



Barratt David Wilson Homes & Hopkins Homes Ltd

Humber Doucy Lane, Ipswich Flood Risk & Drainage Proof of Evidence

Inspectorate reference: APP/X3540/W/24/3350673

890695 PoE V3



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DECEMBER 2024



1 INTRODUCTION

- 1.1 My name is Thomas Fillingham, I am a Senior Infrastructure Engineer within RSK's Land & Development Engineering (LDE) division, which specialises in sustainable engineering and environmental consultancy. I am responsible for technical expertise in surface & foul water drainage and highway design and construction.
- 1.2 My experience covers a wide array of residential development projects. This experience ranges from pre purchase consultation, planning support through to detailed design and construction. I am also experienced in the production surface water drainage strategies to support planning applications. I am responsible for supervising and coordinating aspects of surface water drainage strategies, reviewing and authoring, and for supervising and training staff on flood risk and sustainable drainage.
- 1.3 I have a MEng degree in Civil Engineering from Heriot Watt University. I am Graduate Member of the Institution of Civil Engineers. I have significant experience in this field, gained through a consultancy setting and through academic qualifications.
- 1.4 The evidence which I have prepared and provided for this appeal in this proof of evidence is true and has been prepared, and is given in accordance, with the guidance of my professional institution and I confirm that the opinions expressed are my true professional opinions.

2 SCOPE OF EVIDENCE

2.1 The reason for refusal with respect to drainage is based on Suffolk County Council's (SCC) original consultation response (Appendix A), dated 30th April 2024. For the planning application in question they laid out nine points covering their reasons for recommending a holding objection. The nine points are as follows:

1. A plan of the watercourse network is included in the flood risk assessment and drainage strategy however it is missing some of the watercourses within and/or adjacent to the site. It is of vital importance that the development does not adversely impact the existing surface water network and thus a detailed survey of the existing watercourse network should be undertaken. This should comprise a walkover of the watercourse network and trace each from where it approaches the site, its connectivity through or around it to its outfall beyond the site's boundaries including any culverted sections. The plan should be updated and photos included where necessary. Any required maintenance to the network needs to be highlighted to ensure that the new development will not increase offsite flood risk.

2. There is a watercourse adjacent highway on the eastern parcel that could be adversely impacted by the proposed highway upgrades. Any upgrade works to the existing highway need to be carefully planned in conjunction with existing onsite constraints.

3. The hierarchy set out in the Suffolk SuDS Guide (based on the NPPF and CIRIA SuDS Guide) states that deep infiltration is a last resort and should only be considered once all other options have been fully assessed. Whilst shallow infiltration and a connection to a surface water sewer are understood to be not viable, a discharge to the nearby watercourse network should be considered further. We would encourage a hybrid approach being adopted where surface water is directed to the nearby watercourse network where possible with deep infiltration being used where this is not possible, ie. adjacent the railway line. Constructing deep infiltration structures up to 8m below ground level as is currently proposed requires significant earthworks, is higher risk and less sustainable than surface-based solutions. The deep infiltration structures also increase the risk of discharging pollutants directly into the ground in an area highlighted as being vulnerable to pollution incidents.

4. The greenfield runoff rate has been calculated but is very low compared to the more typical figure of 2l/s/ha that is often used. If a restricted discharge to a watercourse is progressed then this should be reviewed to ensure a viable rate is proposed.

5. Many of the sub catchments use the more traditional pipe to pond approach which does not incorporate above ground conveyance of surface water or address surface water at source. The strategy should be reconsidered to include more SuDS within the parcels, eg. raingardens, downpipe planters, tree pits, permeable paving or swales.

6. The simple index approach has been used to assess the surface water pollution hazard potential however given the number of dwellings, a school and community uses proposed on the site, it is likely that the main distributor road will generate a greater level of pollution than can be assessed using this method. The assessment used only applies to roads with less than 300 traffic movements per day.

7. In accordance with the Suffolk SuDS Guide and Suffolk Design for Streets Guide the main access roads should be drained to roadside swales. Cross sections should be provided to demonstrate how space has been provided to ensure this can be accommodated in the final layout.

8. The school plot will require a connection to services and utilities and this often extends to the SuDS network. It should be confirmed with the schools team if they require a unrestricted discharge into the SuDS network as this may result in a change to the current proposal.

9. The strategic swales and basins should have dimensions provided to demonstrate they are in accordance with the Suffolk SuDS Guide. As many of the parcels are currently shown to be drained by traditional drainage, it is likely that the invert level of the pipes will be too deep to discharge into surface features and this should be considered at this stage to avoid excessive below ground infrastructure being required at the detailed design stage.

- 2.2 RSK provided a written response (Appendix B) returned on the 22nd May 2024, laying out the reasons why we believed all of these to have been addressed by our original submission in the outline application.
- 2.3 In the Statement of Case by SCC, dated 11th November 2024, section 6.45 states points 1, 2, 3 & 4 are considered resolved following the response mentioned above.
- 2.4 On 27th November 2024 SCC and RSK held a meeting to discuss a statement of common ground in which the outstanding points 5, 6, 7, 8 & 9 were discussed.
- 2.5 On Wednesday 4th December 2024 a revised surface water drainage strategy drawing and Statement of Common Ground were submitted to SCC for comment.
- 2.6 On Thursday 12th December 2024 SCC provided a revised Statement of common ground in which they agreed that points 5 and 8 have been satisfied.
- 2.7 As such, the evidence I will be providing below will be in relation to points 6, 7 & 9.

3 SITE BASELINE CONDITIONS

- 3.1 The site is divided into two parcels, the primary development parcel is a large (26.6ha) open area comprising two agricultural fields. The majority of the central parcel is a large irregularly shaped field between Humber Doucy Lane to the south, Westerfield House Farm to the west, and Allen's Farm/Lacy's Farm to the northeast. The smaller eastern parcel (3.61ha) comprises open ground on the land north of Humber Doucy Lane and west of Seven Cottages Lane.
- 3.2 The central parcel falls in two separate directions to the north and south from a central ridge. The highest point of the ridge is at 51.06m AOD. To the north it falls to 44.72m AOD in the junction between the railway and the access track. To the south it falls to 48.17m AOD close to Humber Doucy Lane. The parcel consists of level playing fields and falls from 48.80m AOD in its north-west corner falling to 46.63m AOD along the southern corner at the junction with Seven Cottages Lane.
- 3.3 There are no public sewers within the site boundaries, there are surface water sewers in Humber Doucy Lane and Seven Cottages Lane and combined sewers in Humber Doucy Lane.
- 3.4 The closest main river is the River Fynn which is located approximately 1km to the north-east on the north side of the Greater Anglia Railway line cutting and so is hydraulically separated from the site.
- 3.5 There are surface water features in the vicinity of the site which include a series of ditches running along the boundary of the largest central parcel. There are also several ponds around Lacy's Farm to the northeast of the site. Most of the ditches have sections that run both north and south due to the topographical slopes along the central ridge. There is also a drainage ditch running along the southern boundary of the site located under the existing hedgerow, this is also culverted through a 300mm pipe under an overgrown and disused field access near the south-east corner. These features are not in continuity with any receiving water course.
- 3.6 A site specific geotechnical investigation has been undertaken by RSA Geotechnics Ltd in August 2022 (report reference 16118SI) where the existing soils were found to be generally 0.27-0.7m of Topsoil over 0.35-0.8m of made ground over 0.35-5.4m of cohesive Lowestoft Formation over granular Lowestoft Formation which was investigated down to 15m depth. Soakage testing was carried out in the Lowestoft Formation and was found to provide infiltration in the granular deposits at depths of 4.5 – 6.0m.

- 3.7 Ground water was found in the granular Lowestoft formation. Ground water level monitoring was carried out in September to October 2022 and then from September 2023 to the February of 2024.

4 FLOOD RISK PROFILE

- 4.1 The site lies within flood zone 1, representing a 1 in 1000 year or less annual probability of flooding from fluvial or tidal sources. The closest fluvial flood extents are confined to the course of the River Fynn located 1km to the north-east on the north side of the Greater Anglia Railway line cutting. The site is not at risk from flooding from the sea or reservoirs.
- 4.2 Some surface water flooding was identified on the Environment Agency mapping in the eastern most corner of the smaller parcel. This however only shows in a low risk scenario parallel to a 1 in 1000yr surface water flooding incident and results in a low flood velocity at <0.25m/s.
- 4.3 Groundwater has been identified on site which is at a low level and the risk of it flooding the site is considered very low.
- 4.4 Flooding from sewers is considered to be low as any sewer flooding would be contained on Humber Doucy Lane as it is at a lower level than the site.

5 DRAINAGE PRINCIPLES

- 5.1 The proposed SuDS for the site includes infiltration basins (consisting of an attenuation basin with infiltration below), swales, permeable paving and rainwater harvesting. The basins have been located depending on the topography, positions of the relative infiltration rates, and underlying soil type. The proposed SuDS features are designed to provide the required storage volume to retain the 1 in 100 plus 45% climate change event.
- 5.2 Drainage within individual development parcels will be treated via a combination of on plot swales, permeable pavement and rain gardens. Flows will then be conveyed to site wide strategic swales which provide additional levels of treatment and will convey these flows to the outfalls, the infiltration basins. In which, flows will receive the last stage of treatment prior to infiltrating to the ground. Primary roads will be served by highways swales, which provide both conveyance and treatment prior to discharge into the strategic swales. All treatment is to be in accordance with CIRIA SuDS Manual (Core Document D1). Now CD OT26

6 SCC OBJECTION NUMBER 6 & 7

- 6.1 SCC's 6th point in their holding objection was the following:

The simple index approach has been used to assess the surface water pollution hazard potential however given the number of dwellings, a school and community uses proposed on the site, it is likely that the main distributor road will generate a greater level of pollution than can be assessed using this method. The assessment used only applies to roads with less than 300 traffic movements per day.

- 6.2 SCC's 7th point in their holding objection was the following:

In accordance with the Suffolk SuDS Guide and Suffolk Design for Streets Guide the main access roads should be drained to roadside swales. Cross sections should be provided to demonstrate how space has been provided to ensure this can be accommodated in the final layout.

- CD OT26 6.3 The simple index approach is a methodology laid out in section 26.7.1 in the CIRIA SuDS Manual (Core Document D1) which is used to quantify the level of contamination generated by a proposed development and the level of treatment provided by proposed SuDS features within the drainage strategy.

- 6.4 The forms of contamination are split into three categories, Total Suspended Solids (TSS), Metals and Hydrocarbons. These are assigned a hazard index ranging from 0 (no pollution or hazard of this type) to 1 (high pollution hazard for this containment type).

- 6.5 The forms of treatment, the SuDS features, are then assigned an index associated with the degree to which they can treat each specific form of pollutant. If the treatment index is greater than or equal to the pollution index it is able to provide adequate treatment.

- 6.6 The total SuDS mitigation index must be greater than the pollution hazard index in order to comply with the prescribed guidance. Where more than one SuDS feature is required to treat a certain level of pollutant, the second stage has its treatment index reduced by half for the purposes of calculation.

- 6.7 Section 7.4 of RSK's Flood Risk Assessment (FRA) discusses the level of contamination and treatment in relation to the proposed development.

- 6.8 The following table is an extract from table 26.2 and was presented in RSK's FRA. It outlines the expected level of contamination from the proposed development;

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very Low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2 (0.8 where potential for metal leaching)	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. cul-de-sacs, home zones and general access roads) and non-residential car parking with infrequent change (e.g. schools, offices) i.e. <300 traffic movements/day	Low	0.5	0.4	0.4

- 6.9 The main road (*Spine Road*) was designed in accordance with the Suffolk SuDS Guide and Suffolk Design for Streets Guide in which they require main access roads to be drained to roadside swales.
- 6.10 Page 84 of PRP's Design and Access Statement illustrates the proposed cross section of the main road in 'Illustrative Option 1' and 'Illustrative Option 2'. Both images clearly demonstrate the spine round bound by two swales on either side of the road that will function as a key component of the highway drainage system.
- 6.11 RSK drawing 890695-RSK-ZZ-XX-DR-C-0003, which covers the proposed access strategy, defines the layout of the spine road. The note shown in the image below states that 3.7m is to be provided either side of the carriageway for swales.

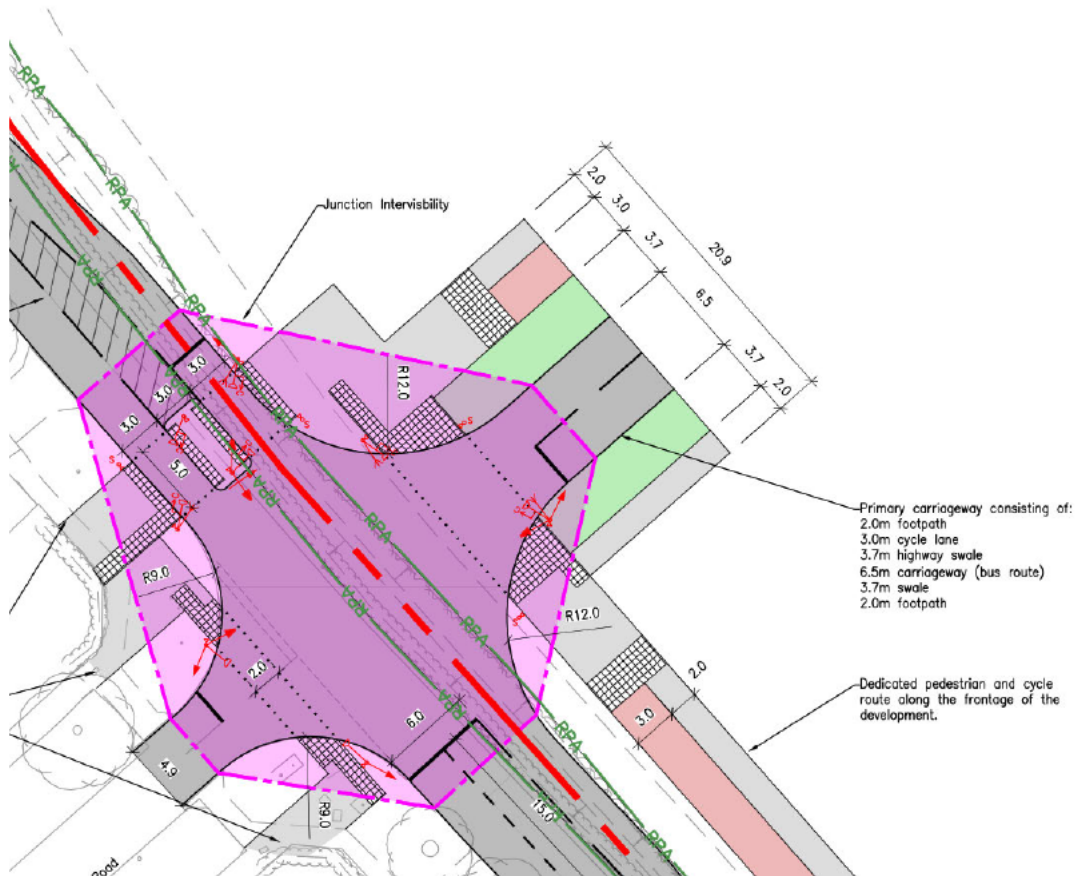


Figure 1 – Extract from RSK drawing 0003.

CD OT26

6.12 The following table is an extract from the CIRIA SuDS Manual (Core Document D1) table 26.2 and was presented in RSK's FRA. It outlines the expected level of treatment that will be provided by the individual components within the proposed drainage strategy.

Type of SuDS Component	TSS	Metals	Hydro-carbons
Swale	0.5	0.6	0.6
Permeable Pavement	0.7	0.6	0.7
Basin	0.5	0.5	0.6

6.13 Therefore, the proposed series of treatment for the main road is as follows;

Type of SuDS Component	TSS	Metals	Hydro-carbons
Stage 1 – Highway Swale	0.5	0.6	0.6
Stage 2 – Detention Basin (factor of 0.5 applied)	0.35	0.3	0.35
Total level of treatment	0.85	0.9	0.95

6.14 As demonstrated in the above table the level of treatment provided by the combination of the highway swale and the detention basin provides adequate levels of treatment in accordance with section 26.7.1 of the CIRIA SuDS Manual (Core Document D1). CD OT26

6.15 I recognise that the main road may be subject to more than 300 traffic movements per day and therefore should be assessed as the subsequent category laid out in table 26.2 of the CIRIA SuDS Manual (Core Document D1). This would change the table from point 4.8 to the following;
CD OT26

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very Low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2 (0.8 where potential for metal leaching)	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. cul-de-sacs, home zones and general access roads) and non-residential car parking with infrequent change (e.g. schools, offices) i.e. <300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g. hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7

6.16 As demonstrated in the above table the level of treatment provided by the combination of the highway swale and the detention basin, demonstrated in point 6.13 above, provides adequate levels of treatment in accordance with section 26.7.1 of the CIRIA SuDS Manual CD OT26 (Core Document D1) even with the increased level of pollution specified by the more onerous Medium Pollution Hazard Level.

6.17 It is therefore my opinion that despite the miscategorisation of the spine road the level of treatment is still adequate and there is sufficient evidence to alleviate the concerns raised in SCC's objection number 6.

6.18 It is also my opinion that the swales are clearly defined in PRP's Design and access statement and RSK drawing 0003 and is sufficient evidence to alleviate the concerns raised in SCC's objection number 7.

7 SCC OBJECTION NUMBER 9

7.1 SCC's 9th point in their holding objection was the following:

The strategic swales and basins should have dimensions provided to demonstrate they are in accordance with the Suffolk SuDS Guide. As many of the parcels are currently shown to be drained by traditional drainage, it is likely that the invert level of the pipes will be too deep to discharge into surface features and this should be considered at this stage to avoid excessive below ground infrastructure being required at the detailed design.

7.2 The Suffolk SuDS Guide prescribes various aspects of the design of detention basins in relation to its dimensions. These points are the following:

- A *Maximum depth of the basin should not exceed 1.5m (C753 p.763) while the maximum water depth within the basin should not exceed 1.0m (C753 p.847).*
- B *A minimum of 300-500mm freeboard should be provided between the maximum 1% AEP + cc water level and the top of structure (C753 p.491).*
- C *Sides slopes should not exceed 1 in 4 unless specific site/safety/maintenance arrangements allow for steeper slopes (C753 p.490 & 651).*
- D *A 1.5m wide wet/dry bench should be provided 600mm above the base (SCC Local Standard).*
- E *A 3.5m wide, level maintenance strip should be provided to allow maintenance access (C753 p.501).*
- F *The recommended length: width ratio for online basins is 3:1 to 5:1, maximising retention times for treatment purposes (C753 p.475).*

7.3 The maximum water depths and the freeboard (vertical distance between the highest modelled water level and the top of bank level) are indicated for each basin on drawing 0007.

7.4 All basins with the exception of basin 3a and 3b have maximum water depths under 1m and freeboards in excess of 400mm. complying with point A above.

7.5 Basins 3a and 3b exceed the maximum water depth by 147mm and 193mm respectively. It is anticipated that these water depths will be refined and improved at both the reserved matters and detail design stage.

7.6 Given that the basins form part of the outline application and not the full planning application, these are subject to further design in the planning process and will be improved upon to ensure full compliance before construction.

- 7.7 All basins have freeboards in excess of 400mm, as indicated on drawing 0007, complying with point B above.
- 7.8 All basins have side slopes of 1in4, as indicated on drawing 0007, complying with point C above.
- 7.9 Point D stipulates the requirement for a 1.5m wet/dry bench 600mm above the base of the basin. This currently has not been included in the design as it is anticipated to be added during the continued design process referenced above.
- 7.10 The surface water network is currently modelled at a conceptual level and will be subject to significant refinement as the design process continues. This will most likely lead to a reduction in overall impermeable area contributing to each network. These are currently based on an assumption of 60% impermeable area for each residential parcel and in reality, will reduce to a more typical value of 50%. In turn reducing storage requirements.
- 7.11 This then presents the necessary opportunities to account for detailed features such as the bench requirement stipulated above.
- 7.12 Modelling the network with a more conservative approach at this stage affords us the ability to refine the design and add in features as the design progresses. It is anticipated that as modelling continues and basin sizes are refined, benches will be added and accommodated into the overall basin sizes.
- 7.13 I consider it appropriate at this stage to design the detention basins with enough detail to provide accurate information to inform the site layout, but with further consideration to follow once the modelling has been refined.
- 7.14 The basins have currently been sized with 3m maintenance strips. Using the same reasoning laid out in points 6.10 to 6.13, it is anticipated that the basin design will be further refined and that the detail required in the design guide will be provided at a later stage.
- 7.15 The shapes of the basins indicated on RSK drawing 0007 have been designed with the intention of maximising the flow time of surface water entering the basins where topographic and site layout constraints allow in line with the recommendation of point F above. Given that this is a recommendation, these ratios have not been quantified at this stage.
- 7.16 The surface water calculations submitted detailed extensive modelled networks for each catchment, in my opinion beyond the scope of what is normally submitted for outline planning.
- 7.17 Contained within this is a conceptual drainage layout accounting for anticipated cover levels, invert levels and length of surface water runs. Demonstrating adequate cover level is to be

provided and that there is sufficient fall across the network to maintain a gravity flow and reach the invert level of the proposed detention basins.

- 7.18 It is my opinion that the calculations provided demonstrate a consideration for the underground drainage and will not lead to excessive underground drainage being introduced at the detailed design stage.
- 7.19 It is therefore my opinion that sufficient information has been provided at this stage of planning and that the additional detail requested will be dealt with at the reserved matters stage.

8 CONCLUSIONS

- 8.1 The evidence presented above has been done so to demonstrate the compliance of the proposed drainage strategy with the Suffolk SuDS Guide and as such is suitable to provide SCC enough detail required for an Outline Application and any points that are not agreed on should be conditioned and addressed at the reserved matters stage of planning.
- 8.2 Despite the miscategorisation of the pollution index of the main road, sufficient treatment has been provided in the form of swales and the detention basin in accordance with section 26.7.1 of the CIRIA SuDS Manual (Core Document D1). CD OT26
- 8.3 PRP's Design and Access Statement and RSK drawing 0003 clearly demonstrate the intention to include roadside swales and that the road corridor has been sized appropriately to accommodate roadside swales on either side.
- 8.4 The surface water detention basins have been detailed out to the extent required to inform the site layout. At this stage, this includes 1in4 side slopes, appropriate water depths and freeboard (aside from one basin, which can be designed out), with a 3m maintenance strip and with appropriate consideration for maximising the flow time through the basin. Whilst not all prescribed dimensions have not been met at this stage, I consider it appropriate at this stage of the design process. Given that the strategy was submitted for outline planning, the drainage is subject to further design and detailing through the reserved matters and detailed design process.

9 APPENDIX

A - SCC CONSULTATION RESPONSE

From: [Hannah Purkis](#)
To: [planning](#)
Cc: [Eleanor Attwood](#); [Benjamin Locksmith](#)
Subject: 2024-04-30 HP Reply Land NE of Humber Doucy Lane, Rushmere St Andrew, Ipswich Ref: DC/24/0771/OUT
Date: 30 April 2024 14:38:06

Dear Eleanor,

Subject: Outline Application (With All Matters Reserved) - Hybrid Application – Full Planning Permission for the means of external access/egress to and from the site. Outline planning application (all matters reserved) for a mixed use development for up to 660 dwellings (Use Class C3), up to 400 sq m (net) of non-residential floorspace falling within Use Class E and/or Use Class F2(b), an Early Years facility, and associated vehicular access and highway works, formal and informal open spaces, play areas, provision of infrastructure (including internal highways, parking, servicing, cycle and pedestrian routes, utilities and sustainable drainage systems), and all associated landscaping and engineering works. Address: Land North-East Of Humber Doucy Lane, Humber Doucy Lane, Rushmere St Andrew, Ipswich.

Suffolk County Council, as Lead Local Flood Authority (LLFA), have reviewed application Ref: DC/24/0771/OUT.

The following submitted document has been reviewed and the LLFA recommends a **holding objection** at this time:

- Flood Risk Assessment and Drainage Strategy Dated: Feb 2024 Ref: 681058-R1(0)-FRA

A holding objection is necessary because the flood risk assessment and drainage strategy has not fully considered the existing watercourse network around the site and therefore presents a risk of the development having an adverse impact on it and a resultant increase in flood risk on neighbouring sites. The drainage strategy relies on deep infiltration structures which are considered a last resort by SCC LLFA, we recommend a discharge to the watercourse network is fully considered as this is more sustainable than deep infiltration. We also require more SuDS incorporated into the parcels, swales along the main access roads and open/above ground conveyance of surface water from the parcels into the strategic basins before we can recommend approval. These points and other more technical details are listed in the bullet points below.

The holding objection is a temporary position to allow reasonable time for the applicant and the LLFA to discuss what additional information is required to overcome the objection(s). This Holding Objection will remain the LLFA's formal position until the local planning authority (LPA) is advised to the contrary. If the LLFA position remains as a Holding Objection at the point the LPA wishes to determine the application, the LPA should treat the Holding Objection as a Formal Objection and recommendation for Refusal to the proposed development. The LPA should provide at least 2 weeks prior notice of the publication of the committee report so that the LLFA can review matters and provide suggested planning conditions, even if the LLFA position is a Formal Objection.

The points below detail the actions required to overcome our current objection:-

[Watercourse network](#)

1. A plan of the watercourse network is included in the flood risk assessment and drainage strategy however it is missing some of the watercourses within and/or adjacent to the site. It is of vital importance that the development does not adversely impact the existing surface water network and thus a detailed survey of the existing watercourse network should be undertaken. This should comprise a walkover of the watercourse network and trace each from where it approaches the site, its connectivity through or around it to its outfall beyond the site's boundaries including any culverted sections. The plan should be updated and photos included where necessary. Any required maintenance to the network needs to be highlighted to ensure that the new development will not increase offsite flood risk.
2. There is a watercourse adjacent highway on the eastern parcel that could be adversely impacted by the proposed highway upgrades. Any upgrade works to the existing highway need to be carefully planned in conjunction with existing onsite constraints.

Drainage Strategy

3. The hierarchy set out in the Suffolk SuDS Guide (based on the NPPF and CIRIA SuDS Guide) states that deep infiltration is a last resort and should only be considered once all other options have been fully assessed. Whilst shallow infiltration and a connection to a surface water sewer are understood to be not viable, a discharge to the nearby watercourse network should be considered further. We would encourage a hybrid approach being adopted where surface water is directed to the nearby watercourse network where possible with deep infiltration being used where this is not possible, ie. adjacent the railway line. Constructing deep infiltration structures up to 8m below ground level as is currently proposed requires significant earthworks, is higher risk and less sustainable than surface-based solutions. The deep infiltration structures also increase the risk of discharging pollutants directly into the ground in an area highlighted as being vulnerable to pollution incidents.
4. The greenfield runoff rate has been calculated but is very low compared to the more typical figure of 2l/s/ha that is often used. If a restricted discharge to a watercourse is progressed then this should be reviewed to ensure a viable rate is proposed.
5. Many of the sub catchments use the more traditional pipe to pond approach which does not incorporate above ground conveyance of surface water or address surface water at source. The strategy should be reconsidered to include more SuDS within the parcels, eg. raingardens, downpipe planters, tree pits, permeable paving or swales.
6. The simple index approach has been used to assess the surface water pollution hazard potential however given the number of dwellings, a school and community uses proposed on the site, it is likely that the main distributor road will generate a greater level of pollution than can be assessed using this method. The assessment used only applies to roads with less than 300 traffic movements per day.
7. In accordance with the Suffolk SuDS Guide and Suffolk Design for Streets Guide the main access roads should be drained to roadside swales. Cross sections should be provided to demonstrate how space has been provided to ensure this can be accommodated in the final layout.
8. The school plot will require a connection to services and utilities and this often extends to the SuDS network. It should be confirmed with the schools team if they require a unrestricted discharge into the SuDS network as this may result in a change to the current proposal.
9. The strategic swales and basins should have dimensions provided to demonstrate they are in accordance with the Suffolk SuDS Guide. As many of the parcels are currently shown to

be drained by traditional drainage, it is likely that the invert level of the pipes will be too deep to discharge into surface features and this should be considered at this stage to avoid excessive below ground infrastructure being required at the detailed design stage.

Kind regards

Hannah

Hannah Purkis BSc (Hons) MCIWEM C.WEM

Flood and Water Manager

Flood and Water Management (Lead Local Flood Authority)

Growth, Highways and Infrastructure Directorate

Suffolk County Council

Endeavour House, 8 Russell Road, Ipswich, Suffolk. IP1 2BX

Tel No: 01473 260386

Please Note: The Suffolk SuDS Guide has been updated (March 2023) and is available [here](#).

My working days are Monday – Thursday during term time.

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B - RSK RESPONSE TO SCC CONSULTATION

08th May 2024

Our reference: 890695-L01(0)-TRF

Hannah Purkis
Flood And Water Manager
Flood and Water Management (Lead Local Flood Authority)
Growth, Highways and Infrastructure Directorate
Suffolk Country Council
Endeavour House, 8 Russel Road, Ipswich, Suffolk, IP1 2BX

**RE: LLFA HOLDING OBJECTION IN RELATION TO OUTLINE APPLICATION – HYBRID
APPLICATION REFERENCE: DC/24/0771/OUT**

Dear Hannah,

Thank you for your recent comments with regards to the drainage strategy for the outline planning application at Humber Doucy Lane, Ipswich. In light of these comments, we have prepared a series of responses which should address all the points raised and allow for the removal of the holding objection. Your comments have been included below for reference along with the official description of the application:

Outline Application (With All Matters Reserved) - Hybrid Application – Full Planning Permission for the means of external access/egress to and from the site. Outline planning application (all matters reserved) for a mixed use development for up to 660 dwellings (Use Class C3), up to 400 sq m (net) of non-residential floorspace falling within Use Class E and/or Use Class F2(b), an Early Years facility, and associated vehicular access and highway works, formal and informal open spaces, play areas, provision of infrastructure (including internal highways, parking, servicing, cycle and pedestrian routes, utilities and sustainable drainage systems), and all associated landscaping and engineering works. Address: Land North-East Of Humber Doucy Lane, Humber Doucy Lane, Rushmere St Andrew, Ipswich.

We would first like to highlight that the onsite drainage strategy falls under the outline planning section of this hybrid application and it is only for the access points that full planning permission is being pursued. As such it is subject to the requirements stipulated 'Outline' in the table from Chapter 3 of the Suffolk Flood Risk Management Strategy Appendix A. These requirements are for 'indicative drawings of layout, properties, open space and drainage infrastructure'.

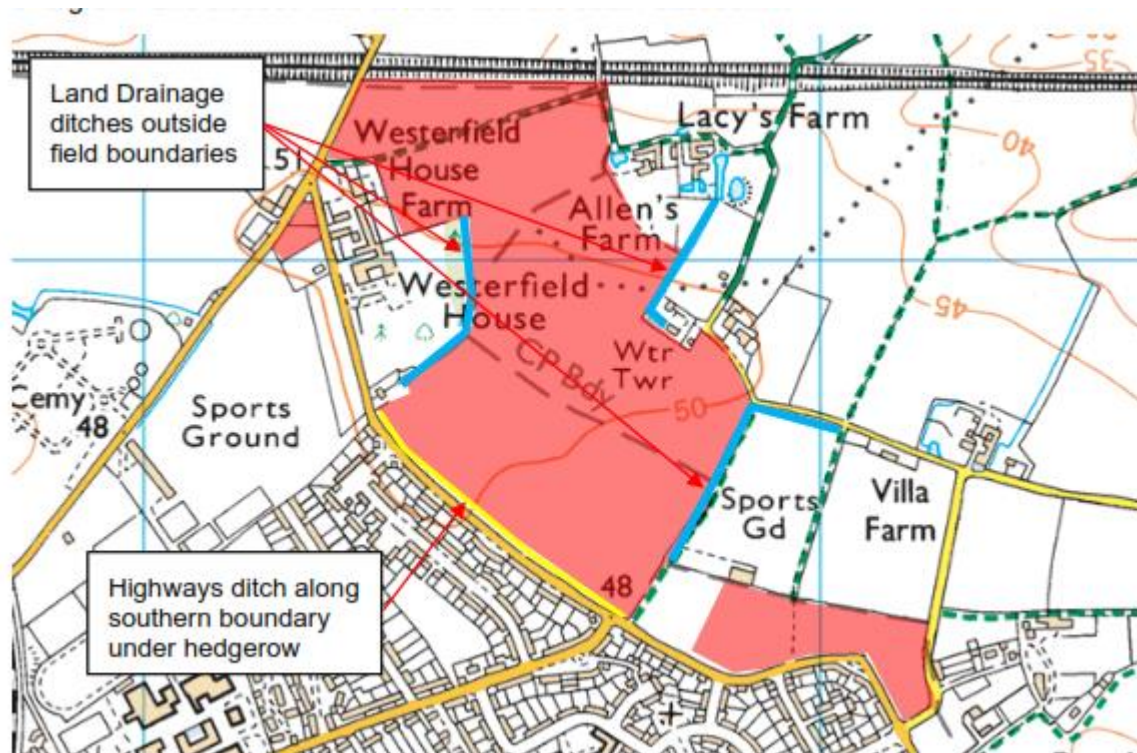
Drawing 890695-RSK-ZZ-XX-DR-C-0007-P01-Proposed Surface Water Drainage Strategy presents an indicative layout for the drainage network demonstrating the relationship of open space, open Suds features and the proposed drainage infrastructure. This includes the details of the proposed detention basins and their associated infiltration. The FRA expands on this information by describing additional forms of treatment, at source, for the sub catchments.

The comments and our responses are as follows:

Watercourse network

- 1. A plan of the watercourse network is included in the flood risk assessment and drainage strategy however it is missing some of the watercourses within and/or adjacent to the site. It is of vital importance that the development does not adversely impact the existing surface water network and thus a detailed survey of the existing watercourse network should be undertaken. This should comprise a walkover of the watercourse network and trace each from where it approaches the site, its connectivity through or around it to its outfall beyond the site's boundaries including any culverted sections. The plan should be updated and photos included where necessary. Any required maintenance to the network needs to be highlighted to ensure that the new development will not increase offsite flood risk.***

The image below, taken from the FRA, shows the ditches in the area as identified by OS mapping.



The OS mapping, IDB mapping and EA mapping do not indicate any further 'watercourse' features bounding the site. The western ditch, and southern ditch (along Humber Doucy Lane) and covered by the existing topographical survey and fall towards the southeastern corner of the development where they appear to terminate. No survey or OS line work indicates any other features in the vicinity. This would suggest that these features do not positively outfall and cannot be considered 'watercourses'. A preliminary site walk over has been conducted and did not indicate any connectivity between the features and/or a positive outfall.

Nevertheless, none of the development proposals include any material changes to these features, they are to be left in place and untouched allowing them to function as they were previously.

- 2. *There is a watercourse adjacent highway on the eastern parcel that could be adversely impacted by the proposed highway upgrades. Any upgrade works to the existing highway need to be carefully planned in conjunction with existing onsite constraints.***

No watercourse is indicated on the OS mapping and or topographical survey around the highway to the eastern parcel. Nevertheless, all proposed highway works will carefully consider existing constraints ensuring not to increase offsite flood risk.

Drainage Strategy

- 3. *The hierarchy set out in the Suffolk SuDS Guide (based on the NPPF and CIRIA SuDS Guide) states that deep infiltration is a last resort and should only be considered once all other options have been fully assessed. Whilst shallow infiltration and a connection to a surface water sewer are understood to be not viable, a discharge to the nearby watercourse network should be considered further. We would encourage a hybrid approach being adopted where surface water is directed to the nearby watercourse network where possible with deep infiltration being used where this is not possible, ie. adjacent the railway line. Constructing deep infiltration structures up to 8m below ground level as is currently proposed requires significant earthworks, is higher risk and less sustainable than surface-based solutions. The deep infiltration structures also increase the risk of discharging pollutants directly into the ground in an area highlighted as being vulnerable to pollution incidents.***

Set out below is the drainage hierarchy taken from page 11 of the Suffolk Flood Risk Management Strategy Appendix A along with the justification for ruling out each method until the proposed deep infiltration:

- *Rainwater Harvesting/Re-Use Onsite.*
 - To be implemented were plausible on plot, but not sufficient for site wide strategy.
- *Shallow infiltration (circa 2.0m, see section on infiltration systems).*
 - Infiltration rates are insufficient at depths of 2.0m or less as indicated in table 3.2 from the FRA.
- *Gravity discharge to a watercourse.*
 - There is no appropriate watercourse in close proximity to the proposed development as discussed in the response to point 1.
- *Gravity discharge to a surface water sewer/highway drain.*
 - The nearest surface water sewer is located along Humber Doucy Lane opposite the eastern parcel. This surface water combines with the foul water into a

combined sewer shortly downstream of the development. A predevelopment enquiry was submitted to Anglian Water for the discharge of surface water. The following is an extract (the full report can be found in the appendix of the FRA):

‘The impact of additional surface water flow to a combined sewer will be to significantly increase the risk of flooding and pollution from the receiving network and potentially to compromise the ability of assets to operate within statutory enforced permitted limits’

As such, this was deemed unfeasible as a point of discharge.

- *Gravity discharge to a combined sewer.*
 - Refer to point above.

The following options are listed as a last resort, rather than a hierarchical order and are based on site specific constraints.

- *Deep infiltration*
 - Infiltration testing at depths from 3m – 7m has indicated feasible infiltration rates, as presented in table 3.2 in the FRA. Therefore, this is the proposed method of discharge.
- *Pumped discharge to a watercourse or infiltration feature.*
 - Refer to point above regarding gravity connection to a watercourse. Pumped solution not required for deep infiltration proposals.
- *Pumped discharge to a surface water sewer/highway drain.*
 - Refer to point above regarding discharge to a surface water sewer
- *Pumped discharge to a combined sewer.*
 - Refer to point above regarding discharge to a surface water sewer
- *Gravity or pumped discharge to a foul sewer.*
 - Refer to point above regarding discharge to a surface water sewer

4. *The greenfield runoff rate has been calculated but is very low compared to the more typical figure of 2l/s/ha that is often used. If a restricted discharge to a watercourse is progressed then this should be reviewed to ensure a viable rate is proposed.*

As the site is to discharge via infiltration this is not pertinent to the strategy. However, the Qbar rate was calculated using the FEH methodology in line with SCC's preferred method of calculation stipulated on page 12 of the Suffolk Flood Risk Management Strategy Appendix A.

5. *Many of the sub catchments use the more traditional pipe to pond approach which does not incorporate above ground conveyance of surface water or address surface*

water at source. The strategy should be reconsidered to include more SuDS within the parcels, eg. raingardens, downpipe planters, tree pits, permeable paving or swales.

The requested detail is beyond the scope of this outline application, please refer to the opening paragraphs of this response.

- 6. The simple index approach has been used to assess the surface water pollution hazard potential however given the number of dwellings, a school and community uses proposed on the site, it is likely that the main distributor road will generate a greater level of pollution than can be assessed using this method. The assessment used only applies to roads with less than 300 traffic movements per day.***

The simple index approach methodology has been applied correctly to this use case. We accept that the spine road would be subject to more than 300 traffic movements per day and as such should be classified as medium hazard. The drainage strategy would still provide the necessary treatment for this classification of contamination as at a minimum the spine road will drain to its associated swales and to the detention basin. The combined mitigation indices of these features exceeds the pollution hazard indices stipulated for a medium hazard level.

- 7. In accordance with the Suffolk SuDS Guide and Suffolk Design for Streets Guide the main access roads should be drained to roadside swales. Cross sections should be provided to demonstrate how space has been provided to ensure this can be accommodated in the final layout.***

The requested detail is beyond the scope of this outline application, please refer to the opening paragraphs of this response.

- 8. The school plot will require a connection to services and utilities and this often extends to the SuDS network. It should be confirmed with the schools team if they require a unrestricted discharge into the SuDS network as this may result in a change to the current proposal.***

Please refer to the official site description in which no reference to a school is made. As such, no unrestricted discharge will be required.

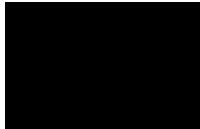
- 9. The strategic swales and basins should have dimensions provided to demonstrate they are in accordance with the Suffolk SuDS Guide. As many of the parcels are currently shown to be drained by traditional drainage, it is likely that the invert level of the pipes will be too deep to discharge into surface features and this should be considered at this stage to avoid excessive below ground infrastructure being required at the detailed design stage.***

The requested detail is beyond the scope of this outline application, please refer to the opening paragraphs of this response.

We trust that the above is sufficient to remove the recommendation for a holding objection for the application. If you have any questions or wish to discuss this further, please do not hesitate to get in touch.

Yours sincerely,

For RSK Land & Development Engineering Limited



Thomas Fillingham
Senior Infrastructure Engineer