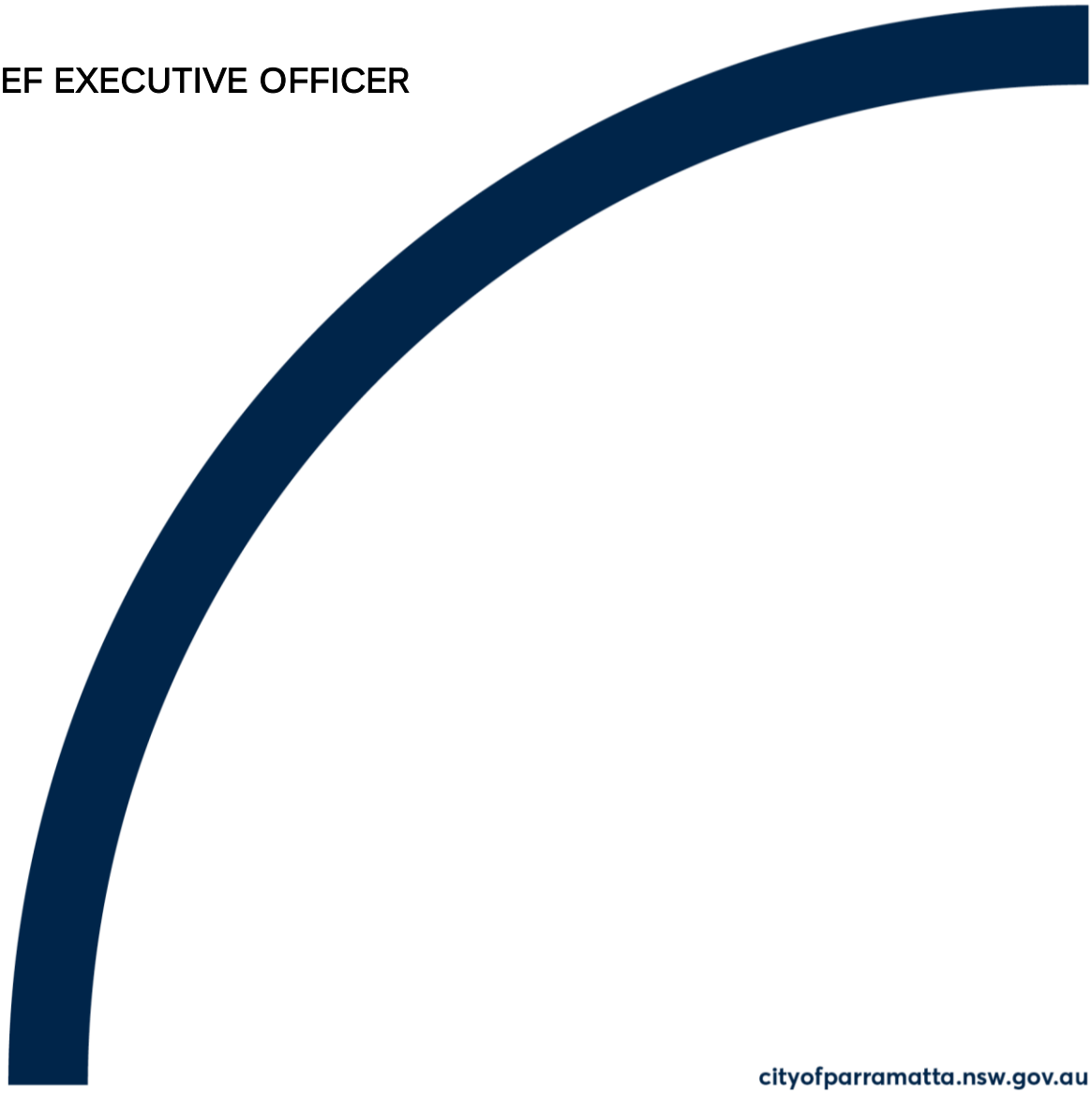
NOTICE OF LOCAL PLANNING PANEL MEETING

PUBLIC AGENDA

A Local Planning Panel meeting will be held in PHIVE 2 Civic Place, Parramatta at 5 Parramatta Square on Tuesday, 21 March 2023 at 3:30pm.

Bryan Hynes
ACTING CHIEF EXECUTIVE OFFICER



CITY OF PARRAMATTA

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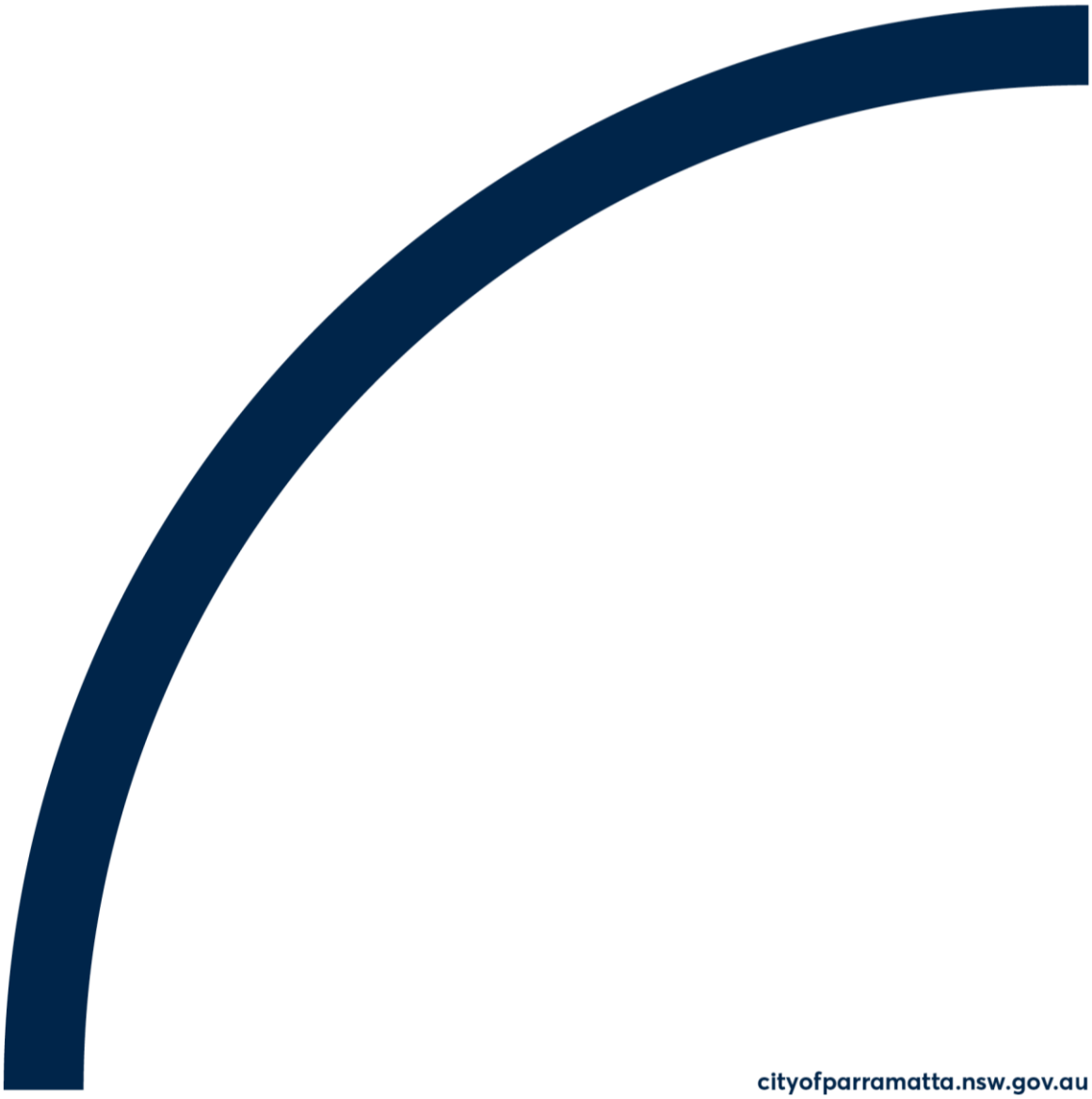

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DEVELOPMENT APPLICATIONS

21 MARCH 2023

DEVELOPMENT APPLICATION

ITEM NUMBER	5.1
SUBJECT	PUBLIC MEETING: 21-23 Norfolk Road, EPPING (Lot 4 DP 8487, Lot A DP 371706)
DESCRIPTION	Section 4.56 modification of DA/745/2018 for Site consolidation, partial demolition and alterations and additions to existing structures, tree removal and construction of a 53 place childcare centre with basement car parking containing 14 car parking spaces (including 6 visitor spaces and 8 staff spaces) and 1 motorcycle space, associated business identification signage and proposed hours of operation from 7:00am to 6:00pm, Monday to Friday. The modification seeks to amend the basement parking, pedestrian entry and other elements in order to increase childcare placements from 53 to 82 and additional carparking from 14 to 23.
REFERENCE	DA/745/2018/A - D08883254
APPLICANT/S	Mr J Apostolou
OWNERS	Mr N S Guo and Mrs X F Huang
REPORT OF	Group Manager Development and Traffic Services
RECOMMENDED	Refusal

DATE OF REPORT 27 FEBRUARY 2023

REASON FOR REFERRAL TO LPP

The application is being referred to Parramatta Local Planning Panel as more than 10 submissions were received over the notification period.

EXECUTIVE SUMMARY

This is a summary of the full assessment of the application as outlined in **Attachment 1**, the Section 4.15 Assessment Report.

Modification Application DA/745/2018/A was lodged on 5 September 2022 and seeks to intensify the court approved childcare centre by increasing the children numbers from 53 up to 82, with additional carparking from 14 to 23.

The application is made pursuant to s4.56 of the *Environmental Planning and Assessment Act 1979*.

In accordance with the Parramatta Consolidated Notification Procedures, the Modification Application was notified between 16 September 2022 and 10 October 2022. Overall, 19 submissions were received over the notification period.

Key concerns raised in the submissions are as follows:

1. Traffic congestion/parking/safety.
2. Noise impacts.
3. Heritage/streetscape.
4. Tree removal.

5. Flooding/evacuation/basement earthworks.
6. Modification not substantially the same development.
7. Solar Access.
8. Devaluation of property value.

In accordance with the *Environmental Planning and Assessment Act 1979*, Section 9.1 – Directions by the Minister, this application is reported to the Parramatta Local Planning Panel for determination as the modified proposal received more than 10 submissions during the notification process.

Section 4.15 Assessment Summary

The application has been assessed relative to section 4.15 of the *Environmental Planning and Assessment Act 1979*, taking into consideration all relevant state and local planning controls.

In order to facilitate the proposed increase in children, various alterations and additions are required to the approved built form, including an increase in GFA of about 20m^2, and increasing the quantum of unencumbered outdoor play space by utilising areas previously required to be dense landscaping.

During the assessment, a number of Council's internal staff requested additional information, including the following:

1. Catchment Engineer – requested additional flood modelling.

2. Landscape Officer – requested the additional shed at the north-west corner of the site be deleted or relocated outside of the TPZ of an adjoining tree. It was also requested to reinstate the dense landscaping required under the approval by the LEC.

3. Heritage Advisor – requested that the design the new proposed ramp be less dominant to the streetscape.

4. Acoustic/Planning – requested that applicant provide further detail regarding how the recommendations of the acoustic report will be implemented, and how access will be facilitated between the play areas within the 2.4m high acoustic fence and the play areas outside of the fence.

However, Council's Traffic and Transport Officer fundamentally objected to the modified proposal, advising that the increase in intensity would have cumulative adverse impacts on the surrounding traffic network. Observations and traffic studies undertaken by Council have already indicated unsafe driver behaviour as a result of the existing traffic conditions and the modified proposal will only exacerbate the issue.

A meeting was organised between the applicant's Traffic Consultant and Council's Officer where no resolution was imminent. In that regard, the applicant was advised that they were not required to respond to the other additional information matters as the safety impacts on the surrounding traffic network were considered to be unresolvable.

Accordingly, having regard to the matters for consideration under Section 4.15, and Section 4.55 of the *Environmental Planning and Assessment Act 1979*, it is recommended that Modification Application No. DA/745/2018/A be refused.

RECOMMENDATION

(a) **That** the Parramatta Local Planning Panel, exercising the function of the consent authority, **refuse** the requested modification to DA/745/2018/A to intensify the approved childcare centre by increasing children numbers from 53 to 82 and parking spaces from 14 to 23.

(b) **Further, that** submitters are advised of the decision.

REASONS FOR REFUSAL

1. State Environmental Planning Policy (Transport and Infrastructure) 2021 – Chapter 3: Educational Establishments and Child Care Facilities

a) The modified proposal is inconsistent with following Design Quality Principles prescribed under the Child Care Planning Guidelines 2021:

1. Principle 3 – Adaptive Learning Spaces;
2. Principle 6 – Amenity; and
3. Principle 7 – Safety.

b) The modified proposal is inconsistent with the following Matters for Consideration prescribed under the Child Care Planning Guidelines 2021:

1. Part 3.1 – Site Selection and Location

2. Hornsby Local Environmental Plan 2013

a) The modified proposal is inconsistent with the following clauses:

1. Clause 5.10 – Heritage Conservation; and
2. Clause 6.3 – Flood Planning.

3. **Environmental Planning and Assessment Act 1979**

a) The modified proposal is not considered to be substantially the same development as originally approved, and therefore does not satisfy the criteria prescribed under s4.56(1)(a).

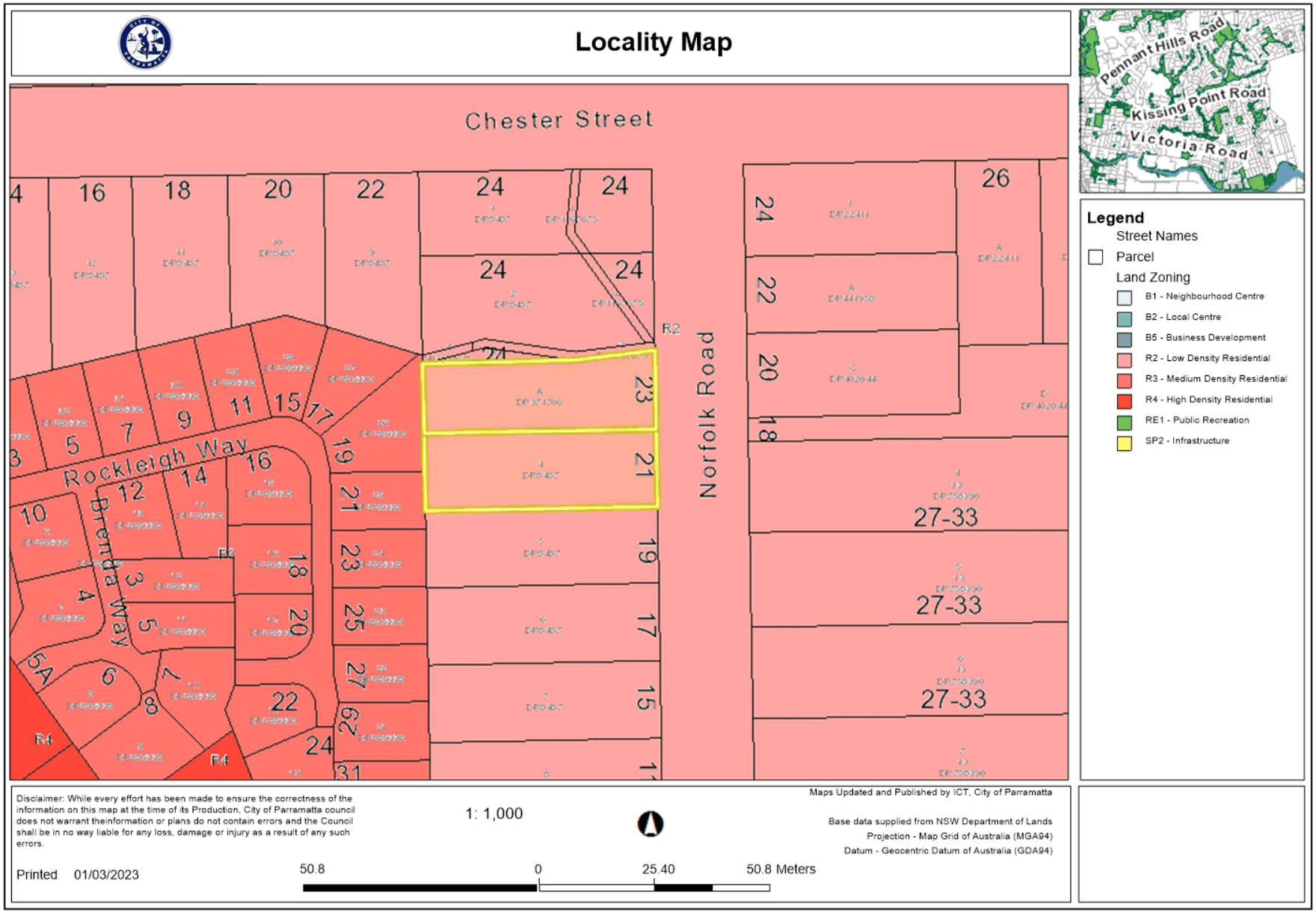
b) The modified proposal also has non-compliances with *SEPP (Transport and Infrastructure) 2021* and *Hornsby Local Environmental Plan 2013*. Accordingly, the proposal fails to satisfy the matters of consideration prescribed under s4.15(1)(a)(i).

c) The modified proposal is therefore not considered to be in the public interest and also fails to satisfy s4.15(1)(b), (d), and (e) of the *Environmental Planning and Assessment Act 1979*.

ATTACHMENTS:

1	Locality Map	1 Page
2	Assessment Report	14 Pages
3	Plans used for assessment	28 Pages
4	Applicant's Traffic Report	34 Pages
5	Applicant's Accoustic Report	32 Pages
6	LEC approved plans	29 Pages

REFERENCE MATERIAL


Locality Map
Chester Street
Norfolk Road
Rockleigh Way
Brenda Way
Pennant Hills Road
Kissing Point Road
Victoria Road
Legend
Street Names
Parcel
Land Zoning
B1 - Neighbourhood Centre
B2 - Local Centre
B5 - Business Development
R2 - Low Density Residential
R3 - Medium Density Residential
R4 - High Density Residential
RE1 - Public Recreation
SP2 - Infrastructure
27-33
Disclaimer: While every effort has been made to ensure the correctness of the information on this map at the time of its Production, City of Parramatta council does not warrant theinformation or plans do not contain errors and the Council shall be in no way liable for any loss, damage or injury as a result of any such errors.
1: 1,000
Maps Updated and Published by ICT, City of Parramatta
Base data supplied from NSW Department of Lands
Projection - Map Grid of Australia (MGA94)
Datum - Geocentric Datum of Australia (GDA94)
Printed 01/03/2023
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City of Parramatta	
File No:	DA/745/2018/A

SECTION 4.56 MODIFICATION REPORT
Environmental Planning & Assessment Act 1979

DA No:	DA/745/2018/A
Subject Property:	Lot 4 DP 8487, Lot A DP 371706, 21 - 23 Norfolk Road, EPPING NSW 2121
Proposal:	Section 4.56 modification of DA/745/2018 for Site consolidation, partial demolition and alterations and additions to existing structures, tree removal and construction of a 53-place childcare centre with basement car parking containing 14 car parking spaces (including 6 visitor spaces and 8 staff spaces) and 1 motorcycle space, associated business identification signage and proposed hours of operation from 7:00am to 6:00pm, Monday to Friday. The modification seeks to amend the basement parking, pedestrian entry and other elements in order to increase childcare placements from 53 to 82 and additional carparking from 14 to 23.
Date of receipt:	5 September 2022
Applicant:	Mr J Apostolou
Owner:	Mr N S Guo and Mrs X F Huang
Property owned by a Council employee or Councillor:	The site is not known to be owned by a Council employee or Councillor.
Political donations/gifts disclosed:	None disclosed on the application form.
Submissions received:	19
Recommendation:	Refusal
Assessment Officer:	Darren Wan

Legislative Requirements

Relevant provisions considered under section 4.15(1)(a) of the Environmental Planning and Assessment Act 1979	• State Environmental Planning Policy (Biodiversity and Conservation) 2021 • State Environmental Planning Policy (Resilience and Hazards) 2021 • State Environmental Planning Policy (Transport and Infrastructure) 2021 • Hornsby Local Environmental Plan 2013 (HLEP 2013) • Hornsby Development Control Plan 2011 (HDCP 2013) • Draft Parramatta Local Environmental Plan 2020 (DLEP 2020).
Zoning	R2 - Low Density Residential
Bushfire Prone Land	No
Heritage	No – However, in vicinity of Heritage Item I385
Heritage Conservation Area	Yes – East Epping Conservation Area
Integrated Development	No
Clause 4.6 variation	No
Delegation	**Parramatta Local Planning Panel (PLPP)** due to >10 submissions

1. EXECUTIVE SUMMARY

Modification Application DA/745/2018/A was lodged on 5 September 2022 and seeks to intensify the court approved childcare centre by increasing the children numbers from 53 up to 82, with additional carparking from 14 to 23.

The application is made pursuant to s4.56 of the Environmental Planning and Assessment Act 1979.

In accordance with the Parramatta Consolidated Notification Procedures, the Modification Application was notified between 16 September 2022 and 10 October 2022. Overall, 19 submissions were received over the notification period.

Key concerns raised in the submissions are as follows:

- Traffic congestion/parking/safety.
- Noise impacts.
- Heritage/streetscape.
- Tree removal.
- Flooding/evacuation/basement earthworks.
- Modification not substantially the same development.
- Solar Access.
- Devaluation of property value.

In accordance with the Environmental Planning and Assessment Act 1979, Section 9.1 – Directions by the Minister, this application is reported to the Parramatta Local Planning Panel for determination as the modified proposal received more than 10 submissions during the notification process.

Section 4.15 Assessment Summary

The application has been assessed relative to section 4.15 of the Environmental Planning and Assessment Act 1979, taking into consideration all relevant state and local planning controls.

In order to facilitate the proposed increase in children, various alterations and additions are required to the approved built form, including an increase in GFA of about 20m^2, and increasing the quantum of unencumbered outdoor play space by utilising areas previously required to be dense landscaping.

During the assessment, a number of Council's internal staff requested additional information, including the following:

- Catchment Engineer – requested additional flood modelling.
- Landscape Officer – requested the additional shed at the north-west corner of the site be deleted or relocated outside of the TPZ of an adjoining tree. It was also requested to reinstate the dense landscaping required under the approval by the LEC.
- Heritage Advisor – requested that the design the new proposed ramp be less dominant to the streetscape.
- Acoustic/Planning – requested that applicant provide further detail regarding how the recommendations of the acoustic report will be implemented, and how access will be facilitated between the play areas within the 2.4m high acoustic fence and the play areas outside of the fence.

However, Council's Traffic and Transport Officer fundamentally objected to the modified proposal, advising that the increase in intensity would have cumulative adverse impacts on the surrounding traffic network. Observations and traffic studies undertaken by Council have already indicated unsafe driver behaviour as a result of the existing traffic conditions and the modified proposal will only exacerbate the issue.

A meeting was organised between the applicant's Traffic Consultant and Council's Traffic and Transport Officer, where no resolution was imminent. In that regard, the applicant was advised that they were not required to respond to the other additional information matters as the safety impacts on the surrounding traffic network were considered to be unresolvable.

Accordingly, having regard to the matters for consideration under Section 4.15, and Section 4.56 of the Environmental Planning and Assessment Act 1979, it is recommended that Modification Application No. DA/745/2018/A be refused.

Note: *The new draft Parramatta LEP 2023 is anticipated to be gazetted prior to this application being presented to the Panel. Pursuant to a savings provision, the Panel is able to determine this application with consideration of Hornsby LEP 2013 instead of the new gazetted LEP.*

2. SITE DESCRIPTION AND CONDITIONS

The subject site comprises two allotments known as 21 Norfolk Road, Epping and 23 Norfolk Road, Epping. The property descriptions of the two allotments are Lot 4 DP 8487 & Lot A 371706. The combined lots are of an irregular shaped and has a cross fall from the south west (rear) to the north east (front) of approximately 4.3 metres. Henceforth in this report, 'subject site' will refer to both allotments as combined.

The subject site has the following area and dimensions:

- Area – 1626.8 square metres
- Frontage – 33.78 metres
- Rear – 32.005 metres
- North – 50.375 metres
- South – 50.29 metres

The site is zoned R2 Low Density Residential. The properties to the north, east and south are also zoned R2 Low Density Residential. The properties to the west are zoned R3 Medium Density Residential.

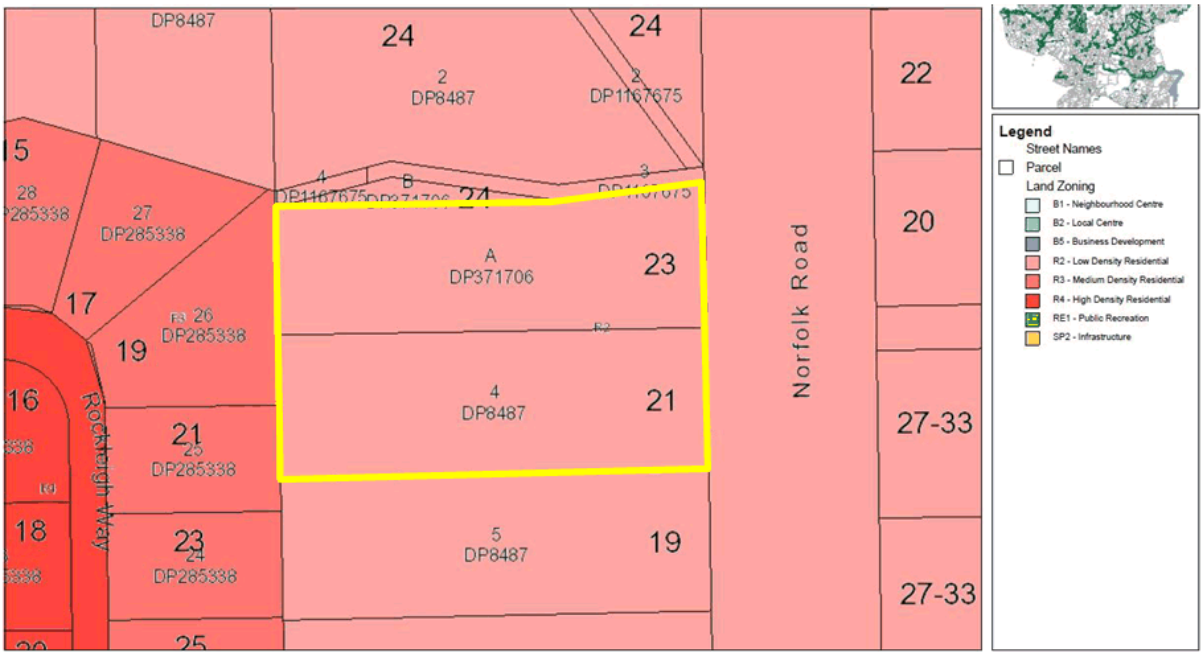


Figure 1: Zoning of the subject site and surrounds

The subject site is located in the East Epping Conservation Area and is in the vicinity of a heritage item – Epping Public School (I385).

The subject site currently accommodates two established post-war single storey brick and tile roof dwellings. The site is located within an established residential area characterised by single and double storey residential dwellings.

The site adjoins an open Council owned stormwater channel to the north that is subject to flooding. The northern part of the site is also subject to flood affectation. A Sydney Water main sewer line also traverses along the northern boundary of the site.

3. RELEVANT SITE HISTORY

Development Application	Description
DA/745/2018	The original application sought consent for *'demolition of existing structures at No. 23 Norfolk Road, partial demolition of the existing dwelling at No. 21 Norfolk Road and construction of a centre based child care facility with basement parking for 15 vehicles. The centre is proposed to operate between 7am and 6pm, Monday to Friday'* and was refused by Parramatta Local Planning Panel on 16 April 2019. Subsequently a Section 8.3 review was lodged and also refused by PLPP on 15 October 2019. The section 8.3 proposal had slight built form changes to accommodate the flooding contentions. It is of note that both the original application and the s8.3 review proposed a maximum of 60 children for the development.
LEC Proceedings	On 21 July 2020, consent was granted by the Land and Environment Court for *'site consolidation, demolition works, tree removal and construction of a 53 place child care centre with basement car parking containing 14 car parking spaces (including 6 visitor spaces and 8 staff spaces) and 1 motorcycle space, associated business identification signage and proposed hours of operation from 7:00am to 6:00pm, Monday to Friday.'*

4. THE PROPOSAL

The modified proposal seeks consent to increase the capacity of the approved Child Care Centre from 53 up to 82. To facilitate this increase, the following works are required:

Basement

- Expanding the footprint of the basement level.
- Increasing parking spaces from 14 to 23 - including 11 staff and 12 visitors.

Ground Level

- Various alterations and additions to the approved built form resulting in the following:
  - New ramp from street level up to reception.
  - Playroom 1 increased from 53.5m^2 (16 - 0-2 year old) up to 130m^2 (40 – 3-5 year old).
  - Playroom 2 decreased from 57.9m^2 (17 – 2-3 year old) down to 55m^2 (17 – 0.2 year old).
  - Playroom 3 increased from 68.2m^2 (20 – 3-5 year old) up to 84m^2 (25 – 2-3 year old).
  - Combined Outdoor Play Area increased from 372.8m^2 up to 598m^2 – by increasing the outdoor play area, it requires utilising areas that were previously excluded for amenity purposes, negotiated during the LEC process.
  - Increase the height of the acoustic barrier around the raised portion of the outdoor play area from 2.1m up to 2.4m.

Use

- The increased number of children requires an increase of staff from 10 up to 14.
- More stringent acoustic requirements to be implemented to accommodate the increase in children – requiring more co-ordination between staff to stagger the children and separate them into 'free-play' and 'passive-play' activities.

5. REFERRALS

Referral	Comment
Transport and Traffic Engineer	Not supported for the following reasons: *It is noted that a 53-place childcare centre has been approved by the LEC based on information that was provided and available at that time. Since then, Council has undertaken further reviews of the existing traffic situation in Norfolk Road, Epping which includes a video traffic and pedestrian count undertaken on 20 September 2022 at the existing pedestrian crossing and at the intersection of Norfolk Road and Pembroke Street. From this, Council has observed the following:* ○ *Although the video traffic counts by Council and the Traffic Modelling by the applicant show similar values, it needs to be acknowledged that SIDRA modelling is limited and does not accurately reflect the complex traffic behaviour during school zone times where parents are often looking for parking or performing parking manoeuvres. Furthermore, the modelling is focused primarily on individual intersections and has not accurately reflected the cumulative impacts in the network of roads near the public school and childcare centre.* ○ *Due to the combined effect of the kiss and ride facility, the existing midblock pedestrian crossing and the intersection of Norfolk Road and Pembroke Street, extensive traffic queues have been observed in video counts at both morning and afternoon school zone peak periods. It was further observed that there were extensive vehicle queues in Pembroke Street east of Essex Street which was also impacting traffic queues in Norfolk Road as shown in the figure below. As a result of the congestion, the video counts show that motorists are taking more risk-taking behaviours and selecting unsafe gaps in traffic as well as queuing across intersections.* ○ *Even though the anticipated traffic generation by the childcare centre during these peak times is only 66 veh/h in the AM peak and 58 veh/h in the afternoon peak, this will still have a cumulative impact on traffic in the area which will make the existing situation worse.* *Based on the above points, this development is not supported on traffic grounds.*
Catchment Management Unit	Additional information requested.
Tree and Landscape	Additional information requested.
Heritage	Additional information requested.
Environmental Health (Acoustic)	Additional information requested.

Note: Whilst the additional information required by Council's Specialists were shared with the applicant, they were informed that they did not need to respond as the fundamental issue of the local traffic capacity was not deemed to be something resolvable by the applicant. Accordingly, it was decided to proceed with the refusal without requiring the additional information.

6. ASSESSMENT UNDER SECTION 4.56

SECTION 4.56	
(a) it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which the consent was originally granted and before that consent as originally granted was modified (if at all), and	The consent, as modified, would retain the approved development type as a Child Care Centre, however, would increase the overall intensity of the development and is not considered to be substantially the same. Please refer to the discussion below.
(b) it has notified the application in accordance with: (i) the regulations, if the regulations so require, or (ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and	The modification was notified in accordance with the Council's Consolidated Notification Procedures.

(c) it has notified, or made reasonable attempts to notify, each person who made a submission in respect of the relevant development application of the proposed modification by sending written notice to the last address known to the consent authority of the objector or other person, and	The modification was notified in accordance with the Council's Consolidated Notification Procedures.
(d) it has considered any submissions made concerning the proposed modification within any period prescribed by the regulations or provided by the development control plan, as the case may be.	All submissions received were considered as part of the assessment of this modification.
(1A) In determining an application for modification of a consent under this section, the consent authority must take into consideration such of the matters referred to in section 4.15(1) as are of relevance to the development the subject of the application. The consent authority must also take into consideration the reasons given by the consent authority for the grant of the consent that is sought to be modified.	An assessment against the relevant matters contained within s4.15 are addressed further in this report.
(1C) The modification of a development consent in accordance with this section is taken not to be the granting of development consent under this Part, but a reference in this or any other Act to a development consent includes a reference to a development consent as so modified.	Noted.
(2) After determining an application for modification of a consent under this section, the consent authority must send a notice of its determination to each person who made a submission in respect of the application for modification.	Noted.
(3) The regulations may make provision for or with respect to the following— (a) the period after which a consent authority, that has not determined an application under this section, is taken to have determined the application by refusing consent, (b) the effect of any such deemed determination on the power of a consent authority to determine any such application, (c) the effect of a subsequent determination on the power of a consent authority on any appeal sought under this Act.	Noted.

ASSESSMENT OF WHETHER THE PROPOSAL IS SUBSTANTIALLY THE SAME

In considering whether the development is substantially the same, the applicant bears the onus of satisfying the consent authority that the modified development is substantially the same as the original development (*Vacik Pty Ltd v Penrith City Council*, unreported, 24 Februaryv1992). In this judgement, Stein J states that it is not appropriate to simply say that the nature of the development, in this case the use of the site as a residential flat building, as amended would be the same use and therefore substantially the same development. Stein J goes on to say that it is necessary to consider whether the proposed modified development would be essentially or materially or having the same essence as that which had been originally approved. These comments are reiterated in **Trinvass Pty Ltd v The Council of the City of Sydney [2018] NSWLEC 77**.

Bignold J in his decision in *Moto Projects No 2 Pty Limited v North Sydney Council*[1999] 106 LGERA 298, states that:

"The requisite factual finding obviously requires a comparison between the development, as currently approved, and the development as proposed to be modified. The result of the comparison must be a finding that the modified development is "essentially or materially" the same as the (currently) approved development.

The comparative task does not merely involve a comparison of the physical features or components of the development as currently approved and modified where that comparative exercise is undertaken in some type of sterile vacuum. Rather, the comparison involves an appreciation, qualitative, as well as quantitative, of the developments being compared in their proper contexts (including the circumstances in which the development consent was granted)."

As such, an assessment of the proposed modified development to determine if substantially the same as the original development requires an assessment of the quantitative and qualitative impacts of the modified proposal.

Quantitative Assessment

The proposed quantitative amendments include the following:

- Increase the overall development GFA from approximately 383.5m² up to 404.7m².
- Increase the footprint of the basement level from approximately 636m² to 773m² and increase parking spaces from 14 to 23.

- Increase overall internal play areas from 179.6m² up to 269m² – this is facilitated by the overall increase in GFA as well as converting GFA previously used for administrative purposes.
- Increases the height of the internal acoustic attenuation fence from 2.1m up to 2.4m.
- Increase children capacity from 53 to 82 (17 X 0–2-year-olds, 25 X 2–3-year-olds, and 40 X 3–5-year-olds).

Qualitative Assessment
The proposed qualitative amendments include the following:

- Increase in intensity of the development will increase the impact on the surrounding traffic network.
- Increase in intensity of the development requires more stringent operational play-time measures to mitigate acoustic impacts on adjoining neighbours.
- Additional shed in the north-west corner of the site impacts upon a neighbouring tree.
- Amended ramp to the lobby changes the streetscape presentation of the street.

Conclusion
Based on the above assessment, the modified development is not considered to be substantially the same as the original approved development, as there are significant quantitative and qualitive amendments that will adversely impact upon the amenity of the surrounding locality and traffic network.

7. ENVIRONMENTAL PLANNING INSTRUMENTS

7.1 STATE ENVIRONMENTAL PLANNING POLICY (BIODIVERSITY AND CONSERVATION) 2021 – CHAPTER 2 VEGETATION IN NON-RURAL AREAS

The original application was assessed under the provisions of State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017, which has subsequently been repealed and replaced with State Environmental Planning Policy (Biodiversity and Conservation) 2021.

The aims of the plan are to protect the biodiversity values of trees and other vegetation in non-rural areas of the State, and to preserve the amenity of the non-rural areas of the State through the preservation of trees and other vegetation.

Council's Landscape Officer requested the following:

- Deletion of the additional structures located in the tree protection area of *Tree 23 – Lophostemon confertus* located in the adjoining property.
- Re-instatement of the boundary screen planting to be consistent with Revision K of the landscaped documentation approved by the LEC.

As discussed above, the additional information request was shared with the applicant, but amended plans were not requested as the traffic issues were considered to be unresolvable.

7.2 STATE ENVIRONMENTAL PLANNING POLICY (RESILIENCE AND HAZARDS) 2021 – CHAPTER 4 REMEDIATION OF LAND

The original application was assessed under the provisions of State Environmental Planning Policy 55 – Remediation of Land, which has subsequently been repealed and replaced with State Environmental Planning Policy (Resilience and Hazards) 2021.

Nevertheless, the suitability of the site for the purposes of a Child Care Facility was assessed under the original proposal and deemed satisfactory. There have not been any notable instances between the issue of the consent and the lodgement of the modified proposal that would indicate a need to revisit the suitability of the subject site for a Child Care Centre. Accordingly, there are no changes to the original assessment and no additional documentation is required.

7.3 STATE ENVIRONMENTAL PLANNING POLICY (TRANSPORT AND INFRASTRUCTURE) 2021 – CHAPTER 3 EDUCATIONAL ESTABLIHMENTS AND CHILD CARE FACILITIES

The original application was assessed under the provisions of SEPP (Educational Establishments and Child Care Facilities) 2017, which has subsequently been repealed and replaced with SEPP (Transport and Infrastructure) 2021. Only the relevant provisions of the new SEPP and Childcare Guideline have been discussed below.

CLAUSE	MODIFIED PROPOSAL	COMPLIANCE
3.22 – Concurrence of the Regulatory Authority This clause applies to development for the purpose of a centre-based child care facility if: (a) the floor area of the building or place does not comply with regulation 107 (indoor unencumbered space requirements) of the Education and Care Services National Regulations, or (b) the outdoor space requirements for the building or place do not comply with regulation 108 (outdoor unencumbered space requirements) of those Regulations.	A total number of 82 children are proposed. The proposal will need a minimum unencumbered indoor and outdoor space as follows: **Indoor**: 266.5m² **Outdoor**: 574m² The proposal provides unencumbered indoor and outdoor space as follows: **Indoor**: 269m² **Outdoor**: 598m²	The modified proposal complies with the required amount of indoor and outdoor play space and concurrence from the regulatory authority is not required. However, it is noted that the expansion of the outdoor play area now includes areas that were explicitly excluded as play area following the negotiations during the LEC appeal.
3.23 – Matters for Consideration by Consent Authorities Before determining a development application for development for the purpose of a centre-based child care facility, the consent authority must take into consideration any applicable provisions of the Child Care Planning Guideline, in relation to the proposed development.	The provisions of the Child Care Planning Guideline were considered in the assessment of the original application. The modified proposal will slightly change the traffic assessment of the development.	The modified proposal is considered to have adverse impacts to the surrounding traffic network and is not supported. Please see discussion in the compliance table below.
3.25 – Floor Space Ratio Development consent must not be granted for the purposes of a centre-based child care facility in Zone R2 Low Density Residential if the floor space ratio for the building on the site of the facility exceeds 0.5:1. This section does not apply if another environmental planning instrument or a development control plan sets a maximum floor space ratio for the centre-based child care facility.	The modified proposal will have a GFA of approximately 404.7m² and equates to an FSR of 0.24:1 and complies.	Yes

CHILD CARE PLANNING GUIDELINE 2021	
Provisions	**Comment**
Part 2 – Design Quality Principles	
Principle 3 – Adaptive Learning Spaces	The modified proposal seeks to increase the quantum of unencumbered outdoor play space by utilising the area outside of the approved internal acoustic fencing, previously required to be dense landscape screening following discussions between experts during the LEC process. There is no indication of how access between the two areas will be facilitated, other than a gap in the acoustic fencing on the south-western corner shown on the architectural plans. However, this gap is not present in the landscape plans, nor is it referred to in the submitted acoustic report. In fact, the acoustic report provides the following statement: *'It is to be noted that gaps between the panels and the posts or the ground will significantly reduce the effectiveness of the noise barrier and may lead to non-compliant noise levels at the adjoining premises. Therefore, all gaps should be minimised.'* It is also of note that if the gap in the fencing is the only way to achieve access, it would create a narrow play space between the acoustic fence and the boundary fence which limits the supervision afforded to future childcare workers at the centre. Accordingly, the modified proposal is not consistent with Principle 3 as it fails to indicate how the additional outdoor play area will be accessed or utilised without additional impacts to the adjoining neighbours.

Principle 5 – Landscape	Principle 5 requires that the design of the landscaped areas to be functional and well designed for the amenity of the children. The modified proposal generally retains the same level of landscaping as previously approved within the aforementioned internal acoustic fencing area and is considered acceptable. The modified proposal also seeks to convert the dense landscaping area and utilise it as additional outdoor play space. This area was previously excluded from the play space calculations and was not required to comply with the landscape treatments outlined under Principle 5. The modified proposal has now designed this space to be more in line with the requirements of this principle. Accordingly, by virtue of converting an area previously unable to be used as play space to a functional play area with garden beds and play equipment, the modified proposal is considered to be consistent with Principle 5.
Principle 6 – Amenity	The modified proposal seeks to significantly increase the intensity of the approved childcare centre by utilising areas previously required to be dense landscape screening to protect the amenity of adjoining neighbours. It will also require more stringent acoustic measures that are difficult to enforce and impacts upon the amenity of the children and the neighbouring properties. Accordingly, the modified proposal is not consistent with Principle 6 as it fails to satisfactorily address how the additional children will be managed without impacting the amenity of the children or the adjoining neighbours.
Principle 7 – Safety	The developments impact on the surrounding traffic network was a determining factor behind the reduction in children numbers from 60 to 53 during the discussions in the LEC process. Council's Traffic and Transport Officer is of the opinion that the surrounding traffic network already exhibits unsafe traffic practices, with motorists engaging in risk-taking behaviours due to the existing congestion caused by the nearby school. Any increase in intensification of the subject site is note supported from a traffic safety perspective. Accordingly, the modified proposal is not consistent with Principle 7 as it is considered to increase the traffic safety risk of the centre and surrounding traffic network.
Part 3 – Matters for Consideration	
3.1 – Site Selection and Location	
C1 *For proposed developments in or* ***adjacent to a residential zone,*** *consider:* • *The acoustic and privacy impacts of the proposed development on the residential properties* • *Visual amenity impacts (e.g. additional building bulk and overshadowing, local character)* • *Traffic and parking impacts of the proposal on residential amenity and road safety*	**Acoustic Privacy** – not acceptable As discussed above, in order to facilitate access between the approved outdoor play area and the area previously used for dense landscaping, the architectural plans show a gap in the acoustic fencing. No information has been provided to indicate how this proposed gap would impact on the level of acoustic attenuation provided by the fencing. In addition, the acoustic report provides two options to manage the noise created by the children. Both options require staggering the children and managing their activities (free-play vs passive-play). These measures are more stringent than previously approved by the LEC when the centre only had 53 children. The extra measures are considered to be excessive and difficult to enforce and indicates that the increased number of children may be more than the site can reasonably accommodate. **Visual Amenity** – not acceptable The modified proposal seeks a new ramp to the front lobby which is not supported by Council's Heritage Advisor as it is not compatible with the surround heritage conservation area. **Traffic and Parking** – not acceptable. As discussed above, Council's Traffic and Transport Officer has indicated that the modified proposal will have an adverse impact on the surrounding traffic network and is not supported.

C4 *A child care facility should be located to avoid risks to children, staff or visitors and adverse environmental conditions arising from:* • *proximity to:* ○ *any other identified environmental hazard or risk relevant to the site and/ or existing buildings within the site.*	**Flooding** The site is affected by flooding. Council's Catchment Engineer requested additional flood modelling to determine the impacts on the modified proposal. The applicant has provided additional flood modelling, but the documentation was not able to be assessed prior to this DA being presented to PLPP.
3.8 – Traffic, Parking and Pedestrian Access	
C32 *A Traffic and Parking Study should be prepared to support the proposal to quantify potential impacts on the surrounding land uses and demonstrate how impacts on amenity will be minimised. The study should also address any proposed variations to parking rates and demonstrate that:* • *the amenity of the surrounding area will not be affected* • *there will be no impacts on the safe operation of the surrounding road network.*	As discussed above, the developments impact on the surrounding traffic network was a determining factor behind the reduction in children numbers from 60 to 53 during the discussions in the LEC process. Council's Traffic and Transport Officer is of the opinion that the surrounding traffic network already exhibits unsafe traffic practices, with motorists engaging in risk-taking behaviours due to the existing congestion caused by the nearby school. Any increase in intensification of the subject site is note supported from a traffic safety perspective.

8. HORNSBY LOCAL ENVIRONMENTAL PLAN 2013

PERMISSIBILITY

The site is zoned **R2 Low Density Residential** under Hornsby Local Environmental Plan 2013. The proposal retains the approved use of the site as a Centre-based childcare facility, which is a use permitted with consent within the R2 Low Density Residential zone.

Zone Objectives

The modified proposal remains consistent with the relevant aims and objectives of the R2 Low Density Residential zoning applying to the land.

Development standard	Compliance
Heritage Conservation.	**No – Not acceptable.** The proposal is not identified as a heritage item, however, is located within the East Epping Conservation Area. The subject site is also within the vicinity of heritage item I385 – Epping Public School. The modified proposal seeks a new ramp to the front lobby which is not supported by Council's Heritage Advisor as it is not compatible with the surround heritage conservation area.

	In light of the above advice from Council's Heritage Advisor, the proposal would not satisfy the objectives of Clause 5.10 and would likely have an adverse impact upon the heritage significance of the area. Therefore, the modified proposal cannot be supported.
Flood planning	**No – Not acceptable.** The site is affected by flooding. Council's Catchment Engineer requested additional flood modelling to determine the impacts on the modified proposal. The applicant has provided additional flood modelling, but the documentation was not able to be assessed prior to this DA being presented to PLPP.

9. DRAFT ENVIRONMENTAL PLANNING INSTRUMENTS

The Draft Parramatta Local Environmental Plan was placed on public exhibition from 31 August 2020 to 12 October 2020. The draft LEP will replace the five existing LEPs that apply within the Local Government Area and will be the primary legal planning document for guiding development and land use decisions made by Council.

The draft LEP will amend key development standards applicable to the site, increasing the building height to 9m and prescribing an FSR control which was previously absent.

Control	**HLEP 2013**	**Draft LEP 2023**
Zoning	R2 Low Density Residential	R2 Low Density Residential
Height	8.5m	9m
FSR	N/A	0.5:1

The draft LEP must be considered when assessing this application under Clause 4.15(1)(a)(ii) of the Environmental Planning & Assessment Act 1979. Regardless, the amendments will have no impact on the compliance of the modified proposal.

It is anticipated that the draft LEP will be gazetted by the time this application is presented to Parramatta Local Planning Panel. On that note, pursuant to a savings provision, the Panel is able to determine this application with consideration of Hornsby LEP 2013 instead of the new gazetted LEP.

10. HORNSBY DEVELOPMENT CONTROL PLAN 2013

The relevant matters to be considered under Hornsby Development Control Plan 2013 for the proposed development are outlined below.

HDCP – Part 3.1 Dwelling Houses and Part 7.1 Community Uses			
Control	**Approved Development**	**Modified Proposal**	**Complies**
Site Coverage	max. 28% or 450m^2	unchanged	Yes
Floor Area	383.5m^2	404.7m^2	Yes
Setbacks			
Front	7.482m	unchanged	Yes
Landscaped Area (45% of lot size)	Total: approx. 800m^2 Front yard: 200m^2	unchanged	Yes
Parking (1 space per 4 children)	14 spaces	23 spaces	Yes

11. DEVELOPMENT CONTRIBUTIONS

As this original Development Application was assessed under the now repealed the *City of Parramatta Council Section 94A Development Contributions Plan (Formerly Hornsby LGA Land and Epping Town Centre)*, the same contributions plan would apply to this modified proposal. As such, a new development contribution would have been calculated and applied to this modification had the application been recommended for approval.

12. BONDS

In accordance with Council's Schedule of Fees and Charges, the developer will be obliged to pay Security Bonds to ensure the protection of civil infrastructure located in the public domain adjacent to the site. A condition of consent relating to the payment of a Security Bond would have been imposed if the application was recommended for approval.

13. EP&A REGULATION 2021

Applicable Regulation considerations including demolition, fire safety, fire upgrades, compliance with the Building Code of Australia, compliance with the Home Building Act, PCA appointment, notice of commencement of works, sign on work sites, critical stage inspections and records of inspection would apply if the proposal was recommended for approval.

14. THE LIKELY IMPACTS OF THE DEVELOPMENT

The assessment demonstrates that the modified proposal will have an adverse impact upon the surrounding traffic network. By allowing the development to increase its intensity, it will adversely impact the safety of the surrounding traffic network, as well as potentially increase the acoustic impacts the children will have on neighbouring properties.

It is for this reason that the modified proposal is not considered to satisfy Section 4.15(1)(b) and cannot be supported.

15. SUITABILITY OF THE SITE

The assessment demonstrates that the subject site cannot accommodate a childcare centre development of the proposed scale as the modified proposal creates unacceptable impacts to the surrounding traffic network and does not satisfactorily demonstrate that the site can support the increased play areas without exacerbating adverse amenity impacts to adjoining neighbours.

In addition, the site is identified as flood prone and it has not been demonstrated that the site is able to accommodate the increased intensity of children without compromising their safety.

It is for this reason that the modified proposal is not considered to satisfy Section 4.15(1)(c) and cannot be supported.

16. PUBLIC CONSULTATION

In accordance with the City of Parramatta Consolidated Notification Procedure, Development Application was advertised between 16 September 2022 and 10 October 2022. Overall, 19 submissions were received over the notification period.

Key concerns raised in the submissions are addressed below:

Issue	Response
Traffic Impacts	The overwhelming majority of submissions raised the existing congestion of the existing surrounding traffic network as a reason not to support the modified proposal. As discussed in the body of this report, Council's Traffic and Transport Officer shared the concerns raised and objects to the modified proposal due to the cumulative impact of the development and other surrounding land uses. This has been included as a reason for refusal.
Noise	Concern was raised regarding the overall increase in children and the additional noise impacts that would result. As discussed in the body of this report, Council's Development Assessment Officer shares the concerns raised and requested additional information regarding how the children will be managed to achieve the required acoustic attenuation criteria. Due to the aforementioned traffic impacts, it was decided to proceed with the refusal without requiring the additional information. This has been included as a reason for refusal.

Heritage/Streetscape	Concern was raised regarding the new built form and ramp fronting Norfolk Road that impacts upon the heritage significance of the East Epping Conservation Area and nearby Heritage Item. As discussed in the body of this report, Council's Heritage Advisor shared the concerns raised and requested additional information to address the streetscape concerns. Due to the aforementioned traffic impacts, it was decided to proceed with the refusal without requiring the additional information. This has been included as a reason for refusal.
Tree Removal	Concern was raised regarding the additional tree removal required to facilitate the modified proposal. As discussed in the body of the report, Council's Landscape Officer shares the concerns raised and requested additional information to address retaining the approved dense landscaping, as well as relocating the proposed storage shed which impacts a neighbouring tree. Due to the aforementioned traffic impacts, it was decided to proceed with the refusal without requiring the additional information. This has been included as a reason for refusal.
Flooding/Evacuation/Basement Earthworks	Concern was raised regarding the additional children numbers on a flood prone site, as well as how the additional earthworks would impact the flooding. As discussed in the body of this report, Council's Catchment Engineer shared the concerns raised and requested additional information to include more flood modelling to determine the safety of the site. Due to the aforementioned traffic impacts, it was decided to proceed with the refusal without requiring the additional information. This has been included as a reason for refusal.
Modification not substantially the same	Concern was raised that the significant increase in intensity of the proposed Childcare Centre was not considered to be 'substantially the same' as required by s4.56 of the EP&A Act 1979. As discussed in the body of this report, Council's Development Assessment Officer shares the concerns raised due to the quantitative and qualitive changes between the approval and the modified proposal. This has been included as a reason for refusal.
Solar Access	Concern was raised regarding the reduction of solar access to adjoining properties. Following an assessment of the modified proposal, it was deemed that the amended built form changes did not significantly alter the approved solar access to adjoining neighbours.
Devaluation of property value	Concern was raised regarding the reduction in surrounding property value as a result of the development. It is of note that surrounding property prices is not a matter for consideration under s4.15 of the EP&A Act 1979

17. PUBLIC INTEREST

As the intensification of the approved childcare centre will cause adverse impacts to the surrounding traffic network and does not satisfactorily demonstrate that there won't be increased adverse acoustic impacts to neighbours.

It is for this reason that the modified proposal is not considered to satisfy Section 4.15(1)(e) and cannot be supported.

18. CONCLUSION

The application has been assessed relative to section 4.15 of the Environmental Planning and Assessment Act 1979, taking into consideration all relevant state and local planning controls.

The modified proposal does not satisfy the requirements under section 4.56(1)(a) as the modified proposal is not substantially the same development as originally approved. It is also considered to have increased impacts on the traffic and safety of the surrounding locality. Having regard to the assessment of the proposal from a merit perspective, Council officers are not satisfied that the intensification of the Childcare Centre will result in a good outcome.

For these reasons, it is considered that the proposal is unsatisfactory having regard to the matters of consideration under Section 4.15 of the Environmental Planning and Assessment Act, 1979 and is recommended for refusal.

19. RECOMMENDATION

Pursuant to Section 4.16 of the Environmental Planning and Assessment Act, 1979:

A. **That** the Parramatta Local Planning Panel, exercising the function of the consent authority, **refuse** the requested modification to DA/745/2018/A to intensify the approved childcare centre by increasing children numbers from 53 to 82 and parking spaces from 14 to 23.

B. **That** Council advise those who made a submission of the determination.

REASONS FOR REFUSAL

1. **State Environmental Planning Policy (Transport and Infrastructure) 2021 – Chapter 3: Educational Establishments and Child Care Facilities**
   a. The modified proposal is inconsistent with following Design Quality Principles prescribed under the Child Care Planning Guidelines 2021:
      - Principle 3 – Adaptive Learning Spaces;
      - Principle 6 – Amenity; and
      - Principle 7 – Safety.

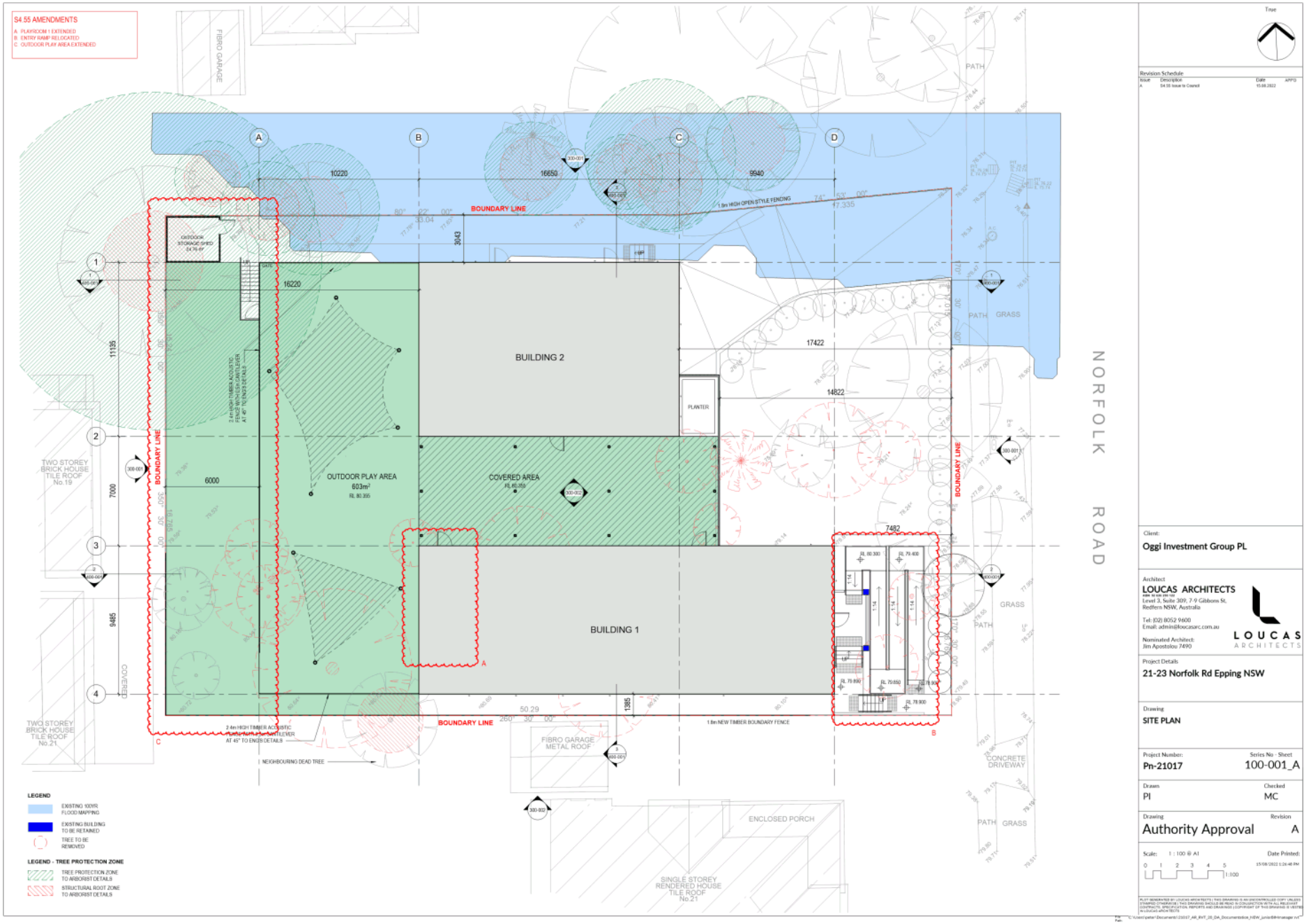
   b. The modified proposal is inconsistent with the following Matters for Consideration prescribed under the Child Care Planning Guidelines 2021:
      - Part 3.1 – Site Selection and Location

2. **Hornsby Local Environmental Plan 2013**
   a. The modified proposal is inconsistent with the following clauses:
      - Clause 5.10 – Heritage Conservation; and
      - Clause 6.3 – Flood Planning.

3. **Environmental Planning and Assessment Act 1979**
   a. The modified proposal is not considered to be substantially the same development as originally approved, and therefore does not satisfy the criteria prescribed under s4.56(1)(a).

   b. The modified proposal also has non-compliances with *SEPP (Transport and Infrastructure) 2021* and *Hornsby Local Environmental Plan 2013*. Accordingly, the proposal fails to satisfy the matters of consideration prescribed under s4.15(1)(a)(i).

   c. The modified proposal is therefore not considered to be in the public interest and also fails to satisfy s4.15(1)(b), (d), and (e) of the *EP&A Act 1979*.


S4.55 AMENDMENTS
A PLAYROOM 1 EXTENDED
B ENTRY RAMP RELOCATED
C OUTDOOR PLAY AREA EXTENDED
BOUNDARY LINE
BUILDING 2
BUILDING 1
OUTDOOR PLAY AREA
603m²
COVERED AREA
PLANTER
NORFOLK ROAD
FIBRO GARAGE
PATH
GRASS
TWO STOREY BRICK HOUSE TILE ROOF No.19
TWO STOREY BRICK HOUSE TILE ROOF No.21
FIBRO GARAGE METAL ROOF
CONCRETE DRIVEWAY
ENCLOSED PORCH
SINGLE STOREY RENDERED HOUSE TILE ROOF No.21
1.9m HIGH OPEN STYLE FENCING
1.8m NEW TIMBER BOUNDARY FENCE
1 NEIGHBOURING DEAD TREE
LEGEND
EXISTING 100YR FLOOD MAPPING
EXISTING BUILDING TO BE RETAINED
TREE TO BE REMOVED
LEGEND - TREE PROTECTION ZONE
TREE PROTECTION ZONE TO ARBORIST DETAILS
STRUCTURAL ROOT ZONE TO ARBORIST DETAILS
Revision Schedule
A S4.55 Issue to Council 15.08.2022
Client: Oggi Investment Group PL
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Nominated Architect: Jim Apostolou 7490
Project Details
21-23 Norfolk Rd Epping NSW
Drawing
SITE PLAN
Project Number: Pn-21017
Series No - Sheet: 100-001_A
Drawn: PI
Checked: MC
Drawing: Authority Approval
Revision: A
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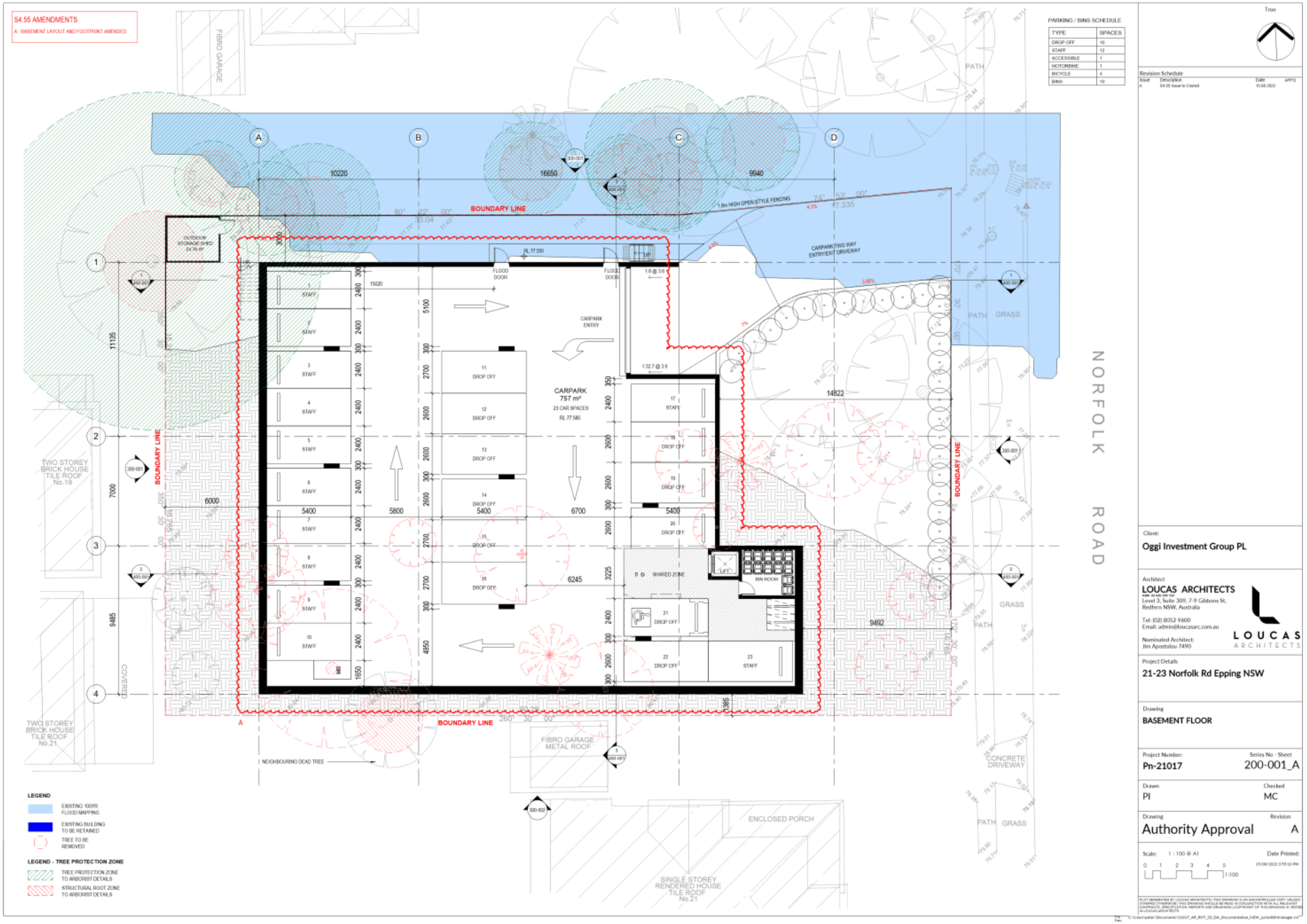
S4.55 AMENDMENTS
A BASEMENT LAYOUT AND FOOTPRINT AMENDED
PARKING / BINS SCHEDULE
TYPE SPACES
DROP OFF 10
STAFF 12
ACCESSIBLE 1
MOTORBIKE 1
BICYCLE 4
BINS 10
Revision Schedule
Issue Description Date APPD
A S4.55 Issue to Council 15.08.2022
BOUNDARY LINE
CARPARK
757 m²
23 CAR SPACES
RL 77.580
CARPARK ENTRY
CARPARK TWO WAY ENTRY/EXIT DRIVEWAY
1.8m HIGH OPEN STYLE FENCING
NORFOLK ROAD
TWO STOREY BRICK HOUSE TILE ROOF No.19
TWO STOREY BRICK HOUSE TILE ROOF No.21
FIBRO GARAGE METAL ROOF
SINGLE STOREY RENDERED HOUSE TILE ROOF No.21
ENCLOSED PORCH
NEIGHBOURING DEAD TREE
CONCRETE DRIVEWAY
LEGEND
EXISTING 100YR FLOOD MAPPING
EXISTING BUILDING TO BE RETAINED
TREE TO BE REMOVED
LEGEND - TREE PROTECTION ZONE
TREE PROTECTION ZONE TO ARBORIST DETAILS
STRUCTURAL ROOT ZONE TO ARBORIST DETAILS
Client:
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Project Details
21-23 Norfolk Rd Epping NSW
Drawing
BASEMENT FLOOR
Project Number: Pn-21017
Series No - Sheet 200-001_A
Drawn PI
Checked MC
Drawing Authority Approval
Revision A
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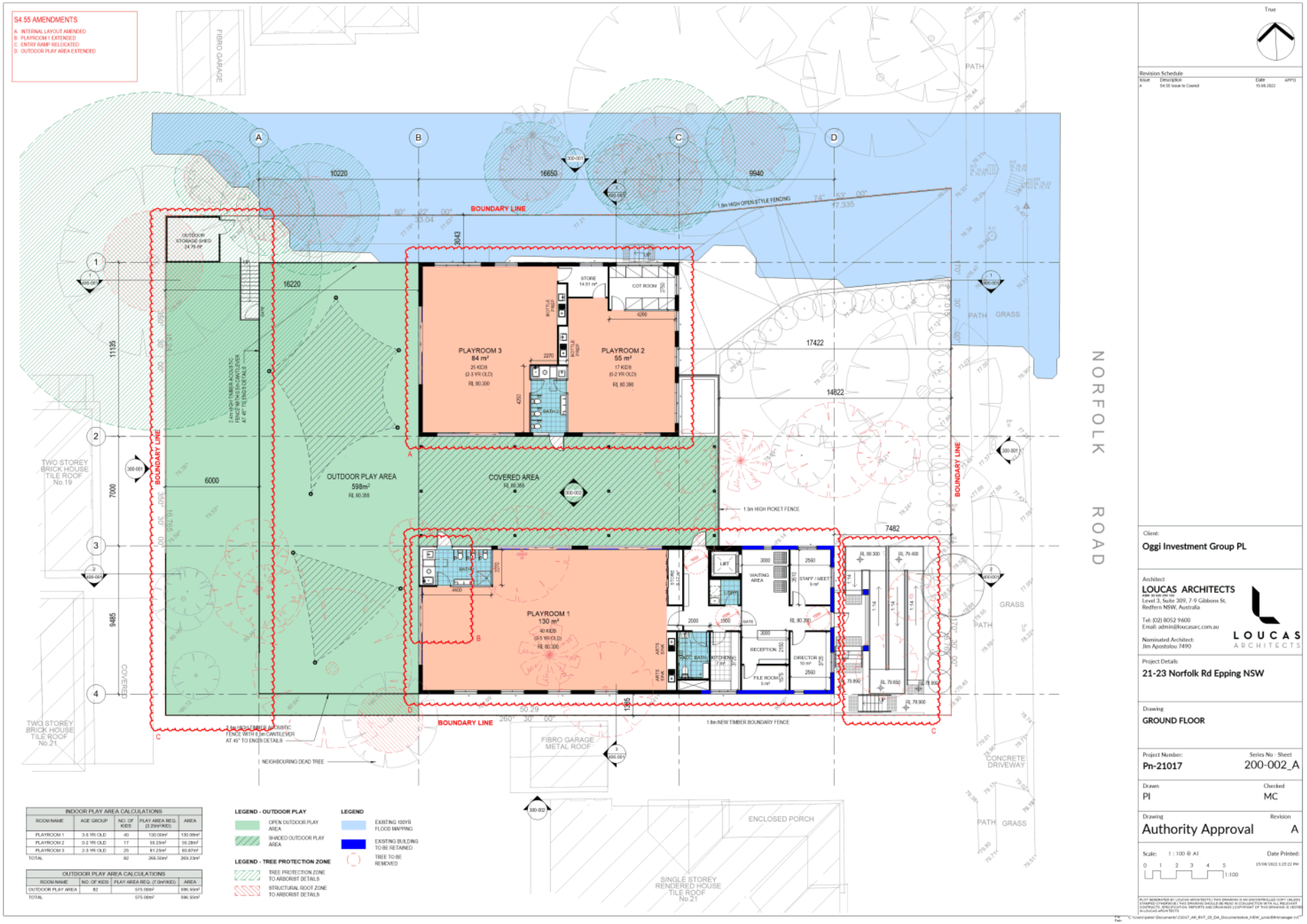
S4.55 AMENDMENTS
A. INTERNAL LAYOUT AMENDED
B. PLAYROOM 1 EXTENDED
C. ENTRY RAMP RELOCATED
D. OUTDOOR PLAY AREA EXTENDED
BOUNDARY LINE
PLAYROOM 3
84 m²
PLAYROOM 2
55 m²
PLAYROOM 1
130 m²
OUTDOOR PLAY AREA
598m²
COVERED AREA
1.8m HIGH OPEN STYLE FENCING
1.8m HIGH PICKET FENCE
1.8m NEW TIMBER BOUNDARY FENCE
NORFOLK ROAD
FIBRO GARAGE
TWO STOREY BRICK HOUSE TILE ROOF No.19
TWO STOREY BRICK HOUSE TILE ROOF No.21
FIBRO GARAGE METAL ROOF
ENCLOSED PORCH
SINGLE STOREY RENDERED HOUSE TILE ROOF No.21
CONCRETE DRIVEWAY
NEIGHBOURING DEAD TREE
INDOOR PLAY AREA CALCULATIONS
OUTDOOR PLAY AREA CALCULATIONS
LEGEND - OUTDOOR PLAY
LEGEND - TREE PROTECTION ZONE
LEGEND
True
Revision Schedule
Client:
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Project Details
21-23 Norfolk Rd Epping NSW
Drawing
GROUND FLOOR
Project Number: Pn-21017
Series No - Sheet: 200-002_A
Drawn: PI
Checked: MC
Drawing: Authority Approval
Revision: A
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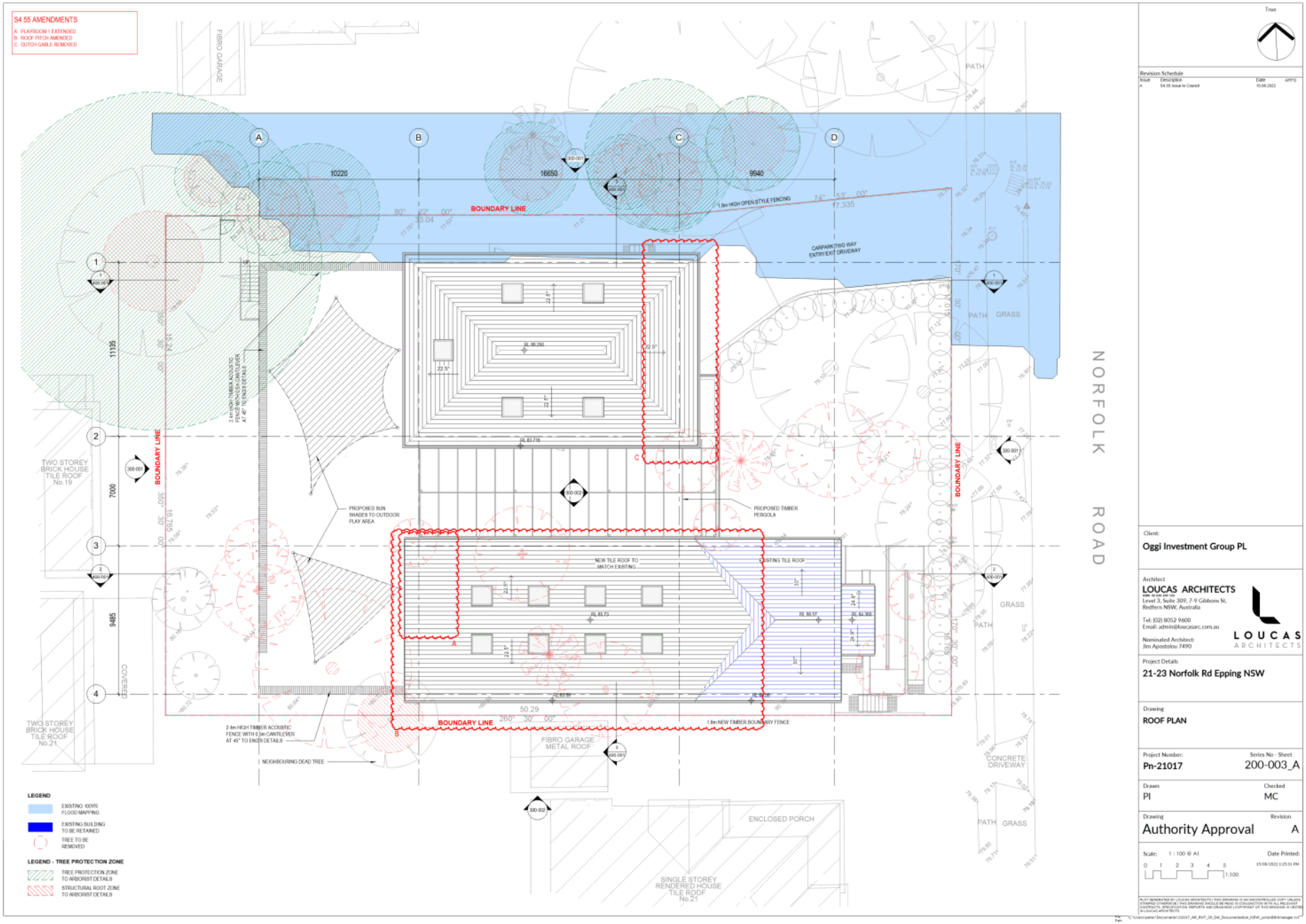
S4 55 AMENDMENTS
A. PLAYROOM 1 EXTENDED
B. ROOF PITCH AMENDED
C. DUTCH GABLE REMOVED
NORFOLK ROAD
BOUNDARY LINE
1.8m HIGH OPEN STYLE FENCING
CARPARK/TWO WAY ENTRY/EXIT DRIVEWAY
PROPOSED SUN SHADES TO OUTDOOR PLAY AREA
PROPOSED TIMBER PERGOLA
NEW TILE ROOF TO MATCH EXISTING
EXISTING TILE ROOF
1.8m NEW TIMBER BOUNDARY FENCE
2.4m HIGH TIMBER ACOUSTIC FENCE WITH 0.5m CANTILEVER AT 45° TO ENDS DETAILS
1 NEIGHBOURING DEAD TREE
FIBRO GARAGE
FIBRO GARAGE METAL ROOF
TWO STOREY BRICK HOUSE TILE ROOF No.19
TWO STOREY BRICK HOUSE TILE ROOF No.21
SINGLE STOREY RENDERED HOUSE TILE ROOF No.21
ENCLOSED PORCH
CONCRETE DRIVEWAY
PATH
GRASS
COVERED
LEGEND
EXISTING 100YR FLOOD MAPPING
EXISTING BUILDING TO BE RETAINED
TREE TO BE REMOVED
LEGEND - TREE PROTECTION ZONE
TREE PROTECTION ZONE TO ARBORIST DETAILS
STRUCTURAL ROOT ZONE TO ARBORIST DETAILS
Revision Schedule
A S4 55 Issue to Council 15.08.2022
Client: Oggi Investment Group PL
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Project Details
21-23 Norfolk Rd Epping NSW
Drawing
ROOF PLAN
Project Number: Pn-21017
Series No - Sheet: 200-003_A
Drawn: PI
Checked: MC
Drawing: Authority Approval
Revision: A
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S4.55 AMENDMENTS
A. ENTRY RAMP RELOCATED
B. ROOF PITCH AMENDED
C. DUTCH GABLE REMOVED
NORTH ELEVATION
1 : 100
EAST ELEVATION
1 : 100
WEST ELEVATION
1 : 100
EXTERNAL FINISHES SCHEDULE
Revision Schedule
Client:
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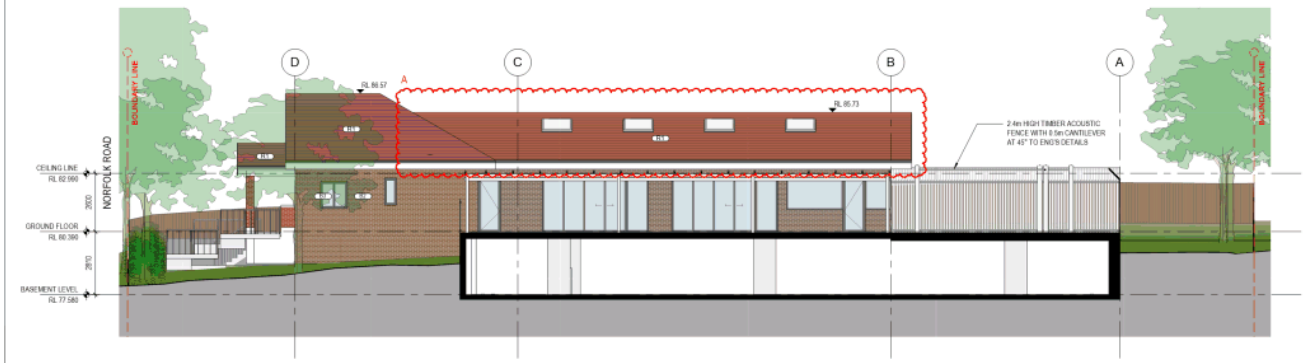
21-23 Norfolk Rd Epping NSW
Drawing
ELEVATIONS 01
Project Number:
Pn-21017
Series No - Sheet
300-001_A
Drawn
PI
Checked
MC
Drawing
Authority Approval
Revision
A
Scale:
Date Printed:

1 SOUTH ELEVATION
1 : 100

2 INTERNAL ELEVATION - NORTH
1 : 100



3 INTERNAL ELEVATION - SOUTH
1 : 100

S4.55 AMENDMENTS

A. ROOF PITCH AMENDED
B. DUTCH GABLE REMOVED

Revision Schedule

Issue	Description	Date	APPD
A	S4.55 Issue to Council	15.08.2022	

EXTERNAL FINISHES SCHEDULE

MARK	DESCRIPTION	COMMENTS	IMAGE
B1	BRICK - EXISTING - RED BRICK	TO BE RETAINED AND PROTECTED	
B2	BRICK - EXISTING SIDE BRICK / TO MATCH EXISTING	NEW TO MATCH EXISTING	
B3	BRICK - PROPOSED	PGH - VELOUR VOLCANIC	
P1	PAINT - OFF WHITE / NEW TO MATCH EXISTING	NEW TO MATCH EXISTING	
P2	PAINT - EXISTING WHITE PAINT / NEW TO MATCH EXISTING	NEW TO MATCH EXISTING	
P3	PAINT - WOODLAND GREY	COLORBOND - WOODLAND GREY	
R1	BRICK - EXISTING TERRACOTTA TILES / NEW TO MATCH EXISTING	NEW TO MATCH EXISTING	

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Project Details
21-23 Norfolk Rd Epping NSW

Drawing
ELEVATIONS 02

Project Number: **Pn-21017**
Series No - Sheet: **300-002_A**

Drawn: **PI**
Checked: **MC**

Drawing: **Authority Approval**
Revision: **A**

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S4.55 AMENDMENTS
A. INTERNAL LAYOUT AMENDED
B. ROOF PITCH AMENDED
C. DUTCH GABLE REMOVED
NORFOLK ROAD
BOUNDARY LINE
8.5M BUILDING HEIGHT LIMIT
2.4m HIGH TIMBER ACOUSTIC FENCE WITH 0.5m CANTILEVER AT 45° TO ENG'S DETAILS
CEILING LINE RL 82.990
GROUND FLOOR RL 80.390
BASEMENT LEVEL RL 77.580
CARPARK
NGL
1 SECTION 01
1 : 100
2 SECTION 02
1 : 100
3 SECTION 03
1 : 100
EXTERNAL FINISHES SCHEDULE
MARK
DESCRIPTION
COMMENTS
IMAGE
Revision Schedule
Client:
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Drawing
SECTIONS
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Series No - Sheet 400-001_A
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Revision A
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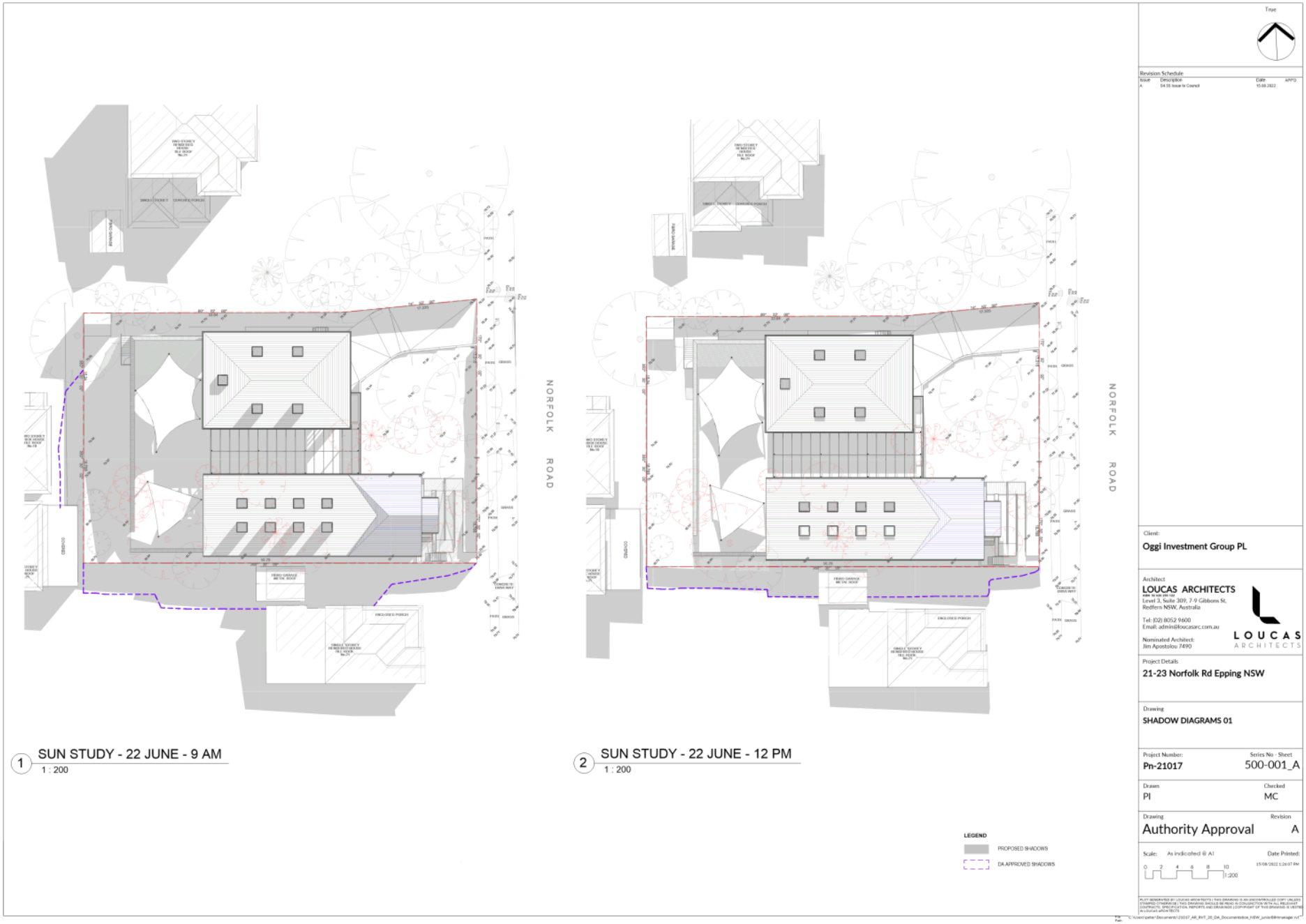
NORFOLK ROAD
NORFOLK ROAD
1 SUN STUDY - 22 JUNE - 9 AM
1 : 200
2 SUN STUDY - 22 JUNE - 12 PM
1 : 200
LEGEND
PROPOSED SHADOWS
DA APPROVED SHADOWS
True
Revision Schedule
Issue Description Date APPD
A S4.55 Issue to Council 15.08.2022
Client:
Oggi Investment Group PL
Architect
LOUCAS ARCHITECTS
Level 3, Suite 309, 7-9 Gibbons St,
Redfern NSW, Australia
Tel: (02) 8052 9600
Email: admin@loucasarc.com.au
Nominated Architect:
Jim Apostolou 7490
LOUCAS ARCHITECTS
Project Details
21-23 Norfolk Rd Epping NSW
Drawing
SHADOW DIAGRAMS 01
Project Number:
Pn-21017
Series No - Sheet
500-001_A
Drawn
PI
Checked
MC
Drawing
Authority Approval
Revision
A
Scale: As indicated @ A1
Date Printed:
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0 2 4 6 8 10
1:200

1 SUN STUDY - 22 JUNE - 3 PM
1 : 200

LEGEND
PROPOSED SHADOWS
DA APPROVED SHADOWS

True

Revision Schedule

Issue	Description	Date	APPD
A	S4.55 Issue to Council	15.08.2022	

Client:
Oggi Investment Group PL

Architect
LOUCAS ARCHITECTS
Level 3, Suite 309, 7-9 Gibbons St,
Redfern NSW, Australia
Tel: (02) 8052 9600
Email: admin@loucasarc.com.au
Nominated Architect:
Jim Apostolou 7490

LOUCAS ARCHITECTS

Project Details
21-23 Norfolk Rd Epping NSW

Drawing
SHADOW DIAGRAMS 02

Project Number:	Series No - Sheet
Pn-21017	500-002_A

Drawn	Checked
PI	MC

Drawing	Revision
Authority Approval	A

Scale: As indicated @ A1
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File Path: C:\Users\peter\Documents\210127_AR_RVT_20_DA_Documentation_hDEW_junior@4mkmaspar.rvt

DECKING STEPS & SEATING AREA FOR STOREY TELLING

RACE SLIDES

SANDPIT

CUBBY HOUSE

TIMBER LOG FENCE

BUBBLE WINDOWS ON ACOUSTIC FENCE

FIXED LOG

STORY TELLING CAMPSITE

SOFT FALL RUBBER PATTERN

TEEPEE

SHADE SAIL

BALANCE BEAMS

INTEGRATED PLANTERS & SEATING

LOG SEAT

LOCATION PLAN

Scale: NTS

LANDSCAPE ITEMS

- Turf area - refer detail 10
- Artificial turf - refer detail 15
- Steel Edging - refer detail 7
- Deco granite surface finishes - refer detail 3
- Concrete retaining / raised planter wall - refer detail 5
- Timber decking - refer detail 9
- Organic mulch area
- Sandpit - refer detail 22
- Sandstone blocks - refer detail 20
- Cubby house - refer detail 13 & manufacturer's detail & Spec.
- Racing slides - refer detail 14 & manufacturer's detail & Spec.
- Teepee - refer manufacturer's detail & sample image.
- Timber log fence - refer detail 11
- Log edge/barrier - refer detail 8
- Vegetable gardens to be selected by client -manufacturer's detail & Spec.
- Selected rocks with smooth edge - refer detail 17
- 2.4m Ht noise barrier with 45degree 0.5m cantilever top towards the play area - refer Acoustic Report
- 1.8m Ht noise barrier refer Acoustic report
- 1.5m Ht noise barrier refer Acoustic report
- Fire pit
- Shade sail - refer detail 12
- Stepping stones with grass in gaps - refer detail 16
- Trees proposed to be removed and replaced with new landscaping
- Existing trees proposed to be retained and protected
- Trees Protection zone
- Structural root zone

DRAWING SCHEDULE

SHEET #	DRAWING TITLE	REV.
/1	HARDSCAPE PLAN	C
/2	LANDSCAPE PLAN	C
/3	DETAILS + SPECIFICATIONS	C
/4	DETAILS	C
/5	DETAILS & CALCULATION	C
/6	SECTION	C

REV	DATE	NOTATION/AMENDMENT
A	04.03.22	Preliminary SK 55 plan prepared for review
B	29.03.22	Final Issue for S4.55
C	17.06.22	Co-ordinated with Acoustic report

ARCHITECT: LOUCAS ARCHITECTS

LANDSCAPE ARCHITECT: Conzept Landscape Architects

COUNCIL: PARRAMATTA

CLIENT: OGGI INVESTMENT GROUP

PROJECT: PROPOSED CHILDCARE DEVELOPMENT
21-23 NORFOLK ROAD,
EPPING

1:75

TITLE: HARDSCAPE PLAN

STATUS: SECTION 4.55

SCALE: 1:75

DATE: JUNE 2022

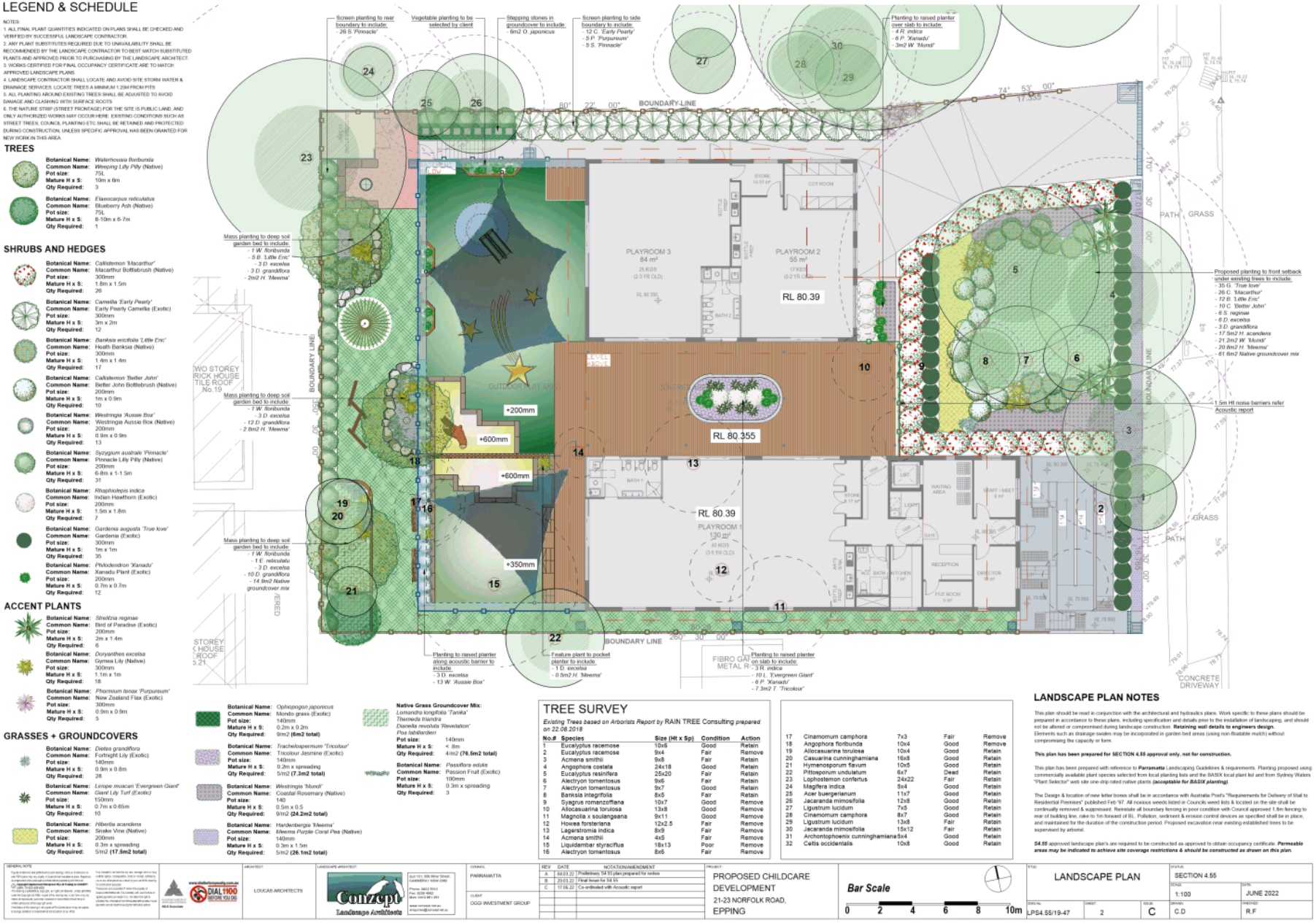
DWG No: LPS4.55/19-47

SHEET: 1

ISSUE: B

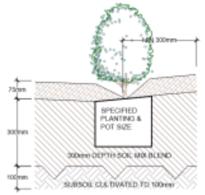
DRAWN: C.D

CHECKED: R.F

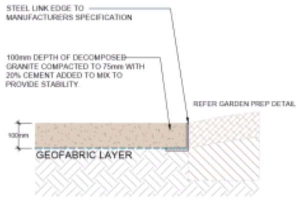

LEGEND & SCHEDULE
NOTES:
1. ALL FINAL PLANT QUANTITIES INDICATED ON PLANS SHALL BE CHECKED AND VERIFIED BY SUCCESSFUL LANDSCAPE CONTRACTOR.
2. ANY PLANT SUBSTITUTES REQUIRED DUE TO UNAVAILABILITY SHALL BE RECOMMENDED BY THE LANDSCAPE CONTRACTOR TO BEST MATCH SUBSTITUTED PLANTS AND APPROVED PRIOR TO PURCHASING BY THE LANDSCAPE ARCHITECT.
3. WORKS CERTIFIED FOR FINAL OCCUPANCY CERTIFICATE ARE TO MATCH APPROVED LANDSCAPE PLANS.
4. LANDSCAPE CONTRACTOR SHALL LOCATE AND AVOID SITE STORM WATER & DRAINAGE SERVICES. LOCATE TREES A MINIMUM 1.25M FROM PITS
5. ALL PLANTING AROUND EXISTING TREES SHALL BE ADJUSTED TO AVOID DAMAGE AND CLASHING WITH SURFACE ROOTS
6. THE NATURE STRIP (STREET FRONTAGE) FOR THE SITE IS PUBLIC LAND, AND ONLY AUTHORIZED WORKS MAY OCCUR HERE. EXISTING CONDITIONS SUCH AS STREET TREES, COUNCIL PLANTING ETC SHALL BE RETAINED AND PROTECTED DURING CONSTRUCTION, UNLESS SPECIFIC APPROVAL HAS BEEN GRANTED FOR NEW WORK IN THIS AREA.
TREES
Botanical Name: Waterhousia floribunda
Common Name: Weeping Lilly Pilly (Native)
Pot size: 75L
Mature H x S: 10m x 6m
Qty Required: 3
Botanical Name: Elaeocarpus reticulatus
Common Name: Blueberry Ash (Native)
Pot size: 75L
Mature H x S: 8-10m x 6-7m
Qty Required: 1
SHRUBS AND HEDGES
Botanical Name: Callistemon 'Macarthur'
Common Name: Macarthur Bottlebrush (Native)
Pot size: 300mm
Mature H x S: 1.8m x 1.5m
Qty Required: 26
Botanical Name: Camellia 'Early Pearly'
Common Name: Early Pearly Camellia (Exotic)
Pot size: 300mm
Mature H x S: 3m x 2m
Qty Required: 12
Botanical Name: Banksia ericifolia 'Little Eric'
Common Name: Heath Banksia (Native)
Pot size: 300mm
Mature H x S: 1.4m x 1.4m
Qty Required: 17
Botanical Name: Callistemon 'Better John'
Common Name: Better John Bottlebrush (Native)
Pot size: 200mm
Mature H x S: 1m x 0.9m
Qty Required: 10
Botanical Name: Westringia 'Aussie Box'
Common Name: Westringia Aussie Box (Native)
Pot size: 200mm
Mature H x S: 0.9m x 0.9m
Qty Required: 13
Botanical Name: Syzygium australe 'Pinnacle'
Common Name: Pinnacle Lilly Pilly (Native)
Pot size: 200mm
Mature H x S: 6-8m x 1-1.5m
Qty Required: 31
Botanical Name: Rhaphiolepis indica
Common Name: Indian Hawthorn (Exotic)
Pot size: 200mm
Mature H x S: 1.5m x 1.8m
Qty Required: 7
Botanical Name: Gardenia augusta 'True love'
Common Name: Gardenia (Exotic)
Pot size: 300mm
Mature H x S: 1m x 1m
Qty Required: 35
Botanical Name: Philodendron 'Xanadu'
Common Name: Xanadu Plant (Exotic)
Pot size: 200mm
Mature H x S: 0.7m x 0.7m
Qty Required: 12
ACCENT PLANTS
Botanical Name: Strelitzia reginae
Common Name: Bird of Paradise (Exotic)
Pot size: 200mm
Mature H x S: 2m x 1.4m
Qty Required: 6
Botanical Name: Doryanthes excelsa
Common Name: Gymea Lily (Native)
Pot size: 300mm
Mature H x S: 1.1m x 1m
Qty Required: 18
Botanical Name: Phormium tenax 'Purpureum'
Common Name: New Zealand Flax (Exotic)
Pot size: 300mm
Mature H x S: 0.9m x 0.9m
Qty Required: 5
GRASSES + GROUNDCOVERS
Botanical Name: Dietes grandiflora
Common Name: Fortnight Lily (Exotic)
Pot size: 140mm
Mature H x S: 0.9m x 0.8m
Qty Required: 28
Botanical Name: Liriope muscari 'Evergreen Giant'
Common Name: Giant Lily Turf (Exotic)
Pot size: 150mm
Mature H x S: 0.7m x 0.65m
Qty Required: 10
Botanical Name: Hibertia scandens
Common Name: Snake Vine (Native)
Pot size: 200mm
Mature H x S: 0.3m x spreading
Qty Required: 5/m2 (17.5m2 total)
Botanical Name: Ophiopogon japonicus
Common Name: Mondo grass (Exotic)
Pot size: 140mm
Mature H x S: 0.2m x 0.2m
Qty Required: 9/m2 (6m2 total)
Botanical Name: Trachelospermum 'Tricolour'
Common Name: Tricolour Jasmine (Exotic)
Pot size: 140mm
Mature H x S: 0.2m x spreading
Qty Required: 5/m2 (7.3m2 total)
Botanical Name: Westringia 'Mundi'
Common Name: Coastal Rosemary (Native)
Pot size: 140
Mature H x S: 0.5m x 0.5
Qty Required: 9/m2 (24.2m2 total)
Botanical Name: Hardenbergia 'Meema'
Common Name: Meema Purple Coral Pea (Native)
Pot size: 140mm
Mature H x S: 0.3m x 1.5m
Qty Required: 5/m2 (26.1m2 total)
Native Grass Groundcover Mix:
Lomandra longifolia 'Tanika'
Thatreda triandra
Dianella revoluta 'Revelation'
Poa labillardieri
Pot size: 140mm
Mature H x S: < .8m
Qty Required: 4/m2 (76.5m2 total)
Botanical Name: Passiflora edulis
Common Name: Passion Fruit (Exotic)
Pot size: 100mm
Mature H x S: 0.3m x spreading
Qty Required: 3
Screen planting to rear boundary to include:
- 26 S. 'Pinnacle'
Vegetable planting to be selected by client
Stepping stones in groundcover to include:
- 6m2 O. japonicus
Screen planting to side boundary to include:
- 12 C. 'Early Pearly'
- 5 P. 'Purpureum'
- 5 S. 'Pinnacle'
Planting to raised planter over slab to include:
- 4 R. indica
- 6 P. 'Xanadu'
- 3m2 W. 'Mundi'
BOUNDARY LINE
Mass planting to deep soil garden bed to include:
- 7 W. floribunda
- 5 B. 'Little Eric'
- 3 D. excelsa
- 3 D. grandiflora
- 2m2 H. 'Meema'
Mass planting to deep soil garden bed to include:
- 7 W. floribunda
- 3 D. excelsa
- 12 D. grandiflora
- 2.8m2 H. 'Meema'
Mass planting to deep soil garden bed to include:
- 7 W. floribunda
- 1 E. reticulatu
- 3 D. excelsa
- 10 D. grandiflora
- 14.9m2 Native groundcover mix
Proposed planting to front setback under existing trees to include:
- 35 G. 'True love'
- 26 C. 'Macarthur'
- 12 B. 'Little Eric'
- 10 C. 'Better John'
- 6 S. reginae
- 6 D. excelsa
- 3 D. grandiflora
- 17.5m2 H. scandens
- 21.2m2 W. 'Mundi'
- 20.8m2 H. 'Meema'
- 61.6m2 Native groundcover mix
1.5m Ht noise barriers refer Acoustic report
Planting to raised planter along acoustic barrier to include:
- 3 D. excelsa
- 13 W. 'Aussie Box'
Feature plant to pocket planter to include:
- 1 D. excelsa
- 0.5m2 H. 'Meema'
Planting to raised planter on slab to include:
- 3 R. indica
- 10 L. 'Evergreen Giant'
- 6 P. 'Xanadu'
- 7.3m2 T. 'Tricolour'
+200mm
+600mm
+600mm
+350mm
RL 80.39
RL 80.355
RL 80.39
PLAYROOM 3
84 m²
PLAYROOM 2
55 m²
PLAYROOM 1
130 m²
OUTDOOR PLAY AREA
COT ROOM
STORE
WAITING AREA
RECEPTION
DIRECTOR
KITCHEN
ACC. BATH
STAFF / MEET
LIFT
GRASS
PATH
CONCRETE DRIVEWAY
TWO STOREY BRICK HOUSE TILE ROOF No.19
STOREY HOUSE ROOF
FIBRO GAR METAL R
TREE SURVEY
Existing Trees based on Arborists Report by RAIN TREE Consulting prepared on 22.08.2018
No.# Species Size (Ht x Sp) Condition Action
1 Eucalyptus racemose 10x6 Good Retain
2 Eucalyptus racemose 9x4 Fair Remove
3 Acmena smithii 9x8 Fair Retain
4 Angophora costata 24x18 Good Retain
5 Eucalyptus resinifera 25x20 Fair Retain
6 Alectryon tomentosus 9x6 Fair Retain
7 Alectryon tomentosus 9x7 Good Retain
8 Banksia integrifolia 8x5 Fair Retain
9 Syagrus romanzoffiana 10x7 Good Remove
10 Allocasuarina torulosa 13x8 Good Remove
11 Magnolia x soulangeana 9x11 Good Remove
12 Howea forsteriana 12x2.5 Fair Remove
13 Lagerstromia indica 8x9 Fair Remove
14 Acmena smithii 4x5 Fair Remove
15 Liquidambar styraciflua 18x13 Poor Remove
16 Alectryon tomentosus 8x6 Fair Remove
17 Cinamomum camphora 7x3 Fair Remove
18 Angophora floribunda 10x4 Good Remove
19 Allocasuarina torulosa 10x4 Good Retain
20 Casuarina cunninghamiana 16x8 Good Retain
21 Hymenosporum flavum 10x5 Good Retain
22 Pittosporum undulatum 8x7 Dead Retain
23 Lophostemon confertus 24x22 Fair Retain
24 Magifera indica 8x4 Good Retain
25 Acer buergerianum 11x7 Good Retain
26 Jacaranda mimosifolia 12x8 Good Retain
27 Ligustrum lucidum 7x5 Good Retain
28 Cinamomum camphora 8x7 Good Retain
29 Ligustrum lucidum 13x8 Fair Retain
30 Jacaranda mimosifolia 15x12 Fair Retain
31 Archontophoenix cunninghamiana 5x4 Good Retain
32 Celtis occidentalis 10x8 Good Retain
LANDSCAPE PLAN NOTES
This plan should be read in conjunction with the architectural and hydraulics plans. Work specific to these plans should be prepared in accordance to these plans, including specification and details prior to the installation of landscaping, and should not be altered or compromised during landscape construction. Retaining wall details to engineers design.
Elements such as drainage swales may be incorporated in garden bed areas (using non-floatable mulch) without compromising the capacity or form.
This plan has been prepared for SECTION 4.55 approval only, not for construction.
This plan has been prepared with reference to Parramatta Landscaping Guidelines & requirements. Planting proposed using commercially available plant species selected from local planting lists and the BASIX local plant list and from Sydney Waters "Plant Selector" web site one drip rated native plants (acceptable for BASIX planting)
The Design & location of new letter boxes shall be in accordance with Australia Post's "Requirements for Delivery of Mail to Residential Premises" published Feb '97. All noxious weeds listed in Councils weed lists & located on the site shall be continually removed & suppressed. Reinstate all boundary fencing in poor condition with Council approved 1.8m fencing to rear of building line, make to 1m forward of RL. Pollution, sediment & erosion control devices as specified shall be in place, and maintained for the duration of the construction period. Proposed excavation near existing established trees to be supervised by arborist.
S4.55 approved landscape plan's are required to be constructed as approved to obtain occupancy certificate. Permeable areas may be indicated to achieve site coverage restrictions & should be constructed as drawn on this plan.
LOUCAS ARCHITECTS
Conzept Landscape Architects
PARRAMATTA
OGGI INVESTMENT GROUP
A Preliminary S4.55 plans prepared for review 29.03.22
B Final Issue for S4.55 17.06.22
C Co-ordinated with Acoustic report
PROPOSED CHILDCARE DEVELOPMENT
21-23 NORFOLK ROAD, EPPING
Bar Scale
0 2 4 6 8 10m
LANDSCAPE PLAN
SECTION 4.55
1:100
JUNE 2022
LPS4.55/19-47
2
C
C.D
R.F

LANDSCAPE WORK SPECIFICATION

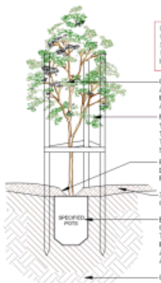
DETAIL 1: TREE PROTECTION ZONE
N.T.S



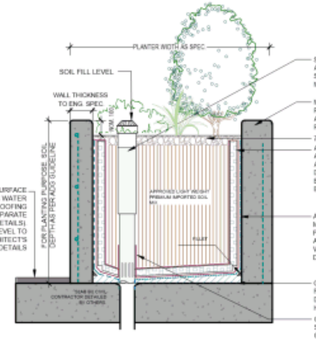
DETAIL 2: TYPICAL GARDEN PREPARATION DETAIL
SCALE 1:10
(ONLY APPLICABLE FOR PLANTING AREA OUTSIDE TREE PROTECTION ZONE OF TREES TO BE RETAINED. NO CHANGES ARE TO OCCUR TO EXISTING LEVELS, INCLUDING RIPPING/CULTIVATING OF THE SOIL WITHIN THE TPZ OF TREES TO BE RETAINED ON SITE)



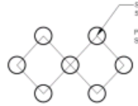
DETAIL 3: DECO GRANITE & LINK EDGE
SCALE: 1:10



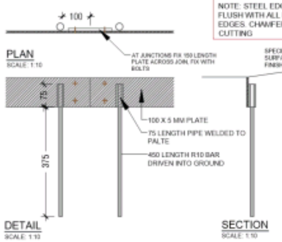
DETAIL 4: TREE PLANTING DETAIL
SCALE: 1:10
(ONLY APPLICABLE FOR PLANTING AREA OUTSIDE TREE PROTECTION ZONE OF TREES TO BE RETAINED. NO CHANGES ARE TO OCCUR TO EXISTING LEVELS, INCLUDING RIPPING/CULTIVATING OF THE SOIL WITHIN THE TPZ OF TREES TO BE RETAINED ON SITE)



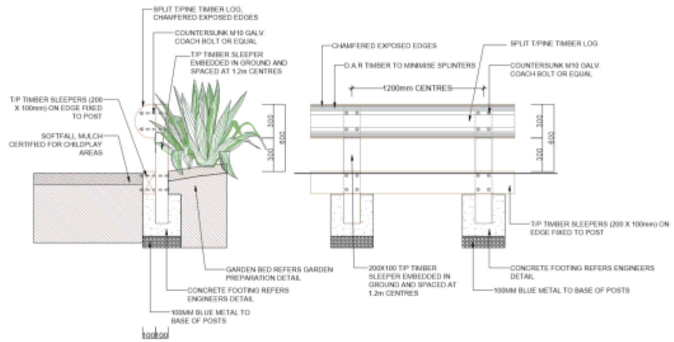
DETAIL 5: INSITU CONCRETE PLANTER ON SLAB DETAIL
SCALE: 1:15



DETAIL 6: MASS PLANTING SETOUT
N.T.S



DETAIL 7: STEEL EDGE DETAIL
SCALE: 1:10

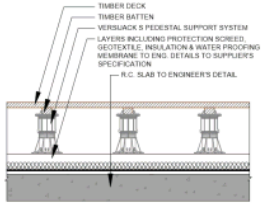


DETAIL 8: LOG EDGE/ BARRIER DETAIL
SCALE: 1:20

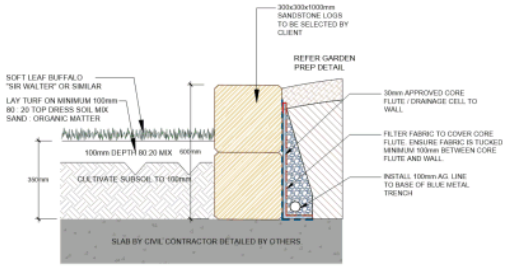
ARCHITECT: LOUCAS ARCHITECTS	LANDSCAPE ARCHITECT: Conzept Landscape Architects	COUNCIL: PARRAMATTA
CLIENT: OGGI INVESTMENT GROUP	PROJECT: PROPOSED CHILDCARE DEVELOPMENT 21-23 NORFOLK ROAD, EPPING	TITLE: DETAILS & SPECIFICATION

REV	DATE	NOTATION/AMENDMENT
A	04.03.22	Preliminary S4.55 plan prepared for review
B	29.03.22	Final Issue for S4.55
C	17.06.22	Co-ordinated with Acoustic report

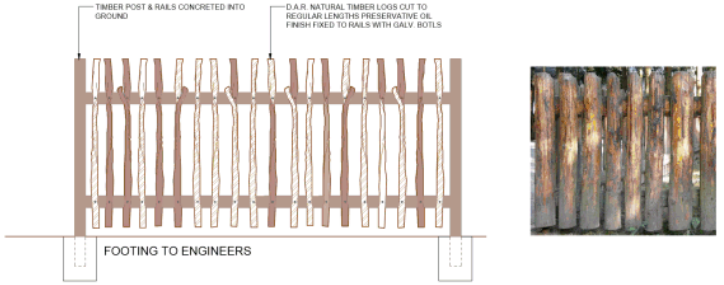
STATUS	SCALE	DATE	DWG No.	SHEET	ISSUE	DRAWN	CHECKED
SECTION 4.55	AS SHOWN @A1	JUNE 2022	LPS4.55/19-47	03	C	C.D	R.F



DETAIL 9: TIMBER DECKING DETAIL
SCALE 1:20

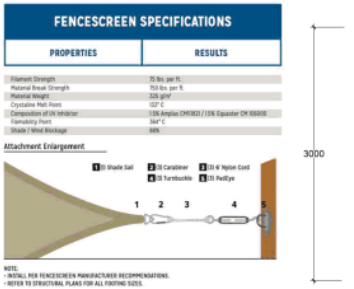


DETAIL 10: TURF & SANDSTONE EDGE
SCALE: 1:10

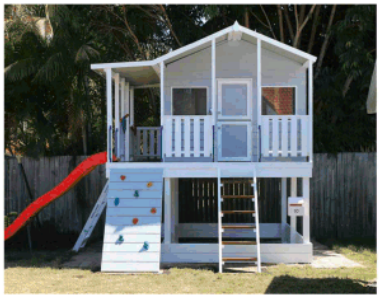


DETAIL 11: NATURAL TIMBER LOG FENCE
SCALE 1:15

SHADE CLOTHE AREAS ARE SHOWN DIAGRAMMATICALLY, AND SHALL BE DESIGNED AND DETAILED BY THE RELEVANT TRADE / CONTRACTOR TO COMPLY WITH SHADE, SAFETY AND STRUCTURAL REQUIREMENTS, CODES AND STANDARDS WITH FUTURE SHOP-DRAWINGS



DETAIL 12: SHADE CLOTHE DETAIL
SCALE: 1:20



MANUFACTURER: AARONS OUTDOOR LIVING

PRODUCT NAME: TAJ MAHAL CUBBY HOUSE 3.3M(W) X 3.3M(L) X 2.1M(H)

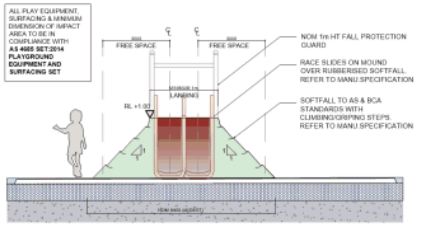
MATERIAL: TREATED PINE(ARSENIC FREE) - INSIDE AND OUT

COLOURBOND ROOF - CHOICE OF COLOURS

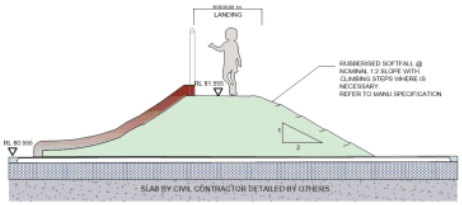
PH: 1300 227 667

WEBSITE: http://www.aaronsoutdoor.com.au/

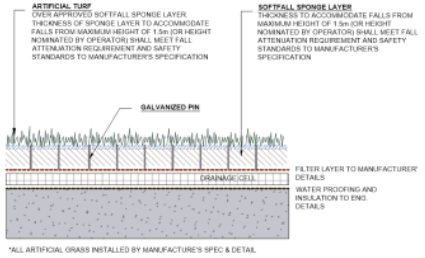
DETAIL 13: CUBBY HOUSE
SCALE N.T.S



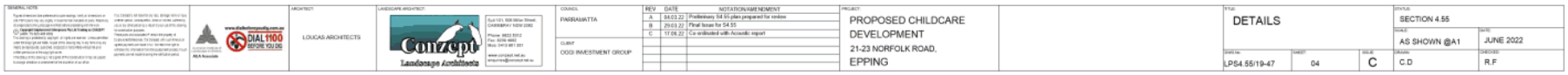
DETAIL 14: SLIDE ON MOUND - FRONT ELEVATION
SCALE: 1:20

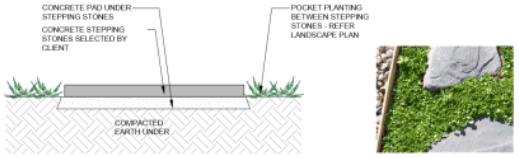


DETAIL 14: SLIDE ON MOUND - SECTION/ ELEVATION
SCALE: 1:20

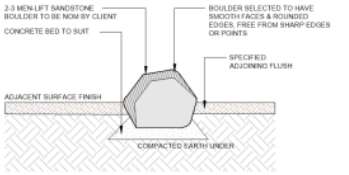


DETAIL 15: TYPICAL ARTIFICIAL TURF ON SLAB
SCALE: 1:10

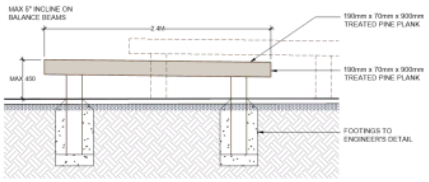




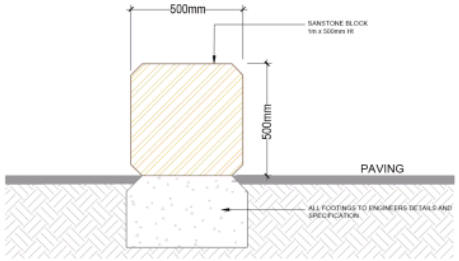
DETAIL 16: STEPPING STONES IN GROUNDCOVER PLANTING
SCALE 1:10



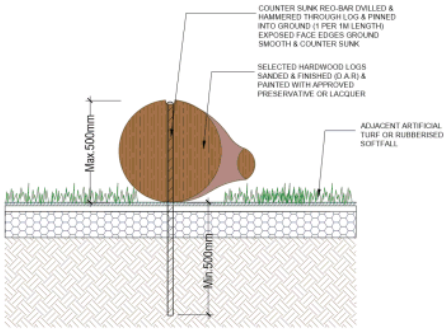
DETAIL 17: SANDSTONE BOULDER TYPICAL DETAIL
SCALE 1:20



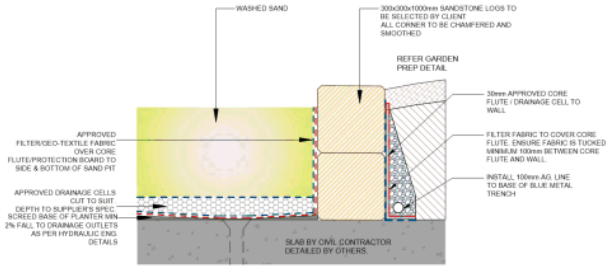
DETAIL 18: BALANCE BEAMS TYPICAL DETAIL
SCALE: 1:25



DETAIL 20: SANDSTONE BLOCK SEATING
SCALE 1:10



DETAIL 21: CLIMBING/SEATING LOG DETAIL
SCALE: 1:10



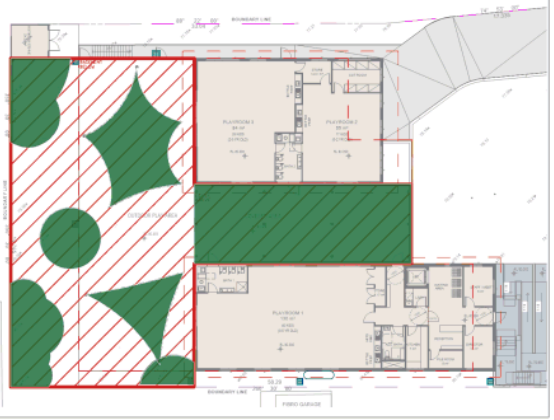
DETAIL 22: SANDPIT ON SLAB
SCALE: 1:10

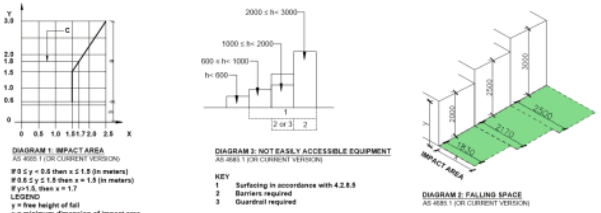
OUTDOOR PLAY AREA CALCULATIONS

OUTDOOR PLAY AREA

PROPOSED OUTDOOR SHADE AREA

REQUIRED OUTDOOR PLAY AREA: (7m² per child, 82 children in total)	**574m²**
PROPOSED OUTDOOR PLAY AREA: (Compliant)	**602.99m²**
REQUIRED OUTDOOR SHADE AREA:	**180.9-361.8m² (30%-60%)**
PROPOSED OUTDOOR SHADE AREA: (COMPLIANT)	**312.4m² (51.8%)**



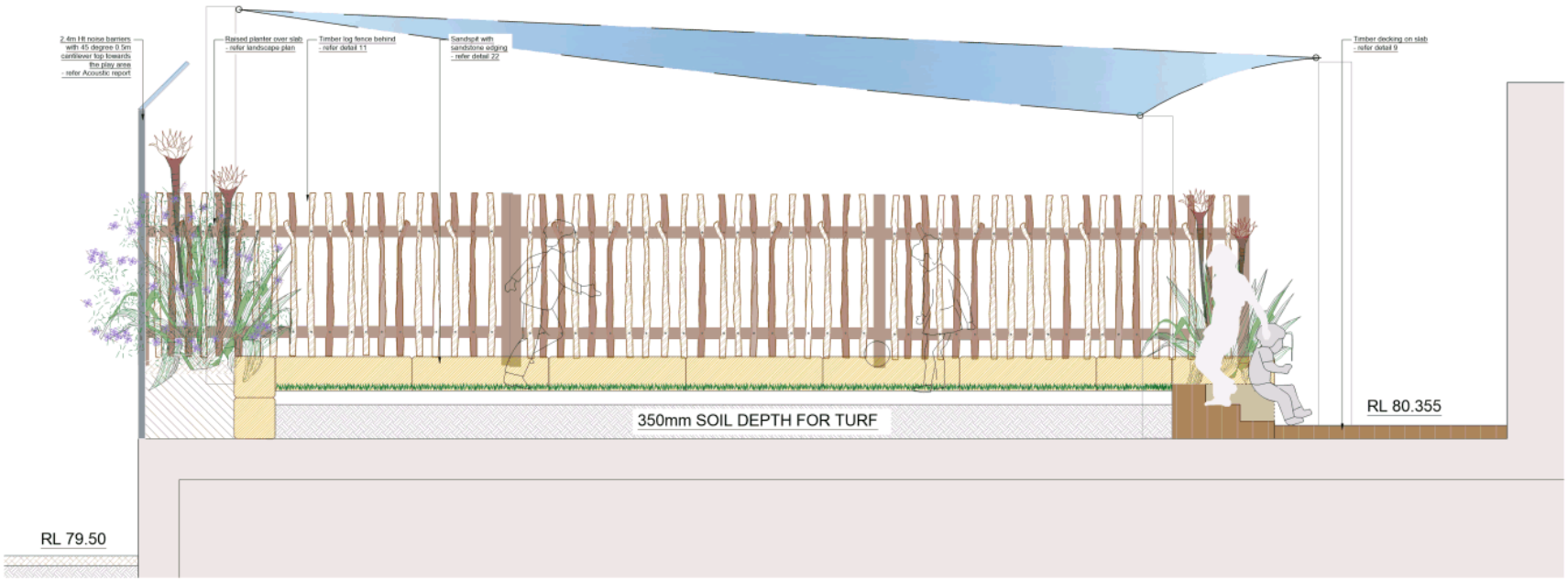


CHILDCARE / PLAYGROUND SAFETYFALL ZONES
(As Published by KIDSAFE NSW)

1. Playground equipment that measures 600mm or more above ground level requires a falling space and impact area.
2. Surfaces must have proof of testing in accordance with AS/NZS 4422
3. The maximum height of platforms in Education and Care Services is 1800mm
4. For static equipment items with platforms 600-1500mm above the ground, the falling space and impact area is 1500mm
5. A falling space/impact area of 1.7m is required for the maximum 1.8m platform height in SECS
6. Slides - Falling space and impact areas are required to be provided surrounding slides elevated more than 600mm above the playing surface
7. Equipment less than 600mm above ground level must be provided with an impact area of less than 1500mm. Kidsafe NSW recommends a circulation zone of 1000mm is provided surrounding low equipment items that are designed for climbing rocking or jumping.
8. The maximum fall height for moveable equipment is 1.5m (at the highest foot support and/or platform)
9. A minimum falling space and impact area of 1.5m is required for equipment items that measure 600mm or more above the ground.

DETAIL 19: CHILDCARE / PLAYGROUND SAFETYFALL ZONES
SCALE 1:20

ARCHITECT	LOUCAS ARCHITECTS	PROJECT	PROPOSED CHILDCARE DEVELOPMENT 21-23 NORFOLK ROAD, EPPING
LANDSCAPE ARCHITECT	Concept Landscape Architects	TITLE	DETAILS
COUNCIL	PARRAMATTA	STATUS	SECTION 4.55
CLIENT	OOGI INVESTMENT GROUP	SCALE	AS SHOWN @A1
REV	C	DATE	JUNE 2022
DRAWING NO.	LPS4.55/19-47	SHEET	05
ISSUE	C	DRAWN	C.D
CHECKED	R.F		



SECTION A
SCALE: 1:15

SECTION B
SCALE: 1:15

DIAL 1100 BEFORE YOU DIG

LOUCAS ARCHITECTS

Conzept Landscape Architects

PARRAMATTA

OOGI INVESTMENT GROUP

REV	DATE	NOTATION/AMENDMENT
A	04.03.22	Preliminary S4.55 plans prepared for review
B	29.03.22	Final Issue for S4.55
C	17.06.22	Co-ordinated with Acoustic report

PROPOSED CHILDCARE DEVELOPMENT
21-23 NORFOLK ROAD,
EPPING

TITLE: SECTIONS
STATUS: SECTION 4.55
SCALE: AS SHOWN @A1
DATE: JUNE 2022
DRWG No: LPS4.55/19-47
SHEET: 06
ISSUE: C
DRAWN: C.D
CHECKED: R.F

21-23 NORFOLK ROAD, EPPING NSW 2121

PROPOSED CHILD CARE CENTRE

STORMWATER CONCEPT PLANS - DEVELOPMENT APPLICATION

STORMWATER NOTES

1. CONTRACTOR MUST VERIFY ALL DIMENSIONS & EXISTING LEVELS, SERVICES & STRUCTURES ON SITE PRIOR TO COMMENCEMENT OF WORK.
2. THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED ARCHITECTURAL, LANDSCAPE, STRUCTURAL, HYDRAULIC, & OTHER SERVICES DRAWINGS & SPECIFICATIONS. IF THERE EXISTS AND DISCREPANCIES BETWEEN THE DRAWINGS, THE BUILDER SHALL REPORT THE DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCEMENT OF ANY WORKS.
3. EQUIVALENT STRENGTH REINFORCED CONCRETE PIPES MAY BE USED.
4. WHERE SUBSOIL DRAINAGE LINES PASS UNDER FLOOR SLABS & VEHICULAR PAVEMENTS, UNSLOTTED uPVC SEWER GRADE PIPE SHALL BE USED.
5. CHARGED LINES TO BE SEWER GRADE & SEALED.
6. ALL PIPES TO HAVE MIN 150mm COVER IF LOCATED WITHIN PROPERTY.
7. ALL PITS IN DRIVEWAYS TO BE CONCRETE & ALL PITS IN LANDSCAPED AREAS TO BE PLASTIC.
8. PITS LESS THAN 600mm DEEP MAY BE BRICK, PRECAST OR CONCRETE.
9. ALL BALCONIES & ROOFS TO BE DRAINED & TO HAVE SAFETY OVERFLOWS IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS.
10. ALL GRATES TO HAVE CHILD PROOF LOCKS.
11. ALL DRAINAGE WORKS TO AVID TREE ROOTS.
12. ALL DOWNPIPES & GUTTERS TO HAVE LEAF GUARDS.
13. COUNCIL'S ISSUED FOOTWAY DESIGN LEVELS TO BE INCORPORATED INTO THE FINISHED LEVELS ONCE ISSUED BY COUNCIL.
14. ALL WORKS SHALL BE IN ACCORDANCE WITH B.C.A. & A.S.3500.3.
15. CARE TO BE TAKEN AROUND EXISTING SEWER. STRUCTURAL ADVICE REQUIRED FOR SEWER PROTECTION AGAINST ADDITIONAL LOADING FROM NEW PITS, PIPES, RETAINING WALLS & OSD BASIN WATER LEVELS.
16. ALL Ø300 DRAINAGE PIPES & LARGER SHALL BE CLASS 2 APPROVED SPIGOT & SOCKET RCP PIPES WITH RUBBER RING JOINTS (U.N.O.). ALL DRAINAGE PIPES UP TO & INCLUDING Ø225 SHALL BE SEWER GRADE uPVC WITH SOLVENT WELD JOINTS (U.N.O.).
17. EQUIVALENT STRENGTH FRC PIPES MAY BE USED.
18. ALL PIPE JUNCTIONS, BENDS & TAPERS UP TO & INCLUDING Ø450 SHALL BE VIA PURPOSE MADE FITTINGS.
19. CONTRACTOR TO SUPPLY & INSTALL ALL FITTINGS & SPECIALS INCLUDING VARIOUS PIPE ADAPTORS TO ENSURE PROPER CONNECTION BETWEEN DISSIMILAR PIPE WORK.
20. ALL CONNECTIONS TO EXISTING DRAINAGE PITS SHALL BE MADE IN A TRADESMAN-LIKE MANNER, & THE INTERNAL WALL OF THE PIT AT THE POINT OF ENTRY SHALL BE CEMENT RENDERED TO ENSURE A SMOOTH FINISH.
21. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIN. 50mm CONCRETE BED (OR 75mm THICK BED OF 12mm BLUE METAL) UNDER THE BARREL OF THE PIPE. THE PIPE COLLAR AT NO POINT SHALL BEAR ON THE ROCK. IN OTHER THAN ROCK, PIPES SHALL BE LAID ON A 75mm THICK SAND BED. IN ALL CASES, BACKFILL THE TRENCH WITH SAND TO 200mm ABOVE THE PIPE. WHERE THE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH WITH SAND OR APPROVED GRANULAR BACKFILL COMPACTED IN 150mm LAYERS TO 98% STANDARD MAX. DRY DENSITY.
22. BEDDING SHALL BE TYPE H1 (U.N.O.), IN ACCORDANCE WITH CURRENT RELEVANT AUSTRALIAN STANDARDS.
23. WHERE STORMWATER LINES PASS UNDER FLOOR SLABS, SEWER GRADE RUBBER RING JOINTS ARE TO BE USED.
24. ALL PIPES IN BALCONIES TO BE Ø65 uPVC CAST IN CONCRETE SLAB.
25. Ø65 PVC @ MIN 1.0% Ø90 PVC @ MIN 1.0% Ø100 PVC @ MIN 1.0% Ø150 PVC @ MIN 1.0% Ø225 PVC @ MIN 0.5% Ø300 PVC @ MIN 0.4% UNLESS NOTED OTHERWISE
26. CONTRACTOR TO PROVIDE A BREAK / OPEN VOID IN RAIL / BALLUSTRADE FOR STORMWATER EMERGENCY OVERFLOW.
27. ALL ENCLOSED AREAS/PLANTER BOXES BE FITTED WITH FLOOR WASTES & TO DRAINED TO OSD.
28. DOWNPIPES TO BE CHECKED BY ARCHITECT & PLUMBER PRIOR TO CONSTRUCTION.
29. PROVIDE 3.0m LENGTH OF Ø100 SUBSOIL DRAINAGE PIPE WRAPPED IN FABRIC SOCK, AT UPSTREAM END OF EACH PIT.
30. ALL THE CLEANING EYES (OR INSPECTION EYES) FOR THE UNDERGROUND PIPES HAVE TO BE TAKEN UP TO THE FINISHED GROUND LEVEL FOR EASY IDENTIFICATION & MAINTENANCE PURPOSES.
31. ALL SUB-SOIL DRAINAGE SHALL BE A MIN OF Ø65 & SHALL BE PROVIDED WITH A FILTER SOCK. THE SUBSOIL DRAINAGE SHALL BE INSTALLED IN ACCORDANCE WITH DETAILS TO BE PROVIDED BY THE LANDSCAPE ARCHITECT.
32. PRIOR TO COMMENCING ANY WORKS, THE BUILDER SHALL ENSURE THAT THE INVERT LEVELS OF WHERE THE SITE STORMWATER SYSTEM CONNECTS INTO THE COUNCILS KERB/DRAINAGE SYSTEM MATCHED THE DESIGN LEVELS. ANY DISCREPANCIES SHALL BE REPORTED TO THE DESIGN ENGINEER IMMEDIATELY.

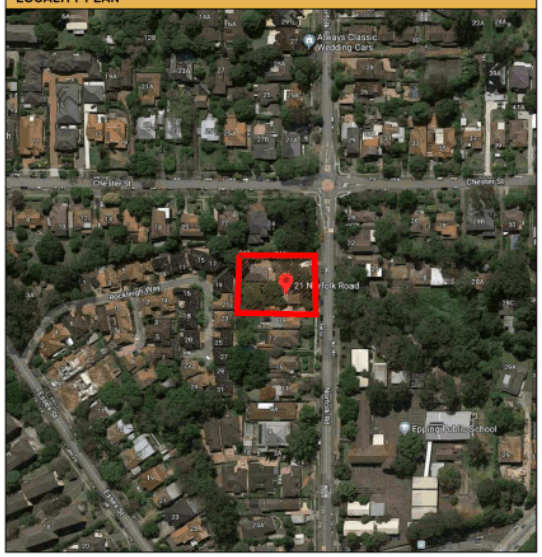
DRAWING INDEX

Drawing No.	DESCRIPTION
MBR18019 - 000	COVER SHEET, NOTES & DRAWING INDEX
MBR18019 - 101	STORMWATER CONCEPT PLAN - BASEMENT LEVEL
MBR18019 - 102	STORMWATER CONCEPT PLAN - GROUND LEVEL
MBR18019 - 103	OSD & WSUD CATCHMENT AREAS
MBR18019 - 104	OSD & WSUD DETAILS & CALCULATION SHEETS - SHEET 1 OF 3
MBR18019 - 105	OSD & WSUD DETAILS & CALCULATION SHEETS - SHEET 2 OF 3
MBR18019 - 106	OSD & WSUD DETAILS & CALCULATION SHEETS - SHEET 3 OF 3
MBR18019 - 107	SEDIMENT & EROSION CONTROL PLAN
MBR18019 - 108	CUT-FILL PLAN
MBR18019 - 109	UPSTREAM CATCHMENT ANALYSIS - SHEET 1 OF 2
MBR18019 - 110	UPSTREAM CATCHMENT ANALYSIS - SHEET 2 OF 2
MBR18019 - 111	MISCELLANEOUS DETAILS SHEET

SITEWORKS NOTES

1. ORIGIN OF LEVELS : AUSTRALIAN HEIGHT DATUM (A.H.D.)
2. CONTRACTOR MUST VERIFY ALL DIMENSIONS & EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK.
3. ALL WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS, THE SPECIFICATIONS & THE DIRECTIONS OF THE PRINCIPAL'S REPRESENTATIVE.
4. EXISTING SERVICES HAVE BEEN PLOTTED FROM SUPPLIED DATA & AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LOCATION & LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE PRINCIPAL'S REPRESENTATIVE. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
5. WHERE NEW WORKS ABUT EXISTING, THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS OBTAINED.
6. THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR.
7. CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER COMMUNICATIONS OR ELECTRICAL SERVICES. HAND EXCAVATE IN THESE AREAS.
8. ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACKFILLED WITH AN APPROVED NON-NATURAL GRANULAR MATERIAL & COMPACTED TO 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289.5.1.1.
9. ALL TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.
10. ON COMPLETION OF PIPE INSTALLATION, ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL & GRASSED AREAS & ROAD PAVEMENTS.
11. PROVIDE 12mm WIDE EXPANDING CORK JOINTS BETWEEN CONCRETE PAVEMENTS & ALL BUILDINGS, WALLS, FOOTINGS, COLUMNS, KERBS, DISH DRAINS, GRATED DRAINS, BOLLARD FOOTINGS ETC
12. CONTRACTOR TO OBTAIN ALL AUTHORITY APPROVALS.
13. ALL BATTERS TO BE GRASSED LINED WITH MIN 100mm TOPSOIL & APPROVED COUCH LAID AS TURF.
14. MAKE SMOOTH TRANSITION TO EXISTING SERVICES & MAKE GOOD.
15. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY DIVERSION DRAINS & MOUNDS TO ENSURE THAT, AT ALL TIMES, EXPOSED SURFACES ARE FREE DRAINING &, WHERE NECESSARY, EXCAVATE SUMPS & PROVIDE PUMPING EQUIPMENT TO DRAIN EXPOSED AREAS.
16. THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED ARCHITECTURAL, LANDSCAPE, STRUCTURAL, HYDRAULIC & ELECTRICAL DRAWINGS & SPECIFICATIONS. IF THERE EXISTS AND DISCREPANCIES BETWEEN THE DRAWINGS, THE BUILDER SHALL REPORT THE DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCEMENT OF ANY WORKS.
17. TRENCHES THROUGH EXISTING ROAD & CONCRETE PAVEMENTS SHALL BE SAWCUT TO FULL DEPTH OF CONCRETE & A MIN 50mm IN BITUMINOUS PAVING.
18. ALL BRANCH GAS & WATER SERVICES UNDER DRIVEWAYS & BRICK PAVING SHALL BE LOCATED IN Ø80 uPVC SEWER GRADE CONDUITS EXTENDING A MIN OF 500mm PAST PAVING.
19. ALL WORKS WITHIN COUNCIL RESERVE TO BE INSPECTED BY COUNCIL PRIOR TO CONSTRUCTION.
20. COUNCIL'S ISSUED FOOTWAY DESIGN LEVELS TO BE INCORPORATED INTO THE FINISHED LEVELS ONCE ISSUED BY COUNCIL.

LOCALITY PLAN



DIAL BEFORE YOU DIG NOTE

DIAL BEFORE YOU DIG www.1100.com.au

THE CONTRACTOR MUST CONTACT ALL SERVICES & MAINTAIN A SET OF 'DIAL BEFORE YOU DIG' DRAWINGS ON SITE AT ALL TIMES.

EROSION & SEDIMENT CONTROL NOTES

GENERAL INSTRUCTIONS:

E1. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE ENGINEERING PLANS, & ANY OTHER PLANS OR WRITTEN INSTRUCTIONS THAT MAY BE ISSUED & RELATING TO DEVELOPMENT AT THE SUBJECT SITE.

E2. THE SITE SUPERINTENDENT WILL ENSURE THAT ALL SOIL & WATER MANAGEMENT WORKS ARE LOCATED AS INSTRUCTED IN THIS SPECIFICATION.

E3. ALL BUILDERS & SUB-CONTRACTORS WILL BE INFORMED OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION & POLLUTION TO DOWNSLOPE LANDS & WATERWAYS.

CONSTRUCTION SEQUENCE:

E4. THE SOIL EROSION POTENTIAL ON THIS SITE SHALL BE MINIMISED. HENCE, WORKS SHALL BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:

a. INSTALL SEDIMENT FENCES, TEMPORARY CONSTRUCTION EXIT & SANDBAG KERB INLET SEDIMENT TRAP.
b. UNDERTAKE SITE DEVELOPMENT WORKS IN ACCORDANCE WITH THE ENGINEERING PLANS. PHASE DEVELOPMENT SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF WORKABLE SIZE.

EROSION CONTROL:

E5. DURING WINDY CONDITIONS, LARGE, UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL.

E6. FINAL SITE LANDSCAPING WILL BE UNDERTAKEN AS SOON AS POSSIBLE & WITHIN 20 WORKING DAYS FROM COMPLETION OF CONSTRUCTION ACTIVITIES.

FENCING:

E7. STOCKPILES WILL NOT BE LOCATED WITHIN 2m OF HAZARD AREAS, INCLUDING LIKELY AREAS OF CONCENTRATED OR HIGH VELOCITY FLOWS SUCH AS WATERWAYS. WHERE THEY ARE BETWEEN 2 & 5m FROM SUCH AREAS, SPECIAL SEDIMENT CONTROL MEASURES SHOULD BE TAKEN TO MINIMISE POSSIBLE POLLUTION TO DOWNSLOPE WATERS, E.G. THROUGH INSTALLATION OF SEDIMENT FENCING.

E8. ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) WILL BE REMOVED AS SOON AS POSSIBLE & WITHIN 10 WORKING DAYS FROM PLACEMENT.

E9. WATER WILL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS IT IS RELATIVELY SEDIMENT FREE, I.E. THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR ANY LIKELY SEDIMENT HAS BEEN FILTERED THROUGH AN APPROVED STRUCTURE.

E10. TEMPORARY SOIL & WATER MANAGEMENT STRUCTURES WILL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE REHABILITATED.

OTHER MATTERS:

E11. ACCEPTABLE RECEPTORS WILL BE PROVIDED FOR CONCRETE & MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS & LITTER.

E12. RECEPTORS FOR CONCRETE & MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS & LITTER ARE TO BE EMPTIED AS NECESSARY. DISPOSAL OF WASTE SHALL BE IN A MANNER APPROVED BY THE SITE SUPERINTENDENT.

SITE INSPECTION & MAINTENANCE:

E13. EROSION & SEDIMENT CONTROL MEASURES SHALL BE INSPECTED AFTER RAINFALL EVENTS TO ENSURE THAT THEY OPERATE EFFECTIVELY. REPAIR & OR MAINTENANCE SHALL BE UNDERTAKEN AS REQUIRED.

NOT FOR CONSTRUCTION
DA APPROVAL ONLY

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ALL PLANS MUST BE PRINTED IN COLOUR & READ PRIOR TO CONSTRUCTION

Rev	Description	Date	Design	Check
C	ARCHITECTURAL AMENDMENTS	28/03/2019	MBR	KE
D	ARCHITECTURAL AMENDMENTS	03/03/2020	MBR	KE
E	MINOR AMENDMENTS	19/05/2020	MBR	KE
F	MINOR AMENDMENTS	10/06/2020	MBR	KE
G	ISSUE FOR SECTION 4.55 APPROVAL	29/08/2022	MBR	KE

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Phone: 02 8052 9600
Email: admin@loucasarc.com.au

CITY OF PARRAMATTA

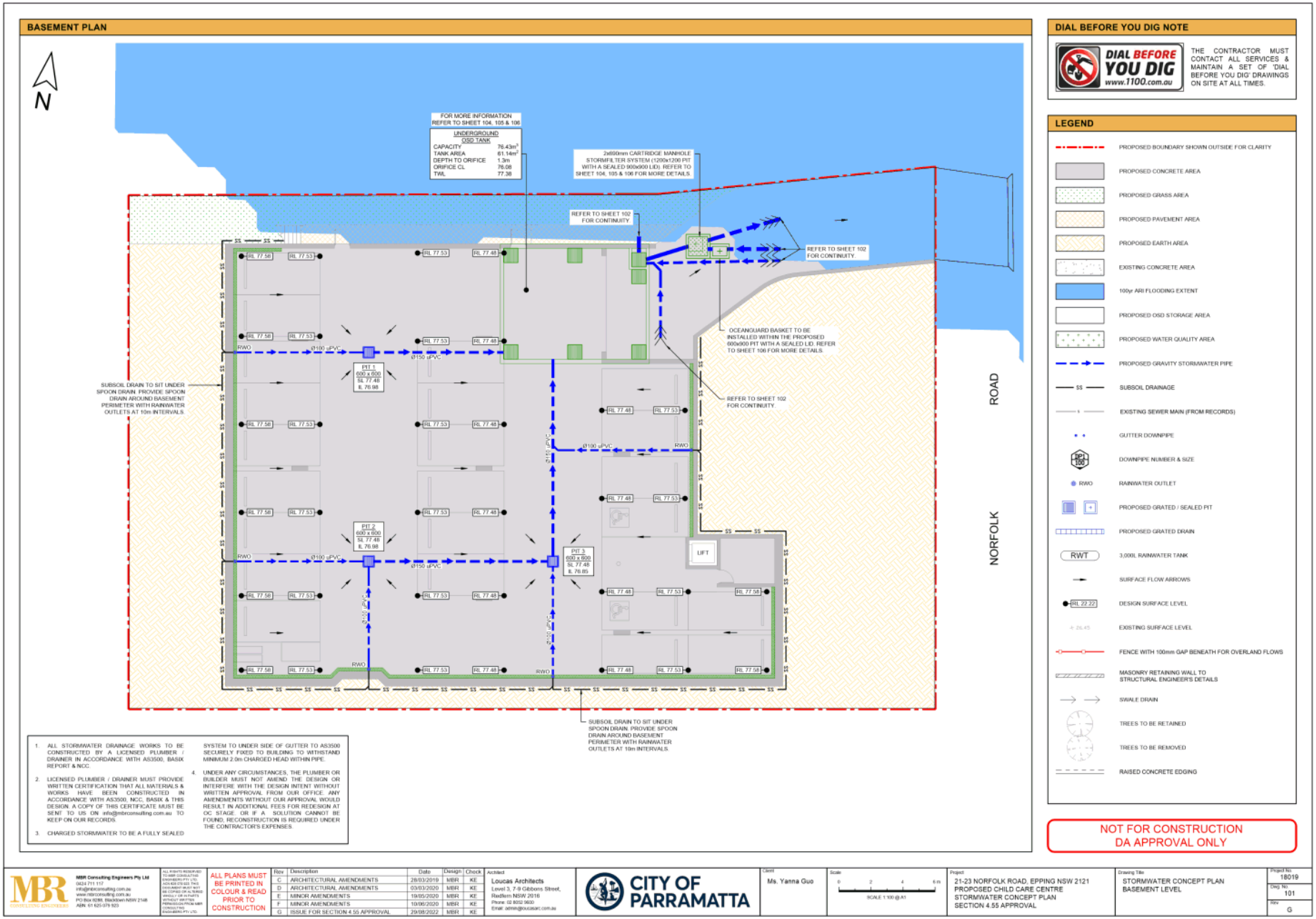
Client: Ms. Yanna Guo

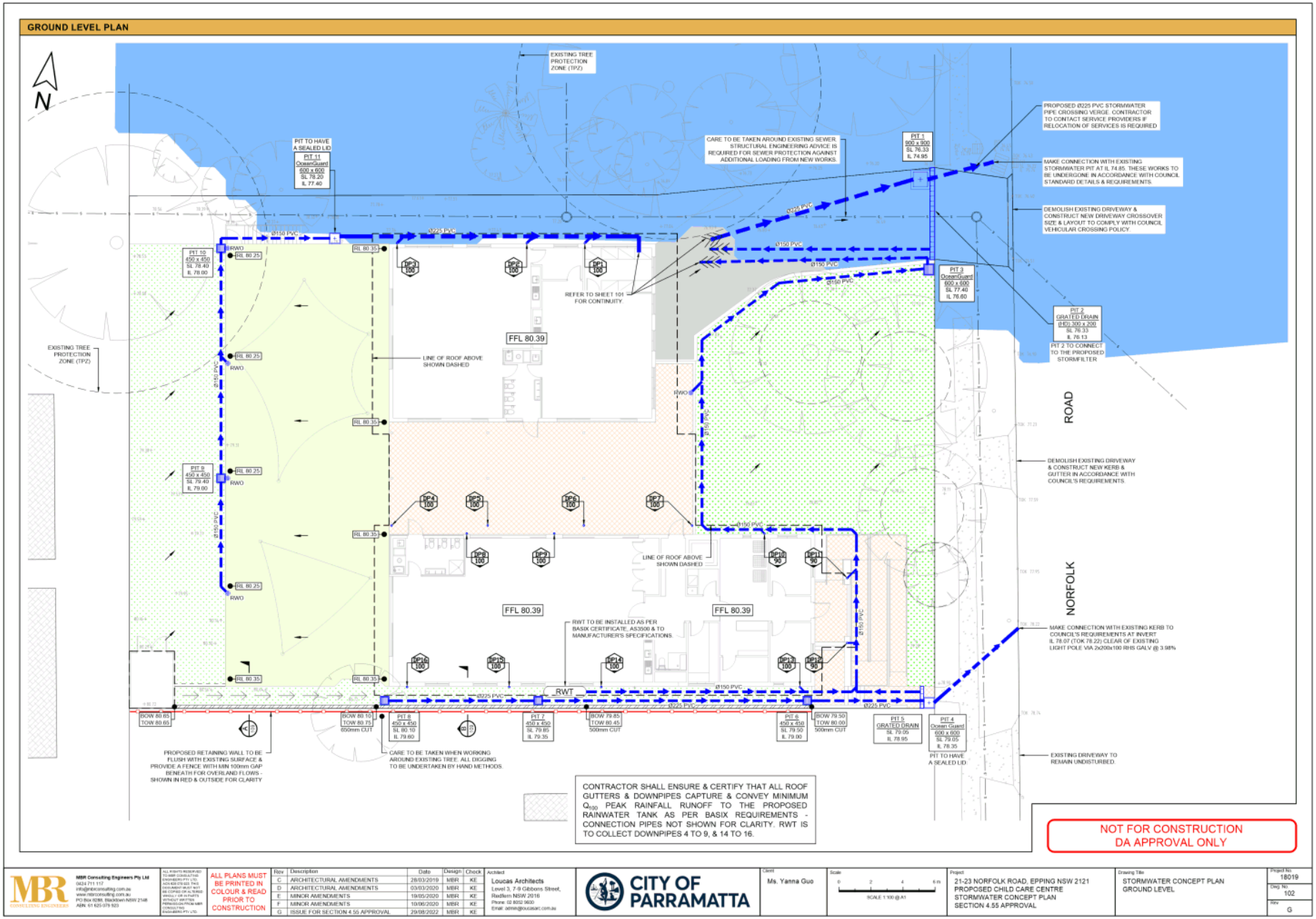
Scale:

Project: 21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
SECTION 4.55 APPROVAL

Drawing Title: COVER SHEET, NOTES & DRAWING INDEX

Project No: 18019
Dwg No: 000
Rev: G


BASEMENT PLAN
N
FOR MORE INFORMATION REFER TO SHEET 104, 105 & 106
UNDERGROUND OSD TANK
CAPACITY 76.43m³
TANK AREA 61.14m²
DEPTH TO ORIFICE 1.3m
ORIFICE CL 76.08
TWL 77.38
2x690mm CARTRIDGE MANHOLE STORMFILTER SYSTEM (1200x1200 PIT WITH A SEALED 900x900 LID). REFER TO SHEET 104, 105 & 106 FOR MORE DETAILS
REFER TO SHEET 102 FOR CONTINUITY
OCEANGUARD BASKET TO BE INSTALLED WITHIN THE PROPOSED 600x900 PIT WITH A SEALED LID. REFER TO SHEET 106 FOR MORE DETAILS.
SUBSOIL DRAIN TO SIT UNDER SPOON DRAIN. PROVIDE SPOON DRAIN AROUND BASEMENT PERIMETER WITH RAINWATER OUTLETS AT 10m INTERVALS.
PIT 1 600 x 600 SL 77.48 IL 76.98
PIT 2 600 x 600 SL 77.48 IL 76.98
PIT 3 600 x 600 SL 77.48 IL 76.85
LIFT
ROAD
NORFOLK
1. ALL STORMWATER DRAINAGE WORKS TO BE CONSTRUCTED BY A LICENSED PLUMBER / DRAINER IN ACCORDANCE WITH AS3500, BASIX REPORT & NCC.
2. LICENSED PLUMBER / DRAINER MUST PROVIDE WRITTEN CERTIFICATION THAT ALL MATERIALS & WORKS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH AS3500, NCC, BASIX & THIS DESIGN. A COPY OF THIS CERTIFICATE MUST BE SENT TO US ON info@mbrconsulting.com.au TO KEEP ON OUR RECORDS.
3. CHARGED STORMWATER TO BE A FULLY SEALED SYSTEM TO UNDER SIDE OF GUTTER TO AS3500 SECURELY FIXED TO BUILDING TO WITHSTAND MINIMUM 2.0m CHARGED HEAD WITHIN PIPE.
4. UNDER ANY CIRCUMSTANCES, THE PLUMBER OR BUILDER MUST NOT AMEND THE DESIGN OR INTERFERE WITH THE DESIGN INTENT WITHOUT WRITTEN APPROVAL FROM OUR OFFICE. ANY AMENDMENTS WITHOUT OUR APPROVAL WOULD RESULT IN ADDITIONAL FEES FOR REDESIGN AT OC STAGE. OR IF A SOLUTION CANNOT BE FOUND, RECONSTRUCTION IS REQUIRED UNDER THE CONTRACTOR'S EXPENSES.
DIAL BEFORE YOU DIG NOTE
DIAL BEFORE YOU DIG www.1100.com.au
THE CONTRACTOR MUST CONTACT ALL SERVICES & MAINTAIN A SET OF 'DIAL BEFORE YOU DIG' DRAWINGS ON SITE AT ALL TIMES.
LEGEND
PROPOSED BOUNDARY SHOWN OUTSIDE FOR CLARITY
PROPOSED CONCRETE AREA
PROPOSED GRASS AREA
PROPOSED PAVEMENT AREA
PROPOSED EARTH AREA
EXISTING CONCRETE AREA
100yr ARI FLOODING EXTENT
PROPOSED OSD STORAGE AREA
PROPOSED WATER QUALITY AREA
PROPOSED GRAVITY STORMWATER PIPE
SUBSOIL DRAINAGE
EXISTING SEWER MAIN (FROM RECORDS)
GUTTER DOWNPIPE
DOWNPIPE NUMBER & SIZE
RWO RAINWATER OUTLET
PROPOSED GRATED / SEALED PIT
PROPOSED GRATED DRAIN
RWT 3,000L RAINWATER TANK
SURFACE FLOW ARROWS
RL 22.22 DESIGN SURFACE LEVEL
EXISTING SURFACE LEVEL
FENCE WITH 100mm GAP BENEATH FOR OVERLAND FLOWS
MASONRY RETAINING WALL TO STRUCTURAL ENGINEER'S DETAILS
SWALE DRAIN
TREES TO BE RETAINED
TREES TO BE REMOVED
RAISED CONCRETE EDGING
NOT FOR CONSTRUCTION
DA APPROVAL ONLY
MBR Consulting Engineers Pty Ltd
ALL PLANS MUST BE PRINTED IN COLOUR & READ PRIOR TO CONSTRUCTION
Rev Description Date Design Check
C ARCHITECTURAL AMENDMENTS 28/03/2019 MBR KE
D ARCHITECTURAL AMENDMENTS 03/03/2020 MBR KE
E MINOR AMENDMENTS 19/05/2020 MBR KE
F MINOR AMENDMENTS 10/06/2020 MBR KE
G ISSUE FOR SECTION 4.55 APPROVAL 29/08/2022 MBR KE
Architect
Loucas Architects
Level 3, 7-9 Gibbons Street, Redfern NSW 2016
Phone: 02 8052 9600
Email: admin@loucasarc.com.au
CITY OF PARRAMATTA
Client
Ms. Yanna Guo
Scale
SCALE 1:100 @ A1
Project
21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
SECTION 4.55 APPROVAL
Drawing Title
STORMWATER CONCEPT PLAN
BASEMENT LEVEL
Project No 18019
Dwg No 101
Rev G


GROUND LEVEL PLAN
N
EXISTING TREE PROTECTION ZONE (TPZ)
PIT TO HAVE A SEALED LID
PIT 11 OceanGuard 600 x 600 SL 78.20 IL 77.40
CARE TO BE TAKEN AROUND EXISTING SEWER. STRUCTURAL ENGINEERING ADVICE IS REQUIRED FOR SEWER PROTECTION AGAINST ADDITIONAL LOADING FROM NEW WORKS.
PIT 1 900 x 900 SL 76.33 IL 74.95
PROPOSED Ø225 PVC STORMWATER PIPE CROSSING VERGE. CONTRACTOR TO CONTACT SERVICE PROVIDERS IF RELOCATION OF SERVICES IS REQUIRED
MAKE CONNECTION WITH EXISTING STORMWATER PIT AT IL 74.85. THESE WORKS TO BE UNDERGONE IN ACCORDANCE WITH COUNCIL STANDARD DETAILS & REQUIREMENTS.
DEMOLISH EXISTING DRIVEWAY & CONSTRUCT NEW DRIVEWAY CROSSOVER SIZE & LAYOUT TO COMPLY WITH COUNCIL VEHICULAR CROSSING POLICY.
Ø225 PVC
Ø150 PVC
PIT 10 450 x 450 SL 78.40 IL 78.00
PIT 3 OceanGuard 600 x 600 SL 77.40 IL 76.60
PIT 2 GRATED DRAIN (HD) 300 x 200 SL 76.33 IL 76.13
PIT 2 TO CONNECT TO THE PROPOSED STORMFILTER
REFER TO SHEET 101 FOR CONTINUITY.
FFL 80.39
LINE OF ROOF ABOVE SHOWN DASHED
EXISTING TREE PROTECTION ZONE (TPZ)
RL 80.25
RWO
RL 80.35
ROAD
PIT 9 450 x 450 SL 79.40 IL 79.00
DEMOLISH EXISTING DRIVEWAY & CONSTRUCT NEW KERB & GUTTER IN ACCORDANCE WITH COUNCIL'S REQUIREMENTS.
NORFOLK
MAKE CONNECTION WITH EXISTING KERB TO COUNCIL'S REQUIREMENTS AT INVERT IL 78.07 (TOK 78.22) CLEAR OF EXISTING LIGHT POLE VIA 2x200x100 RHS GALV @ 3.98%
RWT TO BE INSTALLED AS PER BASIX CERTIFICATE, AS3500 & TO MANUFACTURER'S SPECIFICATIONS.
RWT
BOW 80.65 TOW 80.65
BOW 80.10 TOW 80.75 650mm CUT
PIT 8 450 x 450 SL 80.10 IL 79.60
PIT 7 450 x 450 SL 79.85 IL 79.35
BOW 79.85 TOW 80.45 500mm CUT
PIT 6 450 x 450 SL 79.50 IL 79.00
BOW 79.50 TOW 80.00 500mm CUT
PIT 5 GRATED DRAIN SL 79.05 IL 78.95
PIT 4 Ocean Guard 600 x 600 SL 79.05 IL 78.35
PIT TO HAVE A SEALED LID
EXISTING DRIVEWAY TO REMAIN UNDISTURBED.
PROPOSED RETAINING WALL TO BE FLUSH WITH EXISTING SURFACE & PROVIDE A FENCE WITH MIN 100mm GAP BENEATH FOR OVERLAND FLOWS - SHOWN IN RED & OUTSIDE FOR CLARITY
CARE TO BE TAKEN WHEN WORKING AROUND EXISTING TREE. ALL DIGGING TO BE UNDERTAKEN BY HAND METHODS.
CONTRACTOR SHALL ENSURE & CERTIFY THAT ALL ROOF GUTTERS & DOWNPIPES CAPTURE & CONVEY MINIMUM Q_{100} PEAK RAINFALL RUNOFF TO THE PROPOSED RAINWATER TANK AS PER BASIX REQUIREMENTS - CONNECTION PIPES NOT SHOWN FOR CLARITY. RWT IS TO COLLECT DOWNPIPES 4 TO 9, & 14 TO 16.
NOT FOR CONSTRUCTION DA APPROVAL ONLY
MBR CONSULTING ENGINEERS
MBR Consulting Engineers Pty Ltd
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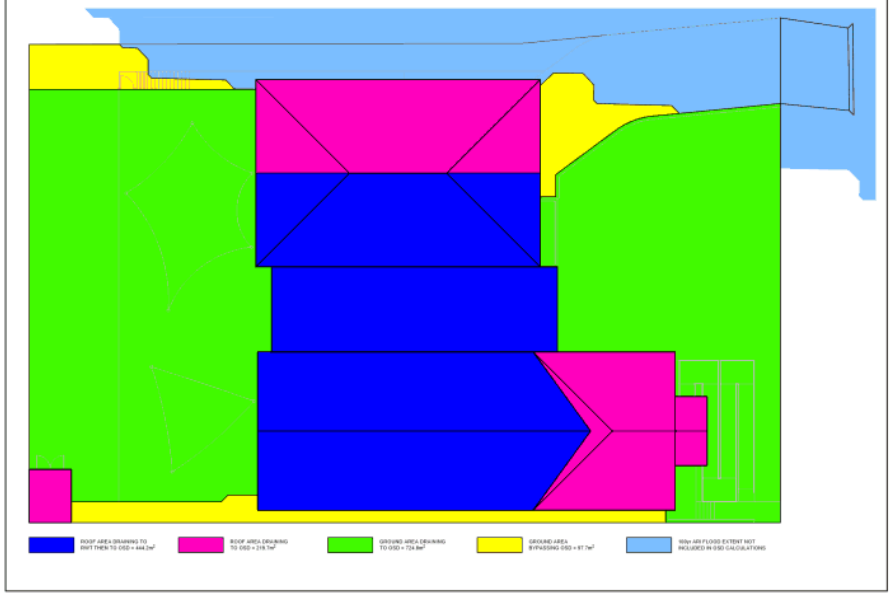
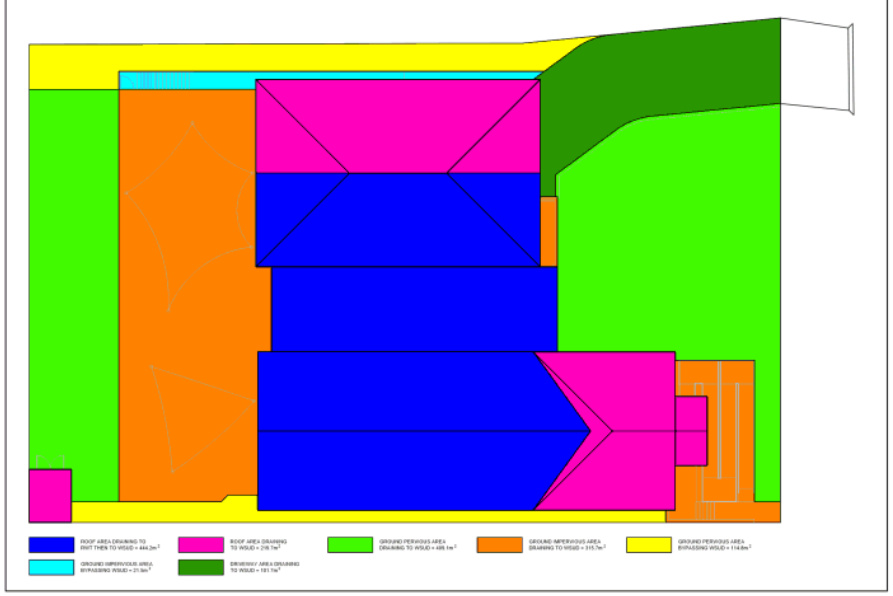
21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
SECTION 4.55 APPROVAL
Drawing Title
STORMWATER CONCEPT PLAN
GROUND LEVEL
Project No. 18019
Dwg No. 102
Rev G

OSD CATCHMENT PLAN



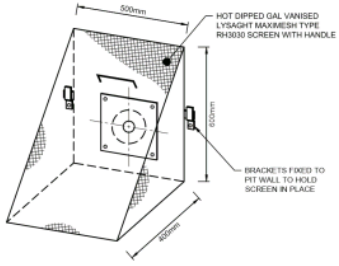
WSUD CATCHMENT PLAN



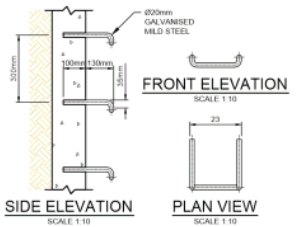
PARRAMATTA CITY COUNCIL
On-Site Detention Calculation Sheet

Project No:	MBR18019		Lot No:	4 & A
Address:	21-23 Norfolk Road Epping		DP No:	8487 & 371706
Designer:	Michael Bou Rada		D.A. No:	745/2018
Phone:	0424 711 117			
Council Prescribed PSD	80	L/sec/ha		
Council Prescribed SSR	300	m^3/ha	1% AEP Free Orifice	1% AEP Drowned Orifice
Total Site Area	1,487.50	m^2		
Area Bypassing OSD	116.20	m^2		
Basic Storage Volume		m^3	44.63	44.63
Basic Discharge		m^3/s	11.90	11.90
Area of Site to Storage		m^2	1371.30	1,371.30
Percentage of Site		%	92	92
Storage per ha of contributing area		m^3/ha	325.42	325.42
Volume / PSD Adjustment		L/sec/ha	132.62	132.62
PSD for site		L/sec	18.19	18.19
Maximum Head to Orifice Centre		m	1.000	0.470
Calculated Orifice Diameter		mm	86.0	86.0
Maximum discharge		L/sec	10.94	10.94
Head for high early discharge		m	1.000	0.370
High Early Discharge		L/sec	9.71	9.71
Mean Discharge		L/sec	10.32	10.32
Average Discharge per Hectare		L/sec/ha	75.29	75.29
Final Site Storage Ratio			335	495
Site Storage Volume		m^3	55.43	67.81
Volume Provided		m^3	76.43	76.43
Percentage		%	168.0	112.7
HED Check using Weir Flow				
Coefficient		C	1.74	1.70
Length of weir		m	1.80	1.80
Mean flow over weir		L/sec	17.83	10.32
Depth over weir		m	0.032	0.023
Checked By:	Kamyar Eivazzaddeh			
Date Checked:	10-Jun-20			

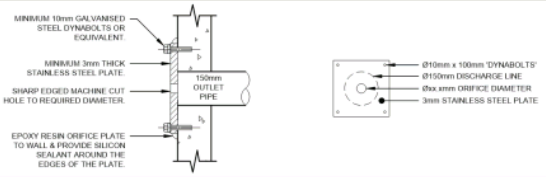
TRASH SCREEN DETAIL



STEP IRON DETAIL



ORIFICE PLATE DETAIL



ON-SITE DETENTION NOTES

1. THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED ARCHITECTURAL, LANDSCAPE, STRUCTURAL, HYDRAULIC, & OTHER SERVICES DRAWINGS & SPECIFICATIONS. IF THERE EXISTS AND DISCREPANCIES BETWEEN THE DRAWINGS, THE BUILDER SHALL REPORT THE DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCEMENT OF ANY WORKS.
2. THE OSD BASIN / TANK IS TO BE BUILT TO THE CORRECT LEVELS & SIZE AS PER THIS DESIGN. ANY VARIATIONS ARE TO BE DONE UNDER CONSULTATION FROM OUR OFFICE ONLY. ANY AMENDMENTS WITHOUT OUR APPROVAL WOULD RESULT IN ADDITIONAL FEES FOR REDESIGN AT OC STAGE OR IF A SOLUTION CANNOT BE FOUND, RECONSTRUCTION IS REQUIRED UNDER THE CONTRACTOR'S EXPENSES.

OCEAN PROTECT NOTES

1. PRECAST STRUCTURE SUPPLIED WITH CORE HOLES TO SUIT OUTER DIAMETER OF NOMINATED PIPE SIZE / MATERIAL.
2. IF THE PEAK FLOW RATE, AS DETERMINED BY THE SITE CIVIL ENGINEER, EXCEEDS THE PEAK HYDRAULIC CAPACITY OF THE PRODUCT, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.
3. PRECAST STRUCTURE SHALL MEET W80 WHEEL LOAD RATING ASSUMING A MAXIMUM EARTH COVER OF 2.0m & A GROUND WATER ELEVATION AT OR BELOW THE OUTLET PIPE INVERT ELEVATION. CERTIFYING ENGINEER TO CONFIRM ACTUAL GROUNDWATER ELEVATION. PRECAST STRUCTURE SHALL BE IN ACCORDANCE WITH AS3600.
4. ALL WATER QUALITY TREATMENT DEVICES REQUIRE PERIODIC MAINTENANCE AS OUTLINED IN THE O&M GUIDELINES.
5. SITE SPECIFIC PRODUCTION DRAWING WILL BE PROVIDED ON PLACEMENT OF ORDER.
6. ANY BACKFILL DEPTH, SUB-BASE, & OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS & SHALL BE SPECIFIED BY SITE CIVIL ENGINEER.
7. CONTRACTOR TO PROVIDE ALL EQUIPMENT WITH SUFFICIENT LIFTING & REACH CAPACITY TO LIFT & SET THE STORMFILTER STRUCTURE (LIFTING DETAIL PROVIDED SEPARATELY).
8. CONTRACTOR TO APPLY SEALANT TO ALL JOINTS & TO PROVIDE, INSTALL & GROUT INLET & OUTLET PIPES.

CONFINED SPACE DANGER SIGN

1. A CONFINED SPACE DANGER SIGN SHALL BE POSITIONED IN A LOCATION AT ALL ACCESS POINTS, SUCH THAT IT IS CLEARLY VISIBLE TO PERSONS PROPOSING TO ENTER THE BELOW GROUND TANKS CONFINED SPACE.
2. MINIMUM DIMENSIONS OF THE SIGN - 300mm x 450mm (LARGE ENTRIES, SUCH AS DOORS) -250mm x 180mm (SMALL ENTRIES SUCH AS GRATES & MANHOLES).
3. THE SIGN SHALL BE MANUFACTURED FROM COLOUR BONDED ALUMINUM OR POLYPROPYLENE.
4. SIGN SHALL BE AFFIXED USING SCREWS AT EACH CORNER OF THE SIGN.
5. COLOURS:
   "DANGER" & BACKGROUND = WHITE
   ELLIPTICAL AREA = RED
   RECTANGLE CONTAINING ELLIPSE = BLACK
   BORDER AND OTHER LETTERING = BLACK

NOT FOR CONSTRUCTION
DA APPROVAL ONLY

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PO Box 9288, Blacktown NSW 2148
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Rev	Description	Date	Design	Check
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Architect
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Level 3, 7-9 Gibbons Street,
Redfern NSW 2016
Phone: 02 8052 9600
Email: admin@loucasarc.com.au

CITY OF PARRAMATTA

Client: Ms. Yanna Guo

Scale: 0 3 6 9 m — SCALE 1:150 @ A1

Project: 21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
SECTION 4.55 APPROVAL

Drawing Title: OSD & WSUD CATCHMENT AREAS

Project No: 18019
Dwg No: 103
Rev: G

ON-SITE DETENTION NOTES

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OCEAN PROTECT NOTES

1. PRECAST STRUCTURE SUPPLIED WITH CORE HOLES TO SUIT OUTER DIAMETER OF NOMINATED PIPE SIZE / MATERIAL.
2. IF THE PEAK FLOW RATE, AS DETERMINED BY THE SITE CIVIL ENGINEER, EXCEEDS THE PEAK HYDRAULIC CAPACITY OF THE PRODUCT, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.
3. PRECAST STRUCTURE SHALL MEET W80 WHEEL LOAD RATING ASSUMING A MAXIMUM EARTH COVER OF 2.0m & A GROUND WATER ELEVATION AT OR BELOW THE OUTLET PIPE INVERT ELEVATION. CERTIFYING ENGINEER TO CONFIRM ACTUAL GROUNDWATER ELEVATION. PRECAST STRUCTURE SHALL BE IN ACCORDANCE WITH AS3600.
4. ALL WATER QUALITY TREATMENT DEVICES REQUIRE PERIODIC MAINTENANCE AS OUTLINED IN THE O&M GUIDELINES.
5. SITE SPECIFIC PRODUCTION DRAWING WILL BE PROVIDED ON PLACEMENT OF ORDER.
6. ANY BACKFILL DEPTH, SUB-BASE, & OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS & SHALL BE SPECIFIED BY SITE CIVIL ENGINEER.
7. CONTRACTOR TO PROVIDE ALL EQUIPMENT WITH SUFFICIENT LIFTING & REACH CAPACITY TO LIFT & SET THE STORMFILTER STRUCTURE (LIFTING DETAIL PROVIDED SEPARATELY).
8. CONTRACTOR TO APPLY SEALANT TO ALL JOINTS & TO PROVIDE, INSTALL & GROUT INLET & OUTLET PIPES.

PARRAMATTA CITY COUNCIL
On-Site Detention Calculation Sheet

Project No:	MBR18019		Lot No:	4 & A
Address:	21-23 Norfolk Road Epping		DP No:	8487 & 371706
Designer:	Michael Bou Rada		D.A. No:	745/2018
Phone:	0424 711 117			
Council Prescribed PSD	80	L/sec/ha	1% AEP Free Orifice	1% AEP Drowned Orifice
Council Prescribed SSR	300	m³/ha		
Total Site Area	1,487.50	m²		
Area Bypassing OSD	116.20	m²		
Basic Storage Volume		m³	44.63	44.63
Basic Discharge		m³/s	11.90	11.90
Area of Site to Storage		m²	1371.30	1,371.30
Percentage of Site		%	92	92
Storage per ha of contributing area		m³/ha	325.42	325.42
Volume / PSD Adjustment		L/sec/ha	132.62	132.62
PSD for site		L/sec	18.19	18.19
Maximum Head to Orifice Centre		m	1.300	0.470
Calculated Orifice Diameter		mm	86.0	86.0
Maximum discharge		L/sec	18.19	10.94
Head for high early discharge		m	1.300	0.370
High Early Discharge		L/sec	16.17	9.71
Mean Discharge		L/sec	17.18	10.32
Average Discharge per Hectare		L/sec/ha	125.82	75.29
Final Site Storage Ratio			332	495
Site Storage Volume		m³	45.48	67.81
Volume Provided		m³	76.43	76.43
Percentage		%	168.0	112.7
HED Check using Weir Flow				
Coefficient		C	1.74	1.70
Length of weir		m	1.80	1.80
Mean flow over weir		L/sec	17.83	10.32
Depth over weir		m	0.032	0.023
Checked By:	Kamyar Eivazzaddeh			
Date Checked:	10-Jun-20			

CONFINED SPACE DANGER SIGN

1. A CONFINED SPACE DANGER SIGN SHALL BE POSITIONED IN A LOCATION AT ALL ACCESS POINTS, SUCH THAT IT IS CLEARLY VISIBLE TO PERSONS PROPOSING TO ENTER THE BELOW GROUND TANK/S CONFINED SPACE.
2. MINIMUM DIMENSIONS OF THE SIGN - 300mm x 450mm (LARGE ENTRIES, SUCH AS DOORS) -250mm x 180mm (SMALL ENTRIES SUCH AS GRATES & MANHOLES).
3. THE SIGN SHALL BE MANUFACTURED FROM COLOUR BONDED ALUMINUM OR POLYPROPYLENE.
4. SIGN SHALL BE AFFIXED USING SCREWS AT EACH CORNER OF THE SIGN.

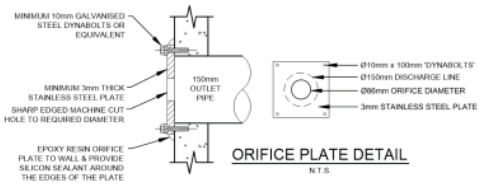
WSUD DATA REQUIREMENTS

STRUCTURE ID	1
WATER QUALITY FLOW RATE (L/S)	15.1
PEAK FLOW RATE (L/S)	15.1
RETURN PERIOD OF PEAK FLOW (yrs)	-
No OF CARTRIDGES REQUIRED	2
CARTRIDGE HEIGHT (310, 460 or 690mm)	690
MEDIA TYPE (PERLITE, PERLITE/ZEOLITE OR ZPG)	PSORB
PRECAST VAULT WEIGHT	- kg
PRECAST LID WEIGHT	- kg

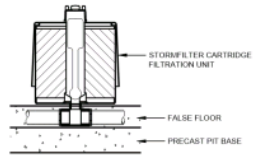
PIPE DATA	INVERT IL	MATERIAL	DIAMETER
INLET PIPE 1	75.95	PVC	150
INLET PIPE 2	75.33	PVC	150
OUTLET PIPE	75.13	PVC	150

OSD CALCULATIONS

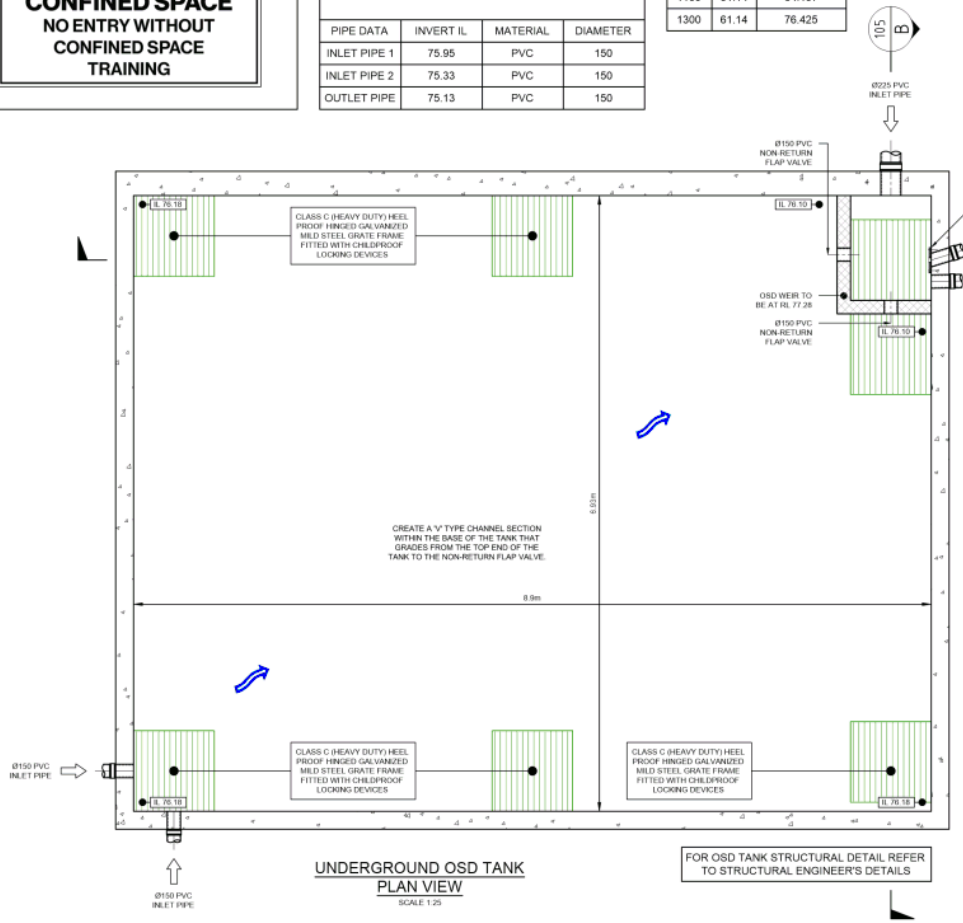
DEPTH (mm)	AREA (m²)	CUMULATIVE VOLUME (m³)
0	61.14	0
100	61.14	3.057
200	61.14	9.171
300	61.14	15.285
400	61.14	21.399
500	61.14	27.513
700	61.14	39.741
900	61.14	51.969
1100	61.14	64.197
1300	61.14	76.425



ORIFICE PLATE DETAIL
N.T.S.

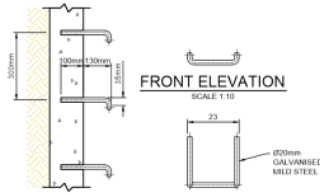


SYSTEM HYDRAULIC DROP
CARTRIDGE FLOW RATE
N.T.S.



UNDERGROUND OSD TANK
PLAN VIEW
SCALE 1:25

FOR OSD TANK STRUCTURAL DETAIL REFER TO STRUCTURAL ENGINEER'S DETAILS

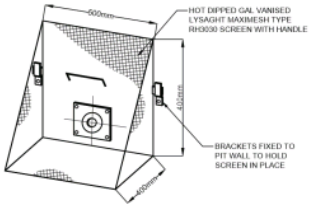


FRONT ELEVATION
SCALE 1:10

SIDE ELEVATION
SCALE 1:10

PLAN VIEW
SCALE 1:10

STEP IRON DETAIL
SCALE 1:10



TRASH SCREEN DETAIL
N.T.S.

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0424 711 117
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ABN: 61 625 079 923

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G	ISSUE FOR SECTION 4.55 APPROVAL	29/08/2022	MBR	KE

Architect: Loucas Architects, Level 3, 7-9 Gibbons Street, Redfern NSW 2016, Phone: 02 8052 9600, Email: admin@loucasarc.com.au

CITY OF PARRAMATTA

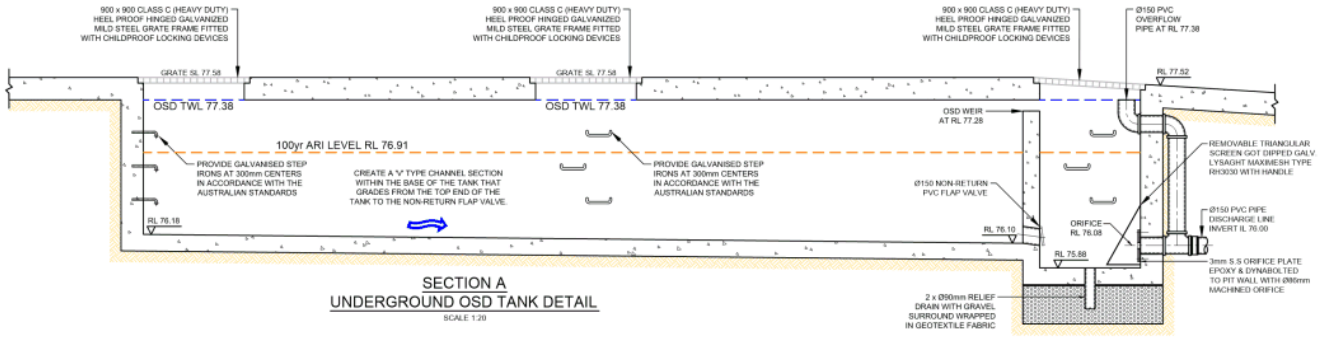
Client: Ms. Yanna Guo

Scale: SCALE 1:10 @ A1, SCALE 1:25 @ A3

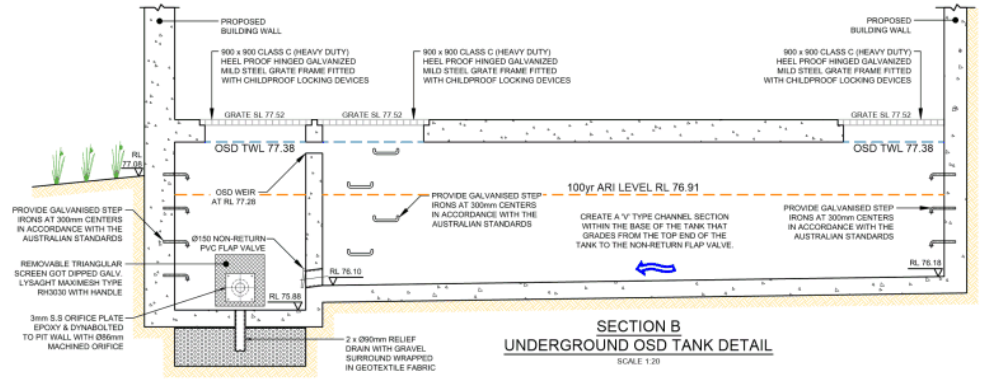
Project: 21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
SECTION 4.55 APPROVAL

Drawing Title: OSD & WSUD DETAILS & CALCULATION SHEETS
SHEET 1 OF 3

Project No: 18019
Dwg No: 104
Rev: G



SECTION A
UNDERGROUND OSD TANK DETAIL
SCALE 1:20



SECTION B
UNDERGROUND OSD TANK DETAIL
SCALE 1:20

DIAL BEFORE YOU DIG NOTE

DIAL BEFORE YOU DIG www.1100.com.au

THE CONTRACTOR MUST CONTACT ALL SERVICES & MAINTAIN A SET OF 'DIAL BEFORE YOU DIG' DRAWINGS ON SITE AT ALL TIMES.

ON-SITE DETENTION NOTES

1. THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED ARCHITECTURAL, LANDSCAPE, STRUCTURAL, HYDRAULIC & OTHER SERVICES DRAWINGS & SPECIFICATIONS. IF THERE EXISTS AND DISCREPANCIES BETWEEN THE DRAWINGS, THE BUILDER SHALL REPORT THE DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCEMENT OF ANY WORKS.
2. THE OSD BASIN / TANK IS TO BE BUILT TO THE CORRECT LEVELS & SIZE AS PER THIS DESIGN. ANY VARIATIONS ARE TO BE DONE UNDER CONSULTATION FROM OUR OFFICE ONLY. ANY AMENDMENTS WITHOUT OUR APPROVAL WOULD RESULT IN ADDITIONAL FEES FOR REDESIGN AT OC STAGE OR IF A SOLUTION CANNOT BE FOUND, RECONSTRUCTION IS REQUIRED UNDER THE CONTRACTOR'S EXPENSES.

CONFINED SPACE DANGER SIGN

1. A CONFINED SPACE DANGER SIGN SHALL BE POSITIONED IN A LOCATION AT ALL ACCESS POINTS, SUCH THAT IT IS CLEARLY VISIBLE TO PERSONS PROPOSING TO ENTER THE BELOW GROUND TANK/S CONFINED SPACE.
2. MINIMUM DIMENSIONS OF THE SIGN - 300mm x 450mm (LARGE ENTRIES, SUCH AS DOORS) -250mm x 180mm (SMALL ENTRIES SUCH AS GRATES & MANHOLES).
3. THE SIGN SHALL BE MANUFACTURED FROM COLOUR BONDED ALUMINUM OR POLYPROPYLENE.
4. SIGN SHALL BE AFFIXED USING SCREWS AT EACH CORNER OF THE SIGN.

OCEAN PROTECT NOTES

1. PRECAST STRUCTURE SUPPLIED WITH CORE HOLES TO SUIT OUTER DIAMETER OF NOMINATED PIPE SIZE / MATERIAL.
2. IF THE PEAK FLOW RATE, AS DETERMINED BY THE SITE CIVIL ENGINEER, EXCEEDS THE PEAK HYDRAULIC CAPACITY OF THE PRODUCT, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.
3. PRECAST STRUCTURE SHALL MEET W80 WHEEL LOAD RATING ASSUMING A MAXIMUM EARTH COVER OF 2.0m & A GROUND WATER ELEVATION AT OR BELOW THE OUTLET PIPE INVERT ELEVATION. CERTIFYING ENGINEER TO CONFIRM ACTUAL GROUNDWATER ELEVATION. PRECAST STRUCTURE SHALL BE IN ACCORDANCE WITH AS3600.
4. ALL WATER QUALITY TREATMENT DEVICES REQUIRE PERIODIC MAINTENANCE AS OUTLINED IN THE O&M GUIDELINES.
5. SITE SPECIFIC PRODUCTION DRAWING WILL BE PROVIDED ON PLACEMENT OF ORDER.
6. ANY BACKFILL DEPTH, SUB-BASE, & OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS & SHALL BE SPECIFIED BY SITE CIVIL ENGINEER.
7. CONTRACTOR TO PROVIDE ALL EQUIPMENT WITH SUFFICIENT LIFTING & REACH CAPACITY TO LIFT & SET THE STORMFILTER STRUCTURE (LIFTING DETAIL PROVIDED SEPARATELY).
8. CONTRACTOR TO APPLY SEALANT TO ALL JOINTS & TO PROVIDE, INSTALL & GROUT INLET & OUTLET PIPES.

SUBMERGED ORIFICE:
THE 100yr ARI LEVEL IN THE ADJACENT ROAD IS ASSUMED TO BE AT RL 76.91 MAKING THIS ORIFICE SUBMERGED.

DETENTION TANK:

MAX TANK DEPTH	1.3m
MIN TANK DEPTH	1.2m
AREA	68.0m²
VOLUME PROVIDED	85.0m³

FOR OSD TANK STRUCTURAL DETAIL REFER TO STRUCTURAL ENGINEER'S DETAILS

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G	ISSUE FOR SECTION 4.55 APPROVAL	29/08/2022	MBR	KE

Architect: Loucas Architects, Level 3, 7-9 Gibbons Street, Redfern NSW 2016, Phone: 02 8052 9600, Email: admin@loucasarc.com.au

CITY OF PARRAMATTA

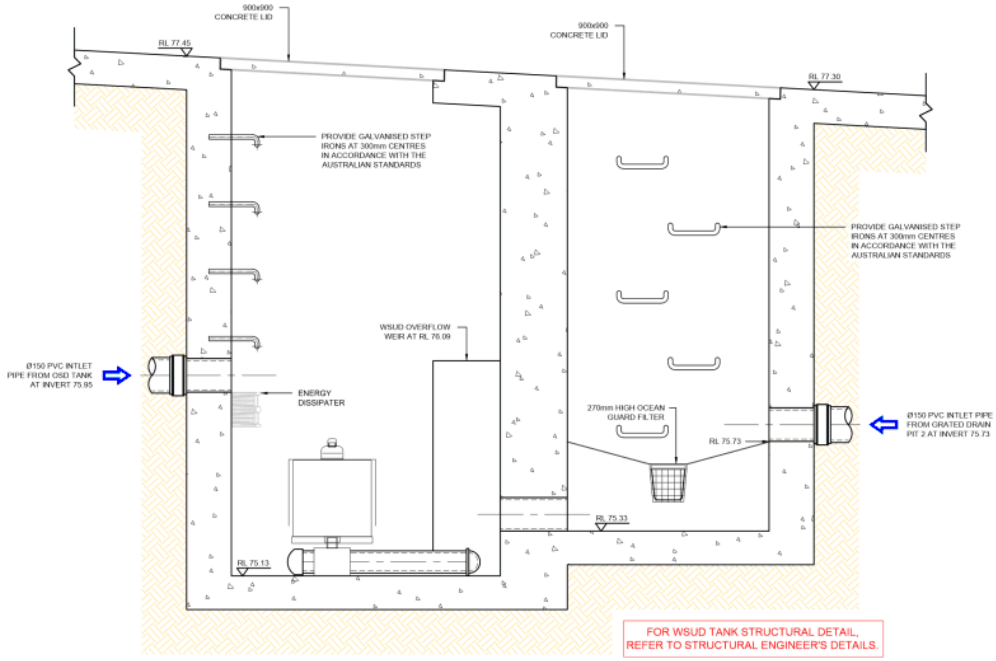
Client: Ms. Yanna Guo

Scale: 0 400 800 1200 mm, SCALE 1:20 @ A1

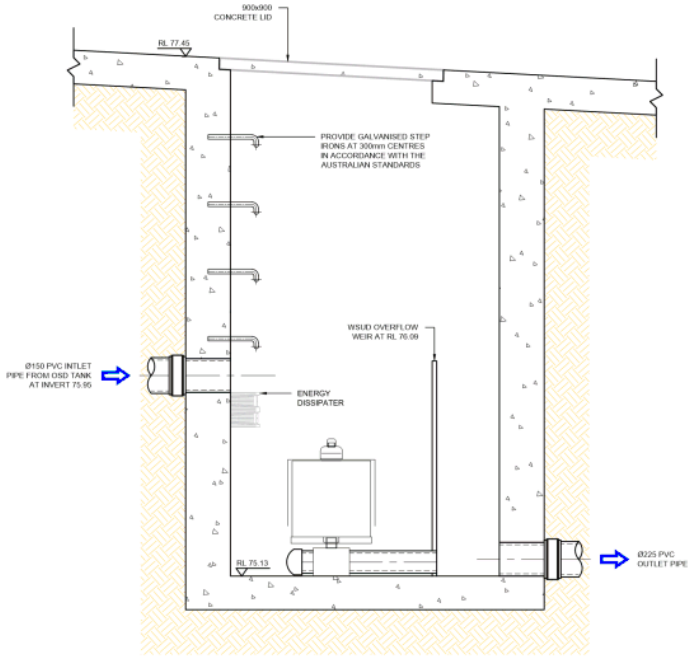
Project: 21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
SECTION 4.55 APPROVAL

Drawing Title: OSD & WSUD DETAILS & CALCULATION SHEETS SHEET 2 OF 3

Project No: 18019
Dwg No: 105
Rev: G



SECTION A
STORMFILTER PIT DETAIL
SCALE 1:10



SECTION B
STORMFILTER PIT DETAIL
SCALE 1:10

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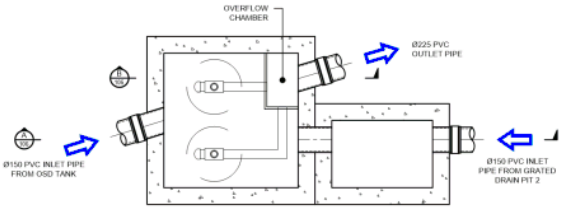
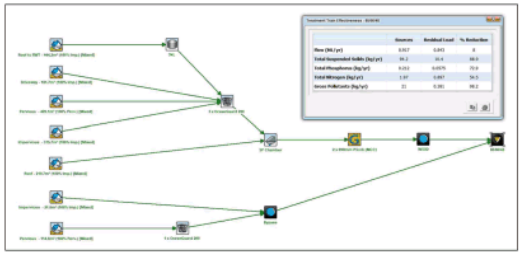
8. CONTRACTOR TO APPLY SEALANT TO ALL JOINTS & TO PROVIDE, INSTALL & GROUT INLET & OUTLET PIPES.



STORMFILTER MANHOLE
PLAN VIEW
SCALE 1:25



MUSIC MODEL RESULTS
N.T.S.

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CITY OF PARRAMATTA

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Project
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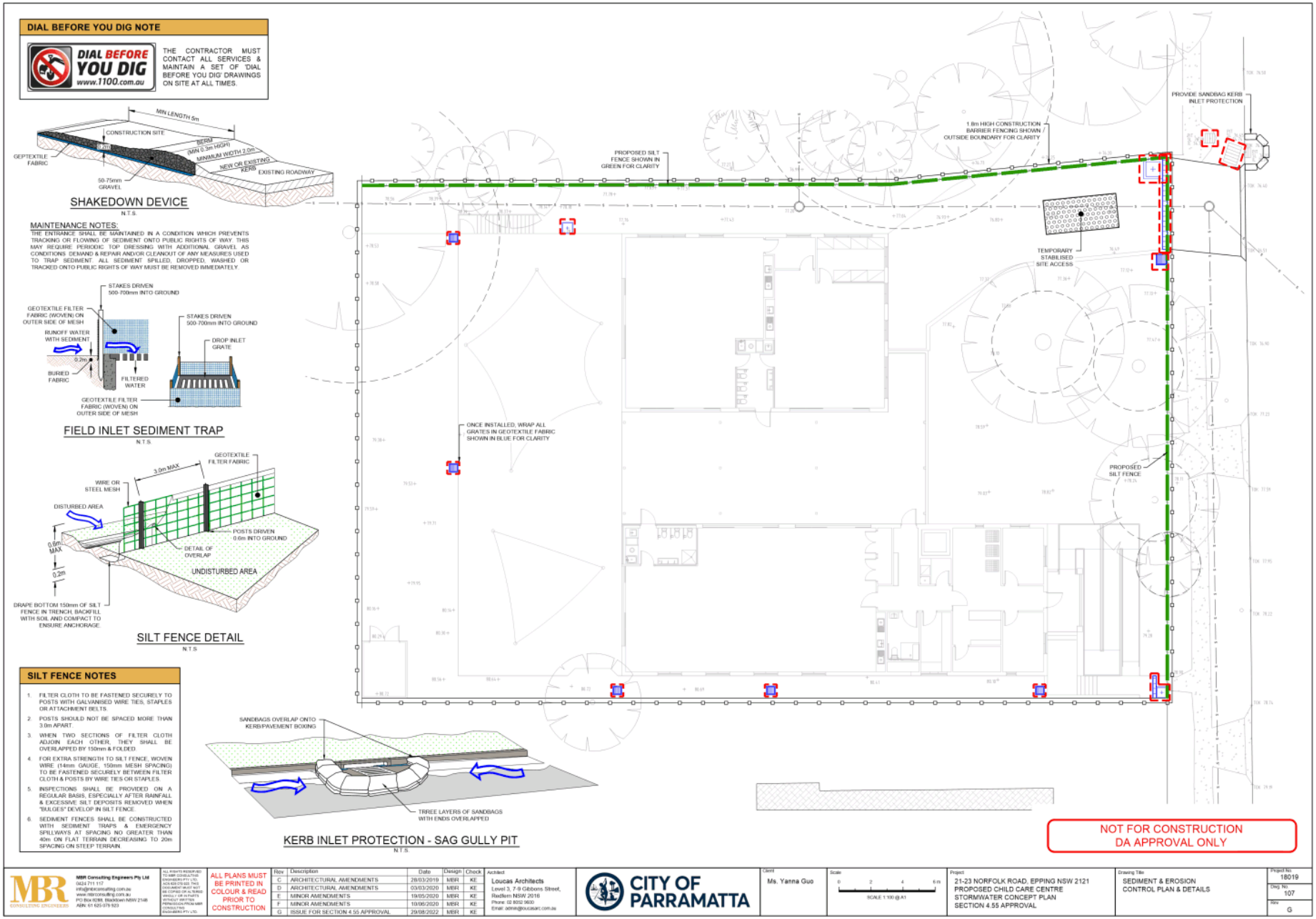
STORMWATER CONCEPT PLAN
SECTION 4.55 APPROVAL

Drawing Title
OSD & WSUD DETAILS
& CALCULATION SHEETS
SHEET 3 OF 3

Project No. 18019
Dwg No. 106
Rev G


DIAL BEFORE YOU DIG NOTE
DIAL BEFORE YOU DIG www.1100.com.au
THE CONTRACTOR MUST CONTACT ALL SERVICES & MAINTAIN A SET OF 'DIAL BEFORE YOU DIG' DRAWINGS ON SITE AT ALL TIMES.
MIN LENGTH 5m
CONSTRUCTION SITE
BERM (MIN 0.3m HIGH)
MINIMUM WIDTH 2.0m
NEW OR EXISTING KERB
EXISTING ROADWAY
GEPTEXTILE FABRIC
50-75mm GRAVEL
SHAKEDOWN DEVICE
N.T.S.
MAINTENANCE NOTES:
THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH PREVENTS TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL GRAVEL AS CONDITIONS DEMAND & REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY.
STAKES DRIVEN 500-700mm INTO GROUND
GEOTEXTILE FILTER FABRIC (WOVEN) ON OUTER SIDE OF MESH
RUNOFF WATER WITH SEDIMENT
0.2m
BURIED FABRIC
FILTERED WATER
STAKES DRIVEN 500-700mm INTO GROUND
DROP INLET GRATE
GEOTEXTILE FILTER FABRIC (WOVEN) ON OUTER SIDE OF MESH
FIELD INLET SEDIMENT TRAP
N.T.S.
GEOTEXTILE FILTER FABRIC
3.0m MAX
WIRE OR STEEL MESH
DISTURBED AREA
0.6m MAX
0.2m
POSTS DRIVEN 0.6m INTO GROUND
DETAIL OF OVERLAP
UNDISTURBED AREA
DRAPE BOTTOM 150mm OF SILT FENCE IN TRENCH, BACKFILL WITH SOIL AND COMPACT TO ENSURE ANCHORAGE
SILT FENCE DETAIL
N.T.S
SILT FENCE NOTES
1. FILTER CLOTH TO BE FASTENED SECURELY TO POSTS WITH GALVANISED WIRE TIES, STAPLES OR ATTACHMENT BELTS.
2. POSTS SHOULD NOT BE SPACED MORE THAN 3.0m APART.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 150mm & FOLDED.
4. FOR EXTRA STRENGTH TO SILT FENCE, WOVEN WIRE (14mm GAUGE, 150mm MESH SPACING) TO BE FASTENED SECURELY BETWEEN FILTER CLOTH & POSTS BY WIRE TIES OR STAPLES.
5. INSPECTIONS SHALL BE PROVIDED ON A REGULAR BASIS, ESPECIALLY AFTER RAINFALL & EXCESSIVE SILT DEPOSITS REMOVED WHEN "BULGES" DEVELOP IN SILT FENCE.
6. SEDIMENT FENCES SHALL BE CONSTRUCTED WITH SEDIMENT TRAPS & EMERGENCY SPILLWAYS AT SPACING NO GREATER THAN 40m ON FLAT TERRAIN DECREASING TO 20m SPACING ON STEEP TERRAIN.
PROPOSED SILT FENCE SHOWN IN GREEN FOR CLARITY
1.8m HIGH CONSTRUCTION BARRIER FENCING SHOWN / OUTSIDE BOUNDARY FOR CLARITY
PROVIDE SANDBAG KERB INLET PROTECTION
TEMPORARY STABILISED SITE ACCESS
ONCE INSTALLED, WRAP ALL GRATES IN GEOTEXTILE FABRIC SHOWN IN BLUE FOR CLARITY
PROPOSED SILT FENCE
SANDBAGS OVERLAP ONTO KERB/PAVEMENT BOXING
TRREE LAYERS OF SANDBAGS WITH ENDS OVERLAPPED
KERB INLET PROTECTION - SAG GULLY PIT
N.T.S.
NOT FOR CONSTRUCTION
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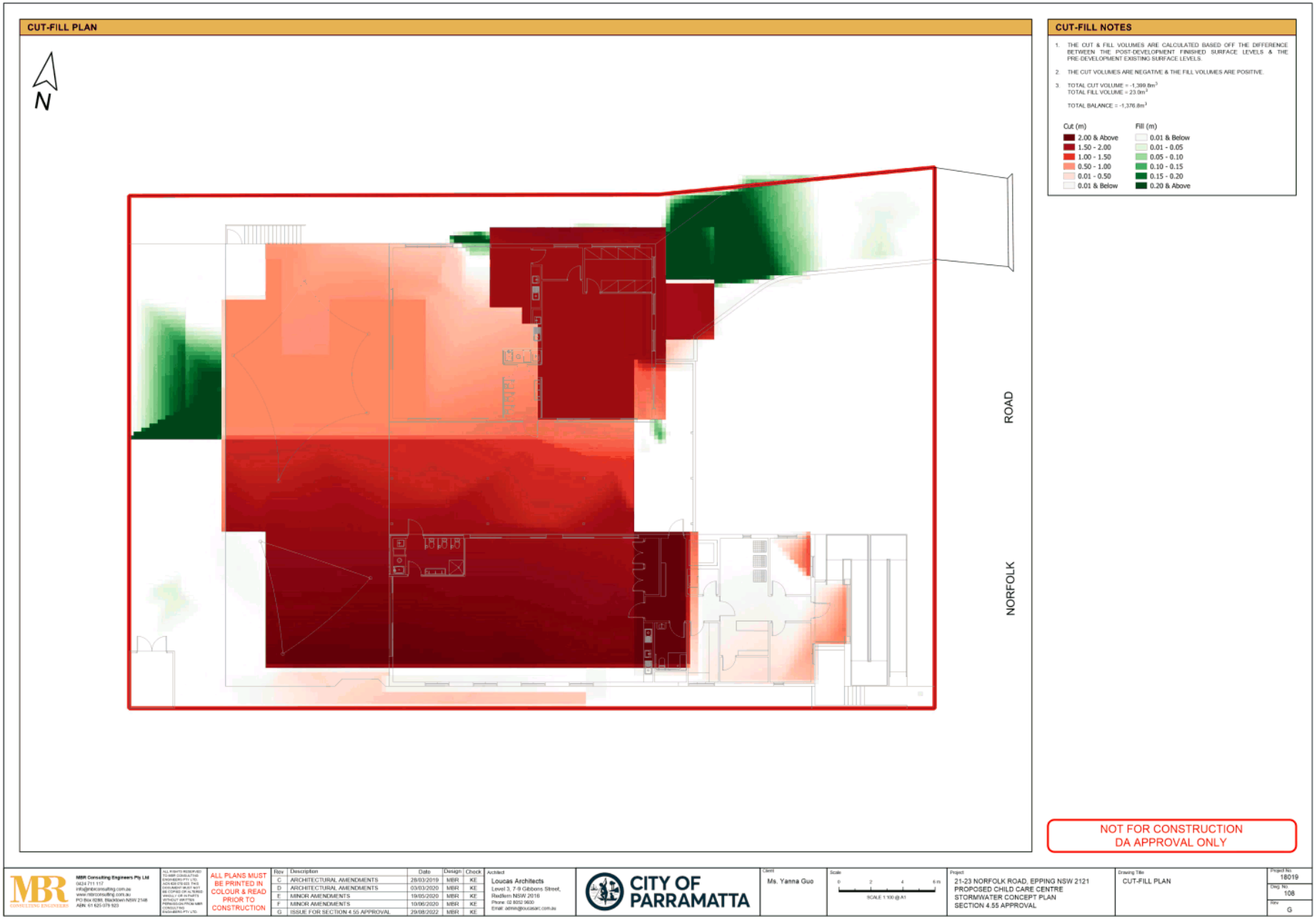
CITY OF PARRAMATTA
Client
Ms. Yanna Guo
Scale
SCALE 1:100 @ A1
Project
21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
SECTION 4.55 APPROVAL
Drawing Title
SEDIMENT & EROSION CONTROL PLAN & DETAILS
Project No. 18019
Dwg No. 107
Rev G


CUT-FILL PLAN
N
ROAD
NORFOLK
CUT-FILL NOTES
1. THE CUT & FILL VOLUMES ARE CALCULATED BASED OFF THE DIFFERENCE BETWEEN THE POST-DEVELOPMENT FINISHED SURFACE LEVELS & THE PRE-DEVELOPMENT EXISTING SURFACE LEVELS.
2. THE CUT VOLUMES ARE NEGATIVE & THE FILL VOLUMES ARE POSITIVE.
3. TOTAL CUT VOLUME = -1,399.8m³
TOTAL FILL VOLUME = 23.0m³
TOTAL BALANCE = -1,376.8m³
Cut (m)
2.00 & Above
1.50 - 2.00
1.00 - 1.50
0.50 - 1.00
0.01 - 0.50
0.01 & Below
Fill (m)
0.01 & Below
0.01 - 0.05
0.05 - 0.10
0.10 - 0.15
0.15 - 0.20
0.20 & Above
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Phone: 02 8052 9600
CITY OF PARRAMATTA
Client
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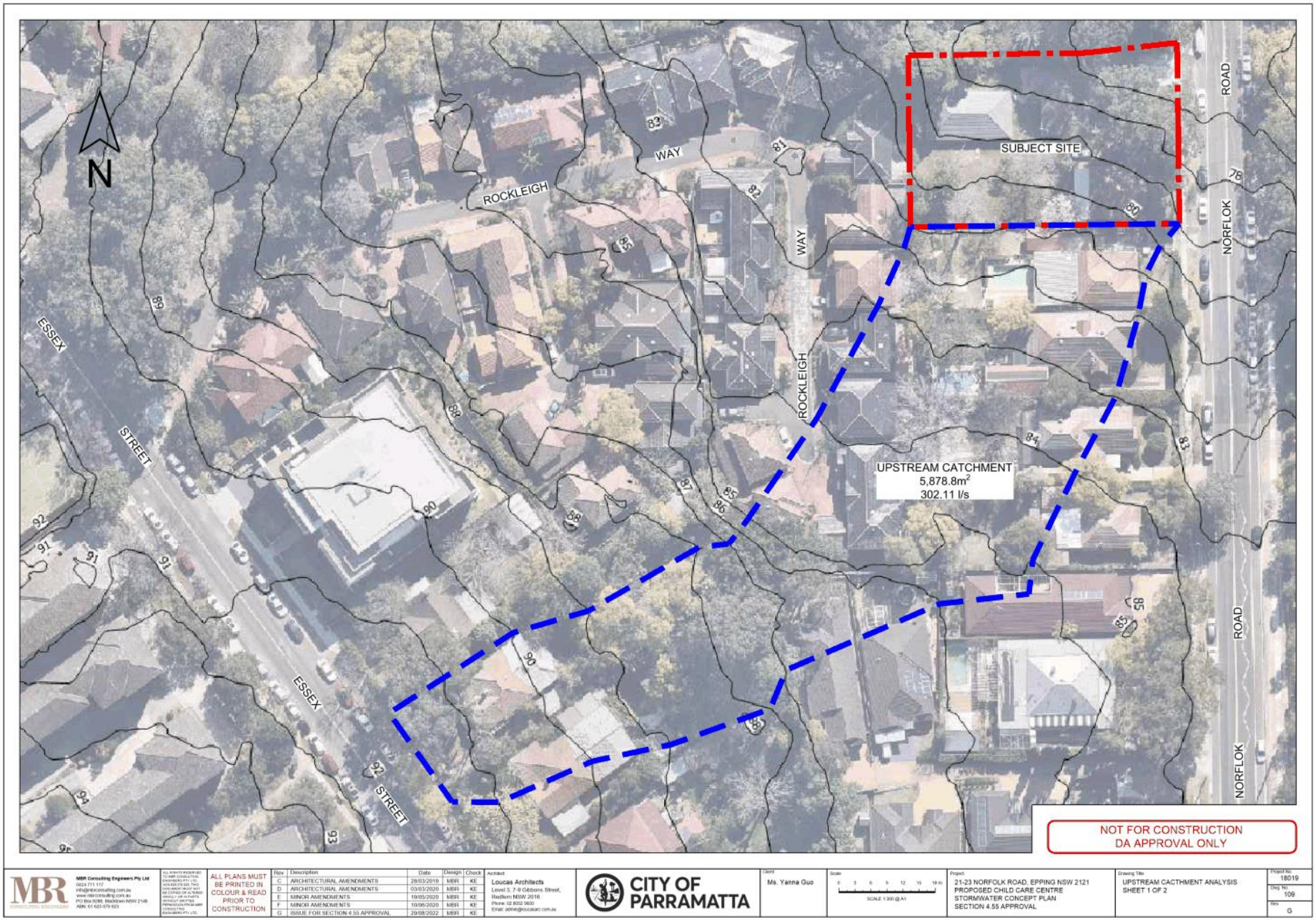
Scale
0 2 4 6 m
SCALE 1:100 @ A1
Project
21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
SECTION 4.55 APPROVAL
Drawing Title
CUT-FILL PLAN
Project No. 18019
Dwg No. 108
Rev G



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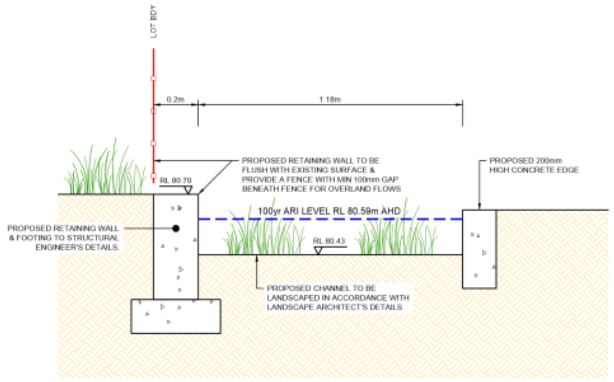
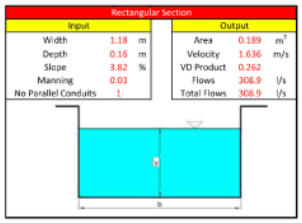
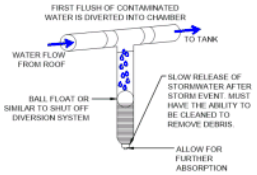


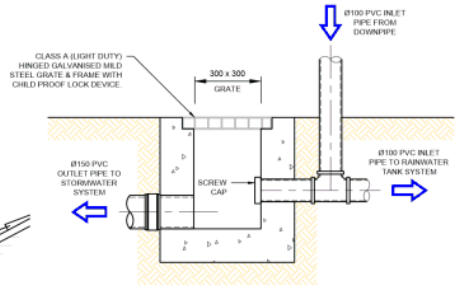
TYPICAL SECTION A DETAIL
SCALE 1:10

Rectangular Section					
Input			Output		
Width	1.18	m	Area	0.189	m^2
Depth	0.16	m	Velocity	1.636	m/s
Slope	3.82	%	VD Product	0.262	
Manning	0.03		Flows	308.9	l/s
No Parallel Conduits	1		Total Flows	308.9	l/s



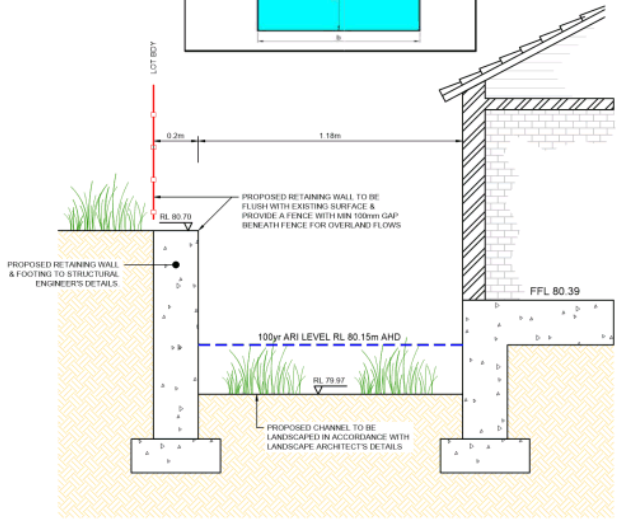


FIRST FLUSH WATER DIVERTER DETAIL
N.T.S.

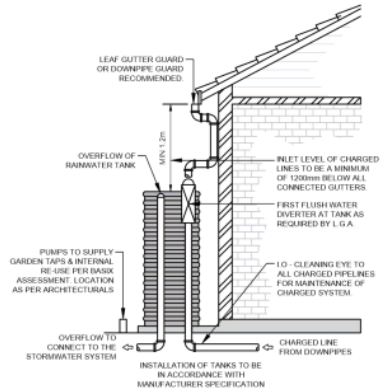


CLEANING EYE DETAIL
SCALE 1:10

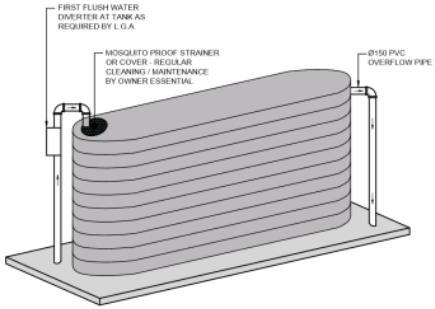
Rectangular Section					
Input			Output		
Width	1.18	m	Area	0.212	m^2
Depth	0.18	m	Velocity	1.438	m/s
Slope	2.61	%	VD Product	0.259	
Manning	0.03		Flows	305.3	l/s
No Parallel Conduits	1		Total Flows	305.3	l/s



TYPICAL SECTION B DETAIL
SCALE 1:10



RAINWATER TANK DETAIL
N.T.S.



STORAGE TANK NOTES

1. TANK WATER TAPS SHALL BE MARKED 'RAINWATER NOT TO HUMAN CONSUMPTION'.
2. RAINWATER TANKS SHALL BE CONNECTED TO MAINS WATER SUPPLY AS BACK-UP.
3. THE PUMPS ARE TO BE INSULATED IN ACCORDANCE WITH COUNCIL POLICY.
4. PUMPS SHALL PROVIDE MINIMUM 150 kPa PRESSURE.
5. EACH TANK TO BE CONNECTED TO AN OUTDOOR TAP FOR IRRIGATION USE.
6. RAINWATER TANKS TO BE CLEANED OUT EVERY 6 MONTHS.
7. WATER TANK & ASSOCIATED STRUCTURE TO BE THE SAME COLOUR, OR A COLOUR COMPLEMENTARY TO THE DWELLING.
8. TOP TANK TO BE BELOW TOP OF NEAREST FENCE, OR 1.8m WHICHEVER IS LESS.
9. THE WATER TANK SHOULD BE LOCATED AT LEAST 450mm FROM ANY PROPERTY BOUNDARY. THE CLIENT IS RESPONSIBLE TO ENSURE COMPLIANCE WITH THIS IN THE INSTALLED STATE.
10. PLUMBING FROM THE WATER TANK IS TO BE KEPT SEPARATED FROM THE RETICULATED WATER SUPPLY SYSTEM.
11. TANK TO BE BUILT ON SELF-SUPPORTING BASE.
12. PROVIDE BACK-FLOW PREVENTION DEVICE AT MAINS WATER METER.
13. ROOF DRAINING TO TANK MUST NOT CONTAIN LEAD, TAR BASED PAINTS OR ASBESTOS.
14. WATER TO BE DRAWN FROM ANAEROBIC ZONE OF TANK.
15. TANK DETAILS SHOWN ARE A SUGGESTED CONFIGURATION ONLY. ANY MODIFICATION TO TANK VOLUME OR INLET & OUTLET LEVELS MUST BE APPROVED BY ENGINEER PRIOR TO COMMENCEMENT OF CONSTRUCTION.
16. ALL JOINTS TO BE SOLVENT WELDED & ALL EXPOSED PIPE WORK TO BE PAINTED TO WITHSTAND EXTERNAL ELEMENTS.
17. FIRST FLUSH WATER DIVERTER AT TANK TO COMPLY WITH SYDNEY WATER & COUNCIL DCP'S.
18. PUMPS TO MANUFACTURER SPECIFICATIONS.
19. RAINWATER TANK TO BE INSTALLED & MAINTAINED TO MANUFACTURER'S SPECIFICATIONS & TO COMPLY WITH ALL SYDNEY WATER GUIDELINES.
20. CLIENT TO BE RESPONSIBLE FOR MAINTENANCE SYSTEM OF CHARGED PIPELINES. DEBRIS ACCUMULATION SIGNIFICANTLY AFFECT SYSTEMS PERFORMANCE. MAINTENANCE PROGRAM ESSENTIAL.
21. STRUCTURAL DETAILS FOR TANK BASE BY MANUFACTURERS OR OTHERS.

WATER NOT SUITABLE FOR DRINKING

NOT FOR CONSTRUCTION
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SCALE 1:10 @ A1

Project
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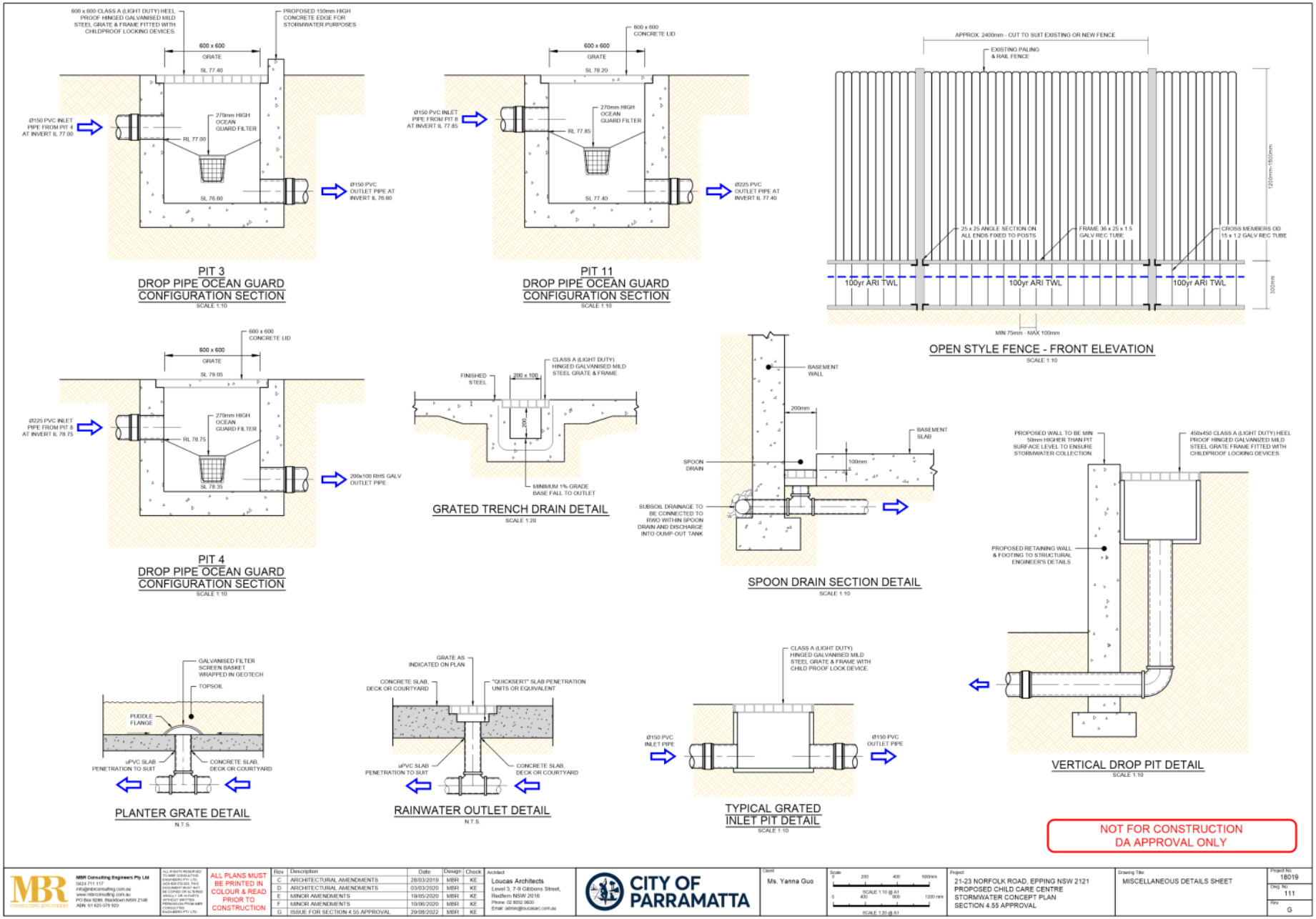
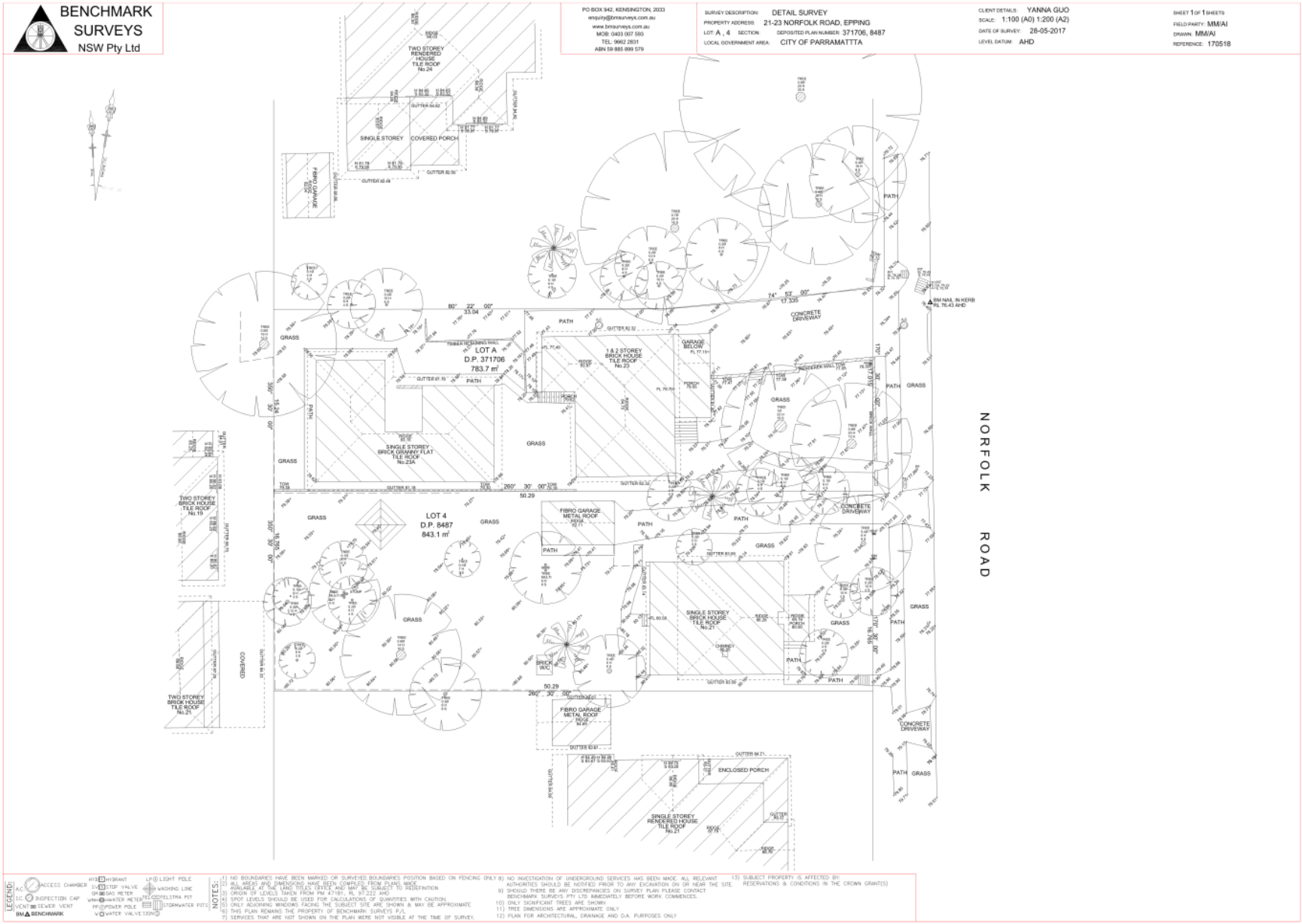
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
SECTION 4.55 APPROVAL

Drawing Title
UPSTREAM CATCHMENT ANALYSIS
SHEET 2 OF 2

Project No. 18019
Dwg No. 110
Rev G


600 x 600 CLASS A (LIGHT DUTY) HEEL PROOF HINGED GALVANISED MILD STEEL GRATE & FRAME FITTED WITH CHILDPROOF LOCKING DEVICES.
PROPOSED 150mm HIGH CONCRETE EDGE FOR STORMWATER PURPOSES
600 x 600 GRATE
SL 77.40
Ø150 PVC INLET PIPE FROM PIT 4 AT INVERT IL 77.00
270mm HIGH OCEAN GUARD FILTER
RL 77.00
SL 76.60
Ø150 PVC OUTLET PIPE AT INVERT IL 76.60
PIT 3
DROP PIPE OCEAN GUARD
CONFIGURATION SECTION
SCALE 1:10
600 x 600 CONCRETE LID
600 x 600 GRATE
SL 78.20
Ø150 PVC INLET PIPE FROM PIT 8 AT INVERT IL 77.85
270mm HIGH OCEAN GUARD FILTER
RL 77.85
SL 77.40
Ø225 PVC OUTLET PIPE AT INVERT IL 77.40
PIT 11
DROP PIPE OCEAN GUARD
CONFIGURATION SECTION
SCALE 1:10
APPROX 2400mm - CUT TO SUIT EXISTING OR NEW FENCE
EXISTING PALING & RAIL FENCE
25 x 25 ANGLE SECTION ON ALL ENDS FIXED TO POSTS
FRAME 36 x 25 x 1.5 GALV REC TUBE
CROSS MEMBERS OD 15 x 1.2 GALV REC TUBE
100yr ARI TWL
100yr ARI TWL
100yr ARI TWL
1200mm-1500mm
300mm
MIN 75mm - MAX 100mm
OPEN STYLE FENCE - FRONT ELEVATION
SCALE 1:10
600 x 600 CONCRETE LID
600 x 600 GRATE
SL 79.05
Ø225 PVC INLET PIPE FROM PIT 8 AT INVERT IL 78.75
270mm HIGH OCEAN GUARD FILTER
RL 78.75
SL 78.35
200x100 RHS GALV OUTLET PIPE
PIT 4
DROP PIPE OCEAN GUARD
CONFIGURATION SECTION
SCALE 1:10
FINISHED STEEL
200 x 100
CLASS A (LIGHT DUTY) HINGED GALVANISED MILD STEEL GRATE & FRAME.
200
MINIMUM 1% GRADE BASE FALL TO OUTLET
GRATED TRENCH DRAIN DETAIL
SCALE 1:20
BASEMENT WALL
200mm
BASEMENT SLAB
SPOON DRAIN
100mm
SUBSOIL DRAINAGE TO BE CONNECTED TO RWO WITHIN SPOON DRAIN AND DISCHARGE INTO OUMP-OUT TANK
SPOON DRAIN SECTION DETAIL
SCALE 1:10
PROPOSED WALL TO BE MIN 50mm HIGHER THAN PIT SURFACE LEVEL TO ENSURE STORMWATER COLLECTION.
450x450 CLASS A (LIGHT DUTY) HEEL PROOF HINGED GALVANIZED MILD STEEL GRATE FRAME FITTED WITH CHILDPROOF LOCKING DEVICES.
PROPOSED RETAINING WALL & FOOTING TO STRUCTURAL ENGINEER'S DETAILS.
VERTICAL DROP PIT DETAIL
SCALE 1:10
GALVANISED FILTER SCREEN BASKET WRAPPED IN GEOTECH
TOPSOIL
PUDDLE FLANGE
uPVC SLAB PENETRATION TO SUIT
CONCRETE SLAB, DECK OR COURTYARD
PLANTER GRATE DETAIL
N.T.S.
GRATE AS INDICATED ON PLAN
CONCRETE SLAB, DECK OR COURTYARD
"QUICKSERT" SLAB PENETRATION UNITS OR EQUIVALENT
uPVC SLAB PENETRATION TO SUIT
CONCRETE SLAB, DECK OR COURTYARD
RAINWATER OUTLET DETAIL
N.T.S.
CLASS A (LIGHT DUTY) HINGED GALVANISED MILD STEEL GRATE & FRAME WITH CHILD PROOF LOCK DEVICE.
Ø150 PVC INLET PIPE
Ø150 PVC OUTLET PIPE
TYPICAL GRATED INLET PIT DETAIL
SCALE 1:10
NOT FOR CONSTRUCTION
DA APPROVAL ONLY
MBR Consulting Engineers Pty Ltd
0424 711 117
info@mbrconsulting.com.au
www.mbrconsulting.com.au
PO Box 9288, Blacktown NSW 2148
ABN: 61 625 079 923
ALL PLANS MUST BE PRINTED IN COLOUR & READ PRIOR TO CONSTRUCTION
Rev | Description | Date | Design | Check
C | ARCHITECTURAL AMENDMENTS | 28/03/2019 | MBR | KE
D | ARCHITECTURAL AMENDMENTS | 03/03/2020 | MBR | KE
E | MINOR AMENDMENTS | 19/05/2020 | MBR | KE
F | MINOR AMENDMENTS | 10/06/2020 | MBR | KE
G | ISSUE FOR SECTION 4.55 APPROVAL | 29/08/2022 | MBR | KE
Architect
Loucas Architects
Level 3, 7-9 Gibbons Street, Redfern NSW 2016
Phone: 02 8052 9600
Email: admin@loucasarc.com.au
CITY OF PARRAMATTA
Client
Ms. Yanna Guo
Scale
SCALE 1:10 @ A1
SCALE 1:20 @ A1
Project
21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
SECTION 4.55 APPROVAL
Drawing Title
MISCELLANEOUS DETAILS SHEET
Project No. 18019
Dwg No. 111
Rev G


BENCHMARK SURVEYS NSW Pty Ltd
PO BOX 942, KENSINGTON, 2033
enquiry@bmsurveys.com.au
www.bmsurveys.com.au
MOB: 0403 007 593
TEL: 9662 2831
ABN 59 885 899 579
SURVEY DESCRIPTION: DETAIL SURVEY
PROPERTY ADDRESS: 21-23 NORFOLK ROAD, EPPING
LOT: A , 4 SECTION: DEPOSITED PLAN NUMBER: 371706, 8487
LOCAL GOVERNMENT AREA: CITY OF PARRAMATTTA
CLIENT DETAILS: YANNA GUO
SCALE: 1:100 (A0) 1:200 (A2)
DATE OF SURVEY: 28-05-2017
LEVEL DATUM: AHD
SHEET 1 OF 1 SHEETS
FIELD PARTY: MM/AI
DRAWN: MM/AI
REFERENCE: 170518
LOT A D.P. 371706 783.7 m²
LOT 4 D.P. 8487 843.1 m²
1 & 2 STOREY BRICK HOUSE TILE ROOF No.23
SINGLE STOREY BRICK GRANNY FLAT TILE ROOF No.23A
TWO STOREY RENDERED HOUSE TILE ROOF No.24
TWO STOREY BRICK HOUSE TILE ROOF No.19
TWO STOREY BRICK HOUSE TILE ROOF No.25
SINGLE STOREY BRICK HOUSE TILE ROOF No.21
SINGLE STOREY RENDERED HOUSE TILE ROOF No.21
FIBRO GARAGE METAL ROOF
CONCRETE DRIVEWAY
PATH
GRASS
COVERED
ENCLOSED PORCH
NORFOLK ROAD
LEGEND:
NOTES:
1) NO BOUNDARIES HAVE BEEN MARKED OR SURVEYED. BOUNDARIES POSITION BASED ON FENCING ONLY.
2) ALL AREAS AND DIMENSIONS HAVE BEEN COMPILED FROM PLANS MADE AVAILABLE AT THE LAND TITLES OFFICE AND MAY BE SUBJECT TO REDEFINITION
3) ORIGIN OF LEVELS TAKEN FROM PM 47181, RL 97.322 AHD
4) SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION.
5) ONLY ADJOINING WINDOWS FACING THE SUBJECT SITE ARE SHOWN & MAY BE APPROXIMATE
6) THIS PLAN REMAINS THE PROPERTY OF BENCHMARK SURVEYS P/L
7) SERVICES THAT ARE NOT SHOWN ON THE PLAN WERE NOT VISIBLE AT THE TIME OF SURVEY.
8) NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE.
9) SHOULD THERE BE ANY DISCREPANCIES ON SURVEY PLAN PLEASE CONTACT BENCHMARK SURVEYS PTY LTD IMMEDIATELY BEFORE WORK COMMENCES.
10) ONLY SIGNIFICANT TREES ARE SHOWN
11) TREE DIMENSIONS ARE APPROXIMATE ONLY
12) PLAN FOR ARCHITECTURAL, DRAINAGE AND D.A. PURPOSES ONLY
13) SUBJECT PROPERTY IS AFFECTED BY: RESERVATIONS & CONDITIONS IN THE CROWN GRANT(S)

M^CLAREN TRAFFIC ENGINEERING

Address: Shop 7, 720 Old Princes Highway Sutherland NSW 2232
Postal: P.O Box 66 Sutherland NSW 1499

Telephone: +61 2 9521 7199
Web: www.mclarentraffic.com.au
Email: admin@mclarentraffic.com.au

Division of RAMTRANS Australia ABN: 45067491678 RPEQ: 19457

Transport Planning, Traffic Impact Assessments, Road Safety Audits, Expert Witness

19 April 2022 Reference: 220012.01FA

Loucas Architects
Level 3, Suite 309, 7-9 Gibbons Street
Redfern NSW 2016
Attention: Mirko Cizmic

S4.55 TRAFFIC AND PARKING IMPACT ASSESSMENT OF CHILDCARE CENTRE AT 21-23 NORFOLK ROAD, EPPING

Dear Mirko,

Reference is made to your request to provide a S4.55 traffic and parking impact assessment for the proposed childcare centre at 21-23 Norfolk Road, Epping (Concept Site layout in **Annexure A**). The subject site is subject to an existing approval for a child care centre through the Land and Environment Court (*Guo v Parramatta City Council [2020] NSWLEC 1311)* of which *M^CLaren Traffic Engineering* was involved with the Applicant, with the original approved TPIA (200102.01FA) finalised on 2 March 2020. The scale of both the approved development and proposed development following modifications, as relevant to traffic and parking impacts, is summarised in **Table 1**.

TABLE 1: PROPOSED SCALE OF DEVELOPMENT

Category	Sub-Category	Approved Scale	Proposed Scale
Childcare Centre	0-2 years old	16	17
	2-3 years old	17	25
	3-6 years old	20	40
Parking Spaces	N/A	14	23

The proposed childcare centre will accommodate 23 car parking spaces within a basement car park operated as a one-way system with a combined entry/exit driveway from Norfolk Road. This was increased from the existing approval of 14 spaces to accommodate a higher volume of children within the childcare centre – a planned increase from the originally approved 53 children capacity to 82 children. As such, the basement car parking area has been redesigned to allow for additional visitor and staff parking. The design of the visitor parking spaces has been designed in accordance with User Class 3A parking spaces in accordance with AS2890.1:2004. User Class 3A designs are typical of shopping centres and has been used within the child care centre to provide for an efficient and safe car parking layout.

The assessment of traffic and parking impacts relating to the updated development is provided in Sections 1-3 of this letter, with a summary of the relevant findings below:

- The proposed design includes a total of 23 car parking spaces including one (1) accessible parking space, satisfying the requirements of the *Hornsby Shire Council Development Control Plan 2013*.
- The design of the parking and access facilities has been assessed to comply with the relevant requirements of AS2890.1 and AS2890.6.
- The traffic generation of the proposed development is estimated at some 66 trips in the AM peak hour and 58 in the PM peak hour, which has been assessed to have minimal adverse impact on the surrounding road network.
    - It is noted that the traffic generation of the approved DA was expected to be 42 (21 IN, 21 OUT) in the AM peak period and 37 (19 IN, 18 OUT) in the PM peak period.

1 Site Location and Access

The location of the site is depicted on an aerial image in **Figure 1**. The characteristics of the site and the surrounding transport network are summarised in **Table 2**.

FIGURE 1: SITE CONTEXT – AERIAL IMAGE

TABLE 2: SITE CONTEXT

Zoning	The site is zoned R2 – Low Density Residential under the Hornsby Local Environmental Plan 2013
Roads Fronting Site	The site fronts the following road: • Norfolk Road (Local) The approved two-way access driveway from Norfolk Road is unchanged as park of the proposed development.
State Planning Controls	The site is neither of sufficient size or capacity or fronted by or provided access via a classified road and is therefore not required to be referred to the Transport for NSW (TfNSW) as part of the Development Application process.
Public Transport	The subject site has access to the existing bus routes 288, 290 and 291 provided by Busways North West with the nearest bus stop (Stop ID: 212123) located approximately 270m walking distance to the south of the site, near the intersection of Epping Road / Pembroke St. The bus routes provide access between Epping, North Ryde, Lane Cove, North Sydney and City. Epping Train Station is located 700m west of the site and services the T9 – Northern Line and the Central Coast & Newcastle Line routes.

2 Parking and Access Design

The car parking, access and servicing requirements of the site have been assessed, with the relevant details summarised in **Table 3**.

TABLE 3: PARKING ASSESSMENT SUMMARY

Category	Control	Compliance with Control
Car Parking Provision	*Child Care Centre:* - *1 space per 4 children*	**Yes –** 23 spaces are proposed where a minimum of 21 spaces (rounded from 20.5) are required.
Bicycle Parking	*No applicable controls are provided within the Council's DCP.*	**Yes –** Since bicycle parking spaces have not been outlined, it can be assumed they are not required. Regardless, four (4) bicycle parking spaces are proposed to be provided.
Motorcycle Parking	*In all buildings that provide on site parking, 1 space suitable for motor cycles should be provided per 50 car parking spaces provided, or part thereof. Each motor cycle parking space is to be designated and located so that parked motorcycles are not vulnerable to being struck by a manoeuvring vehicle.*	**Yes –** One (1) motorcycle parking space is required and one (1) motorcycle parking space has been provided in compliance with requirements.
Accessible Parking	*Minimum number of Accessible Spaces for Educational Establishments is 2-3% of total number of parking spaces required.*	**Yes –** One (1) accessible parking space is required. The site provides one (1) accessible parking space in compliance with DCP requirements.
Loading and Servicing Facilities	*The on site loading and unloading area in a non residential development should incorporate provision for 1 car space and 1 motorcycle space for use by couriers, sited in a convenient location. Larger developments may require more.*	**Yes –** The site can accommodate delivery vehicles (up to a B99 design vehicle) between 9am and 4pm – outside of peak parent pick-up/drop-off times, during which times the delivery vehicle can utilise one of the vacant visitor car parking spaces. A motorcycle parking space has also been provided in compliance with requirements. Waste collection for the childcare centre can be conducted on street via kerbside collection, similar to residential development types.
Car Parking Design	*Design and dimensions of car parks, loading areas and driveways should comply with AS2890.1 and AS2890.2.* *Planning and design layout of parking areas for people with disabilities should be in accordance with AS2890.6 and AS1428.1.*	**Yes -** relevant swept path testing is provided in **Annexure B**.

3 Traffic Generation and Impact

The traffic generation of the site has been calculated and its impact on the surrounding road network assessed, with the relevant details of this assessment provided in **Table 4**.

TABLE 4: TRAFFIC ASSESSMENT SUMMARY

Traffic Generation	*Long-day care* (1) - *7.00-9.00am: 0.8 peak vehicle trips per child* - *2.30-4.00pm: 0.3 peak vehicle trips per child* - *4.00-6.00pm: 0.7 peak vehicle trips per child*	The traffic generation of the childcare centre is expected to be 66 (33 IN, 33 OUT) in the AM peak period and 58 (29 IN, 29 OUT) in the PM peak period. The traffic generation of the approved DA was expected to be 42 (21 IN, 21 OUT) in the AM peak period and 37 (19 IN, 18 OUT) in the PM peak period.
Assessment Needed	*Likely impact of development:* (2) - *Low Impact (<10 Trips): No Detailed Assessment Required* - *Moderate Impact (10-100 Trips): Traffic Impact Statement Required* - *High Impact (>100 Trips): Traffic Impact Assessment Required*	The traffic generation of the site is between 10 – 100 trips and therefore an assessment of traffic impacts is required. Detailed assessment is presented in **Section 3.1** and **3.2** below.

Notes:
(1) Source: RTA Guide to Traffic Generating Developments 2002
(2) Source: Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development Figure 4.1

3.1 Traffic Assignment

The road network and the locations of residential areas surrounding the site have been assessed and the following traffic assignment has been assumed for all traffic to and from the site:

- 50% of traffic to / from the north via the Chester St / Norfolk Rd intersection
- 50% of traffic to / from the south via the Pembroke St / Norfolk Rd intersection.
    - 35% to / from Pembroke St (E)
    - 15% to / from Pembroke St (W)

It is noted that this traffic assignment is consistent with the traffic assignment utilised for the assessment undertaken by *M^CLaren Traffic Engineering* for the approved child care centre development. The adopted traffic assignment is shown in **Figure 2** below.

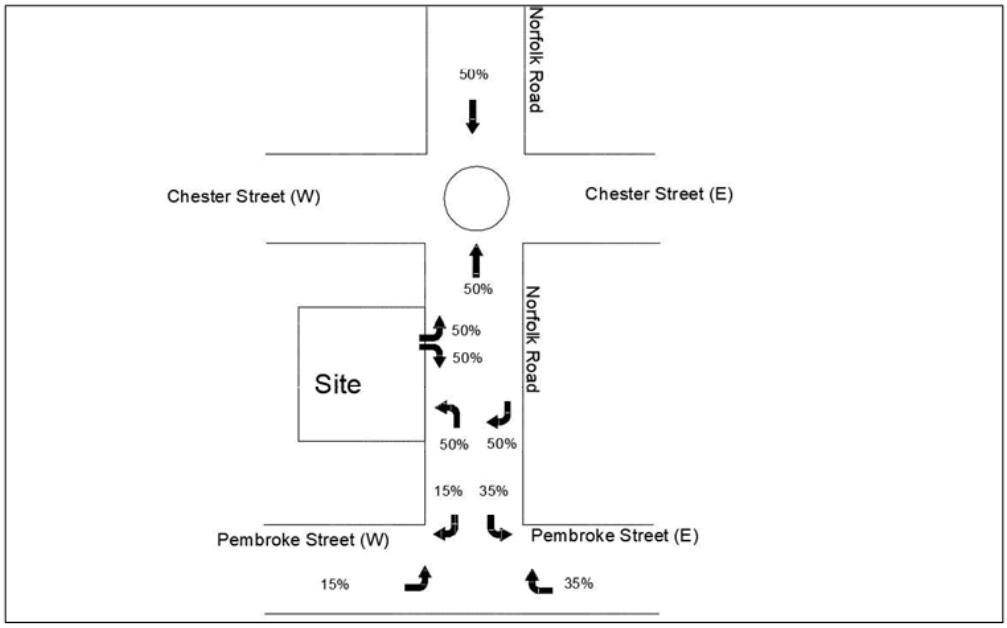


FIGURE 2: TRAFFIC ASSIGNMENT

3.2 Traffic Impact

The traffic generation outlined in **Section 3** above has been added to the existing traffic volumes. SIDRA INTERSECTION 9.0 was used to assess the intersections performance. The purpose of this assessment is to compare the existing intersection operations to the future scenario with the addition of the school and the child care centre under the increased traffic load. The results of this assessment are shown in **Table 5** and **Table 6**, with detailed SIDRA results reproduced in **Annexure C** for reference.

TABLE 5: EXISTING INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/veh)	Level of Service[3][4]	Control Type	Worst Movement	95th Percentile Queue
EXISTING PERFORMANCE							
Norfolk Rd / Chester St	AM	0.31	6.3 (Worst: 10.7)	**A** (Worst: A)	Round-about	UT from Chester Street	1.9 veh (13.1m) Norfolk Road
	PM	0.28	5.7 (Worst: 9.7)	**A** (Worst: A)		UT from Chester Street	1.7 veh (11.9m) Norfolk Road
Pembroke St / Norfolk Rd	AM	0.42	5.2 (Worst: 8.1)	**NA** (Worst: A)	Give Way	RT from Norfolk Road	2.4 veh (16.5m) Norfolk Road
	PM	0.28	4.9 (Worst: 8.1)	**NA** (Worst: A)		RT from Norfolk Road	1.1 veh (7.9m) Pembroke Street

NOTES:
(1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.
(2) The average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.
(3) The Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets. (
(4) No overall Level of Service is provided for Give Way and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

TABLE 6: FUTURE INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/veh)	Level of Service[3]	Control Type	Worst Movement	95th Percentile Queue
FUTURE PERFORMANCE (EXISTING + SCHOOL)							
Norfolk Rd/ Chester St	AM	0.41	6.7 (Worst: 11.5)	**A** (Worst: A)	Round-about	RT from Chester Street	2.8 veh (19.3m) Norfolk Road
	PM	0.36	5.9 (Worst: 9.9)	**A** (Worst: A)		UT from Chester Street	2.4 veh (17m) Norfolk Road
Pembroke St / Norfolk Rd	AM	0.55	6.1 (Worst: 9.8)	**NA** (Worst: A)	Give Way	RT from Norfolk Road	4.6 veh (32m) Norfolk Road
	PM	0.39	5.6 (Worst: 9.6)	**NA** (Worst: A)		RT from Norfolk Road	2 veh (14m) Norfolk Road
FUTURE PERFORMANCE (EXISTING + SCHOOL + CHILD CARE CENTRE) FOR ORIGINAL APPROVAL							
Norfolk Rd / Chester St	AM	0.42	6.7 (Worst: 11.6)	**A** (Worst: A)	Round-about	RT from Chester Street	2.9 veh (20.1m) Norfolk Road
	PM	0.37	5.9 (Worst: 9.9)	**A** (Worst: A)		UT from Chester Street	2.5 veh (17.5m) Norfolk Road
Pembroke St / Norfolk Rd	AM	0.57	6.3 (Worst: 10)	**NA** (Worst: A)	Give Way	RT from Norfolk Road	4.9 veh (34m) Norfolk Road
	PM	0.40	5.7 (Worst: 9.8)	**NA** (Worst: A)		RT from Norfolk Road	2.1 veh (15m) Norfolk Road
FUTURE PERFORMANCE (EXISTING + SCHOOL + CHILD CARE CENTRE) FOR S4.55 APPROVAL							
Chester Street/Norfolk Road	AM	0.43	6.7 (Worst: 11.6)	**A** (Worst: A)	Round-about	RT from Chester Street	2.9 veh (20.4m) Norfolk Road
	PM	0.37	5.9 (Worst: 9.9)	**A** (Worst: A)		UT from Chester Street	2.5 veh (17.8m) Norfolk Road
Pembroke Street/Norfolk Road	AM	0.57	6.3 (Worst: 10.1)	**NA** (Worst: A)	Give Way	RT from Norfolk Road	5 veh (34.9m) Norfolk Road
	PM	0.41	5.7 (Worst: 9.9)	**NA** (Worst: A)		RT from Norfolk Road	2.2 veh (15.5m) Norfolk Road

NOTES:
(1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.
(2) The average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.
(3) The Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.
(4) No overall Level of Service is provided for Give Way and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

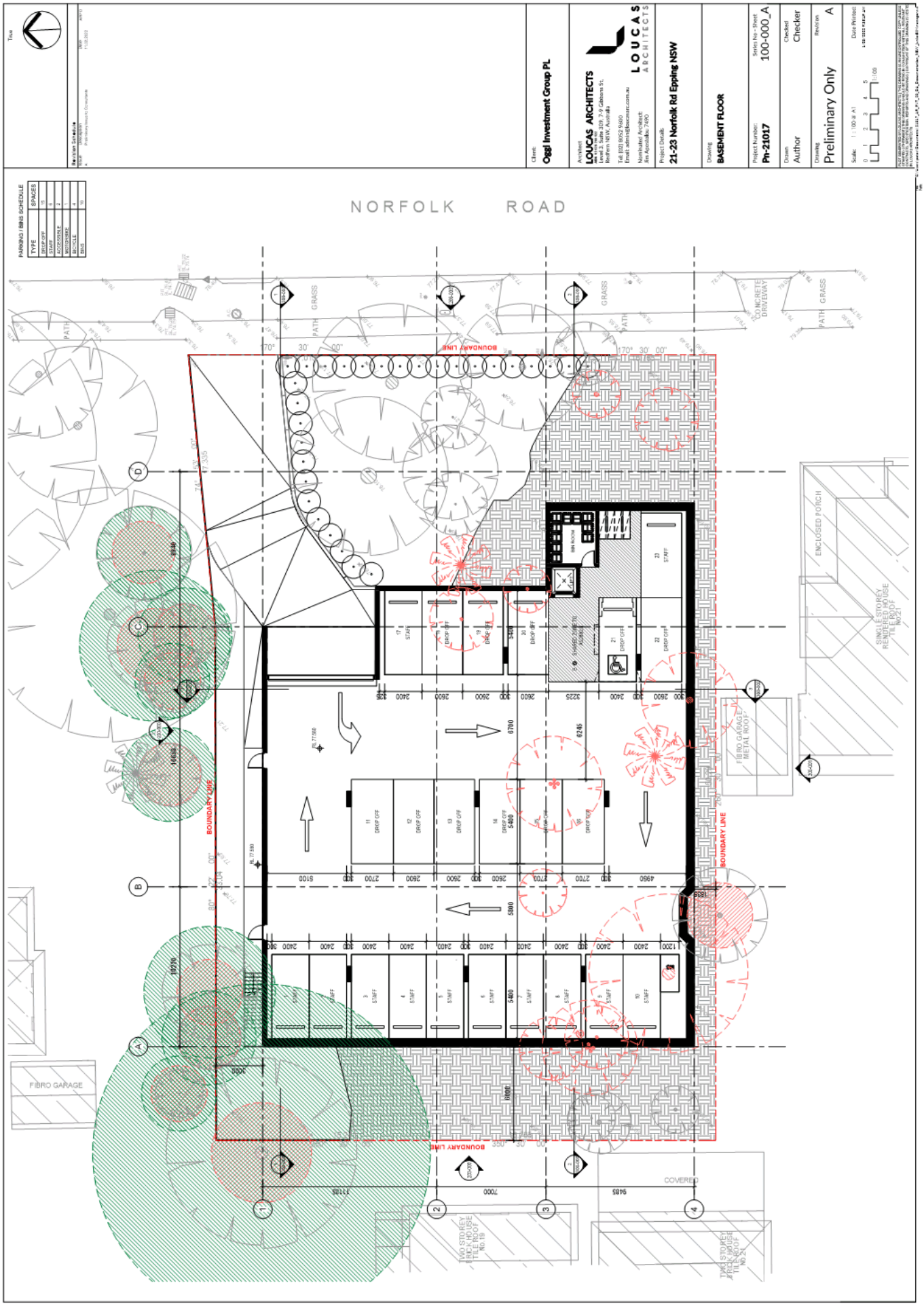
As shown in **Table 5** and **Table 6**, the surrounding intersections remain unaltered under the future proposed scenario from the current approval. The existing Level of Service has been retained with minimal delays and additional capacity maintained. The routes to and from the site do not utilise any residential precincts and are along local arterial or State roads. Therefore, residential amenity will not be impacted by the traffic generated by the proposed development.

Please contact Mr Laen Stewart or the undersigned on 02 9521 7199 should you require further information or assistance.

Yours faithfully
McLaren Traffic Engineering

Matthew McCarthy
Senior Traffic Engineer
BE Civil Engineering
Masters of Engineering Science
RMS Accredited Level 2 Road Safety Auditor

ANNEXURE A: REDUCED PLANS
(3 SHEETS)


NORFOLK ROAD
BOUNDARY LINE
BOUNDARY LINE
BOUNDARY LINE
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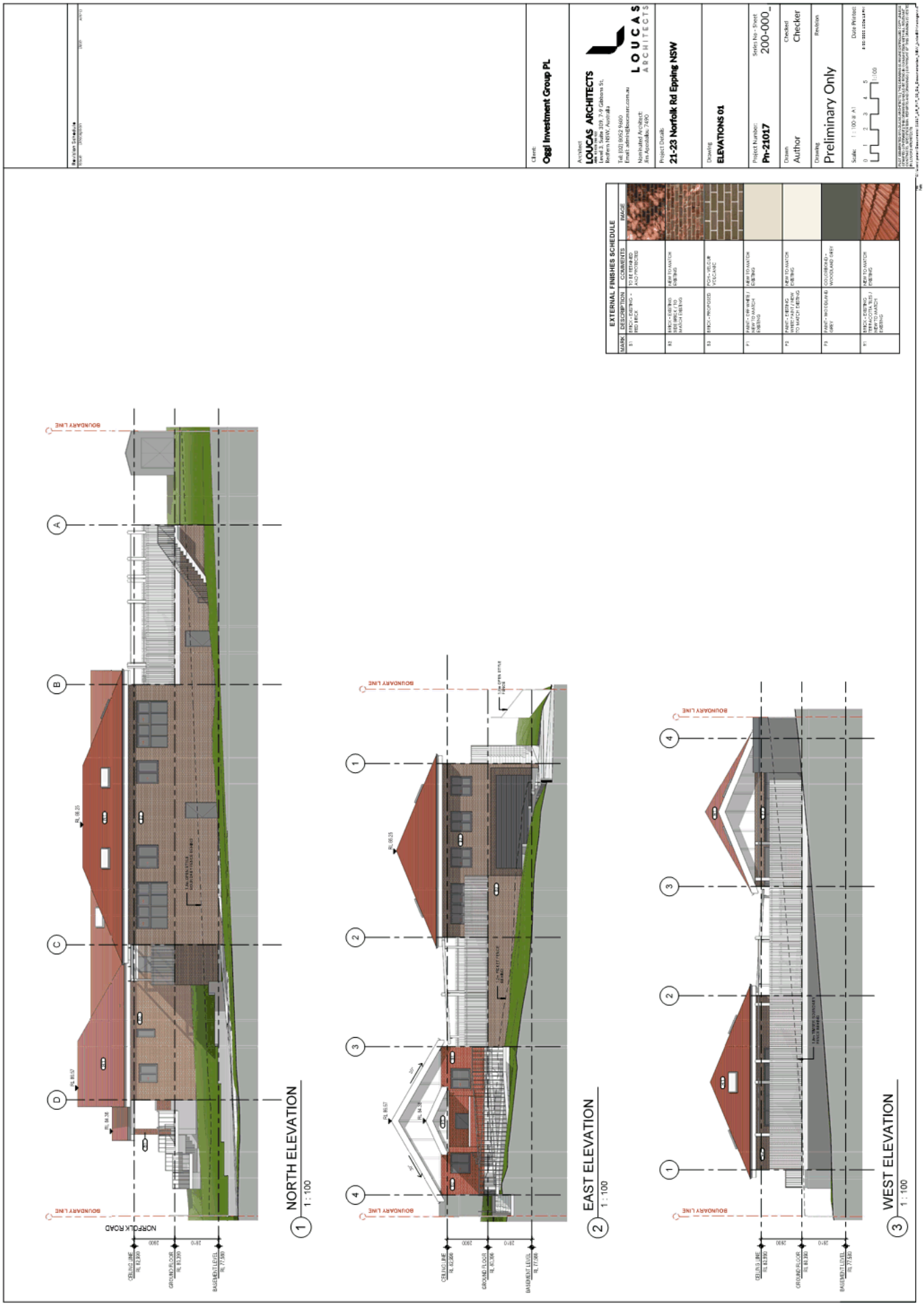
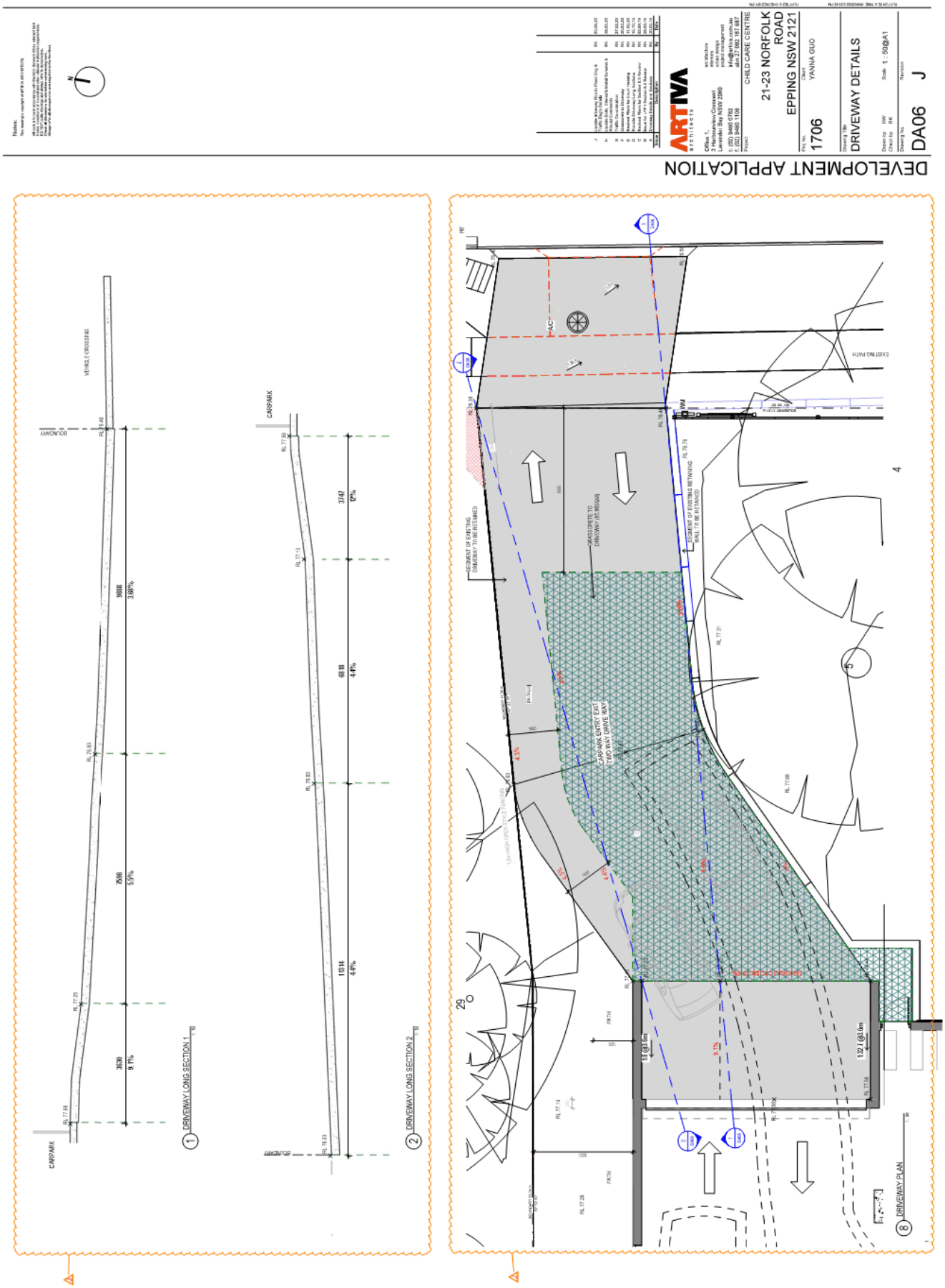
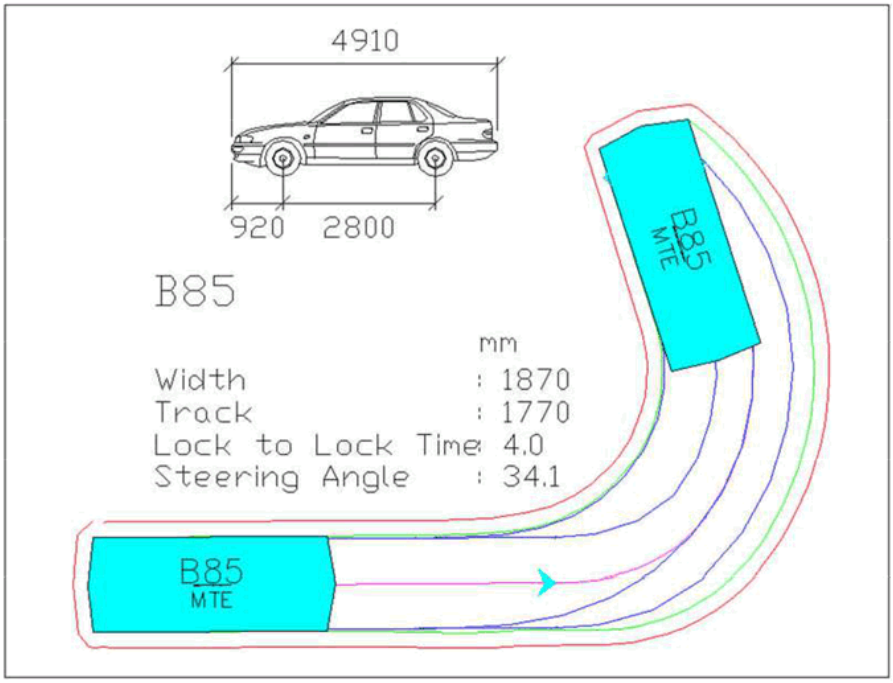
FIBRO GARAGE METAL ROOF
ENCLOSED PORCH
SINGLE STOREY RENDERED BRICK HOUSE TILE ROOF NO.21
TWO STOREY BRICK HOUSE TILE ROOF NO.19
TWO STOREY BRICK HOUSE TILE ROOF NO.23
CONCRETE DRIVEWAY
GRASS
PATH
COVERED
Client: Oggi Investment Group PL
Architect: LOUCAS ARCHITECTS
Project Details: 21-23 Norfolk Rd Epping NSW
Drawing: BASEMENT FLOOR
Project number: Pn-21017
Sales No - Sheet: 100-000_A
Drawn: Author
Checked: Checker
Drawing: Preliminary Only
Revision: A

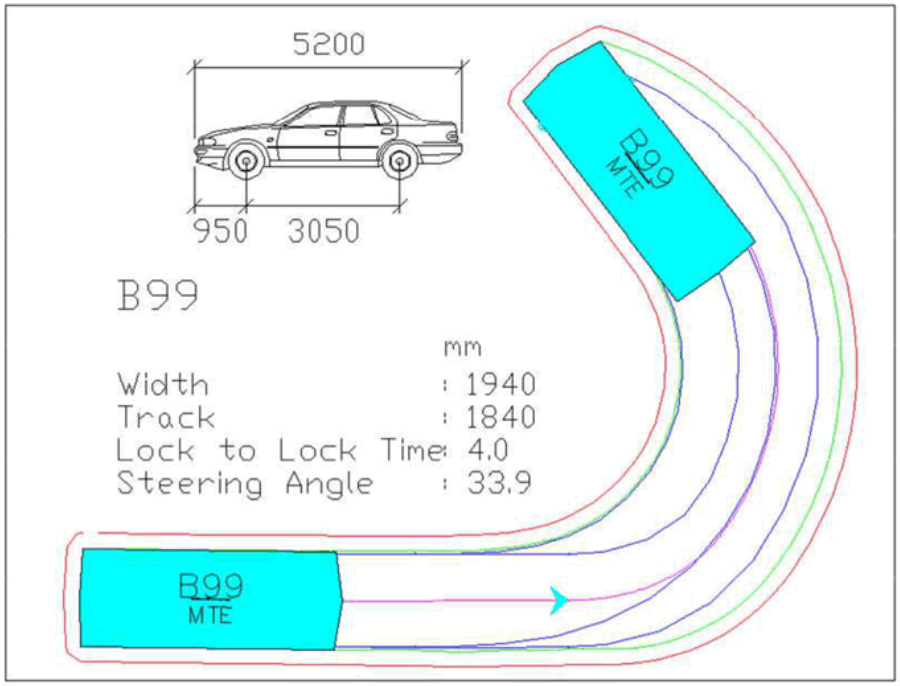

Client:
Oggi Investment Group PL
Architect
LOUCAS ARCHITECTS
Tel: (02) 8852 5660
Nominated Architect:
Project Details:
21-23 Norfolk Rd Epping NSW
Drawing:
ELEVATIONS 01
Project number:
Pn-21017
Series No - Sheet
200-000
Drawn
Author
Checked
Checker
Drawing
Preliminary Only
Revision
Scale: 1 : 100 @ A1
Date Printed:
EXTERNAL FINISHES SCHEDULE
MARK
DESCRIPTION
COMMENTS
IMAGE
B1
BRICK - EXISTING - RED BRICK
TO BE RETAINED AND REPOINTED
B2
BRICK - EXISTING - RED BRICK TO MATCH EXISTING
PAINT TO MATCH EXISTING
B3
BRICK - PROPOSED
POSS - RED OR VOLCANIC
P1
PAINT - OFF WHITE TO MATCH EXISTING
PAINT TO MATCH EXISTING
P2
PAINT - EXISTING WINDOW FRAMES TO MATCH EXISTING
PAINT TO MATCH EXISTING
P3
PAINT - WOODLAND GREY
COLORBOND - WOODLAND GREY
T1
BRICK - EXISTING TERRACOTTA TILES TO MATCH EXISTING
PAINT TO MATCH EXISTING
NORFOLK ROAD
BOUNDARY LINE
CEILING LINE
GROUND FLOOR
BASEMENT LEVEL
NORTH ELEVATION
1 : 100
EAST ELEVATION
1 : 100
WEST ELEVATION
1 : 100


DEVELOPMENT APPLICATION
ARTIVA
architecture
urban design
project management
CHILD CARE CENTRE
21-23 NORFOLK ROAD
EPPING NSW 2121
DRIVEWAY DETAILS
DA06
J
1 DRIVEWAY LONG SECTION 1
2 DRIVEWAY LONG SECTION 2
8 DRIVEWAY PLAN
CARPARK ENTRY EXIT
TWO WAY DRIVE WAY

ANNEXURE B: SWEPT PATH TESTING
(4 SHEETS)

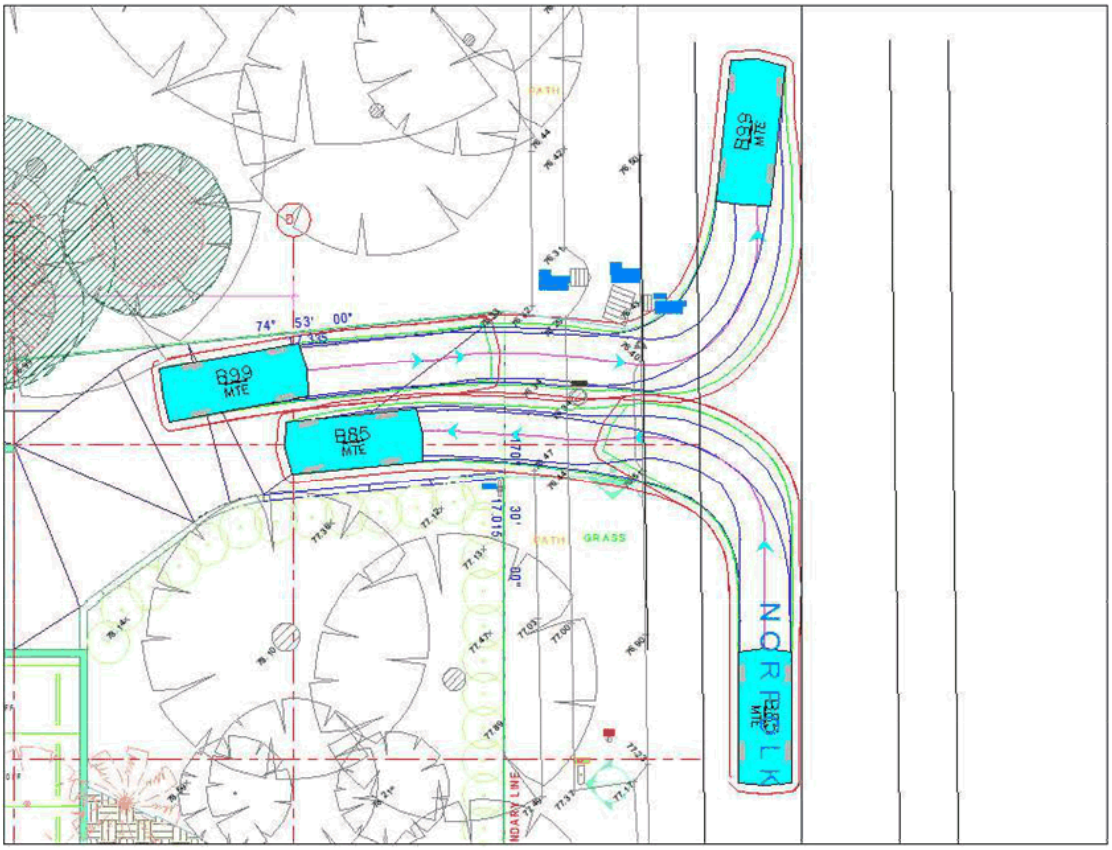


AUSTRALIAN STANDARD 85TH PERCENTILE SIZE VEHICLE (B85)

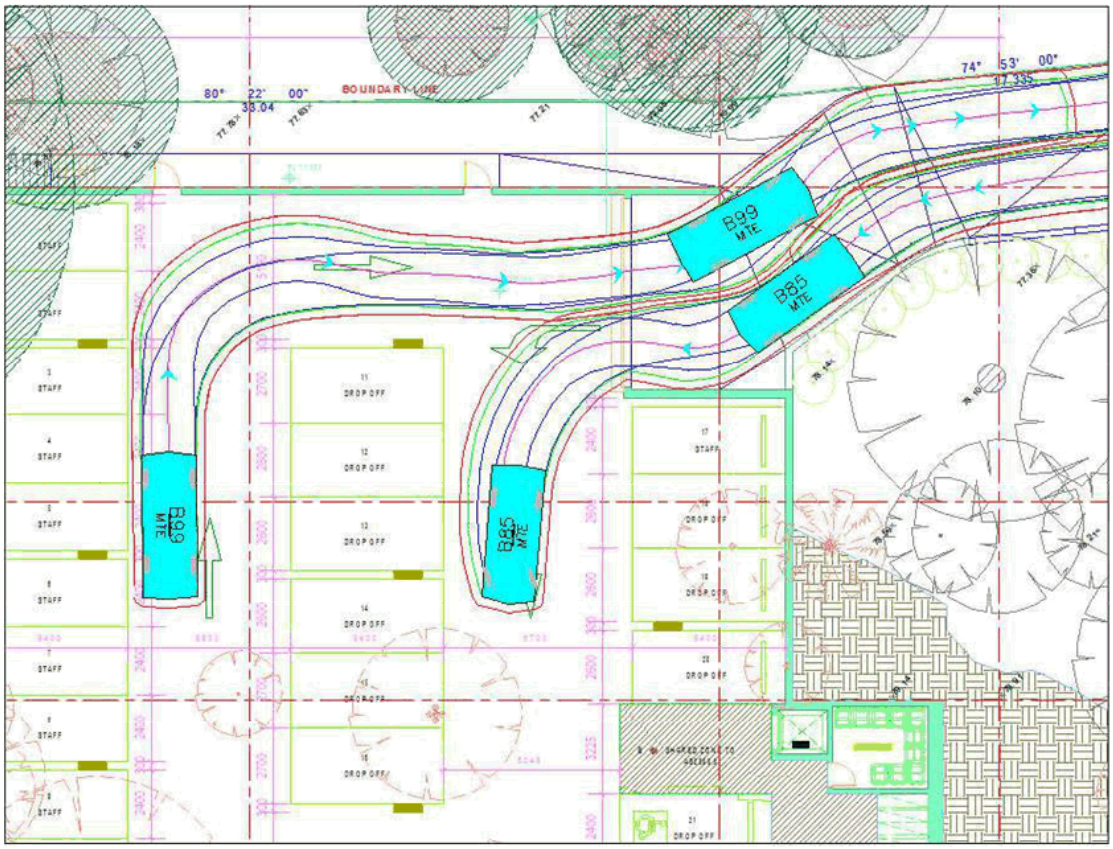


AUSTRALIAN STANDARD 99.8TH PERCENTILE SIZE VEHICLE (B99)

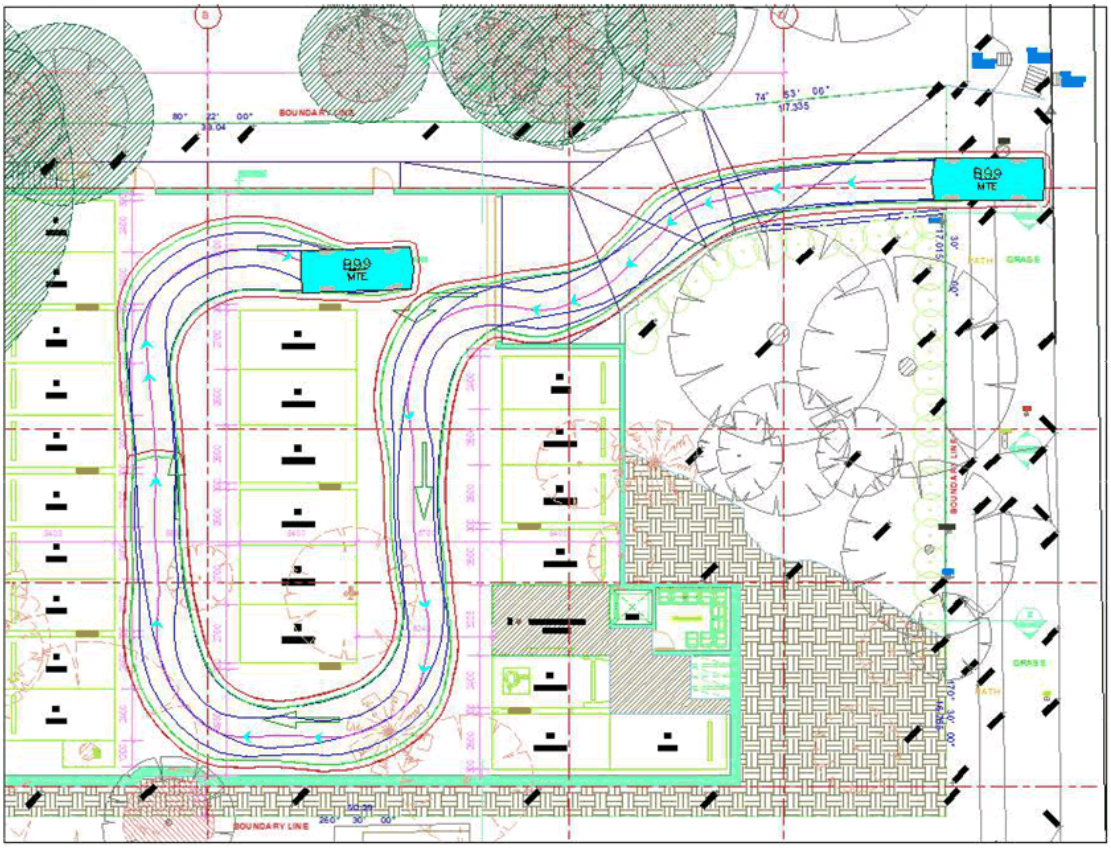
Blue – Tyre Path
Green – Vehicle Body
Red – 300mm Clearance



Driveway Two-way Passing
B85 Left Turn IN / B99 Left Turn OUT
Successful



Roller Door and Ramp Two-way Passing
B85 entry / B99 exit
Successful



B99 basement circulation
Successful

ANNEXURE C: SIDRA MOVEMENT SUMMARY
(16 SHEETS)

MOVEMENT SUMMARY

Site: 101 [Norfolk Rd / Chester St EX AM (Site Folder: General)]

Norfolk Road / Chester Street
Exisitng conditions
AM peak period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Norfolk Road														
1	L2	11	0.0	12	0.0	0.207	5.1	LOS A	1.2	8.2	0.19	0.56	0.19	52.4
2	T1	161	0.0	169	0.0	0.207	5.0	LOS A	1.2	8.2	0.19	0.56	0.19	53.2
3	R2	30	0.0	32	0.0	0.207	8.0	LOS A	1.2	8.2	0.19	0.56	0.19	52.8
3u	U	60	0.0	63	0.0	0.207	9.6	LOS A	1.2	8.2	0.19	0.56	0.19	53.3
Approach		262	0.0	276	0.0	0.207	6.4	LOS A	1.2	8.2	0.19	0.56	0.19	53.1
East: Chester Street														
4	L2	42	0.0	44	0.0	0.069	7.4	LOS A	0.4	2.5	0.55	0.65	0.55	51.9
5	T1	13	0.0	14	0.0	0.069	7.3	LOS A	0.4	2.5	0.55	0.65	0.55	52.7
6	R2	1	0.0	1	0.0	0.069	10.3	LOS A	0.4	2.5	0.55	0.65	0.55	52.3
Approach		56	0.0	59	0.0	0.069	7.4	LOS A	0.4	2.5	0.55	0.65	0.55	52.1
North: Norfolk Road														
7	L2	3	0.0	3	0.0	0.307	5.7	LOS A	1.9	13.1	0.35	0.54	0.35	52.6
8	T1	316	0.0	333	0.0	0.307	5.5	LOS A	1.9	13.1	0.35	0.54	0.35	53.4
9	R2	26	0.0	27	0.0	0.307	8.6	LOS A	1.9	13.1	0.35	0.54	0.35	53.0
9u	U	3	0.0	3	0.0	0.307	10.1	LOS A	1.9	13.1	0.35	0.54	0.35	53.5
Approach		348	0.0	366	0.0	0.307	5.8	LOS A	1.9	13.1	0.35	0.54	0.35	53.4
West: Chester Street														
10	L2	17	0.0	18	0.0	0.052	6.3	LOS A	0.3	1.8	0.42	0.63	0.42	51.6
11	T1	7	0.0	7	0.0	0.052	6.1	LOS A	0.3	1.8	0.42	0.63	0.42	52.3
12	R2	20	0.0	21	0.0	0.052	9.2	LOS A	0.3	1.8	0.42	0.63	0.42	51.9
12u	U	5	0.0	5	0.0	0.052	10.7	LOS A	0.3	1.8	0.42	0.63	0.42	52.4
Approach		49	0.0	52	0.0	0.052	7.9	LOS A	0.3	1.8	0.42	0.63	0.42	51.9
All Vehicles		715	0.0	753	0.0	0.307	6.3	LOS A	1.9	13.1	0.32	0.56	0.32	53.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Norfolk Rd / Chester St FUT AM School (Site Folder: General)]

Norfolk Road / Chester Street
Future conditions with school
AM peak period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Norfolk Road														
1	L2	14	0.0	15	0.0	0.277	5.1	LOS A	1.7	12.2	0.21	0.57	0.21	52.2
2	T1	204	0.0	215	0.0	0.277	5.0	LOS A	1.7	12.2	0.21	0.57	0.21	53.0
3	R2	38	0.0	40	0.0	0.277	8.0	LOS A	1.7	12.2	0.21	0.57	0.21	52.6
3u	U	101	0.0	106	0.0	0.277	9.6	LOS A	1.7	12.2	0.21	0.57	0.21	53.1
Approach		357	0.0	376	0.0	0.277	6.6	LOS A	1.7	12.2	0.21	0.57	0.21	52.9
East: Chester Street														
4	L2	54	0.0	57	0.0	0.097	8.5	LOS A	0.5	3.8	0.65	0.72	0.65	51.1
5	T1	13	0.0	14	0.0	0.097	8.4	LOS A	0.5	3.8	0.65	0.72	0.65	51.8
6	R2	1	0.0	1	0.0	0.097	11.5	LOS A	0.5	3.8	0.65	0.72	0.65	51.5
Approach		68	0.0	72	0.0	0.097	8.6	LOS A	0.5	3.8	0.65	0.72	0.65	51.2
North: Norfolk Road														
7	L2	3	0.0	3	0.0	0.411	6.2	LOS A	2.8	19.3	0.47	0.59	0.47	52.2
8	T1	405	0.0	426	0.0	0.411	6.1	LOS A	2.8	19.3	0.47	0.59	0.47	53.0
9	R2	27	0.0	28	0.0	0.411	9.1	LOS A	2.8	19.3	0.47	0.59	0.47	52.6
9u	U	3	0.0	3	0.0	0.411	10.7	LOS A	2.8	19.3	0.47	0.59	0.47	53.1
Approach		438	0.0	461	0.0	0.411	6.3	LOS A	2.8	19.3	0.47	0.59	0.47	53.0
West: Chester Street														
10	L2	17	0.0	18	0.0	0.063	6.8	LOS A	0.3	2.2	0.49	0.66	0.49	51.1
11	T1	7	0.0	7	0.0	0.063	6.7	LOS A	0.3	2.2	0.49	0.66	0.49	51.8
12	R2	26	0.0	27	0.0	0.063	9.8	LOS A	0.3	2.2	0.49	0.66	0.49	51.5
12u	U	5	0.0	5	0.0	0.063	11.3	LOS A	0.3	2.2	0.49	0.66	0.49	51.9
Approach		55	0.0	58	0.0	0.063	8.6	LOS A	0.3	2.2	0.49	0.66	0.49	51.5
All Vehicles		918	0.0	966	0.0	0.411	6.7	LOS A	2.8	19.3	0.39	0.59	0.39	52.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Norfolk Rd / Chester St FUT AM School + CCC (Site Folder: General)]

Norfolk Road / Chester Street
Future conditions with school and CCC
AM peak period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Norfolk Road														
1	L2	14	0.0	15	0.0	0.285	5.1	LOS A	1.8	12.7	0.22	0.56	0.22	52.3
2	T1	216	0.0	227	0.0	0.285	5.0	LOS A	1.8	12.7	0.22	0.56	0.22	53.0
3	R2	38	0.0	40	0.0	0.285	8.0	LOS A	1.8	12.7	0.22	0.56	0.22	52.7
3u	U	101	0.0	106	0.0	0.285	9.6	LOS A	1.8	12.7	0.22	0.56	0.22	53.1
Approach		369	0.0	388	0.0	0.285	6.6	LOS A	1.8	12.7	0.22	0.56	0.22	53.0
East: Chester Street														
4	L2	54	0.0	57	0.0	0.098	8.7	LOS A	0.5	3.8	0.66	0.72	0.66	51.0
5	T1	13	0.0	14	0.0	0.098	8.5	LOS A	0.5	3.8	0.66	0.72	0.66	51.8
6	R2	1	0.0	1	0.0	0.098	11.6	LOS A	0.5	3.8	0.66	0.72	0.66	51.4
Approach		68	0.0	72	0.0	0.098	8.7	LOS A	0.5	3.8	0.66	0.72	0.66	51.2
North: Norfolk Road														
7	L2	3	0.0	3	0.0	0.422	6.2	LOS A	2.9	20.1	0.48	0.59	0.48	52.2
8	T1	417	0.0	439	0.0	0.422	6.1	LOS A	2.9	20.1	0.48	0.59	0.48	53.0
9	R2	27	0.0	28	0.0	0.422	9.2	LOS A	2.9	20.1	0.48	0.59	0.48	52.6
9u	U	3	0.0	3	0.0	0.422	10.7	LOS A	2.9	20.1	0.48	0.59	0.48	53.1
Approach		450	0.0	474	0.0	0.422	6.3	LOS A	2.9	20.1	0.48	0.59	0.48	53.0
West: Chester Street														
10	L2	17	0.0	18	0.0	0.064	6.9	LOS A	0.3	2.2	0.50	0.67	0.50	51.1
11	T1	7	0.0	7	0.0	0.064	6.8	LOS A	0.3	2.2	0.50	0.67	0.50	51.8
12	R2	26	0.0	27	0.0	0.064	9.8	LOS A	0.3	2.2	0.50	0.67	0.50	51.4
12u	U	5	0.0	5	0.0	0.064	11.4	LOS A	0.3	2.2	0.50	0.67	0.50	51.9
Approach		55	0.0	58	0.0	0.064	8.7	LOS A	0.3	2.2	0.50	0.67	0.50	51.4
All Vehicles		942	0.0	992	0.0	0.422	6.7	LOS A	2.9	20.1	0.39	0.59	0.39	52.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [UPDATED Norfolk Rd / Chester St FUT AM School + CCC (Site Folder: General)]

Norfolk Road / Chester Street
Updated future conditions with school and CCC
AM peak period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Norfolk Road														
1	L2	14	0.0	15	0.0	0.289	5.1	LOS A	1.8	12.9	0.22	0.56	0.22	52.3
2	T1	221	0.0	233	0.0	0.289	5.0	LOS A	1.8	12.9	0.22	0.56	0.22	53.0
3	R2	38	0.0	40	0.0	0.289	8.0	LOS A	1.8	12.9	0.22	0.56	0.22	52.7
3u	U	101	0.0	106	0.0	0.289	9.6	LOS A	1.8	12.9	0.22	0.56	0.22	53.1
Approach		374	0.0	394	0.0	0.289	6.5	LOS A	1.8	12.9	0.22	0.56	0.22	53.0
East: Chester Street														
4	L2	54	0.0	57	0.0	0.099	8.7	LOS A	0.6	3.9	0.66	0.72	0.66	51.0
5	T1	13	0.0	14	0.0	0.099	8.6	LOS A	0.6	3.9	0.66	0.72	0.66	51.7
6	R2	1	0.0	1	0.0	0.099	11.6	LOS A	0.6	3.9	0.66	0.72	0.66	51.4
Approach		68	0.0	72	0.0	0.099	8.7	LOS A	0.6	3.9	0.66	0.72	0.66	51.1
North: Norfolk Road														
7	L2	3	0.0	3	0.0	0.426	6.3	LOS A	2.9	20.4	0.48	0.59	0.48	52.2
8	T1	422	0.0	444	0.0	0.426	6.1	LOS A	2.9	20.4	0.48	0.59	0.48	53.0
9	R2	27	0.0	28	0.0	0.426	9.2	LOS A	2.9	20.4	0.48	0.59	0.48	52.6
9u	U	3	0.0	3	0.0	0.426	10.7	LOS A	2.9	20.4	0.48	0.59	0.48	53.1
Approach		455	0.0	479	0.0	0.426	6.3	LOS A	2.9	20.4	0.48	0.59	0.48	53.0
West: Chester Street														
10	L2	17	0.0	18	0.0	0.064	7.0	LOS A	0.3	2.3	0.50	0.67	0.50	51.0
11	T1	7	0.0	7	0.0	0.064	6.8	LOS A	0.3	2.3	0.50	0.67	0.50	51.8
12	R2	26	0.0	27	0.0	0.064	9.9	LOS A	0.3	2.3	0.50	0.67	0.50	51.4
12u	U	5	0.0	5	0.0	0.064	11.4	LOS A	0.3	2.3	0.50	0.67	0.50	51.9
Approach		55	0.0	58	0.0	0.064	8.7	LOS A	0.3	2.3	0.50	0.67	0.50	51.4
All Vehicles		952	0.0	1002	0.0	0.426	6.7	LOS A	2.9	20.4	0.39	0.59	0.39	52.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Norfolk Rd / Chester St EX PM (Site Folder: General)]

Norfolk Road / Chester Street
Exisitng conditions
PM peak period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Norfolk Road														
1	L2	20	0.0	21	0.0	0.277	5.2	LOS A	1.7	11.8	0.22	0.52	0.22	52.9
2	T1	280	0.0	295	0.0	0.277	5.0	LOS A	1.7	11.8	0.22	0.52	0.22	53.7
3	R2	37	0.0	39	0.0	0.277	8.1	LOS A	1.7	11.8	0.22	0.52	0.22	53.3
3u	U	16	0.0	17	0.0	0.277	9.6	LOS A	1.7	11.8	0.22	0.52	0.22	53.8
Approach		353	0.0	372	0.0	0.277	5.6	LOS A	1.7	11.8	0.22	0.52	0.22	53.6
East: Chester Street														
4	L2	34	0.0	36	0.0	0.064	6.3	LOS A	0.3	2.2	0.43	0.59	0.43	52.4
5	T1	20	0.0	21	0.0	0.064	6.2	LOS A	0.3	2.2	0.43	0.59	0.43	53.2
6	R2	6	0.0	6	0.0	0.064	9.2	LOS A	0.3	2.2	0.43	0.59	0.43	52.8
Approach		60	0.0	63	0.0	0.064	6.6	LOS A	0.3	2.2	0.43	0.59	0.43	52.7
North: Norfolk Road														
7	L2	7	0.0	7	0.0	0.202	5.3	LOS A	1.1	7.8	0.25	0.51	0.25	52.9
8	T1	207	0.0	218	0.0	0.202	5.1	LOS A	1.1	7.8	0.25	0.51	0.25	53.7
9	R2	25	0.0	26	0.0	0.202	8.2	LOS A	1.1	7.8	0.25	0.51	0.25	53.3
9u	U	3	0.0	3	0.0	0.202	9.7	LOS A	1.1	7.8	0.25	0.51	0.25	53.8
Approach		242	0.0	255	0.0	0.202	5.5	LOS A	1.1	7.8	0.25	0.51	0.25	53.7
West: Chester Street														
10	L2	10	0.0	11	0.0	0.035	6.7	LOS A	0.2	1.2	0.48	0.63	0.48	51.5
11	T1	8	0.0	8	0.0	0.035	6.6	LOS A	0.2	1.2	0.48	0.63	0.48	52.3
12	R2	12	0.0	13	0.0	0.035	9.7	LOS A	0.2	1.2	0.48	0.63	0.48	51.9
12u	U	1	0.0	1	0.0	0.035	11.2	LOS A	0.2	1.2	0.48	0.63	0.48	52.3
Approach		31	0.0	33	0.0	0.035	8.0	LOS A	0.2	1.2	0.48	0.63	0.48	51.9
All Vehicles		686	0.0	722	0.0	0.277	5.7	LOS A	1.7	11.8	0.26	0.53	0.26	53.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Norfolk Rd / Chester St FUT PM School (Site Folder: General)]

Norfolk Road / Chester Street
Future conditions with school
PM peak period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Norfolk Road														
1	L2	26	0.0	27	0.0	0.358	5.2	LOS A	2.4	17.0	0.25	0.52	0.25	52.8
2	T1	364	0.0	383	0.0	0.358	5.1	LOS A	2.4	17.0	0.25	0.52	0.25	53.6
3	R2	48	0.0	51	0.0	0.358	8.1	LOS A	2.4	17.0	0.25	0.52	0.25	53.2
3u	U	25	0.0	26	0.0	0.358	9.7	LOS A	2.4	17.0	0.25	0.52	0.25	53.7
Approach		463	0.0	487	0.0	0.358	5.6	LOS A	2.4	17.0	0.25	0.52	0.25	53.5
East: Chester Street														
4	L2	45	0.0	47	0.0	0.082	6.9	LOS A	0.4	2.9	0.50	0.63	0.50	52.1
5	T1	20	0.0	21	0.0	0.082	6.7	LOS A	0.4	2.9	0.50	0.63	0.50	52.9
6	R2	6	0.0	6	0.0	0.082	9.8	LOS A	0.4	2.9	0.50	0.63	0.50	52.5
Approach		71	0.0	75	0.0	0.082	7.1	LOS A	0.4	2.9	0.50	0.63	0.50	52.4
North: Norfolk Road														
7	L2	7	0.0	7	0.0	0.265	5.5	LOS A	1.6	11.0	0.31	0.52	0.31	52.8
8	T1	273	0.0	287	0.0	0.265	5.3	LOS A	1.6	11.0	0.31	0.52	0.31	53.6
9	R2	26	0.0	27	0.0	0.265	8.4	LOS A	1.6	11.0	0.31	0.52	0.31	53.2
9u	U	3	0.0	3	0.0	0.265	9.9	LOS A	1.6	11.0	0.31	0.52	0.31	53.7
Approach		309	0.0	325	0.0	0.265	5.6	LOS A	1.6	11.0	0.31	0.52	0.31	53.5
West: Chester Street														
10	L2	10	0.0	11	0.0	0.044	7.5	LOS A	0.2	1.6	0.55	0.67	0.55	50.9
11	T1	8	0.0	8	0.0	0.044	7.3	LOS A	0.2	1.6	0.55	0.67	0.55	51.7
12	R2	16	0.0	17	0.0	0.044	10.4	LOS A	0.2	1.6	0.55	0.67	0.55	51.3
12u	U	1	0.0	1	0.0	0.044	11.9	LOS A	0.2	1.6	0.55	0.67	0.55	51.8
Approach		35	0.0	37	0.0	0.044	8.9	LOS A	0.2	1.6	0.55	0.67	0.55	51.3
All Vehicles		878	0.0	924	0.0	0.358	5.9	LOS A	2.4	17.0	0.30	0.53	0.30	53.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Norfolk Rd / Chester St FUT PM School +CCC (Site Folder: General)]

Norfolk Road / Chester Street
Future conditions with school and CCC
PM peak period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Norfolk Road														
1	L2	26	0.0	27	0.0	0.365	5.2	LOS A	2.5	17.5	0.25	0.52	0.25	52.8
2	T1	374	0.0	394	0.0	0.365	5.1	LOS A	2.5	17.5	0.25	0.52	0.25	53.6
3	R2	48	0.0	51	0.0	0.365	8.1	LOS A	2.5	17.5	0.25	0.52	0.25	53.2
3u	U	25	0.0	26	0.0	0.365	9.7	LOS A	2.5	17.5	0.25	0.52	0.25	53.7
Approach		473	0.0	498	0.0	0.365	5.6	LOS A	2.5	17.5	0.25	0.52	0.25	53.5
East: Chester Street														
4	L2	45	0.0	47	0.0	0.082	6.9	LOS A	0.4	3.0	0.51	0.63	0.51	52.1
5	T1	20	0.0	21	0.0	0.082	6.8	LOS A	0.4	3.0	0.51	0.63	0.51	52.9
6	R2	6	0.0	6	0.0	0.082	9.8	LOS A	0.4	3.0	0.51	0.63	0.51	52.5
Approach		71	0.0	75	0.0	0.082	7.1	LOS A	0.4	3.0	0.51	0.63	0.51	52.3
North: Norfolk Road														
7	L2	7	0.0	7	0.0	0.273	5.5	LOS A	1.6	11.4	0.31	0.52	0.31	52.8
8	T1	283	0.0	298	0.0	0.273	5.3	LOS A	1.6	11.4	0.31	0.52	0.31	53.6
9	R2	26	0.0	27	0.0	0.273	8.4	LOS A	1.6	11.4	0.31	0.52	0.31	53.2
9u	U	3	0.0	3	0.0	0.273	9.9	LOS A	1.6	11.4	0.31	0.52	0.31	53.7
Approach		319	0.0	336	0.0	0.273	5.6	LOS A	1.6	11.4	0.31	0.52	0.31	53.5
West: Chester Street														
10	L2	10	0.0	11	0.0	0.044	7.5	LOS A	0.2	1.6	0.56	0.67	0.56	50.9
11	T1	8	0.0	8	0.0	0.044	7.4	LOS A	0.2	1.6	0.56	0.67	0.56	51.6
12	R2	16	0.0	17	0.0	0.044	10.4	LOS A	0.2	1.6	0.56	0.67	0.56	51.3
12u	U	1	0.0	1	0.0	0.044	12.0	LOS A	0.2	1.6	0.56	0.67	0.56	51.7
Approach		35	0.0	37	0.0	0.044	8.9	LOS A	0.2	1.6	0.56	0.67	0.56	51.2
All Vehicles		898	0.0	945	0.0	0.365	5.9	LOS A	2.5	17.5	0.30	0.53	0.30	53.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [UPDATED Norfolk Rd / Chester St FUT PM School +CCC (Site Folder: General)]

Norfolk Road / Chester Street
Updated future conditions with school and CCC
PM peak period
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Norfolk Road														
1	L2	26	0.0	27	0.0	0.369	5.2	LOS A	2.5	17.8	0.25	0.52	0.25	52.8
2	T1	379	0.0	399	0.0	0.369	5.1	LOS A	2.5	17.8	0.25	0.52	0.25	53.6
3	R2	48	0.0	51	0.0	0.369	8.1	LOS A	2.5	17.8	0.25	0.52	0.25	53.2
3u	U	25	0.0	26	0.0	0.369	9.7	LOS A	2.5	17.8	0.25	0.52	0.25	53.7
Approach		478	0.0	503	0.0	0.369	5.6	LOS A	2.5	17.8	0.25	0.52	0.25	53.5
East: Chester Street														
4	L2	45	0.0	47	0.0	0.083	7.0	LOS A	0.4	3.0	0.51	0.64	0.51	52.1
5	T1	20	0.0	21	0.0	0.083	6.8	LOS A	0.4	3.0	0.51	0.64	0.51	52.8
6	R2	6	0.0	6	0.0	0.083	9.9	LOS A	0.4	3.0	0.51	0.64	0.51	52.5
Approach		71	0.0	75	0.0	0.083	7.2	LOS A	0.4	3.0	0.51	0.64	0.51	52.3
North: Norfolk Road														
7	L2	7	0.0	7	0.0	0.277	5.5	LOS A	1.7	11.6	0.31	0.52	0.31	52.8
8	T1	288	0.0	303	0.0	0.277	5.3	LOS A	1.7	11.6	0.31	0.52	0.31	53.6
9	R2	26	0.0	27	0.0	0.277	8.4	LOS A	1.7	11.6	0.31	0.52	0.31	53.2
9u	U	3	0.0	3	0.0	0.277	9.9	LOS A	1.7	11.6	0.31	0.52	0.31	53.7
Approach		324	0.0	341	0.0	0.277	5.6	LOS A	1.7	11.6	0.31	0.52	0.31	53.5
West: Chester Street														
10	L2	10	0.0	11	0.0	0.044	7.6	LOS A	0.2	1.6	0.56	0.67	0.56	50.9
11	T1	8	0.0	8	0.0	0.044	7.4	LOS A	0.2	1.6	0.56	0.67	0.56	51.6
12	R2	16	0.0	17	0.0	0.044	10.5	LOS A	0.2	1.6	0.56	0.67	0.56	51.2
12u	U	1	0.0	1	0.0	0.044	12.0	LOS A	0.2	1.6	0.56	0.67	0.56	51.7
Approach		35	0.0	37	0.0	0.044	9.0	LOS A	0.2	1.6	0.56	0.67	0.56	51.2
All Vehicles		908	0.0	956	0.0	0.369	5.9	LOS A	2.5	17.8	0.30	0.53	0.30	53.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▽ Site: 101 [Norfolk Rd / Pembroke St EX AM (Site Folder: General)]

Norfolk Road / Pembroke Street
Existing Conditions
AM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Pembroke Street														
5	T1	89	0.0	94	0.0	0.129	0.8	LOS A	0.6	4.4	0.35	0.34	0.35	56.0
6	R2	106	0.0	112	0.0	0.129	6.4	LOS A	0.6	4.4	0.35	0.34	0.35	54.0
Approach		195	0.0	205	0.0	0.129	3.9	NA	0.6	4.4	0.35	0.34	0.35	54.9
North: Norfolk Road														
7	L2	266	0.0	280	0.0	0.422	6.3	LOS A	2.4	16.5	0.32	0.63	0.35	52.4
9	R2	197	0.0	207	0.0	0.422	8.1	LOS A	2.4	16.5	0.32	0.63	0.35	51.9
Approach		463	0.0	487	0.0	0.422	7.1	LOS A	2.4	16.5	0.32	0.63	0.35	52.2
West: Pembroke Street														
10	L2	143	0.0	151	0.0	0.144	5.6	LOS A	0.0	0.0	0.00	0.32	0.00	55.6
11	T1	117	0.0	123	0.0	0.144	0.0	LOS A	0.0	0.0	0.00	0.32	0.00	57.1
Approach		260	0.0	274	0.0	0.144	3.1	NA	0.0	0.0	0.00	0.32	0.00	56.3
All Vehicles		918	0.0	966	0.0	0.422	5.3	NA	2.4	16.5	0.24	0.48	0.25	53.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▽ Site: 101 [Norfolk Rd / Pembroke St FUT AM School (Site Folder: General)]

Norfolk Road / Pembroke Street
Future Conditions with school
AM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Pembroke Street														
5	T1	91	0.0	96	0.0	0.158	1.1	LOS A	0.8	5.6	0.41	0.39	0.41	55.6
6	R2	136	0.0	143	0.0	0.158	6.7	LOS A	0.8	5.6	0.41	0.39	0.41	53.6
Approach		227	0.0	239	0.0	0.158	4.4	NA	0.8	5.6	0.41	0.39	0.41	54.4
North: Norfolk Road														
7	L2	337	0.0	355	0.0	0.553	7.1	LOS A	4.6	32.0	0.37	0.69	0.49	51.6
9	R2	250	0.0	263	0.0	0.553	9.8	LOS A	4.6	32.0	0.37	0.69	0.49	51.1
Approach		587	0.0	618	0.0	0.553	8.2	LOS A	4.6	32.0	0.37	0.69	0.49	51.4
West: Pembroke Street														
10	L2	183	0.0	193	0.0	0.168	5.6	LOS A	0.0	0.0	0.00	0.36	0.00	55.3
11	T1	119	0.0	125	0.0	0.168	0.0	LOS A	0.0	0.0	0.00	0.36	0.00	56.8
Approach		302	0.0	318	0.0	0.168	3.4	NA	0.0	0.0	0.00	0.36	0.00	55.9
All Vehicles		1116	0.0	1175	0.0	0.553	6.1	NA	4.6	32.0	0.28	0.54	0.34	53.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▽ Site: 101 [Norfolk Rd / Pembroke St FUT AM School +CCC (Site Folder: General)]

Norfolk Road / Pembroke Street
Future Conditions with school and CCC
AM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Pembroke Street														
5	T1	91	0.0	96	0.0	0.165	1.1	LOS A	0.8	5.9	0.41	0.40	0.41	55.5
6	R2	144	0.0	152	0.0	0.165	6.7	LOS A	0.8	5.9	0.41	0.40	0.41	53.5
Approach		235	0.0	247	0.0	0.165	4.5	NA	0.8	5.9	0.41	0.40	0.41	54.3
North: Norfolk Road														
7	L2	345	0.0	363	0.0	0.568	7.2	LOS A	4.9	34.0	0.37	0.70	0.51	51.5
9	R2	254	0.0	267	0.0	0.568	10.0	LOS A	4.9	34.0	0.37	0.70	0.51	51.0
Approach		599	0.0	631	0.0	0.568	8.4	LOS A	4.9	34.0	0.37	0.70	0.51	51.3
West: Pembroke Street														
10	L2	187	0.0	197	0.0	0.170	5.6	LOS A	0.0	0.0	0.00	0.36	0.00	55.3
11	T1	119	0.0	125	0.0	0.170	0.0	LOS A	0.0	0.0	0.00	0.36	0.00	56.8
Approach		306	0.0	322	0.0	0.170	3.4	NA	0.0	0.0	0.00	0.36	0.00	55.9
All Vehicles		1140	0.0	1200	0.0	0.568	6.3	NA	4.9	34.0	0.28	0.54	0.35	53.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▽ Site: 101 [UPDATED Norfolk Rd / Pembroke St FUT AM School +CCC (Site Folder: General)]

Norfolk Road / Pembroke Street
Updated future conditions with school and CCC
AM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Pembroke Street														
5	T1	91	0.0	96	0.0	0.168	1.1	LOS A	0.9	6.0	0.42	0.40	0.42	55.4
6	R2	148	0.0	156	0.0	0.168	6.7	LOS A	0.9	6.0	0.42	0.40	0.42	53.5
Approach		239	0.0	252	0.0	0.168	4.6	NA	0.9	6.0	0.42	0.40	0.42	54.2
North: Norfolk Road														
7	L2	349	0.0	367	0.0	0.573	7.2	LOS A	5.0	34.9	0.37	0.70	0.51	51.4
9	R2	255	0.0	268	0.0	0.573	10.1	LOS A	5.0	34.9	0.37	0.70	0.51	50.9
Approach		604	0.0	636	0.0	0.573	8.5	LOS A	5.0	34.9	0.37	0.70	0.51	51.2
West: Pembroke Street														
10	L2	188	0.0	198	0.0	0.171	5.6	LOS A	0.0	0.0	0.00	0.36	0.00	55.3
11	T1	119	0.0	125	0.0	0.171	0.0	LOS A	0.0	0.0	0.00	0.36	0.00	56.8
Approach		307	0.0	323	0.0	0.171	3.4	NA	0.0	0.0	0.00	0.36	0.00	55.9
All Vehicles		1150	0.0	1211	0.0	0.573	6.3	NA	5.0	34.9	0.28	0.55	0.36	53.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▽ Site: 101 [Norfolk Rd / Pembroke St EX PM (Site Folder: General)]

Norfolk Road / Pembroke Street
Existing Conditions
PM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Pembroke Street														
5	T1	122	0.0	128	0.0	0.205	0.8	LOS A	1.1	7.6	0.36	0.38	0.36	55.7
6	R2	190	0.0	200	0.0	0.205	6.3	LOS A	1.1	7.6	0.36	0.38	0.36	53.7
Approach		312	0.0	328	0.0	0.205	4.2	NA	1.1	7.6	0.36	0.38	0.36	54.5
North: Norfolk Road														
7	L2	128	0.0	135	0.0	0.278	5.9	LOS A	1.1	7.9	0.26	0.63	0.26	52.4
9	R2	145	0.0	153	0.0	0.278	8.1	LOS A	1.1	7.9	0.26	0.63	0.26	51.9
Approach		273	0.0	287	0.0	0.278	7.1	LOS A	1.1	7.9	0.26	0.63	0.26	52.1
West: Pembroke Street														
10	L2	128	0.0	135	0.0	0.122	5.6	LOS A	0.0	0.0	0.00	0.34	0.00	55.5
11	T1	92	0.0	97	0.0	0.122	0.0	LOS A	0.0	0.0	0.00	0.34	0.00	56.9
Approach		220	0.0	232	0.0	0.122	3.3	NA	0.0	0.0	0.00	0.34	0.00	56.1
All Vehicles		805	0.0	847	0.0	0.278	4.9	NA	1.1	7.9	0.23	0.45	0.23	54.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▽ Site: 101 [Norfolk Rd / Pembroke St FUT PM School (Site Folder: General)]

Norfolk Road / Pembroke Street
Future Conditions with school
PM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Pembroke Street														
5	T1	124	0.0	131	0.0	0.258	1.1	LOS A	1.4	10.0	0.42	0.43	0.42	55.2
6	R2	250	0.0	263	0.0	0.258	6.6	LOS A	1.4	10.0	0.42	0.43	0.42	53.3
Approach		374	0.0	394	0.0	0.258	4.8	NA	1.4	10.0	0.42	0.43	0.42	53.9
North: Norfolk Road														
7	L2	166	0.0	175	0.0	0.387	6.3	LOS A	2.0	14.0	0.29	0.66	0.33	51.7
9	R2	188	0.0	198	0.0	0.387	9.6	LOS A	2.0	14.0	0.29	0.66	0.33	51.2
Approach		354	0.0	373	0.0	0.387	8.0	LOS A	2.0	14.0	0.29	0.66	0.33	51.5
West: Pembroke Street														
10	L2	169	0.0	178	0.0	0.147	5.6	LOS A	0.0	0.0	0.00	0.38	0.00	55.2
11	T1	94	0.0	99	0.0	0.147	0.0	LOS A	0.0	0.0	0.00	0.38	0.00	56.6
Approach		263	0.0	277	0.0	0.147	3.6	NA	0.0	0.0	0.00	0.38	0.00	55.7
All Vehicles		991	0.0	1043	0.0	0.387	5.6	NA	2.0	14.0	0.26	0.50	0.28	53.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▽ Site: 101 [Norfolk Rd / Pembroke St FUT PM School + CCC (Site Folder: General)]

Norfolk Road / Pembroke Street
Future Conditions with school and CCC
PM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Pembroke Street														
5	T1	124	0.0	131	0.0	0.264	1.1	LOS A	1.5	10.3	0.42	0.44	0.42	55.2
6	R2	257	0.0	271	0.0	0.264	6.6	LOS A	1.5	10.3	0.42	0.44	0.42	53.3
Approach		381	0.0	401	0.0	0.264	4.8	NA	1.5	10.3	0.42	0.44	0.42	53.9
North: Norfolk Road														
7	L2	173	0.0	182	0.0	0.401	6.4	LOS A	2.1	15.0	0.29	0.66	0.34	51.6
9	R2	192	0.0	202	0.0	0.401	9.8	LOS A	2.1	15.0	0.29	0.66	0.34	51.1
Approach		365	0.0	384	0.0	0.401	8.1	LOS A	2.1	15.0	0.29	0.66	0.34	51.4
West: Pembroke Street														
10	L2	172	0.0	181	0.0	0.148	5.6	LOS A	0.0	0.0	0.00	0.38	0.00	55.2
11	T1	94	0.0	99	0.0	0.148	0.0	LOS A	0.0	0.0	0.00	0.38	0.00	56.6
Approach		266	0.0	280	0.0	0.148	3.6	NA	0.0	0.0	0.00	0.38	0.00	55.7
All Vehicles		1012	0.0	1065	0.0	0.401	5.7	NA	2.1	15.0	0.26	0.50	0.28	53.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▽ Site: 101 [UPDATED Norfolk Rd / Pembroke St FUT PM School + CCC (Site Folder: General)]

Norfolk Road / Pembroke Street
Updated future conditions with school and CCC
PM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Pembroke Street														
5	T1	124	0.0	131	0.0	0.268	1.1	LOS A	1.5	10.4	0.43	0.44	0.43	55.2
6	R2	261	0.0	275	0.0	0.268	6.6	LOS A	1.5	10.4	0.43	0.44	0.43	53.2
Approach		385	0.0	405	0.0	0.268	4.9	NA	1.5	10.4	0.43	0.44	0.43	53.8
North: Norfolk Road														
7	L2	177	0.0	186	0.0	0.407	6.4	LOS A	2.2	15.5	0.29	0.66	0.35	51.6
9	R2	193	0.0	203	0.0	0.407	9.9	LOS A	2.2	15.5	0.29	0.66	0.35	51.1
Approach		370	0.0	389	0.0	0.407	8.2	LOS A	2.2	15.5	0.29	0.66	0.35	51.3
West: Pembroke Street														
10	L2	174	0.0	183	0.0	0.149	5.6	LOS A	0.0	0.0	0.00	0.38	0.00	55.1
11	T1	94	0.0	99	0.0	0.149	0.0	LOS A	0.0	0.0	0.00	0.38	0.00	56.6
Approach		268	0.0	282	0.0	0.149	3.6	NA	0.0	0.0	0.00	0.38	0.00	55.6
All Vehicles		1023	0.0	1077	0.0	0.407	5.7	NA	2.2	15.5	0.26	0.50	0.29	53.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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ACOUSTICAL REPORT FOR S4.55

PROPOSED CHILD CARE CENTRE

21-23 NORFOLK ROAD EPPING NSW

Date: Friday, 20 May 2022

File Reference: 5378R20220505jt21-23NorfolkRdEpping_S4.55_Review_V2.docx

DOCUMENT CONTROL

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Project number	5378
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Version	Date	Author	Review	Notes
V1	10/05/2022	JT	NK	Report version 1 available for issue
V2	20/05/2022	JT	NK	Report version 2 available for issue

Approved by	James Tsevrementzis  Acoustical Consultant (M.A.A.S)
Client	Oggi Investment Group PL Attention: Yanna Guo Email: yanna.guo@live.com.au C/o Loucas Architects Attention: Mirko Cizmic Email: mirko@loucasarc.com.au

The information contained herein should not be reproduced except in full. The information provided in this report relates to acoustic matters only. Supplementary advice should be sought for other matters relating to construction, design, structural, fire-rating, waterproofing, and the like.

ACOUSTICAL REPORT FOR S4.55

PROPOSED CHILD CARE CENTRE

21-23 NORFOLK ROAD EPPING NSW

CONTENTS

TABLE OF APPENDICES

1.0 INTRODUCTION

Koikas Acoustics Pty Ltd has been engaged by Oggi Investment Group Pty Ltd to prepare a noise impact assessment for the proposed modification to the approved child care centre at 21-23 Norfolk Road Epping NSW. The application seeks to modify the number of children at the centre which ultimately results in a net increase in total children of from 53 (approved) to 82 (proposed).

This report primarily presents an assessment of noise egress from the proposed child care centre. The site is not located adjacent to a main road, rail corridor, under a flight path, or adjacent to industrial premises, meaning that external noise impacts on the proposed child care centre are not anticipated.

To derive suitable noise objectives by which to assess the development, reference is made to the City of Parramatta Council Development Control Plan (DCP) and other relevant planning documents such as:

- NSW Government Child Care Planning Guidelines 2017
- State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017
- Association of Australasian Acoustical Consultants (AAAC) Guideline for Child Care Centre Acoustic Assessment (v3.0)
- NSW Environmental Protection Authority (EPA) Noise Policy for Industry (NPfI) 2017
- NSW Environmental Protection Authority (EPA) Road Noise Policy (RNP)

The following sections of this report provide a brief outline of the development, establish the project noise objectives through referencing appropriate guidelines and documents, predicts noise levels to surrounding receivers, and recommend noise mitigation/management measures necessary to meet the project noise objectives.

This report makes reference to the previously prepared DA Acoustic Report prepared by Acoustic Dynamics (File Reference: 4391R001.MW.180818, Dated: 7 September 2018).

2.0 THE DEVELOPMENT PROPOSAL

The proposed child care centre is two (2) single-storey buildings with basement parking located at 21-23 Norfolk Road Epping NSW. The site has a single street frontage (Norfolk Road) to the east and is surrounded by residential premises in all directions. Epping Public School is also located across Norfolk Road.

The designs of the child care centre as prepared by Loucas Architects (Project No.: Pn-21017, Dated: 11.02.2022, Revision: A) shows:

- Basement parking with 23 spaces (visitors drop-off and staff).
- Three (3) separate internal play areas (divided by age group), reception/waiting area, offices, kitchen, staff/meeting room, and amenities in the main building.
- Covered and uncovered areas dedicated to outdoor play (575 m^2 unencumbered area).

***Note**: This acoustic report and any associated recommendations are based solely on the architectural design and drawings as referenced above. Any changes to the above-referenced plans may require a new assessment and recommendations.*

The centre will operate between the hours of 7 am and 6 pm Monday to Friday. Staff members will generally arrive 15-30 minutes prior to opening and depart 15-30 minutes after closing hours. This represents no change to the approved development.

The facility is proposed to cater for a total of 82 children which represents an increase of 29 children from the approved development. The breakdown per age group of the approved versus proposed modified child numbers is:

Table 1. Approved and proposed child numbers

Age group	DA approved	S4.55 proposed
0-2 years	16	17
2-3 years	17	25
3-5 years	20	40
Total	**53**	**82**

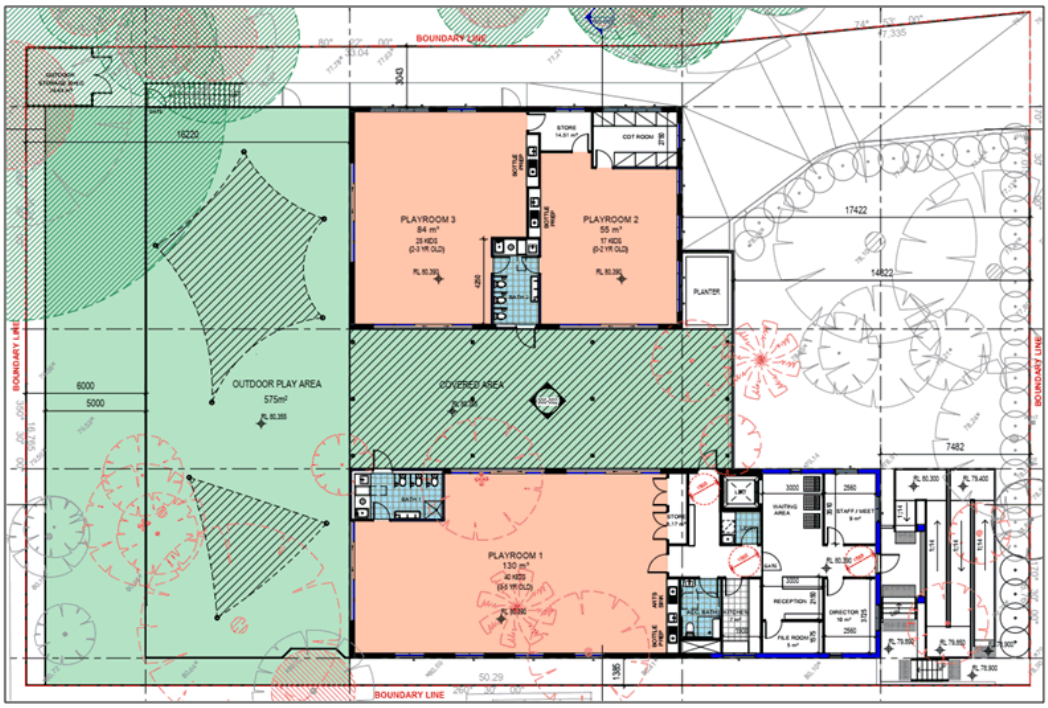


Figure 1. Site plan (Source: Loucas Architects)

3.0 IDENTIFIED NOISE-SENSITIVE RECEIVERS

The development site and the adjacent residential lots are all located within an R3 Medium-Density Residential zoning to the west and R2 Low-Density Residential zoning in all other directions as per the Hornsby Local Environment Plan 2013. The nearest surrounding noise-sensitive residential receptors are the adjacent lots to the north, south and west as well as across Norfolk Road to the East. These premises are identified as:

Table 2. Identified noise-sensitive receptors

Receptor type	Address	Orientation to the development site
Residential dwelling [double storey]	22 Norfolk Road	North-east
Residential dwelling [single storey]	20 Norfolk Road	East
Epping Public School	Epping Public School	East
Residential dwelling [single storey]	19 Norfolk Road	South
Residential townhouses [double storey]	21 Rockleigh Way	West
Residential townhouses [double storey]	19 Rockleigh Way	West
Residential dwelling [double storey]	24 Chester Street	North

Each of the identified noise-sensitive residential receptors is shown in Figure 2, along with the location of the noise loggers installed on-site (by others). These properties and several locations within each property (where necessary) are assessed for resulting noise impacts from the proposed child care centre.

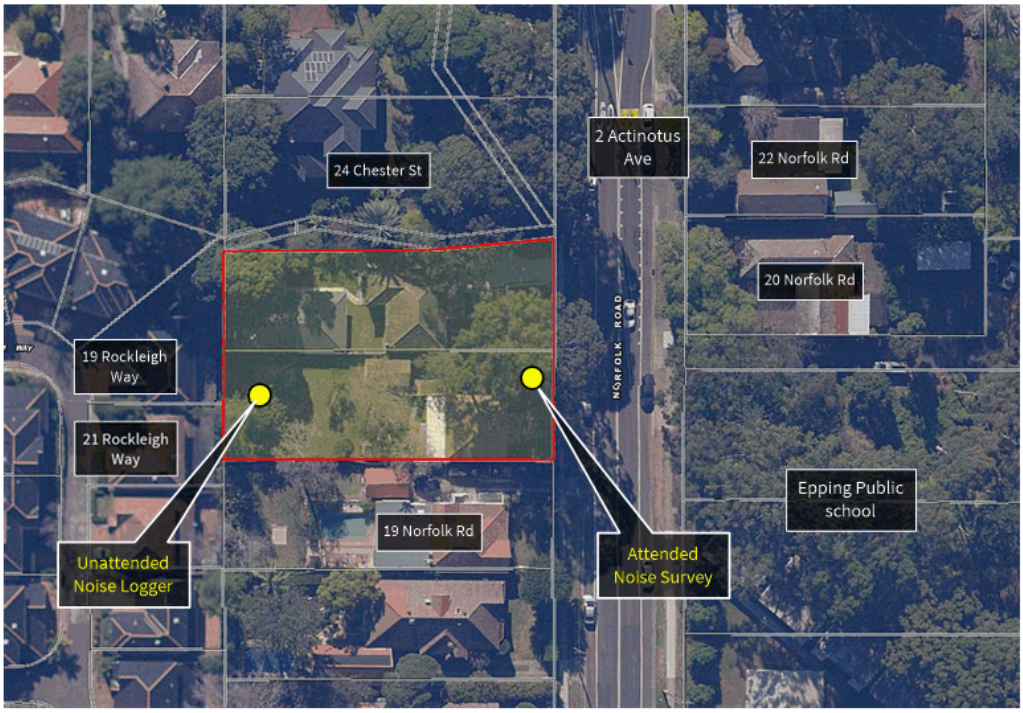


Figure 2. Aerial image (Source: Six Maps)

4.0 EXISTING NOISE ENVIRONMENT

Koikas Acoustics has relied of the noise surveys undertaken by Acoustic Dynamics to determine the ambient noise levels in the area.

Existing unattended ambient noise levels in the local area were surveyed by others between Thursday 16th August and Thursday 23rd August 2018. The relevant noise measurements equipment and standards have been extracted below from the report prepared by Acoustic Dynamics.

3 NOISE MEASUREMENT EQUIPMENT & STANDARDS

All measurements were conducted in general accordance with Australian Standard 1055.1-1997, *"Acoustics - Description and Measurement of Environmental Noise Part 1: General Procedures"*. Acoustic Dynamics' sound measurements were carried out using precision sound level meters conforming to the requirements of IEC 61672-2002 *"Electroacoustics: Sound Level Meters – Part 1: Specifications"*. The survey instrumentation used during the survey is set out in **Table 3.1**.

Table 3.1 Noise Survey Instrumentation

Type	Serial Number	Instrument Description
2270	2664115	Brüel & Kjaer Modular Precision Sound Level Meter
4189	2650956	Brüel & Kjaer 12.5 mm Prepolarised Condenser Microphone
4231	1730737	Brüel & Kjaer Acoustic Calibrator
EL-316	16-306-020	ARL Environmental Data Logger

The reference sound pressure level was checked prior to and after the measurements using the acoustic calibrator and remained within acceptable limits.

Acoustic Dynamics has presented the daytime RBL to be L_{A90} 39 dB. No further noise measurement summaries have been presented in the DA acoustic report prepared by Acoustic Dynamics. The shoulder period between 6.30 am and 7 am was determined to be approximately L_{A90} 40 dB from the unattended noise logger graphs.

Acoustics Dynamics has also advised they have undertaken an attended noise survey of the ambient noise levels at the front of the site, however, details of the measurements have not been presented in the report. Acoustic Dynamics has predicted the following ambient noise levels for the development:

- Indoor play/sleeping area (windows closed) $L_{Aeq} \leq 25$ dB
- Indoor play/sleeping area (windows open) $L_{Aeq} \leq 35$ dB
- Outdoor play or activity area $L_{Aeq} \leq 40$ dB

5.0 NOISE ASSESSMENT GUIDELINES

5.1 HORNSBY DCP 2013

There are no other specific noise-related guidelines for child care centre development within the Hornsby DCP 2013.

5.2 NSW PLANNING AND ENVIRONMENT

The CCPG under Item C23 and C24 recommend the following to minimise noise impacts from the facility on residential neighbours:

- *Provision of an acoustic fence along the property boundary.*
- *Ensure that mechanical plant and equipment is suitably screened to reduce noise.*
- *That an acoustic report is provided with an application that establishes an appropriate background noise level for times the outdoor play area will be in use, identifies an appropriate target noise level (noise criteria) for child care centre noise emission, recommends appropriate heights for any acoustic fences.*

Item C25 which relates to external noise impacts on the proposed child care centre is not relevant in this case.

5.3 SEPP (EDUCATIONAL ESTABLISHMENTS AND CHILD CARE FACILITIES) 2017

Further to the CCPG, the State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017 outlines assessment requirements for educational establishments and child care facilities across NSW, however, also does not present any specific criteria relevant to noise emissions.

To establish suitable noise emission objectives for the use and operation of the proposed child care centre, the guidelines prepared by the Association of Australasian Acoustical Consultants (AAAC) in their *Guidelines for Child Care Centres Acoustic Assessment* document are referenced. The AAAC guidelines do not, however, present noise objectives for an assessment of vehicle noise attributed to additional cars on local roads. The NSW Environment Protection Authority Road Noise Policy (EPA RNP) is referenced for specific noise objectives related to on-road vehicular noise emissions.

5.4 AAAC GUIDELINES

5.4.1 Outdoor play areas

The AAAC recognise that childcare centres will generally be located in residential areas. Some of these areas will have very low pre-existing background noise levels. In such areas where the background level is lower than 40 dB(A), the AAAC recommend adopting a base criterion of $L_{Aeq\ 15\ minutes}$ 45 dB(A) rather than defining a criterion based on a specified emergence of noise above the existing background level.

Where the background noise level is greater than 40 dB(A), the contributed $L_{Aeq\ 15\ minutes}$ of noise emitted from outdoor play must not exceed the background level by more than 5 or 10 dB at the assessment location depending on the usage of the outdoor play area.

If the outdoor play area is limited to no more than two (2) hours in the morning and a further two (2) hours in the afternoon, thus a total usage of four (4) hours per day, the contributed $L_{Aeq\ 15\ minutes}$ of noise emitted from outdoor play shall not exceed the background noise level by more than 10 dB.

If the outdoor play area is not limited to two (2) hours in the morning and a further two (2) hours in the afternoon, thus a total usage of more than four (4) hours per day, the contributed $L_{Aeq\ 15\ minutes}$ of noise emitted from outdoor play shall not exceed the background noise level by more than 5 dB.

To summarise, the noise emitted from outdoor play, assessed as an $L_{Aeq\ 15\ minutes}$, must not exceed:

- A base criterion of 45 dB(A) in areas where the background level is below 40 dB(A).
- The background noise level + 10 dB in areas where the background noise level is greater than 40 dB(A) and where outdoor play **is limited** to no more than two (2) hours in the morning and two (2) hours in the afternoon.
- The background noise level + 5 dB in areas where the background noise level is greater than 40 dB(A) and where outdoor play **is not limited** to two (2) hours in the morning and two (2) hours in the afternoon.

The assessment location is at the most affected point on or within the residential boundary:

- At 1.5 metres above the ground,
- On a balcony at 1.5 metres above the floor level,
- Outside a window on the ground or higher floors.

5.4.2 Indoor play area, mechanical plant, pick-up and drop-off

Noise that is generated as a result of indoor activities, mechanical plant and equipment, and site pick-up/drop-off zones must not exceed the L_{A90} background noise level by more than 5 dB when assessed at the most affected point within any residential property. Childcare centre noise is assessed as $L_{Aeq\ 15\text{-}minutes}$.

5.4.3 Sleep disturbance

Activity on-site before 7 am or during night hours, such as staff arrivals, cleaning etc must be assessed for potential sleep disturbance impacts on nearby residential receptors. The sleep disturbance assessment criterion adopted by the AAAC is for a L_{Amax} not exceeding the background noise level by more than 15 dB outside the nearest habitable room window.

**Note: In addition to the sleep disturbance guideline provided by the AAAC, reference is also taken from the latest version of the NSW EPA industrial noise guidelines (Noise Policy for Industry – 2017) concerning maximum noise levels and the potential for sleep disturbance (Report Section 5.5).*

5.4.4 Commercial receptors and other sensitive receivers

The noise emitted from the cumulative impact of the childcare centre shall not exceed $L_{Aeq,15min}$ 65 dB when assessed at the most affected point at or within the commercial property boundary.

5.4.5 Noise intrusion from external sources

The development site is not affected by external noise sources meaning this component of the guideline has no relevance in this case.

5.5 EPA NOISE POLICY FOR INDUSTRY – SLEEP DISTURBANCE

The NPfI is provided as a guide to determine suitable project noise objectives when assessing environmental noise impacts associated with scheduled activities prescribed within Schedule 1 of the Protection of the Environment Operations Act 1997. It is also commonly used as a reference tool for establishing suitable planning levels for noise generated by mechanical plant and equipment and noise emissions from commercial operations.

With staff cars likely to arrive before the 7 am centre opening, noise associated with the vehicles entering the car park ramp could potentially generate noise-induced sleep disturbance. The NPfI advises conducting a screening assessment to determine the potential for sleep disturbance. Where the screening levels are exceeded, a detailed maximum noise level assessment should be

completed to review the likelihood of sleep disturbance impacts to nearby residential receivers.

The sleep disturbance screening level adopted in the NPfI is:

- $L_{Aeq\ 15\ mins}$ 40 dB(A) or the prevailing RBL + 5 dB, whichever is the greater, and/or
- L_{Amax} 52 dB(A) or the prevailing RBL + 15 dB, whichever is the greater

5.6 EPA ROAD NOISE POLICY

Traffic generating development such as a child care centre will introduce additional vehicles onto the local road network. The noise that is associated with these additional vehicles forms part of the acoustical assessment of the proposed development.

The EPA RNP recommends that traffic noise levels should not exceed $L_{Aeq,\ 1\text{-}hour}$ 55 dB during daytime hours (7 am to 10 pm) at an assessment location of (one) 1 metre from the façade of an affected residential building and at a height of 1.5 metres above the ground. Outside of daytime hours, the objective becomes $L_{Aeq,\ 1\text{-}hour}$ 50 dB.

5.7 PROJECT NOISE OBJECTIVES

Considering the guidelines presented by the AAAC, Koikas Acoustics finds the following project noise objectives for the development to be appropriate:

Table 4. Noise emission objectives [dB]

Assessment location	Assessment period	Noise objective
Outdoor play (4 hours total only per day)		
Residential receivers	Day [7 am to 6 pm]	$L_{Aeq\ 15\ mins}$ 45
Residential receivers Note 1	Day [7 am to 6 pm]	$L_{Aeq\ 15\ mins}$ 50
Commercial Receivers	Day [7 am to 6 pm]	$L_{Aeq\ 15\ mins}$ 65
Indoor play, car park, mechanical plant		
Residential receivers	Day [7 am to 6 pm]	$L_{Aeq\ 15\ mins}$ 44
Commercial Receivers	Day [7 am to 6 pm]	$L_{Aeq\ 15\ mins}$ 65
Sleep disturbance		
Residential receivers fronting Norfolk Road	Night [6.30 am to 7 am]	$L_{Aeq\ 15\ mins}$ 45 L_{Amax} 55
On-road traffic noise		
Residential receivers fronting Norfolk Road	Day [7 am to 6 pm]	$L_{Aeq\ 1\ hr}$ 55

Note 1: If measured ambient background noise levels were found to be L_{A90} 40 dB during the daytime, the adopted outdoor play criterion is L_{A90} 50 dB. Ambient background noise level may have increased by 1 dB since 2018 when the noise logging was conducted by Acoustic Dynamics.

6.0 NOISE MODEL

The noise predictions are based on computer simulation (CadnaA) of the site and the surrounding area. The program predicts noise levels to receiver points based on source sound power levels, source-receiver distances, the presence of any acoustic shielding objects, and the effects of acoustic absorption of the ground and other elements. Noise propagation calculations follow *ISO 9613 Acoustics – Attenuation of sound during propagation outdoors*. Per the sound propagation algorithms adopted in the ISO standard, the output of the noise model is a downwind sound pressure level which constitutes an assessment of noise-enhancing weather conditions.

The CadnaA model has been used to:

- Predict noise emission from the child care centre outdoor play areas
- Breakout from the indoor play areas
- Vehicular noise from drop-off and pick-up
- Noise levels attributed to vehicles on the car park ramp potentially affect residents' sleep
- On-road vehicle noise emission

7.0 ASSESSMENT OF THE CHILD CARE CENTRE

7.1 NOISE SOURCES

Noise sources associated with the child care centre that must be assessed, include:

- Children occupying the outdoor play area
- Noise breakout from children in the indoor play area
- Noise from vehicles during morning drop-off and afternoon pick-up
- Mechanical plant noise such as air conditioners, basement ventilation fans, kitchen fans
- On-road noise from vehicles arriving and departing during morning and afternoon drop-off/pick-up

It is noted that the system selections for the mechanical plant and equipment are not generally available at the application stage. This noise is more appropriately assessed during the detailed design stage. This report presents the noise limits applying to the equipment only.

Noise levels of children playing are referenced from the AAAC guidelines that present effective sound power levels and associated noise spectra for groups of 10 children in age groups of 0-2 years, 2-3 years, and 3-5 years. Outdoor play noise levels are directly calculated from these sound levels. Indoor play noise levels considered these sound levels as well as a room effect. The room effect presumes that the internal reverberation time within each playroom does not exceed 0.7 seconds.

Vehicle noise includes that attributed to cars travelling up and/or down the car park ramp. Database noise levels from measurements conducted by Koikas Acoustics of vehicles travelling up and down a basement car park ramp are used in the assessment. Traffic generation rates for child care centres are referenced from the *RTA Guide to Traffic Generating Development*, being 0.8 vehicle trips per child between 7 am and 9 am. This equates to 65.6 (rounded up to 66) vehicle trips between 7 am and 9 am, or 8 vehicle trips per 15-minutes. This assessment conservatively allows for up to 10 vehicles to enter and leave the basement in 15 minutes.

Noise attributed to engines starting and car doors opening/closing is expected to be well contained in the basement level of the building, having a negligible impact on neighbours.

Maximum noise levels from cars on the ramp arriving before 7 am are typically 6 dB above the corresponding L_{Aeq} sound power level.

On-road vehicle noise is predicted via the road noise module in CadnaA on the presumption of up to 40 cars arriving or departing during 1-hour. Adopting 40 cars in 1-hour presumes that slightly more than half the peak 2-hour vehicles (66 cars) will arrive/depart in peak hour.

Table 5. Source noise levels [dB]

Noise source	Classification	Noise metric	Noise level
10 children aged 0-2 years playing	Effective sound power level [1]	L_{Aeq}	78
10 children aged 2-3 years playing	Effective sound power level [1]	L_{Aeq}	85
10 children aged 3-5 years playing	Effective sound power level [1]	L_{Aeq}	87
0-2 yrs room noise level	Internal average room noise level[2]	L_{Aeq}	80
2-3 yrs room noise level	Internal average room noise level[2]	L_{Aeq}	85
3-5 yrs room noise level	Internal average room noise level[2]	L_{Aeq}	88
1 car driving down the ramp [3] (10 kph)	Sound power level Sound power level	L_{Aeq} L_{Amax}	77 83
1 car driving up the ramp [3] (10 kph)	Sound power level	L_{Aeq}	82
Car door closing	Sound power level	L_{Amax}	93

Notes:
1. An effective sound power level takes into account the directionality of sound from a source where the source orientation is varying, such as for children in outdoor play areas.
2. Data obtained from AAAC Guidelines and corrected for internal space, and number of children
3. The sound power level of 1 car driving UP/DOWN the ramp is entered into the noise model and corrected for the total number of corresponding vehicle movements in the 15-minute assessment period. The model presumes this as a moving point source.
4. The AAAC advise that a -6 dB adjustment can be made to each age group for children involved in passive play.

The above noise levels were used as a basis to calculate/predict noise emission from the proposed development. The base noise levels from the table are corrected per specific design parameters such as the number of vehicle movements, number of children etc.

For reference, the octave band effective sound power levels for children in outdoor play areas as published within the AAAC guidelines are presented below.

Table 6. Effective sound power levels ($L_{Aeq\ 15\ mins}$) for groups of 10 children playing [dB]

Number and age of children	1/1 octave band centre frequency [Hz]								Total
	63	125	250	500	1000	2000	4000	8000	
Active/free play									
10 children – 0 to 2 years	54	60	66	72	74	71	67	64	78
10 children – 2 to 3 years	61	67	73	79	81	78	74	70	85
10 children – 3 to 5 years	64	70	75	81	83	80	76	72	87

Notes:
1. An effective sound power level takes into account the directionality of sound from a source where the source orientation is varying, such as for children in outdoor play areas.

7.2 PREDICTED RECEIVER LEVELS

Noise emitted from the outdoor play area, indoor playrooms, and the car park was assessed to all surrounding residential receptors previously identified in Section 3.0 of this report. Noise levels are assessed at the most affected point within the property boundary, including upper floor windows.

Sleep disturbance noise levels are assessed outside the nearest affected residential windows. The sleep disturbance noise levels are only relevant for staff arrivals in the morning before 7 am.

On-road traffic noise levels are assessed at 1 metre from the residential façade.

The CadnaA noise model layouts provided as an appendix to this report clearly show the location of all receiver points used to assess noise emitted by the child care centre. On those layouts, 'ground' refers to a point at 1.5 m above ground level and 'first' refers to a point at 1.5 m above the upper floor level and outside a window.

7.2.1 Outdoor play (Scenario 1.1-1.4)

The following assumptions are made for the outdoor play area:

- Staggered use of the outdoor play area. Children aged 0-2 years and 2-3 years are outside for 2 hours (total). During a separate 2 hours (total), the 3-5 years children may use the outdoor play area. 0-3 years and 3-5 years children must not be outside at the same time.
- The outdoor play area must not be occupied for longer than 4 hours (total) per day.
- 1.8 m high solid noise barriers are required along the northern, southern and western residential boundaries.

Table 7. Receptor noise levels – Outdoor play, $L_{Aeq\ 15\ mins}$ [dB]				
Receptor ID	**Receptor description**	**Noise criteria**	**Predicted receiver level**	
			10 children 0-2 yrs 15 children 2-3 yrs (Scenario 1.1)	**10 children 3-5 yrs (free-play) 10 children 3-5 yrs (passive-play) (Scenario 1.2)**
R1	22 Norfolk Road	**45**	32	37
R2	20 Norfolk Road	**45**	34	38
R3	Epping Public School	**65**	32	36
R4	19 Norfolk Road	**45**	28	29
R5	19 Norfolk Road	**45**	35	32
R6	21 Rockleigh Way	**45**	39	38
R7	19 Rockleigh Way	**45**	45	45
R8	24 Chester Street	**45**	38	40
R9	24 Chester Street	**45**	40	43
R10	24 Chester Street	**45**	26	34
Note: 1.	Where receivers are not included in the above table, noise levels are sufficiently low to not be of concern regarding acoustic compliance. The above receivers are those most affected.			

The predicted noise levels for both design options are within $L_{Aeq,15min}$ 45 dB and thus are acceptable per the AAAC guidelines, provided the recommendations in Section 7.3 are implemented.

Table 8. Receptor noise levels – Outdoor play, $L_{Aeq\ 15\ mins}$ [dB]				
Receptor ID	**Receptor description**	**Noise criteria**	**Predicted receiver level**	
			17 children 0-2 yrs 25 children 2-3 yrs (Scenario 1.3)	**20 children 3-5 yrs (free-play) 20 children 3-5 yrs (passive-play) (Scenario 1.4)**
R1	22 Norfolk Road	**50**	30	38
R2	20 Norfolk Road	**50**	34	39
R3	Epping Public School	**65**	32	34
R4	19 Norfolk Road	**50**	29	32
R5	19 Norfolk Road	**50**	37	39
R6	21 Rockleigh Way	**50**	42	44
R7	19 Rockleigh Way	**50**	48	50
R8	24 Chester Street	**50**	43	44
R9	24 Chester Street	**50**	46	47
R10	24 Chester Street	**50**	27	35
Note: 1.	Where receivers are not included in the above table, noise levels are sufficiently low to not be of concern regarding acoustic compliance. The above receivers are those most affected.			

The predicted noise levels for both design options are within $L_{Aeq,15min}$ 50 dB and thus are acceptable per the AAAC guidelines, provided the recommendations in Section 7.3 are implemented.

7.2.2 Indoor play and drop-off/pick-up (Scenario 2)

The second stage of the child care centre assessment is to review potential noise impacts arising from noise breakout with the children indoors and from vehicles during morning drop-off and afternoon pick-up. A provisional mechanical plant noise limit can also be set.

Indoor play noise levels have been calculated individually for each of the three (3) playrooms and are dependent upon the number of children, their age range, and the acoustical condition of the room. The calculated indoor average noise levels in each playroom are:

- Playroom 1 – 17 children aged 0-2 years – $L_{Aeq\ 15\ minutes}$ 80 dB
- Playroom 2 – 27 children aged 2-3 years – $L_{Aeq\ 15\ minutes}$ 85 dB
- Playroom 3 – 40 children aged 3-5 years – $L_{Aeq\ 15\ minutes}$ 88 dB

It is assumed that the doors to the playrooms are closed and the glass is 6.38 mm laminated.

As previously discussed in Section 7.1 of this report, up to 10 vehicles are assumed to enter and leave the basement parking level during any 15 minutes.

The following noise levels are predicted at the nearest residential premises:

Table 8. Receptor noise levels – Indoor play and cars, $L_{Aeq\ 15\ mins}$ [dB]

Receptor ID	Receptor description	Noise criteria	Predicted noise level
R1	22 Norfolk Road	44	38
R2	20 Norfolk Road	44	39
R3	Epping Public School	65	36
R4	19 Norfolk Road	44	25
R5	19 Norfolk Road	44	32
R6	21 Rockleigh Way	44	25
R7	19 Rockleigh Way	44	31
R8	24 Chester Street	44	31
R9	24 Chester Street	44	33
R10	24 Chester Street	44	42

Predicted noise levels are within 5 dB of the background level and thus comply with the project noise criterion.

The design and selection of mechanical plant and equipment must consider the cumulative noise generated by the equipment, the parking area, and noise breakout from indoor play areas. The combined noise level must meet the noise objectives stipulated in this report. Considering the small margin of compliance predicted to neighbours, a detailed acoustical review of mechanical plant noise emission will be critical to ensure adequate noise treatments are specified. This detailed review should be commissioned before construction.

7.2.3 Sleep disturbance (Scenario 3.1 and 3.2)

Staff cars entering the basement parking level are predicted to generate $L_{Aeq\ 15\ minutes}$ noise levels of 29 dB (Scenario 3.1) at the most affected windows of 20 and 22 Norfolk Road and are within the $L_{Aeq\ 15\ minutes}$ 44 dB limit.

L_{Amax} noise levels are predicted to reach 54 dB (Scenario 3.2) outside the windows of 20 and 22 Norfolk Road. This complies with the sleep disturbance screening level of L_{Amax} 55 dB.

Koikas Acoustics also draws attention to the NSW EPA RNP, a planning document that includes an extensive review of sleep disturbance research that was available at the time of its publication. The conclusion reached within the sleep disturbance section of the RNP is that internal L_{Amax} noise levels of 50-55 dB are unlikely to awaken people and 1-2 noise events per night of 65-70 dB are not likely to affect health and well-being significantly.

Considering the predicted external maximum noise level of 54 dB, the corresponding internal noise level assuming open windows is 44 dB. This is within the acceptable level prescribed in the RNP and further supports the position that sleep disturbance is unlikely.

7.2.4 On-road vehicle noise (Scenario 4)

Noise attributed to up to 40 vehicles arriving and departing the centre along Norfolk Road during a 1-hour window is predicted to generate noise levels at the residential facades of neighbours ranging from $L_{Aeq\ 1\text{-}hour}$ 41-50 dB. This is within the $L_{Aeq\ 1\text{-}hour}$ 55 dB allowed under the RNP.

7.3 SUMMARY OF RECOMMENDATIONS – CHILD CARE CENTRE

The assessment has found that noise emissions from the child care centre play areas (outdoor and indoor) and noise generated during drop-off/pick-up will meet the project noise objectives with the following requirements for noise mitigation implemented in the design and operation of the premises:

Outdoor play areas (Option 1) – Existing noise logging data (L_{A90} 39 dB)

- All children must not occupy the outdoor play area at the same time. Use of the outdoor play area must be staggered so that either:
    - 10 children (free-play) aged 0-2 years and 15 children (free-play) aged 2-3 years are outside at any one time.
    - 10 children (free-play) aged 3-5 years and 10 children (passive-play) aged 3-5 years outside at any one time
    - Passive activities include painting, drawing, reading, etc.

Outdoor play areas (Option 2) – *will need unattended noise logging to be reconducted*

- Unattended noise logging will have to be reconducted to confirm whether the existing ambient background noise level is L_{A90} 40 dB or higher. If the ambient background noise level is ≥ L_{A90} 40 dB, the following recommendation may be implemented.
- Occupation of the outdoor play areas must be limited to not more than 4 hours in total per day.
- All children must not occupy the outdoor play area at the same time. Use of the outdoor play area must be staggered so that either:
    - 17 children (free-play) aged 0-2 years and 25 children (free-play) aged 2-3 years are outside for no more than 2 hours (total per day).
    - 20 children (free-play) aged 3-5 years and 20 children (passive-play) aged 3-5 years outside for no more than 2 hours (total per day).
    - Passive activities include painting, drawing, reading, etc.

Covered outdoor play areas

- Install acoustic absorption to the underside of the roof for the covered outdoor play area. Use 38 mm thick Megasorber FM38 or an approved equivalent.

Indoor play areas

- Windows and doors must be closed so that the noise is suitably contained internally.
- Glass windows and doors are to be no less than 6.38 mm laminated glass and fitted with acoustic seals.

Mechanical plant and equipment

- A detailed assessment of mechanical plant noise must be completed before construction.

Noise Management Plan

- A centre Noise Management Plan should be prepared and implemented which outlines :
    - staffing responsibilities in terms of noise control and management of children's activities,
    - outlines the noise management requirements of the development as recommended in this report (such as time limits on outdoor play,
    - the closing of doors and windows),
    - notify all neighbours of the relevant site contact assigned to handling noise complaints,
    - outlines the site-specific complaints handling procedure.

Barrier construction materials

- Unless otherwise specified in this report, noise barriers are to be constructed of either:
    a. Double lapped and capped timber
    b. 9 mm fibre cement sheeting fixed to a suitable framing structure
    c. Masonry (70 mm thick or above)
    d. Transparent materials such as 10.38 mm laminated glass or 15 mm thick Perspex panels
    e. Proprietary noise wall solutions such as SlimWall by Modular Walls or similar
- It is to be noted that gaps between the panels and the posts or the ground will significantly reduce the effectiveness of the noise barrier and may lead to non-compliant noise levels at the adjoining premises. Therefore, all gaps should be minimised.
- The extent of all noise barriers is detailed below in Figure 2.
    a. Lines presented in **PURPLE** show noise barriers of 2.4 m height with a 45° 0.5m cantilever top towards the play area.
    b. Lines presented in **BLUE** show noise barriers of 1.8 m in height.
    c. Lines presented in **RED** show noise barriers of 1.5 m in height.

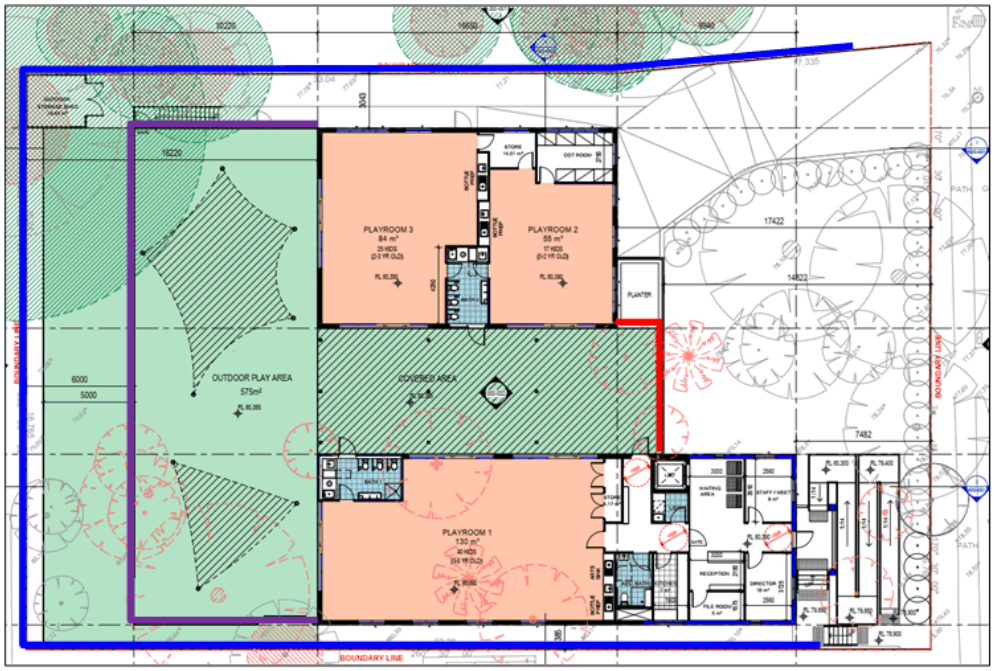


Figure 3. Extent of proposed noise barriers (Source: Architectural Drawings)

8.0 CONCLUSION

This report provides an assessment of noise emission from the proposed child care centre at 21-23 Norfolk Road Epping NSW. The assessment is required to address proposed modifications sought in a Section 4.55 application to City of Parramatta Council.

The basis for the assessment is to ensure that noise amenity is maintained for surrounding premises by applying appropriate noise emission objectives as referenced from standard planning guidelines and as required by the Council under their relevant DCP and LEP provisions.

The noise objectives adopted in this assessment are referenced from the AAAC guidelines for child care centre noise assessment and are supported by additional guidelines proposed by the NSW EPA in their NPfI and RNP. Where noise from the development is found to comply with the project noise objectives it is deemed that an acceptable noise outcome is reached.

The design criterion for this assessment is directly related to the prevailing environmental noise levels. Background levels have been surveyed on-site to determine appropriate noise objectives.

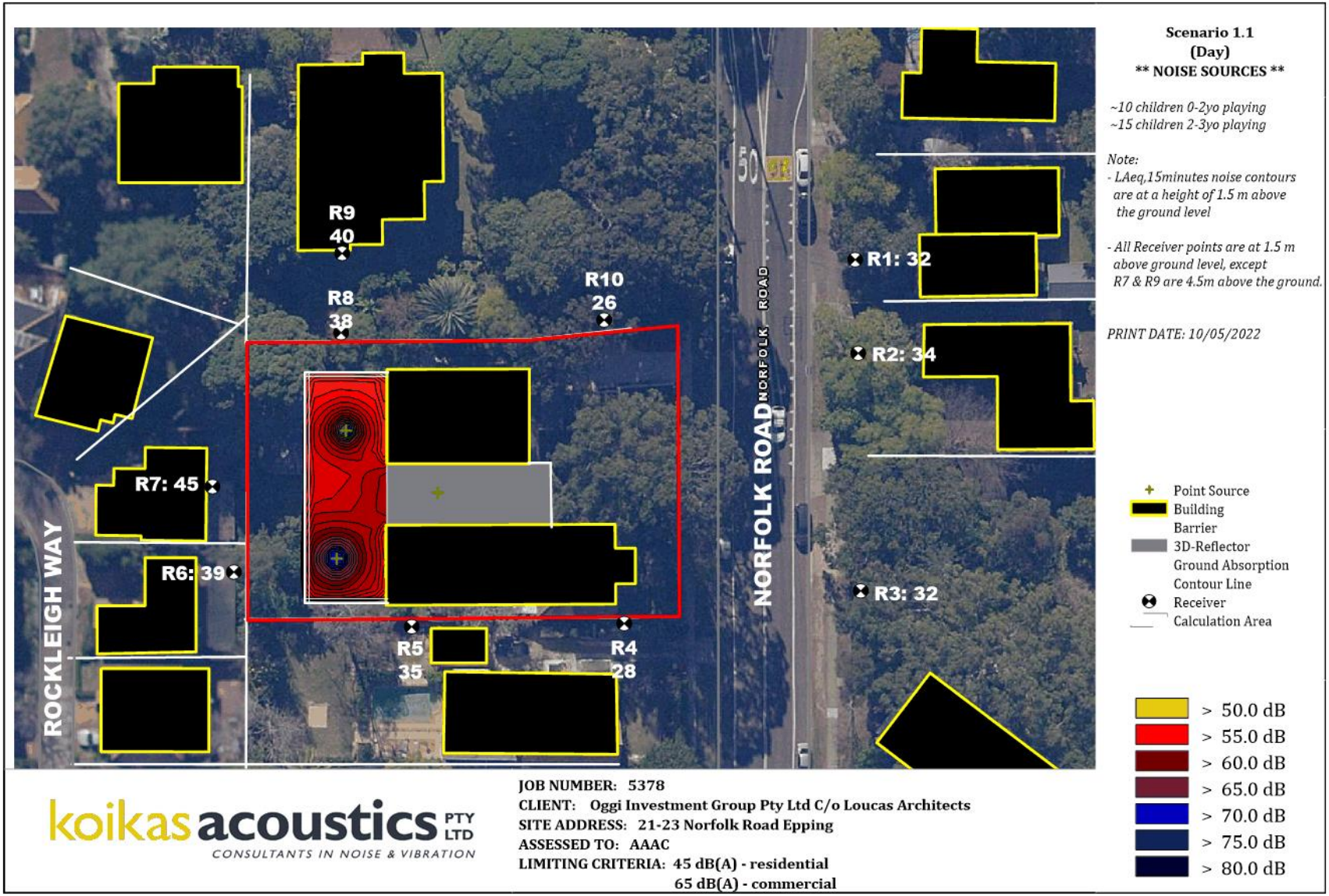
To facilitate the prediction of noise impacts on surrounding receivers, a Cadna/A noise model was prepared. The modelling and subsequent analysis have found that the operation of the child care centre can achieve an acceptable noise outcome for neighbouring residents provided that several noise controls are included within the design and operation of the facility. These recommendations are outlined in detail within the preceding sections of this report.

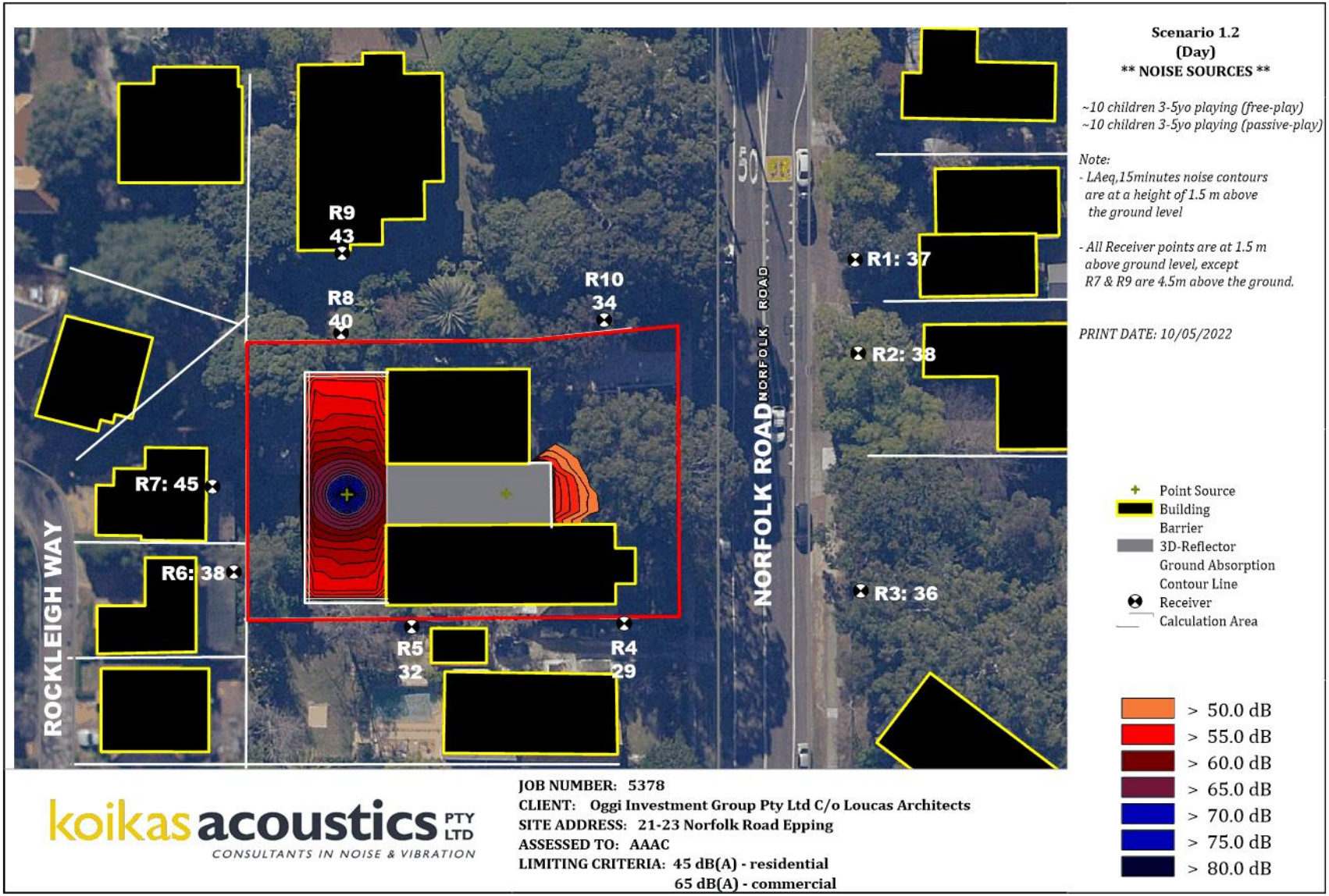
It must be noted that the predictions of this report do not include noise attributed to mechanical plant and equipment, which should be dealt with in a detailed assessment during the design phase of the development. Otherwise, Koikas Acoustics is satisfied that the development as proposed will not result in an unacceptable noise outcome for residential neighbours.

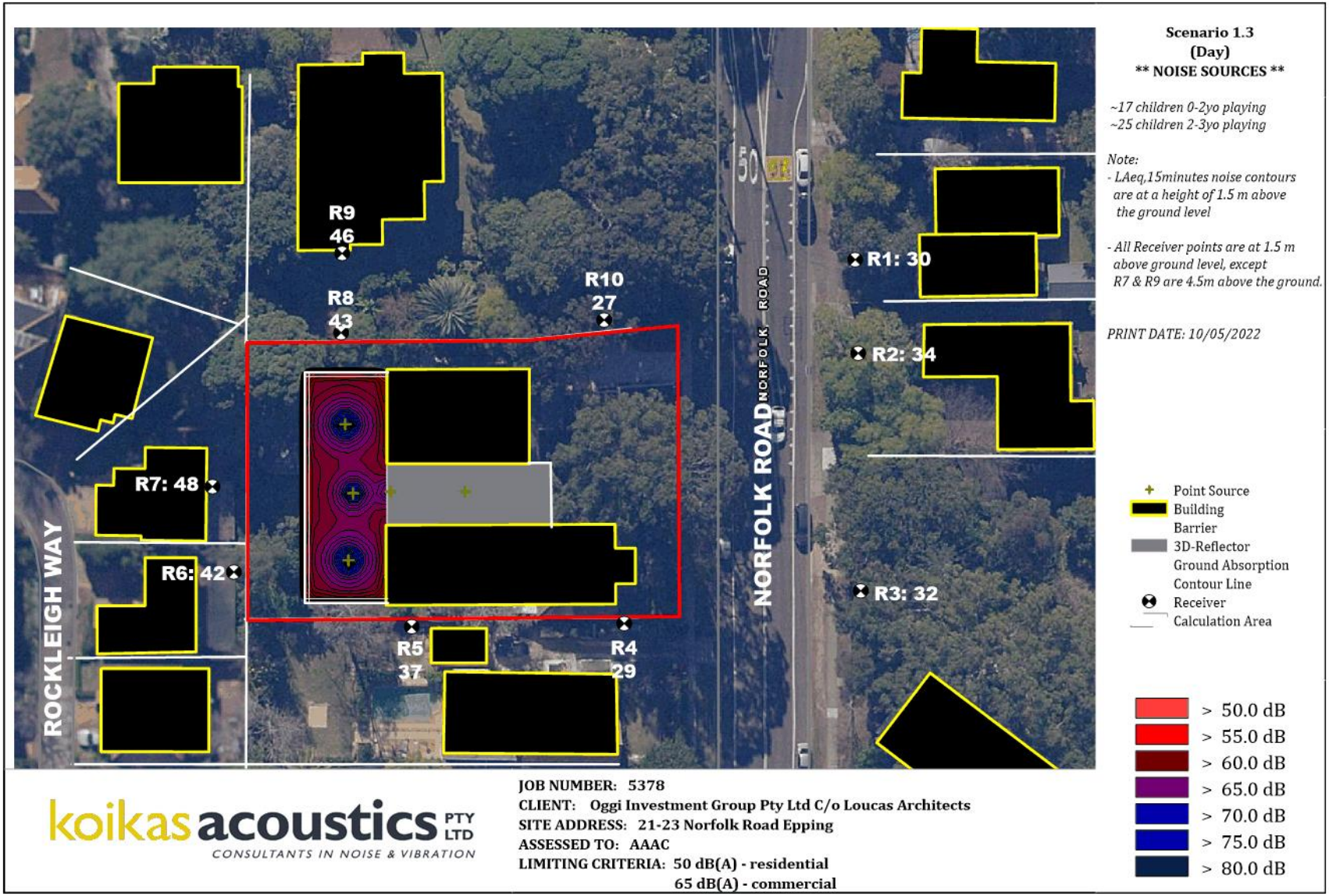
APPENDIX A

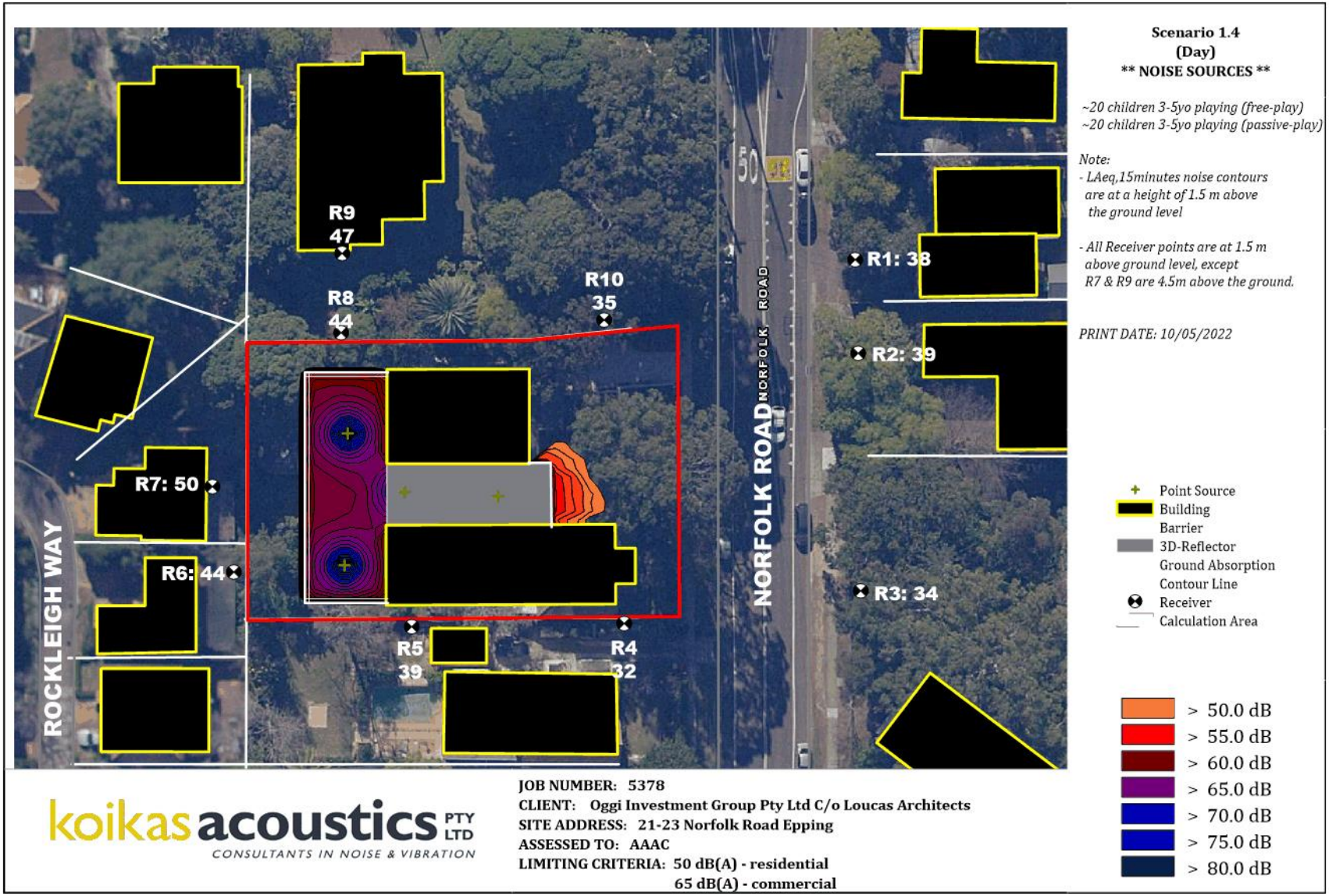
APPENDIX A

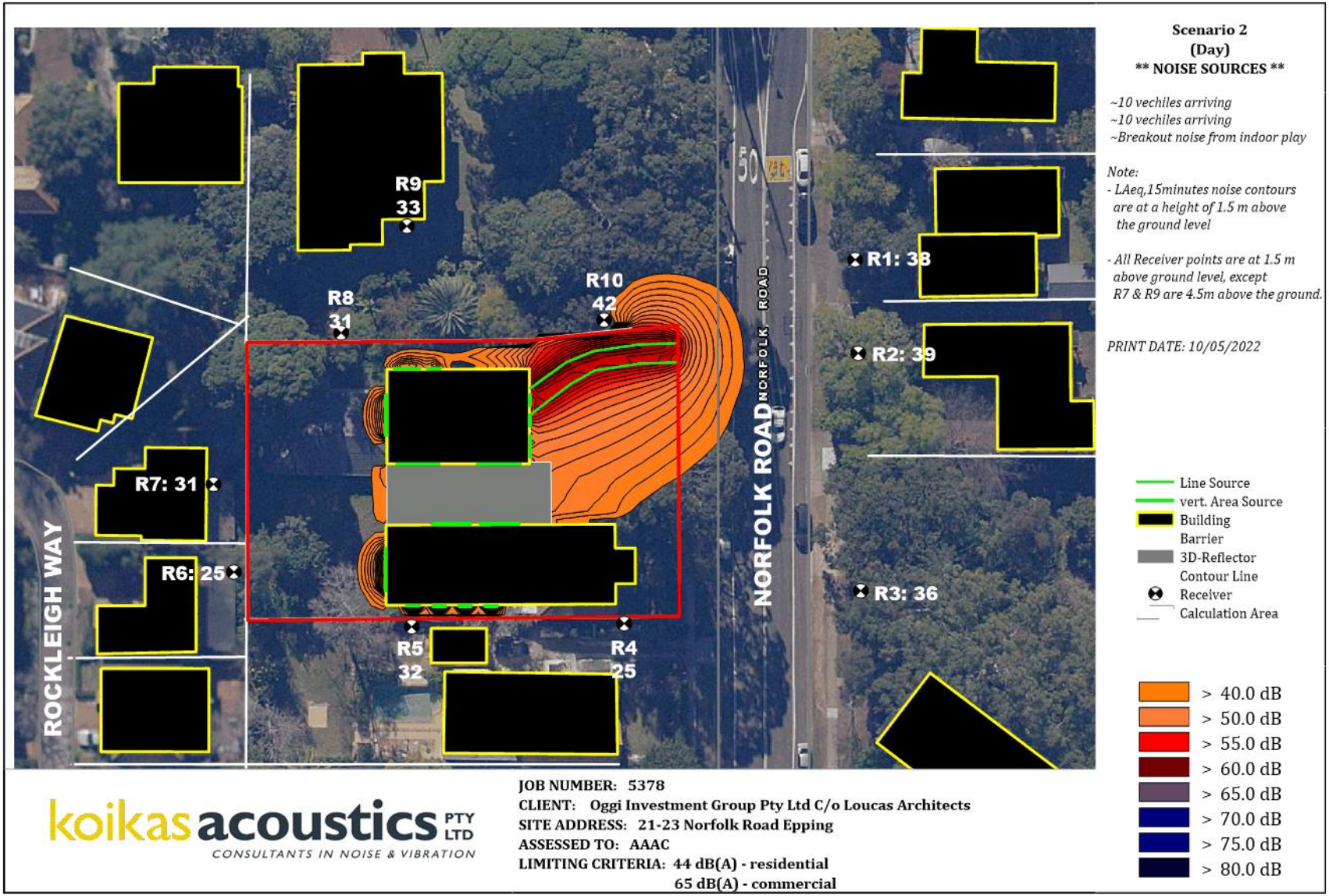
APPENDIX A

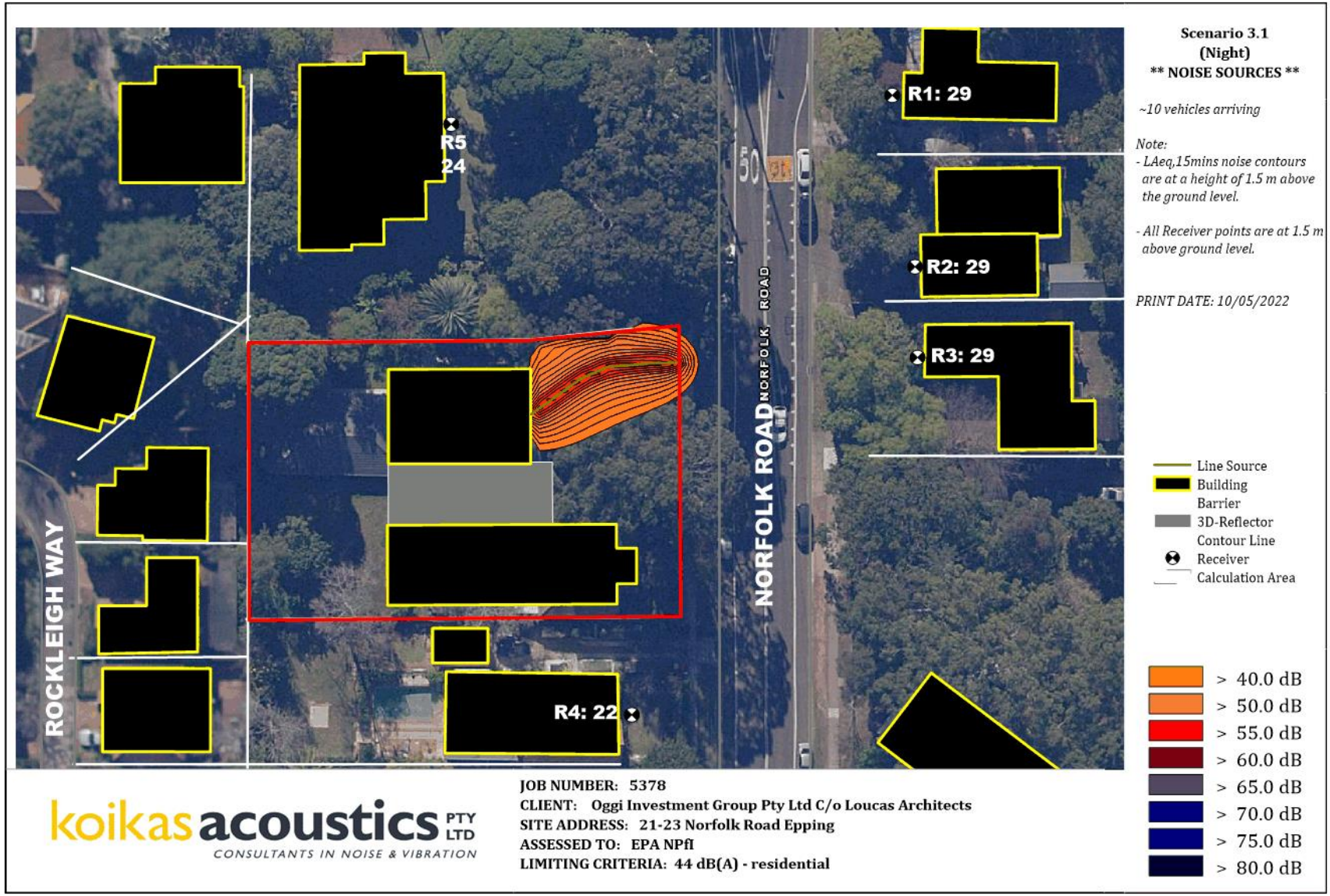

Scenario 1.1
(Day)
** NOISE SOURCES **
~10 children 0-2yo playing
~15 children 2-3yo playing
Note:
- LAeq,15minutes noise contours are at a height of 1.5 m above the ground level
- All Receiver points are at 1.5 m above ground level, except R7 & R9 are 4.5m above the ground.
PRINT DATE: 10/05/2022
R9 40
R10 26
R8 38
R1: 32
R2: 34
R7: 45
R6: 39
R3: 32
R5 35
R4 28
NORFOLK ROAD
ROCKLEIGH WAY
50
Point Source
Building
Barrier
3D-Reflector
Ground Absorption
Contour Line
Receiver
Calculation Area
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION
JOB NUMBER: 5378
CLIENT: Oggi Investment Group Pty Ltd C/o Loucas Architects
SITE ADDRESS: 21-23 Norfolk Road Epping
ASSESSED TO: AAAC
LIMITING CRITERIA: 45 dB(A) - residential
65 dB(A) - commercial

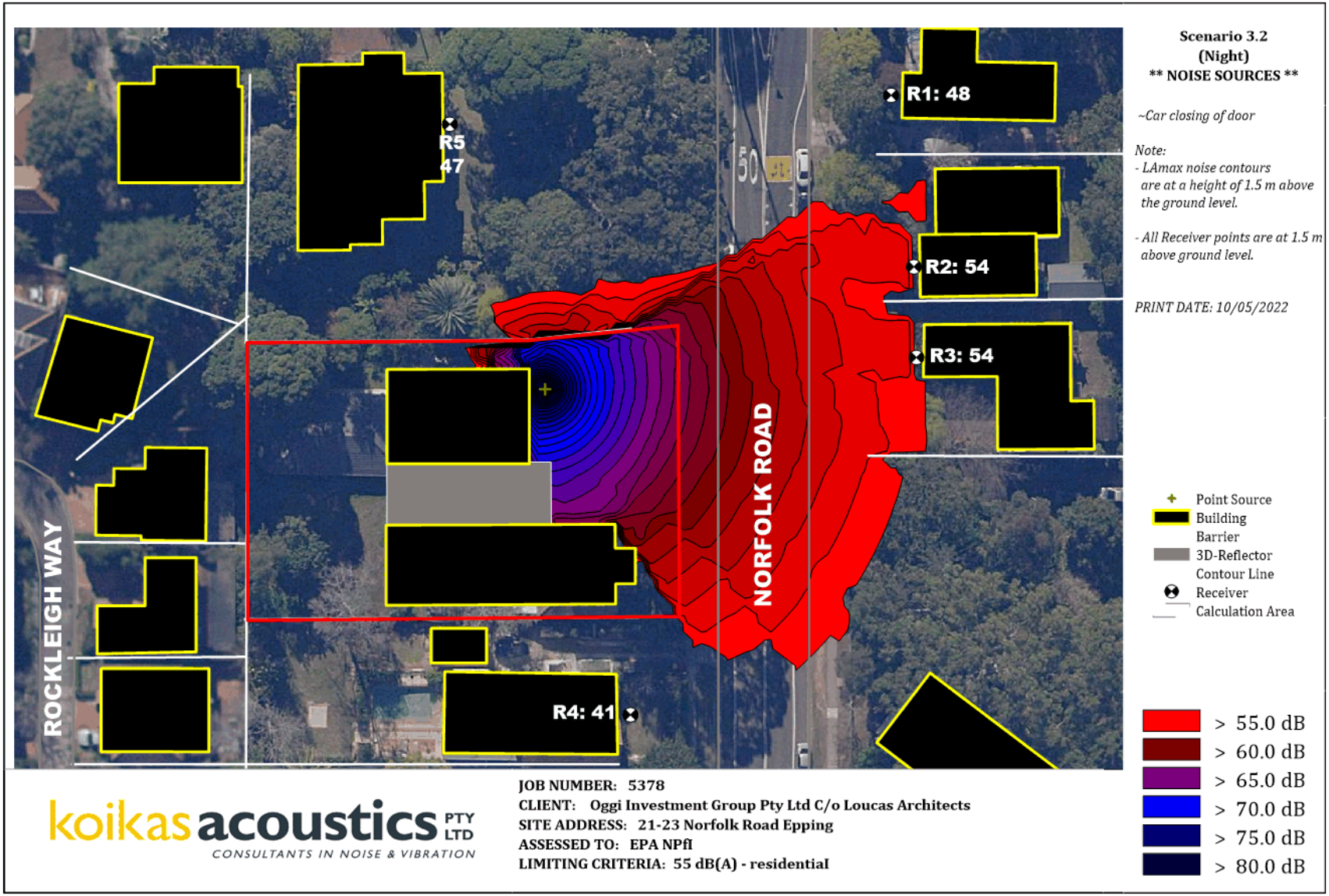

Scenario 1.2
(Day)
** NOISE SOURCES **
~10 children 3-5yo playing (free-play)
~10 children 3-5yo playing (passive-play)
Note:
- LAeq,15minutes noise contours are at a height of 1.5 m above the ground level
- All Receiver points are at 1.5 m above ground level, except R7 & R9 are 4.5m above the ground.
PRINT DATE: 10/05/2022
R9 43
R10 34
R8 40
R1: 37
R2: 38
R3: 36
R4 29
R5 32
R6: 38
R7: 45
NORFOLK ROAD
ROCKLEIGH WAY
Point Source
Building
Barrier
3D-Reflector
Ground Absorption
Contour Line
Receiver
Calculation Area
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION
JOB NUMBER: 5378
CLIENT: Oggi Investment Group Pty Ltd C/o Loucas Architects
SITE ADDRESS: 21-23 Norfolk Road Epping
ASSESSED TO: AAAC
LIMITING CRITERIA: 45 dB(A) - residential
65 dB(A) - commercial

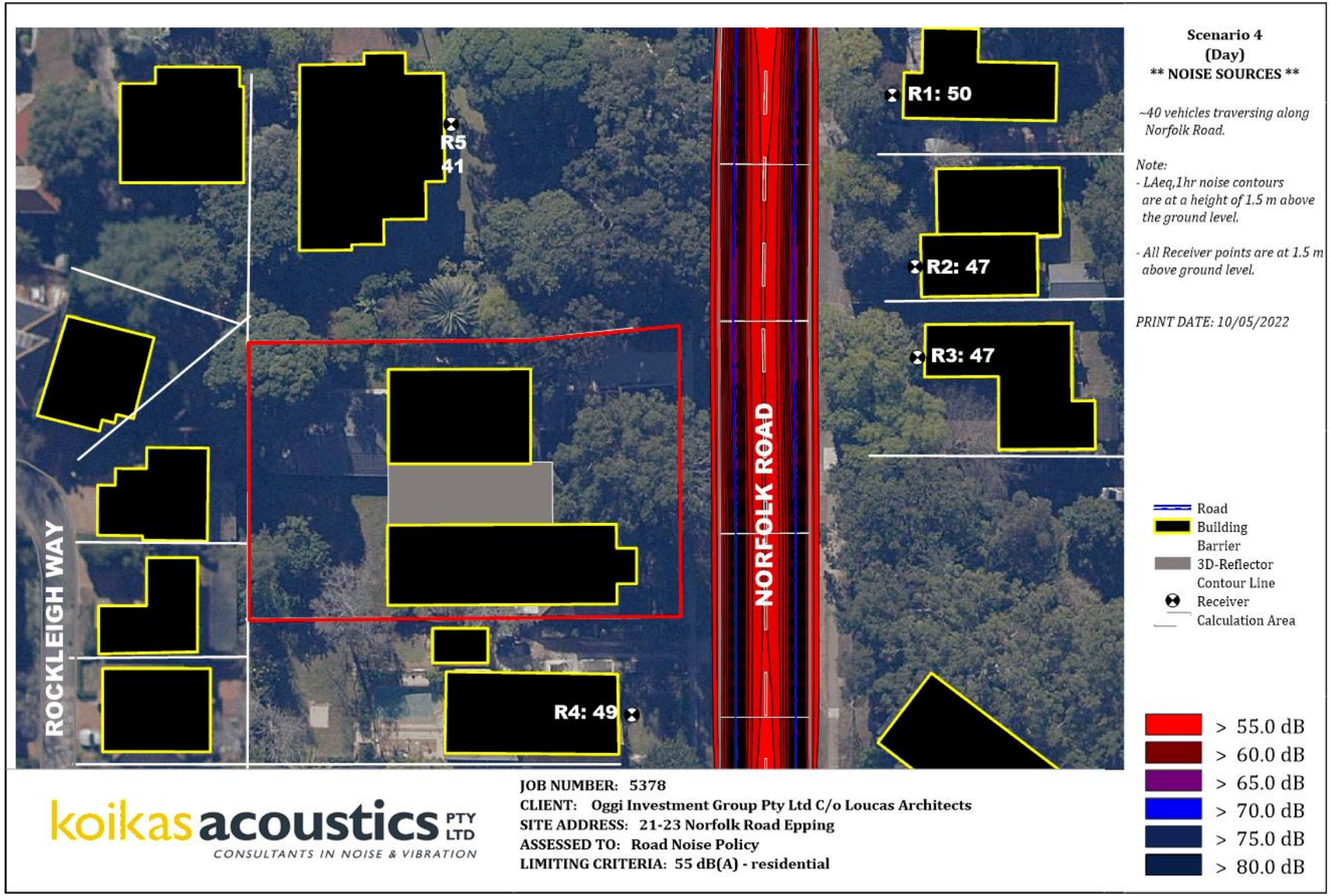

Scenario 1.3
(Day)
** NOISE SOURCES **
~17 children 0-2yo playing
~25 children 2-3yo playing
Note:
- LAeq,15minutes noise contours are at a height of 1.5 m above the ground level
- All Receiver points are at 1.5 m above ground level, except R7 & R9 are 4.5m above the ground.
PRINT DATE: 10/05/2022
R9 46
R10 27
R8 43
R1: 30
R2: 34
R3: 32
R4 29
R5 37
R6: 42
R7: 48
NORFOLK ROAD
ROCKLEIGH WAY
Point Source
Building
Barrier
3D-Reflector
Ground Absorption
Contour Line
Receiver
Calculation Area
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION
JOB NUMBER: 5378
CLIENT: Oggi Investment Group Pty Ltd C/o Loucas Architects
SITE ADDRESS: 21-23 Norfolk Road Epping
ASSESSED TO: AAAC
LIMITING CRITERIA: 50 dB(A) - residential
65 dB(A) - commercial

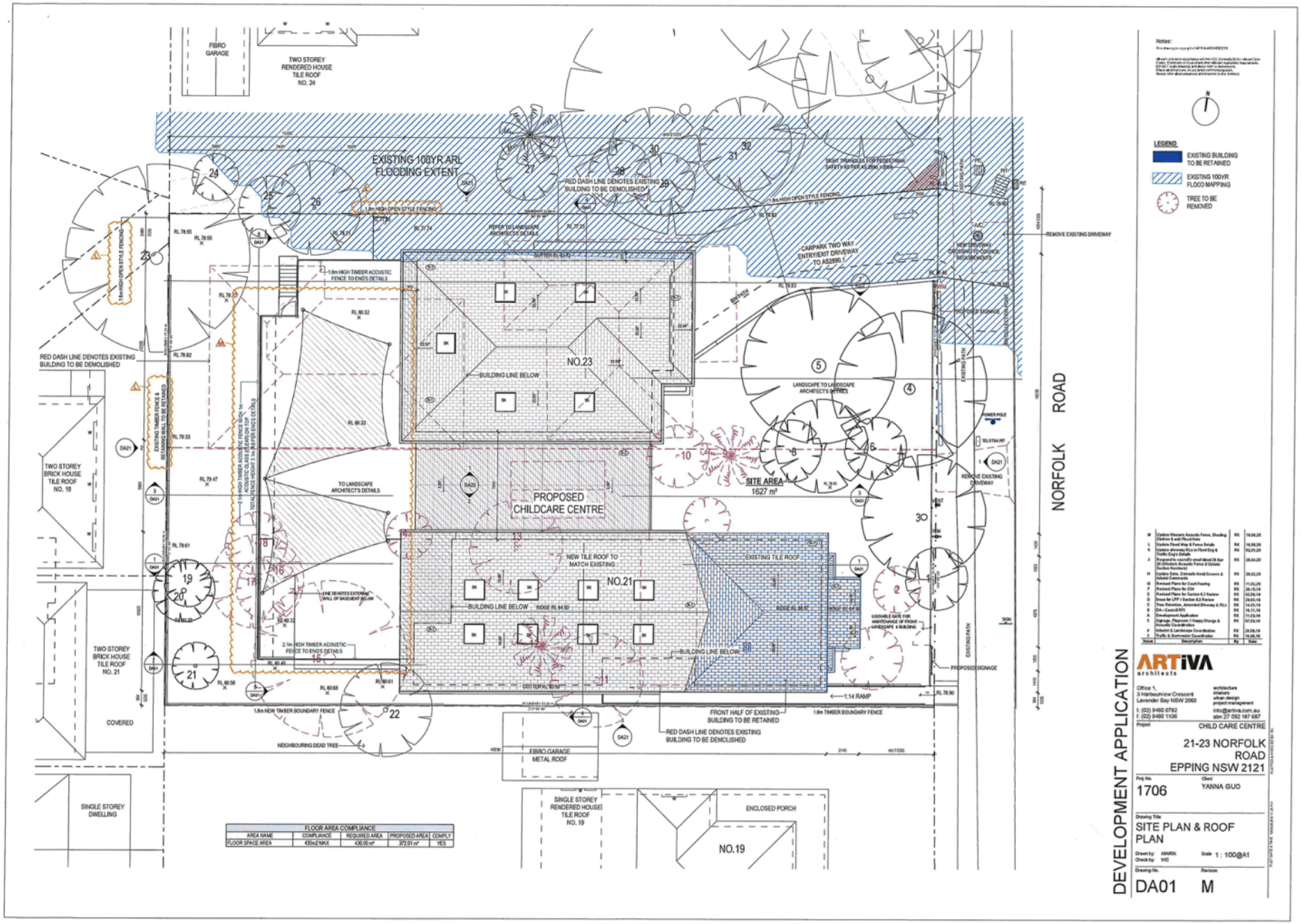

Scenario 1.4
(Day)
** NOISE SOURCES **
~20 children 3-5yo playing (free-play)
~20 children 3-5yo playing (passive-play)
Note:
- LAeq,15minutes noise contours are at a height of 1.5 m above the ground level
- All Receiver points are at 1.5 m above ground level, except R7 & R9 are 4.5m above the ground.
PRINT DATE: 10/05/2022
R9 47
R10 35
R8 44
R1: 38
R2: 39
R3: 34
R4 32
R5 39
R6: 44
R7: 50
NORFOLK ROAD
ROCKLEIGH WAY
Point Source
Building
Barrier
3D-Reflector
Ground Absorption
Contour Line
Receiver
Calculation Area
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION
JOB NUMBER: 5378
CLIENT: Oggi Investment Group Pty Ltd C/o Loucas Architects
SITE ADDRESS: 21-23 Norfolk Road Epping
ASSESSED TO: AAAC
LIMITING CRITERIA: 50 dB(A) - residential
65 dB(A) - commercial


Scenario 2
(Day)
** NOISE SOURCES **
~10 vechiles arriving
~10 vechiles arriving
~Breakout noise from indoor play
Note:
- LAeq,15minutes noise contours are at a height of 1.5 m above the ground level
- All Receiver points are at 1.5 m above ground level, except R7 & R9 are 4.5m above the ground.
PRINT DATE: 10/05/2022
R9 33
R10 42
R8 31
R1: 38
R2: 39
R7: 31
R6: 25
R3: 36
R5 32
R4 25
NORFOLK ROAD
ROCKLEIGH WAY
Line Source
vert. Area Source
Building
Barrier
3D-Reflector
Contour Line
Receiver
Calculation Area
> 40.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION
JOB NUMBER: 5378
CLIENT: Oggi Investment Group Pty Ltd C/o Loucas Architects
SITE ADDRESS: 21-23 Norfolk Road Epping
ASSESSED TO: AAAC
LIMITING CRITERIA: 44 dB(A) - residential
65 dB(A) - commercial


Scenario 3.1
(Night)
** NOISE SOURCES **
~10 vehicles arriving
Note:
- LAeq,15mins noise contours are at a height of 1.5 m above the ground level.
- All Receiver points are at 1.5 m above ground level.
PRINT DATE: 10/05/2022
R1: 29
R2: 29
R3: 29
R4: 22
R5
24
NORFOLK ROAD
ROCKLEIGH WAY
Line Source
Building
Barrier
3D-Reflector
Contour Line
Receiver
Calculation Area
> 40.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION
JOB NUMBER: 5378
CLIENT: Oggi Investment Group Pty Ltd C/o Loucas Architects
SITE ADDRESS: 21-23 Norfolk Road Epping
ASSESSED TO: EPA NPfI
LIMITING CRITERIA: 44 dB(A) - residential


Scenario 3.2
(Night)
** NOISE SOURCES **
~Car closing of door
Note:
- LAmax noise contours are at a height of 1.5 m above the ground level.
- All Receiver points are at 1.5 m above ground level.
PRINT DATE: 10/05/2022
R1: 48
R2: 54
R3: 54
R4: 41
R5 47
NORFOLK ROAD
ROCKLEIGH WAY
Point Source
Building
Barrier
3D-Reflector
Contour Line
Receiver
Calculation Area
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION
JOB NUMBER: 5378
CLIENT: Oggi Investment Group Pty Ltd C/o Loucas Architects
SITE ADDRESS: 21-23 Norfolk Road Epping
ASSESSED TO: EPA NPfI
LIMITING CRITERIA: 55 dB(A) - residential


Scenario 4
(Day)
** NOISE SOURCES **
~40 vehicles traversing along Norfolk Road.
Note:
- LAeq,1hr noise contours are at a height of 1.5 m above the ground level.
- All Receiver points are at 1.5 m above ground level.
PRINT DATE: 10/05/2022
R1: 50
R2: 47
R3: 47
R4: 49
R5
41
NORFOLK ROAD
ROCKLEIGH WAY
Road
Building
Barrier
3D-Reflector
Contour Line
Receiver
Calculation Area
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION
JOB NUMBER: 5378
CLIENT: Oggi Investment Group Pty Ltd C/o Loucas Architects
SITE ADDRESS: 21-23 Norfolk Road Epping
ASSESSED TO: Road Noise Policy
LIMITING CRITERIA: 55 dB(A) - residential


FIBRO GARAGE
TWO STOREY RENDERED HOUSE TILE ROOF NO. 24
EXISTING 100YR ARL FLOODING EXTENT
RED DASH LINE DENOTES EXISTING BUILDING TO BE DEMOLISHED
1.8m HIGH OPEN STYLE FENCING
REFER TO LANDSCAPE ARCHITECTS DETAILS
CARPARK TWO WAY ENTRY/EXIT DRIVEWAY TO AS2890.1
REMOVE EXISTING DRIVEWAY
NEW DRIVEWAY CROSSING TO COUNCIL REQUIREMENTS
PROPOSED SIGNAGE
1.8m HIGH TIMBER ACOUSTIC FENCE TO ENDS DETAILS
NO.23
BUILDING LINE BELOW
LANDSCAPE TO LANDSCAPE ARCHITECTS DETAILS
EXISTING PATH
POWER POLE
TELSTRA PIT
REMOVE EXISTING DRIVEWAY
TWO STOREY BRICK HOUSE TILE ROOF NO. 19
TO LANDSCAPE ARCHITECTS DETAILS
PROPOSED CHILDCARE CENTRE
SITE AREA 1627 m²
NEW TILE ROOF TO MATCH EXISTING
EXISTING TILE ROOF
NO.21
RIDGE RL 84.50
RIDGE RL 84.97
LOCKABLE GATE FOR MAINTENANCE OF FRONT LANDSCAPE & BUILDING
SIGN
TWO STOREY BRICK HOUSE TILE ROOF NO. 21
COVERED
1.8m NEW TIMBER BOUNDARY FENCE
1:14 RAMP
FRONT HALF OF EXISTING BUILDING TO BE RETAINED
1.8m TIMBER BOUNDARY FENCE
NEIGHBOURING DEAD TREE
FIBRO GARAGE METAL ROOF
SINGLE STOREY DWELLING
SINGLE STOREY RENDERED HOUSE TILE ROOF NO. 19
ENCLOSED PORCH
NO.19
NORFOLK ROAD
FLOOR AREA COMPLIANCE
AREA NAME | COMPLIANCE | REQUIRED AREA | PROPOSED AREA | COMPLY
FLOOR SPACE AREA | 430m2 MAX | 430.00 m² | 372.01 m² | YES
Notes:
LEGEND
EXISTING BUILDING TO BE RETAINED
EXISTING 100YR FLOOD MAPPING
TREE TO BE REMOVED
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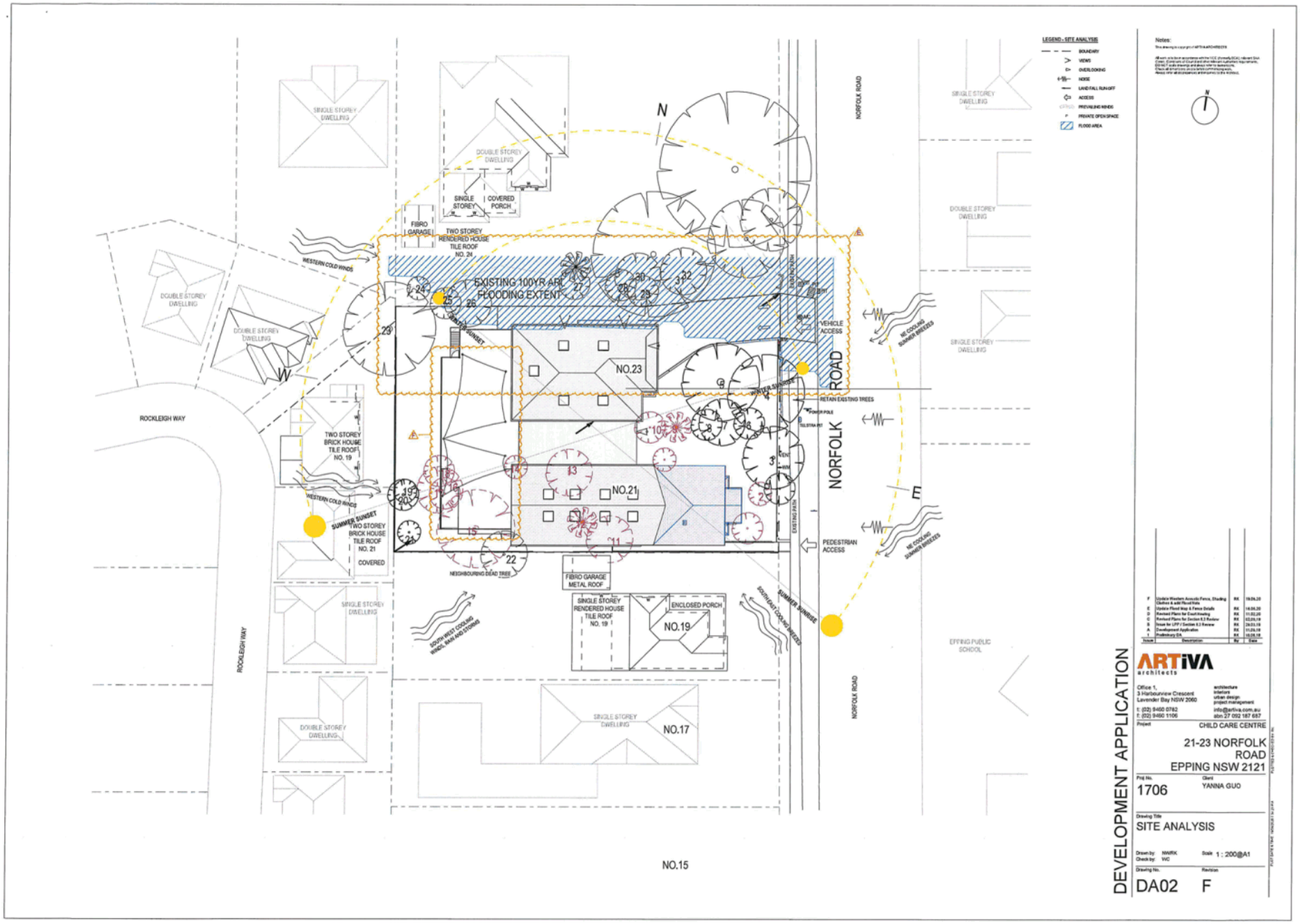
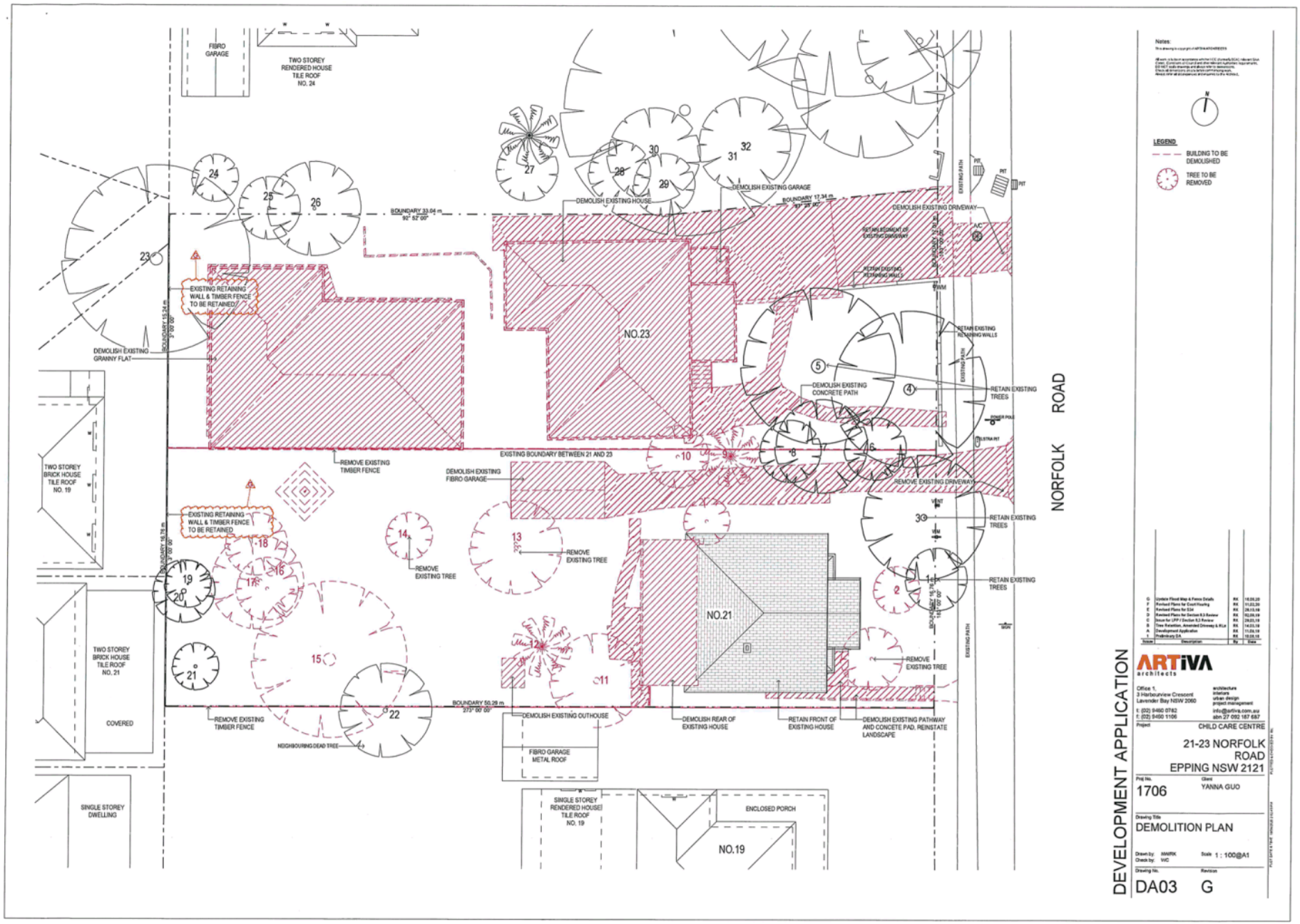
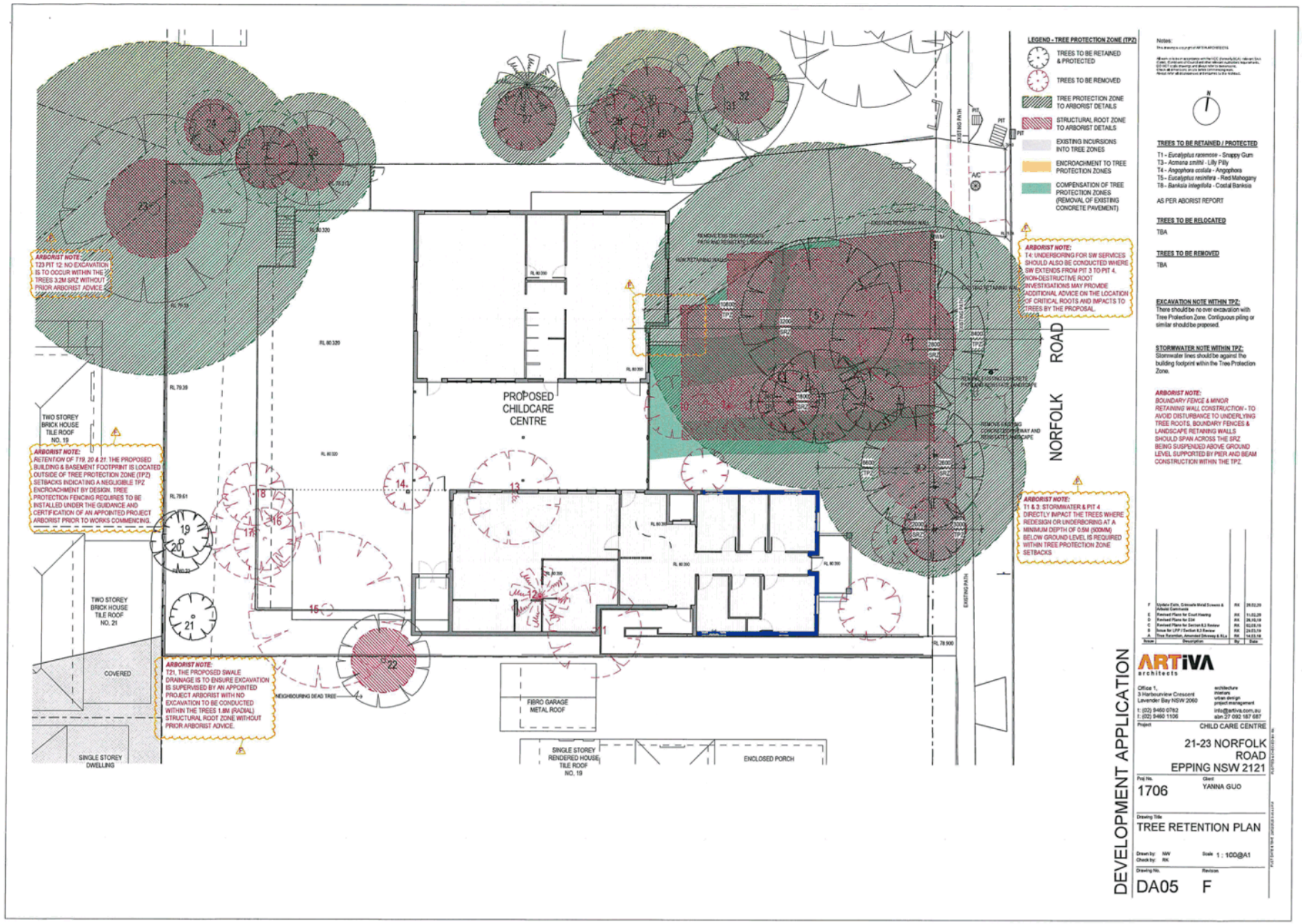
Project
CHILD CARE CENTRE
21-23 NORFOLK ROAD EPPING NSW 2121
Proj No. 1706
Client YANNA GUO
Drawing Title
SITE PLAN & ROOF PLAN
Drawn by: NWRK Check by: WC
Scale 1 : 100@A1
Drawing No. DA01
Revision M
DEVELOPMENT APPLICATION


N
NORFOLK ROAD
NO.23
NO.21
NO.19
NO.17
NO.15
EXISTING 100YR ARI FLOODING EXTENT
TWO STOREY RENDERED HOUSE TILE ROOF NO. 24
FIBRO GARAGE
SINGLE STOREY
COVERED PORCH
VEHICLE ACCESS
RETAIN EXISTING TREES
PEDESTRIAN ACCESS
EXISTING PATH
TWO STOREY BRICK HOUSE TILE ROOF NO. 19
TWO STOREY BRICK HOUSE TILE ROOF NO. 21
COVERED
NEIGHBOURING DEAD TREE
FIBRO GARAGE METAL ROOF
SINGLE STOREY RENDERED HOUSE TILE ROOF NO. 19
ENCLOSED PORCH
ROCKLEIGH WAY
SINGLE STOREY DWELLING
DOUBLE STOREY DWELLING
EPPING PUBLIC SCHOOL
WESTERN COLD WINDS
SUMMER SUNSET
SUMMER SUNRISE
NE COOLING SUMMER BREEZES
SOUTH WEST COOLING WINDS, RAIN AND STORMS
SOUTH EAST COOLING BREEZES
LEGEND - SITE ANALYSIS
BOUNDARY
VIEWS
OVERLOOKING
NOISE
LAND FALL RUN-OFF
ACCESS
PREVAILING WINDS
PRIVATE OPEN SPACE
FLOOD AREA
DEVELOPMENT APPLICATION
ARTiVA architects
CHILD CARE CENTRE
21-23 NORFOLK ROAD
EPPING NSW 2121
Proj No. 1706
Client YANNA GUO
Drawing Title SITE ANALYSIS
Drawn by: NWRK
Check by: WC
Scale 1 : 200@A1
Drawing No. DA02
Revision F


FIBRO GARAGE
TWO STOREY RENDERED HOUSE TILE ROOF NO. 24
NO.23
NO.21
NO.19
NORFOLK ROAD
DEMOLISH EXISTING HOUSE
DEMOLISH EXISTING GARAGE
DEMOLISH EXISTING DRIVEWAY
RETAIN SEGMENT OF EXISTING DRIVEWAY
RETAIN EXISTING RETAINING WALL
EXISTING RETAINING WALL & TIMBER FENCE TO BE RETAINED
DEMOLISH EXISTING GRANNY FLAT
DEMOLISH EXISTING CONCRETE PATH
RETAIN EXISTING TREES
REMOVE EXISTING TIMBER FENCE
EXISTING BOUNDARY BETWEEN 21 AND 23
DEMOLISH EXISTING FIBRO GARAGE
REMOVE EXISTING DRIVEWAY
REMOVE EXISTING TREE
TWO STOREY BRICK HOUSE TILE ROOF NO. 19
TWO STOREY BRICK HOUSE TILE ROOF NO. 21
COVERED
SINGLE STOREY DWELLING
NEIGHBOURING DEAD TREE
DEMOLISH EXISTING OUTHOUSE
FIBRO GARAGE METAL ROOF
DEMOLISH REAR OF EXISTING HOUSE
RETAIN FRONT OF EXISTING HOUSE
DEMOLISH EXISTING PATHWAY AND CONCETE PAD, REINSTATE LANDSCAPE
SINGLE STOREY RENDERED HOUSE TILE ROOF NO. 19
ENCLOSED PORCH
LEGEND
BUILDING TO BE DEMOLISHED
TREE TO BE REMOVED
DEVELOPMENT APPLICATION
ARTiVA architects
21-23 NORFOLK ROAD EPPING NSW 2121
CHILD CARE CENTRE
1706
YANNA GUO
DEMOLITION PLAN
DA03 G


LEGEND - TREE PROTECTION ZONE (TPZ)
TREES TO BE RETAINED & PROTECTED
TREES TO BE REMOVED
TREE PROTECTION ZONE TO ARBORIST DETAILS
STRUCTURAL ROOT ZONE TO ARBORIST DETAILS
EXISTING INCURSIONS INTO TREE ZONES
ENCROACHMENT TO TREE PROTECTION ZONES
COMPENSATION OF TREE PROTECTION ZONES (REMOVAL OF EXISTING CONCRETE PAVEMENT)
PROPOSED CHILDCARE CENTRE
NORFOLK ROAD
ARBORIST NOTE: T23 PIT 12. NO EXCAVATION IS TO OCCUR WITHIN THE TREES 3.2M SRZ WITHOUT PRIOR ARBORIST ADVICE
ARBORIST NOTE: RETENTION OF T19, 20 & 21. THE PROPOSED BUILDING & BASEMENT FOOTPRINT IS LOCATED OUTSIDE OF TREE PROTECTION ZONE (TPZ) SETBACKS INDICATING A NEGLIGIBLE TPZ ENCROACHMENT BY DESIGN. TREE PROTECTION FENCING REQUIRES TO BE INSTALLED UNDER THE GUIDANCE AND CERTIFICATION OF AN APPOINTED PROJECT ARBORIST PRIOR TO WORKS COMMENCING.
ARBORIST NOTE: T21, THE PROPOSED SWALE DRAINAGE IS TO ENSURE EXCAVATION IS SUPERVISED BY AN APPOINTED PROJECT ARBORIST WITH NO EXCAVATION TO BE CONDUCTED WITHIN THE TREES 1.8M (RADIAL) STRUCTURAL ROOT ZONE WITHOUT PRIOR ARBORIST ADVICE.
ARBORIST NOTE: T4: UNDERBORING FOR SW SERVICES SHOULD ALSO BE CONDUCTED WHERE SW EXTENDS FROM PIT 3 TO PIT 4. NON-DESTRUCTIVE ROOT INVESTIGATIONS MAY PROVIDE ADDITIONAL ADVICE ON THE LOCATION OF CRITICAL ROOTS AND IMPACTS TO TREES BY THE PROPOSAL.
ARBORIST NOTE: T1 & 3: STORMWATER & PIT 4 DIRECTLY IMPACT THE TREES WHERE REDESIGN OR UNDERBORING AT A MINIMUM DEPTH OF 0.6M (600MM) BELOW GROUND LEVEL IS REQUIRED WITHIN TREE PROTECTION ZONE SETBACKS
TWO STOREY BRICK HOUSE TILE ROOF NO. 19
TWO STOREY BRICK HOUSE TILE ROOF NO. 21
COVERED
SINGLE STOREY DWELLING
NEIGHBOURING DEAD TREE
FIBRO GARAGE METAL ROOF
SINGLE STOREY RENDERED HOUSE TILE ROOF NO. 19
ENCLOSED PORCH
EXISTING PATH
Notes:
TREES TO BE RETAINED / PROTECTED
T1 - Eucalyptus racemosa - Snappy Gum
T3 - Acmena smithii - Lilly Pilly
T4 - Angophora costata - Angophora
T5 - Eucalyptus resinifera - Red Mahogany
T8 - Banksia integrifolia - Coastal Banksia
AS PER ABORIST REPORT
TREES TO BE RELOCATED
TBA
TREES TO BE REMOVED
TBA
EXCAVATION NOTE WITHIN TPZ:
There should be no over excavation with Tree Protection Zone. Contiguous piling or similar should be proposed.
STORMWATER NOTE WITHIN TPZ:
Stormwater lines should be against the building footprint within the Tree Protection Zone.
ARBORIST NOTE:
BOUNDARY FENCE & MINOR RETAINING WALL CONSTRUCTION - TO AVOID DISTURBANCE TO UNDERLYING TREE ROOTS, BOUNDARY FENCES & LANDSCAPE RETAINING WALLS SHOULD SPAN ACROSS THE SRZ BEING SUSPENDED ABOVE GROUND LEVEL SUPPORTED BY PIER AND BEAM CONSTRUCTION WITHIN THE TPZ.
DEVELOPMENT APPLICATION
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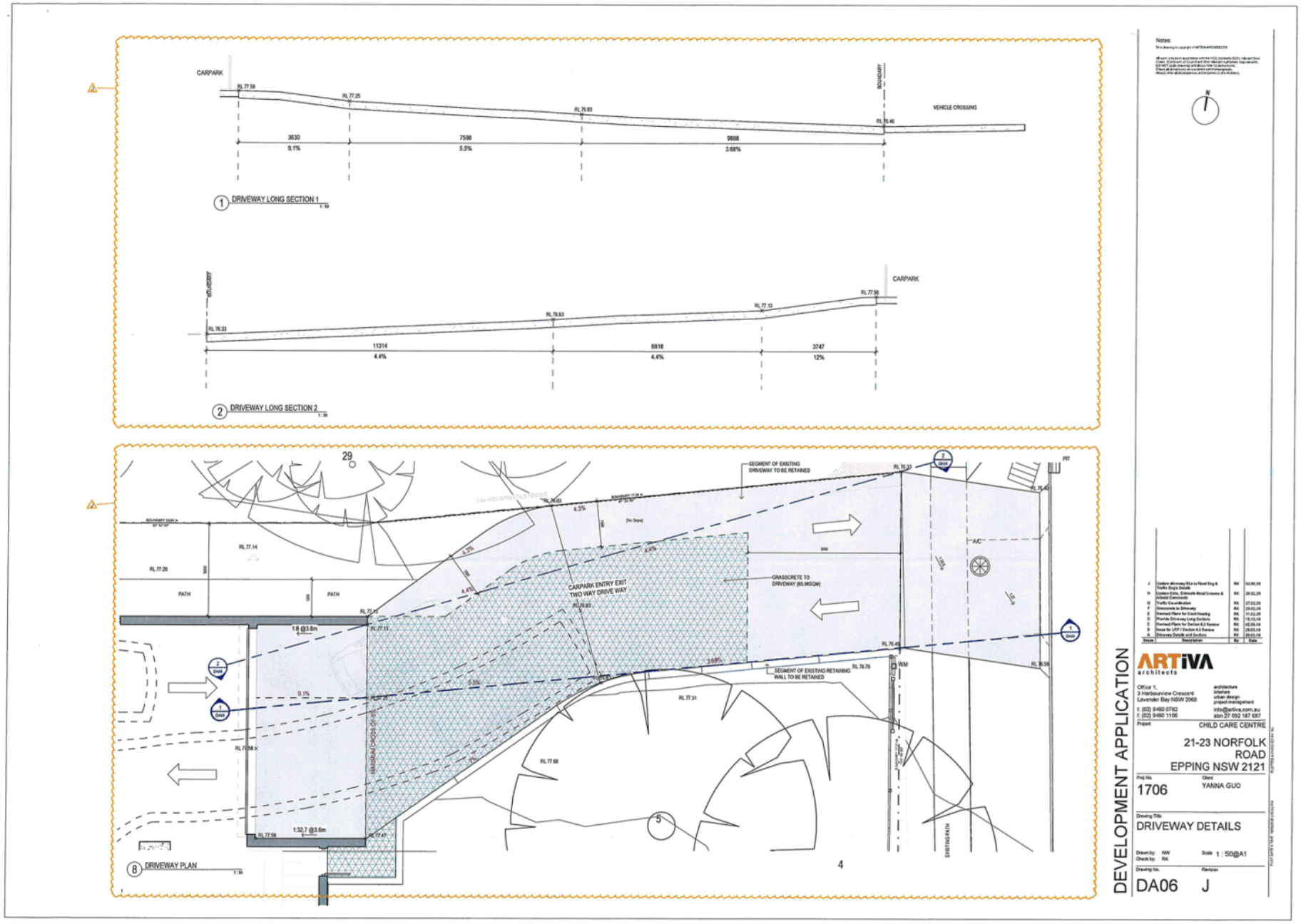
Project
CHILD CARE CENTRE
21-23 NORFOLK ROAD
EPPING NSW 2121
Proj No.
1706
Client
YANNA GUO
Drawing Title
TREE RETENTION PLAN
Drawn by: NW
Check by: RK
Scale 1 : 100@A1
Drawing No.
DA05
Revision
F


CARPARK
VEHICLE CROSSING
BOUNDARY
RL 77.58
RL 77.25
RL 76.83
RL 76.46
3630
9.1%
7598
5.5%
9668
3.66%
1 DRIVEWAY LONG SECTION 1
1:50
BOUNDARY
CARPARK
RL 76.33
RL 76.83
RL 77.13
RL 77.58
11314
4.4%
6818
4.4%
3747
12%
2 DRIVEWAY LONG SECTION 2
1:50
29
SEGMENT OF EXISTING DRIVEWAY TO BE RETAINED
CARPARK ENTRY EXIT TWO WAY DRIVE WAY
GRASSCRETE TO DRIVEWAY (65.985QM)
SEGMENT OF EXISTING RETAINING WALL TO BE RETAINED
PATH
PATH
A/C
WM
PIT
EXISTING PATH
1:8 @3.6m
1:32.7 @3.6m
8 DRIVEWAY PLAN
1:50
4
5
Notes:
DEVELOPMENT APPLICATION
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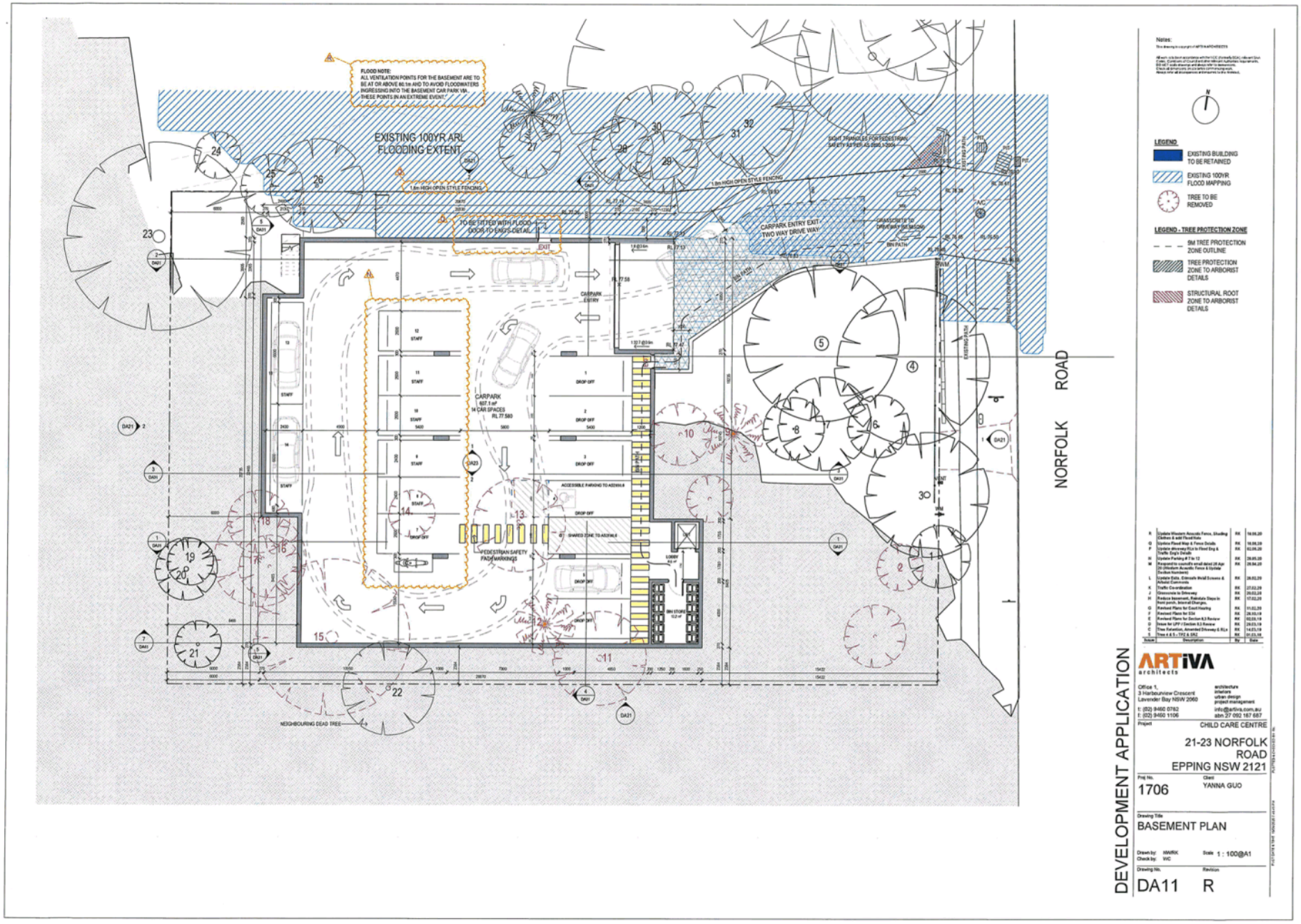
Project
CHILD CARE CENTRE
21-23 NORFOLK ROAD
EPPING NSW 2121
Proj No.
1706
Client
YANNA GUO
Drawing Title
DRIVEWAY DETAILS
Drawn by: NW
Check by: RK
Scale 1 : 50@A1
Drawing No.
DA06
Revision
J


FLOOD NOTE:
ALL VENTILATION POINTS FOR THE BASEMENT ARE TO BE AT OR ABOVE 80.1m AHD TO AVOID FLOODWATERS INGRESSING INTO THE BASEMENT CAR PARK VIA THESE POINTS IN AN EXTREME EVENT.
EXISTING 100YR ARI FLOODING EXTENT
1.8m HIGH OPEN STYLE FENCING
TO BE FITTED WITH FLOOD DOORS TO ENGS DETAIL
EXIT
CARPARK ENTRY EXIT - TWO WAY DRIVE WAY
CARPARK ENTRY
CARPARK
607.1 m²
14 CAR SPACES
RL 77.580
PEDESTRIAN SAFETY PAINT MARKINGS
SHARED ZONE TO AS2890.6
ACCESSIBLE PARKING TO AS2890.6
LOBBY
BIN STORE
112 m²
NEIGHBOURING DEAD TREE
NORFOLK ROAD
LEGEND
EXISTING BUILDING TO BE RETAINED
EXISTING 100YR FLOOD MAPPING
TREE TO BE REMOVED
LEGEND - TREE PROTECTION ZONE
9M TREE PROTECTION ZONE OUTLINE
TREE PROTECTION ZONE TO ARBORIST DETAILS
STRUCTURAL ROOT ZONE TO ARBORIST DETAILS
DEVELOPMENT APPLICATION
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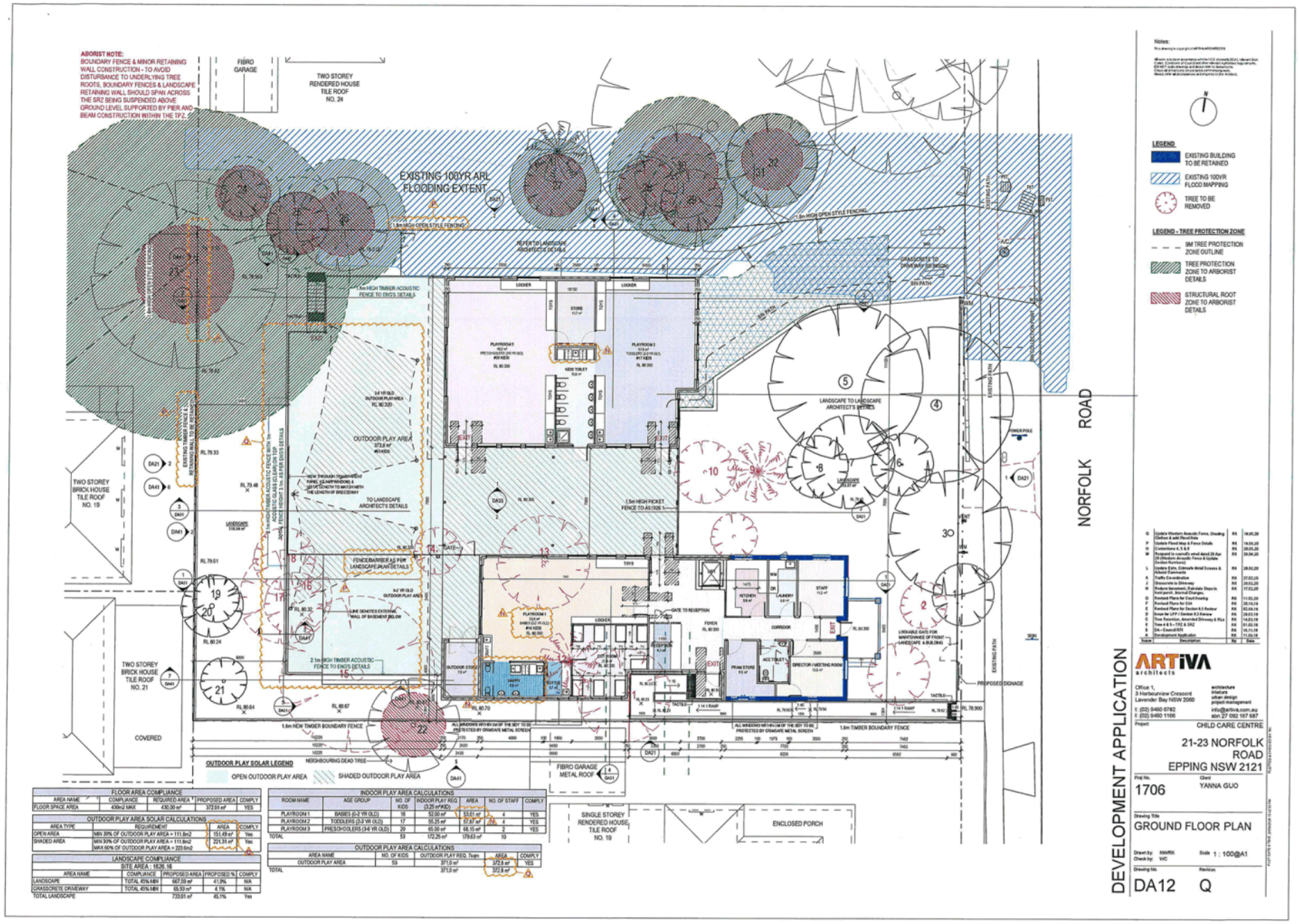
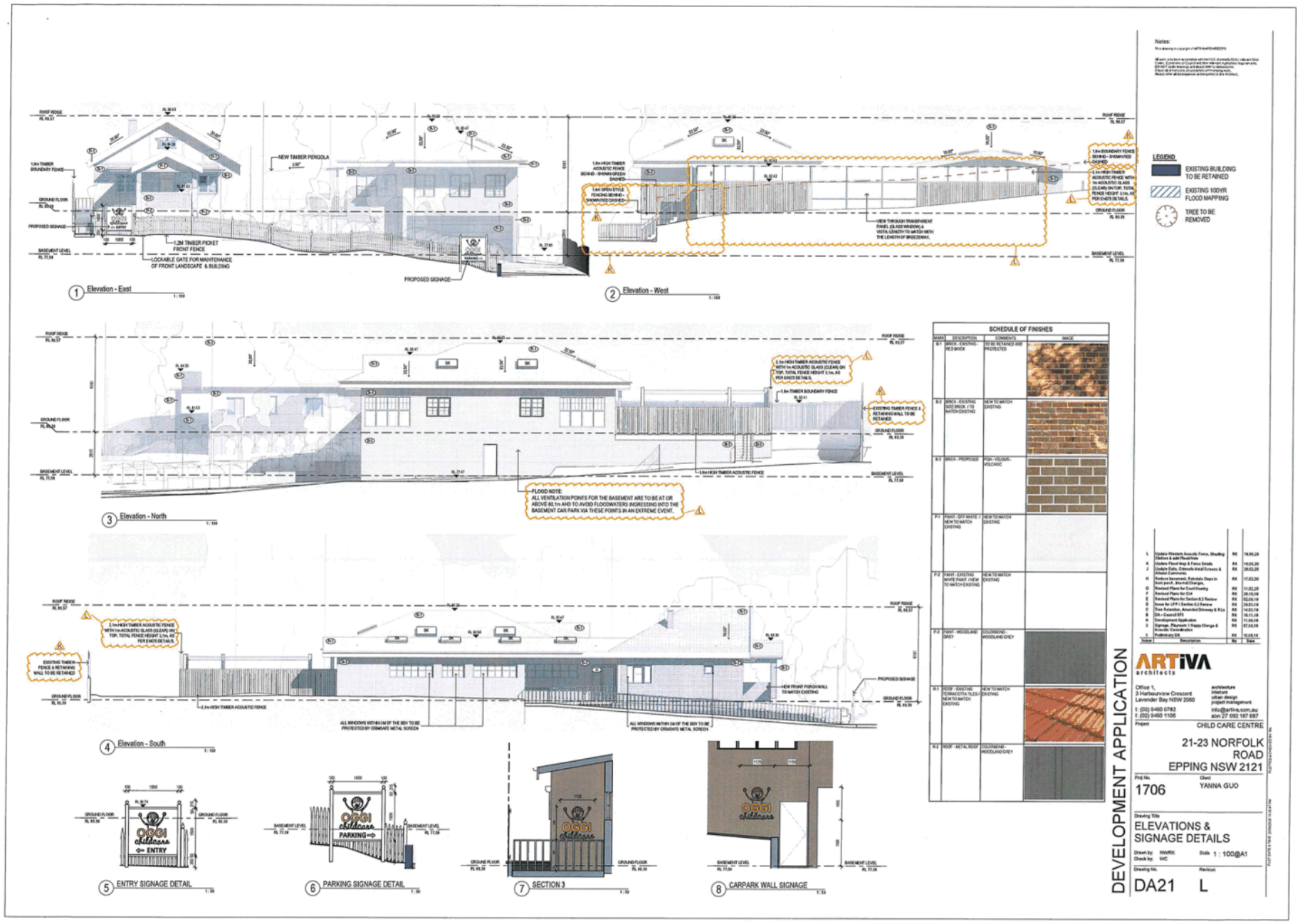
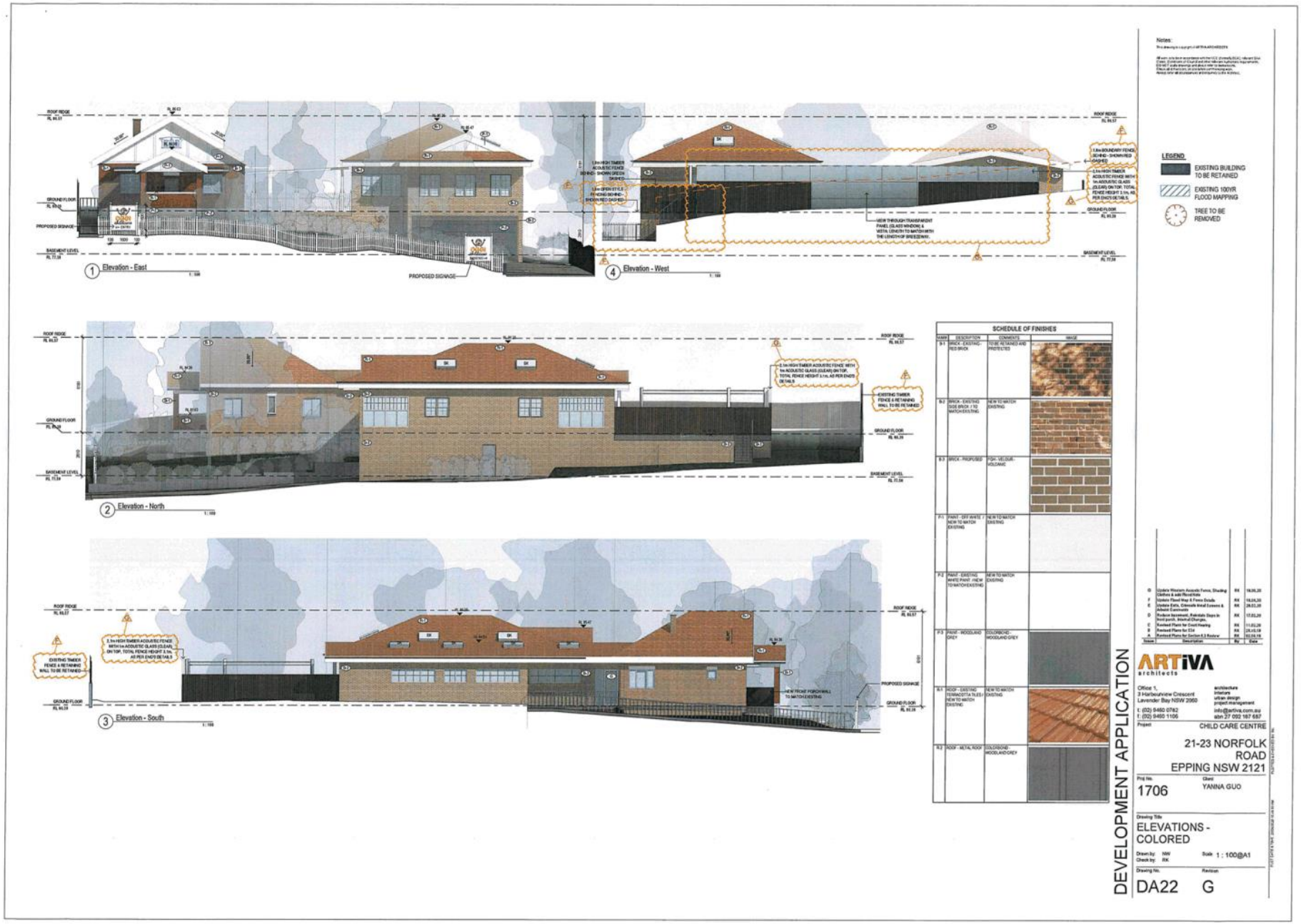
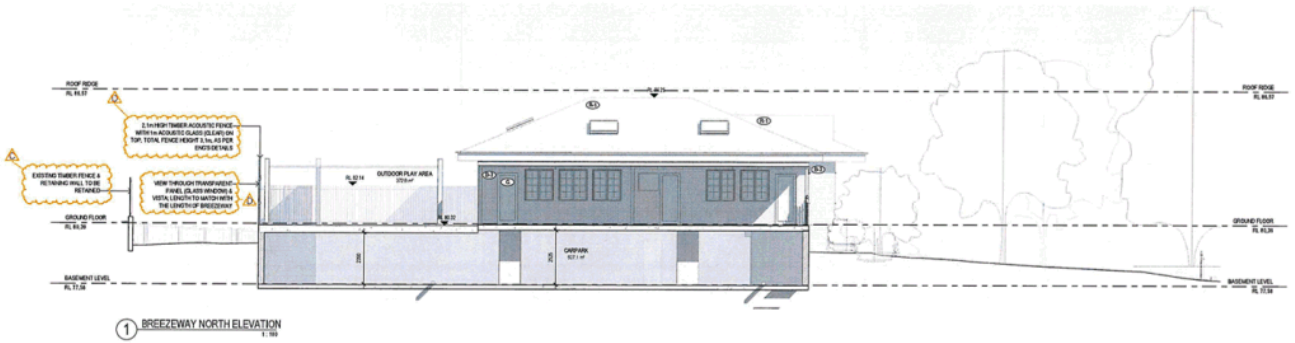
abn 27 092 167 687
Project
CHILD CARE CENTRE
21-23 NORFOLK ROAD
EPPING NSW 2121
Proj No.
1706
Client
YANNA GUO
Drawing Title
BASEMENT PLAN
Drawn by: WWRK
Check by: VIC
Scale 1 : 100@A1
Drawing No.
DA11
Revision
R

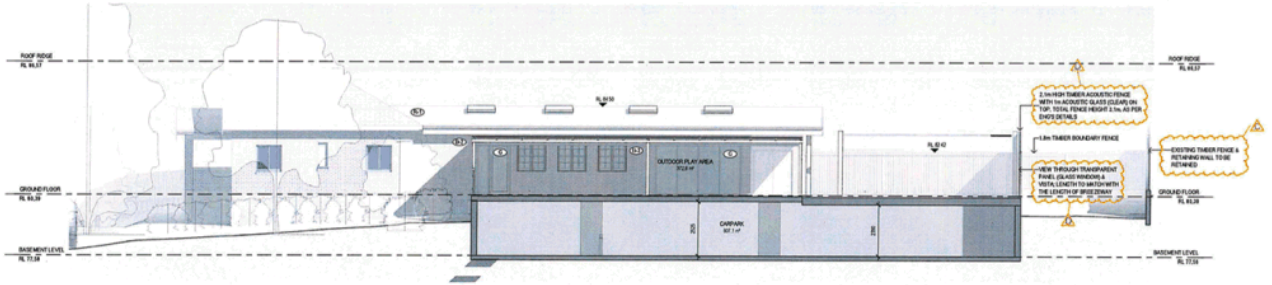

ABORIST NOTE:
BOUNDARY FENCE & MINOR RETAINING WALL CONSTRUCTION - TO AVOID DISTURBANCE TO UNDERLYING TREE ROOTS, BOUNDARY FENCES & LANDSCAPE RETAINING WALL SHOULD SPAN ACROSS THE SRZ BEING SUSPENDED ABOVE GROUND LEVEL SUPPORTED BY PIER AND BEAM CONSTRUCTION WITHIN THE TPZ.
FIBRO GARAGE
TWO STOREY RENDERED HOUSE TILE ROOF NO. 24
EXISTING 100YR ARI FLOODING EXTENT
TWO STOREY BRICK HOUSE TILE ROOF NO. 19
TWO STOREY BRICK HOUSE TILE ROOF NO. 21
COVERED
NORFOLK ROAD
OUTDOOR PLAY AREA 372.8 m²
FIBRO GARAGE METAL ROOF
SINGLE STOREY RENDERED HOUSE, TILE ROOF NO. 19
ENCLOSED PORCH
OUTDOOR PLAY SOLAR LEGEND
OPEN OUTDOOR PLAY AREA
SHADED OUTDOOR PLAY AREA
FLOOR AREA COMPLIANCE
OUTDOOR PLAY AREA SOLAR CALCULATIONS
LANDSCAPE COMPLIANCE
INDOOR PLAY AREA CALCULATIONS
OUTDOOR PLAY AREA CALCULATIONS
LEGEND
EXISTING BUILDING TO BE RETAINED
EXISTING 100YR FLOOD MAPPING
TREE TO BE REMOVED
LEGEND - TREE PROTECTION ZONE
9M TREE PROTECTION ZONE OUTLINE
TREE PROTECTION ZONE TO ARBORIST DETAILS
STRUCTURAL ROOT ZONE TO ARBORIST DETAILS
ARTiVA architects
DEVELOPMENT APPLICATION
CHILD CARE CENTRE
21-23 NORFOLK ROAD
EPPING NSW 2121
1706
YANNA GUO
GROUND FLOOR PLAN
DA12
Q


1 Elevation - East
2 Elevation - West
3 Elevation - North
4 Elevation - South
5 ENTRY SIGNAGE DETAIL
6 PARKING SIGNAGE DETAIL
7 SECTION 3
8 CARPARK WALL SIGNAGE
SCHEDULE OF FINISHES
LEGEND
EXISTING BUILDING TO BE RETAINED
EXISTING 100YR FLOOD MAPPING
TREE TO BE REMOVED
DEVELOPMENT APPLICATION
ARTiVA architects
CHILD CARE CENTRE
21-23 NORFOLK ROAD
EPPING NSW 2121
1706
YANNA GUO
ELEVATIONS & SIGNAGE DETAILS
DA21
L


1 Elevation - East
4 Elevation - West
2 Elevation - North
3 Elevation - South
PROPOSED SIGNAGE
LEGEND
EXISTING BUILDING TO BE RETAINED
EXISTING 100YR FLOOD MAPPING
TREE TO BE REMOVED
SCHEDULE OF FINISHES
DEVELOPMENT APPLICATION
ARTiVA architects
CHILD CARE CENTRE
21-23 NORFOLK ROAD
EPPING NSW 2121
1706
YANNA GUO
ELEVATIONS - COLORED
DA22
G



1 BREEZEWAY NORTH ELEVATION
1 : 100



2 BREEZEWAY SOUTH ELEVATION
1 : 100

Notes:

This drawing is copyright of ARTIVA ARCHITECTS

All work is to be in accordance with the NCC (formerly BCA), relevant Australian Codes, Authorities and Local Government requirements.
DO NOT scale drawings and always refer to dimensions.
Check all dimensions on site before commencing work.
Report any discrepancies and enquiries to the Architect.

No.	Description	By	Date
D	Update Western Acoustic Fence, Shading Clothes & add Flood Note	RK	19.06.20
C	Update Flood Map & Fence Details	RK	18.06.20
B	Reduce basement, Relocate Steps in front porch, Internal Changes.	RK	17.03.20
A	Revised Plans for Court Hearing	RK	11.03.20

DEVELOPMENT APPLICATION

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Project
CHILD CARE CENTRE
21-23 NORFOLK ROAD
EPPING NSW 2121

Proj No.
1706

Client
YANNA GUO

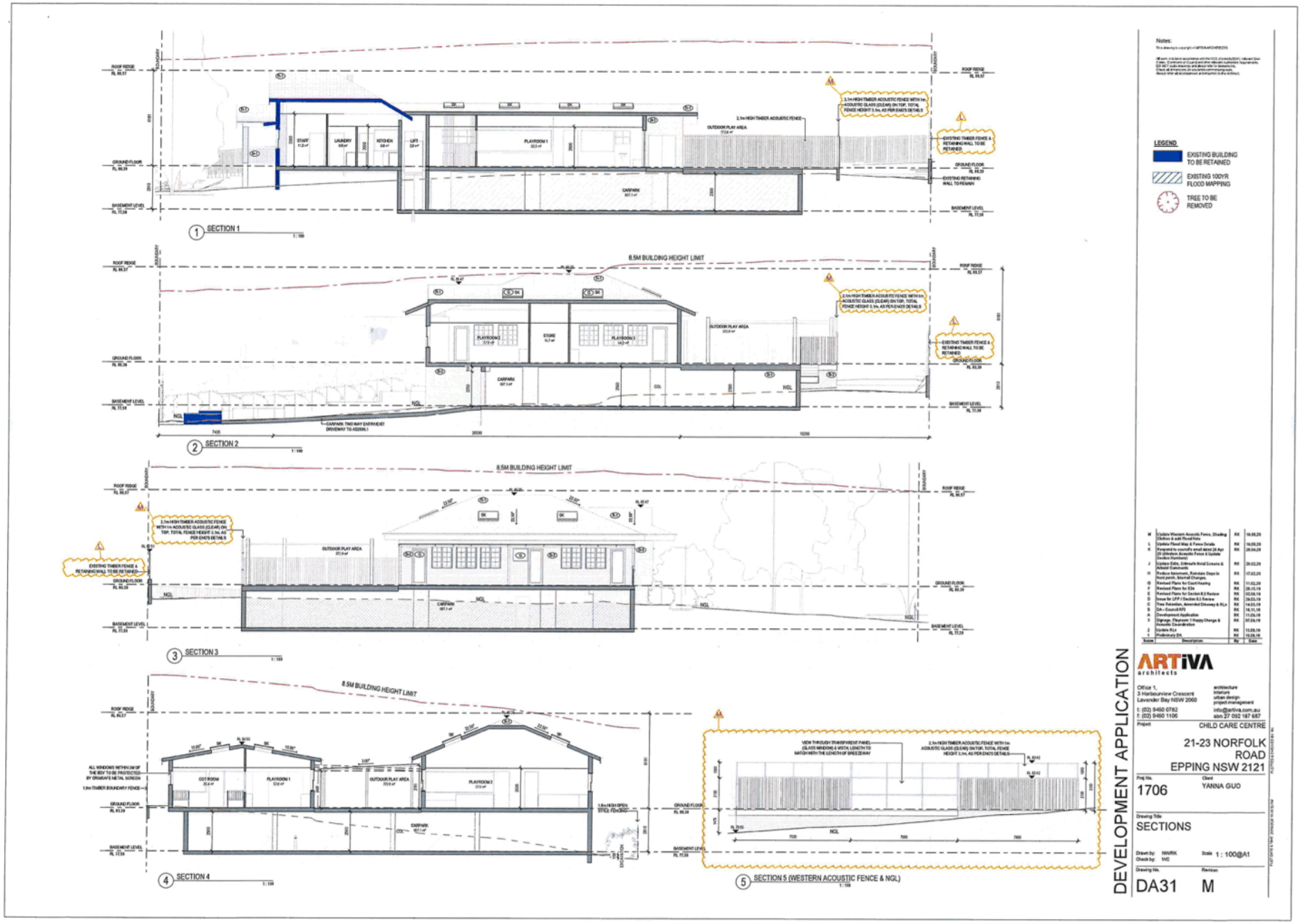
Drawing Title
BREEZEWAY ELEVATIONS

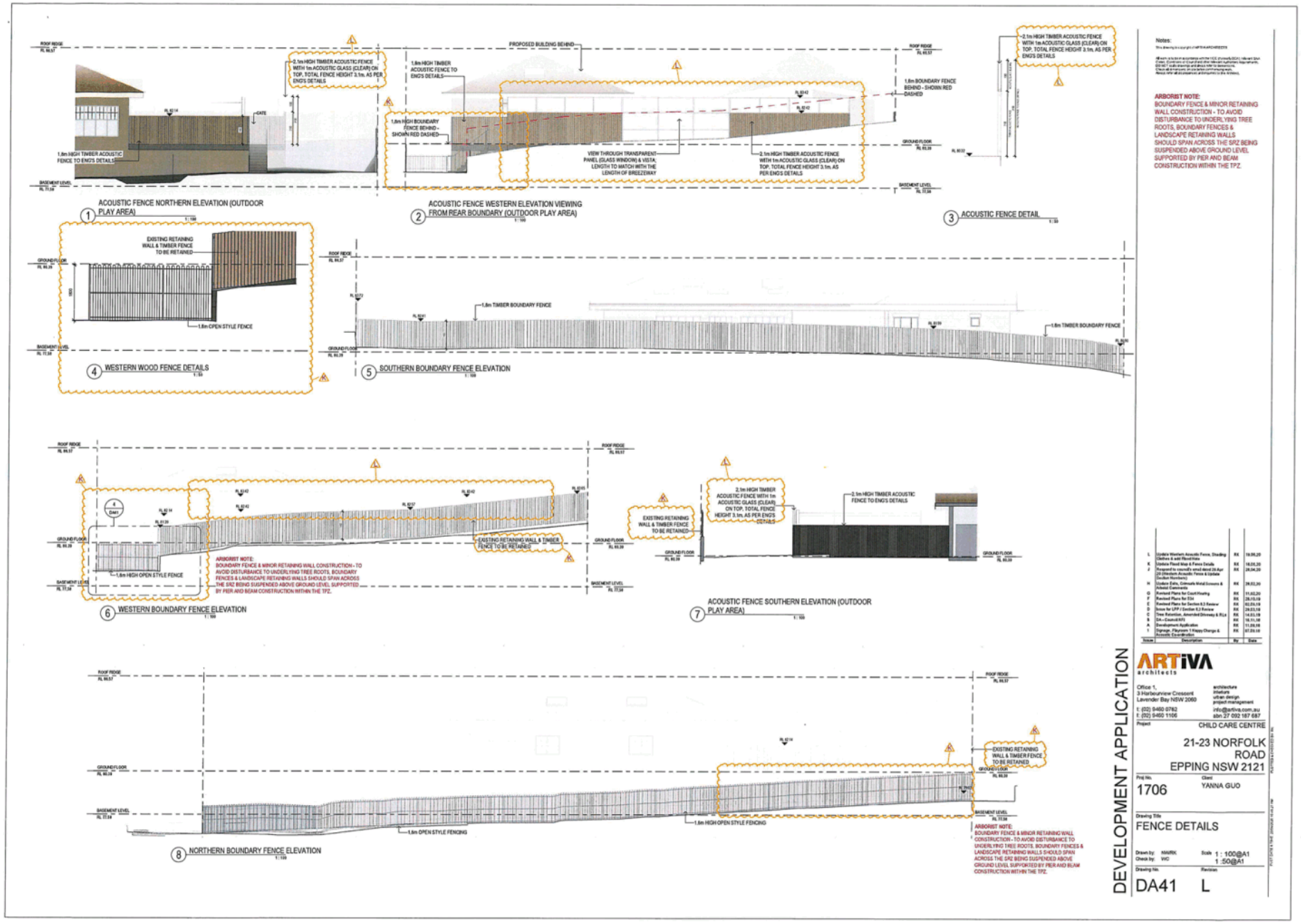
Drawn by: NW
Check by: RK

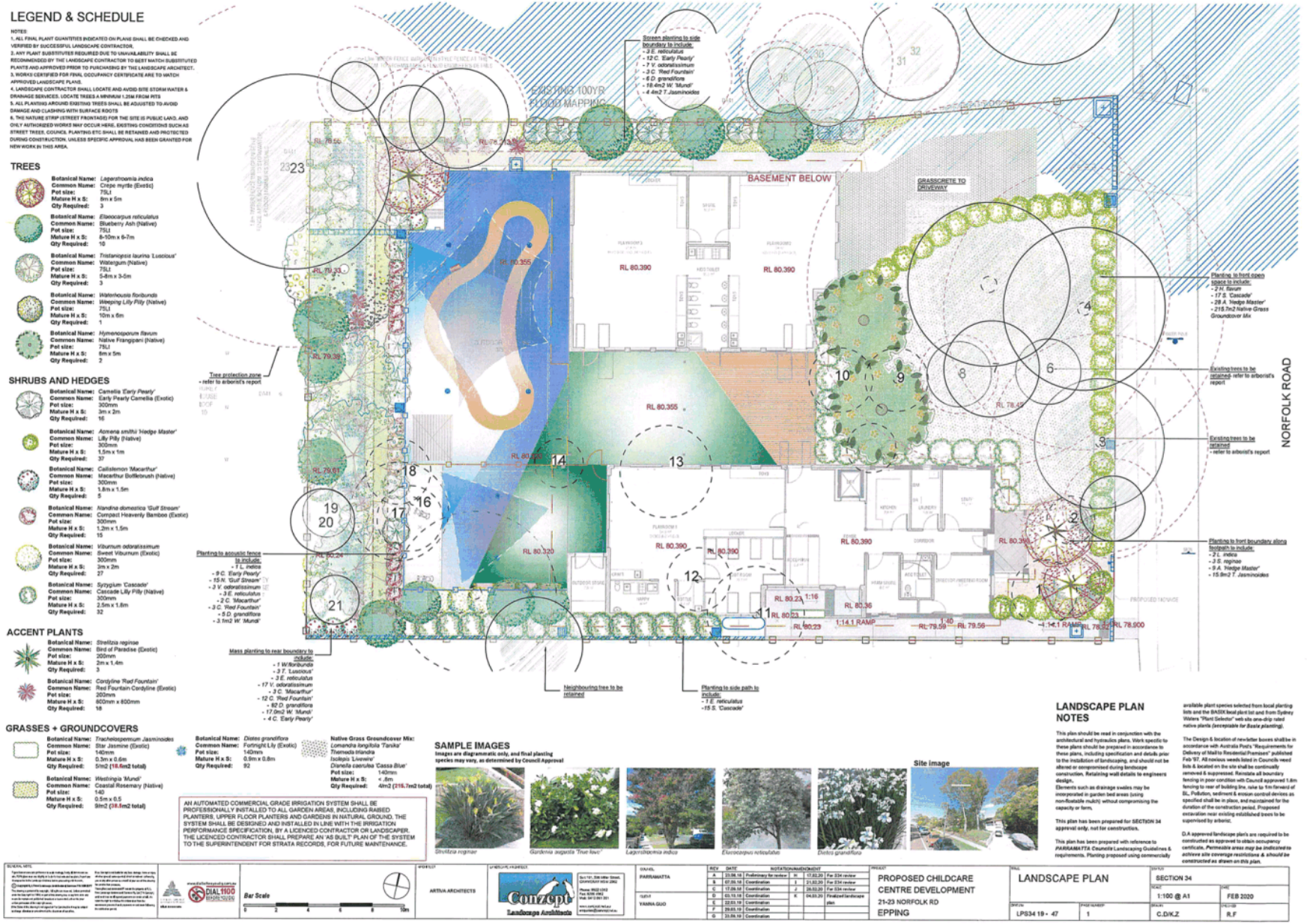
Scale 1 : 100@A1

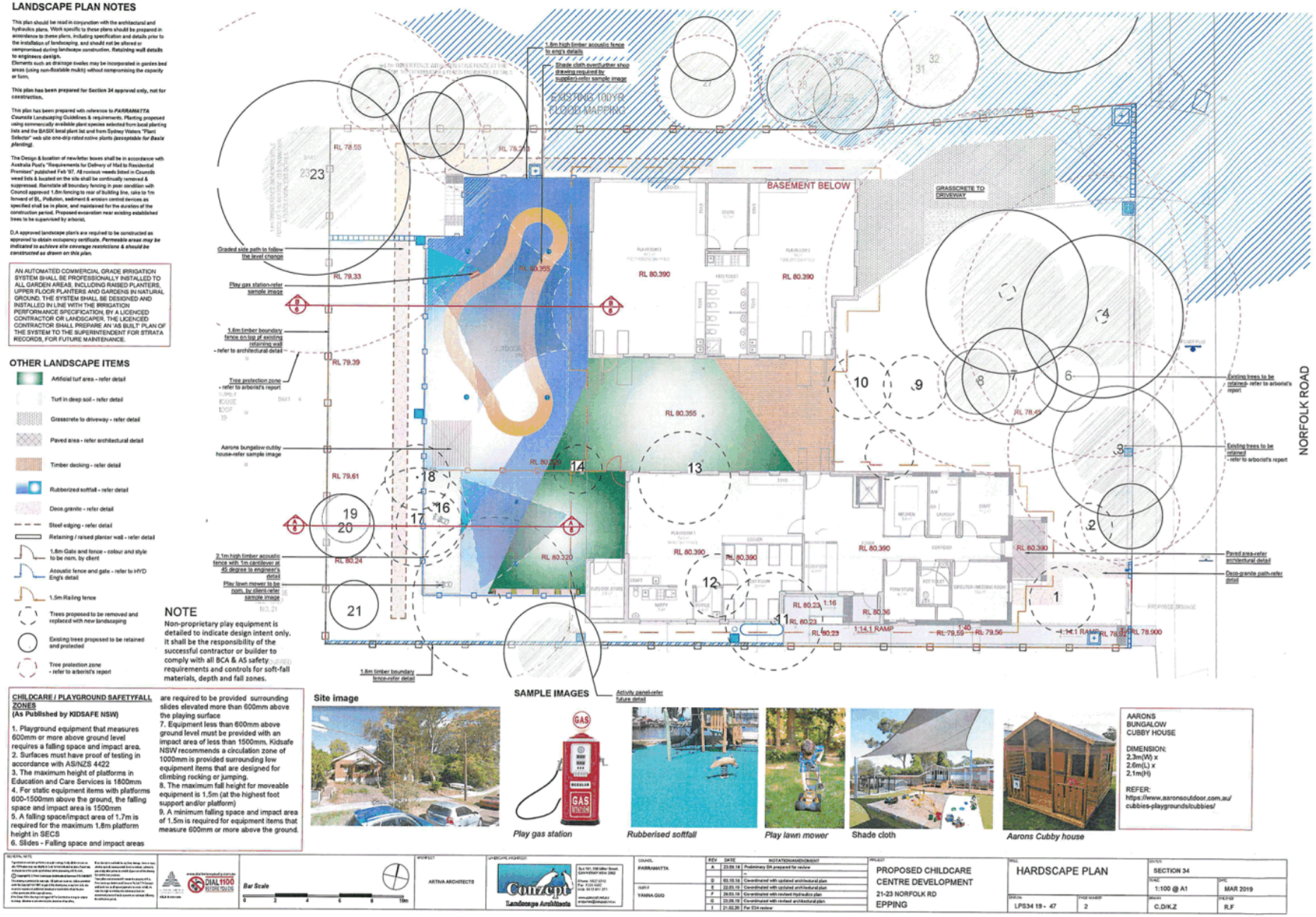
Drawing No.
DA23

Revision
D


1 SECTION 1
2 SECTION 2
8.5M BUILDING HEIGHT LIMIT
3 SECTION 3
4 SECTION 4
5 SECTION 5 (WESTERN ACOUSTIC FENCE & NGL)
LEGEND
EXISTING BUILDING TO BE RETAINED
EXISTING 100YR FLOOD MAPPING
TREE TO BE REMOVED
DEVELOPMENT APPLICATION
ARTiVA architects
CHILD CARE CENTRE
21-23 NORFOLK ROAD
EPPING NSW 2121
1706
YANNA GUO
SECTIONS
DA31
M


ACOUSTIC FENCE NORTHERN ELEVATION (OUTDOOR PLAY AREA)
ACOUSTIC FENCE WESTERN ELEVATION VIEWING FROM REAR BOUNDARY (OUTDOOR PLAY AREA)
ACOUSTIC FENCE DETAIL
WESTERN WOOD FENCE DETAILS
SOUTHERN BOUNDARY FENCE ELEVATION
WESTERN BOUNDARY FENCE ELEVATION
ACOUSTIC FENCE SOUTHERN ELEVATION (OUTDOOR PLAY AREA)
NORTHERN BOUNDARY FENCE ELEVATION
ARBORIST NOTE:
BOUNDARY FENCE & MINOR RETAINING WALL CONSTRUCTION - TO AVOID DISTURBANCE TO UNDERLYING TREE ROOTS, BOUNDARY FENCES & LANDSCAPE RETAINING WALLS SHOULD SPAN ACROSS THE SRZ BEING SUSPENDED ABOVE GROUND LEVEL SUPPORTED BY PIER AND BEAM CONSTRUCTION WITHIN THE TPZ.
DEVELOPMENT APPLICATION
ARTiVA architects
CHILD CARE CENTRE
21-23 NORFOLK ROAD
EPPING NSW 2121
1706
YANNA GUO
FENCE DETAILS
DA41
L


LEGEND & SCHEDULE
TREES
SHRUBS AND HEDGES
ACCENT PLANTS
GRASSES + GROUNDCOVERS
BASEMENT BELOW
NORFOLK ROAD
SAMPLE IMAGES
LANDSCAPE PLAN NOTES
PROPOSED CHILDCARE CENTRE DEVELOPMENT
21-23 NORFOLK RD
EPPING
LANDSCAPE PLAN
SECTION 34
1:100 @ A1
FEB 2020
LPS34 19 - 47
C.D/K.Z
R.F


LANDSCAPE PLAN NOTES
This plan should be read in conjunction with the architectural and hydraulics plans. Work specific to these plans should be prepared in accordance to these plans, including specification and details prior to the installation of landscaping, and should not be altered or compromised during landscape construction. Retaining wall details to engineers design.
Elements such as drainage swales may be incorporated in garden bed areas (using non-floatable mulch) without compromising the capacity or form.
This plan has been prepared for Section 34 approval only, not for construction.
This plan has been prepared with reference to PARRAMATTA Councils Landscaping Guidelines & requirements. Planting proposed using commercially available plant species selected from local planting lists and the BASIX local plant list and from Sydney Waters "Plant Selector" web site one-drip rated native plants (acceptable for Basix planting).
The Design & location of new/letter boxes shall be in accordance with Australia Post's "Requirements for Delivery of Mail to Residential Premises" published Feb '97. All noxious weeds listed in Councils weed lists & located on the site shall be continually removed & suppressed. Reinstate all boundary fencing in poor condition with Council approved 1.8m fencing to rear of building line, rake to 1m forward of BL. Pollution, sediment & erosion control devices as specified shall be in place, and maintained for the duration of the construction period. Proposed excavation near existing established trees to be supervised by arborist.
D.A approved landscape plan's are required to be constructed as approved to obtain occupancy certificate. Permeable areas may be indicated to achieve site coverage restrictions & should be constructed as shown on this plan.
AN AUTOMATED COMMERCIAL GRADE IRRIGATION SYSTEM SHALL BE PROFESSIONALLY INSTALLED TO ALL GARDEN AREAS, INCLUDING RAISED PLANTERS, UPPER FLOOR PLANTERS AND GARDENS IN NATURAL GROUND. THE SYSTEM SHALL BE DESIGNED AND INSTALLED IN LINE WITH THE IRRIGATION PERFORMANCE SPECIFICATION, BY A LICENCED CONTRACTOR OR LANDSCAPER. THE LICENCED CONTRACTOR SHALL PREPARE AN 'AS BUILT' PLAN OF THE SYSTEM TO THE SUPERINTENDENT FOR STRATA RECORDS, FOR FUTURE MAINTENANCE.
OTHER LANDSCAPE ITEMS
Artificial turf area - refer detail
Turf in deep soil - refer detail
Grasscrete to driveway - refer detail
Paved area - refer architectural detail
Timber decking - refer detail
Rubberized softfall - refer detail
Deco.granite - refer detail
Steel edging - refer detail
Retaining / raised planter wall - refer detail
1.8m Gate and fence - colour and style to be nom. by client
Acoustic fence and gate - refer to HYD Eng's detail
1.5m Railing fence
Trees proposed to be removed and replaced with new landscaping
Existing trees proposed to be retained and protected
Tree protection zone - refer to arborist's report
NOTE
Non-proprietary play equipment is detailed to indicate design intent only. It shall be the responsibility of the successful contractor or builder to comply with all BCA & AS safety requirements and controls for soft-fall materials, depth and fall zones.
CHILDCARE / PLAYGROUND SAFETYFALL ZONES
(As Published by KIDSAFE NSW)
1. Playground equipment that measures 600mm or more above ground level requires a falling space and impact area.
2. Surfaces must have proof of testing in accordance with AS/NZS 4422
3. The maximum height of platforms in Education and Care Services is 1800mm
4. For static equipment items with platforms 600-1500mm above the ground, the falling space and impact area is 1500mm
5. A falling space/impact area of 1.7m is required for the maximum 1.8m platform height in SECS
6. Slides - Falling space and impact areas are required to be provided surrounding slides elevated more than 600mm above the playing surface
7. Equipment less than 600mm above ground level must be provided with an impact area of less than 1500mm. Kidsafe NSW recommends a circulation zone of 1000mm is provided surrounding low equipment items that are designed for climbing rocking or jumping.
8. The maximum fall height for moveable equipment is 1.5m (at the highest foot support and/or platform)
9. A minimum falling space and impact area of 1.5m is required for equipment items that measure 600mm or more above the ground.
1.8m high timber acoustic fence to eng's details
Shade cloth over(further shop drawing required by supplier)-refer sample image
EXISTING 100YR FLOOD MAPPING
BASEMENT BELOW
GRASSCRETE TO DRIVEWAY
Graded side path to follow the level change
Play gas station-refer sample image
1.8m timber boundary fence on top of existing retaining wall - refer to architectural detail
Tree protection zone - refer to arborist's report
Aarons bungalow cubby house-refer sample image
2.1m high timber acoustic fence with 1m cantilever at 45 degree to engineer's detail
Play lawn mower to be nom. by client-refer sample image
1.8m timber boundary fence-refer detail
Existing trees to be retained- refer to arborist's report
Existing trees to be retained - refer to arborist's report
Paved area-refer architectural detail
Deco.granite path-refer detail
NORFOLK ROAD
SAMPLE IMAGES
Activity panel-refer future detail
Site image
Play gas station
Rubberised softfall
Play lawn mower
Shade cloth
Aarons Cubby house
AARONS BUNGALOW CUBBY HOUSE
DIMENSION: 2.3m(W) x 2.6m(L) x 2.1m(H)
REFER: https://www.aaronsoutdoor.com.au/cubbies-playgrounds/cubbies/
PROPOSED CHILDCARE CENTRE DEVELOPMENT
21-23 NORFOLK RD
EPPING
HARDSCAPE PLAN
SECTION 34
1:100 @ A1
MAR 2019
LPS34 19 - 47
2
C.D/K.Z
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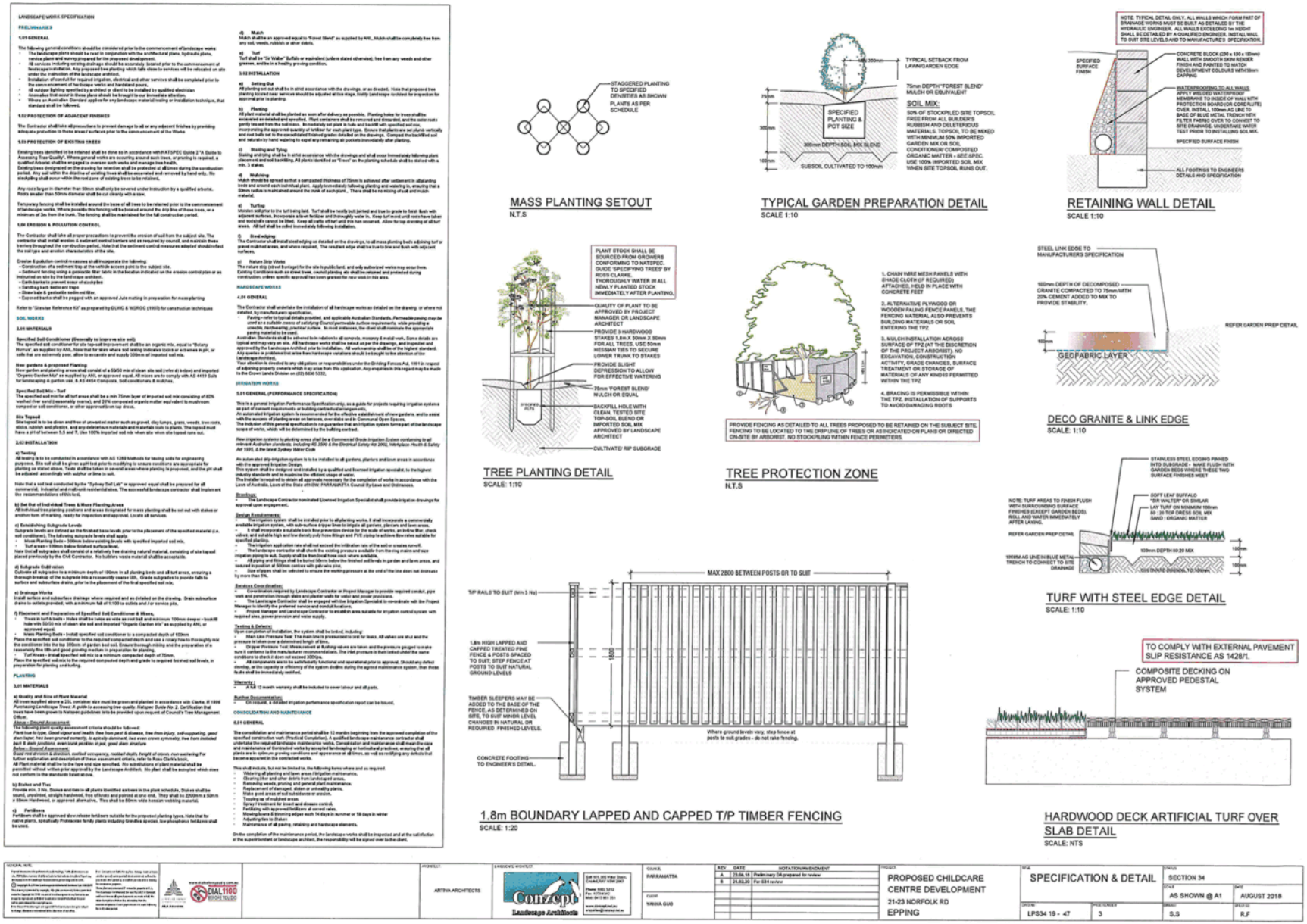
LANDSCAPE WORK SPECIFICATION
PRELIMINARIES
1.01 GENERAL
1.02 PROTECTION OF ADJACENT FINISHES
1.03 PROTECTION OF EXISTING TREES
1.04 EROSION & POLLUTION CONTROL
SOIL WORKS
2.01 MATERIALS
2.02 INSTALLATION
PLANTING
3.01 MATERIALS
3.02 INSTALLATION
CONSOLIDATION AND MAINTENANCE
4.01 GENERAL
HARDSCAPE WORKS
4.01 GENERAL
IRRIGATION WORKS
4.01 GENERAL (PERFORMANCE SPECIFICATION)
STAGGERED PLANTING TO SPECIFIED DENSITIES AS SHOWN
PLANTS AS PER SCHEDULE
MASS PLANTING SETOUT
N.T.S
TYPICAL SETBACK FROM LAWN/GARDEN EDGE
75mm DEPTH "FOREST BLEND" MULCH OR EQUIVALENT
SOIL MIX:
SPECIFIED PLANTING & POT SIZE
300mm DEPTH SOIL MIX BLEND
SUBSOIL CULTIVATED TO 100mm
TYPICAL GARDEN PREPARATION DETAIL
SCALE 1:10
NOTE: TYPICAL DETAIL ONLY. ALL WALLS WHICH FORM PART OF DRAINAGE WORKS MUST BE BUILT AS DETAILED BY THE HYDRAULIC ENGINEER. ALL WALLS EXCEEDING 1m HEIGHT SHALL BE DETAILED BY A QUALIFIED ENGINEER. INSTALL WALL TO SUIT SITE LEVELS AND TO MANUFACTURER'S SPECIFICATION.
SPECIFIED SURFACE FINISH
CONCRETE BLOCK (190 x 190 x 190mm) WALL WITH SMOOTH SKIM RENDER FINISH AND PAINTED TO MATCH DEVELOPMENT COLOURS WITH 50mm CAPPING
WATERPROOFING TO ALL WALLS: APPLY WELDED WATERPROOF MEMBRANE TO INSIDE OF WALL WITH PROTECTION BOARD (OR CORE FLUTE) OVER. INSTALL 100mm AG LINE TO BASE OF BLUE METAL TRENCH WITH FILTER FABRIC OVER TO CONNECT TO SITE DRAINAGE. UNDERTAKE WATER TEST PRIOR TO INSTALLING SOIL MIX.
SPECIFIED SURFACE FINISH
ALL FOOTINGS TO ENGINEERS DETAILS AND SPECIFICATION
RETAINING WALL DETAIL
SCALE 1:10
PLANT STOCK SHALL BE SOURCED FROM GROWERS CONFORMING TO NATSPEC GUIDE 'SPECIFYING TREES' BY ROSS CLARKE. THOROUGHLY WATER IN ALL NEWLY PLANTED STOCK IMMEDIATELY AFTER PLANTING.
QUALITY OF PLANT TO BE APPROVED BY PROJECT MANAGER OR LANDSCAPE ARCHITECT
PROVIDE 3 HARDWOOD STAKES 1.8m X 50mm X 50mm FOR ALL TREES. USE 50mm HESSIAN TIES TO SECURE LOWER TRUNK TO STAKES
PROVIDE SLIGHT DEPRESSION TO ALLOW FOR EFFECTIVE WATERING
75mm 'FOREST BLEND' MULCH OR EQUAL
BACKFILL HOLE WITH CLEAN, TESTED SITE TOP-SOIL BLEND OR IMPORTED SOIL MIX APPROVED BY LANDSCAPE ARCHITECT
CULTIVATED/ RIP SUBGRADE
TREE PLANTING DETAIL
SCALE: 1:10
1. CHAIN WIRE MESH PANELS WITH SHADE CLOTH (IF REQUIRED) ATTACHED, HELD IN PLACE WITH CONCRETE FEET
2. ALTERNATIVE PLYWOOD OR WOODEN PALING FENCE PANELS. THE FENCING MATERIAL ALSO PREVENTS BUILDING MATERIALS OR SOIL ENTERING THE TPZ
3. MULCH INSTALLATION ACROSS SURFACE OF TPZ (AT THE DISCRETION OF THE PROJECT ARBORIST). NO EXCAVATION, CONSTRUCTION ACTIVITY, GRADE CHANGES, SURFACE TREATMENT OR STORAGE OF MATERIALS OF ANY KIND IS PERMITTED WITHIN THE TPZ
4. BRACING IS PERMISSIBLE WITHIN THE TPZ. INSTALLATION OF SUPPORTS TO AVOID DAMAGING ROOTS
PROVIDE FENCING AS DETAILED TO ALL TREES PROPOSED TO BE RETAINED ON THE SUBJECT SITE. FENCING TO BE LOCATED TO THE DRIP LINE OF TREES OR AS INDICATED ON PLANS OR DIRECTED ON-SITE BY ARBORIST. NO STOCKPILING WITHIN FENCE PERIMETERS.
TREE PROTECTION ZONE
N.T.S
STEEL LINK EDGE TO MANUFACTURERS SPECIFICATION
100mm DEPTH OF DECOMPOSED GRANITE COMPACTED TO 75mm WITH 20% CEMENT ADDED TO MIX TO PROVIDE STABILITY.
REFER GARDEN PREP DETAIL
GEOFABRIC LAYER
DECO GRANITE & LINK EDGE
SCALE: 1:10
MAX 2800 BETWEEN POSTS OR TO SUIT
T/P RAILS TO SUIT (MIN 3 No)
1.8m HIGH LAPPED AND CAPPED TREATED PINE FENCE & POSTS SPACED TO SUIT; STEP FENCE AT POSTS TO SUIT NATURAL GROUND LEVELS
TIMBER SLEEPERS MAY BE ADDED TO THE BASE OF THE FENCE, AS DETERMINED ON SITE, TO SUIT MINOR LEVEL CHANGES IN NATURAL OR REQUIRED FINISHED LEVELS.
CONCRETE FOOTING - TO ENGINEER'S DETAIL.
Where ground levels vary, step fence at posts to suit grades - do not rake fencing.
1.8m BOUNDARY LAPPED AND CAPPED T/P TIMBER FENCING
SCALE: 1:20
STAINLESS STEEL EDGING PINNED INTO SUBGRADE - MAKE FLUSH WITH GARDEN BEDS WHERE THESE TWO SURFACE FINISHES MEET
NOTE: TURF AREAS TO FINISH FLUSH WITH SURROUNDING SURFACE FINISHES (EXCEPT GARDEN BEDS). ROLL AND WATER IMMEDIATELY AFTER LAYING.
SOFT LEAF BUFFALO "SIR WALTER" OR SIMILAR
LAY TURF ON MINIMUM 150mm 80 : 20 TOP DRESS SOIL MIX DAVO : ORGANIC MATTER
REFER GARDEN PREP DETAIL
100mm DEPTH 80:20 MIX
100mm AG LINE IN BLUE METAL TRENCH TO CONNECT TO SITE DRAINAGE
TURF WITH STEEL EDGE DETAIL
SCALE: 1:10
TO COMPLY WITH EXTERNAL PAVEMENT SLIP RESISTANCE AS 1428/1.
COMPOSITE DECKING ON APPROVED PEDESTAL SYSTEM
HARDWOOD DECK ARTIFICIAL TURF OVER SLAB DETAIL
SCALE: NTS
DIAL 1100 BEFORE YOU DIG
ARTIVA ARCHITECTS
Conzept Landscape Architects
PARRAMATTA
YANNA GUO
A 23.06.18 Preliminary DA prepared for review
B 21.02.20 For S34 review
PROPOSED CHILDCARE CENTRE DEVELOPMENT
21-23 NORFOLK RD
EPPING
SPECIFICATION & DETAIL
SECTION 34
AS SHOWN @ A1
AUGUST 2018
LPS34 19 - 47
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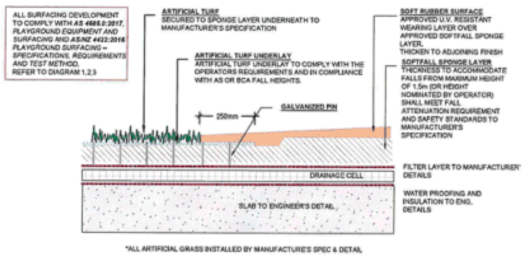


TYPICAL RUBBERISED SOFTFALL AND SYNTHETIC TURF ON SLAB
SCALE: 1:15

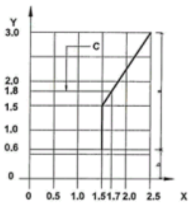


DIAGRAM 1: IMPACT AREA
AS 4685:2014 (OR CURRENT VERSION)

If 0 ≤ y < 0.6 then x ≤ 1.5 (in meters)
If 0.6 ≤ y ≤ 1.5 then x = 1.5 (in meters)
If y>1.5, then x = 1.7
LEGEND
y = free height of fall
x = minimum dimension of impact area
a = impact attenuating surface with requirements (4.2.8.5.2)
b = surface provided in accordance with 4.2.8.5.3
c = maximum free height of fall and impact area for
Supervised Early Childhood Services (SECS)

KEY
1 Surfacing in accordance with 4.2.8.5
2 Barriers required
3 Guardrail required

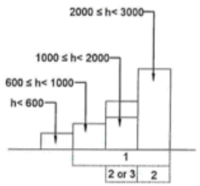


DIAGRAM 2: NOT EASILY ACCESSIBLE EQUIPMENT
AS 4685:2014 (OR CURRENT VERSION)

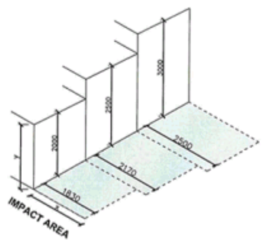
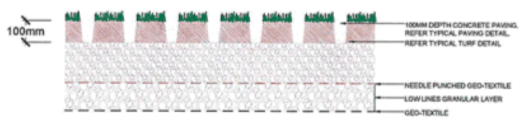


DIAGRAM 3: FALLING SPACE
AS 4685:2014 (OR CURRENT VERSION)



TYPICAL GRASSCRETE DETAIL
SCALE 1:20

TREE SURVEY

Existing Trees based on Arborists Report by rainTree Consulting on 02.04.2019

APPENDIX- C: Tree Assessment Schedule

■ Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification
▨ Trees with low retention values: senescence, developing defects or being "exempt trees from the LGA Tree Preservation Order (TPO)

Tree No	Botanical Name COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ	Age	Health	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT = Neighbouring tree
1	*Eucalyptus racemosa* / Snappy Gum	10 x 6	250	2m / 3	ESM	Good	Fair / Good	3	2C	2	2	Require flower & fruit for ID, bowing lean EST to 3m / potential past root plate failure - may become problematic in future
2	*Eucalyptus racemosa* Snappy Gum	9 x 4	400 at base	2.3 / 4.8	ESM	Good	Fair	3	2A	3	3	Branch stub and decline at 1m EST side, wound degrading top ground level = low retention value
3	*Acmena smithii* Lilly Pilly	9 x 8	150, 200, 200	2.6 / 6.6	ESM	Good	Fair	3	2B/D	2	2	Three stems at ground level with minor stem inclusion development - may become problematic in time, shallow surface roots evident, pruned for power line clearance EST side
4	*Angophora costata* Angophora	24 x 16	700	2.8 / 8.4	SM	Good	Good	2	6	1	2	Slight suppressed canopy form & biomass – EST with no significant defects noted
5	*Eucalyptus resinifera* Red Mahogany	25 x 20	900	3.2 / 10.8	M	Fair / Good	Fair / Good	2	2C/4	2	2	Potentially past termite affected tree, termite activity noted at stub end cut 0m WST, minor wounds on WST side above with epicormic shoots throughout, slight decline in canopy with large diameter deadwood = environmentally stressed
6	*Alectryon tomentosus* Hairy Alectryon	9 x 6	250 at base	1.8 / 3	ESM	Good	Fair / Poor	3	2	3	3	Main stems at 0.6m with stem inclusion development = low retention value
7	*Alectryon tomentosus* Hairy Alectryon	9 x 7	250 at base	1.8 / 3	ESM	Good	Good	3	6	1	2	Tree with no significant defects noted
8	*Banksia integrifolia* Costal Banksia	6 x 5	200	1.8 / 2.4	ESM	Fair	Fair	3	4	2	2	Environmentally stressed with low foliage volume & vigour
9	*Syagrus romanzoffiana* Cocos Palm	10 x 7	300	-	SM	Good	Good	4	6/6	1	2	Palm species with no significant defects noted
10	*Allocasuarina torulosa* Forest Oak	13 x 8	250	2 / 3	ESM	Good	Good	3	6	1	2	Tree within 3m of dwelling. Typical for species type with no significant defects noted

Ref No. RTC-12118 21-23 Norfolk Road, EPPING – arborist – DA – 22.8.2018 15 of 18

■ Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification
▨ Trees with low retention values: senescence, developing defects or being "exempt trees from the LGA Tree Preservation Order (TPO)

Tree No	Botanical Name COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ	Age	Health	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT = Neighbouring tree
11	*Magnolia x soulangeana* Magnolia	9 x 11	500	2.6m / 6	M	Good	Good	4/3	6	1	2	Typical for species type in age class with no significant defects noted
12	*Howea forsteriana* Kentia Palm	12 x 2.5	150	- / 2	LM	Fair / Good	Fair / Poor	4/3	2C	2	2	Large upper trunk wound from ground level to 5m, sound with no progressing decay, potentially pathogen related
13	*Lagerstroemia indica* Crepe Myrtle	8 x 9	700	2.8 / 6.4	M	Good	Fair / Good	4/3	2B/C	2	2	Multi at base, minor stem damage STH/WST side with typical minor stem inclusion development at basal main stem junctions
14	*Acmena smithii* Lilly Pilly	4 x 5	150	1.6 / 2	ESM	Fair / Good	Fair	3	2D/4	3	3	stem inclusion development on central stem, upper branch scaffolds pruned for height control resulting in poor form = low retention value
15	*Liquidambar styraciflua* Liquidambar	18 x 13	650	2.8 / 7.8	SM	Good	Poor	4/3	2	3	3	Structurally damaged tree at 6m EST side, past stem inclusion failure site = low retention value
16	*Alectryon tomentosus* Hairy Alectryon	8 x 6	200	1.8 / 2.4	ESM	Good	Fair / Good	4/3	2B	2	2	Minor stem inclusion development at 1.5m junction evident
17	*Cinnamomum camphora* Camphor Laurel	7 x 3	200 at base	1.6 / 2.4	ESM	Good	Fair / Poor	5	6/2C	2	3	Exempt tree species, twin stems at ground level with damaged stems at 2.5m
18	*Angophora floribunda* Rough Barked Apple	10 x 4	200	1.8 / 2.4	ESM	Fair / Good	Good	3	2C	1	2	Minor decline in central canopy – appears not immediately detrimental
19	*Allocasuarina torulosa* Forest Oak	10 x 4	200	1.8 / 2.4	ESM	Good	Good	3	6	1	2	Tree with no significant defects noted
20	*Casuarina cunninghamiana* River Oak	16 x 8	250	2 / 3	ESM	Good	Good	3	6	1	2	Codominant / twin stemmed at 11m with no significant defects evident
21	*Hymenosporum Flavum* Native Frangipani	10 x 5	200	1.8 / 2.4	ESM	Good	Good	4/3	6	1	2	Tree with no significant defects noted
22 NT	*Pittosporum undulatum* Native Daphne	6 x 7	350	2.1 / -	-	-	-	6	1	4	4	Neighbouring dead tree

Ref No. RTC-12118 21-23 Norfolk Road, EPPING – arborist – DA – 22.8.2018 16 of 18

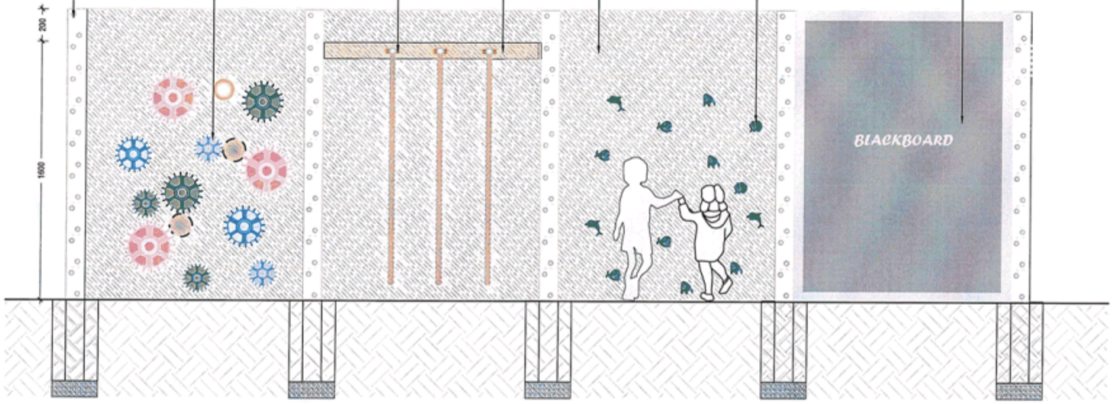
■ Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification
▨ Trees with low retention values: senescence, developing defects or being "exempt trees from the LGA Tree Preservation Order (TPO)

Tree No	Botanical Name COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ	Age	Health	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT = Neighbouring tree
23 NT	*Leptospermum modestus* Old Brush Box	24 x 22	900	3.2 / 10.8	M	Good	Fair / Good	3	2B/E	2	2	Twin stems at 2.5m with minor stem inclusion development, location to infrastructure may become problematic in future with minor trunk lean NTH
24 NT	*Magifera indica* Mango	5 x 4	200	1.8 / 2.4	ESM	Good	Good	4/3	6	1	2	Located at edge of SW drain. Tree with no significant defects noted
25 NT	*Acer buergerianum* Trident Maple	11 x 7	250	2 / 3	ESM	Good	Good	4/3	6	1	2	Tree with no significant defects noted
26 NT	*Jacaranda mimosifolia* Jacaranda	12 x 8	100, 250	2.1 / 4.2	ESM	Good	Good	4/3	6	1	2	Located at edge of SW drain, canopy 3m within at 3m above site, no significant defects noted
27 NT	*Ligustrum lucidum* Broad Leaved Privet	7 x 5	250	2 / 3	ESM	Good	Good	5	0/6	1	2	Neighbouring tree, requires protection, canopy 3m within at 3m above site
28 NT	*Cinnamomum camphora* Camphor Laurel	6 x 7	200	1.8 / 2.4	ESM	Good	Good	5	0/6	1	2	Neighbouring tree, requires protection
29 NT	*Ligustrum lucidum* Broad Leaved Privet	13 x 8	250	2 / 3	ESM	Good	Fair / Good	5	2C	2	2	Neighbouring tree, requires protection, minor wounds at 3m evident
30 NT	*Jacaranda mimosifolia* Jacaranda	15 x 12	400	2.4 / 4.6	ESM	Good	Fair / Good	4/3	2E	2	2	Located at edge of embankment = location to drainage swale may become problematic in future
31 NT	*Archontophoenix cunninghamiana* Bangalow Palm	5 x 4	150	- / 3	ESM	Good	Good	4/3	6	1	2	Palm with no significant defects noted
32 NT	*Celtis occidentalis* Hackberry	10 x 8	250	2 / 3	ESM	Good	Good	4/3	6	1	2	Moderate to strong lean EST with no significant defects noted

Ref No. RTC-12118 21-23 Norfolk Road, EPPING – arborist – DA – 22.8.2018 17 of 18

DIAL 1100 BEFORE YOU DIG

ARCHITECT	LANDSCAPE ARCHITECT	COUNCIL / CLIENT	REV	DATE	NOTATION/AMENDMENT	PROJECT	TITLE	STATUS
ARTIVA ARCHITECTS	Conzept Landscape Architects	PARRAMATTA	A	23.08.18	Preliminary DA prepared for review	PROPOSED CHILDCARE CENTRE DEVELOPMENT 21-23 NORFOLK RD EPPING	DETAILS	SECTION 34
		YANNA GUO	B	21.02.20	For S34 review			DATE: AUGUST 2018
							LPS34 19 - 47 / 4	DRAWN: S.S / CHECKED: R.F



OPTIONAL OUTDOOR PLAY PANEL WITH: ROLLER WHEEL BALL, EXTRUDED ANIMAL CLIMBING WALL, FACET CLIMBING WALL OUTDOOR BLACKBOARD PROGRAMS

LANDSCAPE NOTES

MAX. HEIGHT FOR CLIMBING WALL </= 1600MM. ALL THE DIMENSIONS TO AS+BCA FOR SECURITY MATTER SPEC. AND CONSTRUCTION DETAILS TO FUTURE PACKAGE

SHOWN DETAILS ARE INDICATIVE TO SHOW DESIGN INTENT. FUTURE CONSTRUCTION DETAILS TO BE PROVIDED

SPECIFIC PLAY PROGRAMS TO BE NOM. BY CLIENT. PROPRIETARY ITEM TO FUTURE SPEC./ MANUFACTURER'S DETAILS

FOOTINGS DETAILS REFER ENGINEER'S DRAWING/ DETAILS

DESIGN INTENTS

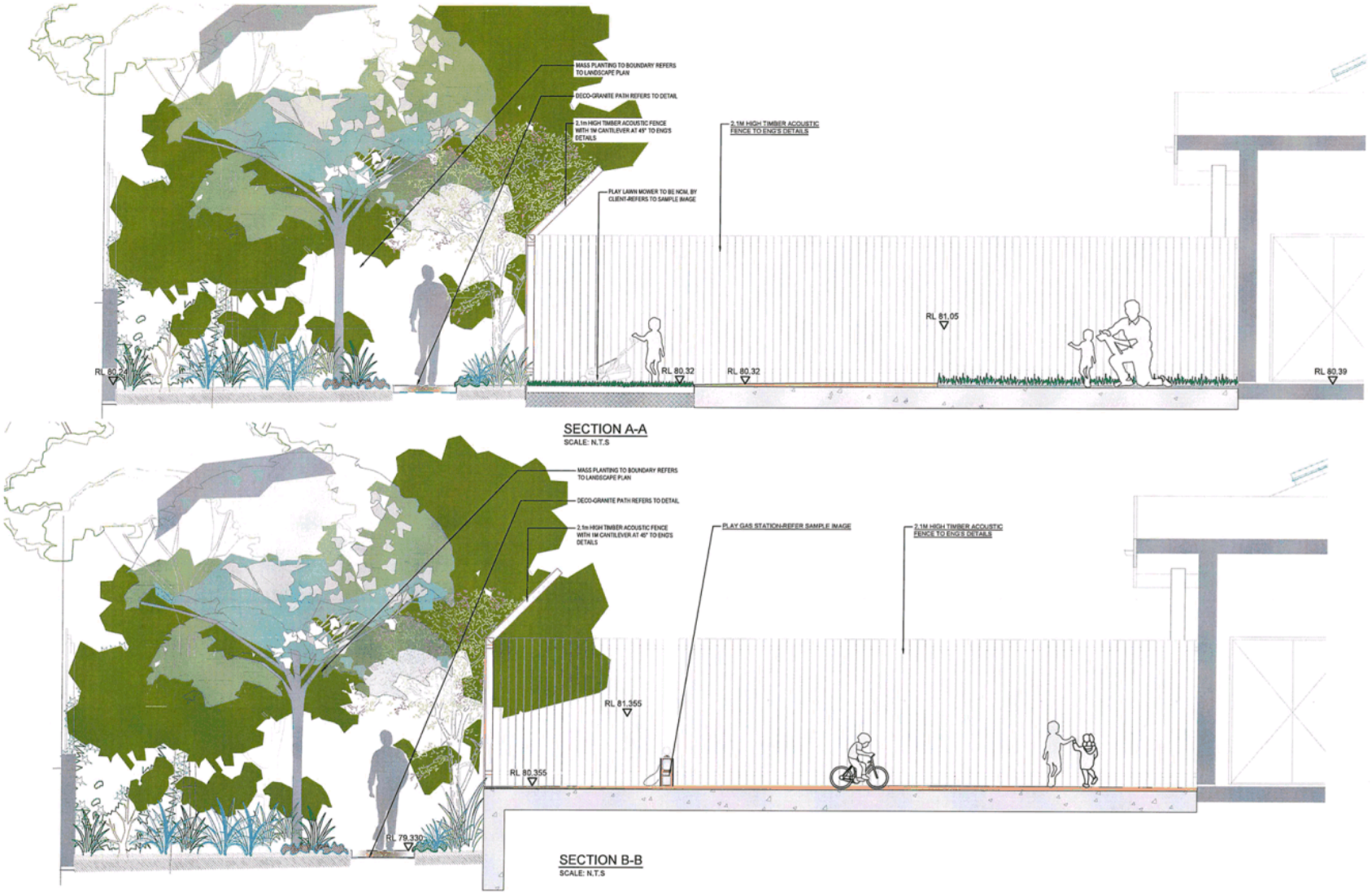
EXTRUDED ANIMAL CLIMBING WALL

FACET CLIMBING WALL

ROPE CLIMBING/ MONKEY PLAY

OUTDOOR BLACKBOARD

ARTINA ARCHITECTS	Conzept Landscape Architects	COUNCIL: PARRAMATTA CLIENT: YANNA GUD	REV A 23.08.18 Preliminary DA prepared for review REV B 21.03.20 For S34 review	PROPOSED CHILDCARE CENTRE DEVELOPMENT 21-23 NORFOLK RD EPPING	DETAILS LPS34 19 - 47 5
				SECTION 34	AUGUST 2018
				S.S	R.F


MASS PLANTING TO BOUNDARY REFERS TO LANDSCAPE PLAN
DECO-GRANITE PATH REFERS TO DETAIL
2.1m HIGH TIMBER ACOUSTIC FENCE WITH 1M CANTILEVER AT 45° TO ENG'S DETAILS
PLAY LAWN MOWER TO BE NOM. BY CLIENT-REFERS TO SAMPLE IMAGE
2.1M HIGH TIMBER ACOUSTIC FENCE TO ENG'S DETAILS
RL 80.24
RL 80.32
RL 80.32
RL 81.05
RL 80.39
SECTION A-A
SCALE: N.T.S
MASS PLANTING TO BOUNDARY REFERS TO LANDSCAPE PLAN
DECO-GRANITE PATH REFERS TO DETAIL
2.1m HIGH TIMBER ACOUSTIC FENCE WITH 1M CANTILEVER AT 45° TO ENG'S DETAILS
PLAY GAS STATION-REFER SAMPLE IMAGE
2.1M HIGH TIMBER ACOUSTIC FENCE TO ENG'S DETAILS
RL 81.355
RL 80.355
RL 79.330
SECTION B-B
SCALE: N.T.S
ARTHA ARCHITECTS
Concept Landscape Architects
PARRAMATTA
YANNA GUO
A 23.08.18 Preliminary DA prepared for review
B 21.02.20 For S34 review
PROPOSED CHILDCARE CENTRE DEVELOPMENT
21-23 NORFOLK RD
EPPING
SECTIONS
SECTION 34
AUGUST 2018
LPS34 19 - 47
6
S.S
R.F

21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE

STORMWATER CONCEPT PLANS - DEVELOPMENT APPLICATION

STORMWATER NOTES

1. CONTRACTOR MUST VERIFY ALL DIMENSIONS & EXISTING LEVELS, SERVICES & STRUCTURES ON SITE PRIOR TO COMMENCEMENT OF WORK.
2. THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED ARCHITECTURAL, LANDSCAPE, STRUCTURAL, HYDRAULIC, & OTHER SERVICES DRAWINGS & SPECIFICATIONS. IF THERE EXISTS AND DISCREPANCIES BETWEEN THE DRAWINGS, THE BUILDER SHALL REPORT THE DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCEMENT OF ANY WORKS.
3. EQUIVALENT STRENGTH REINFORCED CONCRETE PIPES MAY BE USED.
4. WHERE SUBSOIL DRAINAGE LINES PASS UNDER FLOOR SLABS & VEHICULAR PAVEMENTS, UNSLOTTED uPVC SEWER GRADE PIPE SHALL BE USED.
5. CHARGED LINES TO BE SEWER GRADE & SEALED.
6. ALL PIPES TO HAVE MIN 150mm COVER IF LOCATED WITHIN PROPERTY.
7. ALL PITS IN DRIVEWAYS TO BE CONCRETE & ALL PITS IN LANDSCAPED AREAS TO BE PLASTIC.
8. PITS LESS THAN 600mm DEEP MAY BE BRICK, PRECAST OR CONCRETE.
9. ALL BALCONIES & ROOFS TO BE DRAINED & TO HAVE SAFETY OVERFLOWS IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS.
10. ALL GRATES TO HAVE CHILD PROOF LOCKS.
11. ALL DRAINAGE WORKS TO AVID TREE ROOTS.
12. ALL DOWNPIPES & GUTTERS TO HAVE LEAF GUARDS.
13. COUNCIL'S ISSUED FOOTWAY DESIGN LEVELS TO BE INCORPORATED INTO THE FINISHED LEVELS ONCE ISSUED BY COUNCIL.
14. ALL WORKS SHALL BE IN ACCORDANCE WITH B.C.A. & A.S.3500.3.
15. CARE TO BE TAKEN AROUND EXISTING SEWER. STRUCTURAL ADVICE REQUIRED FOR SEWER PROTECTION AGAINST ADDITIONAL LOADING FROM NEW PITS, PIPES, RETAINING WALLS & OSD BASIN WATER LEVELS.
16. ALL Ø300 DRAINAGE PIPES & LARGER SHALL BE CLASS 2 APPROVED SPIGOT & SOCKET RCP PIPES WITH RUBBER RING JOINTS (U.N.O.). ALL DRAINAGE PIPES UP TO & INCLUDING Ø225 SHALL BE SEWER GRADE uPVC WITH SOLVENT WELD JOINTS (U.N.O.).
17. EQUIVALENT STRENGTH FRC PIPES MAY BE USED.
18. ALL PIPE JUNCTIONS, BENDS & TAPERS UP TO & INCLUDING Ø450 SHALL BE VIA PURPOSE MADE FITTINGS.
19. CONTRACTOR TO SUPPLY & INSTALL ALL FITTINGS & SPECIALS INCLUDING VARIOUS PIPE ADAPTORS TO ENSURE PROPER CONNECTION BETWEEN DISSIMILAR PIPE WORK.
20. ALL CONNECTIONS TO EXISTING DRAINAGE PITS SHALL BE MADE IN A TRADESMAN-LIKE MANNER, & THE INTERNAL WALL OF THE PIT AT THE POINT OF ENTRY SHALL BE CEMENT RENDERED TO ENSURE A SMOOTH FINISH.
21. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIN. 50mm CONCRETE BED (OR 75mm THICK BED OF 12mm BLUE METAL) UNDER THE BARREL OF THE PIPE. THE PIPE COLLAR AT NO POINT SHALL BEAR ON THE ROCK. IN OTHER THAN ROCK, PIPES SHALL BE LAID ON A 75mm THICK SAND BED. IN ALL CASES, BACKFILL THE TRENCH WITH SAND TO 200mm ABOVE THE PIPE. WHERE THE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH WITH SAND OR APPROVED GRANULAR BACKFILL COMPACTED IN 150mm LAYERS TO 98% STANDARD MAX. DRY DENSITY.
22. BEDDING SHALL BE TYPE H1 (U.N.O.), IN ACCORDANCE WITH CURRENT RELEVANT AUSTRALIAN STANDARDS.
23. WHERE STORMWATER LINES PASS UNDER FLOOR SLABS, SEWER GRADE RUBBER RING JOINTS ARE TO BE USED.
24. ALL PIPES IN BALCONIES TO BE Ø65 uPVC CAST IN CONCRETE SLAB.
25. Ø65 PVC @ MIN 1.0% Ø90 PVC @ MIN 1.0% Ø100 PVC @ MIN 1.0%
Ø150 PVC @ MIN 1.0% Ø225 PVC @ MIN 0.5% Ø300 PVC @ MIN 0.4%
UNLESS NOTED OTHERWISE
26. CONTRACTOR TO PROVIDE A BREAK / OPEN VOID IN RAIL / BALLUSTRADE FOR STORMWATER EMERGENCY OVERFLOW.
27. ALL ENCLOSED AREAS/PLANTER BOXES BE FITTED WITH FLOOR WASTES & TO DRAINED TO OSD.
28. DOWNPIPES TO BE CHECKED BY ARCHITECT & PLUMBER PRIOR TO CONSTRUCTION .
29. PROVIDE 3.0m LENGTH OF Ø100 SUBSOIL DRAINAGE PIPE WRAPPED IN FABRIC SOCK, AT UPSTREAM END OF EACH PIT.
30. ALL THE CLEANING EYES (OR INSPECTION EYES) FOR THE UNDERGROUND PIPES HAVE TO BE TAKEN UP TO THE FINISHED GROUND LEVEL FOR EASY IDENTIFICATION & MAINTENANCE PURPOSES.
31. ALL SUB-SOIL DRAINAGE SHALL BE A MIN OF Ø65 & SHALL BE PROVIDED WITH A FILTER SOCK. THE SUBSOIL DRAINAGE SHALL BE INSTALLED IN ACCORDANCE WITH DETAILS TO BE PROVIDED BY THE LANDSCAPE ARCHITECT.
32. PRIOR TO COMMENCING ANY WORKS, THE BUILDER SHALL ENSURE THAT THE INVERT LEVELS OF WHERE THE SITE STORMWATER SYSTEM CONNECTS INTO THE COUNCILS KERB/DRAINAGE SYSTEM MATCHED THE DESIGN LEVELS. ANY DISCREPANCIES SHALL BE REPORTED TO THE DESIGN ENGINEER IMMEDIATELY.

DRAWING INDEX

Drawing No.	DESCRIPTION
MBR18019 - 000	COVER SHEET, NOTES & DRAWING INDEX
MBR18019 - 101	STORMWATER CONCEPT PLAN - BASEMENT LEVEL
MBR18019 - 102	STORMWATER CONCEPT PLAN - GROUND LEVEL
MBR18019 - 103	OSD & WSUD CATCHMENT AREAS
MBR18019 - 104	OSD + WSUD DETAILS & CALCULATION SHEETS SHEET 1 OF 3
MBR18019 - 105	OSD + WSUD DETAILS & CALCULATION SHEETS SHEET 2 OF 3
MBR18019 - 106	OSD + WSUD DETAILS & CALCULATION SHEETS SHEET 3 OF 3
MBR18019 - 107	SEDIMENT & EROSION CONTROL PLAN
MBR18019 - 108	CUT-FILL PLAN
MBR18019 - 109	UPSTREAM CATCHMENT ANALYSIS SHEET 1 OF 2
MBR18019 - 110	UPSTREAM CATCHMENT ANALYSIS SHEET 2 OF 2
MBR18019 - 111	MISCELLANEOUS DETAILS SHEET

SITEWORKS NOTES

1. ORIGIN OF LEVELS : AUSTRALIAN HEIGHT DATUM (A.H.D.)
2. CONTRACTOR MUST VERIFY ALL DIMENSIONS & EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK.
3. ALL WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS, THE SPECIFICATIONS & THE DIRECTIONS OF THE PRINCIPAL'S REPRESENTATIVE.
4. EXISTING SERVICES HAVE BEEN PLOTTED FROM SUPPLIED DATA & AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LOCATION & LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE PRINCIPAL'S REPRESENTATIVE. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
5. WHERE NEW WORKS ABUT EXISTING, THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS OBTAINED.
6. THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR.
7. CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER COMMUNICATIONS OR ELECTRICAL SERVICES. HAND EXCAVATE IN THESE AREAS.
8. ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACKFILLED WITH AN APPROVED NON-NATURAL GRANULAR MATERIAL & COMPACTED TO 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289.5.1.1.
9. ALL TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.
10. ON COMPLETION OF PIPE INSTALLATION, ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL & GRASSED AREAS & ROAD PAVEMENTS.
11. PROVIDE 12mm WIDE EXPANDING CORK JOINTS BETWEEN CONCRETE PAVEMENTS & ALL BUILDINGS , WALLS, FOOTINGS, COLUMNS, KERBS, DISH DRAINS, GRATED DRAINS, BOLLARD FOOTINGS ETC
12. CONTRACTOR TO OBTAIN ALL AUTHORITY APPROVALS.
13. ALL BATTERS TO BE GRASSED LINED WITH MIN 100mm TOPSOIL & APPROVED COUCH LAID AS TURF.
14. MAKE SMOOTH TRANSITION TO EXISTING SERVICES & MAKE GOOD.
15. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY DIVERSION DRAINS & MOUNDS TO ENSURE THAT, AT ALL TIMES, EXPOSED SURFACES ARE FREE DRAINING & WHERE NECESSARY, EXCAVATE SUMPS & PROVIDE PUMPING EQUIPMENT TO DRAIN EXPOSED AREAS.
16. THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED ARCHITECTURAL, LANDSCAPE, STRUCTURAL, HYDRAULIC & ELECTRICAL DRAWINGS & SPECIFICATIONS. IF THERE EXISTS AND DISCREPANCIES BETWEEN THE DRAWINGS, THE BUILDER SHALL REPORT THE DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCEMENT OF ANY WORKS.
17. TRENCHES THROUGH EXISTING ROAD & CONCRETE PAVEMENTS SHALL BE SAWCUT TO FULL DEPTH OF CONCRETE & A MIN 50mm IN BITUMINOUS PAVING.
18. ALL BRANCH GAS & WATER SERVICES UNDER DRIVEWAYS & BRICK PAVING SHALL BE LOCATED IN Ø90 uPVC SEWER GRADE CONDUITS EXTENDING A MIN OF 500mm PAST PAVING.
19. ALL WORKS WITHIN COUNCIL RESERVE TO BE INSPECTED BY COUNCIL PRIOR TO CONSTRUCTION.
20. COUNCIL'S ISSUED FOOTWAY DESIGN LEVELS TO BE INCORPORATED INTO THE FINISHED LEVELS ONCE ISSUED BY COUNCIL.

LOCALITY PLAN
N.T.S

PERSPECTIVE PLAN
N.T.S

DIAL BEFORE YOU DIG NOTE

DIAL BEFORE YOU DIG www.1100.com.au

THE CONTRACTOR MUST CONTACT ALL SERVICES & MAINTAIN A SET OF 'DIAL BEFORE YOU DIG' DRAWINGS ON SITE AT ALL TIMES.

EROSION & SEDIMENT CONTROL NOTES

GENERAL INSTRUCTIONS:

E1. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE ENGINEERING PLANS, & ANY OTHER PLANS OR WRITTEN INSTRUCTIONS THAT MAY BE ISSUED & RELATING TO DEVELOPMENT AT THE SUBJECT SITE.

E2. THE SITE SUPERINTENDENT WILL ENSURE THAT ALL SOIL & WATER MANAGEMENT WORKS ARE LOCATED AS INSTRUCTED IN THIS SPECIFICATION

E3. ALL BUILDERS & SUB-CONTRACTORS WILL BE INFORMED OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION & POLLUTION TO DOWNSLOPE LANDS & WATERWAYS.

CONSTRUCTION SEQUENCE:

E4. THE SOIL EROSION POTENTIAL ON THIS SITE SHALL BE MINIMISED. HENCE, WORKS SHALL BE UNDERTAKEN IN THE FOLLOWING SEQUENCE :

a. INSTALL SEDIMENT FENCES, TEMPORARY CONSTRUCTION EXIT & SANDBAG KERB INLET SEDIMENT TRAP.
b. UNDERTAKE SITE DEVELOPMENT WORKS IN ACCORDANCE WITH THE ENGINEERING PLANS. PHASE DEVELOPMENT SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF WORKABLE SIZE.

EROSION CONTROL:

E5. DURING WINDY CONDITIONS, LARGE, UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL.

E6. FINAL SITE LANDSCAPING WILL BE UNDERTAKEN AS SOON AS POSSIBLE & WITHIN 20 WORKING DAYS FROM COMPLETION OF CONSTRUCTION ACTIVITIES.

FENCING:

E7. STOCKPILES WILL NOT BE LOCATED WITHIN 2m OF HAZARD AREAS, INCLUDING LIKELY AREAS OF CONCENTRATED OR HIGH VELOCITY FLOWS SUCH AS WATERWAYS. WHERE THEY ARE BETWEEN 2 & 5m FROM SUCH AREAS, SPECIAL SEDIMENT CONTROL MEASURES SHOULD BE TAKEN TO MINIMISE POSSIBLE POLLUTION TO DOWNSLOPE WATERS, E.G. THROUGH INSTALLATION OF SEDIMENT FENCING.

E8. ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) WILL BE REMOVED AS SOON AS POSSIBLE & WITHIN 10 WORKING DAYS FROM PLACEMENT.

E9. WATER WILL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS IT IS RELATIVELY SEDIMENT FREE, I.E. THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR ANY LIKELY SEDIMENT HAS BEEN FILTERED THROUGH AN APPROVED STRUCTURE.

E10. TEMPORARY SOIL & WATER MANAGEMENT STRUCTURES WILL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE REHABILITATED.

OTHER MATTERS:

E11. ACCEPTABLE RECEPTORS WILL BE PROVIDED FOR CONCRETE & MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS & LITTER.

E12. RECEPTORS FOR CONCRETE & MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS & LITTER ARE TO BE EMPTIED AS NECESSARY. DISPOSAL OF WASTE SHALL BE IN A MANNER APPROVED BY THE SITE SUPERINTENDENT.

SITE INSPECTION & MAINTENANCE:

E13. EROSION & SEDIMENT CONTROL MEASURES SHALL BE INSPECTED AFTER RAINFALL EVENTS TO ENSURE THAT THEY OPERATE EFFECTIVELY. REPAIR & OR MAINTENANCE SHALL BE UNDERTAKEN AS REQUIRED.

NOT FOR CONSTRUCTION
DA APPROVAL ONLY

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www.mbrconsulting.com.au
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ALL PLANS MUST BE PRINTED IN COLOUR & READ PRIOR TO CONSTRUCTION

Issue	Description	Date	Design	Check
B	ARCHITECTURAL AMENDMENTS	24/09/2018	MBR	KE
C	ARCHITECTURAL AMENDMENTS	28/03/2019	MBR	KE
D	ARCHITECTURAL AMENDMENTS	03/03/2020	MBR	KE
E	MINOR AMENDMENTS	19/05/2020	MBR	KE
F	MINOR AMENDMENTS	10/06/2020	MBR	KE

ARTIVA ARCHITECTS

CITY OF PARRAMATTA

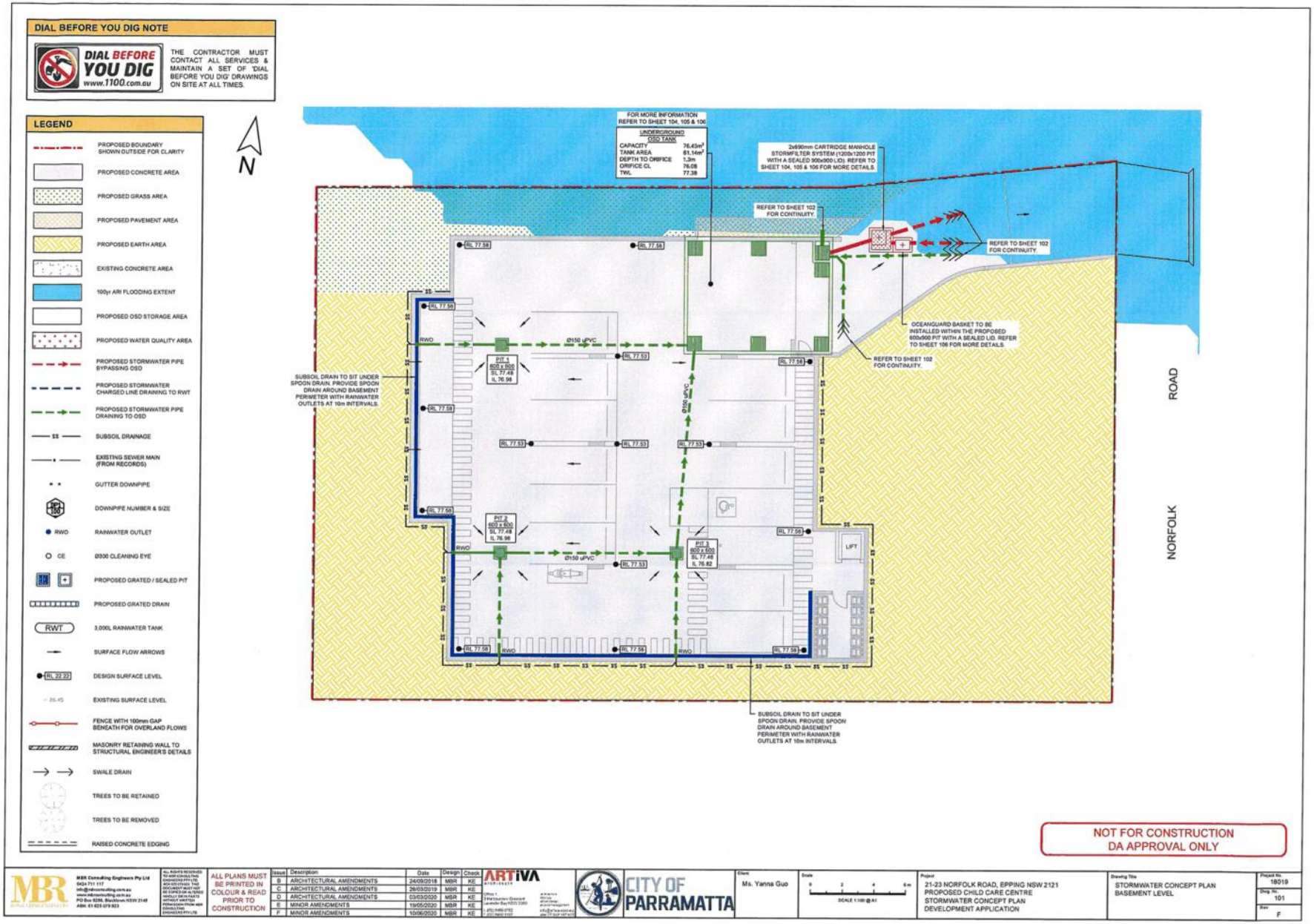
Client: Ms. Yanna Guo

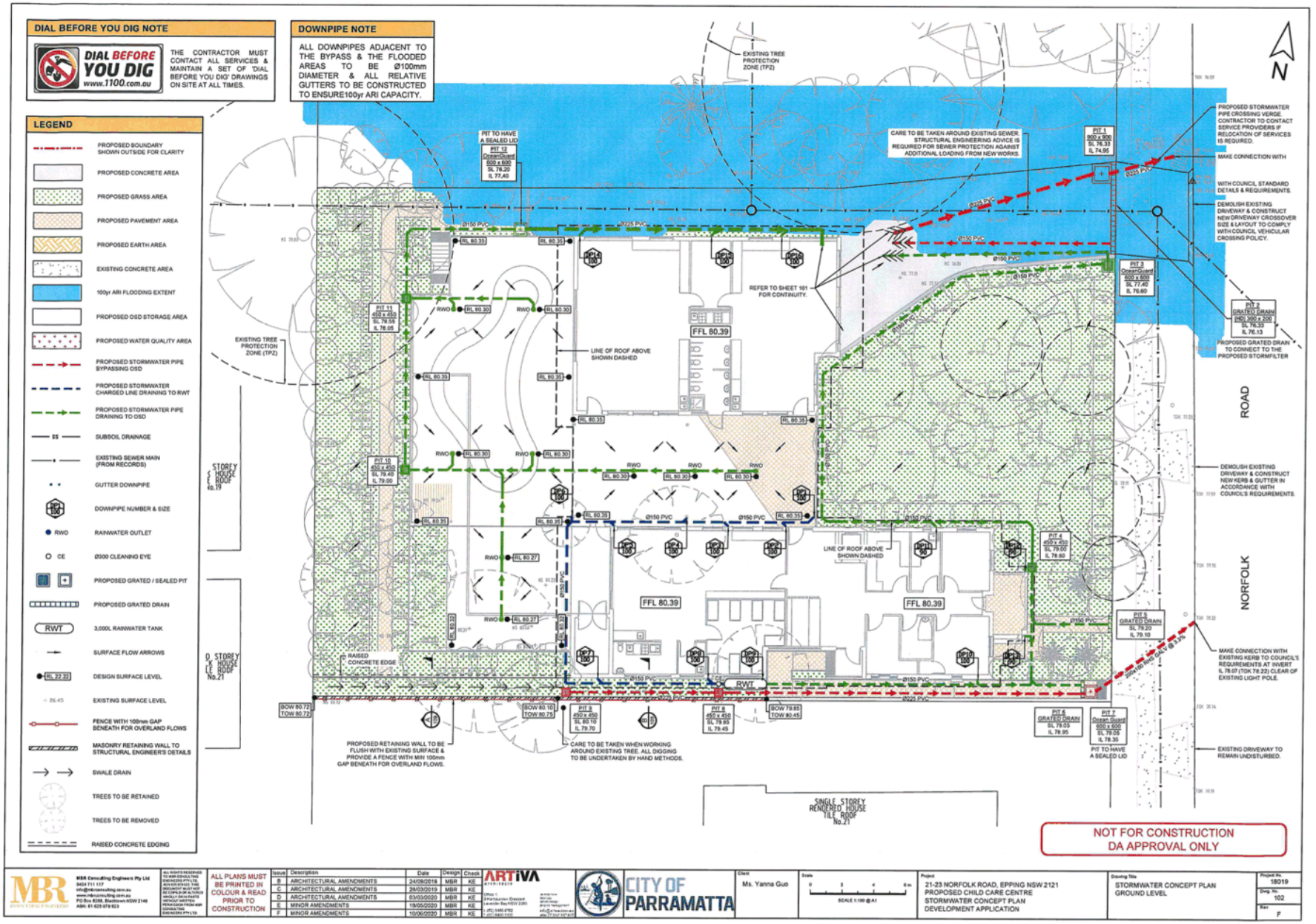
Scale:

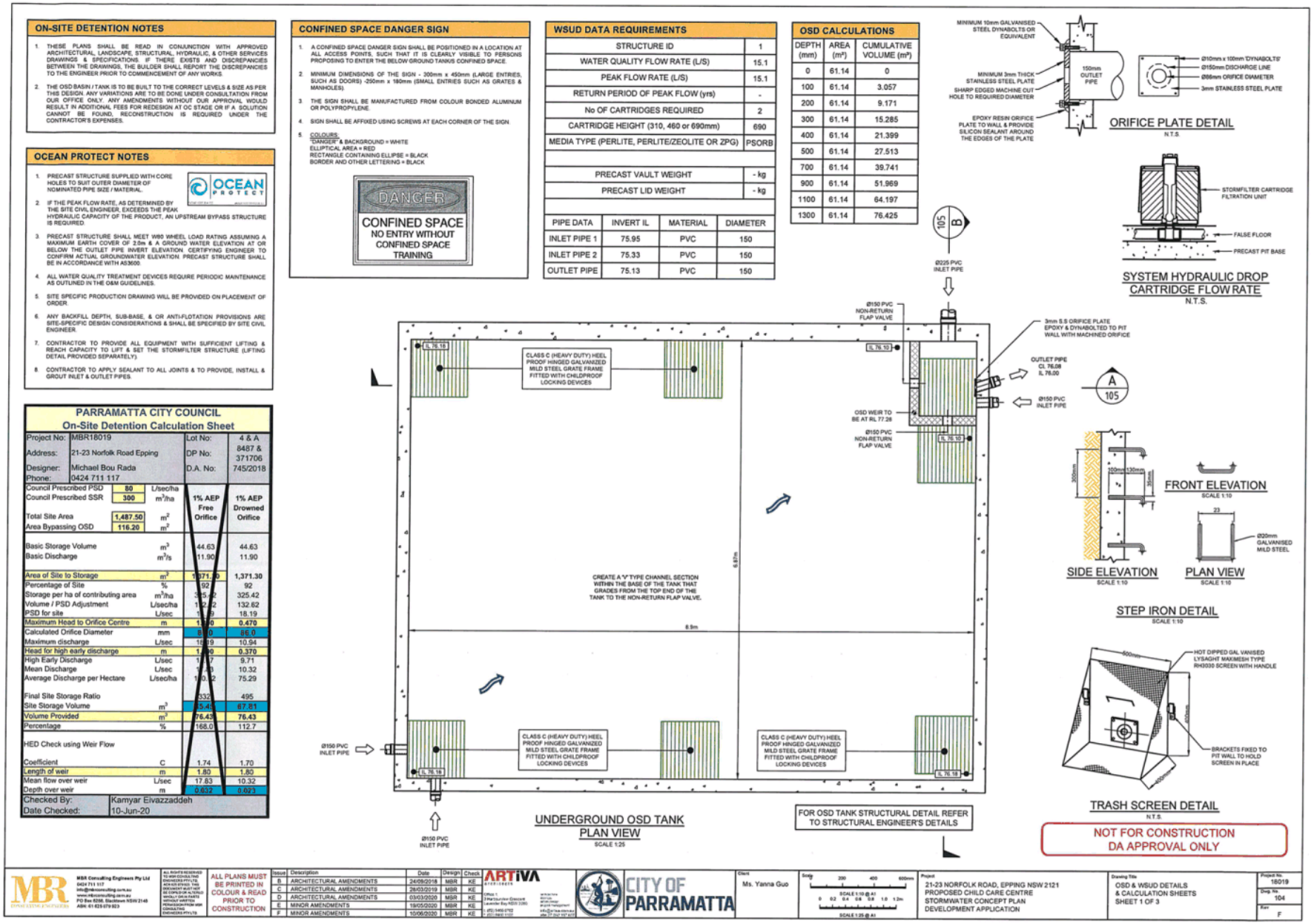
Project: 21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title: COVER SHEET, NOTES & DRAWING INDEX

Project No.: 18019
Dwg No.: 000
Rev: F


DIAL BEFORE YOU DIG NOTE
DIAL BEFORE YOU DIG www.1100.com.au
THE CONTRACTOR MUST CONTACT ALL SERVICES & MAINTAIN A SET OF 'DIAL BEFORE YOU DIG' DRAWINGS ON SITE AT ALL TIMES.
LEGEND
PROPOSED BOUNDARY SHOWN OUTSIDE FOR CLARITY
PROPOSED CONCRETE AREA
PROPOSED GRASS AREA
PROPOSED PAVEMENT AREA
PROPOSED EARTH AREA
EXISTING CONCRETE AREA
100yr ARI FLOODING EXTENT
PROPOSED OSD STORAGE AREA
PROPOSED WATER QUALITY AREA
PROPOSED STORMWATER PIPE BYPASSING OSD
PROPOSED STORMWATER CHARGED LINE DRAINING TO RWT
PROPOSED STORMWATER PIPE DRAINING TO OSD
SUBSOIL DRAINAGE
EXISTING SEWER MAIN (FROM RECORDS)
GUTTER DOWNPIPE
DOWNPIPE NUMBER & SIZE
RWO RAINWATER OUTLET
CE Ø300 CLEANING EYE
PROPOSED GRATED / SEALED PIT
PROPOSED GRATED DRAIN
RWT 3,000L RAINWATER TANK
SURFACE FLOW ARROWS
RL 22.22 DESIGN SURFACE LEVEL
EXISTING SURFACE LEVEL
FENCE WITH 100mm GAP BENEATH FOR OVERLAND FLOWS
MASONRY RETAINING WALL TO STRUCTURAL ENGINEER'S DETAILS
SWALE DRAIN
TREES TO BE RETAINED
TREES TO BE REMOVED
RAISED CONCRETE EDGING
N
FOR MORE INFORMATION REFER TO SHEET 104, 105 & 106
UNDERGROUND OSD TANK
CAPACITY 76.43m³
TANK AREA 61.14m²
DEPTH TO ORIFICE 1.3m
ORIFICE CL 76.08
TWL 77.38
2x690mm CARTRIDGE MANHOLE STORMFILTER SYSTEM (1200x1200 PIT WITH A SEALED 900x900 LID). REFER TO SHEET 104, 105 & 106 FOR MORE DETAILS.
REFER TO SHEET 102 FOR CONTINUITY.
OCEANGUARD BASKET TO BE INSTALLED WITHIN THE PROPOSED 600x900 PIT WITH A SEALED LID. REFER TO SHEET 106 FOR MORE DETAILS.
SUBSOIL DRAIN TO SIT UNDER SPOON DRAIN. PROVIDE SPOON DRAIN AROUND BASEMENT PERIMETER WITH RAINWATER OUTLETS AT 10m INTERVALS.
PIT 1 600 x 600 SL 77.48 IL 76.98
PIT 2 600 x 600 SL 77.48 IL 76.98
PIT 3 600 x 600 SL 77.46 IL 76.82
Ø150 uPVC
RWO
LIFT
ROAD
NORFOLK
NOT FOR CONSTRUCTION DA APPROVAL ONLY
ALL PLANS MUST BE PRINTED IN COLOUR & READ PRIOR TO CONSTRUCTION
Issue Description Date Design Check
B ARCHITECTURAL AMENDMENTS 24/09/2018 MBR KE
C ARCHITECTURAL AMENDMENTS 26/03/2019 MBR KE
D ARCHITECTURAL AMENDMENTS 03/03/2020 MBR KE
E MINOR AMENDMENTS 19/05/2020 MBR KE
F MINOR AMENDMENTS 10/06/2020 MBR KE
ARTiVA
CITY OF PARRAMATTA
Client Ms. Yanna Guo
Scale SCALE 1:100 @ A1
Project 21-23 NORFOLK ROAD, EPPING NSW 2121 PROPOSED CHILD CARE CENTRE STORMWATER CONCEPT PLAN DEVELOPMENT APPLICATION
Drawing Title STORMWATER CONCEPT PLAN BASEMENT LEVEL
Project No. 18019
Dwg. No. 101
Rev. F


DIAL BEFORE YOU DIG NOTE
DIAL BEFORE YOU DIG www.1100.com.au
THE CONTRACTOR MUST CONTACT ALL SERVICES & MAINTAIN A SET OF 'DIAL BEFORE YOU DIG' DRAWINGS ON SITE AT ALL TIMES.
DOWNPIPE NOTE
ALL DOWNPIPES ADJACENT TO THE BYPASS & THE FLOODED AREAS TO BE Ø100mm DIAMETER & ALL RELATIVE GUTTERS TO BE CONSTRUCTED TO ENSURE100yr ARI CAPACITY.
LEGEND
PROPOSED BOUNDARY SHOWN OUTSIDE FOR CLARITY
PROPOSED CONCRETE AREA
PROPOSED GRASS AREA
PROPOSED PAVEMENT AREA
PROPOSED EARTH AREA
EXISTING CONCRETE AREA
100yr ARI FLOODING EXTENT
PROPOSED OSD STORAGE AREA
PROPOSED WATER QUALITY AREA
PROPOSED STORMWATER PIPE BYPASSING OSD
PROPOSED STORMWATER CHARGED LINE DRAINING TO RWT
PROPOSED STORMWATER PIPE DRAINING TO OSD
SUBSOIL DRAINAGE
EXISTING SEWER MAIN (FROM RECORDS)
GUTTER DOWNPIPE
DOWNPIPE NUMBER & SIZE
RWO RAINWATER OUTLET
CE Ø300 CLEANING EYE
PROPOSED GRATED / SEALED PIT
PROPOSED GRATED DRAIN
RWT 3,000L RAINWATER TANK
SURFACE FLOW ARROWS
RL 22.22 DESIGN SURFACE LEVEL
26.45 EXISTING SURFACE LEVEL
FENCE WITH 100mm GAP BENEATH FOR OVERLAND FLOWS
MASONRY RETAINING WALL TO STRUCTURAL ENGINEER'S DETAILS
SWALE DRAIN
TREES TO BE RETAINED
TREES TO BE REMOVED
RAISED CONCRETE EDGING
N
EXISTING TREE PROTECTION ZONE (TPZ)
PIT TO HAVE A SEALED LID
PIT 12 OceanGuard 600 x 600 SL 78.20 IL 77.40
CARE TO BE TAKEN AROUND EXISTING SEWER. STRUCTURAL ENGINEERING ADVICE IS REQUIRED FOR SEWER PROTECTION AGAINST ADDITIONAL LOADING FROM NEW WORKS.
PIT 1 900 x 900 SL 76.33 IL 74.95
PROPOSED STORMWATER PIPE CROSSING VERGE. CONTRACTOR TO CONTACT SERVICE PROVIDERS IF RELOCATION OF SERVICES IS REQUIRED.
MAKE CONNECTION WITH
WITH COUNCIL STANDARD DETAILS & REQUIREMENTS.
DEMOLISH EXISTING DRIVEWAY & CONSTRUCT NEW DRIVEWAY CROSSOVER SIZE & LAYOUT TO COMPLY WITH COUNCIL VEHICULAR CROSSING POLICY.
Ø150 PVC
Ø225 PVC
REFER TO SHEET 101 FOR CONTINUITY.
PIT 3 OceanGuard 600 x 600 SL 77.40 IL 76.60
PIT 2 GRATED DRAIN (HD) 300 x 200 SL 76.33 IL 76.13
PROPOSED GRATED DRAIN TO CONNECT TO THE PROPOSED STORMFILTER
ROAD
PIT 11 450 x 450 SL 78.55 IL 78.05
EXISTING TREE PROTECTION ZONE (TPZ)
LINE OF ROOF ABOVE SHOWN DASHED
FFL 80.39
PIT 10 450 x 450 SL 79.40 IL 79.00
STOREY HOUSE ROOF No.19
DEMOLISH EXISTING DRIVEWAY & CONSTRUCT NEW KERB & GUTTER IN ACCORDANCE WITH COUNCIL'S REQUIREMENTS.
PIT 4 450 x 450 SL 79.00 IL 78.60
NORFOLK
FFL 80.39
FFL 80.39
PIT 5 GRATED DRAIN SL 79.20 IL 79.10
RAISED CONCRETE EDGE
RWT
MAKE CONNECTION WITH EXISTING KERB TO COUNCIL'S REQUIREMENTS AT INVERT IL 78.07 (TOK 78.22) CLEAR OF EXISTING LIGHT POLE.
BOW 80.72 TOW 80.72
PIT 9 450 x 450 SL 80.10 IL 79.70
PIT 8 450 x 450 SL 79.95 IL 79.45
BOW 80.10 TOW 80.75
BOW 79.85 TOW 80.45
PIT 6 GRATED DRAIN SL 78.05 IL 78.95
PIT 7 Ocean Guard 600 x 600 SL 79.05 IL 78.35
PIT TO HAVE A SEALED LID
EXISTING DRIVEWAY TO REMAIN UNDISTURBED.
PROPOSED RETAINING WALL TO BE FLUSH WITH EXISTING SURFACE & PROVIDE A FENCE WITH MIN 100mm GAP BENEATH FOR OVERLAND FLOWS.
CARE TO BE TAKEN WHEN WORKING AROUND EXISTING TREE. ALL DIGGING TO BE UNDERTAKEN BY HAND METHODS.
SINGLE STOREY RENDERED HOUSE TILE ROOF No.21
NOT FOR CONSTRUCTION
DA APPROVAL ONLY
MBR Consulting Engineers Pty Ltd
ALL PLANS MUST BE PRINTED IN COLOUR & READ PRIOR TO CONSTRUCTION
Issue Description Date Design Check
B ARCHITECTURAL AMENDMENTS 24/08/2018 MBR KE
C ARCHITECTURAL AMENDMENTS 28/03/2019 MBR KE
D ARCHITECTURAL AMENDMENTS 03/03/2020 MBR KE
E MINOR AMENDMENTS 19/05/2020 MBR KE
F MINOR AMENDMENTS 10/06/2020 MBR KE
ARTiVA
CITY OF PARRAMATTA
Client: Ms. Yanna Guo
Scale: SCALE 1:100 @ A1
Project: 21-23 NORFOLK ROAD, EPPING NSW 2121 PROPOSED CHILD CARE CENTRE STORMWATER CONCEPT PLAN DEVELOPMENT APPLICATION
Drawing Title: STORMWATER CONCEPT PLAN GROUND LEVEL
Project No. 18019
Dwg. No. 102
Rev. F


ON-SITE DETENTION NOTES
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2. THE OSD BASIN / TANK IS TO BE BUILT TO THE CORRECT LEVELS & SIZE AS PER THIS DESIGN. ANY VARIATIONS ARE TO BE DONE UNDER CONSULTATION FROM OUR OFFICE ONLY. ANY AMENDMENTS WITHOUT OUR APPROVAL WOULD RESULT IN ADDITIONAL FEES FOR REDESIGN AT CC STAGE OR IF A SOLUTION CANNOT BE FOUND, RECONSTRUCTION IS REQUIRED UNDER THE CONTRACTOR'S EXPENSES.
OCEAN PROTECT NOTES
1. PRECAST STRUCTURE SUPPLIED WITH CORE HOLES TO SUIT OUTER DIAMETER OF NOMINATED PIPE SIZE / MATERIAL.
2. IF THE PEAK FLOW RATE, AS DETERMINED BY THE SITE CIVIL ENGINEER, EXCEEDS THE PEAK HYDRAULIC CAPACITY OF THE PRODUCT, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.
3. PRECAST STRUCTURE SHALL MEET W60 WHEEL LOAD RATING ASSUMING A MAXIMUM EARTH COVER OF 2.0m & A GROUND WATER ELEVATION AT OR BELOW THE OUTLET PIPE INVERT ELEVATION. CERTIFYING ENGINEER TO CONFIRM ACTUAL GROUNDWATER ELEVATION. PRECAST STRUCTURE SHALL BE IN ACCORDANCE WITH AS3600.
4. ALL WATER QUALITY TREATMENT DEVICES REQUIRE PERIODIC MAINTENANCE AS OUTLINED IN THE O&M GUIDELINES.
5. SITE SPECIFIC PRODUCTION DRAWING WILL BE PROVIDED ON PLACEMENT OF ORDER.
6. ANY BACKFILL DEPTH, SUB-BASE, & OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS & SHALL BE SPECIFIED BY SITE CIVIL ENGINEER.
7. CONTRACTOR TO PROVIDE ALL EQUIPMENT WITH SUFFICIENT LIFTING & REACH CAPACITY TO LIFT & SET THE STORMFILTER STRUCTURE (LIFTING DETAIL PROVIDED SEPARATELY).
8. CONTRACTOR TO APPLY SEALANT TO ALL JOINTS & TO PROVIDE, INSTALL & GROUT INLET & OUTLET PIPES.
OCEAN PROTECT
CONFINED SPACE DANGER SIGN
1. A CONFINED SPACE DANGER SIGN SHALL BE POSITIONED IN A LOCATION AT ALL ACCESS POINTS, SUCH THAT IT IS CLEARLY VISIBLE TO PERSONS PROPOSING TO ENTER THE BELOW GROUND TANKUS CONFINED SPACE.
2. MINIMUM DIMENSIONS OF THE SIGN - 300mm x 450mm (LARGE ENTRIES, SUCH AS DOORS) -250mm x 180mm (SMALL ENTRIES SUCH AS GRATES & MANHOLES).
3. THE SIGN SHALL BE MANUFACTURED FROM COLOUR BONDED ALUMINUM OR POLYPROPYLENE.
4. SIGN SHALL BE AFFIXED USING SCREWS AT EACH CORNER OF THE SIGN.
5. COLOURS:
"DANGER" & BACKGROUND = WHITE
ELLIPTICAL AREA = RED
RECTANGLE CONTAINING ELLIPSE = BLACK
BORDER AND OTHER LETTERING = BLACK
DANGER
CONFINED SPACE
NO ENTRY WITHOUT
CONFINED SPACE
TRAINING
WSUD DATA REQUIREMENTS
STRUCTURE ID 1
WATER QUALITY FLOW RATE (L/S) 15.1
PEAK FLOW RATE (L/S) 15.1
RETURN PERIOD OF PEAK FLOW (yrs) -
No OF CARTRIDGES REQUIRED 2
CARTRIDGE HEIGHT (310, 460 or 690mm) 690
MEDIA TYPE (PERLITE, PERLITE/ZEOLITE OR ZPG) PSORB
PRECAST VAULT WEIGHT - kg
PRECAST LID WEIGHT - kg
PIPE DATA | INVERT IL | MATERIAL | DIAMETER
INLET PIPE 1 | 75.95 | PVC | 150
INLET PIPE 2 | 75.33 | PVC | 150
OUTLET PIPE | 75.13 | PVC | 150
OSD CALCULATIONS
DEPTH (mm) | AREA (m²) | CUMULATIVE VOLUME (m³)
0 | 61.14 | 0
100 | 61.14 | 3.057
200 | 61.14 | 9.171
300 | 61.14 | 15.285
400 | 61.14 | 21.399
500 | 61.14 | 27.513
700 | 61.14 | 39.741
900 | 61.14 | 51.969
1100 | 61.14 | 64.197
1300 | 61.14 | 76.425
MINIMUM 10mm GALVANISED STEEL DYNABOLTS OR EQUIVALENT
MINIMUM 3mm THICK STAINLESS STEEL PLATE
SHARP EDGED MACHINE CUT HOLE TO REQUIRED DIAMETER
EPOXY RESIN ORIFICE PLATE TO WALL & PROVIDE SILICON SEALANT AROUND THE EDGES OF THE PLATE
150mm OUTLET PIPE
Ø10mm x 100mm 'DYNABOLTS'
Ø150mm DISCHARGE LINE
Ø86mm ORIFICE DIAMETER
3mm STAINLESS STEEL PLATE
ORIFICE PLATE DETAIL
N.T.S.
STORMFILTER CARTRIDGE FILTRATION UNIT
FALSE FLOOR
PRECAST PIT BASE
SYSTEM HYDRAULIC DROP CARTRIDGE FLOW RATE
N.T.S.
PARRAMATTA CITY COUNCIL
On-Site Detention Calculation Sheet
Project No: MBR18019
Address: 21-23 Norfolk Road Epping
Designer: Michael Bou Rada
Phone: 0424 711 117
Lot No: 4 & A
DP No: 8487 & 371706
D.A. No: 745/2018
Council Prescribed PSD 80 L/sec/ha
Council Prescribed SSR 300 m³/ha
Total Site Area 1,487.50 m²
Area Bypassing OSD 116.20 m²
1% AEP Free Orifice | 1% AEP Drowned Orifice
Basic Storage Volume 44.63 44.63 m³
Basic Discharge 11.90 11.90 m³/s
Area of Site to Storage 1,371.30 1,371.30 m³
Percentage of Site 92 92 %
Storage per ha of contributing area 325.42 325.42 m³/ha
Volume / PSD Adjustment 132.62 132.62 L/sec/ha
PSD for site 18.19 18.19 L/sec
Maximum Head to Orifice Centre 0.470 0.470 m
Calculated Orifice Diameter 86.0 86.0 mm
Maximum discharge 10.94 10.94 L/sec
Head for high early discharge 0.370 0.370 m
High Early Discharge 9.71 9.71 L/sec
Mean Discharge 10.32 10.32 L/sec
Average Discharge per Hectare 75.29 75.29 L/sec/ha
Final Site Storage Ratio 495
Site Storage Volume 67.81 m³
Volume Provided 76.43 76.43 m³
Percentage 112.7 %
HED Check using Weir Flow
Coefficient C 1.74 1.70
Length of weir 1.80 1.80 m
Mean flow over weir 17.83 10.32 L/sec
Depth over weir 0.032 0.023 m
Checked By: Kamyar Eivazzadeh
Date Checked: 10-Jun-20
Ø225 PVC INLET PIPE
Ø150 PVC NON-RETURN FLAP VALVE
3mm S.S ORIFICE PLATE EPOXY & DYNABOLTED TO PIT WALL WITH MACHINED ORIFICE
OUTLET PIPE Cl. 76.08 IL 76.00
Ø150 PVC INLET PIPE
OSD WEIR TO BE AT RL 77.26
Ø150 PVC NON-RETURN FLAP VALVE
CLASS C (HEAVY DUTY) HEEL PROOF HINGED GALVANIZED MILD STEEL GRATE FRAME FITTED WITH CHILDPROOF LOCKING DEVICES
CREATE A 'V' TYPE CHANNEL SECTION WITHIN THE BASE OF THE TANK THAT GRADES FROM THE TOP END OF THE TANK TO THE NON-RETURN FLAP VALVE.
6.87m
8.9m
Ø150 PVC INLET PIPE
Ø150 PVC INLET PIPE
UNDERGROUND OSD TANK PLAN VIEW
SCALE 1:25
FOR OSD TANK STRUCTURAL DETAIL REFER TO STRUCTURAL ENGINEER'S DETAILS
FRONT ELEVATION
SCALE 1:10
SIDE ELEVATION
SCALE 1:10
PLAN VIEW
SCALE 1:10
Ø20mm GALVANISED MILD STEEL
STEP IRON DETAIL
SCALE 1:10
HOT DIPPED GAL VANISED LYSAGHT MAXIMESH TYPE RH3030 SCREEN WITH HANDLE
BRACKETS FIXED TO PIT WALL TO HOLD SCREEN IN PLACE
TRASH SCREEN DETAIL
N.T.S.
NOT FOR CONSTRUCTION
DA APPROVAL ONLY
MBR Consulting Engineers Pty Ltd
0424 711 117
info@mbrconsulting.com.au
www.mbrconsulting.com.au
PO Box 8298, Blacktown NSW 2148
ABN: 61 625 079 823
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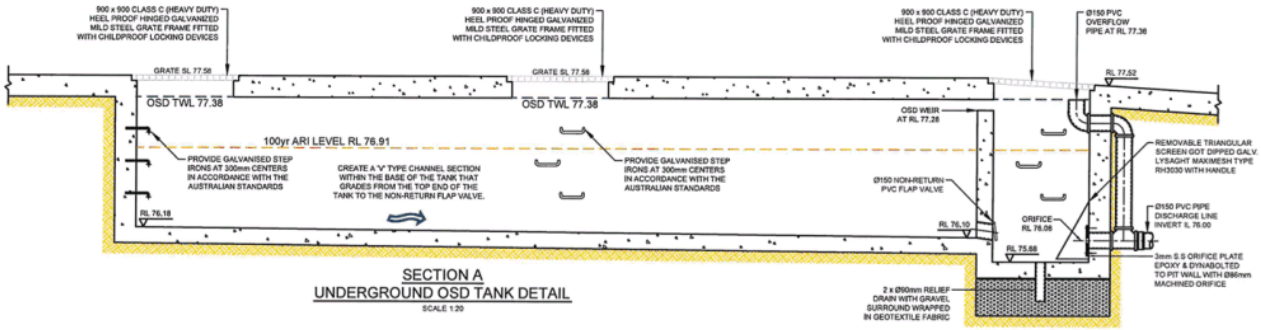
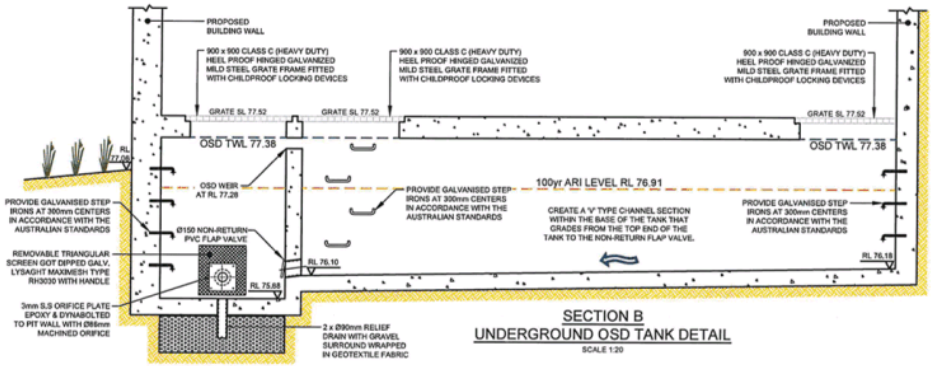
ARTIVA ARCHITECTS
CITY OF PARRAMATTA
Client: Ms. Yanna Guo
Scale: SCALE 1:10 @ A1
SCALE 1:25 @ A1
Project: 21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION
Drawing Title: OSD & WSUD DETAILS & CALCULATION SHEETS
SHEET 1 OF 3
Project No: 18019
Dwg. No: 104
Rev: F



SECTION A
UNDERGROUND OSD TANK DETAIL
SCALE 1:20



SECTION B
UNDERGROUND OSD TANK DETAIL
SCALE 1:20

DIAL BEFORE YOU DIG NOTE

DIAL BEFORE YOU DIG www.1100.com.au

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ON-SITE DETENTION NOTES

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CONFINED SPACE DANGER SIGN

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2. MINIMUM DIMENSIONS OF THE SIGN - 300mm x 450mm (LARGE ENTRIES, SUCH AS DOORS) -250mm x 180mm (SMALL ENTRIES SUCH AS GRATES & MANHOLES).
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5. COLOURS:
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   RECTANGLE CONTAINING ELLIPSE = BLACK
   BORDER AND OTHER LETTERING = BLACK

DANGER
CONFINED SPACE
NO ENTRY WITHOUT CONFINED SPACE TRAINING

OCEAN PROTECT NOTES

1. PRECAST STRUCTURE SUPPLIED WITH CORE HOLES TO SUIT OUTER DIAMETER OF NOMINATED PIPE SIZE / MATERIAL.
2. IF THE PEAK FLOW RATE, AS DETERMINED BY THE SITE CIVIL ENGINEER, EXCEEDS THE PEAK HYDRAULIC CAPACITY OF THE PRODUCT, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.
3. PRECAST STRUCTURE SHALL MEET W80 WHEEL LOAD RATING ASSUMING A MAXIMUM EARTH COVER OF 2.0m & A GROUND WATER ELEVATION AT OR BELOW THE OUTLET PIPE INVERT ELEVATION. CERTIFYING ENGINEER TO CONFIRM ACTUAL GROUNDWATER ELEVATION. PRECAST STRUCTURE SHALL BE IN ACCORDANCE WITH AS3600.
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8. CONTRACTOR TO APPLY SEALANT TO ALL JOINTS & TO PROVIDE, INSTALL & GROUT INLET & OUTLET PIPES.

SUBMERGED ORIFICE:
THE 100yr ARI LEVEL IN THE ADJACENT ROAD IS ASSUMED TO BE AT RL 76.91 MAKING THIS ORIFICE SUBMERGED.

DETENTION TANK:

MAX TANK DEPTH	1.3m
MIN TANK DEPTH	1.2m
AREA	68.0m²
VOLUME PROVIDED	85.0m³

FOR OSD TANK STRUCTURAL DETAIL REFER TO STRUCTURAL ENGINEER'S DETAILS

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0424 711 117
info@mbrconsulting.com.au
www.mbrconsulting.com.au
PO Box 8286, Blacktown NSW 2148
ABN: 61 625 079 923

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Issue	Description	Date	Design	Check
B	ARCHITECTURAL AMENDMENTS	24/09/2018	MBR	KE
C	ARCHITECTURAL AMENDMENTS	26/03/2019	MBR	KE
D	ARCHITECTURAL AMENDMENTS	03/03/2020	MBR	KE
E	MINOR AMENDMENTS	19/05/2020	MBR	KE
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ARTiVA architecture

CITY OF PARRAMATTA

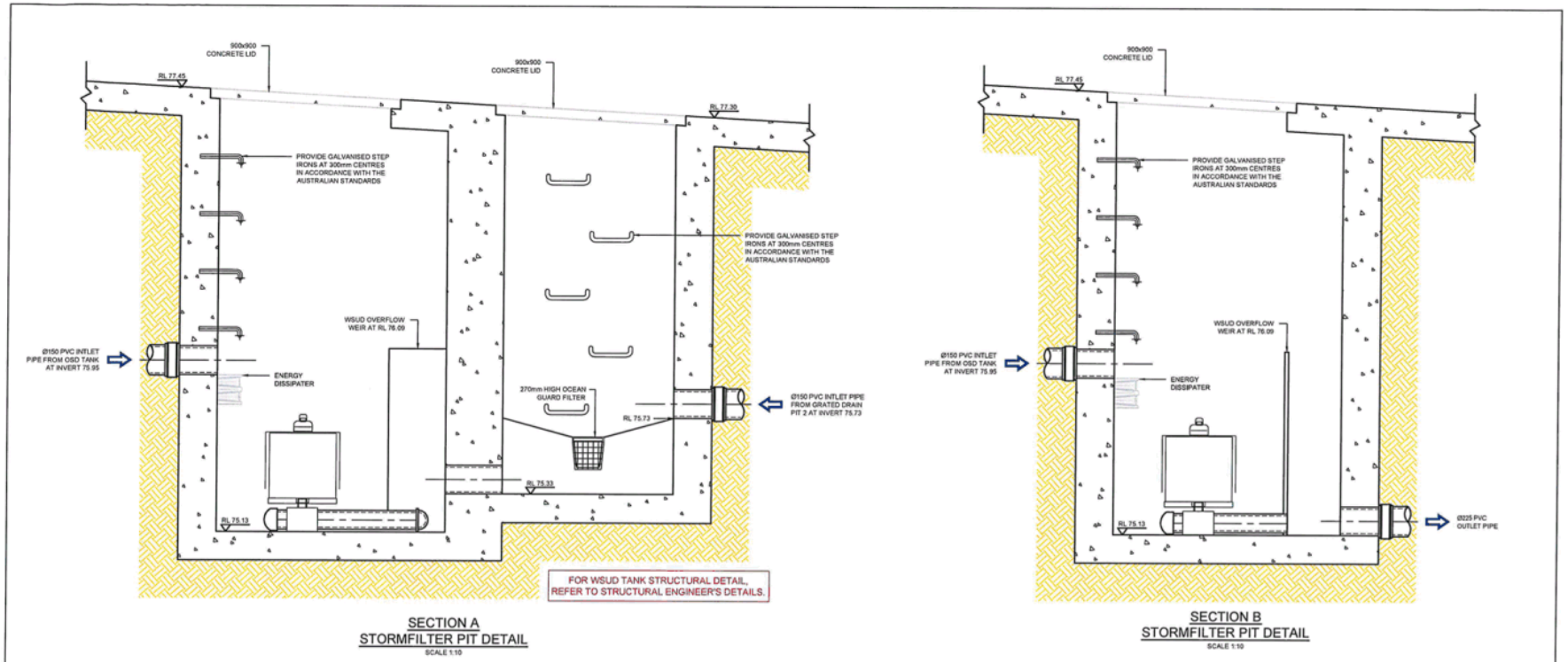
Client: Ms. Yanna Guo

Scale: SCALE 1:20 @ A1

Project: 21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title: OSD & WSUD DETAILS & CALCULATION SHEETS SHEET 2 OF 3

Project No. 18019
Dwg. No. 105
Rev F



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DANGER
CONFINED SPACE
NO ENTRY WITHOUT CONFINED SPACE TRAINING

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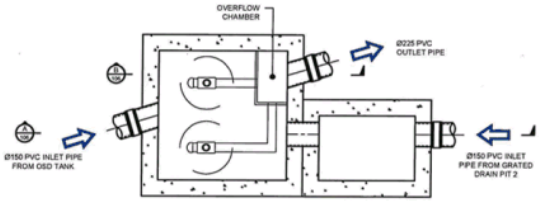
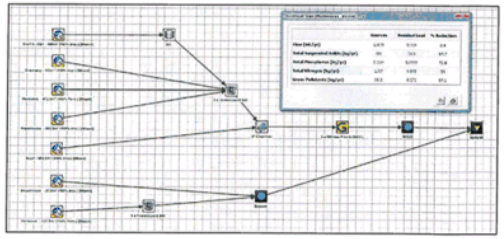
8. CONTRACTOR TO APPLY SEALANT TO ALL JOINTS & TO PROVIDE, INSTALL & GROUT INLET & OUTLET PIPES.



STORMFILTER MANHOLE
PLAN VIEW
SCALE 1:25



MUSIC MODEL RESULTS
N.T.S.

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ABN: 61 651 079 923

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B	ARCHITECTURAL AMENDMENTS	24/09/2018	MBR	KE
C	ARCHITECTURAL AMENDMENTS	28/03/2019	MBR	KE
D	ARCHITECTURAL AMENDMENTS	03/03/2020	MBR	KE
E	MINOR AMENDMENTS	19/05/2020	MBR	KE
F	MINOR AMENDMENTS	10/06/2020	MBR	KE

ARTiVA ARCHITECTS

CITY OF PARRAMATTA

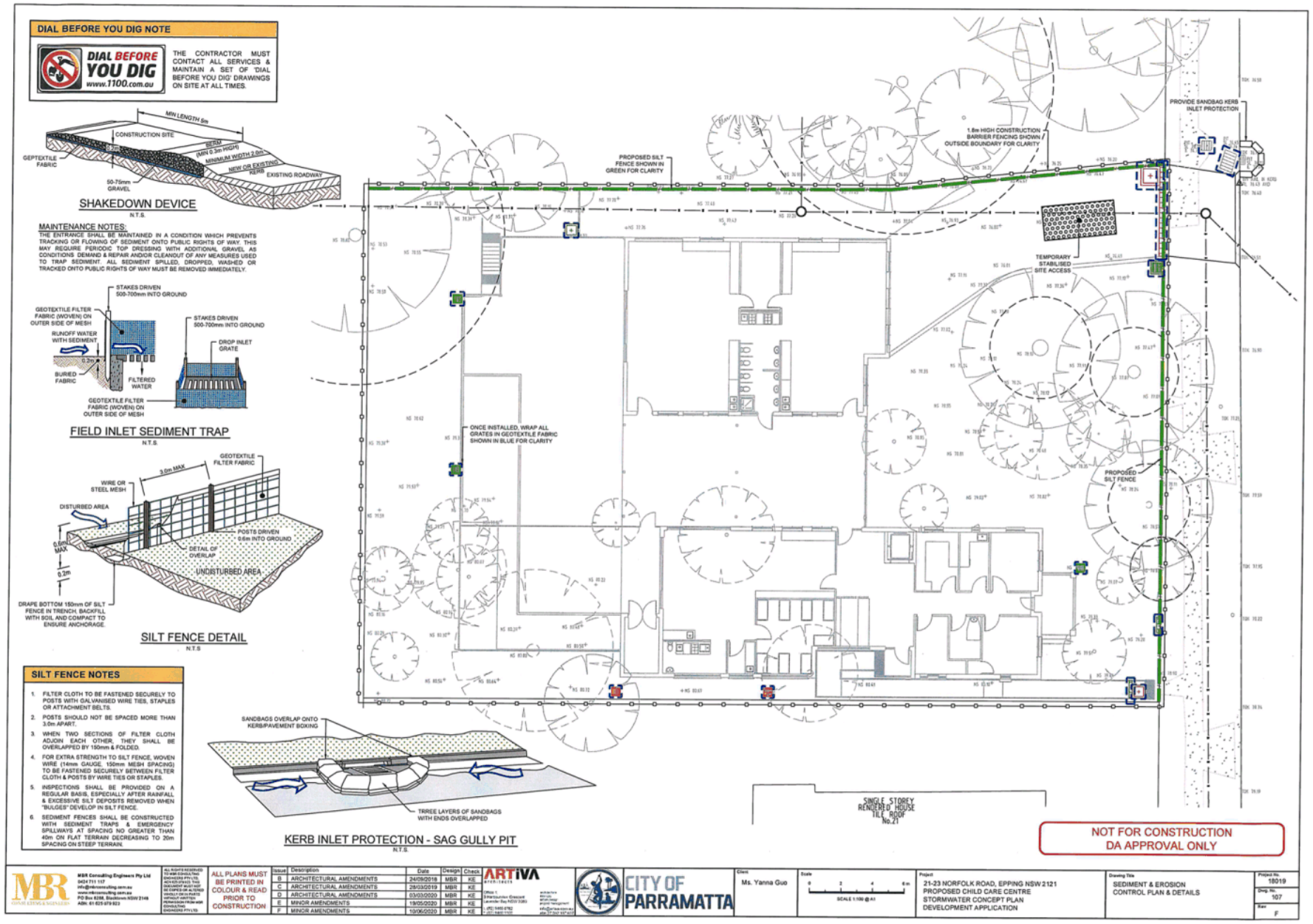
Client: Ms. Yanna Guo

Scale: SCALE 1:10 @ A1 / SCALE 1:25 @ A1

Project: 21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title: OSD & WSUD DETAILS & CALCULATION SHEETS SHEET 3 OF 3

Project No. 18019
Dwg. No. 106
Rev F



Issue	Description	Date	Design	Check
B	ARCHITECTURAL AMENDMENTS	24/09/2018	MBR	KE
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D	ARCHITECTURAL AMENDMENTS	03/03/2020	MBR	KE
E	MINOR AMENDMENTS	19/05/2020	MBR	KE
F	MINOR AMENDMENTS	10/06/2020	MBR	KE


DIAL BEFORE YOU DIG NOTE
DIAL BEFORE YOU DIG
www.1100.com.au
THE CONTRACTOR MUST CONTACT ALL SERVICES & MAINTAIN A SET OF 'DIAL BEFORE YOU DIG' DRAWINGS ON SITE AT ALL TIMES.
CUT-FILL NOTES
1. THE CUT & FILL VOLUMES ARE CALCULATED BASED OFF THE DIFFERENCE BETWEEN THE POST-DEVELOPMENT FINISHED SURFACE LEVELS & THE PRE-DEVELOPMENT EXISTING SURFACE LEVELS.
2. THE CUT VOLUMES ARE NEGATIVE & THE FILL VOLUMES ARE POSITIVE.
3. TOTAL CUT VOLUME = -1,399.8m³
TOTAL FILL VOLUME = 23.0m³
TOTAL BALANCE = -1,376.8m³
Cut (m)
2.00 & Above
1.50 - 2.00
1.00 - 1.50
0.50 - 1.00
0.01 - 0.50
0.01 & Below
Fill (m)
0.01 & Below
0.01 - 0.05
0.05 - 0.10
0.10 - 0.15
0.15 - 0.20
0.20 & Above
N
NORFOLK ROAD
NOT FOR CONSTRUCTION
DA APPROVAL ONLY
MBR Consulting Engineers Pty Ltd
ALL PLANS MUST BE PRINTED IN COLOUR & READ PRIOR TO CONSTRUCTION
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ARTiVA
CITY OF PARRAMATTA
Client
Ms. Yanna Guo
Scale
SCALE 1:100 @ A1
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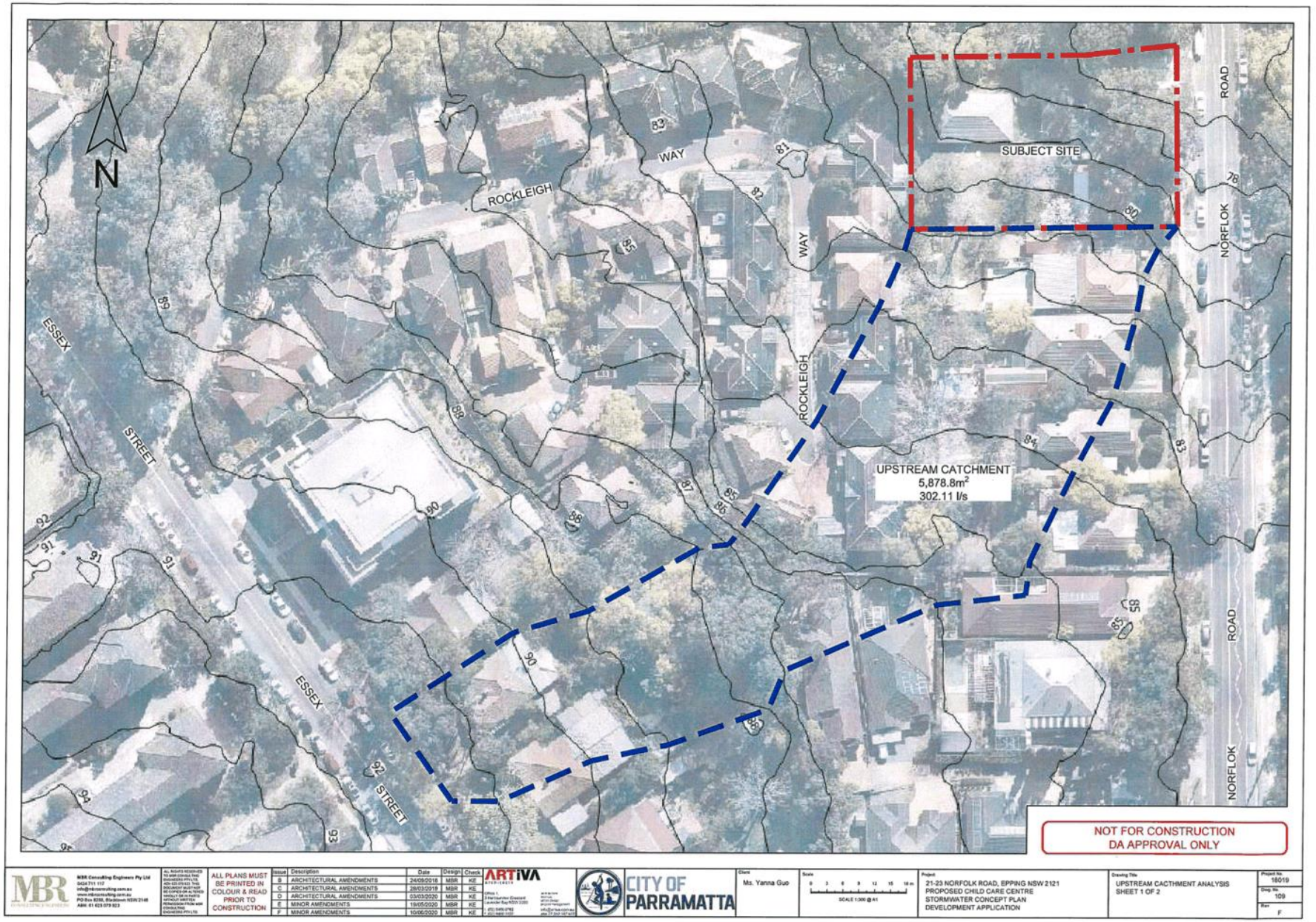
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION
Drawing Title
CUT-FILL PLAN
Project No. 18019
Dwg No. 108
Rev F


N
SUBJECT SITE
UPSTREAM CATCHMENT
5,878.8m²
302.11 l/s
ROCKLEIGH WAY
ROCKLEIGH
ESSEX STREET
NORFLOK ROAD
NOT FOR CONSTRUCTION
DA APPROVAL ONLY
ALL PLANS MUST BE PRINTED IN COLOUR & READ PRIOR TO CONSTRUCTION
CITY OF PARRAMATTA
Ms. Yanna Guo
21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION
UPSTREAM CACTHMENT ANALYSIS
SHEET 1 OF 2
18019
109
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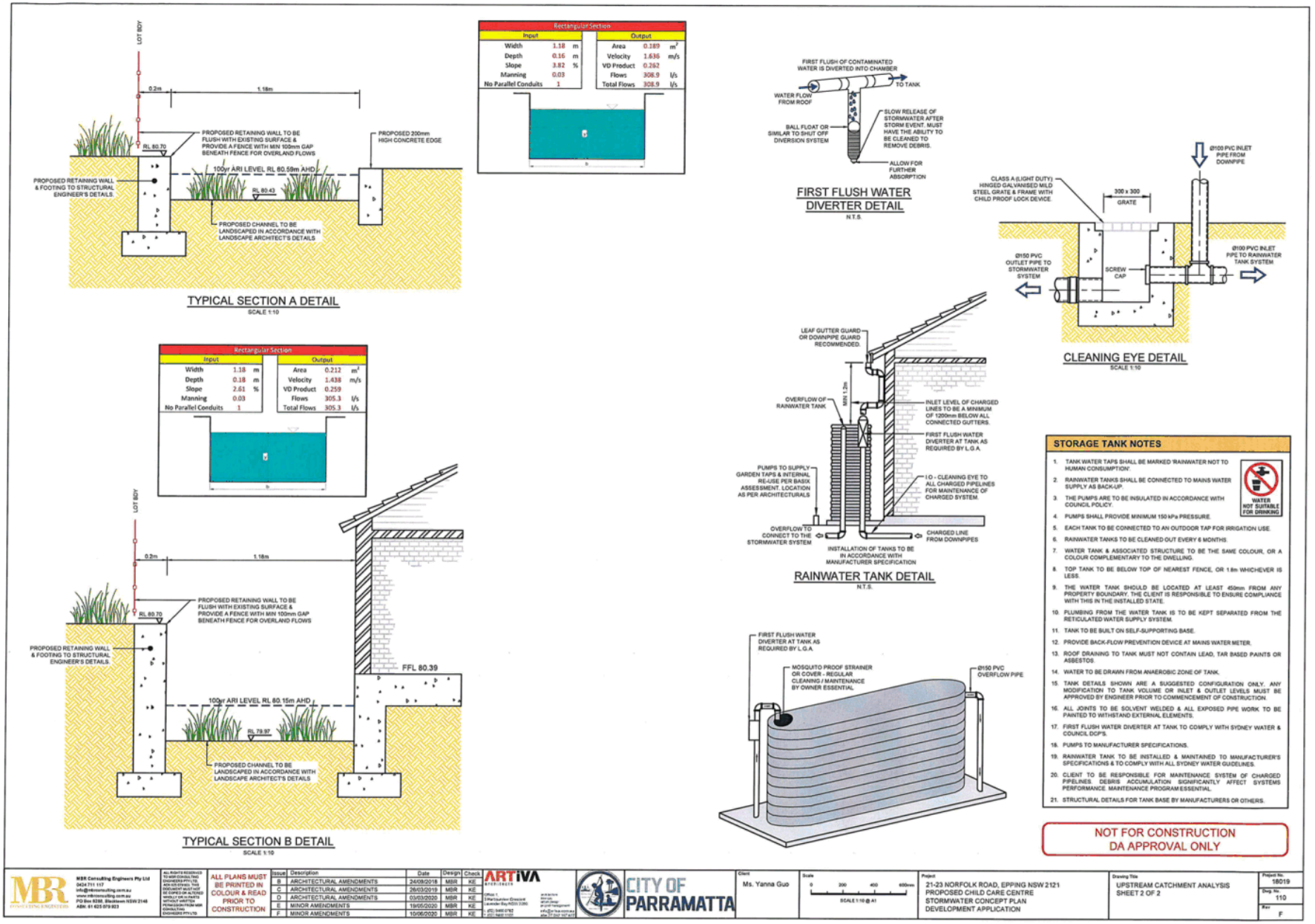
LOT BDY
0.2m
1.18m
RL 80.70
PROPOSED RETAINING WALL TO BE FLUSH WITH EXISTING SURFACE & PROVIDE A FENCE WITH MIN 100mm GAP BENEATH FENCE FOR OVERLAND FLOWS
PROPOSED 200mm HIGH CONCRETE EDGE
100yr ARI LEVEL RL 80.59m AHD
RL 80.43
PROPOSED RETAINING WALL & FOOTING TO STRUCTURAL ENGINEER'S DETAILS.
PROPOSED CHANNEL TO BE LANDSCAPED IN ACCORDANCE WITH LANDSCAPE ARCHITECT'S DETAILS
TYPICAL SECTION A DETAIL
SCALE 1:10
Rectangular Section
Input
Width 1.18 m
Depth 0.16 m
Slope 3.82 %
Manning 0.03
No Parallel Conduits 1
Output
Area 0.189 m²
Velocity 1.636 m/s
VD Product 0.262
Flows 308.9 l/s
Total Flows 308.9 l/s
FIRST FLUSH OF CONTAMINATED WATER IS DIVERTED INTO CHAMBER
TO TANK
WATER FLOW FROM ROOF
BALL FLOAT OR SIMILAR TO SHUT OFF DIVERSION SYSTEM
SLOW RELEASE OF STORMWATER AFTER STORM EVENT. MUST HAVE THE ABILITY TO BE CLEANED TO REMOVE DEBRIS.
ALLOW FOR FURTHER ABSORPTION
FIRST FLUSH WATER DIVERTER DETAIL
N.T.S.
Ø100 PVC INLET PIPE FROM DOWNPIPE
CLASS A (LIGHT DUTY) HINGED GALVANISED MILD STEEL GRATE & FRAME WITH CHILD PROOF LOCK DEVICE.
300 x 300 GRATE
Ø150 PVC OUTLET PIPE TO STORMWATER SYSTEM
SCREW CAP
Ø100 PVC INLET PIPE TO RAINWATER TANK SYSTEM
CLEANING EYE DETAIL
SCALE 1:10
Rectangular Section
Input
Width 1.18 m
Depth 0.18 m
Slope 2.61 %
Manning 0.03
No Parallel Conduits 1
Output
Area 0.212 m²
Velocity 1.438 m/s
VD Product 0.259
Flows 305.3 l/s
Total Flows 305.3 l/s
LOT BDY
0.2m
1.18m
RL 80.70
PROPOSED RETAINING WALL TO BE FLUSH WITH EXISTING SURFACE & PROVIDE A FENCE WITH MIN 100mm GAP BENEATH FENCE FOR OVERLAND FLOWS
PROPOSED RETAINING WALL & FOOTING TO STRUCTURAL ENGINEER'S DETAILS.
FFL 80.39
100yr ARI LEVEL RL 80.15m AHD
RL 79.97
PROPOSED CHANNEL TO BE LANDSCAPED IN ACCORDANCE WITH LANDSCAPE ARCHITECT'S DETAILS
TYPICAL SECTION B DETAIL
SCALE 1:10
LEAF GUTTER GUARD OR DOWNPIPE GUARD RECOMMENDED.
OVERFLOW OF RAINWATER TANK
MIN 1.2m
INLET LEVEL OF CHARGED LINES TO BE A MINIMUM OF 1200mm BELOW ALL CONNECTED GUTTERS.
FIRST FLUSH WATER DIVERTER AT TANK AS REQUIRED BY L.G.A.
PUMPS TO SUPPLY GARDEN TAPS & INTERNAL RE-USE PER BASIX ASSESSMENT. LOCATION AS PER ARCHITECTURALS
I.O - CLEANING EYE TO ALL CHARGED PIPELINES FOR MAINTENANCE OF CHARGED SYSTEM.
OVERFLOW TO CONNECT TO THE STORMWATER SYSTEM
CHARGED LINE FROM DOWNPIPES
INSTALLATION OF TANKS TO BE IN ACCORDANCE WITH MANUFACTURER SPECIFICATION
RAINWATER TANK DETAIL
N.T.S.
FIRST FLUSH WATER DIVERTER AT TANK AS REQUIRED BY L.G.A.
MOSQUITO PROOF STRAINER OR COVER - REGULAR CLEANING / MAINTENANCE BY OWNER ESSENTIAL
Ø150 PVC OVERFLOW PIPE
STORAGE TANK NOTES
1. TANK WATER TAPS SHALL BE MARKED 'RAINWATER NOT TO HUMAN CONSUMPTION'.
2. RAINWATER TANKS SHALL BE CONNECTED TO MAINS WATER SUPPLY AS BACK-UP.
3. THE PUMPS ARE TO BE INSULATED IN ACCORDANCE WITH COUNCIL POLICY.
4. PUMPS SHALL PROVIDE MINIMUM 150 kPa PRESSURE.
5. EACH TANK TO BE CONNECTED TO AN OUTDOOR TAP FOR IRRIGATION USE.
6. RAINWATER TANKS TO BE CLEANED OUT EVERY 6 MONTHS.
7. WATER TANK & ASSOCIATED STRUCTURE TO BE THE SAME COLOUR, OR A COLOUR COMPLEMENTARY TO THE DWELLING.
8. TOP TANK TO BE BELOW TOP OF NEAREST FENCE, OR 1.8m WHICHEVER IS LESS.
9. THE WATER TANK SHOULD BE LOCATED AT LEAST 450mm FROM ANY PROPERTY BOUNDARY. THE CLIENT IS RESPONSIBLE TO ENSURE COMPLIANCE WITH THIS IN THE INSTALLED STATE.
10. PLUMBING FROM THE WATER TANK IS TO BE KEPT SEPARATED FROM THE RETICULATED WATER SUPPLY SYSTEM.
11. TANK TO BE BUILT ON SELF-SUPPORTING BASE.
12. PROVIDE BACK-FLOW PREVENTION DEVICE AT MAINS WATER METER.
13. ROOF DRAINING TO TANK MUST NOT CONTAIN LEAD, TAR BASED PAINTS OR ASBESTOS.
14. WATER TO BE DRAWN FROM ANAEROBIC ZONE OF TANK.
15. TANK DETAILS SHOWN ARE A SUGGESTED CONFIGURATION ONLY. ANY MODIFICATION TO TANK VOLUME OR INLET & OUTLET LEVELS MUST BE APPROVED BY ENGINEER PRIOR TO COMMENCEMENT OF CONSTRUCTION.
16. ALL JOINTS TO BE SOLVENT WELDED & ALL EXPOSED PIPE WORK TO BE PAINTED TO WITHSTAND EXTERNAL ELEMENTS.
17. FIRST FLUSH WATER DIVERTER AT TANK TO COMPLY WITH SYDNEY WATER & COUNCIL DCP'S.
18. PUMPS TO MANUFACTURER SPECIFICATIONS.
19. RAINWATER TANK TO BE INSTALLED & MAINTAINED TO MANUFACTURER'S SPECIFICATIONS & TO COMPLY WITH ALL SYDNEY WATER GUIDELINES.
20. CLIENT TO BE RESPONSIBLE FOR MAINTENANCE SYSTEM OF CHARGED PIPELINES. DEBRIS ACCUMULATION SIGNIFICANTLY AFFECT SYSTEMS PERFORMANCE. MAINTENANCE PROGRAM ESSENTIAL.
21. STRUCTURAL DETAILS FOR TANK BASE BY MANUFACTURERS OR OTHERS.
WATER NOT SUITABLE FOR DRINKING
NOT FOR CONSTRUCTION
DA APPROVAL ONLY
MBR Consulting Engineers Pty Ltd
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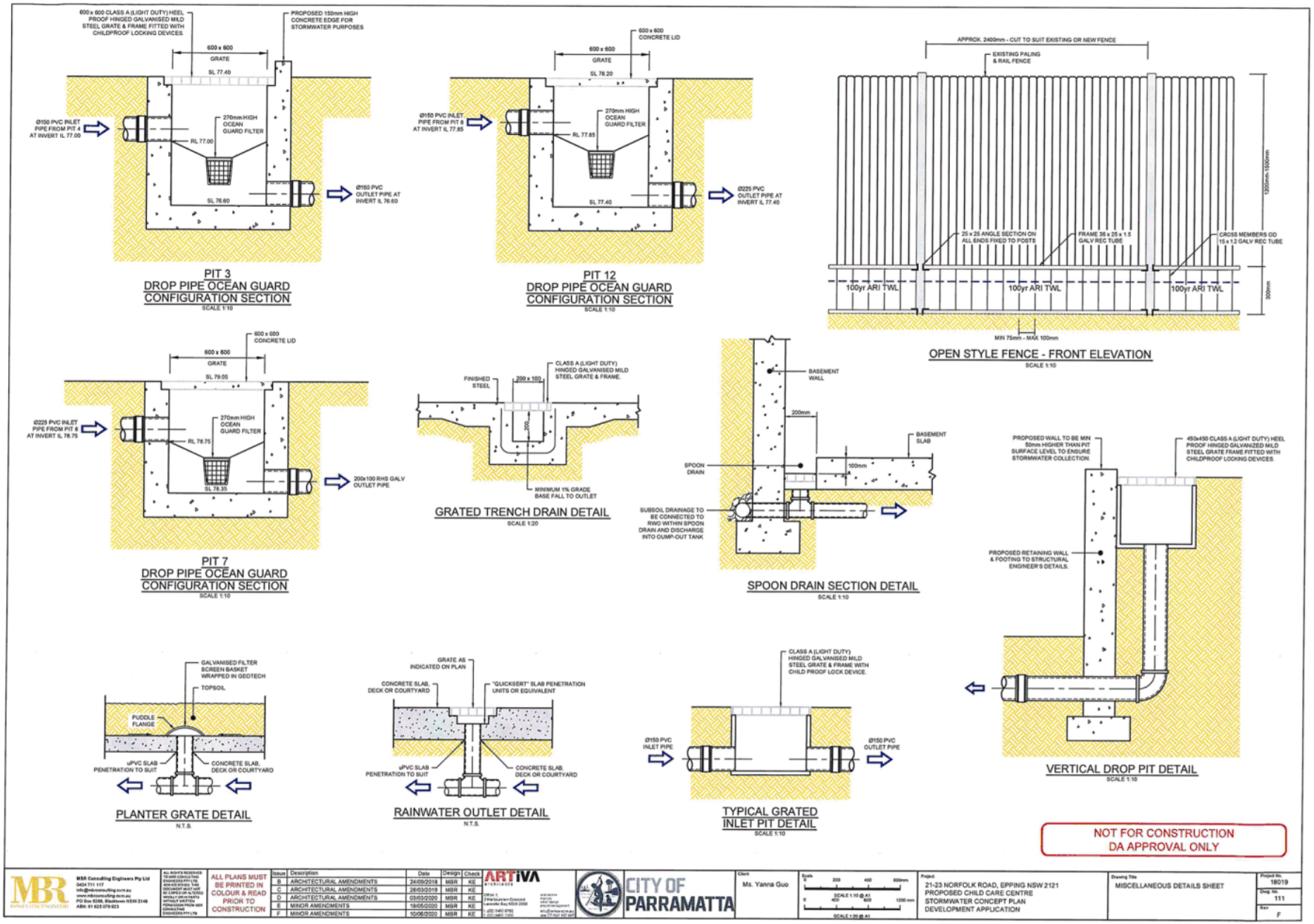
PO Box 8288, Blacktown NSW 2148
ABN: 61 625 079 823
ALL PLANS MUST BE PRINTED IN COLOUR & READ PRIOR TO CONSTRUCTION
Issue | Description | Date | Design | Check
B ARCHITECTURAL AMENDMENTS 24/09/2018 MBR KE
C ARCHITECTURAL AMENDMENTS 26/03/2019 MBR KE
D ARCHITECTURAL AMENDMENTS 03/03/2020 MBR KE
E MINOR AMENDMENTS 19/05/2020 MBR KE
F MINOR AMENDMENTS 10/06/2020 MBR KE
ARTiVA ARCHITECTS
CITY OF PARRAMATTA
Client: Ms. Yanna Guo
Scale: 0 200 400 600mm SCALE 1:10 @ A1
Project: 21-23 NORFOLK ROAD, EPPING NSW 2121 PROPOSED CHILD CARE CENTRE STORMWATER CONCEPT PLAN DEVELOPMENT APPLICATION
Drawing Title: UPSTREAM CATCHMENT ANALYSIS SHEET 2 OF 2
Project No. 18019
Dwg No. 110
Rev F


PIT 3
DROP PIPE OCEAN GUARD
CONFIGURATION SECTION
SCALE 1:10
PIT 12
DROP PIPE OCEAN GUARD
CONFIGURATION SECTION
SCALE 1:10
OPEN STYLE FENCE - FRONT ELEVATION
SCALE 1:10
PIT 7
DROP PIPE OCEAN GUARD
CONFIGURATION SECTION
SCALE 1:10
GRATED TRENCH DRAIN DETAIL
SCALE 1:20
SPOON DRAIN SECTION DETAIL
SCALE 1:10
VERTICAL DROP PIT DETAIL
SCALE 1:10
PLANTER GRATE DETAIL
N.T.S.
RAINWATER OUTLET DETAIL
N.T.S.
TYPICAL GRATED
INLET PIT DETAIL
SCALE 1:10
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21-23 NORFOLK ROAD, EPPING NSW 2121
PROPOSED CHILD CARE CENTRE
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION
MISCELLANEOUS DETAILS SHEET
18019
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