



Yeading Infant & Nursery School
Carlyon Road
Hayes
Middlesex UB4 0NR

Design and Access,
Flood Risk Assessment, SUDS strategy,
Planning Statement

March 2022

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To be read in conjunction with

turner & hoskins architects Ltd.,

Drawings ref: 1234.3. 01 - 14

Context

Located on Carlyon Road, Yeading Infant School the school dates from the earlier part of last century and is built using traditional red clay brick with a roof of brown plain clay tiles. Like many schools of its time, it is generally a single storey symmetrical arrangement, the buildings surrounding an internal courtyard.

The school is set in 1.1 ha. of grounds and currently the main ground floor of the school building occupies a total footprint of 2222.0 sq. M. On site are also an independent pre-fabricated classroom block of 136.0 sq. M, and a canteen block of 191.0 sq. M.

The total built footprint on site is 2549.0 sq. M.

The immediate surrounding consists of two storey semi-detached houses with front and rear gardens in traditional mid- century style.

The existing school is orientated northeast/ southwest front/back with hard and soft play areas to the south. The boundaries to the children's centre and primary school are clearly marked with a combination of steel mesh and timber palisade fencing, and the school orchard.

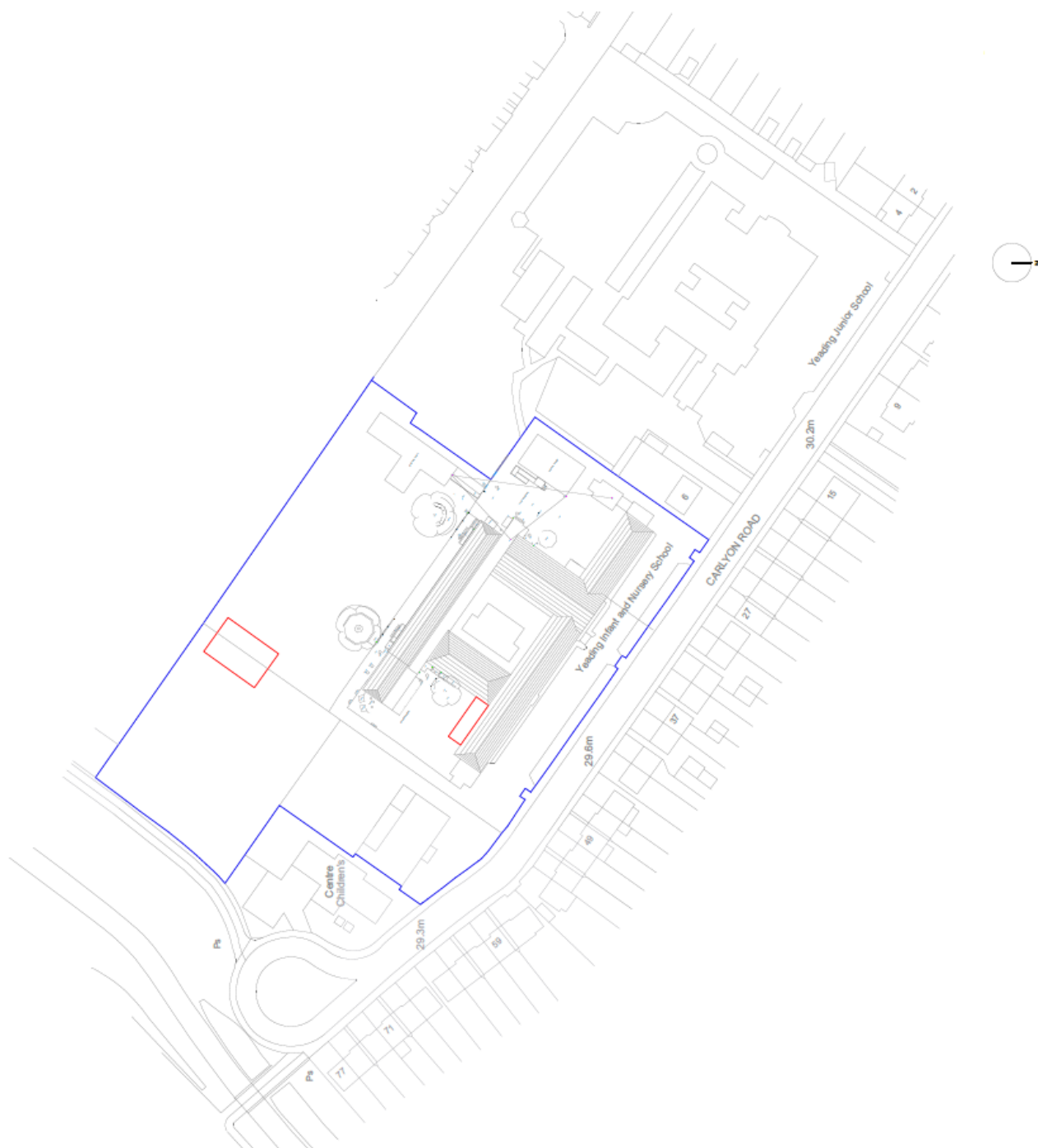
Topography of the site is generally level, and the risk of flooding is low (Environment Agency).

Access to the site is convenient from Carlyon Road; there are footpaths on both sides of the road and a clearly marked crossing point.



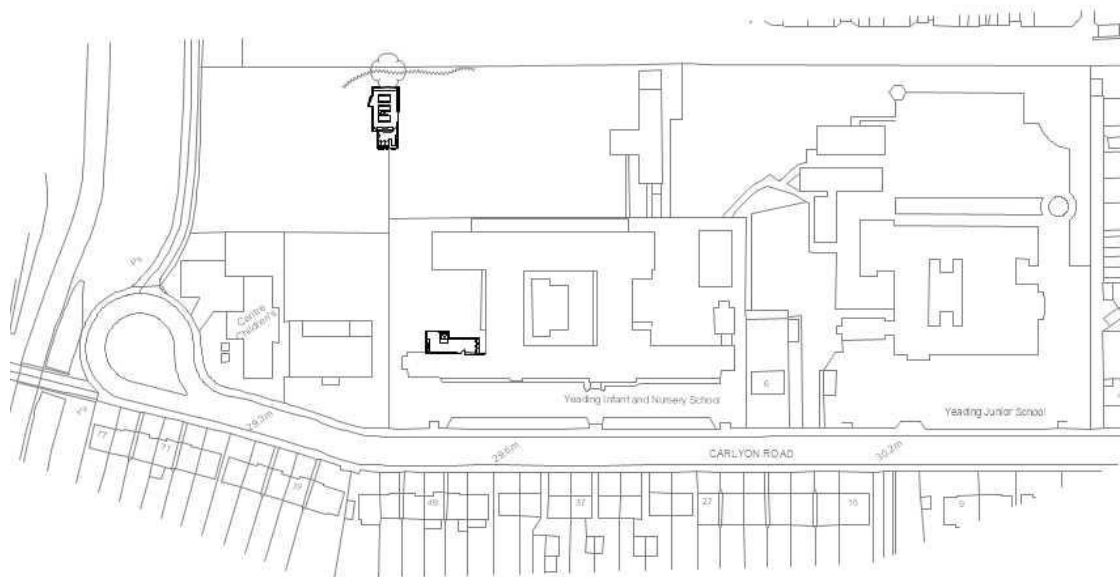
Image from bing maps – note prefabricated classrooms and separate dining hall facility.

Some striking features have been introduced to the school grounds to encourage outdoor learning and give the children a sense of the pleasure to be gained from the 'green' environment. The school takes a proactive approach, teaching the importance of sustainable living and developing an ethos of sustainable energy and respect for the natural environment. Yeading Nursery and Infant School is an eco school.



Location Plan showing proposed sites. - nts

Extent of Proposals



Proposed site plan- nts

The main issues for the extension of the school facilities are:

The provision of additional learning, activity and intervention space for Reception Classes, which are currently provided in a well-used and now worn lean-to construction which has come to the end of its useful life. The existing timber construction is water damaged and leaks during wet weather, see Photos 1 – 6.

The main issues for the addition to the school facilities are:

The provision of small group (4/5 children) SEN area, a dedicated Forest Schools resource space, an accessible Breakfast Club location and an additional Intervention space.

These proposals will rationalise functions within the school and release additional spaces for more learning functions. The area of the existing buildings in total is 2222.0 sq.M; It is proposed to increase the main school building with 52.0 sq. M of replacement floor space and add a further 88.0 sq. M of learning space. The new areas are detailed as follows:

- 1 No. New Learning Space – see drawing 1234.3.07C & 10
provides 52.0 sq. M of learning and intervention space
an uplift of 2.04% of the total school area.
- 1 No New Learning Pod – see drawing 1234.3.07C & 9
provides 67 sq. M of learning space and
21 sq. M of support spaces.
and uplift of 3.45% of the total school area.

See also the Statement of Need provided by the applicant.

Site for lean-to replacement



Photo 1 playground elevation



Photo 2 lean to roof junction



Photo 3 lean to construction rot



Photo 4 lean to interior space



Photo 5 lean to interior space



Photo 6 showing stepped entrance from corridor

Layout and Scale

New Learning Space

The proposal to replace the lean-to seeks to utilise the existing and familiar pattern of circulation around the existing school. The intention is to maintain the light and airy feel to the existing corridors which all benefit from natural light, by the introduction of rooflights to the flat roof over the corridor to supplement daylight lost to construction enclosing the existing corridor windows.

The access to the new classroom will use an existing opening which currently leads directly onto steps to the playground level. The new extension will raise the floor level to match the existing corridor, with steps to the playground level now being external. The existing external ramp will allow access for those with mobility concerns for the first time.

The language of the original building is respected for the new extension, the bricks, roof covering, and roof form are all intended to match the existing materials and geometry on site, and the playground entrance will be wide inviting steps to allow a space to sit.

The new glazed corner is more contemporary in its form but provides children with views onto the playground and forest schools area with natural daylight to stimulate the learning environment.

All the new accommodation will be naturally ventilated by opening windows and passive ventilation systems.



The proposed site for the new extension is currently a covered lean to surrounded by hard landscaping and will not result in a loss of play space or equipment. Any existing play equipment affected can be relocated elsewhere on the existing site.

New Learning Pod

The proposal seeks to provide a new eco-efficient building set within the grounds of the school spanning playing field and dedicated forest schools and growing projects area. The building will accommodate the following functions either relocated from the main school building or founded in response to a growing school community need.

- Termttime school Breakfast Club,
- a focus support space for the delivery of the forest schools learning programme,
- support space for the active Growing Projects area,
- a SEN daily learning centre
- learning intervention zone.

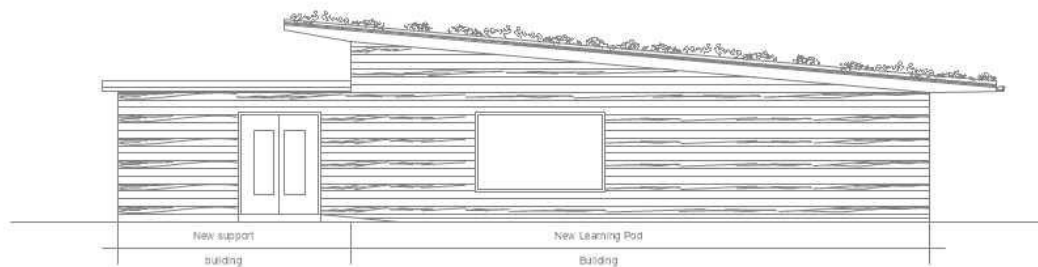
The intention is to construct a thermally efficient building using modern pre-fabricated technology with an extensive green roof of sedum, moss, and herbs to attenuate 50% of the rainwater falling on the new roof area.

The interior of the building will be light and airy benefitting from natural light with glazed areas in a contemporary form to provide children with views onto the playing field and forest schools area. The room min teaching room will be filled with natural daylight to stimulate the learning environment.

The language of the new building is intentionally reminiscent of a woodland building, with timber style cladding to the external walls, deep overhanging eaves and the introduction of a green microclimate at roof level. The support building is intended to relate to the main learning space in the subservient manner of an outbuilding.

The support building will provide storage, w.c., and outdoor clothes/shoes changing facilities to enable the Forest Schools programme to be delivered in a variety of weather conditions.

All the new accommodation will be naturally ventilated by opening windows and passive ventilation systems.



The access to the new Learning Pod will use an existing path extended to meet the new building and provide a new permeable surface path into the Forest Schools and Growing Projects area. Part of the existing hedge, the polytunnel and 3 no raised beds will be removed to prepare the site, all of the items will be re provided in the locations shown on the proposed site plan. The new building will have new external ramps to allow access for those with mobility concerns from either side of the building.

Articulation

New Learning Space

It is intended to continue with the use of upvc framed windows, roof height, roof covering and bricks to unify the new and existing structures. The new space will also have an access directly onto the playground, as has the existing classroom opposite. The visual variety of new form is limited to the playground entrance to the new space and seeks to blend into the existing school form.

This area is intentionally designed to signify a clear point of entry to the new space, it is not intended to add a canopy across the elevation of the learning space as this would reduce the open playground area and become visually overcrowded.

New Learning Pod

It is intended to use a prefabricated system for the construction of the Learning Pod, the system is well suited for use to meet regional and cultural design requirements. External finish can include directly applied render, brick and brick slips, tiles, timber/cement cladding to suit the surrounding context, the external design has incredible flexibility in design options. The total wall thickness of just 275mm offers approximately 10% more accommodation space for any given footprint. This is a major advantage when constructing on an occupied site within a tight timescale.

The system is ideal for projects on limited access as the kit form allows for an efficient and short construction timescale, this will reduce the amount of time the playing field will be affected by the works.

Access

The school is situated within easy reach of major bus routes and encourages a walking to school policy. The school currently has a variety of cycle and scooter parking to encourage to student to use alternative means of transport.

Parking provisions on site will not be affected by this proposal.

Disabled access both into and within the Learning Space and Learning Pod will be fully compliant with Part M (approved document) of the Building Regulations. The thresholds to both the new Learning Space will be level to allow easy access into the new space, and to the rest of the school.

Sustainability & Bio Diversity

The new Learning Space and Learning Pod will meet or exceed the requirements of the current Building Regulations, the high levels of thermal insulation provided within the Learning Pod will create a warm and cosy environment with a U value of 0.10W/m²/K with an air-tightness of 1m³/m²@50pa. The acoustic insulation, which can achieve 60db, a school music room is a minimum of 50dB, this means that external noise related stress impact is largely removed and results in a better learning environment.

Low energy lighting technology is to be employed, which will respond to increases in natural daylight by dimming the fittings and automatically switch off when the rooms are unoccupied for any length of time.

The green roof will contribute to the microenvironment of the school, and rainwater will be saved in strategically placed butts to supply the school growing spaces.

When it comes to small-scale biodiversity improvements, there is no satisfactory “one size fits all approach”. Space, time and resources often guide the type of measures which can be put in place. Animal and plant-oriented approaches, are accessible and can be set up to complement the established Forest Schools programme.

The opportunities available are:

- Nest boxes
- Bird feeders
- Bug hotels
- Hedgehog houses
- Bat boxes
- Log piles
- Communal gardens
- Pollinator nest sites
- Planting wildflowers
- Rain gardens

Many of these items are already present on site, and the positioning of the new Learning Pod lends itself to the creation of a rain garden which can be set up in any area with a water runoff source, such as near buildings.

The water from a roof can be channeled directly into a rain garden instead of into a drain. The area should have a dip to collect the water. Species planted in a rain garden should be deep rooted, and preferably native to the local area. A range of plants can be grown including bushes, flowers, and trees, or even fruit or vegetables.

A rain garden preserves clean water. Water running off from buildings may have low level pollutants in it and passing it through a rain garden can help to purify it. A rain garden creates habitat, by planting flowers, bushes and shrubs and a range of species a habitat for insects and other species, ground cover may be beneficial for small animals such as hedgehogs. A rain garden is also low maintenance, the inclusion of deep-rooted plants means that even in dry periods the plants can still access water and don't require watering. The benefits of natural drainage occur even if the garden has areas with weeds etc.

Suds Strategy & Flood Risk Assessment

Extension to provide a new Learning Space

Building dimensions as drawing 1234.3.07C Proposed Learning Space

<u>Roof area</u>	=	13.9M x 5.57M
	=	77.55 sqm

The existing lean to roof of 52.2 sq. M currently drains directly onto the playground and then into the existing surface water drainage system without issue.

It is proposed to connect the Learning space rainwater drainage to the existing surface water drainage system and provide a soak away to mitigate the additional 25.35 sq. M of flat roof, calculations are as follows.

Planning condition requires sustainable urban drainage (suds) solution to cater for a 1 in 100 yr storm event and including a provision for the effects of climate change of 30% increase in rainfall

Rainfall data

The 1 in 100 year storm event with a 6 hour duration.

CIRIA suds design manual rainfall	=	63.0 mm
add additional 30%	=	18.9 mm
Total	=	81.9 mm
Design Rainfall Event	=	82.0 mm

Sub - soil data

London Clay - assumed soil infiltration 2×10^{-7} m/s

Storage requirements to cater for the 6 hr storm event

Proposed Learning Space Extension

required storage volume	=	25.35 sq.M x 0.082
	=	2.07 cu. M

Possible solutions

Traditional soakaway 1.8m diameter x 1.75m deep below incoming pipe

Storage volume	=	1.75m x 2.54 cu.M/M
	=	4.445 cu. M

Proprietary System

Naylor Metro cells system

3 cells per cu. Metre, allow for 0.95 void ration

$$\begin{aligned}\text{required volume of Metro cells} &= 2.07 / 0.95 \\ &= 2.17 \text{ cu. M}\end{aligned}$$

$$\begin{aligned}\text{Required number of Metro cells} &= 2.17 \times 3 \\ &= 6.53 \text{ cells}\end{aligned}$$

Metro cell units are 1m long x 1m wide x 0.33m deep installation could be 2 units wide x 3 units

Capacity indicates this would be the preferred solution for the new Learning Space.

for all options check proposed pipe from building to storage cells

$$\text{Total rainfall} = 6.35 \text{ cu. M in 6 hours}$$

$$\begin{aligned}\text{Average rainfall over the 6-hour period} &= 2535 / (6 \times 60 \times 60) \\ &= 0.10 \text{ L/s}\end{aligned}$$

$$\text{Estimate of peak flow} = 20\text{mm rainfall in 15min}$$

$$\begin{aligned}\text{max flow} &= 25.35 \text{ sq. M} \times 0.02 / (15 \times 60) \\ &= 0.000563 \text{ cu. M/s}\end{aligned}$$

$$\text{max flow} = 1 \text{ l/s}$$

$$\text{capacity of 100mm pipe laid at 1 in 100} = 6\text{l/s}$$

New building to provide SEN and Forest School Learning Pod

Building dimensions as drawing 1234.3.07C Proposed Learning Pod

161.92 sqm green roof area

100mm depth of sedum/moss/herbs provides an annual water retention average of 50%

$$161.92\text{sqm} / 2 = 80.96 \text{ sq.M}$$

$$27.29 \text{ sqm traditional flat roof} = 27.29 \text{ sq.M}$$

$$\text{Total} = 108.25 \text{ sq.M}$$

Planning condition requires sustainable urban drainage (suds) solution to cater for a 1 in 100 yr storm event and including a provision for the effects of climate change of 30% increase in rainfall

Rainfall data

The 1 in 100-year storm event with a 6 hour duration.

$$\begin{aligned}\text{CIRIA suds design manual rainfall} &= 63.0 \text{ mm} \\ \text{add additional 30\%} &= 18.9 \text{ mm}\end{aligned}$$

$$\text{Total} = 81.9 \text{ mm}$$

$$\text{Design Rainfall Event} = 82.0 \text{ mm}$$

Sub - soil data

London Clay - assumed soil infiltration 2×10^{-7} m/s

Storage requirements to cater for the 6 hr storm event

Proposed Learning Pod

$$\begin{aligned}\text{required storage volume} &= 108.25 \times 0.082 \\ &= 8.87 \text{ cu.M}\end{aligned}$$

Possible solutions

Traditional soakaway 2.4m dia. x 2.4 m below incoming pipe level

$$\begin{aligned}\text{storage volume} &= 2.4 \times 4.52 \text{ cu.M/M} \\ &= 10.848 \text{ cu.M}\end{aligned}$$

Traditional soakaway 2.7m dia. x 1.8 m below incoming pipe level

$$\begin{aligned}\text{storage volume} &= 1.8 \times 5.725 \text{ cu.M/M} \\ &= 10.305 \text{ cu.M}\end{aligned}$$

Proprietary System

Naylor Metro cells system

3 cells per cu. Metre, allow for 0.95 void ration

$$\begin{aligned}\text{required volume of Metro cells} &= 8.87 / 0.95 \\ &= 9.33 \text{ cu.Metres}\end{aligned}$$

$$\begin{aligned}\text{Required number of Metro cells} &= 9.33 \times 3 \\ &= 28.0 \text{ cells}\end{aligned}$$

Metro cell units are 1m long x 1m wide x 0.33m deep installation would be 7 units long x 5 units wide

Trench soakaway with perforated pipe 1.5m deep x 0.75m wide
as (50%) of the effective depth

$$\begin{aligned}&= 2 \times 1.5 \times 0.5 \\ &= 1.5 \text{ sq.M per M run}\end{aligned}$$

$$\begin{aligned}\text{outflow over 6 hours} &= 1.5 \times 2 \times 10 \times 6 \times 60 \times 60 \\ &= 0.00648 \text{ l/M run of trench}\end{aligned}$$

$$\begin{aligned}20 \text{ m long trench outflow} &= 20\text{m} \times 0.00648 \\ &= 0.1296 \text{ litres therefore negligible}\end{aligned}$$

$$\begin{aligned}\text{Storage within trench @ 30\% void ratio} &= 1.5 \text{ M} \times 0.75 \text{ M} \times 0.3 \times 20 \text{ M} \\ &= 6.75 \text{ cu.M/M}\end{aligned}$$

$$\begin{aligned}\text{Trench length required} &= 20 \text{ M} \times 8.87 / 6.75 \\ &= 26.28 \text{ M}\end{aligned}$$

say 27 linear M @ 1.5 M deep

Trench soakaway with perforated pipe 20 M x 2.5M deep with @ 30% void ratio

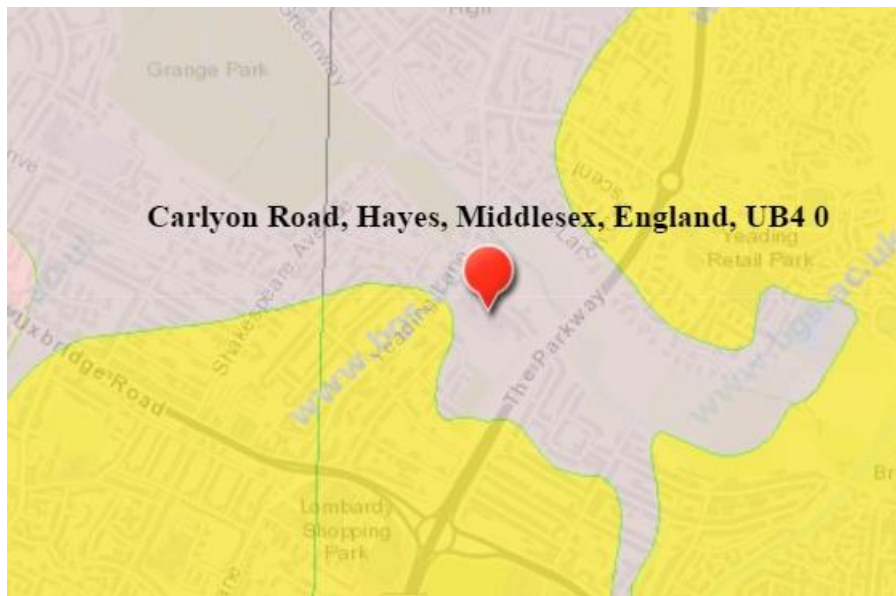
$$\begin{aligned}\text{storage volume} &= 20 \text{ M} \times 2.5 \text{ M} \times 0.75 \text{ M} \times 0.3 \\ &= 11.25 \text{ cu.M}\end{aligned}$$

Concerns over the significant impact of the trench soakaway options on the grassed playing fields area.

For the new Learning Space attached to the school, and the New Learning Pod combined with rainwater butts to collect rainwater for the raised growing beds close to the learning pod. the buried cell soakaway has minimum surface area of disruption to the grassed area.

Ideally the cells could be placed below the new polytunnel site, see drawing 1234.3.12

Site Geology



Key

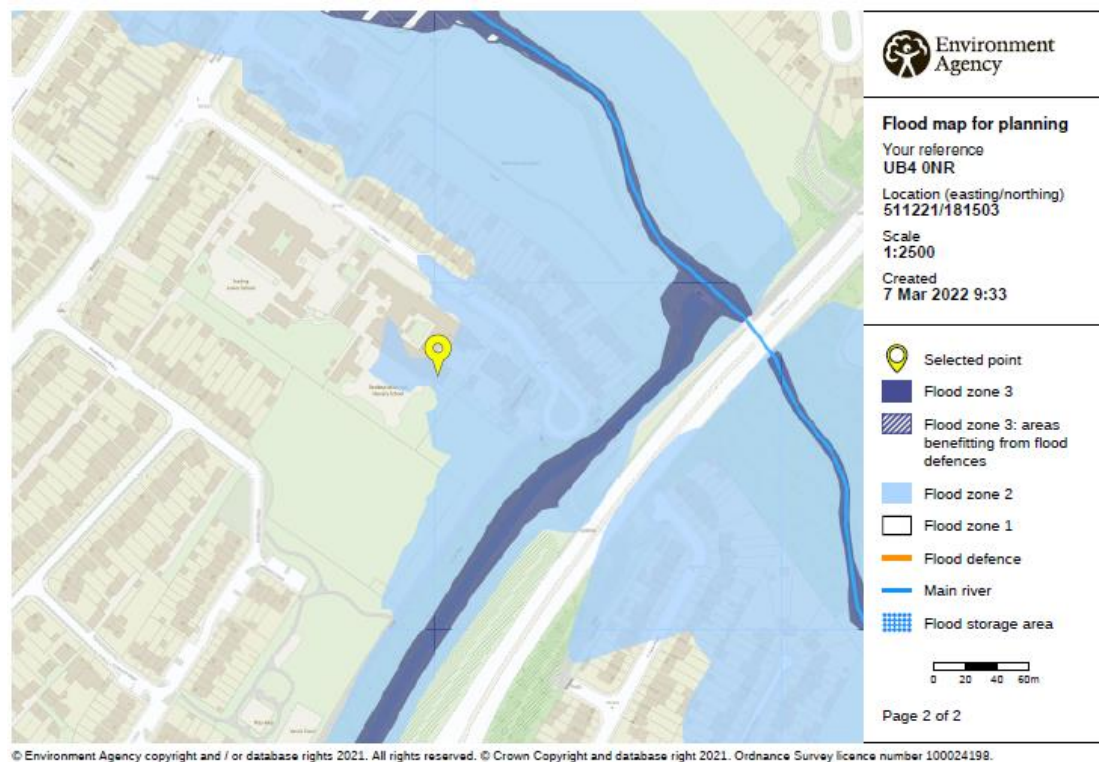
Superficial deposits

- ALLUVIUM - CLAY, SILT, SAND AND GRAVEL
- KEMPTON PARK GRAVEL MEMBER - SAND AND GRAVEL
- LANGLEY SILT MEMBER - CLAY AND SILT
- LYNCH HILL GRAVEL MEMBER - SAND AND GRAVEL
- TAPLOW GRAVEL MEMBER - SAND AND GRAVEL
- BOYN HILL GRAVEL MEMBER - SAND AND GRAVEL

Bedrock geology

- LONDON CLAY FORMATION - CLAY AND SILT
- LONDON CLAY FORMATION - CLAY, SILT AND SAND

Site Flood Zone



The location shown is in zone 2 with a medium probability of flooding.

The water compatible less vulnerable and more vulnerable uses of land and essential infrastructure are appropriate in this zone, education buildings fall into the more vulnerable category. Table 3 of the NPPF clarifies the development proposed is appropriate to the classification of the flood zone.

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	✗	✗	✗

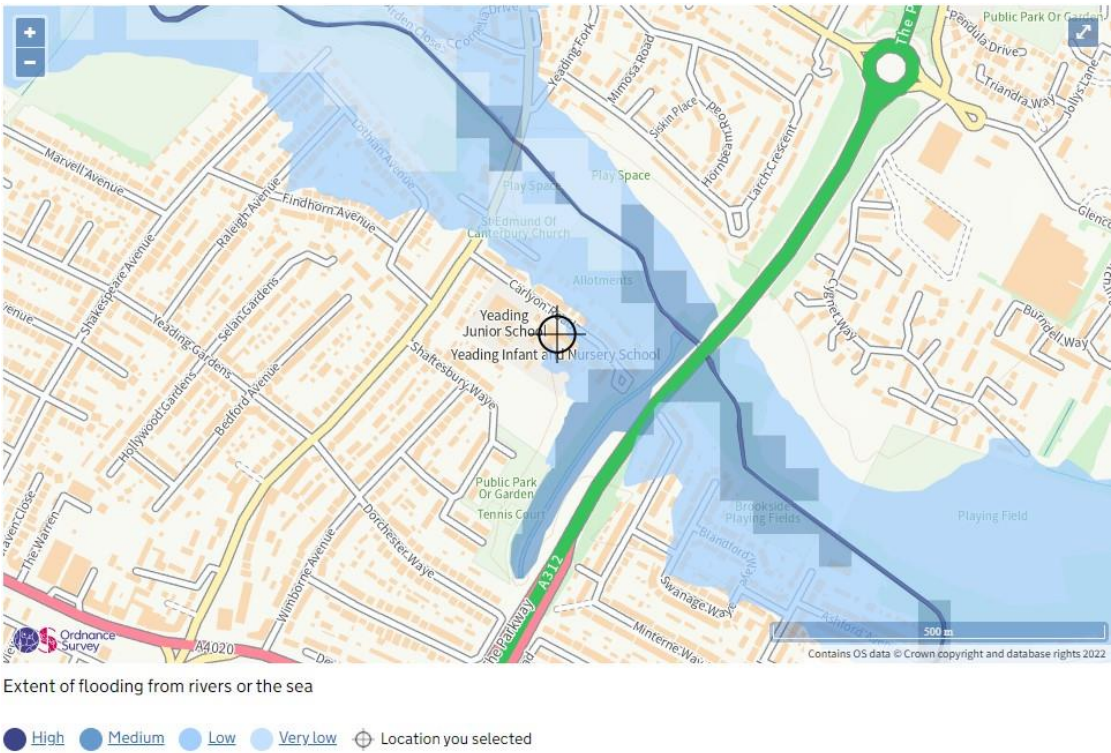
Key:

- ✓ Development is appropriate.
- ✗ Development should not be permitted.

Extent of Surface Water Flood Risk



Extent of River Water Flood Risk



The extent of flooding has been assessed, the zone rating and Suds proposals outlined will manage and mitigate the surface water drainage, combined with an ongoing site maintenance programme implemented by the school management team to ensure all onsite surface water drainage is kept clear of silt and debris. This ensures that the drainage remains efficient at all times.

Planning

The application sits within the parameters outlined in the recent changes to permitted development rights which came into force on 21 April 2021 allow for bigger extensions to existing schools without the requirement to apply for planning permission.

From 21 April 2021, the erection, extension, or alteration of a school building is permitted development provided that:

- The footprint of the extended/new building is no more than 25% of the footprint of the existing building (as it was on 21 April 2021) or 250sqm, whichever is greater.
- the proposed development is not within 5m of the boundary of any residential facilities.
- The height of any new building does not exceed 6m (or 5m if within 10m of a boundary of the curtilage of the premises).
- The height of the building if extended or altered does not exceed its existing height (but if within 10m of the boundary of the curtilage it cannot exceed the lesser of 5m or its existing height).
- The height of any rooftop structure does not exceed 1.5m.
- Any land within the premises which has been used as a playing field in the last five years (and is still used for this purpose) could continue to be used as a playing field after the development has taken place.
- The building in question is not listed or in the curtilage of a listed building.
- The development is within the curtilage of buildings where the predominant use is for the provision of education and the new building will also be used for this purpose (or purposes incidental to it).
- where a new or altered school building will result in an increase to the school's published admission number, a travel plan (a framework for delivering sustainable travel to and from the school) is required to be submitted to the local planning authority (LPA) within six months of completion of the extension.

The changes to permitted development rights will potentially help to deliver more classroom space and/or enhanced facilities by enabling schools to extend more quickly and easily, particularly as a response to the pandemic and other changing circumstances.

Conclusion

The addition of the new Learning Space and Learning Pod will sit well in the site. There is no loss of amenity to the school, and the proposed works are within the 25% allowable additional floor area. The proposal complies with the current planning policies and will have a negligible impact upon the locality.