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Job No. 09809

2<sup>nd</sup> May 2010

Associate Director – Jennifer Cooper  
Urbis Pty Ltd  
GPO Box 5278  
SYDNEY NSW 2001

email: [jcooper@urbis.com.au](mailto:jcooper@urbis.com.au)

Dear Jennifer,

**RE: NSW DEPARTMENT OF PLANNING APPLICATION NO. MP 09\_0054**

## PROPOSED MIXED USE DEVELOPMENT AT THE 'BAKEHOUSE QUARTER' – GEORGE ST AND RAILWAY LN, NORTH STRATHFIELD

## REPORT ON SITE DRAINAGE AND FLOOD CONDITIONS

## 1. Introduction

Pelorus Property Group intends to construct a mixed-use development as part of the Bakehouse Quarter precinct in North Strathfield. Application with the NSW Department of Planning has resulted in Director General's Requirements being issued. The Requirements provides items which need to be addressed as part of the Environmental Assessment for the proposal.

Northrop has been engaged to assess the stormwater drainage and site flooding conditions to be considered for the proposed development. This is in general response to Item 10. of the Director-General's Requirements (Application No. MP 09\_0054). A copy of the "Bakehouse Quarter – Upper Ground Floor Plan" – prepared by Wah Architects, dated 23.04.10, is attached in Appendix A (as a reference for the scope of development).

This report has been prepared to:

- Describe the outcomes of our investigations to identify site stormwater drainage requirements and considerations with potential flooding affecting the subject site, and
- Provide preliminary advice on the treatment measures to be considered to manage site discharge and flood protection for the proposed development. These have been determined generally in accordance with Canada Bay City Council requirements, but are subject to formal response from the stormwater and flooding Authority.

## 2. Site Description

The area for development is within the Bakehouse Quarter Precinct - George Street, North Strathfield. The subject site is located to the south of the Bakehouse Quarter Precinct, and is bounded by the Northern Railway Corridor (east), Parramatta Road (south) and George Street (west). The site is also 'split' by the M4 Western Motorway overpass.

The existing development comprises existing buildings, hardstand, public carparking and road / laneways. The landfall tends from the Railway Corridor (east) to George Street (west).

### 3. Existing Drainage Conditions

Two (2) stormwater-related conditions have been determined to exist for the site.

### 3.1 Provisions Draining the Existing Development

Existing stormwater drainage provisions within the site of proposed development comprise:

- Roof drainage for the existing buildings, and
- Stormwater pits and pipes for collection of surface runoff throughout the existing development.

All of the runoff from these provisions discharges to the Council-owned stormwater drainage system in George Street. The George Street drainage system ultimately discharges to the Powells Creek stormwater channel – located to the west of the Bakehouse Quarter Precinct.

### 3.2 Upstream Flows from the External Eastern Catchment

Overland flow has been experienced along the eastern building edge of the Bakehouse Quarter Precinct (in vicinity of Building H3). This is a pre-existing condition that results from excessive flows traversing the Northern Rail Corridor from an external catchment to the east. The ultimate relief point for this flow is 'shared' - via the subject development site (south), and the Bakehouse Quarter Precinct J (north).

Northrop has undertaken preliminary investigations to ascertain the flow impacting the Bakehouse Quarter. The catchment area is approximately 11.2 hectares – and extends to Concord Road (east), Carrington Road (south) and Nelson Road (north). The following points summarise the general characteristics of this upstream flow:

- Preliminary calculations indicate that the peak discharge for the critical 100-year ARI storm event is approximately 5.9m<sup>3</sup>/s.

- Bringing people, ideas & engineering together

## 5.1 Site Stormwater Management

## Sediment & Erosion Control

To manage the quality of stormwater runoff during the construction phase, sediment and erosion control measures are to be provided and maintained in accordance with the 'Soil and Construction - Managing Urban Stormwater', by Landcom (The Blue Book). Such measures will include:

- Sediment basin;
- Stormwater inlet protection;
- Site boundary protection (eg. dust control and sediment fence);
- Stabilised site access;

Such measures will be provided to limit the amount of sediment that can be eroded away from exposed areas within the site and deposited in downstream waterways. Northrop has prepared a Concept Sediment & Erosion Control Plan to support the Environmental Assessment submission (refer Appendix C).

### On-site Stormwater Detention

The quantity of stormwater discharge from the proposed development will be managed by incorporating On-site Stormwater Detention (OSD) - to restrict site discharge according to The City of Canada Bay Council Stormwater Management Policy. Discharge from the OSD facilities will be directed to the existing Council stormwater drainage system within George Street. This maintains the 'natural' catchment flow conditions.

The following OSD parameters determined to be applicable to this development are as set by Council for 'commercial development':

- Site Storage Requirement (SSR) – 300cum/ha, and
- Permissible Site Discharge (PSD) – 200L/s/ha

### *Rainwater Harvesting Provisions*

Facilities to enable collection and re-use of collected rainwater will be implemented into the development. Harvested rainwater will be used as a means for alternative water supply for non-potable purposes (e.g. irrigation, toilet flushing). The minimum rainwater harvesting storage amount will need to comply with the requirements of BASIX.

Furthermore, it is recommended consideration be given to increasing the rainwater harvesting storage provisions for the site in excess of BASIX requirements – in order to optimise the conservation of water supply from Sydney Water mains. This would be particularly efficient where offsetting OSD storage against rainwater harvesting storage amounts can be negotiated with Council.

At this stage, it is anticipated treated roof water runoff (only) will be discharged to rainwater storage – with provisions for overflow from rainwater storage to the OSD facilities.

## Stormwater Pollution Treatment

The proposed development primarily comprises roof area. This will require 'first flush' treatment prior to discharging to the rainwater harvesting facilities.

Surface runoff will require separate treatment to address the higher range / amount of potential pollutant runoff. This will occur prior to discharging to OSD facilities, or direct to the Council street drainage system. Water Sensitive Urban Design initiatives (e.g. integrating bio-retention treatment within landscaping / street tree pits) could be considered for this purpose, in lieu of installing in-ground proprietary structures (i.e. gross pollutant traps, oil / grease separators).

## 5.2 Managing Upstream Catchment Flows

This assessment by Northrop indicates there is a pre-existing condition where potential runoff from upstream catchments could be directed to the proposed development site. It appears this results from external flows (from the east) traversing the Northern Railway Corridor - with ultimate relief through the subject development site, and northern parts of the Bakehouse Quarter Precinct.

While this flood condition is not a result of the development, its potential will need to be accommodated. On this basis, it is recommended the following flood protection measures be considered for integration into the development:

- Construct the eastern wall to Building F (adjoining the Railway Corridor) to be free of potential inundation (i.e. no penetrations), and using flood-compatible material - to a height of 0.5m above the 100-year ARI flood level calculated within the railway site. It is estimated this would be up to a height of approx. 1.5m.
- Direct flow within the rail corridor further south (beyond the south-eastern corner of Building F). This is to discourage any excessive runoff 'streaming' around the south-eastern corner of the building and along the southern building façade (e.g. into building entries). We recommend the continuation of this flow path within the rail corridor (beyond the corner to Building F) is created to remain stable at all times (particularly in a flood event).
- Incorporate provisions to 'still' the rail corridor overflow before 'spreading' the flow via the existing flood-path (i.e. through the Railway Street / George Lane carpark - to George Street, and ultimately Powells Creek). At this stage it is considered this 'stilling area' could be designed as a shallow basin to integrate with landscaping adjacent to the Railway Corridor, directly to the rear (east) of the existing carparks.
- All levels to building entry points for habitable floor areas and basement carparks are to be a minimum 500mm above the 100-year ARI flood levels calculated for this external catchment flow – particularly along the eastern and southern facades to Building F. It is noted that entries to at-grade loading docks are to be at least 300mm above 100-year ARI flood levels.



## 6. Conclusion

Development within the southern portion of the Bakehouse Quarter Precinct is proposed. Northrop has undertaken an initial investigation and review of stormwater and flood management measures to be considered as part of the works. This has resulted in the preparation of a Concept Stormwater Management Plan (refer Appendix B).

The following stormwater and flood management work has been recommended for consideration in the proposed development:

- On-site stormwater detention to be provided to restrict post-development flows from the building sites to the permissible site discharge set by the Council Stormwater Policy.
- Rainwater harvesting provisions to be implemented – to at least achieve the requirements under BASIX.
- Stormwater pollution control to be provided to manage the specific nature and load of pollutants from new catchment areas (i.e. roofs, hard surfaces and roadways).
- Provide flood-compatible construction for the eastern wall at the ground level of Building F. This is to avoid the potential for inundation from the pre-existing overland flow conditions emanating from the rail corridor.
- Undertake works along the boundary with the Railway Corridor boundary to protect Building F from the external catchment flows. This is proposed to direct and spread these potential flows, prior to discharging to the existing Railway Street / George Lane overland flow route (through the unoccupied (carpark) land).
- Provide levels at all building entry points, basement carpark entries and loading docks to enable adequate protection from the 100-year ARI flood level (calculated for the pre-existing overland flow condition from the rail corridor). This is particularly along the eastern and southern facades to Building F.

This report has been provided to support the Environmental Assessment process with NSW Department of Planning. In this regard, our preliminary assessment confirms that it is likely the proposed development can accommodate the treatments necessary to manage site drainage and existing flood conditions, according to Authority requirements. We remain available to provide any further information – at your discretion.

Regards,



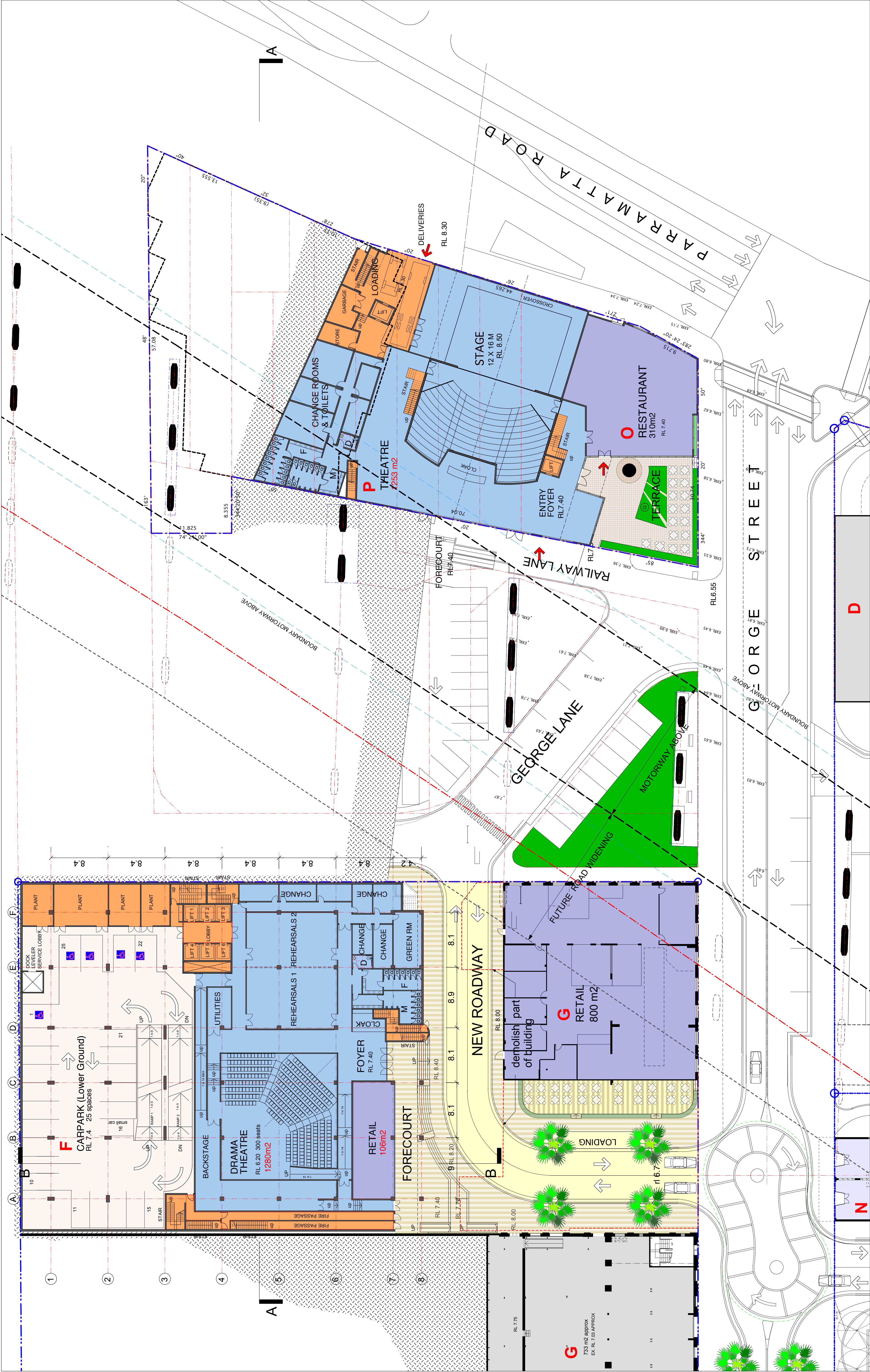
Andrew Dawes  
Civil Engineer  
Northrop Engineers

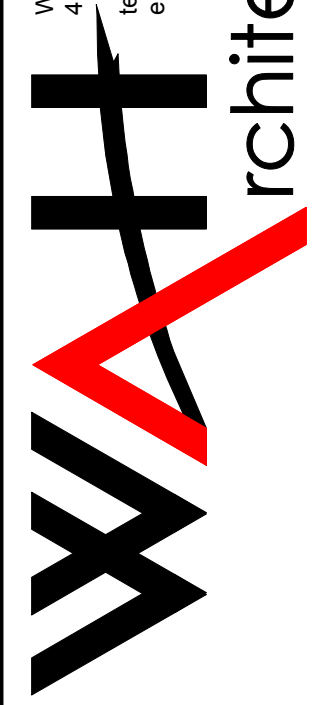
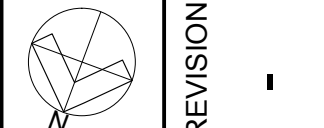


## **APPENDIX A:**

### **“BAKEHOUSE QUARTER – UPPER GROUND FLOOR PLAN”, WAH ARCHITECTS**





	WAH ARCHITECTS PTY LTD ACN 126 035 032 4 HINKLER STREET GREENWICH SYDNEY NSW 2065 Tel 02 9901 1398 Fax 02 9901 4418 m. 0415 292 383 email: yap@waharchitects.com.au		NOTE Figured dimensions take preference to scale readings. Verify all dimensions on site. Report any discrepancies to the Architect for decision before proceeding with the work. If the Status of this drawing is not signed off 'For Construction' it may be subject to change or omission without notice. WAH Architects Pty Ltd is not liable for any loss, damage, harm or injury whether special, consequential or otherwise arising out of or in connection with the use of this drawing for construction purposes.		BY YAP		REVISIONS - 23.04.10 ISSUED FOR REVIEW		CLIENT <b>PELØRUS</b> PROPERTY GROUP LEVEL 3, 50 YEO STREET NEUTRAL BAY NSW 2060		PROJECT PROPOSED REDEVELOPMENT BAKEHOUSE QUARTERS		TITLE LOWER GROUND LEVEL		Copyright WAH Architects Pty Ltd JOB N° 21010SE					
	DATE 23.04.10		DATE 23.04.10		0 1 2 3 4 5		1 : 250 @ A1		0 1 2 3 4 5		1 : 500 @ A3		10		20m		DRAWING N° DA05		REVISION	
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**APPENDIX B:**

**“CONCEPT STORMWATER MANAGEMENT PLAN”, NORTHROP**

LEGEND

MAIN OVERLAND FLOW ROUTE (PRELIMINARY)

PIPE SIZE

Ø150

STORMWATER DRAINAGE PIPE

STORMWATER DRAINAGE PIT

OSD BY-PASS AREA

OSD TANK

LOT BOUNDARY

RETAINING WALL

DESIGN SUMMARY - LOT 1

SITE STORAGE REQUIREMENT (SSR) = 300m<sup>3</sup>/ha

SITE AREA: 0.48 ha

SSR = 144m<sup>3</sup>

AREA DRAINING TO TANK 1: 0.335ha (76.5%)

AREA DRAINING TO TANK 2: 0.103ha (23.5%)

AREA BY-PASSING OSD: 0.0425 (8.85%)

ADJUSTED SSR: 152.64m<sup>3</sup>

VOLUME OF TANK 1: 122m<sup>3</sup> (29x7x0.6)

VOLUME OF TANK 2: 37.5m<sup>3</sup> (10x5x0.75)

TOTAL PROVIDED OSD STORAGE = 159.50m<sup>3</sup>

PERMISSIBLE SITE DISCHARGE (PSD) = 200L/S/ha

PSD = 96L/S

ADJUSTED PSD = 90L/S

PSD 1 = 68L/S

PSD 2 = 21L/S

TOTAL PSD = 89L/S

DESIGN SUMMARY - LOT 2

SITE STORAGE REQUIREMENT (SSR) = 300m<sup>3</sup>/ha

SITE AREA: 0.32 ha

AREA DRAINING TO TANK 3: 0.32ha (100%)

AREA BY-PASSING OSD: 0ha

SSR: 96m<sup>3</sup>

PROVIDED OSD STORAGE = 96m<sup>3</sup>

PERMISSIBLE SITE DISCHARGE (PSD) = 200L/S/ha

PSD = 64L/S

ISSUE

AMENDMENT

VERIFIED

APPROVED

DATE

CLIENT

1

ISSUED WITH ENVIRONMENTAL ASSESSMENT REPORT

A.D.

26.05.10

WAH ARCHITECTS PTY LTD

ARCHITECT

AWARDS FOR  
ACEA  
WINNER  
BRISBANE 2005

0 2.5 5.0 7.5 10.0 12.5m

SCALE 1:250 @ A1

0 2.5 5.0 7.5 10.0 12.5m

SCALE 1:500 @ A3

0 2.5 5.0 7.5 10.0 12.5m

SCALE 1:250 @ A4

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PROJECT

BAKEHOUSE QUARTER PART 3A

DRAWING TITLE

CONCEPT STORMWATER MANAGEMENT PLAN

JOB NUMBER

09809

DRAWING NUMBER

DAO1

REVISION

1

DRAWING SHEET SIZE

A1

**APPENDIX C:**

**“CONCEPT SEDIMENT & EROSION CONTROL PLAN”, NORTHROP**



