



DEVELOPMENT ASSESSMENT REPORT

Application No.	DA/2021/1281
Address	12 Railway Street PETERSHAM NSW 2049
Proposal	Alterations and additions to the existing dwelling, construction of swimming pool, landscaping and associated works.
Date of Lodgement	12 January 2022
Applicant	Design Delta Architects
Owner	Ms Tamara Talmacs
Number of Submissions	Ten (10)
Value of works	\$1,154,500.00
Reason for determination at Planning Panel	Number of submissions
Main Issues	Solar Access and Overshadowing; Tree Management
Recommendation	Approved with Conditions
Attachment A	Recommended conditions of consent
Attachment B	Plans of proposed development
Attachment C	Heritage Impact Statement
Attachment D	Arborist Report



LOCALITY MAP

Subject Site		Objectors		↑ N
Notified Area		Supporters		

Note: Single properties made multiple unique submissions. All objectors are shown on the map.

1. Executive Summary

This report is an assessment of the application submitted to Council for alterations and additions to the existing dwelling, construction of swimming pool, landscaping and associated works. at 12 Railway Street, Petersham.

The application was notified to surrounding properties and 10 submissions were received in response.

The main issues that have arisen from the application include:

- Solar Access and Overshadowing
- Tree Management

Despite the items noted above, the proposal generally complies with the aims, objectives, and design parameters contained in the relevant State Environmental Planning Policies, *Marrickville Local Environmental Plan 2011 (MLEP 2011)*, and Marrickville Development Control Plan 2011 (MDCP 2011).

The potential impacts to the surrounding environment have been considered as part of the assessment process. Any potential impacts from the development are considered to be reasonable.

The application is suitable for consent subject to the imposition of appropriate conditions.

2. Proposal

The proposal seeks development consent for alterations and additions to the existing dwelling, construction of swimming pool, landscaping and associated works.

The proposal in detail is as follows

- Demolition of the rear portion of the dwelling;
- Construction of a basement level including a cellar, storage, study, media room, and lightwell courtyard;
- Construction of a rear ground floor addition containing a new living/dining area and laundry;
- Construction of a rear first floor addition including 2 bedrooms, study and bathroom;
- Reinstatement of the first floor front verandah;
- Construction of an in-ground swimming pool at the rear of the site; and
- Associated landscaping and paving works.

3. Site Description

The subject site is located on the western side of Railway Street, between Queen Street and Fort Street. The site consists of one allotment and is generally rectangular in shape with a total area of 569sqm and is legally described as Lot 1 DP 113218.

The site supports an existing two storey detached dwelling. The surrounding properties are predominately one and two storeys residential dwellings.

The site is identified as a contributory building within the Railway Street (Petersham) Heritage Conservation Area (HCA) (HCA 4) under *MLEP 2011*.



Figure 1: Zoning Map of the subject site (R2 – Low Density Residential highlighted red).



Figure 2: Photo of the subject site (as viewed from Railway Street).

4. Background

4(a) Site history

The following application outlines the relevant development history of the subject site:

Application	Proposal	Decision & Date
PDA/2021/0131	Alterations and additions to existing dwelling	Issued 11/06/2021

4(b) Application history

The following table outlines the relevant history of the subject application.

Date	Interactions
12/01/2022	Application lodged.
01/2/2022 – 15/02/2022	Application notified.
06/05/2022	Request for information (RFI) letter issued to the applicant requiring the following amendments/information: <ul style="list-style-type: none"> • Design revisions to address heritage considerations; • Design revisions to address tree management; • Design revisions to address solar access and overshadowing; and • General documentation matters.
24/05/2022	Revised plans and additional information were submitted in response to the RFI letter. This information forms the basis of the assessment below. Renotification was not required in accordance with the Community Engagement Framework.

5. Assessment

The following is a summary of the assessment of the application in accordance with Section 4.15 of the *Environmental Planning and Assessment Act 1979*.

5(a) Environmental Planning Instruments

The application has been assessed against the relevant Environmental Planning Instruments listed below:

- *State Environmental Planning Policy (Resilience and Hazards) 2021*
- *State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004*

The following provides further discussion of the relevant issues:

5(a)(i) *State Environmental Planning Policy (Resilience and Hazards) 2021*

Chapter 4 Remediation of land

Section 4.16 (1) of the SEPP requires the consent authority not consent to the carrying out of any development on land unless:

“(a) it has considered whether the land is contaminated, and
 (b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and
 (c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.”

In considering the above, there is no evidence of contamination on the site.

There is also no indication of uses listed in Table 1 of the contaminated land planning guidelines within Council’s records. The land will be suitable for the proposed use as there is no indication of contamination.

5(a)(ii) State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004

A BASIX Certificate was submitted with the application and will be referenced in any consent granted.

5(a)(iii) Marrickville Local Environment Plan 2011 (MLEP 2011)

The application was assessed against the following relevant clauses of the *Marrickville Local Environment Plan 2011* in the table below:

Part 1 – Preliminary

Control	Proposed	Compliance
Clause 1.2 Aims of Plan	The proposal is consistent with the relevant aims of the plan as: <ul style="list-style-type: none"> The design of the proposal is considered to be of a high standard and has a satisfactory impact on the private and public domain; and, The proposal conserves the environmental heritage of Marrickville. 	Yes

Part 2 – Permitted of prohibited development

Zone	Proposed Use	Permitted with consent
Clause 2.3 R2 – Low Density Residential	The application proposes alterations and additions to an existing dwelling house , which is permissible with consent in the R2 Low Density Residential zone.	Yes

Clause 2.3 – Zone Objectives	The proposal is consistent with the relevant objectives of the zone, as it will assist to provide for the housing needs of the community within a low density residential environment.	Yes
Control	Proposed	Compliance
Clause 2.7 Demolition requires development consent	The proposal satisfies the clause as follows: <ul style="list-style-type: none"> • Demolition works are proposed, which are permissible with consent; and • Standard conditions are recommended to manage impacts which may arise during demolition. 	Yes, subject to condition

Part 4 – Principal development standards

Control	Proposed		Compliance
Clause 4.3 Height of building	Maximum	9.5m	Yes
	Proposed	6.2m	
Clause 4.4 Floor space ratio (FSR)	Maximum	0.6:1 or 341.4sqm	Yes
	Proposed	0.5:1 or 283.1sqm	
Clause 4.5 Calculation of FSR and site area	The site area and floor space ratio for the proposal has been calculated in accordance with the clause.		Yes

Part 5 – Miscellaneous provisions

Control	Proposed	Compliance
Clause 5.10 – Heritage conservation	<p>The subject site is a contributory building within the Railway Street (Petersham) HCA (HCA 4). The proposal achieves the objectives of this clause as follows:</p> <ul style="list-style-type: none"> • The development has been designed to respond to the significance of the conservation area and preserve contributory elements and fabric of the existing building. • The development will have limited visibility from the streetscape, however the addition is setback behind the original dwelling, 16.9m from the front boundary and is of a scale, form and materiality which does not dominate the original dwelling or the streetscape; and • A heritage statement was submitted with the application, which satisfactorily demonstrates that the proposal achieves the relevant controls and objectives. <p>Given the above, the development preserves the environmental heritage of the Inner West.</p>	Yes

Part 6 – Additional local provisions

Control	Proposed	Compliance
Clause 6.1 Acid sulfate soils	The site is not identified as containing acid sulfate soils. The proposal is considered to adequately satisfy this clause as the application does not propose any works that would result in any significant adverse impacts to the watertable.	Yes
Clause 6.2 Earthworks	The proposed earthworks are unlikely to have a detrimental impact on environmental functions and processes, existing drainage patterns, or soil stability.	Yes
Clause 6.5 Aircraft noise	The site is located within the ANEF 20-25 contour, and as such an Acoustic Report was submitted with the application. The proposal is capable of satisfying this clause as follows: <ul style="list-style-type: none"> A condition has been included in the development consent to ensure that the proposal will meet the relevant requirements of Table 3.3 (Indoor Design Sound Levels for Determination of Aircraft Noise Reduction) in AS 2021:2015, thereby ensuring the proposal's compliance with the relevant provisions Cl. 6.5 MLEP 2011 and Part 2.6 of the MDCP 2011, respectively. 	Yes, subject to condition

5(b) Draft Environmental Planning Instruments

The application has been assessed against the relevant Draft Environmental Planning Instruments listed below:

Draft Environmental Planning Instruments	Compliance
Draft State Environmental Planning Policy (Environment) 2018	Yes
Draft State Environmental Planning Policy (Remediation of Land) 2018	Yes
Draft State Environmental Planning Policy (Environment) 2017	Yes

5(c) Draft Inner West Local Environmental Plan 2020 (Draft IWLEP 2020)

The Draft IWLEP 2020 was placed on public exhibition commencing on 16 March 2020 and accordingly is a matter for consideration in the assessment of the application under *Section 4.15(1)(a)(ii) of the Environmental Planning and Assessment Act 1979*.

The development is considered acceptable having regard to the relevant provisions of the Draft IWLEP 2020.

5(d) Development Control Plans

The application has been assessed and the following provides a summary of the relevant provisions of MDCP 2011. The following provides discussion of the relevant issues:

Part 2 – Generic Provisions

Control	Proposed	Compliance
Part 2.1 – Urban Design	<p>The proposal satisfies the relevant provisions of this Part as follows:</p> <ul style="list-style-type: none"> • The proposal does not impact the definition between the public and private domain and is appropriate for the character of the locality given its form, massing, siting and detailing; and, • The proposal preserves the existing character of the streetscape, as the proposed additions will have limited visibility from the street and conserves the heritage significance of the original dwelling. 	Yes
Part 2.6 – Acoustic and Visual Privacy	<p>The proposal will have a satisfactory impact on visual and acoustic levels of the surrounds in accordance with Part 2.6 as follows:</p> <ul style="list-style-type: none"> • The principal living area and area of private open space is orientated to the rear of the site; • The glazing to the side elevations is limited. On the northern elevation a single first floor window which services a low use room is proposed; and to the southern elevation ground floor highlight windows and a door which services the laundry and a window which services the stairs is proposed which will be screened by an existing boundary fence; • The pool is located in the rear yard away from bedroom areas of the adjoining dwellings; • Conditions have been included to ensure that the noise levels associated with pool pumping unit will not result in adverse noise impacts for surrounding properties; and • The development maintains adequate levels of acoustic and visual privacy for the surrounding residential properties and ensures an adequate level of acoustic and visual privacy for future occupants of the development. 	Yes, subject to condition

<p>Part 2.7 – Solar Access and Overshadowing</p>	<p>The proposal will have a satisfactory impact in terms of solar access and overshadowing on the surrounds in accordance with Part 2.7 as follows:</p> <p><i>Overshadowing</i> The proposal is considered acceptable with respect to the relevant provisions of Part 2.7. Refer to discussion below.</p> <p><i>Solar Access</i></p> <ul style="list-style-type: none"> • At least one habitable room of the dwelling has a window having an area not less than 15% of the floor area of the room, positioned within 30 degrees east and 20 degrees west of true north and will allow for direct sunlight for at least two hours over a minimum of 50% of the glazed surface between 9:00am and 3:00pm on 21 June; and • The private open space provided for the dwelling house receives a minimum two hours of direct sunlight over 50% of its finished surface between 9.00am and 3.00pm on 21 June. 	<p>Acceptable. Refer to discussion below.</p>
<p>Part 2.9 – Community Safety</p>	<p>The proposal satisfies the relevant provisions of Part 2.9 as the dwelling entrance remains identifiable and visible from the street.</p>	<p>Yes</p>
<p>Part 2.10 – Parking</p>	<p>One car parking space is maintained.</p>	<p>Yes</p>
<p>Part 2.18 – Landscaping and Open Spaces</p> <p><u>Private Open Space (POS)</u> <i>Required: 113.8sqm (20%)</i></p> <p><u>Pervious Landscaping</u> <i>Required: 50% of POS</i></p>	<p>The proposal satisfies the relevant provisions of Part 2.18 as follows:</p> <ul style="list-style-type: none"> • The entire front setback is to consist of pervious landscaping with the exception of the pathway; • The Landscape Plan identifies that 247.8sqm, with no dimension being less than 3 metres is to be retained as POS; and <ul style="list-style-type: none"> • In excess of 50% of the POS is to be maintained as pervious landscaping. 	<p>Yes</p>
<p>Part 2.20 – Tree Management</p>	<p>The proposal is considered acceptable with respect to the relevant provisions of Part 2.20. Refer to discussion below.</p>	<p>Acceptable. Refer to discussion below.</p>
<p>Part 2.21 – Site Facilities and Waste Management</p>	<p>The proposal satisfies the relevant provisions of Part 2.21 as follows:</p> <ul style="list-style-type: none"> • The application was accompanied by a waste management plan in accordance with the Part; and • Standard conditions are recommended to ensure the appropriate management of waste during the construction of the proposal. 	<p>Yes, subject to conditions</p>

Part 2.25 – Stormwater Management	Standard conditions are recommended to ensure the appropriate management of stormwater.	Yes, subject to conditions
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Part 2.7 – Solar Access and Overshadowing

Overshadowing

The properties at 28 Fort Street (no. 28), 30 Fort Street (no. 30), 14 Railway Street (no. 14) are to the south of the subject site and the proposal will have a degree of impact on the solar access currently enjoyed by them. The revised shadow diagrams submitted with the application demonstrates that no. 28 retains 2 hours of solar access to 50% of their area of Private Open Space (POS) between 11am and 1pm, with no change to solar access proposed to any windows which service the principal living areas on 21 June. However, the revised shadow diagrams demonstrate that there is an existing non-compliance to principal areas of POS at the rear of no 30 and no. 14 between 9:00am and 3:00pm on 21 June. The proposed development would result in an additional loss of solar access to the area of POS; at no. 30 between 10am and 2pm; and no. 14 at 10am on 21 June. It is noted that there is no change to the non-compliant solar access to the principal living areas of no 14, which is primarily attributed to the orientation of the site and existing floor plan.

Where a development proposal results in a decrease in sunlight available on 21 June resulting in less than two hours of solar access for the adjoining property, the proposal may be considered on its merit with regard to the criteria of points a to d in Control 2 contained in Part 2.7 of MDCP 2011. The planning principle regarding access to sunlight as developed in the case law *Benevolent Society v Waverley Council [2010] NSWLEC 1082* is also used as a tool to interpret the following control.

C2(ii) of Part 2.7.3 of MDCP 2011 states:

If the development proposal results in a further decrease in sunlight available on 21 June, Council will consider:

a. The development potential of the site;

The development potential of the site prescribed by the development standards under the *MLEP 2011* is a maximum 9.5 metre height limit and 0.6:1 FSR. In addition, the subject site is zoned R2 Low Density Residential under *MLEP 2011*, which permits mainly low-density residential development.

The following is noted with respect to this matter:

- The development readily complies with the 9.5m height development standard under the *MLEP 2011*, as a maximum height of 6.2m is proposed;
- The development complies with the 0.6:1 (341.4sqm) FSR development standard under the *MLEP 2011*, as a maximum FSR of 0.5:1 (283.1sqm) is proposed;

- The proposed retains the **dwelling house** use, which is a form of low density, residential development permissible within the site's R2 Low Density Residential zone under *MLEP 2011*;
- The first-floor addition is massed centrally on the site with compliant southern side setbacks of 1545mm for the first floor; and
- The ground floor rear addition includes a skillion roof form which is orientated north to south, and is set back 1370mm.

Based on the above, it is considered the development is within its development potential and has not maximised or exceeded its potential.

b. The particular circumstances of the neighbouring site(s), for example, the proximity of any residential accommodation to the boundary, the resultant proximity of windows to the boundary, and whether this makes compliance difficult;

With respect to the above, the following circumstances are noted:

- The east-west orientation of the subject and no. 14, along with the narrow allotment widths of the adjoining properties and density of existing development within the locality contribute to existing solar access non-compliance.

c. Any exceptional circumstances of the subject site such as heritage, built form or topography; and

With respect to the above, the following circumstances of 12 Railway Street are noted:

- The site is a contributory building within the Railway Street HCA and the location, size and massing of the proposed development is considered a balanced design solution which minimises overshadowing whilst protecting the original built form.

d. Whether the sunlight available in March to September is significantly reduced, such that it impacts upon the functioning of principal living areas and the principal areas of open space. To ensure compliance with this control, separate shadow diagrams for the March/September period must be submitted.

Shadow diagrams in plan form for the equinox were submitted to demonstrate the development's impact during this time. Based on an assessment of these diagrams, the following is evident:

- The proposal retains a minimum of 2 hours direct solar access to principal areas of POS at the rear of the adjoining properties at no 30 and no. 14 between 9:00am and 3:00pm during the equinox.

In assessment of the above and solar access principles, it is considered that the impacts are reasonable and that the proposal satisfies the objectives of Part 2.7 of MDCP 2011.

Part 2.20 – Tree Management

Part 2.20 of MDCP 2011 contains the objectives and controls relating to tree management and protection during development.

The application seeks the retention of all trees within the site and on adjoining properties. However, the proposed works are located in close proximity to tree 4 (Aralia) within the subject sites rear yard to the south; and tree 6 (Lemon Scented Gum) and tree 7 (Chinese Elm) located on the adjoining property 10 Railway Street to the north.

Further information was requested by Council to demonstrate via root mapping that the required excavation for the proposed paved area to the rear and excavation for the basement can be undertaken without having a major impact to any adjoining trees. In addition, it was identified on site that existing pavers have been dislodged likely as a result of roots being very close to existing ground level.

The applicant has chosen not to undertake any further investigations and therefore it is unknown if any woody tree roots may be impacted as a result of this proposal. Instead, the applicant has responded by a design revision to amend the Finished Paved Level and Finished Floor Level from RL 41.35 to RL 41.49 to provide further protection to the trees. The design revision alone is not conclusive that the trees will be protected from the proposed development.

Given the above, arborist supervision for all works within the tree's Structural Root Zone and Tree Protection Zone will be required to ensure no roots greater than 30mm in diameter are severed during works. It is noted that if larger roots are to be encountered, the design will likely need to be modified as the severing of larger roots may have adverse impacts on the structural stability or long term health of any trees.

Overall, subject to the imposition of conditions, which have been included in the recommendation of this report, the proposal is considered acceptable with regard to Part 2.20 of MDCP 2011

Part 4 – Low Density Residential Development

Control	Assessment	Compliance
Part 4.1.4 – Good Urban Design Practice	The height, bulk and scale of the development complement existing developments in the street and the architectural style of the proposal is in keeping with the character of the area.	Yes
Part 4.1.5 – Streetscape and Design	The proposal satisfies the relevant provisions of this Part as the changes proposed to the existing front façade to reconstruct the original first floor verandah, complements the existing streetscape, and the proposed addition will have limited visibility from the existing streetscape. .	Yes

<p>Part 4.1.6 – Built form and character</p> <p><u>Front setback</u></p> <ul style="list-style-type: none"> • <i>Consistent with adjoining developments</i> <p><u>Side setbacks</u></p> <ul style="list-style-type: none"> • <i>One storey – 900mm</i> • <i>Two storeys – 1500m</i> <p><u>Rear setback</u></p> <ul style="list-style-type: none"> • <i>On merit</i> <p><u>Site coverage</u></p> <ul style="list-style-type: none"> • <i>45% (500 – 700sqm)</i> 	<p>The proposal is considered acceptable with respect to the relevant provisions of Part 4.1.6 as follows:</p> <ul style="list-style-type: none"> • The existing front setbacks of the dwelling is to remain unaltered by the proposal; • The development proposes compliant side setbacks; • The proposed rear setback is considered appropriate, as they will not create adverse impacts on adjoining properties in terms of visual bulk, overshadowing or privacy; and • The development proposes a compliant site coverage of 28% (164sqm) of the site. 	<p>Yes</p>
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Part 8 – Heritage

Control	Assessment	Compliance
<p>Part 8.1.1 – Objectives</p>	<p>The proposal will be consistent within the objectives in Part 8.1.1 of the MDCP 2011 in that:</p> <ul style="list-style-type: none"> • The proposal will protect a building which is of value to the community; and • The proposal will complement the surrounding HCA. 	<p>Yes</p>
<p>Part 8.3.2.3 – Building setbacks</p>	<p>The proposal complies with the relevant control in Part 8.3.2.3 as follows:</p> <ul style="list-style-type: none"> • The original building front and side setbacks are to be retained by the proposal; and • Whilst the new addition projects laterally, this is considered acceptable as it is adequately set back 16.9m from the street and subservient to the original dwelling. 	<p>Yes</p>
<p>Part 8.3.2.4 – Building heights</p>	<p>The proposal will comply with the relevant control in Part 8.3.2.4 as follows:</p> <ul style="list-style-type: none"> • The new addition is no higher than the existing roof form and does not overwhelm the existing built form. 	<p>Yes</p>

Part 8.3.2.5 – Building form	The proposal will comply with the relevant control in Part 8.3.2.5 as follows: <ul style="list-style-type: none"> The proposed addition to the dwelling has limited visibility from the main street frontage and does not dominate or detract from the overall form and massing of the building. 	Yes
Part 8.3.2.6 – Roof form	The proposal will comply with the relevant control in Part 8.3.2.5 as follows: <ul style="list-style-type: none"> The development maintains the original roof form to the entirety of the main roof. The development maintains existing chimneys. 	Yes
Part 8.3.2.7 – Building facades	The proposal complies with the relevant control in Part 8.3.2.7 as follows: <ul style="list-style-type: none"> The original scale and proportion of the street façade is retained and reinstated. 	Yes
Part 8.3.2.8 – Verandahs and porches	The proposal complies with the relevant control in Part 8.3.2.8 as follows: <ul style="list-style-type: none"> The first floor verandah of the dwelling is proposed to be reinstated based on historical evidence. 	Yes
Part 8.3.2.10 – Façade materials	The proposal complies with the relevant control in Part 8.3.2.10 as follows: <ul style="list-style-type: none"> The original materials to the front portion of the dwelling are maintained. The new additions to the rear exhibit materials that are compatible with the conservation area. The new windows to the rear of the property have limited visibility and will be screened by timber cladding. 	Yes

Part 9 – Strategic Context

Control	Assessment	Compliance
Part 9.17 – Petersham North (Precinct 2)	The proposal satisfies the relevant provisions of Part 9.2 as follows: <ul style="list-style-type: none"> The proposal protects the existing contributory dwelling on the site; and The proposal retains the original built form including roof forms, original detailing and finishes.. 	Yes

5(e) The Likely Impacts

The assessment of the Development Application demonstrates that, subject to the recommended conditions, the proposal will have minimal impact in the locality.

5(f) The suitability of the site for the development

Provided that any adverse effects on adjoining properties are minimised, this site is considered suitable to accommodate the proposed development, and this has been demonstrated in the assessment of the application.

5(g) Any submissions

The application was notified in accordance with the Community Engagement Framework for a period of 14 days to surrounding properties. Ten (10) submissions were received in response to the notification.

The following issues raised in submissions have been discussed in this report:

- Solar access & overshadowing; and
- Tree protection .

In addition to the above issues, the submissions raised the following concerns which are discussed under the respective headings below:

Issue: Excavation of unknown material

Comment: These comments are noted, however it is considered that the proposed development can reasonably be constructed without any adverse impacts to neighbouring properties subject to appropriate construction methods which will be addressed as part of the Construction Certificate.

Issue: Noise and vibration from excavation

Comment: These comments are noted. Standard conditions regarding construction hours and noise levels, are recommended in any development consent granted to mitigate any significant impacts.

Issue: Tree 6 (Lemon Scented Gem) not accurately represented

Comment: These comments are noted. It is considered through the information submitted and a site inspection, that a sufficient assessment against the relevant planning controls/policies was able to be carried out.

Issue: Loss of on street parking during construction

Comment: These comments are noted and these inconveniences are temporary and parking arrangements can be discussed with the principal certifier during construction.

Issue: Size of basement inconsistently represented

Comment: These comments are noted, however there is expected to be discrepancies between GFA calculations and overall structures footprint.

Issue: Air-conditioning not shown on plans

Comment: These comments are noted. Additional information was submitted clarifying that air conditioning is not proposed as part of this DA. However, air-conditioning may be pursued as exempt development under State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

5(h) The Public Interest

The public interest is best served by the consistent application of the requirements of the relevant Environmental Planning Instruments, and by Council ensuring that any adverse effects on the surrounding area and the environment are appropriately managed.

The proposal is not contrary to the public interest.

6 Referrals

6(a) Internal

The application was referred to the following internal officers/sections whose comments have been taken into consideration in the assessment of the proposed development:

- Heritage Officer
- Urban Forest Officer
- Development Engineer

7. Section 7.12 Levy

Section 7.12 levies are payable for the proposal.

The carrying out of the development would result in an increased demand for public amenities and public services within the area. A contribution of \$11,545 would be required for the development under Marrickville Section 94/94A Contributions Plan 2014. A condition requiring that contribution to be paid is included in the recommendation.

8. Conclusion

The proposal generally complies with the aims, objectives and design parameters contained in the relevant State Environmental Planning Policies (SEPPs), *MLEP 2011* and *MDCP 2011*, respectively.

The development will not result in any significant impacts on the amenity of the adjoining properties and the streetscape and is considered to be in the public interest.

The application is considered suitable for approval subject to the imposition of appropriate conditions.

9. Recommendation

- A. That the Inner West Local Planning Panel exercising the functions of the Council as the consent authority, pursuant to s4.16 of the *Environmental Planning and Assessment Act 1979*, grant consent to Development Application No. DA/2021/1281 for alterations and additions to the existing dwelling, construction of swimming pool, landscaping and associated works. at 12 Railway Street, Petersham subject to the conditions listed in Attachment A below.

Attachment A – Recommended conditions of consent

CONDITIONS OF CONSENT

DOCUMENTS RELATED TO THE CONSENT

1. Documents related to the consent

The development must be carried out in accordance with plans and documents listed below:

Plan, Revision and Issue No.	Plan Name	Date Issued	Prepared by
dwg no. A01 rev B	Site Plan	24/05/2022	Design Delta Architects
dwg no. A05 rev B	Demolition - ground floor	24/05/2022	Design Delta Architects
dwg no. A06 rev A	Demolition - first floor	28/11/2021	Design Delta Architects
dwg no. A07 rev A	Demolition - roof floor	28/11/2021	Design Delta Architects
dwg no. A10 rev A	Basement plan	28/11/2021	Design Delta Architects
dwg no. A11 rev B	Ground floor plan	24/05/2022	Design Delta Architects
dwg no. A12 rev A	First floor plan	28/11/2021	Design Delta Architects
dwg no. A13 rev A	Roof plan	28/11/2021	Design Delta Architects
dwg no. A14 rev A	Pool detail	24/05/2022	Design Delta Architects
dwg no. A20 rev A	North elevation	28/11/2021	Design Delta Architects

dwg no. A21 rev B	South elevation	24/05/2022	Design Delta Architects
dwg no. A22 rev B	East and west elevation	24/05/2022	Design Delta Architects
dwg no. A23 rev B	Section - long	24/05/2022	Design Delta Architects
dwg no. A24 rev C	Section - cross	15/06/2022	Design Delta Architects
dwg no. A30 rev A	External finishes schedule	28/11/2021	Design Delta Architects
A430753_02	BASIX	18/11/2021	Design Delta Architects
-	Arboricultural Impact Assessment	01/12/2021	Urban Arbor

Security Deposit:	\$2,254.00
Inspection Fee:	\$241.50

Payment will be accepted in the form of cash, bank cheque, EFTPOS/credit card (to a maximum of \$10,000) or bank guarantee. Bank Guarantees must not have an expiry date.

The inspection fee is required for the Council to determine the condition of the adjacent road reserve and footpath prior to and on completion of the works being carried out.

Should any of Council's property and/or the physical environment sustain damage during the course of the demolition or construction works, or if the works put Council's assets or the environment at risk, or if any road, footpath or drainage works required by this consent are not completed satisfactorily, Council may carry out any works necessary to repair the damage, remove the risk or complete the works. Council may utilise part or all of the security deposit to restore any damages, and Council may recover, in any court of competent jurisdiction, any costs to Council for such restorations.

A request for release of the security may be made to the Council after all construction work has been completed and a final Occupation Certificate issued.

The amount nominated is only current for the financial year in which the initial consent was issued and is revised each financial year. The amount payable must be consistent with Council's Fees and Charges in force at the date of payment.

3. Section 7.12 (formerly section 94A) Development Contribution Payments

Prior to the issue of a Construction Certificate, written evidence must be provided to the Certifying Authority that a monetary contribution to the Inner West Council has been paid, towards the provision of infrastructure, required to address increased demand for local services generated by additional development within the Local Government Area (LGA). This condition is imposed in accordance with Section 7.12 of the *Environmental Planning and Assessment Act 1979* and in accordance with *Marrickville Section 94/94A Contributions Plan 2014*.

Note: Copies of these contribution plans can be inspected at any of the Inner West Council Service Centres or viewed online at <https://www.innerwest.nsw.gov.au/develop/planning-controls/section-94-contributions>

Payment amount*:\$11,545

*Indexing of the Section 7.12 contribution payment:

The contribution amount to be paid to the Council is to be adjusted at the time of the actual payment in accordance with the provisions of the relevant contributions plan. In this regard, you are recommended to make contact with Inner West Council *prior to arranging your payment method* to confirm the correct current payment amount (at the expected time of payment).

Payment methods:

The required contribution must be paid either *by BPAY (to a maximum of \$500,000); unendorsed bank cheque (from an Australian Bank only); EFTPOS (Debit only); credit card (Note: A 1% credit card transaction fee applies to all credit card transactions; cash (to a maximum of \$10,000)*. It should be noted that personal cheques or bank guarantees cannot be accepted for the payment of these contributions. **Prior to payment contact Council's Planning Team to review charges to current indexed quarter, please allow a minimum of 2 business days for the invoice to be issued before payment can be accepted.**

4. Long Service Levy

Prior to the issue of a Construction Certificate, written evidence must be provided to the Certifying Authority that the long service levy in accordance with Section 34 of the *Building and Construction Industry Long Service Payments Act 1986* has been paid at the prescribed rate of 0.35% of the total cost of the work to either the Long Service Payments Corporation or Council for any work costing \$25,000 or more.

GENERAL CONDITIONS

5. Boundary Alignment Levels

Alignment levels for the site at all pedestrian and vehicular access locations must match the existing back of footpath levels at the boundary.

6. Noise Levels and Enclosure of Pool/spa Pumping Units

Noise levels associated with the operation of the pool/spa pumping units must not exceed the background noise level (L90) by more than 5dBA above the ambient background within habitable rooms of adjoining properties. Pool plant and equipment must be enclosed in a sound absorbing enclosure or installed within a building so as not to create an offensive noise as defined under the *Protection of the Environment Operations Act 1997* and *Protection of the Environment Operations (Noise Control) Regulation 2008*.

Domestic pool pumps and filters must not be audible in nearby dwellings between 8:00pm to 7:00am Monday to Saturday and 8:00pm to 8:00am Sundays and Public Holidays.

7. Waste Management Plan

Prior to the commencement of any works (including any demolition works), the Certifying Authority is required to be provided with a Recycling and Waste Management Plan (RWMP) in accordance with the relevant Development Control Plan.

8. Erosion and Sediment Control

Prior to the issue of a commencement of any works (including any demolition works), the Certifying Authority must be provided with an erosion and sediment control plan and specification. Sediment control devices must be installed and maintained in proper working order to prevent sediment discharge from the construction site.

9. Works Outside the Property Boundary

This development consent does not authorise works outside the property boundaries on adjoining lands.

10. Tree Protection

No trees on public property (footpaths, roads, reserves etc.) are to be removed or damaged during works unless specifically approved in this consent or marked on the approved plans for removal.

Prescribed trees protected by Council's Management Controls on the subject property and/or any vegetation on surrounding properties must not be damaged or removed during works unless specific approval has been provided under this consent.

Any public tree within five (5) metres of the development must be protected in accordance with Council's *Development Fact Sheet—Trees on Development Sites*.

No activities, storage or disposal of materials taking place beneath the canopy of any tree (including trees on neighbouring sites) protected under Council's Tree Management Controls at any time.

The trees identified below are to be retained (site trees) and protected (site trees and trees on adjacent sites) in accordance with the conditions of consent or approved Tree Protection Plan throughout the development (note: tree numbers must correspond with approved Tree Protection Plan if conditioned) :

Tree 1 - *Phoenix canariensis* (Canary Island Date Palm) - Front

Tree 2 - *Howea forsteriana* (Kentia Palm) - Front

Tree 4 - *Aralia species* (Aralia) - Boundary 12/14 Railway Street

Tree 5 - *Jacaranda mimosifolia* (Jacaranda) - Rear

Tree 6 - *Corymbia citriodora* (Lemon Scented Gum) - 10 Railway Street

Tree 7 - *Ulmus parvifolia* (Chinese Elm) - 10 Railway Street

Tree 8 - *Persea americana* (Avocado) - Adjacent site at rear

Tree 9 - *Livistona australis* (Cabbage Palm) - 14 Railway Street

Details of the trees must be included on all Construction Certificate plans and shall be annotated in the following way:

- a. Green for trees to be retained;
- b. Red for trees to be removed;
- c. Blue for trees to be pruned;

NOTE: Reference should be made to the Arboricultural Impact Assessment Report prepared by Urban Arbor dated 1 December 2021 for tree numbering and locations.

11. Project Arborist

Prior to the commencement of any demolition or construction works within close proximity to protected trees a Project Arborist (AQF Level 5) must be engaged for the duration of the site preparation, demolition, construction and landscaping to supervise works. Details of the Project Arborist must be submitted to the Certifying Authority before work commences.

12. Works to Trees

Approval is given for the following works to be undertaken to trees on the site after the issuing of a Construction Certificate:

Tree/location	Approved works
Tree 3 - <i>Howea forsteriana</i> (Kentia Palm)	Removal

Removal or pruning of any other tree (that would require consent of Council) on the site is not approved and shall be retained and protected in accordance with Council's *Development Fact Sheet—Trees on Development Sites*.

PRIOR TO ANY DEMOLITION

13. Hoardings

The person acting on this consent must ensure the site is secured with temporary fencing prior to any works commencing.

If the work involves the erection or demolition of a building and is likely to cause pedestrian or vehicular traffic on public roads or Council controlled lands to be obstructed or rendered inconvenient, or building involves the enclosure of public property, a hoarding or fence must

be erected between the work site and the public property. An awning is to be erected, sufficient to prevent any substance from, or in connection with, the work falling onto public property.

Separate approval is required from the Council under the *Roads Act 1993* to erect a hoarding or temporary fence or awning on public property.

14. Dilapidation Report

Prior to any works commencing (including demolition), the Certifying Authority and owners of identified properties, must be provided with a colour copy of a dilapidation report prepared by a suitably qualified person. The report is required to include colour photographs of all the adjoining properties to the Certifying Authority's satisfaction. In the event that the consent of the adjoining property owner cannot be obtained to undertake the report, copies of the letter/s that have been sent via registered mail and any responses received must be forwarded to the Certifying Authority before work commences.

15. Advising Neighbours Prior to Excavation

At least 7 days before excavating below the level of the base of the footings of a building on an adjoining allotment of land, give notice of intention to do so to the owner of the adjoining allotment of land and furnish particulars of the excavation to the owner of the building being erected or demolished.

16. Construction Fencing

Prior to the commencement of any works (including demolition), the site must be enclosed with suitable fencing to prohibit unauthorised access. The fencing must be erected as a barrier between the public place and any neighbouring property.

PRIOR TO CONSTRUCTION CERTIFICATE

17. Dilapidation Report – Pre-Development – Minor

Prior to the issue of a Construction Certificate or any demolition, the Certifying Authority must be provided with a dilapidation report including colour photos showing the existing condition of the footpath and roadway adjacent to the site.

18. Stormwater Drainage System – Minor Developments

Prior to the issue of a Construction Certificate, the Certifying Authority must be provided with stormwater drainage design plans certified by a suitably qualified Civil Engineer that the design of the site drainage system complies with the following specific requirements:

- a. Stormwater runoff from all roof areas within the property being collected in a system of gutters, pits and pipeline and be discharged, together with overflow pipelines from any rainwater tank(s), by gravity to the kerb and gutter of a public road;
- b. Comply with Council's Stormwater Drainage Code, Australian Rainfall and Runoff (A.R.R.), Australian Standard AS3500.3-2018 'Stormwater Drainage' and Council's DCP;
- c. Pipe and channel drainage systems must be designed to cater for the twenty (20) year Average Recurrence Interval (ARI) storm in the case of low and medium residential developments, the twenty (20) year ARI Storm in the case of high-density residential development and commercial and/or industrial developments and the fifty (50) year ARI Storm in the case of heavy industry. In all cases, the major event surface flow paths must be designed to cater for the one hundred (100) year ARI Storm;
- d. Charged or pump-out stormwater drainage systems are not permitted including for roof drainage other than to drain downpipes to the rainwater tank(s);
- e. To provide for adequate site drainage all roof and surface stormwater from the site and any catchment external to the site that presently drains to it, must be collected in a system of pits and pipelines/channels and major storm event surface flow paths and being discharged to a stormwater drainage system in accordance with the requirements of Council's DCP. Please note any stormwater outlets through sandstone kerbs must be carefully core drilled;
- f. The design plans must detail the existing and proposed site drainage layout, size, class and grade of pipelines, pit types, roof gutter and downpipe sizes;
- g. An overland flowpath must be provided within the setback to the southern side boundary between the rear of the dwelling and the railway Street frontage. The rear courtyard must be graded so that bypass flows from the site drainage system are directed to the overland flowpath.
- h. The stormwater system must not be influenced by backwater effects or hydraulically controlled by the receiving system;
- i. A minimum 150mm step up shall be provided between all external finished surfaces and adjacent internal floor areas;
- j. The design must make provision for the natural flow of stormwater runoff from uphill/upstream properties/lands;
- k. No nuisance or concentration of flows to other properties;
- l. The design plans must specify that any components of the existing system to be retained must be certified during construction to be in good condition and of adequate capacity to convey the additional runoff generated by the development and be replaced or upgraded if required;
- m. An inspection opening or stormwater pit must be installed inside the property, adjacent to the boundary, for all stormwater outlets;
- n. Only a single point of discharge is permitted to the kerb and gutter, per frontage of the site;
- o. New pipelines within the footpath area that are to discharge to the kerb and gutter must be hot dipped galvanised steel hollow section with a minimum wall thickness of 4.0mm

- and a maximum section height and width of 100mm or sewer grade uPVC pipe with a maximum diameter of 100mm;
- p. All stormwater outlets through sandstone kerbs must be carefully core drilled in accordance with Council standard drawings;
 - q. All redundant pipelines within footpath area must be removed and footpath/kerb reinstated;
 - r. Stormwater drainage must be located such that any waters leaving the pool must drain to pervious areas prior to potentially draining to the site stormwater drainage system.

19. Structural Certificate for retained elements of the building

Prior to the issue of a Construction Certificate, the Certifying Authority is required to be provided with a Structural Certificate prepared by a practising structural engineer, certifying the structural adequacy of the property and its ability to withstand the proposed additional, or altered structural loads during all stages of construction. The certificate must also include all details of the methodology to be employed in construction phases to achieve the above requirements without result in demolition of elements marked on the approved plans for retention.

20. Sydney Water – Tap In

Prior to the issue of a Construction Certificate, the Certifying Authority is required to ensure approval has been granted through Sydney Water's online 'Tap In' program to determine whether the development will affect Sydney Water's sewer and water mains, stormwater drains and/or easements, and if further requirements need to be met.

Note: Please refer to the web site <http://www.sydneywater.com.au/tapin/index.htm> for details on the process or telephone 13 20 92

21. Acoustic Report – Aircraft Noise

Prior to the issue of a Construction Certificate, the Certifying Authority must be provided with amended plans detailing the recommendations of an acoustic report prepared by a suitably qualified Acoustic Engineer demonstrating compliance of the development with the relevant provisions of Australian Standard AS 2021:2015 Acoustics – Aircraft noise intrusion – Building siting and construction.

22. Tree Protection Plan

Prior to the issue of a Construction Certificate, the Certifying Authority must be provided with a detailed site-specific Tree Protection Plan (TPP) prepared by a AQF5 Consultant Arborist. The TPP is to be prepared in accordance with Council's *Development Fact Sheet—Trees on Development Sites* and must show all stockpile and wash down areas clear of the protection zones.

The trees identified below are to be retained and protected throughout the development:

Tree 1 - *Phoenix canariensis* (Canary Island Date Palm) - Front
Tree 2 - *Howea forsteriana* (Kentia Palm) - Front
Tree 4 - *Aralia species* (Aralia) - Boundary 12/14 Railway Street
Tree 5 - *Jacaranda mimosifolia* (Jacaranda) - Rear
Tree 6 - *Corymbia citriodora* (Lemon Scented Gum) - 10 Railway Street
Tree 7 - *Ulmus parvifolia* (Chinese Elm) - 10 Railway Street
Tree 8 - *Persea americana* (Avocado) - Adjacent site at rear
Tree 9 - *Livistona australis* (Cabbage Palm) - 14 Railway Street
The tree protection measures contained in the TPP must be shown clearly on the Construction Certificate drawings, including the Construction Management Plan.

The Certifying Authority must ensure the construction plans and specifications submitted fully satisfy the tree protection requirements identified in the TPP.

A Project Arborist is to be appointed prior to any works commencing to monitor tree protection for the duration of works in accordance with the requirements identified in the TPP.

All tree protection measures as detailed in the approved Tree Protection Plan must be installed and certified in writing as fit for purpose by the Project Arborist.

23. Paving/Decking Within the Vicinity of Trees

Prior to the issue of the Construction Certificate, the Certifying Authority must be provided with detailed plans demonstrating that the pavement works within the specified radius of the trunks of the following trees are constructed in a way so as to ensure that existing moisture infiltration and gaseous exchange are maintained or improved. When preparing an area for paving with the specified radius, the soil surface must not be skimmed or excavated. The new surface and subgrade must be established at grade.

Tree 1 - *Phoenix canariensis* (Canary Island Date Palm) - Front - 3m
Tree 2 - *Howea forsteriana* (Kentia Palm) - Front - 2m
Tree 4 - *Aralia species* (Aralia) - Boundary 12/14 Railway Street - 5m
Tree 6 - *Corymbia citriodora* (Lemon Scented Gum) - 10 Railway Street - 7m
Tree 7 - *Ulmus parvifolia* (Chinese Elm) - 10 Railway Street - 6m
Tree 9 - *Livistona australis* (Cabbage Palm) - 14 Railway Street - 3m

DURING DEMOLITION AND CONSTRUCTION

24. Construction Hours – Class 1 and 10

Unless otherwise approved by Council, excavation, demolition, construction or subdivision work are only permitted between the hours of 7:00am to 5.00pm, Mondays to Saturdays (inclusive) with no works permitted on, Sundays or Public Holidays.

25. Survey Prior to Footings

Upon excavation of the footings and before the pouring of the concrete, the Certifying Authority must be provided with a certificate of survey from a registered land surveyor to verify that the structure will not encroach over the allotment boundaries.

26. Inspections by Project Arborist

The trees to be retained must be inspected, monitored and treated by the Project Arborist during and after completion of development works to ensure their long-term survival. Regular inspections and documentation from the Project Arborist to the Certifying Authority are required at the following times or phases of work:

Tree No./ Botanical/ Common Name/ Location	Time of Inspection	Key stage/ Hold point
Tree 1 - <i>Phoenix canariensis</i> (Canary Island Date Palm) - Front Tree 2 - <i>Howea forsteriana</i> (Kentia Palm) - Front Tree 4 - <i>Aralia species</i> (Aralia) - Boundary 12/14 Railway Street	Prior to commencement of works	<ul style="list-style-type: none"> • Inspection and sign off installation of tree protection measures.
Tree 5 - <i>Jacaranda mimosifolia</i> (Jacaranda) - Rear Tree 6 - <i>Corymbia citriodora</i> (Lemon Scented Gum) - 10 Railway Street Tree 7 - <i>Ulmus parvifolia</i> (Chinese Elm) - 10 Railway Street Tree 8 - <i>Persea americana</i> (Avocado) - Adjacent site at rear Tree 9 - <i>Livistona australis</i> (Cabbage Palm) - 14 Railway Street	During Works	<ul style="list-style-type: none"> • Supervise all site preparation and demolition works within the TPZ; • Supervise all works inside or above the TPZ; • Supervise all excavation,

		<p>trenching works, landscaping works and tree/planting replenishment within the TPZ;</p> <ul style="list-style-type: none"> • Supervise all tree work including root (<30mm) pruning and canopy pruning if required.
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Recommendations to ensure the tree/s long term survival must be carried out immediately upon receipt of the report.

27. Canopy and Root Pruning

Canopy pruning of the following trees which is necessary to accommodate the approved building works must be undertaken by a qualified Arborist and supervised by, the Project Arborist.

Tree 4 - *Aralia species* (Aralia) - Boundary 12/14 Railway Street

Tree 6 - *Corymbia citriodora* (Lemon Scented Gum) - 10 Railway Street

Tree 7 - *Ulmus parvifolia* (Chinese Elm) - 10 Railway Street

Pruning is limited to selective pruning to a 3 metre clearance of the existing roofline or building facade.

28. Limited Root Pruning

No tree roots of 30mm or greater in diameter located within the specified radius of the trunks of the following tree/ may be severed or injured in the process of any works (including stormwater or other service line installation) during the construction period:

Tree 4 - *Aralia species* (Aralia) - Boundary 12/14 Railway Street - 5m

Tree 5 - *Jacaranda mimosifolia* (Jacaranda) - Rear - 6m

Tree 6 - *Corymbia citriodora* (Lemon Scented Gum) - 10 Railway Street - 7m

Tree 7 - *Ulmus parvifolia* (Chinese Elm) - 10 Railway Street - 6m

Along the building excavation alignment closest to the trees (Trees 4, 6 and 7) within specified radius of the trunk the excavation must first be undertaken by tree root sensitive measures such as hand digging or pneumatic or hydraulic tools only (e.g. *Airspade*® or hydro excavation) to a depth of one (1) metre under direct supervision of the Project Arborist. Excavation by machinery can proceed if tree roots greater than 30mm in diameter are not encountered. If tree roots less than 30mm diameter are required to be severed for the purposes of constructing the approved works, they must be cut cleanly using a sharp and *fit for purpose tool*. The pruning must be undertaken by a practicing Arborist.

PRIOR TO OCCUPATION CERTIFICATE

29. No Encroachments

Prior to the issue of an Occupation Certificate, the Principal Certifier must ensure that any encroachments on to Council road or footpath resulting from the building works have been removed, including opening doors, gates and garage doors with the exception of any awnings or balconies approved by Council.

30. Protect Sandstone Kerb

Prior to the issue of an Occupation Certificate, the Principal Certifier must ensure that any stone kerb, damaged as a consequence of the work that is the subject of this development consent, has been replaced.

31. Aircraft Noise –Alterations and Additions

Prior to the issue of an Occupation Certificate (whether an interim or final Occupation Certificate), the Principal Certifier must be provided with a report from a suitably qualified person demonstrating that each of the commitments listed in Aircraft Noise Assessment Report required by this consent has been satisfied.

Where it is found that internal noise levels are greater than the required dB(A) rating due to faulty workmanship or the like, necessary corrective measures must be carried out and a further certificate being prepared and submitted to the Principal Certifier in accordance with this condition.

32. Project Arborist Certification

Prior to the issue of any Occupation Certificate, the Principal Certifier is to be provided with certification from the project arborist the requirements of the conditions of consent related to the landscape plan and the role of the project arborist have been complied with.

ADVISORY NOTES

Permits

Where it is proposed to occupy or carry out works on public roads or Council controlled lands, the person acting on this consent must obtain all applicable Permits from Council in accordance with Section 68 (Approvals) of the *Local Government Act 1993* and/or Section 138 of the *Roads Act 1993*. Permits are required for the following activities:

- a. Work zone (designated parking for construction vehicles). Note that a minimum of 2 months should be allowed for the processing of a Work Zone application;
- b. A concrete pump across the roadway/footpath;
- c. Mobile crane or any standing plant;
- d. Skip Bins;
- e. Scaffolding/Hoardings (fencing on public land);
- f. Public domain works including vehicle crossing, kerb & guttering, footpath, stormwater, etc.;
- g. Awning or street veranda over the footpath;
- h. Partial or full road closure; and
- i. Installation or replacement of private stormwater drain, utility service or water supply.

If required contact Council's Road Access team to ensure the correct Permit applications are made for the various activities. Applications for such Permits must be submitted and approved by Council prior to the commencement of the works associated with such activity.

Insurances

Any person acting on this consent or any contractors carrying out works on public roads or Council controlled lands is required to take out Public Liability Insurance with a minimum cover of twenty (20) million dollars in relation to the occupation of, and approved works within those lands. The Policy is to note, and provide protection for Inner West Council, as an interested party and a copy of the Policy must be submitted to Council prior to commencement of the

works. The Policy must be valid for the entire period that the works are being undertaken on public property.

Prescribed Conditions

This consent is subject to the prescribed conditions of consent within clause 98-98E of the *Environmental Planning and Assessment Regulations 2021*.

Notification of commencement of works

At least 7 days before any demolition work commences:

- a. The Council must be notified of the following particulars:
 - i. the name, address, telephone contact details and licence number of the person responsible for carrying out the work; and
 - ii. the date the work is due to commence and the expected completion date; and
- b. A written notice must be placed in the letter box of each directly adjoining property identified advising of the date the work is due to commence.

Storage of Materials on public property

The placing of any materials on Council's footpath or roadway is prohibited, without the prior consent of Council.

Toilet Facilities

The following facilities must be provided on the site:

- a. Toilet facilities in accordance with WorkCover NSW requirements, at a ratio of one toilet per every 20 employees; and
- b. A garbage receptacle for food scraps and papers, with a tight fitting lid.

Facilities must be located so that they will not cause a nuisance.

Infrastructure

The developer must liaise with the Sydney Water Corporation, Ausgrid, AGL and Telstra concerning the provision of water and sewerage, electricity, natural gas and telephones respectively to the property. Any adjustment or augmentation of any public utility services including Gas, Water, Sewer, Electricity, Street lighting and Telecommunications required as a result of the development must be undertaken before occupation of the site.

Other Approvals may be needed

Approvals under other acts and regulations may be required to carry out the development. It is the responsibility of property owners to ensure that they comply with all relevant legislation. Council takes no responsibility for informing applicants of any separate approvals required.

Failure to comply with conditions

Failure to comply with the relevant provisions of *the Environmental Planning and Assessment Act 1979* and/or the conditions of this consent may result in the serving of penalty notices or legal action.

Other works

Works or activities other than those approved by this Development Consent will require the submission of a new Development Application or an application to modify the consent under Section 4.55 of the *Environmental Planning and Assessment Act 1979*.

Obtaining Relevant Certification

This development consent does not remove the need to obtain any other statutory consent or approval necessary under any other Act, such as (if necessary):

- a. Application for any activity under that Act, including any erection of a hoarding;
- b. Application for a Construction Certificate under the *Environmental Planning and Assessment Act 1979*;
- c. Application for an Occupation Certificate under the *Environmental Planning and Assessment Act 1979*;
- d. Application for a Subdivision Certificate under the *Environmental Planning and Assessment Act 1979* if land (including stratum) subdivision of the development site is proposed;
- e. Application for Strata Title Subdivision if strata title subdivision of the development is proposed;
- f. Development Application for demolition if demolition is not approved by this consent;
or
- g. Development Application for subdivision if consent for subdivision is not granted by this consent.

National Construction Code (Building Code of Australia)

A complete assessment of the application under the provisions of the National Construction Code (Building Code of Australia) has not been carried out. All building works approved by this consent must be carried out in accordance with the requirements of the National Construction Code.

Notification of commencement of works

Residential building work within the meaning of the *Home Building Act 1989* must not be carried out unless the PCA (not being the council) has given the Council written notice of the following information:

- a. In the case of work for which a principal contractor is required to be appointed:
 - i. The name and licence number of the principal contractor; and
 - ii. The name of the insurer by which the work is insured under Part 6 of that Act.

- b. In the case of work to be done by an owner-builder:
 - i. The name of the owner-builder; and
 - ii. If the owner-builder is required to hold an owner-builder permit under that Act, the number of the owner-builder permit.

Dividing Fences Act

The person acting on this consent must comply with the requirements of the *Dividing Fences Act 1991* in respect to the alterations and additions to the boundary fences.

Swimming Pools

Applicants are advised of the following requirements under the *Swimming Pools Act 1992*:

- a. The owner of the premises is required to register the swimming pool on the NSW State Government's Swimming Pool Register. Evidence of registration should be provided to the Certifying Authority.
- b. Access to the pool/spa is restricted by a child resistant barrier in accordance with the regulations prescribed in the. The pool must not be filled with water or be allowed to collect stormwater until the child resistant barrier is installed. The barrier is to conform to the requirements of Australian Standard AS 1926:2012.
- c. A high level overflow pipe has been provided from the back of the skimmer box to the filter backwash line discharging to the sewer. This line must not directly vent the receiving Sydney Water sewer. Evidence from the installer, indicating compliance with this condition must be submitted to the Principal Certifier prior to the issue of an Occupation Certificate.
- d. Permanently fixed water depth markers are to be clearly and prominently displayed on the internal surface above the water line at the deep and shallow ends on in-ground pools / spas and on the outside of aboveground pools / spas.
- e. A durable cardiopulmonary resuscitation information poster sign authorised by the Life Saving Association is to be displayed in the pool / spa area in accordance with Clause 10 of the *Swimming Pool Regulation 2008*.
- f. Access to the swimming pool/spa must be restricted by fencing or other measures as required by the *Swimming Pools Act 1992* at all times.

All drainage, including any overland waters associated with the pool/spa, must be pipe-drained via the filter to the nearest sewer system in accordance with the requirements of Council & Sydney Water. No drainage, including overflow from the pool or spa must enter Council's stormwater system.

Noise

Noise arising from the works must be controlled in accordance with the requirements of the *Protection of the Environment Operations Act 1997*.

Amenity Impacts General

The use of the premises must not give rise to an environmental health nuisance to the adjoining or nearby premises and environment. There are to be no emissions or discharges from the premises, which will give rise to a public nuisance or result in an offence under the *Protection of the Environment Operations Act 1997* and Regulations. The use of the premises and the operation of plant and equipment must not give rise to the transmission of a vibration nuisance or damage other premises.

Construction of Vehicular Crossing

The vehicular crossing and/or footpath works are required to be constructed by your own contractor. You or your contractor must complete an application for *Construction of a Vehicular Crossing & Civil Works* form, lodge a bond for the works, pay the appropriate fees and provide evidence of adequate public liability insurance, prior to commencement of works.

Lead-based Paint

Buildings built or painted prior to the 1970's may have surfaces coated with lead-based paints. Recent evidence indicates that lead is harmful to people at levels previously thought safe. Children particularly have been found to be susceptible to lead poisoning and cases of acute child lead poisonings in Sydney have been attributed to home renovation activities involving the removal of lead based paints. Precautions should therefore be taken if painted surfaces are to be removed or sanded as part of the proposed building alterations, particularly where children or pregnant women may be exposed, and work areas should be thoroughly cleaned prior to occupation of the room or building.

Dial before you dig

Contact "Dial Prior to You Dig" prior to commencing any building activity on the site.

Useful Contacts

BASIX Information	1300 650 908 weekdays 2:00pm - 5:00pm www.basix.nsw.gov.au
Department of Fair Trading	13 32 20 www.fairtrading.nsw.gov.au Enquiries relating to Owner Builder Permits and Home Warranty Insurance.
Dial Prior to You Dig	1100 www.dialpriortoyoudig.com.au
Landcom	9841 8660 To purchase copies of Volume One of "Soils and Construction"
Long Service Payments Corporation	131441 www.lspc.nsw.gov.au
NSW Food Authority	1300 552 406 www.foodnotify.nsw.gov.au
NSW Government	www.nsw.gov.au/fibro www.diysafe.nsw.gov.au Information on asbestos and safe work practices.
NSW Office of Environment and Heritage	131 555 www.environment.nsw.gov.au
Sydney Water	13 20 92 www.sydneywater.com.au

Waste Service - SITA 1300 651 116
Environmental Solutions www.wasteservice.nsw.gov.au

Water Efficiency Labelling and Standards (WELS) www.waterrating.gov.au

WorkCover Authority of NSW 13 10 50
www.workcover.nsw.gov.au

Enquiries relating to work safety and asbestos removal and disposal.

Consent of Adjoining property owners

This consent does not authorise the applicant, or the contractor engaged to do the tree works to enter a neighbouring property. Where access to adjacent land is required to carry out approved tree works, Council advises that the owner's consent must be sought. Notification is the responsibility of the person acting on the consent. Should the tree owner/s refuse access to their land, the person acting on the consent must meet the requirements of the *Access To Neighbouring Lands Act 2000* to seek access.

Arborists standards

All tree work must be undertaken by a practicing Arborist. The work must be undertaken in accordance with AS4373—*Pruning of amenity trees* and the Safe Work Australia Code of Practice—*Guide to Managing Risks of Tree Trimming and Removal Work*. Any works in the vicinity of the Low Voltage Overhead Network (including service lines—pole to house connections) must be undertaken by an approved Network Service Provider contractor for the management of vegetation conflicting with such services. Contact the relevant Network Service Provider for further advice in this regard.

Tree Protection Works

All tree protection for the site must be undertaken in accordance with Council's *Development Fact Sheet—Trees on Development Sites* and AS4970—*Protection of trees on development sites*.

REASONS FOR REFUSAL

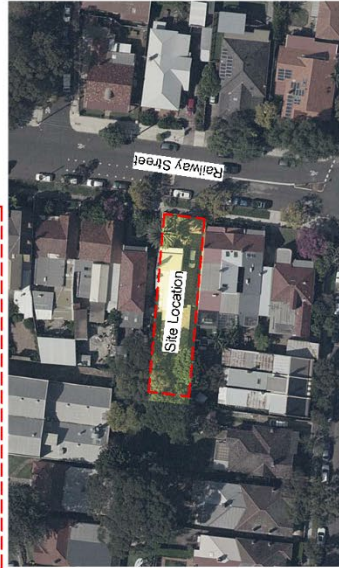
Attachment B – Plans of proposed development

DEVELOPMENT APPLICATION

ALTERATIONS AND ADDITIONS TO FAMILY HOME
12 RAILWAY STREET, PETERSHAM
DRAWING REGISTER

- A01 SITE PLAN
- A02 GFA DIAGRAMS
- A03 BASIX
- A04 SEDIMENTATION CONTROL PLAN
- A05 DEMOLITION - GROUND FLOOR
- A06 DEMOLITION - FIRST FLOOR
- A07 DEMOLITION - ROOF PLAN
- A10 BASEMENT PLAN
- A11 GROUND FLOOR PLAN
- A12 FIRST FLOOR PLAN
- A13 ROOF PLAN
- A14 POOL DETAIL
- A20 NORTH ELEVATION
- A21 SOUTH ELEVATION
- A22 EAST AND WEST ELEVATIONS
- A23 SECTION - LONG
- A24 SECTION - CROSS
- A30 EXTERNAL FINISHES SCHEDULE
- A50 SHADOW DIAGRAMS (PLAN) 9AM
- A51 SHADOW DIAGRAM (PLAN) 10AM
- A52 SHADOW DIAGRAMS (PLAN) 11AM
- A53 SHADOW DIAGRAMS (PLAN) 12PM
- A54 SHADOW DIAGRAMS (PLAN) 1PM
- A55 SHADOW DIAGRAMS (PLAN) 2PM
- A56 SHADOW DIAGRAMS (PLAN) - 3PM
- A57 3D SHADOW DIAGRAMS 9AM - 11AM
- A58 3D SHADOW DIAGRAMS 12PM - 2PM
- A59 3D SHADOW DIAGRAMS 3PM

NEW SHEETS
OUTLINED

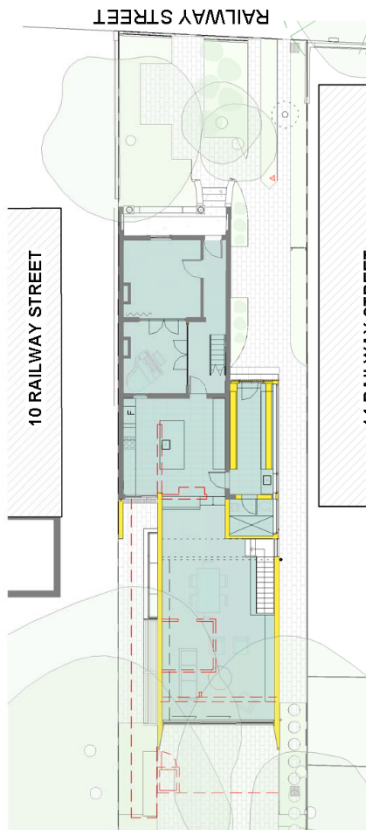


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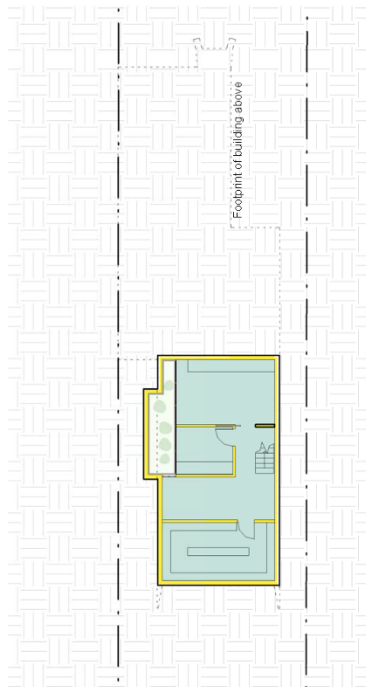
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Australia
admin@designdelta.com.au
www.designdelta.com.au



Document Set ID: 36470686
Version: 1, Version Date: 19/06/2022

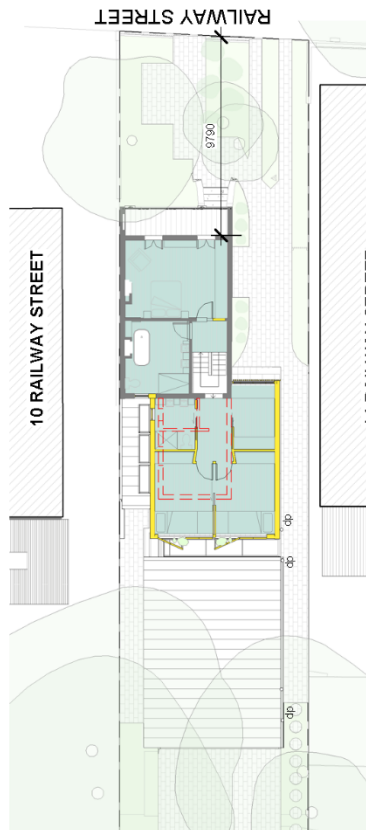


Ground GFA



Basement GFA

GFA CALCULATIONS			
SITE AREA	599sqm	EXISTING	PROPOSED
DCP PERMISSIBLE	174.96sqm	267.05sqm	568.66sqm
GFA	3.28.00sqm	0sqm	134.32sqm
		Basement	76.13sqm
		Ground Floor	58.19sqm
		First Floor	0sqm



First Floor GFA

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				PROJECT NO	1707	SCALE	1 : 200	ISSUE	DEVELOPMENT APPLICATION - RFI	REVISION	B				

0 1 2 3 4 5 6
1m

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Document prepared by: **DESIGN DELTA ARCHITECTS** AND CONFIRMED ON SITE PRIOR TO COMMENCEMENT OF ANY WORK (INCLUDING SHOP DRAWINGS). FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALED READINGS.
Version: 1, Version Date: 18/05/2022

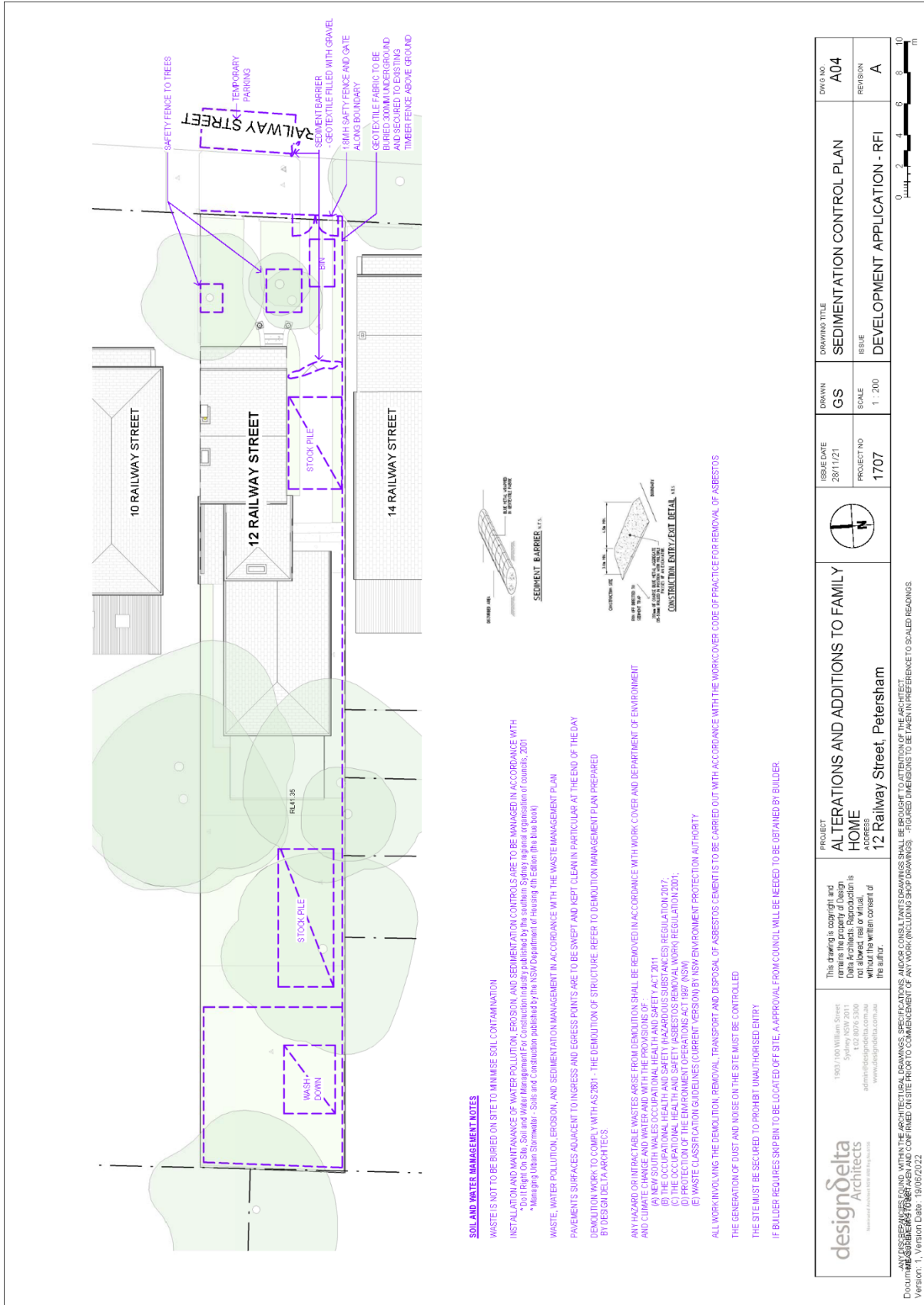
Pool and Spa	Show on DA Plans	Show on CC/DC Plans & Specs	Classifier Check																					
<p>Rainwater tank</p> <p>The applicant must install a rainwater tank of at least 15,000 litres on the site. The rainwater tank must meet, and be installed in accordance with, the requirements of all applicable regulatory authorities.</p> <p>The applicant must configure the rainwater tank to collect rainwater runoff from at least 68 square metres of roof area.</p> <p>The applicant must connect the rainwater tank to a tap located within 10 metres of the edge of the pool.</p> <p>Outdoor swimming pool</p> <p>The swimming pool must be outdoors.</p> <p>The swimming pool must not have a capacity greater than 45 kilolitres.</p> <p>The applicant must install a pool pump/liner for the swimming pool.</p> <p>The applicant must not incorporate any heating system for the swimming pool that is part of this development.</p>	✓	✓	✓																					
<p>Fixtures and systems</p> <p>The applicant must ensure a minimum of 40% of new or altered light fixtures are fitted with fluorescent, compact fluorescent, or light-emitting diode (LED) lamps.</p> <p>Lighting</p> <p>The applicant must ensure new or altered showerheads have a flow rate no greater than 9 litres per minute or a 3 star water rating.</p> <p>The applicant must ensure new or altered toilets have a flow rate no greater than 4 litres per average flush or a minimum 3 star water rating.</p> <p>The applicant must ensure new or altered taps have a flow rate no greater than 9 litres per minute or minimum 3 star water rating.</p>	✓	✓	✓																					
<p>Construction</p> <p>The applicant must construct the new or altered construction (floor(s), walls, and ceilings/roofs) in accordance with the specifications listed in the table below, except that a) additional insulation is not required where the area of new construction is less than 2m²; b) insulation specified is not required for parts of altered construction where insulation already exists.</p> <table border="1"> <thead> <tr> <th>Construction</th> <th>Additional insulation required (R-value)</th> <th>Other specifications</th> </tr> </thead> <tbody> <tr> <td>floor above existing dwelling or building</td> <td>nil</td> <td></td> </tr> <tr> <td>external wall: cavity brick</td> <td>nil</td> <td></td> </tr> <tr> <td>external wall: external insulated facade system (EIFS) (facade panel: 200 mm)</td> <td>nil</td> <td></td> </tr> <tr> <td>external wall: framed (weatherboard, fibro, metal clad)</td> <td>R1.30 (or R1.70 including construction)</td> <td></td> </tr> <tr> <td>raked ceiling, fibred/insulation roof: framed</td> <td>ceiling: R1.75 (up), roof: foil/sarking</td> <td>light (solar absorptance < 0.475)</td> </tr> <tr> <td>flat ceiling, flat roof: framed</td> <td>ceiling: R1.82 (up), roof: foil/sarking</td> <td>light (solar absorptance < 0.475)</td> </tr> </tbody> </table>	Construction	Additional insulation required (R-value)	Other specifications	floor above existing dwelling or building	nil		external wall: cavity brick	nil		external wall: external insulated facade system (EIFS) (facade panel: 200 mm)	nil		external wall: framed (weatherboard, fibro, metal clad)	R1.30 (or R1.70 including construction)		raked ceiling, fibred/insulation roof: framed	ceiling: R1.75 (up), roof: foil/sarking	light (solar absorptance < 0.475)	flat ceiling, flat roof: framed	ceiling: R1.82 (up), roof: foil/sarking	light (solar absorptance < 0.475)	✓	✓	✓
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Glazing requirements	Show on DA Plans	Show on CC/DC Plans & Specs	Classifier Check																																																																																											
<p>Windows and glazed doors</p> <p>The applicant must install the windows, glazed doors and shading devices, in accordance with the specifications listed in the table below. Relevant overshadowing specifications must be satisfied for each window and glazed door.</p> <p>The following requirements must also be satisfied in relation to each window and glazed door:</p> <p>Each window or glazed door with standard aluminium or timber frames and single glazing may either match the description, or have a U-value and Solar Heat Gain Coefficient (SHGC) no greater than that listed in the table below. Total system U-values and SHGCs must be calculated in accordance with National Fenestration Rating Council (NFRC) conditions.</p> <p>Each window or glazed door with improved frames, or polyvinyl chloride (PVC) or clear/air gap/clear glazing, or low-emissivity (low-e) glazing must have a U-value and a Solar Heat Gain Coefficient (SHGC) no greater than that listed in the table below. Total system U-values and SHGCs must be calculated in accordance with National Fenestration Rating Council (NFRC) conditions. The description is provided for information only. Alternative systems with competing U-value and SHGC may be substituted.</p> <p>For projections described in millimetres, the leading edge of each eave, pergola, verandah, balcony or awning must be no more than 500 mm above the head of the window or glazed door and no more than 240 mm above the sill.</p> <p>For projections described as a ratio, the ratio of the projection from the wall to the height above the window or glazed door sill must be at least that shown in the table below.</p> <p>Pergolas with polycarbonate roof or similar translucent material must have a shading coefficient of less than 0.35.</p> <p>External louvres and blinds must fully shade the window or glazed door beside which they are situated when fully drawn or closed. Pergolas with fixed balustrades must have balustrades parallel to the window or glazed door above which they are situated, unless the pergola also shades a perpendicular window. The spacing between balustrades must not be more than 50 mm.</p> <p>Overshadowing buildings or vegetation must be of the height and distance from the centre and the base of the window and glazed door, as specified in the 'overshadowing' column in the table below.</p> <p>Windows and glazed doors glazing requirements</p> <table border="1"> <thead> <tr> <th>Window/door no.</th> <th>Orientation</th> <th>Area of glazing (m²)</th> <th>Height (m)</th> <th>Distance (m)</th> <th>Shading device</th> <th>Frame and glass type</th> </tr> </thead> <tbody> <tr> <td>W01</td> <td>E</td> <td>5.5</td> <td>0</td> <td>0</td> <td>external louvre/blind (fixed)</td> <td>standard aluminium, single clear, (or U-value: 7.63, SHGC: 0.75)</td> </tr> <tr> <td>W02</td> <td>S</td> <td>2.3</td> <td>0</td> <td>0</td> <td>none</td> <td>standard aluminium, single clear, (or U-value: 7.63, SHGC: 0.75)</td> </tr> <tr> <td>W03</td> <td>S</td> <td>0.7</td> <td>0</td> <td>0</td> <td>none</td> <td>standard aluminium, single clear, (or U-value: 7.63, SHGC: 0.75)</td> </tr> <tr> <td>W04</td> <td>S</td> <td>2</td> <td>0</td> <td>0</td> <td>none</td> <td>standard aluminium, single clear, (or U-value: 7.63, SHGC: 0.75)</td> </tr> <tr> <td>W05</td> <td>W</td> <td>11.6</td> <td>0</td> <td>0</td> <td>eave/verandah/pergola/balcony >=100 mm</td> <td>standard aluminium, single clear, (or U-value: 7.63, SHGC: 0.75)</td> </tr> <tr> <td>W06</td> <td>W</td> <td>3.9</td> <td>0</td> <td>0</td> <td>eave/verandah/pergola/balcony >=100 mm</td> <td>standard aluminium, single clear, (or U-value: 7.63, SHGC: 0.75)</td> </tr> <tr> <td>W07</td> <td>N</td> <td>4.4</td> <td>1.8</td> <td>1.9</td> <td>projection/height above sill ratio >=0.23</td> <td>standard aluminium, clear/air gap/clear, (U-value: 5.34, SHGC: 0.67)</td> </tr> <tr> <td>W08</td> <td>N</td> <td>9</td> <td>0</td> <td>0</td> <td>eave/verandah/pergola/balcony >=150 mm</td> <td>standard aluminium, single clear, (or U-value: 7.63, SHGC: 0.75)</td> </tr> <tr> <td>W09</td> <td>E</td> <td>6</td> <td>0</td> <td>0</td> <td>external louvre/blind (fixed)</td> <td>standard aluminium, single clear, (or U-value: 7.63, SHGC: 0.75)</td> </tr> <tr> <td>W10</td> <td>W</td> <td>4.6</td> <td>0</td> <td>0</td> <td>external louvre/blind (fixed)</td> <td>standard aluminium, single clear, (or U-value: 7.63, SHGC: 0.75)</td> </tr> <tr> <td>W11</td> <td>W</td> <td>4.6</td> <td>0</td> <td>0</td> <td>external louvre/blind (fixed)</td> <td>standard aluminium, single clear, (or U-value: 7.63, SHGC: 0.75)</td> </tr> <tr> <td>W12</td> <td>N</td> <td>13.5</td> <td>3</td> <td>1.3</td> <td>eave/verandah/pergola/balcony >=150 mm</td> <td>standard aluminium, single clear, (or U-value: 7.63, SHGC: 0.75)</td> </tr> </tbody> </table>	Window/door no.	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<p>Glazed roofs</p> <p>The applicant must install the glazed roofs described in the table below, in accordance with the specifications listed in the table. The following requirements must also be satisfied in relation to each glazed roof:</p> <p>External awnings and louvres must fully shade the glazed roof above which they are situated when fully drawn or closed.</p> <p>Glazed roofs glazing requirements</p> <table border="1"> <thead> <tr> <th>Glazed roof number</th> <th>Area of glazing (m²)</th> <th>Shading device</th> <th>Class type</th> </tr> </thead> <tbody> <tr> <td>W13</td> <td>2</td> <td>external fixed awning or blind</td> <td>standard aluminium, clear/air gap/clear, (U-value: 5.34, SHGC: 0.67)</td> </tr> <tr> <td>W14</td> <td>5</td> <td>external fixed awning or blind</td> <td>standard aluminium, clear/air gap/clear, (U-value: 5.34, SHGC: 0.67)</td> </tr> <tr> <td>W15</td> <td>1.7</td> <td>external adjustable awning or blind</td> <td>standard aluminium, clear/air gap/clear, (U-value: 5.34, SHGC: 0.67)</td> </tr> </tbody> </table>	Glazed roof number	Area of glazing (m ²)	Shading device	Class type	W13	2	external fixed awning or blind	standard aluminium, clear/air gap/clear, (U-value: 5.34, SHGC: 0.67)	W14	5	external fixed awning or blind	standard aluminium, clear/air gap/clear, (U-value: 5.34, SHGC: 0.67)	W15	1.7	external adjustable awning or blind	standard aluminium, clear/air gap/clear, (U-value: 5.34, SHGC: 0.67)	✓	✓	✓																																																																											
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Project	Issue Date	Drawn	Drawings Title	DWG No
<p>ALTERATIONS AND ADDITIONS TO FAMILY HOME</p> <p>12 Railway Street, Petersham</p>	28/11/21	GS	BASIX	A03
	1707	SCALE	ISSUE	REVISION
			DEVELOPMENT APPLICATION - RFI	A

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Version: 1, Version Date: 18/09/2022



SOLID AND WATER MANAGEMENT NOTES

WASTE IS NOT TO BE BURIED ON SITE TO MINIMISE SOIL CONTAMINATION
 INSTALLATION AND MAINTENANCE OF WATER POLLUTION, EROSION, AND SEDIMENTATION CONTROLS ARE TO BE MANAGED IN ACCORDANCE WITH
 *Do I Right On Site, Soil and Water Management For Construction Industry published by the southern Sydney regional organisation of councils, 2001
 *Managing Urban Stormwater - Soils and Construction published by the NSW Department of Housing 4th Edition (the blue book)
 WASTE, WATER POLLUTION, EROSION, AND SEDIMENTATION MANAGEMENT IN ACCORDANCE WITH THE WASTE MANAGEMENT PLAN
 PAVEMENTS SURFACES ADJACENT TO INGRESS AND EGRESS POINTS ARE TO BE SWEEPED AND KEPT CLEAN IN PARTICULAR AT THE END OF THE DAY
 DEMOLITION WORK TO COMPLY WITH AS 2801 - THE DEMOLITION OF STRUCTURE REFER TO DEMOLITION MANAGEMENT PLAN PREPARED
 BY DESIGN DELTA ARCHITECTS

ANY HAZARDOUS INTRACTABLE WASTES ARISE FROM DEMOLITION SHALL BE REMOVED IN ACCORDANCE WITH WORK COVER AND DEPARTMENT OF ENVIRONMENT
 AND CLIMATE CHANGE AND WATER AND WITH THE PROVISIONS OF:
 (A) NEW SOUTH WALES OCCUPATIONAL HEALTH AND SAFETY ACT 2011
 (B) THE OCCUPATIONAL HEALTH AND SAFETY (HAZARDOUS SUBSTANCES) REGULATION 2017,
 (C) THE ENVIRONMENTAL CONTAMINATION CONTROL ACT 1979 (NSW) (WORK) REGULATION 2017,
 (D) PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1987 (NSW),
 (E) WASTE CLASSIFICATION GUIDELINES (CURRENT VERSION) BY NSW ENVIRONMENT PROTECTION AUTHORITY

ALL WORK INVOLVING THE DEMOLITION, REMOVAL, TRANSPORT AND DISPOSAL OF ASBESTOS GEMENT IS TO BE CARRIED OUT WITH ACCORDANCE WITH THE WORKCOVER CODE OF PRACTICE FOR REMOVAL OF ASBESTOS

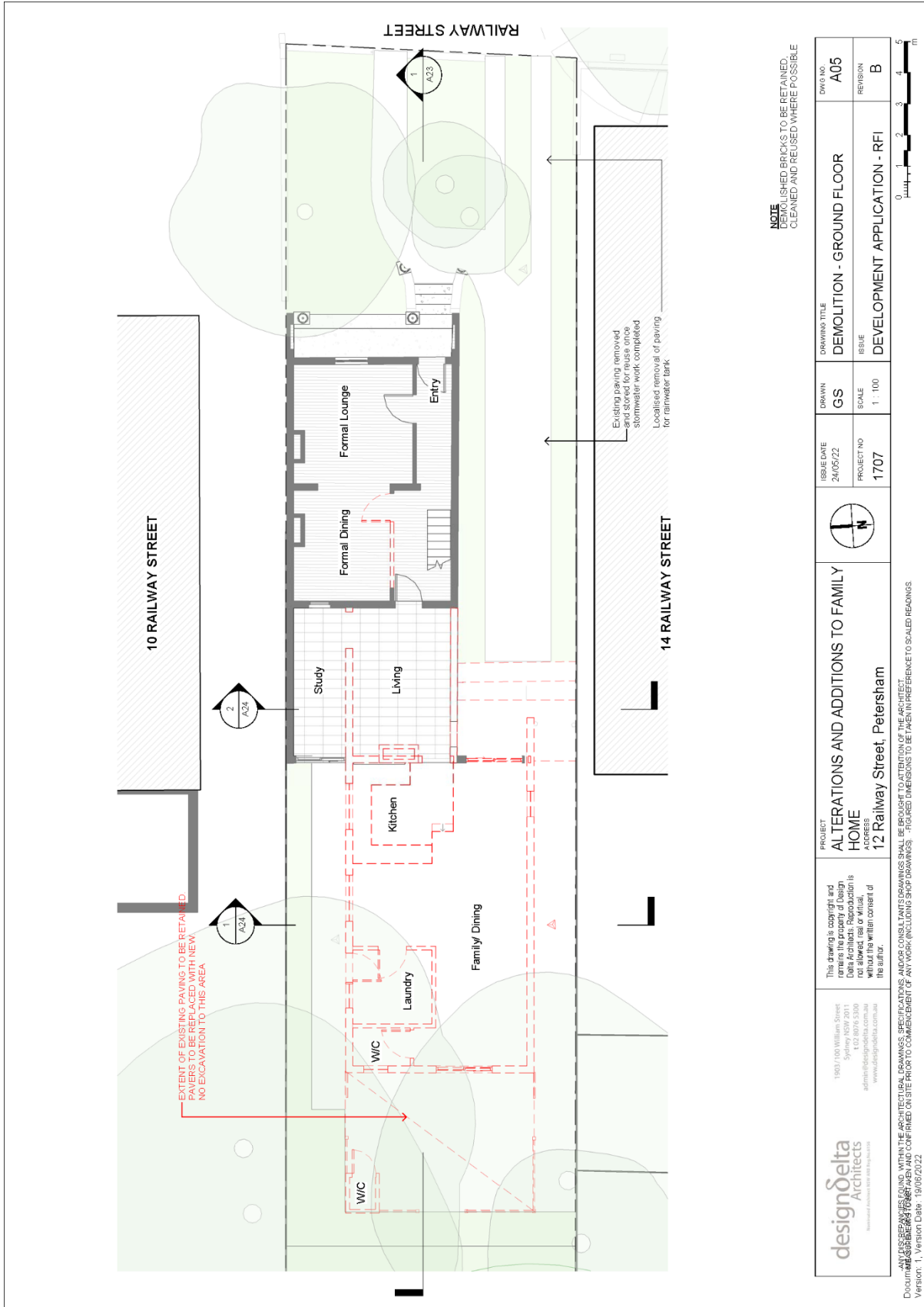
THE GENERATION OF DUST AND NOISE ON THE SITE MUST BE CONTROLLED

THE SITE MUST BE SECURED TO PROHIBIT UNAUTHORISED ENTRY

IF BUILDER REQUIRES SKIP BIN TO BE LOCATED OFF SITE, A APPROVAL FROM COUNCIL WILL BE NEEDED TO BE OBTAINED BY BUILDER

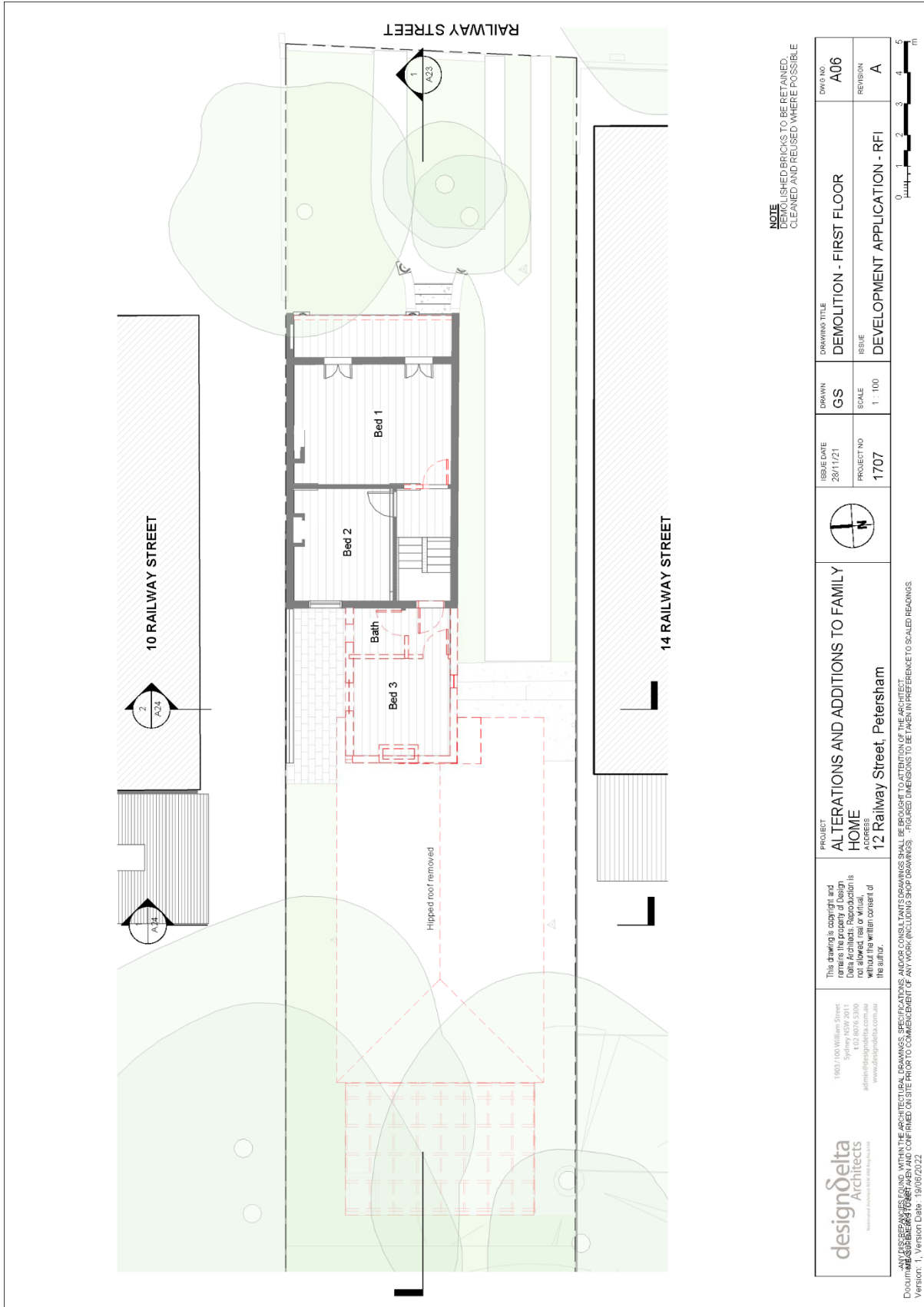
<p>1903/100 Williams Street Sydney NSW 2011 adm@designdelta.com.au www.designdelta.com.au</p>	<p>PROJECT ALTERATIONS AND ADDITIONS TO FAMILY HOME ADDRESS 12 Railway Street, Petersham</p>	<p>ISSUE DATE 28/11/21</p>	<p>DRAWN GS</p>	<p>DRAWING TITLE SEDIMENTATION CONTROL PLAN</p>	<p>DWG NO A04</p>
		<p>PROJECT NO 1707</p>	<p>SCALE 1 : 200</p>	<p>ISSUE DEVELOPMENT APPLICATION - RFI</p>	<p>REVISION A</p>

ANY USE REPAIRS FOUND WITHIN THE ARCHITECTURAL DRAWINGS SPECIFICATIONS AND/OR CONSULTANTS DRAWINGS SHALL BE BROUGHT TO ATTENTION OF THE ARCHITECT.
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 Version: 1, Version Date: 18/09/2022



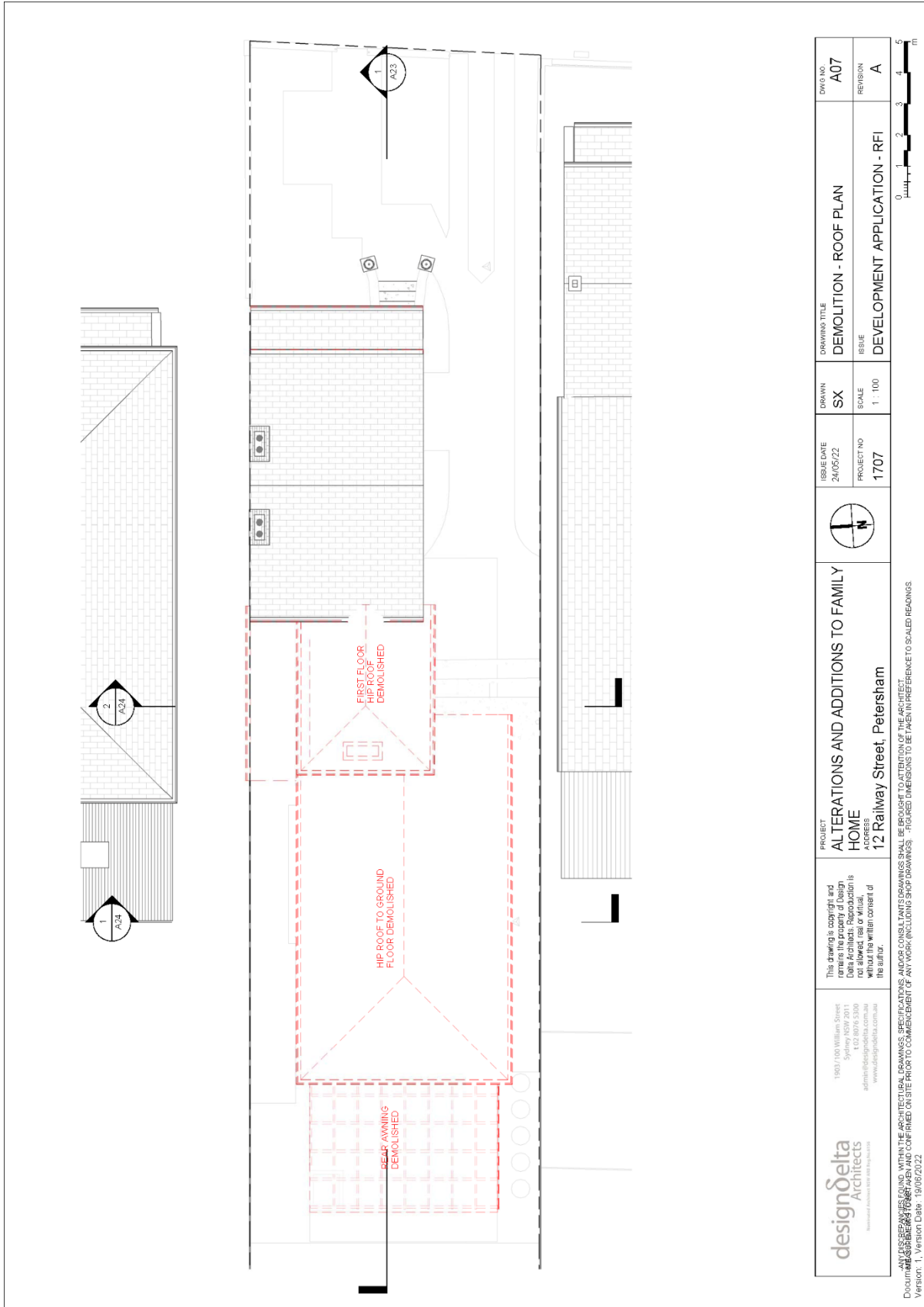
NOTE
 UNFINISHED BRICKS TO BE RETAINED,
 CLEANED AND REUSED WHERE POSSIBLE.

 1903/100 William Street Sydney NSW 2011 admin@designdelta.com.au www.designdelta.com.au <small>NATIONAL ASSOCIATION OF ARCHITECTS</small>	PROJECT ALTERATIONS AND ADDITIONS TO FAMILY HOME ADDRESS 12 Railway Street, Petersham	DRAWING TITLE DEMOLITION - GROUND FLOOR	DWG NO A05
		ISSUE DEVELOPMENT APPLICATION - RFI	REVISION B
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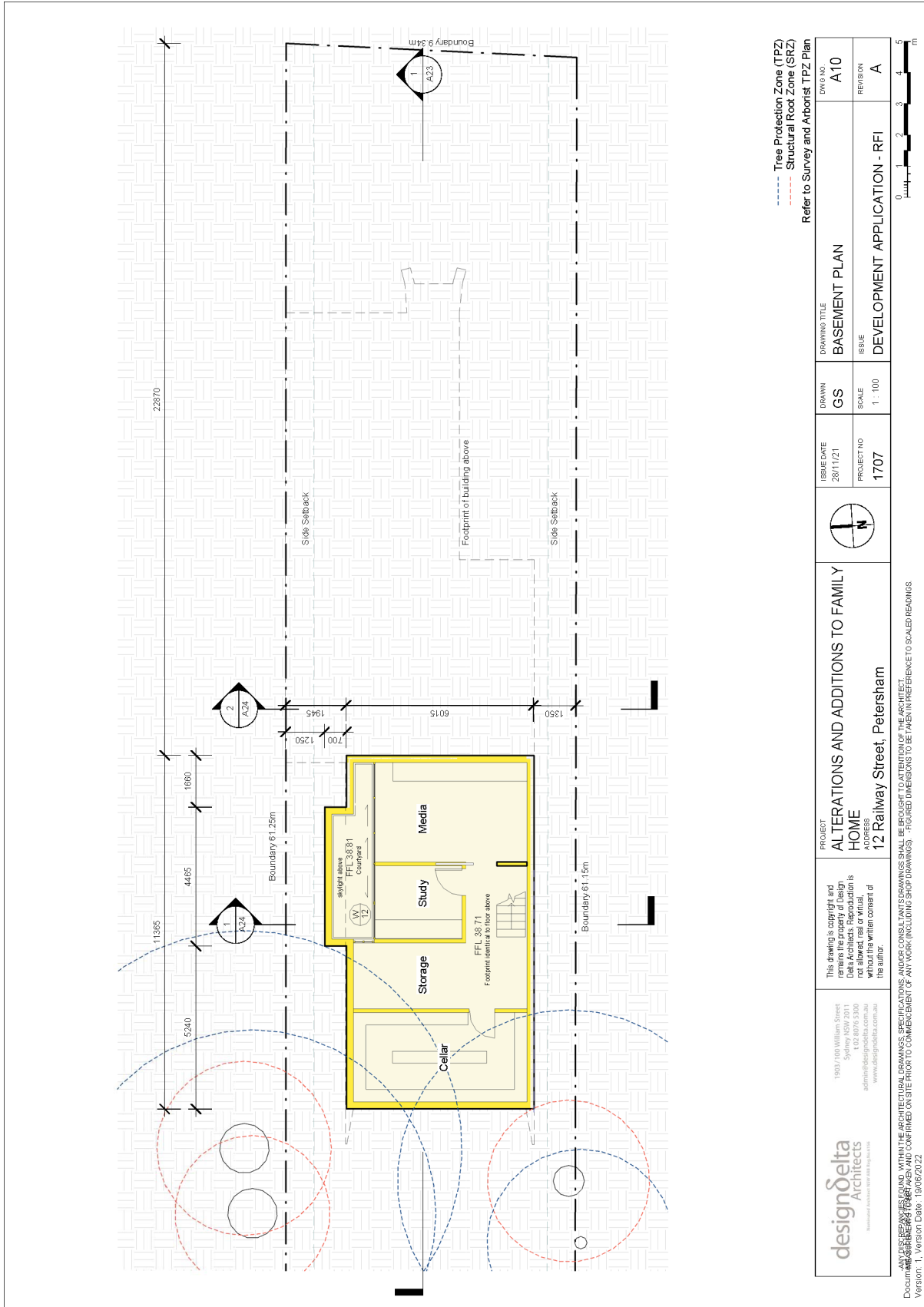
NOTE: UNFINISHED SPACES TO BE RETAINED, CLEANED AND REUSED WHERE POSSIBLE.

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			ISSUE DATE 28/11/21	SCALE 1 : 100	ISSUE DEVELOPMENT APPLICATION - RFI
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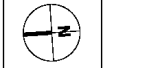
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				24/05/22	SX	DEMOLITION - ROOF PLAN	A07
				PROJECT NO	SCALE	ISSUE	REVISION
				1707	1 : 100	DEVELOPMENT APPLICATION - RFI	A
				<p>0 1 2 3 4 5 6 m</p>			

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--- Tree Protection Zone (TPZ)
 --- Structural Root Zone (SRZ)
 Refer to Survey and Arborist TPZ Plan

ISSUE DATE	26/11/21	DRAWN	GS	DRAWING TITLE	BASEMENT PLAN	DWG NO.	A10
PROJECT NO	1707	SCALE	1:100	ISSUE	DEVELOPMENT APPLICATION - RFI	REVISION	A



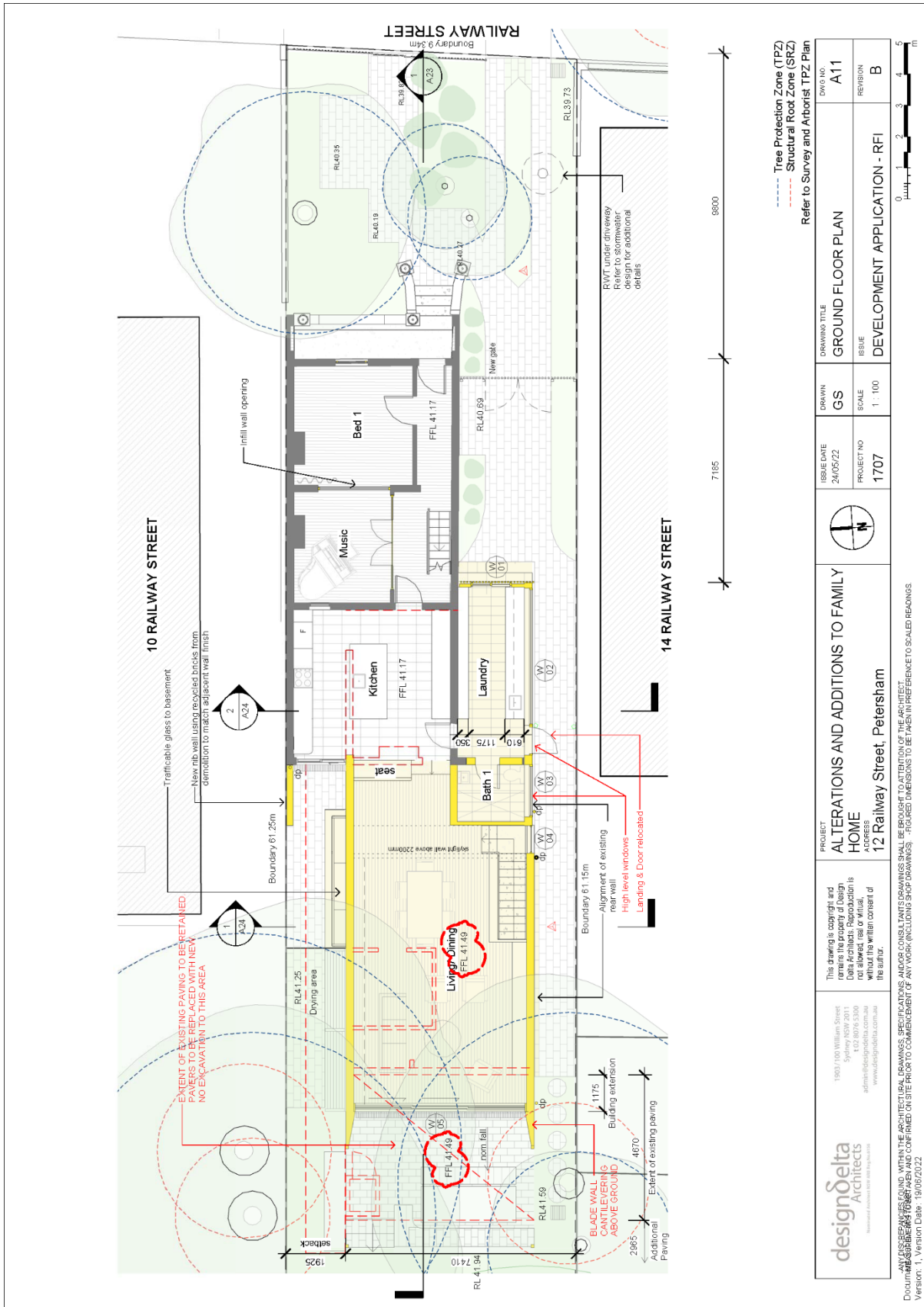
PROJECT
ALTERATIONS AND ADDITIONS TO FAMILY HOME
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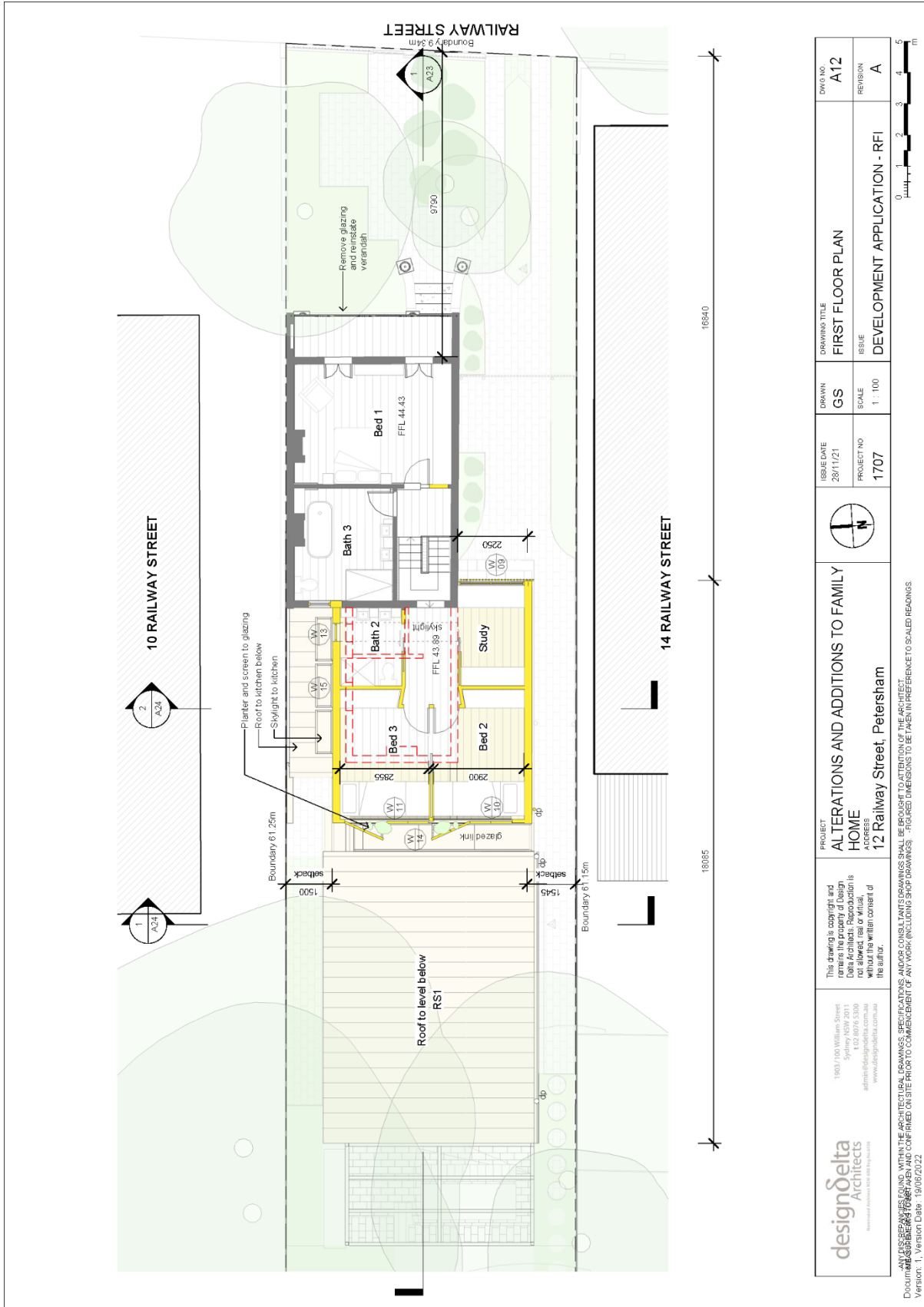


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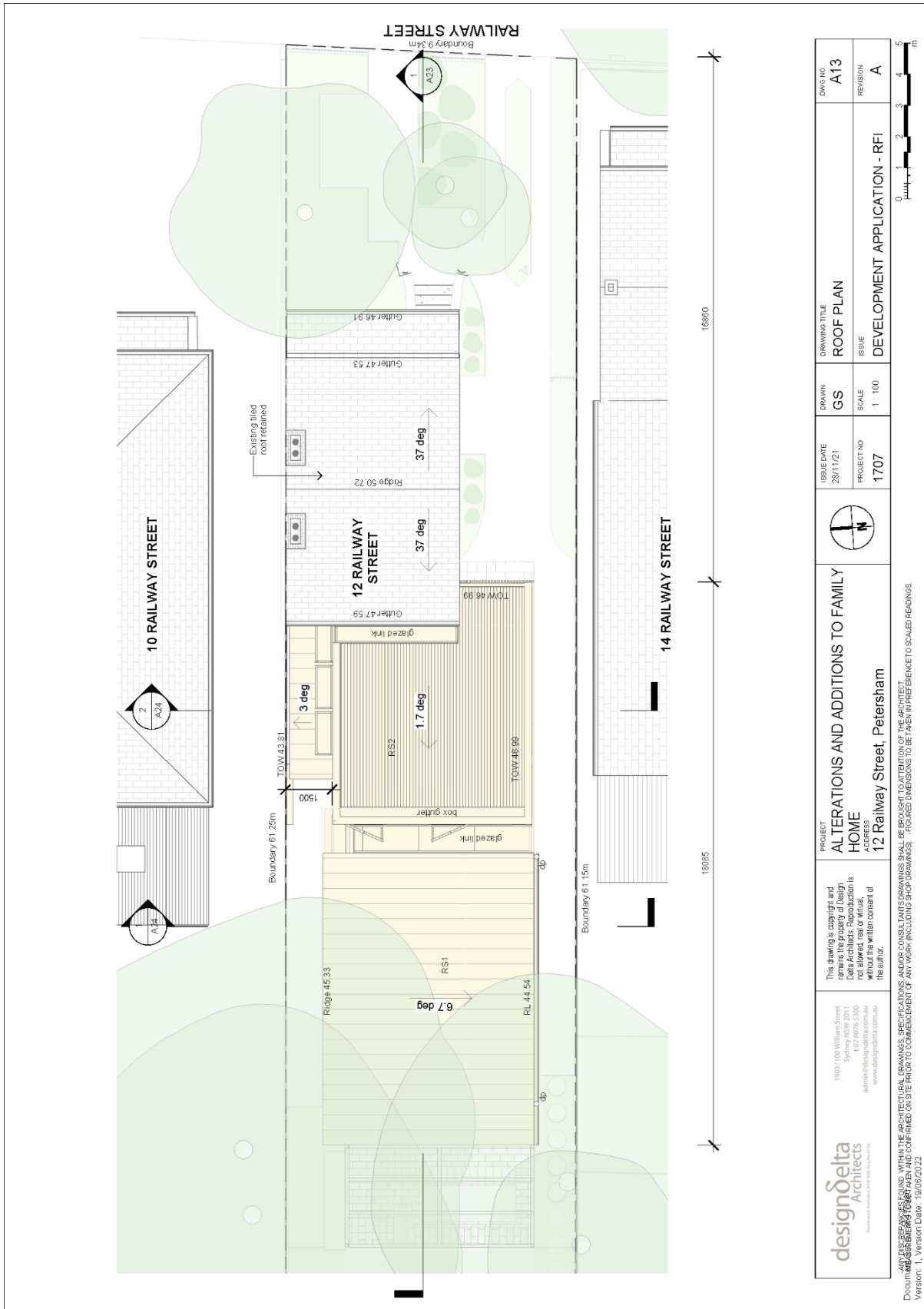
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				24/05/22	GS	GROUND FLOOR PLAN	A11
				PROJECT NO	SCALE	ISSUE	REVISION
				1707	1 : 100	DEVELOPMENT APPLICATION - RFI	B

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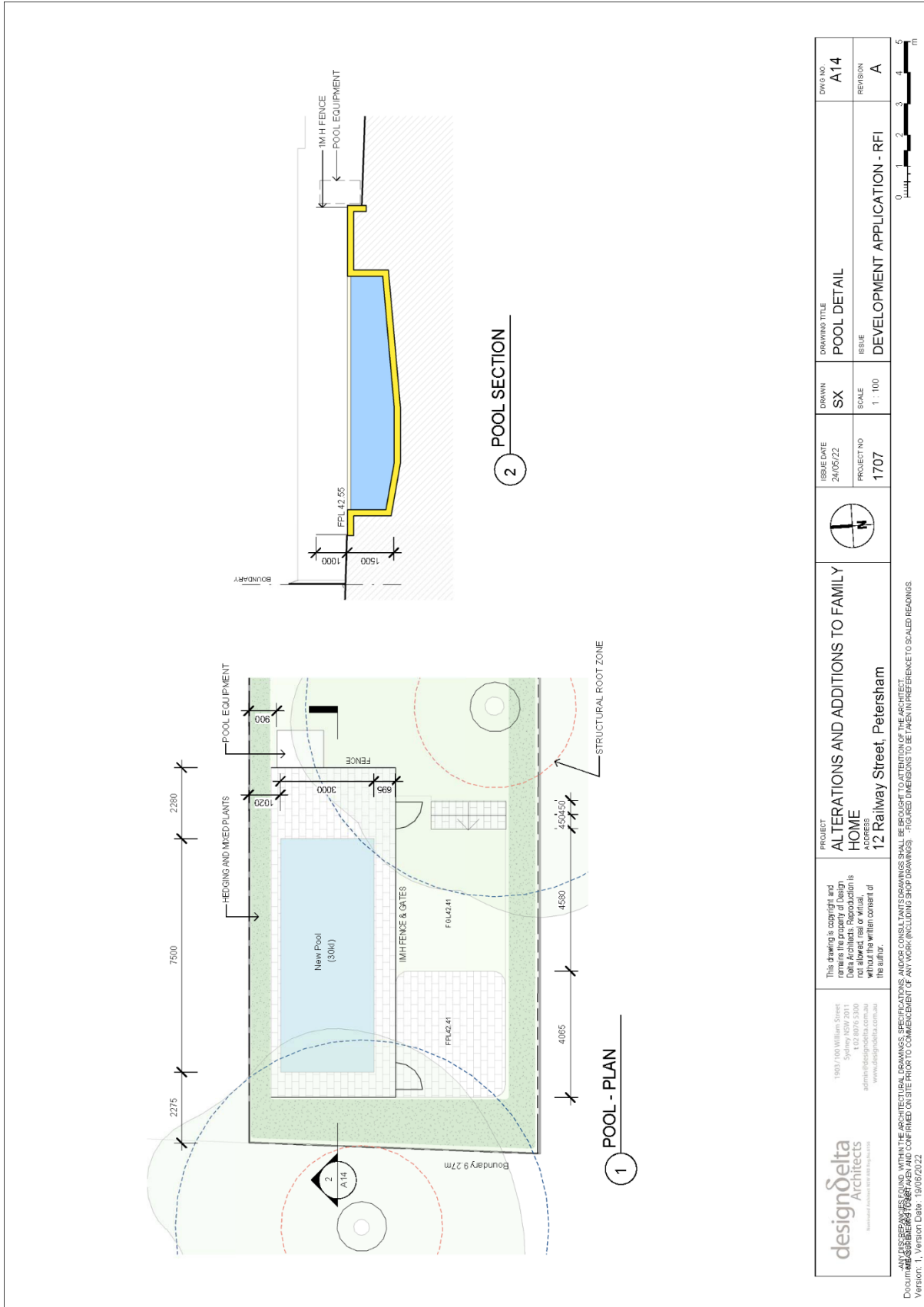
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				28/11/21	GS	FIRST FLOOR PLAN	A12
				PROJECT NO	SCALE	ISSUE	REVISION
				1707	1 : 100	DEVELOPMENT APPLICATION - RFI	A

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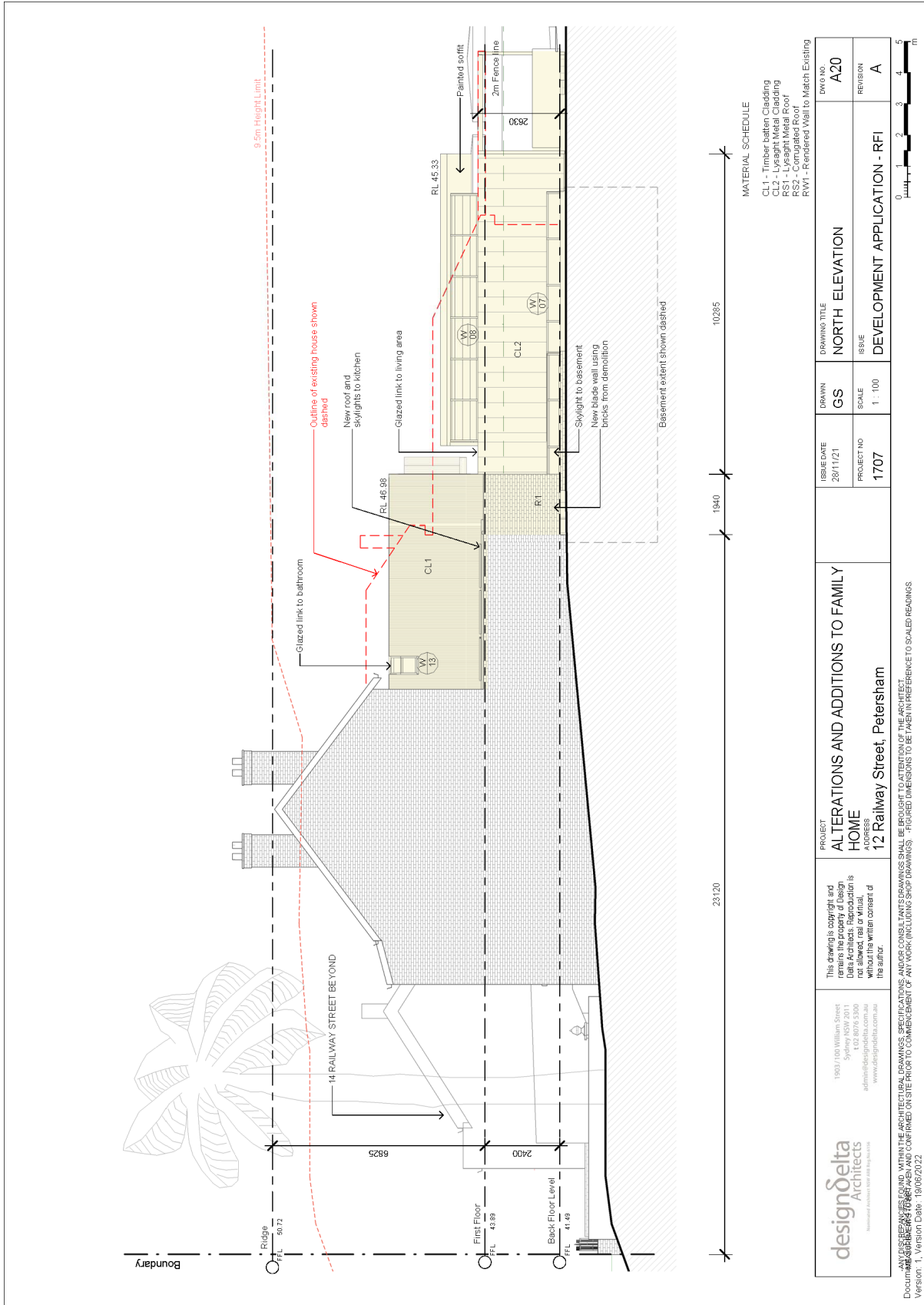
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				PROJECT NO	SCALE	ISSUE	REVISION
				1707	1 : 100	DEVELOPMENT APPLICATION - RFI	A

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			24/05/22	SX	POOL DETAIL	A14
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				1 : 100	DEVELOPMENT APPLICATION - RFI	A
				PROJECT NO	0 1 2 3 4 5 6 m	
				1707		

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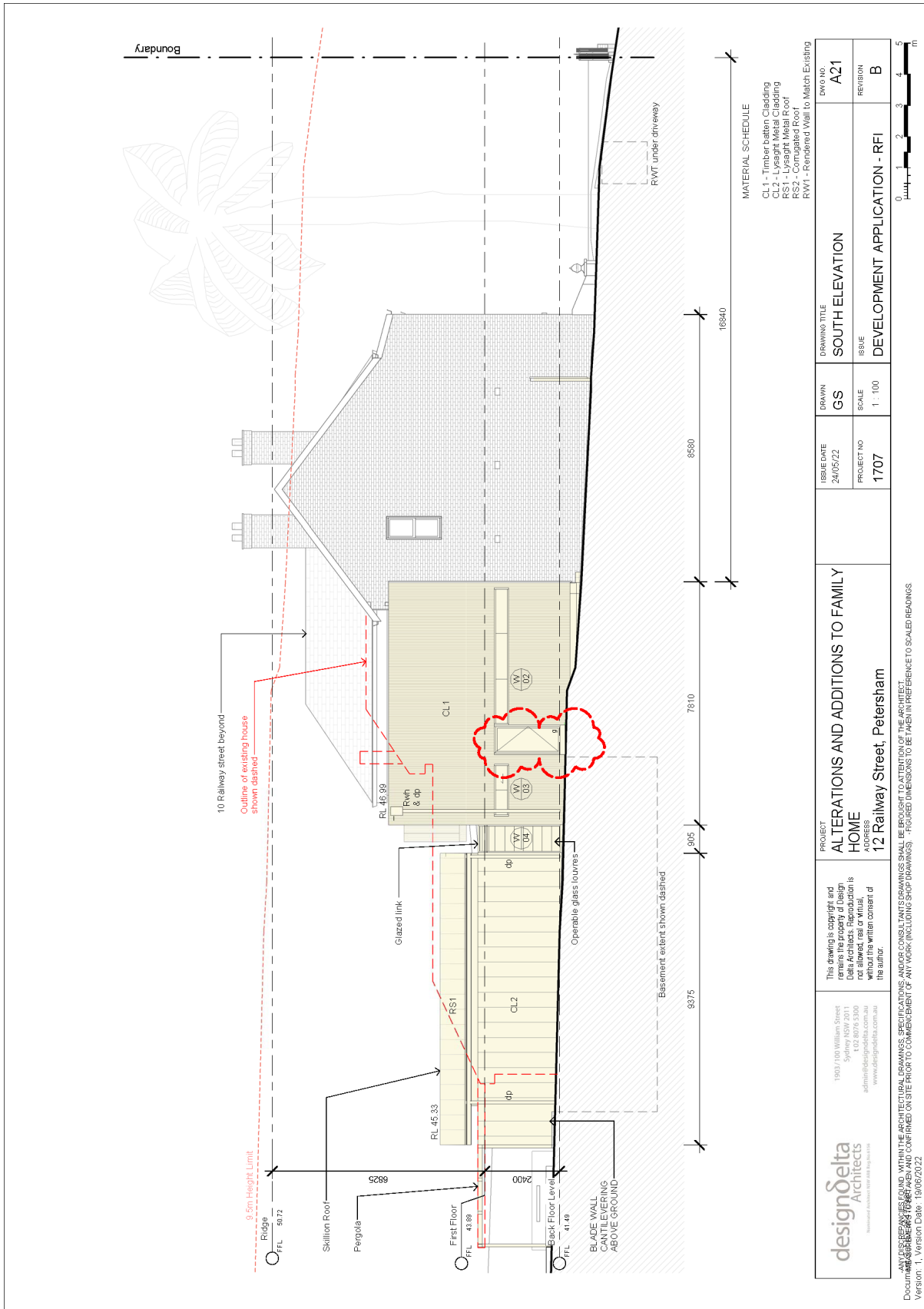
MATERIAL SCHEDULE

- CL1 - Timber batten Cladding
- CL2 - Lysaght Metal Cladding
- RS1 - Lysaght Metal Roof
- RS2 - Lysaght Metal Roof
- RW1 - Rendered Wall to Match Existing

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		<p>SCALE</p> <p>1 : 100</p>	<p>PROJECT NO</p> <p>1707</p>	<p>ISSUE</p> <p>DEVELOPMENT APPLICATION - RFI</p>	<p>REVISION</p> <p>A</p>

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PROJECT
ALTERATIONS AND ADDITIONS TO FAMILY HOME ADDRESS
12 Railway Street, Petersham

ISSUE DATE
 24/05/22

PROJECT NO
 1707

DRAWN
 GS

SCALE
 1 : 100

DRAWING TITLE
SOUTH ELEVATION

DWG NO
A21

REVISION
B

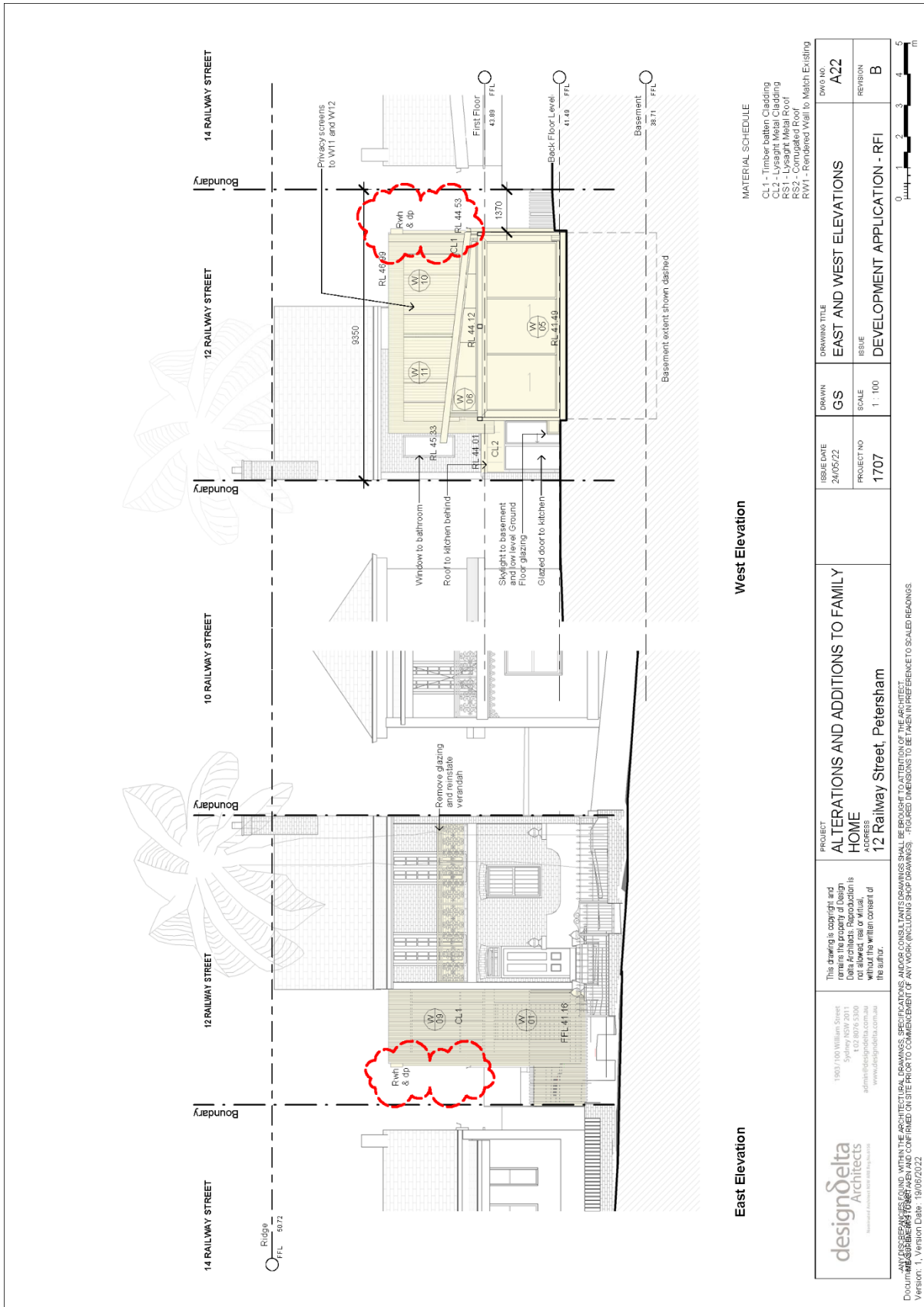
DEVELOPMENT APPLICATION - RFI

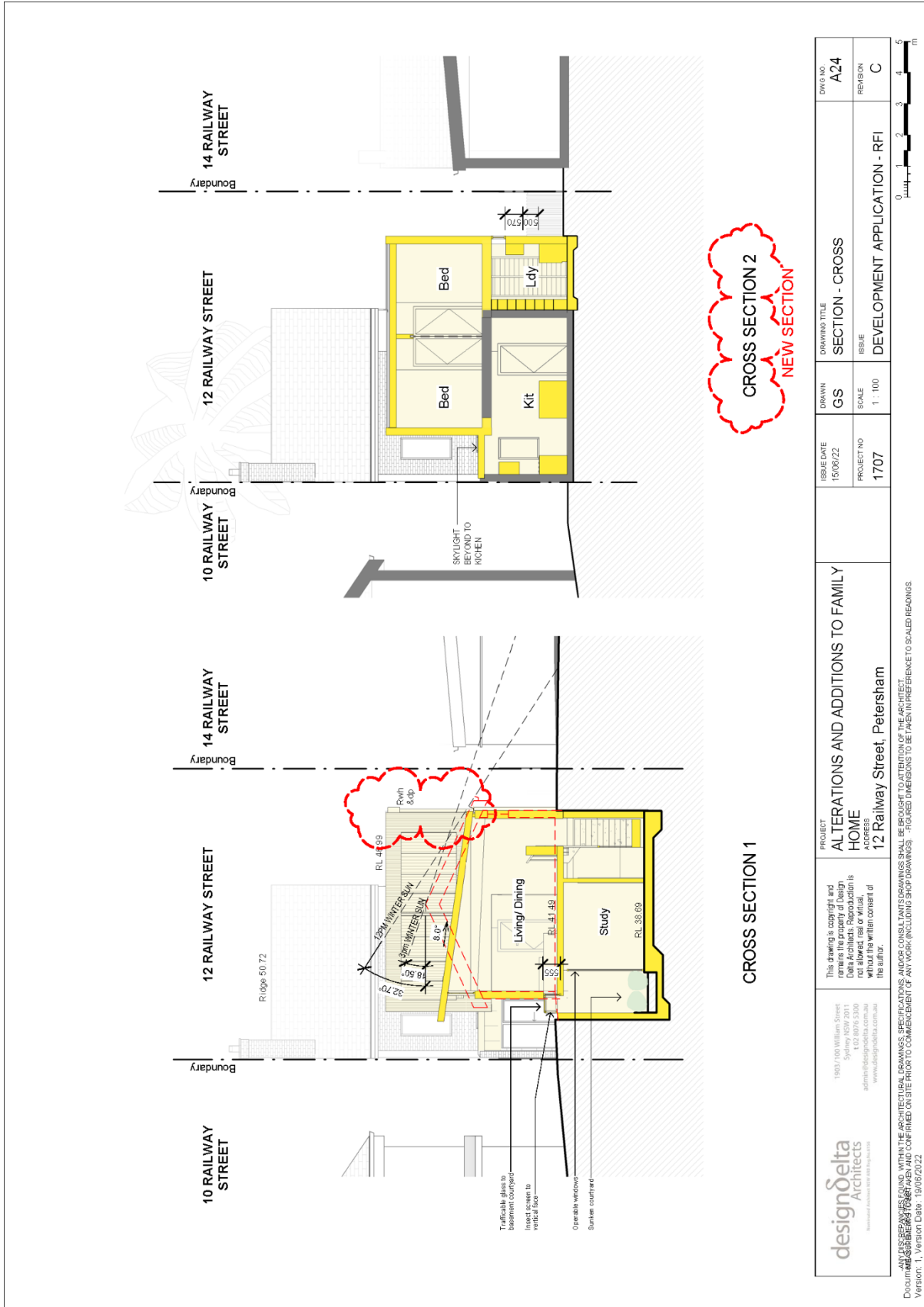
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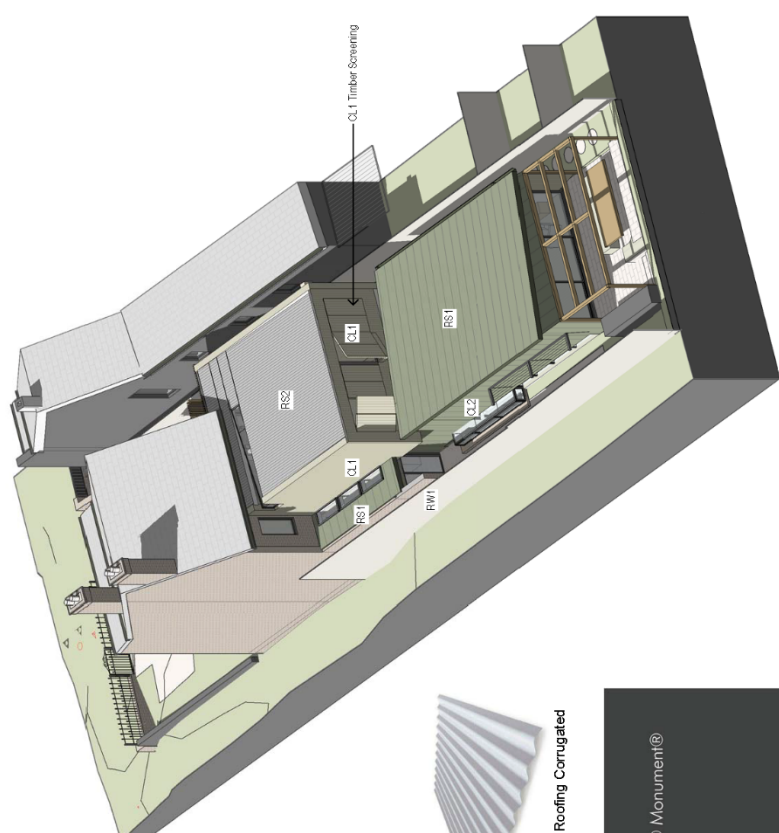
MATERIAL SCHEDULE
 CL1 - Timber batten Cladding
 CL2 - Lysaght Metal Cladding
 RS1 - Lysaght Metal Roof
 RS2 - Insulated Metal Roof
 RW1 - Reinforced Wall to Match Existing

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MATERIAL SCHEDULE


- CL1 - Timber battens Cladding
- CL2 - Lysaght Metal Cladding
- RS1 - Lysaght Metal Roof
- RS2 - Corrugated Iron Roof
- RW1 - Reinforced Wall to Match Existing




CL1 - Timber Cladding - Abodo Vulcan - Straw Finish



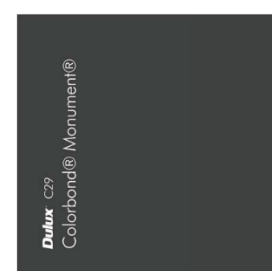
CL2 Lysaght Dominion® (485mm Wide) - Colorbond Mangrove



RS1 Stramit SharpLine® Architectural Cladding (485mm Wide) - Colorbond Mangrove




RS2 Zincalume Roofing Corrugated Iron or Similar




Dulux Colorbond® Monument®

Glazed Doors and Windows - Powdercoat Dulux Monument




Dulux 51746 Mangrove


CL2 and RS1 Dulux Colorbond Mangrove




Precedent - Timber Cladding - Abodo Wood's Cardrona Cabin - Cardrona, New Zealand



Precedent - Metal Cladding - Lysaght Colorbond Mangrove



Precedent - Metal Cladding (colour only) and timber cladding - Backbeach Project - San Remo, VIC, Australia



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PROJECT
ALTERATIONS AND ADDITIONS TO FAMILY HOME
 ADDRESS
12 Railway Street, Petersham

DRAWING TITLE
EXTERNAL FINISHES SCHEDULE

ISSUE DATE
28/11/21

PROJECT NO
1707

DRAWN
GS

SCALE
1 : 100

DWG NO
A30

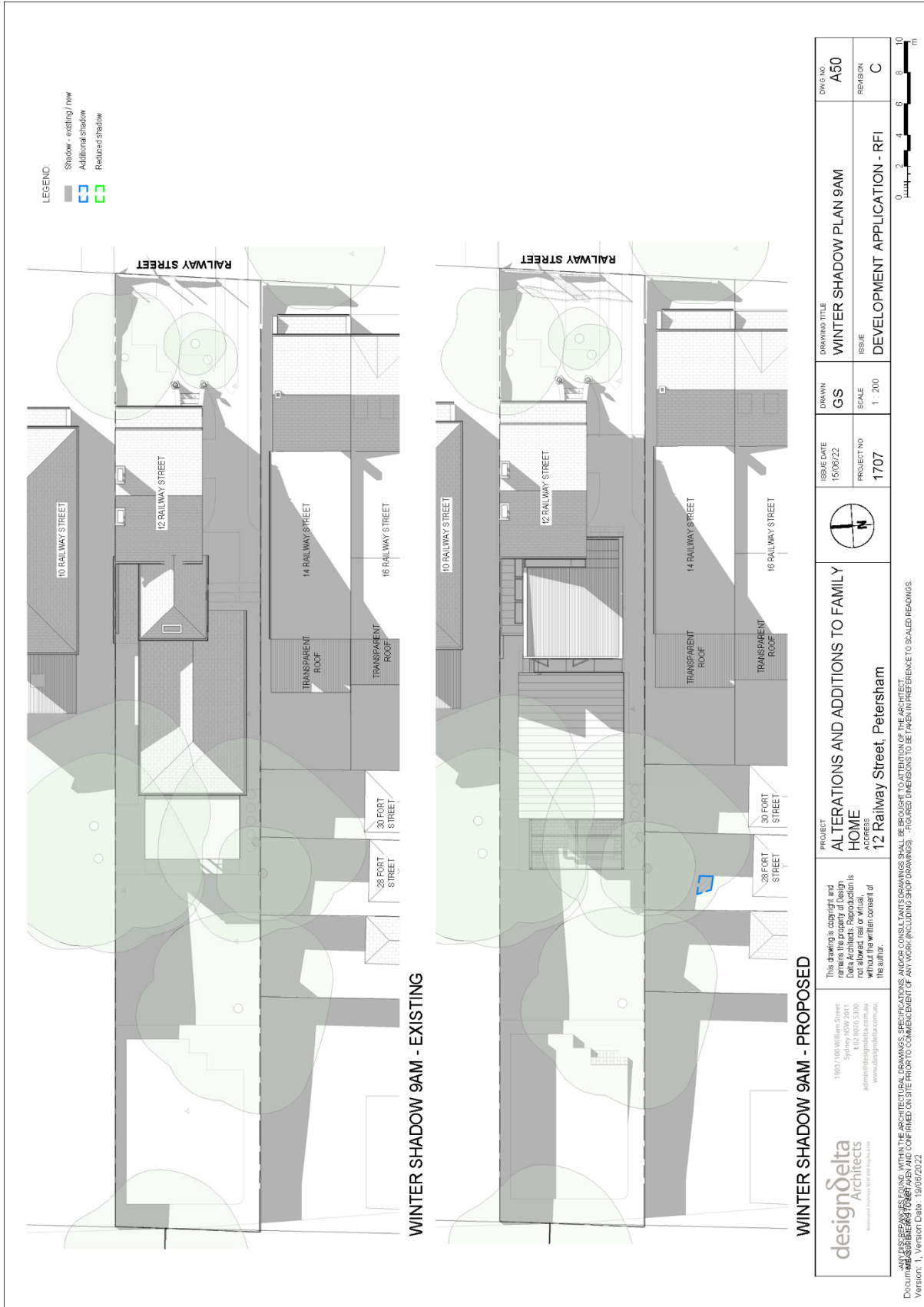
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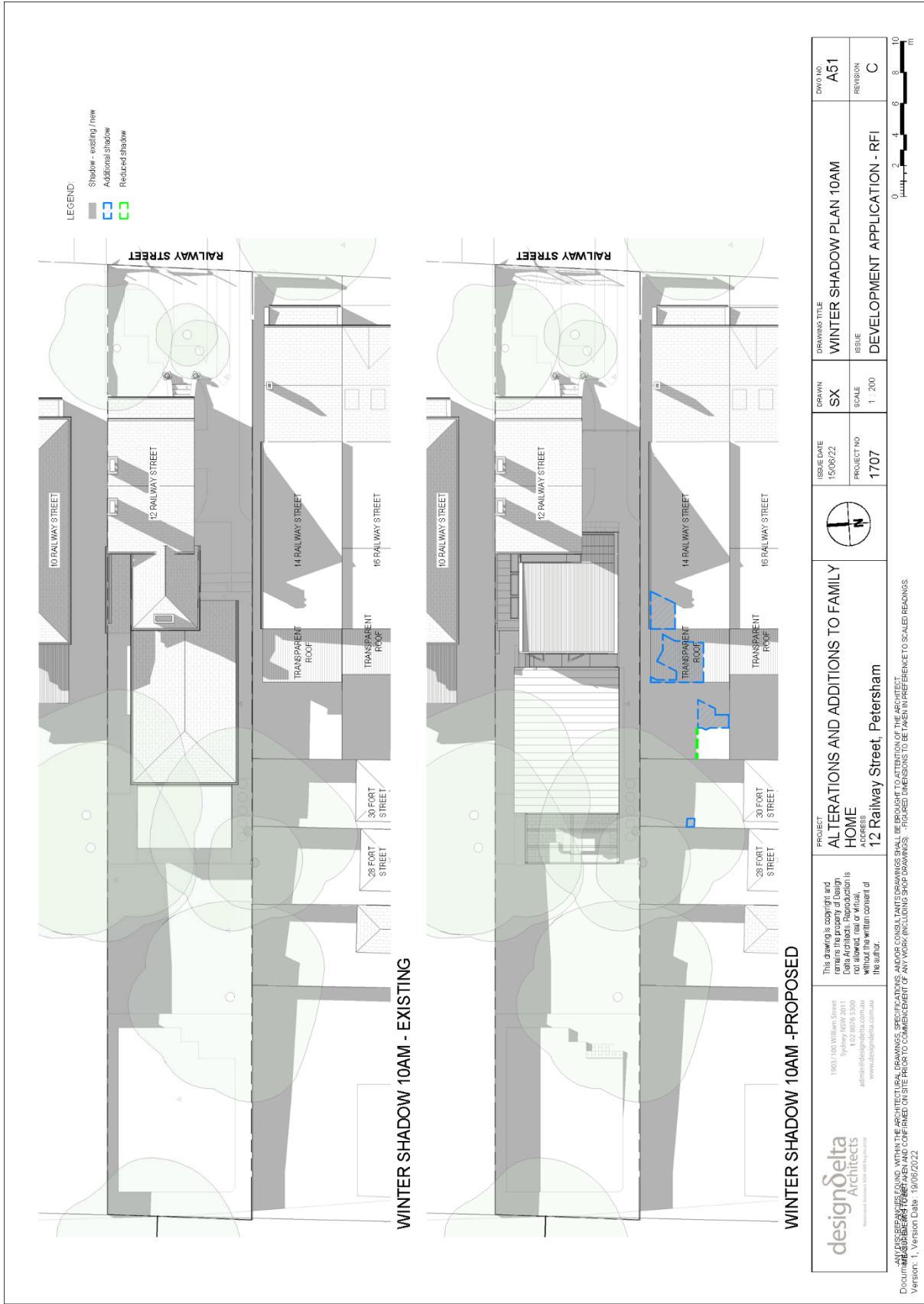
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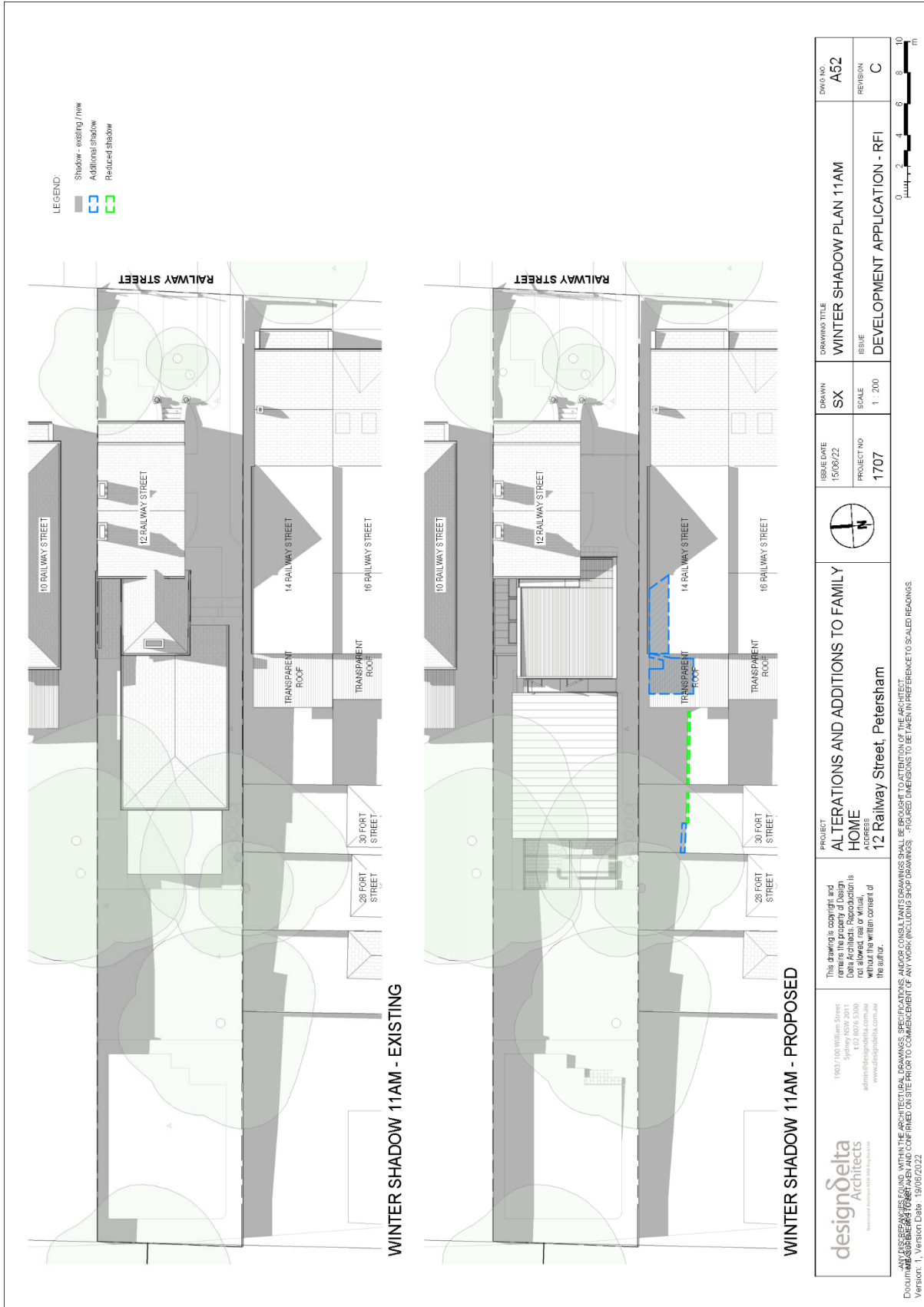
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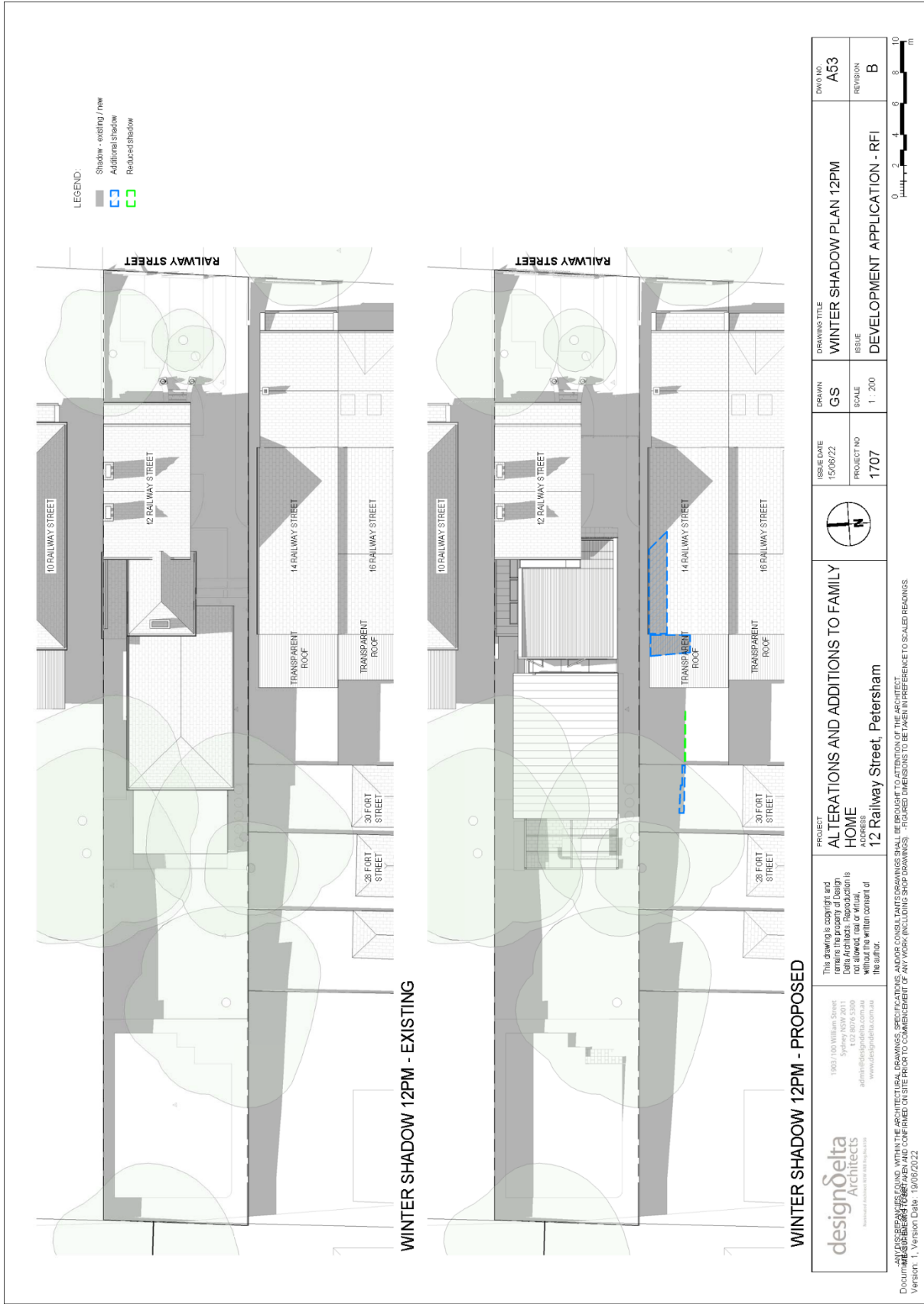
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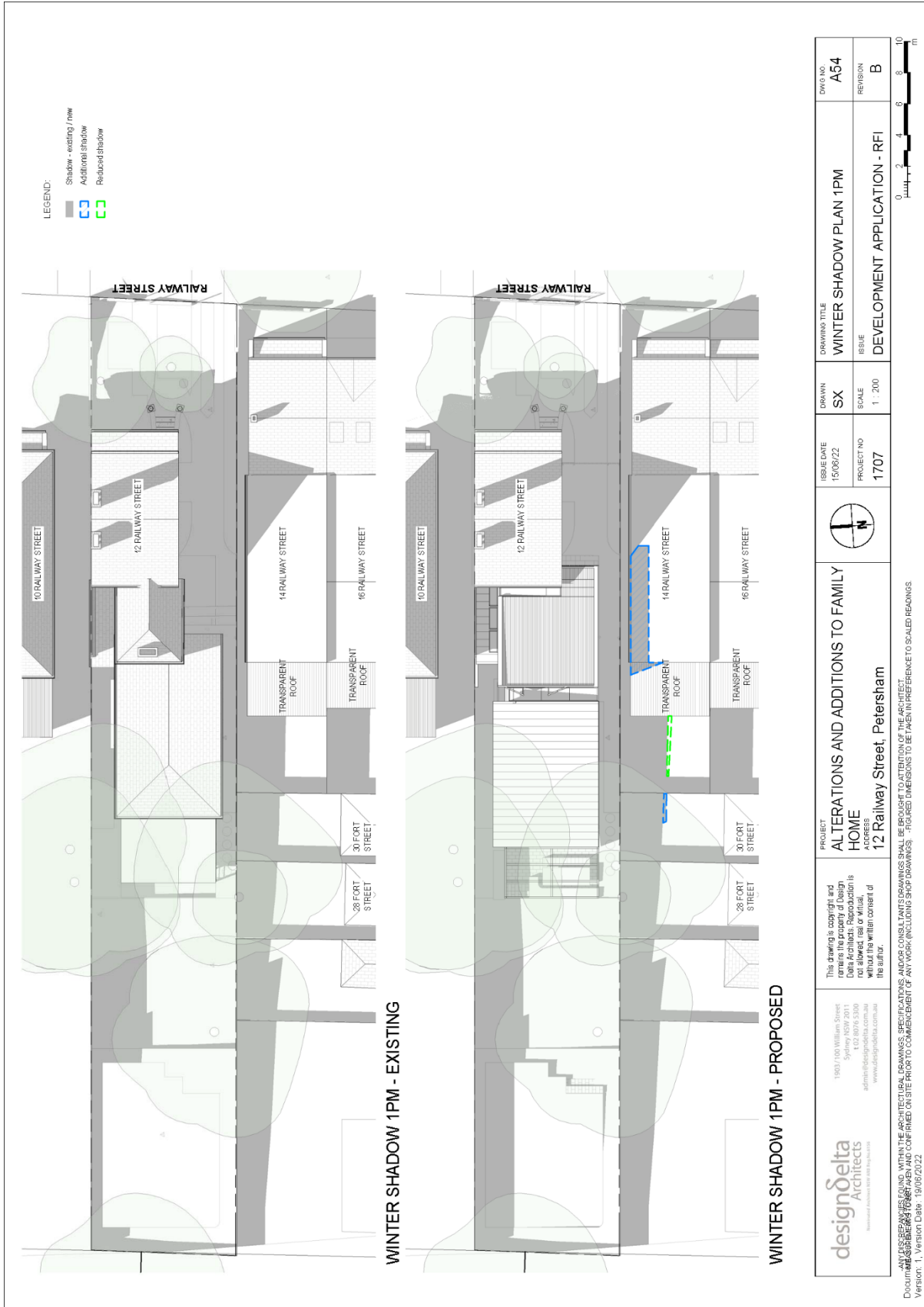
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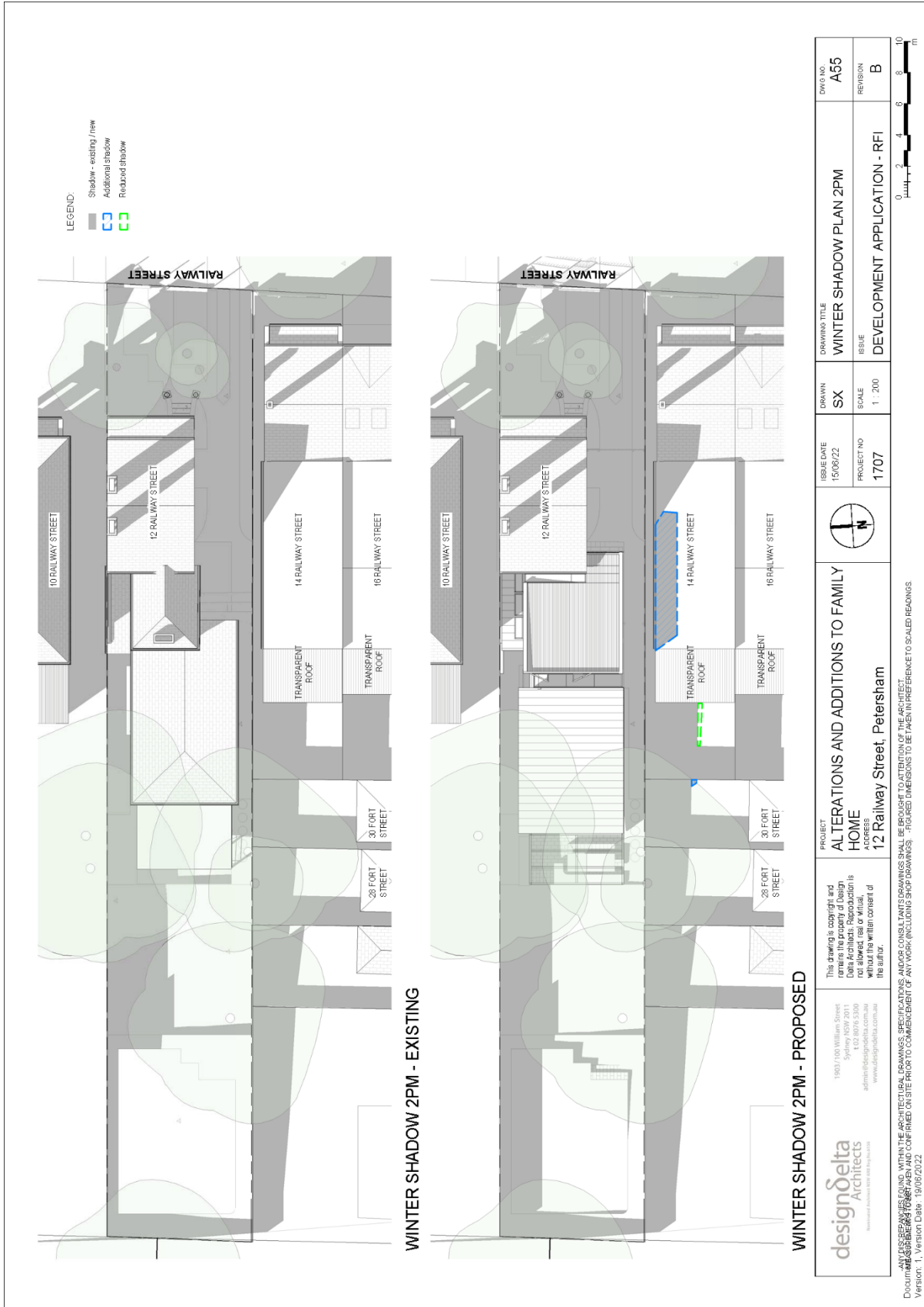


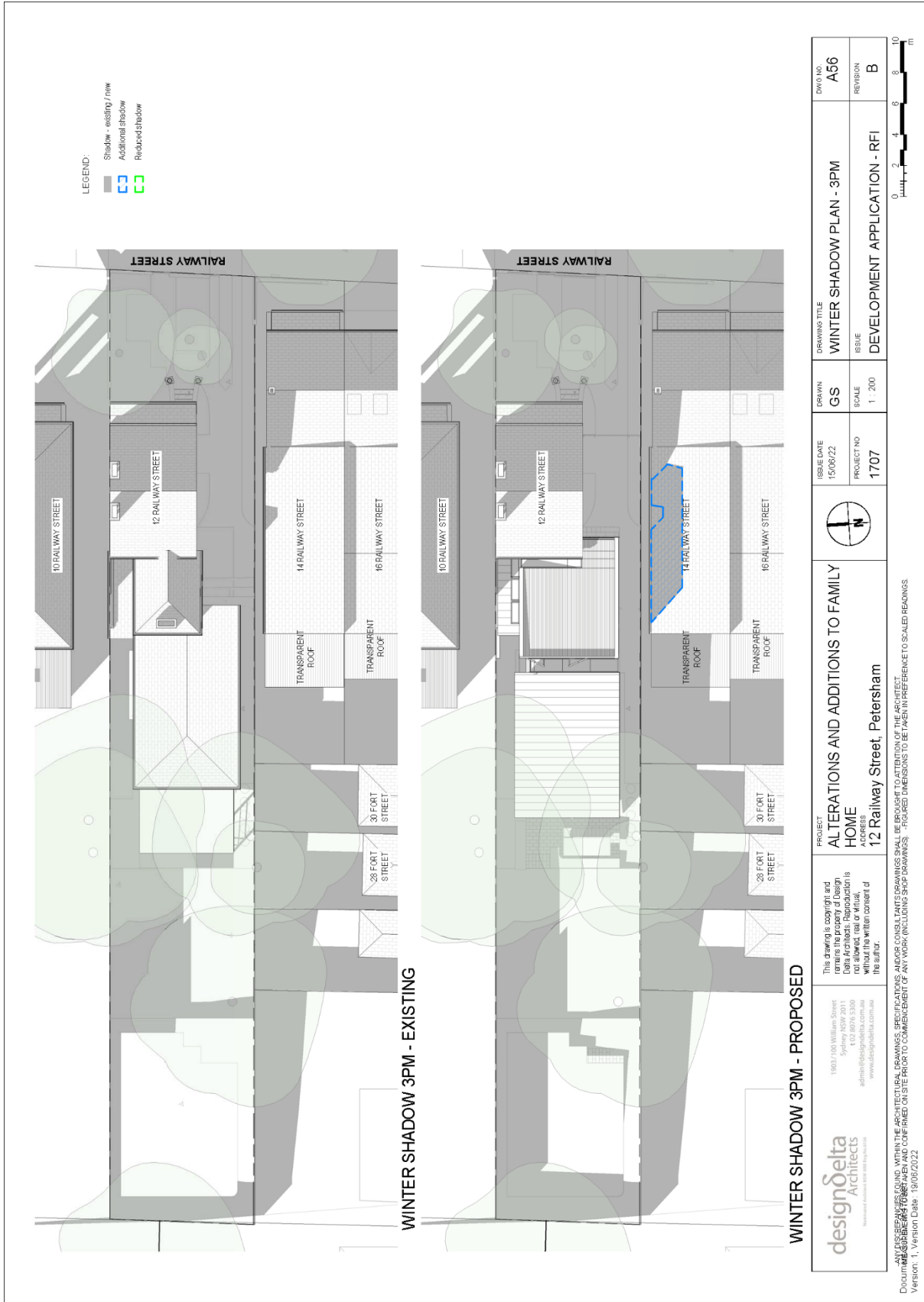




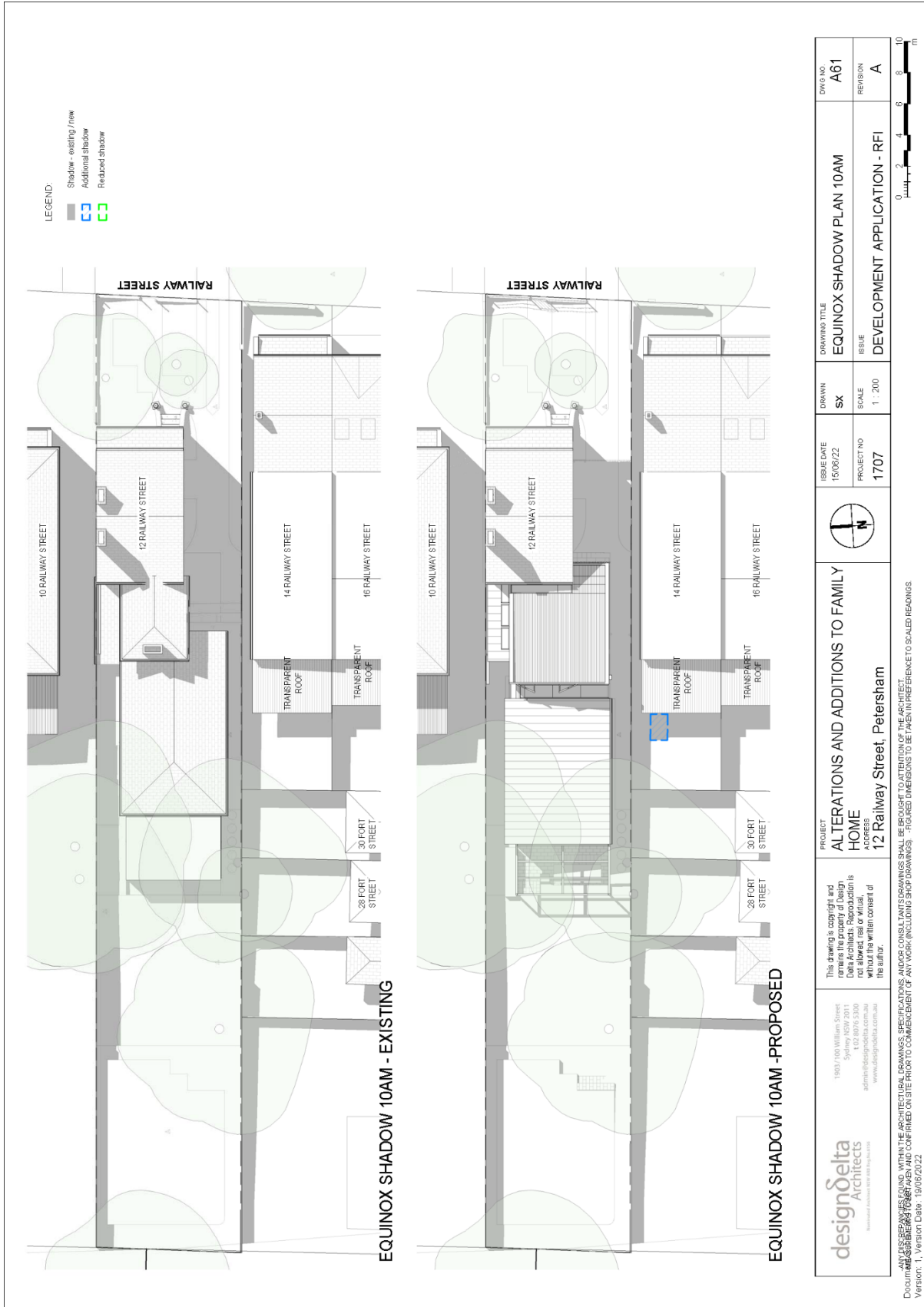


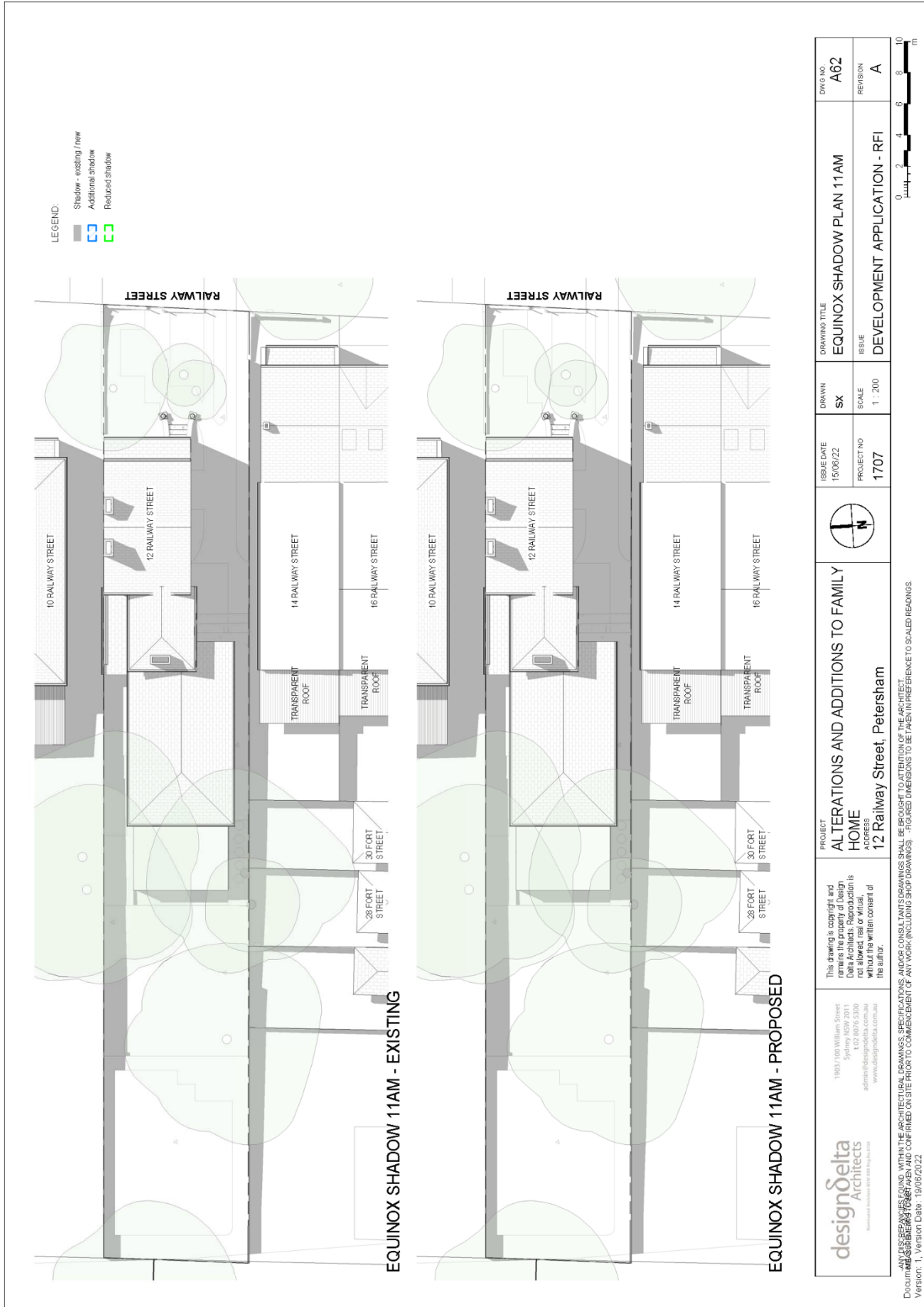


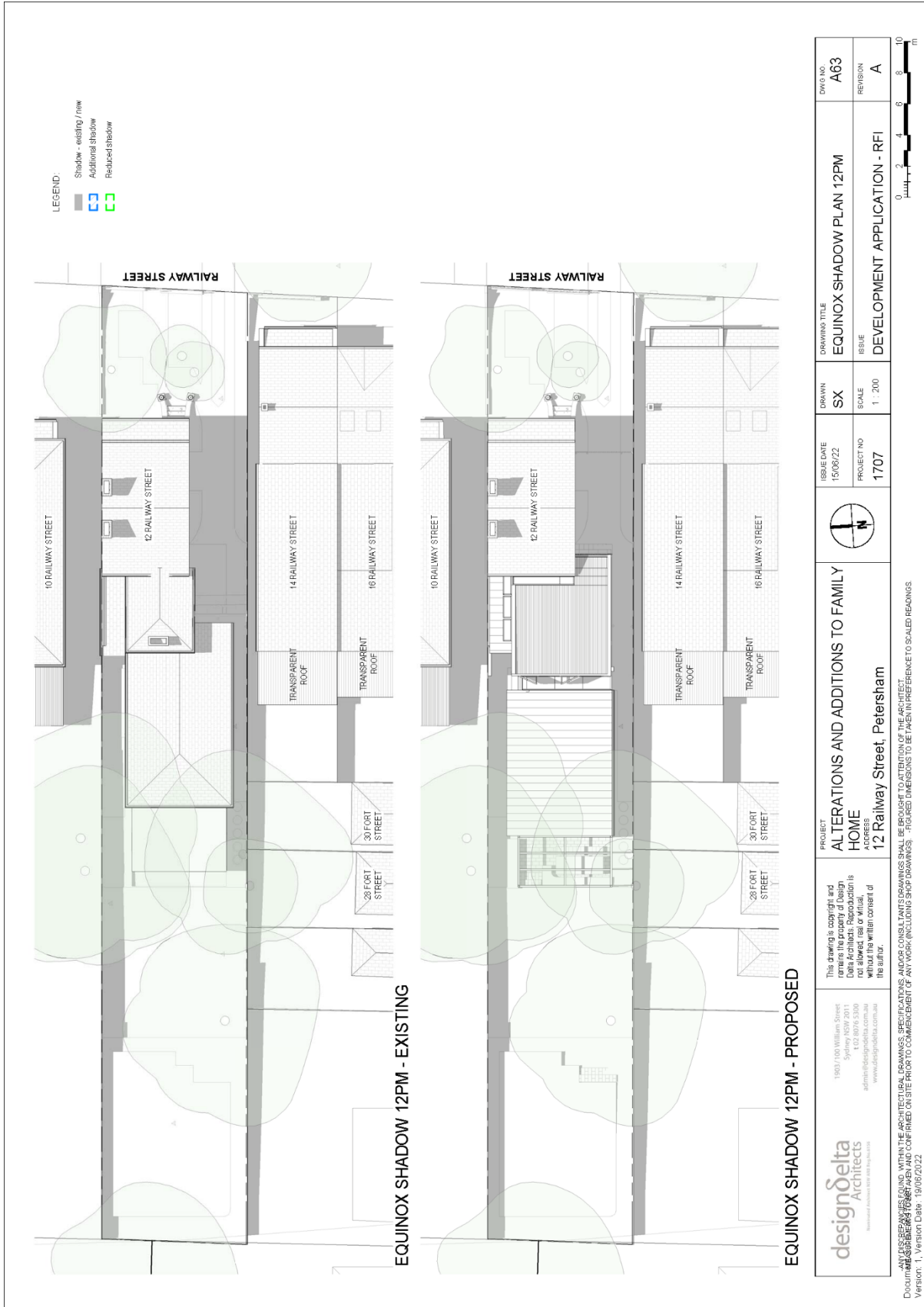


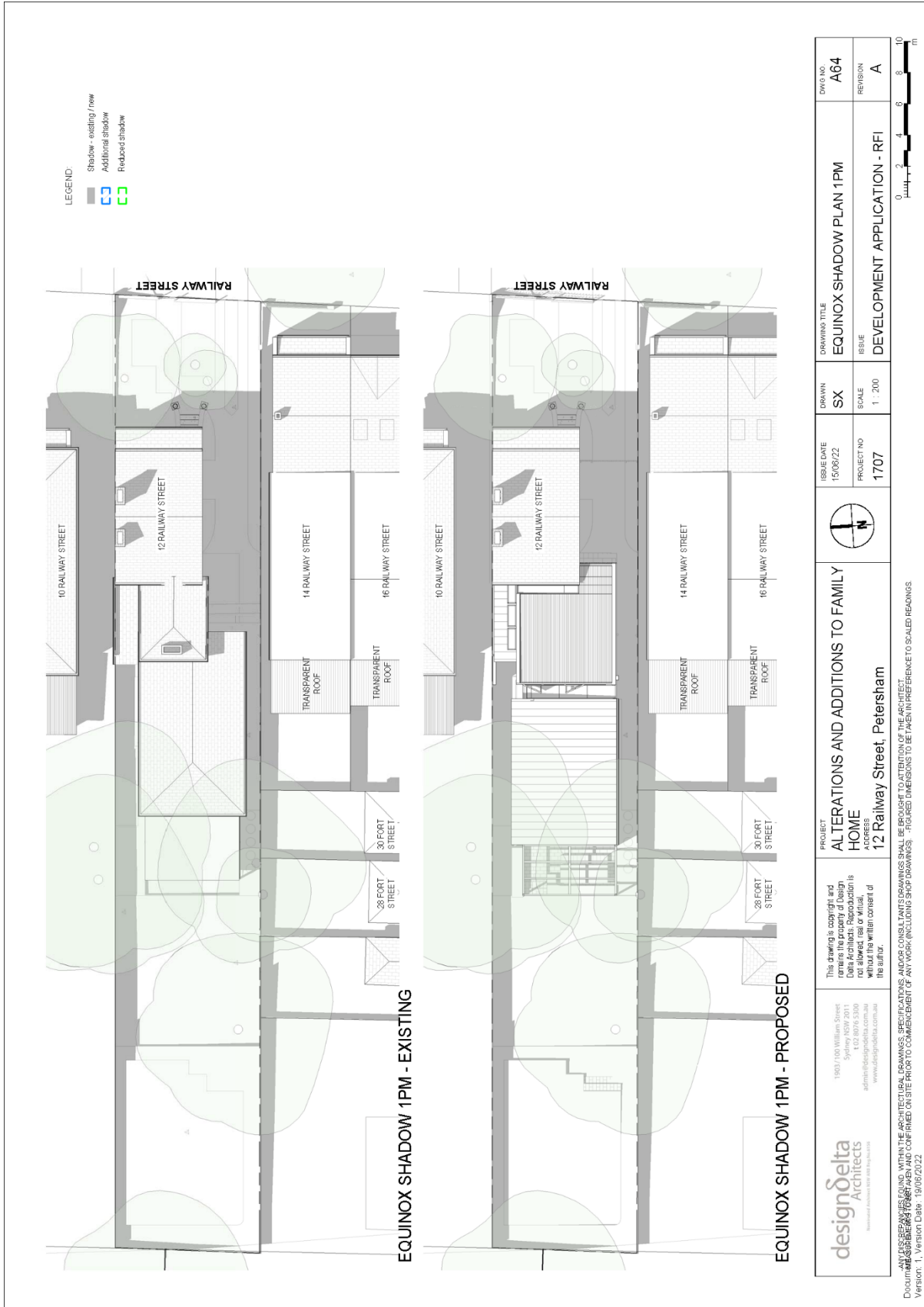






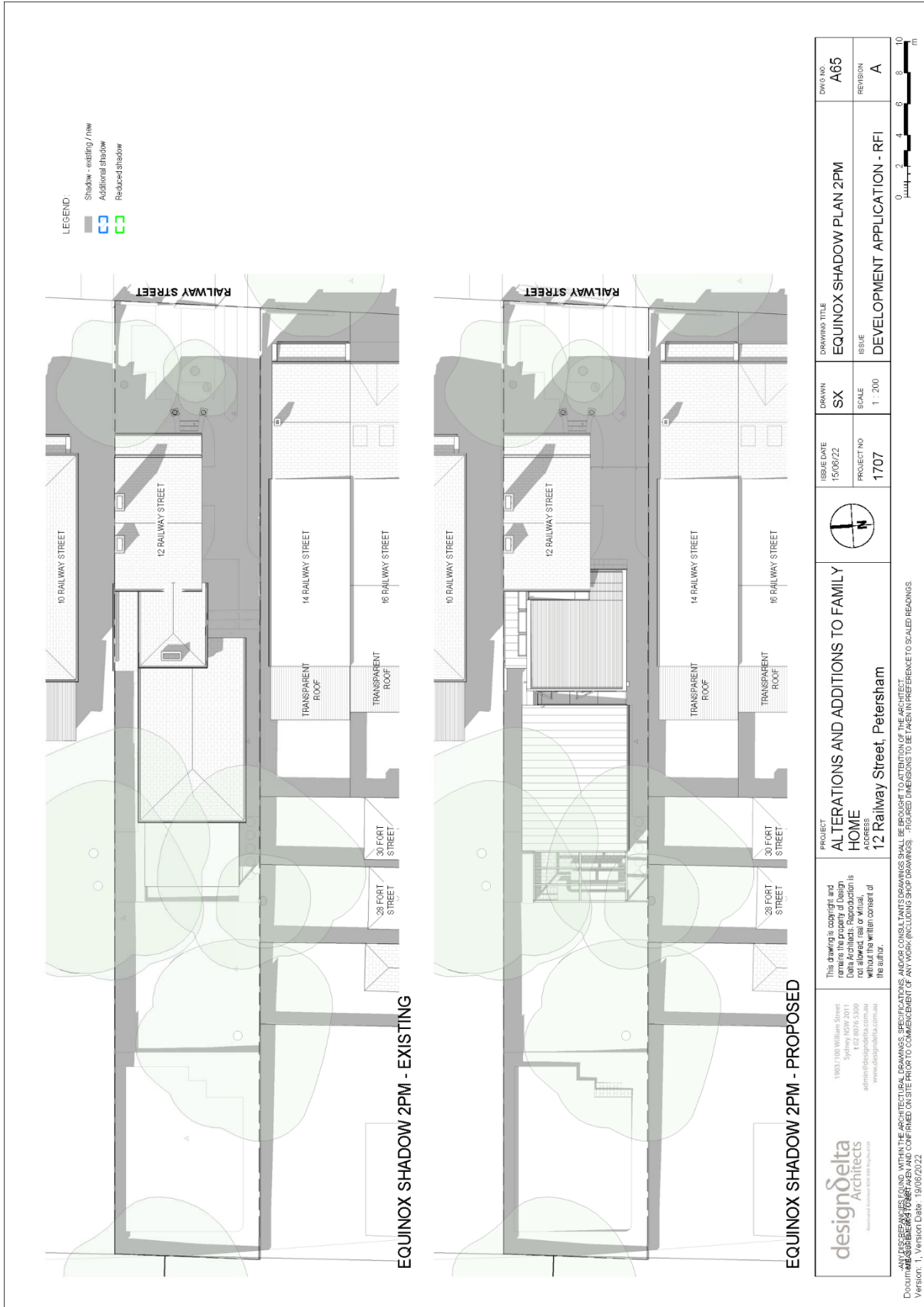


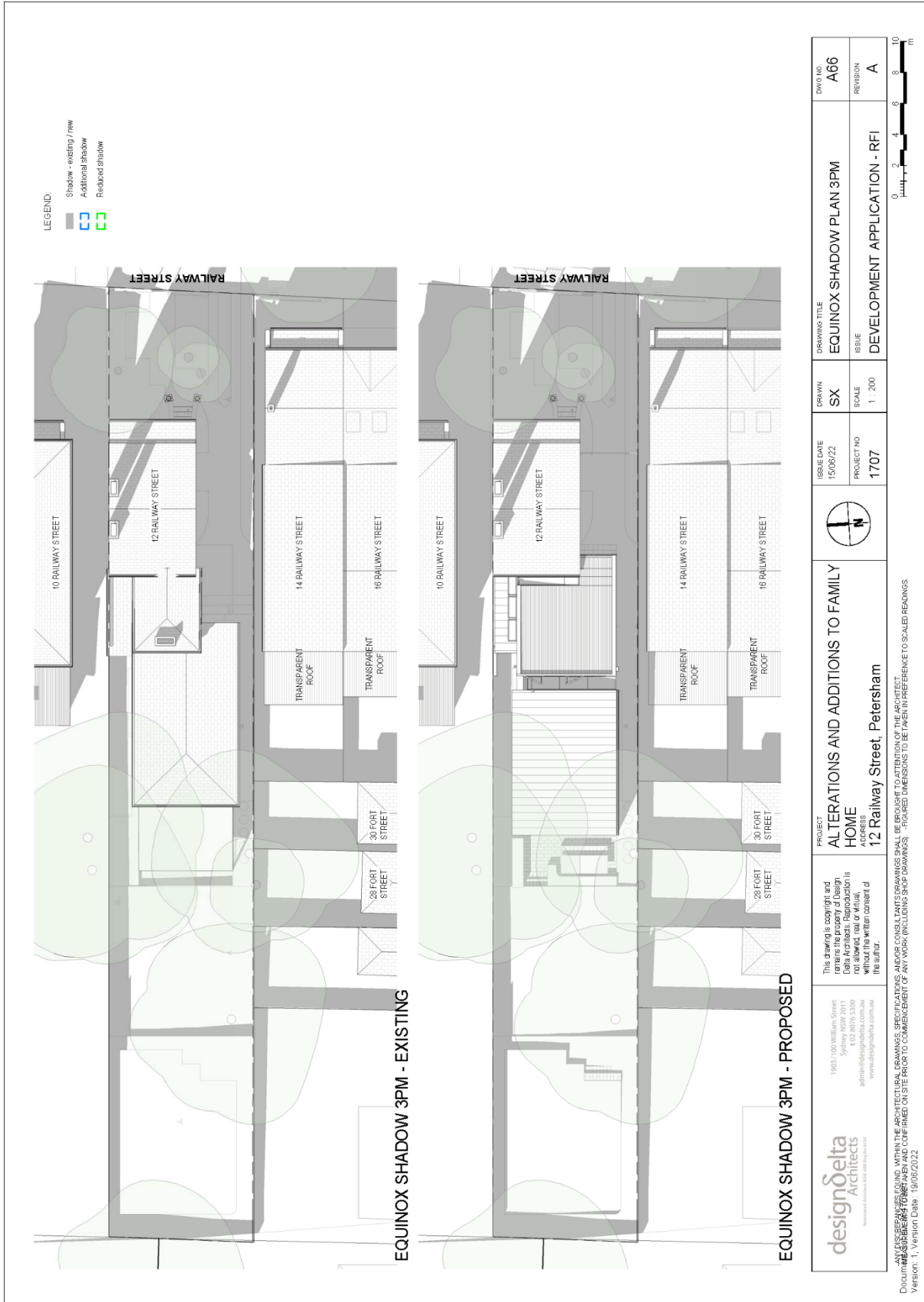




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				15/06/22	SX	EQUINOX SHADOW PLAN 1PM	A64
		PROJECT NO	SCALE	ISSUE	REVISION		
		1707	1 : 200	DEVELOPMENT APPLICATION - RFI	A		

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Attachment C- Heritage Impact Statement

16 May 2022

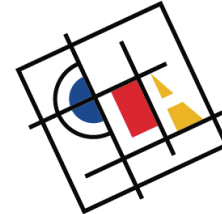
Attn: Inner West Council
PO Box 14,
PETERSHAM NSW 2049

Via Email: annalise.ifield@innerwest.nsw.gov.au

ATTENTION: Ms Annalise Ifield

Dear Ms Ifield,

**RE:12 Railway Street, PETERSHAM NSW 2049
DEVELOPMENT APPLICATION NO: DA/2021/1281**



**CRACKNELL
&
LONERGAN**
ARCHITECTS PTY LTD
ABN 55 100 940 501
Nominated Architect: Peter J Lonerган
NSW Architects Registration No. 5583

I refer to the assessment against DA/2021/1281 at 12 Railway Street Petersham set out by the Inner West Council, dated the 6th of May 2022, and in response to the heritage referral I make the following observations.

The subject dwelling, an 1880s Victorian terrace is not a heritage item, is located in the Railway Street Conservation Area and listed as contributory. The remnant building makes a contribution to the conservation area by its size and stand alone siting and alterations made to it over the 140 years does not make it intact and does not retain all of its significant fabric. The purpose of the assessment is to measure the impact of the proposal on the significance of the conservation area (not the subject site).

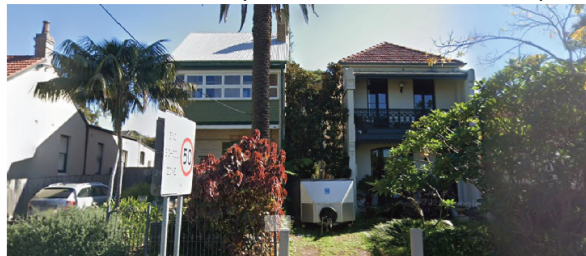
Prior to responding to the matters addressed by the Heritage Officer, the first point I make is with respect to the note raised by the Officer that with regards to *Control(C) C1- Part8.3 of MDCP2011 that "The proposed form of the lateral extension is atypical of the established typology and is not consistent with the recorded elements that contribute to the consistency of the streetscape in the HCA"*.

With regards to "established typology" the streetscape setting is established, though the streetscape typology is mixed.

The Railway Street Conservation Area is of aesthetic significance and as cited in Part 8.2.6.1of MDCP2011, Statement of Heritage Significance as the "diversity of buildings are of high quality". Railway Street is characterised by a diverse range of architectural styles and significant layering demonstrates a hybrid of built forms and eras and as a result some built forms not of high quality and intrusive. For the purposes of this evaluation a photographic record of the streetscape is shown below and brings to light the recorded elements (Part 8.2.6.2 of MDCP2011) that contribute, or in this case may not contribute to the consistency of the streetscape.

No. 12 the subject site is illegible as a Victorian Italianate terrace and is significant in the street for its standalone qualities. The original fabric removed and not intact.

No. 10 the adjoining terrace in the pared back Victorian Italianate style. Original chimney and roof contributing to the visual interest of roof scape removed. Current tiled hipped roof covers the later rear addition, inappropriate in scale and massing and subsequently roof is intrusive to the streetscape in the HCA.



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Streetscape Analysis (within the vicinity of the subject dwelling)



Nos. 14, 16 and 18 A group of buildings from the key period- Inter-war, conjoined tripartite dwellings though high quality of original detailing has been altered.



No. 20: presents an eclectic mix of Inter-war cottage and 1950s Art-Deco. Does not present high quality original detailing.



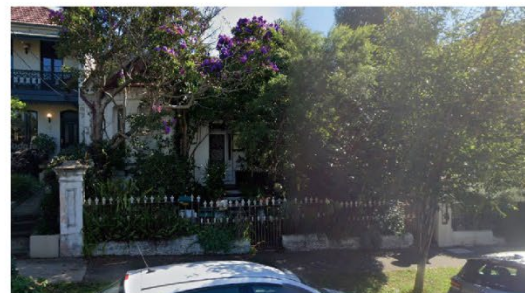
No. 22 a Bungalow style house dressed in motifs without regard for accurate rendition. Additions of a minor scale are obtrusive in the streetscape context: timber valance, aluminium framed windows, louvre shutters and fencing not appropriate to the building typology. Breaks the cohesiveness of materiality.



No. 24, 26 and 28 displays intact group of buildings from a key period of significance- Federation Bungalow and high quality original detailing to front elevation.



No. 30 and 32: Pair of marine villa in the pared back Victorian Italianate style. Detailing and finishes appropriate to the typology though not intact. No 28 Bungalow and high quality original detailing



No 8: Victorian cottage. Garden plantings in front of dwelling obscure the cottage. Inappropriate aluminium screen door to front. Obtrusive to the context.



No 6, 4 and 2: The cottage and villas to the north of the subject site demonstrate high quality detailing to the front elevation, strong street scape quality including cohesiveness of form, scale and materials.



No. 2 and 4: Pair of Victorian villas - "Glenthorn" and "Glenrock" and intact.

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Streetscape Analysis



No. 7 corner sited dwelling is a hybrid of Bungalow and Arts and Crafts, a later lateral lean-to, prominent and viewed in the round to the public domain. Does not contribute to the consistency of the streetscape.



No. 9 Post war Austere dwelling. Its envelope swathed in grey paint and matching grey corrugated iron awnings, stripped of its original finish and lack of original detailing.



No. 13 corner sited dwelling is totally obscured by plantings and trees. The screen of vegetation breaks the streetscape pattern, rhythm and texture.



No. 15 and 17 residential flat buildings Inter War Deco (intact) and Spanish mission later modified with upper level that removes the original roof form.

As evidenced in the photographic analysis, the street's visual catchment shows a variety of dwellings, some layered through loss of original detail, addition of inappropriate building elements in scale, bulk, material, or in some cases front garden settings totally overgrown and the dwellings obscured. The typology is not consistent and illustrates pockets within the streetscape lacking cohesive qualities -diminished with time.

The proposed works comprise the retention and preservation of the heritage fabric, with restoration of the extant principal form, the original balcony and the considered lateral addition which is considerably set back from the street front, retains and activates the Victorian terrace setting and curtilage whilst additions to the rear, not visible to the public domain enable the aesthetic heritage significance of the house to be retained.

Is the proposed lateral addition, largely on the existing footprint and to the second storey quiet enough within the mixed streetscape context? And does it conform to the recorded elements (Part 8.2.6.2 of MDCP2011) that contribute to the consistency of the streetscape and does the addition visible from the public domain, of minor scale respect the original built form and is unobtrusive in the context of the streetscape ?.

The remaining heritage matters raised are addressed:

Clause 5.10(1)(a) & (b) - MLEP 2011: The form and proportions of the proposed development does not satisfactorily conserve the heritage significance of the site and its surrounds.

The intrusive additions to the rear of the original building are removed and the new works contained within the existing footprint, orientated to the west with minimal impact to neighbouring properties, its height below that of the permissible LEP height plane and the upper level built below that of the principal forms gutter line. These design considerations allow the proposed additions not to overwhelm the contributory extant form nor its surrounds.

3.

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•Objective (O) 1 & 2 – Part 8.1 of MDCP 2011: The proposed form and proportions of the lateral extension and does not maintain appropriate settings and views that contribute to the identified heritage values of the area.

The two storey lateral addition has been revised, the tapering roof removed and the built form simplified in massing fenestration and clad in a timber slatted screen. Views to the subject site, are restricted to those available travelling north and south along Railway Street. The front portion of the dwelling and associated landscaping to the front is retained, the lateral addition stylised in form and reads as a “white box” and neutral to the public domain. It is significantly setback from the principal form and the street boundary, articulated as to not overwhelm and as a result activates the views within the HCA.



View to subject dwelling from Railway Street.

•C19 & C21 – Part 8.3 of MDCP 2011: The form of the lateral extension is not consistent with the overall massing and form of the property and is unsympathetic to the existing building form.

The lateral addition has the appearance of a pavilion, clad in a slatted timber screening and reads as a light structure and separate from the original form.

It is contemporary and subservient to the principal form and respects the extant forms integrity by not directly copying or mimicking its aestheticism.

•C42 – Part 8.3 of MDCP 2011: The proposed new glazing/laundry door to the is not appropriate in form or materials for the style of the house and is visible from the street.

The laundry door is relocated to the south face and ribbon window providing privacy to the neighbour.

•C47 & C49 – Part 8.3 of MDCP 2011: The extent of glazing visible from the street is not compatible with the proportions of the existing materials of the property.

The timber slat screening is appropriate, contemporary and assists in simplifying the fenestration. It screens the window to the front and the addition reads more as a minor pavilion on a colonnade base and does not detract from the significant character of the heritage conservation area or the streetscape.

It is my opinion the design as amended is acceptable on heritage grounds and will conserve and enhance the contributory building and the heritage conservation area.

Regards,

Peter Lonergan

Director | Cracknell & Lonergan Architects Pty Limited
Nominated Architect: Peter J Lonergan | Registration No. 5983

Attachment D - Arborist Report



Arboricultural Impact Assessment Report

Site location:

12 Railway Street
Petersham NSW

Prepared for:

Sticks and Stones Landscape Design

Prepared by: Jack Williams

Urban Arbor Pty Ltd

Date Prepared: 1 December 2021

Ref: 211201_12 Railway_AIA



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Site Address: 12 Railway St, Petersham, NSW.
 Prepared for: Sticks and Stones Landscape Design.
 Prepared by: Jack Williams, Urban Arbor Pty Ltd, sales@urbanarbor.com.au, (02) 8004 2802.
 Date prepared: 1 December 2021.

Document Set ID: 35659699
Version: 1, Version Date: 17/12/2021



1. INTRODUCTION

- 1.1 Urban Arbor have been instructed by Sticks and Stones Landscape Design to inspect all significant trees located at the site and provide an Arboricultural Impact Assessment Report in relation to a proposed development.
- 1.2 Below is a list of all documents and information provided to assist in preparing this report;
 - Detail and Level Survey, No date/revision number (see appendix 1A).
 - Architectural Drawings, Design Delta, Revision A - 28 November 2021.
- 1.3 The site and tree inspections were carried out on 2 July 2021. Access was available to the subject site and the adjoining public areas only.

2. SCOPE OF THE REPORT

- 2.1 This report has been undertaken to meet the following objectives.
 - 2.1.1 Conduct a ground level visual assessment of all significant trees located within 10 metres of development works. For the purpose of this report, a significant tree is a tree with a height equal to or greater than 3.5 metres.
 - 2.1.2 Determine the trees estimated contribution years and remaining useful life expectancy and award the trees a retention value.
 - 2.1.3 Provide an assessment of the potential impact the proposed development is likely to cause to the condition of the subject trees in accordance with AS4970 Protection of trees on development sites (2009).
 - 2.1.4 Specify tree protection measures in accordance with AS4970-2009 for any tree to be retained during the development.

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3. LIMITATIONS

- 3.1 The observations and recommendations are based on the site inspections identified in section 1 only. The findings of this report are based on the observations and site conditions at the time of inspection.
- 3.2 All of the observations were carried out from ground level. The accuracy of the assessment of the subject trees structural condition and health is limited to the visibility of the tree at the time of inspection.
- 3.3 The tree inspection was visual from ground level only. No soil or tissue testing was carried out as part of the tree inspection. None of the surrounding surfaces adjacent to trees were lifted or removed during the tree inspections.
- 3.4 Root decay can sometimes be present with no visual indication above ground. It is also impossible to know the extent of any root damage caused by mechanical damage such as underground root cutting during the installation of services without undertaking detailed root investigation. Any form of tree failure due to these activities is beyond the scope of this assessment.
- 3.5 While an assessment of the subject trees estimated useful life expectancy is included in this report, no specific tree risk assessment has been undertaken for any of trees at the site.
- 3.6 The report reflects the subject tree(s) as found on the day of inspection. Any changes to the growing environment of the subject tree, or tree management works beyond those recommended in this report may alter the findings of the report. There is no warranty, expressed or implied, that problems or deficiencies relating to the subject tree, or subject site may not arise in the future.
- 3.7 Tree identification is based on accessible visual characteristics at the time of inspection. As key identifying features are not always available the accuracy of identification is not guaranteed. Where tree species is unknown, it is indicated with an *spp.*
- 3.8 Urban Arbor neither guarantees, nor is it responsible for, the accuracy of information provided by others that is contained within this report.
- 3.9 All diagrams, plans and photographs included in this report are visual aids only and are not to scale unless otherwise indicated.
- 3.10 Alteration of this report invalidates the entire report.

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4. METHODOLOGY

- 4.1 The following information was collected during the assessment of the subject tree(s).
- 4.1.1 Tree common name
 - 4.1.2 Tree botanical name
 - 4.1.3 Tree age class
 - 4.1.4 DBH (Trunk/Stem diameter at breast height/1.4m) - millimetres.
 - 4.1.5 Estimated height - metres
 - 4.1.6 Estimated crown spread (radius of crown) - metres
 - 4.1.7 Health
 - 4.1.8 Structural condition
 - 4.1.9 Amenity value
 - 4.1.10 Estimated remaining contribution years (SULE)¹
 - 4.1.11 Retention value (Tree AZ)²
 - 4.1.12 Notes/comments
- 4.2 An assessment of the trees condition was made using the visual tree assessment (VTA) model (Mattheck & Breloer, 1994).³
- 4.3 Trunk diameter was measured using a DBH tape or in some cases estimated. The trunk diameter of all trees in adjoining sites has been estimated. Tree height and tree canopy spread was measured with a clinometer or in some cases estimated. All other measurements were estimations unless otherwise stated. The other tool used during the assessment was a digital camera.
- 4.4 All information was imported into (GIS) PT-mapper pro software. This software was used to measure/calculate all encroachment estimates included in this report.
- 4.5 All DBH measurements, tree protection zones, and structural root zones were calculated in accordance with methods set out in AS4970 Protection of trees on development sites (2009) in a Microsoft Excel spreadsheet.⁴
- 4.6 Details of how the observations in this report have been assessed are listed in the appendices.

¹ Barrell, J. (2001), 'SULE: Its use and status in the new millennium' in *Management of Mature Trees proceedings of the 4th NAAA Workshop*, Sydney, 2001. Barrell.

² Barrell Tree Consultancy, *Tree AZ version 10.10-ANZ*, <http://www.treeaz.com/>.

³ Mattheck, C. & Breloer, H., *The body language of trees - A handbook for failure analysis*, The Stationary Office, London, England (1994).

⁴ Council Of Standards Australia, *AS4970 Protection of trees on development sites* (2009).

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5. SITE LOCATION AND BRIEF DESCRIPTION

5.1 The site is located in the suburb of Petersham, New South Wales, which is located in the Inner West Local Government Area (LGA). All trees at the site are subject to protection under the Marrickville Local Environmental Plan (LEP) 2011⁵, Marrickville Development Control Plan (DCP) 2011⁶ and the Inner West Council Tree Management DCP 2020.⁷ The site is located inside a Heritage Conservation Area (C4) in the LEP heritage maps.⁸

6. GENERAL INFORMATION IN RELATION TO PROTECTING TREES ON DEVELOPMENT SITES

6.1 **Tree protection zone (TPZ):** The TPZ is the principle means of protecting trees on development sites and is an area required to maintain the viability of trees during development. It is commonly observed that tree roots will extend significantly further than the indicative TPZ, however the TPZ is an area identified in AS4970-2009 to be the area where root loss or disturbance will generally impact the viability of the tree. The TPZ is identified as a restricted area to prevent damage to trees either above or below ground during a development. Where trees are intended to be retained proposed developments must provide an adequate TPZ around trees. The TPZ is set aside for the tree's root zone, trunk and crown and it is essential for the stability and longevity of the tree. The TPZ also incorporates the SRZ (see below for more information about the SRZ). The TPZ is calculated by multiplying the DBH by twelve, with the exception of palms, other monocots, cycads and tree ferns, the TPZ of which have been calculated at one metre outside the crown projection. Additional information about the TPZ is included in Appendix 3.

6.2 **Structural Root Zone (SRZ):** This is the area around the base of a tree required for the trees stability in the ground. An area larger than the SRZ always needs to be maintained to preserve a viable tree. The SRZ is calculated using the following formula; $(DAB \times 50)^{0.42} \times 0.64$. There are several factors that can vary the SRZ which include height, crown area, soil type and soil moisture. It can also be influenced by other factors such as natural or built structures. Generally, work within the SRZ should be avoided. Soil level changes should also generally be avoided inside the SRZ of trees to be retained. Palms, other monocots, cycads and tree ferns do not have an SRZ. See the appendices for more information about the SRZ.

⁵ Marrickville Local Environmental Plan 2011, <https://www.legislation.nsw.gov.au/#/view/EPI/2011/645/full>, accessed 1 December 2021.

⁶ Marrickville Development Control Plan 2011, <https://www.innerwest.nsw.gov.au/develop/planning-controls/current-development-control-plans-dcp/marrickville-dcp>, accessed 1 December 2021.

⁷ Inner West Tree Management Development Control Plan 2020, <https://www.innerwest.nsw.gov.au/live/information-for-residents/trees/trees-on-your-property-pruning-or-removing>, accessed 1 December 2021.

⁸ Marrickville LEP Heritage map - Sheet HER_003, https://eplanningdlprod.blob.core.windows.net/pdfmaps/5200_COM_HER_003_010_20200928.pdf, accessed 1 December 2021.

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6.3 Minor encroachment into TPZ: Sometimes encroachment into the TPZ is unavoidable. Encroachment includes but is not limited to activities such as excavation, compacted fill and machine trenching. Minor encroachment of up to 10% of the overall TPZ area is normally considered acceptable, providing there is space adjacent to the TPZ for the tree to compensate and the tree is displaying adequate vigour/health to tolerate changes to its growing environment.

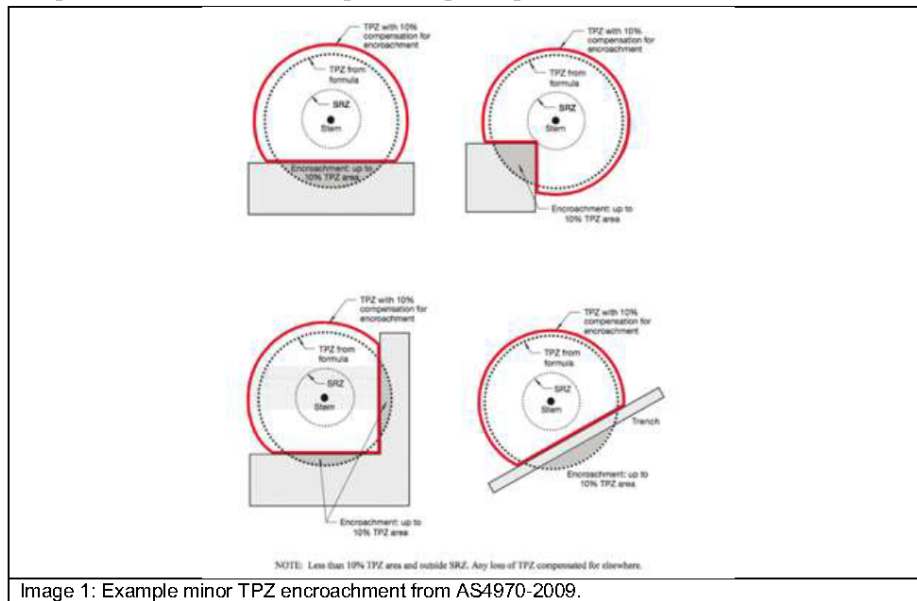


Image 1: Example minor TPZ encroachment from AS4970-2009.

6.4 Major encroachment into TPZ: Where encroachment of more than 10% of the overall TPZ area is proposed the project Arborist must investigate and demonstrate that the tree will remain in a viable condition. In some cases, tree sensitive construction methods such as pier and beam footings, suspended slabs, or cantilevered sections, can be utilised to allow additional encroachment into the TPZ by bridging over roots and minimising root disturbance. Major encroachment is only possible if it can be undertaken without severing significant size roots, or if it can be demonstrated that significant roots will not be impacted. Root investigations may be required to identify roots that will be impacted during major TPZ encroachment (see Appendix 3 for more information in relation to root investigations).

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7. OBSERVATIONS

- 7.1 **Tree information:** Details of each individual tree assessed, including the observations taken during the site inspection, can be found in the tree inspection schedule in Appendix 2, where the indicative tree protection zone (TPZ) and Structural Root Zone (SRZ) has been calculated for each of the subject trees. The TPZ and SRZ should be measured in radius from the centre of the trunk. Each of the subject trees have been awarded a retention value based on the observations using the Tree AZ method. Tree AZ is used to identify higher value trees worthy of being a constraint to development and lower value trees that should generally not be a constraint to the development. The Tree AZ categories sheet (Barrell Tree Consultancy) has been included in Appendix 3 to assist with understanding the retention values. The retention value that has been allocated to the subject trees in this report is not definitive and should only be used as a guideline.
- 7.2 **Site plan:** In appendix 1 two site plans have been prepared, where the tree information including canopy spread, TPZ and SRZ have been overlaid onto the site plans. The following site plans are included;
- Appendix 1A: Existing site plan
 - Appendix 1B: Proposed site plan

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8. ASSESSMENT OF CONSTRUCTION IMPACTS

8.1 Table 1: In the table below, the impact of the proposed development has been assessed for all trees included in the report. The assessed TPZ encroachments include proposed structures and hard landscaping only.

Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
1	<i>Phoenix canariensis</i>	A1	4.0	50.3	N/A	Major	A footpath/hard surfacing is proposed in the TPZ that will encroach by 22% (10.9m ²), which is major TPZ encroachment. There is existing hard surfacing within some of this area that occupies 13% (6.5m ²) of the area of the proposed hard surfacing, the total area of new hard surfacing in the TPZ is by 9%. The proposed site plan RL's indicate that the proposed hard surfacing will be constructed above the existing soil grade in the TPZ. The tree will not be significantly impacted by the proposed hard surfacing providing that no excavation is required during the construction.	Retain and protect
2	<i>Howea forsteriana</i>	Z1	2.0	12.6	N/A	Major	A footpath/hard surfacing is proposed in the TPZ that will encroach by 40% (5.1m ²), which is major TPZ encroachment. There is existing hard surfacing within some of this area that occupies 21% (2.6m ²) of the area of the proposed hard surfacing, the total area of new hard surfacing in the TPZ is by 19%. The proposed site plan RL's indicate that the proposed hard surfacing will be constructed above the existing soil grade in the TPZ. The tree will not be significantly impacted by the proposed hard surfacing providing that no excavation is required during the construction.	Retain and protect
3	<i>Howea forsteriana</i>	Z1	2.0	12.6	N/A	Footprint	The trunk is located within the footprint of proposed hard surfacing.	Remove
4	<i>Unknown spp (possibly Schefflera spp)</i>	A1	5.6	98.5	2.6	Major	The tree is located in an adjoining site. The existing dwelling and alfresco/covered patio occupy 25% (25.1m ²) of the TPZ and are located in the SRZ. The proposed development works in the TPZ include the demolition of the existing structures and the construction of a dwelling addition, including a basement, and new hard surfacing/pergola structure. The proposed dwelling encroaches into the TPZ by 14% (13.6m ²) and into the SRZ, which is major TPZ encroachment. However, the proposed	Retain and protect



Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
							<p>basement encroaches into the TPZ by 8% (8.2m²) but not into the SRZ, 4% of this area is located within the footprint of the existing dwelling. All other parts of the dwelling that encroach into the SRZ are cantilevered above the existing soil grade and will not impact the root system of the tree. The proposed dwelling and basement will therefore not significantly impact the tree.</p> <p>New hard surfacing is also proposed to the rear of the dwelling that will encroach into the TPZ by a further 21% (20.4m²) and into the SRZ, which is major TPZ encroachment. The majority of this area is covered by the existing alfresco. The proposed sections indicate that the hard surfacing will be constructed at the existing soil grade (see image below). The new hard surfacing will therefore not significantly impact the tree providing that the new hard surfacing and sub-base is constructed above existing soil grades in the TPZ.</p> <p>A pergola structure is proposed in the area of the hard surfacing, which will be supported by two pier footings. To ensure that the tree is not impacted by the piers, the location of the piers must be flexible to avoid significant roots in the TPZ (roots greater than 40mm in diameter).</p>	



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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
5	<i>Jacaranda mimosifolia</i>	A1	6.1	116.9	2.7	Minor	The proposed pool and coping/hard surfacing encroaches into the TPZ by 4% (5.2m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted. The tree is located in an adjoining site. The existing dwelling and alfresco/covered patio and hard surfacing occupy 20% (32.2m ²) of the TPZ and are located in the SRZ. The proposed development works in the TPZ include the demolition of the existing structures and the construction of a dwelling addition, including a basement, and hard surfacing/terrace structure. The proposed dwelling encroaches into the TPZ by 12% (20.1m ²) and into the SRZ, which is major TPZ encroachment. However, the proposed basement encroaches into the TPZ by 8% (12.4m ²) but not into the SRZ, 5% of this area is located within the footprint of the existing dwelling. All other parts of the dwelling that encroach into the SRZ are cantilevered above the existing soil grade and will not impact the root system of the tree. The proposed dwelling and basement will therefore not significantly impact the tree.	Retain and protect
6	<i>Corymbia citrifolia</i>	A1	7.2	162.9	2.8	Major	New hard surfacing is also proposed to the rear of the dwelling that will encroach into the TPZ by a further 10% (16m ²) but not into the SRZ, which is major TPZ encroachment. The majority of this area is covered by the existing alfresco. The proposed sections indicate that the hard surfacing will be constructed at the existing soil grade. The new hard surfacing will therefore not significantly impact the tree providing that the new hard surfacing and sub-base is constructed above existing soil grades in the TPZ. A pergola structure is proposed in the area of the hard surfacing, which will be supported by two pier footings. To ensure that the tree is not impacted by the piers, the location of the piers must be flexible to avoid significant roots in the TPZ (roots greater than 40mm in diameter).	Retain and protect

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
7	<i>Ulmus parvifolia</i>	A1	6.0	113.1	2.6	Major	<p>The tree is located in an adjoining site. The existing dwelling and alfresco/covered patio and hard surfacing occupy 15% (16.4m²) of the TPZ. The proposed development works in the TPZ include the demolition of the existing structures and the construction of a dwelling addition, including a basement, and new hard surfacing/ pergola structure.</p> <p>The proposed dwelling encroaches into the TPZ by 6% (6.3m²) but not into the SRZ. The proposed basement encroaches into the TPZ by 2% (1.8m²) but not into the SRZ. All other parts of the dwelling that encroach into the SRZ are cantilevered above the existing soil grade and will not impact the root system of the tree. The proposed dwelling and basement will therefore not significantly impact the tree.</p> <p>New hard surfacing is also proposed to the rear of the dwelling that will encroach into the TPZ by a further 12% (13.9m²) but not into the SRZ, which is major TPZ encroachment. The majority of this area is covered by the existing alfresco. The proposed sections indicate that the hard surfacing will be constructed at the existing soil grade. The new hard surfacing will therefore not significantly impact the tree providing that the new hard surfacing and sub-base is constructed above existing soil grades in the TPZ.</p> <p>A pergola structure is proposed in the area of the hard surfacing, which will be supported by two pier footings. To ensure that the tree is not impacted by the piers, the location of the piers must be flexible to avoid significant roots in the TPZ (roots greater than 40mm in diameter).</p>	Retain and protect
8	<i>Persea americana</i>	A1	6.0	113.1	2.6	Minor	<p>The proposed pool and coping/hard surfacing encroaches into the TPZ by 9% (10.3m²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.</p>	Retain and protect

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
9	<i>Livistona australis</i>	A1	3.0	28.3	N/A	Major	The tree is located in an adjoining site. The existing alfresco/covered patio and hard surfacing occupy 7% (2m ²) of the TPZ. The proposed development works in the TPZ include the demolition of the existing structures and the construction of a new hard surfacing and pergola structure. New hard surfacing is also proposed to the rear of the dwelling that will encroach into the TPZ by 19% (5.5m ²), which is major TPZ encroachment. The majority of this area is covered by the existing alfresco. The proposed sections indicate that the hard surfacing will be constructed at the existing soil grade. The new hard surfacing will therefore not significantly impact the tree providing that the new hard surfacing and sub-base is constructed above existing soil grades in the TPZ.	Retain and protect
10	<i>Robinia pseudoacacia</i>	A1	4.7	69.4	2.3	None	No encroachment into the TPZ.	Retain and protect

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9. CONCLUSIONS

9.1 **Table 2:** Summary of the impact to trees by the development;

Impact	Reason	Category A Tree numbers	Category Z Tree numbers	Total trees
		A	Z	
Trees recommended to be removed	Building construction, new surfacing and/or proximity to proposed structures	None	3	1
Trees recommended to be retained	Removal of existing surfacing/structures and/or installation of new surfacing/structures will not impact the viability of the trees	1, 4, 5, 6, 7, 8, 9, 10	2	9



10. RECOMMENDATIONS

- 10.1 This report assesses the impact of a proposed development at the subject site to all significant trees located inside or adjoining the site. Ten trees have been identified and assessed.
- 10.2 In appendix 1 two site plans have been prepared, where the tree information including canopy spread, TPZ and SRZ have been overlaid onto the site plans. The following site plans are included;
 - Appendix 1A: Existing site plan
 - Appendix 1B: Proposed site plan
- 10.3 One tree has been recommended to be removed to accommodate the development works, including tree 3.
- 10.4 All other trees can be retained in a viable condition, including tree 1, 2, 4, 5, 6, 7, 8, 9 and 10. To ensure the trees 1, 2, 4, 6, 7 and 9 are not adversely impacted, all new hard surfacing in the TPZ should be constructed above the existing soil grades. Also, the location of the piers for the pergola structure in the TPZ of tree 4, 6 and 7 must be flexible to avoid significant roots in the TPZ (roots greater than 40mm in diameter).
- 10.5 All trees to be retained must be protected in accordance with AS4970-2009, details of which are included in section 11.
- 10.6 No landscape plan has been assessed in this report. See section 11.10 for general guidance in relation to minimising the impact of proposed landscaping to retained trees and replacement tree planting.
- 10.7 No services plan has been assessed in this report, all services plans should be subject to review by a consulting Arborist. Where possible underground services should be located outside the TPZ of trees to be retained. All underground services located inside the TPZ of any tree to be retained must be installed via tree sensitive techniques in accordance with AS4970-2009, see section 11.11 for more information.
- 10.8 This report does not provide approval for tree removal or pruning works. All recommendations in this report are subject to approval by the relevant authorities and/or tree owners. This report should be submitted as supporting evidence with the development application.

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11. TREE PROTECTION REQUIREMENTS

- 11.1 **Use of this report:** All contractors must be made aware of the tree protection requirements prior to commencing works at the site. This report and a copy of the site plans (Appendix 1) drawing must also be made available to any contractor prior to works commencing and during any on site operations. Appendix 1 includes the recommended location of tree protection overlaid onto the proposed site plan.
- 11.2 **Project Arborist:** Prior to any works commencing at the site a project Arborist should be appointed. The project Arborist should be qualified to a minimum AQF level 5 and/or equivalent qualifications and experience and should assist with any development issues relating to trees that may arise. If at any time it is not feasible to carryout works in accordance with this, an alternative must be agreed in writing with the project Arborist.
- 11.3 **Tree work:** All tree work should be carried out by a qualified and experienced Arborist with a minimum of AQF level 3 in arboriculture, in accordance with NSW Work Cover Code of Practice for the Amenity Tree Industry (1998) and AS4373 Pruning of amenity trees (2007).
- 11.4 **Initial site meeting/on-going regular inspections:** The project Arborist is to hold a pre-construction site meeting with principal contractor to discuss methods and importance of tree protection measures and resolve any issues in relation to tree protection that may arise. In accordance with AS4970-2009, the project Arborist should carryout regular site inspections to ensure works are carried out in accordance with this document throughout the development process. Site inspections are recommended on a monthly frequency throughout the development.
- 11.5 **Site Specific Tree Protection Recommendations:** It is the responsibility of the principal contractor to install tree protection prior to works commencing at the site (prior to demolition works) and to ensure that the tree protection remains in adequate condition for the duration of the development. The tree protection must not be moved without prior agreement of the project Arborist. The project Arborist must inspect that the tree protection has been installed in accordance with this document and AS4970-2009 prior to works commencing. See section 11.6 for requirements of tree protection. See Appendix 1 for indicative fencing location.

Tree ID	Tree Species	TPZ Radius (m)	SRZ Radius (m)	Recommendations
1	<i>Phoenix canariensis</i>	4.0	N/A	Retain and protect. Tree protection will need to be modified during different phases of the development. Prior to re-landscaping of the front garden, fencing should be aligned at the edge of the garden bed. TPZ signage on fencing. The fencing should only be relocated for landscaping under the approval of the project Arborist.

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Tree ID	Tree Species	TPZ Radius (m)	SRZ Radius (m)	Recommendations
2	<i>Howea forsteriana</i>	2.0	N/A	Retain and protect. Tree protection will need to be modified during different phases of the development. Prior to re-landscaping of the front garden, fencing should be aligned at the edge of the garden bed. TPZ signage on fencing. The fencing should only be relocated for landscaping under the approval of the project Arborist.
3	<i>Howea forsteriana</i>	2.0	N/A	Remove
4	<i>Unknown spp (possibly Schefflera spp)</i>	5.6	2.6	Retain and protect. Prior to demolition works commencing, ground protection is required for the whole area of the TPZ within the site that is outside the footprint of the existing dwelling and hard surfacing. After demolition is complete, additional ground protection is required for any area of the TPZ that is not covered by a structure prior to its construction, for example within the new paved area. The project Arborist should regularly certify that the ground protection is adequate for the phase of development works.
5	<i>Jacaranda mimosifolia</i>	6.1	2.7	Retain and protect. Tree protection will need to be modified during different phases of the development. During the pool construction, an access route will be required through the TPZ. During this phase, fencing should be aligned to restrict access to as much of the TPZ as possible. TPZ signage on fencing. Ground protection is required for the access route/any area of the TPZ not protected by the fence. After the pool construction is complete, it is recommended that the fencing is realigned to restrict access to whole area to the rear of the site.
6	<i>Corymbia citriodora</i>	7.2	2.8	Retain and protect. Prior to demolition works commencing, ground protection is required for the whole area of the TPZ within the site that is outside the footprint of the existing dwelling and hard surfacing. After demolition is complete, additional ground protection is required for any area of the TPZ that is not covered by a structure prior to its construction, for example within the new paved area. The project Arborist should regularly certify that the ground protection is adequate for the phase of development works.
7	<i>Ulmus parvifolia</i>	6.0	2.6	Retain and protect. Prior to demolition works commencing, ground protection is required for the whole area of the TPZ within the site that is outside the footprint of the existing dwelling and hard surfacing. After demolition is complete, additional ground protection is required for any area of the TPZ that is not covered by a structure prior to its construction, for example within the new paved area. The project Arborist should regularly certify that the ground protection is adequate for the phase of development works.

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Tree ID	Tree Species	TPZ Radius (m)	SRZ Radius (m)	Recommendations
8	<i>Persea americana</i>	6.0	2.6	Retain and protect. Fencing should be aligned as close to the proposed pool coping as practical. TPZ signage on fencing
9	<i>Livistona australis</i>	3.0	N/A	Retain and protect. Prior to demolition works commencing, ground protection is required for the whole area of the TPZ within the site that is outside the footprint of the existing dwelling and hard surfacing. After demolition is complete, additional ground protection is required for any area of the TPZ that is not covered by a structure prior to its construction, for example within the new paved area. The project Arborist should regularly certify that the ground protection is adequate for the phase of development works.
10	<i>Robinia pseudoacacia</i>	4.7	2.3	Retain and protect. Trunk protection only.

11.6 Tree Protection Specifications:

- 11.6.1 Trunk and Branch Protection: The trunk must be protected by wrapped hessian or similar material to limit damage. Timber planks (50mm x 100mm or similar) should then be placed around tree trunk. The timber planks should be spaced at 100mm intervals and must be fixed against the trunk with tie wire or strapping and connections finished or covered to protect pedestrians from injury. The hessian and timber planks must not be fixed to the tree in any instance. The trunk and branch protection shall be installed prior to any work commencing on site and shall be maintained in good condition for the entire development period.
- 11.6.2 Protective fencing: The protective fencing must be constructed of 1.8 metre 'cyclone chainmesh fence'. The fencing should only be removed for the landscaping phase, and this should be approved by the project Arborist. Where it is not feasible to install fencing at the specified location due to factors such as restricting access to areas of the site or for constructing new structures, an alternative location and protection specification must be agreed with the project Arborist. Any modifications to the fencing locations must be approved by the project Arborist.
- 11.6.3 TPZ signage: Tree protection signage is to be attached to the protective fencing, displayed in a prominent position and the sign repeated at 10 metres intervals or closer where the fence changes direction. Each sign shall contain in a clearly legible form, the following information:
 - Tree protection zone/No access.
 - This fence has been installed to prevent damage to the tree/s and their growing environment both above and below ground. Do not move fencing or enter TPZ without the agreement of the project Arborist.

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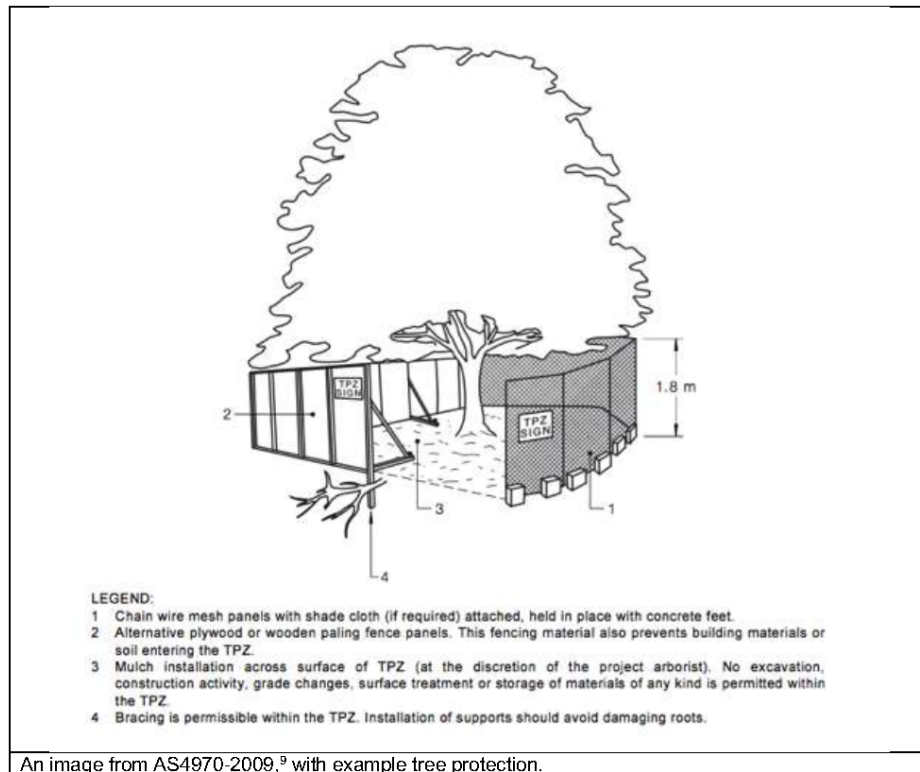
- The name, address, and telephone number of the developer/builder and project Arborist

11.6.4 Mulch: Any areas of the TPZ located inside the subject site must be mulched to a depth of 75mm with good quality mulch. Mulch must not be built-up around the trunk the trees as it can cause collar rot.

11.6.5 Ground Protection: Ground protection is required to protect the underlying soil structure and root system in areas where it is not practical to restrict access to whole TPZ, while allowing space for construction. Ground protection must consist of good quality composted wood chip/leaf mulch to a depth of between 150-300mm, laid on top of geo textile fabric, with timber/plywood boards overlaid. If vehicles are to be using the area, additional protection will be required such as rumble boards or track mats to spread the weight of the vehicle and avoid load points. Ground protection is to be specified and approved by the project Arborist as required.

11.6.6 Temporary irrigation: Temporary irrigation should distribute water evenly throughout the area of the TPZ. The irrigation should be used for at minimum two hours weekly throughout all stages of the development, and may be required a higher frequency, this should be advised by the project Arborist.

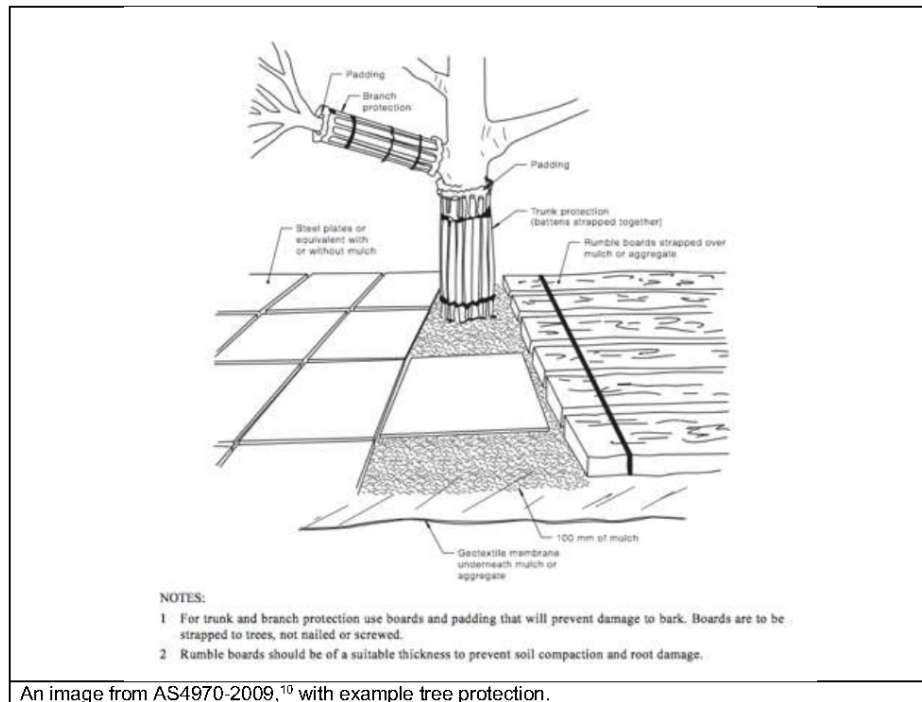
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An image from AS4970-2009,⁹ with example tree protection.

⁹ Council Of Standards Australia, AS4970 Protection of trees on development sites (2009), page 16.

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11.7 **Restricted activities inside TPZ:** The following activities must be avoided inside the TPZ of all trees to be retained unless approved by the project Arborist. If at any time these activities cannot be avoided an alternative must be agreed in writing with the project Arborist to minimise the impact to the tree.

- A) Machine excavation.
- B) Ripping or cultivation of soil.
- C) Storage of spoil, soil or any such materials
- D) Preparation of chemicals, including preparation of cement products.
- E) Refuelling.
- F) Dumping of waste.
- G) Wash down and cleaning of equipment.
- H) Placement of fill.
- I) Lighting of fires.
- J) Soil level changes.
- K) Any physical damage to the crown, trunk, or root system.
- L) Parking of vehicles.

¹⁰ Council Of Standards Australia, *AS4970 Protection of trees on development sites* (2009), page 17.

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- 11.8 Demolition:** The demolition of all existing structures inside or directly adjacent to the TPZ of trees to be retained must be undertaken in consultation with the project Arborist. Any machinery is to work from inside the footprint of the existing structures or outside the TPZ, reaching in to minimise soil disturbance and compaction. If it is not feasible to locate demolition machinery outside the TPZ of trees to be retained, ground protection will be required. The demolition should be undertaken inwards into the footprint of the existing structures, sometimes referred to as the 'top down, pull back' method.
- 11.9 Excavations:** The project Arborist must supervise and certify that all excavations and root pruning are in accordance with AS4373-2007 and AS4970-2009. For continuous strip footings, first manual excavation is required along the edge of the structures closest to the subject trees. Manual excavation should be a depth of 1 metre (or to unfavourable root growth conditions such as bed rock or heavy clay, if agreed by project Arborist). Next roots must be pruned back in accordance with AS4373-2007. After all root pruning is completed, machine excavation is permitted within the footprint of the structure. For tree sensitive footings, such as pier and beam, all excavations inside the TPZ must be manual. Manual excavation may include the use of pneumatic and hydraulic tools, high-pressure air or a combination of high-pressure water and a vacuum device. No pruning of roots greater 30mm in diameter is to be carried out without approval of the project arborist. All pruning of roots greater than 30mm in diameter must be carried out by a qualified Arborist/Horticulturalist with a minimum AQF level 3. Root pruning is to be a clean cut with a sharp tool in accordance with AS4373 Pruning of amenity trees (2007).¹¹ The tree root is to be pruned back to a branch root if possible. Make a clean cut and leave as small a wound as possible.
- 11.10 Landscaping:** All landscaping works within the TPZ of trees to be retained are to be undertaken in consultation with a consulting Arborist to minimise the impact to trees. General guidance is provided below to minimise the impact of new landscaping to trees to be retained.
- All excavations for landscaping works should be manual and in accordance with section 11.9.
 - Replacement planting for all trees recommended for removal should be incorporated into the landscape plan. It is recommended that at minimum one tree for each tree proposed to be removed are planted to maintain/increase overall canopy cover at the site when mature. Any replacement tree must be selected in accordance with AS2303-2015 Tree stock for landscape use.
 - The location of new plantings inside the TPZ of trees to be retained should be flexible to avoid unnecessary damage to tree roots greater than 40mm in diameter.

¹¹ Council Of Standards Australia, AS 4373 Pruning of amenity trees (2007) page 18

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- Level changes should be minimised. The existing ground levels within the landscape areas should not be lowered by more than 50mm or increased by more than 100mm without assessment by a consulting Arborist.
 - New retaining walls should be avoided. Where new retaining walls are proposed inside the TPZ of trees to be retained, they should be constructed from tree sensitive material, such as timber sleepers, that require minimal footings/excavations. If brick retaining walls are proposed inside the TPZ, considerer pier and beam type footings to bridge significant roots that are critical to the trees condition. Retaining walls must be located outside the SRZ and sleepers/beams located above existing soil grades.
 - New footpaths and hard surfaces should be minimised, as they can limit the availability of water, nutrients and air to the trees root system. Where they are proposed, they should be constructed on or above existing soil grades to minimise root disturbance and consider using a permeable surface. Footpaths should be located outside the SRZ.
 - Where fill/sub base is used inside the TPZ, fill material should be a coarse granular material that does not restrict the flow of water and air to the root system below. This type of material will also reduce the impact of soil compaction during construction.
 - Any new fencing in the TPZ of trees should constructed carefully to avoid impacting significant roots. The location of fence posts should be flexible to allow for the retention of root greater than 40mm in diameter. The base of fence panels should be located above existing soil grades.
- 11.11 **Underground Services:** Where possible underground services should be located outside the TPZ of trees to be retained. All underground services located inside the TPZ of any tree to be retained must be installed via tree sensitive techniques. This should include either directional drilling methods or manual excavations to minimise the impact to trees identified for retention. No roots greater than 30mm in diameter should be severed during the installation of service pipes unless approved in writing by the project Arborist.
- 11.12 **Sediment and Contamination:** All contamination run off from the development such as but not limited to concrete, sediment and toxic wastes must be prevented from entering the TPZ at all times.
- 11.13 **Tree Wounding/Injury:** Any wounding or injury that occurs to a tree during the construction process will require the project Arborist to be contacted for an assessment of the injury and provide mitigation/remediation advice. It is generally accepted that trees may take many years to decline and eventually die from root damage. All repair work is to be carried out by the project Arborist, at the contractor's expense.
- 11.14 **Completion of Development Works:** After all construction works are complete the project Arborist should assess that the subject trees have been retained in the same condition and vigour. If changes to condition are identified the project Arborist should provide recommendations for remediation.

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12. CONSTRUCTION HOLD POINTS FOR TREE PROTECTION

12.1 **Hold Points:** Below is a sequence of hold points requiring project Arborist certification throughout the development process. It provides a list of hold points that must be checked and certified. All certification must be provided in written format upon completion of the development. The final certification must include details of any instructions for remediation undertaken during the development. The principal contractor should be responsible for implementing all tree protection requirements.

Hold Point	Stage	Date Completed and Signature of Project Arborist Responsible
Project Arborist to hold pre construction site meeting with principal contractor to discuss methods and importance of tree protection measures and resolve any issues in relation to feasibility of tree protection requirements that may arise. Project Arborist to mark all trees approved for removal under DA consent.	Prior to development work commencing	
Project Arborist to assess and certify that tree protection has been installed in accordance with AS4970-2009 prior to works commencing at site.	Prior to development work commencing.	
In accordance with AS4970-2009 the project arborist should carryout regular site inspections to ensure works are carried out in accordance with the recommendations. Site inspections are recommended on a monthly frequency.	On-going throughout the development	
The removal of existing structures inside the TPZ of any tree to be retained, such as the existing buildings and hard surfaces must be supervised by the project Arborist.	Demolition	
Project Arborist to supervise all manual excavations and root pruning inside the TPZ of any tree to be retained. Project Arborist to approve all pruning of roots greater than 30mm inside TPZ. All root pruning of roots greater than 30mm in diameter must be carried out by a qualified Arborist/Horticulturalist with a minimum AQF level 3.	Construction	
Project Arborist to certify that all underground services including storm water inside TPZ of any tree to be retained have been installed in accordance with AS4970-2009.	Construction	
Project Arborist to approve relocation of tree protection for landscaping. All landscaping works within the TPZ of trees to be retained are to be undertaken in consultation with the project Arborist to minimise the impact to trees.	Construction/ Landscape	
After all demolition, construction and landscaping works are complete the project Arborist should assess that the subject trees have been retained in the same condition and vigour. If changes to condition are identified the project Arborist should provide recommendations for remediation.	Upon completion of development	

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13. BIBLIOGRAPHY/REFERENCES

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14. LIST OF APPENDICES

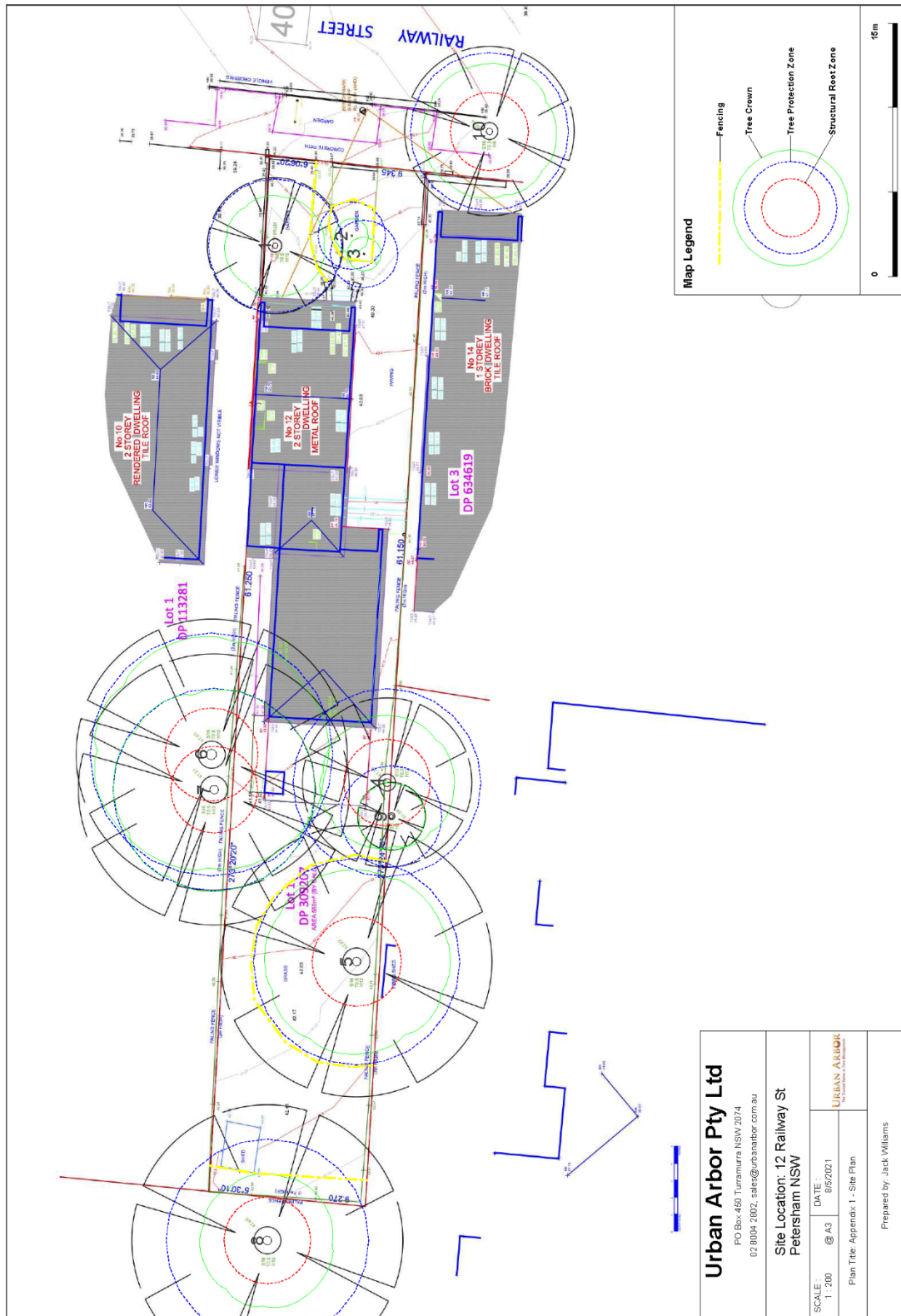
The following are included in the Appendices:

- Appendix 1: Site Plans
- Appendix 2: Tree Inspection Schedule
- Appendix 3: Further Information of Methodology

Jack Williams
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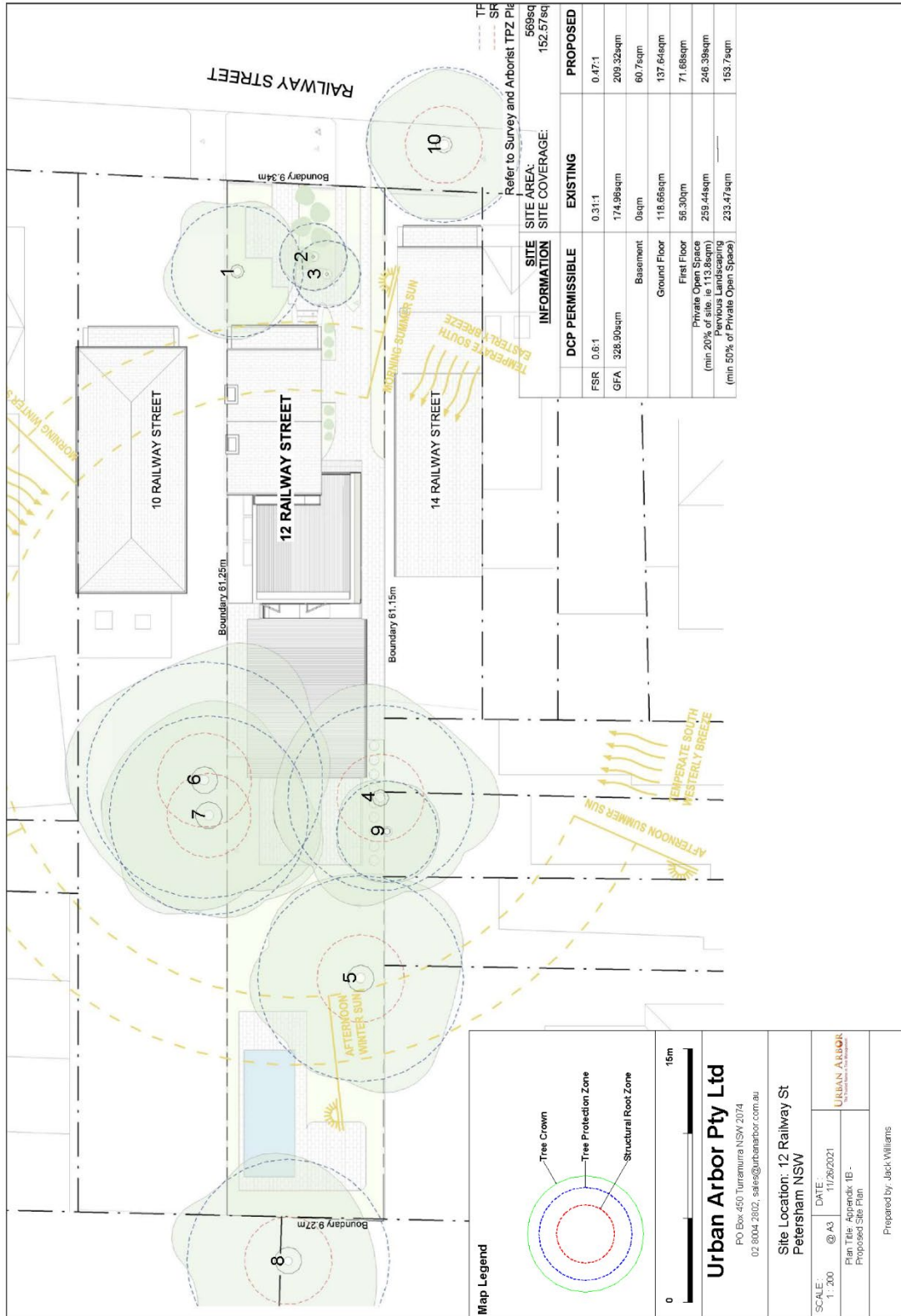
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PO Box 460 Tumamara NSW 2074 02 8004 2002, sales@urbanarbor.com.au	
Site Location: 12 Railway St Petersham NSW	
SCALE: 1 : 200	DATE: 8/5/2021
Plan Title: Appendix 1 - Site Plan	
Prepared by: Jack Williams	

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Appendix 2 - Tree Inspection Schedule

Tree ID	Common Name	Botanical Name	Age Class	Height (m)	Canopy Spread Radius (m)	Stem 1	Stem 2	Stem 3	Stem 4	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
1	Canary Island Date Palm	<i>Phoenix canariensis</i>	Mature	12	3	600				600	N/A	Good	Good	Medium	1. Long	A1	4.0	N/A	None.
2	Kentia Palm	<i>Howea forsteriana</i>	Semi-mature	5	1	120				120	N/A	Good	Good	Low	1. Long	Z1	2.0	N/A	Not marked on survey.
3	Kentia Palm	<i>Howea forsteriana</i>	Semi-mature	5	1	110				110	N/A	Good	Good	Low	1. Long	Z1	2.0	N/A	Not marked on survey.
4	Unknown Species	Unknown spp (possibly <i>Schefflera spp</i>)	Mature	9	4	300	250	250		464	550	Good	Good	Medium	2. Medium	A1	5.6	2.6	Located in adjoining site.
5	Jacaranda	<i>Jacaranda mimosifolia</i>	Mature	12	5.5	510				510	590	Good	Good	Medium	1. Long	A1	6.1	2.7	None.
6	Lemon Scented Gum	<i>Corymbia citriodora</i>	Mature	14	7	600				600	650	Good	Good	High	1. Long	A1	7.2	2.8	Located in adjoining site.
7	Chinese Elm	<i>Ulmus parvifolia</i>	Mature	10	6	500				500	550	Good	Fair	Medium	2. Medium	A1	6.0	2.6	Located in adjoining site. Asymmetric crown shape.
8	Avocado	<i>Persea americana</i>	Mature	9	4	500				500	550	Good	Good	Medium	1. Long	A1	6.0	2.6	Located in adjoining site.
9	Cabbage Palm	<i>Livistona australis</i>	Mature	8	2	400				400	N/A	Good	Fair	Medium	2. Medium	A1	3.0	N/A	located in adjoining site. Trunk leans due to up-sloping from adjacent tree.
10	Black Locust	<i>Robinia pseudoacacia</i>	Mature	8	4	390				390	430	Good	Good	Medium	2. Medium	A1	4.7	2.3	Street tree.

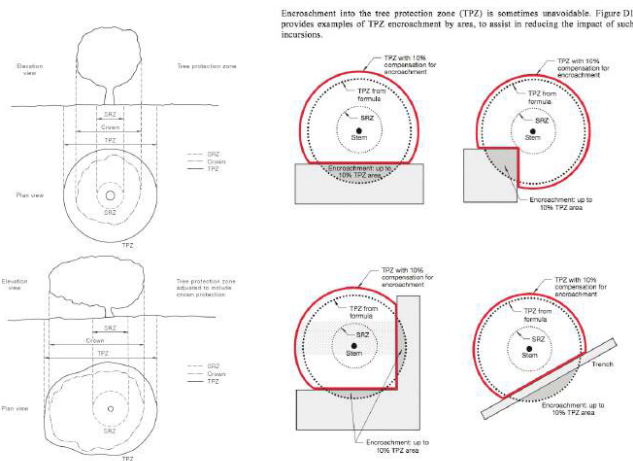
Botanical Notes

Tree Species - Where species is unknown it is indicated with an 'Spp'.
Age Class - Over mature (OM), Mature (M), Early mature (EM), Semi mature (SM), Young (Y).
Diameter at Breast Height (DBH) - Measured with a DBH tape or estimator at approximately 1.4m above ground level.
Height from Building Level (DAB) - Measured from the top edge of the finished ground level to the top of the crown.
Height - Height from the lowest point of the crown to the highest point of the crown. All trees are measured to the highest point of the crown unless otherwise indicated.
Spread - Radius of crown at widest section. All trees spreads are estimated unless otherwise indicated.
Tree Protection Zone (TPZ) - DBH x 12. Measured in radius from the centre of the trunk. Rounded to nearest 0.1m. For mono-cots, the TPZ is set at 1 metre outside the crown projection.
Structural Root Zone (SRZ) - (DAB x 50) ^{1/2} x 0.64. Measured in radius from the centre of the trunk. Rounded up to nearest 0.1m.
Health - Good/Fair/Poor/Dead
Structure - Good/Fair/Poor
Safe Useful Life Expectancy (SULE) - 1. Long (40+ years), 2. Medium (15 - 40 years), 3. Short (5 - 15 years), 4. Remove (under 5 years), 5. Small/young.
Amenity Value - Very High/High/Medium/Low/Very Low.
Retention Value - Tree AZ, see appendix 3 for categories.

Appendix 3 - Further Information of Methodology

1. **Tree Protection Zone:** The tree protection zone (TPZ) is the principle means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable. The radius of the TPZ is calculated for each tree by multiplying its DBH x 12. The derived value is measured in radius from the centre of the stem/trunk at ground level. A TPZ should not be less than 2.0 metres nor greater than 15 metres (except where crown protection is required). It is commonly observed that tree roots will extend significant further than the indicative TPZ, however the TPZ is an area identified AS4970-2009 to be extent where root loss or disturbance will generally not impact the viability of the tree. The TPZ is identified as a restricted area to prevent damage to trees either above or below ground during a development. Where trees are intended to be retained proposed developments must provide an adequate TPZ around trees. The TPZ is set aside for the tree's root zone, trunk and crown and it is essential for the stability and longevity of the tree. The tree protection also incorporates the SRZ (see below for more information about the SRZ). I have calculated the TPZ of palms, other monocots, cycads and tree ferns at one metre outside the crown projection. See appendices for additional information about the TPZ including information about calculating the TPZ and examples of TPZ encroachment.

Minor encroachment into TPZ: Sometimes encroachment into the TPZ is unavoidable. Encroachment includes but is not limited to activities such as excavation, compacted fill and machine trenching. Minor encroachment of up to 10% of the overall TPZ area is normally considered acceptable, providing there is space adjacent to the TPZ for the tree to compensate and the tree is displaying adequate vigour/health to tolerate changes to its growing environment. **Major encroachment into TPZ:** Where encroachment of more than 10% of the overall TPZ area is proposed the project Arborist must investigate and demonstrate that the tree will remain in a viable condition. In some cases, tree sensitive construction methods such as pier and beam footings, suspended slabs, or cantilevered sections, can be utilised to allow additional encroachment into the TPZ by bridging over roots and minimising root disturbance. Major encroachment is only possible if it can be undertaken without severing significant size roots, or if it can be demonstrated that significant roots will not be impacted.



2. **Structural Root Zone:** This is the area around the base of a tree required for the trees stability in the ground. An area larger than the SRZ always need to be maintained to preserve a viable tree as it will only have a minor effect on the trees vigour and health. There are several factors that determine the SRZ which include height, crown area, soil type and soil moisture. It can also be influenced by other factors such as natural or built structures. Generally work within the SRZ should be avoided.

An indicative SRZ radius can be determined from the diameter of the trunk measured immediately above the root buttresses. Root investigation could provide more information about the extent of the SRZ. The following formula should be used to calculate the SRZ.

$$SRZ \text{ radius} = (D \times 50)^{0.75} \times 0.64 \text{ (D = Diameter above root buttress)}$$

3. **Tree Age Class:** It can be difficult to determine the age of a tree without carrying out invasive tests that may damage the tree, so we have categorised there likely age class which is defined below;

- Young/Newly planted: Young or recently planted tree.
- Semi Mature: Up to 20% of the usual life expectancy for the species.
- Early mature/Mature: Between 20%- 80% of the usual life expectancy for the species.
- Over mature: Over 80% of the usual life expectancy for the species.
- Dead: Tree is dead or almost dead.

4. **Health/Physiological Condition:** Below are examples conditions used when assigning a category for tree health.

Category	Example condition	Summary
Good	<ul style="list-style-type: none"> • Crown has good foliage density for species. • Tree shows no or minimal signs of pathogens that are unlikely to have an effect on the health of the tree. • Tree is displaying good vigour and reactive growth development. 	<ul style="list-style-type: none"> • The tree is in above average health and condition and no remedial works are required.
Fair	<ul style="list-style-type: none"> • The tree may be starting to dieback or have over 25% deadwood. • Tree may have slightly reduced crown density or thinning. • There may be some discolouration of foliage. • Average reactive growth development. • There may be early signs of pathogens which may further deteriorate the health of the tree. • There may be epicormic growth indicating increased levels of stress within the tree. 	<ul style="list-style-type: none"> • The tree is in below average health and condition and may require remedial works to improve the trees health.
Poor	<ul style="list-style-type: none"> • The tree may be in decline, have extensive dieback or have over 30% deadwood. • The canopy may be sparse or the leaves may be unusually small for species. • Pathogens or pests are having a significant detrimental effect on the tree health. 	<ul style="list-style-type: none"> • The tree is displaying low levels of health and removal or remedial works may be required.
Dead	<ul style="list-style-type: none"> • The tree is dead or almost dead. 	<ul style="list-style-type: none"> • The tree should generally be removed.

5. **Structural Condition:** Below are examples conditions used when assigning a category for structural condition.

Category	Example condition	Summary
Good	<ul style="list-style-type: none"> • Branch unions appear to be strong with no sign of defects. • There are no significant cavities. • The tree is unlikely to fail in usual conditions. • The tree has a balanced crown shape and form. 	<ul style="list-style-type: none"> • The tree is considered structurally good with well developed form.
Fair	<ul style="list-style-type: none"> • The tree may have minor structural defects within the structure of the crown that could potentially develop into more significant defects. • The tree may have a cavity that is currently unlikely to fail but may deteriorate in the future. • The tree is an unbalanced shape or leans significantly. • The tree may have minor damage to its roots. • The root plate may have moved in the past but the tree has now compensated for this. • Branches may be rubbing or crossing. 	<ul style="list-style-type: none"> • The identified defects are unlikely cause major failure. • Some branch failure may occur in usual conditions. • Remedial works can be undertaken to alleviate potential defects.
Poor	<ul style="list-style-type: none"> • The tree has significant structural defects. • Branch unions may be poor or weak. • The tree may have a cavity or cavities with excessive levels of decay that could cause catastrophic failure. • The tree may have root damage or is displaying signs of recent movement. • The tree crown may have poor weight distribution which could cause failure. 	<ul style="list-style-type: none"> • The identified defects are likely to cause either partial or whole failure of the tree.

6. **Amenity Value:** To determine the amenity value of a tree we assess a number of different factors, which include but are not limited to the information below.

- The visibility of the tree to adjacent sites.
- The relationship between the tree and the site.
- Whether the tree is protected by any statutory conditions.
- The habitat value of the tree.
- Whether the tree is considered a noxious weed species.

The amenity value is rated using one of the following values.

- Very High
- High
- Moderate
- Low
- Very Low

7. **Safe Useful Life Expectancy (SULE), (Barrel, 2001):** A trees safe useful life expectancy is determined by assessing a number of different factors including the health and vitality, estimated age in relation to expected life expectancy for the species, structural defects, and remedial works that could allow retention in the existing situation.

Category	Description
1. Long - Over 40 years	(a) Structurally sound trees located in positions that can accommodate future growth. (b) Trees that could be made suitable for retention in the long term by remedial tree care. (c) Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.
2. Medium - 15 to 40 years	(a) Trees that may only live between 15 and 40 more years. (b) Trees that could live for more than 40 years but may be removed for safety or nuisance reasons. (c) Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. (d) Trees that could be made suitable for retention in the medium term by remedial tree care.
3. Short - 5 to 15 years	(a) Trees that may only live between 5 and 15 more years. (b) Trees that could live for more than 15 years but may be removed for safety or nuisance reasons. (c) Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. (d) Trees that require substantial remedial tree care and are only suitable for retention in the short term.
4. Remove - Under 5 years	(a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions. (b) Dangerous trees because of instability or recent loss of adjacent trees. (c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form. (d) Damaged trees that are clearly not safe to retain. (e) Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. (f) Trees that are damaging or may cause damage to existing structures within 5 years. (g) Trees that will become dangerous after removal of other trees for the reasons given in (a) to (f). (h) Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.
5. Small/Young	(a) Small trees less than 5m in height. (b) Young trees less than 15 years old but over 5m in height. (c) Formal hedges and trees intended for regular pruning to artificially control growth.

8. **Root investigations:** The root investigations should identify roots greater than 30mm in diameter that are located along the edge of the structures footprint or in the location of footings. Root investigations must be carried out using non-invasive methods, such as manual excavations or ground penetrating radar (GPR). Any excavations for the root investigations must be carried out manually to avoid damaging the roots during excavations. Manual excavation may include the use of a high-pressure air/air knife, or a combination of high-pressure water and a vacuum device. When hand excavating carefully work around roots retaining as many as possible. Take care to not fray, wound, or cause damage to any roots during excavations as this may cause decay or infection from pathogens. It is essential that exposed roots are kept moist and the excavation back filled as soon as possible. The root investigations should be carried out by a qualified Arborist minimum AQF3. Once roots are exposed, a visual assessment can be carried out by a consulting Arborist to evaluate the potential impact of the proposed root loss on the health and stability of the tree. A root map/report should be prepared identifying the findings of investigations, including photographs as supporting evidence in the report.

9. **Retention Value:** The system I have used to award the retention value is Troo AZ. Troo AZ is used to identify higher value trees worthy of being a constraint to development and lower value trees that should generally not be a constraint to the development. The table below provides a brief description of each category.

TreeAZ Categories (Version 10.04-ANZ)

CAUTION: TreeAZ assessments must be carried out by a competent person qualified and experienced in arboriculture. The following category descriptions are designed to be a brief field reference and are not intended to be self-explanatory. They must be read in conjunction with the most current explanations published at www.TreeAZ.com.

Category Z: Unimportant trees not worthy of being a material constraint

Local policy exemptions: Trees that are unsuitable for legal protection for local policy reasons including size, proximity and species	
Z1	Young or insignificant small trees, i.e. below the local size threshold for legal protection, etc
Z2	Too close to a building, i.e. exempt from legal protection because of proximity, etc
Z3	Species that cannot be protected for other reasons, i.e. scheduled noxious weeds, out of character in a setting of acknowledged importance, etc
High risk of death or failure: Trees that are likely to be removed within 10 years because of acute health issues or severe structural failure	
Z4	Dead, dying, diseased or declining Severe damage and/or structural defects where a high risk of failure cannot be satisfactorily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, overgrown and vulnerable to adverse weather conditions, etc
Z5	Severe damage and/or structural defects where a high risk of failure cannot be satisfactorily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, overgrown and vulnerable to adverse weather conditions, etc
Z6	Instability, i.e. poor anchorage, increased exposure, etc Excessive nuisance: Trees that are likely to be removed within 10 years because of unacceptable impact on people
Z7	Excessive, severe and intolerable inconvenience to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. dominance, debris, interference, etc
Z8	Excessive, severe and intolerable damage to property to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. severe structural damage to surfacing and buildings, etc
Good management: Trees that are likely to be removed within 10 years through responsible management of the tree population	
Z9	Severe damage and/or structural defects where a high risk of failure can be temporarily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, vulnerable to adverse weather conditions, etc
Z10	Poor condition or location with a low potential for recovery or improvement, i.e. dominated by adjacent trees or buildings, poor architectural framework, etc
Z11	Removal would benefit better adjacent trees, i.e. relieve physical interference, suppression, etc
Z12	Unacceptably expensive to retain, i.e. severe defects requiring excessive levels of maintenance, etc

NOTE: Z trees with a high risk of death/failure (Z4, Z5 & Z6) or causing severe inconvenience (Z7 & Z8) at the time of assessment and need an urgent risk assessment can be designated as ZZ. ZZ trees are likely to be unsuitable for retention and at the bottom of the categorization hierarchy. In contrast, although Z trees are not worthy of influencing new designs, urgent removal is not essential and they could be retained in the short term, if appropriate.

Category A: Important trees suitable for retention for more than 10 years and worthy of being a material constraint

A1	No significant defects and could be retained with minimal remedial care
A2	Minor defects that could be addressed by remedial care and/or work to adjacent trees
A3	Special significance for historical, cultural, commemorative or rarity reasons that would warrant extraordinary efforts to retain for more than 10 years
A4	Trees that may be worthy of legal protection for ecological reasons (Advisory requiring specialist assessment)

NOTE: Category A1 trees that are already large and exceptional, or have the potential to become so with minimal maintenance, can be designated as AA at the discretion of the assessor. Although all A and AA trees are sufficiently important to be material constraints, AA trees are at the top of the categorization hierarchy and should be given the most weight in any selection process.

TreeAZ is designed by Barrell Tree Consultancy (www.barrelltreecare.co.uk) and is reproduced with their permission

Glossary of Terms

Abiotic - Pertaining to non-living agents; e.g. environmental factors

Adventitious shoots - Shoots that develop other than from apical, axillary or dormant buds; see also 'epicormic'

Anchorage - The system whereby a tree is fixed within the soil, involving cohesion between roots and soil and the development of a branched system of roots which withstands wind and gravitational forces transmitted from the aerial parts of the tree

Bark - A term usually applied to all the tissues of a woody plant lying outside the vascular cambium, thus including the phloem, cortex and periderm; occasionally applied only to the periderm or the phellem

Branch:

- **Primary.** A first order branch arising from a stem
- **Lateral.** A second order branch, subordinate to a primary branch or stem and bearing sub-lateral branches
- **Sub-lateral.** A third order branch, subordinate to a lateral or primary branch, or stem and usually bearing only twigs

Branch collar - A visible swelling formed at the base of a branch whose diameter growth has been disproportionately slow compared to that of the parent stem; a term sometimes applied also to the pattern of growth of the cells of the parent stem around the branch base

Brown-rot - A type of wood decay in which cellulose is degraded, while lignin is only modified

Buckling - An irreversible deformation of a structure subjected to a bending load

Buttress zone - The region at the base of a tree where the major lateral roots join the stem, with buttress-like formations on the upper side of the junctions

Cambium - Layer of dividing cells producing xylem (woody) tissue internally and phloem (bark) tissue externally

Canker - A persistent lesion formed by the death of bark and cambium due to colonisation by fungi or bacteria

Compartmentalisation - The confinement of disease, decay or other dysfunction within an anatomically discrete region of plant tissue, due to passive and/or active defences operating at the boundaries of the affected region

Compressive loading - Mechanical loading which exerts a positive pressure; the opposite to tensile loading

Condition - An indication of the physiological condition of the tree. Where the term 'condition' is used in a report, it should not be taken as an indication of the stability of the tree

Crown/Canopy - The main foliage bearing section of the tree

Crown lifting - The removal of limbs and small branches to a specified height above ground level

Crown thinning - The removal of a proportion of secondary branch growth throughout the crown to produce an even density of foliage around a well-balanced branch structure

Crown reduction/shaping - A specified reduction in crown size whilst preserving, as far as possible, the natural tree shape

DAB (Diameter Above Buttress) - Trunk diameter measured above the root buttress

Defect - In relation to tree hazards, any feature of a tree which detracts from the uniform distribution of mechanical stress, or which makes the tree mechanically unsuited to its environment

Dieback - The death of parts of a woody plant, starting at shoot-tips or root-tips

Disease - A malfunction in or destruction of tissues within a living organism, usually excluding mechanical damage; in trees, usually caused by pathogenic micro-organisms

Dominance - In trees, the tendency for a leading shoot to grow faster or more vigorously than the lateral shoots; also the tendency of a tree to maintain a taller crown than its neighbours

Dormant bud - An axial bud which does not develop into a shoot until after the formation of two or more annual wood increments; many such buds persist through the life of a tree and develop only if stimulated to do so

Dysfunction - In woody tissues, the loss of physiological function, especially water conduction, in sapwood

DBH (Diameter at Breast Height) - Stem diameter measured at a height of 1.4 metres or the nearest measurable point. Where measurement at a height of 1.4 metres is not possible, another height may be specified

Deadwood - Branch or stem wood bearing no live tissues. Retention of deadwood provides valuable habitat for a wide range of species and seldom represents a threat to the health of the tree. Removal of deadwood can result in the ingress of decay to otherwise sound tissues and climbing operations to access deadwood can cause significant damage to a tree. Removal of deadwood is generally recommended only where it represents an unacceptable level of hazard

Epicormic shoot - A shoot having developed from a dormant or adventitious bud and not having developed from a first year shoot

Flush-cut - A pruning cut which removes part of the branch bark ridge and or branch-collar

Girdling root - A root which circles and constricts the stem or roots possibly causing death of phloem and/or cambial tissue

Habit - The overall growth characteristics, shape of the tree and branch structure

Hazard beam - An upwardly curved part of a tree in which strong internal stresses may occur without being reduced by adaptive growth; prone to longitudinal splitting

Incorporating extracts from Lonsdale, D. 1999. Principles of Tree Hazard Assessment. Her Majesty's Stationary Office, London

Heartwood/false-heartwood - The dead central wood that has become dysfunctional as part of the aging processes and being distinct from the sapwood

Heave - A term mainly applicable to a shrinkable clay soil which expands due to re-wetting after the felling of a tree which was previously extracting moisture from the deeper layers; also the lifting of pavements and other structures by root diameter expansion; also the lifting of one side of a wind-rocked root-plate

Included bark (ingrown bark) - Bark of adjacent parts of a tree (usually forks, acutely joined branches or basal flutes) which is in face-to-face contact

Lever arm - A mechanical term denoting the length of the lever represented by a structure that is free to move at one end, such as a tree or an individual branch

Lignin - The hard, cement-like constituent of wood cells; deposition of lignin within the matrix of cellulose microfibrils in the cell wall is termed Lignification

Lions tailing - A term applied to a branch of a tree that has few if any side-branches except at its end, and is thus liable to snap due to end-loading

Loading - A mechanical term describing the force acting on a structure from a particular source; e.g. the weight of the structure itself or wind pressure

Mycelium - The body of a fungus, consisting of branched filaments (hyphae)

Occlusion - The process whereby a wound is progressively closed by the formation of new wood and bark around it

Pathogen - A micro-organism which causes disease in another organism

Photosynthesis - The process whereby plants use light energy to split hydrogen from water molecules, and combine it with carbon dioxide to form the molecular building blocks for synthesizing carbohydrates and other biochemical products

Probability - A statistical measure of the likelihood that a particular event might occur

Pruning - The removal or cutting back of twigs or branches, sometimes applied to twigs or small branches only, but often used to describe most activities involving the cutting of trees or shrubs

Radial - In the plane or direction of the radius of a circular object such as a tree stem

Reactive Growth/Reaction Wood - Production of woody tissue in response to altered mechanical loading; often in response to internal defect or decay and associated strength loss (cf. adaptive growth)

Ring-barking - The removal of a ring of bark and phloem around the circumference of a stem or branch, normally resulting in an inability to transport photosynthetic assimilates below the area of damage. Almost inevitably results in the eventual death of the affected stem or branch above the damage

Root-collar - The transitional area between the stem/s and roots

Sapwood - Living xylem tissues

Soft-rot - A kind of wood decay in which a fungus degrades cellulose within the cell walls, without any general degradation of the wall as a whole

Stem/s - Principle above-ground structural component(s) of a tree that supports its branches

Stress - In plant physiology, a condition under which one or more physiological functions are not operating within their optimum range, for example due to lack of water, inadequate nutrition or extremes of temperature

SRZ (Structural Root Zone) - The area around the base of the tree required for the tree's stability in the ground.

Subsidence - In relation to soil or structures resting in or on soil, a sinking due to shrinkage when certain types of clay soil dry out, sometimes due to extraction of moisture by tree roots

Taper - In stems and branches, the degree of change in girth along a given length

Targets - In tree risk assessment (with slight misuse of normal meaning) persons or property or other things of value which might be harmed by mechanical failure of the tree or by objects falling from it

Topping - In arboriculture, the removal of the crown of a tree, or of a major proportion of it

Transpiration - The evaporation of moisture from the surface of a plant, especially via the stomata of leaves; it exerts a suction which draws water up from the roots and through the intervening xylem cells

TPZ (Tree Protection Zone) - A specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development.

Understorey - This layer consists of younger individuals of the dominant trees, together with smaller trees and shrubs which are adapted to grow under lower light conditions

Veteran tree - Tree that, by recognised criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned. These characteristics might typically include a large girth, signs of crown retrenchment and hollowing of the stem

Vigour - The expression of carbohydrate expenditure to growth (in trees)

White-rot - A range of kinds of wood decay in which lignin, usually together with cellulose and other wood constituents, is degraded

Wind exposure - The degree to which a tree or other object is exposed to wind, both in terms of duration and velocity

Wind pressure - The force exerted by a wind on a particular object

Windthrow - The blowing over of a tree at its roots

Incorporating extracts from Lonsdale, D. 1999. Principles of Tree Hazard Assessment. Her Majesty's Stationary Office, London