Monday, 11 February 2019

Project No. 00012998

NCSLSC c/o
Bergstrom Architects
Suite 103, 3 Eden Street
NORTH SYDNEY NSW 2060

ATTENTION Ms Cecille Cura
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NORTH CRONULLA SLSC UPGRADE

Lindsay Dynan Consulting Engineers Pty Ltd (LD) have undertaken a preliminary structural design for the proposed redevelopment of the North Cronulla Surf Lifesaving Club (NCSLSC). The design scheme was based upon preliminary architectural drawings by Bergstrom Architects, received 15/07/2016. We have since reviewed the latest set of Architectural drawings received 04/02/2019 and have updated our Civil documentation accordingly.

The structural design scheme is presented on the following sketches issued for costing and information on 18/04/2016 and 18/07/2016 respectively:

- ST_01[1] to ST_08[1]
- SK01 [A] to SK03 [A]

As the site is identified as 'coastal use' area within the State Environmental Planning Policy (Coastal Management) 2018, the authority must be satisfied that the proposed development is not likely to cause increased risk of coastal hazards. It must be demonstrated that the building will be capable of withstanding severe weather occurrences - namely costal storm surge events prior to the construction of the proposed seawall.

As the structure is in the early stages of design, the structural engineering plans are only at a preliminary level of detail. Nonetheless, the structural scheme has been developed with consideration of the possible extreme weather events and these will be taken into consideration in the structural design of the building.

The geotechnical investigation provided to LD indicates that the club is situated over sandstone at depth of approximately 12m. The sand is loose at ground level and increases in stiffness and compaction with depth. The new building will be supported on piles located beneath all walls and columns and founded in dense sands or sandstone below. It is proposed for the ground floor slab to be independent of the main structure and supported on the higher-level sand layer.

In the event of a storm surge we would expect flooding to the ground floor section of the new club area. The building structure will be designed and detailed to account for severe exposure to wind swept salt water. All electrical outlets are to suitably rated for exposure and able to be isolated from the main structure. Outlets should be placed above the predicted storm surge level. The ground floor structure

in particular will be designed and detailed for potential to be submerged in sea water during a storm surge. All racking and equipment stored at ground level will need to be durable to salt water exposure.

In a significant storm event, erosion of the sands beneath and surrounding the building may occur; however the structure will remain stable as the building will be supported on piles designed to support the lateral loads imposed by the flooding/waves directly to the piles and to the structure over. The height and magnitude of the storm surge event will need to be provided by a specialist coastal engineer consideration in the detailed design of the piles and building structure.

In the ultimate design case, the ground floor slab may be subjected to localised damage as the slab experiences washout of the supporting sands. The concrete slab will be repairable as it will be designed independent of the main structure and.

LD understands that the site is categorised as 'Class 4 Acid Sulphate Soils'. As per Cl 6.1 of SSLEP, an acid sulphate soils investigation is required where works more than 2m below the natural ground surface is proposed. The piles will be founded well below 2m and therefore will trigger the need for an acid sulphate soils investigation. In addition to this, the recent inclusion of a below-ground rainwater tank will require excavation and a suitable batter to form the base and walls of the tank. An acid sulphate soils investigation can be undertaken by a Geotechnical Engineer prior to detailed design. Following this we will develop an acid sulphate soils action plan considering potential concrete additives, additional cover to reinforcement, specialist concrete types and protective membranes if required.

Should you require any further advice or clarification of any of the above, please do not hesitate to contact us.

Yours faithfully
LINDSAY DYNAN
CONSULTING ENGINEERS PTY LIMITED

Lachlan Drake
Senior Engineer

Reviewed by

FOR

Chris Styan
Associate

Encl.
LD ST_01[1] to ST_08[1]
LD SK01 [A] to SK03 [A]

13-012-DA-001-Site Plan -BB
13-012-DA-100-Ground Floor - BB
13-012-DA-101- Level 1 – BB
13-012-DA-12-Level 2 - BB

JK Report 28947ZRrpt Dated 24 March 2016