

Environmental Noise Impact Assessment

Proposed
residential dwellings and mixed-use/commercial
space
146-152 Johnston Street, Casino

**HEALTH SCIENCE ENVIRONMENTAL EDUCATION
ENVIRONMENTAL AUDITOR**

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1. Introduction

1.1 Purpose

Tim Fitzroy & Associates has been engaged by Momentum Collective to undertake an Environmental Noise Impact Assessment (ENIA) to accompany a Development Application to Richmond Valley Shire Council for proposed residential dwellings and mixed-use/commercial space to be located at 146-152 Johnston Street, Casino.

This report provides details on the noise assessment and modelling carried out by *Tim Fitzroy & Associates* and *Noise Measurement Services, Brisbane* to establish existing noise levels at the subject site and investigate potential noise impacts on residences within the development and surrounding residences.

The purpose of this noise assessment is to:

1. Establish existing background noise levels across the subject site;
2. Examine the likely impacts of the proposed development on the existing surrounding residences in accordance with the NSW EPA Noise Policy for Industry (2017);
3. Assess road noise impacts (of the Brunxer Highway (Johnston Street) on users of the proposed residential and commercial buildings as per Section 2.120 of the Transport and Infrastructure SEPP 2021 and relevant *Development near Rail Corridors and Busy Roads – Interim Guideline*; and
4. Report on noise levels and provide recommendations to ensure that the proposed development complies as far as practicable with the intent of the NSW EPA Noise Guidelines.

1.2 Applicable Noise Criteria

Protection of the Environment Operations Act 1997 (POEO Act) and the Protection of the Environment Operations (Noise Control) Regulation 2008 (Noise Control Regulation)

The *Protection of the Environment Operations Act 1997* (POEO Act) and the Protection of the Environment Operations (Noise Control) Regulation 2008 (Noise Control Regulation) provide the main legal framework and basis for managing unacceptable noise.

The POEO Act:

- identifies the authority responsible for regulating noise (s. 6 of the Act)
- defines 'noise' and 'offensive noise' (Dictionary in the Act)
- provides a range of regulatory tools to manage noise, including Noise Control Notices, Prevention Notices, Noise Abatement Directions and Noise Abatement Orders.

Depending on the circumstances, the Noise Control Regulation may require an assessment of a noise's audibility, time of occurrence, duration or offensiveness. The POEO Act does not always require noise to be measured to determine whether it is offensive. However, noise measurement can help in deciding what action, if any, is necessary.

1.2.1 Offensive Noise

Depending on the type of noise under consideration, noise can be considered as offensive in three ways according to it's:

- audibility
- duration
- inherently offensive characteristics.

Given the nature of the noise complaints, it will be necessary for Council to consider a range of factors to determine whether the noise is offensive, including the following:

- the loudness of the noise, especially compared with other noise in the area
- the character of the noise
- the time and duration of the noise
- whether the noise is typical for the area
- how often the noise occurs
- the number of people affected by the noise.

1.2.2 Intrusive Noise

Noise is identified as 'intrusive' if it is noticeably louder than the background noise and considered likely to disturb or interfere with those who can hear it.

1.2.3 Sleep disturbance

Specific provisions relate to sleep disturbance and the World Health Organization recommends that a maximum level of 45 dB (A) should not be exceeded inside a bedroom. For practical purposes this is equivalent to a maximum level of 55 dB (A) outside a residence, with an open window to the bedroom (Guidelines for Community Noise WHO 1999).

1.2.4 Noise Policy for Industry

Despite the introduction of the new *Noise Policy for Industry* (NSW EPA 2017). The new Noise Policy for Industry provides a framework and criteria for the consistent assessment of the impact and control of noise from industrial developments.

It is specifically for large industrial developments that require development approval from the Department of Planning and Environment under the *Environmental Planning and Assessment Act 1979* and/or that the NSW Environment Protection Authority (EPA) regulates, such as mines, quarries and other large industries listed in Schedule 1 of the *Protection of the Environment Operations Act 1997*.

It also has information that may be useful for assessing and controlling noise from smaller industrial premises that are typically regulated by councils.

In general, the types of premises dealt with in the policy include:

- ❖ industrial premises
- ❖ extractive industry premises
- ❖ commercial premises (generally limited to noise from heating, ventilation, air conditioning and refrigeration, and energy generation equipment)
- ❖ warehousing premises
- ❖ maintenance and repair facility premises
- ❖ intensive agricultural and livestock premises, for example, cattle feedlots and poultry farms
- ❖ utility generation/reticulation service premises, for example, energy generation from sources other than wind.

The policy can also be used to assess noise from mechanical plant and equipment; industrial and commercial processes; and **vehicle movements within the premises and/or on private roads.**

The policy does not apply to:

- ❖ vehicles associated with an industrial premise that are on a public road
- ❖ transportation corridors (roadways, railways, waterways and air corridors)
- ❖ noise from sporting facilities, including motor sport facilities
- ❖ construction activities
- ❖ noise sources covered by regulations (domestic/neighbourhood noise)
- ❖ blasting activities
- ❖ shooting ranges
- ❖ internal or occupational noise within any workplace regulated by SafeWork NSW
- ❖ wind farms
- ❖ amplified music/patron noise from premises including those licensed by Liquor and Gaming NSW.

Other government policies, guidelines and legislation typically cover these noise sources.

In regards to the proposed development the application of the Noise Policy for Industry is limited to:

- ❖ Fixed mechanical equipment (air conditioning and mechanical ventilation); and
- ❖ Vehicle movements on the subject property.

Noise associated with the commercial premises is regulated by the NSW “Noise Policy for Industry”. The assessment procedure has the following components to determine the project noise trigger levels:

- Intrusiveness Noise Level (LAeq, 15 min): the limit criteria for this assessment is as follows:
 - LAeq, 15 min ≤ rating background level + 5 dB;
- Amenity Noise Level (LAeq, period): this is achieved by ensuring that the proposed development complies with the noise limit criteria set in Table 2.2 of the Policy. As the area is within an *Urban Area* (as defined in Table 2.3 of the Policy), the following limits apply:

Table 2.2: Amenity noise levels.

Receiver	Noise amenity area	Time of day	L _{Aeq} , dB(A)
(see Table 2.3 to determine which residential receiver category applies)			Recommended amenity noise level
Residential	Rural	Day	50
		Evening	45
		Night	40
	Suburban	Day	55
		Evening	45
		Night	40
	Urban	Day	60
		Evening	50
		Night	45

1.2.1 Road Traffic Noise

Impacts from road traffic noise on public roads, as with other sources of environmental pollution, are assessed in the RNP through criteria that are transparent, equitable and consistent both on an individual project and on a statewide basis.

The criteria aim to provide protection primarily inside and immediately around permanent residences, and at schools, hospitals and other sensitive land uses, rather than at all points in a given locality, which would not be practical or possible. A review of external (outdoor) noise assessment criteria in other countries shows that a planning level of 45–55 dB(A) L_{Aeq} appears to be the most widely used night-time criterion, with a day-time criterion set 5–10 dB above this. In many countries, variations in the criteria allow higher noise levels on existing roads, and lower noise levels on roads in quiet areas or near noise-sensitive land uses such as hospitals. When investigating future residential development adjacent to proposed roads the document suggests that where feasible and reasonable, noise levels should be reduced to meet the noise criteria via judicious design and construction of the development. Locations, internal layouts, building materials and construction should be chosen so as to minimise noise impacts. Additionally, consideration of road surfacing with a smoother surface is known to reduce traffic noise levels.

1.2.2 State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP)

The State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) (Department of Planning 2007) sets internal noise criteria which must be met by new developments along some of the busiest transport corridors in NSW. This is a major initiative to ensure that sustainable higher density living can occur along major transport routes whilst maintaining an acceptable level of amenity for residents.

The SEPP Infrastructure aligns with Australian Standard AS/NZS 2107:2016 ‘Acoustics – Recommended Design Sound Level and Reverberation Times for Building Interiors’. These levels expressed as L_{Aeq} are presented below.

Australian Standard 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors provides relevant interior design sound level ranges for Residential Buildings, Health Buildings and Office Buildings:

- **Residential Buildings** (Houses and apartments in suburban areas or near minor roads)
 - Living areas, work areas: 30 to 40 dB(A) Leq,t
 - Sleeping areas (night): 30 to 35 dB(A) Leq,t
 - Work areas: 35 to 40 dB(A) Leq,t
- **Health Buildings**
 - Consulting Rooms: 40 to 45 dB(A) Leq,t
 - Waiting rooms, reception areas: 40 to 50 dB(A) Leq,t
 - Dining areas: 40 to 45 dB(A) Leq,t
 - Patient lounge: 40 to 45 dB(A) Leq,t
 - Kitchens, sterilizing and service areas: < 55 dB(A) Leq,t
 - Office Areas: 35 to 45 dB(A) Leq,t
- **Office Buildings**
 - Board and conference rooms: 30 to 40 dB(A) Leq,t

1.2.5 Noise Guideline for Local Councils

The NSW Noise Guide for Local Government provides guidance relating to noise emissions from activities that are not specifically the responsibility of the NSW EPA.

1.3 Overview of Noise Assessment

This noise assessment establishes the existing background noise levels within the vicinity of the nearest affected sensitive receiver.

The noise assessment process included the following components:

- Measurement and determination of the existing background and ambient noise at the site;
- Consideration of potential noise impacts on surrounding residences; and
- Consideration of what feasible and reasonable noise mitigation measures ought to be considered where the project-specific noise levels are exceeded.

1.4 Site Description

The subject site covers an area of about 3,233m² on the eastern perimeter of Casino, NSW. The site is accessed via Clarke Street and is currently vacant, comprising a single tree in the south east corner with the remainder cleared grassed.

A site locality diagram is provided in **Illustration 1.1**.

1.4.1 Topography

The site is considered generally level positioned at about RL 22.8m Australian Height Datum (AHD).

1.4.2 Climate

Weather recording data was collected from the official Bureau of Meteorology (BOM) Weather Station at Casino Airport. Rainfall and wind greater than 5km/hr were excluded from the noise monitoring results.

1.4.3 Surrounding Land use

The site is bounded by a Service station and commercial development to the west, residential development to the north and east, the Bruxner Highway (Johnston Street) to the south and thereafter a caravan park mixed with residential accommodation.

1.5 Proposed Development

The proposed development comprises a proposed residential dwellings and mixed-use/commercial space. A copy of the Development Plans is provided in **Appendix A**.

Illustration 1.1 Site Locality



2. Instrumentation

2.1 Noise Monitoring Equipment

Tim Fitzroy & Associates utilised the following equipment in this Noise Impact Assessment:

- A Type 1, 1/3 Octave Band Larson Davis Noise Meter for noise measurements

Calibration of the noise monitoring equipment was undertaken prior to use. To ensure no significant tonal drift occurred over the monitoring period, the calibration was checked before and after each measurement period.

2.2 Monitoring Methodology

Consistent with the purpose of the acoustic assessment, the aim of the noise monitoring process was to establish:

- the existing background and ambient noise at the site;
- consideration of potential noise impacts on proposed and surrounding residences; and
- consideration of what feasible and reasonable noise mitigation measures ought to be considered where the project-specific noise levels are exceeded.

Long term noise monitoring was undertaken to establish the existing background noise environment at the subject site. Ambient sound pressure levels were measured generally in accordance with Australian Standard AS1055.1:1997 - 'Acoustics-Description and measurement of environmental noise - Part 1: General procedures.

Long term noise monitoring was undertaken to assess existing road traffic noise impacts in the location of the proposed dual occupancy dwelling. Ambient sound pressure levels were measured generally in accordance with Australian Standard AS1055.1:1997 - 'Acoustics-Description and measurement of environmental noise - Part 1: General procedures'. A Type 1, 1/3 Octave Band Larson Davis Noise Meter was placed at a measurement location NML1 to monitor the road noise impacts and ambient noise levels, in continuous 15-minute intervals from 8 to 15 August 2023 to gather information of background noise during the day, evening and night. The microphone at each location was 1.35m above ground level.

Illustration 2.1 shows the location of the noise meter.

Illustration 2.1 Noise Monitoring Location



3. Acoustic Assessment

3.1 The Decibel Scale

The human ear responds to sound pressure levels over a very wide range – the loudest sound pressure level to which the human ear responds is ten million times greater than the quietest. This large ratio is reduced to a more manageable size by the use of logarithms. To avoid scale which is too compressed a factor of ten is introduced, giving rise to the decibel. The following **Table 3.1** provides an indication of typical A-Weighted sound pressure levels measured in decibels with typical noise sources. The table provides a good reference when comparing decibel readings.

Table 3.1 Example noise sources and the corresponding A-weighted decibel levels

Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
140	Long range gun, gunner's ear	Extremely noisy to intolerable
130	Threshold of pain	
120	Jet take-off at 100m	
110	Night club dance floor	
100	Loud car horn at 3 metres	Very noisy
90	Heavy truck at 10m	
80	Curbside of busy street	Loud
70	Car interior	
60	Normal conversation at 1m	Moderate to quiet
50	Office noise	
40	Living room in quiet area	Quiet to very quiet
30	Inside bedroom at night	
20	Unoccupied recording studio	Almost silent

The sensitivity of people to noise level changes varies from person to person. However generally, a change of up to 3 dBA in the level of a sound is difficult for most people to detect, whilst a 3 dBA to 5 dBA change corresponds to a small but noticeable change in loudness. A 10 dBA change corresponds to an approximate doubling or halving in loudness.

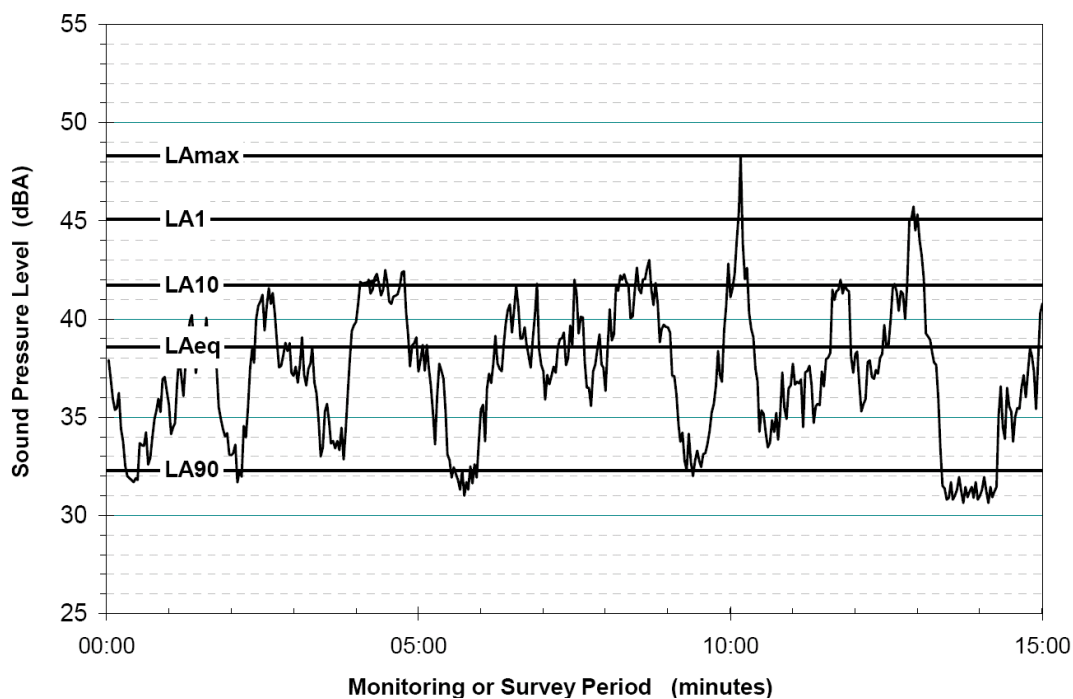
3.2 Acoustical Terms

This report makes reference to a number of different acoustical terms. Particularly the L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} descriptors. Each descriptor is briefly explained below.

- The L_{Aeq} is essentially the average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time; varying sound over a defined measurement period.
- The L_{Amax} noise level is the maximum A-weighted noise level.
- The L_{A10} is the A-weighted sound pressure level exceeded 10% of a given measurement period and is utilised normally to characterise typical maximum noise levels.
- The L_{A90} noise level is the A-weighted sound pressure level exceeded 90% of a given measurement period and is representative of the average minimum background sound level (in the absence of the source under consideration), or simply the “background” level.

A graphical display of typical noise indices and the relationship between each noise descriptor is provided below in Figure 3.1.

Figure 3.1 Graphical Display of Typical Noise Indices



3.3 Existing Noise Environment

The primary noise observed while on site emanates from road traffic along Bruxner Highway (Johnston Street). Secondary noise sources included bird calls.

Table 3.2 Background Sound Pressure Levels

Period	Intrusiveness noise level	Project amenity noise level for Urban Area
Daytime	50 $L_{Aeq, 15min}$ (45 (RBL) + 5)	58 $L_{Aeq, 15min}$ (60 - 5 + 3)
Evening	43 $L_{Aeq, 15min}$ (38 (RBL) + 5)	48 $L_{Aeq, 15min}$ (50 - 5 + 3)
Night time	36 $L_{Aeq, 15min}$ (31 (RBL) + 5)	43 $L_{Aeq, 15min}$ (45 - 5 + 3)

Table 2.2: Amenity noise levels.

Receiver	Noise amenity area	Time of day	L_{Aeq} , dB(A)
(see Table 2.3 to determine which residential receiver category applies)			Recommended amenity noise level
Residential	Rural	Day	50
		Evening	45
		Night	40
	Suburban	Day	55
		Evening	45
		Night	40
	Urban	Day	60
		Evening	50
		Night	45

Notes:

1. Intrusiveness noise level is $L_{Aeq,15min}$ RBL + 5 (Section 2.1 (EPA 2017)).
2. Project amenity noise level (ANL) is rural ANL (Table 2.2, EPA 2017) minus 5 dB(A) plus 3 dB(A) to convert from a period level to a 15-minute level (dB = decibel; dB[A] = decibel [A-weighted]; RBL = rating background noise level).

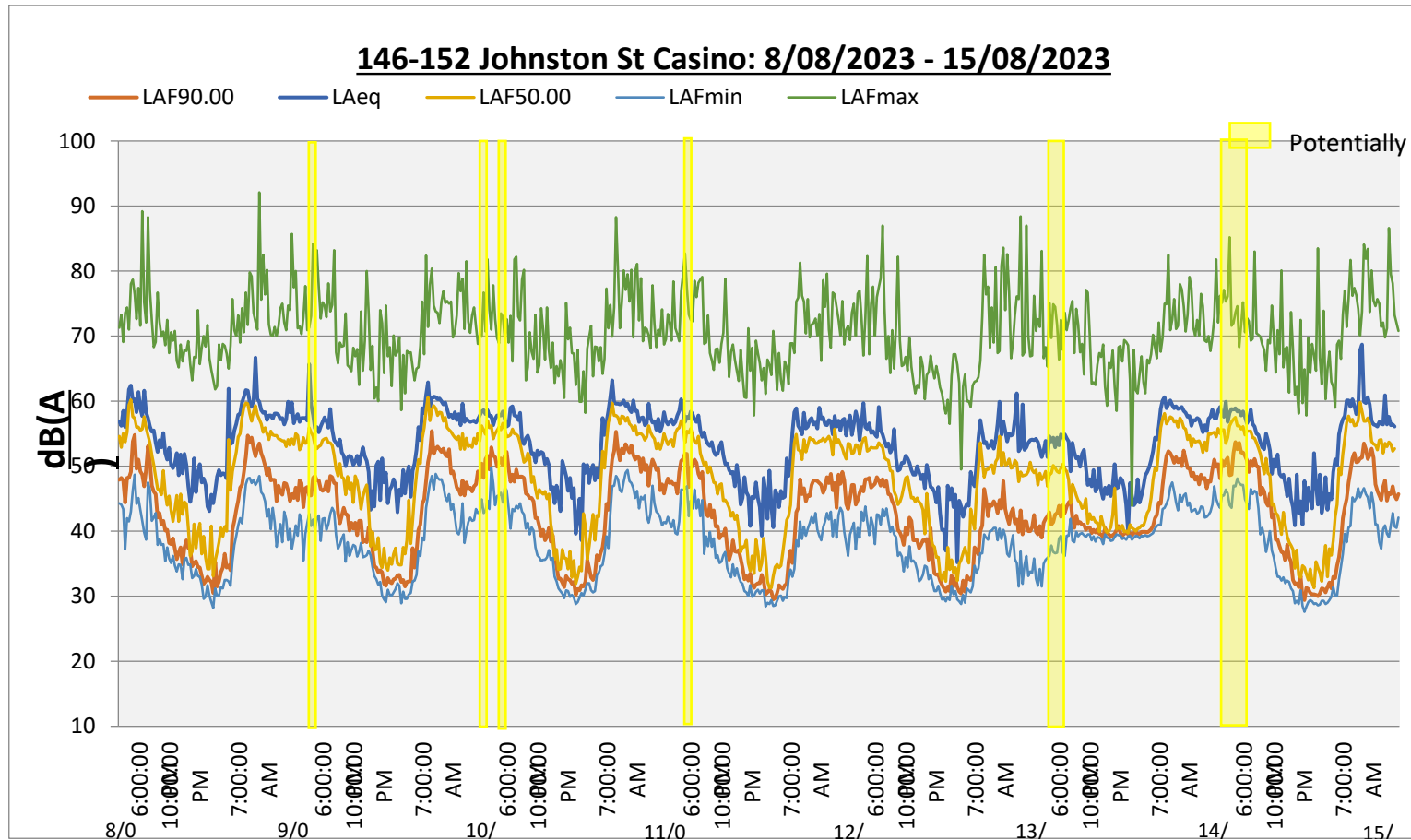
The project noise trigger level is the lower (that is, the most stringent) value of the intrusiveness and amenity noise levels. Therefore, the project noise trigger levels are as follows:

- **daytime: $L_{Aeq,15min}$ 50 dB(A)**
- **evening: $L_{Aeq,15min}$ 43 dB(A)**
- **night-time: $L_{Aeq,15min}$ 36 dB(A)**

As can be seen from the above table, the project specific noise criteria are determined by the intrusive noise criteria.

The ambient and background noise levels measured at NML1 over the monitoring period are presented in **Figure 3.2**.

Figure 3.2 Ambient and Background Noise Levels at Measurement Location ML1



3.4 Impact of Proposed Development on Surrounding Residences

3.4.1 Noise Modelling

Noise levels from the expected activities at the proposed development have been predicted to the closest sensitive dwellings using SoundPLAN v8.0 and the prediction methodology ISO9613-2:1996. Noise source levels are sourced from the SoundPlan Emission Library, relevant published literature, and from previous measurements of similar equipment where applicable. All prediction models have limits to their accuracy of prediction. This is due to the inherent nature of the calculation algorithms that go into the design of the models, the assumptions made in the implementation of the model, and the availability of good source sound power data. Various researchers have suggested that an un-calibrated model has an accuracy of ± 5 dB while a calibrated model has an accuracy of ± 2 dB. Calibration means that the model has been established with reference to measured sound levels at a receiver, known source levels and tightly defined propagation variables (wind speed and direction, for example). Alternatively, a series of predictions with different programs but the same assumption variables can be used for verification purposes.

3.4.2 Noise Source Levels

The significant sources of noise emission from the site are expected to include vehicle movements, mechanical plant / air-conditioning, and children playing in the play area. The modelled noise source levels are presented in **Table 3.3**. Vehicle movements are based on the supplied TIA and conservatively apply the peak hourly movements to all time periods. Assessment is made to all time periods the assumption that children will not use the play area during the night.

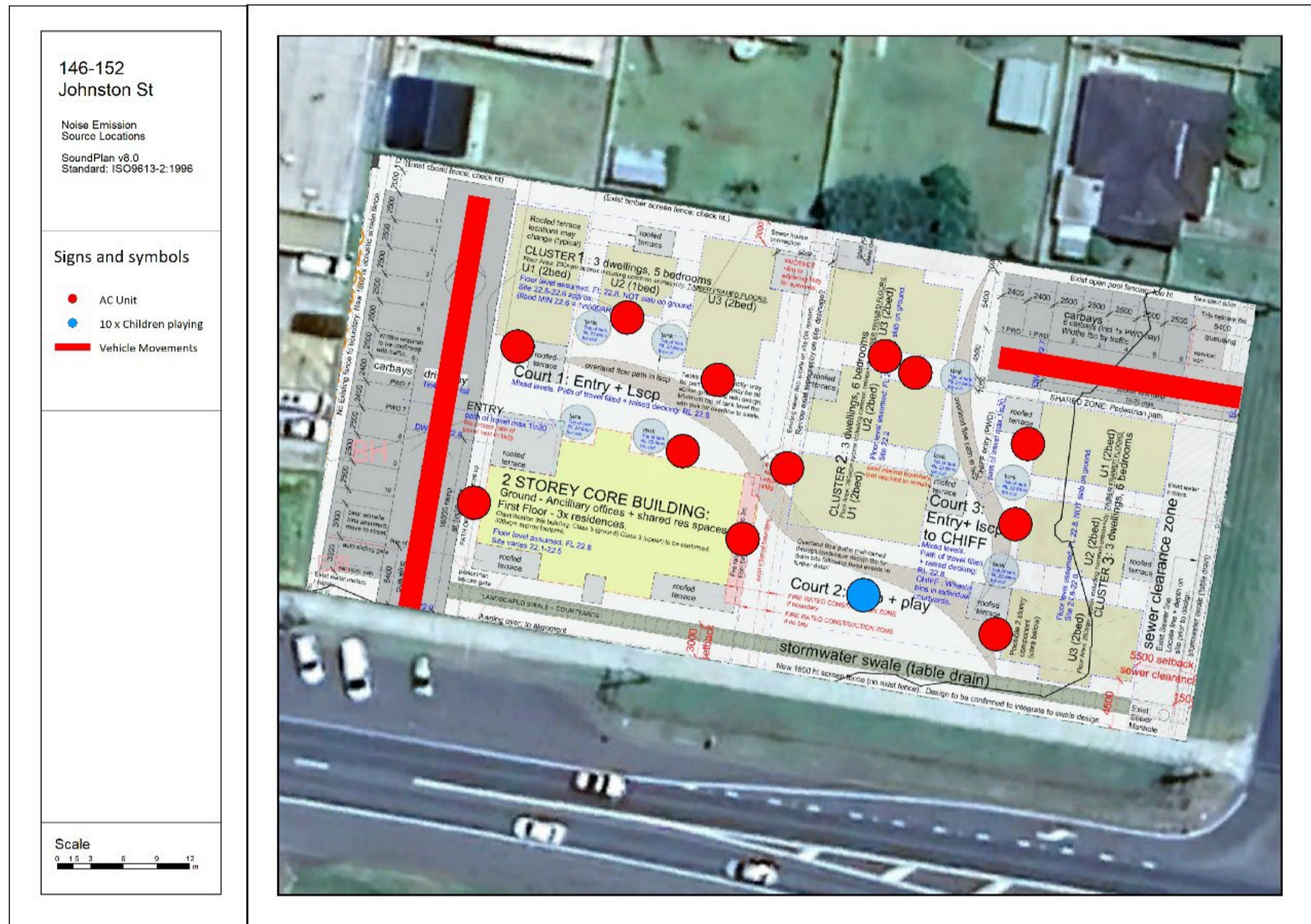
Air conditioner locations are not known at this stage, noise sources representing outdoor plant are positioned to avoid line-of-sight to the closest receivers (i.e., receivers 2 – 8). Noise sources are positioned as presented in **Illustration 3.1**.

Table 3.3 Noise Source Levels

Description	Sum dB(A)	Timing		
		Day	Evening	Night
Car Movement, SWL dB/m Chiff Housing development, Clark St driveway.	85	3vph @ 10kph	3vph @ 10kph	3vph @ 10kph
Car Movement, SWL dB/m Core & Cluster 1 Housing development, Johnston St driveway.	85	6vph @ 10kph	6vph @ 10kph	6vph @ 10kph
Air conditioner, 2.5kW or 5.0 outdoor unit (Daikin Cora)	60	100%	100%	100%
10 x Children playing outdoors	87	100%	100%	-

* Vehicle rate is per driveway.

Illustration 3.1 Location of Noise Sources in Model



3.4.3 Sensitive Receptors

Receptor points have been chosen to represent the closest surrounding dwellings. Receiver points are placed 30m from the dwelling in the direction of the noise source or on the boundary if it is less than 30m from the dwelling. Receivers are positioned at a height of 1.5m above ground, and predicted levels are free-field. Receiver locations are presented in **Illustration 3.2**.

Illustration 3.2 Location of Receivers



3.4.4 Weather Conditions

Noise modelling using the Concawe methodology to present Standard and Noise-enhancing meteorology is not appropriate in this instance due to the short distances involved. Noise modeling has therefore been made using the prediction methodology *ISO9613-2: 1996* which, by default, presents noise levels at the receiver for meteorological conditions which are favorable for propagation from the sound source to the receiver.

The predicted noise levels are considered to represent the average propagation under meteorological conditions including wind and temperature inversion.

3.4.5 Modeling Verification

The noise model presents future scenarios that have not been measured on site and validation measurements are not possible at this stage, the model is therefore considered to be uncalibrated.

3.4.6 Calculation of Noise Levels

Noise levels from the site have been predicted to each receptor. Predicted noise levels include screening from proposed and existing structures and topography, with topographic information sourced from Geoscience Australia. Predicted noise levels are presented with assessment in **Table 3.4**. Visual noise contours are presented in **Illustrations 3.4**, for the day, evening and **3.5** and night periods respectively.

Table 3.4 Predicted noise levels, all noise sources. Levels are in dB(A) Leq

Receptor	Predicted Noise Level			Criteria			Assessment		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
1	26	26	22	50	43	36	Pass	Pass	Pass
2	35	35	35	50	43	36	Pass	Pass	Pass
3	30	30	27	50	43	36	Pass	Pass	Pass
4	32	32	30	50	43	36	Pass	Pass	Pass
5	38	38	35	50	43	36	Pass	Pass	Pass
6	31	31	27	50	43	36	Pass	Pass	Pass
7	38	38	26	50	43	36	Pass	Pass	Pass
8	31	31	23	50	43	36	Pass	Pass	Pass

Illustration 3.4 Noise contours at 1.5m above day and evening noise sources. Levels are in dB(A) Leq.

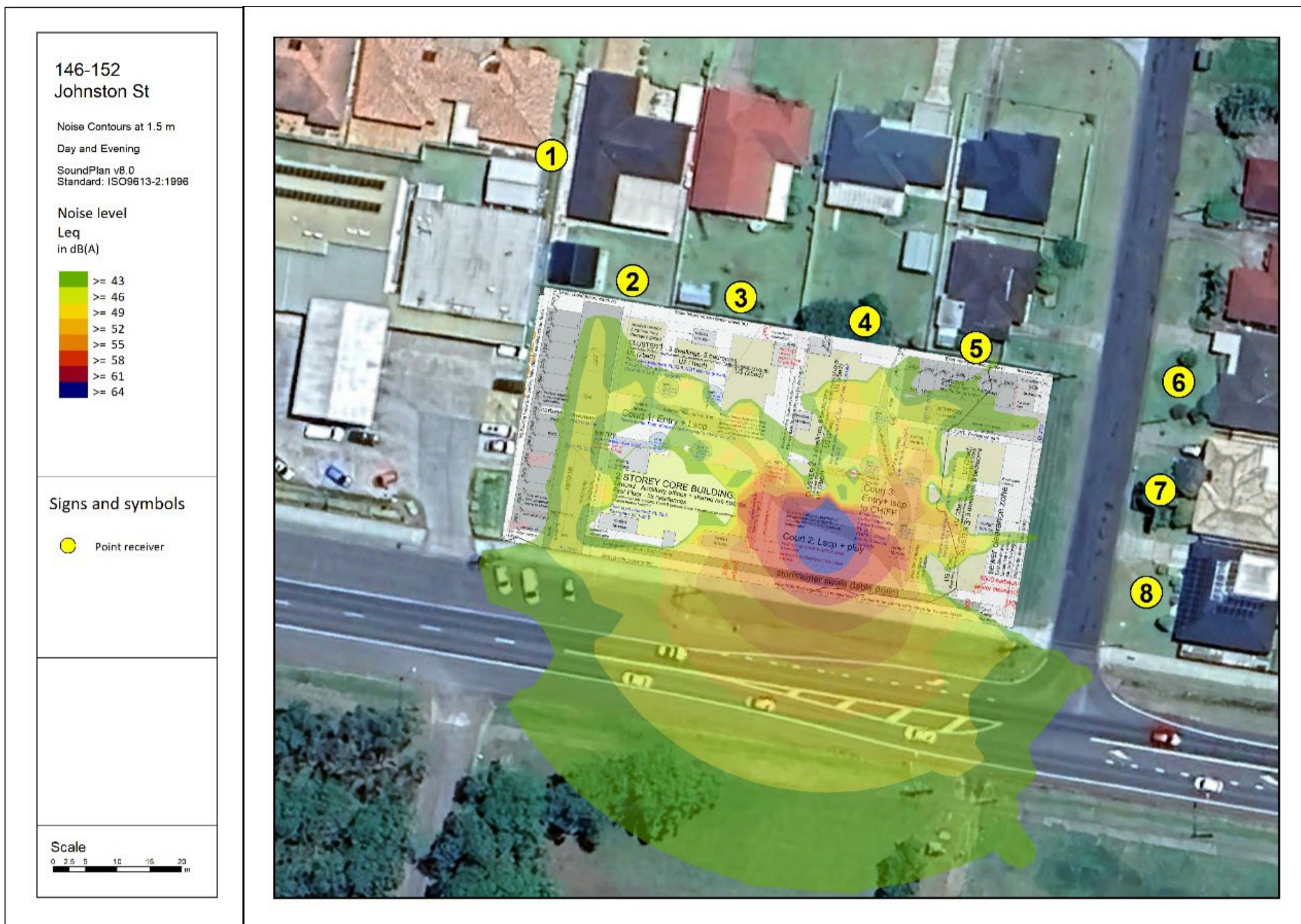
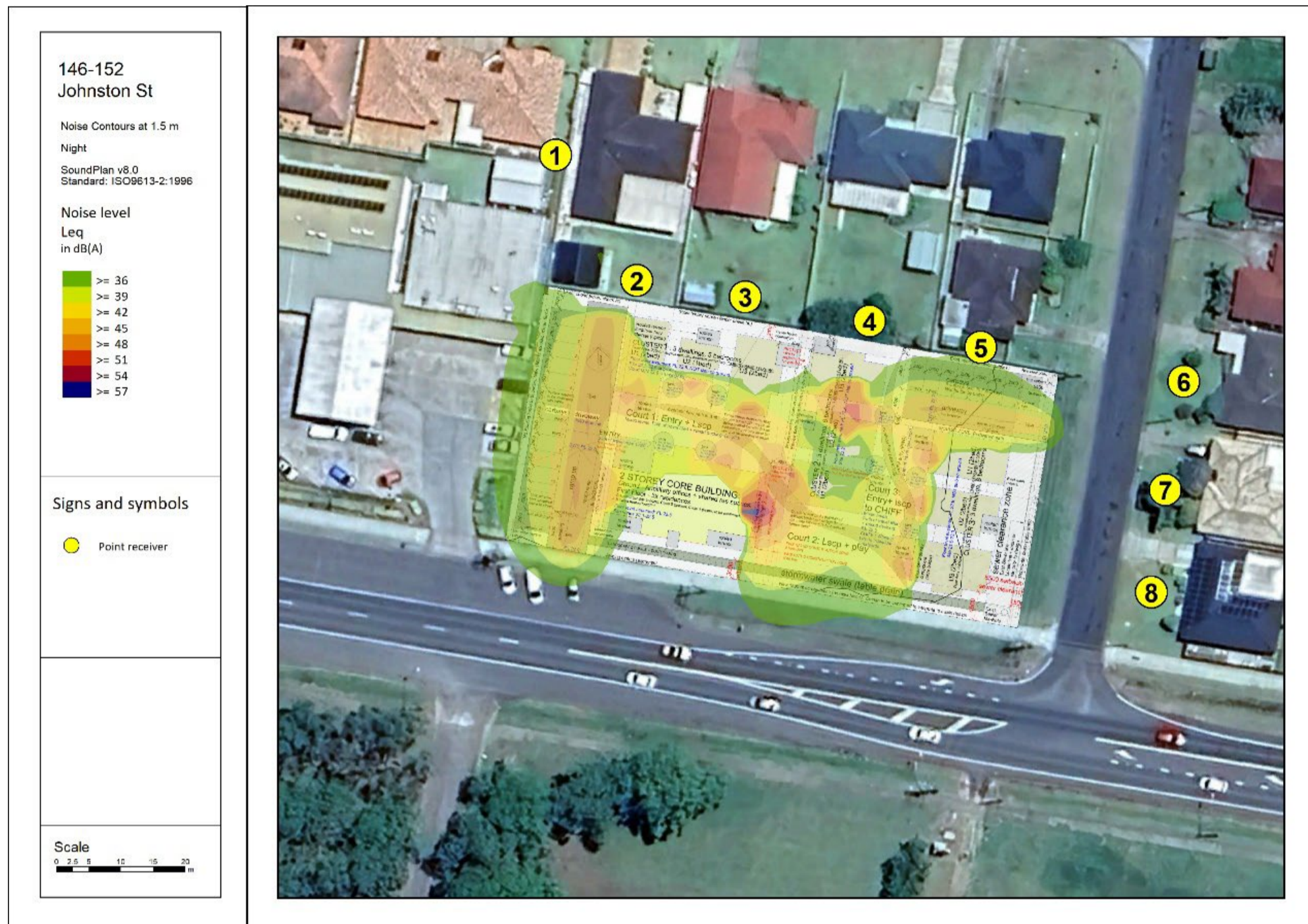


Illustration 3.5 Noise contours at 1.5m above ground, night noise sources. Levels are in dB(A) Leq.



3.4.7 Noise Modelling Outcomes from the Proposed Development

A noise model has been constructed to predict the propagation of noise from expected significant sources at the proposed development. The model includes shielding effects from existing and proposed structures, and topography. Topographic information included in the model was sourced from Geoscience Australia.

As per the assumptions and variables stated, it is concluded that –

- Noise emission levels from the expected sources at the development are predicted to meet the criteria at the closest sensitive receptors during all time periods.
- Mechanical plant must be acoustically screened to avoid direct line-of-sight to the neighbouring dwellings to the north or east. This may be readily achieved by positioning the plant generally as shown in **Illustration 3.1**.

4. Impacts of Road Traffic Noise

The design levels for traffic noise from Johnston Street / Bruxner Highway are calculated for the proposed development. Calculations are performed in accordance with Australian Standard AS2702-1984 Acoustics-Methods for the measurement of road traffic noise and 'Calculation of Road Traffic Noise', 1975-1988. Predicted levels for this report have been calculated using the CoRTN prediction model SoundPLAN and are façade-affected unless stated otherwise. Traffic data was not available at the time of modelling, the modelled traffic flows are validated to the measured noise level at the site, with nominal 3% p.a. growth.

The noise model incorporates screening from surrounding structures and topography. Topographic information was sourced from Geoscience Australia. The model assumptions and results are presented in the following Tables and Illustrations.

Table 4.1 Traffic volumes

Road	Vehicles per 24hr (18hr volume is 94% of 24hr)		Heavy Vehicle %	Speed (km/hr)	Source Height (m)	Road Surface
	2023	2033				
Johnston Street	9,116	10,070	15	50	0.5	DGA
Clark Street	629	695	5	50	0.5	DGA

Table 4.2 Model validation, levels are in LA10,18hr, free-field (9th August 2023)

Location	Measured	SoundPlan	Difference
NML	58.9	59.3	+0.4

The model validation result presented in **Table 4.2** demonstrates an acceptable level of fit between the modelled and measured noise levels at the site. As a conservative assessment, noise levels are predicted into the design horizon based upon the 2033 traffic volumes, as presented in **Table 4.3**.

Table 4.3 Predicted Noise levels, façade-affected.

Building	Floor	Façade	Forecast Noise Level LA10(18hr) façade-affected
Cluster 1 U1	GF	E	50.1
Cluster 1 U1	GF	N	50.2
Cluster 1 U1	GF	S	60.9
Cluster 1 U1	GF	W	60.7
Cluster 1 U2	GF	E	50.0
Cluster 1 U2	GF	N	50.2
Cluster 1 U2	GF	S	57.2
Cluster 1 U2	GF	W	50.1
Cluster 1 U3	GF	E	55.1
Cluster 1 U3	GF	N	50.4
Cluster 1 U3	GF	S	57.7
Cluster 1 U3	GF	W	51.4
Cluster 2 U1	GF	E	61.4
Cluster 2 U1	GF	N	51.7

Building	Floor	Façade	Forecast Noise Level L _{A10(18hr)} façade-affected
Cluster 2 U1	GF	S	65.8
Cluster 2 U1	GF	W	59.8
Cluster 2 U2	GF	E	58.3
Cluster 2 U2	GF	N	51.8
Cluster 2 U2	GF	S	51.8
Cluster 2 U2	GF	W	56.6
Cluster 2 U3	GF	E	56.7
Cluster 2 U3	GF	N	51.5
Cluster 2 U3	GF	S	51.6
Cluster 2 U3	GF	W	54.2
Cluster 3 U1	GF	E	61.5
Cluster 3 U1	GF	N	53.7
Cluster 3 U1	GF	S	52.9
Cluster 3 U1	GF	W	59.2
Cluster 3 U2	GF	E	63.0
Cluster 3 U2	GF	N	52.8
Cluster 3 U2	GF	S	54.7
Cluster 3 U2	GF	W	62.8
Cluster 3 U3	GF	E	66.0
Cluster 3 U3	GF	N	54.0
Cluster 3 U3	GF	S	69.7
Cluster 3 U3	GF	W	65.9
Core	GF	Conference E	67.2
Core	GF	Conference S	69.3
Core	GF	Consult 1 S	68.1
Core	GF	Consult 1 W	65.9
Core	GF	Consult 2 S	67.2
Core	GF	Kid Space E	62.9
Core	GF	Kid Space N	47.7
Core	GF	Kitchen + Meals N	46.0
Core	GF	Living E	65.4
Core	GF	Living S	68.1
Core	GF	Seats-Waiting W	64.2
Core	GF	Staff Office S	69.2
Core	GF	Staff Office W	67.0
Core	GF	Unit 1 N	55.9
Core	GF	Unit 1 S	68.5
Core	L 1	Unit 1 W	65.7
Core	L 1	Unit 2 N	52.3
Core	L 1	Unit 2 W	55.7
Core	L 1	Unit 3 E	67.9
Core	L 1	Unit 3 S	69.7
Core	L 1	Unit 3 W	67.7
Core	L 1	Unit 4 E	65.1
Core	L 1	Unit 4 N	55.2
Core	L 1	Unit 4 S	68.7
Core	L 1	Waiting+Entry N	56.1
Core	L 1	Waiting+Entry W	68.3

Illustration 4.1 Noise contours at 1.8m (Ground Floor), 2033 traffic volumes. Levels are in dB(A) L10,18hr.

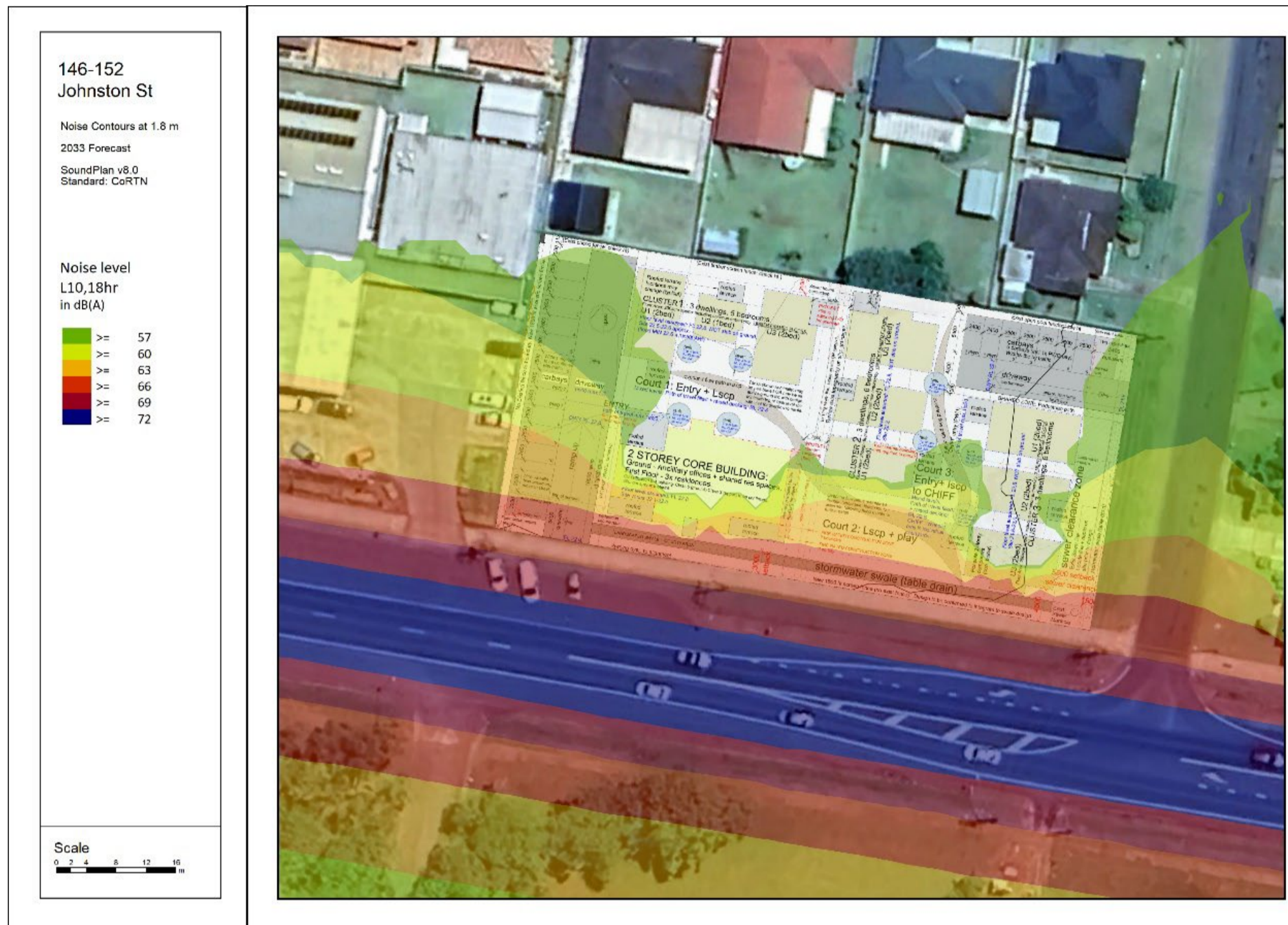
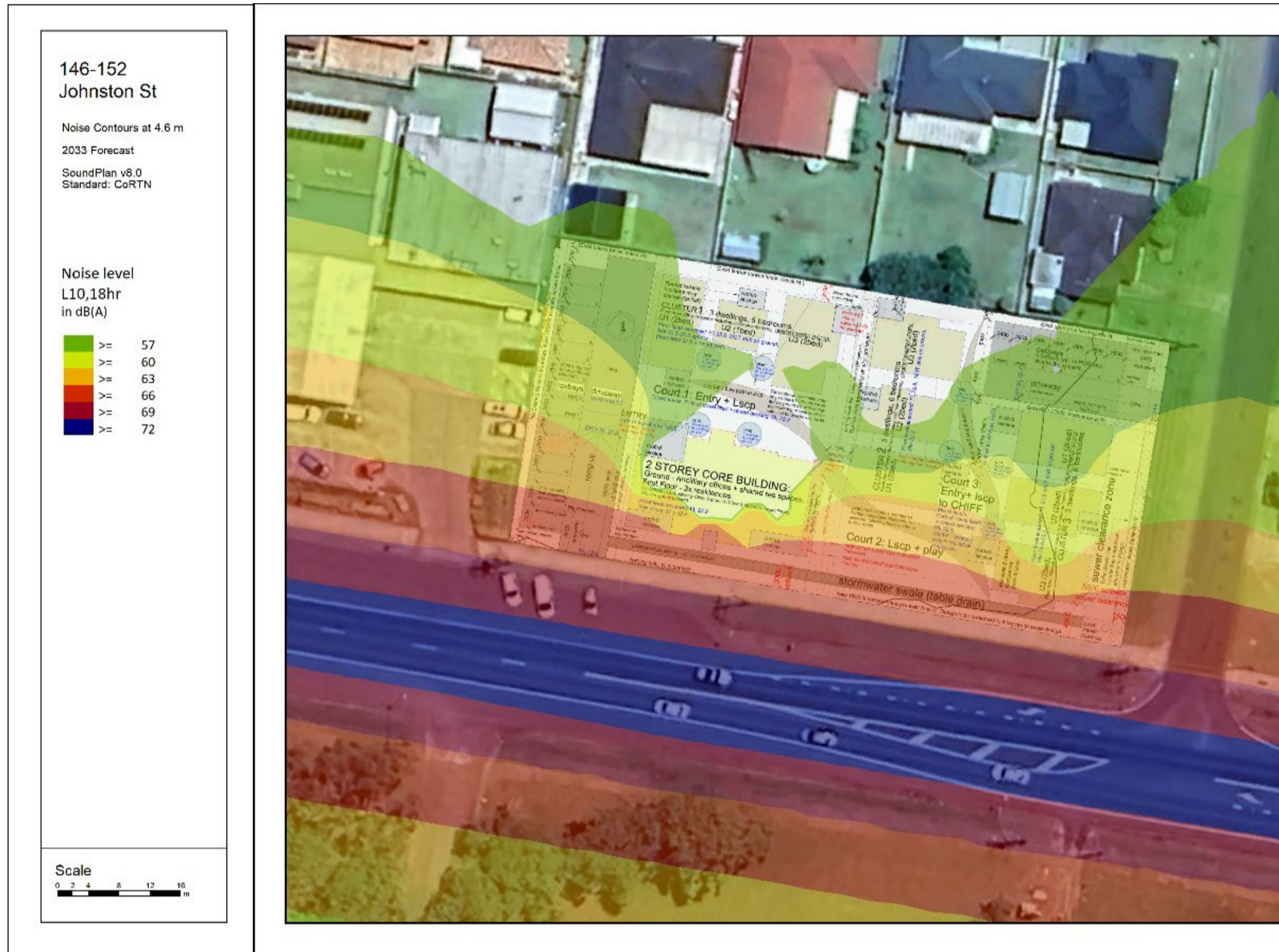


Illustration 4.2 Noise contours at 4.6m (First Floor), 2033 traffic volumes. Levels are in dB(A) L10,18hr.



4.1 Road Traffic Noise Assessment – Residential

It is understood that the residential components of the proposed development must demonstrate that the following external LAeq levels are not exceeded:

- Day (7 a.m. – 10 p.m.): 60 dB(A) LAeq,(15 hour)
- Night (10 a.m. – 7 p.m.): 55 dB(A) LAeq,(9 hour)

Predicted L10,18hr noise levels are converted to LAeq day (15 hour) and night (9 hour) levels using the measured relationships from 9th August 2023, the measured relationships were:

- LAeq,(15 hour) = L10,18hr -1.0 dB(A).
- LAeq,(9 hour) = L10,18hr -4.1 dB(A).

The predicted day and night LAeq façade levels are presented in **Table 4.4** for the residential components of the development alongside assessment to the day and night façade criteria. Facades that exceed criteria are assigned minimum design requirements as presented in Section 4.2.

Table 4.4 Assessment of residential facades, levels are LAeq façade-affected.

Building	Floor	Façade	Forecast Noise Level		Assessment	
			Day LAeq(15hr)	Night LAeq(9hr)	Day (60)	Night (55)
Cluster 1 U1	GF	E	49	46	Pass	Pass
Cluster 1 U1	GF	N	49	46	Pass	Pass
Cluster 1 U1	GF	S	60	57	Pass	+2
Cluster 1 U1	GF	W	60	57	Pass	+2
Cluster 1 U2	GF	E	49	46	Pass	Pass
Cluster 1 U2	GF	N	49	46	Pass	Pass
Cluster 1 U2	GF	S	56	53	Pass	Pass
Cluster 1 U2	GF	W	49	46	Pass	Pass
Cluster 1 U3	GF	E	54	51	Pass	Pass
Cluster 1 U3	GF	N	49	46	Pass	Pass
Cluster 1 U3	GF	S	57	54	Pass	Pass
Cluster 1 U3	GF	W	50	47	Pass	Pass
Cluster 2 U1	GF	E	60	57	Pass	+2
Cluster 2 U1	GF	N	51	48	Pass	Pass
Cluster 2 U1	GF	S	65	62	+5	+7
Cluster 2 U1	GF	W	59	56	Pass	+1
Cluster 2 U2	GF	E	57	54	Pass	Pass
Cluster 2 U2	GF	N	51	48	Pass	Pass
Cluster 2 U2	GF	S	51	48	Pass	Pass
Cluster 2 U2	GF	W	56	53	Pass	Pass
Cluster 2 U3	GF	E	56	53	Pass	Pass
Cluster 2 U3	GF	N	51	47	Pass	Pass
Cluster 2 U3	GF	S	51	48	Pass	Pass
Cluster 2 U3	GF	W	53	50	Pass	Pass
Cluster 3 U1	GF	E	61	57	+1	+2
Cluster 3 U1	GF	N	53	50	Pass	Pass
Cluster 3 U1	GF	S	52	49	Pass	Pass
Cluster 3 U1	GF	W	58	55	Pass	Pass
Cluster 3 U2	GF	E	62	59	+2	+4
Cluster 3 U2	GF	N	52	49	Pass	Pass
Cluster 3 U2	GF	S	54	51	Pass	Pass
Cluster 3 U2	GF	W	62	59	+2	+4
Cluster 3 U3	GF	E	65	62	+5	+7

Building	Floor	Façade	Forecast Noise Level		Assessment	
			Day $L_{Aeq}(15hr)$	Night $L_{Aeq}(9hr)$	Day (60)	Night (55)
Cluster 3 U3	GF	N	53	50	Pass	Pass
Cluster 3 U3	GF	S	69	66	+9	+11
Cluster 3 U3	GF	W	65	62	+5	+7
Core	L 1	Unit 1 N	55	52	Pass	Pass
Core	L 1	Unit 1 S	68	64	+8	+9
Core	L 1	Unit 1 W	65	62	+5	+7
Core	L 1	Unit 2 N	51	48	Pass	Pass
Core	L 1	Unit 2 W	55	52	Pass	Pass
Core	L 1	Unit 3 E	67	64	+7	+9
Core	L 1	Unit 3 S	69	66	+9	+11
Core	L 1	Unit 3 W	67	64	+7	+9
Core	L 1	Unit 4 E	64	61	+4	+6
Core	L 1	Unit 4 N	54	51	Pass	Pass
Core	L 1	Unit 4 S	68	65	+8	+10

4.2 Building Design for Road Traffic Noise Reduction

Detailed façade design requirements are presented for the non-residential component of the development, and for the residential facades that exceed the criteria presented in Section 2.2. AS3671-1989 Acoustics-Road traffic noise intrusion-Building siting and construction provides guidance on the location and construction of new buildings near major roads. The exterior design noise levels have been calculated from the road traffic noise forecasts presented in Section 4.1. Forecast L_{10} , 18hr values have been converted to L_{eq} , 1hr max day/night according to the relationship between descriptors measured on 9th August 2023 at the site, the relationships are as follows:

- L_{Aeq} , 1hr max day = LA_{10} , 18hr + 4.0 dB
- L_{Aeq} , 1hr max night = LA_{10} , 18hr + 2.1 dB

Australian Standard 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors provides relevant interior design sound level ranges for Residential Buildings, Health Buildings and Office Buildings:

- Residential Buildings (Houses and apartments in suburban areas or near minor roads)
 - Living areas, work areas: 30 to 40 dB(A) $L_{eq,t}$
 - Sleeping areas (night): 30 to 35 dB(A) $L_{eq,t}$
 - Work areas: 35 to 40 dB(A) $L_{eq,t}$
- Health Buildings
 - Consulting Rooms: 40 to 45 dB(A) $L_{eq,t}$
 - Waiting rooms, reception areas: 40 to 50 dB(A) $L_{eq,t}$
 - Dining areas: 40 to 45 dB(A) $L_{eq,t}$
 - Patient lounge: 40 to 45 dB(A) $L_{eq,t}$
 - Kitchens, sterilizing and service areas: < 55 dB(A) $L_{eq,t}$
 - Office Areas: 35 to 45 dB(A) $L_{eq,t}$
- Office Buildings
 - Board and conference rooms: 30 to 40 dB(A) $L_{eq,t}$

The required traffic noise reduction levels (TNR) for the building design have been calculated to achieve the internal noise goals. Detailed calculations to AS3671 are presented in **Table 4.5**. Calculations for residential units are based on a nominal 1.8 x 1.8m window into a 3 x 3m bedroom. Assessment is made to night noise levels and criteria for residential units, and to daytime noise levels for non-residential spaces.

Specific building materials or construction methods are not recommended as the various components must be fit for their purpose and can only be determined by the building designer and relevant manufacturer relevant to the STC/Rw calculations presented in **Table 4.5**.

Table 4.5 STC / Rw Calculations to achieve the internal noise goals.

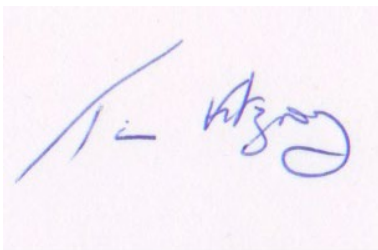
Room	Element	Façade	External LAeq	AS2107 Criteria	TNR	AS3671 Category	Element Area	Floor Area	Ceiling Height (m)	RT60 (s)	C	TNAc	STC/Rw
Cluster 1 U1	Window	S	56.8	35	22	Category 2	3.24	9.00	2.70	0.50	3	22.59	29
Cluster 1 U1	Wall	S	56.8	35	22	Category 2	4.86	9.00	2.70	0.50	3	24.35	30
Cluster 1 U1	Roof		56.8	35	22	Category 2	1.00	1.00	2.70	0.50	3	27.03	33
Cluster 1 U1	Window	W	56.6	35	22	Category 2	3.24	9.00	2.70	0.50	3	22.39	28
Cluster 1 U1	Wall	W	56.6	35	22	Category 2	4.86	9.00	2.70	0.50	3	24.15	30
Cluster 2 U1	Window	E	57.3	35	22	Category 2	3.24	9.00	2.70	0.50	3	23.09	29
Cluster 2 U1	Wall	E	57.3	35	22	Category 2	4.86	9.00	2.70	0.50	3	24.85	31
Cluster 2 U1	Roof		61.7	35	27	Category 3	1.00	1.00	2.70	0.50	3	31.93	38
Cluster 2 U1	Window	S	61.7	35	27	Category 3	3.24	9.00	2.70	0.50	3	27.49	33
Cluster 2 U1	Wall	S	61.7	35	27	Category 3	4.86	9.00	2.70	0.50	3	29.25	35
Cluster 2 U1	Window	W	55.7	35	21	Category 2	3.24	9.00	2.70	0.50	3	21.49	27
Cluster 2 U1	Wall	W	55.7	35	21	Category 2	4.86	9.00	2.70	0.50	3	23.25	29
Cluster 3 U1	Window	E	57.4	35	22	Category 2	3.24	9.00	2.70	0.50	3	23.19	29
Cluster 3 U1	Wall	E	57.4	35	22	Category 2	4.86	9.00	2.70	0.50	3	24.95	31
Cluster 3 U1	Roof		57.4	35	22	Category 2	1.00	1.00	2.70	0.50	3	27.63	34
Cluster 3 U2	Window	W	58.7	35	24	Category 2	3.24	9.00	2.70	0.50	3	24.49	30
Cluster 3 U2	Wall	W	58.7	35	24	Category 2	4.86	9.00	2.70	0.50	3	26.25	32
Cluster 3 U2	Roof		58.9	35	24	Category 2	1.00	1.00	2.70	0.50	3	29.13	35
Cluster 3 U2	Window	E	58.9	35	24	Category 2	3.24	9.00	2.70	0.50	3	24.69	31
Cluster 3 U2	Wall	E	58.9	35	24	Category 2	4.86	9.00	2.70	0.50	3	26.45	32
Cluster 3 U3	Window	W	61.8	35	27	Category 3	3.24	9.00	2.70	0.50	3	27.59	34
Cluster 3 U3	Wall	W	61.8	35	27	Category 3	4.86	9.00	2.70	0.50	3	29.35	35
Cluster 3 U3	Roof		65.6	35	31	Category 3	1.00	1.00	2.70	0.50	3	35.83	42
Cluster 3 U3	Window	S	65.6	35	31	Category 3	3.24	9.00	2.70	0.50	3	31.39	37
Cluster 3 U3	Wall	S	65.6	35	31	Category 3	4.86	9.00	2.70	0.50	3	33.15	39
Cluster 3 U3	Window	E	61.9	35	27	Category 3	3.24	9.00	2.70	0.50	3	27.69	34
Cluster 3 U3	Wall	E	61.9	35	27	Category 3	4.86	9.00	2.70	0.50	3	29.45	35
Core,Conference	Wall	E	66.2	40	26	Category 3	6.48	28.00	2.70	0.50	3	25.07	31
Core,Conference	Wall	S	68.3	40	28	Category 3	4.50	28.00	2.70	0.50	3	25.59	32
Core,Conference	Sliding Door	S	68.3	40	28	Category 3	6.30	28.00	2.70	0.50	3	27.05	33
Core,Consult 1	Wall	S	67.1	45	22	Category 2	4.32	14.10	2.70	0.50	3	22.19	28
Core,Consult 1	Sliding Door	S	67.1	45	22	Category 2	3.78	14.10	2.70	0.50	3	21.61	28
Core,Consult 1	Wall	W	64.9	45	20	Category 2	12.69	14.10	2.70	0.50	3	24.67	31
Core,Consult 2	Wall	S	66.2	45	21	Category 2	4.32	14.10	2.70	0.50	3	21.29	27
Core,Consult 2	Sliding Door	S	66.2	45	21	Category 2	3.78	14.10	2.70	0.50	3	20.71	27
Core,Kid Space	Wall	E	61.9	45	17	Category 2	9.99	21.09	2.70	0.50	3	18.88	25
Core,Living	Wall	E	64.4	45	19	Category 2	12.42	34.50	2.70	0.50	3	20.19	26
Core,Living	Wall	S	67.1	45	22	Category 2	13.95	34.50	2.70	0.50	3	23.40	29
Core,Living	Sliding Door	S	67.1	45	22	Category 2	6.30	34.50	2.70	0.50	3	19.94	26
Core,Seats-Waiting	Wall	W	63.2	50	13	Category 2	4.05	9.90	2.70	0.50	3	14.55	21
Core,Staff Office	Wall	S	68.2	45	23	Category 2	4.50	29.60	2.70	0.50	3	20.25	26
Core,Staff Office	Sliding Door	S	68.2	45	23	Category 2	6.30	29.60	2.70	0.50	3	21.71	28
Core,Staff Office	Wall	W	66.0	45	21	Category 2	6.48	29.60	2.70	0.50	3	19.63	26
Core,Waiting+Entry	Wall	W	67.3	50	17	Category 2	3.51	11.40	2.70	0.50	3	17.41	23
Core,Waiting+Entry	Door	W	67.3	50	17	Category 2	1.89	11.40	2.70	0.50	3	14.72	21
Core,Unit 1	Window	W	61.6	35	27	Category 3	3.24	9.00	2.70	0.50	3	27.39	33
Core,Unit 1	Wall	W	61.6	35	27	Category 3	4.86	9.00	2.70	0.50	3	29.15	35
Core,Unit 1	Window	S	64.4	35	29	Category 3	3.24	9.00	2.70	0.50	3	30.19	36
Core,Unit 1	Wall	S	64.4	35	29	Category 3	4.86	9.00	2.70	0.50	3	31.95	38
Core,Unit 3	Window	E	63.8	35	29	Category 3	3.24	9.00	2.70	0.50	3	29.59	36
Core,Unit 3	Wall	E	63.8	35	29	Category 3	4.86	9.00	2.70	0.50	3	31.35	37
Core,Unit 3	Window	W	63.6	35	29	Category 3	3.24	9.00	2.70	0.50	3	29.39	35
Core,Unit 3	Wall	W	63.6	35	29	Category 3	4.86	9.00	2.70	0.50	3	31.15	37
Core,Unit 3	Window	S	65.6	35	31	Category 3	3.24	9.00	2.70	0.50	3	31.39	37
Core,Unit 3	Wall	S	65.6	35	31	Category 3	4.86	9.00	2.70	0.50	3	33.15	39
Core,Unit 4	Window	E	61.0	35	26	Category 3	3.24	9.00	2.70	0.50	3	26.79	33
Core,Unit 4	Wall	E	61.0	35	26	Category 3	4.86	9.00	2.70	0.50	3	28.55	35
Core,Unit 4	Window	S	64.6	35	30	Category 3	3.24	9.00	2.70	0.50	3	30.39	36
Core,Unit 4	Wall	S	64.6	35	30	Category 3	4.86	9.00	2.70	0.50	3	32.15	38
Core	Roof		65.6	35	31	Category 3	1.00	1.00	2.70	0.50	3	35.83	42

It is concluded that –

- A noise model has been constructed to predict the propagation of noise from Johnston and Clark Streets onto the proposed buildings. The model includes shielding effects from surrounding buildings and topography.
- Residential facades within the development have been assessed against the façade criteria. The majority of facades meet the criteria and no specific acoustic construction is recommended for these facades (see Table 4.4).
- The required traffic noise reduction levels (TNR) for the non-residential component of the development, and for the residential facades that exceed the façade criteria, have been calculated to achieve the appropriate internal noise goals. The required traffic noise reductions (TNR) are between 13 and 31 dB and construction to Category 2 and 3 under AS3671 is required (depending on the façade, see Table 4.5):
 - Category 2: Standard construction, except for lightweight elements such as fibrous cement or metal cladding or all-glass facades. Windows, doors and other openings must be closed. TNR of approximately 25 dB(A) is expected.
 - Category 3: Special construction, chosen in accordance with Clause 3.4. Windows, doors and other openings must be closed. TNR between 25 and 35 dB(A) is expected.
- Calculated STC / Rw ratings are presented in Table 4.5.

It is recommended that the Rw requirements are confirmed once final detailed plans become available.

This report has been prepared by Tim Fitzroy of *Tim Fitzroy & Associates*. Noise modelling was undertaken by Matt Dever, *Noise Measurement Services, Brisbane*.



Tim Fitzroy
Environmental Health Scientist
Environmental Auditor

References

- NSW EPA 2017 Noise Policy for Industry, Environment Protection Authority, Sydney
- NSW DECC, 2009 Noise Guide for Local Government, Department of Environment, Climate Change & Water, Sydney
- A/NZ Standards, 1987 Internal noise limits from Australian/New Zealand Standard AS/NZS 2107:1987.
- World Health Organisation 1999 Guidelines for Community Noise (Editor B Berglund et al Geneva Switzerland 1999)

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A Development Plans

north (typical)

BASIX P1 11Sept23



CASINO SITE - Drawing Register

Sheet No	Sheet Name	Issue Date
DD 0-	NOTES AND SITE 3Ds	
DD 0-01	DWG REGISTER + 3D	11Sept23
DD 0-02	3D OVERALL Views	11Sept23
DD 1-	SITE PLANS	
DD 1-01A	Site Context	11Sept23
DD 1-01B	Site Constraints A1	-
DD 1-01C	Site Constraints A3	-
DD 1-02	Site Plan A1	11Sept23
DD 1-03	Site Plan Part - CLARK ST	11Sept23
DD 1-04	Site Plan Part - JOHNSTON ST	11Sept23
DD 1-05	Site Plan Upper - JOHNSTON ST	11Sept23
DD 1-11	STAGING Option 2 Ground	-
DD 1-12	Site Plan STAGING Option 2	-
DD 1-21	COURTYARD Entries - C+C	-
DD 1-22	COURTYARD Entries - Detail	-
DD 1-31	COURTYARD Entries - CHIFF	-
DD 2-	BUILDING PLANS on SITE	
DD 2-01	Building Plans - CORE GROUND	11Sept23
DD 2-02	Building Plans - CORE UPPER	11Sept23
DD 2-11	CLUSTER (Core+Cluster)	11Sept23
DD 2-12	CLUSTER (CHIFF)	11Sept23
DD 3-	SITE SERVICES	
DD 3-01	Site Services A1	11Sept23
DD 3-02	Site Services A3	11Sept23
DD 4-	SITE ELEVATIONS	
DD 4-00	KEY Elev+Sect	11Sept23
DD 4-01	Site Elev South - JOHNSTON ST	11Sept23
DD 4-02A	Site Elevation East CLARK ST	11Sept23
DD 4-02B	Site Elevation East SHOPTOP	11Sept23
DD 4-03	Site Elevation - WEST	11Sept23
DD 4-04	Site Elevation - NORTH	11Sept23
DD 5-	SITE DETAILS	
DD 5-01	DETAIL Site Section Levels	11Sept23
DD 9-	SITE AREAS	
DD 9-01	SITE AREA Plan - GROUND	11Sept23
DD 9-02	SITE AREA Plan - UPPER	11Sept23

1 3D Cnr Johnston + Clark St



1 JOHNSTON ST 3d
DD 0-02



2 CNR JOHNSTON+CLARK 3d
DD 0-02



3 CLARK ST 3d
DD 0-02



4 NW 3D
DD 0-02



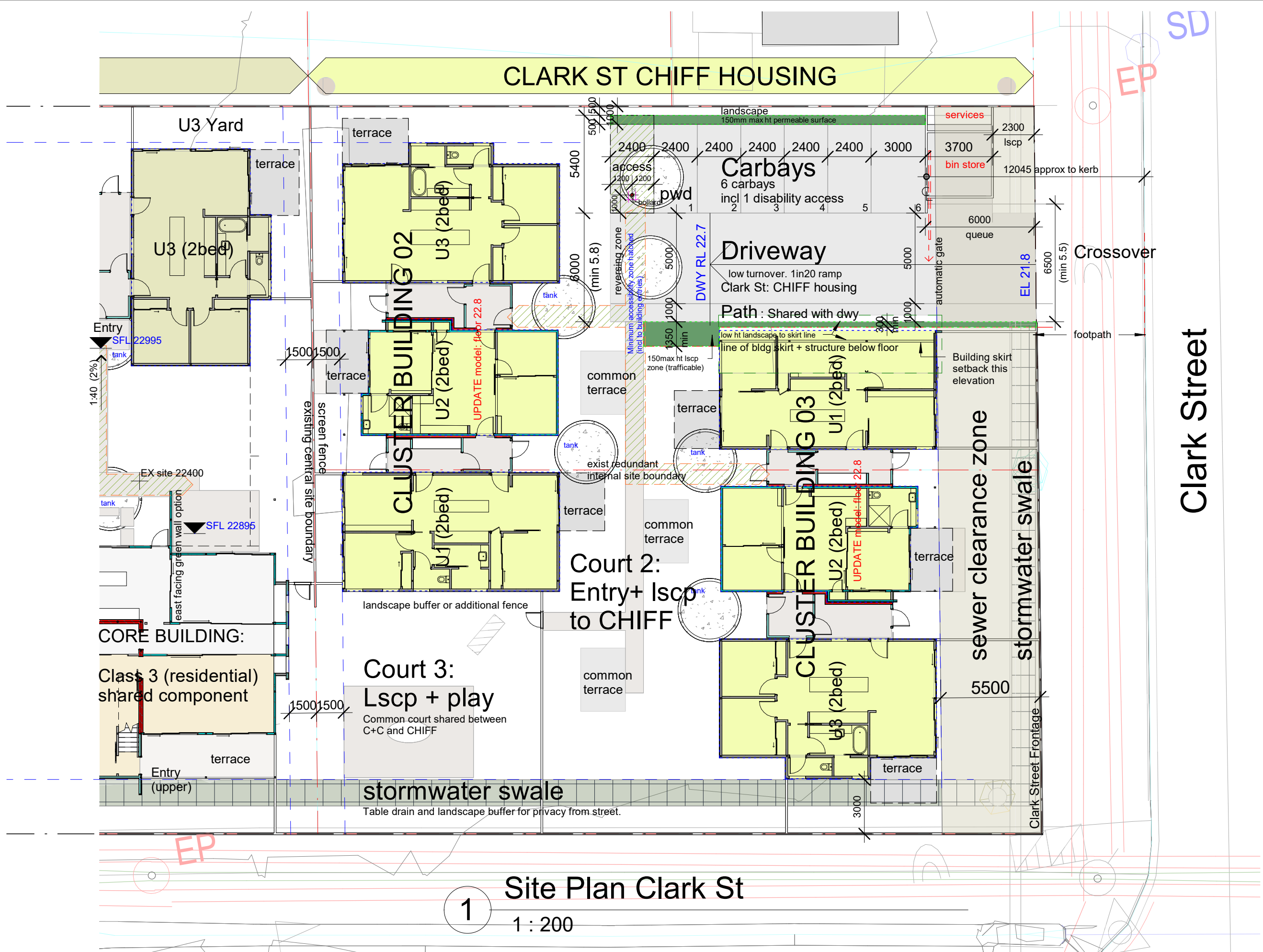
Johnston Street

Clark Street

1 Site Context Plan
1 : 500

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1 Site Plan Clark St
1 : 200



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REV	SCHEDULE	date	Description
1	printed	11/09/2023 12:55:18 PM	

PROJECT
CHIFF + Core+Cluster

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SHEET NAME
**Site Plan Part -
CLARK ST
DD 1-03**
DRAWING NO.

Document Set ID: Y906122
Version: 1, Version Date: 15/02/2024

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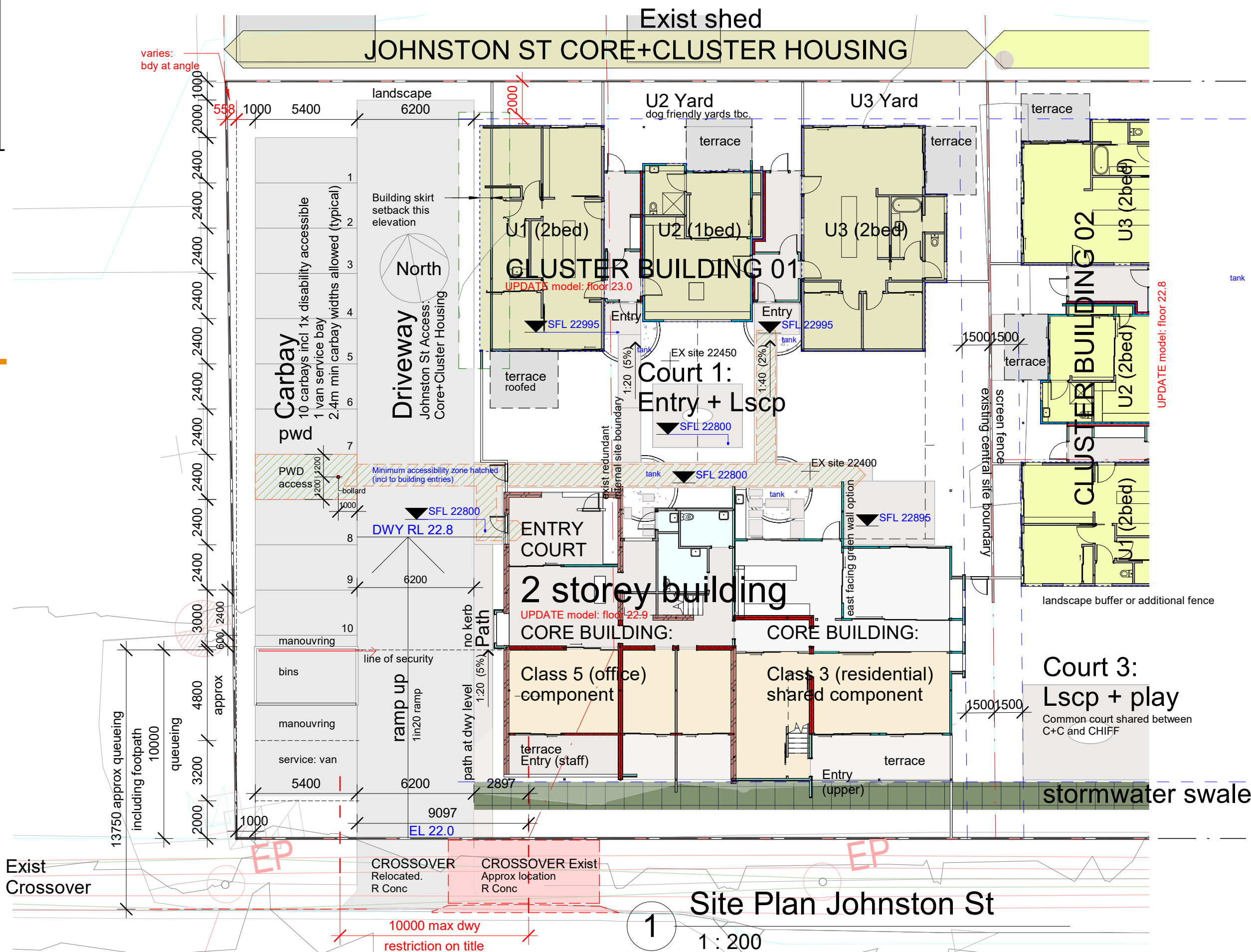
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Site Plan Johnston St

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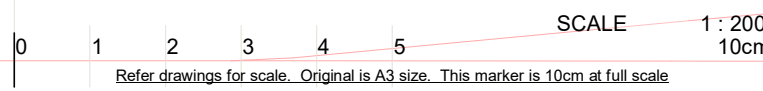
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1	11/09/2023 12:55:20 PM		

PROJECT CHIFF + Core+Cluster

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Site Plan Part - JOHNSTON ST DD 1-04
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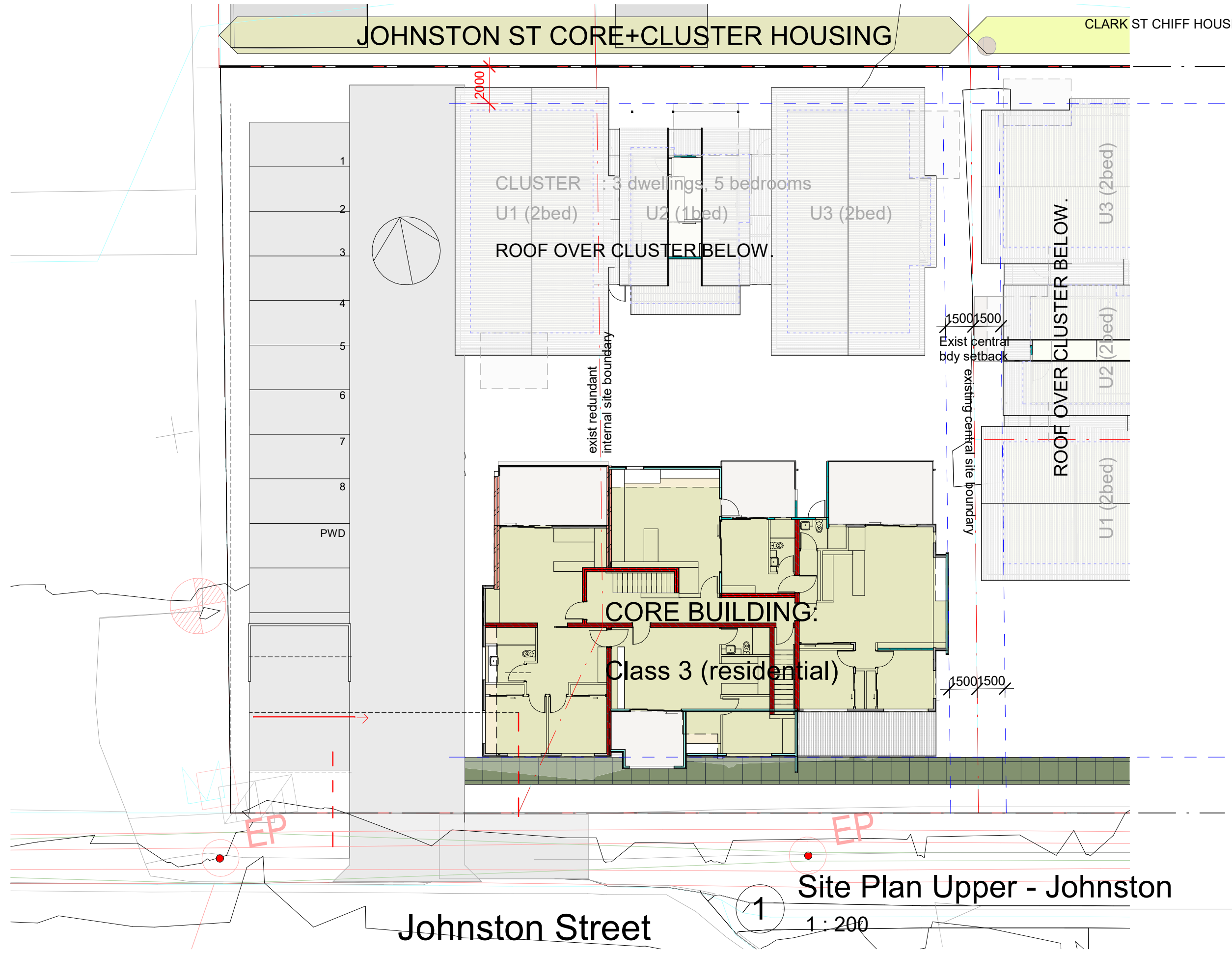


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JOHNSTON ST CORE+CLUSTER HOUSING

CLARK ST CHIFF HOUSING



Site Plan Upper - Johnston

1 : 200



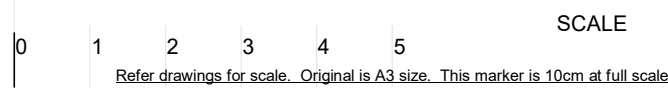
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REV	SCHEDULE	date	Description
0	printed	11/09/2023 12:55:21 PM	

PROJECT CHIFF + Core+Cluster



SCALE 1 : 200
10cm

CLIENT
Momentum Collective
cnr Johnston St + Clark St CASINO

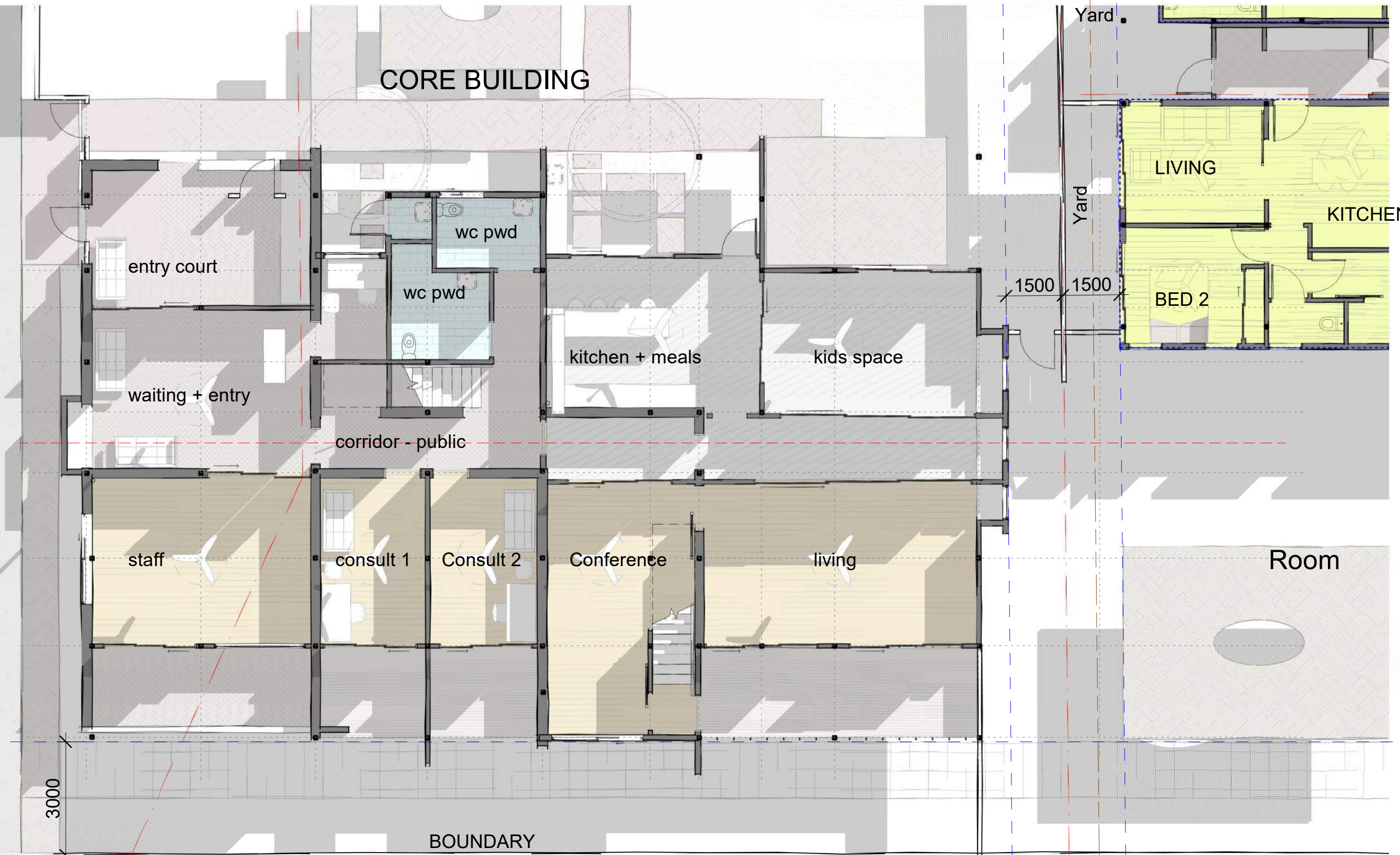
PROJECT NO.
0197:001-B

SHEET NAME
**Site Plan Upper -
 JOHNSTON ST
 DD 1-05**
 DRAWING NO.

BASIX P1 11Sept23
 ISSUE

BASIX P1 11Sept23

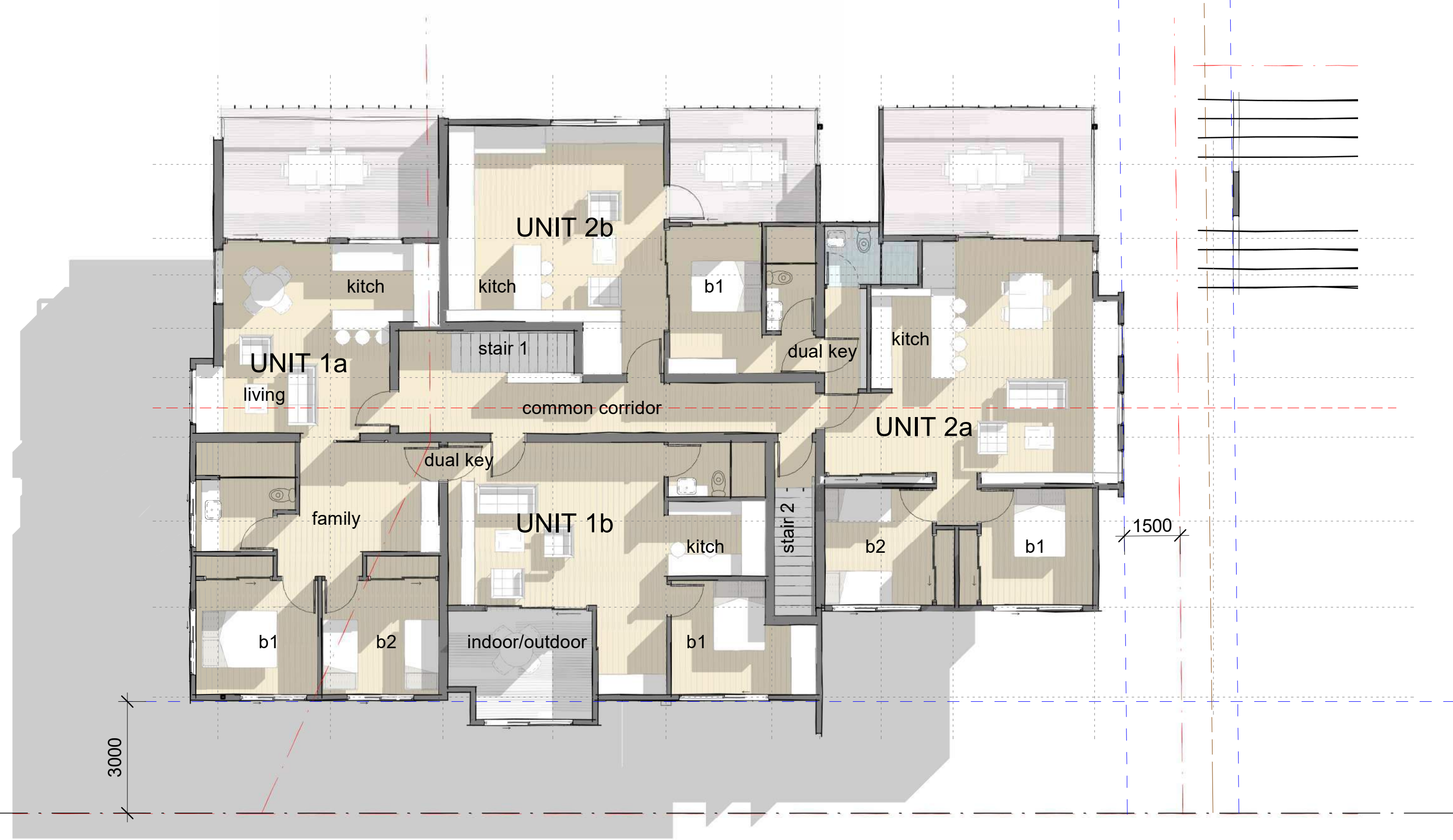
north (typical)



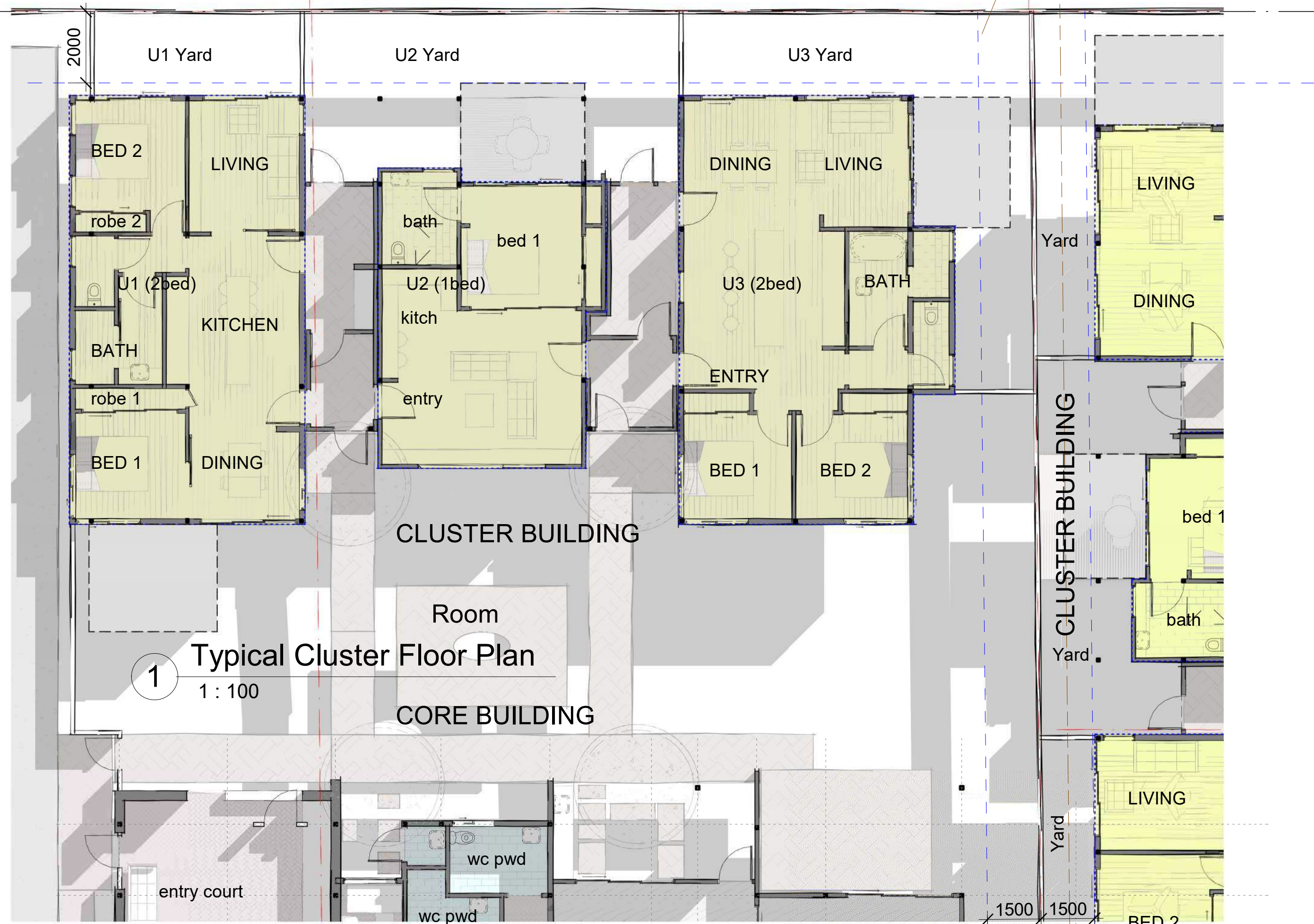
1 Ground Floor Level - Core
1 : 100

BASIX P1 11Sept23

north (typical)



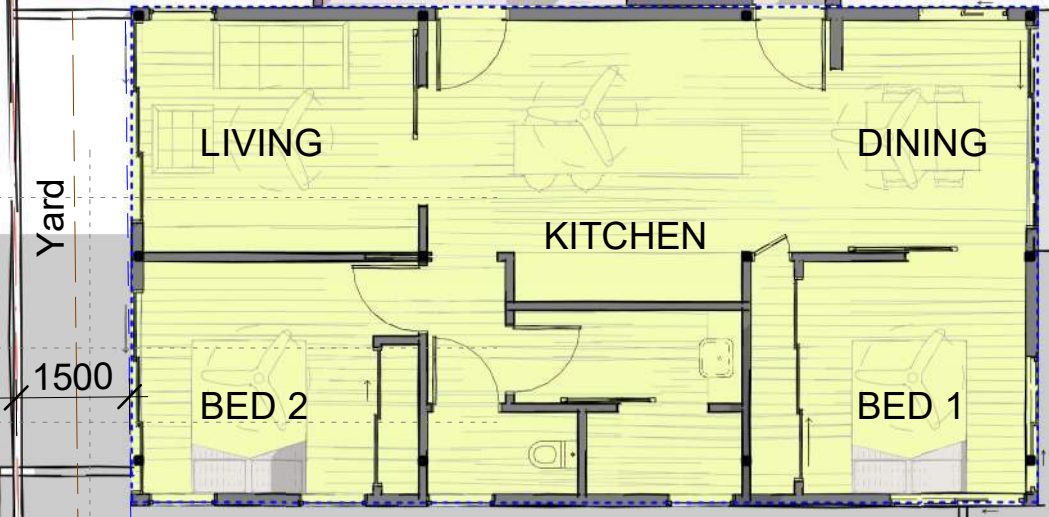
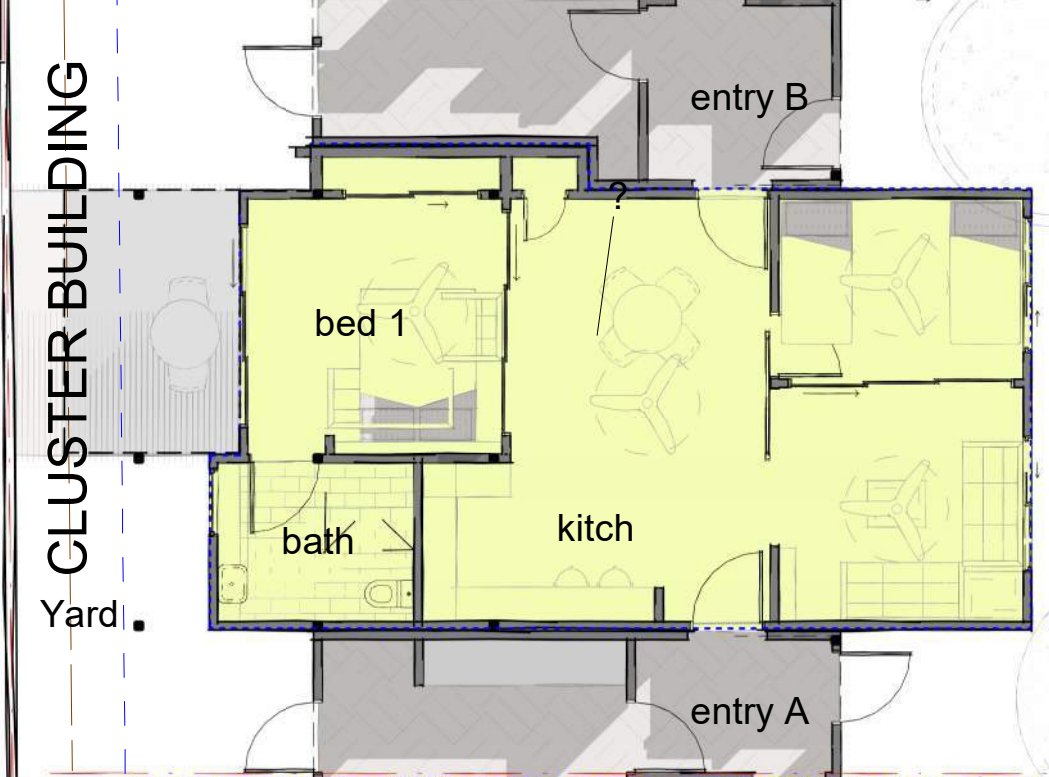
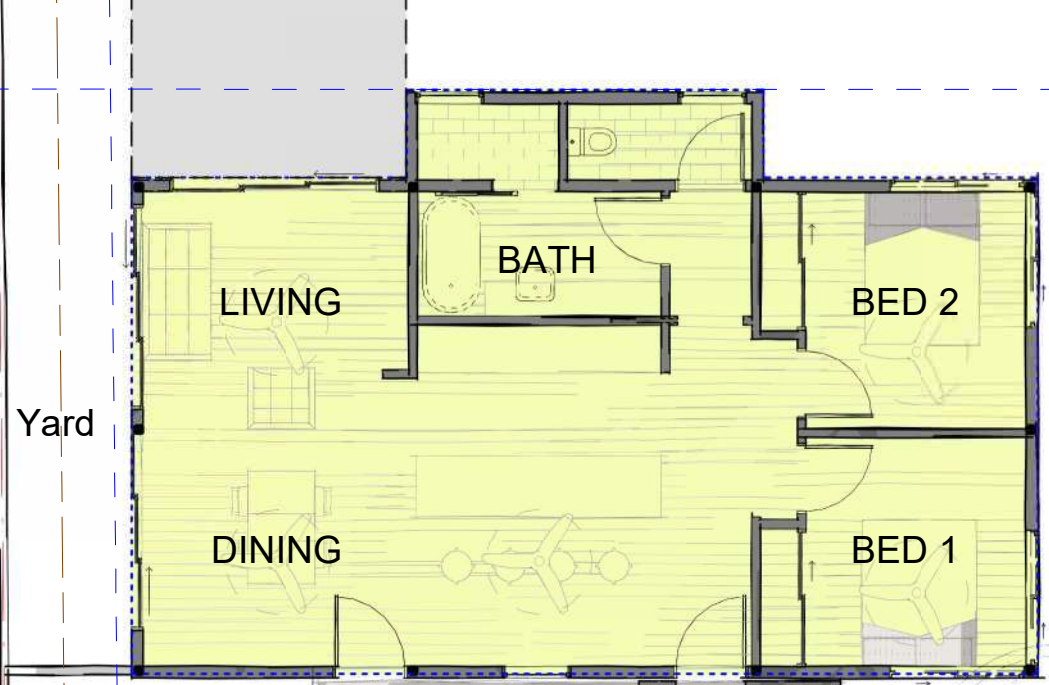
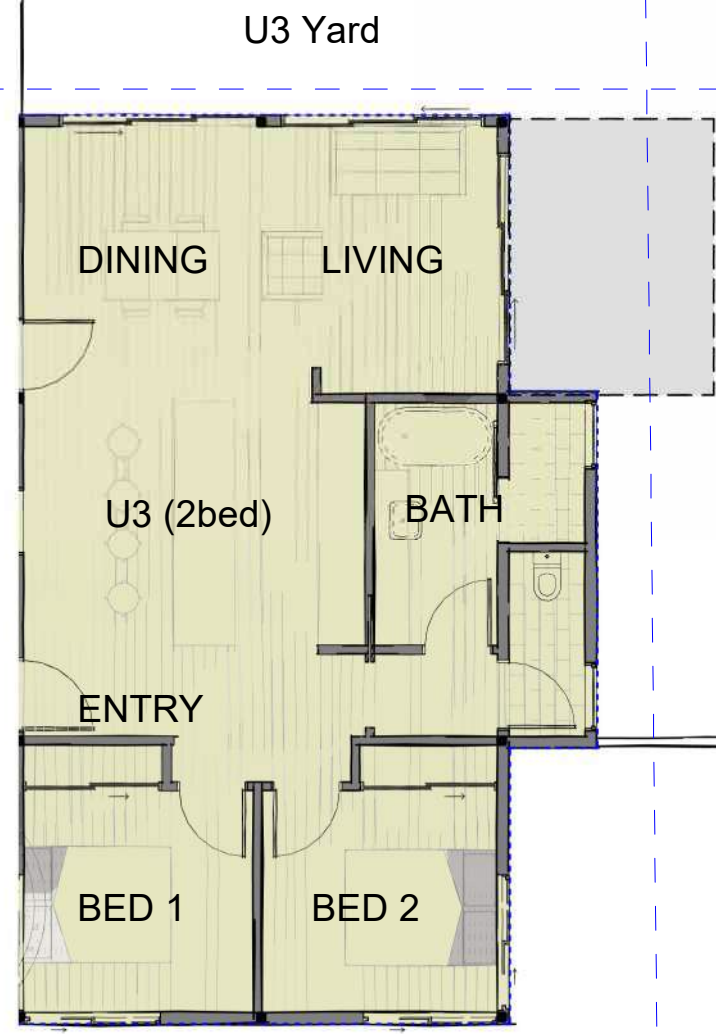
1 Upper Floor Level
1 : 100



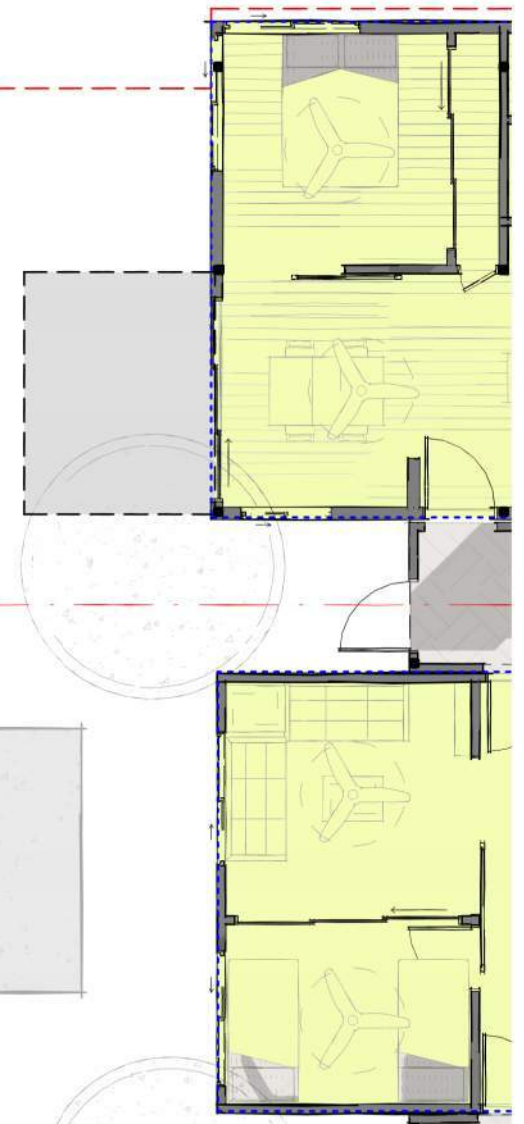
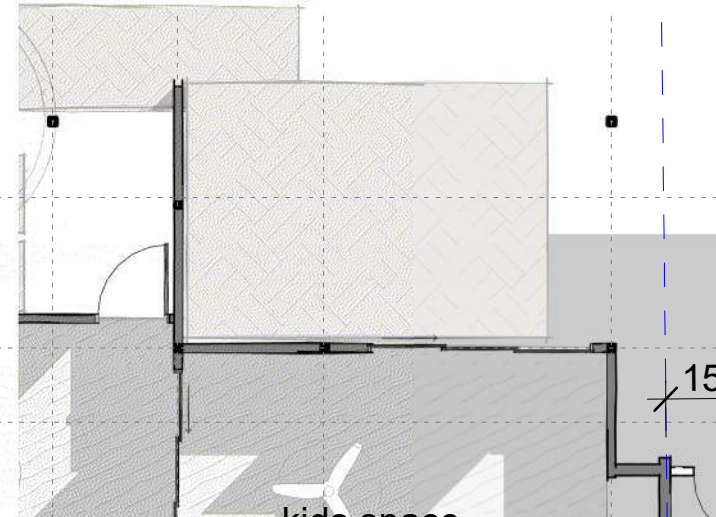
1 Typical Cluster Floor Plan
1 : 100

BASIX P1 11Sept23

north (typical)



1 Cluster Floor Plan - CHIFF
1 : 100



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REV	SCHEDULE	date	Description
1	printed	11/09/2023 12:55:36 PM	

PROJECT
CHIFF + Core+Cluster

0 1 2 3 4 5
Refer drawings for scale. Original is A3 size. This marker is 10cm at full scale

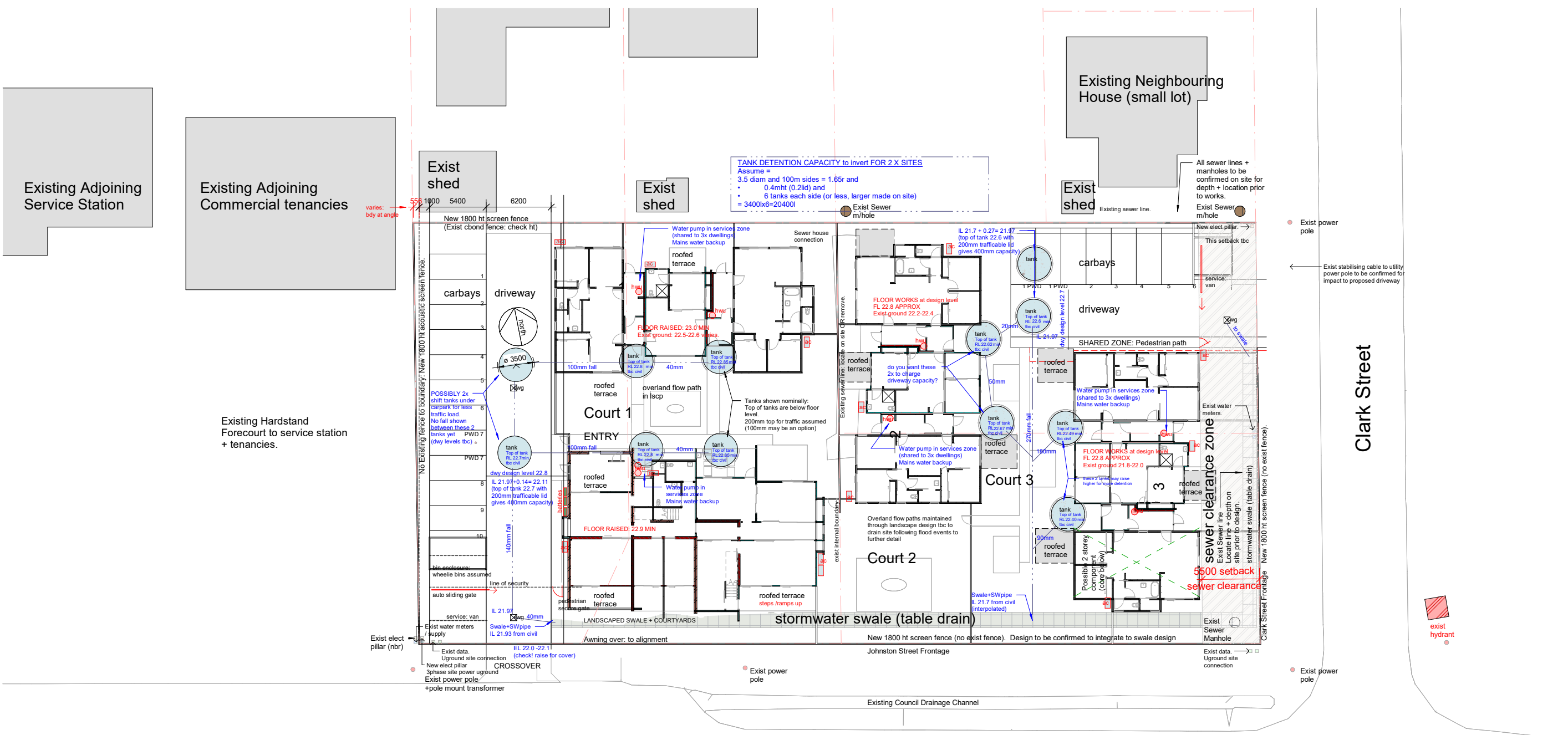
CLIENT
Momentum Collective
cnr Johnston St + Clark St CASINO

SCALE 1 : 100
10cm
PROJECT NO.
0197:001-B

SHEET NAME
CLUSTER (CHIFF)

DD 2-12 BASIX P1 11Sept23
DRAWING NO. ISSUE

9 Sept 23 - BASIX P1 11 Sept 23



Johnston Street

1 SITE SERVICES A1
 DD 3-01 1 : 200 @ A1 size. A3 is 50% (1:400)

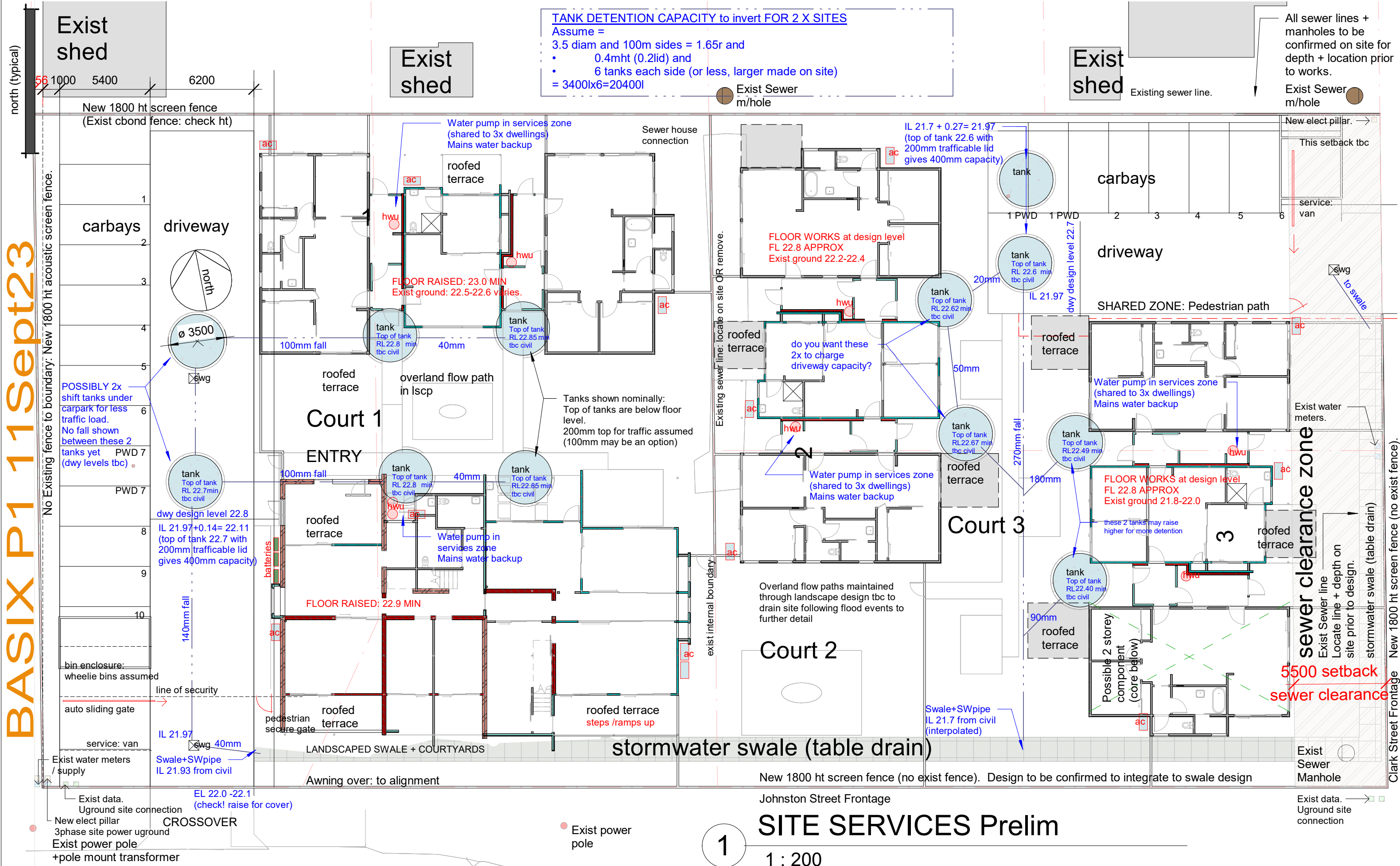
Momentum Collective
 CHIFF + Core+Cluster
 cnr Johnston St + Clark St
 CASINO
 0197-001-B
 DD 3-01
 9 Sept 23 BASIX P1 11 Sept 23

Revision Schedule		
Description	No	Date

BASIX P1 11Sept23

TANK DETENTION CAPACITY to invert FOR 2 X SITES
Assume =
3.5 diam and 100m sides = 1.65r and
• 0.4mht (0.2lid) and
• 6 tanks each side (or less, larger made on site)
= 3400x6=20400l
Exist Sewer m/hole

All sewer lines + manholes to be confirmed on site for depth + location prior to works.
Exist Sewer m/hole



SITE SERVICES Prelim

1 : 200

Existing Council Drainage Channel

CHIFF + Core+Cluster

REV	SCHEDULE	DATE	DESCRIPTION
1	11/09/2023	12:55:38 PM	printed

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SHEET NAME
Site Services A3

PROJECT NO.
0197:001-B

DD 3-02 BASIX P1 11Sept23
DRAWING NO. ISSUE

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Document Set ID: Y906122
Version: 1, Version Date: 15/02/2024

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SCALE 1 : 200
10cm
Refer drawings for scale. Original is A3 size. This marker is 10cm at full scale

BASIX P1 11Sept23

north (typical)

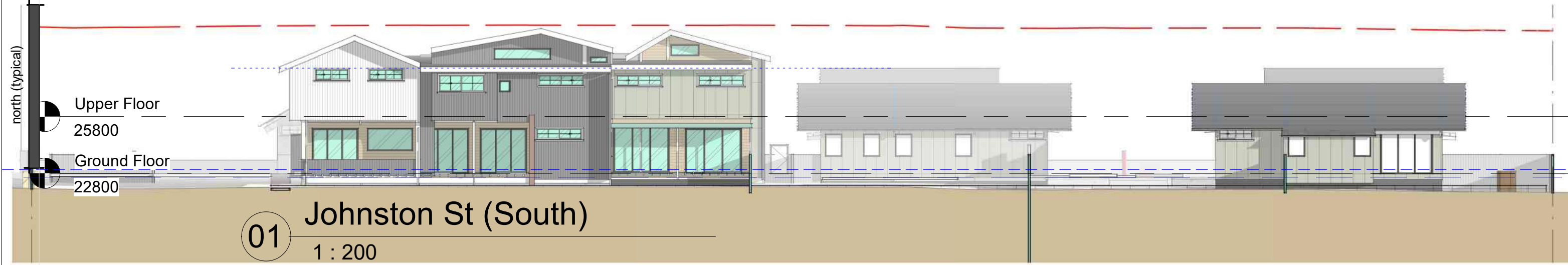


1 KEY PLAN - Elev + Sections
1 : 200

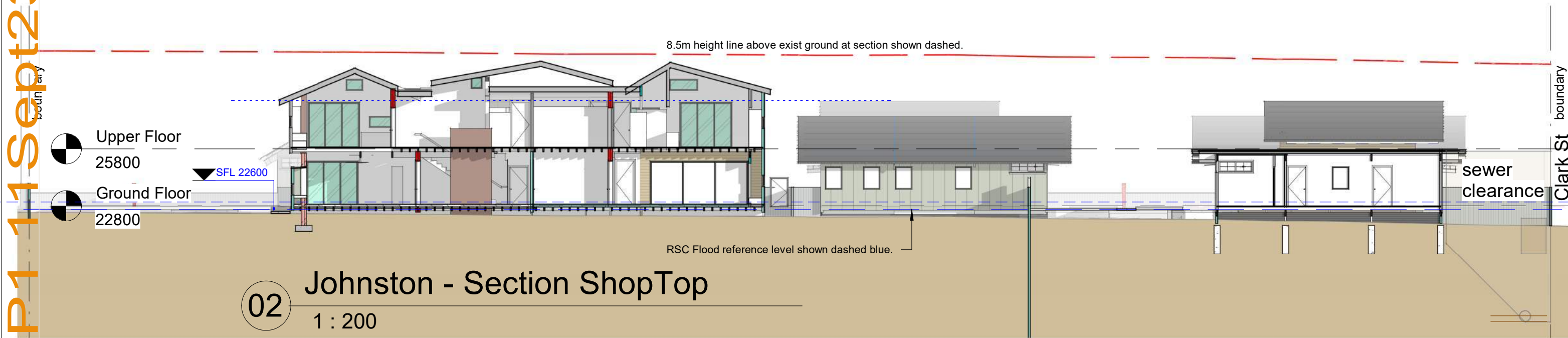
Johnston Street

Clark Street

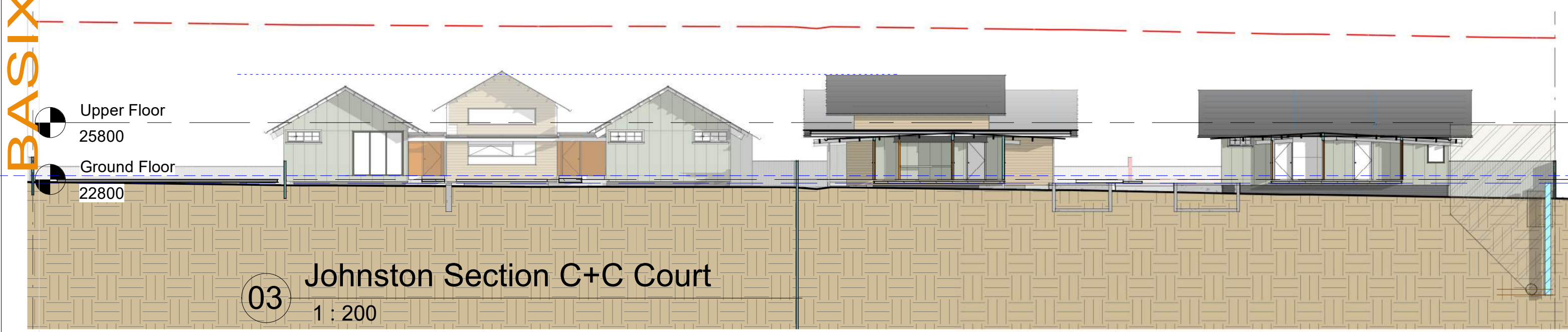
BASIX P1 11Sept23



01 Johnston St (South)
1 : 200



02 Johnston - Section ShopTop
1 : 200



03 Johnston Section C+C Court
1 : 200

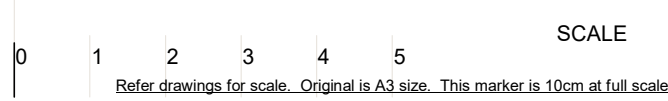


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rev no	11/09/2023	12:55:47 PM

PROJECT
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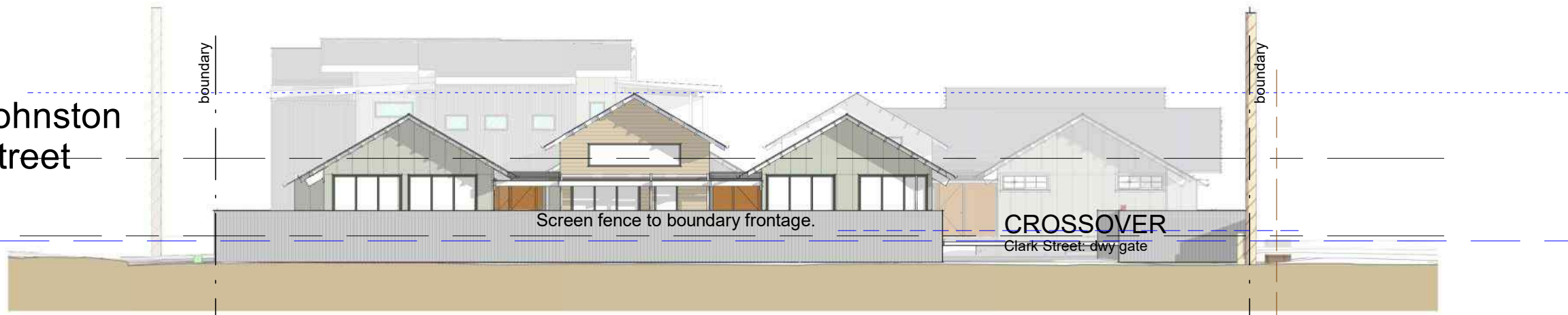
SHEET NAME
**Site Elev South -
JOHNSTON ST
DD 4-01**
DRAWING NO.
BASIX P1 11Sept23
ISSUE

BASIX P1 11Sept23

north (typical)

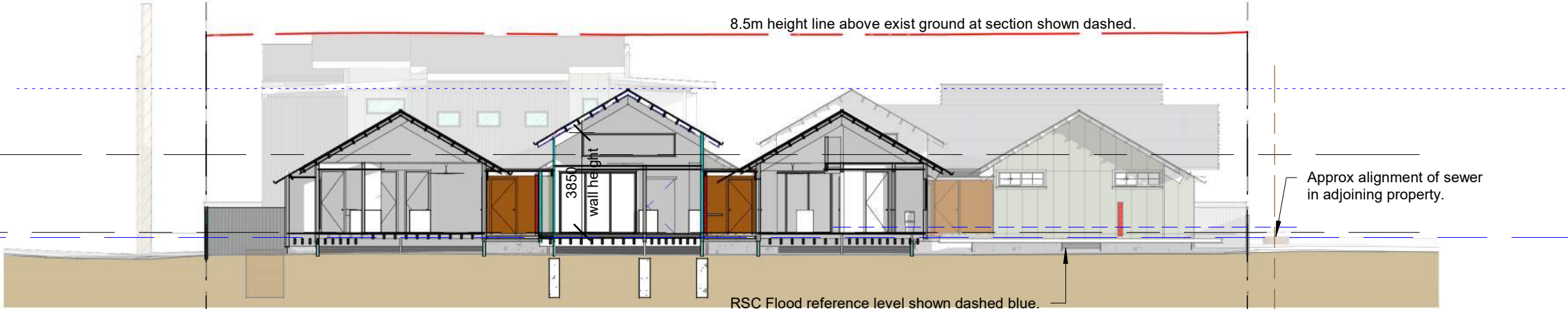
Upper Floor
25800
Ground Floor
22800

Johnston Street



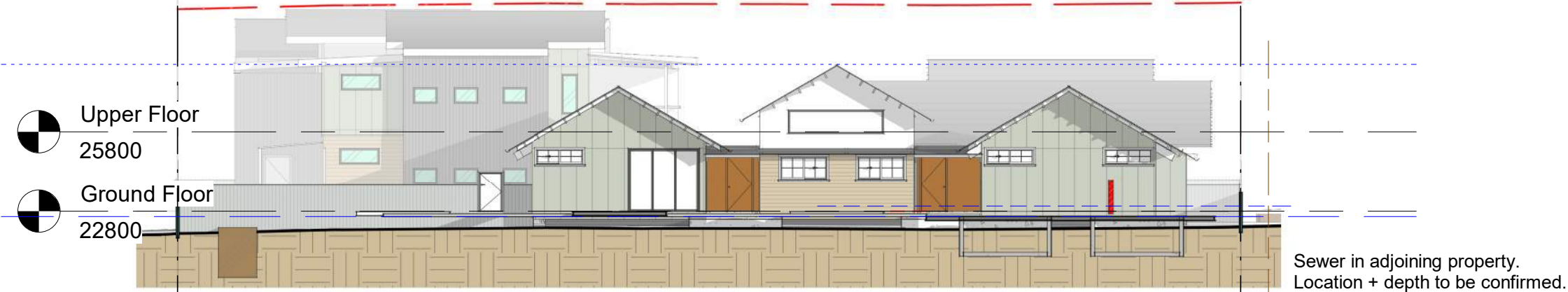
01 Clark St Frontage (East)
1 : 200

Upper Floor
25800
Ground Floor
22800



02 Clark Section CHIFF homes
1 : 200

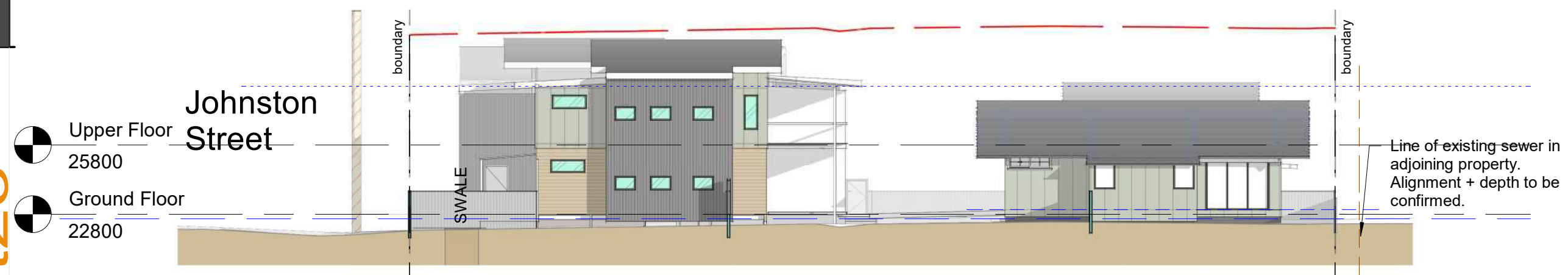
Upper Floor
25800
Ground Floor
22800



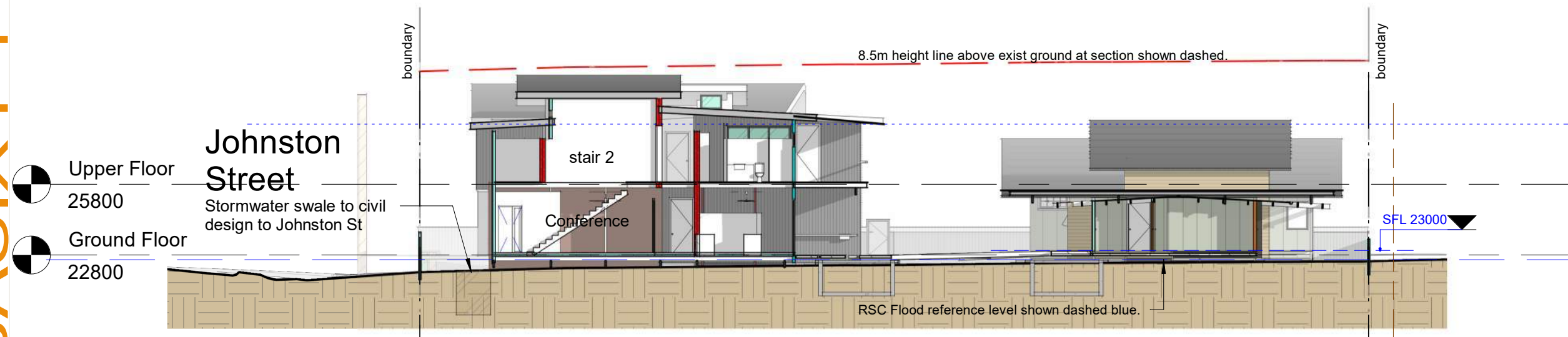
03 Clark Section CHIFF Court
1 : 200

BASIX P1 11Sept23

north (typical)



01 Shop Top (Core) Elevation
1 : 200



02 Shop Top (Core) Section
1 : 200

BASIX P1 11Sept23

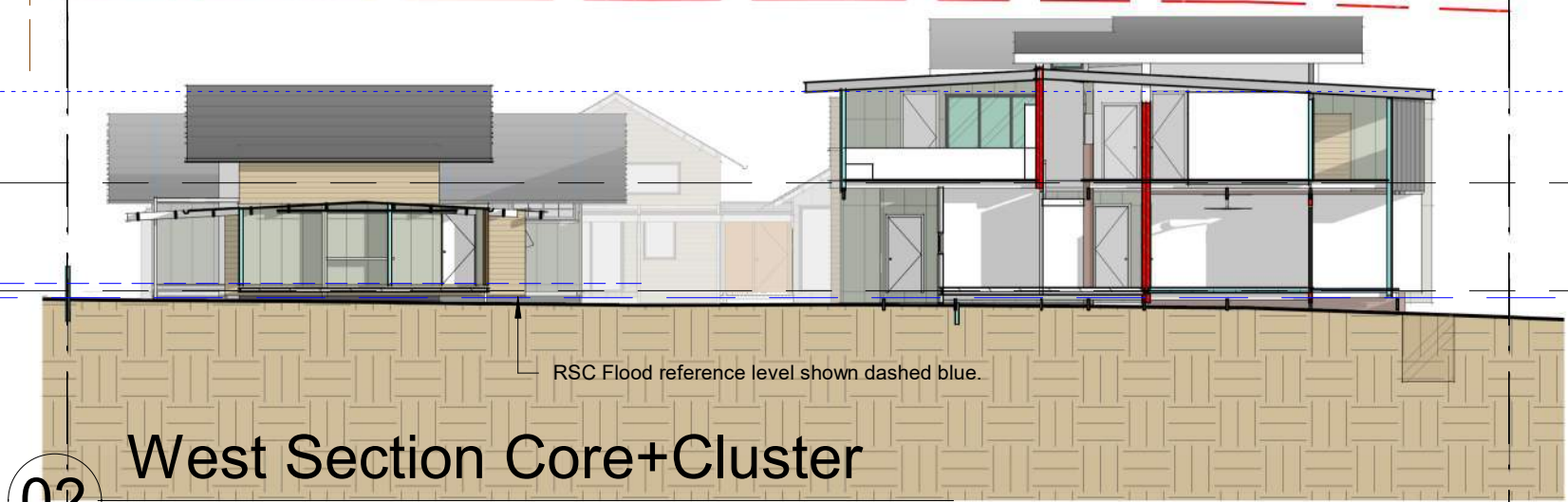
north (typical)



Johnston Street

01 Service Station (West)
1 : 200

8.5m height line above exist ground at section shown dashed.

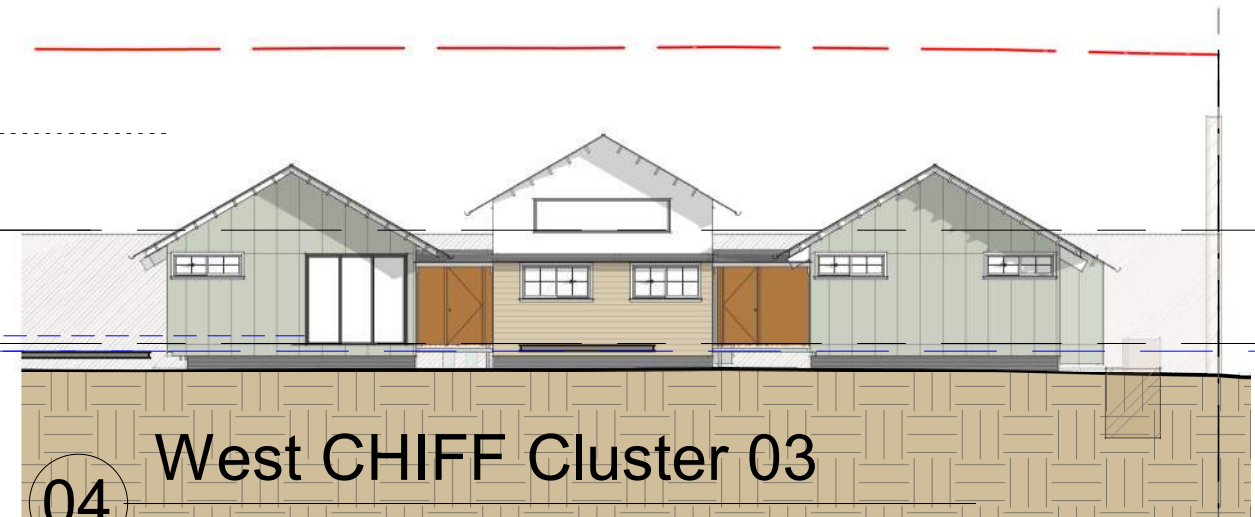


RSC Flood reference level shown dashed blue.

02 West Section Core+Cluster
1 : 200



03 West CHIFF Cluster 02
1 : 200



04 West CHIFF Cluster 03
1 : 200



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printed	11/09/2023 12:55:59 PM	

PROJECT
CHIFF + Core+Cluster

0 1 2 3 4 5
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SCALE
1 : 200
10cm

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PROJECT NO.
0197:001-B

Dwg Revision

SHEET NAME
Site Elevation - WEST
DD 4-03
DRAWING NO.

BASIX P1 11Sept23
ISSUE

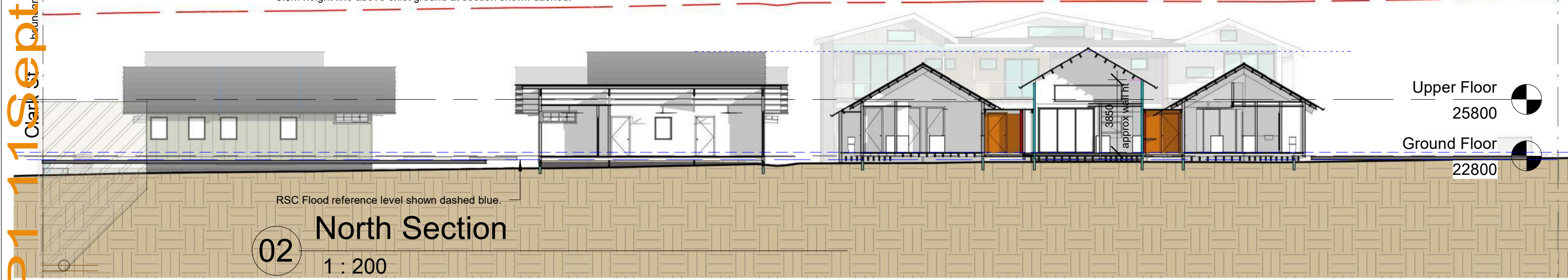
Document Set ID: Y908122
Version: 1, Version Date: 15/02/2024

BASIX P1 11Sept23



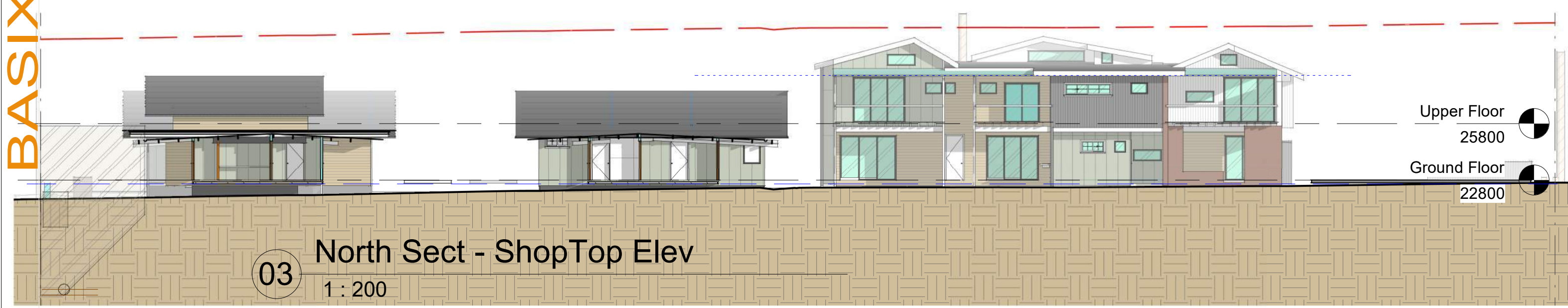
01 Side Boundary (North Elev)
1 : 200

8.5m height line above exist ground at section shown dashed.



02 North Section
1 : 200

RSC Flood reference level shown dashed blue.



03 North Sect - ShopTop Elev
1 : 200



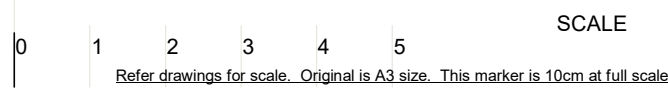
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REV SCHEDULE		
rev no	date	Description
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SCALE
1 : 200
10cm

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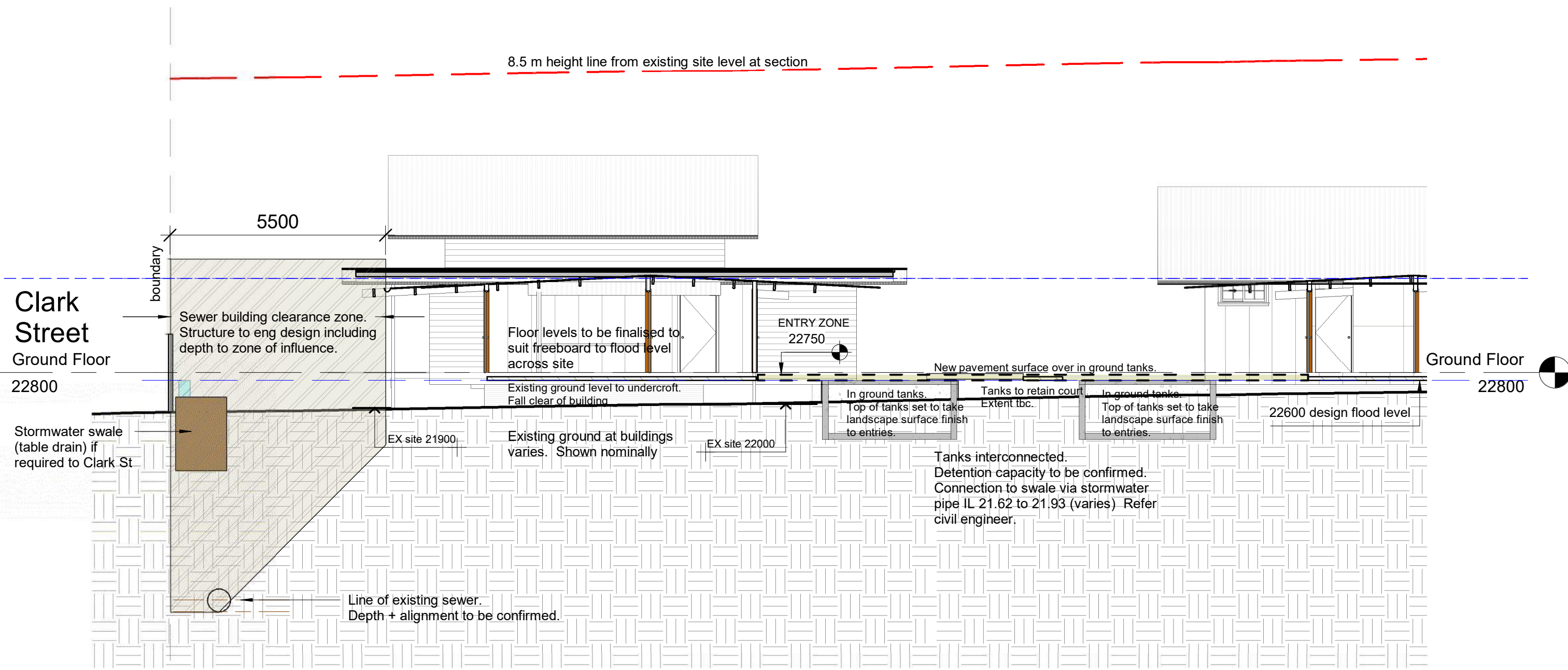
Dwg Revision

SHEET NAME
Site Elevation - NORTH
DD 4-04
DRAWING NO.

BASIX P1 11Sept23
ISSUE

BASIX P1 11Sept23

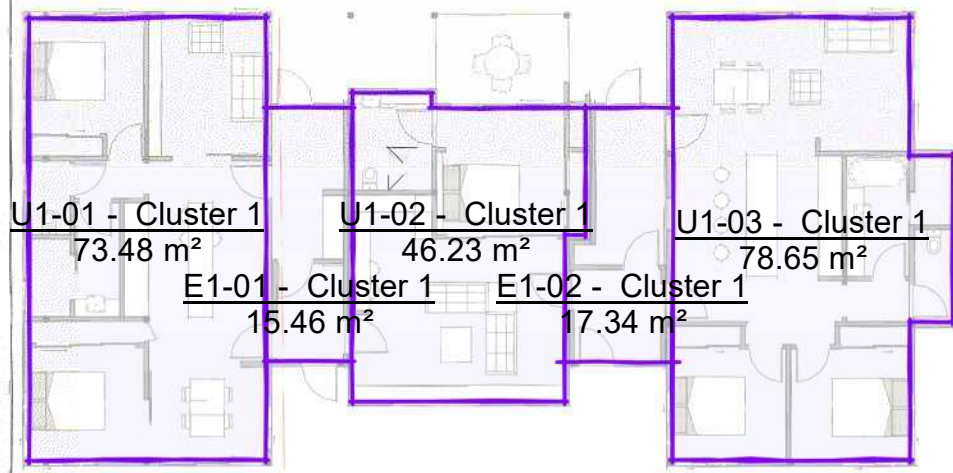
north (typical)



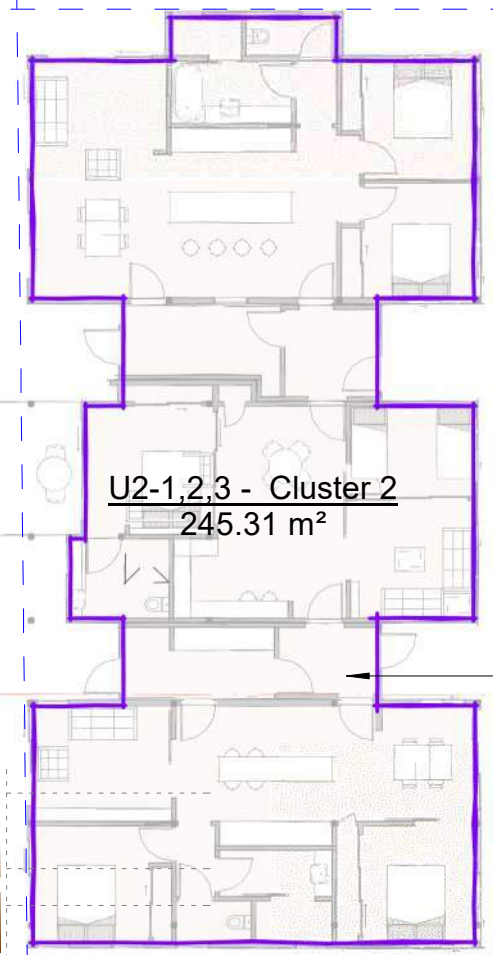
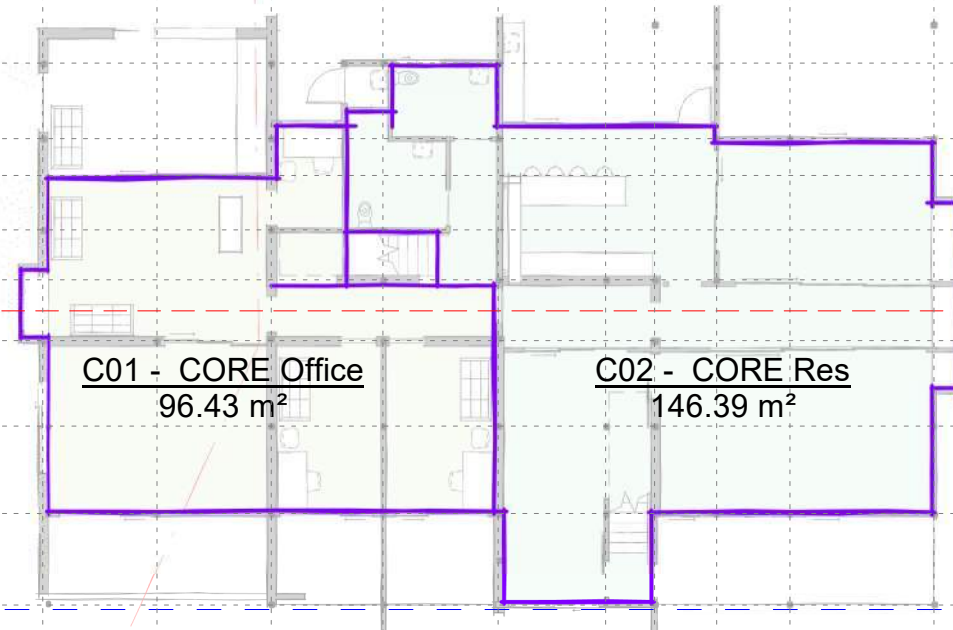
1 Concept Levels - Clark St
1 : 100

BASIX P1 11Sept23

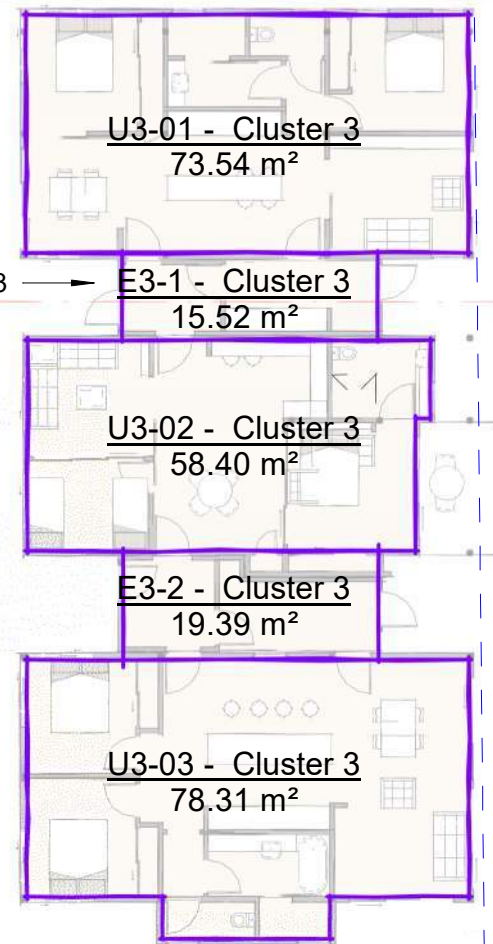
north (typical)



1 Site Cover (Ext Wall Line)
1 : 200

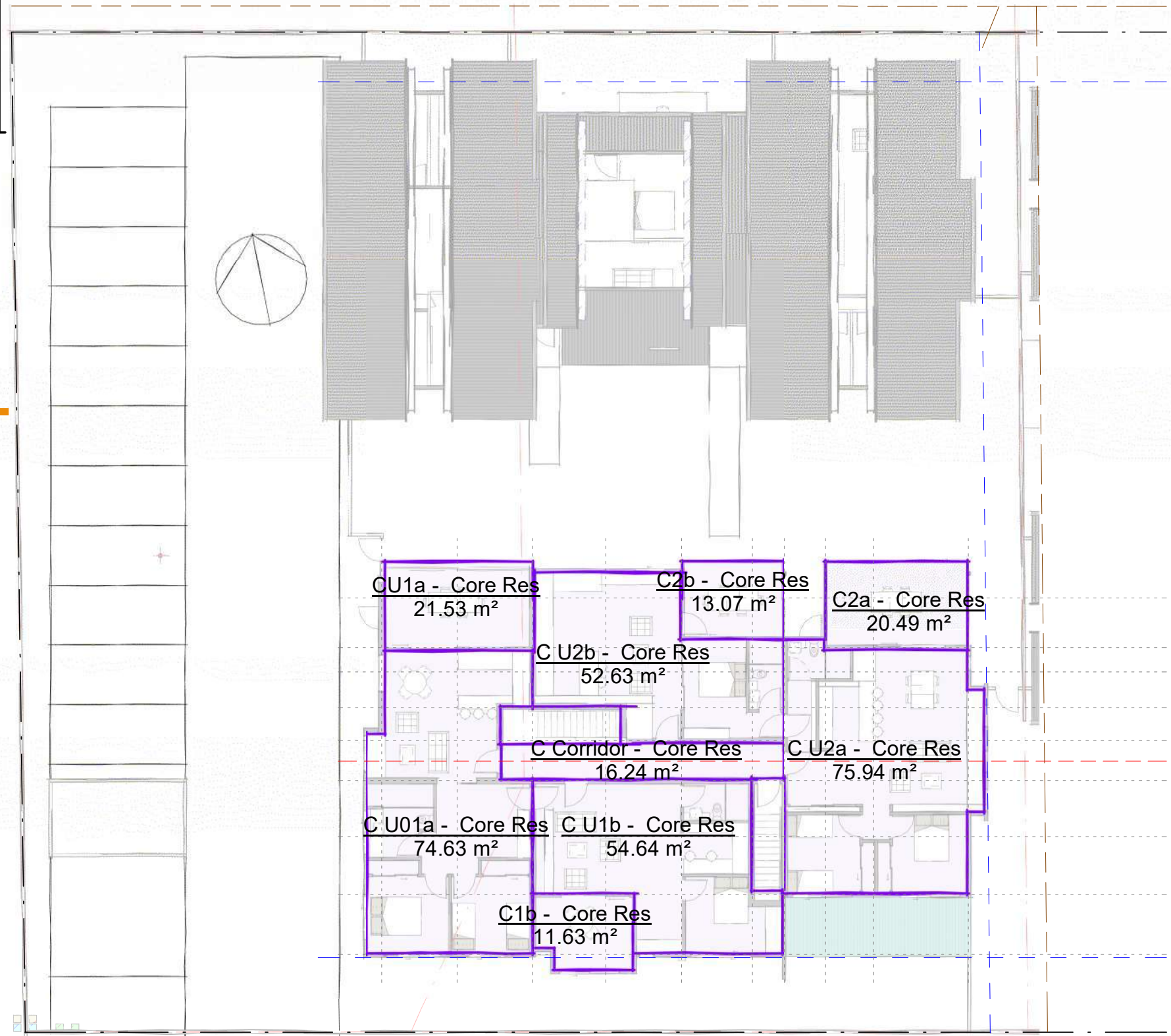


NOTE: CLUSTERS 2+3
Areas are identical.



BASIX P1 11Sept23

north (typical)



2 Upper Floor
1 : 200

Area Schedule (Gross Building)				
Name	Number	Area Type	Level	Area
Cluster 1	U1-02	Gross Building Area	Ground Floor	46 m ²
Cluster 1	U1-01	Gross Building Area	Ground Floor	73 m ²
Cluster 1	U1-03	Gross Building Area	Ground Floor	79 m ²
Cluster 1	E1-02	Gross Building Area	Ground Floor	17 m ²
Cluster 1	E1-01	Gross Building Area	Ground Floor	15 m ²
				231 m ²
				231 m ²
Cluster 2	U2-1,2,3	Gross Building Area	Ground Floor	245 m ²
				245 m ²
				245 m ²
Cluster 3	E3-2	Exterior Area	Ground Floor	19 m ²
Cluster 3	E3-1	Exterior Area	Ground Floor	16 m ²
				35 m ²
Cluster 3	U3-02	Gross Building Area	Ground Floor	58 m ²
Cluster 3	U3-01	Gross Building Area	Ground Floor	74 m ²
Cluster 3	U3-03	Gross Building Area	Ground Floor	78 m ²
				210 m ²
				245 m ²
CORE Office	C01	Gross Building Area	Ground Floor	96 m ²
				96 m ²
				96 m ²
CORE Res	C02	Gross Building Area	Ground Floor	146 m ²
				146 m ²
				146 m ²
Core Res	C1b	Exterior Area	Upper Floor	12 m ²
Core Res	CU1a	Exterior Area	Upper Floor	22 m ²
Core Res	C2b	Exterior Area	Upper Floor	13 m ²
Core Res	C2a	Exterior Area	Upper Floor	20 m ²
				67 m ²
Core Res	C U01a	Gross Building Area	Upper Floor	75 m ²
Core Res	C U1b	Gross Building Area	Upper Floor	55 m ²
Core Res	C U2a	Gross Building Area	Upper Floor	76 m ²
Core Res	C Corridor	Gross Building Area	Upper Floor	16 m ²
Core Res	C U2b	Gross Building Area	Upper Floor	53 m ²
				274 m ²
				341 m ²
Grand total				1305 m ²

BASIX P1 11Sept23

north (typical)



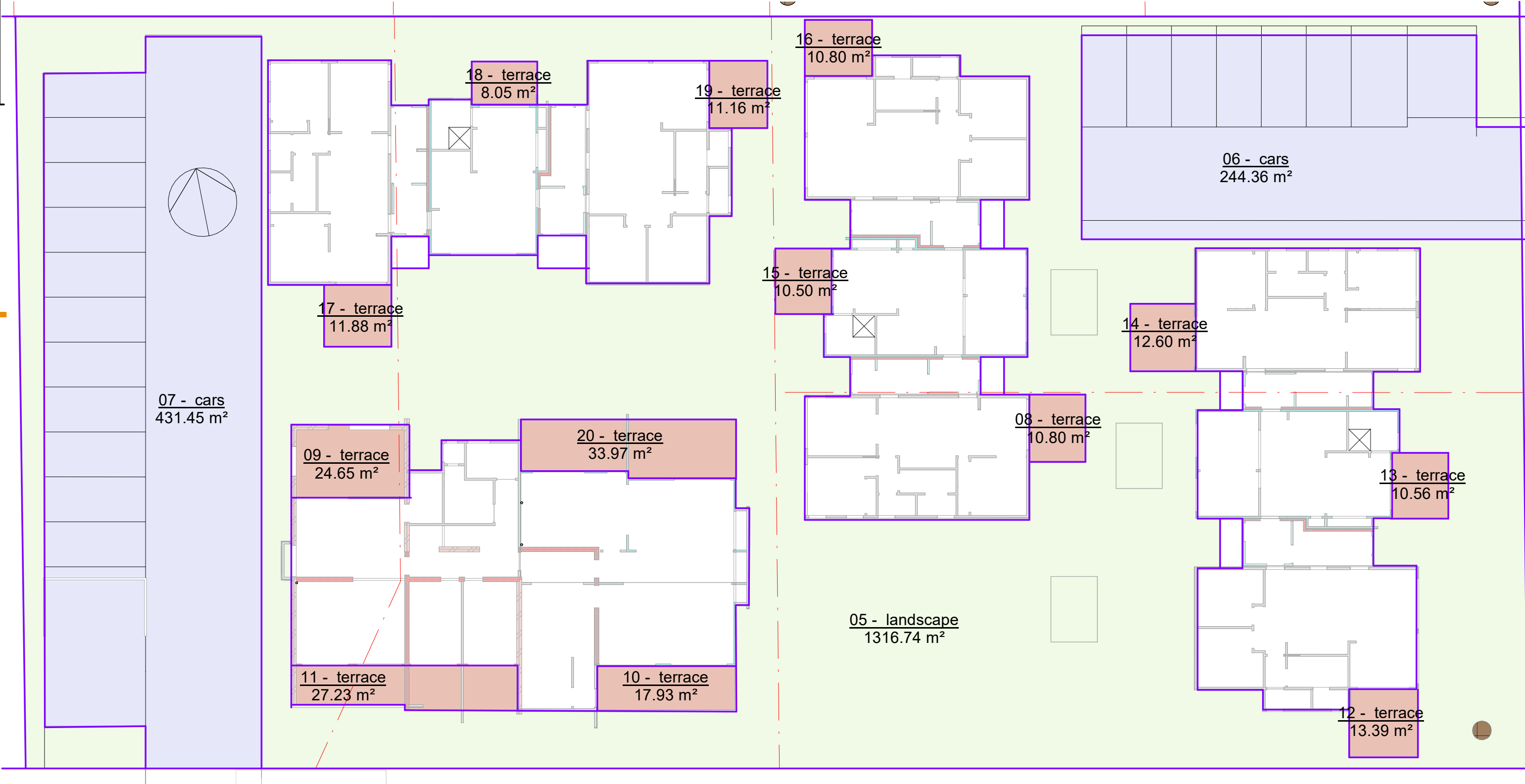
Area Schedule (Roof Area Only)		
Number	Name	Area
01	Core Roof Area	429 m ²
02	Cluster 01 Roof Area	344 m ²
03	Cluster 02 Roof Area	374 m ²
04	Cluster 03 Roof Area	378 m ²
Grand total		1525 m ²

NOTE TERRACES BEING FINALISED.
 Roofed terraces to each dwelling included nominally
 (location being finalised)

1 Roof Area Plan
 1 : 200

BASIX P1 11Sept23

north (typical)



1 LANDSCAPE areas
1 : 200

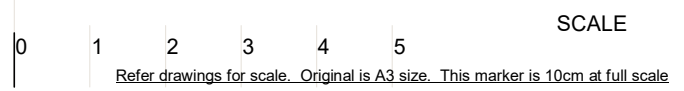


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1	11/09/2023 4:09:14 PM	printed

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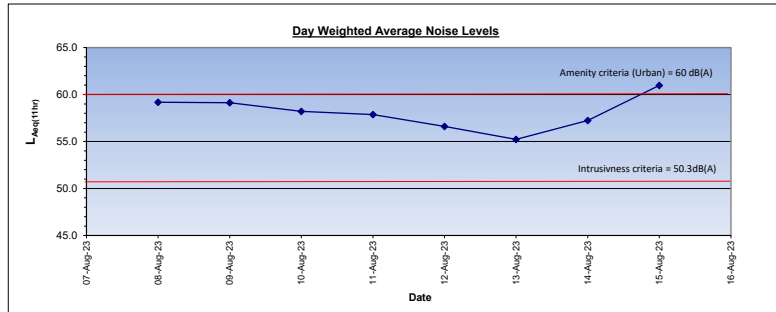
SHEET NAME
**SITE AREA Plan -
Landscape**
DD 9-04 BASIX P1 11Sept23
DRAWING NO. ISSUE

B Noise Data

Noise Assessment

Day Period
 amenity criteria 7am to 6pm **60** dB(A) Urban
 Intrusiveness criteria (RBL+ 5) 50.3 dB(A)
 Interim Construction Noise
 Guidelines (RBL + 10) 55.3 dB(A)
 Average LaeqDay 07:00-18:00 58.1 dB(A)

Day	Date	L _{Aeq(day)}	ABL	RBL
Tuesday	8/08/2023	59.2	46.1	45.3
Wednesday	9/08/2023	59.1	44.6	
Thursday	10/08/2023	58.2	46.4	
Friday	11/08/2023	57.9	45.8	
Saturday	12/08/2023	56.6	44.2	
Sunday	13/08/2023	55.2	39.5	
Monday	14/08/2023	57.2	47.6	
Tuesday	15/08/2023	61.0	44.8	



no.	Date	time	L _{Aeq} (15 minute)	L _{A90} (15minute)	L _{A90} (15min)	ascending order	10 ^{0.5} (L _{Aeq} (15 minute)/10)	period sums	hrly sums	hrly Laeq
1	8/08/2023	1:30:00 PM	57.5	47.9	44.4	44.4	562341			
2	8/08/2023	1:45:00 PM	58.1	48.2	46.1	46.1	645654			
3	8/08/2023	2:00:00 PM	56.9	47.8	46.9	46.9	489779	1697774	56.3	
4	8/08/2023	2:15:00 PM	56.2	44.4	47	47	418869			
5	8/08/2023	2:30:00 PM	58.5	48.2	47.8	47.8	707946			
6	8/08/2023	2:45:00 PM	56	48.2	47.9	47.9	398107			
7	8/08/2023	3:00:00 PM	58.2	49.1	48.2	48.2	660693	2114644	57.2	
8	8/08/2023	3:15:00 PM	61.8	53.8	48.2	48.2	1513561			
9	8/08/2023	3:30:00 PM	62.4	54.8	48.2	48.2	1737801			
10	8/08/2023	3:45:00 PM	60	49.6	48.7	48.7	1000000			
11	8/08/2023	4:00:00 PM	60.3	51	49.1	49.1	1071519	8132752	63.1	
12	8/08/2023	4:15:00 PM	58.3	49.2	49.2	49.2	676083			
13	8/08/2023	4:30:00 PM	61.4	48.7	49.5	49.5	1380384			
14	8/08/2023	4:45:00 PM	58.9	46.9	49.6	49.6	776247			
15	8/08/2023	5:00:00 PM	57.7	49.5	50.6	50.6	588844	3904234	59.9	
16	8/08/2023	5:15:00 PM	61.6	53.1	51	51	1445440			
17	8/08/2023	5:30:00 PM	58.3	50.6	53.1	53.1	676083			
18	8/08/2023	5:45:00 PM	57.4	47	53.8	53.8	549541			
19	8/08/2023	6:00:00 PM	56.1	46.1	54.8	54.8	407380	15704273	3259907	59.1
1	9/08/2023	7:15:00 AM	59.1	51.5	42.8	42.8	812831			
2	9/08/2023	7:30:00 AM	60.1	52.7	43.7	43.7	1023293			
3	9/08/2023	7:45:00 AM	66.7	53.5	44.6	44.6	4677351			
4	9/08/2023	8:00:00 AM	60.3	52	44.6	44.6	1071519	6513475	62.1	
5	9/08/2023	8:15:00 AM	59.9	51.2	44.8	44.8	977237			
6	9/08/2023	8:30:00 AM	58.6	50.1	45.1	45.1	724436			
7	9/08/2023	8:45:00 AM	58.2	48.6	45.5	45.5	660693			
8	9/08/2023	9:00:00 AM	58.3	49.6	45.5	45.5	676083	3433886	59.3	
9	9/08/2023	9:15:00 AM	57.1	47.8	45.6	45.6	512861			
10	9/08/2023	9:30:00 AM	57.8	47.9	45.7	45.7	602560			
11	9/08/2023	9:45:00 AM	57.8	47.9	46	46	602560			
12	9/08/2023	10:00:00 AM	57.3	44.6	46.1	46.1	537032	2394064	57.8	
13	9/08/2023	10:15:00 AM	58.1	47	46.2	46.2	645654			
14	9/08/2023	10:30:00 AM	58.1	46	46.3	46.3	645654			
15	9/08/2023	10:45:00 AM	57.9	45.6	46.4	46.4	616595			
16	9/08/2023	11:00:00 AM	57.2	47.4	46.5	46.5	524807	2444935	57.9	
17	9/08/2023	11:15:00 AM	57.4	47.3	46.6	46.6	549541			
18	9/08/2023	11:30:00 AM	56.4	46.3	46.7	46.7	436516			
19	9/08/2023	11:45:00 AM	57.2	44.6	46.8	46.8	524807			
20	9/08/2023	12:00:00 PM	59.9	45.7	47	47	977237	2035672	57.1	
21	9/08/2023	12:15:00 PM	58.3	45.1	47.3	47.3	676083			
22	9/08/2023	12:30:00 PM	59.8	46.7	47.3	47.3	954993			
23	9/08/2023	12:45:00 PM	56.6	44.8	47.4	47.4	457088			
24	9/08/2023	1:00:00 PM	57.5	47.8	47.4	47.4	562341	3065401	58.8	
25	9/08/2023	1:15:00 PM	58	47.4	47.4	47.4	630957			
26	9/08/2023	1:30:00 PM	56.8	43.7	47.6	47.6	478630			
27	9/08/2023	1:45:00 PM	57.4	46.6	47.8	47.8	549541			
28	9/08/2023	2:00:00 PM	57.4	46.8	47.8	47.8	549541	2221470	57.4	
29	9/08/2023	2:15:00 PM	57.4	45.5	47.8	47.8	549541			
30	9/08/2023	2:30:00 PM	57	45.5	47.8	47.8	501187			
31	9/08/2023	2:45:00 PM	65.7	48.2	47.9	47.9	3715352			

	9/08/2023	3:00:00 PM	59.4	48.5	47.9			5315621	61.2	
	9/08/2023	3:15:00 PM	57.9	47.8	48.2					
	9/08/2023	3:30:00 PM	55.8	47.8	48.3					
	9/08/2023	3:45:00 PM	56	46.5	48.5					
	9/08/2023	4:00:00 PM	55.2	46.2	48.5			0	#NUM!	
	9/08/2023	4:15:00 PM	56.1	46.4	48.6					
	9/08/2023	4:30:00 PM	56.8	47.6	49.6					
32	9/08/2023	4:45:00 PM	57.5	46.1	50.1	562341				
33	9/08/2023	5:00:00 PM	56.9	48.5	51.2	489779		562341	51.5	
34	9/08/2023	5:15:00 PM	55.9	48.3	51.5	389045				
35	9/08/2023	5:30:00 PM	58.8	47.4	52	758578				
36	9/08/2023	5:45:00 PM	55.6	47.3	52.7	363078				
37	9/08/2023	6:00:00 PM	54	42.8	53.5	251189		30238533	2000480	57.0
1	10/08/2023	7:15:00 AM	60.6	52.6	45.5	1148154				
2	10/08/2023	7:30:00 AM	60.3	52.2	45.6	1071519				
3	10/08/2023	7:45:00 AM	60.4	52.7	46.1	1096478				
4	10/08/2023	8:00:00 AM	60	51.7	46.4	1000000				
5	10/08/2023	8:15:00 AM	59.5	51.5	46.6	891251		3316151	59.2	
6	10/08/2023	8:30:00 AM	59.8	52.6	46.7	954993				
7	10/08/2023	8:45:00 AM	58.7	48.9	46.7	741310				
8	10/08/2023	9:00:00 AM	57.6	49.2	46.9	575440		3587554	59.5	
9	10/08/2023	9:15:00 AM	57.9	48.1	47.2	616595				
10	10/08/2023	9:30:00 AM	57.4	46.7	47.5	549541				
11	10/08/2023	9:45:00 AM	58.3	46.4	47.6	676083				
12	10/08/2023	10:00:00 AM	57.1	45.6	47.6	512861		2417659	57.8	
13	10/08/2023	10:15:00 AM	58	47.8	47.8	630957				
14	10/08/2023	10:30:00 AM	56.3	45.5	48.1	426580				
15	10/08/2023	10:45:00 AM	59.6	47.5	48.2	912011				
16	10/08/2023	11:00:00 AM	56.8	46.6	48.2	478630		2482409	57.9	
17	10/08/2023	11:15:00 AM	57.3	46.7	48.2	537032				
18	10/08/2023	11:30:00 AM	57	46.1	48.4	501187				
19	10/08/2023	11:45:00 AM	56.8	46.9	48.4	478630				
20	10/08/2023	12:00:00 PM	56.9	47.2	48.7	489779		1995479	57.0	
21	10/08/2023	12:15:00 PM	57	49.2	48.9	501187				
	10/08/2023	12:30:00 PM	56.7	48.2	49.2					
	10/08/2023	12:45:00 PM	57.2	50.4	49.2					
	10/08/2023	1:00:00 PM	57.8	48.2	49.5			990966	53.9	
	10/08/2023	1:15:00 PM	58.4	51.1	49.5					
22	10/08/2023	1:30:00 PM	58.6	51.6	49.7	724436				
23	10/08/2023	1:45:00 PM	58	49.5	49.9	630957				
24	10/08/2023	2:00:00 PM	58.6	52.9	50.1	724436		1355393	55.3	
25	10/08/2023	2:15:00 PM	57.7	51.6	50.4	588844				
26	10/08/2023	2:30:00 PM	57.7	51.4	50.5	588844				
27	10/08/2023	2:45:00 PM	56.3	49.9	51.1	426580				
	10/08/2023	3:00:00 PM	57.3	50.5	51.2			2328703	57.7	
	10/08/2023	3:15:00 PM	57.8	51.2	51.4					
	10/08/2023	3:30:00 PM	57.8	50.1	51.5					
	10/08/2023	3:45:00 PM	57.8	51.6	51.6					
28	10/08/2023	4:00:00 PM	58.4	52.2	51.6	691831		0	#NUM!	
29	10/08/2023	4:15:00 PM	57.3	49.7	51.6	537032				
30	10/08/2023	4:30:00 PM	56.1	47.6	51.7	407380				
31	10/08/2023	4:45:00 PM	56.3	48.7	52.2	426580				
32	10/08/2023	5:00:00 PM	59	47.6	52.2	794328		2062823	57.1	
33	10/08/2023	5:15:00 PM	59.2	49.5	52.6	831764				
34	10/08/2023	5:30:00 PM	57.8	48.2	52.6	602560				
35	10/08/2023	5:45:00 PM	57.7	48.4	52.7	588844				
36	10/08/2023	6:00:00 PM	57.1	48.4	52.9	512861		23867493	2817495	58.5
1	11/08/2023	7:15:00 AM	59.5	52	42.7	891251				
2	11/08/2023	7:30:00 AM	59.6	53.4	44.9	912011				
3	11/08/2023	7:45:00 AM	60.1	52.7	45.8	1023293				
4	11/08/2023	8:00:00 AM	59.3	52.1	45.8	851138		2826555	58.5	
5	11/08/2023	8:15:00 AM	59.6	53.2	46.3	912011				
6	11/08/2023	8:30:00 AM	58.7	51.7	46.8	741310				
7	11/08/2023	8:45:00 AM	58.3	51	47	676083				
8	11/08/2023	9:00:00 AM	60.1	51.5	47.2	1023293		3180542	59.0	
9	11/08/2023	9:15:00 AM	58.5	51.3	47.2	707946				
10	11/08/2023	9:30:00 AM	58.5	49.1	47.2	707946				
11	11/08/2023	9:45:00 AM	56.8	51.2	47.3	478630				
12	11/08/2023	10:00:00 AM	57.4	49.4	47.4	549541		2917815	58.6	
13	11/08/2023	10:15:00 AM	57.5	50.2	47.6	562341				

14	11/08/2023	10:30:00 AM	56.3	47	48.1	426580	
15	11/08/2023	10:45:00 AM	56.6	49.7	48.1	457088	
16	11/08/2023	11:00:00 AM	59.6	51	48.8	912011	
17	11/08/2023	11:15:00 AM	57.4	50.3	49.1	549541	1995550 57.0
18	11/08/2023	11:30:00 AM	56.7	49.4	49.1	467735	
19	11/08/2023	11:45:00 AM	56.9	49.6	49.1	489779	
20	11/08/2023	12:00:00 PM	55.6	46.3	49.4	363078	2419066 57.8
21	11/08/2023	12:15:00 PM	57.3	47.2	49.4	537032	
22	11/08/2023	12:30:00 PM	55.3	45.8	49.6	338844	
23	11/08/2023	12:45:00 PM	56.2	47.2	49.7	418869	
24	11/08/2023	1:00:00 PM	58.3	48.1	49.7	676083	1655823 56.2
25	11/08/2023	1:15:00 PM	56.9	47.4	50.1	489779	
26	11/08/2023	1:30:00 PM	56.4	47.6	50.2	436516	
27	11/08/2023	1:45:00 PM	56.8	47.2	50.3	478630	
28	11/08/2023	2:00:00 PM	57.2	47.3	50.5	524807	2081008 57.2
29	11/08/2023	2:15:00 PM	56.4	45.8	50.8	436516	
30	11/08/2023	2:30:00 PM	56.8	49.1	51	478630	
31	11/08/2023	2:45:00 PM	57.8	50.8	51	602560	
32	11/08/2023	3:00:00 PM	58.5	51.1	51	707946	2042513 57.1
33	11/08/2023	3:15:00 PM	60.3	51.9	51.1	1071519	
34	11/08/2023	3:30:00 PM	58.6	51.9	51.2	724436	
35	11/08/2023	3:45:00 PM	56.8	46.8	51.3	478630	
36	11/08/2023	4:00:00 PM	57.6	49.7	51.5	575440	2982531 58.7
37	11/08/2023	4:15:00 PM	57.3	50.1	51.7	537032	
	11/08/2023	4:30:00 PM	58.4	51	51.9		
	11/08/2023	4:45:00 PM	58	50.5	51.9		
	11/08/2023	5:00:00 PM	57.1	48.8	52		1112472 54.4
	11/08/2023	5:15:00 PM	56.8	48.1	52.1		
	11/08/2023	5:30:00 PM	57.8	49.1	52.7		
38	11/08/2023	5:45:00 PM	55.5	44.9	53.2	354813	
39	11/08/2023	6:00:00 PM	54.5	42.7	53.4	281838	23850526 354813 49.5
1	12/08/2023	7:15:00 AM	58.2	45.5	43.4	660693	
2	12/08/2023	7:30:00 AM	55.8	45.4	43.6	380189	
3	12/08/2023	7:45:00 AM	56.1	47.1	44.1	407380	
4	12/08/2023	8:00:00 AM	57.1	47.8	44.2	512861	1448263 55.6
5	12/08/2023	8:15:00 AM	57.4	47.8	44.8	549541	
6	12/08/2023	8:30:00 AM	56.4	47.7	45	436516	
7	12/08/2023	8:45:00 AM	56.7	47.4	45.4	467735	
8	12/08/2023	9:00:00 AM	55.8	47.1	45.5	380189	1966653 56.9
9	12/08/2023	9:15:00 AM	59	45.9	45.6	794328	
10	12/08/2023	9:30:00 AM	57.2	46.6	45.7	524807	
11	12/08/2023	9:45:00 AM	57.5	48.3	45.9	562341	
12	12/08/2023	10:00:00 AM	56.4	47.4	45.9	436516	2261666 57.5
13	12/08/2023	10:15:00 AM	56.3	48.8	46.1	426580	
14	12/08/2023	10:30:00 AM	57.1	46.3	46.3	512861	
15	12/08/2023	10:45:00 AM	56.9	47.4	46.6	489779	
16	12/08/2023	11:00:00 AM	54.9	43.6	46.7	309030	1865736 56.7
17	12/08/2023	11:15:00 AM	57.7	48.7	46.8	588844	
18	12/08/2023	11:30:00 AM	56.1	47.3	46.9	407380	
19	12/08/2023	11:45:00 AM	57	49.1	47	501187	
20	12/08/2023	12:00:00 PM	55.5	47.8	47	354813	1806441 56.5
21	12/08/2023	12:15:00 PM	57.1	44.2	47.1	512861	
22	12/08/2023	12:30:00 PM	57.3	43.4	47.1	537032	
23	12/08/2023	12:45:00 PM	54.7	45	47.1	295121	
24	12/08/2023	1:00:00 PM	56.7	47.1	47.1	467735	1699827 56.3
25	12/08/2023	1:15:00 PM	57.8	47.1	47.3	602560	
26	12/08/2023	1:30:00 PM	54.8	44.1	47.3	301995	
27	12/08/2023	1:45:00 PM	56.5	44.8	47.4	446684	
28	12/08/2023	2:00:00 PM	58.4	45.9	47.4	691831	1818973 56.6
29	12/08/2023	2:15:00 PM	57.2	46.8	47.4	524807	
30	12/08/2023	2:30:00 PM	54	46.1	47.7	251189	
31	12/08/2023	2:45:00 PM	56.4	48	47.7	436516	
32	12/08/2023	3:00:00 PM	59.7	48	47.8	933254	1904343 56.8
33	12/08/2023	3:15:00 PM	56	48.2	47.8	398107	
34	12/08/2023	3:30:00 PM	55.7	46.7	47.8	371535	
35	12/08/2023	3:45:00 PM	56.6	47	47.8	457088	
36	12/08/2023	4:00:00 PM	55.1	47.3	48	323594	2159985 57.3
37	12/08/2023	4:15:00 PM	55.4	48.3	48	346737	
38	12/08/2023	4:30:00 PM	54.9	47.8	48	309030	
39	12/08/2023	4:45:00 PM	54.5	47	48.2	281838	
40	12/08/2023	5:00:00 PM	59.1	48	48.3	812831	1261198 55.0

41	12/08/2023	5:15:00 PM	55.5	46.9	48.3		354813
42	12/08/2023	5:30:00 PM	54.9	47.7	48.7		309030
43	12/08/2023	5:45:00 PM	53.9	45.7	48.8		245471
44	12/08/2023	6:00:00 PM	53	45.6	49.1		199526
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1	13/08/2023	7:15:00 AM	52.8	43.9	39		190546
2	13/08/2023	7:30:00 AM	53.1	44.6	39.5		204174
3	13/08/2023	7:45:00 AM	53.9	44.1	39.5		245471
4	13/08/2023	8:00:00 AM	52.7	42.8	39.9		186209
5	13/08/2023	8:15:00 AM	54	44.8	39.9	640191	52.0
6	13/08/2023	8:30:00 AM	56.5	43.5	40		446684
7	13/08/2023	8:45:00 AM	59.9	47.7	40		977237
8	13/08/2023	9:00:00 AM	54.8	43.4	40.5	1861318	56.7
9	13/08/2023	9:15:00 AM	56.9	42.1	40.6		489779
10	13/08/2023	9:30:00 AM	55.4	41.1	40.8		346737
11	13/08/2023	9:45:00 AM	53.8	42.8	41		239883
12	13/08/2023	10:00:00 AM	55	43.5	41.1	1378394	55.4
13	13/08/2023	10:15:00 AM	54.7	41.2	41.2		295121
14	13/08/2023	10:30:00 AM	54.9	41.8	41.3		309030
15	13/08/2023	10:45:00 AM	57.3	39.9	41.4		537032
16	13/08/2023	11:00:00 AM	61.2	43.2	41.5	1457410	55.6
17	13/08/2023	11:15:00 AM	52.3	39.5	41.5		169824
18	13/08/2023	11:30:00 AM	52.8	41.5	41.8		190546
19	13/08/2023	11:45:00 AM	59.5	41.5	41.9		891251
20	13/08/2023	12:00:00 PM	52.5	40	42	2569878	58.1
21	13/08/2023	12:15:00 PM	52.9	40	42.1		194984
22	13/08/2023	12:30:00 PM	53.6	40.6	42.2		229087
23	13/08/2023	12:45:00 PM	54	42.5	42.3		251189
24	13/08/2023	1:00:00 PM	54.1	39.9	42.5	853088	53.3
25	13/08/2023	1:15:00 PM	54	39.5	42.6		251189
26	13/08/2023	1:30:00 PM	54.2	40.8	42.7		263027
27	13/08/2023	1:45:00 PM	53.7	39	42.8		234423
28	13/08/2023	2:00:00 PM	52.7	41.3	42.8	1005678	54.0
29	13/08/2023	2:15:00 PM	51.4	41.9	42.8		138038
	13/08/2023	2:30:00 PM	52.4	42.3	42.9		
	13/08/2023	2:45:00 PM	53.9	42.9	43.2		
	13/08/2023	3:00:00 PM	51.4	41	43.4	324247	49.1
	13/08/2023	3:15:00 PM	54.6	41.4	43.5		
	13/08/2023	3:30:00 PM	53.8	42.6	43.5		
	13/08/2023	3:45:00 PM	54.4	42.7	43.8		
	13/08/2023	4:00:00 PM	52.9	43.9	43.9	0	#NUM!
	13/08/2023	4:15:00 PM	54.4	42.2	43.9		
	13/08/2023	4:30:00 PM	53.2	44	44		
	13/08/2023	4:45:00 PM	54.9	42.8	44.1		
	13/08/2023	5:00:00 PM	54.4	43.8	44.4	0	#NUM!
30	13/08/2023	5:15:00 PM	54.9	44.4	44.6		309030
31	13/08/2023	5:30:00 PM	54.3	44.7	44.7		269153
32	13/08/2023	5:45:00 PM	53.8	42	44.8		239883
33	13/08/2023	6:00:00 PM	49.2	40.5	47.7		83176
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1	14/08/2023	7:15:00 AM	59.4	51.4	46.6		870964
2	14/08/2023	7:30:00 AM	58.9	50.6	47.2		776247
3	14/08/2023	7:45:00 AM	59.2	51.1	47.6		831764
4	14/08/2023	8:00:00 AM	58.8	50	47.8		758578
5	14/08/2023	8:15:00 AM	58.9	52.4	47.9	2478974	57.9
6	14/08/2023	8:30:00 AM	59.1	51	48		812831
7	14/08/2023	8:45:00 AM	58.5	49.7	48.1		707946
8	14/08/2023	9:00:00 AM	58.2	49.7	48.2		660693
9	14/08/2023	9:15:00 AM	57.6	48.5	48.4	3055601	58.8
10	14/08/2023	9:30:00 AM	57.7	49	48.5		588844
11	14/08/2023	9:45:00 AM	56.2	47.9	48.6		416869
12	14/08/2023	10:00:00 AM	57.1	48.4	48.7		512861
13	14/08/2023	10:15:00 AM	57	47.2	48.7	2241846	57.5
14	14/08/2023	10:30:00 AM	57.4	48.7	49		549541
15	14/08/2023	10:45:00 AM	57.2	48	49.1		524807
16	14/08/2023	11:00:00 AM	56.2	48.2	49.5		416869
17	14/08/2023	11:15:00 AM	55.2	46.6	49.7	2088397	57.2
18	14/08/2023	11:30:00 AM	56.3	47.8	49.7		331131
19	14/08/2023	11:45:00 AM	55.4	47.6	49.9		426580
20	14/08/2023	12:00:00 PM	57.3	49.5	49.9		346737
21	14/08/2023	12:15:00 PM	57.6	51	50	1521317	55.8
	14/08/2023	12:30:00 PM	58.7	49.9	50		575440

20114757 1722144 56.3

640191 52.0

1861318 56.7

1378394 55.4

1457410 55.6

2569878 58.1

853088 53.3

1005678 54.0

324247 49.1

0 #NUM!

0 #NUM!

10991447 818066 53.1

2478974 57.9

3055601 58.8

2241846 57.5

2088397 57.2

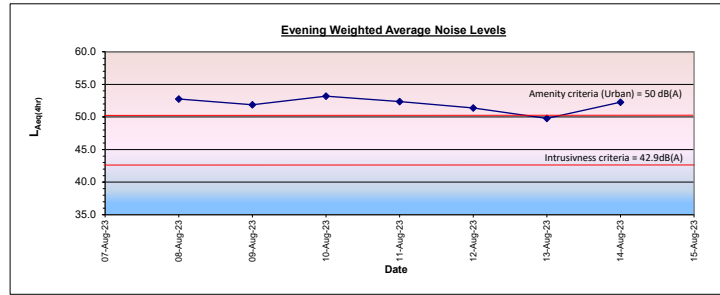
1521317 55.8

	14/08/2023	12:45:00 PM	57.4	50.3	50			
	14/08/2023	1:00:00 PM	57.3	48.1	50	1112472	54.4	
	14/08/2023	1:15:00 PM	58.5	50.9	50.3			
	14/08/2023	1:30:00 PM	59.1	50	50.6			
	14/08/2023	1:45:00 PM	58	50.9	50.8			
	14/08/2023	2:00:00 PM	57.6	51.3	50.9	0	#NUM!	
	14/08/2023	2:15:00 PM	59.9	48.6	50.9			
	14/08/2023	2:30:00 PM	56.8	48.7	50.9			
	14/08/2023	2:45:00 PM	58.2	52	51			
	14/08/2023	3:00:00 PM	58.8	53.7	51	0	#NUM!	
	14/08/2023	3:15:00 PM	58.7	52.6	51.1			
	14/08/2023	3:30:00 PM	58.9	53.6	51.1			
	14/08/2023	3:45:00 PM	58.4	52.1	51.3			
	14/08/2023	4:00:00 PM	58.5	52.1	51.4	0	#NUM!	
22	14/08/2023	4:15:00 PM	57.8	51.6	51.6		602560	
23	14/08/2023	4:30:00 PM	58.4	50.9	52		691831	
24	14/08/2023	4:45:00 PM	57.6	49.1	52.1		575440	
25	14/08/2023	5:00:00 PM	56.6	50.8	52.1	1869830	56.7	
26	14/08/2023	5:15:00 PM	57.1	50	52.4		457088	
27	14/08/2023	5:30:00 PM	58.7	51.1	52.6		512861	
28	14/08/2023	5:45:00 PM	56.5	50	53.6		741310	
29	14/08/2023	6:00:00 PM	56.1	49.9	53.7		446684	
						15,338,387.52	2157943	57.3
1	15/08/2023	7:15:00 AM	58	51.2	44.7		630957	
2	15/08/2023	7:30:00 AM	59	51.3	44.8		794328	
3	15/08/2023	7:45:00 AM	67.8	53.5	44.9		6025596	
4	15/08/2023	8:00:00 AM	68.7	52.6	45.5	7450881	62.7	
5	15/08/2023	8:15:00 AM	59.9	51.1	45.5		977237	
6	15/08/2023	8:30:00 AM	59.7	51.7	45.7		933254	
7	15/08/2023	8:45:00 AM	60.6	52.7	45.7		1148154	
8	15/08/2023	9:00:00 AM	59.5	51.3	45.9	10471748	64.2	
9	15/08/2023	9:15:00 AM	56.9	47.2	46.2		489779	
10	15/08/2023	9:30:00 AM	56.4	46.2	46.8		436516	
11	15/08/2023	9:45:00 AM	56.3	45.5	46.9		426580	
12	15/08/2023	10:00:00 AM	56.1	44.8	47.2	2244125	57.5	
13	15/08/2023	10:15:00 AM	56.8	46.8	47.8		478630	
14	15/08/2023	10:30:00 AM	56.5	47.8	51.1		446684	
15	15/08/2023	10:45:00 AM	56.4	44.7	51.2		436516	
16	15/08/2023	11:00:00 AM	60.9	45.9	51.3	1769210	56.5	
17	15/08/2023	11:15:00 AM	56.4	45.7	51.3		436516	
18	15/08/2023	11:30:00 AM	57.6	46.9	51.7		575440	
19	15/08/2023	11:45:00 AM	56.3	45.5	52.6		426580	
20	15/08/2023	12:00:00 PM	56.4	44.9	52.7		436516	
						25,041,283.79	2668804	58.2

Noise Assessment

Evening Period **6pm to 10pm**
 amenity criteria **50** dB(A) Urban
 Intrusiveness criteria (RBL+ 5) 42.9 dB(A)
 Median LAeqEvening 18:00-22:00 52.3 dB(A)

Day	Date	LAeq(evening)	ABL	RBL
Tuesday Evening	8/08/2023	52.8	35.7	37.9
Wednesday Evening	9/08/2023	51.9	38.3	
Thursday Evening	10/08/2023	53.2	38.6	
Friday Evening	11/08/2023	52.4	36.6	
Saturday Evening	12/08/2023	51.4	37.9	
Sunday Evening	13/08/2023	49.8	39.5	
Monday Evening	14/08/2023	52.3	36.0	



item	Date	time	L _{Aeq} (15 minute)	L _{A90} (15minute)	L _{A90} (15min)	ascending order	10 ^{^(L_{Aeq}(15 minute)/10)}	period sums	hrrly sums	hrrly LAeq	
1	8/08/2023	6:15:00 PM	55.3	45.7	34.9	338844					
2	8/08/2023	6:30:00 PM	55.5	42.1	35.7	354813					
3	8/08/2023	6:45:00 PM	53.6	42.8	36.7	229087					
4	8/08/2023	7:00:00 PM	52.2	41.1	37.3	165959					
5	8/08/2023	7:15:00 PM	54	41.6	37.5	251189		1088703	54.3		
6	8/08/2023	7:30:00 PM	52.9	40.1	37.5	194984					
7	8/08/2023	7:45:00 PM	55.1	40.2	38	323594					
8	8/08/2023	8:00:00 PM	52	38.2	38.2	158489			928256	53.7	
9	8/08/2023	8:15:00 PM	51	38	38.9	125893					
10	8/08/2023	8:30:00 PM	52.8	38.9	40.1	190546					
11	8/08/2023	8:45:00 PM	50.2	37.3	40.2	104713					
12	8/08/2023	9:00:00 PM	49.7	35.7	41.1	93325		514477	51.1		
13	8/08/2023	9:15:00 PM	50.4	36.7	41.6	109648					
14	8/08/2023	9:30:00 PM	52	37.5	42.1	158489					
15	8/08/2023	9:45:00 PM	48.6	34.9	42.8	72444					
16	8/08/2023	10:00:00 PM	51.8	37.5	45.7	151356			491937	50.9	
								3023373			
1	9/08/2023	6:15:00 PM	53.6	41.2	38.3	229087					
2	9/08/2023	6:30:00 PM	53.1	42.4	38.3	204174					
3	9/08/2023	6:45:00 PM	54.1	43.6	38.7	257040					
4	9/08/2023	7:00:00 PM	52.1	42.6	39.4	162181					
5	9/08/2023	7:15:00 PM	51.6	42.5	40.1	144544					
6	9/08/2023	7:30:00 PM	50	40.1	40.4	100000					
7	9/08/2023	7:45:00 PM	51.3	41.3	40.6	134896					
8	9/08/2023	8:00:00 PM	51.6	40.4	41.2	144544			523984	51.2	
9	9/08/2023	8:15:00 PM	51.4	41.3	41.3	138038					
10	9/08/2023	8:30:00 PM	50.2	39.4	41.3	104713					
11	9/08/2023	8:45:00 PM	50.7	41.6	41.6	117490					
12	9/08/2023	9:00:00 PM	51.6	41.6	41.6	144544		504785	51.0		
13	9/08/2023	9:15:00 PM	50.2	38.3	42.4	104713					
14	9/08/2023	9:30:00 PM	51.6	38.7	42.5	144544					
15	9/08/2023	9:45:00 PM	52.9	38.3	42.6	194984					
16	9/08/2023	10:00:00 PM	51.5	40.6	43.6	141254			585495	51.7	
								2466745			
1	10/08/2023	6:15:00 PM	58.2	48.2	38.4	660693					
2	10/08/2023	6:30:00 PM	53.8	45.8	38.6	239883					
3	10/08/2023	6:45:00 PM	53.4	45.6	39.1	218776					
4	10/08/2023	7:00:00 PM	54.3	45.1	39.3	269153					
5	10/08/2023	7:15:00 PM	54.7	45.1	39.4	295121					
6	10/08/2023	7:30:00 PM	53.8	44.6	40.2	239883					
7	10/08/2023	7:45:00 PM	51.8	42	40.5	151356					
8	10/08/2023	8:00:00 PM	52	42	40.8	158489					
9	10/08/2023	8:15:00 PM	50.6	40.8	42	114815					
10	10/08/2023	8:30:00 PM	52.4	39.3	42	173780					
11	10/08/2023	8:45:00 PM	51.7	40.2	44.6	147911					
12	10/08/2023	9:00:00 PM	52.2	38.6	45.1	165959					
13	10/08/2023	9:15:00 PM	52	39.1	45.1	158489					
14	10/08/2023	9:30:00 PM	50.3	40.5	45.6	107152					
15	10/08/2023	9:45:00 PM	51.1	38.4	45.8	128825					
16	10/08/2023	10:00:00 PM	50.2	39.4	48.2	104713			499179	51.0	
								3335000			
1	11/08/2023	6:15:00 PM	55.2	42.3	35.6	331131					

2	11/08/2023	6:30:00 PM	54	44.1	36.6	251189
3	11/08/2023	6:45:00 PM	53.4	42.1	36.8	218776
4	11/08/2023	7:00:00 PM	53.1	43.2	36.9	204174
5	11/08/2023	7:15:00 PM	53.7	40.7	37.5	234423
6	11/08/2023	7:30:00 PM	52.3	40.8	38.6	169824
7	11/08/2023	7:45:00 PM	51.7	38.9	38.9	147911
8	11/08/2023	8:00:00 PM	51.9	39.5	39.4	154882
9	11/08/2023	8:15:00 PM	53	39.4	39.5	199526
10	11/08/2023	8:30:00 PM	53.7	40.4	40.4	234423
11	11/08/2023	8:45:00 PM	51.7	37.5	40.7	147911
12	11/08/2023	9:00:00 PM	50.3	35.6	40.8	107152
13	11/08/2023	9:15:00 PM	50.4	36.6	42.1	109648
14	11/08/2023	9:30:00 PM	49.4	38.6	42.3	87096
15	11/08/2023	9:45:00 PM	48.9	36.9	43.2	77625
16	11/08/2023	10:00:00 PM	49.1	36.8	44.1	81283
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1	12/08/2023	6:15:00 PM	53.5	44.6	37.4	223872
2	12/08/2023	6:30:00 PM	52.1	44	37.9	162181
3	12/08/2023	6:45:00 PM	52.7	42.6	37.9	186209
4	12/08/2023	7:00:00 PM	55.7	40.2	38.6	371535
5	12/08/2023	7:15:00 PM	51.2	39.8	38.6	131826
6	12/08/2023	7:30:00 PM	49.3	39.1	38.6	85114
7	12/08/2023	7:45:00 PM	49.5	37.9	39.1	89125
8	12/08/2023	8:00:00 PM	50.5	40.6	39.5	112202
9	12/08/2023	8:15:00 PM	50.5	39.5	39.8	112202
10	12/08/2023	8:30:00 PM	51.6	42.1	40.2	144544
11	12/08/2023	8:45:00 PM	51.2	41.6	40.6	131826
12	12/08/2023	9:00:00 PM	50.5	38.6	41.6	112202
13	12/08/2023	9:15:00 PM	49.4	38.6	42.1	87096
14	12/08/2023	9:30:00 PM	48.7	38.6	42.6	74131
15	12/08/2023	9:45:00 PM	48.7	37.4	44	74131
16	12/08/2023	10:00:00 PM	50	37.9	44.6	100000
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1	13/08/2023	6:15:00 PM	53.6	42.4	39	229087
2	13/08/2023	6:30:00 PM	52.1	41.2	39.5	162181
3	13/08/2023	6:45:00 PM	51.2	41.4	39.6	131826
4	13/08/2023	7:00:00 PM	51.4	41	39.7	138038
5	13/08/2023	7:15:00 PM	49.9	41	39.8	97724
6	13/08/2023	7:30:00 PM	51.9	40.2	40.2	154882
7	13/08/2023	7:45:00 PM	52.5	40.6	40.2	177828
8	13/08/2023	8:00:00 PM	49.8	40.6	40.3	95499
9	13/08/2023	8:15:00 PM	47.1	39.7	40.5	51286
10	13/08/2023	8:30:00 PM	48	40.2	40.6	63096
11	13/08/2023	8:45:00 PM	46.9	39.8	40.6	48978
12	13/08/2023	9:00:00 PM	49.4	40.3	41	87096
13	13/08/2023	9:15:00 PM	46.1	39.6	41	40738
14	13/08/2023	9:30:00 PM	46.7	39.5	41.2	
15	13/08/2023	9:45:00 PM	49.7	39	41.4	
16	13/08/2023	10:00:00 PM	46.2	40.5	42.4	41687
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1	14/08/2023	6:15:00 PM	55	45.6	35.5	316228
2	14/08/2023	6:30:00 PM	54.8	46.7	36	301995
3	14/08/2023	6:45:00 PM	53.7	46.1	36.7	234423
4	14/08/2023	7:00:00 PM	52.9	44.4	36.8	194984
5	14/08/2023	7:15:00 PM	52.6	43.9	37.7	181970
6	14/08/2023	7:30:00 PM	55	45.8	37.9	316228
7	14/08/2023	7:45:00 PM	53.9	42.1	38.7	245471
8	14/08/2023	8:00:00 PM	52.4	42.6	38.7	173780
9	14/08/2023	8:15:00 PM	48.8	38.7	42.1	75858
10	14/08/2023	8:30:00 PM	51	38.7	42.6	125893
11	14/08/2023	8:45:00 PM	49.9	37.7	43.9	97724
12	14/08/2023	9:00:00 PM	51.8	36.8	44.4	151356
13	14/08/2023	9:15:00 PM	48.8	36.7	45.6	75858
14	14/08/2023	9:30:00 PM	48.4	35.5	45.8	69183
15	14/08/2023	9:45:00 PM	48.7	37.9	46.1	74131
16	14/08/2023	10:00:00 PM	47.3	36	46.7	53703

2756973

2198195

1519946

2688784

1005270 | 54.0

707040 | 52.5

689012 | 52.4

355652 | 49.5

943797 | 53.7

418266 | 50.2

500773 | 51.0

335358 | 49.2

661132 | 52.2

525933 | 51.2

250456 | 48.0

82425 | 43.1

1047630 | 54.2

917449 | 53.6

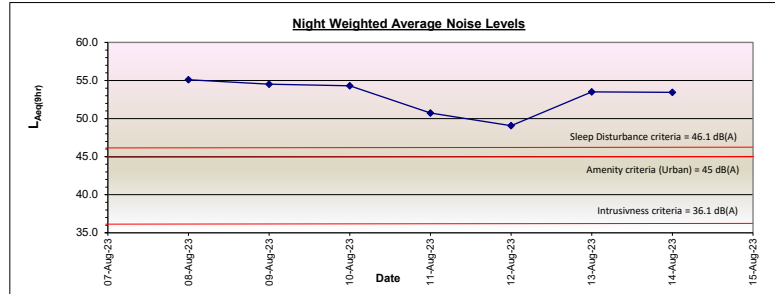
450830 | 50.5

272875 | 48.3

Noise Assessment

Night Period
 amenity criteria **45** dB(A) Urban
 Intrusiveness criteria (RBL+ 5) 36.1 dB(A)
 Sleep Disturbance criteria (RBL+ 15) 46.1 dB(A)
 Median LAeqNight 22:00-07:00 53.5 dB(A)

Night	Date	L _{aeq} (night)	ABL	RBL
Tuesday Night	8/08/2023	55.1	31.9	31.1
Wednesday Night	9/08/2023	54.5	32.0	
Thursday Night	10/08/2023	54.3	31.1	
Friday Night	11/08/2023	50.7	30.3	
Saturday Night	12/08/2023	49.1	30.7	
Sunday Night	13/08/2023	53.5	39.4	
Monday Night	14/08/2023	53.4	30.0	



no.	date	time	L _{Aeq} (15 minute)	L _{A90} (15minute)	L _{A90} (15min)	assending order	10 [^] ((L _{Aeq} (15 minute)/10))	period sums	hrlly sums	hrlly LAeq	Sleep Disturbance events
1	8/08/2023	10:15:00 PM	48.9	38.6		30.5	77625				0
2	8/08/2023	10:30:00 PM	51.9	37.4		31.5	154882				0
3	8/08/2023	10:45:00 PM	50.2	37.3		31.9	104713				0
4	8/08/2023	11:00:00 PM	46.9	34.6		32.2	48978		386197	49.8	0
5	8/08/2023	11:15:00 PM	44.5	35.1		32.3	28184				0
6	8/08/2023	11:30:00 PM	46.2	35.4		32.3	41687				0
7	8/08/2023	11:45:00 PM	51.2	34.5		32.5	131826				0
8	9/08/2023	12:00:00 AM	46	34.4		33	39811		241507	47.8	0
9	9/08/2023	12:15:00 AM	48.9	33.1		33.1	77625				0
10	9/08/2023	12:30:00 AM	50.3	31.9		33.7	107152				0
11	9/08/2023	12:45:00 AM	47.5	32.3		34	56234				0
12	9/08/2023	1:00:00 AM	48.1	33		34.4	64565		305576	48.8	0
13	9/08/2023	1:15:00 AM	47.1	32.5		34.4	51286				0
14	9/08/2023	1:30:00 AM	43.8	32.2		34.4	23988				0
15	9/08/2023	1:45:00 AM	43.1	30.5		34.5	20417				0
16	9/08/2023	2:00:00 AM	45.6	35.3		34.6	36308		132000	45.2	0
17	9/08/2023	2:15:00 AM	44.3	31.5		34.7	26915				0
18	9/08/2023	2:30:00 AM	46.2	32.3		35.1	41687				0
19	9/08/2023	2:45:00 AM	48.4	33.7		35.3	69183				0
20	9/08/2023	3:00:00 AM	49.4	34.4		35.4	87096		224882	47.5	0
21	9/08/2023	3:15:00 AM	48.6	36.5		36.5	72444				0
22	9/08/2023	3:30:00 AM	48.9	34.4		37.3	77625				0
23	9/08/2023	3:45:00 AM	48.8	34.7		37.4	75858				0
24	9/08/2023	4:00:00 AM	48.1	34		38.6	64565		290491	48.6	0
25	9/08/2023	4:15:00 AM	61.9	40.2		40.2	1548817				0
26	9/08/2023	4:30:00 AM	53.4	41.6		41.6	218776				0
27	9/08/2023	4:45:00 AM	53.6	43.3		43.3	229087				0
28	9/08/2023	5:00:00 AM	55.5	44.7		44.7	354813		2351493	57.7	0
29	9/08/2023	5:15:00 AM	56.5	46.7		46.7	446684				0
30	9/08/2023	5:30:00 AM	57.9	47.1		47.1	616595				0
31	9/08/2023	5:45:00 AM	58	49.1		49.1	630957				0
32	9/08/2023	6:00:00 AM	59.8	51.4		51.4	954993		2649229	58.2	0
33	9/08/2023	6:15:00 AM	60.7	54.7		52.7	1174898				0
34	9/08/2023	6:30:00 AM	61.7	53.6		53.6	1479108				0
35	9/08/2023	6:45:00 AM	61.6	54.4		54.4	1445440				0
36	9/08/2023	7:00:00 AM	59.9	52.7		54.7	977237		5076683	61.0	0
1	9/08/2023	10:15:00 PM	50.8	39.7		31.5	120226	11658058			0
2	9/08/2023	10:30:00 PM	49.1	37.1		31.6	81283				0
3	9/08/2023	10:45:00 PM	43.3	34.6		31.9	21380				0
4	9/08/2023	11:00:00 PM	46.2	34.4		32	41687		264576	48.2	0
5	9/08/2023	11:15:00 PM	43.8	33.7		32.2	23988				0
6	9/08/2023	11:30:00 PM	50.1	34		32.2	102329				0
7	9/08/2023	11:45:00 PM	50.7	33.7		32.2	117490				0
8	10/08/2023	12:00:00 AM	44.8	31.9		32.3	30200		274007	48.4	0
9	10/08/2023	12:15:00 AM	51.2	31.6		32.3	131826				0
10	10/08/2023	12:30:00 AM	47.5	32.8		32.5	56234				0
11	10/08/2023	12:45:00 AM	49	32.2		32.6	79433				0
12	10/08/2023	1:00:00 AM	44.3	32		32.7	26915		294408	48.7	0
13	10/08/2023	1:15:00 AM	46.4	32.6		32.8	43652				0
14	10/08/2023	1:30:00 AM	46.9	32.7		33.2	48978				0

15	10/08/2023	1:45:00 AM	48	33.2	33.3	63096		0	
16	10/08/2023	2:00:00 AM	47.1	33.3	33.7	51286	207011 47.1	0	
17	10/08/2023	2:15:00 AM	42.9	32.2	33.7	19498		0	
18	10/08/2023	2:30:00 AM	46.4	32.5	34	43652		0	
19	10/08/2023	2:45:00 AM	45.5	31.5	34.4	35481		0	
20	10/08/2023	3:00:00 AM	49.4	32.2	34.4	87096	185728 46.7	0	
21	10/08/2023	3:15:00 AM	45.8	32.3	34.6	38019		0	
22	10/08/2023	3:30:00 AM	48.7	32.3	36.8	74131		0	
23	10/08/2023	3:45:00 AM	50	37.4	37.1	100000		0	
24	10/08/2023	4:00:00 AM	45.3	34.4	37.4	33884	246034 47.9	0	
25	10/08/2023	4:15:00 AM	49.3	36.8	39.7	85114		0	
26	10/08/2023	4:30:00 AM	50.4	40.2	40.2	109648		0	
27	10/08/2023	4:45:00 AM	52.5	41	41	177828		0	
28	10/08/2023	5:00:00 AM	56	44.2	44.2	398107	770697 52.8	0	
29	10/08/2023	5:15:00 AM	54	44.9	44.9	251189		0	
30	10/08/2023	5:30:00 AM	58.9	47.7	47.7	776247		0	
31	10/08/2023	5:45:00 AM	58.2	50.6	50.6	660693		0	
32	10/08/2023	6:00:00 AM	60.9	52.1	51.9	1230269	2918398 58.6	0	
33	10/08/2023	6:15:00 AM	62.9	55.4	52.1	1949845		0	
34	10/08/2023	6:30:00 AM	59.1	51.9	52.7	812831		0	
35	10/08/2023	6:45:00 AM	60.4	52.7	53	1096478		0	
36	10/08/2023	7:00:00 AM	60.7	53	55.4	1174898	5034051 61.0	0	
								10,194,909.96	0
1	10/08/2023	10:15:00 PM	46.4	36.5	30.2	43652		0	
2	10/08/2023	10:30:00 PM	46.8	34.6	30.9	47863		0	
3	10/08/2023	10:45:00 PM	44.3	32.7	31.1	26915		0	
4	10/08/2023	11:00:00 PM	47	32.7	31.4	50119	168549 46.2	0	
5	10/08/2023	11:15:00 PM	45.4	32.1	31.5	34674		0	
6	10/08/2023	11:30:00 PM	43.1	31.4	31.7	20417		0	
7	10/08/2023	11:45:00 PM	50.8	33.1	31.9	120226		0	
8	11/08/2023	12:00:00 AM	49.7	32.6	32.1	93325	268643 48.3	0	
9	11/08/2023	12:15:00 AM	48.5	32.5	32.2	70795		0	
10	11/08/2023	12:30:00 AM	46.2	31.9	32.2	41687		0	
11	11/08/2023	12:45:00 AM	48.2	32.2	32.5	66069		0	
12	11/08/2023	1:00:00 AM	45.1	30.2	32.5	32359	210910 47.2	0	
13	11/08/2023	1:15:00 AM	46.6	31.1	32.6	45709		0	
14	11/08/2023	1:30:00 AM	39.6	30.9	32.7	9120		0	
15	11/08/2023	1:45:00 AM	41.8	31.7	32.7	15136		0	
16	11/08/2023	2:00:00 AM	45	31.5	32.9	31623	101587 44.0	0	
17	11/08/2023	2:15:00 AM	38.6	32.2	33.1	7244		0	
18	11/08/2023	2:30:00 AM	50.3	35.6	33.4	107152		0	
19	11/08/2023	2:45:00 AM	49	34.3	34.3	79433		0	
20	11/08/2023	3:00:00 AM	50.2	32.9	34.6	104713		0	
21	11/08/2023	3:15:00 AM	47.4	32.5	35.5	54954	298542 48.7	0	
22	11/08/2023	3:30:00 AM	49.4	33.4	35.6	87096		0	
23	11/08/2023	3:45:00 AM	50.2	36.3	36.3	104713		0	
24	11/08/2023	4:00:00 AM	47.8	35.5	36.5	60256	307019 48.9	0	
25	11/08/2023	4:15:00 AM	49.6	36.7	36.7	91201		0	
26	11/08/2023	4:30:00 AM	48.2	37.5	37.5	66069		0	
27	11/08/2023	4:45:00 AM	51.6	39.7	39.7	144544		0	
28	11/08/2023	5:00:00 AM	57.4	44.2	43.3	549541	851355 53.3	0	
29	11/08/2023	5:15:00 AM	54.8	43.3	44.2	301995		0	
30	11/08/2023	5:30:00 AM	56.7	48.3	48.3	467735		0	
31	11/08/2023	5:45:00 AM	58.5	51.1	50.9	707946		0	
32	11/08/2023	6:00:00 AM	60.6	52.3	51.1	1148154	2625830 58.2	0	
33	11/08/2023	6:15:00 AM	63.2	55.3	52.3	2089296		0	
34	11/08/2023	6:30:00 AM	59.8	52.5	52.5	954993		0	
35	11/08/2023	6:45:00 AM	59.6	50.9	52.7	912011		0	
36	11/08/2023	7:00:00 AM	59.6	52.7	55.3	912011	4868310 60.9	0	
								9,700,745.77	0
1	11/08/2023	10:15:00 PM	46.9	37.1	29.5	48978		0	
2	11/08/2023	10:30:00 PM	50.2	35.8	29.7	104713		0	
3	11/08/2023	10:45:00 PM	47.8	34.4	30.3	60256		0	
4	11/08/2023	11:00:00 PM	44.1	32.6	30.5	25704	239651 47.8	0	
5	11/08/2023	11:15:00 PM	45.1	33.1	30.6	32359		0	
6	11/08/2023	11:30:00 PM	48.3	32.4	30.7	67608		0	
7	11/08/2023	11:45:00 PM	46	33.5	31	39811		0	
8	12/08/2023	12:00:00 AM	45.4	31.8	31.1	34674	174452 46.4	0	
9	12/08/2023	12:15:00 AM	40.8	31.3	31.3	12023		0	
10	12/08/2023	12:30:00 AM	45.3	31.8	31.4	33884		0	
11	12/08/2023	12:45:00 AM	45.1	32	31.7	32359		0	
12	12/08/2023	1:00:00 AM	47.5	32	31.7	56234	134501 45.3	0	

13	12/08/2023	1:15:00 AM	45.1	33.3	31.8	32359		0	
14	12/08/2023	1:30:00 AM	43.7	32.3	31.8	23442		0	
15	12/08/2023	1:45:00 AM	39.3	30.3	31.9	8511		0	
16	12/08/2023	2:00:00 AM	48.2	30.6	32	66069	130382 45.1	0	
17	12/08/2023	2:15:00 AM	46	31	32	39811		0	
18	12/08/2023	2:30:00 AM	41.9	30.7	32.3	15488		0	
19	12/08/2023	2:45:00 AM	49.3	29.5	32.4	85114		0	
20	12/08/2023	3:00:00 AM	43.9	29.7	32.6	24547	164960 46.2	0	
21	12/08/2023	3:15:00 AM	40.6	30.5	33.1	11482		0	
22	12/08/2023	3:30:00 AM	46.3	31.7	33.3	42658		0	
23	12/08/2023	3:45:00 AM	45.6	31.4	33.5	36308		0	
24	12/08/2023	4:00:00 AM	43.7	31.1	34.4	23442	113890 44.5	0	
25	12/08/2023	4:15:00 AM	46.2	31.7	35.1	41687		0	
26	12/08/2023	4:30:00 AM	45.1	31.9	35.3	32359		0	
27	12/08/2023	4:45:00 AM	45.3	35.3	35.8	33884		0	
28	12/08/2023	5:00:00 AM	51.2	37	37	131826	239756 47.8	0	
29	12/08/2023	5:15:00 AM	48.5	35.1	37.1	70795		0	
30	12/08/2023	5:30:00 AM	50.6	38.3	38.3	114815		0	
31	12/08/2023	5:45:00 AM	55.2	42.9	42.9	331131		0	
32	12/08/2023	6:00:00 AM	58.3	43.6	43.6	676083	1192824 54.7	0	
33	12/08/2023	6:15:00 AM	58.9	48	44.6	776247		0	
34	12/08/2023	6:30:00 AM	56.2	45.7	45.7	416869		0	
35	12/08/2023	6:45:00 AM	55.7	46.6	46.6	371535		0	
36	12/08/2023	7:00:00 AM	54.9	44.6	48	309030	1873681 56.7	0	
								4264097	0
1	12/08/2023	10:15:00 PM	49.1	38.6	30.4	81283		0	
2	12/08/2023	10:30:00 PM	48	38.5	30.7	63096		0	
3	12/08/2023	10:45:00 PM	48.7	38.8	30.7	74131		0	
4	12/08/2023	11:00:00 PM	46.6	35.6	30.7	45709	264219 48.2	0	
5	12/08/2023	11:15:00 PM	50.2	40.5	30.8	104713		0	
6	12/08/2023	11:30:00 PM	48.6	36.1	31.2	72444		0	
7	12/08/2023	11:45:00 PM	46.8	33.5	31.4	47863		0	
8	13/08/2023	12:00:00 AM	46.6	33.3	31.5	45709	270728 48.3	0	
9	13/08/2023	12:15:00 AM	46	33.4	31.5	39811		0	
10	13/08/2023	12:30:00 AM	44.4	32.4	31.8	27542		0	
11	13/08/2023	12:45:00 AM	46.8	31.8	32.4	47863		0	
12	13/08/2023	1:00:00 AM	42.8	31.2	32.4	19055	134271 45.3	0	
13	13/08/2023	1:15:00 AM	40.2	30.7	32.5	10471		0	
14	13/08/2023	1:30:00 AM	40.2	31.5	32.7	10471		0	
15	13/08/2023	1:45:00 AM	37	30.8	32.7	5012		0	
16	13/08/2023	2:00:00 AM	47	33.2	33.1	50119	76073 42.8	0	
17	13/08/2023	2:15:00 AM	44.9	31.5	33.2	30903		0	
18	13/08/2023	2:30:00 AM	46.6	32.7	33.2	45709		0	
19	13/08/2023	2:45:00 AM	43.7	31.4	33.3	23442		0	
20	13/08/2023	3:00:00 AM	45.6	30.7	33.4	36308	136362 45.3	0	
21	13/08/2023	3:15:00 AM	35.2	30.4	33.5	3311		0	
22	13/08/2023	3:30:00 AM	44.7	32.4	35.6	29512		0	
23	13/08/2023	3:45:00 AM	43.8	30.7	36.1	23988		0	
24	13/08/2023	4:00:00 AM	42.2	33.1	36.4	16596	73408 42.6	0	
25	13/08/2023	4:15:00 AM	43.5	32.7	37.1	22387		0	
26	13/08/2023	4:30:00 AM	44.2	32.5	37.5	26303		0	
27	13/08/2023	4:45:00 AM	43.9	33.2	38.5	24547		0	
28	13/08/2023	5:00:00 AM	49.1	37.5	38.6	81283	154520 45.9	0	
29	13/08/2023	5:15:00 AM	47.6	37.1	38.8	57544		0	
30	13/08/2023	5:30:00 AM	46.9	36.4	40	48978		0	
31	13/08/2023	5:45:00 AM	50.3	40	40.5	107152		0	
32	13/08/2023	6:00:00 AM	54.3	40.9	40.9	269153	482827 50.8	0	
33	13/08/2023	6:15:00 AM	57.1	46.5	42.3	512861		0	
34	13/08/2023	6:30:00 AM	55.3	44.8	44.2	338844		0	
35	13/08/2023	6:45:00 AM	53.5	42.3	44.8	223872		0	
36	13/08/2023	7:00:00 AM	53.7	44.2	46.5	234423	1310001 55.2	0	
								2,902,408.02	0
1	13/08/2023	10:15:00 PM	45	39.7	39.1	31623		0	
2	13/08/2023	10:30:00 PM	46.7	39.5	39.3	46774		0	
3	13/08/2023	10:45:00 PM	45.7	39.1	39.4	37154		0	
4	13/08/2023	11:00:00 PM	47	39.4	39.4	50119		0	
5	13/08/2023	11:15:00 PM	45.4	39.6	39.5	34674	165669 46.2	0	
6	13/08/2023	11:30:00 PM	47.1	40.2	39.5	51286		0	
7	13/08/2023	11:45:00 PM	50.3	40.8	39.5	107152		0	
8	14/08/2023	12:00:00 AM	46.6	39.7	39.6	45709	238821 47.8	0	
9	14/08/2023	12:15:00 AM	46.8	39.3	39.6	47863		0	
10	14/08/2023	12:30:00 AM	48.2	39.6	39.6	66069		0	

11	14/08/2023	12:45:00 AM	47.8	39.8	39.7	60256		0	
12	14/08/2023	1:00:00 AM	46.5	39.5	39.7	44668	218857	47.4	0
13	14/08/2023	1:15:00 AM	44.1	39.7	39.7	25704			0
14	14/08/2023	1:30:00 AM	39.9	39.4	39.7	9772			0
15	14/08/2023	1:45:00 AM	47.4	39.7	39.8	54954			0
16	14/08/2023	2:00:00 AM	45.4	39.9	39.8	34674	125104	45.0	0
17	14/08/2023	2:15:00 AM	44	39.6	39.9	25119			0
18	14/08/2023	2:30:00 AM	44.4	39.5	39.9	27542			0
19	14/08/2023	2:45:00 AM	48	39.9	39.9	63096			0
20	14/08/2023	3:00:00 AM	44.4	39.9	39.9	27542	143299	45.5	0
21	14/08/2023	3:15:00 AM	45.5	39.9	40	35481			0
22	14/08/2023	3:30:00 AM	46.9	39.8	40.2	48978			0
23	14/08/2023	3:45:00 AM	48.6	40	40.3	72444			0
24	14/08/2023	4:00:00 AM	49.1	40.3	40.8	81283	238186	47.7	0
25	14/08/2023	4:15:00 AM	49.8	40.8	40.8	95499			0
26	14/08/2023	4:30:00 AM	50.9	42	42	123027			0
27	14/08/2023	4:45:00 AM	52.3	42.5	42.5	169824			0
28	14/08/2023	5:00:00 AM	54.4	44.4	44.2	275423	663773	52.2	0
29	14/08/2023	5:15:00 AM	54.1	44.2	44.4	257040			0
30	14/08/2023	5:30:00 AM	56.1	47.1	47.1	407380			0
31	14/08/2023	5:45:00 AM	58.8	49.6	49.6	758578			0
32	14/08/2023	6:00:00 AM	60.1	51.6	50.5	1023293	2446290	57.9	0
33	14/08/2023	6:15:00 AM	60.6	52.3	51.4	1148154			0
34	14/08/2023	6:30:00 AM	58.9	52	51.6	776247			0
35	14/08/2023	6:45:00 AM	59.5	51.4	52	891251			0
36	14/08/2023	7:00:00 AM	60.1	50.5	52.3	1023293	3838945	59.8	0
							8,078,943.39		0
1	14/08/2023	10:15:00 PM	45.4	35.3	29.4	34674			0
2	14/08/2023	10:30:00 PM	48.1	32.5	29.7	64565			0
3	14/08/2023	10:45:00 PM	45	31.9	30	31623			0
4	14/08/2023	11:00:00 PM	43.7	32	30.2	23442	154304	45.9	0
5	14/08/2023	11:15:00 PM	40.9	31.4	30.3	12303			0
6	14/08/2023	11:30:00 PM	48.7	33.1	30.3	74131			0
7	14/08/2023	11:45:00 PM	42.8	29.7	30.4	19055			0
8	15/08/2023	12:00:00 AM	44.6	29.4	30.5	28840	134329	45.3	0
9	15/08/2023	12:15:00 AM	41	31.3	30.6	12589			0
10	15/08/2023	12:30:00 AM	47.7	31.1	31.1	58884			0
11	15/08/2023	12:45:00 AM	43.2	30.5	31.1	20893			0
12	15/08/2023	1:00:00 AM	46.7	30.3	31.2	46774	139140	45.4	0
13	15/08/2023	1:15:00 AM	45.3	30.3	31.2	33884			0
14	15/08/2023	1:30:00 AM	43.5	30.2	31.3	22387			0
15	15/08/2023	1:45:00 AM	52	30	31.4	158489			0
16	15/08/2023	2:00:00 AM	47.3	30.4	31.4	53703	268464	48.3	0
17	15/08/2023	2:15:00 AM	44.1	31.2	31.9	25704			0
18	15/08/2023	2:30:00 AM	48.7	31.1	32	74131			0
19	15/08/2023	2:45:00 AM	42.8	30.6	32.1	19055			0
20	15/08/2023	3:00:00 AM	44.5	31.4	32.5	28184	147073	45.7	0
21	15/08/2023	3:15:00 AM	48.3	32.1	32.8	67608			0
22	15/08/2023	3:30:00 AM	43.3	31.2	33	21380			0
23	15/08/2023	3:45:00 AM	45.7	33	33.1	37154			0
24	15/08/2023	4:00:00 AM	44.9	32.8	34.7	30903	157044	45.9	0
25	15/08/2023	4:15:00 AM	49.1	34.7	35.3	81283			0
26	15/08/2023	4:30:00 AM	51	36	36	125893			0
27	15/08/2023	4:45:00 AM	50.1	38.3	38.3	102329			0
28	15/08/2023	5:00:00 AM	54.9	42	42	309030	618534	51.9	0
29	15/08/2023	5:15:00 AM	56.3	43.7	43.7	426580			0
30	15/08/2023	5:30:00 AM	57.2	45	45	524807			0
31	15/08/2023	5:45:00 AM	57.7	47.5	47.5	588844			0
32	15/08/2023	6:00:00 AM	60.1	49.3	49.3	1023293	2563524	58.1	0
33	15/08/2023	6:15:00 AM	60.1	51.2	50.6	1023293			0
34	15/08/2023	6:30:00 AM	59.1	52	50.7	812831			0
35	15/08/2023	6:45:00 AM	60.3	50.6	51.2	1071519			0
36	15/08/2023	7:00:00 AM	59.3	50.7	52	851138	3758781	59.7	0
							7941194		0