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Flood Risk Assessment Rev1

Land adjacent to 2 Mount Ararat Road
London
TW10 6PA

03 December 2019

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Prepared by	Checked by	Date
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This document has been prepared solely as a Surface Water and SuDS Assessment for Goater Jones. Base Energy accepts no responsibility or liability for any use that is made of this document other than by the Client for the purposes for which it was originally commissioned and prepared.

1. Introduction

This Flood Risk Assessment has been prepared in support of the planning application for new residential development on a portion of land located adjacent to 2 Mount Ararat Road, in accordance with the requirements of the National Planning Policy Framework (NPPF) and the accompanying Technical Guidance.

Site Location

The site is a portion of land located adjacent to 2 Mount Ararat Road, and to the rear of 1 Spring Terrace, Paradise Road at OS NGR TQ 182 748. Site location plans are provided in **Figure 1** and **Appendix A**.

Existing and Proposed Site Details

The portion of land proposed for development is currently comprised of grass and associated soft landscaped areas. An existing site layout plan is provided in **Appendix B**.

Proposals are for a single residential dwelling (and ground and basement level) with associated hard and soft landscaped areas. A copy of the proposed site layout plans is provided in **Appendix C**.



Figure 1 - Site Location Plan

2. Planning Policies

National Planning Policy Framework (NPPF) and the accompanying Technical Guidance

The aim of the NPPF (and the accompanying PP Technical Guidance) is to direct development away from areas at highest risk of flooding; where development is necessary, it should be made safe without increasing flood risk elsewhere.

The NPPF states that a Flood Risk Assessment (FRA) is required to support a planning application for developments that are in:

- Flood Zone 2 and/or Flood Zone 3
- Flood Zone 1 and comprise 1ha or above
- Flood Zone 1 and comprises less than 1ha, but is within a designated Critical Drainage Area (CDA), as notified to the Local Planning Authority (LPA) by the Environment Agency (EA)

In order to provide an indication of the flood zone classification of the site, and to ascertain whether a FRA is required, the starting point is the EA flood maps which are available on the EA website.

Environment Agency Flood Map

The EA flood maps show fluvial and tidal flood outlines based on the following:

- Flood Zone 1 - land assessed as having less than 1 in 1000 annual probability of river or sea flooding
- Flood Zone 2 - land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding, or between a 1 in 200 and 1 in 1000 annual probability of flooding from the sea
- Flood Zone 3 - land assessed as having a 1 in 100 or greater annual probability of river flooding, or a 1 in 200 or greater annual probability of flooding from the sea

The Environment Agency flood map is provided in **Figure 2** overleaf, and indicates that the site is located within Flood Zone 1.

Given that the site is less than one hectare and is located in Flood Zone 1, under the NPPF a full FRA would not be required, unless the site is shown to be located within a CDA.

Critical Drainage Area

The London Borough of Richmond Surface Water Management Plan (SWMP) dated June 2011 defines a CDA as ‘

‘a discrete geographic area (usually a hydrological catchment) where multiple and interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) cause flooding in one or more Local Flood Risk Zones during severe weather thereby affecting people, property or local infrastructure’.*

The SWMP includes maps which illustrate CDAs across the borough. The site is shown to be located within a CDA (Group8_004 – Richmond and Mortlake). As such, an FRA is required to support the planning application.

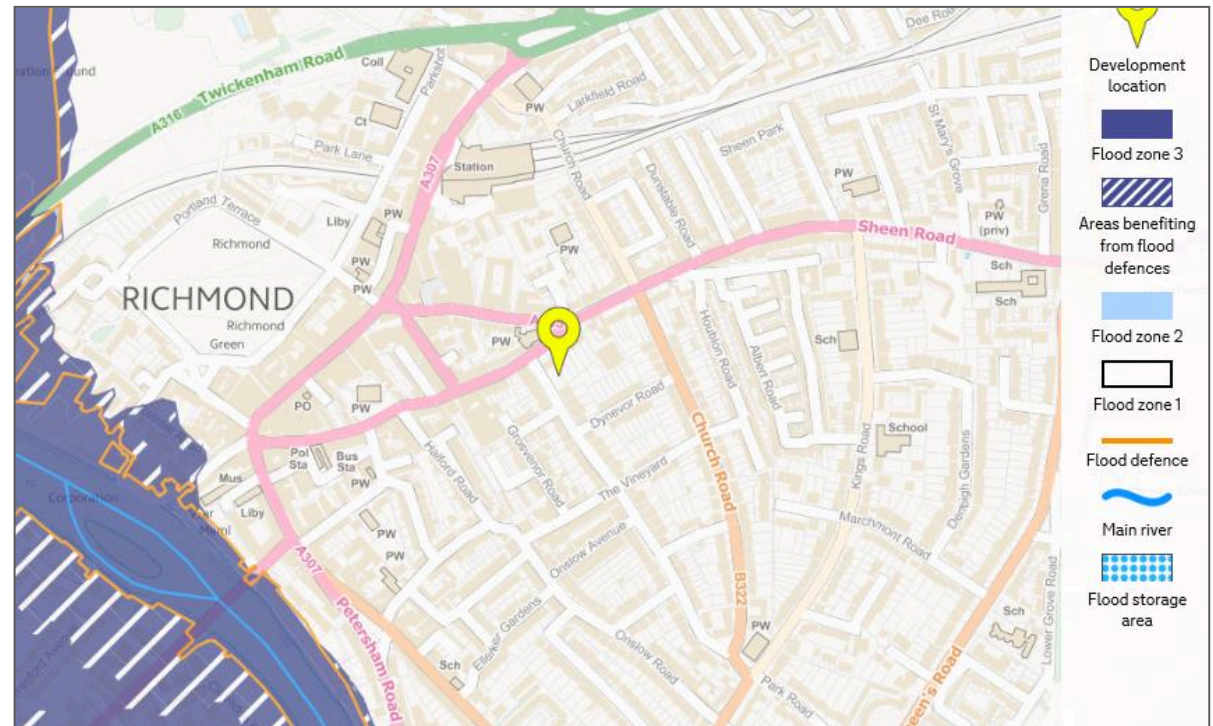


Figure 2 - Environment Agency Flood Map

The following section of this FRA (Section 3) provides more details on the sources of flood risk to the site, and Section 4 provides an overview of the proposed flood mitigation measures.

Local Planning Policies and Guidance

The London Borough of Richmond Council's has a range of planning policies and accompany guidance documents which are associated with flood risk and surface water runoff, including:

- Local Development Framework Development Management Plan (Adopted November 2011)
- Strategic Flood Risk Assessment (SFRA) Update (dated March 2016)
- Planning Advice Note – Good Practice Guidance on Basement Developments (dated May 2015)
- Planning Guidance Document - Delivering SuDS in Richmond (February 2015)

These documents have been reviewed and used to inform this FRA.

3. Flood Risk

Fluvial Flood Risk

As previously noted, the site is shown to be located within Flood Zone 1 and is therefore considered to be at low risk of fluvial / tidal flooding.

Critical Drainage Area

The site is shown to be located within the Richmond and Mortlake CDA.

Within the London Borough of Richmond SWMP it is stated '*the Richmond and Mortlake CDA is located to the north east of the Borough. Pluvial modelling has identified that within this CDA, overland flow from Richmond Park creates natural flow paths travelling in a northerly direction to pool behind the rail embankment which dissects the CDA in an east-west direction. There is some steep topography in this CDA associated with Richmond Hill and there may be potential for basement flooding on roads including Church Road dependant on property threshold levels*'.

The measures outlined in Section 4 of this report are considered sufficient to mitigate the risks associated with the site being located within a CDA.

Groundwater Flooding

Groundwater flooding generally occurs during intense, long-duration rainfall events, when infiltration of rainwater into the ground raises the level of the water table until it exceeds ground levels. It is most common in low-lying areas overlain by permeable soils and permeable geology, or in areas with a naturally high water table.

Reference has been made to the British Geological Society geology maps; these indicate that the site is underlain by the London Clay Formation.

The Soils Maps provided by the National Soil Resources Institute at Cranfield University indicate that the soils at the site and surrounding areas are comprised of '*slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils*'.

Based on the above, the susceptibility to groundwater flooding may be considered low.

However, given that the proposals include basement development, measures to mitigate any residual risk of groundwater flooding are outlined in the following section.

Surface Water Flooding

Surface water flooding results from rainfall generated overland flows, before the runoff reaches a watercourse/ drainage system, or where the watercourse/ drainage system is overwhelmed and unable to accept further runoff. Surface water runoff is usually associated with high intensity rainfall events but may also occur with lower intensity rainfall where the ground is saturated, developed or otherwise has low permeability resulting in overland flows and ponding within depressions in the topography.

The EA provides maps on their website that illustrates the extent of surface water flooding, along with potential depths and velocities. The maps suggest that the Wallingford Avenue is at low risk of surface water flooding, with depths shown to be less than 300mm, and velocities of over 0.25m/s.

It is important to note that following redevelopment of the site, the surface water drainage arrangements should ensure that there will be no increase in rates and volumes of surface water runoff (when compared with the existing situation); therefore, surface water flood risk should not be exacerbated at the site and surrounding areas.

Measures to mitigate the risk of surface water flooding are outlined in the following section, and an overview of surface water management and SuDS is provided in Section 5.

Sewer Flooding

The SWMP states that *'this CDA crosses four post code boundaries in which sewer flooding incidents have been recorded as follows: Richmond Hill TW10 6 1-5 incidents; Richmond Station TW9 1 6-10 incidents; East Sheen SW147 6-10 incidents; Mortlake SW148 11-20 incidents.'*

Although the site is located within TW10 6, it is unknown whether the recorded incidents of sewer flooding occurred at the site or surrounding area.

Following redevelopment of the site, there should be no increase in the peak rates and volumes of surface water runoff entering the public sewer network. As such the development should not exacerbate the risk of sewer flooding.

However, in order to mitigate any risk of sewer flooding measures as outlined in the following section should be considered.

4. Flood Mitigation

Given that the site is within a designated CDA, that there is a low risk of surface water flooding, and that the proposals include basement development, the following should be considered.

Flood Resilient Construction – Ground Floor and Basement

In order to mitigate any risk of flooding, flood resilient construction techniques should be incorporated into the design of the ground floor and basement, in line with guidance provided in the Communities and Local Government Document, *Improving the Flood Performance of New Buildings: Flood Resilient Construction*¹. These include design features and finish materials to minimise the entry of water and/or reduce the damage in the event of floodwaters entering the basement and include:

- Concrete floors
- Flood resilient building materials and fittings
- New power sockets raised above 300mm

Sewer Pump - Basement

The London Borough of Richmond Planning Advice Note – Good Practice Guidance on Basement Developments (dated May 2015) states that basements should have adequate mitigation measures such as non-return valves or pumped sewage devices to prevent back-flows from the system during sewer flooding. As such, a suitable pump should be installed.

¹ Improving the Flood Performance of New Buildings: Flood Resilient Construction. Department for Communities and Local Government. May 2007.

5. Surface Water Runoff

Policy DM SD 7: Sustainable Drainage of the Development Management Plan states:

All development proposals are required to follow the drainage hierarchy (as outlined in The London Plan; see below) when disposing of surface water and must utilise Sustainable Drainage Systems (SuDS) wherever practical:

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

SuDS Overview

SuDS aim to mimic natural drainage and can achieve multiple objectives such as removing pollutants from urban runoff at source, controlling surface water runoff from developments, ensuring that flood risk is not increased further downstream and combining water management with green space which can increase amenity and biodiversity value.

When choosing and designing SuDS for a development, it is important to recognise the constraints associated with the type of SuDS to be installed, including the underlying ground conditions and the size of the site. In this instance, there is the opportunity for SuDS to be installed which could include green/sedum roof, rain garden, water butts.

6. Conclusions

This FRA has been prepared in support of the planning application for new residential development on a portion of land located adjacent to 2 Mount Ararat Road, in accordance with the requirements of the NPPF and the accompanying Technical Guidance.

The portion of land proposed for development is currently comprised of grass and associated soft landscaped areas. Proposals are for a single residential dwelling (and ground and basement level) with associated hard and soft landscaped areas.

The Environment Agency flood map indicates that the site is located within Flood Zone 1.

The SWMP includes maps which illustrate CDAs across the borough. The site is shown to be located within a CDA (Group8_004 – Richmond and Mortlake). As such, an FRA is required to support the planning application

The BGS Geology Maps indicated that the site is underlain by the London Clay Formation. The Soils Maps indicate that the soils at the site and surrounding areas are comprised of '*slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils*'. As such the susceptibility to groundwater flooding may be considered low. However, given that the proposals include basement development, measures to mitigate any residual risk of groundwater flooding should be incorporated into the proposals.

The EA provides maps on their website that illustrates the extent of surface water flooding, along with potential depths and velocities. The maps suggest that the Wallingford Avenue is at low risk of surface water flooding, with depths shown to be less than 300mm, and velocities of over 0.25m/s.

Measures will be incorporated into the design of the dwellings in order to mitigate any residual risk of flooding.

Following redevelopment of the site, the surface water drainage arrangements should ensure that there will be no increase in rates and volumes of surface water runoff (when compared with the existing situation); therefore, surface water flood risk will not be exacerbated at the site and surrounding areas.

7. Recommendations

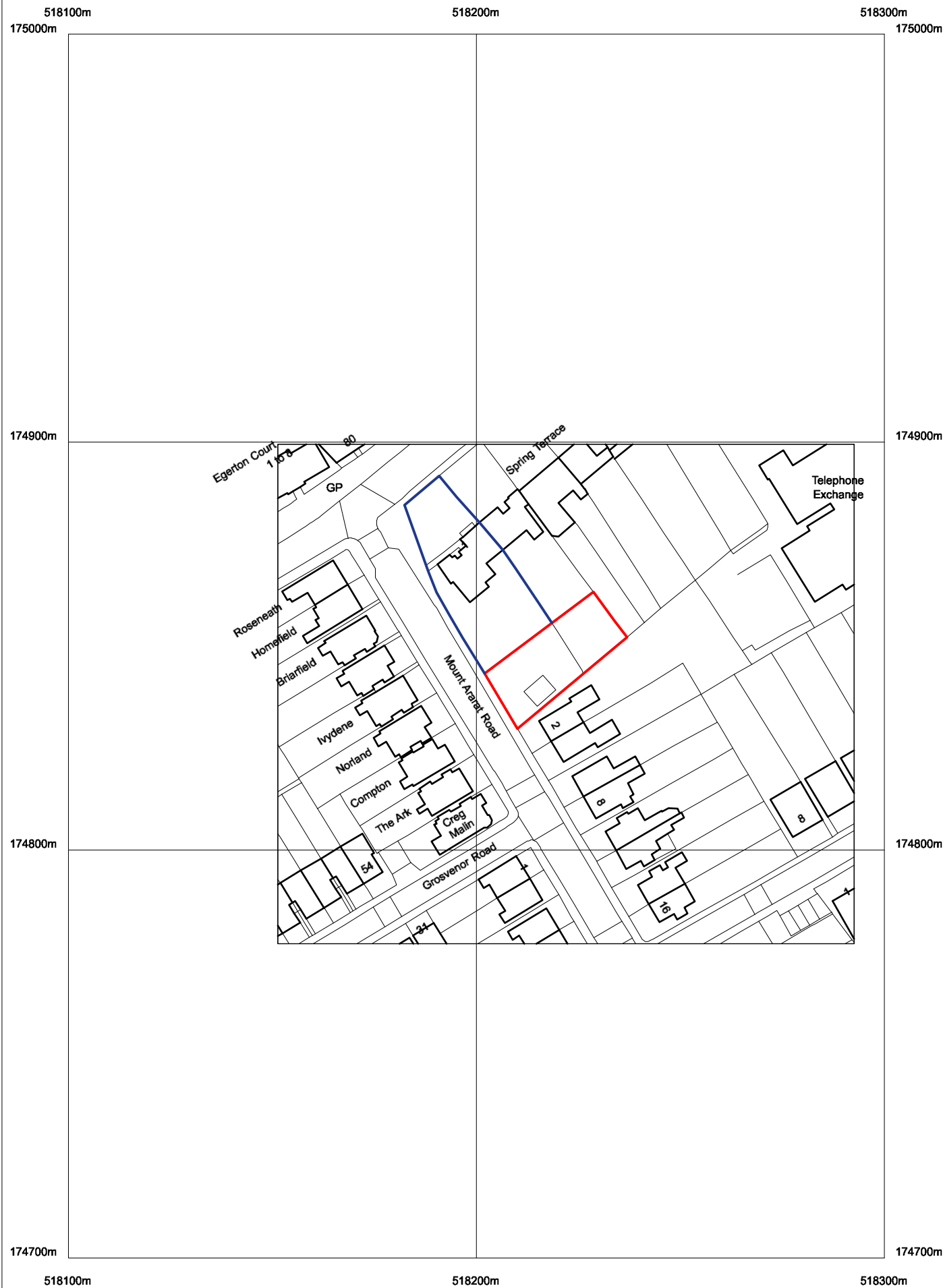
This FRA has demonstrated that the development may be completed without conflicting with the requirements of the NPPF and the accompanying Technical Guidance through the following:

- Flood resilient construction techniques should be incorporated into the design of the ground floor and basement, in line with best practice guidance.
- Non-return valves or pumped sewage devices should be installed to prevent back-flows from the system during sewer flooding
- A surface water and SuDS strategy to be developed in accordance with national and local planning policies

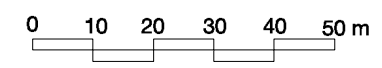
Appendices

Appendix A - Site Location Plan

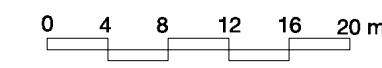
Notes-
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 Please report any omissions and discrepancies to the Architect immediately
 This drawing should be read in conjunction with the Structural Engineers drawings and calculations



OS PLAN - Scale 1:1250



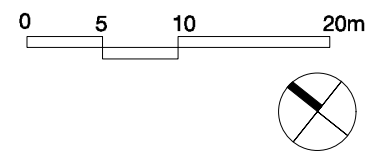
EXISTING SITE PLAN - Scale 1:500



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Project-	Mount Ararat Road
Drawing Title-	OS Map
Drawing No-	17018-100
Scale-	1:1250 @A3
Status-	PLANNING
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Appendix B - Existing Site Layout

Notes-
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EXISTING SITE CONTEXT PLAN

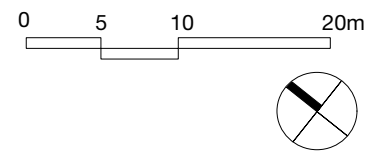
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Client-	Richmond Green Developments Ltd
Project-	Mount Ararat Road
Drawing Title-	Existing Site Context Plan
Drawing No-	17018-101
Scale-	1:500 @A3
Status-	PLANNING

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Appendix C - Proposed Site Layout

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PROPOSED SITE CONTEXT PLAN

REVISIONS: (YY/MM/DD)
 A - 18/07/21 - Initial design
 B - 18/07/21 - Plans updated

Client-	Richmond Green Developments Ltd
Project-	Mount Ararat Road
Drawing Title-	Proposed Site Context Plan
Drawing No-	17018-111
Scale-	1:500 @A3
Status-	PLANNING

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