FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
MONKS HOUSE LANE, SPALDING

FINAL REPORT

ECL0883/SEAGATE HOMES

DATE NOVEMBER 2022

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(Dwg 16170503-SEA-MONK-3D-TOPO)

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(Dwg MHL-SH-PD-MP-1001 A)

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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 Seagate Homes in respect of a development that consists of seventy-eight new residential dwellings at Monks House Lane, Spalding.

A planning application for the proposed development is to be submitted by Seagate Homes.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located at Monks House Lane, Spalding, Lincolnshire, PE11 3LH. The National Grid Reference of the site is 52322/32279.

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 Monks House Lane. The site consists of a residential dwelling and horticultural holding. The western part of the site is predominantly greenhouses and the eastern part of the site is set aside from agricultural use and is vacant. The site has an existing access to Monks House Lane. The area of development is approximately 2.4 hectares.

A topographic survey of the site has been undertaken and is provided in Attachment 1. Ground levels at the site range between +2.8m OD and +3.2m OD. The carriageway level of Monks House Lane at the entrance to the site is +3.1m OD.

The site is in the Welland and Deepings Internal Drainage Board (IDB) District. The site and the surrounding land are within the Urban Spalding catchment and Edward Road Dyke, an IDB Main Drain forms the southern boundary of the site.

The online British Geological Survey maps indicate that the site is likely to be underlain by Oxford 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 seventy-eight new dwelling. The new dwellings will have two storeys. The existing dwelling at the site will be retained. A Master Plan is provided in Attachment 2.

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 Available Flood Risk Information

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.

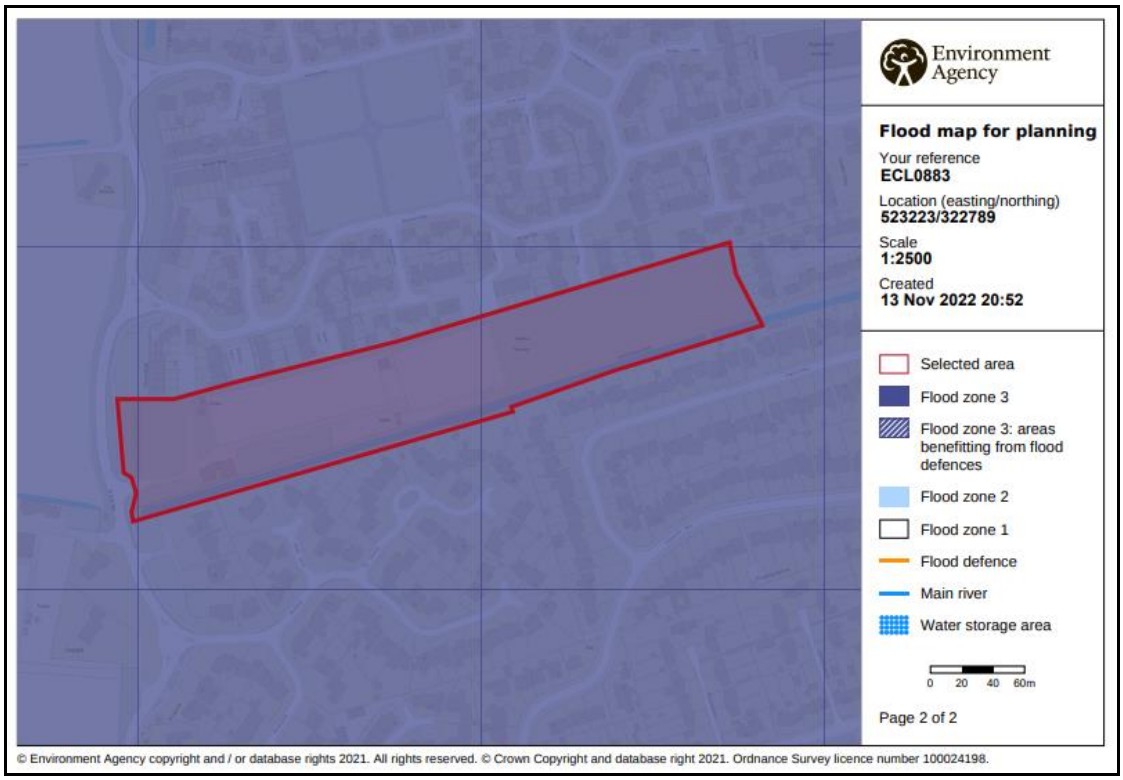


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the eastern part of the site has a medium risk of flooding from rivers or the sea (annual probability between 1% and 3.3%) and the western part of the site has a very low risk (annual probability less than 0.1%);
- the site has a low risk of surface water flooding (annual probability between 0.1% and 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 within the 'Low Hazard' area	The site is within the 'Low Hazard' area
Residual Peak Depth Map for the 1% fluvial and 0.5% tidal event	The site is at risk with flood depths between 0.0m and 0.25m	The site is at risk with flood depths between 0.0m and 0.25m

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 in 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 close to the River Welland lie within Flood Zone 3. As such, opportunities to undertake the development at an alternative site with a lower flood risk are limited. The Environment Agency Flood Maps for Planning show that the whole of Spalding is within Flood Zone 3. In this context it is noted that SE Lincolnshire Local Plan residential allocations are within flood risk areas due to the lack of availability of sites within areas of lower flood risk.

The River Welland has defences that provide protection during the 1% annual probability (1 in 100 chance each year) fluvial event including climate change. 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 1600m west of the River Welland as it flows through Spalding. To the south east of the site the River Welland has an inlet to the Coronation Channel, a bypass channel of the River Welland. The embankments of the Coronation Channel were constructed in the 1950's to convey river flows around Spalding. The Coronation Channel together with the Crowland and Cowbit Washes offer flood reduction to Spalding and the surrounding district.

The River Welland tidal defences are downstream of the confluence of the Coronation Channel and River Welland, however, these defences provide benefit downstream of Spalding and not to the town. The Cowbit Washes, Coronation Channel and River Welland tidal 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 Welland and Deepings IDB. The site and the surrounding land are within the Urban Spalding catchment and drain in a westerly direction to Pode Hole Pumping Station. Pode Hole Pumping Station discharges to Vernatts Drain which flows into the River Welland at Surfleet.

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 Welland and Deepings Internal Drainage Board and the Environment Agency are generally good.

4.2 Sources of Flooding

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

- local blockages to the Welland and Deepings IDB main drain system;
- an event in the local drainage network that exceeds the standard of protection;
- failure of Pode Hole Pumping Station; and
- overtopping and / or breaching of the River Welland defences.

4.3 Probability of Flooding

The probability of flooding associated with blockages in the Welland and Deepings IDB drainage system is low due to the maintenance standards 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 Welland & Deeping IDB main drains incorporating freeboard. This freeboard provides storage during the exceedance events.

The Coronation Channel and the Cowbit Washes protect the site from the River Welland. These flood relief measures provide protection during the 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. Previous historic rainfall events of 1968 and 1978, estimated to be greater than 1% annual probability (1 in 100 chance each year), caused no flooding to any residential properties.

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.

The River Welland 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 in and around Spalding site should a breach occur in the defences. The South East Lincolnshire SFRA includes maps demonstrating the impact of a breach in 2116. The Residual Peak Depth maps within the SFRA indicate the maximum flood depths associated with a breach and overtopping of defences during a 1% fluvial event and 0.5% tidal event. An extract from this map is shown in Figure 3.

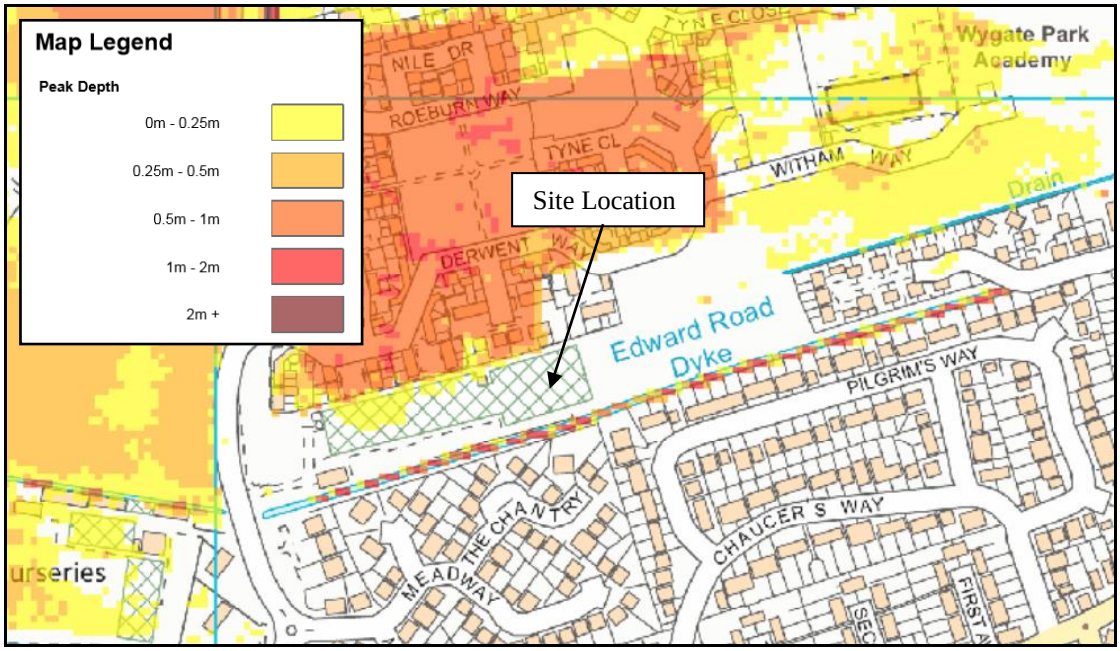


Figure 3 – SFRA 2116 Residual Peak Depth Map during the 1% fluvial and 0.5% tidal Annual Probability Event

The maximum flood depth at the site is 0.25m.

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Pode Hole Pumping Station could lead to an increased level of risk at the site.

The site benefits from any Environment Agency defences that provide protection during the 1% annual probability (1 in 100 chance each year) fluvial event and 0.5% annual probability (1 in 200 chance each year) tidal event. 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. During the 1% annual probability (1 in 100 chance each year) fluvial event plus climate change and 0.5% annual probability (1 in 200 chance each year) plus climate change event the maximum flood depth is 0.25m.

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 a minimum of 0.3m above ground level. It is recommended that there is 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 occupiers of the dwellings should register to receive flood warnings.

Should there be a failure of Pode Hole Pumping Station 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 using temporary pumping equipment.

A Sustainable Drainage Strategy has been prepared to support the application so that stormwater from the development will not affect any adjoining properties or increase the flood risk elsewhere.

6.0 CONCLUSION

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

- The proposed development consists of seventy-eight 2 storey residential dwellings at Monks House Road, Spalding.

- 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 site benefits from defences on the River Welland that provide protection during the 1% annual probability (1 in 100 chance each year) fluvial event and 0.5% annual probability (1 in 200 chance each year) tidal event including climate change.

- During a breach of the defences the maximum flood depth at the site including an allowance for climate change is 0.25m

- It is recommended that the floor level of the dwellings is a minimum of 0.3m above ground level with 0.3m of flood resilient construction above finished floor level.

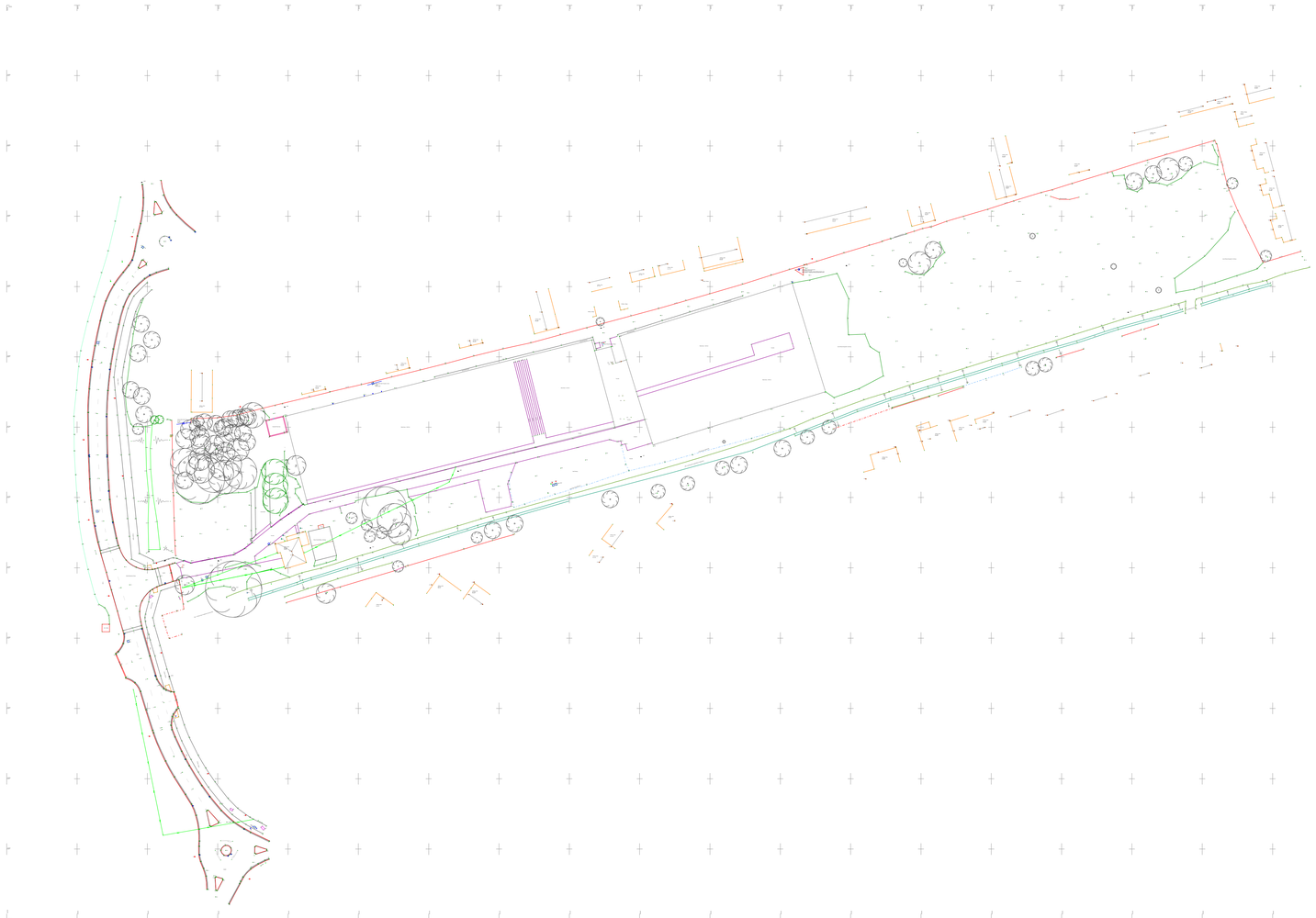
- The development passes the Sequential Test and Exception Test and is therefore suitable for the proposed location.

ATTACHMENT 1

TOPOGRAPHIC SURVEY
(DWG 16170503-SEA-MONK-3D-TOPO)

N

NORTH



Notes :Legends

TOPOGRAPHICAL SURVEYS
ABBREVIATIONS

AV	Air Valve	MH	Manhole
BO	Bollard	MHF	Manhole Foul
BOR	Raising Bollard	MHS	Manhole Surface
BAF	Concrete Baffle	MHC	Manhole Combined
BM	Bench Mark	NAT	Natural
BOH	Bench	RN	Road Name
B/W	Barb Wire Fence	NAIL	Nail Socked
BT	Boundary Tree	OHL-E	Overhead Lines Electric
BT	Communications Box	OHL-C	Overhead Lines Communications
C/P	Closed Panel Fence	PI	Petrol Interceptor
CL	Chain Link Fence	P/R	Post & Rail Fencing
CL	Cover Level	P/W	Post & Wire Fencing
CLD	Capped End	PED	Pedestrian
CN/P	Chestnut Paling Fence	RE	Rodding Eye
CCTV	Close Circuit Camera	RP	Reflective Post
CB	Communication Box	RW	Retaining Wall
CB	Control Box	RL	Ridge Level
CONC	Concrete	SP	Sign Post
DC	Drainage Channel	SV	Service Valve (Water)
DR	Door	SS	Side
DP	Down Pipe	SS	Soil Station
DXC	Dropped Crossing	SD	Soil Drain
ECB	Electrical Control Box	TP	Trial Pit
EP	Electric Pole / Sub Station Shed	TW	Trough/Water Tap
EP	Electric Post	T.H	Height of Tree
ERF	Estate Rail Fencing	TL	Traffic Light
ER	Earthing Rod	TopW	Top of Wall
EJB	Electric Junction Box (210v)	TP	Telegraph Pole
EJB	Electric Junction Box (440v)	UP	Underground Post
ETP	Electric Transformer on Pole	U/K	Unknown Tree
F/B	Flower Bed	U/TL	Unable to Lift
FH	Fire Hydrant	VP	Vent Pipe
FP	Feeder Pillar	W/C/B	Cobble Wall
FP	Fence Post	W/C/B	Cobble Wall
GY	Gully Grate	WC	Toilet Block
GAS	Gas Valve	WFP	Water Filtration Pipe
HWC	Headwall Sandbag	WM	Water Meter
HWC	Headwall Concrete	WM	Water Meter
IC	Inspection Chamber	WO	Wash Out
IL	Invert Level	WI	Window
IR	Iron Railings		
LP	Lamp Post		
LP	Lamp Post		
LP-WFI	Post External Light & Wifi		3 Way Overhead Electric Cables
	Overhead Telecom Cable		2 Way Overhead Electric Cables
	Overhead Electric Cable		
	Woodland	D300	- Tree & Diameter@1m up from ground
	Slope Direction		

Topographical Surveys

The description and heights of trees should be used as a guide only

All below ground survey details have been identified from above ground therefore all details relating to these will be approximate only

Some features or location may not have been surveyed due to obstructions or not reasonably visible at the time of the survey

General

This drawing shows the existing topography of the old Nursery off Monks Road, Spalding and the highway adjacent.
Survey carried out on the 5th and 13th November 2022.

Station	Easting	Northing	Level
DS1	523089.910	322748.524	2.953
DS2	523104.293	322732.076	3.135
DS3	523050.214	322727.481	2.947
DS4	523050.731	322757.674	3.082
MR1	523200.475	322764.484	3.142
MR2	523373.643	322815.836	3.152
MR3	523273.481	322832.420	3.217
MR4	523186.267	322810.245	3.025
MR5	523073.796	322782.160	3.078
MR6	523075.225	322744.105	3.095
MR7	523135.455	322759.375	2.975
MR8	523031.296	322727.604	3.062
MR15	523005.297	322798.567	3.084
MR16	523032.766	322686.327	3.399
MR17	523023.015	322862.050	2.785

SURVEY GRID AND LEVEL DATUM

Ordnance Survey (OS) national grid coordinates have been established for survey control point MR2 using GNSS and related to OSTN15(GB).The survey grid is orientated to OS North with a scale factor of 1.000
All levels relate to the Ordnance Survey (OS) level datum using GNSS OSGM15 (GB) established at MR2

Revision	Details	Date
A	Topographical Survey	05.11.22

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All dimensions and or level information shown should be checked on site prior to design and construction.

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All dimensions in metres

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Client:

Seagate Homes
Holbeach Manor
Fleet Road
Holbeach

Project Title:

Monk House Road Development Site
Spalding

Drawing Title:

Topographical Survey of Existing Land & Surrounding Area
3d

Scale:	Sheet Size:	Drawn:	Date:
1:1000	A1	M.M	14.11.22

Drawing Number: 16170503-SEA-MONK-3D-TOPO

Revision: A

ATTACHMENT 2

MASTER PLAN
(DWG MHL-SH-PD-MP-1001 A)

MONKS HOUSE LANE, SPALDING

NOTES:

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Do not scale plans - use figure or grid dimensions where given. Any deviation from the drawing is to be reported to the originator immediately.

IF IN DOUBT ASK !



MASTER PLAN

House Breakdown	
1 Bed Houses	8
2 Bed Houses	35
3 Bed Houses	35
Existing (retained)	1
Total =	79

Site Area = 5.74 Acres (approx)
Open Space = 0.94 Acres (approx)

Revision	Notes	Date	By
A	Roadway moved out of 6m IDB Easement	6.10.22	MD

SEAGATE HOMES

Project:
PROPOSED RESIDENTIAL DEVELOPMENT,
OFF MONKS HOUSE LANE, SPALDING, LINCS.

Drawing:
MASTER PLAN

Drawn: MD Date: 23.09.2022

Status: PRELIMINARY Scale: 1:1000 @ A2

Drawing Number:
MHL-SH-PD-MP-1001 A