Crown Sydney Hotel Resort

Sydney, AU

Pedestrian Wind Study

RWDI # 1401805
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SUBMITTED TO

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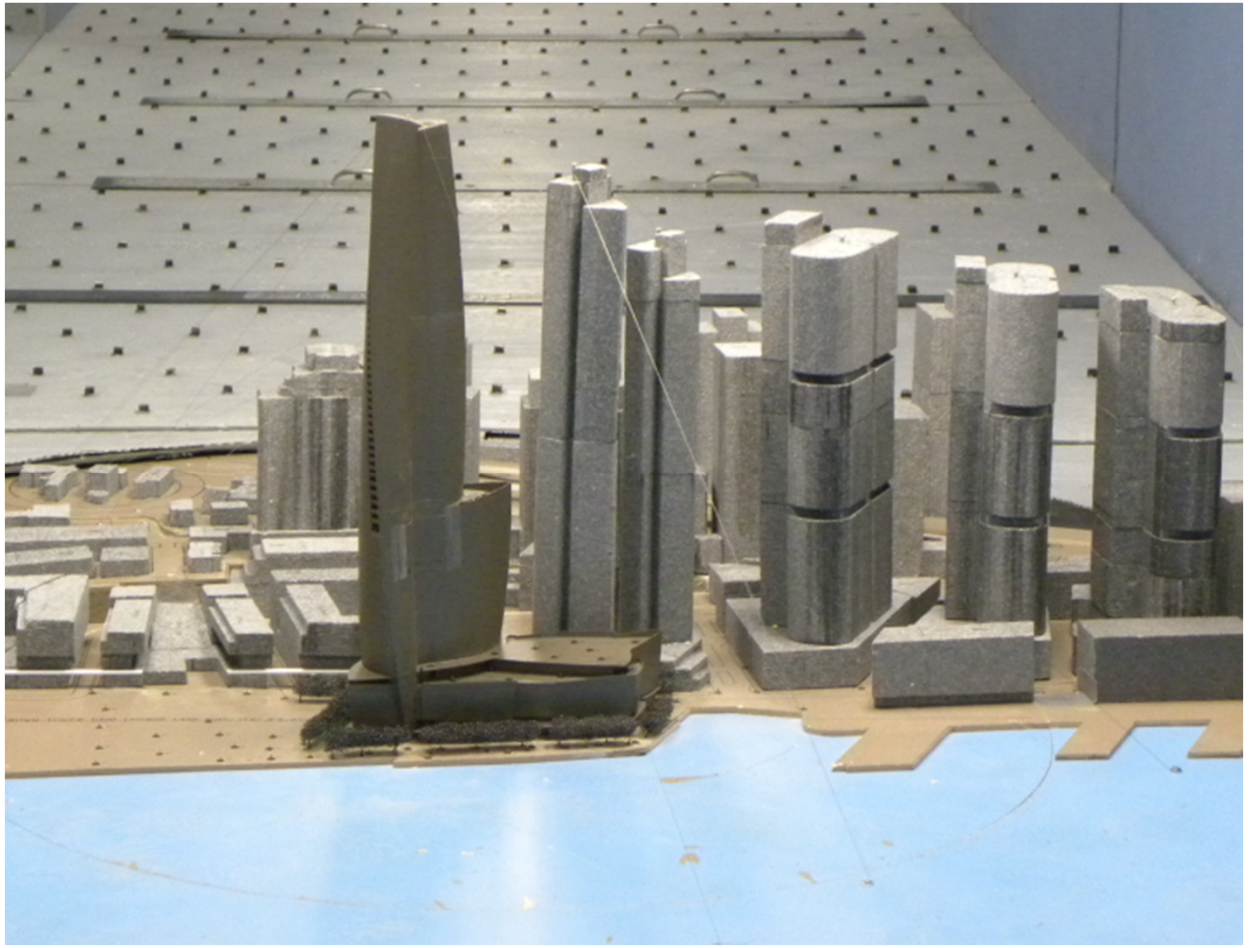

1. INTRODUCTION

Rowan Williams Davies & Irwin Inc. (RWDI) was retained by Crown Resorts Ltd. to assess the wind environment for the proposed Crown Sydney Hotel Resort, located in Sydney, Australia. The results of the five completed tests are discussed within this report. Further testing is currently underway which includes refined landscaping along the Promenade and within the park north of the proposed Crown Sydney Hotel Resort.

This objective was achieved through wind tunnel testing of a 1:400 scale model of the following site configurations (see Images 1 through 6):

Configuration A – The proposed Crown Sydney Hotel Resort and existing surroundings;

Configuration B – Configuration A, with the Preliminary Landscape Concept landscaping;

Configuration C – Configuration A, with the Revised Landscaping Plan, as provided in Appendix A. **NOTE** – a single, wide band of foam was used to represent the double row of trees along the waterfront;

Configuration D – Configuration C, with a pergola north of the Crown Sydney Hotel Resort; and,

Configuration E – Configuration C, with underplantings below the trees.

This report summarizes the methodology of wind tunnel studies for pedestrian wind conditions, describes the RWDI pedestrian wind criteria, and presents the local wind conditions and their effects on pedestrians.

The placement of wind measurement locations was based on our experience and understanding of the pedestrian usage of the site, and were reviewed by the design team.

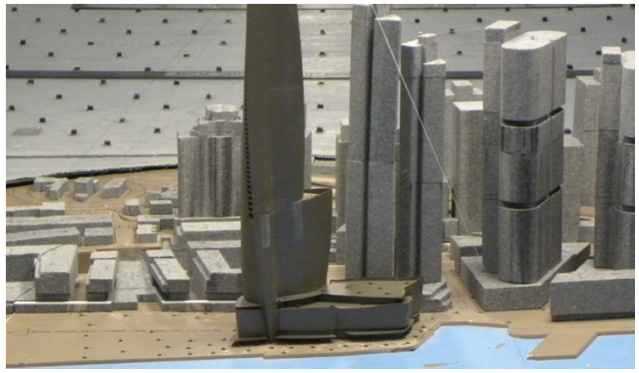

Image 1 – Configuration A - No Landscaping Included

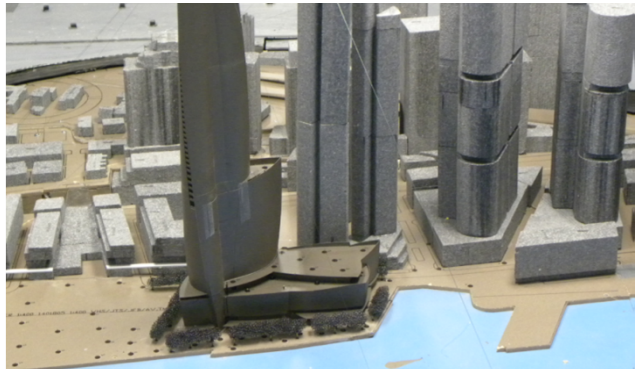

Image 2 – Configuration B - Initial Landscaping

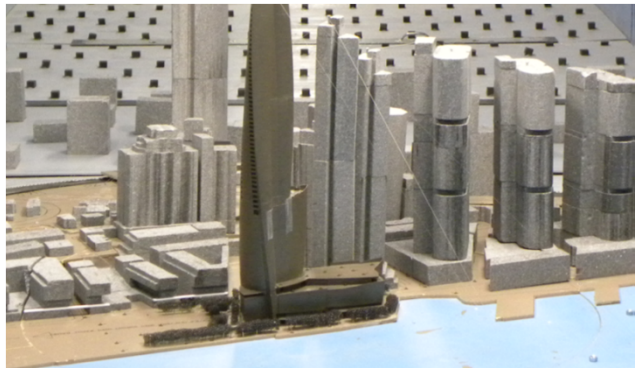

Image 3 – Configuration C - Revised Landscaping Included

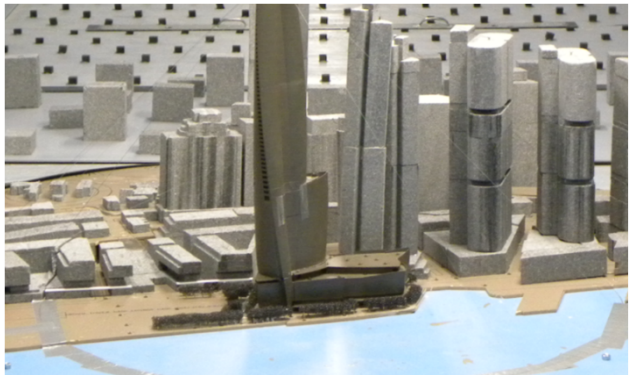

Image 4 – Configuration D - Revised Landscaping Included and Additional Pergola

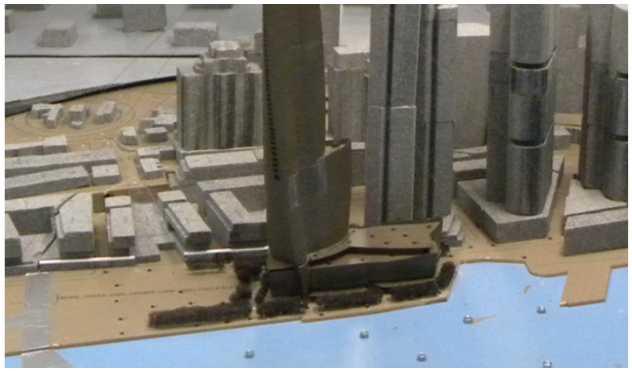

Image 5 – Configuration E - Revised Landscaping Included and Additional Underplanting

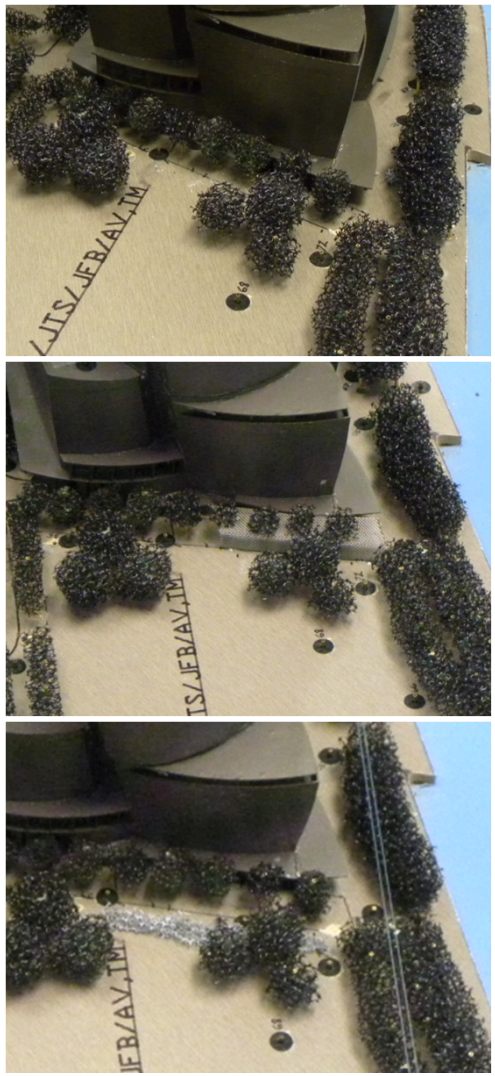

Image 6 – Close ups of Configuration C (top), Configuration D (middle) and Configuration E (bottom)

1.1 Purpose of Report

This report has been prepared on behalf of Crown Resorts Limited to accompany a State Significant Development Application (SSDA) for the Crown Sydney Hotel Resort at Barangaroo. The Hotel Resort is proposed in accordance with the approved Barangaroo Concept Plan (as modified) and is located within Barangaroo South.

1.2 Site Location and Context

Barangaroo is located on the northwestern edge of the Sydney Central Business District (CBD), bounded by Sydney Harbour to the west and north; the historic precinct of Millers Point (for the northern half), The Rocks and the Sydney Harbour Bridge approach to the east; and a range of new development dominated by large CBD commercial tenants and the King Street Wharf/Cockle Bay precinct to the south.

The 22 ha Barangaroo site is generally rectangular in shape and has a 1.4 km harbour foreshore frontage, with an eastern street frontage to Hickson Road. The site has been divided into three distinct redevelopment areas (from north to south) – the Headland Park, Barangaroo Central and Barangaroo South, and has been subject to multiple investigations that detail the physical and natural characteristics of the site.

1.3 Crown Sydney Hotel Resort Development

The Crown Sydney Hotel Resort development will comprise a single high rise building that will include a hotel, VIP gaming facilities and residential apartments. More specifically approval is sought for:

- construction and use of a hotel, VIP gaming facilities and residential apartment building with associated retail and restaurant uses and a basement car park to accommodate parking and servicing allocated to the proposed uses within the development, comprising a total Gross Floor Area of approximately 77,500m^2 and a maximum building height of approximately 271 metres (RL 275);
- associated building signage; and
- provision of services and utilities required to service the building.

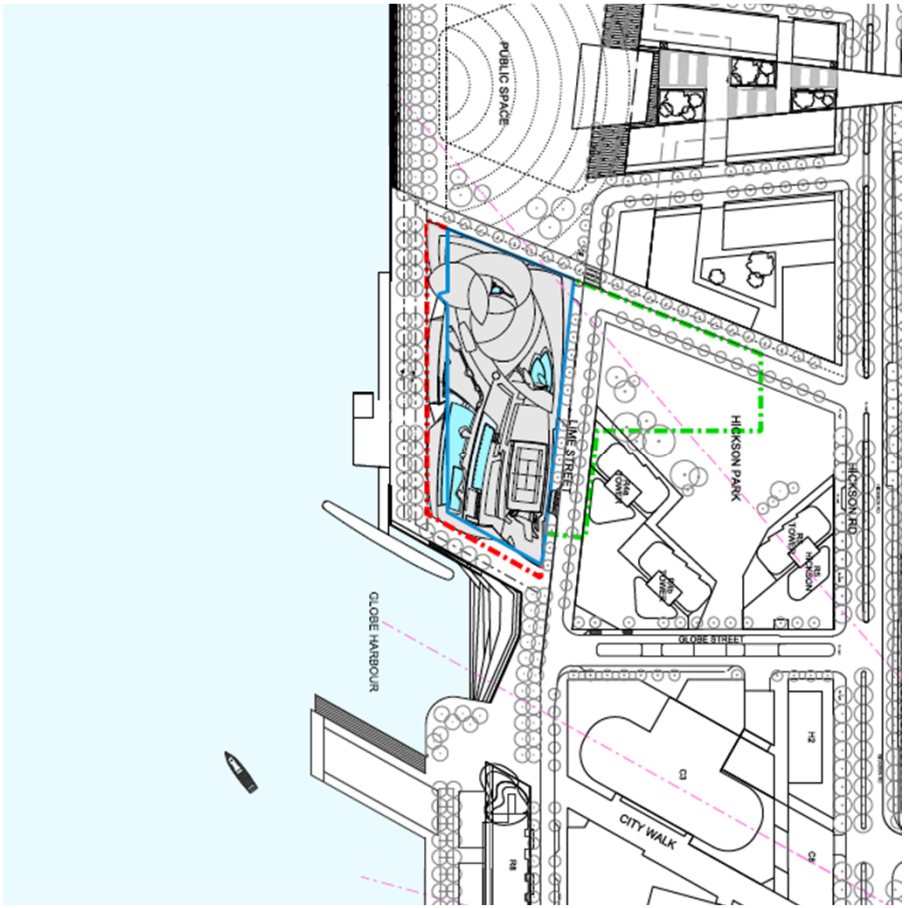

Image 7 – Site Plan

2. METEOROLOGICAL DATA

The long-term weather data recorded at the Sydney International Airport (for the period of 1986 to 2013) were analyzed for the Summer (November through April) and Winter (May through October) seasons. Image 8 graphically depicts the directional distributions of wind frequencies and speeds for the two seasons. Winds from the north-northeast, northeast, couth and south-southeast are predominant during the summer, while winter winds tend to originate from the west-southwest through northwest and the southerly directions, as indicated by the wind roses. Strong winds of a mean speed greater than 30 km/h measured at the airport (at an anemometer height of 10m) occur more often in the summer (15.0%) than in the winter (10.8%).

Wind Speed (km/h)	Probability (%) Summer	Winter
Calm	7.8	9.9
1-10	18.1	21.2
11-20	30.9	35.9
21-30	28.2	22.2
31-40	11.5	7.8
>40	3.5	3.0

Image 8– Directional Distribution (%)of Winds (Blowing From) at Sydney International Airport (1986 – 2013).