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APPENDIX L

Aviation Impact Assessment

AvLaw

AERONAUTICAL IMPACT ASSESSMENT

Barangaroo South Mod 10 Submission

31 January 2020

AVLAW CONSULTING

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Publication Title

Aeronautical Impact Assessment: Barangaroo South Mod 10 Submission

Prepared for

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V1 FINAL	09/09/2019	Amin Hamzavian	Comments incorporated
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ABOUT
AVLAW PTY LTD

AvLaw has established a reputation in the Asia-Pacific region as a highly respected provider of aviation consultancy services, as evident from our diverse range of clients which include aircraft owners and operators, government departments and agencies, safety regulators, airport operators, mining and resource companies and property developers.

The AvLaw team of consultants and auditors are comprised of senior airline executives, airport directors, engineers, planning and operations specialists and safety regulators.

Our subject matter experts each have extensive operational experience across a wide range of disciplines including airport and flight operations, maintenance, engineering, air traffic management, aviation law and regulations, aviation security, aviation economics and drones/RPA.

1

Introduction

Introduction

This report supports a Section 75W Modification to Concept Plan Approval MP06_0162 (known as Modification 10) pursuant to clause 3C, Schedule 2 of Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017 (Savings and Transitional Regulation).

Avlaw Pty Ltd, trading as Avlaw Aviation Consulting (Avlaw), completed an Aeronautical Impact Assessment in October 2014 titled "Barangaroo South Mod 8 Submission – Report to Identify the Impacts of the Barangaroo South Proposal on Prescribed Airspace for Sydney Airport" (Report). The Report assessed the aeronautical impacts associated with the proposed construction Stage 1B Residential i.e. two high-rise towers (R4A and R4B) at Barangaroo South, which concluded that aviation approval for both buildings and associated crane activity should be given. Since the completion of the Report, the following milestones have been reached with respect to development activities at Barangaroo South:

- three Commercial International Towers have been completed;
- the Crown Hotel and construction cranes have received aviation approval;
- construction of the Crown Hotel has commenced and is estimated to be finished by December 2020; and
- details are being finalised for the residential towers and associated construction cranes.

The key modification of the concept plan assessed as part of this report is the increase in height for the Building Envelope Plan for Building R4B. In particular, this report assesses the aeronautical impacts associated with the proposed Building R4B at a height of RL235 which subsequently increases the necessary crane height to complete construction from RL 270 to RL 295.

Avlaw also notes that Building R5 is not considered an obstacle from an aeronautical perspective as its height is below that which prescribed airspace commences across the site and therefore does not require aviation approval to be constructed.

2

Overview of Proposed Modification

Overview of Proposed Modification

Concept Plan (Mod 10) seeks to increase the height of the Building Envelope Plan for R4B to RL 235 and increase the GFA of Blocks 4A and 4B by a total of 8,000m2.

In order to support the above changes, the following modifications are proposed:

- increase the Concept Plan maximum GFA for Block 4A from 86,979m2 to 92,629m2 and the State Significant Precincts SEPP (SSP SEPP) Block 4A maximum GFA from 94,740m2 to 100,390m2;
- increase the Concept Plan maximum GFA for Block 4B from 19,158m2 to 21,508m2 and the State Significant Precincts SEPP (SSP SEPP) Block 4B maximum GFA from 20,970m2 to 23,320m2;
- increase the Concept Plan residential maximum GFA of Block 4A from 86,166m2 to 91,816m2;
- increase the Concept Plan residential maximum GFA of Block 4B from 18,287m2 to 20,637m2; and
- increase the Concept Plan maximum height on the Building Envelope Plan for R4B from RL 210 to RL 235, noting Block 4A currently provides for a maximum height of RL 250 under the SSP SEPP.

This Modification also seeks to amend the condition to align the time for delivery of Key Worker Housing at Barangaroo South and off site. This is to reflect that it will be completed prior to the issue of the occupation certificate for Building R5.

The changes described above necessitate modifications to the existing Instrument of Approval, Statement of Commitments and Barangaroo South Built Form Principles and Urban Design Controls for the Concept Plan as well as the relevant provisions of the State Significant Precinct SEPP.

3

Site Location

Site Location

Barangaroo is located on the north western edge of Central Sydney, bounded by Sydney Harbour to the west and north, the historic precinct of Millers Point (for the northern half), The Rocks and the Sydney Harbour Bridge approach to the east; and King Street Wharf to the south.

The Barangaroo site has been divided into three distinct redevelopment areas (from north to south) – the Barangaroo Reserve, Central Barangaroo and Barangaroo South. Concept Plan (Mod 10) relates to Barangaroo South only.

4

Airspace Height Controls

Airspace Height Controls

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 define sets of invisible surfaces above the ground around an airport. The airspace above these surfaces forms the airport's **Prescribed Airspace**. With respect to Sydney Airport, the following airspace protection surfaces have been "declared" at by the Department of Infrastructure, Transport, Cities and Regional Development (Department) and are therefore enshrined in legislation as the airport's Prescribed Airspace:

- Precision Approach Path Indicator (PAPI) system protection surfaces;
- Obstacle Limitation Surfaces (OLS);
- Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) surfaces;
- Navigation Aid Protected Surfaces;
- High Intensity Light Protected Surfaces;
- Radar Terrain Clearance Chart (RTCC)/Radar Lowest Sector Altitude (RLSALT) surfaces; and
- Combined Radar Departure Assessment surfaces.

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Airspace Approval Process

Airspace Approval Process

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" and requires that controlled activities cannot be carried out without approval. Controlled activities include the following:

- permanent structures, such as buildings, intruding into the Prescribed Airspace;
- temporary structures such as cranes intruding into the Prescribed Airspace; 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.

The Regulations differentiate between short-term (not expected to continue longer than 3 months) and long-term controlled activities. The Regulations allow for the airport operator to approve short-term penetrations of the OLS under delegation from the Department following consultation with the Civil Aviation Safety Authority (CASA) and Airservices Australia (Airservices).

With respect to long-term penetrations (e.g. a building penetrating the OLS), 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** for assessments of proposals resulting in a penetration of surfaces including PAPI, PANS-OPS etc.;
- **the local council authority** responsible for building approvals; and
- **the Department of Defence** in the case of joint-user airports.

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 and CASA. The Department cannot approve short-term penetrations of the PANS-OPS without the support of the airport operator and also cannot approve long-term penetrations of the OLS in the event CASA's assessment is not supportive of the application. Long-term intrusions of the PANS-OPS surfaces (e.g. cranes penetrating for longer than three months) are prohibited.

The information required in the application must include:

- a description of the proposed controlled activity (building construction, crane operation etc.)
- its precise location (street address and grid reference)

- if the controlled activity consists of the erection of a building or structure:
    - the proposed maximum height of the structure above the Australian Height Datum (including any antennae, towers, BMU etc.), and
    - the proposed maximum height of any temporary structure or equipment (e.g. cranes, scaffolding) intended to be used in the erection of the structure

Each penetration of Prescribed Airspace has to be assessed against the effect on published departure and approach procedures and other matters relating to the management and use of airspace surrounding airports. These include published survey data and Air Traffic Control (ATC) procedures and practices, including compatibility with the promulgated ATC RTCC that is used to safely vector aircraft in instrument meteorological conditions (non-visual). Each proposal has to be checked for proximity to published procedures to ensure statutory tolerances and safety buffers are maintained. The tolerances vary according to the type of navigation or aid being utilised by aircraft and cover vertical, lateral and longitudinal criteria.

The approval process requires separate assessments of the permanent building structure and temporary construction crane(s), although approvals for permanent structures (even if assessed favourably) will not be issued to the Proponent until the all aviation stakeholders have completed their assessment of temporary structures (e.g. cranes). Applications can be made in advance of planning approval for both, however CASA does require detailed architectural drawings to be provided prior to completing its assessment. Based on this, Avlaw's advice is that applications for controlled activity approvals be submitted to the airport only when final building designs, construction methodologies and timelines are known.

Timing to assess applications varies depending on the complexity of the assessment and the workload within the respective agencies at the time of receipt. Avlaw's experience on previous tall building projects suggests Proponents should allow at least five months for Sydney Airport, Airservices, CASA and the Department to conduct their own assessments in succession. Complex applications such as those which are seeking penetrations of PANS-OPS surfaces are more likely to take longer to assess. Avlaw notes that one proposed reform contained in the Modernising Airspace Protection Public Consultation Paper (Paper) refers to a submission timeframe of 90 days prior to lodgement of a DA for controlled activities.

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.

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Proposed Controlled Activity

Proposed Controlled Activity

Stage 1B Residential at Barangaroo South includes the construction of two high-rise towers. These two towers are indicated below as R4A (RL 250) and R4B (RL 235), with crane activity associated with construction of each tower also showing the maximum height for which aviation approval will be required i.e. RL 310 and RL 295 respectively.

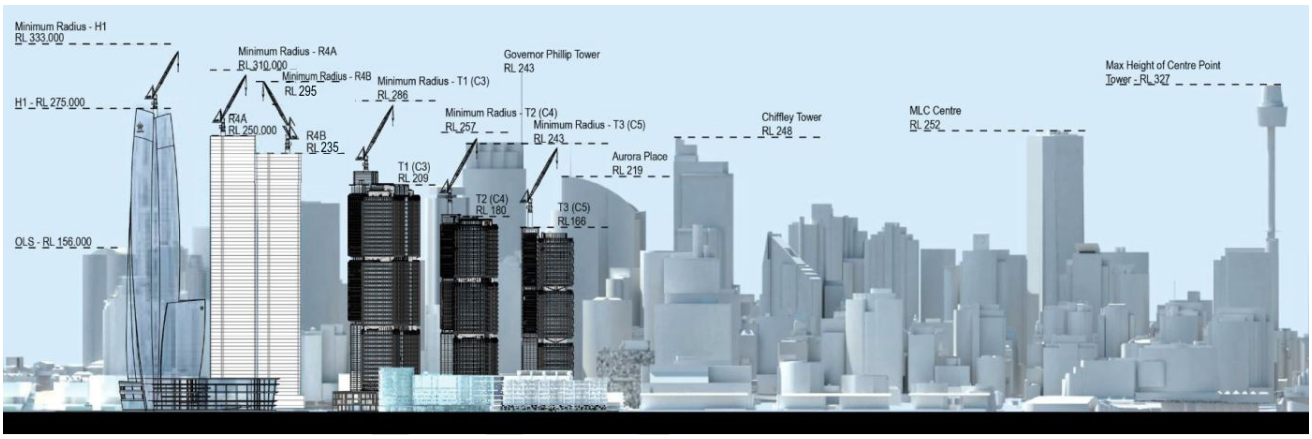

Figure 1: Maximum building and crane heights in relation to other existing and under construction buildings

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Aeronautical Impact Assessment Findings

Aeronautical Impact Assessment Findings

This findings of Avlaw's assessment of Sydney Airport's airspace protection surfaces that cover the site are summarised below.

SYDNEY AIRPORT					
Airspace Surface	Height	R4A (Maximum RL 250)		R4B (Maximum RL 235)	
		Clearance/Penetration (building)	Clearance/Penetration (crane)	Clearance/Penetration (building)	Clearance/Penetration (crane)
OLS	156m AHD	94m	154m	79m	139m
PANS-OPS	315m AHD	65m	5m	80m	20m
RTCC	335.28m AHD	85.28m	25.28m	100.28m	40.28m

Figure 1: Summary of Aeronautical Impact Assessment Findings

The main differences between this document and the Report that are relevant to the aeronautical impact assessment findings are listed below:

- The proposed Building Envelope Plan for R4B enables the height of R4B to be increase by 25m from RL210 to a maximum of RL235;
- The proposed maximum construction crane height has increased from RL 270 to RL 295; and
- Aviation approvals for the three Commercial buildings, Crown Hotel and associated construction cranes have already been issued.

With respect buildings R4A and R4B, both will be shielded by the Crown Hotel tower that has received aviation approval. While the temporary construction crane that has also been given aviation approval on Crown Hotel tower is in place, in practical terms, temporary construction cranes on buildings R4A and R4B will both be shielded. Temporary construction cranes on R4A and R4B may not be shielded for the final stages of construction if the Crown Hotel construction crane is removed before buildings R4A and R4B are completed. Building R4B is on a construction schedule behind building R4A. Avlaw notes that the strict application of shielding applies to existing permanent structures only (as specified in Manual of Standards Part 139 7.4.1.4) i.e. buildings only. The location of the R4A and R4B temporary construction cranes are both in less critical locations and heights than the currently approved Crown Hotel temporary construction crane.

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Conclusion

Conclusion

Avlaw notes that no applications for aviation approvals have been lodged for R4A or R4B. Avlaw's assessment is that aviation approval will be readily given for R4A and R4B and their associated construction cranes as they are in a less critical location from an aviation perspective and at lower heights that the approved Crown Hotel and its temporary construction crane.

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Appendix

APPENDIX 1 – Barangaroo South Indicative Master Plan (Mod 10)

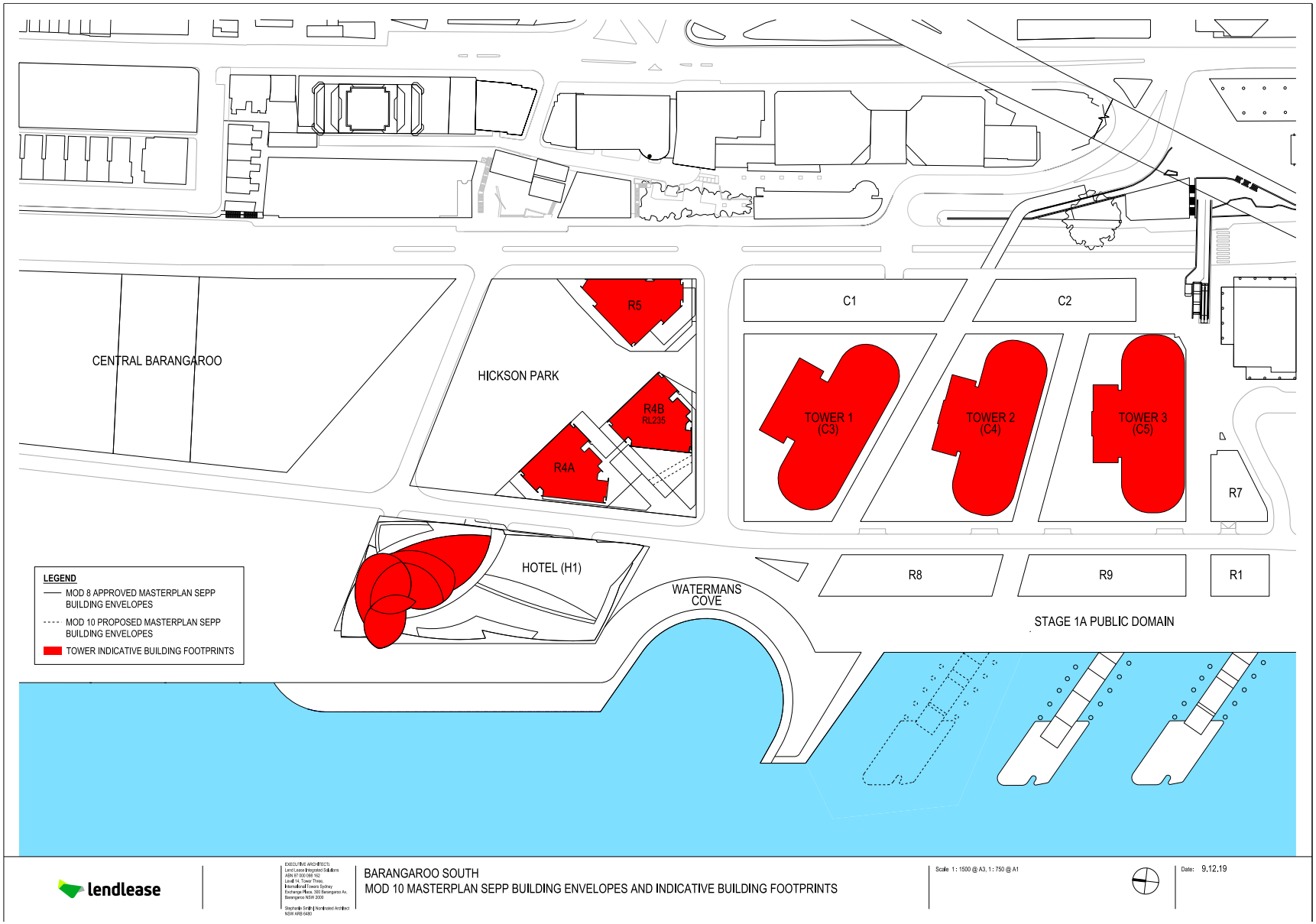

Figure 2: Barangaroo South Building Envelopes and Indicative Footprints

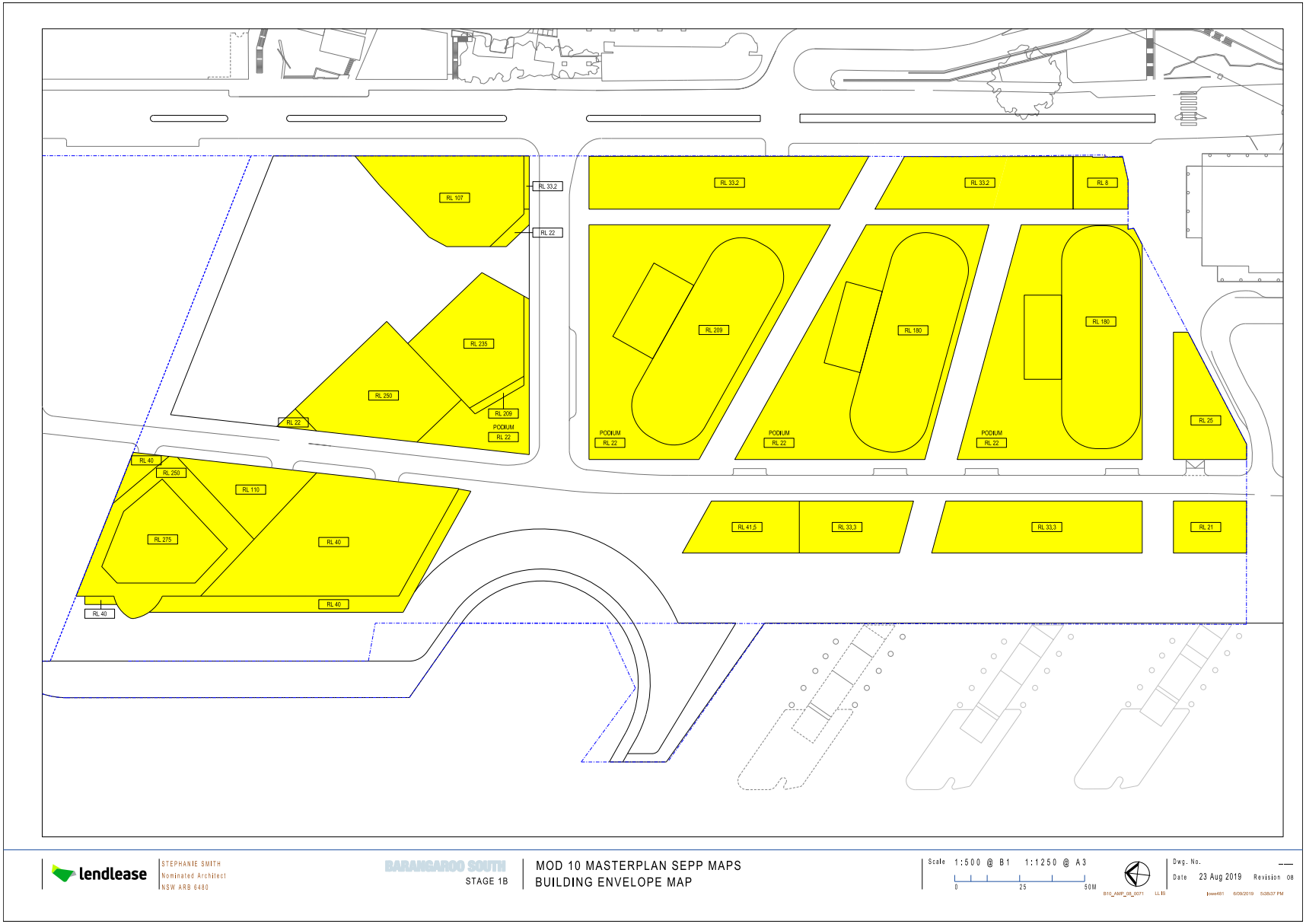

Figure 3: Building Height Envelope Map

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