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23 July 2024

Enquiries: Bayzid Khan
Project No: 300305301

City of Canada Bay Council
c/o Urban Property Group
Suite 110, Level 1
180-186 Burwood Road
BURWOOD NSW 2134

Attention: Sid Mawad (Assistant Development Manager)

Dear Sid

RE: 25 George Street, North Strathfield
Response to Request for Further Information – Traffic Comments

Background

A Development Application (DA-2024/0064) has been lodged with City of Canada Bay Council (Council) for a residential development on land located at 25 George Street, North Strathfield. As part of the DA, Stantec submitted a Transport Impact Assessment in March 2024.

Council have since issued a Request for Further Information letter dated 25 June 2024. This following section discusses and responds to the traffic-related matters raised in the Request for Further Information letter.

Council comments

Comment: *3. Traffic and Parking – Local Infrastructure*

The proposal seeks to increase density with an additional 41 units. Notwithstanding the new provisions under the Housing SEPP incentivising in-fill affordable housing development, the CBLEP and CBDCP development standards and controls have been established under local planning processes, during which it has been identified that road network issues in the area are problematic.

The subject site is situated within the Concord West area, as identified under Special Precincts K of the City of Canada Bay Development Control Plans as sub-precinct 7. Part K6 of the CBDCP has been prepared to align this area of the LGA with the strategic planning of the Parramatta Road Corridor Urban Transformation Strategy (PRCUTS).

The Site primarily connects to Parramatta Road via George Street, with vehicular access to and from the Site being restricted via this George Street route. Council has identified, amongst others, a problematic pinch point at the intersection of George Street and Pomeroy Street. See figure 1 below.

Figure 1: Aerial of the Site and its proximity to the George / Pomeroy Streets intersection (Source: IntraMaps)

The intersection of George and Pomeroy Streets is identified as one of the several intersections in the area that is currently and will continue to experience congestion. However, the impact of the proposal on other intersections should also be considered in any traffic assessment, including:

- *George Street/Parramatta Road*
- *Pomeroy Street/Underwood Road*
- *Queen Street/Pomeroy Street/Beronga Street*

The submitted traffic report concludes that the development will generate more vehicle trips than that of planned growth studies for the area, and planned growth studies for the area have not taken into consideration the potential uplift in density now afforded by the recent Housing SEPP provisions. Further, the 19 visitor space shortfall is likely to have impact on street parking availability and has not been adequately addressed.

Response: While acknowledging that the Transport Impact Assessment Report (by Stantec, Dated: 28 March 2024) shows a minor increase of trips (6 vehicles per hour), the TIA report uses a higher trip generation rate (0.25 vehicles per hour) compared to Sydney average trip rates of 0.19 vph and 0.15 vph during AM and PM peaks as a conservative approach. Using the average trips rates, the development would generate 37 and 26 trips per hour which is similar to/lower than what is being generated by the planned development of the area. Such minor/no increase of trips is anticipated to have no visible impacts on the existing intersection performance.

Notwithstanding the above, reference is also made to the recent 'Draft Homebush TOD Rezoning Precinct Transport Statement' (by ARUP, dated 03 July 2024) and 'Infrastructure Delivery and Implementation Plan Homebush State Led Rezoning' Report (by ARCADIS, dated 03 July 2024) prepared for Department of Planning, Housing and Infrastructure (DPHI). Both reports are currently on public exhibition until 16 August 2024. Homebush has been identified as an accelerated precinct under the Transport Oriented Development (TOD) Program. As part of the TOD program, the Department of Planning, Housing and Infrastructure has reviewed the current planning controls for the Homebush precinct to determine areas of the precinct suitable to support more homes.

As part of the proposed Homebush TOD, the area will experience a significant increase of dwellings (16,100 dwellings) and jobs (2,670 jobs) in near future. Number of road network improvement measures are proposed, including the following measures in close proximity to the site (Table 3 of Infrastructure Delivery and Implementation and Plan for Homebush State Led Rezoning):

- Detailed assessment of number of key intersections, including Goerge Street/Pomeroy Street, Pomeroy Street/Underwood and George Street/Parramatta Road intersections and identify improvement measures

- New north-west street along the edge of Powells Creek between Conway Avenue and Pomeroy Street
- New active transport facilities and
- New public bus services along George Street

The above requires significant assessment of the wider area considering the proposed increase of dwellings and jobs, and is beyond the scope of this study. Any upgrades recommended to accommodate the site would likely not be suitable in accommodating development of the entire Precinct. Therefore, any recommended mitigation measures would not offer any practical benefits in terms of intersection treatments/ upgrades.

In regard to the shortfall of 19 visitors' parking, reference is made to the Canada Bay DCP 2023, which specifies maximum parking requirements for residents as well as visitors. As per the DCP 2023, the maximum 34 parking spaces is required for the proposed 174 dwellings. As such, provision of 15 visitors parking complies with the DCP 2023.

In addition, the recent published 'Draft Homebush TOD Rezoning Precinct Transport Statement' (by ARUP, dated 03 July 2024) identified the subject site within Tier 1 parking areas (Figure 27 and Table 5) and a reduced parking requirement is recommended due to active and public transport coverages. The recommended rate proposed maximum 0.1 visitor parking per dwellings, i.e., maximum 17 visitors' spaces. Hence, the proposed provision of 15 visitors' spaces is considered appropriate and complies with the requirements and also aligns with the proposed Homebush TOD recommendations.

Based on the above, it is anticipated that the detailed assessment of the wider network will include the proposed development in identifying any road network improvement measures. Considering negligible increase vehicular trips, the proposed development does not anticipate to have any adverse impacts on the surrounding road network performance (from the existing performance level) and on-street parking.

Comment: *4. Traffic and Parking – Engineering*

Council's Engineer has reviewed the proposal and provided comments based on the following documentation lodged with the application:

- *Transport Impact Assessment prepared by Stantec, dated 28 March 2024*
- *Architectural Drawings by Fuse Architect, dated 2 February 2024*

Council's Engineer's comments include:

i) AS/NZS 2890.6:2009 requires disabled spaces to be 2.4m wide beside a 2.4m wide shared area. A bollard must be installed in the shared area and the shared area diagonally line marked. The building plans shall demonstrate compliance with this requirement prior to the issue of development consent.

Response: The plans are reviewed as per the latest AS/NZS 2890.2:2022. Please see attached design review and swept path analysis.

Comment: *ii) The applicant is required to provide the following details for an assessment prior to the issue of development consent.*

a) Longitudinal section along the extreme wheel paths of each driveway/access ramp demonstrating compliance with AS/NZS 2890.1:2004 and AS2890.2:2018. It shall include all levels, grades, transitions and headroom clearances. It shall extend from the centreline of the roadway through to the parking area. Where the driveway crosses the footpath, it shall be graded a minimum 1% away from the property boundary but not exceeding 2.5%.

Response: Please see attached design review and swept path analysis. No scraping is seen.

Comment: *b) Longitudinal section along the gutter line showing how it is intended to transition the vehicular crossing into the existing kerb and gutter.*

c) Location of verge trees, street furniture and service installations.

Response: Refer to main RFI response.

Comment: *iii) The applicant shall include the proposed vehicular crossing layout with dimension within the road reserve, compliance with Council's DCP Appendix 2 – Engineering Specifications. The vehicle turning manoeuvre diagrams shall be demonstrated using this proposed vehicular crossing layout.*

Response: Refer to main RFI response.

Comment: *iv) As per Council's DCP requirement, the proposed development is required to provide a service vehicle space which should accommodate removalist vehicles and other service requirement for the site. As such the space should be designed for medium rigid vehicle as per AS2890.2. The proposed garbage collection area may have shared use with these types of vehicles if a direct access is provided between garbage collection bay and front foyer.*

Response: The loading dock area can accommodate 10.5m long council's garbage truck as well as medium rigid vehicles (MRV).

Comment: *v) It is noted that Council's DCP requires the proposed development to provide a maximum of 171 residentials parking spaces. However, the development proposes a total of 176 residential parking spaces. Noting the proposal provides lower visitor parking spaces than required as per Council's DCP, the additional 5 parking spaces shall be allocated to visitor parking spaces.*

Response: The proposal has been amended to reduce the number of car parking spaces to address traffic and parking concerns, resulting in 167 resident and 15 visitor spaces, for a total of 182 spaces, being a reduction of 9 spaces overall (compared to the lodged scheme).

Comment: *vi) Council's DCP – General Controls requires residential developments to provide 2 bicycle storage space for every dwelling and 2 bicycle parking facility for every 10 dwellings.*

The bicycle storage area is in addition to minimum requirement of storage cages. These bicycle storages shall be included in the plan and in accordance with AS2890.3:2015. The building plans shall demonstrate compliance with this requirement prior to the issue of development consent.

Response: The proposal will provide a total of 36 bicycle spaces for visitors (18 on Basement 1 near the lift core, 16 on ground floor near the chair lift / main entry to Building A). This complies with the requirement of the DCP, which requires 34 spaces.

The amended proposal also provides 172 storage cages, capable of accommodating 2 bicycle per apartment, also in compliance with the DCP.

I trust this letter provides the necessary information. Should you have any questions, please do not hesitate to contact me directly.

Yours sincerely

Stantec Australia Pty Ltd

Bayzid Khan
Principal Transport Engineer

AMENDED CLAUSE 4.6 – BUILDING HEIGHT

Development Application for alterations and additions to an approved residential development seeking consent for three additional storeys to Building A, and an additional storey to both Building B and C.

25 George Street, North Strathfield
Prepared for: *Urban Property Group*

REF: M230119
DATE: 23 July 2024

PLANNING
INGENUITY

Clause 4.6 Variation –
Building Height

Clause 4.6 Variation Statement – Building Height (CBLEP Clause 4.3 and Housing SEPP Section 16(3)

1. Height of Buildings Standard

Clause 4.3 of the *Canada Bay Local Environmental Plan 2013* (CBLEP 2013) relates to the maximum height requirements and refers to the *Height of Buildings Map.* The relevant map identifies the subject site as having a maximum height of 16m to George Street, and 22m centrally and to the rear of the site.

It is noted however that this application is made pursuant to *Part 2 Development for affordable housing*, *Division 1 In-fill affordable housing*, *Section 16 Affordable housing requirements for additional floor space ratio*, subsection *(3)* of the *State Environmental Planning Policy (Housing) 2021* (Housing SEPP). Specifically, this application seeks to benefit from the 30% floor space ratio (FSR) and building height bonuses under Section 16(3) of the Housing SEPP, where an affordable housing component of 15% of the total floor space ratio (FSR) is provided for a minimum 15-year period. Accordingly, and per the Housing SEPP, the subject site is permitted a maximum building height of 20.8m (where the 16m limit applies) and 28.6m (where the 22m limit applies).

Building height is defined as:

> ***building height*** *(or* ***height of building****) means—*
>
> *(a) in relation to the height of a building in metres—the vertical distance from ground level (existing) to the highest point of the building, or*
>
> *(b) in relation to the RL of a building—the vertical distance from the Australian Height Datum to the highest point of the building,*
>
> *including plant and lift overruns, but excluding communication devices, antennae, satellite dishes, masts, flagpoles, chimneys, flues and the like.*

As identified above, when applying the 30% building height bonus afforded by Section 16(3) of the Housing SEPP, a maximum height of 20.8m is permitted to George Street, and 28.6m centrally and to the rear of the site.

Figure 1 Extract from the Height of Buildings Map [20.8m, 28.6m]

2. Proposed variation to height of buildings development standard

Where the 20.8m height limit applies, the architectural plans indicate that the proposed development has a maximum height of 22.607m to the central portion of the parapet roof of Level 6 (seventh storey), Building A. This is measured from 'ground level (existing)' in accordance with the definition of 'building height' under the CBLEP 2013.

Accordingly, the proposal varies the 20.8m building height development standard set by the Housing SEPP Section 16(3), and seeks a maximum variation of 1.807m, or 8.6%.

It is noted that the six storey portion of Building A complies with the 20.8m maximum building height. Additionally, both Building B and Building C are situated well below the 28.6m development standard for this portion of the site, with a maximum height of 26.64m and 25.55m, respectively. **Figure 2** below provides a height blanket diagram of the proposed development, with building heights dimensioned.

It should be noted that the proposal, as amended from that as originally lodged, has been reduced in height by 0.513m (where the 20.8m limit applies, on Building A). The reduction in height is the result of setting back the 7th storey of Building A further from George Street (which has reduced the technical non-compliance as the topography of the site slopes downwards to George Street) and deletion of the lift overrun.

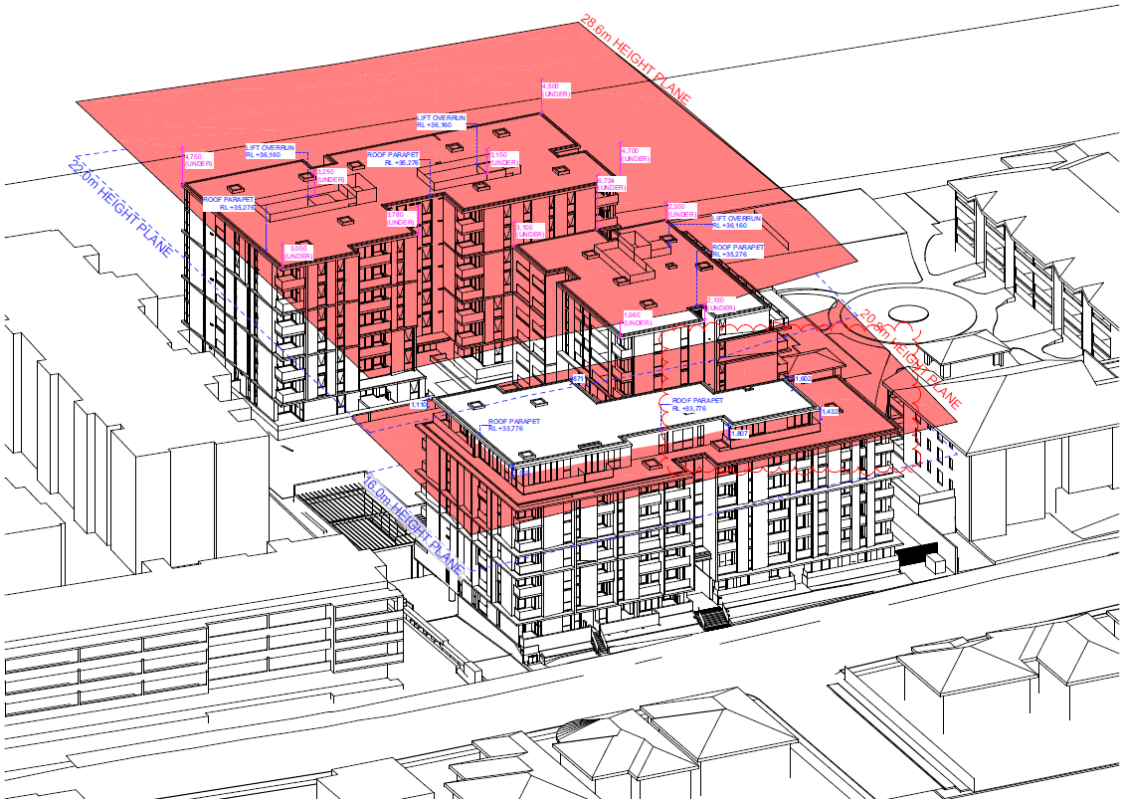


Figure 2 Height Blanket Diagram

3. Clause 4.6 to CBLEP 2013

The objectives and provisions of clause 4.6 of the CBLEP 2013 are as follows:

> *(1) The objectives of this clause are as follows—*

(a) to provide an appropriate degree of flexibility in applying certain development standards to particular development,

(b) to achieve better outcomes for and from development by allowing flexibility in particular circumstances.

(2) Development consent may, subject to this clause, be granted for development even though the development would contravene a development standard imposed by this or any other environmental planning instrument. However, this clause does not apply to a development standard that is expressly excluded from the operation of this clause.

(3) Development consent must not be granted to development that contravenes a development standard unless the consent authority is satisfied the applicant has demonstrated that—

(a) compliance with the development standard is unreasonable or unnecessary in the circumstances, and

(b) there are sufficient environmental planning grounds to justify the contravention of the development standard.

***Note**— The Environmental Planning and Assessment Regulation 2021 requires a development application for development that proposes to contravene a development standard to be accompanied by a document setting out the grounds on which the applicant seeks to demonstrate the matters in paragraphs (a) and (b).*

(4) The consent authority must keep a record of its assessment carried out under subclause (3).

(5) (Repealed)

(6) Development consent must not be granted under this clause for a subdivision of land in Zone RU1 Primary Production, Zone RU2 Rural Landscape, Zone RU3 Forestry, Zone RU4 Primary Production Small Lots, Zone RU6 Transition, Zone R5 Large Lot Residential, Zone C2 Environmental Conservation, Zone C3 Environmental Management or Zone C4 Environmental Living if—

(a) the subdivision will result in 2 or more lots of less than the minimum area specified for such lots by a development standard, or

(b) the subdivision will result in at least one lot that is less than 90% of the minimum area specified for such a lot by a development standard.

***Note**— When this Plan was made it did not include all of these zones.*

(7) (Repealed)

(8) This clause does not allow development consent to be granted for development that would contravene any of the following—

(a) a development standard for complying development,

(b) a development standard that arises, under the regulations under the Act, in connection with a commitment set out in a BASIX certificate for a building to which State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 applies or for the land on which such a building is situated,

(c) clause 5.4,

(caa) clause 5.5,

(ca) clauses 6.4 and 6.5,

(cb) clause 6.10,

(cc) clauses 7.3 and 7.8(2)(a)–(c).

The development standards in clause 4.3 are not "expressly excluded" from the operation of Clause 4.6.

4. Compliance is unreasonable or unnecessary in the circumstances of the case (Clause 4.6(3)(a))

In *Wehbe V Pittwater Council* (2007) NSW LEC 827 Preston CJ sets out ways of establishing that compliance with a development standard is unreasonable or unnecessary. This list is not exhaustive. It states, inter alia:

> *"An objection under SEPP 1 may be well founded and be consistent with the aims set out in clause 3 of the Policy in a variety of ways. The most commonly invoked way is to establish that compliance with the development standard is unreasonable or unnecessary because the objectives of the development standard are achieved notwithstanding non-compliance with the standard."*

The judgement goes on to state that:

> *"The rationale is that development standards are not ends in themselves but means of achieving ends. The ends are environmental or planning objectives. Compliance with a development standard is fixed as the usual means by which the relevant environmental or planning objective is able to be achieved. However, if the proposed development proffers an alternative means of achieving the objective strict compliance with the standard would be unnecessary (it is achieved anyway) and unreasonable (no purpose would be served)."*

Preston CJ in the judgement then expressed the view that there are 5 different ways in which an objection may be well founded and that approval of the objection may be consistent with the aims of the policy, as follows (with emphasis placed on number 1 for the purposes of this Clause 4.6 variation [our underline]):

1. *The objectives of the standard are achieved notwithstanding non-compliance with the standard;*
2. *The underlying objective or purpose of the standard is not relevant to the development and therefore compliance is unnecessary;*
3. *The underlying object or purpose would be defeated or thwarted if compliance was required and therefore compliance is unreasonable;*
4. *The development standard has been virtually abandoned or destroyed by the Council's own actions in granting consents departing from the standard and hence compliance with the standard is unnecessary and unreasonable;*
5. *The zoning of the particular land is unreasonable or inappropriate so that a development standard appropriate for that zoning is also unreasonable and unnecessary as it applies to the land and compliance with the standard that would be unreasonable or unnecessary. That is, the particular parcel of land should not have been included in the particular zone.*

Relevantly, in *Initial Action Pty Ltd v Woollahra Municipal Council [2018] NSWLEC 118* (paragraph 16), Preston CJ makes reference to *Wehbe* and states:

> *…Although that was said in the context of an objection under State Environmental Planning Policy No 1 – Development Standards to compliance with a development standard, the discussion is equally applicable to a written request under cl 4.6 demonstrating that compliance with a development standard is unreasonable or unnecessary.*

The objectives and relevant provisions of clause 4.3 of CBLEP are as follows:

> *(a) to ensure that buildings are compatible with the height, bulk and scale of the desired future character of the locality and positively contribute to the streetscape and public spaces,*
>
> *(b) to protect the amenity of residential accommodation, neighbouring properties and public spaces in terms of—*
>
> > *(i) visual and acoustic privacy, and*
> >
> > *(ii) solar access and view sharing,*
>
> *(c) to establish a transition in scale between medium and high density centres and adjoining lower density and open space zones to protect local amenity,*
>
> *(d) to ensure that buildings respond to the natural topography of the area.*

In order to address the requirements of Subclause 4.6(4)(a)(ii), the objectives of Clause 4.3 are addressed in turn below. Whilst it is noted that there are no objectives for the height bonus afforded by the Housing SEPP, the objective of *Division 1 In-fill affordable housing* of the Housing SEPP is also addressed.

Objective (a): "to ensure that buildings are compatible with the height, bulk and scale of the desired future character of the locality and positively contribute to the streetscape and public spaces"

It is noted that objective (a) refers to being "compatible" with the height, bulk and scale of the desired future character of the locality. It is considered that "compatible" does not promote "sameness" in built form, but rather requires that development fits comfortably with its urban context. Of relevance to this assessment are the comments of *Roseth SC in Project Venture Developments Pty Ltd v Pittwater Council [2005] NSWLEC 191*:

> *"22 There are many dictionary definitions of compatible. The most apposite meaning in an urban design context is capable of existing together in harmony. Compatibility is thus different from sameness. It is generally accepted that buildings can exist together in harmony without having the same density, scale or appearance, though as the difference in these attributes increases, harmony is harder to achieve."*

Council does not have any specific desired future character objectives under CBLEP but reiterates that the desired future character is set by the applicable planning controls. However, the use of a DCP to determine desired future character of an LEP was overturned by Preston CJ in *Woollahra Municipal Council v SJD DB2 Pty Limited [2020] NSWLEC 115*. That is, the desired future character of the locality is not defined under CBLEP and is subjective.

Therefore, the desired future character of the neighbourhood must be set by the existing, recently approved and proposed buildings within the neighbourhood. The subject site is zoned R3 Medium Density Residential, opposes R2 Low Density Residential land to the west (which is anticipated to undergo significant transformation, as detailed below) and SP2 Railway land to the east. The site and surrounding locality is anticipated to undergo change and an increase in density, consistent with the existing and future planning controls, accessible location and proximity to Concord West and North Strathfield Railway Stations.

Design of proposal and compatibility in the streetscape

Firstly, the site contains an existing approval for the delivery of three residential flat buildings, ranging from four to six storeys in height, under DA2020/0143, which contributes to the desired future character of the locality through its high quality design and arrange of built form, significant landscaping and communal zones. These key attributes are not proposed to be compromised by the proposed amendments to the design, and are not affected by the minor height breach. Compatibility is achieved through a consistent approach to site planning, architectural and landscaped design, cognisant with DA2020/0143.

Furthermore, the 7th storey of Building A, to which the minor height variation relates, includes a substantial setback to George Street. This significant setback ensures that the uppermost level will be concealed when viewed from numerous points from the public domain and that the development will sit comfortably in its context, presenting to the public domain as six storeys in height. As shown in the streetscape images in **Figures 3 to 5** below, the 6 storey form presenting to George Street sits comfortably and in harmony with neighbouring properties and within the streetscape. The building will present with a human scale, and will set a desirable precedent for transit orientated, affordable housing development in this locality.

Figure 3 Streetscape perspectives of revised proposal from Argonne Street

Figure 4 Streetscape perspectives of revised proposal, looking south-east along George Street

Figure 5 Streetscape perspectives of revised proposal looking north along George Street

Compatibility with the desired future character the locality

Imperative to the consideration of the proposal's compatibility with the desired future character of the locality is the *Homebush Transport Orientated Development Precinct* (Homebush TOD Precinct). Specifically, Homebush TOD Precinct Rezoning Proposal seeks to:

- rezone the R2 Low Density Residential land immediately to the west of the subject to R4 High Density Residential, and also increase the maximum permitted FSR to 2.2:1 and building height to 28m. This increase

in density will permit a maximum height of 8 or 9 storeys, which will result in a bulk and scale greater than that proposed in the subject application; and

- Land to the south of the site on the eastern side of George Street is also proposed to be upzoned to R4 High Density Residential and MU1 Mixed Use, with increases in FSR from 2.8:1 – 4:1, and heights between 42m – 103m.

This considerable uplift in density forms a critical part of the desired future character of North Strathfield and George Street, inclusive of 8 to 9 storey built forms, and must be considered for the subject application (and minor height variation). Whilst the approved and surrounding developments contribute to desired future character, the locality is earmarked for significant change. That is, the subject site and surrounding properties are located within 800m walking distance to Concord West and North Strathfield Railway Stations and are capable of accommodating an increase in density as desired for transit orientated developments, per the Homebush TOD Precinct, and as also afforded by the Housing SEPP.

Therefore, the proposal, at 7 storeys, is considered entirely compatible with the desired future character of the locality as set out above.

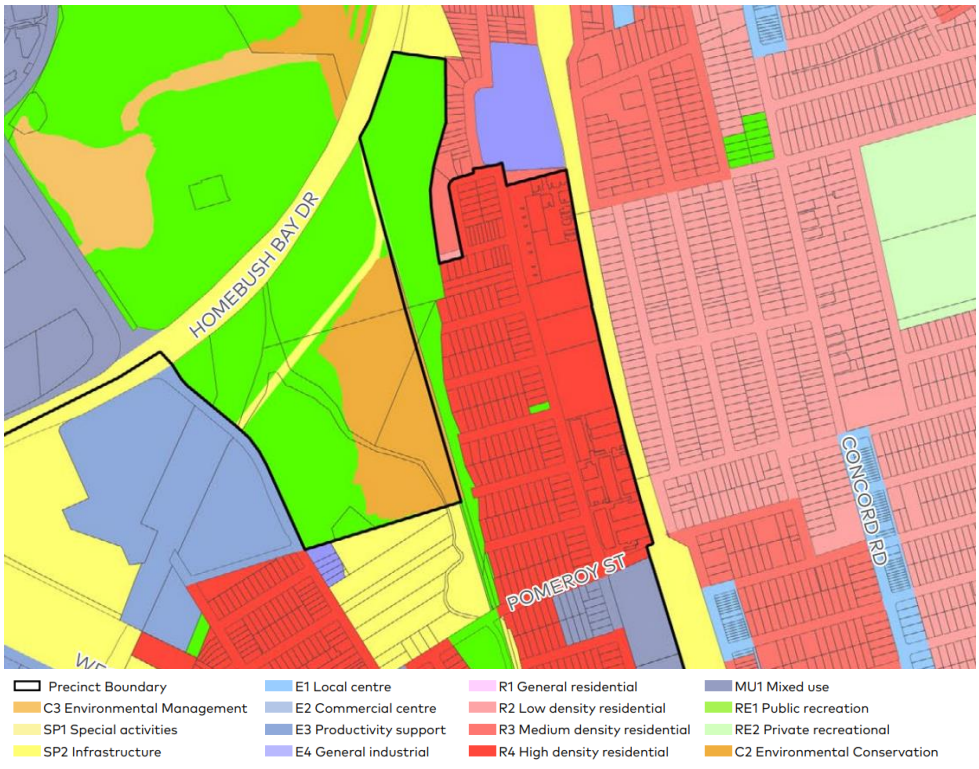


Figure 6 Homebush TOD Precinct – Proposed Zoning

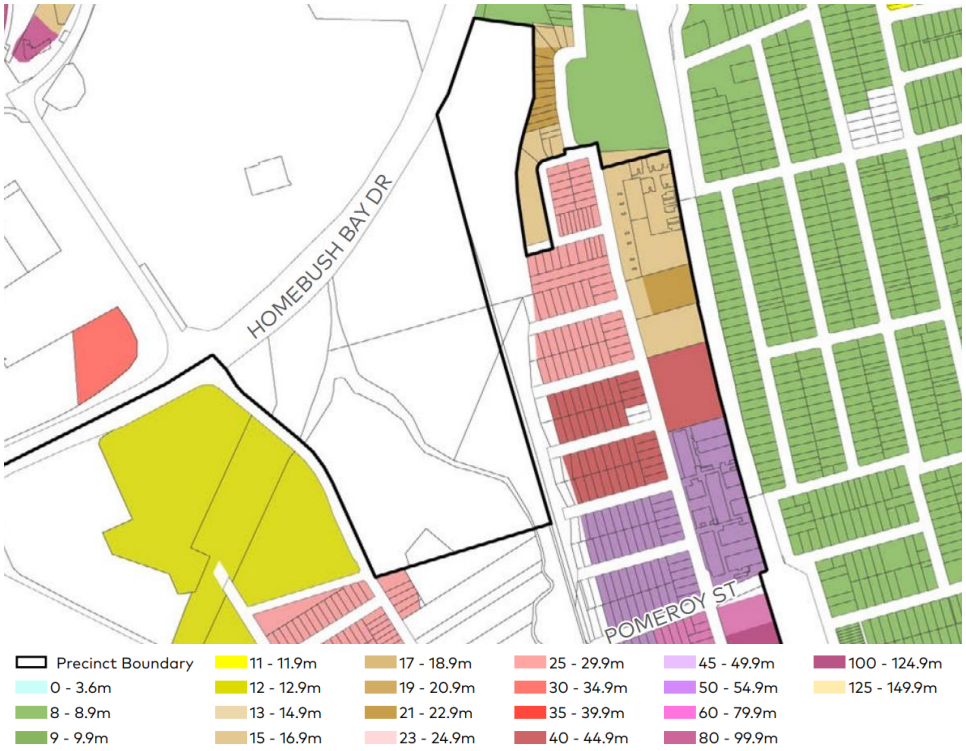


Figure 7 Homebush TOD Precinct – Proposed Building Height

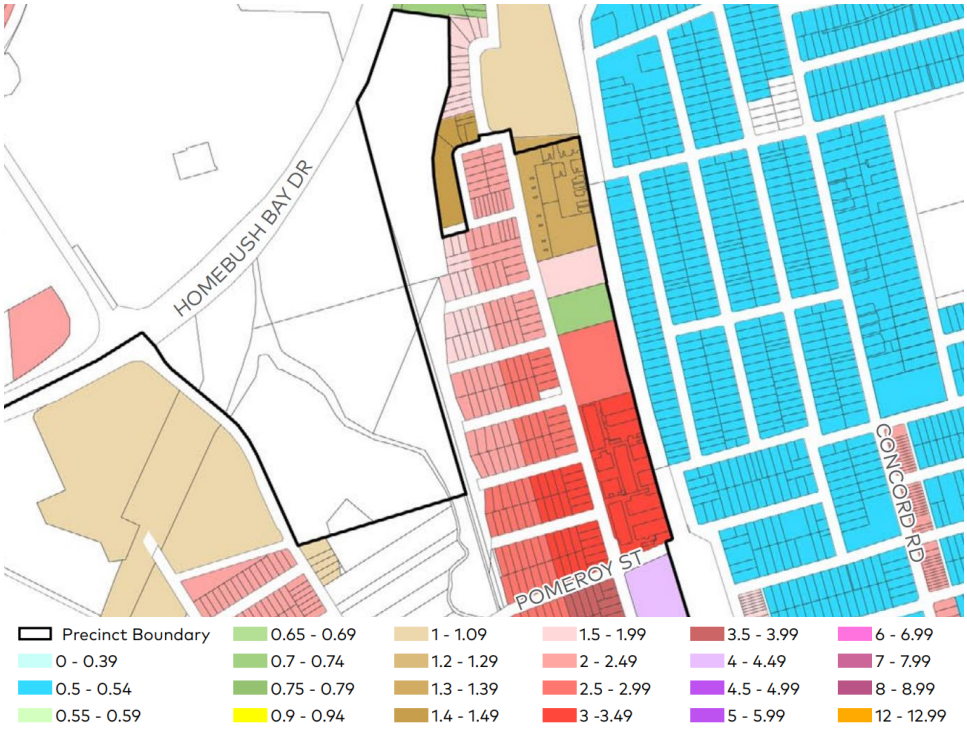


Figure 8 Homebush TOD Precinct – Proposed FSR

Figure 9 Homebush TOD Precinct – Perspective Images

Accordingly, the burden on insisting on strict compliance would result in the removal of high quality, residential apartments which would be an unreasonable and unnecessary outcome given the bulk, scale and character of the proposal is entirely compatible with both the existing and future character of the locality.

The proposal is therefore consistent with objective (a), despite the height breach.

Objective (b): "to protect the amenity of residential accommodation, neighbouring properties and public spaces in terms of—

(i) visual and acoustic privacy, and

(ii) solar access and view sharing"

The extent of variation associated with the seventh storey of Building A has been designed to protect the amenity of future residents, neighbouring properties and the public domain. As described under the Environment Planning Grounds (Section 5 of this Variation Statement), the proposed additional floor space has been purposefully distributed across the three buildings (including on Building A) to limit any adverse amenity impact to the neighbouring properties or residents on the subject site.

Privacy

In terms of privacy, the height variation does not result in any adverse additional privacy impacts beyond a compliant building envelope. The non-compliant building height is concentrated towards George Street, and is set back considerably from the boundaries shared with neighbouring properties. When facades (including glazed openings) of the 7th storey are setback 10.8m to the northern boundary, and 14.9m to the southern (side) boundary, which comply with the ADG Design Criteria under Part 3F, therefore mitigating any adverse privacy impact. As such, objective (b)(i) is satisfied.

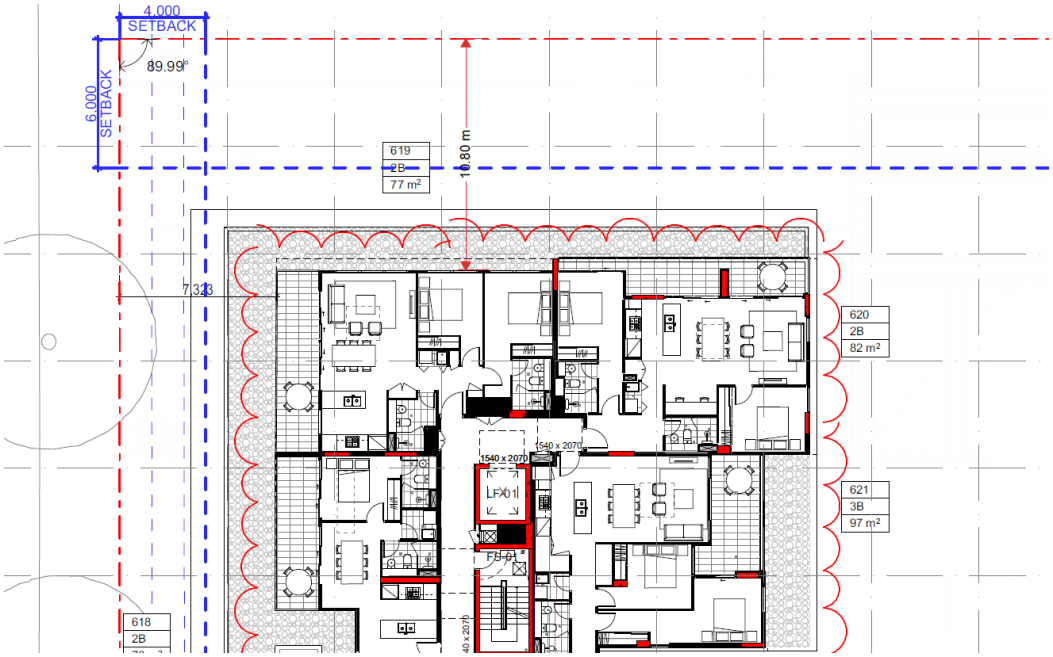


Figure 10 Proposed 10.8m setback to northern (side) boundary

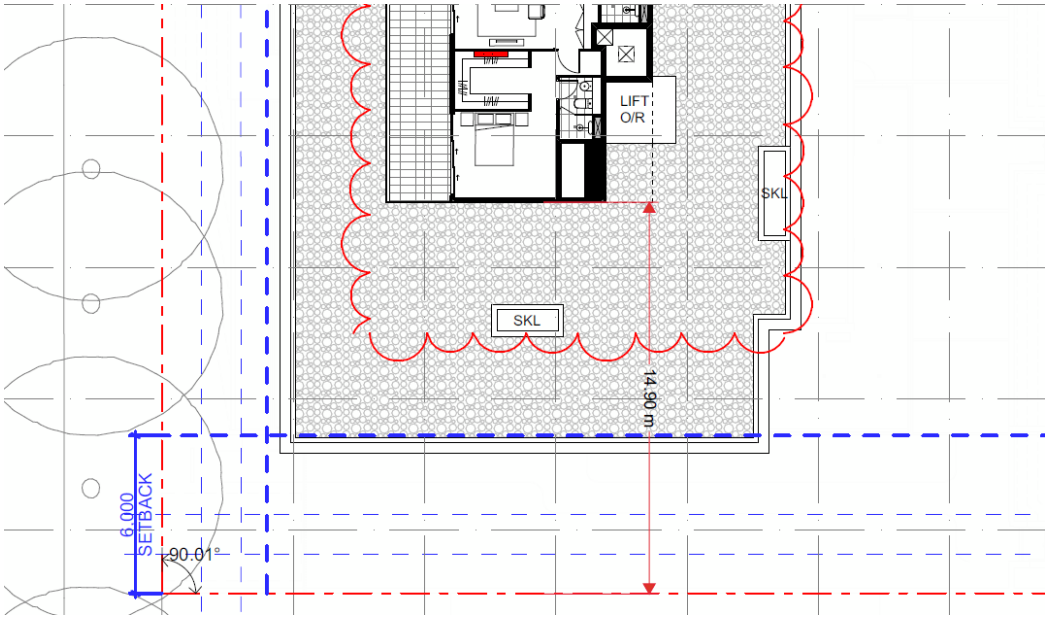


Figure 11 Proposed 14.9m setback to southern (side) boundary

Overshadowing

With regards to overshadowing, the proposed height variation will not result in any adverse overshadowing as opposed to an entirely compliant built form. The shadow diagrams submitted with the architectural plans confirm that whilst the variation itself will result in a minor increase in overshadowing, this is primarily cast onto the public domain of Argonne Street to the west from 9am to 10am during mid-winter. Throughout the remainder of mid-winter, additional shadow resulting from the non-compliant element is cast onto the roof top of the proposed Building A. As a result, the proposed

variation will not result in any adverse solar impact to the properties to the south, including their communal open space, and will not impact the communal open space proposed on the subject site.

Figures 12 and **13** below show the extent of additional shadow cast by the 7th storey on Argonne Street in midwinter, in the morning (additional shadow in red).

Figure 12 Mid-winter shadow diagram at 9am (additional shadow in red)

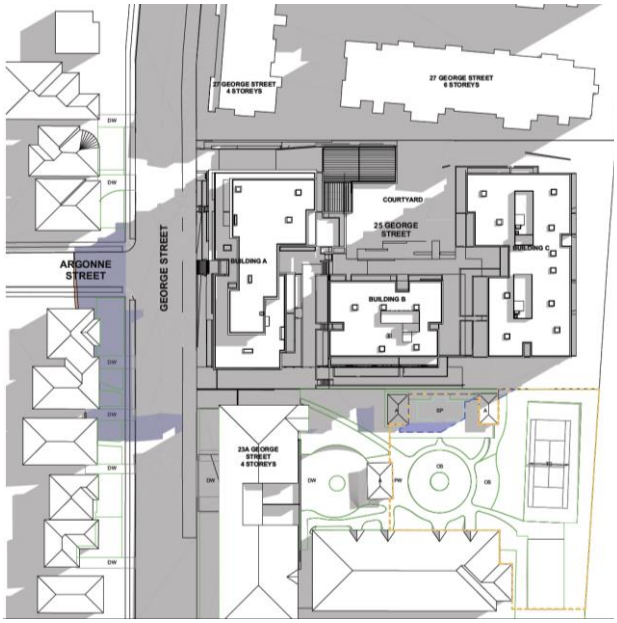
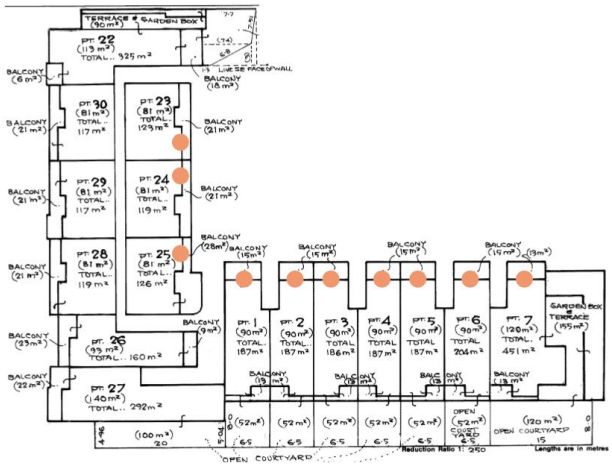
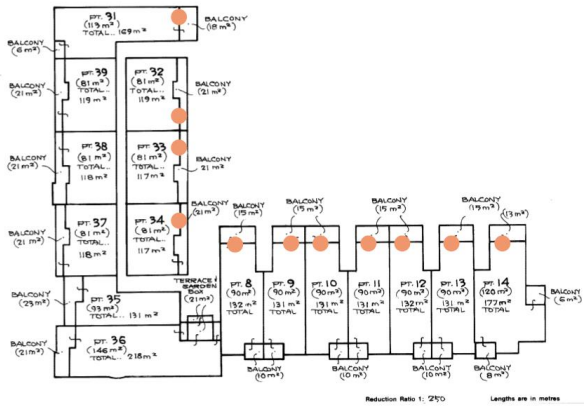


Figure 13 Mid-winter shadow diagram at 10am (additional shadow in red)

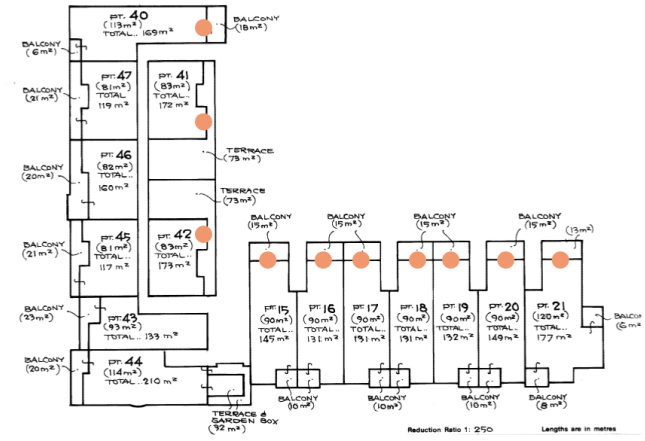
Further to the above, it is noted that the distribution of floor space and resultant height variation to Building A results in a superior outcome in terms of overshadowing and solar access to No. 23A George Street. That is, whilst a height compliant development can be achieved through locating additional floor area and distributing greater mass above Buildings B or C, this would result in additional overshadowing to the residential apartments and communal open space of the southern neighbour. As a result of the massing strategy employed, 23A George Street will retain 2 hours of solar access during mid-winter to 66% of residential apartments, which is the same number as approved under DA2020/0143, per **Figure 14**.



1 23 GEORGE ST - GROUND FLOOR



2 23 GEORGE ST - LEVEL 1



3 23 GEORGE ST - LEVEL 2

FLOOR	UNITS	EXISTING SOLAR ACCESS (AS PER CONSTRUCTED DA2020/0143)	PROPOSED 30% SOLAR ACCESS
GF	16	10	10
L1	16	11	11
L2	15	10	10
TOTAL	47	31	31
%	100%	66%	66%

Figure 14 Solar access of residential apartments at No. 23A George Street

Furthermore, this modification improves the solar access to the communal open space compared to the lodged proposal. The communal open space of 23A George Street will continue to outperform the ADG requirement for solar access in midwinter, with a total of 53% to 99% of the communal open space achieving more than 2 hours of direct solar access between 9am-3pm (well above the 50% requirement of the ADG), which also satisfies the ADG requirement. The massing strategy will also ensure the swimming pool of 23A George Street will retain full solar access from 9am to 3pm in mid-summer, when the swimming pool will be most frequently used.


10am
11am
12pm
1pm
ARGONNE STREET
GEORGE STREET
GREAT NORTHERN RAILWAY
COURTYARD
25 GEORGE STREET
BUILDING A
BUILDING B
BUILDING C
27 GEORGE STREET 6 STOREYS
27 GEORGE STREET 4 STOREYS
23A GEORGE STREET 4 STOREYS

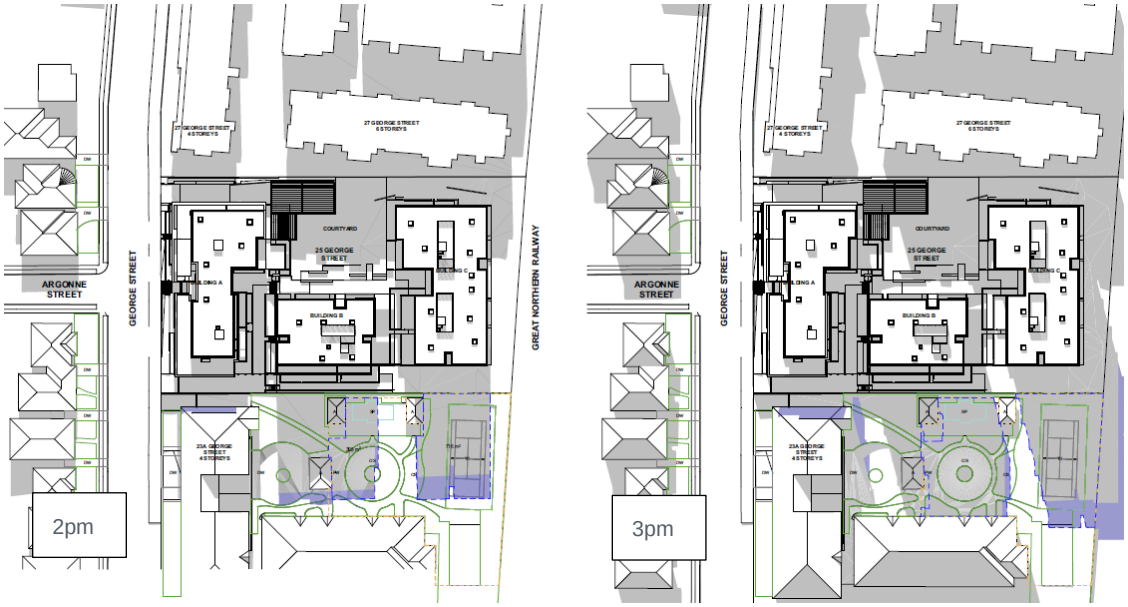


Figure 15 Overshadowing during mid-winter to communal open space at No. 23A George Street

As such, the additional overshadowing impact as a result of the height breach when compared to a compliant development are insignificant or nil.

View loss

In terms of view loss, the proposed variation will not result in any loss of views or outlook compared to a building with a compliant height. Importantly, there are no significant views currently enjoyed across the subject site from the public domain or neighbouring properties. The maximum height non-compliance is limited and any potential view loss would be caused by the approved and compliant building envelope. As such, objective (b)(ii) is satisfied.

Objective (c): "to establish a transition in scale between medium and high density centres and adjoining lower density and open space zones to protect local amenity"

As illustrated in the streetscape diagrams, the proposed development establishes an appropriate transition between the medium and low density zones and scale of development on the eastern and western sides of George Street, respectively. This is because the uppermost level (seventh storey), which includes the minor height variation, is set back substantially from the compliant envelope below, to ensure it is generally not visible from the public domain, and that the development presents as a six storey building from the street. As established in the streetscape analysis discussed earlier in this Variation Statement, the 6 storey form is compatible with the 4 storey and 2 storey scale of development fronting George Street, and in the same vein, provides a transition in scale, as anticipated by the objective of the development standard.

Whilst the land to the west is currently zoned R2, as described, the Homebush TOD Precinct will result in a rezoning of that land to R4 High Density Residential, permitting a maximum height of 9 storeys (28m) and FSR of 2.2:1, and likewise, allow for heights as high as 42m – 103m along George Street. In this context, the proposal will also provide for an appropriate transition having regard to the future context, with height graduating from low to high southward along George Street. The proposed minor height variation on Building A does not detract from the ability of the proposal to contribute to this appropriate transition.

As such, the removal of the proposed variation will not result in any meaningful change to the objective of achieving a transition in density, when compared to a strictly compliant development. As such, the proposal is considered to satisfy Objective (c) irrespective of the minor height variation.

Objective (d): "to ensure that buildings respond to the natural topography of the area"

As described, this application seeks approval for alterations and additions to the approved development which was designed originally to respond to the topography of the subject site. The proposed height variation is a result of floor area being purposefully located on Building A, which represents a strategic response to the site constraints and relationship to neighbouring properties. Whilst the development will result in a variation with the maximum building height of 20.8m, the non-compliant elements have been designed with appropriate setbacks to mitigate any visual impact as viewed from the public domain.

Most importantly, the uppermost level is set back from George Street to ensure it is concealed as viewed from the public domain, as shown in the streetscape analysis contained within the architectural plans. The location and setback of the non-compliant elements represents an appropriate response to the natural topography and is consistent with the development as originally approved. Accordingly, Objective (d) is satisfied despite non-compliance.

Housing SEPP Cl. 15A objective: *The objective of this division is to facilitate the delivery of new in-fill affordable housing to meet the needs of very low, low and moderate income households.*

The proposed development, including the non-compliant building height, will facilitate the delivery of new in-fill affordable housing which will meet the needs of very low, low and moderate income households. To request strict compliance and require deletion of the uppermost level of Building A will reduce the provision of affordable residential accommodation without any benefit to streetscape character or amenity of neighbouring properties.

The proposed distribution of floor space is strategic and has considered the site constraints and relationship to neighbouring properties. Whilst this can be located elsewhere on the subject site and technically comply, the proposed location (resulting in the non-compliance) is considered the most appropriate with minimal environmental impact, namely, as it pertains to the overshadowing of No. 23A George Street. As such, the proposal will satisfy the objective of *Division 1 In-fill affordable housing* despite non-compliance.

5. Sufficient environmental planning grounds (Clause 4.6(3)(b))

Having regard to Clause 4.6(3)(b) and the need to demonstrate that there are sufficient environmental planning grounds to justify contravening the development standard. Specifically, Preston CJ in *Initial Action Pty Ltd v Woollahra Municipal Council [2018] NSWLEC 118* (paragraph 24) states:

> *The environmental planning grounds relied on in the written request under cl 4.6 must be "sufficient". There are two respects in which the written request needs to be "sufficient". First, the environmental planning grounds advanced in the written request must be sufficient "to justify contravening the development standard". The focus of cl 4.6(3)(b) is on the aspect or element of the development that contravenes the development standard, not on the development as a whole, and why that contravention is justified on environmental planning grounds. The environmental planning grounds advanced in the written request must justify the contravention of the development standard, not simply promote the benefits of carrying out the development as a whole: see Four2Five Pty Ltd v Ashfield Council [2015] NSWCA 248 at [15]. Second, the written request must demonstrate that there are sufficient environmental planning grounds to justify contravening the development standard so as to enable the consent authority to be satisfied under cl 4.6(4)(a)(i) that the written request has adequately addressed this matter: see Four2Five Pty Ltd v Ashfield Council [2015] NSWLEC 90 at [31].*

The assessment of this numerical non-compliance is also guided by the decisions of the NSW LEC in *Four2Five Pty Ltd v Ashfield Council [2015] NSWLEC 90* and *Four2Five Pty Ltd v Ashfield Council [2015] NSWCA 248* whereby Justice Pain ratified the original decision of Commissioner Pearson. The following planning grounds are submitted to justify contravening the maximum building height:

1. The proposal successfully redistributes floor space and height, resulting in the non-compliance.

a. The proposed variation is a result of the strategic distribution of floor space across the approved Buildings A, B and C. The proposal situates part-of the additional floor area above Building A, to achieve a number of distinctive benefits. The benefits are as follows:

i. The positioning of additional floor area on Building A has the least amount of impact to the amenity of neighbouring properties, particularly as it relates to the solar access of No. 23A George Street;

ii. The uppermost level of Building A (to which the minor variation pertains) is setback significantly from the edge of the building, ensuring it is concealed from views on the public domain, as shown in the **Figures 16** to **18** below (extracted from the streetscape analysis);

Figure 16 Streetscape perspectives of proposed development from Argonne Street

Figure 17 Streetscape perspectives of proposed development from the north of George Street

Figure 18 Streetscape perspectives of proposed development from the south of George Street

iii. Whilst Building B or C can potentially accommodate the additional floor space, this is considered to be an inferior location as it would result in adverse amenity impacts to the neighbouring properties to the south at No. 23A George Street, including solar access and privacy of the residents apartments and communal open space, and would also result in self-shadowing to the proposed development itself at 25 George Street.

2. **The site is in a precinct undergoing significant transition with respect to height, bulk and scale of development**

    a. In addition to the above, it is imperative to consider the desired future character of the locality as set by the *Homebush Transport Orientated Development Precinct* (Homebush TOD Precinct) which has recently been publicly exhibited, as of 16 July 2024. As set out previously in this Statement, the Homebush TOD Precinct seeks to provide significant uplift in development density along both sides of George Street, permitting heights of between 25m and 80m. The character of the locality will transition to a high density, transport-oriented development precinct.

    b. In this regard, the minor height variation to part of the seventh storey of Building A, which is recessive and concealed as viewed from the public domain, will be insignificant in this changing context, and entirely subordinate in bulk and scale when compared to the future character along George Street. That is, the proposal addresses the public domain as a six storey form, despite the non-compliance, and will be compatible with the desired, transit oriented, future character of the locality.

3. **The extent of non-compliance is minor**

    a. The extent of variation is relatively minor and does not exceed 10%. It has been held in *Eather v Randwick City Council* [2021] NSWLEC 1075 that a particularly small departure from the actual numerical standard which lacks any material impacts consequential of the departure will be a sufficient environmental planning ground to justify contravening the development standard. The impacts created by the departure are discussed under Planning Ground 6.

4. **The variation results from an environmental design response, based on site analysis**

    a. The location of the variation is an appropriate response to the amenity of neighbouring properties, as discussed above, and limits the extent of adverse privacy and overshadowing impacts. The proposal has been designed following an analysis of the relationship of properties, particularly given the site orientation.

    b. Ultimately, the variation will merge, or be absorbed, into the anticipated bulk and scale of the locality. That is, the subject site is located within close proximity to the Concord West Railway Station, and it is anticipated that the subject site and other surrounding properties will benefit from the increase in density afforded by the Housing SEPP and as desired for transit orientated development (namely, the Homebush TOD Precinct). Given the extent of non-compliance is concealed form the public domain and is integrated into the remaining (compliant) built form, the impact will be minimal as viewed from the streetscape and surrounding properties.

5. **Orderly and economic use of land**

    a. The social benefits of providing affordable housing stock within a highly sought after location should be given weight in the consideration of the variation request. The distribution of floor space is

predicated on the relationship to surrounding properties and the public domain, and has resulted in a form and scale that breaches the 20.8m height limit. It would be a loss to the community (and contrary to the public interest) to deny the variation and require the removal of residential accommodation within a well located and well-designed development.

b. As described, the relocation of this floor area to Building B and C will create adverse amenity impacts to the approved communal open space on the subject site, or residential apartments and communal open space of the neighbouring property to the south at No. 23A George Street. As such, the proposed height breach is considered to be the most suitable outcome to protecting amenity, whilst delivering additional residential accommodation within 800m of a railway station.

6. Limited environmental impacts

a. It is considered that there is an absence of any significant material impacts attributed to the variation to the height standard on the amenity or the environmental values of surrounding properties, the amenity of future building occupants and on the character of the locality. Specifically:

   i. The height non-compliance creates no significant adverse overshadowing impacts to adjoining properties when compared to a compliant building envelope. That is, although the additional height results in a minor degree of overshadowing, this is cast onto Argonne Street from 9am to 10am during mid-winter. From 10am to 3pm, the height non-compliance casts shadows onto the roof form of the subject development and will have no additional impact to the solar gain of neighbouring properties. Furthermore, the non-compliance does not result in any adverse additional impact to the solar access of the approved communal open space on-site.

      Further to the above and as described under Objective (b), to provide for a strictly compliant development would exacerbate overshadowing to No. 23A George Street to the south. That is, to locate floor space above Buildings B and C will create additional overshadowing to the residential apartments and communal open space of the neighbouring properties. The proposal, as amended, will maintain solar access to 66% of the neighbouring apartments for 2 hours during mid-winter (as approved under DA2020/0143) and will maintain compliance with the communal open space solar access requirements of the ADG. As such, the increase to overshadowing caused by the non-compliant elements would be insignificant, as demonstrated in the submitted shadow diagrams;

   ii. The height breach does not result in any adverse additional privacy impacts. The extent of privacy impacts caused by the height breach will have no greater impact on the privacy of adjoining properties when compared to the compliant portion of the proposed development. To the north, the proposal provides for a 10.8m setback to the non-

compliant, external façade. Whilst being situated above the permitted building height, the proposed setback, which exceeds the 9m Design Criteria contained within the ADG, will ensure any potential privacy impacts are mitigated. Similarly and to the south, the non-compliant portion of Building A is setback 14.9m from the boundary shared with the neighbouring property and satisfies the ADG. As such, the loss of privacy caused by the non-compliant elements would be insignificant; and

iii. The height breach will not result in any significant view loss as the subject site does not contain any significant views across or from the public domain. The maximum height non-compliance is limited and any potential view loss would be caused by the approved and compliant building envelope. As such, the extent of view loss caused by the non-compliant element would be insignificant.

7. The proposal meets aims and objectives of key planning documents

a. The proposed development meets the objectives of the development standard, objectives of *Division 1 In-fill affordable housing* of the Housing SEPP and objectives of the R3 Medium Density Residential zone;

b. The proposed development achieves the objects in Section 1.3 of the EPA Act, specifically:
   i. The proposal promotes the orderly and economic use and development of land through the redevelopment of an underutilise site (1.3(c));
   ii. To promote the delivery and maintenance of affordable housing (1.3(d));
   iii. The proposed development promotes good design and amenity of the built environment through a well-considered design which is responsive to its setting and context (1.3(g)).

c. The variation to the height of buildings development standard will give better effect to the aims of Chapter 4 Design of residential apartment development, of the Housing SEPP. In particular:
   i. The proposed variation will provide more sustainable housing in social and environmental terms and better achieve urban planning policies (clause 2(3)(a)(i));
   ii. To achieve better built form and aesthetics of buildings and of the streetscapes and the public spaces they define (clause 2(3)(b);
   iii. To contribute to the provision of a variety of dwelling types to meet population growth (clause 2(3)(f);
   iv. Approval of the proposed variation will support a variety of housing types by providing a well-located and compact development that will be a better choice for families (clause 2(3)(g)).

The above environmental planning grounds are not general propositions and are circumstances unique to the proposed development, particularly given the site specific massing approach in applying the bonuses afforded under the Housing SEPP. Further to this, the proposal has appropriately distributed the additional floor space throughout the site to ensure

there is minimal streetscape impact and that the additional height does not significantly impact the amenity of the neighbouring properties (when compared to a compliant development). Ultimately, the proposal has been designed to address George Street, with the height non-compliance recessed and concealed, ensuring it is not visually jarring from the public domain or neighbouring properties. Insistence on compliance with the height will result in the removal or relocation of a number of residential apartments which is a disproportionate outcome given the limited impacts of the proposal.

It is noted that *in Initial Action Pty Ltd v Woollahra Municipal Council [2018] NSWLEC 118*, Preston CJ clarified what items a Clause 4.6 does and does not need to satisfy. Importantly, there does not need to be a "better" planning outcome:

> *86. The second way is in an error because it finds no basis in cl 4.6. Clause 4.6 does not directly or indirectly establish a test that the non-compliant development should have a neutral or beneficial effect relative to a compliant development. This test is also inconsistent with objective (d) of the height development standard in cl 4.3(1) of minimising the impacts of new development on adjoining or nearby properties from disruption of views or visual intrusion. Compliance with the height development standard might be unreasonable or unnecessary if the non-compliant development achieves this objective of minimising view loss or visual intrusion. It is not necessary, contrary to what the Commissioner held, that the non-compliant development have no view loss or less view loss than a compliant development.*
>
> *87. The second matter was in cl 4.6(3)(b). I find that the Commissioner applied the wrong test in considering this matter by requiring that the development, which contravened the height development standard, result in a "better environmental planning outcome for the site" relative to a development that complies with the height development standard (in [141] and [142] of the judgment). Clause 4.6 does not directly or indirectly establish this test. The requirement in cl 4.6(3)(b) is that there are sufficient environmental planning grounds to justify contravening the development standard, not that the development that contravenes the development standard have a better environmental planning outcome than a development that complies with the development standard.*

As outlined above, it is considered that in many respects, the proposal will provide for a better planning outcome than a strictly compliant development. At the very least, there are sufficient environmental planning grounds to justify contravening the development standard.

6. Conclusion

This application seeks to benefit from the building height and floor space bonuses afforded by *Part 2*, *Division 1 In-fill affordable housing*, *Section 16(3)* of the Housing SEPP. This written request has been prepared in relation to the proposed variation to the 20.8m maximum building height, inclusive of a 30% bonus afforded by Section 16(3) of the Housing SEPP, to the base 16m development standard contained within Clause 4.3 of CBLEP.

Having regard to all of the above, it is our opinion that compliance with the maximum height development standard, as increased by the Housing SEPP in-fill affordable housing bonus, is unreasonable and unnecessary in the circumstances of this case as the development meets the objectives of that standard and the zone objectives. The proposal has also demonstrated sufficient environmental planning grounds to support the breach.

Therefore, insistence upon strict compliance with that standard would be unreasonable. On this basis, the requirements of Clause 4.6(3) are satisfied and the variation supported.

BASIX® Certificate

Building Sustainability Index www.basix.nsw.gov.au

Multi Dwelling

Certificate number: 754373M_10

This certificate confirms that the proposed development will meet the NSW government's requirements for sustainability, if it is built in accordance with the commitments set out below. Terms used in this certificate, or in the commitments, have the meaning given by the document entitled "BASIX Definitions" dated 10/09/2020 published by the Department. This document is available at www.basix.nsw.gov.au

This certificate is a revision of certificate number 754373M_02 lodged with the consent authority or certifier on 24 November 2021 with application DA2020/0143.

It is the responsibility of the applicant to verify with the consent authority that the original, or any revised certificate, complies with the requirements of Schedule 1 Clause 2A, 4A or 6A of the Environment Planning and Assessment Regulation 2000

Secretary
Date of issue: Friday, 26 July 2024
To be valid, this certificate must be lodged within 3 months of the date of issue.

Project summary	
Project name	2020 - 25 George Street, North Strat_10
Street address	25 GEORGE STREET NORTH STRATHFIELD 2137
Local Government Area	CANADA BAY
Plan type and plan number	Strata Plan 22302
Lot no.	-
Section no.	-
No. of residential flat buildings	3
No. of units in residential flat buildings	172
No. of multi-dwelling houses	0
No. of single dwelling houses	0

Project score		
Water	✔ 41	Target 40
Thermal Comfort	✔ Pass	Target Pass
Energy	✔ 32	Target 25

Certificate Prepared by
Name / Company Name: JENSEN HUGHES PTY. LIMITED
ABN (if applicable): 29077183192

Description of project

Project address	
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Plan type and plan number	Strata Plan 22302
Lot no.	-
Section no.	-

Project type	
No. of residential flat buildings	3
No. of units in residential flat buildings	172
No. of multi-dwelling houses	0
No. of single dwelling houses	0

Site details	
Site area (m²)	7485
Roof area (m²)	2700
Non-residential floor area (m²)	0.00
Residential car spaces	141
Non-residential car spaces	0

Common area landscape	
Common area lawn (m²)	1400.00
Common area garden (m²)	700.00
Area of indigenous or low water use species (m²)	0.00

Assessor details and thermal loads	
Assessor number	101535
Certificate number	0006824780
Climate zone	56
Ceiling fan in at least one bedroom	No
Ceiling fan in at least one living room orother conditioned area	No

Project score			
Water	✔	41	Target 40
Thermal Comfort	✔	Pass	Target Pass
Energy	✔	32	Target 25

Description of project

The tables below describe the dwellings and common areas within the project

Residential flat buildings - Building A, 61 dwellings, 7 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
001	2	77.00	0.00	20.00	0.00
005	3	102.00	0.00	20.00	0.00
009	2	77.00	0.00	20.00	0.00
106	4+	135.00	0.00	0.00	0.00
111	2	75.00	0.00	0.00	0.00
204	2	75.00	0.00	0.00	0.00
211	2	75.00	0.00	0.00	0.00
303	1	50.00	0.00	0.00	0.00
307	4+	129.00	0.00	0.00	0.00
418	2	83	0	0	0
422	3	103	0	0	0
426	4+	129	0	0	0
520	2	75	0	0	0
524	1	56	0	0	0
617	3	140	0	0	0
621	3	97	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
002	3	104.00	0.00	20.00	0.00
006	2	75.00	0.00	20.00	0.00
101	2	76.00	0.00	0.00	0.00
107	3	127.00	0.00	0.00	0.00
201	2	76.00	0.00	0.00	0.00
206	4+	134.00	0.00	0.00	0.00
212	2	75.00	0.00	0.00	0.00
304	2	75.00	0.00	0.00	0.00
310	3	125.00	0.00	0.00	0.00
419	1	50	0	0	0
423	2	76	0	0	0
427	1	56	0	0	0
521	1	51	0	0	0
525	3	125	0	0	0
618	2	76	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
003	1	50.00	0.00	20.00	0.00
007	3	104.00	0.00	20.00	0.00
102	3	104.00	0.00	0.00	0.00
109	2	76.00	0.00	0.00	0.00
202	3	104.00	0.00	0.00	0.00
207	4+	126.00	0.00	0.00	0.00
301	2	76.00	0.00	0.00	0.00
305	1	50.00	0.00	0.00	0.00
311	2	75.00	0.00	0.00	0.00
420	2	75	0	0	0
424	1	56	0	0	0
518	2	83	0	0	0
522	3	103	0	0	0
526	4+	129	0	0	0
619	2	77	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
004	2	75.00	0.00	20.00	0.00
008	2	77.00	0.00	20.00	0.00
104	3	127.00	0.00	0.00	0.00
110	2	75.00	0.00	0.00	0.00
203	1	50.00	0.00	0.00	0.00
210	4+	125.00	0.00	0.00	0.00
302	3	104.00	0.00	0.00	0.00
306	2	79.00	0.00	0.00	0.00
312	2	75.00	0.00	0.00	0.00
421	1	51	0	0	0
425	3	125	0	0	0
519	1	50	0	0	0
523	2	76	0	0	0
527	1	56	0	0	0
620	2	82	0	0	0

Residential flat buildings - Building C, 75 dwellings, 7 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
016	2	77.00	0.00	20.00	0.00
020	1	50.00	0.00	20.00	0.00
024	2	84.00	0.00	20.00	0.00
120	1	50.00	0.00	0.00	0.00
124	2	78.00	0.00	0.00	0.00
128	2	76.00	0.00	0.00	0.00
222	2	75.00	0.00	0.00	0.00
226	1	50.00	0.00	0.00	0.00
319	2	77.00	0.00	0.00	0.00
324	2	84.00	0.00	0.00	0.00
328	2	75.00	0.00	0.00	0.00
409	1	51	0.00	0.00	0.00
413	2	78	0.00	0.00	0.00
417	2	74	0.00	0.00	0.00
510	2	75.00	0.00	0.00	0.00
514	1	50.00	0.00	0.00	0.00
606	3	75	0	0	0
610	1	50	0	0	0
614	3	106	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
017	3	104.00	0.00	20.00	0.00
021	3	101.00	0.00	20.00	0.00
025	2	76.00	0.00	20.00	0.00
121	2	75.00	0.00	0.00	0.00
125	1	50.00	0.00	0.00	0.00
219	2	77.00	0.00	0.00	0.00
223	1	50.00	0.00	0.00	0.00
227	3	103.00	0.00	0.00	0.00
320	3	104.00	0.00	0.00	0.00
325	2	78.00	0.00	0.00	0.00
329	2	76.00	0.00	0.00	0.00
410	2	75	0.00	0.00	0.00
414	1	50	0.00	0.00	0.00
507	2	77.00	0.00	0.00	0.00
511	1	50.00	0.00	0.00	0.00
515	3	106.00	0.00	0.00	0.00
607	2	104	0	0	0
611	2	84	0	0	0
615	2	75	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
018	1	50.00	0.00	20.00	0.00
022	2	78.00	0.00	20.00	0.00
118	2	77.00	0.00	0.00	0.00
122	1	50.00	0.00	0.00	0.00
126	3	103.00	0.00	0.00	0.00
220	3	104.00	0.00	0.00	0.00
224	2	84.00	0.00	0.00	0.00
228	2	75.00	0.00	0.00	0.00
322	4+	126.00	0.00	0.00	0.00
326	1	50.00	0.00	0.00	0.00
407	2	75	0.00	0.00	0.00
411	1	50	0.00	0.00	0.00
415	3	106	0.00	0.00	0.00
508	3	104.00	0.00	0.00	0.00
512	2	84.00	0.00	0.00	0.00
516	2	75.00	0.00	0.00	0.00
608	1	51	0	0	0
612	2	78	0	0	0
616	2	74	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
019	2	75.00	0.00	20.00	0.00
023	3	97.00	0.00	20.00	0.00
119	3	104.00	0.00	0.00	0.00
123	2	84.00	0.00	0.00	0.00
127	2	75.00	0.00	0.00	0.00
221	1	50.00	0.00	0.00	0.00
225	2	78.00	0.00	0.00	0.00
229	2	76.00	0.00	0.00	0.00
323	1	50.00	0.00	0.00	0.00
327	3	103.00	0.00	0.00	0.00
408	3	104	0.00	0.00	0.00
412	2	84	0.00	0.00	0.00
416	2	75.00	0.00	0.00	0.00
509	1	50.00	0.00	0.00	0.00
513	2	78.00	0.00	0.00	0.00
517	2	74.00	0.00	0.00	0.00
609	2	75	0	0	0
613	1	50	0	0	0

Residential flat buildings - Building B, 36 dwellings, 7 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
010	2	77.00	0.00	20.00	0.00
014	4+	129.00	0.00	20.00	0.00
115	2	75	0	0	0
214	1	50.00	0.00	0.00	0.00
313	3	103.00	0.00	0.00	0.00
317	4+	128.00	0.00	0.00	0.00
404	2	76.00	0.00	0.00	0.00
503	3	103.00	0.00	0.00	0.00
602	1	50	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
011	2	77.00	0.00	20.00	0.00
112	3	103.00	0.00	0.00	0.00
116	2	75.00	0.00	0.00	0.00
215	3	103.00	0.00	0.00	0.00
314	1	50.00	0.00	0.00	0.00
401	3	103.00	0.00	0.00	0.00
405	4+	128.00	0.00	0.00	0.00
504	2	76.00	0.00	0.00	0.00
603	3	103	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
012	2	77.00	0.00	20.00	0.00
113	1	50.00	0.00	0.00	0.00
117	1	51.00	0.00	0.00	0.00
216	2	76.00	0.00	0.00	0.00
315	3	103.00	0.00	0.00	0.00
402	1	50.00	0.00	0.00	0.00
501	3	102.00	0.00	0.00	0.00
505	4+	128.00	0.00	0.00	0.00
604	1	57	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
013	2	77.00	0.00	20.00	0.00
114	3	103.00	0.00	0.00	0.00
213	3	103.00	0.00	0.00	0.00
217	4+	128.00	0.00	0.00	0.00
316	2	76.00	0.00	0.00	0.00
403	3	103.00	0.00	0.00	0.00
502	1	50.00	0.00	0.00	0.00
601	3	102	0	0	0
605	4+	103	0	0	0

Description of project

The tables below describe the dwellings and common areas within the project

Common areas of the development (non-building specific)

Common area	Floor area (m²)
Car park area (Basement 2)	3680
Comms Room	8
Meter & Pump Room	14

Common area	Floor area (m²)
Car park area (Basement 1)	3280
Garbage rooms	221

Common area	Floor area (m²)
Storage Rooms	775
Plant Rooms	540

Common areas of unit building - Building A

Common area	Floor area (m²)
Lift car (No. 1)	0.00
Hallway/lobby type A	313

Common area	Floor area (m²)
Lift car (No. 2)	0.00

Common area	Floor area (m²)
Ground floor lobby type A	100

Common areas of unit building - Building B

Common area	Floor area (m²)
Lift car (No. 3)	0.00

Common area	Floor area (m²)
Ground floor lobby type B	60.00

Common area	Floor area (m²)
Hallway/lobby type B	248

Schedule of BASIX commitments

1. Commitments for Residential flat buildings - Building A

(a) Dwellings

(i) Water

(ii) Energy

(iii) Thermal Comfort

(b) Common areas and central systems/facilities

(i) Water

(ii) Energy

2. Commitments for Residential flat buildings - Building C

(a) Dwellings

(i) Water

(ii) Energy

(iii) Thermal Comfort

(b) Common areas and central systems/facilities

(i) Water

(ii) Energy

3. Commitments for Residential flat buildings - Building B

(a) Dwellings

(i) Water

(ii) Energy

(iii) Thermal Comfort

(b) Common areas and central systems/facilities

(i) Water

(ii) Energy

4. Commitments for single dwelling houses

5. Commitments for multi-dwelling houses

6. Commitments for common areas and central systems/facilities for the development (non-building specific)

(a) Common areas and central systems/facilities

(i) Water

(ii) Energy

Schedule of BASIX commitments

The commitments set out below regulate how the proposed development is to be carriedout. It is a condition of any development consent granted, or complying development certificate issued, for the proposed development, that BASIX commitments be complied with.

1. Commitments for Residential flat buildings - Building A

(a) Dwellings

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).	✔	✔	
(c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.		✔	✔
(d) The applicant must install an on demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below.		✔	✔
(e) The applicant must install:			
(aa) a hot water diversion system to all showers, kitchen sinks and all basins in the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below; and		✔	✔
(bb) a separate diversion tank (or tanks) connected to the hot water diversion systems of at least 100 litres. The applicant must connect the hot water diversion tank to all toilets in the dwelling.		✔	✔
(e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.	✔	✔	
(f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).		✔	
(g) The pool or spa must be located as specified in the table.	✔	✔	
(h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.	✔	✔	✔

	Fixtures					Appliances		Individual pool				Individual spa		
Dwelling no.	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 617, 618, 619, 620, 621	3 star (> 4.5 but <= 6 L/min)	4 star	5 star	5 star	-	not specified	3 star	-	-	-	-	-	-	-
All other dwellings	3 star (> 4.5 but <= 6 L/min)	4 star	5 star	5 star	-	not specified	3 star	-	-	-	-	-	-	-

	Alternative water source						
Dwelling no.	Alternative water supply systems	Size	Configuration	Landscape connection	Toilet connection (s)	Laundry connection	Pool top-up	Spa top-up
All dwellings	No alternative water supply	-	-	-	-	-	-	-

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must install each hot water system specified for the dwelling in the table below, so that the dwelling's hot water is supplied by that system. If the table specifies a central hot water system for the dwelling, then the applicant must connect that central system to the dwelling, so that the dwelling's hot water is supplied by that central system.	✔	✔	✔
(c) The applicant must install, in each bathroom, kitchen and laundry of the dwelling, the ventilation system specified for that room in the table below. Each such ventilation system must have the operation control specified for it in the table.		✔	✔
(d) The applicant must install the cooling and heating system/s specified for the dwelling under the "Living areas" and "Bedroom areas" headings of the "Cooling" and "Heating" columns in the table below, in/for at least 1 living/bedroom area of the dwelling. If no cooling or heating system is specified in the table for "Living areas" or "Bedroom areas", then no systems may be installed in any such areas. If the term "zoned" is specified beside an air conditioning system, then the system must provide for day/night zoning between living areas and bedrooms.		✔	✔
(e) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Artificial lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that the "primary type of artificial lighting" for each such room in the dwelling is fluorescent lighting or light emitting diode (LED) lighting. If the term "dedicated" is specified for a particular room or area, then the light fittings in that room or area must only be capable of being used for fluorescent lighting or light emitting diode (LED) lighting.		✔	✔
(f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.	✔	✔	✔
(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must: (aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and (bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.		✔ ✔	
(h) The applicant must install in the dwelling: (aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below; (bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and (cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✔ ✔ ✔	✔
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✔	

	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	Central hot water system (No. 1)	individual fan, ducted to façade or roof	interlocked to light	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	interlocked to light

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or diningroom	Each kitchen	All bathrooms/ toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
617, 619, 620, 621	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	-	-	-	-	-	-	0	-
106, 206, 207, 210, 307, 426, 526	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	4(dedicated)	1(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	0	no
003, 203, 303, 305, 419, 421, 424, 427, 519, 521, 524, 527	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1(dedicated)	1(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	0	no
002, 005, 007, 102, 104,	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	3(dedicated)	1(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	0	no

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or diningroom	Each kitchen	All bathrooms/ toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
107, 202, 302, 310, 422, 425, 522, 525, 618												
All other dwellings	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	2(dedicated)	1(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	0	no

	Individual pool		Individual spa		Appliances & other efficiency measures							
Dwelling no.	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/ oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 518, 519, 520, 521, 522,	-	-	-	-	gas cooktop & electric oven	-	yes	4 star	-	2 star	no	no

	Individual pool		Individual spa		Appliances & other efficiency measures							
Dwelling no.	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/ oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
523, 524, 525, 526, 527, 617, 618, 619, 620, 621												
All other dwellings	-	-	-	-	gas cooktop & electric oven	-	yes	4 star	-	2 star	no	no

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must attach the certificate referred to under "Assessor details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for a final occupation certificate for the proposed development.			
(b) The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			
(c) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the "Thermal Loads" table below.			
(d) The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Thermal Comfort Protocol requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor, to certify that this is the case.	✔		
(e) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.		✔	
(f) The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✔	✔
(g) Where there is an in-slab heating or cooling system, the applicant must:	✔	✔	✔
(aa) Install insulation with an R-value of not less than 1.0 around the vertical edges of the perimeter of the slab; or			

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(bb) On a suspended floor, install insulation with an R-value of not less than 1.0 underneath the slab and around the vertical edges of the perimeter of the slab.			
(h) The applicant must construct the floors and walls of the development in accordance with the specifications listed in the table below.	✔	✔	✔

	Thermal loads	
Dwelling no.	**Area adjusted heating load (in MJ/m²/yr)**	**Area adjusted cooling load (in MJ/m²/yr)**
All dwellings	28.9	20.7

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✔	✔
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✔	✔	✔
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✔	✔	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✔	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✔	✔
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✔	✔

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	4 star	no common facility	no common laundry facility

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✔	✔
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✔	✔
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✔	✔	✔

	Common area ventilation system		Common area lighting		
Common area	**Ventilation system type**	**Ventilation efficiency measure**	**Primary type of artificial lighting**	**Lighting efficiency measure**	**Lighting control system/ BMS**
Lift car (No. 1)	-	-	light-emitting diode	connected to lift call button	no
Lift car (No. 2)	-	-	light-emitting diode	connected to lift call button	no
Ground floor lobby type A	no mechanical ventilation	-	light-emitting diode	motion sensors	no
Hallway/lobby type A	ventilation supply only	none i.e., continuous	light-emitting diode	motion sensors	no

Central energy systems	Type	Specification
Lift (No. 1)	gearless traction with V V V F motor	Number of levels (including basement): 8
Lift (No. 2)	gearless traction with V V V F motor	Number of levels (including basement): 9

2. Commitments for Residential flat buildings - Building C

(a) Dwellings

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).	✔	✔	
(c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.		✔	✔
(d) The applicant must install an on demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below.		✔	✔
(e) The applicant must install: (aa) a hot water diversion system to all showers, kitchen sinks and all basins in the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below; and		✔	✔
(bb) a separate diversion tank (or tanks) connected to the hot water diversion systems of at least 100 litres. The applicant must connect the hot water diversion tank to all toilets in the dwelling.		✔	✔
(e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.	✔	✔	
(f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).		✔	
(g) The pool or spa must be located as specified in the table.	✔	✔	
(h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.	✔	✔	✔

	Fixtures					Appliances		Individual pool				Individual spa		
Dwelling no.	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
614, 615, 616	3 star (> 4.5 but <= 6 L/min)	4 star	5 star	5 star	-	not specified	3 star	-	-	-	-	-	-	-

	Fixtures					Appliances		Individual pool				Individual spa		
Dwelling no.	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
All other dwellings	3 star (> 4.5 but <= 6 L/min)	4 star	5 star	5 star	-	not specified	3 star	-	-	-	-	-	-	-

	Alternative water source						
Dwelling no.	Alternative water supply systems	Size	Configuration	Landscape connection	Toilet connection (s)	Laundry connection	Pool top-up	Spa top-up
All dwellings	No alternative water supply	-	-	-	-	-	-	-

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must install each hot water system specified for the dwelling in the table below, so that the dwelling's hot water is supplied by that system. If the table specifies a central hot water system for the dwelling, then the applicant must connect that central system to the dwelling, so that the dwelling's hot water is supplied by that central system.	✔	✔	✔
(c) The applicant must install, in each bathroom, kitchen and laundry of the dwelling, the ventilation system specified for that room in the table below. Each such ventilation system must have the operation control specified for it in the table.		✔	✔
(d) The applicant must install the cooling and heating system/s specified for the dwelling under the "Living areas" and "Bedroom areas" headings of the "Cooling" and "Heating" columns in the table below, in/for at least 1 living/bedroom area of the dwelling. If no cooling or heating system is specified in the table for "Living areas" or "Bedroom areas", then no systems may be installed in any such areas. If the term "zoned" is specified beside an air conditioning system, then the system must provide for day/night zoning between living areas and bedrooms.		✔	✔
(e) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Artificial lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that the "primary type of artificial lighting" for each such room in the dwelling is fluorescent lighting or light emitting diode (LED) lighting. If the term "dedicated" is specified for a particular room or area, then the light fittings in that room or area must only be capable of being used for fluorescent lighting or light emitting diode (LED) lighting.		✔	✔
(f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.	✔	✔	✔

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must:			
(aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and		✔	
(bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.		✔	
(h) The applicant must install in the dwelling:			
(aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below;		✔	
(bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and		✔	✔
(cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✔	
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✔	

	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	Central hot water system (No. 1)	individual fan, ducted to façade or roof	interlocked to light	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	interlocked to light

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or diningroom	Each kitchen	All bathrooms/ toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
409	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1(dedicated)	1(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	1	no
017, 021, 023,	1-phase airconditioning /	1-phase airconditioning /	1-phase airconditioning /	1-phase airconditioning /	3(dedicated)	1(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	0	no

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or diningroom	Each kitchen	All bathrooms/ toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
119, 126, 220, 227, 320, 322, 327, 408, 415, 508, 515, 606, 614	EER 3.0 - 3.5(zoned)	EER 3.0 - 3.5(zoned)	EER 3.5 - 4.0(zoned)	EER 3.5 - 4.0(zoned)								
018, 020, 120, 122, 125, 221, 223, 226, 323, 326, 411, 414, 509, 511, 514, 608, 610, 613	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1(dedicated)	1(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	0	no
All other dwellings	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	2(dedicated)	1(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	0	no

	Individual pool		Individual spa		Appliances & other efficiency measures							
Dwelling no.	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/ oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616	-	-	-	-	gas cooktop & electric oven	-	yes	4 star	-	2 star	no	no
All other dwellings	-	-	-	-	gas cooktop & electric oven	-	yes	4 star	-	2 star	no	no

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must attach the certificate referred to under "Assessor details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for a final occupation certificate for the proposed development.			
(b) The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			
(c) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the "Thermal Loads" table below.			
(d) The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Thermal Comfort Protocol requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor, to certify that this is the case.	✔		
(e) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.		✔	
(f) The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✔	✔
(g) Where there is an in-slab heating or cooling system, the applicant must:	✔	✔	✔

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(aa) Install insulation with an R-value of not less than 1.0 around the vertical edges of the perimeter of the slab; or (bb) On a suspended floor, install insulation with an R-value of not less than 1.0 underneath the slab and around the vertical edges of the perimeter of the slab.			
(h) The applicant must construct the floors and walls of the development in accordance with the specifications listed in the table below.	✔	✔	✔

	Thermal loads	
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)
All dwellings	28.9	20.7

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✔	✔
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✔	✔	✔
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✔	✔	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✔	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✔	✔
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✔	✔

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	4 star	no common facility	no common laundry facility

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✔	✔
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✔	✔
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✔	✔	✔

	Common area ventilation system		Common area lighting		
Common area	**Ventilation system type**	**Ventilation efficiency measure**	**Primary type of artificial lighting**	**Lighting efficiency measure**	**Lighting control system/ BMS**
Lift car (No. 4)	-	-	light-emitting diode	connected to lift call button	no
Lift car (No. 5)	-	-	light-emitting diode	connected to lift call button	no
Ground floor lobby type C	no mechanical ventilation	-	light-emitting diode	motion sensors	no
Hallway/lobby type C	ventilation supply only	none i.e., continuous	light-emitting diode	motion sensors	no

Central energy systems	Type	Specification
Lift (No. 4)	gearless traction with V V V F motor	Number of levels (including basement): 9
Lift (No. 5)	gearless traction with V V V F motor	Number of levels (including basement): 9

3. Commitments for Residential flat buildings - Building B

(a) Dwellings

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).	✔	✔	
(c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.		✔	✔
(d) The applicant must install an on demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below.		✔	✔
(e) The applicant must install: (aa) a hot water diversion system to all showers, kitchen sinks and all basins in the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below; and		✔	✔
(bb) a separate diversion tank (or tanks) connected to the hot water diversion systems of at least 100 litres. The applicant must connect the hot water diversion tank to all toilets in the dwelling.		✔	✔
(e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.	✔	✔	
(f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).		✔	
(g) The pool or spa must be located as specified in the table.	✔	✔	
(h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.	✔	✔	✔

	Fixtures					Appliances		Individual pool				Individual spa		
Dwelling no.	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
All dwellings	3 star (> 4.5 but <= 6 L/min)	4 star	5 star	5 star	-	not specified	3 star	-	-	-	-	-	-	-

	Alternative water source							
Dwelling no.	**Alternative water supply systems**	**Size**	**Configuration**	**Landscape connection**	**Toilet connection (s)**	**Laundry connection**	**Pool top-up**	**Spa top-up**
All dwellings	No alternative water supply	-	-	-	-	-	-	-

(ii) Energy	**Show on DA plans**	**Show on CC/CDC plans & specs**	**Certifier check**
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must install each hot water system specified for the dwelling in the table below, so that the dwelling's hot water is supplied by that system. If the table specifies a central hot water system for the dwelling, then the applicant must connect that central system to the dwelling, so that the dwelling's hot water is supplied by that central system.	✔	✔	✔
(c) The applicant must install, in each bathroom, kitchen and laundry of the dwelling, the ventilation system specified for that room in the table below. Each such ventilation system must have the operation control specified for it in the table.		✔	✔
(d) The applicant must install the cooling and heating system/s specified for the dwelling under the "Living areas" and "Bedroom areas" headings of the "Cooling" and "Heating" columns in the table below, in/for at least 1 living/bedroom area of the dwelling. If no cooling or heating system is specified in the table for "Living areas" or "Bedroom areas", then no systems may be installed in any such areas. If the term "zoned" is specified beside an air conditioning system, then the system must provide for day/night zoning between living areas and bedrooms.		✔	✔
(e) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Artificial lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that the "primary type of artificial lighting" for each such room in the dwelling is fluorescent lighting or light emitting diode (LED) lighting. If the term "dedicated" is specified for a particular room or area, then the light fittings in that room or area must only be capable of being used for fluorescent lighting or light emitting diode (LED) lighting.		✔	✔
(f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.	✔	✔	✔
(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must:			
(aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and		✔	
(bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.		✔	
(h) The applicant must install in the dwelling:			

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below;		✔	
(bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and		✔	✔
(cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✔	
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✔	

	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	Central hot water system (No. 1)	individual fan, ducted to façade or roof	interlocked to light	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	interlocked to light

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or diningroom	Each kitchen	All bathrooms/ toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
014, 217, 317, 405, 505, 605	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	4(dedicated)	1(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	0	no
113, 117, 214, 314, 402, 502, 602, 604	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1(dedicated)	1(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	0	no

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or diningroom	Each kitchen	All bathrooms/ toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
010, 011, 012, 013, 115, 116, 216, 316, 404, 504	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	2(dedicated)	1(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	0	no
All other dwellings	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.0 - 3.5(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	1-phase airconditioning / EER 3.5 - 4.0(zoned)	3(dedicated)	1(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	yes(dedicated)	0	no

	Individual pool		Individual spa		Appliances & other efficiency measures							
Dwelling no.	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/ oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
115, 601, 602, 603, 604, 605	-	-	-	-	gas cooktop & electric oven	-	yes	4 star	-	2 star	no	no
All other dwellings	-	-	-	-	gas cooktop & electric oven	-	yes	4 star	-	2 star	no	no

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must attach the certificate referred to under "Assessor details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for a final occupation certificate for the proposed development.			
(b) The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			
(c) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the "Thermal Loads" table below.			
(d) The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Thermal Comfort Protocol requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor, to certify that this is the case.	✔		
(e) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.		✔	
(f) The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✔	✔
(g) Where there is an in-slab heating or cooling system, the applicant must: (aa) Install insulation with an R-value of not less than 1.0 around the vertical edges of the perimeter of the slab; or (bb) On a suspended floor, install insulation with an R-value of not less than 1.0 underneath the slab and around the vertical edges of the perimeter of the slab.	✔	✔	✔
(h) The applicant must construct the floors and walls of the development in accordance with the specifications listed in the table below.	✔	✔	✔

	Thermal loads	
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)
All dwellings	28.9	20.7

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✔	✔
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✔	✔	✔
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✔	✔	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✔	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✔	✔
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✔	✔

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	4 star	no common facility	no common laundry facility

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✔	✔
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✔	✔
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✔	✔	✔

	Common area ventilation system		Common area lighting		
Common area	**Ventilation system type**	**Ventilation efficiency measure**	**Primary type of artificial lighting**	**Lighting efficiency measure**	**Lighting control system/ BMS**
Lift car (No. 3)	-	-	light-emitting diode	connected to lift call button	no
Ground floor lobby type B	no mechanical ventilation	-	light-emitting diode	motion sensors	no
Hallway/lobby type B	ventilation supply only	none i.e., continuous	light-emitting diode	motion sensors	no

Central energy systems	Type	Specification
Lift (No. 3)	gearless traction with V V V F motor	Number of levels (including basement): 9

6. Commitments for common areas and central systems/facilities for the development (non-building specific)

(a) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✔	✔
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✔	✔	✔
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✔	✔	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✔	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✔	✔
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✔	✔

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	4 star	no common facility	no common laundry facility

Central systems	Size	Configuration	Connection (to allow for...)
Fire sprinkler system (No. 1)	-	-	-
Fire sprinkler system (No. 2)	-	-	-
Central water tank - rainwater or stormwater (No. 1)	5000	To collect run-off from at least: - 500 square metres of roof area of buildings in the development - 0.00 square metres of impervious area in the development - 0.00 square metres of garden/lawn area in the development - 0.00 square metres of planter box area in the development (excluding, in each case, any area which drains to, or supplies, any other alternative water supply system).	- irrigation of 1500 square metres of common landscaped area on the site - car washing in 0 car washing bays on the site

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✔	✔
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✔	✔
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✔	✔	✔

	Common area ventilation system		Common area lighting		
Common area	Ventilation system type	Ventilation efficiency measure	Primary type of artificial lighting	Lighting efficiency measure	Lighting control system/ BMS
Car park area (Basement 2)	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	fluorescent	motion sensors	no
Car park area (Basement 1)	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	fluorescent	motion sensors	no
Storage Rooms	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	fluorescent	motion sensors	no
Comms Room	ventilation supply only	thermostatically controlled	fluorescent	motion sensors	no
Garbage rooms	ventilation exhaust only	-	fluorescent	motion sensors	no
Plant Rooms	ventilation supply only	interlocked to light	fluorescent	motion sensors	no
Meter & Pump Room	ventilation supply only	interlocked to light	fluorescent	motion sensors	no

Central energy systems	Type	Specification
Central hot water system (No. 1)	gas-fired boiler	Piping insulation (ringmain & supply risers): (a) Piping external to building: R1.0 (~38 mm); (b) Piping internal to building: R1.0 (~38 mm)
Other	-	-

Notes

1. In these commitments, "applicant" means the person carrying out the development.
2. The applicant must identify each dwelling, building and common area listed in this certificate, on the plans accompanying any development application, and on the plans and specifications accompanying the application for a construction certificate / complying development certificate, for the proposed development, using the same identifying letter or reference as is given to that dwelling, building or common area in this certificate.
3. This note applies if the proposed development involves the erection of a building for both residential and non-residential purposes (or the change of use of a building for both residential and non-residential purposes). Commitments in this certificate which are specified to apply to a "common area" of a building or the development, apply only to that part of the building or development to be used for residential purposes.
4. If this certificate lists a central system as a commitment for a dwelling or building, and that system will also service any other dwelling or building within the development, then that system need only be installed once (even if it is separately listed as a commitment for that other dwelling or building).
5. If a star or other rating is specified in a commitment, this is a minimum rating.
6. All alternative water systems to be installed under these commitments (if any), must be installed in accordance with the requirements of all applicable regulatory authorities. NOTE: NSW Health does not recommend that stormwater, recycled water or private dam water be used to irrigate edible plants which are consumed raw, or that rainwater be used for human consumption in areas with potable water supply.

Legend

1. Commitments identified with a "✔" in the "Show on DA plans" column must be shown on the plans accompanying the development application for the proposed development (if a development application is to be lodged for the proposed development).
2. Commitments identified with a "✔" in the "Show on CC/CDC plans and specs" column must be shown in the plans and specifications accompanying the application for a construction certificate / complying development certificate for the proposed development.
3. Commitments identified with a "✔" in the "Certifier check" column must be certified by a certifying authority as having been fulfilled. (Note: a certifying authority must not issue an occupation certificate (either interim or final) for a building listed in this certificate, or for any part of such a building, unless it is satisfied that each of the commitments whose fulfilment it is required to monitor in relation to the building or part, has been fulfilled).

FUSE

SEPP65 Design Statement

25 George Street North Strathfield

MARCH 2024 | Version 04

FUSE

Contact Details
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Contents

14.03.2024

Residential Flat Building 25 George Street North Strathfield

In accordance with Clause 50(1A) of the Environmental Planning and Assessment Regulations 2000, I, Rachid Andary am a qualified architect for the purposes of State Environmental Planning Policy No 65 – Design Quality of Residential Flat Development.

I verify that the Mixed Use Building, as stated above was designed under my instruction with regard to Parts 3 and 4 of the State Environmental Planning Policy No 65 – Design Quality of Residential Flat Development.

Rachid Andary
NSW Registered Architect 8627

SEPP65 Design Principles 2

Introduction

The proposal for 25 George Street North Strathfield is an infill development in response to the change of use of an existing industrial development in an already developed residential area.

Exploration started with a questioning of the potential of an infill development and the challenge to prioritise and balance the ambitions set out for the sites new zoning against the qualities and amenity of the existing neighbourhood.

The project, as we saw it, was to find a meaningful way to overlay these ideals over the sustainability imperative for maximum yield whilst ultimately delivering quality homes for future occupants and contributing positively to the existing neighbourhood.

Our design process involved a detailed analysis of the existing context and a teasing out of its inherit character augmented and composed into a striking yet sympathetic architectural intervention.

The design is fundamentally a courtyard building to deliver 172 new homes over 7 storeys. It is a bespoke response to well serviced site that meets key SEPP 65 and ADG requirements with a simple and elegant form appropriate for its time, its purpose and its context.

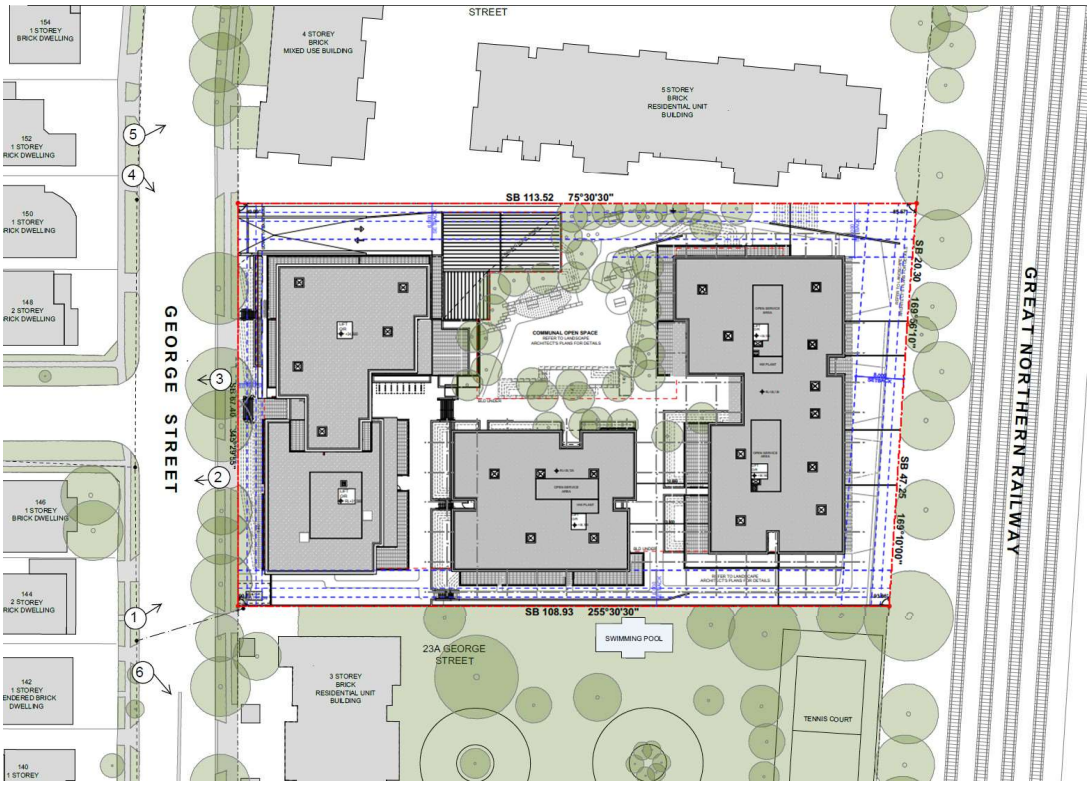
SEPP65 Design Principles 2

Principle 1: Context and Neighbourhood Character

Good design responds and contributes to its context. Context is the key natural and built features of an area, their relationship and the character they create when combined. It also includes social, economic, health and environmental conditions.
Responding to context involves identifying the desirable elements of an area's existing or future character. Well designed buildings respond to and enhance the qualities and identity of the area including the adjacent sites, streetscape and neighbourhood.
Consideration of local context is important for all sites, including sites in established areas, those undergoing change or identified for change.

- The site is currently occupied by the Homebush Industrial Estate within what is the Concord West Special Precinct at the northern end of the Bakehouse Quarter half way along George Street.
- The site contains a number of small industrial tenancies with a single frontage to George Street
- It is located 500m from Concord West and 700m from North Strathfield train stations.
- The site has a 2.82m cross fall along George Street and rises 5.08m along its northern boundary
- It is located within a corridor of medium density residential development, being the only non-residential site in this immediate vicinity.
- The immediate development to the:
  - north is a large mixed use development containing commercial and residential uses.
  - south is a large residential development, with open private open space located along the southern boundary of the subject site.
  - east is the Sydney Trains T1 Northern Line corridor.
  - west is low density residential and Argonne Street
- The area is well serviced by public open recreational space, being 100m from the Powells Creek natural waterway, cycle and walking paths.
- The proposal is for a residential flat building that is consistent with the existing and desired character of the area as defined by Canada Bay Council.

2.1.1 Context Photos



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Principle 2: Built Form and Scale

Good design achieves a scale, bulk and height appropriate to the existing or desired future character of the street and surrounding buildings.
Good design also achieves an appropriate built form for a site and the building's purpose in terms of building alignments, proportions, building type, articulation and the manipulation of building elements.
Appropriate built form defines the public domain, contributes to the character of streetscapes and parks, including their views and vistas, and provides internal amenity and outlook.

- The proposal is for three blocks around a central courtyard. The front block fronting the street presents a 6 storey form consistent with the future multi residential development context when viewed from the public domain.
- architectural expression of the building is the result of its environmental and planning constraints. It's primarily a layered courtyard form oriented practically for light and air and programmatically for an appropriate contextual fit.
- The courtyard mass is conceived of as a building set within the landscape.
- The base form expression is one of distinct horizontal bands in reference to the historic masonry buildings with their strong horizontality. The base becomes a dense landscape and masonry band on which the larger form is visually founded. Subsequent bands are then stacked in 2-3 storey groups with a distinct light weight clad penthouse band capping the mass below. The modulated bands are infilled with subtly splayed walls and offset windows to diminish the perceived bulk of the overall form. The banded base form is then punctuated through the deliberate shifting of the floor plan expressed as a more restrained mass to breakdown the scale and length of the built form to create a unique façade and building expression.
- The buildings banded expression is reinforced by cladding those bands in the same light weight board regardless of orientation with variation provided only through the horizontal stratification.
- The built form provides significant articulation and building indentation around its entire perimeter. The form along the southern boundary is given two breaks between block A, B + C to allow direct northern light into the neighbouring communal open space.
- The massing strategy results in the maximum number of apartments facing north with excellent amenity.

2.2.1 Context Form

Principle 3: Density

Good design achieves a high level of amenity for residents and each apartment, resulting in a density appropriate to the site and its context.
Appropriate densities are consistent with the area's existing or projected population. Appropriate densities can be sustained by existing or proposed infrastructure, public transport, access to jobs, community facilities and the environment.

- The proposed density of the development and associated floor space yield is appropriate for the site and its location.
- The total site area is 7485sqm.The proposed development has a FSR 2.08:1 or 15,567 sqm of GFA which represents a density in line with the desired outcomes of the Housing 2023 SEPP, while being sympathetic to the neighbourhood.
- The site is less than 500m from Concord West and 700m from North Strathfield train stations.
- North Strathfield Bakehouse Quarter is a vibrant self-contained retail, employment and shopping strip with numerous eating, entertainment and employment options.
- The site has ample access to a range of community facilities and public open spaces and parks.
- The density proposed does not give rise to any significant impacts on the adjoining properties (current or future) in terms of overshadowing, loss of privacy or visual impact.
- A high level of amenity is provided for future residents of the development.

Principle 4: Sustainability

Good design combines positive environmental, social and economic outcomes.

Good sustainable design includes use of natural cross ventilation and sunlight for the amenity and livability of residents and passive thermal design for ventilation, heating and cooling reducing reliance on technology and operation costs. Other elements include recycling and reuse of materials and waste, use of sustainable materials and deep soil zones for groundwater recharge and vegetation

- The development is designed with the maximum number of apartments positioned around a well landscaped central communal open space to maximise the amenity of the apartments.
- The site provides 29% deep soil for groundwater recharge and mature vegetation to the building ground plane.
- The development is designed to embrace ESD principles with 69.2% of apartments receiving 2hours of direct sunlight and 69.9% providing natural cross ventilation.
- Proximity to existing transport hubs makes it the perfect place to deliver long term resident homes with excellent amenity. The architecture leverages the inherit transport connections of the site but filters those down to the fine grain considerations of arrival, circulation and habitation.
- 150 or 87% of the apartments are oriented north, east or west ensuring direct solar access into the primary living spaces, external living areas and courtyards throughout the day.
- All apartments have living spaces recessed behind balconies for shading in summer.
- Slab edges are extended and coupled with deep window reveals to shade west and east facing glazing.
- The development will meet the energy and water reduction benchmarks as set out in the Building and Sustainability Index (BASIX).
- A Communal Open space has been provided on the ground floor with an active landscape.
- Locally sourced low carbon cladding boards with 100% pure inorganic natural metal oxides, low GHG and VOC footprint
- Low-maintenance, long lifecycle, recyclable and reusable materials
- Minimal basement excavation to meet parking obligations
- Secure Bicycle parking provided for each apartment within the basement storage. Visitor bicycle parking has been integrated within the communal open space adjacent building entrances.

Principle 5: Landscape

Good design recognises that together landscape and buildings operate as an integrated and sustainable system, resulting in attractive developments with good amenity. A positive image and contextual fit of well designed developments is achieved by contributing to the landscape character of the streetscape and neighbourhood.
Good landscape design enhances the development's environmental performance by retaining positive natural features which contribute to the local context, coordinating water and soil management, solar access, micro-climate, tree canopy, habitat values and preserving green networks.
Good landscape design optimises useability, privacy and opportunities for social interaction, equitable access, respect for neighbours' amenity and provides for practical establishment and long term management.

- The landscape and buildings have been designed as an integrated and sustainable system, resulting in greater aesthetic quality and amenity for both residents and the general community.
- The generous open space is layered with landscaping at every opportunity.
- The building is conceived of as an object set within the landscape. The landscape takes its cues from what are significant trees within the street frontage. There is no formal fencing to the street frontage and the landscape has been designed as a formal transition into the public domain giving the building a green earthing into its setting. The 3m front setback is landscape significantly with sandstone terraced walls and planting allowing the modest building to George St to sit softly in its context.
- A double height entrance space and awning acts as a formal threshold into the site from the public domain. The entrance foyer, is then extended into the depth of the site along a considered landscape path that links the internal lobbies to the communal open space
- 2,262sqm of communal open space has been provided on the GF
- Ground Floor terraces are planted simply for natural screening into the communal open space.
- Plant selection to the communal and private open spaces on the ground floor and the roof have been carefully considered maximizing potential for amenity while ensuring resident privacy, minimizing management and water usage.

Principle 6: Amenity

Good design positively influences internal and external amenity for residents and neighbours. Achieving good amenity contributes to positive living environments and resident well being.
Good amenity combines appropriate room dimensions and shapes, access to sunlight, natural ventilation, outlook, visual and acoustic privacy, storage, indoor and outdoor space, efficient layouts and service areas and ease of access for all age groups and degrees of mobility.

- Careful orientation of the building has afforded a high degree of amenity to all apartments and open spaces.
- The primary living spaces and balconies to 90% of apartments face north, east or west providing maximum access to daylight and solar amenity.
- A maximum number of primary living spaces and balconies have been oriented toward the courtyard with the building being used a buffer from the noise of the railway corridor.
- The accommodation consists of 172 dwellings suited to a variety of lifestyles. Residential apartments sizes range from; 1 bedroom – 50-56sqm; 2 bedroom (2bath) 75-89sqm; 3 bedroom (2/3bath) 93-127qm, 4 bedroom 127sqm+
- The dwelling mix is 38x1bed (22%), 79x2beds (46%), 41x3bed (24%) and 14x4bedrooms (8%) and all in single level plans. The mix is in accordance with the DCP/LEP requirements to consider population trends, market demands and and location in relation to public transport, public facilities, employment areas, schools and retail centres.
- 26 (15%) of the apartments are designed to be configured to become adaptable dwellings in accordance with the ADG and DCP.
- 35 (20%) of the apartments are designed to be livable apartments in accordance with the ADG and DCP.
- Each dwelling has access to a secure private open space, such as a balcony or terrace, with a minimum area for the balconies of 8sqm for 1 beds, 10sqm for 2 beds and 12sqm for 3 beds in accordance with the minimum areas in the ADG. Ground floor terrace apartments have gardens 16-303sqm.
- The dwellings have minimum balcony depths of 2 metres in accordance with the ADG.
- The minimum ceiling height of habitable rooms is 2700mm and the floor to floor height is generally 3100mm.
- 50% of the required apartment storage has been provided within units with the remainder provided within basement storage cages. Storage is in exceedance of the minimum areas in the ADG of 6m3 for 1 beds, 8m3 for 2 beds, 10m3 for 3 beds.

Principle 7: Safety

Good design optimises safety and security within the development and the public domain. It provides for quality public and private spaces that are clearly defined and fit for the intended purpose. Opportunities to maximise passive surveillance of public and communal areas promote safety.
A positive relationship between public and private spaces is achieved through clearly defined secure access points and well lit and visible areas that are easily maintained and appropriate to the location and purpose.

- The design of the buildings optimises safety and security, of both the development and the public domain. Safety and security have also been considered in accordance with CPTED principles of surveillance, access, territorial reinforcement, and space management.
- The building orientation provides passive surveillance of the primary street.
- Pedestrian site access is consolidated into a single building entrance from which four individual lobbies branch off.
- The buildings are sited around a generous internal courtyard.
- The single entrance provides secure access with direct sight lines into the communal circulation and open space on the ground floor.
- The large communal areas reinforce social interaction through shared ownership that is perfectly suited to a development such as this.
- Well-lit internal and external communal open spaces reinforce passive safety principles.
- The building will utilise an integrated security and intercom system to the front gate and each individual lobby and car park entry giving residents direct access and visitors a mechanism to communicate with residents.
- Vehicular access is provided by a secure car park from George Street
- The communal courtyard is overlooked by living areas and bedrooms of upper-level apartments.

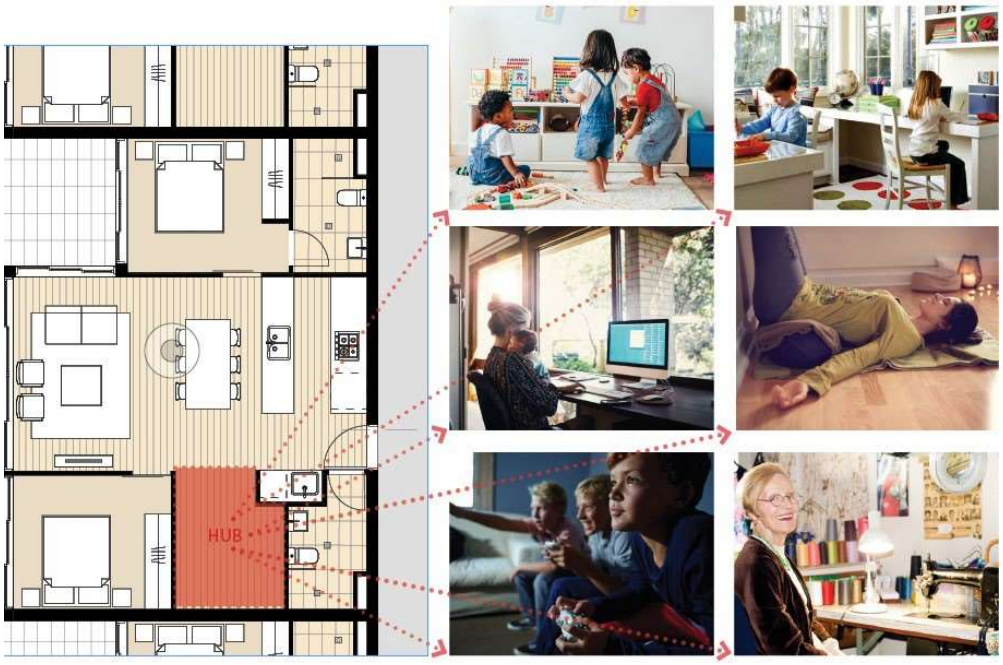
Principle 8: Housing Diversity and Social Interaction

Good design achieves a mix of apartment sizes, providing housing choice for different demographics, living needs and household budgets.
Well designed apartment developments respond to social context by providing housing and facilities to suit the existing and future social mix.

Good design involves practical and flexible features, including different types of communal spaces for a broad range of people and providing opportunities for social interaction among residents

- The objective of this development is to add quality dwellings of high amenity across a range of configurations at different price points. The proposed apartment mix is intended to reflect the broader North Strahfield mix of apartments, in particular offering efficient, affordable apartments.
- Most of the 2 bedroom apartment are given a utility room or “family hub” that can be adapted to suit the needs of residents in their various life stages regardless of the household composition. The room is based on international best practice requirement for accommodating families and children in highrise.
- 26 (15%) units are being designated affordable housing
- Recently designed residential developments in the vicinity have attracted residents from a wide range of backgrounds and age groups and the expectation is the proposal would be no different. Current analysis and data has shown that typically, in developments of this nature, the majority of new residents come from nearby suburbs meaning that developments are an enhancement of existing communities.
- The proposed development offers sound amenity to those with impaired mobility.
- The proposal is conceptually built around a central courtyard that is designed to facilitate opportunities for incidental and daily social interaction between residents and visitors.
- The landscaped communal open space on the ground floor will facilitate a variety of organised and impromptu social opportunities.
- The well detailed roof top terrace will accommodate more private and structured communal and social activities.

(Reference: HIGH-DENSITY HOUSING FOR FAMILIES WITH CHILDREN GUIDELINES
- City of Vancouver, 1992)



Family Hub

Principle 9: Aesthetics

Good design achieves a built form that has good proportions and a balanced composition of elements, reflecting the internal layout and structure. Good design uses a variety of materials, colours and textures.
The visual appearance of a well designed apartment development responds to the existing or future local context, particularly desirable elements and repetitions of the streetscape.

- We believe the success of the aesthetic character of any given design is not derived from its conformance to or response to planning objectives, but in the integrity and legibility of its intent.
- Typical planning objectives calling for aesthetics to be derivative or referential denies richer and more meaningful contributions to urban character. Our intention here is to acknowledge the traces of history of both the precinct and the site, not sentimentally, but in a manner that respectively establishes a new standard not seen in the area.
- The proposal is sympathetic intervention that relates to both the adjacent multi residential development and the opposing low rise residential houses.
- A new building set amongst a varied built form. The typology and scale are consistent, but an opportunity exists to present something better as far as built product.
- The proposal acknowledges the neighbouring residential context as well as the broader industrial and commercial context of the precinct.
- Our aesthetic intent is not one of an imposed or acquired composition, but formation of a coherent whole. It seeks a balanced proportionality, and an understated and subtle response to the scale of the street and the existing surrounds.
- The building is conceived of as modern expression of the predominantly brick banded buildings within the Bakehouse quarter. Those forms present a coupling of storeys expressed horizontally through a brick corbel or step in the façade. This same gesture is incorporated within the proposal, albeit through a modern interpretation of the corbel.
- The proposal takes the colour hues of the existing brick context with a similar horizontal band expression and inserts vertical windows into what is a modern form.
- The banding is generated through a slab extension that then allows variation between bands as the form gets higher.
- The banded form is articulated through the insertion of angled external walls resting on the bands. Slots are then carved out of the resultant form to demarcate lobby entries and variations in the floor plan.
- The form is then further modified by pulling the facade out to offer variation to the building expression in specific locations. This variation uses the same materiality as the base building but expresses slab edges and frames as a grid rather than horizontal bands.
- Materiality like the form is kept simple, robust and uncomplicated
- We consider that the aesthetic content of the development befits the character of what modern housing can become...the future imbued with the past contemporaneously

WASTE MANAGEMENT PLAN

25 George St
North Strathfield
Residential Development

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REVISIONS

Revision	Copy No.	Date	Prepared by	Reviewed by	Approved by	Remarks
A	1	31/08/2016	J Elliot	A Armstrong	N Beattie	Draft
B	1	7/09/2016	J Elliot	A Armstrong	N Beattie	Amendment
C	1	29/09/2016	J Elliot	A Armstrong	N Beattie	Amendment
D	1	6/10/2016	J Elliot	A Armstrong	N Beattie	Final
E	1	11/11/2019	J Parker	A Armstrong	A Armstrong	Amendment
F	1	13/12/2019	J Parker	A Armstrong	A Armstrong	Amendment
G	1	18/11/2021	J Parker	A Armstrong	A Armstrong	Amendment
H	1	31/03/2022	J Parker	A Armstrong	A Armstrong	Amendment
I	1	07/04/2022	J Parker	A Armstrong	A Armstrong	Amendment
J	1	26/05/2022	J Parker	A Armstrong	A Armstrong	Amendment
K	1	15/02/2024	J Parker	A Armstrong	A Armstrong	Amendment
L	1	19/02/2024	J Parker	A Armstrong	A Armstrong	Amendment
M	1	20/03/2024	J Parker	A Armstrong	A Armstrong	Amendment

EXECUTIVE SUMMARY

This waste management plan covers the ongoing management of waste generated by the residential development located at 25 George St, North Strathfield NSW.

Waste audit and management strategies are recommended for new developments to provide support for the building design and promote strong sustainability outcomes for the building. All recommended waste management plans will comply with council codes and any statutory requirements. The waste management plan has three key objectives:

i. ***Ensure waste is managed to reduce the amount of waste and recyclables to land fill*** by assisting residents to segregate appropriate materials that can be recycled; displaying signage to remind and encourage recycling practices; and through placement of recycling and waste bins in the retail precinct to reinforce these messages.

ii. ***Recover, reuse and recycle*** generated waste wherever possible.

iii. ***Compliance*** with all relevant codes and policies.

To assist in providing clean and well-segregated waste material, it is essential that this waste management plan is integral to the overall management of the building and clearly communicated to residents and tenants.

TABLE OF CONTENTS

GLOSSARY OF TERMS

TERM	DESCRIPTION
Baler	A device that compresses waste into a mould to form bales which may be self-supporting or retained in shape by wire ties and strapping
Chute	A ventilated, essentially vertical pipe passing from floor to floor of a building with openings as required to connect with hoppers and normally terminating at its lower end at the roof of the central waste room(s)
Collection Area/Point	The position or area where waste or recyclables are actually loaded onto the collection vehicle
Compactor	A Machine for compressing waste into disposable or reusable containers
Composter	A container/machine used for composting specific food scraps
Crate	A plastic box used for the collection of recyclable materials
Garbage	All domestic waste (Except recyclables and green waste)
Hopper	A fitting into which waste is placed and from which it passes into a chute or directly into a waste container. It consists of a fixed frame and hood unit (the frame) and a hinged or pivoted combined door and receiving unit
Recycling	Glass bottles and jars – PET, HDPE and PVC plastics; aluminium aerosol and steel cans; milk and juice cartons; soft drink, milk and shampoo containers; paper, cardboard, junk mail, newspapers and magazines
Green	Garden organics such as small branches, leaves and grass clippings, tree and shrub pruning, plants and flowers, and weeds
Liquid Waste	Non-hazardous liquid waste generated by commercial premises that is supposed to be connected to sewer or collected for treatment and disposal by a liquid waste contractor (including grease trap waste)
Mobile Garbage Bin(s) (MGB)	A waste container generally constructed of plastic with wheels with a capacity in litres of 120, 240, 660, 1000 or 1100, 1500 or 2000
Putrescible Waste	Component of the waste stream liable to become putrid. Usually breaks down in a landfill to create landfill gases and leachate. Typically applies to food, animal and organic products.

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

The following waste management plan pertains to the residential development located at 25 George St, North Strathfield NSW. This waste management plan is an operational waste management plan and will address the phases of the completed development.

For the purpose of this report the proposed development will consist of 3 buildings with 172 residential units in total

All figures and calculations are based on area schedules as advised by our client and shown on architectural drawings.

CITY OF CANADA BAY

The assessment of waste volumes is an estimate only and will be influenced by the development's management and occupant's attitude to waste disposal and recycling.

The residential waste and recycling will be guided by the services and acceptance criteria of the City of Canada Bay Council. The residential waste and recycling will be collected by council.

All waste facilities and equipment are to be designed and constructed to be in compliance with the City of Canada Bay Council, Australian Standards and statutory requirements.

OBJECTIVES

- Assist in achieving Federal State Government waste minimisation targets in accordance with regional waste plans.
- Minimise overall environmental impacts of waste and foster the principles of ecologically sustainable development (ESD).
- Facilitate source separation and provide design standards that complement waste collection and management services offered by Council and private service providers.

REQUIREMENTS

Location & Appearance

- Waste and recycling storage rooms must be integrated into the design of the overall development;
- minimise adverse impacts associated with proximity to any dwellings, visibility, odours and noise; and
- each service room and storage area must be located for convenient access by users and must be well ventilated and lit.

Size

- Waste/recycling rooms must be of adequate size to comfortably accommodate all waste and recycling bins associated with the development;
- the gradient of waste/recycling storage room floors and the gradient of any associated access ramps must be sufficiently level so that at access for the purpose of emptying containers can occur in accordance with WorkCover NSW Occupational Health & Safety requirements; and
- communal waste storage areas should have adequate space to accommodate and manoeuvre the Council's required number of waste and recycling containers.

Access

- There must be an unobstructed and Continuous Accessible Path of Travel (as per Australian Standard 1428 Design for Access and Mobility – 2001) and free of steps and kerbs from the waste/recycling storage area or rooms to the point at which bins are collected.

GENERATED WASTE VOLUMES

The assessment of projected waste volumes is a calculated estimate only and will be influenced by the development's management and occupant's waste disposal and recycling practices.

CONSTRUCTION AND DEVELOPMENT WASTE

The head contractor will be responsible for removing all construction-related waste offsite in a manner that meets all authority requirements. Please refer to the separate waste management plan submitted for construction waste as part of the Development Application.

BUILDING MANAGER/WASTE CARETAKER

All waste equipment movements are to be managed by the building manager/cleaners at all times. No tenants or residents will be allowed to transport waste or recyclables from the waste room; tenants and residents will only transport their waste to the allocated bin room.

The building manager/cleaner duties include, but are not limited to, the following:

- general maintenance and cleaning of the chute doors on each level (Frequency dependent on waste generation and will be determined based upon building operation);
- organising, maintaining and cleaning the general and recycled waste holding areas (Frequency will depend on waste generation and will be determined based upon building operation);
- transporting of bins as required;
- organising both garbage and recycled waste pick-ups as required;
- cleaning and exchanging all bins;
- ensure site safety for residents, children, visitors, staff and contractors;
- abide by all relevant OH&S legislation, regulations, and guidelines;
- assess any manual handling risks and prepare a manual handling control plan for waste and bin transfers; and
- provide to staff/contractors equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management activities

NOTE: It is the responsibility of the building manager to monitor the number of bins required for the development. As waste volumes may change according to the development's management and occupants' attitudes to waste disposal and recycling, bin numbers and sizes may need to be altered to suit the building operation.

REPORTING

It is recommended that building management ensure that all waste service providers submit monthly reports on all equipment movements and weights of any waste and recycling products removed from the development. Regular reviews of servicing should take place to ensure operational and economic best practise and to assist with sustainability reporting.

EDUCATION

Building management is responsible for creating and managing the waste management education process.

Educational material encouraging correct separation of garbage and recycling items must be provided to each resident to ensure correct use of the waste and recycling chute. This should include the correct disposal process for bulky goods (old furniture, large discarded items, etc.) It is recommended that information is provided in multiple languages to support correct practises and minimise the possibility of chute blockages as well as contamination in the collective waste bins.

Training videos are available to assist in educating residents to use the eDiverter chute doors correctly and the can be found in the links as follows:

eDIVERTER VIDEOS	TENANT VIDEO
https://vimeo.com/98294003	https://vimeo.com/98294002
http://youtu.be/kGBGXOe6P0I	http://youtu.be/kGBGXOe6P0I

It is also recommended that the owners' corporation website contain information for residents to refer to regarding use of the chute. Information should include:

- directions on using the chute doors;
- recycling and garbage descriptions (Council provides comprehensive information);
- how to dispose of bulky goods and any other items that are not garbage or recycling;
- residents' obligations to WHS and building management; and
- how to prevent damage or blockages to the chute (example below).

To prevent damage or blockage to rubbish chute DO NOT dispose of any newspapers, umbrellas, bedding, cigarettes, cartons, coat hangers, brooms, mops, large plastic wrappings from furniture, white goods, any sharp objects, hot liquid or ashes, oil, unwrapped vacuum dust, syringes, paint and solvents, car parts, bike parts, chemicals, corrosive and flammable items, soil, timber, bricks or other building materials, furniture, etc. down the chute.

It is expected that leasing arrangements with retail/commercial operations contain direction on waste management services and expectations.

RESIDENTIAL WASTE PLAN

Using the council's waste generation rates, the projected waste generated by the residential units can be calculated. Please note that calculations are based on generic figures; waste generation rates may differ according to the residents' waste management practice.

Table 1: *Calculated Waste Generation – Residential*

Building/ Core	# Units	Waste Calculation (L/unit/week)	Generated Waste (L/week)	Recycling Calculation (L/unit/week)	Generated Recycling (L/week)
A1	37	120	4440	120	4440
A2	24	120	2880	120	2880
B	36	120	4320	120	4320
C1	40	120	4800	120	4800
C2	35	120	4200	120	4200
TOTAL	**172**		**20640**		**20640**

BIN SUMMARY

The following assumptions have been taken into consideration:

- garbage is not compacted at the base of each chute;
- recycling is not compacted at the base of each chute; and
- number of bins have been rounded up for best operational outcome.

Using the assumptions stated, the required capacity and quantity of garbage and recycling bins have been calculated and tabulated respectively in the following tables:

Table 2: *Bin Summary – Residential*

	Garbage			Recycling		
Building/ Core	Bin Capacity (L)	Quantity	Collection Rate (times/week)	Bin Capacity (L)	Quantity	Collection Rate (times/week)
A1	660	7	1	660	7	1
A2	660	5	1	660	5	1
B	660	7	1	660	7	1
C1	660	8	1	660	8	1
C2	660	7	1	660	7	1

NOTE: Subject to the stakeholders preference/capability (and as built constraints), bin sizes and quantities may be changed. As waste volumes may change according to the development's type, bin numbers and collection frequencies may be altered to suit the building operation.

WASTE MANAGEMENT

Each core will be supplied with an eDiverter system which comprises of a single waste chute fitted with a recycling diversion.

Diversion systems allow for the installation of a single-use chute door for both a garbage and recycling disposal. Providing building owners with significant savings in cost due to the following reasons:

- no recycling areas required on each level – costs savings for developers;
- no recycling bin movement via lifts – energy cost savings;
- reduced bin cleaning time – labour cost savings;
- overall reduced labour for building operators; and
- reduced ongoing building maintenance (may assist in strata fee reduction) – labour cost savings

5 waste chutes will be installed and fitted with eDiverter systems supplied by Elephants Foot. Breakdown is as follows:

Core A1:	single waste chute with eDiverter
Core A2:	single waste chute with eDiverter
Core B:	single waste chute with eDiverter
Core C1:	single waste chute with eDiverter
Core C2:	single waste chute with eDiverter

Garbage discharges into 660L MGBs which is not compacted, and recycling (comingled) into 660L MGBs which is also not compacted. The discharge is located in the waste room for each core. Full bins will be transferred to the bin holding/collection area for servicing by Council.

WASTE HANDLING

All residents of each building will be supplied with a collection area in each unit (generally in the kitchen, under bench or similar alternate area) to deposit garbage and collect recyclable material suitable for one days storage. Residents should wrap or bag their waste. Bagged waste should not exceed 3kg in weight or 35cm x 35cm x 35cm in dimension.

Recycling must not be bagged. It is recommend that residents use a crate or dedicated bin for collecting recyclables within the allocated residential space provided to ensure correct separation before using the chute system. It is expected that residents will place clean and empty recycling items into the chute when using the recycling function.

Each residential level will be supplied with a chute outlet behind an air lock door that provides the opportunity to dispose of garbage and recyclable items *(see Figure 1 – Typical Chute Outlet – page 13).*

Once putrescible and recyclable waste streams are separated, the resident will carry these to the chute door and deposit bagged waste and loose recyclables using the buttons on the chute door.

Residents will select a recycling or waste function button located on each chute door. Direction on using the diversion system will be prominently displayed on each chute door.

The selection button moves a mechanism that guides either the waste or recycling into the correct collection bin, located in the waste room below. If residents on other levels select the same disposal function, they are able to deposit the same waste at the same time (i.e. waste system – all doors will open).

If commingled recycling is chosen during a waste disposal operation, the resident will be required to wait for the diverter to move from the waste bin to the recycling bin function. A wait time of three to ten seconds is the maximum time delay. The chute door will open but will not close until the diverter has returned to accept the correct waste stream.

NOTE: The operation will default to garbage in the case of a power outage.

TEMPORARY STORAGE OF BULKY GOODS

For multi-storey developments that include 10 or more dwellings, a room or caged area with a minimum volume of 8m³ must be allocated for the storage of discarded bulky items, such as old furniture, awaiting Council pickup.

It is recommended that donations to charitable organisations be encouraged. Clean, sound furniture and household goods etc. are highly sought after to provide for the disadvantaged. Donations will be arranged with the assistance of the building manager/caretaker.

OTHER WASTE STREAMS

Disposal or recycling of electronic, liquid waste and home detox (paint/chemicals etc.) will be organised with the assistance of the building caretaker. These items must not be placed in waste or recycling bins due to safety and environmental factors.

Residents should be directed to Councils comprehensive website for further information.

COMPOSTING

Space must be provided for an individual compost container for each dwelling (such as in townhouse and villa developments) or for a communal compost container; the siting of which will have regard to potential amenity impacts (*see APPENDIX C.4 for Typical Worm Farm Specifications*, *APPENDIX C.5 and APPENDIX C.6 for Typical Compost Bins)*.

COMMON AREAS

The lobbies, retail amenities and circulation areas will be supplied with suitably branded waste and recycling bins, where considered appropriate. Building management will monitor use and ensure bins are exchanged and cleaned. These areas generate negligible waste however garbage and recycling receptacles should be placed in convenient locations.

WASHROOM FACILITIES

Washroom facilities in retail and staff areas should be supplied with collection bins for paper towels (if used). Sanitary bins for female restroom facilities must also be arranged with an appropriate contractor.

Building management will monitor use and ensure waste bins are exchanged and cleaned.

GREEN WASTE

There will be green waste generated by the buildings landscaped areas. Any green waste will be collected and removed from site by the maintenance contractor during scheduled or arranged servicing of these areas.

WASTE CHUTES

Waste chutes for each level of the residential building are supplied per the following specifications:

- either 510mm or 610mm galvanised steel or 510mm recycled LLDPE polyethylene plastic;
- galvanised steel chutes or plastic chutes are fully wrapped with Vibralag acoustic wrap to assist in noise reduction;
- chutes are fixed to each slab level with galvanised steel brackets and Dynabolts;
- 30 mm Embleton Neoprene rubber isolation mounts under brackets on all levels;
- mounting brackets are site specific to accommodate penetrations or building shafts;
- penetrations on each building level at vertically perpendicular points with minimum penetration dimensions of 600mm x 600mm or 700mm x 700mm (square or round) for 510mm and 610mm chutes respectively are required to accommodate the chute installation;
- chute is supplied with a vent exiting at the top of each chute, openings for placement of fire sprinklers on every second level and wash down system;
- council and supplier require that all chutes are installed without offsets to achieve best practise operationally for the building; and
- two hour fire-rated (AS1530.4-2005) stainless steel refuse chute doors and throat assemblies are fitted at each required service level. All doors are fitted with a bottom hinged, self-closing mechanism, electronic lock out solenoid, connecting controls ready for wiring to diverter control box

eDIVERTER

eDiverter® BY ELEPHANTS FOOT

Figure 1: *eDiverter Logo*

Each of the waste rooms for will be supplied with an Elephants Foot eDiverter waste and recycling diversion system. Bottom chutes will direct garbage product into 660L MGBs and recycling discharging into 660L. The garbage is not compacted; and recycling not compacted for all bin rooms (s*ee APPENDIX C.1 for Typical eDiverter*).

eDiverter specifications:

- split system body 5mm plate with two bottom out lets;
- steel impact hopper for garbage and recycling products;
- hopper bin feeds and containments which flow waste and recyclables directly into collection bins;
- shut out door with manual over ride to close off chute fitted with fusible link;
- internal diverter plate 5mm activated by a hydraulic cylinder;
- hydraulic power pack with single phase 0.55kW motor and all associated connections;
- PLC control box in garbage room, programmed to operate diverter and lock out doors;
- 12 core 24 volt cables mounted to the external of chute pipes;
- doors fitted with electronic lock out normally closed solenoid;
- at each level above every chute door, four bottom operating switch board;

- electric connections at each station; and
- system connections and operation from every level - test and commission

ACOUSTICS

It is recommended that the walls of the shaft area surrounding the chutes and the chute hopper system construction be built to an Rw 50 construction. This is required to ensure acoustic compliance with typically recommended noise levels. Please note that noise from garbage chutes is not regulated by the BCA.

The following table supplies acoustic criteria that are typically recommended as a satisfactory internal noise level in apartments during the use of chute systems.

Table 3: *Recommended Satisfactory Internal Noise Level in Apartments*

Space Type	**Allowable Maximum Level** (dB(A)L max)
Bedrooms	30
Living Room	35

EQUIPMENT SUMMARY

Table 4: *Equipment Summary*

Component	**Part**	**Quantity**	**Notes**
Chutes	Galvanised Steel / LLDPE Polyethylene Plastic	5	(*See APPENDIX C.2 for Typical Chute Section*)
Equipment A	eDiverter Discharge Systems	5	For each waste room
Equipment B	Suitable Bin Moving Equipment	N/A	Optional (*See APPENDIX C.3 for Typical Bin Mover*)

WASTE ROOM AREAS

The 5 chute discharge rooms will need to accommodate an eDiverter and 2 x 660L MGBs to collect the discharge. The bin store must hold all the waste bins generated weekly, and allow enough room to clean and safely manoeuvre bins. A bin wash down area is provided in this area (see Appendix A.1 – Waste Rooms).

The areas allocated for residential waste rooms, bulky goods and collection areas are detailed in Table 5 below. The areas provided are estimates only. Final areas will depend upon bin and waste room layouts.

Table 5: *Waste Room Areas*

Level	Waste Room Type	Equipment	Allocated Area (m^2)
B1	Chute Discharge Room – A1	2 x 660L MGBs (Garbage) 2 x 660L MGBs (Recycling)	12
	Chute Discharge Room – A2	2 x 660L MGBs (Garbage) 2 x 660L MGBs (Recycling)	12
	Chute Discharge Room – B	2 x 660L MGBs (Garbage) 2 x 660L MGBs (Recycling)	12
	Chute Discharge Room – C1	2 x 660L MGBs (Garbage) 2 x 660L MGBs (Recycling)	12
	Chute Discharge Room – C2	2 x 660L MGBs (Garbage) 2 x 660L MGBs (Recycling)	12
	Bin Holding/Collection Area	34 x 660L MGBs (Garbage) 34 x 660L MGBs (Recycling)	130
	Bulky Goods Storage Area	N/A	$8m^3$

COLLECTION OF WASTE

All waste generated by the development will be collected by Council, with collections occurring on a weekly basis.

The building manager/caretaker will be responsible for ensuring all full bins are in the holding area prior to collection.

Council's collection vehicle will access the site and reverse into the loading bay on basement level 1, remaining in this location whilst the bins are being serviced. Full bins will be emptied and returned to the bin holding area.

COLLECTION AREA

All access and egress details including a swept path analysis for all vehicle movements on site will be provided by the traffic consultant's report.

The collection areas will need to be reviewed by a traffic consultant to confirm that these (and other trucks if required) can enter and exit the building in a forward direction. The final number of truck movements will depend on management of waste contract; final configuration of waste and recycling arrangements therefore number of bin lifts and additional irregular truck movements for hard waste.

It is our understanding that a traffic consultant is preparing drawings to confirm the swept paths for waste collections, access and egress, internal manoeuvring to assume parked position for loading and to exit, load requirements as well as collection vehicle dimensions. This information and supporting drawings will be provided separate to this report.

GARBAGE ROOMS

CONSTRUCTION REQUIREMENTS

The garbage room will be required to contain the following facilities to minimise odours, deter vermin, protect surrounding areas, and make it a user-friendly and safe area:

- waste room floor to be constructed of concrete or other approved materials at least 75mm thick and sealed with a two pack epoxy;
- waste room walls and floor surface is flat and even;
- all corners coved and sealed 100mm up, this is to eliminate build-up of dirt;
- a hot and cold water facility with mixing facility and hose cock must be provided for washing the bins;
- any waste water discharge from bin washing must be drained to sewer in accordance with the relevant water board. (Sydney Water);
- tap height of 1.6m;
- storm water access preventatives (grate);
- all walls painted with light colour and washable paint;
- equipment electric outlets to be installed 1700mm above floor levels;
- the room must be mechanically ventilated;
- light switch installed at height of 1.6m;
- waste rooms must be well lit (sensor lighting recommended);
- optional automatic odour and pest control system installed to eliminate all pest types and assist with odour reduction – this process generally takes place at building handover – building management make the decision to install;
- all personnel doors are hinged and self-closing;
- waste collection area must hold all bins – bin movements should be with ease of access;
- fitted with smoke detectors in accordance with Australian Standards and connected to the fire prevention system of the building
- conform to the Building Code of Australia, Australian Standards and local laws; and
- childproofing and public/operator safety shall be assessed and ensured

SIGNAGE

The building manager/caretaker is responsible for waste room signage including safety signage (*see APPENDIX B.2*). Appropriate signage must be prominently displayed on walls and above all bins, clearly stating what type of waste or recyclables is to be placed in the bin underneath.

A “NO STOPPING” and “DANGER” sign must be on the external face of the waste storage rooms where appropriate. This will be arranged by the building manager/caretaker. Appropriate signage must be prominently displayed on walls and above all bins, clearly stating what type of waste or recyclables is to be placed in the bin underneath.

All chute doors on all residential levels will be labelled with signs directing chute operations and use of chute door.

VENTILATION

Waste and recycling rooms must have their own exhaust ventilation system either;

- Mechanically - exhausting at a rate of 5L/m² floor area, with a minimum rate of 100L/s minimum; or
- Naturally - permanent, unobstructed, and opening direct to the external air, not less than one-twentieth (1/20) of the floor area

Mechanical exhaust systems shall comply with AS1668 and not cause any inconvenience, noise or odour problem.

STORM WATER PREVENTION & LITTER REDUCTION

Building management shall be responsible for the following to minimise dispersion of site litter and prevent stormwater pollution to avoid impact to the environment and local amenity:

- promote adequate waste disposal into the bins;
- secure all bin rooms (whilst affording access to staff/contractors);
- prevent overfilling of bins, keep all bin lids closed and bungs leak-free;
- take action to prevent dumping or unauthorised use of waste areas; and
- ensure collection contractors clean-up any spillage that may occur when clearing bins

ADDITIONAL INFORMATION

Transfer of waste and all bin movements require minimal manual handling therefore the operator must assess manual handling risks and provide any relevant documentation to building management. If required, a bin-tug, trailer or tractor consultant should be contacted to provide equipment recommendations. Hitches may require installation to move multiple bins to the collection area. Council must be informed of any hitch attachments required to be installed on bins.

LIMITATIONS

The purpose of this report is to document a Waste Management Plan (WMP) as part of a development application and is supplied by Elephants Foot Recycling Solutions (EFRS) with the following conditions:

- Drawings, estimates and information contained in this waste management plan have been prepared by analysing the information, plans and documents supplied by you and third parties including Council and government information. The assumptions based on the information contained in the WMP is outside the control of EFRS;
- the figures presented in the report are an estimate only – the actual amount of waste generated will be dependent on the occupancy rate of the building/s and waste generation intensity as well as the building managements approach to educating residents and tenants regarding waste management operations and responsibilities;
- the building manager will make adjustments as required based on actual waste volumes (if waste is greater than estimated) and increase the number of bins and collections accordingly;
- the report will not be used to determine or forecast operational costs or prepare any feasibility study or to document any safety or operational procedures;
- the report has been prepared with all due care however no assurance or representation is made that the WMP reflects the actual outcome and EFRS will not be liable to you for plans or outcomes that are not suitable for your purpose, whether as a result of incorrect or unsuitable information or otherwise;
- EFRS offer no warranty or representation of accuracy or reliability of the WMP unless specifically stated;
- any manual handling equipment recommended should be provided at the recommendation of the appropriate equipment provider who will assess the correct equipment for supply;
- Design of waste management chute equipment and systems must be approved by the supplier.

USEFUL CONTACTS

Elephants Foot Recycling Solutions does not warrant or make representation for goods or services provided by suppliers.

CITY OF CANADA BAY COUNCIL CUSTOMER SERVICE
Phone: 02 9911 6555 Email: council@canadabay.nsw.gov.au

SULO MGB (MGB, Public Place Bins, Tugs and Bin Hitches)
Phone: 1300 364 388

CLOSED LOOP (Organic Dehydrator)
Phone: 02 9339 9801

ELECTRODRIVE (Bin Mover)
Phone: 1800 333 002 Email: sales@electrodrive.com.au

RUD (Public Place Bins, Recycling Bins)
Phone: 07 3712 8000 Email: Info@rud.com.au

CAPITAL CITY WASTE SERVICES
Phone: 02 9359 9999

REMONDIS (Private Waste Services Provider)
Phone: 13 73 73

SITA ENVIRONMENTAL (Private Waste Services Provider)
Phone: 13 13 35

NATIONAL ASSOCIATION OF CHARITABLE RECYCLING ORGANISATIONS INC. (NACRO)
Phone: 03 9429 9884 Email: information@nacro.org.au

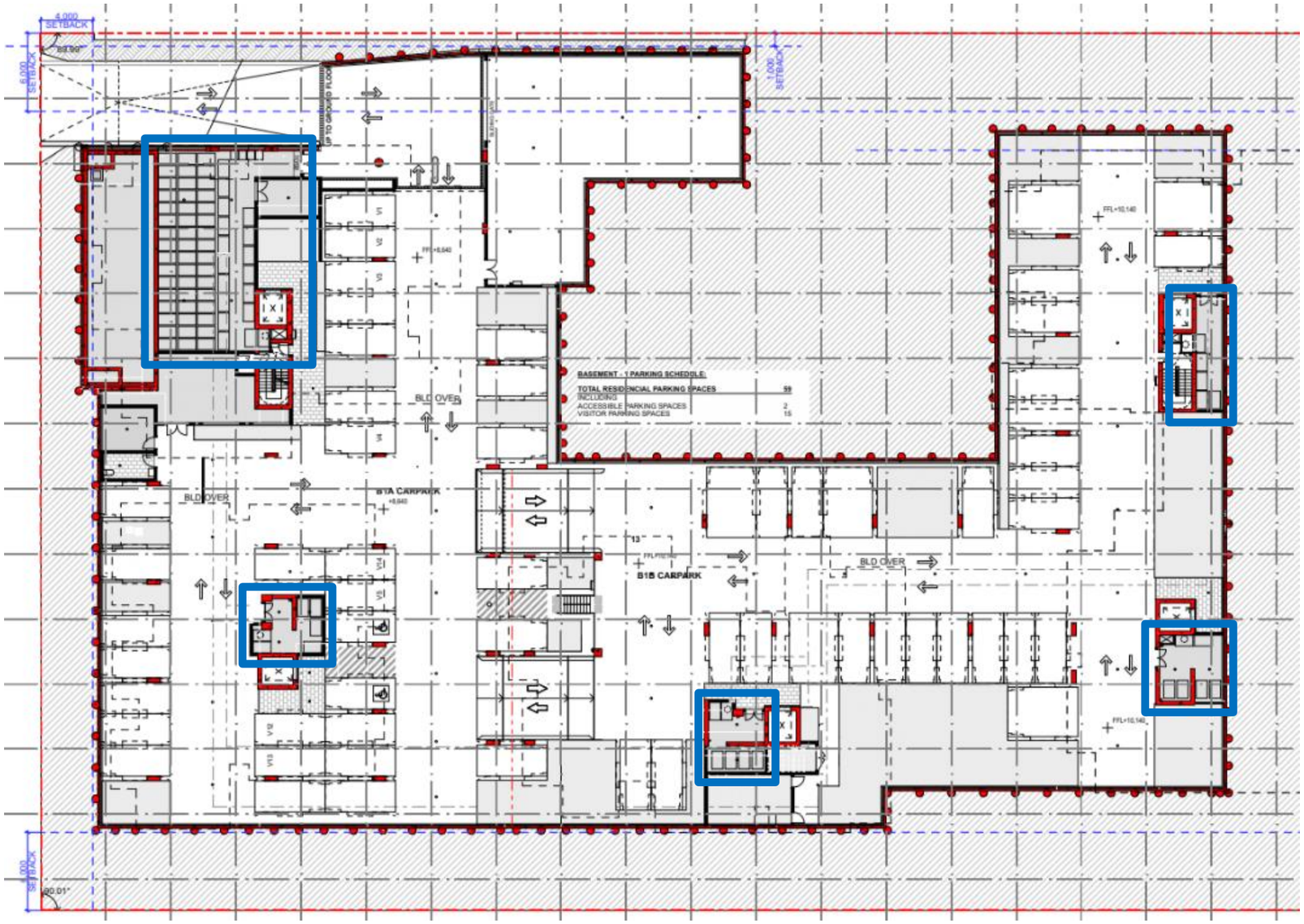
PURIFYING SOLUTIONS (Odour Control)
Phone: 1300 636 877 Email: sales@purifyingsolutions.com.au

Elephants Foot Recycling Solutions (Chutes, Compactors and eDiverter Systems)
44 – 46 Gibson Avenue
Padstow NSW 2211
Free call: 1800 025 073 Email: wmp@elephantsfoot.com.au

APPENDICES

APPENDIX A DRAWING EXCERPTS

APPENDIX A.1 WASTE ROOMS

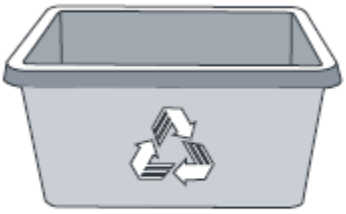


Source: Fuse Architecture, Drawing No. DA 102, Rev.G – Basement 1 Plan

APPENDIX B BETTER PRACTICE GUIDE SPECIFICATIONS

APPENDIX B.1 BIN DIMENSIONS

Crates



Crate size	50L Crate	70L Crate	90L Crate
Height	320 mm	395 mm	420 mm
Length	575 mm	575 mm	450 mm
Width	445 mm	445 mm	450 mm

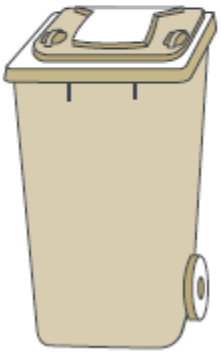
The above dimensions are indicative only of common crate sizes

Mobile garbage bins (MGBs)

MGBs with capacities up to 1700L should comply with the Australian Standard for Mobile Waste Containers (AS 4123). AS 4123 specifies standard sizes and sets out the colour designations for bodies and lids of mobile waste containers that relate to the type of materials they will be used for.

Indicative sizes only for common MGB sizes are provided below. Note that not all MGB sizes are shown; the dimensions are only a guide and differ slightly according to manufacturer, if bins have flat or dome lids and are used with different lifting devices. Refer to AS 4123 for further detail.

Mobile containers with a capacity from 80L to 360L with two wheels



Bin Type	80 Litre MGB	120 Litre MGB	140 Litre MGB	240 Litre MGB	360 Litre MGB
Height	870 mm	940 mm	1065 mm	1080 mm	1100 mm
Depth	530 mm	560 mm	540 mm	735 mm	885 mm
Width	450 mm	485 mm	500 mm	580 mm	600 mm

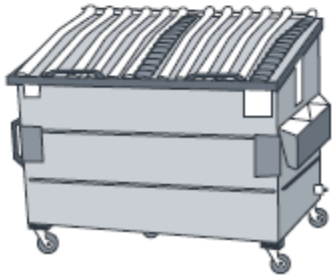
Mobile containers with a capacity from 500L to 1700L with four wheels

Dome or flat lid containers

Bin Type	660 Litre MGB	770 Litre MGB	1100 Litre MGB	1300 Litre MGB	1700 Litre MGB
Height	1250	1425	1470	1480	1470
Depth	850	1100	1245	1250	1250
Width	1370	1370	1370	1770	1770

Bulk bins greater than 1700L capacity

The following bulk bin dimensions are a guide only and may differ slightly according to manufacturer.
Not all available bulk bin sizes are shown.



Bin Type	2.0 m³ Skip	3.0 m³ Skip	4.5 m³ Skip
Height	865 mm	1225 mm	1570 mm
Depth	1400 mm	1505 mm	1605 mm
Width	1830 mm	1805 mm	1805 mm

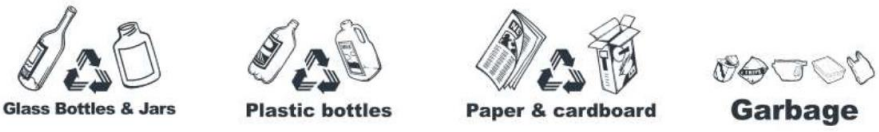
APPENDIX B.2 SIGNAGE FOR WASTE & RECYCLING BINS

WASTE SIGNS

Signs for garbage, recycling and organics bins should comply with the standard signs promoted by the Department of Environment and Heritage.

Example wall posters

Example bin lid stickers



SAFETY SIGNS

The design and use of safety signs for waste rooms and enclosures should comply with AS1319 Safety Signs for Occupational Environment. Safety signs should be used to regulate and control safety behaviour, warn of hazards and provide emergency information, including fire protection information. Below are some examples. Each development will need to decide which signs are relevant for its set of circumstances and service provided.

Examples of Australian Standards:

Australian Standards are available from the SAI Global Limited website (www.saiglobal.com).

Source: Better Practice Guide to Waste Management in Multi-Unit Dwellings, 2008, DECC

APPENDIX B.3 TYPICAL COLLECTION VEHICLE INFORMATION

General

Appropriate heavy rigid vehicle standards should be incorporated into the road and street designs in new developments where onsite collections are proposed. Road and street designs must comply with relevant Acts, regulations, guidelines, and codes administered by Austroads, Standards Australia, NSW Roads and Maritime Services, WorkSafe NSW and any local council traffic requirements.

Applicants and building designers should consult with councils and other relevant authorities before designing new roads or streets and access points for waste collection vehicles to establish specific design requirements.

Table H4.1: Australian Standards for turning circles for medium and heavy rigid class vehicles

Vehicle class	Overall length (m)	Design width (m)	Design turning radius (m)	Swept circle (m)	Clearance (travel) height (m)
Medium rigid vehicle	8.80	2.5	10.0	21.6	4.5
Heavy rigid vehicle	12.5	2.5	12.5	27.8	4.5

Source: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

Large collection vehicles

Waste collection vehicles may be side-loading, rear-loading, front-lift-loading, hook or crane lift trucks. Vehicle dimensions vary by collection service, manufacturer, make and model. It is not possible to provide definitive dimensions, so architects and developers should consult with the local council and/or contractors.

The following characteristics represent typical collection vehicles and are provided for guidance only. Reference to *AS2890.2 Parking facilities: off-street commercial vehicle facilities* for detailed requirements, including vehicle dimensions, is recommended.

Table B2.1: Collection vehicle dimensions

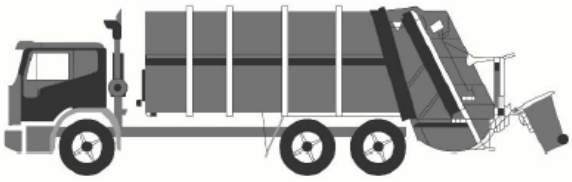
Vehicle type	Rear-loading	Side-loading*	Front-lift-loading	Hook truck	Crane truck
Length overall (m)	10.5	9.6	11.8	10.0	10.0
Width overall (m)	2.5	2.5	2.5	3.0	2.5
Travel height (m)	3.9	3.6	4.8	4.7	3.8
Operational height for loading (m)	3.9	4.2	6.5	3.0	8.75
Vehicle tare weight (t)	13.1	11.8	16.7	13.0	13.0
Maximum payload (t)	10.0	10.8	11.0	14.5	9.5
Turning circle (m)	25.0	21.4	25.0	25.0	18

* The maximum reach of a side arm is 3 m.

Sources: JJ Richards, SUEZ, MacDonald Johnson, Cleanaway, Garwood, Ros Roca, Bingo and Edbro. Figures shown represent the maximum dimensions for each vehicle type.

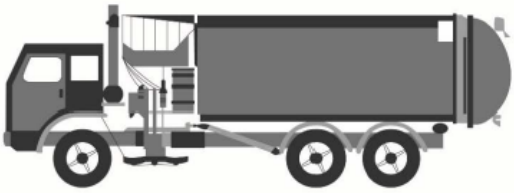
Rear-loading collection vehicles

These vehicles are commonly used for domestic waste collections from MUDs and RFBs and sometimes for recycling. They can be used to collect waste stored in mobile bins or bulk bins, particularly where bins are not presented at the kerbside. They are also used for collecting bulky waste.



Rear-loading waste collection vehicle

Side-loading collection vehicles



Side-loading waste collection vehicle

Front-lift-loading collection vehicles

These vehicles are commonly used for collecting commercial and industrial waste. They can only collect specially designed front-lift bulk bins and not mobile bins.

Front-lift-loading waste collection vehicle

Small collection vehicles

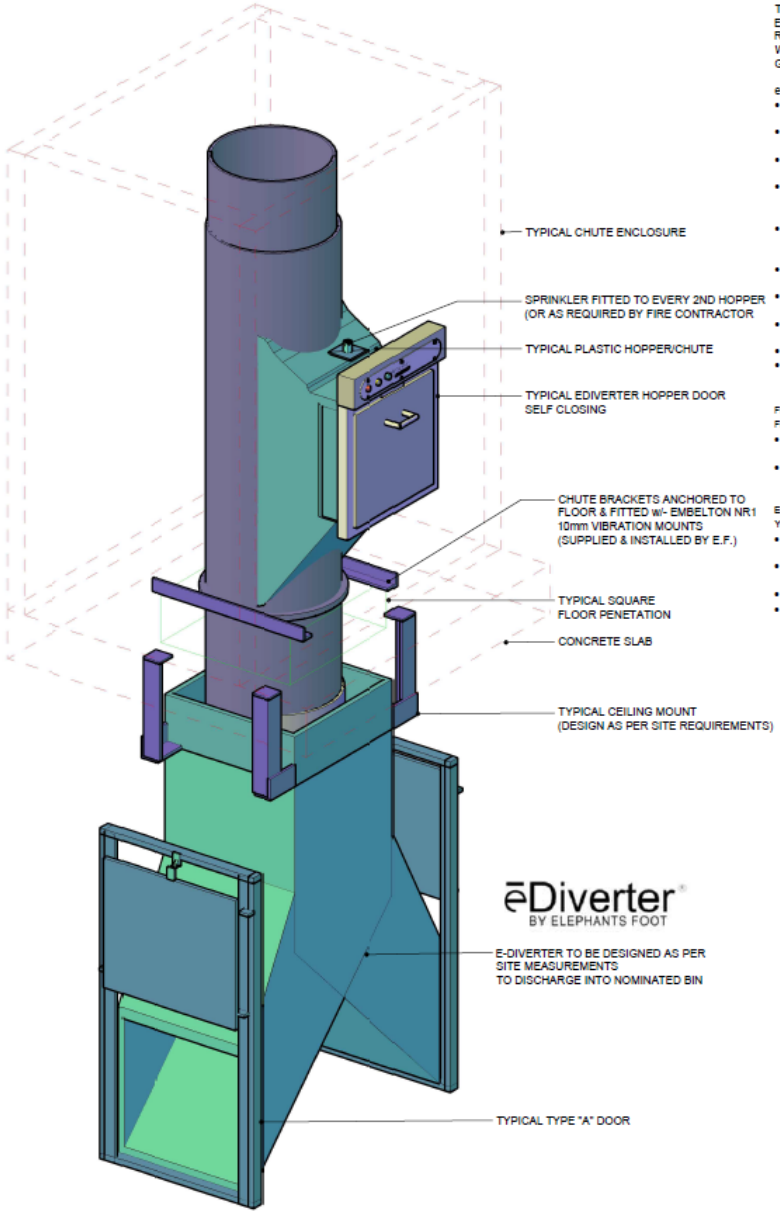
Typically, councils and their contractors operate with large collection vehicles (heavy rigid class vehicles) because they carry greater payloads and allow for more cost-effective collection services. Some councils, or their contractors, may have smaller collection vehicles in their fleet. Early discussion with the council is important to confirm this, but it should not be assumed that the council will have access to small collection vehicles.

The waste management systems and the location of the collection point should always be designed so that the council can provide the standard domestic waste service.

Source: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

APPENDIX C WASTE MANAGEMENT EQUIPMENT SPECIFICATIONS

APPENDIX C.1 TYPICAL eDIVERTER



TYPICAL EDIVERTER - PLASTIC CHUTE
scale NTS

EDIVERTER

THE WASTE ROOM WILL BE SUPPLIED WITH AN ELEPHANTS FOOT eDIVERTER WASTE AND RECYCLING DIVERSION SYSTEM. BOTTOM CHUTES WILL DIRECT PRODUCT INTO NOMINATED GARBAGE/RECYCLING SYSTEMS.

eDIVERTER SPECIFICATIONS:

- SPLIT SYSTEM BODY 5mm PLATE WITH TWO BOTTOM OUTLETS
- SHUT OUT DOOR WITH MANUAL OVER RIDE TO CLOSE OFF CHUTE FITTED WITH FUSIBLE LINK
- INTERNAL DIVERTER PLATE 5mm ACTIVATED BY A HYDRAULIC CYLINDER
- HYDRAULICS POWER PACK WITH SINGLE PHASE 0.55kw MOTOR AND ALL ASSOCIATED CONNECTIONS
- PLC CONTROL BOX IN GARBAGE ROOM, PROGRAMMED TO OPERATE DIVERTER AND LOCK OUT DOORS
- 12 CORE 24 VOLT CABLES MOUNTED TO THE EXTERNAL OF CHUTE PIPES
- DOORS FITTING WITH ELECTRONIC LOCK OUT NORMALLY CLOSED SOLENOID
- AT EACH LEVEL ABOVE EVERY CHUTE FOUR BOTTOM OPERATING SWITCH BOARD
- ELECTRIC CONNECTIONS AT EACH STATION
- SYSTEM CONNECTIONS AND OPERATION FROM EVERY LEVEL - TEST AND COMMISSION

FIRE

FIRE SYSTEM CONTRACTOR TO:

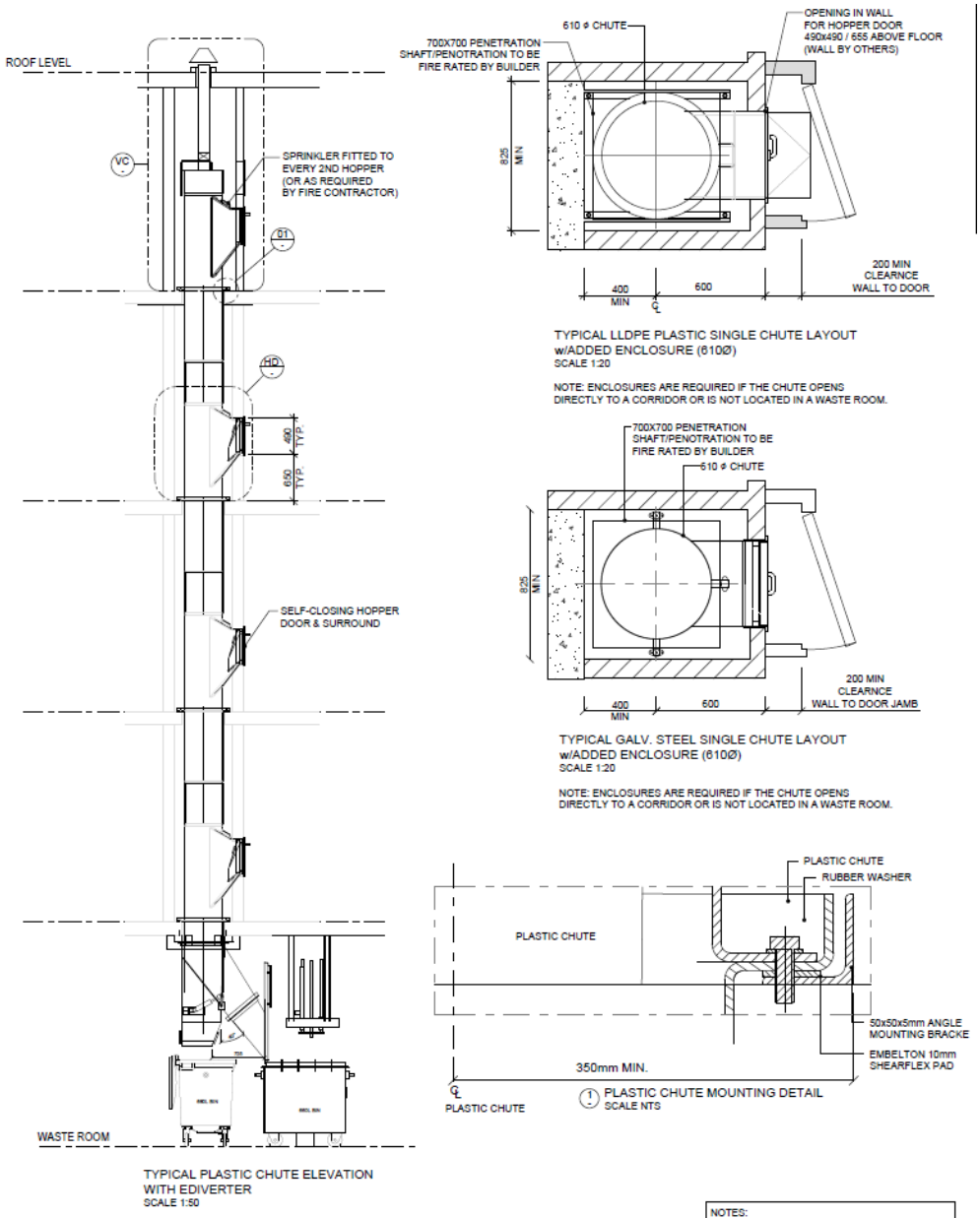
- SUPPLY FIRE SPRINKLERS AND CONNECTION FOR SPRINKLER SYSTEM
- SPRINKLERS FITTED ON EVERY 2ND LEVEL (OR AS PER FIRE CONTRACTOR INSTRUCTION)

ELECTRICAL

YOUR ELECTRICIAN TO PROVIDE:

- ONE (1) STANDARD 240V GPO IN MAIN GARBAGE ROOM
- ONE (1) 415VOLTS, 5 PINS, 20AMPS FOR EACH REQUIRED COMPACTOR, CAROUSEL OR LINEAR
- COORDINATE WITH ELECTRICAL SUBCONTRACTOR
- OUTLETS TO BE WATER PROOF AND TO BE WATER PROOF ADD TO ME LOCATED 1700mm OFF THE GROUND OFF THE GROUND.

APPENDIX C.2 TYPICAL CHUTE PLAN & ELEVATION



APPENDIX C.3 TYPICAL BIN MOVER

Typical applications:

- Move trolleys, waste bin trailers and 660litre/1100 litre bins up and down a ramp incline. Ideal for Apartment Buildings (to move waste bins located at a basement level to road level).
- Quiet, smooth operation with zero emissions and simple to use, no driver's licence required

Features:

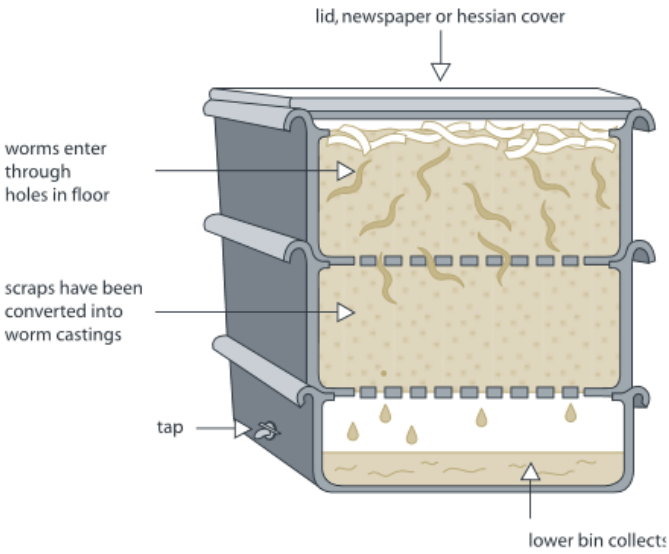
- Up to 1 Tonne on a ramp surface (depending on ballast and incline)
- Anti-rollback system on slopes
- Foot print: 1548L x 795W x 1104H (handle in the drive position)
- Pin Hitch is standard however alternate hitching options may be available to suit your specific application (e.g. tow ball)

Safety Features:

- Intuitive paddle lever control
- Stops and repels the unit if activated when reversing.
- Site assessment recommended to assess ramp incline steepness *(See Useful Contacts)*

APPENDIX C.4 TYPICAL WORM FARM SPECIFICATIONS

Worm farms



Space requirements for a typical worm farm for an average household:

Height – 300mm per level

Width – 600mm

Length – 900mm

There are many worm farm arrangements. The above dimensions are indicative only.

SOURCE: *Department of Environment and Climate Change NSW 2008, Better Practice Guide for Waste Management in Multi-Unit Dwellings*

APPENDIX C.5 TYPICAL APARTMENT STYLE COMPOST BINS

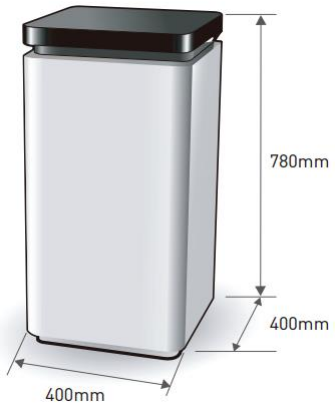
Apartment Style Compost bin – available from hardware stores

Suitable for:

- Vegetables
- Coffee grounds and filters
- Tea and tea bags
- Crushed eggshells (but not eggs)
- Nutshells
- Houseplants
- Leaves
- Cardboard rolls, cereal
- Boxes, brown paper bags
- Clean paper
- Shredded newspaper
- Fireplace ashes
- Wood chips, sawdust,
- Toothpicks, burnt matches
- Cotton and wool rags
- Dryer and vacuum cleaner lint
- Hair and fur
- Hay and straw

APPENDIX C.6 ELECTRIC ORGANIC COMPOST BIN

CLOSED LOOP
LOVE WHAT YOU DO
CLO'ey



Product Specifications

Decomposition Method	Fermentation by microorganisms
Decomposition Capacity	2 metric tonnes per year* (4 kg per day*)
Rating	220–240 V 50/60 Hz – 1.1 A
Decomposition Time	24 hrs
Operating Temperature	0C and 40C.**
Deodorisation Method	Nano-Filter system
Maximum Power	210 W
Power Usage	Average 1 kwh per day
Weight	21 kgs
External Dimensions	w 400 mm d 400 mm h 780 mm

* Food Waste Handling Capacity – based on an optimal operating environment.
** Ambient temperature range of area where unit may be installed.

SOURCE: *Closed Loop Domestic Composter – See Useful Contacts*

APPENDIX C.7 TYPICAL PUBLIC PLACE WASTE BINS

** Products and specifications may change according to manufacturer.*

SOURCE: *SULO Environmental Technology*

ABN: 47 644 736 514
ELEPHANTS FOOT CONSULTING. PTY LTD
1300 456 374 | consulting@elephantsfoot.com.au
www.elephantsfoot.com.au

23rd July 2024

RE: 25 George Street, North Strathfield

To Whom It May Concern,

This letter has been prepared to accompany the Development Application No. DA2024/0064 for the proposed modification to the previously approved Development Application No. DA2020/0143 in relation to 25 George Street, North Strathfield. The proposal seeks approval for 41 additional apartments and a total of 172 apartments. Please note that the original approval contained 145 apartments.

Elephants Foot Consulting have reviewed the latest architectural plans produced by Fuse Architecture (Particularly the Basement 1 Plan, Revision I) and made a minor update to the Operational Waste Management Plan (Revision M, dated 20/03/24) to reflect the latest number of units.

Elephants Foot Consulting are of the opinion that the changes proposed in the modification do not have a significant impact on the waste strategy, and that Revision M of the Operational Waste Management Plan is reflected in the architectural plans.

It is noted that City of Canada Bay Council have issued an RFI letter (Dated 25/06/24) requesting additional space for bulky waste and Food Organics and Garden Organics (FOGO). As these were not requirements when the original Development Application was submitted and approved, they have not been factored into the design. A full re-design of the basement would be required in order to accommodate this. As the developer is not seeking to make changes to the approved waste strategy, they have opted against re-designing the basement.

If further information or clarification is required, please do not hesitate to contact the undersigned.

Kind Regards,

Jordan Parker

Consultancy Services Manager
Elephants Foot Consulting
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25 George Street, North Strathfield

The Halston

Noise and Vibration Impact Assessment

UPG Halston Pty Ltd

Report number: 240001-25 George Street, North Strathfield -Noise and Vib Impact Assessment-R1
Date: 20 March 2024
Version: For Information

PULSE WHITE NOISE ACOUSTICS Level 5, 73 Walker Street, North Sydney NSW 2060
P 1800 4 PULSE (1800 478 573) **E** info@pwna.com.au **pwna.com.au** ABN 95 642 886 306

DOCUMENT CONTROL

Project Name	25 George Street, North Strathfield
Project Number	240001
Report Reference	240001-25 George Street, North Strathfield -Noise and Vib Impact Assessment-R1
Client:	UPG Halston Pty Ltd

Revision	Description	Reference	Date	Prepared	Checked	Authorised
0	For Information	240001-25 George Street, North Strathfield -Noise and Vib Impact Assessment-R0	1 January 2024	Ben White	Matt Furlong	Ben White
0	For Information	240001-25 George Street, North Strathfield -Noise and Vib Impact Assessment-R1	20 March 2024	Ben White	Matt Furlong	Ben White

PREPARED BY:

Pulse White Noise Acoustics Pty Ltd
ABN 95 642 886 306
Level 5, 73 Walker Street, North Sydney, 2060
1800 4 PULSE

TABLE OF CONTENTS

TABLES

FIGURES

1 INTRODUCTION

Pulse White Noise Acoustics Consultancy Pty Ltd (Pulse White Noise Acoustics) has been engaged to undertake an acoustic assessment for the residential development located at 25 George Street, North Strathfield.

The proposed project includes the following:

1. 2 basement levels of carparking.
2. Six stories of residential dwellings.

This assessment includes the acoustic investigation into the potential for noise impacts from the operation of the completed project as well as potential noise and impacts from existing noise sources within the vicinity of the site which predominantly includes traffic noise from surrounding roadways and the train line located to the west of the site.

2 PROJECT DETAILS

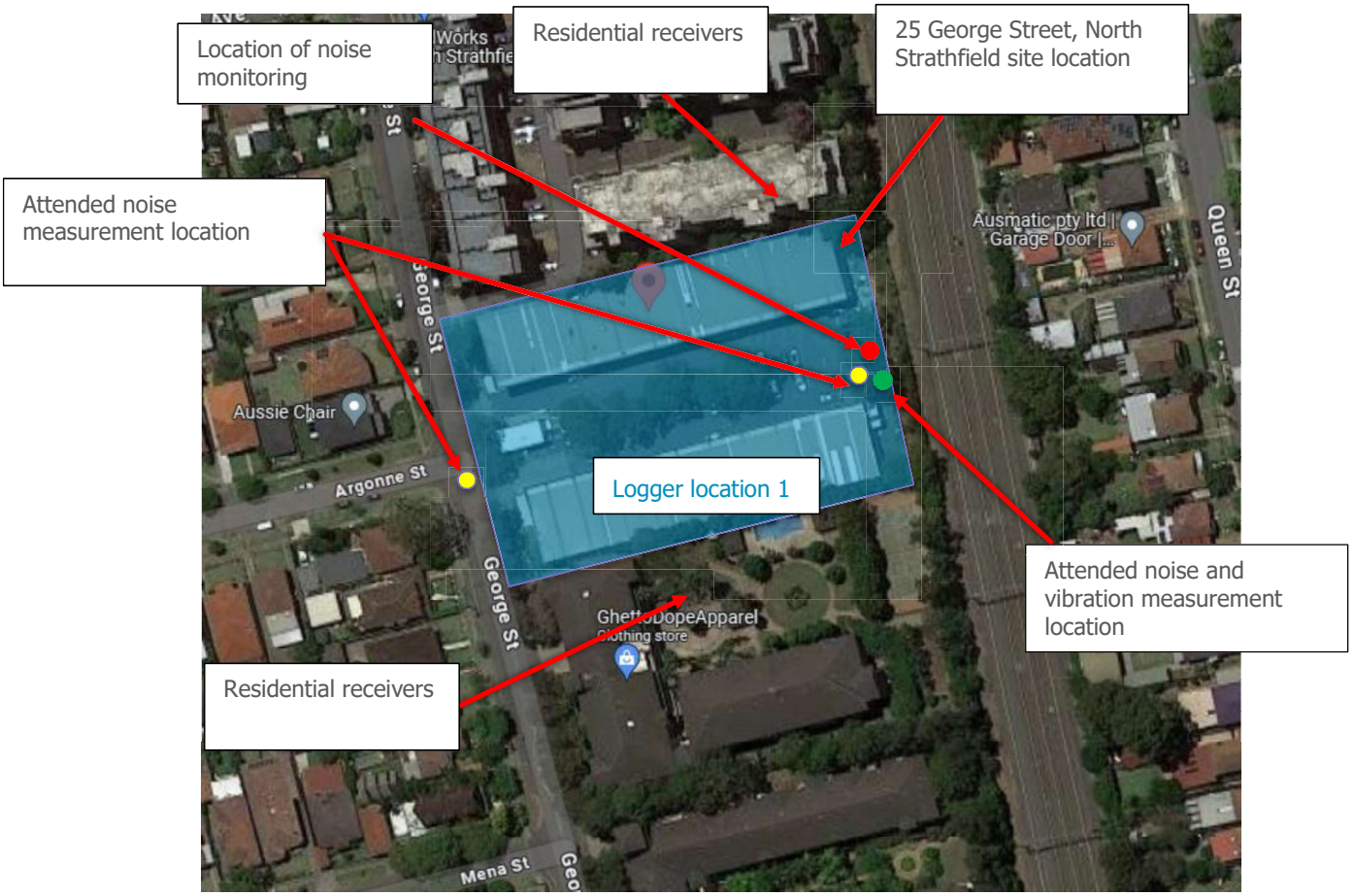
2.1 Site Location

The proposed development is located at 25 George Street, North Strathfield.

The surrounding receivers to the site include residential dwellings within the proximity of the site.

The site location is detailed in Figure 2-1 below which includes the location of the previously completed noise survey of the site.

Figure 2-1 Site location and Noise Measurement Locations

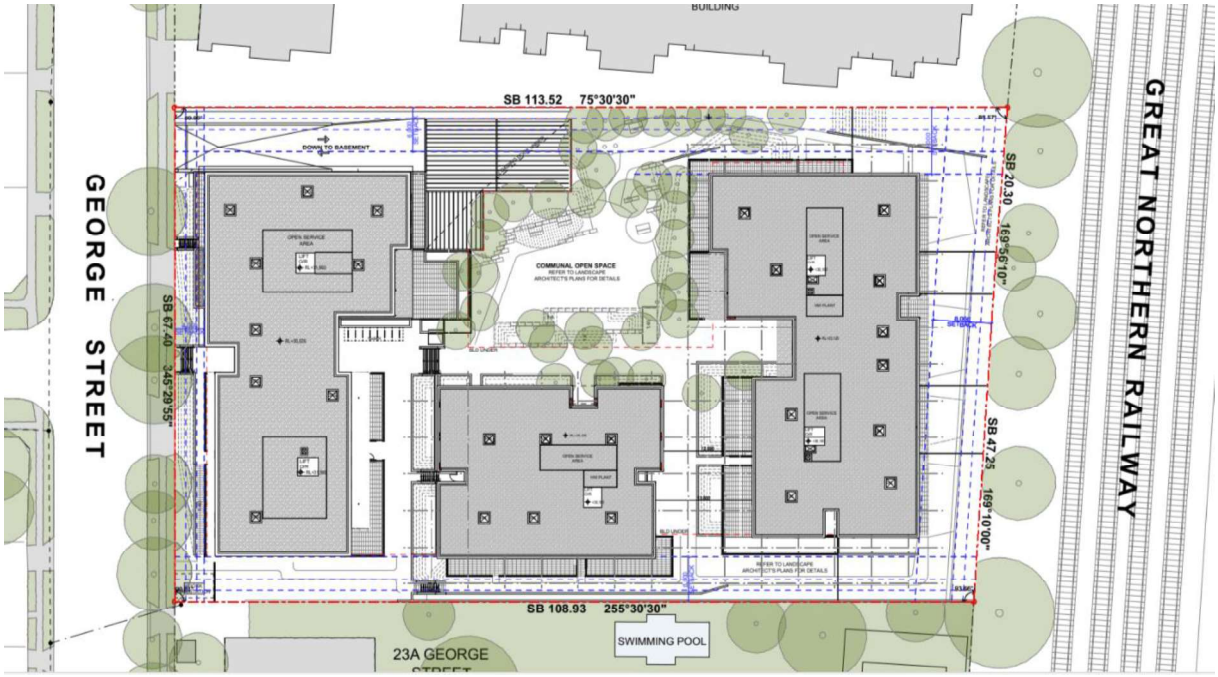


2.2 Project Description

The development includes a six story residential development located at 25 George Street, North Strathfield. The projects design in included in the Fuse Architects architectural drawings with job number 1711 and dated March 2023.

A site plan of the development is included in the figure below.

Figure 2-2 Project Site Plan



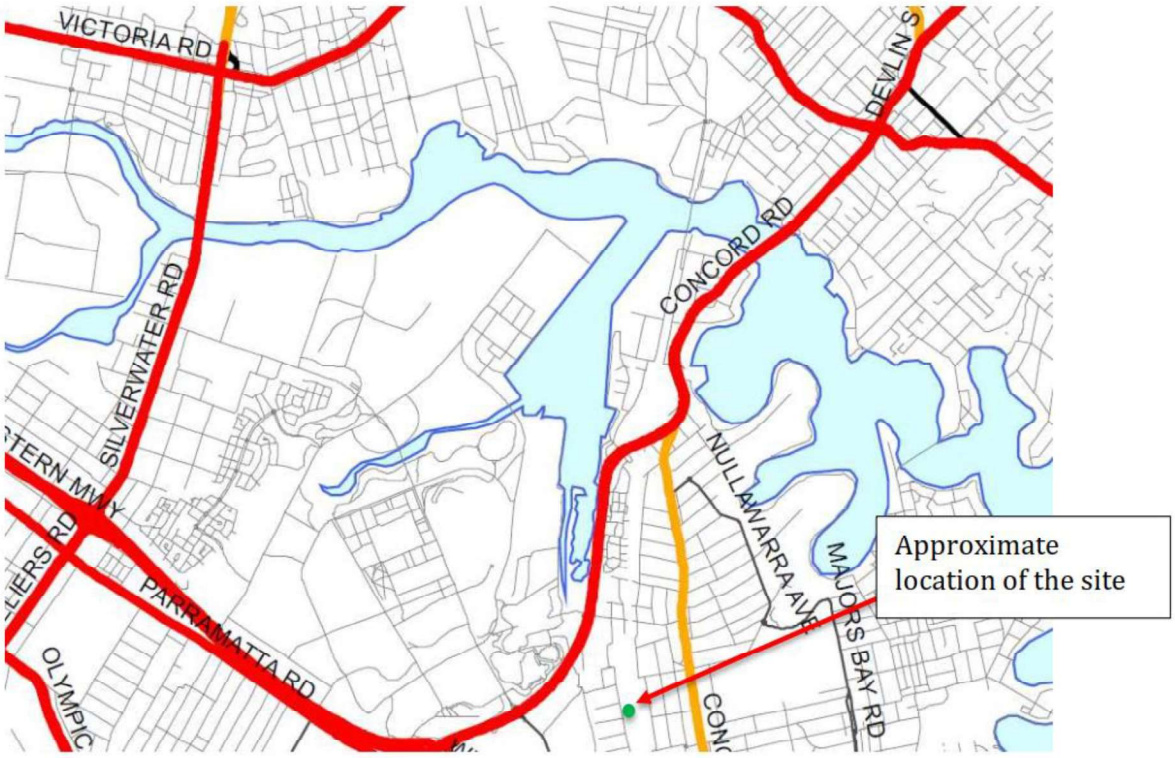
3 EXISTING ACOUSTIC ENVIRONMENT

The 25 George Street, North Strathfield site is located with an area which is classified as Suburban residential area as defined by the NSW EPA *Noise Policy for Industry*. The exiting noise levels at the site are predominantly as a result from traffic noise within the vicinity of the site on surrounding roadways and the train line which is located to the east of the site.

The site is located on George Street which is not defined as a busy road carrying over 20,000 Annual Average Daily Traffic (AADT) number as defined in Map 15 of the RTA's *Traffic Volume Maps for Noise Assessment for Buildings on Land Adjacent to Busy Roads*.

See the Figure below which includes the site location included on Map 15 of the RTA.

Figure 3-1 Site Location of Map 15 of the RTA's *Traffic Volume Maps for Noise Assessment for Buildings on Land Adjacent to Busy Roads*



3.1 Noise Descriptors and Terminology

Environmental noise constantly varies in level with time. Therefore, it is necessary to measure noise in terms of quantifiable time periods with statistical descriptors. Typically environmental noise is measured over 15 minute periods and relevant statistical descriptors of the fluctuating noise are determined to quantify the measured level.

Noise (or sound) consists of minute fluctuations in atmospheric pressure capable of detection by human hearing. Noise levels are expressed in terms of decibels, abbreviated as dB or dBA, the "A" indicating that the noise levels have been frequency weighted to approximate the characteristics of normal human hearing. Because noise is measured using a logarithmic scale, 'normal' linear arithmetic does not apply, e.g. adding two sound sources of equal values result in an increase of 3 dB (i.e. 60 dBA plus 60 dBA results in 63 dBA). A change of 1 dB or 2 dB in the sound level is difficult for most people to detect, whilst a 3 dB – 5 dB change corresponds to a small but noticeable change in loudness. A 10 dB change roughly corresponds to a doubling or halving in loudness.

The most relevant environmental noise descriptors are the L_{Aeq}, L_{A1}, L_{A10} and L_{A90} noise levels. The L_{Aeq} noise level represents the "equivalent energy average noise level". This parameter is derived by integrating the noise level measured over the measurement period. It represents the level that the fluctuating noise with the same acoustic energy would be if it were constant over the measured time period.

The L_{A1}, L_{A10} and L_{A90} levels are the levels exceeded for 1%, 10% and 90% of the sample period. These levels can be considered as the maximum noise level, the average repeatable maximum and average repeatable minimum noise levels, respectively.

Specific acoustic terminology is used in this assessment report. An explanation of common acoustic terms is included in Appendix A.

3.2 Noise Survey Results

As part of this assessment the previously completed noise survey of the site has been used as the basis of this assessment. Details of the acoustic survey include those included in the White Noise Acoustics *25 George Street, North Strathfield – Noise and Vibration Impact Assessment* with reference 19084_291019_Noise Impact_R1 and dated 4/11/2019. Details of the noise survey completed as part of the White Noise Acoustics assessment have been undertaken in accordance with the requirements of the Australin Standard AS1055 and the NSW EPA *Noise Policy for industry.* Details of the noise survey of the site are included in this section of the report. The previously completed noise logging undertaken at the site are included in Appendix B.

An additional acoustic survey of the site was undertaken on the 9th January 2024 and are detailed in this section of the report.

3.2.1 Noise Survey Results

The Rating Background Noise Level (RBL) is the background noise level used for assessment purposes at the nearest potentially affected receivers. It is the 90th percentile of the daily background noise levels during each assessment period, being day, evening and the night. The RBL LA90 (15minute) and LAeq noise levels are presented in Table 3-1 for the unattended logging. The measured noise levels are considered to be representative of the levels to be expected at the nearest and most affected residence to the proposed development.

Details of the noise survey undertaken at the site and detailed within the White Noise Acoustics *25 George Street, North Strathfield – Noise and Vibration Impact Assessment* with reference 19084_291019_Noise Impact_R1 and dated 4/11/2019 are summarised in the following table.

Table 3-1 Noise Survey Results

Measurement Location	Daytime[1] 7:00 am to 6:00 pm		Evening[1] 6:00 pm to 10:00 pm		Night-time[1] 10:00 pm to 7:00 am	
	L_{A90}[2]	L_{Aeq}[3]	L_{A90}[2]	L_{Aeq}[3]	L_{A90}[2]	L_{Aeq}[3]
Logger Location – Eastern Boundary as detailed in Figure 2-1 above	45	63	40	58	33	52

Note 1: For Monday to Saturday, Daytime 7:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 7:00 am. On Sundays and Public Holidays, Daytime 8:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 8:00 am

Note 2: The LA90 noise level is representative of the "average minimum background sound level" (in the absence of the source under consideration), or simply the background level.

Note 3: The LAeq is the energy 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.

3.2.2 Attended Noise Measurements

Supplementary attended noise testing was conducted at the site to conform the previous noise logging completed at the site and detailed in the sections above. Attended noise level testing was undertaken using a Bruel and Kjaer 2236C type meter. The meter was calibrated before and after testing and no significant drift was recorded.

The attended and unattended noise locations were selected to obtain suitable noise levels for the assessment of background noise levels ($L_{90\,(t)}$) as well as the impact from traffic movements ($Leq_{(t)}$).

Attended noise level measurements were undertaken by PWNA at the site on the 9th January 2023 during the morning period of 8.30pm to 10am. The results of the attended noise level measurements are detailed in the table below. Details of the previously completed attended noise level measurements detailed within the White Noise Acoustics *25 George Street, North Strathfield – Noise and Vibration Impact Assessment* with reference 19084_291019_Noise Impact_R1 and dated 4/11/2019 are also included in the table below.

Table 3-2 Attended Noise Level Measurement

Measurement Location	Time of measurement	Measured $L_{Aeq, 15min}$ dB(A)	Measured $L_{A90, 15min}$ dB(A)	Comments
Previously completed attended noise level measurements by White Noise Acoustics				
Facing Railway line to the east of the site	During day time period	62	46	Noise levels resulting from natural noise sources and traffic noise from roadways and the train line to the east of the site.
Facing George Street to the west of the site	During day time period	58	48	
Supplementary noise levels conducted by Pulse White Noise Acoustics				
Facing Railway line to the east of the site	During day time period	63	46	Noise levels resulting from natural noise sources and traffic noise from roadways and the train line to the east of the site.
Facing George Street to the west of the site	During day time period	57	47	

Based on the results of the noise survey conducted at the site, including the additional survey completed in January 2024 the previously completed noise survey undertaken at the site and included in the White Noise Acoustics *25 George Street, North Strathfield – Noise and Vibration Impact Assessment* remain suitable for the assessment of the project.

4 INTERNAL NOISE LEVEL ASSESSMENT

Internal noise levels within the future residential occupancies have been based on the relevant noise levels as detailed within the Australian Standard AS2107:2016 *Acoustics - Recommended design sound levels and reverberation times for building interiors* and the Department of Planning *Development Near Rail Corridor and Busy Roads – Interim Guideline* (DNRCBR).

The *recommended* levels for various areas of the project are detailed in the following table. The recommended noise levels for residential dwellings near major roadways detailed within AS2107:2016 have been used as the basis of this assessment. The DNRCBR includes the following requirements for the relevant design of internal areas of residential developments near train line roads:

> *If the development is for the purpose of a building for residential use, the consent authority must be satisfied that appropriate measures will be taken to ensure that the following LA_{eq} levels are not exceeded:*
>
> - *in any bedroom in the building: 35dB(A) at any time 10pm–7am*
> - *anywhere else in the building (other than a garage, kitchen, bathroom or hallway): 40dB(A) at any time.*

The recommended levels for various areas of the project are detailed in the following table. The recommended noise levels for residential dwellings near major roadways detailed within AS2107:2016 and DNRCBR have been used as the basis of this assessment.

Table 4-1 Project Internal Environmental Noise Level Criteria

Type of Occupancy/Activity	Design sound level maximum ($L_{Aeq,t}$)
Common areas (e.g. foyer, lift lobby)	50 $L_{Aeq\ 15\ hour}$
Residential[1] - Living areas	40 $L_{Aeq\ 15\ hour}$
Residential[1] - Sleeping areas (night time)	35 $L_{Aeq\ 9\ hour}$[1]
Toilets	55 $L_{Aeq\ 15\ hour}$

Note 1: The criteria for residential dwellings included within the Australian Standard have been used for the assessment of the proposed shop top development.

5 ENVIRONMENTAL NOISE INTRUSION ASSESSMENT

This section of the report details the assessment of environmental noise intrusion into the proposed development and the recommended acoustic treatments to ensure the recommended internal noise levels detailed in the Sections above (including environmental noise and train noise intrusion) are achieved. Internal noise levels within the future areas of the development will result from the noise intrusion into the building through the external façade including glass, masonry and other façade elements. Typically, the acoustic performance of building elements including the relatively light weight elements of the building façade, including glass and/or plasterboard constructions, will be the determining factors in the resulting internal noise levels.

Calculations of internal noise levels have been undertaken based on the measured traffic and calculated environmental noise levels at the site and the characteristics of the building, including window openings, buildings constructions and the like.

5.1.1 External Glass Elements

The recommended acoustic constructions to the buildings external façade glass elements are detailed in the table below to ensure the recommended internal noise levels detailed above are achieved, with the façade building openings closed.

Table 5-1 External Glass Acoustic Requirements

Building	Façade Orientation	Room Type	Recommended Glass Construction	Minimum Façade Acoustic Performance[1]
Building C	**Eastern Façade facing railway line**	Bedrooms	10.38mm Laminated	Rw 35
		Living Rooms	10.38mm Laminated	Rw 35
		Wet areas	6.38mm Laminated	Rw 30
		Common areas	6.38mm Laminated	Rw 30
	All other façade orientations	Bedrooms	6.38mm Laminated	Rw 30
		Living Rooms	6.38mm Laminated	Rw 30
		Wet areas	6.38mm Laminated	Rw 30
		Common areas	6.38mm Laminated	Rw 30
Buildings A and B	**All façade orientation**	Bedrooms	6.38mm Laminated	Rw 30
		Living Rooms	6.38mm Laminated	Rw 30
		Wet areas	6.38mm Laminated	Rw 30
		Common areas	6.38mm Laminated	Rw 30

Note 1: The acoustic performance of the external façade includes the installed glazing and frame including (but not limited to) the façade systems seals and frame. All external glazing systems are required to be installed using acoustic bulb seals.

The recommended glass constructions detailed in the table above include those required to ensure the acoustic requirements of the project are achieved. Thicker glazing may be required to achieve other project requirements such as structural, thermal, safety or other requirements and is to be advised by others.

5.2 External Building Elements

The proposed external building elements including masonry or concrete external walls and roof are acoustically acceptable without additional acoustic treatment.

Any lightweight external plasterboard walls should be constructed from a construction with a minimum acoustic performance of Rw 50.

5.3 External Roof

The required external roof and ceiling constructions for the project are required to include the following:

- Concrete external roof construction – no additional acoustic treatments required.
- Metal Deck or tiled room construction – no additional acoustic treatments required.

5.4 External Opening and Penetrations

All openings and penetrations are required to be acoustically treated such that the performance of the building construction is not compromised. This may require lining of duck work behind mechanical service openings/grills, treatments to ventilation opening and the like.

5.5 Alternative Ventilation Requirements

The internal design sound levels detailed above are achieved with external operable building openings closed. As internal noise levels with windows open will result in noise levels which are greater than 10 dB(A) with windows open to 5% of the floor area for ventilation an alternative method of providing outside air ventilation will be required to all units within the development of the eastern façade of Building C which face towards to the railway line.

As part of the proposed development the provision for an alternative outside air source to all residential dwellings is required. The options for the proposed alternative source of ventilation are discussed below:

1. The acoustic design of the building includes performance of glass and solid façade elements which will ensure internal noise levels with operable windows closed will achieve internal noise level requirements and ensure a suitable acoustic amenity for future residence.
    a. The use of the operable windows and doors could be used to provide ventilation/cross ventilation to the units. This can be undertaken by opening the operable elements of the façade at the discretion of the future occupants.
2. In the event occupants choose to keep the windows closed, an alternative source of outside air will be provided to the residential dwellings. The method of providing an alternative outside air will include a design which is in accordance with AS1668 and does not reduce the acoustic performance of the building's external façade. Possible methods of providing an alternative outside air source include one of the following:
    a. The use of a mechanical system to provide outside air such as a dedicated fan or the use of the fan within a units FCU including an outside air source (which would not be required to condition air to provide outside air to the unit).
    b. Provision of an outside air source to the intake air side of the Fan Coil Units (FCU) located in the ceiling space of each apartment. The outside air is mixed with the return air in the return air plenum and provided to the dwelling using the fan of the FCU which can operate with or without air conditioning being functional.
    c. Provision of outside air via a dedicated supply air fan which can be operated at the discretion of future occupants.
    d. Other methods of outside air supply which are compliant with the requirements of the Australian Standard AS1668.2.

    The installation of the ventilation should not compromise the acoustic performance of the external building shell and is required to comply with the noise emission criteria detailed in this report.

6 RAIL PASS-BY VIBRATION

This section of the report details the suitable vibration criteria for possible impacts from the railway line located to the east of the project.

6.1 Vibration Impact Criteria

The potential for vibration impact from a rail pass-bys on the line to the north of the site has been assessed for both tactile vibration impact as well as ground borne vibration resulting in structure borne noise.

The suitable criteria for the assessment of tactile vibration and structure borne noise are detailed in the following sections.

6.1.1 Tactile Vibration Impacts

The Department of Planning *Development Near Rail Corridor and Busy Roads – Interim Guideline (DNRCBR)* references to *"Assessing Vibration – A Technical Guideline".*

Vibration effects relating specifically to the human comfort aspects of the project are taken from the guideline titled *"Assessing Vibration – A Technical Guideline"*. (AVTG). The AVTG recommends that habitable rooms should comply with the criteria therein which is in line with the requirements of British Standard BS 6472:1992 "*Evaluation of Human Exposure to Vibration in Buildings (1Hz to 80Hz)*".

The British Standard details suitable criteria for the assessment of intermittent vibrations to prevent advise impacts on future residence.

Table 6-1 Intermittent vibration impacts criteria (m/s1.75) 1 Hz-80 Hz, Vibration Dose Values (VDV)

Measurement Location	Daytime		Night-Time	
	Preferred Values	Maximum Values	Preferred Values	Maximum Values
Residences	**0.20**	0.40	**0.13**	0.26

For the purpose of this assessment the *Preferred Values* detailed in the standard have been used as the criteria used in this assessment.

6.1.2 Structure Borne Noise

The borne vibration is the potential for audible noise to be generated as the result of vibration transferred through the building structure and emanating from the building surfaces (such as walls, ceilings and the like) as audible noise within the future residential dwellings within the development.

Potential structure borne noise impacts as a result of the proposed light rail has been assessed in accordance with the criteria detailed within the DNRCBR which includes the following:

> *Generally, ground borne noise is associated more closely with rail operations than roads. Where buildings are constructed over or adjacent to land over tunnels, ground-borne noise may be present without the normal masking effect of airborne noise.*
>
> *In such cases, residential buildings should be designed so that the 95th percentile of train pass-bys complies with a ground-borne LAmax noise limit of 40dBA (daytime) or 35dBA (night-time) measured using the "slow" response time setting on a sound level meter.*

As the railway line located to the east of the site is an above ground line and not within a tunnel the requirements for ground borne vibration is not required to be assessed based on the DNRCBR as detailed above.

As existing rail is above ground the impact of airborne noise on the future residence will be greater than the potential for structure borne noise levels. Providing suitable treatments for airborne noise impacts are included in the design of the project and tactile vibration levels comply with the relevant criteria then all relevant acoustic requirements will be achieved.

6.2 Rail Pass Bye Vibration Measurements

As part of the assessment measurements of vibration impacts from a rail pass bye on the railway line to the east of the site has been conducted. This assessment has included the previously conducted vibration measurements undertaken at the site and detailed within the White Noise Acoustics *25 George Street, North Strathfield – Noise and Vibration Impact Assessment* with reference 19084_291019_Noise Impact_R1 and dated 4/11/2019.

Vibration measurements have been undertaken at the location detailed in Figure 2-1 above.

6.2.1 Vibration Measurements

This section of the report details the measured vibration levels associated with rail pass byes at the location detailed in Figure 2-1 of this report.

The assessment included attended vibration measurements conducted by White Noise Acoustics and detailed within the *25 George Street, North Strathfield – Noise and Vibration Impact Assessment* with reference 19084_291019_Noise Impact_R1 and dated 4/11/2019.

Obtained vibration levels included a number of rail pass beys which have been used to determine the period vibration exposure for the daytime and night-time periods Vibration Dose Values (VDV).

The results of the vibration level measurements including the calculations for VDV are detailed in the table below.

Table 6-2 Calculated VDV

Location	Period	Criteria VDV m/s1.75	Calculated VDV m/s1.75
Future Residential Dwellings	Daytime	0.20	0.12
	Night-Time	0.13	0.09

Based on the results of the assessment of tactile vibration no additional acoustic treatment (or building vibration isolation) is required to comply with the relevant standards and ensure a suitable acoustic amenity for future occupants of the development.

8 EXTERNAL NOISE EMISSION ASSESSMENT

This section of the report details the relevant noise level criteria for noise emissions generated on the site once completed.

The relevant authority which provides the required noise level criteria for noise levels generated on the site includes the NSW Environmental Protection Authority's (EPA) Noise Policy for Industry (NPI).

This section contains noise criteria on the operational criteria, construction criteria and vibration criteria.

The following criteria are relevant for the assessment of noise and vibration emissions from the proposed training centre:

- For the assessment of the predicted operational noise emissions by the training facility: The criteria have been derived in accordance with the *Noise Policy for Industry* (EPA, 2017), details are included in the following sections of this report.

8.1 NSW Noise Policy for Industry

In NSW, the control of noise emissions is the responsibility of Local Government and the NSW Environment Protection Authority (NSW EPA). In October 2017, the NSW EPA released the *Noise Policy for Industry* (NSW NPI). The purpose of the policy is to ensure that noise impacts associated with particular industrial developments are evaluated and managed in a consistent and transparent manner. The policy aims to ensure that noise is kept to acceptable levels in balance with the social and economic value of industry in NSW.

The NSW NPI criteria for industrial noise sources have two components:

- Controlling the intrusive noise impacts for residential receivers in the short-term; and
- Maintaining noise level amenity of particular land uses for residents and sensitive receivers in other land uses.

The project noise trigger level is derived from the more stringent value out of the project intrusiveness noise level and the project amenity noise level.

8.1.1 Intrusive Noise Impacts (Residential Receivers)

The NSW NPI states that the noise from any single source should not intrude greatly above the prevailing background noise level. Industrial noises are generally considered acceptable if the equivalent continuous (energy-average) A-weighted level of noise from the source (L_{Aeq}), measured over a 15 minute period, does not exceed the background noise level measured in the absence of the source by more than 5 dB(A). This is often termed the Intrusiveness Criterion.

The 'Rating Background Level' (RBL) is the background noise level to be used for assessment purposes and is determined by the methods given in the NSW NPI. Using the rating background noise level approach results in the intrusiveness criterion being met for 90% of the time. Adjustments are to be applied to the level of noise produced by the source that is received at the assessment point where the noise source contains annoying characteristics such as tonality or impulsiveness.

8.1.2 Protecting Noise Amenity (All Receivers)

To limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels specified in Table 2.2 of the NSW NPI. That is, the ambient L_{Aeq} noise level should not exceed the level appropriate for the particular locality and land use. This is often termed the 'Background Creep' or Amenity Criterion.

The amenity assessment is based on noise criteria specified for a particular land use and corresponding sensitivity to noise. The cumulative effect of noise from industrial sources needs to be considered in assessing the impact. These criteria relate only to other continuous industrial-type noise and do not include road, rail or community noise. If the existing (measured) industrial-type noise level approaches the criterion value, then the NSW NPI sets maximum noise emission levels from new sources with the objective of ensuring that the cumulative levels do not significantly exceed the criterion.

8.1.3 Area Classification

The NSW NPI characterises the "Suburban Residential" as an area that has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry. This area often has the following characteristic: evening ambient noise levels defined by the natural environment and human activity.

For the considered receptors in the rural area, the recommended amenity noise level is shown in Table 8-1 below. When the existing noise level from industrial noise sources is close to the recommended "Amenity Noise Level" (ANL) given above, noise from the new source must be controlled to preserve the amenity of the area in line with the requirements of the NSW NPI.

Table 8-1 NSW NPI – Recommended L_{Aeq} Noise Levels from Industrial Noise Sources

Type of Receiver	Indicative Noise Amenity Area	Time of Day[1]	Recommended Amenity Noise Level ($L_{Aeq, period}$)[2]
Residence	Suburban	Day	55
		Evening	45
		Night	40
Commercial Receiver	-	When in use	65

Note 1: For Monday to Saturday, Daytime 7:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 7:00 am. On Sundays and Public Holidays, Daytime 8:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 8:00 am

Note 2: The L_{Aeq} is the energy 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.

8.1.4 Project Trigger Noise Levels

The intrusive and amenity criteria for industrial noise emissions derived from the measured data are presented in Table 8-2. The amenity and intrusive criterion are nominated for the purpose of determining the operational noise limits for noise sources associated with the development which can potentially affect noise sensitive receivers.

For each assessment period, the project trigger noise levels are the lower (i.e. the more stringent) of the amenity or intrusive criteria. The project trigger noise levels are shown in bold text in Table 8-2.

Table 8-2 External noise level criteria in accordance with the NSW NPI

Location	Time of Day	Project Amenity Noise Level, $L_{Aeq, period}$ [1] (dBA)	Representative Background Noise level $L_{A90, 15\ min}$ (RBL) [2] (dBA)	Measured $L_{Aeq, period}$ Noise Level (dBA)	Intrusive $L_{Aeq, 15\ min}$ Criterion for New Sources (dBA) [3]	Amenity $L_{Aeq, 15\ min}$ Criterion for New Sources (dBA) [3, 4]
Residence (Suburban)	Day	50	45	53	**50**	53
	Evening	40	40	45	45	**43**
	Night	35	33	45	38	**38**
Commercial Receiver	When in Use	60	-	-	**-**	**63**

Note 1: Project Amenity Noise Levels corresponding to "suburban" areas, equivalent to the Recommended Amenity Noise Levels minus 5 dBA

Note 2: L_{A90} Background Noise or Rating Background Level, including L_{A90} Background Noise or Rating Background Level based on the assumed minimum rating of the EPA NPfI.

Note 3: Project Noise Trigger Levels are shown in bold

Note 4: According to Section 2.2 of the NSW NPI, the LAeq, 15 minutes is equal to the LAeq, period + 3 dB

9 OPERATIONAL ACOUSTIC ASSESSMENT

This section of the report details the assessment of potential noise generated as part of the proposed development.

The assessment of potential noise impacts from various sources of noise on the site are detailed in the following sections.

9.1 Mechanical Services Equipment

Detailed selections of the proposed mechanical plant and equipment to be used on the site are not available at this time. All future plant and equipment are to be acoustically treated to ensure the noise levels at all surrounding receivers comply with noise emission criteria detailed within this report. Experience with similar projects indicated that it is both possible and practical to treat all mechanical equipment such that the relevant noise levels are achieved. Examples of the possible acoustic treatments to mechanical equipment includes the following:

- Supply and Exhaust Fans – location of fans within the building and treated using internally lined ductwork or acoustic silencers.
- General supply and exhaust fans – general exhaust and supply fans such as toilet, kitchen, lobby and other small mechanical fans can be acoustically treated using acoustic flex ducting or internal lined ducting.

Details of the required mechanical services equipment and acoustic treatments to ensure the relevant noise level criteria is achieved will be provided as part of the CC submission of the project.

Experience with similar projects indicates that the acoustic treatment of the proposed mechanical equipment to be installed on the project is both possible and practical.

9.2 Waste and Garbage Collections

Noise resulting from the removal of waste and garbage from the site, including garbage trucks and the like will be undertaken in accordance with council's waste management requirements.

Noise resulting from the collection of waste from the site will include intermittent collection using approved waste collection vehicles. The resulting noise impact resulting from the site will be similar to noise levels currently experienced by exiting receivers from exiting waste collection services, train noise and vehicle movements on surrounding roadways.

The recommended acoustic treatments to the building facade detailed in this report include those required to ensure internal noise levels within the future dwellings of the project from the collection of waste will be acoustically acceptable and compliant with the recommended internal noise levels.

10 CONCLUSION

Pulse White Noise Acoustics Consultancy Pty Ltd (Pulse White Noise Acoustics) has been engaged to undertake the Noise and Vibration Impact Assessment of the residential development located at 25 George Street, North Strathfield.

This report details the required acoustic constructions of the building's façade, including external windows, to ensure that the future internal noise levels comply with the relevant noise levels of the Australian Standard AS2107:2016 for environmental noise. Providing the recommended constructions detailed in this report are included in the construction of the project the required internal noise levels will be achieved.

An assessment of the potential for noise and vibration impact from the operation of the railway line which is located to the north of the site has been undertaken and providing the recommendations in this report are included in the design and construction of the project compliance with the Department of Planning *Development Near Rail Corridors and Busy Roads – Interim Guideline* and the *Infrastructure SEPP* will be achieved.

External noise emissions from the site have been assessed and detailed in accordance with the NSW Environmental Protection Authorities *Noise Policy for Industry*. The future design and treatment of all building services associated with the project can be acoustically treated to ensure all noise emissions from the site comply with the EPA NPfI criteria including the following:

1. Operation of mechanical services on the site.

Regards

Ben White
Director

Pulse White Noise Acoustics

11 APPENDIX A: ACOUSTIC TERMINOLOGY

The following is a brief description of the acoustic terminology used in this report.

Sound power level	The total sound emitted by a source
Sound pressure level	The amount of sound at a specified point
Decibel [dB]	The measurement unit of sound
A Weighted decibels [dB(A])	The A weighting is a frequency filter applied to measured noise levels to represent how humans hear sounds. The A-weighting filter emphasises frequencies in the speech range (between 1kHz and 4 kHz) which the human ear is most sensitive to, and places less emphasis on low frequencies at which the human ear is not so sensitive. When an overall sound level is A-weighted it is expressed in units of dB(A).
Decibel scale	The decibel scale is logarithmic in order to produce a better representation of the response of the human ear. A 3 dB increase in the sound pressure level corresponds to a doubling in the sound energy. A 10 dB increase in the sound pressure level corresponds to a perceived doubling in volume. Examples of decibel levels of common sounds are as follows:

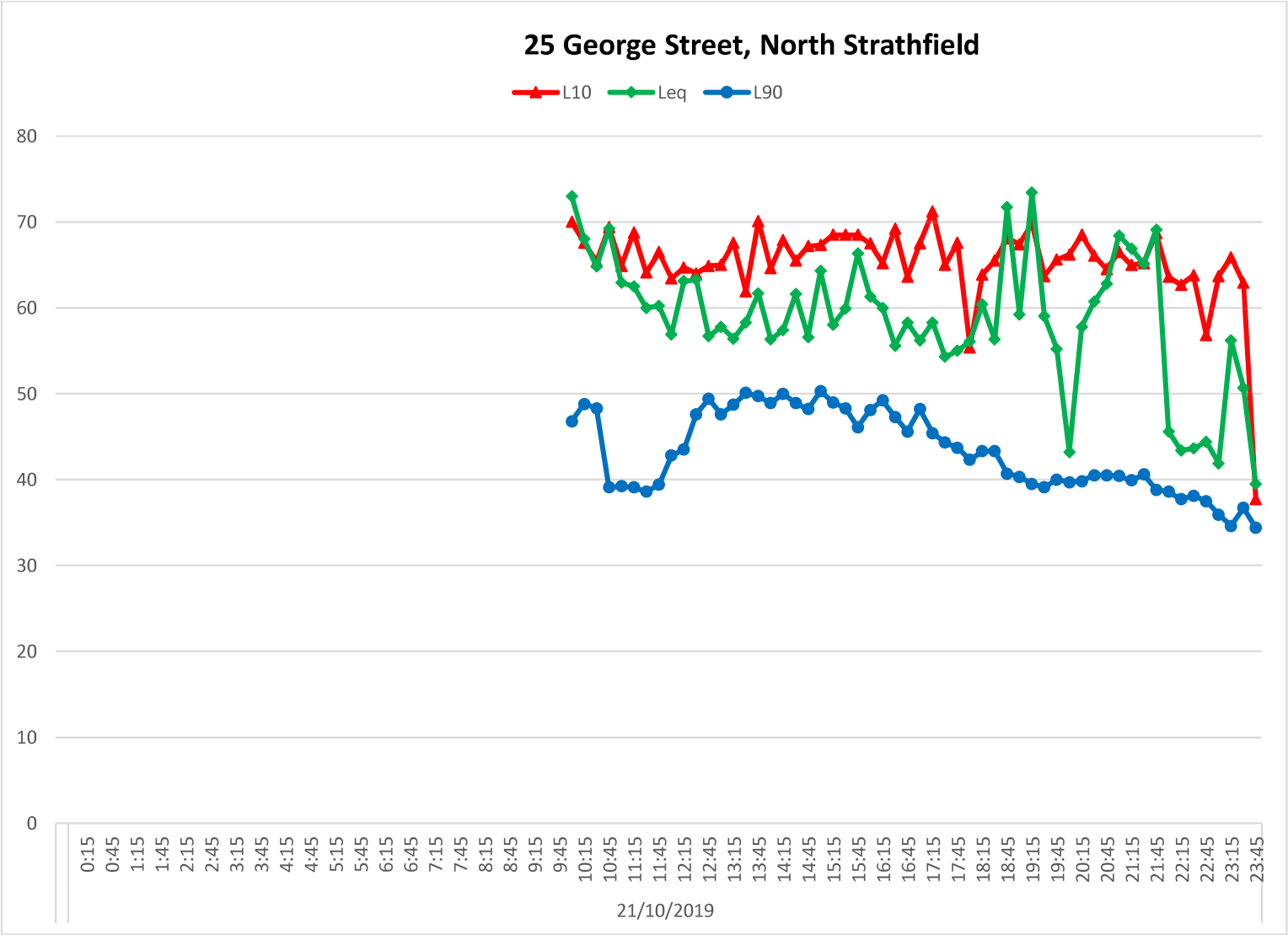
0dB(A)	Threshold of human hearing
30dB(A)	A quiet country park
40dB(A)	Whisper in a library
50dB(A)	Open office space
70dB(A)	Inside a car on a freeway
80dB(A)	Outboard motor
90dB(A)	Heavy truck pass-by
100dB(A)	Jackhammer/Subway train
110 dB(A)	Rock Concert
115dB(A)	Limit of sound permitted in industry
120dB(A)	747 take off at 250 metres

Frequency [f]	The repetition rate of the cycle measured in Hertz (Hz). The frequency corresponds to the pitch of the sound. A high frequency corresponds to a high pitched sound and a low frequency to a low pitched sound.
Ambient sound	The all-encompassing sound at a point composed of sound from all sources near and far.
Equivalent continuous sound level [L_{eq}]	The constant sound level which, when occurring over the same period of time, would result in the receiver experiencing the same amount of sound energy.
Reverberation	The persistence of sound in a space after the source of that sound has been stopped (the reverberation time is the time taken for a reverberant sound field to decrease by 60 dB)
Air-borne sound	The sound emitted directly from a source into the surrounding air, such as speech, television or music
Impact sound	The sound emitted from force of one object hitting another such as footfalls and slamming cupboards.
Air-borne sound isolation	The reduction of airborne sound between two rooms.
Sound Reduction Index [R] (Sound Transmission Loss)	The ratio the sound incident on a partition to the sound transmitted by the partition.
Weighted sound reduction index [R_w]	A single figure representation of the air-borne sound insulation of a partition based upon the R values for each frequency measured in a laboratory environment.
Level difference [D]	The difference in sound pressure level between two rooms.

Normalised level difference [D_n]	The difference in sound pressure level between two rooms normalised for the absorption area of the receiving room.
Standardised level difference [D_{nT}]	The difference in sound pressure level between two rooms normalised for the reverberation time of the receiving room.
Weighted standardised level difference [$D_{nT,w}$]	A single figure representation of the air-borne sound insulation of a partition based upon the level difference. Generally used to present the performance of a partition when measured in situ on site.
C_{tr}	A value added to an R_w or $D_{nT,w}$ value to account for variations in the spectrum.
Impact sound isolation	The resistance of a floor or wall to transmit impact sound.
Impact sound pressure level [L_i]	The sound pressure level in the receiving room produced by impacts subjected to the adjacent floor or wall by a tapping machine.
Normalised impact sound pressure level [L_n]	The impact sound pressure level normalised for the absorption area of the receiving room.
Weighted normalised impact sound pressure level [$L_{n,w}$]	A single figure representation of the impact sound insulation of a floor or wall based upon the impact sound pressure level measured in a laboratory.
Weighted standardised impact sound pressure level [$L'_{nT,w}$]	A single figure representation of the impact sound insulation of a floor or wall based upon the impact sound pressure level measured in situ on site.
C_I	A value added to an L_{nW} or $L'_{nT,w}$ value to account for variations in the spectrum.
Energy Equivalent Sound Pressure Level [$L_{A,eq,T}$]	'A' weighted, energy averaged sound pressure level over the measurement period T.
Percentile Sound Pressure Level [$L_{Ax,T}$]	'A' weighted, sound pressure that is exceeded for percentile x of the measurement period T.

*Definitions of a number of terms have been adapted from Australian Standard AS1633:1985 *"Acoustics – Glossary of terms and related symbols"*

12 APPENDIX B: UNATTENDED NOISE LOGGING – PREVIOULYS COMPLETED AT THE SITE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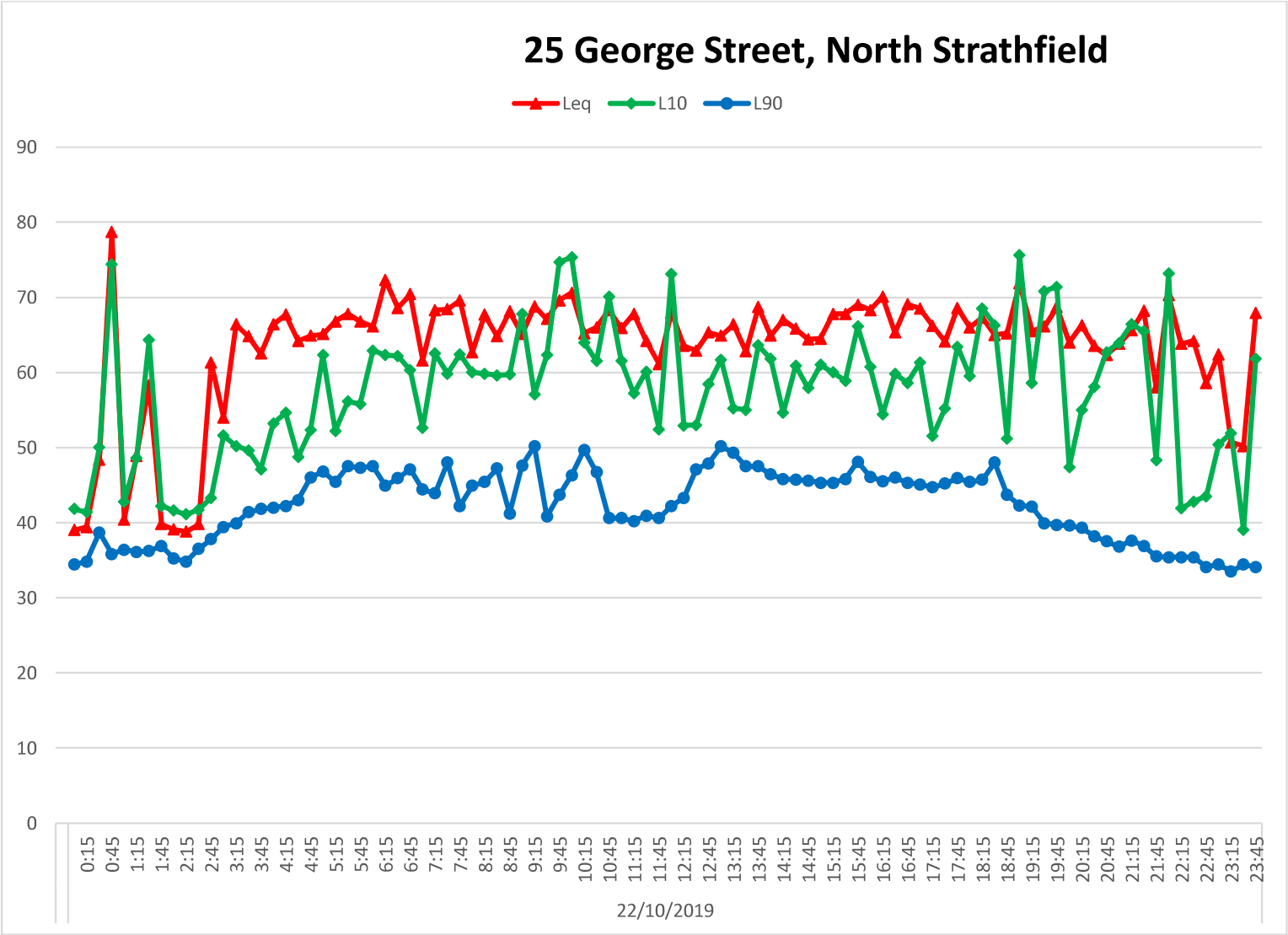
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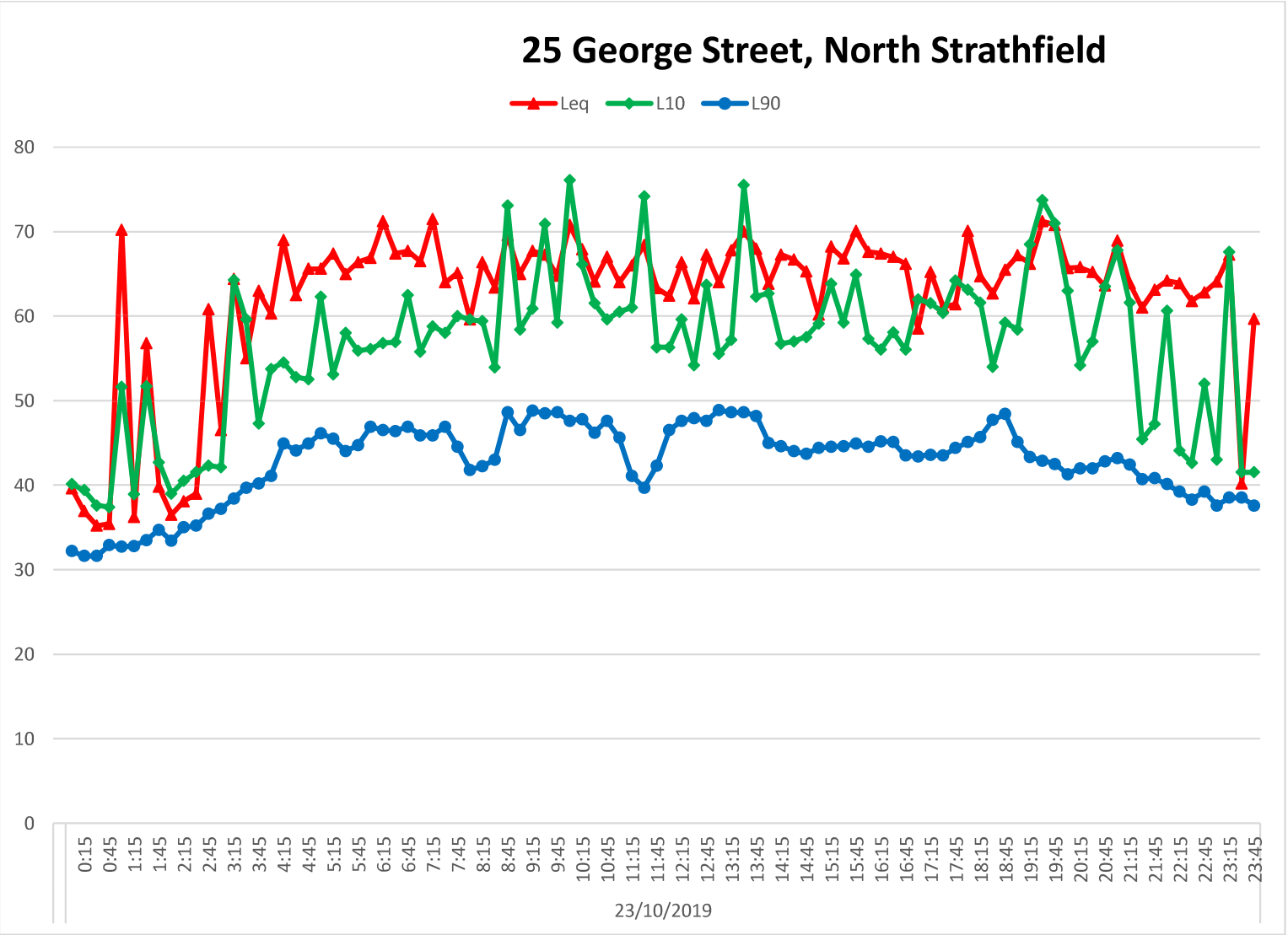
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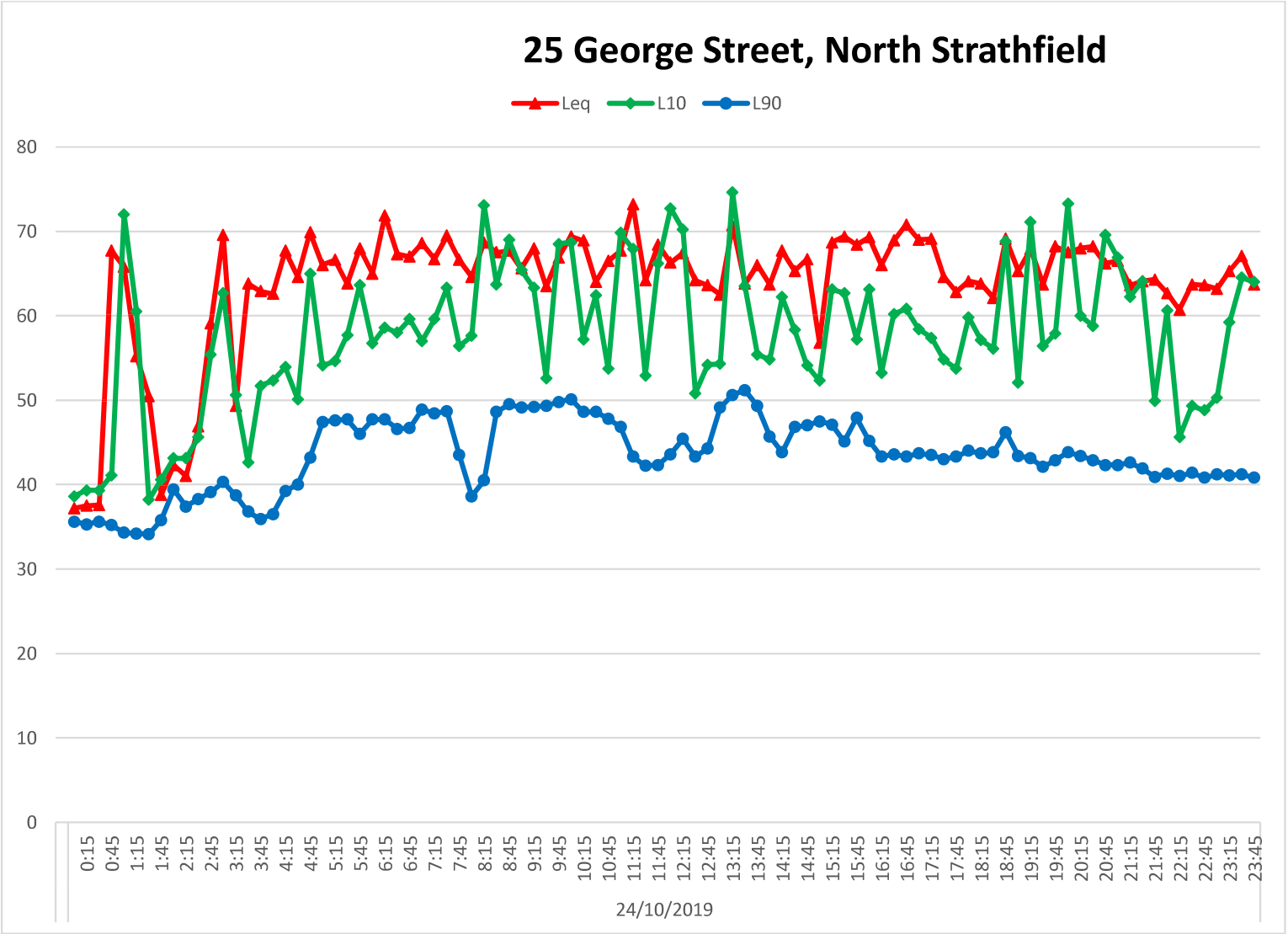
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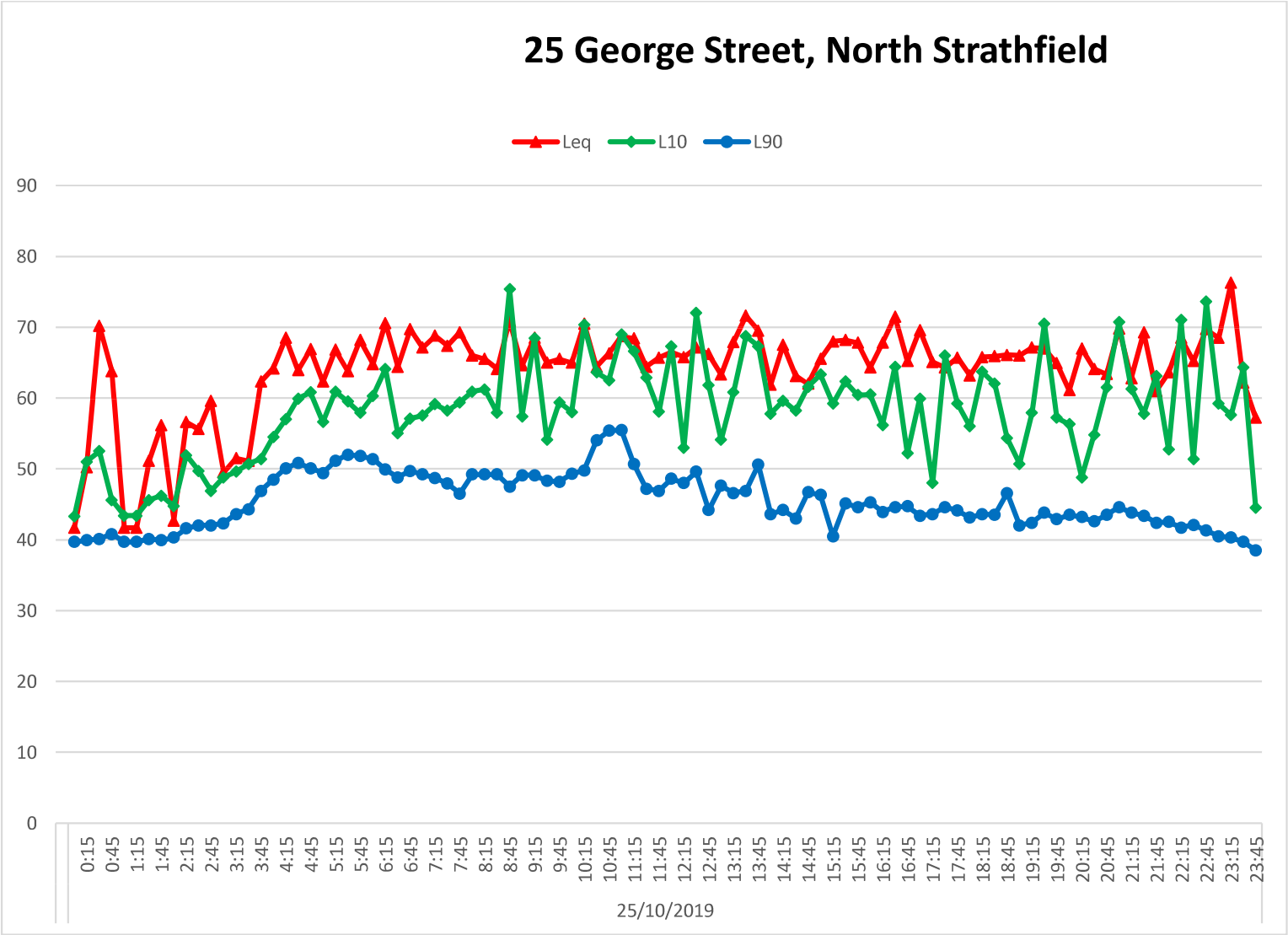
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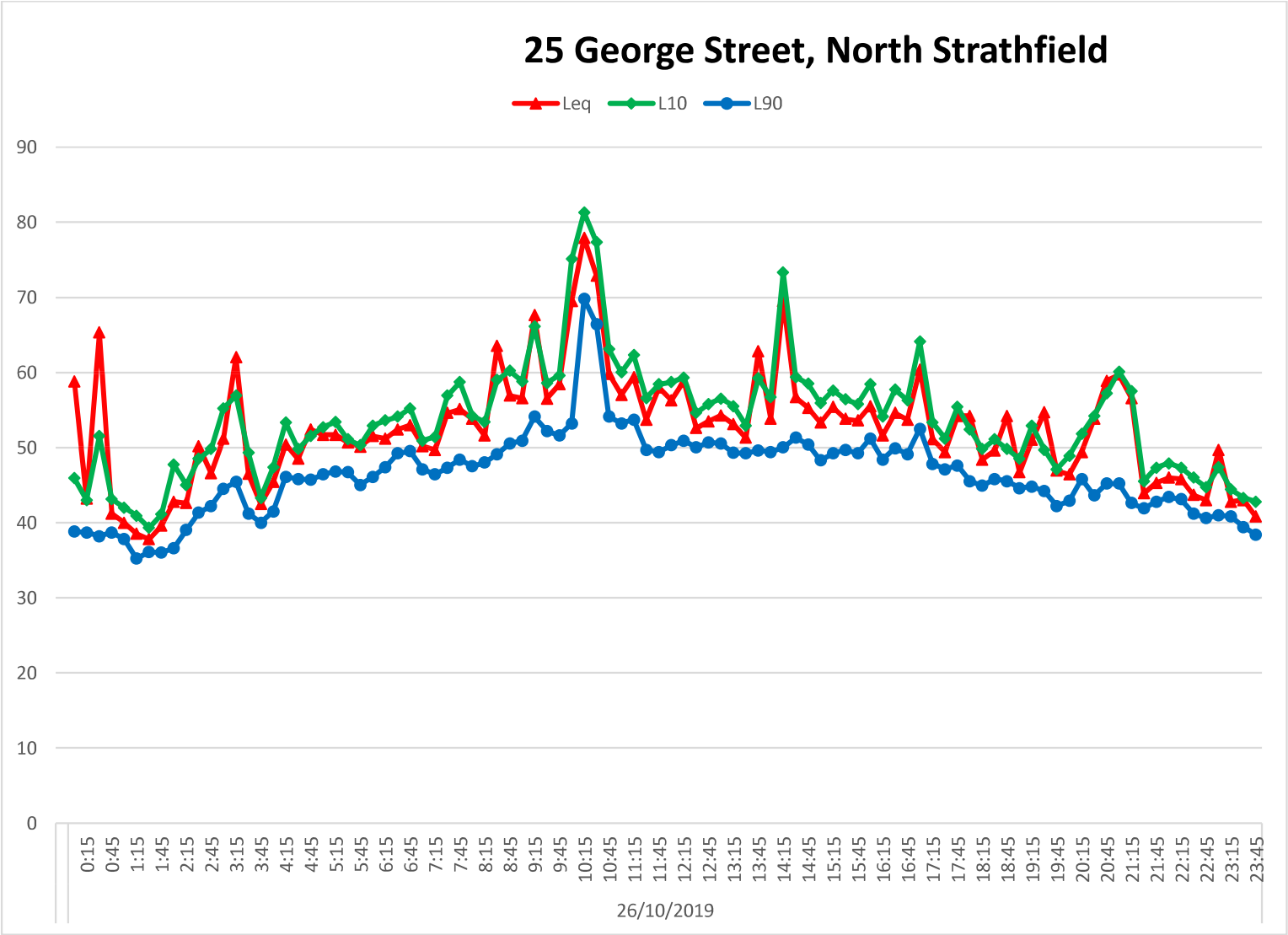
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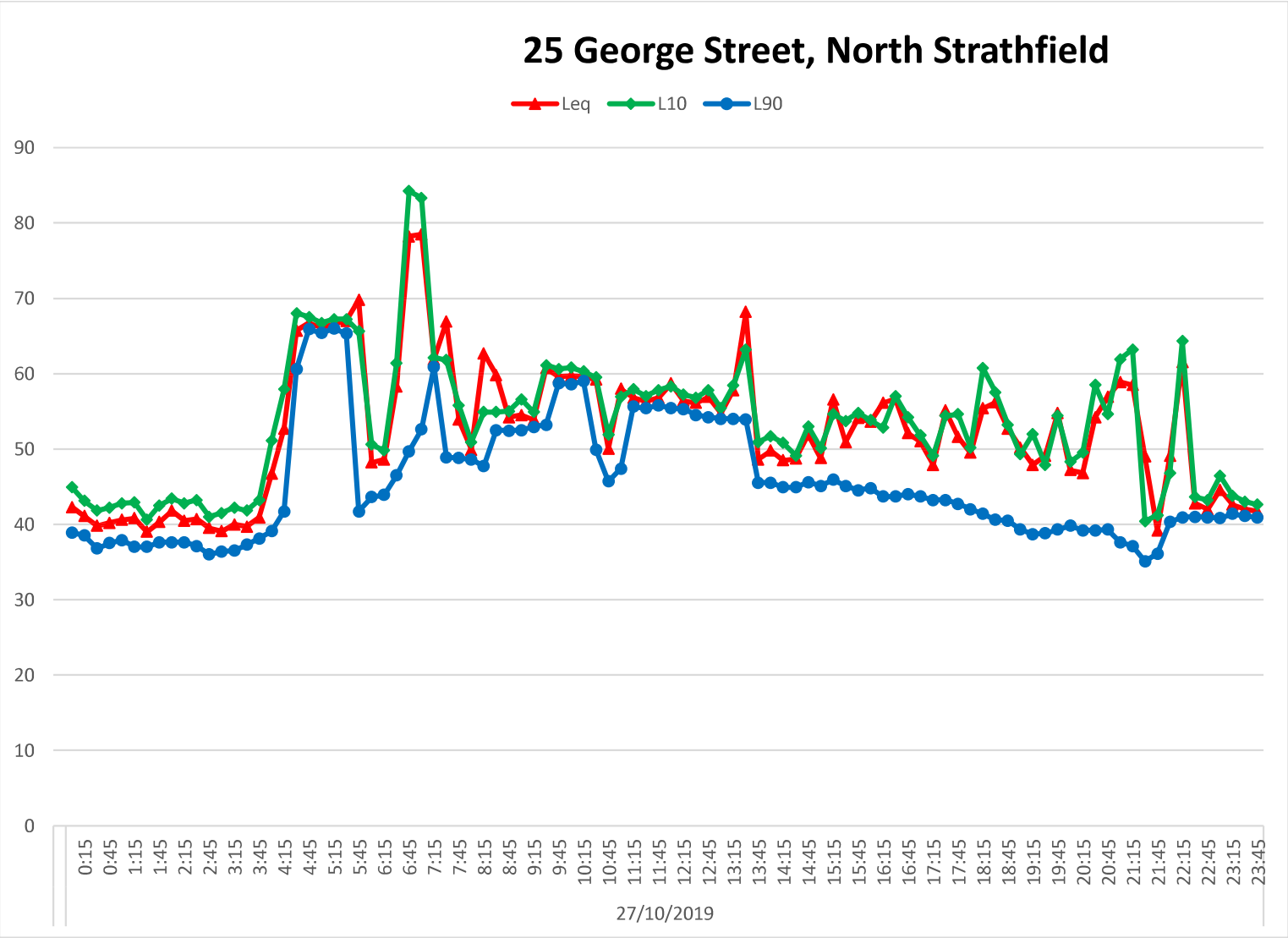
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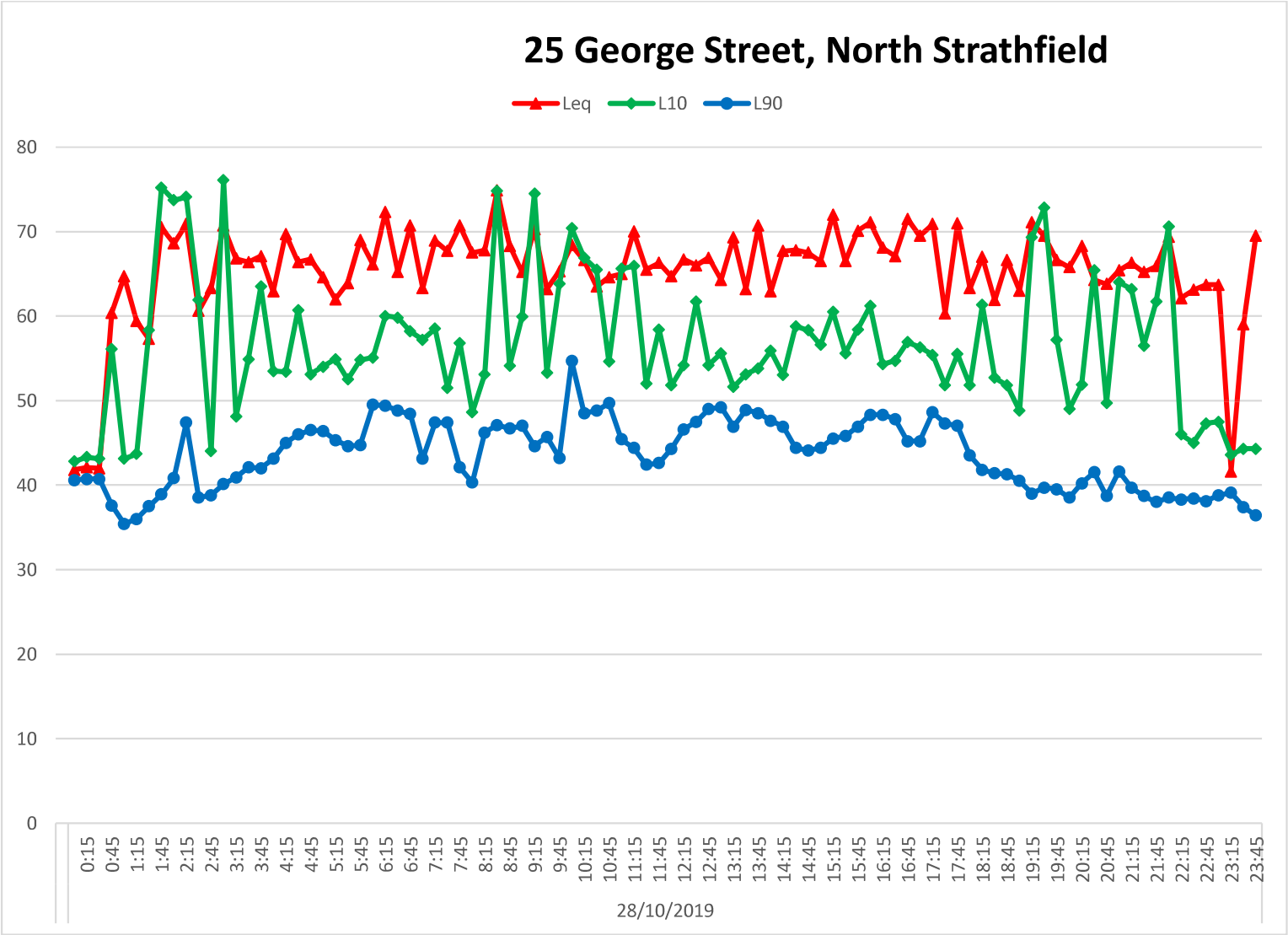
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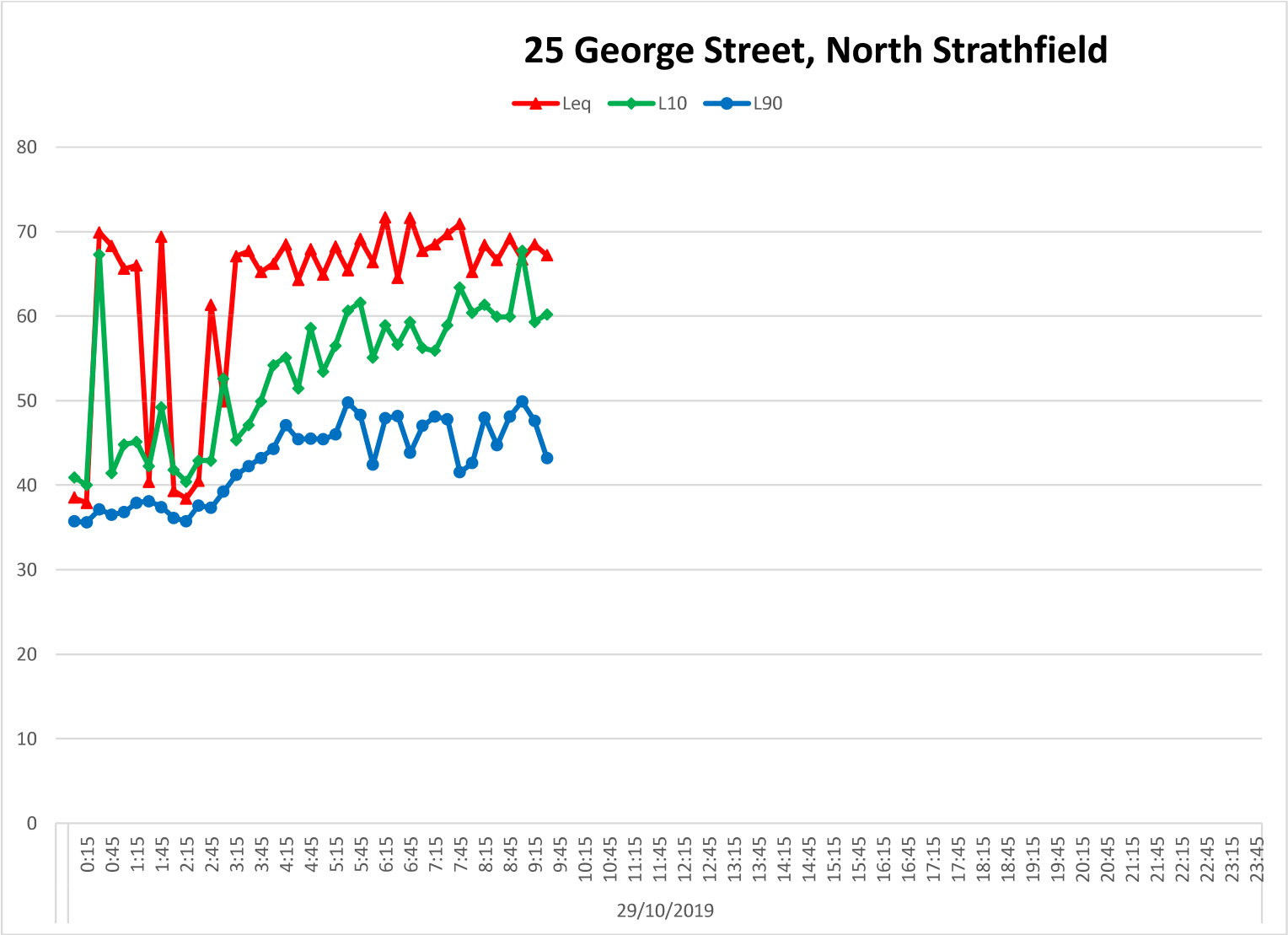
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11 July 2024

Re: Estimated Development Cost (EDC) for Affordable Housing Component (Not for Bank Use)
Project: 25 George Street, North Strathfield NSW 2137
Job Code: Q23B028

The purpose of this Cost Plan Letter is to provide an indicative Estimated Development Cost (EDC) of the Affordable Housing Units for the subject Residential Development at No. **25 George Street, North Strathfield NSW 2137.**

The proponent provided a summary of the Affordable Housing Units below:

Level	Bld Block Ref.	Old Apt No.
G	A.2	G07
1	A.1	102
1	B	114
1	C.1	118
2	A.1	202
2	C.1	220
3	A.1	302
3	C.1	320
3	C.2	328
4	NEW A.1	418
4	NEW A.1	420
4	NEW A.1	423
4	C.1	408
4	C.2	415
5	NEW A.1	518
5	NEW A.1	520
5	NEW A.1	523
6	NEW B	604
6	NEW C.1	609
6	NEW C.1	611
6	NEW C.2	616
6	NEW C.2	612
6	NEW C.2	614
6	NEW C.2	615

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www.constructionconsultants.net.au

Based on our review of the above, the indicative Estimated Development Cost (EDC) of the Affordable Housing Units is in the vicinity of **$9,120,000 excl. GST or $10,032,000 incl. GST.**

This QS Letter has been prepared for the sole purpose of providing cost advice in relation to the Affordable Housing component only. This Quantity Survey Letter is not to be used for any other purpose. The Writer does not accept any contractual, tortuous or other form of liability for any consequences, loss or damage which may arise as a result of any other person acting upon or using this Letter.

Letter and estimate prepared by

Michael M. Dakhoul *B. Build (Hons. 1) FAIQS CQS MAIB MCIOB ICECA*
FAIQS Reg. No. 3618

18 July 2024

Re: **Estimated Development Cost (EDC) for new Affordable Housing Component (Not for Bank Use)**
Project: **25 George Street, North Strathfield NSW 2137**
Job Code: **Q23B028**

The purpose of this Cost Plan Letter is to provide an indicative Estimated Development Cost (EDC) of the new Affordable Housing Units for the subject Residential Development at No. **25 George Street, North Strathfield NSW 2137.**

The proponent provided a summary of the new Affordable Housing Units below:

Level	Bld Block Ref.	Old Apt No.
4	NEW A.1	418
4	NEW A.1	420
4	NEW A.1	423
5	NEW A.1	518
5	NEW A.1	520
5	NEW A.1	523
6	NEW B	604
6	NEW C.1	609
6	NEW C.1	611
6	NEW C.2	616
6	NEW C.2	612
6	NEW C.2	614
6	NEW C.2	615

Based on our review of the above, the indicative Estimated Development Cost (EDC) of the new Affordable Housing Units is in the vicinity of **$5,072,600 excl. GST or $5,579,860 incl. GST.**

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This QS Letter has been prepared for the sole purpose of providing cost advice in relation to the new Affordable Housing component only. This Quantity Survey Letter is not to be used for any other purpose. The Writer does not accept any contractual, tortuous or other form of liability for any consequences, loss or damage which may arise as a result of any other person acting upon or using this Letter.

Letter and estimate prepared by

Michael M. Dakhoul *B. Build (Hons. 1) FAIQS CQS MAIB MCIOB ICECA*
FAIQS Reg. No. 3618