Joseph Norton SEMH School
Deighton, Huddersfield

Flood Risk Assessment

HSP2022-C4164-C&S-FRAS1-1069
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hsp consulting

CIVIL | STRUCTURAL | GEOTECHNICAL & ENVIRONMENTAL | TRAFFIC AND TRANSPORT

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Issue & Revision History

Revision	Status	Originator	Checked	Approved	Date
-	DRAFT	Callum Jeffrey BSc (Hons)	Sean Straw BEng (Hons)	P Daykin BSc(Hons) MCIHT MCIOB CEnv	10.03.23
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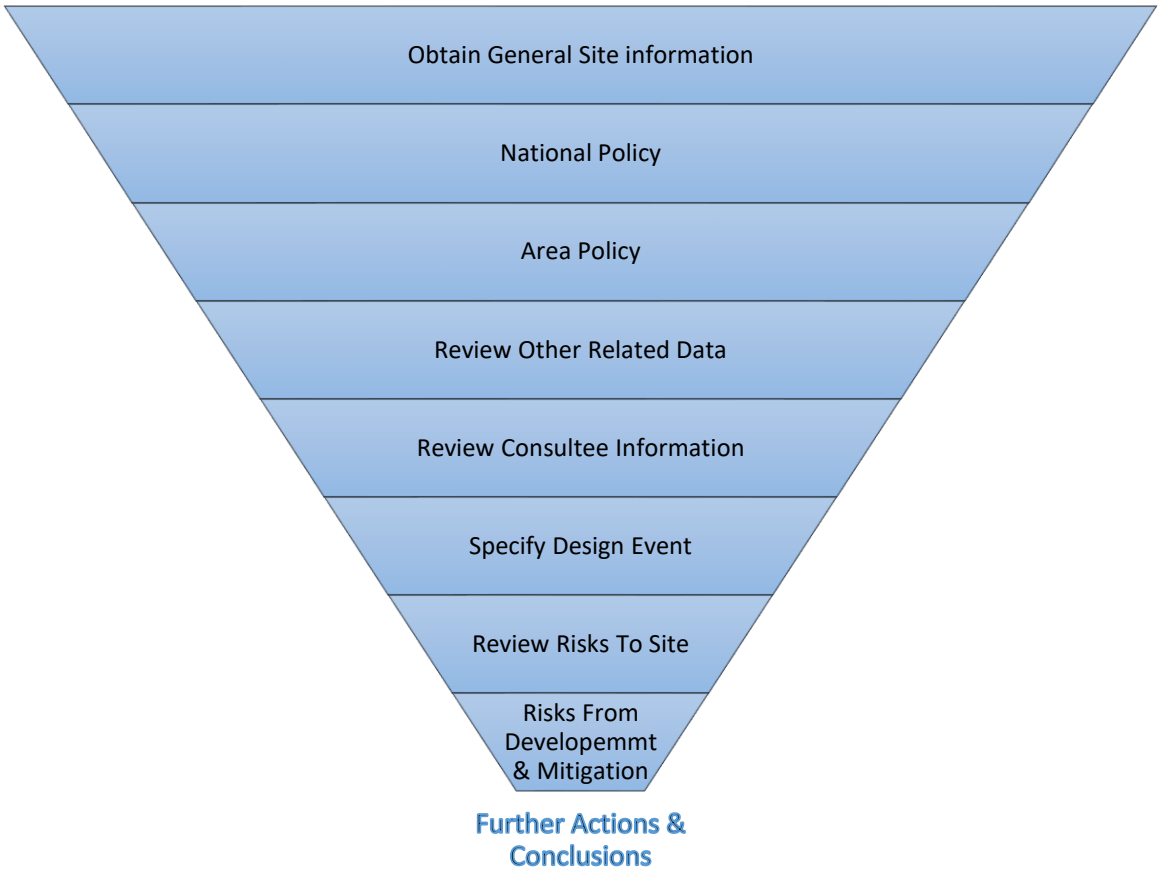
1 Introduction

1.1 General

1.1.1 HSP Consulting Engineers Ltd has been commissioned to undertake a Flood Risk Assessment in support of a feasibility appraisal for proposed works at the former Deighton Centre, Deighton Road, Huddersfield, HD2 1JP.

1.2 Format of this Report

1.2.1 This report is reliant upon publicly available information and/or that provided by Consultees which is then reviewed, in outline terms, in accordance with the graphic below:



1.3 Sources of Data

1.3.1 This report is based on information from the following principal sources of information:

i. Environment Agency Flood Zone (for Planning) Mapping

ii. Government Long Term Flood Risk Mapping

iii. Lead Local Flood Authority (Kirklees Council)

iv. Kirklees Local Flood Risk Management Strategy

v. Kirklees Preliminary Flood Risk Assessment

vi. Kirklees Surface Water Management Plan

vii. Calder Catchment Strategic Flood Risk Assessment

viii. Phase I Geo-Environmental Desk Study (HSP Consulting)

2 Site Location, Description & Proposed Development

2.1 Site Location

2.1.1 The site is located at National Grid reference (NGR) E415963, N419571 (approximately).

2.1.2 The site is located at the following address:

Former Deighton Centre,
Deighton Road,
Huddersfield,
HD2 1JP

2.1.3 A site location plan is included within Appendix 1 of this document.

2.1.4 The Lead Local Flood Authority (LLFA) is Kirklees Council (KC).

2.2 Description

2.2.1 This site is irregular in shape and occupies an area of approximately 2.07 ha.

2.2.2 Vehicular access is gained from the southeast corner of the site off Deighton Road via an access road which also serves Deighton Sports Arena.

2.2.3 The site was formerly occupied by the Deighton Centre, which was demolished in 2013 and is therefore now vacant land. Demolition drawings have been provided by the client. The ‘Site Finishes Plan’ (included in Appendix 1) indicates the following activities were to be undertaken during demolition:

i. Locate, disconnect and seal all redundant drains and connections

ii. Demolish identified buildings including removal of perimeter pathways, paving areas, signs, retaining walls, ramps, steps and hardstanding areas – down to ground level including excavation of floor slab and foundations

iii. Use suitably crushed demolition material to fill any below ground voids (presumably basement areas)

iv. Remove all excess demolition material off site

v. Introduce 150mm layer of topsoil and seed.

2.2.4 While the building footprints have been removed in their entirety, the former access road and car park remain and generally appear in good condition. Scrubland/overgrown greenspace occupies the former school area. A number of informal paths cut across this area, which are understood to be used by the general public. A right of way footpath is located adjacent to the southwestern/west site boundary.

2.2.5 The site lies in a low-density urban setting with boundaries formed as follows:

i. North: Woodland with residential properties beyond.

ii. East: Playing fields with residential properties beyond.

iii. South: Deighton Sports Arena, access road and residential properties beyond.

iv. West: Christ Church CE Academy with residential properties beyond.

2.3 Topography

2.3.1 Topographically, the site lies towards the top of a natural ridge/slope. In regard to the wider area, the land to the west and southwest is at a similar level, whilst land to the north, east and southeast falls away from the site.

2.3.2 The topographical survey, which is included in Appendix 1 of this document, indicates the following:

i. The highest point on the site is in the south, at approximately 136.50m AOD.

ii. The site falls away to the north, with the lowest point recorded approximately 128.80m AOD (level difference of approximately 7.50m) and also falls to the east (towards the playing fields).

iii. Sections provided within the topographical drawing show the profile from the far west of the site and across the playing fields in the east. The section shows the far west of

the site at approximately 133.25m AOD, with the most eastern point of the playing fields at approximately 105.75m AOD.

iv. Although the levels across the playing fields generally slope to the east, it is clear that the area has been terraced historically to create a suitable playing surface.

2.4 Proposed Development

2.4.1 Outline development proposals have been provided and are included in Appendix 2 of this document.

2.4.2 Development plans at present are for a new SEND school in the north/centre of the site, with a range of external uses including parking/drop-off areas, a forest school, habitat areas, a farm, a MUGA and external 'passive' and 'active' spaces for pupils.

3 Geology, Hydrogeology, Hydrology

3.1 Site Investigation

3.1.1 At the time of preparation, an intrusive site investigation was not available for review.

3.1.2 For guidance, publicly available reference material has been reviewed in order to establish the likely geological setting.

3.2 Geology

3.2.1 Published British Geological Society (BGS) online database records indicate the following:

3.2.2 Made Ground:

The BGS mapping indicates that Made Ground is present across the majority of the site.

3.2.3 Superficial Deposits:

There are no superficial deposits recorded beneath the subject site.

3.2.4 Bedrock:

The site is underlain by geology of the Pennine Lower Coal Measures Formation; that is, sedimentary bedrock formed between 319 and 318 million years ago during the Carboniferous Period.

The BGS describes the Pennine Lower Coal Measures Formation as *"interbedded grey mudstone, siltstone and pale grey sandstone, commonly with mudstones containing marine fossils in the lower part, and more numerous and thicker coal seams in the upper part."*

3.3 Hydrogeology

3.3.1 The Groundwater Vulnerability Map of England and the Environment Agency and MagicMap websites have been reviewed to determine the aquifer designations.

3.3.2 These sources show that:

i. The site is not situated within a Groundwater Source Protection Zone.

ii. Groundwater vulnerability is designated as a “high”. These are defined as areas that can easily transmit pollution to groundwater. They are characterised by high-leaching soils and the absence of low-permeability superficial deposits.

iii. The underlying bedrock is recorded as being a “Secondary A” aquifer. Secondary A aquifers are defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

3.4 Hydrology

3.4.1 The nearest main river to the site is the River Colne, located at its closest point approximately 1km to the east of the site. It is a tributary of the River Calder.

3.4.2 The Huddersfield Broad Canal is located approximately 550m to the south of the site, follows the River Colne and connects the Calder and Hebble Navigation with the Huddersfield Narrow Canal.

3.4.3 The nearest ordinary watercourse is located approximately 150 m to the north of the site, runs through Bradley Gate Wood and appears to discharge into the Huddersfield Broad Canal.

3.5 Miscellaneous

3.5.1 No additional documents of relevance were identified and/or reviewed during the preparation of this report.

4 National Planning Framework

4.1 General

4.1.1 Flood Risk Assessments in England are undertaken using the prescriptive procedures and guidance within the National Planning Policy Framework (NPPF) and “Planning practice Guide – Flood Risk and Coastal Change” (PPG) produced by Communities and Local Government, in addition to the details set out in BS 8533:2017 “Assessing and managing flood risk in development - Code of practice”.

4.1.2 NPPF provides a directive which seeks to ensure that development does not take place in areas at risk or increase flood risk in offsite areas. NPPF acknowledges that developments vary in their sensitivity to flooding and enables the correlation between proposed use and the underlying environs (flood risk) through the application of the Sequential Test.

4.2 The Sequential Test

4.2.1 The aim of the Sequential Test is to steer new development into areas with the lowest and/or appropriate probability of flooding.

4.2.2 The sequential test provides the potential to compare the subject site with other available sites to determine which has the lowest flood risk.

4.2.3 Table 1 of PPG prescribes three principal flood risk zones:

- Zone 1 (Low Probability) - land assessed as having a less than 0.1% (1 in 1000) annual probability of river or sea flooding;
- Zone 2 (Medium Probability) - land assessed as having between a 1% (1 in 100) and 0.1% (1 in 1000) annual probability of river flooding; or between a 0.5% (1 in 200) and 0.1% (1 in 1000) annual probability of sea flooding;
- Zone 3a (High Probability) - land assessed as having a 1% (1 in 100) or greater annual probability of river flooding or a 0.5% (1 in 200) or greater annual probability of flooding from the sea;
- Zone 3b (The Functional Floodplain) - land where water has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. However, land which would naturally flood with an annual probability of 1 in 20 (5%) or greater in any year, is typically assumed to be functional floodplain.

4.2.4 The Sequential Test is not normally required for developments in Flood Zone 1 (i.e. the lowest probability of flooding), unless other flood related issues exist within the area of the development; for example, a critical drainage area.

4.2.5 Similarly, a Sequential Test is not required in respect of the intended Planning Application if one has already been undertaken for a development of the type proposed (e.g. a residential development) on the subject site. This may be the case where the site is ‘allocated’ in the Authorities Local Plan.

4.2.6 A Sequential Test is required where both of the following apply:

- The proposed development is in Flood Zone 2 or 3

- A sequential test has not already been undertaken for a development of the type which is planned.

4.3 Land Use and Development

4.3.1 Current guidance accepts that it is not always possible to direct developments into areas of low flood risk and that the type of development/end use materially affects flood risk sensitivity.

4.3.2 Table 3 of "Planning Practice Guide – Flood Risk and Coastal Change", reproduced below, provides the outline mechanism for assessing the suitability of a development within a specific Flood Zone.

Reproduction of Table 3 of "Planning Practice Guide – Flood Risk and Coastal Change"					
Flood risk vulnerability classification	**Essential infrastructure**	**Water compatible**	**Highly vulnerable**	**More vulnerable**	**Less vulnerable**
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception Test required	✓	✓
Zone 3a	Exception Test required	✓	×	Exception Test required	✓
Zone 3b	Exception Test required	✓	×	×	×
Key: ✓ Development is appropriate × Development should not be permitted					

4.3.3 For guidance, Table 2 of "Planning Practice Guide – Flood Risk and Coastal Change", is reproduced below to illustrate Flood Risk Vulnerability classifications.

Reproduction of Table 2 of "Planning Practice Guide – Flood Risk and Coastal Change"	
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 stations, Ambulance stations and Fire stations and Command Centres and 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').

Reproduction of Table 2 of "Planning Practice Guide – Flood Risk and Coastal Change"	
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 and cafes; hot food takeaways; offices; general industry; storage and distribution; non–residential institutions not included in 'more vulnerable'; 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 workings. • Docks, marinas and wharves. • Navigation facilities. • MOD 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.

4.4 The Exception Test

4.4.1 The Exception Test may be applied where, following application of the Sequential Test, it is not possible for the development to be located in zones with a lower probability of flooding.

4.4.2 For the Exception Test to be passed both of the following conditions must be met:

- It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk; and,
- A site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

5 Local Planning Framework

5.1 Local Flood Risk Management Strategy (LFRMS), 2012

5.1.1 The Local Flood Risk Management Strategy (LFRMS) was produced and published by Kirklees Council in 2012.

5.1.2 The LFRMS sets out the following objectives:

i. Improving the level of understanding of local flood risk;

ii. Ensuring that local communities understand their responsibilities;

iii. Actively managing flood risk from new developments;

iv. Balancing economic, environmental and social benefits in managing local flood risk;

v. Improving the capacity of existing drainage systems through targeted maintenance;

vi. Encouraging responsible maintenance of privately-owned drainage assets;

vii. Identifying affordable improvement programmes, maximising external funding contributions; and,

viii. Aligning local flood risk management knowledge with the Council's emergency planning procedures.

5.1.3 While the LFRMS outlines beneficial information on the relevant authoritarian bodies and general flood risk in the local area, no information specific to the subject site was included.

5.2 Preliminary Flood Risk Assessment (PFRA), 2009

5.2.1 The Kirklees Preliminary Flood Risk Assessment was published by Kirklees Council in June 2009 with the aim of providing a high-level overview of flood risk from local sources such as surface water, ordinary watercourses and groundwater.

5.2.1.1 No information relevant to the subject site is noted within the report.

5.3 Kirklees Surface Water Management Plan (SWMP), 2011

5.3.1 A Surface Water Management Plan (SWMP) was prepared by Kirklees Council in 2011.

5.3.2 In summary, the purpose of the SWMP is to:

i. Provide a framework for responsible parties to understand and manage surface water flood risk

ii. To facilitate sustainable surface water management decisions

iii. To coordinate and plan drainage provisions on large developments

iv. Provide a framework for the management of water quality and promotion of SUDS.

5.3.3 No information relevant to the subject site is noted within the report.

5.4 Calder Catchment Strategic Flood Risk Assessment (SFRA), 2016

5.4.1 The Calder Catchment Strategic Flood Risk Assessment (SFRA) was prepared by JBA Consulting on behalf of Kirklees Council in April 2016 as an update to the 2013 report.

5.4.2 The aims and objectives of the SFRA are:

i. To form part of the evidence base and inform the Sustainability Appraisal for the Council's Local Plans

ii. To assist in the preparation of and to make recommendations of appropriate policies for the management of flood risk within the Council's Local Plans

iii. To understand flood risk from all sources and to investigate and identify the extents and severity of flood risk throughout the Calder Valley catchment in each Council area

iv. To pay particular attention to surface water flood risk and to explore the proposed designation of Critical Drainage Areas (CDAs).

v. To enable Councils to meet their obligations under the National Planning Policy Framework (NPPF) and the technical guidance

vi. To assess the suitability of potential development site allocations across the Calder catchment

vii. To supplement current policy guidelines and to provide a straightforward risk based approach to development management in the area

viii. To provide a reference document to which all parties involved in development planning and flood risk can reliably turn to for initial advice and guidance.

ix. To identify land required for current and future flood management

x. To assist the Councils in identifying specific locations where further and more detailed assessment is required as part of a Level 2 SFRA.

5.4.3 The following salient matters are reproduced for information and guidance.

5.4.3.1 Figure 3-5 Areas Susceptible to Groundwater Flooding

The map indicates that less than 25% of the surrounding area is considered to be susceptible to groundwater emergence.

5.4.3.2 Appendix A – Map K Bradley, Deighton

According to the map the site is not considered to be at risk of fluvial flooding.

6 Miscellaneous References and/or Reports

6.1 No additional documents of relevance were identified and/or reviewed during the preparation of this report.

7 Consultation Responses

7.1 Public Sewers/Local Drainage Infrastructure

7.1.1 At the time of writing, public sewer records were not available for review.

7.1.2 However, given the developed/urban nature of the surrounding area, public sewers are expected to be present in the vicinity of the site.

7.2 Environment Agency

7.2.1 The Environment Agency (EA) has been consulted in respect of the proposed development site. Their formal response is awaited; however, the current trend is for consultants to be directed to web-site based data unless significant abnormal risks are present.

7.2.2 Publicly available reference material has been reviewed, the content of which is summarised below.

Flood Map for Planning

7.2.3 The entirety of the site is located within Flood Zone 1; that is, an area with the lowest probability of flooding.

7.2.4 Land in Flood Zone 1 is considered as having a less than 1 in 1000 annual probability of river or sea flooding.

7.2.5 The nearest conjectural flood risk envelope (Flood Zone 2 or 3) is located approximately 550m to the south of site.

7.2.6 Refer to section entitled “The Sequential Test” for definitions of the ‘Flood Map for Planning’ Flood Zones.

Flood Risk from Rivers or the Sea

7.2.7 The Environment Agency “Flood Risk from Rivers or the Sea” map categorises risk as follows:

i. High - a chance of flooding of greater than 3.3%.

ii. Medium - a chance of flooding of between 1% and 3.3%.

iii. Low - a chance of flooding of between 0.1% and 1%.

iv. Very Low - a chance of flooding of less than 0.1%.

7.2.8 These risk categories take into account the effect of any flood defences in the area. Where defences exist, these will reduce, but not completely stop, the chance of flooding as they can be overtopped or fail.

7.2.9 The site is identified as being at “very low” risk of flooding. That is, land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (< 0.1%).

7.2.10 Given the above, the site is not considered to be at risk of flooding from rivers or the sea.

Flood Risk from Surface Water

7.2.11 The Environment Agency “Flood Risk from Surface Water” map categorises surface water flooding as follows:

i. High - a chance of flooding of greater than 3.3%.

ii. Medium - a chance of flooding of between 1% and 3.3%.

iii. Low - a chance of flooding of between 0.1% and 1%.

iv. Very Low - a chance of flooding of less than 0.1%.

7.2.12 The site is identified as being at “very low” risk of surface water flooding; that is, land assessed as having a less than 1 in 1000 annual probability of flooding from surface water (<0.1%).

7.2.13 The site is not inferred to present a significant preferential flow path for offsite derived runoff.

7.2.14 Given the above, the site is not considered to be at significant risk of surface water flooding.

7.2.15 Elevated surface water flood risk is identified in Deighton Road and Whitacre Street to the east. However, it is considered likely that safe access/egress from the site will be afforded during all but the most extreme flooding events.

7.2.16 Notwithstanding the above, flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features such as terrain aberrations can greatly affect the chance and severity of flooding.

Reservoir

7.2.17 Based upon the EA Long-term Flood Risk Mapping, the site is not located within an area depicted as being at risk of flooding from reservoirs. A conjectural flood risk envelope is located approximately 550m to the south.

7.2.18 Extracts from the Environment Agency online mapping is reproduced within Appendix 4.

7.3 Lead Local Flood Authority (LLFA)

7.3.1 As Lead Local Flood Authority (LLFA), Kirklees Council was consulted in respect of the proposed development site. Their response is reproduced in Appendix 3 and also summarised below:

i. There is only 1No. recorded flood incident in recent history in the vicinity of the site which was reportedly caused by floodwaters accumulating on the playing fields to the east of the site impacting residential properties to the southeast.

ii. The site is not in a critical drainage area.

iii. The EA holds records of a culvert that runs along the eastern boundary of the wider site that has a diameter of 225mm and an approximate depth of 1.4m.

8 Planning Policy & Compatibility of the Proposed Development

8.1 Table 2 of PPG categorises the development proposals as “More Vulnerable”.

8.2 Table 3 of PPG indicates that More Vulnerable end uses are compatible with Flood Zone 1 and the Exception Test is not required.

8.3 The site is therefore considered to be compatible with general planning policy.

9 Existing Drainage

9.1 Site Specific Existing Surface Water Drainage

9.1.1 At the time of preparation, details of existing site-specific drainage were not available for review. However, survey works undertaken at the site identified multiple manholes and inspection chambers in the vicinity of the former school and access roads which suggests that an existing drainage network is present.

9.1.2 Furthermore, given the inferred presence of public sewers in the vicinity, it is anticipated that the existing drainage network discharges to a public sewer. However, the locations of any connections are currently unknown.

9.2 Site Specific Existing Foul Water Drainage

9.2.1 At the time of preparation, details of existing site-specific drainage were not available for review. However, survey works undertaken at the site identified multiple manholes and inspection chambers in the vicinity of the former school and access roads which suggests that an existing drainage network is present.

9.2.2 As with surface water, given the inferred presence of public sewers in the vicinity, it is anticipated that the existing drainage network discharges to a public sewer. However, the locations of any connections are currently unknown.

10 Climate Change and Design Event

10.1 Lifetime of Development

10.1.1 A development of this type is typically considered to have a design life of 25 years to 100 years.

10.1.2 Using the precautionary principal, for the purpose of this FRA the design life is assumed to be 100 years.

10.2 Peak Rainfall Intensity

10.2.1 The table below, summarises the contemporary Climate Change Allowances provided by the Department for Environment Food & Rural Affairs website for the Aire and Calder Management Catchment.

Epoch	Annual Exceedance	Central	Upper
2050s	3.3%	20%	35%
2070s	3.3%	25%	40%
2050s	1%	25%	40%
2070s	1%	30%	45%

10.2.2 Development with a lifetime beyond 2100, this includes development proposed in applications or local plan allocations should include an appraisal of upper end allowances. This should include the 1% (100 year) and 3.3% annual exceedance probability events for the 2070s epoch (2061 to 2125), albeit the 1% (100 year) event is likely to define the attenuation requirements.

10.2.3 Development with a lifetime between 2061 and 2100 should utilise a similar approach but use the central allowance for the 2070s epoch (2061 to 2125).

10.2.4 Development with a lifetime up to 2060 should use the central allowance for the 2050s epoch (2022 to 2060).

10.3 Peak River Flow/River Flooding Envelope

10.3.1 Given the site setting, river flows are not considered necessary for further discussion within this appraisal.

10.4 Design Event (Drainage)

10.4.1 Notwithstanding the design life variability, using the precautionary principal and the anticipated Regulator's prescriptive requirements, it is considered appropriate to study the development, and in particular the surface water drainage design, relative to the 1 in 100-year event, including an uplift of 45% for the effects of climate change.

10.4.2 It should be noted that this analysis must determine if the impacts of the climate change allowance are significant and lead to any unacceptable flood risks (it is not normally expected that the site would not flood in this scenario, only that if this storm were to occur the impacts would be minimal). The design may need to be modified to avoid any unacceptable risks, but may also need additional mitigation allowances, for example a higher freeboard on attenuation features and/or provision of exceedance routes.

10.4.3 An additional allowance for urban creep may be required during the design process. While normally applied to residential development, urban creep may be requested at the discretion of the LLFA/Planning Authority and influences the surface water drainage design and, in particular, the attenuation requirements.

10.4.4 Rainfall Runoff Management for Developments, jointly published by the Department for Food & Rural Affairs and the Environment Agency, recommends the following:

"*Urban creep is now an acknowledged issue which results in an increase in runoff from an estate over time. An allowance should be made by factoring the impermeability percentage by 1.1 (10% increase) …*"

10.4.5 As noted, published guidance is typically centred upon residential development. It is therefore recommended that any Urban Creep allowance for non-residential development is be agreed with the LLFA at the pre-application stage once the principles of development (such as proportion of hard area) are known.

11 Potential Sources of Flooding

11.1 General

11.1.1 BS 8533: 2011 “Assessing and managing flood risk in development – Code of practice” provides recommendations and guidance the assessment and management of flood risk for proposed development within the UK.

11.1.2 Assessment should include an appraisal of risk both to- and from- the development from all sources of flooding, including:

i. Tidal and fluvial flooding – flooding from main rivers, ordinary watercourses and the sea.

ii. Surface water flooding – flooding from overland flow due to rainfall.

iii. Flooding from sewers and drains – flooding from surcharging of below ground drainage systems.

iv. Groundwater flooding – flooding related to the water table, where ground water levels rise above surface levels.

v. Flooding caused by the failure of infrastructure, such as from reservoir, canal or land drainage infrastructure, usually as a result of catastrophic failure.

12 Flooding Risks to the Development

12.1 Tidal Flood Risk

12.1.1 The site is not located within the influence of tidal watercourses and is therefore not considered to be at risk of tidal flooding.

12.2 Fluvial Flood Risk

12.2.1 The site is identified as being at “very low” risk of flooding. That is, land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

12.2.2 The site is not considered to be at risk of fluvial flooding.

12.3 Groundwater Flooding

12.3.1 Publicly available mapping suggests that the site is not at significant risk of groundwater flooding.

12.3.2 Notwithstanding the above, site-specific groundwater investigation is recommended to further assess the potential for groundwater to impact the site and drainage solutions.

12.4 Pluvial Flood Risk

12.4.1 The site is identified as being at “very low” risk of surface water flooding; that is, land assessed as having a less than 1 in 1000 annual probability of flooding from surface water (<0.1%).

12.4.2 Elevated surface water flood risk is identified in Deighton Road and Whitacre Street to the east. However, it is considered likely that safe access/egress from the site will be afforded during all but the most extreme flooding events.

12.4.3 The site is not inferred to present a significant preferential flow path for offsite derived runoff.

12.4.4 Overall, the site is not considered to be at significant risk of surface water/pluvial flooding,

12.5 Sewer Flooding

12.5.1 There is a paucity of information regarding the risk posed to the site by sewer flooding.

12.5.2 No evidence of impact upon the subject site has been identified during the preparation of this report. Importantly, ‘no evidence’ should not necessarily be interpreted as ‘no risk’.

12.5.3 Notwithstanding the above, the risk of sewer flooding is considered to be ‘low’.

12.6 Infrastructure/Reservoir Flood Risk

12.6.1 Based upon publicly available Flood Risk Mapping published by the Environment Agency, the site is not located within an area considered to be at risk of flooding from reservoirs.

13 Effect of Development on Flooding & Design Inclusions

13.1 Surface Water Drainage

13.1.1 It should be noted that insufficient information is held on both the existing and proposed development to enable a definitive statement in respect of surface water drainage.

13.1.2 Given the former use of the site, the proposed development is not expected to have a significant adverse impact. However, increased adverse impacts typically correlate with an increase in drained area and in the absence of sufficient information, definitive commentary cannot be provided.

13.1.3 It can be inferred from publicly available reference material that infiltration drainage systems may be viable at the site. However, the infiltration potential of the underlying soils should be investigated in order to formally confirm the inferences made.

13.1.4 The potential/requirement for a discharge to public sewer cannot be discounted.

13.1.5 All connections to the public sewer, whether made directly to the sewer or indirectly via existing private pipework, can only be legally made with the permission of the Undertaker. Such permission will not be given where this presents an unacceptable risk to the receiving sewer. Where there is insufficient capacity, the applicant may be required to contribute to public sewer reinforcements.

13.1.6 Assuming on-parcel drainage is appropriately managed the development will not have an adverse impact on the site or surrounding area.

13.1.7 Appropriate management will require consideration of discharge:

i. Rate

ii. Quantity

iii. Quality

13.1.8 Assuming on-parcel drainage is designed:

i. In accordance with good practice;

ii. To attenuate flows to existing greenfield rates, and;

iii. To accommodate the 1 in 100 year plus 40% (for climate change) event;

the development will not have an adverse impact on surface water drainage.

13.1.9 Section 14 provides additional guidance and commentary on surface water drainage.

13.2 Foul Water Drainage

13.2.1 The detailed design and appraisal of foul water drainage is outside of the scope of this assessment.

13.2.2 As with surface water drainage, insufficient information is held on both the existing and proposed development to enable a definitive statement in respect of foul drainage.

13.2.3 However, given the current use of the site, it is considered likely that a discharge to a public sewer can be made.

13.2.4 Notwithstanding the above, once anticipated discharge rates can be confirmed, confirmation of capacity and/or sewer reinforcement requirements should be sought from the Undertaker.

13.2.5 As with surface water discharges to sewer, it should be noted that all connections to the public sewer, whether made directly to the sewer or indirectly via existing pipework, can only be legally made with the permission of the Undertaker. Such permission will not be given where this presents an unacceptable risk to the receiving sewer. Where there is

insufficient capacity, the applicant may be required to contribute to public sewer reinforcements.

13.2.6 Assuming on-parcel drainage is designed:

i. In accordance with good practice; and,

ii. To discharge flows to the existing public sewer to the north of the site;

the proposed works are not considered likely to adversely impact on offsite flood risk as a result of foul water drainage.

13.2.7 As with surface water drainage, in the absence of information, no comment is offered in respect of constraints and the potential to achieve a gravity discharge.

13.3 Overland Flows

13.3.1 Based upon available information, the site does not present itself as being an identified overland surface water flow route(s) associated with significant off-site sources of watershed.

13.3.2 It is therefore considered unlikely that the development of the subject parcel will have an adverse post-development effect as a result of displaced or obstructed watershed.

13.4 Floodplain/Displacement of Floodwaters

13.4.1 The development area is located within Flood Zone 1; that is, land assessed as having a less than 0.1% (1 in 1000) annual probability of river or sea flooding.

13.4.2 Given the ‘very low’ fluvial flood risk, it is suggested that floodplain compensation should not be a prerequisite of the development works.

13.5 Means of Access/Egress

13.5.1 Access/egress to the site is expected to be via the existing entrance off Deighton Road.

13.5.2 Elevated surface water flood risk is identified in Deighton Road and Whitacre Street to the east. However, it is considered likely that safe access/egress from the site will be afforded during all but the most extreme flooding events.

13.5.3 Abnormal mitigation measures are not expected to be required.

13.6 Groundwater

13.6.1 Given that the site has a history of development, it is considered unlikely that the proposed works will have an adverse effect upon groundwater.

13.6.2 However, groundwater is an unquantified risk at the subject site and requires further investigation.

13.6.3 Mitigation measures should they be required typically comprise omission of basement construction and careful consideration of finished levels within sensitive areas of the site.

13.6.4 Consideration may also be required for construction activities, for example trenches. Where features such as basins are proposed these may require the installation of an impermeable liner.

13.7 Flood Resistant/Resilient Construction

13.7.1 The site is not located within an identified fluvial floodplain.

13.7.2 Specific flood resistant/resilient construction techniques are not considered necessary.

13.7.3 However, mindful of the absence of a detailed proposal and detailed knowledge of the groundwater regime, the following items may require additional consideration where they are to be included:

i. Earthworks cuttings

ii. Basements

iii. Floatation of buried surface water attenuation devices

iv. Groundwater ingress into surficial attenuation features (e.g. swales)

Finished levels should also be developed to ensure that 'clear water flooding' does not result in areas where ground levels are lowered.

14 Proposed Surface Water Drainage Strategy

14.1 Preface

14.1.1 The management and/or disposal of surface water is a material planning matter.

14.1.2 Building Regulations (Part H) and other contemporary guidance requires that surface water should be disposed according to the following hierarchy:

i. Infiltration to ground.

ii. Discharge to a local watercourse.

iii. Discharge to the local sewerage network.

14.1.3 At the time of preparation there was a paucity of information in respect of potential surface water outfalls and underlying soils; however, a discharge to watercourse has been discounted due to the immediate vicinity.

14.1.4 It is inferred from published data that infiltration drainage solutions may be viable at the site; however, this is to be confirmed. Mindful of the preferential hierarchy, a disposal by infiltration would be preferred where proven to be viable.

14.1.5 In the absence of a demonstrable infiltration capacity, for the purpose of estimated potential attenuation requirements it is assumed that a discharge will be made to sewer.

14.2 Sustainability: Discharge Rate and Attenuation Volume

14.2.1 Using the precautionary principal, where a discharge to sewer is required, it is assumed that the Regulators will require the development to mimic greenfield runoff rates as far as possible for all events up to and including the climate adjusted 1 in 100 year (1% AEP) design event.

14.2.2 The UK SuDs online Greenfield Runoff Rate Estimation Tool has been used to estimate the greenfield runoff rate using the ICP SuDs methodology, from the existing site. The results are summarised in the table below:

Period	Runoff (l/s) *			Runoff (l/s/ha)
	25% (0.52ha)	50% (1.04ha)	75% (1.55ha)	
Qbar	3.11	6.21	9.26	5.98
1 year	2.67	5.34	7.97	5.14
30 year	5.44	10.88	16.21	10.46
100 year	6.46	12.93	19.27	12.43
*Actual drained area unknown. Range of scenarios shown. Based upon 2.07 ha total development parcel area				

14.2.3 For guidance, Causeway Flow's Quick Storage Estimate tool has been used to calculate the required volume of attenuation based upon estimates of the proposed hard area and climate change scenarios; see table below:

New Impermeable Area*	Discharge Rate** (l/s)	100 year + 30% Attenuation *** (cu.m)	100 year + 45% Attenuation *** (cu.m)
0.52 ha	3.11	290 - 392	333 - 446
1.04 ha	6.21	580 - 784	667 - 893
1.55 ha	9.26	865 - 1169	993 - 1330
*100% of new developed area assumed to be impermeable **2 l/s assumed as practicable minimum or pro-rata of Qbar ***Based upon FSR inputs			

14.2.4 The attenuation estimate is based upon Flood Studies Report (FSR) inputs. Where the site is to be designed with reference to Flood Estimation Handbook (FEH) derived storm events the attenuation is typically in the range of 10% to 20% greater than those for FSR events. However, during detailed design it is often found that FEH attenuation provisions are typically at the upper range of the generic FSR estimates.

14.2.5 Moreover, it should also be noted the estimates above are based upon a simple control; that is, the outfall rate is fixed at a single rate. Where a complex control is proven to be feasible during the detailed design (e.g. rising discharge rate to mimic the variation currently experienced during differing return period) the attenuation requirements may reduce.

14.2.6 It should also be noted surficial attenuation/conveyance features, such as swales and basins, are preferred due to their potential sustainability and ecological benefits. Specific comment cannot be provided on the practicability of including such features at this time. However, such features are not usually considered viable on a *typical* school site due to perceived issues associated with maintenance (including access for maintenance and use of maintenance vehicles when children may be present) and access to surficial water by children. Where they can be included, their use may limit the need for 'hard engineered' storage, particularly of severe storms; see also previous comments in respect of requirements for drainage to store runoff from severe events.

14.2.7 Refer to Appendix 5 for reproductions of calculations.

14.3 Sustainability: Discharge Volume

14.3.1 In the absence of infiltration, where the drained area increases the volume of water disposed off-site will also increase. In the absence of development proposals, the effect on discharge volume cannot be determined. However, given that the proposals are notionally a replacement for existing, the change in discharge volume post development is expected to be negligible.

14.3.2 Controlling the volume of runoff from the site can be a significant matter when considering offsite flood risks.

14.3.3 LLFA typically require:

i. Discharge rates to mimic existing greenfield runoff rates of the 1:1 year, 1:30 year and 1:100-year storm events as long as long-term storage is utilised for flow volumes in excess of the greenfield volume for the 1:100-year 6-hour event.

ii. The long-term storage volume must discharge at a rate no greater than 2 l/s/ha and the total flow rate must not exceed the 1:100-year greenfield flow rate.

iii. If long term storage is not designed for, Qbar should be applied to all events.

14.3.4 Using the precautionary principle, it is assumed that discharge will be restricted Qbar for all events (i.e. simple controls used). Where this is the case, the LLFA's requirements are likely to be achieved without significant additional consideration to long term attenuation. However, this assertion should be verified, and remedied if appropriate, during the detailed drainage design process.

14.4 Sustainability: Discharge Quality

14.4.1 The management of water quality is a significant issue, and it is envisaged that measures will be required.

14.4.2 CIRCIA C753 "The SuDS Manual" provides guidance of treatment measures (also known as the treatment train) required to offset contaminant and sediment loads.

14.4.3 Permeable surfacing, green/blue roofs, filter strips and basins provide treatment and should be incorporated wherever practicable.

14.4.4 Given the paucity of information, further specific comment cannot be provided at this time. The following are common scenario:

14.4.5 Roofs.

No specific pollution mitigations are anticipated for these areas but is dependent upon material usage.

14.4.6 Permeable Hard Surfacing

Where access and parking are constructed as a permeable surfacing, it is anticipated that the permeable surfacing and sub-base will provide suitable pollution mitigation.

14.4.7 Impermeable Hard Surfacing

Where a significant area of impermeable surfacing is proposed, a petrol interceptor is likely to be required to provide suitable pollution control.

14.5 Operation and Maintenance

14.5.1 The long-term efficacy of any installed drainage system will be compromised by a lack of maintenance.

14.5.2 During the detailed design stage, consideration should be given to the maintenance of any proposed system. It is recommended that a drainage maintenance regime is developed and provided in an "Operation and Maintenance Manual" for the scheme which should conform to the requirements set out within CIRIA C753 The SuDS Manual.

14.5.3 Refer to Appendix 6 for typical considerations.

15 Further Actions

15.1 Infiltration Potential

15.1.1 The infiltration potential of the underlying soils should be investigated in order to formally confirm inferences made from generic, published information. This will have a significant influence upon the drainage strategy.

15.2 Groundwater Monitoring

15.2.1 While the potential for groundwater to impact upon the subject parcel is considered to be relatively low this assertion is not substantiated.

15.2.2 Shallow groundwater may influence the selection of infiltration devices.

15.2.3 The risk (both in the completed works and during construction) cannot be eliminated based upon the information currently held and it is recommended that the depth to groundwater is established and that it is monitored during the winter period for potential fluctuation.

15.3 Sewerage Undertaker

15.3.1 The sewerage undertaker should be contacted in order to formally confirm discharge constraints, where a connection is proposed and to obtain any additional records of sewer flooding.

15.4 Lead Local Flood Authority (LLFA) Discharge Constraints

15.4.1 Confirm with the LLFA the required allowance to be incorporated within the surface water drainage strategy for:

i. Urban Creep; and,

ii. Discharge rates/design storm including potential for a betterment over existing where a discharge to sewer is required.

15.5 Design Co-ordination

15.5.1 The management of surface water will require the provision of significant resources, each with their own constraints; for example, legal easements and access for maintenance/maintenance equipment.

15.5.2 It is recommended that the provision of drainage is considered during the evolution of the detailed design to ensure that an appropriate compromise between cost, performance and environmental responsibility can be provided.

16 Conclusions

16.1 The site occupies an area of approximately 2.07 ha and was formerly occupied by the Deighton Centre, which was demolished in 2013 and is therefore now vacant land.

16.2 Outline development plans at present are for a new SEND school in the north/centre of the site, with a range of external uses including parking/drop-off areas, a forest school, habitat areas, a farm, a MUGA and external ‘passive’ and ‘active’ spaces for pupils.

16.3 Based upon its end use as a school, the proposed development is classified as More Vulnerable.

16.4 The entirety of the site is located within Flood Zone 1; that is, an area with a low probability of flooding. Planning Policy Guidance advises that More Vulnerable end uses are compatible with Flood Zone 1 and. As such, the Exception Test is not required.

16.5 The nearest main river to the site is the River Colne, located at its closest point approximately 1km to the east of the site. The Huddersfield Broad Canal is located approximately 550m to the south of the site and the nearest ordinary watercourse is located approximately 150 m to the north of the site.

16.6 Public sewer records were not available for review. However, given the urban nature of the locale, public sewers are expected to be present around the site.

16.7 Potential exists for the existing site to benefit from a surface water connection into the public sewer network. However, it is inferred from published reference material that infiltration drainage solutions may be feasible. Both assertions should be confirmed.

16.8 The site is located a considerable distance from a fluvial/tidally influenced watercourse and is therefore not considered to be at risk of fluvial/tidal flooding.

16.9 No instances of sewer flooding have been identified during the preparation of this report. Notwithstanding this, consultation with the Sewerage Undertaker is recommended.

16.10 According to publicly available Flood Risk Mapping published by the Environment Agency, the site is not located within an area considered to be at risk of flooding from reservoirs.

16.11 The site is identified as being at “very low” risk of surface water flooding. That is, land assessed as having between a 1 in 1,000 and 1 in 100 annual probability of flooding from surface water (0.1% - 1%).

16.12 Elevated surface water flood risks have been identified along the peripheral highways; however, they are at distance from the site. With regards to site access/egress, it is considered likely that the site will be afforded a means of safe escape during all but the most extreme events.

16.13 From the flood risk envelope depicted, the site does not present as being a preferential route for offsite originating overland flows.

16.14 Published information does not suggest that the site is at risk of groundwater flooding.

16.15 If the underlying soils are proven to support infiltration drainage systems there is a preference in current planning ethos to use infiltration as the means of surface water disposal.

16.16 Notwithstanding the above, the potential for infiltration drainage, including establishing groundwater depth, should be confirmed by intrusive site investigation.

16.17 Where a discharge to sewer is required, the permitted rate of discharge must be confirmed with the LLFA (surface water only) and sewerage undertaker.

16.18 Requirements for inclusions within the surface water drainage design for climate change, urban creep and betterment should be similarly agreed with the Regulators. It is the current 'norm' for greenfield discharge rates to be prescribed unless this is demonstrably impractical.

16.19 Consideration of surface water discharge quality will be required. Regulators typically favour the use of permeable paving, swales, basins and the like over interceptors.

16.20 Attenuation of surface water flow will be required. A range of scenarios are provided within Section 14. Attenuation is typically provided by basins, swales, permeable paving (lined), modular storage cells and oversized pipes where the outfall is made to sewer. The attenuation commentary is provided for guidance only and should not be inferred as the preferred means of surface water disposal being to sewer.

16.21 It is anticipated that the Regulators will express a preference for the use of basins, permeable paving and swales where a discharge to sewer is made. Infiltration devices tend to have attenuation constructed into the asset itself (e.g., the subbase of permeable paving, chamber of a soakaway, etc).

16.22 Innovative pollution and flow attenuation techniques such as green/blue roofs and rain gardens may be applicable.

16.23 Overall, with respect to flood risk, the site is considered:

i. To be at the lowest risk of tidal/fluvial flooding;

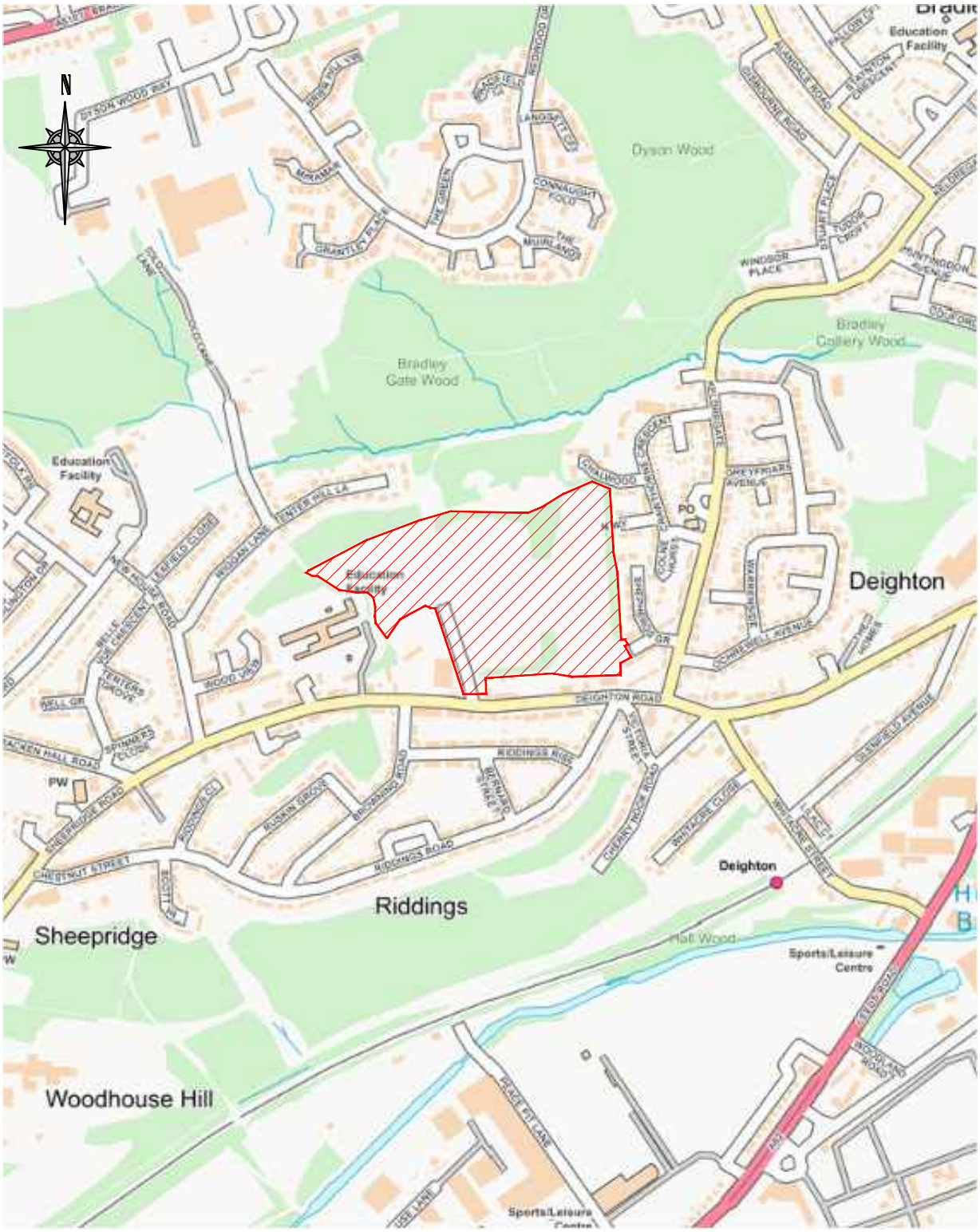
ii. To be at a low/negligible risk of groundwater flooding;

iii. To be at the lowest risk of surface water flooding; and,

iv. To require surface water discharge attenuation of both quantity and quality.

Appendix 1

- C4164-SK001 Site Location Plan
- C4164-HSP-00-00-DR-C-5001-P01 Topographical Survey
- C4164-HSP-00-00-DR-C-5002-P01 Cross Section Survey



P01	GI	25/01/23	First Revision	-
REV	BY	DATE	DETAILS	CKD

CLIENT Frank Shaw Associates Ltd	SCALE (A4) NTS
	DATE 25/01/2023
PROJECT Joseph Norton SEMH School Deighton Road, Huddersfield, HD2 1JP	DRAWN BY GI
	CHECKED BY -
TITLE Site Location Plan	PROJECT NO. C4164
DRAWING NO. SK001	REV P01

STATUS: S2 - INFORMATION

hsp consulting
Lawrence House, 6 Meadowbank Way, Eastwood, Nottingham, NG16 3SB
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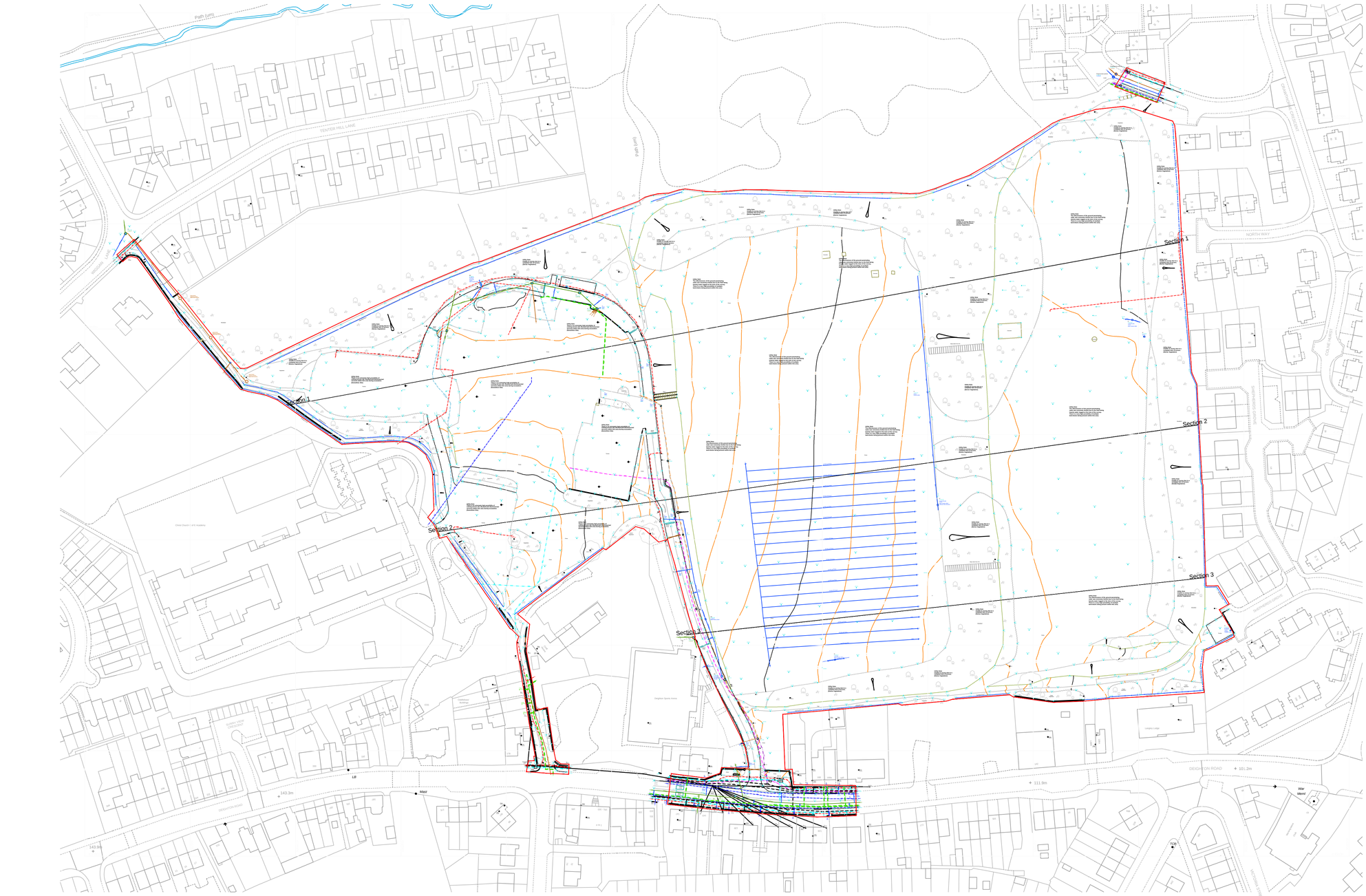
www.hspconsulting.com



GENERAL NOTES

1. Do not scale.

2. All dimensions shown are in millimetres unless noted otherwise.

3. This drawing is based on Mapmatic Drawing Number, 5447 0001, Topographical & Utility Survey, dated 15/12/22 .

4. All survey information is provided by the surveying company and HSP cannot accept any liability for any discrepancies there in. All survey information to be verified on site by contractor. Should discrepancies be identified, HSP to be notified immediately.

KEY FOR UNDERGROUND SERVICES

Foul water
Surface water
Other
Gas
Electric
Telephone
Cable TV
Unidentified
Water
Closed Circuit TV
Communications
Heating Pipe
Empty Duct
Fibre Optics
Vents
Fire
Traffic Signal
Gauge Lines
Vapor Recovery
Offsets
Fuel

Where chamber extents are significantly greater than the cover size, their approximate extents are shown thus;

ABBREVIATION KEY

Key:

Av	Air valve	Gi	Girth circumference	Sv	Stop valve
Bg	Back gully	Gy	Gully	TCB	Telephone cell box
BH	Borehole	Ht,	Height	TTLI	Tree top level
BM	Benchmark	IC	Inspection cover	ThL	Threshold level
Bol	Bollard	IFL	Internal floor level	TCB	Telephone cell box
Bs	Bus stop	IL	Invert level	TL	Traffic light
BT	British Telecom	Lb	Letter box	ThL	Threshold level
Bg	Back Gully	Lp	Lamp Post	Tp	Telegraph post
CL	Cover Level	MG	Mudgrills	Ts	Traffic signal
CBX	Control box	MH	Manhole	TT	Tactile paving
CPS	Concrete paving slab	Mkp	Marker post	TwL	Top of wall level
CTV	Cable TV cover	NVP	No visible pipes	UTL	Unable to lift
Eb	Electric cover	PInv	Pipe invert	WL	Water level
Ep	Electricity pole	Pb	Post box	Wm	Water meter
Er	Earth rod	Re	Rodding eye	Wo	Wash out
Fh	Fire hydrant	Sp	Sign post		
Fa	Flagstaff	St	Stop tap		

Road
Drop Kerb
Verge Tarmac
Verge Concrete
Verge Grass
Verge Tops
Bottoms

Ordnance Survey information is provided for a guide only.

OS BUILDING OUTLINE OS DETAIL

Station	Easting (m)	Northing (m)	Level (m)
M1	416014.640	419373.960	123.405
M2	415982.643	419498.972	129.309
M3	415961.000	419593.140	131.226
M4	415869.272	419541.783	134.028
M5	415900.647	419482.971	137.758
M6	415917.457	419394.266	131.349

REV	BY	DATE	DETAILS	CKD
P01	IA	09.01.23	First revision	LB

STATUS: S2 - INFORMATION

CLIENT: Frank Shaw Associates Ltd

PROJECT: Joseph Norton SEMH School

TITLE: Topographical and Utility Survey Overview

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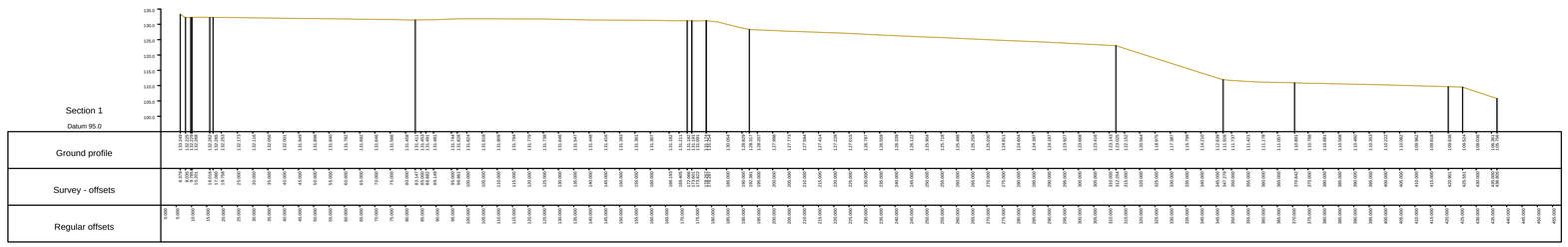
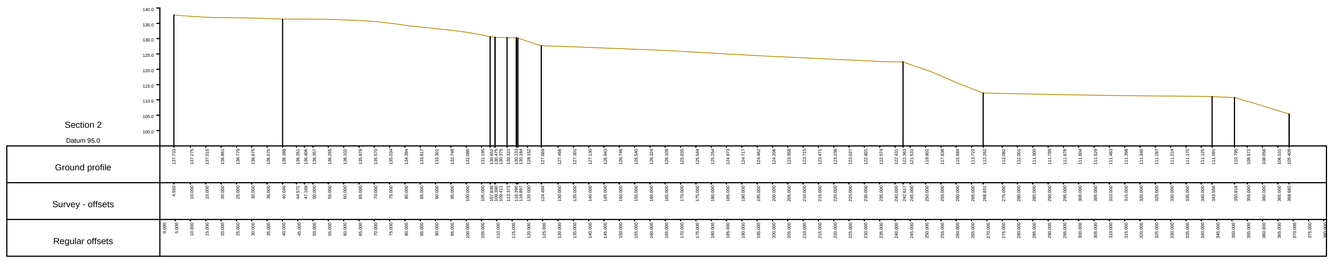
SCALE	PROJECT NO.	SHEET SIZE
1:1000	C4164	A1

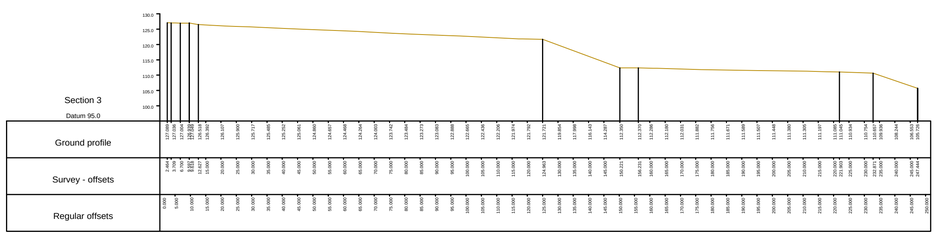
DATE	DRAWN	CHECKED
09.01.23	IA	LB

DRAWING NO.: C4164-HSP-00-00-XX-C-5001

REV: P01







GENERAL NOTES

1. Do not scale.

2. All dimensions shown are in millimetres unless noted otherwise.

3. This drawing is based on Mapmatic Drawing Number, 5447 0001, Topographical & Utility Survey, dated 15/12/22 .

4. All survey information is provided by the surveying company and HSP cannot accept any liability for any discrepancies there in. All survey information to be verified on site by contractor. Should discrepancies be identified, HSP to be notified immediately.

REV	BY	DATE	DETAILS	CKD
P01	IA	09.01.23	First revision	LB

STATUS	S2 - INFORMATION

CLIENT

Frank Shaw Associates Ltd

PROJECT

Joseph Norton
SEMH School

TITLE

Cross Section Survey

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SCALE	PROJECT NO.	SHEET SIZE A1
1:1000	C4164	

DATE	DRAWN	CHECKED
09.01.23	IA	LB

DRAWING NO.	REV
C4164-HSP-00-00-XX-C-5002	P01

Appendix 2 ▪ Outline Development Proposals

The use of drawings by the Customer acts as an agreement to the following statements. The Customer must not use the drawings if it does not agree with any of the following statements:

All drawings are based upon site information supplied by third parties and as such their accuracy cannot be guaranteed. All features are approximate and subject to clarification by a detailed topographical survey, statutory service enquiries and confirmation of the legal boundaries. Do not scale the drawings. Figured dimensions must be used in all cases. All dimensions must be checked on site. Any discrepancies must be reported in writing to Colour-UDL before proceeding. All drawings are copyright protected. Refer to full Terms & Conditions at www.colour-udl.com

KEY

Site Boundary

SOFTSCAPE

- Existing Trees (RPZ dashed)
- Existing Trees to be removed
- Proposed Trees
- Hedgerow Planting
- Ornamental Shrub Planting
- Native Shrub Planting
- Wildflower Meadow Seeding
- Wetland / Pond Margin Seeding
- Woodland Undergrowth Seeding
- Grazing Pasture Seeding
- Amenity Grass Seeding
- Reinforced Grass Turf

HARDSCAPE

- Retaining Wall (refer to Engineer's details)
- 2.0m high Freestanding Wall (refer to Engineer's details)
- Slab Paving
- Blacktop Tarmac
- Coloured Tarmac
- Wet Pour Safety Surface
- Timber Decking
- MUGA Sports Surface
- Permeable Paving
- Reinforced Gravel
- Seating

FENCING

- 3.0m Closeboard Vertical Featheredge Fencing
- 3.0m Rebound Weld Mesh Fencing
- 2.4m Anti-climb Weld Mesh Fencing
- 1.8m Anti-climb Weld Mesh Fencing
- 1.5m Anti-climb Weld Mesh Fencing
- 1.5m Galvanised Wire Mesh Fencing to Goats Enclosure (75-150mm mesh size)
- 1.5m Galvanised Wire Mesh Fencing to Chicken Run (25mm mesh size)
- 1.1m Galvanised Wire Mesh Fencing to Pigs Enclosure (75-150mm mesh size) with electr. pasture tape to bottom
- 1.1m Timber Picket Fencing to Veg. beds with 600mm high rabbit-proof wire netting
- 1.1m Cleft Chestnut Fencing

Rev	Amendments	Date	Drwn	Chkd
31	Revised Substation location	21.09.23	TK	-

Project
Joseph Norton Academy, Deighton

Drawing Title
General Arrangement Plan
Landscape Layout

Project No.	Scale @ A2	Project Status
2352	1:500	For Planning
Drawing No.		Revision
L-2352-GAP-1000		31

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Appendix 3

- Lead Local Flood Authority Consultation Response

George Innes

From: Richard Harrison
Sent: 30 January 2023 09:16
To: George Innes
Subject: FW: Customer enquiry

From: Floodmanagement <Floodmanagement@kirklees.gov.uk>
Sent: 30 January 2023 09:15
To: Richard Harrison <richard.harrison@hspconsulting.com>
Subject: RE: Customer enquiry

OFFICIAL - SENSITIVE

Good morning Richard,

Please see the below information regarding your request.

We only have 1 recorded flood incident in recent history in the vicinity of this location. The reported cause of this was water flowing off the playing fields to the south east of the fields and impacting residential properties.

The site is not in a critical drainage area.

It is likely that a culvert flows through at least some portion of the site. We have records of a culvert on the east border that has a diameter of 225mm and a rough depth of 1.4m.

If you need any more information please let me know.

Thanks,
Jason

From: Customer Enquiries <Customer.Enquiries@kirklees.gov.uk>
Sent: 26 October 2022 14:40
To: Floodmanagement <Floodmanagement@kirklees.gov.uk>
Cc: Richard Harrison <richard.harrison@hspconsulting.com>
Subject: Customer enquiry

OFFICIAL - SENSITIVE

Good Afternoon

Please see customer enquiry below and advise

Kind regards

KD Web Assist MS

Person Details		Address	
Title:	Mr	House No./Name:	Former Deighton Centre
Forename:	Richard	Street:	Deighton Road
Lastname:	Harrison	Location:	Deighton
Email:	richard.harrison@hspconsulting.com	Town:	Huddersfield
Telephone:	07709408693	Postcode:	HD2 1JP
Date Of Birth:			
Ethnicity:			

Nature Of Request

Action Required

Further Information

Dear Sir/madam, We have a proposed school site in Deighton we are producing a flood risk assessment for (address referenced). Approximate coordinates for the centre of the site are E415963, N419571. As Lead Local Flood Authority can you confirm any data you hold regarding historic flooding, critical drainage areas, other requirements, etc. (CTC SMILE: Service Email:- floodmanagement@kirklees.gov.uk)

Appendix 4

- EA Flood Map for Planning
- EA Long-term Flood Risk Mapping Extracts

Flood map for planning

Your reference	Location (easting/northing)	Created
Joseph Norton SEMH School	**416006/419551**	**25 Jan 2023 13:32**

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following:**

- bigger that 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.