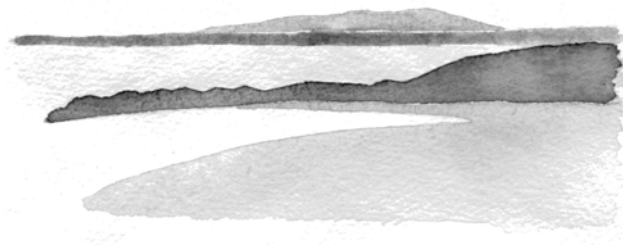


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10 December 2008

Workshop1 Dunn + Hillam Architects
33 Salisbury St
Botany NSW 2019

Dear Sirs,

**PROPOSED DEVELOPMENT - 3 CLYDE STREET BATEMANS BAY
- SEA LEVEL RISE ISSUES**

With regard to the DoP requirement to address the full range of Sea Level Rise and following our July 2008 submission, in line with your instructions we now amend the design SLR component to the 'high range' value of 0.9 meters. The attached report reflects these amendments - in **Sections 3 and 7** in particular.

We note that our originally adopted 0.6m SLR value utilises a 100 year planning period nominally to year 2100, which is noted as acceptable to the department. The planning period is therefore kept at 2100 in the revised report.

We confirm that the adopted approach with floodgates responds well to a 'high range' SLR estimate of 0.9 meters. Proposed floodgate heights are revised to 0.9m for the commercial area and 1.2m for the carpark entry, to provide protection slightly in excess of the 'high range' SLR level.

In line with the required flexibility associated with managing uncertainty, if the next round of SLR scenario models were to increase or decrease the current estimates, floodgate heights could be readjusted.

I trust this clarifies our approach as reflected in the revised report (**December 2008** version). Please let me know if you require further detail.

Regards,

Peter Spurway
Director
Peter Spurway & Associates Pty Ltd

▪ natural resources & environmental planning ▪
▪ estuary & coastal planning ▪
▪ project management ▪



COASTAL PROCESSES AND FLOODING REVIEW

**PROPOSED SERVICED AND RESIDENTIAL
APARTMENTS, RETAIL USES AND
ASSOCIATED PARKING AT LOT 4 DP 585556**

3 CLYDE STREET, BATEMANS BAY

(ORIGINAL : DECEMBER 2007)

UPDATED : DECEMBER 2008

Report prepared by

Peter Spurway & Associates Pty Limited

COASTAL PROCESSES AND FLOODING REVIEW

PROPOSED SERVICED & RESIDENTIAL APARTMENTS, RETAIL USES AND ASSOCIATED PARKING

LOT 4 DP 585556

3 CLYDE STREET, BATEMANS BAY

(APPLICATION NUMBER: 06_0008)

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Version: 10 December 2008

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COASTAL PROCESSES AND FLOODING REVIEW
PROPOSED SERVICED & RESIDENTIAL APARTMENTS,
RETAIL USES AND ASSOCIATED PARKING
LOT 4 DP 585556
3 CLYDE STREET, BATEMANS BAY
(APPLICATION NUMBER: 06_0008)

EXECUTIVE SUMMARY

This report reviews impacts on the development and surrounding properties of combined river flooding and ocean inundation in the Batemans Bay Central Business District (CBD). It addresses Director General's Requirements for Coastal Processes and Flooding, in particular **Key Issues No. 5.1 and 5.2.**

Consideration of climate change impacts is made, notably the Sea Level Rise (SLR) component based on a recent CSIRO study. This updated version adopts a 'high range' SLR component of 0.9 meters for the year 2100.

Recommendations are made for both active and passive mitigation measures to be put in place to manage the flood risk. These include:

- Minimum commercial floor heights in accordance with current Eurobodalla Shire Council policy
- Carpark access above the 1% flood level in accordance with current Eurobodalla Shire Council policy
- Carpark to be free draining in the event that the design level were exceeded
- Provision in the design for floodgates to be installed on the commercial frontage to cater for sea level rise
- Provision in the carpark access design for floodgates to be installed on the carpark entry to cater for sea level rise
- Measures to ensure safe evacuation if necessary

These proposed measures are noted to exceed Council's current planning requirements, in recognition of the need to manage sea level rise uncertainty.

COASTAL PROCESSES AND FLOODING REVIEW

No. 3 CLYDE STREET, BATEMANS BAY

An Appendix provides the outline of a **Flood Emergency Response Plan** that would be prepared within 12 months of the completion and occupation of the development.

DGR Key Issues

Key Issues raised by the Department of Planning in the October 2007 Director General's Requirements (DGR's) are addressed in this report as follows:

DGR KEY ISSUE		REPORT REFERENCE(S)
5	Hazard Management and Mitigation - Coastal Processes and Flooding	
5.1 Provide a flood investigation report which assesses any flood risk on the site (for the full range of floods including events greater than the design flood, up to probable maximum flood; and from coastal inundation, catchment based flooding or a combination of the two), having consideration for relevant provisions of the NSW Floodplain Development Manual (2005) and recommendations from the Bateman's Bay Coastal Hazard Management Plan (for the Batemans Bay CBD).		Coastal Inundation: - Section 2 Catchment Flooding: - Sections 2 (Table 1) & Section 3.4 PMF - Section 3.4
5.2 Demonstrate and suitably investigate:		
a. appropriate floor levels (based on flood levels plus freeboard) and suitable protection for underground car parks (which may include appropriate levels for driveway crests and adequate flood proofing in the car park);		Sections 2 & 5
b. impact of flooding on the development (including potential for wave run-up from tidal inundation);		Sections 4 & 5
c. impact of the development on flooding to surrounding properties (due to raising floor levels);		Section 6
d. adequate egress and safety in a flood event. A flood management plan should be provided which outlines how the development will manage flood events (including suitable evacuation routes or warnings).		Section 7 and Appendix 1
e. impacts of climate change, sea level rise and more frequent and intense storms on flooding.		Sections 3 & 7

COASTAL PROCESSES AND FLOODING REVIEW

PROPOSED SERVICED APARTMENTS, RETAIL AND

ASSOCIATED PARKING AT LOT 4 DP 585556

3 CLYDE STREET, BATEMANS BAY

(APPLICATION NUMBER: 06_0008)

1 INTRODUCTION

This report supports a Major Project application over No. 3 Clyde Street, Batemans Bay. It addresses Director General's Requirements for **Coastal Processes and Flooding**, in particular **Key Issues No. 5.1 and 5.2**. The site is located on **Figure 1**.

The report outlines, utilising data from the Batemans Bay Coastline Hazard Management Plan (*CHMP Eurobodalla Shire Council 2001*), impacts on the development and surrounding properties of combined river flooding and ocean inundation in the Batemans Bay Central Business District (CBD). Considerations of the latest findings on Climate Change (*CSIRO 2007*) are incorporated. Recommendations are made for the management of impacts.

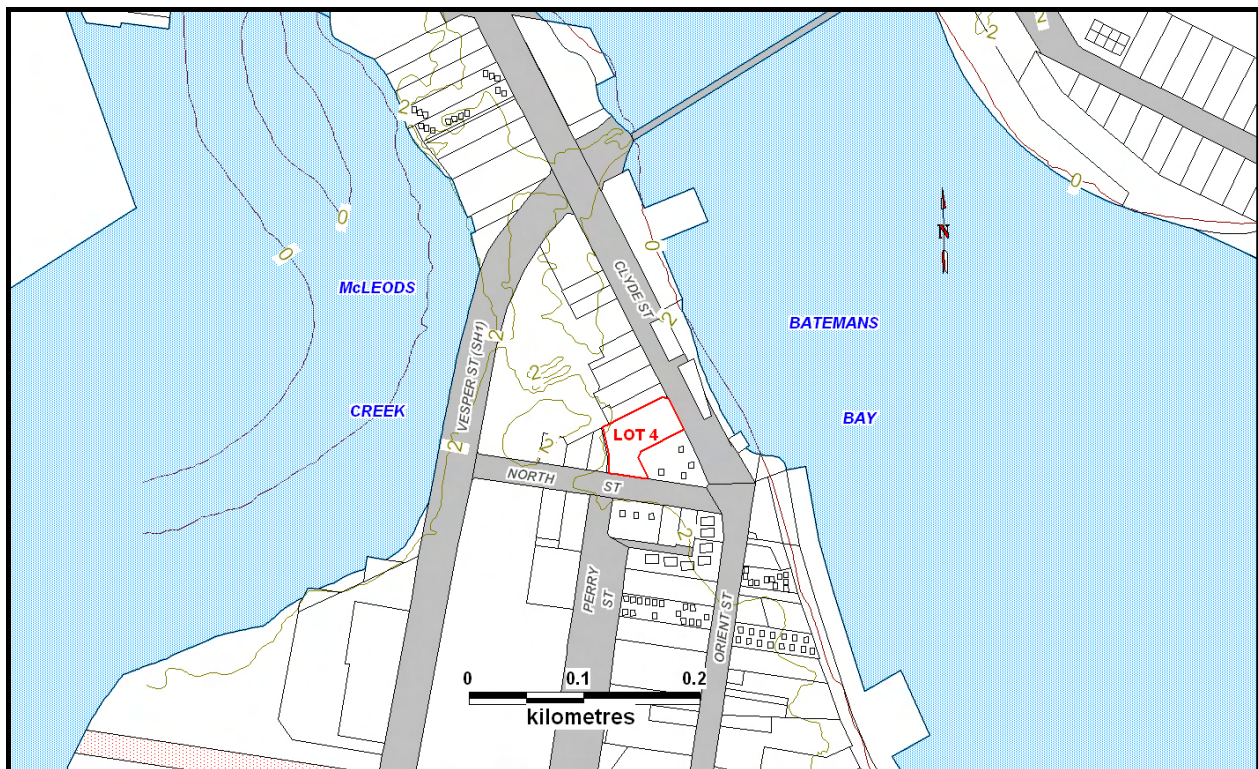


Figure 1 Locality Plan of Lot 4 (No 3 Clyde St) within the Batemans Bay CBD

2 CBD COASTAL PROCESSES CONSIDERATIONS

The Batemans Bay Coastline Hazard Management Plan (CHMP) defines coastal inundation and catchment flooding combinations, and deduces design inundation events for the Batemans Bay CBD. The main coastal hazards affecting the Batemans Bay CBD are inundation as a result of wave overtopping of the foreshore training wall together with wave impacts along the immediate foreshore during major storm/tide events. Coastal inundation of the Batemans Bay CBD could occur with a frequency around once in twenty years.

For severe storms, the Batemans Bay CBD is predicted to receive storm waves of about 1.0 metres maximum wave height. These storms elevate normal tidal water levels along the immediate foreshore. In addition barometric pressure is typically low and strong onshore winds would be expected. The resultant cumulative setup water levels adopted by CHMP for the training wall near the Batemans Bay CBD are shown in **Table 1**.

Note these figures incorporate allowances for Sea Level Rise of 0.2m and for a coincident 10 year Clyde River catchment flood of 0.1m at locations downstream of the Princes Highway bridge.

The setup levels exceed the height of the foreshore training wall which CHMP report at 1.7 to 2.2m AHD. Waves would overtop the wall and encroach into the Batemans Bay CBD foreshore area. The CHMP calculates a 1% peak overtopping rate over the whole 300 meters length of CBD foreshore training wall estimated at 360 cu.m / sec.

Table 1 Batemans Bay CBD Foreshore - Design Setup Water Levels (CHMP Table 12)

AEP	Astronomic Tide & Storm Surge (m)	Allowance for Clyde River Flooding (m)	Sea Level Rise Allowance (m)	Wave Setup (m)	Cumulative Foreshore Water Level (m AHD)
5%	1.4	0.1	0.2	0.1	1.8
2%	1.45	0.1	0.2	0.15	1.9
1%	1.5	0.1	0.2	0.2	2.0

These factors elevate water levels in the immediate foreshore area subject to wave attack as predicted by CHMP for the 1% event at 2.4m AHD (**Table 2**). In the backshore zone, 1% inundation levels are slightly less at 2.2m AHD.

COASTAL PROCESSES AND FLOODING REVIEW

No. 3 CLYDE STREET, BATEMANS BAY

Table 2 Batemans Bay CBD Design Water Levels (CHMP Table 13) - Foreshore and Backshore Zones

AEP	Overtopping Flows (cu.m/sec)	Inundation Level Clyde St Foreshore (m AHD)	Inundation Level North St Backshore (m AHD)
5%	240	2.2	2.0
2%	300	2.3	2.1
1%	360	2.4	2.2

Council policy adopts the 1% event and adds a freeboard of 0.3m to the above figures to determine minimum floor levels for commercial development in the Batemans Bay CBD. Resultant minimum design commercial floor levels are shown in **Table 3**. Eurobodalla Shire Council staff confirms that Council does not require a freeboard component for the proposed above-ground carpark, provided that the carpark entrance is at or above the Backshore inundation level for North Street and that the carpark is of a free draining design (*R. Toohey 22.11.07*).

Table 3 Batemans Bay CBD Design (1%) Minimum Floor Levels

AEP	Commercial Floor Level Clyde Street Foreshore (m AHD)	Commercial Floor Level North Street Backshore (m AHD)
1%	2.7	2.5

3 CLIMATE CHANGE CONSIDERATIONS

Communities and assets along the New South Wales coastline will increasingly come under threat from a range of climate change impacts. These include coastal flooding and erosion due to rising mean sea levels and possible changes in weather patterns. A 2007 study by CSIRO has assisted to define the variables that are responsible for these processes, which may change as a result of climate change due to the enhanced greenhouse effect for 2030 and 2070 planning horizons.

In particular CSIRO (2007) investigates changes to offshore wind and wave climate, storm surge changes, and regional variations in mean sea level rise. The study uses two sites in NSW, one of which is conveniently located at Batemans Bay. The following figures are quoted from CSIRO (2007).

3.1 Sea Level Rise Implications

Relative to the 1990 level, global average mean sea level is likely to increase by **0.18 to 0.59** meters by 2100, with a possible additional contribution from a future rapid dynamical response of the ice sheets of **0.1 to 0.2 m**. However, these increases in sea level would not occur uniformly across the world due to variations in thermal expansion of the ocean. CSIRO projects an additional local SLR component at Batemans Bay (varying between climate models) from extremes of **0.00m to 0.12m**.

Adding these three components gives a range of overall sea level rise towards the end of this century. This could lie in the range **0.3m to 0.91m** relative to 1990-1999 levels.

As required by the Department of Planning, consideration of a high-range SLR figure is required. Accordingly this amended report addresses the SLR component of **0.9 meters**.

3.2 Future Changes in Swell Waves

Both climate models predict very small changes in average significant storm wave heights and wave periods at both 2030 and 2070.

The average storm wave direction is predicted to shift anti-clockwise by not more than 2.1° by 2030, while it is predicted to shift clockwise by not more than 3.8° by 2070.

These predictions would be expected to have little impact on the Batemans Bay CBD and may be more relevant for sandy beaches.

3.3 Future Storm Surge Implications

Storm surges are caused by strong winds and falling atmospheric pressure associated with severe weather systems. Weather systems associated with storm surge events on the NSW South Coast are produced by southerly to south-easterly winds.

CSIRO projections for 100 year storm surge suggest a small variation in surge height of between -3% and +1%. In terms of water levels compared to SLR variations, this factor is of the order of a few centimetres and can be ignored.

3.4 Future Clyde River Flooding

Implications of climate change is less frequent but more intense rainfall events. No recent work has been carried out on the implications of this on flood levels. The Batemans Bay Vulnerability Study (DLWC 1996) assessed increases in river flood flows and determined that a post-greenhouse flood allowance of **0.2 meters** was appropriate for the Batemans Bay CBD. The 1% design inundation levels of 2.4m AHD (Clyde Street) and 2.2m AHD (North Street) are noted in **Table 1** to include a 0.1 meter Clyde River flooding component. An additional 0.1m river flooding component would cater for climate change.

The NSW Government Floodplain Management Manual and the Department of Planning **Key Issue 5.1** consider flooding up to the **Probable Maximum Flood (PMF)**. The PMF is a flood based on maximum possible rainfall intensity, and for catchment flooding defines the extent of flood prone land. While this is an appropriate issue for river flood management, it has no equivalent for ocean inundation.

In the absence of better data, and considering the relatively minor contribution that river flooding makes to overall flood levels at the Batemans Bay CBD, we would propose to adopt an additional river flood component of 0.1 meters to cater for climate change impacts.

3.5 Design Inundation Levels

The 1% design inundation levels of 2.4m AHD (Clyde Street) and 2.2m AHD (North Street) are noted in **Table 1** to include a 0.2 meter sea level rise component. This should be subtracted from the design figures prior to adding the 0.9m high range SLR estimate. Hence an additional 0.7 meter allowance for SLR should be added, plus an additional 0.1m for river flooding, in order to derive 1% design flood heights for 2100 shown in **Table 4**.

Table 4 Batemans Bay CBD - Derived 1% Water Levels allowing for High-range Sea Level Rise to 2100- Foreshore and Backshore Zones

AEP	Inundation Level Clyde St Foreshore (m AHD)	Inundation Level North St Backshore (m AHD)
1%	3.2	3.0

3.6 Flood Planning Levels

The Flood Planning Level (FPL) is the combination of flood level and freeboard selected for planning purposes. The freeboard is a factor of safety to compensate for uncertainties in flood level estimation, possible effects of local wave surge, a possible additional increase in Clyde River flood component, and the potential for a greater SLR component. Eurobodalla Shire Council has adopted a FPL in the Batemans Bay CBD for commercial development, to be the 1% flood level with a 0.3 meter freeboard.

Flood Planning levels for the 1% event in 2100 and also incorporating a 0.3m freeboard would be a conservative approach, giving FPL's as shown in **Table 5**.

Table 5 Flood Planning Levels allowing for High-range SLR to 2100 and incorporating a 0.3m freeboard

AEP	Clyde Street Foreshore (m AHD)	North Street Backshore (m AHD)
1%	3.5	3.3

Implications of climate change on the design and the development responses are discussed in **Section 7**.

4 EXISTING FLOODING BEHAVIOUR

4.1 General Area

The Clyde Street foreshore area is subject to coastal inundation in severe coastal storm events. At the subject property, inundation of Clyde Street would occur during the peak of a 1% ocean storm. Overtopping flows would discharge across the foreshore park and carpark to inundate commercial properties fronting Clyde Street to a level of 2.4m AHD. This event would last for a few hours around the high tide at the peak of the storm.

Wave impact would not be an issue on the western side of Clyde Street. Overtopping water would drain (in between 'pulses' of waves) back to the roadway towards the lowest point on the North Street corner. The stormwater system would be surcharged at these levels so this water would pond over a few hours, until levels in the Bay receded with the dropping tide.

Water would slowly back up westwards along North Street as the level increased. The CHMP states that levels in North Street (and the whole Batemans Bay CBD 'Backshore') would not exceed 2.2m AHD at the peak of a 1% event. This level makes allowances for both foreshore overtopping rates and catchment runoff.

4.2 Subject Land

Road levels provide an indication of how water flows would behave after overtopping the foreshore training wall. Road levels along the lot frontage on Clyde Street are at even grade and average 1.8m to 1.9m AHD. At the 1% peak waters would be close to 0.5 to 0.6m deep and the road would be impassable to traffic. Fall is southwards towards North Street.

Along North Street road levels gradually rise westwards from a low point at the Clyde St intersection of 1.7m AHD. At the property's south-eastern corner the road level is 1.7m AHD while at its south-western corner it is 1.92m AHD. Near the south-western corner at the 1% peak, waters would be 0.3m deep and the road would be closed east of this point. North Street would be free of inundation at the 2.2m AHD level, mid-way between Perry Street and Vesper Street (Princes Highway).

Surface levels on the property at the block's North Street frontage are about 1.9 m AHD, with levels in the existing carpark varying between 1.8m and 2.0m AHD (*Lawrence Group Survey Plan 051130 of January 2005*). The crest of the existing driveway to North Street is at 2.07m AHD.

COASTAL PROCESSES AND FLOODING REVIEW
No. 3 CLYDE STREET, BATEMANS BAY

The pedestrian lane linking North Street to the Woolworth's carpark (running along the subject land's western boundary) has surface levels between 1.90 m and 2.56 m AHD.

Surface levels within the property at the block's Clyde Street frontage are about 2.0 m AHD. Three existing buildings on the block have ground floor levels of 2.13m AHD with a fourth building to the west of the block at 2.21m AHD. The lower buildings of the existing motel would all be prone to inundation at the 1% flood peak by a depth of 0.27 meters.

5 MANAGEMENT OF FLOOD IMPACTS

The design for No. 3 Clyde Street addresses current flooding constraints as follows. Climate change impacts and design responses are discussed in **Section 7**.

5.1 Floor Levels

Commercial floor levels as nominated on design plans of 2.7m AHD (Clyde Street frontage) and 2.5m AHD (North Street frontage) allows for a 0.3m freeboard to the 1% inundation level in accordance with Eurobodalla Shire Council policy.

The eastern (Clyde Street) face of the current development would at present allow water ingress to the internal carpark and motel buildings. The new development proposes a front colonnade to allow ramped access to the proposed shop on Clyde Street. This proposed Clyde Street elevation would intentionally prevent floodwaters to enter the property from the east.

5.2 Vehicle Access and Carpark Levels

The redevelopment of the site focuses vehicle entry / egress and parking access from North Street to avoid the deeper inundation on Clyde Street. It proposes access from the property's western corner at the highest available point on North Street. Indeed this access lane is proposed to service all future redevelopment along Clyde Street, and its use in flood response access or egress is improved by its higher elevation at the North Street intersection.

This access layout maximises opportunity to elevate parking area surface levels to above the 1% flood level of 2.2m AHD. Levels in the rear access lane would meet the 1% design level, rendering the remainder of the carpark free of flooding provided the crest level was not overtopped by a larger event. The carpark shall be graded to be free draining in response to this possibility.

5.3 Flood Emergency Response Plan

We note that all proposed flood controls to the current 1% planning level satisfy Eurobodalla Shire Council policy. Furthermore, the development responds to flooding constraints to the 1% level in ways that do not require active floodproofing responses.

Because of the short duration of ocean inundation (few hours) we do not see the need for emergency evacuation arising under current flooding scenarios. The future situation incorporating climate change is discussed in **Section 7.3**.

6 IMPACTS OF DEVELOPMENT ON FLOODING OF ADJOINING PROPERTIES

We conclude from the above discussion that the impacts of wave runup on this development will be insignificant. Runup would be confined to the Clyde Street foreshore area, with wave runup energies spent over the width of the foreshore landscaped area and carpark. Therefore the development as sited would not produce any diversion of wave runup flows. There is no scope for adverse impacts of this development on adjoining lots by diverting runup flows.

Raised floor levels for the proposed development would have no impact on ponded water levels. Hence no adverse impacts on adjoining development currently or in the future are foreseen.

7 CLIMATE CHANGE MANAGEMENT MEASURES

On the one hand, this issue is a major one for low-lying areas such as the Batemans Bay CBD, and broad scale solutions to issues of this magnitude are beyond one development. Yet on the other hand, individual developments could consider and incorporate feasible ways to manage uncertainty if possible.

The following additional measures have been adopted in the final design to manage the uncertainty of future sea-level rise under climate change scenarios.

Section 3 discussed the latest projections of sea level rise for the Batemans Bay area. Sea level rise is the major climate change impact for Batemans Bay - effects of small changes in storm wave height, period and direction, and small variations in storm surge, are out-weighted by SLR possibilities. As summarised in this section, a high-range SLR figure would require water levels (including a freeboard) up to about **3.5m AHD** (Clyde Street frontage) and **3.3m AHD** (North Street frontage) to be addressed.

7.1 Commercial Areas

We note that the design of the ground floor commercial development makes adequate provision for the fitting of floodgates. Commercially available floodgates would suit the entrances to commercial premises by way of appropriately-placed installation support columns. For instance a commercial floodgate system similar to that manufactured by *Floodgate Australia* would be suitable to the proposed layout. Floodgates would be capable of being fitted at short notice and with a rapid response time.

Standard floodgate heights of 0.9 meters above the colonnade (2.7m AHD) would attain a suitable level of protection. This system has been proven to be effective in the protection of large apertures and structures. In this way, should inundation in future decades attain higher levels than the current design level, inconvenience and flood damages could be proactively managed.

7.2 Vehicle Access and Carpark

In future it is feasible that the current 1% design entry level of the carpark could be exceeded. The carpark would drain to the North Street entrance if design inundation levels were exceeded. This would permit efficient drainage once the tide and storm peak had passed.

Allowance has been made for the fitting of commercial floodgates across the carpark entrance. A suitable installation support point is shown on design plans at the carpark entry from the proposed service laneway. Based on a proposed pavement level of 2.2m AHD, an

1200mm high floodgate would floodproof the carpark to above the likely peak level of 3.3m AHD. A suitable floodgate system is commercially available.

7.3 Flood Emergency Response Plan - Climate Change

The proposals for management of flood risk to the current 1% flood design level are by passive means (Section 5.3). Management of climate change impacts requires an active response - installation of floodgates on the commercial frontages and to the carpark entrance for instance would be the most important aspects. These responses require those responsible to be aware of their individual and shared responsibilities.

As discussed and agreed with Eurobodalla Shire Council staff, development of this plan would be premature without relevant personnel being involved (*R. Toohey 22.11.07*). Accordingly a Final Response Plan should be provided prior to occupation / commencement of commercial operations.

In the meantime, an outline of the requirements of a **Flood Emergency Response Plan** for these non-passive mitigation measures is presented in **APPENDIX 1**.

8 CONCLUSIONS

We would conclude that

- the relevant requirements of DGR Key Issues 5.1 and 5.2 have in our opinion been addressed in this report for Coastal Processes and Flooding
- the proposed development meets Eurobodalla Shire Council's current flood standards for commercial floor levels
- carpark access and design meets Eurobodalla Shire Council's current flood standards
- the proposal will have no adverse impact on the flooding of surrounding development
- climate change impacts have been assessed in line with current knowledge and the proposed development adequately responds to the possibility of 'high range' sea level rise.
- the building structure makes adequate provision for the fitting of floodgates. In this way, should inundation in future decades attain higher levels than the current design level, inconvenience and flood damages could be proactively managed.
- the development will not put at risk human life or safety
- an Emergency Response and Evacuation Plan should be developed for the development prior to occupation and commencement of commercial operations, with education of responsible staff an essential part of plan implementation.

9 REFERENCES

CSIRO (August 2007) **Projected Changes in Climatological Forcing for Coastal Erosion in NSW** - *A Project Undertaken for the NSW Department of Environment and Climate Change*

Department of Land & Water Conservation (DLWC) (May 1996) **Batemans Bay Vulnerability Study** - *Report to Eurobodalla Shire Council and the Commonwealth Department of Environment, Sport and Territories*

Webb McKeown & Associates Pty Ltd (2001) **Batemans Bay Coastline Hazard Management Plan** - *Report to Eurobodalla Shire Council*

10 **APPENDIX 1 FLOOD EMERGENCY RESPONSE PLAN OUTLINE**

Inherent in Eurobodalla Shire Council's flood policy is a preference for passive management of risk e.g. by the provision of flood planning levels which set minimum floor levels without requiring further action. The proposed development satisfies these requirements.

However as proposed in the report accompanying this plan, management of the uncertainty of sea level rise is addressed but should not necessitate fixed standards.

The proposals for management of flood risk (above the current 1% flood design levels to incorporate SLR potential to 2100) would require active responses such as floodgate installation. These responses require those responsible to be aware of their individual and shared responsibilities.

A Flood Emergency Response Plan should define the following:

1. Overall responsibilities for co-ordination of emergency responses
2. Storeroom areas for storage of floodgate racks for commercial shops on Clyde Street and the carpark access floodgates
3. Procedures and responsibilities for erection of floodgates
4. Link to State Emergency Services personnel and warning system
5. Means of notification of motel residents of impending event and timeframe
6. Timing of response from receipt of inundation warning
7. Need for evacuation of shops is not relevant
8. Evacuation of vehicles from carpark is not necessary but would be southbound via North Street up until floodgate installation
9. Road closures and traffic direction beyond the site would be by emergency services personnel

This emergency response plan outline is included in this report to guide a final plan, which should cover all actions required for the active management of inundation risk. Education of the staff would form a major component of plan implementation. Hence a plan would be recommended for finalisation, prior to the occupation and commencement of the development.

11 **APPENDIX 2 COUNCIL RESPONSE**

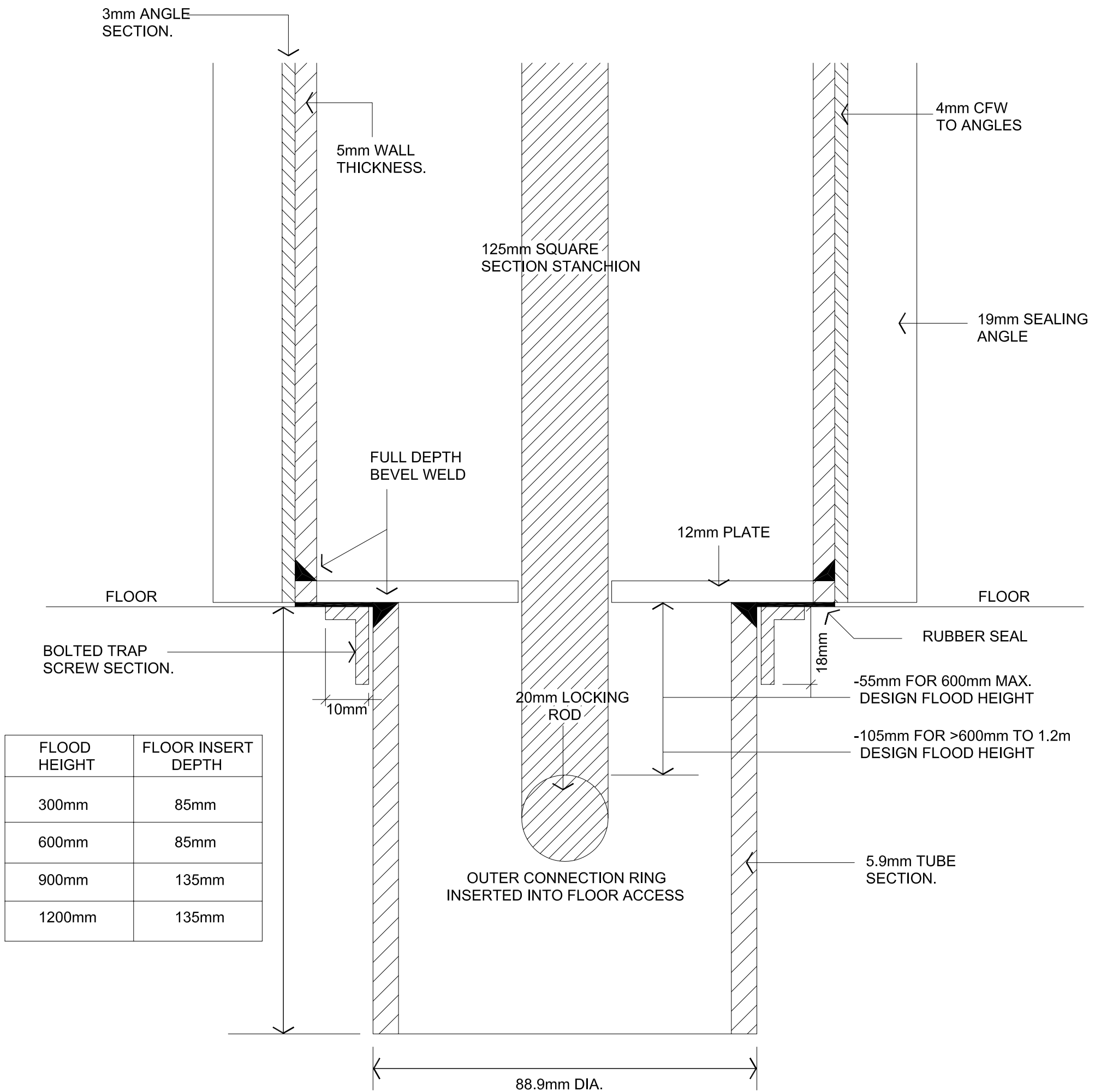
Council's Asset Engineer Mr Royce Toohey was consulted during the preparation of this report. The final report was reviewed by Mr Toohey who offered the following comments, extracted from his Email message to ourselves dated 21 December 2007.

I have reviewed your Coastal Process and Flooding Review Report.

The process, in particular making allowances for protection as and if sea level rise occurs, meets with Council Approval. It is appropriate to treat the situation as an "at-grade" carpark with the understanding that it may be inundated at some time in the future due to storm activity that exceeds the current planning levels and therefore protection will be needed in the future.

Given that the proposal does meet the foreseen expectancies, a Management Plan is not required at this time but, as with any coastal development, it would be appropriate to have a Management Plan and Evacuation Plan in place before the redevelopment commences operation. Therefore I would recommend that they be prepared and in place before the revised use commences.

This Email was also forwarded to Paulina Hon of the Department of Planning.



SECTION VIEW THROUGH STANCHION CONNECTION TO FLOOR COUPLING
NOTE: ALL TUBES BLACK EXTRA HEAVY

SKETCH J204201/A