

Flood Risk Assessment
AEG4269_W2_Bayswater_01

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Site Address: Hallfield Primary School
Porchester Gardens
Bayswater
London
W2 6JJ

UK Experts in Flood Modelling, Flood Risk Assessments, and Surface Water Drainage Strategies

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Document Issue Record

Project: Flood Risk Assessment

Prepared for: Hallfield Primary School

Reference: AEG4269_W2_Bayswater_01

Site Location: Hallfield Primary School, Porchester Gardens, Bayswater, London, W2 6JJ

Issue	Date	Author	Check	Auth.	Comments
1	12/02/2024	Daniel Cunningham	OM	NDD	First issue

Please Note:

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Summary

Development Description	Existing	Proposed
Development Type	Tarmac Playground	New playground equipment (including resurfacing)
EA Vulnerability Classification	More Vulnerable	No change
Ground Floor Level	EA 1m LiDAR data shows the ground elevation of the site vary between approximately 19.62m AOD and 21.62m AOD.	No change
Impermeable Surface Area	Majority of the site is considered impermeable	Proposed development consists of areas of permeable Wetpour and artificial grass. Negligible change.
Surface Water Drainage	N/A[1]	Proposed to manage runoff via existing drainage on site. Small scale SuDS are recommended where possible in external areas due to the site being located in a Surface Water Management Zone.
Site Size	Approximately 1,250m²	No change
Risk to Development	**Summary**	**Comment**
EA Flood Zone	Flood Zone 1	
Flood Source	Pluvial	Site located in a Surface Water Management Zone.
SFRA Available	Draft Strategic Flood Risk Assessment 2023 (Westminster City Council, 2019)	
Management Measures	**Summary**	**Comment**
Ground floor level above extreme flood levels	Yes	Located in Flood Zone 1 and is at low risk from modelled surface water flooding based on EA RoFSW dataset.

Safe Access/Egress Route	Yes	Surrounding area in Flood Zone 1 and dry access/egress can be sought in modelled pluvial return periods. Given that proposal is for alterations to existing play area, access/ egress arrangements would remain as existing anyway.
Flood Resilient Design	Not required	Flood resistant design in not required because the site is located in Flood Zone 1 and is considered to be at low risk from modelled surface water flooding based on EA RoFSW dataset.
Site Drainage Plan	Drain as per existing	Proposed to manage runoff via existing drainage on site. Small scale SuDS are recommended where possible in external areas due to the site being located in a Surface Water Management Zone.
Flood Warning and Evacuation Plan	N/A	Recommended that management staff Met Office Weather Warnings for extreme weather events.
Offsite Impacts	**Summary**	**Comment**
Displacement of floodwater	Negligible	Located in Flood Zone 1 and is considered to be at low risk from modelled surface water flooding based on EA RoFSW dataset.
Increase in surface run-off generation	No	Proposed to manage runoff via existing drainage on site. Small scale SuDS are recommended where possible in external areas due to the site being located in a Surface Water Management Zone. Proposed includes the resurfacing of parts of the site from impermeable tarmac to permeable Wetpour and

		artificial grass, thus reducing surface water generation.
Impact on hydraulic performance of channels	No	No mapped watercourse within 500m of the site

[1] not required for this assessment [2] data not available.

1. Introduction

1.1. Aegaea were commissioned by Hallfield Primary School to undertake a Flood Risk Assessment (FRA) to facilitate a planning application for the proposed development. This FRA has been prepared in accordance with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance.

1.2. This FRA is intended to support a full planning application and as such the level of detail included is commensurate and subject to the nature of the proposals.

Site Overview

1.3. The site of the proposed development is Hallfield Primary School, Porchester Gardens, Bayswater, London, W2 6JJ (Figure 1).

Figure 1: Site Location (Base map from Google Hybrid ©)

1.4. The existing site is an impermeable tarmac playground. The proposed development is for construction of new playground equipment (including resurfacing a large proportion of the tarmac into permeable Wetpour and artificial grass).

1.5. In the absence of a topographical survey, Environment Agency Light Detection and Ranging (LiDAR) data Digital Terrain Model has been used to review the topography of the site. The LiDAR data shows the ground elevation of the site varies between approximately 19.62m AOD (Above Ordnance Datum) and 21.62m AOD (Figure 2).

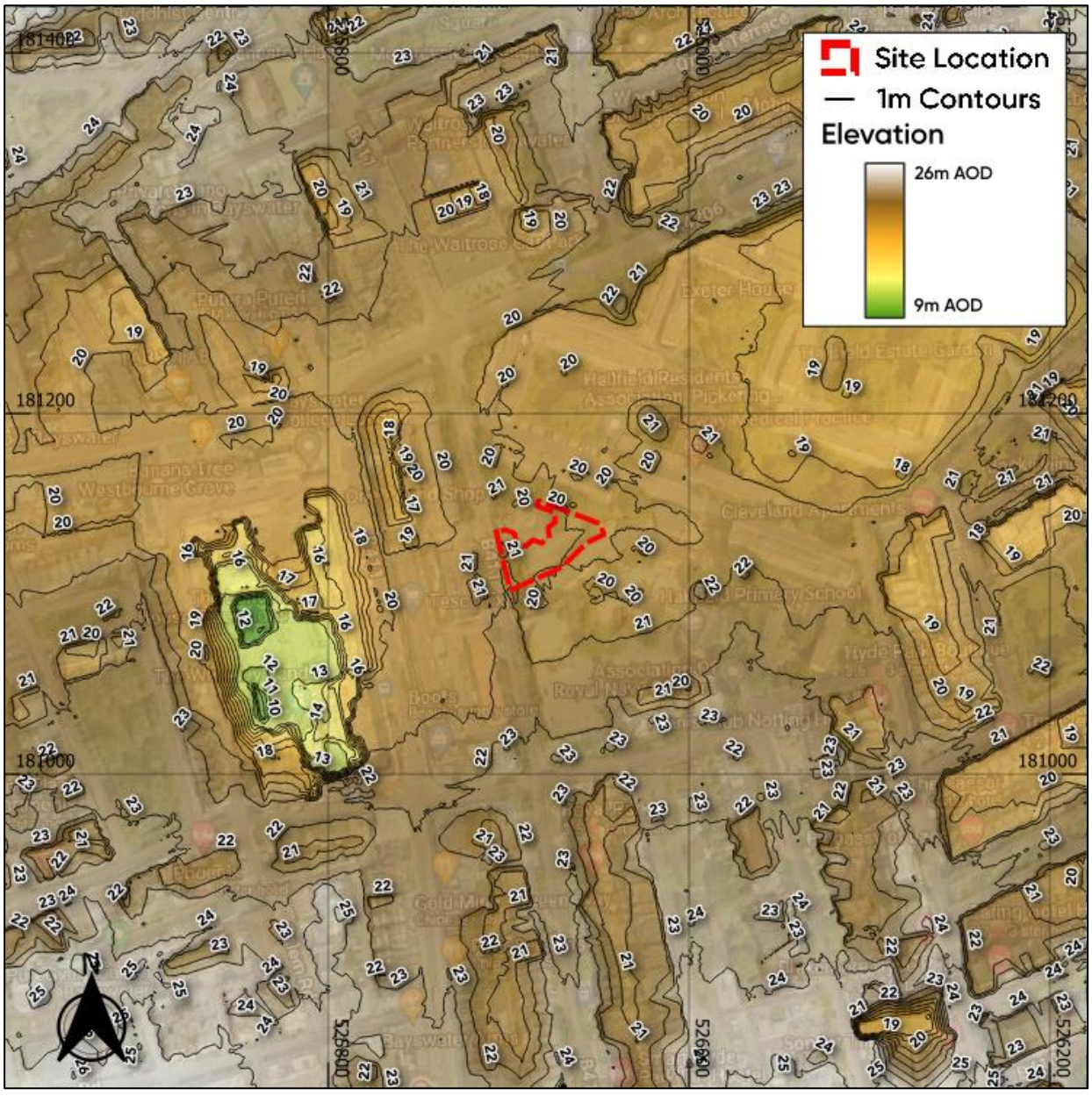

Figure 2: Site Topography (Base map from Google Hybrid © Contains public sector information licensed under the Open Government Licence v3.0)

1.6. Westminster City Council is the Local Planning Authority (LPA) for the site and also the designated Lead Local Flood Authority (LLFA). The site sits within the Environment Agency's Hertfordshire and North London region.

Planning Policy and Guidance

1.7. UK government planning guidance states[1] that an FRA is required for developments which are:

- *in flood zone 2 or 3 including minor development and change of use*
- *more than 1 hectare (ha) in flood zone 1*
- *less than 1 ha in flood zone 1, including a change of use in development type to a more vulnerable class (for example from commercial to residential), where they could be affected by sources of flooding other than rivers and the sea (for example surface water drains, reservoirs)*
- *in an area within flood zone 1 which has critical drainage problems as notified by the Environment Agency*

1.8. The site is located within Flood Zone 1 on land which has been identified by the Westminster City Council SRFA as being in a Surface Water Management Zone. The SFRA states that site specific Flood Risk Assessments should be carried out in:

'All development located within a surface water management zone'

1.9. As such an FRA is required.

1.10. The objective of this FRA is to demonstrate that the proposals are acceptable in terms of flood risk. This report summarises the findings of the study and specifically addresses the following issues in the context of the current legislative regime:

- Fluvial/ tidal flood risk
- Surface water flood risk
- Risk of flooding from other sources

[1]https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications#when-you-need-an-assessment

2. Planning Policy

2.1. Inappropriate development in a flood risk area could pose significant risk in terms of personal safety and damage to property for the occupiers of the development or for people elsewhere. The approach taken in the assessment of flood risk at the planning stage is set out in national, regional, and local planning policy and associated guidance. This section summarises the key policies and guidance relevant to the proposed development.

National Planning Policy Framework (NPPF)

2.2. The National Planning Policy Framework[2] (NPPF) (DLUHC, 2023) which includes UK Government policy on development and flood risk states:

> *165. Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.*
>
> *173. When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:*
>
> *a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;*
>
> *b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;*
>
> *c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;*

[2] https://www.gov.uk/guidance/national-planning-policy-framework, **last updated Dec 2023**

d) any residual risk can be safely managed; and

e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

174. Applications for some minor development and changes of use should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments set out in footnote 59.

2.3. Footnote 59 of the NPPF states:

A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

2.4. Flood Zones in England are defined as follows:

Table 1: Flood Zone Definitions

Flood Zone	Definition
Zone 1 Low Probability	Land having less than 1 in 1,000 annual probability of river or sea flooding (all land outside Zones 2 and 3).
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.
Zone 3b The Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

2.5. An FRA should be appropriate to the scale, nature, and location of the development. It should identify and assess the risk from all sources of flooding to and from the development and demonstrate how any flood risks will be managed over the lifetime of the development.

2.6. An assessment of hydrological impacts should be undertaken, including to surface water runoff and impacts to drainage networks in order to demonstrate how flood risk to others will be managed following development and taking climate change into account.

The London Plan

2.7. The London Plan prepared by the Greater London Authority in 2021 sets out the policies for development in the region.

2.8. Policy SI 12 Flood risk management outlines the requirements for new development within the region. It states:

> *A. Current and expected flood risk from all sources (as defined in paragraph 9.2.12) across London should be managed in a sustainable and cost-effective way in collaboration with the Environment Agency, the Lead Local Flood Authorities, developers and infrastructure providers.*
>
> *B. Development Plans should use the Mayor's Regional Flood Risk Appraisal and their Strategic Flood Risk Assessment as well as Local Flood Risk Management Strategies, where necessary, to identify areas where particular and cumulative flood risk issues exist and develop actions and policy approaches aimed at reducing these risks. Boroughs should cooperate and jointly address cross-boundary flood risk issues including with authorities outside London.*
>
> *C. Development proposals should ensure that flood risk is minimised and mitigated, and that residual risk is addressed. This should include, where possible, making space for water and aiming for development to be set back from the banks of watercourses.*
>
> *D. Developments Plans and development proposals should contribute to the delivery of the measures set out in Thames Estuary 2100 Plan. The Mayor will work with the Environment Agency and relevant local planning authorities, including authorities outside London, to safeguard an appropriate location for a new Thames Barrier.*
>
> *E. Development proposals for utility services should be designed to remain operational under flood conditions and buildings should be designed for quick recovery following a flood.*
>
> *F. Development proposals adjacent to flood defences will be required to protect the integrity of flood defences and allow access for future maintenance and upgrading. Unless exceptional circumstances are demonstrated for not doing so, development proposals should be set back from flood defences to allow for any foreseeable future maintenance and upgrades in a sustainable and cost-effective way.*

G. Natural flood management methods should be employed in development proposals due to their multiple benefits including increasing flood storage and creating recreational areas and habitat.

2.9. Policy SI 13 Sustainable drainage outlines the requirements for new development within the region. It states:

A. Lead Local Flood Authorities should identify - through their Local Flood Risk Management Strategies and Surface Water Management Plans - areas where there are particular surface water management issues and aim to reduce these risks. Increases in surface water run-off outside these areas also need to be identified and addressed.

B. Development proposals should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible. There should also be a preference for green over grey features, in line with the following drainage hierarchy:

1. rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)

2. rainwater infiltration to ground at or close to source

3. rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)

4. rainwater discharge direct to a watercourse (unless not appropriate)

5. controlled rainwater discharge to a surface water sewer or drain

6. controlled rainwater discharge to a combined sewer.

C. Development proposals for impermeable surfacing should normally be resisted unless they can be shown to be unavoidable, including on small surfaces such as front gardens and driveways.

D. Drainage should be designed and implemented in ways that promote multiple benefits including increased water use efficiency, improved water quality, and enhanced biodiversity, urban greening, amenity and recreation.

Local Plan

2.10. The Local Plan prepared by the Local Planning Authority, Westminster City Council, sets out the policies for development in the local area.

2.11. Policy 35 Flood risk outlines the requirements for new development within the area. It states:

> *A. All developments should be safe for their lifetime from the risk of flooding, complying with the council's Strategic Flood Risk Assessment (SFRA), Surface Water Management Plan (SWMP), Local Flood Risk Management Strategy (LFRMS) and the Mayor of London's Regional Flood Risk Appraisal (RFRA).*
>
> *B. A site-specific Flood Risk Assessment (FRA) must be submitted for:*
>
> > *1. developments of 1 hectare or greater;*
> >
> > *2. all developments in Flood Zones 2 and 3; and*
> >
> > *3. all developments within a Surface Water Flood Risk Hotspot.*
>
> *C. Highly Vulnerable Uses will not be allowed within Flood Zone 3; in Flood Zone 2 they will be required to pass the Exception Test and should as far as possible be located outside of the Surface Water Flood Risk Hotspots.*
>
> *D. Proposals for Essential Infrastructure and More Vulnerable Uses within Flood Zone 3 will be required to pass the Exception Test. Within the Rapid Inundation Zone, basement dwellings and basement extensions to existing dwellings will not be acceptable.*
>
> *E. More Vulnerable Uses should, as far as possible, be directed away from Surface Water Flood Risk Hotspots.*
>
> *F. A Flood Warning and Evacuation Plan will generally be required for More Vulnerable Uses within the areas at risk of tidal breach flooding, especially if the land use is within the Rapid Inundation Zone.*
>
> *G. All existing flood management infrastructure will be protected, including access for maintenance. Wherever possible, an undeveloped buffer zone of 16m should be maintained around flood defence structures, including buried elements of the flood defence.*

H. Improvements to flood defences will be secured through planning conditions and / or legal agreements where the size, type and / or location of development impacts on flood risk. Development should not limit future raising of flood defences outlined in the Thames Estuary 2100 Plan.

I. Where appropriate, planning permission for developments which result in the need for off-site upgrades to the water or sewerage network, will be subject to conditions to ensure the occupation is aligned with the delivery of necessary infrastructure upgrades.

J. New development must incorporate Sustainable Drainage Systems (SuDS) to alleviate and manage surface water flood risk. Development should aim to achieve greenfield run-off rates and demonstrate how all opportunities to minimise site run-off have been taken.

Sequential and Exception Tests

2.12. The Sequential and Exception Tests are applied in specific cases defined by UK Government policy. Their purpose is to drive development to areas of low flood risk and to support developments which improve flood risk for developments in areas at risk of flooding.

2.13. The existing site impermeable tarmac playground associated with the existing primary school. The proposed development is for construction of new playground equipment (including resurfacing a large proportion of the tarmac into permeable Wetpour and artificial grass), therefore providing a betterment to the existing situation by including permeable surfacing.

2.14. As such, a site-specific Sequential Test and Exception Test for the proposed developments is not considered necessary for a development of this nature and scale.

Summary

2.15. This flood risk assessment has been prepared with due consideration to the above local and national policy.

3. Consultation and Review

Documents and Online Mapping

3.1. Local Governments and Lead Local Flood Authorities provide documents which contain data and policies on flood risk and new development in their areas. These documents are introduced and briefly summarised below. For the purposes of this FRA, these documents have been reviewed for relevant information and any relevant data is discussed within the appropriate sub heading of this report.

3.2. The following sources of information have been reviewed for this assessment:

- Flood Map for Planning on the Environment Agency website *https://flood-map-for-planning.service.gov.uk/*
- Long Term Flood Risk Information on the Environment Agency website *https://www.gov.uk/check-long-term-flood-risk*
- National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing and Communities, 2023)
- Planning Practice Guidance - Flood Risk and Coastal Change (Department for Levelling Up, Housing and Communities, 2022)
- Geoindex Onshore (British Geological Survey, 2023)
- The London Plan (Greater London Authority, 2021)[4] and City Plan 2019-2040 (Westminster City Council, 2021)[5]
- Preliminary Flood Risk Assessment (Westminster City Council, 2011)[6]
- Strategic Flood Risk Assessment 2023 (Westminster City Council, 2023)[7]

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[4] https://www.london.gov.uk/sites/default/files/the_london_plan_2021.pdf

[5] https://www.westminster.gov.uk/sites/default/files/media/documents/City%20Plan%202019-2040%20-%20April%202021.pdf

[6] https://www.yumpu.com/en/document/view/28995754/preliminary-flood-risk-assessment-city-of-westminster

[7]https://www.westminster.gov.uk/sites/default/files/media/documents/SFRA%20Report%20%283%29.pdf

- Local Flood Risk Management Strategy 2017-2022 (Westminster City Council, 2017)[8]

Preliminary Flood Risk Assessment (PFRA)

3.3. The PFRA, published in 2011, is a high-level appraisal of flood risk across Lead Local Flood Authority Westminster City Council. The flood risk from all sources, including fluvial, surface water, groundwater, and surcharged sewers is evaluated. It is the basis upon which the Local Flood Risk Management Strategy is produced.

3.4. The PFRA summarises historical flood incidents in Westminster City Council. The site is not recorded as having been affected by any flood event.

Strategic Flood Risk Assessment (SFRA)

3.5. The SFRA, published in 2023 provides the evidence base for the Local Planning Authority Westminster City Council Local Plan and guidance for consideration when determining planning applications.

3.6. The SFRA seeks to place new development into areas of lower flood risk taking into account current flood risk, future flood risk, and the effect a proposed development would have on the risk of flooding.

3.7. The SFRA mapping provided by Westminster City Council has been used throughout production of this report as a source of information, particularly pertaining to historical flood incidents.

Local Flood Risk Management Strategy (LFRMS)

3.8. The Local Flood Risk Management Strategy sets out roles and responsibilities for flood risk management, assesses the risk of flooding in the area, where funding can be found to manage flood risk, and the policies, objectives, and actions of the Lead Local Flood Authority.

[8] **https://www.westminster.gov.uk/planning-building-control-and-environmental-regulations/planning-applications/make-application/advice-planning-application-supporting-documents/flooding-and-planning-application-requirements**

3.9. The Westminster City Council LFRMS is used within this report to identify any flood management infrastructure and historical incidences of flooding.

4. Sources of Flood Risk

Fluvial

4.1. Flooding from watercourses arises when flows exceed the capacity of the channel, or where a restrictive structure is encountered, resulting in water overtopping the banks into the floodplain.

Main Rivers and Ordinary Watercourses

4.2. There are no recorded EA Main Rivers in the vicinity of the site.

4.3. There are no other recorded watercourses in the vicinity of the site.

EA Flood Map for Planning

4.4. The site is located in Flood Zone 1 (Figure 3). Flood Zone 1 denotes a risk of flooding from fluvial and tidal sources less than 1 in 1,000 (0.1%) probability.

Figure 3: EA Flood Map for Planning (Base map from Google Hybrid © Contains public sector information licensed under the Open Government Licence v3.0)

Historical Fluvial Flooding

4.5. Based on the EA Recorded and Historical Flood Outlines dataset there are no records of historical fluvial flooding on-site (Figure 4).

Figure 4: EA Historic Flood Mapping (Base map from Google Hybrid © Contains public sector information licensed under the Open Government Licence v3.0)

4.6. As such, the risk from fluvial flooding to the site can be considered low.

Tidal

4.7. Tidal flooding occurs when a high tide and high winds combine to elevate sea levels. An area behind coastal flood defences can still flood if waves overtop the defences or break through them. Tidal flooding can also occur a long way from the coast by raising river levels. Water may overtop the river bank or river defences when tide levels are high.

4.8. The site is a significant distance from any tidal source and above the anticipated extreme tidal levels, even when considering the impacts of climate change. The risk of flooding from tidal sources is considered low.

Canals

4.9. The Canal and River Trust (CRT) generally maintains canal levels using reservoirs, feeders, and boreholes and manages water levels by transferring it within the canal system.

4.10. The site is approximately 700m from the Regent's Canal.

4.11. The SFRA states that:

> *'The Grand Union and Regent's Canals in Westminster present minimal flood risk as they have limited surface water inputs and none of the canals to our knowledge are on embankments.'*

4.12. As such, the risk from canals flooding to the site can be considered low.

Pluvial

4.13. Pluvial flooding can occur during prolonged or intense storm events when the infiltration potential of soils, or the capacity of drainage infrastructure is overwhelmed leading to the accumulation of surface water and the generation of overland flow routes.

4.14. Local policy documentation identifies the site as being in a Surface Water Management Zone (previously called a Surface Water Flood Hotspot) (Figure 5).

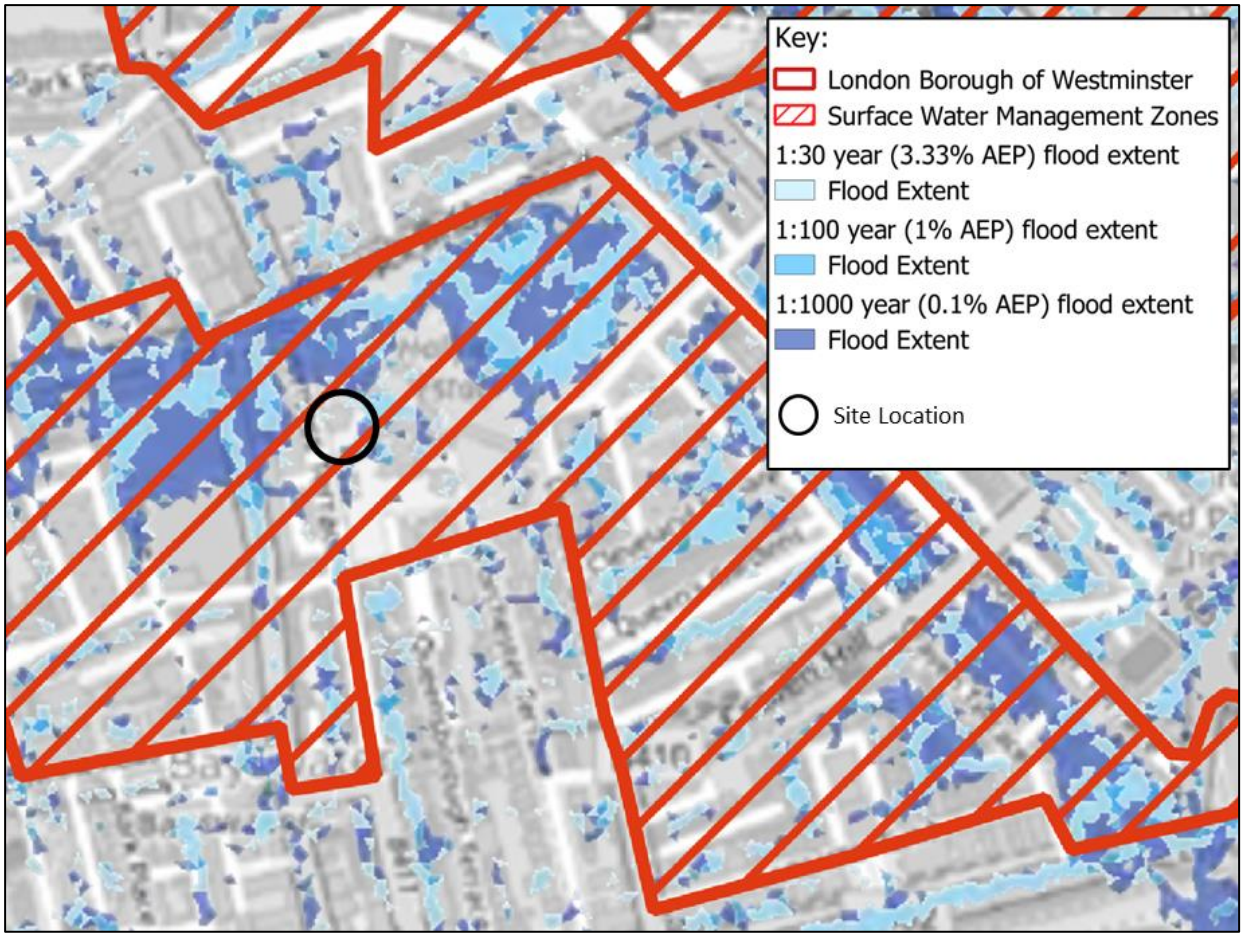


Figure 5: Location of Surface Water Management Zone (Westminster City Council interactive mapping, 2019 - 2040)

4.15. As such the risk of flooding from pluvial sources has been assessed in further detail below.

4.16. Annual surface water flood risk is labelled by the EA as:

- 'High Risk'; >3.3% AEP (annual probability greater than 1 in 30).
- 'Medium Risk'; 1.1% to 3.3% AEP (annual probability between 1 in 100 and 1 in 30).
- 'Low Risk'; 0.1% to 1% AEP (annual probability between 1 in 1000 and 1 in 100).
- 'Very Low Risk'; <0.1% AEP (annual probability less than 1 in 1000).

4.17. Examination of the EA's Flood Risk from Surface Water mapping for High Risk, Medium Risk, and Low Risk AEP flood events shows the site is partially at risk of flooding in 'Low' surface water flood events (Figure 6).

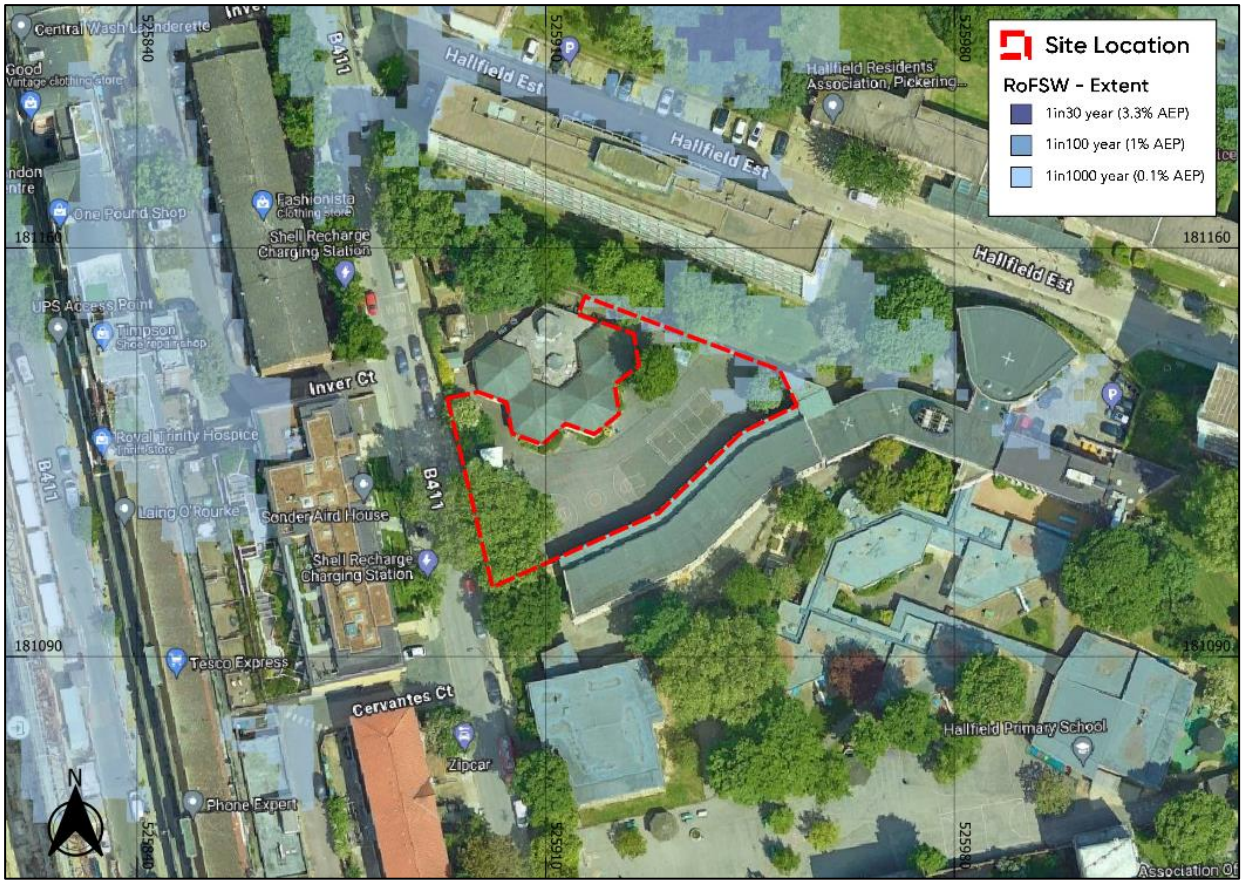


Figure 6: EA Surface Water Flood Risk Mapping (Base map from Google Hybrid © Contains public sector information licensed under the Open Government Licence v3.0)

4.18. As can be seen in Figure 7, during the modelled 1 in 100 year event, surface water flooding does not affect the site or its immediate surrounding area. Dry access/egress should be achievable on the B411 in this event.

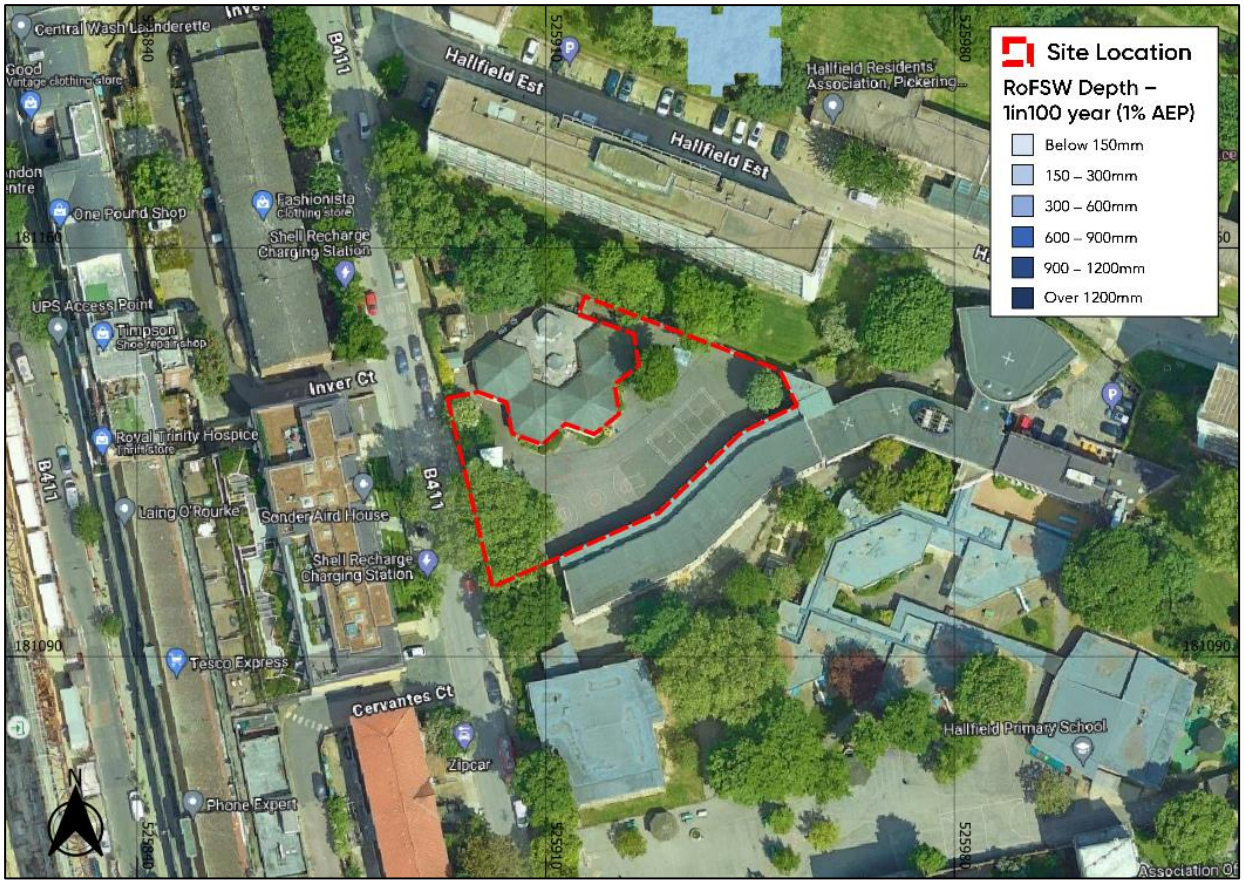


Figure 7: EA Surface Water Flood Risk Mapping 1 in 100 Year Depth (Base map from Google Hybrid © Contains public sector information licensed under the Open Government Licence v3.0)

4.19. As can be seen in Figure 8, during the modelled 1 in 1000 year event, surface water flooding depths reach 150mm to 300mm at the north border of the site. It is noted that the flood extent only covers approximately 10% of the site. Dry access/egress should be achievable on the B411 in this event. Given that the proposal is for alterations to existing play area, access/ egress arrangements would remain as existing anyway.

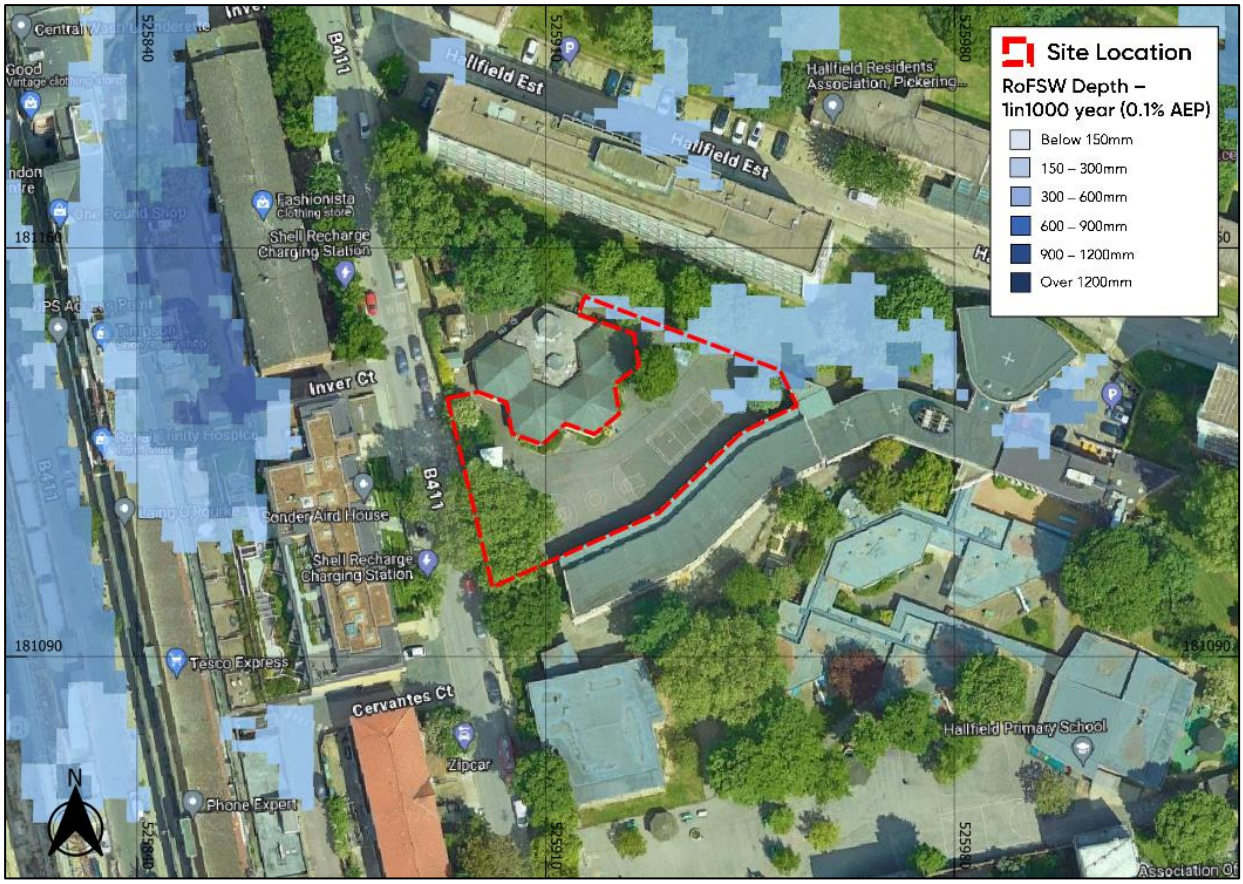


Figure 8: EA Surface Water Flood Risk Mapping 1 in 1000 Year Depth (Base map from Google Hybrid © Contains public sector information licensed under the Open Government Licence v3.0)

4.20. The SFRA provides mapping of historical surface water flood incident records kept by the local authority. No historical surface water incidents have been recorded in the vicinity of the site.

4.21. As such the risk to the site from surface water flooding is considered low.

Reservoirs

4.22. Flooding can occur from large waterbodies or reservoirs if they are impounded above the surrounding ground levels or are used to retain floodwater. Although unlikely, reservoirs and large waterbodies could overtop or breach leading to rapid inundation of the downstream floodplain.

4.23. According to the EA's Flood Risk from Reservoirs mapping the site is outside modelled flood extents in the event of reservoir flooding (Figure 9).

Figure 9: EA Reservoir Flood Risk Mapping (Base map from Google Hybrid © Contains public sector information licensed under the Open Government Licence v3.0)

4.24. As such, the risk to the site from reservoir flooding is considered low.

Groundwater

4.25. Groundwater flooding occurs in areas where underlying geology is permeable, and water can rise within the strata sufficiently to breach the surface.

4.26. The British Geological Survey's (BGS) mapping shows no superficial deposits underlying the site. The bedrock underlying the site is London Clay Formation comprised of clay, silt and sand.

4.27. The closest historical BGS borehole TQ28SE1422 was approximately 25m west from the site and was bored to a depth of 25m and no groundwater was recorded to have been encountered.

4.28. The SFRA identifies that the site is not in an area considered to have Potential for Groundwater Flooding to Occur (Figure 10).

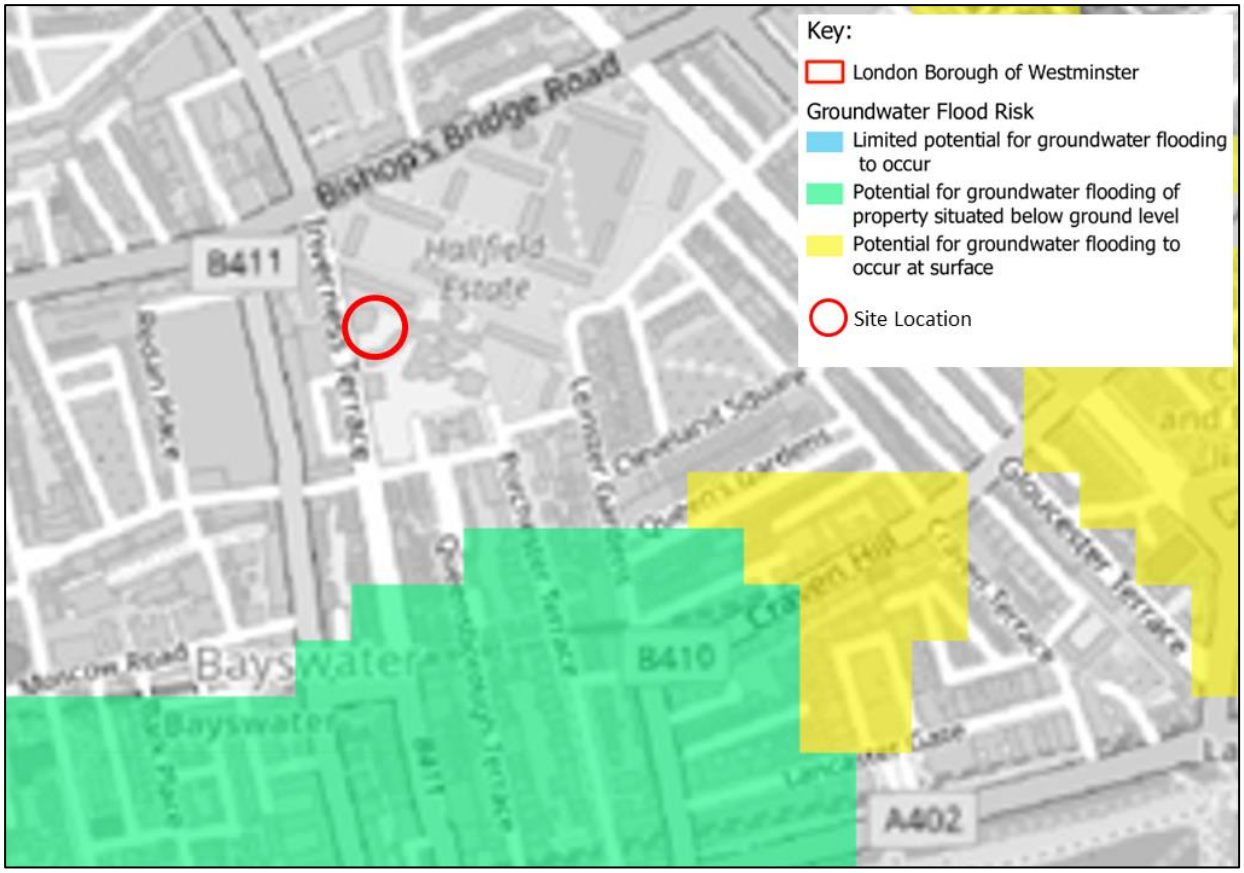


Figure 10: Groundwater Flood Risk (Westminster City Council SFRA, 2023)

4.29. As such the risk to the site from groundwater flooding can be considered low.

Sewers

4.30. Foul or surface water sewers can be a cause of flooding if the drainage network becomes overwhelmed, either by blockage or due to local development beyond the designed capabilities of the drainage system.

4.31. The SFRA provides historical sewer flood incident records detailed by Thames Water. Table 3.1 of the SFRA showed that, in the sites postcode (W2), there were 44 internal and 1 external incidents of sewer flooding in the last 20 years. It is noted that due to the postcode coving a wide area, there is no evidence to suggest the site or its immediate vicinity has been affected by historical sewer flooding.

4.32. As such, the risk to the site from sewer flooding is considered low.

5. Flood Risk Mitigation

Pluvial

5.1. The site is located in a Surface Water Management Zone (as identified by the Westminster Council SFRA), however, is considered at low risk from all the sources mentioned in this report, and therefore low impact to flooding elsewhere.

5.2. Furthermore, the majority of the existing site is impermeable tarmac. The proposed development consists of resurfacing a large proportion of the tarmac into permeable Wetpour and artificial grass. As such the proposed development may have a reduced impact on flooding compared to the existing.

5.3. The SFRA states that:

> *all development must be safe from surface water flooding, and, unless there are practical reasons for not doing so, SuDS should be used to manage surface water runoff.*

5.4. As such, it is recommended that small scale SUDS are implemented where possible on the site to reduce its impact further.

Fluvial, Tidal, Canals, Reservoirs, Groundwater and Sewers

5.5. Flood risk from these sources is considered to be low, therefore mitigation is not required.

Increase to Flood Risk Elsewhere

5.6. The existing site is an impermeable tarmac playground. The proposed development is for construction of new playground equipment (including resurfacing a large proportion of the tarmac into permeable Wetpour and artificial grass).

5.7. As such the proposed development may have a reduced impact on flooding risk elsewhere compared to the existing.

Flood Warnings

5.8. The site is not in an area where Environment Agency (EA) provide specific flood alerts and warnings. We advise the occupant of the dwelling to monitor Met Office Weather Warnings to be prepared for extreme weather events.

5.9. Met Office is the national meteorological service for the UK; they issue weather warnings up to 5 days in advance, through the National Severe Weather Warning Service, when severe weather has the potential to bring impacts to the UK. It is also possible to stay up to date with weather warnings through the Met Office app (available on both android and apple), social media (twitter, Facebook) or email alerts.

5.10. During periods of bad weather, site management staff should monitor local weather reports and sign up for the Met Office UK weather warnings. Procedures should be formalised (if not done so already) in the event of a severe weather warning or flooding.

6. Conclusions

6.1. This FRA has been undertaken with reference to the requirements of NPPF and Planning Practice Guidance with respect to the development at Hallfield Primary School, Porchester Gardens, Bayswater, London, W2 6JJ. It has been written to support a planning application and prepared with due consideration to the nature of the proposed development to provide the appropriate level of detail.

6.2. An assessment of the risk of flooding from all sources has been undertaken and is summarised in the table below:

Source of Flooding	Flood Risk Summary
Pluvial	The site is located in a Surface Water Management Zone (as identified by the Westminster Council SFRA), however, is considered at low risk from all the sources mentioned in this report, and therefore low impact to flooding elsewhere. Furthermore, the majority of the existing site consists of impermeable tarmac. The proposed development consisted of resurfacing a large proportion of the tarmac into permeable Wetpour and artificial grass. As such the proposed development may have a reduced impact on flooding compared to the existing. The SFRA stated that: *all development must be safe from surface water flooding, and, unless there are practical reasons for not doing so, SuDS should be used to manage surface water runoff.* As such, it is recommended that small scale SUDS are implemented where possible on the site to reduce its impact further.
Fluvial Tidal Canals Reservoirs Groundwater Sewers	The site is considered to be at low risk from these sources.

6.3. The FRA supports the planning application and demonstrates that there is an acceptable level of flood risk to the site if the mitigation strategies recommended are implemented in the scheme. The development does not increase flood risk off site or to the wider area.

6.4. This Flood Risk Assessment should be submitted as part of the planning application to satisfy the requirements under NPPF.

Appendix A - Development Proposals

0 2 4 6 8 12

Scale Bar (m) 1:200

NOTE: All levels to remain as existing

LEGEND:

Existing fencing

Existing Screening

Bamboo Screening around the perimeter of the playspace

Rev	Date	Description	Initials

Client
Westminster City Council

Project Name
College Park Satellite School Playground

Drawing Title
Existing Site Plan

Issue Status
PLANNING

Designed	Drawn	Checked	Approved
PG	PG	LR	LR

Scale & Paper Size
1:200@A2

Date Originated
DEC 2023

Drawing Number

Project	Originator	Volume	Level	Type	Discipline	Number	Suitability	Revision
P523	3BM	V2	ZZ	DR	A	800	S1	R00

Architecture + Planning

Unit LM07 G01
The Leather Market
Weston Street
London, SE1 3ER

www.3bm.co.uk

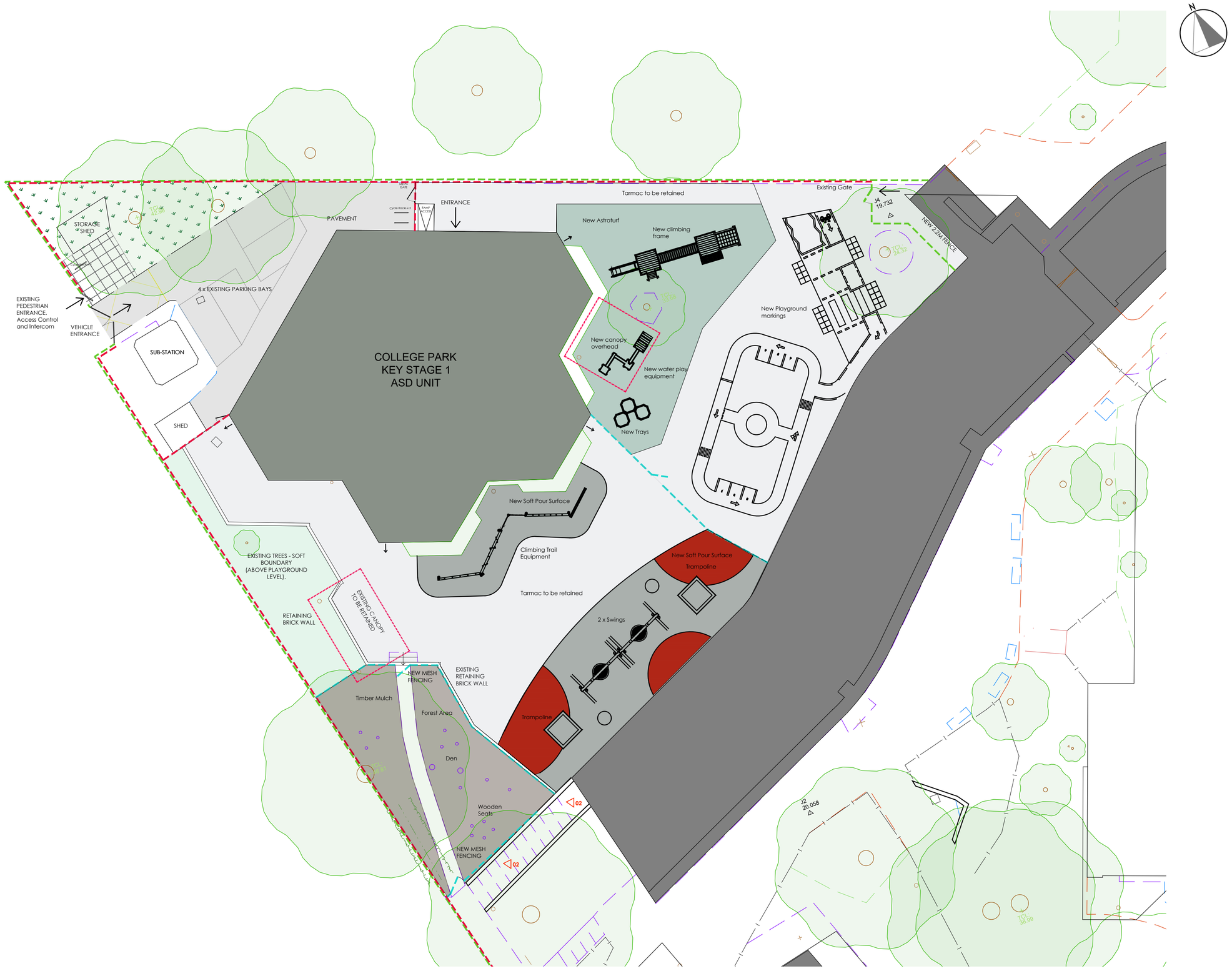
0 2 4 6 8 12

Scale Bar (m) 1:200

NOTE: All levels to remain as existing

LEGEND:

- Existing fencing
- Existing Screening
  Bamboo Screening around the perimeter of the playspace
- Proposed New Fencing



Rev	Date	Description	Initials

Client
Westminster City Council

Project Name
College Park Satellite School Playground

Drawing Title
Proposed Site Plan

Issue Status
PLANNING

Designed	Drawn	Checked	Approved
PG	PG	LR	LR

Scale & Paper Size
1:200@A2

Date Originated
DEC 2023

Drawing Number

Project	Originator	Volume	Level	Type	Discipline	Number	Suitability	Revision
P523	3BM	V2	ZZ	DR	A	801	S1	R00

Architecture + Planning

Unit LM07 G01
The Leather Market
Weston Street
London, SE1 3ER

www.3bm.co.uk

REV.	DESCRIPTION	DATE
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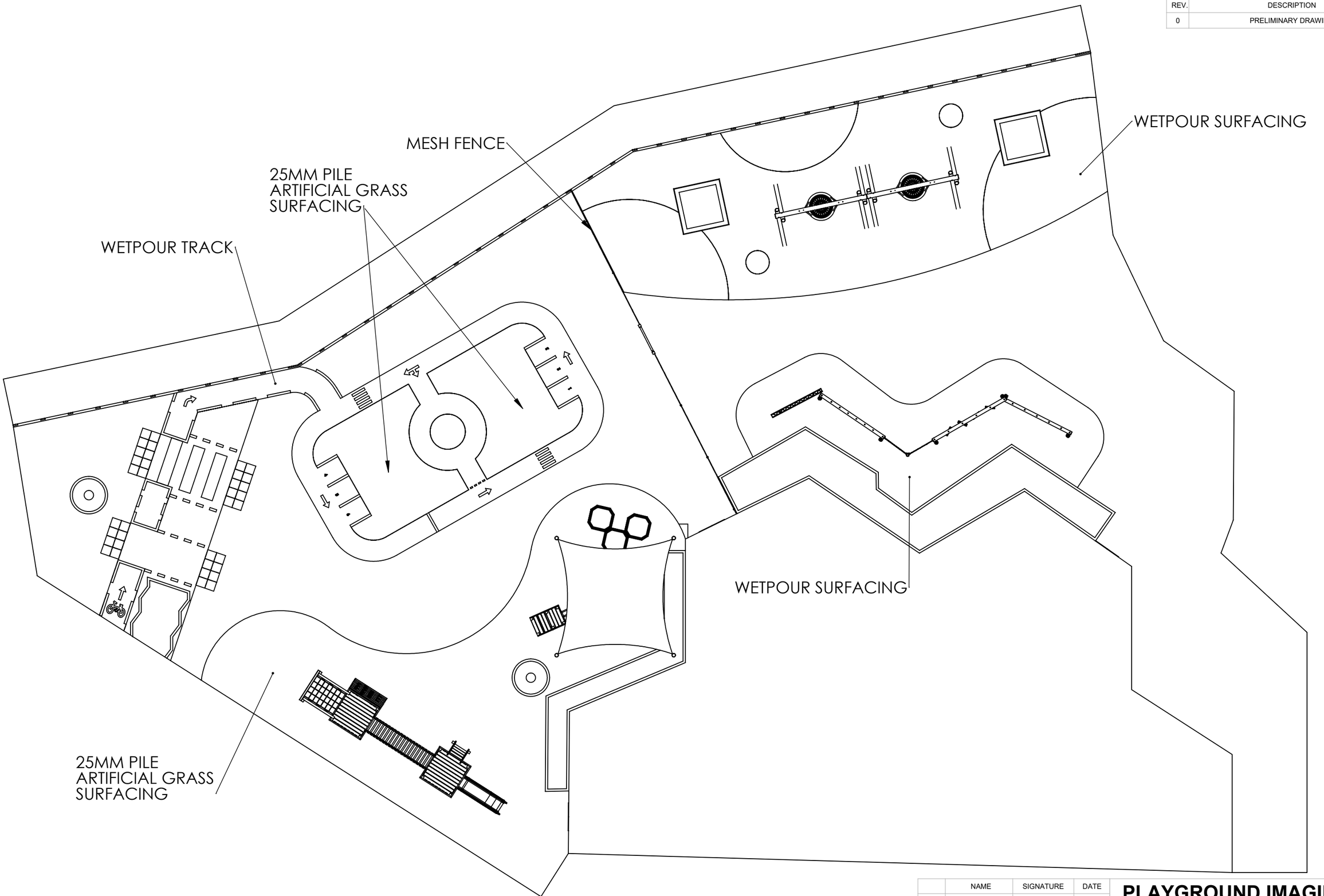

SCALE 1:150

	NAME	SIGNATURE	DATE
DRAWN			
CHK'D			

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Unit 10 Willow Court
Warrington, Cheshire, WA2 8UF
www.playgroundimagineering.co.uk
Tel: 01925 648 959

PLAYGROUND IMAGINEERING

TITLE:
COLLEGE PARK SCHOOL @ HALLFIELDS

DWG NO.
PLAYGROUND OVERVIEW
Q2845 - REV B

A3

SCALE:1:150

SHEET 1 OF 8

REV.	DESCRIPTION	DATE
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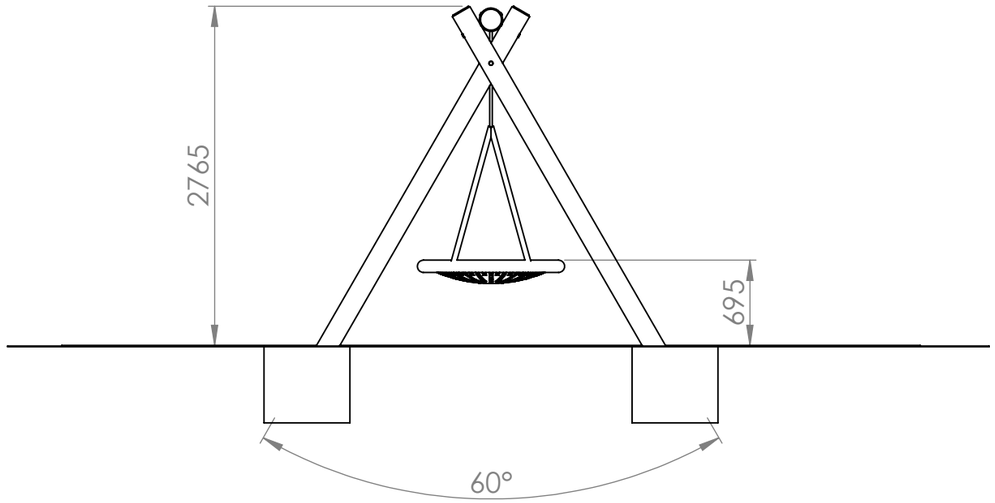

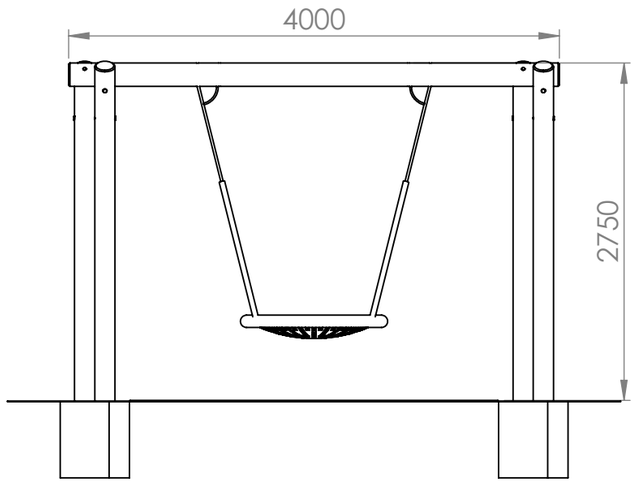

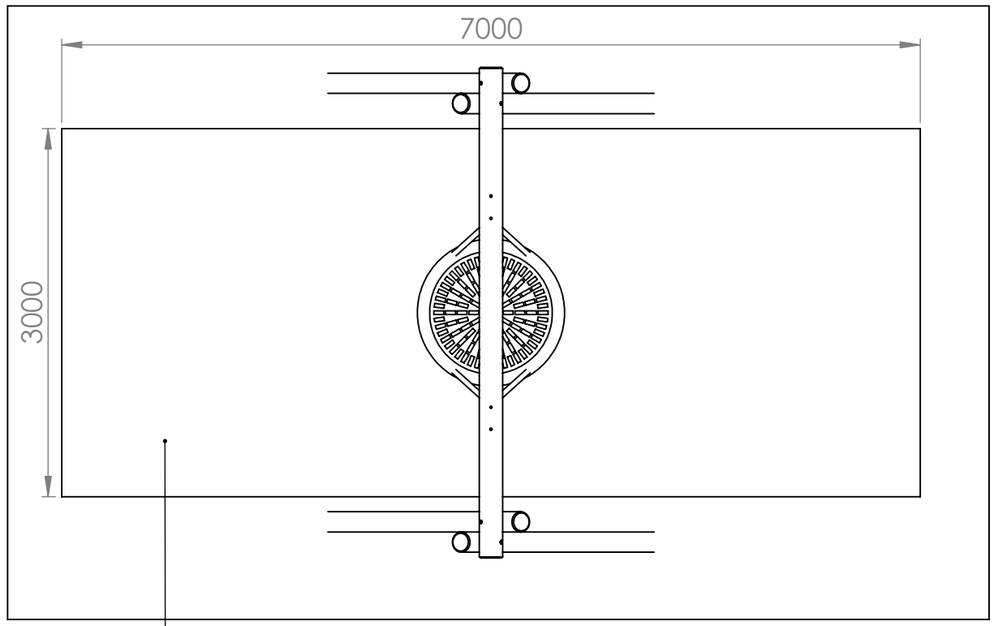

MATERIAL DETAIL:

PLAYGRADE RADIATA PINE FRAME (15 YEAR GUARANTEE AGAINST ROT & INFESTATION)
NYLON COATED STEEL CORE ROPES (2 YEAR GUARANTEE)
SECURITY FIXINGS (10 YEAR GAURANTEE AGAINST STRUCTURAL FAILURE)

	NAME	SIGNATURE	DATE
DRAWN			
CHK'D			

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PLAYGROUND IMAGINEERING

TITLE:
COLLEGE PARK SCHOOL @ HALLFIELDS

DWG NO.
BIRDS NEST SWING
Q2845 - REV B

A3

SCALE: 1:50

REV.	DESCRIPTION	DATE
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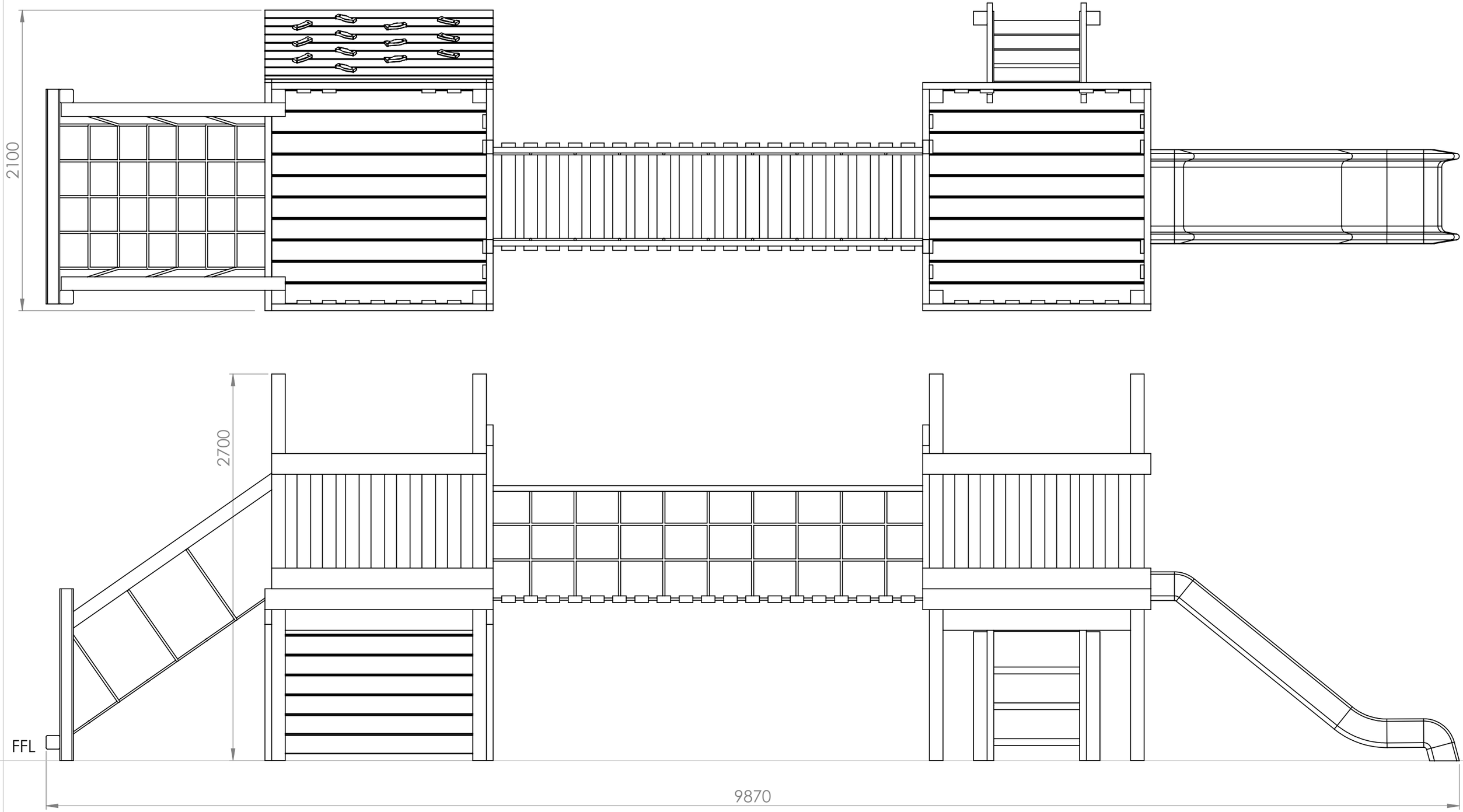

MATERIAL DETAIL:

PLAYGRADE SMOOTH PLANED R4C REDWOOD FRAME (10 YEAR GUARANTEE AGAINST ROT AND INFESTATION)
NYLON COATED STEEL CORE ROPES (2 YEAR GAURANTEE)
STAINLESS STEEL HANDRAILS(15 YEAR GAURANTEE ON STRUCTURAL FAILURE)
HDPE PLASTIC SLIDE (10 YEAR GAURANTEE, 5 YEAR GAURANTEE FOR COLOUR DEGRADATION)
SECURITY FIXINGS (10 YEAR GAURANTEE AGAINST STRUCTURAL FAILURE)

	NAME	SIGNATURE	DATE
DRAWN			
CHK'D			

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PLAYGROUND IMAGINEERING

TITLE:
COLLEGE PARK SCHOOL @ HALLFIELDS

DWG NO.
TWO TOWER CLIMBING STRUCTURE
Q2845 - REV B

A3

SCALE: 1:25

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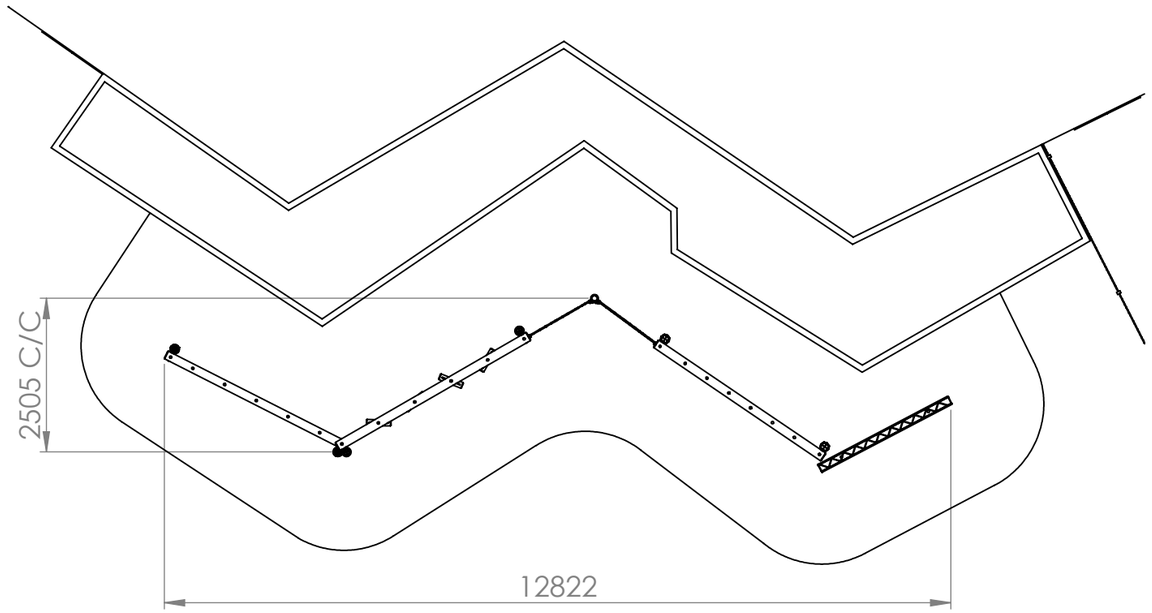
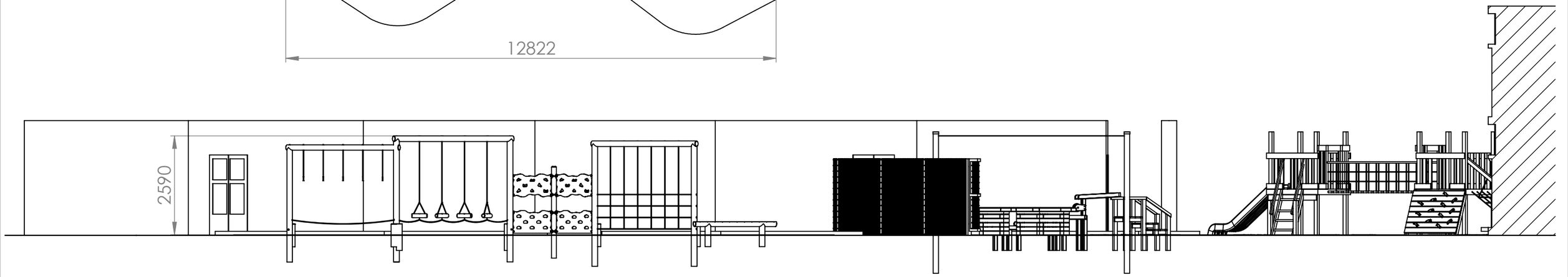
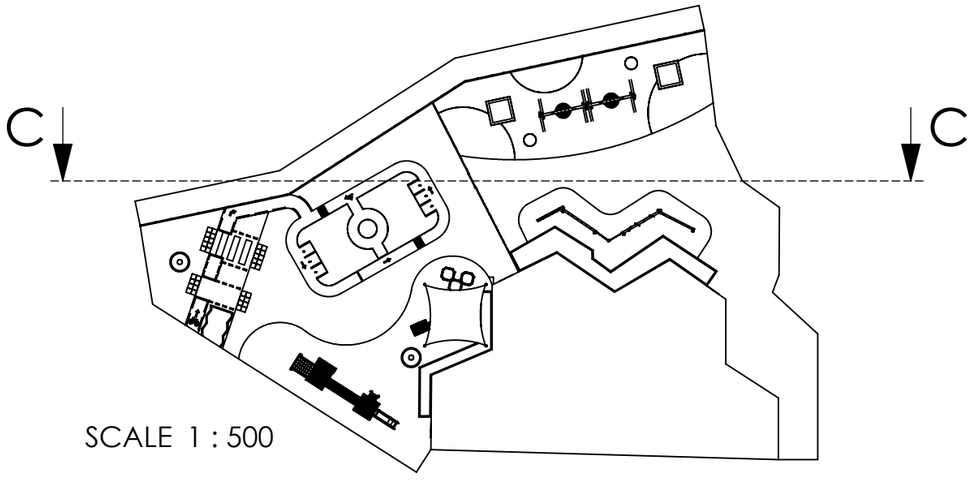




SECTION C-C

SCALE 1 : 100



SCALE 1 : 500

MATERIAL DETAIL:

PLAYGRADE RADIATA PINE FRAMES (15 YEAR GUARANTEE)
NYLON COATED STEEL CORE ROPES (2 YEAR GUARANTEE)
SECURITY FIXINGS (10 YEAR GAURANTEE AGAINST STRUCTURAL FAILURE)

	NAME	SIGNATURE	DATE
DRAWN			
CHK'D			

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PLAYGROUND IMAGINEERING

TITLE:

COLLEGE PARK SCHOOL @ HALLFIELDS

DWG NO.

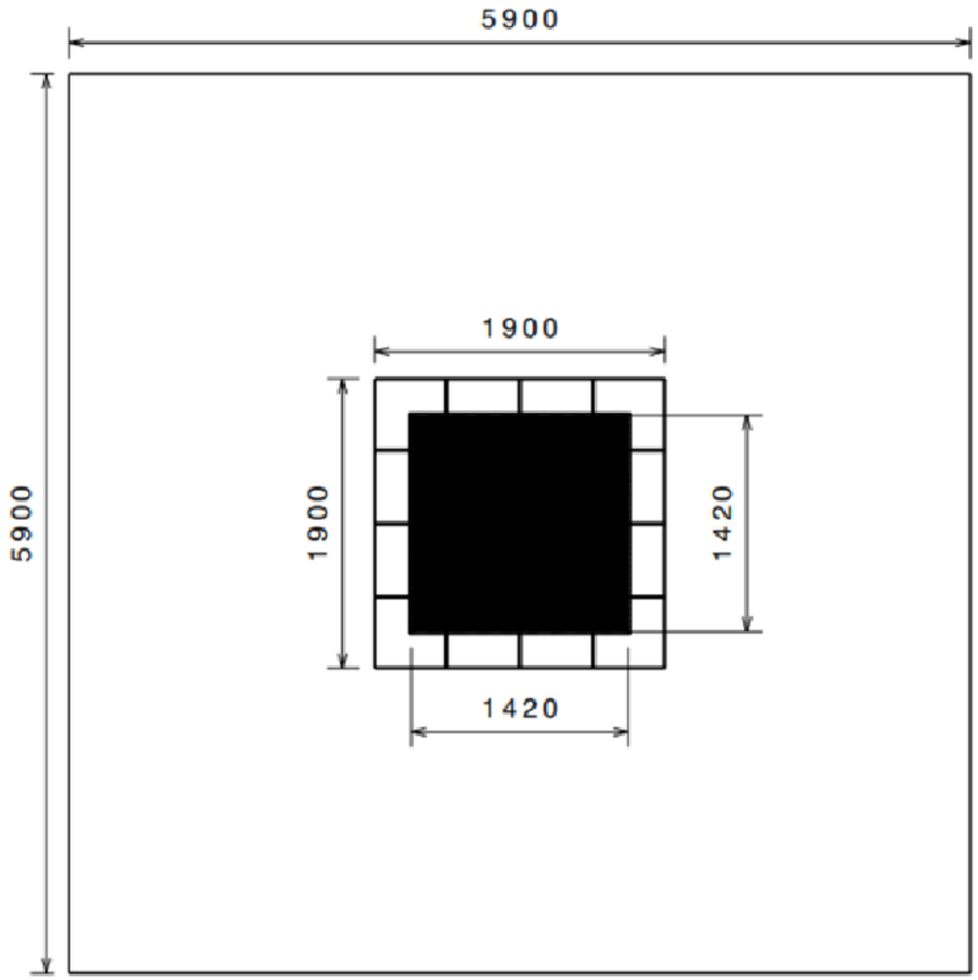
FITNESS & ADVENTURE TRAIL
Q2845 - REV B

A3

SCALE:1:500

REV.	DESCRIPTION	DATE
0	PRELIMINARY DRAWING	

4 Drawings and illustrations



impact area

top view **of Bouncer Medium**

jumping area:	1420 x 1420 mm
outside measures:	1900 x 1900 mm
impact area:	5900 x 5900 mm

MATERIAL DETAIL:

GALVANISED STEEL METAL FRAME
RUBBER MAT SURROUND
BLUE PLASTIC LAMELLA INNER MESH

	NAME	SIGNATURE	DATE
DRAWN			
CHK'D			

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PLAYGROUND IMAGINEERING

TITLE:
COLLEGE PARK SCHOOL @ HALLFIELDS

DWG NO.
INGROUND TAMPOLINE Q2845 - REV B

A3

SCALE:1:500

REV.	DESCRIPTION	DATE
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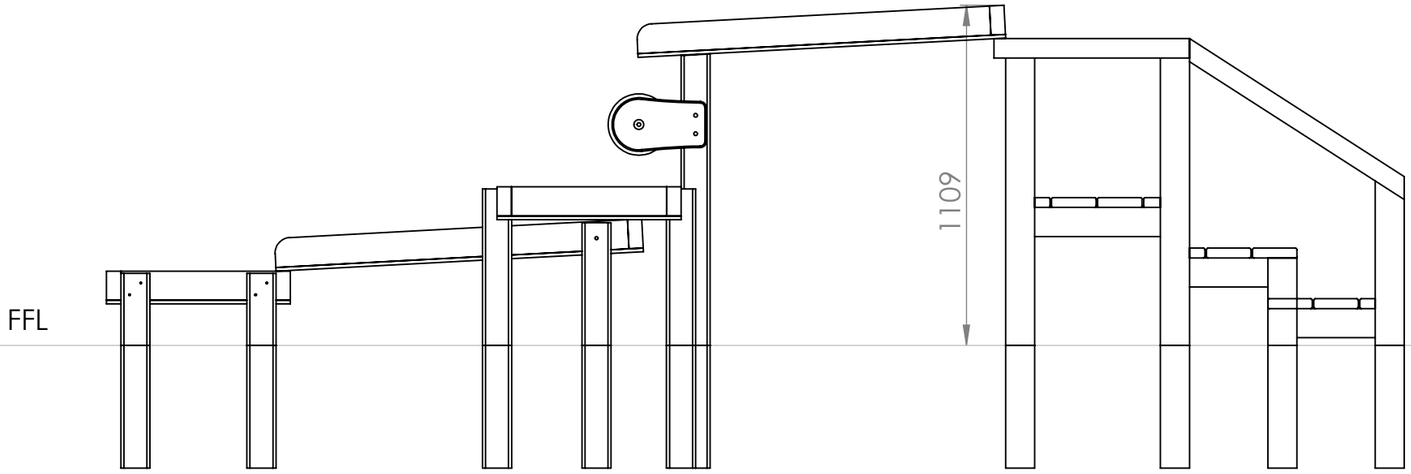

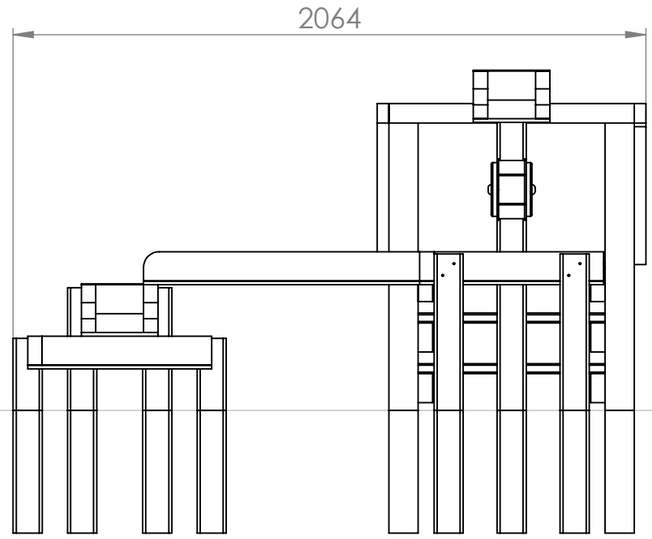

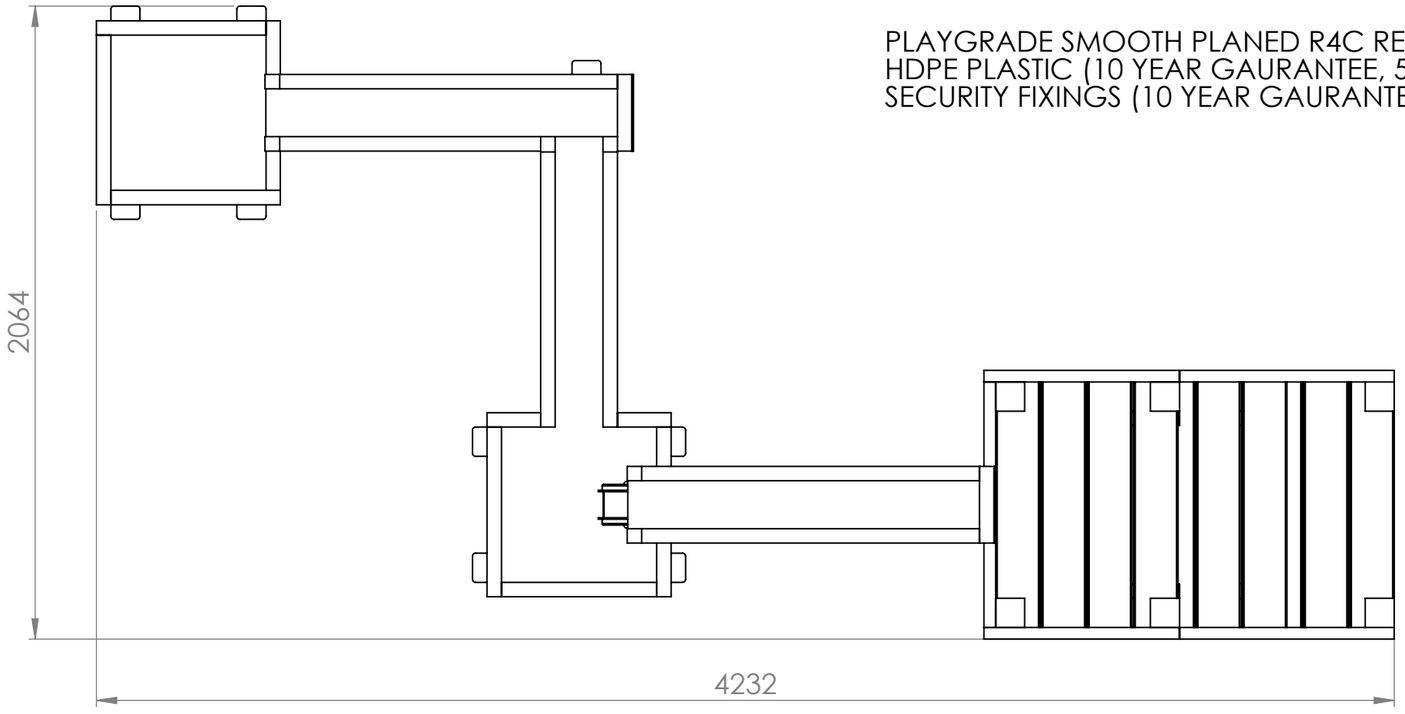

MATERIAL DETAIL:

PLAYGRADE SMOOTH PLANED R4C REDWOOD FRAME (10 YEAR GUARANTEE AGAINST ROT AND INFESTATION)
HDPE PLASTIC (10 YEAR GAURANTEE, 5 YEAR GAURANTEE FOR COLOUR DEGRADATION)
SECURITY FIXINGS (10 YEAR GAURANTEE AGAINST STRUCTURAL FAILURE)

	NAME	SIGNATURE	DATE
DRAWN			
CHK'D			

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PLAYGROUND IMAGINEERING

TITLE:
COLLEGE PARK SCHOOL @ HALLFIELDS

DWG NO.
MODULAR WATER PLAY
Q2845 - REV B

A3

SCALE: 1:20

REV.	DESCRIPTION	DATE
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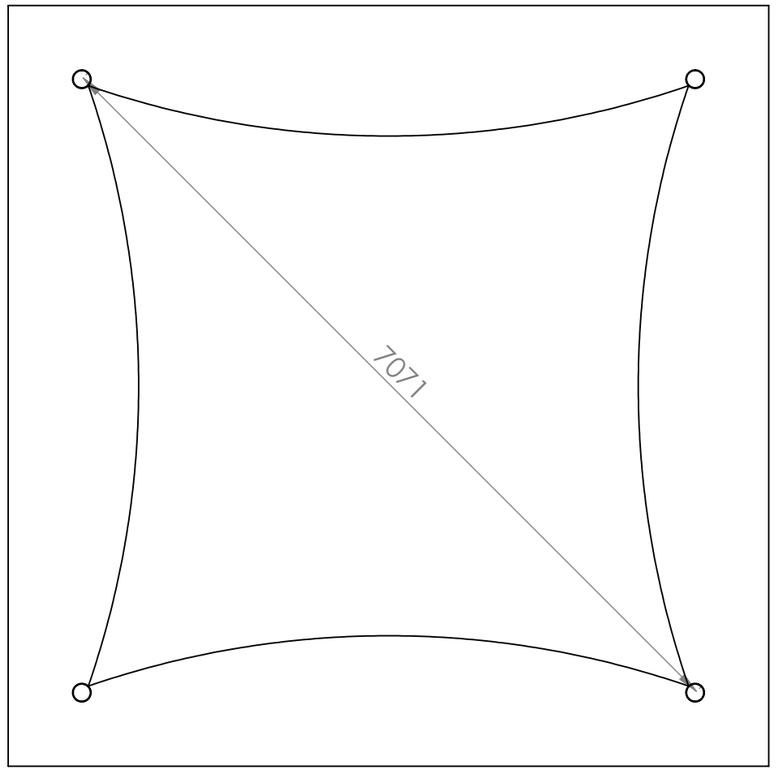

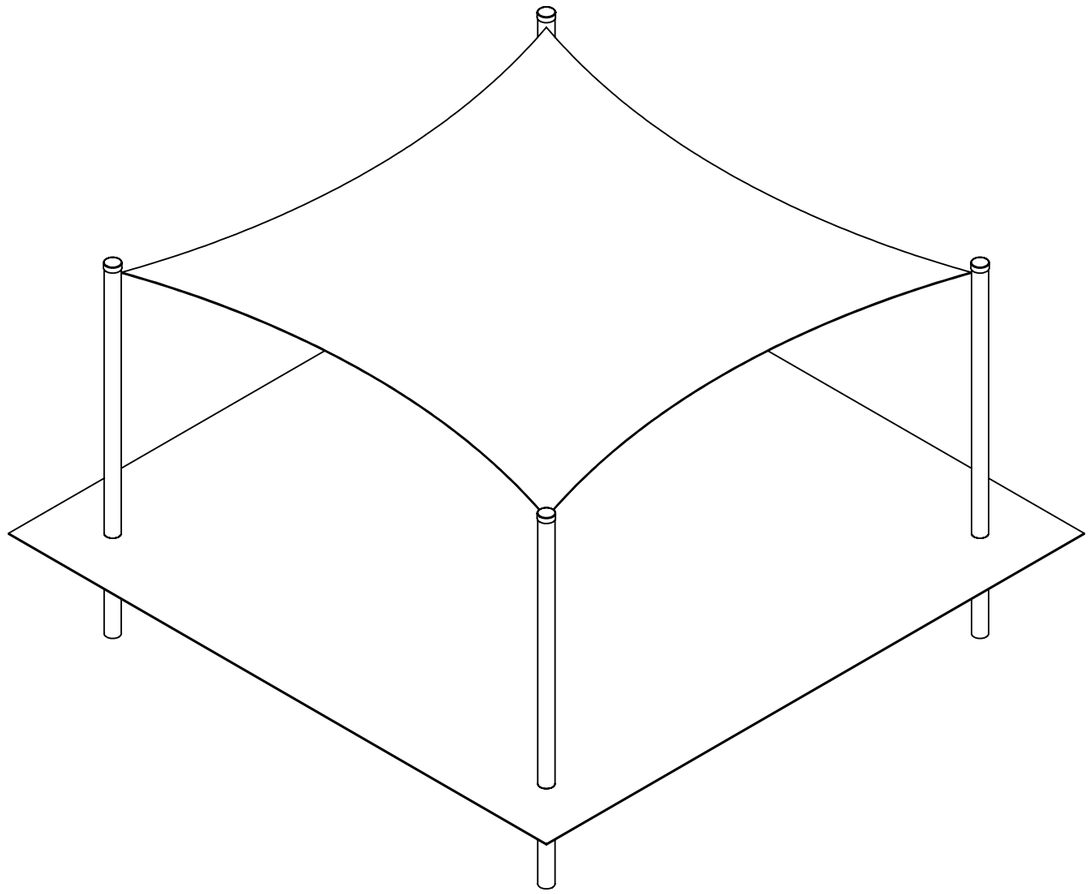

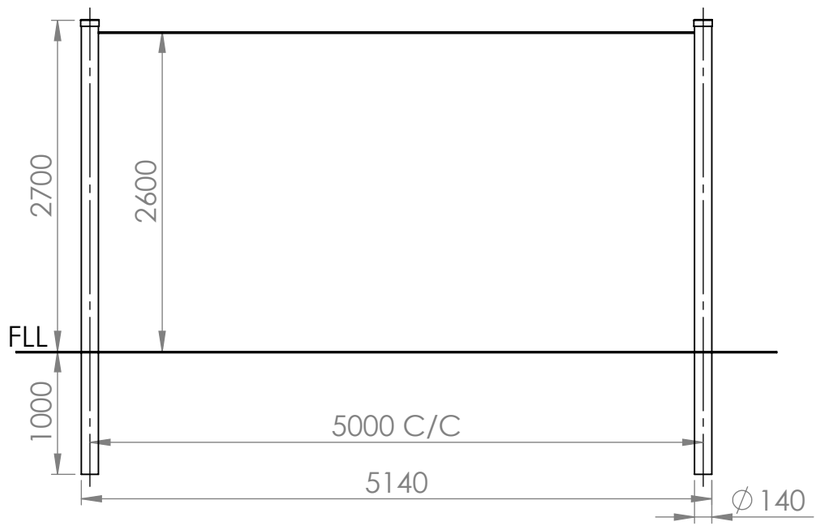

MATERIAL DETAIL:

GALVANISED STEEL UPRIGHT POSTS(15 YEAR GAURANTEE ON STRUCTURAL FAILURE)
COMMERCIAL 95 HDPE FABRIC SAIL SHADE (10 YEAR UV GAURANTEE)
SECURITY FIXINGS (10 YEAR GAURANTEE AGAINST STRUCTURAL FAILURE)

	NAME	SIGNATURE	DATE
DRAWN			
CHK'D			

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PLAYGROUND IMAGINEERING

TITLE:
COLLEGE PARK SCHOOL @ HALLFIELDS

DWG NO.
SAIL SHADE
Q2845 - REV B

A3

SCALE:1:100

REV.	DESCRIPTION	DATE
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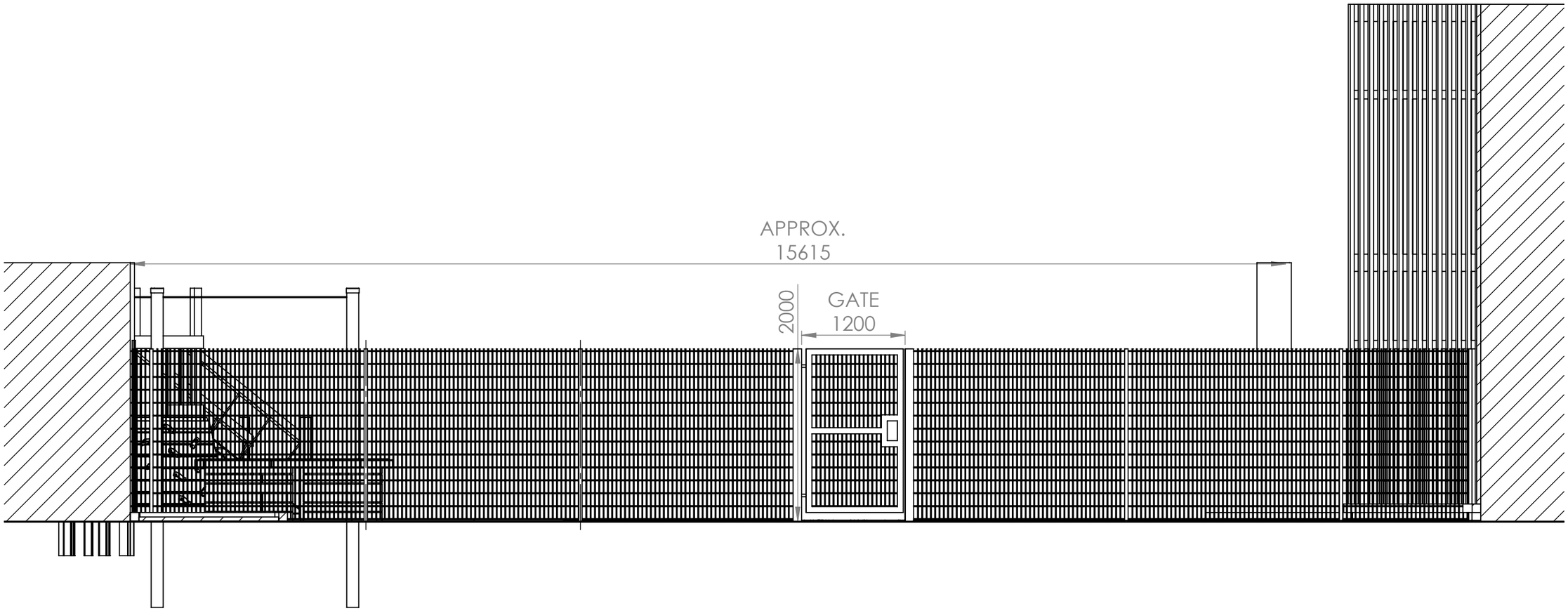

SECTION E-E

SCALE 1 : 50

MATERIAL DETAIL:

PROFILED WELDED MESH FENCING - GALVANISED AND POWDER COATED.
SECURITY FIXINGS (10 YEAR GAURANTEE AGAINST STRUCTURAL FAILURE)

	NAME	SIGNATURE	DATE
DRAWN			
CHK'D			

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PLAYGROUND IMAGINEERING

TITLE:
COLLEGE PARK SCHOOL @ HALLFIELDS

DWG NO.
FENCE
Q2845 - REV B

A3

SCALE:1:500

SHEET 8 OF 8