

Park Hyatt Sydney

MP09_0044

Climate Change Risk Assessment

July 2010

urbis

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1 Introduction

This report is prepared on behalf of Dasho Developments Sydney Pty Ltd to assess the potential risks associated with sea level rise for the purposes of the redevelopment of the Park Hyatt Hotel at 7 Hickson Road the Rocks (MP 09_0044). This assessment is provided as part of a Part 3A application that involves the redevelopment of the existing hotel to improve amenity, and the overall function and operation of the hotel.

It has been prepared in response to Director Generals Requirements (DGRs) issued on the 4th of June 2010. The DGRs for the application stated the following:

9 - CLIMATE CHANGE AND SEA LEVEL RISE

An assessment of the risks associated with sea level rise on the proposal as set out in the draft NSW Coastal Planning Guideline: Adapting to Sea Level Rise

This report provides an assessment of the risks associated with sea level rise on the proposal in accordance with the DRAFT NSW Coastal Planning Guideline: Adapting to Sea Level Rise.

1.1 Policy context

The NSW State Government confirmed a position on sea level rise through its **NSW Sea Level Rise Policy Statement**¹ released in 2009. This policy statement specifies sea level rise planning benchmarks of **an increase above 1990 mean sea levels of 40cm by 2050 and 90cm by 2100**. Following the release of the policy statement, relevant state government agencies were required to prepare guidelines and policies to reflect the NSW State Government position,

The NSW Department of Planning prepared a **DRAFT NSW Coastal Planning Guideline: Adapting to Sea Level Rise**² (the Guideline) for consultation in October 2009 and has since that time consulted extensively with industry over the content of the guideline. This guideline has been prepared to provide clarity for government and industry, a structure for strategic and statutory planning for coastal areas and provides criteria for development assessment.

The guideline adopts the benchmarks set by the Policy statement and defines coastal risk areas that consider erosion risk areas and flooding risk areas associated with predicted sea level rise. It also sets a number of principles that are addressed by the guideline. These principles are:

COASTAL PLANNING PRINCIPLES: ADAPTING TO SEA LEVEL RISE

- **Principle 1** – Assess and evaluate coastal risks taking into account the NSW sea level rise planning benchmarks.
- **Principle 2** – Advise the public of coastal risks to ensure that informed land use planning and development decision-making can occur.
- **Principle 3** – Avoid intensifying land use in coastal risk areas through appropriate strategic and land use planning.
- **Principle 4** – Consider options to reduce land use intensity in coastal risk areas where feasible.
- **Principle 5** – Minimise the exposure to coastal risks from proposed development in coastal areas.
- **Principle 6** – Implement appropriate management responses and adaptation strategies, with consideration for the environmental, social and economic impacts of each option.

¹ <http://www.environment.nsw.gov.au/resources/climatechange/09708sealevrisepolicy.pdf>

² <http://www.planning.nsw.gov.au/LinkClick.aspx?fileticket=1Mz7Sun64mw%3d&tabid=177>

These principles inform the guideline, council policy, strategic land use policy and development within the areas classified as within coastal risk areas. As part of the guideline, the Department of Planning requires consideration of the planning benchmarks and principles in preparing the Director Generals requirements (DGRs) for Part 3A applications where relevant to a particular proposal. The DGR for the current Park Hyatt Hotel application issued on the 4th of June 2010 stated the following:

9 - CLIMATE CHANGE AND SEA LEVEL RISE

An assessment of the risks associated with sea level rise on the proposal as set out in the draft NSW Coastal Planning Guideline: Adapting to Sea Level Rise

This report addresses this requirement.

1.2 Development considerations

For the purposes of development assessment the guidelines require that developments proposed in coastal risk areas as defined by the guideline provide a consideration of the principles 5 and 6 above and respond to a set of planning criteria for development. Section 4 of the guideline outlines the process for considering sea level rise in the preparation and assessment of development applications in coastal areas. It includes criteria for site selection and requirements for submission with development applications.

The guideline includes the following criteria for selecting and assessing coastal development sites and in the assessment of development proposals.

PLANNING CRITERIA FOR PROPOSED DEVELOPMENT IN COASTAL RISK AREAS

1. Development avoids or minimises exposure to immediate coastal risks (seaward of the immediate hazard line)
2. Development provides for the safety of residents, workers or other occupants on-site from risks associated with coastal processes
3. Development does not adversely affect the safety of the public off-site from a change in coastal risks as a result of the development
4. Development does not increase coastal risks to properties adjoining or within the locality of the site
5. Infrastructure, services and utilities on-site maintain their function and achieve their intended design performance
6. Development accommodates natural coastal processes
7. Coastal ecosystems are protected from development impacts
8. Existing public beach, foreshore or waterfront access and amenity is maintained

The development is assessed against these criteria in section 2 of this report.

The assessment of the proposal is also to consider the level of risk associated with the type of development proposed and the coastal hazard the development is exposed to. The guideline defines risk as the probability of an event occurring and the likely severity of the impacts. The guideline sets out considerations for the assessment to enable the consent authority to manage the risks associated with the development and the predicted sea level rise. In addition to the consideration of principles 5 and 6 the consent authority is to consider the following:

- Location of development site in relation to coastal risk areas
- Level of risk associated with type and extent of development proposed
- Whether development can achieve the planning criteria
- Whether development proposal includes management responses and adaptation strategies commensurate with level of risk, based on site location & development type
- Issues raised in public submissions
- Advice/General Terms of Approval (GTA) from State agencies

The following section provides an assessment of the Park Hyatt proposal against the requirements set out in the guideline.

2 Assessment

This assessment provides a response to the determination requirements set out in section 4.6 of the Guideline. The table below provides a reference to the considerations.

Table 1 – Determination regards (Guideline 4.6)

Considerations	Reference
Location of development site in relation to coastal risk areas	Section 2.1 of this report
Level of risk associated with type and extent of development proposed	Section 2.2 of this report
Whether development can achieve the planning criteria	Section 2.3 of this report
Whether development proposal includes management responses and adaptation strategies commensurate with level of risk, based on site location and development type	Section 2.3 of this report
Issues raised in public submissions	To be addressed in preferred project report (PPR) if required.
Advice/General Terms of Approval (GTA) from State agencies	To be addressed in PPR if required.

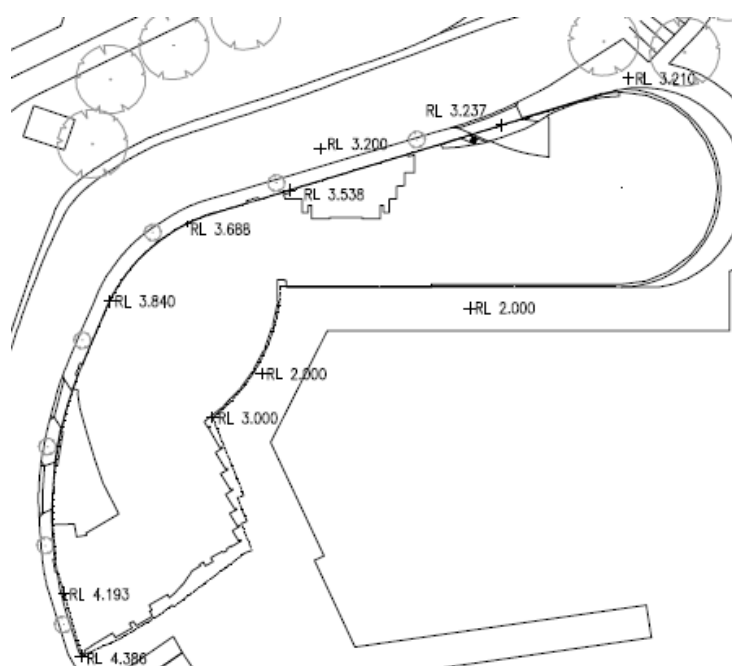
2.1 Location of development site in relation to coastal risk areas

The following information provides the context for the development against the sea level rise benchmarks and increased tidal range. This considers the NSW sea level rise planning benchmarks at an increase above 1990 mean sea levels of **40cm by 2050 and 90cm by 2100** and the implication on the proposed works.

2.1.1 Existing development levels

The following figure shows spot levels on the plan of the existing building. These levels will not change as part of the proposed works. Also refer to Appendix AA. This shows the minimum level on the promenade at RL 2 with Hickson Road at RL 3.2 and the lowest floor at RL3.0.

Figure 1 – Plan showing current spot levels around the existing building



2.1.2 Increased tidal range

Information requested from the NSW Public Works Manly Hydraulics Lab shows that in accordance with the Surveyor General's Directions No. 6, Water as a Boundary Procedures March 2004 Version 5.5, Tidal Planes are defined for the following location and period of record.

- Location: Middle Head, Sydney Harbour
- Geographic Co-ordinates: MGA Zone 56, 338720E, 6255620N
- Period of data analysed: 1987-2009
- Mean High Water Springs 0.647m AHD +/- 0.05m

The above Tidal Plane is an average level taken over 19 years of data, in the absence of 19 years of data the entire period of data has been analysed. In accordance with this 19-year cycle and sea level rise levels will be updated each year. This level is current between 01/07/2009 – 30/07/2011.

The Mean High Water Springs (MHWS) provided above is an average value of the high water recordings, of the spring tides, in Sydney Harbour. Historically higher levels than this can be experienced. The table below shows the maximum water levels recorded at Fort Denison between 1914 and 2006.

Table 2 – Maximum recorded water levels at Fort Denison³

AHD (metres)	Date (time)
1.475	25 May 1974 (2300 hrs)
1.425	27 April 1990 (2200 hrs)
1.395	10 June 1956 (2100 hrs)
1.345	30 June 1984 (2200 hrs)
1.345	19 August 2001 (2000 hrs)

Source: Below - based on hourly measurements (31 May 1914 to 31 December 2006)

For the purposes of identifying a possible maximum event for 2050 and 2100 we have provided modelling based on the May 1974 level of 1.475 metres AHD. The following table provides a breakdown of the sea level rise predictions considering the Mean High Water and maximum tidal range.

Table 3 –Sea level rise predictions and increased tidal range

Scenario	Mean High Tides	Levels (AHD)
Base	Mean High Water Springs 0.647m AHD +/- 0.05m (2009)	0.697
	Maximum High Tide	1.475
Model for 2050	Expected 2050 sea level rise	0.400
	Expected 2050 + Mean High Water Springs	1.097
	Expected 2050 + Maximum high tide	1.875
Model for 2100	Expected 2100 sea level rise	0.900
	Expected 2100 + Mean High Water Springs	1.597
	Expected 2100 + Maximum high tide	2.375

³ <http://www.coastalconference.com/2009/papers2009/Phil%20Watson%20Full%20paper%201.pdf>

2.1.3 Model on levels to AHD

The proposed works associated with the projects will not significantly modify any of the existing levels within vicinity of the building or any of the internal levels. The assessment in the following table shows the impact of the tidal levels and sea level rise on the existing development levels. These have been prepared by Erbas & Associates and model the lowest points of the building against the 2050 and 2100 Mean High Water scenarios.

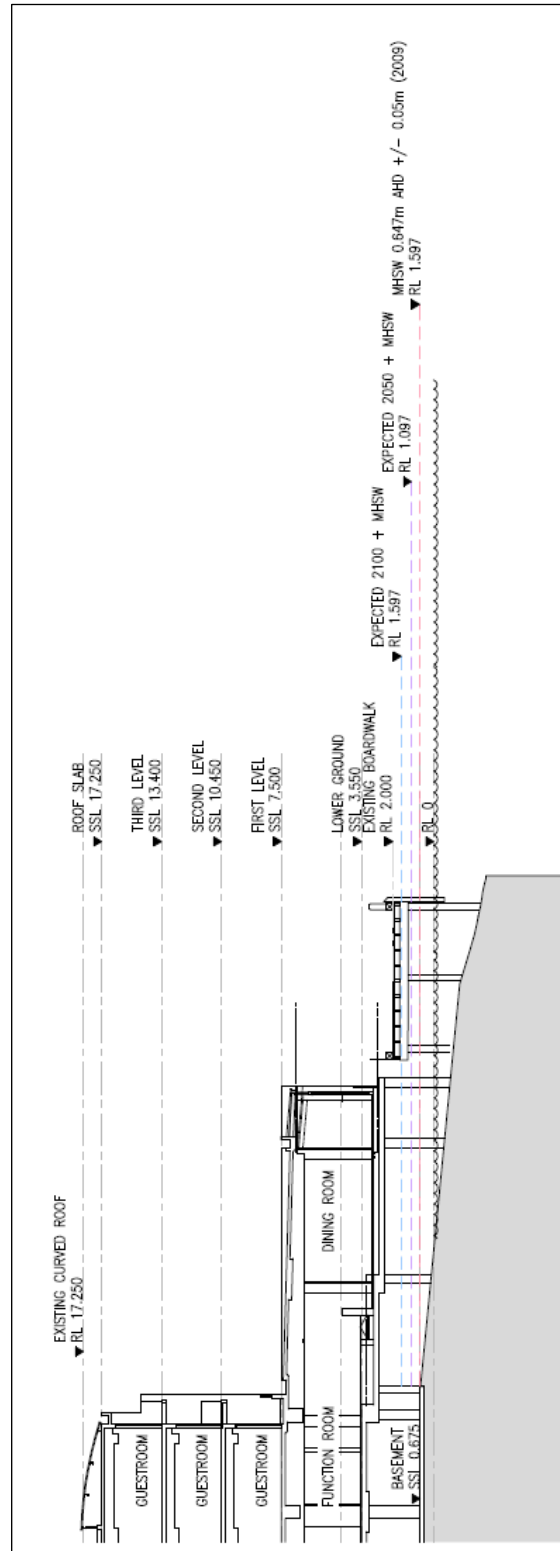
Table 4 – Assessment of levels in AHD

Location	Existing Levels	2050		2100	
		Expected Mean High Water Springs	Level below existing building level:	Expected Mean High Water Springs	Level below existing building level:
Lowest point along promenade sea wall.	2.000	1.097	0.903	1.597	0.403
Lowest point along building perimeter off Hickson Road	3.200	1.097	2.103	1.597	1.603
Lowest point of Building Floor Level	3.020	1.097	1.923	1.597	1.423

Source: Erbas & Associates 16.07.2010 with data as provided by Manly Hydraulics Laboratory and Sydney City Council

Figure 1 below shows a section through the building showing the modelled Mean High Water Springs (MHWS) for 2050 and 2100. Also refer to Appendix AA.

Figure 2 – Section showing predicted sea level rise at Mean High Water Springs 2050 and 2100



2.1.4 Environmental considerations

Section 4.3 of the Guideline sets out a number of environmental considerations to be addressed (where relevant) in a development assessment. The following table provides an assessment of the relevancy of the other environmental considerations provided in the Guideline.

Table 5 – Assessment of environmental issues

Environmental issues	Assessment of relevance to proposed works
Permanent increase in sea level and increased tidal range;	Not relevant / No impact
Soft coast erosion – beach and foredune loss and/or migration, shoreline recession, beach realignment;	Not relevant / No impact
Coastal flooding;	Not relevant / No impact
Coastal entrance behaviour;	Not relevant / No impact
Intermittently open and closed lakes and lagoons reconfiguration;	Not relevant / No impact
Cliff and slope instability;	Not relevant / No impact
Wetland migration; and	Not relevant / No impact
Groundwater elevation and/or salinisation.	Not relevant / No impact

The assessment finds that the environmental issues are not considered relevant for the purposes of the proposal and the works involved.

2.2 Level of risk associated with type and extent of development proposed

This section provides the development context and discussion on the extent of development and level of risk associated.

2.2.1 Development type

The guideline sets a process for assessing the sea level rise risk associated with the function, type and sitting of development proposed. The guideline recognises that there are varying levels of risk associated with different development types based on the potential risk to life, property and or the environment. Some forms of development require a more detailed assessment against the criteria whereas those considered minor do not require the same level of assessment. The following extract from the guideline provides the breakdown of development type:

Assess risk related to type of proposed development

The impact of an event (the effects of coastal hazard events on a development site) will be a function of the type of development. As a guide, the following types of development proposals in coastal risk areas would require further detailed assessment of risks to life, property or the environment:

- Construction of new residential, commercial, retail or industrial buildings or structures or substantially increasing the floor space ratio of existing buildings or structures;
- Subdivision, with consideration for proposed building envelopes, access and service easements;

- Institutional developments, especially where evacuating people may be particularly difficult e.g. hospitals, schools, child care or aged care facilities;
- Material change of use that substantially increases the number of people living or working on site;
- Manufacture or storage of hazardous or dangerous materials or waste disposal; or
- Sewerage treatment works, substations & other key infrastructure.

The following types of development could generally be considered minor, however the consent authority should consider each application on a case-by-case basis:

- internal fitouts, minor alterations, additions or extensions to existing buildings or structures that are landward of the seaward alignment of the existing buildings or structures;
- waterway recreation structures including jetties, slipways, wharves, boat sheds and pontoons;
- exempt development; or
- temporary or minor relocatable structures.

If the consent authority considers the proposed development to be minor development, applications need not be assessed against planning criteria.

The proposed works for Park Hyatt being considered in this application involve the redevelopment of the existing hotel to improve amenity, and the overall function and operation of the hotel. The proposed works seek to enhance and refurbish the décor and facilities of the hotel to a standard consistent with Sydney's premier hotel. The following summarises the key features of the proposed works:

- Rooftop level modifications including rearrangements of the terrace and roof
- Room refurbishments for all rooms including new windows, doors and minor terrace improvements
- Façade refurbishments and maintenance
- Lobby refurbishment including new glazing and internal works

For the purposes of this guideline the works would be considered to be **minor** as the proposed works are mostly on internal fit outs and alterations to the existing building landward of the seaward alignment.

2.2.2 Risk criteria

The assessment requirements in identifying the risk associated with the development proposed define risk as the following:

Risk = Probability of an event occurring x likely severity of the impacts

As part of the assessment of risk the guidelines require the consent authority to determine if the type of development proposed and its use are likely to have implications associated with the assessment criteria. The predominant use of the development is as a commercial hotel facility. There are no permanent residents and the facility is under a single ownership. The following table provides an assessment of the proposed development and the potential level of risk.

Table 6 – Risk area implications assessment (Guideline 4.5)

Criteria	Level of risk associated with proposed works
Exposure to immediate coastal risks (seaward of the immediate hazard line);	Low
Safety of residents, workers or other occupants on-site;	Low
Safety of public off-site from a change in coastal hazards as a result of the development;	Low

Criteria	Level of risk associated with proposed works
Safety of properties adjoining or within the locality of the development site;	Low
Performance of infrastructure, services and utilities on-site;	Low
Natural coastal processes as a result of the design of the development;	Low
Coastal ecosystems on or adjoining the site; or	Low
Existing public beach, foreshore or waterfront access and amenity	Low

For the purposes of the assessment the level of risk associated with the proposed works are considered **low**. This is considering the sea level and severity of the impacts on the proposed development works.

2.2.3 Conclusion

Though the development is within a coastal risk area, the type of works proposed is considered **minor** and the exposure to risks would be considered **low**. The assessment undertaken in the following section provides detail of the development and a clarification of the risk assessment process.

2.3 Assessment against planning criteria

The following table provides a brief assessment of the proposed development against the planning criteria. Some further assessment has been provided on the infrastructure, services and utilities on site below the table. Considering the proposed works are considered to be of **minor** nature in relation to the guidelines and that the risks are perceived as **low**, a more detailed assessment is not required.

Table 7 – Assessment against planning criteria for the proposed development

Criteria	Compliance of current proposal
1. Development avoids or minimises exposure to immediate coastal risks (seaward of the immediate hazard line)	Complies - No increased exposure
2. Development provides for the safety of residents, workers or other occupants on-site from risks associated with coastal processes	Complies - No increased exposure
3. Development does not adversely affect the safety of the public off-site from a change in coastal risks as a result of the development	Complies - No change to coastal risks
4. Development does not increase coastal risks to properties adjoining or within the locality of the site	Complies - No change to coastal risks
5. Infrastructure, services and utilities on-site maintain their function and achieve their intended design performance	Complies - The building servicing will not change as part of the proposed works.
6. Development accommodates natural coastal processes	Complies - No modification of current coastal processes
7. Coastal ecosystems are protected from development impacts	Complies - No modification of current coastal processes
8. Existing public beach, foreshore or waterfront access and amenity is maintained	Complies - The height of the promenade is above the predicted 2100 levels.

2.3.1 Conclusion

The proposed development complies with the planning criteria from the guideline. Further development of management responses and adaptation strategies are not considered relevant to this proposal commensurate with level of risk and compliance with the criteria.

Appendix AA Drawings

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2000/1/187

10 JUN 1998

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WATER BOARD APPROVED

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3. Portion of Diagram in Particular for the
4. Portion of Diagram in Particular for the

27 JUL 1998

WATER BOARD APPROVED

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City Planning Department

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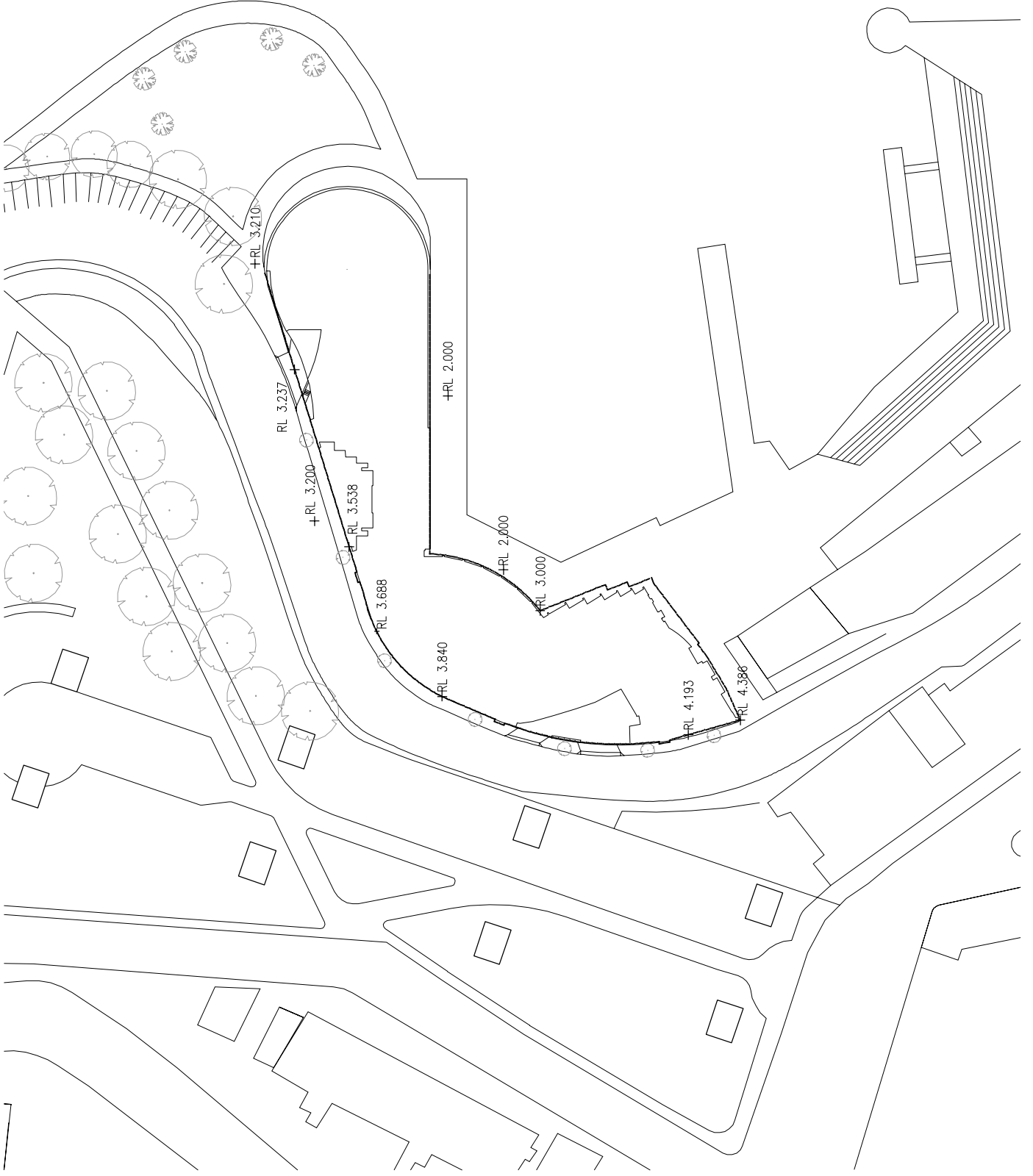
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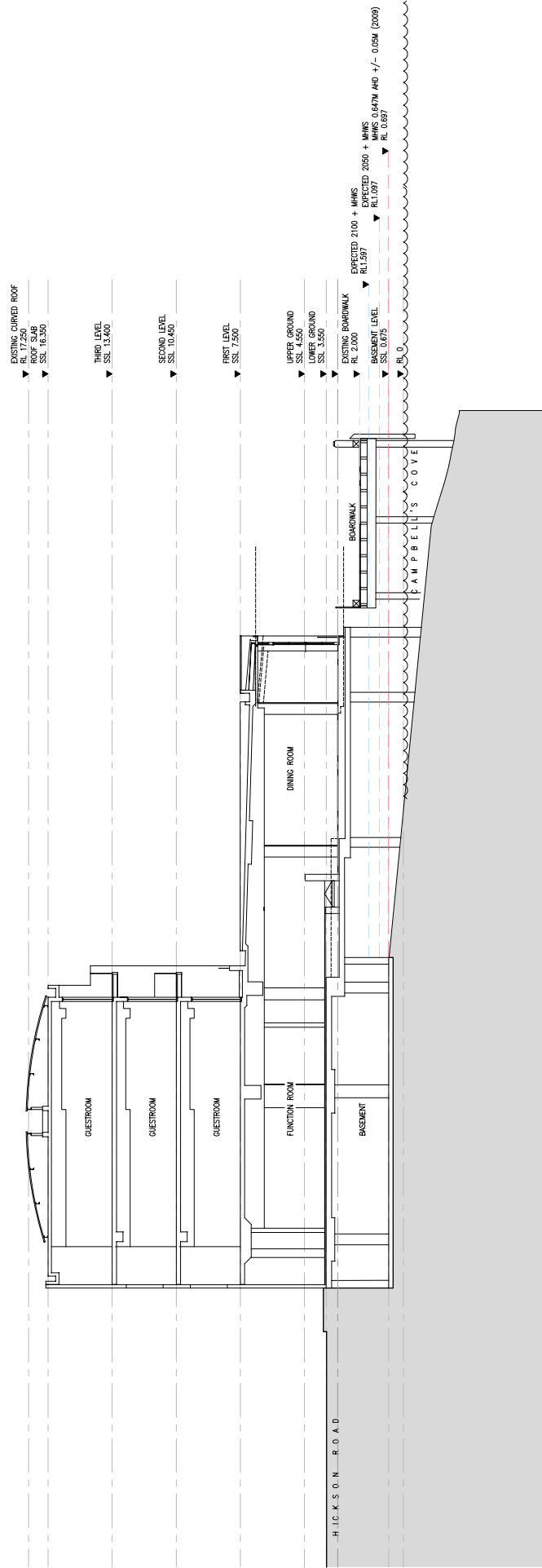
THE HOTEL ON CAMPBELLS COVE

SITE PLAN

0 50 100 METRES

10 JUN 1998





Appendix BB Engineers Tables

Mean High Tides	
Mean High Water Springs 0.647m AHD +/- 0.05m	0.697
Expected 50yr sea rise	0.400
Expected 50yr Mean High Water Springs	1.097
expected 100yr sea rise	0.900
Expected 100yr Mean High Water Springs	1.597

TIDAL LEVELS				
Location	Existing Levels	Expected 50yr Mean High Water Springs	Level below existing building level:	Expected 100yr Mean High Water Springs
Lowest point along promenade sea wall is RL2.0.	2.000	1.097	0.903	1.597
Lowest point along building perimeter off Hickson Road	3.200	1.097	2.103	1.597
Lowest point of Building Floor Level	3.020	1.097	1.923	1.597
				Available Freeboard above expected tidal levels:
				0.403
				1.603
				1.423

Flood levels (as per Council advise)	
Description	Levels
Highest recorded (more than 100 year record) Sydney harbour water levels.	1.470
Recommended 1:100 yr ARI flood level for Harbour	2.000
Minimum Freeboard for habitable building floor levels	0.500
Minimum floor level (MFL) or Flood planning Level (FPL)	2.500
Existing Ground Floor floor level	3.020
Available Freeboard above Flood Plain Level	0.520

Appendix CC NSW Public Works – Mean High Water, Sydney Harbour

As provided by NSW Public Works on 16 July 2010



Public Works
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16 July 2010

Stephen Brown
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P.O. Box 41 St Leonards
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Dear Stephen,

RE: Mean High Water – Middle Head, Sydney Harbour

In accordance with the Surveyor General's Directions No. 6, Water as a Boundary Procedures March 2004 Version 5.5, Tidal Planes are defined for the following location and period of record.

- Location: Middle Head, **Sydney Harbour**
- Geographic Co-ordinates: MGA Zone 56, 338720E, 6255620N
- Period of data analysed: 1987-2009
- Mean High Water Springs 0.647m AHD +/- 0.05m

Please note that the Mean High Water Springs (MHWS) value above is an average value of the high water recordings, of the spring tides, in Sydney harbour and higher levels than this can be experienced.

The above Tidal Plane is an average level taken over 19 years of data, in the absence of 19 years of data the entire period of data has been analysed. In accordance with this 19-year cycle and sea level rise levels will be updated each year. This level is current between 01/07/2009 – 30/07/2011.

Thank you for your request, if you have any further questions regarding this request or other information held by MHL, please contact Sarah Hesse on (02) 9949 0265 at the Laboratory.

Yours faithfully

Sarah Hesse
Floodgroup Manager
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