Brentnall Technical Solutions

Our ref: T10007

17 November 2011

Sydney Superyacht Marina
PO Box 436
ROZELLE NSW 20392

Att: Tony Ellis

Subject: **Building Code of Australia Capability Assessment**
Sydney Superyacht Marina

Reference is made to the proposed development and our engagement to review the extent of compliance achieved by the current design with the relevant requirements of the Building Code of Australia 2011 (BCA).

As requested, we have conducted a review of the proposed design against the applicable requirements of BCA. The results of that review are contained in the following report.

Should you require clarification of any matter contained within the report, please contact the undersigned.

Yours faithfully

Mark Brentnall
Brentnall Technical Solutions Pty Ltd

Assessment report

Building Code of Australia

Prepared for

Sydney Superyacht Marina

Regarding

Sydney Superyacht Marina

Reference: T10007

17 November 2011

Brentnall Technical Solutions Pty Ltd • Locked Bag 2005 Croydon LPO NSW 2132

Tel 02 8065 6365 • Fax 02 8065 4425 • ABN 43 140 418 739

Email info@technicalsolutions.com.au • Web www.technicalsolutions.com.au

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Executive Summary

1.1 General

Arising from the assessment undertaken it is considered that, on compliance with the recommendations below, that the proposed building works will comply with the applicable requirements of the Building Code of Australia.

1.2 Recommendations

(i) Access must be provided to, within and between all buildings to the requirements of AS 1428.1-2009.

(ii) A system of fire hydrants must be provided to serve each building, requiring the provision of a Fire Brigade Booster Valve Assembly at the entry to the site.

(iii) The eastern and western buildings must be provided with a sprinkler system, requiring the provision of a Fire Brigade Booster Valve Assembly at the entry to the site

1.3 Conclusion

On the basis of the contents of this report, on satisfaction of the matters identified above it is considered that the design of the proposed building works is capable of complying with the applicable requirements of the Building Code of Australia without requiring alterations to the plans that would necessitate the lodgement of an application to modify and Development Consent that is issued.

Author:

Mark Brentnall
For **Brentnall Technical Solutions Pty Ltd**

Introduction

2.1 Basis of Assessment

Location

The building works being the subject of this report are to be undertaken incorporate two commercial buildings with an associated carpark building situated at James Craig Road, Rozelle Bay.

Report purpose

This report has been prepared in response to a request from Sydney Superyacht Marina to review the proposed design in relation to its level of compliance with the Building Code of Australia, 2011 edition.

Basis of report

This report is based on:

(a) A review of the documentation identified in Annexure 1;
(b) Building Code of Australia (BCA) 2011, and the NSW Variations;
(c) Environmental Planning and Assessment Act, 1979, and Regulations;

Exclusions

This report does not imply, nor make reference to the extent of compliance achieved by the building with any other legislation relating to the construction or use of the proposed building.

2.2 Building Description

Building Code of Australia (BCA)

Classification	Rise in storeys	Type of construction
Class 3 – Dormitories Class 5 – Offices Class 6 – Retail & restaurants Class 7a – Carparking Class 9b – Yacht club	The eastern and western buildings have a rise in storeys of 2 The carpark building has a rise in storeys of 3	Eastern building – Type C construction required Western building & carpark – Type B construction required Note: Where Compartmentation is not provided between levels the eastern building must be constructed as Type B construction due to the compartment size within the building

Compartment area	Compartment volume	Effective height	Climate zone
Eastern building – 3,346m²	Eastern building – 10,038m²	Less than 12m	5
Western building – 2,799m²	Western building – 8,397m²		
Carpark – NA	Carpark – NA		

Building assessment

Section B – Structure

BCA Part B1 – Structural provisions

Requirement	Comment
Structural design compliance with Australian Standards	The structural design of the building will be certified to the requirements of the applicable Australian Standards AS/NZS 1170.0-2002 – General principles AS/NZS 1170.1-2002 – Permanent, imposed & other actions AS/NZS 1170.2 – Wind actions AS 1170.4 – Earthquake loads AS 3700-2001 – Masonry AS3600-2001 – Concrete AS 4100-1998 – Steel structures AS/NZS 4600-2005 – Cold formed steel structures NASH Standard – Residential & low rise steel framing
Design compliance with Australian Standards	Compliance with the applicable Australian Standards to be incorporated in architectural specification. AS/NZS 1664 Part 1 or 2-1997 – Aluminium construction AS 1562.1-1992 – Metal sheet roofing AS 1288-2006 – Glazing AS 2047-1999 – Windows in buildings AS 1562.1-1992 – Metal roofing

Section C – Fire resistance

BCA Part C1 – Fire resistance & stability

Requirement	Comment
Fire rating of building structure	**Carpark** The following fire resistance levels will be achieved by the building structure: Load bearing external walls & columns within 18m of the eastern building: 180/60/- Loadbearing walls more than 18m from the eastern building: -/-/- Non loadbearing walls: -/-/- Internal loadbearing walls – ground & 1st floor: 180/-/- Internal loadbearing walls – upper floor: -/-/- Floors: -/-/- Roof: -/-/- **Eastern & western buildings** The following fire resistance levels will be achieved by the building structure: Load bearing external walls within 18m of the carpark: 180/60/- Loadbearing walls more than 18m from the carpark: -/-/- Non loadbearing walls: -/-/- Internal loadbearing walls – ground floor: 180/-/- Internal loadbearing walls – upper floor: -/-/- Floors: -/-/- Roof: -/-/-
Fire hazard properties of construction materials	Floor linings & coverings, including lift cars, will have a critical radiant heat flux not less than 2.2 and a maximum smoke development rate of 750 percent-minutes Walls & ceiling linings will have a smoke growth rate index not more than 100 or an average specific extinction area less than 250m²/kg. materials will be selected as follows **Dormitories** Walls & ceilings in public corridors – Groups 1 or 2 Walls & ceilings in other areas – Groups 1, 2 or 3 **Offices, shops & restaurants** Walls – Group 1, 2 or 3 Ceilings– Group 1 or 2 **Yacht club** Walls & ceilings in public corridors – Group 1 Walls & ceilings in other areas – Groups 1, 2 or 3

BCA Part C2 – Compartmentation and separation

Requirement	Comment
Floor area and volume limitations	By virtue of the area of the connected space within the Eastern Building, that building will be constructed as Type B Construction. There are no floor area or volume limitations relating to the carpark.
Compartmentation requirements	With the Eastern & Western Buildings being Type B Construction each building has a compartment size within the maximum permissible area. As such, there is no Compartmentation required within either building.
Separation of classifications	The Eastern & Western Buildings will be constructed with fire resistance levels appropriate to accommodate Class 3, 5 6 & 9b uses. As such, it is not necessary to separate each particular usage classification within the building.
Separation of lift shafts	The lift shaft is not required to be fire isolated.
Separation of equipment & electricity supply	There are no requirements for the separation of equipment or electricity supply within the building.
Separation of dormitories	The proposed dormitories will be separated from the remainder of the building by walls having an FRL not less than 90/90/90 and a floor having an FRL not less than 30/30/30.
Public corridors in Class 2 & 3 buildings	The corridor serving the dormitories will be fitted with a smoke door (automatic closing or self-closing) such that the length of the corridor does not exceed 40m.

BCA Part C3 – Protection of openings

Requirement	Comment
Protection of openings in external walls	There are no openings in the external walls that require protection.
Protection of openings in fire walls, fire stairs & lift shafts	There are no required fire isolated stairways, lifts or service shafts.
Residential bounding construction	The doorways to each of the dormitories will be fitted with 35mm solid core doors.
Openings for services	Openings in the floors, walls & ceilings for services will be protected to maintain the fire resisting performance of the wall. This will be limited to the construction surrounding the dormitories.

BCA Section D – Access & egress

BCA Part D1 – Provision for escape

Requirement	Comment
Number of exits required	Complies
Exit travel distances & distance between alternative exits	The provision of exits within each of the buildings is such that the exit travel distances are within the permitted maximums.
Dimensions of exits & paths of travel to an exit	The aggregate exit width is generally acceptable for the anticipated populations of the buildings. The exits proposed to serve the yacht club at the upper floor of the western building are adequate to serve a population of 560 people. Additional population may be accommodated in this area by increasing the aggregate egress width.
Stairway design	Each stairway may be constructed as a non-fire-isolated exit. The stairways serving the carpark will be separated from the ground floor of the building by construction having an FRL not less than 60/60/60.
Number of people accommodated	The population of the building cannot be accurately determined at this time due to the lack of detail provided in relation to the building fitout. Notwithstanding that, the exit systems and sanitary facilities have been designed to accommodate the anticipated maximum populations.

BCA Part D2 – Construction of exits

Requirement	Comment
Stairway design	The design of the stairways within the building will be designed to meet the requirements of BCA Part D2. The existing design is capable of complying with the applicable requirements without significant alteration to the building design.
Balustrades & handrails	The balustrades and handrails within the building will be designed to meet the requirements of BCA Part D2. The existing design is capable of complying with the applicable requirements without significant alteration to the building design.
Exit doors	The exit doors proposed are capable of achieving compliance without significant alteration to the building design.

BCA Part D3 – Access for people with disabilities

Requirement	Comment
General building access requirements	Access will be provided to and within all areas of the buildings normally used by the occupants. Access will be provided from all accessible parking spaces on the site and from the street boundary. That access pathway will comply with the provisions of AS 1428.1-2009 including all crossfalls and gradients. Lift cars will be designed to the requirements of AS 1428.1-2009 In that regard, compliant access is achievable without significant alteration to the building design.
Carparking	3 accessible parking spaces will be provided. The configuration of each space will comply with the requirements of AS/NZS 2890.6-2009.
Signage	Will be provided as required
Tactile indicators	Will be provided to the top and bottom of all stairways and to all overhead obstructions lower than 2m.
Glazing	Glazing installed on an accessway that does not incorporate transoms, all fully glazed doors and all glazing capable of being mistaken for a doorway or opening will be clearly marked to the requirements of Clause 6.6 of AS 1428.1-2009.

BCA Section E – Services & equipment

BCA Part E1 – Fire fighting equipment

Requirement	Comment
Fire hydrants	The buildings will be served by a system of fire hydrants installed to the requirements of AS 2419.1-2005. That system of fire hydrants will require the provision of a Fire Brigade Booster Valve Assembly at the entrance to the site and may require the provision of a booster pump, which must be accommodated on the site.
Fire hose reels	The buildings will be provided with a system of Fire Hose Reels to the requirements of AS 2441-2005.
Fire sprinklers	Not required, the carpark is deemed to be an open deck carpark
Portable fire extinguishers	Will be provided throughout the building to the requirements of AS 2444-2001.
Fire control centres	Not required

BCA Part E2 – Smoke hazard management

Requirement	Comment
Smoke detection & alarm systems	A smoke detection and alarm system will be provided to the dormitory areas of the eastern building to the requirements of AS 1670.1-2004.
Sprinkler system	Because the fire compartment containing the Class 6 portions of the building will have a fire compartment size of greater than 2,000m² the eastern and western buildings will be provided with a sprinkler system

BCA Part E3 – Lift installations

Requirement	Comment
Stretcher facility	Not required – less than 12m effective height
Emergency lifts	Not required – less than 25m effective height
Landings	Access to the landings will comply with AS 1428.1-2009
Accessibility	Will comply with the provisions of AS 1735 Part 2, 3 or 16 and be designed with the features required by BCA Table E3.6b
Fire service controls	Not required – less than 12m effective height

BCA Part E4 – Emergency lighting, exit signs & warning systems

Requirement	Comment
Emergency lighting	Will be provided throughout each building to the requirements of AS 2293.1-2005.
Exit signage	Will be provided throughout each building to the requirements of AS 2293.1-2005.
Sound systems & intercom systems for emergency purposes	Not required as the building does not contain any areas that could be assessed as being theatres, public halls or the like.

BCA Section F – Health & amenity

BCA Part F1 – Damp & weatherproofing

Requirement	Comment
Stormwater drainage	Will be provided to the requirements of AS/NZS 3500.3-2003
Waterproofing	Will be provided to the requirements of AS 3740-2004
Damp proofing	Will be provided as required
Floor wastes	Not required

BCA Part F2 – Sanitary & other facilities

Requirement	Comment
Sanitary facilities	The sanitary facilities
Accessible facilities	Accessible sanitary facilities have been provided as required. The accessible facilities will be designed to the requirements of AS 1428.1-2009.

BCA Part F3 – Room sizes

Requirement	Comment
Ceiling heights	The following minimum ceiling heights will be maintained a) 2.1m to all corridors & passageways & sanitary compartments b) 2.0m above the nosing line of stairways c) 2.4m to all other areas

BCA Part F4 – Light & ventilation

Requirement	Comment
Artificial lighting	Will be provided to the requirements of AS/NZS 1680.0-2009
Ventilation of rooms	Will be provided to the requirements of AS 1668.2-1991
Position of water closets and airlocks	Complies
Carpark ventilation	The carpark is an open deck carpark, no ventilation is required
Kitchen exhaust	Kitchen exhaust ventilation will be provided as part of the detailed fitout of each restaurant space.

BCA Part F5 – Sound transmission & insulation

Applies to the Dormitory areas of the eastern building

Requirement	Comment
Airborne sound insulation ratings	The design of the construction separating residential areas will have sound insulation ratings as determined under BCA Spec F5.2.
Impact sound insulation ratings	Walls having an impact sound rating requirement will be of discontinuous construction (20mm cavity between two separate leaves and no mechanical linkage except for resilient ties).
Ratings for floors	Floors bounding sole occupancy units will have a Rw+Ctr (airborne) rating of not less than 50 and an Lnw+Ci (impact) rating of not less than 62.
Ratings for walls	Walls between sole occupancy units will have a Rw+Ctr (airborne) rating of not less than 50. Walls bounding the sole occupancy units will have an Rw (airborne) rating not less than 50. Entry doors to sole occupancy units will have an Rw rating not less than 30.
Ratings for services	Services will be provided with insulation achieving a Rw+Ctr (airborne) rating of not less than 40 (where the room is a habitable room other than a kitchen) or 25 (non-habitable rooms).
Pumps	Will be provided with flexible couplings at the point of connection between the service pipes and the pump.

BCA Section G – Ancillary provisions

BCA Part G1 – Minor structures & components

Requirement	Comment
Cool rooms & vaults	Not applicable – to be incorporated in the fitout designs.

BCA Part G2 – Heating appliances, fire places chimneys & flues

Not applicable

BCA Part G3 – Atrium construction

Not applicable

BCA Part G4 – Construction in alpine areas

Not applicable

BCA Part G5 – Construction in bushfire prone areas

Not applicable

BCA Section J – Energy efficiency

BCA Part J1 – Building fabric

Requirement	Comment
Application of Part	Applies to the eastern and western buildings
Thermal construction generally	Insulation must comply with AS/NZS 4859.1-2002
Roof & ceiling construction	A total R-value of R3.2 must be achieved (except where adjusted for a reduction in insulation coverage such as down lights or exhaust fans)
Roof lights	Not applicable
Walls	External walls forming part of the envelope of the conditioned space must have a minimum Total R-value of R2.8 Internal walls that form the envelope to a conditioned space must achieve a minimum Total R-value of R1.0
Floors	No insulation required

BCA Part J2 – Glazing

Requirement	Comment
Glazing	The proposed glazing will be selected using the Australian Building Codes Board calculator http://www.abcb.gov.au/index.cfm?objectid=73874810-28B9-11DE-835E001B2FB900AA
Shading	Where required, shading must comply with the requirements of BCA Clause J2.5.

BCA Part J3 Building sealing

Requirement	Comment
Windows and doors	Draft seals must be fixed, except where windows comply with AS 2047-1999. The entry doorway to the marina must be self-closing.
Exhaust fans	Must be fitted with a damper
Construction of roofs, walls and floors	The joints between all walls, floors and ceilings must be sealed to prevent drafts.

BCA Part J5 Air-conditioning & ventilation systems

Requirement	Comment
Air-conditioning and ventilation systems	Air conditioning and ventilation systems to the carpark and marina office must be designed to the requirements of BCA Part J5
Heating & cooling systems	Will be a combination of (A) a solar heater; or (B) a gas heater; or (C) an oil heater, but only if reticulated gas is not available at the allotment boundary; or (D) a heat pump heater; or (E) a solid-fuel burning heater; or (F) a heater using reclaimed heat from another process such as reject heat from a refrigeration plant; or (G) a combination of (A) to (F); or (H) electric only where a) reticulated gas is not available at the boundary line and the heating power load does not exceed 45W/m² b) a fixed space heating appliance installed outdoors, is controlled to automatically turn off when not needed by an outdoor air temperature sensor, timer, motion detector, or the like.
Miscellaneous exhaust systems	Exhaust systems with an air flow rate of more than 1000L/s must be designed to the requirements of this clause

BCA Part J6 Artificial lighting & power

Requirement	Comment
Artificial lighting	The lighting to the carpark, eastern and western buildings will be within the lighting power loads detailed under BCA Part J6 including and external or decorative lighting.

BCA Part J7 Hot water supply & swimming pool & spa pool plant

Requirement	Comment
Hot water supply	Any new hot water supply will comply with AS/NZS 3500.4-2003

BCA Part J8 Access for maintenance and facilities for monitoring

Requirement	Comment
Access for maintenance	Access must be provided to all energy efficiency measures for maintenance as required.
Facilities for energy monitoring	Each building must have the facility to record individually the energy consumption of: a) Air-conditioning plant b) Artificial lighting c) Appliance power d) Central hot water supply e) Lifts

Annexure 1 Assessed documentation

The following documentation has been reviewed in the preparation of this report

Plans & specifications

Architectural documentation as prepared by Scott Carver Pty Ltd

Drawing no	Title	Revision
DA00	Title sheet	B
DA01	Site analysis	B
DA02	Location plan	B
DA03	Perspectives – Sheet 1	B
DA04	Site plan	B
DA05	Ground floor plan	B
DA06	First floor plan	B
DA07	Roof plan	B
DA08	Elevations – sheet 1	B
DA09	Elevations – sheet 2	B
DA10	Sections	B
DA11	Shadow diagrams	A
DA12	Perspectives – Sheet 2	B