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# Stormwater Management Plan 2-12 & 14 Tennyson Road, Gladesville

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**for Darcsol Pty Ltd**

22 April 2013

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## 1.0 INTRODUCTION

This stormwater management plan is submitted by Engineering Consultancy firm Taylor Thomson Whitting (TTW) who have been engaged by Darcsol Pty Ltd to investigate and design the storm water for the redevelopment of sites 2-12 & 14 Tennyson Road, Gladesville. The purpose of this plan is to satisfy council requirements so that future development will not have an adverse impact on stormwater runoff for the existing site and the downstream catchment.

## 2.0 DEVELOPMENT SITE

The sites are located on the east side of Tennyson Road in Gladesville, Sydney. The sites are bounded by commercial buildings in the north and east, and with residential properties on the southern side. The sites are currently occupied with a number of commercial buildings, factories, car parking, roads and landscaping with a total combined area of approximately 2.4ha. An aerial image of the site is shown below in Figure 1.



Figure 1. Development Site

## 3.0 LOCAL TOPOGRAPHY

The local topography slopes from north to south. The intersection of Victoria and Monash Roads is roughly where the crest exists. Contours of the land can be seen in Figure 2. Site 2-12 is a former quarry. It is lower than the surrounding properties of about 5m to 15m. As site 2-12 is lower than all surrounding properties it has no overland flow path for stormwater.

Site 14 sits higher than property 2-12 and the residential properties on the east and southern sides. Site 14 has overland flow which falls to the rear of the residential properties.

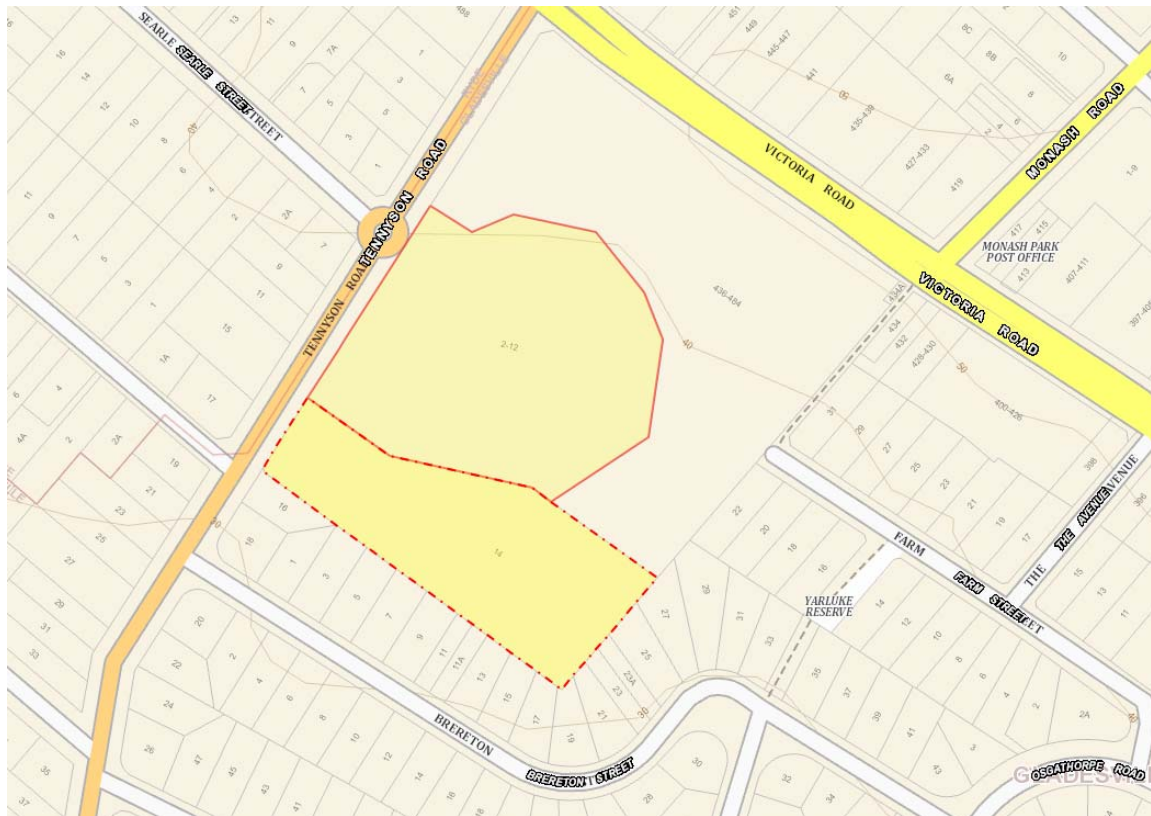


Figure 2. Topography

#### 4.0 EXISTING STORMWATER

The existing stormwater on the development site drains existing buildings, car parks and roads. There are two sub catchment areas. The first sub catchment relates to site 2-12 and includes the south western part of site 14. The second sub catchment relates to the northern and eastern parts of site 14.

Site 2-12 drains under site 14 to the council system on western section of Brereton Street. Site 2-12 does not have any water attenuation tanks.

Site 14 discharges to the council system from two connections. The first connection drains east through residential properties to council's stormwater system in Brereton Street. The second is assumed to connect to the same line from site 2-12.

Site 14 has at least one water attenuation tank with storage volume of about 80m<sup>3</sup>. This tank discharges to council stormwater system located on the east side of the property on Brereton Street.

A plan showing outfall locations and existing sub catchment areas are shown in Figure 3 below.





**Figure 3. Existing Catchments and Outfall Locations**

## 5.0 PROPOSED DEVELOPMENT

The proposed redevelopment of the site includes; demolition of existing buildings with construction of buildings, roadways, landscaping and includes a below ground carpark. The proposed site plan is shown in Figure 4 below. The proposed building will be multi-storey with a combination of commercial, residential and industrial.

The design of the stormwater system will ensure that the development does not lead to;

- An increase in stormwater runoff from the site
- An increase in the risk of downstream flooding
- An increase in the risk of on-site flooding

In accordance with Ryde Council's stormwater policy (DCP10 8-2-1) peak flow for storms 5 year up to the 100 year are not to increase for all storm durations.

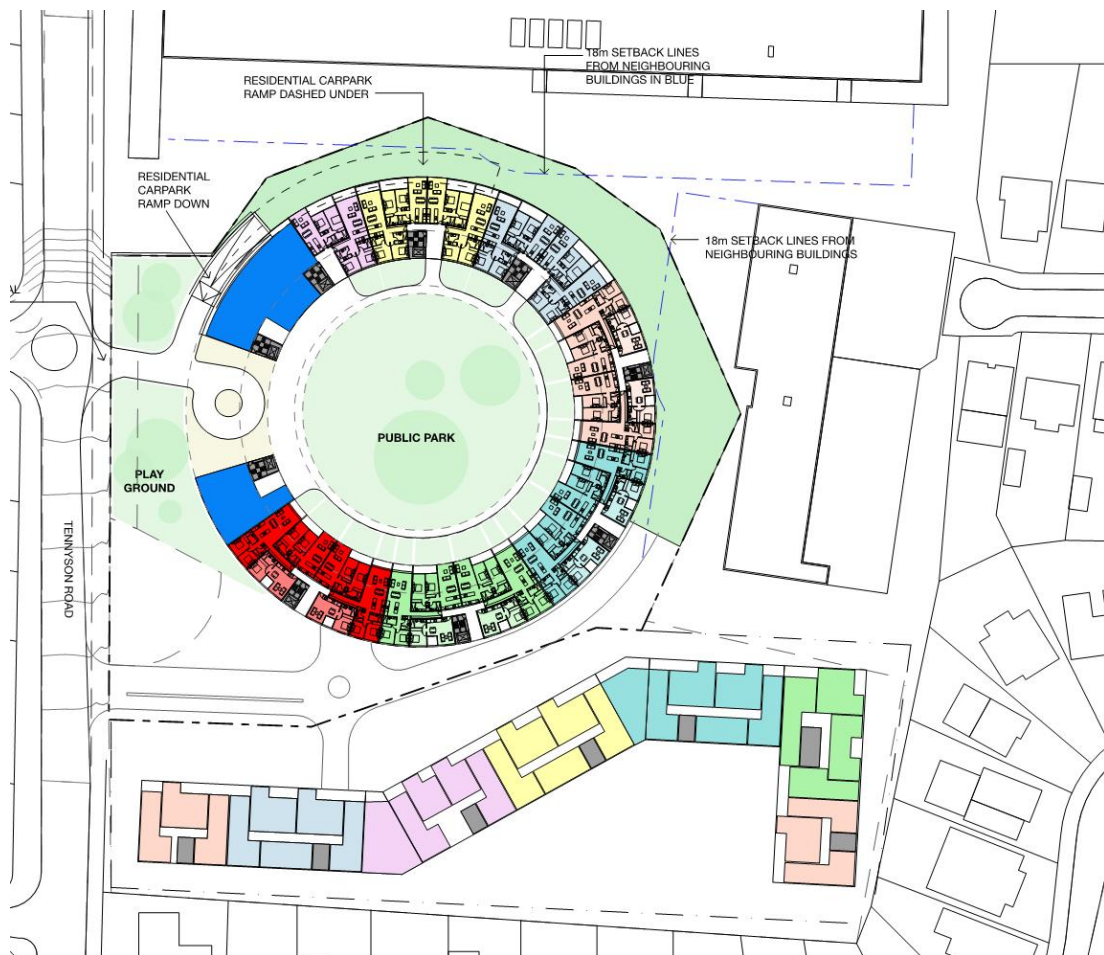


Figure 4. Proposed Site Plan

## 6.0 PROPOSED CATCHMENTS

The proposed development will alter the existing catchment characteristics. The characteristics that will change include the total area of impervious surfaces and type of surface. As a result of these changes the proposed stormwater system will ensure that the development does not have a negative impact on the runoff as detailed in section 5 above.

### Catchments Comparison

A comparison of the pre and post-development catchments has been made to ensure that any impacts from runoff are addressed as part of the stormwater management.

The proposed development will not change the site's total catchment area however there will be an overall increase in impermeable area. After the development is constructed, the catchments will change in the following ways:

- Catchment for site 2-12 increases in impermeable area by 27%
- Catchment for site 14 has a decrease in impermeable area by 18%.
- As mentioned in section 5 there must be no increase in runoff. Therefore due to the increase in impermeable area on-site detention is required.

## 7.0 STORMWATER RUNOFF ANALYSIS

### Site 2-12

The stormwater runoff has been analysed using DRAINS for the 5, 10, 20, 50 and 100 year ARI's, with multiple storm durations between 5 and 120 minutes. The proposed storm water design for the development ensures that the piped system for the whole development does not surcharge up to the 100 year ARI. This site has no overland flow path possible as it is significantly lower than the surrounding properties. If the piped systems blocks there will be ponding on the proposed site.

Preliminary DRAINS analysis indicates that 270m<sup>3</sup> of detention storage will be required for site 2-12.

### Site 14

14 Tennyson Road has a reduction in impervious area and from this no increase in on-site detention is required. However, due to the proposed building footprint and road works, the existing tanks may need to be reconstructed to suit the proposed works.

The stormwater runoff for 14 Tennyson Road has been analysed using DRAINS for the 5, 10, 20, 50 and 100 year ARI's, with multiple storm durations between 5 and 120 minutes. The proposed stormwater design for the development ensures that the piped system for the whole development does not surcharge up to the 100 year ARI.

Preliminary DRAINS analysis indicates that 135m<sup>3</sup> of detention storage will be required for the property.

The existing tank on eastern side of the site has a volume of about 80m<sup>3</sup>.

The design will ensure that during the 100 year ARI storm event, overland flow is directed away from buildings.

### Connection to existing stormwater system

The new stormwater system within site 2-12 will maintain the existing connection under site 14 down to Brereton Road. It is assumed that this pipe has no capacity issues and is able to take the existing flow (and future) without surcharge.

The new stormwater system within 14 Tennyson Road will maintain the two existing connections. Both pipes connect to Brereton Road – one pipe connects in the east and the other in south western. It is assumed that these pipes have no capacity issues and is able to take the existing flow (and future) without surcharge.

Refer to **Appendix A** for Stormwater Concept plan.

## 8.0 SUMMARY OF DEVELOPMENT IMPACT

The proposed development alters the catchment characteristics and increases the impervious areas of the site. This results in an increase in surface water runoff from the site that could potentially lead to an increase in the risk of downstream flooding. The implementation of stormwater management controls will ensure that;

- The peak runoff from the site is not increased
- The risk of downstream and on-site flooding is reduced
- The quality of the stormwater runoff is improved
- Risk of stormwater inundation on the proposed development is minimised

The overland flow routes from site 14 will be maintained, whereas site 2 – 12 will continue to have no overland flow path due to being several metres lower than the surrounding properties.

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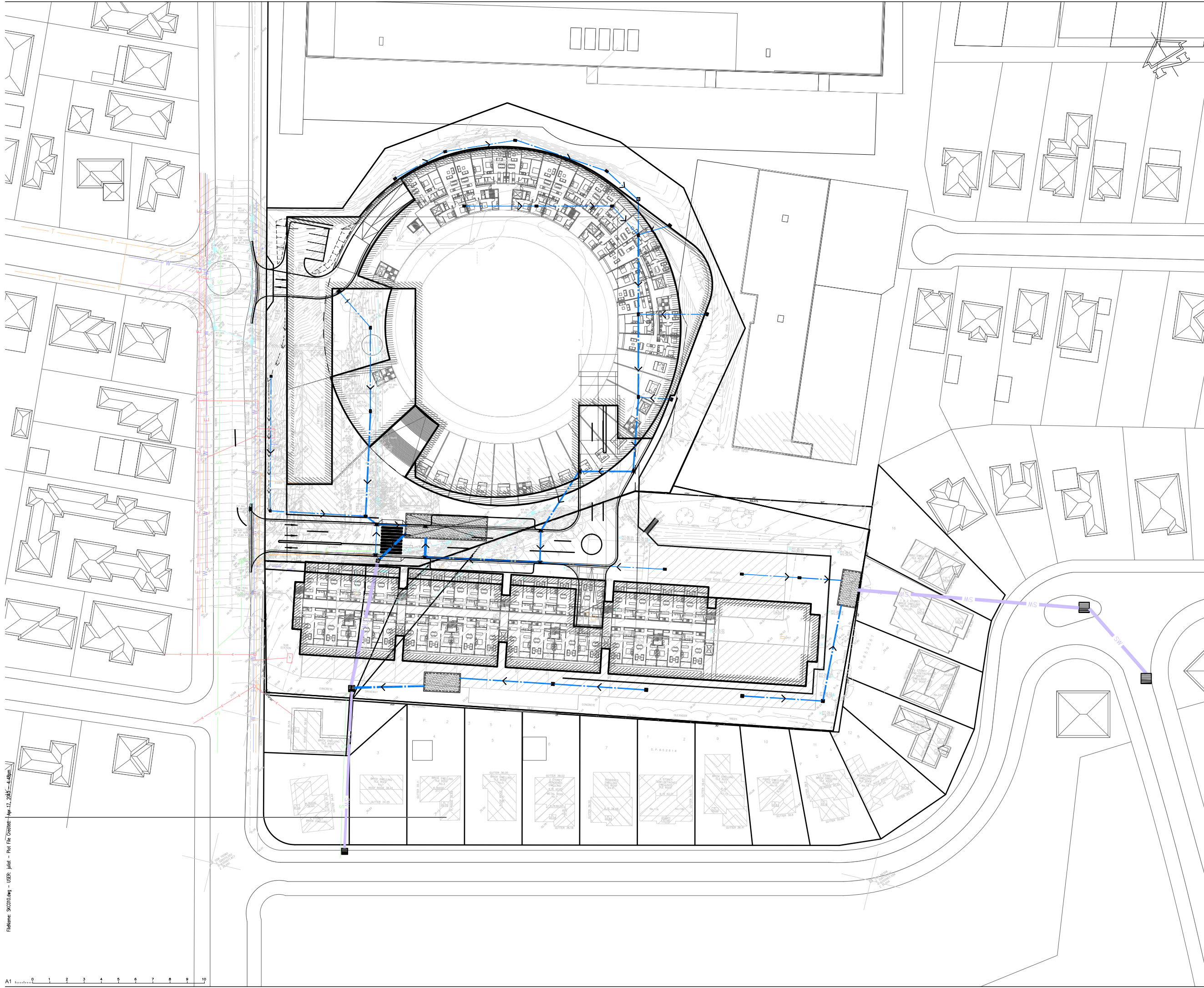


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## **APPENDIX A – STORMWATER CONCEPT PLANS**



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|-----|------------------------|-----|-------|----------|
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Project  
**2-12 TENNYSON ROAD,  
GLADESVILLE**

Sheet Subject  
**OVERALL SITE PLAN**

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