GHBullard & Associates LLP
Civil and Traffic Engineering Consultants

Proposed Tennis MUGA

Churchill Free School, Chalkstone Way, Haverhill, Suffolk

FLOOD RISK ASSESSMENT
AND DRAINAGE STRATEGY

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1. INTRODUCTION

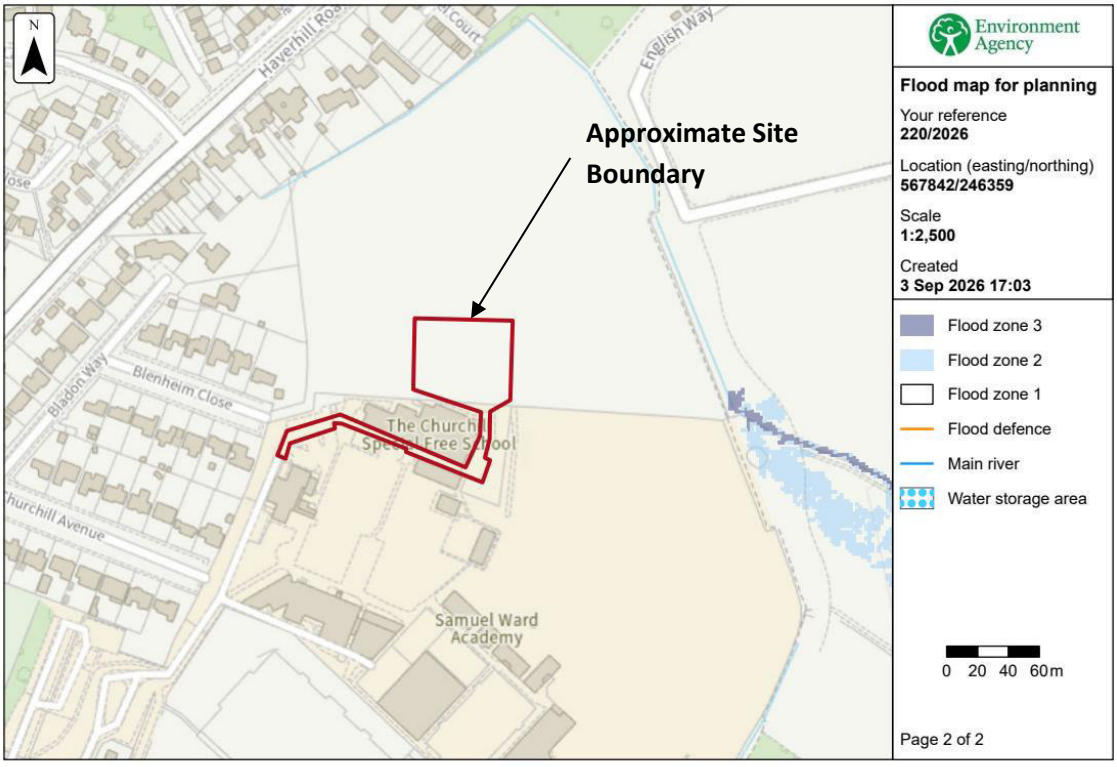
1.1. This flood risk assessment and drainage strategy is being submitted to accompany a planning application for a proposed Tennis MUGA (Multi-Use Games Area) at Churchill Free School, Chalkstone Way, Haverhill, Suffolk. Site location plans are attached in **Appendix A** and the location is shown on Figure 1.1.

1.2. This report includes a thorough review of commercially available flood risk and Environment Agency (EA) data indicating potential sources of flood risk to the Site.

1.3. The information provided within this report is based on the best available data currently recorded or provided by a third party. The accuracy of this report is therefore not guaranteed and does not obviate the need to make additional appropriate searches, inspections and enquiries.

1.4. The Drainage Strategy within this report has been developed with reference to the current National Standards for sustainable drainage systems (SUDS) updated 30 July 2025, but has been prepared to reflect the guidance provided within the Lead Local Flood Authority's (LLFA) current document 'Suffolk Flood Risk Management Strategy, Appendix A Sustainable Drainage Systems (SuDS); A Local Design Guide, 2023. The LLFA has advised that this is their current design guidance to be followed until updated guidance following the National Standards for SuDS is issued at a future date.

1.5. The Environment Agency has produced standing guidance for developments dependent on their size and location. As can be seen from Figure 1.1, the Site is located within Flood Zone 1 with a Low probability of flooding.



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Figure 1.1 – Environment Agency Flood Map (Rivers and Seas)

1.6. Industry best practice requires assessment of all flooding sources to be carried out. Despite this document having now been superseded by the NPPF, Figure 3.2 of the "PPS25: Development and Flood Risk" (PPS25) Practice Guide lists five key sources of flooding:

i. Fluvial (refer to Section 5);

ii. Tidal (refer to Section 6);

iii. Pluvial (refer to Section 7);

iv. Groundwater (refer to Section 8); and

v. Infrastructure Failure (refer to Section 9).

2. POLICY CONTEXT

2.1. The objective of the policies in this chapter is to minimise risks to development arising from all sources of flooding and coastal change, taking into account the impacts of climate change, by steering development away from areas of risk, ensuring that development will be safe for its lifetime without increasing flood risk elsewhere, and incorporating sustainable drainage systems where appropriate. – *NPPF, Section 18.*

2.2. West Suffolk Local Plan 2024 – 2041, dated July 2025; Policy SP1: The climate and environment emergency and sustainable development; Policy SP2: Flood risk and sustainable drainage.

2.3. Environment Agency Flood Risk Assessment guidance.

2.4. West Suffolk Strategic Flood Risk Assessment Level 1, dated April 2021, prepared by Arcadis.

2.5. West Suffolk Strategic Flood Risk Assessment Level 2, dated July 2023, prepared by Arcadis.

2.6. Suffolk County Council, as lead local flood authority, document Suffolk Flood Risk Management Strategy February 2023 advises on the standards to be used at a local level, including design guidance in Appendix A – Sustainable Drainage Systems (SuDS): A Local Design Guide, 2023.

2.7. DEFRA Guidance - National standards for sustainable drainage systems (SUDS) updated 30 July 2025.

2.8. The SuDS Manual (C753) – Ciria Industry Best Practice Guidance.

3. EXISTING SITE INFORMATION

3.1. The Site is located at the Churchill Free School, Haverhill, with the proposed Tennis MUGA area located on grassland within the school ownership, to the north of the existing school building. The location of the MUGA pitch is bound by open field/grassland to the west, north and east and the existing Churchill Free School Building to the south. The proposed MUGA pitch Site area is accessed via the existing school vehicle access, car park and pedestrian route to the south of the school building. Site location plans are attached in **Appendix A**, and an existing site layout plan is attached in **Appendix B**. Images of the Site are also attached in **Appendix B**.

3.2. The site can be located from the following information:

i. Postcode: CB9 0LB

ii. NG Reference: TL 678463

iii. The site levels range from 97.16 m AOD at the north-west boundary to 95.19 m AOD at the south-east corner, sloping at an approximate gradient of 1:59. Refer to **Appendix B** for the topographical survey levels and surrounding LiDAR levels.

3.3. The BGS records describe the geology as:

i. Superficial: Lowestoft Formation - Diamicton

ii. Bedrock: Lewes Nodular Chalk Formation and Seaford Chalk Formation (Undifferentiated) - Chalk

3.4. The BGS 1:50,000 scale drift maps (Figure 3.1) show the form of the Superficial deposits.

3.5. BGS records show there is a BGS Borehole log located approximately 355 m south of the MUGA Site, Ref: TL64NE42 which shows the ground conditions to comprise Boulder Clay Fill over Clay to 38.5 m bgl, with groundwater struck at 5.8 m bgl. Refer to **Appendix C** for the borehole log.

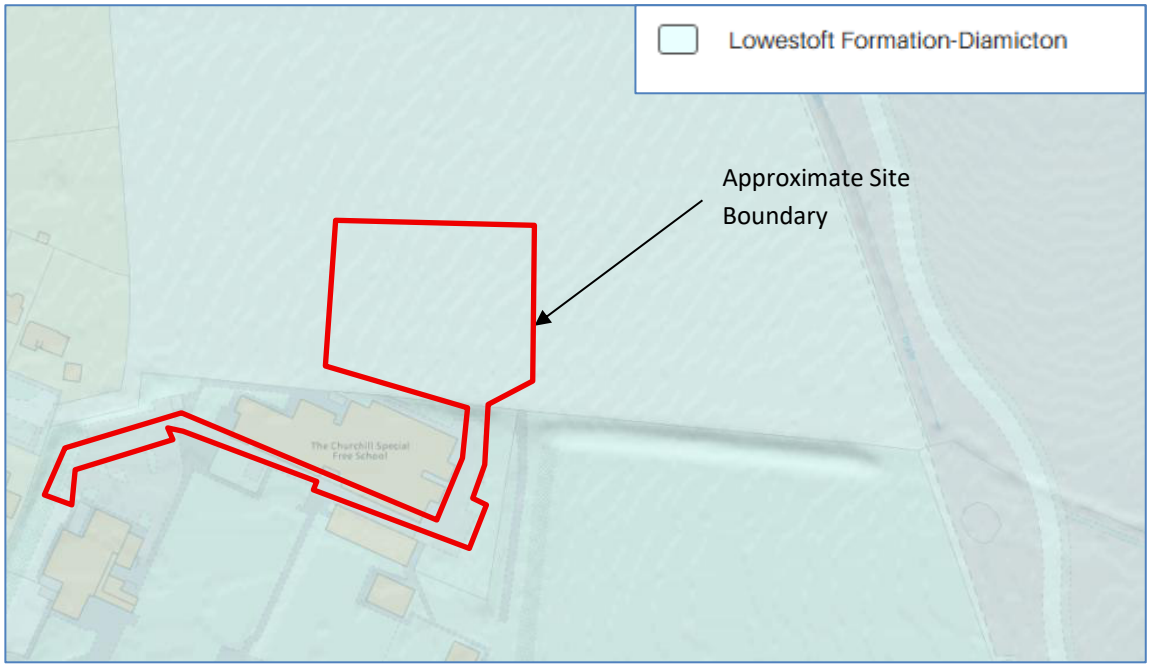


Figure 3.1 - BGS 1:50,000 Superficial Drift Map

3.6. The existing greenfield runoff rate from the Site, has been assessed using the FEH (2025) Statistical Methodology as Q_{bar} = **3.8 l/s/ha.** Refer to **Appendix D** for the calculation.

3.7. The nearest main river is the River Stour located approximately 2.5 km east of the Site at Keddington.

3.8. The nearest watercourse to the Site is located approximately 130 m north-east of the proposed MUGA Site area, which flows south-east. The watercourse route is shown on Figure 1.1 and on the drawing in **Appendix B**, with images of the watercourse also attached in **Appendix B**.

3.9. The Environment Agency has mapped Source Protection Zones which shows the Site is located over a Zone III Total Catchment zone; this is the area around a supply source within which all the groundwater ends up at the abstraction point. This is the point from where the water is taken. This could extend some distance from the source point.

3.10. Environment Agency Aquifer (Bedrock Geology) mapping shows that the Site is located over a Principal Aquifer; these aquifers provide significant quantities of drinking water, and water for business needs. They may also support rivers, lakes and wetlands.

3.11. Environment Agency Superficial Drift Geology Aquifer Designations mapping information shows that the Site is located over a Secondary (Undifferentiated) Aquifer; theses are aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only a minor value.

3.12. The Environment Agency has mapped groundwater vulnerability and Figure 3.2 shows the site is located over an aquifer of Medium vulnerability with a soluble rock risk.

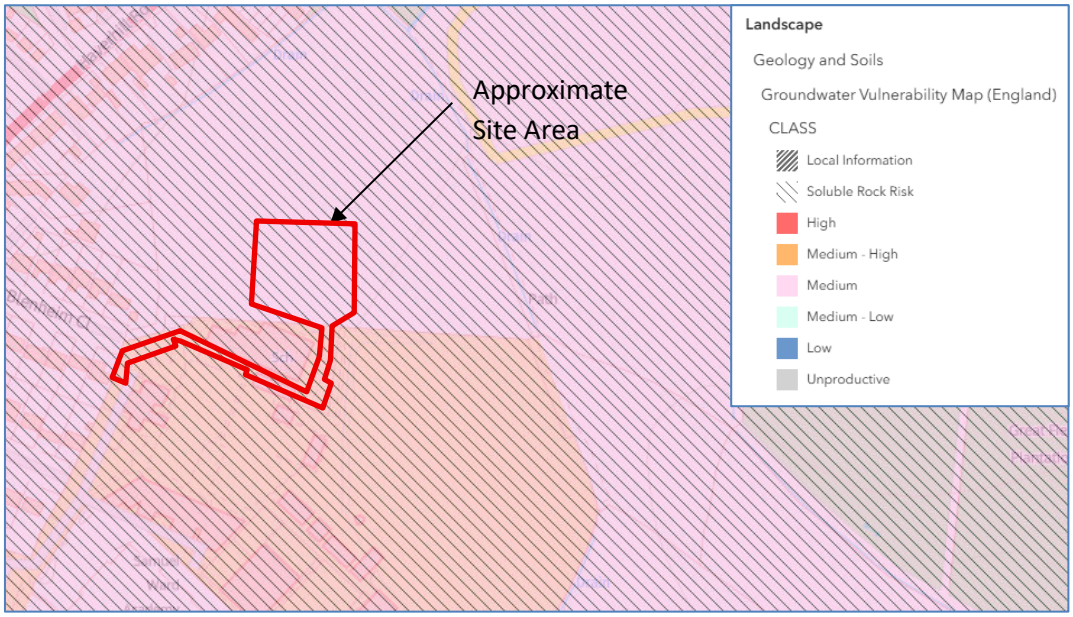


Figure 3.2- Environment Agency Groundwater Vulnerability Zones

4. PROPOSED DEVELOPMENT

4.1. The development comprises the construction of a Tennis MUGA with 3 No. Tennis courts and perimeter fencing, and a pedestrian access link to the existing Free School building site. The proposed tennis court area will comprise a permeable surfacing with an under-drain system. Refer to **Appendix E** for the proposed development layout and cross-sections.

4.2. The development is considered to be classified as **Water-Compatible Development**; Amenity open space, nature conservation and biodiversity, **outdoor sports and recreation** and essential facilities such as changing rooms.

4.3. In accordance with Table 3 in Annex F of the NPPF (August 2026), Water-Compatible development located within Flood Zone 1 does not require the application of the Exception Test.

4.4. The design life of the development is 75 years.

Climate Change

4.5. The climate change allowances are predictions of anticipated change for:

i. Peak river flow by river basin district

ii. Peak rainfall intensity

iii. Sea level rise

iv. Offshore wind speed and extreme wave height

4.6. The Environment Agency has provided peak rainfall climate change allowances by Management Catchment, which for this Site are summarised in Figure 4.1. In accordance with current Environment Agency guidance, an allowance of 35% and 45% will be used in the design of the drainage strategy for the 3.3% AEP and 1% AEP rainfall events respectfully.

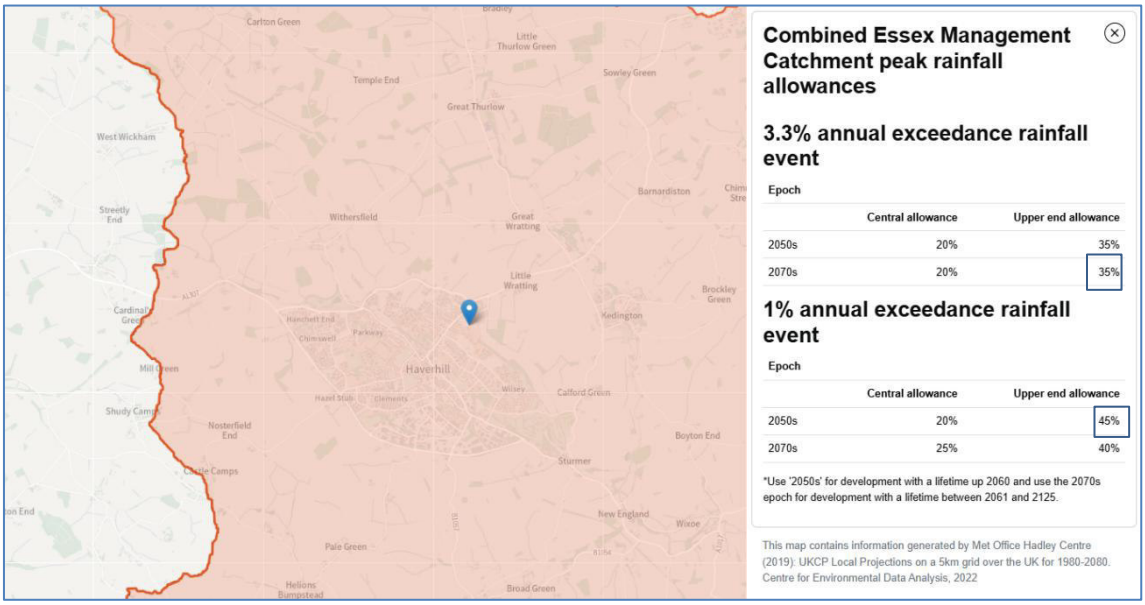


Figure 4.1: Environment Agency Peak Rainfall Allowances

FLOOD RISK ASSESSMENT

5. FLUVIAL FLOODING

5.1. Figure 1.1 shows that the Site is located within Flood Zone 1 where the risk of flooding is less than 1 in 1000 (0.1% AEP), with a low probability of flooding.

6. TIDAL FLOODING

6.1. As outlined in 5.1, the Environment Agency Flood Map for Rivers and Seas shows the Site is located within Flood Zone 1, where the likelihood of tidal flooding is less than 0.1% AEP.

7. PLUVIAL FLOODING

7.1. Pluvial flooding is a risk of overland flows and ponding associated with extreme rainfall events. This can take the form of:

i. Sheet runoff from adjacent land (urban or rural)

ii. Surcharged sewers

7.2. The Environment Agency has produced Flood Maps for Planning which show surface water flood depths, including for climate change for 2061 to 2125, for the 1 in 30, 1 in 100 and 1 in 1000 year return periods, and these are shown in Figures 7.1 to 7.3, with the 1% AEP plus climate change flood depths shown on the drawing in **Appendix B**.

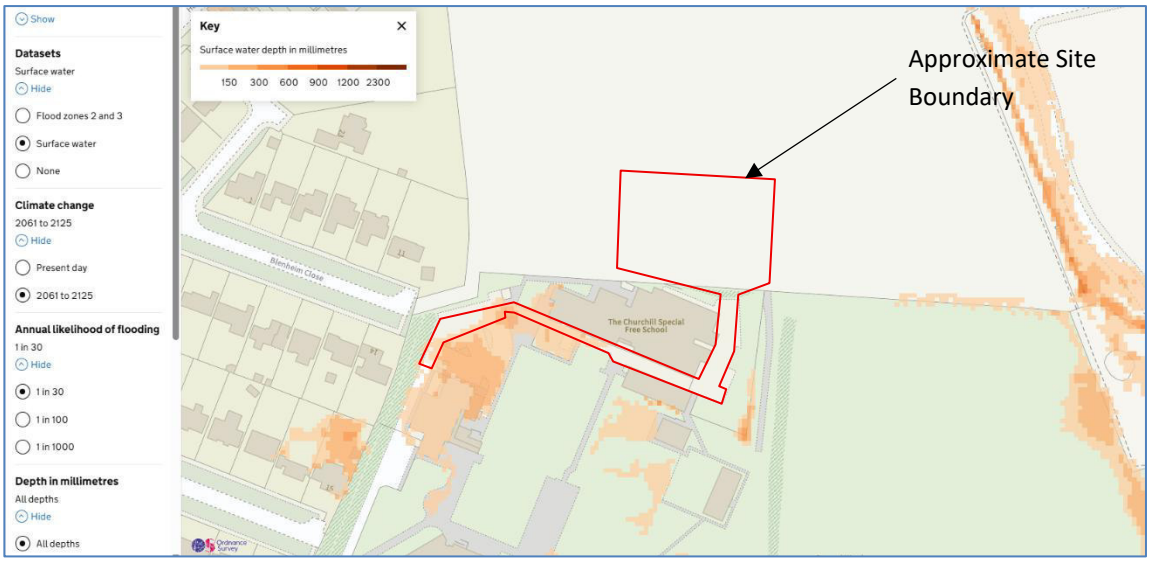


Figure 7.1 – Environment Agency Flood Map for Planning - Surface Water Flood Depths 2061-2125, 1 in 30 year event

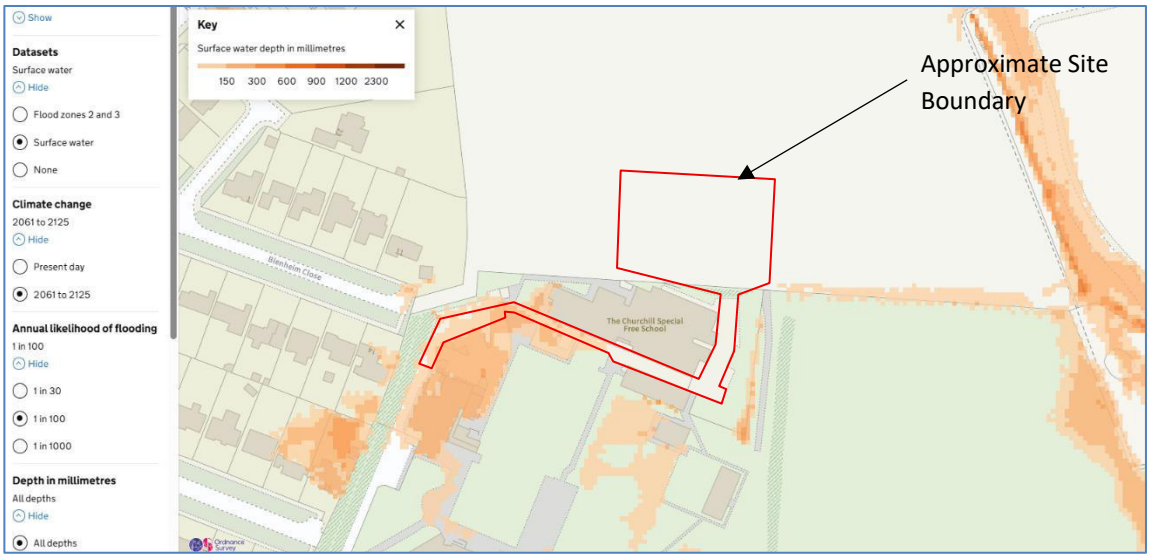


Figure 7.2: Environment Agency Flood Map for Planning - Surface Water Flood Depths 2061-2125, 1 in 100 year event

7.3. Figure 7.1 shows that the proposed MUGA area is not at risk of flooding in the 1 in 30 year plus climate change scenario, with the existing access at risk of flooding at depths ≤ 150 mm with a localised are at risk of 150 – 300 mm.

7.4. Figure 7.2 (and the drawing in **Appendix B**) shows that the proposed MUGA area is not at risk of flooding in the 1 in 100 year plus climate change scenario, with the existing access at risk of flooding at depths ≤ 150 mm and at 150 – 300 mm in locations to the south-west of the existing school building. The area indicated at risk of flooding at depths ≤ 150 mm to the east of the MUGA is in the location of the treeline at the edge of the field (refer to the photographs in **Appendix B**).

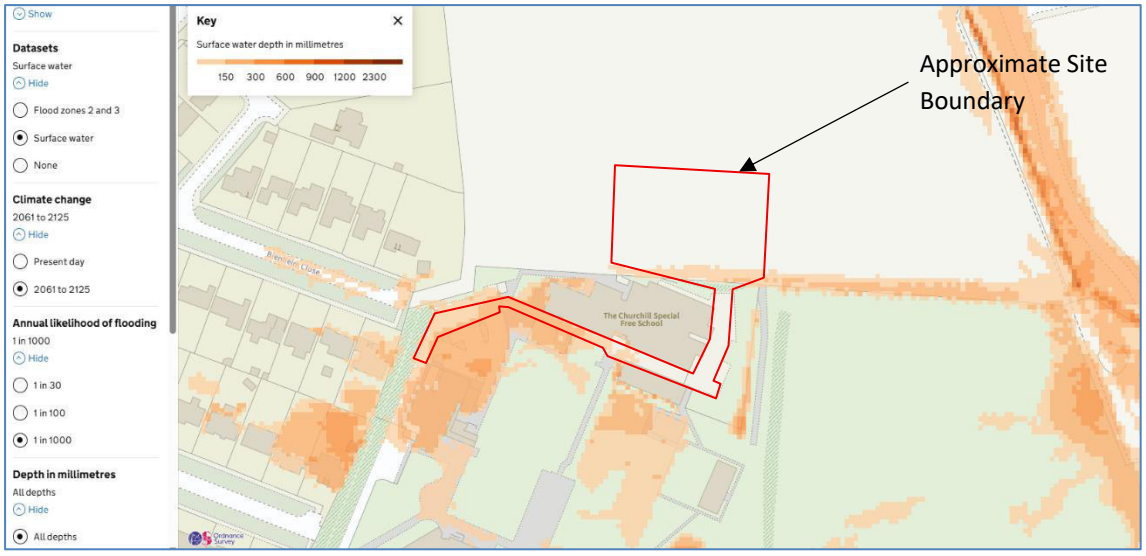


Figure 7.3: Environment Agency Flood Map for Planning - Surface Water Flood Depths 2061-2125, 1 in 1000 year event

7.5. Figure 7.3 shows that in the extreme 1 in 1000 year plus climate change event, the south boundary of the MUGA area is at risk of flooding at flooding at depths ≤ 150 mm with spots at 150 – 300 mm, with the existing Site access at risk of flooding at depths ≤ 150 mm and at 150 – 300 mm.

7.6. The risk of surface water flooding is associated with the existing Site access and car parking area for the Churchill Free School. In a flood event, the school access and car park will be closed, with access to the MUGA development prevented in a flood event.

7.7. There is a risk of overland flow from the grassland to the west of the proposed Tennis MUGA; it is therefore proposed that a Filter Trench is located to the west of the Tennis Courts and associated retaining structure, to intercept and direct any overland flow around the development to the east. Any overland flow would follow the contours to the south-east towards the existing watercourse, away from the Site.

8. GROUNDWATER FLOODING

8.1. Groundwater flooding is a risk of the water table rising after prolonged rainfall to emerge above ground level remote from a watercourse. It is most likely to occur in low lying areas underlain by aquifers of high vulnerability.

8.2. The Environment Agency has mapped groundwater vulnerability and Figure 3.2 shows the Site is located over a Medium vulnerability Aquifer.

8.3. The West Suffolk Strategic Flood Risk Assessment (SFRA) Level 2, dated July 2023 includes mapping of groundwater flooding classification and this is attached in **Appendix F**. The mapping indicates that the Site is located within an area with 'Limited Potential for groundwater flooding to occur'.

8.4. The Environment Agency Long Term Flood Risk Summary for the existing Churchill Free School states that the location is outside of a groundwater flood alert area.

8.5. Given the SFRA mapping, BGS borehole depth to groundwater, groundwater vulnerability and location of watercourses, the Site is considered to be at Low risk of groundwater flooding.

9. INFRASTRUCTURE FAILURE FLOODING

9.1. Infrastructure failure flooding is a risk of collapse, failure or surcharging of man-made structures and drainage systems. This could take the form of:

i. Reservoirs

ii. Canals

iii. Burst water mains

iv. Blocked sewers

v. Failed pumping stations

9.2. The Environment Agency have mapped failure of reservoirs, which shows the Site is not located within the maximum extent of flooding from reservoirs.

9.3. The risk of flooding from blocked sewers is considered to be Low due to the nature of the surrounding development and Site topography; any flood water would follow the Site contours and enter the network downstream or flow east towards the existing watercourse and away from the Site.

10. HISTORIC FLOODING

10.1. The West Suffolk Strategic Flood Risk Assessment Level 1, dated April 2021 and West Suffolk Strategic Flood Risk Assessment Level 2, dated July 2023 have not identified any flood records at the Site.

10.2. A review of the Environment Agency Historic Flood and Recorded Flood Outlines Maps has not identified historic flooding at the Site.

10.3. A review of Suffolk County Council's flood investigation records (S19) does not indicate a flood investigation at the Site.

DRAINAGE STRATEGY

11. SURFACE WATER DRAINAGE STRATEGY

11.1. The development comprises the construction of a Tennis MUGA with 3 No. Tennis courts and perimeter fencing, and a pedestrian access link to the existing School building site. The proposed tennis court area will comprise a permeable surfacing with an under-drain system. Refer to **Appendix E** for the proposed development layout and cross-sections.

11.2. Development proposals which could affect drainage on or around the development site should incorporate sustainable drainage systems to control flow rates and reduce volumes of runoff, in ways which are proportionate to the nature and scale of the proposal. The systems employed should provide multifunctional benefits wherever possible, facilitating improvements in water quality, biodiversity and amenity – *F8, NPPF August 2026*.

11.3. Surface water runoff from the development will be drained by making full use of Sustainable Drainage Systems (SuDS) where possible. The National Standards for Sustainable Drainage Systems (SuDS), Standards 1 to 7, outlines the design approach to be followed in the design of surface water drainage systems.

11.4. This Drainage Strategy has been developed with reference to the current National Standards for sustainable drainage systems (SUDS) updated 30 July 2025, but has been designed in line with the current guidance provided within Suffolk County Councils' local design document. The following sections indicate how the proposed Drainage Strategy follows the National Standards for sustainable drainage systems (SUDS) and also details, where applicable, how the strategy meets the design requirements of document 'Suffolk Flood Risk Management Strategy, Appendix A Sustainable Drainage Systems (SuDS); A Local Design Guide, 2023.

Standard 1: Runoff Destinations

11.5. Standard 1 dictates that collection for non-potable use should be considered first (priority 1). Rainwater harvesting has been considered as part of the development, however given the development type, it is not considered a feasible option, and the planning proposal does not have a use with an operational water demand.

11.6. Standard 1 requires infiltration to ground to be considered next. After infiltrating at source has been considered, the next priority is to discharge runoff to an above ground water body, then surface water sewer or other piped surface water system, with the lowest priority to discharge to a combined sewer.

11.7. Given the BGS mapping indicating Diamicton superficial geology across the Site, indicated as Clay (with low soakage potential) to 38.5 m bgl in the nearby borehole log, discharge via infiltration is not considered a viable option. It is therefore proposed that the surface water from the surface of the Tennis Courts is discharged at a restricted greenfield rate to the existing watercourse 130 m south-east of the Site, with the runoff attenuated on-site within the sub-base of the tennis Court surfacing.

11.8. It is proposed that the runoff will discharge via the permeable Tennis Court surfacing to the granular sub-base beneath, with an under-drain system flowing to a flow control device. The restricted runoff will then be conveyed via a shallow open channel to the existing watercourse

via a new headwall. The conveyance channel will be located on land within the wider site ownership.

11.9. A Filter Trench is proposed to the west of the Tennis Courts and associated retaining structure, to intercept and direct any overland flow from the adjacent grassland, around the development to the east. Refer to the layout drawing in **Appendix G**.

11.10. The proposed drainage strategy and construction detail drawings are attached in **Appendix G**.

11.11. Table 11.1 summarises how the use of SuDS components has been considered and utilised in this drainage strategy.

SUDS Type	Component Type	Suitable	Explanation/Comments
Source Control	Rainwater Harvesting systems	No	Not viable given the nature of the development.
	Green Roofs	No	As above
	Rain gardens/Tree Pits	No	As above
	Permeable Paving	Yes	Permeable Surfacing proposed.
Infiltration	Soakaway	No	Not proposed due to poor infiltration potential
	Filter Drain/Strips	No	
	Infiltration Basin	No	
	Swale	No	
	Tree Pits	No	
Conveyance	Swale	Yes	Shallow swale-like feature to be used to convey the restricted flow to the watercourse.
	Filter Drain	Yes	Filter Trench proposed to intercept and drain Overland Flow.
Detention	Sub-surface Storage	Yes	Attenuation of runoff within surfacing sub-base.
	Detention Basin	No	No requirement for additional storage.
	Pond	No	As above
	Wetland	No	As above

Table 11.1: Table summarising the use of SuDS components.

Standard 2: Management of Everyday Rainfall (Interception)

Given the proposal to discharge the runoff via a permeable surface, the drainage strategy is considered to be compliant with Standard 2 and Suffolk Flood Risk Management Strategy, Appendix A Sustainable Drainage Systems (SuDS).

Standard 3: Management of Extreme Rainfall and Flooding

11.12. Info-Drainage has been used to design the attenuation storage required to achieve a restricted discharge rate of 0.6 l/s from the Site. The discharge rate has been assessed based on the greenfield runoff rate of 3.8 l/s/ha and a catchment area of 0.17 ha. The calculations have assessed the runoff associated with the 1 in 2 year, 1 in 30 year and 1 in 100 year events plus climate change allowances of 35% and 45% respectively. No allowance for urban creep has been included for due to the nature of the development. The calculations include for current FEH 2022 rainfall data and a C_v value of 1.0 and are attached in **Appendix H**.

11.13. The calculations show that the proposed surfacing sub-base can store the runoff from the Site for up to the 1% AEP plus climate change event without flooding.

Exceedance

11.14. In an exceedance event in which rainfall surpasses the design capacity, there should be no vulnerable buildings or infrastructure at risk of flooding.

11.15. Site ground levels will be locally contoured to deflect water away from building thresholds and the Tennis MUGA, eastwards towards the existing watercourse as currently would occur.

11.16. The exceedance paths have been shown on the layout plan in **Appendix G**.

Standard 4: Water Quality

11.17. The water discharging to the watercourse must be cleansed and therefore treatment processes are introduced through the drainage network. These should be in accordance with Chapter 26 of the Ciria SuDS Manual C753, where the hazard of low to medium is mitigated with the various SuDS components to equal or exceed the hazard indices. Refer to the following Tables 26.2 and 26.3 which show the hazard and mitigation indices associated with the proposed drainage scheme. The pollution hazard level associated with the Tennis MUGA surface runoff is considered to be Low.

11.18. It is proposed that the runoff from the Tennis MUGA will discharge via a permeable surface to the granular sub-base below, from where an underdrain system will direct flow via a flow control device to a shallow swale-like conveyance channel, to the watercourse.

11.19. The tables show that the mitigation indices associated with the permeable surfacing exceed the hazard indices associated with the Tennis MUGA runoff. Therefore, the surface water runoff will be sufficiently cleansed prior to discharge to the watercourse.

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters

	Mitigation indices[1]		
Type of SuDS component	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond[4]	0.7[3]	0.7	0.5
Wetland	0.8[3]	0.8	0.8
Proprietary treatment systems[5,6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Standard 5 and Standard 6: Amenity and Biodiversity

11.20. Amenity and biodiversity are often considered together as they overlap and linkages are made.

11.21. Amenity is the multi-functional use that should be highlighted for any part of the SuDS landscape, which is available for use by people when not being used for drainage. This is an underlying principle of place making urban design, to make a location desirable to live and work.

11.22. Biodiversity encompasses the number and abundance of all species of life on earth. Locally, biodiversity reflects the character of the plants and wildlife that share the space in which humans live, work and play.

11.23. The development runoff will discharge via the permeable surfacing of the Tennis MUGA area providing a combined amenity and drainage solution. The proposed conveyance channel downstream of the MUGA area will also provide biodiversity value, encouraging growth for native species.

Standard 7: Design of Drainage for Construction, Operation, Maintenance, Decommissioning and Structural Integrity

11.24. It is important to establish the adopting authorities at an early stage to define the requirement and how these meet the standards.

11.25. It is not proposed that the drainage will be adopted; it will be maintained by the Management Company associated with the wider Churchill Free School site.

11.26. The local council could designate flood features if they so wish in accordance with 'Flood & Water Management Act 2010 Section 30 and Schedule 1, designation of features', to protect from future change.

11.27. It is important to prevent silt from entering the drainage system during the construction phase and a Construction Surface Water Management Plan should be developed prior to commencement of works.

11.28. Maintenance of the system will include for frequent inspections of the network, permeable surfacing, flow control device, conveyance channel feature and outfall, with debris removal to ensure designed levels of performance are achieved. Refer to the Maintenance Plan attached in **Appendix I**.

12. SUMMARY

12.1. It has been demonstrated that the Site is located within Flood Zone 1.

12.2. Table 12.1 summarises the probability of the Site flooding from the five key sources as listed in PPS25.

Source	Description	Risk	
Fluvial	Rivers	Flood Zone 1	**(<0.1% AEP)**
Tidal	Seas		
Pluvial	Surface Water	Very Low to High	**(<0.1% AEP to >3.3% AEP)**
Groundwater	Aquifers	Low	-
Infrastructure failure	Reservoirs Blocked Sewers	Outside extent of flooding Low	-

Table 12.1 – Flood Risk Summary

12.3. The Site area at risk of surface water flooding in the 1 in 100 year plus climate change scenario is the existing school access, which is at risk of flooding at depths ≤ 150 mm and at 150 – 300 mm in locations to the south-west of the existing school building. In a flood event, the school access and car park will be closed, with access to the MUGA development prevented in a flood event.

12.4. Runoff from the development will be discharged at the restricted greenfield runoff rate of 3.8 l/s/ha (0.6 l/s) to the existing watercourse south-east of the Tennis MUGA, with runoff attenuated within the sub-base beneath the proposed MUGA surfacing. The runoff will initially discharge via permeable surfacing to the granular sub-base with an underdrain system flowing to a flow control device. The restricted runoff will then flow via a shallow conveyance channel (swale-like feature), outfalling to the existing watercourse.

12.5. The attenuation storage has been designed to store runoff up to the 1% AEP plus climate change event without flooding, using current FEH22 data and a C_v value of 1.

12.6. The discharge of runoff via the permeable surfacing will suitably cleanse the water prior to final discharge to the watercourse.

12.7. Exceedance flow will be directed away from vulnerable buildings and infrastructure and outflow along its original path to the south-east towards the watercourse as currently occurs.

12.8. In accordance with government policy, SuDS will be used on Site where possible, and surface water drainage of the Site will be carried out in a sustainable way.

12.9. As long as maintenance of the new drainage systems are correctly carried out, the risk of flooding and the subsequent risks from infrastructure failure or pluvial means, is Low.

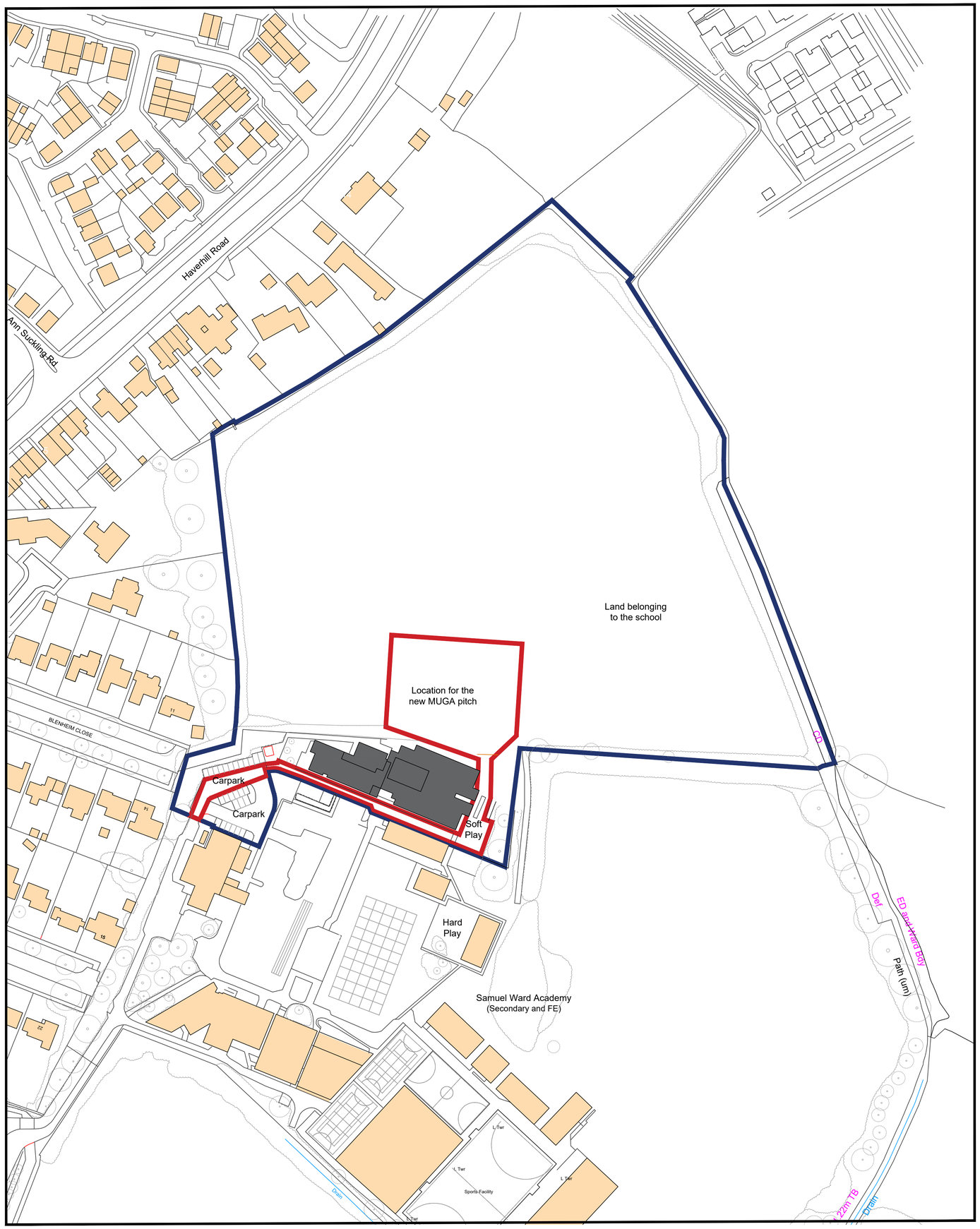
12.10. It is considered that the risk of flooding to the Site has been adequately considered and therefore development of the Site, in accordance with the recommendations outlined in this report, does not pose an unacceptable flood risk either to occupants of the Site or to others off site.

12.11. The Environment Agency accepts that extreme floods will occur and it will never be possible to eliminate flood risk altogether.

APPENDICES

Appendix A

Site Location Plans



EXISTING LOCATION PLAN 1:1000

ALL WORKING DIMENSIONS TO BE CHECKED ON SITE.
FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALED DIMENSIONS.
ANY DISCREPANCIES BETWEEN DRAWINGS OF DIFFERING SCALES AND BETWEEN DRAWINGS AND SPECIFICATION WHERE APPROPRIATE TO BE NOTIFIED TO SUPERVISING OFFICER FOR DECISION.
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Legend:

- Area of development
- Property Outline

Rev	Date:	Notes:
0	09/07/2026	Initial Issue.

REVISION HISTORY

CHURCHILL SPECIAL FREE SCHOOL
CHALKSTONE WAY
HAVERHILL
CB9 0LB

UNITY SCHOOLS PARTNERSHIP

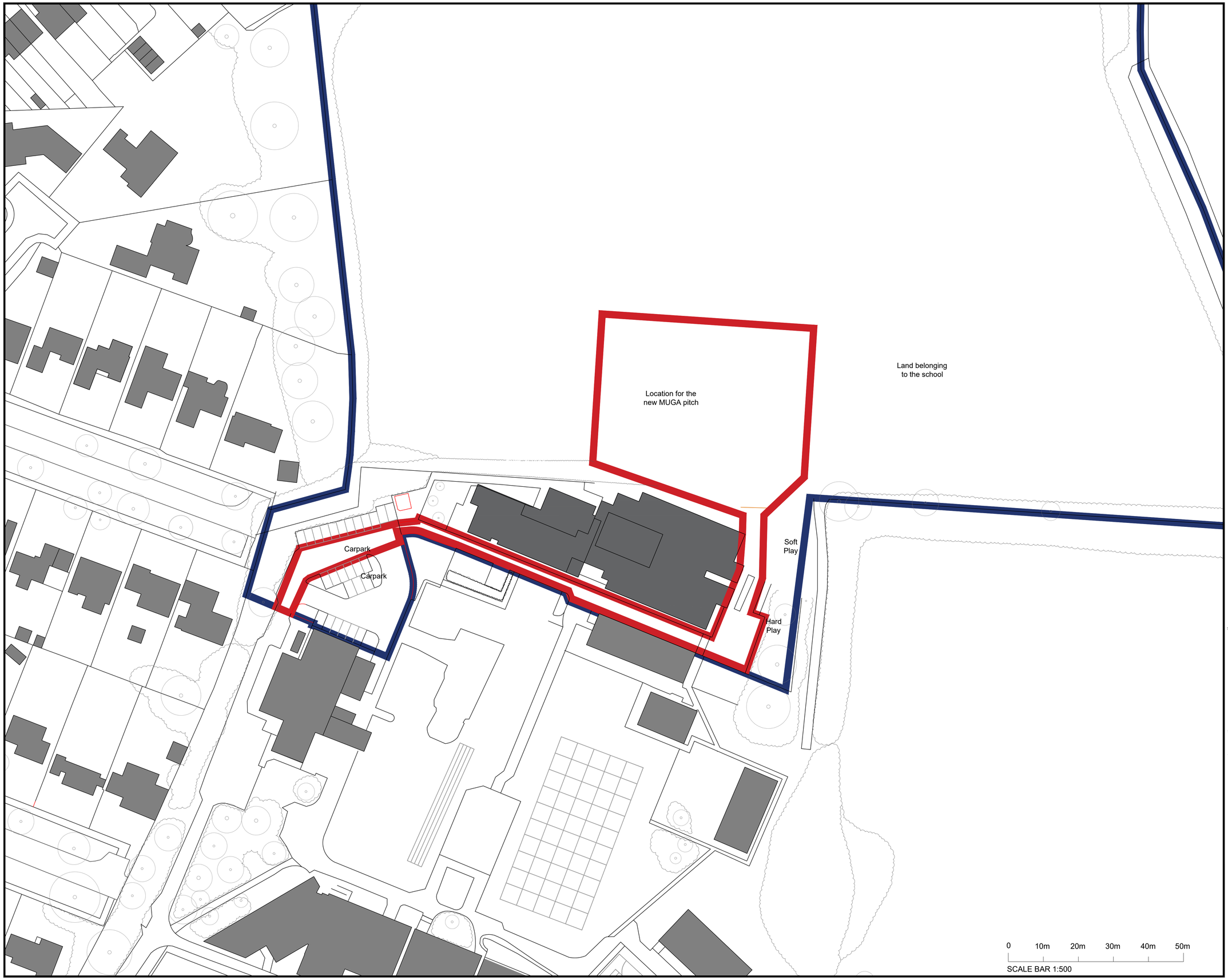
NEW TENNIS MUGA
EXISTING LOCATION PLAN

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DATE	07/07/2026	DRAWN BY	JW
SCALE (@ A1)	1:500	CHECKED BY	MH

341-2 PL-001.R0



EXISTING BLOCK PLAN
1:500

ALL WORKING DIMENSIONS TO BE CHECKED ON SITE.
FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALED DIMENSIONS.
ANY DISCREPANCIES BETWEEN DRAWINGS OF DIFFERING SCALES AND BETWEEN DRAWINGS AND SPECIFICATION WHERE APPROPRIATE TO BE NOTIFIED TO SUPERVISING OFFICER FOR DECISION.
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Legend:

- Area of development
- Property Outline

0 10m 20m 30m 40m 50m

SCALE BAR 1:500

N

Rev	Date:	Notes:
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REVISION HISTORY

CHURCHILL SPECIAL FREE SCHOOL
CHALKSTONE WAY
HAVERHILL
CB9 0LB

UNITY SCHOOLS PARTNERSHIP

NEW TENNIS MUGA
EXISTING BLOCK PLAN

P C H
A S S O C I A T E S
L T D

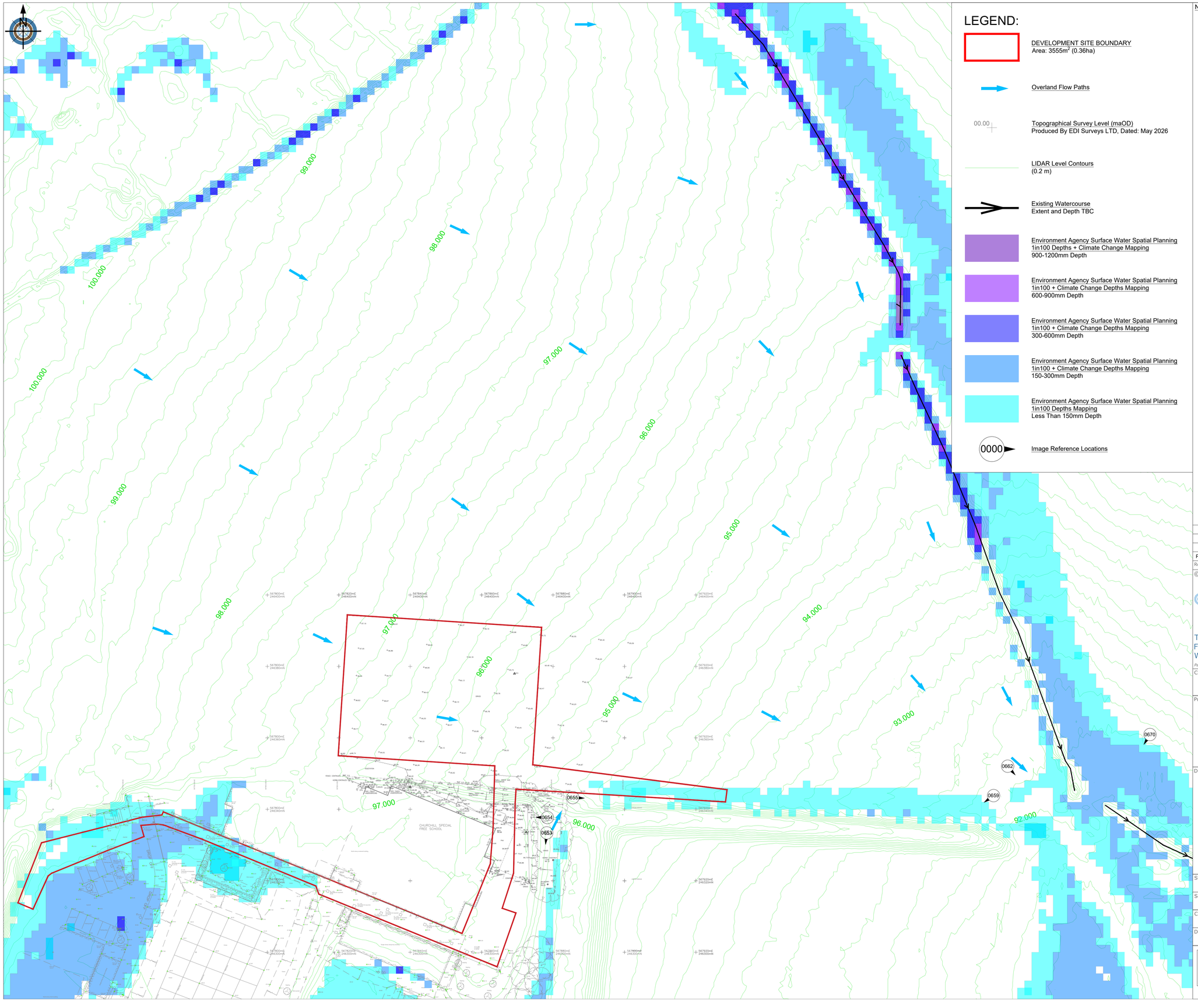
01638 667676
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info@pchassociates.co.uk

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SCALE (@ A1)	1250	CHECKED BY	MH

341-2 PL-002.R0

Appendix B

Existing Site Layout Drawing and Photographs



LEGEND:

- DEVELOPMENT SITE BOUNDARY
  Area: 3555m² (0.36ha)
- Overland Flow Paths
- 00.00 Topographical Survey Level (maOD)
  Produced By EDI Surveys LTD, Dated: May 2026
- LIDAR Level Contours
  (0.2 m)
- Existing Watercourse
  Extent and Depth TBC
- Environment Agency Surface Water Spatial Planning
  1in100 Depths + Climate Change Mapping
  900-1200mm Depth
- Environment Agency Surface Water Spatial Planning
  1in100 + Climate Change Depths Mapping
  600-900mm Depth
- Environment Agency Surface Water Spatial Planning
  1in100 + Climate Change Depths Mapping
  300-600mm Depth
- Environment Agency Surface Water Spatial Planning
  1in100 + Climate Change Depths Mapping
  150-300mm Depth
- Environment Agency Surface Water Spatial Planning
  1in100 Depths Mapping
  Less Than 150mm Depth
- 0000 Image Reference Locations

NOTES:

1. This drawing is to be read in conjunction with GHB series NNN/2026 drawings and documents and any other relevant project team documents.
2. Preliminary Issue - This drawing is not to be used for construction or detailed pricing purposes. Any work undertaken before approvals are received (in writing) are at risk of abortive works.
3. This drawing has been produced based upon the following information:
   Topographical Survey by EDI Surveys LTD (Ref. 341-2_BASE_PR_Lv-2_R02_Topo_(Re-aligned-Base) dated May2026) subject to transformation of :
   Scale 1 and translation (0, 0, 0) about point (0, 0, 0).
   Architectural Layout by PCH Associates LTD (Ref. 341-2_FS-003_R00_Proposed-Siteplan dated 10/04/2026) subject to transformation of : Scale 1 and translation (0, 0, 0) about point (0, 0, 0).
4. All site levels and finished floor levels to remain indicative for planning purposes and are subject to verification following detailed design.
5. This drawing has been prepared solely for the purpose of obtaining a Planning Consent based on information available and planning requirements at the date of issue only.

Rev	Rev Date	Description	Drawn	Chck'd
P1	15/07/26	Initial Issue	BAF	JAH

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IP31 3PA
T: (01359) 235071
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W: http://www.ghbullard.co.uk
Partnership No. OC383830, Registered in England and Wales

Client:
CHURCHILL FREE SCHOOL

Project:
PROPOSED TENNIS MUGA CHURCHILL FREE SCHOOL, CHALKSTONE WAY, HAVERHILL, SUFFOLK

Drawing Title:
FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY EXISTING SITE LAYOUT

Status:	FOR PLANNING		
Scale:	1:500 @ A1		
Created:	SEP 2026	Drawn:	BAF
DWG Reference:	220-2026.DWG	Checked:	JAH
Drawing Number:	220/2026/010	Revision:	P1

P# = Preliminary, C# = Construction, AB# = As Built

220-2026 Chuchill School – Site Images 27th August 2026



[0653]
View South From Corner of School Site



[0654]
View East Along School Boundary Fence



[0655]
View West From Corner of School Site



[0659]
View East from English Way Along Hedge Line back to School.



[0662]
View South Along Unofficial Track over Culvert



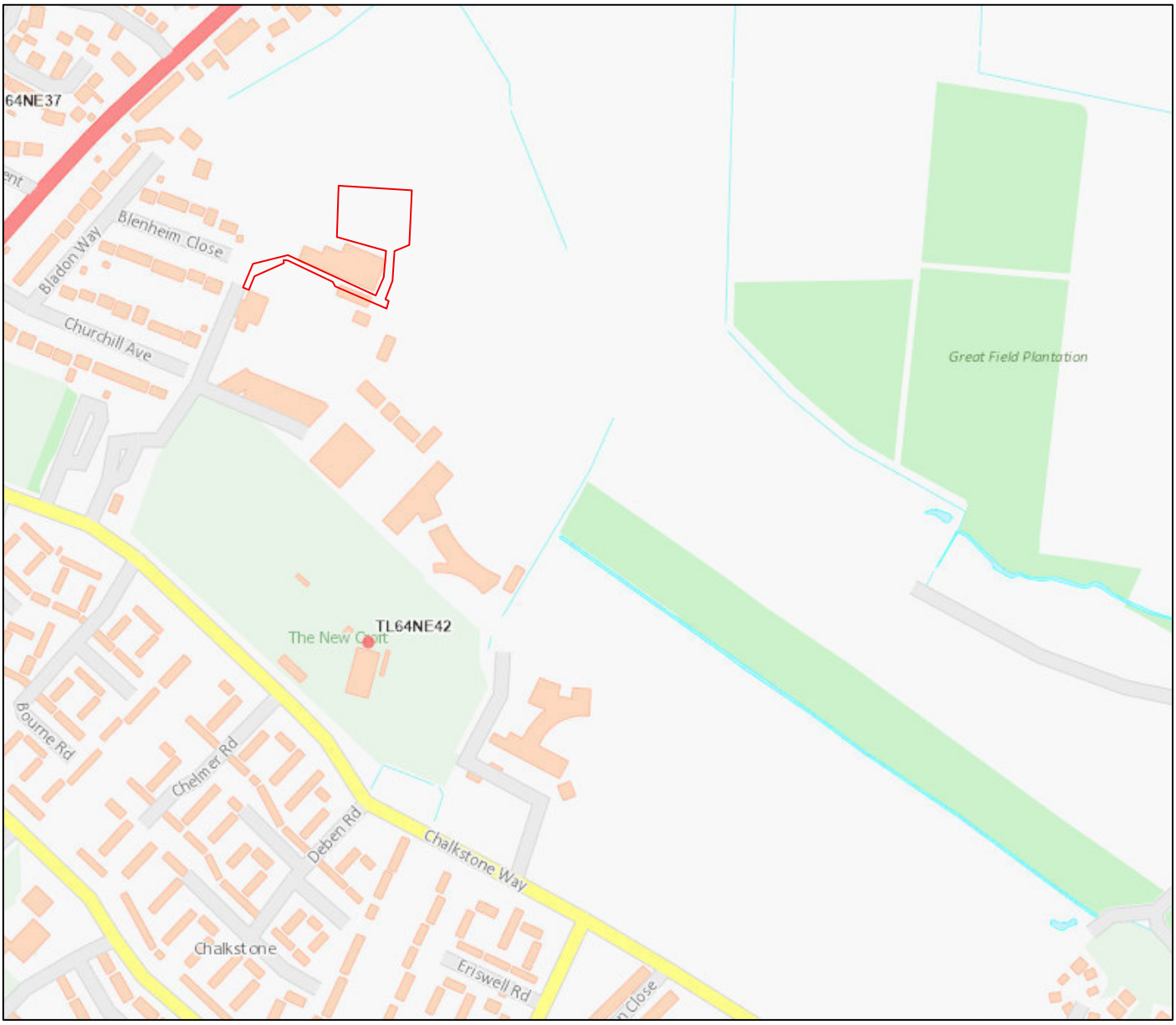
[0670]
View From Engliah Way Of Access Across Culvert

Appendix C

BGS Borehole Log

220/2026: Proposed Tennis MUGA, Churchill Free School, Chalkstone Way, Haverhill, Suffolk, CB9 0LB

BGS Borehole Location



British Geological Survey

BGS ID: 18595391 : BGS Reference: TL64NE42
British National Grid (27700) : 567850,245990

TL64/67

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

INFORMATION MANAGEMENT PROGRAMME

A SITE DETAILS

Borehole drilled for: HAVERHILL COMMUNITY FOOTBALL PROJECT
Location: CHARLSTONE WAY, HAVERHILL, SUFFOLK CB9 0LD
NGR (8 figures): TL 6785 4599
Ground Level (if known): N/K Please attach site plan
Drilling Company: A G BROWN DRILLING
Date of Drilling: Commenced 16/4/10 Completed 30/4/10

B CONSTRUCTION DETAILS

Borehole Datum (if not ground level) _____ above / m below GL

(point from which all measurements of depth are taken e.g. flange, edge of chamber, etc.)

Borehole drilled diameter 200 mm from GL to 23 m/depth
mm from to m/depth
mm from to m/depth

Casing material diameter mm from to m/depth
and type (e.g. if plain steel, plastic slotted)

Casing material PLAIN STEEL diameter 150 mm from GL to 43.5 m/depth
Casing material PVC PLAIN diameter 125 mm from GL to 40 m/depth
Casing material PVC SLOTTED diameter 125 mm from 40 to 80 m/depth

Grouting details

Water struck at 5.8 m (depth below datum - mbd)
m (depth below datum - mbd)

Rest water level on completion 36.9 mbd

C TEST PUMPING SUMMARY (Please supply full details on Forms WR-39)

Test Pumping Datum (if different from borehole datum) _____ m above / below borehole datum (mbd)

Pump Suction depth _____ mbd (BALE TEST)
Water Level (Start of Test) 36.9 mbd
Water Level (End of Test) 36.9 mbd
Pumping rate _____ m^3/d:l/s
for 1 ~~days~~/hours
Recovery to 36.9 mbd in 0 mins: ~~hrs: days~~
(from end of pumping)
Date(s) of measurements 30/4/10

Please supply chemical Analysis if available

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 18595391 : BGS Reference: TL64NE42
British National Grid (27700) : 567850,245990

D STRATA LOG

Geological Classification (BGS only)	Description of strata	Thickness m	Depth m
	BOULDER CLAY fill	1.0	GL
	STIFF BROWN BOULDER CLAY	4.1	1.0
	VERY STIFF GREY BOULDER CLAY with occasional SILTY SANDY WATER BEARING lenses	1.9	5.1
	VERY STIFF GREY BOULDER CLAY	31.5	7.0
	DENSE YELLOW BROWN SILTY SAND	1.0	38.5
	CHALK WITH FLINTS	40.5	39.5
	(continue on separate page if necessary)		80m
	Other comments (e.g. gas encountered, saline water intercepted, etc.)		

FOR OFFICIAL USE ONLY

FILE	CONSENT NO	NGS REF NO:
LIC NO:	PURPOSE:	EA REF NO:
DATE REC:	COPY TO:	ENTERED BY:

[redacted]

Contact BGS: ngdc@bgs.ac.uk

Appendix D

Greenfield Runoff Rate Calculation

220/2026: Proposed Tennis MUGA, Churchill Free School, Chalkstone Way, Haverhill, Suffolk, CB9 0LB

FEH Data


```
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Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

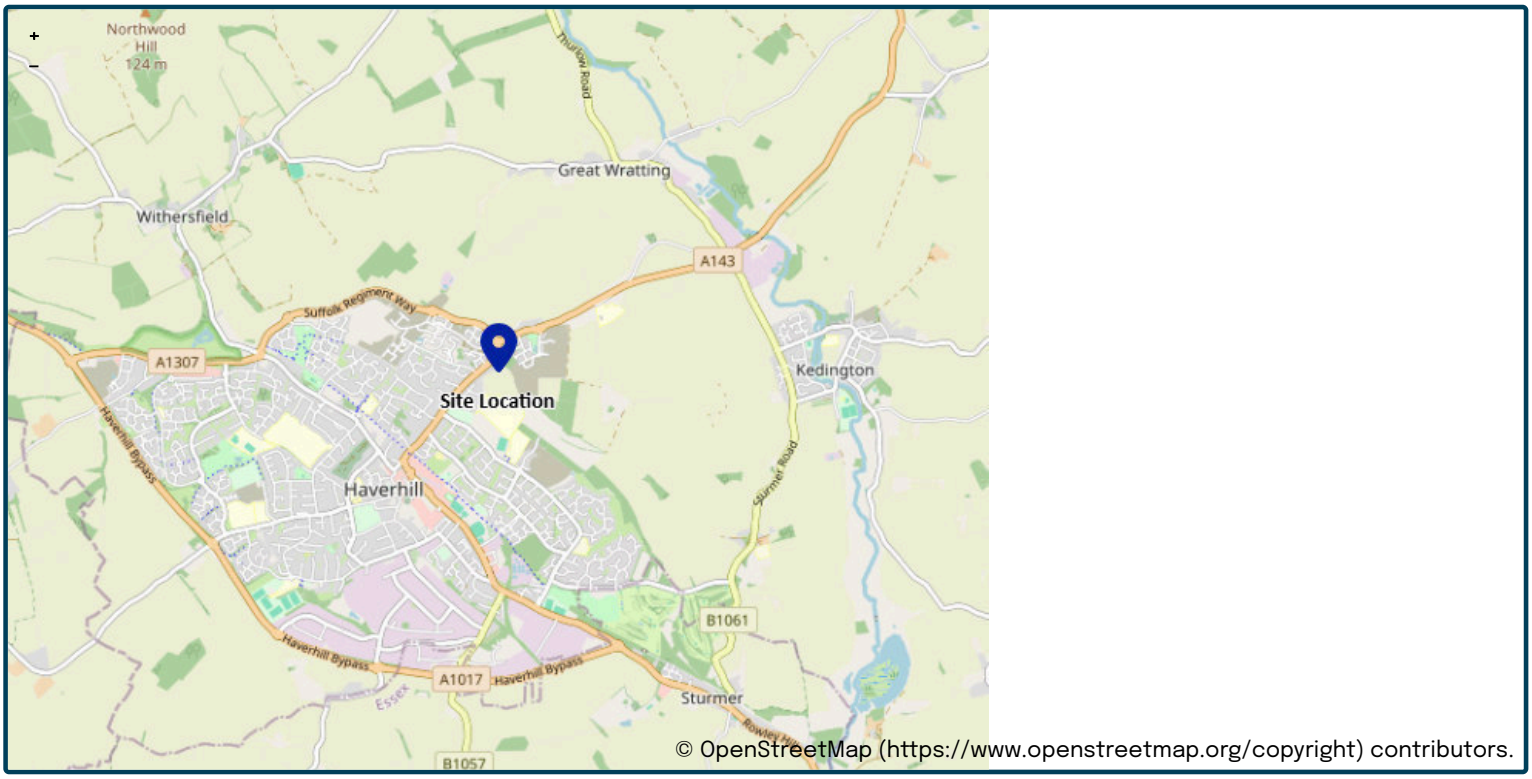
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015).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

Project details

Date	01/07/2026
Calculated by	BAF
Reference	220-2026
Model version	2.2.3

Location

Site name	churchill free school
Site location	haverhill



Site easting (British National Grid)	567855
Site northing (British National Grid)	246362

Site details

Total site area (ha)	1 ha

Greenfield runoff

Method

Method	FEH statistical (2025)

FEH statistical (2025)

	My value		Map value
SAAR9120 (mm)	635 mm		
BFIHOST19scaled	0.338		
QMed-QBar conversion	1.136		1.136
QMed (l/s)	3.4 l/s		
QBar (FEH statistical 2025) (l/s)	3.8 l/s		

Growth curve factors

	My value		Map value
Hydrological region	6		6
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

Results

Method	FEH statistical (2025)
Flow rate 1 year (l/s)	3.3 l/s
Flow rate 2 year (l/s)	3.4 l/s
Flow rate 10 years (l/s)	6.2 l/s
Flow rate 30 years (l/s)	8.8 l/s
Flow rate 100 years (l/s)	12.2 l/s
Flow rate 200 years (l/s)	14.3 l/s

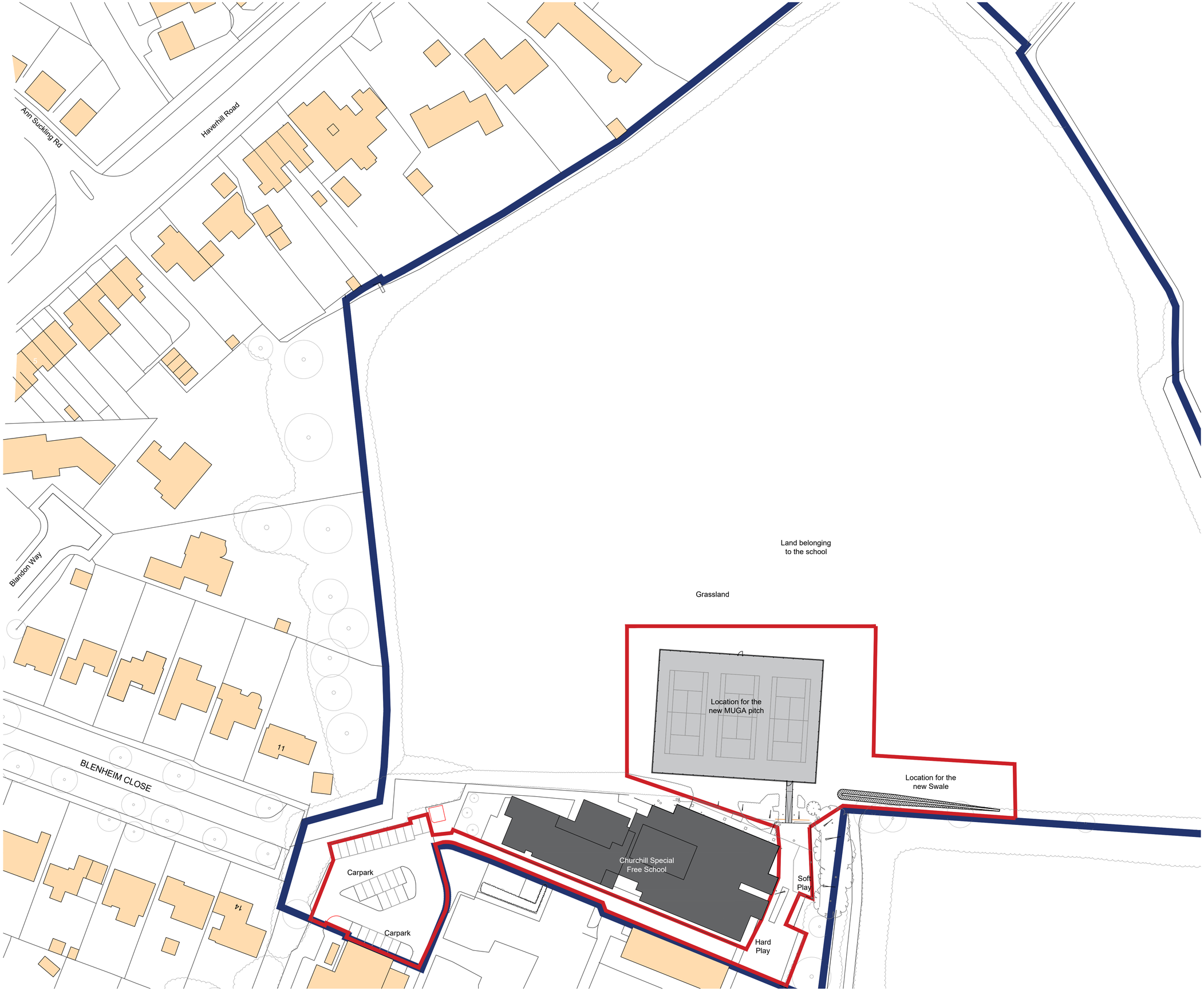
Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (https://www.uksuds.com/). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (https://www.uksuds.com/terms-conditions). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Appendix E

Proposed Development Layout and Sections



PROPOSED BLOCK PLAN
1:500

ALL WORKING DIMENSIONS TO BE CHECKED ON SITE.
FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALED DIMENSIONS.
ANY DISCREPANCIES BETWEEN DRAWINGS OF DIFFERING SCALES AND BETWEEN DRAWINGS AND SPECIFICATION WHERE APPROPRIATE TO BE NOTIFIED TO SUPERVISING OFFICER FOR DECISION.
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Legend:

- Area of development
- Property Outline
- Swale

0 10m 20m 30m 40m 50m

SCALE BAR 1:500

N

Rev	Date:	Notes:
0	04/09/2026	Initial Issue.

REVISION HISTORY

CHURCHILL SPECIAL FREE SCHOOL
CHALKSTONE WAY
HAVERHILL
CB9 0LB

UNITY SCHOOLS PARTNERSHIP

NEW TENNIS MUGA
PROPOSED BLOCK PLAN

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DATE	07/07/2026	DRAWN BY	JW
SCALE (@ A1)	1:500	CHECKED BY	MH

341-2 PL-004_R0

6m Margin for Land Battering to prevent soil collapse

96.64
96.37
96.16
96.93
97.16
95.96
95.72
95.55
Rear Maintennance Access Gate

1.8 metre high twin mesh fence PPC coated RAL 6005 - Moss Green

1.8 metre high twin mesh fence PPC coated RAL 6005 - Moss Green

Permeable Macadam Run-off area finished in Green Anti Slip Paint

97.05
95.48
FFL +96.40
96.96
95.47
New 3no Tennis Court (51.81mx35.35m)
FFL +96.40
GRASS
FFL +96.40
1.8 metre high twin mesh fence PPC coated RAL 6005 - Moss Green
95.20
Permeable Macadam Run-off area finished in Green Anti Slip Paint
Permeable Macadam Run-off area finished in Green Anti Slip Paint
Permeable Macadam Run-off area finished in Green Anti Slip Paint
96.83
95.18
Permeable Macadam Tennis Court finished in Blue Anti Slip Paint
Permeable Macadam Tennis Court finished in Blue Anti Slip Paint
Permeable Macadam Tennis Court finished in Blue Anti Slip Paint
Permeable Macadam Run-off area finished in Green Anti Slip Paint
96.77
95.21
Permeable Macadam Run-off area finished in Green Anti Slip Paint
1.2m wide Single gate- Twin Mesh PPC coated RAL 6005 - Moss Green
1.8 metre high twin mesh fence PPC coated RAL 6005 - Moss Green
1.8 metre high twin mesh fence PPC coated RAL 6005 - Moss Green
FFL +96.40
New Swale
96.80
96.74
96.69
96.55
96.39
96.26
95.19
1.8 metre high twin mesh fence PPC coated RAL 6005 - Moss Green
FFL +96.40
1.8 metre high twin mesh fence PPC coated RAL 6005 - Moss Green
95.56
95.48
New tarmac path
96.26
Natural Ground Level Raised Up to support new path and court
95.92
Existing borderline
95.57
SMALL TREES AND VEGETATION
95.16
Existing borderline
VEGETATION
Existing borderline
IC CL96.73
96.20
96.35
95.66
CH 2.0
SILVER BIRCH
95.09
94.82
94.83
CE CONTINUES
WMF 2.5
96.72
96.64
96.54
GRASS
96.39
IC CL96.69
IC 96.36
WMF 2.0
96.98
96.20
96.27
95.98
95.92
WMF 2.5 95.79
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CH 2.0
95.24
7mH
95.17
WMF 2.0
95.01
94.95
FENCE HEIGHT
New 1500mm wide Path 1:21 Gradient

6m Margin for Land Battering to prevent soil collapse

6m Margin for Land Battering to prevent soil collapse

PROPOSED GA PLAN 1:100

N

ALL WORKING DIMENSIONS TO BE CHECKED ON SITE.
FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALED DIMENSIONS.
ANY DISCREPANCIES BETWEEN DRAWINGS OF DIFFERING SCALES AND BETWEEN DRAWINGS AND SPECIFICATION WHERE APPROPRIATE TO BE NOTIFIED TO SUPERVISING OFFICER FOR DECISION.
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0 5m 10m

SCALE BAR 1:100

Rev	Date:	Notes:
0	10/04/2026	Initial Issue.

REVISION HISTORY

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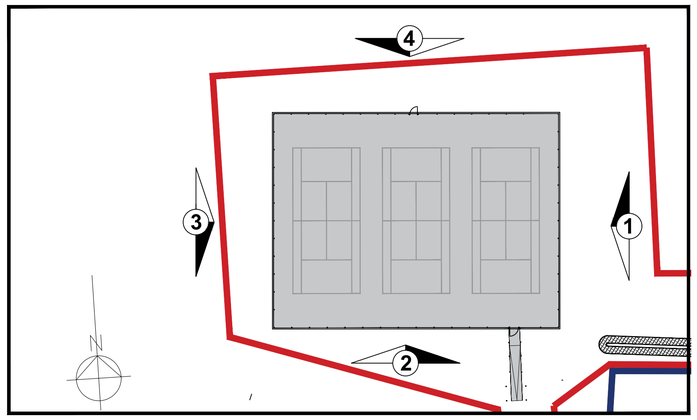
UNITY SCHOOLS PARTNERSHIP

NEW TENNIS MUGA
PROPOSED GENERAL ARRANGEMENT PLAN

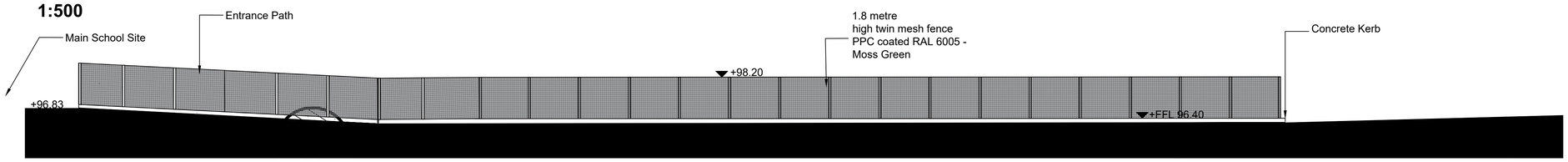
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DATE	07/07/2026	DRAWN BY	JW
SCALE (@ A1)	1:100	CHECKED BY	MH

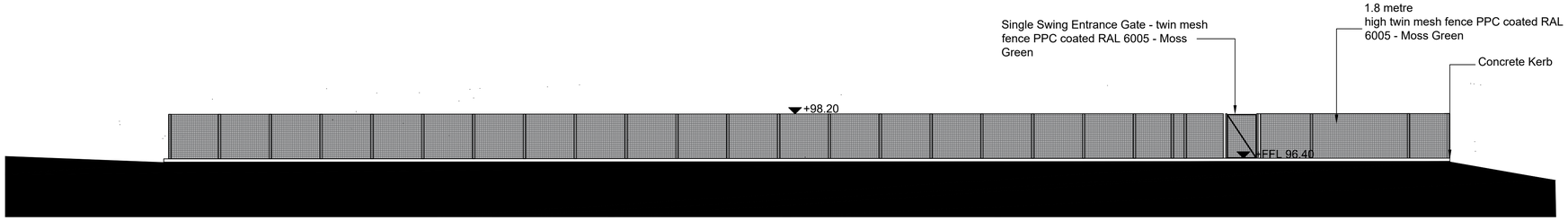
341-2 PL-006.R0



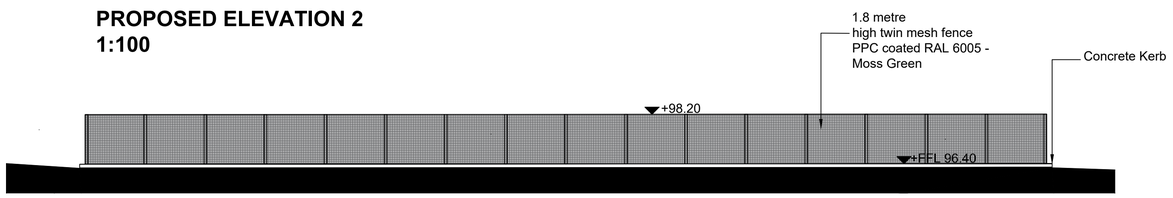
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1:500



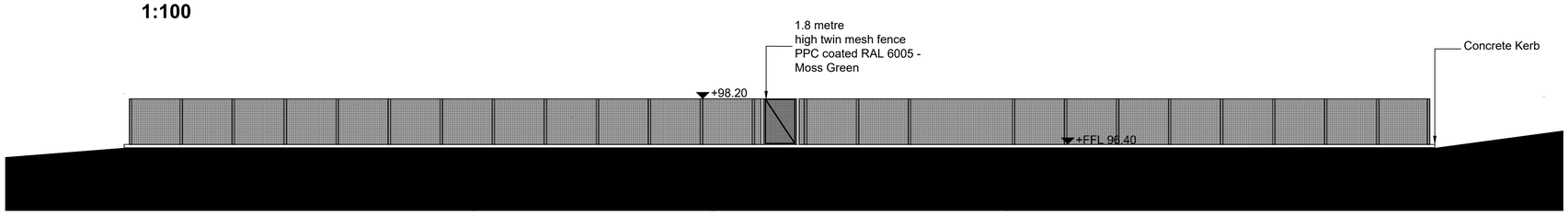
PROPOSED ELEVATION 1
1:100



PROPOSED ELEVATION 2
1:100

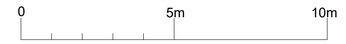


PROPOSED ELEVATION 3
1:100

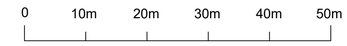


PROPOSED ELEVATION 4
1:100

ALL WORKING DIMENSIONS TO BE CHECKED ON SITE.
FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALED DIMENSIONS.
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SCALE BAR 1:100



SCALE BAR 1:500

Rev	Date:	Notes:
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NEW TENNIS MUGA
PROPOSED ELEVATIONS

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DATE	07/07/2026	DRAWN BY	JW
SCALE (@ A1)	1:100	CHECKED BY	MH

341-2 PL-008.R0

Appendix F

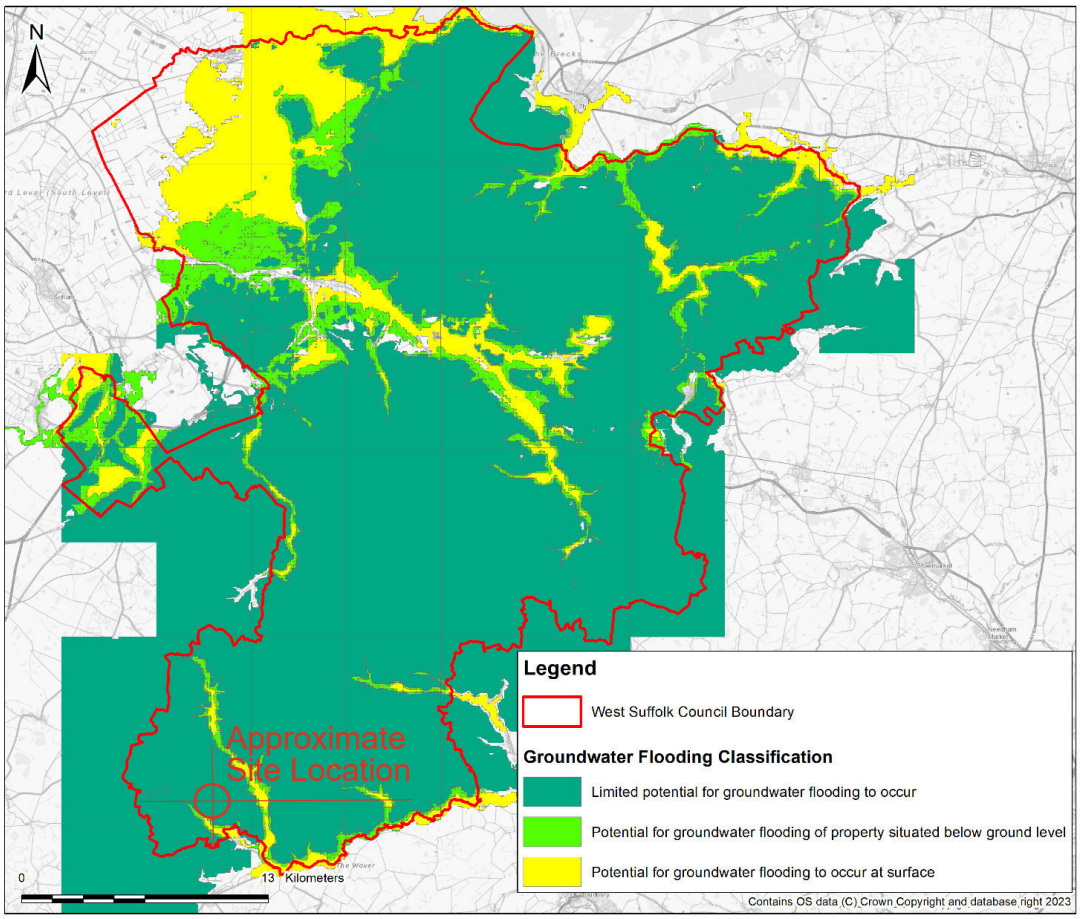
Strategic Flood Risk Assessment – Groundwater Flooding Classification

8 Flood risk from groundwater

Groundwater flooding is the emergence of groundwater at the ground surface and occurs in response to a combination of already high groundwater levels (commonly during winter) and intense or unusually lengthy storm events. Groundwater flooding tends to last much longer than fluvial flooding.

The British Geological Survey (BGS) susceptibility to groundwater flooding dataset was obtained and used to assess the potential for groundwater flooding in the study area. This dataset is based on geological and hydrogeological information and has been used to identify areas where geological conditions could enable groundwater flooding to occur, and where groundwater may come close to the ground surface. This is a susceptibility dataset and does not indicate hazard or risk, or the likelihood of the occurrence of an event of a particular magnitude. Much of the district is classed as having limited potential for groundwater flooding, with areas of higher potential aligning with the river valleys. The Geographic Information System (GIS) layer GroundwaterFlooding_v6_1.shp shows this information and it is mapped in Figure 9.

Figure 9 – A map to show different groundwater flood risk classifications across West Suffolk



Appendix G

Drainage Strategy and Construction Details Drawings

PROPOSED TENNIS MUGA
1:250 @ A1

Indicative Filter Trench

Overland Runoff To Be Intercepted And Directed Around The Retaining Feature

Indicative Retaining Wall Structure To Be Designed By Others

Permeable MUGA Surfacing Construction As Detailed By Others 25% Void Type 3 Sub-Base 410mm

100Ø Perforated Pipe

Back Drop 580mm

SWFCC CL: 96.40 IL: 95.88 Orifice Ø: 21mm

SWIC IL: 95.30

HeadWall IL: 94.60

Conveyance Swale 300mm Deep Laid at 1:46 To Match Existing Ground Level and Tying in Back to Ground Level at 1:100

0655

0654

0653

CHURCHILL SPECIAL FREE SCHOOL

REFER TO TENNIS MUGA INSERT

PROPOSED SITE LAYOUT PLAN
1:500 @ A1

0670

0662

IL: 750mm Deep

Additional Survey of Existing Watercourse Required To Confirm Depths and Extent

0659

IL: 600mm Deep

NOTES:

1. This drawing is to be read in conjunction with GHB series NNN/2026 drawings and documents and any other relevant project team documents.
2. Preliminary Issue - This drawing is not to be used for construction or detailed pricing purposes. Any work undertaken before approvals are received (in writing) are at risk of abortive works.
3. This drawing has been produced based upon the following information: Topographical Survey by EDI Surveys LTD (Ref. 341-2_BASE_PR_Lv-2_R02_Topo_(Re-aligned-Base) dated May2026) subject to transformation of : Scale 1 and translation (0, 0, 0) about point (0, 0, 0). Architectural Layout by PCH Associates LTD (Ref. 341-2_FS-003_R00_Proposed-Siteplan dated 10/04/2026) subject to transformation of : Scale 1 and translation (0, 0, 0) about point (0, 0, 0).
4. All site levels and finished floor levels to remain indicative for planning purposes and are subject to verification following detailed design.
5. This drawing has been prepared solely for the purpose of obtaining a Planning Consent based on information available and planning requirements at the date of issue only.

LEGEND:

- DEVELOPMENT SITE BOUNDARY
  Area: 3555m² (0.36ha)
- Proposed Tennis MUGA & Access
  Area: 0.17 ha
  MUGA Surface Construction TBD - By Others
- Indicative Proposed Swale
  To Convey Flow to Watercourse
- Proposed Surface Water Drainage Network
- Exceedance Flow Paths
- LIDAR Level Contours
  (0.2 m)
- Existing Watercourse
  Extent and Depth TBC

Rev	Rev Date	Description	Drawn	Chck'd
P1	15/09/26	Initial Issue	BAF	JAH

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Partnership No. OC383830, Registered in England and Wales

Client: CHURCHILL FREE SCHOOL

Project: PROPOSED TENNIS MUGA CHURCHILL FREE SCHOOL, CHALKSTONE WAY, HAVERHILL, SUFFOLK

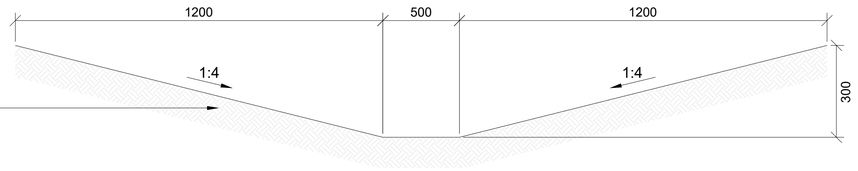
Drawing Title: FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY PROPOSED SITE LAYOUT

Status:	FOR PLANNING		
Scale:	VARIES AS ON PLAN		
Created:	SEP 2026	Drawn:	BAF
DWG Reference:	220-2026.DWG	Checked:	JAH

Drawing Number: 220/2026/011

Revision: P1

P# = Preliminary, C# = Construction, AB# = As Built



300 - 400 Landscaping and Topsoil Specially Selected for Use in Wet Flow Conditions. Turfed or Seeded with Swale Vegetation in Coir Matting until Vegetation Established.

TYPICAL SWALE PROFILE

D400 Ductile Iron Cover and Frame (300 mm x 300 mm x 100 mm) to BS-EN 124, Bedded on Class M1, M2 or Epoxy Mortar

Class B Engineering Brickwork (215 mm thick) to BS 5911 Bedded on and Pointed in Sand/Cement Mortar (10 mm thick). Courses to Suit Site Requirements. Max. Oversail 30 mm Per Course.

In-Situ Class C32/40 Concrete Collar (150 mm thick) to SHW Clause 1704

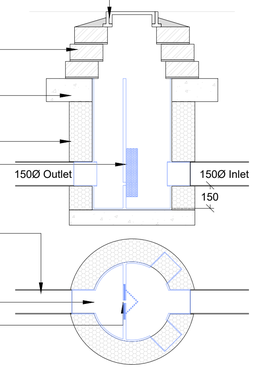
4/10 Gc 85/20 Single Sized Aggregate Backfill (150 mm thick) Compacted in Layers of 150 mm

Perforated Filter

600 mm Rocker Pipe (or Bend) on All Inlets and Outlets

Controflow Universal Flow Control Chamber

21Ø Orifice Inside Perforated Filter



TYPICAL FC FLOW CONTROL CHAMBER

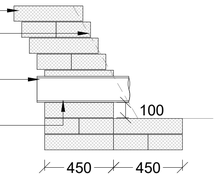
If Pipe Outfalls to the Side of Existing Ditch,Hessian Sandbags to be Raked Back as Existing Ditch Side Slope.

Existing Ditch Alignmnet

Hessian Sandbags (760x300 unfilled) to be Filled with ST1 Concrete and to an Average of 450x225x100 when Filled.

150mm Diameter Pipe. Material As Per Plan and Sections and Installed In Accordance With Manufacturer's Guidance.

NOTE: Existing Ditch to be Cleared of Silt and Debris to Ensure Suitable Foundation for Proposed Culvert



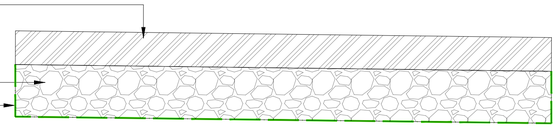
TYPICAL HEADWALL OUTFALL CONSTRUCTION DETAIL

MUGA Surfacing To Be Designed By Others

Min. 340 Non-Frost-SusceptibleType 3 Granular Material to SHW Clause 805 (Min. 25% Voids) 0/40 G_c 80/5 (UF5). Based on a 5% CBR (To Be Confirmed by In-situ Testing. #

Refer to Engineer if CBR Values are less than 5%

Highly Permeable Membrane To Divide Granular Material And Underlying Ground



TYPICAL PERMEABLE BLOCK PAVED ROAD CONSTRUCTION DETAIL

NOTES:

1. This drawing is to be read in conjunction with GHB series NNN/2026 drawings and documents and any other relevant project team documents.
2. Preliminary Issue - This drawing is not to be used for construction or detailed pricing purposes. Any work undertaken before approvals are received (in writing) are at risk of abortive works.
3. This drawing has been produced based upon the following information: Topographical Survey by EDI Surveys LTD (Ref. 341-2_BASE_PR_Lv-2_R02_Topo_(Re-aligned-Base) dated May2026) subject to transformation of : Scale 1 and translation (0, 0, 0) about point (0, 0, 0). Architectural Layout by PCH Associates LTD (Ref. 341-2_FS-003_R00_Proposed-Siteplan dated 10/04/2026) subject to transformation of : Scale 1 and translation (0, 0, 0) about point (0, 0, 0).
4. All site levels and finished floor levels to remain indicative for planning purposes and are subject to verification following detailed design.
5. This drawing has been prepared solely for the purpose of obtaining a Planning Consent based on information available and planning requirements at the date of issue only.

Rev	Rev Date	Description	Drawn	Chck'd
P1	07/09/26	Initial Issue	BAF	JAH

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Partnership No. OC383830, Registered in England and Wales

Client: CHURCHILL FREE SCHOOL

Project: PROPOSED TENNIS MUGA CHURCHILL FREE SCHOOL, CHALKSTONE WAY, HAVERHILL, SUFFOLK

Drawing Title: FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY CONSTRUCTION DETAILS

Status:	FOR PLANNING
Scale:	NOT TO SCALE
Created:	SEP 2026
Drawn:	BAF
DWG Reference:	220-2026.DWG
Checked:	JAH

Drawing Number: 220/2026/012

Revision: P1

P# = Preliminary, C# = Construction, AB# = As Built

Appendix H

Info-Drainage Calculations

Project:	Date:		
220-2026 Churchill Free School, Haverhill CD_M-P1	04/09/2026		
	Designed by: BAF	Checked by: JAH	Approved By: JAH
Report Details: Type: Inflows Storm Phase: Phase	Company Address: G.H.Bullard & Associates 27 Barton Road, Thurston Bury St. Edmunds, Suffolk		



Catchment Area

Type : Catchment Area

Area (ha)	0.17

Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date:		
220-2026 Churchill Free School, Haverhill CD_M-P1	04/09/2026		
	Designed by:	Checked by:	Approved By:
	BAF	JAH	JAH
Report Details: Type: Junctions Storm Phase: Phase	Company Address: G.H.Bullard & Associates 27 Barton Road, Thurston Bury St. Edmunds, Suffolk		

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
Manhole	Manhole	567876.603	246354.459	95.200	0.520	94.680	Circular	1.200

Name	Lock
Manhole	None

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
Manhole	Outlet	(None)	Orifice
	Diameter (m)	0.021	
	Coefficient of Discharge	0.600	
	Invert Level (m)	94.680	

Project:	Date:		
220-2026 Churchill Free School, Haverhill CD_M-P1	04/09/2026		
	Designed by: BAF	Checked by: JAH	Approved By: JAH
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: G.H.Bullard & Associates 27 Barton Road, Thurston Bury St. Edmunds, Suffolk		



Tennis Court

Type : Porous Paving

Dimensions

Exceedance Level (m)	95.200
Depth (m)	0.520
Base Level (m)	94.680
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	3.0
Porosity (%)	25
Length (m)	46.930
Long. Slope (1:X)	1000.00
Width (m)	35.350
Total Volume (m³)	170.045

Advanced

Conductivity (m/hr)	500.0

Project:	Date:		
220-2026 Churchill Free School, Haverhill CD_M-P1	04/09/2026		
	Designed by:	Checked by:	Approved By:
	BAF	JAH	JAH
Report Title:	Company Address:		
Rainfall Analysis Criteria	G.H.Bullard & Associates 27 Barton Road, Thurston Bury St. Edmunds, Suffolk		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FEH

Type: FEH

Site Location	GB 567788 246248 TL 67788 46248
Rainfall Version	2022
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0.000
30.0	35.000
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880
2160	4320
2880	5760
4320	8640
5760	11520
7200	14400
8640	17280
10080	20160

Project:	Date:		
220-2026 Churchill Free School, Haverhill CD_M-P1	04/09/2026		
	Designed by: BAF	Checked by: JAH	Approved By: JAH
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: G.H.Bullard & Associates 27 Barton Road, Thurston Bury St. Edmunds, Suffolk		

FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
Manhole	FEH: 2 years: +0 %: 8640 mins: Summer	95.200	94.680	94.791	0.111	0.3	0.126	0.000	0.3	102.828	OK

Project:	Date:		
220-2026 Churchill Free School, Haverhill CD_M-P1	04/09/2026		
	Designed by: BAF	Checked by: JAH	Approved By: JAH
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: G.H.Bullard & Associates 27 Barton Road, Thurston Bury St. Edmunds, Suffolk		

FEH: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
Manhole	FEH: 30 years: +35 %: 1440 mins: Winter	95.200	94.680	94.987	0.307	0.8	0.347	0.000	0.5	65.894	Flood Risk

Project:	Date:		
220-2026 Churchill Free School, Haverhill CD_M-P1	04/09/2026		
	Designed by: BAF	Checked by: JAH	Approved By: JAH
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: G.H.Bullard & Associates 27 Barton Road, Thurston Bury St. Edmunds, Suffolk		

FEH: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
Manhole	FEH: 100 years: +45 %: 1440 mins: Winter	95.200	94.680	95.088	0.408	1.0	0.461	0.000	0.6	77.109	Flood Risk

Project:	Date:		
220-2026 Churchill Free School, Haverhill CD_M-P1	04/09/2026		
	Designed by: BAF	Checked by: JAH	Approved By: JAH
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: G.H.Bullard & Associates 27 Barton Road, Thurston Bury St. Edmunds, Suffolk		

FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. DS Depth

Storm Event	Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 2 years: +0 %: 8640 mins: Summer	Tennis Court	94.839	94.791	0.112	0.111	0.8	48.366	0.000	0.000	0.3	102.832	OK

Project:	Date:		
220-2026 Churchill Free School, Haverhill CD_M-P1	04/09/2026		
	Designed by: BAF	Checked by: JAH	Approved By: JAH
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: G.H.Bullard & Associates 27 Barton Road, Thurston Bury St. Edmunds, Suffolk		

FEH: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. DS Depth

Storm Event	Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 30 years: +35 %: 1440 mins: Winter	Tennis Court	95.015	94.987	0.288	0.307	4.3	124.629	0.000	0.000	0.8	52.282	OK

Project:	Date:		
220-2026 Churchill Free School, Haverhill CD_M-P1	04/09/2026		
	Designed by: BAF	Checked by: JAH	Approved By: JAH
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: G.H.Bullard & Associates 27 Barton Road, Thurston Bury St. Edmunds, Suffolk		

FEH: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. DS Depth

Storm Event	Stormwater Control	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 1440 mins: Winter	Tennis Court	95.113	95.088	0.387	0.408	5.7	165.808	0.000	0.000	1.0	64.579	OK

Appendix I

Drainage Maintenance Plan



GHBullard & Associates LLP
Civil and Traffic Engineering Consultants

27 Barton Road, Thurston
Suffolk, IP31 3PA
Tel: 01359 235071
Fax: 01359 231138
Web-site: www.ghbullard.co.uk

Maintenance Plan for Drainage Systems

Site: 220/2026 – Proposed Tennis MUGA, Churchill Free School, Chalkstone Way, Haverhill, Suffolk, CB9 0LB

Date: 04/09/2026

Regular inspection and maintenance are required to ensure the effective long-term operation of drainage infrastructure. Maintenance responsibility for systems should be placed with a suitable organisation or individual. The schedules below provide guidance on the type of operational and maintenance requirements that may be appropriate for each asset type employed on this project and indicative regularity of this maintenance. The list of actions is not exhaustive, and the frequencies suggested may alter depending on a number of variables.

CDM 2015 requires designers to ensure that all maintenance risks have been identified, eliminated, reduced and/or controlled where appropriate. This information will be required as part of the health and safety file.

1. Surface Water Systems

Inspection Chambers and Piped Networks: Operation and Maintenance Requirements

Surface water chambers with sumps act to provide water treatment through the removal of silt suspended in water. The less silt contained within a sump, the more effectively it removes particles. There must be a balance between maintenance and cost.

To service the surface water drainage system, it is suggested that inspection, silt removal and, if necessary, rodding of any blockages and jetting through of any blocked pipework on a minimum of two occasions per year is undertaken. It would be advisable that this maintenance occurs prior to and following the winter months such as in September and March. If further maintenance is required, it would be expected that this would also be required in the winter as this is the predominant raining season.

SuDS Element	Chambers and Gullies		
Maintenance Issues	Build-up of silt/debris		
Schedule	Action	Frequency	Responsibility
Regular	Remove silts and other debris from chamber/ gully	Annually (in autumn, after leaf fall)	Maintenance Company associated with the wider school site.
	Check for evidence of poor operation	Three-monthly (or 48 hrs after large storms)	As above
	Check (inlet) inspection chambers and pipework.	Annually	As above
	Inspect silt accumulation rates and adjust cleaning frequencies accordingly.	Annually	As above
Occasional	Remove sediment, oil, grease and floatables	As Required	As above
Remedial	Replace malfunctioning parts or structures	As Required	As above

Dan Henning C.Eng., M.C.I.H.T.
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Open Channels

Soft landscaped open channels and basins are elements which serve a functional purpose for the conveyance and storage of surface water runoff. These are generally planted with grass and allowance for this is made within the hydraulic modelling. To ensure correct flow behaviours, this vegetation must be maintained the channel sections maintained as per the accepted design.

SuDS Element	Above Ground Basin and/or Open Channels		
Maintenance Issues	Overgrown vegetation, Blockages, Siltation		
Schedule	Action	Frequency	Responsibility
Regular	Remove litter and debris	Monthly	Maintenance Company associated with the wider school site.
	Cut grass- for spillways and access routes	Monthly (during growing season), or as required	As above
	Cut grass- meadow in and around basin.	Half yearly (Spring- before nesting season, and Autumn – prior to winter rainfall)	As above
	Manage other vegetation and remove nuisance plants.	Monthly (at start, then as required)	As above
	Inspect inlets, outlets and overflow for blockages and clear if required.	Monthly	As above
	Inspect banksides, structures, pipework etc for evidence of physical damage.	Monthly	As above
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then Annually (or as required)	As above
	Check any penstock and other mechanical devices.	Annually	As above
	Tidy all dead growth before start of growing season.	Annually	As above
	Remove sediment from inlets, outlet and forebays (as appropriate)	Annually (or as required)	As above
	Manage wetland plants in outlet pool- where provided.	Annually (or as required)	As above
Occasional	Re-seed areas of poor vegetation growth.	As required	As above
	Prune and trim any trees and remove cuttings	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)	As above
	Remove sediment from inlets, outlets, forebay and channels when required.	As required	As above
Remedial	Repair erosion or other damage by reseeding or re-turfing channels/ bases.	As required	As above

SuDS Element	Above Ground Basin and/or Open Channels		
Maintenance Issues	Overgrown vegetation, Blockages, Siltation		
Schedule	Action	Frequency	Responsibility
	Realignment of rip-rap/ erosion protection.	As required	As above
	Repair/rehabilitation of inlets, outlets, and overflows.	As required	As above
	Relevel uneven surfaces and reinstate design levels.	As required	As above

Orifice Flow Control Chambers: Operation and Maintenance Requirements

For controlling discharge from the attenuation systems, the strategy for this development utilises an orifice plate flow control. The specified Controflow chambers are installed with a specifically designed orifice plate, protected by an in-built filter and overflow weir, and therefore require some additional maintenance.

SuDS Element	Controflow Orifice Flow Control Chambers		
Maintenance Issues	Build-up of silt/debris		
Schedule	Action	Frequency	Responsibility
Regular	Remove silts and other debris from chamber/ gully	Annually (in autumn, after leaf fall)	Maintenance Company associated with the wider school site.
	Check for evidence of poor operation	Three-monthly (or 48 hrs after large storms)	As above
	Check (inlet) inspection chambers and pipework.	Annually	As above
	Inspect silt accumulation rates and adjust cleaning frequencies accordingly.	Annually	As above
Occasional	Remove sediment, oil, grease and floatables	As Required	As above
Remedial	Replace malfunctioning parts or structures	As Required	As above

Permeable Pavements: Operation and Maintenance Requirements

Regular inspection and maintenance are important for the effective operation of pervious pavements. Before handing over the facility to the Client, the surface should be inspected for clogging, litter, weeds and water ponding and all failures should be rectified. After handover, the facility should be inspected regularly, preferably during and after heavy rainfall to check effective operation and to identify any areas of ponding.

SuDS Element	Permeable Paving		
Maintenance Issues	Pervious surfaces are susceptible to silt blockage		
Schedule	Action	Frequency	Responsibility
Regular	Localised surface brushing to reduce silt accumulation.	Monthly	Maintenance Company associated with the wider school site.
	Brushing and suction sweep or jet wash and suction sweep. Replace lost jointing material.	Annually (in autumn, after leaf fall)	As above
	Check for evidence of poor operation and/or weed growth	Three-monthly (or 48 hrs after large storms)	As above
	Check outlets and control structures.	Annually	As above
	Inspect silt accumulation rates and adjust brushing frequencies accordingly.	Annually	As above
Occasional	Jetting and suction where silt has accumulated in joints or voids. Replace lost jointing material and vibrate surface to lock.	As Required	As above
	Stabilise and mow grass edges to paving at 35-50 mm and remove weeds and leaves.	As Required	As above
Remedial	Where shrinkage or surface damage occurs, uplift blocks, remove grit bedding layer and geotextile if present and reinstate to design profile.	As Required	As above
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users and replace lost jointing material.	As Required	As above
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 -15 years (or as required)	As above

Note 1:

Pervious surfaces need to be regularly cleaned of silt and other sediments to preserve their infiltration capability. As suggested a minimum of three surface sweepings per year is relevant although Manufacturers' recommendations should always be followed.

A brush and suction cleaner, which can be a lorry-mounted device or a smaller precinct sweeper, should be used and the sweeping regime should be as follows:

1. End of winter (April) – to collect winter debris.
2. Mid-summer (July/August) – to collect dust, flower and grass-type deposits.
3. After autumn leaf fall (November).

The likely design life should be no different from standard asphalt assuming that an effective maintenance regime is in place to minimise risks of infiltration clogging.

Materials removed from the voids or the layers below the surface may contain heavy metals and hydrocarbons and may need to be disposed of as a controlled waste. Sediment testing should be carried out before disposal to confirm its classification and appropriate disposal methods.

Note 2:

Permeable Block Pavings should be checked and cleared 48-hours after a large rainfall event.