Dice

100954 Top Wighay Farm, Hucknall

Drainage & Flood Risk Review

+44 (0) 115 952 8752
info@diceconsult.co.uk
diceconsult.co.uk

Top Wighay Farm, Hucknall
Drainage & Flood Risk Review

February 2024

REPORT REF: TWFH-DCE-XX-XX-RP-C-0001

Date:	March 2024
Report ref:	TWFH-DCE-XX-XX-RP-C-0001
Report revision:	REV -P01
Client:	Linby Parish Council

Engineer: Dice Consulting Engineers Ltd
The Courtyard
Third Floor
35-37 St Mary's Gate
Nottingham
NG1 1PU

info@diceconsult.co.uk
+ 44 (0) 115 952 8752

Report Prepared By:

.....

George Grant
BEng (hons)
Senior Civil Engineer

Report Approved By:

.....

Ivayla Dimitrov
MSc
Principal Infrastructure Engineer

+44 (0) 115 952 8752
info@diceconsult.co.uk
diceconsult.co.uk

CONTENTS

APPENDICES

+44 (0) 115 952 8752
info@diceconsult.co.uk
diceconsult.co.uk

DISCLAIMER

The opinions and interpretations presented in this report represent our best technical interpretation of the data made available to us. However, due to uncertainty inherent in the estimation of all parameters, we cannot, and do not guarantee the accuracy or correctness of any interpretation and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, cost, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. The findings and opinions expressed are relevant to the dates of the site works and should not be relied upon to represent conditions at substantially later dates. If additional information becomes available which may affect our comments, conclusions or recommendations, the author reserves the right to review the information, reassess any new potential concerns and modify our opinions accordingly.

Except for the provision of professional services on a fee basis, Dice Consulting Engineers Ltd does not have a commercial arrangement with any person or company involved in the interests that are the subject of this report. Dice Consulting Engineers Ltd cannot accept any liability for the correctness, applicability or validity for the information they have provided, or indeed for any consequential costs or losses in this regard. Our efforts have been made on a “best endeavours” basis and no responsibility or liability is warranted or accepted by Dice Consulting Engineers Ltd.

+44 (0) 115 952 8752
info@diceconsult.co.uk
diceconsult.co.uk

1.0 Introduction

1.1. Scope of Works

Dice Consulting Engineers Ltd (Dice) has been commissioned by Linby Parish Council to undertake a review of the drainage strategy and flood risk information submitted for the proposed development at Top Wighay Farm, Hucknall (Outline Ref. 2020/0050). The development proposes the erection of up to 763 residential dwellings, including public open space, community hub/multi use games area and allotments, and associated infrastructure. The supporting information submitted as part of the subsequent planning applications references 2023/0872 and Planning Variation 2024/0063 have also been reviewed.

1.2 Site Location

The site is located in North Nottingham, approximately 11.8km from Nottingham City Centre, covering a total area of approximately 40ha, including development areas that are not to be served by the proposed infrastructure. Site postcode: NG15 8JN.

The wider site can be seen in **Appendix A**, with the red areas not being included in the strategy that is being reviewed.

1.2 Site Description

The site is classified as entirely greenfield, comprising grassland and farmland.

1.3 Site Proposals

The site proposals that are being reviewed show the development of approximately 28.4ha, including the school, which is to have independent attenuation to the wider site, with the school development covering an area of 2.15ha.

1.4 Topography

The site has reasonable sloping topography, with a central low point within the middle of the site, and low points along the eastern boundaries.

1.5 Existing Drainage Assets

There are no known public or private sewers within the site. There are, however, several watercourses, generally running from North West to South East.

Dice
+44 (0) 115 952 8752
info@diceconsult.co.uk
diceconsult.co.uk

2.0 Pre-development Flood Risk

2.1. Existing Discharges

The site is classified as greenfield, as such the existing greenfield runoff can be calculated for the 28.4ha development area at 83.36/s. Therefore, this quantifies 83.36l/s following the existing flood route path.

2.2. Pluvial Flooding

Pluvial flooding occurs when natural and engineered systems have insufficient capacity to deal with the volume of rainfall. This flood water would then be conveyed via overland flow routes dictated by the local topography.

The Environment Agency Risk of Flooding from Surface Water mapping for the site area is shown in **Figure 1** below. The map indicates several hot spots of low to high flood risk throughout the site, predominantly where the watercourses are present, which is not uncommon. There is however a centralised spot of high flood risk in the middle of the site. From reviewing the topography and pre-development flood route path, this area looks to collect a large amount of existing runoff, with no positive outfall. This means that this hotspot likely stores and infiltrates a large portion of the site's existing runoff.

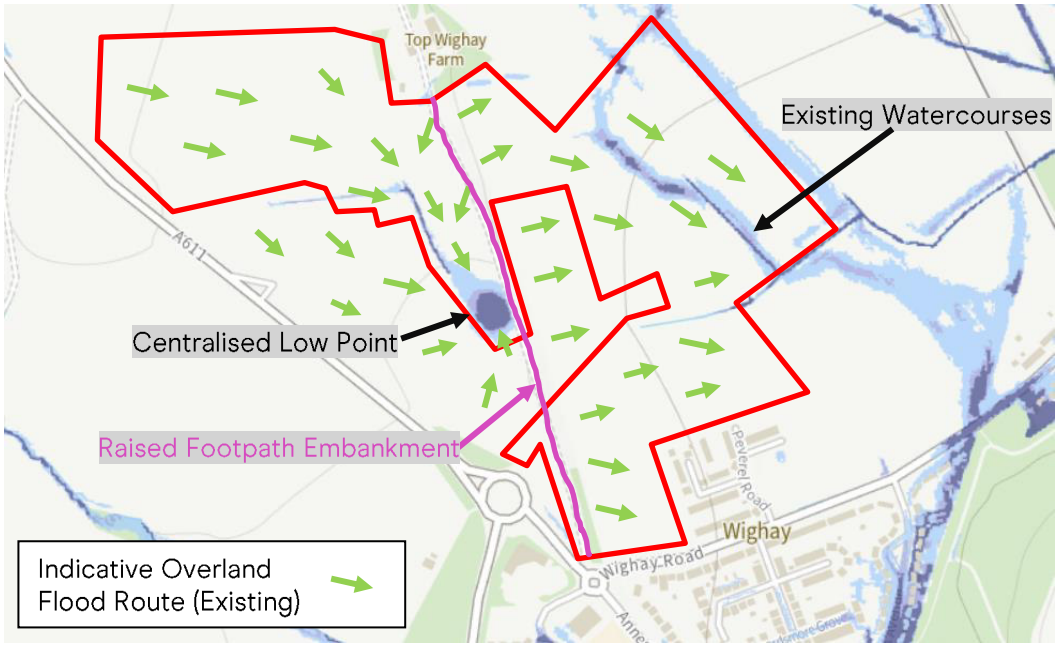

Figure 3 - Environment Agency Flood Mapping – Risk of Flooding from Surface Water, Edited

2.3. Groundwater Flooding

The site is identified as being within an area at high risk from groundwater flooding, with the Geo-environmental assessment (Ref. 19-1149.01) confirming groundwater to be present within a few hotspots across the site. Though groundwater risk is high in some areas, a considerate earthworks design and implementation of SuDS can likely mitigate any risk this poses.

2.3. Other Flooding Sources

All other flooding sources including reservoirs, fluvial, sewer and tidal are considered low risk.

+44 (0) 115 952 8752
info@diceconsult.co.uk
diceconsult.co.uk

3.0 Drainage Proposal Review

The below review has been undertaken for the below documents and drawings:

1. Geo-Environmental Assessment – Ref. 19-1149.01 (DeltaSimons 2019) (Outline Ref. 2020/0050)
2. Flood Risk Assessment & Drainage Strategy – Ref. TWFH-BSP-ZZ-XX-RP-C-001-P02_Flood_Risk_Assessment (BSP Consulting 2019) (Outline Ref. 2020/0050)
3. Drainage Proposals Strategy – Ref. 22095-126 (Mucklow & Harris 2023) (Planning Ref. 2023/0872)
4. Addendum to the Flood Risk Assessment – Ref 22095 (Muchlow & Harris 2024) (Planning Ref. 2023/0872)

3.1. Proposed Discharge Rates

The Drainage Proposals Strategy (3.), shown in **Appendix B**, proposes a total of 4 no. outfalls totalling an overall discharge rate of 115.44l/s. The proposals show to drain a development area of approximately 28.4ha, which will be made up of hardstanding and greenspace. In line with the LLFA requirements and best practices, the development should restrict overall runoff to greenfield runoff rates. Dice have independently undertaken a greenfield calculation, which can be seen in **Appendix C.**

The calculated greenfield runoff rate assumes a corrected soil value of 3 (ranges 1-5, higher values = greater runoff), with the default recommendation for this area being 1. However, a soil value of 1 for this site has been considered unfeasible, as this assumes granular free-draining soil, when in fact much of the site is underlain by cohesive clay. It is also considered that soil values higher than 3 are unrealistic for the site due to a reasonable topography and hot spots of underlying granular sand. The soil values themselves are taken from broad geological information so they cannot be considered accurate for each site.

The result of this calculation was 83.36l/s (QBAR) runoff for the 28.4ha site. This newly calculated rate is lower than the proposed rate submitted at planning, as such it is recommended that the greenfield runoff be reviewed before site development.

3.2. Proposed Discharge Locations

The Drainage Proposals Strategy (3.) proposes 4no. outfalls, that are independently controlled and attenuated. All these outfalls show discharges into watercourses. However, due to the topography directing water away from the proposed discharge points, the existing runoff from the pre-developed site does not enter these locations entirely. The areas that are experiencing catchment transfer have been identified in **Figure 2**.

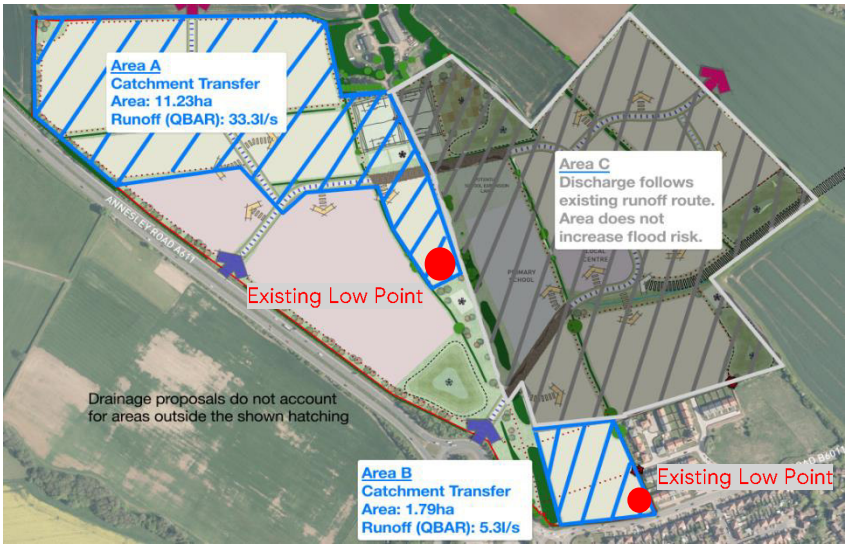

Figure 2 – Dice Catchment Sketch

+44 (0) 115 952 8752
info@diceconsult.co.uk
diceconsult.co.uk

Area A covers a significant portion of the site at 11.23ha, therefore having a calculated existing greenfield runoff rate of 33.3l/s. This runoff is directed along the existing overland flood route, indicated in **Figure 1**, towards a centralised low point with no confirmed positive outfall. The BSP FRA (2.) states this low point is currently served by a drainage ditch with a positively drained pipe, however, there remains insufficient evidence to confirm if this is the case or where the pipe ultimately discharges to. This means that the directed rainfall runoff collects within this centralised low point, as shown on the Environment Agency's surface water flood maps. Once at the low point, surface water is most likely stored and infiltrated over time, unless the outfall pipe mentioned can be traced to confirm connection to one of the watercourses within or surrounding the site.

Therefore, runoff from Area A does not currently enter any of the outfall watercourses. The Drainage Proposals Strategy (3.) shows proposed runoff to be directed out of Area A and into a watercourse that is not currently serving this catchment. The drainage proposals strategy (3.) shows positive drainage to direct runoff from impermeable areas north. The FRA addendum (4.) then shows a new culvert crossing to be installed to divert flooding from the low point eastwards. As such the proposed development within this area could pose increased flood risk to the wider area due to increasing the volume of water that is currently entering the watercourses on the eastern boundary.

Likewise, Area B does not currently enter a watercourse, with the existing rainfall runoff from this area collecting on the south-eastern boundary. Anecdotal evidence suggests there are existing flooding issues within this area and to the existing neighbouring property, which confirms the flood route path analysis undertaken. Similarly to Area A, the Drainage Proposals Strategy (3.) shows runoff from Area B to be directed away from the existing flood route and into a watercourse that does not currently service this area. Granted this diversion would assist the existing flooding issues experienced on this boundary, but would ultimately incur additional runoff entering the wider ditch network.

The combination of Area A & B presents an additional proposed flow of approximately 38.6l/s entering the eastern watercourses, on top of what is currently entering them. Should the existing watercourses already be close to or be at capacity, then this additional flow may cause flooding issues to the proposed site and the wider area. As such it is recommended that an analysis be undertaken to understand if the receiving watercourses can manage this additional flow before any site development. Alternatively, additional evidence can be provided to show that the existing site does in fact enter the receiving watercourses and that the proposed development runoff resembles that of the predevelopment runoff.

In addition to the surface water sewerage proposals, there are several proposals to clear ditches and remove existing culverts. These proposals should be backed up by calculations to evidence that these works will not increase flooding downstream. Currently, no assessment has been undertaken to identify current flooding issues downstream of this ditch network. Should anecdotal evidence of flooding issues in Linby be correct, then it is possible that these ditch works could exacerbate existing flooding issues further.

3.3. Discharge Hierarchy

Part H of the Building Regulations 2015 recommends that surface water run-off shall discharge to one of the following, listed in order of priority:

- An adequate soakaway or other adequate infiltration system, or where that is not reasonably practicable;
- A watercourse, or, where that is not reasonably practicable;
- A sewer.

+44 (0) 115 952 8752
info@diceconsult.co.uk
diceconsult.co.uk

As part of the Geo-environmental investigation report, intrusive testing was carried out on-site to monitor groundwater, contamination, and infiltration potential. The results from this report show groundwater to be present in some locations, which could render infiltration unviable in the areas if a 1m offset cannot be achieved between groundwater and the base of the infiltration component.

The report does however show acceptable infiltration rates in SA105, and no groundwater encounters. Therefore, it is suggested that infiltration be considered within this area, as well as any others that do not experience shallow groundwater or poor infiltration. In addition to this, it is advised that additional infiltration tests be carried out at the site's low points (identified in **Figure 2**) to better understand if there are other infiltration opportunities within the site.

3.3. Drainage Areas & Attenuation

Dice have estimated the impermeable areas to be circa 15.6ha, which is circa 0.9ha larger than the submitted information. The proposals and calculations should be reviewed to ensure the areas calculated are correct.

Dice cannot comment on the attenuation given the above findings and recommendations, but the volumes shown look reasonable for the discharge rates proposed. However, as discussed above Dice recommends the discharge rates are reconsidered to ensure the pre-development runoff rate remains equal to the post-development runoff rate.

+44 (0) 115 952 8752
info@diceconsult.co.uk
diceconsult.co.uk

4.0 Conclusion

4.1 Dice Consulting Engineers Ltd (Dice) has been commissioned by Linby Parish Council to undertake a review of the drainage strategy and flood risk information submitted for the proposed development at Top Wighay Farm, Hucknall (Outline Ref. 2020/0050).

4.2 The site is currently classified as greenfield with the proposal of up to 763 residential dwellings, including public open space, community hub/multi-use games area and allotments, and associated infrastructure.

4.3 The development area covers approximately 28.4ha, equating to a greenfield discharge rate of 83.36/s following the pre-development flood exceedance route.

4.4 The pre-development flood exceedance route shows existing surface water runoff to be directed in 3 different directions, splitting the site into 3 separate areas. One of these areas (A) shows runoff to be directed towards a centralised low point, where excess runoff collects and is likely stored and infiltrated over time. This is reinforced within the surface water flood risk maps, as this area is identified at high risk of surface water flooding. Another area (B) then directs runoff towards the existing highway, with anecdotal evidence suggesting historical flooding issues in this area. Finally, the last area (C), directs runoff to the watercourses that are located along the eastern boundary.

4.5 The proposed development shows to positively drain the impermeable development areas towards the eastern watercourses and control flows to a total of 115.44l/s. This is larger than what Dice have calculated as the greenfield runoff following the pre-development exceedance route. On top of this, as discussed above, not all of the greenfield runoff leaves the site, resulting in the proposals showing additional flow entering the watercourses beyond what is currently experienced.

4.6 The estimated runoff that is likely to leave the existing site, and enter the eastern watercourses, is approximately 55.71l/s. This is significantly lower than what is proposed in the submitted strategy.

4.7 Should a discharge rate greater than 55.71l/s be proposed to leave the site, then it is recommended that further investigation be undertaken to understand the available capacity of the receiving watercourses and downstream network. This is to ensure that an increased flow within these assets will not cause flooding issues for the proposed site or wider area.

4.8 In addition to the discharge rate proposals. Dice believe inadequate evidence has been submitted to discount infiltration as a viable means of surface water disposal, and suggests infiltration be considered in catchments rather than the sitewide approach currently adopted.

4.9 Dice cannot review the attenuation requirements given the above recommendations regarding discharge rates. However, the impermeable areas shown within the proposed strategy look to be circa 0.9ha lower than the Dice estimate. As such it is recommended an impermeable areas plan be submitted to confirm the calculated attenuation volumes.

Dice
+44 (0) 115 952 8752
info@diceconsult.co.uk
diceconsult.co.uk

Appendices

+44 (0) 115 952 8752
info@diceconsult.co.uk
diceconsult.co.uk

Appendix A

ANNESLEY ROAD A611

WIGHAY ROAD B6011

0 50 100 m

Key

Site Boundary

Built Form Parameters

Residential Built Form
Maximum Height: 12m (3 storeys)

Residential Built Form
Maximum Height: 10.5m (2.5 storeys)

Employment Built Form
Maximum Height: 13.5m (3 storeys)

School Built Form
Maximum Height: 10.5m (2 storeys)

Indicative Local Centre Location

Access and Movement Parameters

Vehicular Site Access
See planning application NCC ref. FR3/4054

Primary Vehicular Access Corridor
To include Bus Route / School Access based on Illustrative Masterplan

Proposed NET Extension Route
Width 12.5m

Landscape Parameters

Retained Tree Planting
Except to allow for Access & Movement Parameters / Drainage Parameters

Open Space / Green Corridors
Except to allow for Access & Movement & Drainage Parameters includes:
1. Proposed landscaping
2. Open space typologies
3. Drainage areas
4. Pedestrian and/or Cycle Links
5. Play Spaces
6. Front gardens and private drive/lane access to dwellings

Drainage Parameters

Indicative SUDS Location
Based on Illustrative Masterplan

Existing Watercourse

Planning | Design | Environment | Economics | Heritage
East Midlands

Top Wighay Farm, Wighay Road, Linby - **Parameter Plan**

I Drawn by: WJB I Approved by: SLR I Date: 20/07/20 I Scale: 1:2500 @ A2 I DRG: P19-0346 005 Sheet No: - Rev: D I Client: Nottinghamshire County Council I

Pegasus Group

+44 (0) 115 952 8752
info@diceconsult.co.uk
diceconsult.co.uk

Appendix B

Parcel A Surface Water Design Details

Total Parcel Area 91584m²
Area Total Impermeable Area 57590m² (inc 10% Urban Creep)
QBAR 4.393 L/S/ha (taken From BSP FRA)

Discharge Rate of 37.0L/S (Based on QBAR to be confirmed by Nottinghamshire County Council LLFA)

Storage based upon 1 in 100 year + 40% storm event (360minutes)

Pond and Attenuation Tank attenuates 1 in 100 year plus 40% for climate change

Pond Volume 2375m³ (An allowance of 10% for Urban Creep)

Attenuation Tank = 2322m³ 67.5 x 43.0 x 0.8m deep
(10% Urban Creep has been allowed for)

Pipes within proposed highway only convey surface water runoff to proposed pond and do not provide any attenuation

TABLE 21.3 Operation and maintenance requirements for attenuation storage tanks

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/ or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

Parcel B Surface Water Design Details

Total Parcel Area 91112m²
Area Total Impermeable Area 53747m² (inc 10% Urban Creep)
QBAR 4.393 L/S/ha (taken From BSP FRA)

Discharge Rate of 40.0L/S (Based on QBAR to be confirmed by Nottinghamshire County Council LLFA)

Storage based upon 1 in 100 year + 40% storm event (360minutes)

Pond attenuates 1 in 100 year plus 40% for climate change
Pond Volume 3715m³ (An allowance of 10% for Urban Creep)

Pipes within proposed highway only convey surface water runoff to proposed pond and do not provide any attenuation

Outfall to existing ditchcourse to match greenfield runoff

Outfall to existing ditchcourse to match greenfield runoff

Outfall to existing ditchcourse to match greenfield runoff

Private Discharge direct to head of existing water course 2.15ha from School Site at Greenfield Runoff 9.44L/S (QBAR) - As confirmed by BSP

Allowance of 6000m² Impermeable Area for future development as indicated by BSP connection into Vistry drainage proposals

Parcel C Surface Water Design Details

Total Parcel Area 73855m²
Area Total Impermeable Area 35900m² (inc 10% Urban Creep)
QBAR 4.393 L/S/ha (taken From BSP FRA)

Discharge Rate of 29.0L/S (Based on QBAR to be confirmed by Nottinghamshire County Council LLFA)

Storage based upon 1 in 100 year + 40% storm event (360minutes)

Pond attenuates 1 in 100 year plus 40% for climate change
Pond Volume 2700m³ (An allowance of 10% for Urban Creep)

Pipes within proposed highway only convey surface water runoff to proposed pond and do not provide any attenuation

TABLE 23.1 Operation and maintenance requirements for ponds and wetlands

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – public areas	Monthly (during growing season)
	Cut the meadow grass	Half yearly (spring, before nesting season, and autumn)
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage and/or physical damage	Monthly
	Inspect water body for signs of poor water quality	Monthly (May – October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options	Half yearly
	Check any mechanical devices, eg penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1 m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to a minimum of 1m above water level	Annually
	Tidy all dead growth (scrub clearance) before start of growing season. (Note: tree maintenance is usually part of overall landscape management contract)	Annually
	Remove sediment from any forebay.	Every 1–5 years, or as required
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays.	Every 5 years, or as required
Occasional maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, eg every 25–50 years
Remedial actions	Repair erosion or other damage	As required
	Replant, where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip–rap or repair other damage	As required
	Repair / rehabilitate inlets, outlets and overflows.	As required

The requirement of land drainage / drainage channels within rear gardens to be assessed on site by site manager and Groundworker

Any drainage within proximity of existing or proposed trees is subject to Yorkshire Water and LA approval, additional protection or relocation may be required.

Trees Protection
1. In order to protect trees, a protection zone should be set-up around each tree (i.e. fencing) before starting construction work. Extent of protection zone needs to be agreed with Local Authority Tree Officer.
2. Careful planning and communication with LA Tree Officer, landscape designers and contractors prior to works, to reduce tree damage.
3. Must adhere to British Standard BS5837: 2004.

Additional Public Sewers may now be available post October 2011 'Transfer of Private Sewers'. Further onsite investigation required to ascertain suitability of making a Section 106 connection. Possible 3rd party land crossings required.

Invert Level needs to be determined prior to any drainage works and reported back to the Engineer

All pipes to be 150Ø unless otherwise stated

All sewer diversions and discharges to public sewers are indicative only and are subject to approval by the Sewerage Undertaker

All drainage locations indicated on this drawing are preliminary only. Architect is to provide detailed drawings confirming all proposed foul outlet and rwp positions for all units.

EX MH's invert level and location need to be checked prior to any drainage works. Any differences between actual and drawn details are to be reported immediately

All existing public sewers on the site to be CCTV surveyed to check for third party connections

Invert Levels for existing manholes have been taken from Sewer Records. Any differences between actual and drawn details are to be reported immediately to the Engineers prior to any sewage diversion works.

All existing public sewers are shown indicative only. All locations and levels to be checked prior to any detailed drainage design or on-site works.

N
NW NE
W E
SW
S
MAGNETIC NORTH

Scale 1:1250

Notes

Drawings must not be scaled. Work to figured dimensions only

1. Due to a change in legislation on 1st October 2011, there could be formally private sewers which have transferred over to the responsibility of the Sewerage Undertaker. If such sewers are located on site during construction works, please contact Mucklow & Harris Ltd so that a Section 185 Agreement can be prepared to divert these sewers.
2. The survey information used in the preparation of this drawing is not warranted. The Contractor must verify all dimensions and levels on site.
3. This drawing must be read in conjunction with the site investigation report. Before work commences contractor should consult the engineer and the SI report regarding any contamination issues. All necessary Health and Safety measures to be taken.
4. Before work commences, the contractor shall liaise with all Statutory Authorities to determine the exact location of all apparatus and take all precautions deemed necessary to locate, protect and where necessary divert such equipment.
5. This drawing is subject to approval by Local Authority, Building Control, Sewerage Undertaker and the Environment Agency. Any works undertaken prior to the granting of these approvals is carried out at risk to others.
6. If any contaminated or unsuitable material require disposed off site, it should be taken to a suitably licensed landfill site.
7. The contractor shall check all dimensions and levels on site.
8. Setting out to be confirmed by the Architect.
9. Prior to commencing work on the drainage, all existing drains, sewers manholes and outfalls to remain shall be located, identified and a CCTV condition survey carried out. Where necessary, protection to the existing drainage infrastructure shall be provided.
10. All existing sewers and manholes abandoned due to the proposed works are to be grouted up and removed unless noted otherwise.
11. All external drainage works shall be constructed in accordance with civil engineering specification for the water industry and Design Construction Guidance for adoptable drainage, for private drainage in accordance with the Building regulations Part H and BS.EN 752.
12. All existing drainage levels, diameters & locations need to be checked on site prior to any drainage works, and any discrepancies need to be reported back to the Engineer.
13. Cover levels for manholes are approximate only and should be adjusted to match surrounding levels.
14. All manhole and drainage covers shall comply with BS.EN124. Manhole covers within carriageway, kerbs and footways shall be recessed. Cover strengths to be :
    Class E400 in areas of heavy loading
    Class D400 in heavy trafficked areas (roads, services yards).
    Class C250 Lightly trafficked areas (car parks).
    Class B125 in landscape and non trafficked areas (min. 100mm dp frame).
15. Drainage pipes 100mm diameter unless stated otherwise.
16. Pipes to be :- Vitrified clay to BS EN 295 or Concrete to BS 5911 or UPVC pipes to BS EN 1452 or Thermoplastic Structured wall pipes complying with WIS 4-35-01 BSI Kitemarked. Class 8kN/m² nominal short term ring stiffness.
17. All pipes to be laid with soffits level, unless noted otherwise.
18. Where cover to pipes is less than 1200mm under carriageway - concrete bed and surround to be reinforced as detailed by the Engineer.
19. All pipes beneath buildings to be BS45 in concrete. Where cover is less than 300mm the concrete is to be cast integrally with the floor slab.
20. Pipes Penetrating Walls.
    An opening is to be formed through walls to give pipes at least 50mm clearance all round. Brickwork over shall be supported by a lintel. Opening to be masked each side with rigid sheet material.
    Pipes embedded in walls shall have joints formed within 150mm of either wall face. Adjacent rocker pipes of max 600mm length with flexible joints shall continue the alignment.
21. Pipe runs near Buildings.
    If a trench is within 1m of a building it shall be filled with concrete up to the lowest level of the adjacent foundation. If a trench is greater than 1m from a building the trench shall be filled with concrete up to a level below the building equal to the distance from the building less 150mm.
22. Ventilation shall be provided at the head of the foul drainage runs.
23. For setting out of SVP and RWP, see architects layout.
24. Threshold drainage is required where levels fall towards a building entrance. Architect to confirm if not required.
25. Yard Gully positions are indicative, should be adjusted on site to suit levels.
26. Road gullies shall be trapped 450 diameter x 900mm deep.
27. Road gullies shall be trapped 450 diameter x 900mm deep with Class D 400 frame and grating to BS EN 124.
28. Drainage channel detailed design to be undertaken by manufactures. Alternative channels may be used, subject to Engineers approval.
29. All concrete to drainage, manholes bases, surrounds etc to be in accordance with the BRE special digest 1 - Concrete in aggressive ground. Refer to site investigation report for sulphate requirements.
30. All manholes, pipe trenches etc. to be backfilled with imported granular fill to Class NI 2.6.5. (Capping material) to (BWM) Table 6/1 & compacted in accordance with Table 6/2.
31. All pipelines shall be tested both before and after backfilling, using either air test or water test, in accordance with BS EN 1610.
32. Demarcation manholes and lateral drains need to be constructed in accordance with the Water UK/WRc "Design Construction Guidance".
33. All works to sewers/ manholes being offered for adoption or on existing public sewers should be in accordance with "Design Construction Guidance" and the Adopting Water Authority's recommendations.
34. Requirement for Land Drains to be assessed on site by the Site Manager.

KEY

- Existing Storm Drain
- Existing Storm Drain Abandoned
- Existing Foul Drain
- Existing Foul Drain Abandoned
- Foul Drain
- Foul Inspection Chamber
- Foul Drainage Offered for Adoption
- Foul Manhole Offered for Adoption
- Storm Drain
- Storm Inspection Chamber
- Storm Manhole
- Storm Drainage Offered for Adoption
- Storm Manhole Offered for Adoption
- Sewer Easement

REV	DATE	AMENDMENT	BY

MUCKLOW & HARRIS
CONSULTING CIVIL & STRUCTURAL ENGINEERS

DRAWING STATUS: PRELIMINARY

CLIENT: Vistry Partnerships

PROJECT: Top Wighay Farm Hucknall

TITLE: Drainage Proposals Strategy

DATE	DRAWN
15.11.2023	DJH
SCALE: 1:1250	SIZE: A0
CHECKED: AM	
DRAWING NUMBER: 22095-126	REVISION: *

+44 (0) 115 952 8752
info@diceconsult.co.uk
diceconsult.co.uk

Appendix C

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	George Grant
Site name:	Top Wighay Farm
Site location:	Hucknall

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	53.05182° N
Longitude:	1.21689° W
Reference:	3174509290
Date:	Mar 25 2024 13:52

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	28.4

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	1	3
HOST class:	N/A	N/A
SPR/SPRHOST:	0.1	0.37

Hydrological characteristics

	Default	Edited
SAAR (mm):	713	713
Hydrological region:	4	4
Growth curve factor 1 year:	0.83	0.83
Growth curve factor 30 years:	2	2
Growth curve factor 100 years:	2.57	2.57
Growth curve factor 200 years:	3.04	3.04

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited

Q_{BAR} (l/s):	4.87	83.36
1 in 1 year (l/s):	4.05	69.19
1 in 30 years (l/s):	9.75	166.72
1 in 100 year (l/s):	12.53	214.24
1 in 200 years (l/s):	14.82	253.42