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Central Coast Quarter – Northern Tower, 26-30 Mann Street, Gosford NSW

Noise and Vibration Impact Assessment

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1 INTRODUCTION

This noise and vibration impact assessment is submitted to the Department of Planning, Industry and Environment (DPIE) on behalf of the SH Gosford Residential and in support of an application for SSD application number 23588910 at 26-30 Mann Street, Gosford. The SSDA seeks consent for:

- Demolition of the existing retaining wall on site.
- Removal of three trees located at the site interface with Baker Street.
- Excavation to a depth of approximately 1.3m to accommodate the proposed ground floor structure.
- Earthworks to level the site in readiness for the proposed building.
- Construction of a 25-storey (26 level) mixed-use building, comprising:
- 621sqm of retail GFA.
- 136 apartments, equating to 13,263sqm of residential GFA.
- Four parking levels for 181 cars, with vehicular access from Baker Street.
- Storage areas and services.
- Communal open space.
- Publicly accessible through site link, including stairs, walkways, public lift, public art and landscaping.

The purpose of this assessment is to address the SEARs related to noise and vibration impacts, including an assessment of noise emissions during the construction and operational phases of the project and potential impacts from surrounding environmental noise sources.

Noise impacts addressed in this assessment include:

- Traffic noise intrusion into the development from the Central Coast Highway and Mann Street.
- Operational noise, mechanical plant noise.
- Construction noise and vibration emissions.

Noise and vibration impacts have been addressed in accordance with:

- Gosford City Centre Development Control Plan (DCP) 2018
- NSW State Environmental Planning Policy (Infrastructure) 2007(iSEPP)
- NSW Department of Planning and Environment – 'Apartment Design Guide (ADG)'
- NSW Department of Planning – 'Development Near Rail Corridors and Busy Roads' (DNRCBR)
- NSW Environment Protection Authority (EPA) - Noise Policy for Industry 2017.
- NSW Department of Environment and Climate Change - Interim Construction Noise Guidelines
- NSW Department of Environment and Conservation - Assessing Vibration: A Technical Guideline document.

2 RESPONSE TO SEARS

The environmental noise and vibration impact assessment is required by the Secretary's Environmental Assessment Requirements (SEARs) for SSD-23588910. Table 1 identifies the SEARs and report reference within this report.

Table 1- SEARs and Relevant Reference

SEARs Item	Report Reference
Item 6. Environmental and Residential Amenity Assess the environmental and residential amenity impacts associated with the proposal, including solar access, acoustic impacts, visual privacy, view loss, overshadowing, lighting impacts and wind impacts as required by the Future Environmental Assessment Requirements SSD Concept Approval SSD-10114. A high level of environmental amenity must be demonstrated; Demonstrate that the proposed building envelopes are consistent with SEPP 65 and the Apartment Design Guide (ADG) and ensure the proposal achieves a high level of environmental and residential amenity; and Demonstrate that the proposal has considered and adopted best practice Crime Prevention Through Environmental Design (CPTED) principles.	Section 5
Item 15. Noise and Vibration Prepare a noise and vibration assessment as per the Future Environmental Assessment Requirements SSD Concept Approval SSD-10114; and the assessment must address both construction and operational noise and vibration impacts.	Section 6 & 7

We note that the SEARs requirements above reference the SSD-10114 noise and vibration requirements which are presented below (from the previous development consent requirements for the proposed development):

Condition 31

Future development application(s) shall be accompanied by a Noise and Vibration Impact Assessment (NVIA) that identifies and provides a quantitative assessment of the main noise generating sources and activities during operation. The NVIA shall include details of any mitigations measures to ensure the amenity of sensitive land uses are protected during the operation of the development.

Condition 35b

Construction Noise and Vibration Impact Assessments that identifies and provides a quantitative assessment of the main noise generating sources and activities during construction. Details are to be provided outlining any mitigation measures to ensure the amenity of adjoining sensitive land uses is protected throughout the construction period(s).

In this assessment we will:

- Identify nearby noise sensitive receivers and operational noise sources with the potential to adversely impact nearby development.
- Identify relevant Council and EPA noise emission criteria applicable to the development.
- Assess compliance with Infrastructure SEPP requirements.
- Predict operational and construction noise emissions and assess them against relevant acoustic criteria.
- If necessary, determine building and/or management controls necessary to mitigate potential noise impacts.

3 PROPOSED DEVELOPMENT

The site is located at 26 Mann Street, Gosford. The proposed future development consists of three towers. This report will address the development proposal for Central Coast Quarter – North Tower, which will consist of :

- Construction of a 25-storey (26 level) mixed-use building, comprising:
- 621sqm of retail GFA.
- 136 apartments, equating to 13,263sqm of residential GFA.
- Four parking levels for 181 cars, with vehicular access from Baker Street.
- Storage areas and services.
- Communal open space.
- Publicly accessible through site link, including stairs, walkways, public lift, public art and landscaping.

Noise sources impacting the site are:

- Mann Street, to the east of the site, which carries moderate traffic volumes.
- The Central Coast Highway runs adjacent to the Gosford City Park to the west of the site. Noise from the Highway has potential impacts on the west and south façades of the development.

Development in the vicinity of the site is generally commercial. The nearest noise sensitive residential development to the subject site are current/future residences approximately 60m to the east across Mann Street at 21-37 Mann Street. Further east there are residential apartments along Henry Parry Drive at 25 Mann Street & 127 Georgiana Terrace, approximately 100m to the east of the site.

The nearest commercial development is located at 99 Georgina Terrace adjoining the site to the north and 32 Mann Street to the east of the site. In addition, there is also commercial development further east of the site (on the opposite side of Mann Street).

To the west of the site there is an active recreation area known as the Leagues Club Field.

Figure 1 below provides a satellite view of the site and surrounding developments with the subject site location and measurement locations positions noted.

Figure 1: Site Survey and Monitoring Positions

4 EXISTING ACOUSTIC ENVIRONMENT

The existing acoustic environment at the site is categorised primarily by traffic noise from the Central Coast Highway during the day, evening and night.

4.1 ENVIRONMENTAL NOISE DESCRIPTORS

Environmental noise constantly varies. Accordingly, it is not possible to accurately determine prevailing environmental noise conditions by measuring a single, instantaneous noise level.

In analysing environmental noise, three-principal measurement parameters are used, namely L_{Max}, L_{90} and L_{eq}.

The L_{90} measurement parameter is a statistical level that represent the average minimum noise levels. The L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the 15-minute period. L_{eq} is important in the assessment of environmental noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of environmental noise.

The L_{max} noise level is the maximum level measured over a given measurement interval.

4.2 BACKGROUND NOISE LEVELS

Background noise levels which will be used as a basis for this assessment are detailed in the following sections.

4.2.1 Measurement Equipment

Unattended noise monitoring was conducting using Acoustic Research Laboratories Pty Ltd noise logger. The logger was programmed to store 15-minute statistical noise levels throughout the monitoring period. The equipment was calibrated at the beginning and the end of the measurement using a Rion NC-73 calibrator; no significant drift was detected. All measurements were taken on A-weighted fast response mode.

4.2.2 Measurement Location

Long term noise monitoring was conducted in the following locations:

- L1 - The southwest corner of the subject site (refer to Figure 1).
- L2 – At the rear of 79-87 Henry Parry Drive.
- L3 – The balcony within apartment 804 of Merindah Apartments
- L4 – The corner of Vaughan Avenue and Mann Street

4.2.3 Measurement Period

Long term noise monitoring was conducted in the following periods at each location:

- L1 - 8th February to 15th February 2018
- L2 - 5th April to12th April 2017
- L3 – Installed 27th August 2021 – Monitoring in progress
- L4 – Installed 27th August 2021 – Monitoring in progress

4.2.4 Background Noise Levels

The ambient noise levels established from the unattended noise monitoring are detailed in the table below.

Table 2 – Long Term Noise Logging Data
(Rating Background Noise Level and Ambient Noise Level)

Location	Time of Day*		
	Day	**Evening**	**Night**
Noise Monitor Location 1	55dB(A)$L_{eq(Period)}$ 51dB(A)L_{90}	55dB(A)$L_{eq(Period)}$ 49dB(A)L_{90}	53dB(A)$L_{eq(Period)}$ 41dB(A)L_{90}
Noise Monitor Location 2	57dB(A)$L_{eq(Period)}$ 54dB(A)L_{90}	55dB(A)$L_{eq(Period)}$ 51dB(A)L_{90}	53dB(A)$L_{eq(Period)}$ 41dB(A)L_{90}
Noise Monitor Location 3**	55dB(A)$L_{eq(Period)}$ 51dB(A)L_{90}	55dB(A)$L_{eq(Period)}$ 49dB(A)L_{90}	53dB(A)$L_{eq(Period)}$ 41dB(A)L_{90}
Noise Monitor Location 4**	55dB(A)$L_{eq(Period)}$ 51dB(A)L_{90}	55dB(A)$L_{eq(Period)}$ 49dB(A)L_{90}	53dB(A)$L_{eq(Period)}$ 41dB(A)L_{90}

**Note – Time of day is as described within the NSW EPA Noise Policy for Industry (NPI) 2017.*
***Note – Further noise monitoring (noise monitor location 3 & 4) is currently in progress to confirm the background noise levels for the current/future residential receivers at 21-37 Mann Street, and their results will be added later to the report once the required monitoring period as defined in the NPI is completed. Therefore, in the interim assessments within this report to these residential receivers have adopted the rating background and ambient noise levels determined from noise monitor location 1.*

5 EXTERNAL NOISE INTRUSION ASSESSMENT

The noise intrusion assessment has been conducted for potential impacts from the Central Coast Highway and Mann Street.

5.1 NOISE INTRUSION CRITERIA

A traffic noise intrusion assessment has been conducted based off the requirements of the following acoustic requirements:

- Gosford City Centre Development Control Plan (DCP) 2018
- NSW State Environmental Planning Policy (Infrastructure) 2007(iSEPP)
- NSW Department of Planning and Environment – 'Apartment Design Guide (ADG)'
- NSW Department of Planning – 'Development Near Rail Corridors and Busy Roads' (DNRCBR)

5.1.1 Gosford City Centre Development Control Plan (DCP) 2018

Section 8.7 entitled 'Noise and Vibration' has the following acoustic criteria regarding noise intrusion on the proposed development.

3. Noise sensitive developments, such as dwellings, should be designed to reasonably protect the proposed development from noise sources such as arterial roads, railway lines, sporting complexes and entertainment venues.

As Gosford City Centre DCP 2018 does not have any specific criteria for traffic noise the assessment will be conducted in accordance with iSEPP and DNRCBR.

5.1.2 NSW State Environmental Planning Policy (Infrastructure) 2007(iSEPP)

The iSEPP details specific acoustic requirements for traffic noise intrusion into residential uses as part of a development.

102 Impact of road noise or vibration on non-road development

(1) This clause applies to development for any of the following purposes that is on land in or adjacent to the road corridor for a freeway, a tollway or a transitway or any other road with an annual average daily traffic volume of more than 40,000 vehicles (based on the traffic volume data published on the website of the RTA) and that the consent authority considers is likely to be adversely affected by road noise or vibration:

(a) a building for residential use,

(b) a place of public worship,

(c) a hospital,

(d) an educational establishment or child care centre.

(2) Before determining a development application for development to which this clause applies, the consent authority must take into consideration any guidelines that are issued by the Director-General for the purposes of this clause and published in the Gazette.

(3) If the development is for the purposes of a building for residential use, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded:

(a) in any bedroom in the building—35 dB(A) at any time between 10 pm and 7 am,

(b) anywhere else in the building (other than a garage, kitchen, bathroom or hallway)— 40 dB(A) at any time.

The SEPP Infrastructure defines busy roads that are subject to an acoustic assessment as:

> *"Roads specified in Clause 102 of the Infrastructure SEPP: a freeway, tollway or a transit way or any other road with an average annual traffic (AADT) volume of more than 40,000 vehicles (based on the traffic volume data provided on the website of the RTA).*
>
> *Any other road – with an average annual daily traffic (AADT) volume of more than 20,000 vehicles (based on the traffic volume data published on the website of the RTA).*
>
> *Any other road – with a high level of truck movements or bus traffic."*

RTA Map No. 7 of the traffic volume maps referenced by the Infrastructure SEPP on the RTA website (see below), classifies the section of the Central Coast Highway where the development is located adjacent to as a road where a noise intrusion assessment is recommended under clause 102 of the SEPP Infrastructure 2007.

See RTA average annual daily road traffic volume map number 7 and the approximate location of the site below.

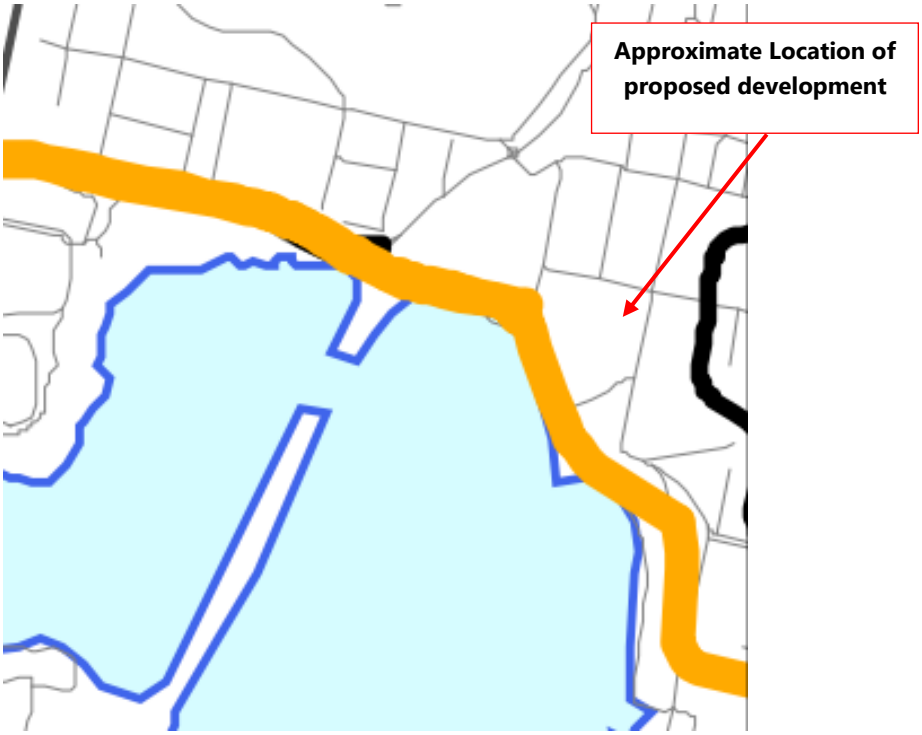


Figure 2 – RTA Map No. 7 and Approximate Location of Proposed Development

5.1.3 NSW Department of Planning and Environment – 'Apartment Design Guide (ADG)'

Objective 4B-1 of the Apartment Design Guide (ADG) requires all that habitable rooms must be able to be naturally ventilated.

Sections 4H & J relate to the provision of acoustic privacy. 4H addresses "*typical considerations for acoustic privacy*". 4H states that" for *constrained sites near rail corridors, major roads or underneath flight paths refer to Section 4J Noise and Pollution for further guidance*".

Objective 4H-1 requires "minimising noise through siting and layout", the items listed in design guidance have been considered and it is not practical for the subject building to completely address noise impacts using siting and planning alone. In respect of Objective 4H-2 "noise mitigated through layouts and acoustic treatments", it is possible to resolve noise conflicts "where physical separation cannot be achieved" by using the methods noted. These being double or acoustic glazing, acoustic seals and use of material with low noise penetration properties.

Given the site is impacted by environmental noise that cannot be practically mitigated through siting and planning it is concluded that the subject site is *"constrained"* and the provisions of Section 4J are applicable.

The recommendations of the ADG in relation to ventilation requirements in the subject development can be summarised as follows:

- Openings in the façade must be provided for natural ventilation. In considering ADG Objective 4J-1, consideration of alternatives to some of the design criteria (including natural cross ventilation) is permitted.
- The site is impacted by traffic noise and is "constrained".
- SEPP 65 (multi-dwelling residential) development must have regard to the recommendations of *Development near Rail Corridors and Busy Roads - Interim Guideline. (DNRCBR)* and AS 2021.
- A noise attenuating façade can be used in this case to provide an acceptable indoor noise environment (applying Objective 4J-2) with "windows closed".
- DNRCBR also provides an "open windows" noise level test to determine if internal noise levels under a naturally ventilated scenario are acceptable.
- If the internal noise level exceeds the DNRCBR internal "windows closed" noise level plus 10 dB(A) when the rooms are naturally ventilated, then supplementary ventilation should be provided to enable windows to be closed while still complying with the ventilation requirements of the BCA.
- The BCA permits this ventilation to be achieved in a number of ways, including mechanical ventilation.

In summary, the intent of the ADG is that every habitable room should have a natural ventilation source. However, in constrained, high noise level environments, the DNRCBR guideline imposes an additional requirement to provide a supplementary ventilation source (complying with the BCA) where it is not practical to achieve acceptable "windows open" noise levels stipulated in DNRCBR.

5.1.4 NSW Department of Planning – 'Development Near Rail Corridors and Busy Roads' (DNRCBR)

The Department of Planning "Apartment Design Guide" (2015) states that new development affected by noise from major noise sources must have regard to NSW Department of Planning's '*Development near Rail Corridors and Busy Roads (Interim Guideline)*' ("DNRCBR"). Section 3.5 states:

> *"The following provides an overall summary of the assessment procedure to meet the requirements of clauses 87 and 102 of the Infrastructure SEPP. The procedure covers noise at developments for both Road and Rail.*
>
> - *If the development is for the purpose of a building for residential use, the consent authority must be satisfied that appropriate measures will be undertaken to ensure that the following LAeq levels are not exceeded:*
>
> - *In any bedroom in the building: 35dB(A) at any time 10pm – 7am*
>
> - *Anywhere else in the building (other than a garage, kitchen, bathroom, or hallway): 40 dB(A) at any time."*
>
> - …If internal noise levels with windows or doors open exceed the criteria by more than 10dB(A), the design of the ventilation for these rooms should be such that occupants can leave windows closed, if they so desire, and also to meet the ventilation requirements of the Building Code of Australia."

5.1.5 Summarised Traffic Noise Intrusion Criteria

The internal noise level criteria adopted for each internal space for the development is presented in the table below.

Room Type	Governing Criteria	Measurement Period	Resultant Internal Noise Level*
Sleeping Areas	iSEPP/DNRCBR	Night (10pm – 7am)	35 dB(A)$L_{eq(9hr)}$
Habitable Rooms Other than Sleeping Areas		Anytime	40 dB(A)$L_{eq(15hr)}$

**Note - A supplementary ventilation system complying with the BCA should be provided where windows open noise levels (to 5% of the floor area) exceed the windows closed criteria by more than 10 dB(A).*

5.2 EXTERNAL NOISE MEASUREMENTS

This section of the report details noise measurements conducted at the site to establish traffic noise levels impacting the development.

5.2.1 Measurement Equipment

Attended short term measurements of traffic noise which were undertaken by this office, to supplement the unattended noise monitoring. Measurements were conducted using a Norsonic 118 Sound Analyser. The analyser was set to fast response and calibrated before and after the measurements using a Norsonic Sound Calibrator type 1251. No significant drift was noted.

Unattended noise monitoring was conducting using Acoustic Research Laboratories Pty Ltd noise logger. The logger was programmed to store 15-minute statistical noise levels throughout the monitoring period. The equipment was calibrated at the beginning and the end of the measurement using a Rion NC-73 calibrator; no significant drift was detected. All measurements were taken on A-weighted fast response mode.

5.2.2 Measurement Location & Period

Measurement locations are detailed in the aerial photo in Section 2.

Attended noise measurements were conducted on 19th August 2019 (4pm-6pm) in addition to the long-term noise logging data collected at the site between 8th February to 15th February 2018.

5.2.3 Traffic Noise Levels

The existing traffic noise levels listed in the table below were determined based on the unattended noise monitoring and attended noise measurements.

Table 3 – Existing Traffic Noise Levels at Proposed Site

Location	Summary of Existing Traffic Noise Level	
	Day Time	Night Time
5m from Mann Street	58dB(A)$L_{eq(15hour)}$	54dB(A)$L_{eq(9hour)}$*
3m from Central Coast Highway	68dB(A)$L_{eq(15hour)}$	64dB(A)$L_{eq(9hour)}$*

**Note - Determined based on the $L_{eq(15hr)}/L_{eq(9hr)}$ difference from the long-term noise logging data gathered at the site.*

5.3 NOISE INTRUSION ANALYSIS

Traffic noise intrusion into the proposed development was assessed using the measured traffic noise levels above. The measured noise levels at 3m from the Highway were corrected to the account for the additional distance and barrier losses to the proposed dwellings (11 dB(A) reduction).

Calculations were undertaken taking into account the orientation of windows, barrier effects *(where applicable)*, the total area of glazing, facade transmission loss and room sound absorption characteristics. In this way, the likely interior noise levels can be predicted.

Provided the following recommendations are adhered to then the internal noise levels from traffic noise intrusion will comply with the requirements of Section 5.1.5.

5.4 INDICATIVE COMPLYING CONSTRUCTIONS

A final design of façade systems should be conducted once façade design is complete. The following sections outline indicative recommended façade treatments.

5.4.1 Glazed Windows and Doors

No additional acoustic treatment to windows is required above standard building constructions (i.e. minimum 6mm float glass– R_w 29, or 6/12/6 IGU R_w 35).

Any glazed louvres to bedrooms or living areas should be submitted to the acoustic consultant as part of the detailed design to ensure compliance with internal noise objectives.

5.4.2 External Roof/Ceiling

The proposed roof construction is a masonry system (e.g., concrete slab) which will be acoustically acceptable without additional treatment.

If any penetrations are required through any of the external lining of any of the systems above for other building services, all gaps should be filled with acoustic sealant to ensure compliance with internal noise level requirements.

5.4.3 External Walls

The proposed external wall constructions are to be a concrete reinforced panel and insulated stud system. In order to meet the acoustic requirements, the following minimum construction in the table below is recommended.

Table 4 – External Light Weight Wall Construction

Space	External Lining	Stud System	Internal Lining
All	35mm Concrete Reinforced Panel	64mm Steel Stud Separation with Minimum 75mm Thick, 11kg/m^3 Glass Wool Insulation to Stud Cavity	1x13mm Plasterboard

If any penetrations are required through any of the external lining of any of the systems above for other building services, all gaps should be filled with acoustic sealant to ensure compliance with internal noise level requirements.

5.4.4 Entry Doors

Entry doors will be via internal corridors and as such constructions will be formulated pursuant to the Building Code of Australia.

5.4.5 Ventilation

With respect to natural ventilation of the dwelling, the NSW Department of Planning document "Development near Busy Roads and Rail Corridors - Interim Guideline" states that with windows open, the allowable internal noise goal is permitted to be 10dB(A) higher than when the windows are closed (i.e. – allowable level in bedrooms becomes 45dB(A), and 50dB(A) in living rooms). The proposed development will not require an alternative source of ventilation besides natural ventilation: (windows open to 5% of the floor area) to comply with the requirements of Section 3.5 of the NSW Department of Planning's (DoP) 'Development near Rail Corridors and Busy Roads (Interim Guideline).

6 NOISE AND VIBRATION EMISSIONS ASSESSMENT

6.1 OPERATIONAL NOISE EMISSION CRITERIA

6.1.1 Gosford City Centre DCP

The DCP has general objectives in respect of limiting noise emissions from plant and activities on the site so that surrounding receivers are not adversely impacted. Because no specific controls are recommended, noise emissions objectives have been adopted based on guidelines within the EPA Noise Policy for Industry.

6.1.2 EPA – Noise Policy for Industry

The Noise Policy for Industry (NPI) provides guidelines for assessing noise impacts from industrial developments. The recommended assessment objectives vary depending on the potentially affected receivers, the time of day, and the type of noise source. The NPI has two requirements which must be complied with, namely an amenity criterion and an intrusiveness criterion.

6.1.2.1 Intrusiveness Criterion

The guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the L_{eq} descriptor not exceed the background noise level by more than 5 dB(A).

Rating background noise levels for the area have been established from long term unattended noise monitoring as detailed in Section 4.2.

Table 5 – Intrusiveness Noise Criteria (near Project Site)

Time of Day	Rating Background Noise Level, dB(A)L_{90}	Intrusiveness Noise Criteria, dB(A)$L_{eq(15min)}$
Day	51	56
Evening	49	54
Night	41	46

**Note – Time of day is as described within the NSW EPA Noise Policy for Industry (NPI) 2017.*

Table 6 – Intrusiveness Noise Criteria (near Henry Parry Drive)

Time of Day	Rating Background Noise Level, dB(A)L_{90}	Intrusiveness Noise Criteria, dB(A)$L_{eq(15min)}$
Day	54	59
Evening	51	56
Night	41	46

**Note – Time of day is as described within the NSW EPA Noise Policy for Industry (NPI) 2017.*

Table 7 – Intrusiveness Noise Criteria (21-37 Mann Street)

Time of Day	Rating Background Noise Level, dB(A)L_{90}	Intrusiveness Noise Criteria, dB(A)$L_{eq(15min)}$
Day	51	56
Evening	49	54
Night	41	46

**Note – Time of day is as described within the NSW EPA Noise Policy for Industry (NPI) 2017.*
***Note – Monitoring near these residences is in progress and once completed the intrusiveness criteria can be determined. In lieu of the monitoring data the RBL's from the monitor near the project site (with the most stringent RBL's) has been used to determine the criteria to these residences.*

6.1.2.2 Project Amenity Criterion

The guideline is intended to limit the absolute noise level from all noise sources to a level that is consistent with the general environment. The NPI sets out acceptable noise levels for various land uses. Table 2.2 has three categories to distinguish different residential areas. They are rural, suburban and urban

Pursuant to Section 2.4 of the NPI, 'Suburban' and 'Urban' are defined as areas which have acoustical environments which incorporate the following characteristics.

Urban - an area with an acoustical environment that:

- Is dominated by 'urban hum' or industrial source noise
- Has through traffic characteristically heavy and continuous traffic flows during peak periods
- Is near commercial districts or industrial districts
- Has any combination of the above,

  Where 'urban hum' means the aggregate sound of many unidentifiable, mostly traffic-related sound sources.

Suburban - An area that has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry. This area often has the following characteristics:

- Decreasing noise levels in the evening period (1800-2200); and/or
- Evening ambient noise levels defined by the natural environment and infrequent human activity.

Project Amenity Criteria noise emission goals are presented below.

Table 8 – NPI Project Amenity Acceptable Noise Levels

Type of Receiver	Indicative Noise Amenity Area	Time of day	Recommended Acceptable Noise Level dB(A)$L_{eq(15min)}$
Residential (Near Project Site)	Urban	Day (7am-6pm)	58
		Evening (6pm-10pm)	48
		Night (10pm-7am)	43
Residential (Henry Parry Drive)	Suburban	Day (7am-6pm)	53
		Evening (6pm-10pm)	43
		Night (10pm-7am)	38
Residential (21-37 Mann Street)	Urban	Day (7am-6pm)	58
		Evening (6pm-10pm)	48
		Night (10pm-7am)	43
Commercial Premises (Surrounding Project Site)	All	When in use	63
Active Recreation Area (Leagues Club Field)	All	When in use	53

6.1.2.3 Sleep Arousal (Maximum Noise Level) Assessment

Potential sleep arousal impacts should be considered for noise generated after 10pm. Sleep arousal is a function of both the noise level and the duration of the noise. As recommended in the NPfI, to assess potential sleep arousal impacts, a two-stage test is carried out:

- Step 1 – Section 2.5 *Maximum noise level event assessment* from the NPfI states the following:

  Where the subject development/premises night-time noise levels at a residential location exceed:

  - *$L_{Aeq,15min}$ 40dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or*
  - *L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is greater,*

  a detailed maximum noise level event assessment should be undertaken.

Based on the above the following noise objectives apply:

Table 9 – Sleep Arousal Criteria (Average/Leq Noise Levels)

Location	Rating Background Level dB(A)L_{90}	Rating Background Level + 5dB(A)	Governing Criteria dB(A)$L_{Aeq(15mins)}$
Residential (Near Project Site)	41	46	46
Residential (Henry Parry Drive)	41	46	46
Residential (21-37 Mann Street)	41	46	46

Table 10 – Sleep Arousal Criteria (Maximum/Lmax Noise Events)

Location	Rating Background Level dB(A)L_{90}	Rating Background Level + 15dB(A)	Governing Criteria dB(A)L_{max}
Residential (Near Project Site)	41	56	56
Residential (Henry Parry Drive)	41	56	56
Residential (21-37 Mann Street)	41	56	56

- Step 2 - If there are noise events that could exceed the average/maximum criteria detailed in the tables above, then an assessment of sleep arousal impact is required to be carried out taking into account the level and frequency of noise events during the night, existing noise sources, etc. This test takes into account the noise level and number of occurrences of each event with the potential to create a noise disturbance. As is recommended in the explanatory notes of the EPA Industrial Noise Policy, this more detailed sleep arousal test is conducted using the guidelines in the EPA Road Noise Policy. Most relevantly, the Road Noise Policy states:

  For the research on sleep disturbance to date it can be concluded that:

  - *Maximum internal noise levels below 50-55dB(A) are unlikely to awaken people from sleep.*
  - *One to two noise events per night with maximum internal noise levels of 65-70dB(A) are not likely to affect health and wellbeing significantly.*

6.2 CONSTRUCTION NOISE AND VIBRATION CRITERIA

6.2.1 Central Coast Council

We note that there are no construction noise acoustic criteria published by Council. Given this, EPA Interim Construction Noise Guideline will be adopted for the purpose of assessment.

We are advised that construction hours typically permitted by Central Coast Council are 7am-6pm and that the clearing of the land, excavation, and/or earthworks, building works, and delivery of building materials will only be carried out between the following hours:

- Monday to Fridays – 7am to 6pm
- Saturdays – 8am-4pm
- No work is permitted on Sundays and Public Holidays, except for emergency work

6.2.2 EPA Interim Construction Noise Guidelines

EPA guidelines adopt differing strategies for noise control depending on the predicted noise level at the nearest residences:

- *"Noise affected" level*. Where construction noise is predicted to exceed the "noise effected" level at a nearby residence, the proponent should take reasonable/feasible work practices to ensure compliance with the "noise effected level". For Rural residences, the "noise effected" level occurs when construction noise exceeds ambient levels by more than:
    - 10dB(A)$L_{eq(15min)}$for work during standard construction hours(SCH) (7am-6pm Monday to Friday and 8am to 1pm on Saturdays) and
    - 5dB(A)$L_{eq(15min)}$for work outside of standard construction hours (OSCH).
- "*Highly noise affected level"*. Where noise emissions are such that nearby properties are "highly noise effected", noise controls such as respite periods should be considered. For Rural residences, the "highly noise effected" level occurs when construction noise exceeds 75dB(A)$L_{eq(15min)}$ at nearby residences.

A summary of noise emission goals for both standard hours of construction and outside standard hours are presented.

Table 11 – Construction Noise Management Levels

Location	"Noise Affected" Level - dB(A)$L_{eq(15min)}$	"Highly Noise Affected" Level - dB(A)$L_{eq(15min)}$
Residential (Henry Parry Drive)	64 (SCH) 59 (OSCH)	75
Residential (21-37 Mann Street)	61 (SCH) 56 (OSCH)	75
Commercial (when in use)	70	N/A
Industrial (when in use)	75	N/A
Active Recreation Areas/Leagues Club Field (when in use)	65	N/A

**Note – For residential receivers the noise affected level (NAFL) during standard construction hours (SCH) and outside standard construction hours (OSCH) is presented.*

6.2.3 Construction Vibration

Vibration goals for the amenity of nearby land users are those recommended by the EPA document *Assessing Vibration: A technical guideline*. These levels are presented below:

Table 12 – Construction Vibration Goals

Location	Time	Peak velocity (mm/s)	
		Preferred	Maximum
Continuous Vibration			
Residences	Daytime	0.28	0.56
Commercial/Industrial	When in use	0.56	1.12
Impulsive Vibration			
Residences	Daytime	8.6	17
Commercial/Industrial	When in use	18	36

6.2.4 Noise from Increased Traffic Generation on Public Streets

For land use developments with the potential to create additional traffic on public streets, the development should comply with the EPA *Road Noise Policy*.

Noise levels generated by traffic should not exceed the noise levels set out in the table below when measured at a nearby building façade.

Table 13 – Criteria for Traffic Noise Impacts from New Developments

Noise Receiver	Road Type	Time of Day	Permissible Noise Generation (External Noise Level)
Residential	Sub-Arterial	Day (7am to 10pm)	60dB(A)$L_{eq(15hr)}$
		Night (10pm to 7am)	55dB(A)$L_{eq(9hr)}$

However, if existing noise levels exceed those in the table above, Section 3.4 of the Road Noise Policy is applicable, which requires noise impacts to be reduced through feasible and reasonable measures. However, in determining what is feasible/reasonable, the Policy notes that an increase of less than 2dB(A) is a minor impact and would be barely perceptible and therefore treatment of this is not normally reasonable.

6.3 ANALYSIS OF NOISE AND VIBRATION EMISSIONS

6.3.1 Noise from Increased Traffic Generation on Public Streets

The existing morning and afternoon peak hour traffic volume counts surrounding the site have been conducted by GTA Consultants NSW (*Document reference: N131974, dated 27/11/2020)* as well as the predicted peak hour traffic volumes to be generated once the development is completed. With reference to this data the resultant increase in noise level from traffic by the completed development will be less than 0.5dB(A) on the roads surrounding the project site.

We note that a 1 dB(A) increase in noise level is imperceptible, and therefore the potential increase in traffic due to the Stage 1 development will not (perceptibly or) adversely impact the acoustic amenity of surrounding receivers. When the other traffic on the surrounding roads is added, the effect of any additional traffic generated by this development will be even lower.

6.3.2 Loading Dock

The primary noise associated with the use of the loading dock will consist of trucks moving into or out of the loading dock which is located on the ground level carpark to the south east of the Stage 1 development. Access to the loading dock is at the south east of the development from a private road that connects to Baker Street.

We note that the loading dock will contain a turntable designed to cater for up to 12.5-metre-long heavy rigid vehicles, to enter and exit in a forward direction. Uses associated with the loading dock at the development consists of trucks catering to the retail tenancies, garbage trucks and ad hoc general deliveries and removalist trucks.

Noise emission to the nearby developments was predicted based on a typical truck sound power level of 105dB(A)L_{eq} and no more than two truck movements in any 15-minute period.

For the nearby commercial developments, a noise level of the 59dB(A) $L_{eq(15min)}$ is predicted at the boundary of the commercial receiver to the north (99 Georgina Terrace) and 62dB(A) $L_{eq(15min)}$ at the boundary of the commercial

receiver at the south (32 Mann Street). The predicted noise levels at the boundary of these receivers comply with the NSW EPA Noise Policy for Industry (2017) amenity criterion of 63dB(A) $L_{eq(15min)}$ for commercial receivers.

For the nearest residential developments located at 21-37 Mann Street having a line of sight to the truck movements associated with the loading dock the estimated noise levels at the boundary of these residences is expected to be 42dB(A) $L_{eq(15min)}$. The predicted noise levels at the boundary of these receivers comply with the NSW EPA Noise Policy for Industry (2017) project noise trigger level (PNTL) most stringent night time criterion of 43dB(A) $L_{eq(15min)}$ for residential receivers.

At the Leagues Club Field, a noise level of 52dB(A) $L_{eq(15min)}$ is predicted at the boundary. The predicted noise levels at the boundary of this receiver comply with the NSW EPA Noise Policy for Industry (2017) amenity criterion of 53dB(A) $L_{eq(15min)}$ for active recreation area receivers.

6.3.3 Communal Spaces

The outdoor communal areas are located on the level 4 podium deck and level 21 roof garden within the Stage 1 development.

Noise from the use of common areas within residential apartment buildings is not governed by any specific regulations or guidelines and is typically considered as neighbourhood noise.

Generally, any noise impact to the proposed residential building which may result from the use of these spaces would be addressed by management controls imposed as part of the building strata by-laws (e.g., restrictions on time of use, size of gatherings, amplified music etc) rather than with specific acoustic treatments such as barriers or awnings. However, acoustically rated glazing (6mm float glass– R_w 29) has been recommended for all facades of the Stage 1 development to mitigate external noise intrusion.

With respect to nearby sites, the most sensitive receiver is the commercial receiver located adjacent to the site at 32 Mann Street. Based on the occupancy of communal spaces indicated on the drawings we have estimated the noise level at the boundary from the communal spaces to be 49dB(A) $L_{eq(15min)}$ at the nearest commercial receiver. This complies with the NSW EPA Noise Policy for Industry (2017) amenity criterion of 63dB(A) $L_{eq(15min)}$. It is noted that commercial building adjacent is an office building has a sealed, modern façade and the anticipated noise level within the development from noise emissions from the communal space is predicted to be 23dB(A) $L_{eq(15min)}$ which will be imperceptible to occupants.

For the nearest residential developments located at 21-37 Mann Street the estimated noise levels at the boundary of these residences is expected to be 39dB(A) $L_{eq(15min)}$. The predicted noise levels at the boundary of these receivers comply with the NSW EPA Noise Policy for Industry (2017) project noise trigger level (PNTL) most stringent night time criterion of 43dB(A) $L_{eq(15min)}$ for residential receivers.

At the Leagues Club Field, a noise level of 39dB(A) $L_{eq(15min)}$ is predicted at the boundary. The predicted noise levels at the boundary of this receiver comply with the NSW EPA Noise Policy for Industry (2017) amenity criterion of 53dB(A) $L_{eq(15min)}$ for active recreation area receivers.

6.3.4 Noise from Mechanical Plant

Detailed acoustic design of mechanical plant cannot be undertaken at approval stage as plant selections and locations are not finalised. However, an indicative assessment of primary plant items is presented below. Compliance with NPI acoustic criteria as set out in Section 6.1 and 6.1.2.3 will be achievable, provided that detailed acoustic review of plant items is undertaken once plant is selected.

Plant treatment may include combination of siting, quiet selections, speed controllers and scheduling to limit night operation, barriers and enclosures, duct treatment or attenuators to achieve the nominated noise criteria.

6.3.5 Commercial Spaces

A number of commercial use spaces are proposed. These are likely to be a combination of food and beverage outlets and general commercial spaces. Potential noise impacts will depend on the final use, times of operation, etc. These impacts should be assessed as part of the development approval for these individual uses and appropriate noise controls implemented to meet the objectives of the DCP.

6.3.6 Construction Noise

With respect to construction noise, the impact on nearby development will be dependent on the activity in question and where on the site the activity is undertaken. Excavation and piling works tend to be the loudest typical construction activity. Work close to the northern and eastern boundary will have greatest potential impact (given the proximity to the existing nearby commercial buildings).

Primary noise emissions will occur during excavation/site levelling. Equipment items will typically have sound power levels of approximately 115dB(A)$L_{eq(15min)}$ for excavation in rock and 105dB(A) for excavation in soil/bored piling. Predicted noise levels at nearby development are:

- We note that during construction along the northern and eastern site boundary, the closest commercial development will be as close as 10m away (99 Georgina Terrace and 32 Mann Street). Noise levels at the property boundary may intermittently exceed the EPA Noise Management Level for commercial developments of 70dB(A).

- Despite this, the majority of activities (other than excavation using hydraulic hammers) are unlikely to produce noise levels exceeding 45dB(A) *inside* the commercial developments, and as such, the impact on occupant amenity is likely to be low (45dB(A) being Australian Standard 2017 recommended internal noise level for open plan offices).

- Given the distance from the site to the nearest residences (Corner of Georgiana Terrace and Henry Parry Drive), significant exceedances of the "Background+10dB(A)" noise management levels are not expected. The construction noise will also be well below the EPA "Highly Noise Effected" level of 75dB(A).

This office has been advised that:

- Excavation into rock is unlikely due to the soil being largely sandy silt with fill elements above RL5.
- There are no significant structures on the site to be demolished.

Therefore, at most, there will be limited need for hydraulic hammers and similar percussive techniques on the site. Driven/vibrating piles will also not be used on this site; bored piers are proposed. In light of the above, the likelihood of adverse impact is significantly reduced. The following contingency measures are recommended in respect of noisy activities (such as hydraulic hammers, vibratory compactors) if these are found to be required:

- Identify the location on the site. Calculate the expected noise level at sensitive receivers and the duration of impact.

- If noise levels are expected to cause receivers to be "highly noise affected" implement appropriate respite periods or scheduling of works to avoid sensitive periods during the day or limit continuous exposure.

6.3.6.1 Activities To Be Conducted and Associated Noise Levels

Typically, the most significant sources of noise or vibration generated during a construction project will be demolition, excavation/ground works and building structure works. The following table presents assessment noise levels for typical construction equipment expected to be used:

Table 14 – Sound Power Levels of Typical Equipment

Equipment/Process	Sound Power Level dB(A)
Rock Hammering	120
Excavator (rock)	115
Excavator (in clay/soil)	105
CFA Piling Rig	103
Concrete Pump	110
Concrete Vibrator	100
Trucks (idling)	95
Materials Handling (Forklifts etc)	95
Tower Crane (Electric)	95
Tower Crane (Diesel)	105
Powered Hand Tools	95-100

The noise levels presented in the above table are derived from the following sources:

- Table A1 of Australian Standard 2436:2010; and
- Data held by this office from other similar studies.

6.3.6.2 Prediction of Noise Impacts

Noise generated by plant and equipment will be managed to generally comply with noise management levels, and where this noise goal may be exceeded, noise will be managed based on principles consistent with Australian Standard 2436 and the recommendations of the ICNG. Noise levels will vary depending on where in the construction site the work is undertaken.

Noise levels from construction works have been predicted to the nearby sensitive receivers to the project site and assessed against EPA guidelines (the "Noise Management Level"), as identified in section 6.2.2. We note that receivers further away will have less of a construction noise impact then those predicted in the following tables due to further distance and/or screening from existing surrounding buildings which limit or remove direct line of sight to the noise source.

The predicted noise levels to each receiver are shown in the tables below.

Table 15 – Potential Construction Noise Impacts to Residences at 21-37 Mann Street, Gosford (East of the Site)

Equipment/Process	Predicted External Noise Level dB(A)$L_{eq(15min)}$	Comment
Rock Hammering	68-76	Exceeds highly noise affected management level when working close to eastern boundary. Refer to recommendations in Section 7
Excavator (rock)	63-71	Meets highly noise affected management level at all times. Exceeds noise affected management level. Refer to recommendations in Section 7
Excavator (in clay/soil)	53-61	Meets noise affected management levels
CFA Piling Rig	51-59	Meets noise affected management levels
Concrete Pump	58-66	Meets highly noise affected management level at all times. Exceeds noise affected management level. Refer to recommendations in Section 7
Concrete Vibrator	48-56	Meets noise affected management levels
Trucks (idling)	43-51	Meets noise affected management levels
Materials Handling (Forklifts etc)	43-51	Meets noise affected management levels
Tower Crane (Electric)	43-51	Meets noise affected management levels
Tower Crane (Diesel)	53-61	Meets noise affected management levels
Powered Hand Tools	43-56	Meets noise affected management levels

**Note – Comment has been made with reference to the noise management levels during standard construction hours.*

Table 16 – Potential Construction Noise Impacts to Residences at 25 Mann Street (East of the site along Henry Parry Drive)

Equipment/Process	Predicted External Noise Level dB(A)$L_{eq(15min)}$	Comment
Rock Hammering	67-71	Exceeds highly noise affected management level when working close to eastern boundary. Refer to recommendations in Section 7
Excavator (rock)	62-66	Exceeds highly noise affected management level when working close to eastern boundary. Refer to recommendations in Section 7
Excavator (in clay/soil)	52-56	Meets noise affected management levels
CFA Piling Rig	50-54	Meets noise affected management levels
Concrete Pump	57-61	Meets noise affected management levels
Concrete Vibrator	47-51	Meets noise affected management levels
Trucks (idling)	42-46	Meets noise affected management levels
Materials Handling (Forklifts etc)	42-46	Meets noise affected management levels
Tower Crane (Electric)	42-46	Meets noise affected management levels
Tower Crane (Diesel)	52-56	Meets noise affected management levels
Powered Hand Tools	42-51	Meets noise affected management levels

**Note – Comment has been made with reference to the noise management levels during standard construction hours.*

Table 17 – Potential Construction Noise Impacts to Residences at 127 Georgiana Terrace (East of the site along Henry Parry Drive)

Equipment/Process	Predicted External Noise Level dB(A)$L_{eq(15min)}$	Comment
Rock Hammering	62-66	Meets highly noise affected management level at all times. Exceeds noise affected management level. Refer to recommendations in Section 7
Excavator (rock)	57-61	Meets noise affected management levels
Excavator (in clay/soil)	47-51	Meets noise affected management levels
CFA Piling Rig	45-49	Meets noise affected management levels
Concrete Pump	52-56	Meets noise affected management levels
Concrete Vibrator	42-46	Meets noise affected management levels
Trucks (idling)	37-41	Meets noise affected management levels
Materials Handling (Forklifts etc)	37-41	Meets noise affected management levels
Tower Crane (Electric)	37-41	Meets noise affected management levels
Tower Crane (Diesel)	47-51	Meets noise affected management levels
Powered Hand Tools	37-46	Meets noise affected management levels

**Note – Comment has been made with reference to the noise management levels during standard construction hours.*

Table 18 – Potential Construction Noise Impacts to Commercial Receiver at 32 Mann Street (East of the site)

Equipment/Process	Predicted External Noise Level dB(A)$L_{eq(15min)}$	Comment
Rock Hammering	77-92	Exceeds noise affected management level. Refer to recommendations in Section 7
Excavator (rock)	72-87	Exceeds noise affected management level. Refer to recommendations in Section 7
Excavator (in clay/soil)	62-77	Exceeds noise affected management level when working close to eastern boundary. Refer to recommendations in Section 7
CFA Piling Rig	60-75	Exceeds noise affected management level when working close to eastern boundary. Refer to recommendations in Section 7
Concrete Pump	67-82	Exceeds noise affected management level when working close to eastern boundary. Refer to recommendations in Section 7
Concrete Vibrator	57-72	Exceeds noise affected management level when working close to eastern boundary. Refer to recommendations in Section 7
Trucks (idling)	52-67	Meets noise affected management levels
Materials Handling (Forklifts etc)	52-67	Meets noise affected management levels
Tower Crane (Electric)	52-67	Meets noise affected management levels
Tower Crane (Diesel)	62-77	Exceeds noise affected management level when working close to eastern boundary. Refer to recommendations in Section 7
Powered Hand Tools	52-72	Exceeds noise affected management level when working close to eastern boundary. Refer to recommendations in Section 7

Table 19 – Potential Construction Noise Impacts to Commercial Receiver at 99 Georgiana Terrace (North of the site)

Equipment/Process	Predicted External Noise Level dB(A)$L_{eq(15min)}$	Comment
Rock Hammering	74-92	Exceeds noise affected management level. Refer to recommendations in Section 7
Excavator (rock)	69-87	Exceeds noise affected management level. Refer to recommendations in Section 7
Excavator (in clay/soil)	59-77	Exceeds noise affected management level when working close to northern boundary. Refer to recommendations in Section 7
CFA Piling Rig	57-75	Exceeds noise affected management level when working close to northern boundary. Refer to recommendations in Section 7
Concrete Pump	64-82	Exceeds noise affected management level when working close to northern boundary. Refer to recommendations in Section 7
Concrete Vibrator	54-72	Exceeds noise affected management level when working close to northern boundary. Refer to recommendations in Section 7
Trucks (idling)	49-67	Meets noise affected management levels
Materials Handling (Forklifts etc)	49-67	Meets noise affected management levels
Tower Crane (Electric)	49-67	Meets noise affected management levels
Tower Crane (Diesel)	59-77	Exceeds noise affected management level when working close to northern boundary. Refer to recommendations in Section 7
Powered Hand Tools	49-72	Exceeds noise affected management level when working close to northern boundary. Refer to recommendations in Section 7

Table 20 – Potential Construction Noise Impacts to Leagues Club Field (West of the site)

Equipment/Process	Predicted External Noise Level dB(A)$L_{eq(15min)}$	Comment
Rock Hammering	76-92	Exceeds noise affected management level. Refer to recommendations in Section 7
Excavator (rock)	71-87	Exceeds noise affected management level. Refer to recommendations in Section 7
Excavator (in clay/soil)	61-77	Exceeds noise affected management level when working close to western boundary. Refer to recommendations in Section 7
CFA Piling Rig	59-75	Exceeds noise affected management level when working close to western boundary. Refer to recommendations in Section 7
Concrete Pump	66-82	Exceeds noise affected management level. Refer to recommendations in Section 7
Concrete Vibrator	56-72	Exceeds noise affected management level when working close to western boundary. Refer to recommendations in Section 7
Trucks (idling)	51-67	Exceeds noise affected management level when working close to western boundary. Refer to recommendations in Section 7
Materials Handling (Forklifts etc)	51-67	Exceeds noise affected management level when working close to western boundary. Refer to recommendations in Section 7
Tower Crane (Electric)	51-67	Exceeds noise affected management level when working close to western boundary. Refer to recommendations in Section 7
Tower Crane (Diesel)	61-77	Exceeds noise affected management level when working close to western boundary. Refer to recommendations in Section 7
Powered Hand Tools	51-72	Exceeds noise affected management level when working close to western boundary. Refer to recommendations in Section 7

6.3.7 Construction Vibration

Excavation, earth retention and civil works are the primary vibration generating activities.

In the event that excavation using hydraulic hammers, vibratory compaction or vibro-piling is required adjacent to the northern and/or eastern boundary (99 Georgina Terrace and 32 Mann Street), vibration monitoring is recommended. Any vibration monitor should have SMS warning capability.

7 CONTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN

The assessment of noise and vibration from the proposed activities indicates that adverse impacts may occur for some activities and primarily when these works occur near the site boundaries. Construction noise and vibration emissions should be minimised by adopting the following management plan.

7.1 HYDRAULIC HAMMERING (IF NEEDED)

Where prolonged hammering is necessary the following management measures are recommended to be adopted:

- Provide respite periods and/or.
- Conduct operation prior to 9am, around lunch time or after 5pm when operating close to the commercial receiver boundary.

Where feasible, the use of a concrete crusher attachment for excavators should be considered as an alternative to hydraulic/pneumatic hammers during demolition and rock sawing. The use of a ripper attachment on bulldozers in preference to hammering closer to boundaries, where feasible.

7.2 CONCRETE PUMPS, PILING PLANT

Concrete pumping stations should be located as far as practical from nearby receivers.

7.3 VEHICLE NOISE

Controls to minimise noise from vehicles entering the site include the following:

- Trucks, trailers, and concrete trucks must turn off their engines when on site or waiting in the street to reduce impacts on adjacent land use (unless engines need to run e.g., during concrete pumping).

7.4 ACOUSTIC BARRIERS

Where required, the placement of barriers at the source is generally only effective for static plant (tower cranes, diesel generators). Equipment which is on the move or working in rough or undulating terrain cannot be effectively attenuated by placing barriers at the source.

The degree of noise reduction provided by barriers is dependent on the amount by which line of sight can be blocked by the barrier. If the receiver is totally shielded from the noise source reductions of up to 15 dB(A) can be expected. Where only partial obstruction of line of sight occurs, noise reductions of 5 to 8 dB(A) may be achieved. Where no line of sight is obstructed by the barrier, generally no noise reduction will occur.

7.5 OTHER ACTIVITIES

In the event of complaint, noise management techniques identified in this report should be employed to minimise the level of noise impact if management levels are found to be exceeded. This may include additional community consultation and re-scheduling of loud construction processes.

Notwithstanding above, general management techniques and acoustic treatments are included in Section 7.6 which may be implemented on a case-by-case basis to reduce noise emissions to surrounding receivers.

7.6 GENERAL RECOMMENDATIONS

Other noise management practices which may be adopted are discussed below. In addition, notification, reporting, and complaints handling procedures should be adopted as recommended in this report.

7.6.1 Treatment of Specific Equipment

Where construction process or appliances are noisy, the use of silencing devices may be possible. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

7.6.2 Material Handling

The installation of rubber matting over material handling areas can reduce the sound of impacts due to material being dropped by up to 20dB(A).

7.6.3 Selection of Alternate Appliance or Process

Where a particular activity or construction appliance is found to generate excessive noise levels, it may be possible to select an alternative approach or appliance. For example, the use of a hydraulic hammer on certain areas of the site may potentially generate high levels of noise. By carrying out this activity by use of bulldozers ripping and/or milling machines lower levels of noise will result.

7.6.4 Establishment of Site Practices

This involves the formulation of work practices to reduce noise generation. This includes locating fixed plant items as far as possible from residents as well as rotating plant and equipment to provide respite to receivers. Construction vehicles accessing the site should not queue in residential streets and should only use the designated construction vehicle routes. Loading of these vehicles should occur as far as possible from any sensitive receiver.

7.6.5 Management Training

All site managers should be aware of noise and vibration limits, applicable control measures and methods. They should ensure that all agreed noise and vibration measures are carried out by employees and sub-contractors.

A copy of the Noise Management Plan is to be available to contractors, and site inductions should detail the site contact in the event of noise complaints.

7.6.6 Noise Monitoring

Noise monitoring is to be undertaken:

- To determine the effectiveness of measures which are been implemented, whilst the results of monitoring can be used to devise further control measures.
- In the event of a complaint.

Attended noise measurements should be conducted in accordance with Australian Standard AS1055: 2018 *'Acoustics- Description and measurement of environmental noise'*, and should include the following:

- Type 1 or type 2 sound level meter (calibrated)
- Use of appropriate noise descriptor (in this case, $L_{eq(15min)}$).
- Detail of measurement position and proximity to reflecting surface if any (building or similar). Measurement positions will typically be a residential property boundary or inside office space.

7.6.7 Vibration Monitoring

Vibration levels during the demolition and excavation phases should occur at the nearest building should vibratory compaction be found to be necessary. The measurement location should be determined from time to time to best measure representative vibration levels. The monitor used should log the peak particle velocities and also transmit SMS warnings to the contractor and acoustic expert if a pre-determined threshold is exceeded. Regular reports should be provided (twice monthly) showing the vibration levels recorded and comparing these to the criteria.

Attended or unattended monitoring should also be undertaken at other locations in response to complaints, as appropriate.

7.7 COMMUNITY INTERACTION AND COMPLIANTS HANDLING

Notification of the anticipated commencement and duration of the proposed demolition, excavation, piling and construction works is recommended.

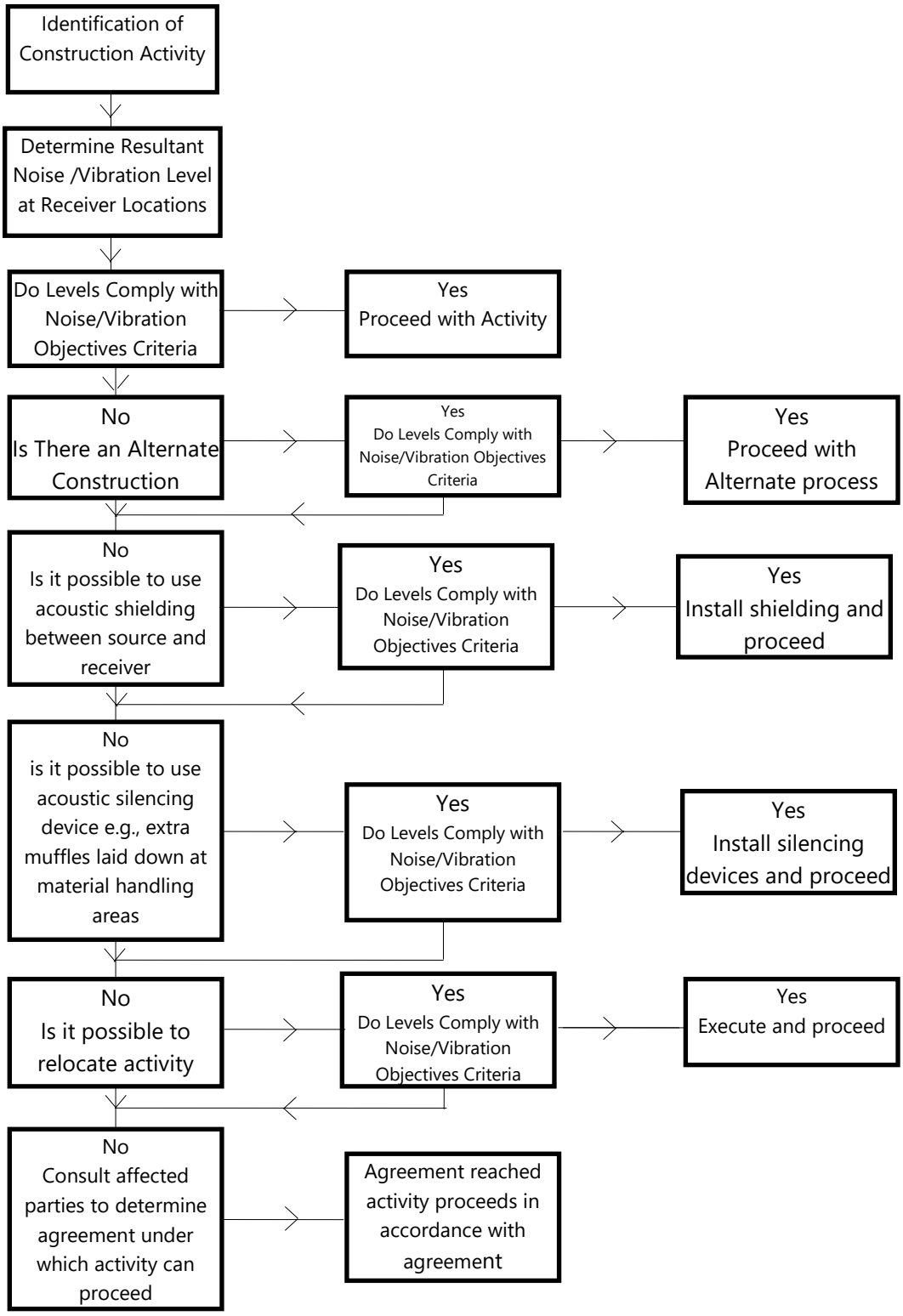
Should ongoing complaints of excessive noise or vibration criteria occur immediate measures shall be undertaken to investigate the complaint, the cause of the exceedances and identify the required changes to work practices. In the case of exceedances of the vibration limits all work potentially producing vibration shall cease until the exceedance is investigated.

If a noise complaint is received the complaint should be recorded on a Noise Complaint Form and kept in a register. The complaint form should list:

- The name and address of the complainant (if provided).
- The time and date the complaint was received.
- The nature of the complaint and the time and date the noise was heard.
- The name of the employee who received the complaint.
- Actions taken to investigate the complaint, and a summary of the results of the investigation.
- Required remedial action, if required.
- Validation of the remedial action.
- Summary of feedback to the complainant.

7.8 CONTROL OF CONSTRUCTION NOISE AND VIBRATION – PROCEDURAL STEPS

The flow chart presented below illustrates the process that should be followed in assessing construction activities.



8 CONCLUSION

This report presents the assessment of noise and vibration impacts associated with the proposed development known as the Central Coast Quarter – Northern Tower to be located at 26-30 Mann Street, Gosford. This assessment has addressed the SEARs requirements for SSD application number 23588910 (See – Section 2).

A review of the traffic noise impact on the development as per the requirements of iSEPP, ADG and DNRCBR has been conducted in Section 5. Provided that the recommendations in Section 5.4 are adopted, suitable internal noise levels/residential amenity will be achieved.

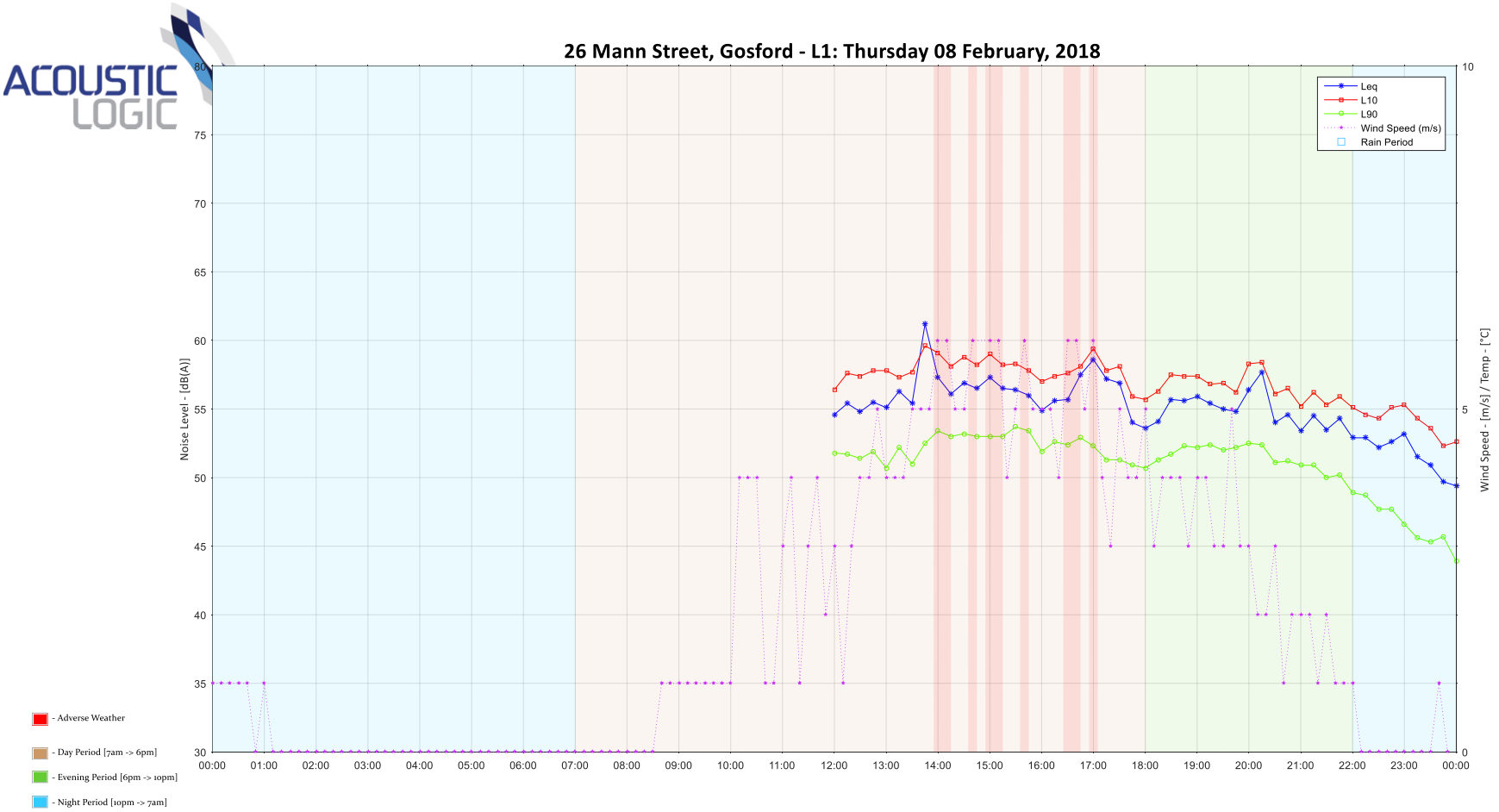
Noise emission criteria have been determined based on guidelines in the NSW EPA Noise Policy for Industry. A detailed review of plant noise should be undertaken at CC stage, however initial analysis indicates that external noise emissions associated with the operation of the site will be compliant with EPA guidelines with the adoption of the recommended measures.

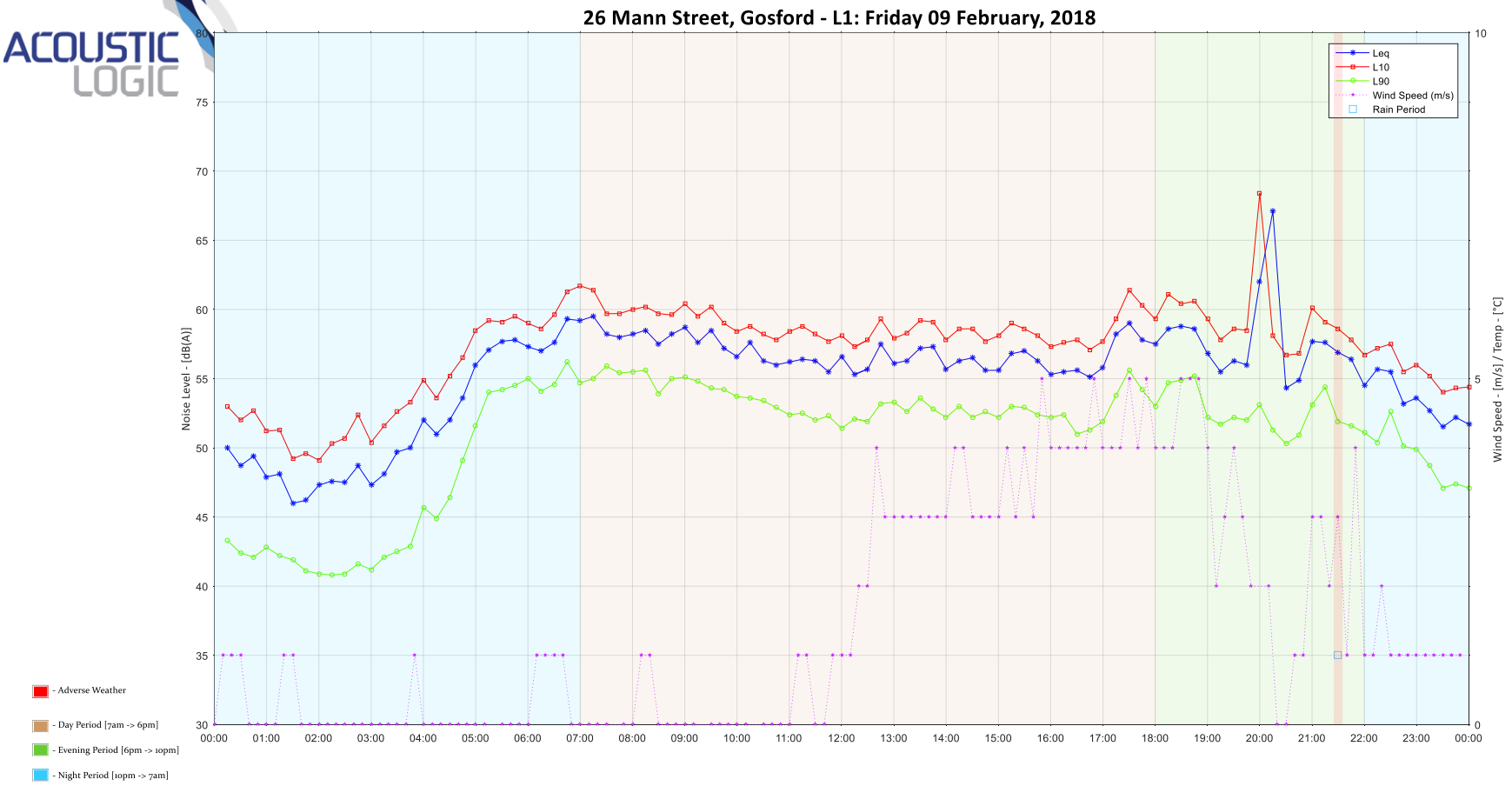
A construction noise assessment has been undertaken. This indicates that significant adverse impact is unlikely. Notwithstanding, the implementation of the Construction Noise and Vibration Management Plan outlined in this report is recommended to be adopted to minimise impacts to the extent that is reasonable and feasible in accordance with the EPA Interim Construction Noise Guideline.

Yours faithfully,

Acoustic Logic Pty Ltd
Alex Salazar

APPENDIX 1 – UNATTENDED NOISE MONITORING DATA FOR LOCATION L1


26 Mann Street, Gosford - L1: Thursday 08 February, 2018
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
Leq
L10
L90
Wind Speed (m/s)
Rain Period
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


26 Mann Street, Gosford - L1: Friday 09 February, 2018
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
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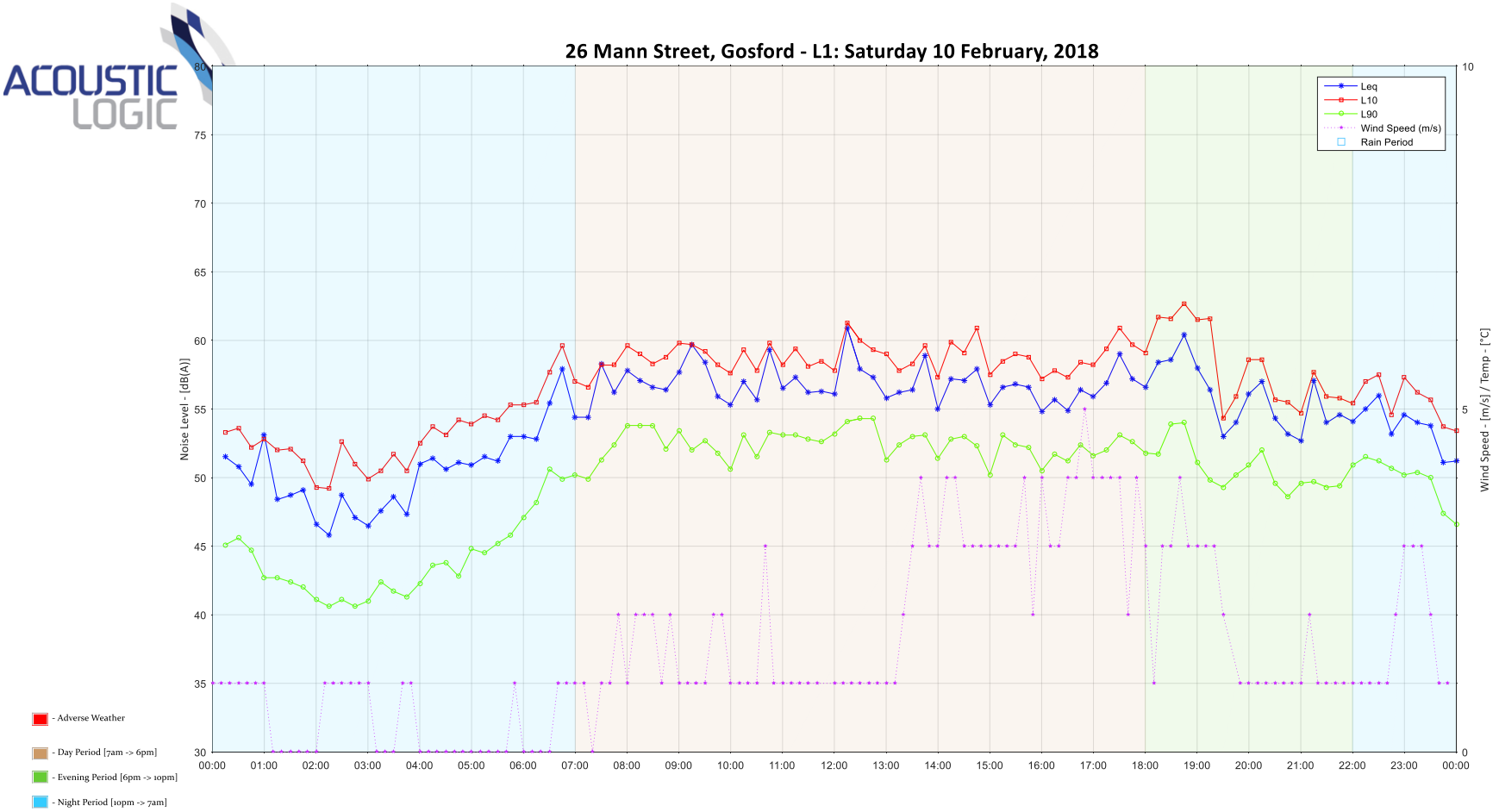
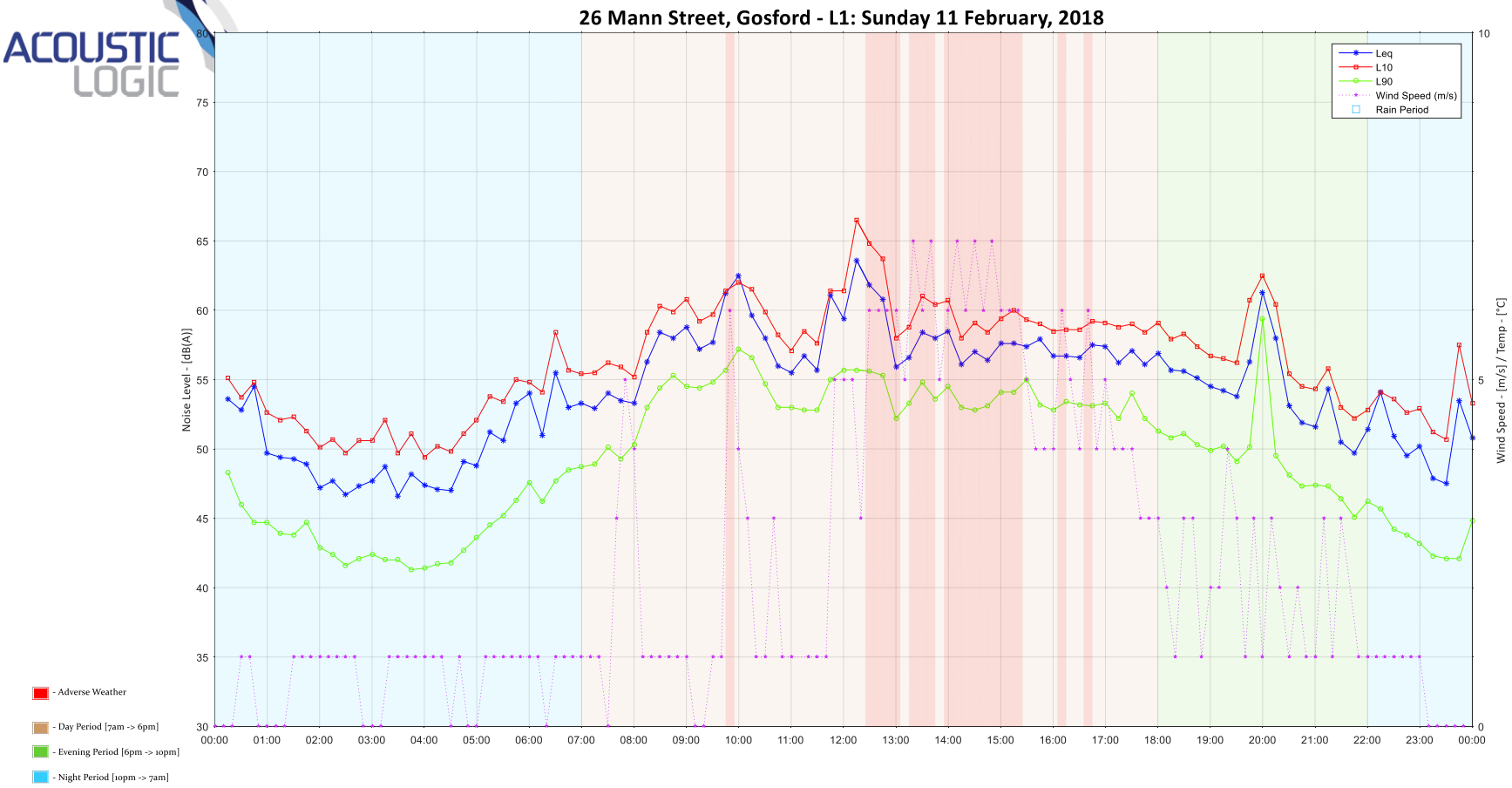
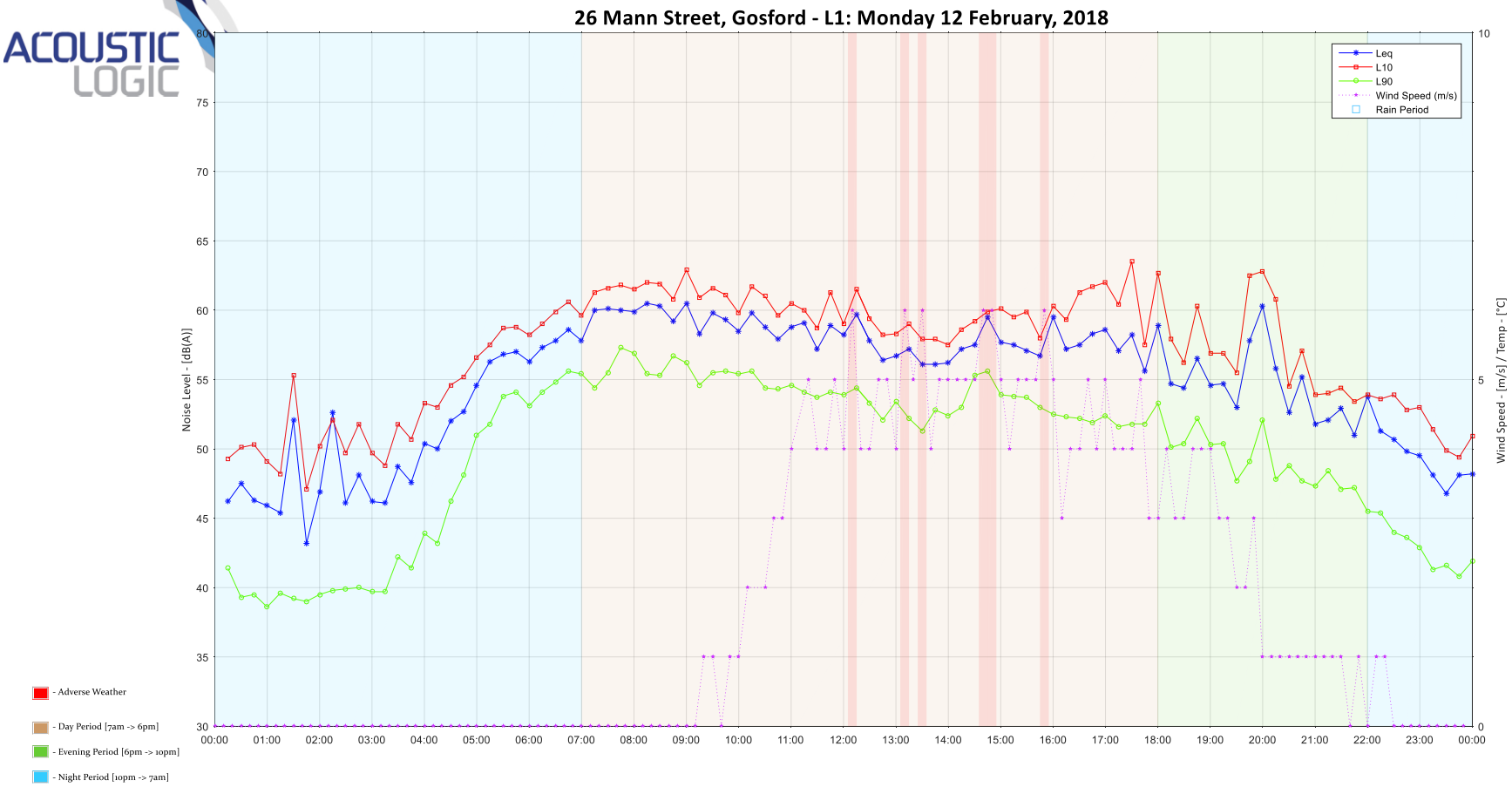
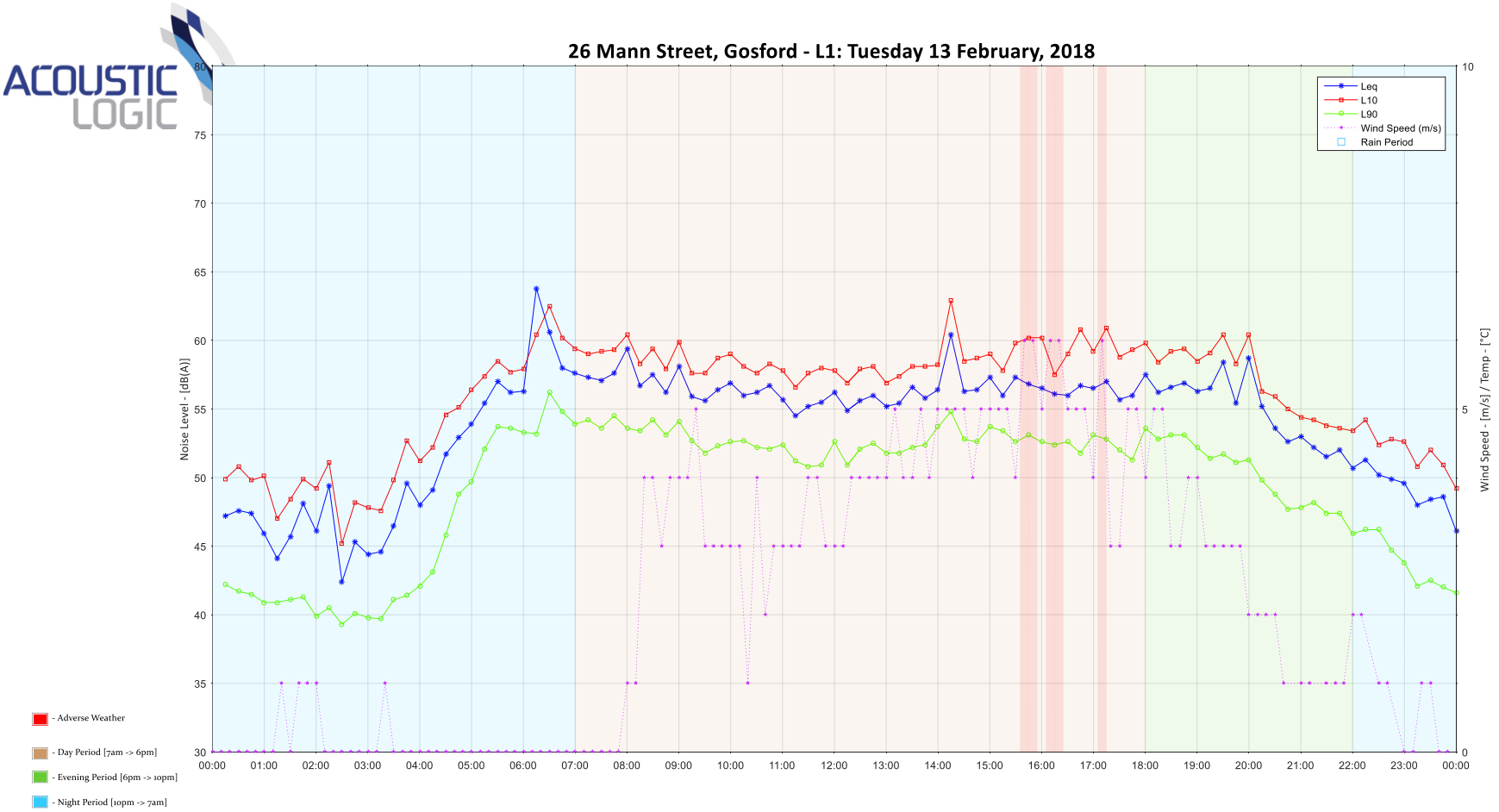
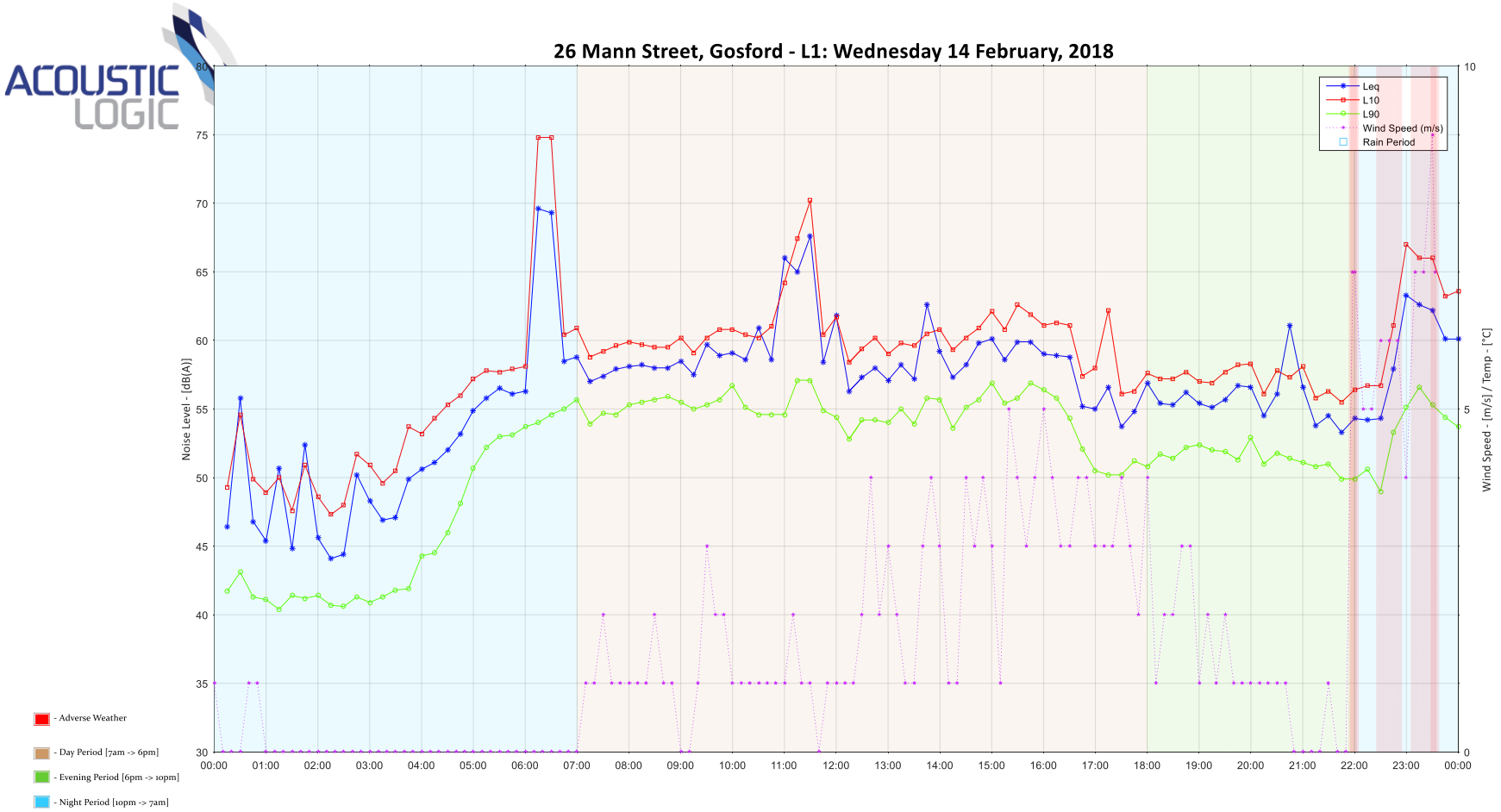
19:00
20:00
21:00
22:00
23:00
00:00
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]

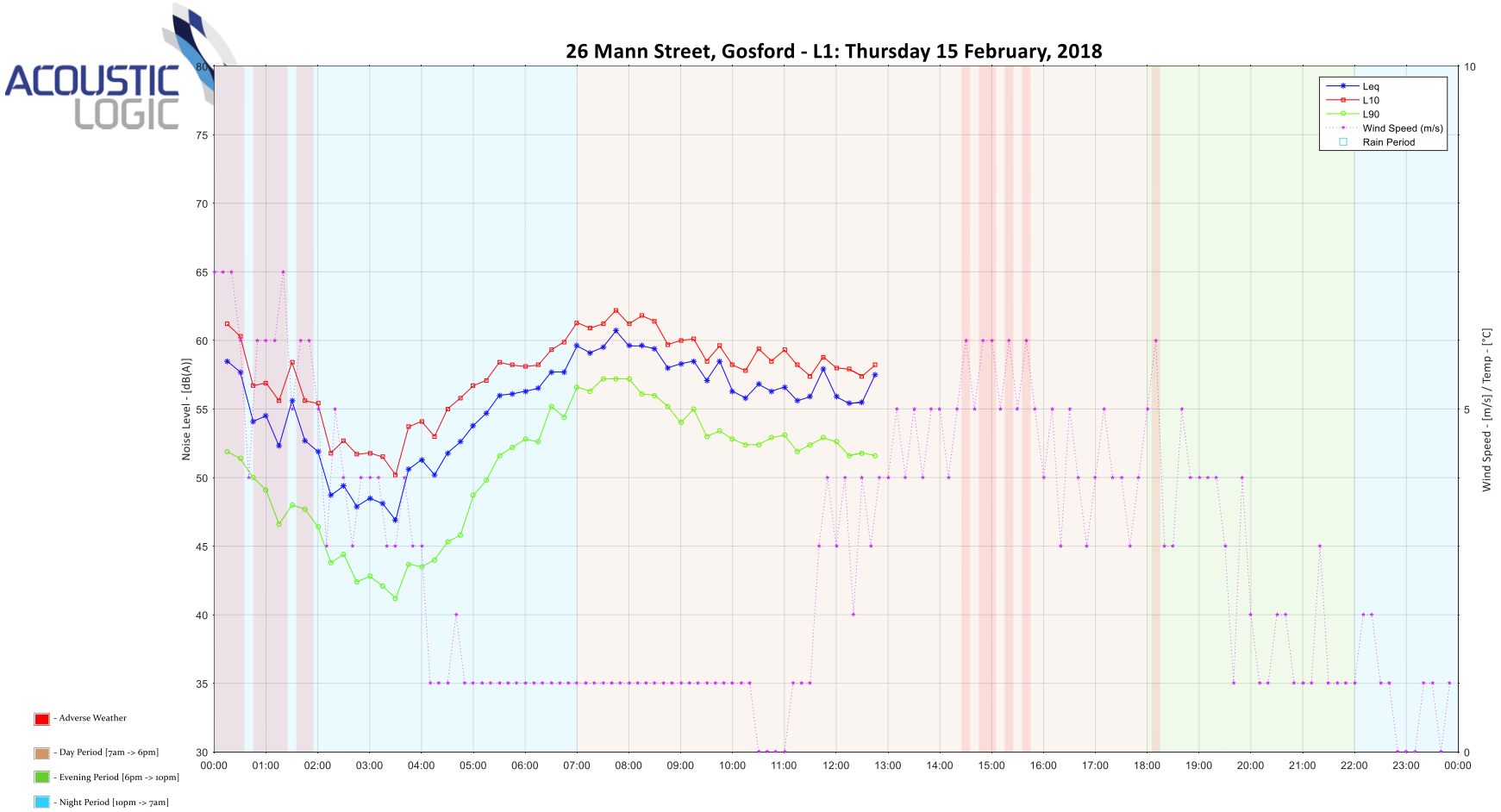

26 Mann Street, Gosford - L1: Saturday 10 February, 2018
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


26 Mann Street, Gosford - L1: Sunday 11 February, 2018
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


26 Mann Street, Gosford - L1: Monday 12 February, 2018
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
Leq
L10
L90
Wind Speed (m/s)
Rain Period
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]

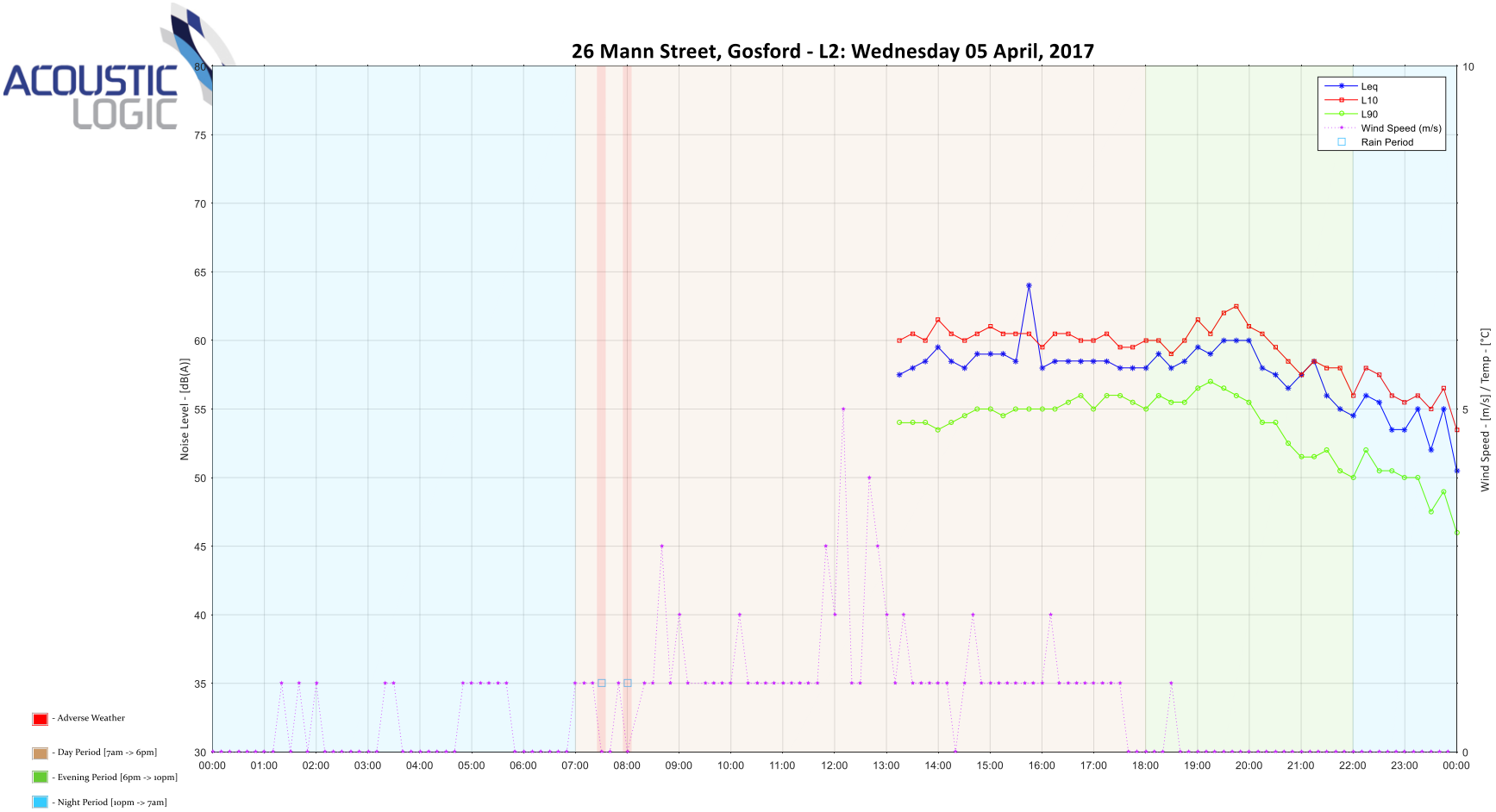

26 Mann Street, Gosford - L1: Tuesday 13 February, 2018
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]

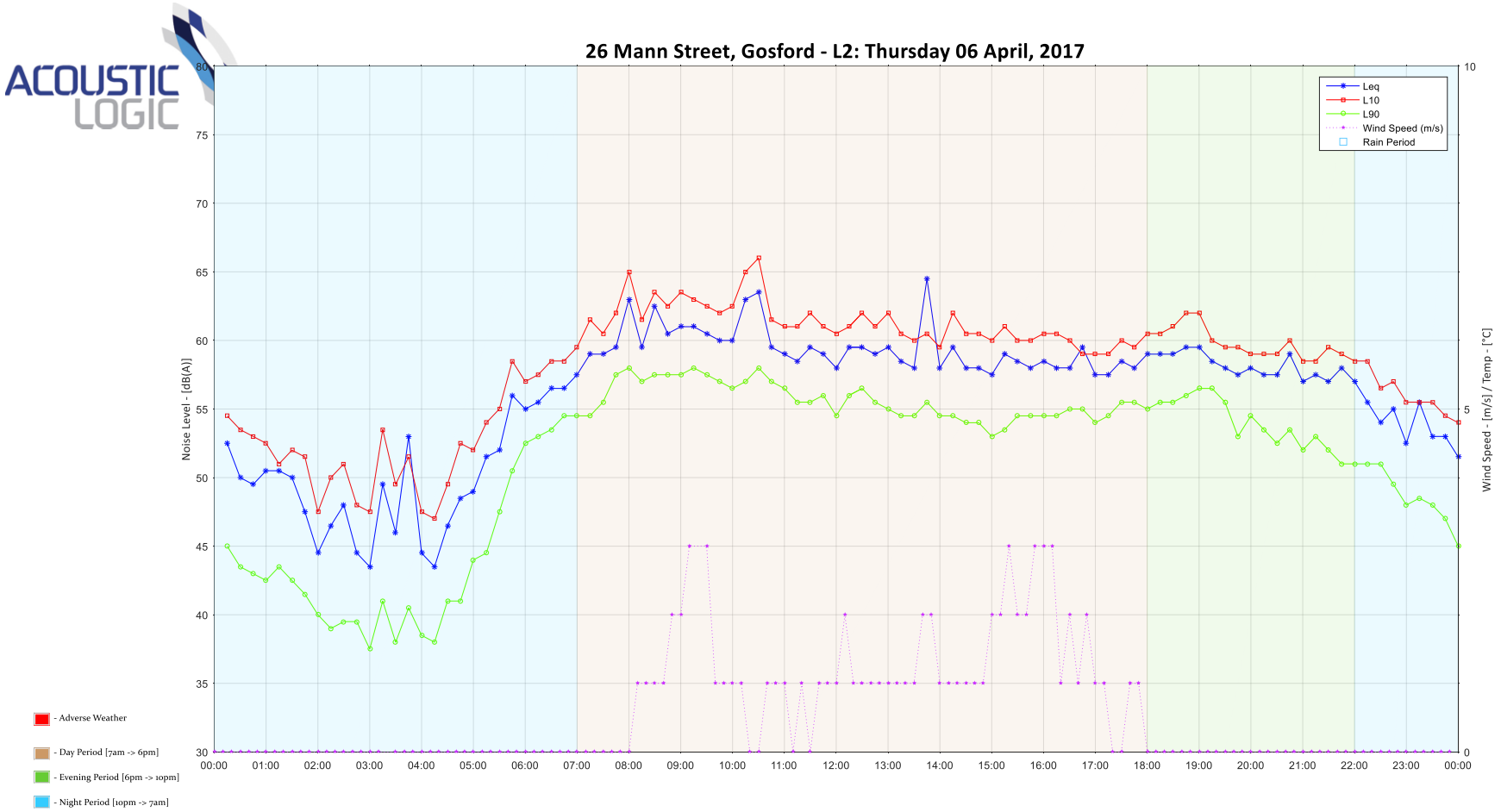

26 Mann Street, Gosford - L1: Wednesday 14 February, 2018
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


26 Mann Street, Gosford - L1: Thursday 15 February, 2018
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
Leq
L10
L90
Wind Speed (m/s)
Rain Period
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]

APPENDIX 2 – UNATTENDED NOISE MONITORING DATA FOR LOCATION L2

79-87 HENRY PARRY DRIVE


26 Mann Street, Gosford - L2: Wednesday 05 April, 2017
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
Leq
L10
L90
Wind Speed (m/s)
Rain Period
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


26 Mann Street, Gosford - L2: Thursday 06 April, 2017
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
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11:00
12:00
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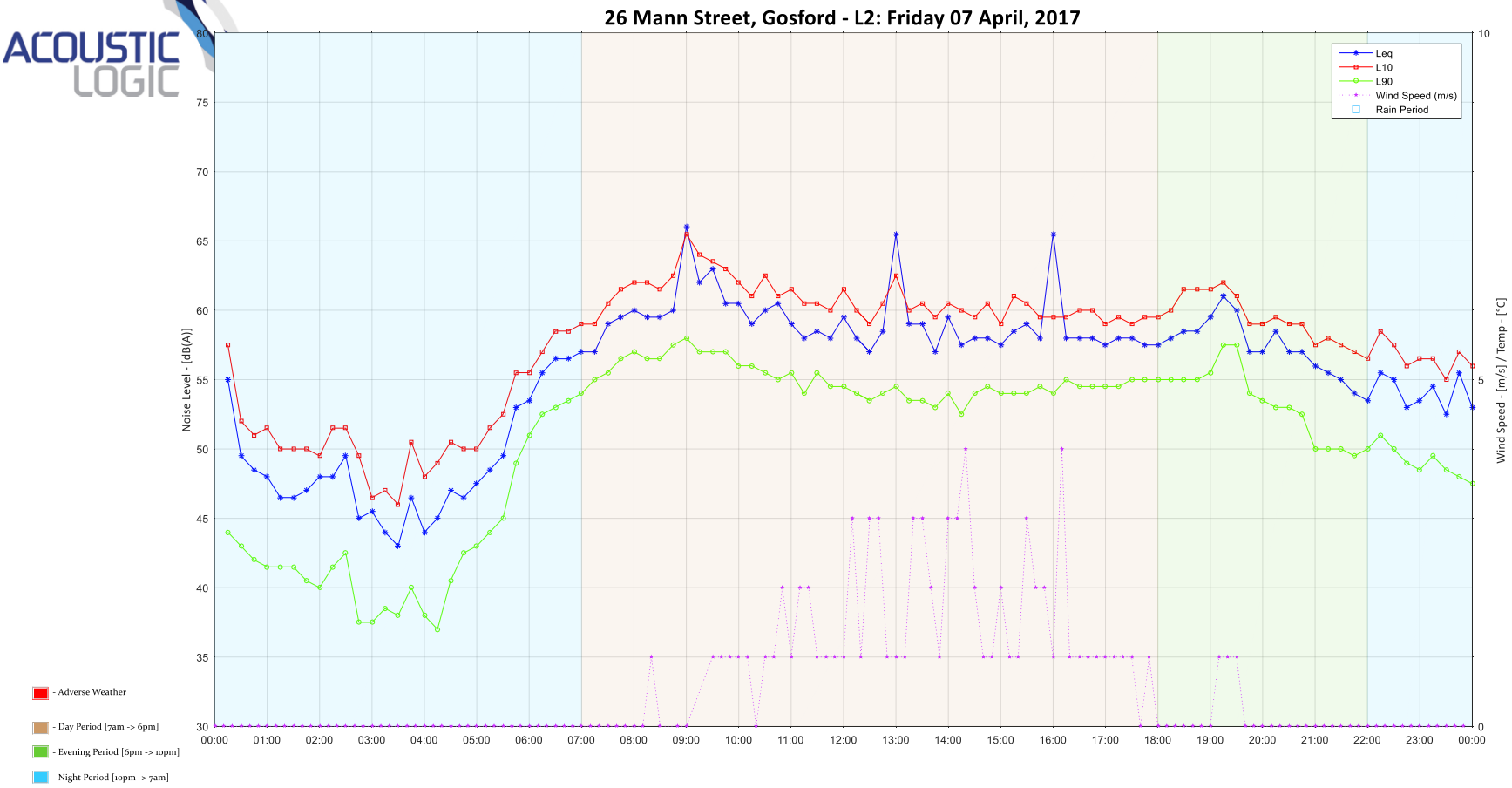
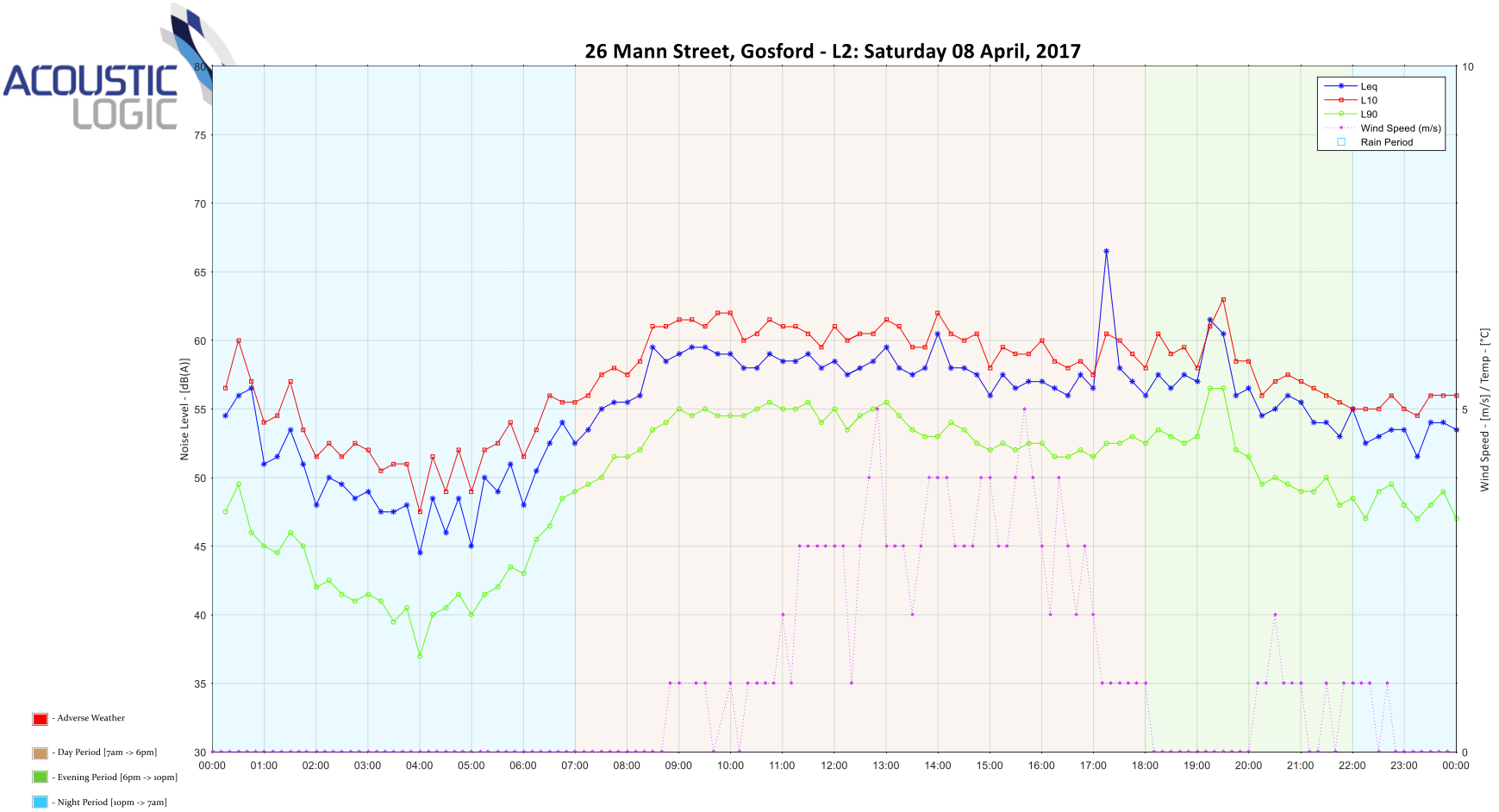
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


26 Mann Street, Gosford - L2: Friday 07 April, 2017
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


26 Mann Street, Gosford - L2: Saturday 08 April, 2017
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
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13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
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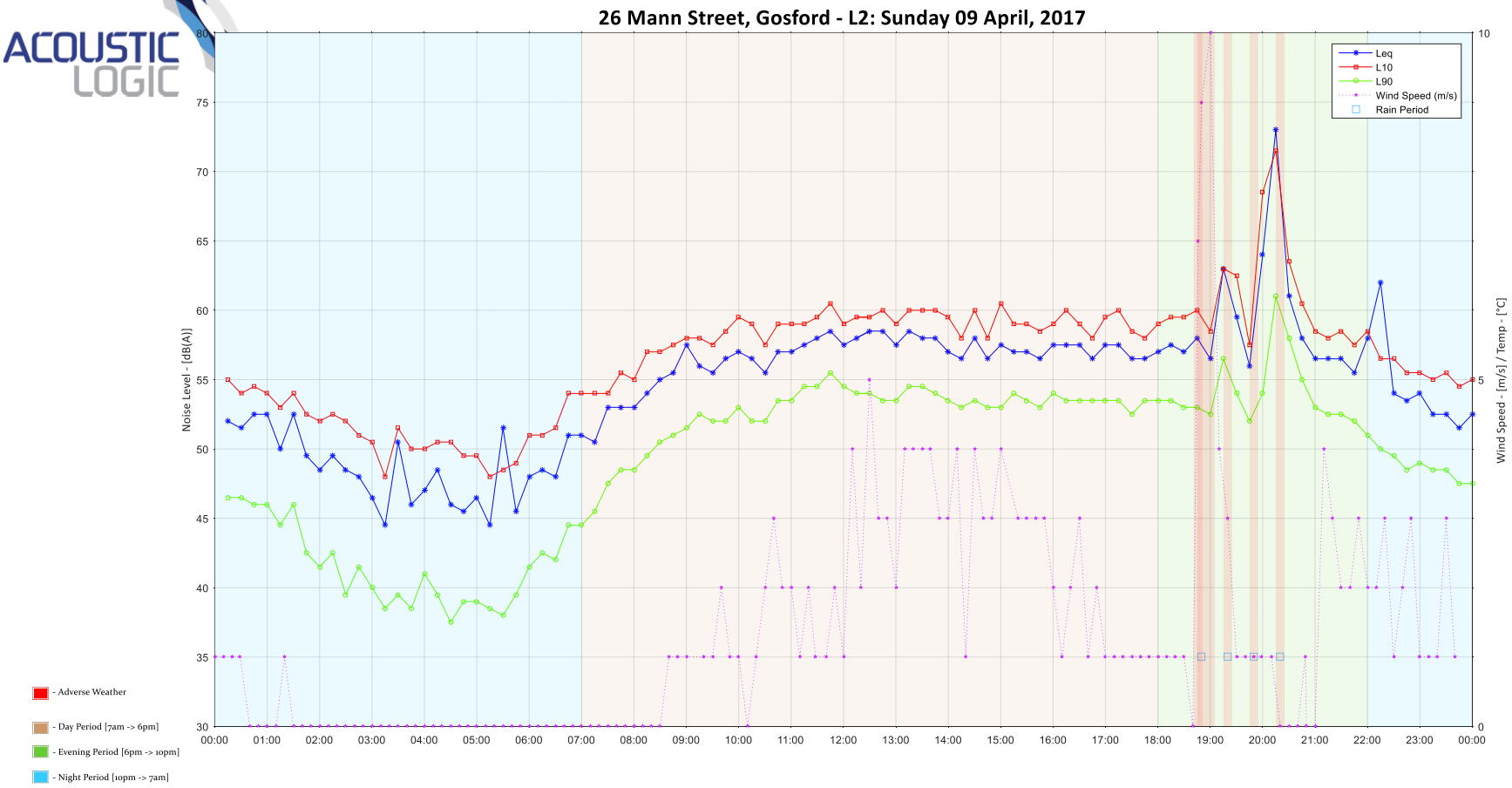
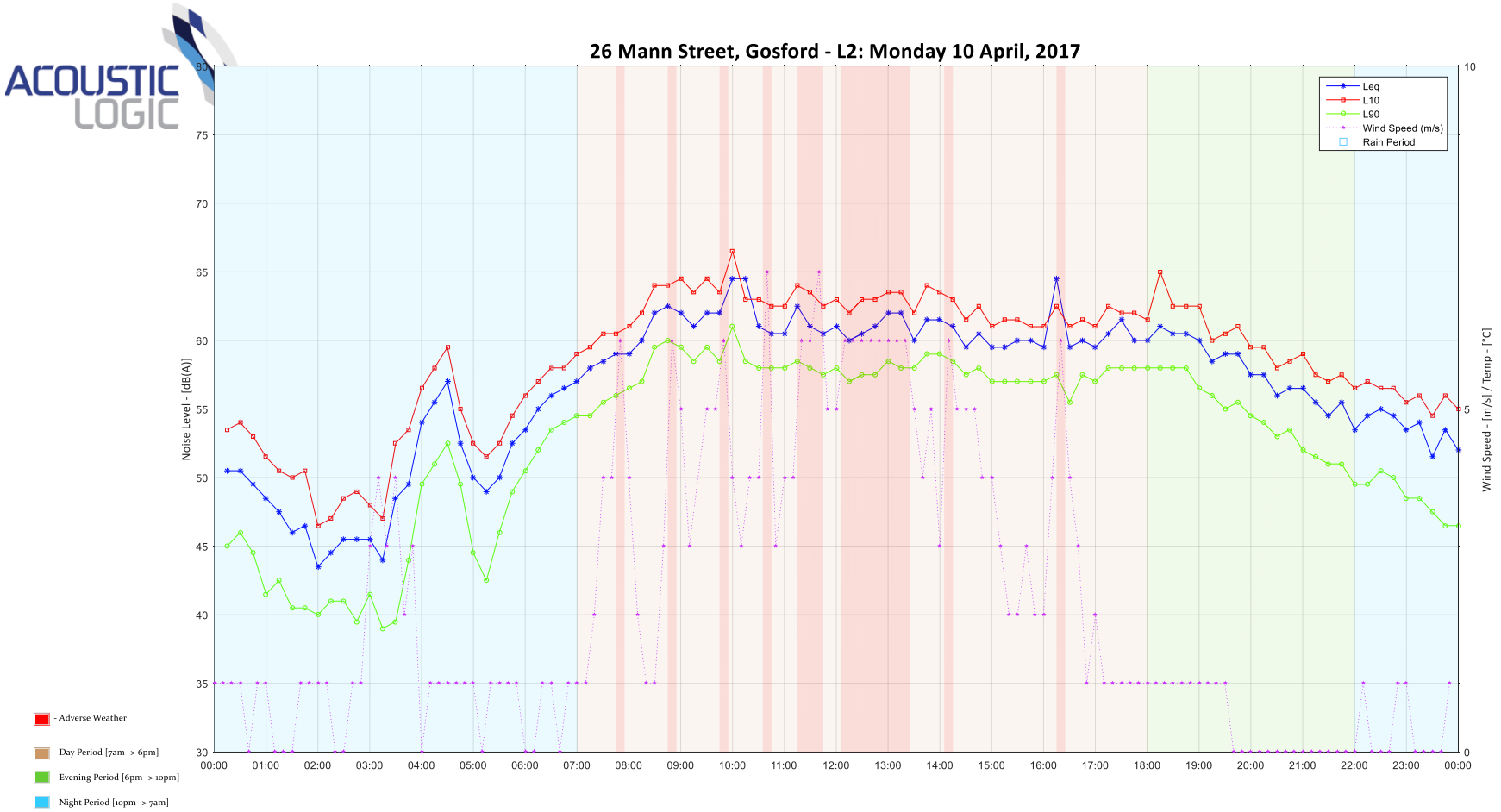
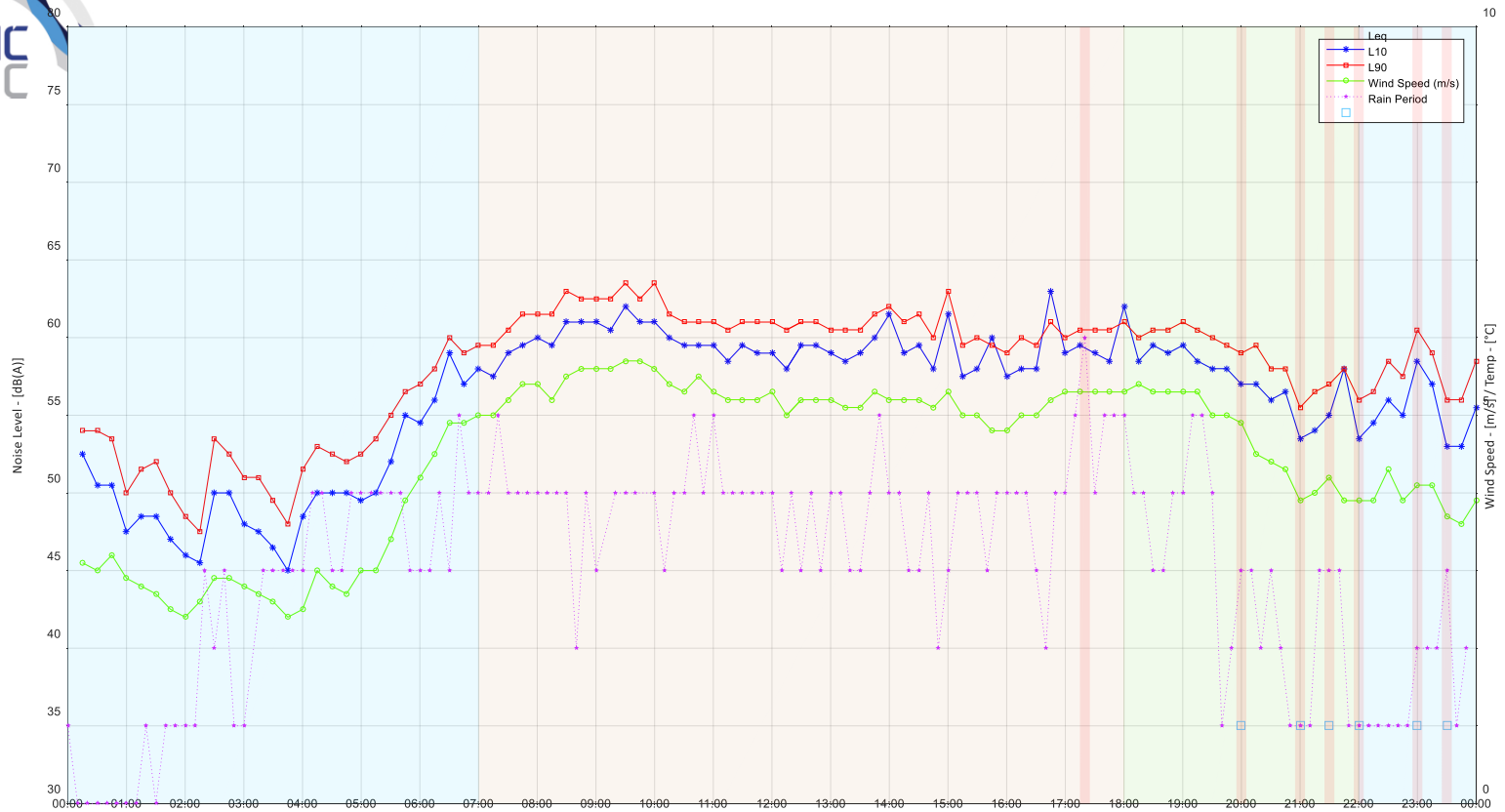
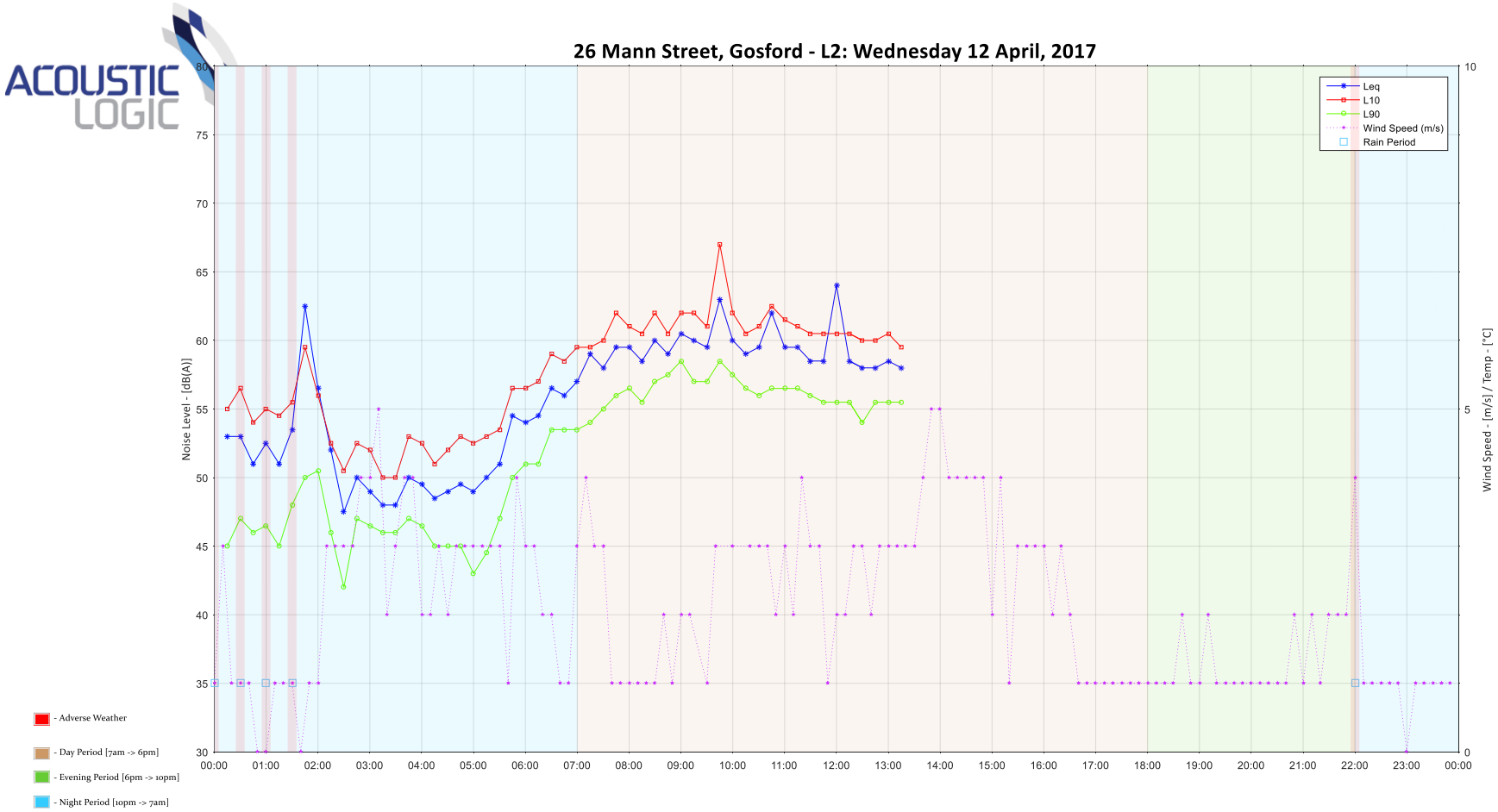
00:00
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


26 Mann Street, Gosford - L2: Sunday 09 April, 2017
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
35
30
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


26 Mann Street, Gosford - L2: Monday 10 April, 2017
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
Leq
L10
L90
Wind Speed (m/s)
Rain Period
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]

26 Mann Street, Gosford - L2: Tuesday 11 April, 2017




26 Mann Street, Gosford - L2: Wednesday 12 April, 2017
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
Leq
L10
L90
Wind Speed (m/s)
Rain Period
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]

APPENDIX 3 –DEVELOPMENT APPLICATION DRAWINGS BY DKO ARCHITECTURE (NSW)

Development Application

26-30 Mann Street, Gosford, NSW, 2250

SUBSET	DRAWING No.	DESCRIPTION	Revision ID
Cover Page			
	DA001	Title Page	A
Site Series			
	DA101	Staging Plan	A
	DA102	Site Plan	A
	DA103	Site Survey	A
GA Plans 1:125			
	DA201	Ground Floor	A
	DA202	Level 1	A
	DA203	Level 2	A
	DA204	Level 3	A
	DA205	Level 4	A
	DA206	Level 5	A
	DA207	Level 6-12	A
	DA208	Level 13-20	A
	DA209	Level 21	A
	DA210	Level 22-23	A
	DA211	Level 24	A
	DA212	Roof Plan	A
Elevations & Sections			
	DA301	North Elevation	A
	DA302	South Elevation	A
	DA303	East Elevation (Mann Street)	A
	DA304	West Elevation (Baker Street)	A
	DA305	Sections - AA	A
	DA306	Sections - BB	A
	DA307	Materials & Finishes	A
Compliance Drawings			
	DA401	GFA Calculations	A
	DA402	GFA Calculations	A
	DA403	Unit Mix	A
	DA404	Cross Ventilation Calc.	A
	DA405	Eye of the Sun 1/3	A
	DA406	Eye of the Sun 2/3	A
	DA407	Eye of the Sun 3/3	A
	DA408	Solar Access Calculations 8am to 4pm	A
	DA409	Solar Access Calculations 9am to 3pm	A
	DA410	Communal Open Space & Deep Soil	A
	DA411	Shadow Diagram Proposed 1/2	A
	DA412	Shadow Diagram Proposed 2/2	A
	DA413	Shadow Diagram COS	A
	DA414	Apartment Types 1/3	A
	DA415	Apartment Types 2/3	A
	DA416	Apartment Types 3/3	A
	DA417	Storage Diagram 1/2	A
	DA418	Storage Diagram 2/2	A
	DA419	Pre & Post Adaptable	A
	DA420	DDA & Livable Unit Calc.	A
	DA421	Pre & Post Adaptable & Livable	A
	DA422	South West Perspective	A
	DA423	West Perspective	A
	DA424	North West Perspective	A
	DA425	North East Perspective	A
DPIE Request for additional information			
	SK01	Level 3 Through-site Link Details	A
	SK02	Active Frontage Analysis	A

Rev.	Date	By	Ckd	Description
A	8/20/2021	A	A	Development Application

DKO Architecture (NSW) Pty Ltd
42 Davies Street
Surry Hills, NSW 2010
T +61 2 8346 4500
info@DKO.com.au
www.DKO.com.au
ABN: 81956706590
NSW: Nominated Architects
Koos de Keijzer 5767
David Randerson 8542

DKO

Project Name	Central Coast Quarter	Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250	Drawing Name	Title Page
		Scale	@A1
		Date	April 2021
Client	St. Hilliers	Drawing Number	DA001
		Revision	A

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

STAGE 1 TOTAL
4,255 m²

STAGE 1A
3,093 m²

Stage 1B
1,162 m²

STAGE 2
1,551 m²

STAGE 3
3,109 m²

LOT 11
DP 1250131
VACANT

LOT 12
DP 1250131

32 Mann Street
Commercial Building

LOT 7
LOT 6
LOT 5
LOT 4
LOT 3
LOT 2

DP 14761

MANN STREET

VAUGHAN AVENUE

E 345700.552
N 6299891.098

E 345790.717
N 6299876.593

(B) RIGHT OF WAY VARI
(X) LAND EXCLUDES MIN
(Y) - POSITIVE COVENAN
- RESTRICTION ON
(G) EASEMENT FOR ELE
(Z) PROPOSED EASEME
(DP 1115064)

Client Details

SH Gosford Residential Pty Ltd

Consultants

Land Survey - Veris
1300 765 315

Planner - Urbis
Andrew Harvey
aharvey@urbis.com.au
02 8233 9900

Landscape Design - Turf
Scott Jackson
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02 8394 9990

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Traffic - GTA
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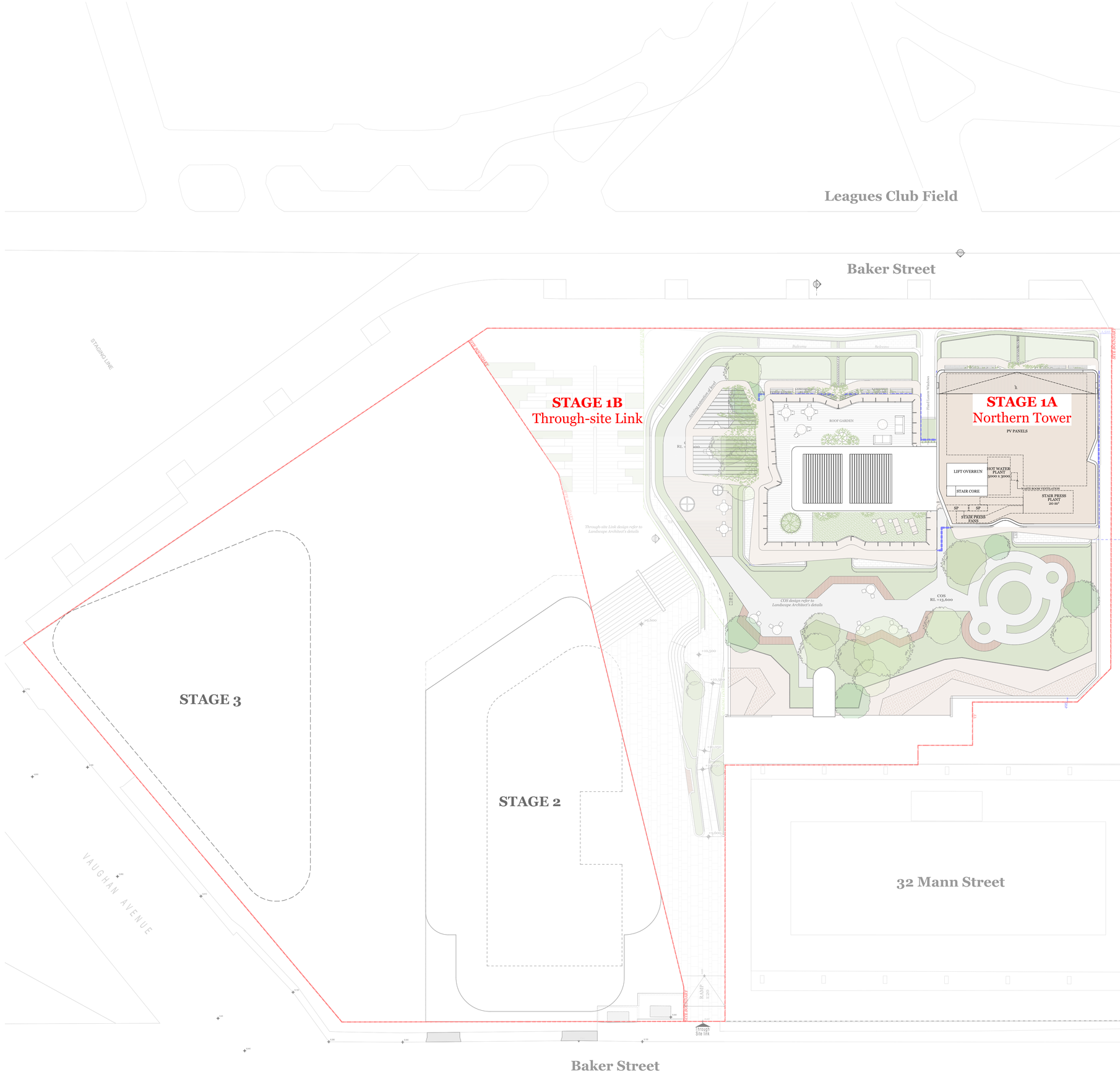
ABN: 81957706590
NSW: Nominated Architects
Koos de Keijzer 5767
David Randerson 8542

Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:250@A1 1:250@A3
Drawing Series	Site Series
Drawing Name	Staging Plan

Drawing Number **DA101**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and Job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application



Client Details

SH Gosford Residential Pty Ltd

Consultants

Land Survey - Veris
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Planner - Urbis
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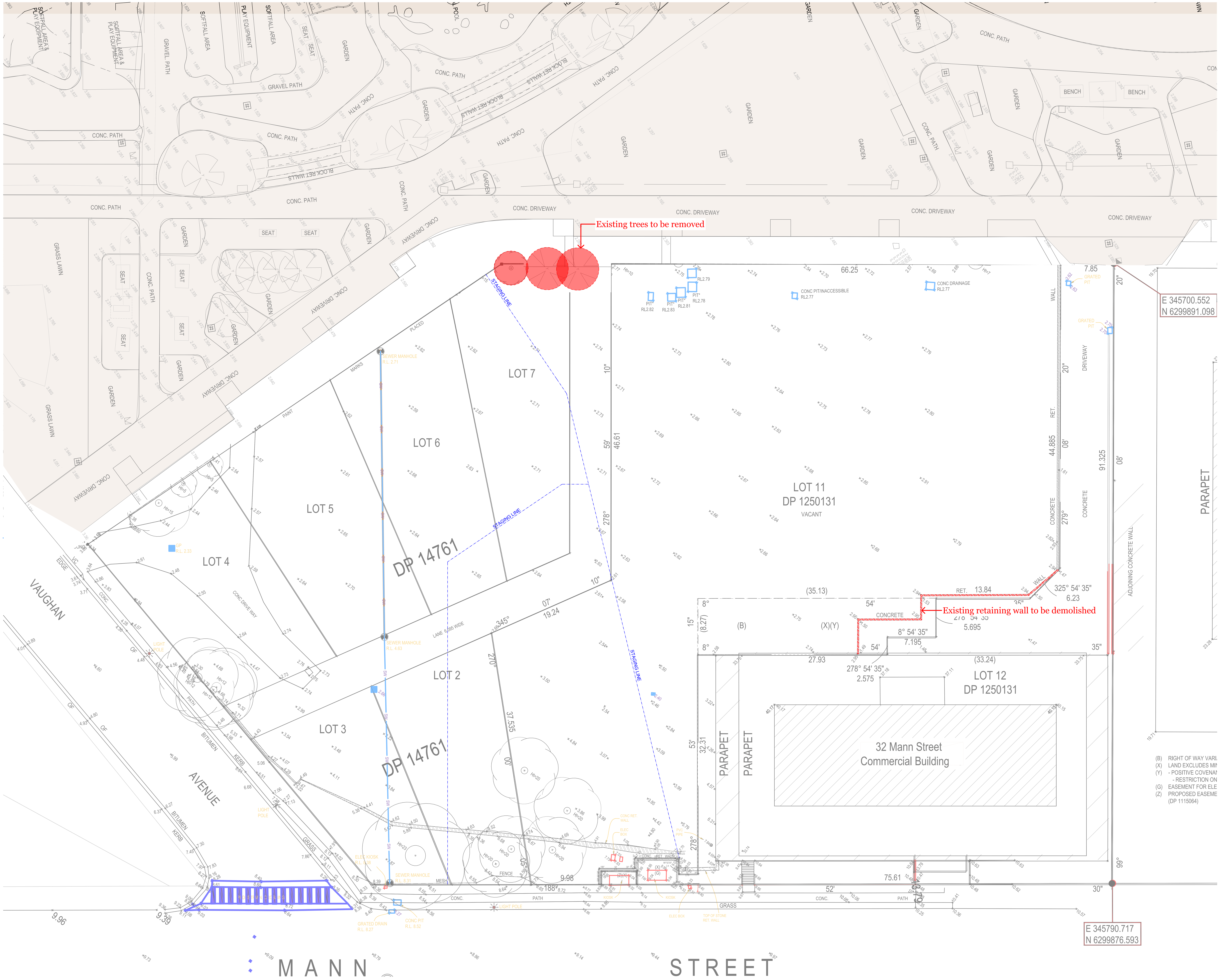
ABN: 81956706590
NSW: Nominated Architects
Koos de Keijzer 5767
David Randerson 8542

Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:250@A1
Drawing Series	Site Series
Drawing Name	Site Plan
Drawing Number	DA102
Revision	A



Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

Client Details
SH Gosford Residential Pty Ltd

Consultants

Land Survey - Veris
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Planner - Urbis
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NSW: Nominated Architects
Koos de Keijzer 5767
David Randerson 8542

Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:250@A1 1:250@A3
Drawing Series	Site Series
Drawing Name	Site Survey

Drawing Number **DA103**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences Figured dimensions take precedence over drawings and job dimensions. All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

Client Details

SH Gosford Residential Pty Ltd

Consultants

Land Survey - Veris
1300 765 315

Planner - Urbis
Andrew Harvey
aharvey@urbis.com.au
02 8233 9900

Landscape Design - Turf
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Building Services- S4B
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www.DKO.com.au
ABN: 81956706590
NSW: Nominated Architects
Koos de Keijzer 5767
David Randerson 8542

Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:125@A1 1:250@A3
Drawing Series	GA Plans 1:125
Drawing Name	Ground Floor
Drawing Number	**DA201**
Revision	**B**

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and Job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

BAKER STREET

Glass wind screen to Wind Engineer's specs

SITE BOUNDARY

STAGING LINE

Through-site Link design as per Landscape Architect's details

Stage 1 temporary balustrade to be removed for stage 2

+4,500

Stage 1 temporary meshed screen to be removed for Stage 2

4,300

1,515

VOID

VISITOR

GOODS HOIST

SERVICES

FIRE TANK
1800H x 10010W x 8301D

LIFT 01

LIFT 02

L1 Car Park
+4,500

RESI

VISITOR DDA

RESI DDA

12.00 %

25.00 %

25.00 %

12.00 %

LEVEL 1:
38 Resi
10 Visitor
3 DDA

5 Motorbikes

2,650

3,750

SITE BOUNDARY

Client Details

SH Gosford Residential Pty Ltd

Consultants

Land Survey - Veris
1300 765 315

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Koos de Keijzer 7767
David Randerson 8542

Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:125@A1 1:250@A3
Drawing Series	GA Plans 1:125
Drawing Name	Level 1

Drawing Number **DA202**
Revision **B**

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

Client Details

SH Gosford Residential Pty Ltd

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Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:125@A1 1:250@A3
Drawing Series	GA Plans 1:125
Drawing Name	Level 2

Drawing Number **DA203**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and Job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

BAKER STREET

SITE BOUNDARY

STAGING LINE

SITE BOUNDARY

SITE BOUNDARY

STAGING LINE

Through-site Link design refer to Landscape Architect's details

Balcony 36 m²
Balcony 25 m²
Balcony 20 m²
Balcony 17 m²
Balcony 22 m²
Obscure Windows
3:01 2B/2B 91 m²
3:02 2B/2B 82 m²
3:03 1B/1B 53 m²
3:04 1B/1B 53 m²
3:05 1B/1B 70 m²
1,315

RESI
RESI DDA
GOODS HOIST
L3 Lobby RL +10,500
LIFT 01
LIFT 02
FS 01
FS 02
Garbage Chute Room
20 Stores
L3 Car Park RL +10,300
Fan Room 13 m²
Fan Room 13 m²
12.00%
25.00%
MB
ST

RETAIL 77 m²

+9,600
+10,500
+10,500
+10,050
+10,050

WC
Service Room

2,650
3,757

LEVEL 3:
40 Resi
5 DDA

5 Motorbike

Client Details

SH Gosford Residential Pty Ltd

Consultants

Land Survey - Veris
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Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:125@A1 1:250@A3
Drawing Series	GA Plans 1:125
Drawing Name	Level 3

Drawing Number **DA204**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and Job dimensions.
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Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

BAKER STREET

SITE BOUNDARY

STAGING LINE

9,650

1,510

SITE BOUNDARY

Awning extention of level above shown dashed

COS
RL +13,600

ENVELOPE LINE

Courtyard 45 m²

Courtyard 30 m²

Fixed Louvre Windows

Courtyard 30 m²

Courtyard 25 m²

4:01 2B/2B 85 m²

4:02 2B/2B 86 m²

4:03 2B/2B 79 m²

4:04 2B/2B 94 m²

L4 Lobby
RL +13,600

LIFT 01

LIFT 02

FS.01

FS.02

4:05 2B/2B 87 m²

4:06 2B/2B 85 m²

4:07 2B/2B 87 m²

Courtyard 41 m²

Courtyard 26 m²

Courtyard 21 m²

Through-site Link design refer to Landscape Architect's details

COS design refer to Landscape Architect's details

COS
RL +13,600

+9,600

+10,500

+10,500

+10,050

+10,050

495

B Fire stairs amended

6m 5 3.75 2.5 1.25 0

13m 10 7.5 5 2.5 0

Client Details

SH Gosford Residential Pty Ltd

Consultants

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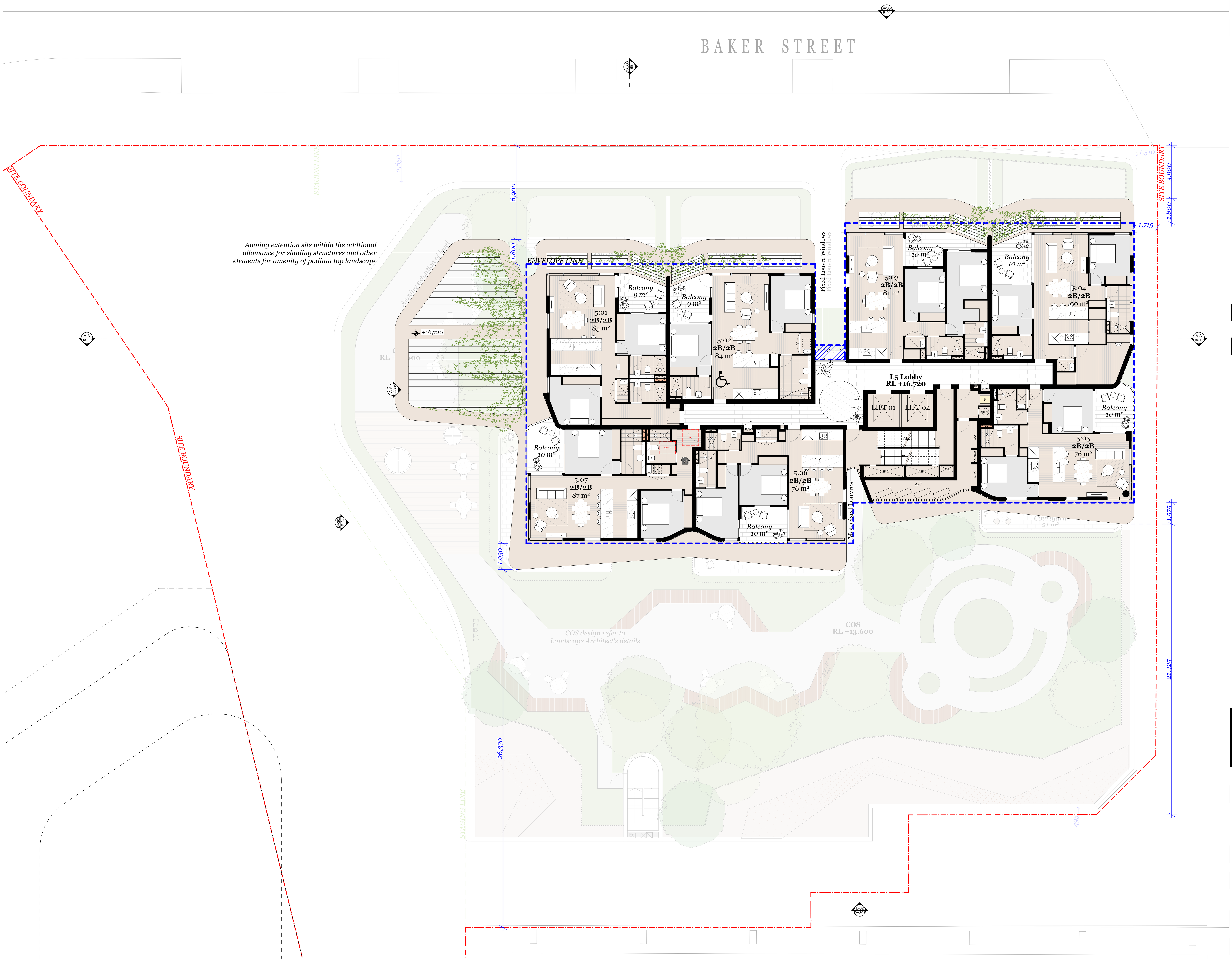
David Randerson 8542

Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:125@A1 1:250@A3
Drawing Series	GA Plans 1:125
Drawing Name	Level 4

Drawing Number **DA205**
Revision **A**



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Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

Client Details

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Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:125@A1 1:250@A3
Drawing Series	GA Plans 1:125
Drawing Name	Level 5

Drawing Number DA206
Revision A

Builder/Contractor shall verify job dimensions before any job commences
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Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

BAKER STREET

44,800

SITE BOUNDARY

SITE BOUNDARY

8,700

20,600

28,300

ENVELOPE LINE

1,710

5,700

20,600

23,000

Fixed Louvre Windows

Motorised Louvres

12:01
2B/2B
85 m²

12:02
2B/2B
84 m²

12:03
2B/2B
82 m²

12:04
2B/2B
90 m²

12:05
2B/2B
76 m²

12:06
2B/2B
76 m²

12:07
2B/2B
87 m²

Balcony
10 m²

LIFT 01

LIFT 02

FS.01

FS.02

A/C

SITE BOUNDARY

SITE BOUNDARY

6m 5 3.75 2.5 1.25 0

13m 10 7.5 5 2.5 0

Client Details

SH Gosford Residential Pty Ltd

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Land Survey - Veris
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Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:125@A1 1:250@A3
Drawing Series	GA Plans 1:125
Drawing Name	Level 6-12

Drawing Number **DA207**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences Figured dimensions take precedence over drawings and job dimensions. All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

Client Details

SH Gosford Residential Pty Ltd

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Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:125@A1 1:250@A3
Drawing Series	GA Plans 1:125
Drawing Name	Level 13-20

Drawing Number **DA208**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
01	10/15/2020			Preliminary Issue
P2	10/19/2020			Preliminary Issue
A	8/20/2021	XD, NV	NB	Development Application

BAKER STREET

44,800

SITE BOUNDARY

SITE BOUNDARY

8,700

20,600

28,300

ENVELOPE LINE

ROOF GARDEN
+66,830

COMMUNAL LOUNGE
+66,830

Balcony
13 m²

21:01
3B/2B
111 m²

Balcony
14 m²

21:02
3B/2B
145 m²

Living, Dining & Kitchen
42m²

L21 Lobby
RL +66,640

LIFT 01

LIFT 02

FS.01

FS.02

A/C

Bedroom 3
14m²

Bedroom 2
10m²

Bedroom 1
14m²

1,710

SITE BOUNDARY

5,700

20,600

23,000

SITE BOUNDARY

SITE BOUNDARY

6m 5 3.75 2.5 1.25 0
13m 10 7.5 5 2.5 0

Client Details

SH Gosford Residential Pty Ltd

Consultants

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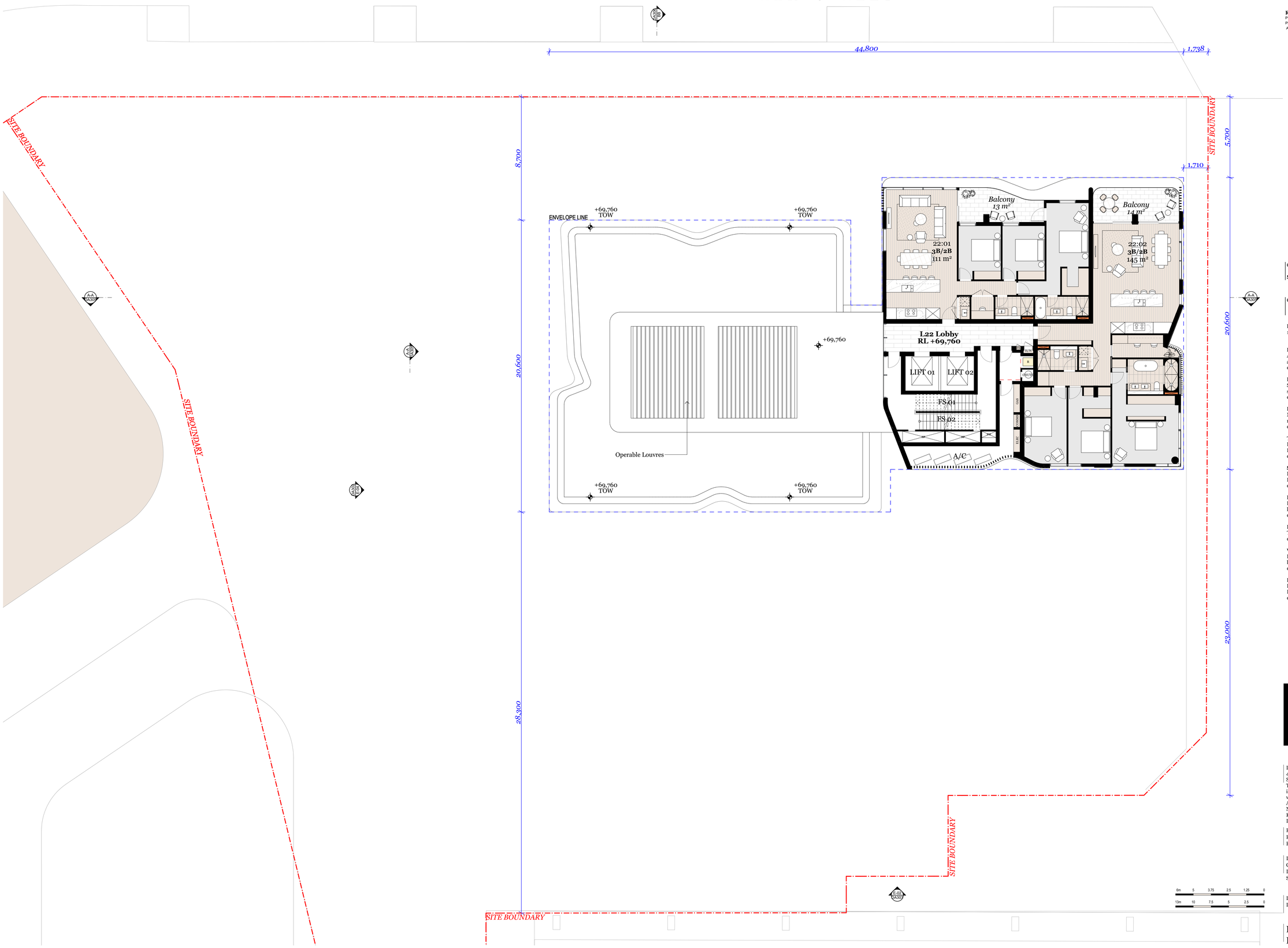
Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:125@A1 1:250@A3
Drawing Series	GA Plans 1:125
Drawing Name	Level 21

Drawing Number **DA209**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
P1	9/15/2020	PP	JC	Preliminary Issue
P2	10/15/2020			Preliminary Issue
A	8/20/2021	XD, NV	NB	Development Application



Client Details

SH Gosford Residential Pty Ltd

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Land Survey - Veris
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Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:125@A1 1:250@A3
Drawing Series	GA Plans 1:125
Drawing Name	Level 22-23

Drawing Number **DA210**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

BAKER STREET

44,800

1,738

SITE BOUNDARY

SITE BOUNDARY

8,700

20,600

ENVELOPE LINE

ROOF BELOW

1,710

SITE BOUNDARY

5,700

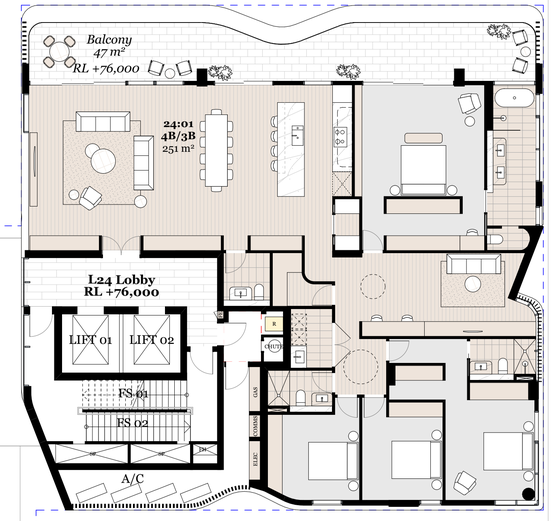
20,600

23,000

28,300

SITE BOUNDARY

SITE BOUNDARY



6m 5 3.75 2.5 1.25 0
13m 10 7.5 5 2.5 0

Client Details

SH Gosford Residential Pty Ltd

Consultants

Land Survey - Veris
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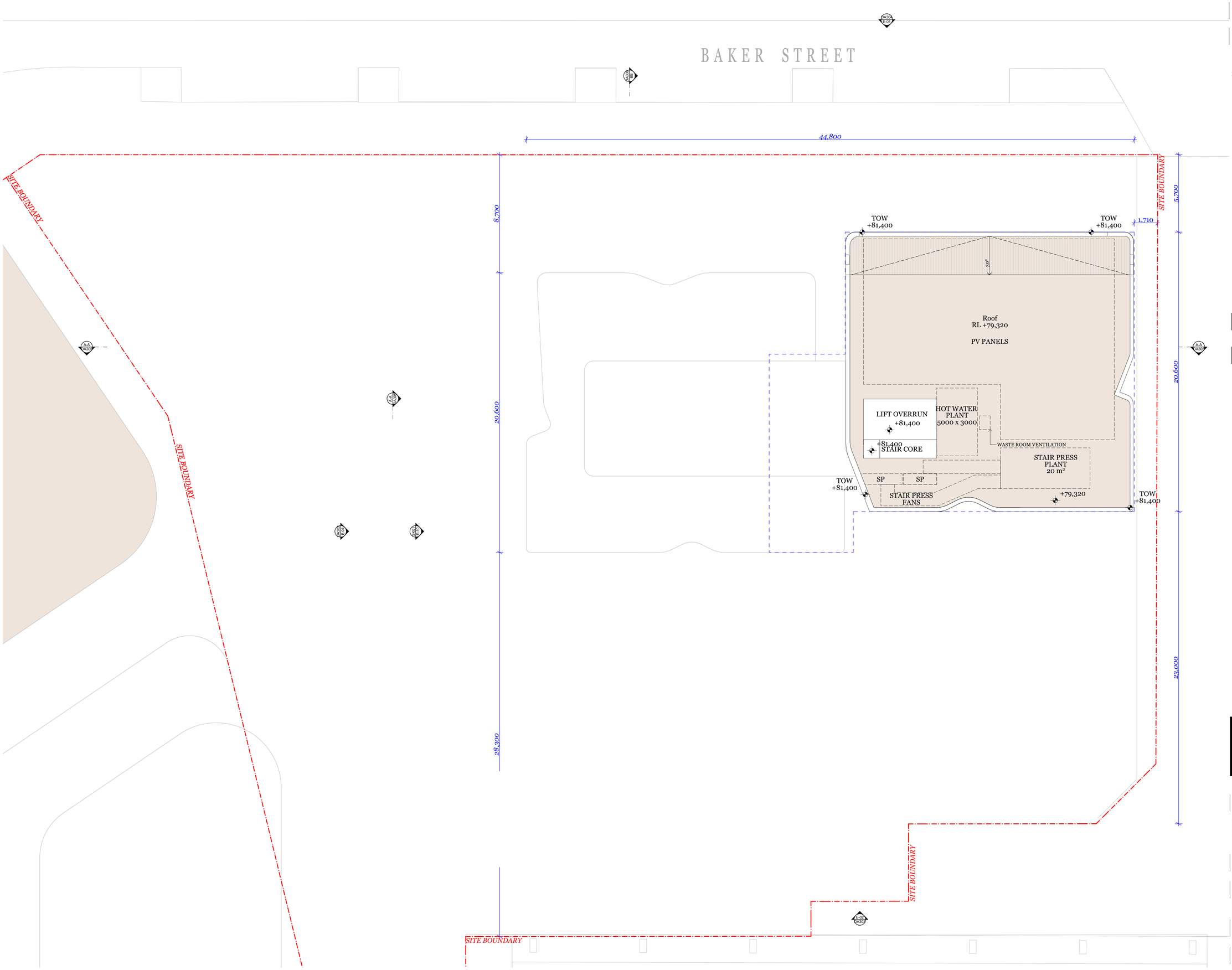
Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:125@A1 1:250@A3
Drawing Series	GA Plans 1:125
Drawing Name	Level 24

Drawing Number **DA211**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application



Client Details

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David Randerson 8542

Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:125@A1 1:250@A3
Drawing Series	GA Plans 1:125
Drawing Name	Roof Plan

Drawing Number **DA212**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and Job dimensions.
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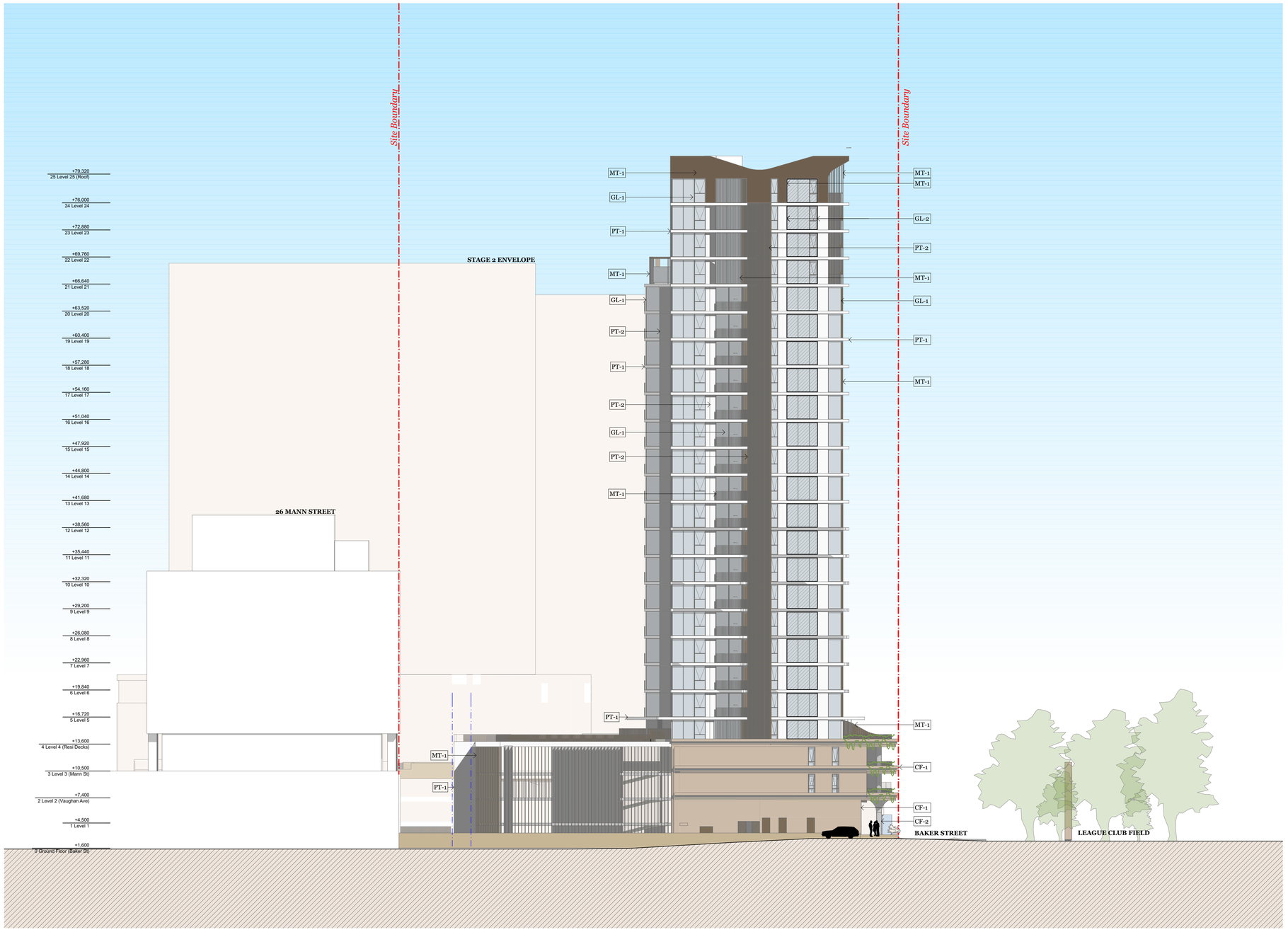

LEGEND:

CF-1: CONCRETE FINISH (SAND)
CF-2 : CONCRETE FINISH (GREY)
GL-1: CLEAR GLASS
GL-2: COLOURBACK GLASS (LIGHT GREY)
PT-1: WHITE PAINT
PT-2: DARK BRONZE PAINT
MT-1: METAL PANEL (DARK BRONZE)

REFER TO DA 307 FOR FINISH SCHEDULE

Client Details

SH Gosford Residential Pty Ltd

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Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:250@A1 1:250@A3
Drawing Series	Elevations & Sections
Drawing Name	North Elevation

Drawing Number **DA301**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences
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Rev.	Date	By	Ckd	Description.
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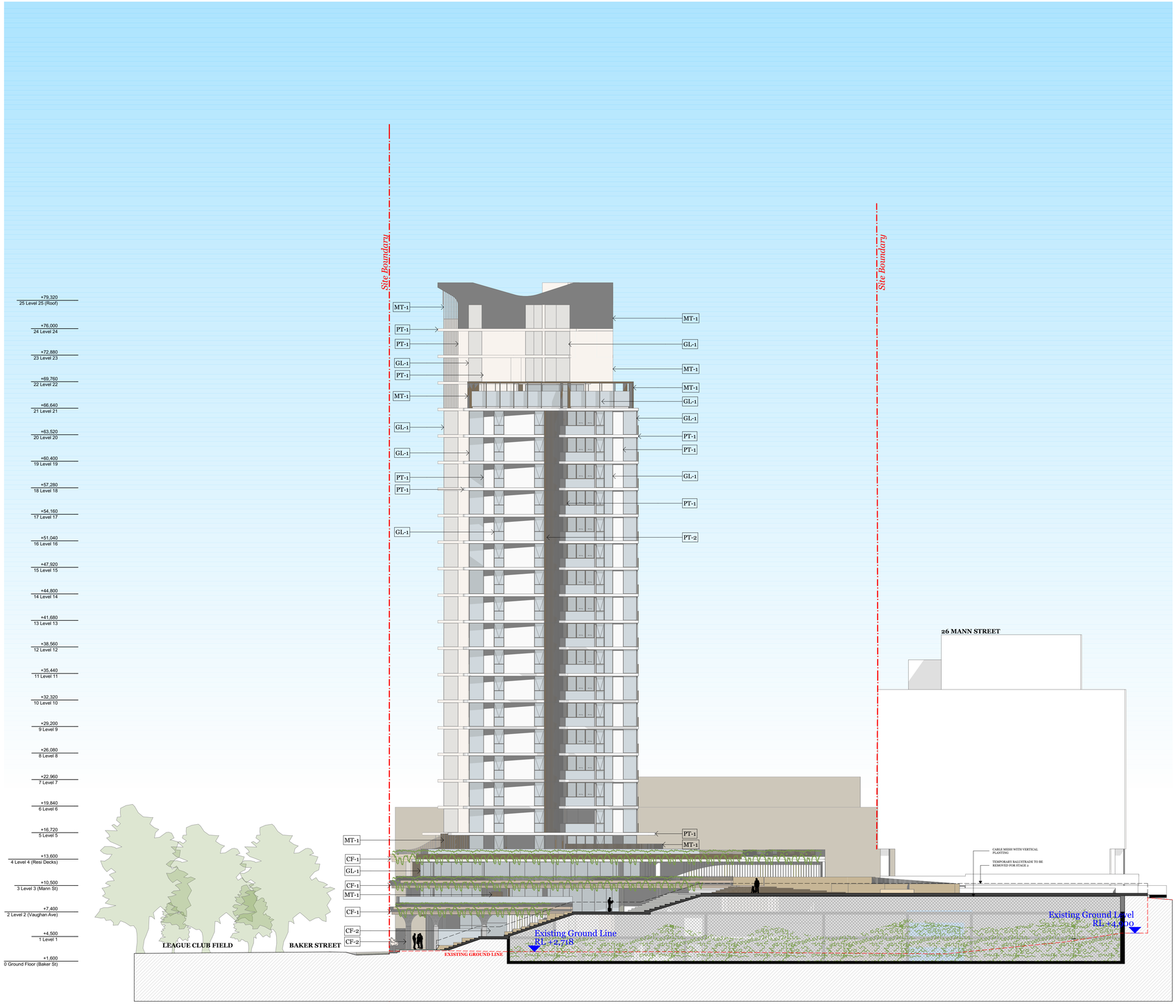

LEGEND:

CF-1: CONCRETE FINISH (SAND)
CF-2 : CONCRETE FINISH (GREY)
GL-1: CLEAR GLASS
GL-2: COLOURBACK GLASS (LIGHT GREY)
PT-1: WHITE PAINT
PT-2: DARK BRONZE PAINT
MT-1: METAL PANEL (DARK BRONZE)

REFER TO DA 307 FOR FINISH SCHEDULE

Client Details

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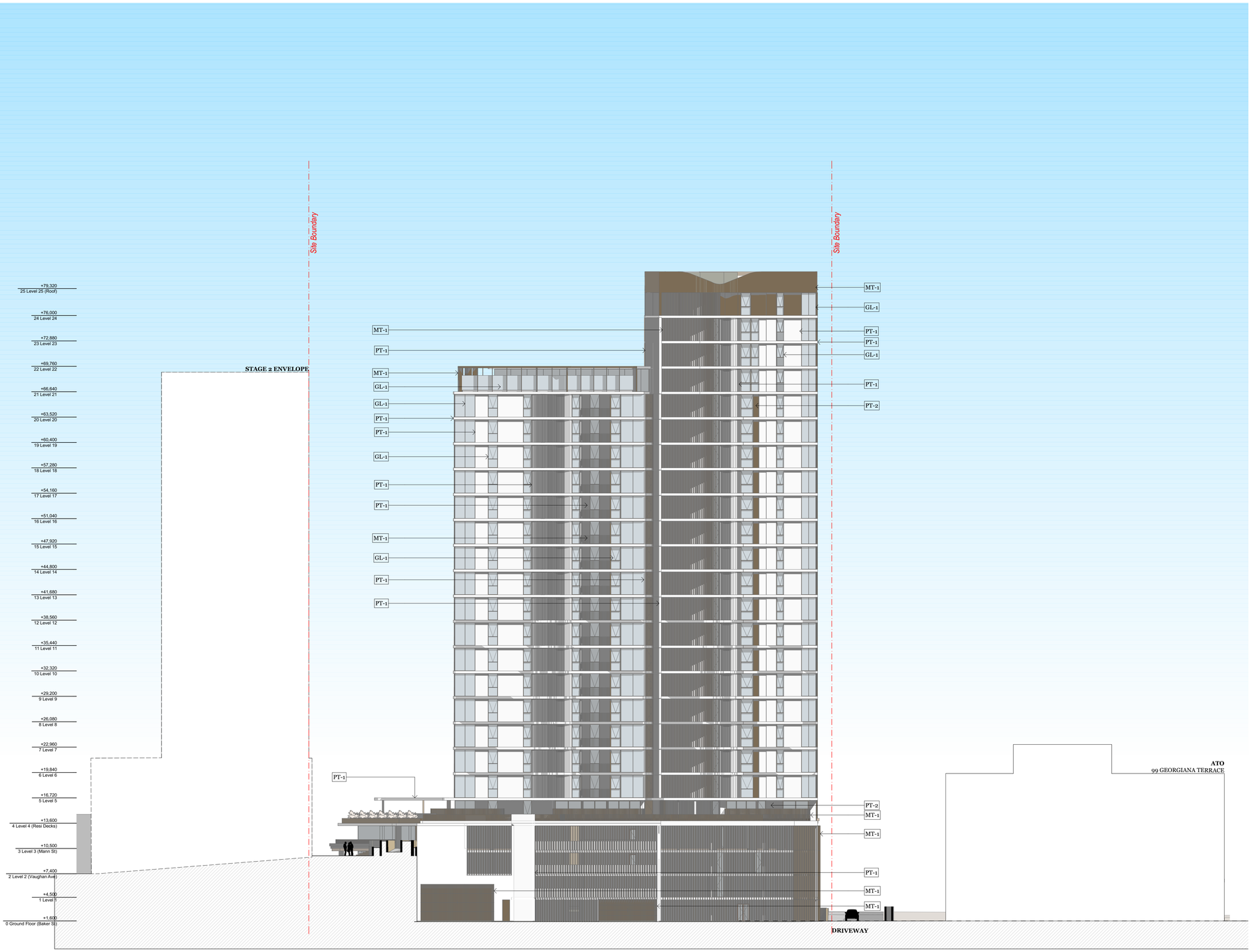
Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:250@A1 1:250@A3
Drawing Series	Elevations & Sections
Drawing Name	South Elevation

Drawing Number **DA302**
Revision **A**



Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

LEGEND:

CF-1: CONCRETE FINISH (SAND)
CF-2 : CONCRETE FINISH (GREY)
GL-1: CLEAR GLASS
GL-2: COLOURBACK GLASS (LIGHT GREY)
PT-1: WHITE PAINT
PT-2: DARK BRONZE PAINT
MT-1: METAL PANEL (DARK BRONZE)

REFER TO DA 307 FOR FINISH SCHEDULE

Client Details

SH Gosford Residential Pty Ltd

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Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:250@A1 1:250@A3
Drawing Series	Elevations & Sections
Drawing Name	East Elevation (Mann Street)
Drawing Number	**DA303**
Revision	**A**

Builder/Contractor shall verify job dimensions before any job commences
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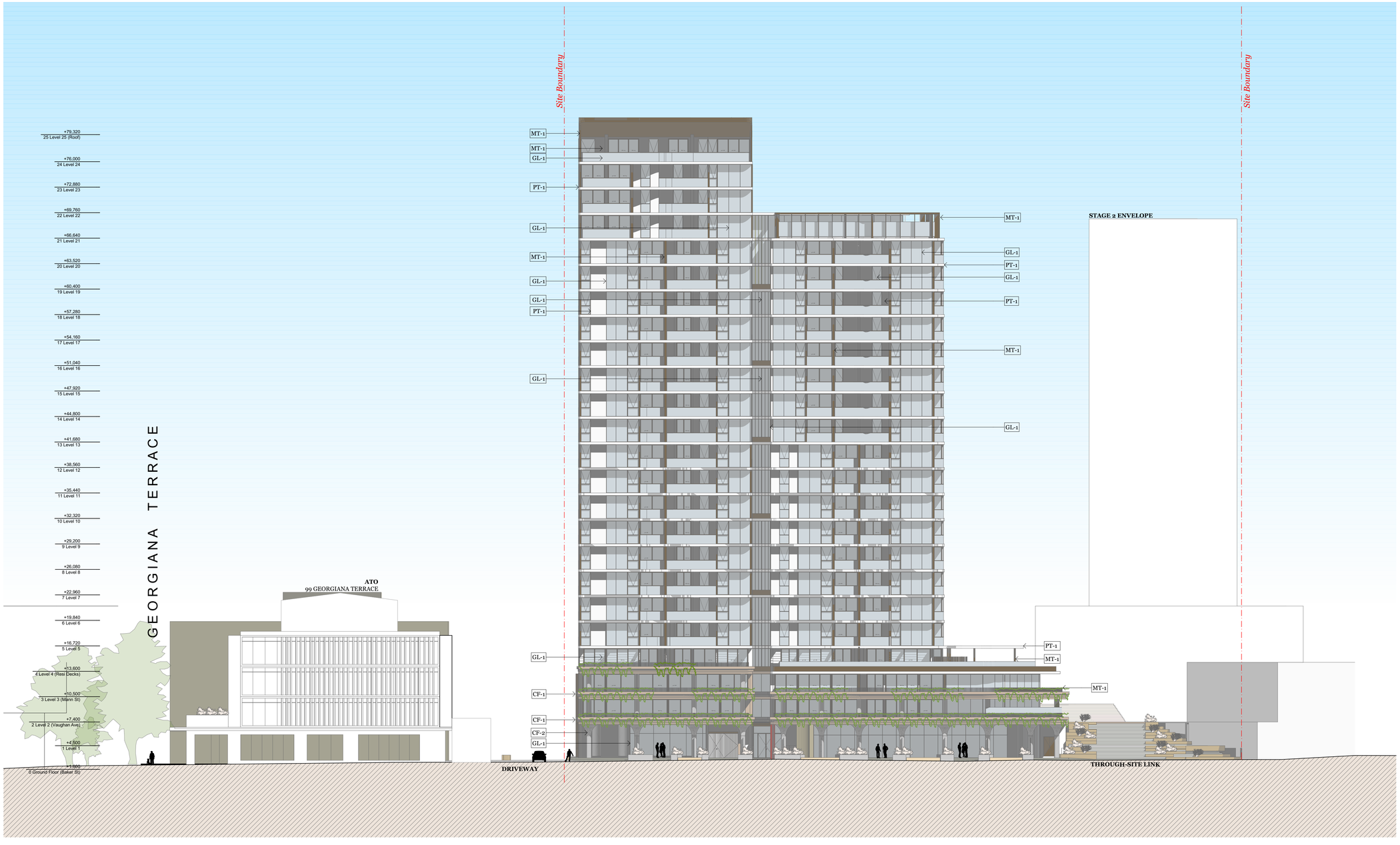
Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application



LEGEND:

CF-1: CONCRETE FINISH (SAND)
CF-2 : CONCRETE FINISH (GREY)
GL-1: CLEAR GLASS
GL-2: COLOURBACK GLASS (LIGHT GREY)
PT-1: WHITE PAINT
PT-2: DARK BRONZE PAINT
MT-1: METAL PANEL (DARK BRONZE)

REFER TO DA 307 FOR FINISH SCHEDULE

Client Details

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Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:250@A1 1:250@A3
Drawing Series	Elevations & Sections
Drawing Name	West Elevation (Baker Street)

Drawing Number **DA304**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences
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Rev.	Date	By	Ckd	Description.
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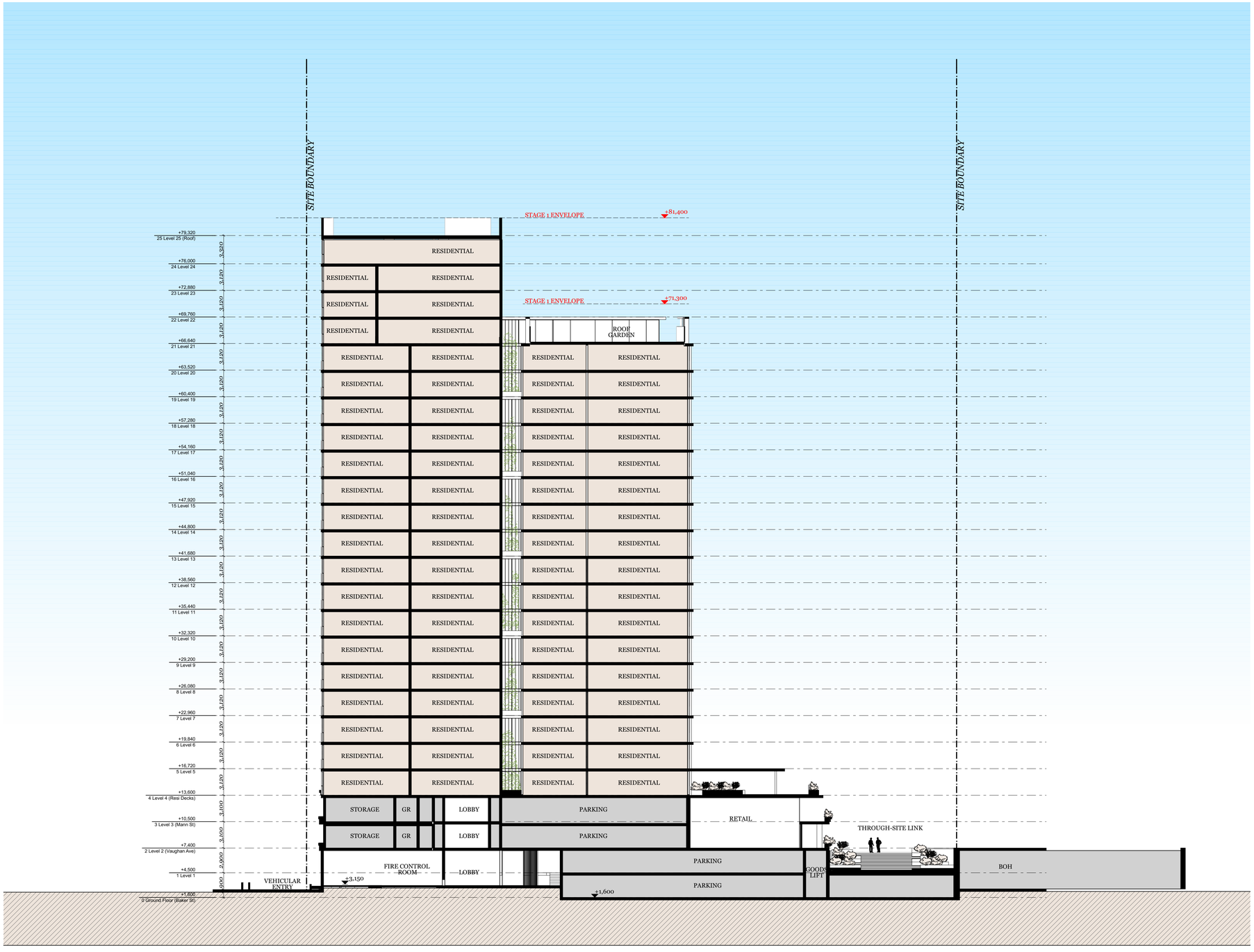

Client Details

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Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:250@A1 1:250@A3
Drawing Series	Elevations & Sections
Drawing Name	Sections - AA

Drawing Number **DA305**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences
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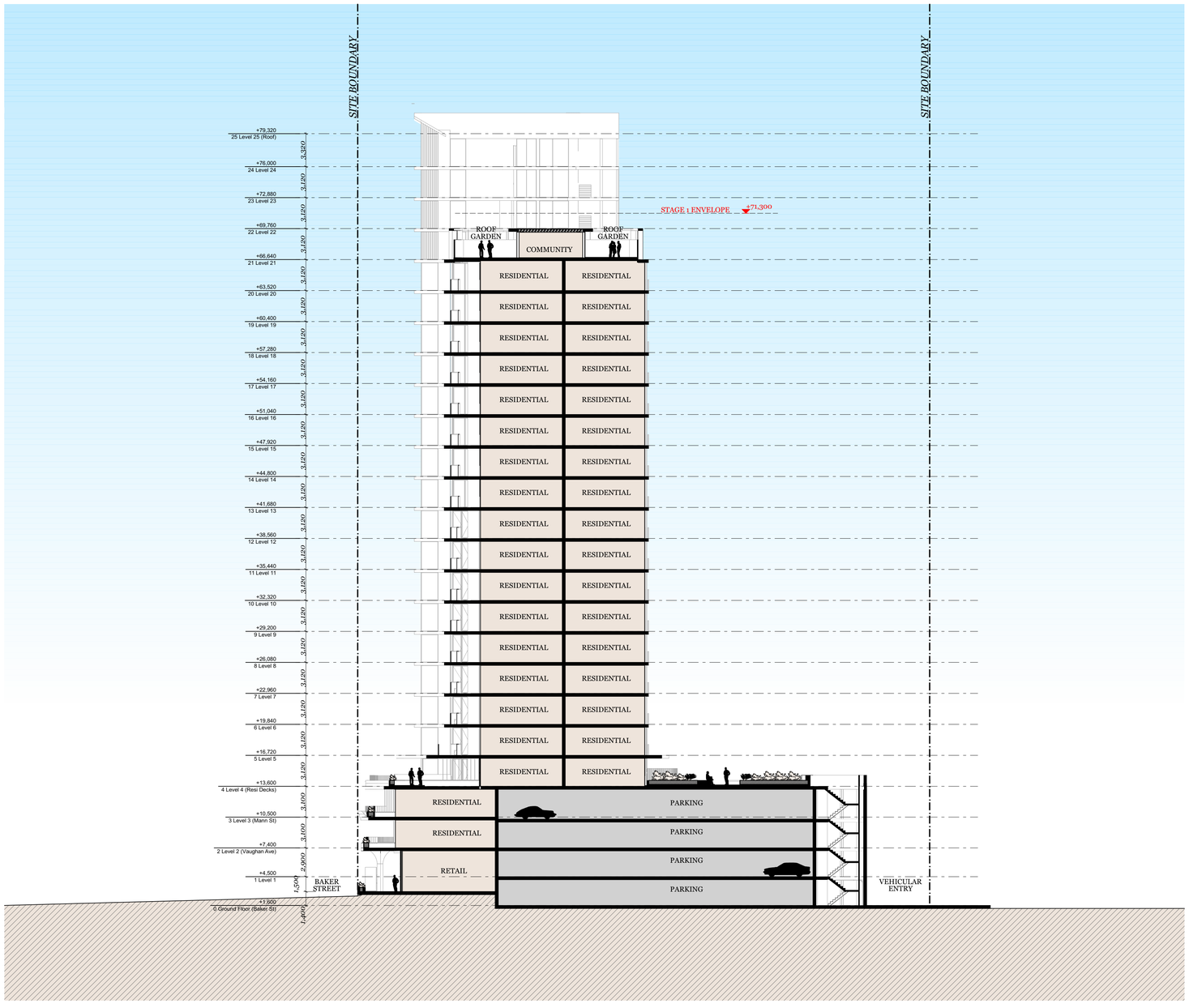
Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application



Client Details

SH Gosford Residential Pty Ltd

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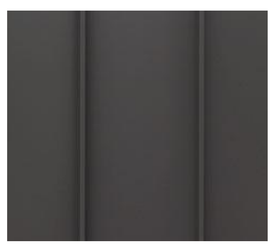
Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:250@A1 1:250@A3
Drawing Series	Elevations & Sections
Drawing Name	Sections - BB

Drawing Number **DA306**
Revision **A**

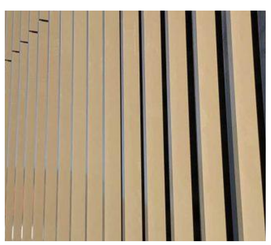
PERSPECTIVE VIEW - NORTHEAST

METAL PROFILES



MT-1 METAL PANEL (STANDING SEAM)

TYPE: ALUMINUM PANEL
COLOUR: **DARK BRONZE**
LOCATION: PH LEVELS & ROOF
'NOTES: 600mm SPACING



MT-1 METAL PANEL (FACADE BLADES)

TYPE: ALUMINUM PANEL
COLOUR: **DRAK BRONZE**
LOCATION: PARKING SCREENS & FLOOR TO FLOOR BLADES ON TOWER FACADE

MT-1 METAL PANEL (BALUSTRADES)

TYPE: ALUMINUM PANEL
COLOUR: **DARK BRONZE**
LOCATION: METAL BALUSTRADES

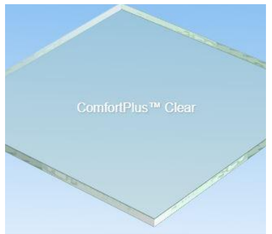
EXTERIOR MATERIALS, FINISHES + COLOURS

CF-1 CONCRETE FINISH (SAND)

TYPE: CAST-IN-PLACE CONCRETE
COLOUR: SANDSTONE TONE
LOCATION: PODIUM SLAB (GL-L3)

CF-2 CONCRETE FINISH (GREY)

TYPE: PRE-CAST CONCRETE
COLOUR: NATURAL GREY
LOCATION: COLUMNS GROUND LEVEL



GL-1 CLEAR GLASS

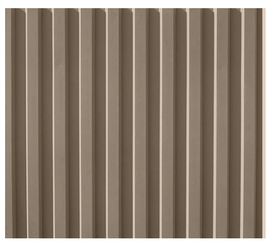
TYPE: GLAZED PANEL
COLOUR: CLEAR
LOCATION: TYPICAL

GL-2 COLOURBACK GLASS

TYPE: GLAZED PANELS
COLOUR: LIGHT GREY
LOCATION: NORTH FACADE

PT-1 WHITE PAINT

TYPE: EXTERIOR PAINT
COLOUR: WHITE
LOCATION: EXTERIOR WALLS, TYP



PT-2 DARK BRONZE PAINT

TYPE: EXTERIOR PAINT
COLOUR: DARK BRONZE
LOCATION: RIBBED PRECAST PANELS

MT-1 METAL PANEL

TYPE: ALUMINUM PANEL
COLOUR: **DARK BRONZE, MATT FINISH**
LOCATION: WINDOW FRAMES, BALUSTRADES, ROOF

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A	8/20/2021	XD, NV	NB	Development Application

Client Details

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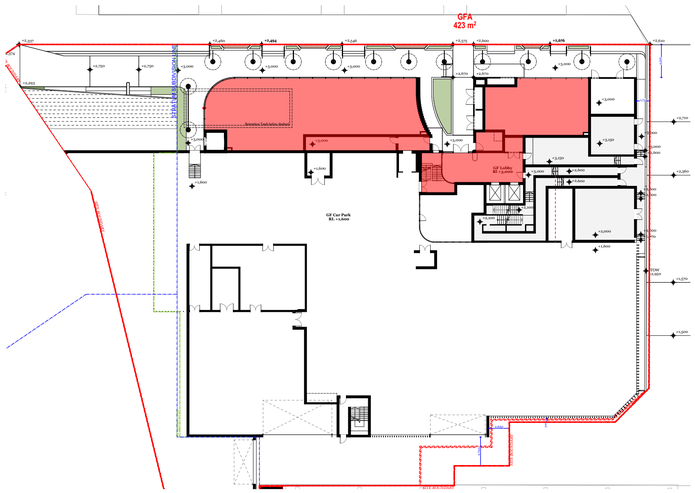
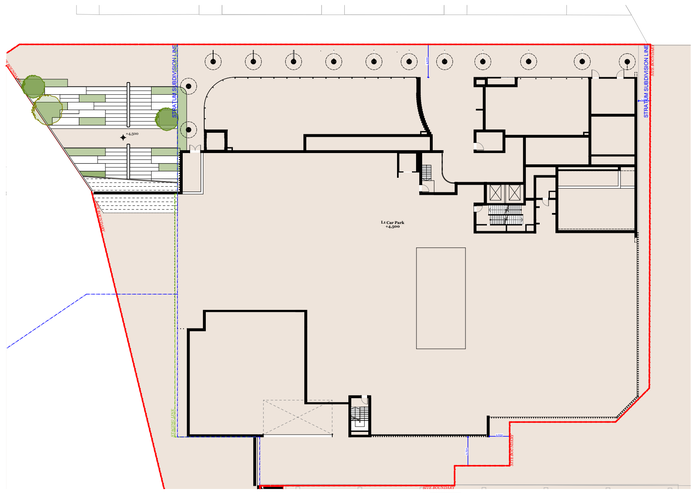
Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	NTS 1:250@A3
Drawing Series	Elevations & Sections
Drawing Name	Materials & Finishes

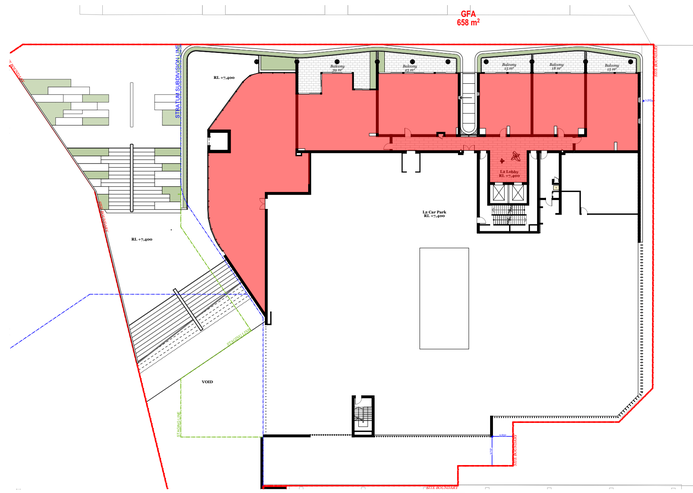
Drawing Number **DA307**
Revision **A**



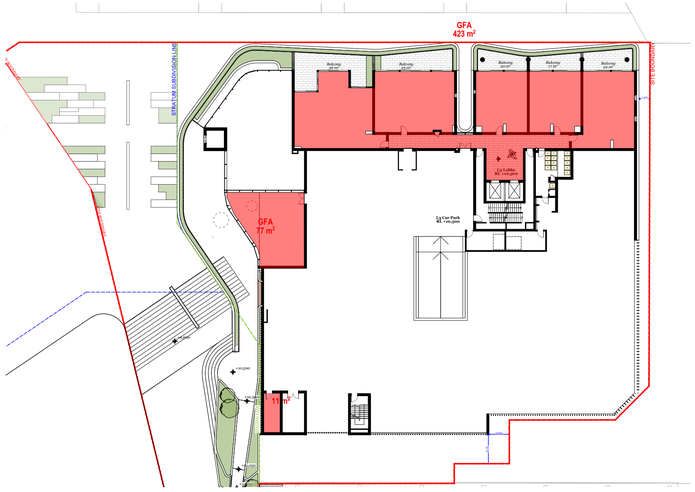
Ground Floor — 423 m²



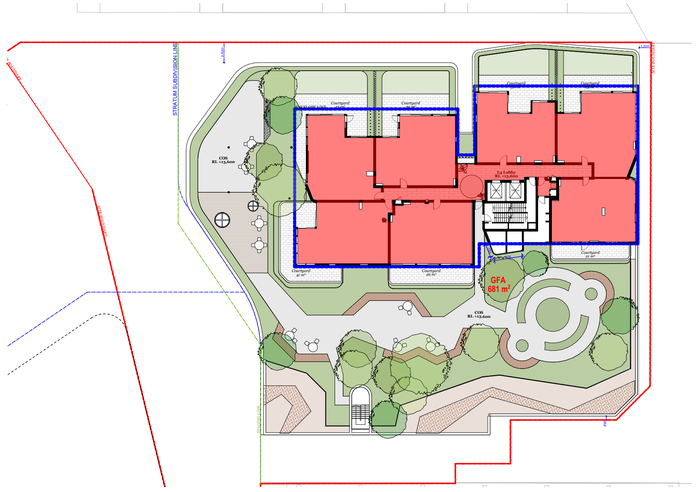
Level 1



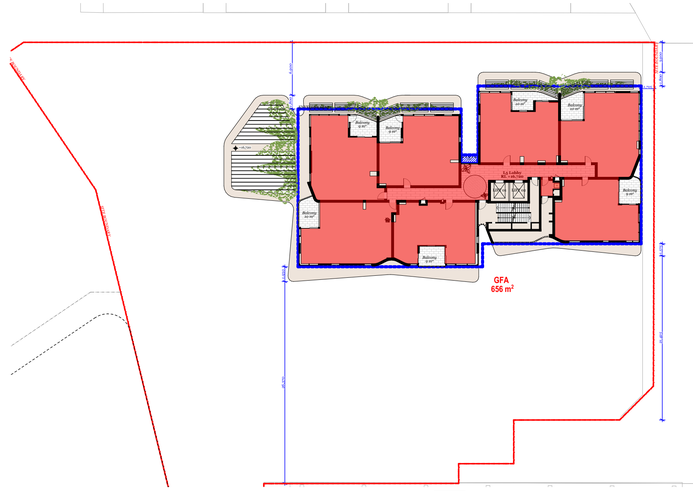
Level 2 — 658 m²



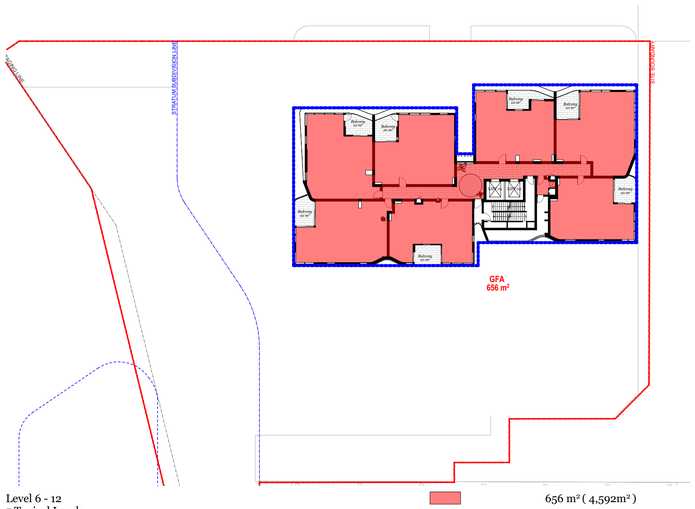
Level 3 — 511 m²



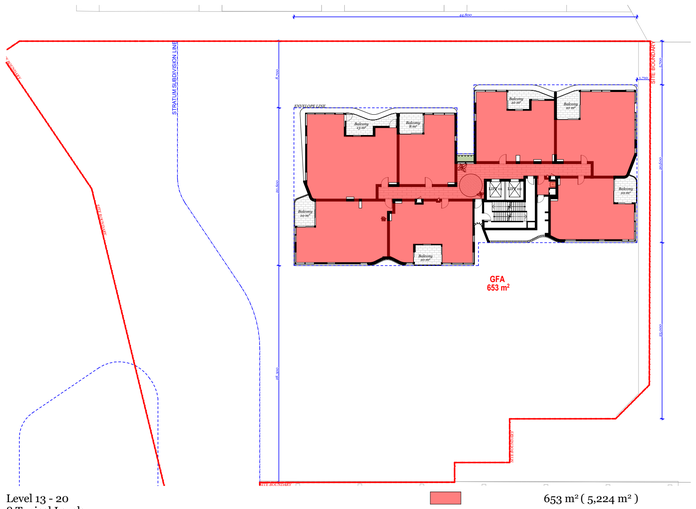
Level 4 — 681 m²



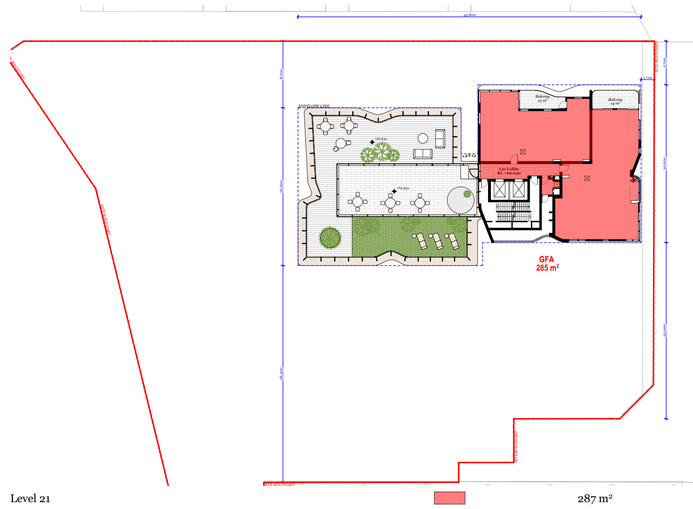
Level 5 — 656 m²



Level 6 - 12
7 Typical Levels — 656 m² (4,592m²)



Level 13 - 20
8 Typical Levels — 653 m² (5,224 m²)



Level 21 — 287 m²

Builder/Contractor shall verify job dimensions before any job commences
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Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

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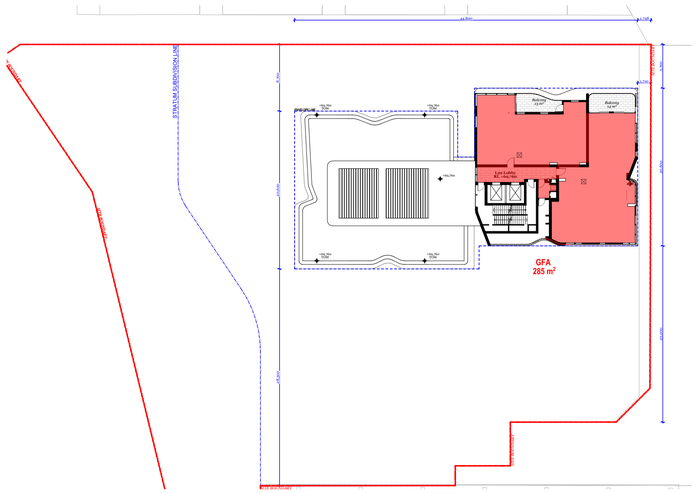
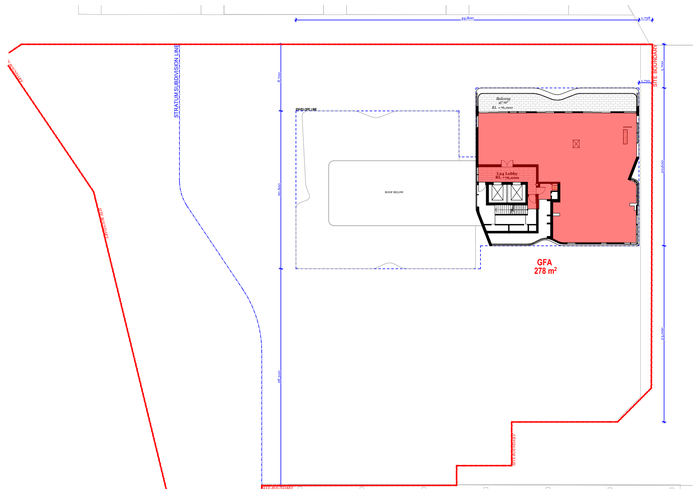
Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:400@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	GFA Calculations

Drawing Number **DA401**
Revision **A**



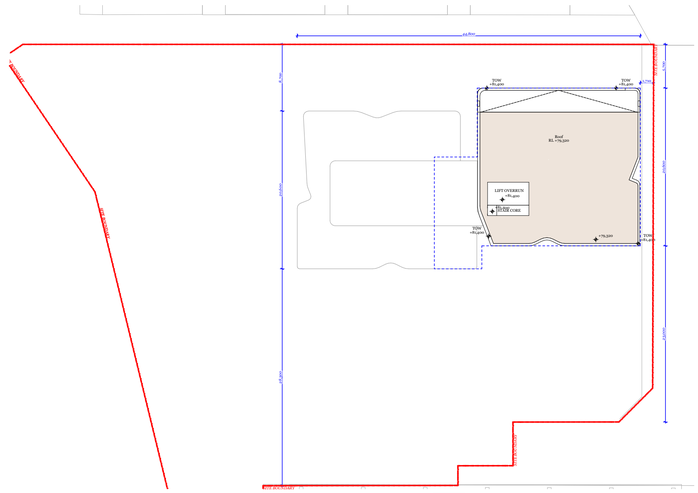
Level 22 - 23
2 Typical Levels

287 m² (574 m²)



Level 24

278 m²



Roof Plan

0 m²

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Parking Calculation

		Stage 1					*GFA Retail	*GFA
	Unit Type	1B	2B	3B	PH(4B)	Subtotal	*GFA Retail	*GFA
	Target Sizes	50	70-85	95-110	130+		m²	m²
	N/A							
LEVELS	Ground Level						315	423
	Level 1						0	
	Level 2	3	2			**5**	229	658
	Level 3	3	2			**5**	77	511
	Level 4 (podium)		7			**7**		681
	Level 5		7			**7**		656
	Level 6		7			**7**		656
	Level 7		7			**7**		656
	Level 8		7			**7**		656
	Level 9		7			**7**		656
	Level 10		7			**7**		656
	Level 11		7			**7**		656
	Level 12		7			**7**		656
	Level 13	1	5	1		**7**		653
	Level 14	1	5	1		**7**		653
	Level 15	1	5	1		**7**		653
	Level 16	1	5	1		**7**		653
	Level 17	1	5	1		**7**		653
	Level 18	1	5	1		**7**		653
	Level 19	1	5	1		**7**		653
	Level 20	1	5	1		**7**		653
	Level 21			2	0	**2**		287
	Level 22			2	0	**2**		287
	Level 23			2	0	**2**		287
	Level 24				1	**1**		278
	Roof Level							
	GFA Retail Total						**621**	
	GFA Total							**13884**

Parking Calculation

	Residential	Accessible	Visitor	Retail	Total
Level Ground	4	2	15	15	36
Level 1	38	3	10	0	51
Level 2	44	7	0	0	51
Level 3	40	5	0	0	45
Total	126	17	25	15	**183**

	Residential	Retail	Visitors	TOTAL
Motorcycle	1/15 unit	1/25 Spaces		10
Bicycle	1/3 unit	1/200m² GFA (Employees) 1/750m² GFA (Visitors)	1/12 unit	63

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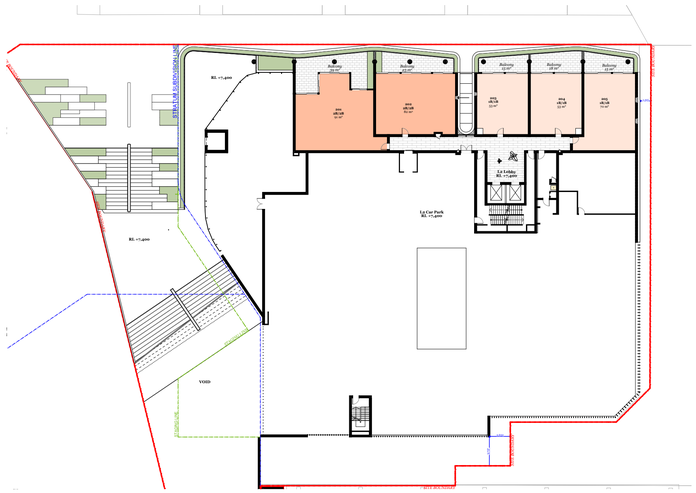
Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:400@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	GFA Calculations
Drawing Number	**DA402**
Revision	**A**



Level 2

1 Bed : 3
2 Bed : 2
3 Bed : 0

Level 3

1 Bed : 3
2 Bed : 2
3 Bed : 0

Level 4

1 Bed : 0
2 Bed : 7
3 Bed : 0

Level 5

1 Bed : 0
2 Bed : 7
3 Bed : 0

Level 6 -12
7 Typical Levels

1 Bed : 0
2 Bed : 7 (49)
3 Bed : 0

Level 13 - 20
8 Typical Levels

1 Bed : 1 (8)
2 Bed : 5 (40)
3 Bed : 1 (8)

Level 21 - 23
3 Typical Levels

1 Bed : 0
2 Bed : 0
3 Bed : 2 (6)

Level 24

1 Bed : 0
2 Bed : 0
3 Bed : 0
4 Bed : 1

Apartment Mix Calculation

1 Bed :	14
2 Bed :	107
3 Bed :	14
3 Bed+ :	1
Total	136

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LEGEND:

▨	1 BED
▨	2 BED
■	3 BED

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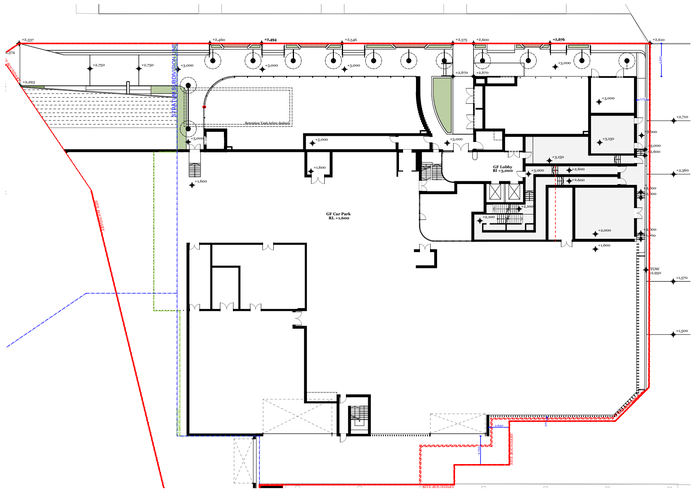
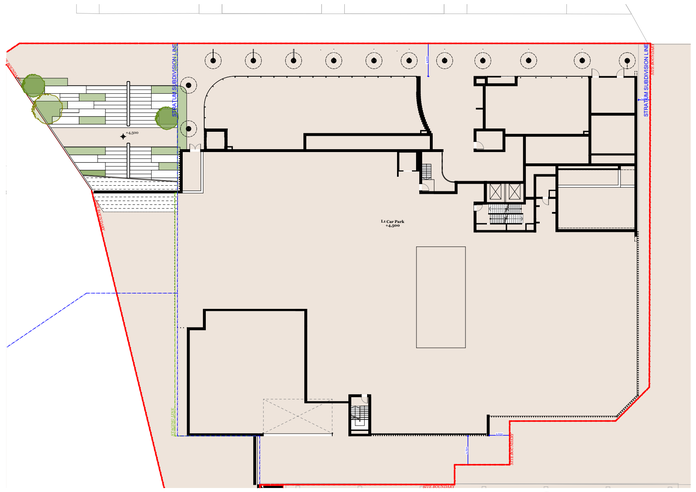
Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:400@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Unit Mix

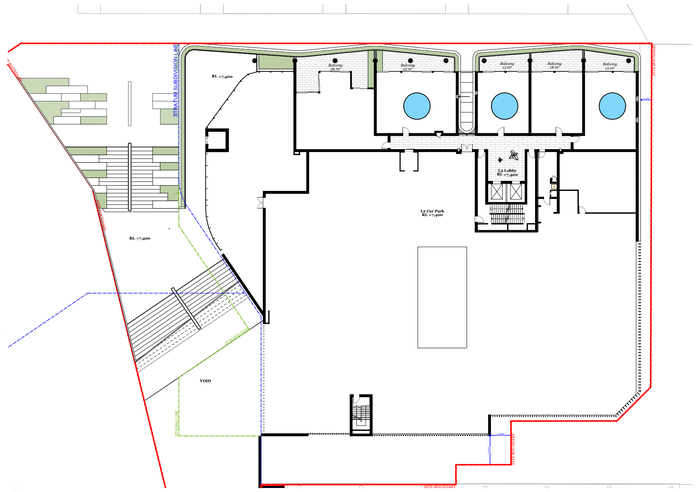
Drawing Number DA403
Revision A



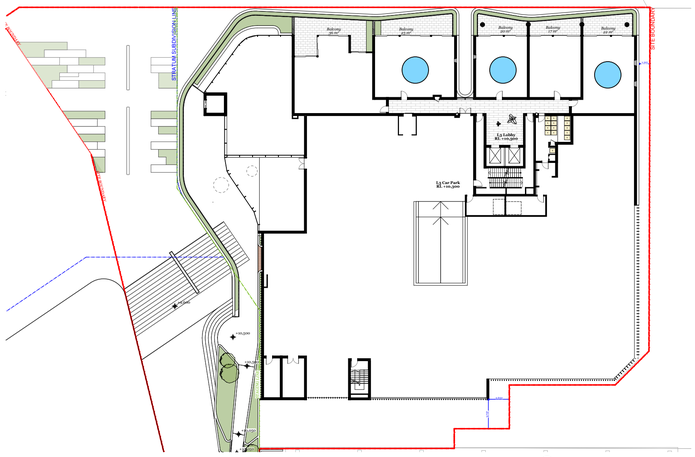
Ground Floor 0



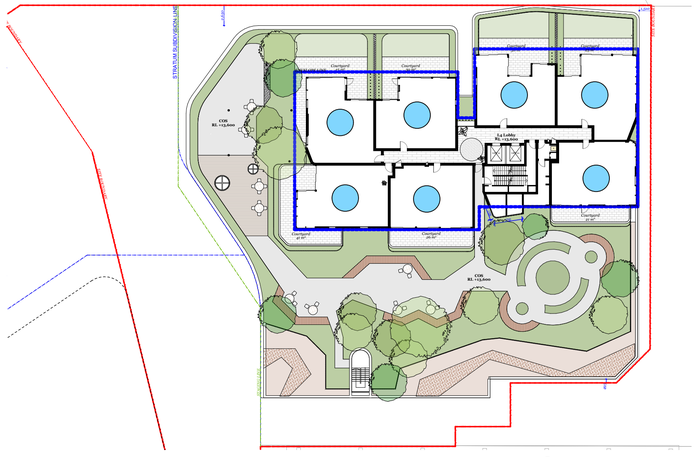
Level 1 0



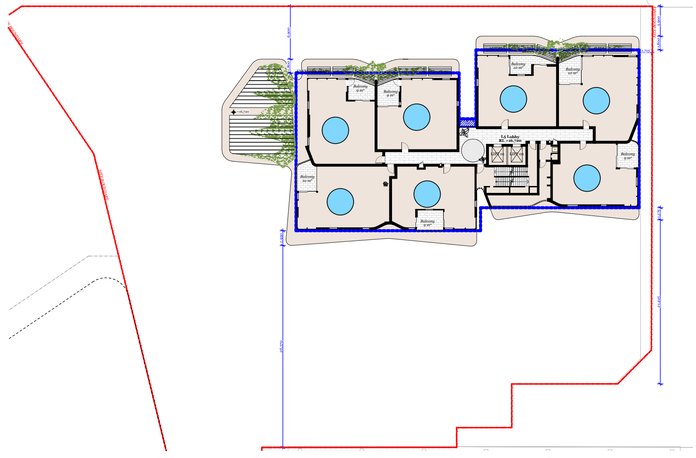
Level 2 1/5



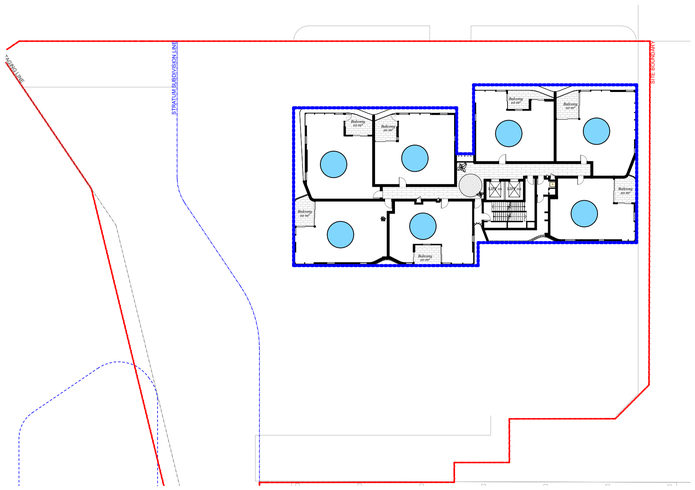
Level 3 1/5



Level 4 7/7



Level 5 7/7



Level 6 - 8
3 Typical Levels 7/7 (21/21)

Cross Ventilation Calculation

Total Unit Number *Up to 9 levels*	:	45
Cross Ventilated units	:	41/45 (91%)

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Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:400@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Cross Ventilation Calc.
Drawing Number	**DA404**
Revision	**A**

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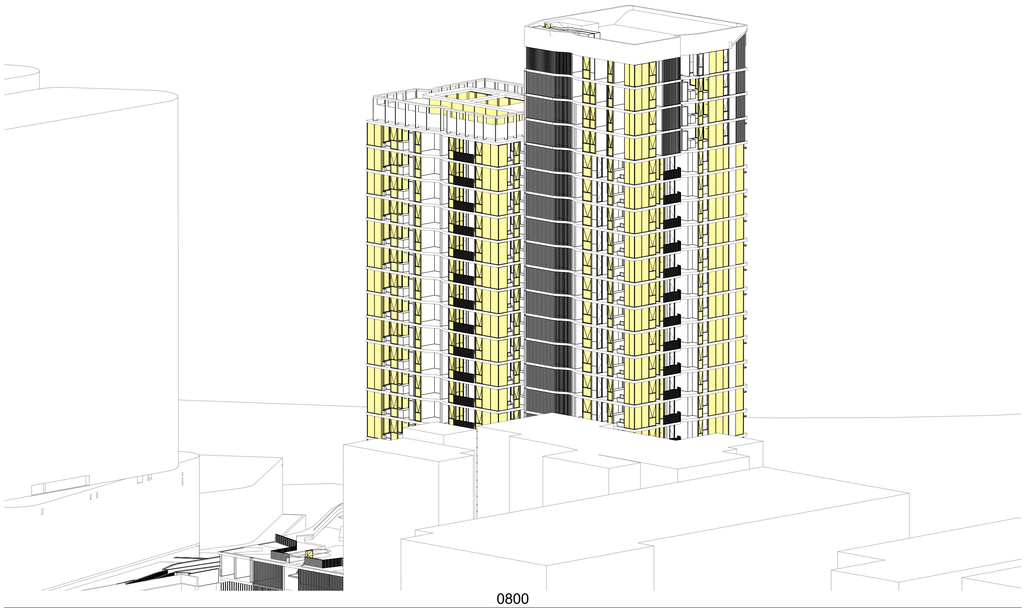

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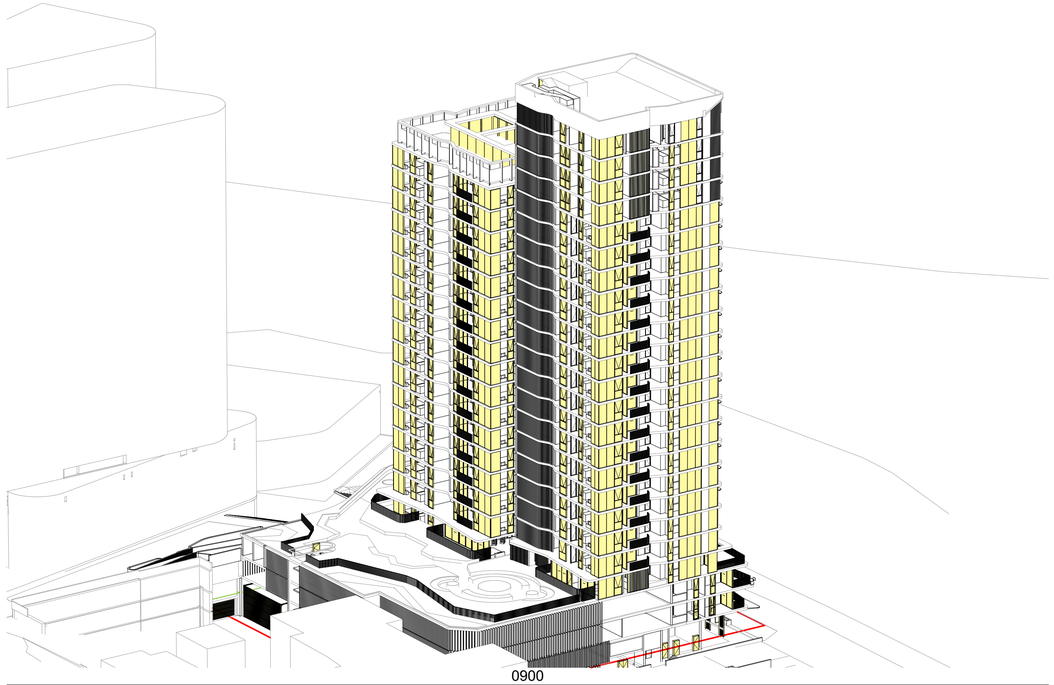

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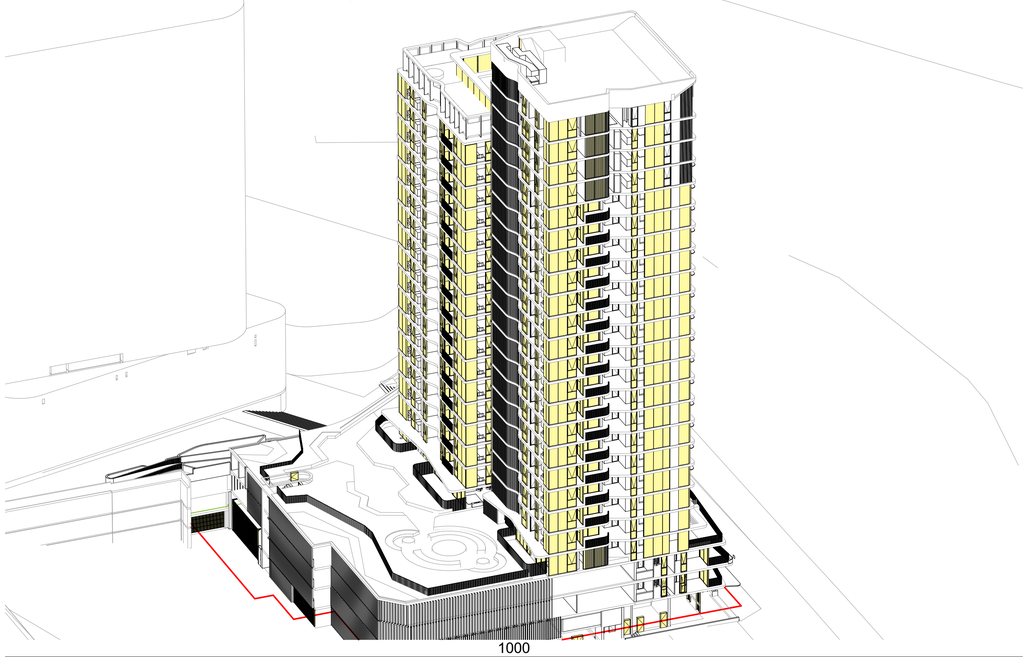

1000

1100

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Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Eye of the Sun 1/3

Drawing Number **DA405**
Revision **A**

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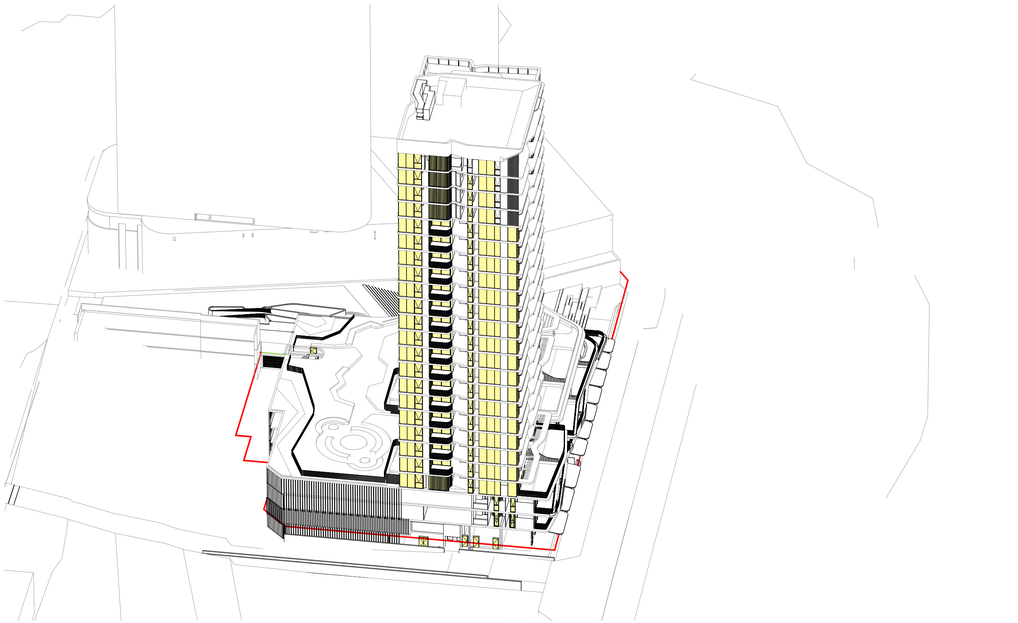

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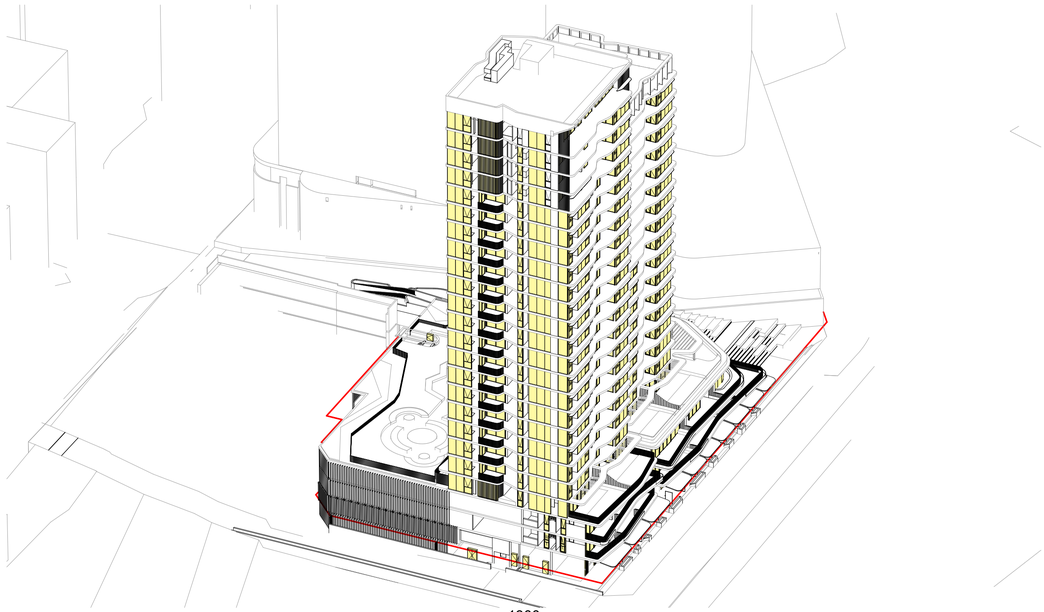

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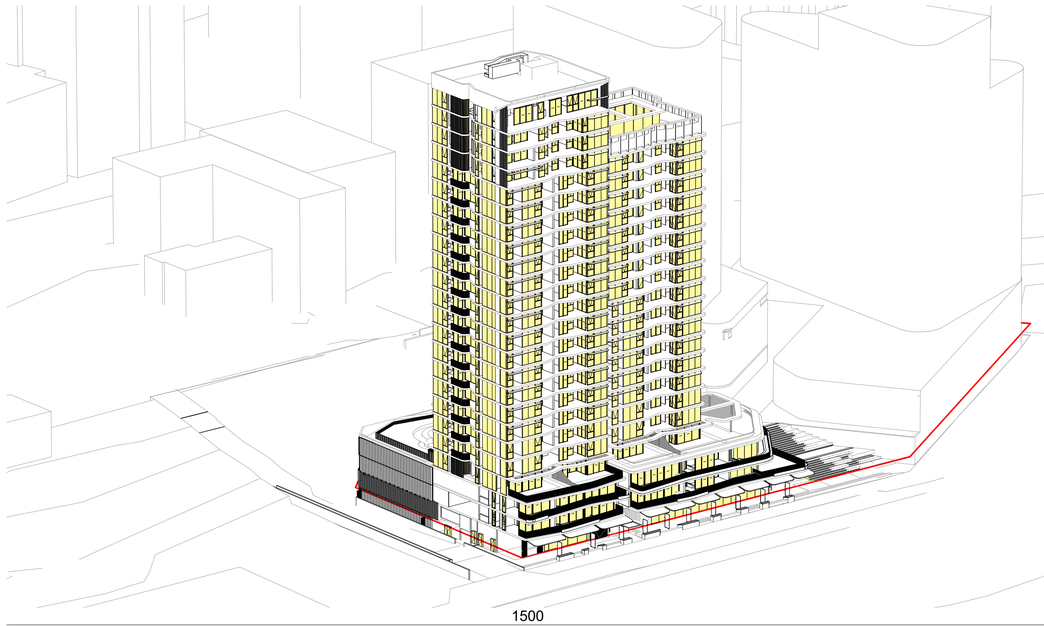

1500

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Project Number	11725
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Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Eye of the Sun 2/3

Drawing Number **DA406**
Revision **A**

1600

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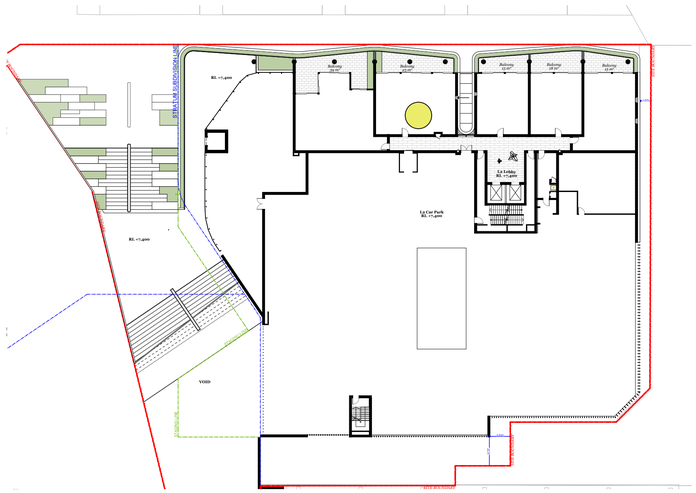
NSW: Nominated Architects
Koos de Keijzer 5767
David Randerson 8542

Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:1099.48@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Eye of the Sun 3/3
Drawing Number	**DA407**
Revision	**A**



Level 2

○ 1/5

● 0/5

Level 3

○ 4/5

● 0/5

Level 4

○ 5/7

● 1/7

Level 5 - 8
4 Typical Levels

○ 5/7 (20/28)

● 1/7 (4/28)

Level 9 - 12
4 Typical Levels

○ 6/7 (24/28)

● 1/7 (4/28)

Level 13 - 20
8 Typical Levels

○ 6/7 (48/56)

● 1/7 (8/56)

Level 21- 23
3 Typical Levels

○ 2 (6)

● 0

Level 24

○ 1

● 0

Solar Calculation - 21 June (3hr 8 am - 4 pm)

	Total Unit Number	:	136
○	Solar units	:	109/136 (80%)
●	Non - Solar units (No solar access to private open space only)	:	17/136 (12%)

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

Client Details

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Consultants

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1300 765 315

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aharvey@urbis.com.au
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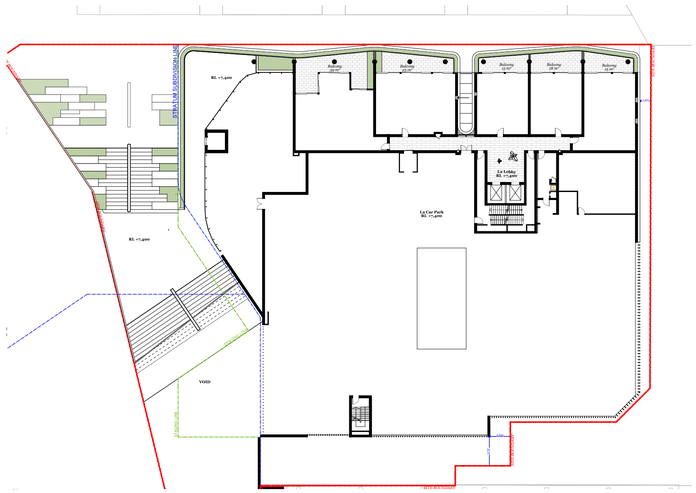
David Randerson 8542

Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:400@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Solar Access Calculations 8am to 4pm

Drawing Number **DA408**
Revision **A**



Level 2

🟡 0/5

● 0/5

Level 3

🟡 0/5

● 0/5

Level 4

🟡 2/7

● 1/7

Level 5 - 8
4 Typical Levels

🟡 5/7 (20/28)

● 1/7 (4/28)

Level 9 - 12
4 Typical Levels

🟡 5/7 (20/28)

● 1/7 (4/28)

Level 13 - 20
8 Typical Levels

🟡 5/7 (40/56)

● 1/7 (8/56)

Level 21- 23
3 Typical Levels

🟡 2 (6)

● 0

Level 24

🟡 1

● 0

Solar Calculation - 21 June (3hr 9 am - 3 pm)

Total Unit Number : 136

🟡 Solar units : 85/136 (63%)

● Non - Solar units
(No solar access to private open space only) : 17/136 (12%)

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

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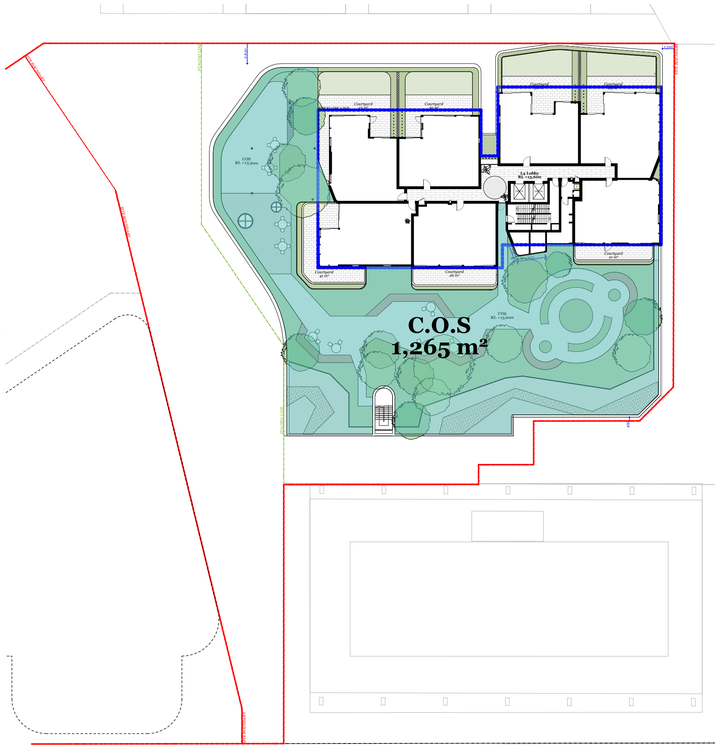
Project Name: Central Coast Quarter - North Tower
Project Number: 11725
Project Address: 26-30 Mann Street,
Gosford, NSW 2250

Drawn By: XD, NV
Checked By: NB
Date: August 2021
Scale: 1:400@A1
1:250@A3

Drawing Series: Compliance Drawings
Drawing Name: Solar Access Calculations 9am to 3pm

Drawing Number **DA409**
Revision **A**



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drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

Level 4 1,265 m²

Level 21 365 m²

Deep Soil 51 m²

Communal Open Space Calculation

Total Site Area	:	3,093 m²
Proposed C.O.S	:	1,630 m²

Deep Soil Calculation

Total Site Area	:	3,174 m²
Proposed Deep Soil	:	51 m²

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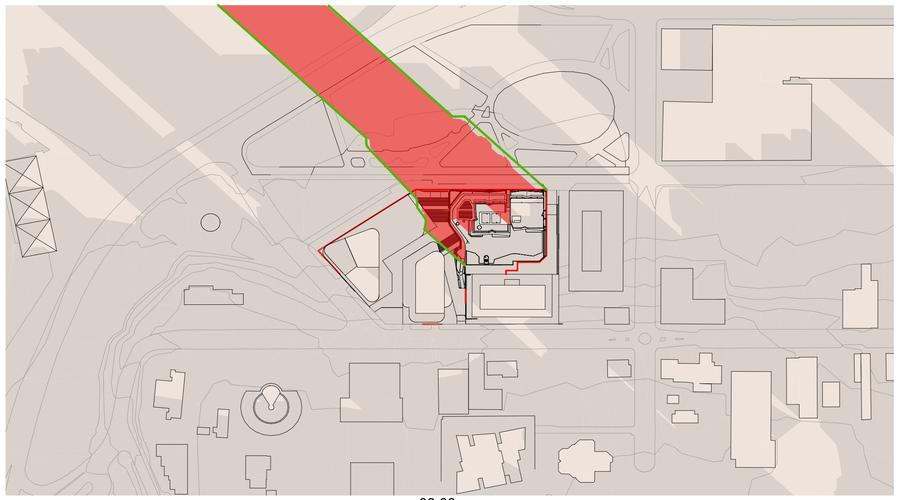
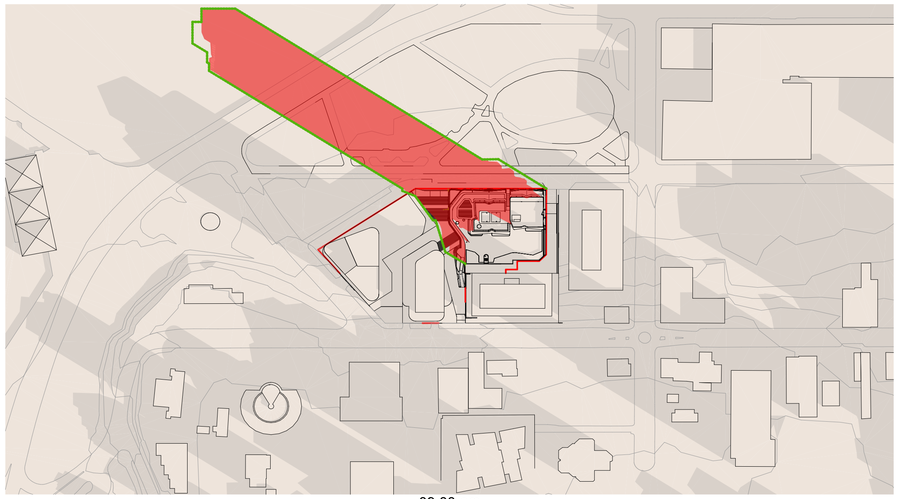
Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:400@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Communal Open Space & Deep Soil

Drawing Number **DA410**
Revision **A**



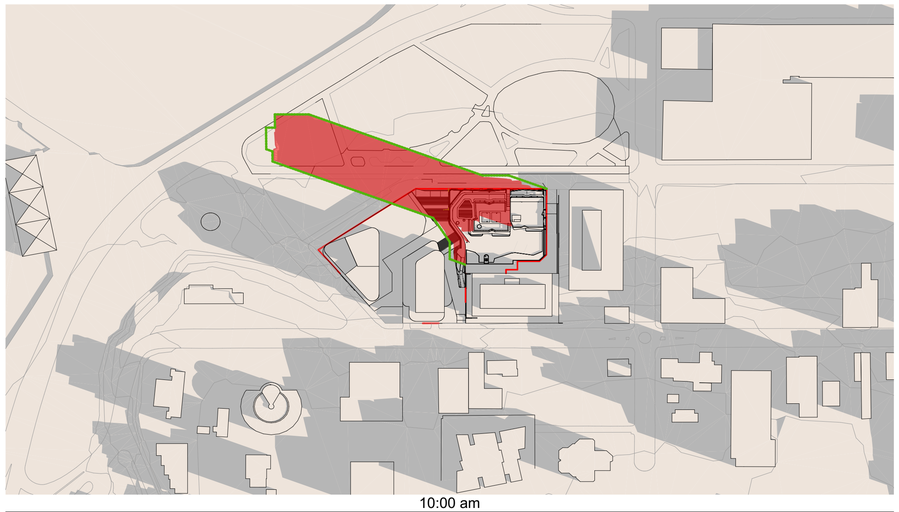
08:00 am

REDUCTION OF OVERSHADOWING: 346m² (4%)



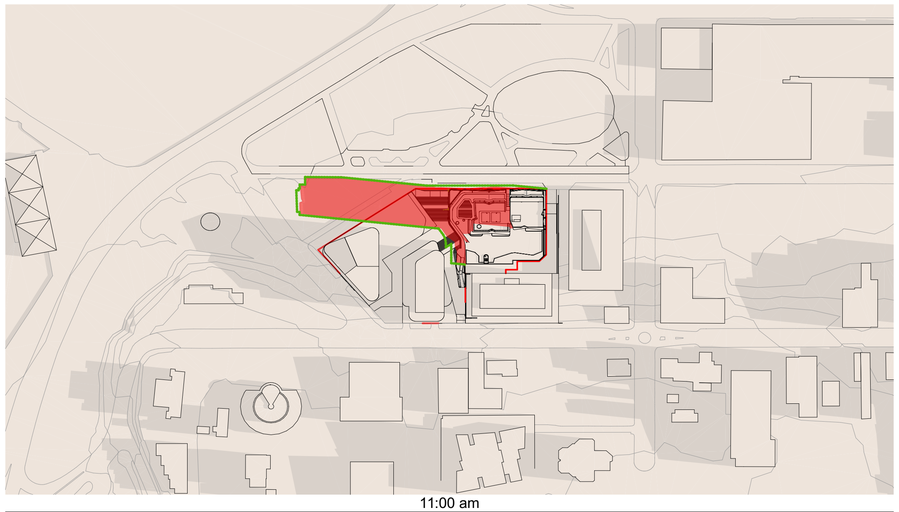
09:00 am

REDUCTION OF OVERSHADOWING: 257m² (4%)



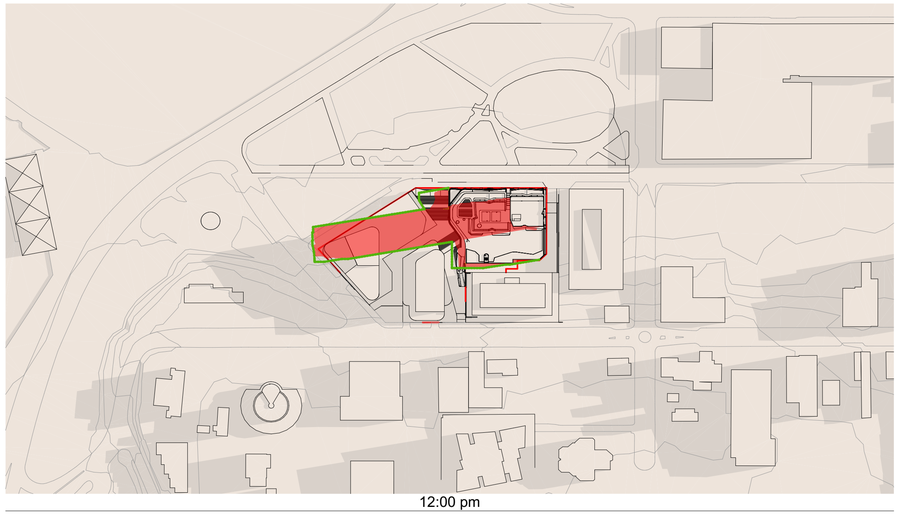
10:00 am

REDUCTION OF OVERSHADOWING: 302m² (6%)



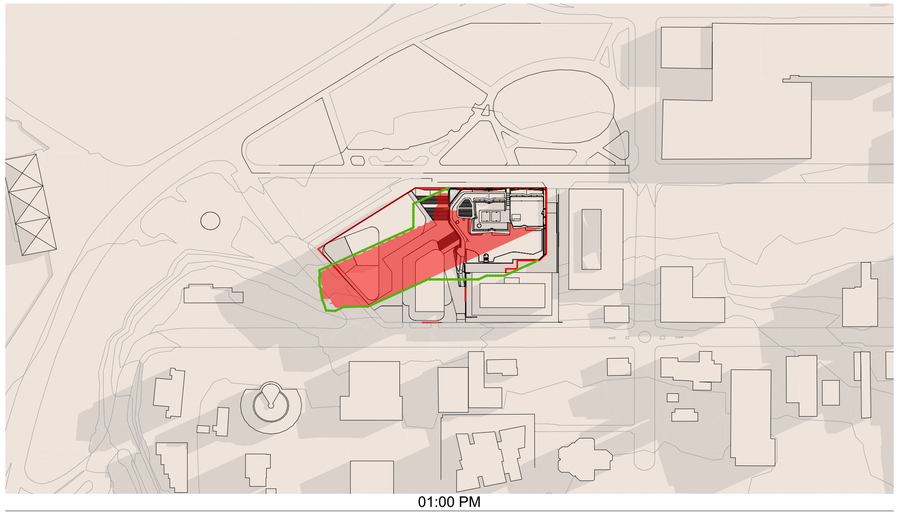
11:00 am

REDUCTION OF OVERSHADOWING: 225m² (8%)



12:00 pm

REDUCTION OF OVERSHADOWING: 263m² (10%)



01:00 PM

REDUCTION OF OVERSHADOWING: 532m² (14%)

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

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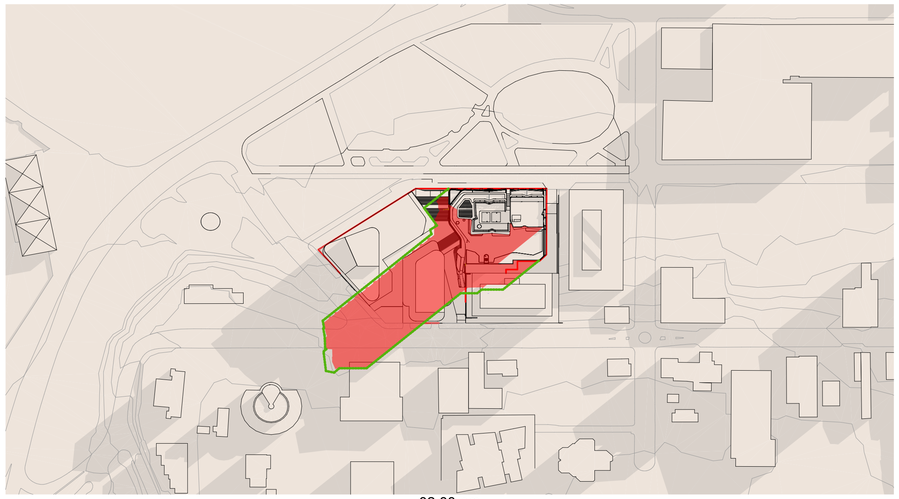
Overshadowing Impact Assessment 21 June :

Proposed Building Shadow

Outline of Concept Building Envelope Shadow

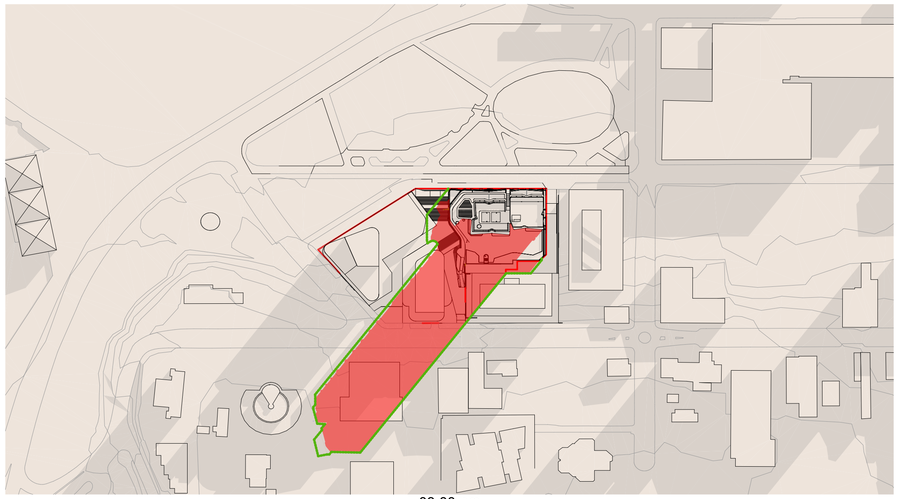
Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:2000@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Shadow Diagram Proposed 1/2

Drawing Number **DA411**
Revision **A**



02:00 pm

REDUCTION OF OVERSHADOWING: 409m² (9%)



03:00 pm

REDUCTION OF OVERSHADOWING: 517m² (7%)

04:00 pm

REDUCTION OF OVERSHADOWING: 706m² (6%)

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Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

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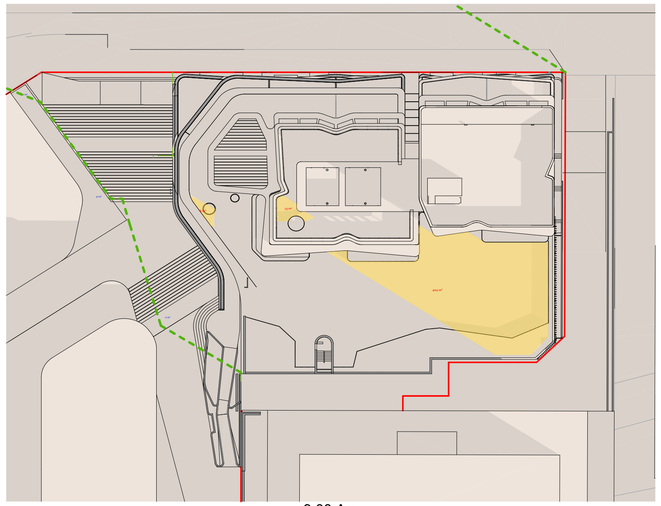
Overshadowing Impact Assessment 21 June :

Proposed Building Shadow

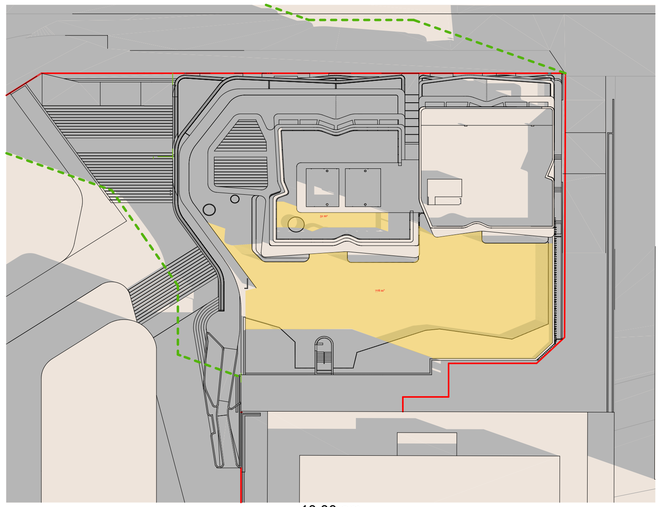
Outline of Concept Building Envelope Shadow

Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:2000@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Shadow Diagram Proposed 2/2
Drawing Number	**DA412**
Revision	**A**



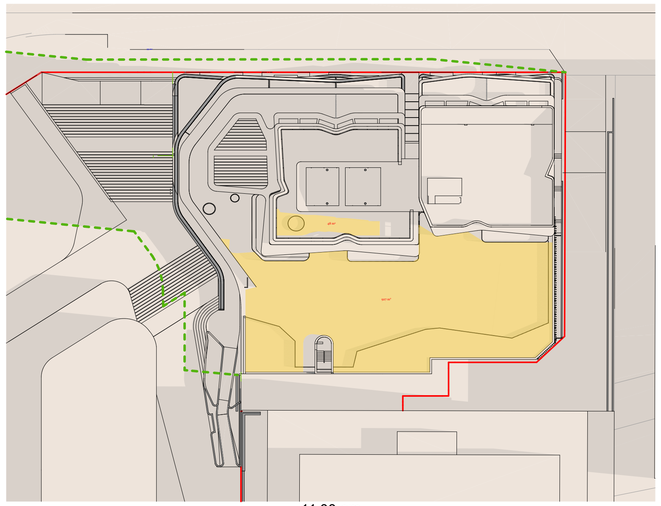
9:00 Am

426 m² 26%



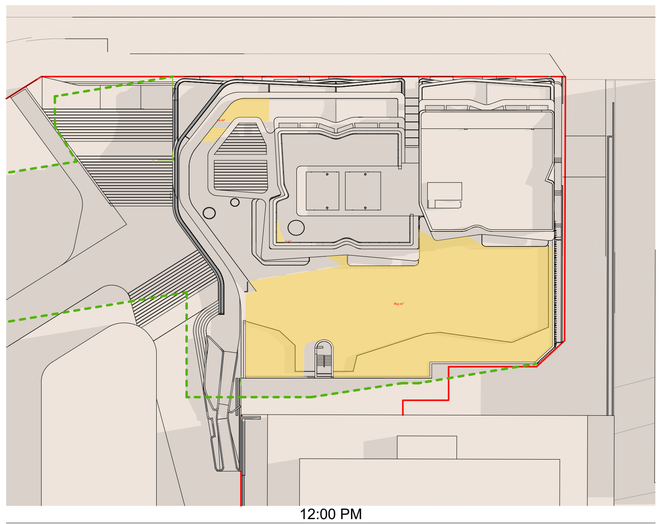
10:00 am

829 m² 51%



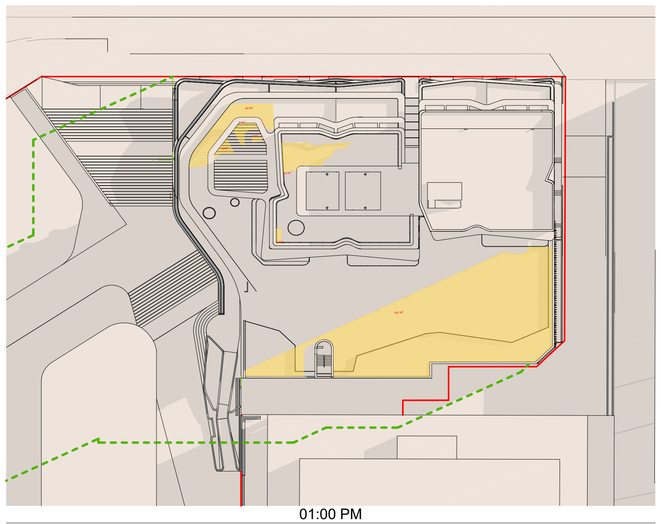
11:00 am

975 m² 58%



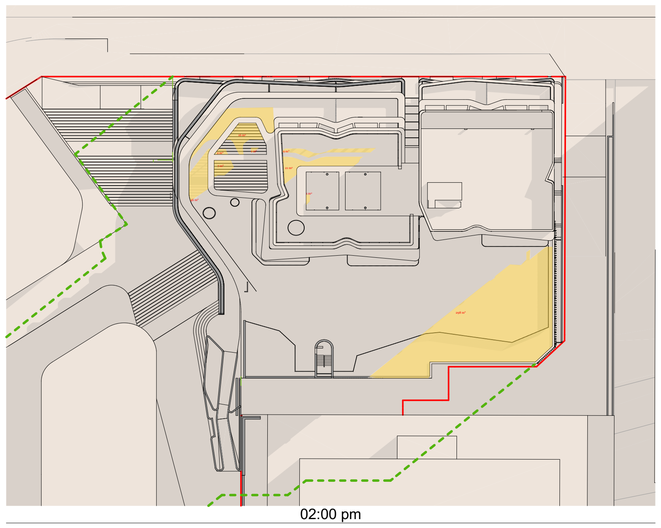
12:00 PM

925 m² 56%



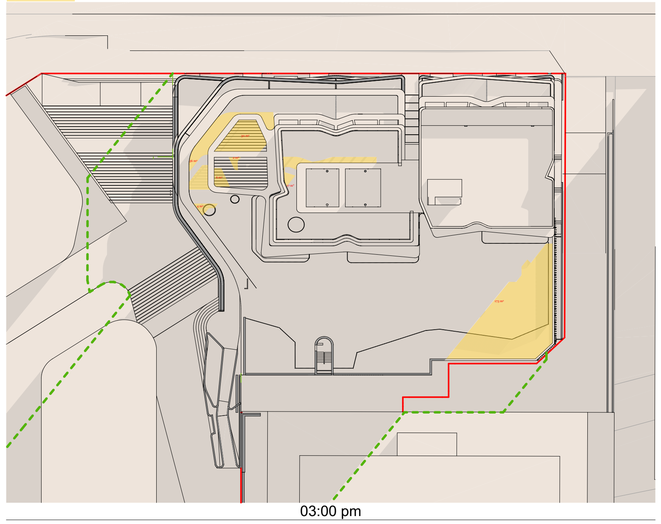
01:00 PM

630 m² 39%



02:00 pm

401 m² 25%



03:00 pm

268 m²

Communal Open Space Solar Access - 21 June :

Proposed C.O.S	:	1,630 m²	
10am	:	829 m²	51%
11am	:	975 m²	60%
12pm	:	925 m²	57%

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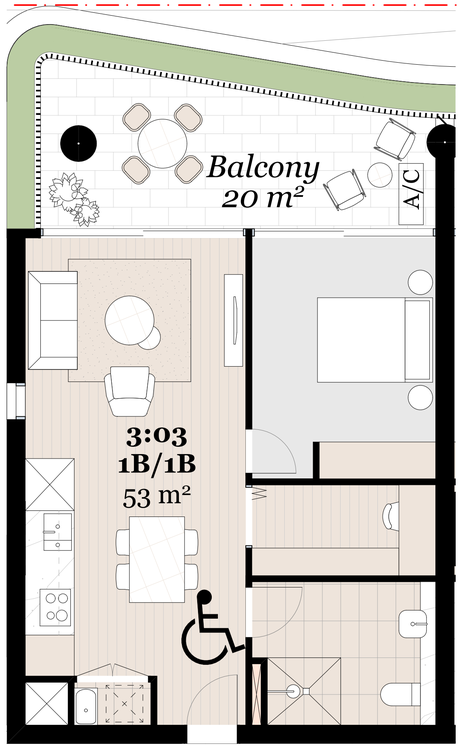
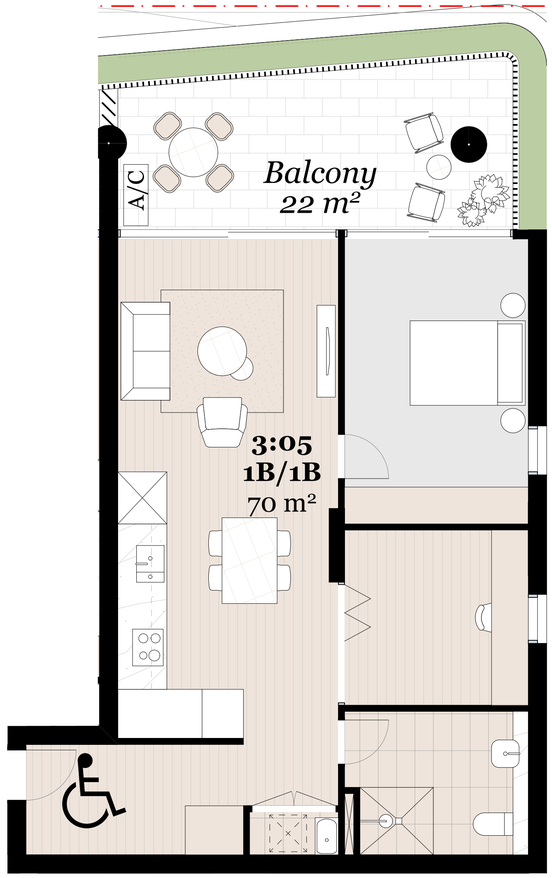
Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:500@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Shadow Diagram COS

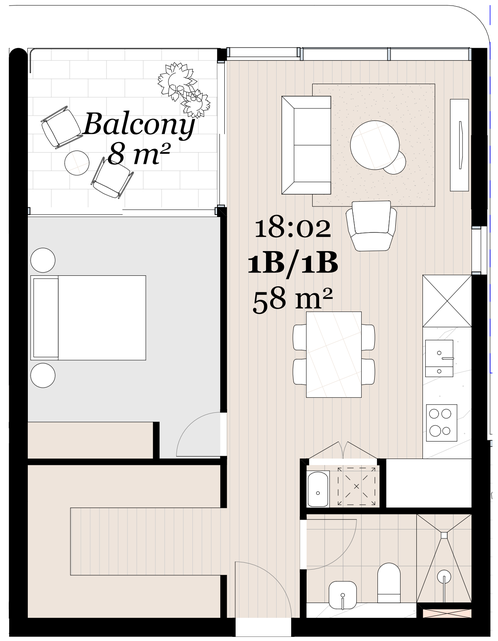
Drawing Number **DA413**
Revision **A**



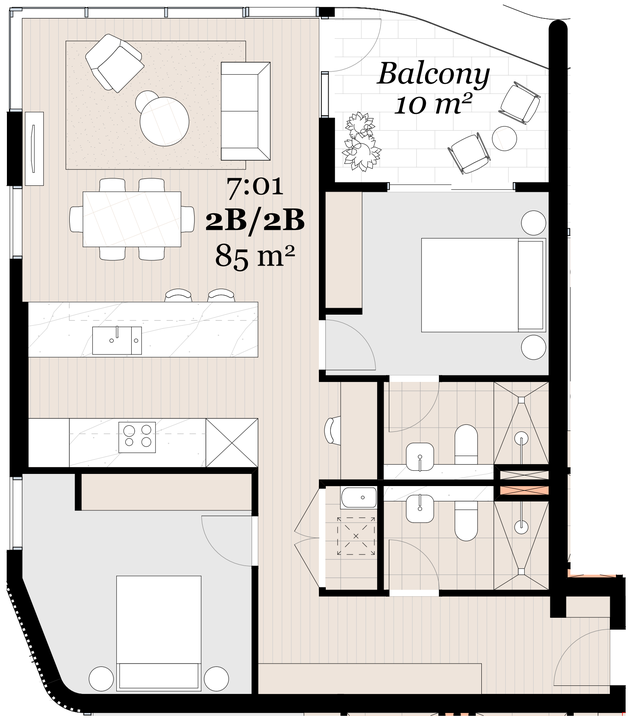
Typical 1 Bed Unit 1:50



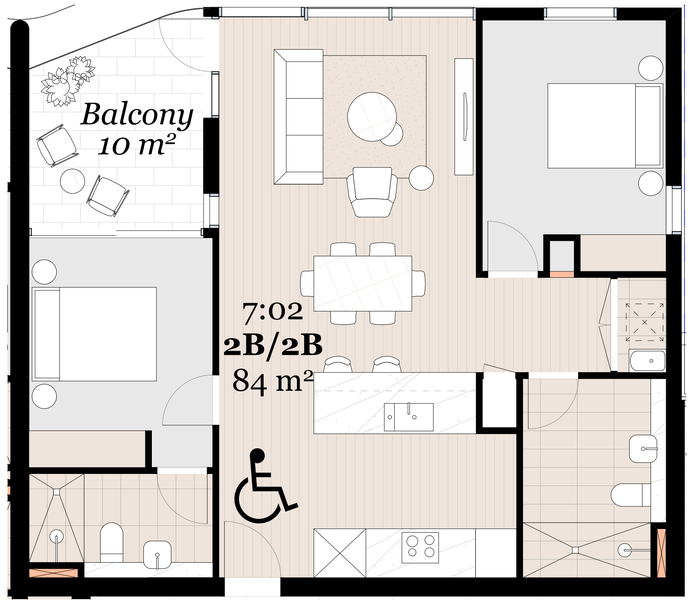
Typical 1 Bed Unit 1:50



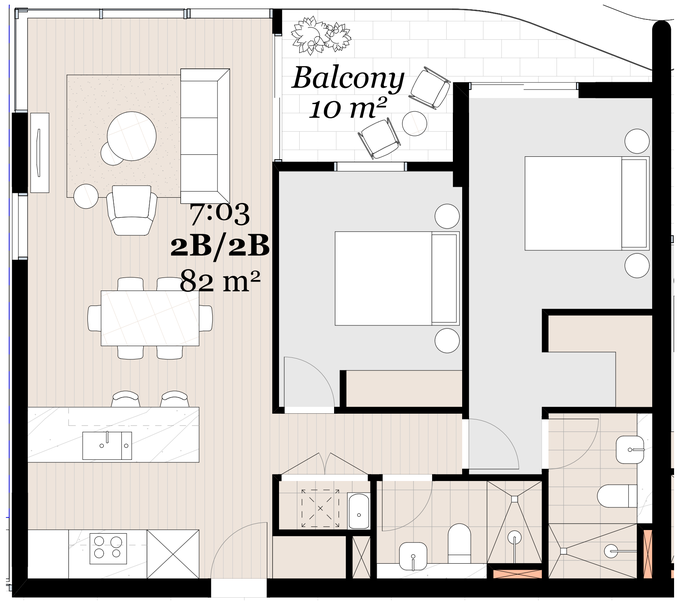
Typical 1 Bed Unit 1:50



Typical 2 Bed Unit 1:50



Typical 2 Bed Unit 1:50



Typical 2 Bed Unit 1:50

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

Client Details

SH Gosford Residential Pty Ltd

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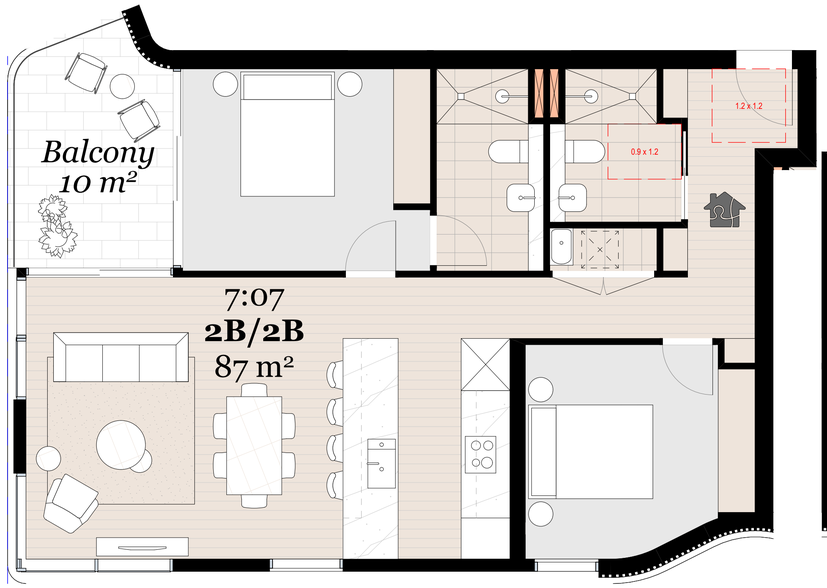
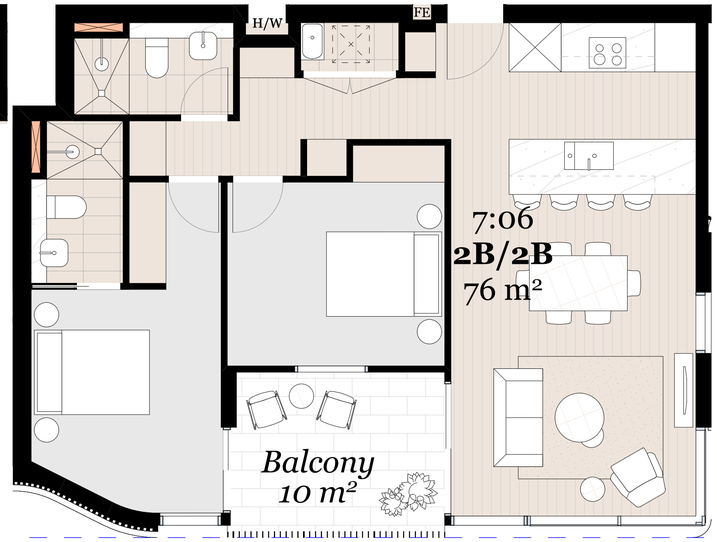
Koos de Keijzer 5767
David Randerson 8542

Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:50@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Apartment Types 1/3

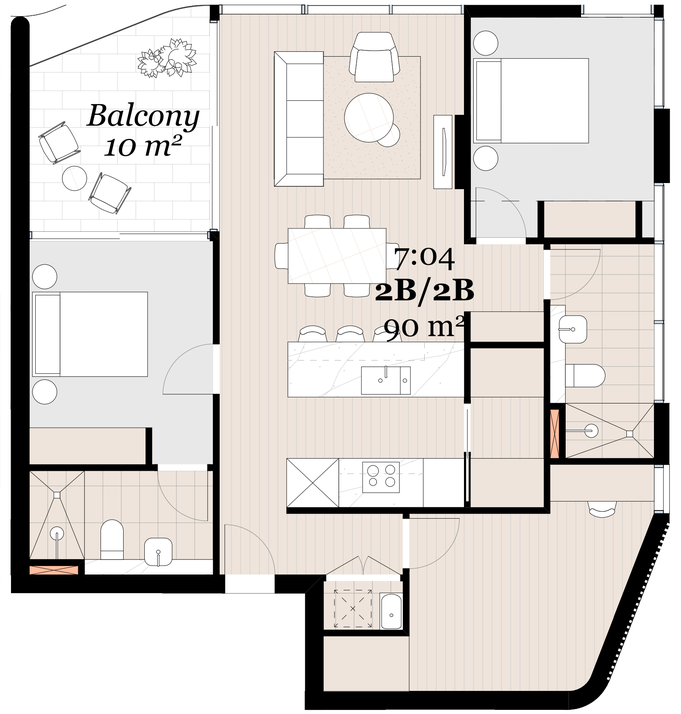
Drawing Number **DA414**
Revision **A**



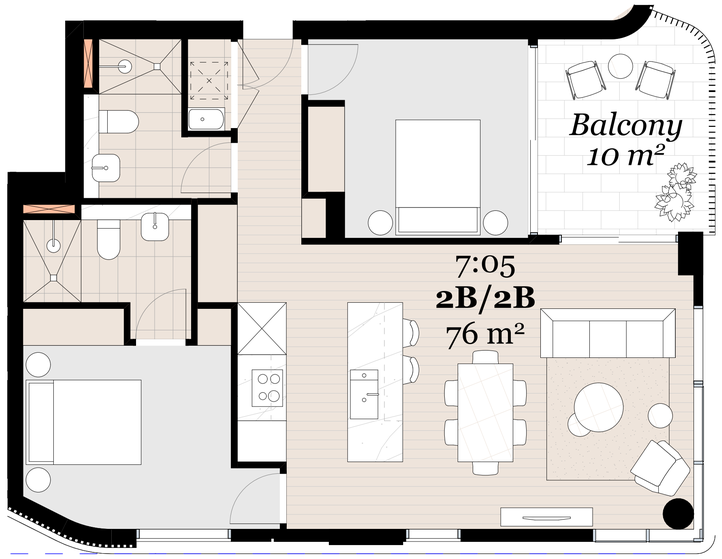
Typical 2 Bed Unit 1:50



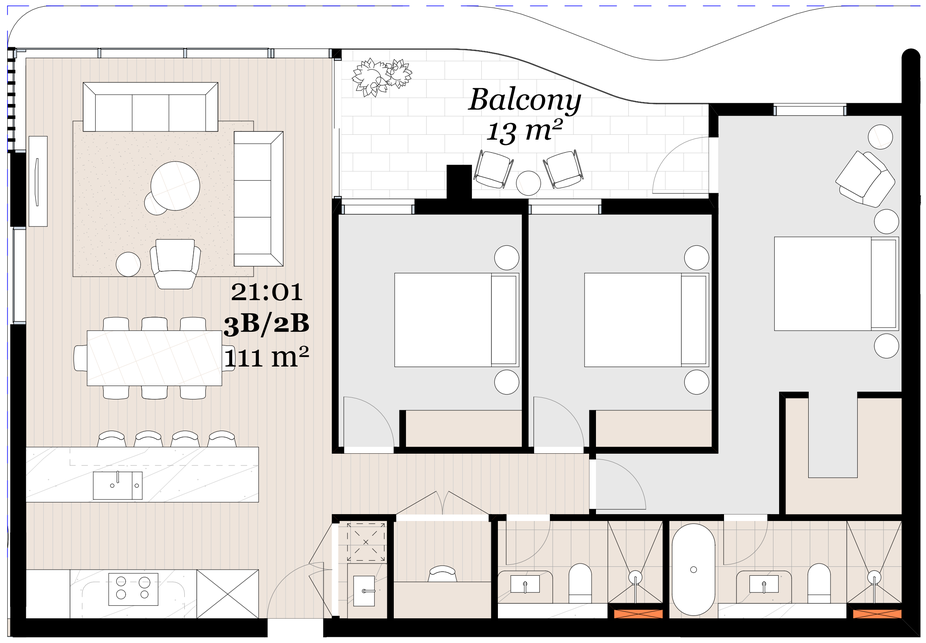
Typical 2 Bed Unit 1:50



Typical 2 Bed Unit 1:50



Typical 2 Bed Unit 1:50



Typical 3 Bed Unit 1:50

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Rev.	Date	By	Ckd	Description.
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David Randerson 8542

Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:50@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Apartment Types 2/3
Drawing Number	DA415
Revision	A

Builder/Contractor shall verify job dimensions before any job commences
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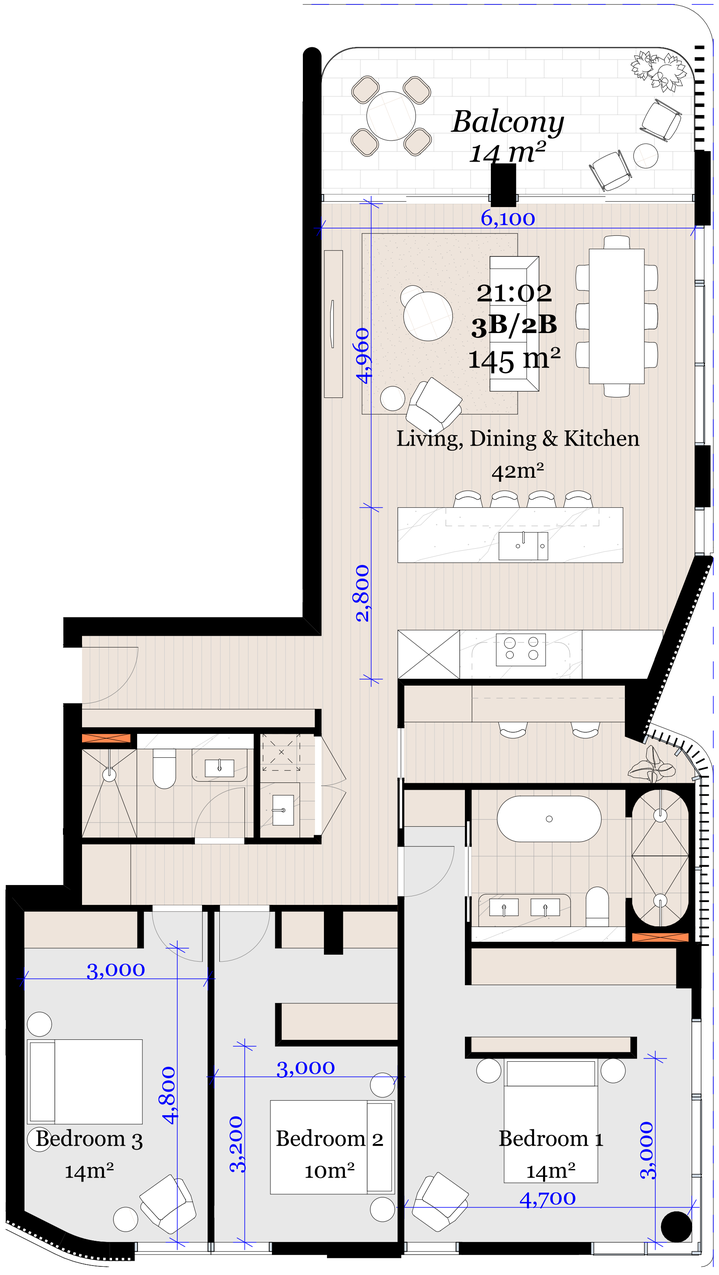
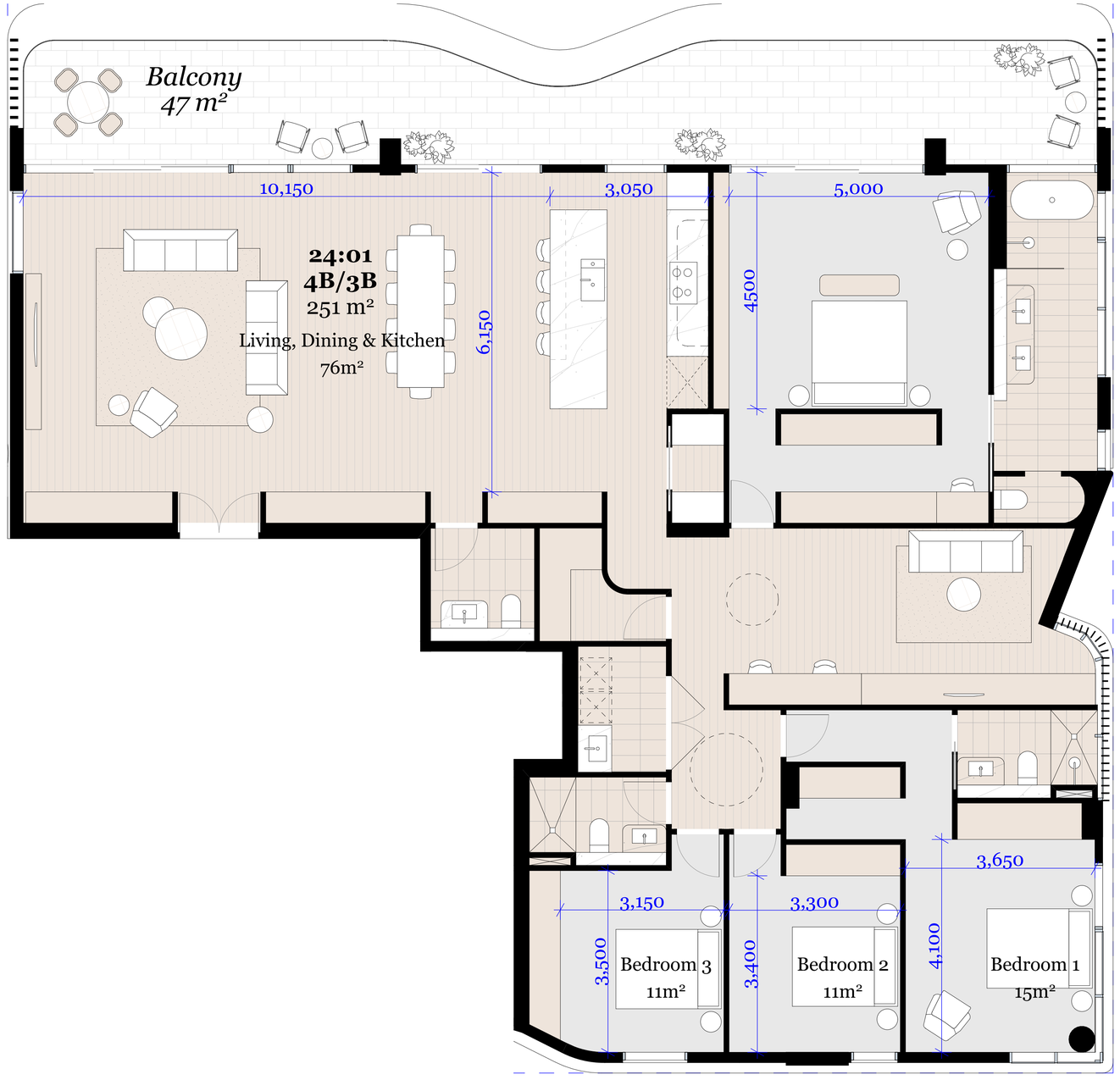
Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application



Typical 3 Bed Unit 1:50



Typical 4 Bed Unit 1:50

Client Details
SH Gosford Residential Pty Ltd

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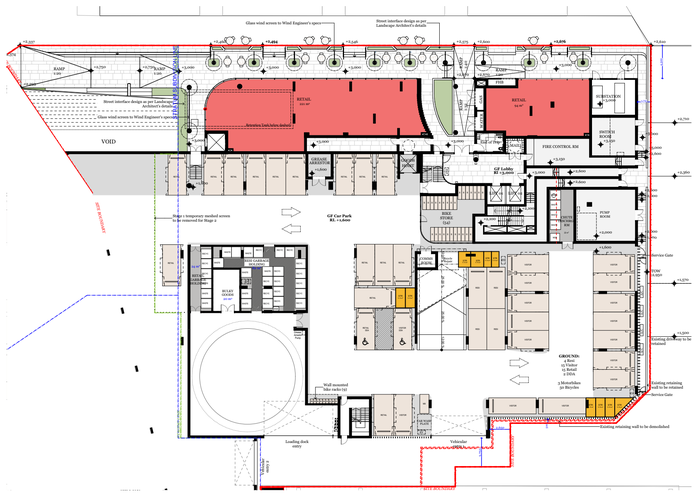
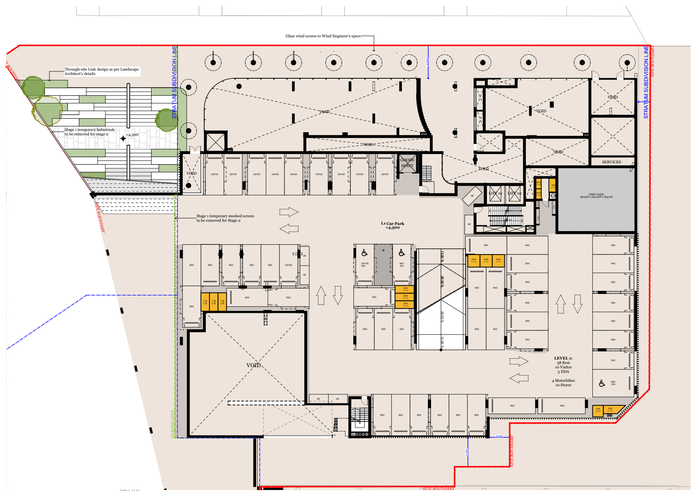
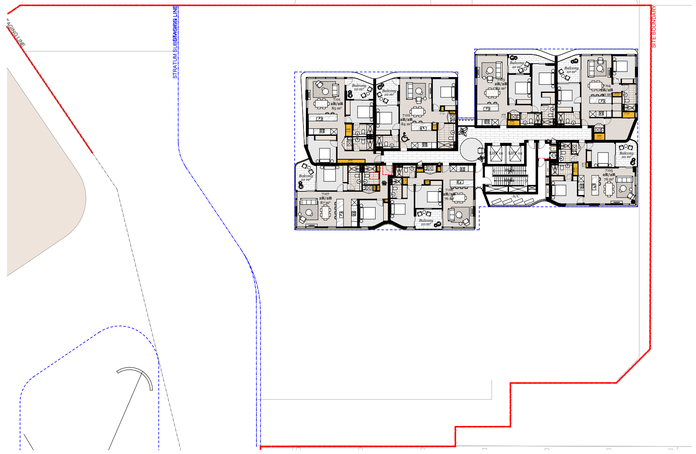
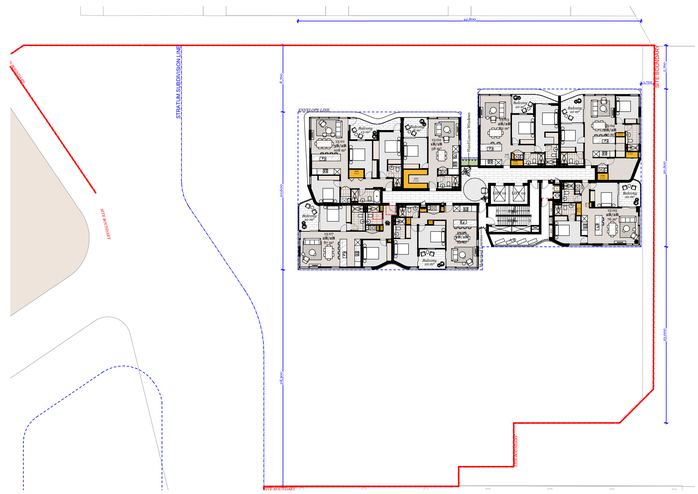
Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:50@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Apartment Types 3/3

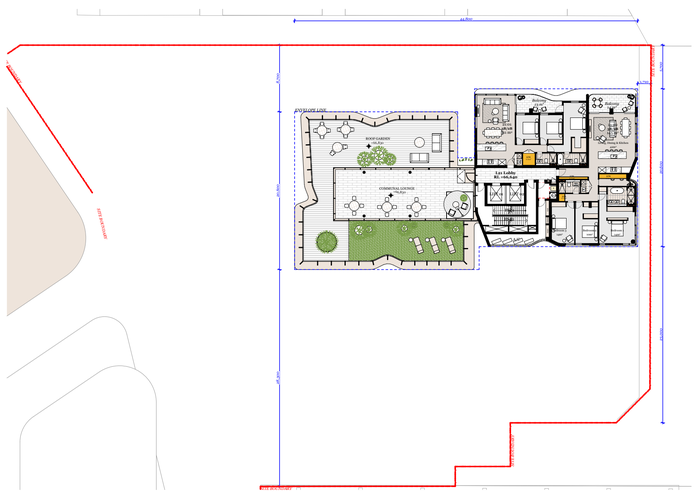
Drawing Number **DA416**
Revision **A**

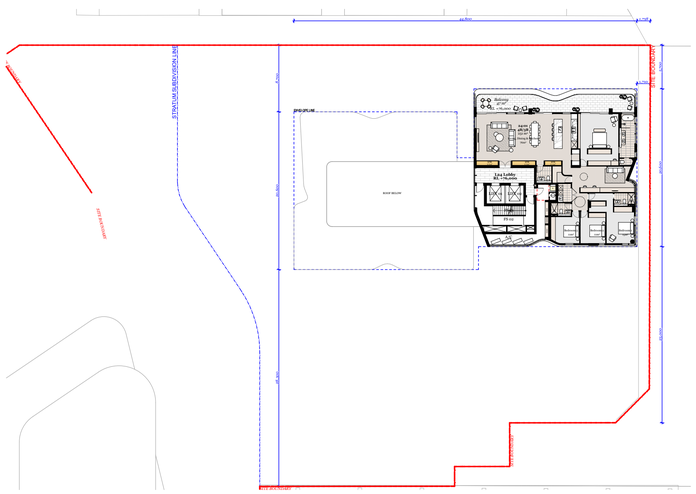












Storage Provision

Builder/Contractor shall verify job dimensions before any job commences
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Rev.	Date	By	Ckd	Description.
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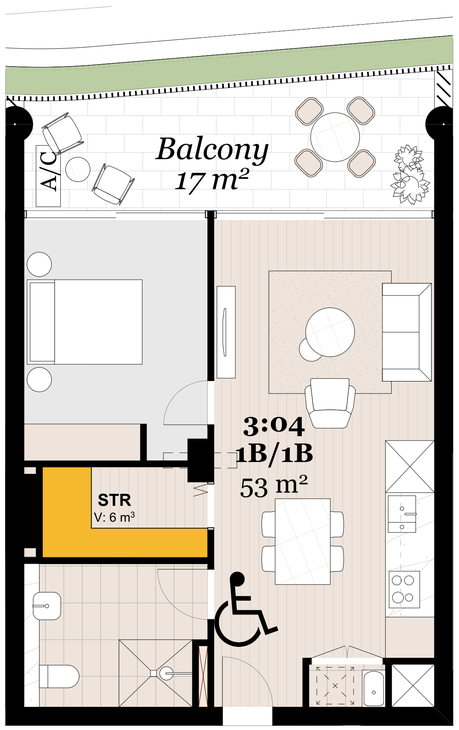
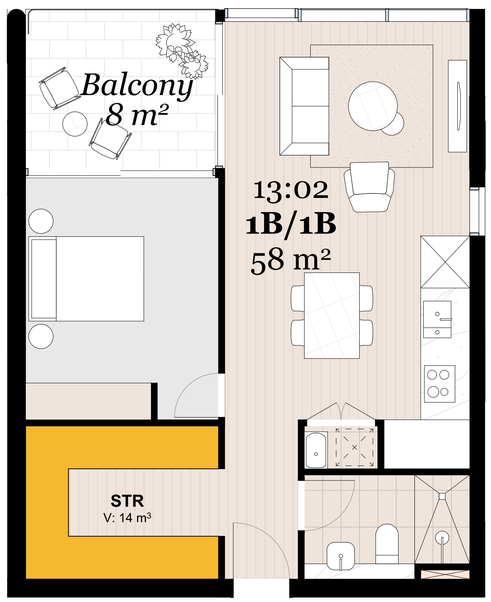
David Randerson 8542

Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:400@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Storage Diagram 1/2
Drawing Number	DA417
Revision	A



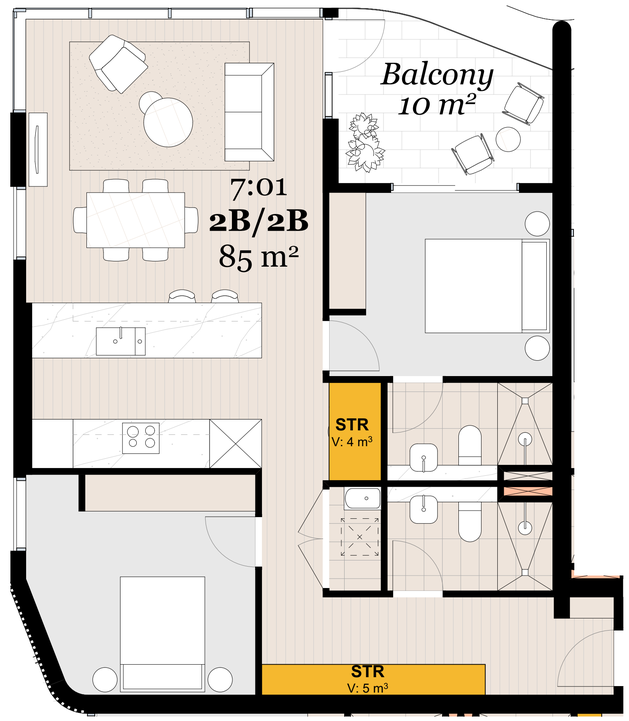
Typical 1 Bed Unit 1:50

Internal Storage: 6m³



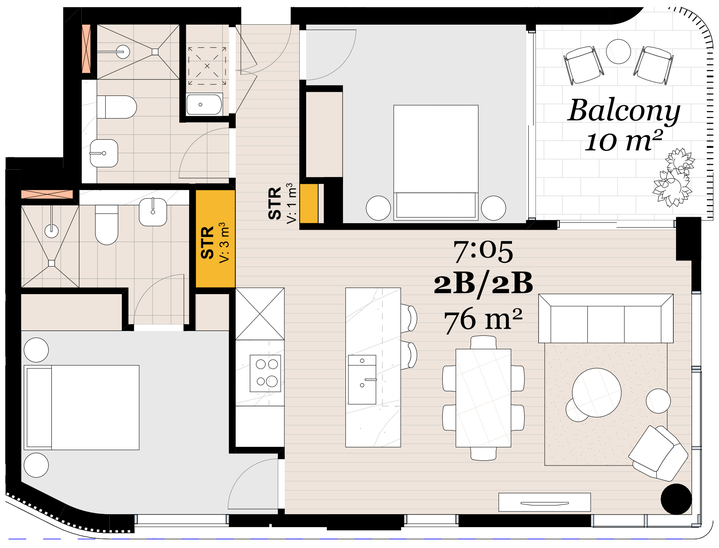
Typical 1 Bed Unit 1:50

Internal Storage: 14m³



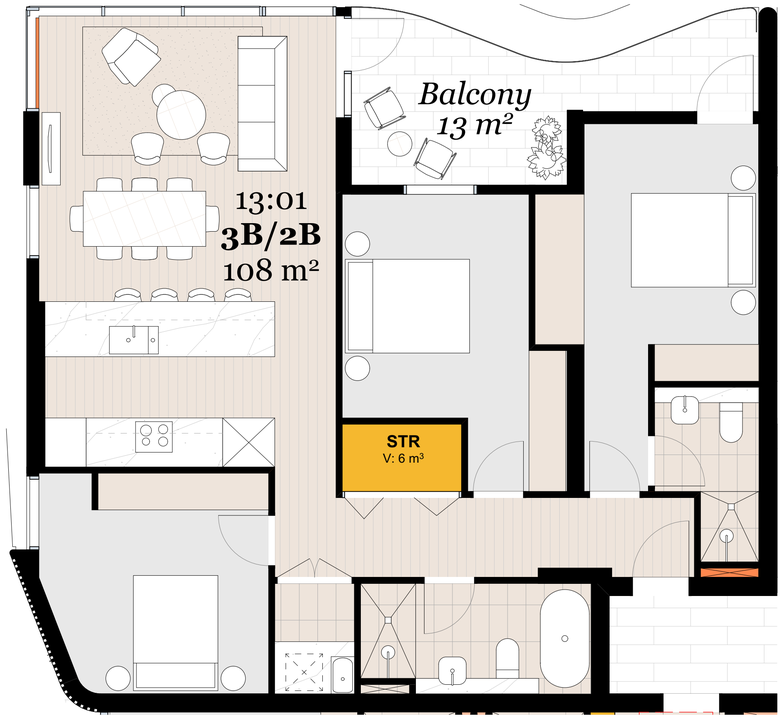
Typical 2 Bed Unit 1:50

Internal Storage: 9m³



Typical 2 Bed Unit 1:50

Internal Storage: 4m³



Typical 3 Bed Unit 1:50

Internal Storage: 6m³

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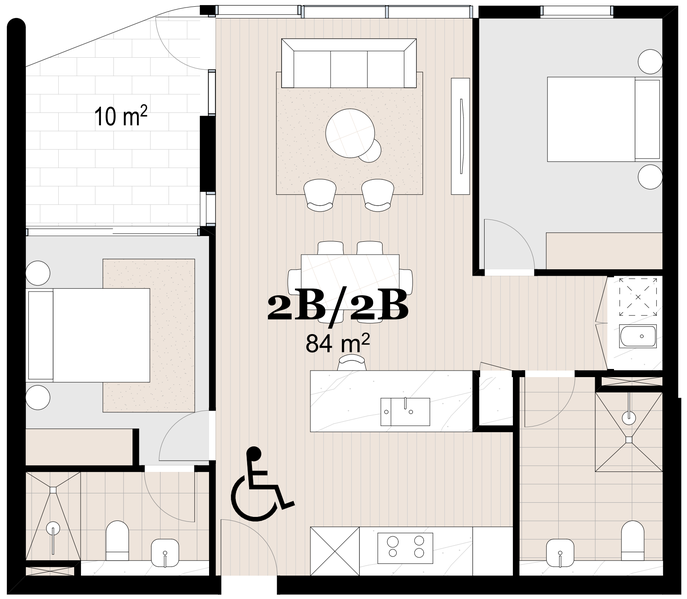
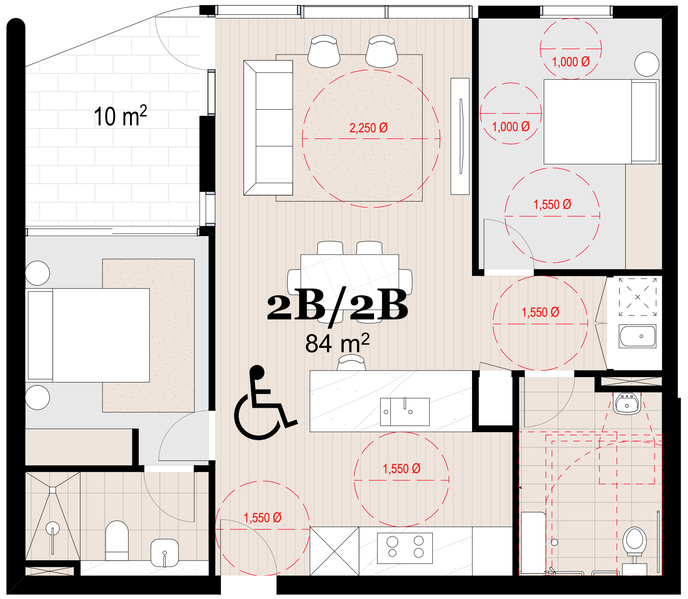
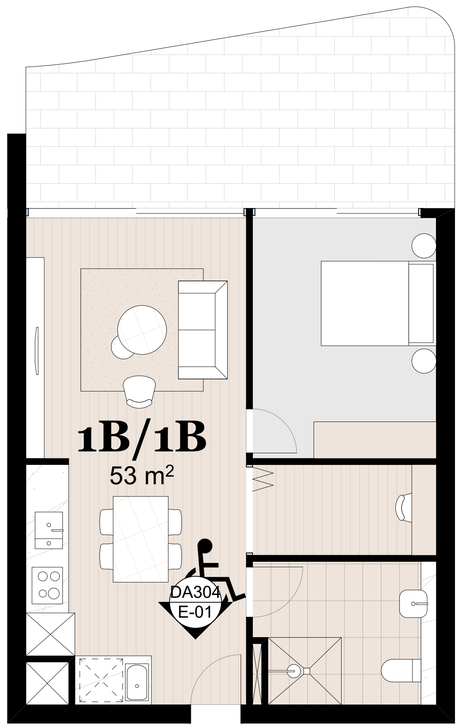
Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:50@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Storage Diagram 2/2
Drawing Number	**DA418**
Revision	**A**



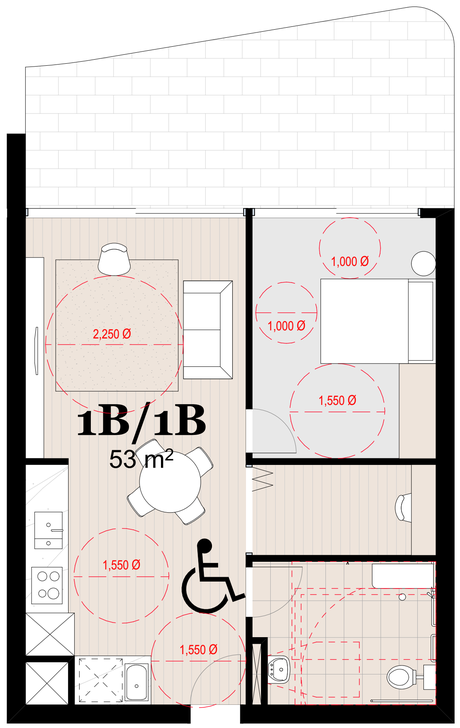
2 Bedroom Adaptable Unit - Pre



2 Bedroom Adaptable Unit - Post



1 Bedroom Adaptable Unit - Pre



1 Bedroom Adaptable Unit - Post

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Rev.	Date	By	Ckd	Description.
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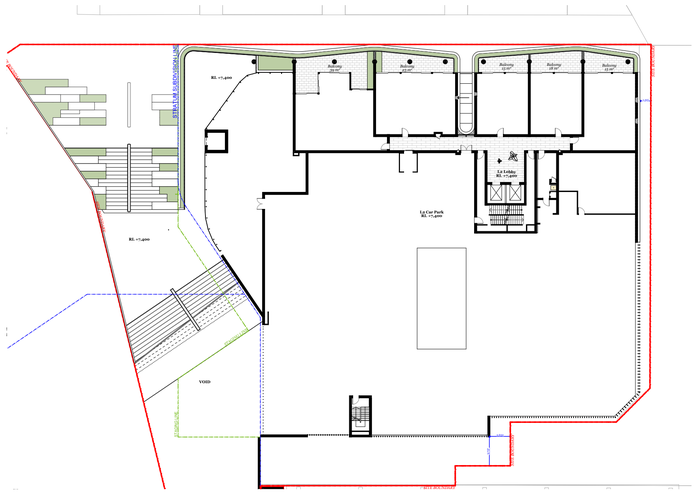
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:50@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Pre & Post Adaptable
Drawing Number	**DA419**
Revision	**A**



Level 2 - 3

3 (6)
0 (0)

Level 4

0 (0)
1 (1)

Level 5

1
1

Level 6 - 12
7 Typical Levels

1 (7)
1 (7)

Level 13 - 20
8 Typical Levels

0 (0)
1 (8)

Level 21

0
0

Level 22 - 23
2 Typical Levels

0
0

Level 24

0
0

DDA & Livable Calculation

Total Unit Number : 136
DDA Units : 14/136 (10%)
Livable Units : 31/136 (23%)

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Project Name	Central Coast Quarter - North Tower
Project Number	11725
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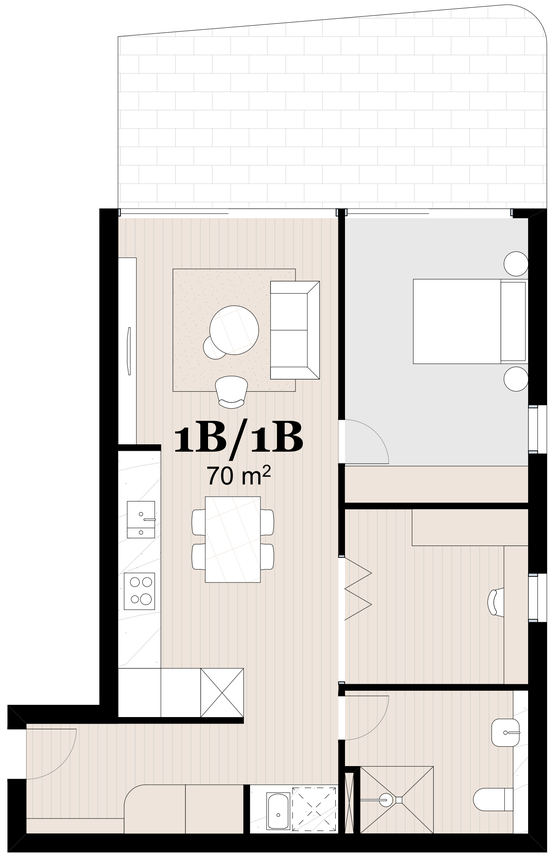
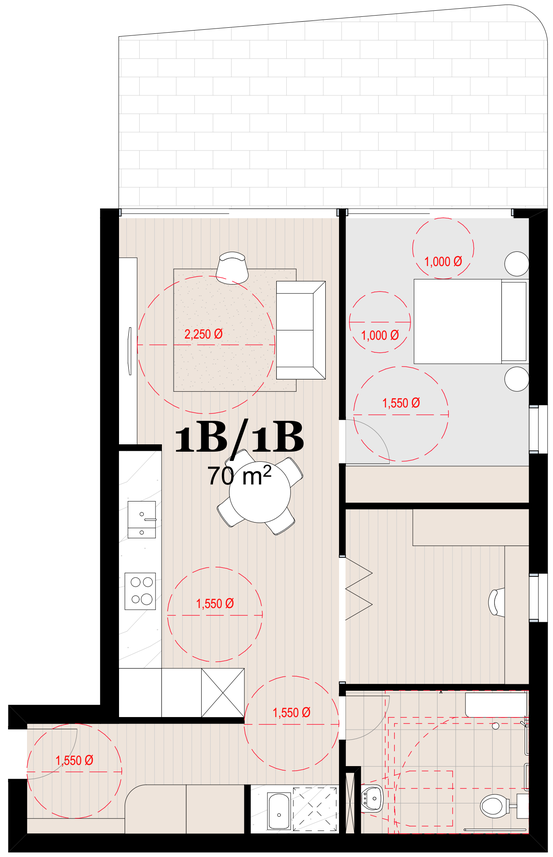
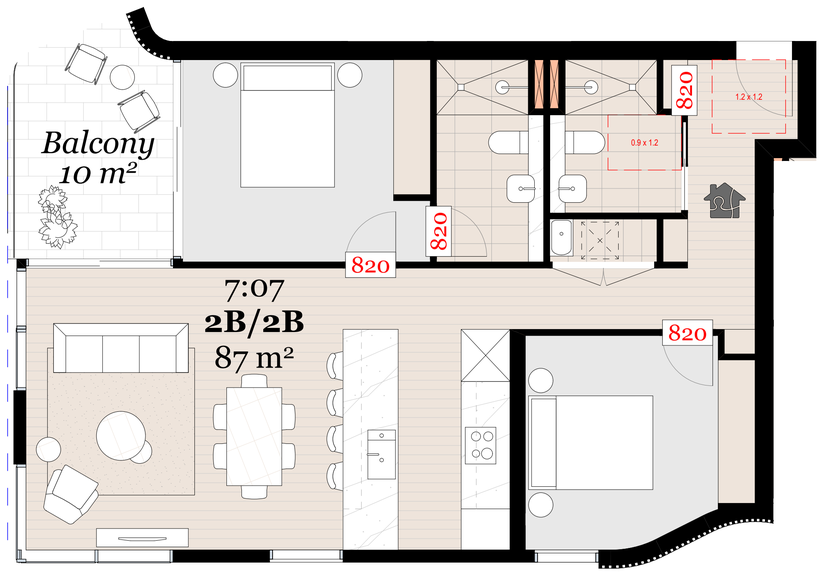
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:400@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	DDA & Livable Unit Calc.
Drawing Number	DA420
Revision	A



1 Bedroom Adaptable Unit - Pre



1 Bedroom Adaptable Unit - Post



2 Bedroom Liviable Unit Plan

Builder/Contractor shall verify job dimensions before any job commences
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Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

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David Randerson 8542

Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:50@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	Pre & Post Adaptable & Livable
Drawing Number	**DA421**
Revision	**A**

Builder/Contractor shall verify job dimensions before any job commences
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Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

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Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:0.61@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	South West Perspective

Drawing Number **DA422**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences
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Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

Client Details

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Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:0.61@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	West Perspective

Drawing Number **DA423**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences
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All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

Client Details

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Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:0.61@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	North West Perspective

Drawing Number **DA424**
Revision **A**

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

Client Details

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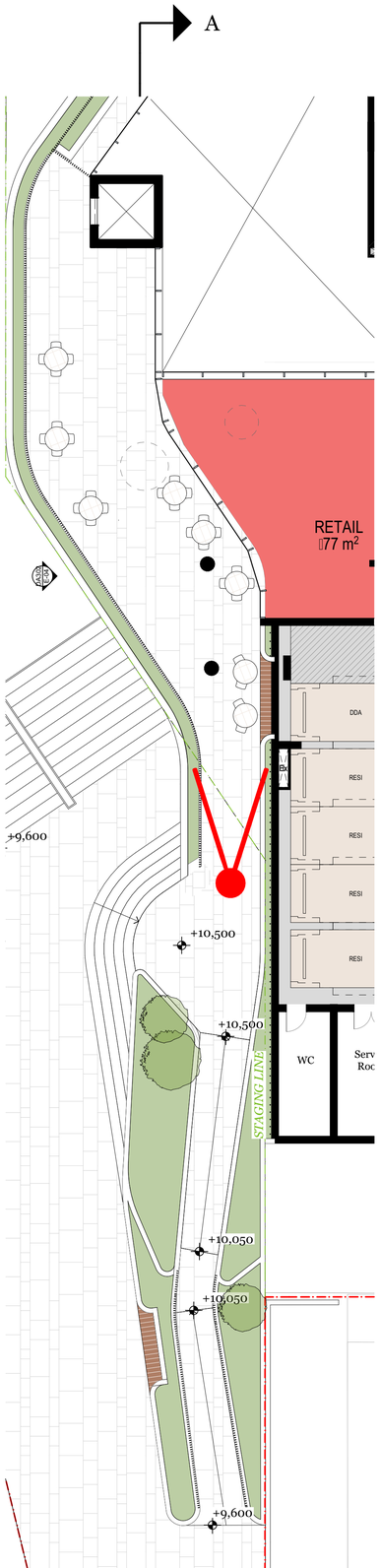
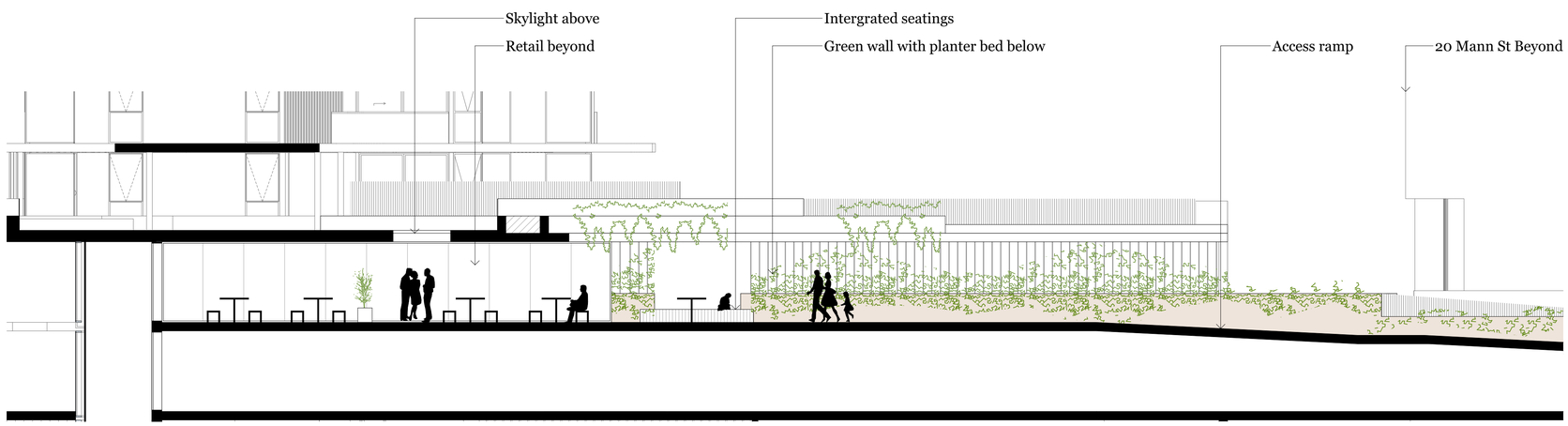
Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:0.61@A1 1:250@A3
Drawing Series	Compliance Drawings
Drawing Name	North East Perspective

Drawing Number **DA425**
Revision **A**



Level 3 Plan

Perspective View



Elevation A-A

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Rev.	Date	By	Ckd	Description.
A	8/20/2021	XD, NV	NB	Development Application

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Project Name	Central Coast Quarter - North Tower
Project Number	11725
Project Address	26-30 Mann Street, Gosford, NSW 2250
Drawn By	XD, NV
Checked By	NB
Date	August 2021
Scale	1:100, 1:125@A1 1:250@A3
Drawing Series	DPIE Request for additional information
Drawing Name	Level 3 Through-site Link Details

Drawing Number **SK01**
Revision **A**