

Technical Note

Job title	Hawkedon Primary School, Lower Earley, Reading, RG6 3AP
Subject	Flood Risk Assessment
Date	20 April 2026
Client	Orchard Learning Alliance
File Reference	P302/FRA

DEVELOPMENT LOCATION

GWD have been commissioned to consider the flood risks to a replacement modular nursery building (black box) within the site of the Hawkedon Primary School, Lower Earley within the boundary of Wokingham Borough Council (**Figure 1**). The property has a post code RG6 3AP and a grid reference of SU 76180 70693.

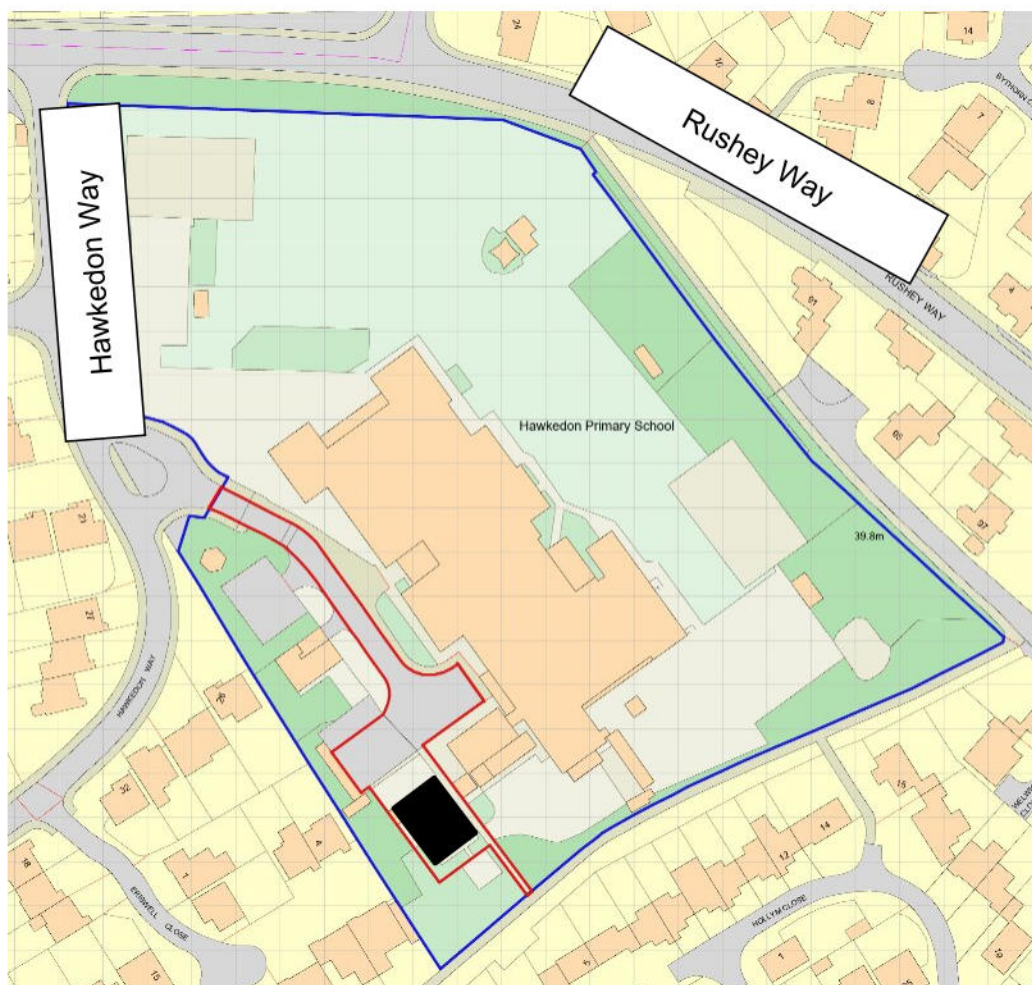


Figure 1 – Site Location

DEVELOPMENT PROPOSAL

This Flood Risk Assessment has been prepared to support a planning application to replace the existing modular building, known as the Family Centre, with a modern fit-for-purpose facility (**Figure 2**).

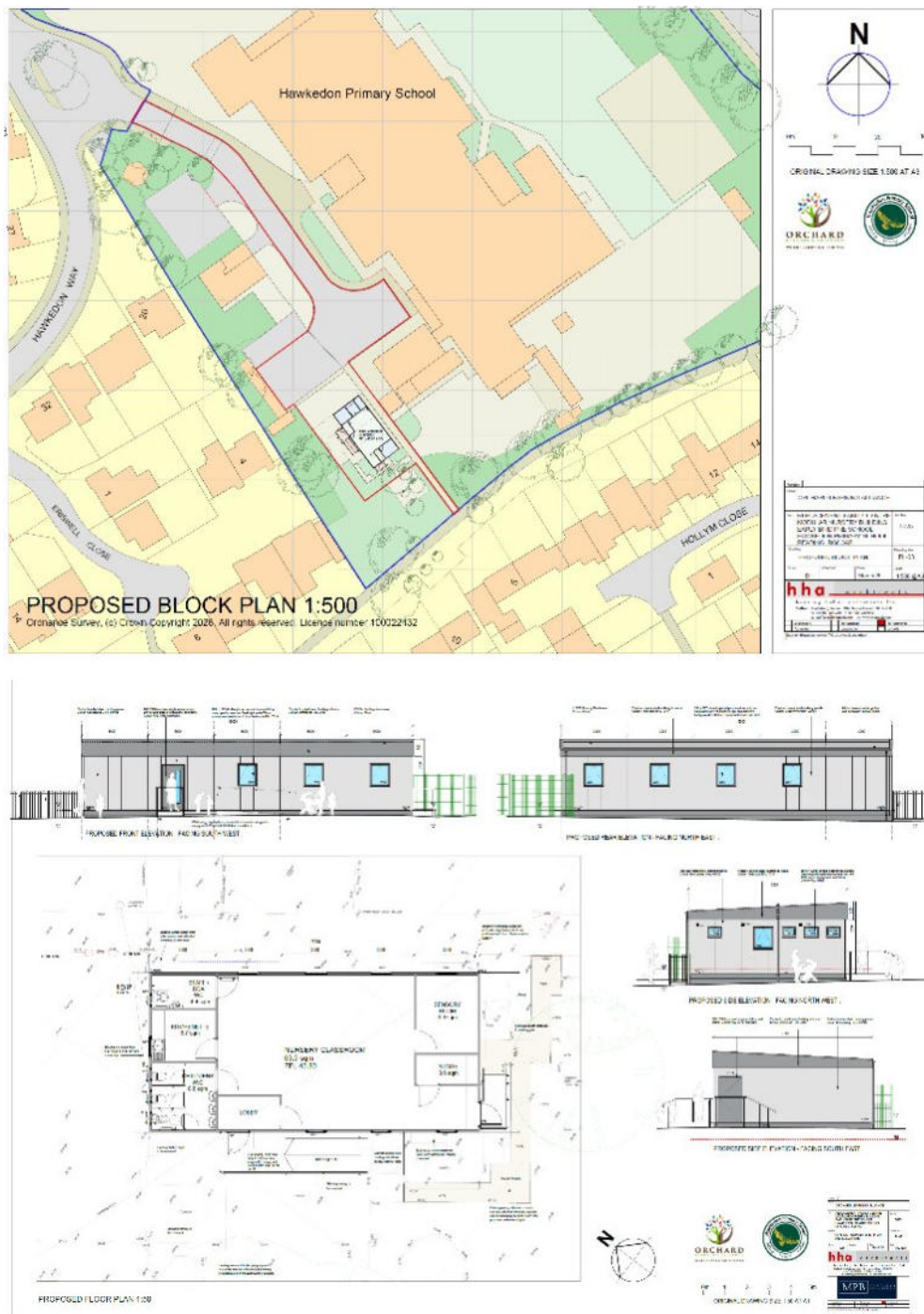


Figure 2 – Horsley Huber Architects drawings PL-03 & PL-07

The Architect drawings are included in **Appendix A**.

Technical Note

REFERENCES

- National Planning Policy Framework – December 2024
- Wokingham Borough Local Development Framework – Adopted Core Strategy Development Plan - January 2010
- Wokingham Borough Development Plan – Adopted Managing Development Delivery Local Plan – February 2014
- Wokingham Borough Council Level 1 Strategic Flood Risk Assessment (Level 1 SFRA) – May 2023
- Thames River Basin District Flood Risk Management Plan 2021 to 2027
- Wokingham Borough Council Local Flood Risk Management Strategy (LFRMS) – April 2015
- Hawkedon Primary School Flood Risk Assessment – AECOM - 2011
- Flood risk Assessments: Climate change allowances – May 2022
- Flood Map for Planning – March 2026
- Long-Term Flood Risk Map – March 2026
- Canal and River Trust website – March 2026
- Thames Water sewer mapping – 2011

DEVELOPMENT DESIGN LIFE

As the proposals are for a modular building structure, the **Design Life of the building will be 25 years** (year 2051).

REVIEW OF NATIONAL AND LOCAL PLANNING POLICY ASSOCIATED WITH FLOODING

National Planning Policy

The National Planning Policy Framework (NPPF) was published in December 2024 and sets out the Government's national policies for flood risk management in a land use planning context within England.

The NPPF states that developers and local authorities should try to locate development in areas with the lowest probability of flooding from all sources, including the current and future impacts of climate change. This should be achieved by application of the Sequential Test, and then, if necessary, the Exception Test. The aim is to ensure that a sequential approach is followed to steer new development to areas with the lowest probability of flooding from all sources.

The Planning Practice Guidance (PPG): Flood risk and coastal change (August 2022) defines how the NPPF should be applied. Table 2 (**Figure 3**) of the PPG sets out the 'compatibility' of the vulnerability classification within the identified flood zones.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	x	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	x	x	x	✓*

Key:

✓ Development is appropriate

x Development should not be permitted.

Figure 3 – Table 2: Flood risk vulnerability and flood zone 'compatibility'

It is assessed that the modular nursery building can be classified as 'non-residential uses for educational establishments' and, therefore is a 'More vulnerable' development. From a flood risk perspective, this type of development is compatible with Flood Zones 1, 2 and 'by exception' in Flood Zone 3a.

Wokingham Borough Local Development Framework – Adopted Core Strategy Development Plan - January 2010

The Wokingham Borough Local Development Framework was adopted in 2010 sets out a vision for the Borough until 2026. The document is currently in the process of being reviewed and updated.

Policies CP1 (item 9) and CP3 (general) focus on flood risk as outlined in **Figures 4 and 5**.

CP1 – Sustainable development

Planning permission will be granted for development proposals that:

- 1) Maintain or enhance the high quality of the environment;
- 2) Minimise the emission of pollutants into the wider environment;
- 3) Limit any adverse effects on water quality (including ground water);
- 4) Ensure the provision of adequate drainage;
- 5) Minimise the consumption and use of resources and provide for recycling;
- 6) Incorporate facilities for recycling of water and waste to help reduce per capita water consumption;
- 7) Avoid areas of best and most versatile agricultural land;
- 8) Avoid areas where pollution (including noise) may impact upon the amenity of future occupiers;
- 9) Avoid increasing (and where possible reduce) risks of or from all forms of flooding (including from groundwater);
- 10) Provide attractive, functional, accessible, safe, secure and adaptable schemes;
- 11) Demonstrate how they support opportunities for reducing the need to travel, particularly by private car in line with CP6; and
- 12) Contribute towards the goal of reaching zero-carbon developments⁴¹ as soon as possible by:
 - a) Including appropriate on-site renewable energy features; and
 - b) Minimising energy and water consumption by measures including the use of appropriate layout and orientation, building form, design and construction, and design to take account of microclimate so as to minimise carbon dioxide emissions through giving careful consideration to how all aspects of development form.

Figure 4 – Policy CP1 – Sustainable Development – Adopted Core Strategy Development Plan

CP3 - General Principles for development

Planning permission will be granted for proposals that:

- a) Are of an appropriate scale of activity, mass, layout, built form, height, materials and character to the area together with a high quality of design without detriment to the amenities of adjoining land users including open spaces or occupiers and their quality of life;
- b) Provide a functional, accessible, safe, secure and adaptable scheme;
- c) Have no detrimental impact upon important ecological, heritage, landscape (including river valleys) or geological features or water courses.
- d) Maintain or enhance the ability of the site to support fauna and flora including protected species;
- e) Use the full potential of the site and contribute to the support for suitable complementary facilities and uses;
- f) Contribute to a sense of place in the buildings and spaces themselves and in the way they integrate with their surroundings (especially existing dwellings) including the use of appropriate landscaping;
- g) Provide for a framework of open space in secure community use achieving at least 4.65 ha/1,000 population provision together with recreational/sporting facilities in addition to private amenity space;
- h) Contribute towards the provision of an appropriate sustainable network of community facilities;
- i) Do not lead to a net loss of dwellings and other residential accommodation or land; and
- j) Do not lead to a loss of community or recreational facilities/land or infrastructure unless suitable alternative provision is available.

Development proposals will be required to demonstrate how they have responded to the above criteria through the submission of Design and Access Statements, clear and informative plans, elevations and streetscenes and where required Masterplans, Development Briefs, Concept Statements and Design Codes.

Figure 5 – Policy CP3 – General Principles for Development – Adopted Core Strategy Development Plan

Wokingham Borough Development Plan – Adopted Managing Development Delivery Local Plan – February 2014

The Managing Development Delivery Local Plan (MDD) adds extra detail to the policies within the Core Strategy. Together, these two documents set out how the Borough will develop up until 2026.

Policy CC09 focusses on Flood Risk and is outlined in **Figure 5**.

Policy CC09: Development and Flood Risk (from all sources)

1. All sources of flood risk, including historic flooding, must be taken into account at all stages and to the appropriate degree at all levels in the planning application process to avoid inappropriate development in areas at risk of flooding. Proposals must be consistent with the guidance in paragraphs 99-104 of the National Planning Policy Framework (NPPF); the Technical Guidance to the NPPF and demonstrate how they have used the Strategic Flood Risk Assessment (SFRA) to determine the suitability of the proposal.
2. Development proposals in Flood Zones 2 or 3 must take into account the vulnerability of proposed development.
3. Development must be guided to areas of lowest flood risk by applying the sequential approach taking into account flooding from all sources and shall ensure flood risk is not worsened for the application site and elsewhere, and ideally that betterment of existing conditions is achieved. The sequential test will not be required if at least one of the following applies:
 - a) Replacement of an existing single residential property. However, the replacement property should, where possible, be located on the part of the site at lowest risk
 - b) Conversions and change of use unless it involves a change to a more vulnerable class
 - c) Minor development, as defined in footnote 10 of the Technical Guidance Note to the NPPF.
4. In exceptional circumstances, new development in areas of flood risk will be supported where it can be demonstrated that:
 - a) The development provides wider sustainability benefits to the community that outweigh flood risk
 - b) The development will:
 - i. Be safe for its lifetime, taking account of the vulnerability of its users
 - ii. Not increase flood risk in any form elsewhere and, where possible, will reduce flood risk overall
 - iii. Incorporate flood resilient and resistant measures into the design
 - c) Appropriate evacuation and flood response procedures are in place to manage the residual risk associated with an extreme flood event.
5. Where required, suitable and appropriately detailed flood risk information will need to accompany a planning application. A Flood Risk Assessment (FRA) is required for:
 - a) All proposals in areas of known historic flooding from all sources
 - b) Where there is evidence of a risk from all sources of flooding identified in the Strategic Flood Risk Assessment
 - c) Those proposals set out in footnote 20 to paragraph 103 of the NPPF.

Figure 6 – Policy CC09 – Development and Flood Risk (from all sources) – Adopted Managing Development Delivery Local Plan

The Sequential Approach

Flood Zone 1

A review of the land associated with Hawkedon Primary School (**Figure 7**) indicated that it included Flood Zones 1, 2 and 3. In accordance with the NPPF and Policy CC09 (3) 'development must be guided to the areas of lowest flood risk'.



Figure 7 – Flood Map for Planning

A review was undertaken by the Headteacher of Hawkedon Primary School of the northern area of the site that is in Flood Zone 1. The area was found to be unsuitable for the following reasons and the relocation maybe considered contrary to parts of Policy CP3:

- **Safeguarding Risks (Policy CP3b):** Relocating the nursery to the northern part of the site would create significant safeguarding vulnerabilities. The building is intended for letting to external hirers such as Earleybird Nursery, requiring complete separation between hirer staff, parents, and pupils from our school pupils. The northern area, positioned on open playing fields, cannot provide the secure, gated separation necessary for enhanced safeguarding.
- **Critical space requirements (Policy CP3g):** The current playing field space is essential for the 600+ pupils at breaks and lunchtimes. The pupils require outdoor space, the loss of any playing field area would create dangerous overcrowding, increase the risk of accidents, and fail to meet recommended outdoor space standards for pupil welfare and physical activity.

- **Operational Inefficiency and Increased Costs (Policy CP3h):** The nursery requires shared staff and play space with suitable equipment to operate effectively and economically. Development in the northern area would require the operation of a separate facility, require duplicated staffing (significantly increasing operational costs), and deny nursery children access to the outdoor space and age-appropriate equipment. This would be financially unsustainable and educationally detrimental to the early years provision.
- **Whole School Grounds Integrity (Policy CP3j):** The playing fields form an integral part of the whole school grounds and are essential for delivering a broad and balanced curriculum, particularly for physical education, outdoor learning, and supporting pupils' physical and mental health. Reducing this space would directly undermine the ability to provide adequate opportunities for physical activity during curriculum time and breaks, negatively impacting pupils' personal development, their sense of enjoyment in learning, and their overall well-being – all of which are fundamental to our educational provision and statutory responsibilities.

Flood Zone 2

An initial assessment indicates that the existing site is in Flood Zone 2, and it is therefore proposed to assess flood risk in that location. Consequently, this assessment will focus on Policy CC09, point 4b):

- b) The development will:
 - i. Be safe for its lifetime, taking account of the vulnerability of its users
 - ii. Not increase flood risk in any form elsewhere and, where possible, will reduce flood risk overall
 - iii. Incorporate flood resilient and resistant measures into the design
- c) Appropriate evacuation and flood response procedures are in place to manage the residual risk associated with an extreme flood event.

REVIEW OF STRATEGIC FLOOD RISK ASSESSMENT

Wokingham Borough Council Level 1 Strategic Flood Risk Assessment (Level 1 SFRA) – May 2023

A Strategic Flood Risk Assessment (SFRA) is a study carried out by one or more local planning authorities to assess the risk to an area from flooding from all sources, now and in the future, taking account of the impacts of climate change, and to assess the impact that land use changes and development in the area will have on flood risk.

References to the Level 1 SFRA are contained within the salient parts of this assessment.

Thames River Basin District Flood Risk Management Plan 2021 to 2027

The Thames River Basin District Flood Risk Management Plan (FRMP) was published by the EA in December 2022 and outlines how they plan to manage flood risk in the Flood Risk Areas. The site is included within the Loddon and Tributaries Management Catchment.

There are no policies specifically relating to the site.

Wokingham Borough Council Local Flood Risk Management Strategy (LFRMS) – April 2015

Wokingham Borough Council is the Lead Local Flood Authority (LLFA) for the site, and the strategy was developed to manage the impact of local flood risk from surface water run-off, groundwater, and ordinary watercourses across the Borough.

There are no site-specific references within the LFRMS.

Critical Drainage Area

A Critical Drainage Area (CDA) is an area that has critical drainage problems, and which has been notified to the local planning authority as such by the Environment Agency in line with the National Planning Policy Framework (NPPF). In these locations, there is a need for surface water to be managed to a higher standard than normal to ensure any new development will contribute to a reduction in flooding risks in line with NPPF. These higher standards are determined by the Environment Agency.

The Level 1 SFRA confirms that there are no CDAs in the Wokingham Borough Council area.

REVIEW OF THE FLOOD RISK ASSESSMENT FOR HAWKEDON PRIMARY SCHOOL

Overview

In 2011, consultants AECOM produced a Flood Risk Assessment associated with the redevelopment of the existing school site. In this assessment, the Flood Risk Assessment will be referred to as FRA (2011).

Details

As the FRA (2011) is 15 years old, many of the references in the document have been updated and the flood mapping updated. The following matters are noted:

- The site was assessed as being in **Flood Zone 1**.
- Pluvial (surface water), groundwater, reservoirs and sewers were not assessed as being a potential flood risk.
- The document focuses on the use of Sustainable Urban Drainage Systems (SuDS) to manage surface water disposal.

Overall

Updates and revised mapping have presented a different flood risk scenario than was assessed in the FRA (2011).

IMPACT OF CLIMATE CHANGE

Introduction

An increasing body of research indicates that human influence has warmed the atmosphere, ocean, and land. Measurements of the average temperature at the Earth's surface show it has risen by about 1.1°C since the pre-industrial period.

Each of the last three decades have been hotter than the previous one and the seven warmest years on record have occurred between 2015 and 2021. The United Kingdom (UK) is experiencing rising temperatures. The most recent decade (2012-2021) has been on average 1.0°C warmer than the 1961-1990 average. All ten of the warmest years in the UK have occurred since 2003. 2022 was the UK's hottest year on record, with an average year-round temperature above 10°C seen for the first time.

Along with warming at the Earth's surface, many other changes in the climate are occurring in the UK, such as:

- Hotter, drier summers
- Warmer, wetter winters
- Sea level rise
- Increase in extreme weather conditions

To assess the impact of these conditions in respect to flood risk and drainage, the predicted climate changes for the UK are outlined in "*Flood Risk Assessments: climate change allowances*" which was most recently updated on 27 May 2022. This data will be utilised to assess the future flood risk on the site.

Peak river flow

The site is located within the Loddon and tributaries Management Catchment and the peak rainfall allowances for the 1 in 100-year (1.0% AEP) event is shown below:

	Central	Higher	Upper
2020s	7%	11%	23%
2050s	4%	10%	25%
2080s	14%	23%	46%

For 'More vulnerable' developments the 'central' allowance will be used in combination with a design life of 25 years (year 2051) and hence 'notionally' a **5% allowance for climate change will be assessed**.

Peak rainfall intensity

The site is located within the Loddon and tributaries Management Catchment and the peak rainfall allowances for the 1 in 100-year (1.0% AEP) event is shown below:

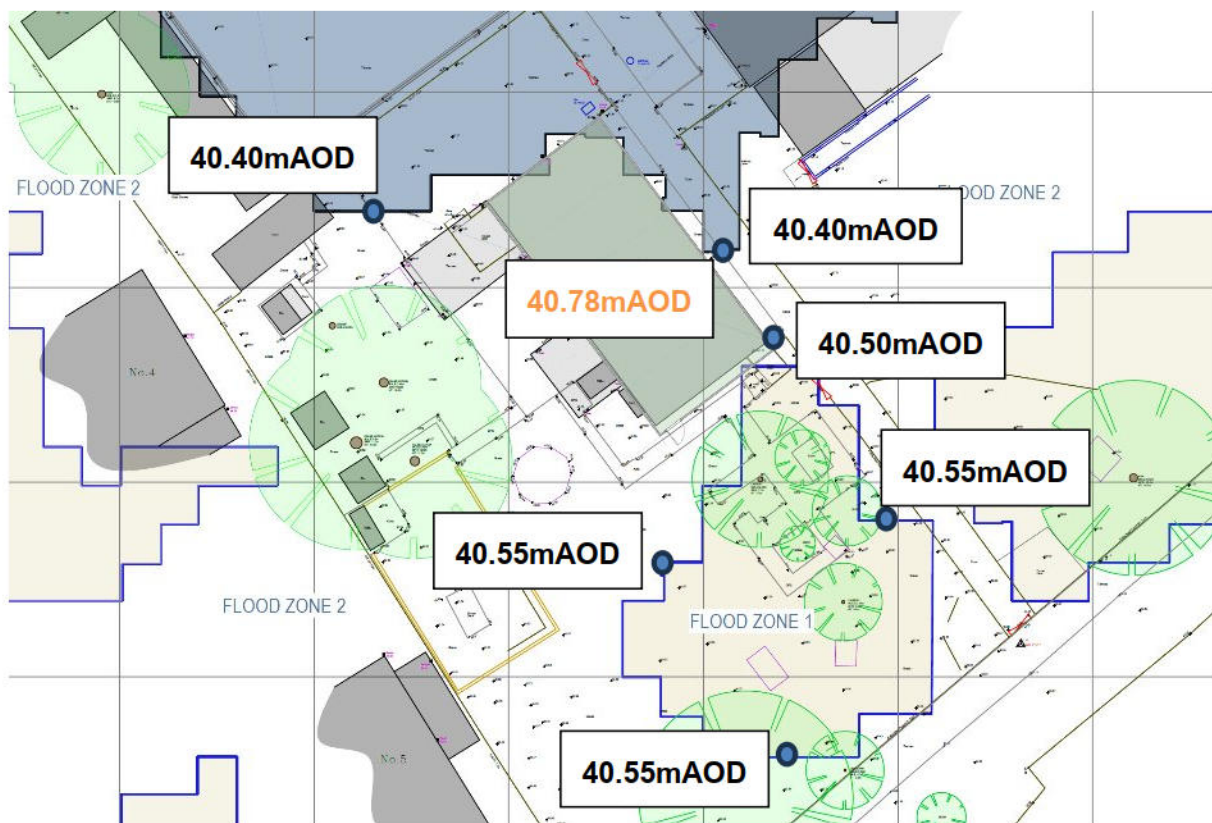
	Central allowance	Upper end allowance
2050s	20%	40%
2070s	25%	40%

Based on a 25-year Design Life (year 2051) and by utilising an Upper end allowance the **peak rainfall intensity will be increased by 40%** to allow for the effects of climate change.

The pluvial flood mapping will be utilised for the period 2040 to 2060 to represent the risk in the year 2051.

TOPOGRAPHICAL SURVEY

A topographical survey was undertaken by MIC Surveys in March 2026. The survey was overlain with the Flood Map for Planning. The salient levels that have been interpreted on the survey and used in this assessment are highlighted in **Figure 8**.



Feature	Level (mAOD)
Flood Zone 3	40.40
Flood Zone 2	40.55
Highest pluvial (surface water) level (year 2069)	40.50
Finished Floor Level of the existing nursery	40.78

Figure 8 – Salient levels extracted from the topographical survey (2026)

FLOOD RISK

Sources of flooding

The UK is subject to seven main types of flooding:

- Tidal (sea or coastal)
- Fluvial (river flood)
- Pluvial (surface water)
- Groundwater
- Reservoirs
- Canals
- Sewers

Flood Map for Planning

The Flood Map for Planning is a tool used to assess flood risk for development applications. It provides information on the different flood zones, which are classified based on the likelihood of flooding from rivers and the sea and since March 2025 it can include flood risk from surface water.

There are 3 flood zones as defined by the EA; Flood Zone 1, 2 and 3. These areas have been defined following a national scale modelling project for the EA and are regularly updated using recorded flood extents and local detailed modelling. The flood zones are based on the likelihood of an area of flooding, with flood zone 1 areas least likely to flood and flood zone 3 areas more likely to flood.

Flood Zone 1 - Areas deemed to be in flood zone 1 have been shown to be at less than 0.1% chance of flooding in any year, this is sometimes known as a 1:1000-year flood event.

Flood Zone 2 - Areas deemed to be in flood zone 2 have been shown to have between 0.1% – 1% chance of flooding from rivers in any year (between 1:1000 and 1:100-year event) or between 0.1% – 0.5% chance of flooding from the sea in any year (between 1:1000 and 1:200-year event). Flood Zone 2 is shown in light blue on flood maps.

Flood Zone 3 - Flood zone 3 is divided into 2 separate zones; 3a and 3b by the local planning authorities however the EA do not split the zone and as such their maps only identify a general flood zone 3. Areas within flood zone 3 have been shown to be at a 1% (1:100-year) event or greater probability of flooding from rivers or 0.5% (1:200-year event) or greater probability of flooding from the sea. Flood Zone 3 is shown in dark blue on flood maps.

Flood Zone 3b - Flood zone 3b's are classified as functional floodplain and are deemed to be the most at-risk land of flooding from rivers or the sea. Local planning authorities have classified areas at significant risk of flooding to be within flood zone 3b. This classification is usually classified as land which had a 3.33% (1:30 year) event or greater probability of flooding from rivers or the sea.

The Flood Map for Planning (Flood Zones 2 and 3) (**Figure 9**) indicates that the site is **within Flood Zones 2 & 3, assuming no defences exist.**

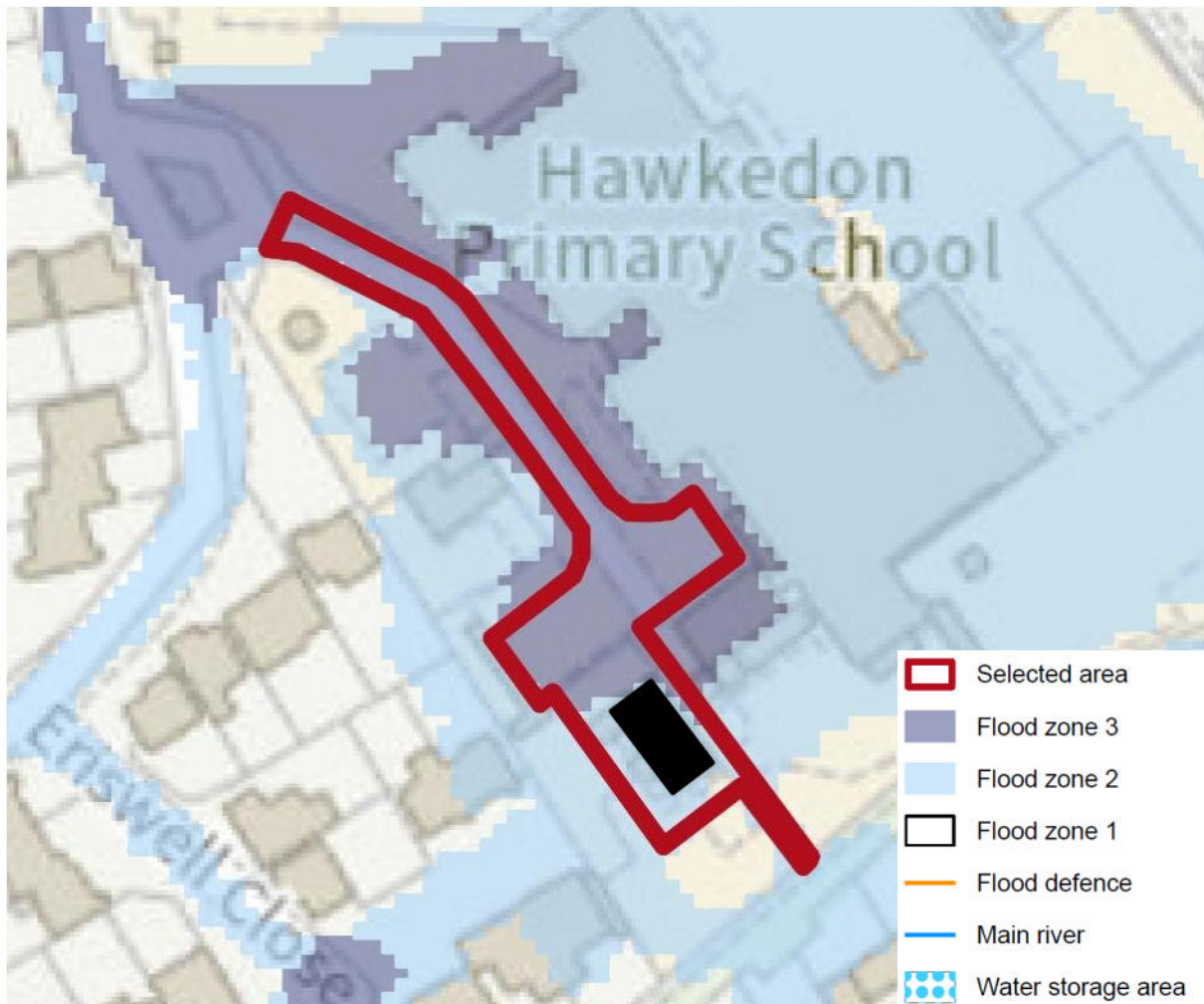


Figure 9 – Extract from Flood Map for Planning (Flood Zones 2 & 3)

The replacement family centre modular nursery building is in **Flood Zone 2** whereas the main access to it is in **Flood Zone 3**.

Flood defences

The EA Product 4 confirmed that there are no publicly funded flood defences protecting the site.

The Level 1 SFRA confirmed that the EA have no plans for defence schemes that would affect the site.

Tidal (coastal)

Coastal flooding is the inundation of land areas along the coast by seawater. Common causes of coastal flooding are intense windstorm events occurring at the same time as high tide (storm surge), and tsunamis.

Based on the location and elevation of the site (40.5mAOD) the tidal flood risk is assessed as 'negligible'.

Fluvial (river flood) - Introduction

A fluvial, or river flood, occurs when the water level in a river, lake or stream rises and overflows onto the surrounding banks, shores, and neighbouring land. The water level rise could be due to excessive rain or snowmelt.

Fluvial (river flood) – Current flood risk

The Long-Term Flood Risk mapping (**Figure 10**) indicates the current fluvial flood risk.

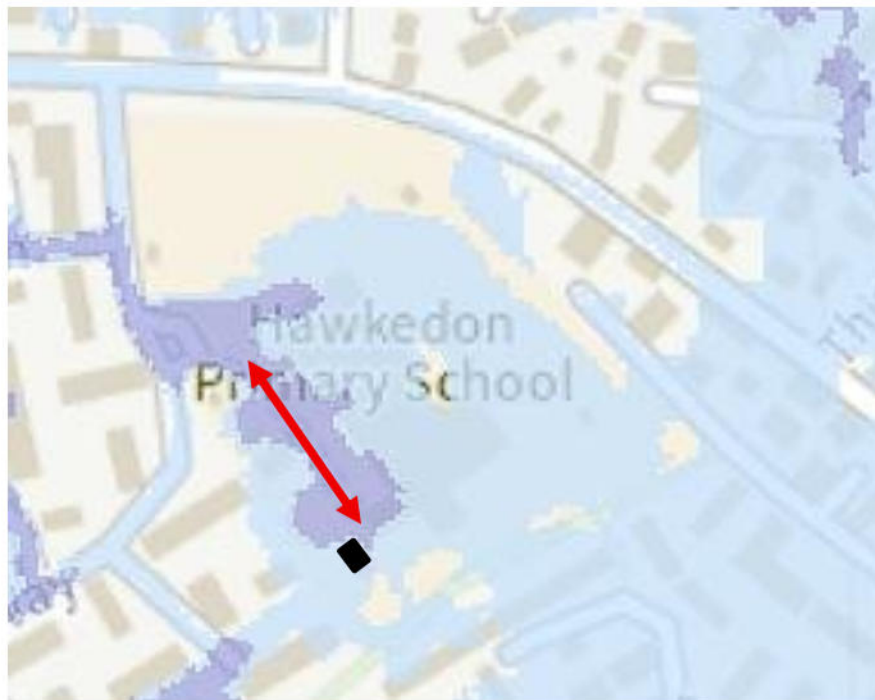


Figure 10 – Extract from Long-Term mapping current fluvial flood risk

The mapping indicates that there is currently a 'Medium' risk of fluvial flooding adjacent to the building on the site. It is indicated that the potential depth flooding is between 200-300mm.

It is noted that the highest frequency of fluvial flooding (red arrow) is to the north of the building, potentially affecting access and egress.

Fluvial (river flood) – Current modelled flood risk

The EA Product 4 includes output from the Loddon (Lower) computer model from 2009.

Figure 11 shows that the building is unaffected by the current 1 in 1000-year (0.1% AEP) fluvial event from the River Loddon.



Figure 11 – Extract from River Loddon Computer Model (2009)

No computer modelling has been provided for the flooding shown to affect the site on the Long-Term Flood Risk Mapping. It is assumed that this modelling was completed for the March 2025 update of the mapping and has not yet been released.

Fluvial (river flood) – Future flood risk – 2036 to 2069

The Long-Term Flood Risk mapping (**Figure 12**) indicates the future fluvial flood risk for the years through to 2069.

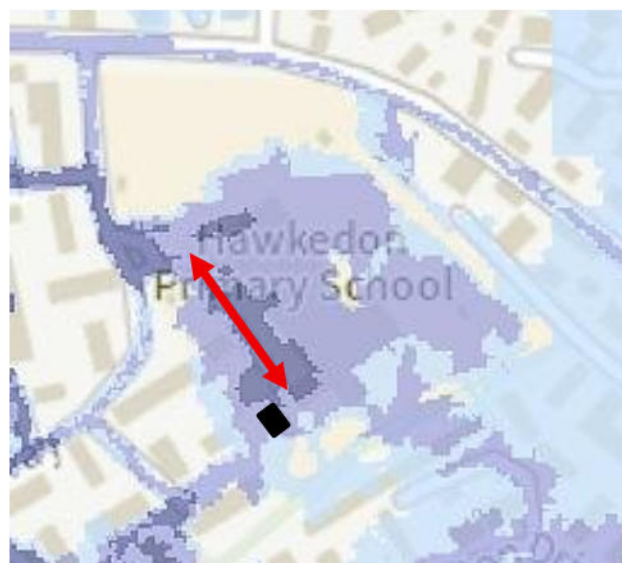


Figure 12 – Extract from Long-Term mapping future fluvial flood risk 2036 to 2069

The mapping indicates that there is potentially a 'High' risk of fluvial flooding adjacent to (but not within) the building. It is indicated that the potential depth flooding remains between 200 and 300mm.

It is noted that the frequency of the fluvial flooding (red arrow) increases to the north of the building.

Fluvial (river flood) – Future modelled flood risk

The EA Product 4 includes output from the Loddon (Lower) computer model from 2009.

Figure 13 shows that the building is not at risk from a future 1 in 100-year fluvial event plus 20% climate change from the River Loddon. An allowance of 20% is a greater allowance for climate change than currently required (14%) even for a 100-year Design Life.

No computer modelling has been provided for the flooding shown to affect the site on the Long-Term Flood Risk Mapping. It is assumed that this modelling was completed for the March 2025 update of the mapping and has not yet been released.

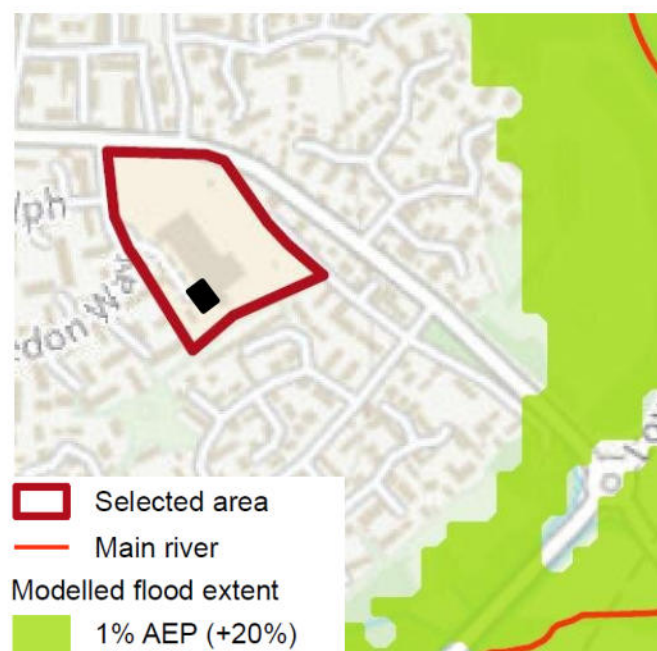


Figure 13 – Extract from River Loddon Computer Model (2009) including climate change allowance

Pluvial floods (surface water) - Introduction

A pluvial flood occurs when an extreme rainfall event creates a flood independent of an overflowing water body. Pluvial flooding can happen in any location, urban or rural, even in areas with no water bodies in the vicinity. There are two common types of pluvial flooding:

- **Surface water floods** – these occur when an urban drainage system is overwhelmed, and water flows out into streets and nearby structures. It occurs gradually, which provides people time to move to safe locations, and the level of water is usually shallow (rarely more than 1 meter deep). It creates no immediate threat to lives but may cause significant economic damage.
- **Flash floods** - These are characterized by an intense, high velocity torrent of water triggered by torrential rain falling within a short amount of time within the vicinity or on nearby elevated terrain. They can also occur via sudden release of water from an upstream levee or a dam. Flash floods are very dangerous and destructive not only because of the force of the water, but also the hurtling debris that is often swept up in the flow.

The UK.GOV Risk of Flooding from Surface Water (RoFSW) mapping uses the best available surface water flood risk information. Wherever possible it uses outputs from local detailed surface water models. The EA have developed a national model for surface water flooding using up to date data and techniques. This provides flood risk information where no detailed local data is available and categorises them as high, medium & low.

- **High** – events with an annual probability greater than 3.33% (1 in 30-year flood event). High risk areas are shown in dark blue on flood maps.
- **Medium** – events with an annual probability between 3.33% and 1% (between 1 in 30 and 1 in 100-year flood event). Medium risk areas are shown in mid blue on flood maps.
- **Low** - events with an annual probability between 1% and 0.1% (between 1 in 100 and 1 in 1000-year flood event). Low risk areas are shown in light blue on flood maps.
- **Very Low** - events with an annual probability less than 0.1% (1 in 1000-year flood event). Any remaining areas.

The EA have used industry standard techniques to specify rainfall inputs, depending on the geographic location. They have estimated how much rain would run off the land surface, depending on the surface type. In urban areas the surface is represented as 100% impervious. However, they do make allowances for subsurface drainage systems. In non-urban areas, they model natural surfaces like fields and parks using industry standard techniques. These consider the soil moisture and other factors to predict how water flows over the land.

Building footprints are raised above their surroundings as part of the modelling process. They have used an uplift of 300mm above the 'zero' elevation of the building.

The map does not provide property-specific data and cannot specify whether individual buildings are themselves at risk. However, it is important that the RoFSW maps indicate where buildings are identified to be in a flood risk area.

Pluvial floods (surface water) – Current flood risk

The Long-Term Flood Risk mapping (**Figure 14**) indicates the current pluvial flood risk.



Figure 14 – Extract from Long-Term mapping current pluvial flood risk

The mapping indicates that there is currently a 'Low' risk of pluvial flooding adjacent to the building on the site. It is indicated that the depth of the flooding is less than 200mm.

It is noted that the frequency of the pluvial flooding increases on the vehicle and pedestrian entrance (red arrow) to the north of the building.

Pluvial floods (surface water) – Future flood risk in the years 2040 – 2060

Based on the effects of climate change and an anticipated increase in rainfall intensity the Long-Term Flood Risk mapping (**Figure 15**) provides the pluvial flood risk up to the year 2060.



Figure 15 – Extract from Long-Term mapping pluvial flood risk 2040 to 2060

The mapping indicates that the risk of pluvial flooding adjacent to the building increases to 'Medium', with the depth potentially between 200-300mm.

Groundwater

Groundwater flooding occurs where the water levels in rock and soil become high enough for the water to appear near to or above the ground surface. This may happen where there are underlying gravels, or porous or fractured rocks, allowing water to pass through.

The Long-Term Flood Risk mapping indicates that *"this location is outside of a groundwater flood alert area"*. This means that the site is not part of a groundwater flood alert area and the EA do not monitor groundwater levels in this area. They caveat this by stating that there may still be a risk of groundwater flooding.

The mapping in Appendix A that accompanies the Level 1 SFRA (**Figure 16**) indicates that groundwater has the potential to rise to the surface of the site (less than 0.025m below the surface).

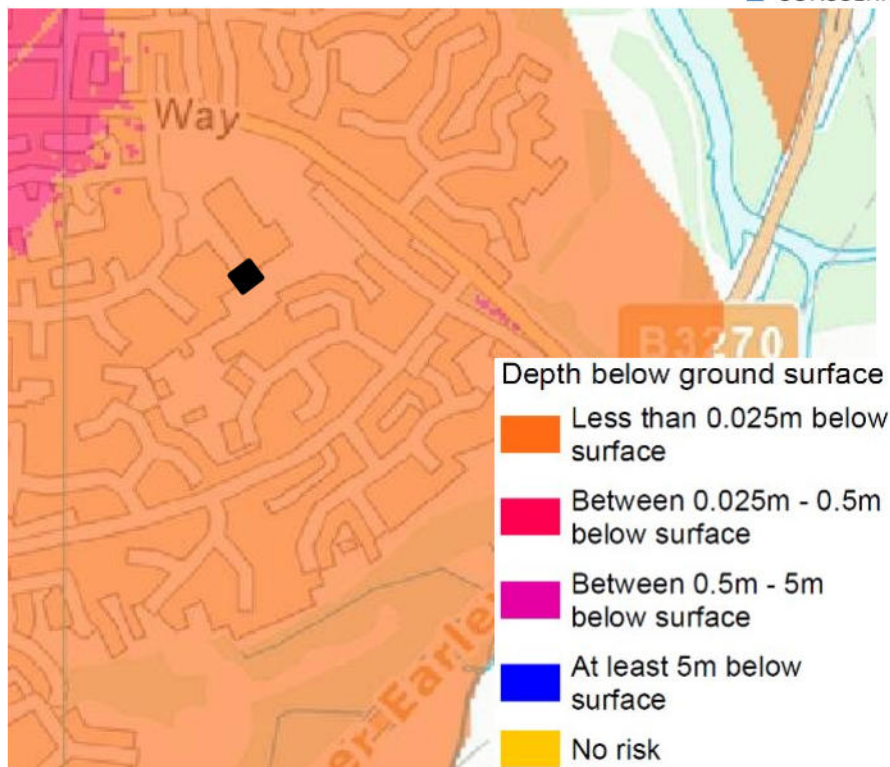


Figure 16 – Extract from Level 1 SFRA – Appendix A – Map D2 – groundwater flood risk

Overall, there are limited records of groundwater flood events in the Borough (and on the site) and it is likely that any flooding will be concurrent with a fluvial or pluvial event and hence the risk of independent groundwater flooding on the site is 'conservatively' assessed as 'Medium' both now and in the future.

Reservoirs

Reservoir flooding can occur because of dam failure. Whilst rare they do occur and can result in the loss of life and cause significant damage.

The reservoir flood mapping indicates two flooding scenarios: 'when the river levels are normal' and 'when there is also flooding from rivers'. The 'rivers levels are normal' scenario (marked in dark blue) predicts the flooding if the reservoir failed when the river is at a normal level. The 'flooding from rivers' scenario (marked in light blue) predicts how much worse the flooding might be if the river is already experiencing an extreme natural flood.

The Long-Term Flood Risk map (**Figure 17**) confirms that the site could be affected in the event of a 'flooding from rivers' reservoir failure.



Figure 17 – Extract from the Reservoirs Flood Map

There are four reservoirs owned and maintained by public authorities and private companies affecting the site area as follows:

Reservoir name	Responsible authority
Wellington Country Park Lake	Wellington Country Park Ltd
Bearwood Lake	The Reading Football Club Limited
Maiden Erlegh Lake (No.1)	Earley Town Council
Southlake (Wokingham Borough Council)	Wokingham Borough Council

Reservoirs in the UK have an extremely good safety record and there has been no loss of life in the UK from reservoir flooding since 1925. The EA is the enforcement authority for the Reservoirs Act 1975 in England and Wales. All large reservoirs must be inspected and supervised by reservoir panel engineers. It is assumed that these reservoirs are regularly inspected, and essential safety work is carried out.

On this basis, it is considered that the flood risk due to a reservoir failure can be assessed as 'Low'.

Canals

Flooding from canals can occur when the structure fails, especially in locations where the canal is supported by an embankment. Whilst rare they do occur and can result in the loss of life and cause significant damage.

The Canal and River Trust website confirms that the site does not benefit from a canal network.

Sewers

Sewer flooding can occur because of inadequate capacity in the sewer network, typically where urban areas have expanded to accommodate growth without upgrading the sewer network.

Sewer records (**Figure 18**) confirm that a foul water pumping main is located on the southern boundary of the site. A Sewer Flooding History Enquiry confirmed that the flooding records held by Thames Water indicate that there have been no incidents of flooding because of overloaded public sewers.

On this basis, flooding from public sewers is assessed as 'Low' both now and in the future.



Figure 18 – Thames Water Sewer Record

Historical Flood Records

The mapping that accompanies the Level 1 SFRA (**Figure 19**) and the EA Product 4 indicates that the EA hold no records that the site has flooded fluvially.



Figure 19 – Extract from Level 1 SFRA EA Historic Flood Map

SUMMARY OF FLOOD RISK

Replacement modular nursery building

The potential sources of flood risk to the building are summarised in the table below:

	Current Defended Flood Risk	Future Defended Flood Risk
Tidal (coastal)	Not applicable	Not applicable
Fluvial (river)	Medium	High
Pluvial (surface water)	Low	Medium
Groundwater	Medium	Medium
Reservoir	Low	Low
Canals	Not applicable	Not applicable
Sewers	Low	Low

This assessment will consider the mitigation required to address fluvial (river), pluvial (surface water) and groundwater flood risk to the building both now and into the future.

Pedestrian and vehicle access to Hawkedon Way entrance

	Current Defended Flood Risk	Future Defended Flood Risk
Tidal (coastal)	Not applicable	Not applicable
Fluvial (river)	Medium	High
Pluvial (surface water)	High	High
Groundwater	Medium	Medium
Reservoir	Low	Low
Canals	Not applicable	Not applicable
Sewers	Low	Low

This assessment will consider the impact and associated mitigation of restricted vehicle and pedestrian access to the Hawkedon Way entrance.

FINISHED FLOOR LEVELS

Elevating Finish Floor Levels above all sources of flood risk provides a permanent and robust approach to flood risk management. However, building proposals within a developed site can often present conflicting requirements.

Analysis of existing Finished Floor Level above Flood Zones 2 and 3

The Finished Floor Level (FFL) of the existing nursery is at 40.78mAOD which is 380mm above the current Flood Zone 3 and 230mm above Zone 2.

On this basis, the existing building is unlikely to be affected by a current fluvial event.

Analysis of proposed Finished Floor Level

Fluvial

The GOV.UK '*Preparing a flood risk assessment: standing advice*' (October 2025) indicates that Finished Floor Levels should be at least 300mm above the 1 in 100-year fluvial flood level including an allowance for climate change commensurate with the Design Life of the building.

The Design Life of the building is 25 years and climate change for a fluvial event is estimated to be at or around 5% and so Flood Zone 3 will be above 40.4mAOD, but not 40.55mAOD. To ensure a 'precautionary approach' a Flood Design Level of 40.5mAOD will be assumed for the year 2051. Based on providing 300mm of freeboard a FFL of 40.8mAOD for the replacement building is considered appropriate.

Pluvial

The pluvial flood mapping indicates that the surface water may reach a level of 40.5mAOD in the year 2069. The mapping indicates that surface water flows could be 200-300mm deep and hence a FFL of 40.8mAOD is sufficient to ensure that surface water flows do not enter the building.

Groundwater

The Level 1 SFRA indicated that groundwater could reach ground level and so at an average ground level of at or around 40.55mAOD a FFL of 40.8mAOD provides sufficient freeboard from this flood source.

Recommended Finished Floor Level

The provision of a **minimum FFL of 40.8mAOD for the replacement nursery building** provides sufficient freeboard relative to all the identified sources of flooding. In addition, this level (20mm higher than existing) allows the replacement building to relate well to the external surfaces and ensures that Disability Discrimination Act (DDA) access can be achieved.

ACCESS AND EGRESS

This assessment has identified that access and egress via the entrance to Hawkedon Way may, in certain flood scenarios, present difficulties. This assessment has identified that the access road is at a greater risk of fluvial and pluvial flooding than the building itself.

Pedestrian access and egress

The Long-term flood mapping indicates that both pluvial and fluvial flooding on the access road could be at or around a depth of 300mm. Figure 13.1 of Flood Risks to People FD2320/TR2 indicates that a depth of flooding of 300mm (at 0.25 metres/second) represents 'a danger for some'.

Table 13.1 Danger to people for different combinations of depth and velocity

Velocity (m/s)	Depth of flooding (m)										
	0.05	0.10	0.20	0.30	0.40	0.50	0.60	0.80	1.00	1.50	2.00
0.00											
0.10											
0.25											
0.50											
1.00											
1.50											
2.00											
2.50											
3.00											
3.50											
4.00											
4.50											
5.00											

Key:

- Danger for some
- Danger for most
- Danger for all

Table 13.1: Defra/Environment Agency 'Flood Risk Assessment Guidance for New Development, Phase 2, R&D Technical Report FD2320/TR2.

'Danger for some' highlights hazards that are likely to affect access involving children and hence an 'alternative' access and egress route is recommended.

A review of the site indicates the nursery benefits from a pedestrian entrance (**Photograph 1**) that links with a footway on the southern boundary of the site



Photograph 1 – Pedestrian entrance to the southern boundary (looking north)

The Long-Term fluvial mapping 2036 to 2069 (**Figure 20**) indicates that the depth of water on this access and egress route will be less than 200mm deep in a 'Very low' chance event in the year 2069.

On this basis, the route provides a viable alternative for pedestrians that are unable to use the access to Hawkedon Way.



Figure 20 – Long Term Flood Risk Mapping – Fluvial flood depths to the year 2069

Standard motorised vehicle access and egress

A standard motorised vehicle has the potential to float in depths of water greater than 300mm and so the access route will remain navigable.

Emergency vehicle access and egress

The depth of flooding is significantly less than 900mm and so access by emergency vehicles remains possible.

FLOOD ALERT SYSTEMS

Sign up to the Environment Agency's Flood Warning System

To enable the safe management of the Nursery, it is recommended that the occupiers sign up to the **Environment Agency's Flood Warning system for the River Loddon at Lower Earley and Sindlesham**. For a single location it is free to sign up to receive the warnings by phone, email or text.

The Warning will provide advanced notice of any likely fluvial events in the area.



FLOOD IMPACT ON OTHER PROPERTIES

Obstruction to channel capacity or flood flows

The replacement modular nursery building is not located near to the channel of a main river or ordinary watercourse.

The building is within the same location as existing and therefore it will not adversely affect flood flows.

Displacement of flood plain volume

The building is within the same location as at present and the underside of the modular building has a void beneath it. Therefore, the proposal will not reduce the flood plain volume.

FLOOD RESISTANCE AND RESILIENCE MEASURES

By establishing the Finished Floor Level at 40.8mAOD it is not necessary to provide any additional flood resistance or resilience measures.

CONCLUSIONS AND RECOMMENDATIONS

The development

This Food Risk Assessment has been prepared to support a planning application for a replacement modular nursery building with the grounds of Hawkedon Primary School.

As the facility is a modular nursery building the design life has been established as 25 years.

Replacement modular nursery building

Fluvial (river), pluvial (surface water) and groundwater flood risk have been identified as potential sources of flooding to the building.

	Current Defended Flood Risk	Future Defended Flood Risk
Tidal (coastal)	Not applicable	Not applicable
Fluvial (river)	Medium	High
Pluvial (surface water)	Low	Medium
Groundwater	Medium	Medium
Reservoir	Low	Low
Canals	Not applicable	Not applicable
Sewers	Low	Low

Pedestrian and vehicle access to Hawkedon Way entrance

A higher flood risk for fluvial (river), pluvial (surface water) has been identified for the pedestrian and vehicle access route to Hawkedon Way.

	Current Defended Flood Risk	Future Defended Flood Risk
Tidal (coastal)	Not applicable	Not applicable
Fluvial (river)	Medium	High
Pluvial (surface water)	High	High
Groundwater	Medium	Medium
Reservoir	Low	Low
Canals	Not applicable	Not applicable
Sewers	Low	Low

Recommendations

Flood Resistance Measures

- A minimum Finished Floor Level of 40.80mAOD.

Emergency access and egress

- Ensure that pedestrian access can be achieved via existing pathways on the southern boundary of the site.

Flood Alert Systems

- If the Nursery has not already done so they should sign up to the Environment Agency's Flood Alert system for River Loddon at Lower Earley and Sindlesham

Overall

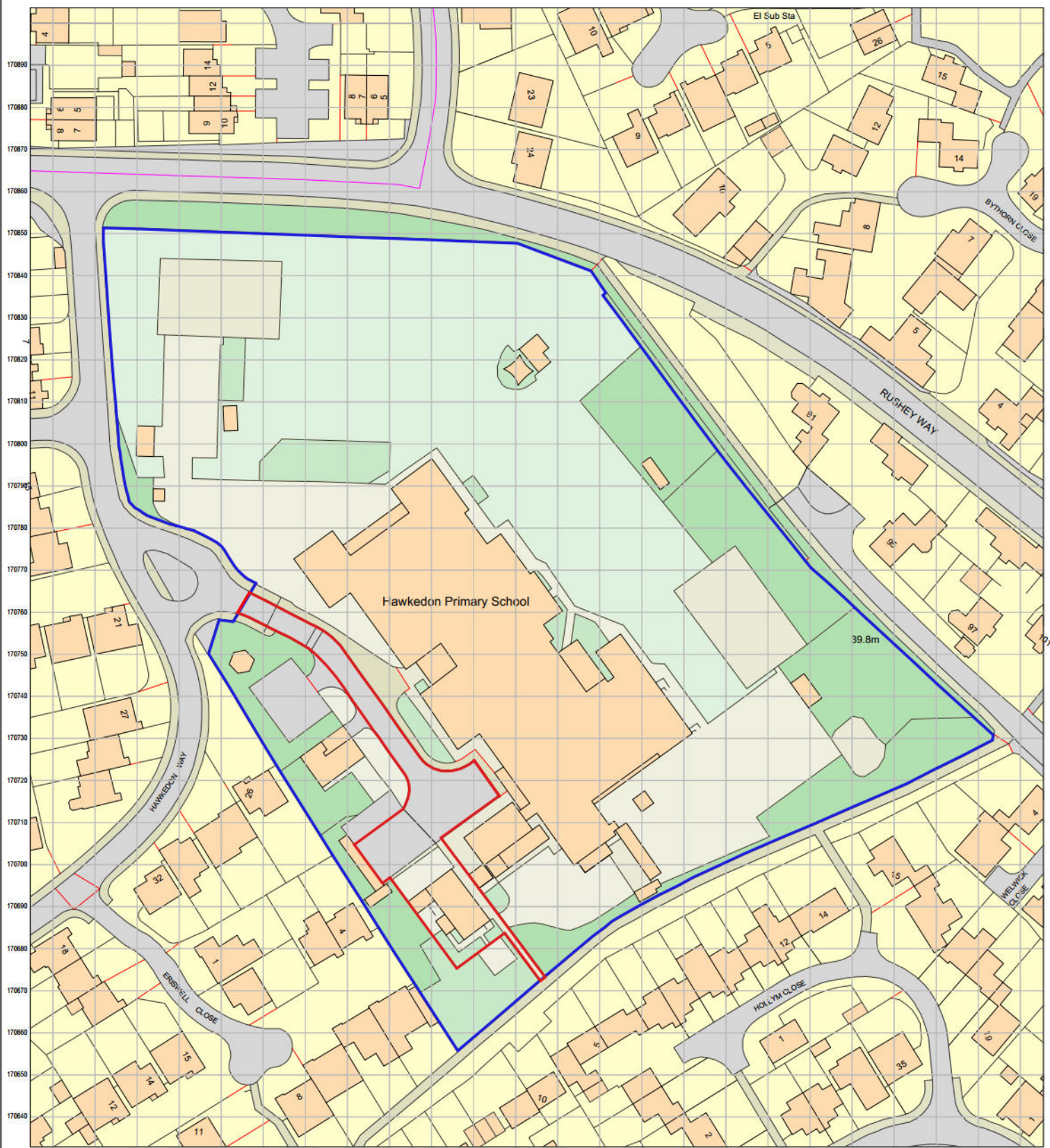
The Sequential Approach has been undertaken to identify the site for the replacement modular building. The building is in Flood Zone 2, which in accordance with the NPPF is a compatible use for a non-residential educational establishment.

To comply with Policy CC09, point 4b), it has been demonstrated that:

- The building will be safe to use and occupy for its Design Life of 25 years.
- The building will not increase flood risk on the site or elsewhere.
- A minimum Finished Floor Level that provides flood resistance (with a suitable freeboard) until at least the year 2060.
- Establishes an emergency evacuation route for pedestrians.

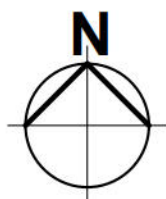
APPENDIX A – DRAWINGS





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SITE LOCATION PLAN 1:1250



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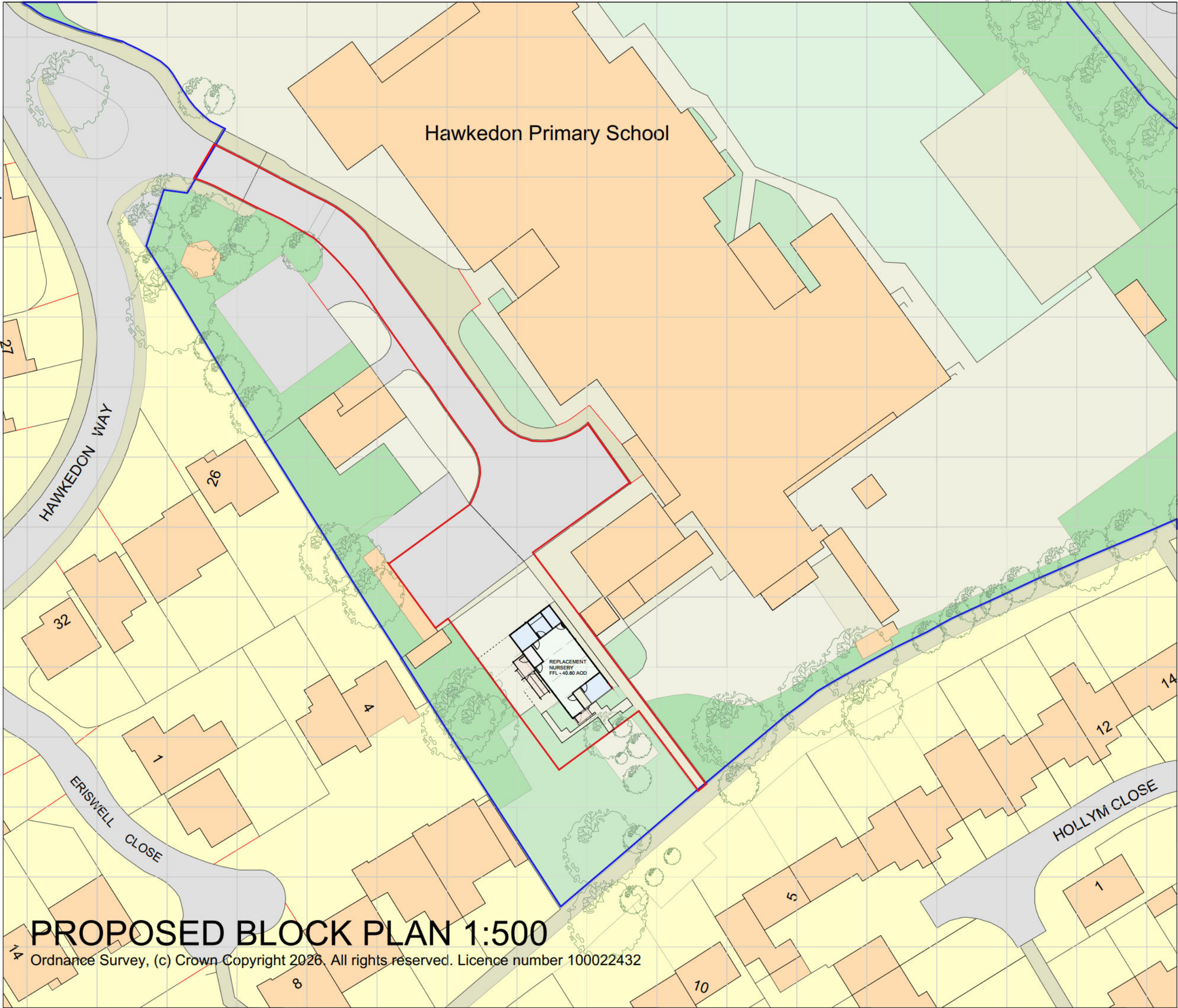
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hha architects
horsley huber architects ltd
Castleberg Studios 134 Newport Road Stafford ST16 2HB
t: 01785 251238
e: stafford@hhasstudio.com
w: www.hhasstudio.com

preliminary	for comment construction	for approval as built
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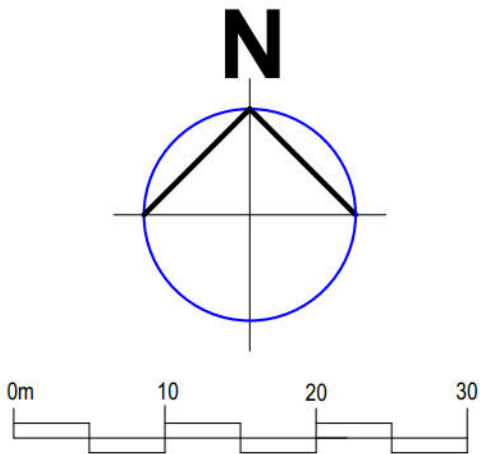
Do not scale. Check all dimensions on site. This drawing is copyright

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Job		REPLACEMENT FAMILY CENTRE MODULAR NURSERY BUILDING EARLY BIRD PRE SCHOOL HAWKEDON PRIMARY SCHOOL READING RG6 3AP.	Job No 5025
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Drawn	Checked	Date	Scale
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PROPOSED BLOCK PLAN 1:500

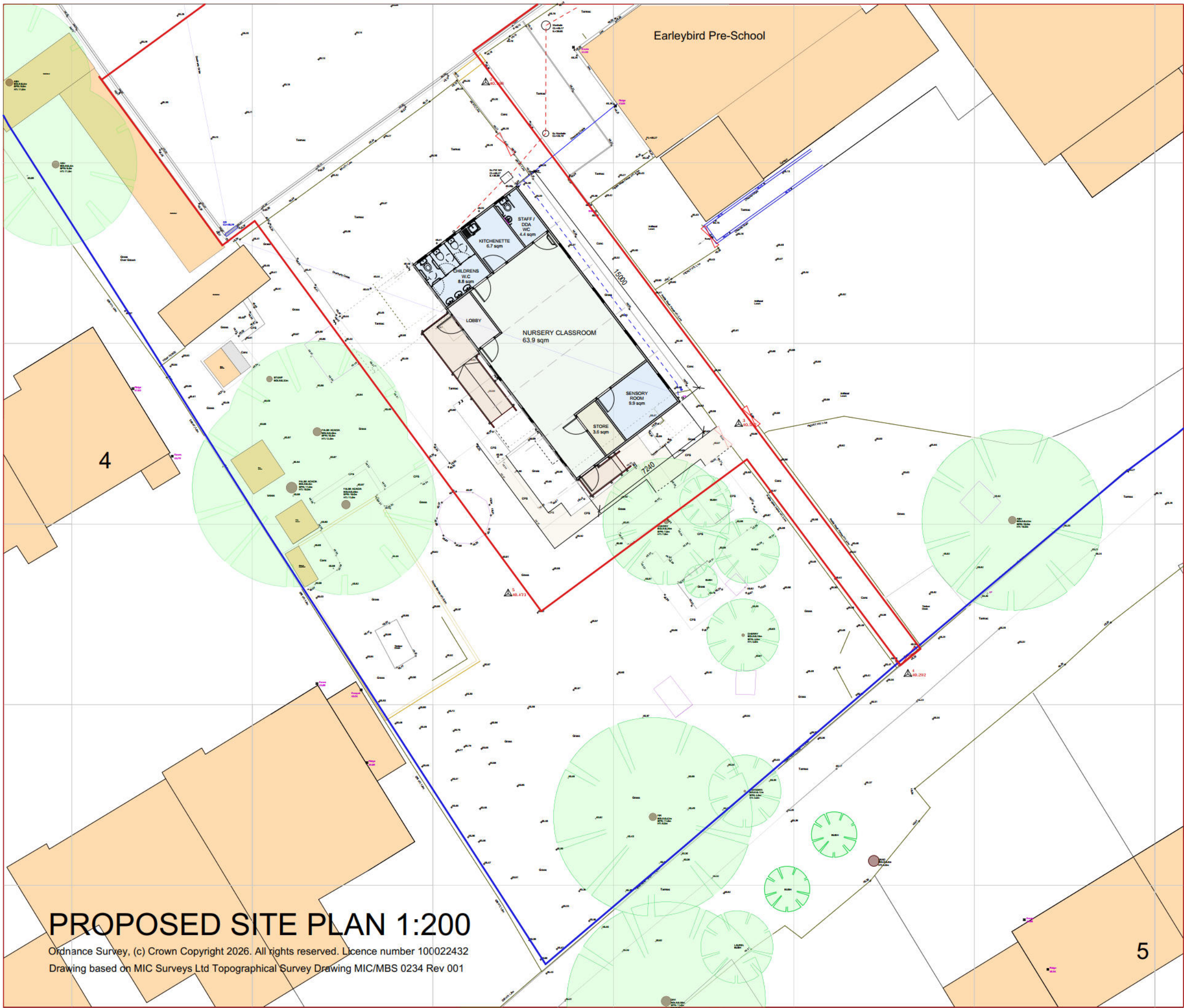
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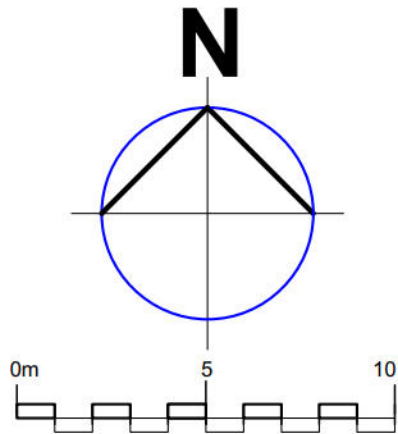


Revision			
Client			
ORCHARD LEARNING ALLIANCE			
Job	REPLACEMENT FAMILY CENTRE MODULAR NURSERY BUILDING EARLY BIRD PRE SCHOOL HAWKEDON PRIMARY SCHOOL READING RG6 3AP.		Job No 5025
Drawing	PROPOSED BLOCK PLAN		Drawing No PL-03
Drawn	Checked	Date	Scale
DH		March 26	1:500 @A3
h h a architects horsley huber architects ltd Stafford Castleberg studios 134 Newport Road ST16 2HB t: 01785 251238 f: 01785 257843 e: stafford@hhastudio.com w: www.hhastudio.com			
preliminary	for comment		for approval
for tender	construction		as built
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PROPOSED SITE PLAN 1:200

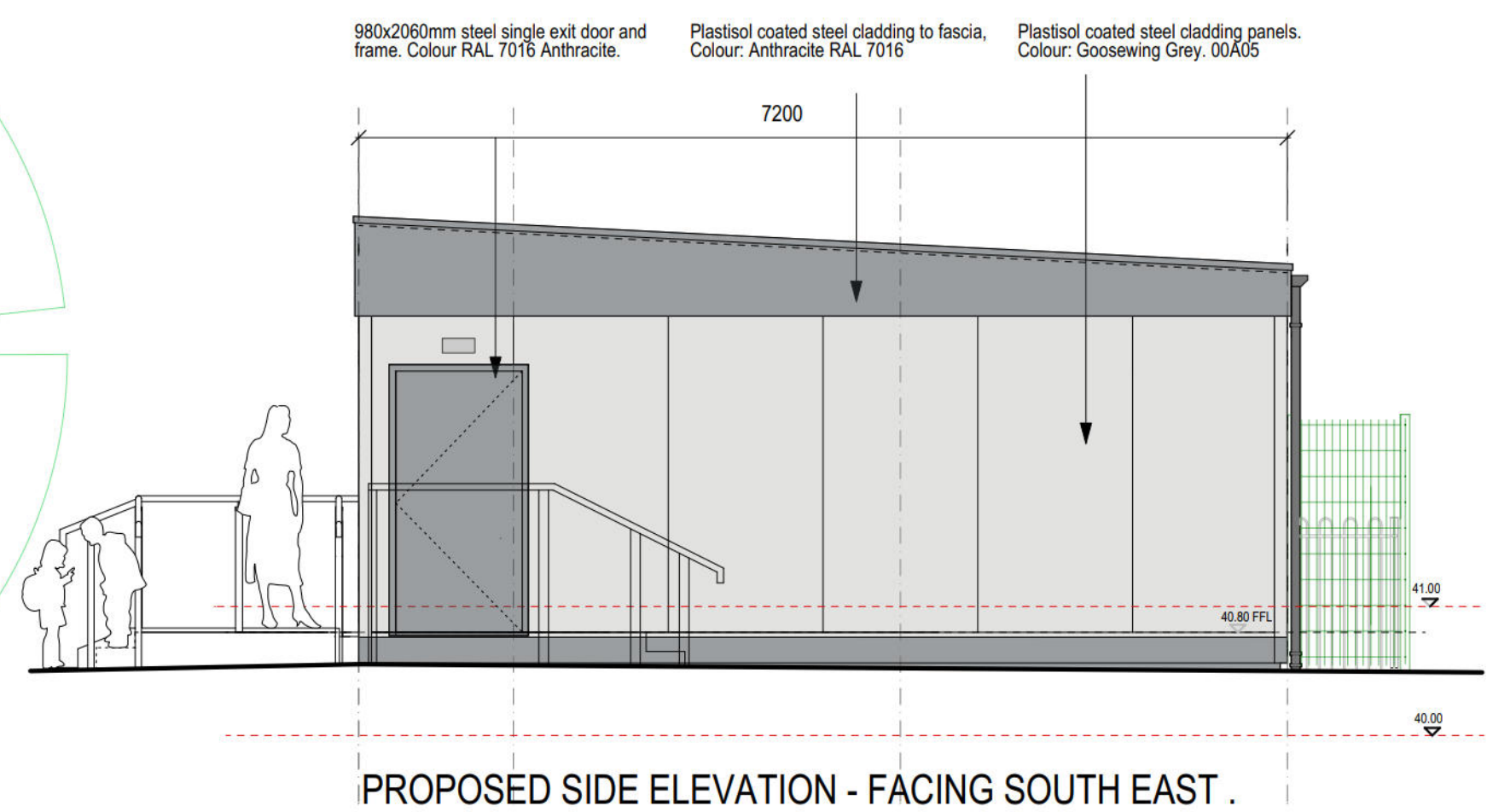
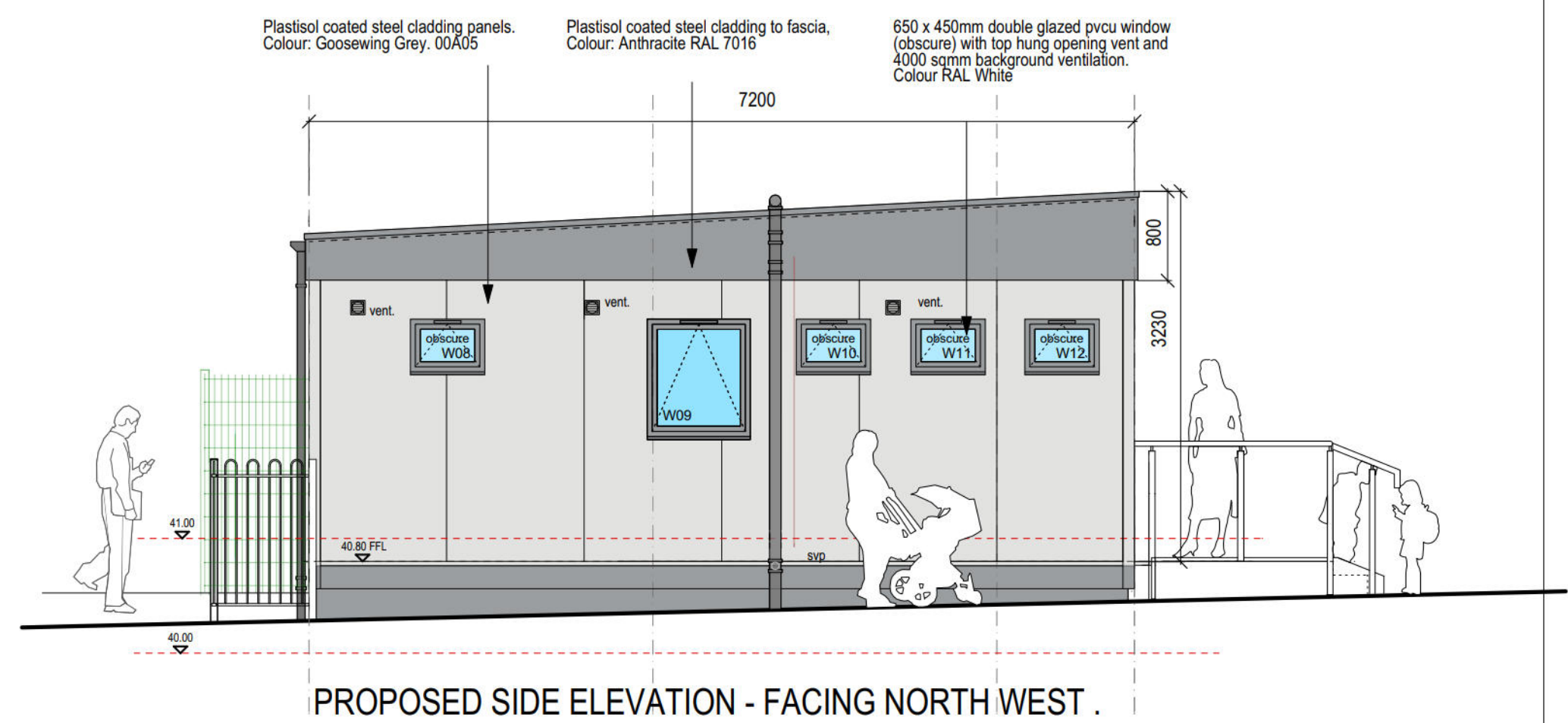
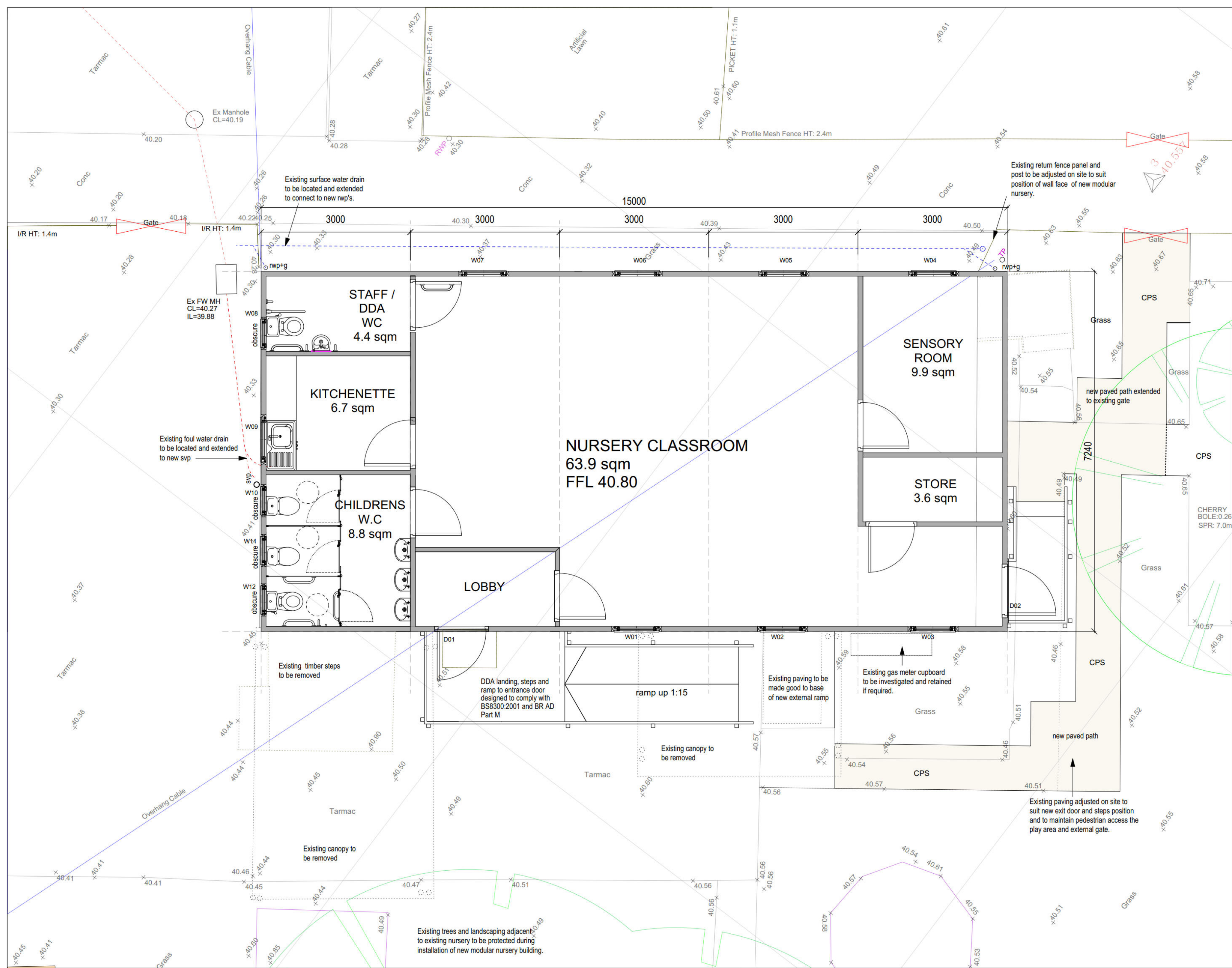
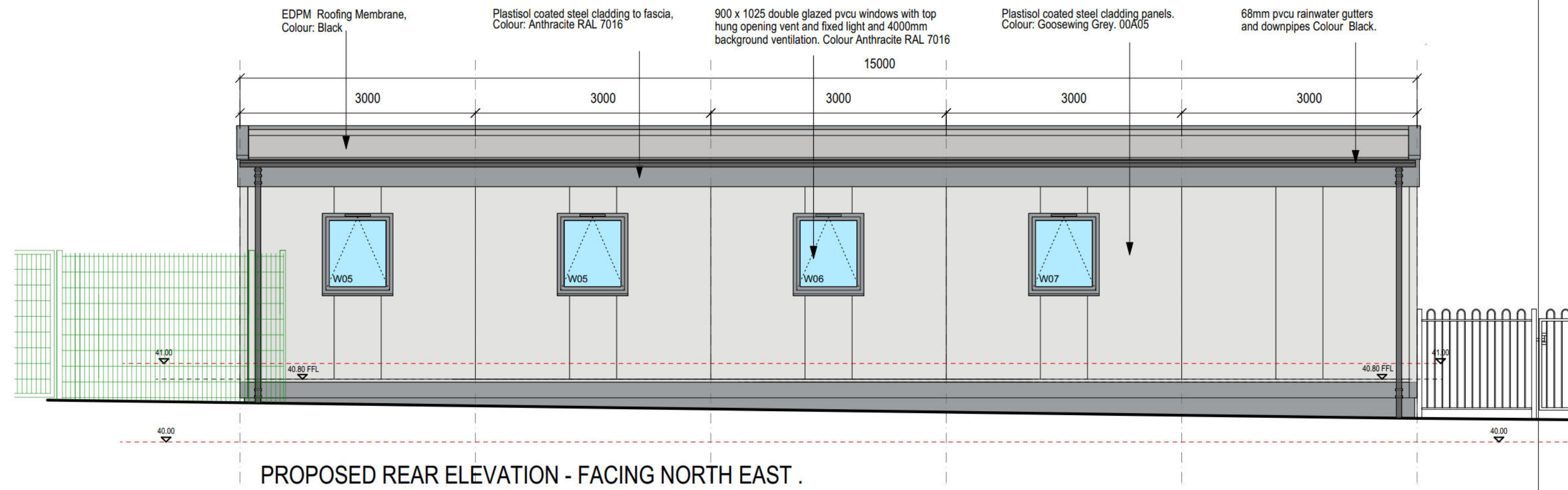
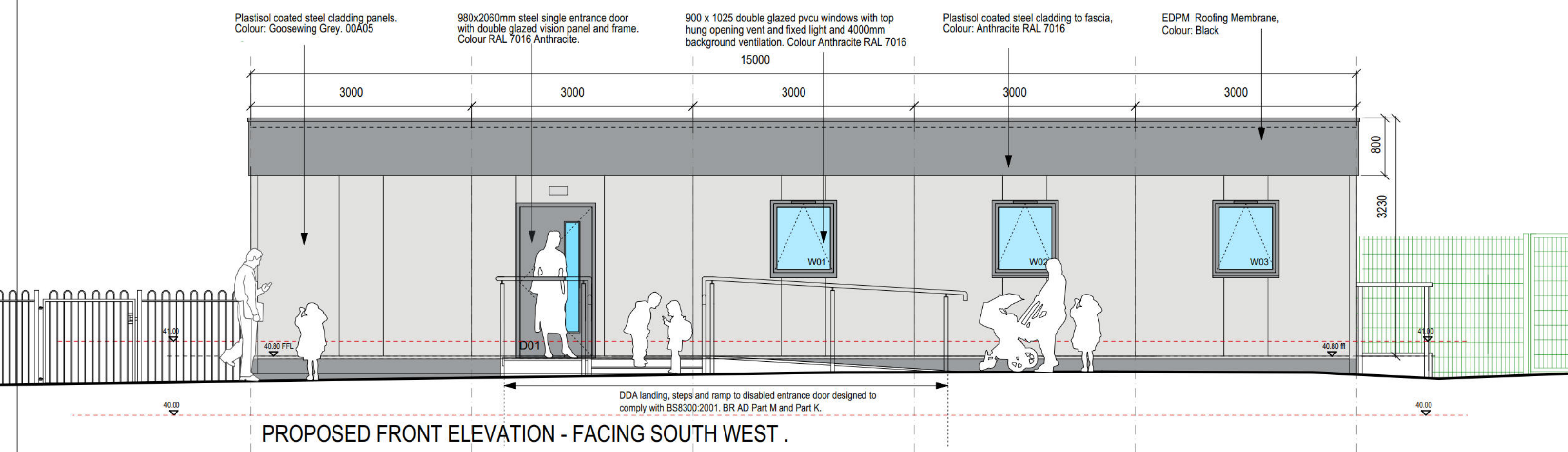
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Drawing based on MIC Surveys Ltd Topographical Survey Drawing MIC/MBS 0234 Rev 001



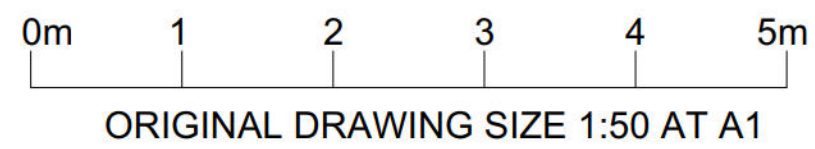
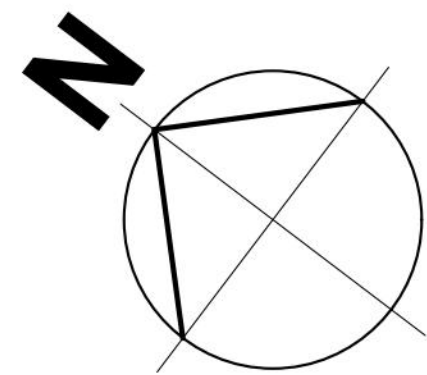
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Revision			
Client			
ORCHARD LEARNING ALLIANCE			
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Drawing			Drawing No
PROPOSED SITE PLAN			PL-05
Drawn	Checked	Date	Scale
DH		March 26	1:200 @A3
h h a architects			
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t: 01785 251238 f: 01785 257843			
e: stafford@hstudio.com w: www.hstudio.com			
			
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for tender	construction		as built
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PROPOSED FLOOR PLAN 1:50



Client	ORCHARD LEARNING ALLIANCE		
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Drawn	Checked	Date	Scale
DH		March 26	1:50 @A1
hha architects			
horsley huber architects ltd			
Stafford, Cheshire studios 124 Newport Road ST16 2PB t 01785 251238 f 01785 257843 e stafford@horsleyhuber.com w www.horsleyhuber.com			
MPB PORTABLE BUILDINGS			
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