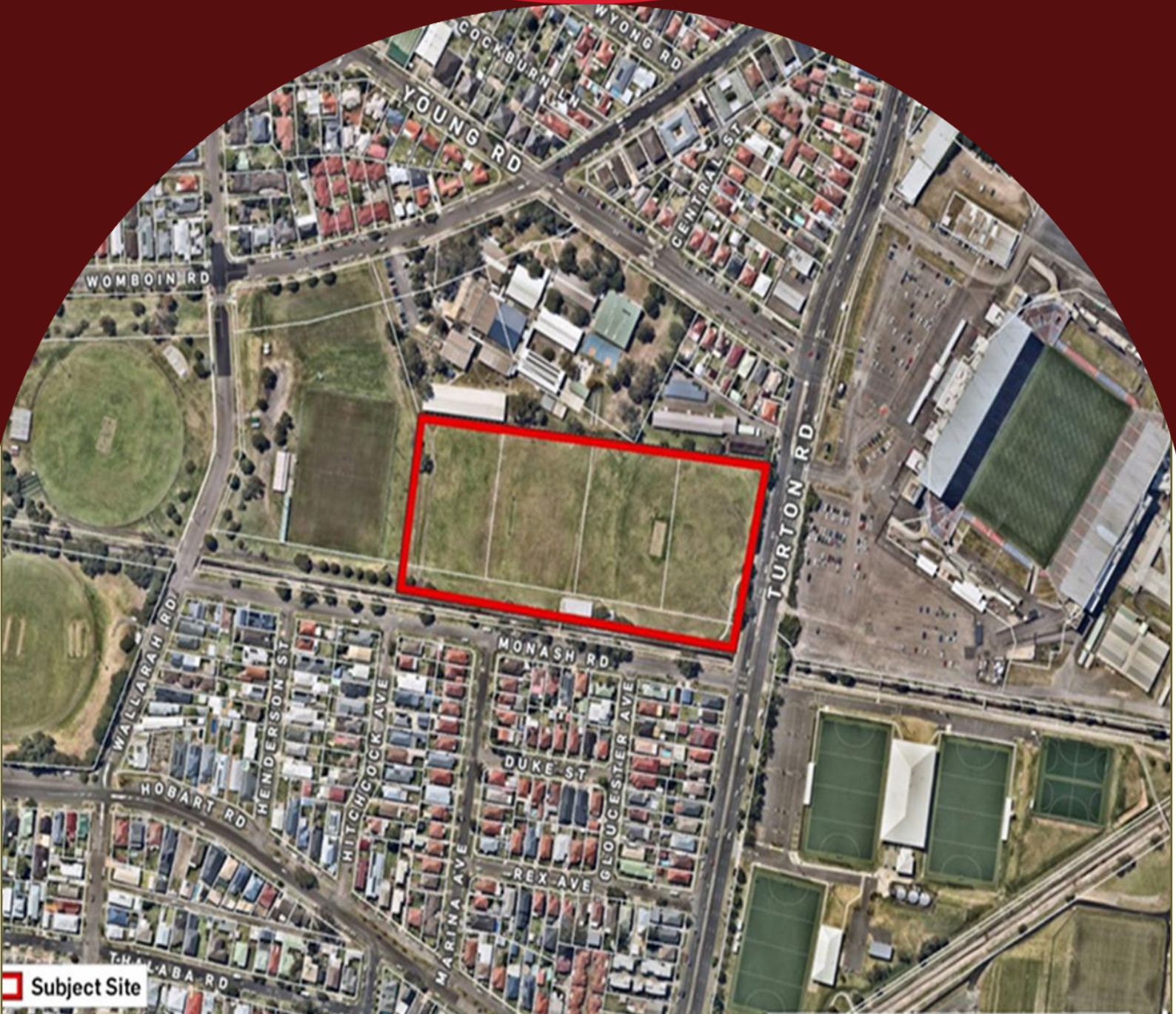


Hunter Indoor Sports Centre

Prepared for Basketball Association of Newcastle

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Subject Site

Document Information

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PROJECT NAME:	Hunter Indoor Sports Centre
REPORT TITLE:	Flood Impact Assessment Building Structure
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Hunter Indoor Sport Centre – Flood Assessment: Building Structure

Northrop Consulting Engineers has been commissioned by Basketball Association of Newcastle Limited (BANL) to prepare this report in accordance with the technical requirements of the Secretary’s Environmental Assessment Requirements (SEARs), and in support of the State Significant Development Application (SSD- 65595459) for the proposed Hunter Indoor Sport Centre with courts, indoor stadium, amenities and associated civil and landscaping works, at 2 Monash Road and 24 Wallarah Road, New Lambton.

The purpose of this engineering report is to comment on the potential impact flood waters may have on the proposed building Structure.

SITE AND PROJECT DESCRIPTION

The site is located at 2 Monash Road and 24 Wallarah Road, New Lambton, within the Newcastle local government area (LGA). The site comprises multiple parcels of land and is legally described as:

- Lot 2380 DP755247
- Lot 2379 DP755247
- Lot 2378 DP755247
- Lot 2377 DP755247
- Lot 1 DP1304081

The site is identified in the figure below.



Figure 1 – Site Location

Reference Material & Data

The assessment of the building structure has been undertaken in accordance with the following:

- Flood Impact Assessment (FIA) prepared by Torrent as part of the DA submission.
- Australian Building Codes Board 'Construction of Buildings in Flood Hazard Areas' Standard.
- Guidance on Building in Flood Prone areas - Reducing Vulnerability of Buildings to Flood Damage (prepared for the Hawkesbury-Nepean Floodplain Management Steering Committee).

The above documents include flood modelling data together with guidelines and recommendations on the assessment of building structures when subjected to flood waters, including:

- Maximum depth of flooding at the location of the Building in the order of 1.4m.
- Maximum velocity of flood water in the order of 1.7 m/s.
- Hydrostatic forces.
- Hydrodynamic forces.
- Debris impact.
- Impact on Structure foundation material. i.e. scour.

PROPOSED BUILDING STRUCTURE & FOUNDATION

Based upon the DA documentation for the proposed sports centre, the building structure is likely to consist of reinforced concrete slab on ground with concrete block subfloor. Structural Steel portal frames with metal cladding will form the basis of the superstructure.

Based upon the site-specific Geotechnical report prepared by Kleinfelder Ref# 24002155, dated 23rd November 2023, we envisage that the building structure will be supported on piles founded in the medium dense sands at a depth in the order of 8m below existing ground level.

SUITABILITY OF BUILDING MATERIAL & STRUCTURE TO RESIST THE IMPACT OF FLOOD WATERS.

Ground Floor and Footings

Subject to detailed design, the concept or DA level design documentation indicates the building incorporates or is capable of incorporating flood compatible materials and structural elements as outlined below.

Based upon available geotechnical information, the combination of concrete slab on ground supported on piles will provide high resistance to the potential impacts resulting from flooding, including;

- Provides robust attachment (Fixity) to piling structure and anchoring to foundation material to resist forces likely to result from flood waters.
- Provides good resistance to erosion and scouring of foundation material in the event of flooding.
- Unaffected by immersion for periods likely resulting from flood event.
- Reinforced concrete is very robust with high resistance to impact loads from debris and scouring.
- The mass of the concrete floor is also adequate to resist the potential buoyancy forces that may result from the flood waters and inundation.

External Walls and Vertical Structure

The proposed building structure throughout the ground level is likely to consist of structural steel portal frames, metal cladding. Pre-cast concrete elements may also be considered appropriate for parts of this type of structure.

These elements are very resistant to the impacts of flood waters and likely to remain unaffected in the event of flood waters inundating the site.

Advantages of these materials include:

- Unaffected by immersion for periods likely resulting from flood event.
- Reinforced concrete and structural steel are very robust with high resistance to impact loads from debris and scouring.
- The mass of the concrete floor is also adequate to resist the potential buoyancy forces that may result from the flood waters and inundation.

Lateral Forces resulting from Flood waters

In addition to the above, preliminary assessment of the potential impact of hydrodynamic forces on the building structure indicates that these forces are likely to be similar to those resulting from wind and earthquake. Whilst we expected hydrodynamic forces may be larger than those resulting from wind and earthquake events, we believe the building structure can be designed to accommodate the impact of such forces.

CONCLUSION

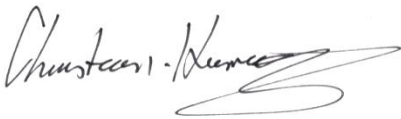
Having reviewed the DA documentation for the proposed Hunter Indoor Sports Centre, at 24 Wallarah Rd, New Lambton, together with relevant flood impact assessments and site-specific geotechnical report, we note the following;

- The building structure is proposed to be constructed of flood resistant materials
- The proposed building structure adopting reinforced concrete elements for the Ground floor slab and footings will provide a robust structure that is highly resistant to the likely impacts resulting from flooding waters. i.e., scour, hydrodynamic forces, impact of debris, & buoyancy.

From our assessment of the information presented herein, we believe the proposed building structure can be designed to resist the expected forces from floodwaters and remain structurally adequate in the event of flooding.

We trust the above meets your requirements; however, should you have any queries, please feel free to contact the undersigned.

Yours sincerely,



Christian Kirrage

Principal | Structural Section Manager

BEng (Civil) (Hons 1) MIEAust CPEng NER (Structural)

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