FLOOD RISK ASSESSMENT & SURFACE WATER DRAINAGE STRATEGY

Boxted Solar Farm

Land at Boxted, Suffolk

On behalf of RES Ltd

Date: 25/10/2023 | Pegasus Ref: P21-2950 – Author: Sophie Blainey



Document Management

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1. Introduction

Background

1.1. Pegasus Planning Group Ltd has been appointed by RES Ltd to undertake a Flood Risk Assessment (FRA) and Surface Water Drainage Strategy for a proposed solar farm on Land west of Boxted, Suffolk.

1.2. This assessment considers the risk of flooding from all sources, including tidal, fluvial, surface water, historic, groundwater, sewer and artificial sources.

1.3. This document has been updated (September 2026) to reflect the following:

- New Site Layout (Doc Ref: 04806-RES-LAY-DR-PT-004)
- Updated NPPF (August 2026) and EA Flood Risk Data (July 2026)
- LLFA Consultation Responses (from 2024).

1.4. The LLFA Consultation Response Document (Response to LLFA Holding Objections) document has been appended to this document and integrated into this report where necessary. The Response to LLFA Holding Objections document has been included within **Appendix A**.

National and Local Policies

National Planning Policy Framework

1.5. Policies F1 to F9 set out in Chapter 18 of the NPPF aim to "minimise risks to development arising from all sources of flooding and coastal change, taking into account the impacts of climate change, by steering development away from areas of risk, ensuring that development will be safe for its lifetime without increasing flood risk elsewhere, and incorporating sustainable drainage systems where appropriate." The policies within Chapter 18 comprise:

- F1: Assessing flood risk for plan-making.
- F2: Planning for effective flood risk management.
- F3: Managing coastal change.
- F4: Assessing flood risk for decision-making.
- F5: The sequential test.
- F6: Development in areas at risk of flooding from rivers or the sea.
- F7: Ensuring development is safe from flooding.
- F8: Sustainable drainage systems (SuDS) and watercourses.
- F9: Development in coastal change management areas.

1.6. Annex F, Table 1 of the NPPF defines each flood zone based on the probability of river and sea flooding in that area:

- Zone 1 – low probability (less than a 1 in 1,000 annual probability of river or sea flooding; all land outside Zones 2, 3a and 3b).
- Zone 2 – medium probability (between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding).
- Zone 3a – high probability (a 1 in 100 or greater annual probability of river flooding; or a 1 in 200 or greater annual probability of sea flooding).
- Zone 3b – the functional floodplain (typically a 1 in 30 or greater annual probability of flooding (with any flood risk management infrastructure operating effectively) or land that is designed to flood); land where water from rivers or the sea has to flow or be stored in times of flood).

1.7. Within Policy F4 of the NPPF, it is stated that:

- 'A site-specific flood risk assessment should accompany all development proposals in Flood Zones 2, 3a, and 3b' or;
- In Flood Zone 1, a site-specific flood risk assessment should inform and accompany all development proposals involving:

    a) Sites of one hectare or more;

    b) Land which has been identified by the Environment Agency as having critical drainage problems;

    c) Land identified in a strategic flood risk assessment or the Flood Map for Planning as being at risk of flooding from any source, whether now or in the future'.

1.8. As the site is approximately 43.7ha in area and contains a small area of Flood Zone 2, a full FRA is required.

1.9. Within Policy F8 of the NPPF, it is stated that:

- 'Development proposals which could affect drainage on or around the development site should incorporate sustainable drainage systems to control flow rates and reduce volumes of runoff, in ways which are proportionate to the nature and scale of the proposal. The systems employed should provide multifunctional benefits where possible, facilitating improvements in water quality, biodiversity and amenity'.

1.10. Given the above, the proposed development will also require a surface water drainage strategy to be submitted. The drainage strategy must also account for climate change over the lifetime of the development, in accordance with the climate change allowances published by the EA.

1.11. In addition to the requirements from the NPPF and EA, as discussed above, this assessment has also reviewed the information and requirements included in the Babergh & Mid Suffolk District Councils' Level 1 Strategic Flood Risk Assessment (SFRA) (2020).

2. Existing Site & Hydrology

Site Location & Existing Conditions

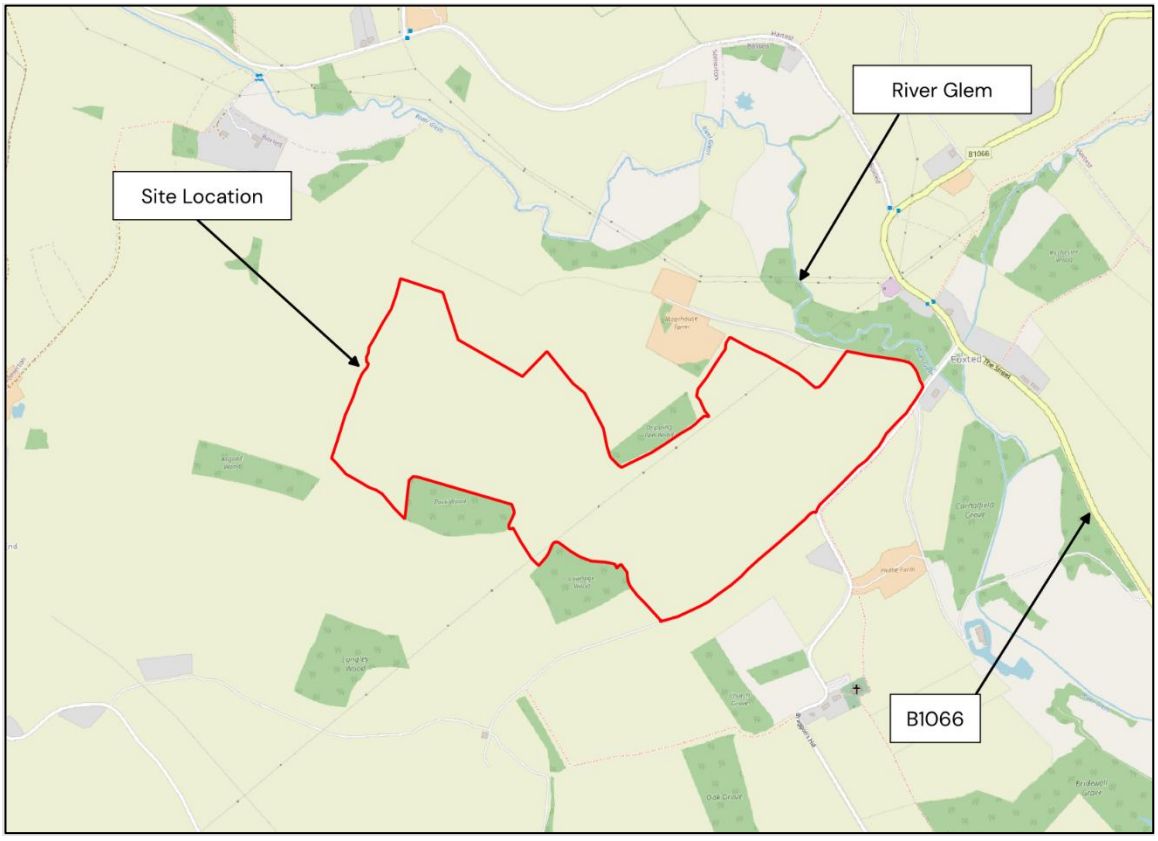
2.1. The site is located on Land West of Boxted, Suffolk.

2.2. The site is surrounded by the River Glem to the north, the B1066 Road to the east, and agricultural land to the south and west.

2.3. Approximate co-ordinates at the centre of the site are E: 581941, W: 250938. The nearest postcode to the site is IP29 4JR.

2.4. The site location is shown in Figure 2.1.

Figure 2.1 – Site Location



2.5. A topographic survey of the site was conducted by Mark Beaver Surveying in March 2023, a pdf of which is included in **Appendix B.**

2.6. The topographic survey shows that the site falls in height from roughly 88mAOD to 54mAOD, from the western side to the eastern side, towards the River Glem.

Existing Drainage and Hydrology

2.7. Though there are no Main Rivers running within the site boundary, the River Glem runs closely adjacent to the eastern edge of the site.

2.8. There are several Ordinary Watercourses flowing through the site. These are generally field boundary ditches assumed to assist with the drainage of the existing agricultural fields.

2.9. Watercourses on site and in the immediate vicinity are shown in Figure 2.2.

2.10. As the site currently consists of agricultural land, it is unlikely that there is an existing underground sewer network located within the site boundary. However, there is a significant number of land drains within the site boundary, to aid in the drainage of the agricultural fields. These are proposed to be kept in situ.

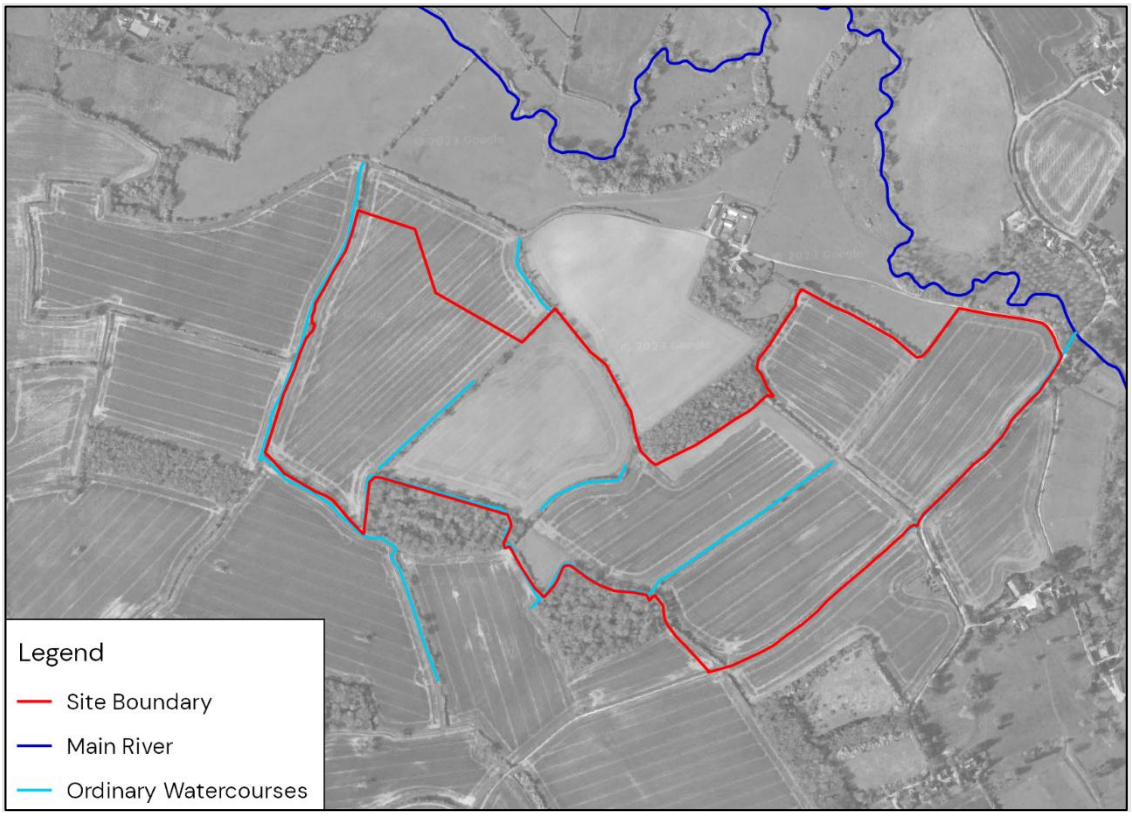
2.11. Regarding superficial deposits, geological data from the British Geological Survey (BGS) shows that the majority of the site consists of "Diamicton - A type of siliciclastic sediment and sedimentary rock" with pockets of "clay, silt, sand and gravel" and "sand and gravel" throughout.

2.12. BGS also shows that most of the site consists of 'Lewes nodular chalk formation, Seaford chalk formation, Newhaven chalk formation and culver chalk formation (undifferentiated) – chalk' apart from the northwest corner of the site, which consists of 'Crag group – sand'.

2.13. SoilScapes mapping shows that the majority of the site comprises of 'Lime-rich loamy and clayey soils' with 'slightly impeded drainage'. The northern edge of the site comprises of 'Freely draining slightly acid loamy soils'.

2.14. The hydrogeology aquifer classification defines most of the site as a 'highly productive aquifer', with the southwestern corner being defined as a 'moderately productive aquifer'.

Figure 2.2 –Watercourses



3. Proposed Development

3.1. The site is proposed for the erection of a solar farm across 43.7ha of agricultural land.

3.2. The proposals include:

- Access track
- Solar PV arrays
- Inverter and battery storage areas
- Hardstands
- Substation compound
- Temporary construction compound
- Perimeter deer fence
- Security fence

3.3. The proposed site layout is included in **Appendix C**.

4. Development Vulnerability & Flood Zone Classification

4.1. Annex F, Table 3 of the NPPF sets out a matrix indicating the types of development that are acceptable in different Flood Zones.

4.2. The proposal is for solar farm which is classified as 'Essential Infrastructure'.

4.3. A small section of the site is located within Flood Zone 2. In accordance with the NPPF, 'Essential Infrastructure' is appropriate within Flood Zone 2, as shown in Table 5.1.

Table 5.1 – Flood Risk Vulnerability and Flood Zone Compatibility

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	✗	Exception Test Required	✓	✓
Zone 3b	Exception Test Required	✗	✗	✗	✓

Sequential Test

4.4. Policy F5 of the NPPF states the sequential test aims to "steer new development to areas with the lowest risk of flooding from any source".

4.5. It notes the sequential test should be used in "areas known to be at risk now or in the future from any form of flooding, other than for:

a) Sites allocated in the development plan which were subject to the sequential test during plan preparation;

b) Sites where a site-specific flood risk assessment demonstrates clearly that:

i. No built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk; or

ii. Where the site would be at risk of surface water flooding only, the proposed layout, design, and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development without increasing flood risk elsewhere in accordance with policy F7".

4.6. Policy F5 of the NPPF also sets out the types of development which are exempt from the sequential test.

4.7. Flood risk from all sources is assessed in detail in Section 4. All proposed development is located within Flood Zone 1. No infrastructure is proposed within the Flood Zone 2 or 3 extents. Therefore, it is concluded that the sequential test is not required as no proposed development is not at risk of flooding from the assessed sources, except surface water flooding which will be mitigated as per this report.

Exception Test

4.8. All proposed development is located in Flood Zone 1, leaving the small area of Flood Zone 2 on site entirely undeveloped. Essential Infrastructure located in Flood Zone 1 does not require the Exception Test (see Table 5.1).

5. Site Specific Flooding Issues and Existing Flood Records

5.1. Local Planning Authorities, (LPA) have a statutory obligation to consult the Environment Agency (EA) on all applications in the flood zones. The EA will consider the effects of flood risk in accordance with the NPPF.

National Planning Policy Framework (NPPF)

5.2. In accordance with the National Planning Policy Framework, this Flood Risk Assessment considers all sources of flooding including:

a) Tidal Flooding – from the sea;

b) Fluvial Flooding – from rivers and streams;

c) Surface Water Flooding – from overland surface water flow and exceedance;

d) Historic Flooding – known historic flooding issues;

e) Groundwater Flooding – from elevated groundwater levels or springs;

f) Flooding from Sewers – exceedance flows from existing sewer systems; and

g) Artificial Sources – reservoirs, canals etc.

Tidal Flooding

5.3. The Flood Map for Planning (Rivers and Sea) (see Figure 7.1) defines the majority of the site as Flood Zone 1. A small area of the northeast corner of the site is located in Flood Zone 2, though no development is proposed within this area.

5.4. The Flood Map for Planning (Rivers and Sea) details the flood extents shown toward the northeast corner of the site are not tidally influence, but instead reflective of fluvial flood risk. Further detail of fluvial flood risk is provided within the section below.

5.5. The Babergh and Mid Suffolk SFRA (2020) states that 'the majority of the study area is currently not at risk of tidal flooding.'

5.6. The above information, and the site's inland location, will ensure that the overall tidal flood risk is considered to be **Very Low.**

Fluvial Flooding

5.7. The Flood Map for Planning (Rivers and Sea) (Figure 5.1) defines most of the area of the site to fall within Flood Zone 1, at Low risk of fluvial flooding, not predicted to be affected by a 1 in 1,000 year flood event.

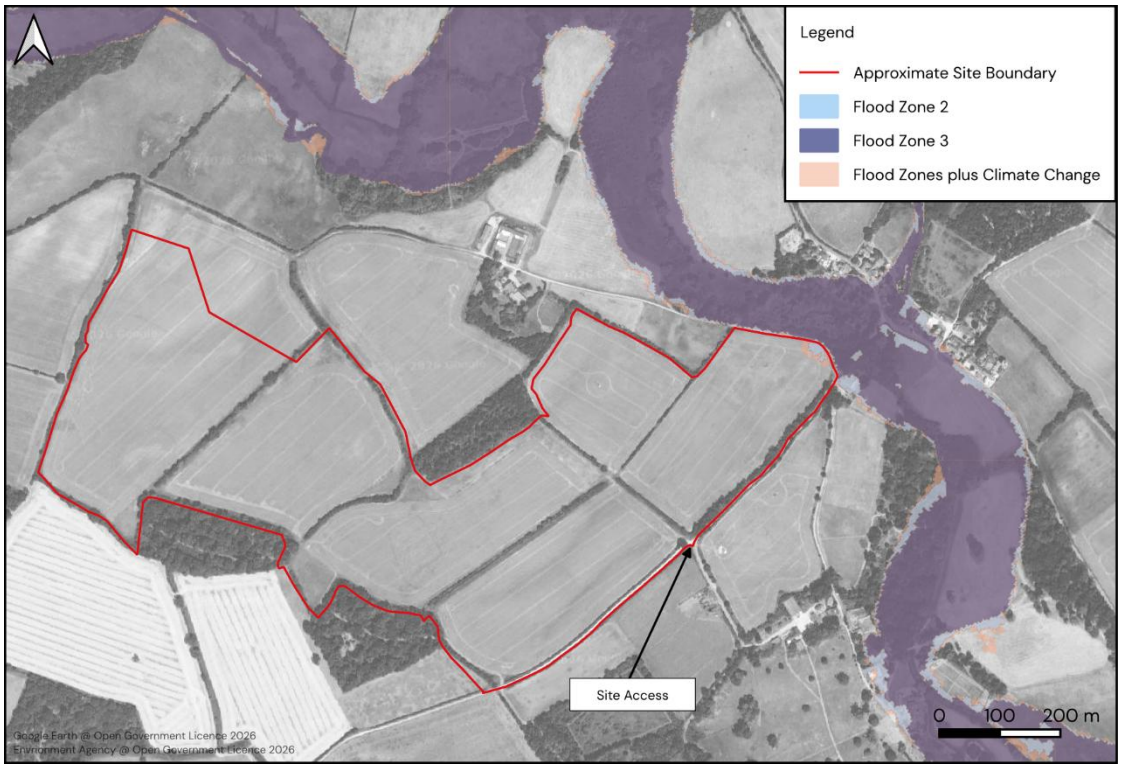
5.8. A small area in the northeast of the site falls within Flood Zone 2, predicted to be impacted by a 1 in 1,000 year event. This is associated with a tributary of the River Glem. No development is proposed within Flood Zone 2.

5.9. The Flood Map for Planning (Rivers and Sea) plus Climate Change mapping shows the fluvial extents within the site to minorly increase within the northeast section of the site (see Figure 5.1). However, all proposed development is still shown to be located within Flood Zone 1.

5.10. Given the information above, the site is considered to be at **Very Low** risk of fluvial flooding.

5.11. The site access is shown to be within Flood Zone 1, with the location illustrated within Figure 5.1 below. Therefore, safe access and egress to the site is not shown to be impeded during fluvial flood events.

Figure 5.1 – Flood Map for Planning



Surface Water Flooding

5.12. Surface water (pluvial) flooding is caused by rainfall levels exceeding the natural infiltration properties of the surrounding soils. Flooding could often result in ponding of water at topographical low points, or when surface water flow routes are obstructed. Insufficient capacity in, or poor maintenance of, a drainage system can also contribute to surface water flooding.

5.13. The Flood Map for Planning – SW (FMfP – SW) dataset sets out the present-day flood risk, as well as future flood risk in line with the latest climate change projections. Risk is displayed as one of three likelihood categories within the surface water mapping:

- 1 in 1,000 (0.1%) chance of flooding each year (low chance).
- 1 in 100 (1%) chance of flooding each year (medium chance).
- 1 in 30 (3.3%) chance of flooding each year (high chance).

5.14. Areas on the surface water mapping shown as being located outside of the above categories are deemed to have a very low chance of flooding; this is a less than 1 in 1,000 chance of flooding each year.

5.15. The FMfP – SW 1 in 100 year and 1 in 1000-year extent mapping shows an isolated area of pooling toward the northeast of the site, and a couple of small surface water flow routes on site (Figure 5.2). The depth of the pooling (1 in 100-year event) toward the northeast of the site is not shown to exceed 300mm, with no infrastructure proposed in this area. The depths of the surface water flow routes shown in Figure 5.2, are also not shown to exceed 300mm, and flow in line with the site's topography.

5.16. The FMfP – SW plus Climate Change 1 in 100 year and 1 in 1000-year mapping does show a small increase in surface water extents within the site (Figure 5.3). However, the depths of the flow routes are not shown to exceed 300mm under the 1 in 100 year plus climate change event. The surface water flow routes shown on the 1 in 1000 year plus climate change mapping are not likely to exceed 300mm.

5.17. All solar panels proposed in areas predicted to be at risk of surface water flooding will have their lowest edge raised above the predicted 1 in 1,000 year surface water flood depths and therefore are therefore not predicted to be impacted by surface water flooding, nor negatively impact flood risk elsewhere. As solar panels are proposed to be raised above ground levels, any existing surface water flow routes would not be impeded, allowing flows to pass beneath the panels without obstruction.

5.18. Safe access and egress to the site is not shown to be impeded for any modelled surface water events, including an allowance for climate change.

5.19. A Surface Water Drainage Strategy (SWDS) has been prepared to manage surface water runoff generated from the proposed development, ensuring that the proposed development does not result in an increased rate and volume of surface water leaving the site, and does not increase flood risk downstream.

5.20. Given the above and the inclusion of the SWDS, the site is considered to be at **Low** risk of flooding from surface water.

Figure 5.2 – Flood Map for Planning – Surface Water Present Day

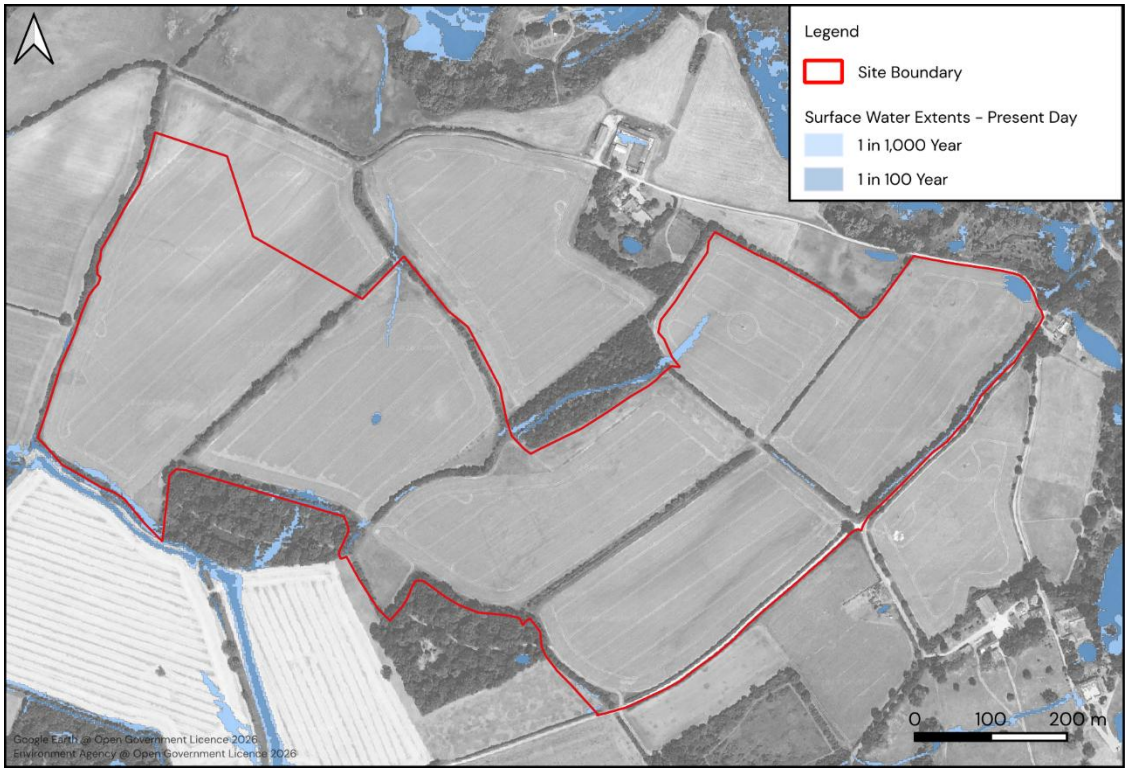
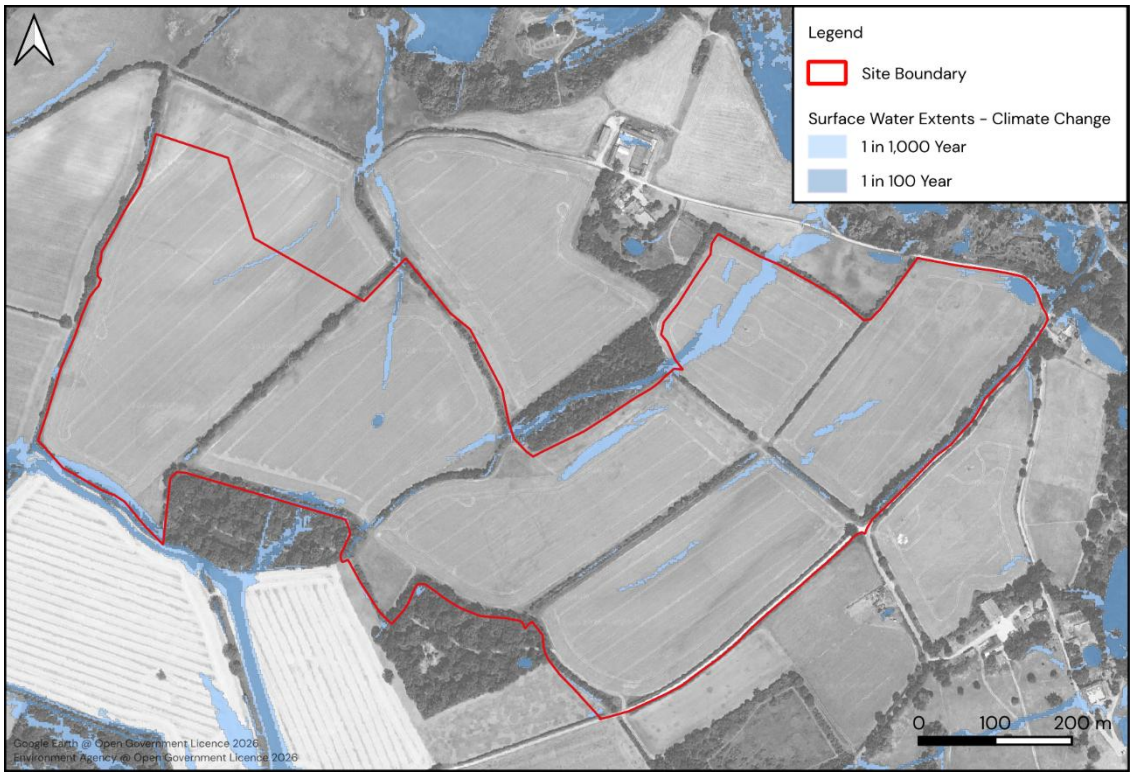


Figure 5.3 – Flood Map for Planning – Surface Water plus Climate Change



Historic Flooding

5.21. The EA's Historic Flood Map shows a historic flood event running across the northeastern edge of the site, associated with the River Glem (see Figure 7.4). Though there is a negligible overlap between the recorded flood outline and the site boundary, it is important to note.

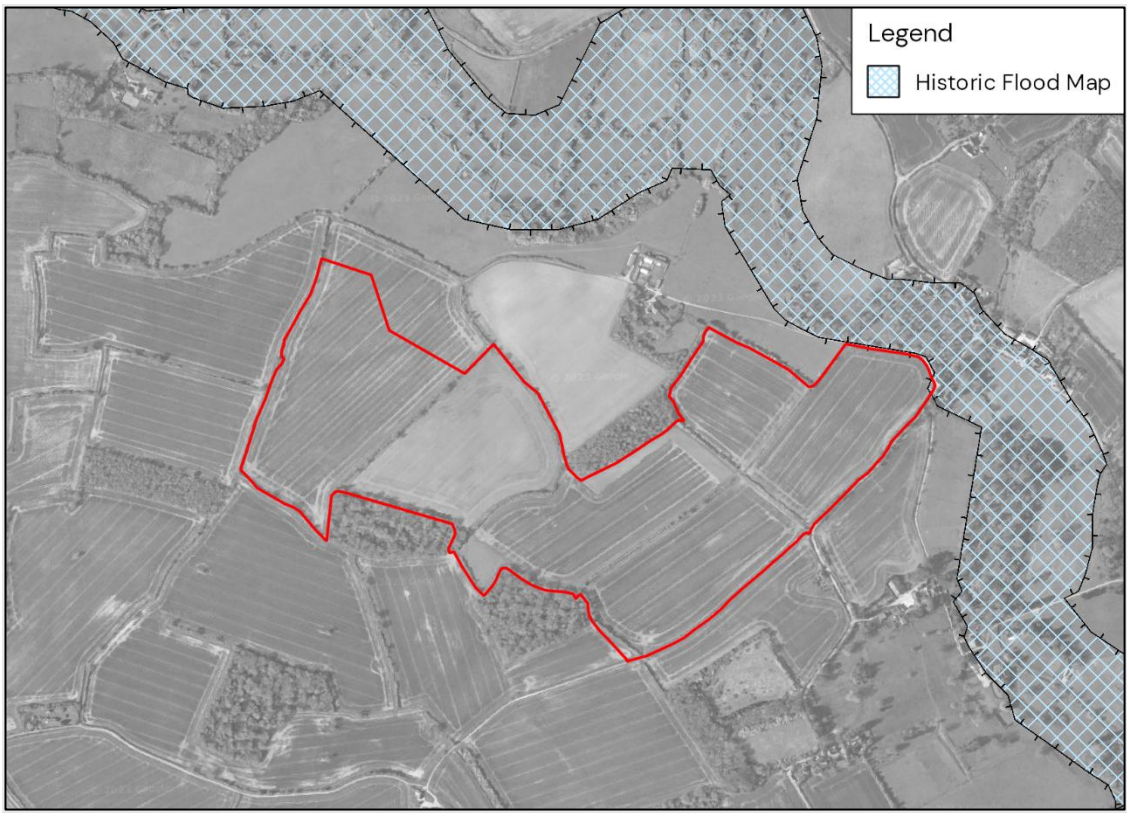
5.22. The Babergh and Mid Suffolk SFRA (2020) states that 'surface water flooding is the most frequent recorded cause of flooding within B&MS'. Despite this, no historical floods have occurred within the site boundary, and the site remains largely unaffected by historical flooding.

5.23. As included within **Appendix A** (Response to LLFA Holding Objections), the response to the LLLFA's standing advise is as follows:

- '*The LLFA's standing advice (enclosed) details that "the FRA should include reference to any historical flood instances that have been recorded". The submitted FRA (RO01v2-IN_P21-2950-FRA & Surface Water Drainage Strategy) assessed historic flood records held by the Environment Agency and included in the Babergh and Mid Suffolk SFRA (2020), concluding that here were no known historic flood events impacting the site. The assessment of LLFA historic flood records was requested during the meeting with the LLFA in February 2024. LLFA historic flood records were received in February 2024 and are enclosed at the end of this document. The LLFA's historic flood records do not highlight any historic flood events that have impacted the site. There is a "flood incident record – medium priority" recorded just outside the site boundary*'.

5.24. Given the above information, it is considered unlikely that the site has been impacted by historic flood events.

Figure 7.4 Historic Flood Map



Groundwater Flooding

5.25. BGS data show that most of the site is underlain by chalk bedrock geology (expected to be permeable). The hydrogeology aquifer classification defines most of the site as a 'highly productive aquifer', with the southwest corner being defined as a 'moderately productive aquifer'. BGS record various superficial deposits at the site comprising of "Diamicton - A type of siliciclastic sediment and sedimentary rock" with pockets of "clay, silt, sand and gravel" and "sand and gravel" throughout. Therefore, groundwater emergence may be possible.

5.26. Any clay superficial deposits across the site are expected to limit groundwater emergence on site.

5.27. SoilScapes Mapping shows both freely draining loamy soils and clayey soils with slightly impeded drainage present at the site. Drainable soils will ensure that any groundwater that does emerge will be able to soak back into the ground easily. Equally, poorly draining soils will limit groundwater emergence on site.

5.28. Topography on site is also not conducive to groundwater flooding – any groundwater to emerge would follow the existing site topography towards the various watercourses on site and in the immediate vicinity and towards the River Glem to the northeast of the site.

5.29. The Babergh and Mid Suffolk SFRA (2020) states that there is "generally negligible risk of groundwater flooding in B&MS. In both districts, areas which are at risk of groundwater flooding tend to correspond to the chalk geology and location of watercourses". Though the

majority of the site does consist of chalk bedrock, the other discussed factors such as the topography of the site and local watercourses should mitigate this risk.

5.30. Considering the above information, the risk of groundwater flooding at the site is considered to be **Low**.

Flooding from Sewers

5.31. The Babergh and Mid Suffolk Council SFRA (2020) does not list any flooding from sewers occurring within the IP29 postcode.

5.32. As the site is entirely agricultural land, it is unlikely that there is an existing underground sewer network located within the site boundary. Additionally, any flood water from sewers in the close vicinity of the site would follow local topography and would not be expected to accumulate within the site boundary.

5.33. A series of land drains are located beneath the site. However, these are not expected to pose a flood risk as they are designed specifically for the site to manage water levels. They are assumed to be sufficiently sized and have sufficient capacity for the site.

5.34. The risk of flooding from sewers to the site is therefore considered to be **Low.**

Flooding from Artificial Sources

5.35. The EA's Reservoir Flood Extents data does not show any risk of reservoir flooding should a catastrophic breach occur.

5.36. The Babergh and Mid Suffolk SFRA (2020) state that "there is generally negligible risk of Reservoir Flooding in B&MS".

5.37. There are no artificial sources of flooding or canals located in the vicinity of the site that would present a flood risk.

5.38. The site is therefore considered to be at **Very Low** risk of flooding from artificial sources.

Post Development Flood Risk Summary

5.39. The risk of flooding to the site from all sources has been assessed above, with the conclusions summarised in Table 5.2:

Table 5.2 – Flood Risk Summary

Flood Source	Flood Risk	Mitigation/Comments
Tidal	Very Low	• The majority of the site is within Flood Zone 1, at Low risk of flooding. • A small area of the site that is located in Flood Zone 2 is associated with fluvial flooding. There is no infrastructure proposed within Flood Zone 2.

		• The Flood Map for Planning (Rivers and Sea) shows the section of Flood Zone 2 within the site to be fluvial in origin, and not tidally influenced.
Fluvial	Low	• The majority of the site is within Flood Zone 1, at Low risk of flooding. • No development is located within Flood Zone 2.
Surface Water	Low	• The Flood Map for Planning – Surface Water dataset shows that most of the site to be free of surface water extents, with depths not shown to exceed 300mm (including an allowance for climate change) up to the 1 in 1,000 year event. • Where solar panels are proposed in areas predicted to be at risk of surface water flooding, they will have their lowest edge raised above the predicted 1 in 1,000 year flood depths.
Historic	Low	• A negligible section of the site is affected by historical flooding.
Groundwater	Low	• Although the site is underlain with assumed permeable bedrock and a highly productive aquifer, clay deposits and soils with impeded drainage are expected to limit groundwater emergence on site. • Topography on site is not conducive to groundwater flooding.
Sewers	Low	• The Babergh and Mid Suffolk Council SFRA (2020) does not list any flooding from sewers occurring within the IP29 postcode. • As the site is entirely agricultural land, it is unlikely that there is an existing underground drainage network located within the site boundary. • The land drains that occur underneath the site are not expected to pose a flood risk as they are designed specifically for the site to manage water levels. • Any flood water from sewers in the close vicinity of the site would follow local topography and would not be expected to accumulate within the site boundary.

Artificial	Low	• The EA's Reservoir Flood Extents data does not show any risk of reservoir flooding should a catastrophic breach occur. • The Babergh and Mid Suffolk SFRA (2020) state that "there is generally negligible risk of Reservoir Flooding in B&MS". • There are no artificial sources of flooding or canals located in the vicinity of the site that would present a flood risk.

Access & Egress

5.40. Access and egress to the proposed solar farm will be off Braggon's Hill to the south of the site.

5.41. Where Braggon's Hill meets the B1066 close to the northern site boundary, away from the access/egress point for the site, flooding associated with the River Gilm is predicted by the Flood Map for Planning (Rivers and Sea) and Surface Water datasets (see Figure 5.1 and 5.2 above). Should extreme flooding occur here that precludes vehicles passing, it is expected that access and egress via Braggon's Hill to the south would remain safe for vehicles.

5.42. In addition to the above, during the operational phase, the site will be managed remotely and only visited occasionally for maintenance. Site access and egress should therefore not be needed during an extreme flood event.

6. Mitigation Measures and Surface Water Drainage

6.1. This section summarises the proposed mitigation measures required on site to ensure that:

a) The development is not at significant risk of surface water flooding.

b) The potential impacts of the development on surface water runoff are minimised.

6.2. This section also considers if, with proposed mitigation measures in place, any further measures (such as a surface water drainage strategy) are required to ensure that the proposed development is safe and does not increase flood risk elsewhere.

6.3. Included within **Appendix A**, is the Response to LLFA Holding Objection document, which contains details of the actions taken to address LLFA comments. The document has been referenced throughout this section where appropriate.

Surface Water Flood Risk

6.4. As discussed in Section 7, the Flood Map for Planning – Surface Water dataset predicts small areas of the site to be at risk of surface water flooding.

6.5. As detailed within **Appendix A**, '*the LLFA's standing advice details that "existing flood flow routes or blue corridors should be maintained". As detailed in the submitted Flood Risk Assessment (R001v2-IN_P21-2950-FRA & Surface Water Drainage Strategy), the impact of the proposed solar panels on existing flow routes is considered to be negligible and a surface water drainage strategy has been proposed to ensure the infrastructure proposed on site also does not impact existing flow routes*'.

6.6. To ensure that the proposed development is not at significant risk of surface water flooding, the following mitigation measures have been included in the proposed site design:

- No vulnerable infrastructure (inverters, substations etc) is located in areas predicted to be at risk of surface water flooding during an extreme, 1 in 1,000 year, rainfall event.

- All proposed solar panels located in areas predicted to be at risk of flooding during a 1 in 1,000 year surface water flood event will have their lowest edge raised above the predicted 1 in 1,000 year surface water flood depths. Even during an extreme event, surface water will therefore be able to flow freely beneath the panels and surface water flow paths will not be impacted. 1 in 1,000 year surface water flood depths of up to 300mm are predicted on site and generally not expected to exceed this (see Section 5).

6.7. Overall, with the above mitigation measures in place, the proposed development will not be at significant risk of flooding from surface water.

Impact on Surface Water Runoff

Solar Panels

6.8. The proposed solar panels will generally comprise a 'fixed system' with vertical supports driven directly into the ground and generally, no need for concrete foundations. There will be a minimum gap of 2m between rows of solar panels.

6.9. Given the small area of concrete foundations expected for the solar panels, the impact on surface water runoff is likely to be negligible. The exact areas of concrete foundations proposed will be confirmed during detailed design and the impacted on surface water runoff, re-assessed.

6.10. At this stage, as no areas of concreate foundations have been confirmed, this assessment of the impact on surface water runoff has presumed all solar panels will comprise a fixed system with vertical supports driven directly into the ground.

6.11. As discussed above, all proposed solar panels will be raised above the predicted 1 in 1,000 year surface water flood depths to allow surface water to flow freely below.

6.12. Given the above, the impact of the proposed solar panels on surface water runoff patterns is considered to be **negligible** and no further mitigation measures are proposed.

Vulnerable Infrastructure

6.13. In addition to solar panels, a variety of vulnerable infrastructure is proposed on site including inverters, battery storage and a DNO substation. Additional areas of hardstanding associated with the vulnerable infrastructure are also proposed on site. Overall, the areas of proposed vulnerable infrastructure on site will increase the impermeable area on site and therefore have the potential to increase surface water runoff from the proposed development. A surface water drainage strategy is therefore required to manage runoff from the proposed infrastructure. The proposed surface water drainage strategy is included in **Appendix D.**

Access Tracks

6.14. The proposed access tracks will be constructed with a running surface, with a base/capping layer and subgrade below (see **Appendix C**). The typical track section also includes an adjacent drainage swale which will help manage surface water runoff from the proposed access tracks, should this be required. No further mitigation measures are considered necessary.

Proposed Land Use Change

6.15. The proposals will result in the cessation of agricultural activities at the site which will in turn, result in a variety of beneficial effects which will serve to reduce soil compaction and runoff rates from the site, as listed below:

- The site will not be left without vegetation cover during the winter as experienced with arable farming;
- The site will not be regularly traversed by heavy machinery.

6.16. It is also recommended that following installation of the panels, the site is chisel-ploughed or similarly cultivated and seeded with native meadow grass and wildflowers. Chisel-ploughing will reduce soil compaction on the site and promote seed growth; it has been proven to significantly increase infiltration rates thereby reducing runoff rates from the site.

6.17. Additionally, longer meadow type grasses and wildflower vegetation provide high levels of natural attenuation which will serve to reduce the risks of erosion and limit surface water flows across the site. With the implementation of chisel-ploughing, changing the site's primary function to solar power generation will have several potential longer-term benefits regarding surface water runoff rates.

6.18. As included within **Appendix A**, the following response to the LLFA's concerns of erosion between solar panels is included below:

- 'The risk of erosion between rows of solar panels was raised as a concern by the LLFA during the meeting in February 2024. The LLFA's standing advice (enclosed) does not specifically highlight the risk of erosion between solar panels but details that "the density, height and number of PV panels will dictate the type of surface water management system that is required by the LLFA. This can be done by using perimeter swales or filter strips every 5th row of PV panels'.

- 'During the meeting in February 2024, the LLFA detailed that they would consider two options to address the risk of erosion between solar panels:

    a) Implementing filter strips every 5th row of PV panels

    b) Implementing a low grazing density regime on site

- It is confirmed that the grazing regime on site will remain low. The applicant will provide a detailed grazing regime for the site at a later date, and it is requested that the provision of this regime is conditioned. With a low density grazing regime on site, it is not considered necessary to provide filter strips on site to manage the risk or erosion between rows of solar panels. The implementation of a low grazing density regime on site will ensure sufficient vegetation cover is maintained on site. The proposed Landscape Masterplan for the site in enclosed. Land beneath the solar panels proposed on site will be maintained as grass/wildflower seed mix and not be left as bare ground which could be eroded. Cook and McCuen's 2013 report on the "Hydrologic Response of Solar Farms" states that "with well-maintained grass underneath the panels, the solar panels themselves do not have much effect on total volumes of the runoff". It is therefore considered that the proposed landscaping on site will offer sufficient mitigation measures against the potential for erosion between rows of solar panels'.

6.19. The Proposed Landscape Masterplan has been included within **Appendix E**.

7. Proposed Surface Water Drainage Strategy

7.1. As discussed above, the proposed vulnerable infrastructure on site will increase the impermeable area on site. To ensure surface water runoff from the development and associated flood risk does not increase as a result of the proposals, a surface water drainage strategy is therefore required.

7.2. The proposed surface water drainage strategy has been updated based upon LLFA consultation, standing advise and **Appendix A** (Response to LLFA holding objections) documents. Following consultation with the LLFA in 2024, additional boundary swales and filter strips were incorporated to capture and manage overland flows. More detail on the response to LLFA holding objections is included within this section where appropriate.

Surface Water Management

7.3. The SuDS hierarchy demands that surface water run off should be disposed of as high up the following list as practically possible:

• Into the ground (infiltration) and re-use, or then;

• To a surface water body, or then;

• To a surface water sewer, highway drain or another drainage system, or then;

• To a combined sewer.

7.4. In order to determine the most suitable method of surface water disposal from the site the options listed above have been considered as follows:

Infiltration

7.5. From a desktop review, ground conditions on site appear to be suited to infiltration-based SuDS. BGS show the site to be underlain by chalk and sand bedrock geology, both of which are expected to be permeable. SoilScapes data show 'lime-rich loamy and clayey soils' with 'slightly impeded drainage' and 'freely draining slightly acid loamy soils' present at the site.

7.6. Given the above, it is proposed to manage surface water runoff from the proposed development with infiltration-based SuDS.

SuDS selection process

7.7. Various methods of SuDS (Sustainable Drainage Systems) should be considered for use as different methods have constraints attached to them and may not be suitable for this development.

7.8. An assessment of the suitability of different SuDS techniques is summarised in Table 7.1 below. Guidance from 'The SuDS manual' C753 has been used to form the basis of this assessment.

Table 7.1 – Assessment of SuDS Suitability

SuDS Technique	Potentially suitable for this development	Justification
Rainwater Harvesting	No	Not considered suitable for solar development
Green Roofs	No	Not considered suitable for solar development
Infiltration Systems (Soakaways, etc.)	Yes	Proposed to manage runoff from the proposed areas of vulnerable infrastructure (see surface water drainage strategy included in **Appendix D**)
Filter Drains	Yes	Gravel trenches/filter drains are proposed on site.
Swales	Yes	Proposed to capture runoff downslope of the access tracks to prevent surface water flows from leaving the site (**Appendix D**).
Bioretention Systems	Yes	Could be considered during detailed design
Trees	Yes	Could be considered but would not significantly reduce the storage requirements
Underground storage	No	Should be avoided
Detention basins & ponds	No	Not considered necessary due to small area of impermeable hardstanding to be managed
Wetlands	No	Not considered suitable due to land take
Permeable Paving	No	Not considered suitable due to the land take

Infiltration Rate

7.9. The proposed drainage strategy is based on an estimated infiltration rate of **0.00108m/hr**. This rate has been used to design the proposed surface water drainage features on site. The rate has been estimated using data from Soilscapes which define 'lime-rich loamy and clayey soils' and 'slightly acid loamy soils' present at the site and Table 25.1 – "typical infiltration coefficients based on soil texture (after Bettess, 1996) included in the CIRIA SuDS Manual which provides a typical infiltration rate for "sandy clay loam" as 3 x $10x^{-7}$m/s, which is calculated as **0.00108m/hr**.

7.10. If infiltration testing is complete during detailed design, the proposed drainage strategy should be updated to reflect the calculated infiltration rates on site or indeed, to direct surface water runoff to a surface water body or sewer network should infiltration prove unviable on site.

Impermeable Area

7.11. As mentioned above, the vulnerable infrastructure proposed on site will increase the impermeable area on site. The vulnerable infrastructure can be divided to two categories: a) the inverters and battery storage areas with associated hardstanding and b) the substation compound.

7.12. Each of the individual inverters and battery storage areas with associated hardstanding comprise of the following impermeable areas:

- Hardstanding Areas: 225m^2
- Battery Storage Units: 30.3m^2
- DC Converter Units: 8.64m^2
- Inverters and BusPlus Units: 18m^2
- Transformer Units: 12.3m^2

7.13. Total impermeable per individual inverter & battery storage areas: 294m2 / 0.029ha

7.14. It should be noted that the above impermeable area associated with the "hardstanding area" is a conservative assumption as this area will comprise type 1 unbound stone which has a semi-permeable nature.

7.15. The total substation compound area of **0.111ha** has been assumed as impermeable for the purpose of the proposed surface water drainage strategy. This is also a conservative assumption as part of this compound will also comprise of compacted type 1 or single sized crushed rock (see **Appendix C**) which are expected to provide a degree or permeability.

Climate Change Allowances

7.16. The proposed surface water drainage strategy presented here has been designed to manage surface water runoff for all storm events up to and including the 1 in 100 year plus 25% allowance for climate change.

7.17. This is in accordance with Environment Agency guidance which states that for development with a lifetime of between 2061 and 2100, the central allowance for the 2070s epoch should

be used. For the "Combined Essex Management Catchment", the central allowance for the 2070s epoch for a 1 in 100 year rainfall event is 25%.

Surface Water Drainage Strategy

7.18. It is proposed to manage surface water runoff from the proposed impermeable areas on site (as detailed above) with a series of gravel trenches.

7.19. For each of the individual inverters and battery storage areas with associated hardstanding on site which yield 0.029ha of impermeable area, a 66m long infiltration trench is proposed to wrap around the proposed infrastructure, situated within the proposed footprint, to manage surface water runoff from this area. An infiltration trench width of 1.1m and depth of 1.0m is required to manage surface water runoff from the storage areas for all storm events up to and including the 1 in 100 year plus 25% climate change event. Microdrainge source control calculations are included in **Appendix F.**

7.20. It is also proposed to locate an infiltration trench just outside the substation footprint to manage surface water runoff from this area. Here, a gravel trench 101.8m long, 2.2m wide and 1.5m deep is required to manage surface water runoff from the storage areas for all storm events up to and including the 1 in 100 year plus 25% climate change event. Microdrainge source control calculations are included in **Appendix F.**

7.21. The proposed infiltration trenches on site will allow surface water runoff to be stored prior to infiltration into the surrounding ground and will ensure surface water runoff from the proposed development does not increase.

7.22. As included within **Appendix A**, the LLFA would expect to see perimeter swales or filter strips on every 5th row of panels. The response is detailed below:

- 'As discussed above, the LLFA's standing advice details that "the density, height and number of PV panels will dictate the type of surface water management system that is required by the LLFA. This can be done by using perimeter swales or filter strips every 5th row of PV panels". During the meeting held in February 2024, the LLFA confirmed that they would expect to see perimeter swales installed on site to ensure overland flows do not impact neighbouring land'.

- 'The LLFA have raised concerns about the impact of the proposed solar panels on the volume and concentration of overland flows and how this may impact neighbouring area of land. To minimise the risk of increased overland flows, the LLFA have requested that additional mitigation measures are considered'.

- 'In response to these concerns, we would like to point the LLFA to the proposed access track details. A typical access track detail is enclosed at the end of this document. The track section shows that the design has accounted for a drainage swale to be located on the downslope side to the access tracks. Many of the proposed solar panel blocks include an access track and associated drainage swale alongside them. These swales will help capture overland flows on site to reduce the risk of impacting neighbouring land. In addition, the proposed site layout and topographic survey have been reviewed to identify any locations at the downslope side of a proposed block of solar panels where there is not currently an access track and associated swale proposed. Here, additional swales or gravel trenches have been added to

- capture any overland flows from the development and promote infiltration of this surface water. A drawing which highlights where current access track drainage swales are proposed and where additional swales and gravel trenches will now also be proposed is enclosed at the end of this document. Stone will be placed at the end of solar table rows to allow for maintenance vehicles to turn across swales during operation of the solar farm'.

7.23. In line with the above, additional swales were included within the proposed drainage strategy, to ensure that risk to neighbouring land is reduced. Subsequently, following submission of the Response to LLFA Holding Objections (**Appendix A**), the LLFA have approved the proposed surface water drainage strategy, subject to conditions. The LLFA's response has been included in **Appendix G**, and confirms the proposals are in accordance with the LLFA's requirements.

7.24. The proposed surface water drainage strategy drawing is included in **Appendix D.**

Water Quality

7.25. The SuDS Manual (CIRIA C753) states that the design of surface water drainage should consider minimising contaminants in surface water runoff discharged from the site. The level of treatment required depends on the proposed land use, according to the pollution hazard indices.

7.26. Table 7.2 shows the pollution indices for the proposed development. The category of "other roofs" is considered to best describe the areas to be managed.

Table 7.2 – Pollution Hazard Indices

Pollutant	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2	0.05

7.27. Table 7.3 shows the pollution mitigation indices for the proposed gravel trenches (filter drains) and swales. It is shown that the pollution mitigation indices exceed the proposed development pollution indices. Therefore, the mitigation measures are deemed adequate for the site.

Table 7.3 – Indicative SuDS Mitigation Indices

Type of SuDS component	Total suspended solids (TSS)	Metals	Hydrocarbons
Filter Drain	0.4	0.4	0.4
Swale	0.5	0.6	0.6
Aggregated Surface Water Pollution Mitigation Index	**0.65**	**0.7**	**0.7**

Maintenance of SuDS Feature

7.28. As included within **Appendix A**, the response to the LLFA's holding conditions relating to the maintenance of SuDS features are as follows:

- *'The LLFA's standing advice details that "as below the panel will normally be laid to grass or pastureland, the type of maintenance will vary depending on how the ground below and around the panels is to be utilised". The proposed SuDS on site will also require maintenance. It is requested that an Operation and Maintenance Manual is secured by condition'.*

7.29. Maintenance of the drainage system and SuDS features would be carried out in accordance with the manufacturer guidance and through an approved maintenance plan to minimise the residual flood risk of drainage system blockage or failure.

7.30. Maintenance would be undertaken by a private management company, as the proposed system is intended to stay private.

8. Summary

8.1. The site is approximately 43.7ha in area is currently entirely greenfield. The site is proposed for a solar farm development with associated infrastructure.

8.2. There is a very small portion of the site located in Flood Zone 2. All proposed development is located in Flood Zone 1. Areas of surface water flood risk are also predicted on site. Mitigation measures are proposed to help protect the proposed development from surface water flooding over its lifetime. Mitigation measures include raising the lowest edge of proposed solar panels above proposed flood depths and ensuring vulnerable infrastructure is sequentially located in areas of lowest flood risk.

8.3. The site is not considered to be at significant risk of flooding from any source and access, and egress is not predicted to be impeded during an extreme flood event.

8.4. Surface water runoff from proposed infrastructure will be managed with a series of gravel trenches designed to manage surface water runoff from all storm events up until and including the 1 in 100 year plus 25% allowance for climate change. Additional perimeter swales have been included within the updated proposed drainage strategy drawing, to ensure that the risk of runoff entering neighbouring land is reduced, as per LLFA holding conditions. Following submission of the updated proposed surface water drainage strategy, the LLFA approved the strategy, and the holding objection was removed.

8.5. With mitigation measures and the proposed surface water drainage strategy in place, the proposed development will not increase flood risk on site or elsewhere.

8.6. The proposal is considered to accord with the requirements of the National Planning Policy Framework (NPPF) with residual risk to the site fully mitigated, and as such considered Low risk.

Appendix A – Response to LLFA Holding Objections

Project Name: Boxted Solar Farm

Report Name: Response to LLFA Holding Objection

Author: Lucy Ginn

Approved by: Simon Jacques

Date: 30/01/2025

Project Number: P21-2950

Introduction

This document provides a response to the holding objection received from Suffolk County Council as Lead Local Flood Authority to the proposed Boxted Solar Farm (application no: DC/23/05127-FUL). The holding objection was received on the 15th November 2023 from Jason Skilton (Flood and Water Engineer). The LLFA's comments are enclosed at the end of this document. The comments detail that "the applicant needs to make a minor amendment to the surface water drainage strategy" and request that the submitted Flood Risk Assessment and surface water drainage strategy are re-submitted "referencing the LLFA Standing Advice – Solar Panels (PV) and Solar Farms (January 2022)". This standing advice document is enclosed at the end of this document.

Following receipt of the LLFA's comments, a meeting was held on 28th February 2024 between Pegasus Group (attended by Lucy Ginn – Senior Flood Risk Consultant and Luke Johnson – Principal Engineer) and Suffolk County Council LLFA (attended by Jason Skilton – Flood and Water Engineer). This meeting was held for the benefit of Pegasus Group to better understand what the LLFA would expect to see to address their holding objection. The response presented here to the LLFA holding objection is in accordance with the discussions held with the LLFA in February 2024.

This document has been split into sections identified as the key concerns raised by the LLFA during the meeting held in February 2024 and seek to ensure the proposals make reference to the standing advice as requested in the LFFA holding objection.

Risk of Erosion Between Rows of Solar Panels

The risk of erosion between rows of solar panels was raised as a concern by the LLFA during the meeting in February 2024. The LLFA's standing advice (enclosed) does not specifically highlight the risk of erosion between solar panels but details that "the density, height and number of PV panels will dictate the type of surface water management system that is required by the LLFA. This can be done by using perimeter swales or filter strips every 5th row of PV panels".

During the meeting in February 2024, the LLFA detailed that they would consider two options to address the risk of erosion between solar panels:

a) Implementing filter strips every 5th row of PV panels.

b) Implementing a low grazing density regime one site.

It is confirmed that the grazing regime on site will remain low. The applicant will provide a detailed grazing regime for the site at a later date, and it is requested that the provision of this regime is conditioned. With a low density grazing regime on site, it is not considered necessary to provide filter strips on site to manage the risk or erosion between rows of solar panels. The implementation of a low grazing density regime on site will ensure sufficient vegetation cover is maintained on site. The proposed Landscape Masterplan for the site in enclosed. Land beneath the solar panels proposed on site will be maintained as grass/wildflower seed mix and not be left as bare ground which could be eroded. Cook and McCuen's

2013 report on the "Hydrologic Response of Solar Farms" states that "with well-maintained grass underneath the panels, the solar panels themselves do not have much effect on total volumes of the runoff". It is therefore considered that the proposed landscaping on site will offer sufficient mitigation measures against the potential for erosion between rows of solar panels.

Swales to Capture Overland Flows

As discussed above, the LLFA's standing advice (enclosed) details that "the density, height and number of PV panels will dictate the type of surface water management system that is required by the LLFA. This can be done by using perimeter swales or filter strips every 5th row of PV panels". During the meeting held in February 2024, the LLFA confirmed that they would expect to see perimeter swales installed on site to ensure overland flows do not impact neighbouring land.

The LLFA have raised concerns about the impact of the proposed solar panels on the volume and concentration of overland flows and how this may impact neighbouring area of land. To minimise the risk of increased overland flows, the LLFA have requested that additional mitigation measures are considered.

In response to these concerns, we would like to point the LLFA to the proposed access track details. A typical access track detail is enclosed at the end of this document. The track section shows that the design has accounted for a drainage swale to be located on the downslope side to the access tracks. Many of the proposed solar panel blocks include an access track and associated drainage swale alongside them. These swales will help capture overland flows on site to reduce the risk of impacting neighbouring land. In addition, the proposed site layout and topographic survey have been reviewed to identify any locations at the downslope side of a proposed block of solar panels where there is not currently an access track and associated swale proposed. Here, additional swales or gravel trenches have been added to capture any overland flows from the development and promote infiltration of this surface water. A drawing which highlights where current access track drainage swales are proposed and where additional swales and gravel trenches will now also be proposed is enclosed at the end of this document. Stone will be placed at the end of solar table rows to allow for maintenance vehicles to turn across swales during operation of the solar farm.

Historic Flood Records

The LLFA's standing advice (enclosed) details that "the FRA should include reference to any historical flood instances that have been recorded". The submitted FRA (RO01v2-IN_P21-2950-FRA & Surface Water Drainage Strategy) assessed historic flood records held by the Environment Agency and included in the Babergh and Mid Suffolk SFRA (2020), concluding that here were no known historic flood events impacting the site. The assessment of LLFA historic flood records was requested during the meeting with the LLFA in February 2024. LLFA historic flood records were received in February 2024 and are enclosed at the end of this document. The LLFA's historic flood records do not highlight any historic flood events that have impacted the site. There is a "flood incident record – medium priority" recorded just outside the site boundary.

Maintenance of SuDS Features

The LLFA's standing advice (enclosed) details that "as below the panel will normally be laid to grass or pastureland, the type of maintenance will vary depending on how the ground below and around the panels is to be utilised". The proposed SuDS on site will also require maintenance. It is requested that an Operation and Maintenance Manual is secured by condition.

Surface Water Flow Routes

The LLFA's standing advice (enclosed) details that "existing flood flow routes or blue corridors should be maintained". As detailed in the submitted Flood Risk Assessment (RO01v2-IN_P21-2950-FRA & Surface Water Drainage Strategy), the impact of the proposed solar panels on existing flow routes is considered

to be negligible and a surface water drainage strategy has been proposed to ensure the infrastructure proposed on site also does not impact existing flow routes.

Summary

Based on the above, we would request that the LLFA review the additional information provided and remove their holding objection. We would welcome your earliest consideration of this additional information.

Enclosures

Suffolk County Council LLFA Holding Objection

Suffolk County Council Standing Advice – Solar Panels (PV) and Solar Farms (January 2022)

Landscape Masterplan

Typical Access Track Detail

LLFA Historic Flood Records

Proposed Mitigation Measures – Swales & Gravel Trench Drawing

From: BMSDC Planning Area Team Green <planninggreen@baberghmidsuffolk.gov.uk>
Sent: 15 Nov 2023 10:22:48
To:
Cc:
Subject: FW: 2023-11-15 JS reply Land West Of Boxted Ref DC/23/05127 - FUL
Attachments:

From: GHI Floods Planning <floods.planning@suffolk.gov.uk>
Sent: Wednesday, November 15, 2023 10:19 AM
To: BMSDC Planning Area Team Green <planninggreen@baberghmidsuffolk.gov.uk>
Cc: Isaac Stringer <Isaac.Stringer@baberghmidsuffolk.gov.uk>
Subject: 2023-11-15 JS reply Land West Of Boxted Ref DC/23/05127 - FUL

Dear Issac Stringer,

Subject: Land West Of Boxted Ref DC/23/05127 - FUL

Suffolk County Council, as Lead Local Flood Authority (LLFA), have reviewed application ref DC/23/05127

The following submitted documents have/has been reviewed and the LLFA recommends a **holding objection** at this time:

- Flood Risk Assessment and Surface Water Drainage Strategy Ref Pegasus Ref: P21-2950 Date: 23/10/2023

A holding objection is necessary because the applicant needs to make a minor amendment to the surface water drainage strategy.

The holding objection is a temporary position to allow reasonable time for the applicant and the LLFA to discuss what additional information is required to overcome the objection(s). This Holding Objection will remain the LLFA's formal position until the local planning authority (LPA) is advised to the contrary. If the LLFA position remains as a Holding Objection at the point the LPA wishes to determine the application, the LPA should treat the Holding Objection as a Formal Objection and recommendation for Refusal to the proposed development. The LPA should provide at least 2 weeks prior notice of the publication of the committee report so that the LLFA can review matters and provide suggested planning conditions, even if the LLFA position is a Formal Objection.

The points below detail the actions required to overcome our current objection:-

1. Resubmit the Flood Risk Assessment and Surface Water Drainage Strategy referencing the LLFA Standing Advice – Solar Panels (PV) and Solar Farms (January 2022).
    a. Note this is the LLFA stand way to manage surface water from this type of development and is based on best practise across the country.

Kind Regards

Jason Skilton
Flood and Water Engineer
Suffolk County Council

The Suffolk SuDS Guide has been updated (March 2023)

-----Original Message-----
From: planninggreen@baberghmidsuffolk.gov.uk <planninggreen@baberghmidsuffolk.gov.uk>
Sent: Monday, November 6, 2023 5:03 PM
To: GHI Floods Planning <floods.planning@suffolk.gov.uk>
Subject: BDC Planning Consultation Request - DC/23/05127 - FUL

Please find attached planning consultation request letter relating to planning application - DC/23/05127 - Land West Of Boxted, , ,

Kind Regards

Planning Support Team

Emails sent to and from this organisation will be monitored in accordance with the law to ensure compliance with policies and to minimize any security risks. The information contained in this email or any of its attachments may be privileged or confidential and is intended for the exclusive use of the addressee. Any unauthorised use may be unlawful. If you receive this email by mistake, please advise the sender immediately by using the reply facility in your email software. Opinions, conclusions and other information in this email that do not relate to the official business of Babergh District Council and/or Mid Suffolk District Council shall be understood as neither given nor endorsed by Babergh District Council and/or Mid Suffolk District Council.

Babergh District Council and Mid Suffolk District Council (BMSDC) will be Data Controllers of the information you are providing. As required by the Data Protection Act 2018 the information will be kept safe, secure, processed and only shared for those purposes or where it is allowed by law. In some circumstances however we may need to disclose your personal details to a third party so that they can provide a service you have requested, or fulfil a request for information. Any information about you that we pass to a third party will be held securely by that party, in accordance with the Data Protection Act 2018 and used only to provide the services or information you have requested.
For more information on how we do this and your rights in regards to your personal information and how to access it, visit our website.

Standing Advice – Solar Panels (PV) and Solar Farms

Introduction

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

Flood Risk

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

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

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

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

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

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

Surface Water Drainage

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

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

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

Below Panel Maintenance

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

Grass

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

Pastureland

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

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

Surface Water Flow Routes

Existing flood flow routes or blue corridors should be maintained.

Ordinary Watercourses

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

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

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

More details can be found here



Landscape Strategy

The landscape strategy has been guided by the Site Tree Survey (Barton Hyett Associates), the Suffolk Landscape Character Assessment within which the site lies mostly within the Undulating Ancient Farmlands with the northern edges at the cusp of the adjoining Rolling Valley Farmlands LCA) and the Valued Landscape Assessment, Stour Valley Additional Project Area (March 2020).

Management of Existing Hedgerows

Across the site, existing elm suckers shall be identified and allowed to develop to form hedgerow trees during the ongoing course of hedgerow management. Existing hedgerows are surveyed within the Tree Survey as being of varied heights. Where hedgerows are already established to heights above 3.6m, these heights shall be maintained. Where hedgerows are below 3.6m in average height they shall be managed to increased heights of 3.6m and above. The hedgerow to the southern boundary should be managed to a minimum of 4m.

Existing hedgerows H18 and H23 shall be allowed to grow to heights of between 4-7m (see Barton Hyett Associates' Tree Survey Plan drawing (BHA_4890_01) for reference).

Native hedgerow tree planting

Trees to be double low-staked with ties and spacers. Each tree to be protected with 600 mm clear plastic spiral guard.

Native mixed hedgerows

To be planted at 5/linear metre in a double-staggered row, with rows 500mm apart. Hedges to be protected by spiral guards with cane, or within rabbit proof fencing, as appropriate.

Selected Standard Trees within Woodland Mix Planting

Trees to be set out informally within woodland areas with spacing between trees of 25-35m. Trees to be double low-staked with ties and spacers. Each tree to be protected with 600mm clear plastic spiral guard.

N.B. *where there is an existing grass-flower margin this shall be retained and its width added to if necessary.*

KEY

EXISTING

- Red line boundary
- Trees and vegetation
- Root Protection Areas
- Overhead line
- Public Rights of Way

PROPOSED

- Native woodland mix
- Native hedgerow tree planting
- Standard trees within woodland mix planting
- Native mixed hedgerow planting
- Strategic infill planting where required: native mixed hedgerow
- Swale: Emorsgate EM8 Meadow Mixture for Wetlands
- Grass / Wildflower seed mix: Emorsgate Hedgerow Mixture EH1 or similar approved suitable for site's ground conditions to be agreed (outside the security fence)
- Grass / Wildflower seed mix: Grazing mixture - species-rich grassland suitable for site's ground conditions to be agreed (within the security fence)
- Grass / Wildflower seed mix: Emorsgate Woodland mixture EW1 or similar approved suitable for site's ground conditions to be agreed (outside the security fence)

Indicative planting list

Native Hedgrow Tree Planting

ID	Plant Species	Size	Primary (P) or secondary (S) species
A.c	Acer campestre	12-14cm, 350-425cm ht	P
C.b.	Carpinus betulus	12-14cm, 350-425cm ht	P
J.r	Juglans regia	12-14cm, 350-425cm ht	S
M.s	Malus sylvestris	12-14cm, 350-425cm ht	P
P.a	Prunus avium	12-14cm, 350-425cm ht	S
Q.r	Quercus robur	10-12cm, 350-425cm ht	P

Native Mixed Hedgerows

ID	Plant Species	Height/Pot Size	%
A.c	Acer campestre	Selected to 900mm ht	10
A.c	Acer campestre	2m Feathered	5
C.s	Cornus sanguinea	Selected to 900mm ht	5
C.a	Corylus avellana	Selected to 900mm ht	7.5
C.m	Crataegus monogyna	Selected to 900mm ht	50
C.m	Crataegus monogyna	1.5m Feathered	5
Eu.eu.	Euonymus europaeus	Selected to 900mm ht	2.5
I.a	Ilex aquifolium	200-300mm ht	2.5
L.p	Lonicera periclymenum	200-300mm ht	2.5
P.s	Prunus spinosa	Selected to 900mm ht	10

(based upon W8 Woodland - JNCC)

Native Woodland Mix

ID	Plant Species	Height	%
A.p	Acer pseudoplatanus	1.75m Feathered	2.5
C.b.	Carpinus betulus	1.75m Feathered	10
Co.s	Cornus sanguinea	400-600mm ht	5
C.a	Corylus avellana	Selected to 900mm ht	10
C.m	Crataegus monogyna	Selected to 900mm ht	15
Eu.eu.	Euonymus europaeus	Selected to 900mm ht	10
I.a	Ilex aquifolium	200-300mm ht	5
L.p	Lonicera periclymenum	200-300mm ht	2.5
P.a.	Prunus avium	1.75m Feathered	2.5
Q.r	Quercus robur	1.75m Feathered	5
Q.r	Quercus robur	Selected to 900mm ht	10
S.c*	Salix caprea	Selected to 900mm ht	5
S.a	Sorbus aucuparia	1.75m Feathered	10
V.l.	Viburnum lantana	Selected to 900mm ht	7.5

*Salix caprea to be positioned to the northern edges of proposed woodlands

Selected Standard Trees within Woodland Mix Planting

ID	Plant Species	Size (Girth)	Planting Height (m)
A.c	Acer campestre	12-14cm	3.5-4.0
C.b.	Carpinus betulus	12-14cm	3.5-4.0
P.a	Prunus avium	12-14cm	3.5-4.0
Q.r	Quercus robur	10-12cm	3.0-3.5

N 0 50 100 m

Rev	Date	By	Note
D	23.01.25	LAB	Updated to revised layout
C	26.10.23	VR	Minor amend to landscape notes
B	18.10.23	VR	Updates following receipt of ecologist's comments
A	09.10.23	FH	Client comments

Landscape Masterplan

Boxted Solar Farm

Client: RES Ltd. REV: D

DRWG No: P21-2960_EN_004

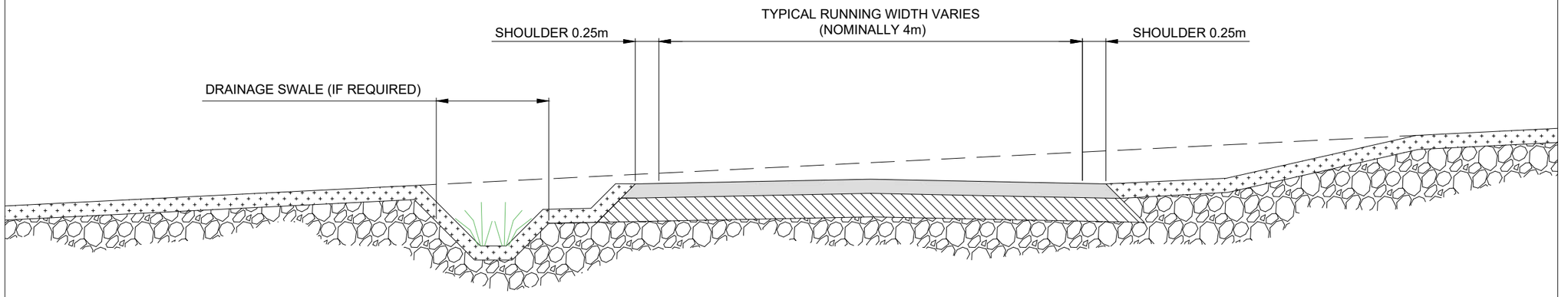
Drawn by: LAB Approved by: FH

Date: 23/01/2025

Scale: 1:2,000 @ A1

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TYPICAL TRACK SECTION

KEY

- RUNNING SURFACE
- BASE/CAPPING LAYER
- TOPSOIL
- SUBGRADE
- EXISTING GROUND LEVEL

NOTES

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL EMBANKMENT SLOPES TO BE PROVIDED AT A STABLE ANGLE BASED ON THE PROPERTIES OF THE MATERIAL ENCOUNTERED ON SITE.
3. TRACK CONSTRUCTION TYPE TO BE DETERMINED DURING DETAILED DESIGN. LAYOUT OF DRAINAGE MAY VARY.
4. RUNNING SURFACE AND BASE/CAPPING LAYER TO BE FORMED FROM SUITABLE MATERIALS COMPACTED IN LAYERS.
5. GEOSYNTHETIC REINFORCEMENT OR SOIL STABILISATION MAY BE USED TO REDUCE THE DEPTH OF TRACK CONSTRUCTION. REQUIREMENT TO BE DETERMINED DURING DETAILED DESIGN.
6. OPTIONAL DRAINAGE SWALES SHOWN. ACTUAL REQUIREMENTS TO BE DETERMINED DURING DETAILED DESIGN.

ISSUE	DRAWN	CHKD	APPD	DATE	REVISION NOTES
1	FG	JM	ML	2023-10-16	First Issue

PURPOSE: PERMITTING	COORDINATES: N/A
SCALE: 1:50 @A3	DATUM: N/A
LAYOUT DRAWING: N/A	T-LAYOUT NO: N/A

PROJECT TITLE

BOXTED SOLAR

DRAWING TITLE

FIGURE 6
TYPICAL ACCESS TRACK DETAIL

RES DRAWING NUMBER	REV
04806-RES-ERW-DR-PT-001	1

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BEAUFORT COURT,
EGG FARM LANE,
KINGS LANGLEY,
HERTS WD4 8LR. UK
TEL +44 (0) 1923 299200
WWW.RES-GROUP.COM

Legend

- Flood Incident Record - high priority
- Flood Incident Record - medium priority
- Flood Incident Record - low priority
- Unprocessed road flooding Incidents from storm Babet
- Flood Zone 2 (1 in 1000) Feb 2020 data.
- Flood Zone 3 (river = 1 in 100 chance of flooding each year). Feb 2020 data.

N
W E
S

Tittle Hall Lane

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Suffolk County Council
Growth, Highways and Infrastructure.
Endeavour House, 8 Russell Road, Ipswich, Suffolk. IP1 2BX.

0 250
meters
Scale 1:5,000

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River and Sea Flood Risk for - Site west of Tittle Hall Lane, Boxted, Bury St Edmunds, Suffolk. IP29 4TR.

*** Please note this map should not be used to assess flood risk for individual properties, it should only be viewed at a local area scale to give an approximate flood extent.For example, small flood defences may not have been incorporated into these flood maps which can influence flood risk.**

Map data valid for 6 months after publish date.

06/02/2024

Legend

- Flood Incident Record - high priority
- Flood Incident Record - medium priority
- Flood Incident Record - low priority
- Unprocessed road flooding Incidents from storm Babet
- Flood Map for Surface Water Flooding 1 in 30 year event (Dec 2013)
- Flood Map for Surface Water Flooding 1 in 100 year event (Dec 2013)
- Historic Flood Map (December 2023)

N
W E
S

Tittle Hall Lane

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Suffolk County Council
Growth, Highways and Infrastructure.
Endeavour House, 8 Russell Road, Ipswich, Suffolk. IP1 2BX.

0 250
meters
Scale 1:5,000

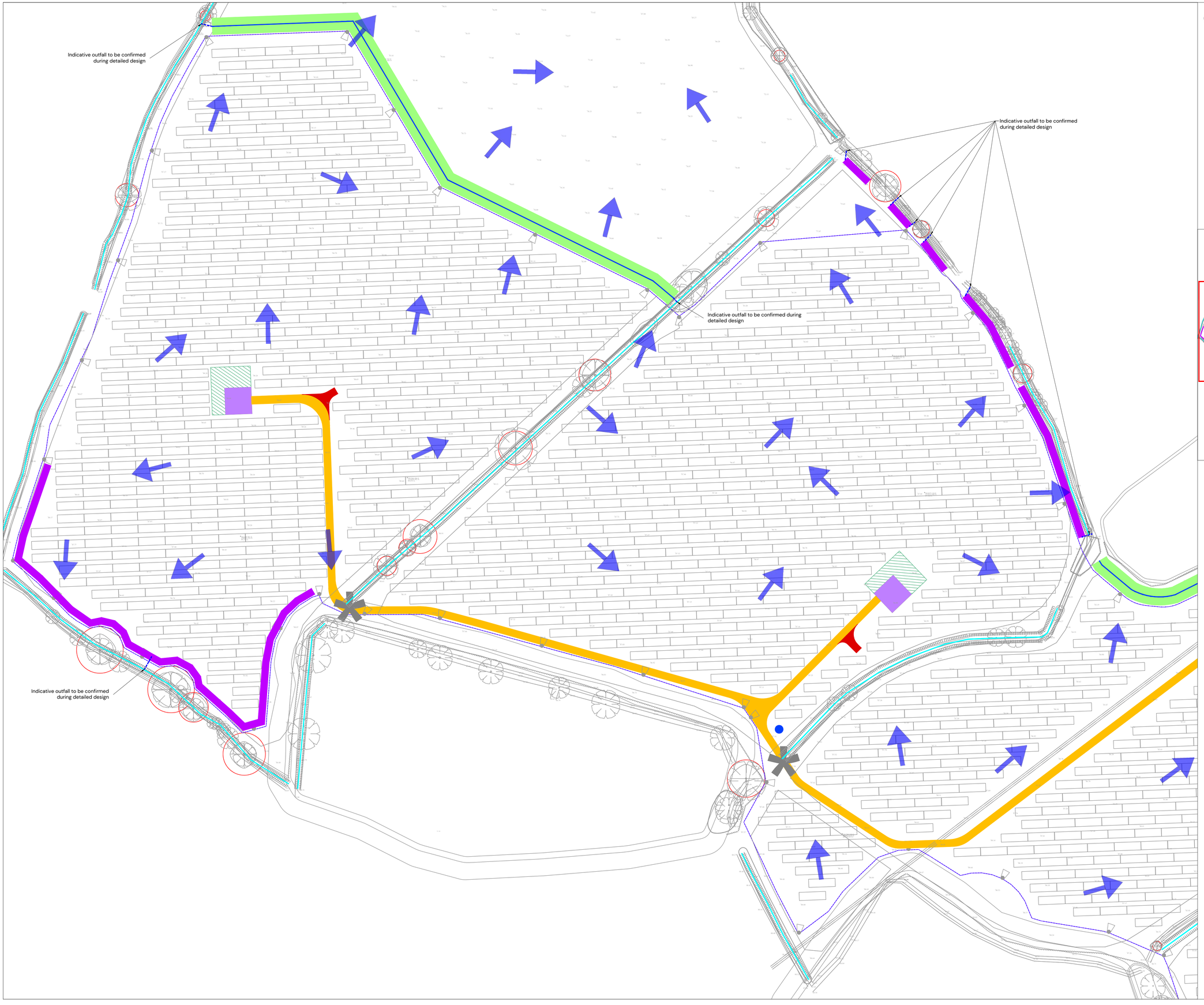
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Surface Water Flood Risk for - Site west of Tittle Hall Lane, Boxted, Bury St Edmunds, Suffolk. IP29 4TR.

*** Please note this map should not be used to assess flood risk for individual properties, it should only be viewed at a local area scale to give an approximate flood extent. For example, small drainage ditches may not have been incorporated into these flood maps which can influence flood risk.**

Map data valid for 6 months after publish date.

06/02/2024



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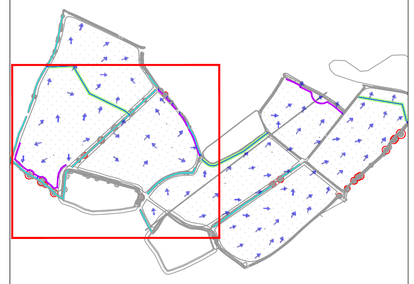
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Key:

- Proposed Access Track
- Proposed Additional Swales
- Proposed Gravel Trench
- Overland Flow Path
- Ordinary Watercourse
- Surface Water Drain

Notes:

1. This drawing has been provided for information purposes, not to be used for construction or costing.
2. Do not use this drawing to scale from.
3. Pegasus group take no responsibility for the misuse of this drawing.
4. Swales have been designed to be 0.5 x 0.5m deep with a 1:3 embankment, with a 3m maintenance strip either side.
5. Gravel Trench constitutes of a 1m wide x 0.5m deep trench with a 1m maintenance strip either side.



REV	DATE	DESCRIPTION	REVISED	CHECKED	APPROVED
P4	27.01.2025	Updated Layout	JTW	LG	SAJ
P3	07.11.2024.	Minor additional updates	JTW	SAJ	SAJ
P2	09.10.2024.	Drawing updated to suit RPAs	DBK	LG	LAJ
P1	12.08.2024.	First Issue	DBK	LG	LAJ

PROPOSED SWALE ADDITIONS SHEET 1

Land to the west of B1066
Boxted, Suffolk

CLIENT:
RES Group

DATE: 12.08.2024	SCALE: 1:500@A1	DRAWN BY: DBK CHECKED BY: SAJ APPROVED BY: SAJ

DRAWING NUMBER: P21-2950- PEG - XX - XX - DR - C - 0103 - P4
PG OFFICE / TEAM: BRS

PEGASUS REF No: P21-2950
DRAWING STATUS: S0

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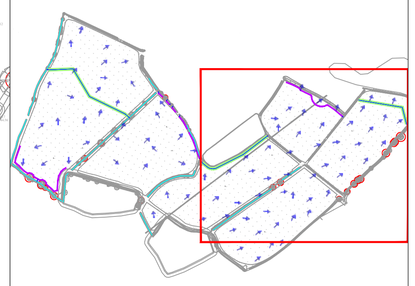
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0 25m 50m

Key:

- Proposed Access Track
- Proposed Additional Swales
- Proposed Gravel Trench
- Overland Flow Path
- Ordinary Watercourse
- Surface Water Drain

Notes:

1. This drawing has been provided for information purposes, not to be used for construction or costing.
2. Do not use this drawing to scale from.
3. Pegasus group take no responsibility for the misuse of this drawing.
4. Swales have been designed to be 0.5 x 0.5m deep with a 1:3 embankment, with a 3m maintenance strip either side.
5. Gravel Trench constitutes of a 1m wide x 0.5m deep trench with a 1m maintenance strip either side.



REV	DATE	DESCRIPTION	REVISED	CHECKED	APPROVED
P4	27.01.2025	Updated Layout	JTW	LG	SAJ
P3	07.11.2024.	Minor additional updates	JTW	SAJ	SAJ
P2	09.10.2024.	Drawing updated to suit RPAs	DBK	LG	LAJ
P1	12.08.2024.	First Issue	DBK	LG	LAJ

PROPOSED SWALE ADDITIONS SHEET 2

Land to the west of B1066
Boxted, Suffolk

CLIENT:
RES Group

DATE: 12.08.2024
SCALE: 1:500@A1
DRAWN BY: DK
CHECKED BY: LG
APPROVED BY: LAJ

DRAWING NUMBER: P21-2950-PEG-XX-XX-DR-C-0104-P4
PG OFFICE / TEAM: BRS

PEGASUS REF No: P21-2950
DRAWING STATUS: S0

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Indicative outfall to be confirmed during detailed design

Indicative outfall to be confirmed during detailed design

N

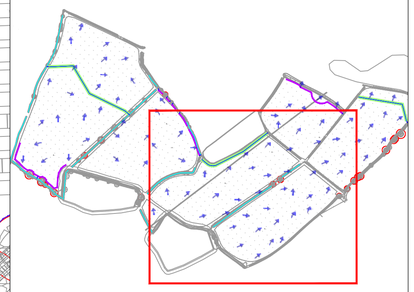
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0 12.5m 25m

Key:

- Proposed Access Track
- Proposed Additional Swales
- Proposed Gravel Trench
- Overland Flow Path
- Ordinary Watercourse
- Surface Water Drain

Notes:

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REV	DATE	DESCRIPTION	REVISED	CHECKED	APPROVED
P4	27.01.2025	Updated Layout	JTW	LG	SAJ
P3	07.11.2024.	Minor additional updates	JTW	SAJ	SAJ
P2	09.10.2024.	Drawing updated to suit RPAs	DBK	LG	LAJ
P1	12.08.2024.	First Issue	DBK	LG	LAJ

PROPOSED SWALE ADDITIONS SHEET 3

Land to the west of B1066
Boxted, Suffolk

CLIENT:
RES Group

DATE: 12.08.2024
SCALE: 1:500@A1
DRAWN BY: DK
CHECKED BY: LG
APPROVED BY: LAJ

DRAWING NUMBER: P21-2950-PEG-XX-XX-DR-C-0105-P4
PG OFFICE / TEAM: BRS

PEGASUS REF No: P21-2950
DRAWING STATUS: S0

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Appendix B – Topographical Survey

ABBREVIATIONS

ASPH	asphalt	PB	post box
AV	air valve	PL	parapet level
		PM	parking meter
BD	bollard	PT	post
BD	backdrop		
BH	borehole	RE	rodding eye
BP	block paving	RL	ridge level
BS	bus stop	RS	road sign
		RSL	road level
CH	channel level	RWP	rain water pipe
CL	cover level		
CONC	concrete	SA	soakaway
CTV	cable television	SL	sill level
CUL	culvert	SP	stand pipe
		SSL	structural slab level
dia	diameter	STN	control station
DK	dropped kerb	SV	stop valve
		SW	surface water
EC	electric cable		
EIC	electric inspection cover	TAP	tap
EL	crown level	TB	tree hole
EP	electric pole	TCB	telephone call box
ER	earthing rod	TH	trial hole
		TIC	telephone inspection cover
FFL	finished floor level	TP	telegraph pole
FH	fire hydrant	TP	tactile paving
FW	foul water	TS	traffic signal
G	gully	UMG	unmode ground
GL	ground level	UTL	unable to lift
GP	gate post		
GS	granite setts	VP	vent pipe
GV	gas valve		
		WM	water meter
ht	height	WSV	water stop valve
HL	head level		
HW	headwall		
IC	inspection cover		
IL	invert level		

FENCE AND WALL TYPES

BW	brick wall
BWF	barbed wire fence
CIF	corrugated iron fence
CLF	chestnut paling fence
CLF	chain link fence
CPAWMF	concrete post and wire mesh fence
CBF	close boarded fence
CW	concrete wall
IRF	iron railing fence
PRF	post and rail fence
PWF	post and wire fence
RW	retaining wall

E552127.492 E
N93606.195 N
67.065 OSTN

68.10 Survey Station

Tree canopy

Tree

Fence

Hedge

Bank

71.16 Spot Height

67.80

Gate

DATE	AMENDMENT	REV

GENERAL NOTES:

SURVEY NOTES:
1. Orientation, origin and level datum of survey relate to OSGB36(15)
2. Survey uses ST3 as a base station and a scale factor 1.000000
3. Kerb levels are taken in channel.
4.All tree species should be verified by a arboriculturist.

NORTH

MARK BEAVER SURVEYING
Land and Engineering Surveys
Construction Setting Out
Measured Building Surveys

Highbanks, Old Rectory Lane
Shimpling, Bury St Edmunds, Suffolk
IP29 4HG
Tel: (01284) 830756
web: www.markbeaversurveying.co.uk
e-mail: info@markbeaversurveying.co.uk

CLIENT:
PEGASUS PLANNING GROUP

PROJECT:
BOXTED SOLAR FARM
BOXTED
BURY ST EDMUNDS
IP29 4JR

TITLE:
TOPOGRAPHIC SURVEY

SURVEYOR: MB

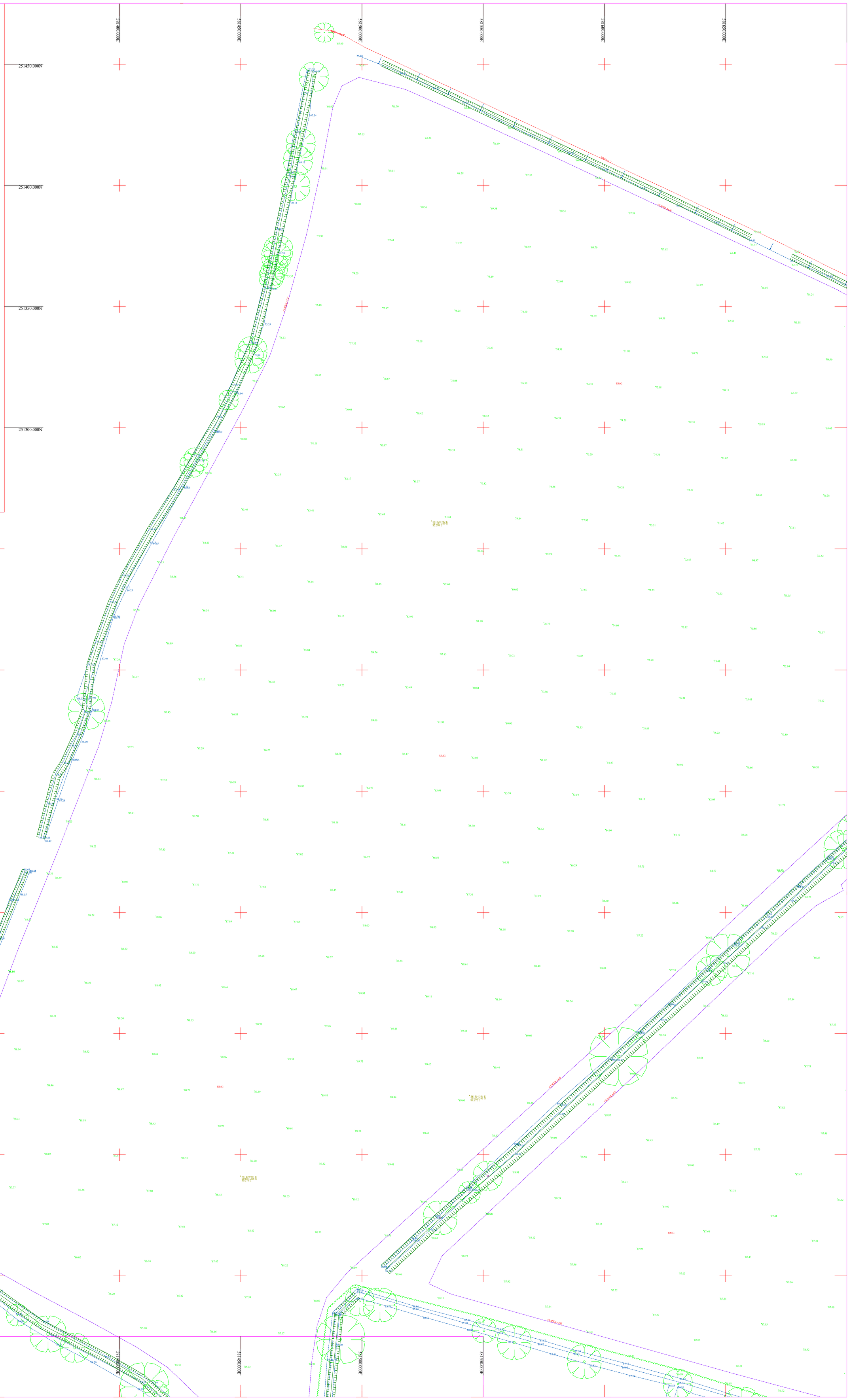
DRAWN BY: MB — SHEET SIZE: A0

DATE: 21.03.2023 — SCALE: 1:500

DRAWING No: 1472/01 — JOB No: 1472

SHEET LAYOUT





381700.000E
381750.000E
381800.000E
381850.000E
381900.000E
381950.000E
382000.000E
251450.000N
251400.000N
251350.000N
251300.000N
251250.000N
251200.000N
251150.000N
251100.000N
251050.000N
251000.000N
250950.000N
250900.000N
CURTILAGE
UMG

ABBREVIATIONS

ASPH	asphalt	PB	post box
AV	air valve	PL	parapet level
		PM	parking meter
BD	bollard	PT	post
BTD	backdrop		
BH	borehole	RE	rodding eye
BP	block paving	RL	ridge level
BS	bus stop	RS	road sign
		RSL	road level
CH	channel level	RWP	rain water pipe
CL	cover level		
CONC	concrete	SA	soakaway
CTV	cable television	SL	sill level
CUL	culvert	SP	stand pipe
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		TIC	telephone inspection cover
FFL	finished floor level	TP	telegraph pole
FH	fire hydrant	TP	tactile paving
FW	foul water	TS	traffic signal
G	gully	UMG	unmade ground
GL	ground level	UTL	unable to lift
GP	gate post		
GS	granite setts	VP	vent pipe
GV	gas valve		
		WM	water meter
ht	height	WSV	water stop valve
HL	high level		
HW	headwall		
IC	inspection cover		
IL	invert level		

FENCE AND WALL TYPES

BW	brick wall
BWF	barbed wire fence
CIF	corrugated iron fence
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CLF	chain link fence
CPA/WMF	concrete post and wire mesh fence
CSF	close boarded fence
CW	concrete wall
IRF	iron railing fence
PRF	post and rail fence
PWF	post and wire fence
RW	retaining wall

Survey Station
Tree canopy
Tree
Fence
Hedge
Bank
Spot Height
Gate

DATE	AMENDMENT	REV

GENERAL NOTES:

SURVEY NOTES:
1. Orientation, origin and level datum of survey relate to OSGB36(15)
2. Survey uses ST3 as a base station and a scale factor 1.000000
3. Kerb levels are taken in channel
4.All tree species should be verified by a arboriculturist.

NORTH

MARK BEAVER SURVEYING
Land and Engineering Surveys
Construction Setting Out
Measured Building Surveys

Highbanks, Old Rectory Lane
Shimpling, Bury St Edmunds, Suffolk
IP29 4HG
Tel: (01284) 830756
web: www.markbeaversurveying.co.uk
e-mail: info@markbeaversurveying.co.uk

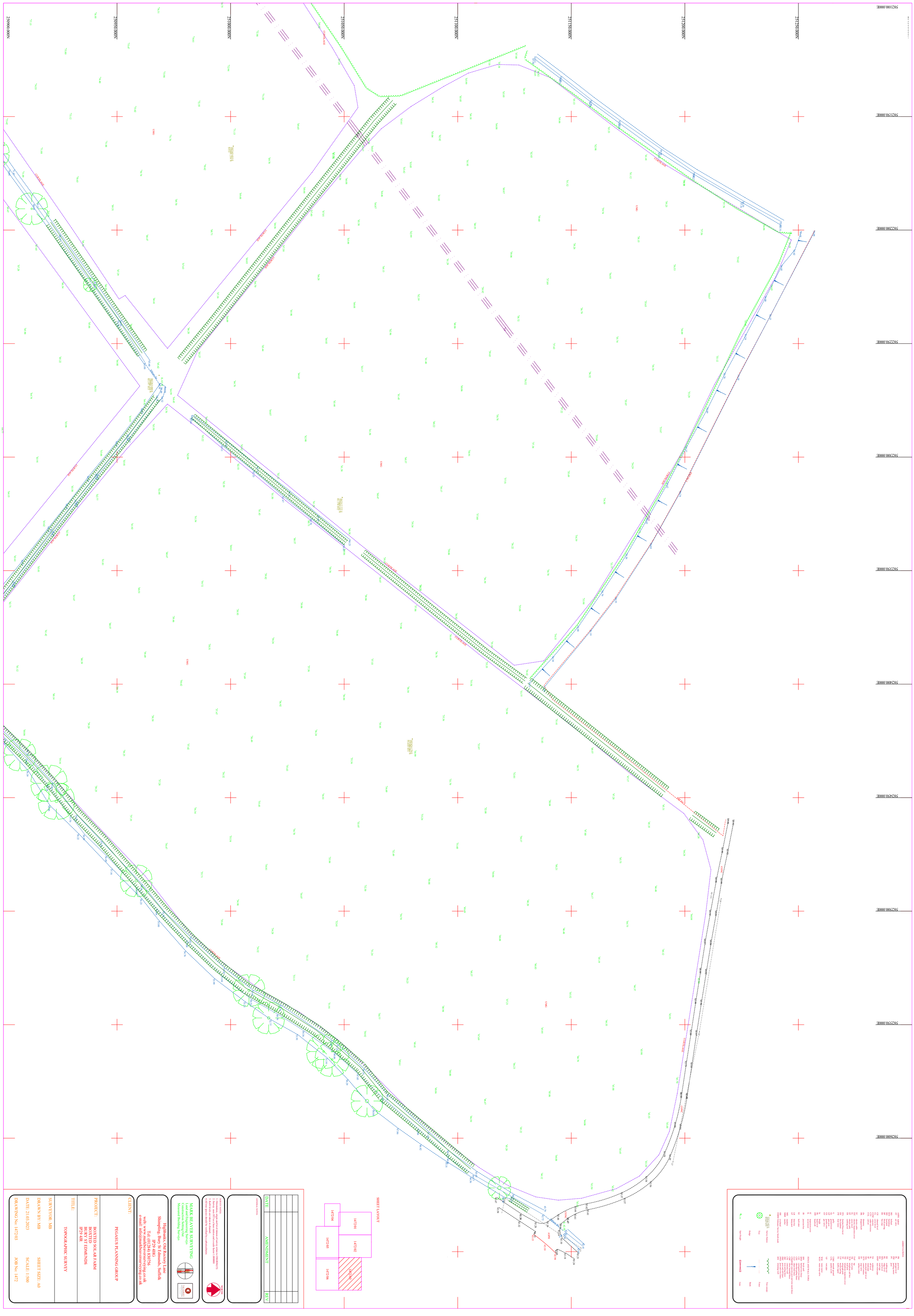
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PEGASUS PLANNING GROUP

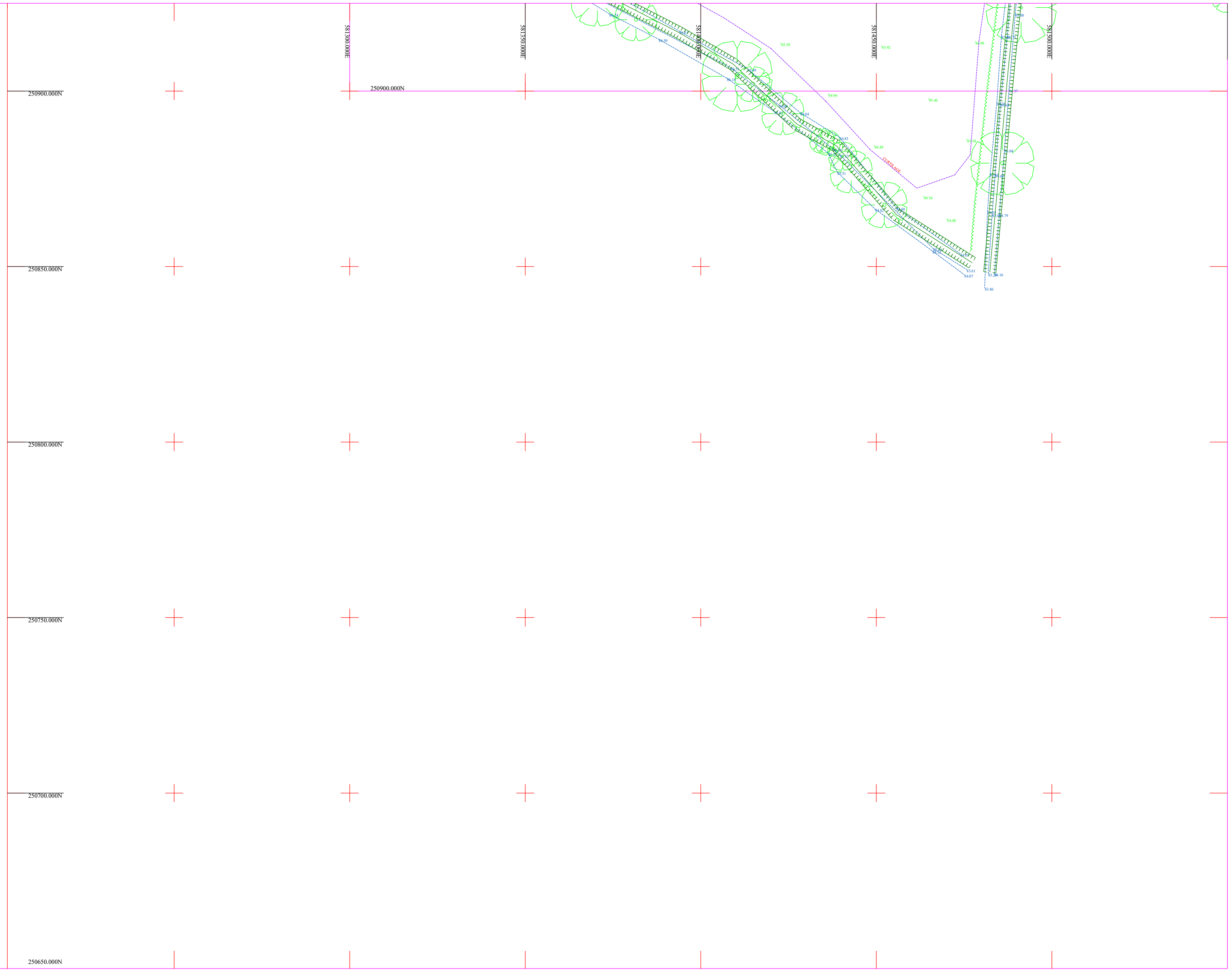
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BOXTED SOLAR FARM
BOXTED
BURY ST EDMUNDS
IP29 4JR

TITLE:
TOPOGRAPHIC SURVEY

SURVEYOR: MB
DRAWN BY: MB
SHEET SIZE: A0
DATE: 21.03.2023
SCALE: 1:500
DRAWING No: 1472/02
JOB No: 1472

SHEET LAYOUT


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250950.000N
251000.000N
251050.000N
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251150.000N
251200.000N
251250.000N
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582150.000E
582200.000E
582250.000E
582300.000E
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582400.000E
582450.000E
582500.000E
582550.000E
582600.000E
CURTILAGE
PROW FP23
ABBREVIATIONS
SHEET LAYOUT
1472/04
1472/01
1472/02
1472/05
1472/03
1472/06
CENTRAL NOTES
SURVEY NOTES
1. Orientation, origin and level datum of survey relate to OSGB36(15)
2. Survey control established with GNSS
3. Keith levels are taken in datum4.
4.All tree species should be verified by a arboriculturist.
NORTH
DATE
AMENDMENT
REV
MARK BEAVER SURVEYING
Land and Engineering Surveys
Geomatics Building Surveys
Measured Building Surveys
Highbanks, Old Rectory, Lane
Shimpling, Bury St Edmunds, Suffolk
IP29 4HG
Tel: (01284) 830756
web: www.markbeaversurveying.co.uk
e-mail: info@markbeaversurveying.co.uk
CLIENT:
PEGASUS PLANNING GROUP
PROJECT:
BOXTED SOLAR FARM
BOXTED
BURY ST EDMUNDS
IP29 4JR
TITLE:
TOPOGRAPHIC SURVEY
SURVEYOR: MB
DRAWN BY: MB
SHEET SIZE: A0
DATE: 21.03.2023
SCALE: 1:500
DRAWING No: 1472/03
JOB No: 1472



ABBREVIATIONS

ASPH	asphalt	PB	post box
AV	air valve	PL	parapet level
		PM	parking meter
BD	bollard	PT	post
BD	backdrop		
BH	borehole	RE	rodding eye
BP	block paving	RL	ridge level
BS	bus stop	RFL	roof level
		RS	road sign
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GP	gate post		
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HW	headwall		
IC	inspection cover		
IL	invert level		

FENCE AND WALL TYPES

JB	junction box	BW	brick wall
		BWF	barbed wire fence
KI	kerb inlet	CIF	corrugated iron fence
		CPF	chestnut paling fence
LB	litter bin	CLF	chain link fence
LP	lamp post	CLFWM	chain link fence post and wire mesh fence
		CBF	close boarded fence
MH	manhole	CW	concrete wall
MKR	marker	IRF	iron railing fence
		PRF	post and rail fence
OH	overhead	PWF	post and wire fence
OSBM	Ordnance Survey bench mark	RW	retaining wall

E74717.492 N58366.585 81.905 OSTN — Survey Station

Tree

Hedge

+81.16 — Spot Height

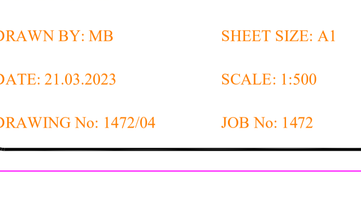
Tree canopy

Fence

Bank

Gate

SHEET LAYOUT



DATE	AMENDMENT	REV

GENERAL NOTES:

SURVEY NOTES:
1. Orientation, origin and level datum of survey relate to OSGB36(15)
2. Survey was ST3 as a base station and a scale factor 1.000000
3. Kerb levels are taken in channel.
4.All tree species should be verified by a arboriculturist.

NORTH

MARK BEAVER SURVEYING
Land and Engineering Surveys
Construction Setting Out
Measured Building Surveys

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Tel: (01284) 830756
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CLIENT:
PEGASUS PLANNING GROUP

PROJECT:
BOXTED SOLAR FARM
BOXTED
BURY ST EDMUNDS
IP29 4JR

TITLE:
TOPOGRAPHIC SURVEY

SURVEYOR: MB

DRAWN BY: MB — SHEET SIZE: A1

DATE: 21.03.2023 — SCALE: 1:500

DRAWING No: 1472/04 — JOB No: 1472

ABBREVIATIONS

ADPC	asphalt duct/pipe conduit	PO	pole box
AV	air valve	PP	power pylon
BD	bollard	PPL	pumping station
BH	borehole	PT	post
BO	blow off valve	RE	right bank
BP	bollard (post)	RL	right left
BS	bus stop	RM	road marker
C	centre line	RP	road sign
CB	concrete block paving	RS	road sign/sign
CL	centre line	RWP	rain water pipe
CO	clean out chamber	SA	stop line
CON	concrete	SB	soil bund
CTV	cable television	SC	soil compaction
dia	diameter	SD	sand dune
DK	dropped kerb	SDR	standard dimension ratio
EC	electricity supply/generator	SW	soil/water
EM	electricity meter/consumer unit	TA	traffic island
EP	electricity pole	TB	telephone call box
ES	electricity pit	TC	telephone cabinet
EV	electricity valve	TD	telephone duct
FFL	finished floor level	TP	telegraph pole
FH	fire hydrant	TR	telephone/telegraph/electricity cover
FM	flow meter	TV	television cover
G	gully	UMC	unmade carpark
GC	gully (kerbed)	UP	utility pole
GP	guard post	V	vent pipe
GR	guard rail	WM	water meter
GV	gate valve	WSV	water scour valve
HC	hedgerow/ditch/earth bank		
HL	handrail		
HR	handrail		
IC	inspection cover		
IL	invert level		
IN	junction box		
KI	kerb inlet		
LP	lamp post		
MH	manhole		
MM	marker post		
OH	overhead		
OHBK	Ordnance Survey bench mark		

FENCE AND WALL TYPES

BW	brick wall
BWH	brick wall with hedge
CB	cleft chestnut paling
CBH	cleft chestnut paling & hedge
CBWMF	concrete post and wire mesh fence
CF	concrete fence
CW	concrete wall
HF	hedge/post and wire fence
PBF	post and rail fence
PWF	post and wire fence
RW	retaining wall
TGF	Tile hung
TH	tile hung/hedge
TWF	timber fence
WF	wire fence
WH	wire fence/hedge

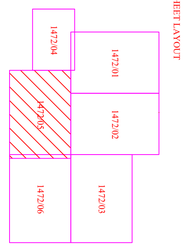
SURVEY NOTES:

1. Orientation, origin and level datum of survey relate to OSGB36 (1)
2. Survey undertaken and is valid from 1:1000
3. Kerb levels are taken to channel.
4. All tree species should be verified by a arboriculturist.

GENERAL NOTES:

DATE	AMENDMENT	REV

SHEET LAYOUT



MARK BEAVER SURVEYING
Land and Engineering Surveys
Geomatics Engineering
Measured Building Surveys

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Tel: (01284) 830756
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CLIENT:

PEGASUS PLANNING GROUP

PROJECT:

BOXTED SOLAR FARM
BOXTED
BURY ST EDMUNDS
IP29 4JR

TITLE:

TOPOGRAPHIC SURVEY

SURVEYOR: MB

DRAWN BY: MB

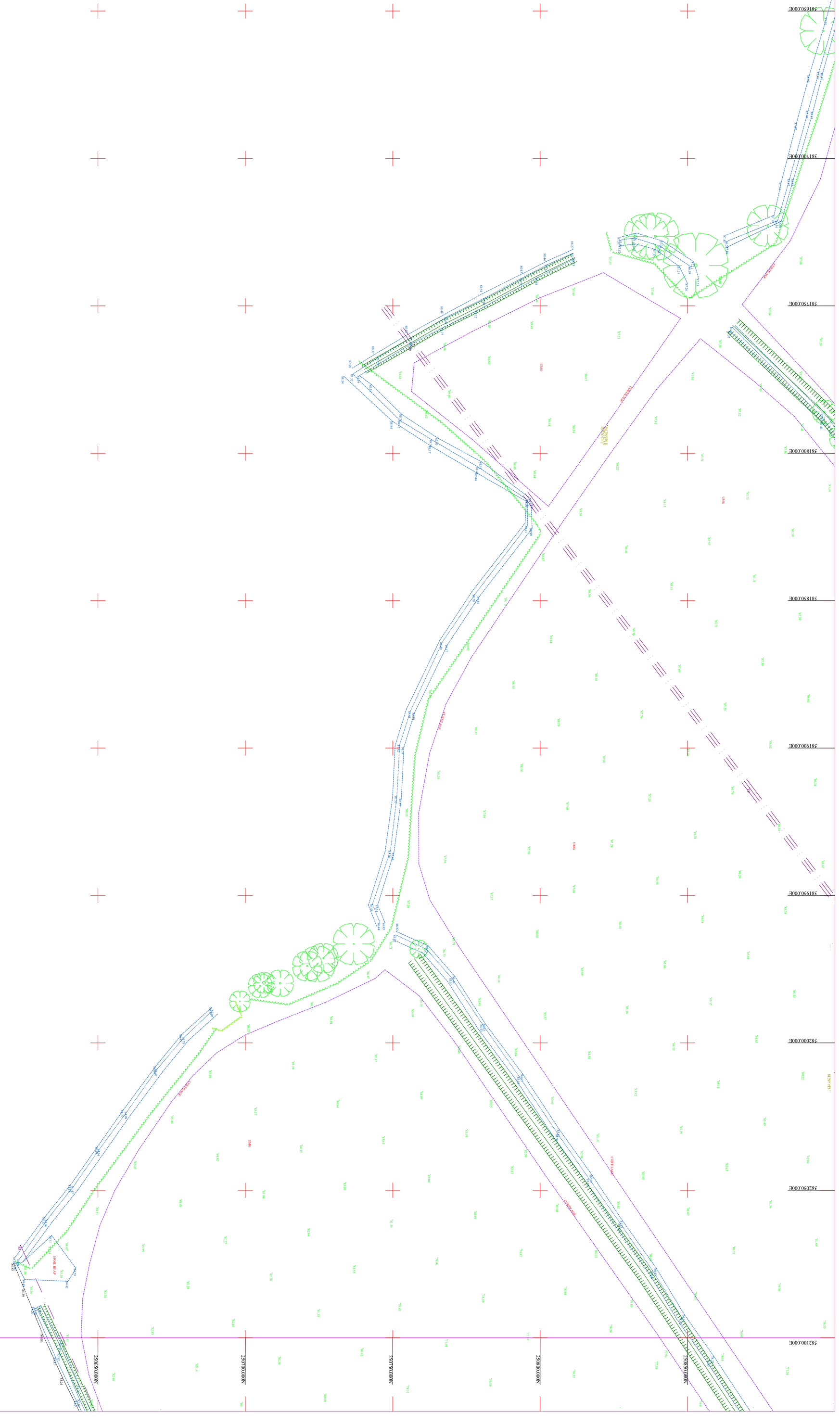
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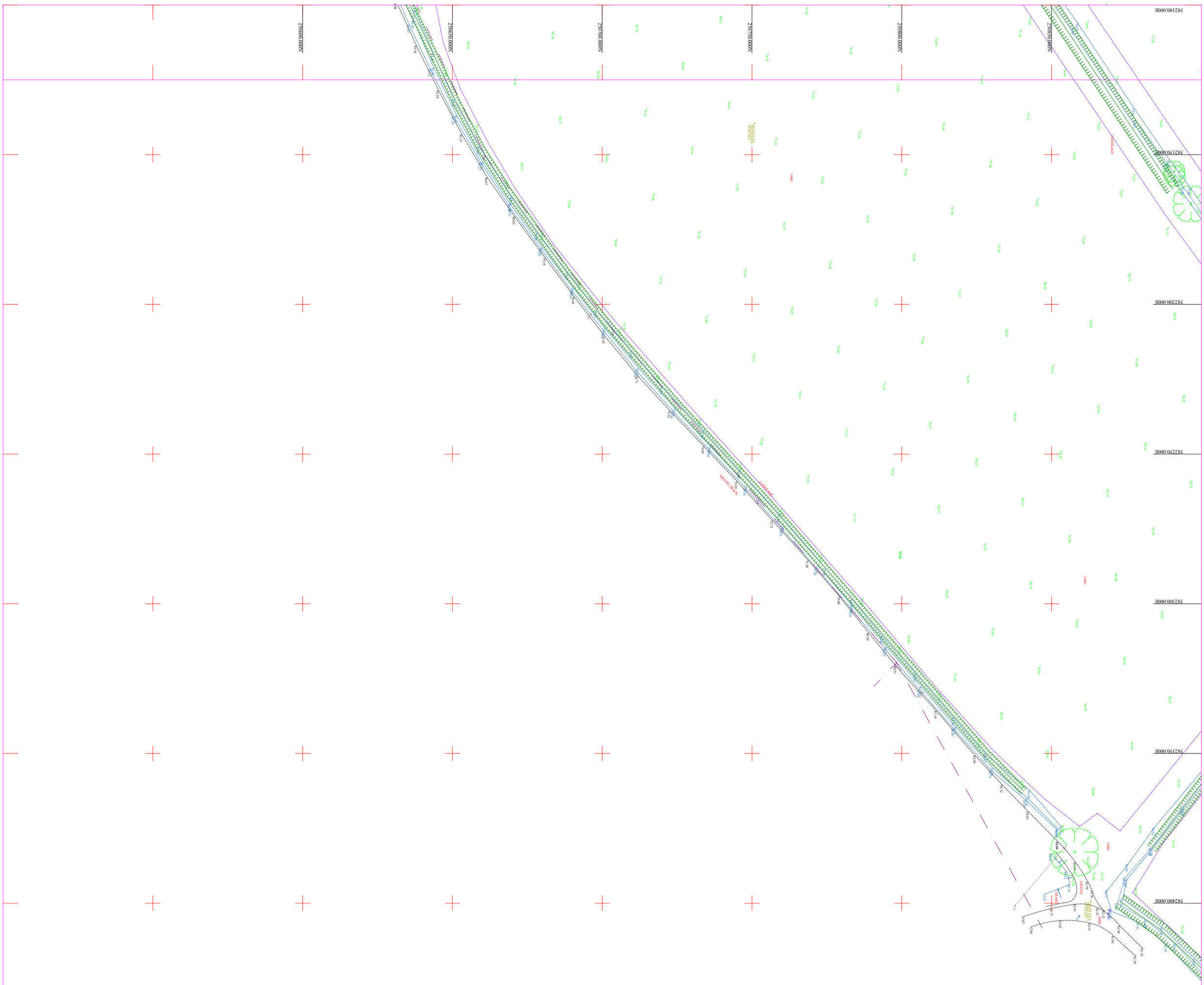
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SCALE: 1:500

DRAWING No: 1472/05

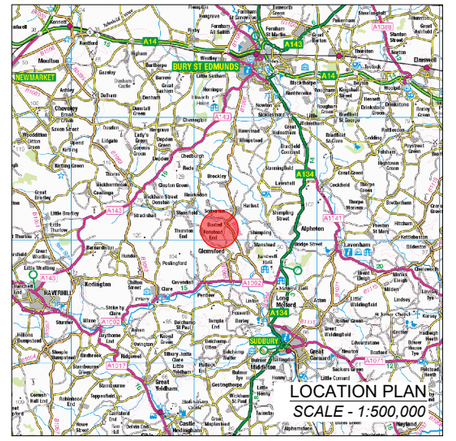
JOB No: 1472




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582600.000E
2506000.000N
2506500.000N
2507000.000N
2507500.000N
2508000.000N
2508500.000N
EDGE OF TRACK
EDGE
GRAVEL TRACK
GRASS
ASPHALT
ABBREVIATIONS
ADJ adjacent
AV air valve
BAS basin
BBS bus bay stop
BH bore hole
BO blow off
BOL bollard
BT bus stop
BW back of kerb
C/L centre line
CCTV cctv camera
dia diameter
DK duct
EC electric cabinet
EP electric pole
FB finished floor level
FH fire hydrant
FW foul water
GV gate valve
HH hand hole
HP hydrant
IC inspection cover
IL invert level
LP lamp post
MH manhole
MKR marker
OHL overhead
OHWL Ordinance Survey bench mark
PC pedestrian crossing
PP power pole
RE rodding eye
SC stop cock
SP soil pipe
TC telecom cover
TP telegraph pole
WM water meter
WO water stop valve
WV water valve
Survey Station
Tree
Hedge
Spot Height
Tree canopy
Fence
Bank
Gate
FENCE AND WALL TYPES
BRW brick wall
BRW brick wall dwarf
CBW concrete block wall
CFE chainlink/palisade fence
CHB/WF concrete post and timber fence
CHB/WP concrete post and metal mesh fence
CWB concrete wall
MWB masonry wall
PWF post and rail fence
PWM post and wire fence
RW retaining wall
SHEET LAYOUT
1472/01
1472/02
1472/03
1472/04
1472/05
1472/06
GENERAL NOTES
DATE
AMENDMENT
REV.
SURVEY NOTES
1. Orientation, origin and level datum of survey relate to OSGB36(15)
2. Survey was undertaken and scale fixed 1:500
3. Kerb levels are taken as shared.
4. All tree species should be verified by a arboriculturist.
NORTH
MARK BEAVER SURVEYING
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Mapping, Setting Out
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CLIENT:
PEGASUS PLANNING GROUP
PROJECT:
BOXTED SOLAR FARM
BOXTED
BURY ST EDMUNDS
IP29 4JR
TITLE:
TOPOGRAPHIC SURVEY
SURVEYOR: MB
DRAWN BY: MB
SHEET SIZE: A0
DATE: 21.03.2023
SCALE: 1:500
DRAWING No: 1472/06
JOB No: 1472

Appendix C – Proposed Site Layout

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2026 LICENCE NUMBER AC0000808122.



KEY:

- SITE BOUNDARY (*OUTSIDE OF LINE DENOTES BOUNDARY*)
- PROPOSED ACCESS TRACK
- INDICATIVE SOLAR PV ARRAY
- INVERTER & BATTERY STORAGE AREA
- HARDSTAND
- SUBSTATION COMPOUND
- TEMPORARY CONSTRUCTION COMPOUND
- FENCE LINE
- GATE (FENCE)
- DITCH CROSSING
- CCTV
- EXISTING DITCH CROSSING TO BE UPGRADED
- SITE ENTRANCE - VISIBILITY SPLAY
- HYDRANT WATER STORAGE LOCATION
- PROPOSED ADDITIONAL SWALE

ISSUE	DRAWN	CHKD	APPD	DATE	REVISION NOTES
4	FG	JM	CC	2026-07-20	Table layout update (fields removed, archaeo)
3	FG	JM	CC	2025-01-13	Site entrance, turning head update
2	FG	JM	ML	2023-10-18	Site boundary updated
1	FG	ML	ML	2023-09-19	First Issue

PURPOSE: PERMITTING	COORDINATES: OSGB 1936
SCALE: 1:5,000 @A3	DATUM: N/A
LAYOUT DRAWING: N/A	T-LAYOUT NO: N/A

PROJECT TITLE

BOXTED SOLAR

DRAWING TITLE

FIGURE 4
INFRASTRUCTURE LAYOUT

RES DRAWING NUMBER	REV
04806-RES-LAY-DR-PT-004	3.1

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EGG FARM LANE,
KINGS LANGLEY,
HERTS WD4 8LR. UK
TEL +44 (0) 1923 299200
WWW.RES-GROUP.COM

Appendix D – Surface Water Drainage Strategy

Impermeable Area: 0.111 ha
Assumed Infiltration Rate: 0.00108 m/hr
Gravel Trench Length: 101.8m
Gravel Trench Width: 2.2m
Gravel Trench Depth: 1.5m

Indicative outfall to be confirmed during detailed design

Impermeable Area: 0.029 ha
Assumed Infiltration Rate: 0.00108 m/hr
Gravel Trench Length: 66m
Gravel Trench Width: 1.1m
Gravel Trench Depth: 1.0m

Impermeable Area: 0.029 ha
Assumed Infiltration Rate: 0.00108 m/hr
Gravel Trench Length: 66m
Gravel Trench Width: 1.1m
Gravel Trench Depth: 1.0m

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Gravel Trench Length: 66m
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Gravel Trench Depth: 1.0m

Indicative outfall to be confirmed during detailed design

Impermeable Area: 0.029 ha
Assumed Infiltration Rate: 0.00108 m/hr
Gravel Trench Length: 66m
Gravel Trench Width: 1.1m
Gravel Trench Depth: 1.0m

N

1:500
0 12.5m 25m

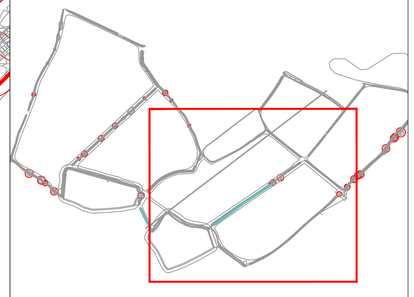
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Key:

- Proposed Access Track
- Proposed Additional Swales
- Proposed Gravel Trench
- Overland Flow Path
- Ordinary Watercourse
- Surface Water Drain

Notes:

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5. THIS DRAWING IS SCHEMATIC AND FOR CLARITY ONLY, POSITION OF DRAINAGE FEATURES MAY VARY DUE TO SITE CONDITIONS.
6. SWALES USED TO CAPTURE AND MANAGE OVERLAND FLOWS HAVE BEEN DESIGNED TO BE 0.5m X 0.5m DEEP WITH 1:3 SIDE SLOPES AND A 3m MAINTENANCE BUFFER ON EITHER SIDE.
7. GRAVEL TRENCHES USED TO CAPTURE AND MANAGE RUNOFF FROM THE AREAS OF HARDSTANDING HAVE BEEN DESIGNED TO 1m WIDE X 0.5m DEEP, WITH A 1m MAINTENANCE STRIP EITHER SIDE.
8. SUDS FEATURES HAVE BEEN DESIGNED TO THE 1 IN 100 YEAR PLUS 25% CLIMATE CHANGE EVENT.
9. GRAVEL TRENCHES WILL INFILTRATE AT A RATE OF 0.00108m/hr.



REV	DATE	DESCRIPTION	REVISED	CHECKED	APPROVED
P5	02.09.2026	Updated Layout XREF'ed into drawing	MG	LG	CT
P4	27.01.2025	Updated Layout	JTW	LG	SAJ
P3	07.11.2024.	Minor additional updates	JTW	SAJ	SAJ
P2	09.10.2024.	Drawing updated to suit RPAs	DBK	LG	LAJ
P1	12.08.2024.	First Issue	DBK	LG	LAJ

PROPOSED DRAINAGE STRATEGY SHEET 3

Land to the west of B1066
Boxted, Suffolk

CLIENT:
RES Group

DATE: 12.08.2024	SCALE: 1:500@A1	DRAWN BY: DK CHECKED BY: LG APPROVED BY: LAJ

DRAWING NUMBER: P21-2950- PEG - XX - XX - DR - C- 0105 - P5

PG OFFICE / TEAM: BRS

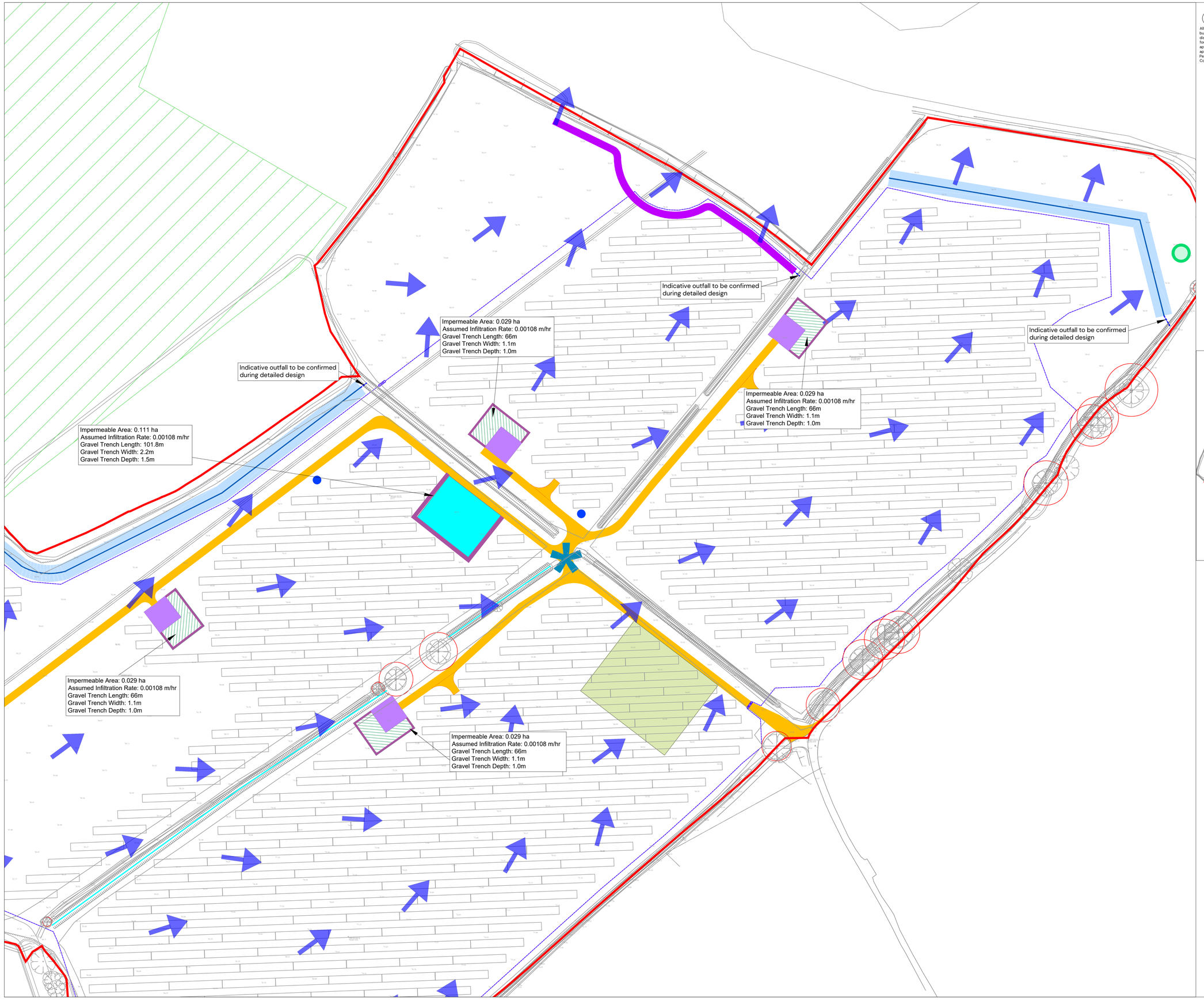
PEGASUS REF No: P21-2950

DRAWING STATUS: S2

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N

1:1000
0 25m 50m

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Key:

- Proposed Access Track
- Proposed Additional Swales
- Proposed Gravel Trench
- Overland Flow Path
- Ordinary Watercourse
- Surface Water Drain

Notes:

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6. SWALES USED TO CAPTURE AND MANAGE OVERLAND FLOWS HAVE BEEN DESIGNED TO BE 0.5m X 0.5m DEEP WITH 1:3 SIDE SLOPES AND A 3m MAINTENANCE BUFFER ON EITHER SIDE.
7. GRAVEL TRENCHES USED TO CAPTURE AND MANAGE RUNOFF FROM THE AREAS OF HARDSTANDING HAVE BEEN DESIGNED TO 1m WIDE X 0.5m DEEP, WITH A 1m MAINTENANCE STRIP EITHER SIDE.
8. SUDS FEATURES HAVE BEEN DESIGNED TO THE 1 IN 100 YEAR PLUS 25% CLIMATE CHANGE EVENT.
9. GRAVEL TRENCHES WILL INFILTRATE AT A RATE OF 0.00108m/hr.



REV	DATE	DESCRIPTION	REVISED	CHECKED	APPROVED
P5	02.09.2026	Updated Layout XREF'ed into drawing	MG	LG	CT
P4	27.01.2025	Updated Layout	JTW	LG	SAJ
P3	07.11.2024	Minor additional updates	JTW	SAJ	SAJ
P2	09.10.2024	Drawing updated to suit RPAs	DBK	LG	LAJ
P1	12.08.2024	First Issue	DBK	LG	LAJ

PROPOSED DRAINAGE STRATEGY SHEET 2

Land to the west of B1066
Boxted, Suffolk

CLIENT:
RES Group

DATE:	SCALE:	DRAWN BY:	DK
12.08.2024	1:500@A1	CHECKED BY:	LG
		APPROVED BY:	LAJ

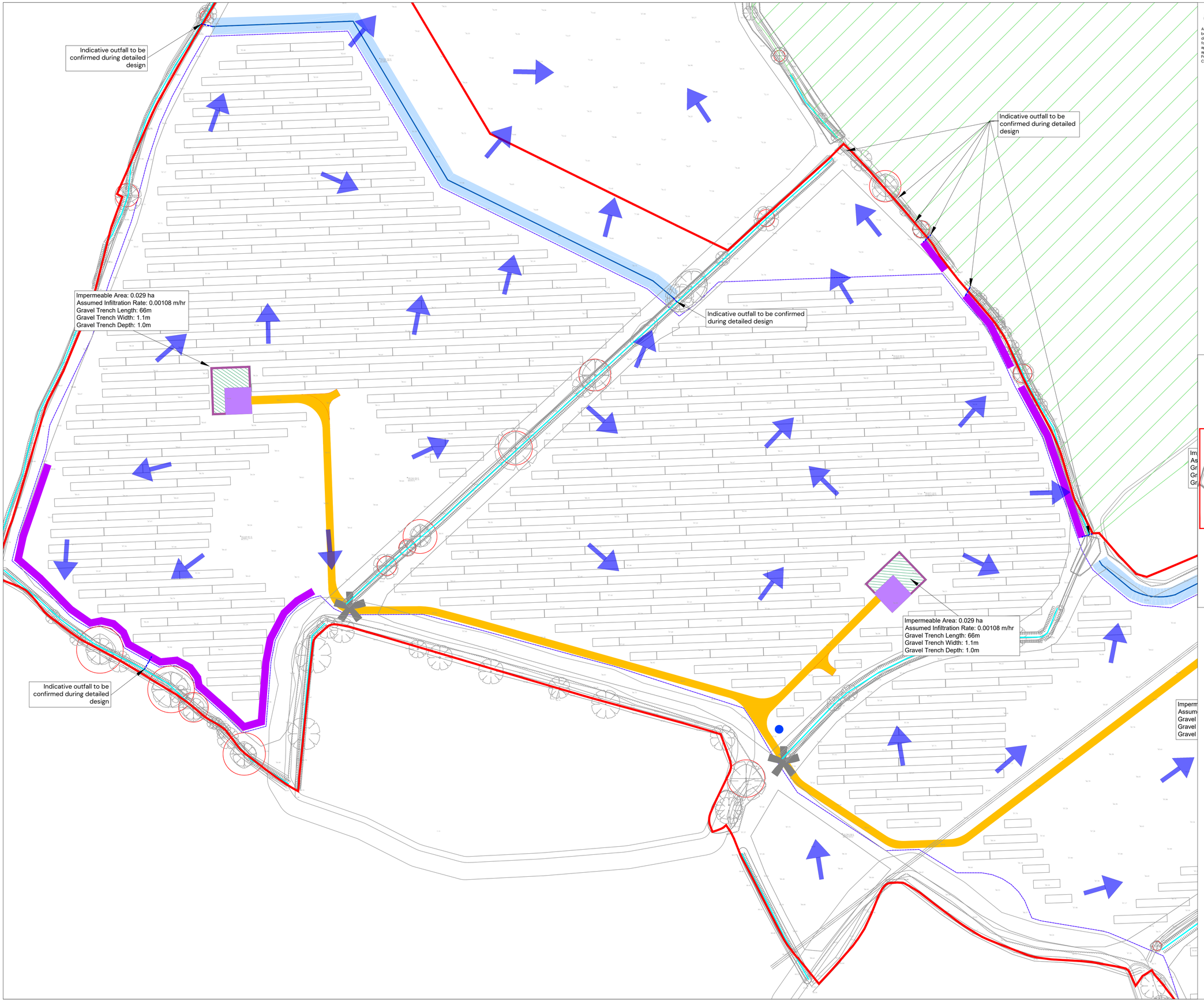
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PG OFFICE / TEAM: BRS

PEGASUS REF No: P21-2950

DRAWING STATUS: S2

PEGASUS GROUP



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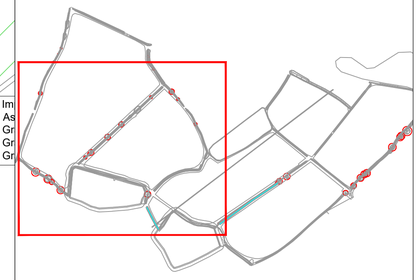
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Key:

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- Proposed Additional Swales
- Proposed Gravel Trench
- Overland Flow Path
- Ordinary Watercourse
- Surface Water Drain

Notes:

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7. GRAVEL TRENCHES USED TO CAPTURE AND MANAGE RUNOFF FROM THE AREAS OF HARDSTANDING HAVE BEEN DESIGNED TO 1m WIDE X 0.5m DEEP, WITH A 1m MAINTENANCE STRIP EITHER SIDE.
8. SUDS FEATURES HAVE BEEN DESIGNED TO THE 1 IN 100 YEAR PLUS 25% CLIMATE CHANGE EVENT.
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P5	02.09.2026	Updated Layout XREF'ed into drawing	MG	LG	CT
P4	27.01.2025.	Updated Layout	JTW	LG	SAJ
P3	07.11.2024.	Minor additional updates	JTW	SAJ	SAJ
P2	09.10.2024.	Drawing updated to suit RPAs	DBK	LG	LAJ
P1	12.08.2024.	First issue	DBK	LG	LAJ

PROPOSED DRAINAGE STRATEGY SHEET 1

Land to the west of B1066
Boxted, Suffolk

CLIENT:
RES Group

DATE:	SCALE:	DRAWN BY:	DBK
12.08.2024	1:500@A1	CHECKED BY:	SAJ
		APPROVED BY:	SAJ

DRAWING NUMBER: P21-2950- PEG - XX - XX - DR - C - 0103 - P5

PG OFFICE / TEAM: BRS

PEGASUS REF No: P21-2950

DRAWING STATUS: S2

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Appendix E – Proposed Landscape Masterplan

Creation of new woodland blocks throughout northern edges of site to reflect existing landscape character; selected Standard trees to be scattered throughout proposed woodland mixes to add height and structure at implementation.

Existing hedgerows H18 and H23 to be managed to heights between 4m and 7m (see Barton Hyett Associates' Tree Survey Plan drawing (BHA_4890_01) for reference).

Swales to be included along the north of the site and will be sown with a seasonally wet meadow mix.

Planting of native hedgerow trees across site to reflect existing landscape features and strengthen historical field boundaries.

Any gaps in existing hedgerow length to be infilled with proposed native hedgerow species to ensure dense coverage, reinforcing historical hedgerow patterns.

Hedgerow along southern boundary to be infilled wherever necessary with proposed native hedgerow species to ensure dense coverage along boundary length; hedgerow to be managed to a minimum of 4m height.

Existing woodland

Existing woodland

Existing woodland

Moorhouse Farm

Hall Farm

Boxted Hall

B1066

River Glem

Landscape Strategy

The landscape strategy has been guided by the Site Tree Survey (Barton Hyett Associates), the Suffolk Landscape Character Assessment within which the site lies mostly within the Undulating Ancient Farmlands with the northern edges at the cusp of the adjoining Rolling Valley Farmlands LCA) and the Valued Landscape Assessment, Stour Valley Additional Project Area (March 2020).

Management of Existing Hedgerows

Across the site, existing elm suckers shall be identified and allowed to develop to form hedgerow trees during the ongoing course of hedgerow management. Existing hedgerows are surveyed within the Tree Survey as being of varied heights. Where hedgerows are already established to heights above 3.6m, these heights shall be maintained. Where hedgerows are below 3.6m in average height they shall be managed to increased heights of 3.6m and above. The hedgerow to the southern boundary should be managed to a minimum of 4m.

Existing hedgerows H18 and H23 shall be allowed to grow to heights of between 4-7m (see Barton Hyett Associates' Tree Survey Plan drawing (BHA_4890_01) for reference).

Native hedgerow tree planting

Trees to be double low-staked with ties and spacers. Each tree to be protected with 600 mm clear plastic spiral guard.

Native mixed hedgerows

To be planted at 5/linear metre in a double-staggered row, with rows 500mm apart. Hedges to be protected by spiral guards with cane, or within rabbit proof fencing, as appropriate.

Selected Standard Trees within Woodland Mix Planting

Trees to be set out informally within woodland areas with spacing between trees of 25-35m. Trees to be double low-staked with ties and spacers. Each tree to be protected with 600mm clear plastic spiral guard.

N.B. *where there is an existing grass-flower margin this shall be retained and its width added to if necessary.*

KEY

EXISTING

- Red line boundary
- Trees and vegetation
- Root Protection Areas
- Overhead line
- Overhead line 10m landscape buffer
- Public Rights of Way

PROPOSED

- Native woodland mix
- Native hedgerow tree planting
- Native mixed hedgerow planting
- Standard trees within woodland mix planting
- Strategic infill planting where required: native mixed hedgerow
- Swale: Emorsgate EM8 Meadow Mixture for Wetlands
- Indicative Permissive Footpath through Woodland
- Grass / Wildflower seed mix: Emorsgate Hedgerow Mixture EH1 or similar approved suitable for site's ground conditions to be agreed (outside the security fence)
- Grass / Wildflower seed mix: Grazing mixture - species-rich grassland suitable for site's ground conditions to be agreed (within the security fence)
- Grass / Wildflower seed mix: Emorsgate Woodland mixture EW1 or similar approved suitable for site's ground conditions to be agreed (outside the security fence)
- Picnic Area

Indicative planting list

Native Hedgrow Tree Planting

ID	Plant Species	Size	Primary (P) or secondary (S) species
A.c	Acer campestre	12-14cm, 350-425cm ht	P
C.b.	Carpinus betulus	12-14cm, 350-425cm ht	P
J.r	Juglans regia	12-14cm, 350-425cm ht	S
M.s	Malus sylvestris	12-14cm, 350-425cm ht	P
P.a	Prunus avium	12-14cm, 350-425cm ht	S
Q.r	Quercus robur	10-12cm, 350-425cm ht	P

Native Mixed Hedgerows

ID	Plant Species	Height/Pot Size	%
A.c	Acer campestre	Selected to 900mm ht	10
A.c	Acer campestre	2m Feathered	5
C.s	Cornus sanguinea	Selected to 900mm ht	5
C.a	Corylus avellana	Selected to 900mm ht	7.5
C.m	Crataegus monogyna	Selected to 900mm ht	50
C.m	Crataegus monogyna	1.5m Feathered	5
Eu.eu.	Euonymus europaeus	Selected to 900mm ht	2.5
I.a	Ilex aquifolium	200-300mm ht	2.5
L.p	Lonicera periclymenum	200-300mm ht	2.5
P.s	Prunus spinosa	Selected to 900mm ht	10

Native Woodland Mix

(based upon W8 Woodland – JNCC)

ID	Plant Species	Height	%
A.p	Acer pseudoplatanus	1.75m Feathered	2.5
C.b.	Carpinus betulus	1.75m Feathered	10
Co.s	Cornus sanguinea	400-600mm ht	5
C.a	Corylus avellana	Selected to 900mm ht	10
C.m	Crataegus monogyna	Selected to 900mm ht	15
Eu.eu.	Euonymus europaeus	Selected to 900mm ht	10
I.a	Ilex aquifolium	200-300mm ht	5
L.p	Lonicera periclymenum	200-300mm ht	2.5
P.a.	Prunus avium	1.75m Feathered	2.5
Q.r	Quercus robur	1.75m Feathered	5
Q.r	Quercus robur	Selected to 900mm ht	2.5
S.c	Salix caprea	Selected to 900mm ht	10
S.a*	Sorbus aucuparia	1.75m Feathered	5
V.l.	Viburnum lantana	Selected to 900mm ht	10
			7.5

*Salix caprea to be positioned to the northern edges of proposed woodlands

Selected Standard Trees within Woodland Mix Planting

ID	Plant Species	Size (Girth)	Planting Height (m)
A.c	Acer campestre	12-14cm	3.5-4.0
C.b.	Carpinus betulus	12-14cm	3.5-4.0
P.a	Prunus avium	12-14cm	3.5-4.0
Q.r	Quercus robur	10-12cm	3.0-3.5

N 0 50 100 m

Rev	Date	By	Note
J	25.08.26	MH	Amends to aerial imagery
I	17.08.26	MH	Amends to access tracks
H	11.08.26	MH	Amends to grassland
G	10.08.26	MH	Amends following client comment
F	07.08.26	RM	Amends following client comment
E	03.08.26	RM	Updated to revised layout
D	23.01.25	LAB	Updated to revised layout
C	26.10.23	VR	Minor amend to landscape notes
B	18.10.23	VR	Updates following receipt of ecologist's comments
A	09.10.23	FH	Client comments

Landscape Masterplan

Boxted Solar Farm

Client: RES Ltd. REV: J

DRWG No: P21-2960_EN_004

Drawn by: RM Approved by: FH

Date: 07/08/2026

Scale: 1:2,000 @ A1

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Appendix F – Micro drainage Source Calculations

Summary of Results for 100 year Return Period (+25%)

Half Drain Time : 5780 minutes.

Outflow is too low. Design is unsatisfactory.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	98.869	0.369	0.1	24.8	O K
30 min Summer	98.985	0.485	0.1	32.6	O K
60 min Summer	99.105	0.605	0.1	40.7	O K
120 min Summer	99.246	0.746	0.1	50.1	O K
180 min Summer	99.332	0.832	0.1	55.9	O K
240 min Summer	99.391	0.891	0.1	59.8	O K
360 min Summer	99.464	0.964	0.1	64.8	O K
480 min Summer	99.508	1.008	0.1	67.7	O K
600 min Summer	99.537	1.037	0.1	69.7	O K
720 min Summer	99.557	1.057	0.1	71.0	O K
960 min Summer	99.581	1.081	0.1	72.6	O K
1440 min Summer	99.601	1.101	0.1	74.0	O K
2160 min Summer	99.606	1.106	0.1	74.3	O K
2880 min Summer	99.601	1.101	0.1	74.0	O K
4320 min Summer	99.591	1.091	0.1	73.3	O K
5760 min Summer	99.593	1.093	0.1	73.4	O K
7200 min Summer	99.609	1.109	0.1	74.5	O K
8640 min Summer	99.631	1.131	0.1	76.0	O K
10080 min Summer	99.658	1.158	0.1	77.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	119.500	0.0	19
30 min Summer	78.626	0.0	34
60 min Summer	49.188	0.0	64
120 min Summer	30.487	0.0	124
180 min Summer	22.768	0.0	184
240 min Summer	18.364	0.0	244
360 min Summer	13.374	0.0	364
480 min Summer	10.581	0.0	484
600 min Summer	8.784	0.0	604
720 min Summer	7.526	0.0	724
960 min Summer	5.871	0.0	962
1440 min Summer	4.127	0.0	1442
2160 min Summer	2.907	0.0	2160
2880 min Summer	2.280	0.0	2880
4320 min Summer	1.650	0.0	4020
5760 min Summer	1.333	0.0	4720
7200 min Summer	1.147	0.0	5480
8640 min Summer	1.024	0.0	6232
10080 min Summer	0.937	0.0	7064

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Summary of Results for 100 year Return Period (+25%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	98.913	0.413	0.1	27.8	O K
30 min Winter	99.043	0.543	0.1	36.5	O K
60 min Winter	99.178	0.678	0.1	45.6	O K
120 min Winter	99.337	0.837	0.1	56.2	O K
180 min Winter	99.433	0.933	0.1	62.7	O K
240 min Winter	99.499	0.999	0.1	67.2	O K
360 min Winter	99.583	1.083	0.1	72.8	O K
480 min Winter	99.633	1.133	0.1	76.1	O K
600 min Winter	99.666	1.166	0.1	78.4	O K
720 min Winter	99.690	1.190	0.1	79.9	O K
960 min Winter	99.718	1.218	0.1	81.8	Flood Risk
1440 min Winter	99.745	1.245	0.1	83.6	Flood Risk
2160 min Winter	99.757	1.257	0.1	84.5	Flood Risk
2880 min Winter	99.758	1.258	0.1	84.6	Flood Risk
4320 min Winter	99.759	1.259	0.1	84.6	Flood Risk
5760 min Winter	99.759	1.259	0.1	84.6	Flood Risk
7200 min Winter	99.776	1.276	0.1	85.7	Flood Risk
8640 min Winter	99.801	1.301	0.1	87.4	Flood Risk
10080 min Winter	99.830	1.330	0.2	89.3	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	119.500	0.0	19
30 min Winter	78.626	0.0	34
60 min Winter	49.188	0.0	64
120 min Winter	30.487	0.0	124
180 min Winter	22.768	0.0	182
240 min Winter	18.364	0.0	242
360 min Winter	13.374	0.0	360
480 min Winter	10.581	0.0	478
600 min Winter	8.784	0.0	596
720 min Winter	7.526	0.0	716
960 min Winter	5.871	0.0	952
1440 min Winter	4.127	0.0	1416
2160 min Winter	2.907	0.0	2116
2880 min Winter	2.280	0.0	2796
4320 min Winter	1.650	0.0	4108
5760 min Winter	1.333	0.0	5304
7200 min Winter	1.147	0.0	5696
8640 min Winter	1.024	0.0	6656
10080 min Winter	0.937	0.0	7568

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 582237 251189 TL 82237 51189
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+25

Time Area Diagram

Total Area (ha) 0.111

Time (mins) From:	To:	Area (ha)
0	4	0.111

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Model Details

Storage is Online Cover Level (m) 100.000

Infiltration Trench Structure

Infiltration Coefficient Base (m/hr)	0.00108	Trench Width (m)	2.2
Infiltration Coefficient Side (m/hr)	0.00108	Trench Length (m)	101.8
Safety Factor	1.0	Slope (1:X)	0.0
Porosity	0.30	Cap Volume Depth (m)	1.500
Invert Level (m)	98.500	Cap Infiltration Depth (m)	1.500

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Summary of Results for 100 year Return Period (+25%)

Half Drain Time : 3447 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	99.297	0.297	0.0	6.5	O K
30 min Summer	99.390	0.390	0.0	8.5	O K
60 min Summer	99.486	0.486	0.0	10.6	O K
120 min Summer	99.598	0.598	0.0	13.0	O K
180 min Summer	99.665	0.665	0.0	14.5	O K
240 min Summer	99.711	0.711	0.1	15.5	Flood Risk
360 min Summer	99.766	0.766	0.1	16.7	Flood Risk
480 min Summer	99.797	0.797	0.1	17.4	Flood Risk
600 min Summer	99.816	0.816	0.1	17.8	Flood Risk
720 min Summer	99.828	0.828	0.1	18.0	Flood Risk
960 min Summer	99.839	0.839	0.1	18.3	Flood Risk
1440 min Summer	99.840	0.840	0.1	18.3	Flood Risk
2160 min Summer	99.821	0.821	0.1	17.9	Flood Risk
2880 min Summer	99.801	0.801	0.1	17.4	Flood Risk
4320 min Summer	99.783	0.783	0.1	17.1	Flood Risk
5760 min Summer	99.777	0.777	0.1	16.9	Flood Risk
7200 min Summer	99.779	0.779	0.1	17.0	Flood Risk
8640 min Summer	99.786	0.786	0.1	17.1	Flood Risk
10080 min Summer	99.796	0.796	0.1	17.3	Flood Risk
15 min Winter	99.333	0.333	0.0	7.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	119.500	0.0	19
30 min Summer	78.626	0.0	34
60 min Summer	49.188	0.0	64
120 min Summer	30.487	0.0	124
180 min Summer	22.768	0.0	184
240 min Summer	18.364	0.0	244
360 min Summer	13.374	0.0	364
480 min Summer	10.581	0.0	482
600 min Summer	8.784	0.0	602
720 min Summer	7.526	0.0	722
960 min Summer	5.871	0.0	962
1440 min Summer	4.127	0.0	1442
2160 min Summer	2.907	0.0	2160
2880 min Summer	2.280	0.0	2480
4320 min Summer	1.650	0.0	3240
5760 min Summer	1.333	0.0	4040
7200 min Summer	1.147	0.0	4896
8640 min Summer	1.024	0.0	5712
10080 min Summer	0.937	0.0	6552
15 min Winter	119.500	0.0	19

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Summary of Results for 100 year Return Period (+25%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	99.437	0.437	0.0	9.5	O K
60 min Winter	99.545	0.545	0.0	11.9	O K
120 min Winter	99.671	0.671	0.0	14.6	O K
180 min Winter	99.747	0.747	0.1	16.3	Flood Risk
240 min Winter	99.798	0.798	0.1	17.4	Flood Risk
360 min Winter	99.861	0.861	0.1	18.7	Flood Risk
480 min Winter	99.897	0.897	0.1	19.5	Flood Risk
600 min Winter	99.919	0.919	0.1	20.0	Flood Risk
720 min Winter	99.933	0.933	0.1	20.3	Flood Risk
960 min Winter	99.948	0.948	0.1	20.6	Flood Risk
1440 min Winter	99.953	0.953	0.1	20.8	Flood Risk
2160 min Winter	99.939	0.939	0.1	20.5	Flood Risk
2880 min Winter	99.920	0.920	0.1	20.0	Flood Risk
4320 min Winter	99.895	0.895	0.1	19.5	Flood Risk
5760 min Winter	99.885	0.885	0.1	19.3	Flood Risk
7200 min Winter	99.883	0.883	0.1	19.2	Flood Risk
8640 min Winter	99.884	0.884	0.1	19.3	Flood Risk
10080 min Winter	99.889	0.889	0.1	19.4	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	78.626	0.0	34
60 min Winter	49.188	0.0	64
120 min Winter	30.487	0.0	122
180 min Winter	22.768	0.0	182
240 min Winter	18.364	0.0	242
360 min Winter	13.374	0.0	360
480 min Winter	10.581	0.0	478
600 min Winter	8.784	0.0	596
720 min Winter	7.526	0.0	712
960 min Winter	5.871	0.0	944
1440 min Winter	4.127	0.0	1400
2160 min Winter	2.907	0.0	2076
2880 min Winter	2.280	0.0	2708
4320 min Winter	1.650	0.0	3372
5760 min Winter	1.333	0.0	4320
7200 min Winter	1.147	0.0	5256
8640 min Winter	1.024	0.0	6144
10080 min Winter	0.937	0.0	7064

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 582237 251189 TL 82237 51189
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+25

Time Area Diagram

Total Area (ha) 0.029

Time (mins) From:	To:	Area (ha)
0	4	0.029

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Model Details

Storage is Online Cover Level (m) 100.000

Infiltration Trench Structure

Infiltration Coefficient Base (m/hr)	0.00108	Trench Width (m)	1.1
Infiltration Coefficient Side (m/hr)	0.00108	Trench Length (m)	66.0
Safety Factor	1.0	Slope (1:X)	0.0
Porosity	0.30	Cap Volume Depth (m)	1.000
Invert Level (m)	99.000	Cap Infiltration Depth (m)	1.000

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Appendix G – LLFA Approval Response

Your Ref: DC/23/05127
Our Ref: SCC/CON/0525/25
Date: 12th February 2025
Enquiries to: Floods@suffolk.gov.uk

All planning enquiries should be sent to the Local Planning Authority.
Email: planninggreen@baberghmidsuffolk.gov.uk

The Planning Department
GREEN @ Barbergh Mid Suffolk District Council
1st Floor, Endeavour House

8 Russell Road

Ipswich

Dear Rose Rimell,

TOWN AND COUNTRY PLANNING ACT 1990

CONSULTATION RETURN: DC/23/05127

PROPOSAL: Planning Application. Construction of a solar farm with all associated works,

equipment, necessary infrastructure and biodiversity net gains.

LOCATION: Land West Of Boxted

Suffolk County Council, as Lead Local Flood Authority (LLFA), have reviewed application Ref: DC/23/05127 and the following submitted document(s) and we recommend **Approval of this application subject to condition(s):.**

- Flood Risk Assessment and Surface Water Drainage Strategy Ref Pegasus Ref: P21-2950 Date: 23/10/2023
- Report Name: Response to LLFA Holding Objection Author Project Number: P21-2950 Date: 30/01/2025

We propose the following condition(s) in relation to surface water drainage for this application:

1. The strategy for the disposal of surface water (ref: P21-2950 dated 23/10/23 & 30/01/2025) shall be implemented as approved in writing by the local planning authority (LPA). The strategy shall thereafter be managed and maintained in accordance with the approved strategy.

Reason: To ensure that the principles of sustainable drainage are incorporated into this proposal, to ensure that the proposed development can be adequately drained

2. No development shall commence until details of a Construction Surface Water Management Plan (CSWMP) detailing how surface water and storm water will be managed on the site during construction (including demolition and site clearance operations) is submitted to and agreed in writing by the LPA. The CSWMP shall be implemented and thereafter managed and maintained in accordance with the approved plan for the duration of construction. The approved CSWMP shall include:

Method statements, scaled and dimensioned plans and drawings detailing surface water management proposals to include:-

i. Temporary drainage systems

ii. Measures for managing pollution / water quality and protecting controlled waters and watercourses

iii. Measures for managing any on or offsite flood risk associated with construction

Reason: To ensure the development does not cause increased flood risk, or pollution of watercourses or groundwater

https://www.suffolk.gov.uk/roads-and-transport/flooding-and-drainage/guidance-on-development-and-flood-risk/construction-surface-water-management-plan/

We would like to make the applicant aware of the following informatives:

- Any works to a watercourse may require consent under section 23 of the Land Drainage Act 1991.
- Any discharge to a watercourse or groundwater needs to comply with the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.
- Any discharge of surface water to a watercourse that drains into an Internal Drainage Board district catchment is subject to payment of a surface water developer contribution.
- Any works to lay new surface water drainage pipes underneath the public highway will need a licence under section 50 of the New Roads and Street Works Act.
- Any works to a main river may require an environmental permit.

Yours Sincerely,

Jason Skilton
Flood & Water Engineer
Growth, Highways and Infrastructure

PEGASUS GROUP

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