



Courtlands
37 Parklands Avenue, Worthing

**Flood Risk Assessment and Drainage
Strategy**

For

Courtlands By The Sea

Document Control Sheet

Courtlands

37 Parklands Avenue, Worthing

Courtlands By The Sea

This document has been issued and amended as follows:

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Contents

1.0 Introduction 1

2.0 Site Description 2

3.0 Legislative and Policy Framework 4

4.0 Current Flood Risk 9

5.0 Summary of Flood Risk14

6.0 Surface Water Drainage Strategy15

7.0 Compliance with the National Standards for SuDS17

8.0 Summary and Conclusions19

Appendices

A Site Layout

B EA’s Flood Map for Planning

C EA’s RoFSW Maps

D LiDAR Topographical Plan

E Envirocheck FSR: Groundwater Maps

F Envirocheck FSR: Historic Flood Map

1.0 Introduction

- 1.1 This Flood Risk Assessment (FRA) and Drainage Strategy has been produced by Motion on behalf of their client, Courtlands By The Sea. It supports the planning application at 37 Parklands Avenue, Goring-by-Sea, Worthing, BN12 4NG.
- 1.2 The planning application requests approval for the following:
 - ▶ Change of use from a care/school facility with overnight accommodation (Class C2) to a Special Educational Needs (SEN) School (Class F1) for up to 80 pupils;
 - ▶ Removal of the previously approved overnight accommodation from the scheme;
 - ▶ Retention of two replacement outbuildings (retrospective sheds);
 - ▶ Erection of additional lodge-style classroom buildings within the grounds;
 - ▶ Installation of a modest Multi-Use Games Area (MUGA);
 - ▶ Associated internal and external works.
- 1.3 A site layout of the developments can be seen in **Appendix A**.
- 1.4 The 1.17 hectares (ha) site is located within Flood Zone 1 according to the EA's Flood Map for Planning (**Appendix B**).
- 1.5 With reference to the EA's Risk of Flooding from Surface Water (RoFSW) map in **Appendix C**, the majority of the site is in the 'very low' surface water flood risk category (areas of less than the 1 in 1,000-year return period). There are areas of low to high surface water flood risk category along the south/southwestern boundary of the site.
- 1.6 This FRA and drainage strategy has been produced to discuss the flood risks to the developments, from all sources. This FRA and drainage strategy will also define how the site will manage its surface water so that the development does not increase flood risk in the area or to neighbouring properties/land.
- 1.7 This drainage strategy follows the guidance set out in:
 - ▶ National Planning Policy Framework (NPPF)
 - ▶ Planning Practice Guidance (PPG) to the National Planning Policy Framework
 - ▶ CIRIA SuDS Manual 2015 (C753)
 - ▶ Environment Agency Rainfall Runoff Management for Developments
 - ▶ Non-Statutory Technical Standards for SuDS (NSTS)
 - ▶ New National Standards for SuDS.
- 1.8 Therefore, this report will define how the site will manage its surface water so that the development does not increase flood risk in the area or to neighbouring properties/land.

2.0 Site Description

Table 2.1 – Site Summary

Site Name	Courtlands
Location	37 Parklands Avenue, Goring-by-Sea, Worthing, BN12 4NG
Grid Reference	TQ 11912 02495
Site Area	Developable Area = 11,706 m ² (1.17 ha)
Flood Zone	Flood Zone 1
Flood Risk Vulnerability Classification	More Vulnerable
Surface Water Flood Risk	Low to Medium
Local Water Authority	Southern Water
Local Planning Authority	Adur & Worthing Councils
Lead Local Flood Authority	Adur & Worthing Councils

Site Location and Description

- 2.1 The developments are located on Parklands Avenue, in Goring-by-Sea.
- 2.2 The existing site consists of a care/school facility with overnight accommodation (Class C2), known as Courtlands.
- 2.3 The proposals include:
- ▶ Change of use to a Special Educational Needs (SEN) School (Class F1) for up to 80 pupils;
 - ▶ Removal of the previously approved overnight accommodation from the scheme;
 - ▶ Retention of two replacement outbuildings (retrospective sheds);
 - ▶ Erection of additional lodge-style classroom buildings within the grounds;
 - ▶ Installation of a modest Multi-Use Games Area (MUGA);
 - ▶ Associated internal and external works.
- 2.4 A site layout of the developments can be seen in **Appendix A**.

Topography

- 2.5 The topographic situation of the site has been reviewed using Light Detection and Ranging (LiDAR) data. This can be seen in **Appendix D**.
- 2.6 Overall, the site has a highpoint in the northern area and the site levels fall gently to the south. The site levels fall from around 8.0 metres Above Ordnance Datum (mAOD) to a level of around 5.0 mAOD.

Geology

- 2.7 The British Geological Survey (BGS) online 1:50,000 Geoindex mapping identifies that the underlying bedrock geology is New Pit Chalk Formation - Chalk.

- 2.8 The BGS online 1:50,000 Geoindex mapping describes the superficial geology as 'River Terrace Deposits (Undifferentiated) – Sand, Silt and Clay'.
- 2.9 Defra's Magic Map online application has been referred to, which lists the soils in the area as 'freely draining slightly acid loamy soils'.

Hydrogeology

- 2.10 Groundwater Source Protection Zones (SPZ's) are defined around groundwater abstraction sources such as wells, boreholes and springs that are used for public drinking water supply.
- 2.11 Defra's Magic Map was reviewed to see where the site is in relation to the Groundwater SPZ's and the site is not within any SPZ's.
- 2.12 The site's bedrock geology (New Pit Chalk Formation) is listed as a 'principal' aquifer and the site's superficial geology (River Terrace Deposits (Undifferentiated)) is listed as a 'secondary B' aquifer.
- 2.13 The Groundwater Vulnerability Map (England) classification is shown as 'Medium' for the site with soluble rock risk.

Hydrology

- 2.14 The nearest designated Main River is the Ferring Rife, which is around 2.86km to the west of the site and flows into the sea.
- 2.15 The site is located around 510m north of Goring-by-Sea beach.

3.0 Legislative and Policy Framework

- 3.1 LLFA's have a responsibility under the FWMA to develop, maintain, apply and monitor the application of a strategy for local flood risk in their area. Local flood risk is defined as flood risk arising from local sources, such as surface water run-off, groundwater and ordinary watercourses (i.e. non-main rivers). The EA plays a role in managing, maintaining and regulating activity around the watercourses designated as Main Rivers.

The National Planning Policy Framework

- 3.2 The NPPF sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. The Planning Practice Guidance (PPG) to the NPPF provides further information on the policies set out in the NPPF. It encourages development to take place in areas of lower flood risk wherever possible and stresses the importance of preventing increases in flood risk off-site to the wider catchment area. This includes ensuring that flood risk is considered at all stages of the planning process, avoiding inappropriate development in areas at risk of flooding and directing development away from those areas where risks are highest.
- 3.3 The process of directing development away from those areas where risks are highest is the Sequential Test. It covers all forms of flooding, and this is covered in Paragraphs 23 and 24 of the NPPF. Following the December 2024 update to the NPPF, Paragraph 175 was added that states that development can be appropriate on sites with flood risk "in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would not be at risk of flooding from any source, now and in the future". This essentially means that if a sequential approach is applied within the site boundary, and areas of flood risk now and in the future are avoided, that flood risk should not prevent the development coming forward and that the Sequential Test is not required.

The Environment Agency Flood Map for Planning

- 3.4 The updated Environment Agency's Flood Map for Planning was released on 25th March 2025. This updated and new National Flood Risk Assessment (NaFRA) uses both existing detailed local information and improved national data, includes the potential impact of climate change on flood risk, based on UK Climate Projections (UKCP18) and shows potential flood depths. This allows the Flood Map for Planning to provide much higher resolution maps that make it easier to see where there is risk.
- 3.5 The New NaFRA Flood Map for Planning remains split into 'Flood Zones', which demarcate the extent of flooding from rivers or the sea for different return periods.
- 3.6 Table 3.1, on the next page, lists the flood zone categories and explains the flood risk probabilities they represent.

Table 3.1 – Flood Zone Categories

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding (shown as 'clear' on the Flood Map – 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 tidal flooding (land shown in light blue on the Flood Map)
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 tidal flooding (land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water must flow or be stored in times of flood, which is typically the 1 in 30-year flood event or greater. Local planning authorities should identify in their SFRAs areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map, but may be distinguished in Product 4 information, for example)

- 3.7 A site-specific FRA is required for proposals of 1ha or greater in Flood Zone 1, all proposals for development in Flood Zones 2 and 3, or in an area within Flood Zone 1 that has critical drainage problems (as notified to the local planning authority by the EA). There are flood risk on the site and the site is over 1ha in area, thus flood risk from all sources will be reviewed for the completeness of the application.
- 3.8 An FRA should identify and assess the risks of all forms of flooding and demonstrate how these flood risks will be managed so that a development remains safe throughout its lifetime, taking climate change into account.
- 3.9 Within each Flood Zone, a key factor in determining planning applications for development is the flood risk vulnerability of a development. Table 2 of the PPG to the NPPF categorises different development types according to their vulnerability to flooding. These categories are:
- ▶ Essential infrastructure;
 - ▶ Highly vulnerable development;
 - ▶ More vulnerable development;
 - ▶ Less vulnerable development, and;
 - ▶ Water-compatible development.
- 3.10 Within the different Flood Zones each of the above development categories are considered appropriate or not permissible. The Technical Guidance to the NPPF lists these as:

Flood Zone 1:

- ▶ All the development categories listed above are appropriate.

Flood Zone 2:

- ▶ Water-compatible, less vulnerable development, more vulnerable development and essential infrastructure is appropriate in this zone.

Flood Zone 3a:

- ▶ Water-compatible and less vulnerable development is appropriate in this zone. Highly vulnerable development should not be permitted in this zone.

Flood Zone 3b:

- ▶ Only water-compatible development and essential infrastructure that must be there should be permitted in this zone.

- 3.11 The above information sets out the basis by which developments must be assessed in terms of flood risk. Later in this report, the development proposals will be reviewed against the Flood Zone in which they are located, and an assessment will be made of the appropriateness of the development, as per the advice within the PPG to the NPPF.

The New National Standards for SuDS

- 3.12 On 19 June 2025 the UK government published its new National Standards for Sustainable Drainage Systems (SuDS). The new standards are a minor evolution of industry standards and current best practice, many of which practitioners and design engineers had already been actively incorporating in recent years. Therefore, while the New National Standards do not fundamentally change current standards, they are a welcome step in clarifying points that had previously been uncertain and have enshrined them in a single piece of guidance.
- 3.13 The standards emphasise how sustainable drainage and flood risk should be considered in developments, and the importance of site appraisal and early, integrated design with the site's natural features and proposed infrastructure.
- 3.14 The New National Standards for SuDS outline that:
- ▶ SuDS are mandatory for major developments and drainage strategies must conform with the new national criteria and LLFA guidance.
 - ▶ There is a stronger emphasis on the 'four pillars' of SuDS. Drainage strategies must demonstrate benefits for water quantity and quality as well as amenity, and biodiversity. This pushes designers to incorporate more surface level SuDS and rely less on below-ground attenuation.
 - ▶ There is more clarity on long-term adoption and maintenance of the SuDS system and LPA's will expect clearer maintenance and management strategies for drainage systems and require stronger evidence of deliverability.
- 3.15 As stated before, this is a minor evolution of the current approach to drainage design, but there are subtle differences in the design factors, which could lead to an increase in size of attenuation features. In addition to the above overarching principles of the New National Standards for SuDS, there are seven core standards that are to be achieved in drainage design. These are:

Standard 1 – Runoff destinations (Drainage hierarchy)

- 3.16 Surface water runoff must be discharged following a strict five-tier sustainability hierarchy, prioritising solutions that keep water close to where it falls:

Priority 1: Collected for non-potable reuse (e.g. rainwater harvesting)

Priority 2: Infiltrated to ground

Priority 3: Discharged to an above-ground surface water body

Priority 4: Discharged to a surface water sewer or piped system

Priority 5: Discharged to a combined sewer

- 3.17 Use of lower-priority options must be robustly justified.

Standard 2 – Management of everyday rainfall (interception)

- 3.18 SuDS must manage frequent, small rainfall events at source, with the key points being:

- ▶ The first 5mm of rainfall should be intercepted within the development.
- ▶ Interception should prevent runoff for most rainfall events, across both summer and winter seasons.
- ▶ Interception can typically be delivered through features like green roofs, rain gardens, permeable paving, and bioretention.

Standard 3 – Management of extreme rainfall and flooding

- 3.19 SuDS must manage intense and extreme rainfall events to reduce flood risk:

- ▶ Control surface water runoff rates and volumes to greenfield runoff rates.
- ▶ Safely manage exceedance flows without negative impact on third-party land.
- ▶ Ensure flooding (where unavoidable) is shallow, slow, and low-hazard.
- ▶ Prevent flooding of buildings and critical infrastructure.

Standard 4 – Water quality

- 3.20 SuDS must protect and improve water quality:

- ▶ Designs must be based on a site-specific water quality risk assessment.
- ▶ Drainage features should treat runoff according to the pollution risks of the proposed land use and this should be in accordance with Chapter 26 of the CIRIA SuDS Manual (C753).
- ▶ Multiple treatment stages are expected where risks are high (discharge to protected waters, for example).

Standard 5 – Amenity

- 3.21 SuDS must deliver positive placemaking outcomes, not just drainage quantity benefits:

- ▶ Contribute to attractive, usable, and safe spaces.
- ▶ Support recreation, wellbeing, and visual quality.
- ▶ Be integrated into landscaping and public realm design.

Standard 6 – Biodiversity

- 3.22 SuDS must enhance the natural environment:

- ▶ Deliver biodiversity benefits, aligned with Biodiversity Net Gain ambitions.
- ▶ Use vegetated, nature-based solutions wherever possible.
- ▶ Support habitats for plants, invertebrates, and wildlife.

Standard 7 – Design for construction, operation, maintenance, and structural integrity

- 3.23 SuDS must be designed for their whole lifecycle:

- ▶ They should be safe and effective to construct.
- ▶ They should include clear, deliverable maintenance and management plans.

- ▶ They must remain structurally sound over their design life.
- ▶ They should allow for decommissioning or adaptation (if required).

3.24 The below specific points should be borne in mind by designers and included in any drainage strategies:

- ▶ Standard 2 provides explicit guidance on the management of everyday rainfall. The first 5mm of rainfall (the 'first flush') must be managed by interception and should not leave the site. Instead, it should either be collected for reuse, infiltrated into the ground, or else captured, conveyed, and stored within SuDS features (but there are specific criteria that make this last point acceptable).
- ▶ The latest standards now formalise that the minimum permissible infiltration rate for discharging surface water via a 'System A' (Total Infiltration) solution. The minimum infiltration coefficient that can support an infiltration-based drainage solution is 1.0×10^{-6} m/sec. Additionally, the standards now add that the half-drain time in the 3.3% AEP event should be less than 24 hours.
- ▶ A 'relaxation factor' should instead be applied to the target greenfield runoff rates on a brownfield site. It defines that the maximum relaxation factor for runoff rates should be no greater than five times the greenfield rates. This allows for easier implementation on heavily developed urban sites, especially where LLFA's previously demanded greenfield runoff rates.
- ▶ The New National Standards confirm a previous 'grey area' by stating that SuDS features should be included in the contributing catchment area. It also notes that there is no requirement to provide attenuation for external overland flows entering the site, but these flows should be considered for capacity of the pipe network.
- ▶ Standard 3 of the New National Standards for SuDS clarifies the expectations with regards to urban creep. It says "*within developments an urban creep uplift factor shall be applied by adding a percentage increase to the calculated area of the impermeable area within the property curtilages. This shall be 10% for all developments unless there are no external private permeable spaces, for example, flats and apartments, when it shall be 0%.*"

3.25 The developments at Courtlands acknowledges the requirements of the New National Standards for SuDS and will deliver them through the drainage strategy, where they are achievable alongside the competing technical and regulatory constraints.

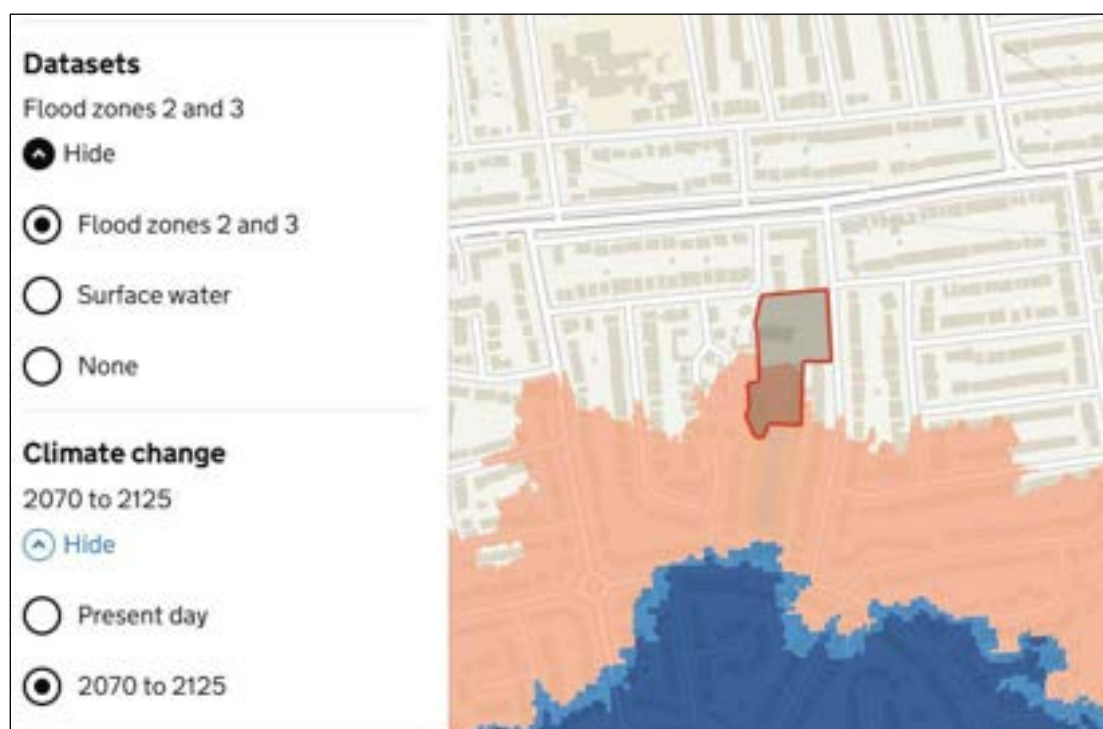
4.0 Current Flood Risk

- 4.1 Flooding can arise from a variety of combination of sources. These may be natural, or artificial and may be affected by climate change. These are discussed, below, in the following two sections and are summarised in Table 5.1, which is in Chapter 5.

Flooding from Rivers and the Sea

- 4.2 The EA's Flood Map for Planning (**Appendix B**) shows that the site is within Flood Zone 1, which means it is outside the 1 in 1,000-year flood event outline (Flood Zone 2).
- 4.3 However, the 2024 NPPF and the supporting Technical Guidance document sets out how flood risk should be considered over the lifetime of a development. This requires an increase in flood risk due to climate change to be taken into account.
- 4.4 The EA's NaFRA2 Flood Map for Planning includes an increase for climate change. This is for the 2080's epoch, which covers the period of 2070 to 2125. With an inclusion for climate change the developments site will be at risk of flooding as is shown in Figure 4.1, below.

Figure 4.1 – Future fluvial flood risk (2070 to 2125)



- 4.5 The southern area of the site is projected to be at risk of tidal flooding in the future. As indicated by the site layout in **Appendix A**, Classroom 1 and the MUGA currently lie outside any present or future fluvial flood risk zones, while Classroom 2 and both sheds are within the projected tidal flood risk area. Nevertheless, the site benefits from tidal flood defences that will be continually upheld at their designed standards.
- 4.6 It is important to note that these findings are not based on detailed modelling, so there may be limitations in the data's accuracy. The assessment likely does not account for enhancements in protection resulting from future maintenance and upgrades to tidal flood defences. Additionally, the expected lifespan of the lodges or sheds should be taken into account, as it is improbable they would remain in use or exist after 50 to 100 years.

- 4.7 Overall, this means the residual flood risk is anticipated to be very low and should not affect the developments.
- 4.8 The lodges are 'incidental to the enjoyment of the school' and cannot be considered to provide residential living functions. This means that only the occupants of Courtlands will use the lodges and, in a flood event, no further occupants than those already at Courtlands will be a risk. Furthermore, should rising flood levels become apparent, the occupants of Courtlands will cease the use of the lodges as a precautionary measure.
- 4.9 This FRA recommends that the occupants of Courtlands should sign up to the Environment Agency's flood warning service (the Floodline number is 0345 988 1188 and online information can be found at <https://www.gov.uk/sign-up-for-flood-warnings>). Due to the nature of tidal flood risk, warnings can be issued well in advance of any inland flooding.

Flood Risk and Appropriateness of the Developments

- 4.10 According to the classifications in the NPPF lodges are considered to be 'more vulnerable' development.
- 4.11 Table 3 of the PPG to the NPPF (see below) states that 'more vulnerable' development is appropriate in Flood Zone 1, thus the development is appropriate in this location.

Table 3 of the NPPF – Flood Risk Vulnerability and Flood Zone Compatibility

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

Key:

✓ Development is appropriate

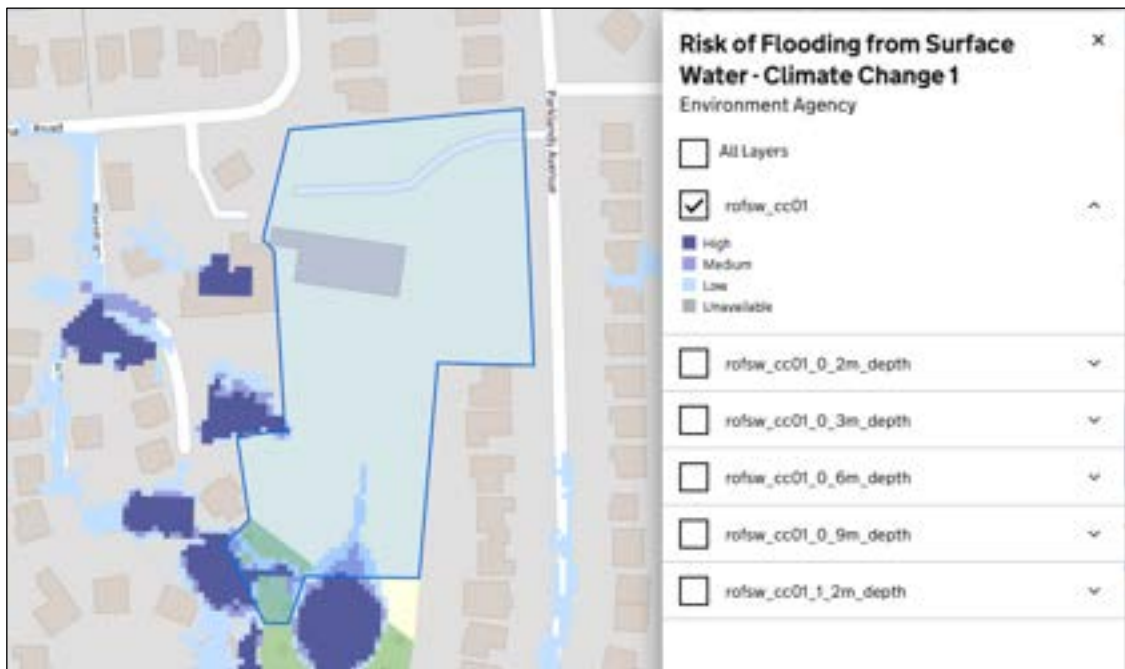
✗ Development should not be permitted.

Surface Water Flooding

- 4.12 Surface water, or pluvial flooding, results from rainfall-generated overland flow, where rainwater has not yet reached a watercourse or sewer and where the local drainage systems become overwhelmed. Pluvial flooding often occurs during short, very intense storms, but can also occur during longer periods of rainfall when the ground is already saturated, or where land has low permeability due to development.
- 4.13 In these conditions surface water can build up where the topography allows it to converge or pond. Where it gathers it will travel down prevailing gradients. Pluvial flooding then occurs at locations where significant surface water flow paths converge, at localised low points and/or due to overland obstructions. In urban areas pluvial flooding often occurs where the built environment channels overland flow routes

- (down roads that are bounded by kerbs, for example) or where there are obstacles to the natural overland flow routes. Boundary walls and buildings are often the main causes and, hence, the likelihood of pluvial flooding to impact property and built-up areas.
- 4.14 Pluvial flooding is exacerbated in many cases by the mistreatment or failure of the below ground infrastructure (including partial or full blockages of gullies and/or within the combined sewers and the accumulation of fats, oils and greases within the sewer networks).
- 4.15 The EA's Risk of Flooding from Surface Water (RoFSW) map was updated and refined in January 2025. The map uses improvements in data, technology and modelling and includes information and input from LLFAs, where this is available. This New National Model (NNM) for surface water represents a significant improvement over previous national-scale models and, generally speaking, has shown a reduction in overall surface water flood risk (when compared with the previous RoFSW mapping) with more targeted risk areas that tie in better with local land features and overall topography.
- 4.16 The EA's Risk of Flooding from Surface Water (RoFSW) maps for Courtlands can be found in **Appendix C**. This shows that most of the site is at very low surface water flood risk (areas outside the 1 in 1,000-year return period).
- 4.17 There are areas of low surface water flood risk (areas of between the 1 in 100-year return period and the 1 in 1,000-year return period) and medium surface water flood risk (areas of between the 1 in 30-year return period and the 1 in 100-year return period) along the south/southwestern boundary of the site. There is also a very small area of high surface water flood risk (areas greater than the 1 in 30-year return period) along the southwestern boundary of the site.
- 4.18 The development site is within the Arun and Western Streams Management Catchment. Therefore, the peak rainfall climate change increase predicted for this management catchment is 45% for the 2050's and 2070's epochs.
- 4.19 A climate change peak rainfall intensity increase of this amount will increase surface water flood risk in the future. To investigate the impact of this increase in surface water flood risk, the future RoFSW flood mapping has been reviewed, which includes a climate change increase. An excerpt of this mapping in the location of the development site can be seen in Figure 4.2 on the next page.

Figure 4.2 – Future surface water flood risk (2050's epoch)



- 4.20 As indicated by the site layout in **Appendix A**, Classrooms 1 and 2, and the MUGA pitch currently lie outside any present or future surface water flood risk areas, while both sheds lie just within present and future surface water flood risk areas.
- 4.21 Sheds are not designed to be water-tight structures and, during a surface water flood event, would readily allow floodwater to enter through gaps in doors, wall joints, ventilation openings and beneath the structure. As a result, the sheds would flood in a similar manner to the surrounding ground and would not act as impermeable obstructions to overland flow. Consequently, the presence of the sheds within areas at risk of surface water flooding would not materially displace floodwater or reduce available flood storage volume, nor would they increase flood risk elsewhere on or off site.
- 4.22 Therefore, it can be seen that the site is at very low to medium surface water flood risk.

Groundwater Flooding

- 4.23 There are no flood risk maps for groundwater, as stated by the Environment Agency in their 2011 guidance note 'flooding from groundwater'. Mapping products currently available only show areas where the geological and hydrogeological conditions *may* combine to cause groundwater flooding, but they should not be considered as groundwater flood risk maps. They only show *susceptibility* to groundwater flooding.
- 4.24 There are several mapping products that depict areas that may be susceptible to groundwater flooding, but they are not comparable in detail to the risk maps developed for fluvial, tidal and surface water, such as those used by practitioners and risk management authorities to support planning decisions. The mapping does not show the likelihood of groundwater flooding occurring and can only be considered as a hazard, but not a risk-based dataset.
- 4.25 As such, the mapping products can be viewed as indicative at best and should only be used as a prompt to review site-based information to determine whether groundwater is a risk factor that should be considered. Indeed, the Environment Agency state that:

"The susceptibility data should not be used on its own to make planning decisions at any scale and, in particular, should not be used to inform planning decisions at the site scale. The susceptibility data cannot be used on its own to indicate risk of groundwater flooding."

- 4.26 This FRA will review the groundwater flooding susceptibility mapping available, which has been supplied in an Envirocheck Landmark Flood Screening Report (FSR) and can be seen in **Appendix E**.

BGS Geological Indicators of Flooding

- 4.27 The BGS Geological Indicators of Flooding map shows that the site is not in an area with indicators of groundwater flooding.

BGS Groundwater Flooding Susceptibility

- 4.28 The BGS Groundwater Flooding Susceptibility map shows that the site most of the site is in an area with potential for groundwater flooding of property situated below ground level. Along the eastern edge of the site there is a small area with limited potential for groundwater flooding to occur.

Geosmart Information Groundwater Flood Map

- 4.29 The Geosmart Information Groundwater Flood Map places the site in an area of 'low' risk.

Groundwater Flood Risk Summary

- 4.30 Courtlands is not in an area with indicators of groundwater flooding, however most of the site is in an area with potential for groundwater flooding of property situated below ground level. There is a small

area of the site with limited potential for groundwater flooding to occur. Due to this and there being in areas of 'low' risk, it can be seen that the development site is at low groundwater flood risk.

Flooding from Infrastructure Failure

- 4.31 Sewer flooding can occur when the capacity of the infrastructure is exceeded by excessive flows, or because of a reduction in capacity due to collapse, siltation, blockage, or if the downstream system becomes surcharged. This can lead to the sewers flooding onto the surrounding ground via manholes and gullies, which can generate overland flows.
- 4.32 Typically, sewer systems are constructed to accommodate rainstorms with a 30-year return period or less, depending on their age. Consequently, rainstorm events greater than 1 in 30-years would be expected to result in surcharging of some parts of the sewer system. In fact, due to most gullies being poorly maintained and often partially blocked with silt, leaves and other debris, their capacity is often estimated to be closer to the 1 in 10-year storm.
- 4.33 The 2024 Strategic Flood Risk Assessment (SFRA) for Adur and Worthing Councils talks about the historical incidents of flooding detailed by Southern Water.
- 4.34 All Water Companies have a statutory obligation to maintain a register of properties/areas which have reported records of flooding from the public sewerage system, and this is shown on the 'DG5 Flood Register'. This includes records of flooding from foul sewers, combined sewers and surface water sewers that are deemed to be public and maintained by the Water Company.
- 4.35 The 2024 SFRA states that the 'BN12 4' postcode area had a total of 13 recorded flood incidents.
- 4.36 13 reported cases of sewer flooding over a whole postcode area show that there is low risk of sewer flooding locally. Therefore, the development site cannot be considered to be at risk of sewer flooding or flooding from infrastructure failure because the location of the development is not in area where sewer flooding has occurred before.

Flooding from Artificial sources

- 4.37 The EA provides a map showing the maximum potential flood extent should all reservoirs with a capacity of greater than 25,000 cubic metres fail and release the water they hold.
- 4.38 The map shows that the site would not experience flooding in this scenario.
- 4.39 There are no other artificial sources of flooding (such as canals) in the vicinity of the site that could cause flooding.

Historic Flooding

- 4.40 The Envirocheck Landmark FSR includes a map showing recorded flood outlines, which can be seen in **Appendix F**.
- 4.41 This map shows that the site has no record of flooding in the past. Thus the Historic Flood Map supports this report's conclusion that the site is at low risk of flooding and that the development is appropriate in this location.

5.0 Summary of Flood Risk

- 5.1 Historic, current and future flood risk, from all sources, has been reviewed in the context of the developments at Courtlands, Worthing. A summary of these flood risks is summarised in Table 5.1, below. The allocation of overall flood risk shows the residual flood risk once the site-specific conditions have been taken into account.

Table 5.1 - Summary of Flood Risk From All Sources

Flood Source	Risk Level				Comment
	High	Medium	Low	Very Low	
Rivers and Sea				X	The site is within Flood Zone 1 on the EA Flood Map.
Groundwater			X		Site is mostly in an area with potential for groundwater flooding of property situated below ground, no indicators of groundwater and at 'low' risk.
Surface Water		X	X	X	Most of the site is at very low risk of surface water flooding but a small area of low/medium risk of surface water flooding.
Canals				X	No canals in the local area.
Reservoirs				X	No reservoirs in the local area.
Infrastructure Failure				X	No indication that local drainage infrastructure would cause elevated levels of flood risk.
Increase due to Climate Change		X	X		Increased peak rainfall intensities and river flows are expected to affect the property in the future.

6.0 Surface Water Drainage Strategy

Drainage Strategy Overview

- 6.1 With regards to surface water drainage, Paragraph 182 of the NPPF states that:

*"Applications **which could affect drainage on or around the site** should incorporate sustainable drainage systems to control flow rates and reduce volumes of runoff, and **which are proportionate to the nature and scale of the proposal.**"*

- 6.2 The Courtlands site has an area of 1.171ha. The footprint of the lodges only total 150m². Given the very small scale of the area, it is not technically feasible to manage runoff at an equivalent greenfield rate, and so it would be disproportionate to require a full SuDS strategy for structures of this size. Also, due to the isolated locations of the lodges, they will not be well situated to benefit from the existing drainage of the site.
- 6.3 Because the lodges have a small roof area and will be positioned in an area surrounded by open garden spaces, with significant distances to the site boundary and third-party land, they will be very unlikely to alter overall surface water runoff from the site. Not including a formal drainage strategy for the small area of the lodges is in accordance with the proportionality requirements of Paragraph 182 of the NPPF.
- 6.4 Notwithstanding this, it is to incorporate GreenBlue's SuDS Pods online to the lodges roof drainage. The integration of GreenBlue Urban's SuDS Pods offers an efficient and proportionate source-control measure. By intercepting rainfall directly from the downpipes, SuDS Pods provide immediate on-plot storage and controlled discharge, thereby relieving pressure on the existing drainage network and assisting in meeting greenfield or betterment runoff targets. Their soil-and-mulch filtration layers promote first-flush water quality treatment by retaining silt and pollutants at source, improving compliance with SuDS water-quality objectives.
- 6.5 Their compatibility with typical roof drainage arrangements ensures straightforward installation while supporting the broader strategy of distributing storage across the site, reducing reliance on a single attenuation feature.
- 6.6 Water falling on the lodges and not retained in the SuDS Pod will drain naturally to surrounding ground (at a reduced rate). Therefore, the natural drainage regime is maintained, but with betterment in terms of runoff rate due to the use of the SuDS Pods.
- 6.7 The replacement of the existing sheds with new ones can be considered as improvements to existing infrastructure (this includes works that involve the installation, replacement, or upgrading of surfaces or components without creating a new facility). Since the proposed sheds replace existing ones, they align with the category of replacement and improvements intended to upgrade performance or safety of the overall site function.
- 6.8 This principle is essential in determining what is a proportionate solution to the drainage for the sheds, because the New National Standards for SuDS confirm that they are not designed to apply to replacement and improvement schemes, noting that retrofit projects *"often have different objectives and face broader constraints"* and that full compliance may not be achievable. In the context of replacement and improvement schemes, the standards serve as a *"starting point"* only. Specifically, the National Standards for SuDS state:
- "It is important to acknowledge that constraints specific to retrofit projects may prevent the full application of the standards."*
- 6.9 This means that the New National Standards for SuDS cannot be mandatorily applied to the replacement sheds, and the proportionality approach of Paragraph 182 also applies. With this in mind, a SuDS and drainage strategy is also not proposed for the sheds.

Surface Water Quality

- 6.10 The NPPF states that the development should not have a detrimental impact on the environment, including the water environment. The technical guidance to the NPPF provides further advice on the benefits of ensuring runoff quality is to an appropriate standard.
- 6.11 The CIRIA SuDS Manual provides guidance on the treatment of surface water runoff. With regards to the developments, Table 4.3 of the CIRIA SuDS Manual rates the pollution hazard from roof water runoff as 'very low'. The only requirement for roof water runoff is the removal of gross solids and sediments. This is accomplished by the SuDS Pods, which utilise soil and mulch filtration layers to trap silt and contaminants at their origin. In doing so, they deliver high-quality first-flush treatment and support adherence to SuDS water quality standards.

Management and Maintenance

- 6.12 SuDS Pods require simple, routine maintenance to ensure continued performance, primarily involving periodic removal of accumulated silt and organic debris from the soil-and-mulch filtration layer, and general inspection of the unit to confirm flows are not obstructed. This aligns with wider SuDS maintenance principles, which emphasise regular, occasional, and remedial tasks to keep drainage features operating efficiently. As part of a site-wide SuDS management plan, maintenance should be undertaken by a competent person familiar with the components, with records kept as part of the site's ongoing drainage maintenance documentation.

7.0 Compliance with the National Standards for SuDS

- 7.1 The seven core standards for SuDS, as laid out in the National Standards for SuDS, were presented in Section 3 of this report.
- 7.2 This section will review how the drainage strategy has attained the seven core standards for SuDS, which is presented below.

Standard 1 – Runoff destinations (Drainage hierarchy)

- 7.3 With regards to the development and its drainage strategy, the tiers of the drainage hierarchy that have been achieved are outlined in Table 7.1, below. These are the highest available tiers, as demonstrated by the discussion of the geoenvironmental characteristics and constraints discussed in Section 2 of this report.

Table 7.1 - Compliance with Standard 1 and the Drainage Hierarchy

Tier	Discharge Method	Used?	Notes
1	Collected for non-potable use	✓	SuDS Pods are to be used on the downpipes of the lodges.
2	Use infiltration techniques	✓	Water falling on the lodges and draining through the SuDS Pod will drain naturally to the surrounding ground at a restricted rate. Therefore, the natural drainage regime is maintained, but with betterment due to the use of the SuDS Pods.
3	Discharged to an above ground surface water body	✗	This tier of the drainage hierarchy will not be needed.
4	Discharged to a surface water sewer, or another piped surface water drainage system	✗	This tier of the drainage hierarchy will not be needed.
5	Discharged to a combined sewer	✗	This tier of the drainage hierarchy will not be needed.

Standard 2 – Management of everyday rainfall (interception) - ✓

- 7.4 The lodges will be fitted with a SuDS Pod to support sustainable drainage at the site.
- 7.5 Therefore adequate interception, as required by Standard 2 of the National Standards for SuDS, has been provided.

Standard 3 – Management of extreme rainfall and flooding - ✓

- 7.6 SuDS Pods retain some surface water for non-potable use, but they also release a proportion of surface water but at a restricted rate. Therefore, extreme rainfall will be informally managed through betterment, attenuation and the slow release of surface water.

Standard 4 – Water quality - ✓

- 7.7 SuDS Pods provide clear water-quality benefits by treating runoff at source: as water enters the Pod, the soil-and-mulch filtration layers trap silt, debris, and pollutants, delivering the level of treatment required

for roof runoff and aligning with SuDS water quality standards that require drainage features to treat runoff in accordance with pollution risk.

- 7.8 This source-control filtration improves runoff quality before it enters the wider drainage network, supporting compliance with Standard 4 – Water Quality of the National SuDS Standards and the CIRIA SuDS Manual.

Standard 5 – Amenity - ✓

- 7.9 SuDS Pods provide amenity benefits by introducing planted, attractive green features that enhance the visual quality of a space, soften built form, and contribute to a more pleasant and welcoming environment.

Standard 6 – Biodiversity - ✓

- 7.10 SuDS Pods deliver biodiversity benefits by incorporating planted, soil-based growing media that create small pockets of habitat for invertebrates and support healthier urban ecosystems. Their vegetated surfaces introduce nature into areas, helping to enhance ecological value and promote greener, more resilient environments, consistent with SuDS objectives to improve biodiversity as well as drainage performance.

Standard 7 – Design for construction, operation, maintenance, and structural integrity - ✓

- 7.11 By using surface-level SuDS in the drainage strategy, a system that is safe to construct and is sustainable to use and maintain, and safely integrates into the development, has been specified.
- 7.12 SuDS Pods require simple routine upkeep, including periodic removal of silt and organic debris and basic inspections to ensure flows remain unobstructed, carried out by a competent person with maintenance recorded as part of the site's drainage management plan.

8.0 Summary and Conclusions

- 8.1 This FRA and Drainage Strategy has been produced by Motion on behalf of their client, Courtlands By The Sea. It supports the planning application at 37 Parklands Avenue, Goring-by-Sea, Worthing, BN12 4NG.
- 8.2 The developments at Courtlands are located within Flood Zone 1, signifying a very low risk of flooding from rivers and the sea. While future climate change may marginally increase risk, ongoing tidal flood defences and precautionary measures will ensure the site remains suitable for its intended use. The lodges are not for residential purposes, and only the occupants of Courtlands will use them, with proactive steps advised during flood events.
- 8.3 The EA's Risk of Flooding from Surface Water (RoFSW) maps for Courtlands shows that most of the site is at very low surface water flood risk. There are areas of low, medium and high surface water flood risk in the areas along the south-western boundary. This takes into account of future climate change allowances.
- 8.4 The MUGA pitch and Classrooms 1 and 2 currently lie outside any present or future surface water flood risk areas, while both sheds lie just within present and future surface water flood risk areas. The sheds are not water-tight and would readily allow floodwater to enter during a surface water event. They would therefore flood in a similar manner to the surrounding ground and would not obstruct overland flow or displace floodwater or increase flood risk on or off site.
- 8.5 Courtlands is located within areas of low groundwater flood risk, with only limited potential for groundwater flooding, primarily affecting below-ground properties; overall, the site is considered to be at low risk of groundwater flooding.
- 8.6 The site is considered to be at very low risk of sewer flooding, is not at risk of reservoir flooding or any other artificial sources, and with no recorded history of past flooding.
- 8.7 The surface water drainage for the development will use SuDS Pods to drain the lodges roof, ensuring necessary water quality, amenity, and biodiversity benefits.
- 8.8 The proposed strategy fully complies with all seven of the new national standards for SuDS, ensuring a robust and sustainable approach to surface water management across the site.
- 8.9 In conclusion, the current flood risks to Courtlands do not preclude the development, which is appropriate in this location.

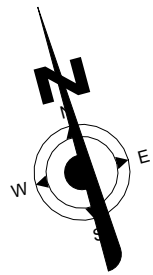
Appendix A

Site Layout

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- Developable Area
- Site Boundary
- Location of Existing Sheds
- Tree Locations
- Hedge Locations



Revision Number	Revision Description	Issued by	Revision Date
DATE:	STATUS:	SHEET SIZE:	
06/10/25	PLANNING ISSUE	A1	
SCALE:	DRAWN:	CHECKED:	
As indicated	AP		
CLIENT:		SITE ADDRESS:	
Courtlands			

DRAWING: Change of Use

TITLE: Proposed Location & Site Plan

PROJECT NO: COURTLANDS
DRAWING NO: APC/012/26/63
REVISION:



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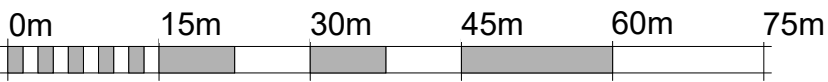
01798 879894



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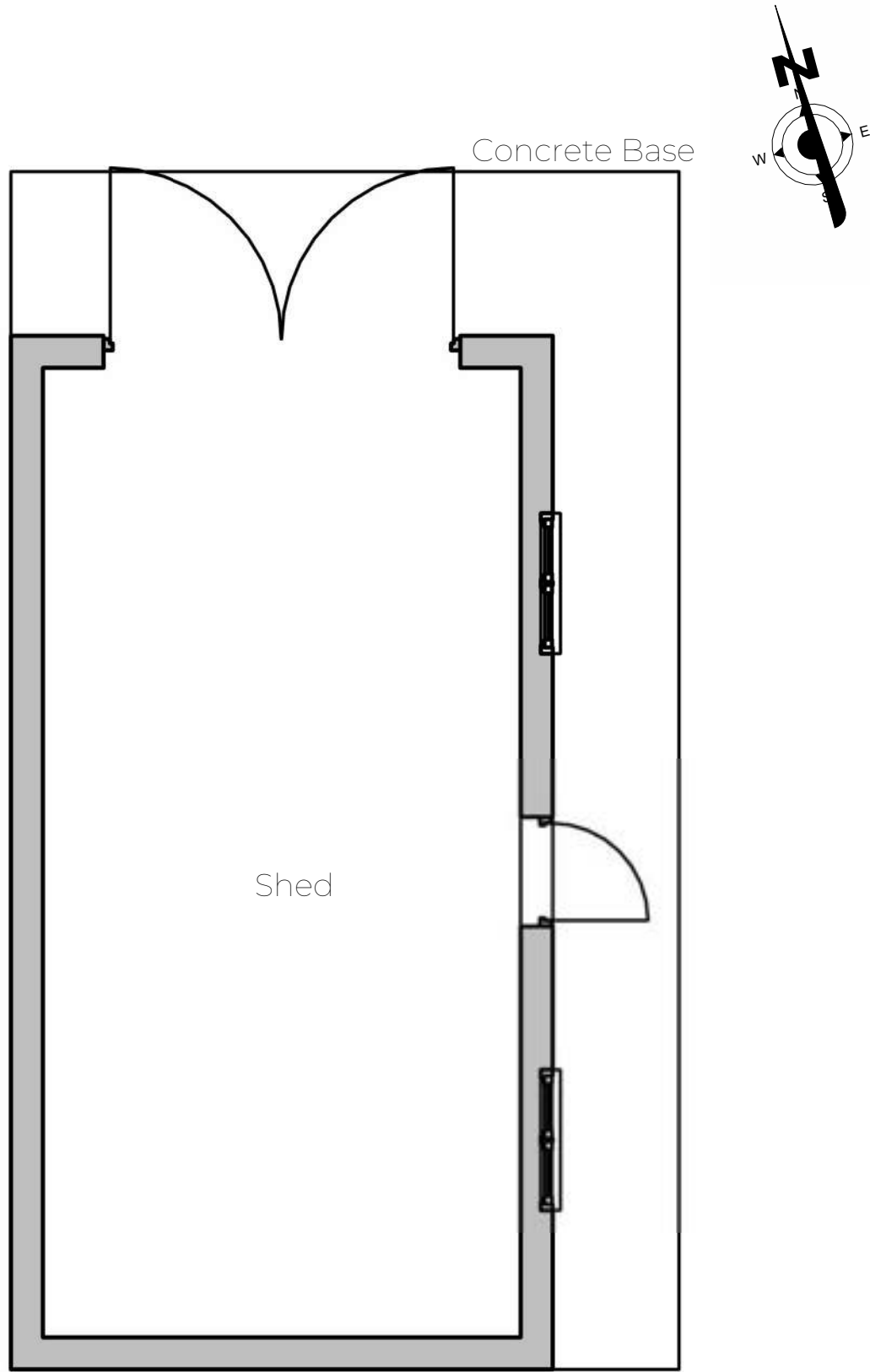
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VISUAL SCALE 1:750 @ A1



VISUAL SCALE 1:1250 @ A1



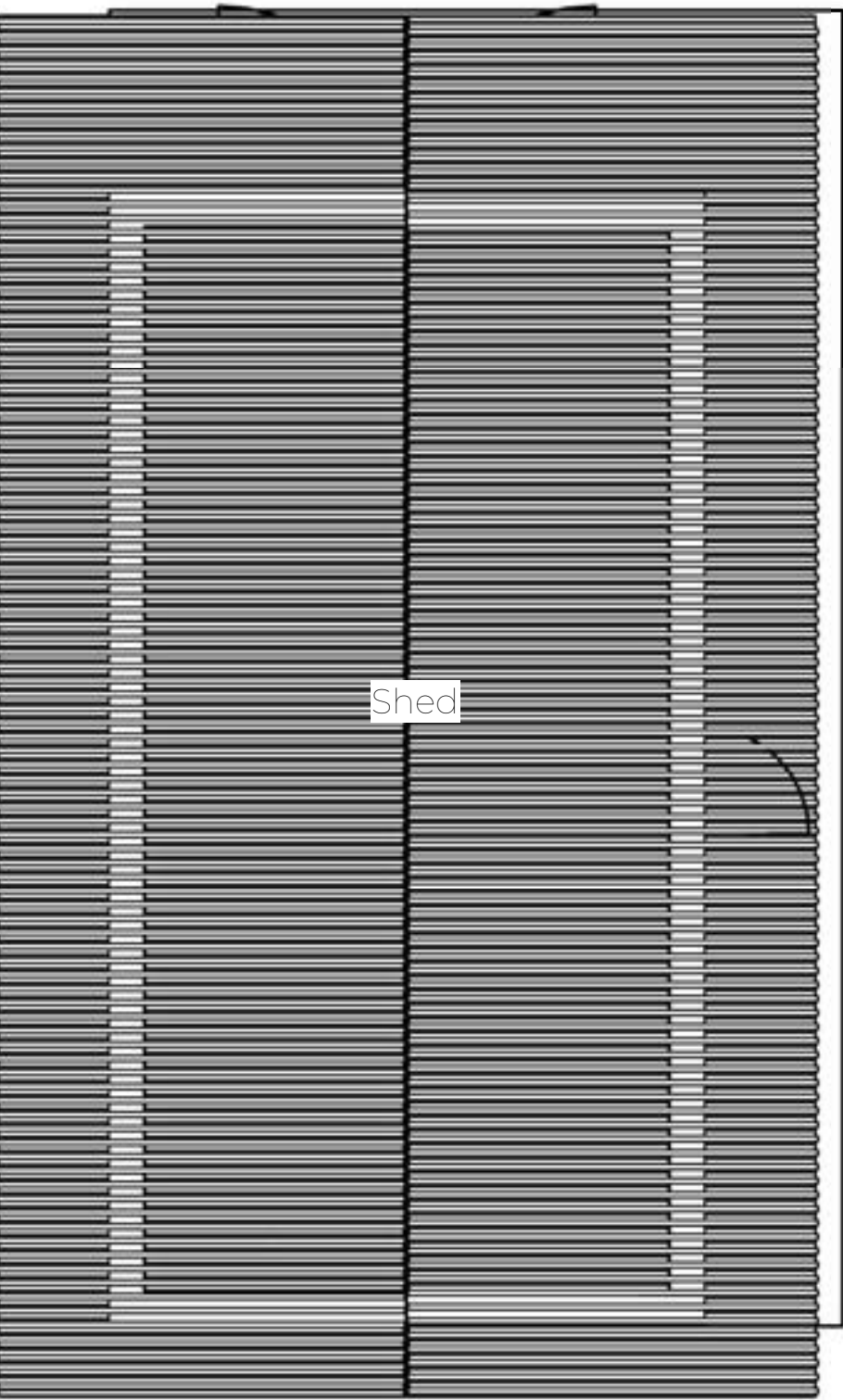
Proposed Shed 1
1 : 50



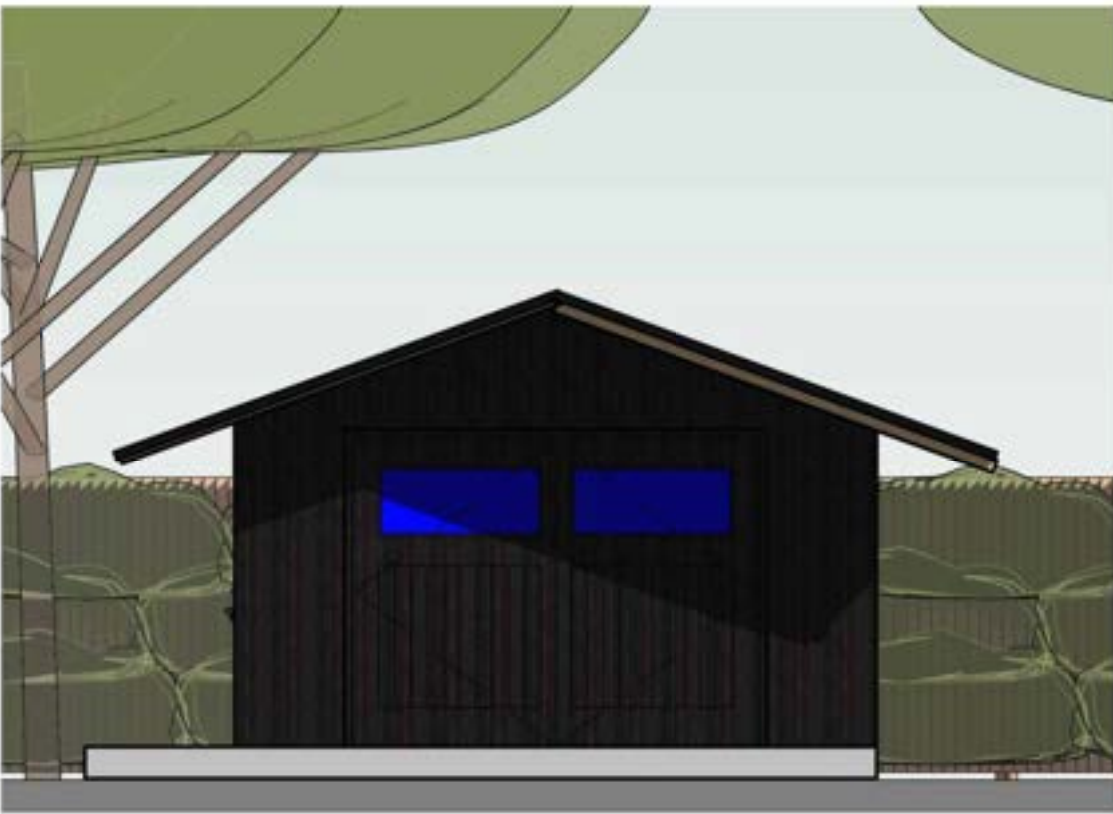
(South) Rear Elevation
1 : 50



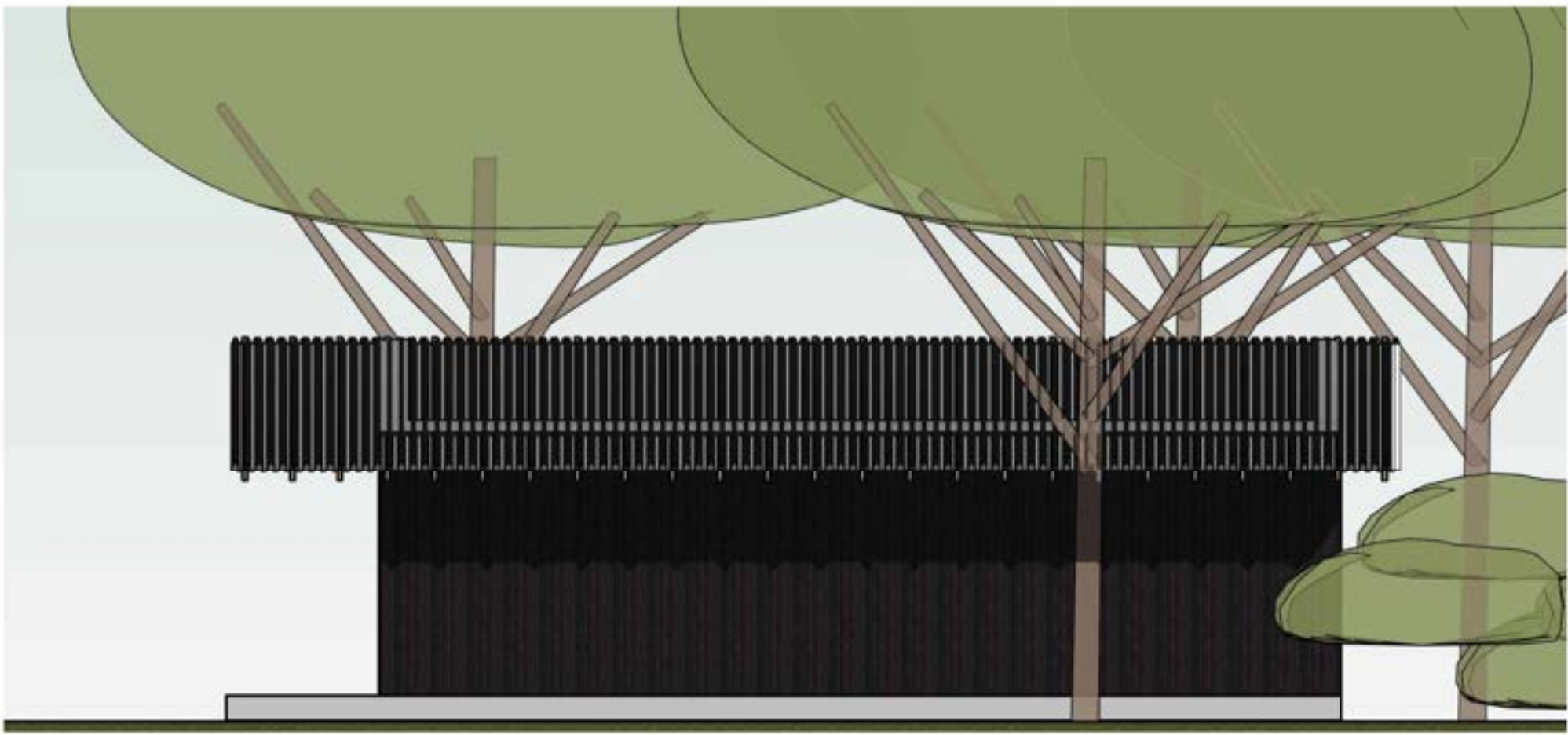
(East) Side Elevation
1 : 50



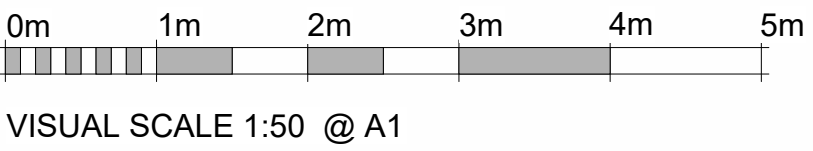
Proposed Shed 1 Roof Plan
1 : 50



(North) Front Elevation
1 : 50



(West) Side Elevation
1 : 50



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02/11/26	PLANNING ISSUE		
SCALE:	DRAWN:	CHECKED:	
1 : 50	AP		
CLIENT:		SITE ADDRESS:	
Courtlands			

DRAWING:

Change of Use

TITLE:

Proposed Shed 1



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REVISION:

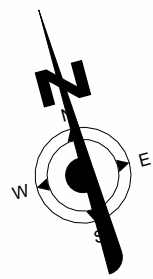
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ARC/012/ 26/57

PROJECT NO:

Courtlands

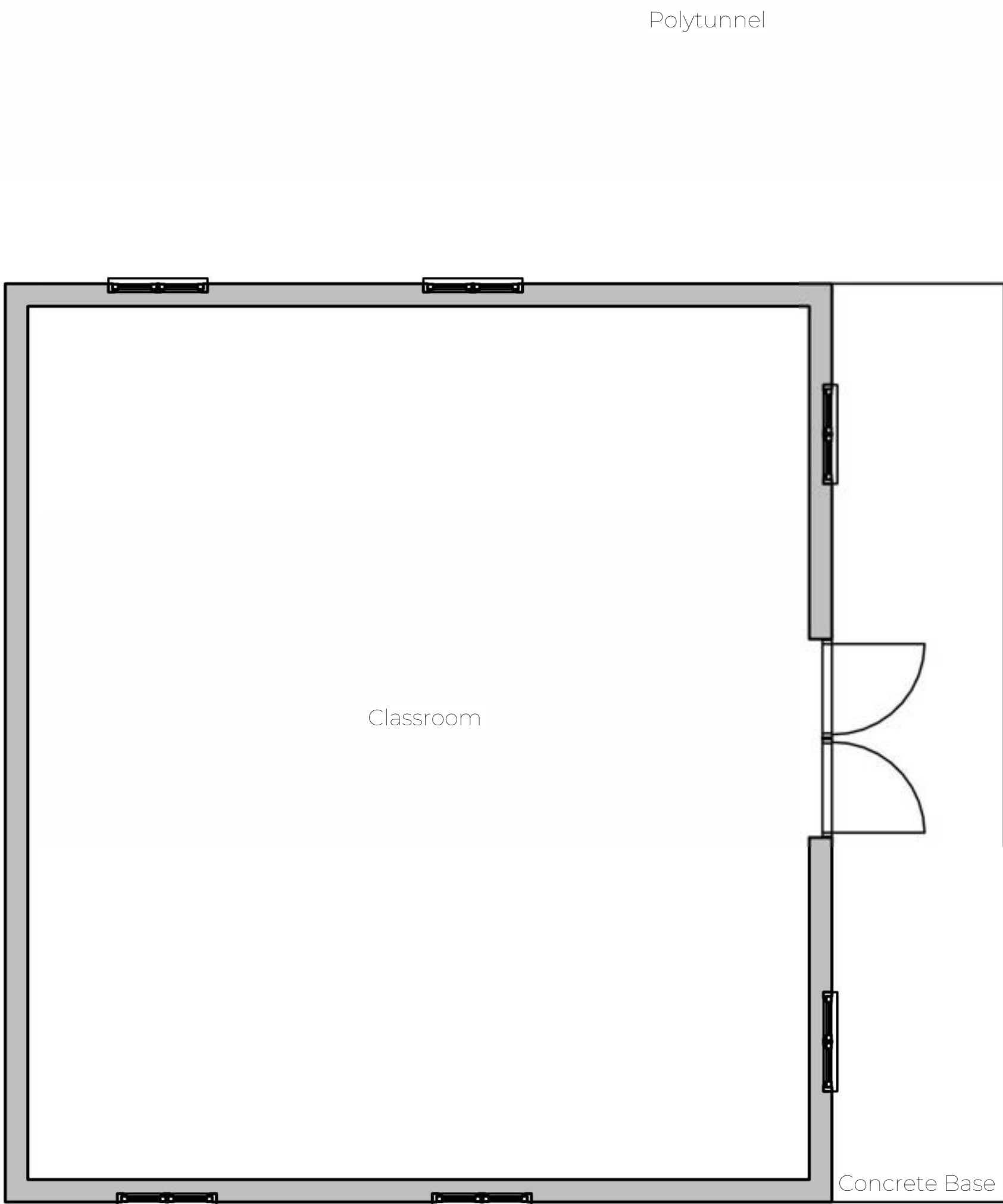




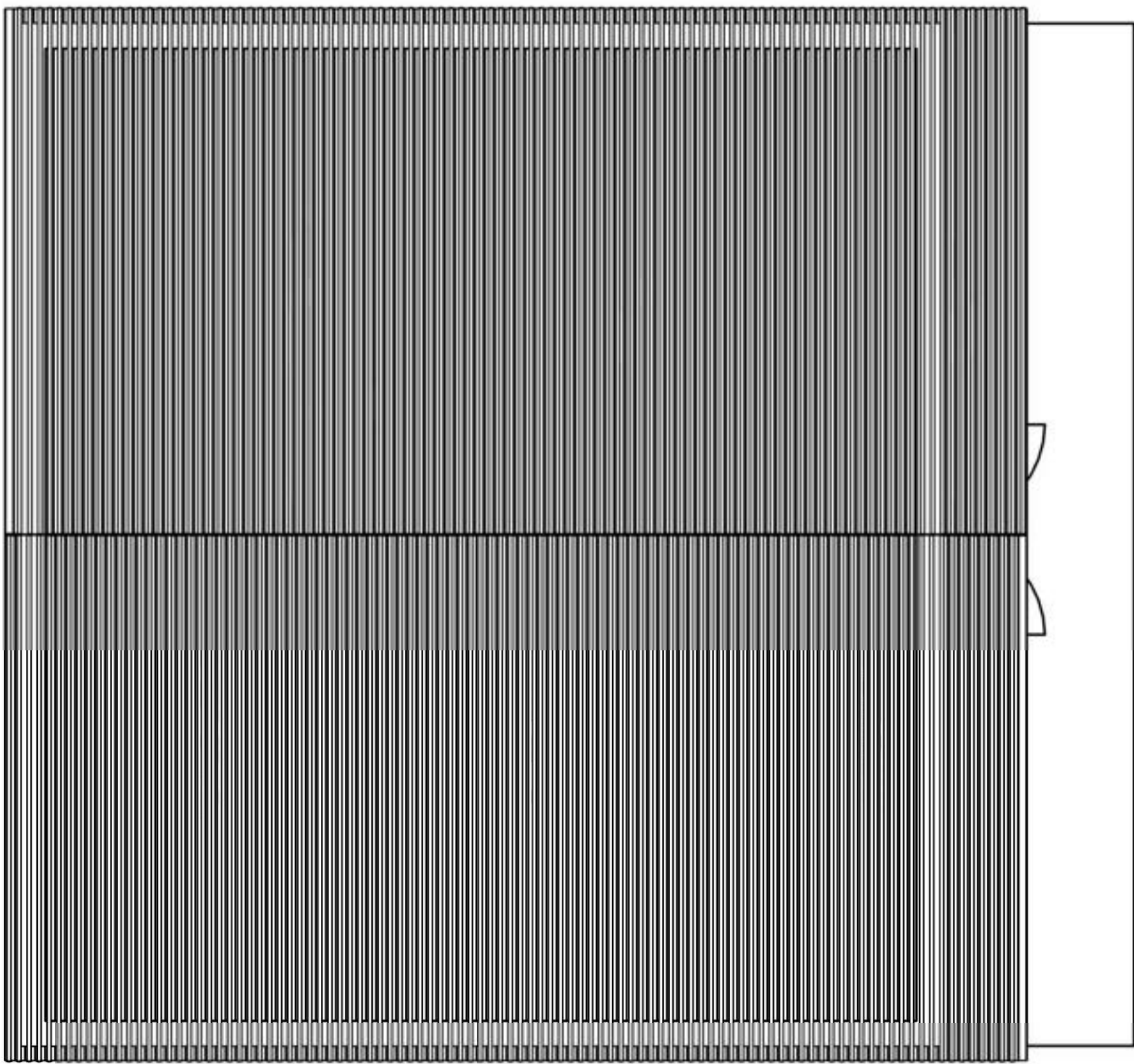
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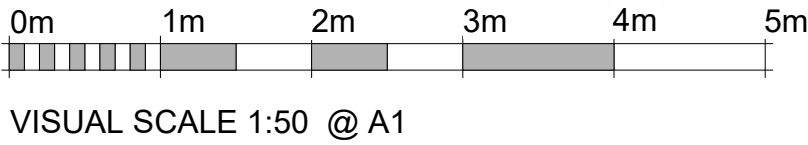
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02/12/26 PLANNING ISSUE A1			
SCALE: DRAWN: CHECKED:			
1 : 50 AP			
CLIENT: SITE ADDRESS:			
Courtlands			



Proposed Classroom
1 : 50



Proposed Classroom Roof Plan
1 : 50



DRAWING:

Change of Use

TITLE:

Proposed Classroom Floor Plans

PROJECT NO:

Courtlands

DRAWING NO:

APC/012/ 26/58

REVISION:

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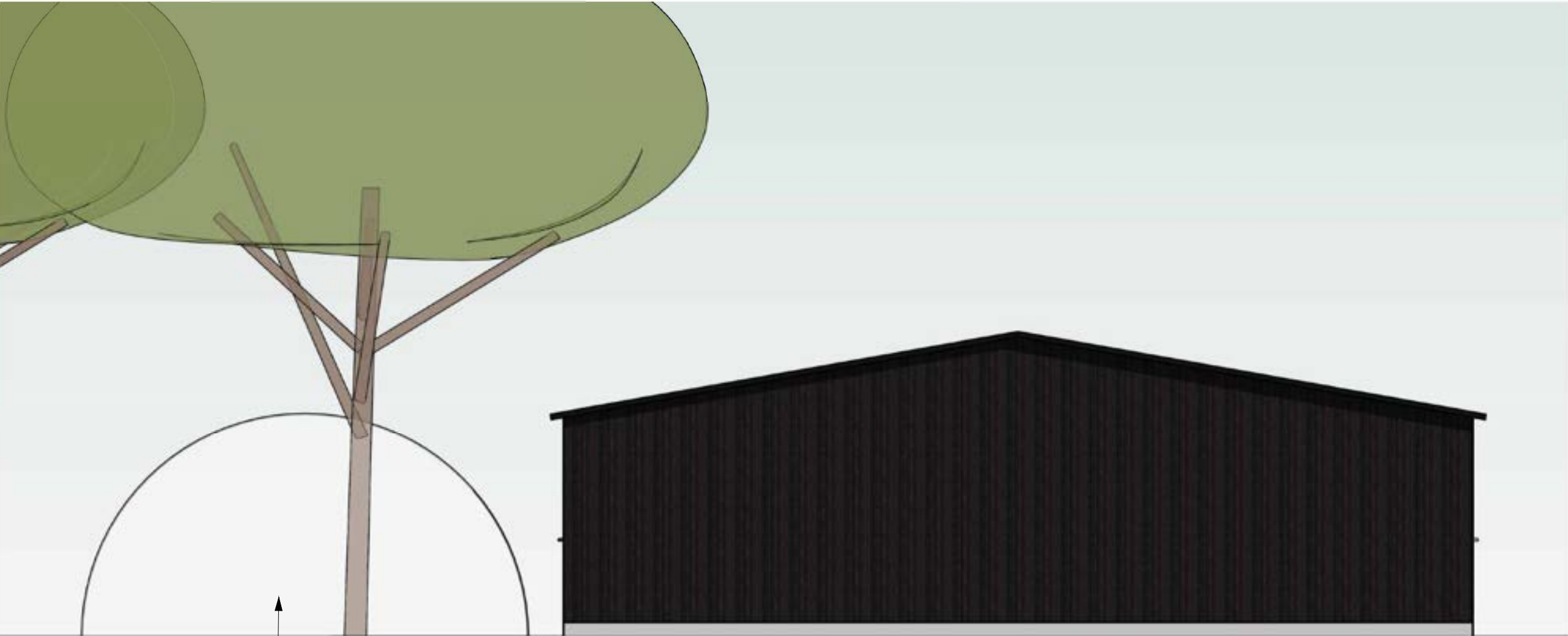
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Classroom Front Elevation
1 : 50



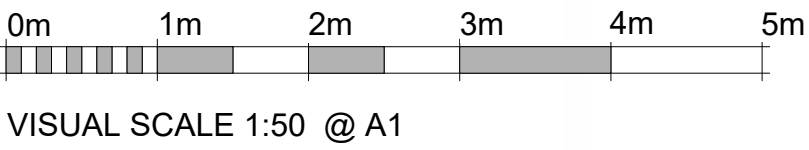
Classroom Side Elevation 2
1 : 50



Classroom Rear Elevation
1 : 50



Classroom Side Elevation 1
1 : 50



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1 : 50	AP		
CLIENT:		SITE ADDRESS:	
Courtlands			

DRAWING: Change of Use

TITLE: Proposed Classroom Elevations

PROJECT NO: Courtlands

DRAWING NO: APC/012/ 26/59

REVISION:



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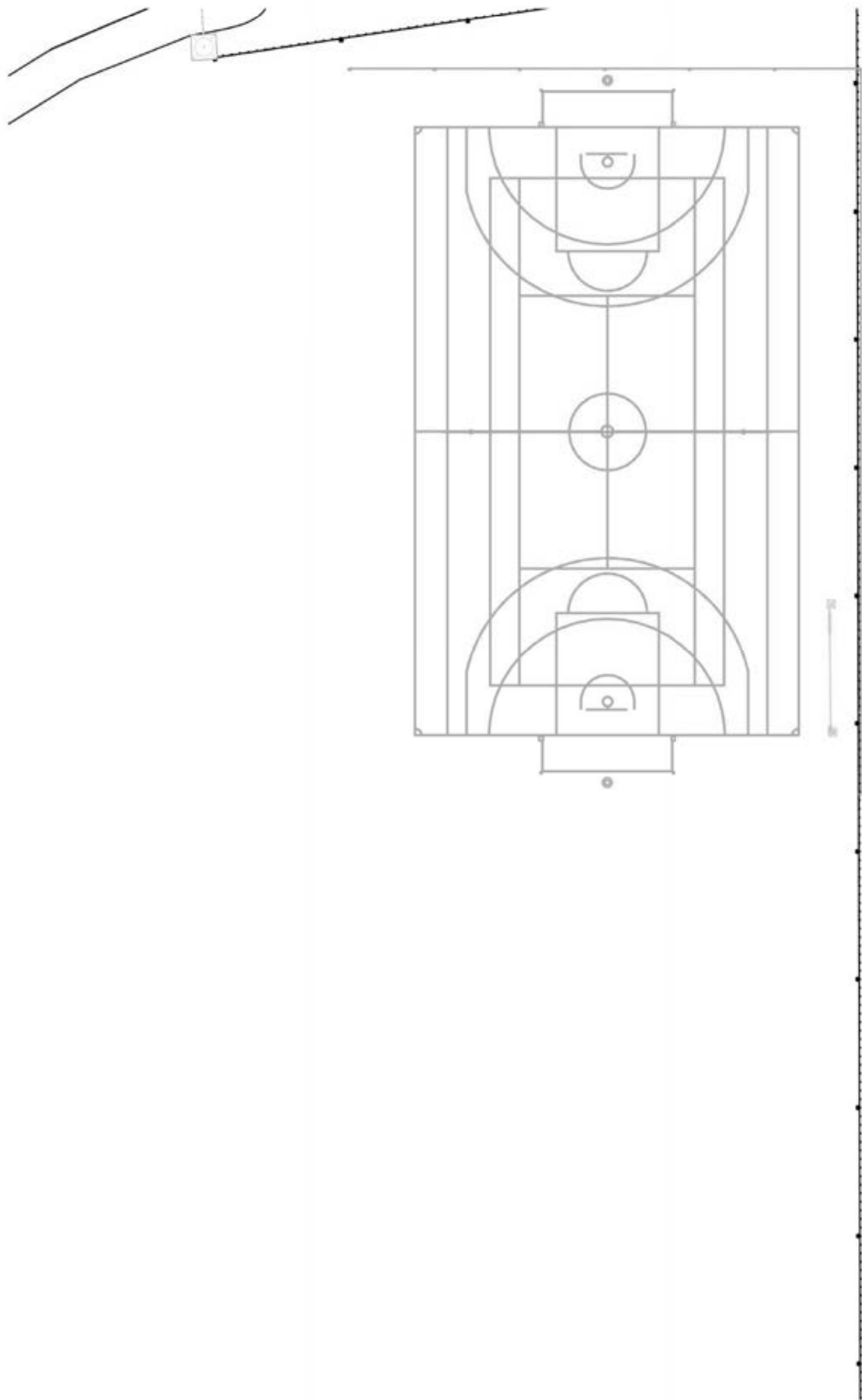
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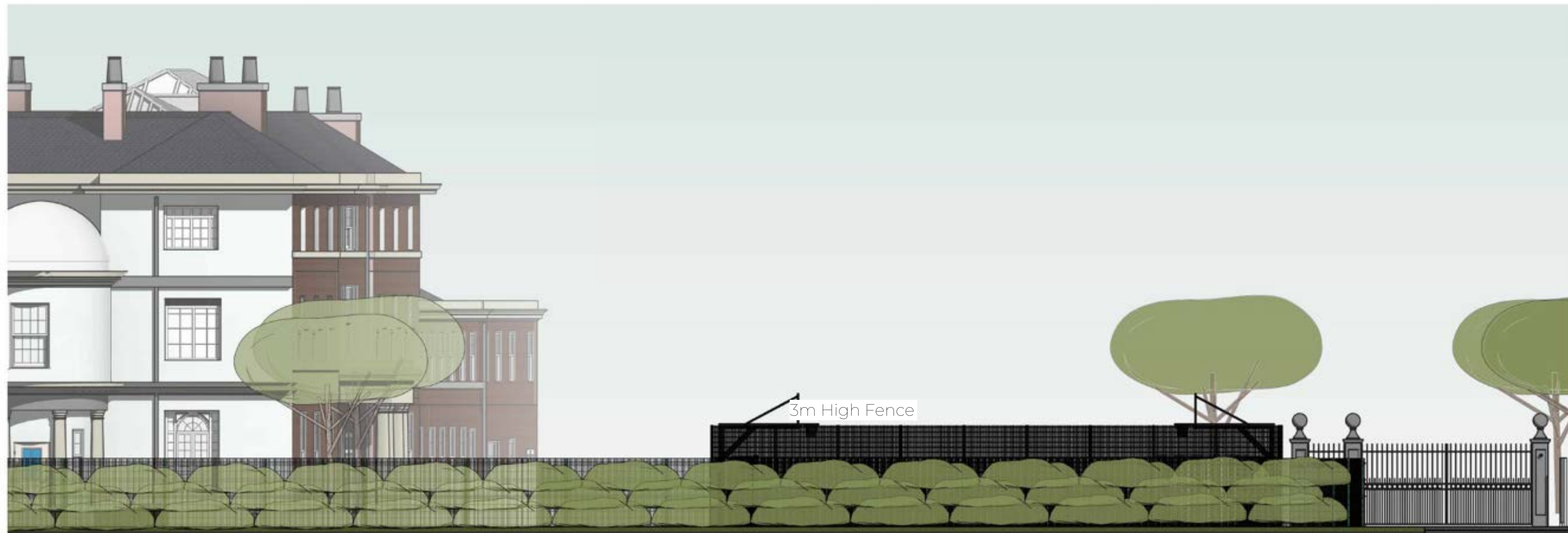
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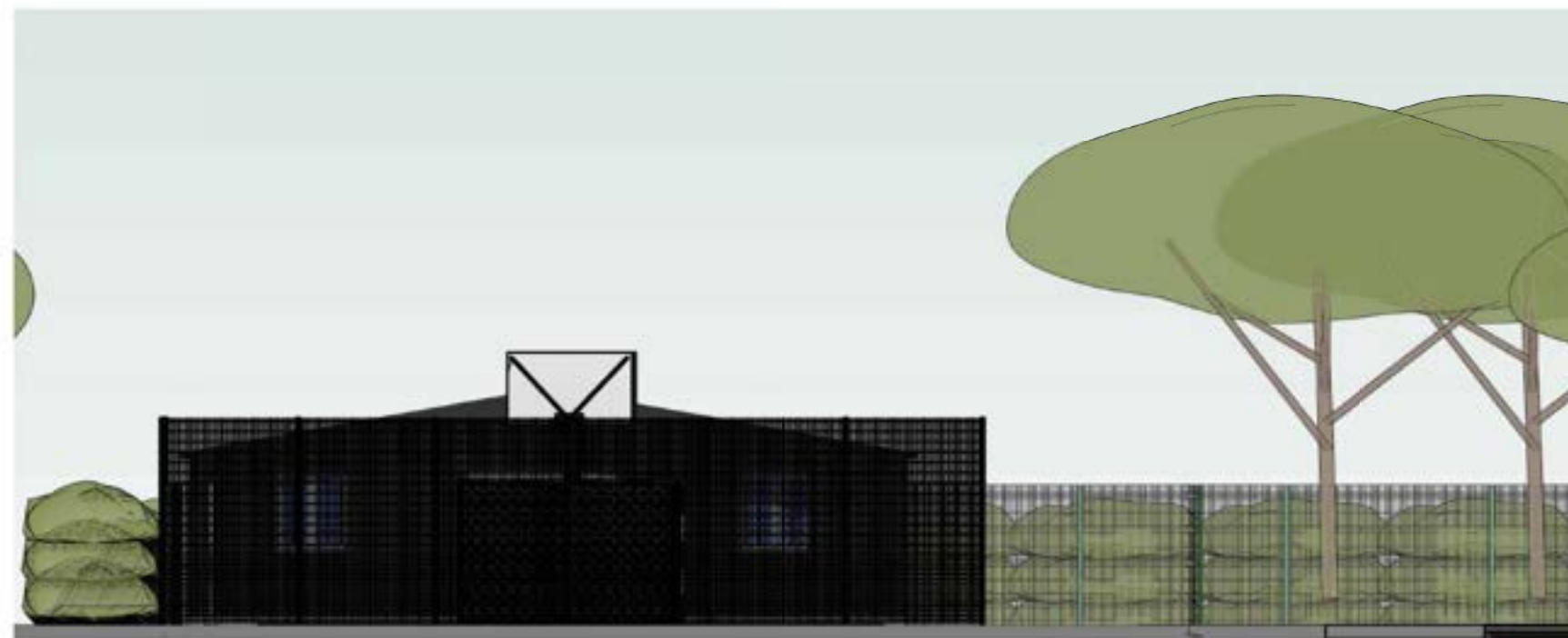




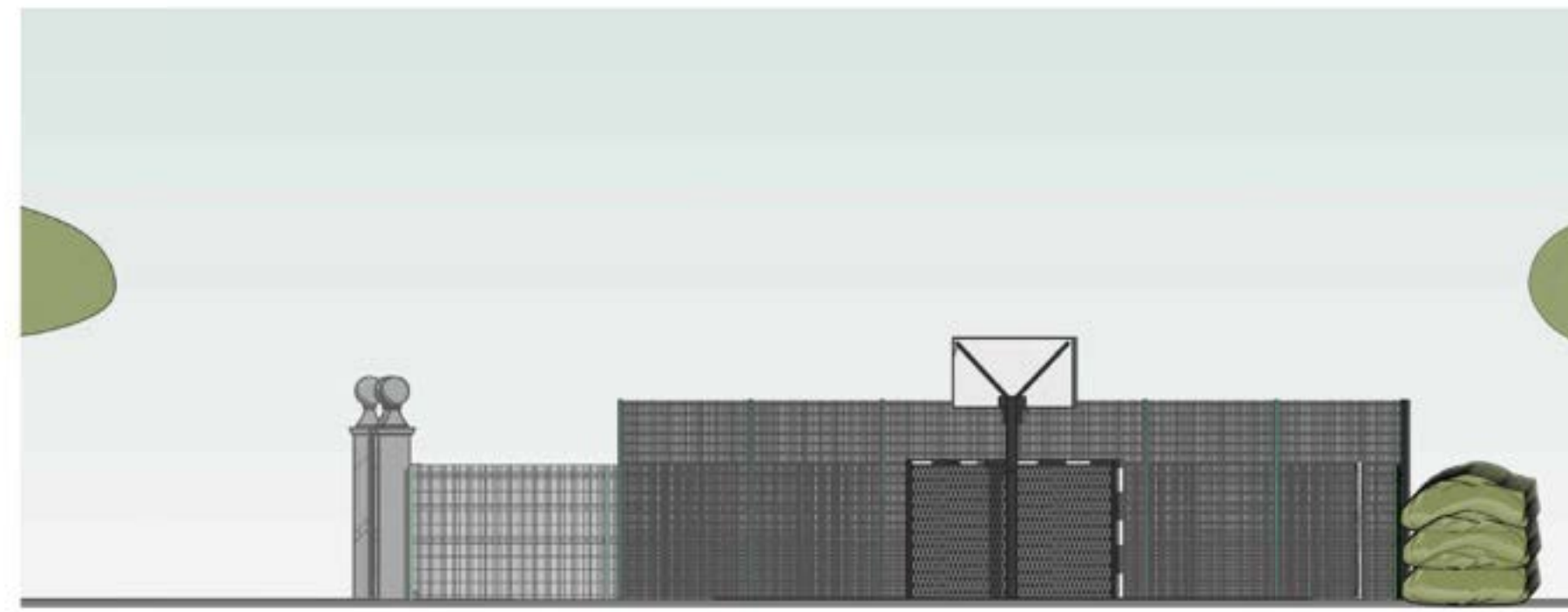
Proposed Muga Plan
1 : 100



Muga Side Elevation (East)
1 : 100



Muga North Elevation
1 : 100



Muga South Elevation
1 : 100



Muga Side Elevation (West)
1 : 100

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Revision Number	Revision Description	Issued by	Revision Date
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DATE:	STATUS:	SHEET SIZE:
02/12/26	PLANNING ISSUE	

SCALE:	DRAWN:	CHECKED:
1 : 100	AP	

CLIENT:	SITE ADDRESS:
Courtlands	

DRAWING:
Change of Use

TITLE:
Proposed Muga

PROJECT NO:
Courtlands

DRAWING NO:
APC/012/ 26/60

REVISION:



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Appendix B

EA's Flood Map for Planning

Flood map for planning

Your reference
Unspecified

Location (easting/northing)
511916/102475

Created
31 March 2026 14:54

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following**:

- bigger than 1 hectare (ha)
- in an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2026 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference

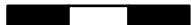
Unspecified

Location (easting/northing)
511916/102475

Scale
1:2,500

Created
31 Mar 2026 14:54

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area


0 20 40 60m

Appendix C

EA's RoFSW Maps

Datasets

Surface water

☒ Hide

☐ Flood zones 2 and 3

☒ Surface water

☐ None

Annual likelihood of flooding

1 in 1000

☒ Hide

☐ 1 in 30

☐ 1 in 100

☒ 1 in 1000



Datasets

Surface water

☒ Hide

☐ Flood zones 2 and 3

☒ Surface water

☐ None

Annual likelihood of flooding

1 in 100

☒ Hide

☐ 1 in 30

☒ 1 in 100

☐ 1 in 1000



Datasets

Surface water

 Hide

☐ Flood zones 2 and 3

☒ Surface water

☐ None

Annual likelihood of flooding

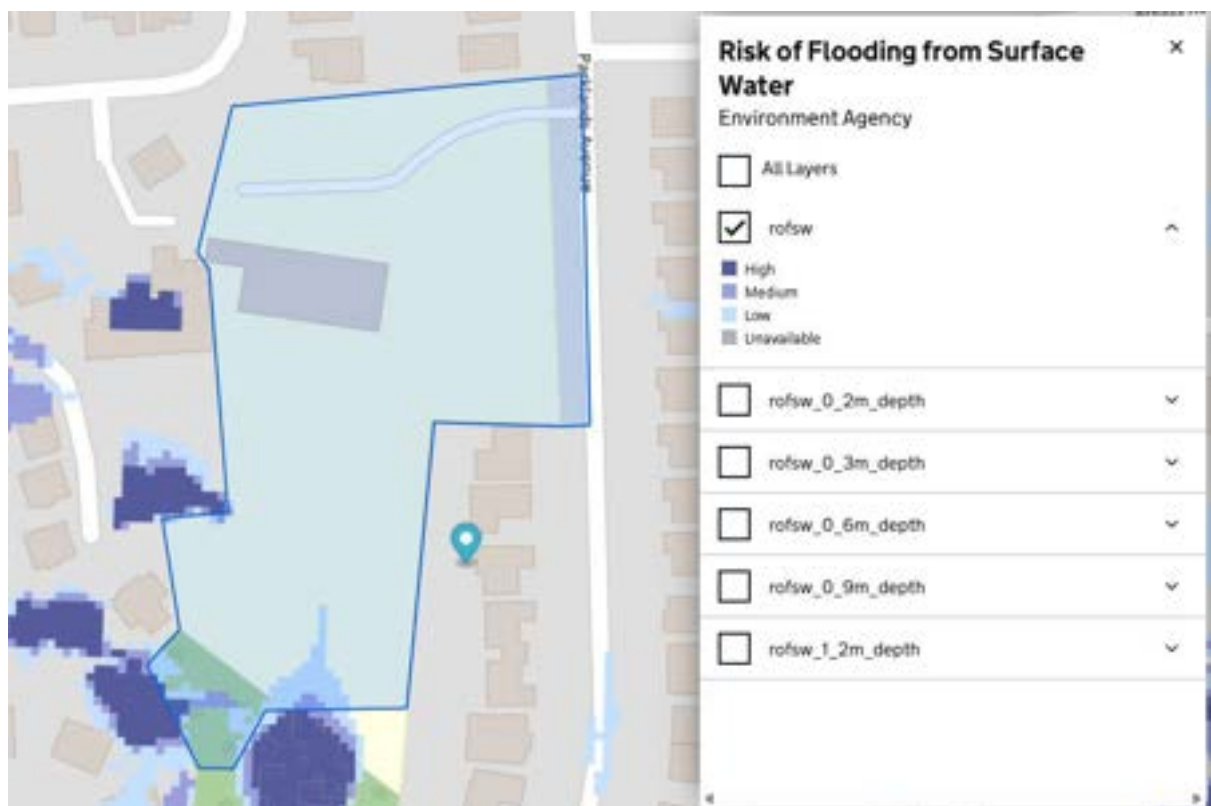
1 in 30

 Hide

☒ 1 in 30

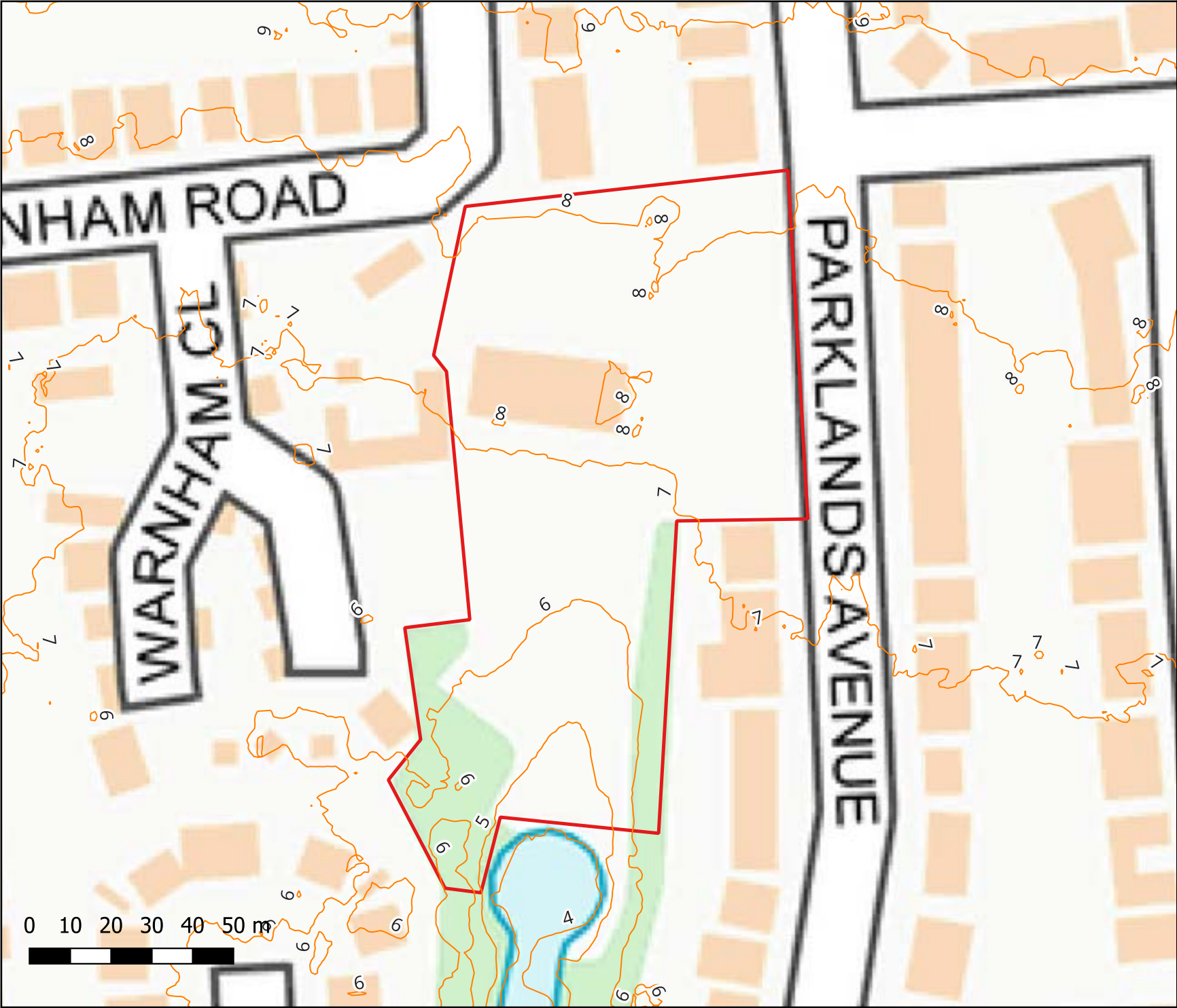
☐ 1 in 100

☐ 1 in 1000



Appendix D

LiDAR Topographical Plan



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Key:

- Countour Lines
- Site Boundary

Project
Courtlands, Worthing

Title
LiDAR Data Contour Lines



84 North Street, Guildford, GU1 4AY
Tel: +44 (0) 1483 206 531300

scale stated	drawn by LJ	date 30/03/2026
drawing number Figure 1		rev A

Appendix E

Envirocheck FSR: Groundwater Maps



BGS Flood Data (1:50,000)

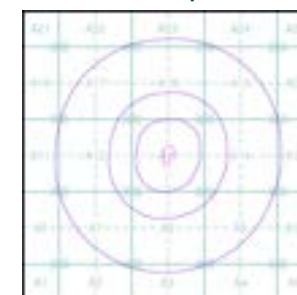
General

-  Specified Site
-  Specified Buffer(s)
-  Bearing Reference Point
-  Slice
-  Map ID

BGS Geological Indicators of Flooding

-  Coastal
-  Inland
-  Bodies of Water

BGS Flood Data Map - Slice A



Order Details

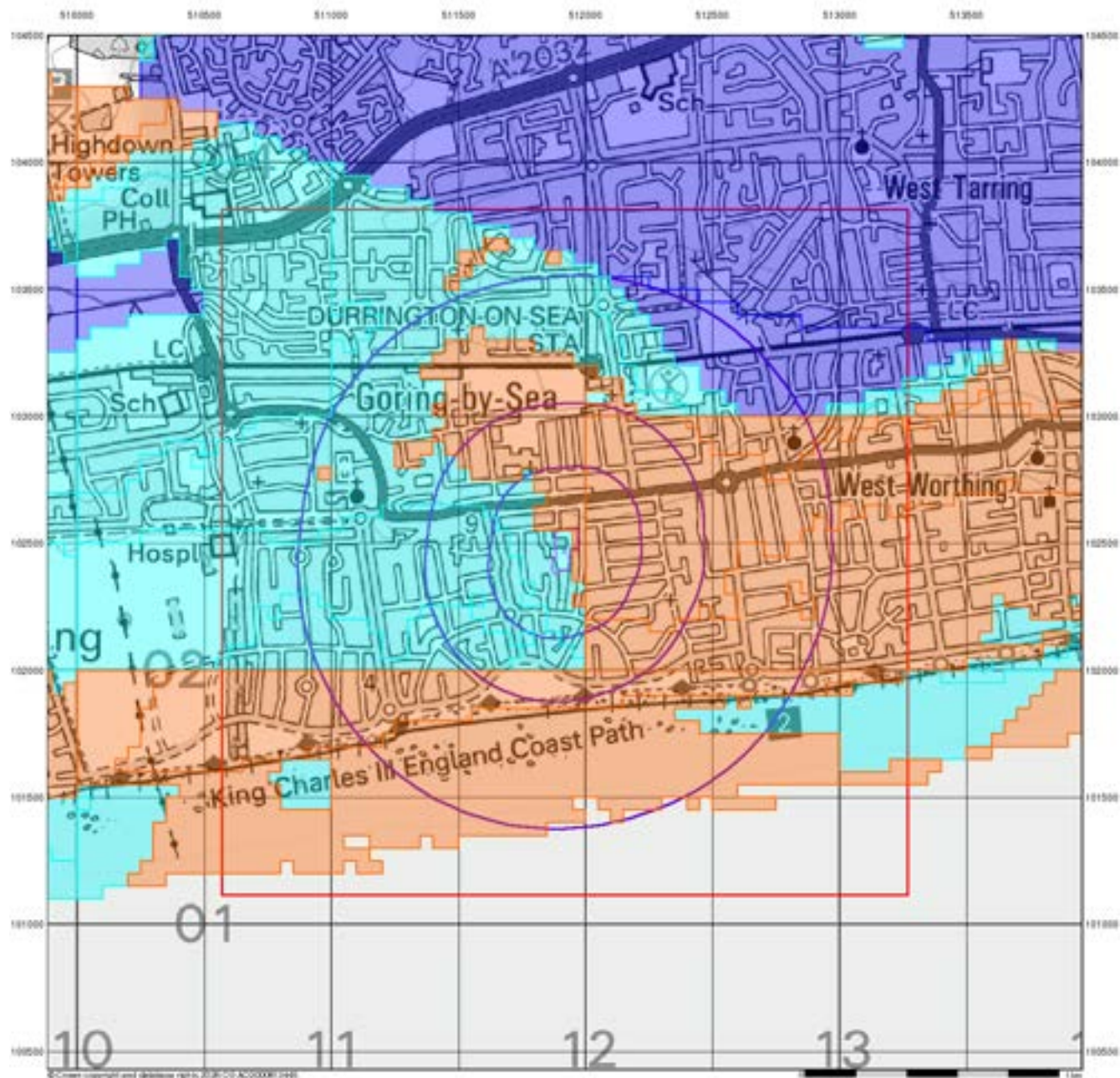
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 National Grid Reference: 511920, 102470
 Slice: A
 Site Area (Ha): 1.18
 Search Buffer (m): 1000

Site Details

Courtlands By the Sea, 37, Parklands Avenue, Goring-by-Sea, Worthing,
 BN12 4NG

Landmark
 Landmark Information Group Service

Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk



BGS Flood Data (1:50,000)

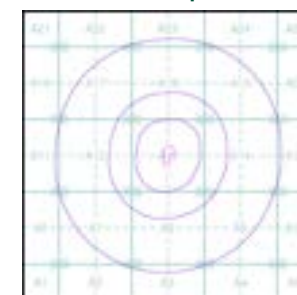
General

-  Specified Site
-  Specified Buffer(s)
-  Bearing Reference Point
-  Slice
-  Map ID

BGS Groundwater Flooding Susceptibility

-  Potential for Groundwater Flooding to Occur at Surface
-  Potential for Groundwater Flooding of Property Situated Below Ground Level
-  Limited Potential for Groundwater Flooding to Occur

BGS Flood Data Map - Slice A



Order Details

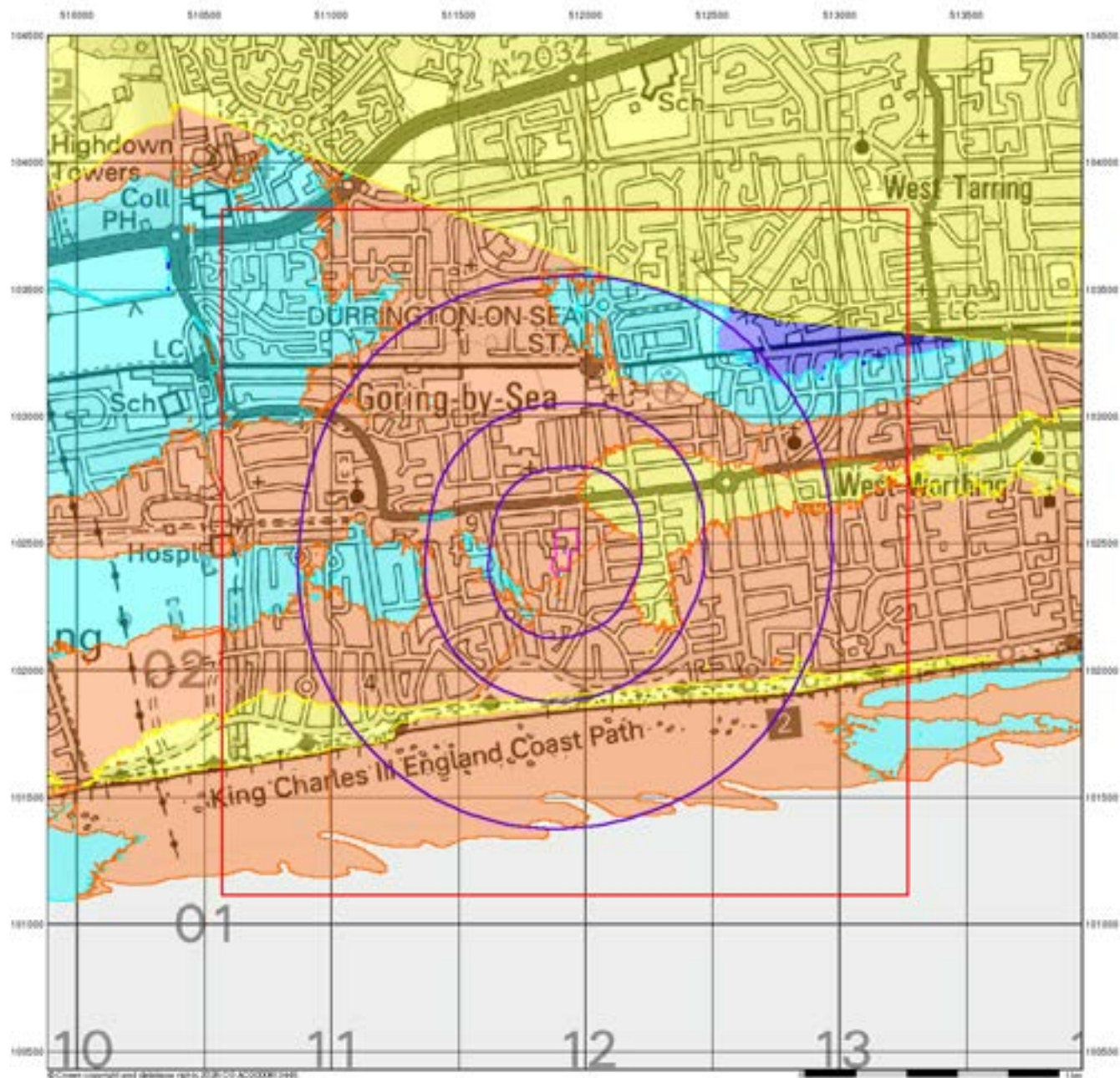
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 Search Buffer (m): 1000

Site Details

Courtlands By the Sea, 37, Parklands Avenue, Goring-by-Sea, Worthing, BN12 4NG

Landmark
 A Landmark Information Group Service

Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk



GeoSmart Information Groundwater Flood Map (1:50,000)

General

Specified Site Specified Buffer(s) Bearing Reference Point

Site

GeoSmart Information Groundwater Flooding Risk

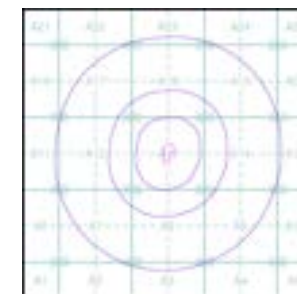
High Risk

Moderate Risk

Low Risk

Negligible Risk

GeoSmart Information Groundwater Flood Map - Slice A



Order Details

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Customer Ref: 1eccou/2601091-LJ
National Grid Reference: 511920, 102470
Slice: A
Site Area (Ha): 1.18
Search Buffer (m): 1000

Site Details

Courtlands By the Sea, 37, Parklands Avenue, Goring-by-Sea, Worthing, BN12 4NG



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Appendix F

Envirocheck FSR: Historic Flood Map

EA/NRW Historic Flood Map (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID

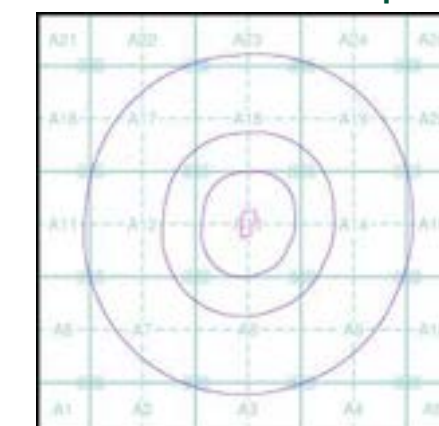
Historic Flood Events Data

- | | |
|--|--|
| Channel Capacity Exceeded (no raised defences) | Obstruction/Blockage - Culvert |
| Channel Capacity Exceeded /Surface Water | Obstruction/Blockage - Debris Screen |
| Groundwater/High Water Table | Operational Failure/ Breach of Defence |
| Local Drainage/Surface Water | Other |
| Mechanical Failure | Overtopping of Defences |
| Obstruction/Blockage - Bridge | Surface Water |
| Obstruction/Blockage - Channel | Unknown |
| Historical Flood Liabilities | |

Contours (height in metres)

- Standard Contour 105
- Master Contour 100
- Spot Height 107.8
- MLW Mean Low Water
- MHW Mean High Water

EA/NRW Historic Flood Map - Slice A



Order Details

Order Number: 398722566_1_1
 Customer Ref: 1eccou/2601091-LJ
 National Grid Reference: 511920, 102470
 Slice: A
 Site Area (Ha): 1.18
 Search Buffer (m): 1000

Site Details

Courtlands By the Sea, 37, Parklands Avenue, Goring-by-Sea, Worthing, BN12 4NG

Landmark
 INFORMATION GROUP

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