FLOOD RISK ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT AT 29 DELPH ROAD, LONG SUTTON, LINCS.

FINAL REPORT

GEOFF BEEL CONSULTANCY

JUNE 2017

GCB/STATUS DESIGN

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Fig 1 - Location Plan – OS Map

Fig 2 - Bungalow Design –
Status Design drg. no. SD17-013/1

Fig 3 - Site Plan –
Status Design drg. no. SD17-013/2

Fig 4 - Environment Agency Flood Map for Planning

Fig 5 - South Holland District Council Updated Strategic Flood Risk Assessment Map – Depth of Flooding 2115

Fig 6 - South Holland Internal Drainage Board District Plan

1.0 INTRODUCTION

1.1 A full planning application is to be submitted by Status Design for proposed residential development at land adjacent to 29 Delph Road, Long Sutton, Lincs.

1.2 A Flood Risk Assessment is required to accompany the planning application and meet the requirements and general principles of the Planning Practice Guidance to the National Planning Policy Framework (NPPF) and for approval by the Environment Agency.

The site, as situated, is located within Flood Zone 3, of the Environment Agency's Flood Zone Maps. The latest Agency Flood Maps have been created as a tool to raise awareness of flood risk with the public and our partner organisations, such as Local Authorities, Emergency Services and Drainage Authorities. The Maps do not take into account any flood defences.

The site is also shown in fluvial Flood Zone 1 of the present day South Holland District Council's Updated Strategic Flood Risk Assessment Residual Depth Maps.

The site is also located in the South Holland IDB drainage district.

1.3 Geoff Beel Consultancy was appointed on 13th June 2017 to undertake a Flood Risk Assessment.

2.0 LOCATION

2.1 The development site is located at 29 Delph Road, Long Sutton. The National Grid Reference of the central point of the development is TF 42202230.

2.2 The position and extent of the site is shown on Fig 1 – Location Plan at the end of the document.

2.3 The site, located within the South Holland Internal Drainage Board district is shown within Flood Zone 3 as detailed on the Environment Agency Flood Map for Planning and in fluvial Flood Zone 1 of the Council's Updated Strategic Flood Risk Assessment Residual Depth Map (present day) as defended by the Internal Drainage Board system.

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is currently garden and outbuildings to 29 Delph Road.

3.2 The area of development is approximately 0.09 hectare.

3.3 The proposed site layout consists the construction of a single storey bungalow.

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 is protected against both the 1 in 200 year return period tidal event and the 1 in 100 year return period fluvial event and located in fluvial Flood Zone 1 of the Council's Updated Strategic Flood Risk Assessment Residual Depth Map (present day).

3.5 Flood mitigation measures have been incorporated into the design and construction of the new cottage by raising finished floor levels above existing ground level to safeguard against the risk of flooding as result of a breach to the River Nene tidal defences and to ensure the proposals pass Part 2 of the Exception Test with an adequate water exclusion strategy for the design flood and breach event.

4.0 EXISTING FLOOD ALLEVIATION MEASURES

4.1 The site is within a defended floodplain, as defined in Appendix 1 of the Environment Agency's 'Policy for the Protection of Floodplains' and is considered to be passive until such time as a flood greater than that for which the defences were designed occurs. The likelihood of flooding due to overtopping or failure of a flood defence embankment is considered to be small.

The South Holland Internal Drainage Board is protected by a combination of the River Welland tidal defences downstream of Spalding, the River Welland fluvial embankments as well as the River Nene tidal defences downstream of Foul Anchor.

4.2 The site and the surrounding land drains by gravity to IDB main drains to the South Holland Main Drain and hence to the tidal River Nene at the Sutton Bridge Sluice. Land level at the site is generally at 3.00m aOD.

4.3 The existing standard of drainage for the South Holland 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 900mm is provided to the lowest land levels.

4.4 Current maintenance standards within the South Holland Internal Drainage Board and of the Environment Agency defences 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.

5.0 POTENTIAL SOURCES OF FLOODING

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

a) local blockages to IDB main drain system.
b) storm return period of 1 in 50 years being exceeded
c) failure of Sutton Bridge Sluice
d) overtopping and breaching of defences of the tidal River Nene

5.2 The probability of flooding from source a) is low due to the maintenance standards already achieved and managed by the IDB.

The probability of flooding from b) is also low due to the South Holland IDB main drain design standard incorporating a minimum 900mm freeboard to the lowest land level which provides adequate storage in events greater than 1 in 50 years.

Previous historic rainfall events of 1968 and 1978, estimated to be greater than 1 in 100 year events, caused no flooding to any residential properties at the time and the Boards policy is to provide a standard of drainage which satisfies (NPPF) requirements of a 1 in 100 year return period for fluvial protection inclusive of the effects of climate change and developments to the arterial system enables a flexible approach to be adopted and meet the criteria for "sustainable urban drainage".

5.3 Failure of Sutton Bridge Sluice may occur due to long term mechanical breakdown or power supply being disrupted. However, in these circumstances, if conditions were such as 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.

5.4 The flood embankments to the tidal River Nene provide a 1 in 200 year return period level of protection.

The Environment Agency has recently published The Wash Shoreline Management Plan 2 from Gibraltar Point to Old Hunstanton. The summary of the plan between Gibraltar Point and Wolferton Creek is as follows:

The intent of management for this Policy Development Zone (PDZ) is to sustain flood defence for the communities and their hinterland on the low-lying areas around The Wash. This includes an increase of management as needed to sustain the current level of flood risk in the face of climate change.

5.5 The proposed drainage system is to soakaways within the development site which will accommodate the 1 in 100 year rainfall event inclusive of climate change. The drainage system will also include rainwater harvesting with the soakaways designed to BRE365 requirements.

5.6 More recent hydraulic modelling work carried out by consulting engineers on behalf of the Environment Agency has been included in the South Holland Updated Strategic Flood Risk Assessment Flood Maps.

The Environment Agency has confirmed that the site could be affected by floodwaters of up to 0.50m as a result of breaching and/or overtopping of the tidal defences to the Wash and River Nene in year 2115.The site is located some 6.00kms from the nearest point of any tidal defence.

It is therefore necessary to mitigate against such risks and flood resilient construction should be incorporated into the proposed bungalow with floor levels raised 500mm above existing ground level and flood resilient construction up to 300mm above finished floor level.

6.0 EXTENT OF KNOWN FLOODING

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

7.0 PROBABILITIES AND TRENDS OF FLOODING

7.1 The probability of this development flooding from localised drainage systems is very low.

7.2 The probability of the site flooding with water from any South Holland IDB main drain 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.

7.3 The probability of the site flooding with fluvial waters from any main river system is less than 1% because of the standards of the existing flood defences and the location of the site.

7.4 If under very extreme events, levels of floodwater from the South Holland IDB main drains 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.

7.5 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 floor levels 500mm above existing ground level and flood resilient construction up to 300mm above finished floor level will be acceptable for the design life of the development (i.e. 100 years).

8.0 IMPACTS OF FLOODING

8.1 No significant impacts of flooding are anticipated.

8.2 Floor level of the development will be 500mm above existing ground levels which together with the flood resilient construction and the proposed drainage system will offer additional protection against impacts arising from any extreme short duration, localised events.

8.3 The general location of the site within the catchment is such that if flooding occurred from any of the South Holland IDB main drain systems, then probably 2 to 3 days warning time would be available.

8.4 No displacement of water from the site will affect any adjoining properties. The site will have a soakaway drainage system such that surface water drainage is attenuated before discharging to the nearby IDB main drain.

8.5 The developer will ensure that the eventual occupiers of the property 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 Warnings Codes and uses direct warning methods where the risks and impacts of flooding are high. Indirect warnings are provided to all flood risk areas, event 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 and the occupiers of the property should register with the Floodline Direct Warnings Service to receive any future flood warnings.

8.6 Safe and dry access/egress is available after receipt of a flood warning onto Delph Road and hence via the A17 and the B1515 roads to Holbeach where land is in Flood Zone 1. Safe refuge will also be provided in the roof space of the bungalow with veluxe windows to enable escape in any extreme event.

9.0 RESIDUAL RISK – EXTREME EVENTS

9.1 The residual risk from extreme events is very low on this site, because of its location, within the South Holland IDB area and its location 6.00kms from the River Nene tidal defences.

9.2 The site is within Flood Zone 1 with a very low risk of flooding due to the current standards of drainage and flood defence and land levels. The site is not located within a Functional Flood Plain of any 'main river' or 'main drain'. The Environment Agency Flood Map for Planning has been produced irrespective of 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 an Updated Strategic Flood Risk Assessment of the whole District by appointed Consulting Engineers.

The Strategic Flood Risk Assessment has produced similar Flood Risk Maps to those published by the Environment Agency and at the same time has analysed flood return periods of all tidal and fluvial defences up to 2115 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 As a result of the Updated Strategic Flood Risk Assessment; the South Holland Main Drain and associated IDB main drains have been determined as providing protection against a 1 in 100 year return period event up to 2115 inclusive of the effects of climate change.

9.5 The development site has been identified outside of any Flood Risk Zone from the South Holland Main Drain and associated IDB main drain up to the year 2115 but could be affected by floodwaters as a result of breaching of the River Nene tidal defences.

10.0 CONCLUSIONS AND RECOMMENDATIONS

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

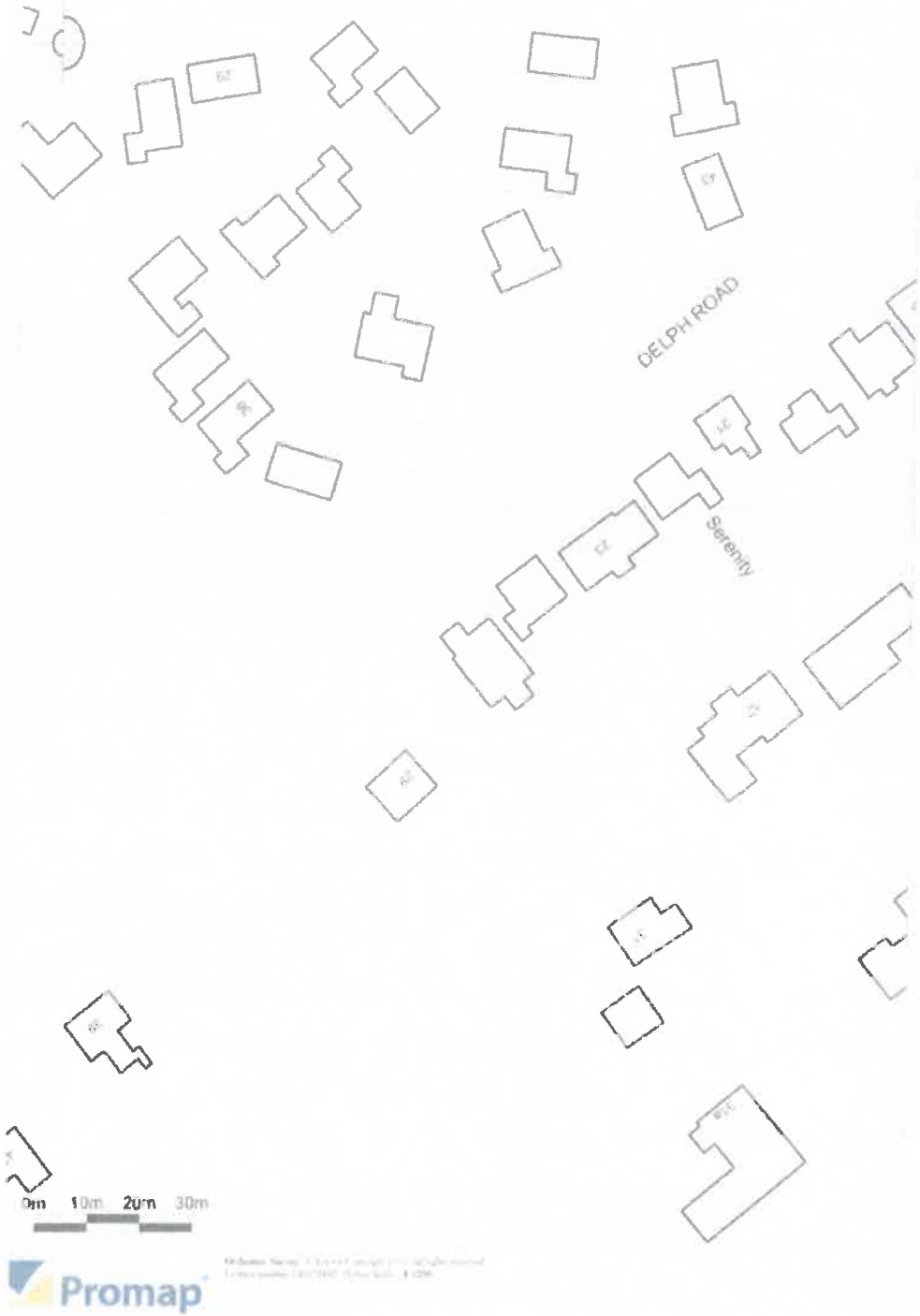
- The proposed development is not in a Functional Floodplain. It is located in the Passive Floodplain protected by defences to a 1 in 100 year return period. (1.0%)

- The site has been identified in Flood Zone 1 of the present day South Holland District Council's Strategic Flood Risk Assessment Residual Depth Maps.

- 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.

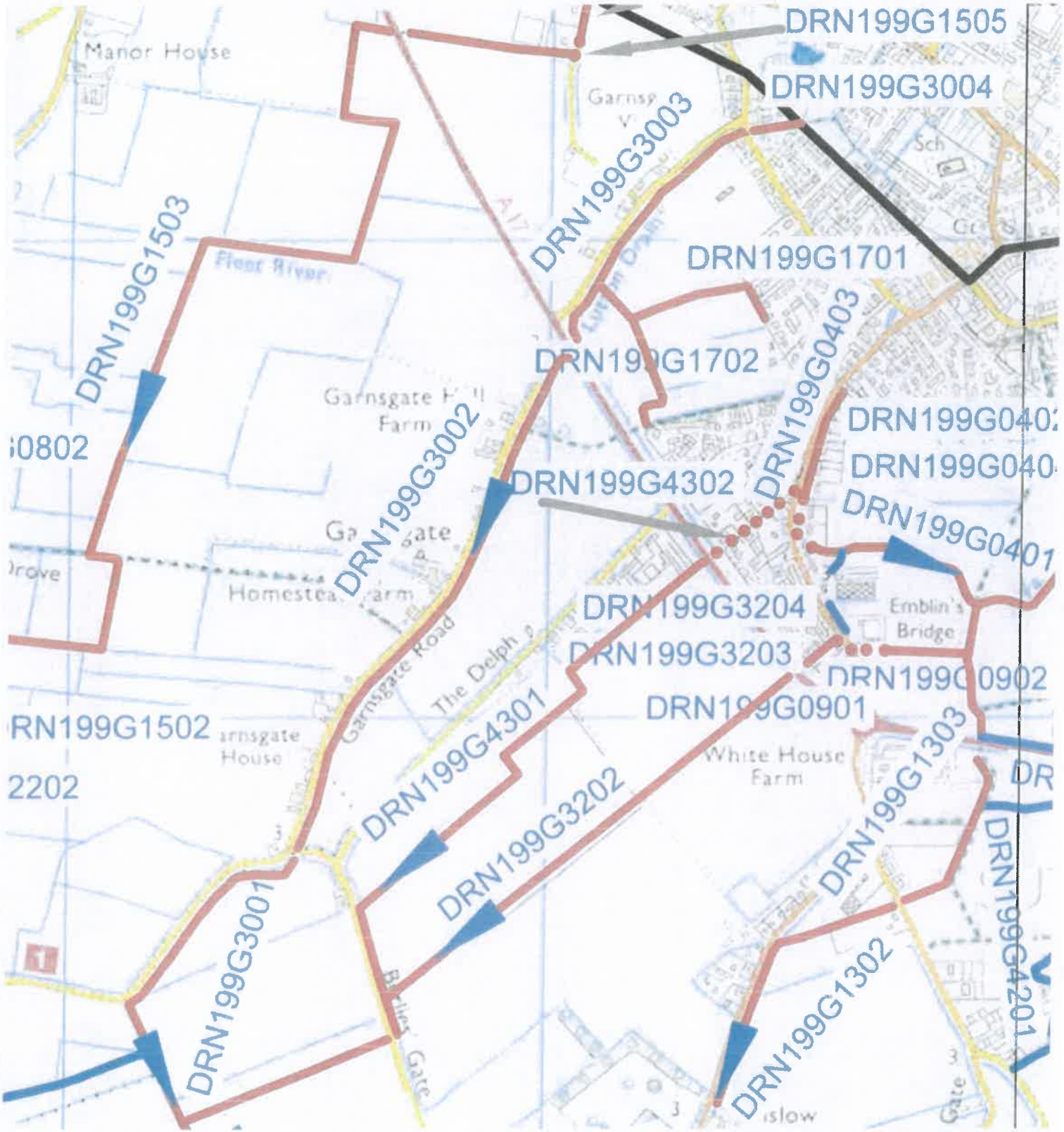
- On site rainwater from the development will be discharged to soakaways to BRE 365 design requirements.

- Floor levels are 500mm above existing land level with flood resilient construction up to 300mm above finished floor level to safeguard against the risk of flooding from tidal defences being breached in year 2115.


DELPH ROAD
Serenity
0m
10m
20m
30m
Promap


Garnsgate Hall Farm
Garnsgate Hall Cottage
Garnsgate
Homestead Farm
Lutton Gowts Drain
Lutton Gowts
B1390

A1101
Long Sutton
Sutton
Manor Hb
Old Gate


DRN199G1505
DRN199G3004
DRN199G3003
DRN199G1503
DRN199G1701
DRN199G1702
DRN199G0403
DRN199G3002
DRN199G4302
DRN199G0401
DRN199G3204
DRN199G3203
DRN199G4301
DRN199G0901
DRN199G3202
DRN199G1303
DRN199G3001
DRN199G1302
DRN199G4201
Manor House
Fleet River
Garnsgate Road
The Delph
Emblin's Bridge
White House Farm
Homestead Farm
Garnsgate House
Bullers Gate