Ashwood Homes

Town Dam Lane, Donington
Residential Development

Flood Risk Assessment & Drainage Strategy

Final
July 2017

Revision Schedule

Flood Risk Assessment

May 2017

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CONTENTS **Page**

1.0 INTRODUCTION....3

2.0 SITE DESCRIPTION....3

3.0 NATIONAL PLANNING POLICY FRAMEWORK (NPPF)....4

4.0 ADDITIONAL REFERENCES AND REPORTS....5

5.0 THE PROPOSED DEVELOPMENT....9

6.0 VULNERABILITY....9

7.0 SEQUENTIAL TEST....11

8.0 FLUVIAL FLOOD RISK....12

9.0 PLUVIAL FLOOD RISK....13

10.0 FLOOD RISK FROM SEWERS AND DRAINAGE....13

11.0 GROUNDWATER FLOOD RISK....14

12.0 FLOOD RISK FROM RESERVOIRS, CANALS, LAKES AND OTHER ARTIFICIAL SOURCES....14

13.0 DRAINAGE STRATEGY....14

14.0 CONCLUSION & RECOMMENDATIONS....17

APPENDIX A Proposed Site Layout

APPENDIX B Calculations

APPENDIX C Proposed Indicative Drainage Layout

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1.0 Introduction

1.1 Inspire Design & Development Ltd has been appointed by Ashwood Homes to prepare a Flood Risk Assessment (FRA) and a Drainage Strategy for a proposed residential development adjacent to Town Dam Lane, Donington, Spalding.

1.2 Environment Agency online mapping indicates that the site comprises a combination of flood zone 1 (land assessed as having <1% annual probability of river or sea flooding in any year), flood zone 2 (land assessed as having between 1% and 0.1% annual probability of river flooding, or between a 0.5% – 0.1% annual probability of sea flooding), with a portion of flood zone 3 (land assessed as having a greater than 1% annual probability of river flooding) (check sea)). The distribution of these areas broadly span from west to east, with the highest risk area to the east.

1.3 The National Planning Policy Framework (NPPF) requires planning applications for all development proposals in Flood Zone 2 and 3 to include an FRA. This report will assess the risk of flooding on the development and also provide a drainage strategy.

2.0 Site Description

2.1 The site lies adjacent to the B1168 Town Dam Lane and is located in Donington, to the south-west of Boston, and north of Spalding, Lincolnshire.

2.2 The site is currently agricultural land. To the north and west of the site is residential development, to the east of the site is a playground and skatepark and the southern boundary borders agricultural land occupied by a series of large greenhouses. The National Grid Reference (NGR) for the approximate centre of the site is 520793,335234 and the proposed site boundary is highlighted in figure 2.1.1 below.

2.3 The site is approximately 2.63 hectares with access from Town Dam Lane to the north and west. The site is generally flat with a moderate gradient towards the east, with maximum levels in the region of 2.97m AOD and minimum levels to the order of 2.47m AOD in the central western area of the site.

2.4 The site is located in an area where land drainage ditches are prevalent, and OS mapping indicates that the site is bounded by ditches to the north, south and west. To the east is a further ditch, however this is not directly adjacent to the site boundary but is approximately 20 metres, beyond the playground and skatepark. The ditches to the north, west and south have no designation and are, as such, under riparian management, however the ditch to the east is highlighted by the Black Sluice Internal

Drainage Board (BSIDB) as an ordinary watercourse drain, referred to as Drain Number 26, 'Branch North of Flinder's Park).

2.5 The closest main river to the site is 'South Forty Foot Drain', approximately 3km to the east. Online mapping indicates that this is protected by flood defences.

Figure 2.2.1: Site Boundary Imagery ©2016 Getmapping plc, Map data ©2016 Google

3.0 National Planning Policy Framework (NPPF)

3.1 The NPPF and the guidance on Site Specific Flood Risk Assessment at Paragraph: 030, Reference ID: 7-030-20140306 of the Planning Practice Guidance (NPPG), published by the Department for Communities and Local Government, updated March 2014 supersedes the Planning Policy Statement 25 (PPS 25) that was published by Communities and Local Government in December 2006. The National Planning Practice Guidance provides additional support to the Local Planning Authority (LPA). This Guidance retains key elements of PPS25 and retention of this is an interim measure pending a wider review of guidance to support planning policy. The Environment Agency is a statutory consultee for all planning applications and will give comment and recommendations to the planning authority for any proposed developments affecting a watercourse. Under the Flood Water Management Act 2010 Lincolnshire County Council is the Lead Local Flood Authority (LLFA) and has a responsibility of managing flood risk. A flood risk assessment, in accordance with NPPF, is required to accompany a planning application as the site is within flood zone 2.

3.2 The non-statutory technical standards for sustainable drainage systems, published by the Department for Environment, Food and Rural Affairs, March 2015 should be used in conjunction with NPPG noted above. This document provides additional guidance with reference to flood risk assessments, peak flow and volume control, structural integrity, design and construction of drainage within a proposed site and has been considered as part of this study.

4.0 Additional References and Reports

4.1 GEO-ENVIRONMENTAL ASSESSMENT

4.2 A Phase I and II Geo-environmental Investigation was completed by Geomatters Consulting Engineers dated January 2017, reference GML16228. In terms of drainage and flood risk, the following information from the report is of particular relevance:

4.2.1 Minor groundwater was encountered withi the exploratory holes undertaken across the site. Subesquent groundwater monitoring has recorded groundwater at depths of between 0.38m and 1.00m below ground level.

4.2.2 In situ soakaway testing was undertaken within four test pits. Variable infiltration rates were recorded between 2.79x10-6m/s and 5.73x10-7m/s with several of the tests failing the 24hr criterion outlined in BRE Digest 365. The conclusion of the report was that some areas proved potentially unsuitable to support in situ drainage soakaways as part of final drainage designs.

4.3 The superficial deposits beneath the site is recorded to comprise Tidal Flat Deposits. This is generally recorded to comprise clay and silt with sand and gravel layers. The solid geology beneath the site is recorded to comprise Oxford Clay Formation. This is generally recorded to comprise slightly silty silicate mudstone.

4.4 SFRA LEVEL 1: SOUTH HOLLAND DISTRICT COUNCIL

4.4.1 A Strategic Flood Risk Assessment (SFRA) Level 1, dated January 2010, was produced by Royal Haskoning (consulting engineers) on behalf of South Holland District Council.

4.4.2 The following extracts are of relevance to the subject site:

a. *"…….The South Forty Foot Drain, on the western boundary of the district is a man-made embanked watercourse recieiving and conveying drainage runoff from adjacent low-lying land. Drainage is towards the River Witham at Bopston."*

b. *"Through consultation with Anglian Water, as well as drawing on the Council's own local experience, it is found that flooding from sewers is limited to minor isolated cases. It is not of strategic significance as regards flood risk."*

c. *"With regard to the secondary sources…… the majority of arterial drains are in rural areas and are designed with a degree of 'freeboard' in the system. This gives them extra capacity over the nominal design standard and helps to avoid frequent flooding……the majority of these meet target design standards, and the systems and control structures are well maintained. Hence, there are relatively few arterial watercourses which create a flood risk to significant numbers of properties. It is therefore generally reasonable to conclude that if existing IDB systems are operated and maintained efficiently they are unlikely to pose a significant degree of flood risk."*

4.4.3 Figure 4 of the SFRA indicates that South Forty Foot Drain's defences are in 'Good' condition. The SFRA also makes reference to a pumping station to the east of Donnington, although this is a significant distance from the proposed development.

4.5 SOUTH HOLLAND LOCAL PLAN

4.5.1 South Holland Local Plan was adopted in July 2006 and includes the following policies relevant to flood risk and drainage:

(1) Policy SG9: Development and Flood Risk - In areas of flood risk planning permission will only be granted where a flood risk assessment has been carried out and submitted to the Council. Proposals shall, where necessary, include details of measures designed to reduce the risk and consequences of flooding. For permission to be granted the Strategic Flood Risk Assessment and site specific assessment will need to demonstrate how the proposed development will be defended from flooding for its proposed life, taking into account proposed mitigation measures. Built development that would be at high risk of flooding, or which may be subject to rapid inundation, will not normally be permitted unless exceptionally required for operational reasons.

(2) Policy SG11: Sustainable Urban Drainage Systems - Development generating surface water run-off, likely to result in increased flood risk, will be permitted provided that:

(a) The development's surface water management system accords with sustainable development principles and has been designed as part of the development layout; and

(b) The system will effectively control and adequately mitigate or attenuate any adverse effects from surface water run-off on people, habitats of acknowledged importance and property; and

(c) Developers can ensure long term maintenance of the drainage systems, where necessary through planning obligations.

Where this is not possible the developer will be required to implement an alternative method of surface water disposal that is to the Council's satisfaction.

(3) Policy SG12: Sewerage and Development - Proposals for development which would give rise to foul sewage discharge will only be granted planning permission if they include provision for its effective collection, treatment and disposal as follows:

(a) new development shall be served by mains foul sewers and sewage treatment works, wherever the opportunity exists;

(b) where it is impracticable to provide mains foul sewerage (and if there are no works programmed which would enable such connection) development shall normally be served by a package treatment plant;

(c) septic tanks will only be acceptable as an alternative to package treatment plants where:

(i) only a single dwelling or small group of dwellings is proposed, and

(ii) ground conditions (in terms of the structure and drainage of the soil) are proven by the applicant to achieve long term acceptable levels of performance, and

(iii) the plot is of sufficient size to provide an adequate subsoil drainage system.

4.6 BLACK SLUICE IDB DEVELOPER GUIDANCE

4.6.1 The Black Sluice Internal Drainage Board (the Board) is an independent authority constituted under the 1930 Land Drainage Act, with duties "to exercise a general supervision over all matters relating to the drainage of land within its district". The Board acts as a non-statutory consultee to Local Planning Authorities, but importantly the Board has its own statutory powers with respect to drainage which also determines how and if a development may proceed. The Board's current powers derive from the Land Drainage Act 1991. As of the 6th April 2015, the Board also acts as a sub-consultee to the Lead Local Flood Authority (Lincolnshire County Council) for all matters regarding flood risk and surface water discharge.

4.6.2 In terms of surface water runoff, the IDB indicate that:

'Where possible, sustainable methods of disposal should be used which do not adversely affect existing surface water management, nor adversely expose people or property to an increased risk of flooding. In most instances sustainable disposal will best be achieved by dealing with rainfall run-off at or as near as possible to source using Sustainable Drainage Systems (SUDS). SUDS is now a presumption for all developments of 10 properties and above.'

4.6.3 The IDB detail their requirements in terms of discharge from development sites, however it should be noted that this relates to discharges into IDB watercourses and ditches only, which is relevant to the ditch approximately 20m to the east of the site. A development contribution is payable to the IDB for any discharge above greenfield rate, where greenfield rate is stipulated as being 1.4litres per second per hectare. The contribution indicated in their guidance [accessed 15 February 2017] is £7.40 + vat per

impervious square metre of development (£74,000/ha). It is noted that no charge is made for the use of soakaways.

4.6.4 The guidance indicates that where the discharge is via a third party system, such as an LCC adopted highway or SUDs system, an Anglian Water surface water sewer, or a private riparian watercourse, then the permission of the relevant authority or landowner is required.

5.0 The Proposed Development

5.1 The proposal comprises a residential development of 73 dwellings of mixed sizes. All properties have been designed with gardens to both the front and rear with associated parking. The proposed layout of the site is included in Appendix A.

6.0 Vulnerability

6.1 Table 2: Flood Risk Vulnerability Classification Paragraph: 066 Reference ID: 7-066-20140306 of the Planning Practice Guidance in Technical Guidance to the NPPF reproduced as table 5.1.1 below has been used to assess the Flood Risk Vulnerability classification for the proposed use of the site. The classification "More Vulnerable" matches residential use and includes "buildings used for dwelling houses, student halls of residence drinking establishments, night clubs and hotels".

Essential Infrastructure • Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly Vulnerable • Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need

to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').
More Vulnerable • Hospitals • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill* and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable • Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'More Vulnerable' class; and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill* and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.
Water-Compatible Development • Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

7.0 Sequential Test

7.1 The Sequential Test is a decision making tool designed to direct development away from areas at high risk of flooding from rivers and the sea. The aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding.

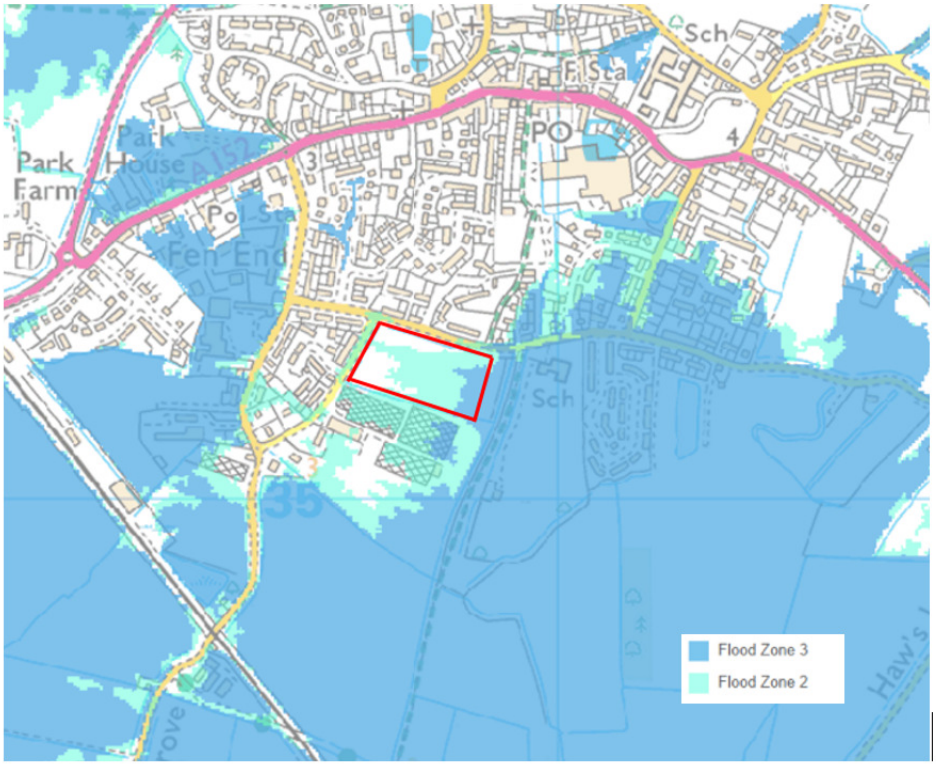

Figure 7.1.1: EA flood map (rivers & sea) showing approximate location

7.2 The majority of the proposed Town Dam Lane site is located in Flood Zone 1 and 2. Given the prevalence and extents of flooding in the area in which the site is located, as indicated on EA flood mapping, it is considered that the development has been allocated to the most appropriate site within the locality. Referring to Figure 7.1.2 below, the proposed use of the site is considered compatible in Flood Zone 1. In Flood Zone 2, the Exception Test is required and development is not considered appropriate in Flood Zone 3. The Exception Test is discussed in Section 7.3 below and mitigation to avoid development the Flood Zone 3 area of the site is discussed in Section 8.3.

Flood Risk Vulnerability Classification		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test Required	✓	✓
	Zone 3a	Exception Test Required	✓	x	Exception Test Required	✓
	Zone 3b 'Functional Floodplain'	Exception Test Required	✓	x	x	x

Figure 7.1.2: Flood Risk vulnerability and flood zone compatibility

7.3 An 'exception test' is required for the site due to it falling in Flood Zone 2. The Exception Test, as set out in paragraph 102 of the Planning Practice Guidance under the NPPF, is a method to demonstrate and help ensure that flood risk to people and property will be managed satisfactorily, while allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available. The two parts to the test require proposed development to show that it will provide wider sustainability benefits to the community that outweigh flood risk, and that it will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall. Both elements of the test will have to be passed for development to be allocated or permitted. Mitigation to support the exception test is discussed in Section 8.3.

8.0 Fluvial Flood Risk

8.1 Online EA mapping (Figure7.1.1) indicates that the majority of the development site is located in Flood Zone 1 or 2, with a portion to the east of the site located in Flood Zone 3.

8.2 The site is located some distance from any main river, however an ordinary watercourse ditch which is managed by Black Sluice IDB is located approximately 20m to the east of the site. It is considered that this, the prevalence of low lying fenland, and the proximity to the coast account for the flood zone classification as featured on EA mapping.

8.3 The majority of the site is considered to be at low or moderate risk of fluvial flooding, and the portion to the east of the site is considered to be at high risk of flooding. These risks will be mitigated as follows:

(i) Low risk areas (Flood Zone 1) – no mitigation deemed necessary, residential development to be directed into these areas where possible;

(ii) Moderate risk areas (Flood Zone 2) – Product 4 to be obtained from the Environment Agency and finished floor levels to be designed a minimum of 300mm above the predicted flood level;

(iii) High flood risk areas (Flood Zone 3) – Development should be directed away from this area, and substitution used to allocate 'less vulnerable' or 'water compatible' uses (for example, public open space or recreational facilities). Any areas within the functional floodplain should be marked such that residents are aware that they are allocated for management of floodwaters.

8.4 In all cases, residents should upon purchase be made aware of and advised to use the Governments' flood warning system, given that the site is located in a Flood Alert area.

9.0 Pluvial Flood Risk

9.1 EA mapping available online indicates that the majority of the site is at 'very low' risk of surface water flooding. Isolated areas are indicated as being at 'low' risk, which correspond with the location of natural low points in the topography, to the centre of the site and where ditches exist on the boundaries.

9.2 The topography of the site and surrounding areas is such that surface water run off during extreme rainfall events is generally shallow, and slow flowing, as indicated by EA modelling.

9.3 The site is considered to be at low risk of surface water flooding.

10.0 Flood Risk from Sewers and Drainage

10.1 Anglian Water is the sewerage undertaker for the area and their sewer records show that there is a foul sewer approximately 3m deep immediately to the north of the site

in Town Dam Lane. In addition, there are separate surface water and foul sewers in Salters Way to the west of the site.

10.2 Through consultation with Anglian Water, as well as drawing on the Council's own local experience, it is found that flooding from sewers is limited to minor isolated cases. It is not of strategic significance as regards flood risk.

10.3 There are no known instances of sewer flooding in this area and in general given that the location of the site is relatively rural, it is not thought that sewer flooding is likely to be prevalent.

11.0 Groundwater Flood Risk

11.1 There are no reports of groundwater flooding occurring in the District. SFRA, PFRA. This issue is therefore taken as having no strategic significance in relation to flood risk.

11.2 The site is not located on a known aquifer and the EA's 'Groundwater Source Protection Zones' shows that the site is not in a source protection zone and the site is not located on any known aquifer.

11.3 The Phase I and II ground investigation found very little groundwater at the time when trial pits were dug, however subsequent monitoring found levels of between 0.38m and 1.00m below ground level.

11.4 Given the prevalence of land drainage in the locality of the site and the monitored high water level at 0.38m below ground level, it is considered unlikely that the site would experience groundwater flooding or seepage above ground level.

12.0 Flood Risk from Reservoirs, Canals, Lakes and other Artificial Sources

12.1 The EA map of flood risk from reservoirs shows the site to not be at risk of flooding from reservoirs. The site can therefore be considered at very low risk from this source.

13.0 Drainage Strategy

Surface Water

13.1 The current Greenfield run off volume for this site for a 1 in 100 year 6 hour storm plus 30% climate change has been calculated at 597m^3.

13.2 Greenfield Runoff Volume and ICP SuDS peak flow calculations have been produced by using Causeway Flow drainage design software and verified using the online HR Wallingford online SuDS tool, reference should be made to Appendix B where the calculation sheets are provided.

Design Event	Run-off (l/s)
Development mean annual peak flow (Q_{BAR})	3.3
100% (1 in 1) annual event probability (Q_{1yr})	2.9
33.3% annual event probability (Q_{30yr})	8.5
1% annual event probability (Q_{100yr})	11.8

13.3 It is noted that in the Black Sluice IDB Developer Guidance that a Greenfield runoff rate of 1.4litres per second per hectare is stipulated. Based on the site area at 2.63Ha the Greenfield runoff rate based on this criteria is calculated at 3.68l/s.

13.4 A hierarchical approach was used for selection of SuDS techniques for the disposal of surface water runoff. As discussed previously the failure of many of the soakaway tests conducted, the low infiltration rates of those that were able to be calculated, and the presence of groundwater during monitoring, it is considered that infiltration methods of drainage are likely to be unsuitable for the site. It is proposed therefore to use source control methods of attenuation, with the next most preferential method of disposal of surface water; via discharge to an IDB watercourse (Branch North to Flinder's Park Ref. 2/26).

13.5 In order to reduce the impact on flows in the downstream drainage network, discharge from the site will be limited to 3.68l/s as determined above.

13.6 To determine the volume of attenuation storage required on site, the Flow 'Storage Estimate' tool has been used. These provide a range of volumes as an approximation of the storage requirement. For the1 in 100 year (1%) plus 30% climate change peak flow, the estimation indicates that a storage volume of between 665m^3 and 899m^3 is required. It is proposed that this attenuation is provided in underground geo-cellular storage within the area of public open space to the centre of the site.

13.7 In order to maximise the biodiversity and pollution control opportunities within the drainage system, a filter drain is proposed around the public open space that could be included within the highway adoption by Lincolnshire County Council.

13.8 The surface water is to be attenuated to not exceed the peak flow control levels based on the ICP SuDS standard. The drainage system is designed to accommodate and attenuate flows arising from a 1 in 100 year storm + 30% climate change allowance to the Greenfield run-off rate.

13.9 It is proposed that new sewers will be offered for adoption with Anglian Water, and new highway drains with Lincolnshire County Council. It is proposed that the surface water outfall is into the riparian managed ditch to the east of the site owned by Black Sluice IDB. In order to achieve a gravity connection from the proposed attenuation structure, levels will have to be lifted at the eastern & southern parts of the site. All of these ditches ultimately discharge into the IDB managed ordinary watercourse immediately downstream. A proposed drainage layout for the site is included in Appendix C.

13.10 The proposed landform of the site will be designed to achieve a cut/fill balance and general levels will fall towards the on-site drainage facilities. The surface water drainage strategy is to be designed to mimic the natural landform, with detention basins located in natural depressions. Site levels and drainage falls will be such that the water will not inundate properties during exceedance and will be channelled along controlled routes to the onsite drainage facilities.

Foul Water

13.11 The foul sewerage system is to be designed and constructed in accordance with Sewers for Adoption latest edition. The system will be offered for adoption under Section 104 of the Water Industry Act 1991.

13.12 Subject to approval via Section 106 Agreement from Anglian Water, the proposed development is to discharge to the existing public foul sewer in Town Dam Lane. The site levels indicate that the proposed foul system can be gravity fed. The indicative proposed drainage strategy is included in Appendix C.

APPENDIX A PROPOSED SITE LAYOUT

key to layout

house type schedule

Type	Beds	No
WELLAND	2	14
CLYDE	3	14
AVON	3	8
CORONATION	3	6
LOCK	3	13
MERE	3	4
SPARTA	3	2
BRANSBY	4	3
RIBBLE	4	3
BAIN	5	1
HUMBER	4	5
TOTAL		73

GRAND TOTAL	73units
Site Area	6.5acres
POS	0.93 "
Net Area	5.57 "
DENSITY	13 units / acre

Revisions:

Rev A: Easement widened to 6m between plots 11 & 12.	2.8.17
Rev B: A902 block updated.	4.8.17
Rev C: Highway amended to front of plots 17-25.	29.8.17
Rev D: Affordable mix updated.	12.9.17
Rev E: Numbers reduced to 76.	10.10.17
Rev F: Numbers reduced to 73.	12.10.17
Rev G: Plot 70 handed.	13.10.17

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PROJECT
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TITLE
PLANNING LAYOUT

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SCALE	DATE	DRAWN
1:500 @ A1	JAN 2017	NKW

DRAWING NUMBER 1199-004

REVISION G

APPENDIX B GREENFIELD RUNOFF CALCULATIONS

Storage Estimate

Return Period (years)	100	OK
Climate Change (%)	30	Cancel
Impermeable Area (ha)	1.138	
Peak Discharge (l/s)	5.700	
Required Storage (m³)	Calc	
from	665	
to	899	

Pre-development discharge

Site Makeup	Greenfield	OK
Greenfield Method	IH124	Cancel
Positively Drained Area (ha)	2.370	
SAAR (mm)	558	Load
Soil Index	2	
SPR	0.30	
Region	5	
Growth Factor 1 year	0.87	
Growth Factor 30 years	2.55	
Growth Factor 100 years	3.56	
Betterment (%)	0	
	Calc	
QBar (l/s)	3.3	
Q 1 year (l/s)	2.9	
Q 30 year (l/s)	8.5	
Q 100 year (l/s)	11.8	

APPENDIX C PROPOSED INDICATIVE DRAINAGE LAYOUT

THIS DOCUMENT HAS BEEN PREPARED IN ACCORDANCE WITH THE SCOPE OF INSPIRE DESIGN & DEVELOPMENT LTD'S APPOINTMENT WITH ITS CLIENT AND IS SUBJECT TO THE TERMS OF THAT APPOINTMENT, INSPIRE DESIGN & DEVELOPMENT LTD ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS CLIENT AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED, © INSPIRE DESIGN & DEVELOPMENT LTD 2017

PROPOSED FOUL OUTFALL TO EXISTING ANGLIAN WATER FOUL SEWER (SUBJECT TO SECTION 106 AGREEMENT) ESTIMATED IL = 0.52m

FLOW CONTROL RESTRICTED TO 3.7L/S

SURFACE WATER OUTFALL VIA HEADWALL INTO IDB DITCH

EX 6303 CL 0.02 IL -0.94

EX 7201 CL 3.18 IL -0.66

EX 8201 CL 2.99 IL -0.44

EX 8202 CL 2.99 IL -0.27

MODULAR STORAGE ATTENUATION VOLUME 782m³

Tank

Tank

Path (um)

KEY

- SITE BOUNDARY
- SURFACE WATER SEWER & MANHOLE
- FOUL WATER SEWER & MANHOLE
- EXISTING FOUL SEWER & MANHOLE
- FILTER DRAIN
- PROPOSED HIGHWAY DRAINAGE

NOTES

1. THE DRAWING IS ONLY AN INDICATIVE PRELIMINARY DRAINAGE STRATEGY FURTHER DETAILS SHOULD BE INCLUDED AT THE DETAILED DESIGN STAGE.
2. THIS DRAINAGE STRATEGY SHOULD BE READ IN CONJUNCTION WITH THE FLOOD RISK ASSESSMENT DATED REF. AHL-1237-01-FRA-001.
3. THE SITE LAYOUT HAS BEEN PROVIDED BY NKW DESIGN LTD.
4. DISCHARGE OF FOUL WATER INTO THE EXISTING FOUL SEWER IS SUBJECT TO A SECTION 106 AGREEMENT.
5. THE DRAINAGE STRATEGY IS BASED ON USE OF THE IDB DITCH TO THE EAST OF THE SITE FOR THE DISPOSAL OF SURFACE WATER.

REV	DATE	NAME	CHECK	NOTE
P3	17/10/17	GB	CR	LAYOUT AMMENDED
P2	03/07/17	LB	BC	PLANNING COMMENTS
P1	23/03/17	GB	BC	DWG LAYOUT AMMENDED

DRAWING STATUS:

FOR APPROVAL

CLIENT

ASHWOOD HOMES LTD

PROJECT

TOWN DAM LANE, DONINGTON

DRAWING TITLE

DRAINAGE STRATEGY

DRAWN	CHECKED	APPROVED
GB	SR	CR

DATE: 17 OCTOBER 2017

SCALE @ A1: 1:500

DRAWING No.: AHL-1237-01-DR-001

REVISION No.: P3