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## PROPOSED BALLINA GATEWAY PROJECT

274 RIVER STREET ~ BALLINA

### Response to Agency Comments and Public Submissions

Prepared for: **Samtay Developments (NSW) Pty Ltd**

Date: 14 December 2006



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## **INTRODUCTION**

Ardill Payne & Partners (APP) has been requested by the Applicant for Part 3A Application No. 05-0009 Ballina Gateway Project, to provide technical responses and additional information where required to submissions received for the subject application.

APP provided engineering advice and technical reports as supporting information to the original application.

Where submissions have raised issues requiring clarification of the proposal or further means of assessing the project, refinements of the previous set of commitments have been provided.



## **1. RESPONSE – PUBLIC SUBMISSIONS**

### **1.1 Obstruction of River Flows**

*Extension of development into the river. The drawings suggest the development will protrude further into the river and further river studies are required.*

The drawings neither suggest nor depict the development protruding into the river. The treatment of the river foreshore is shown on APP Sketch REVET 1 and REVET 2. These sketches show all riverfront rehabilitation above the MHWL is kept within the existing property boundary.

Based on previous requirements by the Department of Planning and Ballina Shire Council for CBD commercial developments fronting the river it has been assumed riverbank stabilisation will be required from MHWL to a scour depth below the MHWL down the face of the riverbank. The means of stabilisation and required scour depth will be determined by detailed design as described in Section 2.1 of this report.

Therefore the development does not extend further into the river than the existing boundaries. Accordingly further river studies are not required.

Two small jetties are shown on the Architect's plans. One is existing whilst the other would be the subject of a license application to the Department of Lands and is the same shape and scale as the existing jetty. Jetties do not cause significant eddies and backwater effects. Any tidal, stability, safety and navigational issues are required to be investigated by a Department of Lands license application.

As part of the Construction Certificate process a License application will be lodged with Department of Lands for construction of the additional jetty.

### **1.2 Building On Crown Land**

*Concern regarding stability of buildings on reclaimed land.*

Coffey Geosciences technical report on building foundations recommends all buildings are to be piled. Piling to strong ground (approximately 25m deep) will address any issues regarding building stability on natural or filled ground.



### 1.3 Local Infrastructure

*Concern regarding increased sewer load to West Ballina STP and effect on receiving waters.*

Ballina Council and the Department of Commerce undertook a detailed analysis of sewage treatment options for Ballina between 2000 and 2003. This analysis included a Project Reference Group of Community representatives from the Ballina Shire. From this process Council decided to upgrade the West Ballina STP to receive additional sewage load from extensions to and infill of urban land in Ballina. Included in this study was the effect on receiving waters in Ballina.

Consequently Ballina Shire Council engaged GHD to investigate requisite upgrades to the existing sewage infrastructure to receive any additional sewer load. The GHD report and the adoption of its recommendations by Ballina Council are discussed in APP's infrastructure report.

Therefore the additional sewer load generated by the development and the effect this would have on West Ballina STP and receiving waters in Ballina have previously been addressed by Council.

### 1.4 River Revetments

*Proximity of site to main river channel and non uniform alignment of the riverbank will cause a severe erosion problem. Timber boardwalks over existing revetments are considered inadequate.*

Two riverbank revetment treatment systems shown in APP's Infrastructure and Engineering report, pages 29 and 30. These represent the two current preferred methods of riverbank stabilisation in Ballina shire.

System 1 consists of maintaining the existing mortared rock wall in front of the Sundowner Motel (Lot 10 DP 244352) due to the historical durability and solid foundation of this section of wall. Scour protection is proposed below MHWL additional to that already in existence.

System 2 consists of taking vertical load off the riverbank by building the vertical retaining wall away from the edge of the riverbank and constructing a lightweight boardwalk to the boundary edge. A rock armoured beach is built below low tide to attenuate wave action onto the wall and control scour along the river edge. A good example of this type of system is the foreshore protection work along Fawcett Street Park which was built by Ballina Council and the existing over-water restaurant of the RSL Club. Both structures have been subject to severe flooding in recent years without any adverse scour effects.



It is acknowledge that non-uniform vertical faces can cause eddies along the river which can cause debris to be trapped. Strong eddies have been observed in front of the existing walls on Lot 10. The effect of non-uniform wall alignments on eddies will be incorporated in the detailed engineering. However, given the existing eddy process, it is unlikely that a setback in wall alignment would cause additional eddies at the alignment change. A uniform vertical wall could be achieved by demolishing the existing mortared wall on Lot 10 and using System 2 described above for the entire frontage.



## **2. RESPONSE – BALLINA COUNCIL**

### **2.1 Riverbank Stability**

*The geotechnical report has not investigated how the stability of the riverfront will be maintained pre and post construction.*

Ballina Council and the Department of Planning have previously received and approved riverbank stabilisation methods provided by APP and its subconsultants for the Ramada Hotel development and Watermark developments on the same stretch of the Richmond River. We confirm that the soil profiles along the Ballina Gateway site are similar to those at the projects referred to above and that similar stabilisation methods are proposed. Namely rock armouring (thickness varies from 1m to 0.45m) to a nominated scour depth with removal of surcharge loading by System 2 (described in 1.4 above) if required. Thickness and extent of rock armouring and slope will be determined as part of detailed design.

APP's report on this matter states:

*River front structures will revolve around the pedestrian thoroughfares and small bridges and jetties depicted on the Architect's plans. Ballina Council has required the river front banks of the Richmond River to be stabilised for the Probable Maximum flood (PMF) both against scour and stability. This has required most developments in recent times to ensure the riverbank has a slope no greater than 1 vertical to 2 horizontal with limited vertical loads on the apex of this slope and scour protection extended to the edge of the main boat channel. This is usually around 18 metres from the bank's edge. Typically then, the solution will require suspended boardwalks over an armoured river bank at a 2:1 slope. Other lengths of the river frontage will be stable in their current form in terms of the existing revetment, scour protection and riverbank slope. Where the riverbank is steeper than 2:1 some excavation of the river bank will be required to achieve the desired slope with suitable sediment controls in place during excavation to limit turbidity and spreading of contaminated sediments. Control of sediments will be particularly important during excavation of the slipways*

As part of the detailed design and construction certificate process an analysis is planned of the existing riverbank, using information from the existing geotechnical report and existing slopes to ensure adequate factors of safety are provided against instability and scour for the PMF. Refer to APP sketch REVET2 in original report for arrangement.



## 2.2 Stormwater

*Insufficient details have been provided to demonstrate compliance with DCP 1 Chapter 13.*

The principles of Water Sensitive Urban Design have been adopted in the design as required by Ballina Council's DCP 1 Chapter 13 and stated in APP's report, page 25.

*Stormwater is to be disposed of in accordance with Water Sensitive Urban Design Principles and Ballina Shire Council's planning controls for stormwater disposal. In summary Ballina Council requires treatment of stormwater discharging into sensitive environments. Treatment systems are required to ensure there is a no net increase in pollutant load from the site. The Richmond River is considered a sensitive environment. Council also requires that stormwater discharge rates be kept at or below existing rates.*

The proposal therefore seeks to implement the requirements of Ballina Shire Council's DCP 1 Chapter 13 and provide a "no net increase in pollutant load". APP's engineering infrastructure report undertakes to perform water quality modelling, provide primary and secondary treatment and recycle stormwater. The original concept treatment train is depicted on APP Sketch SW-1. This is provided overleaf and has been expanded to show treatment areas and systems.

Reuse capacity calculations by EMF Griffiths indicate a minimum storage capacity of 57kL is required. Additional storage will be provided for retention purposes.

A modification to commitment SW1 for stormwater capture, treatment and disposal is provided below to address Council's concerns.

### Amend Commitment (SW1)

To demonstrate compliance with DCP 1 Chapter 13 the proponent will model stormwater capture, treatment and disposal using the MUSIC and DRAINS programs. Background baseline data will be gathered by APP. A detailed stormwater treatment train will then be provided to Council for approval based on this model and data collected.





## 2.3 Public Infrastructure

*Design details are required for the following public infrastructure:*

- *paved area along River Street in accordance with recently upgraded River Street*
- *proposed boardwalk*

Concept boardwalk details are provided in Figure REVET 2 of the APP report, page 30. Final design details will be subject to resolution of riverbank stability systems and eddy effects as discussed in Section 1.4 above.

The new paved area along River Street is to have a surface treatment in accordance with the Architect's and Landscape plans provided elsewhere. The engineering design of the paths will follow traditional cross-falls to an upright kerb as per Council standards. Surface treatment will be as per Architect's plans and current Australian Standards.

The proposal will differ from the recent upgrades to River Street in that the decision by Council to widen footpaths and restrict traffic flow between Moon and Cherry Streets would be inappropriate for traffic movements around the proposed development. That is, existing footpath widths and road carriageways will be maintained.

No changes are proposed to the current details provided.



## 2.4 Contamination

*Council's review of the Coffey Geosciences Pty Ltd Preliminary Environmental Investigation recommends further testing before consent is provided.*

This advice is contrary to that received by APP. APP considers Council's review is selective in quoting the advice provided in the Coffey and APP reports.

Coffey advise in relation to contamination and remediation that:

*"Remediation of this (excavated) material by excavation either wet or dry, followed by disposal to landfill within the Ballina Shire, is considered feasible".*

*"Remediation of the existing (UST's) and the surrounding hydrocarbon soils is considered feasible".*

APP considers Council review of the contamination report to be not merit based. The review ignores the fact that the site has a predominantly residential/commercial history (motel, houses, shops) with smaller light industrial uses (automotive servicing and a slipway). This is reflected in the preliminary contamination results which show 27 of the 29 samples had contamination levels below SIL levels considered suitable for residential use. Tributyltin figures found by Coffey were reported by them as being below trigger levels considered harmful to marine life. Where possible, drill holes were sunk over possible UST locations but no evidence of tanks was found. Coffeys and APP have recommended that despite these encouraging results further investigations are warranted to:

- locate possible UST sites and pipework
- isolate hot spot contamination areas around the industrial slipway
- monitor Tributyltin values and extent in the shallow riverbed
- investigate the extend of hazardous building materials

The contamination report recommends carrying out these further investigations to prepare a Remediation Action Plan in conjunction with staged demolition because:

- access to other possible UST sites are below existing buildings which require demolition
- the extend of pipework to possible UST's will require removal of concrete slabs which will be part of the demolition process
- it would seem logical to complete the other detailed investigations in conjunction with the UST investigation and hazardous waste report

To address Council's concern over preparation of the RAP it is suggested that commitment EE1 be modified to include the RAP process.



### Amended Commitment (EE1)

EE1: Complete SEPP55 contaminated land investigations to isolate contaminated areas and remediate the areas of contamination to threshold levels stipulated as suitable for proposed land uses in NEPC Guidelines for Health Based Investigation Levels and EPA Guidelines for Assessment, Classification and Management of Liquid and Non-Liquid Waste.

**A RAP be prepared in conjunction with demolition and lodged with Council for approval prior to issue of a Construction Certificate.**

## **2.5 Acid Sulphate Soils**

*Council considers this section adequately addressed but is not in favour of off-site treatment.*

With regard to off-site treatment of Acid Sulphate Soils. APP considers that this should be permitted as there is no technical reason for not doing this provided adequate management protocols are in place. Furthermore, APP considers that given the difficult site conditions that basement car parks impart, PASS would be better managed and treated off-site due to the space and elevation available on playing fields (for example).

This procedure is common to many sites where pass is encountered. PASS is not usually treated at the excavation site but at the disposal site. Usually sites are big enough to contain both areas. In this instance the disposal site would be off-site.

## **2.6 Dewatering**

No comments required because Ballina Council has advised in their assessment that the issue was adequately addressed in APP's Infrastructure Report.



### **3. RESPONSE – DEPARTMENT OF NATURAL RESOURCES**

#### **3.1 Acid Sulphate Management**

*DNR recommendations*

*Excavations be enclosed laterally to minimise the intrusion of ground water into the site such as the “fully tanked” option in Section 7.3 of Coffey Geosciences’ report.*

The basement design concept is to construct a “waterproof” basement by using existing concrete technology and jointing systems similar to those used in other projects that are in water charged environments (eg. Sydney Harbour Tunnel, Manly Ferry Terminal). This will minimise the intrusion of groundwater into the basement as desired by both DNR and the owners.

##### **3.1.2 Liming Ratios**

*DNR proposes that all excavated soil be limed at 60 kg/m<sup>3</sup> in a manner described in Coffey Geoscience’s report dated 25 November 2005.*

Coffey Geoscience’s report states that:

*“The available test results indicated the liming ratio requirements are 60kg of lime per cubic metre of soil for all soils excavated from depths between 2m and 5m. Liming ratios should be confirmed by testing at the time of construction”.*

APP advises that in the past 6 years all PASS treatment supervised by APP has involved laboratory testing of excavated PASS prior to confirming lime rates. This is industry practice and reflected in the Coffey report.

It is proposed to maintain this procedure for the Ballina Gateway project.

#### **3.2 Groundwater**

*DNR Part V License requirements.*

It is acknowledged that a Part V license will be required. Based on experience with previous similar jobs the owners would seek a temporary license during construction as temporary dewatering will be required. As the connection to the groundwater table will be sealed by the construction method described above, a permanent license will not be sought.

A commitment to seek this licence is provided in Commitment No. 2.6 of *The Statement of Commitments (Appendix 17 of the EAR)*



### **3.3 Rivers and Foreshores Improvement Act**

The items which DNR list as being normally required for approval under Part 3A of the RFI Act, namely:

- provision of detailed design drawings of revetment work and walkways
- provision of adequate sediment control
- provision of appropriate Acid Sulphate Soil controls

will be provided as part of the detailed design phase and lodged for approval with the relevant authority as part of the Construction Certificate process.



## 4. RESPONSE – DEPARTMENT OF PLANNING

### 4.1 Stormwater - General

*In Attachment 2 Item 2 of the Department of Planning's letter of 5 December 2006, the Department has requested additional details be provided concerning types of treatment measures that will be employed on site to provide primary and secondary treatment measures proposed by Ardill Payne and Partners. The DoP recommends the use of infiltration trenches, grass swales, gross pollutant traps and other systems be adopted. The DoP also requires more details on the amount of detention that will be provided to maintain existing peak discharge flows and how water will be conveyed for the various storm events.*

The principles of Water Sensitive Urban Design have been adopted in the design as required by Ballina Council's DCP 1 Chapter 13 and stated in APP's report, page 25.

*Stormwater is to be disposed of in accordance with Water Sensitive Urban Design Principles and Ballina Shire Council's planning controls for stormwater disposal. In summary Ballina Council requires treatment of stormwater discharging into sensitive environments. Treatment systems are required to ensure there is a no net increase in pollutant load from the site. The Richmond River is considered a sensitive environment. Council also requires that stormwater discharge rates be kept at or below existing rates.*

Because the building sits predominantly on an excavated carpark infiltration trenches and grass swales are unlikely, in general, to be successful tools in the treatment train because of the absence of a dispersive medium below. Some degree of treatment via grass swale effects may be achievable depending on Landscape details adopted. In areas where a dispersive medium exists below the treatment train, infiltration is proposed as depicted on amended sketch SW-1 attached. Gross pollutant traps are to be incorporated. GPT's are included along the treatment train as upstream devices to the secondary devices described below in section 1. A typical GPT is provided in APP Figure SW-1.

Two different treatment systems will be required to treat:

- a. Hardstand runoff for discharge to Council's system and
- b. Roof water for recycling

The systems are separate and portrayed in Figure SW-1 of APP's original report which is reproduced overleaf. The systems are defined by colour and are described overleaf.



## 4.2 Hardstand Runoff System

Depicted as the red to green treatment train for hardstand treatment on SW-1. Water treated to secondary standard suitable for discharge to Council stormwater system. The red line represents “raw” stormwater unsuitable for recycling undergoing treatment by some of the systems described below. The green line represents the treated stormwater suitable for discharge to the stormwater system. The final selection of which combination of systems will be adopted will depend on Architectural and Landscape details. Options considered include:

- Depending on the landscape details a water feature system can be used to treat and aerate water. The system includes piped discharges across grassed verges with collection in a central hard channel and discharge to Councils stormwater. Water is recycled through the channel from the recycling tanks when runoff treatment not required.
- Depending on the landscape details and falls available, APP has used permeable pavers over sand beds as secondary treatment and detention of stormwater in hardstand area in commercial premises. Discharge is to Council’s stormwater system with overflows collected by grated inlet pits with silt baskets and directed to kerb or revetment discharge.
- Where grades restrict the use of the above APP proposes to use proprietary secondary treatment systems installed below the podium level concrete deck. Such systems include the Ingal Environmental Services Twin Cartridge Stormwater Units. APP has successfully installed and monitored these units in similar situations (grade restricted flow over basement carpark) and considers that they provide an acceptable treatment and maintenance regime.

## 4.3 Roof Runoff

The blue line on SW-1 represents high quality roof water which can be used for recycling once gross pollutants are removed. Piped discharge from roofs is directed to GPT and / or SQUID treatment devices as depicted on SW-1.



## 4.4 Hydraulic Considerations and Detention

- Hydraulic Design

Hydraulic design for stormwater treatment trains is based on industry and government accepted practice that flows up to 3 months ARI contain most pollutant load and thereafter bypass mechanisms are required to divert flows to piped or overland flow systems. The 3 month criterion is sometimes increased to a 6 month flow and this is proposed in this instance. Larger flows still direct their pollutant load to the treatment system, the first flush of the larger storms being treated as 6 month events with adequate pollutant capture provided. Thereafter flows are diverted so that blockages do not occur which can stir up captured pollutants and discharge the capture to the receiving waters.

The piped system will be designed to a 1 in 10 year system as described in the DoP comments. Attached calculations for detention requirements are based on the 1 in 10 year event. Flows for the 1 in 100 year event follow the same flow paths as the red, green and blue lines shown on Figure SW-1 via conventional overland flow paths.

- Detention Requirements.

The proposed development would increase peak discharge flows without detention being provided. Council requires detention in its DCP and this proposed as per previous commitments. Council has previously required detention for commercial areas to cater for the 1 in 10 year event. This is the basis of the calculations below:

### Current Site Discharge Properties

- Area =  $A = 1.26$  ha
- Fraction Impervious = 40%
- Time of Concentration = 8 minutes
- Intensity Value =  $I = 175$  mm/hr
- Runoff coefficient =  $C = 0.75$
- Discharge =  $C \times I \times A / 360 = 460$  litres per second

### Proposed Discharge without Detention

- $A = 1.26$  ha
- Fraction Impervious = 83%
- Time of Concentration = 6 minutes
- $I = 193$  mm / hr
- $C = 0.86$
- Discharge = 580 litres per second





The required detention can be calculated a number of ways. A simple and commonly used method for preliminary design is to compare the hydrographs generated by the two cases described above. The volume of detention is then the area measured between the developed site hydrograph and undeveloped hydrograph prior to the undeveloped hydrograph reaching its peak discharge point.

The volume calculated by this procedure is 50.4 cubic metres or 50,400 litres. Proposed recycling tanks will provide all detention capacity via dedicated storage capacity provided as a buffer volume within the tanks.

## 5. DEVELOPMENT CONTROL – WETLANDS OR FISHERY HABITAT

*The North Coast REP requires through clauses 15(a) and (b) that:*

*The council shall not consent to an application to carry out development for any purpose within, adjoining or upstream of a river or stream, coastal or inland wetland or fishery habitat area or within the drainage catchment of a river or stream, coastal or inland wetland or fishery habitat area unless it has considered the following matters:*

- (a) the need to maintain or improve the quality or quantity of flows of water to the wetland or habitat,*
- (b) the need to conserve the existing amateur and commercial fisheries,*

Council's DCP controls referred to above require water quality to be maintained or improved as part of the development process. The secondary treatment train referred to above will have the capacity to achieve this end. Consequently the requirements of clauses 15(a) and (b) will be met via compliance with Council's DCP

Your's faithfully

W.E. Payne B.E. M.I.E.  
**ARDILL PAYNE and PARTNERS**

encl. APP Drawing SW-1