Reviewed by	Signature	Date
Cory Foster BSc Graduate Flood Risk Consultant		05/06/2025

Approved for issue by	Signature	Date
Patrick Goodey BSc MSc Head of Flood Risk & Hydrology		05/06/2025

CONTENTS

1	INTRODUCTION	3
2	EXISTING SITE AND PROPOSALS	4
3	FLOOD RISK	6
4	DRAINAGE STRATEGY	10
5	SUMMARY	13

Tables

Table 3-1	Water Quality Indices (as per C753 The SuDS Manual)	12
-----------	---	----

Figures

Figure 1-1	Site Location	3
Figure 2-2	Topography	4
Figure 3-1	Flood Zones	6
Figure 3-2	RoFSW with Climate Change	7
Figure 3-3	Topo Survey Extract	8
Figure 3-3	Depth-Duration Curve Model Results	11

Appendices

Appendix A	Topographic Survey
Appendix B	Site Proposals

1 INTRODUCTION

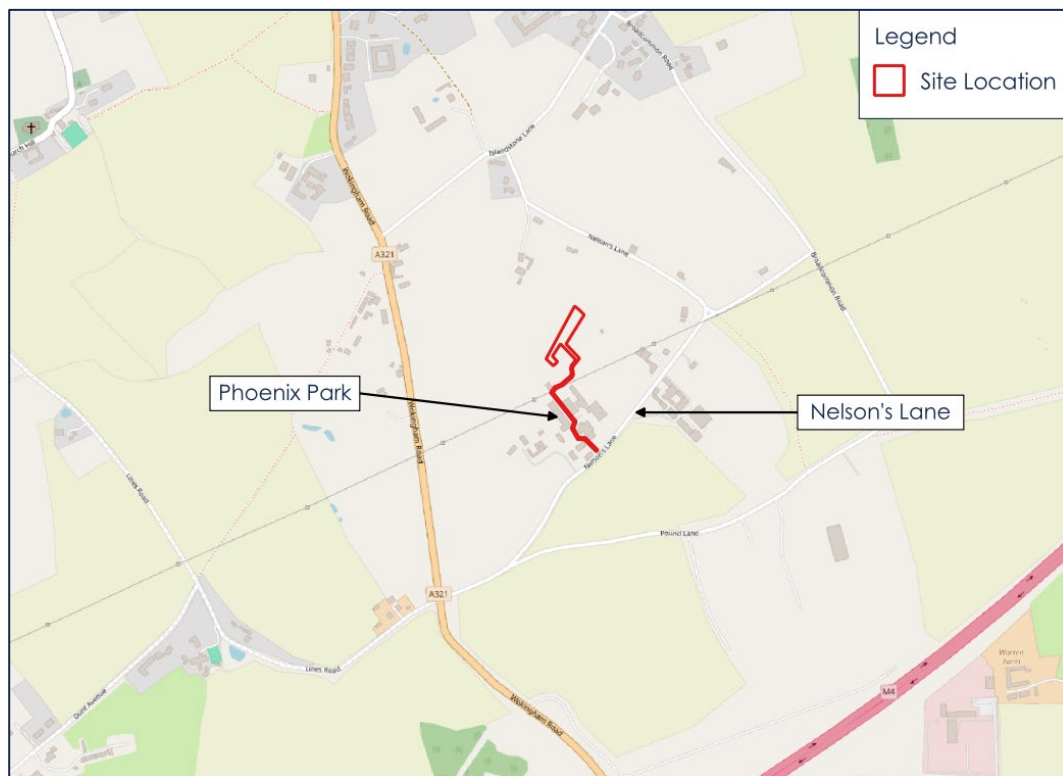
1.1 Background

- 1.1.1 Calibro has been appointed to undertake a Drainage Strategy to support a planning application for the installation of two telecommunications masts with associated maintenance shelters, access and parking.
- 1.1.2 The site measures less than 1ha but falls within an area of mapped surface water flood risk. Consequently, in accordance with the requirements of the National Planning Policy Framework (NPPF), a flood risk assessment is required.

1.2 Site Description

- 1.2.1 The site is located on an existing farm on the grounds of Phoenix Park off Nelson's Lane near Wokingham. Figure 1-1 shows the site location.
- 1.2.2 The approximate coordinates at the centre of the site are 480550, 172550 and the closest postcode is RG10 0RR. Figure 2-1 shows the site location.
- 1.2.3 The site is accessed from Nelson's Lane through the existing commercial area.

Figure 1-1 Site Location

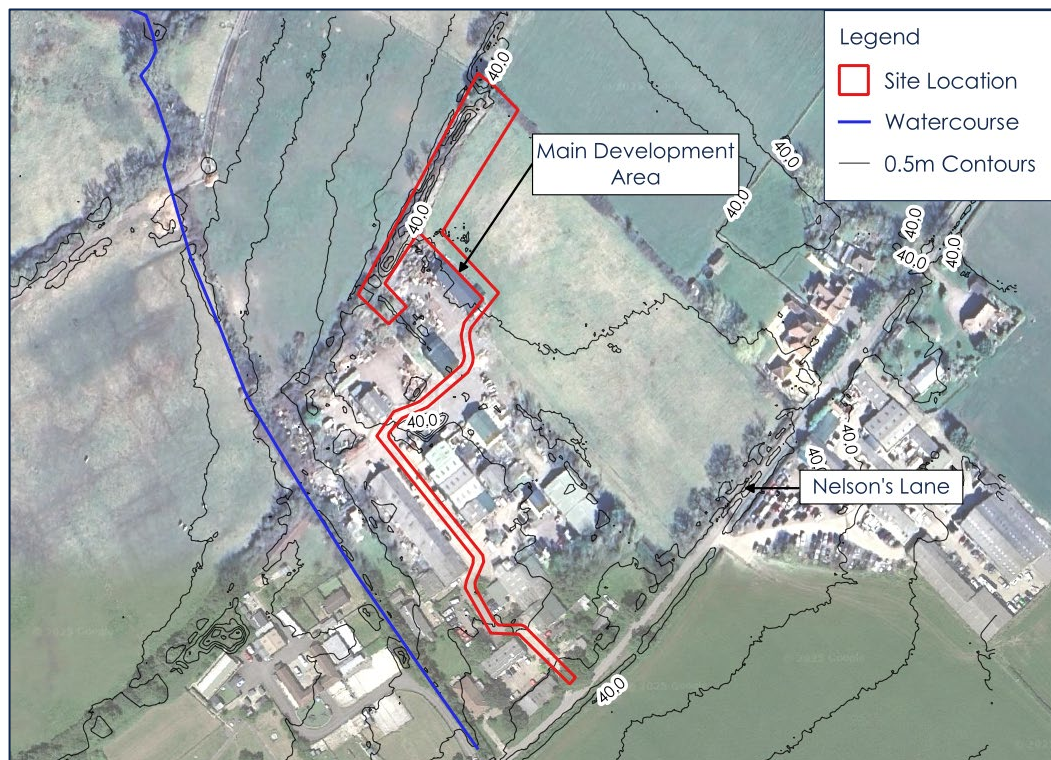


2 EXISTING SITE AND PROPOSALS

2.1 Hydrology and Topography

- 2.1.1 The nearest watercourse to the site is a small unnamed watercourse located over 100m to the southwest. Although this is a designated Main River, it is unnamed.
- 2.1.2 The main development area of the site is existing greenfield, with the access through the commercial area being hardstanding and an existing access.
- 2.1.3 A Topographic Survey has been completed and is provided in Appendix A. This only extends across the development area and therefore LiDAR data has been used to determine the topography of the remaining site and surroundingsite.
- 2.1.4 As shown in Figure 2-2, the site slopes very gently to the southwest, with the development area being at approximately 39.5mAOD.

Figure 2-1 Topography



2.2 Geology and Soils

- 2.2.1 Geological data held by the British Geological Survey (BGS) shows that the site and surrounding area is underlain by 'London Clay' bedrock, which is designated as 'Rocks with essentially no groundwater'. There are no mapped superficial deposits within the vicinity of the site.

- 2.2.2 Soilscape mapping shows the site to be underlain by Soilscape 18 '*Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils*'.

2.3 Site Proposals

- 2.3.1 The proposals are for the placement of two telecommunications masts.
- 2.3.2 The masts would have a limited footprint (each measuring approximately 9m²) and be based on permeable gravel surfacing or with a gravel surround.
- 2.3.3 To facilitate the maintenance of the site, two shelters are proposed attached to the rear of an existing farm building. They are therefore effectively an extension of the existing building.
- 2.3.4 The shelters would be open sided, and timber framed with corrugated roofs and would have a limited combined footprint, approximately 30m². They will be placed on an area of permeable surfaced shingle track area to facilitate parking and access. The parking and access area would have a footprint of approximately 230m².
- 2.3.5 Access to the development area would be via the existing hardstanding access road. If improvements or refurbishment of the road are proposed, they would not impact the impermeable footprint of the site and they would use the existing drainage arrangements.
- 2.3.6 The site would be remotely operated with access likely only required intermittently for planned maintenance purposes.
- 2.3.7 Permission is being sought for 10 years, which therefore defines the lifetime of the development.
- 2.3.8 Given the above, particularly the only hardstanding being less than 250m² and an extension to the existing building, the proposals are assessed as being minor development in accordance with Paragraph 051 of the Flood Risk and Coastal Change Planning Practice Guidance (PPG).
- 2.3.9 Paragraph 051 explains that minor development should be subject to an FRA and meet the requirements of the NPPF. However, the assessment should be pragmatic in scale and meet the following:
- Not have an adverse effect on a watercourse, floodplain or flood defences
 - Not impede access to flood defences;
 - Not have a cumulative impact of similar minor developments in the catchment.
- 2.3.10 Minor development is also not required to apply the Sequential nor Exception Test.
- 2.3.11 Site proposals are provided in Appendix B.

3 FLOOD RISK

3.1 Flood Zones

- 3.1.1 According to the March 2025 iteration of the Flood Map for Planning, part of the existing access road site lies in Flood Zone 2 but inspection of this data shows that the origin of this extent is from a direct rainfall model and therefore reflects surface water flooding, described below.
- 3.1.2 Consequently, the site is assessed as being at Low risk of fluvial flooding and it is well beyond any tidal limits.

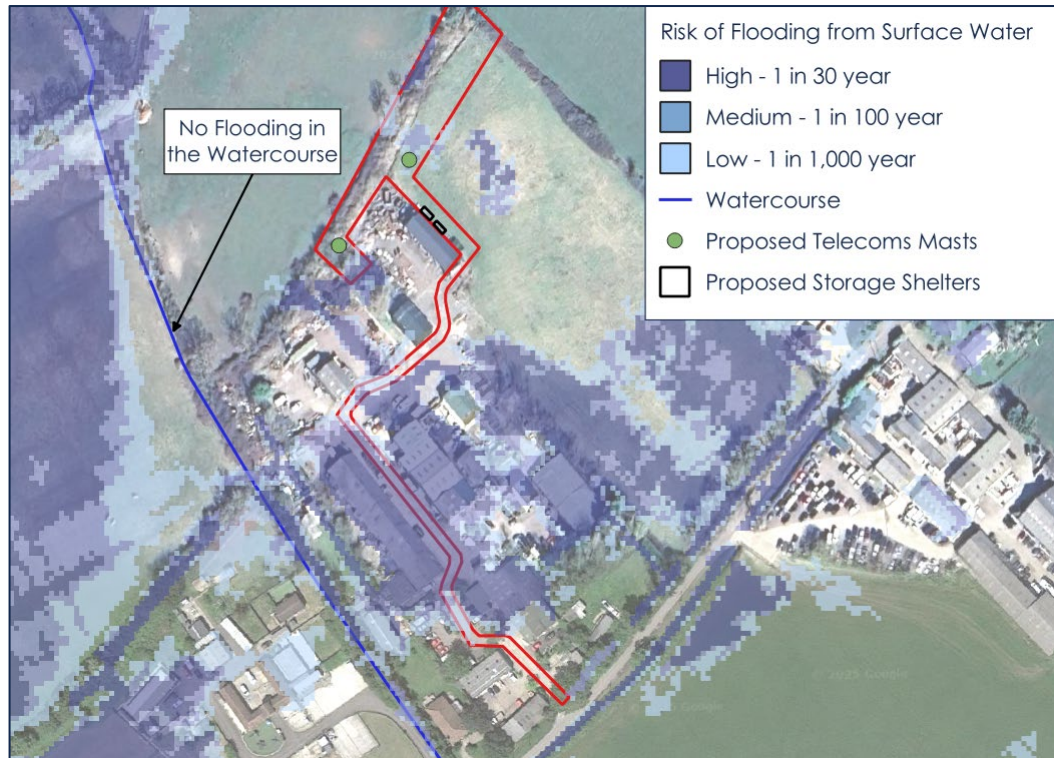
Figure 3-1 Flood Zones



3.2 Surface Water

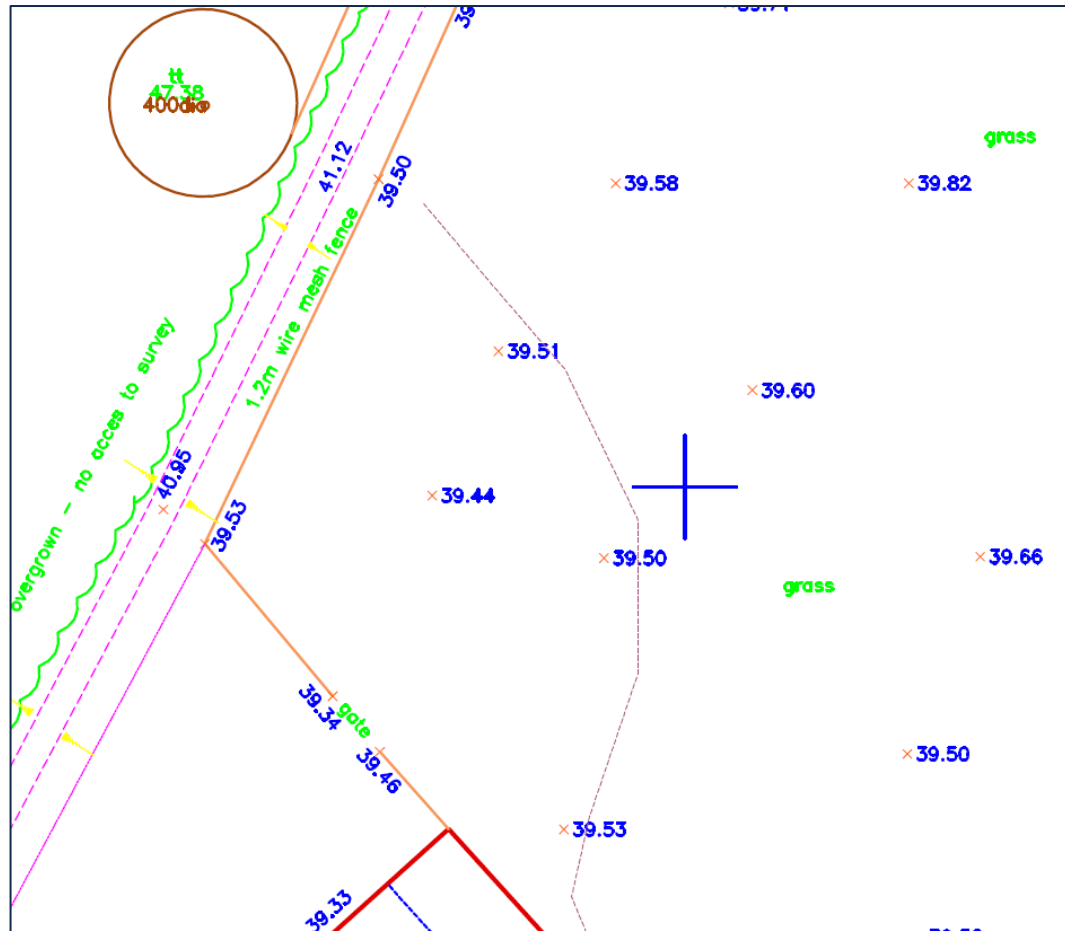
- 3.2.1 According to the Environment Agency's Risk of Flooding from Surface Water (RoFSW) dataset, parts of the site are at mapped risk of surface water flooding, as shown in Figure 3-1. Despite the short duration of the application (10 years), the climate change surface water mapping has been used to ensure a conservative approach.
- 3.2.2 The RoFSW mapping is produced on a strategic scale and therefore resolution. This means that local features such as local topography and small watercourses are often not represented, meaning the risk of flooding is often overestimated. As shown in Figure 3-1, the nearby watercourse is evidently not represented in the model.

Figure 3-2 RoFSW with Climate Change



3.2.3 For example, closer inspection of the site-specific topographic survey in the vicinity of the northern mast shows that there is no discernible topographic depression that would result in the ponding of surface water. An extract of the survey is shown in Figure 3-3.

Figure 3-3 Topo Survey Extract



- 3.2.4 The above demonstrates that the ground model upon which the RoFSW mapping is based upon is erroneous, again likely to be due to its strategic nature. The site specific topo survey shows that overland flows would flow across the field and not pond as predicted by the mapping.
- 3.2.5 Consequently, all the proposed infrastructure (masts and maintenance area and shelters) are assessed as being at Very Low risk of flooding and consequently sequentially located within the site.
- 3.2.6 Inspection of the RoFSW mapping also shows that the areas of mapped risk in the vicinity of the existing access road coincide with the existing buildings, some of which are relatively large. The processing of the digital terrain model used by flood mapping in such circumstances can sometimes lead to inaccuracies.
- 3.2.7 It is therefore assessed that this is causing water to become artificially trapped behind the buildings, whereas in reality it would flow to the southwest and into the watercourse without ponding to a depth that exceeds the minimum threshold for mapped flooding by the RoFSW.

- 3.2.8 It should be noted that unless they are a formal flood defence, buildings are effectively removed from flood models to reflect the fact they are unlikely to be flood resistant.
- 3.2.9 Notwithstanding the above, the depths of flooding predicted by the RoFSW with climate change mapping is shallow (less than 300mm) which would not impede access to and from the site in the extremely unlikely event that such access were required during extreme flood conditions.
- 3.2.10 Consequently, no mitigation against surface water flooding would be required.

4 DRAINAGE STRATEGY

4.1 Drainage Hierarchy

4.1.1 The SuDS hierarchy requires that surface water runoff should be managed as high up the following list as practically possible:

- Into the ground (infiltration), or then;
- To a surface water body, or then;
- To a surface water sewer, highway drain or another drainage system, or then;
- To a combined sewer.

4.1.2 In order to determine the most suitable method of surface water management, the options have been assessed below, with the highest option in the SuDS hierarchy used.

Preferred Discharge Destination

4.1.3 There are no known public sewers within the vicinity of the site and the nearby watercourse is located outside the redline boundary.

4.1.4 The majority of the proposals would be permeable so would encourage rain to the ground locally, mimicking the existing site.

4.1.5 The only proposed hardstanding would be the storage shelters, which would have a limited combined footprint of approximately 30m².

4.1.6 Limiting the discharge from such a small area using positive drainage solutions (flow control devices etc.) to greenfield rates would be impossible whilst adhering to relevant Sewerage Sector Guidance in terms of managing blockage risk. Therefore, any piped flows from the shelters would likely increase rates compared to equivalent greenfield rates.

4.1.7 Consequently, the most sustainable option is to discharge rain falling on the shelters and the permeable surfaced surrounds to the ground, mimicing existing arrangements.

4.1.8 The existing access would be retained or enhanced therefore with negligible impact on the behaviour of surface water runoff.

4.2 Climate Change

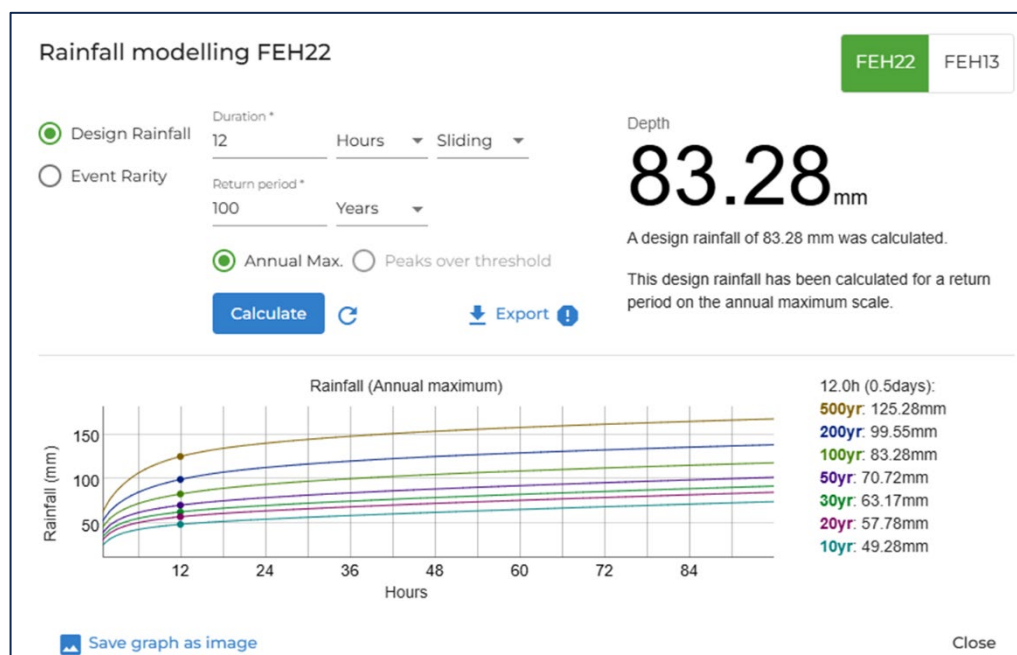
4.2.1 In accordance with NPPF, an allowance for climate change must be applied to the rainfall calculations. The proposed site is estimated to have an anticipated lifetime of 10 years. However, for the purposes of this assessment the 2070s epoch is applied to ensure a conservative approach. The site lies within the Loddon and Tributaries Management Catchment. For this management catchment the central allowance

for the 2070s epoch equates to a 25% uplift in rainfall rates. The design event for the proposals is therefore 1 in 100 year +25%.

4.3 Storage Requirements

- 4.3.1 The permeable access and parking area would discharge water via natural soakage rather than a fitted outfall. It has been sized to store runoff generated during a 1 in 100 year, 12 hour storm, inclusive of climate change and with no infiltration or outflow allowance in the calculations.
- 4.3.2 The 12-hour duration has been chosen given this is double the duration used as part of the volumetric runoff assessment within the Non-Statutory Technical Standards for Sustainable Drainage Guidance.
- 4.3.3 To calculate the likely volume of runoff generated from the parking and access area, including the storage shelters during the 1 in 100 year, 12 hour storm, the Depth-Duration-Frequency model in the Flood Estimation Handbook (FEH) was used. The FEH predicted rainfall depth for the present day is 77.6mm provided in Figure 6-1, which equates to 97mm (0.097m) for the design event.

Figure 3-1 Depth-Duration Curve Model Results



- 4.3.4 The footprint area of the parking and access area would be 230m². This would result in runoff of approximately 23m³ during the design event. It is recommended that the permeable surfacing would be designed with a granular sub-base with a porosity of 0.3. If the sub-base had a depth of 0.4m (and area of 230m²), it would provide approximately 28m³ of storage.

4.4 Design for Exceedance

- 4.4.1 As calculated above, the storage capacity of the parking area granular base would exceed the volume of runoff in a design event, providing some additional capacity for an exceedance event.
- 4.4.2 In the unlikely event the capacity of the bases were exceeded, water would slowly dissipate to the north and overland onto surrounding grassed areas, where it would absorb into the ground as per the existing site and general antecedent conditions.

4.5 Water Quality

- 4.5.1 The SuDS Manual (CIRIA C753) states that the design of surface water drainage should consider minimising contaminants in surface water runoff discharged from the Site. The level of treatment required depends on the proposed land use, according to the pollution hazard indices. To provide adequate treatment, the SuDS mitigation indices for the development must be equal to, or exceed, the pollution hazard indices.
- 4.5.2 Using a precautionary approach to runoff water quality, the closest land use in the SuDS Manual to the shelters is 'other roofs'. Surface water runoff from 'other roofs' are considered by Table 26.2 of the SuDS Manual to present a Low hazard to water quality, respectively (see Table 3-1). Similarly, the parking and access area would be equivalent to 'individual property driveways', which would have a Low hazard level.
- 4.5.3 Table 26.4 of the SuDS Manual provides SuDS mitigation indices for various SuDS methods discharging to the ground, as summarised in Table 6-2. This shows that the nearest equivalent to gravel bases would be infiltration trenches. Alone, this would not provide sufficient mitigation of the likely pollutants expected and therefore it is proposed that the sub-base of the permeable surfacing would be wrapped in a suitable geotextile for additional filtration and cleansing.

Table 3-1 Water Quality Indices (as per C753 The SuDS Manual)

		Pollution Hazard Level	Total suspended solids	Metals	Hydro-carbons
Land Use	Other roofs	Low	0.3	0.2	0.05
	Individual property driveways	Low	0.5	0.4	0.4
SuDS Mitigation Indices	Infiltration trenches	-	0.4	0.4	0.4

5 SUMMARY

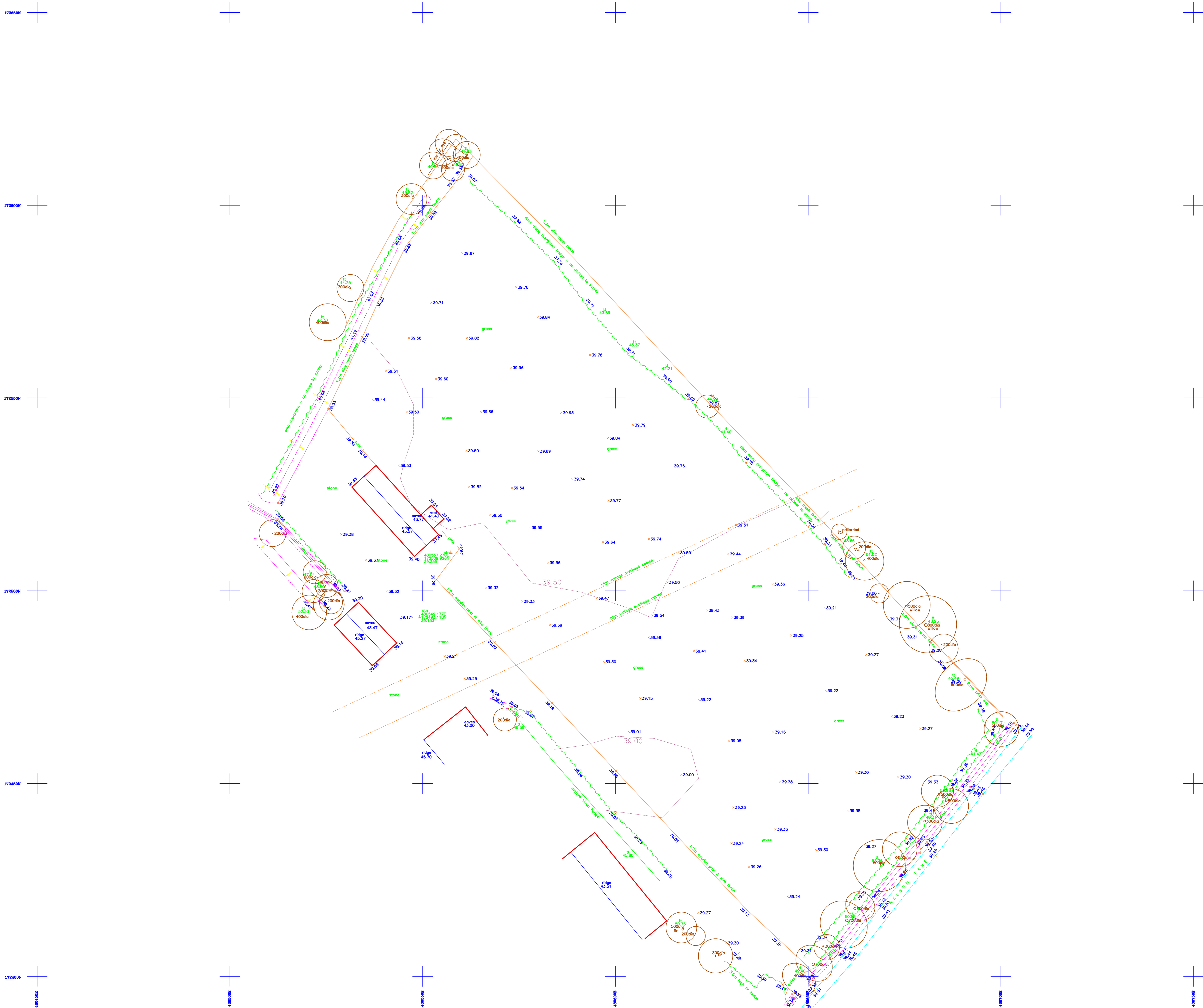
- 5.1.1 It is proposed to install two telecommunications masts. Maintenance of the masts would be facilitated by two storage shelters located on a parking and access compound to the rear of an existing building.
- 5.1.2 The majority of the proposals, including the parking and access area, would be permeable surfaced meaning the only hardstanding would be the two storage shelters. These would have a limited footprint, totalling approximately 30m².
- 5.1.3 The existing access road through the existing Pheonix Park would be retained with no change to impermeable area of this, nor therefore the behaviour of drainage.
- 5.1.4 Consequently the proposals are deemed to be minor development in accordance with paragraph 015 of the PPG.
- 5.1.5 The access road is in Flood Zone 2 associated with surface water flooding.
- 5.1.6 The northern mast is in an area of mapped surface water risk but analysis of the topographic survey shows that the RoFSW ground model is erroneous and ponding here would not occur in reality. Therefore the proposed development area (masts, parking and storage shelters) are sequentially located within the development.
- 5.1.7 The access road falls within an area of predicted surface water flooding. Analysis of the model shows that the predicted flooding is likely due to the filtering of LiDAR to create a digital terrain model to not properly represent the interaction of the ground with the buildings.
- 5.1.8 Nonetheless, analysis shows that surface water flooding would only be shallow, less than 300mm along the access road.
- 5.1.9 The site would be remotely operated and only visited occasionally for planned maintenance purposes.
- 5.1.10 Even presuming the RoFSW modelling was accurate, the depths would be sufficiently shallow to allow access for maintenance vehicles in the extremely unlikely event that access were required during extreme flood conditions.
- 5.1.11 The footprint of the proposed hardstanding is minor, with relatively extensive permeable surfacing proposed. Therefore, the most sustainable option for the management of rainfall is to allow it to percolate to ground locally, mimicking the existing greenfield conditions.
- 5.1.12 The permeable parking and access compound would house the shelters. The total area of the compound would be 230m². Presuming this would be underlain by 0.4m depth of granular sub-base would provide 28m³ of storage, more than the 23m³ of runoff expected during the design event (1 in 100 year, 12 hour duration +25%).

- 5.1.13 Runoff would be of low pollution hazard. Therefore, wrapping the gravel base in permeable geotextile would sufficiently augment the cleansing provided by the granular base to satisfy the SuDS Manual water cleansing guidelines.
- 5.1.14 The above demonstrates how the proposals meet the requirements of the NPPF and crucially the three tests placed upon minor developments identified in Section 2.3.

APPENDICES

APPENDIX A

Topographic Survey



NOTES:
LEVELS RELATE TO O.S. DATUM
TREE SPECIES SHOULD BE VERIFIED WHERE OF
CRITICAL IMPORTANCE
THE ARCHITECT SHOULD SATISFY THEMSELVES THAT ALL TREES
LIKELY TO AFFECT HIS DESIGN HAVE BEEN SHOWN
INTER CONNECTION OF MANHOLES SHOULD BE VERIFIED
WHERE OF CRITICAL IMPORTANCE USING CCTV
PIPE SIZES & INVERTS DETERMINED THROUGH
ENTRY INTO MANHOLE
ALL DIMENSIONS & LEVELS SHOWN IN METRES
ON SITE DIRECTIONAL ACCURACY IS TAKEN RELATIVE TO
THE PRINTED SCALE AND SHOULD BE CHECKED ON SITE
WHERE OF CRITICAL IMPORTANCE

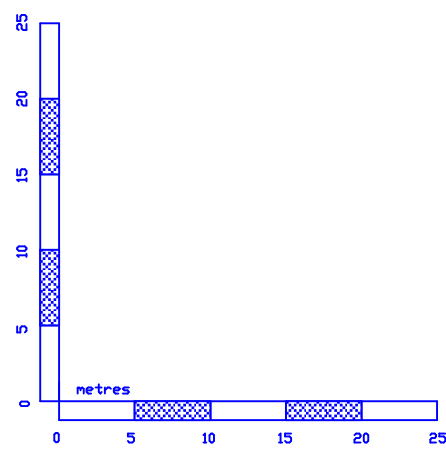
NORTH WINDS
LOWER LANE
BISHOPS WALTHAM
SOUTHAMPTON
HAMPSHIRE
SO32 1AS

TEL : 023 8060 1876

MOBILE: -
07973 348165

EMAIL: -
PAUL@PSLANDSURVEYS.COM

CLIENT: -	RATESU LIMITED
CONTRACT: -	PHDENIX PARK NELSONS LANE HURST
TITLE: -	TOPOGRAPHIC SURVEY
SCALE: -	1: 500 @A1
DRAWING NO.	11818/01
DATE: -	MARCH 2025
SURVEYOR: -	PS



APPENDIX B

Site Proposals



🏠 Spectrum, Bond St., | Bristol | BS1 3LG

☎ 0117 2441 970

✉ hello@calibro-consultants.com

🌐 www.calibro-consultants.com

Registered office as above

Registered in England & Wales: 9988524



Transport Planning | Flood Risk & Hydrology | Infrastructure & Drainage

ITEMA Transforming the world
to sustainability