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18 March 2008

Goodman International
Level 10 60 Castlereagh Street
Sydney NSW 2000

Our ref: 21/16225/135599
Your ref:

Attn: Kym Dracopoulos

Dear Kym

Central Project Application No. 1 - Estate Works & DHL Stormwater Management Strategy

1 Introduction

This letter report has been prepared as an addendum to the Water Sensitive Urban Design (WSUD) Strategy report prepared by GHD (GHD, December 2007). This addendum specifically considers the works proposed under Project Application Number One, which involves the development of Buildings 1A and 2A (DHL) of the Central Precinct. The strategy has been developed with consideration given to the proposed ongoing operation of the Bedford Quarry in the precinct.

The stormwater management strategy described herein relates to Buildings 1A and 2A of the Central Precinct development area.

Buildings 1A and 2A are proposed to be developed while the quarry is in operation. As a result, the WSUD strategy will need to be staged to take account of runoff from Buildings 1A and 2A before the entire Central Precinct area is developed.

The stormwater management strategy assumes that the erosion and sediment control measures required for the Bedford Quarry will remain in place until quarrying ceases and the area rehabilitated. Therefore, the quarry has been excluded from this assessment.

Figure 1 provides a diagrammatic representation of the proposed stormwater management strategy for the central precinct and Buildings 1A and 2A referred to in the following sections.

2 Stormwater Quantity

Stormwater detention will be provided for each building via on site detention (OSD).

From the preliminary hydrologic modelling performed as part of the Oakdale WSUD Strategy report (GHD, December 2007) it was found a volume of approximately 250 m^3/ha is required for stormwater detention with a permissible site discharge (PSD) of 140L/s/ha for the 100-year Average Recurrence Interval (ARI) event. This configuration has been adopted for this addendum.

The final design will be completed in accordance with Fairfield City Council Guidelines whereby other ARI events will need to be modelled to show the post-development flow rates are maintained at pre-development levels for various ARI events.

GHD Pty Ltd ABN 39 008 488 373 Level 6, 20 Smith Street Parramatta NSW 2150 PO Box 788 Parramatta NSW 2124 Australia
T 61 2 8898 8800 **F** 61 2 8898 8810 **E** ptamail@ghd.com.au **W** www.ghd.com.au

The Austral Brickworks to the east of Old Wallgrove Road from an external catchment that flows in the northeast corner of the Central Precinct. The Brickworks may be redeveloped in the future and it has been assumed that stormwater detention will be provided east of Old Wallgrove Road. Hence no stormwater detention is being provided for the Brickworks in the Central Precinct area:

Table 1 Detention Parameters (100-year ARI Event)

Location	OSD (m^3)	PSD (l/s)
Lot 1	1,030	575
Lots 2	1,600	900

3 Flooding

The flood study carried out as part of the Oakdale WSUD Strategy Report (GHD, December 2007) has been reviewed and updated using detailed field survey. The detailed field survey is considered more accurate than the airborne laser survey date used previously. In addition, allowance has been made for a future bridge crossing of the Category 2 watercourse in the model and the removal of the existing dam located near this crossing. Figure 1 shows the updated 100-year Average Recurrence Interval (ARI) flood extents for the Central Precinct (East).

4 Stormwater Quality

Stormwater quality treatment for Buildings 1A and 2A will be provided by Basin 1 (bio-retention basin) and vegetated swales between the proposed quarry and the Sydney Catchment Authority pipelines. Basin 1 has been sized to meet the objectives outlined in the WSUD Strategy Report for the ultimate configuration, that is, Buildings 1A, 1B and 1C and a portion of the Link Road.

The sedimentation basin for the quarry works is outside of the position of Basin 1. Thus the bio-retention basin can be constructed while earthworks operations continue.

The WSUD strategy for Buildings 1A and 2A has been modelled using MUSIC software. The results of the analysis are summarised in Table 2.

Table 2 Water Quality Modelling Results

Pollutant	Sources	Residual Load	Reduction	Required Reduction
Total Suspended Solids (kg/yr)	16,800	471	97.2 %	85 %
Total Phosphorus (kg/yr)	27.5	5.35	80.5%	65 %
Total Nitrogen (kg/yr)	188	85.8	54.2 %	45 %
Gross Pollutants (kg/yr)	2,930	0 (approx)	99 % (approx)	90 %

5 Open Channels

5.1 Southern Channel

A channel will be required on the northern side of Burley Road (which is unmade in this area) to intercept stormwater runoff from the CSR-PGH Brickworks to the watercourse that runs through the Central Precinct. Fairfield City Council requires a velocity in the channel of less than 2 m/s. Preliminary hydraulic calculations indicate a channel width of 11 metres will be required (depth 1m, base 2m, 1:4 side slopes, 1.5% longitudinal grade).

5.2 Northern Channel

A channel running adjacent to the proposed Link Road is indicated on Figure 1. This has been sized to convey the 100-year ARI storms from Lots 1, 3 and 5 as well as the external Austral Brickworks catchment mentioned in Section 2. The channel has a 1.1% longitudinal grade, 1.4 side slopes and a 2m base. The minimum depth of the channel is 1.2m.

Yours faithfully
GHD Pty Ltd

Chris McDougall
Civil Engineer
2 8898 8858

Attachment: Figure 1 - Stormwater Management Strategy

0 40 80 120m
SCALE 1:4000 AT ORIGINAL SIZE

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GOODMAN INTERNATIONAL LTD
OAKDALE CENTRAL PROJECT APPLICATION (PA1)
ESTATE WORKS & DHL

STORMWATER STRATEGY

scale | 1:4000 for A3 date | MARCH 2008

job no. | 21-16225
rev no. | D

Figure 1

10 Bond Street, Sydney NSW 2000 Australia **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au

Plot Date: 18 March, 2008 - 1:57 PM Cad File No: G:\21\16225\CADD\Drawings\ 21-16225-STORMWATER_PA1.dwg