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Caulton's Field, Deeping St Nicholas, Lincs

Flood Risk Assessment
For
Trustees of D W Dennis Settlement

15736/FRA
Original February 2016

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Flood Risk Assessment

Proposed Development, Caulton's Field, Deeping St Nicholas

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Revision: -

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Executive Summary

Introduction	BSP Consulting has been commissioned by Trustees of D W Dennis Settlement to undertake a Flood Risk Assessment for a proposed residential development at Caulton's Field, off Littleworth Drove, Deeping St Nicholas, Lincolnshire. This Flood Risk Assessment has been prepared in accordance with the Department for Communities and Local Government (DCLG) publication 'Technical Guidance to the National Planning Policy Framework'.
Existing Site Conditions	The existing site occupies an area of approximately 3.19 ha and is located to the north west of Littleworth Drove, Deeping St Nicholas. The survey shows site levels to undulate. Typical levels are between 2.7 and 0.9m AOD with an average level at or about 1.4m AOD. The levels adjacent the frontage with Littleworth Drove are at or around 3.1m AOD. Drainage ditches were noted to be present to both the north east and south west of the site.
Development Description and Planning Context	The proposal is for the construction of a new residential development, the necessary supporting infrastructure and landscaped open space. In accordance with the National Planning Policy Framework, the proposed "dwelling houses" use falls under the **more vulnerable** category in terms of flood risk.
Definition of Flood Hazard	The River Welland is the primary main river to the south of Deeping St Nicholas. The site is protected from the risk of flooding from tidal sources by the flood defences to the local rivers and the WDIDB pumping station at Pode Hole.
Probability	The EA Flood Map for Planning indicates that site frontage with Littleworth Drove is in the medium risk Flood Zone 2 and would be at risk of flooding in a 0.1% (1:1000 year) probability flood event due to flooding from the River Welland. The north west of the site is noted to be in the High Risk Flood Zone 3 and would be at risk of flooding in a 1.0% (1:100 year) probability flood event due to flooding from the River Welland. The Year 2115 1% Fluvial/ 0.5% Tidal Event Probability flood mapping that was produced for the SFRA indicates flooding generally to the south east of Deeping St Nicholas with flooding emanating from the River Witham. This flood depth mapping indicates a zero depth of flooding at the site as a result of breaching or overtopping of the flood defences.
Climate Change	The implications of climate change have been taken into account in the modelling work that was carried out for the SFRA.
Detailed Development Proposals	The National Planning Policy Framework states that developments of a more vulnerable category such as the proposed residential use are appropriate within Flood Zones 2 and 3 subject to the sequential/exception tests being passed by the Local Planning Authority.
Flood Risk Management Measures	Mitigation measures with regard to floor level, site levels, SuDS drainage and flood warning are proposed for this site.
Off Site Impacts	The proposed development surface water strategy is to discharge to the IDB drainage network at their greenfield runoff rate therefore the proposed development will not increase or exacerbate any flooding problems adjacent to or downstream of the site for the proposed scheme lifetime.
Residual Risks	The investigations carried out as part of this flood risk assessment and flood risk management measures proposed have demonstrated that the development will be safe, without increasing flood risk elsewhere.
Recommendations	The following recommendations are made to ensure flood risk is minimised: • Finished floor levels will be set at least 150mm above proposed surrounding ground levels with levels falling through the site in line with the proposed surface water drainage strategy. • Flood flow corridors will be set up as part of the levels strategy to allow the safe passage of surface water runoff through the site. • Permeable paved roads, filter strips and swales are proposed as source control SuDS features to give primary treatment to surface water runoff. • An attenuation pond in the form of a typically dry detention basin is proposed at

	this stage to act as site control SuDS with the final discharge to the offsite drainage restricted to an allowable discharge of 4.4 l/s for all storms up to and including the peak 1:100 year plus 30% climate change rainfall event. • The final form of the SuDS to be incorporated in this scheme to give the necessary water quality improvements will be developed in the detailed scheme design. • It is proposed that foul water from the site shall be discharged to the adopted foul water sewer in Herdsman's Close to the south of the Littleworth Drove. • The prospective occupants should to register to receive flood warnings.

1.0 INTRODUCTION

1.1 TERMS OF REFERENCE

1.1.1 BSP Consulting has been commissioned by Trustees of D W Dennis Settlement to undertake a Flood Risk Assessment for a proposed residential development at Caulton's Field, off Littleworth Drove, Deeping St Nicholas, Lincolnshire.

1.1.2 In the preparation of this report, consultations have been undertaken with the Environment Agency (EA), Welland and Deepings IDB (WDIDB) and South Holland District Council. A site visit was made in February 2016, to walk the local area, to assess the local topography, significant watercourses and current site use. The South Holland District Council Update of Strategic Flood Risk Assessment Final Report January 2010 has also been referred to.

1.1.3 This Flood Risk Assessment has been prepared in accordance with the Department for Communities and Local Government (DCLG) publication 'Technical Guidance to the National Planning Policy Framework' while retaining the layout as recommended in the superseded 'Planning Policy Statement 25 (PPS25) Development and Flood Risk'.

1.1.4 This report has been produced on behalf of the client, Trustees of D W Dennis Settlement, 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 NATIONAL PLANNING POLICY FRAMEWORK

1.2.1 The National Planning Policy Framework was published on 27 March 2012. This replaces Planning Policy Statement 25: Development and Flood Risk.

1.2.2 Technical Guidance to the National Planning Policy Framework has been published and this site specific FRA is written in compliance with this guidance.

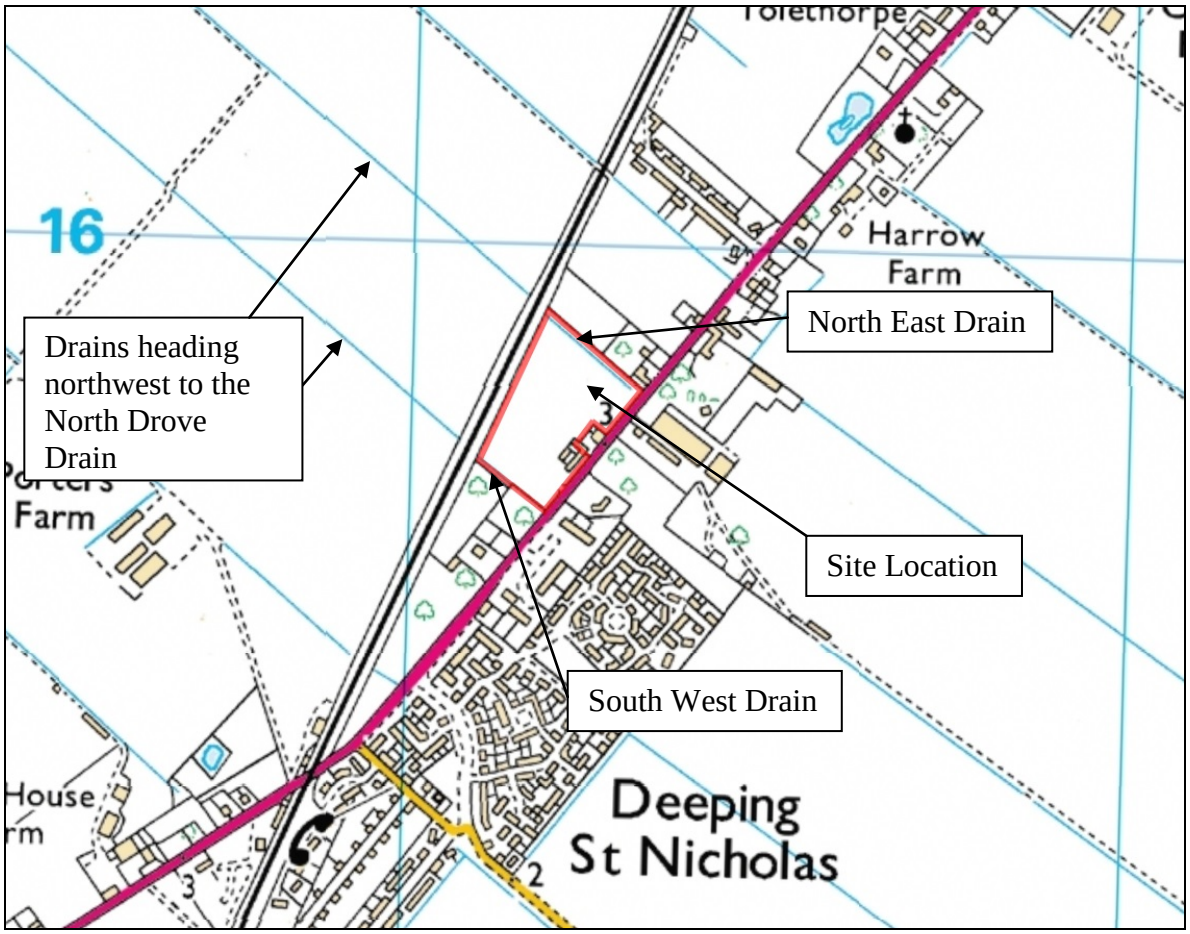
1.2.3 The National Planning Policy Framework, and supporting technical guidance, can be downloaded free of charge from the internet at the following link:

http://www.communities.gov.uk/publications/planningandbuilding/nppf

2.0 BACKGROUND INFORMATION

2.1 SITE LOCATION, DESCRIPTION AND DETAILS

2.1.1 Figure 2.1 below indicates the location of the site; a detailed site location plan is included in Appendix A. A site visit was made in February 2016, to walk the local area, to assess the local topography, significant watercourses and current site use.



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Figure 2.1 Caulton's Field, Deeping St Nicholas - Site Location Plan

2.1.2 The existing site occupies an area of approximately 3.19 ha and is located to the north west of Littleworth Drove, Deeping St Nicholas at OS GR 521200E 315760N. The site had been close cropped and was in the process of being ploughed for agriculture at the time of the site visit. The site is bounded by existing dwellings to the north east and south with a railway to the western boundary. Photographs of the site and locality are shown below in figures 2.2-2.7.

2.1.3 A topographical survey of the site has been carried out and a copy of this is included as Appendix B. This shows site levels to undulate. Typical levels are between 2.7 and 0.9m AOD with an average level at or about 1.4m AOD. The levels adjacent the frontage with Littleworth Drove are at or around 3.1m AOD. The site appears to be well drained. This regime is as noted on the topographical survey in Appendix B.

2.1.4 Drainage ditches were noted to be present to both the north east and south west of the site. Positive outfalls were present under the railway heading north west from the site towards the main drainage to the north of the site.

2.1.5 Site and Local Area Photographs



Figure 2.2 Site frontage onto Littleworth Drove. (Looking North)



Figure 2.3 General site view. (Looking south west)



Figure 2.4 Drain at the north east of the site. (Looking North West)



Figure 2.5 Piped outfall from the North East Drain under the adjacent railway.



Figure 2.6 North western boundary fence. (Looking south west)



Figure 2.7 Piped outfall from the South West Drain under the adjacent railway.

2.1.6 Overall Catchment Context and Local Watercourse Classifications

River Welland:	Non-tidal but tide locked Main River which flows from south to north 3km to the south east of the site.
North Drove Drain:	Non Tidal, IDB maintained land drainage watercourse which flows from southwest to northeast 3.5km to the north west of the site.
North East Drain:	Non Tidal, riparian land drainage watercourse which flows from southeast to northwest immediately to the north east of the site.
South West Drain:	Non Tidal, riparian land drainage watercourse which flows from southeast to northwest immediately to the south west of the site.

The locations of the above named drains in relation to the site are shown on Figure 2.1 above.

2.2 APPROACH TO THE ASSESSMENT

2.2.1 The Environment Agency (EA) has been contacted regarding predicted floodplain flood levels and flood extent data. They have confirmed that the appropriate source for this data is the South Holland District Council Update of Strategic Flood Risk Assessment Final Report January 2010. This assessment seeks to draw together the relevant level information from the EA, IDB and SHDC and to collate this with the findings of our investigations and discussions to assess the flood risk at this site.

3.0 FLOOD RISK ASSESSMENT

3.1 DEVELOPMENT DESCRIPTION AND PLANNING CONTEXT

3.1.1 The proposal is for the construction of a new residential development, the necessary supporting infrastructure and landscaped open space.

3.1.2 The local area benefits from a Strategic Flood Risk Assessment. This assessment is the South Holland District Council Update of Strategic Flood Risk Assessment Final Report January 2010 was produced by Royal Haskoning for South Holland District Council.

3.1.3 In accordance with the National Planning Policy Framework, the proposed residential development of "dwelling houses" use falls under the **more vulnerable** category in terms of flood risk.

3.2 DEFINITION OF THE FLOOD HAZARD

3.2.1 The potential sources of flooding in the vicinity of the site are as detailed below:

3.2.2 Fluvial Flood Risk

3.2.2.1 The River Welland is the primary main river to the south of Deeping St Nicholas. It lies 3km to the south of Deeping St Nicholas at its closest to the site. Primary drainage for Deeping St Nicholas is provided by the North and South Drove Drains. In turn these IDB drains are drained to the River Welland to the north east of Spalding, via a pumping station at Pode Hole and the Vernatt's Drain. Following a data request the EA have confirmed that the appropriate source for flood data for the River Welland is the South Holland District Council Update of Strategic Flood Risk Assessment Final Report January 2010 (SFRA). A copy of this confirmation is included in Appendix D.

3.2.2.2 We have obtained the relevant information from the SFRA from South Holland District Council.

3.2.2.3 The risk for flooding from the River Welland is covered in more detail in the following section 3.3 Probability.

3.2.2.4 WDIDB have confirmed that they maintain much of the local land drainage but not the drains at the site. The connecting outfall pipes of the site drainage to the drains to the north west were observed to be clear of blockage at the time of the site visit. Some standing water was noted in the South West Drain but not in the North East Drain. The land drainage at Deeping St Nicholas is served by the North and South Drove Drains. WDIDB have confirmed that they do not hold flood depth information for the locality but that they are not aware of any flooding to the site. The North and South Drove Drains do not therefore present a significant flood risk to the site.

3.2.3 Tidal Flood Risk

3.2.3.1 The site is at a minimum level of 0.9m above mean sea level. The site is protected from the risk of flooding from tidal sources by the flood defences to the local rivers and the WDIDB pumping station at Pode Hole. The issue of tidal flood risk is addressed in more detail in the following section 3.3 Probability.

3.2.4 Surface Water Flood Risk

3.2.4.1 The site is located in a generally flat area with very gentle falls that are not perceivable from Ordnance Survey mapping. Generally flat areas do not tend to generate any quantum of sheet runoff and any surface flooding from pluvial sources tends to pond in localised depressions. The EA Surface Water Flood Risk mapping, included below as Figure 3.1, indicates that the site is at Very Low to Low risk of surface water flooding. The site is therefore not at significant risk of flooding from surface water flooding from adjacent land.

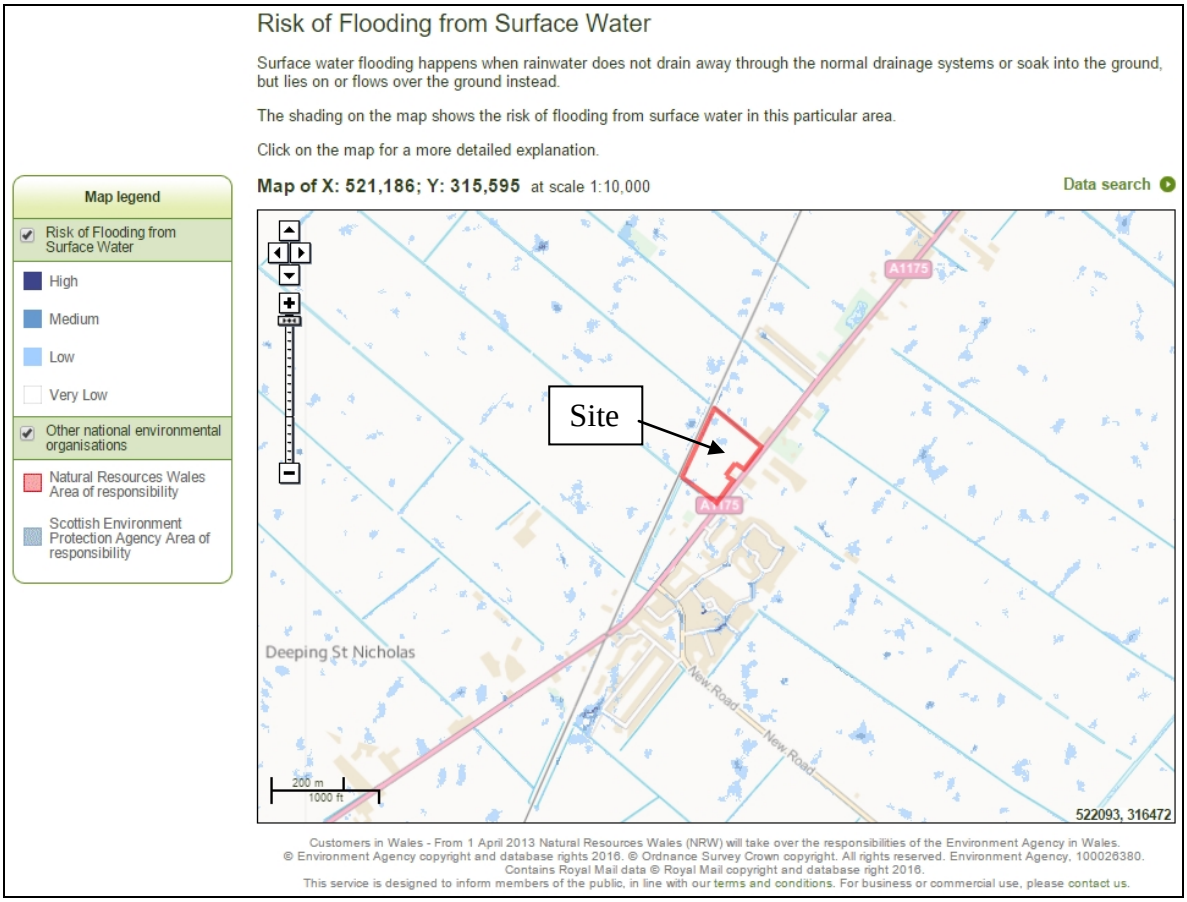


Figure 3.1 Caulton's Field, Deeping St Nicholas – EA Surface Water Flood Map

3.2.5 Flood Risk from Ground Water

3.2.5.1 The Phase 1 Site Investigation for this scheme notes the presence of drains separating the fields to the north-west of the site and that this indicates that groundwater is likely to be present at shallow depth beneath the site. It should be

noted that the drains are positively drained to the North Drove Drain and that this assists in keeping ground water levels at an acceptable level for agriculture. The site is therefore not at significant risk of flooding from ground water.

3.2.6 Flood Risk from Sewers and Infrastructure

3.2.6.1 There are no significant sewers in close proximity to the site. We are not aware of any flooding issues relating to the local minor sewerage. It is considered that local sewerage presents minimal risk to the proposed development.

3.2.6.2 With regard to the flood risk from reservoirs the SFRA notes "*There are three flood storage reservoirs within the district, namely Surfleet Reservoir, Crowland Washlands and Cowbit Washlands. The latter two are designated as large raised reservoirs under the Reservoir's Act 1975. The flood embankments associated with these reservoirs are the same as the flood defences of the River Welland and River Glen and have already been assessed for risk of overtopping and breach. No further assessment is therefore required.*" The Crowland Washlands and Cowbit Washlands flood storage reservoirs reduce the flood risk at this site and are remote from the site as they lie to the south east of the River Welland defences.

3.2.6.3 The site is not within close proximity of any wet process industrial works. The sewers and infrastructure flood risk source can therefore be discounted as a significant source of flood risk to the site.

3.3 PROBABILITY

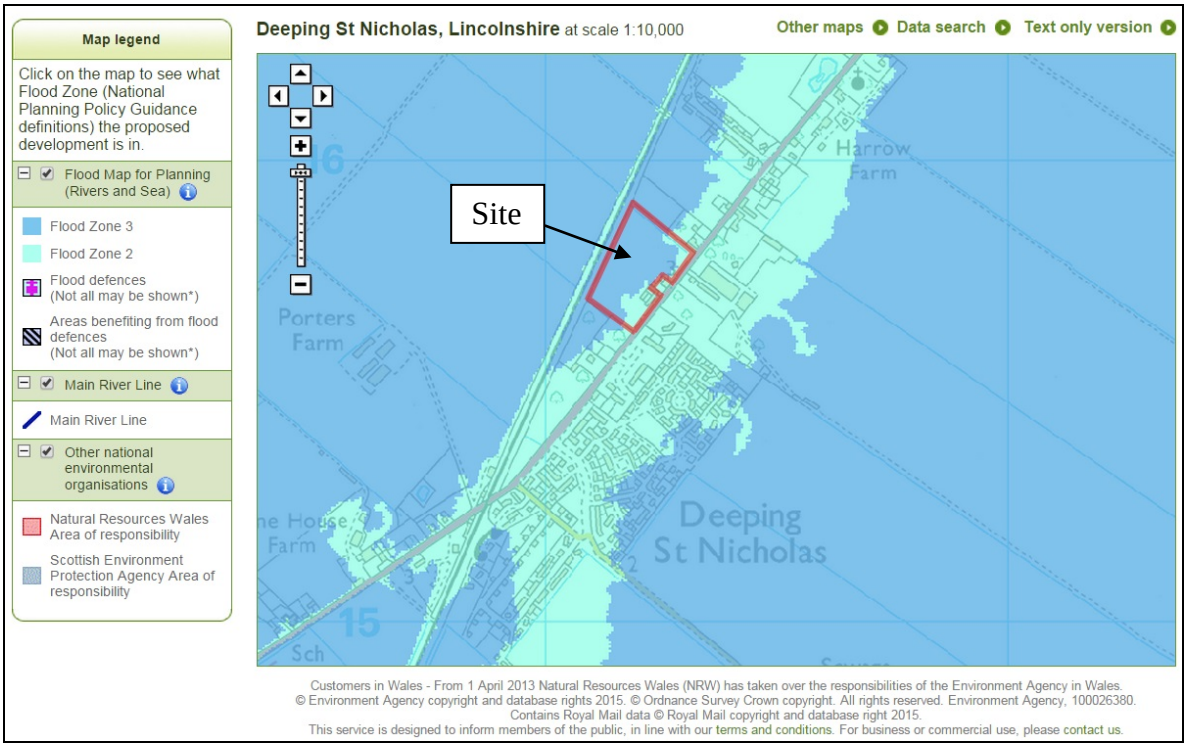


Figure 3.2 Caulton's Field, Deeping St Nicholas – EA Flood Map for Planning

3.3.1 The EA Flood Map for Planning, included above as Figure 3.2, indicates that site frontage with Littleworth Drove is in the medium risk Flood Zone 2 and would be at risk of flooding in a 0.1% (1:1000 year) probability flood event due to flooding from the River Welland. The north west of the site is noted to be in the High Risk Flood Zone 3 and would be at risk of flooding in a 1.0% (1:100 year) probability flood event due to flooding from the River Welland. This map shows the indicative extent of the natural floodplain, if there were no flood defences or certain other manmade structures, such as surface water sewers, and channel improvements.

3.3.2 The Year 2115 1% Fluvial/ 0.5% Tidal Event Probability flood mapping that was produced for the SFRA gives more detail with regard to flood risk at the site. The EA have agreed that this mapping should be used to assess potential flood depth at the site. As per the title this mapping takes into account both fluvial and tidal sources of flood risk. This mapping is reproduced below as Figure 3.3 and in Appendix D.

3.3.3 The mapping indicates flooding generally to the south east of Deeping St Nicholas with flooding emanating from the River Witham. This flood depth mapping indicates a zero depth of flooding at the site as a result of breaching or overtopping of the flood defences.

3.3.4 The site is therefore at "low risk" of flooding from fluvial and tidal flood risk sources, as though it were in Flood Zone 1.

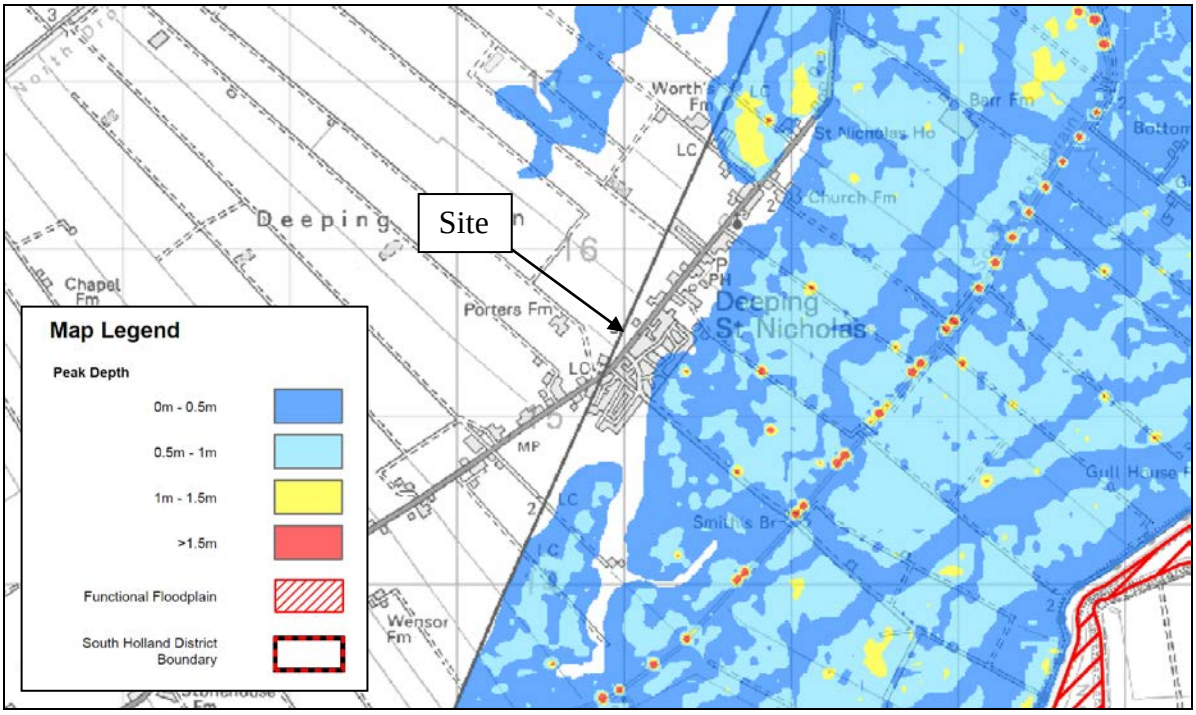


Figure 3.3 Caulton's Field, Deeping St Nicholas – SFRA Residual Peak Depth – District - Year 2115 1% Fluvial / 0.5% Tidal Event Probability

3.4 CLIMATE CHANGE

3.4.1 Climate change is recognised as a factor for consideration in terms of its effects on flood risk. This issue affects the local catchment from fluvial sources in as much as fluvial flood flows are estimated to increase by up to 20% over the next 100 years.

3.4.2 The implications of climate change have been taken into account in the modelling work that was carried out for the SFRA and in the discussions on probability above.

3.5 DETAILED DEVELOPMENT PROPOSALS

3.5.1 The proposed development and vulnerability classification are discussed in Section 3.1 above.

3.5.2 The National Planning Policy Framework states that developments of a more vulnerable category such as the proposed residential use are appropriate within Flood Zones 2 and 3 subject to the sequential/exception tests being passed by the Local Planning Authority.

3.6 FLOOD RISK MANAGEMENT MEASURES

3.6.1 Existing Flood Defences

3.6.1.1 There are formal flood defences adjacent the River Witham and flood storage reservoirs at Crowland Washlands and Cowbit Washlands that specifically reduce the risk of flooding from the River Welland at this site. These defences, and breaches of same, are addressed in the SFRA. These flood defences "*bank with road on crest*" are maintained by the EA and reduce the risk of flooding at this site.

3.6.2 Proposed Site Development and Finished Floor Levels

3.6.2.1 The development proposals are for the construction of a new residential development, the necessary supporting infrastructure and landscaped open space. It is proposed that finished floor levels will be set at least 150mm above proposed surrounding ground levels with levels falling through the site in line with the proposed surface water drainage strategy. This sets the proposed ground floor levels above any localised flood risk and provides safe flood flow corridors through the site.

3.6.3 Sustainable Site Drainage Systems

3.6.3.1 The site is essentially greenfield in its present state.

3.6.3.2 We have approached the strategy for the drainage of this site in accordance with the hierarchy for surface water disposal as set out in Part H of the Building Regulations. This hierarchy notes that surface water should be drained by

infiltration. Where this is not practicable it should be drained to a watercourse. Where neither of the above are practicable discharge should be made to a sewer.

3.6.3.3 Infiltration Drainage

3.6.3.3.1 As noted previously the Phase 1 Site Investigation for this scheme notes the presence of drains separating the fields to the north-west of the site and that this indicates that groundwater is likely to be present at shallow depth beneath the site. Additionally it is noted that the sub soils are anticipated to be silty clays and peats of the Barroway Drove Beds and they are likely to have poor in-situ permeability. "*In view of the anticipated poor permeability of the near surface strata and the likely shallow ground water beneath the site, it is considered that soakaways are unlikely to be viable at the site.*"

3.6.3.3.2 On the basis of the above it is evident that drainage of surface water from the site by infiltration is not a viable option for this site.

3.6.3.4 Drainage to a Watercourse

3.6.3.4.1 The North East Drain and South West Drain have been shown to have connectivity to the land drainage to the north west of the railway. These in turn drain to the North Drove Drain. The site currently drains to these watercourses with a dominant fall towards the North East Drain. The North Drove Drain is maintained by WDIDB and they have noted that if surface water is discharged to the drains that it should be restricted to the Board's Greenfield runoff rate of 1.4 l/s/ha.

3.6.3.4.2 The North East Drain outfalls under the railway in a 300mm diameter pipe at an invert level of 0.29m AOD. This would therefore provide a viable outfall for surface water from the site.

3.6.3.5 Drainage to a sewer

3.6.3.5.1 There is no evidence of any surface water sewers within close proximity to the site.

3.6.3.6 Proposed SuDS Surface Water Drainage Strategy

3.6.3.6.1 It is therefore proposed that the impermeable area of the developed site will be drained to the North East Drain at an attenuated rate in line with WDIDB requirements. Given that the site area is 3.19ha the allowable discharge from the site is 4.4 l/s. Flows from the site will need to be restricted back to this rate in the 1:100 year plus 30% climate change rainfall event.

3.6.3.6.2 The site development is as a residential development which will be served by adopted highways. In recent discussions with Lincolnshire County Council (LCC) Highways (as Highway Authority and LLFA) LCC have confirmed, in principle, that they will adopt permeable paved roads, filter strips and swales. Additionally they have noted that they will accept surface water flows from private areas subject to the agreement of commuted sums to cover for the increased

maintenance liability. We have therefore worked up a drainage strategy on the basis of the utilisation of these elements.

3.6.3.6.3 The impermeable area of the proposed development has been assessed and this amounts to circa 1.65ha.

3.6.3.6.4 An attenuation pond in the form of a typically dry detention basin is proposed at this stage to act as site control SuDS. Calculations have been undertaken on the basis of an allowable discharge from the proposed development of 4.4 l/s. The calculations included in Appendix E confirm that attenuation is provided for all storms up to and including the peak 1:100 year plus 30% climate change rainfall event.

3.6.3.6.5 The preliminary drainage strategy drawing included in Appendix E indicates how the site could be drained to the pond and how this discharge can be conveyed to the North East Drain.

3.6.3.6.6 The final form of the SuDS to be incorporated in this scheme to give the necessary water quality improvements will be developed in the detailed scheme design.

3.6.4 Foul Drainage

3.6.4.1 There is no discharge of foul water from the site in its current use.

3.6.4.2 Anglian Water sewer records have been acquired to confirm the location of the adopted foul sewerage in the vicinity of the site and a copy of the records is included in Appendix D. These records confirm that there is an adopted foul water sewer in Herdsman's Close to the south of the Littleworth Drove.

3.6.4.3 Given that there is a fall within the site away from Littleworth drove it is assumed that a gravity connection to the existing public sewers will not be achievable. A foul water pumping station has been included in the proposed site layout to allow pumping to the existing adopted sewer in Herdsman's Close. The layout of the proposed sewers is included on the preliminary drainage strategy drawing included in Appendix E. This drawing confirms the routing of the on-site sewers and the proposed rising main to a new connection to existing manhole 2601.

3.6.5 Flood Warning

3.6.5.1 The site lies in a flood warning area, as indicated below in Figure 3.4. This flood warning area is *"Eastern areas of Spalding on the right bank of the river Welland and surrounding areas, including Deeping St Nicholas, Crowland, Cowbit, Moulton and Whaplode"*. The prospective occupants should call Floodline on 0345 988 1188, select option 1 and enter Quickdial number 0311415 to register to receive flood warnings. This is an elective scheme that requires occupants to register to receive automated warnings in times of heightened flood risk.

3.6.5.2 Should a flood event reach the level where the village of Deeping St Nicholas will be at risk of inundation, then a severe flood warning will be issued by the

Environment Agency. Emergency services will then make arrangements to assist as necessary in the evacuation of occupants within the areas at risk of flooding to land in Flood Zone 1.

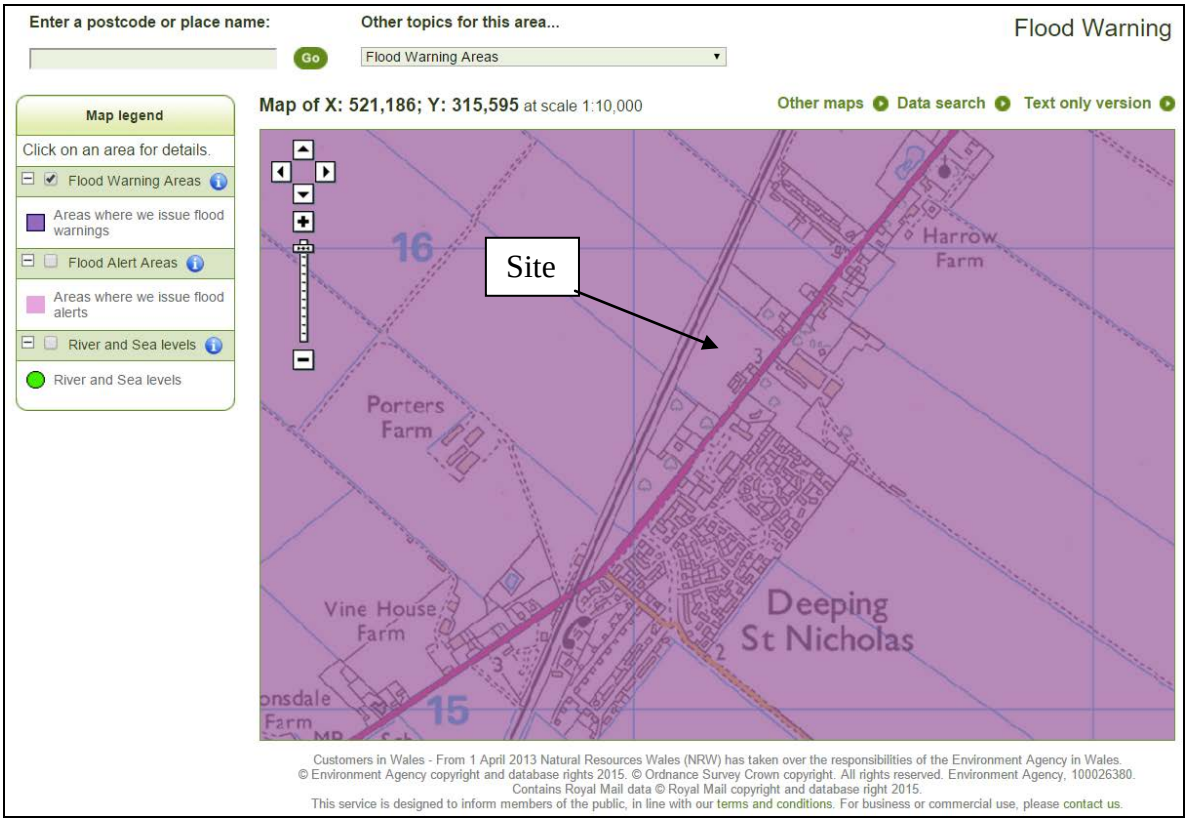


Figure 3.4 Caulton's Field, Deeping St Nicholas – EA Flood Warning Area Eastern areas of Spalding on the right bank of the river Welland and surrounding areas, including Deeping St Nicholas, Crowland, Cowbit, Moulton and Whaplode

3.7 OFF SITE IMPACTS

3.7.1 The proposed development surface water strategy is to discharge to the IDB drainage network at their greenfield runoff rate therefore the proposed development will not increase or exacerbate any flooding problems adjacent to or downstream of the site for the proposed scheme lifetime.

3.7.2 The site lies outside of the area at risk of flooding in a 1 in 20 year flood event therefore the site will not encroach into the functional floodplain.

3.8 RESIDUAL RISKS

3.8.1 The residual risks associated with the potential sources of flood risk have been discussed and mitigation proposed as previously noted.

3.8.2 The investigations carried out as part of this flood risk assessment and flood risk management measures proposed have demonstrated that the development will be safe, without increasing flood risk elsewhere.

4.0 RECOMMENDATIONS

4.1 The following recommendations are made to ensure flood risk at this site is minimised:

- Finished floor levels will be set at least 150mm above proposed surrounding ground levels with levels falling through the site in line with the proposed surface water drainage strategy.
- Flood flow corridors will be set up as part of the levels strategy to allow the safe passage of surface water runoff through the site.
- Permeable paved roads, filter strips and swales are proposed as source control SuDS features to give primary treatment to surface water runoff.
- An attenuation pond in the form of a typically dry detention basin is proposed at this stage to act as site control SuDS with the final discharge to the offsite drainage restricted to an allowable discharge of 4.4 l/s for all storms up to and including the peak 1:100 year plus 30% climate change rainfall event.
- The final form of the SuDS to be incorporated in this scheme to give the necessary water quality improvements will be developed in the detailed scheme design.
- It is proposed that foul water from the site shall be discharged to the adopted foul water sewer in Herdsman's Close to the south of the Littleworth Drove.
- The prospective occupants should to register to receive flood warnings.

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 Trustees of D W Dennis Settlement for the above site only.

Appendix A
Detailed Site Location Plan



Caulton's Field, Deeping St Nicholas – Detailed Site Location Plan

Appendix B
Topographical Survey

E521500.00 E521600.00 E521650.00 E521700.00 E521750.00 E521800.00 E521850.00 E521900.00 E521950.00 E522000.00 E522050.00 E522100.00 E522150.00

N316000.00 N315950.00 N315900.00 N315850.00 N315800.00 N315750.00 N315700.00 N315650.00 N315600.00 N315550.00 N315500.00

BLOCK HEADWALL
TOP 1.71
PIPE TOP 0.94
PIPE IL 0.29

DYKE
IL 0.39

WOODEN POST & WIRE MESH FENCE

DYKE
IL 0.66

INTERPOLATED FENCE LINE

DYKE
IL 0.76

<<< RAILWAY >>>

FENCE TOP 2.03

WOODEN POST & WIRE MESH FENCE

FENCE TOP 2.03

FENCE CENTRES

SHALLOW DYKE IL 0.76

DENSE HEDGE & TREES OVERGROWN DYKE

SHALLOW DYKE IL 0.76

DENSE TREES & HEDGE

WOODEN POST & WIRE FENCE

GRASS FIELD

STEEP BANK (WITHIN HEDGE)

BRAMBLES

DERELICT BARN

OVERGROWN HAY FENCE

BRICK RUBBLE

TREES & HEDGE

CHANNEL

THRESHOLD

DYKE
IL 0.43

DWELLING
RIDGE 5.61
EAVES 3.91

OUTBUILDINGS
RIDGE 3.94
EAVES 2.74

GUTTER TOP 2.45

GUTTER TOP 2.84

RIDGE 3.13

RIDGE 3.06

GUTTER TOP 2.74

RIDGE 3.04

GUTTER TOP 2.74

BRICK SUB-STN ROOF 5.61 FFL 3.41

BTMH's

PCC CHANNEL

FENCE

HEDGE

MH CL 3.17

BRICK WALL

PCC KERBS

STN 9009

STN 9010

BT POLE

BTMH

HEDGE & TREES

LITTLEWORTH GROVE

HERDSMANS CLOSE

NOTES

ABBREVIATIONS & SYMBOLS

AV	AIR VALVE	OHC	OVERHEAD CABLE
BH	BORE HOLE	PB	POST BOX
BOL	BOLLARD	PINV	PIPE INVERT LEVEL
CATV	CABLE TV MH	PM	PARKING METER
CCTV	SECURITY CAM	PO	POST
CL	COVER LEVEL	PT	PIPE TOP LEVEL
CH	CHANNEL	P/R	POST & RAIL FENCE
COL	COLUMN	P/W	POST & WIRE FENCE
DC	CABLE TV LID	RD	EDGE OF ROAD/NO KERB
DP	DOWN PIPE	RE	RODDING EYE/POINT
DR	DRAIN	RL	RIDGE LEVEL
EL	EAVES LEVEL	RP	REFLECTIVE POST
EP	ELECTRIC POLE	RS	ROAD SIGN
ER	EARTH ROD	SLVL	STONE LEVEL
FB	FLOWER BED	SOFF	SOFFIT LEVEL
FH	FIRE HYDRANT	SV	VALVE
FFL	FINISHED FLOOR LEVEL	SW	SURFACE WATER
FP	FLAG POLE	Tac	TACTILE PAVING
FW	FOUL WATER	TH	TRIAL HOLE
GV	GAS VALVE	TL	TRAFFIC LIGHTS
HW	HEADWALL	TLVL	TARMAC LEVEL
IC	INSPECTION COVER	TOW	TOP OF WALL LEVEL
IL	I NVERT LEVEL	TP	TELEGRAPH POLE
KB	KERB BOTTOM	TRK	TRACK
KO	KERB OFFLET	UTL	UNABLE TO LIFT
KT	KERB TOP	VP	VENT PIPE
LP	LAMP POST	WL	WATER LEVEL
LC	LIGHT COLUMN	WLVL	WATER LEVEL
MH	MANHOLE	WM	WATER METER
MP	MARKER POST	WO	WASH OUT POINT

FENCE
HEDGE
ELECTRIC
BANK EDGE
STORM LINE
FOUL LINE
TELECOM LINE
GAS LINE
LARSON PILES
CHANNELS
WATER MAIN

TREE
BOREHOLE
STATION
TBM
MANHOLE
GULLY
BATTER
WATER LVL
GATE

1. THE POSITION OF THIS SURVEY IS BASED ON GPS OSTN02 GRID.
2. ALL LEVELS RELATE TO GPS DATA ACQD. WITH TRIMBLE VRS.
3. TREES SPREADS ARE DRAWN TO SCALE AND SHOW THE GENERAL/AVERAGE CANOPY SPREAD.
4. ALL BELOW GROUND LEVEL INFORMATION INCLUDING VOIDS, DRAINAGE & SERVICES HAVE BEEN IDENTIFIED FROM THE SURFACE LEVEL ONLY, THEREFORE PIPE SIZES ETC ARE ESTIMATIONS ONLY. ALL CRITICAL DIMENSIONS SHOULD BE CHECKED PRIOR TO THE COMMENCEMENT OF ANY SITE WORKS.
5. EVERY EFFORT HAS BEEN MADE TO LOCATE AND SURVEY ALL VISIBLE FEATURES. IT SHOULD BE NOTED THAT SOME ITEMS MAY HAVE BEEN OBSCURED AT THE TIME OF THE SURVEY AND THEREFORE NOT SHOWN ON THIS DRAWING.
6. PHYSICAL BOUNDARY FEATURES SHOWN ON THIS DRAWING DO NOT NECESSARILY REPRESENT THE ACTUAL LEGAL BOUNDARIES. THIS INFORMATION SHOULD BE CONFIRMED WITH THE RELEVANT DOCUMENTATION.
7. THE CONTRACTOR MUST CHECK AND VERIFY ALL SITE LEVELS, DIMENSIONS, UTILITIES AND DRAINAGE DETAILS PRIOR TO THE COMMENCEMENT OF ANY SITE WORKS. ANY DISCREPANCIES MUST BE NOTIFIED TO DANIEL CHARLES SURVEYS LTD.
8. ALL SURVEY STATION CONTROL POINTS MUST BE CHECKED BY THE CONTRACTOR PRIOR TO STARTING ANY SITE WORKS.

SURVEY CONTROL POINT INFORMATION.

Point	Easting	Northing	Elevation
9000	521329.168	315791.215	3.253
9002	521278.671	315728.013	3.087
9003	521265.101	315711.076	2.993
76	521237.682	315676.649	3.013
9004	521216.663	315649.006	3.073
9006	521208.966	315652.080	3.074
9007	521232.775	315682.622	3.000
9008	521268.835	315728.394	3.067
270	521295.982	315763.593	3.216
9009	521272.798	315780.713	1.672
9010	521191.247	315720.088	1.916

SURVEY DATE	07/10/15	INITIALS	MJW

REV	AMENDMENTS	DRN	DATE

Client:
THE TRUSTEES OF THE
D W DENNIS SETTLEMENT

Project Title:
CAULTONS FIELD
LITTLEWORTH DROVE
DEEPING ST NICHOLAS

Drawing Title:
TOPOGRAPHICAL SURVEY

Scale @ A0:	Date:
1:500	08/10/2015
Drawing No: 15 - 175 - 01	Rev:
C.A.D.Title: grace machin deeping st nicholas\topo master.mjo	
Drawn By: MJW	Checked By: SRW

Daniel Charles Surveys Ltd
Land Surveying & Engineering Services
Honeywood Barn, Honeyholes lane,
Dunholme, Lincoln. LN2 3SU
Tel : 01673 860444 Fax : 01673 863362
Email : info@daniel-charles.co.uk
Website : www.daniel-charles.co.uk

Appendix C
Proposed Site Plan

Do not scale, use figured dimensions only. All discrepancies to be notified to Artech Designs Limited.
This drawing remains the copyright of Artech Designs Limited.

Scale Bar

0 25m 50m

10m 20m 30m 40m



Indicative Site Layout

Schedule:

Dwelling Unit Mix:
2 Bed units = 14no (21%)
3 Bed units = 33no (50%)
4 Bed Units = 19no (29%)

Total Number of Dwelling Units = **66no**

Total Site Area = **31,900m² or 3.19ha**

Public Open Space:
14% of developable area
(Site area) - (pond area) = 31,900 - 3,700 = 28,200
($\frac{28200}{100}$) x 14 = 3,948m²

Public Open Space Proposed = **4,050m²**
(Excludes the area allocated to the pond)

Developable Area:
Therefore, Site Density =
66units ÷ 2.82 = **23units/ha**

Parking Provision:
Each dwelling unit has a min. of **2no parking spaces**

Affordable Units:
30% of total number of units = **20no units**

Landscaping:

Existing hedges & trees to be retained where practical & protected. New trees planted as shown to be 2.75m high standards twice tied with rainbow ties to 63mm stakes & protected with plastic spiral guards. New hedges planted as shown in double rows at staggered 450mm centres. Plot boundaries to be Lincolnshire Post & Rail fence. Front Gardens to be turfed or grass seeded.

Existing Hedges to be retained.

Denotes new hedge planting as following specification:- Mixed hedge of hawthorn 50%, hazel 15%, field maple 5%, native crab 5%, spindle 5%, guelder rose 5%, wild rose 5%, purging buckthorn 5%, wayfaring tree 5%. Plant random mixture with hawthorn as dominant species & other plants in 3 or 5 of same species together as groups between hawthorn.

Denotes New Tree planting of native mix

Indicates permeable paved areas

Indicates Grassed & Soft Landscaping areas

New low level underplanting / shrubbery in mass planting format in min. groups of 10 at max. 900mm cts. made up of the following species:
Honeysuckle - Lonicera Periclymenum
Cotoneaster - C. Dammen
Guelder Rose - Viburnum Opulus
Box - Buxus Sempervirens

All beds excavated & filled with 400mm topsoil, subgrade well broken up. All beds covered in 50mm coarse bark mulch & maintained weed free. Hedgerows and shrubs to be irrigated to ensure establishment. Planting of trees, shrubs & hedgerows should be in accordance with BS. 4428:1989 and amendment no1 (1991) "Code of Practice" for general Landscaping Operations excluding hard landscaping. All failures are to be replaced within 5 year establishment period.

Close Boarded Fencing:
2.0m high comprising of 100 x 125mm pressure treated posts encased in lean mix concrete at max. 2.7m cts, ex. 25 x 125mm feather edge boarding with 20mm laps on 3no. ex. 75 x 75mm arris rails. 150 x 25mm gravel boards on 50 x 50 x 450mm stumps at both sides of posts & at mid panel locations.

Acoustic Barrier:
Formed at boundary position where indicated using solid close boarded fencing with gravel boards, to a min. height of 2.0m, all in line with the findings of the Noise Assessment report prepared by BSP Consulting Ref:15736/JAD.

NB: Any dwellings considered affected by noise would include construction proposals relating to External Walls, Roofs, Glazing and Ventilation as set out in Section 5 of the Noise Assessment Report prepared by BSP Consulting Ref:15736/JAD.

Revision	Description	Date
.	.	.

Trustees of D W Dennis Settlement

Caulton's Field, Littleworth Drove,
Deeping Saint Nicholas
Lincolnshire

Drawing:	Proposed Site Plan
Status:	Planning
Scale:	1:500 @ A1
Date:	February 2016
Drwg. No:	1429D/002
Revision:	.
Drawn by	mdf

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martin@artechdesigns.co.uk
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Appendix D
Correspondence

Tony Goddard

From: Lincs & Northants, Customer Enquiries <LNenquiries@environment-agency.gov.uk>
Sent: 31 December 2015 09:43
To: Tony Goddard
Subject: RE: 151222/SW10 RE: Data Request - Proposed Development at Littleworth Drove, Deeping St Nicholas, Spalding CCN/2015/516

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Tony,

Thank you for your email of 21 December 2015.

The site location is covered within the South Holland Hazard mapping, which should be used to inform any planning applications. The information can be found via the following link
http://www.sholland.gov.uk/environment/plandev/localplan/background/lfraupdatefinal2010.htm

The residual flood depths should be used to determine the finished floor levels.

- Single storey must have dry carpets in 0.1% (1 in 1000) plus CC (2115)
- All other must have FFL above 1% (1 in 100) plus CC (2115)

Our local team have advised we have Product 3 Basic Flood Risk Assessment available if required.

If you would like to discuss this further, please contact, Partnership & Strategic Overview Officer by calling 0203 025 3480 or email PSOWN@environment-agency.gov.uk

If you wish to purchase a Product 3, for you to use this information, we will require a payment of £60. This is not a charge for supplying the data, but a charge for the copyright licence which is set out in our Standard Notice. The Standard Notice explains how you may use the information you have asked for and will be sent to you when we send you your information.

This charge has been calculated as follows:

Copyright licence charge	=	£50
VAT @ 20 percent (GB 662 4901 34)	=	£10
Total cost	**=**	**£60.00**

(VAT Registration Number: GB 662 4901 34)

If you are paying by cheque, please can you make it payable to the 'Environment Agency' and send to the Customers and Engagement department at the address below. If you would prefer to pay by credit or debit card, please contact me using the number below. Please be aware for credit/debit card payments we will need to speak to the person named on the card before we can complete the transaction.

Once we receive your payment, we will aim to reply to your request within 10 working days. While we make every effort to reply within this time, please be aware that under Freedom of Information we have up to 20 working days to respond. Our policy states payment must be made before we can start to deal with your enquiry. If we have not received payment within 60 days of this letter being issued, we will assume you no longer require the information and your request will be closed.

In a recent survey, we found our customers prefer to receive a response from us by email. If you would like an alternative format or have any special requirements, please let me know and I will arrange for our response to be sent to you in this way.

I look forward to hearing from you.

Kind regards

Rebecca Baker
Customers & Engagement Officer

Environment Agency
Lincolnshire and Northamptonshire Area
✉ Waterside House, Waterside North, Lincoln, LN2 5HA
☎ 01522 785031
☎ 7 50 5031 (internal)
rebecca.baker@environment-agency.gov.uk
www.gov.uk/environment-agency



Awarded to Lincolnshire and Northamptonshire Area

Follow us on Twitter @LincsOpsEA

We constantly strive to provide a first-class service to our customers. Our customers give us feedback about what we have got right and wrong. If you would like to see the results of your feedback and what we have done to improve, please let me know.

From: Tony Goddard [mailto:T.Goddard@bsp-consulting.co.uk]
Sent: 21 December 2015 14:15
To: Enquiries, Unit
Subject: Data Request - Proposed Development at Littleworth Drove, Deeping St Nicholas, Spalding

Dear External Relations,

Please can you provide me with a quote for the data listed on the attached letter.

If you have any queries with this please call me.

Kind regards,

Tony Goddard BEng (Hons) CEng MICE
Associate Director

On Behalf Of
BSP Consulting
12 Oxford Street
Nottingham
NG1 5BG
Tel: 0115 8402227
Extension No: 209

email: t.goddard@bsp-consulting.co.uk
web: www.bsp-consulting.co.uk

Welland & Deepings
Internal Drainage Board

Welland & Deepings
Internal Drainage Board
Deeping House
Welland Terrace
Spalding
PE11 2TD

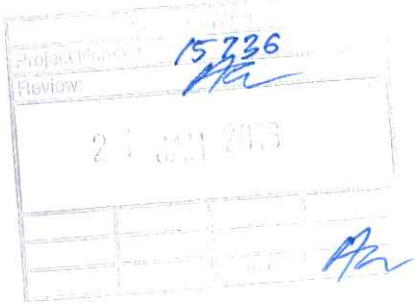
Chief Executive - Mrs Karen Daft

Operations Engineer – Nick Morris

Our Ref. JB/JP/P/D/5

Your Ref. AG/15736

18th January 2016



This matter is being handled by
Julian Boden

Mr A Goddard
BSP Consulting
12 Oxford Street
Nottingham NG1 5BG

Dear Mr Goddard

Re: Flood Data for Flood Risk Assessment –
Proposed Development at Littleworth Drove, Deeping St Nicholas, Spalding

I write further to your letter of the 21st December 2015.

Welland & Deepings IDB do maintain some watercourses within the vicinity of the proposed development site (see enclosed plan). However, the drains serving the north-east boundary and the south-west boundary are riparian; these drains may outfall into the North Drove Drain approximately 3.5km away. Connection into the drains on the west side of the railway line should be confirmed. Agreement should also be sought from the riparian land owners (including Network Rail) for discharge, along with a maintenance strategy for both the drain and any culverts that may be under the railway.

We do not have any flood depth records for the area. However, I am not aware of any flooding to the proposed site.

In line with current recommendations, the use of SUDS (Sustainable Urban Drainage Systems) should be considered as a first approach to dealing with surface water run-off. I suggest discussions with Lincolnshire County Council are held at an early stage, as they are the Lead Local Flood Authority for this area and will have a key input into any SUDS or surface water disposal strategy.

Surface water should be attenuated to the Board's Greenfield run-off rate of 1.4 litres/sec/hectare. The Board's prior written consent and agreement of technical details would be required for any surface water discharged into the drainage system.

The drains that run along the boundaries of the site are not Board maintained. However, any alteration, e.g. piping, etc would require the prior written consent of the Board.

Continued / ...

At present, we do not charge for our consent application process but we are currently reviewing this, along with how we charge for surface water discharges.

Yours sincerely

J Boden
Assistant Engineer

Enc