FLOOD RISK ASSESSMENT AND SUSTAINABLE DRAINAGE STRATEGY

Westfield Energy Conservation Park
Hertfordshire

Reference	**6437-JPG-XX-XX-RP-D-0620-S2-P07**
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CONFIDENTIALITY STATEMENT

This report is addressed to and may be relied upon by the following:

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1.0 INTRODUCTION

JPG (Leeds) Limited (JPG) has been instructed by Lanpro Services Limited (Lanpro) on behalf of Lightrock Power Limited (the 'Applicant') to prepare a Flood Risk Assessment and Sustainable Drainage Strategy to accompany the planning application for Westfield energy Conservation Park, which incorporates a Battery Energy Storage System (BESS), co-located ground-mounted solar farm, associated infrastructure, access, biodiversity enhancements and landscaping (the 'Proposed Development') on land south of A507 at Westfield Common, Hertfordshire ('the Site'). The Site is within the jurisdiction of North Hertfordshire District Council ('the Council').

The report will review the flood risk issues associated with the Proposed Development and recommend any mitigation which should take place as part of the development.

This document is prepared in accordance with the requirements of the Overarching National Policy Statement for energy, the National Policy Statement for renewable energy infrastructure and the Planning Practice Guidance & National Planning Policy Framework (NPPF), which states that a site-specific flood risk assessment should be carried out by (or on behalf of) the developer or those proposing development.

The assessment should demonstrate to the decision-maker how flood risk will be managed now and over the development's lifetime, taking climate change into account, and with regard to the vulnerability of its users.

The objectives of a site-specific flood risk assessment are to establish:

- Whether a proposed development is likely to be affected by current or future flooding from any source.
- Whether it will increase flood risk elsewhere.
- Whether the measures proposed to deal with these effects and risks are appropriate.
- The evidence for the local planning authority to apply (if necessary) the Sequential Test.
- Whether the development will be safe and pass the Exception Test, if applicable.
- Satisfying the local planning authority that any flood risk to the development or additional risk arising from the proposal will be successfully managed with the minimum environmental effect, to ensure that the Site can be developed and occupied safely.

The NPPF defines flood zones as follows:

- Zone 1 – Low Probability – Land having less than 1 in 1000-annual probability (< 0.1%) of river or sea flooding in any year.
- Zone 2 – Medium Probability – Land having between a 1 in 100 and 1 in 1000-annual probability (1% - 0.1%) of river flooding or land having between a 1 in 200 and 1 in 1000-annual probability of sea flooding (0.5% - 0.1%) in any year.
- Zone 3a – High Probability – ~Land having a 1 in 100 or greater annual probability (> 1%) of river flooding or land having a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
- Zone 3b – The Functional Floodplain – This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise:
  - Land having a 1 in 30 or greater annual probability of flooding (3.3%), with any existing flood risk management infrastructure operating effectively; or
  - Land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 1 in 1000 (0.1%) annual probability of flooding).

The 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. (Note Zone 3b is not separately distinguished from Zone 3a on the Flood Map).

A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a Strategic Flood Risk Assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

The NPPF Annex 3 splits development into five "Flood Risk Vulnerability Classifications" as follows:

- Essential Infrastructure.
- Highly Vulnerable.
- More Vulnerable.
- Less Vulnerable.
- Water Compatible Development.

Note the Sequential Test and Exception Test are not covered in this flood risk Assessment report and are addressed within Section 6.12 of the Planning, Design and Access Statement.

Table 2 in the NPPF guidance document details which development vulnerability classifications are incompatible with the different flood zones.

Where developments contain different elements of vulnerability, the highest vulnerability category should be used for assessment, unless the development is considered in its component parts.

Table 2 is below:

Table 2: Flood risk vulnerability and flood zone 'incompatibility'

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✔	✔	✔	✔	✔
Zone 2	✔	Exception Test required	✔	✔	✔
Zone 3a †	Exception Test required †	X	Exception Test required	✔	✔
Zone 3b *	Exception Test required *	X	X	X	✔ *

Key:

✔ Exception test is not required

X Development should not be permitted

"†" In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

"*" In Flood Zone 3b (functional floodplain) essential infrastructure that has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- Remain operational and safe for users in times of flood.
- Result in no net loss of floodplain storage.
- Not impede water flows and not increase flood risk elsewhere.

Other documents that have been reviewed and referred to in compiling this Flood Risk Assessment and Sustainable Drainage Strategy are detailed below.

These include both technical, nontechnical, legislation, codes, and guidance documents at both national and local level:

- National Planning Policy Framework 2024.
- Overarching National Policy Statement for energy (EN-1) 2024.
- National Policy Statement for renewable energy infrastructure (EN-3) 2024.
- National Policy Statement for electricity networks infrastructure (EN-5) 2024.
- Planning Practice Guidance Flood Risk and Costal Change 2022.
- Flood and Water Management Act 2010.
- Water Industry Act 1991.
- DEFRA's Non-Statutory Technical Standards for SuDS.
- CIRIA C753 SUDS Manual and various other CIRIA guidance.
- Building Regulations: Approved Document H - Drainage and Waste Disposal (2015 edition).
- BS 8582:2013 Code of Practice for Surface Water Management for Development Sites.
- BS 8533:2017 Assessing and managing flood risk in development. Code of practice.
- BS EN 752:2017 Drain and sewer systems outside buildings - sewer system management.
- Hertfordshire County Council PFRA Report (2017).
- Hertfordshire County Council Level 1 SFRA Report (2022).
- Hertfordshire County Council LFRMS 2 (2019-2029).
- North Hertfordshire District Council Level 1 and 2 SRFA Report (2017).
- Thames Water Foul and Surface Water Drainage Policies.
- Sewers for Adoption 6th and 7th Edition *(now superseded)*.
- Design and Construction Guidance (DCG) version 2.0, March 2020.

2.0 THE SITE

2.1 Location

The Site is located to the south of the A507 between Clothall and Cumberlow at Westfield Common, Hertfordshire.

The approximate centre of the Site is located at NGR 529060, 230372.

A location plan is provided in Appendix A.

2.2 Site Description

The Site is irregular in shape with an overall area of approximately 187.3 hectares. The Site currently comprises agricultural fields separated by hedgerows, land drains and trees with isolated areas of woodland.

The Site has been separated into a series of field numbers for ease of reference, as shown on the Site Layout Plan refenced below and presented in Appendix C of this report.

- Lanpro Drawing 5686-LAN-XX-XX-DR-L-1002 Rev P09.

A Site walkover of readily accessible areas was carried out by a JPG engineer on 10 February 2025. Pertinent information is described within the Geoenvironmental Desk Study Report Reference 6437-JPG-XX-XX-RP-G-0601.

Two areas of named woodland, Coldash Wood and Rydals Wood, are located adjacent to Fields 16 and 11 respectively. A further copse is located between Fields 4 and 10.

There are two public rights of way (PRoW) running through the Site. One running north to south adjacent to the unnamed watercourse reference Clothall 019 and bisects the Site. A second PRoW runs from Cumberlow Green in a southwesterly direction through the Site reference Clothall 020.

An existing pylon is located on Field 9 with 400kV overhead electricity lines (OHELs) aligned roughly east to west.

Site boundaries are generally formed by hedgelines, trees and/or adjacent agricultural land.

The Site is located in a rural setting with two areas of woodland present beyond the A507 with a further farm (Cumberlow Green) located on the eastern side of the A507 to the northeast of the Site. Residential properties are also present adjacent to the northwest (Field 1).

2.3 Site Topography

Ground levels generally fall to the PROW and watercourse at a ground level of approximately 108m AOD with the highest ground present in the west (Field 15) with ground levels at approximately 138m AOD. A series of hillsides and valleys is present in the eastern half with the topography rising and falling steadily.

A copy of the topographical survey is provided in Appendix B.

3.0 EXISTING DRAINAGE NETWORK

3.1 Watercourses and Land Drainage

The River Beane is located approximately 670m to the northeast and approximately 200m to the south of the Site at its closest point. Weston Tributary is located approximately 250m to the south of the Site and flows downstream to the River Beane at a confluence point adjacent to Newell Lane located approximately 600m to the south of the Site boundary.

There is a centrally located existing unnamed water course located within the Site boundary that flows south towards Weston Tributary.

There is direct access to the unnamed existing watercourse from within the Site boundary and it is likely that a gravity connection would be possible.

There is an extensive network of land drainage ditches located in Field 12 in the west of the Site which convey overland flows to the centrally located unnamed watercourse.

3.2 Public Sewer Network

The Proposed Development is situated in an area of arable farmland. Due to the agricultural nature of the Site, it is considered there are no public sewer mains in the vicinity and, therefore, Thames Water were not consulted as a part of the preparation of this report.

At the time of writing this report we have not obtained public sewer records from Thames Water (TW) due to the nature of the existing Site.

The law regarding responsibility for drains and sewers changed on the 1 October 2011. From this date the Government transferred the majority of drainage pipes that are either outside a property's boundary or are shared with other buildings to the Sewage/Water companies. The sewer records may not show all transferred sewers.

3.3 Private Drainage Systems/Network

There are existing land drains situated within Field 12 and along the field boundary that convey overland flows to the centrally located unnamed watercourse. The existing land drainage system has been desilted by the landowner prior to the development proposals detailed within this report. There are several inlet pipes recorded along the existing land drains suggesting that there are perforated pipes located underneath the existing ground conveying overland flows from surrounding arable land to the existing drainage ditches. There are two culverted sections recorded along the boundary of Field 12 of 200mm and 300mm diameter respectively.

The Proposed Development is situated in an area of arable farmland. Due to the agricultural nature of the Site, it is considered there are no existing private drainage networks within the development areas.

4.0 DEVELOPMENT PROPOSALS

Westfield Energy Conservation Park incorporates a Battery Energy Storage System (BESS), co-located ground mounted solar farm, associated infrastructure, access, biodiversity enhancement and landscaping.

No development is to take place in Fields 1, 2,11, 16 and the northeast corner of Field 7. The BESS is proposed in the southern part of Field 9 to the south of the proposed substation compound and pre-existing 400kV OHEL. The remaining fields will be installed with solar panels, landscaping and biodiversity proposals.

The proposed Site layout plan reference 5686-LAN-XX-XX-DR-L-1002 produced by Lanpro is located in Appendix C.

5.0 FLOOD RISK ASSESSMENT

Flooding information was obtained from the Environment Agency (EA) website, which confirms that part of the Site lies within Flood Zone 2 and 3.

The Environment Agency Flood Mapping for surface water is in Appendix D.

Flood Zone 2 comprises land between Flood Zone 3 and the extent of the flooding from rivers or the sea with a 1 in 1,000 (0.1%) chance of flooding each year.

Flood Zone 3 comprises land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

NPPF Technical Guidance states that essential infrastructure is appropriate in Flood Zones 2 and 3, subject to Sequential and Exception testing.

NPPF Technical Guidance states that flood risk should be considered from all sources, including:

- Rivers and sea (Fluvial).
- Adjoining land (Pluvial).
- Groundwater.
- Flooding from sewers and drains.
- Flooding from reservoirs, canals and other artificial sources.

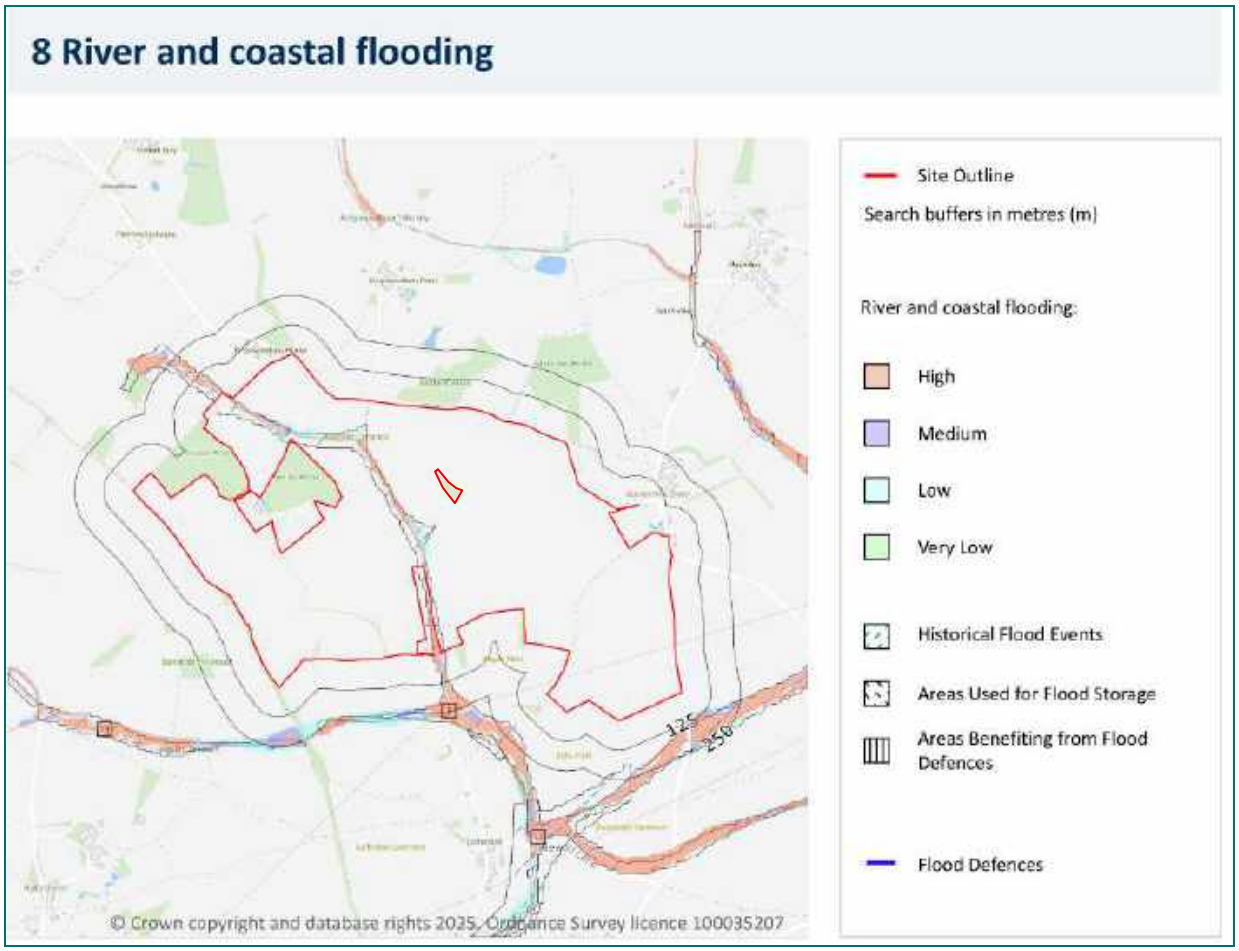
5.1 Flooding from Rivers and Sea (Fluvial)

The River Beane is located approximately 670m to the northeast and approximately 200m to the south of the Site at its closest point. Weston Tributary is located approximately 250m to the south of the Site and flows downstream to the River Beane at a confluence point adjacent to Newell Lane located approximately 600m to the south of the Site boundary.

There is a centrally located existing unnamed water course located within the Site boundary that flows south towards Weston Tributary.

An excerpt of the mapping contained within the third party Groundsure insight report showing the extent of flooding from rivers and the sea is shown below.

The Proposed Development areas are located outside of the high risk flood extents, and due to the existing topography would be situated in an elevated position in relation to the water courses and identified flood zones.

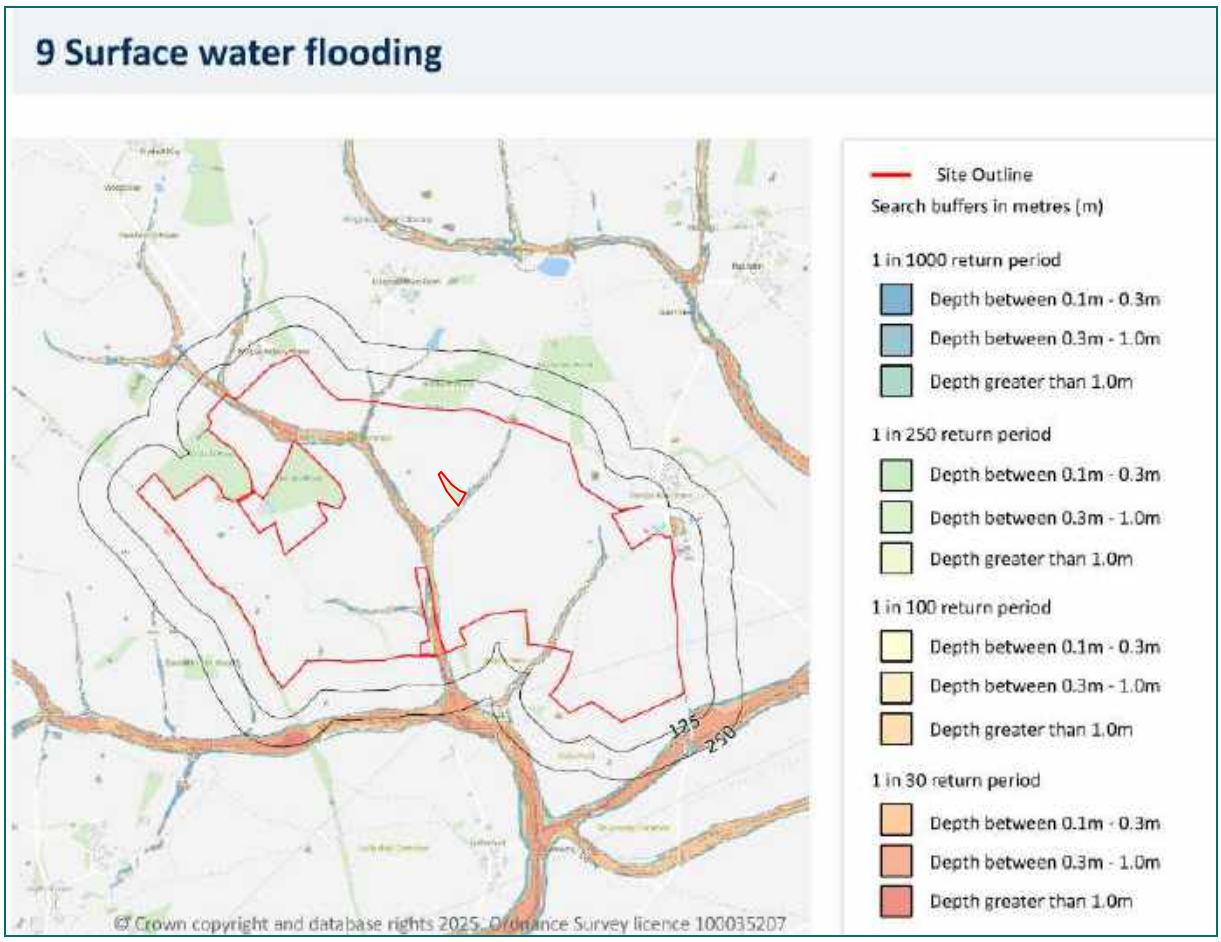


The risk to the Proposed Development from this potential flooding source is considered to be low to very low.

5.2 Flooding from Adjoining Land (Pluvial)

Overland flow/surface water flooding typically arises because of intense rainfall, often for a short duration. The runoff generated from this is unable to soak into the ground or enter drainage systems. It can run quickly off land and result in localised flooding.

An excerpt of the mapping contained within the third party Groundsure insight report showing the extent of flooding from surface water is shown below.



As indicated on the above mapping the majority of the Site fall within low to very low risk from surface flooding.

Where pluvial flood risk and overland flow routes have been identified on the mapping these tend to follow the existing field boundaries.

The existing field boundaries are to be retained other than in two locations where a new access track is proposed with the existing hedgerow only removed locally.

The ground profile along the field boundaries tends to be lower than the adjacent land used for agricultural purposes. Shallow depressions /ditches form here either naturally or manmade for farming activities. These areas collect runoff from agricultural land and direct water to the watercourse located in the valley.

Areas identified to have pluvial flood risk and/or overland flows are as follows.

- Overland flow route within the Site boundary originates within the public highway adjacent to Field 4 (the A507) and traverses southwest through a valley within Fields 4 and 10 to the existing centrally located unnamed watercourse.
- Overland flow route traverses from the public highway along the southeast boundary of Field 6 (the A507, north of the Site) where it exits the Site boundary and conveys flows towards the Weston Tributary.
- There is an area at low to medium risk of flooding located within Field 12 denoting the existing land drainage network that conveys flows to the existing unnamed watercourse at the Site boundary to the south. It is understood that the existing land drainage ditches in this area have been de-silted.
- There are several areas at high risk of pluvial flooding identified adjacent to the centrally located unnamed watercourse. The proposed Solar development areas within Fields 3, 10, & 12 are situated outside of the identified high pluvial flood risk extents which are adjacent the existing unnamed watercourse.
- There are no areas of pluvial flood risk identified within both the proposed sub-station and BESS compound areas, however, there is an overland flow route identified between fields 7 and 9. The risk from this potential flooding source is, however, considered to be low and would not affect the sub-station and BESS compound areas.

In terms of depth of pluvial flood risk and overland flow routes these are also shown on the third party Groundsure insight report (refer to the previous extract).

The depth of pluvial flood water as identified on the map could be in exceed 1.00m however, there are minimal areas within the Site boundary where the water reaches to this depth. These areas are restricted to the existing watercourse corridor and field boundaries passing through the Site and the overland flow path in field 6.

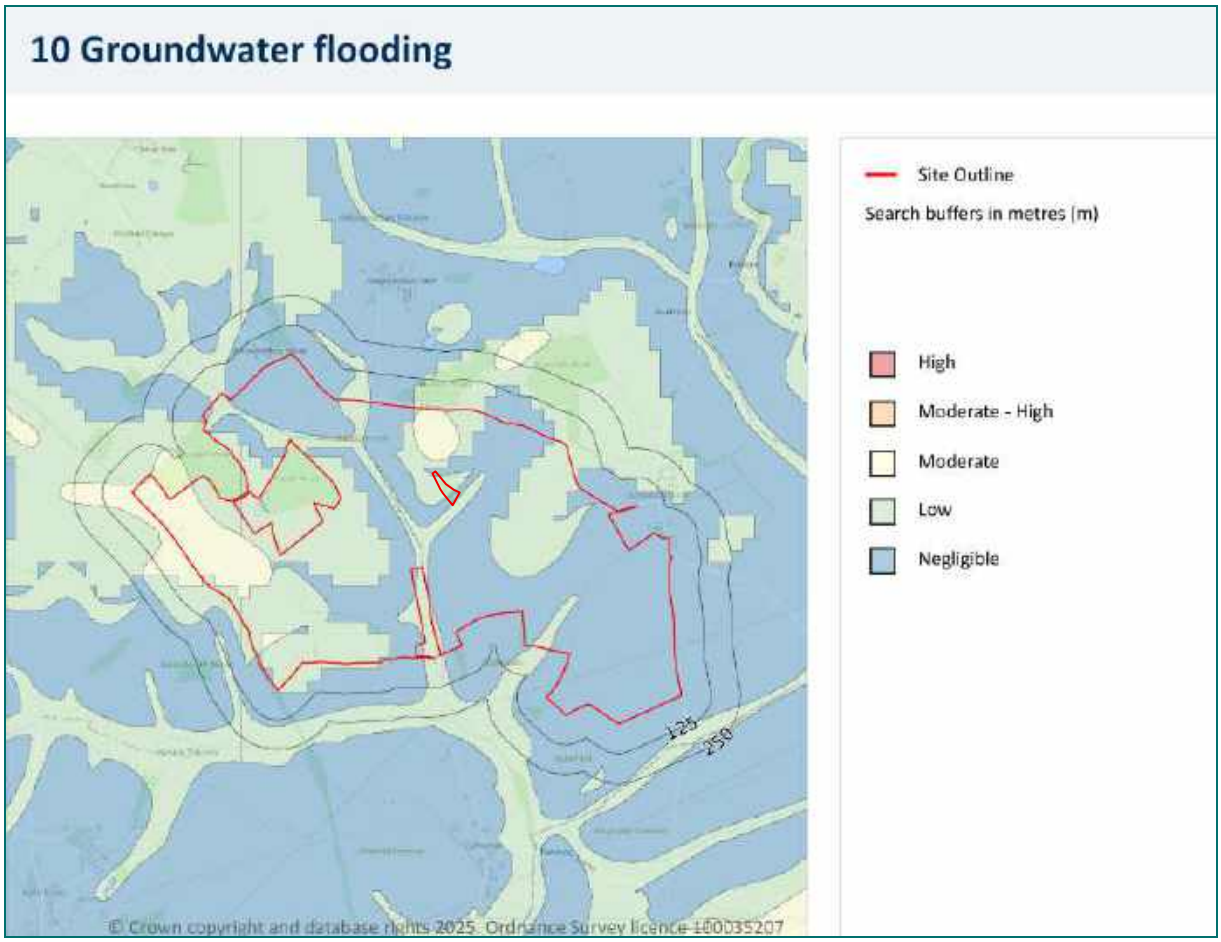
No solar panels are proposed immediately adjacent to the watercourse with the solar panel's installation starting higher up the valley side. In addition, the solar panels are constructed in an elevated position (minimum 0.80m above existing ground levels). The overland flow path indicated in field 6 indicated flow depths of much less than 1.0m and as such would be able to pass beneath the panels unhindered.

Existing levels are to be retained within the Solar development areas and, as such, the Proposed Development would have a negligible impact on the existing overland flow routes within the development boundary.

Based on the above assessment the risk to the Proposed Development areas from this potential flooding source is considered to be low.

5.3 Flooding from Groundwater

An excerpt of the mapping contained within the third party Groundsure insight report showing the extent of flooding from groundwater is below.



The Groundsure insight report indicates that the risk of groundwater flooding ranges from negligible to moderate.

The majority of the Site is located within areas at negligible to low risk with two localised areas at moderate risk of groundwater flooding adjacent to the Proposed Development in the north and east of the Site.

The proposed Sub-Station and BESS compound are both situated within an area of negligible groundwater flood risk.

Low risk extents are located adjacent to the existing unnamed watercourse and at existing field boundaries which are at a lower level than the proposed Solar development areas.

The moderate risk area in identified in the west within Field No. 15 and extends into the northern portion of Field No. 14a.

While this area is shown to be a moderate risk it only contains solar panels.

Existing ground levels are to be retained in the solar development areas and the proposed solar panels themselves are situated in an elevated position on legs, minimum 0.80m, above the existing ground levels, any flooding resulting from ground water would pass beneath the solar panels.

As such the risk to the development from groundwater flooding in the locality of fields 15 and 14a is considered to have a negligible impact.

A second area of moderate risk has been identified in the northern area of Field 3. Again, this is within the solar development area. The area at moderate risk corresponds with an area of superficial glacial deposits of sandy gravel denoted within the third-party Groundsure report. Existing ground levels are to be retained in the solar development areas with the proposed solar panels situated in an elevated position on legs minimum 0.80m above the existing ground levels. Any flooding resulting from ground water would pass beneath the solar panels.

As such the risk to the development from groundwater flooding in the locality of field 3 is considered to have a negligible impact.

A Phase 1 Geo-environment Desk Study has been undertaken on the Site by JPG reference 6437-JPG-XX-XX-RP-G-0601.

The Desk Study Report and the following geological publication have been consulted:

- British Geological Survey (BGS), Sheet 221, Hitchin, 1:50,000 Scale, Solid and Drift Edition, dated 1995.
- BGS, Onshore GeoIndex.
- BGS, Lexicon of Named Rock Units.

Historical borehole records have been obtained and reviewed from the BGS Onshore GeoIndex. There are five BGS borehole located on and within 250m of the Site, two of which are well records without any strata descriptions. The three borehole records containing strata descriptions are summarised in the desk study.

A summary of the historic borehole groundwater levels is provided in Table 1.0 below:

Table 1.0 – Summary of Historic Borehole Groundwater Levels

BGS Reference	Location	Recorded Water Level (m bgl)
TL23SE84	Field 15	41.5m
TL23SE9	47m northwest of the Site	Approx. 41m (137 ft)
TL23SE1	101m northwest of the Site	No Water Strike recorded

The historic borehole data indicates that the presence of shallow groundwater is not expected and, therefore, the risk of groundwater flooding occurring on the Site is negligible.

It should be noted that the groundwater conditions recorded are based on historic observations made by third parties. Groundwater levels are likely to vary owing to seasonal and weather-related effects and on-site testing is recommended as part of the detailed design phase.

The overall risk to the Proposed Development from this groundwater flooding is considered to be low.

5.4 Flooding from Sewers and Drains

The Proposed Development is situated in an area of arable farmland. Due to the agricultural nature of the Site locality, it is considered there is minimal to no existing private drainage infrastructure within the development areas. Should this exist it is not recorded on records or plans.

Likewise, it is considered unlikely that any substantial public sewers are situated within the Proposed Development boundary. Thames Water were not consulted as a part of the preparation of this report.

The overall risk to the Proposed Development from this potential flooding source is, therefore, considered to be low.

5.5 Flooding from Reservoirs, Canals and Other Artificial Sources

From review of the Environment Agency flood risk mapping from reservoir, canals and other artificial sources this confirmed that the Site is not in an area at risk from failure of a reservoir, canal or other artificial source.

The overall risk to the Proposed Development from reservoir, canal or other artificial source flooding is considered to be low to very low.

6.0 PROPOSED SURFACE WATER DRAINAGE

6.1 Proposed Surface Water Drainage & Disposal Hierarchy

The proposed on-site plot drainage will consist of a separate surface and foul water drainage system and will remain in private ownership.

SuDS features employed as part of the drainage infrastructure for the proposed development will be maintained by the Site owner or operator.

The Site owner or operator may wish to pass on maintenance of the on-site drainage infrastructure including any SuDS feature to a nominated management company or specialist facilities management contractor.

The following assessment summarises the disposal of surface water from the Site.

As detailed in DEFRA National Standards for Sustainable Drainage Systems the hierarchy for surface water drainage disposal is as follows:

- Discharge to ground (infiltration).
- Discharge to a surface water body (Land drainage Ditch, Water Body or Watercourse).
- Discharge to a surface water sewer.
- Discharge to a combined water sewer.
- Discharge to a foul water sewer.

All options for the disposal of the surface water have been considered in accordance with current legislation, recommendation, and good practice. Refer to Section 6.3 of this report for more details.

6.2 Sustainable Urban Drainage Systems (SuDS)

Sustainable Urban Drainage System (SuDS) may be used in conjunction with conventional drainage systems to improve water quality as well as manage surface water discharge. Incorporation of SuDS should be considered at the planning design stage of the project.

A third-party Groundsure report has been undertaken on the Site and surrounding area, document reference 'GS-645-QLI-Q3G-3ES'.

The third-party Groundsure report stated that there are Secondary aquifers located within the Site boundary. There are 'Secondary A' aquifers located on Site which have permeable layers capable of supporting water supplies. The third-party Groundsure report, therefore, concluded the underlaying existing ground conditions could be suitable for infiltration drainage methods.

The use of infiltration drainage methods on-site would be subject to groundwater monitoring and on-site permeability testing. This testing would need to be undertaken as part of the detailed design and be submitted as part of the discharge of the relevant planning condition(s).

National and local guidance require developers to consider the utilisation of SuDS features as part of new development. This is detailed in the Hertfordshire County Council Local Flood Risk Management Strategy. The suitability of SuDS at the development Site would be determined post planning approval and would require on-site ground investigation and permeability testing to be undertaken.

Based on the requirements that SuDS drainage features should be considered and that infiltration drainage methods at the Site are subject to further testing, the following audit has been undertaken relating to suitability of SuDS features/systems at the Proposed Development.

While the audit outlines drainage features that could be considered, detailed design stage (post planning determination) and the levels of the Site will dictate what can be reasonably incorporated.

Site specific SuDS Audit below:

Drainage Method	Description/Suitability	Proposal/Feasibility
1. Infiltration.	Site ground conditions suitable for infiltration subject to infiltration testing and groundwater monitoring on-site.	Applicable
2. Ponds and wetlands.	May be utilised – subject to detailed design.	Applicable (infiltration/non-infiltration method)
3. Infiltration Basins.	Site ground conditions suitable for infiltration subject to infiltration testing and groundwater monitoring on-site.	Applicable
4. Detention Basins.	May be utilised – subject to detailed design.	Applicable (infiltration/non-infiltration method)
5. Swale.	May be utilised – subject to detailed design.	Applicable (infiltration/non-infiltration method)
6. French/Filter drain.	May be utilised to convey water.	Applicable (infiltration/non-infiltration method)
7. Pervious/Permeable Pavement.	May be utilised - subject to detailed design.	Applicable (infiltration/non-infiltration method)
8. Geocellular Systems/Tank systems.	May be utilised – subject to detailed design.	Applicable.
9. Oversized pipes.	May be used as surface water attenuation.	Applicable.
10. Box culverts.	May be used as surface water attenuation.	Applicable.
11. Proprietary tanks systems.	May be used as surface water attenuation.	Applicable.

6.3 Surface Water Drainage

DEFRA National Standards for Sustainable Drainage Systems establishes a preferred hierarchy for the disposal of surface water. Consideration should firstly be given to soakaway, infiltration, watercourse, and sewer in that priority order.

Based on the third-party Groundsure report, and experience infiltration drainage methods could be suitable on this Site, subject to further testing. Refer to Section 5.3 in the Flood Risk Assessment for details of the existing underlaying ground conditions.

Based on the above statement and drainage hierarchy, connection to watercourse should be considered next.

There is a centrally located existing unnamed water course located within the Site boundary that flows south towards Weston Tributary. This would be used should infiltration prove to be unsuitable.

Due to the rural and agricultural nature of the Site, it is considered there are no public sewer located in the vicinity; therefore, Thames Water have not been consulted via their preplanning service, at the time of writing this report. Sewer record drawings have not been obtained based on this consideration.

Thus, the preferred method for disposal of surface water from the Proposed Development would be via infiltration subject to on-site permeability testing. Should the permeability test prove that the ground is unsuitable for infiltration drainage systems then discharge to a watercourse would need to be considered.

6.4 Runoff and Restricted Discharge

The Proposed Development is situated in an area of arable farmland. There is no existing impermeable area within the Solar Farm, BESS or Substation compounds.

As detailed in Section 6.3 above the proposal would be to drain the Site via infiltration. Should this prove not to be feasible then alternative methods for the disposal of surface water would need to be considered based on the hierarchy for disposal of surface water.

This would be discharge to local watercourse/land drainage system.

On the assumption that infiltration would not be suitable at the Site, we have undertaken greenfield runoff calculations in accordance with HCC LFRMS requirements.

This states for greenfield sites, the peak runoff rate from the development for the 1 in 1-year rainfall event and the 1 in 100-year rainfall event must not exceed the peak greenfield runoff rate from the whole Site for the same event.

To support any existing Site runoff assessment, a topographic survey of the Site has been undertaken by the developer, which details the current Site topography, and thus demonstrates the receiving catchments and discharge locations.

The topographical survey is located in Appendix B.

An assessment of pre-development greenfield runoff has been undertaken using industry recognised methodology based on either the IH 124, ICP-SuDS or FEH 2013 method.

Discharge to watercourse/land drainage system would only be considered for the Sub-Station and BESS areas.

For the fields with proposed solar panels these will discharge at unrestricted rate due to the negligible impermeable area induced and the minimal impact on the existing greenfield runoff rate.

Surface water runoff will fall between solar panels or drip from the face of the solar panels to the existing ground and soft landscaping.

Surface water runoff will discharge as per the existing situation and topography, via infiltration or conveyance through existing overland flow routes and/or land drains to ultimately discharge to the existing unnamed watercourse.

The proposed BESS and Substation impermeable areas are approximately 9.386 Ha.

The proposed impermeable areas are denoted on the conceptual drainage strategy drawing 6437-JPG-ZZ-ZZ-R-D-1400 located in Appendix G.

Based on the above stated impermeable area greenfield runoff has been calculated using the ICP-SuDS methodology which generated a discharge rate of QBAR 1.700 l/s/Ha.

The ICP-SuDS greenfield runoff calculation is located in Appendix E.

Runoff from the BESS and Substation compounds will be restricted to the greenfield runoff rates, as detail on the drainage strategy drawing located in Appendix G.

However, the limiting factor for the discharge rate will likely be the criteria that states generally flow control device orifices should not be less than 75mm in diameter as quoted in C753 the SuDS Manual.

Refer to Section 6.6 of this report which will provide further detail on the proposed restricted discharge rate.

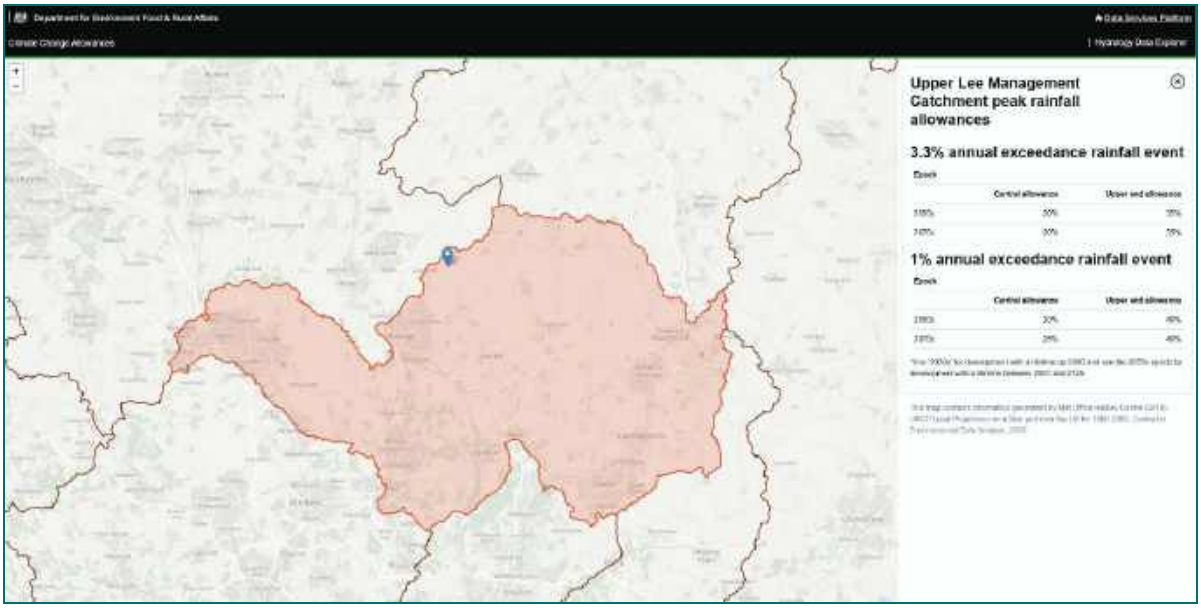
Note the restricted discharges would only be considered should infiltration drainage methods prove to be unsuitable for this Site.

Should an infiltration drainage system be suitable for the Site the runoff would be restricted by the Site proved permeability testing and determined infiltration rate.

6.5 Climate Change Allowance

As detailed in EA guidance document for all new surface water systems the appropriate allowance for climate change should be adopted as set out within EA Guidance Peak Rainfall Allowance Table.

A copy of EA Guidance Peak Rainfall Allowance Table is shown below.



The table gives a range of uplift percentages for development base on the design life.

EA guidance states that both the central and upper allowances should be considered. For developments with a lifetime up to both 2060 and between 2060 and 2100, then the Central Allowance should be used.

The proposed lifespan of the development will fall within the time scales and, as such, the allowance for climate change for the Proposed Development would be 25%. However, consideration will be given to the upper allowance of 40%.

6.6 Surface Water Attenuation

Should infiltration drainage methods prove not to be suitable the runoff generated by the sub-station and BESS compounds would be restricted and require surface water attenuation to be provided within the Site.

Based on the agreed discharge rate (refer to section 6.4), proposed impermeable areas and allowance for climate change, the following attenuation volumes have been calculated using Info Drainage design software.

The Design Parameters for the Proposed BESS and Substation compounds are below:

- Rainfall FEH 2022.
- Restricted Discharge = Qbar = 1.700 l/s/Ha.
- Uplift for climate change 40%.

The following surface water attenuation volumes have been calculated for each development area and are detailed below:

BESS

- Development Impermeable Area = 6.989 Ha.
- Restricted Discharge Rate = 11.881 l/s.
- 1:100 Year Return Period (+40% cc) = circa 7155m^3.

Substation

- Development Impermeable Area = 2.397 Ha.
- Restricted Discharge Rate = 4.075 l/s.
- 1:100 Year Return Period (+40% cc) = circa 2454m^3.

Info drainage quick storage estimates are located in Appendix F.

The proposed on-site drainage system shall be designed in accordance with the relevant parts of national non-statutory technical SuDS standards, British Standards, Building Regulations and DEFRA National Standards for Sustainable Drainage Systems along with industry best practice and shall demonstrate that:

- No surcharge of pipes occurs in the 1 in 2-year rainfall event.
- No surface flooding occurs in 1 in 30-year rainfall event.
- No flooding to buildings and adjacent properties occurs in 1 in 100-year rainfall event (including an allowance of for the effects of future climate change), as defined in NPPF Technical Guidance. The climate change allowance shall be 40%.

The drainage system for the Solar areas, Substation and BESS compounds will consist of separate systems as detailed on the conceptual drainage strategy drawing 6437-JPG-ZZ-ZZ-DR-D-1400 and is located in Appendix G.

The typical drainage system features to be implemented for each development area are detailed on drawing 6437-JPG-ZZ-ZZ-DR-D-1410, which is located in Appendix G.

Solar Farms

The proposed solar farm areas comprise of elevated solar panels and access tracks for panel maintenance.

For the purposes of assessing a worst-case scenario, the access tracks are considered to comprise of impermeable hardstanding. For typical access track installation details refer to Lanpro drawing 5686-LAN-XX-XX-DR-L-3008, which is located in Appendix C.

Access tracks will be constructed with a crossfall to one side.

Surface water runoff from the access track will be intercepted by a filter drain or ditch located immediately adjacent to the access track (ideally to the low side).

The filter drains or drainage ditches will provide both short term storage and treatment for runoff induced by the access tracks prior to discharging via infiltration.

For typical details of the proposed access track drainage refer to the Typical Drainage Details drawing reference 6437-JPG-ZZ-ZZ-DR-C-1410 which is also located in Appendix G.

Precipitation is estimated to be intercepted by approximately 25% to 40% of the solar development areas. There is the potential risk of water "sheeting" off the solar panel surfaces; the uncontrolled flow of precipitation as a continuous thin layer across the surface of the panels could induce an increase of velocity and volume of runoff when it reaches ground level. Rainfall intercepted by the panels will either flow down their surfaces and drip onto the ground below or evaporate from the panel surfaces.

Without mitigation, there is a risk of soil erosion beneath the panels due to uncontrolled concentrated flows dripping onto the ground from the panel surface, which could lead to the formation of rivulets and increase runoff velocity across the solar farm areas, however, the risk of erosion induced by the water sheeting and dripping effect are mitigated by the intrinsic design of the solar farm areas.

The solar panels will be installed with a pitch of 20 degrees, which will slow water flowing over their surface and reduce the likelihood of water sheeting. Solar panel installations typically incorporate offsets between individual panels or around 3.50m which allow water to disperse uniformly onto the vegetated ground below.

For typical solar panel installation details refer to Lanpro drawing 5686-LAN-XX-XX-DR-L-3019 which is located in Appendix C.

Offsets between panel rows will assist in reducing the velocity of runoff, allowing water to drip through gaps between panels rather than sheeting and dripping off the lower edges of the modules.

Despite these design features, runoff from the solar panels will have increased velocity in comparison to existing greenfield conditions. The increased velocity of runoff at the extent of each panel may eventually cause the formation of rivulets at ground level which subsequently increase the velocity of runoff.

Solar panels are proposed to be installed in alignment with the existing topography along contours to increase the likelihood of infiltration to the existing ground which will prevent concentrated flows.

Proposed soft landscaping and vegetation will enhance surface water infiltration compared to the existing arable land use, where the ground is often bare following crop harvests. Soft landscaping and vegetated areas will be maintained in accordance with the Environmental Masterplan (5686-LAN-XX-XX-DR-L-1003) submitted with this planning application.

The land adjacent to the existing unnamed watercourse will be seeded with appropriate grass species and other flora, in accordance with the Environmental Masterplan. Vegetated ground adjacent to the panels will facilitate infiltration at the point where precipitation falls, and any excess runoff will be absorbed by soft landscaping areas beneath the panels. The implementation of vegetated areas adjacent to the watercourse will increase infiltration rates reducing the discharge volumes to the unnamed watercourse.

Consequently, runoff reaching on-site watercourses via natural drainage pathways will not be increased.

Substation

The substation equipment is to be located within a compound area which will consist of a granular matrix with a minimum 30% porosity ratio.

The stone matrix will be contained within an impermeable liner system to contain any pollutants. For further details on pollution control refer to Section 6.7 of this report.

Areas of hardstanding will be laid to nominal falls to allow surface water to runoff into the granular subbase layers where it will be conveyed via a perforated piped land drainage system to the infiltration basin.

For typical details of the proposed subbase attenuation system and associated land drain refer to the typical detail in Appendix G.

Under normal operation, the primary treatment of the runoff will be provided via the granular matrix around the substation plant which will filtrate pollutants and slow down the runoff. Secondary treatment will be provided via the infiltration basin. Additional pollution prevention will need to be consider should a fire occur in the sub-station compound. For further details on pollution control refer to Section 6.7.

Detailed design of the infiltration basin SuDS feature can only be undertaken once on-site permeability testing has confirmed the infiltration rate at the location of the SuDS features.

Alternatively, should infiltration drainage methods prove not to be suitable this may result in the Substation compound requiring further drainage infrastructure to be constructed as part of the wider watercourse/land drainage system.

BESS

The BESS compound drainage system will operate in a similar manor to the Substation compound. Electrical infrastructure within the BESS area will be sited on concrete pads located within the proposed granular matrix compound area.

This granular matrix shall consist of granular material which has a minimum 30% porosity ratio.

The stone matrix will be contained within an impermeable liner system to contain any pollutants. For further details on pollution control refer to Section 6.7 of this report.

A series of perforated land drains will convey thew water to the infiltration swale/ditch.

For typical details of the proposed subbase attenuation system and associated land drain refer to the typical detail in Appendix G.

Under normal operation the primary treatment of the runoff will be provided via the granular matrix within the BESS compound which will filtrate pollutants and slow down the runoff. Secondary treatment will be provided via the infiltration swale/ditch.

Additional pollution prevention will need to be consider should a fire occur in the BESS compound. For further details on pollution control refer to Section 6.7.

Detailed design of the infiltration basin SuDS feature can only be undertaken once on-site permeability testing has confirmed the infiltration rate at the location of the SuDS features.

Alternatively, should infiltration drainage methods prove not to be suitable this may result in the BESS compound requiring further drainage infrastructure to be constructed as part of the wider watercourse/land drainage system.

6.7 Water Quality and Pollution Control

It is a requirement to ensure that the quality of any receiving water body is not adversely affected by the Proposed Development.

Both SuDS and proprietary treatment systems can be incorporated into the drainage design to assist with cleaning of the surface water runoff.

Runoff from the impermeable areas will be routed through appropriately sized proprietary treatment systems and/or SuDS features to provide treatment of the runoff prior either infiltration or discharge off-site.

The pollution hazard level of surface water runoff from the Proposed Development is detailed in Chapter 26 of the SuDS Manual.

The Proposed Development is split into three different development areas; the Solar area, the BESS compound and the Substation compound.

The Solar areas primarily consist of solar panels and access tracks for maintenance workers. Maintenance is assumed to comprise of infrequent traffic; therefore, the proposed use of these areas aligns with the low pollution hazard level specified in Table 26.2 of the CIRIA SuDS Manual.

The BESS and Substation compounds falls outside of the defined categories for land use specified in Table 26.2 of the CIRIA SuDS manual. The SuDS manual recommends that the indices should be adapted and agreed with the approving drainage approving body (LLFA). The pollution mitigation indices for the BESS and Substation compounds should therefore be specified and agreed through consultation with the LLFA. The LLFA where contacted in February 2025 and at the time of writing this report, we have received no consultation response from the LLFA.

In lieu of a formal response from the LLFA we would consider the pollution hazard indices for the Proposed Development to be low and the following figures for Total Suspended Solids (TSS), Metals and Hydrocarbons would be representative of the Site and future operations.

	TSS	**Metals**	**Hydrocarbons**
Hazard Indices Low	0.50	0.40	0.40

These figures have been taken from CIRIA SuDS manual table 26.2 and extract is below:

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

Notes

1 Motorways and trunk roads should follow the guidance and risk assessment process set out in Highways Agency (2009).

2 These should only be used if considered appropriate as part of a detailed risk assessment – required for all these land use types (Table 4.3). When dealing with high hazard sites, the environmental regulator should first be consulted for pre-permitting advice. This will help determine the most appropriate approach to the development of a design solution.

Where a site land use falls outside the defined categories, the indices should be adapted (and agreed with the drainage approving body) or else the more detailed risk assessment method should be adopted.

Where nutrient or bacteria and pathogen removal is important for a particular receiving water, equivalent indices should be developed for these pollutants (if acceptable to the drainage approving body) or the risk assessment method adopted.

Table 26.3 of the CIRIA SuDS Manual details SuDS mitigation indices for Total Suspended Solids (TSS), Metals and Hydrocarbons for a range of SuDS devices. Extract of this table is below:

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters

	Mitigation indices[1]		
Type of SuDS component	**TSS**	**Metals**	**Hydrocarbons**
Filter strip	0.4	0.4	0.5
Filter drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond[4]	0.7[3]	0.7	0.5
Wetland	0.8[3]	0.8	0.8
Proprietary treatment systems[5,6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Notes

1 SuDS components only deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters.

2 Filter drains can remove coarse sediments, but their use for this purpose will have significant implications with respect to maintenance requirements, and this should be taken into account in the design and Maintenance Plan.

3 Ponds and wetlands can remove coarse sediments, but their use for this purpose will have significant implications with respect to the maintenance requirements and amenity value of the system. Sediment should normally be removed upstream, unless they are specifically designed to retain sediment in a separate part of the component, where it cannot easily migrate to the main body of water.

4 Where a wetland is not specifically designed to provide significantly enhanced treatment, it should be considered as having the same mitigation indices as a pond.

5 See Chapter 14 for approaches to demonstrate product performance. A British Water/Environment Agency assessment code of practice is currently under development that will allow manufacturers to complete an agreed test protocol for systems intended to treat contaminated surface water runoff. Full details can be found at: **http://tinyurl.com/qf7yuj7**

6 SEPA only considers proprietary treatment systems as appropriate in exceptional circumstances where other types of SuDS component are not practicable. Proprietary treatment systems may also be considered appropriate for existing sites that are causing pollution where there is a requirement to retrofit treatment. SEPA (2014) also provides a flowchart with a summary of checks on suitability of a proprietary system.

Sufficient SuDS mitigation will need be provided in accordance with the pollution hazard indices for the Proposed Development through the incorporation of SuDS and/or proprietary treatment systems during the detailed design stage.

In addition to normal operation consideration should be given to a fire occur at the substation or BESS compounds. In this situation there would need to be a means of containing any contaminated fire water and stop this entering the infiltration basin and swales.

At the granular matrix below the substation and BESS compound will be lined fire water runoff could be contained within this area in the granular matrix. To allow this to happen cut off valves or shut valves would need to be installed between the compound granular matrix and the SuDS infiltration and/or the attenuation features which would be activated as part of the fire alarm system/procedure at the Site.

Details of how this would operate and be controlled are outside the scope of this report and would be design and detailed by specialist fire consultants as part of discharging the relevant planning condition.

6.8 Volume Control

SuDS guidance advises that the runoff volume from the development Site for the 1 in 100-year, six-hour rainfall event should not exceed the greenfield runoff volume for the same event.

The predevelopment greenfield runoff volume for the 1 in 100-year, six-hour event has been calculated as 15383.78m^3.

Volume calculations for the predevelopment Site are included in Appendix H.

The solar farm areas will discharge as per the existing greenfield runoff volume.

By nature of the development proposals, surface water restriction and attenuation of the Substation and BESS areas will result in the increase of the post development runoff volume for the 1 in 100-year, six-hour plus 40% climate change event.

As this extra runoff volume cannot be retained on-site it will be discharged from the Site via infiltration or at a maximum restricted discharge of 2 l/s/ha or QBAR, whichever is the higher value, as detailed in the SuDS Manual Chapter 24, Section 24.4.

The Site runoff will be restricted to QBAR for all events up to and including the 1 in 100-year event plus climate change and as such meets with the criteria.

6.9 Exceedance Event

For storm events above the design event of 1 in 100-year event plus climate change runoff would be managed so that it would not affect the Proposed Development or any third party land or property.

The flood exceedance route would be applicable for storm events above the 1 in 100-year plus climate change event.

A Drainage Exceedance Plan drawing 6437-JPG-ZZ-ZZ-DR-D-1401 has been produced to demonstrate the exceedance event overland flow routes. A copy of the exceedance plan drawing is located in Appendix I.

6.10 Foul Water Drainage

No foul water drainage is proposed as part of the new development.

7.0 CONCLUSIONS

This assessment has looked at flood risk in relation to Proposed Development which incorporates a Battery Energy Storage System (BESS), co-located ground mounted solar fam, associated infrastructure, access, biodiversity enhancement and landscaping.

The report has been prepared to determine a conceptual drainage strategy and to assess the drainage impact for the Proposed Development.

Part of the Site is located within Flood Zones 2 and 3, and NPPF Technical Guidance states that solar farms as essential infrastructure are appropriate in Flood Zones 2 and 3, subject to Sequential and Exception testing.

This report has considered all potential sources of flood risk to the Proposed Development and can conclude that these are considered low from all sources.

Overall, this report demonstrates that flood risk to the Proposed Development is considered to be low.

The on-site private surface water drainage system will be designed and constructed in accordance with all national and local standards and best practice.

Hierarchy for discharge of surface water has been considered. Consideration should firstly be given to soakaway/infiltration, watercourse and then sewer in that priority order.

To date the LLFA has not confirmed the preferred method of discharge.

Infiltration drainage methods could be suitable on this Site, subject to permeability testing on-site. SuDS infiltration features would be used for the Substation and BESS compounds. This would be in the form of infiltration basins and swales.

Alternatively, should infiltration drainage methods prove not to be suitable this may result in the Substation/BESS compound requiring further drainage infrastructure to be constructed as part of the wider watercourse/land drainage system.

Any discharge into the existing watercourses or the land drainage system would be restricted to the calculated greenfield runoff rate of 1.700l/s/Ha based on the impermeable area and shall connect into the existing watercourse catchment.

Where a restricted discharge is required and to limit the risk of blockage the minimum orifice size shall be 75mm.

Attenuation storage if required for the Substation and BESS compounds will be provided in the granular matrix and attenuation swales and basins for details refer to the conceptual drainage strategy (Appendix G).

Proposed allowance for climate change for this Site is 40%.

The reports supporting calculations and drawings provide a robust case for justifying the means of surface water drainage and that the Site can be suitably, safely, and sustainably drained.

Overall, this report demonstrates that the recommended surface water drainage systems are reasonable and acceptable for the Proposed Development.

Appendix A Site Location Plan

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NOTES

GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP IS TO COMPLY WITH JPG CONSULTANTS STANDARD SPECIFICATION & ALL RELEVANT BRITISH & EUROPEAN STANDARDS.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, M & E CONSULTANTS AND JPG CONSULTANTS DRAWINGS.
3. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO COMMENCEMENT OF WORKS.

SITE INFORMATION

SITE ADDRESS
ADDRESS - HERTFORDSHIRE, CUMBERLOW GREEN, BUNTINGFORD, SG7 6RN
OS CO-ORDINATES - E529060, N230372

LEGEND

RED LINE BOUNDARY

0m 125m 250m

SCALE 1:5000

SITE LOCATION PLAN
SCALE 1:5000

REV	DESCRIPTION	DATE	CHK	BY
P03	REDLINE BOUNDARY UPDATED	21/07/25	RMR	JDM
P02	PROJECT TITLE AMENDED.	07/03/25	JDM	ETR
P01	PRELIMINARY ISSUE.	19/02/25	JBW	ETR

Project - 6437
WESTFIELD ENERGY CONSERVATION PARK, HERTFORDSHIRE

Drawing Title
SITE LOCATION PLAN

INFORMATION

JPG
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6437-JPG-ZZ-ZZ-DR-C-1000 | S2 | **P03**

Appendix B Topographic Survey

Clothall Road
Private Property
Dense Vegetation 8h (Unable to Survey)
Dense Vegetation 3h (Unable to Survey)
Arable Land
Grass
Sapling
Unmade
Ditch
Hedge
Fence
Ground Track
Rail Fence
Post & Wire Fence
Gate
Gate Pillar
Tree
Oak
Ash
Hawthorn
Elder
Willow
Rose
Bramble
Nettle
Thistle
Rushes
Reeds
Ivy
Grass
Scrub
Saplings
Unable to trace bank due to dense vegetation
Dense Vegetation 2h (Unable to Survey)
Dense Vegetation 3h (Unable to Survey)
Dense Vegetation 8h (Unable to Survey)
Dense Vegetation 2h (Unable to Survey)
Dense Vegetation 3

TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

ABBREVIATIONS & SYMBOLS

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

Survey Control Station

DRAWING NOTES

Topographical Surveys

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

All building names, descriptions, number of storeys, construction type includir 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 feature 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.

Surveyed physical features may not necessarily represent the legal boundary lines.

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.

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Do not scale from this drawing.

2

SHEET LAYOUT

SURVEY CONTROL CO-ORDINATES

STATIONS	EASTINGS	NORTHINGS	LEVEL	DESCRIPTION
G03	528936.105	230755.174	111.143	Peg & Nail
G04	528735.794	230688.656	116.664	Peg & Nail
G05	528797.747	230582.845	116.958	Peg & Nail
G06	528797.167	230420.466	116.374	Peg & Nail
G07	528671.885	230358.535	122.333	Peg & Nail
RW03	528731.963	230277.891	121.532	Peg & Nail
RW02	528597.917	230272.082	131.910	Peg & Nail
RW01	528460.817	230472.082	131.910	Peg & Nail
JH05	528398.109	230527.071	132.507	PK Nail
JH04	528433.509	230583.029	129.040	PK Nail
JH03	528477.607	230655.061	121.961	PK Nail
JH02	528526.092	230706.473	117.864	PK Nail
JH01	528545.511	230803.980	113.036	PK Nail
G001	528584.834	230937.448	107.957	Peg & Nail
G002	528984.834	230187.448	107.957	Peg & Nail
G003	528934.402	230077.833	106.415	Peg & Nail
R201	528586.490	230080.805	119.562	Peg & Nail
R202	528636.305	229961.405	120.541	Peg & Nail
RW04	528632.150	230124.550	110.416	Peg & Nail
R203	528499.815	229944.489	124.946	Peg & Nail
R204	528436.121	230024.219	134.098	Peg & Nail
JH06	528290.121	230524.219	134.098	Peg & Nail
J501	528427.841	230501.615	132.281	Peg & Nail
J502	528434.312	230477.711	132.209	PK Nail
JH07	528191.364	230531.507	133.891	Peg & Nail
JH08	528004.125	230535.210	136.747	Peg & Nail

SURVEY GRID AND LEVEL DATUM

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

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

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

REV	DESCRIPTION	DRAWN	APPR	DATE

SURVEY SOLUTIONS

LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING

0845 040 5969
survey-solutions.co.uk

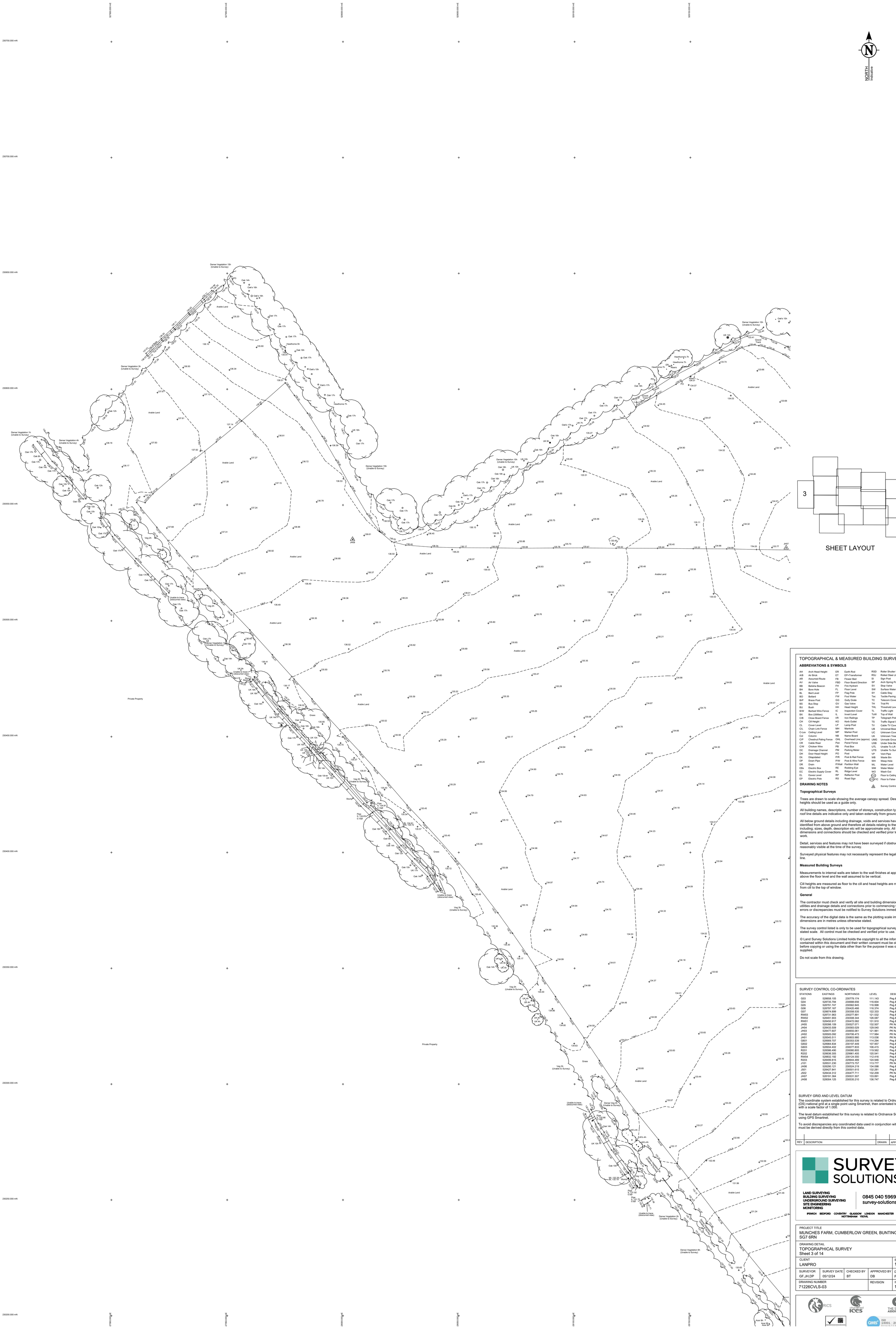
IPSWICH BEDFORD COVENTRY GLASGOW LONDON MANCHESTER NORWICH NOTTINGHAM TROWL

PROJECT TITLE
MUNCHES FARM, CUNBERLOW GREEN, BUNTINGFORD SG7 6RN

DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 2 of 14

CLIENT				SCALE
LANPRO				1:500
SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATU
GF,JH,DP	06/12/24	BT	DB	FINAL
DRAWING NUMBER		REVISION		ISSUE DATE
71226CVLS-02				11/12/20

RICS APC ices THE SURVEY ASSOCIATION
ISO 14001 2015 REGISTERED



TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

ABBREVIATIONS & SYMBOLS

AH	Arch Head Height	ER	Earth Rod	RSD	Roller Shutter Door
A/B	Air Brick	ET	EP+Transformer	RSJ	Rolled Steel Joist
AR	Assumed Route	FB	Flower Bed	SI	Sign Post
AV	Air Valve	FBD	Floor Board Direction	SP	Arch Spring Point Height
BB	Bellaha Beacon	FH	Fire Hydrant	SV	Stop Valve
BH	Bore Hole	FL	Floor Level	SW	Surface Water
BL	Bed Level	FP	Flag Pole	SY	Cable Stay
BO	Bollard	FW	Foul Water	Tac	Tactile Paving
BrP	Brace Post	GG	Gully Grate	TC	Telecom Cover
BS	Bus Stop	GV	Gas Valve	TH	Trial Pit
BU	Bush	HH	Head Height	THL	Threshold Level
B/W	Barbed Wire Fence	IC	Inspection Cover	TL	Traffic Light
BX	Box (Utilities)	IL	Invert Level	ToW	Top of Wall
C/B	Close Board Fence	IR	Iron Railings	TP	Telegraph Pole
CH	Cill Height	KO	Kerb Outlet	TS	Traffic Signal Cover
CL	Cover Level	LP	Lamp Post	TV	Cable TV Cover
C/L	Chain Link Fence	MH	Manhole	UB	Universal Beam
C-Lev	Ceiling Level	MP	Marker Post	UC	Unknown Cover
Col	Column	NB	Name Board	UK	Unknown Tree
C/P	Chestnut Paling Fence	OHL	Overhead Line (approx)	UMG	Unmade Ground
CR	Cable Riser	Pan	Panel Fence	USB	Under Side Beam
C/W	Chicken Wire	PB	Post Box	UTL	Unable To Lift
DC	Drainage Channel	PM	Parking Meter	UTS	Unable To Survey
DH	Door Head Height	PO	Post	VP	Vent Pipe
Dil.	Dilapidated	P/R	Post & Rail Fence	WB	Waste Bin
DP	Down Pipe	P/W	Post & Wire Fence	WH	Weep Hole
DR	Drain	P/Wall	Partition Wall	WL	Water Level
ElBx	Electric Box	RE	Rodding Eye	WM	Water Meter
EC	Electric Supply Cover	RL	Ridge Level	WO	Wash Out
EL	Eaves Level	RP	Reflector Post	(2.50)	Floor to Ceiling Height
EP	Electric Pole	RS	Road Sign	(2.50)F/C	Floor to False Ceiling Ht
					Survey Control Station

DRAWING NOTES

Topographical Surveys

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

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General

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Do not scale from this drawing.

SURVEY CONTROL CO-ORDINATES

STATIONS	EASTINGS	NORTHINGS	LEVEL	DESCRIPTION
G03	528658.105	230779.174	111.143	Peg & Nail
G04	528735.794	230688.656	116.604	Peg & Nail
G05	528791.747	230562.845	116.998	Peg & Nail
G06	528797.167	230420.466	116.374	Peg & Nail
G07	528674.899	230358.535	122.333	Peg & Nail
RW03	528731.963	230277.891	121.532	Peg & Nail
RW02	528491.903	230308.344	126.087	Peg & Nail
RW01	528450.917	230472.082	131.810	Peg & Nail
JH05	528398.109	230527.071	132.507	PK Nail
JH04	528433.509	230583.029	129.040	PK Nail
JH03	528477.607	230655.061	121.961	PK Nail
JH02	528505.092	230706.473	117.984	PK Nail
JH01	528545.511	230803.980	113.036	PK Nail
G601	528909.707	230353.539	114.294	Peg & Nail
G602	528984.834	230197.449	107.957	Peg & Nail
G603	528934.402	230077.833	106.415	Peg & Nail
R201	528586.490	230080.805	119.562	Peg & Nail
R202	528636.305	229961.405	120.541	Peg & Nail
RW04	528832.192	230124.550	112.416	Peg & Nail
R203	528499.815	229944.489	124.946	Peg & Nail
J101	528531.230	230773.757	113.777	PK Nail
J106	528290.121	230524.219	134.098	Peg & Nail
J501	528427.841	230501.615	132.281	Peg & Nail
J502	528434.312	230477.711	132.209	PK Nail
JH07	528191.364	230531.507	133.891	Peg & Nail
JH08	528004.125	230535.210	136.747	Peg & Nail

SURVEY GRID AND LEVEL DATUM

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REV	DESCRIPTION	DRAWN	APPR	DATE

SURVEY SOLUTIONS

LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING

0845 040 5969
survey-solutions.co.uk

IPSWICH BEDFORD COVENTRY GLASGOW LONDON MANCHESTER NORWICH NOTTINGHAM YEOVIL

PROJECT TITLE: MUNCHES FARM, CUMBERLOW GREEN, BUNTINGFORD SG7 6RN				
DRAWING DETAIL: TOPOGRAPHICAL SURVEY Sheet 3 of 14				
CLIENT: LANPRO				SCALE: 1:500
SURVEYOR: GF,JH,DP	SURVEY DATE: 05/12/24	CHECKED BY: BT	APPROVED BY: DB	DWG STATUS: FINAL
DRAWING NUMBER: 71226CVLS-03			REVISION	ISSUE DATE: 11/12/2024

TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

ABBREVIATIONS & SYMBOLS

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CH	Cill Height	KO	Kerb Outlet	TS	Traffic Signal Cover
CL	Cover Level	LP	Lamp Post	TV	Cable TV Cover
CL	Chain Link Fence	MH	Manhole	UB	Universal Beam
CLev	Ceiling Level	MP	Marker Post	UC	Unknown Cover
Col	Column	NB	Name Board	UK	Unknown Tree
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CW	Chicken Wire	PB	Post Box	UTL	Unable To Lift
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Survey Control Station

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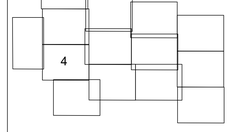

SHEET LAYOUT

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G06	528861.147	230482.865	117.364	Peg & Nail
G07	528674.899	230368.535	122.333	Peg & Nail
RW03	528731.963	230277.891	121.532	Peg & Nail
RW02	528491.903	230308.344	126.087	Peg & Nail
RW01	528450.917	230472.082	131.910	Peg & Nail
JH05	528398.109	230527.071	130.507	PK Nail
JH04	528433.509	230583.029	129.040	PK Nail
JH03	528496.002	230683.473	117.984	PK Nail
JH02	528545.092	230766.473	117.984	PK Nail
JH01	528545.511	230833.980	113.036	PK Nail
G601	528909.707	230353.539	114.294	Peg & Nail
G602	528984.834	230197.449	107.957	Peg & Nail
G603	529034.402	230077.833	106.415	Peg & Nail
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RW04	528552.102	230124.555	119.416	Peg & Nail
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REV	DESCRIPTION	DRAWN	APPR	DATE

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LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING

0845 040 5969
survey-solutions.co.uk

IPSWICH BEDFORD COVENTRY GLASGOW LONDON MANCHESTER NORWICH NOTTINGHAM YEOVIL

PROJECT TITLE
MUNCHES FARM, CUNBERLOW GREEN, BUNTINGFORD SG7 6RN

DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 4 of 14

CLIENT			SCALE
LANPRO			1:500
SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATU
GF,JH,DP	06/12/24	BT	DB	FINAL
DRAWING NUMBER		REVISION	ISSUE DATE
71226CVLS-04			11/12/20

RICS ices THE SURVEY ASSOCIATION
ISO 14001 : 2015 REGISTERED

Arable Land
Rough Grass
Woodland 12h
Woodland 8h
Woodland 9h
Private Property
Trees and shrub 5h
Dense Vegetation 8h (Unable to Survey)
Dense Vegetation 9h (Unable to Survey)
Dense Vegetation 10h (Unable to Survey)
Dense Vegetation 7h (Unable to Survey)
Dense Vegetation 3h (Unable to Survey)
Dense Vegetation 5h (Unable to Survey)
Dense Vegetation 6h (Unable to Survey)
Unable to trace, vision obscured
Unable to trace, concrete cap
Unable access
Dirt Mound
Spring
Oak 10h
Oak 11h
Oak 12h
Oak 13h
Oak 14h
Oak 15h
Oak 16h
Oak 17h
Oak 18h
Oak 19h
Oak 20h
Oak 21h
Oak 22h
Oak 23h
Oak 24h
Oak 25h
Oak 26h
Oak 27h
Oak 28h
Oak 29h
Oak

TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

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Survey Control Station

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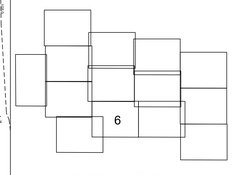

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REV	DESCRIPTION	DRAWN	APPR.	DATE

SURVEY SOLUTIONS

LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING

0845 040 5969
survey-solutions.co.uk

IPSWICH BEDFORD COVENTRY GLASGOW LONDON MANCHESTER NORWICH NOTTINGHAM YEOVIL

PROJECT TITLE
MUNCHES FARM, CUNBERLOW GREEN, BUNTINGFORD SG7 6RN

DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 6 of 14

CLIENT
LANPRO

SCALE
1:500

SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATU
GF,JH,DP	06/12/24	BT	DB	FINAL

DRAWING NUMBER
71226CVLS-06

REVISION

ISSUE DATE
11/12/20

RICS ICES THE SURVEY ASSOCIATION
ISO 14001 : 2015 REGISTERED

d Survey Solutions Limited 01/01/2010

Original Sheet Size A0H

TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

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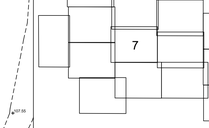

SHEET LAYOUT

SURVEY CONTROL CO-ORDINATES

STATIONS	EASTINGS	NORTHINGS	LEVEL	DESCRIPTION
GD3	528636.105	230779.174	111.143	Peg & Nail
GD4	528735.794	230688.656	116.604	Peg & Nail
GD5	528791.747	230562.845	116.598	Peg & Nail
GD6	528797.167	230429.466	116.374	Peg & Nail
GD7	528674.899	230398.535	122.333	Peg & Nail
RW03	528731.963	230277.891	121.532	Peg & Nail
RW02	528491.903	230309.344	126.087	Peg & Nail
RW01	528450.917	230477.082	131.910	Peg & Nail
JH04	528433.938	230582.028	129.040	PK Nail
JH04	528433.939	230583.029	129.040	PK Nail
JH03	528477.607	230655.061	121.961	PK Nail
JH02	528506.092	230790.473	117.984	PK Nail
JH01	528545.511	230853.980	113.036	PK Nail
GE01	528908.707	230333.539	114.294	Peg & Nail
GE02	528954.834	230197.449	107.957	Peg & Nail
GE03	528836.834	230080.849	109.562	Peg & Nail
RD01	528586.490	230080.805	119.562	Peg & Nail
RD02	528636.305	229961.405	120.541	Peg & Nail
RW04	528632.192	230124.055	112.416	Peg & Nail
RD03	528499.815	229644.488	124.946	Peg & Nail
JY01	528531.230	230773.757	113.777	PK Nail
JH06	528290.121	230524.219	134.098	Peg & Nail
JH05	528344.312	230477.111	132.259	PK Nail
JS02	528434.312	230477.111	132.259	PK Nail
JH07	528191.364	230531.507	133.891	Peg & Nail
JH08	528004.129	230583.210	136.747	Peg & Nail

SURVEY GRID AND LEVEL DATUM

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REV	DESCRIPTION	DRAWN	APPR	DATE

SURVEY SOLUTIONS

LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING

0845 040 5969
survey-solutions.co.uk

IPSWICH BEDFORD COVENTRY GLASGOW LONDON MANCHESTER NORWICH NOTTINGHAM YEOVIL

PROJECT TITLE	MUNCHES FARM, CUNBERLOW GREEN, BUNTINGFORD SG7 6RN			
DRAWING DETAIL	TOPOGRAPHICAL SURVEY Sheet 7 of 14			
CLIENT	LANPRO			SCALE 1:500
SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATU
GF,JH,DP	06/12/24	BT	DB	FINAL
DRAWING NUMBER			REVISION	ISSUE DATE
71226CVLS-07				11/12/20

RICS
ices
THE SURVEY ASSOCIATION
ISO 14001 : 2015 REGISTERED

Clothall Road
Arable Land
Private Property
Grass
Gravel Track
Asphalt
Dense Vegetation 3m (Unable to Survey)
Dense Vegetation 8m (Unable to Survey)
Dense Vegetation 2m (Unable to Survey)
Dense Vegetation 4m (Unable to Survey)
Dense Vegetation 6m (Unable to Survey)
Hedge 1.5m
Hedge 2m
Fence 1.8m
Oak 12m
Oak 15m
Oak 10m
Oak 8m
Ash 12m
Ash 15m
UK 12m
UK 15m
UK 8m
UK's 12m
Shrub 4m
Shrub and dense trees 4m
Woodland 8m
Hawthorn group 4m
Pipe obscured by vegetation
Pipe 1.2m
Pipe 1.5m
Pipe 1.8m
Pipe 2.1m
Pipe 2.4m
Pipe 3.0m
Pipe 3.6m
Pipe 4.2m
Pipe 4.8m
Pipe 5.4m
Pipe 6.0m
Pipe 6.6m
Pipe 7.2m
Pipe 7.8m
Pipe 8.4m
Pipe 9.0m
Pipe 9.6m
Pipe 10.2m
Pipe 10.8m
Pipe 11.4m
Pipe 12.0m
Pipe 12.6m
Pipe 13.2m
Pipe 13.8m
Pipe

TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

ABBREVIATIONS & SYMBOLS

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AB	Air Brick	ET	EP+Transformer	RSJ	Rolled Steel Joist
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Survey Control Station

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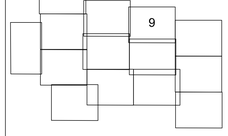

SHEET LAYOUT

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PROJECT TITLE
MUNCHES FARM, CUNBERLOW GREEN, BUNTINGFORD SG7 6RN

DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 9 of 14

CLIENT			SCALE
LANPRO			1:500
SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATU
GF,JH,DP	06/12/24	BT	DB	FINAL
DRAWING NUMBER		REVISION	ISSUE DATE
71226CVLS-09			11/12/20

RICS ices THE SURVEY ASSOCIATION
RICS ISO 14001 : 2015

Woodland 8h
Arable Land
Shrub 5h
Bumps
Oak 8h
Pole 6.5m
Pole 5.5m
Pole 4.5m
Pole 3.5m
Pole 2.5m
Pole 1.5m
Pole 0.5m
Pole 0.0m
Pole 0.1m
Pole 0.2m
Pole 0.3m
Pole 0.4m
Pole 0.6m
Pole 0.7m
Pole 0.8m
Pole 0.9m
Pole 1.0m
Pole 1.1m
Pole 1.2m
Pole 1.3m
Pole 1.4m
Pole 1.5m
Pole 1.6m
Pole 1.7m
Pole 1.8m
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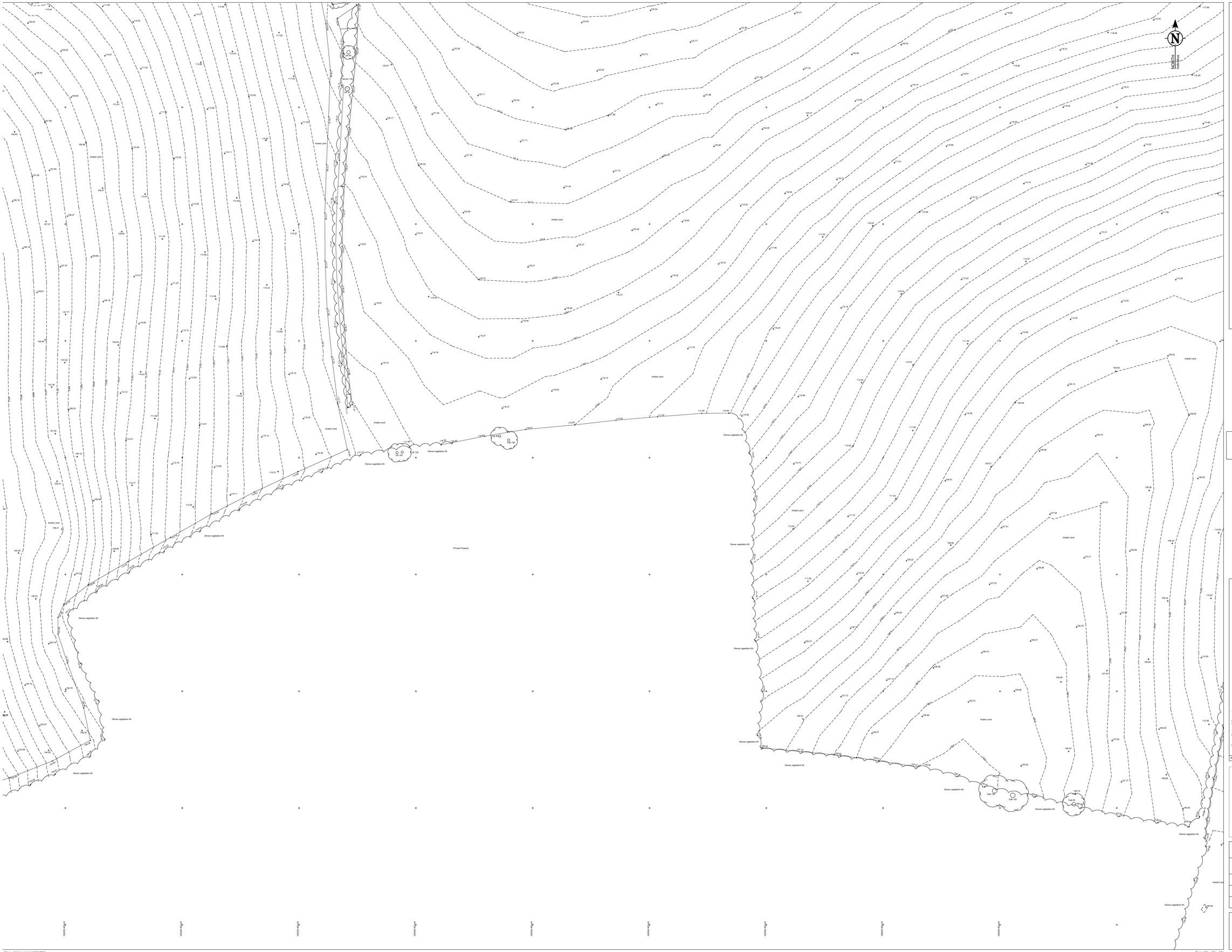
Pole



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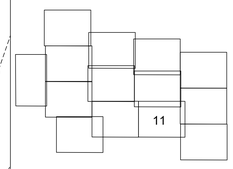

SHEET LAYOUT

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DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 11 of 14

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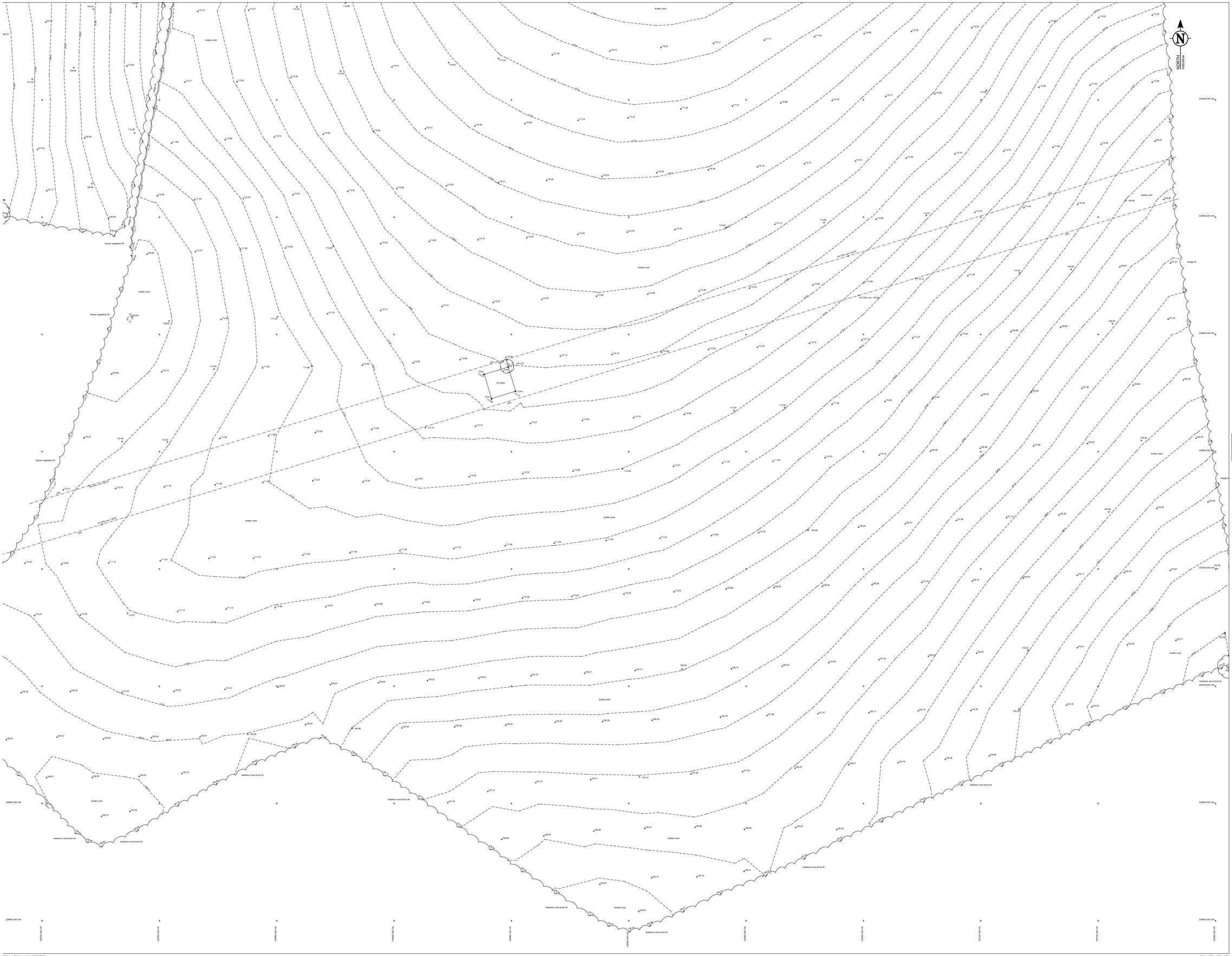
LANPRO			1:500
SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATU
GF,JH,DP	06/12/24	BT	DB	FINAL
DRAWING NUMBER		REVISION	ISSUE DATE
7122BCVLS-11			11/12/20

RICS ices THE SURVEY ASSOCIATION
RISQS QUALIFIED
CMS ISO 14001 : 2015 REGISTERED



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RW02	528491.903	230308.344	126.097	Peg & Nail
RW01	528450.917	230472.082	131.910	Peg & Nail
JH05	528398.109	230527.071	132.507	PK Nail
JH04	528432.509	230583.029	129.040	PK Nail
JH03	528515.092	230636.473	117.964	PK Nail
JH02	528505.092	230706.473	117.964	PK Nail
JH01	528545.511	230803.980	113.036	PK Nail
G601	528867.707	230353.539	114.294	Peg & Nail
G602	528984.834	230197.449	107.957	Peg & Nail
G603	528934.402	230077.833	106.415	Peg & Nail
R201	528586.490	230080.805	119.562	Peg & Nail
RW04	528532.192	230134.550	112.416	Peg & Nail
RW04	528632.192	230134.550	112.416	Peg & Nail
R203	528499.815	229944.469	124.946	Peg & Nail
J101	528351.230	230773.757	113.777	PK Nail
JH06	528290.121	230524.219	134.098	Peg & Nail
J601	528427.841	230301.615	132.251	Peg & Nail
J502	528434.312	230477.711	132.209	PK Nail
JH07	528191.364	230531.507	133.891	Peg & Nail
JH08	528004.125	230535.210	136.747	Peg & Nail

SURVEY GRID AND LEVEL DATUM

The coordinate system established for this survey is related to Ordnance Surve (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.

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REV	DESCRIPTION	DRAWN	APPR	DATE

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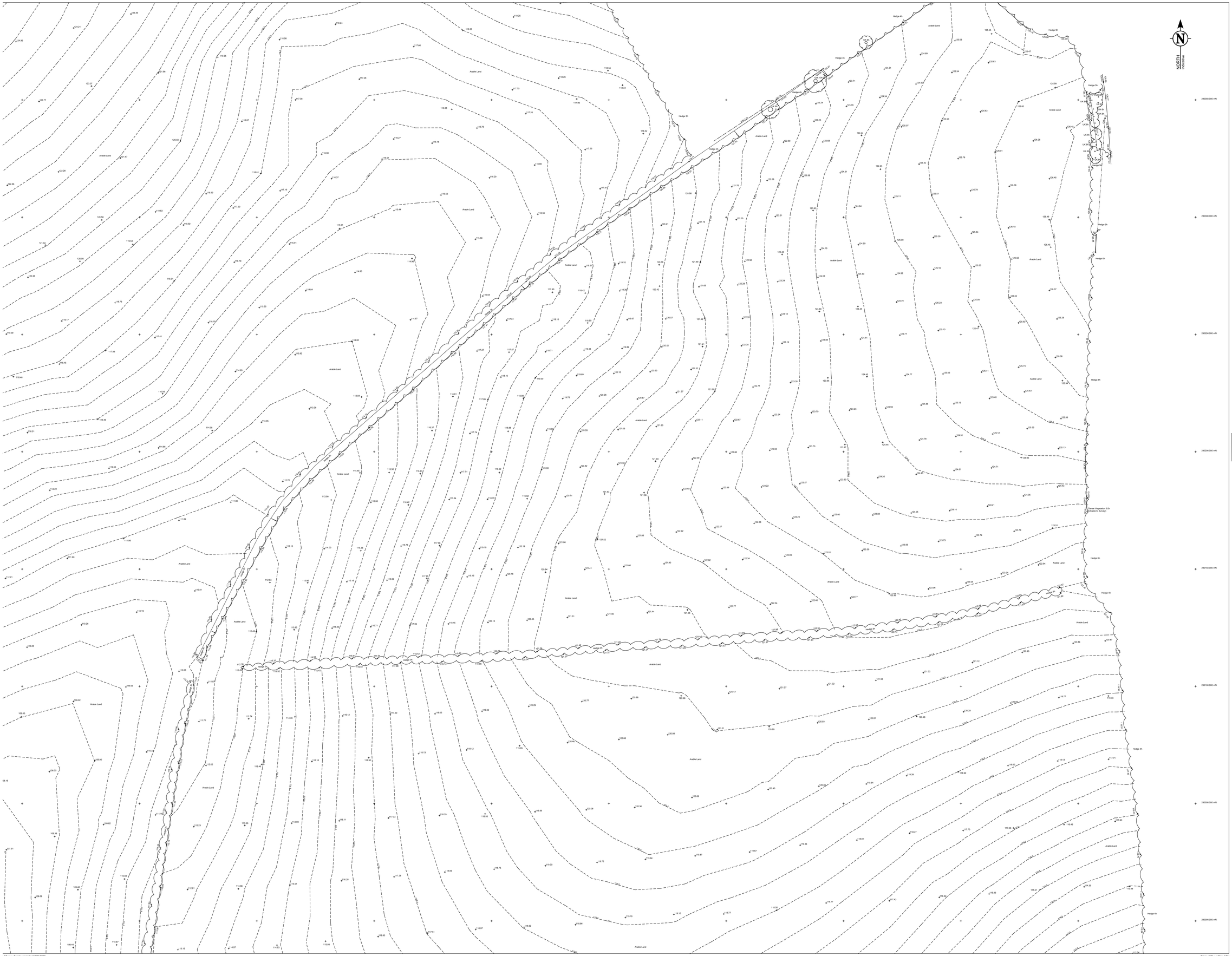
PROJECT TITLE
MUNCHES FARM, CUNBERLOW GREEN, BUNTINGFORD SG7 6RN

DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 12 of 14

CLIENT			SCALE
LANPRO			1:500
SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATU
GF,JH,DP	06/12/24	BT	DB	FINAL
DRAWING NUMBER		REVISION	ISSUE DATE
71226CVLS-12			11/12/20

RICS ices THE SURVEY ASSOCIATION
RISQS QUALIFIED
ISO 14001 : 2015 REGISTERED



TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

ABBREVIATIONS & SYMBOLS

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

Survey Control Station

DRAWING NOTES

Topographical Surveys

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

All building names, descriptions, number of storeys, construction type includir 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 feature 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.

Surveyed physical features may not necessarily represent the legal boundary lines.

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.

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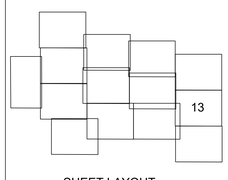

SHEET LAYOUT

SURVEY CONTROL CO-ORDINATES

STATIONS	EASTINGS	NORTHINGS	LEVEL	DESCRIPTION
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G04	528735.794	230688.656	116.604	Peg & Nail
G05	528797.747	230562.845	116.998	Peg & Nail
G06	528797.167	230420.466	116.374	Peg & Nail
G07	528674.899	230358.535	122.333	Peg & Nail
RW03	528731.963	230277.991	121.532	Peg & Nail
RW04	528632.192	230124.550	112.416	Peg & Nail
RW05	528482.917	230472.082	131.910	Peg & Nail
JH05	528398.109	230527.071	132.507	PK Nail
JH04	528433.509	230583.029	129.040	PK Nail
JH03	528477.607	230655.061	121.961	PK Nail
JH02	528506.092	230706.473	117.664	PK Nail
JH01	528544.511	230803.980	113.036	PK Nail
G001	528884.834	230971.449	107.957	Peg & Nail
G002	528984.834	230197.449	107.957	Peg & Nail
G003	528934.402	230077.833	106.415	Peg & Nail
R201	528586.490	230060.805	119.562	Peg & Nail
R202	528636.305	229961.405	120.541	Peg & Nail
RW04	528632.192	230124.550	112.416	Peg & Nail
R203	528499.815	229944.489	124.946	Peg & Nail
J101	528539.223	230124.777	133.777	Peg & Nail
J005	528420.591	230567.419	132.285	PK Nail
J004	528437.941	230567.615	132.287	PK Nail
J002	528434.812	230477.711	132.209	PK Nail
JH07	528191.364	230531.507	133.891	Peg & Nail
JH06	528004.125	230535.210	136.747	Peg & Nail

SURVEY GRID AND LEVEL DATUM

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

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REV	DESCRIPTION	DRAWN	APPR	DATE

SURVEY SOLUTIONS

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BUILDING SURVEYING
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PROJECT TITLE	MUNCHES FARM, CUNBERLOW GREEN, BUNTINGFORD SG7 6RN			
DRAWING DETAIL	TOPOGRAPHICAL SURVEY Sheet 13 of 14			
CLIENT	LANPRO			SCALE 1:500
SURVEYOR: GF,JH,DP	SURVEY DATE 06/12/24	CHECKED BY BT	APPROVED BY DB	DWG STATU FINAL
DRAWING NUMBER 71226CVLS-13			REVISION	ISSUE DATE 11/12/20

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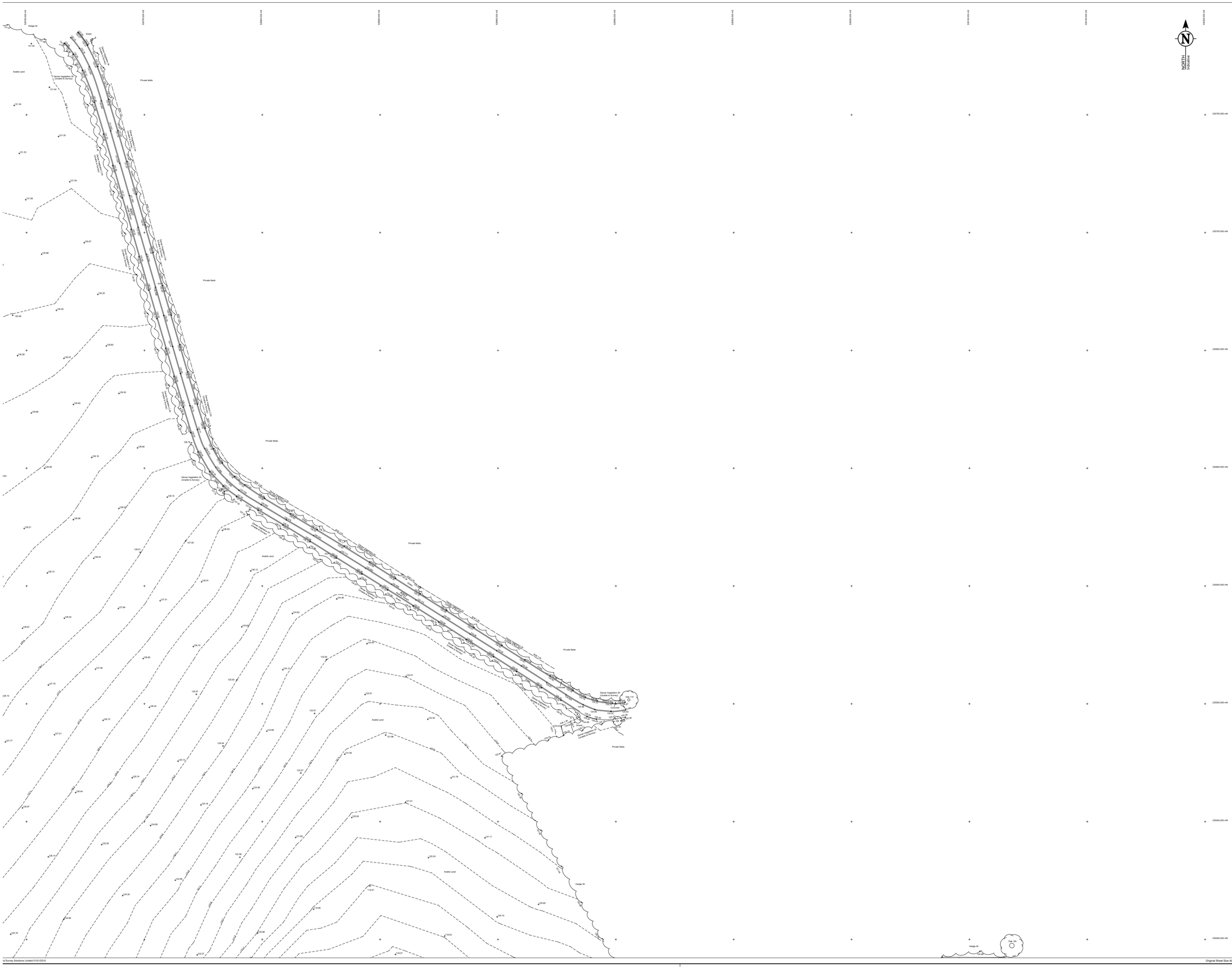
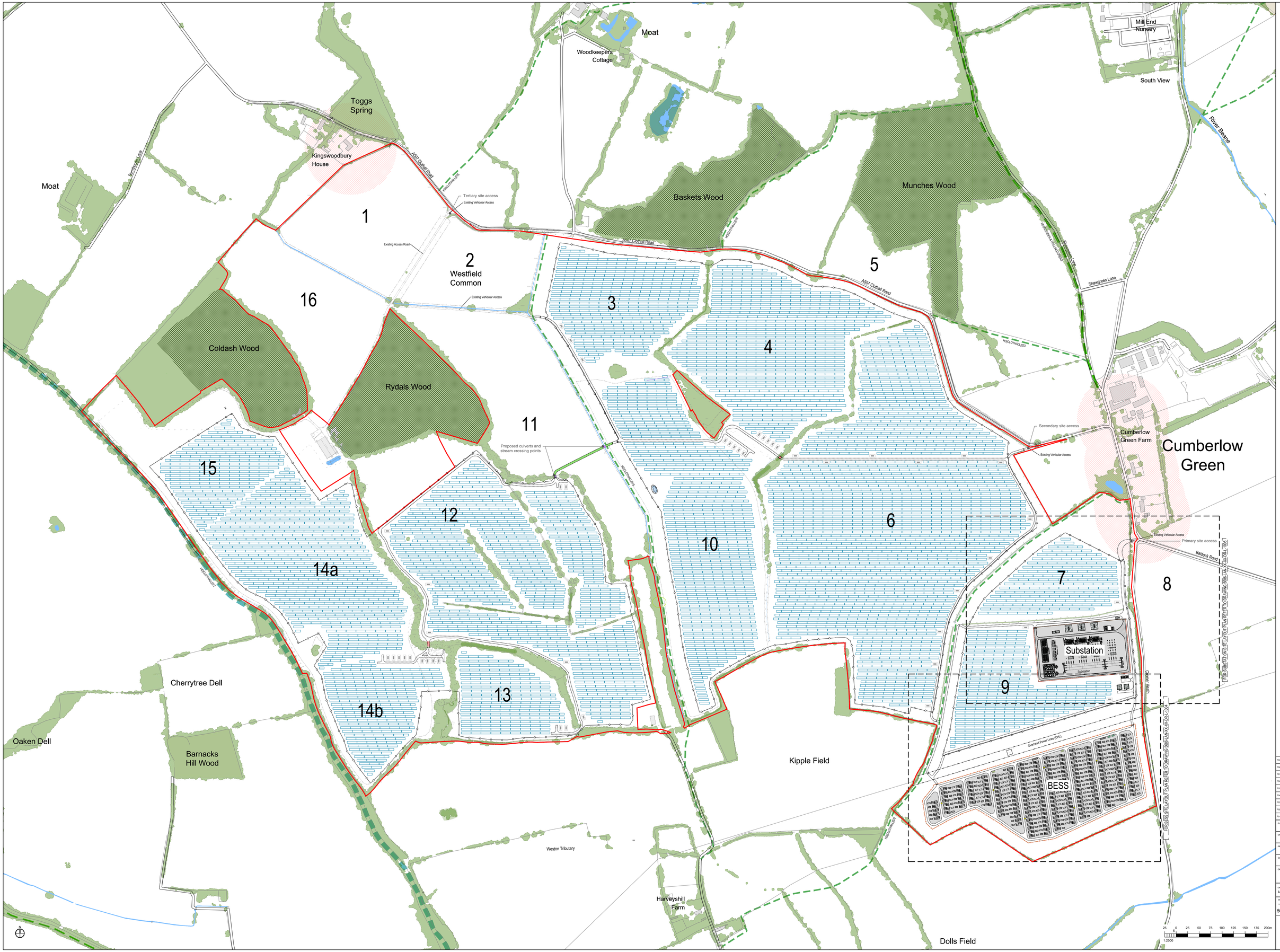
d Survey Solutions Limited 01/01/2010

Original Sheet Size A0H


NORTH
Hedge 4h
Grass
Arable Land
Private fields
Dense Vegetation 2h
(Unable to Survey)
Hedge 3h
Oak 13h
Oak 12h
Oak 11h
Ditch
Overhead Telephone & Electric Cables
Overhead Telephone & Electric Cables (Unable to Survey)
Overhead Telephone & Electric Cables (Unable to Survey) 7.5h
Overhead Telephone & Electric Cables (Unable to Survey) 8.5h
Overhead Telephone & Electric Cables (Unable to Survey) 9.5h
Overhead Telephone & Electric Cables (Unable to Survey) 10.5h
Overhead Telephone & Electric Cables (Unable to Survey)

Appendix C Proposed Site Layout Plan and Typical Details



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It is your responsibility as a client to make yourself aware of your rules and responsibilities under CDM 2015 and act accordingly.

KEY

- Planning Red Line Boundary

Existing Features

- Existing Buildings
- Existing Vegetation
- Existing Waterbodies
- Existing Ancient Woodlands (Unaffected)
- Existing Public Right of Way (PRoW) Footpath
- Existing PRoW - Bridlepath
- Existing PRoW - Byway Open to All Traffic (BOAT)

Proposed Features

- Existing vegetation removed
- 100m Buffer from Residential Properties to Proposed Development Infrastructure
- 1 Proposed Field Parcel Numbers
- Proposed Solar Panels
- Proposed Medium Voltage Station (MVS) Unit
- Proposed Made, Type 2 Road within Substation Compound
- Proposed Cellular Access Tracks: 6m Wide to the Substation and 4m Wide Across the Site
- Proposed Type 2 hardstanding - Crushed Rock or Gravel, within BESS and substation compounds
- Proposed Concrete Plinth/Footings
- Proposed Green Access Track. Reinforced Vehicular Surface sown with Native Grassland Seed Mix
- Proposed Concrete Culvert and Access Across Existing Stream
- Proposed Security Fencing around Substation - CAT2 Mesh
- Proposed Acoustic Fencing to BESS (Inside of Security Fencing)
- Proposed Palisade Security Fencing around BESS
- Proposed Solar Perimeter Fencing
- Proposed Access Gate
- Proposed Fire Hydrant within BESS compound
- Proposed CCTV camera
- Proposed Battery and MVS Units
- Proposed Water Tank (228.000L capacity) with min. 10m buffer to BESS
- Proposed Car Parking for Substation and BESS
- Proposed LV Units
- Proposed Spares Container
- Proposed Welfare Facilities and Operations Office
- Proposed Control Room
- Proposed Shallow Sided Wildlife Pond

Rev	Description	Date	Drawn	Checked	Approved
P09	Red line boundary updated	12.02.25	MT	JC	CJ
P08	Access 4 removed, Access 3 updated, Primary access route to remain as existing, 2 no. new accesses from substation compound	10.02.25	MT	JC	CJ
P07	Red line boundary updated	06.02.25	MT	JC	CJ
P06	Red line boundary updated, Access 4 added	04.02.25	MT	JC	CJ
P05	Red line boundary updated	31.01.25	MT	JC	CJ
P04	Red line boundary updated, Access 4 added	30.01.25	MT	JC	CJ
P03	Red line boundary updated, Access 3 added	29.01.25	MT	JC	CJ
P02	Red line boundary updated, Access 2 added	28.01.25	MT	JC	CJ
P01	Red line boundary updated	27.01.25	MT	JC	CJ

PURPOSE OF ISSUE	PL - PLANNING SUBMISSION
WIP STAGE	S3
DRAWING STATUS	S3 - FOR REVIEW AND COMMENT
PROJECT TITLE	Westfield Energy Conservation Park
CLIENT	Lightrock Power
DRAWING TITLE	Site Layout
SCALE	1:2500@A0
DATE	12.02.25
DRAWN BY	MT
CHECKED BY	JC
APPROVED BY	CJ
DRAWING NUMBER	5686-LAN-XX-XX-DR-L-1002-P09

25 0 25 50 75 100 125 150 175 200m
1:2500

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Tel:
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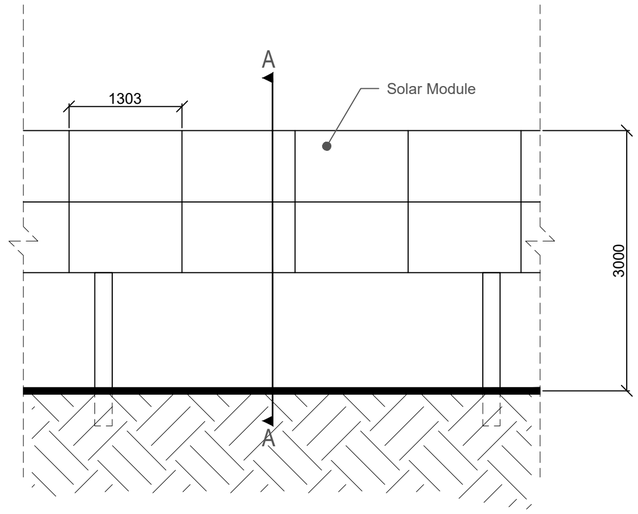

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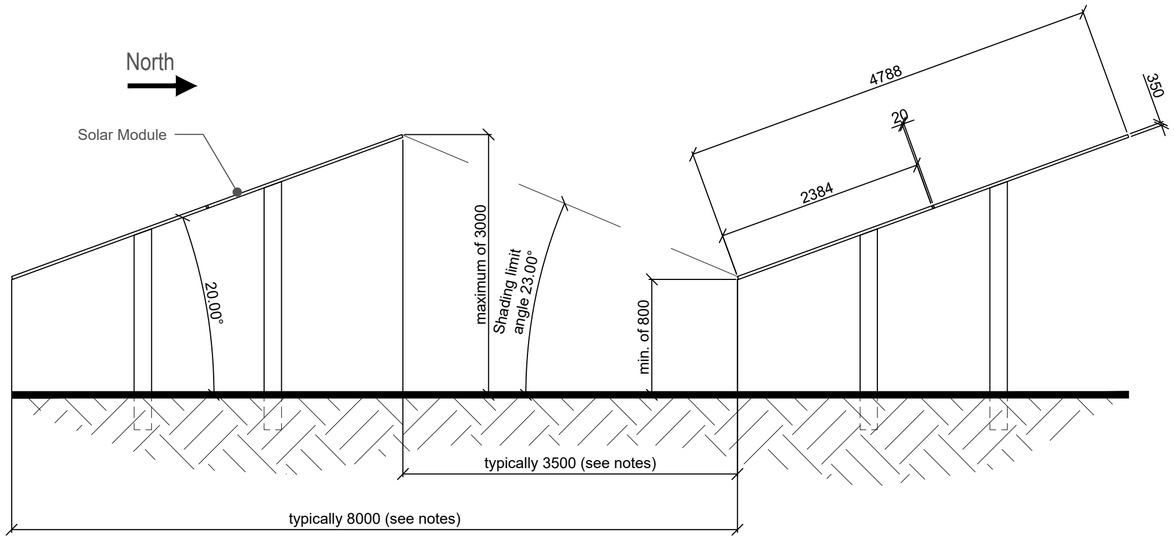

SECTION A-A

1 0 1 2 3 4 5m

1:50

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http://www.hse.gov.uk/construction/cdm/2015/responsibilities.html

It is your responsibility as a client to make yourself aware of your roles and responsibilities under CDM 2015 and act accordingly.

Notes:
1. The panels are fixed facing south at a tilt angle between 10 and 35 degrees.

2. Depending on the final panel dimensions and tilt angle, the panels could be mounted as low as 0.8m to the ground rising to 3m at the highest point.

3. Spacing would typically be 3.5m but could vary between 2m – 6m which is determined by topography and aspect parameters.

4. Panel mounting structure can very depending on ground conditions and will be confirmed following detailed design prior to construction.

P02	Revised following client comments				
	REVISED BY: CW	DATE: 02.07.25	CHECKED BY: MT	DATE:02.07.25	
P01	First Issue				
	REVISED BY: CW	DATE: 01.07.25	CHECKED BY: MT	DATE:01.07.25	

PURPOSE OF ISSUE: PL - PLANNING SUBMISSION
RIBA STAGE: 3

DRAWING STATUS: S2 - Suitable for Information

PROJECT TITLE: Westfield Energy Conservation Park

CLIENT: Lightrock Power

DRAWING TITLE: Solar Panels
SCALE: 1:50 @A2

DATE	DRAWN BY	CHECKED BY	APPROVED BY
01.07.25	CW	MT	MT

DRAWING NUMBER

PROJECT NO | DRAWING FIELDS | REVISION

5686-LAN-XX-XX-DR-L-3019-**P02**

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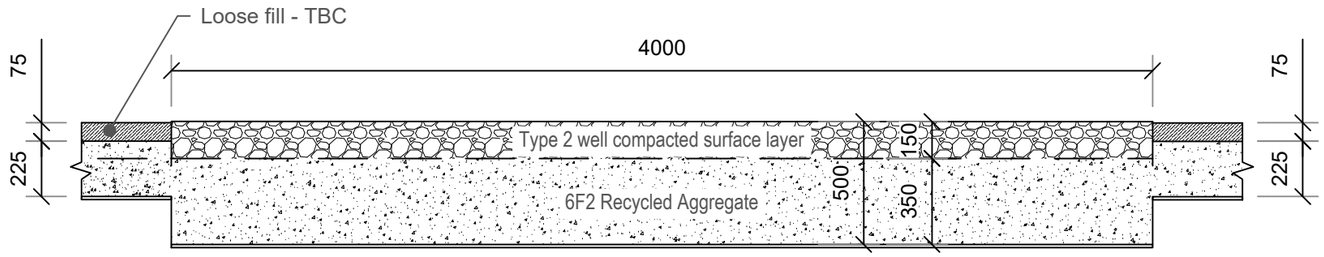
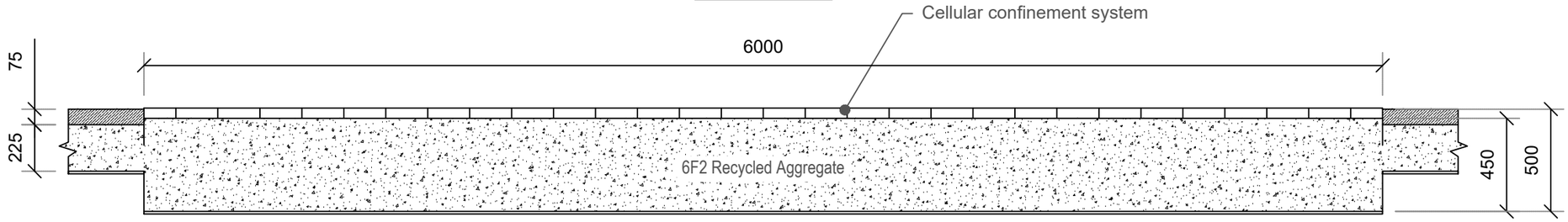
Last Edit: 7/2/2025 3:09 PM
5686-LAN-XX-XX-DR-L-3002 - Standard Inspection
Z:\Projects\5686 Westfield Energy Conservation Park\4 Technical\Drawings\5686-LAN-XX-XX-DR-L-3002 - Standard Inspection.rvt

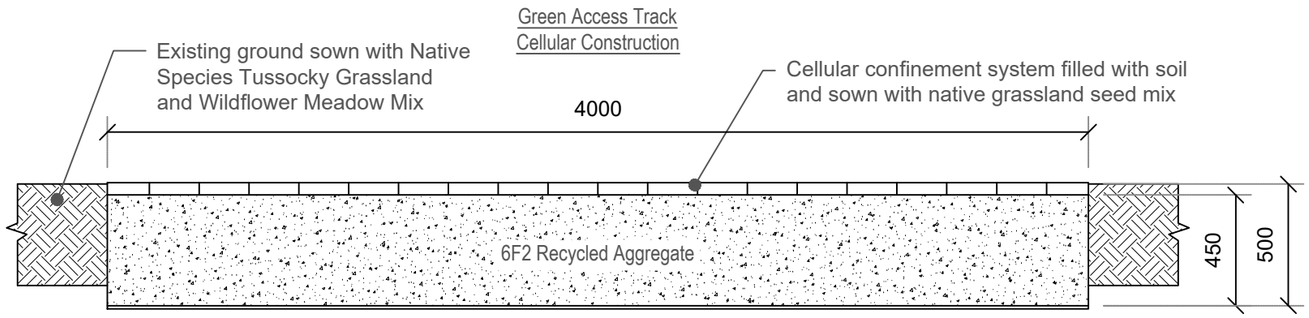
Access track within Substation
Made Track (Type 2 Aggregate)



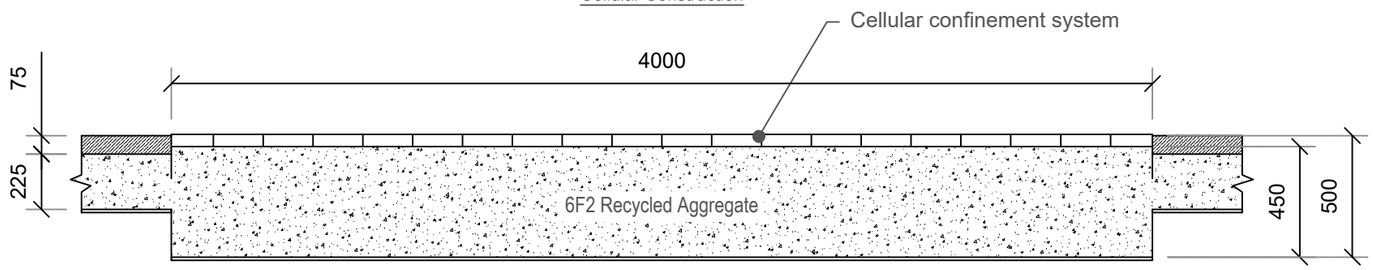
Access track to Substation
Cellular Construction



Green Access Track
Cellular Construction



All other tracks
Cellular Construction



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It is your responsibility as a client to make yourself aware of your roles and responsibilities under CDM 2015 and act accordingly.

P03	Revised to include Green Access Track -				
	REVISED BY: CW	DATE: 03.07.25	CHECKED BY: MT	DATE:03.07.25	
P02	Revised to reflect client comments -				
	REVISED BY: CW	DATE: 11.06.25	CHECKED BY: MT	DATE:11.06.25	
P01	First Issue -				
	REVISED BY: CW	DATE: 14.03.25	CHECKED BY: MT	DATE:14.03.25	

PURPOSE OF ISSUE: PL - PLANNING SUBMISSION
RIBA STAGE: 3

DRAWING STATUS: S2 - Suitable for Information

PROJECT TITLE: Westfield Energy Conservation Park

CLIENT: Lightrock Power

DRAWING TITLE: Access Tracks
SCALE: 1:25@A3

DATE	DRAWN BY	CHECKED BY	APPROVED BY
12.03.25	CW	MT	MT

DRAWING NUMBER

PROJECT NO | DRAWING FIELDS | REVISION

5686-LAN-XX-XX-DR-L-3008-**P03**

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Appendix D Environment Agency Flood Mapping

Flood map for planning

Your reference	Location (easting/northing)	Created
6437	**529065/230375**	**9 July 2025 09:38**

Your selected location is in flood zone 3, an area with a high probability of flooding.

This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see https://www.gov.uk/guidance/flood-risk-assessment-standing-advice)

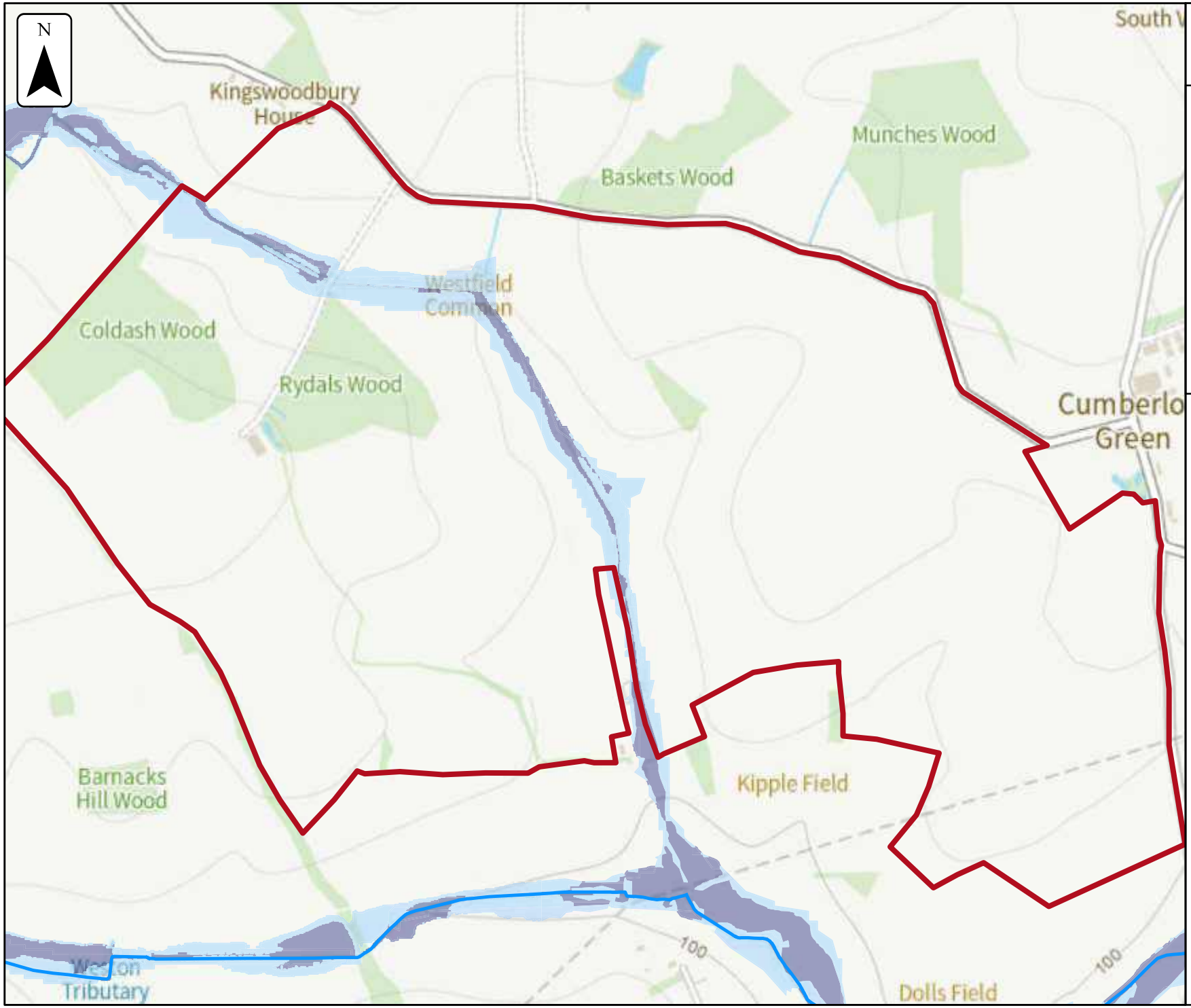
Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2025 AC0000807064. https://flood-map-for-planning.service.gov.uk/os-terms



Environment Agency

Flood map for planning

Your reference
6437

Location (easting/northing)
529065/230375

Scale
1:10,000

Created
9 Jul 2025 09:38

- Selected area
- Flood zone 3
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 100 200 300m

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Appendix E Greenfield Runoff Calculation ICP-SuDS

5 John Charles Way
LEEDS LS12 6QA
Tel: 0113 263 1155

admin@jpg.group
www.jpg.group

Project No 6437

Sheet No 1

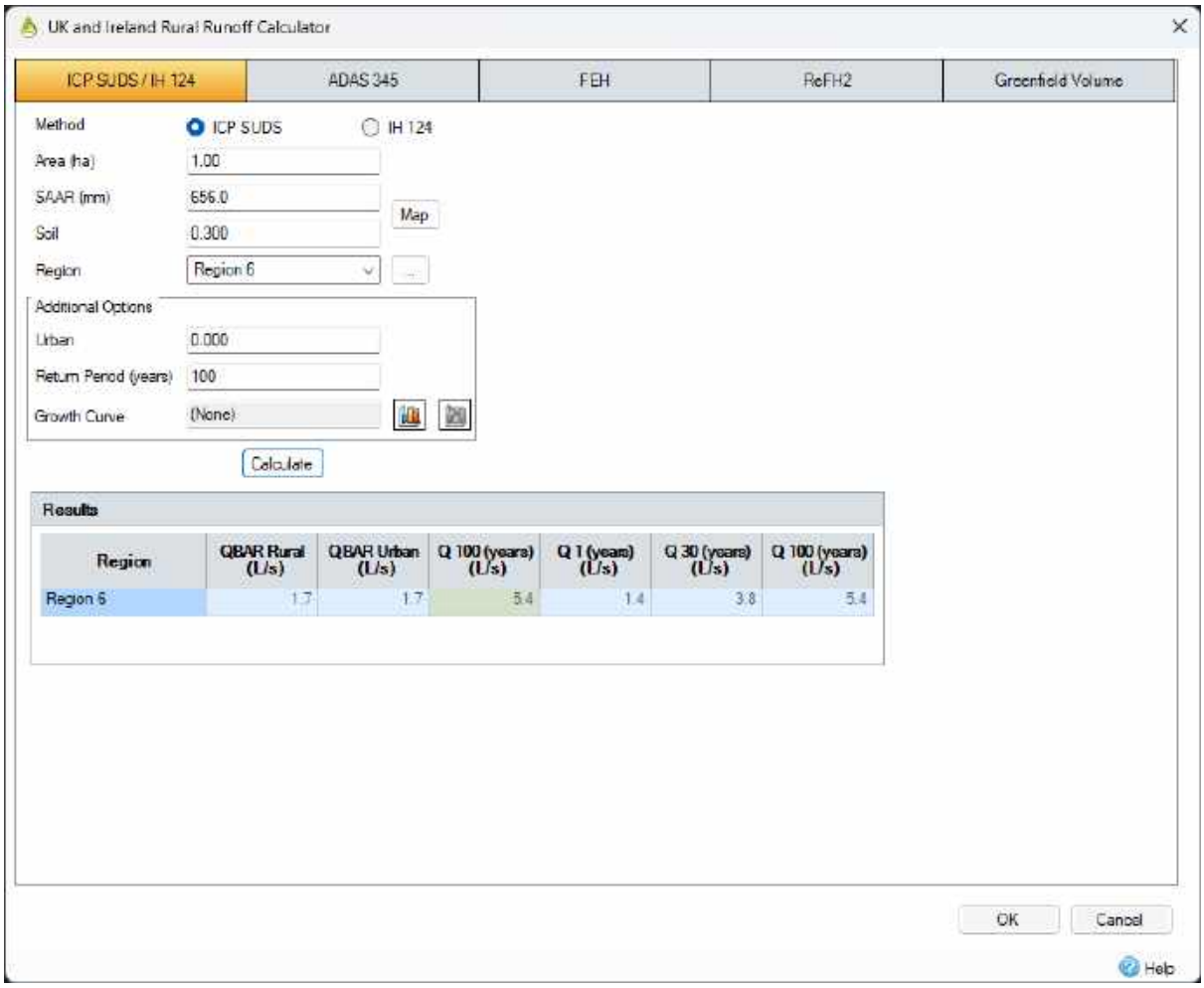
Made By ETR

Project WESTFIELD ENERGY CONSERVATION PARK, HERTFORDSHIRE

Date 07/03/2025

QBAR CALCULATIONS

INFODRAINAGE ICP SUDS



QBAR = 1.7 l/s/Ha

Appendix F SW Drainage Quick Storage Estimate Hydraulic Calculations

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Tel: 0113 263 1155

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Project No 6437

Sheet No 1

Made By JDM

Project WESTFIELD ENERGY CONSERVATION, HERTFORDSHIRE

Date 01/07/2025

ATTENUATION CALCULATIONS

INFODRAINAGE QUICK STORAGE ESTIMATE SUBSTATION COMPOUND

SUPPORTING INFORMATION

Greenfield Run off rate = **Qbar** = **1.700 l/s/Ha** (Qbar calculated using ICP SUDS calculation method).

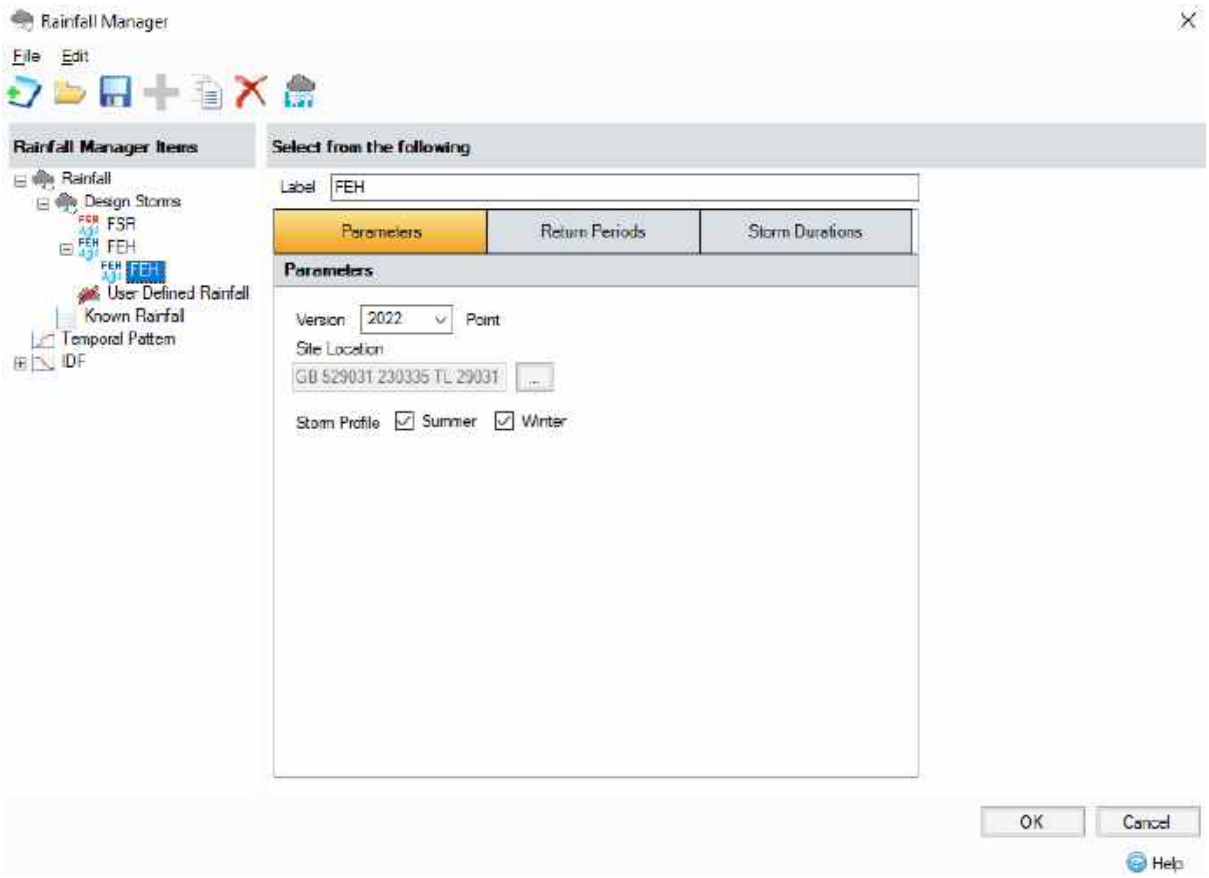
Total restricted discharge = **4.075 l/s**

Impermeable Area – **2.397 Ha**.

$\mathbf{V_{max}}$ calculated using Quick Storage Estimate feature on Info Drainage.

Attenuation calculated for a 1 in 100 Year Storm Event plus **40%** Climate Change.

Rainfall Parameters below:



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Sheet No 2

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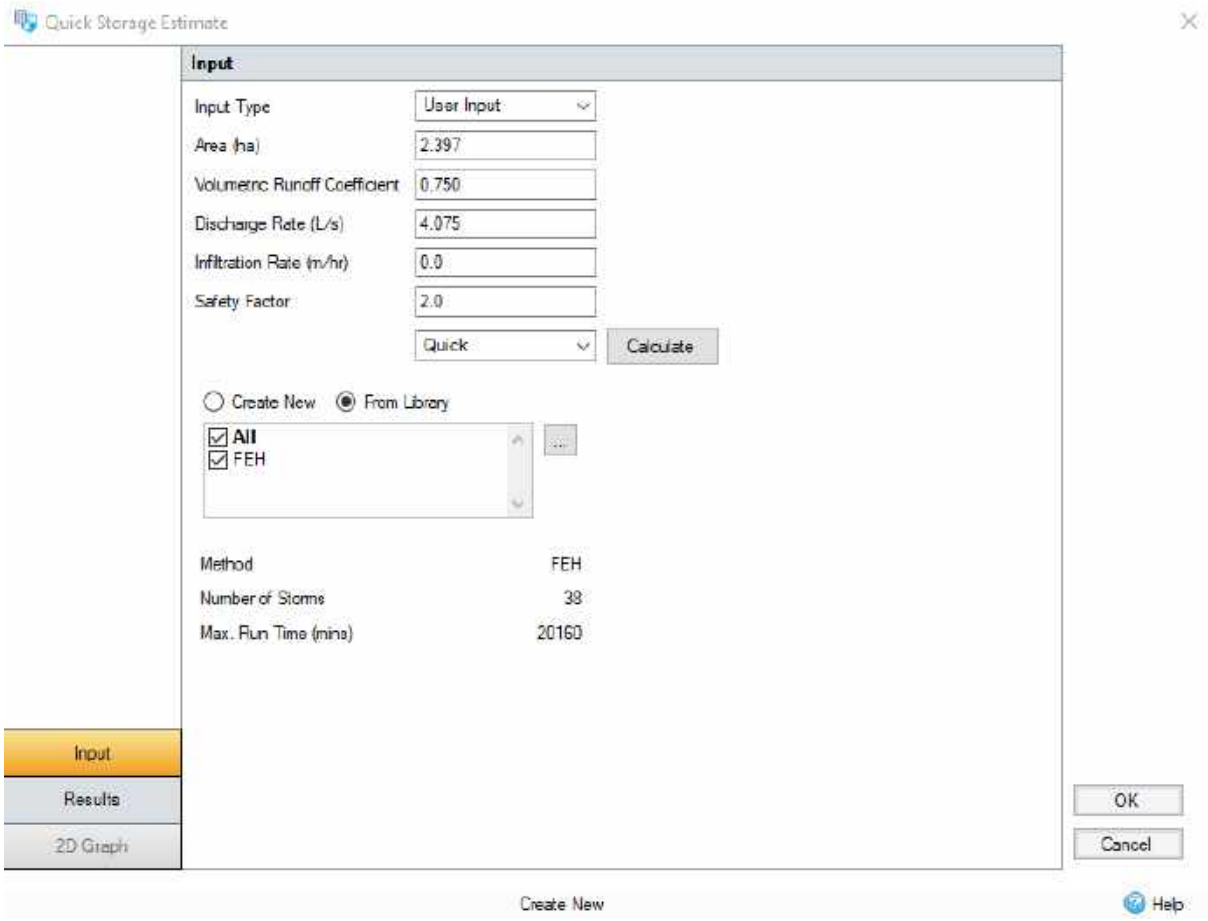
Project WESTFIELD ENERGY CONSERVATION, HERTFORDSHIRE

Date 01/07/2025

Quick Storage Parameters below:



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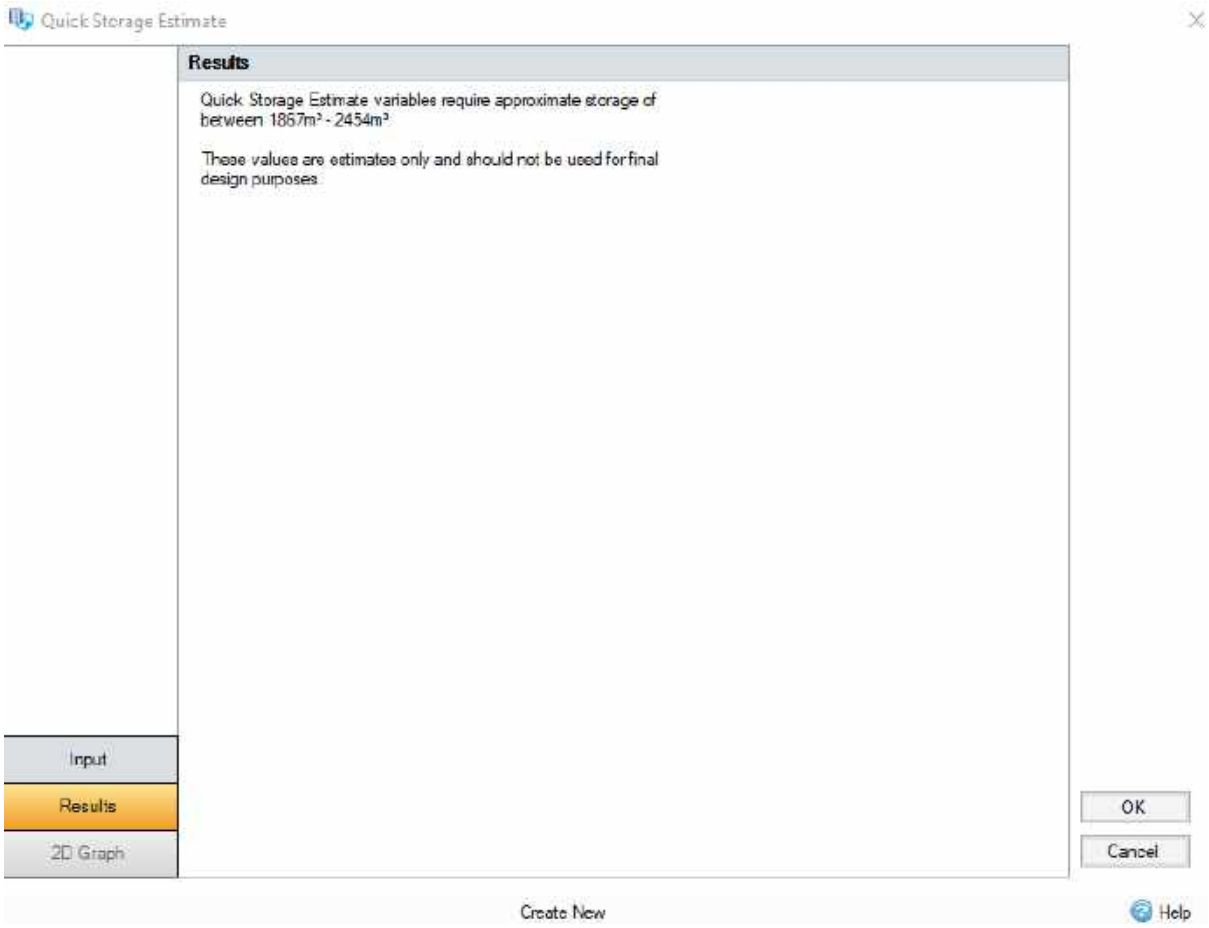
Date 01/07/2025

Attenuation Volume below



$V_{req.} = 2454.0 \ m^3$

Attenuation volume required based on infiltration drainage methods not been feasible on the site based on undertaking on site permeability testing.

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Date 01/07/2025

ATTENUATION CALCULATIONS

INFODRAINAGE QUICK STORAGE ESTIMATE BESS COMPOUND

SUPPORTING INFORMATION

Greenfield Run off rate = **Qbar** = **1.700 l/s/Ha** (Qbar calculated using ICP SUDS calculation method).

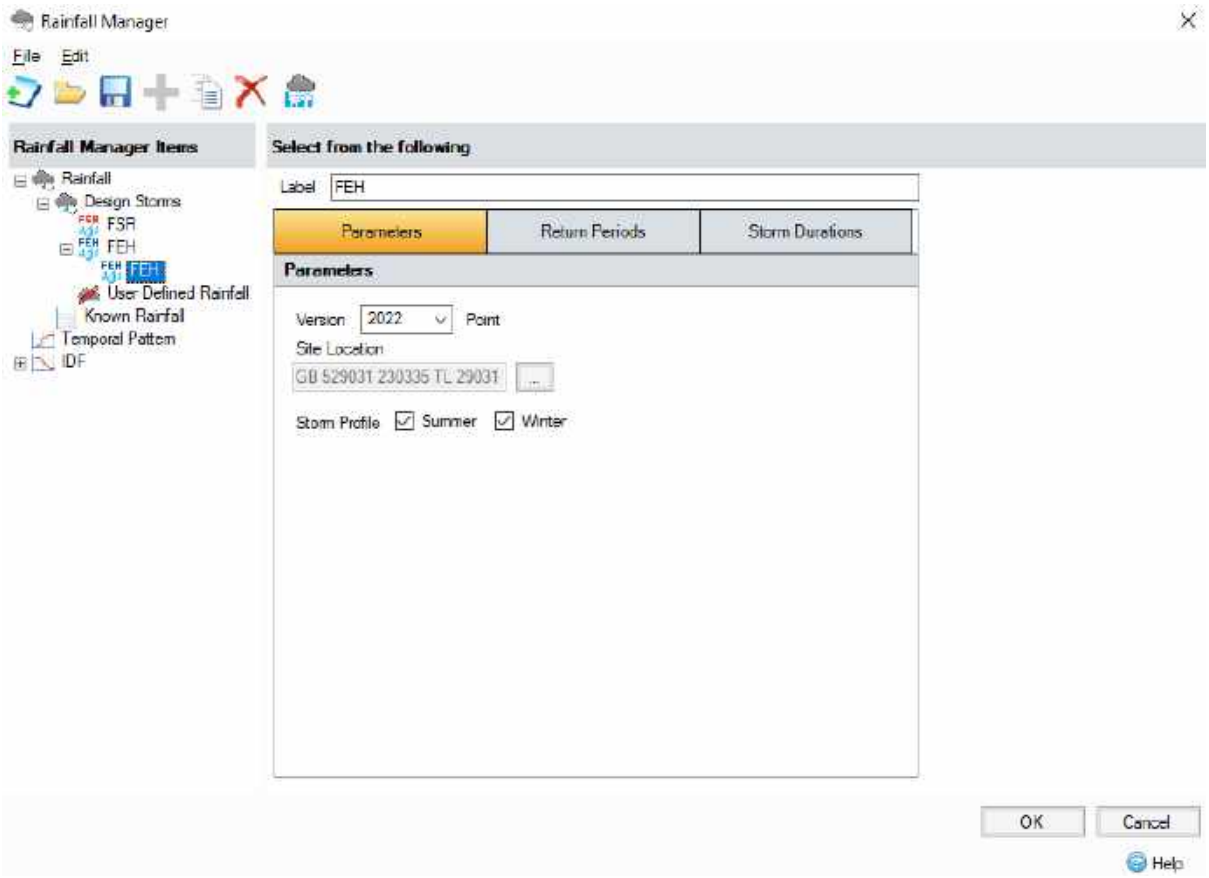
Total restricted discharge = **11.881 l/s**

Impermeable Area = **6.989 Ha**.

$\mathbf{V_{max}}$ calculated using Quick Storage Estimate feature on Info Drainage.

Attenuation calculated for a 1 in 100 Year Storm Event plus **40%** Climate Change.

Rainfall Parameters below:



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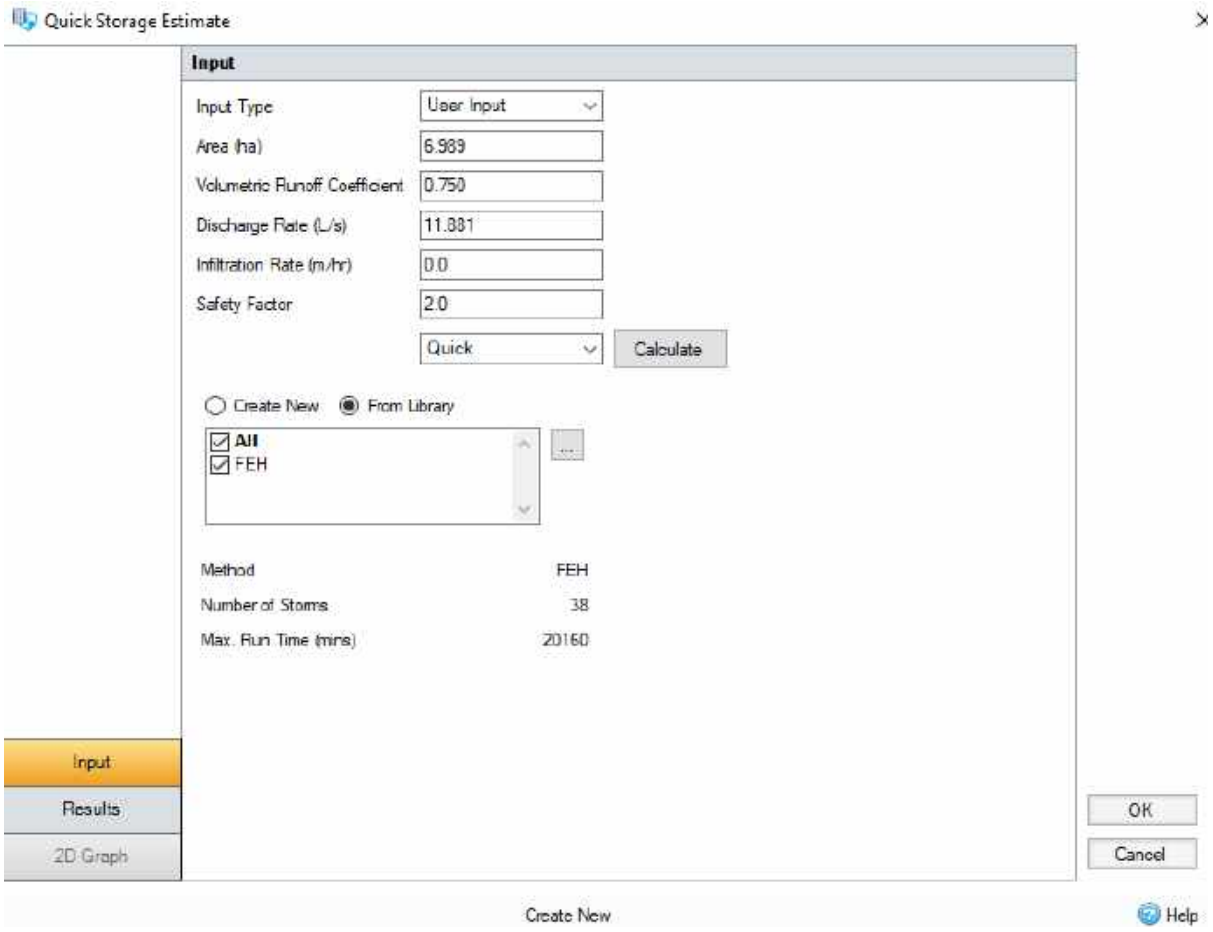
Date 01/07/2025

Quick Storage Parameters below:



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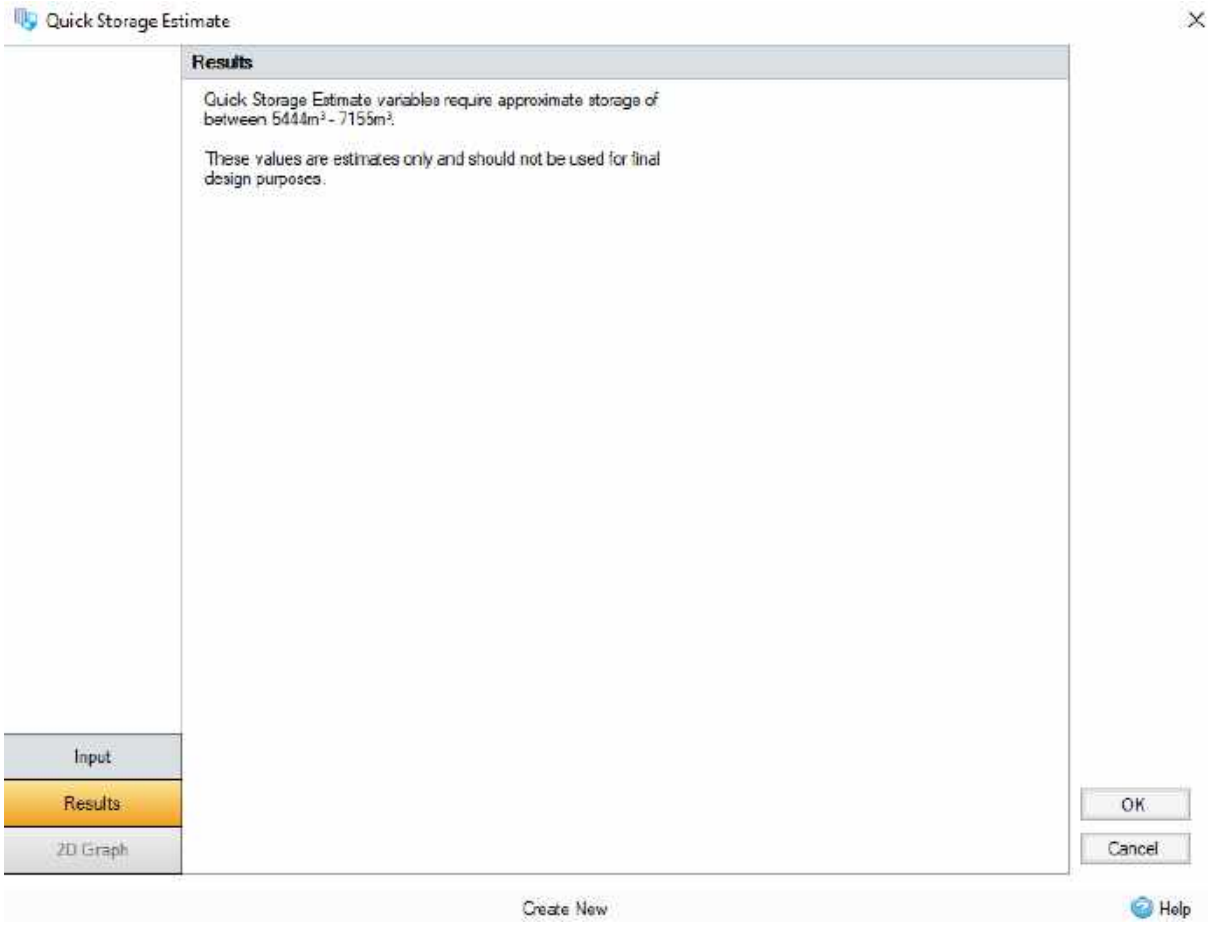
Date 01/07/2025

Attenuation Volume below



$\mathbf{V_{req.} = 7155.0\ m^3}$

Attenuation volume required based on infiltration drainage methods not been feasible on the site based on undertaking on site permeability testing.

Appendix G Conceptual Drainage Strategy

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LEGEND

- RED LINE BOUNDARY
- BATTERY ELECTRICITY STORAGE SYSTEM (BESS) AREA
- SUBSTATION AREA
- WATER BODY
- ACCESS TRACK PROPOSED INFILTRATION DRAINAGE DITCHES
- ACCESS TRACK PROPOSED INFILTRATION FILTER DRAIN
- SW DRAIN
- LAND DRAIN
- FLOOD EXCEEDANCE ROUTE

IMPERMEABLE AREAS

TOTAL DEVELOPMENT AREA = 1215391.665m²/121.539Ha

B.E.S.S IMP. AREA = 6.989 Ha
SUBSTATION IMP. AREA = 2.397 Ha

TOTAL IMP. AREA = 9.386 Ha

0m 62.5m 125m
SCALE 1:2500

WHERE FLOOD ZONE 2 EXIST ADJACENT TO EXISTING UNNAMED WATERCOURSE THIS WILL BE KEPT DEVELOPMENT FREE

THE PROPOSED SOLAR PANELS WILL BE SITUATED IN AN ELEVATED POSITION IN RELATION TO WATERCOURSE AND AND IDENTIFIED FLOOD ZONES

SOLAR PANELS WILL BE SET AT AN ELEVATED POSITION ABOVE THE VEGETATED GROUND

EXISTING TOPOGRAPHY WILL BE RETAINED AND SW RUNOFF FROM THE PROPOSED SOLAR PANELS WILL DRIP ONTO THE EXISTING GROUND AND WILL DISCHARGE VIA INFILTRATION OR OVERLAND TO THE EXISTING UNNAMED WATERCOURSE AT GREENFIELD RATE AS PER THE EXISTING SCENARIO

PROPOSED SOLAR PANELS WILL INDUCE MINIMAL POLLUTION

SW RUN OFF FROM SOLAR PANELS WILL BE TREATED AS IT FLOWS OVER GREENFIELD AREAS AND THROUGH VEGETATION PRIOR TO DISCHARGING VIA INFILTRATION OR TO THE EXISTING WATERCOURSE

MAINTENANCE ACCESS TRACKS WILL HAVE INFREQUENT USE AND AS A RESULT WILL PRESENT A MINIMAL POLLUTION RISK

SW RUN OFF FROM THE ACCESS TRACKS WILL BE CAPTURED VIA THE DITCHES AND/OR FILTER DRAINS WHICH WILL PROVIDE PRIMARY TREATMENT

RUNOFF TREATMENT WILL BE PROVIDED TO ACHIEVE SUFFICIENT SuDS MITIGATION INDICES FOR THE ACCESS TRACKS.

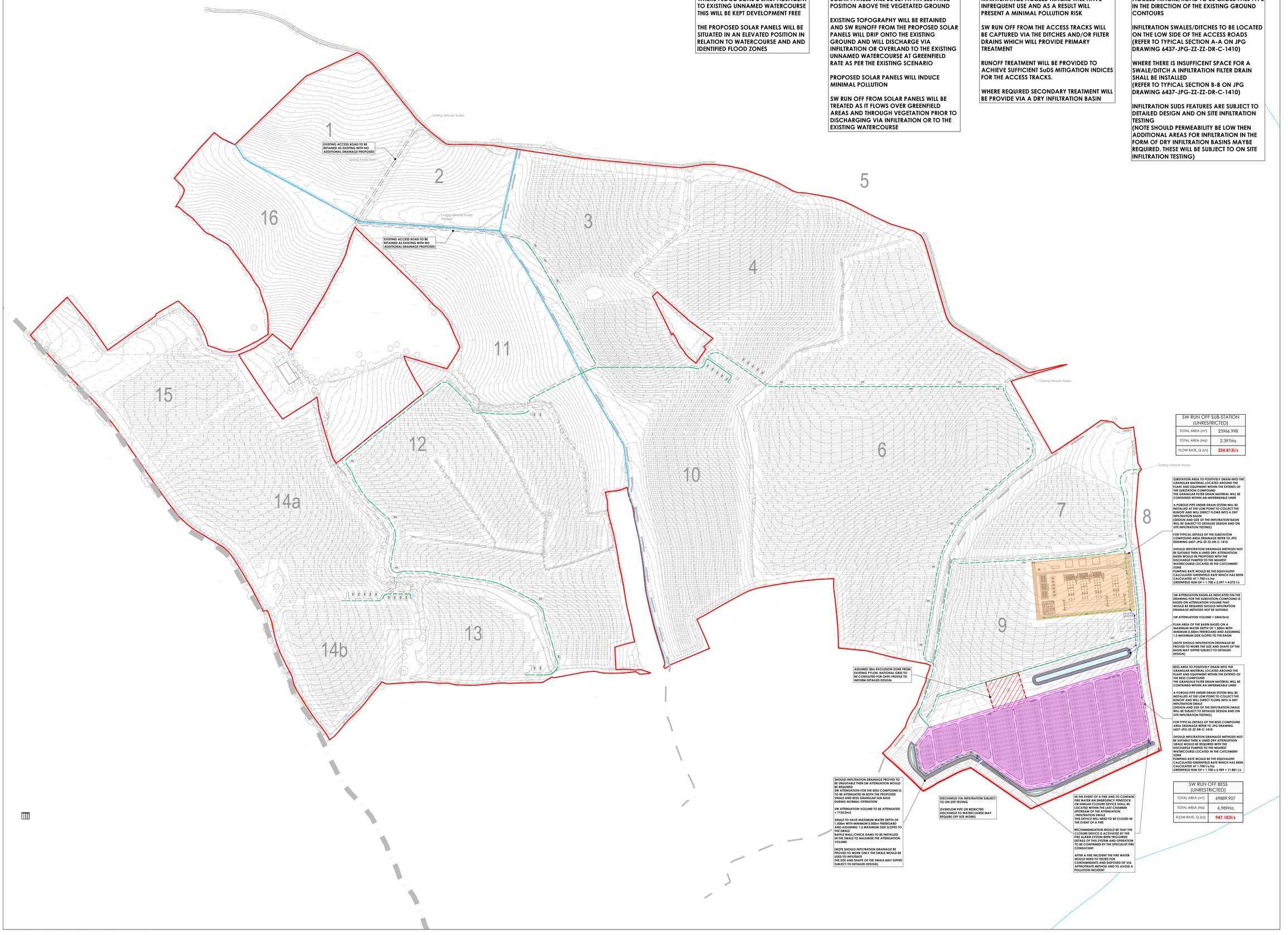
WHERE REQUIRED SECONDARY TREATMENT WILL BE PROVIDE VIA A DRY INFILTRATION BASIN

ACCESS TRACKS/ROAD TO BE CROSS FALL TYPE IN THE DIRECTION OF THE EXISTING GROUND CONTOURS

INFILTRATION SWALES/DITCHES TO BE LOCATED ON THE LOW SIDE OF THE ACCESS ROADS (REFER TO TYPICAL SECTION A-A ON JPG DRAWING 6437-JPG-ZZ-ZZ-DR-C-1410)

WHERE THERE IS INSUFFICENT SPACE FOR A SWALE/DITCH A INFILTRATION FILTER DRAIN SHALL BE INSTALLED (REFER TO TYPICAL SECTION B-B ON JPG DRAWING 6437-JPG-ZZ-ZZ-DR-C-1410)

INFILTRATION SUDS FEATURES ARE SUBJECT TO DETAILED DESIGN AND ON SITE INFILTRATION TESTING (NOTE SHOULD PERMEABILITY BE LOW THEN ADDITIONAL AREAS FOR INFILTRATION IN THE FORM OF DRY INFILTRATION BASINS MAYBE REQUIRED. THESE WILL BE SUBJECT TO ON SITE INFILTRATION TESTING)



SW RUN OFF SUB-STATION (UNRESTRICTED)	
TOTAL AREA (m²)	23966.998
TOTAL AREA (Ha)	2.397Ha
FLOW RATE. Q (l/s)	**324.813l/s**

SUBSTATION AREA TO POSITIVELY DRAIN INTO THE GRANULAR MATERIAL LOCATED AROUND THE PLANT AND EQUIPMENT WITHIN THE EXTENTS OF THE SUBSTATION COMPOUND
THE GRANULAR FILTER DRAIN MATERIAL WILL BE CONTAINED WITHIN AN IMPERMEABLE LINER

A POROUS PIPE UNDER DRAIN SYSTEM WILL BE INSTALLED AT THE LOW POINT TO COLLECT THE RUNOFF AND WILL DIRECT FLOWS INTO A DRY INFILTRATION BASIN (DESIGN AND SIZE OF THE INFILTRATION BASIN WILL BE SUBJECT TO DETAILED DESIGN AND ON SITE INFILTRATION TESTING)

FOR TYPICAL DETAILS OF THE SUBSTATION COMPOUND AREA DRAINAGE REFER TO JPG DRAWING 6437-JPG-ZZ-ZZ-DR-C-1410

SHOULD INFILTRATION DRAINAGE METHODS NOT BE SUITABLE THEN A LINED DRY ATTENUATION BASIN WOULD BE PROPOSED WITH THE DISCHARGE PUMPED TO THE NEAREST WATERCOURSE LOCATED IN THE CATCHMENT ZONE
PUMPING RATE WOULD BE THE EQUIVALENT CALCULATED GREENFIELD RATE WHICH HAS BEEN CALCULATED AT 1.700 l/s/ha
GREENFIELD RUN OF = 1.700 x 2.397 = 4.075 l/s

SW ATTENUATION BASIN AS INDICATED ON THE DRAWING FOR THE SUBSTATION COMPOUND IS BASED ON ATTENUATION VOLUME THAT WOULD BE REQUIRED SHOULD INFILTRATION DRAINAGE METHODS NOT BE SUITABLE

SW ATTENUATION VOLUME = 2454.0m3

PLAN AREA OF THE BASIN BASED ON A MAXIMUM WATER DEPTH OF 1.500m WITH MINIMUM 0.500m FREEBOARD AND ASSUMING 1:3 MAXIMUM SIDE SLOPES TO THE BASIN

(NOTE SHOULD INFILTRATION DRAINAGE BE PROVED TO WORK THE SIZE AND SHAPE OF THE BASIN MAY DIFFER SUBJECT TO DETAILED DESIGN)

BESS AREA TO POSITIVELY DRAIN INTO THE GRANULAR MATERIAL LOCATED AROUND THE PLANT AND EQUIPMENT WITHIN THE EXTENTS OF THE BESS COMPOUND
THE GRANULAR FILTER DRAIN MATERIAL WILL BE CONTAINED WITHIN AN IMPERMEABLE LINER

A POROUS PIPE UNDER DRAIN SYSTEM WILL BE INSTALLED AT THE LOW POINT TO COLLECT THE RUNOFF AND WILL DIRECT FLOWS INTO A DRY INFILTRATION SWALE (DESIGN AND SIZE OF THE INFILTRATION SWALE WILL BE SUBJECT TO DETAILED DESIGN AND ON SITE INFILTRATION TESTING)

FOR TYPICAL DETAILS OF THE BESS COMPOUND AREA DRAINAGE REFER TO JPG DRAWING 6437-JPG-ZZ-ZZ-DR-C-1410

SHOULD INFILTRATION DRAINAGE METHODS NOT BE SUITABLE THEN A LINED DRY ATTENUATION SWALE WOULD BE REQUIRED WITH THE DISCHARGE PUMPED TO THE NEAREST WATERCOURSE LOCATED IN THE CATCHMENT ZONE
PUMPING RATE WOULD BE THE EQUIVALENT CALCULATED GREENFIELD RATE WHICH HAS BEEN CALCULATED AT 1.700 l/s/ha
GREENFIELD RUN OF = 1.700 x 6.989 = 11.881 l/s

SW RUN OFF BESS (UNRESTRICTED)	
TOTAL AREA (m²)	69889.907
TOTAL AREA (Ha)	6.9891Ha
FLOW RATE. Q (l/s)	**947.183l/s**

SHOULD INFILTRATION DRAINAGE PROVED TO BE UNSUITABLE THEN SW ATTENUATION WOULD BE REQUIRED
SW ATTENUATION FOR THE BESS COMPOUND IS TO BE ATTENUATED IN BOTH THE PROPOSED SWALE AND BESS GRANULAR SUB-BASE DURING NORMAL OPERATION

SW ATTENUATION VOLUME TO BE ATTENUATED = 7155.0m3

SWALE TO HAVE MAXIMUM WATER DEPTH OF 1.500m WITH MINIMUM 0.500m FREEBOARD AND ASSUMING 1:3 MAXIMUM SIDE SLOPES TO THE SWALE
BAFFLE WALL/CHECK DAMS TO BE INSTALLED IN THE SWALE TO MAXIMISE THE ATTENUATION VOLUME

(NOTE SHOULD INFILTRATION DRAINAGE BE PROVED TO WORK ONLY THE SWALE WOULD BE USED TO INFILTRATE THE SIZE AND SHAPE OF THE SWALE MAY DIFFER SUBJECT TO DETAILED DESIGN)

DISCHARGE VIA INFILTRATION SUBJECT TO ON SITE TESTING

OVERFLOW PIPE OR RESRICTED DISCHARGE TO WATERCOURSE MAY REQUIRE OFF SITE WORKS.

IN THE EVENT OF A FIRE AND TO CONTAIN FIRE WATER AN EMERGENCY PENSTOCK OR SIMILAR CLOSURE DEVICE SHALL BE LOCATED WITHIN THE LAST CHAMBER UPSTREAM OF THE ATTENUATION /INFILTRATION SWALE
THIS DEVICE WILL NEED TO BE CLOSED IN THE EVENT OF A FIRE

RECOMMENDATION WOULD BE THAT THE CLOSURE DEVICE IS ACTIVATED BY THE FIRE SERVICE ON ARRIVAL AT SITE. DETAILS OF THIS SYSTEM AND OPERATION TO BE CONFIRMED BY THE SPECIALIST FIRE CONSULTANT

AFTER A FIRE INCIDENT THE FIRE WATER WOULD NEED TO TESTED FOR CONTAMINANTS AND DISPOSED OF VIA APPROPRIATE METHOD AND TO AVOID A POLLUTION INCIDENT

CONCEPTUAL DRAINAGE STRATEGY

SCALE 1:2500

REV	DESCRIPTION	DATE	CHK	BY
P04	REDLINE BOUNDARY UPDATED	21/07/25	RMR	DM
P03	UPDATE TO REFLECT THE LATEST SITE LAYOUT	01/07/25	RMR	JDM
P02	UPDATED TO INCORPORATE BASIN AND DITCHES.	01/04/25	JDM	ETR
P01	FIRST ISSUE.	07/03/25	JDM	ETR

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Drawing Title
CONCEPTUAL DRAINAGE STRATEGY

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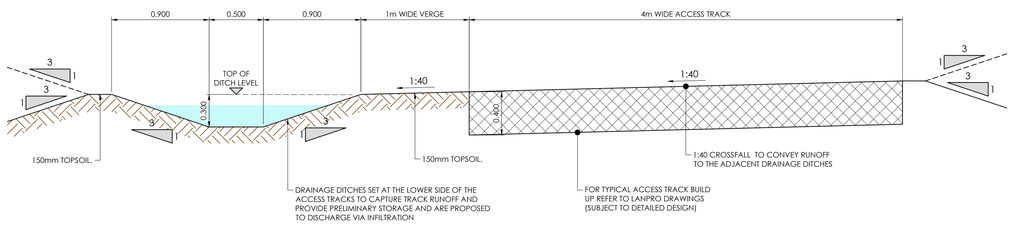
FOR PLAN DETAILS REFER TO JPG DRAWING REF. 6437-JPG-ZZ-ZZ-DR-C-1400.

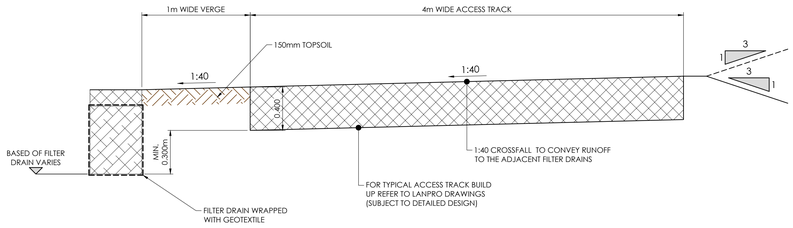
0m 0.5m 1m

SCALE 1:20



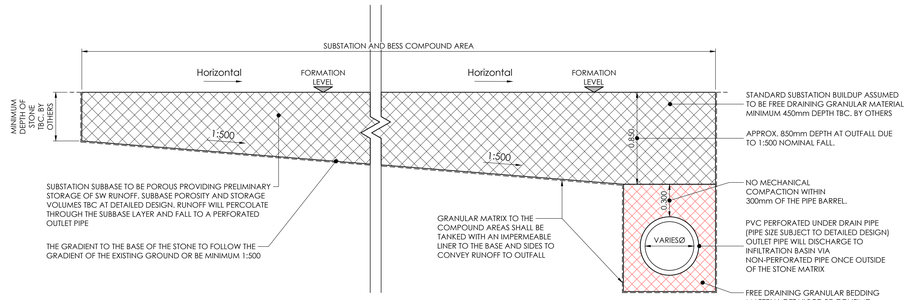
TYPICAL SECTION THROUGH SOLAR FARM ACCESS TRACK WITH SWALE/DITCH (SECTION A-A)

SCALE 1:25



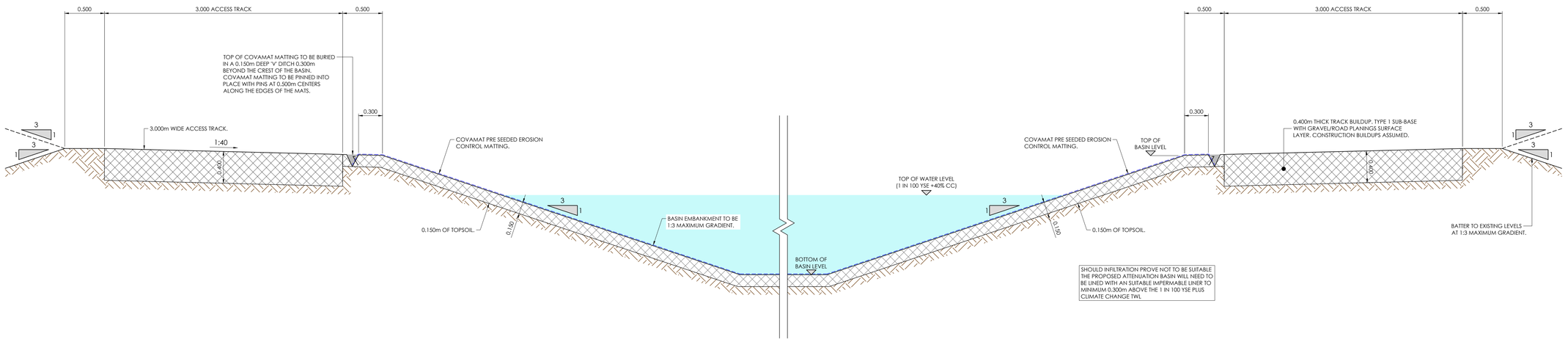
TYPICAL SECTION THROUGH SOLAR FARM ACCESS TRACK WITH FILTER DRAIN (SECTION B-B)

SCALE 1:25



TYPICAL SECTION THROUGH SUBSTATION AND BESS COMPOUND

SCALE 1:25



TYPICAL SECTION THROUGH INFILTRATION BASIN

SCALE 1:25

REV	DESCRIPTION	DATE	CHK	BY
P03	REVISED IN LINE WITH LATEST PROPOSAL AND DETAILS	12/07/25	RMR	JDM
P02	DETAILS GENERALLY UPDATED	02/06/25	RMR	JDM
P01	FIRST ISSUE	01/04/25	JDM	ETR

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DRAINAGE TYPICAL DETAILS

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Appendix H Existing Greenfield Runoff Volume Calculations

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Sheet No 1

Made By ETR

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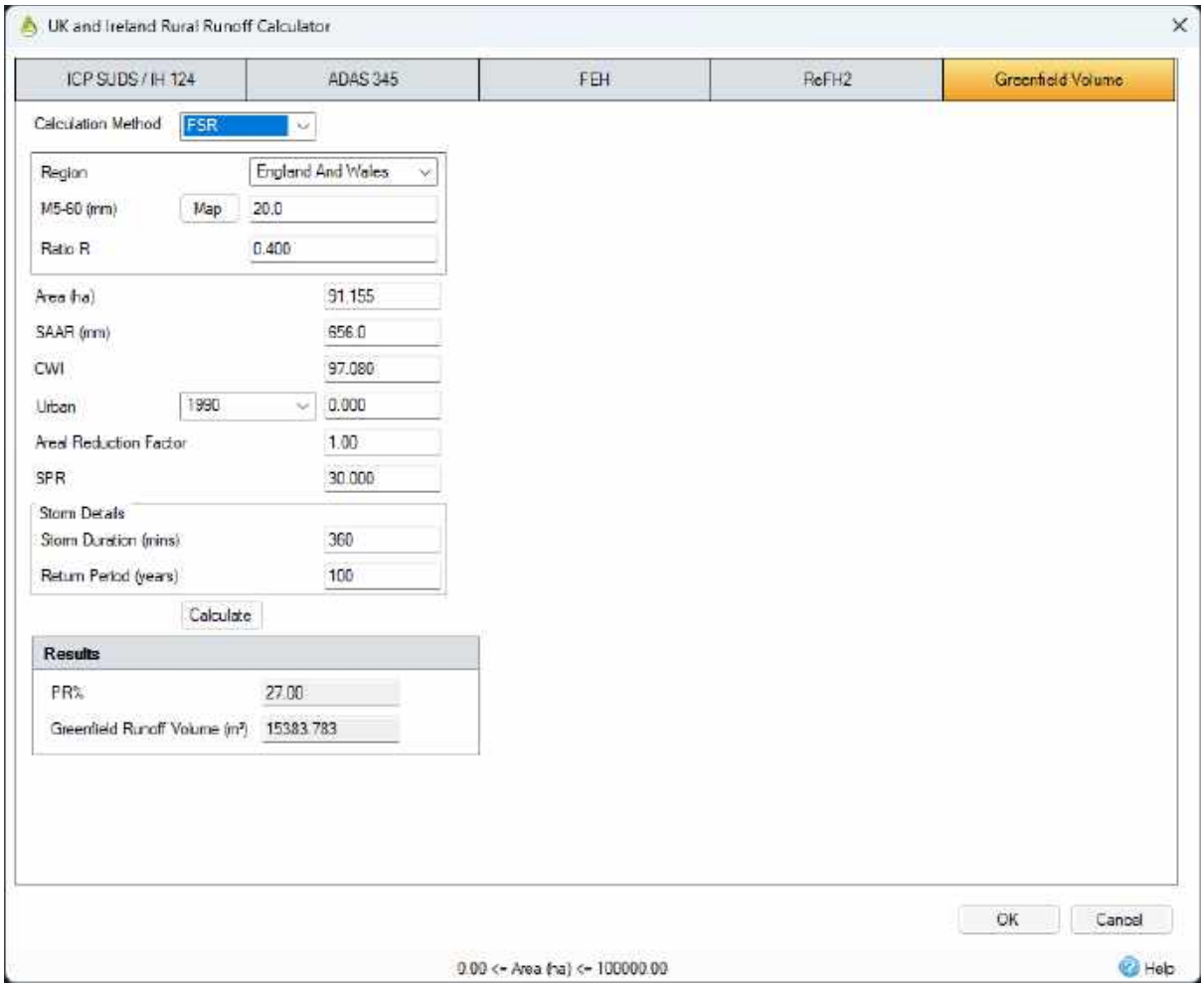
Date 07/03/2025

GREENFIELD RUN OFF VOLUME CALCULATION

INFODRAINAGE GREENFIELD RUN OFF VOLUME



GREENFIELD RUNOFF VOLUME = **15383.783 m^3**

Appendix I Drainage Exceedance Plan

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LEGEND

- RED LINE BOUNDARY
- FIELD BOUNDARY
- WATER BODY
- DENOTES FLOOD EXCEEDANCE ROUTE

0m 62.5m 125m

SCALE 1:2500

Filter drain to discharge into existing watercourse

Track laid to fall into existing watercourse

OVERLAND FLOWS PLAN

SCALE 1:2500

REV	DESCRIPTION	DATE	CHK	BY
P03	REDLINE BOUNDARY UPDATED	21/07/25	RMR	JDM
P02	UPDATED TO SUIT THE LATEST SITE MASTER PLAN	01/07/25	RMR	JDM
P01	FIRST ISSUE.	07/03/25	JDM	ETR

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