Eckersley
O'Callaghan

St Catherine's School, Twickenham
Flood Risk Assessment and SUDS Statement

Issue P02

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Contents

1 Summary

1.1 Guidance documents

This report has been prepared using the following documents:

— Richmond Strategic Flood Risk Assessment, March 2021
— The Environment Agency
— British Standard 12056: Gravity drainage systems inside buildings, 2000

1.2 Introduction

The aim of this report is to demonstrate that the proposed development at St Catherine's School will not increase the flood risk to this local site or any properties downstream. The flood risk to the site from a number of sources has been assessed. The proposed surface water and foul water schemes have been outlined and will be fully designed once planning permission has been granted and a geotechnical investigation survey for the site has been performed.

2 Existing site

2.1 Location

The site is located in Twickenham area of Greater London, see Figure 1. The site is part of St Catherine's School and comprises several school buildings. The site is bordered to the north and south by the roads Grotto Road and Pope's Grove respectively.

The surrounding area is predominantly residential, with some small retail businesses. The nearest surface water is the river Thames, which is located approximately 60 m to the east and is flowing from south to north.

Figure 1 – Site location plan – Source: Google Earth

2.2 Site boundary

The St Catherine's school lies in a plot approximately 1.4 hectares. The A310 runs along its east elevation; Grotto Rd runs along its north elevation and the plot is surrounded by residential blocks to the south.

The proposed development sits between the main school building and The Lodge building, replacing the existing music school building and an existing extension to The Lodge which are proposed to be demolished. (See Figure 2).

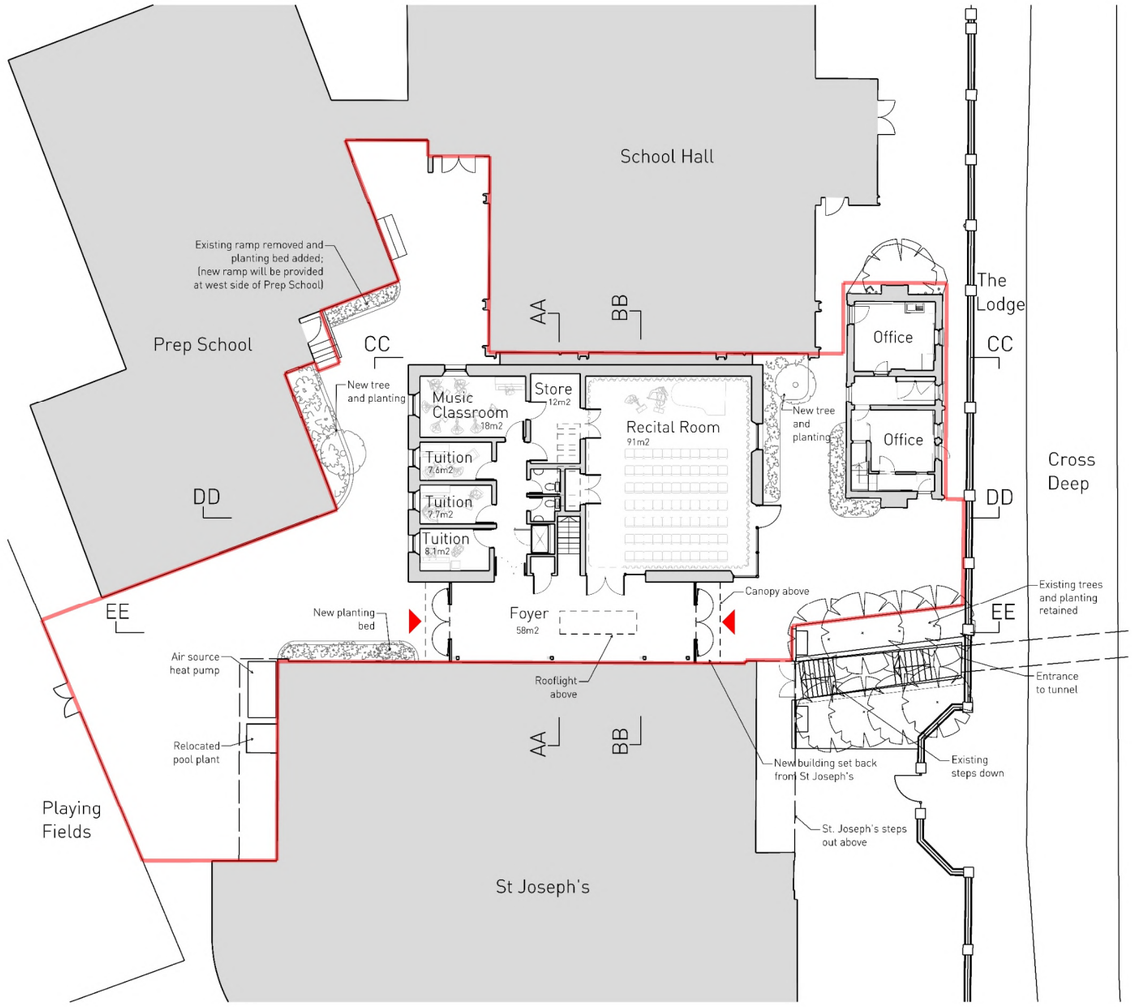


Figure 2 – Site boundary of proposed development has been highlighted in red.

2.3 Existing buildings and landscape

The campus has a number of existing buildings along Cross Deep and Popes Grove Streets, two of which will be demolished to enable the construction of the proposed development.

Figure 3 – Existing buildings surrounding the proposed development (in red the buildings proposed to be demolished)

The existing development site is surrounded by hard landscaping (asphalt) as shown in Figure 4.

The surface water from the existing building roofs and the impermeable paving is collected and taken to the existing soakaways located to the west of the plot towards the playing field (See Figure 5).

Figure 5 shows the extract of the existing drainage plan from AKS Ward Construction Consultant relating to the works carried out in the neighbouring St Josephs Building – Senior School & Sixth Form for planning application in 2009. It shows a partial footprint area of the new proposed works which are located to the north of the area shown.
There is an existing soakaway between The Lodge and the Swimming Pool building to the south which serves St Josephs Building.

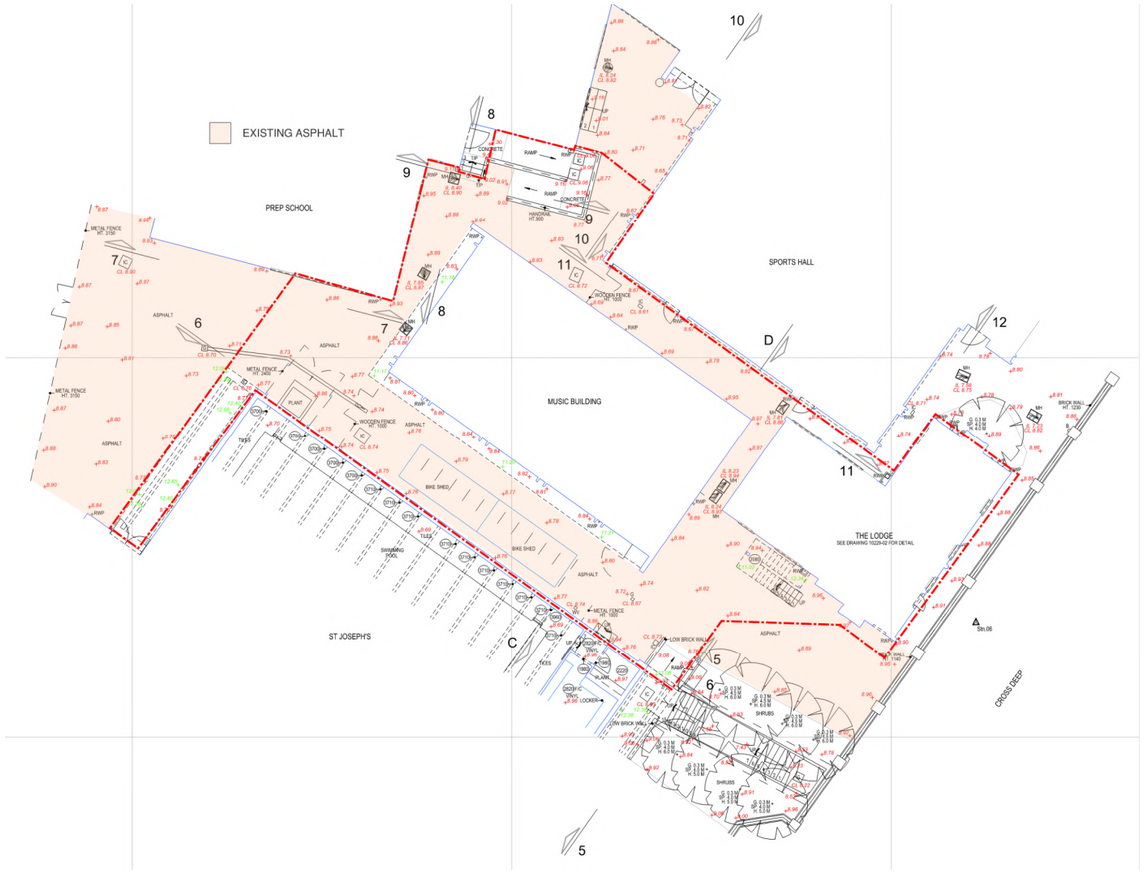


Figure 4 – Existing development site plan highlighting the hard landscaping around the existing music building – Extract from Survey Drawing. Outline in red indicates existing site boundary.

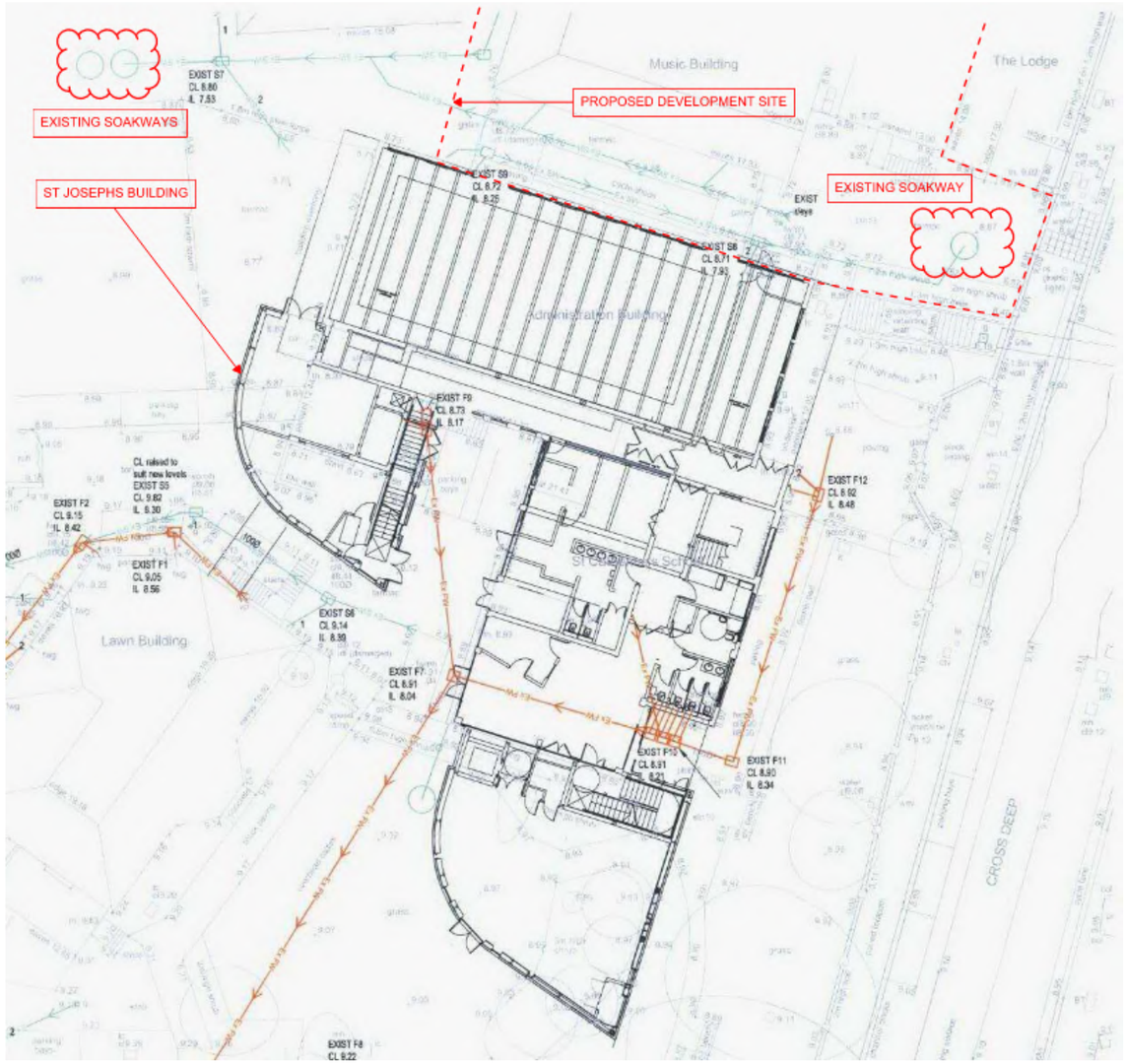


Figure 5 - The existing plan drainage drawing from AKS Ward showing the existing soakaways (clouded in red).

2.4 Ground conditions

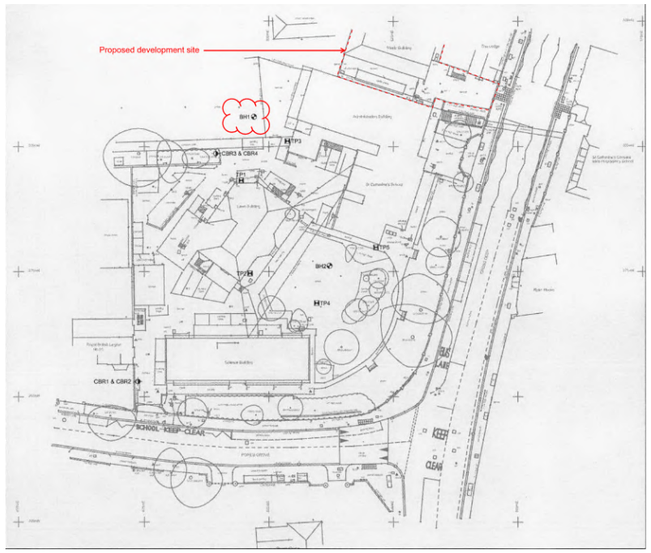
St Catherine's School is located on an area of Langley Silt Member, described as sandy clay and silt ('Brickearth') with London Clay Formation below.

Figure 6 – Superficial surface geology map. St Catherine's School is indicated by the red pin, taken from BGS

Figure 7 – Bedrock geology map. St Catherine's School is indicated by the red pin, taken from BGS

A geotechnical investigation for the site and a number of trial pits will be performed before detailed design commences to assess the existing foundations to the neighbouring buildings.

A borehole near the proposed development site has been performed during the Site Investigation in 2009 which shows the ground conditions. The borehole (BH1) is located not far from the site towards the playing field and therefore we believe that the same ground conditions can be considered for the new development.



Contract: St Catherines Sixth Form, Twickenham		Client: AKS Ward		Borehole: BH1
Contract Ref: 723426	Start: 11.08.09 End: 11.08.09	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 2

Samples and In-situ Tests Depth	No	Type	Results	Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
						MADE GROUND: Grass over TOPSOIL of brown clayey slightly gravelly SAND. Gravel is subangular to subrounded fine to coarse chert.	0.10	
0.50	1	D				MADE GROUND: Brown slightly silty slightly gravelly SAND. Gravel is angular to subangular fine to coarse brick and chert.	(0.65) 0.75	
						Medium dense brown very silty gravelly SAND. Gravel is angular to subrounded fine to coarse chert. (River Terrace Deposits)		
1.20-1.65	2	SPT	N=16				(1.25)	
1.20-1.70	3	B					2.00	
2.00-2.45	4	SPT(c)	N=8			Loose brown very silty gravelly SAND. Gravel is angular to subrounded fine to coarse chert. (River Terrace Deposits)		
2.00	4	D					(0.90)	
						Firm dark grey medium strength CLAY. Contains frequent fine gypsum crystals. (London Clay Formation)	2.90	
3.00	5	D						
3.50-3.95	6	SPT	N=13			... thinly laminated from 3.50m depth.	(1.80)	
4.50	7	D					4.70	
4.50	8	$U_{(100)}$	65 blows			Stiff becoming very stiff dark grey CLAY. Contains frequent fine gypsum crystals and occasional white nodules. (London Clay Formation)		
5.00	9	D						
5.00		HP	c_u=175/175/200					
6.00	10	$U_{(100)}$	70 blows				(2.90)	
6.50	11	D						
7.50	12	$U_{(100)}$	0% recovery				7.60	
7.60	13	D				Medium strength dark grey MUDSTONE containing occasional 1-2mm veins of gypsum. (London Clay Formation)	8.00	
8.25	14	D				Very stiff dark grey high strength CLAY. Contains frequent fine gypsum crystals and occasional white nodules. (London Clay Formation)		
8.25		HP	c_u=>200/>200/>200					
8.50	15	$U_{(100)}$	90 blows					

Figure 8 – Extract of the Hole Location Plan and Borehole Log from previous SI (2009) by AKS Ward. Water table is at -2.3 m BGL.

2.5 Topography

The site is at an elevation of 12 metres above sea level, see Figure 6. The land slopes from west to east. The River Thames runs along the low-lying land.

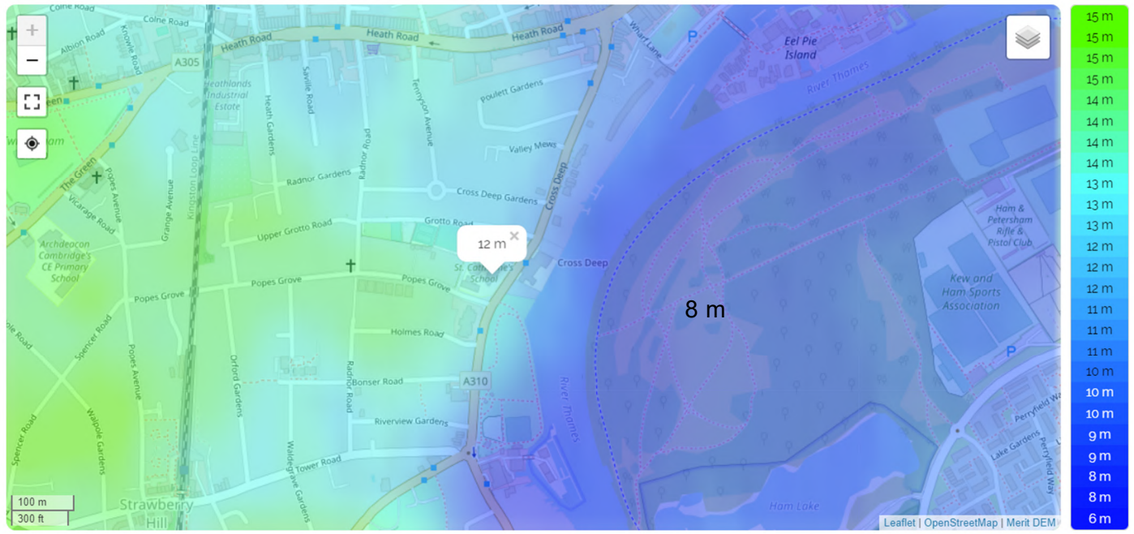


Figure 9 – Local topography, St Catherine's School indicated by grey arrow, taken from www.en-gb.topographic-map.com/places/DA1-2JT-3953367/

3 Proposed development

3.1 Description

The proposed development is a new two-storey building providing art and music classrooms. The total footprint of the building is 270m^2, see Figure 10 (Outline of the development site highlighted in red).

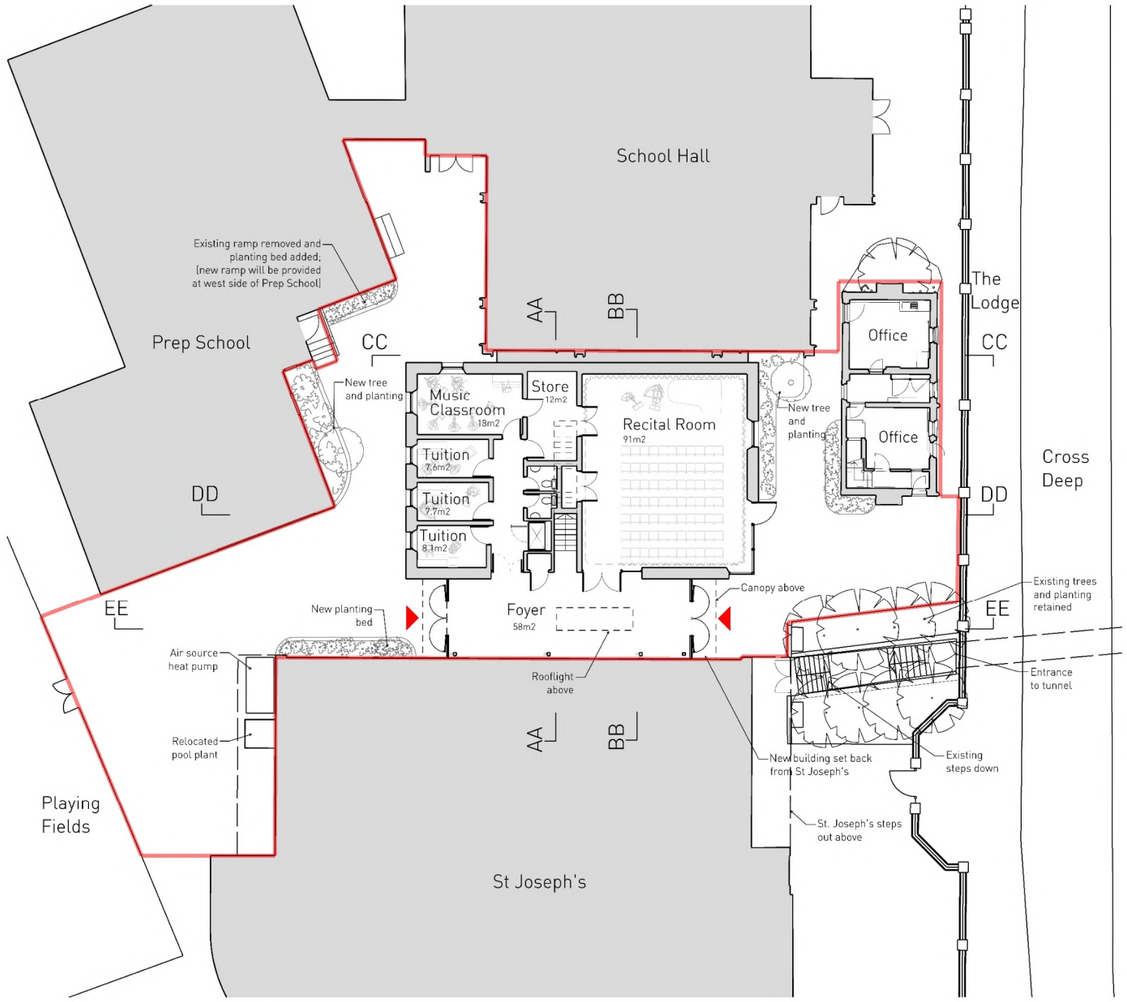


Figure 10 – Proposed Music and Art Building - Ground floor plan, from Tim Ronalds Architects.

Minor works will be performed to create hard landscaping over the footprint of the demolished building by creating a new paved courtyard which will provide access to the building. Soft landscaping (approximately 33 m2 of planting beds) will be introduced as part of the development – See Figure 11.

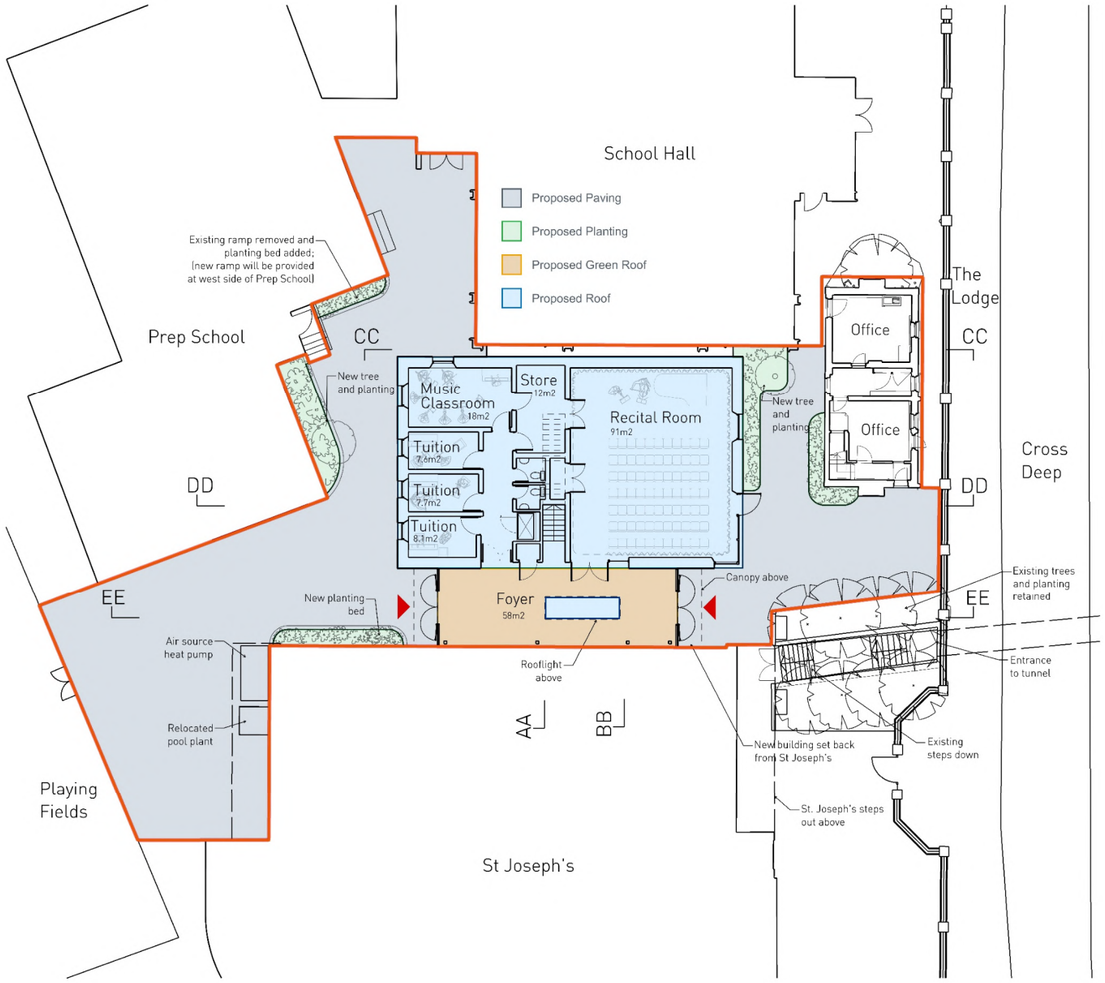


Figure 11 – Mark-up on the Architects Ground floor plan showing the hard landscaping, the new covered area and the soft landscaping of the proposed development.

3.2 The Sequential Test and the Exception Test

As the development is located within flood risk zone 1, and is a minor development, neither the Sequential test nor the Exception test are required.

4 Definition of the flood hazard

4.1 Flood zone

St Catherine's School lies in Flood Zone 1, see Figure 12. The Environment Agency states that properties within this zone have a low probability of flooding.

"Flood risk" is a combination of the probability and the potential consequences of flooding. Areas at risk of flooding are those at risk of flooding from any source, now or in the future. Sources include rivers and the sea, direct rainfall on the ground surface, rising groundwater, overwhelmed sewers and drainage systems, reservoirs, canals and lakes and other artificial sources. Flood risk also accounts for the interactions between these different sources.

For areas at risk of river and sea flooding, this is principally land within Flood Zones 2 and 3 or where a Strategic Flood Risk Assessment shows it will be at risk of flooding in the future. It can also include an area within Flood Zone 1 which the Environment Agency has notified the local planning authority as having critical drainage problems.

St Catherine's School is located in an area within Flood Zone 1, However, a Flood Risk Assessment will be required for planning as the site sits within critical drainage area – See Figure 13.

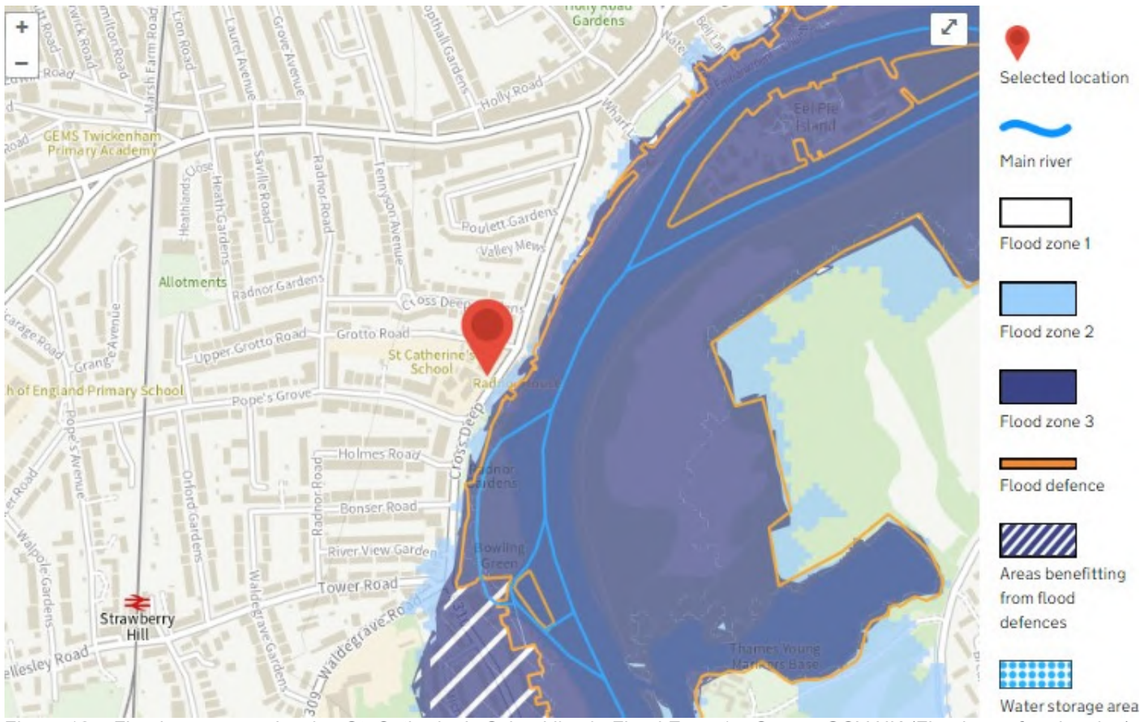


Figure 12 – Flood zone map showing St. Catherine's School lies in Flood Zone 1 – Source GOV UK (Flood map for planning)

Figure 13 – SFRA Map showing the critical drainage area over the development site – Source: Richmond SFRA

4.2 Sources of flooding

The risk of flooding due to the following sources has been assessed using the Environment Agency flood maps:

- River and tidal flooding
- Groundwater flooding
- Reservoir flooding
- Surface water flooding
- Sewer flooding

Both the risk to the proposed development and its impact on downstream properties have been assessed.

4.2.1 River and tidal flooding

St Catherine's School in Twickenham is not at risk from river and tidal flooding, see Figure 14.

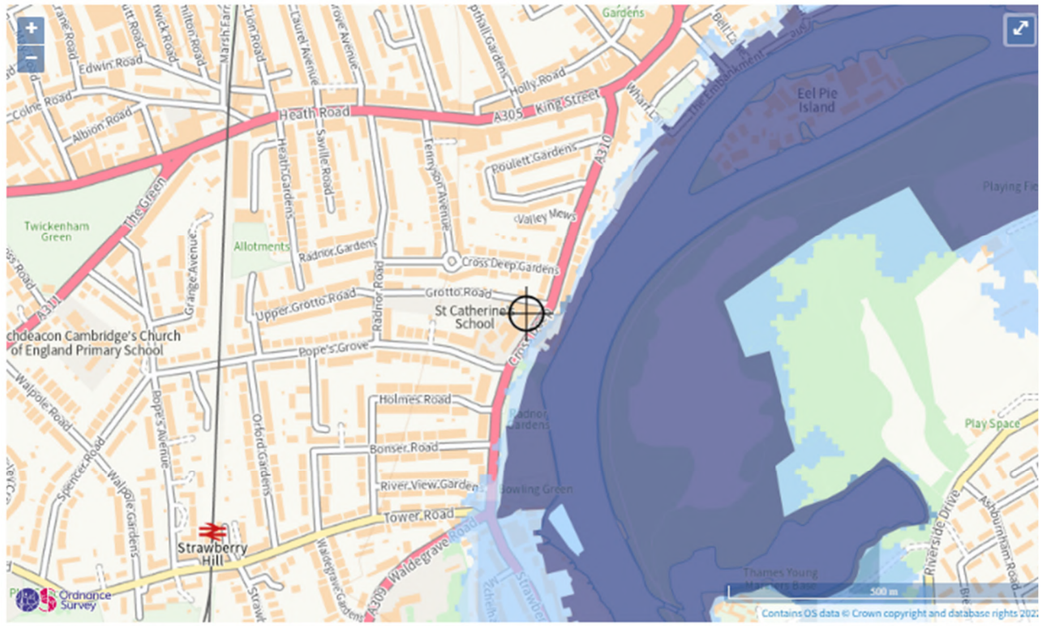


Figure 14 – Map of flood risk from rivers or the sea showing that St Catherine's School is not at risk – Source GOV.UK (Flood map for planning)

4.2.2 Groundwater flooding

Groundwater flooding occurs because of the underground water table rising, which can result in water emerging through the ground and causing flooding. This source of flooding tends to occur after extensive periods of heavy rainfall, potentially occurring for weeks or months. During these periods, a greater volume of water infiltrates through the ground, causing an underlying aquifer to rise above its regular depth below the ground's surface. Springs and low-lying areas, where the water table is likely to be closer to the surface, pose greater risk of groundwater flooding. Groundwater flooding can occur in areas where the underlying soil and bedrock can become saturated with water. Therefore, ground composition and aquifer vulnerability are significant influences on the potential rate of groundwater flooding

The Richmond SFRA Map shows that St. Catherine's School site is in an area susceptible to Groundwater Flood between 50% and 75%.

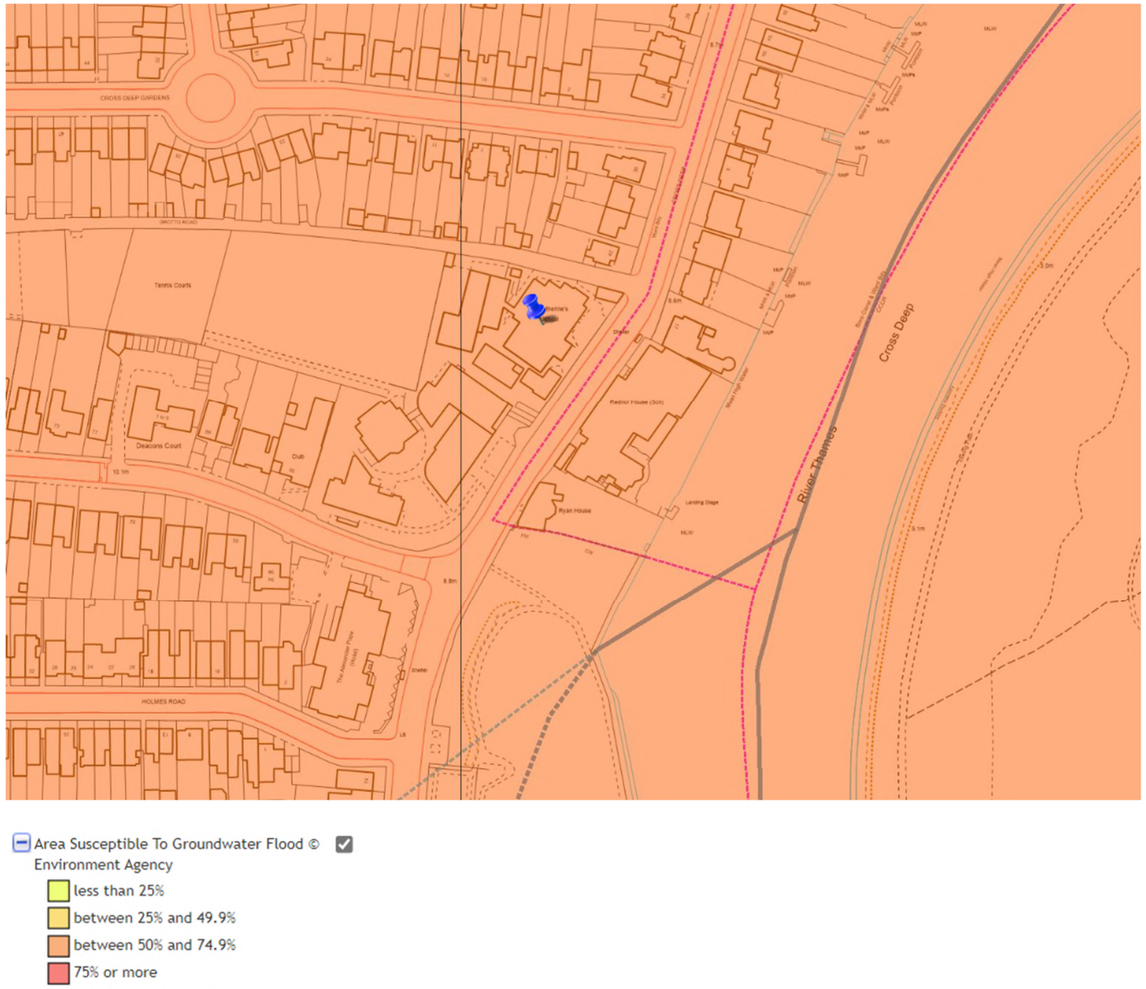


Figure 15 – Blue pin shows location of St Catherine's School – Source London Borough of Richmond Upon Thames

As shown on the above map, the risk is general to a large area around the development site, and it is not local. There is no new basement in the proposed scheme, and we believe that this does not represent a major risk to the proposed development.

4.2.3 Reservoir flooding

It is noted that there is a risk of flooding from reservoirs which affects a large area around the development site (included) – See Figure 16 below. Flooding from reservoirs is extremely unlikely therefore, this should not be a concern.

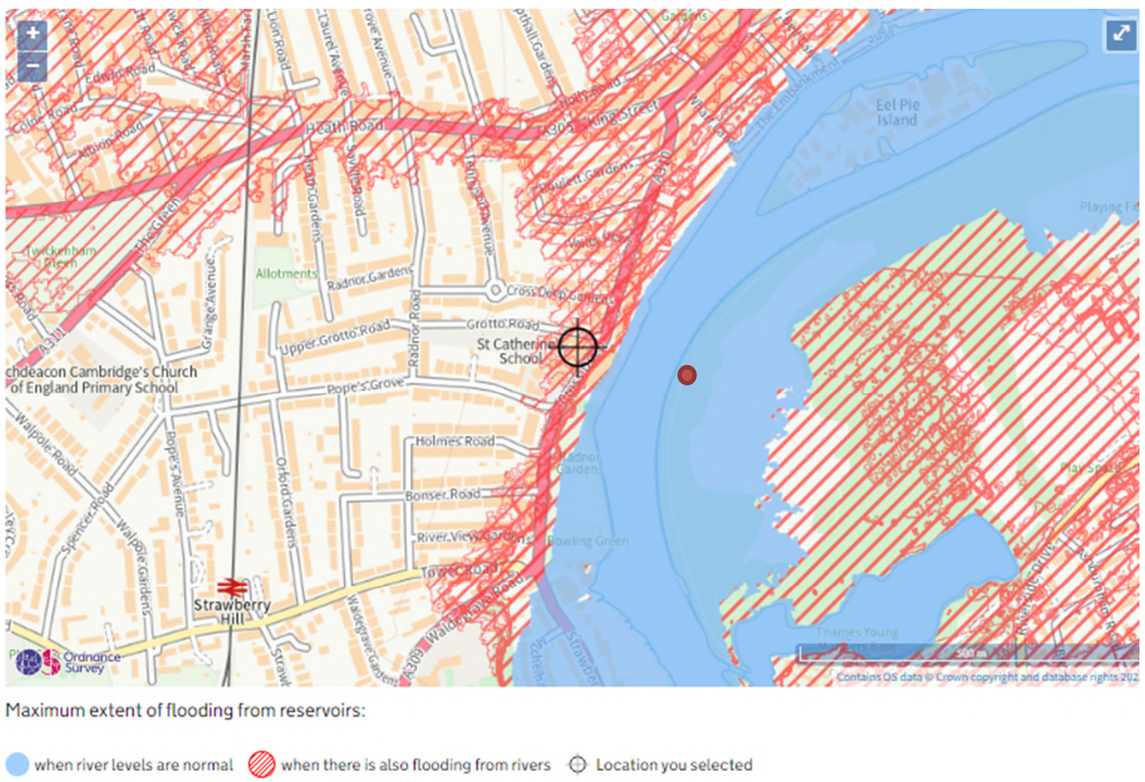


Figure 16 – Map of flood risk from reservoirs showing that St Catherine's area is at risk of flooding from reservoirs – Source GOV UK (Flood map for planning)

4.2.4 Surface water flooding

Surface water flooding occurs as a result of high intensity rainfall where water ponds or flows over ground before entering the underground drainage network or a watercourse. Ordinary watercourse flooding occurs under similar circumstances but is associated with non-main river watercourses or ditches. Surface water flooding is often exacerbated by the intensity or duration of the rainfall event overwhelming drainage points, leaving soil, drainage channels and other drainage systems incapable of draining water away at a sufficient rate. Extreme weather conditions can also lead to ordinary watercourses exceeding their capacity, overwhelming systems, and causing water to flow onto land.

The proposed building is at high risk from surface water flooding, see Figure 17.

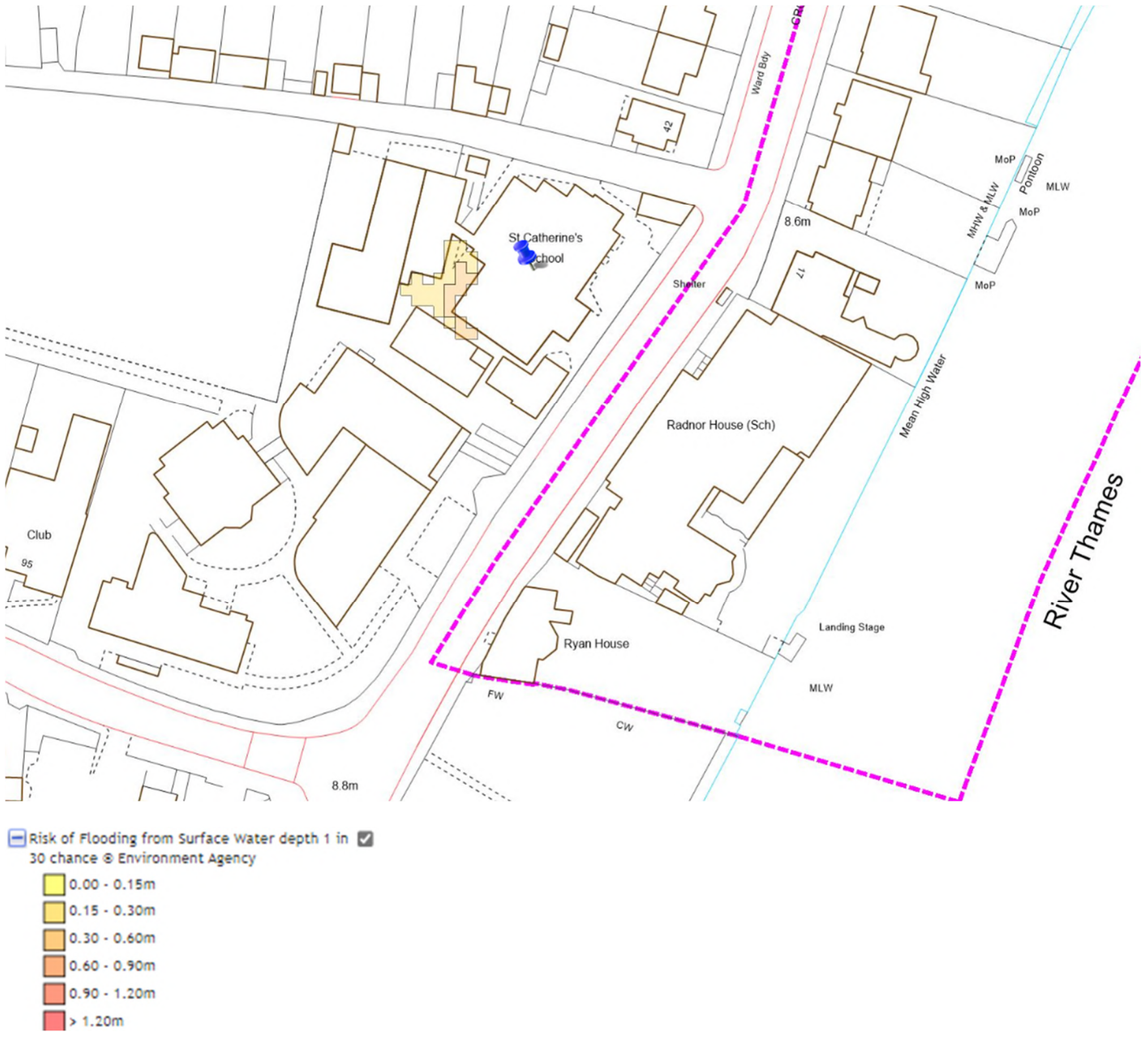


Figure 17 – Map of flood risk from surface water for St Catherine's School area – Source London Borough of Richmond Upon Thames

The proposed development will not worsen the existing condition with regards to surface water flooding. The above risk is very local between the existing buildings, and we believe it is due to local issues with falls and lack of gullies. The external landscaping will be ungraded as part of the project with upgraded falls and gullies.

The existing drains run to the nearby soakaways to the west and the proposed impermeable area is less than the existing. Therefore, we believe that the existing 2 No. soakaways should be sufficient - Refer to Figure 18.

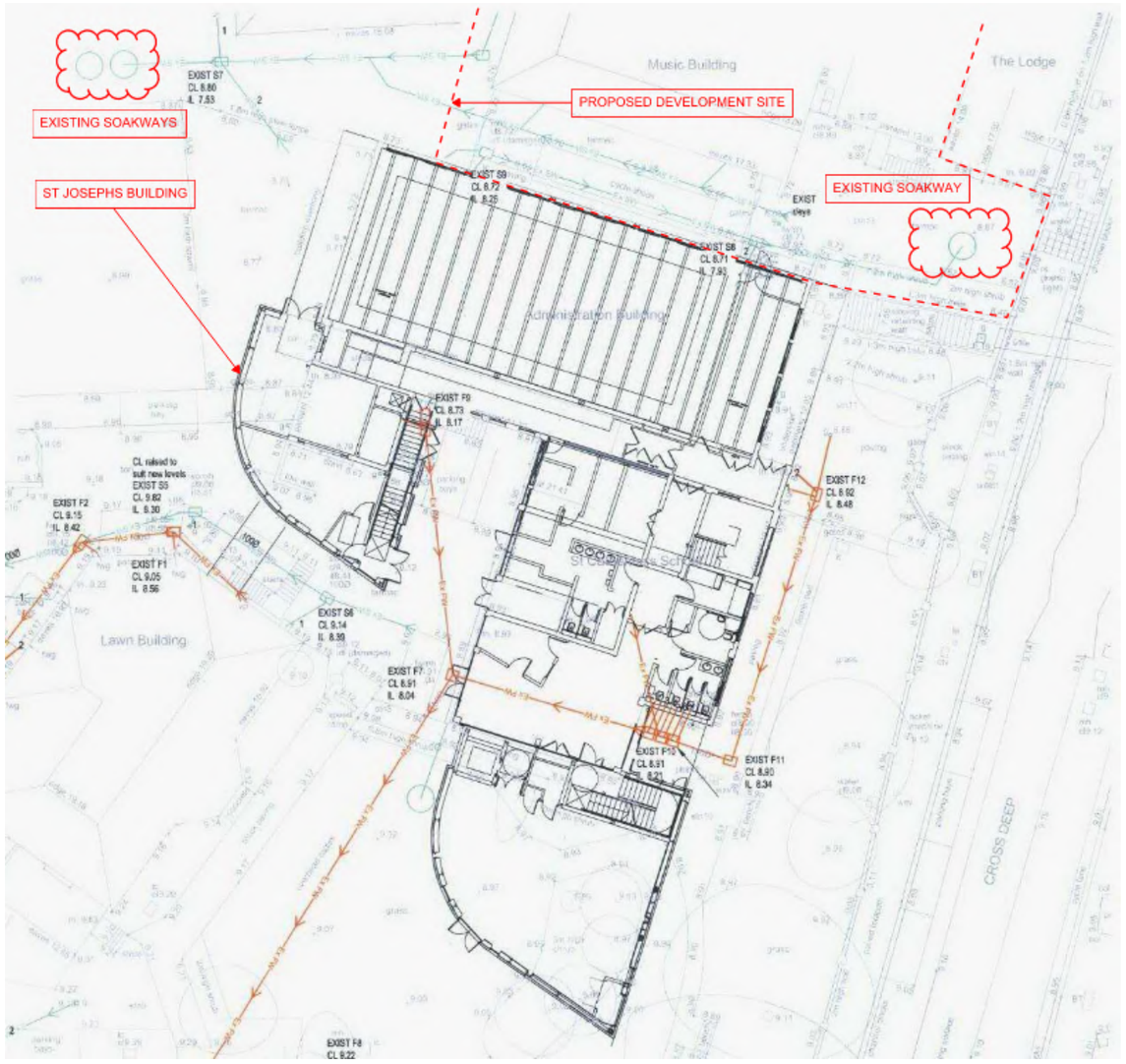


Figure 18 - The existing plan drainage drawing from AKS Ward showing the existing soakaways (clouded in red to the west).

4.2.5 Sewer flooding

Sewer flooding can occur due to drainage system infrastructure failure. Flooding can also occur due to an increased flow and volume of water entering a sewer system, resulting in the system exceeding its hydraulic capacity and surcharging as a result. If sewer outfall points are either blocked or submerged due to high water levels, water can back up in a sewer system and cause flooding. These issues can result in water overflowing from gullies and manholes, causing flooding in the local area. Blockages caused by sediment or debris can further exacerbate the probability of sewer flooding.

The SFRA map for Richmond indicates that 0-10 recorded sewer flooding incidents have occurred within the St Catherine's School area. The relevant Water and Sewerage Company must be consulted to confirm if the development site has historically flooded.

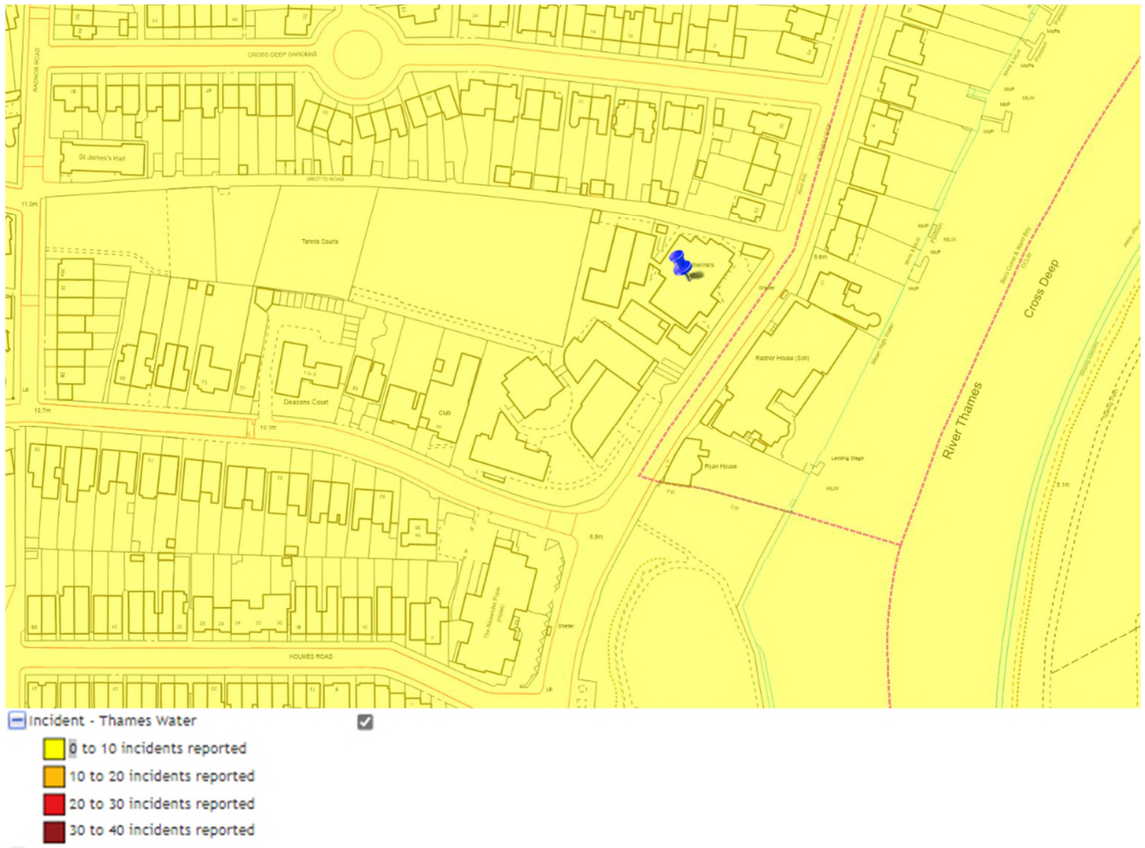


Figure 19 – Map showing recorded sewer flooding incidents near the site – Source GOV UK (Flood map for planning)

4.2.6 Summary of Flood Risk to the Development Site

Source of Potential Flooding to the Development Site	Flood Risk	Mitigation/Comments
River and tidal flooding	Very Low	No mitigation required
Groundwater flooding	High	No mitigation required
Reservoir flooding	Normal	No mitigation required
Surface water flooding	High	New landscaping and improved local drainage systems will mitigate the risk
Sewer flooding	Low	No mitigation required

Table 1: Summary of Flood risks to the site

5 Surface water drainage strategy

5.1 Permeable and impermeable surfaces

The areas covered by buildings and hard and soft landscaping have been measured from the Architect's plan drawings for the existing and proposed conditions. This is summarised in the table below.

	Existing (m^2)	Proposed (m^2)
Total area of site	788	788
Roofs	318	373 (inc. 48sqm green roof)
Hard landscaping	470	382
Soft landscaping	0	33
Permeable areas	0	33
Impermeable areas	788	755

Table 2: Permeable and impermeable surfaces

There is a minor reduction of impermeable areas between the existing and the proposed development which will improve the existing development site by introducing planting areas.

5.2 Existing surface water scheme

A record drawing from 2009 gives information of how the existing surface water system for St Catherine's School is functioning, see Figure 18 on the next page. The surface water run off from the roofs of some of the existing buildings and hard landscaping is directed to three soakaways. The capacities of these is unknown but the soakaway testing, undertaken by Ground Condition Consultants in September 2018, have confirmed that the infiltration drainage is suitable at the site.

A CCTV drainage survey will be conducted to understand the layout of the existing system.

5.3 SuDs

Richmond Council requires new developments to follow the guidance outlined in their Drainage and Planning Policy Statement. This document is based on the National Planning Policy Framework which favours sustainable urban drainage techniques (SuDs) as a means of surface water disposal.

In order to reduce the risk of surface water and sewer flooding, all development proposals in this borough are required to follow the London Plan drainage hierarchy:

- Store rainwater for later use
- Use infiltration techniques, such as porous surfaces in non-clay areas
- Attenuate rainwater in ponds or open water features for gradual release
- Attenuate rainwater by storing in tanks or sealed water features for gradual release
- Discharge rainwater direct to a watercourse
- Discharge rainwater to a surface water sewer/drain
- Discharge rainwater to the combined sewer

The proposed development should not produce surface water discharge which will cause a flood risk or possible surcharge flooding within the site or further downstream. The proposed surface water system will be detailed to ensure this requirement is met.

5.4 Proposed surface water drainage strategy

The proposed development consists of demolishing the existing buildings and building a new two-three-storey building. The impermeable area of the proposed development is less than the existing and therefore the existing 2 No. soakaways to the north-west of the site should be sufficient to serve the new roof and the hard landscape.
The infiltration rates have been tested by Ground Condition Consultants in September 2018 in the near playing field which has indicated an infiltration rate between 1.05×10^{-5} to 9.83×10^{-6} m/s.
The ground water level has been determined during the Site Investigation for the playing field in 2009 which has indicated the GWL being at approximately 2.4 m below ground level.

The rainwater from the roof will be collected from rainwater pipes at ground level and slot drains will collect the run-off from the hard landscaping, the surface water will then be directed to the existing soakaways.

6 Foul water drainage strategy

6.1 Foul water appliances

The number of foul water appliances for the proposed building have been counted. BS12056 gives a discharge rate for each appliance, and this has been used to calculate the peak wastewater flow rate for the system, see the table below.

$Q_{wastewater}=K\sqrt{\sum DU}$

Where K= reduction factor to allow for non-simultaneous use, BS 12056 gives 0.7 for schools

∑DU= sum of discharge units into the system

Appliance	DU per appliance	Number of appliances	DU total per appliance
Wash hand basin	0.3	6	1.8
WC with 6 litres cistern	1.2	2	2.4
Total discharge units			4.2
Peak wastewater flow $Q=K\sqrt{\sum DU}$ (litres/second)			**1.4**

Table 3: Wastewater flow in the proposed scheme

As per above table, the building will produce a wastewater flow of 1.4 l/s. This outflow will be connected to the existing system which discharges into the existing foul system as per drainage sketch below (Figure 23).

Appliance	DU per appliance	Number of appliances	DU total per appliance
Wash hand basin	0.3	3	0.9
WC with 6 litres cistern	1.2	4	4.8
Total discharge units			5.7
Peak wastewater flow $Q=K\sqrt{\sum DU}$ (litres/second)			**1.7**

Table 4: Wastewater flow in the existing scheme

The proposed total discharge units are less than the existing units and therefore the proposed wastewater flow is lower than the existing.

A pre-development enquiry will be submitted to Thames Water to check that there is capacity in the existing main sewer to serve the proposed development. Given that existing buildings on the site will be demolished to enable the development, it is considered that there is sufficient capacity in the main sewer to carry the 1.4 l/s.

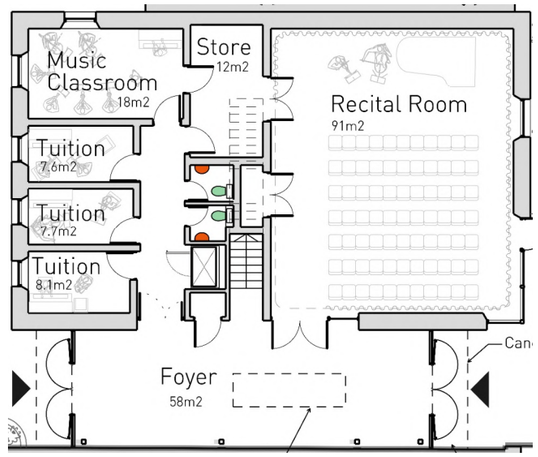


Figure 20: Ground Floor extract from TRA showing the wash hand basin (in red) and WC units (in green)

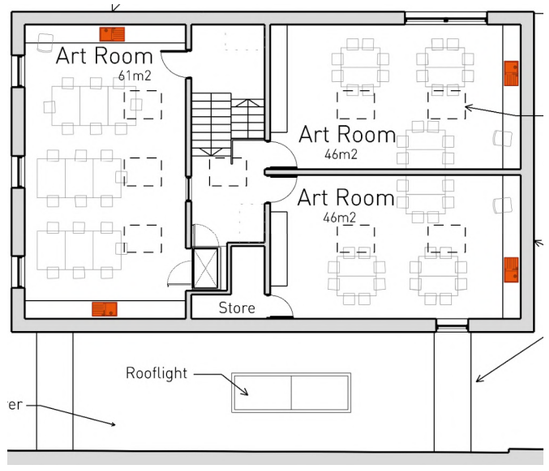


Figure 21: First Floor extract from TRA showing the wash hand basin (in red)

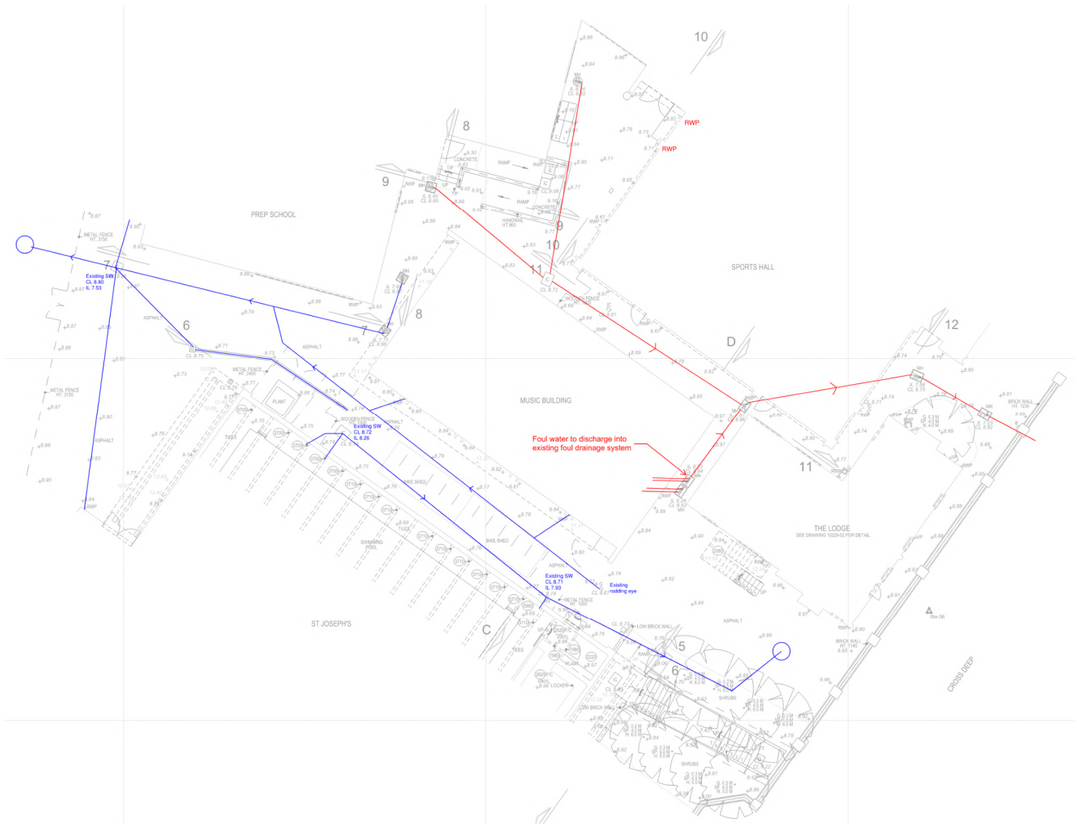


Figure 22 – Mark-up of the existing drainage on the survey plan extract of the site

7 Flood risk management measures

The new development site lies within Flood zone 1. However, due to the site being within the critical drainage area, there is a risk of flooding. We believe that this can be mitigated by the new landscape and by improving the local drainage system around the development site.

8 Conclusions

— St Catherine's School lies in Flood Zone 1 and the risk of flooding from various sources has been assessed. The proposed works will not increase the risk from any of these sources.

— The proposed development will cause a reduction the impermeable area on the site, replaced by planting areas.

— The proposed surface water scheme uses two soakaways to the west to infiltrate the surface water run-off from the roof and hard landscaping into the soil. The size of the existing soakaways should be sufficient and should not need to be increased.

— See Appendix C for local and site wide drainage layouts.

9 Appendix

Appendix A – St Catherine's School Existing drainage drawings

Appendix B – Foul water appliances marked up on general arrangements

Appendix C – Existing Topographical Survey Drawing

Appendix A – St Catherine's School Existing drainage drawings

515990.000 E | 516010.000 E | 516030.000 E

172810.000 N

172790.000 N

172770.000 N

PREP SCHOOL

MUSIC BUILDING

SPORTS HALL

ST JOSEPH'S

THE LODGE
SEE DRAWING 10229-02 FOR DETAIL

Existing SW
CL 8.80
IL 7.53

Existing SW
CL 8.72
IL 8.26

Existing SW
CL 8.71
IL 7.93

Existing
rodding eye

RWP

RWP

METAL FENCE
HT. 3150

METAL FENCE
HT. 2400

METAL FENCE
HT. 1000

WOODEN FENCE
HT. 1800

BRICK WALL
HT. 1230

BRICK WALL
HT. 1140

LOW BRICK WALL

ASPHALT

TILES

PLANT

SHRUBS

BIKE SHED

SWIMMING
POOL

CONCRETE

RAMP

HANDRAIL
HT. 900

LOCKER

CROSS DEEP

Stn.06

NORTH

Eckersley O'Callaghan

Project Name: St Catherine's School, Twickenham

Project Number: 22169

Sketch Number: STC-EOC-SK221031

By: PM

Date: 31.10.2022

Appendix B – Foul water appliances marked up on general arrangements

NOTE: HATCH IN RED REPRESENTS THE HAND BASIN UNITS AND THE HATCH IN GREEN REPRESENTS THE WC UNITS IN THE PROPOSED SCHEME - MARK-UP ON TRA PLAN DRAWINGS

School Hall

Existing ramp removed and planting bed added; (new ramp will be provided at west side of Prep School)

Prep School

CC

AA

BB

New tree and planting

Music Classroom 18m2

Store 12m2

Recital Room 91m2

Tuition 7.6m2

Tuition 7.7m2

Tuition 8.1m2

New tree and planting

Office

Office

The Lodge

CC

DD

Cross Deep

DD

EE

New planting bed

Foyer 58m2

Canopy above

Existing trees and planting retained

EE

Air source heat pump

Rooflight above

Entrance to tunnel

Relocated pool plant

AA

BB

New building set back from St Joseph's

Existing steps down

St. Joseph's steps out above

Playing Fields

St Joseph's

N

0 5m

Eckersley O'Callaghan

Project Name: St Catherines School, Twickenham
Project Number 22169
Sketch Number: STC-EOC-SK221027
By: KJ
Date: 27.10.2022

DRAFT

Rev	Date	Status/Notes
J	06.11.23	2nd Planning Application DRAFT
H	03.07.23	2nd Planning Pre-Application Submission
G	29.03.23	Reduced Scheme for Client Review
F	16.11.22	Planning Application
E	22.09.22	Client Review
D	15.09.22	Client Review
C	14.06.22	Client Review
B	20.05.22	Client Review
A	07.02.22	Planning Pre-Application Advice
*	09.08.21	Feasibility Study

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St Catherine's School
New Music & Art Building

Ground Floor Plan
As Proposed

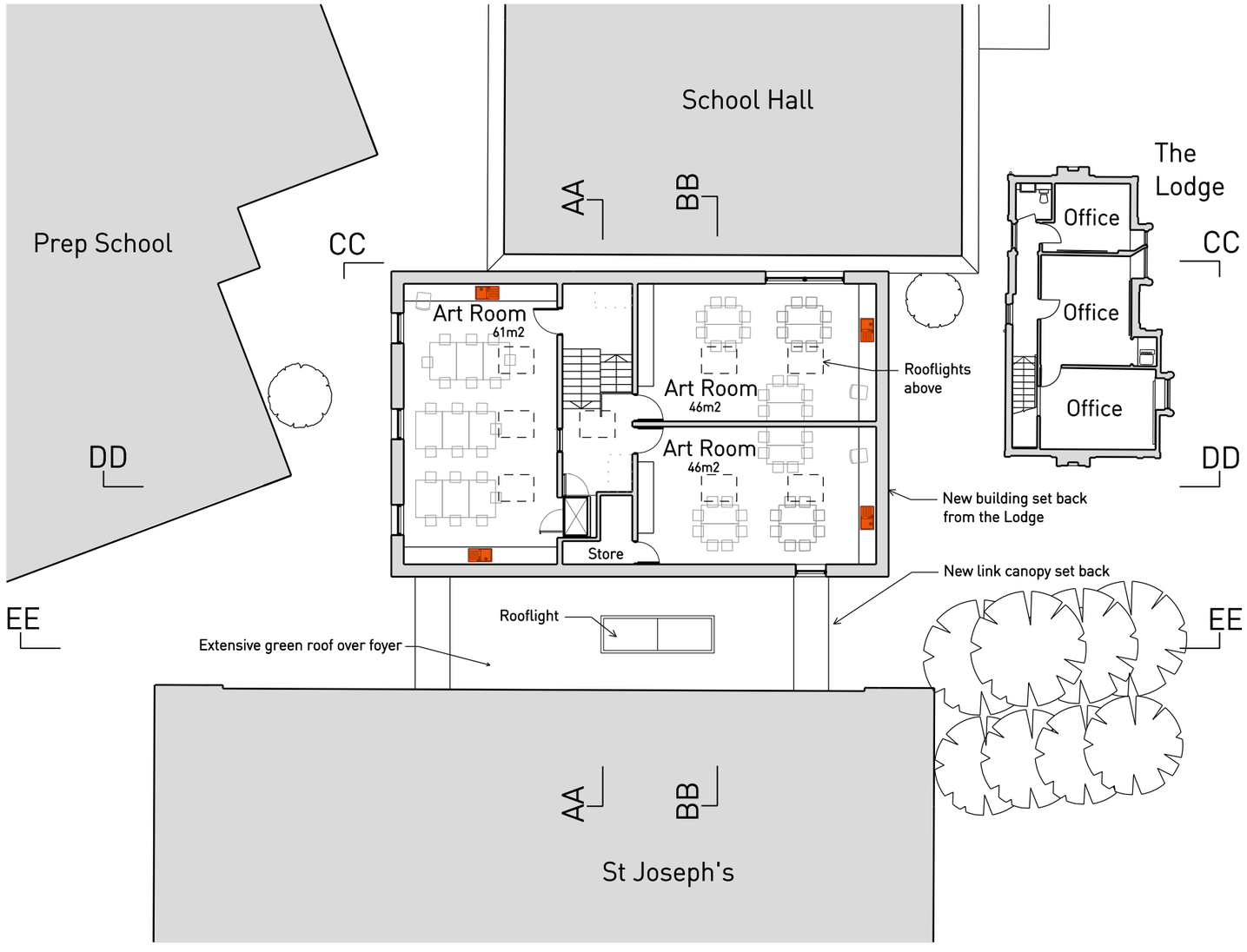
Scale at A1 /(A3)	Drawn	Checked
1:100/(200)	PS	TR

SCT 100 J

NOTE: HATCH IN RED REPRESENTS THE HAND BASIN UNITS AND THE HATCH IN GREEN REPRESENTS THE WC UNITS IN THE PROPOSED SCHEME - MARK-UP ON TRA PLAN DRAWINGS

N

0 5m



Eckersley O'Callaghan

Project Name: St Catherines School, Twickenham
Project Number 22169
Sketch Number: STC-EOC-SK221031
By: KJ
Date: 31.10.2022

Rev	Date	Status/Notes
J	08.11.23	2nd Planning Application DRAFT
H	03.07.23	2nd Planning Pre-Application Submission
G	29.03.23	Reduced Scheme for Client Review
F	16.11.22	Planning Application
E	22.09.22	Client Review
D	15.09.22	Client Review
C	14.06.22	Client Review
B	20.05.22	Client Review
A	07.02.22	Planning Pre-Application Advice
*	09.08.21	Feasibility Study

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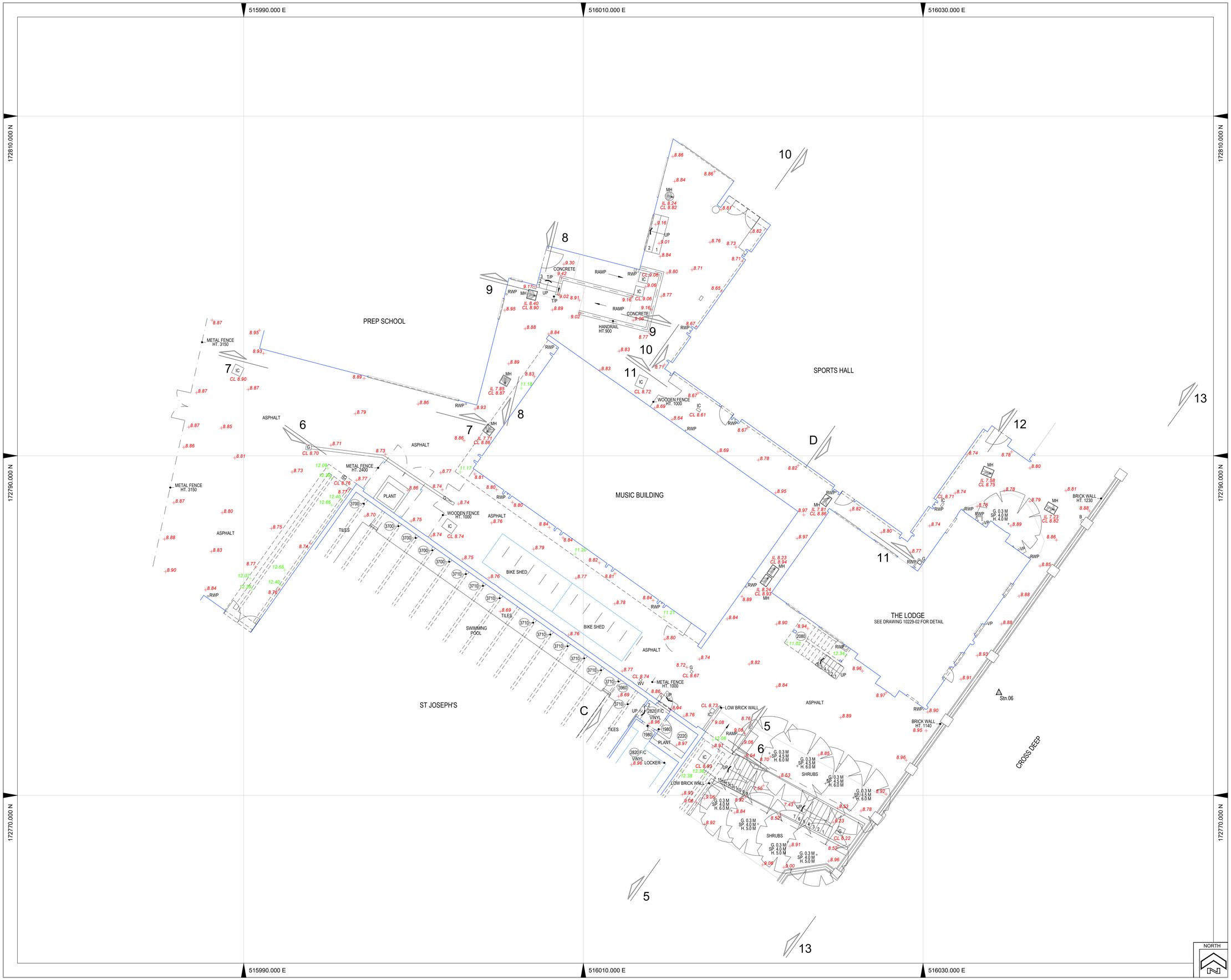
St Catherine's School
New Music & Art Building

First Floor Plan
As Proposed

Scale at A1 /(A3)	Drawn	Checked
1:100 (/200)	PS	TR

SCT 101 J

Appendix C – Existing Topographical Survey Drawing



DATE	REVISIONS

CONTROL SURVEY STATIONS

SURVEY ORIENTATED TO ORDNANCE SURVEY GRID USING SIMULTANEOUS STATIC GPS BASELINE OBSERVATIONS BETWEEN SURVEY CONTROL STATIONS 01 AND 02 USING A MINIMUM 2 HOUR OBSERVATION PERIOD. OSTN15 USED
SURVEY LEVELS RELATED TO ORDNANCE SURVEY DATUM USING STATIC GPS BASELINE OBSERVATIONS BETWEEN SURVEY STATIONS 01 AND 02 USING A MINIMUM 2 HOUR OBSERVATION PERIOD. OSGM15 USED

STATION	EASTING (M)	NORTHING (M)	LEVEL (M)
STN01	516094.533	172775.851	4.562
STN02	516078.333	172744.633	4.533
STN06	516034.466	172776.044	8.946
STN07	516060.656	172812.813	8.719

ABBREVIATIONS (WHERE APPLICABLE)

A/C	AIR CONDITIONING	N/A	NO ACCESS
B	BOLLARD	O/H	OVERHEAD
BOE	BRICK ON EDGE COPING	RAD	RADIATOR
BT	BRITISH TELECOM COVER	R/L	ROOF LIGHT
CATV	CABLE TV COVER	RS	ROAD SIGN
CF	CEILING FALL	RSJ	ROLLED STEEL JOIST
CL	COVER LEVEL	RSS	ROLLED STEEL STANCHION
CONC	CONCRETE FINISH	RWP	RAIN WATER PIPE
CPD	CUPBOARD	SAR	SLOPING ASPHALT ROOF
CPT	CARPET FLOOR FINISH	S/C	STRUCTURAL CEILING
CPS	CONCRETE PAVING SLABS	SGR	SLOPING GLASS ROOF
DK	DROP KERB	SP	SIGN POST
DP	DOWN PIPE	SSR	SLOPING SLATE ROOF
ER	EARTH ROD	STR	SLOPING TILED ROOF
EVCP	EV CHARGING POINT	SVP	SOIL & VENT PIPE
FAR	FLAT ASPHALT ROOF	TCB	TRAFFIC CONTROL BOX
FB	FLOWER BED	T/L	TRAFFIC LIGHT
F/C	FALSE CEILING	T/P	TACTILE PAVING
FH	FIRE HYDRANT	U	URINAL
FHR	FIRE HOSE REEL	VP	VENT PIPE
G	GULLY	WC	TOILET
GM	GAS METER	WHB	WASH HAND BASIN
GPO	TELECOM COVER	WMV	WATER METER VALVE
GV	GAS VALVE	WSC	WATER STOP COCK
HT	HEIGHT	WT	WATER TANK
IC	INSPECTION COVER		
L/L	LOW LEVEL		
LP	LAMP POST		

LEGEND (WHERE APPLICABLE)

	LINE INDICATES OVERHEAD OR HIDDEN DETAIL
	INDICATES CENTRE OF STEEL, RAILING OR FENCES
C. 0000	CILL HEIGHT TO OPENING FROM FINISHED FLOOR LEVEL
SP. 0000	SPRING HEIGHT TO ARCH FROM CILL LEVEL
H. 0000	HEAD HEIGHT TO OPENING FROM CILL LEVEL
+ 10.00	CROSS INDICATES POSITION OF LEVEL
DL 10.00	INDICATES POSITION OF DEDUCED LEVEL
(0000)	INDICATES RELEVANT CEILING, BEAM OR SOFFIT HEIGHT
	EXISTING TREE (SPREAD & HEIGHTS - NEAREST METRE) G. GIRTH H. HEIGHT S. SPREAD

PLEASE NOTE (WHERE APPLICABLE)

1. THE ACCURACY OF THIS SURVEY DRAWING IS DEPENDENT UPON THE SCALE AT WHICH IT IS PRODUCED. USERS SHOULD NOT RE-SCALE THIS DRAWING WITHOUT WRITTEN CONSENT.
2. WHILST ALL REASONABLE CARE HAS BEEN TAKEN IN LOCATING THE UNDERGROUND SERVICES SHOWN ON THIS DRAWING, THE COMPLETENESS OR THE ACCURACY OF THE INFORMATION CANNOT BE GUARANTEED. USERS SHOULD SATISFY THEMSELVES WITH REGARD TO THE TYPE, SIZE AND ROUTE OF SERVICES BEFORE CONNECTIONS ARE AUTHORISED.
3. THE ABILITY TO SCALE FROM THIS SURVEY DRAWING IS DEPENDENT ON THE STABILITY OF THE DRAWING MATERIAL. USERS SHOULD VERIFY, BY THE SCALE OF THE SURVEY GRID, THE ACCURACY OF THE DRAWING MATERIAL PRIOR TO SCALING DIMENSIONAL INFORMATION.

ORDNANCE SURVEY RELATED MARK

TRAVERSE CONTROL STATION 01

VALUE = 4.562m

TITLE
SITE PLAN

PROJECT
ST CATHERINE'S SCHOOL

CLIENT
TIM RONALDS ARCHITECTS

SCALE	DRAWN	DATE	DRAWING	REVISION
1:100@A1	J.M	SEP 2022	10229/01	

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NORTH