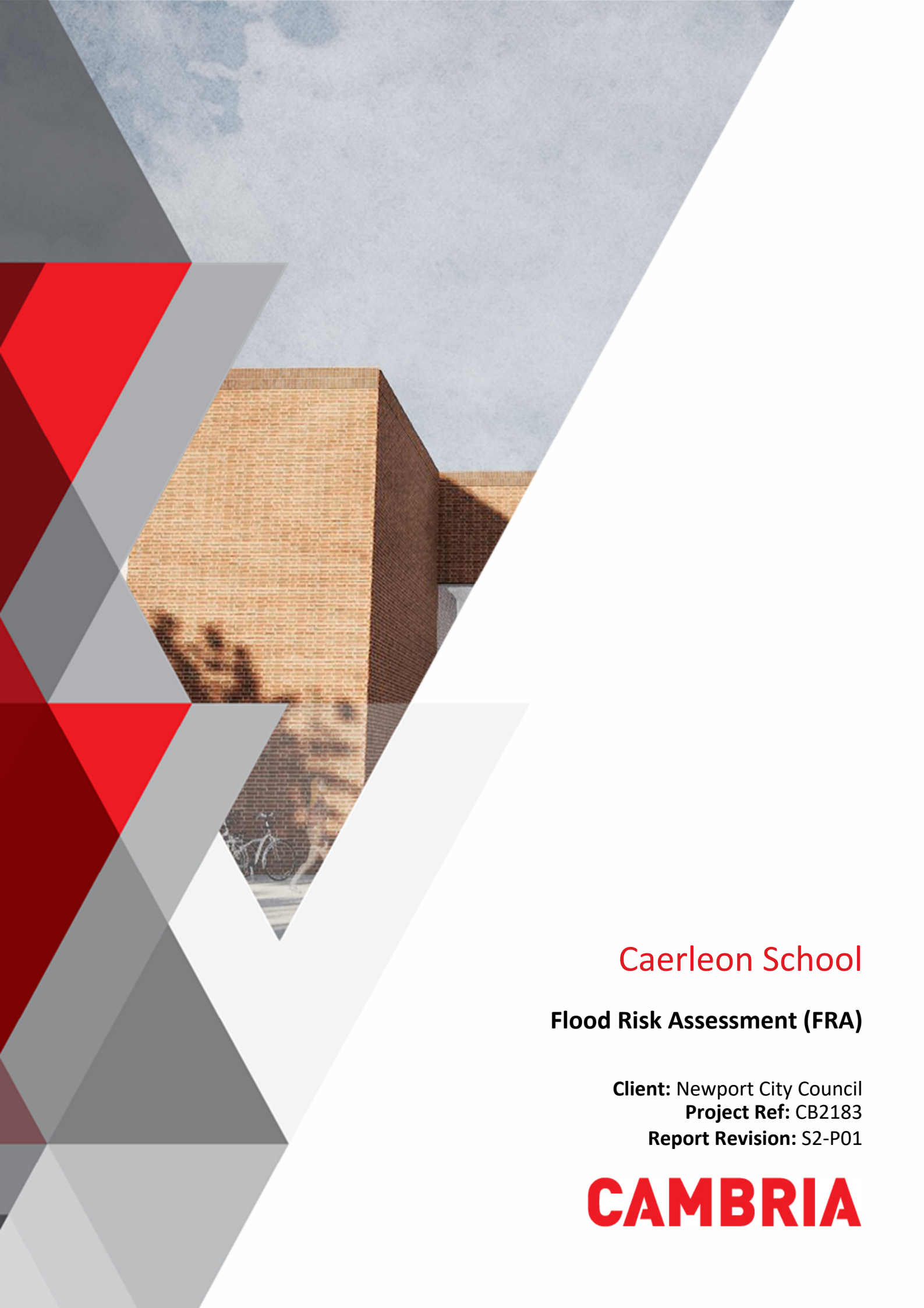




Caerleon School

Flood Risk Assessment (FRA)

Client: Newport City Council

Project Ref: CB2183

Report Revision: S2-P01

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Report Control Sheet

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1 Introduction

- 1.1.1 Cambria Consulting Limited have been appointed by Newport Norse on behalf of Newport City Council to develop a Flood Risk Assessment in support of achieving a BREEAM credit(s) for the development of the proposed Caerleon Comprehensive School redevelopment.
- 1.1.2 The proposed redevelopment involves the partial demolition and repurposing of the Main block (A), and then a new build teaching block (N) with an integrated sports hall to replace further blocks being demolished. There are also additional changes to the external areas.
- 1.1.3 The objectives of this report are to assess the risk of flooding to the development from all the potential sources and discuss potential mitigation measures where necessary.

2 Site Description

- 2.1.1 The proposed development site for Caerleon Comprehensive School is the existing school site, off Cold Bath Rd, Caerleon, Newport NP18 1NF, OS grid reference ST334905. The proposed site is approximately 0.67Ha in total area, within a 5.91Ha School site.
- 2.1.2 At present, the site is occupied by five main buildings situated on the site. These buildings are located to be clustered towards the eastern side of the site.
- 2.1.3 There are three main car parks, two of which are positioned to the South and East of the main buildings, with the third car park located to the North of the site. To the west of the main buildings lies an artificial football pitch and playing field, whilst to the north lies a number of Netball courts. The eastern border is bordered by playing fields used by Caerleon Rugby Football Club.
- 2.1.4 There are several significant offsite features, with the most notable being the remains of Roman Barracks approximately 50m from the Eastern site margin. The site proximity to the Roman Barracks and Amphitheatre is likely to dictate significant archaeological interest. A further prominent offsite feature is the River Usk, 400m from the site's Eastern border.
- 2.1.5 The site location is shown below in Figure 2-1.

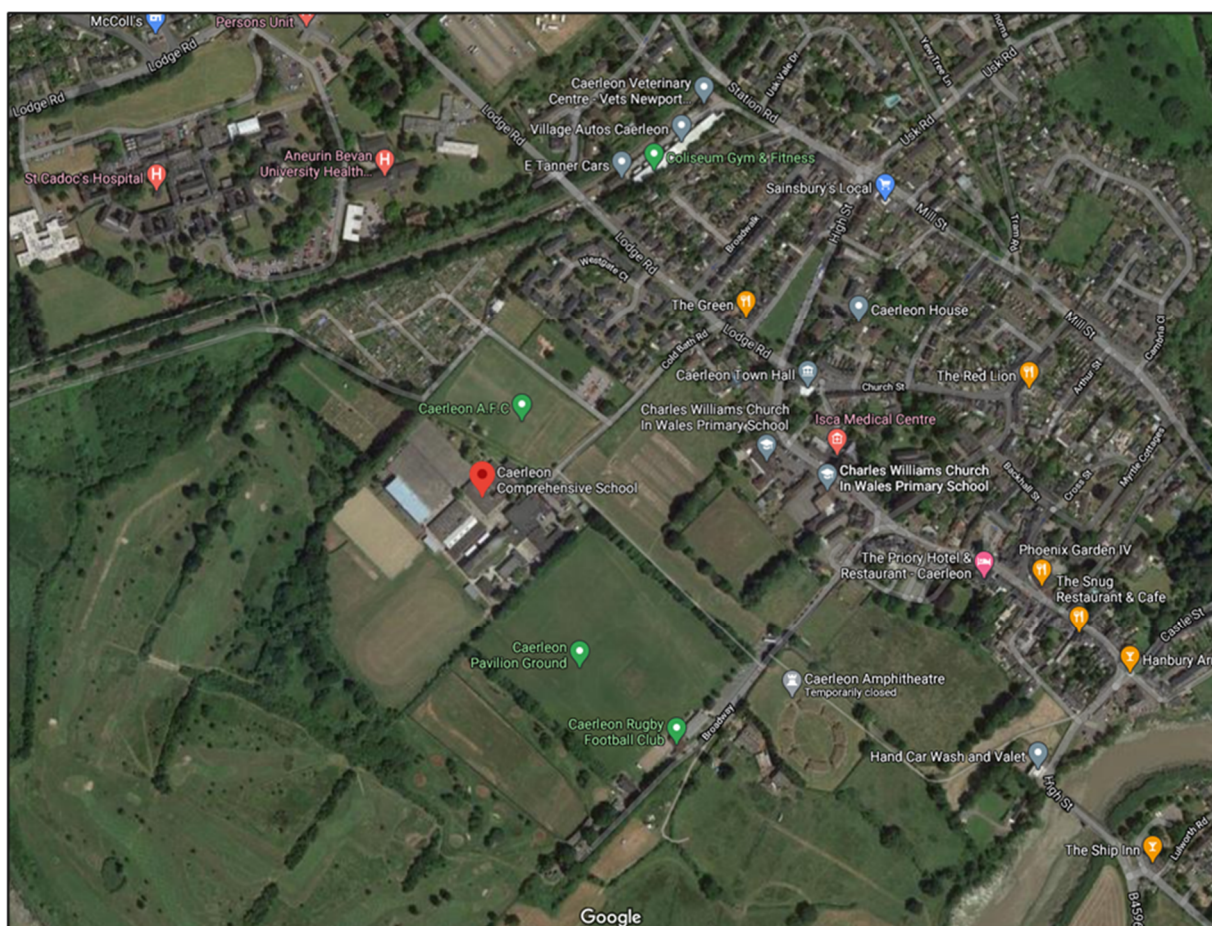


Figure 2-1 – Site Location from Data Map Wales

2.2 Topography

- 2.2.1 Atlas Surveys LLP conducted a Topographical & GPR survey during July 2019.
- 2.2.2 The school buildings lie on a relatively flat site. Embankments to the South and West fall to the adjacent fields at ~1:7. The football pitch to the Southwest of the school buildings has an average 1:100 fall to the southwestern boundary of the site. These fields have a ground slope of 1:60 closer to the buildings and 1:30 in the South-westerly half of the fields. Levels across site range from 16.95mAOD in the north to 9.85mAOD in the south.
- 2.2.3 There is a ~2m retaining wall to the Northeast of the northeastern car park between the site and the Caerleon Roman Barracks.
- 2.2.4 The Atlas Topographical Survey is shown in Figure 2-2 below and refer to *Appendix A* for a copy of the Atlas Topographical Survey.

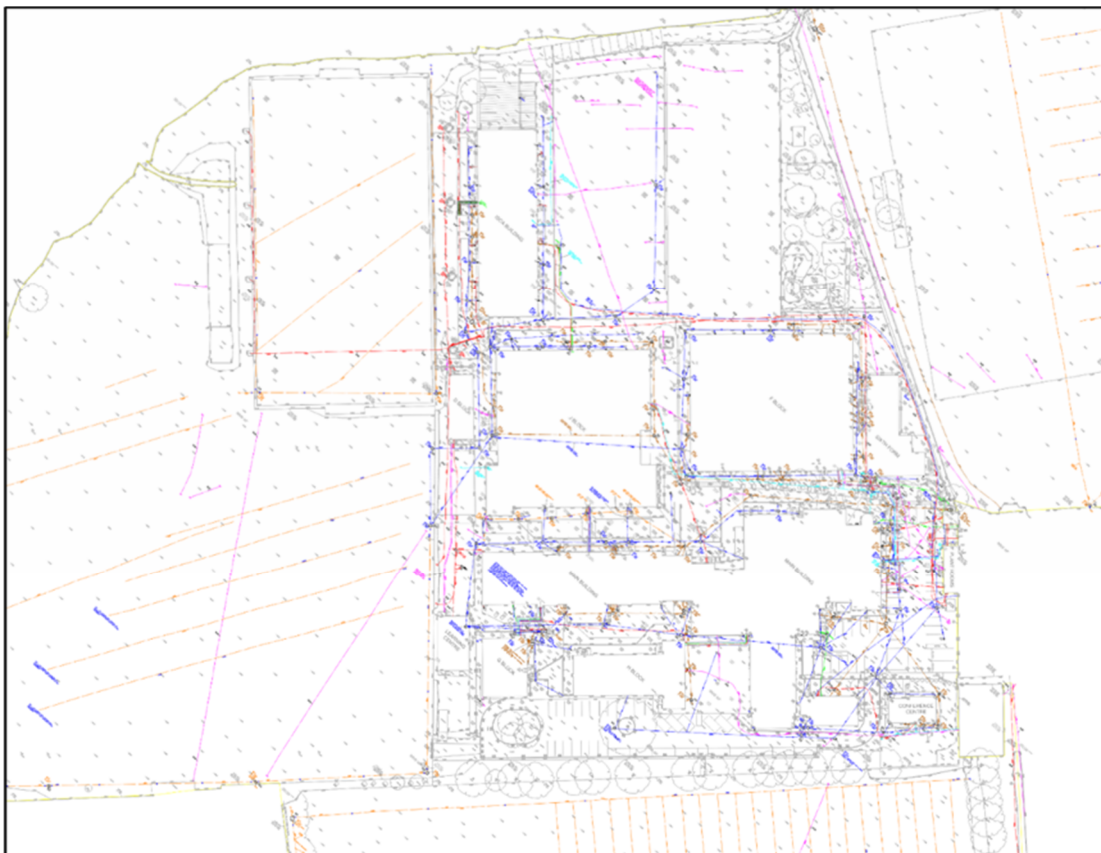


Figure 2-2 – Topographical & GPR Survey (Atlas Surveys LLP Ref. ASP1797-1)

2.3 Ground Conditions

- 2.3.1 An intrusive ground investigation was undertaken by Terra Firma (TF) on 28th and 29th October. The Site Investigation Report was published in December 2020 (Ref: 161120-16381-ISSUE) and is available upon request. Additional site investigation was undertaken in August 2022 to undertake further 3 no. windowless sample boreholes and 1 no. hand-dug trial pit.
- 2.3.2 In total, the geotechnical and environmental site investigations for the site comprised of:
- ▶ 6 No. Machine Excavated Trial Pits
 - ▶ 1 No. Hand-dug Trial Pits
 - ▶ 7 No. Windowless Sample Boreholes
 - ▶ 6 No. BRE365 Infiltration Tests (Within 6 No. Machine Excavated Trail Pits)
 - ▶ 3 No. Dynamic Cone Penetration Tests
- 2.3.3 The Coal Authority interactive map indicates that the site is not located within a high-risk development area. The western half of the site is located outside the coalfield consultation area. It is therefore concluded that the risk of ground subsidence occurring because of past shallow recorded or unrecorded mine workings is considered to be low. The report stated that; no past mining recorded, no faults, fissures or break lines recorded, no mine entries recorded on site or within 100m of the site boundary.
- 2.3.4 With respect to the risks to human health the majority of the analysed chemical elements or compounds are present at concentrations below the appropriate thresholds. However, initial screening indicates exceedances of beryllium and several PAH compounds. Asbestos was not detected within the screened samples.
- 2.3.5 Within the underlying clay soils, minor groundwater seepages were encountered at variable depths. Extremely fast inflow was also recorded at varying depths, with water standing in boreholes for periods after survey.
- 2.3.6 Groundwater strikes were observed in the majority of exploratory hole locations. The results show that there is a high groundwater table present within the sites with groundwater strikes ranging from depths of 0.2m BGL to 4.7m BGL with a range of extremely fast flow, minor seepage, moderate seepage, and groundwater standing still within in the exploratory hole.
- 2.3.7 Representative soil samples were taken from the trial pits/boreholes for laboratory chemical and geotechnical testing. Based on the data obtained from the site investigation works preliminary WAC testing, any waste materials comprising the existing made ground are likely to be classified as a combination of non-hazardous and hazardous waste. The existing natural ground are likely to be classified as non-hazardous waste.

2.4 Proposed Development Site & Buildings

- 2.4.1 The project comprises of several key elements, as shown on the architect's masterplan.
- 2.4.2 The principal elements from a Structural Engineering perspective are:

- 2.4.3 The proposed site layout design has been produced by HLM Architects, an extract of the layout is shown in Figure 2-3 below and included in *Appendix B*.

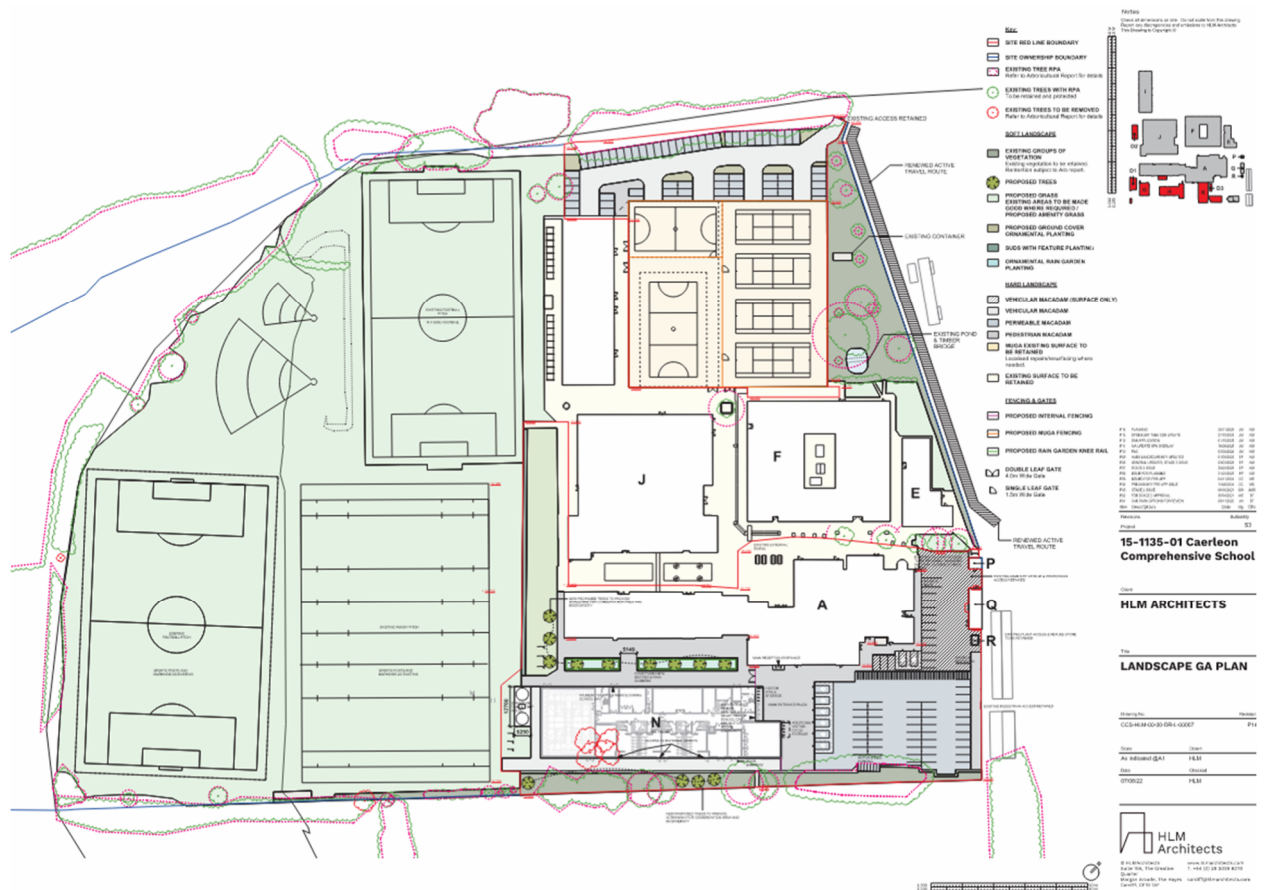


Figure 2-3 – Proposed Site Layout (HLM Architects)

3 Flood Risk

3.1 Flood Maps for Planning

- 3.1.1 The site lies within Flood Zone 1 area and is therefore not susceptible to river and sea flooding, as shown on Natural Resources Wales (NRW) Flood Map for Planning. It is acknowledged that the site boundary is close to, but not within Flood Zone 2 (river) and Flood Zone 3 (sea) areas. No TAN15 Defended Zones are within or in close proximity to the development site.
- 3.1.2 The NRW Surface Water and Small Watercourses Flood Map for Planning shows one area of Flood Area 2 & 3 within the development site. This catchment area is within the car park South of the main School entrance and will be considered as part of the site-wide drainage arrangement. No canals are in the vicinity of the site and therefore do not contribute to surface water flooding.
- 3.1.3 Therefore, the existing school site and development area are not identified to be located within river, sea and surface water flood risk areas. Proposed levels design shall consider potential overland flows to ensure the proposed development is protected in extreme storm events.
- 3.1.4 The NRW Flood Map for Planning: Rivers and Sea, and Surface Water and Small Watercourses are respectively shown below in Figure 3-1 and Figure 3-2

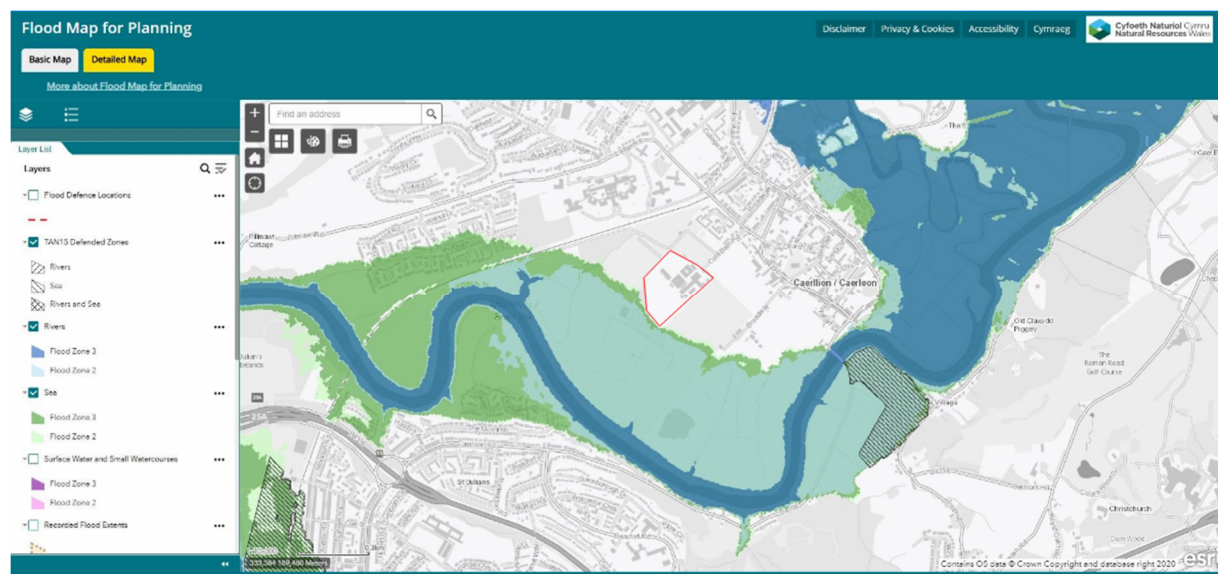


Figure 3-1 – Extract from NRW Flood Map for Planning: Rivers and Sea

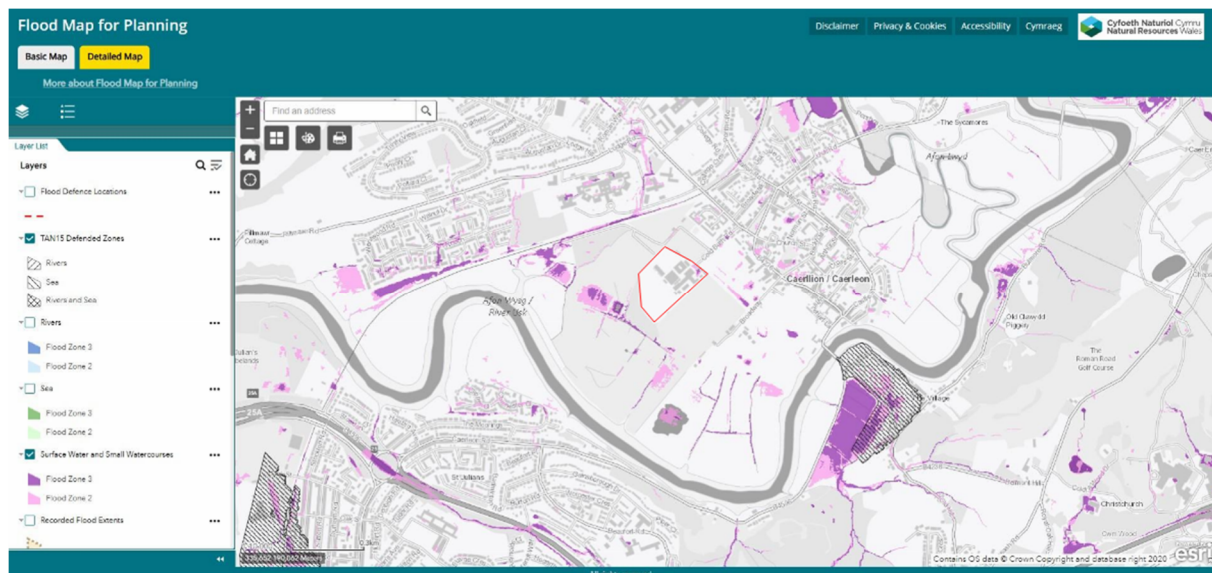


Figure 3-2 – Extract from NRW Flood Map for Planning: Surface Water and Small Watercourses

3.2 Groundwater Flooding

3.2.1 The BGS Flood Data Map below in Figure 3-3 indicates a potential for groundwater flooding of property situated below ground level.

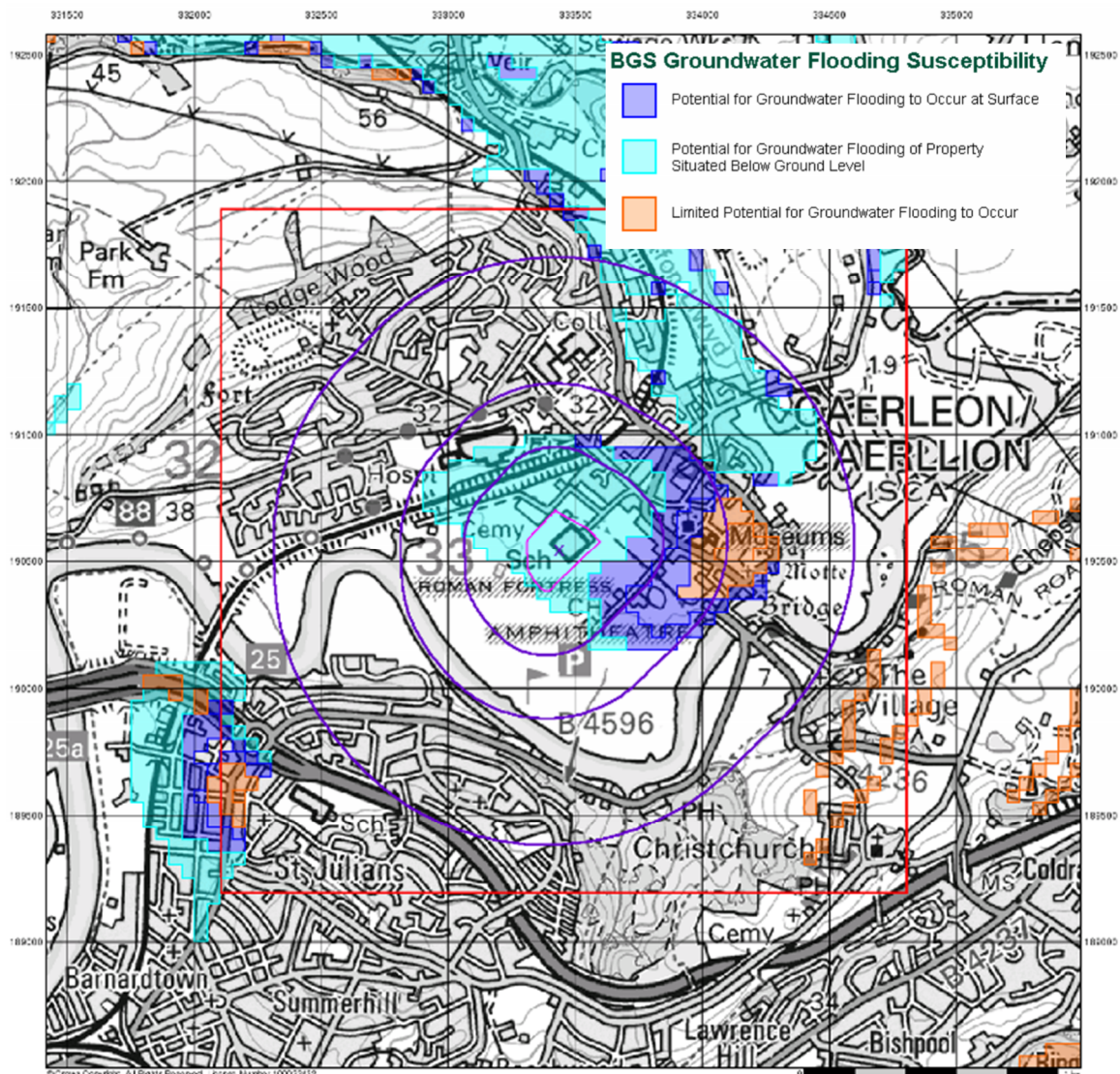


Figure 3-3 – BGS Flood Data Map (1:50,000)

- 3.2.2 Terra Firma's Site Investigation identified within underlying clay soils, minor groundwater seepages were encountered at variable depths. Extremely fast inflow was also recorded at varying depths, with water standing in boreholes for periods after survey.
- 3.2.3 Groundwater strikes were observed in the majority of exploratory hole locations. The results show that there is a high groundwater table present within the site with groundwater strikes ranging from depths of 0.2m BGL to 4.7m BGL with a range of extremely fast flow, minor seepage, moderate seepage, and groundwater standing still within in the exploratory hole.

3.3 Sewer Flooding

- 3.3.1 Dwr Cymru Welsh Water records show there are no public foul water sewers within the site. The site is bound by residential development to the north and east. There are multiple public combined sewers within the residential developments. There is a 200mm diameter cast iron rising main public combined sewer that runs adjacent to the eastern boundary, headed in a north-west direction.
- 3.3.2 The proposed foul drainage from Block N shall connect to the existing private pump station near the main school entrance/exit.
- 3.3.3 It is considered that a DCWW predevelopment enquiry is not required to confirm sufficient sewerage capacity for the foul drainage generated from the development and to agree a suitable connection point to the sewerage network. This development's enhancement of the existing school facility is perceived not to increase in loading / capacity requirements.
- 3.3.4 Asset information of the existing DCWW sewer records is shown below in Figure 3-4.



Figure 3-4 – Extract of Dwr Cymru Welsh Water Records (1:1,500)

3.4 Highway Drainage

3.4.1 There is existing highway drainage present within Cold Bath Road in the form of a series of road gullies that likely discharge into the public combined sewer and flush kerbs draining into the verge. Failure of the Cold Bath Road highway drainage would not cause any potential flood water to enter the site due to existing channel drainage collecting terminal runoff at the site gates.

3.4.2 There is deemed a low risk of flooding from the existing highway drainage system.

3.5 Historical Flooding

3.5.1 The NRW historical flood maps below in Figure 3-5 show there are no recorded flooding incidents within the site.

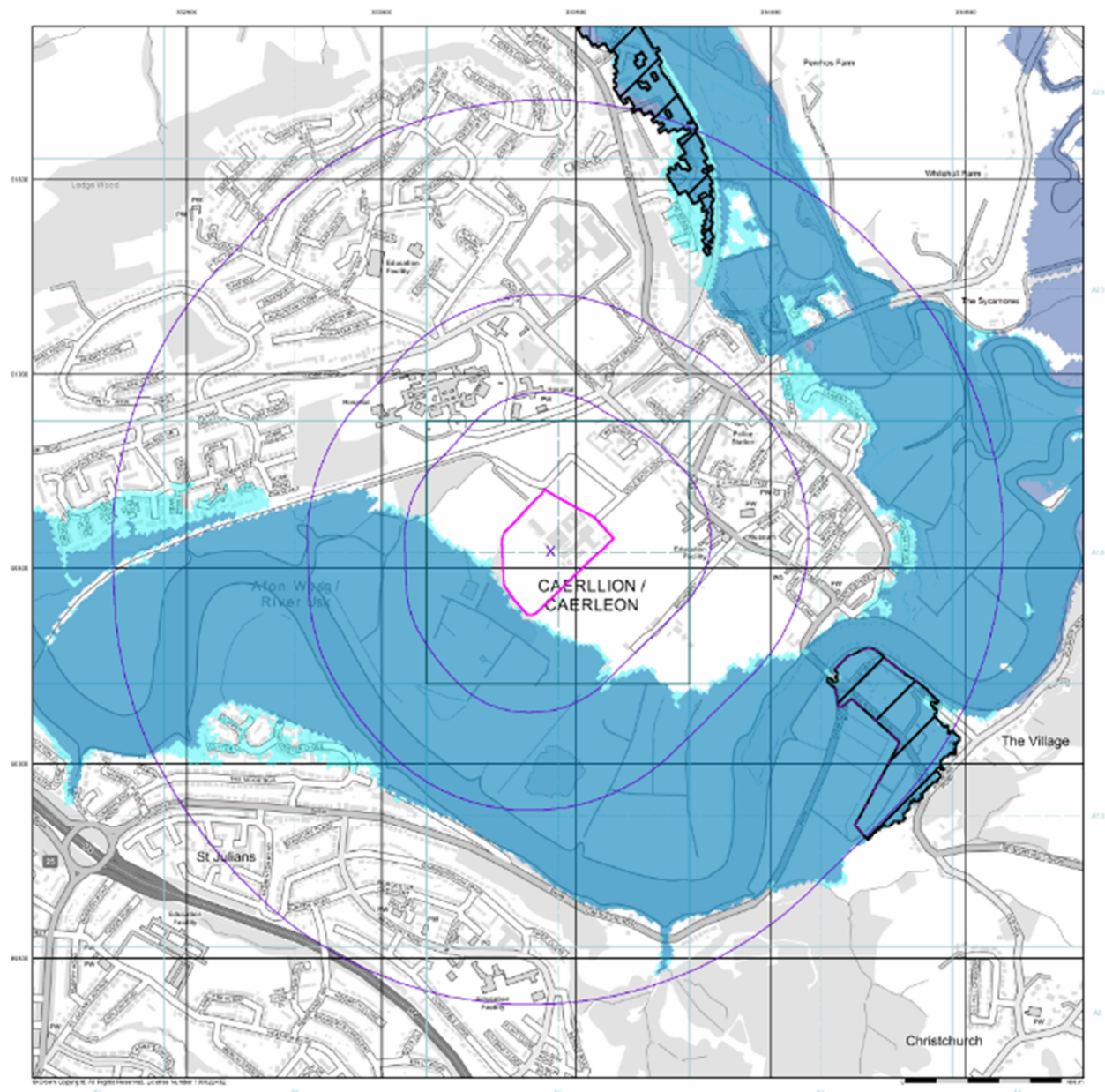


Figure 3-5 – NRW Historic Flood Map (1:10,000)

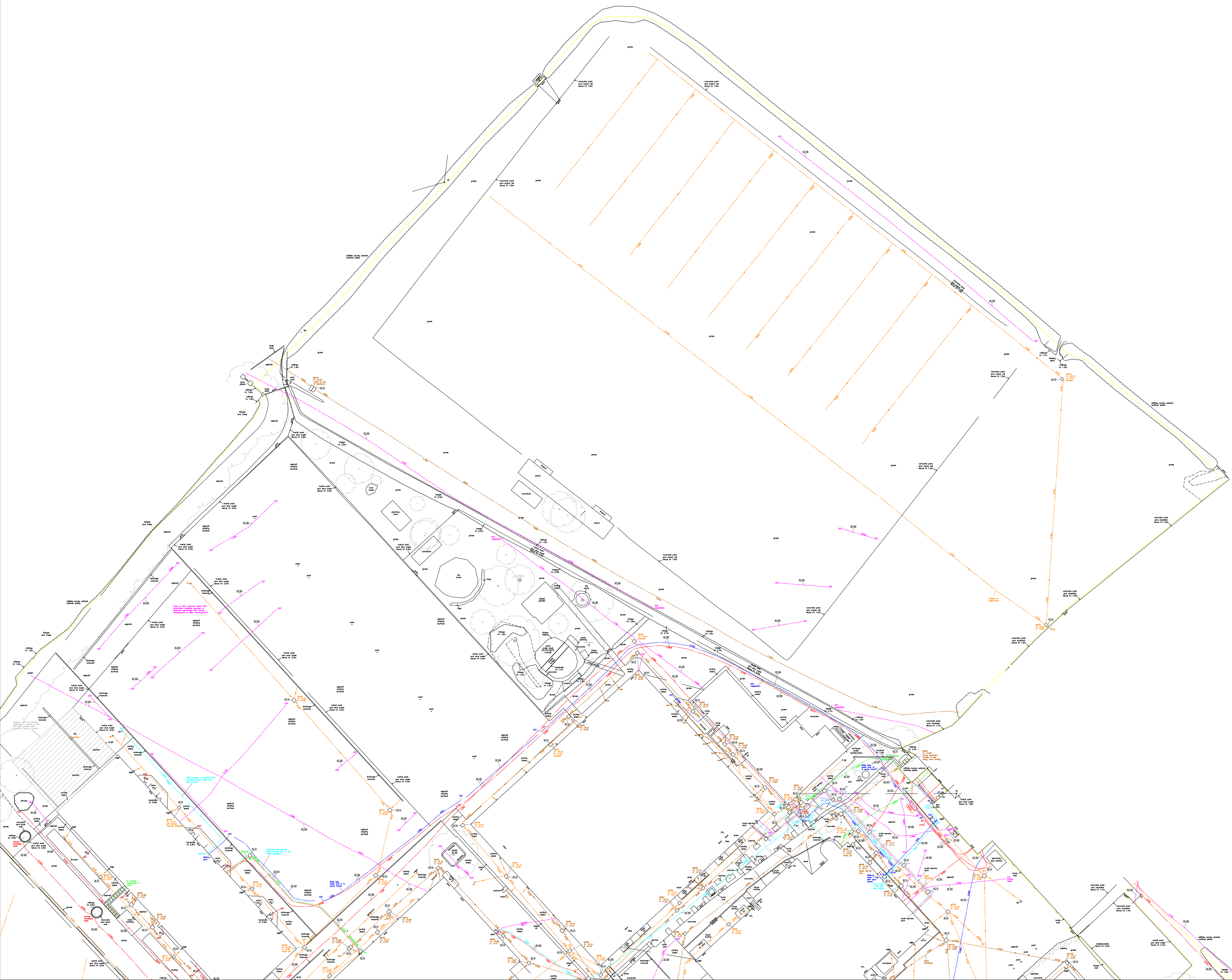
4 Flood Risk Mitigation Measures

- 4.1.1 The proposed development will introduce new SuDS measures which will provide surface water cleansing and restrict surface water runoff into the existing surface water network to mimic predevelopment conditions of the site.
- 4.1.2 The site history as shown in the Terrafirma site investigation (Ref. 16381 REPORT Caerleon (Full)) states the site was undeveloped agricultural land until the 1955-1970 edition when Caerleon Comprehensive School is shown. Additional development of the school site has been undertaken by the late 1970s, and the school then remains relatively unchanged to the present day. Surface drainage on the site is complex and in poor condition, in places. Surface water drainage from the development site will be intercepted by proposed SuDS features and discharge at a restricted rate to a private sewer to the south of the site, before re-entering into the surface water network.
- 4.1.3 All levels will fall away from proposed thresholds and threshold drains are included within the scheme. The proposed levels design considers exceedance events and flow of potential floodwaters to ensure in case of blockages, or an exceedance of the design storm event routes are provided for water to escape the site at suitable depths and velocities.
- 4.1.4 A series of existing land drains protect lower areas of the site.

5 Conclusions

- 5.1.1 The site is generally at low risk of flooding from Fluvial, Pluvial and Sea Flooding and negligible risk of flooding from Canal Failure, Groundwater & Sewer flooding.
- 5.1.2 As a result of the development proposals, flood risk is mitigated by the inclusion of an extensive Sustainable Drainage system which betters the predevelopment brownfield rate. Existing surface drainage on the site is complex and in poor condition, in places. Surface water drainage from the development site will be intercepted by proposed SuDS features and discharge at a restricted rate to a private sewer to the south of the site, before re-entering into the surface water network.
- 5.1.3 The development scheme is designed for a 1 in 100year+40% event and consideration has been given to overland flow routes in exceedance events to ensure the proposed buildings are protected and suitable access is maintained in such events.

Appendix A: Topographical & Utility Survey



EXTERNAL ABBREVIATIONS			
06	Belted Boobee	08	Black Duck
07	Belted Kingfisher (Parasiticide)	09	Black Duck (general)
08	Belted Kingfisher	10	Black Duck
09	Belted Kingfisher	11	Black Duck
10	Belted Kingfisher	12	Black Duck
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290	Belted Kingfisher	292</	

[illegible]

Revisions:

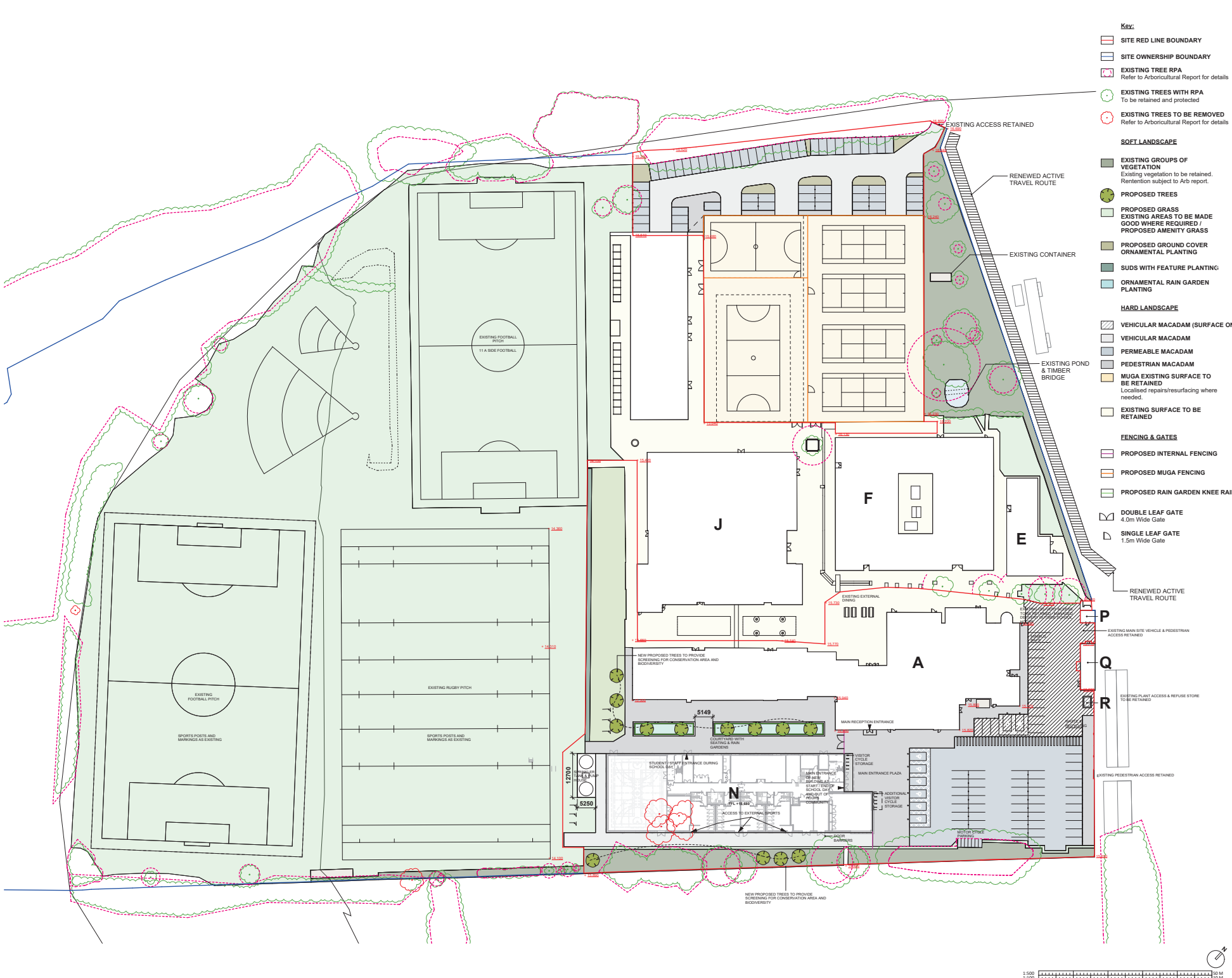
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LINETYPE KEY

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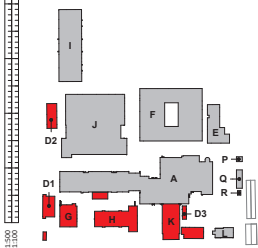
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Appendix B: Proposed Architects Site Layout



- Key:**
- SITE RED LINE BOUNDARY
 - SITE OWNERSHIP BOUNDARY
 - EXISTING TREE RPA
Refer to Arboricultural Report for details
 - EXISTING TREES WITH RPA
To be retained and protected
 - EXISTING TREES TO BE REMOVED
Refer to Arboricultural Report for details
- SOFT LANDSCAPE**
- EXISTING GROUPS OF VEGETATION
Existing vegetation to be retained. Retention subject to Arb report.
 - PROPOSED TREES
 - PROPOSED GRASS
EXISTING AREAS TO BE MADE GOOD WHERE REQUIRED / PROPOSED AMENITY GRASS
 - PROPOSED GROUND COVER ORNAMENTAL PLANTING
 - SUDS WITH FEATURE PLANTING
 - ORNAMENTAL RAIN GARDEN PLANTING
- HARD LANDSCAPE**
- VEHICULAR MACADAM (SURFACE ONLY)
 - VEHICULAR MACADAM
 - PERMEABLE MACADAM
 - PEDESTRIAN MACADAM
 - MUGA EXISTING SURFACE TO BE RETAINED
Localised repairs/resurfacing where needed.
 - EXISTING SURFACE TO BE RETAINED
- FENCING & GATES**
- PROPOSED INTERNAL FENCING
 - PROPOSED MUGA FENCING
 - PROPOSED RAIN GARDEN KNEE RAIL
- DOUBLE LEAF GATE**
4.0m Wide Gate
- SINGLE LEAF GATE**
1.5m Wide Gate

Notes
Check all dimensions on site. Do not scale from this drawing.
Report any discrepancies and omissions to HLM Architects.
This Drawing is Copyright ©



P14	PLANNING	26/11/2025	JM	KM
P13	SPRINKLER TANK SIZE UPDATE	27/11/2025	JM	KM
P12	SAB APPLICATION	01/10/2025	JM	KM
P11	ASL/UPDATES RPA OVERLAY	18/05/2025	JM	KM
P10	PAC	03/05/2025	JM	KM
P09	WARD LANDSCAPE KEY UPDATED	01/05/2025	EP	KM
P08	GENERAL UPDATES, STAGE 3 ISSUE	03/03/2025	EP	KM
P07	STAGE 3 ISSUE	28/02/2025	EP	KM
P06	ISSUE FOR PLANNING	21/02/2025	EP	KM
P05	ISSUED FOR PRE APP	04/10/2024	CC	MS
P04	PRELIMINARY PRE APP ISSUE	13/05/2024	CC	MS
P03	STAGE 2 ISSUE	06/05/2021	GW	AMS
P02	FOR STAGE 2 APPROVAL	30/04/2021	MC	BT
P01	CAR PARK OPTIONS FOR REVIEW	09/11/2020	JM	BT
Rev	Description	Date	By	CHK

15-1135-01 Caerleon Comprehensive School

Client
HLM ARCHITECTS

Title
LANDSCAPE GA PLAN

Drawing No.	Revision
CCS-HLM-00-00-DR-L-00007	P14
Scale	Drawn
As indicated @A1	HLM
Date	Checked
07/06/22	HLM