FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
TRINITY ROAD, WALPOLE HIGHWAY

FINAL REPORT

ECL0656/PETER HUMPHREY ASSOCIATES

DATE JULY 2022

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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 Arthur Markillie Ltd in respect of a development that consists of one residential dwelling at Trinity Hall Farmhouse, Trinity Road, Walpole Highway.

A planning application for the proposed development is to be submitted by Peter Humphrey Associates.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is situated at Trinity Hall Farm, Trinity Road, Walpole Highway, Wisbech, PE14 7SN. The National Grid Reference of the site is 55235/31154.

The location of the site is shown in Figure 1.

Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is within an agricultural holding on the eastern side of Trinity Road. The site consists of part of a paddock that is alongside Trinity Road. There are two residential dwellings to the north of the site. The area of the proposed development is approximately 0.18 hectares.

A topographic survey has been undertaken and spot levels are shown in Attachment 1. Ground levels within the site are typically between +1.2m OD and +1.5m OD. Trinity Road adjacent to the site is at a level of +2.1m OD.

The site is in the King's Lynn Internal Drainage Board's (IDB) area. Surface water at the site would naturally drain through soakaway and hence to the IDB drain system. There is a riparian drain 100m north east of the site and an IDB Watercourse that is 300m to the east of the site.

The online British Geological Survey maps indicate that the site is likely to be underlain by the Ampthill 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 one residential dwelling. The dwelling will have two storeys and provide accommodation for the farm manager. The proposed Site Plan is provided in Attachment 2.

2.4 Local Development Documents

The King's Lynn and West Norfolk Borough Council Local Development Framework - Core Strategy is the adopted Local Plan for the district. Policy CS08 for Sustainable Development states the requirements for flood risk reduction.

The King's Lynn and West Norfolk Borough Council Level 1 Strategic Flood Risk Assessment (SFRA) was prepared in November 2018. The Level 2 SFRA was prepared in March 2019.

The Norfolk Lead Local Flood Authority (LLFA) Statutory Consultee Guidance Document has been drafted to support the development of Norfolk County Council's LLFA role as a statutory consultee to planning and to inform stakeholders in this process such as Local Planning Authorities (LPA's) and developers.

2.5 Flood Zones

An extract from the Environment Agency Flood Map for Planning is shown in Figure 2. The site is located within Flood Zone 3, an area with a high probability of flooding that benefits from flood defences.

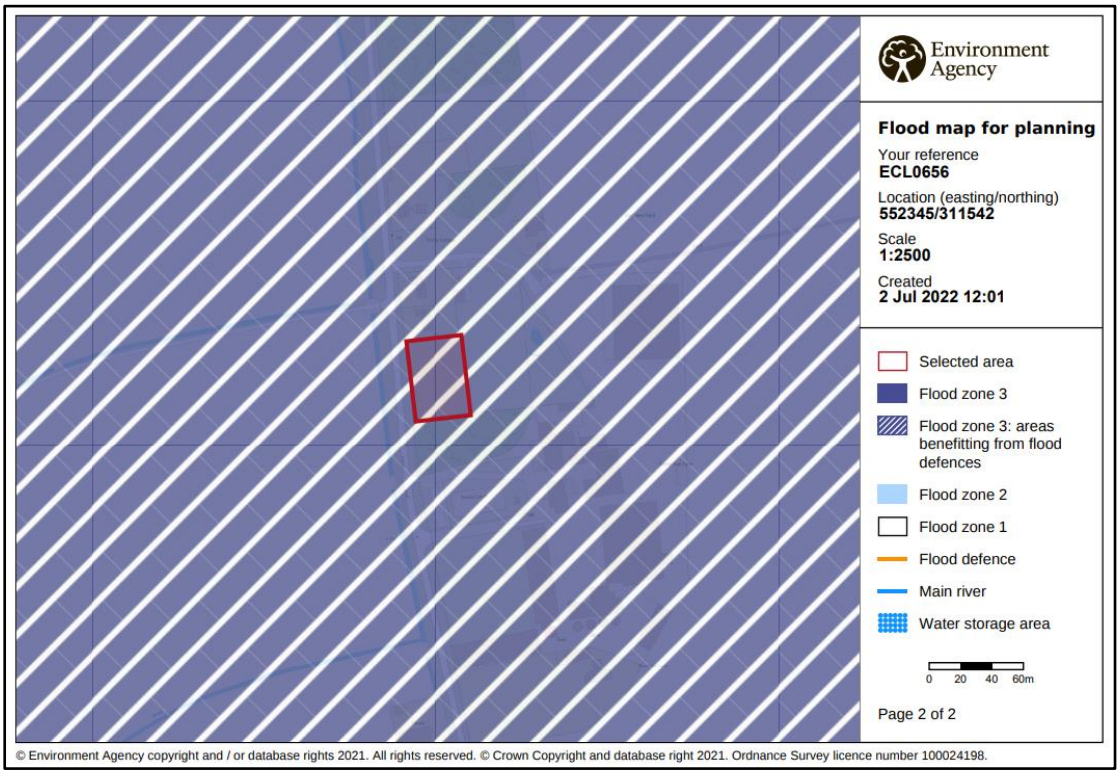


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the site has a medium risk of flooding (annual probability between 1% and 3.3%);
- the site has a very low risk of surface water flooding (annual probability less than 0.1%); and
- the site is not within an area at risk of reservoir flooding.

Marshland St James is one of the settlements considered within the King's Lynn and West Norfolk Borough Council Level 2 SFRA. The maps show that:

- the highest source of flood risk in Marshland St James is coastal;
- the most likely source of flood risk in Marshland St James is from surface water;
- the site is within Flood Zone 3;
- the site is not at risk during a 1% annual probability (1 in 100 chance each year) fluvial event including allowance for climate change;
- the site is not at risk during a 0.5% annual probability (1 in 200 chance each year) tidal event including allowance for climate change;
- the site is not at risk of surface water flooding during the 1% annual probability (1 in 100 chance each year) event including climate change;
- the site has a very low susceptibility to groundwater flooding; and
- the site is not within the area at risk during a breach.

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 proposed development is in Flood Zone 3 and 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 Test 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 King's Lynn and West Norfolk Borough Council district between the River Nene and River Great Ouse, to the north and east of Wisbech, lie in Flood Zone 3. The SFRA confirms that the site is not at risk during a 1% annual probability (1 in 100 chance each year) fluvial or a 0.5% annual probability (1 in 200 chance each year) tidal event including an allowance for climate change.

The dwelling will provide accommodation for the Farm Manager. It is necessary for the Farm Manager to be on site for the operation of the farm and security. The agricultural holding is in Flood Zone 3 so there are no opportunities to undertake the development at an alternative location with a lower level of flood risk. The development 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 economic value of rural areas is dependent upon the success of the business within them. Provision of a Key Workers dwelling at this site will be a benefit to the rural economy.

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 6.4km from the River Nene and 7.4km from the River Great Ouse. The site is protected by tidal defences on both the River Nene and the River Great Ouse. These defences are 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 the King's Lynn IDB. Surface water at the site would discharge to an IDB Watercourse is located 300m east of the site. The site, and surrounding land, drains by gravity to Smeeths Lode which outfalls to the River Great Ouse via the Islington Pumping Station. The Islington Pumping Station is maintained and operated by King's Lynn IDB.

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 Board's assets are commensurate with the standard of protection that is sought.

The site is 4.4km from the Middle Level Main Drain, an embanked channel which flows to St Germans Pumping Station to discharge to the tidal River Great Ouse. The Middle Level Main Drain and St Germans Pumping Station are the responsibility of the Middle Level Commissioners.

Current maintenance standards of the King's Lynn IDB's, the Middle Level Commissioners and the Environment Agency's defences are generally good.

4.2 Sources of Flooding

The following potential sources of flooding have been identified during this assessment:

- local blockages to the IDB main drain system;
- an event in the local drainage network that exceeds the standard of protection;
- failure of Islington Pumping Station;
- overtopping and/or breaching of the Middle Level Main Drain; and
- overtopping and/or breaching of the River Great Ouse tidal defences or River Nene tidal defences.

Overtopping and/or breach of the Middle Level Main Drain is a lesser risk than a tidal breach. As such it has not been considered further in this assessment.

4.3 Probability of Flooding

The probability of flooding associated with blockages in the IDB's drainage system is low due to the maintenance standards already achieved and managed by the IDB.

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 King's Lynn IDB main drains incorporating freeboard. This freeboard provides storage during the exceedance events. This standard of protection is also provided by the Islington Pumping Station.

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

4.4 Historic Flooding

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

4.5 Climate Change and Residual Risks

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 Great Ouse and River Nene.

The SFRA maps show that the site is not at risk during the 0.5% annual probability (1 in 200 chance each year) tidal event with climate change. When this event is considered in the River Great Ouse it is likely to lead to some overtopping of the defences. However, the level of overtopping is such that it would not affect the site.

The SFRA shows that the site is not at risk of flooding during a breach.

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

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Islington Pumping Station could increase the 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 defence systems. Over time there will be a gradual increase in risk to the site due to climate change. During the design life of the development the site is not at risk during the 1% annual probability (1 in 100 chance each year) event.

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

5.2 Mitigation Measures

Based upon the information available during the preparation of this flood risk assessment the site has a low level of flood risk. To mitigate against the risk of flooding it is recommended that the finished floor levels are 0.3m above typical ground levels. It is recommended that there is 0.3m of flood resilient construction above finished floor level.

The risks during a flood are lowered because the dwelling will have two storeys with the sleeping accommodation on the first floor.

The developer should ensure that the eventual occupier of the dwelling is 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 dwelling should register to receive flood warnings.

During an exceedance event it is anticipated that sufficient time would be available to take precautionary actions to limit the potential impact of flooding.

Failure of Islington Pumping Station may occur due to long term mechanical breakdown or power supply being disrupted. However, in these circumstances, if conditions were such to put properties and land at risk of flooding, the IDB would take emergency action to maintain the drainage level of service by using temporary pumping equipment. The Board of King's Lynn IDB has recently completed the replacement of the Islington Pumping Station to provide protection during the 1% annual probability (1 in 100 chance each year) with climate change event.

It is recommended that surface water run-off is managed so that stormwater from the development will not affect any adjoining properties or increase the flood risk elsewhere.

6.0 CONCLUSIONS

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

- The proposed development consists of one 2 storey dwelling for a Farm Manager at Trinity Hall Farm, Trinity Road, Walpole Highway.

- 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.

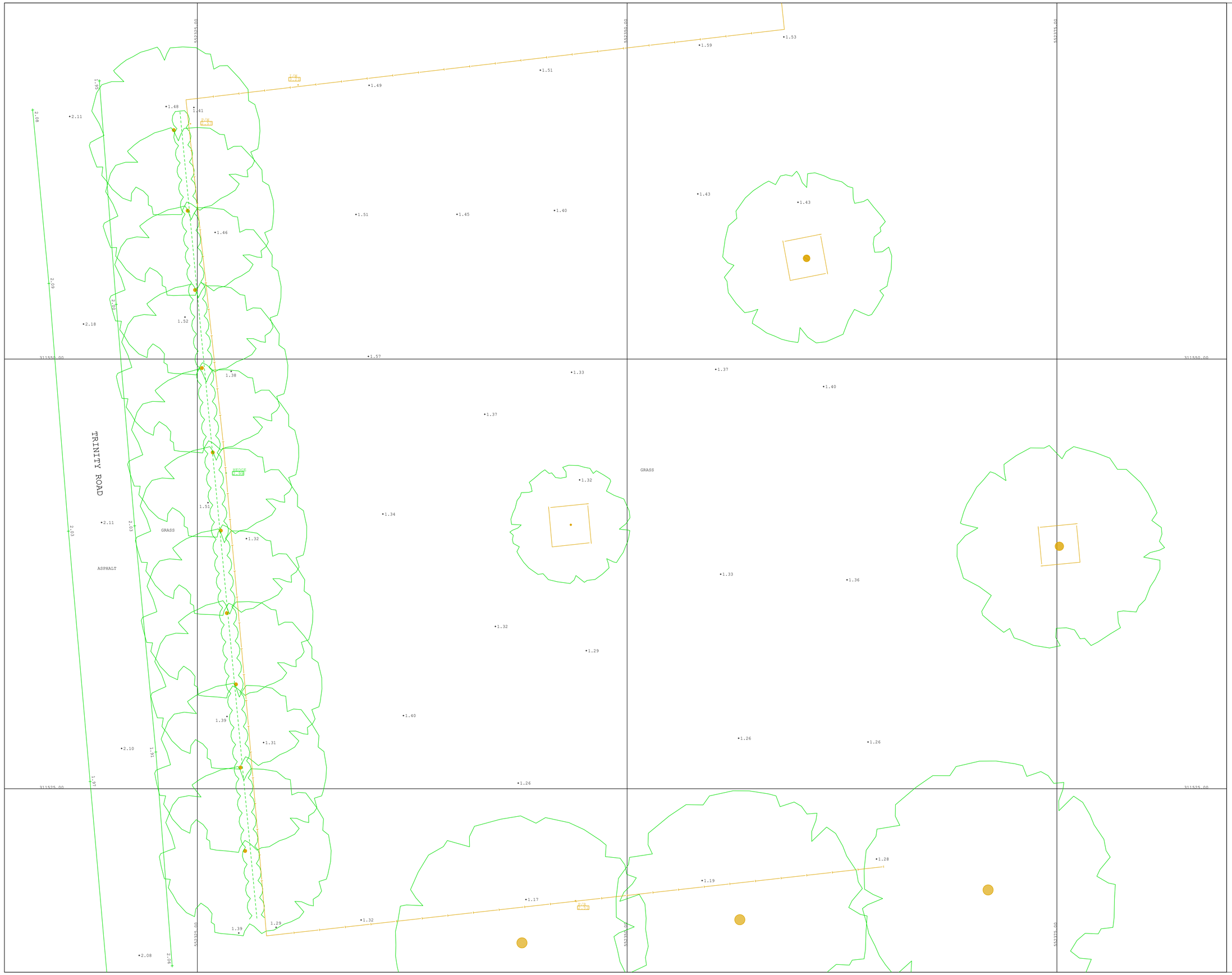
- The proposed development is in defended Flood Zone 3. The site benefits from defences on the tidal River Great Ouse and tidal River Nene which provide protection against the 0.5% annual probability (1 in 200 chance each year) event including climate change.

- It is recommended that the finished floor level of the dwelling is 0.3m above typical ground levels with a further 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 SJG 3857)



Co-ordinate Table				
Station	Type	Easting (mE)	Northing (mN)	Level (mZ)
S1	PK Nail	552421.937	311513.332	2.061
S2	PK Nail	552431.691	311512.050	2.058

SURVEY RELATED TO OSGB36(15) ORDNANCE SURVEY GRID CO-ORDINATES TRANSFORMED FROM ETRS89 (WGS84) USING GEIOD MODELS OSGM15/OSTN15

N

Grid North

NOTES

1. GRID AND LEVELS RELATED TO ORDNANCE SURVEY GPS NETWORK
2. ALL LEVELS ON KERB LINES ARE CHANNEL LEVELS UNLESS NOTED OTHERWISE.
3. SERVICE ROUTES HAVE BEEN IDENTIFIED BY LIFTING OF INSPECTION COVERS & VISUAL INSPECTION FROM THE SURFACES.
4. FOR SAFETY REASONS, DRAINAGE PIPE SIZES HAVE BEEN DETERMINED FROM THE SURFACE AND SHOULD BE TREATED AS APPROXIMATE ONLY.
5. DRAINAGE PIPE SIZES ARE DIAMETERS AND ARE SHOWN IN MILLIMETERS.
6. TREE SPECIES SHOULD BE CHECKED BY AN ARBORIST IF CRITICAL.

Revisions	
A	
B	
C	

Drawing No: SJG3857 — Revision: - — Sheet: 1/1

Surveyed By:-	Drawn By:-	Checked By:-	Sheet Size	Date
MJ	MJ	SJ	A1	08/12/2021

Client:-
Peter Humphrey Associates Ltd.

Scale:-
1:100

Project:-
Trinity Road, Wisbech.

SYMBOLS

Banking
Hedge
Tree
Bush
Gate
O/H Electric
O/H Telecom
S1 Control Station

LEGEND

AV	Air Valve	MH	Manhole
BD	Bollard	MK	Marker
BH	Borehole	NP	Name Plate
CB	Cable Box	O/H	Overhead
CHY	Chimney	OSBM	Ordnance Bench Mark
CL	Cover Level		
CONC	Concrete	P	Post Or Pillar
CTV	Cable TV	PM	Parking Meter
DK	Drop Kerb	RE	Rodding Eye
DP	Down Pipe	RS	Road Sign
DR	Drain	SAP	Sapling
ELC	Electricity	SC	Stop Cock
EP	Elec.Pole	SL	Sump Level
ER	Earth Rod	ST	Stop Tap
FB	Flower Bed	SV	Sluice Valve
FH	Fire Hydrant	TAR	Tarmac
FP	Footpath	TC	Telecom Cover
GY	Gully	TCB	Telephone Call Box
GP	Gate Post		
GV	Gas Valve	TL	Traffic Lights
IC	Inspec. Cover	TP	Telegraph Pole
IL	Invert Level	TV	Television Box
JB	Junction Box	UTL	Unable to lift
KO	Kerb Outlet	VP	Vent Pipe
LB	Letter Box	WL	Water Level
LP	Lamp Post	WM	Water Meter
		WO	Wash Out

FENCE TYPES

B/W	Barbed Wire	C/P	Chestnut Paling
C/B	Close Boarded	I/R	Iron Railing
C/I	Corrugated Iron	I/W	Interwoven
C/L	Chainlink	P/R	Post & Rail
		P/S	Pallisade
		P/W	Post & Wire

BOX AROUND LEVEL INDICATES LEVEL AT TOP OF FEATURE - eg WALL

SURVEYED BY:-

SJ GEOMATICS SURVEYORS

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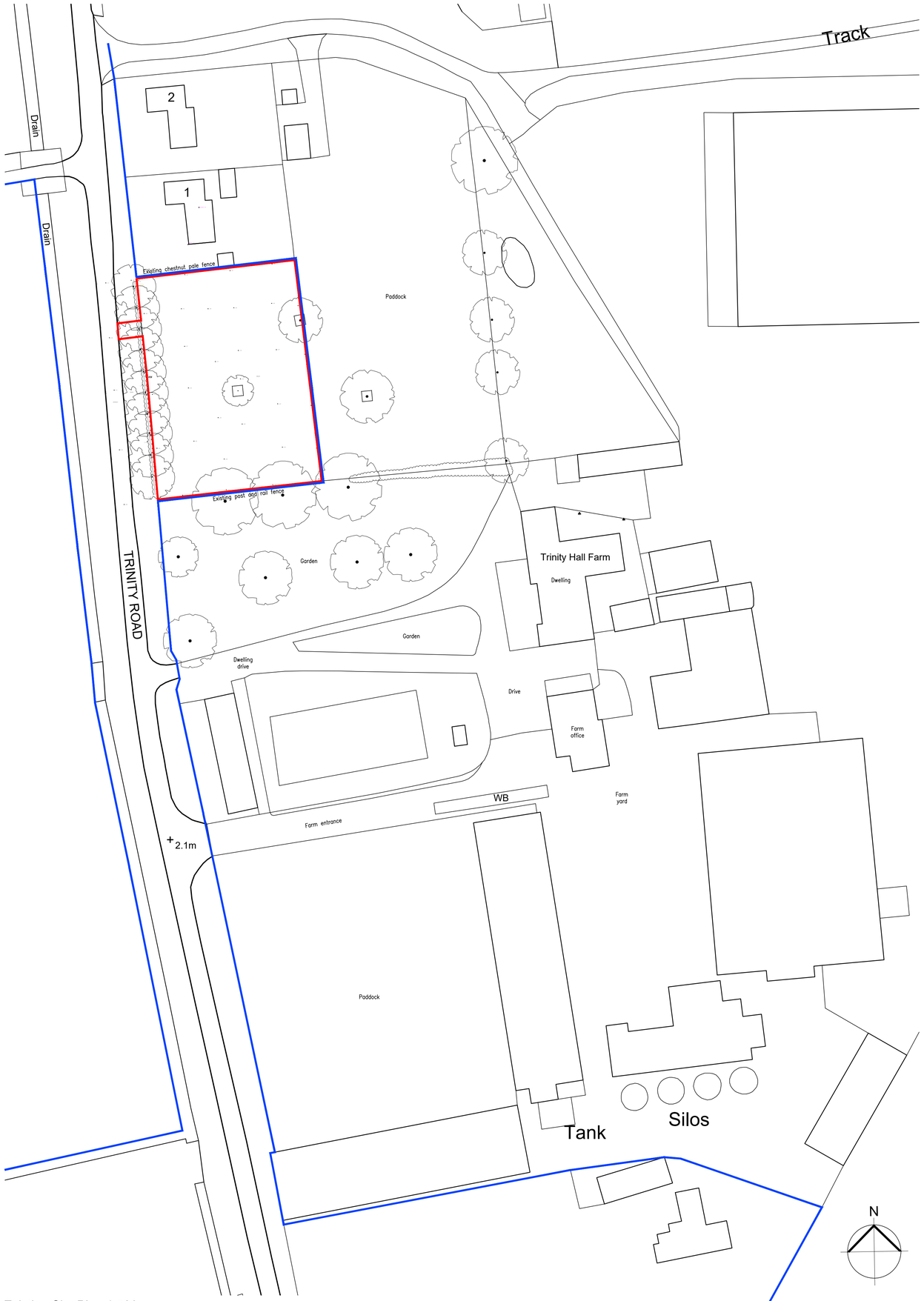
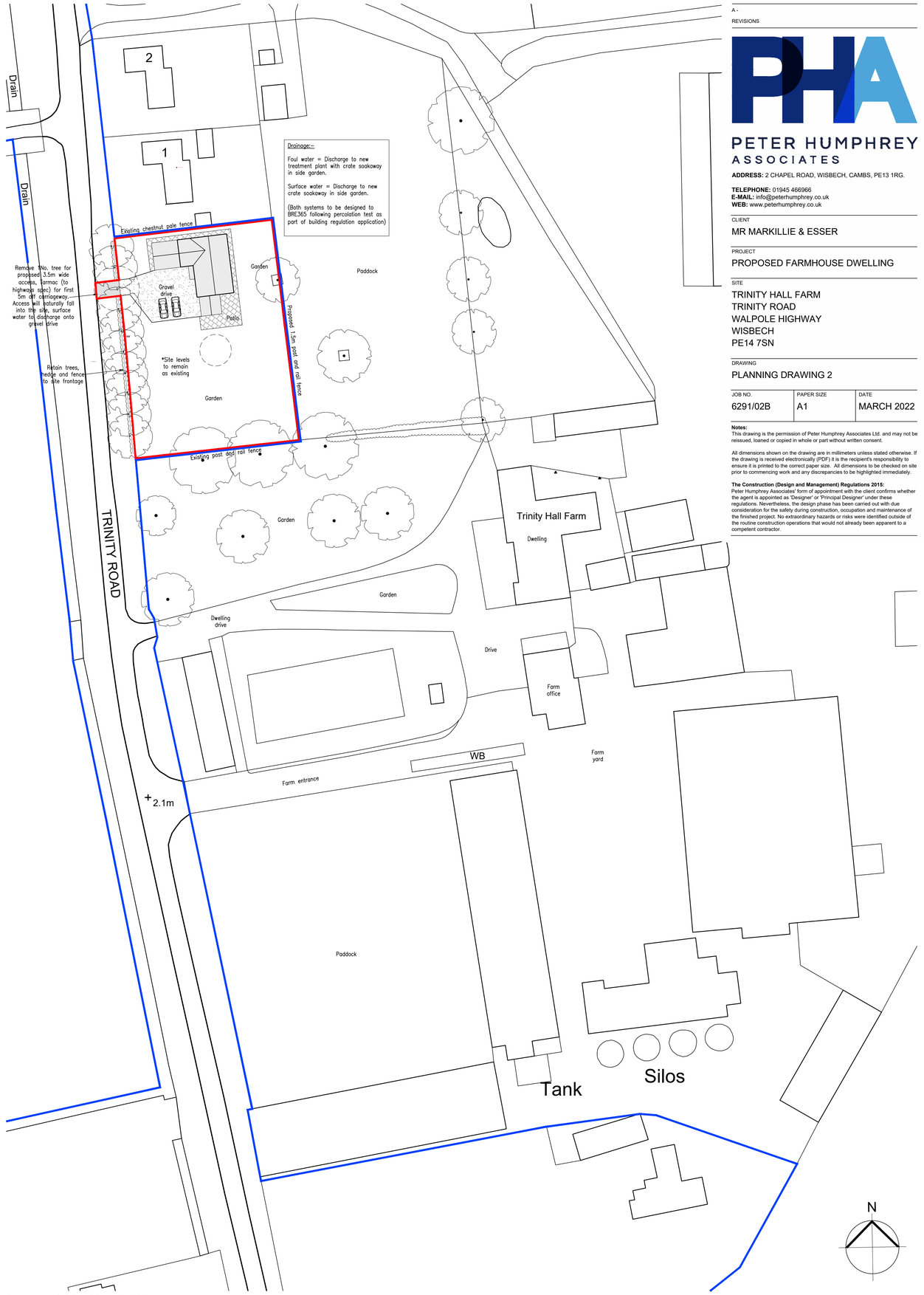
Company Registration Number 8081329

ATTACHMENT 2

EXISTING AND PROPOSED SITE PLANS
(DWG 6291/02B)



Existing Site Plan 1:500



Proposed Site Plan 1:500

A -

REVISIONS

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CLIENT

MR MARKILLIE & ESSER

PROJECT

PROPOSED FARMHOUSE DWELLING

SITE

TRINITY HALL FARM
TRINITY ROAD
WALPOLE HIGHWAY
WISBECH
PE14 7SN

DRAWING

PLANNING DRAWING 2

JOB NO.	PAPER SIZE	DATE
6291/02B	A1	MARCH 2022