FLOOD RISK ASSESSMENT
FOR PROPOSED RESIDENTIAL DEVELOPMENT BETWEEN 61 & 71 SEAS END ROAD, SURFLEET, SPALDING, LINCS

FINAL REPORT

GEOFF BEEL CONSULTANCY

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GCB/MATRIX PLANNING

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Fig 1 - Location Plan & Site Layout – Alan Hornsby drg. no. 15/11/01

Fig 2 - Environment Agency Flood Map for Planning

Fig 3 - South Holland Strategic Flood Risk Assessment Residual Depths Map (2116)

Fig 4 - Welland & Deepings Internal Drainage Board district plan

1.0 INTRODUCTION

1.1 A full planning application is to be submitted by Matrix Planning on behalf of Mr T Rowbotton, Mrs A Bradbury & Mr M Hammond for proposed residential development at land between 61 & 71 Seas End Road, Surfleet, Spalding, Lincs.

1.2 Planning approval requires a Flood Risk Assessment to accompany the application to meet the requirements and general principles contained in the Planning Practice Guidance to the National Planning Policy Framework (NPPF) and for approval by the Environment Agency.

The site is shown partly within Flood Zone 1 of the Environment Agency's Flood Map for Planning. The latest Flood Zone Maps have been created as a tool to raise awareness of flood risk with the public and partner organisations, such as Local Authorities, Emergency Services and Drainage Authorities. The Maps take into account existing flood defences.

The site is also shown in the South Holland District Council's Strategic Flood Risk Assessment Map and located in the Welland and Deepings Internal Drainage Board district.

1.3 Geoff Beel Consultancy was appointed on 19th April 2017 to undertake a Flood Risk Assessment.

1.4 A previous Flood Risk Assessment prepared by the author in June 2015 was approved by the Environment Agency but the planning application was refused both by the District Council and the Planning Inspectorate on sustainable development grounds.

2.0 LOCATION

2.1 The development site is between 61 & 71 Seas End Road, Surfleet, Spalding. The National Grid Reference of the central point of the site is TF 27102885.

2.2 The position and extent of the site are shown on Fig 1 – Location Plan & Site Layout at the end of the document.

2.3 The site, located within the Welland and Deepings Internal Drainage Board district is shown within Flood Zone 1 as detailed on the Environment Agency Flood Map for Planning and in a defended area of the Council's Strategic Flood Risk Assessment Map.

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is agricultural land.

3.2 The area of development is approximately 0.25 hectare.

3.3 The proposed site layout consists 4 no. new two-storey detached dwellings.

3.4 The Sequential Test and Exception Test will require to be applied by the Local Planning Authority but the development may be permitted as the site may be protected against the 1 in 100 year fluvial event by a combination of existing defences with mitigation measures meeting the requirements of NPPF. The suite is located in the Flood Zone 1 of the Environment agency Flood Maps for Planning which is more recent that the South Holland SFRA Maps and hence the Sequential Test is met.

Flood mitigation measures have been incorporated into the design and construction of the dwellings to ensure the development remains safe during its lifetime.

4.0 EXISTING FLOOD ALLEVIATION MEASURES

4.1 The site is located on the north side of the River Glen upstream of Surfleet Sluice with existing land levels varying between 4.51m and 5.20m aOD with Seas End Road carriageway level at 4.27m aOD.

The standard of protection offered by existing land levels would be up to the 1 in 100 year return period.

4.2 The Surfleet Sluice Gate with the adjoining flood embankments offer protection against the tidal flood event of the River Welland. The existing 1 in 200 year modelled flood event of the River Welland is 5.99m aOD whilst the 1 in 100 year estimated flood level of the River Glen inclusive of climate change is 5.06m aOD.

4.3 The site is located within the Welland and Deepings Internal Drainage Board district with the nearest ‘main drain’ open watercourse, some 500 metres north of the site. Land levels at the site vary between 4.51m and 5.20m aOD.

4.4 The existing standard of drainage for the Welland and Deepings Internal Drainage Board is 1 in 50 years return period, compatible with the Department of the Environment, Food and Rural Affairs target level of service for rural drainage and flood defence works. Freeboard of 1.00 metre is provided to the lowest land levels.

4.5 The surrounding land north of the River Glen drains to the Old Beach Drain East which discharges into the tidal River Welland some 1.20kms east of the site at the Surfleet Marsh Pumping Station.

4.6 Current maintenance standards within the Welland and Deepings Internal Drainage Board are generally very good. During the operation and maintenance of its pumping stations, associated structures and channel systems, particularly those that could affect property, the Board 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. However, bank slips, blocked culverts etc may occur from time to time and these matters are usually dealt with promptly.

4.7 Maintenance standards of the Environment Agency's main rivers and defences are well maintained and regularly inspected for their asset condition.

5.0 POTENTIAL SOURCES OF FLOODING

5.1 Four potential sources of flooding have been identified as a result of this assessment:

a) storm return period of 1 in 100 years being exceeded
b) failure of Surfleet Sluice
c) failure of Surfleet Marsh Pumping Station
d) overtopping and breaching of the tidal River Welland defences

5.2 The probability of flooding from a) is low due to the Environment Agency main river design standard incorporating storage in the River Glen channel upstream.

5.3 Failure of Surfleet Sluice 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 Environment Agency would take emergency action to maintain the drainage level of service by utilising temporary pumping equipment. The probability of such an occurrence is also considered to be low.

Previous historic rainfall events of 1998 and 2000, estimated to be as great as than 1 in 100 year events, caused no flooding to residential properties alongside the development site.

5.4 Failure of the Surfleet Marsh 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 Internal Drainage Board would take emergency action to maintain the drainage level of service by utilising temporary pumping equipment. The probability of such an occurrence is also considered to be low.

5.5 The possible overtopping and breaching of the tidal River Welland flood defences which may affect the site under extreme conditions is considered to be low. The present standard of defence of 1 in 200 years would most probably have to be exceeded to create such conditions. If a breach, however, did occur, it is estimated that the floodwaters would not affect the development site, but a precautionary approach should be adopted as regards proposed floor levels.

5.6 It is therefore recommended that proposed floor levels of the development should be 750mm above Seas End Road carriageway level at 5.07m aOD to safeguard against the River Glen estimated 1 in 100 year fluvial flood event inclusive of climate change. Flood resistant/resilient measures will also be incorporated into the design and construction of the new dwellings.

5.7 The developer will 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 provides a Flood Warning Service which includes Flood Warning Codes and uses direct warning methods where the risks and impacts of flooding are high. Indirect warnings are provided to all flood risk areas, even those at low risk of flooding. The main method is media broadcasts via local radio and also by television.

In addition to direct and indirect flood warnings, the Environment Agency operates a 24 hour a day Floodline Service providing advice and information on flooding, contact tel. no: 0345 988 1188. The occupiers of the new dwellings should register with the Floodline Direct Warnings Service to receive any future flood warnings.

6.0 EXTENT OF KNOWN FLOODING

6.1 During the preparation of this assessment no evidence was discovered of the site and adjoining properties being flooded.

7.0 PROBABILITIES AND TRENDS OF FLOODING

7.1 The probability of this development flooding from localised drainage systems is very low. It is also intended to construct floor level 750mm above Seas End Road carriageway level such that it is above the River Glen 1 in 100 year return period flood level inclusive of climate change.

7.2 The probability of the site flooding with water from any Welland and Deepings river system is less than 1% because of the standards of the existing flood defence systems, storage within existing drainage channels and the location of the site. Similarly the same standard is provided by the Environment Agency's main river and defences.

7.3 If under very extreme events, levels of floodwater from any Environment Agency or Welland and Deepings river or arterial systems rose to such an extent that the site was affected, the situation would not be sudden. It is very probable that sufficient time would be available to take precautionary actions to limit the extent and potential impact of flooding.

7.4 The water levels in the drainage channels will tend to rise as a result of the impacts of climate change. However the existing systems and defences together with the raising of floor levels above existing Seas End Road carriageway level and estimated flood level will be appropriate for the design life of the development (i.e. 100 years).

7.5 The more recent updated version of the South Holland Strategic FRA shows the site affected by yup to 250mm of floodwaters on the Residual Depth Map in year 2116.

8.0 IMPACTS OF FLOODING

8.1 No significant impacts of flooding are anticipated due to the mitigation measures being proposed.

8.2 Floor levels of the development will be raised 750mm above existing Seas End Road carriageway level offering additional protection against impacts arising from any extreme short duration, localised events. Surface water drainage will be discharged to soakaway designed to BRE365 specification and Building Regulations approval.

8.3 The general location of the site within the catchment is such that if flooding occurred from any of the Environment Agency or Welland and Deepings river systems, then sufficient warning time would be available.

8.4 No displacement of water from the site will affect any adjoining properties and agricultural land as soakaway drainage will be designed to BRE365 requirements and Building Regulations approval.

9.0 RESIDUAL RISK – EXTREME EVENTS

9.1 The residual risk from extreme events is very low on this site, because of its location protected by the River Glen fluvial defences and the River Welland tidal defences.

9.2 The site is within Flood Zone 1 according to NPPF classification, with a very low risk of flooding due to the current standards of drainage and flood defence and land levels. The site is located within a Functional Flood Plain of any ‘main river’ or ‘main drain’. The Environment Agency Flood Zone Maps have been produced taking into account existing flood defences and standards of protection.

9.3 South Holland District Council in conjunction with the Environment Agency and the local IDB’s within the Council area have carried out a Strategic Flood Risk Assessment of the whole District by appointed Consulting Engineers.

The updated version of the Strategic Flood Risk Assessment has produced more definitive Flood Risk Maps similar to those published by the Environment Agency and at the same time has analysed flood return periods of all tidal and fluvial defences for years 2002 and 2116 to account for the effects of climate change.

Breach scenarios of embankments failing and/or being overtopped have also been carried out to establish Flood Risk Zones.

9.4 Safe access and egress to the site is available via Seas End Road in a westerly direction to Surfleet village where land is in Flood Zone 1.

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 As a result of the assessment, the following conclusions have been reached:-

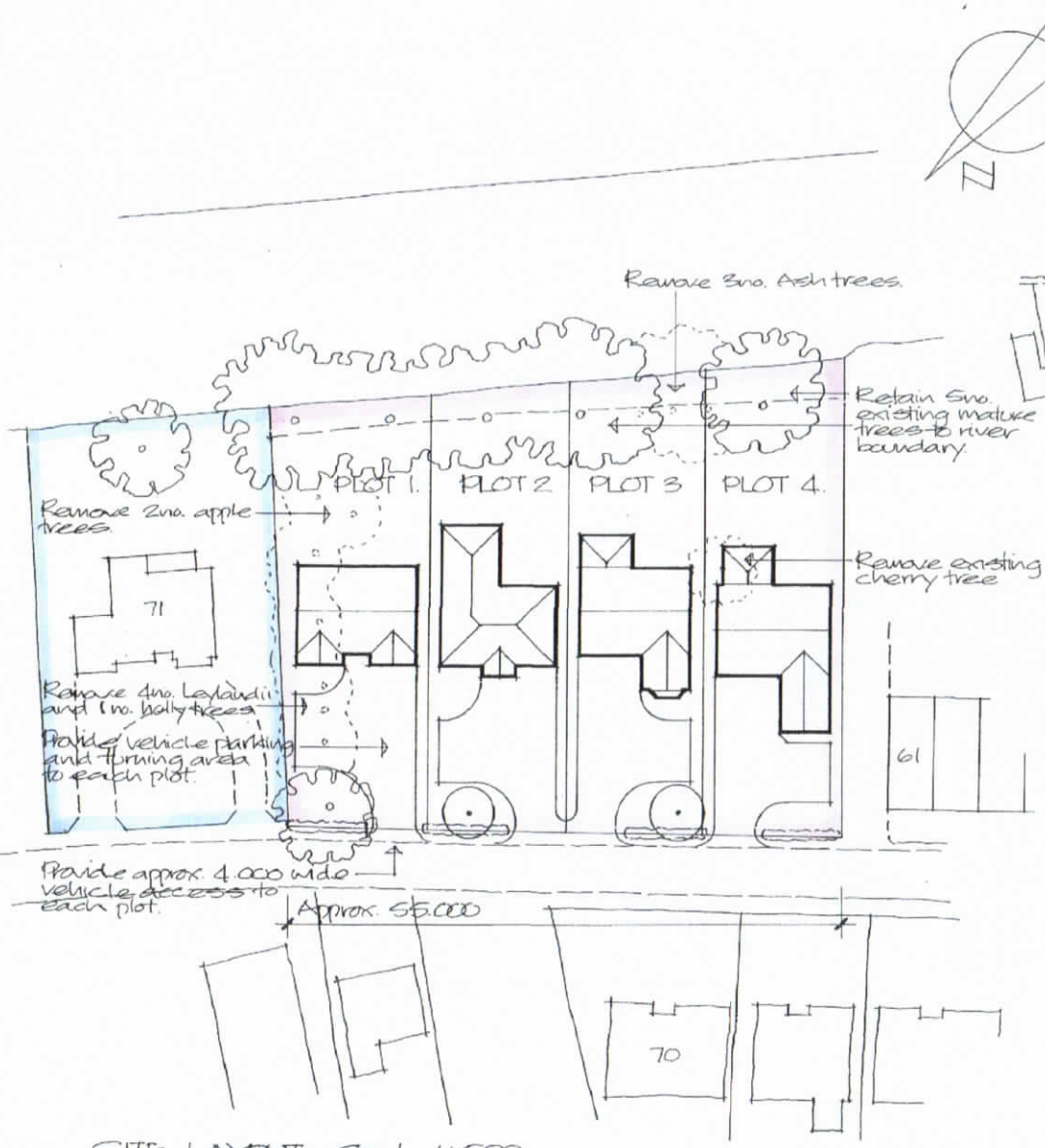
- The proposed development is in the Passive Floodplain of the River Glen and the Welland & Deepings IDB.

- The site is in Flood Zone 1, with the actual risk of flooding from the River Glen system being very low.

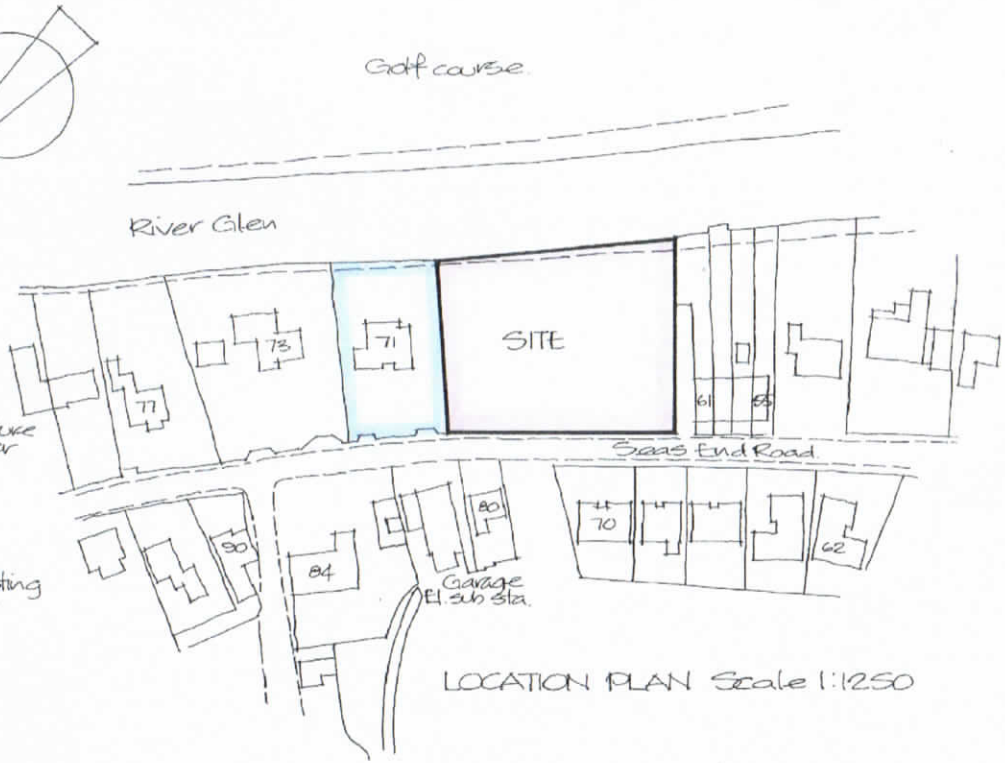
- Although the site is located within an Internal Drainage District with a minimum standard of drainage of 1 in 50 years, this accords with Defra guidelines for rural development. Freeboard to design water level of 900mm to lowest land level is available for events greater than 1 in 50 years providing further storage within the drainage channels.

- Floor levels will be raised 750mm above existing Seas End Road carriageway level at 5.07m aOD with flood resilient measures incorporated into the design and construction of the proposed dwellings.

- On site surface water drainage will be discharged to soakaway to BRE365 specification and Building Regulations approval.



SITE LAYOUT Scale 1:500



LOCATION PLAN Scale 1:1250

Project
PROPOSED RESIDENTIAL DEVELOPMENT LOCATED BETWEEN 61 AND 71 SEAS END ROAD, SURFLEET, SPALDING.

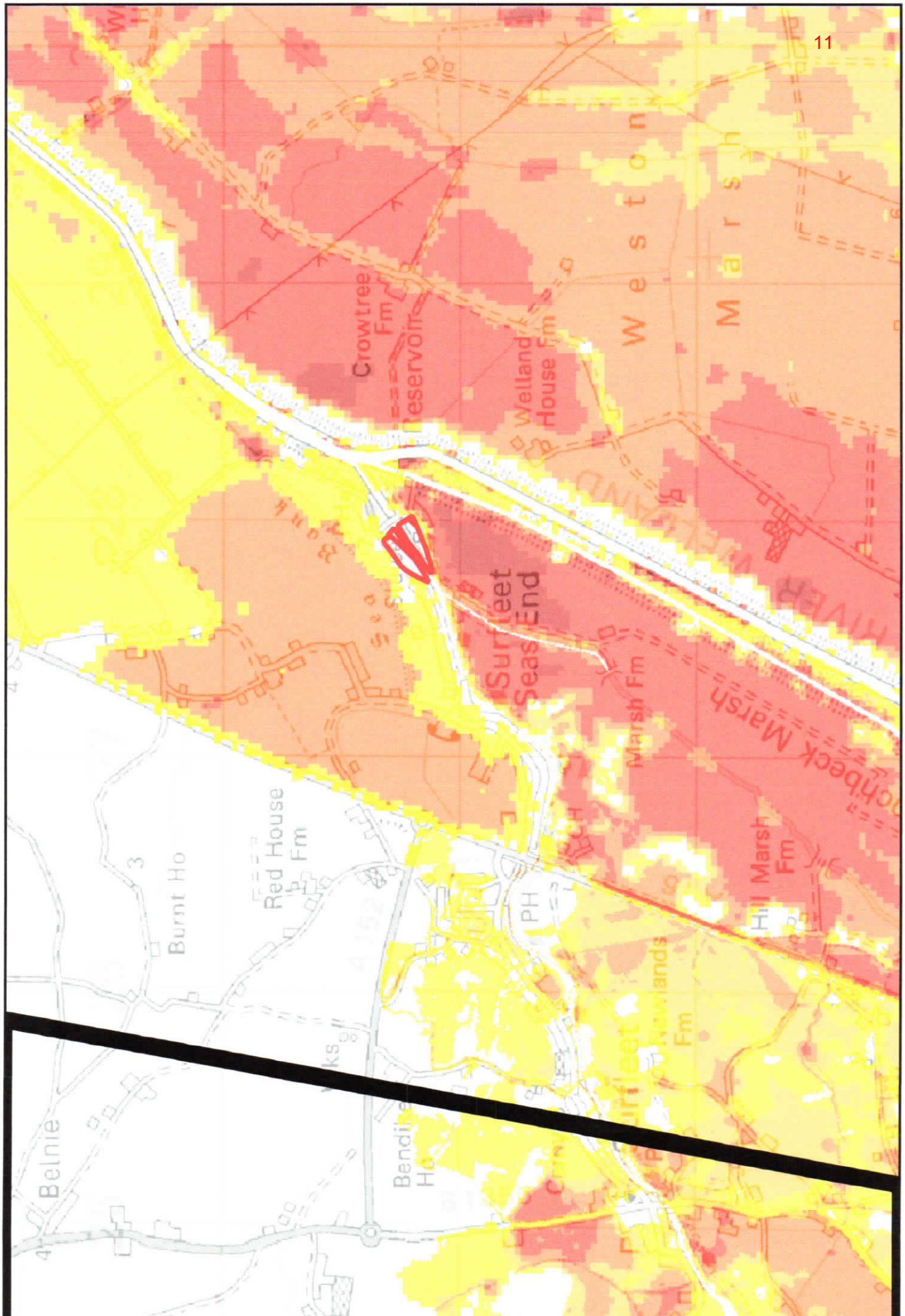
Client **MR T ROWBOTTOM, MRS A BRADBURY & MR M HAMMOND C/O R LONGSTAFF & CO**

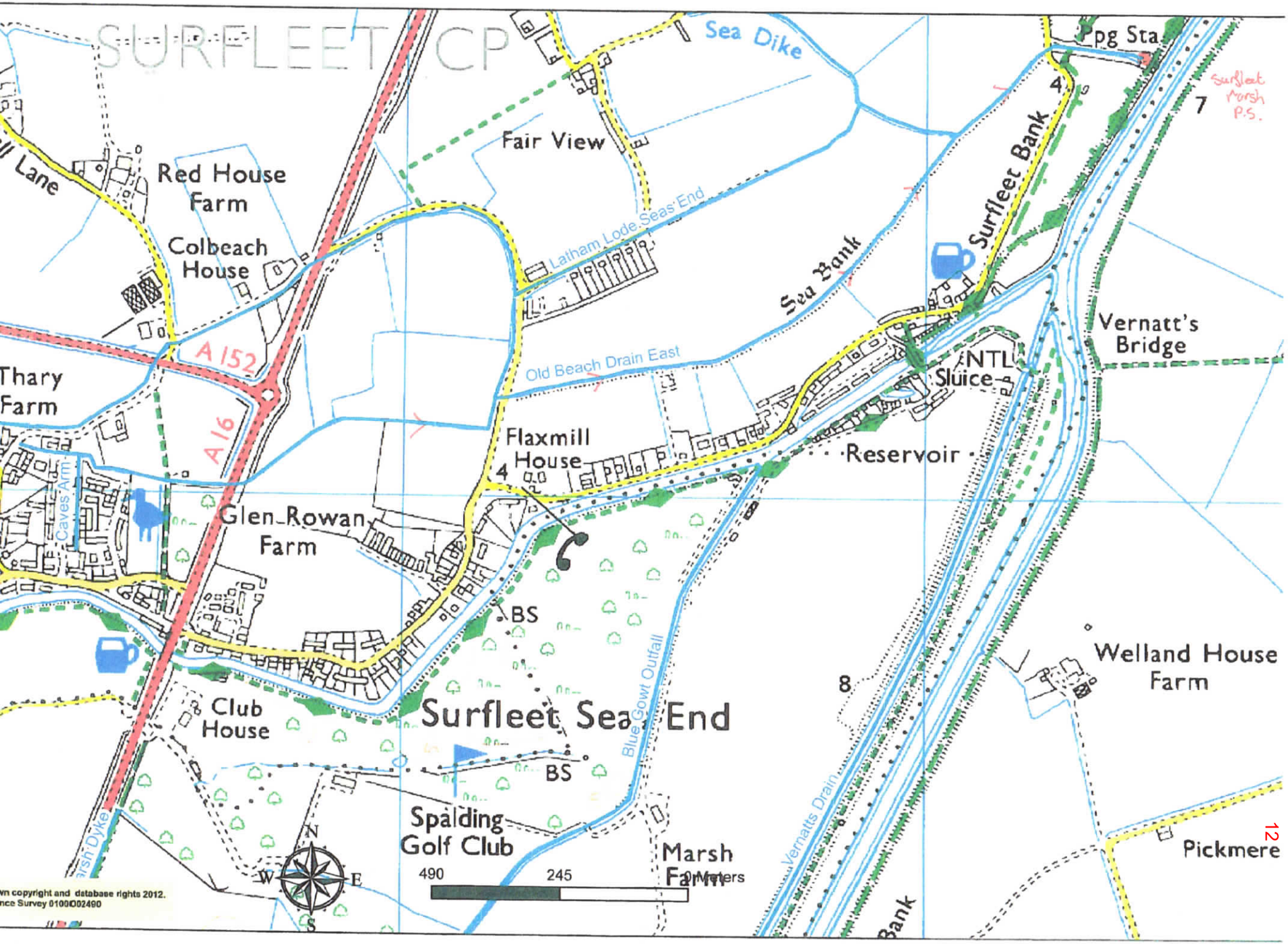
ALAN HORNSBY
ARCHITECTURAL SERVICES
"Little Acre"
35 Peak Hill, Cowbit,
Spalding, Lincs. PE12 6AW
Tel. Holbeach (01406) 380591

Scale 1:500 & 1:1250 Drg. no. 15/11/01A
Date May 2015

6


Surfleet
Reed
Bed
Glen Rowan
Farm
Flaxmill
RESERVOIR ROAD
Piggery
Surfleet
Seas End
Glen House
Farm
SEAS END ROAD
River Glen
Golf Course


Crowtree Fm
Reservoir
Welland House Fm
Weston Marsh
Surfleet Seas End
Marsh Fm
Hill Marsh Fm
Red House Fm
Burnt Ho
PH
Belnie
Bendike Ho
Newlands Fm


SURFLEET CP
Sea Dike
Pg Sta
Surfleet Marsh P.S.
Fair View
Red House Farm
Colbeach House
Latham Lode Seas End
Sea Bank
Surfleet Bank
Vernatt's Bridge
NTL Sluice
Reservoir
Old Beach Drain East
A152
A16
Thary Farm
Flaxmill House
Glen Rowan Farm
Caves Arm
BS
Club House
Surfleet Sea End
Blue Gowt Outfall
Welland House Farm
Spalding Golf Club
Marsh Farm
Vernatts Drain
Pickmere
490
245
Meters
N
S
E
W
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