

ENVIRONMENT

Richborough Estates and Mr & Mrs Adcock
Land East of Stoke Road and North of Normandy Way (A47)
Hinckley
Sustainable Drainage Statement

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1. INTRODUCTION

- 1.1 A Sustainable Drainage Statement (SDS) sets out the principles of drainage design for a development and summarises the reasoning behind the chosen design. This includes consideration of national and local guidance, justification of specific flow rates, volumes of attenuated storage, as well as the appropriate level of treatment to be provided to surface water runoff.
- 1.2 This SDS has been produced by BWB Consulting on behalf of Richborough Estates and Mr & Mrs Adcock in respect of a planning application for a proposed residential-led development at Land East of Stoke Road and North of Normandy Way (A47), Hinckley.
- 1.3 A Flood Risk Assessment (FRA) has been produced for the site (reference HIN-BWB-ZZ-XX-RP-YE-0001) and this SDS accompanies this overarching document.
- 1.4 This SDS is intended to support an outline planning application and as such the level of detail included is commensurate and subject to the nature of the proposals.
- 1.5 A location plan and an illustrative masterplan are provided as **Appendix 1**. The development is anticipated to provide up to 475 dwellings, including public open space, land reserved for a primary school together with future expansion land (Use Class F1(a)), landscaping, drainage and associated infrastructure.
- 1.6 The location of the site is illustrated within **Figure 1.1**, with contextual information provided within **Table 1.1**.

Table 1.1: Site Details

Site Name	Land East of Stoke Road and North of Normandy Way (A47)
Location	Hinckley
NGR (approx.)	SP419956
Application Site Area (ha)	25.4
Development Area (ha)	13.35
Development Type	Residential
Lead Local Flood Authority	Leicestershire County Council
Local Planning Authority	Hinckley & Bosworth Borough Council
Environment Agency Area	East Midlands
Sewerage Undertaker	Severn Trent Water

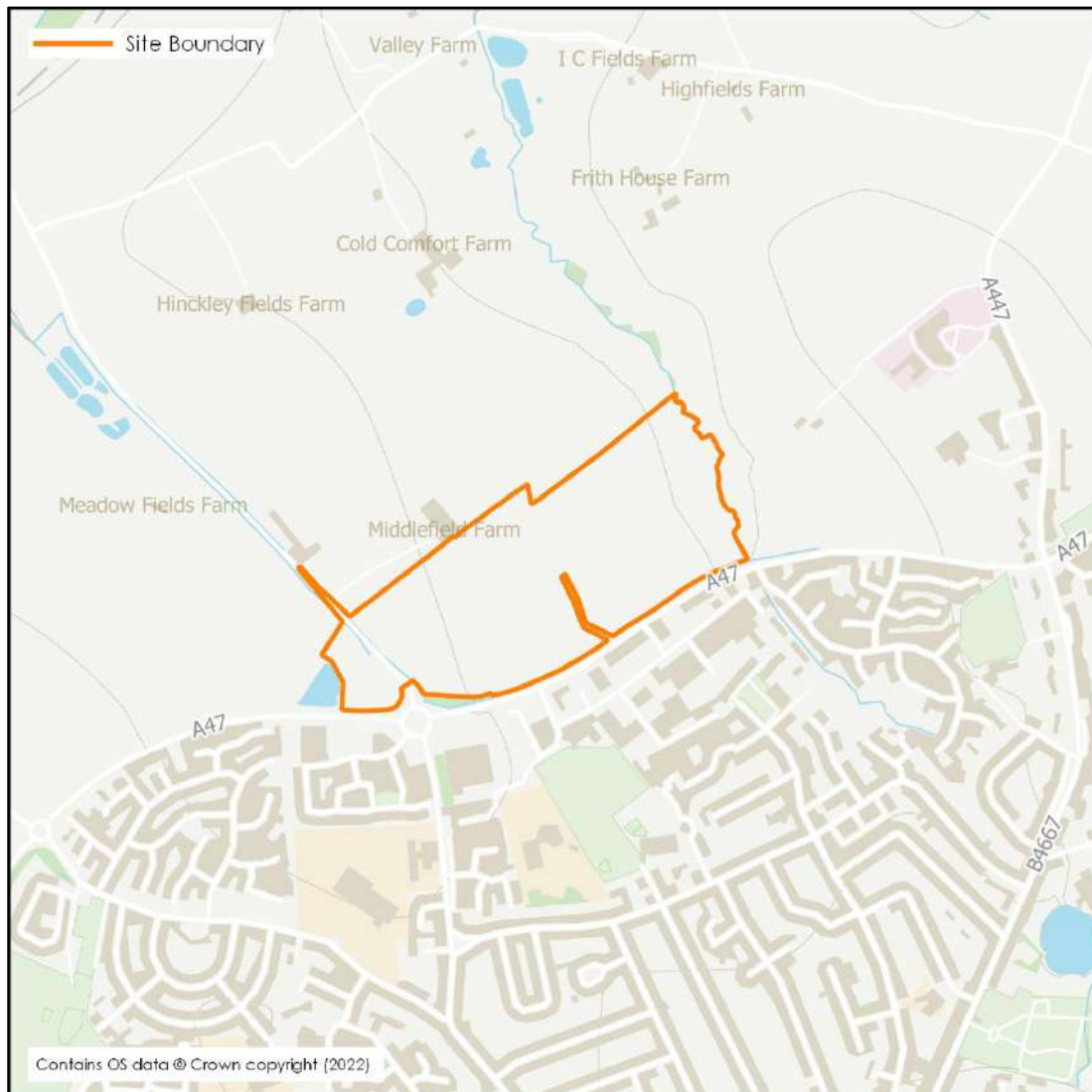


Figure 1.1: Site Location

Sustainable Drainage Guidance

- 1.7 Sustainable Drainage Systems (SuDS) aim to reduce the impact of development by replicating the natural runoff regime in a sustainable, cost-effective manner whilst protecting water quality and reducing pollution. The four key objectives of SuDS design are to achieve improvements in water quantity, water quality, amenity provision and biodiversity.
- 1.8 Leicestershire County Council, as the Lead Local Flood Authority (LLFA), are required to assess applications in line with the current planning legislation therefore the following documents have been utilised to inform this strategy;
 - i. NPPF – National Planning Policy Framework¹

¹ National Planning Policy Framework - GOV.UK (www.gov.uk)

- ii. Non - Statutory Technical Standards²
- iii. Written Ministerial Statement regarding Sustainable Drainage (HCWS161)³
- iv. The SuDS Manual - C753 - CIRIA Industry Best Practice guidance⁴
- v. Flood Risk Planning Policy Guidance⁵
- vi. Building Regulations Part H⁶

1.9 Additionally, Leicestershire County Council have produced an Interim LLFA Guidance Note⁷ which specifically states that (note this list is not exhaustive);

- i. The discharge of surface run off should be as high up the hierarchy of drainage options as reasonably practicable.
- ii. The level of any surface water outfall receptor must be fully evidenced.
- iii. Where an infiltration drainage proposal is submitted with no alternative non-infiltration option(s) identified, BRE Digest 365 Soakaway Design compliant test results for the site must be provided with calculations supporting the proposals.
- iv. The existing and proposed discharge rate should be clearly identified and expressed in litres per second (l/s) and litres per second per hectare (l/s/ha).
- v. To minimise the risk of system blockage the council would allow 5 l/s as the minimum discharge rate from a site.
- vi. Where applicable, the impacts of 'urban creep' should be included. Unless it can be demonstrated otherwise, a 10% increase in the impermeable area should be included within the storage calculations

1.10 A 40% allowance for the potential implications of climate change has been applied, in accordance with the Environment Agency's (EA) guidance⁸.

² Sustainable drainage systems: non-statutory technical standards - GOV.UK (www.gov.uk)

³ 6.-DCLG-sustainable-drainage-systems.pdf (parliament.uk)

⁴ SuDS Manual C753 Chapter List (ciria.org)

⁵ Flood risk and coastal change - GOV.UK (www.gov.uk)

⁶ Drainage and waste disposal: Approved Document H - GOV.UK (www.gov.uk)

⁷ Interim LLFA Guidance Note: Planning and Development in Leicestershire, Leicestershire County Council

⁸ Flood risk assessments: climate change allowances - GOV.UK (www.gov.uk)

2. EXISTING CONDITIONS

- 2.1 The whole 25.4 hectares of the site is greenfield in nature. The south of the site is bound by the A47 while the rest of the site is surrounded by agricultural land. An Unnamed Ordinary Watercourse (UOW) runs adjacent to the eastern boundary of the site. Stoke Road bisects the west of the site.
- 2.2 The parcel of land to the west of Stoke Road is proposed to be a combined area of biodiversity and Public Open Space (POS) and as such will not be included in the design of the drainage strategy.
- 2.3 A topographic survey of the existing site has been undertaken and is included as **Appendix 2**. The site is shown to have a high point of approximately 119m Above Ordnance Datum (AOD) located in the centre of the site. The levels of the site then fall off in both the west and east direction with levels on the west boundary being approximately 105m AOD, and 107m AOD in the east.
- 2.4 A site visit was undertaken by BWB Consulting Ltd on 12/01/21. During which a selection of existing drainage features were observed and are shown in **Figure 2.1**.
 - i. Several drains were found to be serving the existing site. Three of four drains appeared to outfall to the previously mentioned UOW. The remaining drain in the west appeared to outfall to a ditch which flows towards the western boundary of the site. The existing drains are expected to be land drainage features however; a CCTV survey is recommended to investigate any further connectivity.
 - ii. A network of drainage ditches with culverts were observed on the western boundary of the site which all appeared to be connected to the wet ditch/channel which ultimately flowed toward the pond to the west of the site.
 - iii. A small pond with a shallow water level was observed in the north-west of the site.
 - iv. A topographical depression appeared to be present in the south of the site, however due to this being located on a high point of the site it is unlikely that this is a drainage feature.

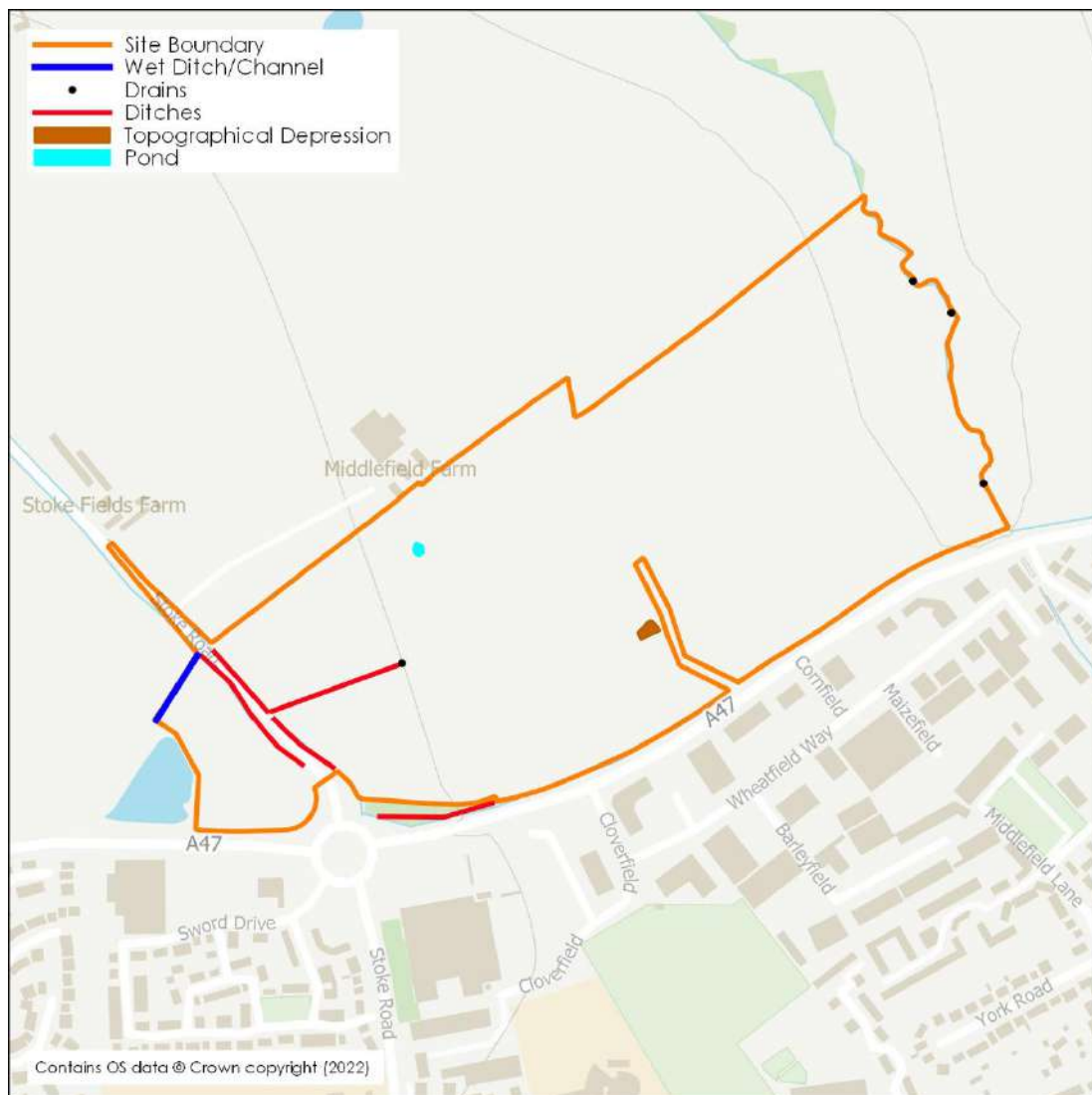


Figure 2.1: Existing Drainage Features On Site

- 2.5 Severn Trent Water (STW) asset records are provided as **Appendix 3**. They show there to be no existing sewers within the site boundary, however this should be confirmed via a utility tracing survey. Surface and foul water sewers are present relatively close to the southwest and south east boundaries of the site. Furthermore, there is a foul water pumping station located to the southwest of the site.
- 2.6 The British Geology Survey (BGS) Mapping for bedrock shows the site to be underlain by Mudstone of the Mercia Mudstone Group. This is designated as a Secondary B aquifer. Secondary B aquifers are defined as having predominantly lower permeability layers which may store and yield limited amounts of groundwater.
- 2.7 The BGS Mapping for superficial deposits shows the site to be underlain by a range of superficial deposits, as illustrated in **Figure 2.2**. The superficial deposits in the east of the site are designated as Secondary A aquifers which can be defined as permeable layers capable of supporting water supplies at a local scale.

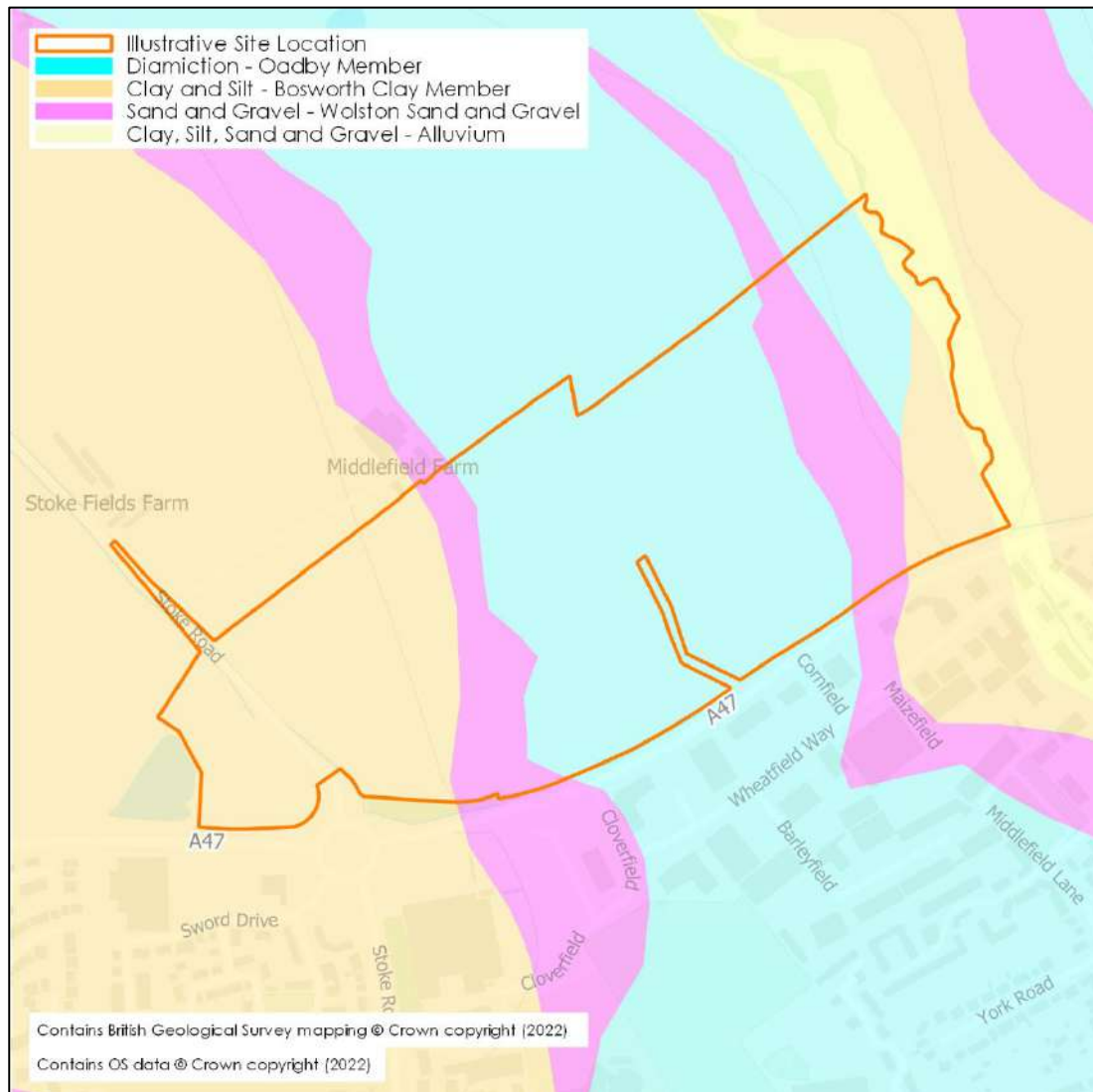


Figure 2.2: BGS Mapping of Superficial Deposits

Existing Runoff Rates

- 2.8 An assessment of the existing surface water runoff per hectare has been undertaken and is summarised within

2.9 **Table 2.1.** Calculations are included within **Appendix 4.**

2.10 The runoff rates have been estimated using the IH124 method, with appropriate prorated adjustments for a site of less than 50ha, as recommended in Interim Code of Practice for Sustainable Drainage⁹. This was undertaken within Micro Drainage, which makes the necessary adjustments for small sites automatically.

2.11 Based upon a gross developable area of 13.35ha, this equals a total QBAR rate of 58.8l/s.

⁹ The National SUDS Working Group (2004), Interim Code of Practice for Sustainable Drainage

Table 2.1: Existing Runoff Rate per Hectare

Return Period (Yrs.)	Runoff Rate (l/s/ha)
1	3.6
Mean Annual Flow Rate (QBAR)	4.4
30	8.6
100	11.3

Existing Runoff Volume

- 2.12 As the existing 25.4 ha site is permeable, the runoff volume has been calculated using the Source Control module within Micro Drainage to be 7,370m³, results are included within **Appendix 5**.

3. SURFACE WATER DRAINAGE STRATEGY

- 3.1 The proposed development has been divided into drainage catchments based upon existing topography, as shown in **Figure 3.1**. Catchment areas are shown below in **Table 3.1**.

Table 3.1: Catchment Areas

Catchment	Area (ha)
West	7.45
East A	1.25
East B	4.65
Future Development	2.0

- 3.2 The impermeable area of each catchment has been estimated at 65%. Furthermore, an allowance of 10% has been added to allow for Urban Creep. Therefore, the total estimated impermeable area for each catchment is shown in **Table 3.2**.

Table 3.2: Impermeable Area of Each Catchment

Catchment	Impermeable Area (ha)
West	5.38
East A	0.90
East B	3.10
Future Development	N/A

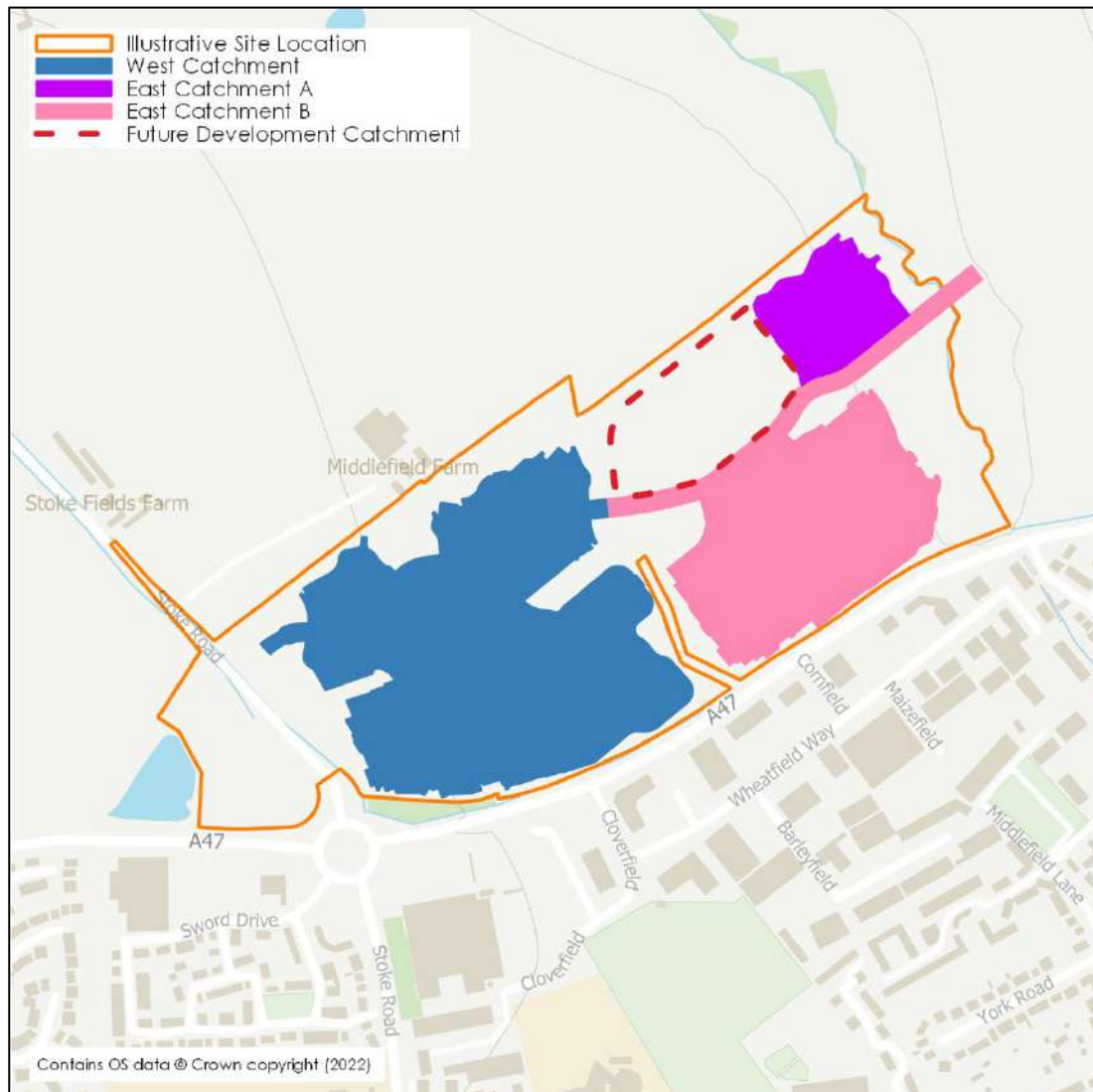


Figure 3.1: Catchment Split

- 3.3 Access to the site is proposed via a new roundabout structure off Stoke Road. As previously stated, a network of ditches are present along Stoke Road, therefore to minimise the amount of culverting works, a watercourse diversion scheme is proposed. Further information on the scheme and flood risk mitigation measures can be found in the accompanying FRA (ref: HIN-BWB-ZZ-XX-RP-YE-0003).

Drainage Hierarchy

- 3.4 The Planning Policy Guidance¹⁰ and the SuDS Manual¹¹ identify that surface water runoff from a development should be disposed of as high up the following hierarchy as reasonably practicable:
- i. into the ground (infiltration);
 - ii. to a surface water body;

¹⁰ Planning Practice Guidance, <http://planningguidance.planningportal.gov.uk/>.

¹¹ The SuDS Manual (C753). CIRIA 2015.

- iii. to a surface water sewer, highway drain, or another drainage system;
 - iv. to a combined sewer.
- 3.5 The aim of this approach is to manage surface water runoff close to where it falls and mimic natural drainage as closely as possible.
- 3.6 Due to the underlying bedrock geology being Mudstone it is assumed that infiltration on site would not be viable. There are superficial deposits of sand and gravel located in the east of the site which could potentially allow infiltration; however, these deposits do not appear to be in the low points of the site. Infiltration Testing to BRE365 guidance should be undertaken to confirm this assumption.
- 3.7 There is an UOW located on the east boundary of the site. Therefore, it is proposed that the east catchment will drain surface water from the site at a restricted rate to the receiving watercourse, in line with the existing condition.
- 3.8 Several drainage ditches and culverts are present adjacent to Stoke Road. Therefore, it is proposed that the west catchment will drain surface water from the site at a restricted rate to the receiving watercourse, in line with the existing condition.

Peak Flow Control

- 3.9 To comply with the Non-Statutory Technical Standards for Sustainable Drainage Systems S2-S3¹², runoff from greenfield developments should not exceed the equivalent greenfield rates for the 1 and 100-year return period events.
- 3.10 For previously developed sites, the proposed runoff rate must be “as close as reasonably practicable” to the greenfield runoff rates but should never exceed the rate of discharge prior to redevelopment for that event.
- 3.11 To comply with the peak flow control criterion, it is proposed to restrict the 1 in 1-year discharge rate from the development to the receiving watercourse/drainage ditches at the equivalent greenfield 1 in 1-year rate. All other rainfall events will be restricted to the equivalent greenfield QBAR rate up to the 1 in 100-year plus climate change event. This is summarised within **Table 3.3**.

Table 3.3: Existing & Proposed Runoff Rates per Hectare

Return Period (Yr.)	Existing Runoff Rate (l/s/ha)	Proposed Discharge Rate (l/s/ha)
1	3.6	3.6
QBAR	4.4	4.4
30	8.6	
100	11.3	
100 + 40%	-	

¹² 2015, DEFRA, Non-statutory technical standards for sustainable drainage systems

- 3.12 The maximum proposed discharge rates for each catchment are described below in **Table 3.4**.
- 3.13 Land allocated for future development is included within two separate parcels within the East B catchment. The combined area of these parcels is 2ha therefore, an allowance has been included in the proposed discharge rates for the 1 in 1-year storm event and all other events up to and including the 1 in 100-year +40%CC storm event respectively.

Table 3.4: Proposed Runoff Rates per Catchment

Catchment	Catchment Area	Proposed Runoff Rate for the 1 in 1-year return period (l/s)	Proposed Runoff Rate for all other events up to the 1 in 100-year +40% return periods (l/s)
West	7.45	26.8	32.8
East A	1.25	4.5	5.5
East B	4.65	16.7	20.5
Future Development	2	7.2	8.8
Total Site	15.35	55.2	67.5

Attenuated Storage

- 3.14 As the development proposals require a restricted runoff rate, it will be necessary to provide attenuated storage to balance the excess volume in a safe manner within the site.
- 3.15 The surface water storage should be located within the site in a position where it can receive runoff from the development and discharge from the site by gravity, and in a position where it is hydraulically isolated from any fluvial floodplain or external surface water floodplain/ overland flow route that may be present in the site.
- 3.16 Sufficient storage for events up to the 1 in 100-year storm with a 40% allowance for climate change should be provided.
- 3.17 After considering the site constraints and development aspirations it is suggested that the necessary surface water storage volume across both catchments is found within detention basins located at the lowest elevation of each catchment, between the proposed development and the outfall location.
- 3.18 For this outline assessment it has been assumed that the basins will accommodate all of the necessary storage, but it may be possible to redistribute a portion of the storage within other drainage components during the detailed design of the development (e.g.: in the pipe network, swales, filter drains, etc).

- 3.19 Based upon the parameters set out in this report, a simulation has been run using Micro Drainage 'Source Control' to identify the necessary storage provision. The results are summarised in **Table 3.5** and calculations are included as **Appendix 6**.

Table 3.5: Outline Attenuated Storage Requirements

Catchment	Rainfall Method	Maximum Volume (m ³)
West	FSR	3,635
	FEH	3,850
East A	FSR	570
	FEH	605
East B	FSR	2,190
	FEH	2,325
Total Site	FSR	6,395
	FEH	6,780

- 3.20 At this conceptual stage it is expected that a total of 6,780m³ of attenuated storage will be provided to cater for the maximum anticipated runoff volume for all storm durations up to the 1 in 100-year return period storm, including a 40% climate change allowance and future urban creep.
- 3.21 It is envisaged that the final required attenuated storage volume will be determined during the detailed design stage once the development layout and drainage areas are fixed.

Runoff Volume Control

- 3.22 The Non-Statutory Technical Standards for Sustainable Drainage Systems S4-S6¹³ states that where reasonably practical the runoff volume from a development for the 1 in 100-year 6 hour rainfall event should not exceed the runoff volume prior to development or redevelopment. Where it is not reasonably practicable to constrain the volume of runoff from a development at or below the existing volume, then the runoff must be discharged in a manner that does not adversely affect flood risk, i.e.:
- The additional runoff volume resulting from the development (the 'long term storage volume') should be discharged separately from the site at a rate of 2l/s/ha or less. Or,
 - All the runoff volume from the development should be discharged at a rate equivalent to the mean annual flow rate (QBAR) rate under greenfield conditions or less. Or,

¹³ 2015, DEFRA. Non-statutory technical standards for sustainable drainage systems

- iii. All the runoff volume from the development should be discharged at a rate of 2l/s/ha or less.
- 3.23 An estimate of the post-development runoff volume from the 1 in 100-year 6 hour storm has been calculated using a rainfall depth of 63.96mm (FEH Website) across the impermeable area of 9.38ha. Approximately 16.01ha of the site is to remain undeveloped, the runoff volume for this area has been calculated using the Source Control module within Micro Drainage to be 4,650m³, the results are included within **Appendix 7**. The proposed permeable and impermeable post-development runoff volumes have been added to give the total post-development runoff volume, as compared within **Table 3.6**.

Table 3.6: Runoff Volume Comparison

Existing Volume (m ³)	Proposed Volume (m ³) for 100-year 6-hour event		Difference (m ³)
	Permeable	Impermeable	
7,370	4,650	6,000	3,280

- 3.24 The 1 in 100-year 6 hour storm runoff volume from the site has been shown to increase as a result of the proposed development. However, as the runoff volume from the development will be discharged at a rate equivalent to the mean annual flow rate (QBAR) rate under greenfield conditions, the volume control criteria will be met.

Sustainable Drainage Systems

- 3.25 In the East Catchment A, surface water will be collected via a combination of road gullies, downpipes and channel drains. Surface water will be conveyed through an underground pipe network towards a detention basin before being discharged into the receiving watercourse located on the north east boundary at the restricted rate (achieved via a vortex flow control).
- 3.26 In the East Catchment B, surface water will be collected via a combination of road gullies, downpipes and channel drains. Surface water will be conveyed through an underground pipe network towards a detention basin before being discharged into the receiving watercourse located on the east boundary at the restricted rate (achieved via a vortex flow control). An additional allowance of 8.8l/s has been included in this catchment to allow for the future development of the 2ha area. It is envisaged that the future development will have on site storage, restricted to a maximum of 8.8l/s.
- 3.27 In the West Catchment, surface water will be collected via a combination of road gullies, downpipes and channel drains as well as a central swale feature which has been incorporated into the proposed green corridor. The surface water will then be stored within detention basins before being discharged into the receiving watercourse located adjacent to Stoke Road at the restricted rate (achieved via a vortex flow control).
- 3.28 The detention basins have been designed with accessible bank slopes to enable easy access for maintenance. They should be planted appropriately with native species. At the detailed design stage, it is recommended that the detention basins are not fenced

off from the public where possible, and they should be landscaped into the public open space of the development to provide amenity benefit. They should also be designed to accommodate a low flow channel, variable depths and gradients, forebays at all inlets and areas of semi-permanent water. This will provide a thorough treatment train to surface water leaving the site and create a variety of habitats, enhancing the ecological value of the development, whilst also helping intercept surface water from small rainfall events.

- 3.29 The swales which are proposed in the western catchment should also be landscaped into the public open space and planted appropriately with native species. The swales will provide further treatment as well as amenity and biodiversity value.
- 3.30 The majority of on-site storage is to be provided in detention basins that are situated at the eastern and western boundaries of the primary development parcels. It is expected that any shortfall in calculated storage volume is to be provided within the freeboard of the basins, conveyance swales (displayed along the green corridor) and through distributed cellular storage within the fabric of the development. Such storage could be offered in areas of Public Open Space (POS) or beneath shared/private roads and parking areas. It is anticipated that attenuation volumes will reduce as the site progresses through the detailed design stage and further network modelling is undertaken.
- 3.31 Additionally, further SuDS features should be considered at the detailed design stage, including but not limited to;
- i. Permeable Paving
 - ii. Tree Pits
 - iii. Bio-retention Areas
 - iv. Grey water harvesting techniques.
 - v. Cellular Storage
- 3.32 An indicative surface and foul water layout for the development is shown on BWB drawing number HIN-BWB-ZZ-XX-DR-CD-0001 which is included as **Appendix 8**.

Residual Risk and Designing for Exceedance

- 3.33 It is recommended that the final layout uses the proposed road infrastructure to provide drainage exceedance (overland flood flow) routes through the scheme and towards the basins for events more than the capacity of the drainage system.
- 3.34 If the capacity of the attenuated storage is exceeded, ground levels should be profiled to direct overland flows towards the adjacent watercourses.
- 3.35 In addition to the volume of storage provided within the main attenuation, there will be capacity within upstream pipes and manholes and swales which has not been accounted for at this stage and a further level of redundancy to the network will therefore be provided.

- 3.36 The detention basins have been designed with a minimum 300mm freeboard in the 1 in 100-year event to account for extreme events in exceedance of the design standard.

4. FOUL WATER DRAINAGE

- 4.1 As the existing site is greenfield there are no existing drainage features on site and therefore a new connection will be required.
- 4.2 A pre-development enquiry from STW is provided as **Appendix 9**. They state that the 300mm foul sewer to the south west of the site (ref: MH 7302) is the most suitable point of connection for a foul water supply.
- 4.3 Based upon this connection point, it is proposed that the West Catchment will drain foul flows via gravity to the STW foul water sewer located to the west of the site. The East Catchment will require a foul water pumping station due to the topography of the site. However, consultation with STW is ongoing over the potential to discharge foul flows for the East Catchment to a closer point of connection, potentially negating the need for a pumping station.
- 4.4 The foul water pump station dimensions will need to be to adoptable standards as per the Sewer Sector Guidance Notes¹⁴. The pump station is required to be positioned next to a public access road for maintenance purposes. Furthermore, a 15m cordon sanitaire from the centre of the wet well will be required in which no habitable dwelling must be placed.

¹⁴ Sewerage Sector Guidance-approved documents | Water UK

5. MAINTENANCE

- 5.1 The proposed drainage system should be designed in accordance with the Design and Construction Guidance¹⁵ (DCG) and is expected to be offered up for adoption to STW. If any parts of the drainage network remain unadopted, or until the point they are, an appropriate management company should be appointed to ensure continuous maintenance and management.
- 5.2 Requirements for ongoing maintenance of the drainage network should form part of the Operation and Maintenance manual for the site. Any specialist or proprietary products that are specified at detailed design should have a manufacturer specific maintenance regime which should be included within the document.
- 5.3 It is envisaged that the Operation and Maintenance manual will be developed at the detailed design stage, but some examples are included below.
- i. All drainage features should be in open areas which are readily accessible.
 - ii. Gullies should be inspected and de-silted at least once a year, where necessary.
 - iii. Pipes, manholes and silt traps should be inspected and de-silted at least once a year, where necessary.
 - iv. Regular inspections of the detention basin should be undertaken to remove litter/debris, invasive/colonising vegetation and silt build up, as necessary. Inlet and outlet structures to be regularly inspected, with remedial work as required to maintain water flows and prevent silt/vegetation build up.
 - v. Vegetation/grass within the detention basin should be maintained appropriately to allow establishment and promote habitat formation, without impeding the operation of the inlet and outlet structure.
 - vi. Flow controls should be inspected every 6 months, litter/debris and silt build up should be removed, as necessary.

¹⁵ SSG-App-C-Des-Con-Guide.pdf (water.org.uk)

6. SUMMARY

- 6.1 This statement and supporting appendices demonstrate that the drainage design for the development will comply with the relevant local and national standards, specifically the hierarchy of discharge, runoff rate and volume criterion.
- 6.2 This SDS is intended to support an outline planning application and as such the level of detail included is commensurate and subject to the nature of the proposals.

Table 6.1: Sustainable Drainage Statement Summary

		Existing Site	Proposed Development
Site Area (ha)		25.4	
Impermeable Area (ha)		0.0	8.81
Outfall Location		Watercourse	Watercourse
Peak Runoff Rate (l/s/ha)	1 in 1-year	3.6	3.6
	QBAR	4.4	4.4
	1 in 30-Year	8.6	
	1 in 100-Year	11.3	
	1 in 100-Year + CC	-	
Runoff Volume (100yr RP 6 hour Storm)		7,370m ³	10,650m ³
Volume Control		-	Discharge rate limited to QBAR
Proposed Storage Volume		-	6,780m ³
Flow Control Type		-	Vortex Flow Control
SuDS Features		-	Swales Detention Basins (Plus, others to be confirmed at detailed design stage)

- 6.3 It is envisaged that the final drainage strategy will be determined during the detailed design stage, as the development layout is finalised.

APPENDICES

Appendix 1: Location Plan and Illustrative Masterplan



KEY

SITE LOCATION
25.39 HECTARES / 62.74 ACRES

PROPOSED RESIDENTIAL DEVELOPMENT

PROPOSED 1 HECTARE FOR 1 FORM ENTRY SCHOOL + 1 HECTARE SAFE GUARDED LAND

PUBLIC OPEN SPACE (INCLUDING SuDS) - 8.08 HA / 19.97 ACRES

RETAINED EXISTING LANDSCAPE

ADDITIONAL/ REINSTATED VEGETATION

PRIMARY STREET / AVENUE

KEY FOCAL JUNCTION

SECONDARY STREET

SIDE STREET / SHARED SURFACE

PRIVATE LANES

RETAINED PUBLIC OF RIGHT OF WAY

KEY PEDESTRIAN MOVEMENT WITHIN SITE

SUSTAINABLE URBAN DRAINAGE

NEIGHBOURHOOD EQUIPPED AREA OF PLAY

LOCALLY EQUIPPED AREA OF PLAY

LOCAL AREA OF PLAY/ NATURAL PLAY SPACE

KEY VISUAL CORRIDORS

- KEY PRINCIPLES**
1. PROPOSED NEW ACCESS VIA HIGHWAYS IMPROVEMENTS TO STOKE ROAD;

2. PRIMARY STREET PROVIDING VEHICULAR, PEDESTRIAN AND CYCLE MOVEMENT;

3. SECONDARY MOVEMENT ROUTES PROVIDING A LOOPED INFRASTRUCTURE TO PRIMARY MOVEMENT ROUTES;

4. SHARED SURFACE ROUTES SERVING CLUSTERS OF DEVELOPMENT;

5. PRIVATE LANES SERVING OUTWARD FACING DEVELOPMENT PROVIDING PASSIVE SURVEILLANCE OVER NEWLY CREATED OPEN SPACE;

6. HIGHWAYS IMPROVEMENTS ALONG NORMANDY ROAD PROVIDING DEDICATED CROSSING POINTS TO EXISTING DEVELOPMENT;

7. RETAINED PUBLIC RIGHT OF WAY RUNNING NORTH-SOUTH THROUGH DEVELOPMENT, PICKING UP KEY EAST-WEST MOVEMENT ROUTES;

8. KEY PEDESTRIAN MOVEMENT ROUTES RUNNING IN A NORTH-SOUTH AND EAST-WEST MOVEMENT ROUTES OFFERING FULL PEDESTRIAN PERMEABILITY;

9. KEY MEETING POINT AT HIGHEST POINT OF DEVELOPMENT PROVIDING KEY VISUAL CORRIDORS TO SURROUNDING CONTEXT;

10. KEY PLAY SPACES ALONG PEDESTRIAN MOVEMENT ROUTES SERVING MAXIMUM RESIDENTS

11. MAXIMUM RETENTION OF EXISTING FIELD BOUNDARIES AND WOODED AREAS;

12. CREATION OF COMMUNITY SPACES IN THE FORM OF COMMUNITY ORCHARDS AND INFORMAL KICK ABOUT AREAS;

13. CREATION OF A SERIES OF GREENWAYS PROVIDING A KEY WILDLIFE NETWORK THROUGHOUT DEVELOPMENT;

14. PROPOSED ADDITIONAL PLANTING TO THE NORTHERN EDGE TO AID BIO-DIVERSITY AND WILDLIFE OPPORTUNITIES;

15. POTENTIAL SCHOOL SITE WITH SAFE GUARDED LAND FOR FUTURE SCHOOL EXPANSION;

16. KEY (PEDESTRIAN MEETING POINTS PROVIDING RESIDENTS OPPORTUNITIES WITH SOCIAL INCLUSION;

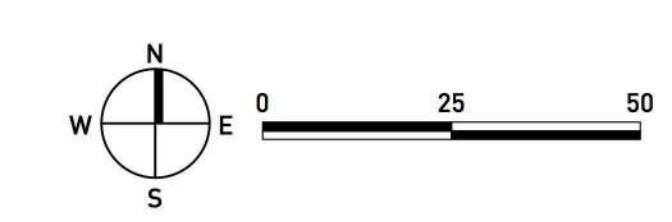
17. SITE LOW POINTS UTILISED FOR SUSTAINABLE URBAN DRAINAGE AIDING WETLAND HABITATS ALONG EXISTING WATERCOURSES;

18. MAXIMUM CONTINUOUS FRONTAGE ALONG DEVELOPMENT ABUTTING NORMANDY WAY TO REDUCE IMPACT OF ACOUSTIC INTERFERENCE TO REAR GARDEN SPACES;

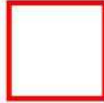
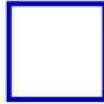
19. STREETS AND DEVELOPMENT ORIENTATED TO RUN WITH CONTOURS REDUCING IMPACT OF RETAINING STRUCTURES ON STREET SCENE;

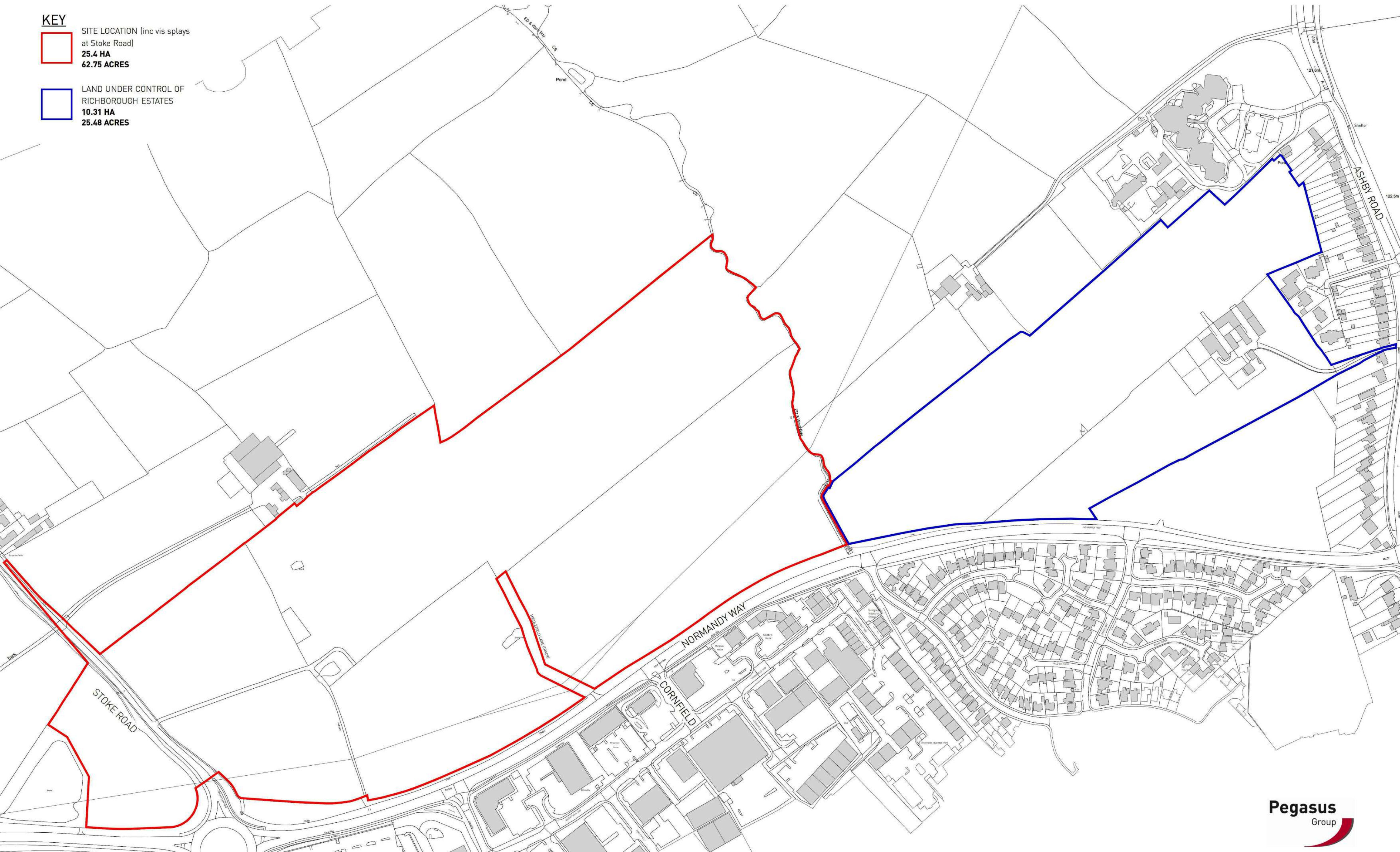
20. 2M HIGH PLANTED BUND TO REDUCE ANY POTENTIAL ACOUSTIC DISTURBANCE; AND

21. POTENTIAL ACCESS POINT FOR FUTURE DEVELOPMENT.

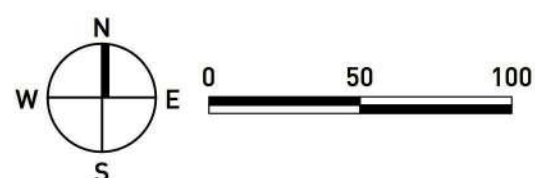


KEY

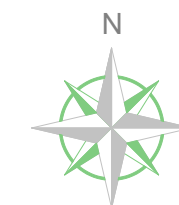
-  SITE LOCATION (inc vis splays at Stoke Road)
25.4 HA
62.75 ACRES
-  LAND UNDER CONTROL OF RICHBOROUGH ESTATES
10.31 HA
25.48 ACRES



LAND NORTH OF NORMANDY WAY, HINCKLEY SITE LOCATION PLAN - PHASE 1



Appendix 2: Topographical Survey



Station Information:

Station	Easting (m)	Northing (m)	Level (m)
GH1	441576.932	295275.593	103.879
GH2	441675.346	295630.625	104.577
GH3	441761.651	295225.156	105.731
GH4	441835.129	295444.191	107.341
GH5	441918.494	295644.191	108.951
R1	441796.543	295399.392	107.302
R2	441887.367	295411.801	106.602
R3	441816.624	295399.392	107.236
R4	441874.368	295234.996	107.236
TC1	443233.857	295677.771	127.136
TC2	443113.107	295577.162	125.944
TC3	443004.425	295697.861	127.136
TC4	442892.634	295697.861	128.896
TC5	442668.136	295723.630	112.369
TC6	442534.818	296957.338	110.272
TC7	442405.575	295649.558	110.772
TC8	442383.679	295575.575	113.606
TC9	442106.771	295459.054	114.954

OS Note:

This survey has been orientated to the Ordnance Survey (O.S.) National Grid OSGB36(15) via Global Navigation Satellite Systems (GNSS) and the O.S. Active Network (OS Net).

A true OSGB36 coordinate has been established near to the site centre via a transformation using the OSTN15GB & OSGM15GB transformation models.

The survey has been correlated to this point and a further one or more OSGB36 (15) points established to create a true O.S. bearing for angle orientation.

No scale factor has been applied to the survey therefore the coordinates shown are arbitrary & not true O.S. Coordinates which have a scale factor applied.

Please refer to Survey Station Table to enable establishment of the on-site grid and datum.

+ 123.66
levels shown at margins are taken from Ordnance Survey
lidar data. Access to 3rd party land unauthorised

Legend:

[illegible]

Rev	Date	Description	Drawn	Q. Re
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- Topographical Surveys
- Site Engineering
- Utility / CCTV Surveys
- Measured Building Surveys
- 3D Laser Scanning
- Revit & BIM Models

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CLIENT

Richborough Estates Ltd

PROJECT

Hinckley North
LE10 3EA

	TITLE
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Topographical Survey

SCALE A1@ 1: 2500	DATE Nov 2021
DRAWN ALS	QUALITY REF GH12172

Level datum	See note
Grid orientation	See note

Job number	42117	
Drawing No.	42117_T	Rev. 0

Comments

This plan should only be used for its original purpose. Greenhatch Group accepts no responsibility for this plan if supplied to any party other than the original client.

Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

Notes: