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Grocon Group

THE RIBBON – 31 Wheat Road

Civil Engineering Consultancy

Civil Report for Development Application

Author: Stephen Naughton

Reviewer: Tim Hoare

Report no: 2001320C Rev 3 For Approval **Date:** 5 July 2013

Contents

1 Introduction

This report has been prepared to describe the Civil systems associated with the Development Application for the proposed development known as The Ribbon at 31 Wheat Road, Darling Harbour.

This Civil Report addresses stormwater drainage, overland flow, roadworks and excavation/fill issues associated with the development. Previous reports and studies by Worley Parsons and Hyder have been prepared for the Darling Quarter (Darling Walk) and SICEEP developments, and these have been referred to in the preparation of this report and the associated Civil Plans, 2001320 01/CSK01, CSK02 and CSK03.

The Civil plans address the requirements detailed in the Director Generals Requirements – Plans and Documents section. Specifically, they show the changes proposed to the level of the land.

2 Site Description

The Ribbon site is located in Darling Harbour, adjacent to Sydney Harbour. The development is bounded by Darling Harbour promenade (to the West and North), Wheat Road (to the East), and Darling Quarter (to the South).

The existing site is partly occupied by the Imax building and the Sydney Visitor Centre building (which is located under and just to the south of road overpass). The remainder of the site is comprised of promenade.

The development incorporates the demolition of the existing Imax and Visitor Centre buildings and reconstruction of surrounding promenade. Landscaping works are proposed to the west of the promenade walkway that links Darling Walk with the harbour edge to the north, in addition to a section to the south of the proposed building.

A walkway link on the east side of the site will be maintained, and will consist of a forecourt leading to the promenade adjacent to the harbour.

3 Stormwater Drainage & Overland Flow

The existing site has an overland flow path (identified in the report prepared by Worley Parsons for Darling Walk) passing to the east and west of the existing building. The overland flow is conveyed through the site and discharges to the harbour via the promenade to the north of the site. The flood level adjacent to the site is nominated in both the Worley Parsons and Hyder Reports. The Hyder Report (completed more recently than the Worley Parsons Report) identifies a flood level of approximately RL2.8 at the southern end of the existing building, decreasing to RL2.4m at the northern end of the existing building. This is generally consistent with the flood levels for the site nominated in the Worley Parsons Report.

The proposed building and promenade works will be designed to ensure that there are no adverse impacts on upstream properties. It is proposed to locally raise the promenade levels around the building to match the proposed building floor level (which is nominated as RL 2.9m). The proposed promenade levels will match to the existing promenade levels (at approximately RL 2.3m at the north edge of the promenade and RL 3.1m at the southern extent of works) as shown on drawing 2001320 01 CSK02.

The impact of the proposed public domain works and building footprint on the flood levels adjacent to the site are being modelled in TUFLOW. This modelling will confirm the required floor levels.

The existing seating at the edge of the harbour presents a blockage to the overland flow path. It is proposed to adjust this seating, removing the amount of blockage provided. The promenade level seating will be removed, and replaced with a form of seating that allows flow through to occur. This will allow the overland flow path to function more efficiently. The floodway has been widened from 22m to 30m at the “pinch point” location between the building western edge and the retaining wall as shown on drawing 2001320 01 CSK03.

The design of the stormwater system for the development will be based on relevant national design guidelines, Australian Standard Codes of Practice, the standards of Sydney City Council, and accepted engineering practice. Concept drawings showing the proposed surface levels and direction of overland flows have been prepared and are attached to this report. Refer drawings 2001320 01 CSK02 and CSK03.

Runoff from buildings will be designed in accordance with AS 3500.3 National Plumbing and Drainage Code Part 3 – Stormwater Drainage. Roof drainage will be documented by the hydraulics consultant. Roof drainage will be directed to rainwater harvest tank/s for re-use. Surplus water will discharge to the street stormwater system. Refer to the Hydraulic Report and drawings for further information regarding roof drainage.

Overall site runoff and stormwater management will be designed in accordance with the Institution of Engineers, Australia publication "Australian Rainfall and Runoff" (1987 Edition), Volumes 1 and 2 (AR&R 1987).

Stormwater quality will be addressed through the use of water sensitive urban design measures incorporated into the landscape design documentation. A rainwater reuse tank is proposed for the building. This will collect all roof water. It is envisaged that rainwater will be reused for toilet flushing and irrigation of adjoining landscaping of the promenade. Where possible, all site runoff will be directed to vegetated areas to allow for infiltration. This is to satisfy Item 14 of the Director Generals Requirements.

4 Roadworks

The proposed development will require roadworks to the site access from Harbour Street. Reconstruction of a section of the existing median between the proposed building and Harbour Street is also proposed. This will allow for vehicles to turn off Harbour Street to access the carpark/loading dock and the drop-off section at the east of the proposed building.

A crest at approximately RL 3.5m in the access from Harbour Street is proposed to prevent overland flow from Harbour Street entering the carpark/loading dock. An overland flow path will be maintained at the northern end of the existing median. It is proposed to adjust the existing median and roadway to compensate for the reduction in overland flow path caused by the construction of the crest (which protects the carpark/loading dock from overland flow).

5 Excavation/Fill

The bulk earthworks required for the development are detailed on Bonacci Drawing 2001320 01C SK01.

The proposed finished level of the ground floor level is RL 2.9m AHD. It is expected that bulk excavation will be to RL 2.0m AHD (refer Bonacci Drawing). There will be deeper localised excavation to allow for construction of lifts, grease arrestors and deeper Imax slab. Refer to Bonacci Drawing 2001320 01C SK01 for nominal localised bulk excavation levels.

Localised demolition of the existing promenade will be required to allow construction of the proposed building.

There will be fill associated with the construction of the access from Wheat Road to the carpark/loading dock entrance. It is proposed to create a crest at approximately RL 3.5m at this location to prevent overland flow entering and flooding the carpark/loading dock.

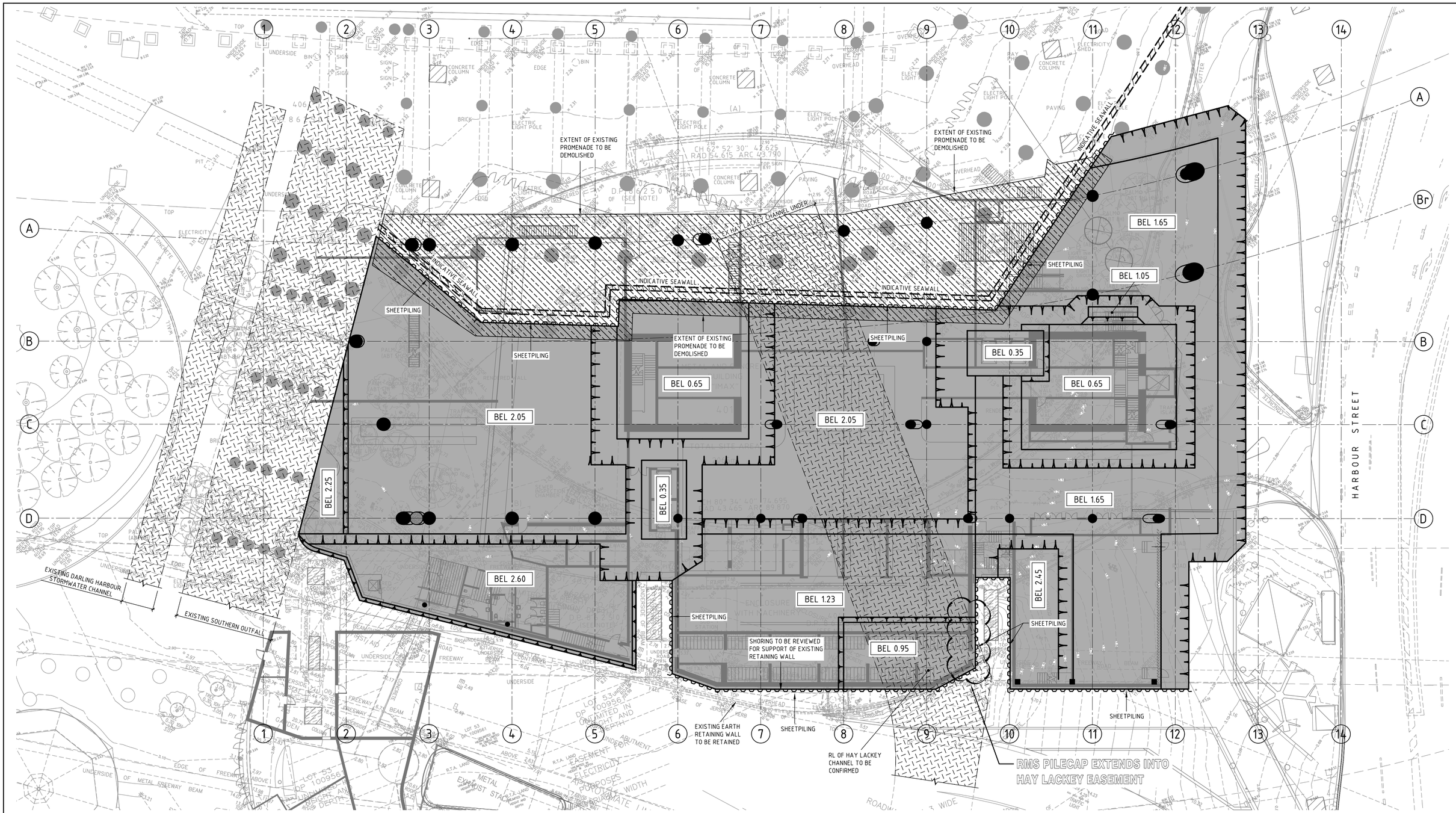
Sediment and Erosion control measures will be implemented during construction. The design of these measures will be in accordance with the Landcom "Blue Book". An appropriate Soil and Water Management Plan is to be developed prior to construction.

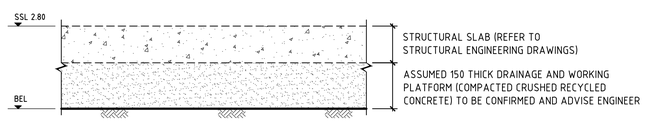
6 Conclusions/Recommendations

The proposed development widens the available floodway to the western edge of the building. This allows for better conveyance of any overland flow toward Darling Harbour.

TUFLOW modelling (currently being undertaken by Bonacci Group) is to be completed to verify the proposed floor levels and ensure that the proposed development has no adverse impacts on adjacent locations (particularly upstream).

A Soil and Water Management Plan is to be developed in order to ensure that the construction of the project does not have adverse environmental impacts. The sediment and erosion control measures as detailed in the Plan are to be maintained during construction to ensure that the environment is protected.





TYPICAL BULK EXCAVATION DETAIL

SCALE 1:10

BULK EXCAVATION NOTES

1. LEVELS BASED ON GROUND FLOOR SSL 2.80
2. LEVELS DO NOT INCLUDE PILING RIG WORKING PLATFORM.
3. LEVELS INCLUDE THE PLACEMENT OF AN ASSUMED 150mm THICK DRAINAGE AND WORKING PLATFORM (COMPACTED CRUSHED RECYCLED CONCRETE) TO BE CONFIRMED AND ADVISE ENGINEER
4. PROVIDE TEMPORARY 1 IN 2 MAX BATTERS. GEOTECH TO CONFIRM BATTER ACCEPTABILITY

LEGEND

- EXISTING PROMENADE PILE
- PROPOSED BUILDING COLUMN LOCATION
- PROPOSED DEMOLITION OF EXISTING PROMENADE
- EXISTING STORMWATER CHANNELS

SCALE 1:200 0m 2m 4m 8m 12m

Rev	Description	Date	By	App
P3	ISSUED FOR DEVELOPMENT APPLICATION	05.07.13	JF	-
P2	ISSUED FOR DEVELOPMENT APPLICATION	07.12.12	JF	SN
P1	ISSUED FOR DEVELOPMENT APPLICATION	03.12.12	JF	MB

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Project Name: THE RIBBON
31 WHEAT ROAD
SYDNEY

Drawing Title: BULK EARTHWORKS
PLAN LAYOUT

DEVELOPMENT APPLICATION

Designed	SN
Drawn	JF
Scale	1:200 @ A1
Date	NOV 2012
Sheet	
Project Director Approved	Date
Project Ref	20 01320 01
Drawing No	SK01
Rev	P3

North

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NOTE - REFER TO DRAWING SK03 FOR OVERLAND FLOW PATH

MATCH TO EXISTING LEVELS AT EDGE OF PROMENADE

ADJUST SEATING

ASSUMED FFL 2.90

EXISTING DARLING HARBOUR CHANNEL UNDER

MATCH TO EXISTING SURFACE AT RL 3.10

EX HAY LACKEY CHANNEL UNDER

RL 2.60 OUTLINE OF PROPOSED BUILDING

ASSUMED FFL 2.70

ASSUMED FFL 2.55

ASSUMED FFL 3.00

ASSUMED FFL 3.10

EXISTING SEAWALL UNDER

TOTAL SITE AREA 2065m

RAMP OF (13%)

HARBOUR STREET

LEGEND

- EXISTING CONTOUR
- RL 3.40 — DESIGN CONTOUR
- EXISTING PROMENADE PILE
- PROPOSED BUILDING COLUMN LOCATION
- PROPOSED DEMOLITION OF EXISTING PROMENADE
- PROPOSED SHARED PATHWAY
- EXISTING SEAWALL UNDER
- FK — FLUSH KERB
- KO — KERB ONLY

SCALE 1:250 0m 2.5m 5m 10m 15m

Rev	Description	Date	By	App
P3	ISSUED FOR DEVELOPMENT APPLICATION	05.07.13	JF	-
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Project Name: THE RIBBON
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Drawing Title: CIVIL CONCEPT PLAN

DEVELOPMENT APPLICATION

Designed	SN	Project Director Approved	Date
Drawn	JF		North
Scale	1:250 @ A1	Project Ref	Drawing No / Rev
Date	NOV 2012	20 01320 01	SK02 P3
Sheet			

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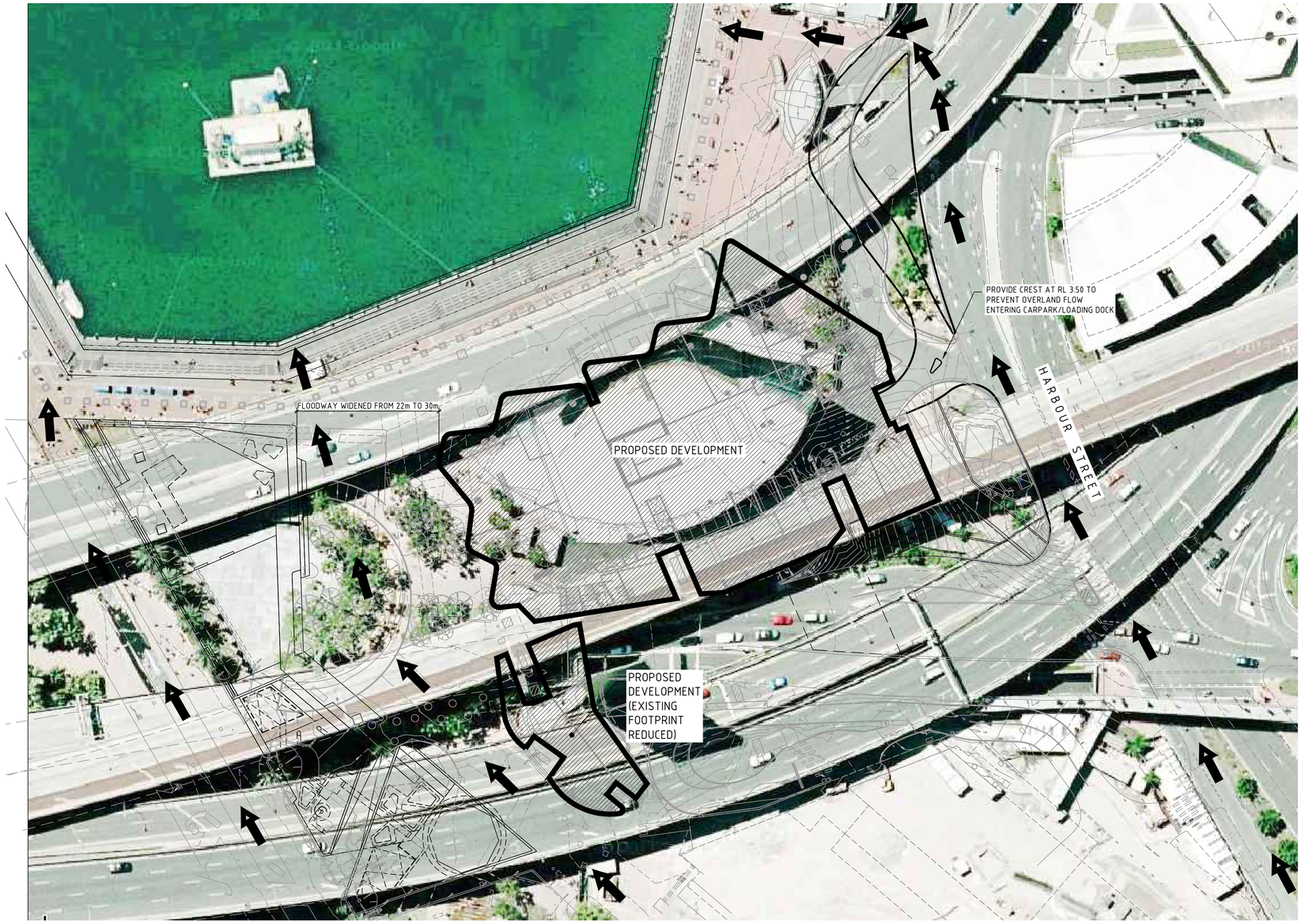

LEGEND

OVERLAND FLOW PATH

PROPOSED BUILDING FOOTPRINT

SCALE 1:500 0m 5m 10m 20m 30m

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P3	ISSUED FOR DEVELOPMENT APPLICATION	05.07.13	JF	-
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Project Name: THE RIBBON
31 WHEAT ROAD
SYDNEY

Drawing Title: OVERLAND FLOW PATH PLAN

DEVELOPMENT APPLICATION

Designed	SN
Drawn	JF
Scale	1:500 @ A1
Date	NOV 2012
Sheet	

Project Director Approved | Date | North

Project Ref: 20 01320 01 | Drawing No: SK03 | Rev: P3

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