

PROPOSED DEVELOPMENT
OF TWO DWELLINGS AT
LAND TO THE REAR OF THE
ROSE AND CROWN PUBLIC
HOUSE, THE STREET,
ELMSETT, SUFFOLK

# **FLOOD RISK ASSESSMENT**

**OCTOBER 2023** 

REPORT REF: 3291/RE/10-23/01

**Evans Rivers and Coastal Ltd** 

T: 07896 328220

E: <u>Enquiries@evansriversandcoastal.co.uk</u>
W: <u>www.evansriversandcoastal.co.uk</u>

#### CONTRACT

Evans Rivers and Coastal Ltd has been commissioned by The Rose and Crown to carry out a Flood Risk Assessment for a proposed development of two dwellings at land to the rear of The Rose and Crown public house, The Street, Elmsett, Suffolk.

## **QUALITY ASSURANCE, ENVIRONMENT AND HEALTH AND SAFETY**

Evans Rivers and Coastal Ltd operates a Quality Assurance, Environmental, and Health and Safety Policy.

This project comprises various stages including data collection; hydrological and hydrogeological assessments; surface water drainage designs; and reporting. Quality will be maintained throughout the project by producing specific methodologies for each work stage. Quality will also be maintained by initiating internal quality procedures including the validation of third party deliverables; creation of an audit trail to record any changes made; and document control using a database and correspondence log file system.

To adhere to the Environmental Policy, data will be obtained and issued in electronic format and alternatively by post. Paper use will also be minimised by communicating via email or telephone where possible. Documents and drawings will be transferred in electronic format where possible and all waste paper will be recycled. Meetings away from the office of Evans Rivers and Coastal Ltd will be minimised to prevent unnecessary travel, however for those meetings deemed essential, public transport will be used in preference to car journeys.

The project will follow the commitment and objectives outlined in the Health and Safety Policy operated by Evans Rivers and Coastal Ltd. All employees will be equipped with suitable personal protective equipment prior to any site visits and a risk assessment will be completed and checked before any site visit. Other factors which have been taken into consideration are the wider safety of the public whilst operating on site, and the importance of safety when working close to a water source and highway. Any designs resulting from this project and directly created by Evans Rivers and Coastal Ltd will also take into account safety measures within a "designers risk assessment".

Report carried out by:

Rupert Evans, BSc (Hons), MSc, CEnv, C.WEM, MCIWEM, PIEMA

#### **DISCLAIMER**

This report has been written and produced for The Rose and Crown. No responsibility is accepted to other parties for all or any part of this report. Any other parties relying upon this report without the written authorisation of Evans Rivers and Coastal Ltd do so at their own risk.

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#### 1. **INTRODUCTION**

#### 1.1 **Project Scope**

1.1.1 Evans Rivers and Coastal Ltd has been commissioned by The Rose and Crown to carry out a Flood Risk Assessment for a proposed development of two dwellings at land to the rear of The Rose and Crown public house, The Street, Elmsett, Suffolk.

- 1.1.2 It is understood that this assessment will be submitted to the Local Planning Authority as part of a planning application. Specifically, this assessment intends to:
  - 1) Review any literature and guidance specific to this area such as the SFRA;
  - 2) Assess the flood risk from all sources to people and property and propose mitigation measures accordingly;
  - 3) Review existing evacuation and warning procedures for the area;
  - 4) Report findings and recommendations.
- 1.1.3 This assessment is carried out in accordance with the requirements of the National Planning Policy Framework (NPPF) dated 2021. Other documents which have been consulted include:
  - DEFRA/EA document entitled Framework and guidance for assessing and managing flood risk for new development Phase 2 (FD2320/TR2), 2005;
  - Communities and Local Government 2007. Improving the Flood Performance of New Buildings. HMSO.
  - DEFRA/EA document entitled The flood risks to people methodology (FD2321/TR1), 2006;
  - EA Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose, 2008;
  - National Planning Practice Guidance Flood Risk and Coastal Change.
  - UK Government's climate change allowances guidance.
  - Suffolk Local Flood Risk Management Plan dated 2012.
  - Suffolk County Council Preliminary Flood Risk Assessment dated 2011.
  - Babergh and Mid Suffolk Level 1 Strategic Flood Risk Assessment (SFRA) dated 2020.

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## 2. DATA COLLECTION

- 2.1 To assist with this report, the data collected included:
  - Ordnance Survey 1:10,000 street view map obtained via Promap (Evans Rivers and Coastal Ltd OS licence number 100049458).
  - British Geological Survey, Online Geology of Britain Viewer.
  - Filtered LIDAR data at 1m resolution covering the site and surrounding area.
  - 1:625,000 *Hydrogeological Map of England and Wales*, published in 1977 by the Institute of Geological Sciences (now the British Geological Survey).
  - Topographical survey data shown on Drawing Number AS2092-01.

## 3. SITE CHARACTERISTICS

## 3.1 Existing Site Characteristics and Location

3.1.1 The site is located at land to the rear of The Rose and Crown public house, The Street, Elmsett, Suffolk. The approximate Ordnance Survey (OS) grid reference for the site is 605661 246620 and the location of the site is shown on Figure 1.

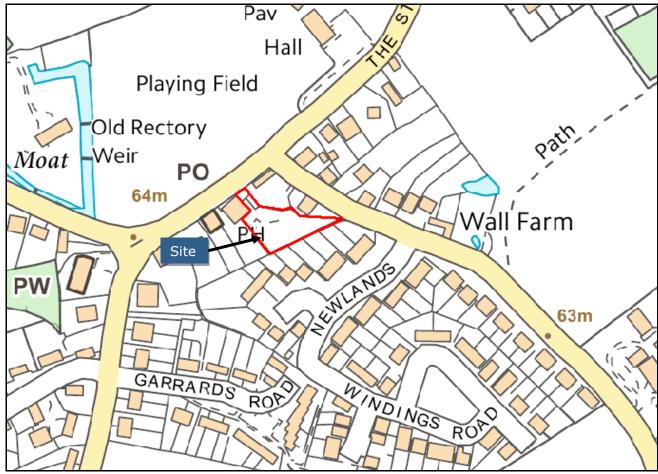


Figure 1: Site location plan (Source: Ordnance Survey)

- 3.1.2 The site comprises an area of grassland, made ground and an outbuilding. The site is accessed from The Street to the north west of the site.
- 3.1.3 A topographical survey can be seen on Drawing Number AS2092-01. Filtered LIDAR data at 1m resolution has been obtained to determine and illustrate the topography of the site and surrounding area (Figure 2).
- 3.1.4 It can be seen from the survey data that ground levels fall gently in a south easterly direction.



Figure 2: Filtered LIDAR survey data at 1m resolution where higher ground is denoted by red and orange colours and lower ground is denoted by blue colours

## 3.2 Site Proposals

- 3.2.1 It is the Client's intention to demolish the existing outbuilding and develop the site with two dwellings together with garages and garden area. A shared access road will be provided.
- 3.2.2 The proposed site layout can be seen on Drawing Number 1616-06-02/A.

#### 4. SOURCES OF FLOODING

#### 4.1 Fluvial

4.1.1 The Environment Agency Flood Map (Figure 3) and Appendix B of the SFRA (Hadleigh North Ward) shows that the site is located within the NPPF Flood Zone 1, 'Low Probability' which comprises land as having less than a 1 in 1000 year annual probability of fluvial or tidal flooding (i.e. an event more severe than the extreme 1 in 1000 year event). NPPF states that all uses of land are appropriate in this zone.

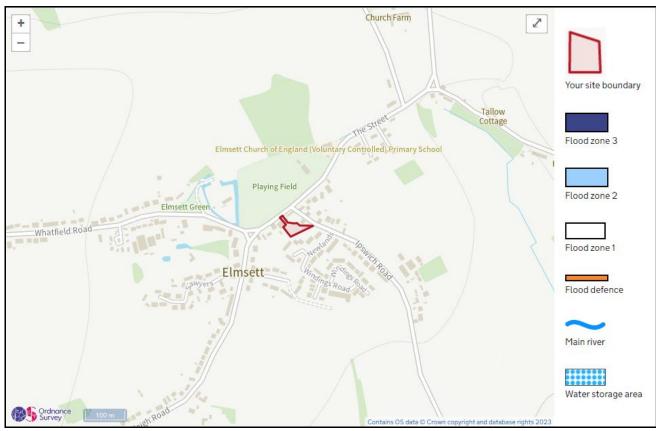


Figure 3: Environment Agency Flood Zone Map (Source: Environment Agency)

## 4.2 Groundwater Flooding

4.2.1 In order to assess the potential for groundwater flooding during higher return period rainfall events, the Jacobs/DEFRA report entitled *Strategy for Flood and Coastal Erosion Risk Management: Groundwater Flooding Scoping Study*, published in May 2004, was consulted, together with the guidance offered within the document entitled *Groundwater flooding records collation, monitoring and risk assessment (ref HA5)*, commissioned by DEFRA and carried out by Jacobs in 2006.

## Soil and Geology at the Site

4.2.2 The British Geological Survey's *Online Geology of Britain Viewer*, indicates that the soils beneath the site comprise clay deposits.

## **Groundwater Flooding Potential at the Site**

4.2.3 There have been no recorded groundwater flood events across the area between 2000 and 2003, as indicated by the Jacobs study. Appendix G of the SFRA indicates that this area is deemed as having a negligible risk from groundwater flooding due to the nature of the local geological deposits.

## 4.3 Surface Water Flooding and Sewer Flooding

- 4.3.1 Surface water and sewer flooding across urban areas is often a result of high intensity storm events which exceed the capacity of the sewers thus causing them to surcharge and flood. Poorly maintained sewer networks and blockages can also exacerbate the potential for sewer flooding. Surface water flooding can also occur as a result of overland flow across poorly drained rural areas.
- 4.3.2 Appendix E of the SFRA shows that there have been no recorded sewer flood incidents in this postcode area. Appendix D of the SFRA indicates that there have been recorded flood incidents within the vicinity of the site, however, there are no flood incidents that have been investigated at this location by Suffolk County Council.
- 4.3.3 The Environment Agency's Surface Water Flooding Map (Figure 4 and 5) together with Appendix A of the SFRA indicates that there is largely a very low surface water flood risk across the site (i.e. less than a 1 in 1000 year chance).
- 4.3.4 Further more detailed data has been obtained via the Data.gov.uk site (<a href="https://environment.data.gov.uk/DefraDataDownload/?Mode=rofsw">https://environment.data.gov.uk/DefraDataDownload/?Mode=rofsw</a>). The flood extent, depth and hazard GIS shape file was downloaded from Data.gov.uk (for tile TM 04).
- 4.3.5 It is generally accepted that the low risk flood event (i.e. between 1 in 1000 years and 1 in 100 years) on the Agency's map is used as a substitute for the climate change 1 in 100 year event to provide a worst-case scenario. There is no policy requirement to apply climate change onto the 1 in 1000 year event, as climate change is applied up to the 1 in 100 year event as confirmed at <a href="https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#when-to-use-climate-change-allowance">https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#when-to-use-climate-change-allowance</a>.
- 4.3.6 A small isolated area of the site is shown on Figure 5 as having a low surface water flood risk. The Agency's map generally shows lower areas of ground where water may pond during storm events and identify areas which receive subsequent runoff from surrounding land during heavy rainfall events. The low risk area is shown to be an isolated area of flood risk and does not form part of a wider flow path.
- 4.3.7 Figure 6 shows that the proposed dwellings will be located across very low risk areas, thus providing safe dry refuge and no increase in flood risk elsewhere. Parking areas and access road is shown to be partially located within the low risk area.



Figure 4: Environment Agency Surface Water Flooding Map (Source: Environment Agency, 2023)

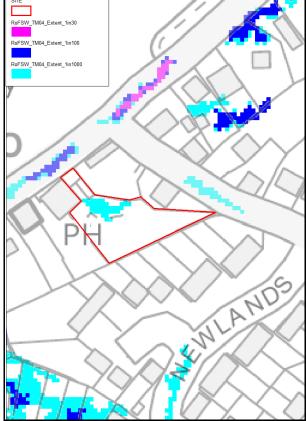


Figure 5: Environment Agency Surface Water Flooding Map (Source: Environment Agency, 2023)

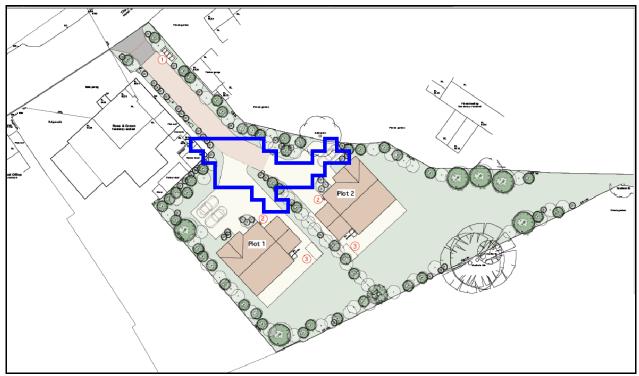


Figure 6: Low risk surface water flood extent and proposed layout

## Reducing Vulnerability to the Hazard

4.3.8 Flood Warnings for surface water flooding do not currently exist, however, the occupants should sign up to the Met Office weather warning system <a href="https://www.metoffice.gov.uk/public/weather/warnings">https://www.metoffice.gov.uk/public/weather/warnings</a> and safe refuge is available at all times.

**Table 1: Flood Event Action Plan** 

Alert	Level Definition	Action	Responsibility
Yellow: be aware	Yellow warnings can be	Monitor flood risk through	Occupants
	issued for a range of	media.	
	weather situations.		
		Locate family members	
	Many are issued when it is	and inform them of risk.	
	likely that the weather will	If away from the site	
	cause some low level	make assessment on risk	
	impacts, including some	if considering returning to	
	disruption to travel in a	site (i.e. how long it will	

	few places.	take to return etc).	
	Other yellow warnings are	Check flood kit, check	
	issued when the weather	occupants, check pets -	
	could bring much more	BE PREPARED in case the	
	severe impacts to many	situation gets worse.	
	people but the certainty of		
	those impacts occurring is		
	much lower.		
	It is important to read the		
	content of yellow		
	warnings to determine		
	which weather situation is		
	being covered by the		
	yellow warning.		
Amber: be prepared	There is an increased	Monitor weather through	Occupants
	likelihood of impacts from	media and local	
	severe weather, which	observations.	
	could potentially disrupt		
	your works plans.	Consider advice given	
	,	from authorities including	
	This means there is the	Council, Environment	
	possibility of travel delays,	Agency and emergency	
	road and rail closures,	services.	
	power cuts and the		
	potential risk to life and	Begin to implement Flood	
	property.	Plan.	
	p. opcity.	i ivilli	
		Check insurance, Check	
		flood kit, Check Pets.	
		HOUR KIL, CHECK PELS.	
Red: Take Action	Dangerous weather is	Follow advice given by	Occupants
	expected and, if you	Emergency Services,	
	haven't already done so,	Environment Agency and	
	you should take action	Council.	
	now to keep yourself and		
	your works force safe	Maintain communication	
	from the impact of the	through the media.	
	severe weather.		

It is very likely that there	Occupants can evacuate	
, ,	,	
will be a risk to life, with	themselves if they feel	
substantial disruption to	unsafe providing that they	
travel, energy supplies	make a judgement in	
and possibly widespread.	relation to any external	
	flood hazard. Take flood	
You should avoid	kit, occupants and pets	
travelling, where possible,	with you.	
and follow the advice of		
the emergency services	People who do not	
and local authorities.	evacuate should reside	
	across building.	

## Safe Access/Egress

- 4.3.9 The Agency's map shows that there is a low to medium risk along The Street adjacent to the site entrance.
- 4.3.10 The flood hazard is calculated based on different combinations of floodwater depth and velocity, and subsequently by using the hazard equation as cited in the DEFRA/EA R&D Document Framework and guidance for assessing and managing flood risk for new development Phase 2 (FD2320/TR2). The numerical hazard rating extracted from the model is then categorised into four degrees of flood hazard (Table 2) in accordance with Table 3.2 of FD2321/TR1 and Table 4.2 of FD2321/TR2.

Table 2: Hazard to people categories (taken from Table 3.2 of FD2321/TR1 and Table 4.2 of FD2321/TR2)

4.2 01 1 D 2 3 2 1 / 1 1 Z )				
Hazard Rating	Degree of Flood Hazard	Description		
< 0.75	Very low hazard	Caution "Flood zone with shallow flowing water or deep standing water"		
0.75 - 1.25	Danger for Some	Dangerous for some (i.e. children) "Danger: Flood zone with deep or fast flowing water"		
1.25 - 2.0	Danger for Most	Dangerous for most people (i.e. general public) "Danger: Flood zone with deep fast flowing water"		
> 2.0	Danger for All	Dangerous for all "Extreme danger: flood zone with deep fast flowing water"		

- 4.3.11 By reviewing the flood hazard GIS shape file downloaded from Data.gov.uk (<a href="https://environment.data.gov.uk/DefraDataDownload/?Mode=rofsw">https://environment.data.gov.uk/DefraDataDownload/?Mode=rofsw</a>) it can be seen that the hazard to people along The Street during low risk events would be Very low (Figure 6).
- 4.3.12 However, there would be a small area across the proposed parking area and access road which would be *Dangerous for Some*. People would be able to navigate around this area.

- 4.3.13 As discussed in paragraph 6.13 of the superseded 2009 DCLG document entitled PPS 25 Development and Flood Risk Practice Guide, cars can be unstable in depths greater than 300mm. The DEFRA/EA document FD2321/TR1 and FD2321/TR2 suggests that heavier vehicles such as fire engines become unstable in 0.9m of still water and this value reduces as the velocity increases.
- 4.3.14 Therefore, during the worst-case low risk surface water flood event, the flood depth along part of the internal access road/ parking area would largely be up to 0.30m, and therefore vehicles and emergency services will be able to access/egress the site safely.

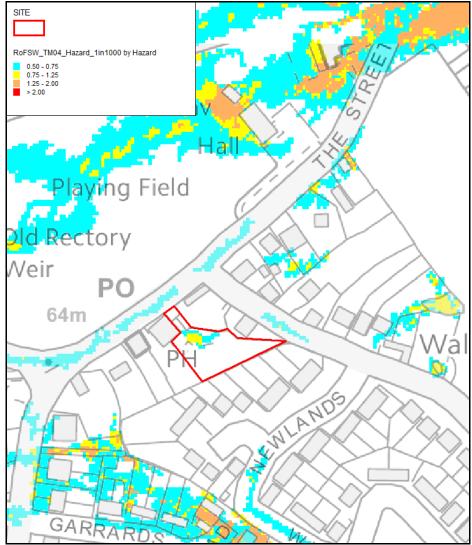


Figure 6: Hazard during low risk events (see Table 2 for hazard classification)

## 4.4 Reservoirs, Canals And Other Artificial Sources

- 4.4.1 The failure of man-made infrastructure such as flood defences and other structures can result in unexpected flooding. Flooding from artificial sources such as reservoirs, canals and lakes can occur suddenly and without warning, leading to high depths and velocities of flood water which pose a safety risk to people and property.
- 4.4.2 The Environment Agency's "Risk of flooding from reservoirs" map suggests that the site is not at risk from reservoirs.

#### 5. CONCLUSIONS

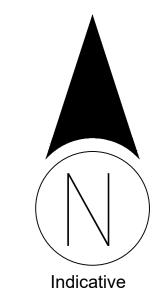
- The site is located within Flood Zone 1.
- There is a low groundwater flood risk and low risk from reservoirs.
- There is a very low to low surface water flood risk across the site. A more detailed analysis of the flood risk has been undertaken using the Data.gov.uk GIS data.
- The mapping shows that the proposed dwellings will be set across very low surface water flood risk areas (i.e. chance less than 1 in 1000 years) thus providing safe dry refuge and no increase in flood risk elsewhere.
- A small part of the parking areas and access roads is located within the low risk flood extent.
- It is generally accepted that the low risk flood event (i.e. between 1 in 1000 years and 1 in 100 years) on the Agency's map is used as a substitute for the climate change 1 in 100 year event to provide a worst-case scenario. There is no policy requirement to apply climate change onto the 1 in 1000 year event, as climate change is applied up to the 1 in 100 year event as confirmed at <a href="https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#when-to-use-climate-change-allowances">https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#when-to-use-climate-change-allowances</a>.
- The proposed buildings will therefore be located outside of the low risk (1000yr/100yr plus climate change) flood extent.
- Safe access/egress is available at all times.

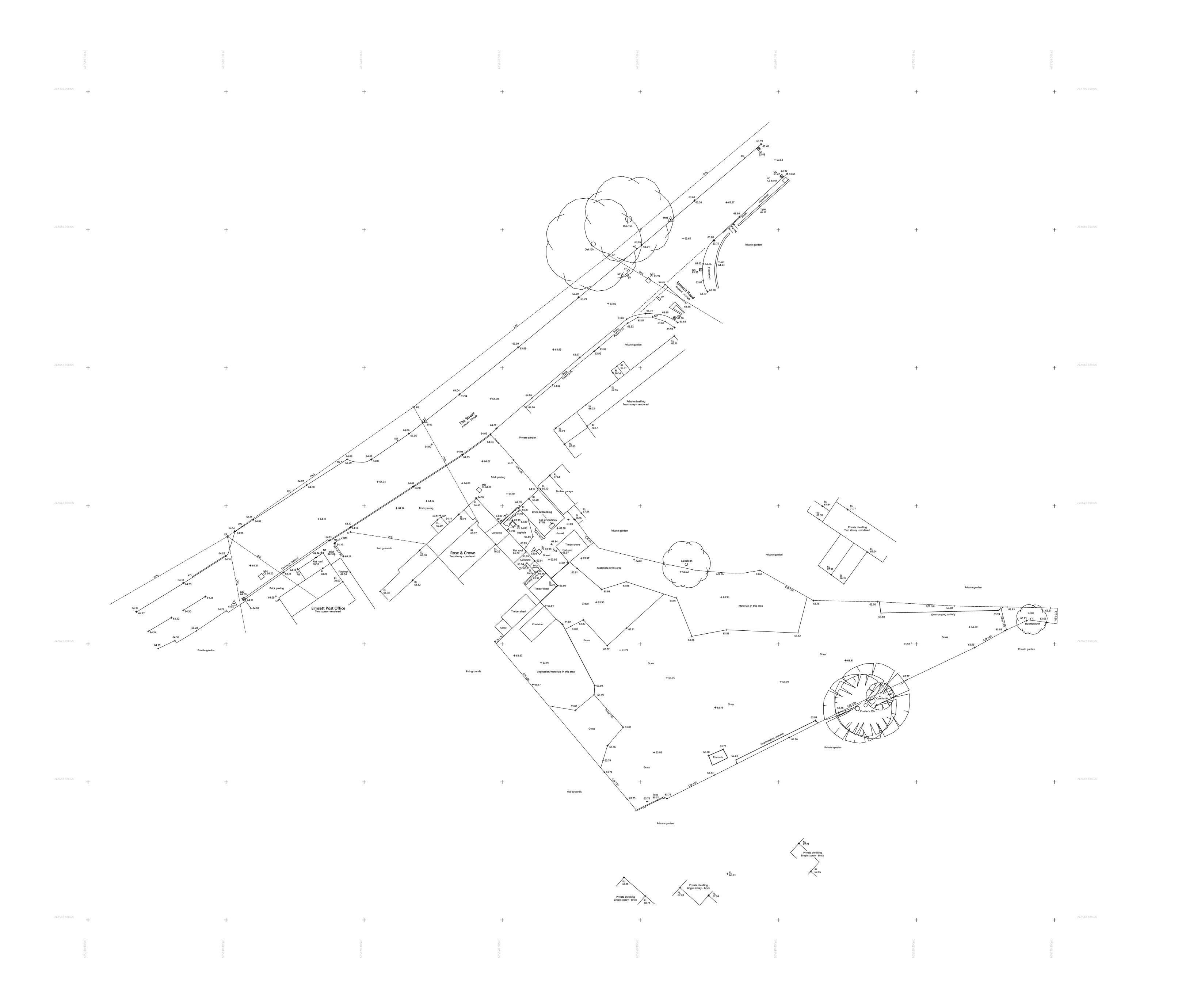
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## **DRAWINGS**





General

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work. Any errors or discrepancies must be notified to Alpha Surveys immediately.

The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The survey control listed is only to be used for topographical surveys at the stated scale. All control must be checked and verified prior to use.

Please do not scale from this drawing.

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Control Table

-	Control	rabie			
	Control ID	Easting	Northing	Elevation	Description
	ST01	605664.395	246681.456	63.710	Hilti Nail
	ST02	605628.757	246652.313	64.056	Hilti Nail
	ST03	605601.164	246625.851	64.204	Hilti Nail
	ST04	605644.632	246633.562	63.885	Hilti Nail
- 1	1				

# SURVEY GRID AND LEVEL DATUM

The coordinate system established for this survey is related to OSGB36-15 (OS) national grid at a single point using Leica GPS and then orientated to grid north with a scale factor of 1.000.

The level datum established for this survey is related to OSGB36-15 (OS) using Leica GPS.

REV DESCRIPTION DRAWN DATE

ROSE & CROWN, THE STREET, ELMSETT, IPSWICH, SUFFOLK, IP7 6PA.

TOPOGRAPHICAL SURVEY

CLIENT

WILKINSON PLANNING

SURVEYOR SURVEY DATE DWG STATUS REVISION ISSUE DATE 10.08.2023

DRAWING NUMBER

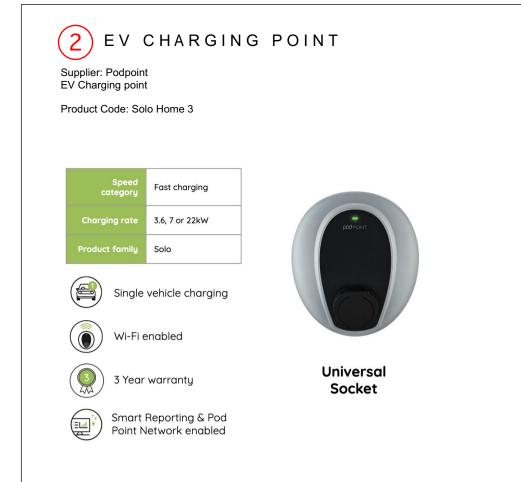
AS2092-01

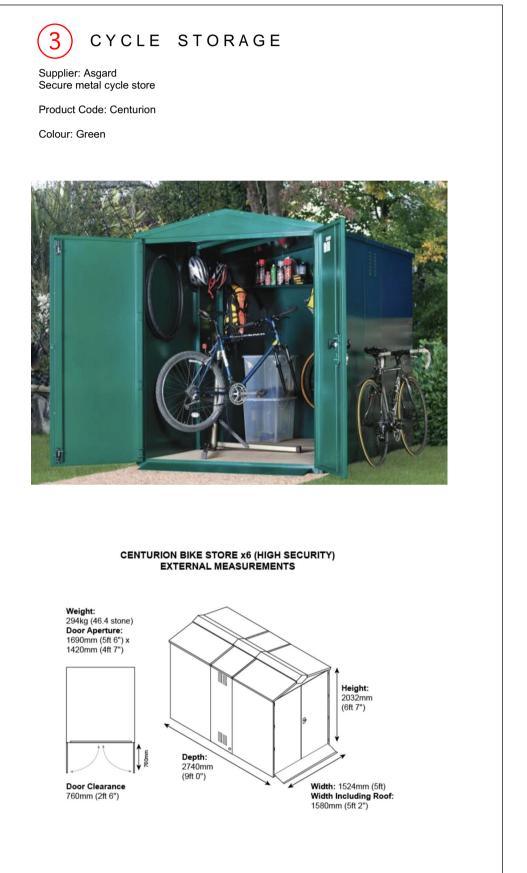
MBER SCALE 1:200-A0



Mob No: 07775 847287
alphasurveys@outlook.com
Topographical Surveys - Measured Building Surveys







Α	Plot 1 updated		02.09.23
TITLE:	PROPOSED SITE PLA	AN	
PROJECT:	LAND TO THE REAR OF THE ROSE & CROWN, THE STREET, ELMSETT, SUFFOLK, IP7 6PA		
CLIENT:	WILKINSON PLANN	ING	
SCALE:	1:200@A1	DATE:	AUG 2023
STATUS:	PLANNING	DRAWN:	JS

JOB NO: 1616-06



Land to the rear of The Rose & Crown, Elmsett - Proposed Site Plan

