

structural

civil

transportation

environmental

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Land at Station Road, Kirton in Lindsey.

Flood Risk and Drainage Feasibility Statement

For

Mr. J H Franklin

**09119: FR&DFS**  
**Original: April 2009**

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**1.0 Introduction****1.1 Terms of Reference**

- 1.1.1 BSP Consulting has been commissioned by Mr. J H Franklin to undertake a Flood Risk and Drainage Feasibility Statement for the proposed development of land Station Road, Kirton in Lindsey.
- 1.1.2 In the preparation of this report a copy of sewer records for the locality have been obtained from Severn Trent Water (STW). A site visit has been undertaken to walk the local area, assess the local topography and proposed development site constraints.
- 1.1.3 This Flood Risk and Drainage Feasibility Statement has been prepared in accordance with the Department for Communities and Local Government (DCLG) publication 'Planning Policy Statement 25 (PPS25) Development and Flood Risk' and in line with current guidance and best practice.
- 1.1.4 This report has been produced on behalf of the client, Mr. J H Franklin, and no responsibility is accepted to any third party for all or any part. This report should not be relied upon or transferred to any other parties without the express written authorisation of BSP Consulting. If any unauthorised third party comes into possession of this report, they rely on it at their own risk and the authors owe them no duty of care or skill.

**1.2 PLANNING POLICY STATEMENT 25 (PPS 25)**

- 1.2.1 The final version of PPS 25 was released on the 7<sup>th</sup> December 2006 by DCLG and replaced the previous guidance on development and flood risk stated in PPG 25. PPG 25 has now been withdrawn.
- 1.2.2 PPS 25 can be downloaded free of charge from the internet at the following link:

<http://www.communities.gov.uk/publications/planningandbuilding/pps25floodrisk>

## 2.0 Background Information

### 2.1 Site Location, Description and Details

- 2.1.1 A detailed site location plan is located in Appendix A.
- 2.1.2 The site has an area of 2.91ha and is located to the west of Station Road, Kirton in Lindsey at OS GR: 493200E, 399200N.
- 2.1.3 The site is currently an open grassed field. The site is bounded by existing residential development to the south, light industry and open fields to the north and a railway to the west. The field to the south west is used for horse grazing.
- 2.1.4 Ordnance survey mapping indicates a number of small watercourses draining from the west of Kirton in Lindsey towards the River Trent Valley via the River Eau, which flows through Scotter. This mapping is indicated below on Fig 2.0.

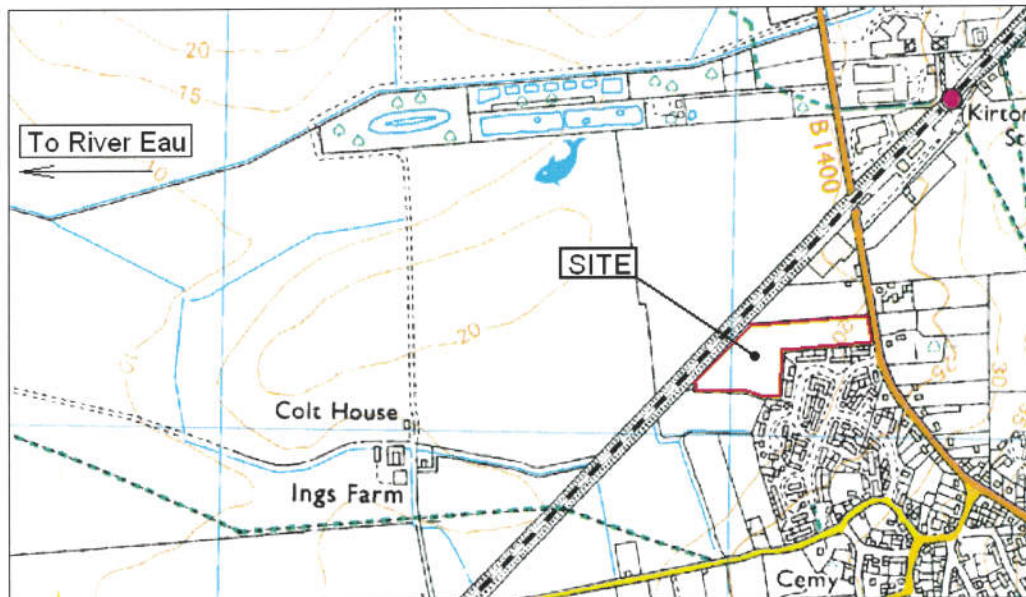


Fig 2.0 Site location and local watercourse mapping

- 2.1.5 The site walkover confirmed that the predominant fall of the land is from east to west, in line with the general area. Station Road falls towards the north and an open ditch course is present to the north of the railway along the east of Station Road. This appears to drain the highway and land to the east of Station Road.

## 2.2 Main Drainage Catchment Context and Local Watercourse Classifications

### Main Rivers

River Eau: Non Tidal, Main River which flows from south to north 2.5km to the west of the site.

### Watercourses

Unnamed watercourse: An unnamed watercourse flows west from South-Dale Close approximately 80m south of the site. This drain picks up highway drainage.

### Adopted Main Sewers

Surface Water: No adopted surface water sewers are noted on the STW sewer records of Kirton in Lindsey.

Foul Water: Adopted foul sewers are noted to be present in the development to the south of the site and in Station Road to the east of the site.

Highway Drain: A highway drain is indicated on the STW sewer records. This appears to drain part of Station Road through the development that lies immediately to the south of the site.

The locations of the adopted sewers and highway drain are indicated on the STW sewer records included in Appendix C. Fig 2.0 above shows the location of the unnamed watercourse.

## 2.3 Approach To The Assessment

- 2.3.1 This assessment seeks to consider the risks of flooding both to the site and to the wider area as a consequence of the development proposal and means by which the site be safely drained. This also requires assessment of the development constraints of the site and the opportunities offered by the existing infrastructure and natural environment in order to propose a strategy by which the site can be developed both economically and sustainably. This assessment draws upon our investigations and experience within the local area.

### **3.0 Flood Risk and Drainage Feasibility Statement**

#### **3.1 Flood Risk Context**

##### 3.1.1 Fluvial Flood Risk

3.1.2 The site is noted to lie in the low risk flood zone 1 and therefore the risk of flooding from rivers is less than 1 in 1000 years. The River Eau lies about 2.5km west of the site at a lower level. This watercourse is therefore not considered to present a flood risk to the proposed development. There are no other significant watercourses within influence distance of the site.

##### 3.1.3 Tidal Flood Risk

3.1.4 Kirton in Lindsey is remote from the coast and the River Eau is not tidal. The site is therefore not at risk of flooding from tidal sources.

##### 3.1.5 Surface Water Flood Risk

3.1.6 The site is located on the lower west side of Station Road. The local topography to the east of Station Road is more steeply sloping. The general fall is towards the west. Any sheet runoff from the developed and rural area to the east of Station Road would be intercepted by the highway and highway drainage in Station Road. During the site walkover it appeared as though the highway drainage in Station Road drained towards the north, in line with the topography, and into the open ditch to the north of the railway. In either event the highway would intercept any flow heading towards the site. The site is therefore not at risk of flooding from sheet run-off from adjacent land.

3.1.7 The site is greater than 1 hectare in size and therefore there is an inherent risk of localised on site flooding from the development sewerage and of increasing the flood risk to others. This risk is a result of a greater the rate of runoff from any increase in the area of impermeable surfaces following the development.

3.1.8 The proposals for the management of surface water in section 3.4 of this report seek to address this issue.

##### 3.1.9 Flood Risk from Ground Water

3.1.10 There are no springs noted to be present in the local area of the site and the site was noted to be dry during the site walkover. The site is therefore not at risk of flooding from ground water.

##### 3.1.11 Flood Risk from Infrastructure

3.1.12 The site is not within close proximity of any reservoirs, canals or wet process industrial works. This site is not at risk of flooding from sewers or water mains based on the comments raised in paragraph 3.1.6.

### 3.2 Development Description and Planning Context

- 3.2.1 The current development proposals are for residential dwellings as outlined on the Proposed Site Layout included in Appendix B.
- 3.2.2 In accordance with PPS 25, the proposed residential end use falls under the More Vulnerable category in terms of flood risk. All forms of development are appropriate in flood zone 1.

### 3.3 Pre Development Surface Water Runoff

- 3.3.1 The existing greenfield site benefits from the presence of land drainage as indicated below in Fig 3.0. This historical plan was passed to us by the land owner.

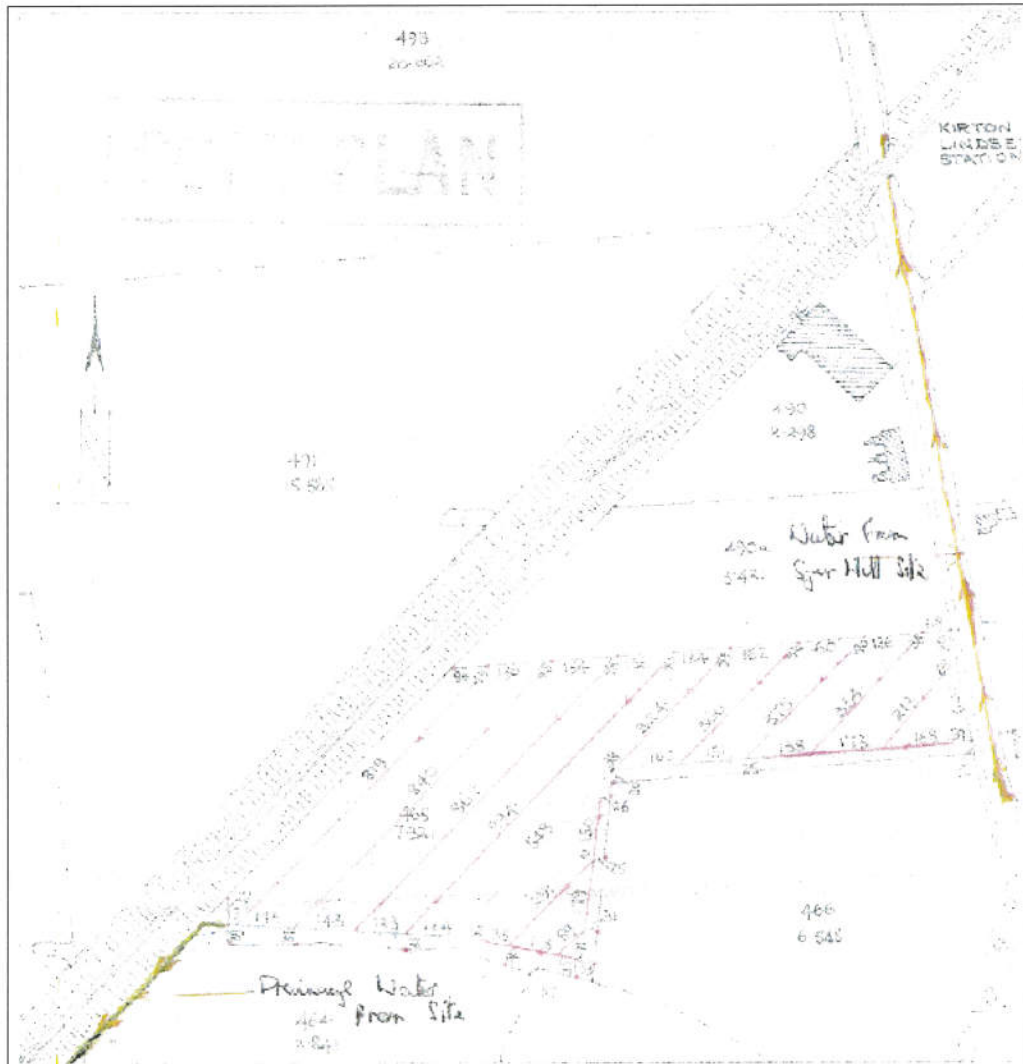


Fig 3.0 Records of the land drainage at the site

- 3.3.2 The land drainage flows generally south west and enters a ditch course at the east of the railway. This ditch course has become silted up over time and was noted to be present only as a shallow depression during the site walkover.
- 3.3.3 Fig 3.0 also indicates the line of the highway drain in Station Road heading north to join up with the open ditch course.
- 3.3.4 The land drainage generally lowers the water table and gives a more rapid runoff response than is normal for a simple green-field site.
- 3.3.5 During extreme rainfall events the capacity of the land drainage system would be exceeded. Exceedance flood water would flow south west across the site to open ditch course at the south west of the site.

#### **3.4 Proposed Developed Site Surface Water Strategy**

- 3.4.1 The development proposal is for residential dwellings and roadways. These impermeable areas are to be positively drained.
- 3.4.2 The impermeable areas of the proposed layout will need to be drained to prevent the build up of surface water on the site.
- 3.4.3 The use of soakaways and other such infiltration drainage techniques should be investigated at the detailed design stage once a phase 1 and 2 site investigation has been undertaken.
- 3.4.4 If viable it is proposed that permeable paving and soakaways are utilised as a preferable means for the disposal of surface water from the site.
- 3.4.5 If infiltration drainage is not a viable option for the site then it is proposed that surface water from the site should be attenuated in open or closed surface water balancing facilities prior to release at a rate equivalent to the existing site runoff.
- 3.4.6 The point of discharge should be to the ditch course at the south west of the site, in line with the existing situation. This ditch course is in poor condition and will need to be cleaned out to restore it to its original depth which is understood to be in the order of 600mm deep. A potential solution is indicated on the Proposed Site Drainage Arrangements drawing included as Appendix D.
- 3.4.7 On the basis that either attenuated flows or soakaways are utilised in the final design it can be confirmed that the proposed development will be safe from flooding without increasing the risk of flooding to others. This proposal is therefore compliant with PPS 25 - Development and Flood Risk.
- 3.4.8 The final design proposals will need to be verified by Building Control, Severn Trent Water and the Environment Agency as necessary.



**3.5 Design Considerations for Exceedance**

- 3.5.1 The proposed surface water drainage system should be designed to accommodate the 1 in 30 year rainfall event without any surface water flooding and should be capable of retaining the 1 in 100 year plus climate change storm event on site without flooding any buildings.

**3.6 Climate Change**

- 3.6.1 Climate change is recognised as a factor for consideration in terms of its effect on surface water runoff. This issue affects the likely future runoff from developed areas to the extent whereby it is proposed that the detailed surface water design calculations should be checked with a factor of 1.3 to assess exceedance flows.

**3.7 Pre Development Foul Water Regime**

- 3.7.1 The site is currently a grassed field and there is no provision for foul drainage at the site.

**3.8 Proposed Developed Site Foul Water Strategy**

- 3.8.1 The foul water flows to be generated by the proposed development should be accommodated within the adopted foul sewer network.
- 3.8.2 Adopted foul pump stations are present to both the south and north of the site and an adopted foul sewer runs along Station Road at the site frontage. The detailed design and discussion with STW will confirm whether or not it is possible to drain to these locations under gravity or whether additional pumping is required.
- 3.8.3 A potential solution is indicated on the Proposed Site Drainage Arrangements drawing included as Appendix D.
- 3.8.4 The final design proposals will need to be verified by building control and Severn Trent Water as necessary.

**3.9 Land Drainage**

- 3.9.1 The land drainage that is currently present on the site will become obsolete as the development progresses.
- 3.9.2 It is not envisaged that there will need to be any accommodation works carried out as part of the design proposals to reconnect or divert any land drainage on the site.

**3.10 Development Considerations**

- 3.10.1 The levels of dwellings should be slightly elevated above the external levels in order that any localised, site generated, flood water would not enter the dwellings.

#### **4.0 Recommendations**

4.1 The following recommendations are made to reduce flood risk and promote a sustainable and practicable drainage strategy at the proposed development:

- If infiltration drainage techniques are proven to be viable it is proposed that permeable paving and soakaways are utilised as a preferable means for the disposal of surface water from the site.
- If surface water is to be drained to the existing point of discharge then the ditch course at the south west of the site should to be cleaned out to restore it to its original depth, which is understood to be in the order of 600mm deep. This should then be used as the final point of discharge for surface water from the site. The discharge should be restricted to the existing runoff rate.
- The detailed design of the foul drainage system should be progressed in consultation with STW to confirm the proposed outfall location and if it is possible to drain to the adopted sewer network under gravity or whether additional pumping is required.
- The levels of dwellings should be slightly elevated above the external levels in order that any localised, site generated, flood water would not enter the dwellings.

#### **Disclaimer**

We would note that all comments made in this report are based on the sources stated in Section 1.1. This report and its recommendations are intended for the use of Mr J H Franklin for the above site only.

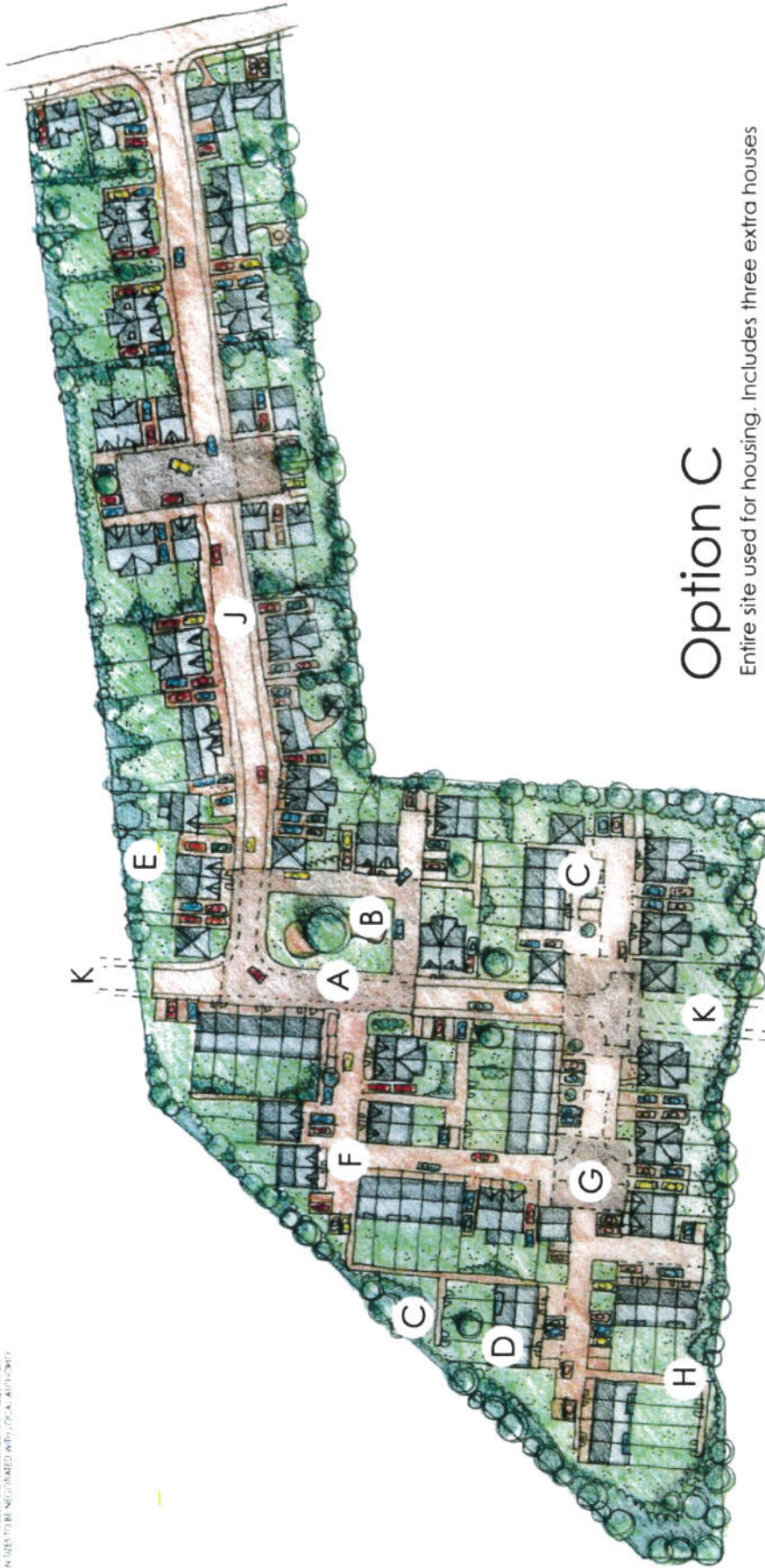
Appendix A  
Site Location Plan



*Station Road, Kirton in Lindsey – Detailed Site Location Plan*

**Appendix B  
Proposed Site Layout**

THIS DRAWING IS BASED UPON INVESTIGATION PROVIDED BY OTHERS  
 AND WHICH FRANKLIN ELLIS AND PARTNERS ARE NOT RESPONSIBLE FOR  
 THE ACCURACY OF THE INFORMATION PROVIDED. THE DRAWING IS FOR  
 ALL AREAS AND DIMENSIONS ARE IN METERS ONLY.  
 NO LIABILITY WILL BE ACCEPTED FOR NEGLIGENCE OR OTHERWISE.  
 REAR GARDENS (NOT) BE NEGOTIATED WITH LOCAL AUTHORITY



## Option C

Entire site used for housing. Includes three extra houses

- A. Courtyards as a place defined by surface treatment
- B. Informal play space included as a village green. Safe, attractive and creates a sense of place
- C. 10m buffer zone with existing planting retained to railtrack edge
- D. 150% car parking for terraced house and 200% for semi-detached and detached houses
- E. 12m rear gardens in the main
- F. Shared surface streets defined by houses to encourage slow cautious driving
- G. Shared surface courtyards included turning heads that are not defined by kerbs
- H. Rear garden access
- J. Adaptable feeder road, 5.5m wide with pavements to both sides
- K. Location of potential future access points to adjacent sites

Schedule	
33nr	2br houses
36nr	3br houses
30nr	4br houses
99nr houses in total	



Proposed New Residential Development  
 Kirtton in Lindsey, North Lincolnshire

1:435 SK3 / Option C / 1:1000 scale @ A3 approx / 01.02.2008

**Appendix C**  
**Severn Trent Water Sewer Records**



**Appendix D**  
**Proposed Site Drainage Arrangements**



