

Preliminary Aeronautical Impact Assessment

UNSW N13 Barker St
Student Accommodation

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Preliminary Aeronautical Impact Assessment: UNSW N13 Barker St Student Accommodation

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Contents

1. Executive Summary.....	4
2. Aviation Regulatory Framework	7
2.1 Airspace Height Controls.....	8
2.2 Airspace Approval Process	8
3. Proposed Development	11
3.1 Site Description.....	12
3.2 Location	12
3.3 Permanent Structure.....	13
3.4 Indicative Crane Activity	15
3.5 Non-Structural Elements.....	20
4. Prescribed Airspace Assessment Findings.....	21
4.1 OLS.....	24
4.2 PANS-OPS.....	25
4.3 RTCC	27
5. Helicopter Operations	28
6. Other Aviation Compliance Criteria.....	34
7. Conclusions.....	44

1

Executive Summary

Executive Summary

This Preliminary Aeronautical Impact Assessment has been prepared by Avlaw Aviation Consulting Pty td (Avlaw) and is submitted to the Department of Planning, Housing and Infrastructure (DPHI) on behalf of the University of New South Wales (UNSW) (the Applicant), to support a State Significant Development Application (SSDA) for the development of three (3) buildings comprising on-campus student accommodation at 39 Barker Street, Kensington (the site).

This report has been prepared to assess the proposed built and temporary structures at the site against any applicable aviation restrictions that have the potential to limit the height of development activities. These constraints are in place to protect the safety, efficiency and regularity of aircraft operations by ensuring necessary clearances (mandated in legislation) that must be provided between an aircraft and an obstacle (e.g. as buildings and cranes) are maintained. With regards to the proposed development at the site, aircraft operations at Sydney Kingsford Smith Airport (Sydney Airport) as well as the helicopter flight paths associated with the helipad at the Prince of Wales Hospital (POW) are most relevant and are the focus of this assessment. This by default addresses the site-specific Secretary's Environmental Assessment Requirements (SEARS).

Three buildings are proposed to be constructed at the site, reaching heights of 79.7m AHD (Building A), 67.427m AHD (Building B) and 64.4m AHD (Building C), with all ancillary features captured within this envelope.

A combination of hammerhead cranes and mobile cranes will be used to complete construction. Construction will commence with the installation of two hammerhead cranes (i.e. TC1 and TC2), which will reach heights of 76.65m AHD and 83.49m AHD respectively. TC2 will then be relocated, becoming TC3, and will reach a height of 94.23m AHD. Mobile cranes will also be utilised for brief periods during construction, specifically when the Sydney Airport curfew is in effect, however the heights of these structures is unknown at the time of writing.

Avlaw's assessment has found that the critical (i.e. lowest) prescribed airspace protection surface covering the site is the Conical Surface of the Sydney Airport Obstacle Limitation Surfaces (OLS), which ranges in height from 52.5m AHD to 58.5m AHD, rising to the east. All three of the buildings as well as all cranes will intrude this surface and will therefore each be considered controlled activities that require approval from aviation authorities, prior to being erected.

Above the OLS, the next lowest airspace protection surfaces covering the site relate to Instrument Flight Procedures (IFP) conducted at Sydney Airport, also referred to as PANS-OPS. Two specific PANS-OPS surfaces are most limiting at various parts of the site, with the eastern portion limited by the RNP final approach for aircraft landing on Runway 25, whereas the western portion is restricted by the straight ahead climb segment of the Standard Instrument Departure (SID) for aircraft departing from runway 07. The combined surfaces range in height from 89.0m AHD to 125.0m AHD. None of the proposed building or cranes will intrude these surfaces.

Given the proximity of the site to the Prince of Wales Hospital (POW), which has a soon to be operational rooftop Helicopter Landing Site (HLS), assessment of the proposed buildings and cranes against flight paths to/from this helipad (and associated airspace boundaries) were considered key to determining if aircraft safety or the efficiency of operations would be adversely impacted. The proposed buildings and cranes will all remain clear of the Obstacle Accountability Area (OAA)

related to all flight paths to this HLS, therefore, no adverse impacts on helicopter operations are anticipated if the development proceeds.

Other aviation compliance criteria which are described in the National Airports Safeguarding Framework (NASF) have been considered and Avlaw has not identified any impediments or compliance issues. Avlaw believes the proposed controlled activities at the site should be approved, subject to conditions such as marking and lighting, which will be determined by CASA.

2

Aviation Regulatory Framework

Aviation Regulatory Framework

2.1 Airspace Height Controls

Protection of airspace surrounding an airport is a critical component of maintaining requisite safety standards that facilitate the efficient use of runways, whilst also managing the associated impacts of their use on other critical infrastructure (e.g. taxiways), the environment and the general public.

As a signatory to the *Chicago Convention 1944*, Australia adopts International Civil Aviation Organisation (ICAO) Standards and Recommended Practices (SARPs) with respect to airspace which defines various sets of invisible surfaces above the ground around an airport. In Australia, the airspace above these surfaces forms what is referred to as an airport's 'prescribed airspace' with the OLS and PANS-OPS those that are most relevant at the site. Avlaw has completed its assessment of the development at the site based on the applicable ICAO Annex 14 Standards.

The airspace which is protected to ensure the safety of helicopter operations including those associated with hospital helipads is not encapsulated in prescribed airspace requirements described above. Instead, there are various guidelines and advisory publications in circulation that define what volumes of airspace should remain free of obstacles in Australia and therefore, which development activities should be approved. These are discussed further below.

2.2 Airspace Approval Process

The aviation approval processes for penetrations of Sydney Airport's airspace and those which apply to helicopter operations are covered by different legislative and administrative processes. Each has been described below separately.

Sydney Airport

Part 12 of the *Airports Act 1996* (Act) and the *Airports (Protection of Airspace) Regulations 1996* (Regulations) establish a framework for the protection of airspace at and around airports. The Act defines any activity resulting in an intrusion into an airport's prescribed airspace to be a "controlled activity" that cannot be carried out without approval from aviation stakeholders. Controlled activities include the following:

- permanent structures, such as buildings, intruding into the prescribed airspace (relevant at the site);
- temporary structures such as cranes intruding into the prescribed airspace (relevant at the site); or
- any activities causing intrusions into the prescribed airspace through glare from artificial light or reflected sunlight, air turbulence from stacks or vents, smoke, dust, steam or other gases or particulate matter (not relevant to the site).

The Regulations differentiate between short-term (not expected to continue longer than 3 months) and long-term controlled activities (expected to continue for more than 3 months).

With respect to long-term penetrations (i.e. a crane intruding the OLS for longer than 3 months), the airport operator is required to invite the following stakeholders to assess or comment on an application if there is an intrusion into prescribed airspace:

- **CASA** for an assessment of the impact on aviation safety;
- **Airservices Australia** for assessments of proposals resulting in a penetration of surfaces relating to navigation equipment or instrument flight procedures;
- **The local council authority** responsible for building approvals; and
- **The Department of Defence** in the case of joint-user airports (not relevant in this instance).

The final approving authority for all short-term penetrations of the PANS-OPS and long-term penetrations of the OLS is the Department as specified in the Act and the Regulations. In making its determination, the Department is required to assess the respective assessments of the airport operator, Airservices Australia and CASA. The Department cannot approve short-term penetrations of the PANS-OPS without the support of the airport operator (in this instance, Sydney Airport) and also cannot approve long-term penetrations of the OLS in the event CASA's assessment is not supportive of the application. It should be noted that long term intrusions of the PANS-OPS surfaces are prohibited, however that is not being proposed at the site.

It is also worth noting that during recent discussions with Sydney Airport with respect to the UNSW G25 development (specifically applications relating to cranes), a proposed installation date in 2027 led Sydney Airport to withhold progressing the controlled activity approval process, citing two main reasons:

- The *Airports (Protection of Airspace) Regulations 1996* are sunseting in 2026 and will be replaced with new regulations; and
- The rolling out of the modernisation of the OLS was announced by the ICAO earlier this year, which at some point in the years to come will impact airspace design around Sydney Airport.

Avlaw does not expect any of the changes above to introduce any additional risk to the likelihood of controlled activity approvals being issued at the site or for more restrictive criteria to be adopted by Sydney Airport that would impact the conclusions in this report. However, this will need to be re-assessed as and when sufficient details relating to the changes described above become available, alongside the final CMP.

The "Airspace Protection Form" and "Crane Enquiry Form", both of which can be downloaded through [this link](#), should be populated and emailed to airspaceprotection@syd.com.au to commence the controlled activity application process. Approvals for intrusions into prescribed airspace are issued with specific conditions, which may include a combination of marking and lighting requirements, as well as specific dates of activity. UNSW should be cognisant of this as they progress towards engagement of a builder, as the staging of lifts and associated dates will need to be included on the application forms, and be submitted with enough lead time (nominally 3-4 months) for approvals to be issued prior to the installation of cranes.

Carrying out a controlled activity without approval is an offence under Section 183 of the Act 1996 and is punishable by a fine of up to 250 penalty units. It is an offence under Section 185 of the Act to contravene any conditions imposed on an approval. Under Section 186 of the Act it is an offence not to give information to the airport operator that is relevant to a proposed controlled activity.

Hospital Helipads

The triggers for assessment of proposed development activities with respect to airspace

surrounding hospital HLSs are not captured within the regulations and legislation described above for Sydney Airport. Applications for aviation approval for developments in close proximity to hospital HLSs are instead lodged with the asset owner (i.e. POW in this instance) who in turn refer the application to their aviation advisors and Helicopter Emergency Medical Services (HEMS) operators that fly to/from the HLS in question for assessment.

In order to assess if there will be any adverse impact on hospital helipads by the proposed development at the site, Avlaw has applied the operational airspace dimensions defined by ICAO as relevant to the activities at POW i.e. HEMS operations operating in Performance Class 1. This aligns with advice contained in CASA AC139.R-01 v3.0 which serves to inform such assessments within Australia. Avlaw's findings based on these criteria can be found in Section 6.

3

**Proposed
Development**

Proposed Development

3.1 Site Description

The site is located at 39 Barker Street, Kensington within the City of Randwick Local Government Area (LGA). It is legally identified as part Lot 3 in DP1264172 and is situated along the southern boundary of the UNSW Kensington Campus.

The site has a frontage of 143m along Barker Street and extends 50m into the UNSW campus (including Southern Drive). The site is currently occupied by the Barker Street student housing apartments containing 260 beds and ranging between 3-5 storeys. An aerial image of the site is shown below in Figure 1.



Figure 1: Aerial image of the site

Source: Nearmap, Beam Planning

3.2 Location

In the context of airport operations, the site is approximately 4.06km ENE of the nearest runway at Sydney Airport i.e. RWY 07/25. This is illustrated in the figure below. The MGA 2020 coordinates for the centre of the site are N 6,245,371.946, E 336,297.912.



Figure 2: Satellite imagery showing the site in relation to Sydney Airport (approx. 4.06km from runway 07/25)

3.3 Permanent Structure

Three buildings are proposed to be constructed at the site, reaching heights of 79.7m AHD (Building A), 67.427m AHD (Building B) and 64.4m AHD (Building C), with all ancillary features captured within this envelope. Elevation drawings showing the built structure are inserted below.

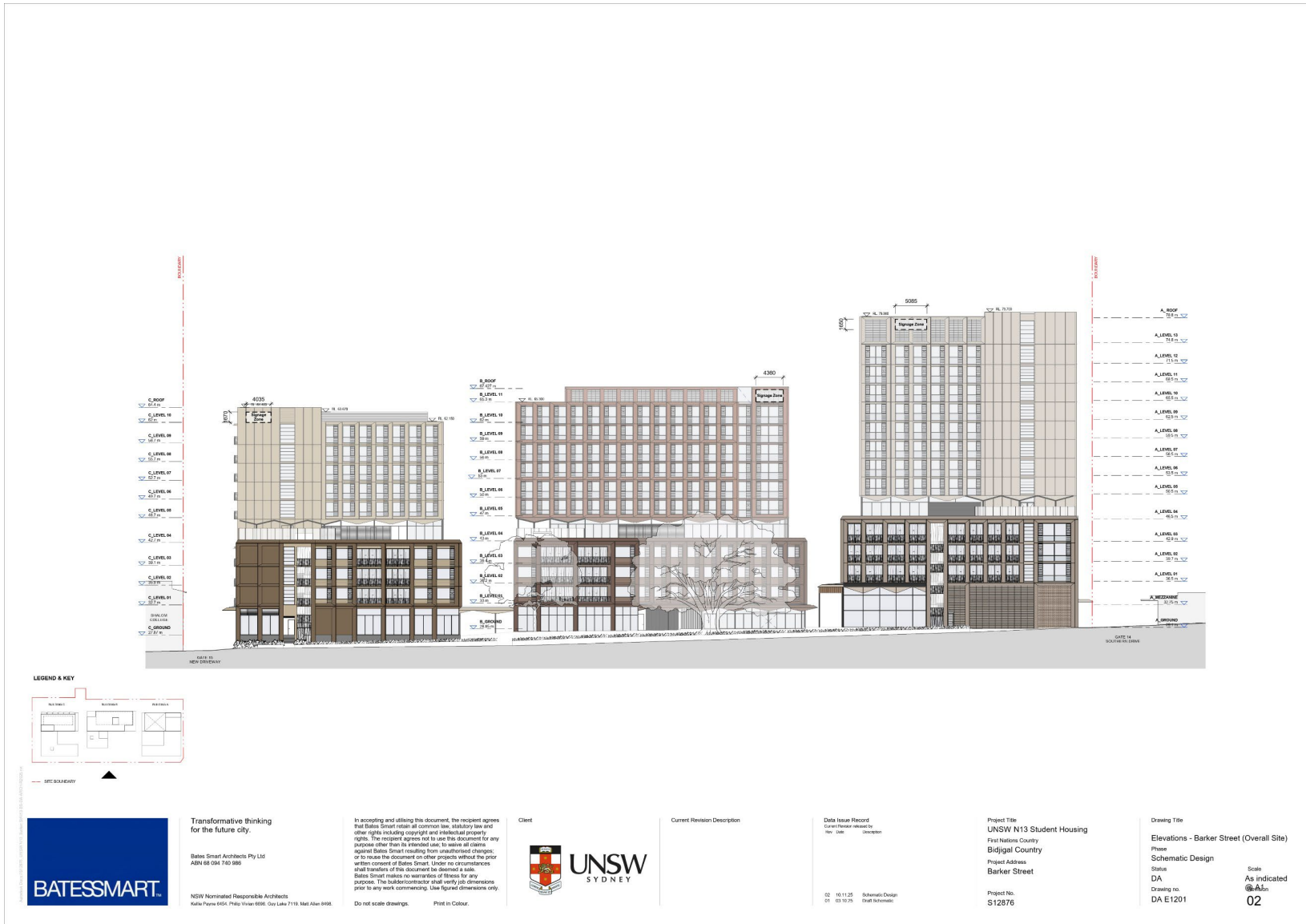


Figure 3: North-South elevation showing three buildings proposed at the site (from right to left, A, B and C)

3.4 Indicative Crane Activity

Following initial consultation between Avlaw and the other consultants on the project on the initial crane strategy, subsequent iterations of the CMP were primarily informed by Avlaw's advice of the heights of critical airspace protection surfaces impacting the site, penetration of which should be avoided.

Close coordination was required given the limited vertical buffers between some of the built form and critical airspace protection surfaces (i.e. PANS-OPS), as well as the lateral clearances that would ensure the swing arcs of certain cranes would not introduce hazards to aircraft operations at Sydney Airport.

Every effort has been made to facilitate construction of the built form whilst minimising hazards to the safety, regularity and efficiency of aircraft operations to avoid any major risks or impediments to the development proceeding based on the design described in the SSDA.

Once the contract for the builder is awarded, the final CMP that will be implemented will need to be reviewed and assessed against airspace restrictions which apply at the time. That will then subsequently inform the application seeking controlled activity approval, which will be required for the development to proceed.

The figures on the following pages illustrate the information described above.

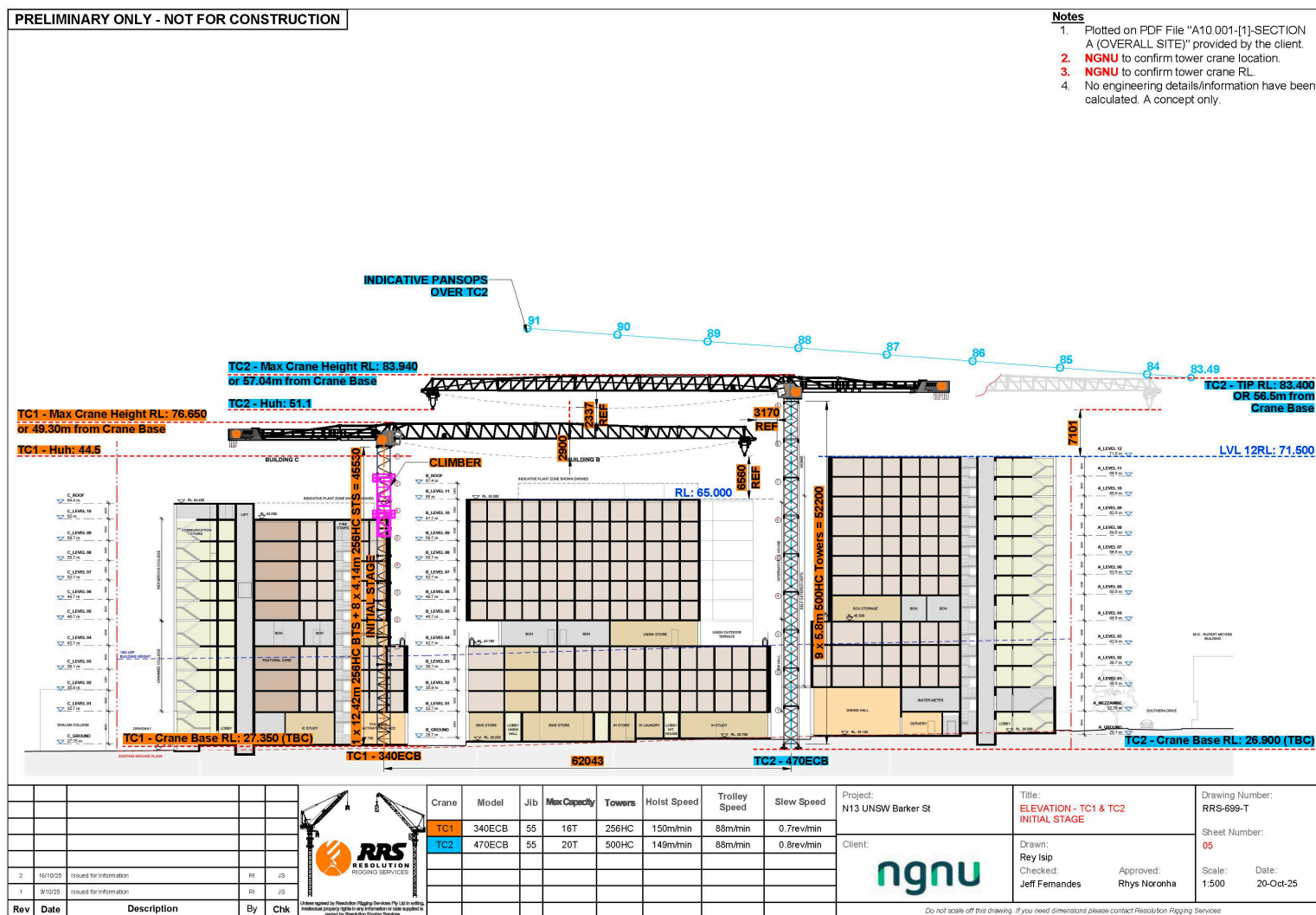


Figure 4: TC1 and TC2 highlighted at their maximum operating heights

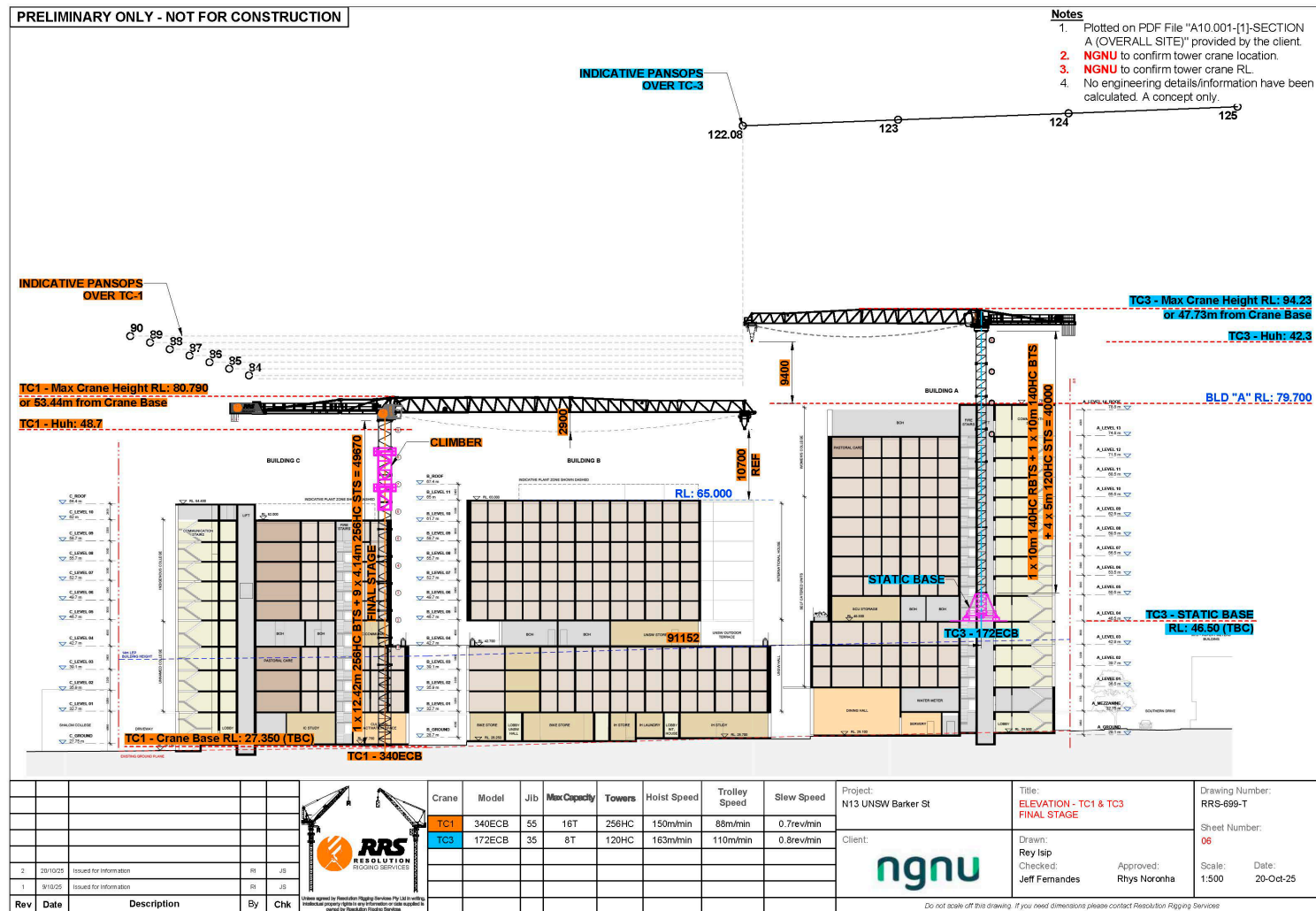


Figure 5: TC2 and TC3 shown at their maximum operating heights

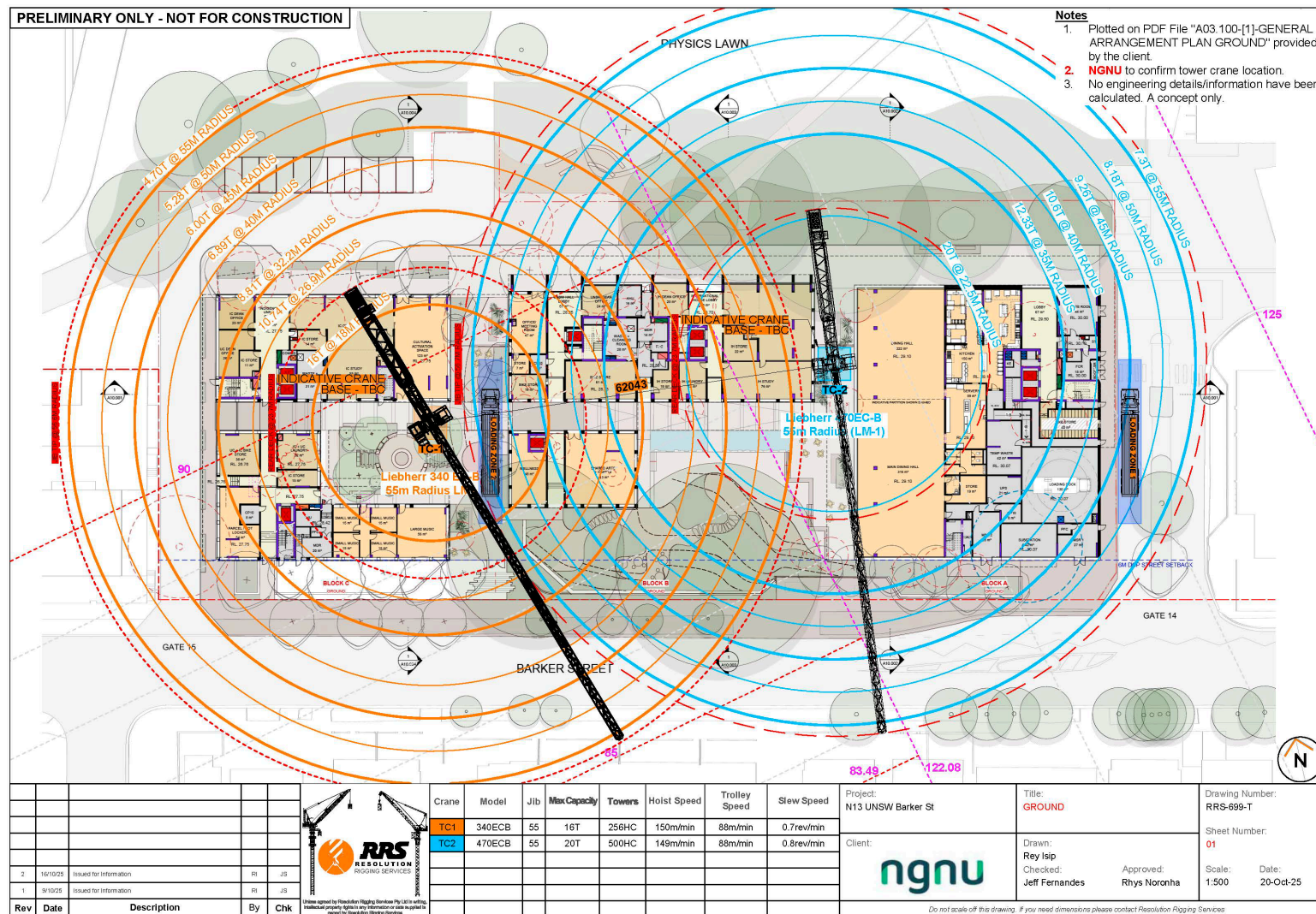


Figure 6: Site plan showing the swing arcs for TC1 and TC2

Note: PANS-OPS surfaces indicated in pink cannot be verified. Refer to Section 4.2 for Avlaw's modelling results.

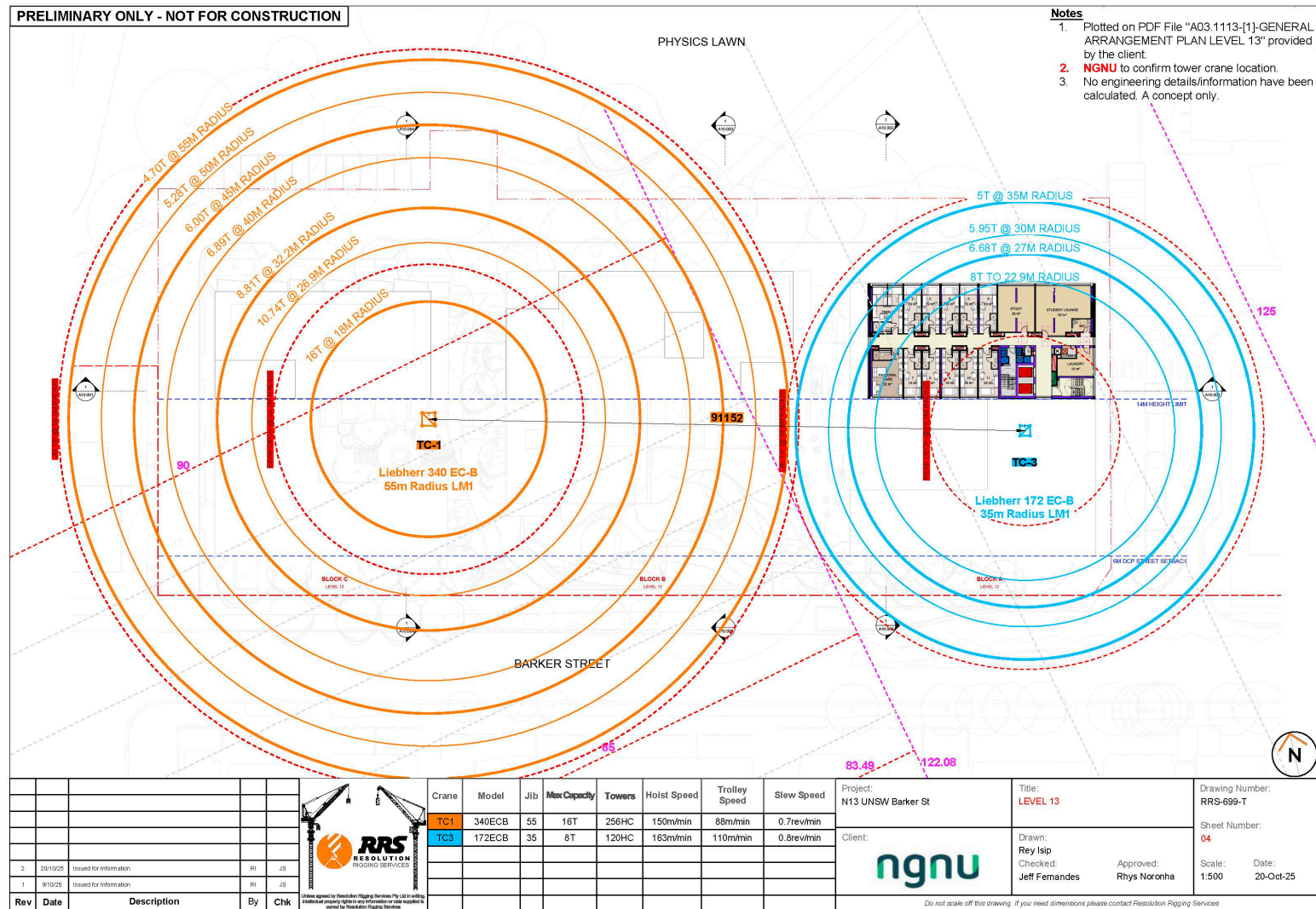


Figure 7: Site plan showing the swing arcs for TC1 and TC3

Note: PANS-OPS surfaces indicated in pink cannot be verified. Refer to Section 4.2 for Avlaw's modelling results.

3.5 Non-Structural Elements

In addition to permanent and temporary obstacles which require assessment and approval in the event they intrude prescribed airspace, non-structural elements which introduce hazards to aircraft safety in the form of turbulence (e.g. discharge from vents, exhausts) must, when applicable, also be considered carefully.

Such features must be considered in the context of applicable aviation regulations to ensure they will not introduce any unacceptable hazards to aircraft operations. Civil Aviation Safety Regulations (CASR) Part 139.180 states that *"CASA may determine a gaseous efflux having a velocity in excess of 4.3m/s will be a hazard to aircraft operations because of the velocity or location of the efflux"*.

UNSW have advised that the relevant SME (Arup) will undertake calculations at the detailed design stage to quantify the velocity of discharge from features such as bathroom and kitchen exhaust fans, as well as the stair press relief system. AN exceedance of the CASR criteria is not expected, given the land use is not industrial in nature.

Therefore, further assessment against this criteria is excluded from the remainder of this report.

4

Prescribed Airspace Assessment Findings

Prescribed Airspace Assessment Findings

Based on the site location provided, coordinates supplied by the contracted surveyor and interrogation of satellite imagery, Avlaw has calculated the heights of the most relevant airspace protection surfaces covering the site. If these surfaces are penetrated, a controlled activity approval is required. Although extracts from various Sydney Airport charts are included for reference and comparison in this section, the heights summarised below along with any conclusions made are based on Avlaw's own modelling.

UNSW Barker St Car Park (N18) – Prescribed Airspace Assessment Findings (Sydney Airport)			
Surface	Height	Description	Intrusion(s) Proposed
OLS	52.5m AHD to 58.5m AHD	Conical Surface covers the site, which rises to the east	Buildings A, B and C TC1, 2 and 3
PANS-OPS	89.0 AHD to 125.0m AHD	RNP final approach to runway 25 impacts eastern portion of the site Runway 07 SID impacts western portion of the site	Nil
RTCC	152.4m AHD	Horizontal plane across the entire site	Nil

Figure 8: Summary of the most critical prescribed airspace surfaces impacting the site (modelled by Avlaw) and proposed intrusions

4.1 OLS

The site falls under the Conical Surface of the Sydney Airport OLS. The figure immediately below is an extract from the Sydney Airport OLS chart, followed by a diagram showing the results of Avlaw's modelling.

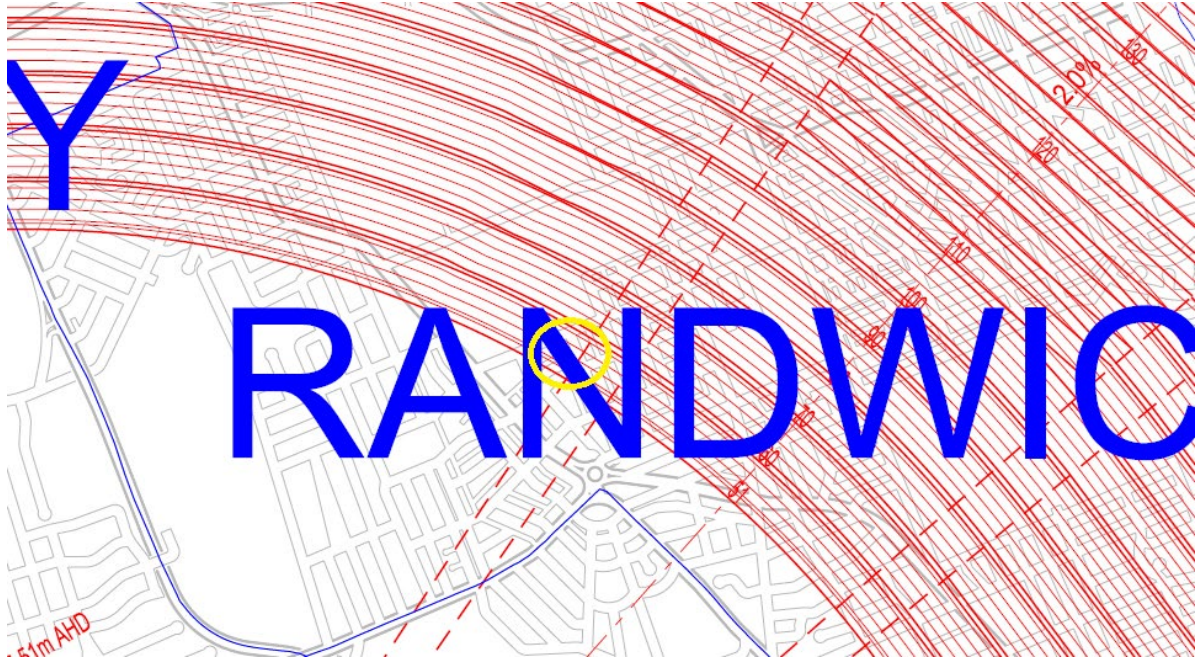


Figure 9: Sydney Airport OLS chart (approximate location of site indicated in 'yellow')

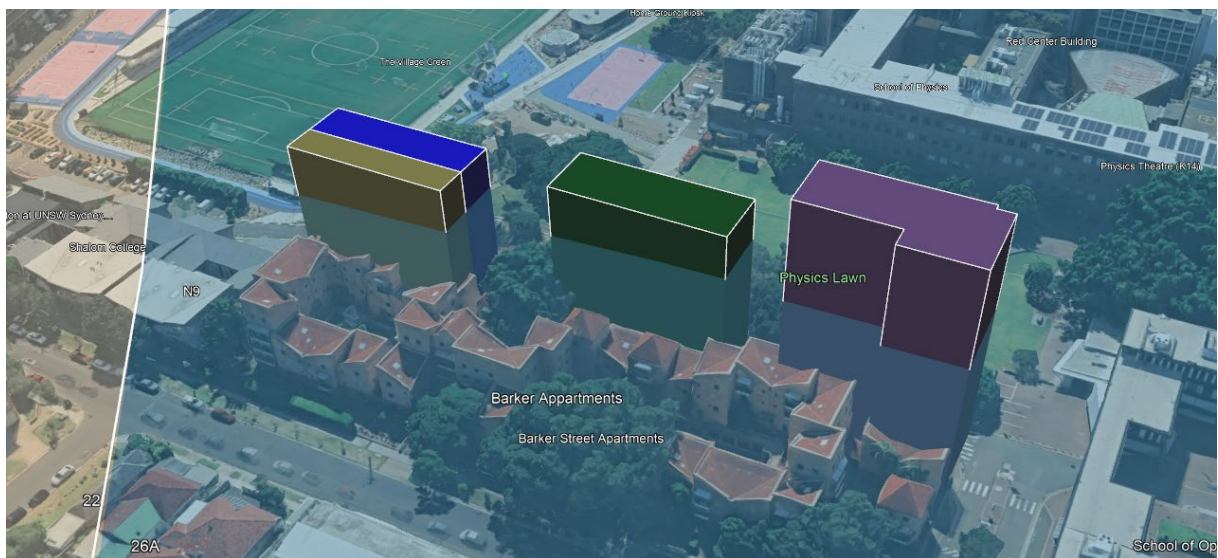


Figure 10: Avlaw's model of the OLS over the site (all buildings intruding)

Note: grey surface

At proposed heights of 79.7m AHD (Building A), 67.427m AHD (Building B) and 64.4m AHD (Building C), all three of the buildings proposed at the site will intrude the OLS and will therefore each be

considered an obstacle from an aviation perspective, requiring controlled activity approval prior to their construction.

Construction will commence with the installation of two hammerhead cranes (i.e. TC1 and TC2), which will reach heights of 76.65m AHD and 83.49m AHD respectively. TC2 will then be relocated, becoming TC3, and will reach a height of 94.23m AHD. TC1, TC2 and TC3 will all also intrude the Sydney Airport OLS, requiring controlled activity approval prior to their erection. These cranes however will remain below all other airspace protection surfaces, described in Sections 5.2 and 5.3. Conditions such as marking and/or lighting may apply, and will be determined by either CASA (in accordance with Manual of Standards Part 139) and/or NSW Health (in accordance with the NSW Health Guideline, which is due for renewal).

Mobile cranes will also be utilised for brief periods during construction, specifically when the Sydney Airport curfew is in effect, however the heights of these structures is unknown at the time of writing. Heights, locations and periods of activity for all cranes will be finalised once the contract for the builder is awarded once the DA for the site has been issued.

4.2 PANS-OPS

The site is covered by a range of protection surfaces related to Instrument Flight Procedures (IFP), which are protected through the establishment of PANS-OPS surfaces for aircraft operating at Sydney Airport. At the site, two specific PANS-OPS surfaces are most limiting at various parts of the site:

- RNP final approach for aircraft landing on Runway 25; and
- Straight ahead climb segment SID for aircraft departing from Runway 07

The eastern portion of the site is limited by the RNP final approach, whereas the western portion is restricted by the Runway 07 SID. When considered collectively, the height of the surfaces associated with both procedures ranges from 89.0m AHD to 125.0m AHD. None of the proposed building or cranes will intrude these surfaces, therefore no IFP will be adversely impacted by the development.

The figure immediately below shows an extract from the published Sydney Airport PANS-OPS chart, followed by another image which shows the results of Avlaw's own modelling.

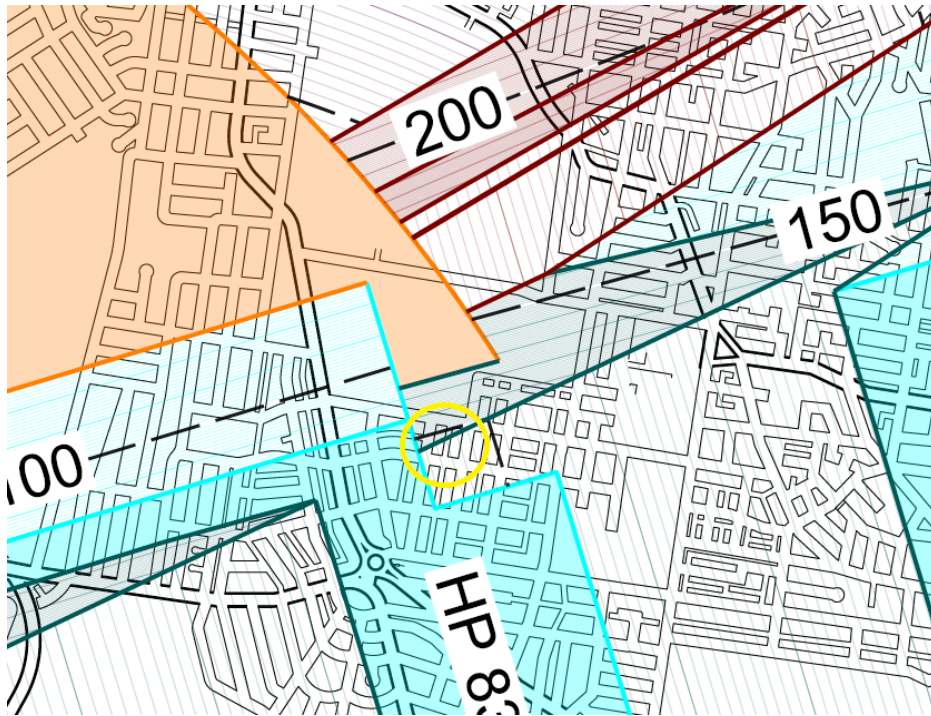


Figure 11: Sydney Airport PANS-OPS chart (approximate location of site indicated in 'yellow')



Figure 12: Avlaw's model of the PANS-OPS surfaces over the site (no intrusions proposed)

Note: pink contours relate to Runway 25 (RNP approach) and blue contours relate to Runway 07 (SID)

Note: red line through site is 110m AHD, each thinner line through the site is a 1m increment (rising to the north)

The proposed built structure at the site (56.64m AHD) and TC1 (78.46m AHD) will both remain below this surface, therefore, there will be no impact on IFP at Sydney Airport if the proposed development proceeds.

4.3 RTCC

The site is covered by the Sydney Airport RTCC, specifically a horizontal segment at 152.4m AHD. As with the OLS and PANS-OPS described in section 5.1 and 5.2 above, Avlaw has produced a model of the RTCC surfaces from first principles which produces a different result to that which is published.

The image below is an extract from the RTCC that is published by Sydney Airport on their website whereas the next image shows the results of Avlaw's model, which is relied on for the purposes of this assessment.

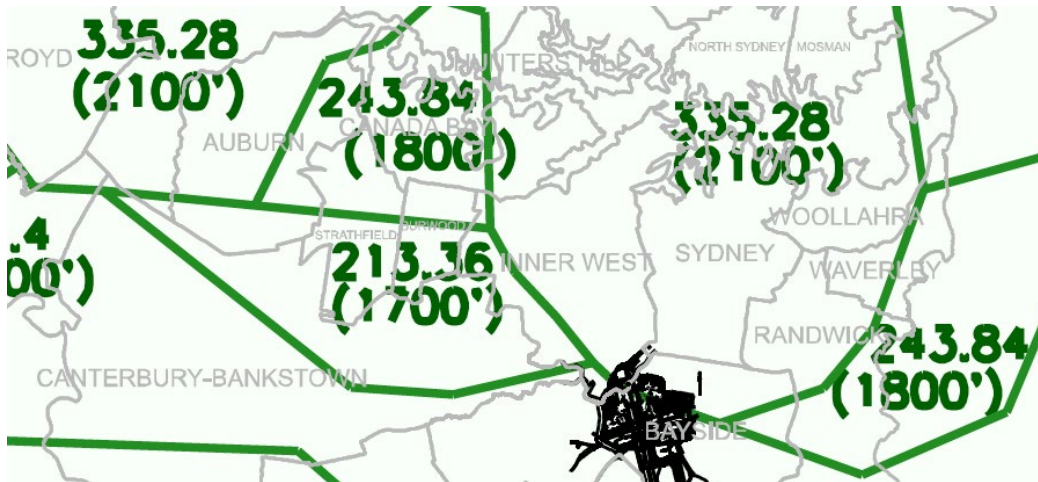


Figure 13: Extract from RTCC published on Sydney Airport's website (dated 27 Feb 2024)

Note: site estimated to fall within the 335.28m AHD sector (near Randwick)

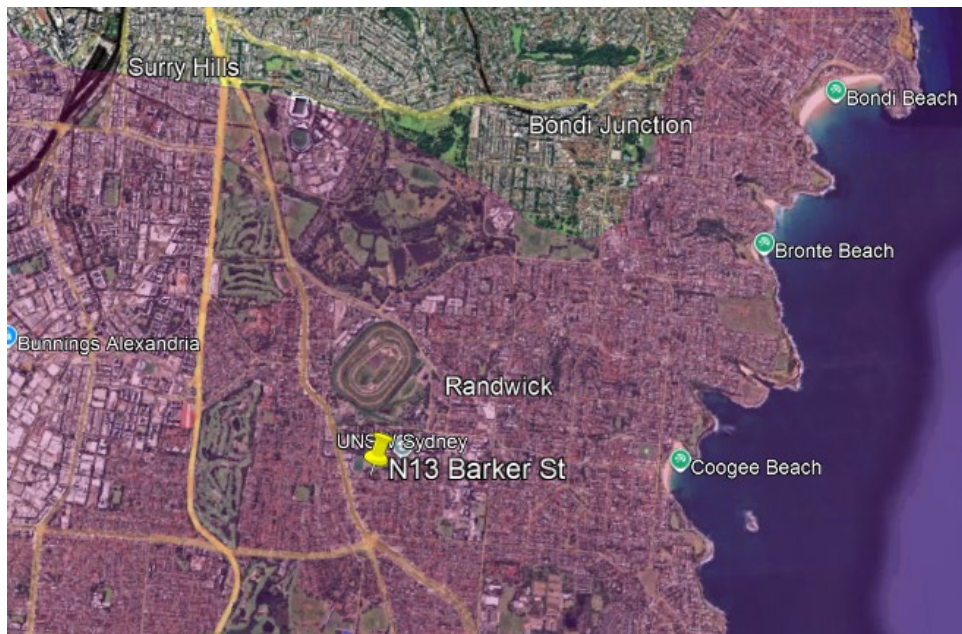


Figure 14: Avlaw model of Sydney Airport RTCC over the site (no intrusions proposed)

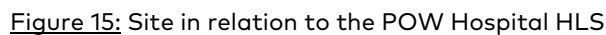
Note: 152.4m AHD protection surface covering the entirety of the site and surrounding area

The proposed development will not impact the safety of vectoring of aircraft as all built and temporary structures proposed will remain below the 152.4m AHD protection surface over the site.

5

Helicopter Operations

The closest hospital to the site with a HLS is the POW Hospital. This HLS is located on the rooftop of the hospital at an elevation of 101.21m AHD and is approximately 710m east of the site. There is another rooftop HLS further south-east on the rooftop of the Sydney Children's Hospital, however, as it is further away and expected to be decommissioned soon, the POW Hospital HLS will be the primary focus of Avlaw's assessment in this section.



The airspace associated with hospital helipads is not protected under the Act or Regulations. Instead, there are a range of guidelines and other standards which collectively prevent any buildings or cranes with the potential to adversely impact helicopter operations at hospitals from being approved prior to consultation with the owners of the assets, their aviation advisors and the helicopter operators that use the HLS. One of those document references is Guideline H of the [NASF](#) which has been developed to offer some form of protection to what are termed Strategically Important Helicopter Landing Sites (SHLSs).

Preliminary Aeronautical Impact Assessment ■ UNSW N13 Barker St Student Accommodation

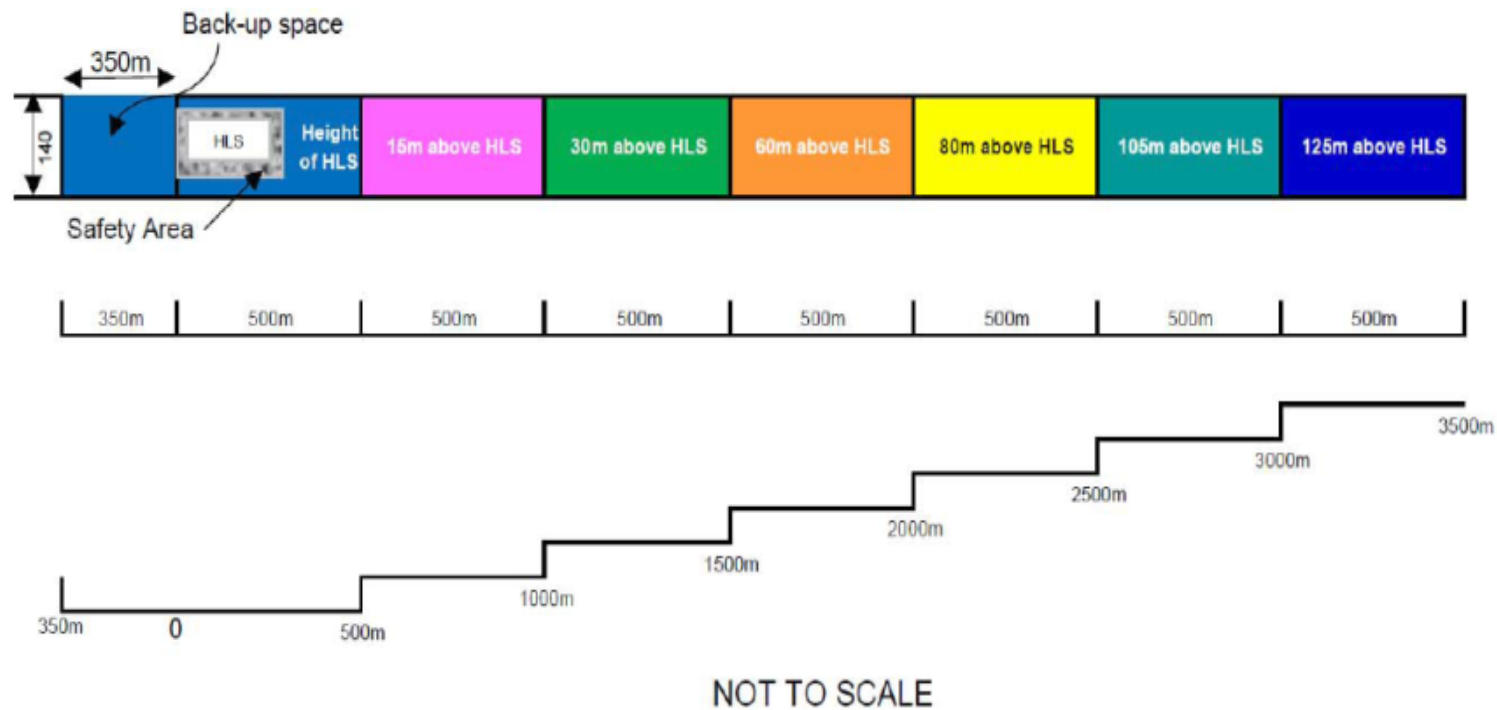


Figure 16: Referral trigger for SHLS as per NASF Guideline H

When applying the NASF referral trigger above, given the site is approximately 710m from the HLS, any permanent or temporary structure which is 30m (or more) taller than the elevation of the HLS, and which is in the direction of the flight paths, would trigger a requirement for additional assessment. Given the tallest building proposed at the site is 79.7m AHD and the tallest crane is expected to reach a height of 94.23m AHD, none of the proposed structures at the site are tall enough to meet the trigger for additional assessment under NASF Guideline H, given the helipad at POW hospital is 101.21m AHD.

The next stage of Avlaw's assessment in the context of nearby helicopter operations has been based on the OAA as defined by ICAO and supported by CASA. The lateral limits of the OAA based on CASA AC139.R-01 v3.0 is indicated by the light blue in the figure below and as is clearly seen, the site boundary and swing arcs of all cranes are clear.

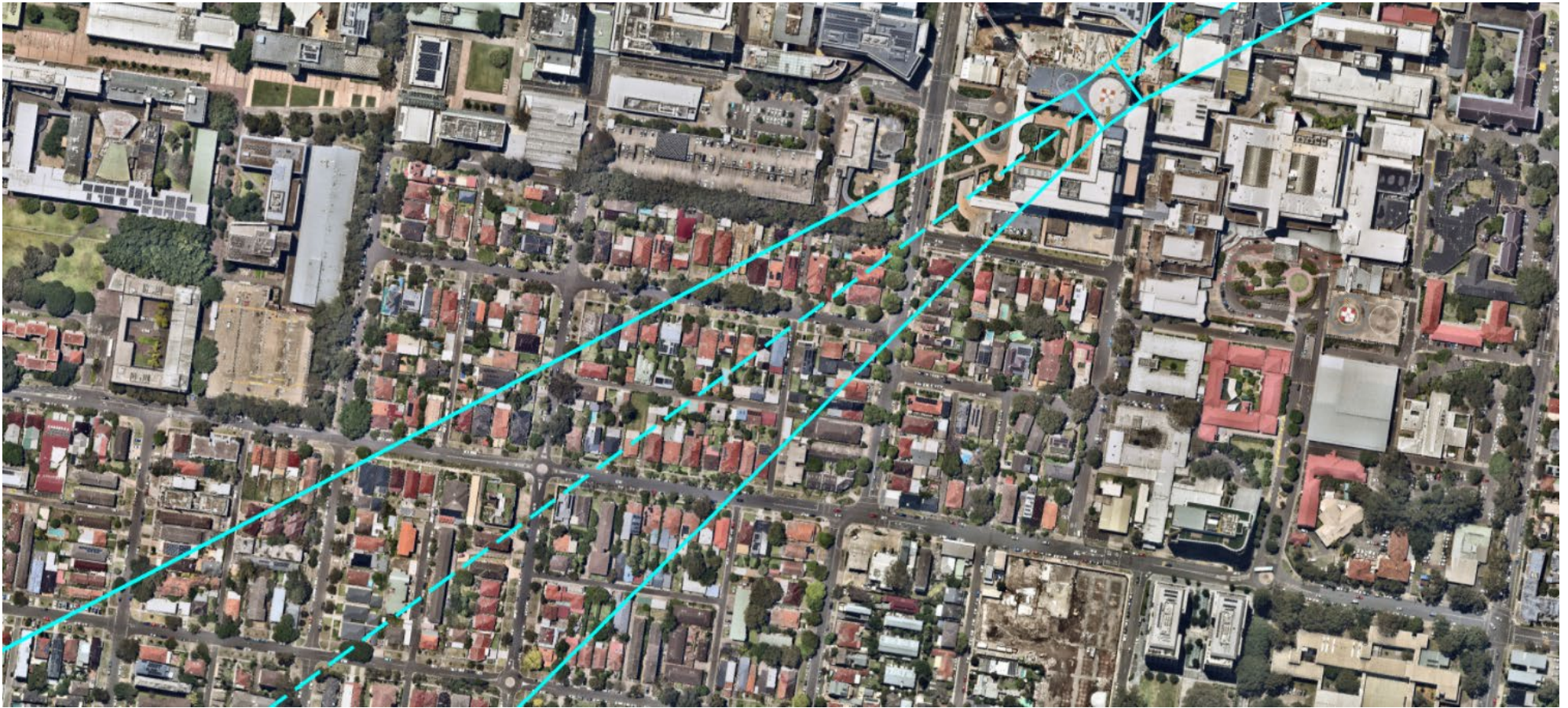


Figure 17: Avlaw's model of the OAA for the nearest HLS in relation to the site
Note: site on the left side of the image i.e. clear of the operational airspace boundary

Given the intrusion by buildings and cranes into Sydney Airport's OLS discussed earlier in this report, CASA may require cranes to be appropriately marked and lit in accordance with CASR Part 139 MOS. In addition to CASA's requirements, NSW Health aviation advisors AviPro have previously advised Avlaw that cranes will need to be visual to pilots using night vision goggles i.e. every 5m along the jib there will need to be 1 LED strip light. This specific condition will need to be confirmed by NSW Health after they are given an opportunity to assess the proposed development. Given the height of the buildings and cranes, relative to the tracks and elevations flown by helicopters in the vicinity of the site, this would be considered a conservative approach, but one that may be required, subject to input from the relevant aviation stakeholders.

In summary, Avlaw's assessment of helicopter operations in the vicinity of the site concludes that the built and temporary structures at the site will remain clear of the OAA related to the POW HLS and should be supported by relevant aviation stakeholders, noting that it is likely to be accepted based on specific conditions described above.

6

Other Aviation Compliance Criteria

Other Aviation Compliance Criteria

The prescribed airspace limits associated with aircraft operations at Sydney Airport and flight paths flown by helicopters operating to/from the POW Hospital that were discussed in earlier sections of this report were considered by Avlaw as being the most critical and likely to limit the height of permanent and temporary structures at the site, hence the detailed analysis in those respective sections.

There are however other aviation compliance criteria which are in place to protect hazards aircraft operations in the context of property development and are contained in various guidelines and principles that collectively form the [National Airports Safeguarding Framework \(NASF\)](#). A desktop assessment of these other restrictions has been considered appropriate in the context of this proposed development, the findings of which are summarised in the table on the following page.

Sydney Airport	
Aviation hazard	Desktop findings
NASF Guideline A - Noise	Outside both 2033 and 2039 ANEF contours
NASF Guideline B - Windshear and Turbulence	The site is outside the trigger area
NASF Guideline C - Wildlife	3-8km buffer zone
NASF Guideline D - Wind Turbines	N/A given the proposed land use
NASF Guideline E - Lighting	The site is outside light control zones A, B, C and D
NASF Guideline F - Protected Airspace	Refer to Section 4
NASF Guideline G - Aviation Facilities	The site is outside the Building Restricted Area No Navigation Aid protection surfaces will be impacted by the proposed built or temporary structures
NASF Guideline H - Helicopter Landing Sites	Refer to Section 5
NASF Guideline I - Public Safety Areas	The site is outside all PSA contours

Figure 18: Summary of NASF Assessment Findings for the site



Figure 19: Site does not fall within any of the lighting planes for Sydney Airport

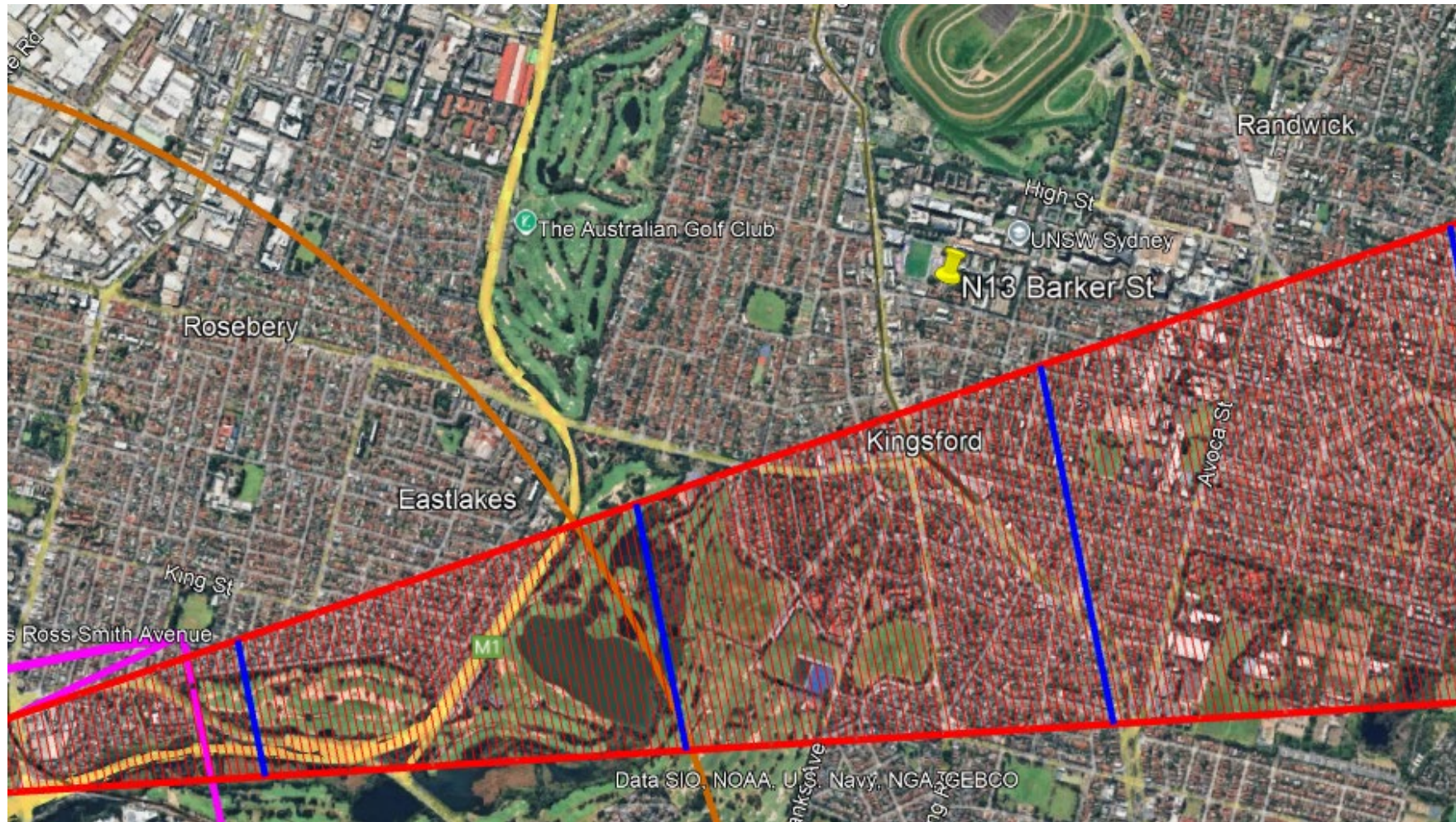


Figure 20: Site is not impacted by any navigation aid protection surfaces

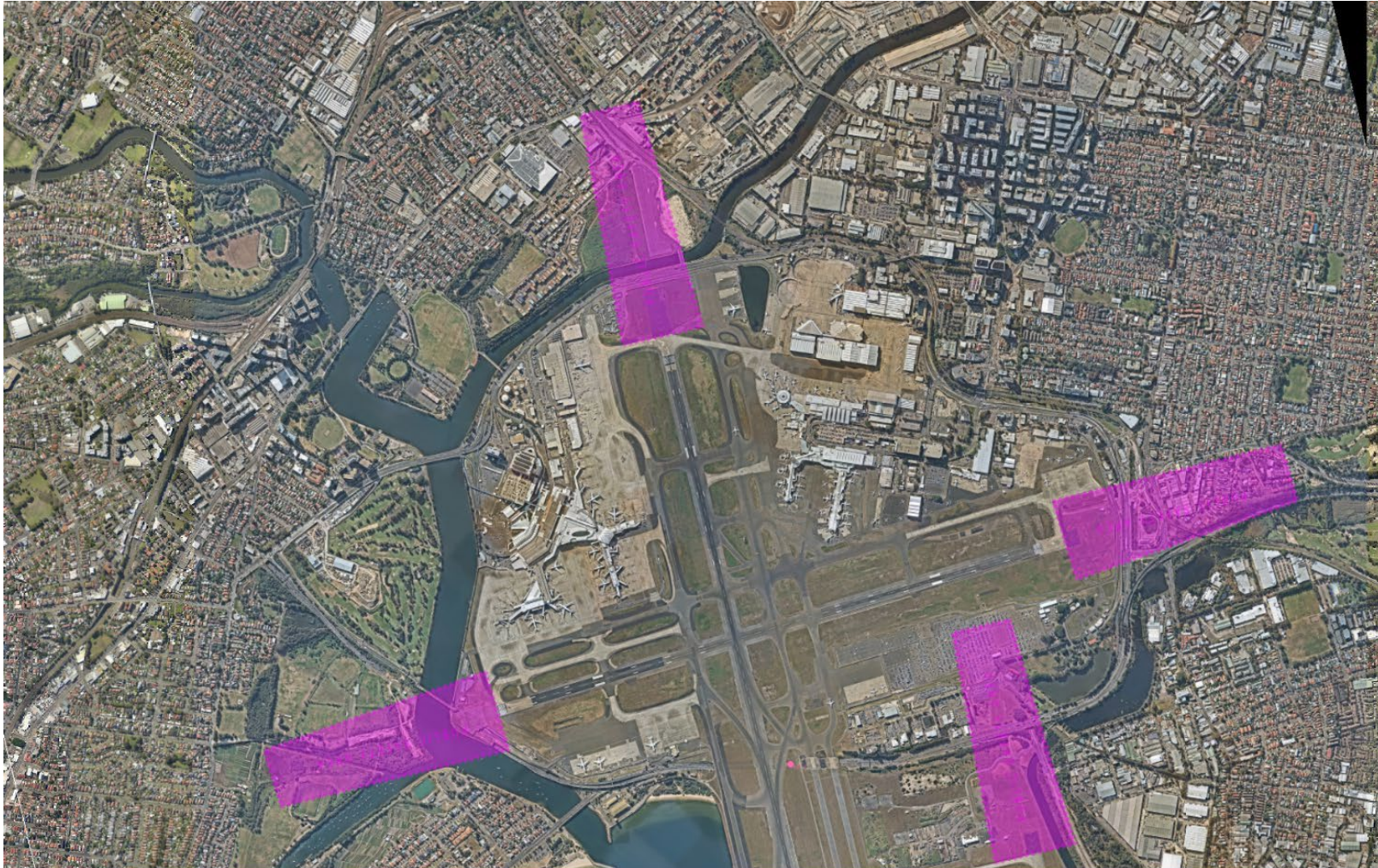
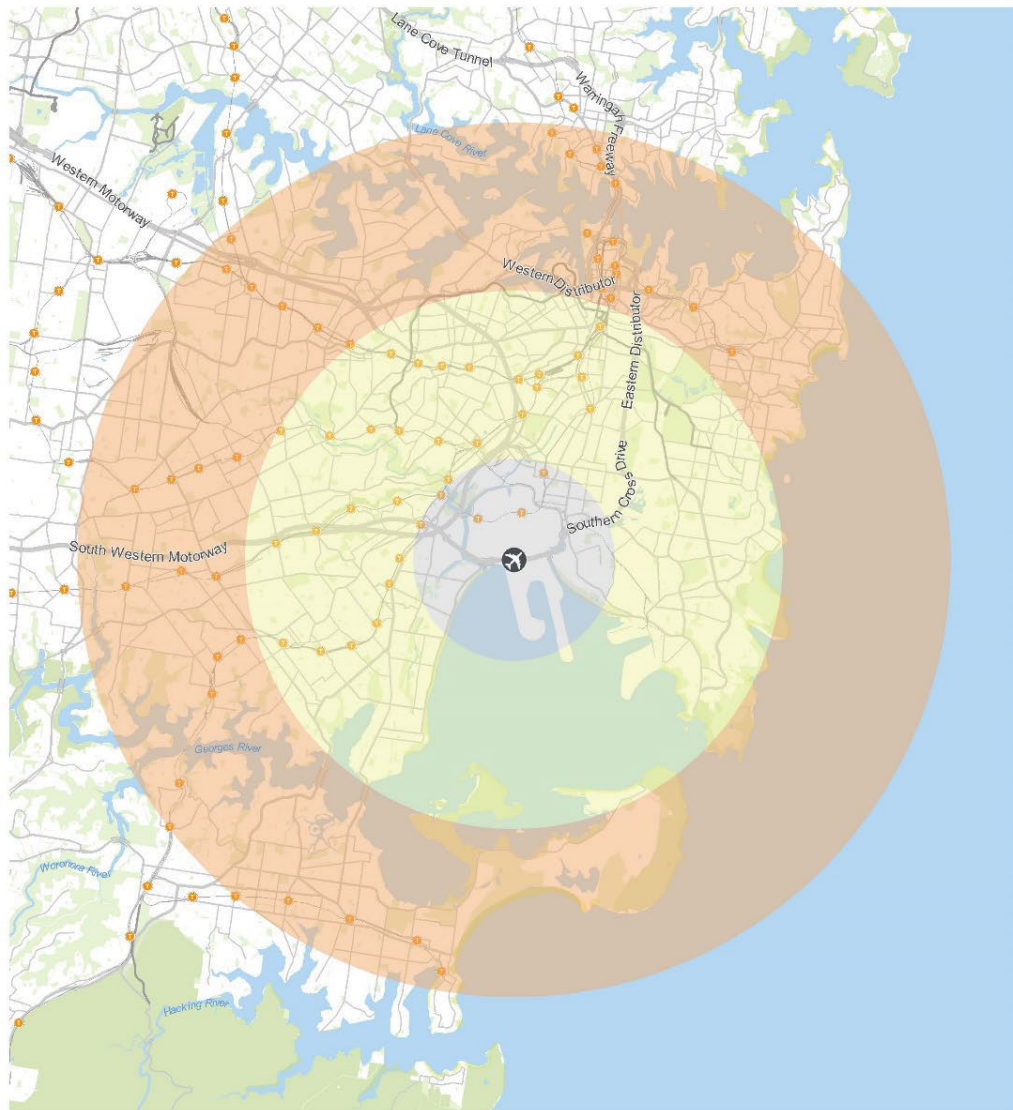


Figure 21: Public Safety Area contours for all runways at Sydney Airport (site East of where image is cut off)



Attachment 2. Example Wildlife Management Areas Map (Sydney Kingsford-Smith Airport)

- | | |
|---------------------------|--|
| Aerodrome Reference Point | Watercourse |
| Railway station | Area A (3km radius) |
| Heavy rail | Area B (3-8km radius) |
| Motorway | Area C (8-13km radius) |
| Primary road | Waterbody |
| Arterial road | National Parks and Wildlife Service Estate |
| Sub-Arterial road | Open space |
| Distributor road | |

0 1.25 2.5 5 Km N
 Intended Map Size: A4
 Publication Date: 12/09/2023
 Coordinate System: GDA 1984 MGA Zone 56

Disclaimer: The Department of Planning and Environment makes every effort to ensure the quality of information available on this map. Before relying on the information on this map, users should carefully evaluate its accuracy, currency, completeness and relevance for their purposes. The Department cannot guarantee and assumes no legal liability or responsibility for the accuracy, currency or completeness of the information.

Figure 22: Wildlife buffer zones for Sydney Airport (site within 3-8km radius i.e. yellow zone)

Wildlife Hazard Management Action Table

Attachment 1

Land use types	Likely attractants ▲ natural elements ■ structural elements ● waste and food	Wildlife attraction risk	Actions for existing development and land uses in wildlife management areas			Actions for new and changed development and land uses in wildlife management areas		
			0-3 km (Area A)	3-8 km (Area B)	8-13 km (Area C)	0-3 km (Area A)	3-8 km (Area B)	8-13 km (Area C)
Agriculture								
Turf farm, piggery, abattoir, aquaculture	▲ ■ ●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Fruit tree farm/orchard	▲ ■ ●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Fish processing/packing plant	▲ ■ ●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Farm (cattle, dairy, poultry, crops)	▲ ■ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Horticulture, viticulture, market farms/gardens	▲ ■ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Forestry	▲ ●	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Plant nursery	▲ ■ ●	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Conservation								
Wildlife/conservation area - wetland, waterways	▲	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Wildlife/conservation area - dryland	▲	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Recreation								
Significant open water (ancillary to development)	▲	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Showground	▲ ■ ●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Significant landscaped space (ancillary to development)	▲	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Golf course	▲ ■ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Park, playground	▲ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Picnic areas, camping ground	▲ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Racetrack, horse riding school	▲ ■ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Sports facility (tennis, bowls, football fields)	▲ ■ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Commercial								
Food processing or storage facility	■ ●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Fast food, drive-in, outdoor restaurant	■ ●	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Shopping centre	■ ●	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Warehouse (food storage)	■ ●	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Car park	■ ●	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Cinemas	■ ●	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Hotel/motel	■ ●	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Office building	■ ●	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Petrol station	■ ●	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Warehouse (non-food storage)	■ ●	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Utilities								
Food / organic waste facility	■ ●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Putrescible waste facility - landfill	■ ●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Putrescible waste facility - transfer station	■ ●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Water infrastructure (drains, channels, basins)	▲	High	Mitigate	Mitigate	Monitor	Mitigate	Mitigate	Monitor
Non-putrescible waste facility - landfill	■ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Non-putrescible waste facility - transfer station	■ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Sewage / wastewater treatment facility	■ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Potable water treatment facility	▲ ■	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action

Figure 23: Wildlife Hazard Management Action Table (NASF Guideline C)

Note: Hotel/motel is deemed to be the most appropriate land use type for the site i.e. no action recommended within 3-8km buffer zone



261

Figure 24: ANEF 2039 and 2033 contours clear of the site

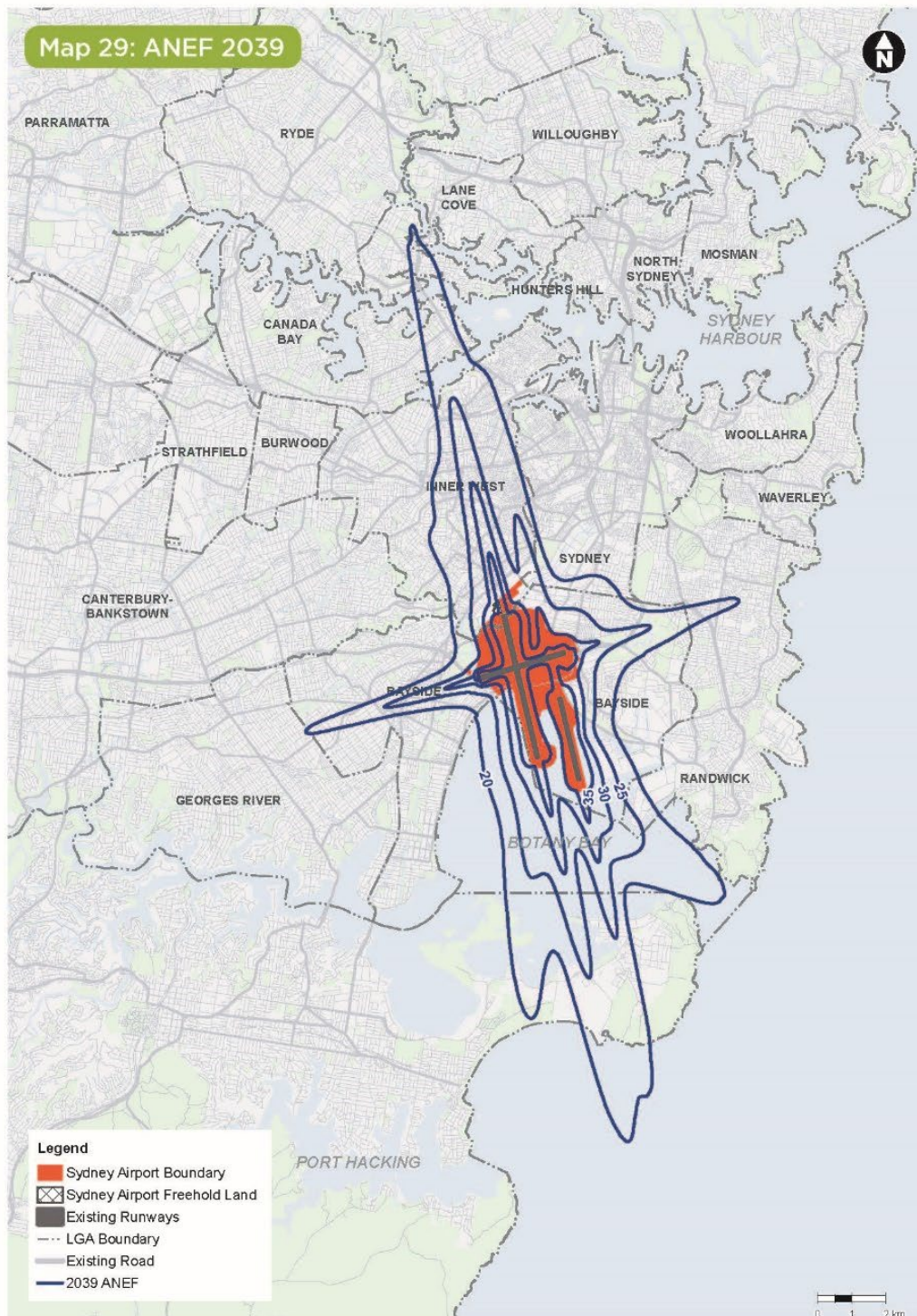


Figure 25: 2039 ANEF contours clear of the site

8

Conclusions

Conclusions

The conclusions from Avlaw's Preliminary Aeronautical Impact Assessment are summarised below:

- Buildings A, B and C will all intrude Sydney Airport's OLS and will therefore require controlled activity approval prior to being constructed. No other airspace protection surfaces will be impacted.
- TC1, TC2 and TC3 will all intrude the Sydney Airport OLS and will therefore require controlled activity approval prior to their installation. No other airspace protection surfaces will be impacted.
- Neither the built structure nor crane activity will intrude the OAA for any of the helipads at the POW Hospital.
- No other impediments or risks to aircraft operations have been identified when assessing the proposed development at the site against all other relevant criteria contained in the NASF
- Controlled activity applications should be lodged with Sydney Airport, seeking approval for Buildings A, B and C intruding the OLS, which based on the heights assessed in this report, should be approved.
- Once the CMP is frozen, an application seeking controlled activity approval for crane activity should be lodged with Sydney Airport, which based on the heights assessed in this report, should be approved.



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