



Robert **Bird** Group

Civil & Structural Engineering Review
Report, of

**CBD and South East Light Rail (CSELR)
Project
Environmental Impact Statement (EIS)**

Issue: C

Prepared For: Australian Turf Club

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Signing for and on behalf of
Robert Bird Group Pty Ltd
Date: 19th December 2013

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1.0 Introduction

1.1 Report scope

Robert Bird Group Pty Ltd (RBG) have been engaged by Australian Turf Club (ATC) to conduct a civil and structural engineering review of the Environmental Impact Statement (EIS) which was publicly exhibited by Transport NSW for the CBD and South East Light Rail (CSELR) project on 12 December 2013.

This report summarises the RBG civil and structural engineering review of the EIS. The review focuses on impacts, considerations, and opportunities of the CSELR project as it pertains to the ATC Royal Randwick Racecourse (RRR), adjoining ATC property, and associated property, infrastructure, and servicing.

The following report will provide advice in the form of a general review of the proposed light rail scheme, including comments on the civil and structural aspects relevant to, or affecting, ATC property or operations; and

1.2 References

The following documents were referenced in this review:

- CBD and South East Light Rail Project Environmental Impact Statement – Volumes 1-6, dated November 2013;
- Light Rail – ATC Information Briefing.
- Randwick UAP Council Briefing Presentation, Department of Planning.
- RRR plans and surveys as provided by ATC.

1.3 Abbreviations

ATC	Australian Turf Club
CSELR	CBD and South East Light Rail
EIS	Environmental Impact Statement
LRV	Light Rail Vehicle
RBG	Robert Bird Group
RRR	Royal Randwick Racecourse
TfNSW	Transport New South Wales
UAP	Urban Activation Precinct

1.4 CSELR Project Description

The CSELR proposal comprises construction and operation of a light rail service from Circular Quay to Kingsford and Randwick via Surry Hills. A summary of the CSELR project is contained within the EIS.

The CSELR as it relates to the ATC is broadly categorised into the following CSELR elements:

- Randwick Line, including
 - Alison Road track alignment;
 - Wansey Road track alignment;
 - UNSW High Street Stop;
 - Royal Randwick Racecourse Stop; and,
 - Wansey Road Stop;
- Randwick LRV stabling facility.



Figure 1.1 - Proposed alignment of CSELR Project (source EIS Figure 1.2)

2.0 Review of CSELR Environmental Impact Statement

2.1 Wansey Road Alignment, Wansey Stop

a) Description of Issue

EIS Section 6.26 notes that gabion or crib walls may be adopted for proposed retaining walls along Alison and Wansey Road. Elsewhere in the EIS (i.e. Table 15.21), the retaining solution is referred to as piled.

Comment

EIS is contradictory on the proposed retaining solution. It is understood that the engineered solution is to be the piled and reinforced concrete retaining wall (as illustrated in Figure 5.48 of the EIS).

Gabions and crib walls typically have greater land-take. Also these retaining structures are not appropriate for suspending a shared path. Final solution to be engineered to allow heavy vehicle crossings for existing and future developments, complete without amendment to the retaining structures. In addition all retaining structures need to be treated with an architectural finish and landscaped solution which requires minimal maintenance by TfNSW.

b) Description of Issue

EIS Section 5.6.2 details a suspended shared path over ATC land. The path is suspended off a new concrete retaining wall founded on piles. Wansey Road existing retaining wall to be replaced. Approximately 125m in length up to 4.5m in height. The retaining wall requires land acquisition from ATC.

Comment

Construction of the retaining wall will likely impact RRR to enable construction of the piled footing (loss of trees and piling rig access), and maintenance of the suspended path will likely require an easement inside RRR for inspection and maintenance access. The easement must not impact current ATC operations and must cater for the proposed UAP development including basement structure to be constructed without interfering with the High Street and Wansey Road stops.

Treatment of the retaining wall to be confirmed, and considered in relation to the amenity of the future stables development.

A fence providing screening of Royal Randwick Racecourse (RRR) is required from the suspended path to horse training and stabling areas.

RRR vehicle clearances from suspended path to be considered. A vehicle exclusion zone is likely to be required to prevent impacts on the structure. This may impact RRR circulation.

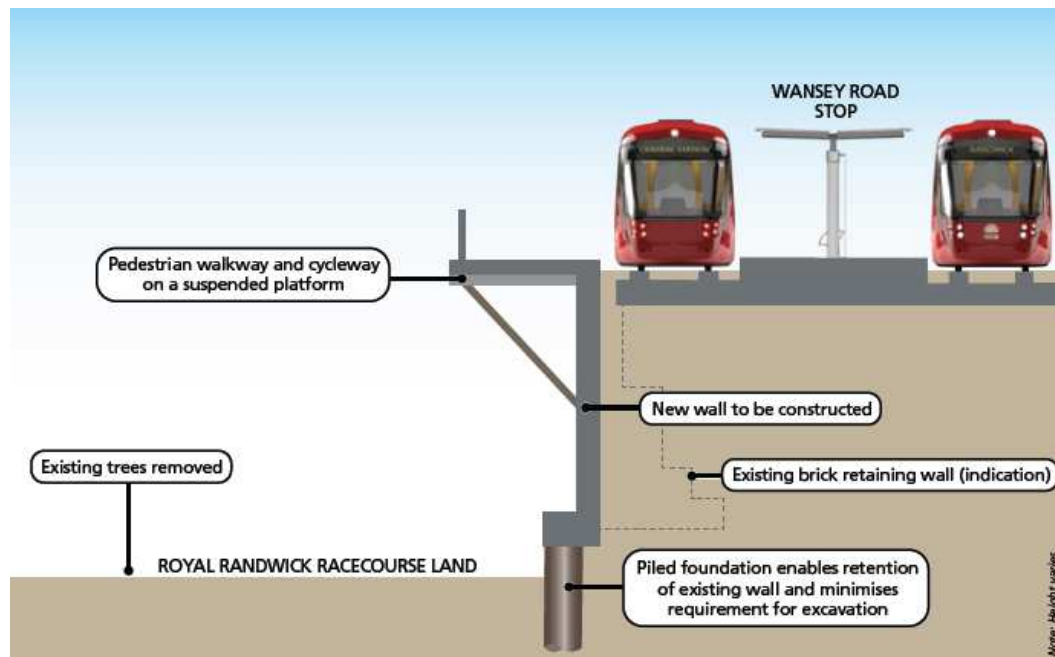


Figure 2.1 - Typical section through Wansey Road Stop (sourced from EIS Figure 10.5).

c) Description of Issue

EIS Appendix J, section O.17 identifies a mitigation measure, proposed to reduce construction impacts at High Cross Park, which is to locate a satellite construction compound in the vicinity of Wansey Road Stop. This may impact ATC access and ATC preparation areas.

Comment

Subject to the compound extents, this may not impact ATC other than as will already be impacted as part of land acquisition; however the compound must not cut off access. It is unclear how the compound would be configured and what ATC areas will be used, TfNSW to clarify nil impact to ATC operations.

d) Description of Issue

EIS Table 6.1. Table describes early works activities, including:

- Demolition Works (where required for Early Works)
- Implementation of road configuration changes identified in the early works package.
- Undertaking long lead time utility relocation and modification works.
- Early light rail works, such as preparation works for the track slab construction.

Early Works activities may include works that impact on RRR, i.e. loss of access, demolition of ATC buildings and reservoir, and construction access for piling rigs along Wansey Road.

Comment

Impacts on ATC as part of Early Works may trigger an early requirement to relocate existing stabling and other facilities (earlier than Main Works activities). Identify extent of Early Works that impact on RRR.



Figure 2.2 – RRR impacts along Wansey Road and Alison Road.

2.2 Alison Road Alignment and Royal Randwick Racecourse Stop

e) Description of Issue

Substation proposed to be sited on ATC lands requiring land acquisition. Development constraints may exist around the substation.

Comment

Confirm with TfNSW the specific development constraints that will exist around substations. There may be constraints that exist outside the land acquisition footprint. These constraints to be reviewed against proposed developments to ensure no impact to ATC.

f) Description of Issue

Alignment will impact a stewards tower adjacent to the track.

Comment

It appears steward's tower will require relocation. This has not been considered as part of current TfNSW documents. Should the steward's tower on ATC land adjacent to Alison road require relocation, detailed assessment with Racing NSW and relevant racing stewards is required.

g) Description of Issue

Existing access to the racecourse along Alison Road will be restricted by CSELR.

Comment

Consider providing new access to RRR at proposed signalised intersection of Alison Road and Wansey Road. Significant grade separation at this point, however this may mitigate access

restriction issues associated with normal racecourse operations, and also enable access for the future stables development (albeit with a redesigned stables Masterplan). Civil design required for signalised intersection to Alison Road main entry. Redesign of entry gates, footings, walls etc to be designed and reconstructed by TfNSW.

h) Description of Issue

Significant trees lost along Wansey and Alison Road frontages providing screening, potentially providing wind mitigation on to track and surrounding facilities, loss of shade to stabling and training facilities.

Comment

Consider impact of removal of trees to RRR.

i) Description of Issue

The alignment of the CSELR in the vicinity of the RRR Stop passes very close to the existing ATC Administration Building. The proposed alignment requires demolition of the existing brick wall outside the Alison Road frontage of the building, removal of trees, and impacts on an awning and services.

Comment

Other than the impacts noted above, with the alignment passing a few metres from the building, consideration should also be given to

- Vibration impacts on the existing structure and occupants.
- Noise impacts on occupants.
- Pedestrian safety for occupants exiting the building with the rail passing close to the front door.

The use of noise/vibration attenuating trackform should be considered in this area and any areas adjacent to buildings or stables should be utilised to minimise impacts.

EIS Technical Paper 11 – Part A, page 18, notes that noise catchment area NCA05.2 as being a minimum distance of 4m to nearest receptor building façade. Preliminary CSELR alignments would indicate that the CSELR is closer than 4m to the ATC administration building. Technical Paper 11 notes the use of high-resilience trackform to mitigate impacts of ground-borne noise on sensitive receptors. The extracts below from the EIS nominate the proposed trackform options to reduce noise (and potentially vibration) effects on receptors. The Alison Road alignment, including the ATC administration building frontage, is noted as being Standard Trackform. Consideration has been given to the future hotel within the RRR, however consideration should be given to provided noise and vibration attenuating trackform in front of the ATC administration building, and other potentially sensitive receptor areas on the RRR boundary, including existing and future horse stabling.

Figure 14 Indicative Embedded Rail Trackforms

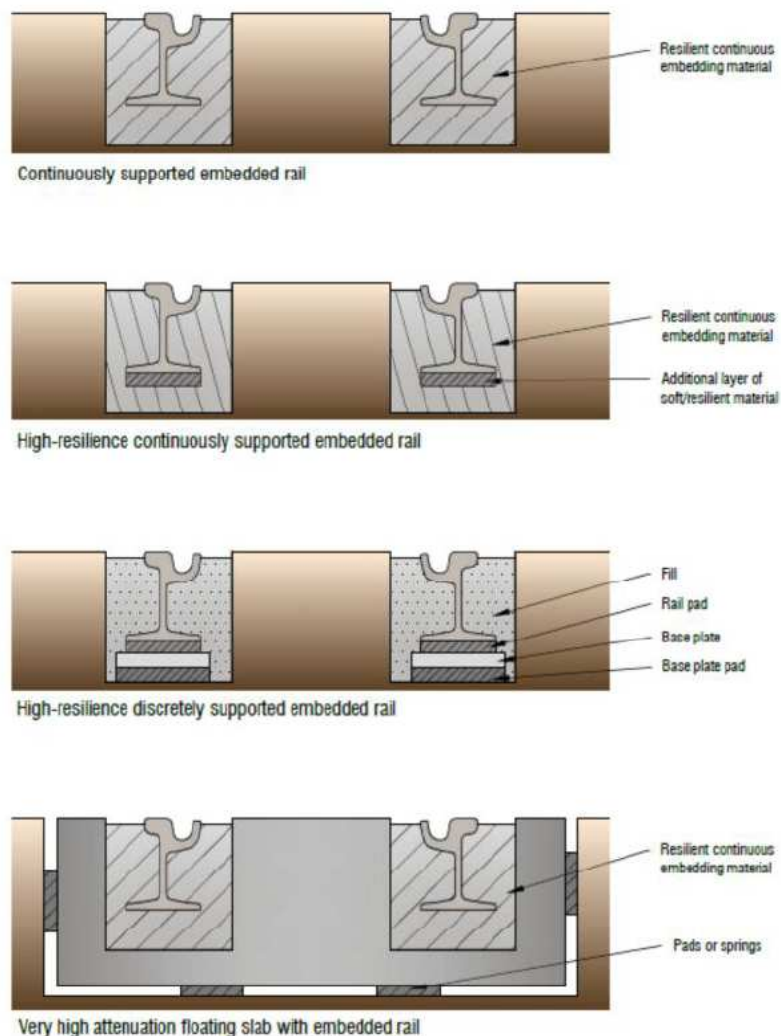


Table 21 Trackform Extents

Trackform Type	Locations and Comments
Standard	<p>Standard trackform would be employed at locations where there are no particularly sensitive receptors, and through the majority of the pedestrianised zone along George Street where speeds would be low. Locations for standard trackform are:</p> <ul style="list-style-type: none"> • Alfred St at Circular Quay • Between Bathurst Street and the Wynyard Stop • Eddy Avenue at Central Station • Moore Park (South Dowling Street to Robertson Road) • Alison Road to Wansey Road Stop, except adjacent to the new hotel proposed at Royal Randwick Racecourse
High-resilience	<p>High-resilience trackform would be required throughout the majority of the proposal area where sensitive receptors line the route. This trackform would control ground-borne noise impacts on receptors where the facade provides a high level of attenuation to airborne noise, meaning ground-borne noise is more likely to be noticeable. The high density of receptors particularly throughout Surry Hills and the City Centre means that while ground-borne noise may be masked in the front rooms of buildings, it may be noticeable in rooms set back from the facades.</p> <p>High-resilience trackform would be used at all locations except those identified for standard trackform above, and possible locations where very high attenuation may be required (subject to detailed design investigations).</p>
Very high attenuation	<p>Very high attenuation track is not likely to be required for ground-borne noise control with the possible exception of locations near theatres or recording studios. Very high attenuation track may be required for vibration attenuation at some locations, for example adjacent to the Randwick hospital precinct (see Section 0)</p>

Figure 2.3 – Proposed CSELR trackform type and extents (extract from EIS).

2.3 Randwick Stabling Facility

j) **Description of Issue**

EIS Chapter 19, Climate Change Risk Assessment item 3b notes that climate change causes increased frequency and severity of storm events. The EIS notes that the Randwick Stabling site is inundated in a 1 in 5 year event up to 200mm, and all events beyond this. EIS notes that 15% should be added to rainfall intensities to account for climate change. However, the capacity of the existing network is insufficient to flood protect the system to CSELR criteria. EIS does not propose a solution to this issue. CSELR stabling yard to be located in flood prone land. Construction of the LRB stables in this flood prone land may exacerbate flooding issues elsewhere. CSELR does not propose a solution to flood protecting the stabling yard. There may be an impact on RRR subject to the proposed solution.

Comment

EIS notes upgrading the downstream drainage network is noted as potential solution. This may be too large and costly solution for TfNSW. Construction of stabling yards, and filling site for flood protection, in what appears to be flood backwaters, may cause flood impacts elsewhere. EIS notes detention as option. This is likely to be a significant volume (to replace lost flood storage volume) and there may be issues getting a hydraulic solution that does not involve pumping.

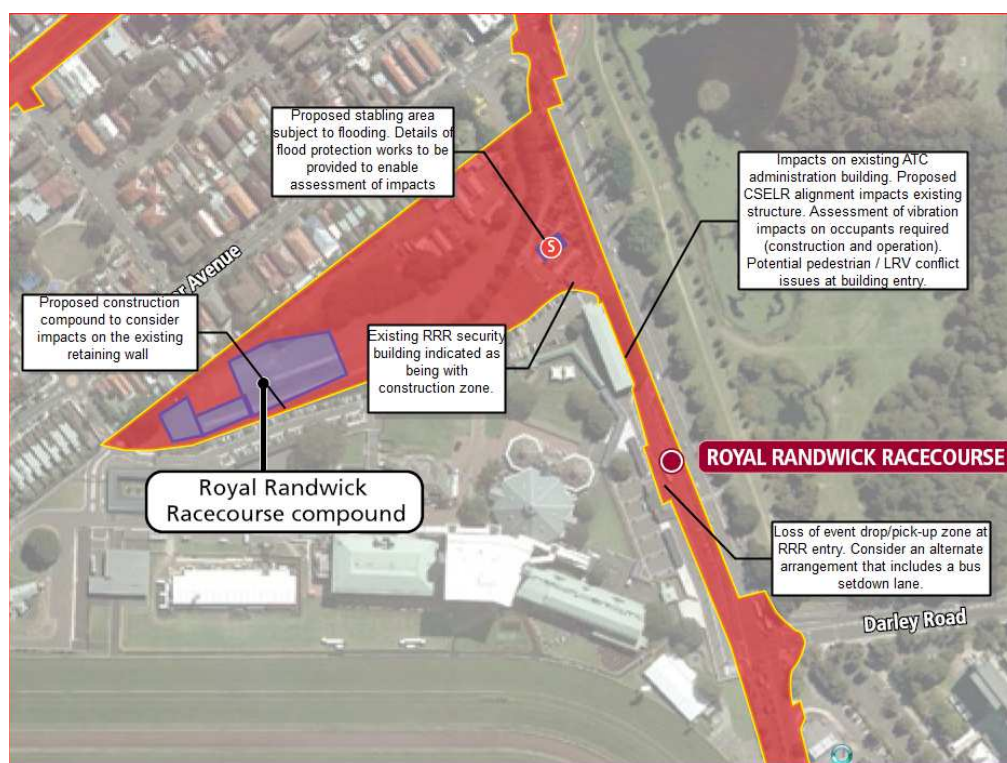


Figure 2.4 – RRR impacts at Stabling Yard and RRR Stop.

k) Description of Issue

The EIS notes that a 6m noise wall will be constructed between the residential properties and the proposed stabling yard.

Comment

EIS focused on impacts to the existing residential properties. Limited discussion or assessment on impacts to the RRR facilities (i.e. administration building, guard hut, event buildings/facilities).

- Consider visual amenity of a 6m noise wall along the boundary.
- Consider light pollution from flood lighting the stabling facility.

l) Description of Issue

EIS notes high groundwater in proposed Royal Randwick stabling site. Proposes measures to protect aquifer from contamination. Mitigation measures not described within the EIS.

Comment

Consider impact and possible mitigation measures to protect aquifer against contamination during construction. Noting also that site is subject to flooding.

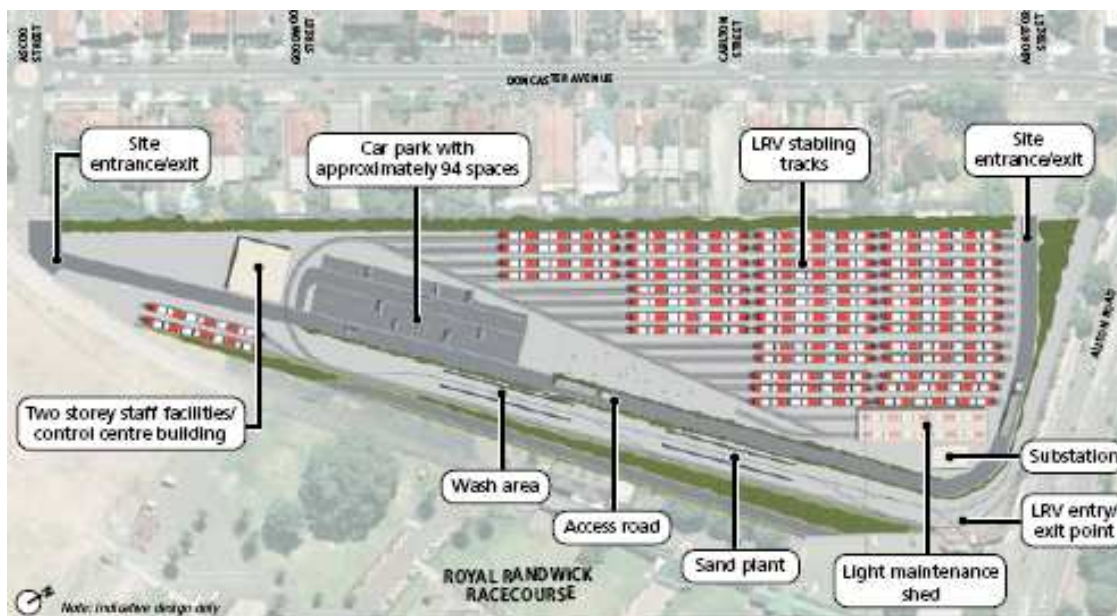


Figure 2.5 – Proposed stabling yard facility with RRR.

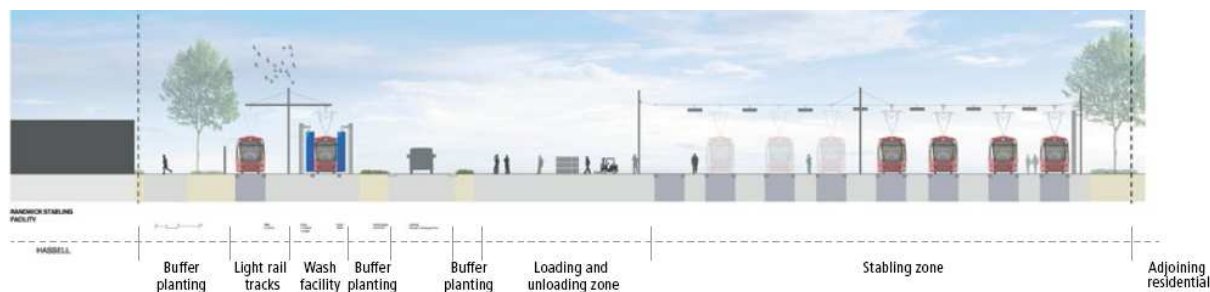


Figure 2.5 – Typical section through proposed stabling yard within RRR.

2.4 General Impacts / Other Issues

m) **Description of Issue**

The CSELR proposal may constrain access and servicing to future UAP sites within ATC lands and impact development potential. Current UAP built form densities/heights are indicated in Figure 2.7 below.

Comments

- Civil and structural design and construction of the light rail must allow for heavy vehicle crossovers at all existing entrances and exits.
- Civil and structural design and construction of the light rail must allow for heavy vehicle crossovers to approved developments and future urban activation precincts (UAP).
- The engineering of the track and all associated retaining structures must be engineered and co-ordinated with authorities to cater for services penetrations, existing and future provisions.

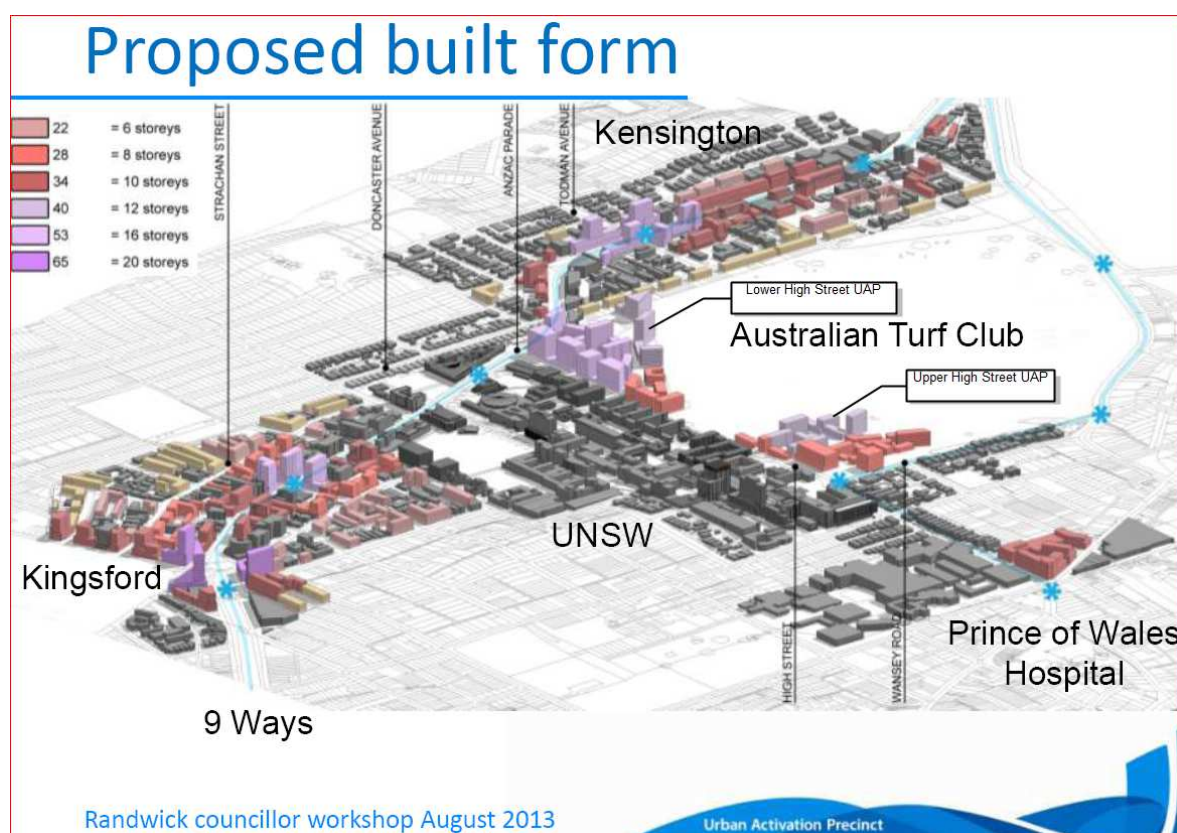


Figure 2.6 –Proposed UAP future built form within ATC lands (sourced from <http://www.planning.nsw.gov.au>).



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