

**FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
JARVIS GATE, SUTTON ST JAMES**

FINAL REPORT

ECL1166a/STATUS DESIGN

DATE JULY 2024

ELLINGHAM CONSULTING LTD

Email: tim@ellinghamconsulting.co.uk

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1.0 INTRODUCTION

This Flood Risk Assessment has been prepared in accordance with National Planning Policy Framework (NPPF) and supporting planning practice guidance (PPG) on Flood Risk and Coastal Change.

In areas at risk of flooding or for sites of 1 hectare or more, developers are required to undertake a site-specific Flood Risk Assessment to accompany an application for planning permission. This Flood Risk Assessment has been produced on behalf of Status Design in respect of a development that consists of two dwellings at Jarvis Gate, Sutton St James.

A planning application for the proposed development is to be submitted by Status Design.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located at 2 Jarvis Gate, Sutton St James, Spalding, PE12 0EP. The National Grid Reference of the site is 54006/31852.

The location of the site is shown in Figure 1.



Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is on the eastern side of Jarvis Gate. The site is comprised of two paddocks. There is agricultural land to the east of the site and residential dwellings to the north and south. The area of development is approximately 0.28 hectares.

A topographic survey has been undertaken and provided in Attachment 1. The site is flat with ground levels between +2.1m OD and +2.4m OD. The carriageway level of Jarvis Gate adjacent to the site is approximately +2.5m OD.

The site is in the South Holland Internal Drainage Board (IDB) District. Surface water at the site would naturally drain through soakaway and hence to the IDB drain system. There is a riparian drain on the northern boundary of the site and an IDB Ordinary Watercourse 500m east of the site.

The online British Geological Survey maps indicate that the site is likely to be underlain by Amptill Clay Formation mudstone. The bedrock is shown to be overlain with superficial deposits of clay and silt.

2.3 Proposed Development

The proposed development consists of two new dwellings. The dwellings will be single storey. The proposed Site Plan is provided in Attachment 1.

2.4 Local Development Documents

The South East Lincolnshire Local Plan 2011 – 2036, adopted in March 2019, is the Local Plan for the district. Policy 4: Approach to Flood Risk states the requirements for flood risk reduction.

The South East Lincolnshire Level 1 and Level 2 Strategic Flood Risk Assessment (SFRA) was prepared in June 2017.

The Joint Lincolnshire Flood Risk and Drainage Management Strategy has been prepared by Lincolnshire County Council as the Lead Local Flood Authority. The purpose of the Strategy is to increase the safety of people across Lincolnshire by reducing the number of people at risk of flooding, increasing the resilience of local communities, and reducing the impact of flooding.

2.5 Flood Zones

An extract from the Environment Agency Flood Maps for Planning is shown in Figure 2. The site is partly located within Flood Zone 3, an area with a high probability of flooding and Flood Zone 2, an area with a medium probability of flooding.

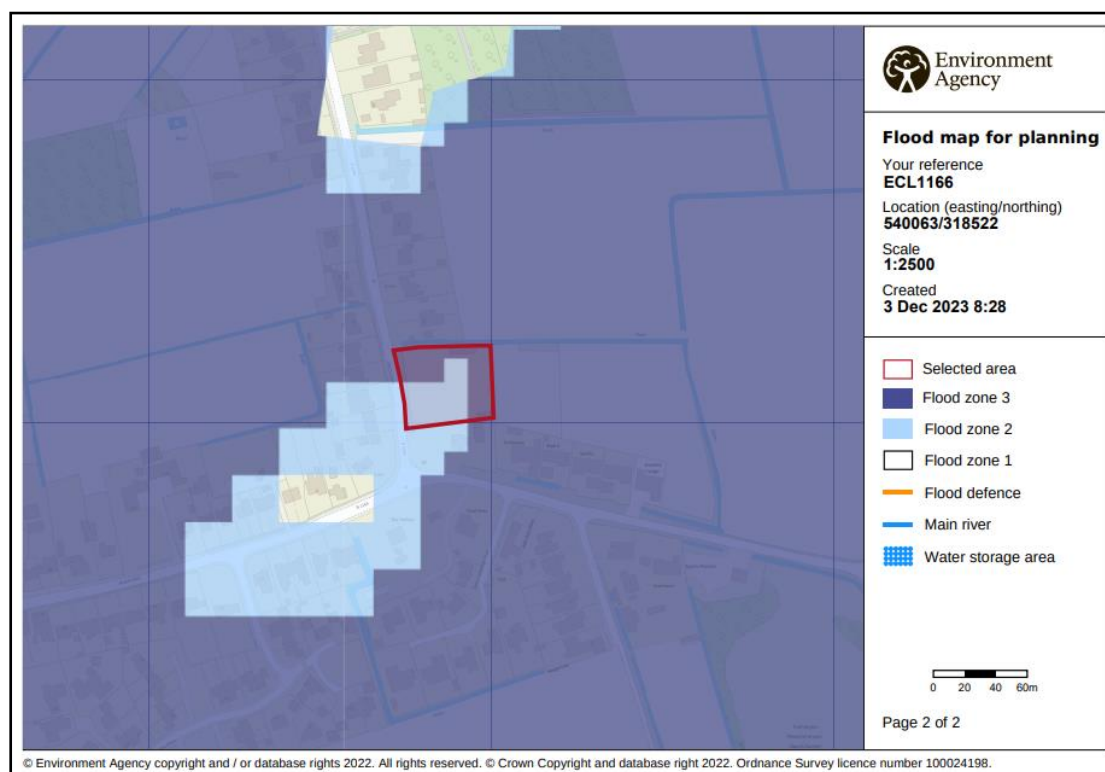


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the site has a low risk of flooding from rivers or the sea (annual probability between 0.1% and 1%);
- the site has a very low risk of surface water flooding (annual probability of less than 0.1%); and
- the site is not within an area at risk of reservoir flooding.

Table 1 shows the level of risk at the site within the South East Lincolnshire SFRA.

SFRA Map	Present Day	2116
Residual Flood Hazard Map for the 1% fluvial and 0.5% tidal event	The site is outside the 'Low Hazard' area	The site is outside the 'Low Hazard' area
Residual Peak Depth Map for the 1% fluvial and 0.5% tidal	The site is outside the area at risk	The site is outside the area at risk

Table 1 – Flood Risk within SFRA Maps

3.0 FLOOD RISK VULNERABILITY

3.1 The Sequential and Exception Test

The NPPF requires the application of a Sequential Test to ensure that new development is in areas with the lowest probability of flooding.

The Exception Test is a method to demonstrate and help ensure that flood risk to people and property will be managed, while allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available.

3.2 Vulnerability Classification

Table 2 of the PPG Flood Risk and Coastal Change categorises different types of uses and development according to their vulnerability to flood risk. The proposed development is covered by the description of buildings used for dwellings and is classified as 'More Vulnerable'.

Table 3 of the PPG Flood Risk and Coastal Change sets out Flood Risk Vulnerability and flood zone 'compatibility'. The site is within Flood Zone 3 and the development is 'More Vulnerable' therefore it is necessary to complete the Exception Test.

PPG Flood Risk and Coastal Change defines that the lifetime of the development in terms of flood risk and coastal change is 100 years.

3.3 Application of the Sequential and Exception Test

It is for the Local Planning Authority, using the evidence provided and taking advice from the Environment Agency as appropriate, to consider whether an application passes the Sequential Test.

Large parts of the South Holland district between the River Welland and River Nene lie within Flood Zone 2 or Flood Zone 3. The River Nene and River Welland have defences that provide protection during the 0.5% annual probability (1 in 200 chance each year) event and therefore the 'actual risk' of flooding at the site is low.

The SFRA states that as it is necessary to use the refined flood risk information (hazard and depth maps) to assist with the application of the sequential test. The refined flood risk information contained within the SFRA demonstrates the site is not at risk during the 1% annual probability fluvial and 0.5% annual probability tidal event. The site therefore has a low probability of flooding and is considered to pass the Sequential Test.

The Exception Test requires consideration of the wider sustainability benefits of a development and that the development would be safe and residual risks managed.

The Local Plan has a target of a net increase of at least 11,681 dwellings in South Holland over the 25-year local plan period. The Plan considers this new housing is

required to ensure the sustainability of the Local Plan area. The proposed development will contribute to this target.

Section 5 of this Flood Risk Assessment describes the flood mitigation measures and the management of the residual risks, demonstrating that this development will be safe and not increase flood risk elsewhere. The development is considered to pass the Exception Test.

4.0 SITE SPECIFIC FLOOD RISK

4.1 Local Flood Assets

The site is 6.6 km west of the tidal River Nene. The site is protected by the River Nene tidal defences between Wisbech and Sutton Bridge. The River Nene is the responsibility of the Environment Agency.

There is a long-term strategy for the maintenance of the Environment Agency defences which is reviewed and updated periodically.

There is an extensive local drainage network managed by South Holland IDB. There is an IDB Ordinary Watercourse approximately 500m to the east of the site. The site and the surrounding land are within the Sutton St James catchment and drain to Sutton St James Pumping Station to discharge to the South Holland Main Drain. The South Holland Main Drain discharges to the tidal River Nene at the Sutton Bridge Outfall Sluice. The site is approximately 1100m south of the South Holland Main Drain.

During the operation and maintenance of its pumping stations, associated structures, and channel systems, the IDB seeks to maintain a general standard capable of providing flood protection to its district. A routine maintenance programme is in place to ensure that the Boards assets are commensurate with the standard of protection that is sought.

Current maintenance standards of the South Holland Internal Drainage Board and the Environment Agency are generally good.

4.2 Sources of Flooding

A summary of the sources of flooding is provided in Table 2.

Source of Flooding	Level of Risk
Drainage Network Flooding	The risk is assessed in Section 4.3.
Surface Water Flooding	Based upon the EA maps the risk is very low.
Fluvial Flooding	The site is not at risk of fluvial flooding.
Tidal Flooding	The risk is assessed in Section 4.3 and 4.5.
Reservoir Flooding	The risk of a breach is assessed in Section 4.6.
Groundwater Flooding	There is no evidence to suggest the site is at risk of groundwater flooding.

Table 2 – Sources of Flooding

4.3 Probability of Flooding

The probability of flooding associated with blockages in the South Holland IDB drainage system is low due to the maintenance standards achieved and managed by the IDB. Failure of Sutton St James Pumping Station could lead to an increased level of risk in the IDB catchment.

Through the operation and maintenance of the pumping stations and the channel system the Board seek to maintain a general standard capable to providing flood protection to agricultural land and developed areas of 1 in 20 years and 1 in 100 years, respectively. The risk associated with flood events that exceed the standard of protection provided is lowered due to the South Holland IDB main drains incorporating freeboard. This freeboard provides storage during the exceedance events.

The site benefits from defences on the River Nene that provide protection during a 0.5% annual probability (1 in 200 chance each year) tidal event and a 1% annual probability (1 in 100 chance each year) fluvial event.

4.4 Historic Flooding

During the preparation of this assessment, no evidence was discovered of the site being flooded.

4.5 Climate Change

Climate change is likely to impact the site through increased rainfall intensity and duration affecting the local drainage network and increased flood levels in the River Nene.

The River Nene tidal defences have been designed to include an allowance for climate change.

In summary the existing systems and defences are appropriate for the design life of the development (i.e., 100 years).

4.6 Residual Risk

There is a residual risk of flooding at the site should a breach of the tidal defences occur. The South East Lincolnshire SFRA includes maps demonstrating the residual peak depth in 2116. When climate change allowances are applied to the 1% annual probability (1 in 100 chance each year) fluvial event and 0.5% annual probability (1 in 100 chance each year) tidal event the extent of flooding does not affect the site. An extract from this map is shown in Figure 3.



The proposed development is for single storey dwellings and therefore the finished floor level within these dwellings needs to consider the 0.1% annual probability (1 in 1000 chance each year) event in 2115. The South East Lincolnshire SFRA includes 0.1% annual probability (1 in 1000 chance each year) maps for specific locations, but these do not cover the site.

Through a comparison of the flood depths in the areas covered by the maps during the 0.5% and 0.1% annual probability events for 2115 it can be estimated that flood depths are 0.1m higher for the more extreme event. Through a comparison of the flood extents in the areas covered by the maps during the 0.5% and 0.1% annual probability events in 2115 and the ground levels at the site it is not anticipated that the site is at risk during the more extreme event.

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Sutton St James Pumping Station or Sutton Bridge Outfall Sluice could lead to an increased level of risk at the site.

The probability of the site flooding from any Environment Agency system is less than 1% annual probability (1 in 100 chance each year) because of the standards of the existing flood defences. Over time there will be a gradual increase in risk to the site due to climate change. During the design life of the development, it is not anticipated that the site would flood.

The SFRA considers the residual risk associated with overtopping and a breach in the defences in 2116. The maps show that the site is not at risk.

The proposed arrangement increases the impermeable area and therefore there will be an increased volume of surface water that has the potential to increase flood risk.

5.2 Mitigation Measures

The site has a low 'actual risk' of flooding. Based upon the information available during the preparation of this flood risk assessment, it is recommended that the floor level of the dwellings is constructed 0.3m above surrounding ground levels. Furthermore, there should be 0.3m of flood resilient construction above finished floor level.

The developer should ensure that the eventual occupiers of the dwellings are sufficiently aware of the risk of flooding, and the standard of the existing defences. The Environment Agency operates a flood warning system for properties at risk of flooding to enable householders to protect life or take actions to manage the effect of flooding on property. Floodline Warnings Service is a national system run by the Environment Agency for broadcasting flooding warnings. The occupier of the dwellings should register to receive flood warnings.

Should there be a failure of Sutton St James Pumping Station or Sutton Bridge Outfall Sluice and conditions were such to put properties and land at risk of flooding, the Internal Drainage Board would take emergency action to maintain the drainage level of service by utilising temporary pumping equipment.

It is recommended that surface water runoff is managed so that stormwater will not affect the adjoining land or increase the flood risk elsewhere.

6.0 CONCLUSIONS

As a result of the assessment, the following conclusions have been reached.

- The proposed development consists of two single storey dwellings on Jarvis Gate, Sutton St James.
- The site is located within an Internal Drainage Board catchment and through the operation and maintenance of the pumping stations and the channel system the Board seek to maintain a general standard capable to providing flood protection to agricultural land and developed areas of 1 in 20 and 1 in 100 years, respectively.
- The proposed development is in Flood Zone 3. The proposed development is protected during the 1% annual probability (1 in 100 chance each year) event including an allowance for climate change by defences on the tidal River Nene.
- It is recommended that the floor level of the dwellings is 0.3m above surrounding level and there is 0.3m of flood resilient construction above finished floor level.
- The development passes the Sequential Test and Exception Test and is therefore suitable for the proposed location.

ATTACHMENT 1

**TOPOGRAPHIC SURVEY
(DWG JARVIS TOPO 001)**

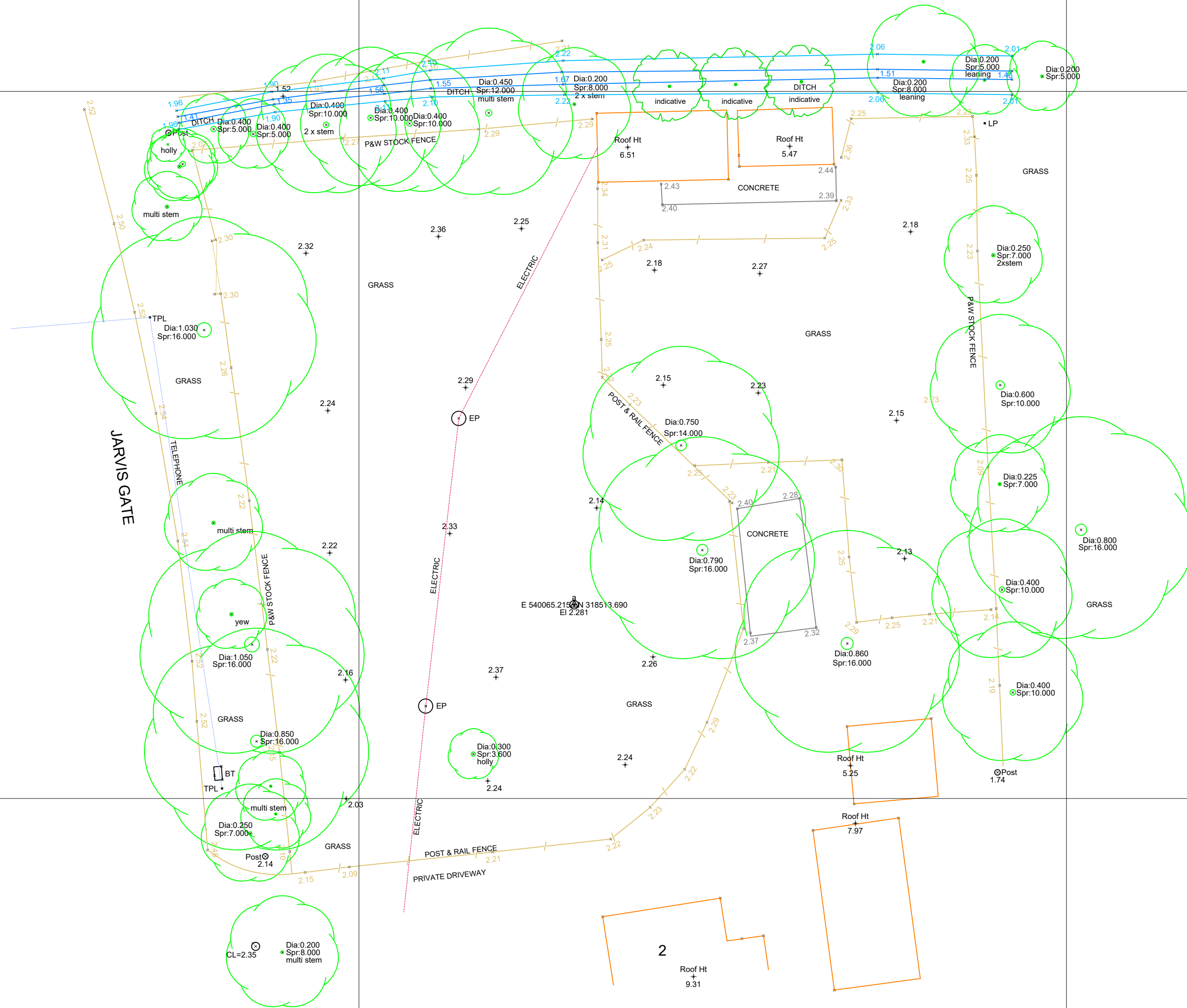
**INDICATIVE SITE PLAN
(Dwg SD23-022/1)**

318550 N

540050 E

540100 E

318500 N



NOTE

All tree positions shown on this drawing have been surveyed in to the centre of bole unless noted as "indicative"



M.D Surveys
4 Beech Drive
Ryhall
Stamford
Lincolnshire
PE9 4EW
Tel 01780 763378
mob 07484 870454
email mdsurveys@btinternet.com

Job Title :	Land adjacent to "2" Jarvis Gate - Sutton St James	
Client :	Status Design - PE12 7PW	
Drawn :	MDS	Date : 8th March 2024
Drawing number:	Jarvis topo 001	Scale 1:250 on A2 sheet

THE DEPICTION OF A WALL, FENCE OR HEDGE DOES NOT NECESSARILY REPRESENT A LEGAL BOUNDARY. IT IS THE CLIENTS RESPONSIBILITY TO CONFIRM LEGAL BOUNDARIES WITH THE VENDOR / CONTRACTOR

Survey information is as result of measurement to existing features and does not imply legal ownership of boundaries or land divisions. Where boundary alignment lines are added to the survey drawing and are taken from legal documents or other information supplied they are done so within the constraints of drawing quality and scale. They are provided on the basis of opinion and do not imply legal contract. Drainage information is as a result of surface inspection only, no chambers have been accessed. Manhole and pipe diameters should be checked before design and construction

This plan should only be used for its original purpose. No responsibility will be accepted if this plan is supplied to any party other than the original client.

All dimensions should be checked on site prior to design and construction.

DO NOT SCALE FROM THIS DRAWING

All tree heights and spreads are approximate. We have tried to identify tree types, however, if tree species is critical specialist advice should be sought.

The data used for the computation of horizontal & vertical control for this survey was recorded using survey grade GPS receivers and corrected data from Trimble VRS Services using Geoid model OSTN15 with OSGM 15. Station establishment was carried out in accordance with best practice guidelines issued by The Survey Association.

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The General Contractor is to check all dimensions on site and report discrepancies to the Architect.

All details shown on this drawing are based upon typical site conditions unless otherwise noted. The Architect is not responsible for any discrepancies between the site conditions and the design intentions. Site and survey are recommended in respect of any discrepancies between the site conditions and the design intentions.

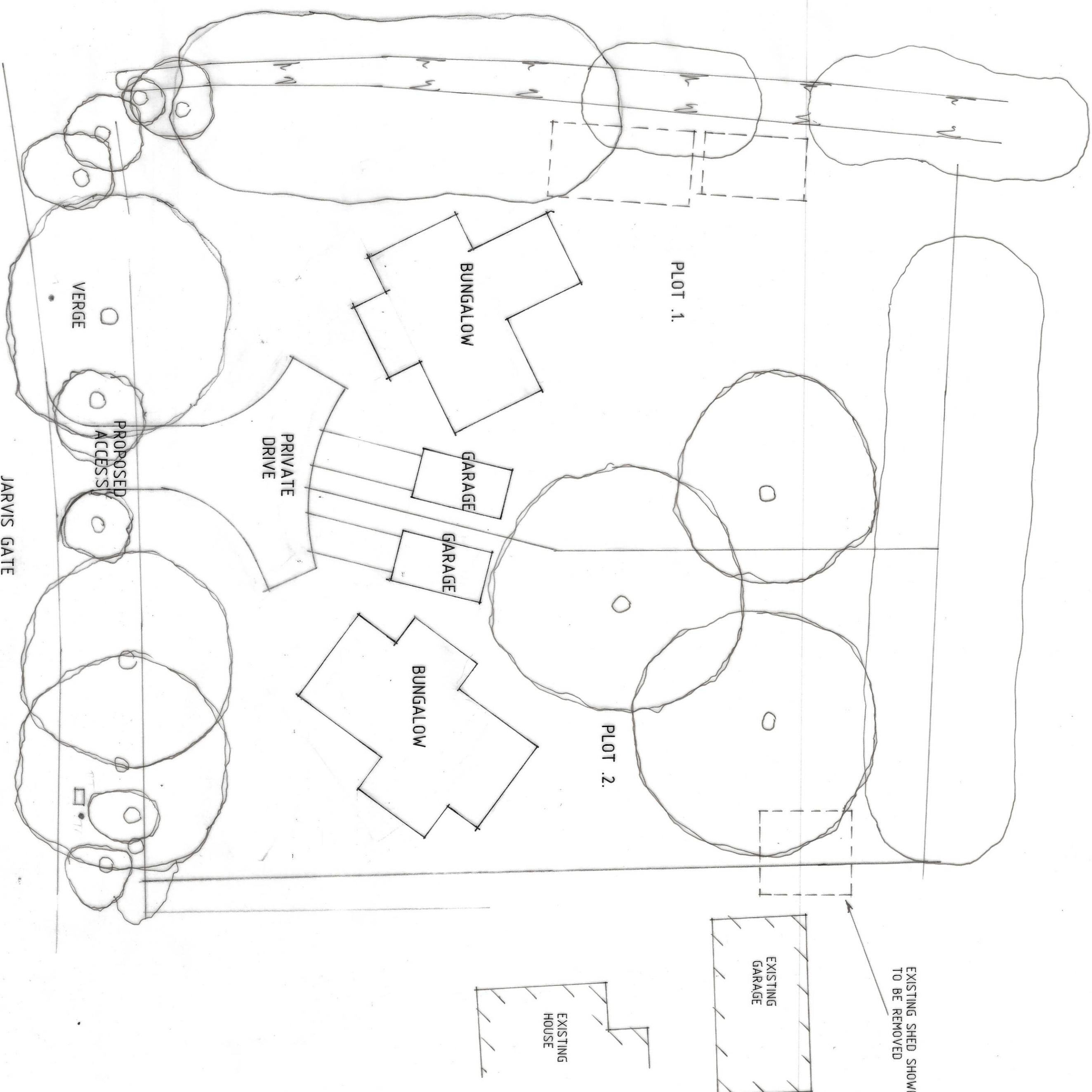
Please note: this drawing is not a construction drawing.

Proposed work, including to be submitted by the owner for the design and construction of the works. The design and construction of the works is to be in accordance with the design and construction of the works. The design and construction of the works is to be in accordance with the design and construction of the works.

All materials to be used shall be of the highest quality and shall be in accordance with the design and construction of the works. The design and construction of the works is to be in accordance with the design and construction of the works.

The Employer shall ensure that the selected contractor is consistent with the design and construction of the works. The Employer shall ensure that the selected contractor is consistent with the design and construction of the works. The Employer shall ensure that the selected contractor is consistent with the design and construction of the works.

It is the Employer's responsibility to ensure that the works are in accordance with the design and construction of the works. The Employer shall ensure that the selected contractor is consistent with the design and construction of the works.



INDICATIVE SITE PLAN

Status
DESIGN
CONSULTANTS IN ARCHITECTURE & PLANNING

PROPOSED RESIDENTIAL
DEVELOPMENT FOR 2NO
BUNGALOWS ADJ. 2 JARVIS
GATE, SUTTON ST. JAMES
FOR

MR. F. CAMPBELL

INDICATIVE SITE LAYOUT.

1:200 | SD23-022/2

MARCH-24 | B. GILHAM.

2 Edinburgh Walk, Highbury,
Spalding, Lincs. PE12 7AP
Tel: 01406 424343 Fax: 01406 430002

SD23-022/2